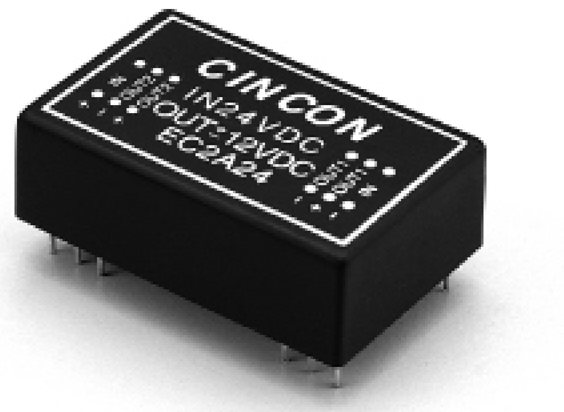
S E R I E S

EC2A

1.5 WATT DC-DC CONVERTERS



Features

- 24-Pin DIP Package
- Regulated Outputs
- 50% Efficiency
- Pi Input Filter
- Low Ripple and Noise

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT ULL LOAD	CASE
EC2A01		5 VDC	300 mA		620 mA	
EC2A02		12 VDC	125 mA		550 mA	
EC2A03	5 VDC	15 VDC	100 mA	110 mA	550 mA	A
EC2A04		±12 VDC	±60 mA		550 mA	
EC2A05		±15 VDC	±50 mA		550 mA	
EC2A11		5 VDC	300 mA		260 mA	
EC2A12		12 VDC	125 mA		215 mA	
EC2A13	12 VDC	15 VDC	100 mA	40 mA	215 mA	A
EC2A14		±12 VDC	±60 mA		215 mA	
EC2A15		±15 VDC	±50 mA		215 mA	
EC2A21		5 VDC	300 mA		130 mA	
EC2A22		12 VDC	125 mA		115 mA	
EC2A23	24 VDC	15 VDC	100 mA	20 mA	115 mA	A
EC2A24		±12 VDC	±60 mA		115 mA	
EC2A25		±15 VDC	±50 mA		115 mA	
EC2A31		5 VDC	300 mA		110 mA	
EC2A32		12 VDC	125 mA		100 mA	
EC2A33	28 VDC	15 VDC	100 mA	20 mA	100 mA	A
EC2A34		±12 VDC	±60 mA		100 mA	
EC2A35		±15 VDC	±50 mA		100 mA	
EC2A41		5 VDC	300 mA		65 mA	
EC2A42		12 VDC	125 mA		60 mA	
EC2A43	48 VDC	15 VDC	100 mA	15 mA	60 mA	A
EC2A44		±12 VDC	±60 mA		60 mA	
EC2A45		±15 VDC	±50 mA		60 mA	

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... ±10%
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy .... ± 4.0% max.
Temperature Coefficient .... ± 0.02% / °C
Ripple and Noise, 20MHz BW .... 50mV p-p max.
Short Circuit Protection .... Momentary
Line Regulation .... ± 0.3%
Load Regulation .... ± 0.5%

GENERAL SPECIFICATIONS:

Efficiency 50%
Isolation Capacitance 30pF
Isolation Resistance .... 10^9 ohms
Switching Frequency .... 20KHz, min
Operating Temperature Range .... -25°C to + 71°C
Case Temperature (Plastic case) .... 95°C max.
(Copper case) .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40°C to + 100°C
Dimensions .... 1.25 x 0.8 x 0.4 inches
(31.8 x 20.3 x 10.2mm)

ISOLATION VOLTAGE:

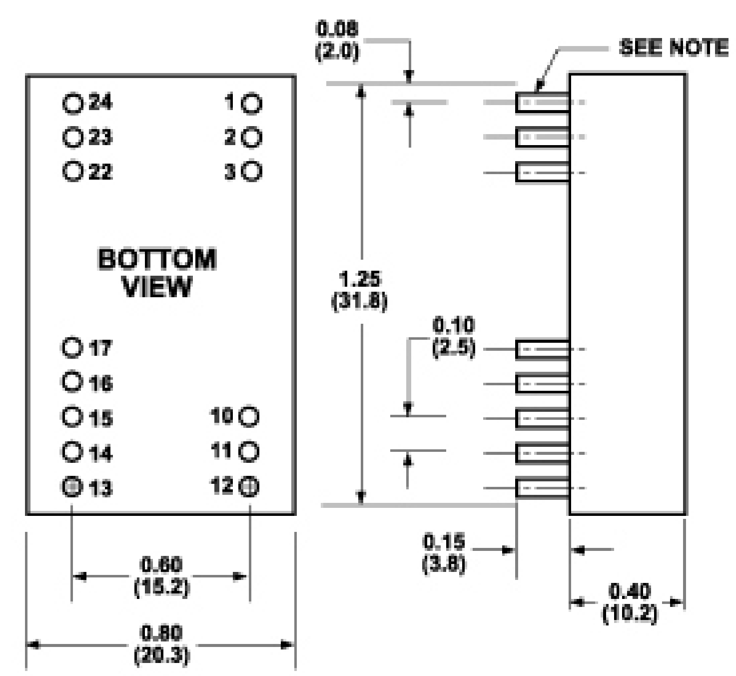
500 VDC min. .... Standard Models
3K VDC min. .... Suffix "H" Models

CASE MATERIAL:

Standard Models .... Non-Conductive Black Plastic
Suffix "M" Models .... Black Coated Copper
with Non-Conductive Base

CASE A

NOTE:Pin Size is .02" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010



PIN CONNECTION					
500 VDC			3K VDC		
Pin	Single Output	Dual Output	Pin	Single Output	Dual Output
1 24	+V Input	+V Input	1 2,3	+V Input	+V Input
2 23	NC	-V Output	22,23,24	-V Input	-V Input
3 22	NC	Common	10 11	NP	Go Output
10	-V Output	Common	12	-V Output	-TP
11	+V Output	+V Output	13	+V Output	-V Output
12	-V Input	-V Input	14	NP	NP
13	-V Input	-V Input	15	NP	+V Output
14	+V Output	+V Output	16	NP	+TP
15	-V Output	Common	17	+TP	NP

*NP-NO PIN
*TP-TEST POINT
*NC-NO CONNECTION WITH PIN
*GO-GROUND

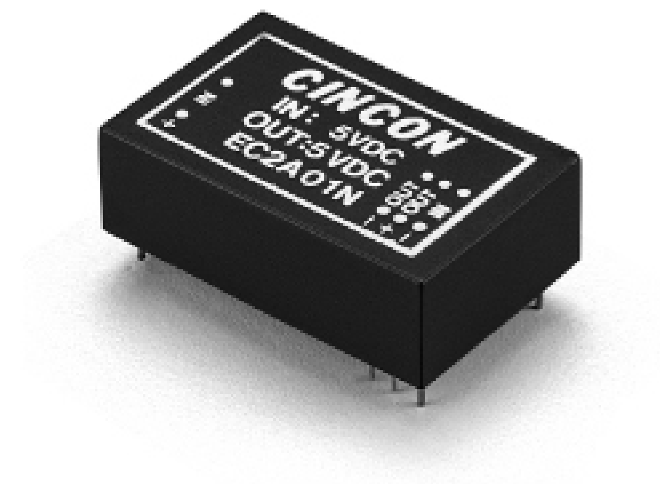
All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

EC2A

S E R I E S

EC2AN

1.0 TO 1.5 WATT DC-DC CONVERTERS



Features

- 24-Pin DIP Package
- Pi Input Filter
- Unregulated Outputs
- Low Ripple and Noise
- 70% Efficiency

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	CASE
EC2A01N		5 VDC	220mA	115 mA	330 mA	
EC2A02N		12 VDC	125 mA	115 mA	420 mA	
EC2A03N	5 VDC	15 VDC	100 mA	115 mA	420 mA	A
EC2A04N		±12 VDC	±62 mA	115 mA	420 mA	
EC2A05N		±15 VDC	±50 mA	115 mA	420 mA	
EC2A11N		5 VDC	220 mA	45 mA	120 mA	
EC2A12N		12 VDC	125 mA	45 mA	165 mA	
EC2A13N	12 VDC	15 VDC	100 mA	45 mA	165 mA	A
EC2A14N		±12 VDC	±62 mA	45 mA	165 mA	
EC2A15N		±15 VDC	±50 mA	45 mA	165 mA	

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... ±10%
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy .... ±3.0% max.
Ripple and Noise, 20MHz BW[1] .... 100mV p-p max.
Short Circuit Protection .... Momentary
Line Regulation[2] .... ±1.2%
Load Regulation[3], EC2A01N .... ±8.0%
All Other Models .... ±6.0%

GENERAL SPECIFICATIONS:

Efficiency .... 60%~80%
Isolation Capacitance 30pF
Isolation Resistance .... 10^9ohms
Switching Frequency .... 20KHz, min
Operating Temperature Range .... -25°C to + 71°C
Case Temperature (Plastic case) .... 95°C max.
(Copper case) .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40°C to + 100°C
Dimensions .... 1.25 x 0.8 x 0.4 inches (31.8 x 20.3 x 10.2mm)

ISOLATION VOLTAGE:

500 VDC min .... Standard Models
3K VDC min[4] .... Suffix "H" Models

CASE MATERIAL:

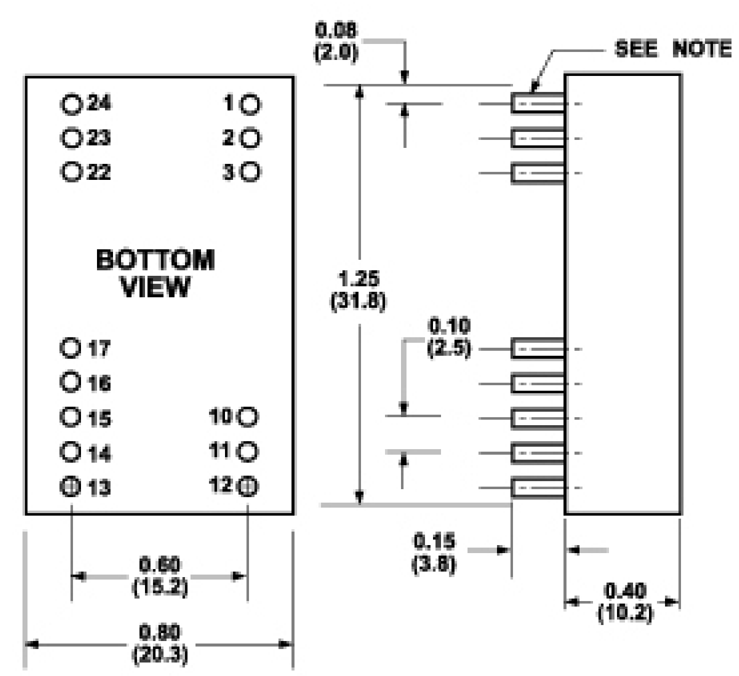
Standard Models .... Non-Conductive Black Plastic
Suffix "M" Models .... Black Coated Copper with Non-Conductive Base

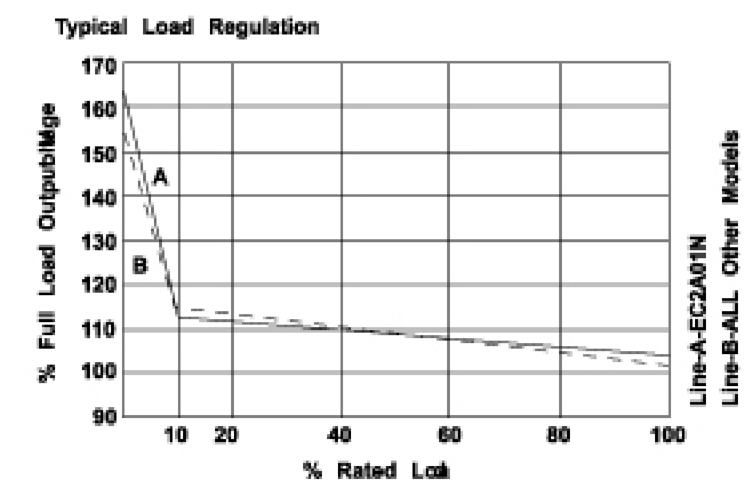
NOTE:

1. 15 µF 35V, Tantalum Capacitor Across Each Output.
2. Line regulation is per 1.0% change in input voltage.
3. Load regulation is for load change from 100% to 20% See graph of load regulation.
4. Suffix "HM" 1.5K VDC Instead of 3K VDC Isolation

CASE A

NOTE:Pin Size is 0.02" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010





PIN CONNECTION					
500 VDC			1.5K & 3K VDC		
Pin	Single Output	Dual Output	Pin	Single Output	Dual Output
1 24	+V Input	+V Input	1 2,3	+V Input	+V Input
2 23	NC	-V Output	22,23,24	-V Input	-V Input
3 22	NC	Common	10 11	NP	Go Output
10	-V Output	Common	12	-V Output	-TP
11	+V Output	+V Output	13	+V Output	-V Output
12	-V Input	-V Input	14	NP	NP
13	-V Input	-V Input	15	NP	+V Output
14	+V Output	+V Output	16	NP	+TP
15	-V Output	Common	17	+TP	NP

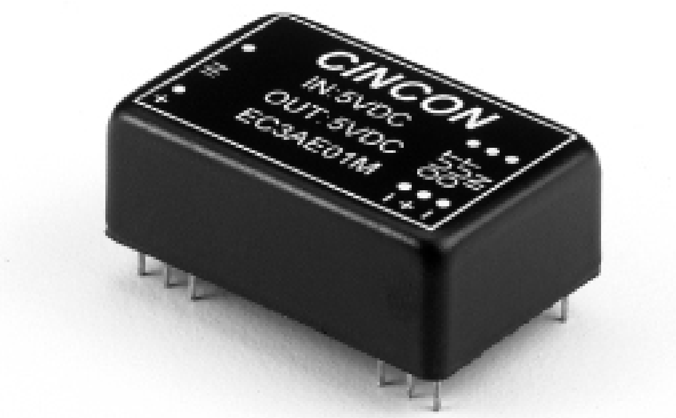
*NP-NO PIN *TP-TEST POINT
*NC-NO CONNECTION WITH PIN *GO-GROUND

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC3AE

3 WATT DC-DC CONVERTERS



Features

- 3W Isolated Output
- 24-Pin DIP Package
- Efficiency to 61%
- Regulated Outputs
- Low Ripple and Noise
- LC Input Filter

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	%EFF	CASE
EC3AE01M		5 VDC	600 mA				
EC3AE02M		12 VDC	250 mA				
EC3AE03M	5 VDC	15 VDC	200 mA	120 mA	984 mA	61	A
EC3AE04M		±12 VDC	±125 mA				
EC3AE05M		±15 VDC	±100 mA				
EC3AE11M		5 VDC	600 mA				
EC3AE12M		12 VDC	250 mA				
EC3AE13M	12 VDC	15 VDC	200 mA	60 mA	410 mA	61	A
EC3AE14M		±12 VDC	±125 mA				
EC3AE15M		±15 VDC	±100 mA				
EC3AE21M		5 VDC	600 mA				
EC3AE22M		12 VDC	250 mA				
EC3AE23M	24 VDC	15 VDC	200 mA	40 mA	205 mA	61	A
EC3AE24M		±12 VDC	±125 mA				
EC3AE25M		±15 VDC	±100 mA				
EC3AE31M		5 VDC	600 mA				
EC3AE32M		12 VDC	250 mA				
EC3AE33M	28 VDC	15 VDC	200 mA	35 mA	176 mA	61	A
EC3AE34M		±12 VDC	±125 mA				
EC3AE35M		±15 VDC	±100 mA				
EC3AE41M		5 VDC	600 mA				
EC3AE42M		12 VDC	250 mA				
EC3AE43M	48 VDC	15 VDC	200 mA	20 mA	102 mA	61	A
EC3AE44M		±12 VDC	±125 mA				
EC3AE45M		±15 VDC	±100 mA				

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... ±10%
Input Filter .... LC Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy .... ± 3.0% max.
Temperature Coefficient .... ± 0.02% / °C
Ripple and Noise, 20MHz BW .... 50mV p-p max.
Short Circuit Protection .... Indefinite & Current Limit
Line Regulation[1], Single/Dual .... ± 0.3% max.
Load Regulation[2], Single .... ± 0.5% max.
Dual .... ± 1.0% max.

GENERAL SPECIFICATIONS:

Efficiency .... See Table
Isolation Capacitance .... 150pF Typ.
Isolation Resistance .... 10^9 ohms
Switching Frequency .... 80KHz, Typ.
Operating Temperature Range .... -25°C to + 71°C
Case Temperature .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40°C to + 100°C
Dimensions .... 1.25 x 0.8 x 0.4 inches (31.8 x 20.3 x 10.2mm)

ISOLATION VOLTAGE:

500 VDC min. .... Standard Models

CASE MATERIAL:

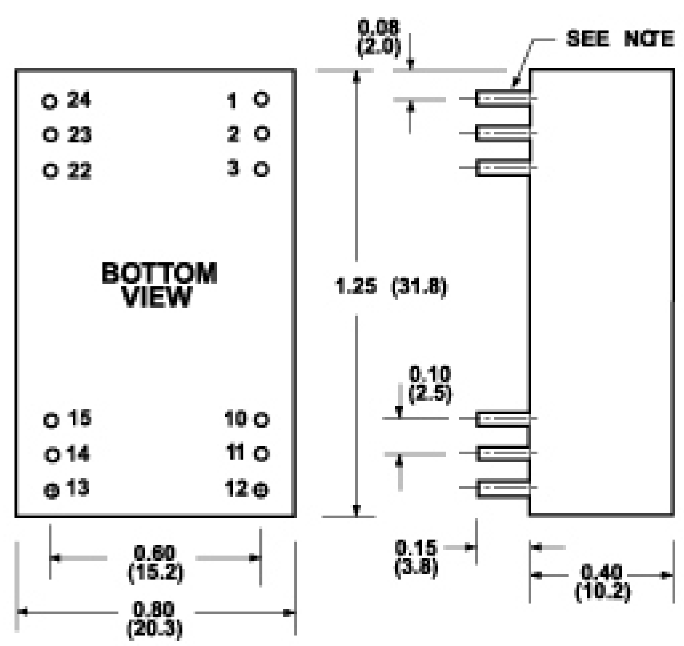
Standard Models .... Black Coated Copper with Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load

CASE A

NOTE:Pin Size is 0.02" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010



PIN CONNECTION
500 VDC

Pin	Single Output	Dual Output
1, 24	+V Input	+V Input
2, 23	NC	-V Output
3, 22	NC	Common
10	-V Output	Common
11	+V Output	+V Output
12	-V Input	-V Input
13	-V Input	-V Input
14	+V Output	+V Output
15	-V Output	Common

*NC-NO CONNECTION WITH PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC3A

3 WATT WIDE INPUT DC-DC CONVERTERS

E178177 H/HM Versions Only

Features

- 3W Isolated Output
- 24-Pin DIP Package
- Efficiency to 80%
- 2:1 Input Range
- Regulated Outputs
- Pi Input Filter
- Continuous Short Circuit Protection

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	NPUT CURRENT I NO LOAD	ULL LOAD	EFF.	CASE
EC3A01		5 VDC	600 mA	15 mA	850 mA	70	
EC3A02		12 VDC	250 mA	15 mA	800 mA	75	
EC3A03		15 VDC	200 mA	15 mA	800 mA	75	
EC3A04	4.5-6.0 VDC	±5 VDC	±300 mA	25 mA	850 mA	70	A
EC3A05		±12 VDC	±125 mA	25 mA	800 mA	75	
EC3A06		±15 VDC	±100 mA	25 mA	800 mA	75	
EC3A07		3.3 VDC	600 mA	15 mA	619 mA	64	
EC3A11		5 VDC	600 mA	7.5 mA	340 mA	73	
EC3A12		12 VDC	250 mA	7.5 mA	320 mA	78	
EC3A13		15 VDC	200 mA	7.5 mA	320 mA	78	
EC3A14	9-18 VDC	±5 VDC	±300 mA	12 mA	340 mA	73	A
EC3A15		±12 VDC	±125 mA	12 mA	320 mA	78	
EC3A16		±15 VDC	±100 mA	12 mA	320 mA	78	
EC3A17		3.3 VDC	600 mA	7.5 mA	236 mA	70	
EC3A21		5 VDC	600 mA	5 mA	168 mA	74	
EC3A22		12 VDC	250 mA	5 mA	156 mA	80	
EC3A23		15 VDC	200 mA	5 mA	156 mA	80	
EC3A24	18-36 VDC	±5 VDC	±300 mA	7.5 mA	168 mA	74	A
EC3A25		±12 VDC	±125 mA	7.5 mA	156 mA	80	
EC3A26		±15 VDC	±100 mA	7.5 mA	156 mA	80	
EC3A27		3.3 VDC	600 mA	5 mA	113 mA	73	
EC3A31		5 VDC	600 mA	2 mA	82 mA	76	
EC3A32		12 VDC	250 mA	2 mA	78 mA	80	
EC3A33		15 VDC	200 mA	2 mA	78 mA	80	
EC3A34	36-72 VDC	±5 VDC	±300 mA	3 mA	82 mA	76	A
EC3A35		±12 VDC	±125 mA	3 mA	80 mA	78	
EC3A36		±15 VDC	±100 mA	3 mA	80 mA	78	
EC3A37		3.3 VDC	600 mA	3 mA	58 mA	71	

NOTE: 1. Nominal Input Voltage 5, 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range....5V....4.5-6V
12V....9-18V
24V....18-36V
48V....36-72V
Input Filter....Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy....± 2.0% max.
Voltage Balance (Dual)....±1.0% max.
Temperature Coefficient....± 0.05% / °C
Ripple and Noise, 20MHz BW....3.3V / 5V....100mV p-p max.
12V / 15V....1% p-p max.
Short Circuit Protection....Continuous
Line Regulation, Single/Dual[1]....± 0.5%
Load Regulation, Single[2]....± 0.5%
Dual[3]....± 1.0%

GENERAL SPECIFICATIONS:

Efficiency....See Table
Isolation Resistance....10^8 Ohms
Switching Frequency....100kHz min.
Operating Temperature Range....-25°C to +71°C
Case Temperature (Plastic case)....95°C max.
(Copper case)....100°C max.
Cooling....Free-Air Convection
Storage Temperature Range....-40°C to +100°C
Dimensions....1.25 x 0.8 x 0.4 inches
(31.8 x 20.3 x 10.2 mm)

ISOLATION VOLTAGE:

500 VDC min....Standard Models
3K VDC min[5]....Suffix "H" Models

CASE MATERIAL:

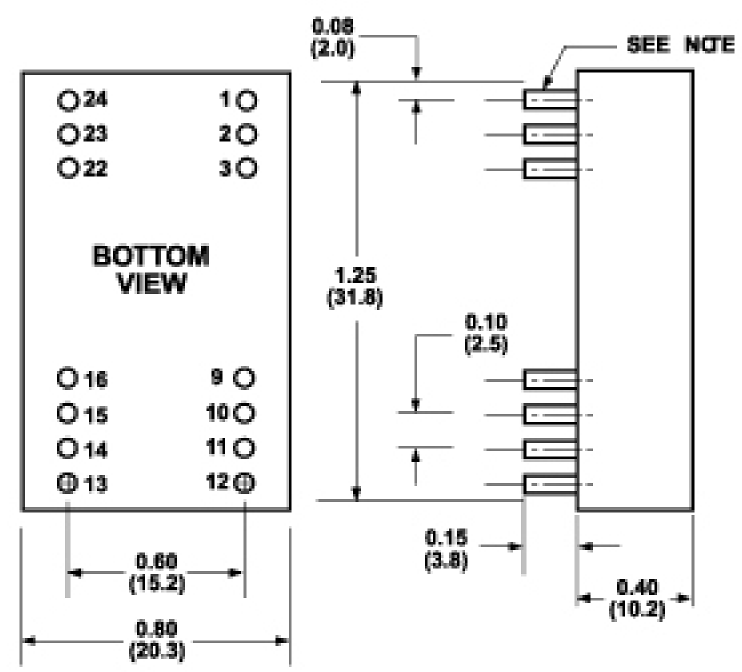
Standard Models....Non-Conductive Black Plastic
Suffix "M" Models[4]....Black Coated Copper with Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load
4. Non-Conductive Black Plastic Only
5. Suffix "HM" 1.5K VDC Instead of 3K VDC Isolation

CASE A

NOTE:Pin Size is 0.02" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010



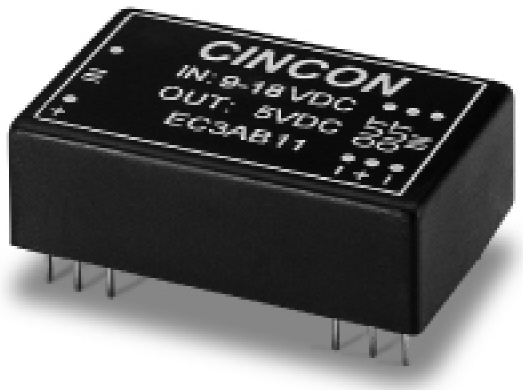
PIN CONNECTION					
	500 VDC			1.5K & 3K VDC	
Pin	Single Output	Dual Output	Pin	Single Output	Dual Output
1	+V Input	+V Input	1	NP	NP
2	NC	-V Output	2	-V Input	-V Input
3	NC	Common	3	-V Input	-V Input
9	NP	NP	9	NC	Common
10	-V Output	Common	10	NC	NC
11	+V Output	+V Output	11	NC	-V Output
12	-V Input	-V Input	12	NP	NP
13	-V Input	-V Input	13	NP	NP
14	+V Output	+V Output	14	+V Output	+V Output
15	-V Output	Common	15	NC	NC
16	NP	NP	16	-V Output	Common
22	NC	Common	22	+V Input	+V Input
23	NC	-V Output	23	+V Input	+V Input
24	+V Input	+V Input	24	NP	NP

*NP-NO PIN
*NC-NO CONNECTION WITH PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC3AB



3 WATT WIDE INPUT DC-DC CONVERTERS

E176177 H/HM Versions Only

Features

- 3W Isolated Output
- 24-Pin DIP Package
- Efficiency to 80%
- 2:1 Input Range
- Regulated Outputs
- Pi Input Filter
- Continuous Short Circuit Protection
- Meets EN55022 Class B, Conducted
- Remote ON/OFF Option

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF.	CASE
EC3AB11		5 VDC	600 mA	7.5 mA	340 mA	73	
EC3AB12		12 VDC	250 mA	7.5 mA	320 mA	78	
EC3AB13		15 VDC	200 mA	7.5 mA	329 mA	76	
EC3AB14	9-18 VDC	±5 VDC	±300 mA	12 mA	340 mA	73	A
EC3AB15		±12 VDC	±125 mA	12 mA	329 mA	76	
EC3AB16		±15 VDC	±100 mA	12 mA	333 mA	75	
EC3AB17		3.3 VDC	600 mA	7.5 mA	236 mA	70	
EC3AB21		5 VDC	600 mA	5 mA	168 mA	74	
EC3AB22		12 VDC	250 mA	5 mA	156 mA	80	
EC3AB23		15 VDC	200 mA	5 mA	156 mA	80	
EC3AB24	18-36 VDC	±5 VDC	±300 mA	7.5 mA	168 mA	74	A
EC3AB25		±12 VDC	±125 mA	7.5 mA	156 mA	80	
EC3AB26		±15 VDC	±100 mA	7.5 mA	160 mA	78	
EC3AB27		3.3 VDC	600 mA	5 mA	113 mA	73	
EC3AB31		5 VDC	600 mA	2 mA	82 mA	76	
EC3AB32		12 VDC	250 mA	2 mA	82 mA	77	
EC3AB33		15 VDC	200 mA	2 mA	82 mA	77	
EC3AB34	36-72 VDC	±5 VDC	±300 mA	3 mA	82 mA	76	A
EC3AB35		±12 VDC	±125 mA	3 mA	82 mA	76	
EC3AB36		±15 VDC	±100 mA	3 mA	82 mA	76	
EC3AB37		3.3 VDC	600 mA	3 mA	58 mA	71	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... 12V 9-18V
24V 18-36V
48V 36-72V
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy .... ± 2.0% max.
Voltage Balance (Dual) .... ± 1.0% max.
Temperature Coefficient .... ± 0.05% / °C
Ripple and Noise, 20MHz BW .... 3.3V / 5V .... 100mV p-p max.
12V / 15V .... 1% p-p max.
Short Circuit Protection .... Continuous
Line Regulation, Single/Dual[1] .... ± 0.5%
Load Regulation, Single[2] .... ± 0.5%
Dual[3] .... ± 1.0%

GENERAL SPECIFICATIONS:

Efficiency .... See Table
Isolation Resistance .... 10^9 ohms
Switching Frequency .... 100KHz, min
Operating Temperature Range .... -25 C to + 71 C
Case Temperature (Plastic case) .... 95°C max.
(Copper case) .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40 C to + 100 C
EMI / RFI .... Conductive EMI Meet EN55022 Class B
Dimensions .... 1.25 x 0.8 x 0.5 inches (31.8 x 20.3 x 12.7mm)

ISOLATION VOLTAGE:

500 VDC min .... Standard Models
3K VDC min[5] .... Suffix "H" Models

CASE MATERIAL:

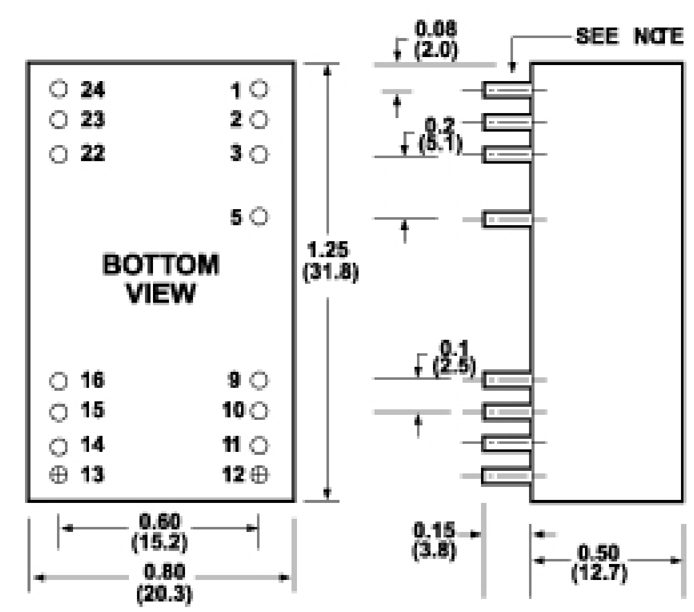
Standard Models .... Non-Conductive Black Plastic
Suffix "M" Models[4] .... Black Coated Copper with Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load
4. Non-Conductive Black Plastic Only
5. Suffix "HM" 1.5K VDC Instead of 3K VDC Isolation
6. Suffix "T" to the Model Number with Remote On/Off for "H"/"HM" Versions Only

CASE A

NOTE:Pin Size is 0.02" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010



Remote On/Off Control	
Logic Compatibility	CMOS or Open Collector TTL
Ec-On	>+5.5 VDC or Open Circuit
Ec-Off	<1.8 VDC
Shutdown Idle Current	10mA
Control Common	Referenced to Input Minus

PIN CONNECTION

Pin	500 VDC Single Output	500 VDC Dual Output	Pin	1.5K & 3K VDC Single Output	1.5K & 3K VDC Dual Output
1	+V Input	+V Input	1	NP	NP
2	NC	-V Output	2	-V Input	-V Input
3	NC	Common	3	-V Input	-V Input
5	NP	NP	5	NP (Remote On/Off)	
9	NP	NP	9	NC	Common
10	-V Output	Common	10	NC	NC
11	+V Output	+V Output	11	NC	-V Output
12	-V Input	-V Input	12	NP	NP
13	-V Input	-V Input	13	NP	NP
14	+V Output	+V Output	14	+V Output	+V Output
15	-V Output	Common	15	NC	NC
16	NP	NP	16	-V Output	Common
22	NC	Common	22	+V Input	+V Input
23	NC	-V Output	23	+V Input	+V Input
24	+V Input	+V Input	24	NP	NP

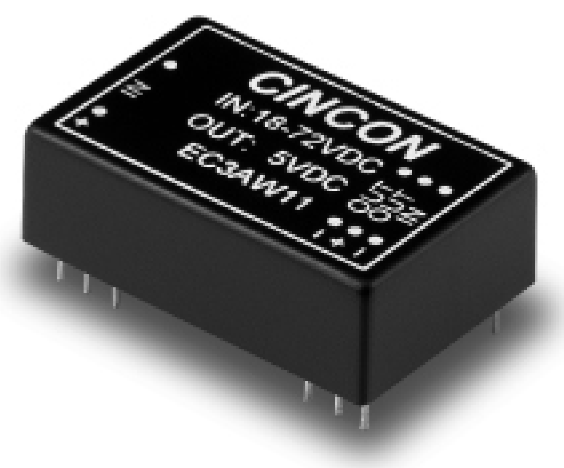
*NP-NO PIN *NC-NO CONNECTION WITH PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC3AW

3 WATT WIDE INPUT DC-DC CONVERTERS



Features

- 3W Isolated Output
- 24-Pin DIP Package
- Efficiency to 80%
- Continuous Short Circuit Protection
- 4 : 1 Input Range
- Regulated Outputs
- Pi Input Filter

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	NPUT CURRENTI NO LOAD	FULL LOAD	EFF.	%CASE
EC3AW01		5 VDC	600 mA	15 mA	174 mA	72	
EC3AW02		12 VDC	250 mA	15 mA	165 mA	76	
EC3AW03		15 VDC	200 mA	15 mA	165 mA	76	
EC3AW04	9-36VDC	±5 VDC	±300 mA	25 mA	179 mA	70	A
EC3AW05		±12 VDC	±125 mA	25 mA	174 mA	72	
EC3AW06		±15 VDC	±100 mA	25 mA	174 mA	72	
EC3AW07		3.3 VDC	600 mA	15 mA	117 mA	70	
EC3AW11		5 VDC	600 mA	7.5 mA	87 mA	72	
EC3AW12		12 VDC	250 mA	7.5 mA	78 mA	80	
EC3AW13		15 VDC	200 mA	7.5 mA	78 mA	80	
EC3AW14	18-72VDC	±5 VDC	±300 mA	12 mA	88 mA	71	A
EC3AW15		±12 VDC	±125 mA	12 mA	87 mA	72	
EC3AW16		±15 VDC	±100 mA	12 mA	87 mA	72	
EC3AW17		3.3 VDC	600 mA	7.5 mA	58 mA	70	

NOTE:1.Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........24V........9-36V
48V........18-72V
Input Filter........Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy........± 2.0% max.
Voltage Balance (Dual)........± 1.0% max.
Temperature Coefficient........± 0.05% /°C
Ripple and Noise, 20MHz BW, Single & ±5V........100mV p-p max.
Dual........1% p-p max.
Short Circuit Protection........Continuous
Line Regulation[1], Single/Dual........± 0.5% max.
Load Regulation, Single[2]........± 0.5% max.
Dual[3]........± 1% max.

GENERAL SPECIFICATIONS:

Efficiency........See Table
Isolation Resistance........10^9 Ohms
Switching Frequency........100kHz min.
Operating Temperature Range........-25°C to +71°C
Case Temperature (Plastic case)........95°C max.
(Copper case)........100°C max.
Cooling........Free-Air Convection
Storage Temperature Range........-40°C to +100°C
Dimensions........1.25 x 0.8 x 0.4 inches
(31.8 x 20.3 x 10.2 mm)

ISOLATION VOLTAGE:

500 VDC min.........Standard Models
3K VDC min[4]........Suffix "H" Models

CASE MATERIAL:

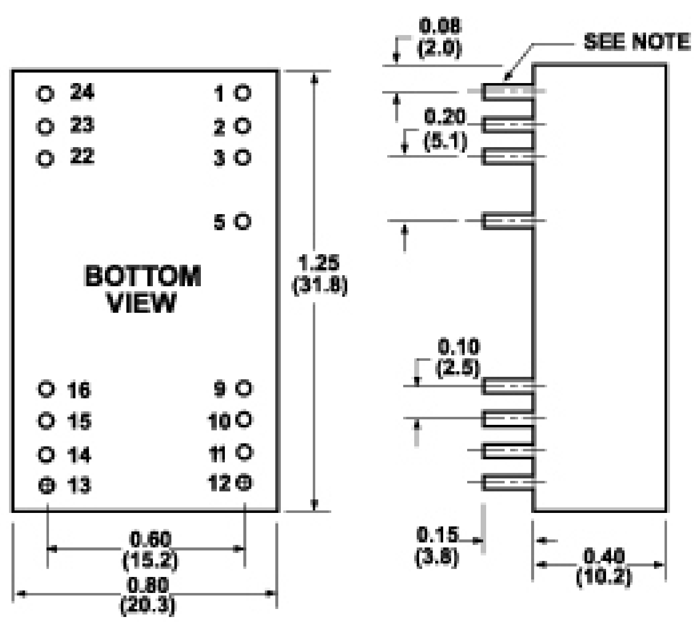
Standard Models........Non-Conductive Black Plastic
Suffix "M" Models[5]........Black Coated Copper with Non-Conductive Base

NOTE:

1. Measured From High Line to low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load
4. Non-Conductive Black Plastic Only
5. Suffix "HM" 1.5KVDC Instead of 3KVDC Isolation

CASE A

NOTE:Pin Size is 0.02" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010



PIN CONNECTION

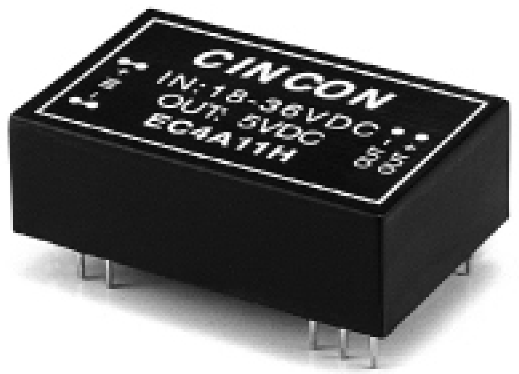
Pin	500 VDC Single Output	Dual Output	Pin	1.5K & 3K VDC Single Output	Dual Output
1	+V Input	+V Input	1	NP	NP
2	NC	-V Output	2	-V Input	-V Input
3	NC	Common	3	-V Input	-V Input
5	NP	NP	5	NP	NP
9	NP	NP	9	NC	Common
10	-V Output	Common	10	NC	NC
11	+V Output	+V Output	11	NC	-V Output
12	-V Input	-V Input	12	NP	NP
13	-V Input	-V Input	13	NP	NP
14	+V Output	+V Output	14	+V Output	+V Output
15	-V Output	Common	15	NC	NC
16	NP	NP	16	-V Output	Common
22	NC	Common	22	+V Input	+V Input
23	NC	-V Output	23	+V Input	+V Input
24	+V Input	+V Input	24	NP	NP

*NP-NO PIN
*NC-NO CONNECTION WITH PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC4A



5-6 WATT WIDE INPUT DC-DC CONVERTERS

E176177 H/HM Versions Only

Features

- 5-6 W Isolated Output
- 24-Pin DIP Package
- Efficiency to 82%
- 2:1 Input Range
- Regulated Outputs
- Pi Input Filter
- Continuous Short Circuit Protection

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF.	CASE
EC4A01		5 VDC	1000 mA	7.5 mA	545 mA	76	
EC4A02		12 VDC	470 mA	7.5 mA	585 mA	80	
EC4A03		15 VDC	400 mA	7.5 mA	625 mA	80	
EC4A04	9-18 VDC	±12 VDC	±230 mA	12 mA	575 mA	80	A
EC4A05		±15 VDC	±190 mA	12 mA	590 mA	80	
EC4A06		±5 VDC	±500 mA	12 mA	545 mA	76	
EC4A07		3.3 VDC	1000 mA	7.5 mA	393 mA	70	
EC4A11		5 VDC	1000 mA	5 mA	265 mA	78	
EC4A12		12 VDC	470 mA	5 mA	285 mA	82	
EC4A13		15 VDC	400 mA	5 mA	305 mA	82	
EC4A14	18-36 VDC	±12 VDC	±230 mA	7.5 mA	285 mA	81	A
EC4A15		±15 VDC	±190 mA	7.5 mA	295 mA	81	
EC4A16		±5 VDC	±500 mA	7.5 mA	265 mA	78	
EC4A17		3.3 VDC	1000 mA	5 mA	197 mA	70	
EC4A21		5 VDC	1000 mA	2 mA	133 mA	78	
EC4A22		12 VDC	470 mA	2 mA	145 mA	81	
EC4A23		15 VDC	400 mA	2 mA	154 mA	81	
EC4A24	36-72 VDC	±12 VDC	±230 mA	3 mA	142 mA	81	A
EC4A25		±15 VDC	±190 mA	3 mA	147 mA	81	
EC4A26		±5 VDC	±500 mA	3 mA	133 mA	78	
EC4A27		3.3 VDC	1000 mA	2 mA	98 mA	70	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... 12V 9-18V
24V 18-36V
48V 36-72V
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy .... ±2.0% max.
Voltage Balance (Dual) .... ±1.0% max.
Temperature Coefficient .... ±0.05%/°C
Ripple and Noise, 20MHz BW .... 3.3V/5V .... 100mV p-p max.
12V/15V .... 1% p-p max.
Short Circuit Protection .... Continuous
Line Regulation, Single/Dual[1] .... ± 0.5%
Load Regulation, Single[2] .... ± 0.5%
Dual[3] .... ± 1.0%

GENERAL SPECIFICATIONS:

Efficiency .... See Table
Isolation Resistance .... 10^9 ohms
Switching Frequency .... 100KHz, min
Operating Temperature Range .... -25 C to + 71 C
Case Temperature (Plastic case) .... 95°C max.
(Copper case) .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40 C to + 100 C
Dimensions .... 1.25 x 0.8 x 0.4 inches
(31.8 x 20.3 x 10.2mm)

ISOLATION VOLTAGE:

500 VDC min .... Standard Models
3K VDC min[4] .... Suffix "H" Models

CASE MATERIAL:

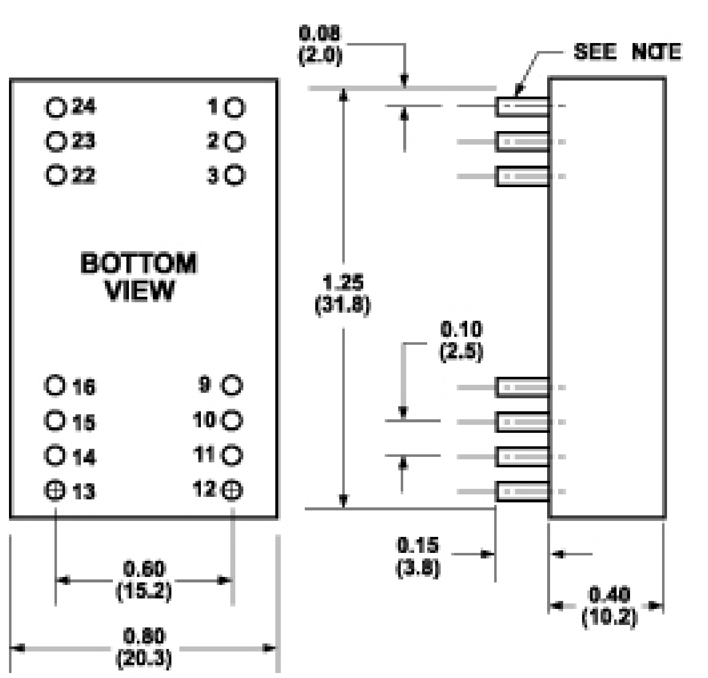
Standard Models .... Non-Conductive Black Plastic
Suffix "M" Models[5] .... Black Coated Copper with Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load
4. Non-Conductive Black Plastic Only
5. Suffix "HM" 1.5K VDC Instead of 3K VDC Isolation

CASE A

NOTE: Pin Size is 0.02" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010



PIN CONNECTION					
500 VDC			1.5K & 3K VDC		
Pin	Single Output	Dual Output	Pin	Single Output	Dual Output
1	+V Input	+V Input	1	NP	NP
2	NC	-V Output	2	-V Input	-V Input
3	NC	Common	3	-V Input	-V Input
9	NP	NP	9	NC	Common
10	-V Output	Common	10	NC	NC
11	+V Output	+V Output	11	NC	-V Output
12	-V Input	-V Input	12	NP	NP
13	-V Input	-V Input	13	NP	NP
14	+V Output	+V Output	14	+V Output	+V Output
15	-V Output	Common	15	NC	NC
16	NP	NP	16	-V Output	Common
22	NC	Common	22	+V Input	+V Input
23	NC	-V Output	23	+V Input	+V Input
24	+V Input	+V Input	24	NP	NP

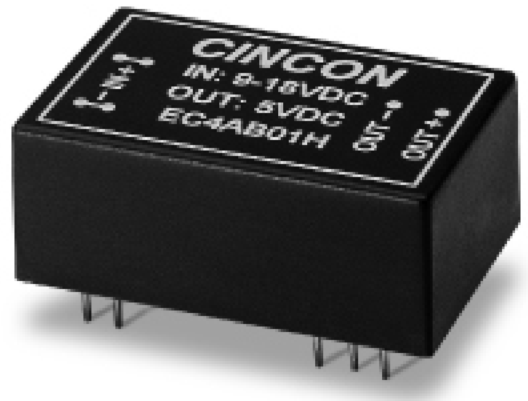
*NP-NO PIN
*NC-NO CONNECTION WITH PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC4AB

5-6 WATT WIDE INPUT DC-DC CONVERTERS



E176177 H/HM Versions Only

Features

- 5-6 W Isolated Output
- 24-Pin DIP Package
- Efficiency to 82%
- 2:1 Input Range
- Regulated Outputs
- Pi Input Filter
- Continuous Short Circuit Protection
- Meets EN55022 Class B, Conducted
- Remote ON/OFF Option

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF.	CASE
EC4AB01		5 VDC	1000 mA	7.5 mA	545 mA	76	
EC4AB02		12 VDC	470 mA	7.5 mA	585 mA	80	
EC4AB03		15 VDC	400 mA	7.5 mA	625 mA	80	
EC4AB04	9-18 VDC	±12 VDC	±230 mA	12 mA	575 mA	80	A
EC4AB05		±15 VDC	±190 mA	12 mA	590 mA	80	
EC4AB06		±5 VDC	±500 mA	12 mA	545 mA	76	
EC4AB07		3.3 VDC	1000 mA	7.5 mA	393 mA	70	
EC4AB11		5 VDC	1000 mA	5 mA	265 mA	78	
EC4AB12		12 VDC	470 mA	5 mA	285 mA	82	
EC4AB13		15 VDC	400 mA	5 mA	305 mA	82	
EC4AB14	18-36 VDC	±12 VDC	±230 mA	7.5 mA	285 mA	81	A
EC4AB15		±15 VDC	±190 mA	7.5 mA	295 mA	81	
EC4AB16		±5 VDC	±500 mA	7.5 mA	265 mA	78	
EC4AB17		3.3 VDC	1000 mA	5 mA	197 mA	70	
EC4AB21		5 VDC	1000 mA	2 mA	133 mA	78	
EC4AB22		12 VDC	470 mA	2 mA	145 mA	81	
EC4AB23		15 VDC	400 mA	2 mA	154 mA	81	
EC4AB24	36-72 VDC	±12 VDC	±230 mA	3 mA	142 mA	81	A
EC4AB25		±15 VDC	±190 mA	3 mA	147 mA	81	
EC4AB26		±5 VDC	±500 mA	3 mA	133 mA	78	
EC4AB27		3.3 VDC	1000 mA	2 mA	98 mA	70	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range............12V............9-18V
24V............18-36V
48V............36-72V
Input Filter............Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy............±2.0% max.
Voltage Balance (Dual)............±1.0% max.
Temperature Coefficient............±0.05%/°C
Ripple and Noise, 20MHz BW............3.3V/5V............100mV p-p max.
12V/15V............1% p-p max.
Short Circuit Protection............Continuous
Line Regulation, Single/Dual[1]............± 0.5%
Load Regulation, Single[2]............± 0.5%
Dual[3]............± 1.0%

GENERAL SPECIFICATIONS:

Efficiency............See Table
Isolation Resistance............10^9ohms
Switching Frequency............100KHz, min
Operating Temperature Range............-25 C to + 71 C
Case Temperature (Plastic case)............95°C max.
(Copper case)............100°C max.
Cooling............Free-Air Convection
Storage Temperature Range............-40 C to + 100 C
EMI / RFI............Conductive EMI Meet EN55022 Class B
Dimensions............1.25 x 0.8 x 0.5 inches
(31.8 x 20.3 x 12.7mm)

ISOLATION VOLTAGE:

500 VDC min............Standard Models
3K VDC min[5]............Suffix "H" Models

CASE MATERIAL:

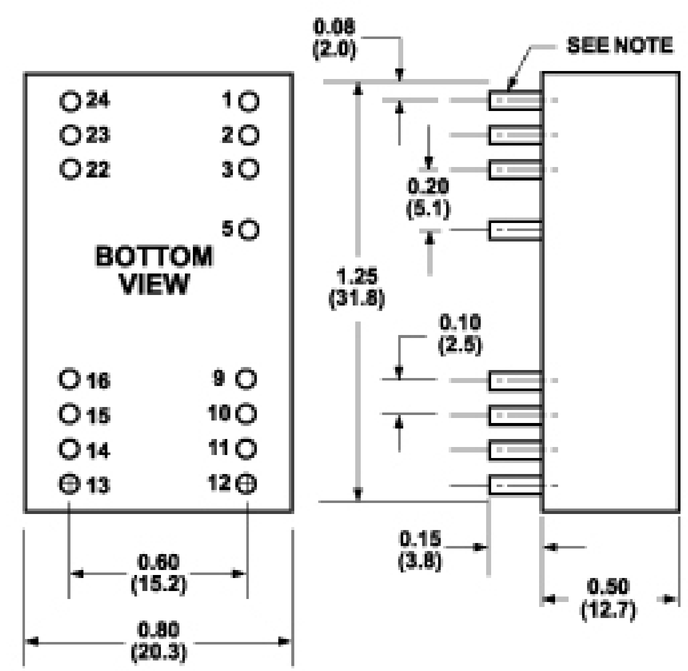
Standard Models............Non-Conductive Black Plastic
Suffix "M" Models[4]............Black Coated Copper with
Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load
4. Non-Conductive Black Plastic Only
5. Suffix "HM" 1.5K VDC Instead of 3K VDC Isolation
6. Suffix "T" to the Model Number with Remote On/Off for "H"/"HM" Versions Only

CASE A

NOTE:Pin Size is 0.02" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010



Remote On/Off Control	
Logic Compatibility	CMOS or Open Collector TTL
Ec-On	>+5.5 VDC or Open Circuit
Ec-Off	<1.8 VDC
Shutdown Idle Current	10mA
Control Common	Referenced to Input Minus

PIN CONNECTION

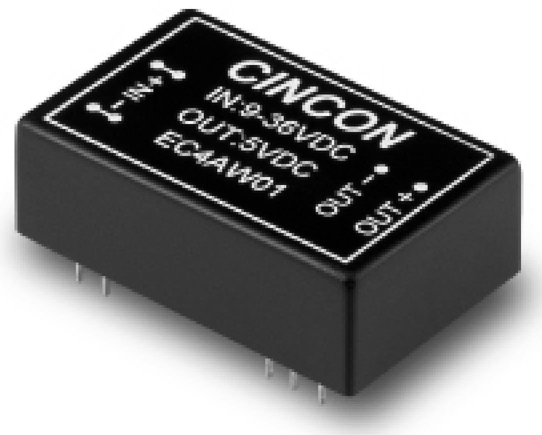
500 VDC Pin	500 VDC Single Output	500 VDC Dual Output	1.5K & 3K VDC Pin	1.5K & 3K VDC Single Output	1.5K & 3K VDC Dual Output
1	+V Input	+V Input	1	NP	NP
2	NC	-V Output	2	-V Input	-V Input
3	NC	Common	3	-V Input	-V Input
5	NP	NP	5	NP (Remote On/Off)	
9	NP	NP	9	NC	Common
10	-V Output	Common	10	NC	NC
11	+V Output	+V Output	11	NC	-V Output
12	-V Input	-V Input	12	NP	NP
13	-V Input	-V Input	13	NP	NP
14	+V Output	+V Output	14	+V Output	+V Output
15	-V Output	Common	15	NC	NC
16	NP	NP	16	-V Output	Common
22	NC	Common	22	+V Input	+V Input
23	NC	-V Output	23	+V Input	+V Input
24	+V Input	+V Input	24	NP	NP

*NP-NO PIN *NC-NO CONNECTION WITH PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC4AW



5-6 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 5-6W Isolated Output
- Efficiency to 80%
- Regulated Outputs
- Continuous Short Circuit Protection
- 24-Pin DIP Package
- 4 : 1 Input Range
- Pi Input Filter

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF.	CASE
EC4AW01		5 VDC	1000 mA	15 mA	267 mA	78	
EC4AW02		12 VDC	470 mA	15 mA	294 mA	80	
EC4AW03		15 VDC	400 mA	15 mA	313 mA	80	
EC4AW04	9-36 VDC	±12 VDC	±230 mA	25 mA	288 mA	80	A
EC4AW05		±15 VDC	±190 mA	25 mA	297 mA	80	
EC4AW06		±5 VDC	±500 mA	25 mA	267 mA	78	
EC4AW07		3.3 VDC	1000 mA	15 mA	191 mA	72	
EC4AW11		5 VDC	1000 mA	7.5 mA	134 mA	78	
EC4AW12		12 VDC	470 mA	7.5 mA	149 mA	79	
EC4AW13		15 VDC	400 mA	7.5 mA	157 mA	80	
EC4AW14	18-72 VDC	±12 VDC	±230 mA	12 mA	146 mA	79	A
EC4AW15		±15 VDC	±190 mA	12 mA	149 mA	80	
EC4AW16		± 5 VDC	±500 mA	12 mA	135 mA	77	
EC4AW17		3.3 VDC	1000 mA	7.5 mA	100 mA	70	

NOTE: 1. Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.......24V.......9-36V
48V.......18-72V
Input Filter.......Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy.......± 2.0% max.
Voltage Balance (Dual).......± 1.0% max.
Temperature Coefficient.......± 0.05% / °C
Ripple and Noise, 20MHz BW.......3.3V/5V.......100mV p-p max.
12V/15V.......1% p-p max.
Short Circuit Protection.......Continuous
Line Regulation[1], Single/Dual.......± 0.5% max.
Load Regulation, Single[2].......± 0.5% max.
Dual[3].......± 1.0% max.

GENERAL SPECIFICATIONS:

Efficiency.......See Table
Isolation Resistance.......10^9 ohms
Switching Frequency.......200KHz, min.
Operating Temperature Range.......-25°C to + 71°C
Case Temperature (Plastic case).......95°C max.
(Copper case).......100°C max.
Cooling.......Free-Air Convection
Storage Temperature Range.......-40°C to + 100°C
Dimensions.......1.25 x 0.8 x 0.4 inches
(31.8 x 20.3 x 10.2mm)

ISOLATION VOLTAGE:

1.5 KVDC min.......Standard Models
3 KVDC min[4].......Suffix "H" Models

CASE MATERIAL:

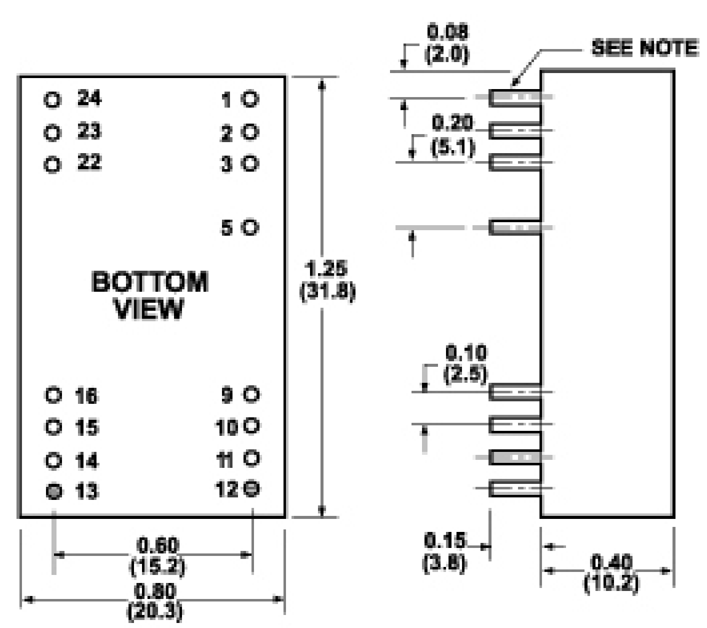
Standard Models.......Non-Conductive Black Plastic
Suffix "HM" Models[5].......Black Coated Copper with Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load
4. Non-Conductive Black Plastic Only
5. Suffix "HM" 1.5K VDC Instead of 3K VDC Isolation

CASE A

NOTE:Pin Size is 0.02" inch (0.5mm) DIA
All Dimension In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010



PIN CONNECTION
1.5K VDC & 3K VDC

Pin	Single Output	Dual Output
1	NP	NP
2	-V Input	-V Input
3	-V Input	-V Input
5	NP	NP
9	NC	Common
10	NC	NC
11	NC	-V Output
12	NP	NP
13	NP	NP
14	+V Output	+V Output
15	NC	NC
16	-V Output	Common
22	+V Iutput	+V Iutput
23	+V Intput	+V Intput
24	NP	NP

*NP-NO PIN
*NC-NO CONNECTION WITH PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC5A

6-24 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 6 - 24 W Non-Isolated Output
- Efficiency to 94%
- Input LC Filter
- 24-Pin DIP Package
- Regulated Outputs

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF.	CASE
EC5A-05S33	4.7-6 VDC	3.3 VDC	2000 mA	15 mA	1553 mA	85	
EC5A-12S33	9-32 VDC	3.3 VDC	2000 mA	15 mA	655 mA	84	
EC5A-12S05	9-32 VDC	5 VDC	2000 mA	15 mA	947 mA	88	
EC5A-12S12	9-32 VDC	12 VDC	830 mA	15 mA	954 mA	87	A
EC5A-12S15	9-32 VDC	15 VDC	666 mA	15 mA	957 mA	87	
EC5A-24S12	16-32 VDC	12 VDC	1600 mA	15 mA	860 mA	93	
EC5A-24S15	19-32 VDC	15 VDC	1600 mA	15 mA	1064 mA	94	

NOTE: 1. Nominal Input Voltage 5,12 or 24 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range......5.0V......4.7-6V
12V......9-32V
24V......16-32V
24V......19-32V
Input Filter......LC Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy......± 2.0% max.
Temperature Coefficient......± 0.05% / °C
Ripple and Noise, 20MHz BW, ...3.3V/5V......100mV p-p max.
12V/15V......1% p-p max.
Over Current Protection......120%~150%
Line Regulation[1]......± 0.5% max.
Load Regulation[2]......± 0.5% max.

GENERAL SPECIFICATIONS:

Efficiency......See Table
Switching Frequency......150KHz, Typ.
Isolation Voltage (Input/Output)......Non-Isolation
Operating Temperature Range......-25°C to +71°C
Case Temperature......100°C max.
Cooling......Free-Air Convection
Storage Temperature Range......-40°C to + 100°C
Dimensions......1.25 x 0.8 x 0.4 inches
(31.8 x 20.3 x 10.2mm)

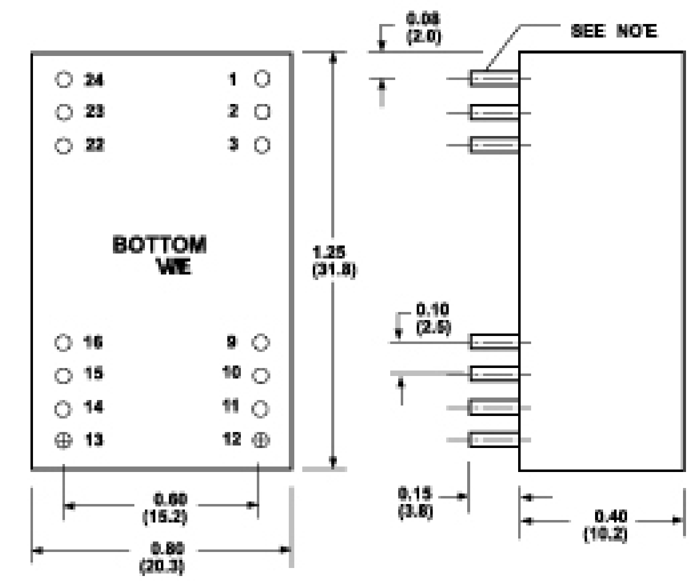
CASE MATERIAL:

Standard Models......Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to low Line
2. Measured From Full Load to 10% Load

CASE A

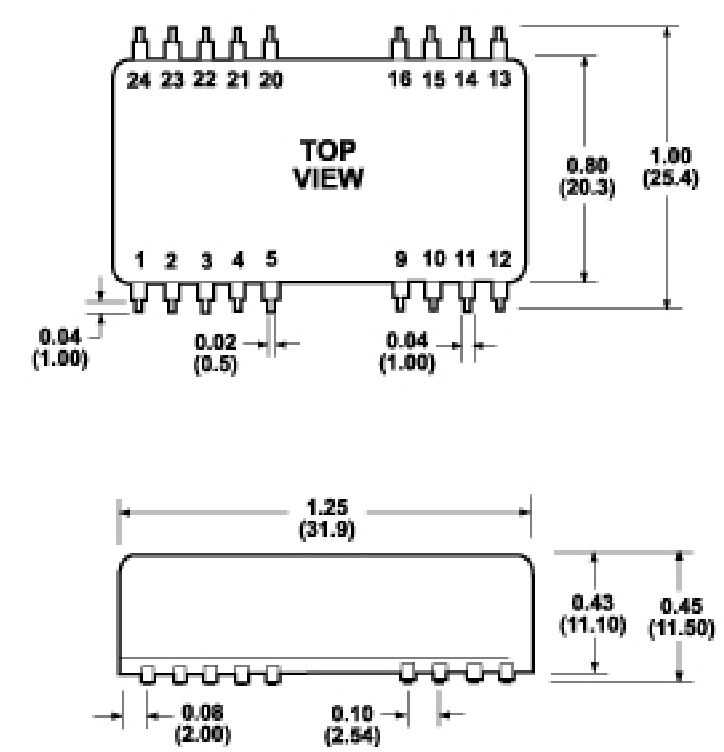
NOTE: Pin Size is 0.02" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010

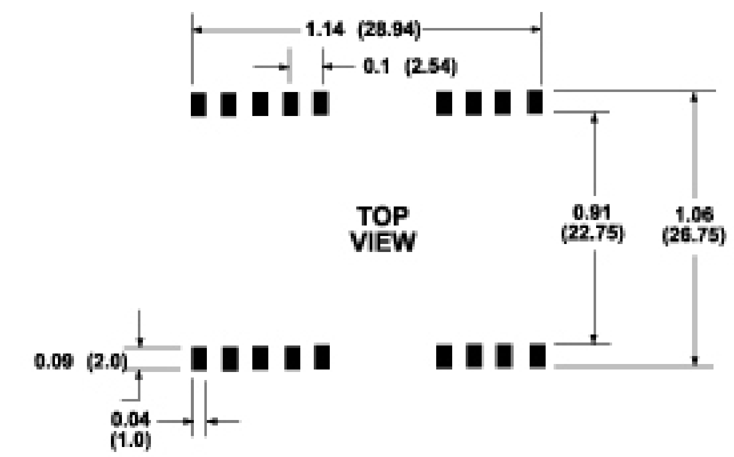


PIN CONNECTION			
Pin	Function	Pin	Function
1.	NP	24	NP
2.	-V Input	23	+V Input
3.	-V Input	22	+V Input
9	-V Output	16	-V Output
10	NC	15	NC
11	+V Output	14	+V Output
12	NP	13	NP

*NP-NO PIN
*NC-NO CONNECTION WITH PIN

CASE AS





Pin	Function	Pin	Function
1.	NC	13	NC
2.	-V Input	14	+V Output
3.	-V Input	15	NC
4	NC	16	-V Output
5	NC	20	NC
9	-V Output	21	NC
10	NC	22	+V Input
11	+V Output	23	+V Input
12	NC	24	NC

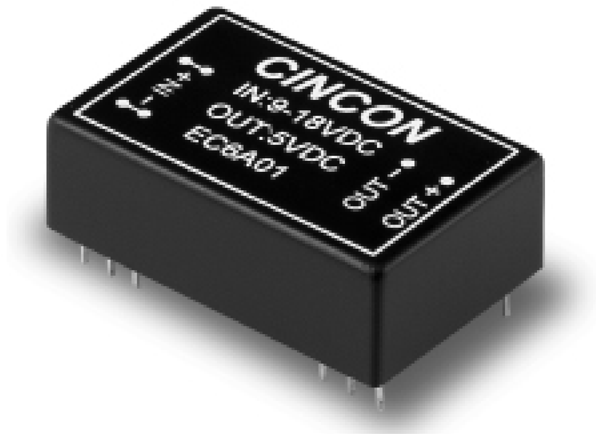
*NC-NO CONNECTION WITH PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC6A

7.5 WATT WIDE INPUT DC-DC CONVERTERS



Features

- 7.5W Isolated Output
- Efficiency to 83%
- Regulated Outputs
- Continuous Short Circuit Protection
- 24-Pin DIP Package
- 2 : 1 Input Range
- Pi Input Filter

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF.	CASE
EC6A01		5 VDC	1500 mA	25 mA	801 mA	78	
EC6A02		12 VDC	625 mA	25 mA	762 mA	82	
EC6A03		15 VDC	500 mA	25 mA	762 mA	82	
EC6A04	9-18 VDC	±5 VDC	±750 mA	30 mA	791 mA	79	A
EC6A05		±12 VDC	±310 mA	30 mA	753 mA	83	
EC6A06		±15 VDC	±250 mA	30 mA	753 mA	83	
EC6A07		3.3VDC	1500 mA	25 mA	557 mA	74	
EC6A11		5 VDC	1500 mA	20 mA	396 mA	79	
EC6A12		12 VDC	625 mA	20 mA	381 mA	82	
EC6A13		15 VDC	500 mA	20 mA	381 mA	82	
EC6A14	18-36 VDC	±5 VDC	±750 mA	25 mA	386 mA	81	A
EC6A15		±12 VDC	±310 mA	25 mA	377 mA	83	
EC6A16		±15 VDC	±250 mA	25 mA	377 mA	83	
EC6A17		3.3VDC	1500 mA	20 mA	271 mA	76	
EC6A21		5 VDC	1500 mA	10 mA	195 mA	80	
EC6A22		12 VDC	625 mA	10 mA	190 mA	82	
EC6A23		15 VDC	500 mA	10 mA	190 mA	82	
EC6A24	36-72 VDC	±5 VDC	±750 mA	15 mA	193 mA	81	A
EC6A25		±12 VDC	±310 mA	15 mA	188 mA	83	
EC6A26		±15 VDC	± 250 mA	15 mA	188 mA	83	
EC6A27		3.3VDC	1500 mA	10 mA	136 mA	76	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........12V........9-18V
24V........18-36V
48V........36-72V
Input Filter........Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy........±2.0% max.
Voltage Balance (Dual)........±1.0% max.
Temperature Coefficient........±0.05%/°C
Ripple & Noise,20MHz BW........100mV p-p max.
Short Circuit Protection........Continuous
Line Regulation[1] Single/Dual........±0.2% max.
Load Regulation Single[2]........±0.5% max.
Dual[3]........±1.0% max.

GENERAL SPECIFICATIONS:

Efficiency........See Table
Isolation Voltage........1500VDC min.
Isolation Resistance........10^9ohms
Switching Frequency........300KHz, typ.
Operating Temperature Range........-25 C to + 71 C
Case Temperature........100°C max.
Cooling........Free-Air Convection
Storage Temperature Range........-40 C to + 100 C
Dimensions........1.25 x 0.8 x 0.4 inches
(31.8 x 20.3 x 10.2 mm)

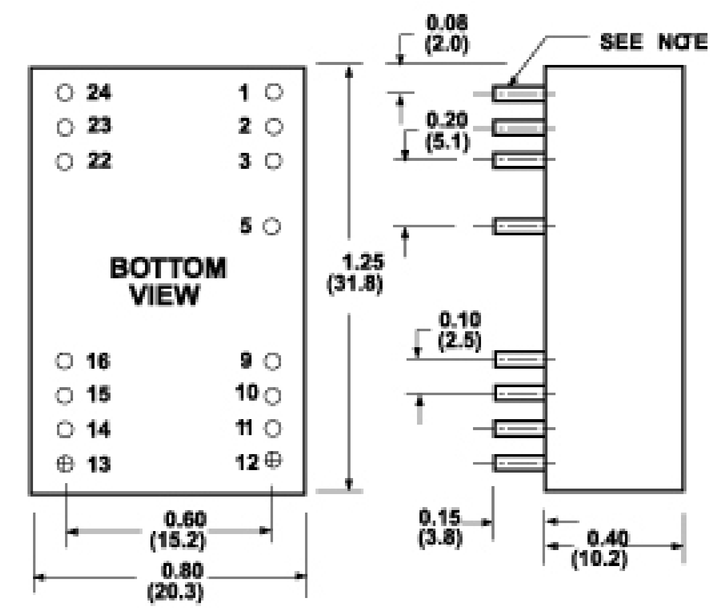
CASE MATERIAL:

Case Material........Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load

CASE A

NOTE: Pin Size is 0.020" Inch (0.5mm) DIA
All Dimensions In Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010



PIN CONNECTION
1500 VDC

Pin	Single Output	Dual Output
1	NP	NP
2	-V Input	-V Input
3	-V Input	-V Input
5	NP	NP
9	NC	Common
10	NC	NC
11	NC	-V Output
12	NP	NP
13	NP	NP
14	+V Output	+V Output
15	NC	NC
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input
24	NP	NP

*NP-NO PIN
*NC-NO CONNECTION WITH PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

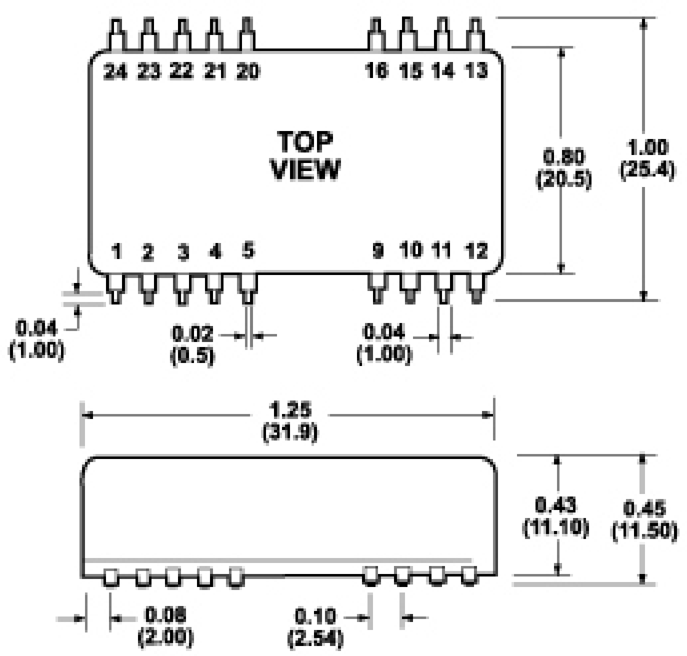
SMD

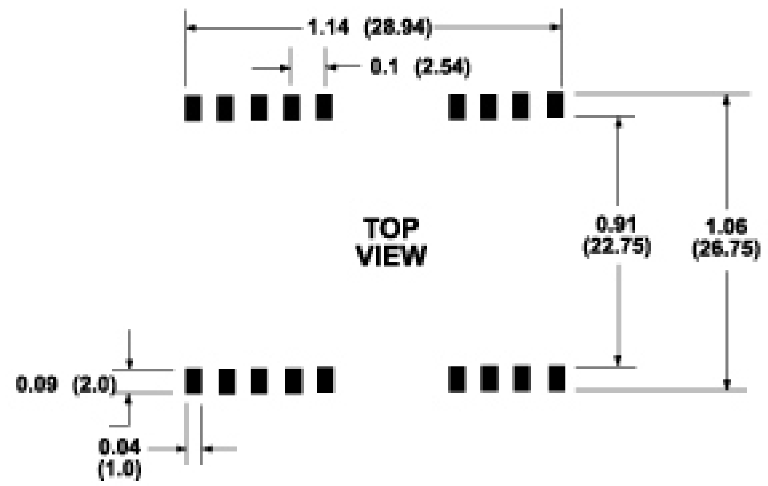
A CASE SMD DC-DC CONVERTERS

Recommended land pattern

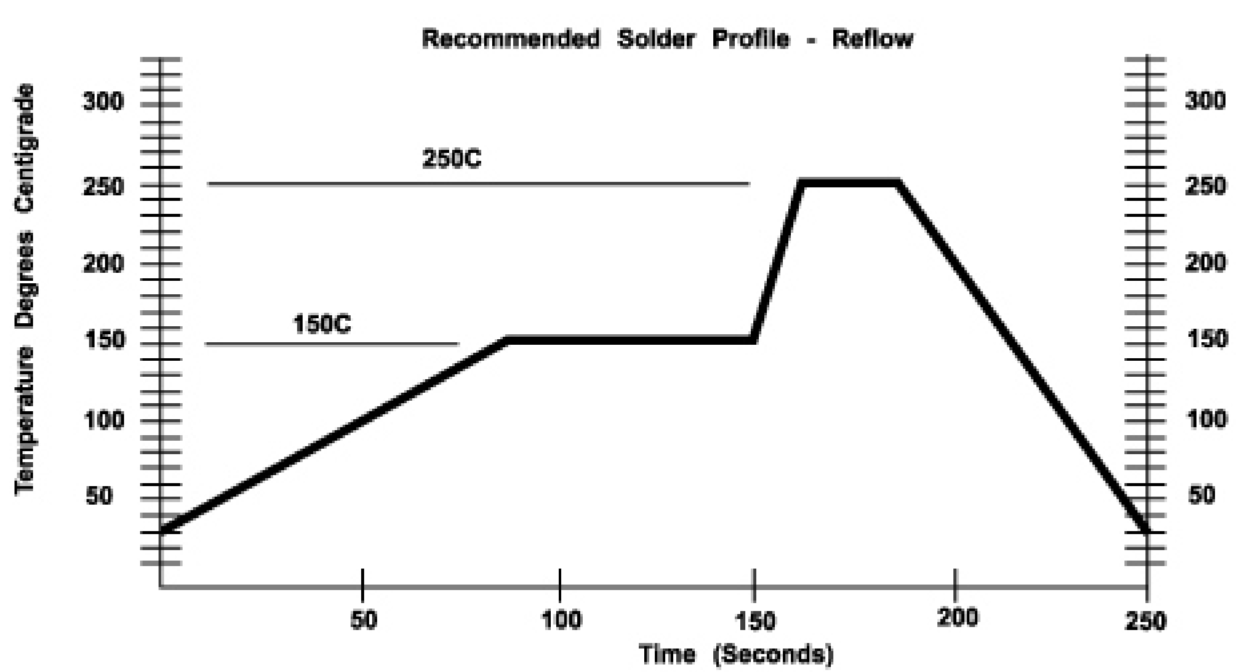
All Dimensions in Inches (mm)

CASE AS



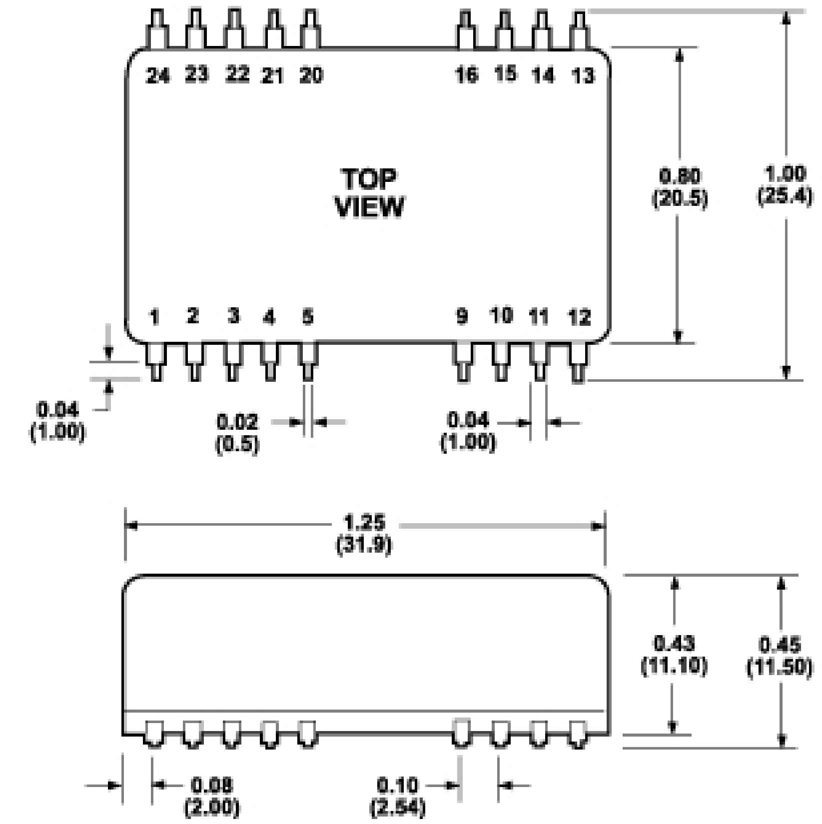


Recommended reflow profile



SMD PINNING For EC2A & EC2AN "M"/"HM" Versions and EC3AE Only

All Dimensions in Inches (mm)
Tolerance .xx= ±.02, .xxx= ±.010



PIN CONNECTION

	500 VDC		1500 VDC	
Pin	Single Output	Dual Output	Single Output	Dual Output
1	+V Input	+V Input	+V Input	+V Input
2	NC	-V Output	+V Input	+V Input
3	NC	Common	+V Input	+V Input
4	NC	NC	NC	NC
5	NC	NC	NC	NC
9	NC	NC	NC	NC
10	-V Output	Common	NC	GO Output
11	+V Output	+V Output	NC	GO Output
12	-V Input	-V Input	-V Output	-TP
13	-V Input	-V Input	+V Output	-V Output
14	+V Output	+V Output	NC	NC
15	-V Output	Common	NC	+V Output
16	NC	NC	NC	+TP
20	NC	NC	NC	NC
21	NC	NC	NC	NC
22	NC	Common	-V Input	-V Input
23	NC	-V Output	-V Input	-V Input
24	+V Input	+V Input	-V Input	-V Input

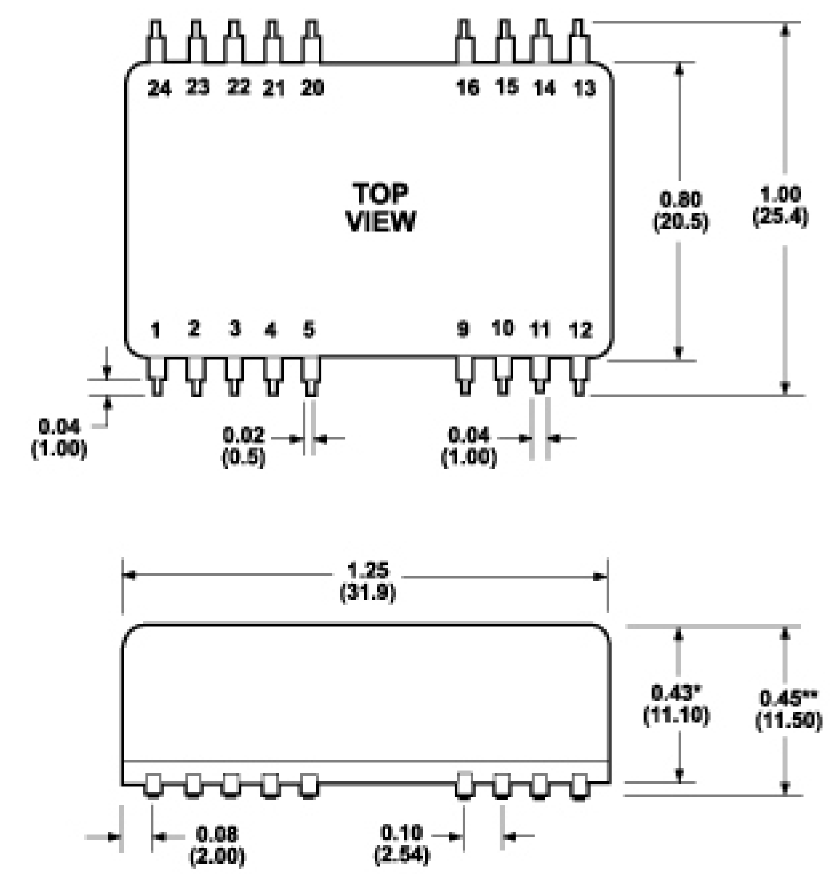
*NC-NO CONNECTION WITH PIN *TP-TEST POINT
*GO-GROUND

SMD PINNING For EC3A/3AB/4A/4AB/3AW "M"/"HM" ,EC4AW "M" ,EC6A only

All Dimensions in Inches(mm)
Tolerance .xx= ±.02, .xxx= ±.010

Remote On/Off Control

Logic Compatibility	CMOS or Open Collector TTL
Ec-On	>+5.5 VDC or Open Circuit
Ec-Off	<1.8 VDC
Shutdown Idle Current	10mA
Control Common	Referenced to Input Minus



PIN CONNECTION

	500 VDC		1500 VDC	
Pin	Single Output	Dual Output	Single Output	Dual Output
1	+V Input	+V Input	NC	NC
2	NC	-V Output	-V Input	-V Input
3	NC	Common	-V Input	-V Input
4	NC	NC	NC	NC
5	NC	NC	NC (or Remote ON/OFF)	
9	NC	NC	NC	Common
10	-V Output	Common	NC	NC
11	+V Output	+V Output	NC	-V Output
12	-V Input	-V Input	NC	NC
13	-V Input	-V Input	NC	NC
14	+V Output	+V Output	+V Output	+V Output
15	-V Output	Common	NC	NC
16	NC	NC	-V Output	Common
20	NC	NC	NC	NC
21	NC	NC	NC	NC
22	NC	Common	+V Input	+V Input
23	NC	-V Output	+V Input	+V Input
24	+V Input	+V Input	NC	NC

*NC-NO CONNECTION WITH PIN

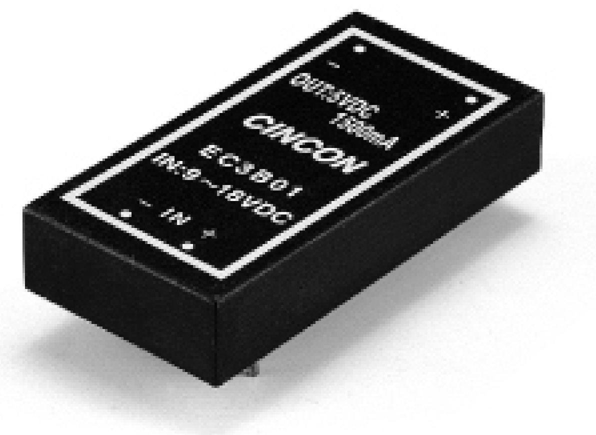
NOTE:
*0.53(13.6)mm for EC3AB/4AB "M", "HM"
**0.55(14.0)mm for EC3AB/4AB "M", "HM"

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC3B

7.5 WATT WIDE INPUT DC-DC CONVERTERS



Features

- 7.5W Isolated Output
- Efficiency to 82%
- 2:1 Input Range
- Regulated Outputs
- Pi Input Filter
- Continuous Short Circuit Protection

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	NPUT CURRENT NO LOAD	FULL LOAD	EFF.	CASE
EC3B01		5 VDC	1500 mA	7.5 mA	820 mA	76	
EC3B02		12 VDC	625 mA	7.5 mA	780 mA	80	
EC3B03		15 VDC	500 mA	7.5 mA	780 mA	80	
EC3B04	9-18 VDC	±12 VDC	±310 mA	12 mA	775 mA	80	B
EC3B05		±15 VDC	±250 mA	12 mA	780 mA	80	
EC3B06		±5 VDC	±750 mA	7.5 mA	820 mA	76	
EC3B07		3.3 VDC	1500 mA	7.5 mA	557 mA	74	
EC3B11		5 VDC	1500 mA	5 mA	400 mA	78	
EC3B12		12 VDC	625 mA	5 mA	380 mA	82	
EC3B13		15 VDC	500 mA	5 mA	380 mA	82	
EC3B14	18-36 VDC	±12 VDC	±310 mA	7.5 mA	385 mA	81	B
EC3B15		±15 VDC	±250 mA	7.5 mA	385 mA	81	
EC3B16		±5 VDC	±750 mA	7.5 mA	400 mA	78	
EC3B17		3.3 VDC	1500 mA	5 mA	271 mA	76	
EC3B21		5 VDC	1500 mA	2 mA	200 mA	78	
EC3B22		12 VDC	625 mA	2 mA	192 mA	81	
EC3B23		15 VDC	500 mA	2 mA	192 mA	81	
EC3B24	36-72 VDC	±12 VDC	±310 mA	3 mA	192 mA	81	B
EC3B25		±15 VDC	±250 mA	3 mA	192 mA	81	
EC3B26		±5 VDC	±750 mA	3 mA	200 mA	78	
EC3B27		3.3 VDC	1500 mA	3 mA	136 mA	76	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.......12V 9-18V
24V 18-36V
48V 36-72V
Input Filter.......Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy.......± 2.0% max.
Voltage Balance (Dual).......± 1.0% max.
Temperature Coefficient.......± 0.05%/°C
Ripple and Noise, 20MHz BW.......3.3V / 5V.......100mV p-p max.
12V / 15V.......1% p-p max.
Short Circuit Protection.......Continuous
Line Regulation, Single/Dual¹.......± 0.5%
Load Regulation, Single².......± 0.5%
Dual³.......± 1.0%

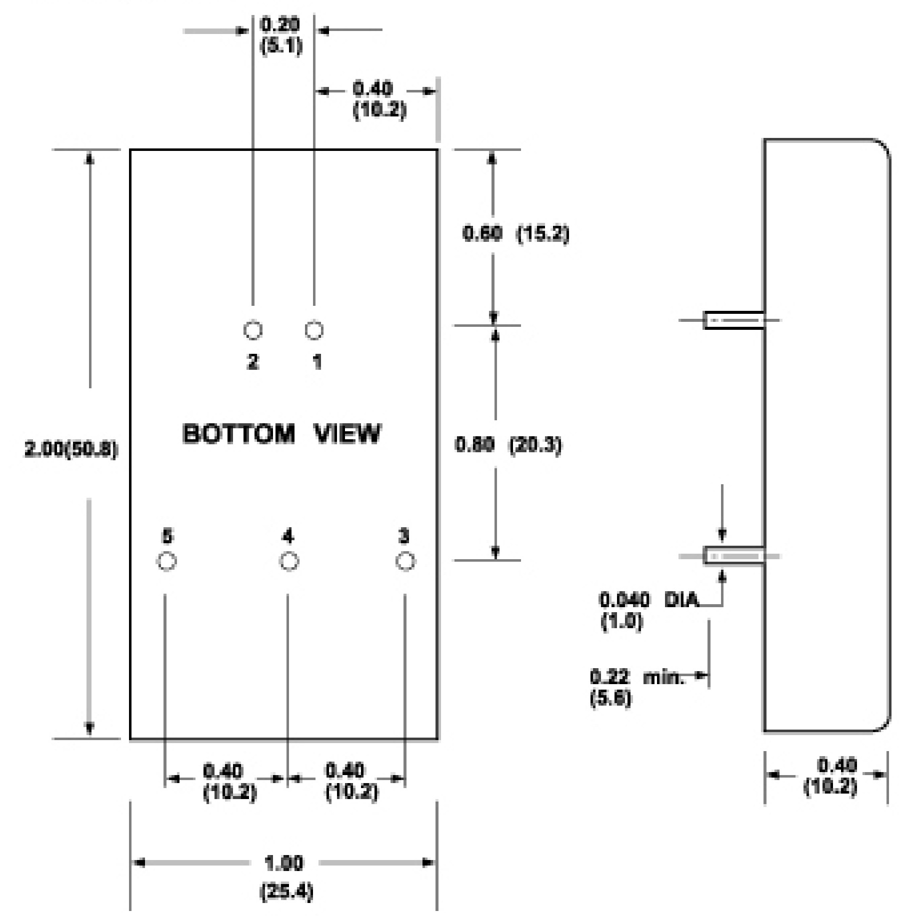
GENERAL SPECIFICATIONS:

Efficiency.......See Table
Isolation Voltage.......1500 VDC min.
Isolation Resistance.......10⁹ohms
Switching Frequency.......100KHz, min.
Operating Temperature Range.......-25°C to + 71°C
Case Temperature.......100°C max.
Cooling.......Free-Air Convection
Storage Temperature Range.......-40°C to + 100°C
Dimensions.......2 x 1 x 0.4 inches
(50.8 x 25.4 x 10.2mm)
Case Material.......Black Coated Copper With
Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load

CASE B

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION

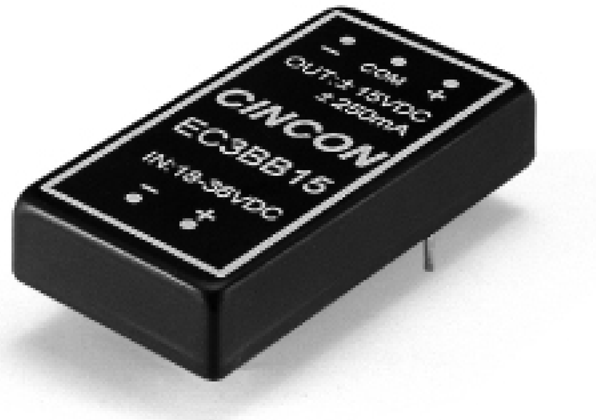
Pin	unction F
1.	+ Input
2.	- Input
3.	+ Output
4.	Common/NP
5.	- Output

*NP-NO PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC3BB



7.5 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 7.5W Isolated Output
- Remote ON/OFF Option
- Efficiency to 82%
- 2:1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Meets EN55022 Class B, Conducted
- Pi Input Filter

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF.	CASE
EC3BB01		5 VDC	1500 mA	7.5 mA	820 mA	76	
EC3BB02		12 VDC	625 mA	7.5 mA	780 mA	80	
EC3BB03		15 VDC	500 mA	7.5 mA	780 mA	80	
EC3BB04	9-18 VDC	±12 VDC	±310 mA	12 mA	775 mA	80	B
EC3BB05		±15 VDC	±250 mA	12 mA	780 mA	80	
EC3BB06		±5 VDC	±750 mA	7.5 mA	820 mA	76	
EC3BB07		3.3 VDC	1500 mA	7.5 mA	557 mA	74	
EC3BB11		5 VDC	1500 mA	5 mA	400 mA	78	
EC3BB12		12 VDC	625 mA	5 mA	380 mA	82	
EC3BB13		15 VDC	500 mA	5 mA	380 mA	82	
EC3BB14	18-36 VDC	±12 VDC	±310 mA	7.5 mA	385 mA	81	B
EC3BB15		±15 VDC	±250 mA	7.5 mA	385 mA	81	
EC3BB16		±5 VDC	±750 mA	7.5 mA	400 mA	78	
EC3BB17		3.3 VDC	1500 mA	5 mA	271 mA	76	
EC3BB21		5 VDC	1500 mA	2 mA	200 mA	78	
EC3BB22		12 VDC	625 mA	2 mA	192 mA	81	
EC3BB23		15 VDC	500 mA	2 mA	192 mA	81	
EC3BB24	36-72 VDC	±12 VDC	±310 mA	3 mA	192 mA	81	B
EC3BB25		±15 VDC	±250 mA	3 mA	192 mA	81	
EC3BB26		±5 VDC	±750 mA	3 mA	200 mA	78	
EC3BB27		3.3 VDC	1500 mA	3 mA	136 mA	76	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range............12V............9-18V
24V............18-36V
48V............36-72V
Input Filter............Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy............± 2.0% max.
Voltage Balance (Dual)............± 1.0% max.
Temperature Coefficient............± 0.05%/°C
Ripple and Noise, 20MHz BW............3.3V / 5V............100mV p-p max.
12V / 15V............1% p-p max.
Short Circuit Protection............Continuous
Line Regulation, Single/Dual[1]............± 0.5%
Load Regulation, Single[2]............± 0.5%
Dual[3]............± 1.0%

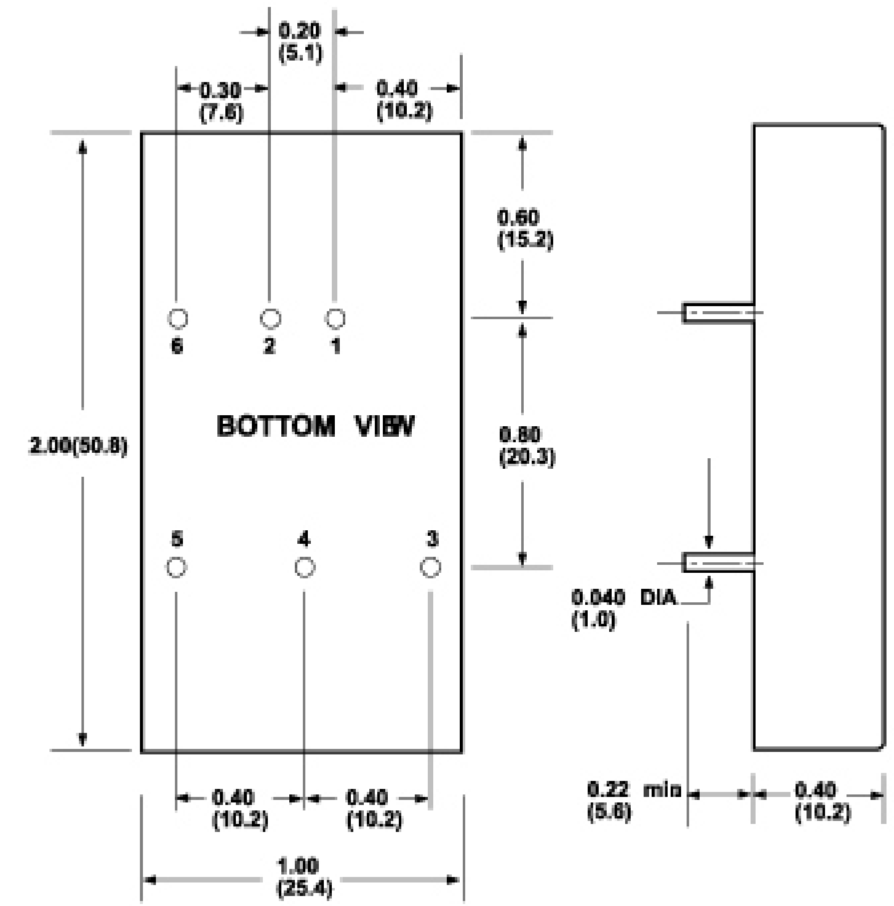
GENERAL SPECIFICATIONS:

Efficiency............See Table
Isolation Voltage............1500 VDC min.
Isolation Resistance............10^9 ohms
Switching Frequency............100KHz, min.
Operating Temperature Range............-25°C to + 71°C
Case Temperature............100°C max.
Cooling............Free-Air Convection
Storage Temperature Range............-40°C to + 100°C
EMI / RFI............Conductive EMI Meet EN55022 Class B
Dimensions............2 x 1 x 0.4 inches
(50.8 x 25.4 x 10.2mm)
Case Material............Black Coated Copper With
Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load
4. Suffix "T" to the Model Number with Remote ON/OFF

CASE B

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



Remote On/Off Control	
Logic Compatibility	CMOS or Open Collector TTL
Ec-On	>+5.5 VDC or Open Circuit
Ec-Off	<1.8 VDC
Shutdown Idle Current	10mA
Control Common	Referenced to Input Minus

PIN CONNECTION

Pin	Function
1.	+Input
2.	-Input
3.	+Output
4.	Common/NP
5.	-Output
6.	NP (Remote ON/OFF)

*NP-NO PIN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC4B

10 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 10W Isolated output
- Efficiency to 82%
- 2:1 Input Range
- Pi Input Filter
- Continuous Short Circuit Protection
- Meets EN55022 Class A, Conducted

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT MIN.	OUTPUT CURRENT MAX.	NPUT CURRENT NO LOAD	NPUT CURRENT FULL LOAD	EFF. %	CASE
EC4B01	9-18 VDC	5 VDC	100 mA	2000 mA	30 mA	1100 mA	76	B
EC4B02		12 VDC	45 mA	830 mA	30 mA	1065 mA	78	
EC4B03		15 VDC	35 mA	666 mA	30 mA	1065 mA	78	
EC4B04		±12 VDC	±25 mA	±415 mA	40 mA	1065 mA	78	
EC4B05		±15 VDC	±20 mA	±333 mA	40 mA	1065 mA	78	
EC4B06		±5 VDC	±50 mA	±1000 mA	40 mA	1065 mA	78	
EC4B11	18-36 VDC	5 VDC	100 mA	2000 mA	20 mA	535 mA	78	B
EC4B12		12 VDC	45 mA	830 mA	20 mA	520 mA	80	
EC4B13		15 VDC	35 mA	666 mA	20 mA	520 mA	80	
EC4B14		±12 VDC	±25 mA	±415 mA	20 mA	520 mA	80	
EC4B15		±15 VDC	±20 mA	±333 mA	20 mA	520 mA	80	
EC4B16		±5 VDC	±50 mA	±1000 mA	20 mA	520 mA	80	
EC4B21	36-72 VDC	5 VDC	100 mA	2000 mA	10 mA	260 mA	80	B
EC4B22		12 VDC	45 mA	830 mA	10 mA	254 mA	82	
EC4B23		15 VDC	35 mA	666 mA	10 mA	254 mA	82	
EC4B24		±12 VDC	±25 mA	±415 mA	10 mA	254 mA	82	
EC4B25		±15 VDC	±20 mA	±333 mA	10 mA	254 mA	82	
EC4B26		±5 VDC	±50 mA	±1000 mA	10 mA	254 mA	82	
EC4B31	4.7-9 VDC	5 VDC	0 mA	1600 mA	15 mA	2130 mA	75	B
EC4B32		12 VDC	0 mA	666 mA	15 mA	2100 mA	76	
EC4B33		15 VDC	0 mA	533 mA	15 mA	2100 mA	76	
EC4B34		±12 VDC	0 mA	±333 mA	15 mA	2100 mA	76	
EC4B35		±15 VDC	0 mA	±266 mA	15 mA	2100 mA	76	
EC4B36		±5 VDC	0 mA	±800 mA	15 mA	2100 mA	76	

NOTE: 1. Nominal Input Voltage 5, 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........5V........4.7-9V
12V........9-18V
24V........18-36V
48V........36-72V
Input Filter........Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output........±1.0% max.
Dual + Output........±1.0% max.
Dual – Output........±1.0% max.
Voltage Balance (Dual)........±1.0% max.
Transient Response
Single 25% Step Load Change........<500µ sec.
Dual FL-1/2L ±1% Error Band........<500µ sec.
Ripple and Noise,20MHzBW........100mV p-p max.
Temperature Coefficient........±0.02%/°C max.
Short Circuit Protection........Continuous
Line Regulation[1] Single/Dual Output........±0.2%
Load Regulation[2] Single/Dual Output........±1.0%

GENERAL SPECIFICATIONS:

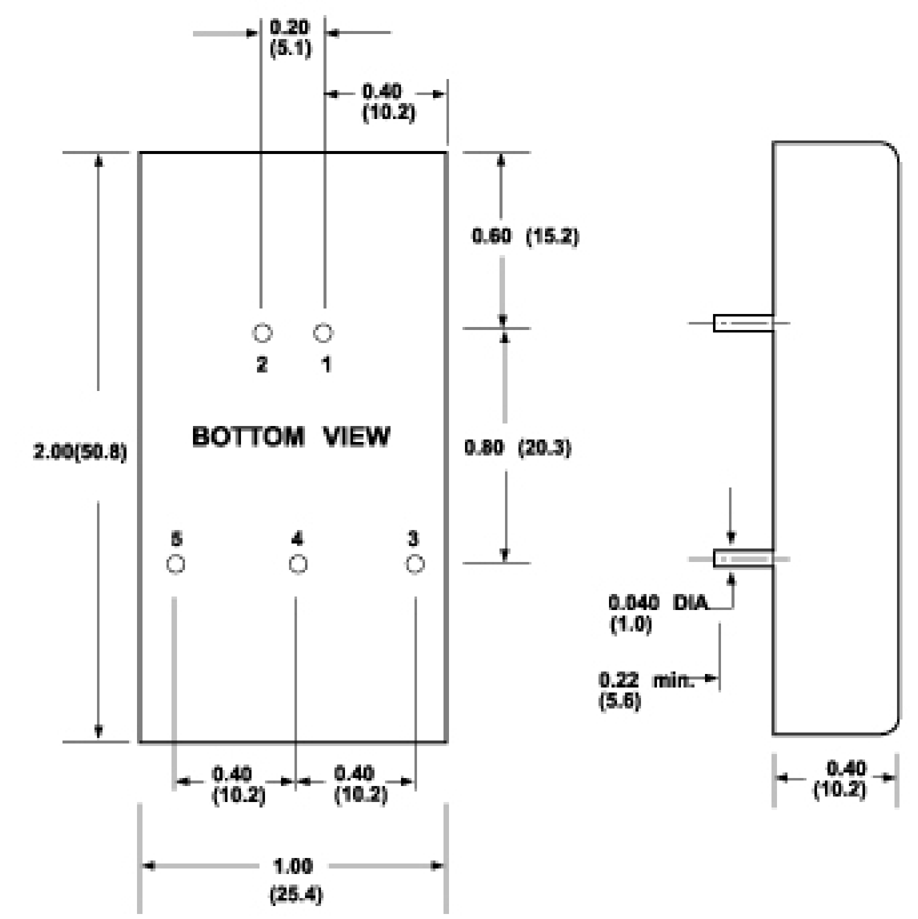
Efficiency........See Table
Isolation Voltage........500 VDC min.
Isolation Resistance........10^9ohms
Switching Frequency........200KHz, min.
Operating Temperature Range........-25 C to + 71 C
Case Temperature........100°C max.
Cooling........Free-Air Convection
Storage Temperature Range........-40 C to + 100 C
EMI/RFI........Six sided Continuous Shield
Dimensions........2 x 1 x 0.4 inches
(50.8 x 25.4 x 10.2 mm)
Case Material........Black Coated Copper with
Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load
3. A Minimum Load On the Output is Necessary to Maintain Regulation

CASE B

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION	
Pin	Function
1.	+Input
2.	-Input
3.	+Output
4.	Common/NP
5.	-Output

NP*:NO PIN ON SINGLE OUTPUT

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC4BE

10 WATT WIDE INPUT DC-DC CONVERTERS

E176177

Features

- 10W Isolated Output
- Efficiency to 82%
- 2:1 Input Range
- Pi Input Filter
- Continuous Short Circuit Protection
- Meets EN55022 Class A, Conducted

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT MIN.	OUTPUT CURRENT MAX.	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF. %	CASE
EC4BE01	9-18 VDC	5 VDC	100 mA	2000 mA	30 mA	1100 mA	76	B
EC4BE02		12 VDC	45 mA	830 mA	30 mA	1065 mA	78	
EC4BE03		15 VDC	35 mA	666 mA	30 mA	1065 mA	78	
EC4BE04		±12 VDC	±25 mA	±415 mA	40 mA	1065 mA	78	
EC4BE05		±15 VDC	±20 mA	±333 mA	40 mA	1065 mA	78	
EC4BE06		±5 VDC	±50 mA	±1000 mA	40 mA	1065 mA	78	
EC4BE11	18-36 VDC	5 VDC	100 mA	2000 mA	20 mA	535 mA	78	B
EC4BE12		12 VDC	45 mA	830 mA	20 mA	520 mA	80	
EC4BE13		15 VDC	35 mA	666 mA	20 mA	520 mA	80	
EC4BE14		±12 VDC	±25 mA	±415 mA	20 mA	520 mA	80	
EC4BE15		±15 VDC	±20 mA	±333 mA	20 mA	520 mA	80	
EC4BE16		±5 VDC	±50 mA	±1000 mA	20 mA	520 mA	80	
EC4BE21	36-72 VDC	5 VDC	100 mA	2000 mA	10 mA	260 mA	80	B
EC4BE22		12 VDC	45 mA	830 mA	10 mA	254 mA	82	
EC4BE23		15 VDC	35 mA	666 mA	10 mA	254 mA	82	
EC4BE24		±12 VDC	±25 mA	±415 mA	10 mA	254 mA	82	
EC4BE25		±15 VDC	±20 mA	±333 mA	10 mA	254 mA	82	
EC4BE26		±5 VDC	±50 mA	±1000 mA	10 mA	254 mA	82	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........12V 9-18V
24V 18-36V
48V 36-72V
Input Filter........Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output........±1.0% max.
Dual + Output........±1.0% max.
Dual – Output........±1.0% max.
Voltage Balance (Dual)........±1.0% max.
Transient Response
Single 25% Step Load Change........<500μ sec.
Dual FL-1/2L ±1% Error Band........<500μ sec.
Ripple and Noise, 20MHz BW........100mV p-p max.
Temperature Coefficient........±0.02%/°C max.
Short Circuit Protection........Continuous
Line Regulation[1] Single/Dual Output........±0.2% max.
Load Regulation[2] Single/Dual Output........±1.0% max.

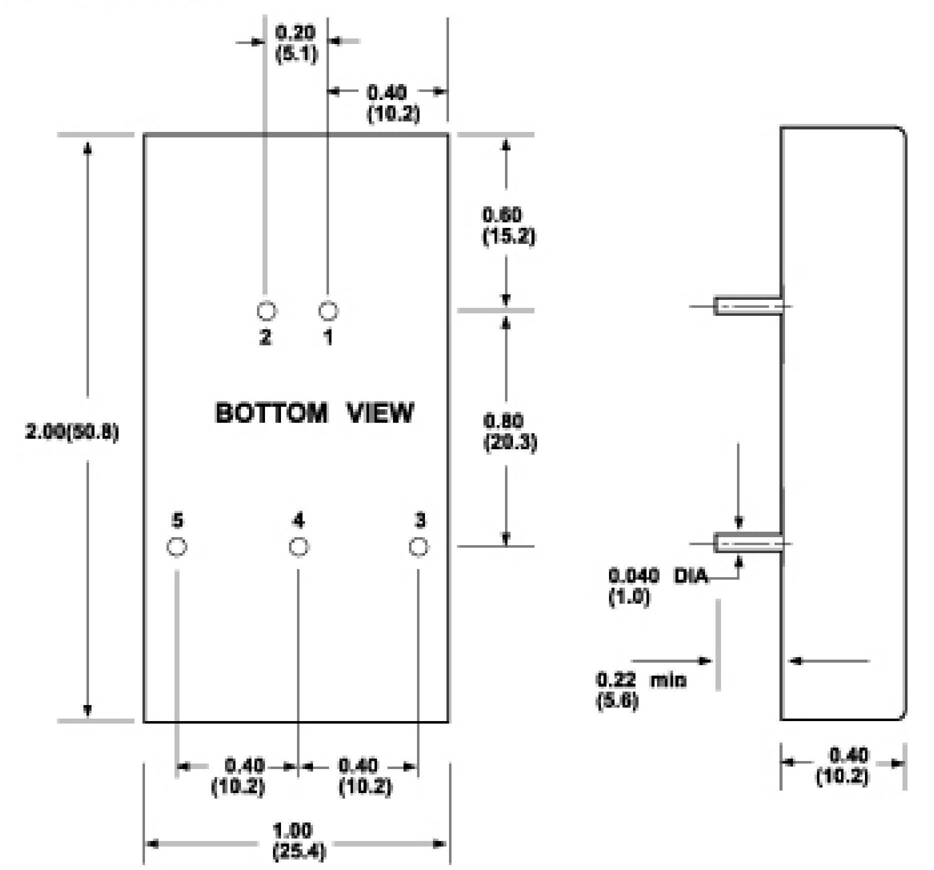
GENERAL SPECIFICATIONS:

Efficiency........See Table
Isolation Voltage........500 VDC min.
Isolation Resistance........10⁹ ohms
Switching Frequency........200KHz, min.
Operating Temperature Range........-25 C to + 71 C
Case Temperature........100°C max.
Cooling........Free-Air Convection
Storage Temperature Range........-40 C to + 100 C
EMI/RFI........Six sided Continuous Shield
Dimensions........2 x 1 x 0.4 inches
(50.8 x 25.4 x 10.2 mm)
Case Material........Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load
3. A Minimum Load On the Output is Necessary to Maintain Regulation

CASE B

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION	
Pin	Function
1.	+ Input
2.	- Input
3.	+ Output
4.	Common/NP
5.	- Output

NP*-NO PIN ON SINGLE OUTPUT

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC4BW

10 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 10W Isolated Output
- Efficiency to 82%
- 4:1 Input Range
- Pi Input Filter
- Continuous Short Circuit Protection
- Meets EN55022 Class A, Conducted

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF.	CASE
EC4BW01		5 VDC	2000 mA	15 mA	534 mA	78	
EC4BW02		12 VDC	830 mA	15 mA	520 mA	80	
EC4BW03		15 VDC	666 mA	15 mA	520 mA	80	
EC4BW04	9-36VDC	±12 VDC	±415 mA	20 mA	520 mA	80	B
EC4BW05		±15VDC	±333mA	20 mA	520 mA	80	
EC4BW06		±5 VDC	±1000mA	20 mA	520 mA	80	
EC4BW07		3.3 VDC	2000mA	15 mA	362 mA	76	
EC4BW11		5 VDC	2000 mA	10 mA	260 mA	80	
EC4BW12		12 VDC	830 mA	10 mA	257 mA	81	
EC4BW13		15 VDC	666 mA	10 mA	257 mA	81	
EC4BW14	18-72VDC	±12 VDC	±415 mA	15 mA	257 mA	81	B
EC4BW15		±15 VDC	±333 mA	15 mA	253 mA	82	
EC4BW16		±5 VDC	±1000mA	15 mA	253 mA	82	
EC4BW17		3.3 VDC	2000mA	10 mA	181 mA	76	

NOTE:1.Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........24V 9-36V
48V 18-72V
Input Filter........Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy Single Output........±1.0% max.
Voltage Accuracy Dual + Output........±1.0% max.
Voltage Accuracy Dual - Output........±1.0% max.
Voltage Balance Dual Output at Full Load........±1.0% max.
Transient Response
Single 25% Step Load Change........<500μ sec.
Dual FL-1/2 ±1% Error Band........<500μ sec.
Ripple and Noise, 20MHz BW........75mV p-p max.
Temperature Coefficient........±0.02%/°C max.
Short Circuit Protection........Continuous
Line Regulation¹ Single / Dual Output........±0.2% max.
Load Regulation² Single / Dual Output........±1.0% max.

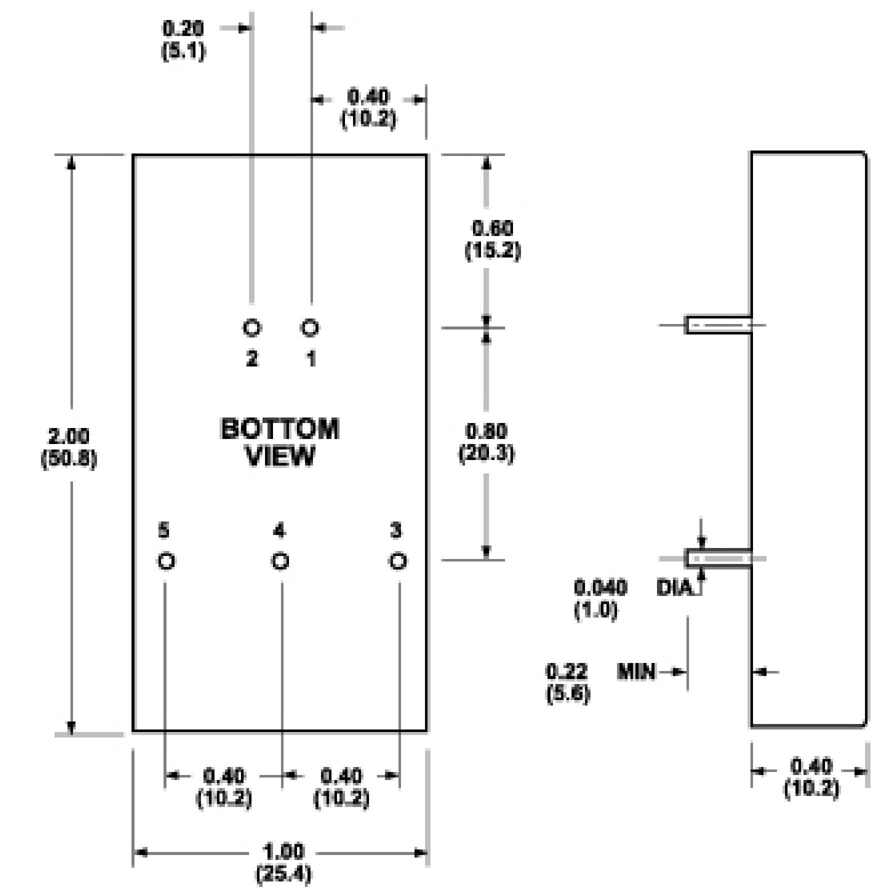
GENERAL SPECIFICATIONS:

Efficiency........See Table
Isolation Voltage........500 VDC
Isolation Resistance........10⁹Ohms
Switching Frequency........300KHz typ.
Operating Temperature Range........-25°C to + 71°C
Case Temperature........100°C max.
Cooling........Free-Air Convection
Storage Temperature Range........-40°C to +100°C
EMI / RFI........Six sided Continuous Shield
Dimensions........2 x 1 x 0.4 inches
(50.8 x 25.4 x 10.2 mm)
Case Material........Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load

CASE B

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION Pin	Function
1.	+ Input
2.	- Input
3.	+ Output
4.	Common/NP
5.	- Output

NP*-NO PIN ON SINGLE OUTPUT

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC5B

15 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 15W Isolated Output
- Efficiency to 82%
- 2:1 Input Range
- Pi Input Filter
- Continuous Short Circuit Protection
- Meets EN55022 Class A, Conducted

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT MIN.	OUTPUT CURRENT MAX.	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF. %	CASE
EC5B01		5 VDC	150 mA	3000 mA	20 mA	1610 mA	78	
EC5B02		12 VDC	65 mA	1250 mA	20 mA	1525 mA	82	
EC5B03		15 VDC	50 mA	1000 mA	20 mA	1525 mA	82	
EC5B04	9-18 VDC	±12 VDC	±35 mA	±625 mA	30 mA	1510 mA	83	B
EC5B05		±15 VDC	±25 mA	±500 mA	30 mA	1510 mA	83	
EC5B06		±5 VDC	±75 mA	±1500 mA	30 mA	1565 mA	80	
EC5B07		3.3 VDC	150 mA	3000 mA	20 mA	1086 mA	76	
EC5B11		5 VDC	150 mA	3000 mA	20 mA	800 mA	78	
EC5B12		12 VDC	65 mA	1250 mA	20 mA	780 mA	80	
EC5B13		15 VDC	50 mA	1000 mA	20 mA	780 mA	80	
EC5B14	18-36 VDC	±12 VDC	±35 mA	±625 mA	30 mA	780 mA	80	B
EC5B15		±15 VDC	±25 mA	±500 mA	30 mA	780 mA	80	
EC5B16		±5 VDC	±75 mA	±1500 mA	30 mA	780 mA	80	
EC5B17		3.3 VDC	150 mA	3000 mA	20 mA	543 mA	76	
EC5B21		5 VDC	150 mA	3000 mA	10 mA	390 mA	80	
EC5B22		12 VDC	65 mA	1250 mA	10 mA	380 mA	82	
EC5B23		15 VDC	50 mA	1000 mA	10 mA	380 mA	82	
EC5B24	36-72 VDC	±12 VDC	±35 mA	±625 mA	15 mA	380 mA	82	B
EC5B25		±15 VDC	±25 mA	±500 mA	15 mA	380 mA	82	
EC5B26		±5 VDC	±75 mA	±1500 mA	15 mA	380 mA	82	
EC5B27		3.3 VDC	150 mA	3000 mA	15 mA	272 mA	76	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... 12V 9-18V
24V 18-36V
48V 36-72V
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output .... ±1.0% max.
Dual + Output .... ±1.0% max.
Dual – Output .... ±1.0% max.
Voltage Balance (Dual) .... ±1.0% max.
Transient Response
Single 25% Step Load Change .... <500μ sec.
Dual FL-1/2L ±1% Error Band .... <500μ sec.
Ripple and Noise, 20MHz BW .... 100mV p-p max.
Temperature Coefficient .... ±0.02%/°C max.
Short Circuit Protection .... Continuous
Line Regulation[1] Single/Dual Output .... ±0.2% max.
Load Regulation[2] Single/Dual Output .... ±1.0% max.

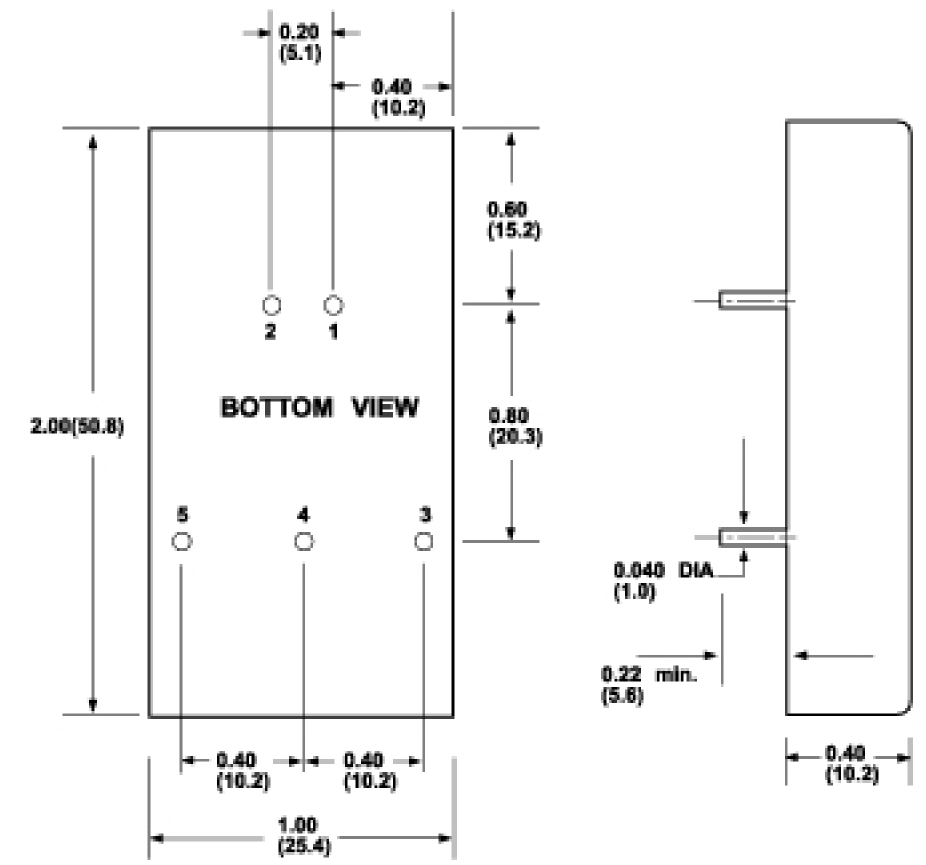
GENERAL SPECIFICATIONS:

Efficiency .... See Table
Isolation Voltage .... 500 VDC min.
Isolation Resistance .... 10^9ohms
Switching Frequency .... 200KHz, min.
Operating Temperature Range .... -25 C to + 71 C
Case Temperature .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40 C to + 100 C
EMI/RFI .... Six sided Continuous Shield
Dimensions .... 2 x 1 x 0.4 inches (50.8 x 25.4 x 10.2 mm)
Case Material .... Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load
3. A Minimum Load On the Output is Necessary to Maintain Regulation

CASE B

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION	
Pin	Function
1.	+Input
2.	-Input
3.	+Output
4.	Common/NP
5.	-Output

NP*-NO PIN ON SINGLE OUTPUT

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC5BE

15 WATT WIDE INPUT DC-DC CONVERTERS

E178177

Features

- 15W Isolated Output
- Efficiency to 83%
- 2:1 Input Range
- Continuous Short Circuit Protection
- Meets EN55022 Class A, Conducted
- Remote On/Off Option

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF.	CASE
EC5BE01		5 VDC	3000 mA	20 mA	1602 mA	78	
EC5BE02		12 VDC	1250 mA	20 mA	1524 mA	82	
EC5BE03		15 VDC	1000 mA	20 mA	1524 mA	82	
EC5BE04	9-18 VDC	±12 VDC	±625 mA	30 mA	1506 mA	83	B
EC5BE05		±15 VDC	±500 mA	30 mA	1506 mA	83	
EC5BE06		±5 VDC	±1500 mA	30 mA	1563 mA	80	
EC5BE07		3.3 VDC	3000 mA	20 mA	1086 mA	76	
EC5BE11		5 VDC	3000 mA	20 mA	780 mA	80	
EC5BE12		12 VDC	1250 mA	20 mA	762 mA	82	
EC5BE13		15 VDC	1000 mA	20 mA	762 mA	82	
EC5BE14	18-36 VDC	±12 VDC	±625 mA	25 mA	755 mA	83	B
EC5BE15		±15 VDC	±500 mA	25 mA	755 mA	83	
EC5BE16		±5 VDC	±1500 mA	25 mA	772 mA	81	
EC5BE17		3.3 VDC	3000 mA	20 mA	543 mA	76	
EC5BE21		5 VDC	3000 mA	15 mA	391 mA	80	
EC5BE22		12 VDC	1250 mA	15 mA	377 mA	83	
EC5BE23		15 VDC	1000 mA	15 mA	377 mA	83	
EC5BE24	36-72 VDC	±12 VDC	±625 mA	20 mA	377 mA	83	B
EC5BE25		±15 VDC	±500 mA	20 mA	377 mA	83	
EC5BE26		±5 VDC	±1500 mA	20 mA	381 mA	82	
EC5BE27		3.3 VDC	3000 mA	15 mA	271 mA	76	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range............................12V 9-18V
24V 18-36V
48V 36-72V
Input Filter............................Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output............................±1.0% max.
Dual + Output............................±1.0% max.
Dual – Output............................±1.0% max.
Voltage Balance (Dual)............................±1.0% max.
Transient Response
Single 25% Step Load Change............................<500μ sec.
Dual FL-1/2L ±1% Error Band............................<500μ sec.
Ripple and Noise, 20MHz BW............................75mV p-p max.
Temperature Coefficient............................±0.02%/°Cmax.
Short Circuit Protection............................Continuous
Line Regulation[1] Single/Dual Output............................±0.2% max.
Load Regulation[2] Single/Dual Output............................±1.0% max.

GENERAL SPECIFICATIONS:

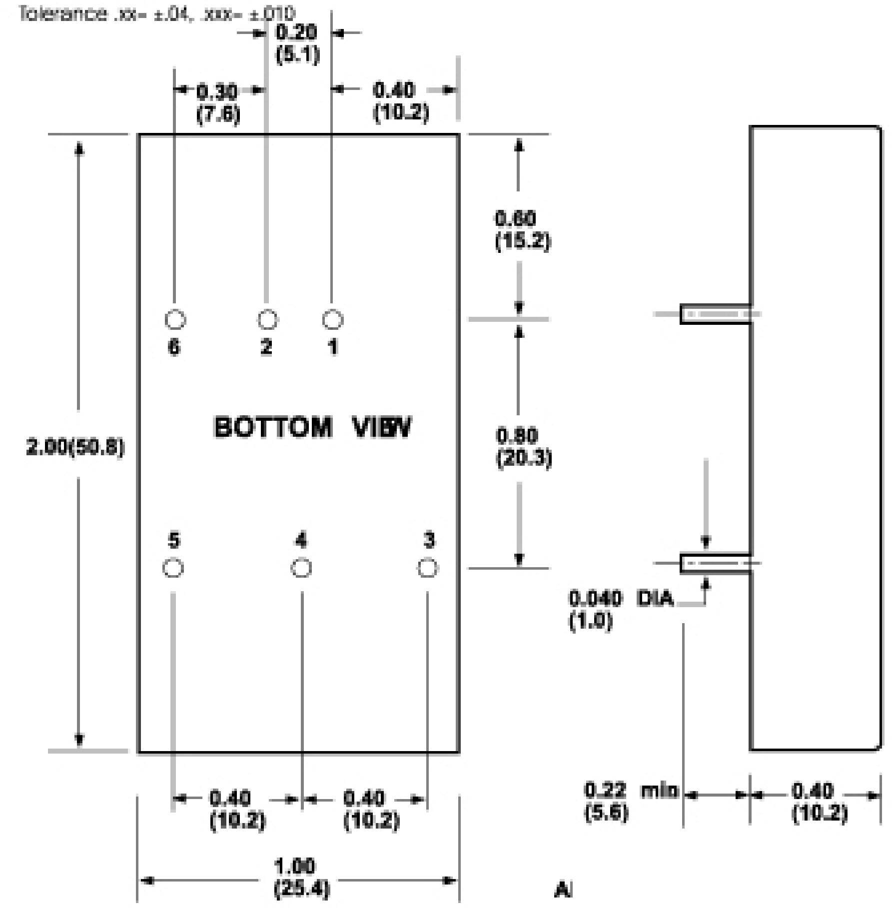
Efficiency............................See Table
Isolation Voltage............................500 VDC min.
Isolation Resistance............................10^9ohms min.
Switching Frequency............................300KHz, typ.
Operating Temperature Range............................-25 C to + 71 C
Case Temperature............................100°C max.
Storage Temperature Range............................-40 C to + 100 C
EMI/RFI............................Six sided Continuous Shield
Dimensions............................2 x 1 x 0.4 inches
(50.8 x 25.4 x 10.2 mm)
Case Material............................Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load

OPTION:
1. Suffix "T" to the Model Number with Remote On/Off Remote On/Off Control:
   Logic Compatibility............................COMS or Open Collector TTL
   EC-ON............................>+5.5VDC or Open Circuit
   EC-OFF............................<1.8 VDC
   Control Common............................Referenced to Input Minus
2. Suffix "A" to the Model Number with Output Voltage Adjustable External Trim Adj. Range ≥ ±10%, Single Output Only

CASE B

All Dimensions in Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION	
Pin	Function
1.	+V Input
2.	-V Input
3.	+V Output
4.	Common/NP/Trim (Option)
5.	-V Output
6.	NP/Remote (Option)

NP*-NO PIN ON SINGLE OUTPUT

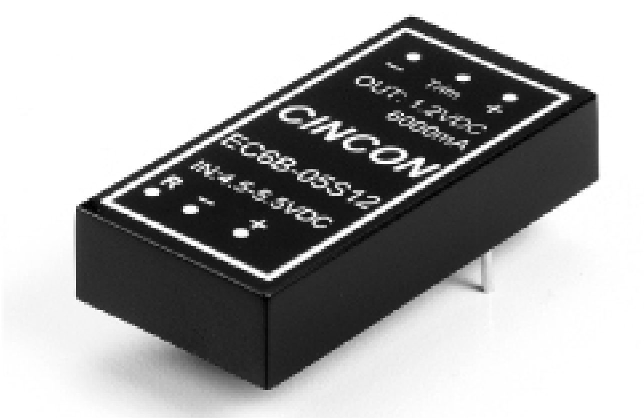
All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

EC5BE

S E R I E S

EC6B

7.2 TO 20 WATT
DC-DC CONVERTERS
SINGLE OUTPUT



Features

- 20W Non-Isolated Output
- Efficiency to 88%
- Constant Frequency
- Regulated Outputs
- Over Current Protection
- Under Input Voltage Protection
- Output Voltage Adjustment
- Remote On/Off Control

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	%EFF	CASE
EC6B-05S12	4.5-5.5 VDC	1.2 VDC	6A	40 mA	1895 mA	76	B
EC6B-05S21	4.5-5.5 VDC	2.1 VDC	6A	40 mA	3000 mA	84	B
EC6B-05S25	4.5-5.5 VDC	2.5 VDC	6A	40 mA	3530 mA	85	B
EC6B-05S33	4.5-5.5 VDC	3.3 VDC	6A	40 mA	4500 mA	88	B

NOTE : 1. Nominal Input Voltage 5 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........ 5V........4.5-5.5V
Input Filter Type[1]........Capacitive
Remote shutdown[2]........Positive Logic

OUTPUT SPECIFICATIONS:

Voltage Accuracy........±1% max.
External Trim Adj. Range........±10%
Ripple & Noise, 20MHz BW[3]........75mV pk-pk max.
Temperature Coefficient........±0.05%/°C
Over Current Protection........Auto-Recovery
Current Limit........120% ~150% Nominal Output
Line Regulation[4]........±0.5% max.
Load Regulation[5]........±0.5% max.

GENERAL SPECIFICATIONS:

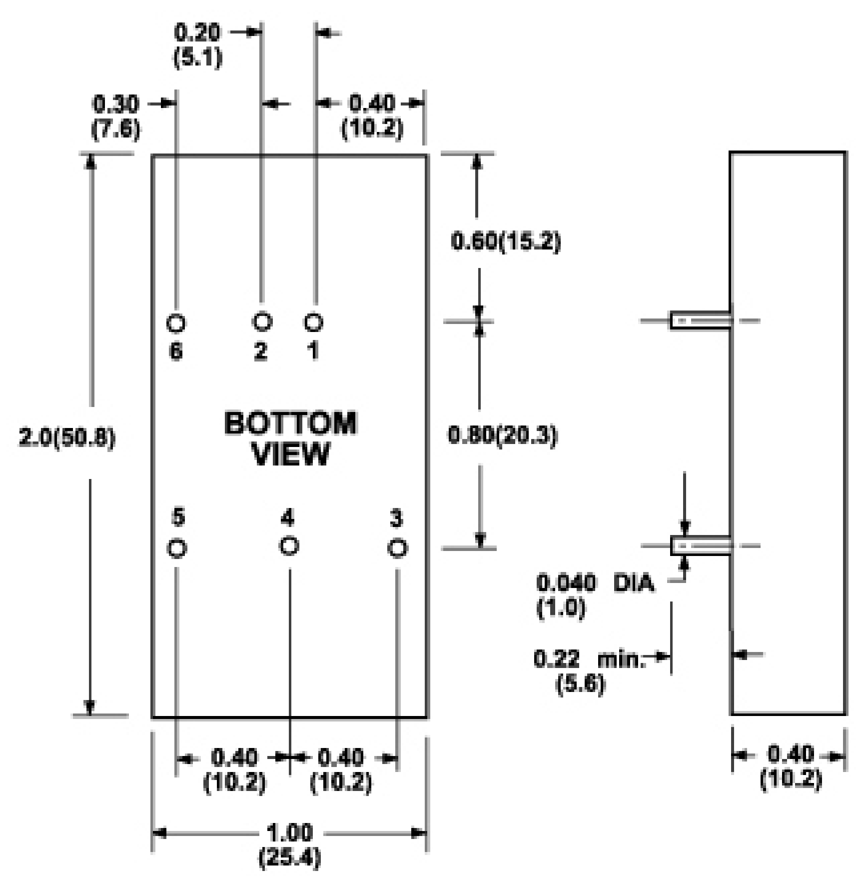
Efficiency........See Table
Switching Frequency........200KHz Typ.
Operating Temperature Range........-25°C to 71°C
Case Temperature........95°C max.
Storage Temperature Range........-40°C to +105°C
Dimensions........2.0x1.0x0.4 inches
(50.8x25.4x10.2 mm)
Case Material........Non-Conductive Black Plastic

NOTE:

1. Specification apply to model and require an 470μF input capacitor.
2. Logic Compatibility with Open Collector TTL or CMOS.
3. Measured From Output connect with an external capacitor 0.1μF ceramic.
4. Measured From High Line to Low Line.
5. Measured From Full Load to 10% Load.

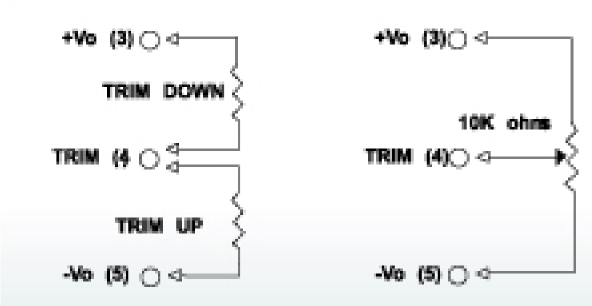
CASE B

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION	
Pin	Function
1.	+Input
2.	-Input
3.	+Output
4.	Trim
5.	-Output
6.	Remote ON/OFF

External Output Trim

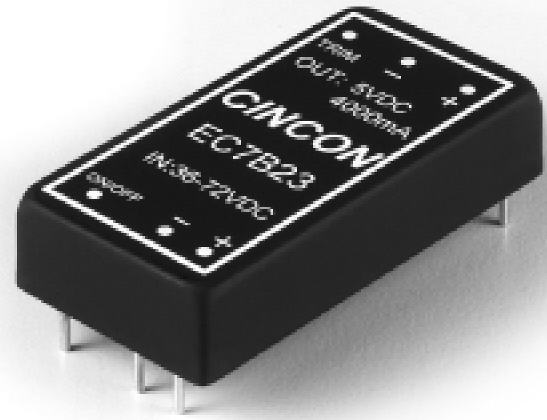


All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC7B

20 WATT WIDE INPUT DC-DC CONVERTERS



Features

- 20W Isolated Output
- Efficiency to 86%
- 2:1 Input Range
- Pi Input Filter
- Continuous Short Circuit Protection
- Remote On/Off Option

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT URRENT	NPUT CURRENT C NO LOAD	FULL LOAD	%EFF	CASE
EC7B11		2.5 VDC	5000 mA	50 mA	645 mA	81	
EC7B12	18-36 VDC	3.3 VDC	5000 mA	55 mA	828 mA	83	B
EC7B13		5 VDC	4000 mA	55 mA	981 mA	85	
EC7B21		2.5 VDC	5000 mA	45 mA	318 mA	82	
EC7B22	36-72 VDC	3.3 VDC	5000 mA	45 mA	410 mA	84	B
EC7B23		5 VDC	4000 mA	45 mA	485 mA	86	

NOTE : 1. Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... 24V 18-36V
48V 36-72V
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy .... ±1.0% max.
Transient Response: Single 25% Step Load Change .... <500μ sec.
Minimum Output Current .... 10% Full Load
Ripple & Noise, 20MHz BW .... 75mV p-p max.
Temperature Coefficient .... ±0.02%/°C max.
Line Regulation[1] Single Output .... ±0.2% max.
Load Regulation[2] Single Output .... ±1.0% max.
Short Circuit Protection .... Continuous
Current Limit Threshold Range, % Io rated .... 110% ~140%
External Trim Adj. Range .... ±10%
Remote On/Off Control:
Logic Compatibility .... COMS or Open Collector TTL
EC-ON .... >+5.5VDC or Open Circuit
EC-OFF .... < 1.8 VDC
Control Common .... Referenced to Input Minus

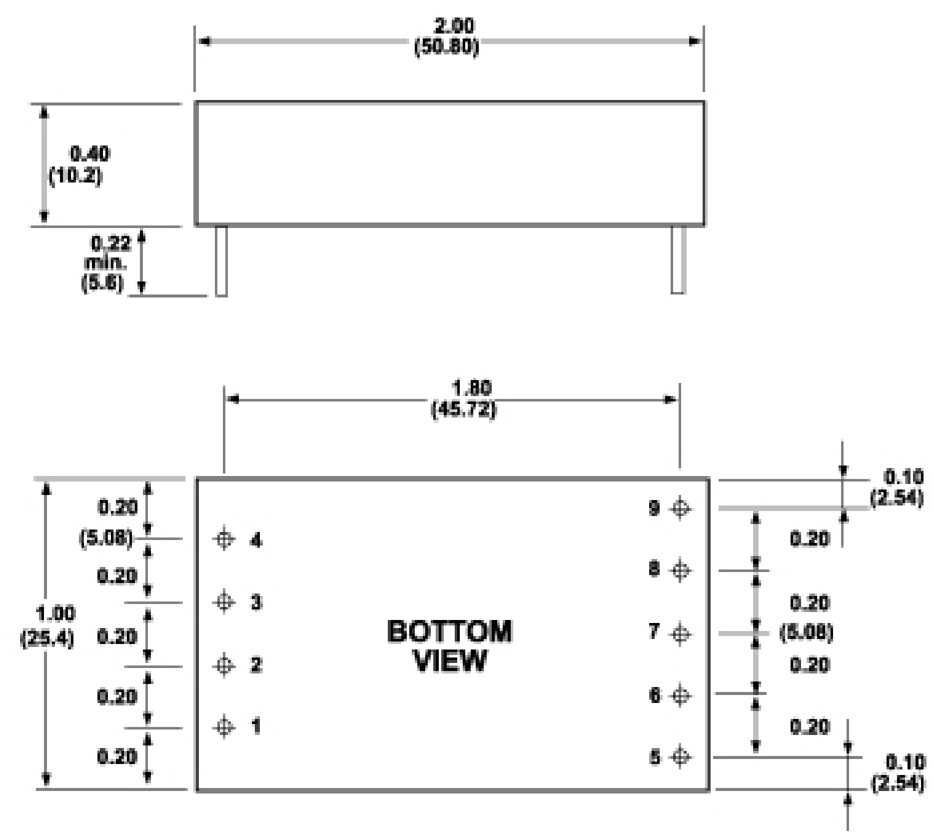
GENERAL SPECIFICATIONS:

Efficiency .... See Table
Isolation Voltage .... 500 VDC min.
Isolation Resistance .... 10⁹ Ohms min.
Switching Frequency .... 500KHz Typ.
Operating Temperature Range .... -25°C to +71°C
Case Temperature .... 100°C max
Storage Temperature Range .... -40°C to +100°C
EMI / RFI .... Six Sided Continuous Shield
Dimensions .... 2 x1 x 0.4 inches (50.8x25.4x10.2 mm)
Case Material .... Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line.
2. Measured From Full Load to 1/4 Load.

CASE B

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010

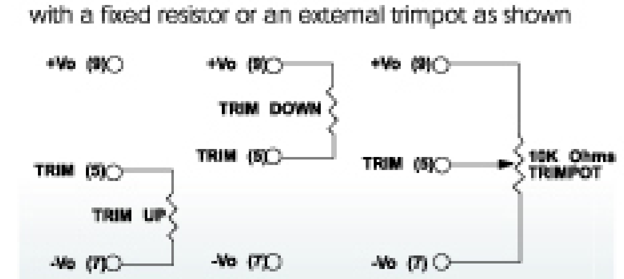


PIN CONNECTION	
Pin	Function
1.	Remote ON/OFF
2.	NP
3.	-Vin
4.	+vin
5.	Trim
6.	NP
7.	-Vout
8.	NP
9.	+Vout

NC: NO CONNECTION
NP: NO PIN

External Output Trimming

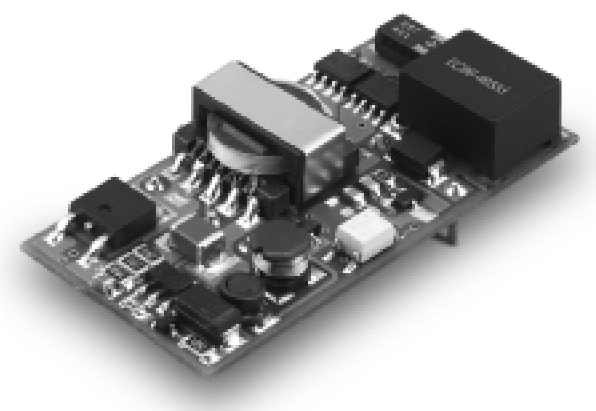
Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown



All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC8B



10.8 TO 15 WATT OPEN FRAME DC-DC CONVERTERS

Features

- 10.8 – 15W Isolated Output
- Efficiency to 87%
- 300KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Pi Input Filter

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT MIN.	OUTPUT CURRENT MAX.	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	%EFF	SIZE
EC8B-24S18	18-36 VDC	1.8 VDC	0 mA	6000 mA	30 mA	542mA	83	B
EC8B-24S25	18-36 VDC	2.5 VDC	0 mA	6000 mA	30 mA	735mA	85	B
EC8B-24S33	18-36 VDC	3.3 VDC	0 mA	4500 mA	30 mA	720mA	86	B
EC8B-24S05	18-36 VDC	5 VDC	0 mA	3000 mA	40 mA	718mA	87	B
EC8B-48S18	36-75 VDC	1.8 VDC	0 mA	6000 mA	30 mA	271mA	83	B
EC8B-48S25	36-75 VDC	2.5 VDC	0 mA	6000 mA	30 mA	364mA	86	B
EC8B-48S33	36-75 VDC	3.3 VDC	0 mA	4500 mA	30 mA	356mA	87	B
EC8B-48S05	36-75 VDC	5 VDC	0 mA	3000 mA	40 mA	360mA	87	B

NOTE : 1. Nominal Input Voltage 24 or 48VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........ 24V..........18-36V
48V..........36-75V
Undervoltage lockout ....24Vin power up..........17V
power down 15.5V
48Vin power up 34V
power down 32.5V

Input Filter .... PI Type
Positive Logic Remote on/off Control :
Logic Compatibility..........CMOS or Open Collector TTL
Module ON..........>+5.5VDC or Open Circuit
Module OFF..........<1.8VDC

GENERAL SPECIFICATIONS:

Efficiency..........See Table
Isolation Voltage..........1500 VDC min.
Isolation Resistance ....10^8 Ohms min.
Switching Frequency ....300KHz Typ.
Over Temperature Protection..........120°C Typ.
Operating Ambient Temperature Range..........-40°C to +60°C
Derating, Above 60°C .... Linearly to Zero Power at +100°C
Storage Temperature Range ....-40°C to +120°C

Dimensions.......... 2 x 1 x 0.4 inches
(50.8 x 25.4 x 10.2 mm)
Material..........Non-potted With Open Frame Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy..........±1.0% max.
Transient Response :25% Step Load Change..........<500μ sec.
Ripple and Noise, 20MHz BW[3] ....75mV p-p max.

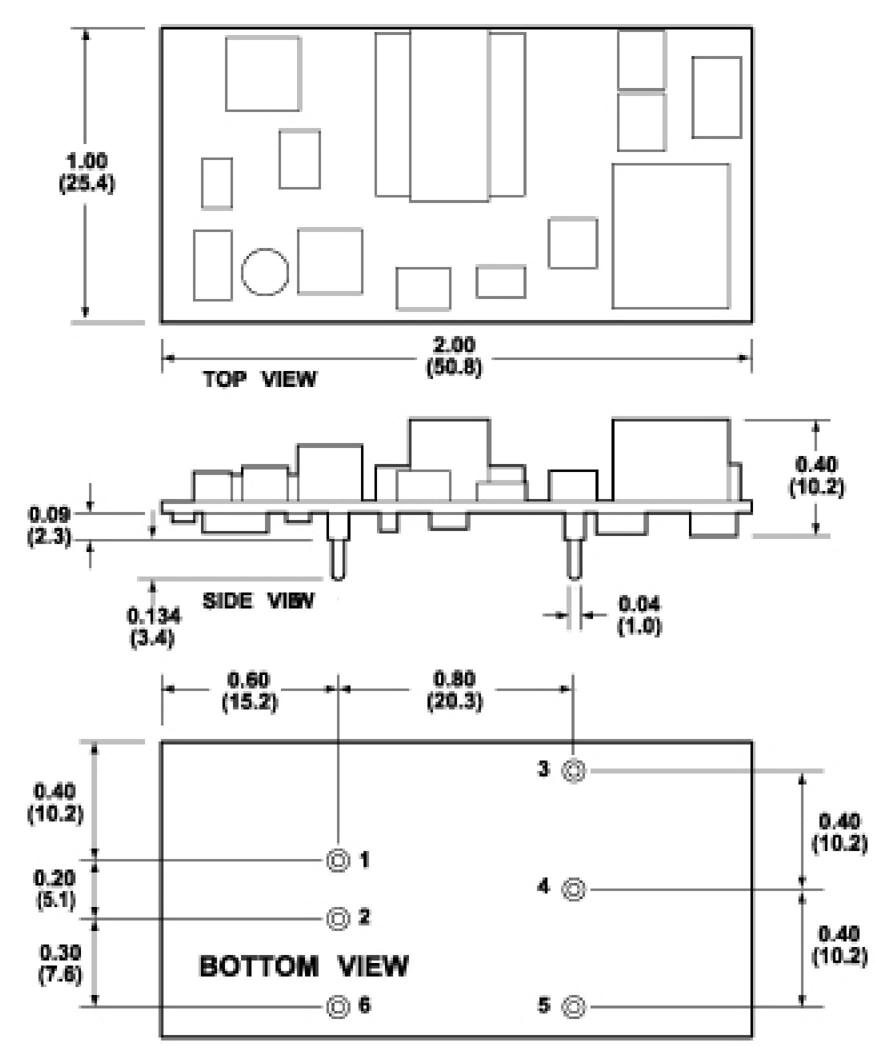
Temperature Coefficient..........±0.03%/C max.
Short Circuit Protection..........Continuous
Line Regulation[1]..........±0.2% max.
Load Regulation[2]..........±1.0% max.
Over Voltage Protection..........Zener or TVS Clamp
External Trim Adj. Range..........±10%

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to Min. Load
3. The output noise is measured with 4.7μf tantalum capacitor and 0.1μf ceramic capacitor across output.

Mechanical Specification

All Dimensions In Inches(mm)

Tolerances .XX±.02 .XXX±.010



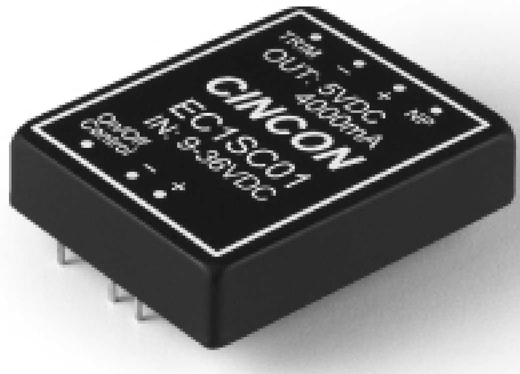
PIN CONNECTION	
Pin	Function
1.	+V Input
2.	-V Input
3.	+V Output
4.	Trim
5.	-V Output
6.	Remote ON/OFF

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC1SC

20 WATT WIDE INPUT DC-DC CONVERTERS



E176177

Features

- 20W Isolated Output
- Efficiency to 84%
- 4:1 Input Range
- Pi Input Filter
- Continuous Short Circuit Protection
- Meets EN55022 Class A, Conducted
- Remote On/Off Control

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	NPUT CURRENT NO LOAD	ULL LOAD	%EFF	CASE
EC1SC01		5 VDC	4000mA	15mA	1029 mA	81	
EC1SC02		12 VDC	1670mA	15mA	1006 mA	83	
EC1SC03		15 VDC	1330mA	15mA	1004 mA	83	
EC1SC04	9-36 VDC	±12 VDC	±833mA	20mA	1004 mA	83	SC
EC1SC05		±15 VDC	±666mA	20mA	1004 mA	83	
EC1SC06		±5 VDC	±2000mA	20mA	1004 mA	83	
EC1SC07		3.3 VDC	4000mA	15mA	705 mA	78	
EC1SC11		5 VDC	4000mA	10mA	508 mA	82	
EC1SC12		12 VDC	1670mA	10mA	497 mA	84	
EC1SC13		15 VDC	1330mA	10mA	496 mA	84	
EC1SC14	18-72 VDC	±12 VDC	±833mA	15mA	496 mA	84	SC
EC1SC15		±15 VDC	±666mA	15mA	496 mA	84	
EC1SC16		±5 VDC	±2000mA	15mA	496 mA	84	
EC1SC17		3.3 VDC	4000mA	10mA	353 mA	78	

NOTE : 1. Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........ 24V 9-36V
48V 18-72V
Input Filter ....Pi Type
Positive Logic Remote ON/OFF Control........See Note3

OUTPUT SPECIFICATIONS:

Voltage Accuracy Single Output........±1.0% max.
Voltage Accuracy Dual + Output........±1.0% max.
Voltage Accuracy Dual - Output........±2.0% max.
Voltage Balance, Dual Output at Full Load........±1.0% max.
Transient Response
Single 25% Step Load Change ....<500μ sec.
Dual -FL-1/2L ±1% Error Band ....<500μ sec.
External Trim Adj. Range ....±10%
Ripple & Noise, 20MHz BW........20mV RMS, max.
75mV p-p max.
Temperature Coefficient........±0.02%/°C max.
Short Circuit Protection........Continuous
Line Regulation¹, Single / Dual Output ....±0.5% max.
Load Regulation², Single / Dual Output........±0.5% max.

GENERAL SPECIFICATIONS:

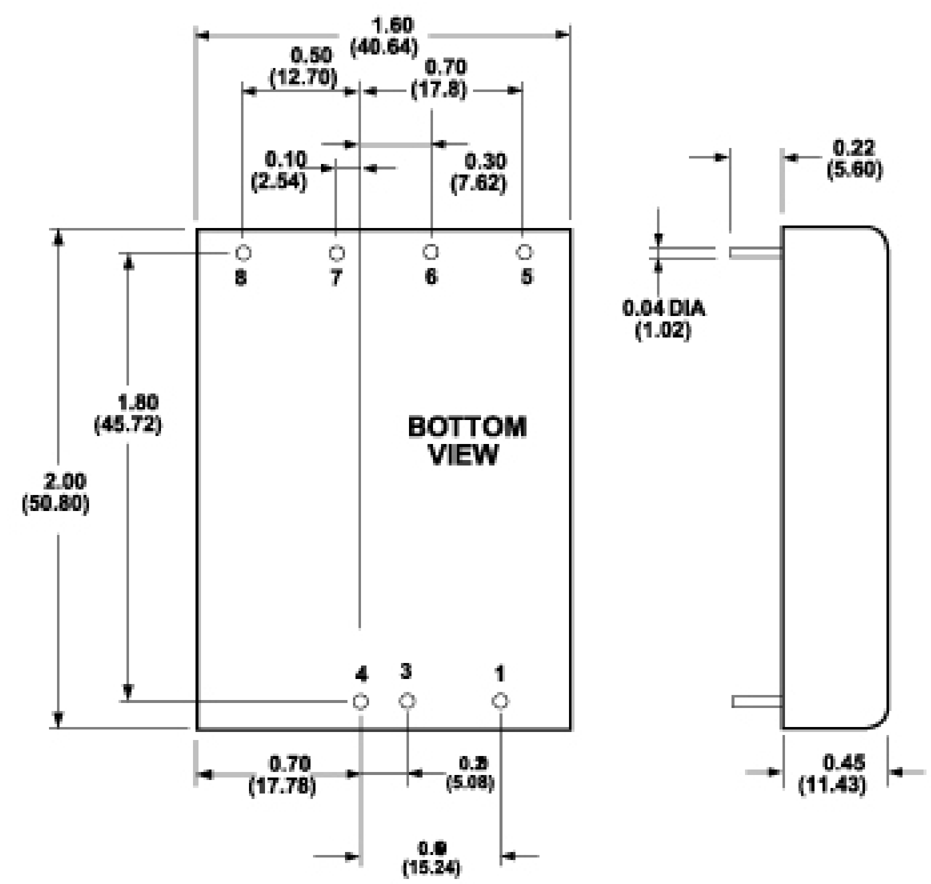
Efficiency........See Table
Isolation Voltage........1500 VDC min.
Isolation Resistance........10⁹ Ohms min.
Switching Frequency ....300KHz Typ.
Operating Temperature Range........-25°C to +71°C
Derating, Above 60°C........Linearly to Zero Power at + 100°C
Case Temperature........100°C max.
Storage Temperature Range........-55°C to +105°C
EMI / RFI........Six Sided Continuous Shield
Dimensions ....2 x1.6 x 0.45 inches
(50.8 x 40.64 x 11.43mm)
Case Material .....Black Coated Copper with Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line.
2. Measured From Full Load to 1/4 Load.
3. Remote On/Off Control:
   Logic Compatibility........CMOS or Open Collector TTL
   EC-ON........>+5.5VDC or Open Circuit
   EC-OFF........< 1.8 VDC
   Control Common........Referenced to Input Minus

CASE SC

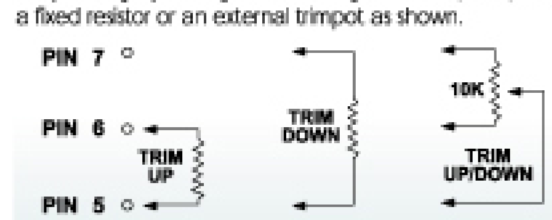
All Dimensions in Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION		
Pin	Single Output	Dual Output
1	On/Off Control	On/Off Control
3	-Vin	-Vin
4	+Vin	+Vin
5	Trim	Trim
6	-Vout	-Vout
7	+Vout	Common
8	No Pin	+Vout

External Output Trimming

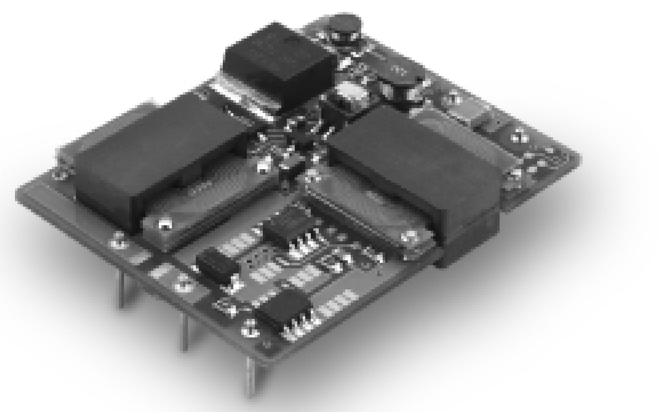
Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC2SC



14.4 TO 25 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT

Features

- 14.4 - 25W Isolated Output
- High Efficiency Up to 91%
- Fixed 300KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Open-Frame
- 2" X 1.6" size
- Industry Standard Pin-Out

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT URRENT C	NPUT CURRENT NO LOAD	ULL LOAD	%EFF	IZES
EC2SC-24S18	18-36 VDC	1.8 VDC	8 A	50 mA	723 mA	83	SC
EC2SC-24S25	18-36 VDC	2.5 VDC	8 A	50 mA	980 mA	85	SC
EC2SC-24S33	18-36 VDC	3.3 VDC	6 A	50 mA	959 mA	86	SC
EC2SC-24S05	18-36 VDC	5.0 VDC	5 A	50 mA	1197 mA	87	SC
EC2SC-24S12	18-36 VDC	12 VDC	2 A	50 mA	1136 mA	88	SC
EC2SC-24S15	18-36 VDC	15 VDC	1.6 A	50 mA	1136 mA	88	SC
EC2SC-48S18	36-75 VDC	1.8 VDC	8 A	30 mA	353 mA	85	SC
EC2SC-48S25	36-75 VDC	2.5 VDC	8 A	30 mA	479 mA	87	SC
EC2SC-48S33	36-75 VDC	3.3 VDC	6 A	30 mA	474 mA	87	SC
EC2SC-48S05	36-75 VDC	5.0 VDC	5 A	30 mA	572 mA	91	SC
EC2SC-48S12	36-75 VDC	12 VDC	2A	30 mA	562 mA	89	SC
EC2SC-48S15	36-75 VDC	15 VDC	1.6A	30 mA	562 mA	89	SC

NOTE : 1. Nominal Input Voltage 24, 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.................................. 24V..................18-36V
48V..................36-75V
Undervoltage lockout .... 24Vin power up 17V
24Vin power down 15V
48Vin power up 34V
48Vin power down 30V
Positive Logic Remote ON/OFF[3,4]
Input Filter .... PI Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±1% max.
Transient Response: 75% - 100% Step Load Change
Error Band .... ±2% Vout nominal
Recovery Time ....< 300μ sec.
Output Voltage Adjustment Range , %Vo .... 90% - 110%
Ripple & Noise, 20MHz BW
1.8V & 2.5V & 3.3V & 5V .... 20mV RMS, max. 75mV pk-pk, max.
12V & 15V .... 20mV RMS, max. 100mV pk-pk, max.
Temperature Coefficient.. ±0.02% / C
Output Line Regulation[1].. ±0.5% max.
Output Load Regulation[2].. ±0.5% max.
Output Over Voltage Clamp Range ,% Vo nom. 115-140%
Output Current Limit, % Nominal Output ....110% ~150%
Output Short Circuit Protection .... Continuous (hiccup mode).

GENERAL SPECIFICATIONS:

Efficiency...See Table
Isolation Voltage ....Input/Output.................. 1500VDC max.
Isolation Resistance .... 10^9 ohm min.
Switching Frequency .... 300KHz, Typ
Operating Ambient Temperature[a].............................. -40°C to +71°C
Storage Temperature .... -55°C to +125°C
Thermal Shutdown Case Temp..120°C Typ.
Dimensions .... 2.0 x 1.6 x 0.40 inches
(50.8x40.6x10.2 mm)

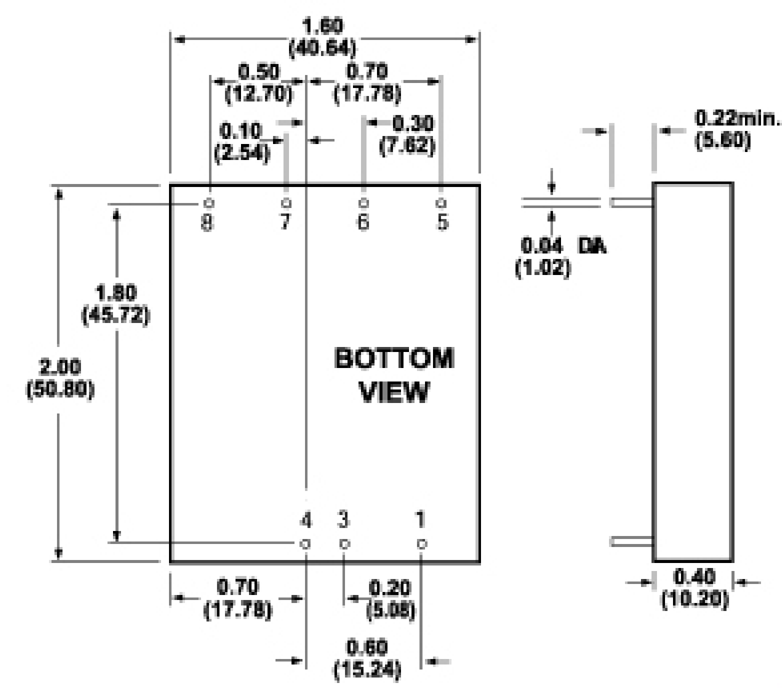
NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Logic Compatibility .... CMOS or Open Collector TTL, ref. to -Vin
   Module ON .... > +2Vdc or Open Circuit
   Module OFF .... < 1.2Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF
   Module ON .... < 1.2Vdc
   Module OFF .... >+2Vdc or Open Circuit
5. Derating. Above 60°C .... Linearly to Zero power at 100°C

Mechanical Specification

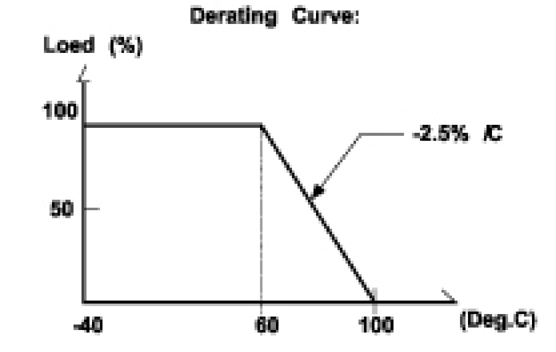
All Dimensions In Inches(mm)

Tolerances Inches .XX±.04 .XXX±.010



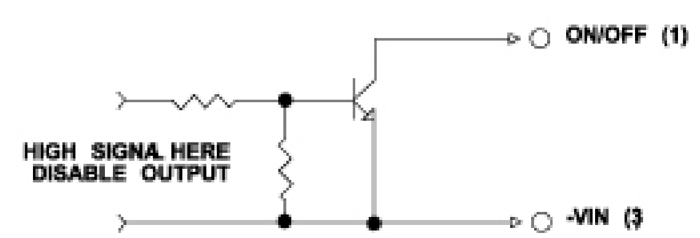
PIN CONNECTION	
Pin	Function
1.	On/Off Control
3.	-V Input
4.	+V Input
5.	Trim
6.	-V Output
7.	+V Output
8.	No Pin

Derating Curve:

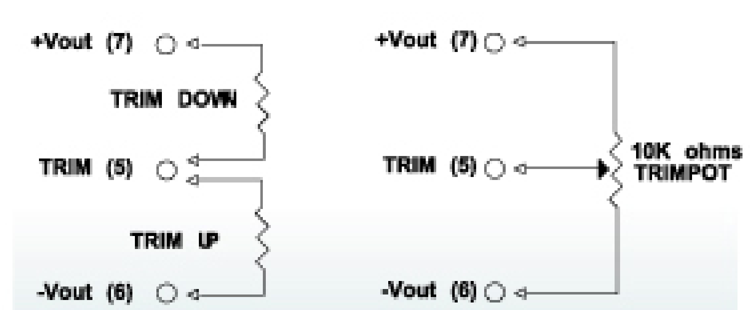


a. Operating Temperature: -40℃ to 60℃ ---> without derating
b. Operating Temperature: -60℃ to 100℃ ---> derating (-2.5%/C)

Remote ON/OFF Control



External Output Trim

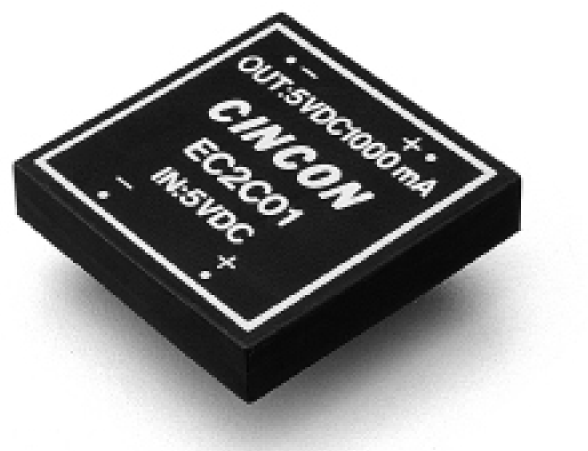


All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC2C

5 TO 6 WATT DC-DC CONVERTERS



Features

- High Performance
- 60% Efficiency
- Pi Input Filter
- Regulated Outputs
- Low Ripple and Noise
- 500 VDC Isolation

MODEL NUMBER	INPUT VOLTAGE	OUTPUT OLTAGEV	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	CASE	ALT' PIN OUT
EC2C01		5 VDC	1000 mA	60 mA	1700 mA		
EC2C02		12 VDC	470 mA	70 mA	1750 mA		
EC2C03	5 VDC	15 VDC	400 mA	70 mA	1800 mA	C	S
EC2C04		±12 VDC	±230 mA	130 mA	1700 mA		
EC2C05		±15 VDC	±190 mA	140 mA	1700 mA		
EC2C11		5 VDC	1000 mA	40 mA	690 mA		
EC2C12		12 VDC	470 mA	40 mA	700 mA		
EC2C13	12 VDC	15 VDC	400 mA	40 mA	750 mA	C	S
EC2C14		±12 VDC	±230 mA	60 mA	710 mA		
EC2C15		±15 VDC	±190 mA	60 mA	710 mA		
EC2C21		5 VDC	1000 mA	20 mA	350 mA		
EC2C22		12 VDC	470 mA	20 mA	340 mA		
EC2C23	24 VDC	15 VDC	400 mA	20 mA	360 mA	C	S
EC2C24		±12 VDC	±230 mA	35 mA	360 mA		
EC2C25		±15 VDC	±190 mA	35 mA	360 mA		
EC2C31		5 VDC	1000 mA	20 mA	290 mA		
EC2C32		12 VDC	470 mA	20 mA	300 mA		
EC2C33	28 VDC	15 VDC	400 mA	20 mA	310 mA	C	S
EC2C34		±12 VDC	±230 mA	25 mA	290 mA		
EC2C35		±15 VDC	±190 mA	25 mA	290 mA		
EC2C41		5 VDC	1000 mA	14 mA	170 mA		
EC2C42		12 VDC	470 mA	14 mA	170 mA		
EC2C43	48 VDC	15 VDC	400 mA	14 mA	180 mA	C	S
EC2C44		±12 VDC	±230 mA	20 mA	170 mA		
EC2C45		±15 VDC	±190 mA	20 mA	170 mA		

NOTE: 1. Alternative pin-out version. To order, suffix a "S" to the standard model number.

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........±10%
Input Filter........Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy........±1.0% max.
Voltage Balance, Dual Output........±0.5% max.
Temperature Coefficient
 Single Output........± 0.02%/°C
 Dual Output........± 0.01%/°C
Ripple and Noise, 20MHz BW
 Single Output........50mV p-p max.
 Dual Output........35mV p-p max.
Short Circuit Protection........Short Term
Line Regulation........±0.02%
Load Regulation........±0.05%

GENERAL SPECIFICATIONS:

Efficiency........60%
Isolation Voltage........500 VDC min.
Isolation Capacitance........80pF
Isolation Resistance........10^9ohms
Switching Frequency........20KHz, min.
Operating Temperature Range........-25 C to + 71 C
Case Temperature (Plastic case)........95°C max.
 (Copper case)........100°C max.
Cooling........Free-Air Convection
Storage Temperature Range........-40 C to + 100 C
Dimensions........2 x 2 x 0.4 inches
(50.8 x 50.8 x 10.2mm)

CASE MATERIAL:

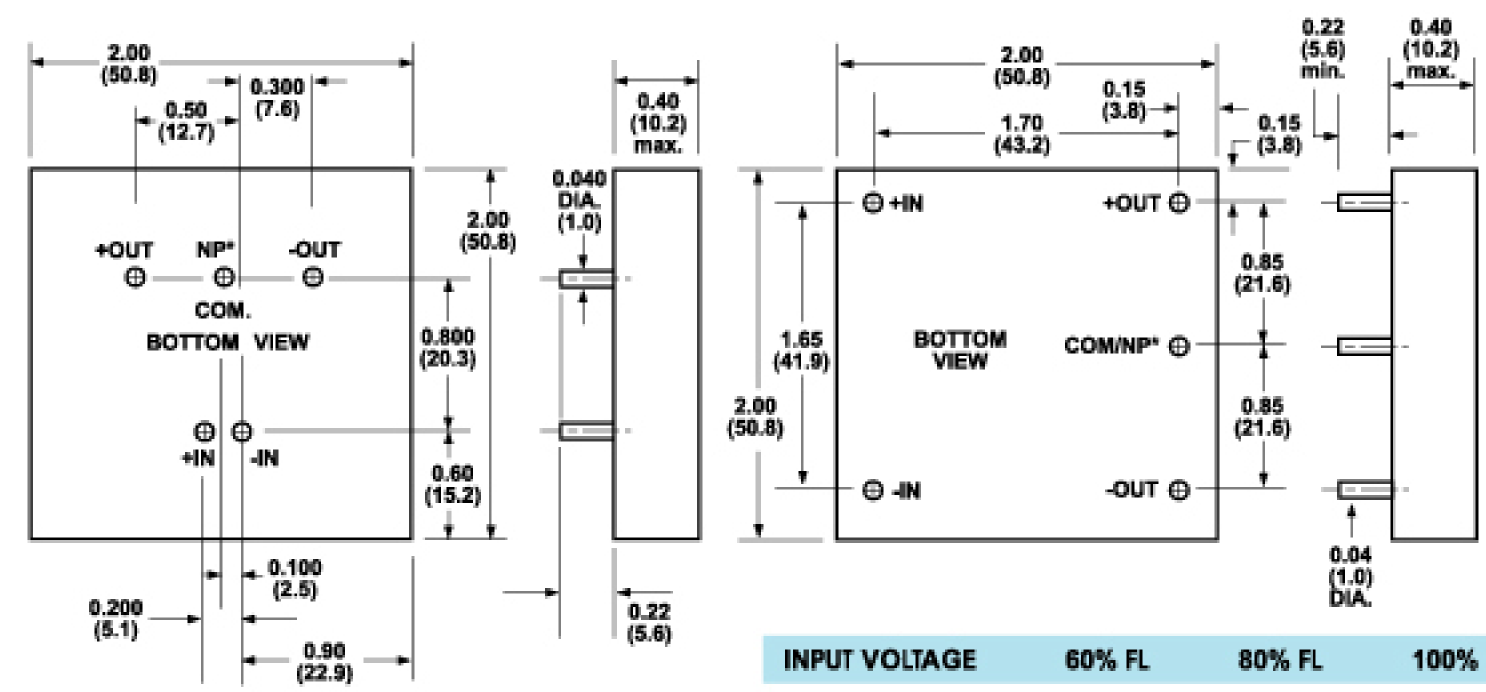
Standard Models........Non-Conductive Black Plastic
Suffix "M" Models........Black Coated Copper with Non-Conductive Base

CASE C

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010

STANDARD PIN CONFIGURATION

ALTERNATE PIN CONFIGURATION SUFFIX "S"



NP* - NO PIN ON SINGLE OUTPUT MODLES

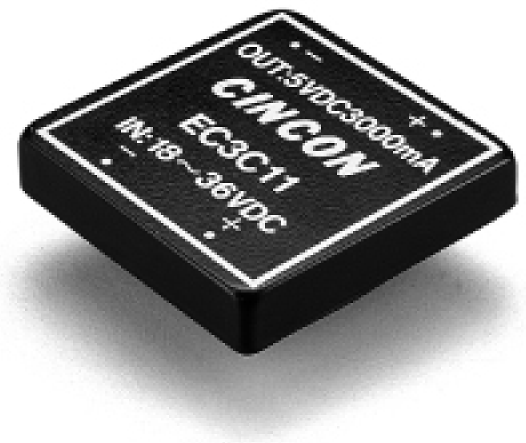
INPUT VOLTAGE	60% FL	80% FL	100% FL
5V	4.4-6.5V	4.5-6.0V	4.65-5.5V
12V	10.56-15.6V	10.8-14.4V	11.16-13.2V
24V	21.12-31.2V	21.6-28.8V	22.32-26.4V
28V	24.64-36.4V	25.2-33.6V	26.04-30.8V
48V	42.24-62.4V	43.2-57.6V	44.64-52.8V

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC3C

15 WATT WIDE INPUT DC-DC CONVERTERS



Features

- 15W Isolated Output
- 2:1 Input Range
- Six-Sided Shield
- 200KHz Switching Frequency
- Efficiency to 82%

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT[1] NO LOAD	INPUT CURRENT[1] FULL LOAD	EFF.	CASE[2]
EC3C01		5 VDC	3000 mA	30 mA	1660 mA	75	
EC3C02		12 VDC	1250 mA	30 mA	1625 mA	78	
EC3C03		15 VDC	1000 mA	30 mA	1625 mA	78	
EC3C04	9-18 VDC	±12 VDC	±625 mA	35 mA	1620 mA	77	C/S
EC3C05		±15 VDC	±500 mA	35 mA	1620 mA	77	
EC3C06		±5 VDC	±1500 mA	35 mA	1620 mA	77	
EC3C07		3.3 VDC	3000 mA	30 mA	1178 mA	70	
EC3C11		5 VDC	3000 mA	15 mA	812 mA	78	
EC3C12		12 VDC	1250 mA	20 mA	772 mA	81	
EC3C13		15 VDC	1000 mA	20 mA	772 mA	81	
EC3C14	18-36 VDC	±12 VDC	±625 mA	25 mA	780 mA	80	C/S
EC3C15		±15 VDC	±500 mA	25 mA	780 mA	80	
EC3C16		±5 VDC	±1500 mA	25 mA	780 mA	80	
EC3C17		3.3 VDC	3000 mA	15 mA	557 mA	74	
EC3C21		5 VDC	3000 mA	10 mA	390 mA	80	
EC3C22		12 VDC	1250 mA	15 mA	381 mA	82	
EC3C23		15 VDC	1000 mA	15 mA	381 mA	82	
EC3C24	36-72 VDC	±12 VDC	±625 mA	20 mA	386 mA	81	C/S
EC3C25		±15 VDC	±500 mA	20 mA	386 mA	81	
EC3C26		±5 VDC	±1500 mA	20 mA	386 mA	81	
EC3C27		3.3 VDC	3000 mA	20 mA	271 mA	76	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC
2. Alternative pin-out version. To order, suffix a "S" to the standard model number.

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... 12V 9-18V
24V 18-36V
48V 36-72V
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output .... ±1.0% max.
Dual + Output .... ±1.0% max.
Dual - Output .... ±3.0% max.
Voltage Balance Dual Output at Full Load .... ±1.0% max.
Transient Response
Single 25% Step Load Change .... <500μ sec.
Dual FL-1/2L ±1% Error Band .... <500μ sec.
Ripple & Noise 20MHz BW .... 10mV RMS. max.
75mV p-p max.
Temperature Coefficient .... ±0.02%/°C
Short Circuit Protection .... Indefinite & Current Limit
Line Regulation[1] Single/Dual Output .... ±0.2% max.
Load Regulation[2] Single/Dual Output .... ±1.0% max.

GENERAL SPECIFICATIONS:

Efficiency .... See Table
Isolation Voltage .... 500 VDC min.
Isolation Resistance .... 10^9 ohms
Switching Frequency .... 200KHz, typ.
Operating Temperature Range .... -25°C to + 71°C
Case Temperature .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40°C to + 100°C
EMI/RFI .... Six-Sided Continuous Shield
Dimensions .... 2 x 2 x 0.4 inches
(50.8 x 50.8 x 10.2mm)
Case Material .... Black Coated Copper With Non-Conductive Base

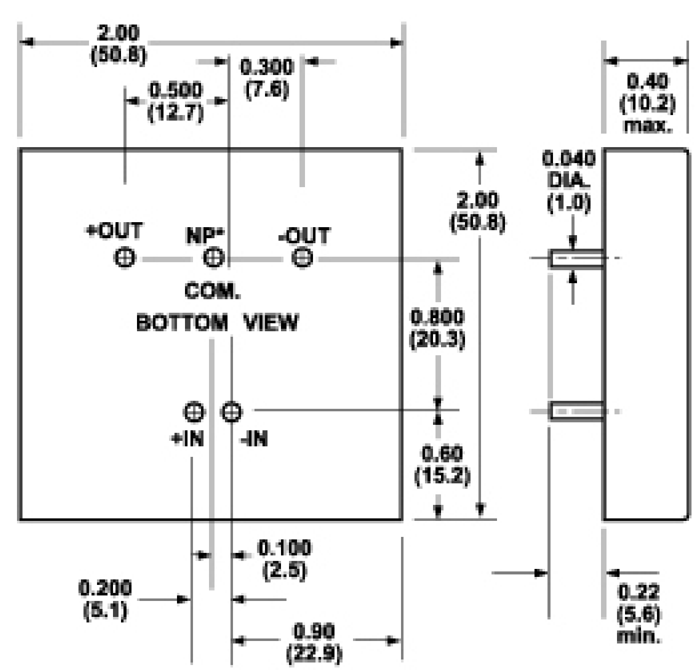
NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Full Load
3. Determine the Correct Fuse Size by Calculating the Maximum DC Current Drain at Low Line Input, Maximum Load and Then Adding 20 to 25% to Get Desired Fuse Size.
4. Alternative Pin Configuration Suffix "S"

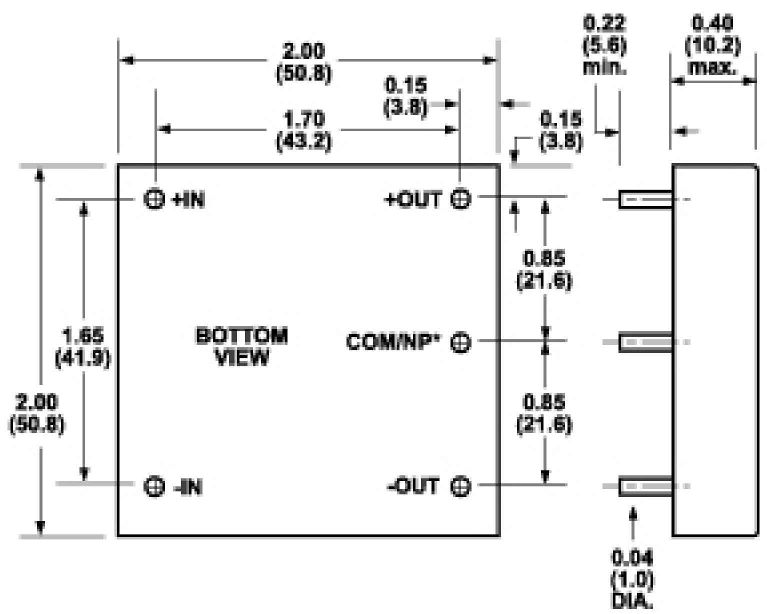
CASE C

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010

STANDARD PIN CONFIGURATION



ALTERNATIVE PIN CONFIGURATION SUFFIX "S"



*NP-NO PIN ON SINGLE OUTPUT MODELS

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC3CB

15 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 15W Isolated Output
- 2:1 Input Range
- Efficiency to 82%
- Six-Sided Shield
- 200KHz Switching Frequency
- Regulated Outputs
- Pi Input Filter
- Continuous Short Circuit Protection
- Meets EN55022 Class B, Conducted

MODEL NUMBER	INPUT VOLTAGE	OUTPUT OLTAGEV	OUTPUT CURRENT	NPUT CURRENT NO LOAD	FULL LOAD	EFF.	CASE
EC3CB01		5 VDC	3000 mA	30 mA	1660 mA	75	
EC3CB02		12 VDC	1250 mA	30 mA	1625 mA	78	
EC3CB03		15 VDC	1000 mA	30 mA	1625 mA	78	
EC3CB04	9-18 VDC	±12 VDC	±625 mA	35 mA	1620 mA	77	C/S
EC3CB05		±15 VDC	±500 mA	35 mA	1620 mA	77	
EC3CB06		±5 VDC	±1500 mA	35 mA	1620 mA	77	
EC3CB07		3.3 VDC	3000 mA	30 mA	1178 mA	70	
EC3CB11		5 VDC	3000 mA	15 mA	812 mA	78	
EC3CB12		12 VDC	1250 mA	20 mA	772 mA	81	
EC3CB13		15 VDC	1000 mA	20 mA	772 mA	81	
EC3CB14	18-36 VDC	±12 VDC	±625 mA	25 mA	780 mA	80	C/S
EC3CB15		±15 VDC	±500 mA	25 mA	780 mA	80	
EC3CB16		±5 VDC	±1500 mA	25 mA	780 mA	80	
EC3CB17		3.3 VDC	3000 mA	15 mA	557 mA	74	
EC3CB21		5 VDC	3000 mA	10 mA	390 mA	80	
EC3CB22		12 VDC	1250 mA	15 mA	381 mA	82	
EC3CB23		15 VDC	1000 mA	15 mA	381 mA	82	
EC3CB24	36-72 VDC	±12 VDC	±625 mA	20 mA	386 mA	81	C/S
EC3CB25		±15 VDC	±500 mA	20 mA	386 mA	81	
EC3CB26		±5 VDC	±1500 mA	20 mA	386 mA	81	
EC3CB27		3.3 VDC	3000 mA	20 mA	271 mA	76	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC
2. Alternative pin-out version. To order, suffix a "S" to the standard model number.

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... 12V 9-18V
24V 18-36V
48V 36-72V
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output .... ±1.0% max.
Dual + Output .... ±1.0% max.
Dual - Output .... ±3.0% max.
Voltage Balance Dual Output at Full Load .... ±1.0% max.
Transient Response
Single 25% Step Load Change .... <500μ sec.
Dual FL-1/2L ±1% Error Band .... <500μ sec.
Ripple & Noise 20MHz BW .... 10mV RMS. max.
75mV p-p max.
Temperature Coefficient .... ±0.02%/°C
Short Circuit Protection .... Indefinite & Current Limit
Line Regulation[1] Single/Dual Output .... ±0.2% max.
Load Regulation[2] Single/Dual Output .... ±1.0% max.

GENERAL SPECIFICATIONS:

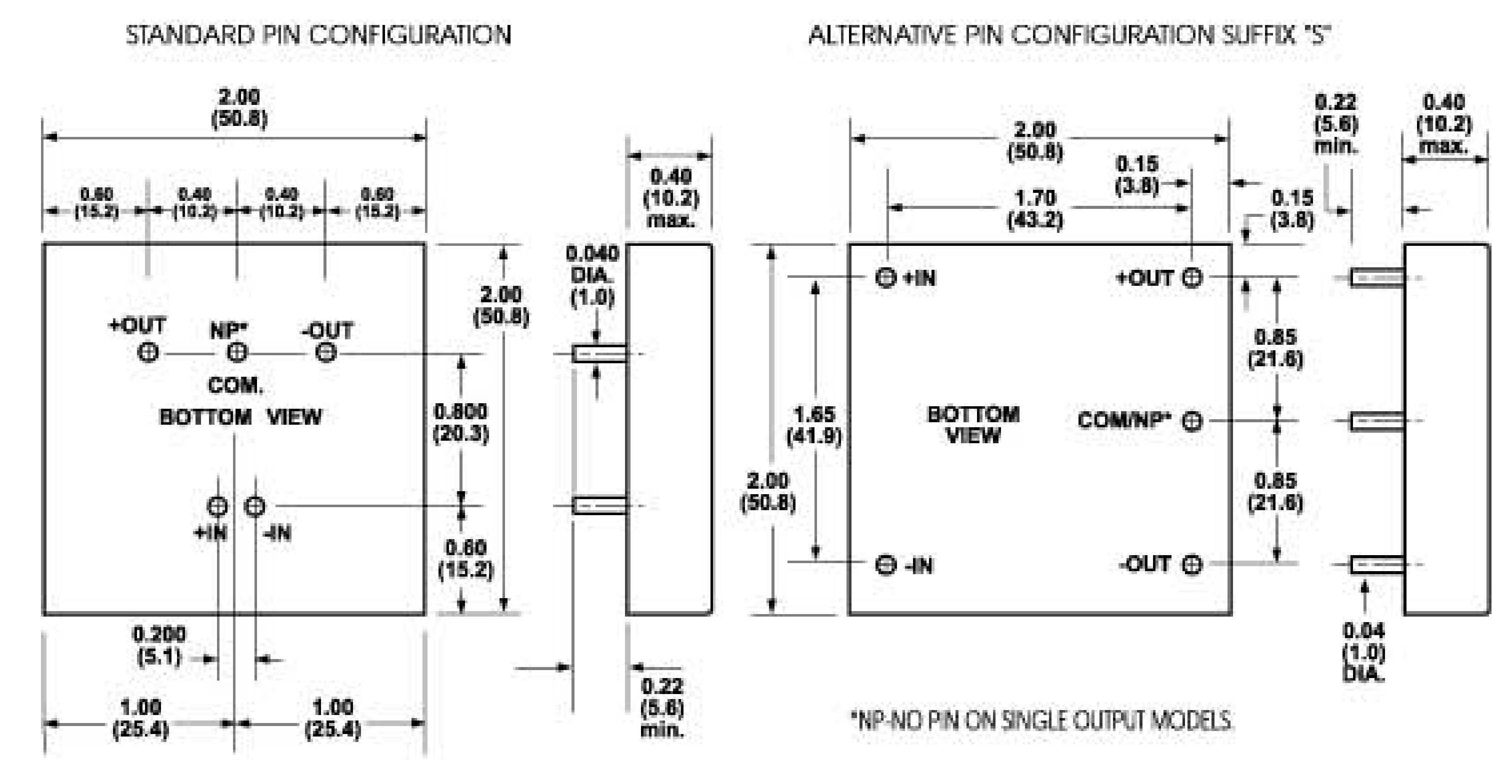
Efficiency .... See Table
Isolation Voltage .... 500 VDC min.
Isolation Resistance .... 10^9ohms
Switching Frequency .... 200KHz, typ.
Operating Temperature Range .... -25 C to + 71 C
Case Temperature .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40 C to + 100 C
EMI/RFI .... Conductive EMI Meet EN55022 Class B
Dimensions .... 2 x 2 x 0.4 inches
(50.8 x 50.8 x 10.2mm)
Case Material .... Black Coated Copper With
Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Full Load
3. Determine the Correct Fuse Size by Calculating the Maximum DC Current Drain at Low Line Input, Maximum Load and Then Adding 20 to 25% to Get Desired Fuse Size.
4. Alternative Pin Configuration Suffix "S"

CASE C

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



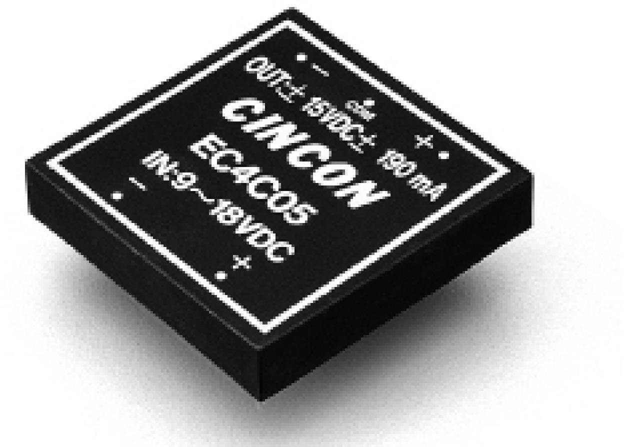
*NP-NO PIN ON SINGLE OUTPUT MODELS.

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC4C

5-6 WATT WIDE INPUT DC-DC CONVERTERS



Features

- 5-6W Isolated Output
- 2:1 Input Range
- Efficiency to 79%
- 200 KHz Switching Frequency

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF. %	CASE
EC4C01		5 VDC	1000 mA	20 mA	570 mA	73	
EC4C02		12 VDC	470 mA	30 mA	626 mA	75	
EC4C03	9-18 VDC	15 VDC	400 mA	30 mA	667 mA	75	C/S
EC4C04		±12 VDC	±230 mA	35 mA	630 mA	73	
EC4C05		±15 VDC	±190 mA	35 mA	650 mA	73	
EC4C11		5 VDC	1000 mA	15 mA	278 mA	75	
EC4C12		12 VDC	470 mA	20 mA	305 mA	77	
EC4C13	18-36 VDC	15 VDC	400 mA	20 mA	325 mA	77	C/S
EC4C14		±12 VDC	±230 mA	25 mA	307 mA	75	
EC4C15		±15 VDC	±190 mA	25 mA	317 mA	75	
EC4C21		5 VDC	1000 mA	10 mA	135 mA	77	
EC4C22		12 VDC	470 mA	15 mA	149 mA	79	
EC4C23	36-72 VDC	15 VDC	400 mA	15 mA	158 mA	79	C/S
EC4C24		±12 VDC	±230 mA	20 mA	149 mA	77	
EC4C25		±15 VDC	±190 mA	20 mA	154 mA	77	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC
2. Alternative pin-out version. To order, suffix a "S" to the standard model number.

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... 12V 9-18V
24V 18-36V
48V 36-72V
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output .... ±1.0% max.
Dual + Output .... ±1.0% max.
Dual - Output .... ±3.0% max.
Voltage Balance Dual Output at Full Load .... ±1.0% max.
Transient Response
Single 25% Step Load Change .... <500μ sec.
Dual FL-1/2L ±1% Error Band .... <500μ sec.
Ripple & Noise, 20MHz BW .... 10mV RMS. max.
75mV p-p max.
Temperature Coefficient .... ±0.02%/°C
Short Circuit Protection .... Indefinite & Current Limit
Line Regulation[1] Single/Dual Output .... ±0.2% max.
Load Regulation[2] Single/Dual Output .... ±1.0% max.

GENERAL SPECIFICATIONS:

Efficiency .... See Table
Isolation Voltage .... 500 VDC min.
Isolation Resistance .... 10^9 ohms
Switching Frequency .... 200KHz, typ.
Operating Temperature Range .... -25°C to + 71°C
Case Temperature (Plastic case) .... 95°C max.
(Copper case) .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40°C to + 100°C
Dimensions .... 2 x 2 x 0.4 inches
(50.8 x 50.8 x 10.2mm)

CASE MATERIAL:

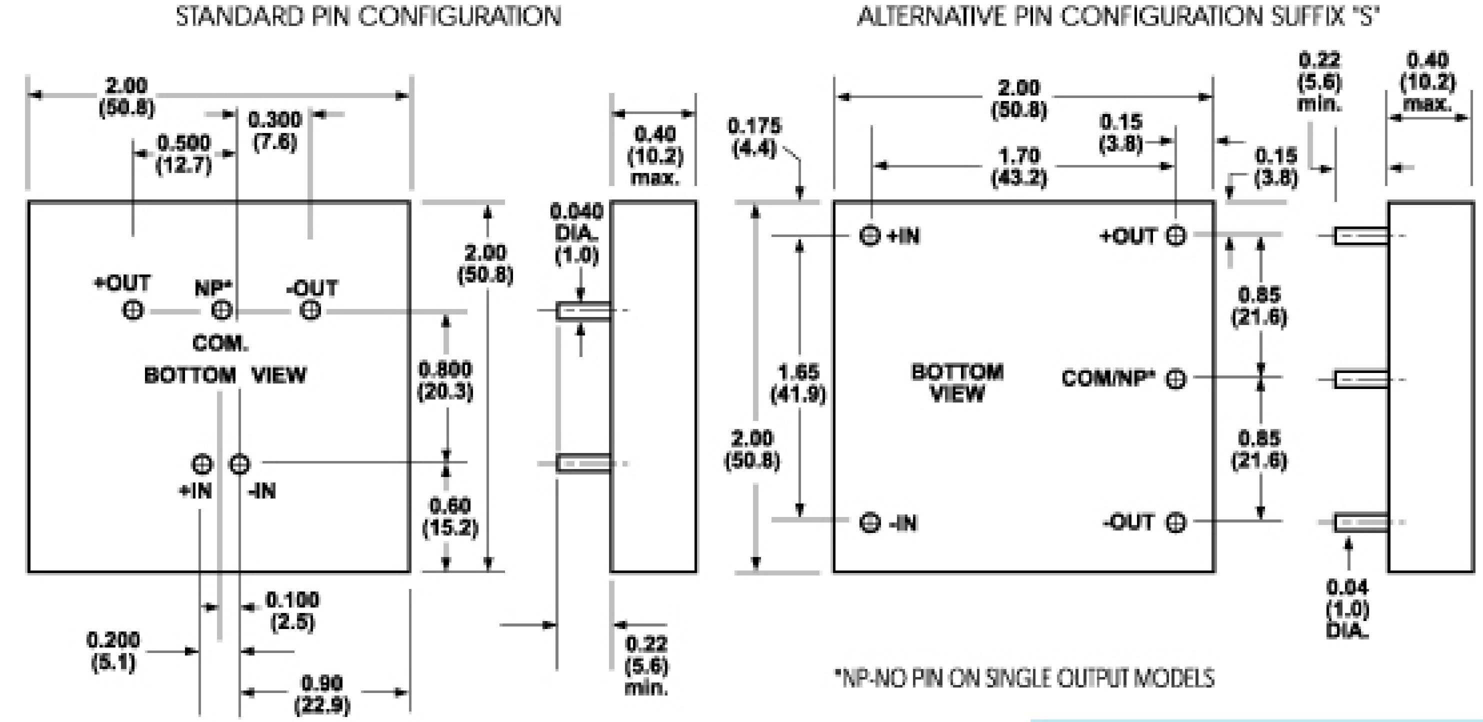
Standard Models .... Non-Conductive Black Plastic
Suffix "M" Models .... Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load
3. Determine the Correct Fuse Size by Calculating the Maximum DC Current Drain at Low Line Input, Maximum Load and Then Adding 20 to 25% to Get Desired Fuse Size.
4. Alternative Pin Configuration Suffix "S"

CASE C

All Dimensions in Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010

STANDARD PIN CONFIGURATION ALTERNATIVE PIN CONFIGURATION SUFFIX "S"



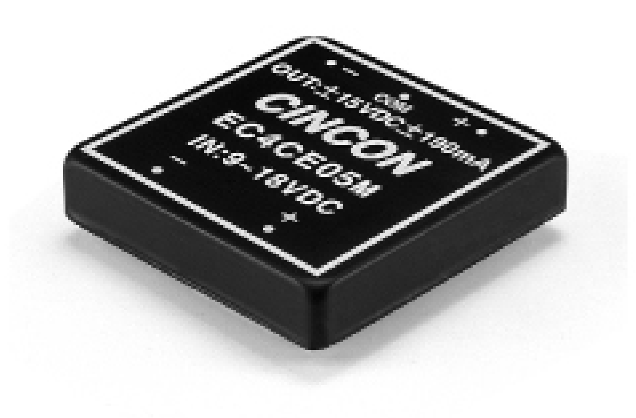
*NP-NO PIN ON SINGLE OUTPUT MODELS

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC4CE

5-6 WATT WIDE INPUT DC-DC CONVERTERS



Features

- 5-6W Isolated Output
- 2:1 Input Range
- Efficiency to 82%
- Pi Input Filter
- Continuous Short Circuit Protection
- Regulated Outputs

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	NPUT CURRENT NO LOAD	FULL LOAD	EFF.	%CASE
EC4CE01		5 VDC	1000 mA	7.5 mA	545 mA	77	
EC4CE02		12 VDC	470 mA	7.5 mA	585 mA	80	
EC4CE03	9-18 VDC	15 VDC	400 mA	7.5 mA	625 mA	80	C
EC4CE04		±12 VDC	±230 mA	12 mA	575 mA	80	
EC4CE05		±15 VDC	±190 mA	12 mA	590 mA	80	
EC4CE11		5 VDC	1000 mA	5 mA	265 mA	78	
EC4CE12		12 VDC	470 mA	5 mA	285 mA	82	
EC4CE13	18-36 VDC	15 VDC	400 mA	5 mA	305 mA	82	C
EC4CE14		±12 VDC	±230 mA	7.5 mA	285 mA	81	
EC4CE15		±15 VDC	±190 mA	7.5 mA	295 mA	81	
EC4CE21		5 VDC	1000 mA	2 mA	133 mA	78	
EC4CE22		12 VDC	470 mA	2 mA	143 mA	81	
EC4CE23	36-72 VDC	15 VDC	400 mA	2 mA	154 mA	81	C
EC4CE24		±12 VDC	±230 mA	3 mA	142 mA	81	
EC4CE25		±15 VDC	±190 mA	3 mA	147 mA	81	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range....12V....9-18V
24V....18-36V
48V....36-72V
Input Filter....Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy....± 2.0% max.
Voltage Balance (Dual)....± 1.0% max.
Temperature Coefficient....± 0.05% / C
Ripple and Noise, 20MHz BW....5V....100mV p-p max.
12V/15V....1% p-p max.
Short Circuit Protection....Continuous
Line Regulation, Single/Dual[1]....± 0.5%
Load Regulation, Single[2]....± 0.5%
Dual[3]....± 1.0%

GENERAL SPECIFICATIONS:

Efficiency....See Table
Isolation Voltage....500 VDC min.
Isolation Resistance....10^9ohms
Switching Frequency....100KHz, min.
Operating Temperature Range....-25 C to + 71 C
Case Temperature (Plastic case)....95°C max.
(Copper case)....100°C max.
Cooling....Free-Air Convection
Storage Temperature Range....-40 C to + 100 C
Dimensions....2 x 2 x 0.4 inches
(50.8 x 50.8 x 10.2mm)

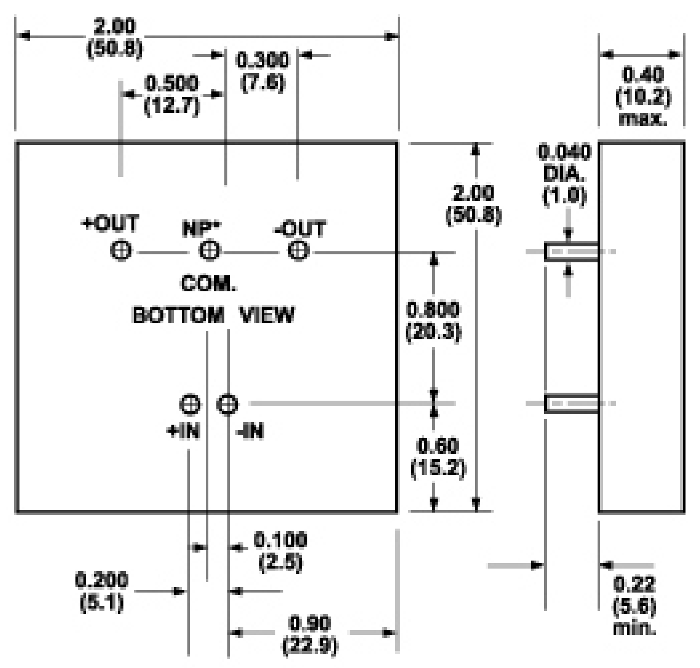
CASE MATERIAL:

Standard Models....Non-Conductive Black Plastic
Suffix "M" Models....Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load

CASE C

STANDARD PIN CONFIGURATION
*NP (NO PIN) ON SINGLE OUTPUT MODELS
All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC5C

15 WATT WIDE INPUT DC-DC CONVERTERS

E176177

Features

- 15W Isolated Output
- 4:1 Input Range
- Six-Sided Shield
- Remote ON/OFF Control
- Efficiency to 82%

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT URRENT C	NPUT CURRENT O LOAD	N FULL LOAD	EFF.	%SE
EC5C01		5 VDC	3000 mA	15 mA	810 mA	77	
EC5C02		12 VDC	1250 mA	15 mA	780 mA	80	
EC5C03		15 VDC	1000 mA	15 mA	780 mA	80	
EC5C04		±5 VDC	±1500 mA	20 mA	810 mA	77	
EC5C05	9-36 VDC	±12 VDC	±625 mA	20 mA	780 mA	80	C
EC5C06		±15 VDC	±500 mA	20 mA	780 mA	80	
EC5C07		5/±12 VDC	1500/±310 mA	20 mA	780 mA	80	
EC5C08		5/±15 VDC	1500/±250 mA	20 mA	780 mA	80	
EC5C09		3.3 VDC	3000 mA	15 mA	545 mA	76	
EC5C11		5 VDC	3000 mA	10 mA	410 mA	77	
EC5C12		12 VDC	1250 mA	10 mA	390 mA	80	
EC5C13		15 VDC	1000 mA	10 mA	390 mA	80	
EC5C14		±5 VDC	±1500 mA	15 mA	400 mA	79	
EC5C15	18-72 VDC	±12 VDC	±625 mA	15 mA	380 mA	82	C
EC5C16		±15 VDC	±500 mA	15 mA	380 mA	82	
EC5C17		5/±12 VDC	1500/±310 mA	15 mA	380 mA	82	
EC5C18		5/±15 VDC	1500/±250 mA	15 mA	380 mA	82	
EC5C19		3.3 VDC	3000 mA	10 mA	270 mA	76	

NOTE: 1. Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.......24V.......9-36V
48V.......18-72V
Input Filter.......Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output.......±1.0% max.
Dual +Output.......±1.0% max.
-Output.......±3.0% max.
Triple, 5V.......±2.0% max.
12V/15V.......±3.0% max.
Voltage Balance (Dual).......±1.0% max.
Transient Response:
Single, 25% Step Load Change.......<500μ sec.
Dual-FL-1/2L ±1% Error Band.......<500μ sec.
External Trim Adj. Range.......±10%.
Ripple & Noise, 20MHz BW.......10mV RMS, max.
75mV p-p max.
Temperature Coefficient.......± 0.02%/ C
Short Circuit Protection.......Continuous
Line Regulation[1], Single/Dual.......±0.2% max.
Triple.......±1.0% max.
Load Regulation[2], Single/Dual.......±1.0% max.
Triple.......±5.0% max.

GENERAL SPECIFICATIONS:

Efficiency.......See Table
Isolation Voltage.......500 VDC min.
Isolation Resistance.......10⁹ohms
Switching Frequency.......300KHz, typ.
Case Grounding.......Connected to Output Common
Operating Temperature Range.......-25 C to + 71 C
Case Temperature.......100˚C max.
Cooling.......Free-Air Convection
Storage Temperature Range.......-55 C to + 105 C
EMI/RFI.......Six-Sided Continuous Shield
Dimensions.......2 x 2 x 0.4 inches
(50.8 x 50.8 x 10.2 mm)
Case Material.......Black Coated Copper with
Non-Conductive Base

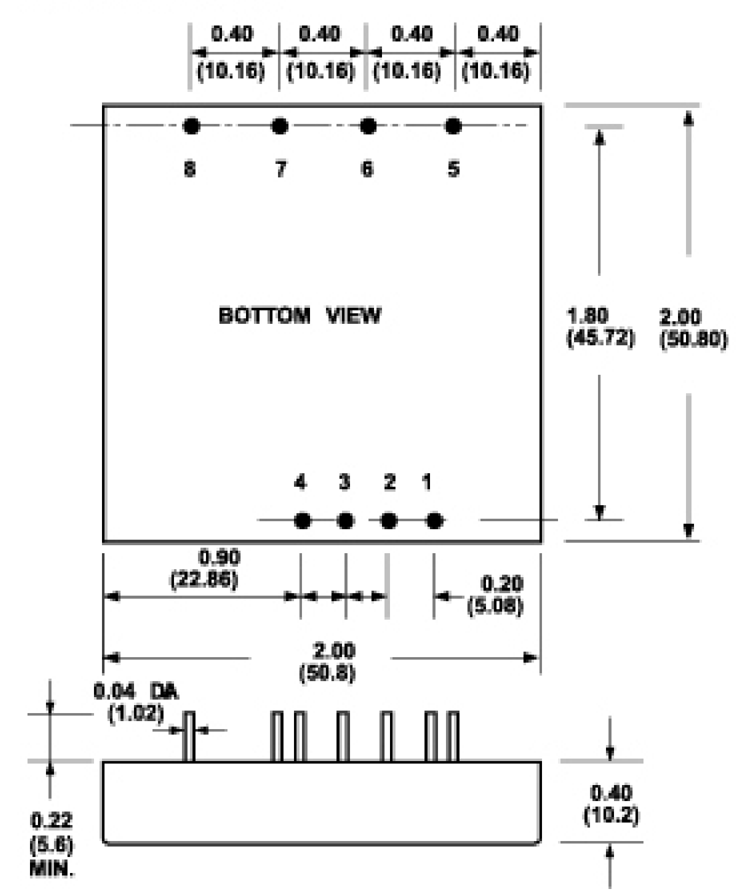
NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load

TRIPLE OUTPUT LOADING TABLE (1)			
Output (Pin No.)	Voltage	Amperes Min.(2)	Nom.
7	+5	0.25	1.5
8 & 5	+12 & -12	0.10	0.31
8 & 5	+15 & -15	0.10	0.25

NOTE:
1. Maximum total power from all outputs is limited to 15 watts but no output should be allowed to exceed its maximum current.
2. Minimum current on each output is required to maintain specified regulation.

CASE C

All Dimensions In Inches (mm)
Tolerance .xx= ±.04, .xxx= ±.010

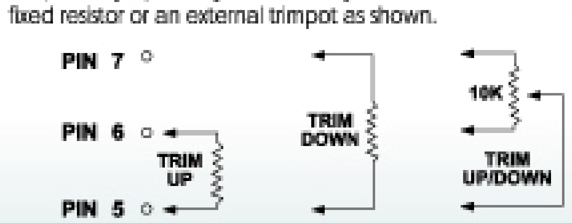


PIN CONNECTION			
Pin	Single	Daul	riple T
1.	Remote On/Off Control		
2.	No Pin	No Pin	No Pin
3.	-Vin	-Vin	-Vin
4.	+Vin	+Vin	+Vin
5.	Trim	Trim	-Aux. Out
6.	-Vout	-Vout	Common
7.	+Vout	Common	+5V out
8.	No Pin	+Vout	+Aux. Out

Remote On/Off Control	
Logic Compatibility	CMOS or Open Collector TTL
EC-On	>+5.5VDC or Open Circuit
EC-Off	<1.8 VDC
Shutdown Idle Current	10 mA
Control Common	Referenced to Input Minus

External Output Trimming

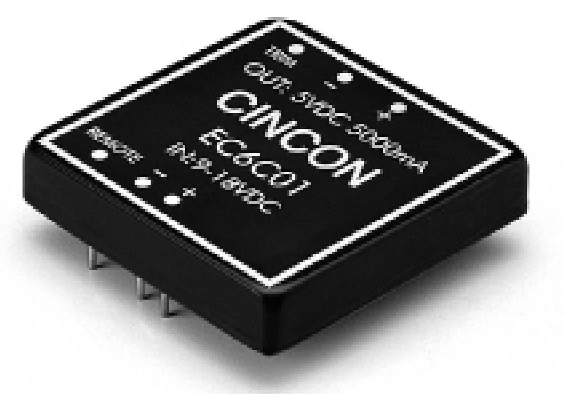
Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC6C



25 TO 30 WATT WIDE INPUT DC-DC CONVERTERS

E176177

Features

- 25W Isolated Output
- 2:1 Input Range
- Six-Sided Shield
- Remote ON/OFF Control
- Efficiency to 85%

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	NPUT CURRENT NO LOAD	FULL LOAD	EFF.	CASE
EC6C01		5 VDC	5000 mA	30 mA	2675 mA	78	
EC6C02		12 VDC	2500 mA	30 mA	3050 mA	82	
EC6C03		15 VDC	2000 mA	30 mA	3050 mA	82	
EC6C04	9-18 VDC	±5 VDC	±2500 mA	35 mA	2675 mA	78	
EC6C05		±12 VDC	±1250 mA	35 mA	3050 mA	82	C
EC6C06		±15 VDC	±1000 mA	35 mA	3050 mA	82	
EC6C07		5/±12 VDC	3500/±310 mA	35 mA	2640 mA	79	
EC6C08		5/±15 VDC	3500/±250 mA	35 mA	2640 mA	79	
EC6C09		3.3 VDC	5000 mA	30 mA	1860 mA	74	
EC6C11		5 VDC	5000 mA	30 mA	1336 mA	79	
EC6C12		12 VDC	2500 mA	30 mA	1525 mA	82	
EC6C13		15 VDC	2000 mA	30 mA	1525 mA	82	
EC6C14	18-36 VDC	±5 VDC	±2500 mA	30 mA	1336 mA	79	
EC6C15		±12 VDC	±1250 mA	30 mA	1470 mA	85	C
EC6C16		±15 VDC	±1000 mA	30 mA	1470 mA	85	
EC6C17		5/±12 VDC	3500/±310 mA	30 mA	1320 mA	80	
EC6C18		5/±15 VDC	3500/±250 mA	30 mA	1320 mA	80	
EC6C19		3.3 VDC	5000 mA	30 mA	920 mA	75	
EC6C21		5 VDC	5000 mA	20 mA	660 mA	79	
EC6C22		12 VDC	2500 mA	20 mA	765 mA	82	
EC6C23		15 VDC	2000 mA	20 mA	765 mA	82	
EC6C24	36-72 VDC	±5 VDC	±2500 mA	25 mA	660 mA	79	
EC6C25		±12 VDC	±1250 mA	25 mA	735 mA	85	C
EC6C26		±15 VDC	±1000 mA	25 mA	735 mA	85	
EC6C27		5/±12 VDC	3500/±310 mA	25 mA	655 mA	80	
EC6C28		5/±15 VDC	3500/±250 mA	25 mA	655 mA	80	
EC6C29		3.3 VDC	5000 mA	20 mA	460 mA	75	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........12V........9-18V
24V........18-36V
48V........36-72V
Input Filter........Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output........±2.0% max.
Dual +Output........±2.0% max.
-Output........±3.0% max.
Triple, 5V........±2.0% max.
12V/15V........±5.0% max.
Voltage Balance (Dual)........±1.0% max.
Transient Response:
Single, 25% Step Load Change........<500µ sec.
Dual FL-1/2L ±1% Error Band........<500µ sec.
External Trim Adj. Range........±10%.
Ripple & Noise, 20MHz BW........10mV RMS, max.
75mV p-p max.
Temperature Coefficient........± 0.02%/ C
Short Circuit Protection........Continuous
Line Regulation[1], Single/Dual........±0.5% max.
Triple........±1.0% max.
Load Regulation[2], Single/Dual........±1.0% max.
Triple........±5.0% max.

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load

GENERAL SPECIFICATIONS:

Efficiency........See Table
Isolation Voltage........500 VDC min.
Isolation Resistance........10⁹ ohms
Switching Frequency........300KHz, typ.
Case Grounding........Connected to Output common
Operating Temperature Range........-25 C to + 71 C
Case Temperature........100°C max.
Cooling........Free-Air Convection
Storage Temperature Range........-55 C to + 105 C
EMI/RFI........Six-Sided Continuous Shield
Dimensions........2 x 2 x 0.4 inches
(50.8 x 50.8 x 10.2 mm)
Case Material........Black Coated Copper with Non-Conductive Base

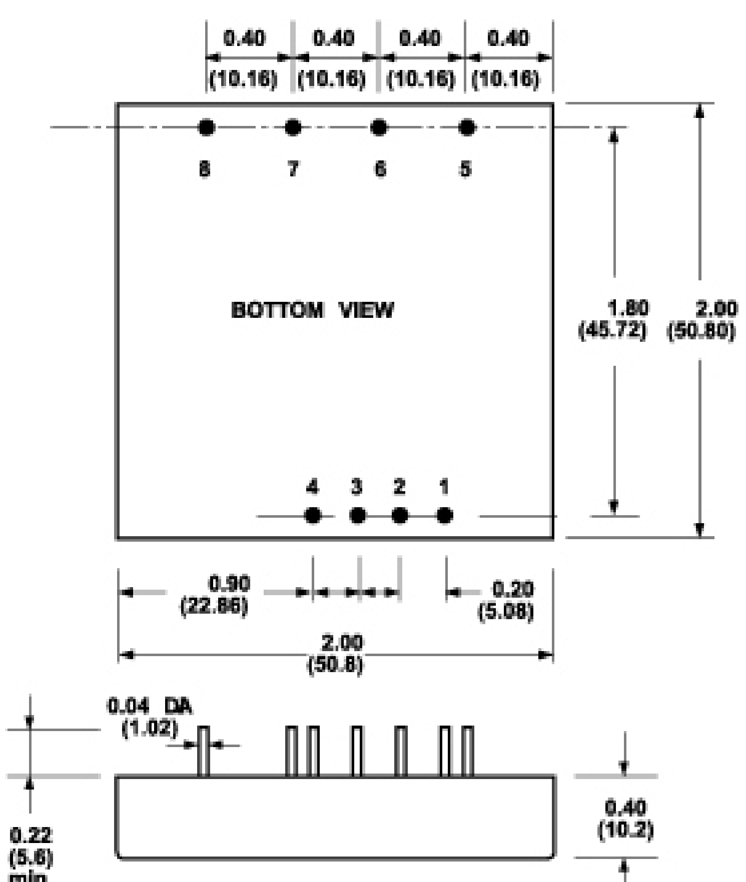
TRIPLE OUTPUT LOADING TABLE (1)

Output (Pin No.)	Voltage	Amperes Min.(2)	Nom.
7	+5	0.50	3.5
8 & 5	+12 & -12	0.10	0.31
8 & 5	+15 & -15	0.10	0.25

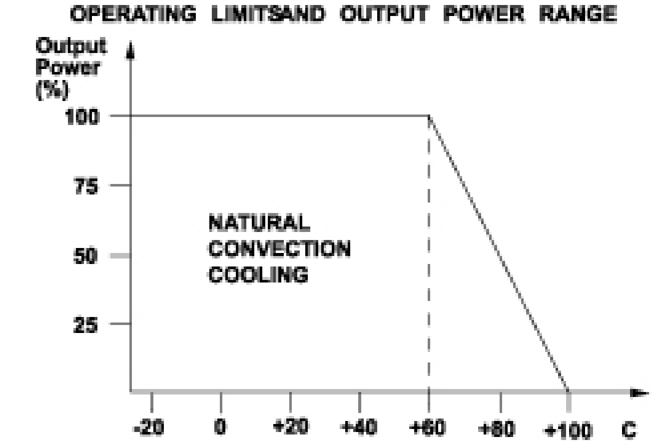
NOTE:
1. Maximum total power from all outputs is limited to 25 watts but no output should be allowed to exceed its maximum current.
2. Minimum current on each output is required to maintain specified regulation.

CASE C

All Dimensions in Inches (mm)
Tolerance .xx= ±.04, .xxx= ±.010



OPERATING LIMITSAND OUTPUT POWER RANGE



PIN CONNECTION

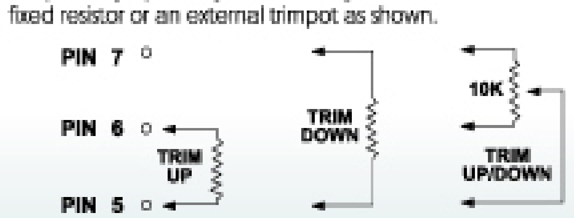
Pin	Single	Daul	ripleT
1.	Remote On/Off Control		
2.	No Pin	No Pin	No Pin
3.	-Vin	-Vin	-Vin
4.	+Vin	+Vin	+Vin
5.	Trim	Trim	-Aux. Out
6.	-Vout	-Vout	Common
7.	+Vout	Common	+5V out
8.	No Pin	+Vout	+Aux. Out

Remote On/Off Control

Logic Compatibility	CMOS or Open Collector TTL
EC-On	>+5.5VDC or Open Circuit
EC-Off	<1.8 VDC
Shutdown Idle Current	10 mA
Control Common	Referenced to Input Minus

External Output Trimming

Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

EC6C

S E R I E S

EC2EE

15 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 15W Isolated Output
- 2:1 Input Range
- Six-Sided Shield
- Remote ON/OFF Control
- Efficiency to 84%
- 200KHz Switching Frequency

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT URRENT C	NPUT CURRENTI O LOADN	ULL EOAD	EFF.	%SE
EC2EE01		5 VDC	3000 mA	20 mA	1700 mA	77	
EC2EE02		12 VDC	1250 mA	20 mA	1600 mA	78	
EC2EE03		15 VDC	1000 mA	20 mA	1600 mA	78	
EC2EE04	9-18 VDC	±12 VDC	±625 mA	35 mA	1520 mA	82	E
EC2EE05		±15 VDC	±500 mA	35 mA	1520 mA	82	
EC2EE06		5/±12 VDC	1500/±310 mA	30 mA	1600 mA	78	
EC2EE07		5/±15 VDC	1500/±250 mA	30 mA	1600 mA	78	
EC2EE08		+5/+12/-5 VDC	1500/310/500 mA	30 mA	1470 mA	78	
EC2EE11		5 VDC	3000 mA	25 mA	810 mA	77	
EC2EE12		12 VDC	1250 mA	25 mA	780 mA	80	
EC2EE13		15 VDC	1000 mA	25 mA	780 mA	80	
EC2EE14	18-36 VDC	±12 VDC	±625 mA	25 mA	750 mA	84	E
EC2EE15		±15 VDC	±500 mA	25 mA	750 mA	84	
EC2EE16		5/±12 VDC	1500/±310 mA	25 mA	780 mA	80	
EC2EE17		5/±15 VDC	1500/±250 mA	25 mA	780 mA	80	
EC2EE18		+5/+12/-5 VDC	1500/310/500 mA	25 mA	715 mA	80	
EC2EE21		5 VDC	3000 mA	10 mA	410 mA	77	
EC2EE22		12 VDC	1250 mA	10 mA	390 mA	80	
EC2EE23		15 VDC	1000 mA	10 mA	390 mA	80	
EC2EE24	36-72 VDC	±12 VDC	±625 mA	15 mA	380 mA	82	E
EC2EE25		±15 VDC	±500 mA	15 mA	380 mA	82	
EC2EE26		5/±12 VDC	1500/±310 mA	15 mA	380 mA	82	
EC2EE27		5/±15 VDC	1500/±250 mA	15 mA	380 mA	82	
EC2EE28		+5/+12/-5 VDC	1500/310/500 mA	15 mA	350 mA	82	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range............12V............9-18V
24V............18-36V
48V............36-72V
Input Filter............Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output............±1.0% max.
Dual +Output............±1.0% max.
-Output............±3.0% max.
Triple, 5V............±2.0% max.
12V/15V............±3.0% max.
Voltage Balance (Dual)............±1.0% max.
Transient Response:
Single, 25% Step Load Change............<500μ sec.
Dual FL-1/2L ±1% Error Band............<500μ sec.
External Trim Adj. Range............±10%.
Ripple & Noise, 20MHz BW............10mV RMS, max.
75mV p-p max.
Temperature Coefficient............± 0.02%/ C
Short Circuit Protection............Continuous
Line Regulation[1], Single/Dual............±0.2% max.
Triple............±1.0% max.
Load Regulation[2], Single/Dual............±1.0% max.
Triple............±5.0% max.

GENERAL SPECIFICATIONS:

Efficiency............See Table
Isolation Voltage............500 VDC min.
Isolation Resistance............10⁹ohms
Switching Frequency............200KHz, typ.
Operating Temperature Range............-25 C to + 71 C
Case Temperature............100°C max.
Cooling............Free-Air Convection
Storage Temperature Range............-55 C to + 105 C
EMI/RFI............Six-Sided Continuous Shield
Dimensions............2.56 x 3.0 x 0.83 inches
(65 x 76.2 x 21.1 mm)
Case Material............Black Coated Copper with
Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load

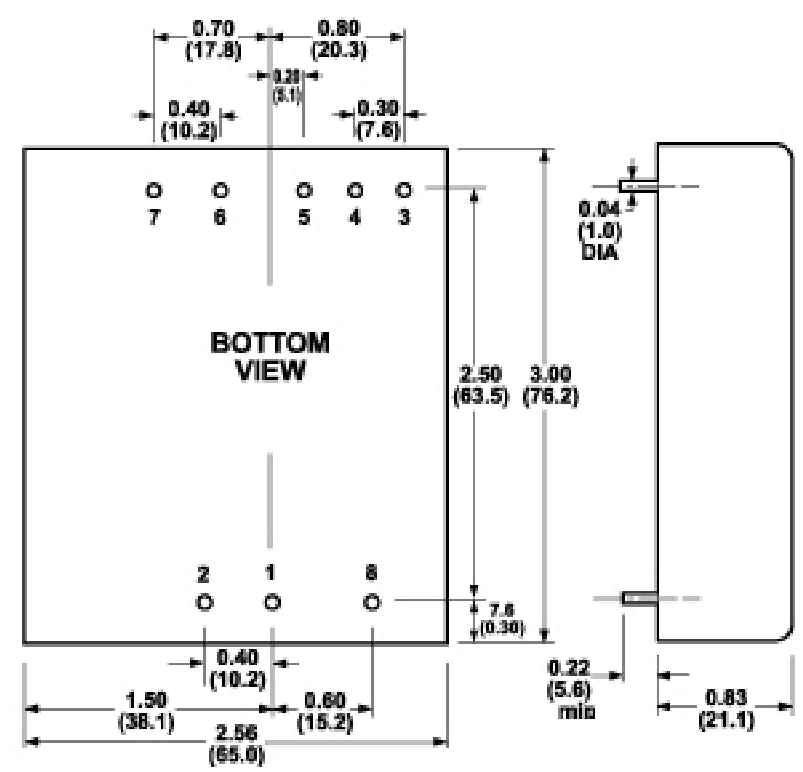
TRIPLE OUTPUT LOADING TABLE (1)

Output (Pin No.)	Voltage	Amperes Min.(2)	Amperes Nom.
6	+5	0.25	1.5
3 & 5	+12 & -12	0.10	0.31
3 & 5	+15 & -15	0.10	0.25
3 & 5	+12 & -5	0.10/0.10	0.31/0.50

NOTE:
1. Maximum total power from all outputs is limited to 15 watts but no output should be allowed to exceed its maximum current.
2. Minimum current on each output is required to maintain specified regulation.

CASE E

All Dimensions in Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION

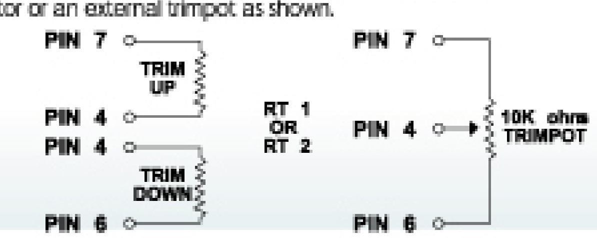
Pin	Single Output	Daul Output	ripfe Output
1.	+Input	+Input	+Input
2.	-Input	-Input	-Input
3.	No Pin	+Output	+Output
4.	Output Trim	Common	Common
5.	No Pin	-Output	-Output
6.	+Output	No Pin	+5V Output
7.	-Output	No Pin	No Pin
8.	Remote On/Off Control		

Remote On/Off Control

Logic Compatibility	CMOS or Open Collector TTL
EC-On	>+5.5VDC or Open Circuit
EC-Off	<1.8 VDC
Shutdown Idle Current	10 mA
Control Common	Referenced to Input Minus

External Output Trimming

Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC4EE

15 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 15W Isolated Output
- 4:1 Input Range
- Six-Sided Shield
- Remote ON/OFF Control
- Efficiency to 82%
- 200KHz Switching Frequency

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT URRENT	C	NPUT CURRENT O LOADN	ULE LOAD	EFF.	% ASE
EC4EE01		5 VDC	3000 mA		15 mA	810 mA	77	
EC4EE02		12 VDC	1250 mA		15 mA	780 mA	80	
EC4EE03		15 VDC	1000 mA		15 mA	780 mA	80	
EC4EE04	9-36 VDC	±12 VDC	±625 mA		20 mA	780 mA	80	E
EC4EE05		±15 VDC	±500 mA		20 mA	780 mA	80	
EC4EE06		5/±12 VDC	1500/±310 mA		20 mA	780 mA	80	
EC4EE07		5/±15 VDC	1500/±250 mA		20 mA	780 mA	80	
EC4EE08		+5/+12/-5 VDC	1500/310/500 mA		20 mA	715 mA	80	
EC4EE11		5 VDC	3000 mA		10 mA	410 mA	77	
EC4EE12		12 VDC	1250 mA		10 mA	390 mA	80	
EC4EE13		15 VDC	1000 mA		10 mA	390 mA	80	
EC4EE14	18-72 VDC	±12 VDC	±625 mA		15 mA	380 mA	82	E
EC4EE15		±15 VDC	±500 mA		15 mA	380 mA	82	
EC4EE16		5/±12 VDC	1500/±310 mA		15 mA	380 mA	82	
EC4EE17		5/±15 VDC	1500/±250 mA		15 mA	380 mA	82	
EC4EE18		+5/+12/-5 VDC	1500/310/500 mA		15 mA	350 mA	82	

NOTE: 1. Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.......................24V.......................9-36V
48V.......................18-72V
Input Filter.......................Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output.......................±1.0% max.
Dual +Output.......................±1.0% max.
-Output.......................±3.0% max.
Triple, 5V.......................±2.0% max.
12V/15V.......................±3.0% max.
Voltage Balance (Dual).......................±1.0% max.
Transient Response:
Single, 25% Step Load Change.......................<500μ sec.
Dual FL-1/2L ±1% Error Band.......................<500μ sec.
External Trim Adj. Range.......................±10%.
Ripple & Noise, 20MHz BW.......................10mV RMS, max.
75mV p-p max.
Temperature Coefficient.......................± 0.02%/ C
Short Circuit Protection.......................Continuous
Line Regulation[1], Single/Dual.......................±0.2% max.
Triple.......................±1.0% max.
Load Regulation[2], Single/Dual.......................±1.0% max.
Triple.......................±5.0% max.

GENERAL SPECIFICATIONS:

Efficiency.......................See Table
Isolation Voltage.......................500 VDC min.
Isolation Resistance.......................10^9ohms
Switching Frequency.......................200KHz, typ.
Operating Temperature Range.......................-25 C to + 71 C
Case Temperature.......................100°C max.
Cooling.......................Free-Air Convection
Storage Temperature Range.......................-55 C to + 105 C
EMI/RFI.......................Six-Sided Continuous Shield
Dimensions.......................2.56 x 3.0 x 0.83 inches
(65 x 76.2 x 21.1 mm)
Case Material.......................Black Coated Copper with
Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load

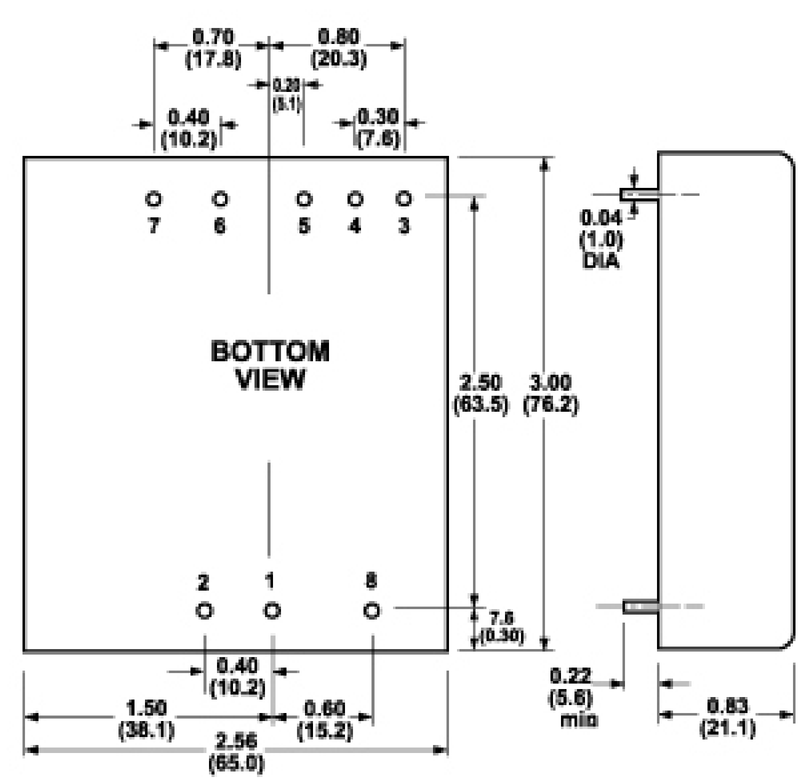
TRIPLE OUTPUT LOADING TABLE (1)

Output (Pin No.)	Voltage	Amperes Min.(2)	Amperes Nom.
6	+5	0.25	1.5
3 & 5	+12 & -12	0.10	0.31
3 & 5	+15 & -15	0.10	0.25
3 & 5	+12 & -5	0.10/0.10	0.31/0.50

NOTE:
1. Maximum total power from all outputs is limited to 15 watts but no output should be allowed to exceed its maximum current.
2. Minimum current on each output is required to maintain specified regulation.

CASE E

All Dimensions in Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION

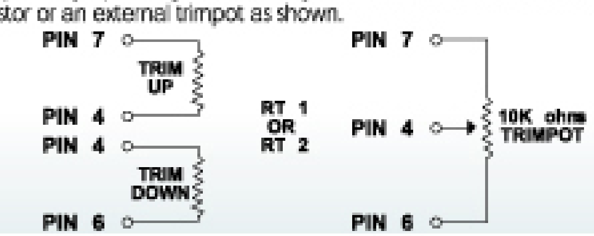
Pin	Single Output	Daul Output	ripIe Output
1.	+Input	+Input	+Input
2.	-Input	-Input	-Input
3.	No Pin	+Output	+Output
4.	Output Trim	Common	Common
5.	No Pin	-Output	-Output
6.	+Output	No Pin	+5V Output
7.	-Output	No Pin	No Pin
8.	Remote On/Off Control		

Remote On/Off Control

Logic Compatibility	CMOS or Open Collector TTL
EC-On	>+5.5VDC or Open Circuit
EC-Off	<1.8 VDC
Shutdown Idle Current	10 mA
Control Common	Referenced to Input Minus

External Output Trimming

Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



S E R I E S

EC5E

25 TO 30 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 30W Isolated Output
- 2:1 Input Range
- Six-Sided Shield
- Remote ON/OFF Control
- Efficiency to 84%
- 200KHz Switching Frequency

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	NPUT CURRENT O LOAD	FULL LOAD	EFF.	CASE
EC5E01		5 VDC	5000 mA	30 mA	2700 mA	77	
EC5E02		12 VDC	2500 mA	30 mA	3150 mA	79	
EC5E03		15 VDC	2000 mA	30 mA	3150 mA	79	
EC5E04	9-18 VDC	±12 VDC	±1250 mA	35 mA	3100 mA	81	E
EC5E05		±15 VDC	±1000 mA	35 mA	3100 mA	81	
EC5E06		5/±12 VDC	3000/±625 mA	35 mA	3200 mA	78	
EC5E07		5/±15 VDC	3000/±500 mA	35 mA	3200 mA	78	
EC5E08		+5/+12/-5 VDC	3000/600/1000 mA	35 mA	2940 mA	77	
EC5E11		5 VDC	5000 mA	30 mA	1350 mA	77	
EC5E12		12 VDC	2500 mA	30 mA	1550 mA	81	
EC5E13		15 VDC	2000 mA	30 mA	1550 mA	81	
EC5E14	18-36 VDC	±12 VDC	±1250 mA	30 mA	1500 mA	84	E
EC5E15		±15 VDC	±1000 mA	30 mA	1500 mA	84	
EC5E16		5/±12 VDC	3000/±625 mA	30 mA	1580 mA	79	
EC5E17		5/±15 VDC	3000/±500 mA	30 mA	1560 mA	80	
EC5E18		+5/+12/-5 VDC	3000/600/1000 mA	30 mA	1450 mA	78	
EC5E21		5 VDC	5000 mA	15 mA	670 mA	78	
EC5E22		12 VDC	2500 mA	15 mA	770 mA	81	
EC5E23		15 VDC	2000 mA	15 mA	770 mA	81	
EC5E24	36-72 VDC	±12 VDC	±1250 mA	20 mA	750 mA	84	E
EC5E25		±15 VDC	±1000 mA	20 mA	750 mA	84	
EC5E26		5/±12 VDC	3000/±625 mA	20 mA	790 mA	79	
EC5E27		5/±15 VDC	3000/±500 mA	20 mA	780 mA	80	
EC5E28		+5/+12/-5 VDC	3000/600/1000 mA	20 mA	725 mA	78	

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... 12V 9-18V
24V 18-36V
48V 36-72V
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output .... ±1.0% max.
Dual +Output .... ±1.0% max.
-Output .... ±3.0% max.
Triple, 5V .... ±1.0% max.
12V/15V .... ±5.0% max.
-5V .... ±2.0% max.
Voltage Balance (Dual) .... ±1.0% max.
Transient Response:
Single, 25% Step Load Change .... <500µ sec.
Dual FL-1/2L ±1% Error Band .... <500µ sec.
External Trim Adj. Range .... ±10%.
Ripple & Noise, 20MHz BW .... 10mV RMS, max.
75mV p-p max.
Temperature Coefficient .... ± 0.02%/ C
Short Circuit Protection .... Continuous
Line Regulation[1], Single/Dual .... ±0.2% max.
Triple .... ±1.0% max.
Load Regulation[2], Single/Dual .... ±1.0% max.
Triple .... ±5.0% max.

GENERAL SPECIFICATIONS:

Efficiency .... See Table
Isolation Voltage .... 500 VDC min.
Isolation Resistance .... 10^9ohms
Switching Frequency .... 200KHz, typ.
Operating Temperature Range .... -25 C to + 71 C
Case Temperature .... 100°C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -55 C to + 105 C
EMI/RFI .... Six-Sided Continuous Shield
Dimensions .... 2.56 x 3.0 x 0.83 inches (65 x 76.2 x 21.1 mm)
Case Material .... Black Coated Copper with Non-Conductive Base

NOTE:
1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load

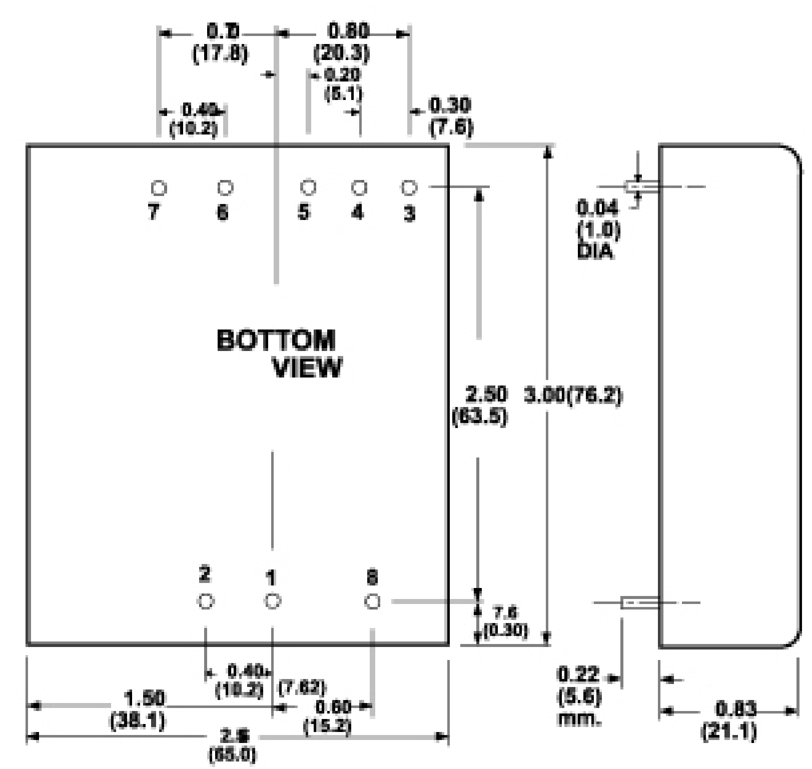
TRIPLE OUTPUT LOADING TABLE (1)

Output (Pin No.)	Voltage	Amperes Min. (2)	Amperes Nom.
6	+5	0.5	3.0
3 & 5	+12 & -12	0.10	0.625
3 & 5	+15 & -15	0.10	0.500
3 & 5	+12 & -5	0.10/0.10	0.60/1.0

NOTE:
1. Maximum total power from all outputs is limited to 30 watts but no output should be allowed to exceed its maximum current.
2. Minimum current on each output is required to maintain specified regulation.

CASE E

All Dimensions In Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



PIN CONNECTION

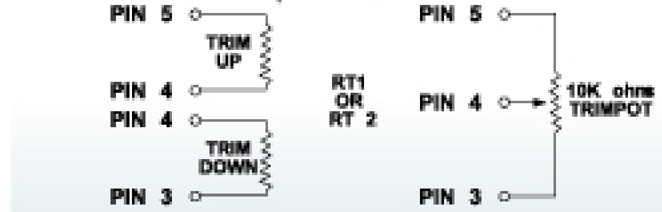
Pin	Single Output	Daul Output	ripfe Output
1.	+Input	+Input	+Input
2.	-Input	-Input	-Input
3.	+Sense	+Output	+Output
4.	Output Trim	Common	Common
5.	-Sense	-Output	-Output
6.	+Output	No Pin	+5V Output
7.	-Output	No Pin	No Pin
8.	Remote On/Off Control		

Remote On/Off Control

Logic Compatibility	CMOS or Open Collector TTL
EC-On	>+5.5VDC or Open Circuit
EC-Off	<1.8 VDC
Shutdown Idle Current	10 mA
Control Common	Referenced to Input Minus

External Output Trimming

Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

EC6E

25 TO 30 WATT WIDE INPUT DC-DC CONVERTERS

Features

- 30W Isolated Output
- 4:1 Input Range
- Six-Sided Shield
- Remote ON/OFF Control
- Efficiency to 84%
- 200KHz Switching Frequency

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	NPUT CURRENT NO LOAD	ULE LOAD	EFF.	%CASE
EC6E01		5 VDC	5000 mA	20 mA	1350 mA	77	
EC6E02		12 VDC	2500 mA	20 mA	1560 mA	80	
EC6E03		15 VDC	2000 mA	20 mA	1560 mA	80	
EC6E04	9-36 VDC	±12 VDC	±1250 mA	25 mA	1560 mA	80	E
EC6E05		±15 VDC	±1000 mA	25 mA	1560 mA	80	
EC6E06		5/±12 VDC	3000/±625 mA	25 mA	1650 mA	76	
EC6E07		5/±15 VDC	3000/±500 mA	25 mA	1650 mA	76	
EC6E08		+5/+12/-5 VDC	3000/600/1000 mA	25 mA	1450 mA	78	
EC6E11		5 VDC	5000 mA	15 mA	670 mA	78	
EC6E12		12 VDC	2500 mA	15 mA	770 mA	81	
EC6E13		15 VDC	2000 mA	15 mA	770 mA	81	
EC6E14	18-72 VDC	±12 VDC	±1250 mA	20 mA	750 mA	84	E
EC6E15		±15 VDC	±1000 mA	20 mA	750 mA	84	
EC6E16		5/±12 VDC	3000/±625 mA	20 mA	790 mA	79	
EC6E17		5/±15 VDC	3000/±500 mA	20 mA	780 mA	80	
EC6E18		+5/+12/-5 VDC	3000/600/1000 mA	20 mA	725 mA	78	

NOTE: 1. Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........24V........9-36V
48V........18-72V
Input Filter........Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy
Single Output........±1.0% max.
Dual +Output........±1.0% max.
-Output........±3.0% max.
Triple, 5V........±1.0% max.
12V/15V........±5.0% max.
-5V........±2.0% max.
Voltage Balance (Dual)........±1.0% max.
Transient Response:
Single, 25% Step Load Change........<500μ sec.
Dual FL-1/2L ±1% Error Band........<500μ sec.
External Trim Adj. Range........±10%.
Ripple & Noise, 20MHz BW........10mV RMS, max.
75mV p-p max.
Temperature Coefficient........± 0.02%/ C
Short Circuit Protection........Continuous
Line Regulation[1], Single/Dual........±0.2% max.
Triple........±1.0% max.
Load Regulation[2], Single/Dual........±1.0% max.
Triple........±5.0% max.

GENERAL SPECIFICATIONS:

Efficiency........See Table
Isolation Voltage........500 VDC min.
Isolation Resistance........10^9ohms
Switching Frequency........200KHz, typ.
Operating Temperature Range........-25 C to + 71 C
Case Temperature........100°C max.
Cooling........Free-Air Convection
Storage Temperature Range........-55 C to + 105 C
EMI/RFI........Six-Sided Continuous Shield
Dimensions........2.56 x 3.0 x 0.83 inches
(65 x 76.2 x 21.1 mm)
Case Material........Black Coated Copper with
Non-Conductive Base

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 1/4 Load

TRIPLE OUTPUT LOADING TABLE (1)

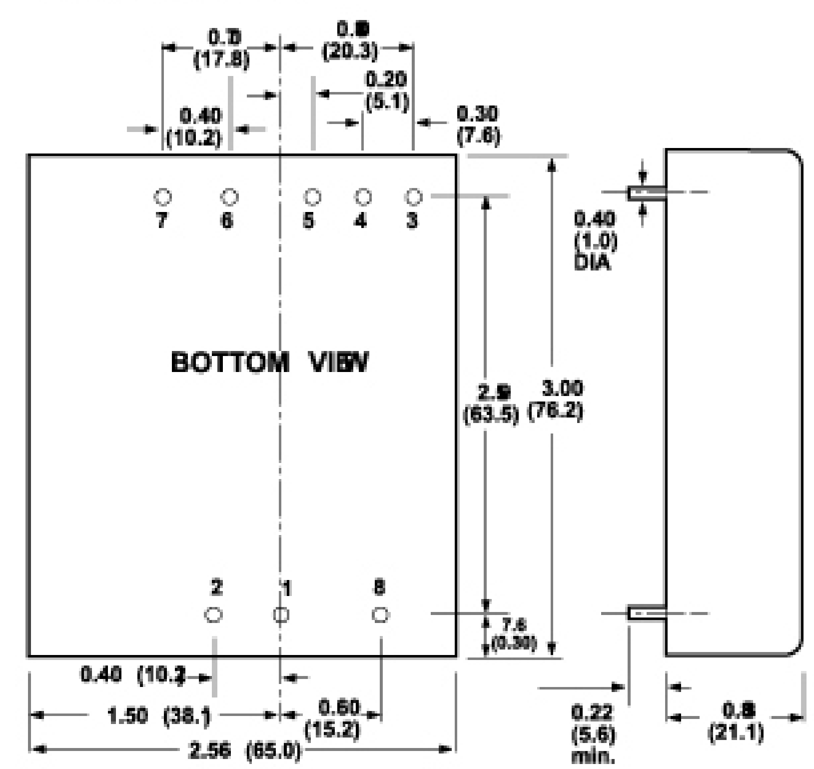
Output (Pin No.)	Voltage	Amperes Min.(2)	Amperes Nom.
6	+5	0.5	3.0
3 & 5	+12 & -12	0.10	0.625
3 & 5	+15 & -15	0.10	0.500
3 & 5	+12 & -5	0.10/0.10	0.60/1.0

NOTE:

1. Maximum total power from all outputs is limited to 30 watts but no output should be allowed to exceed its maximum current.
2. Minimum current on each output is required to maintain specified regulation.

CASE E

All Dimensions in Inches(mm)
Tolerance .xx= ±.04, .xxx= ±.010



Pin	Single Output	Daul Output	ripfe Output
1.	+Input	+Input	+Input
2.	-Input	-Input	-Input
3.	+Sense	+Output	+Output
4.	Output Trim	Common	Common
5.	-Sense	-Output	-Output
6.	+Output	No Pin	+5V Output
7.	-Output	No Pin	No Pin
8.	Remote On/Off Control		

PIN CONNECTION

Remote On/Off Control

Logic Compatibility	CMOS or Open Collector TTL
EC-On	>+5.5VDC or Open Circuit
EC-Off	<1.8 VDC
Shutdown Idle Current	10 mA
Control Common	Referenced to Input Minus

External Output Trimming

Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.

S E R I E S

PKQ75

50 TO 75 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT

c US
E176177

Features

- 50-75W Isolated Output
- Efficiency to 90%
- 300KHz Switching Frequency
- 2:1 Input Range
- Open Frame Type Option
- Regulated Outputs
- Continuous Short Circuit Protection
- Industry Standard Quarter-Brick Package

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	NPUT CURRENT NO LOAD	ULE LOAD	EFF. %	CASE
PKQ75-24S18	18-36 VDC	1.8 VDC	0.5 - 25A	60 mA	2259 mA	83	QB
PKQ75-24S25	18-36 VDC	2.5 VDC	0.5 - 25A	60 mA	3064 mA	85	QB
PKQ75-24S33	18-36 VDC	3.3 VDC	0.5 - 20A	70 mA	3125 mA	88	QB
PKQ75-24S05	18-36 VDC	5 VDC	0.5 - 15A	80 mA	3472 mA	90	QB
PKQ75-48S18	36-75 VDC	1.8 VDC	0.5 - 25A	50 mA	1116 mA	84	QB
PKQ75-48S25	36-75 VDC	2.5 VDC	0.5 - 25A	50 mA	1514 mA	86	QB
PKQ75-48S33	36-75 VDC	3.3 VDC	0.5 - 20A	50 mA	1563 mA	88	QB
PKQ75-48S05	36-75 VDC	5 VDC	0.5 - 15A	80 mA	1736 mA	90	QB

NOTE: 1. Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........................ 24V..........18-36V
48V........... 36-75V
Undervoltage lockout .... 24Vin power up 17V
power down 15.5V
48Vin power up 34V
power down 32.5V
Positive Logic Remote ON/OFF[3,4]
Input Filter .... PI Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±1% max.
Transient Response :75% - 100% Step Load Change
Error Band...±5% Vout
Recover Time..<500μs
External Trim Adj. Range ....±10%
Ripple & Noise, 20MHz BW
.... 40mV RMS., max.
100mV pk-pk, max.
Temperature Coefficient.................................. ±0.03%/°C
Short Circuit Protection...................................Continuous
Line Regulation[1] ....±0.2% max.
Load Regulation[2] ....±0.2% max.
Over Voltage Protection trip Range, % Vo nom......................115-140%
Current Limit ....110% ~140% Nominal Output

GENERAL SPECIFICATIONS:

Efficiency...See Table
Isolation Voltage ....Input/Output.......1500VDC min.
Input/Case..........1500VDC min.
Output/Case.......1500VDC min.
Isolation Resistance ....10^7 ohm min.
Switching Frequency ....300KHz, Typ.
Operating Case Temperature ....-40°C to 100°C
Storage Temperature ....-40°C to +105°C
Thermal Shutdown, Case Temp. ....100°C Typ.
Dimensions ....1.45x2.28x0.50 inches
(36.8x57.9x12.7 mm)
Case Material (Standard).....Aluminum Baseplate with Plastic Case
(Suffix"O" Type)....................................Open Frame

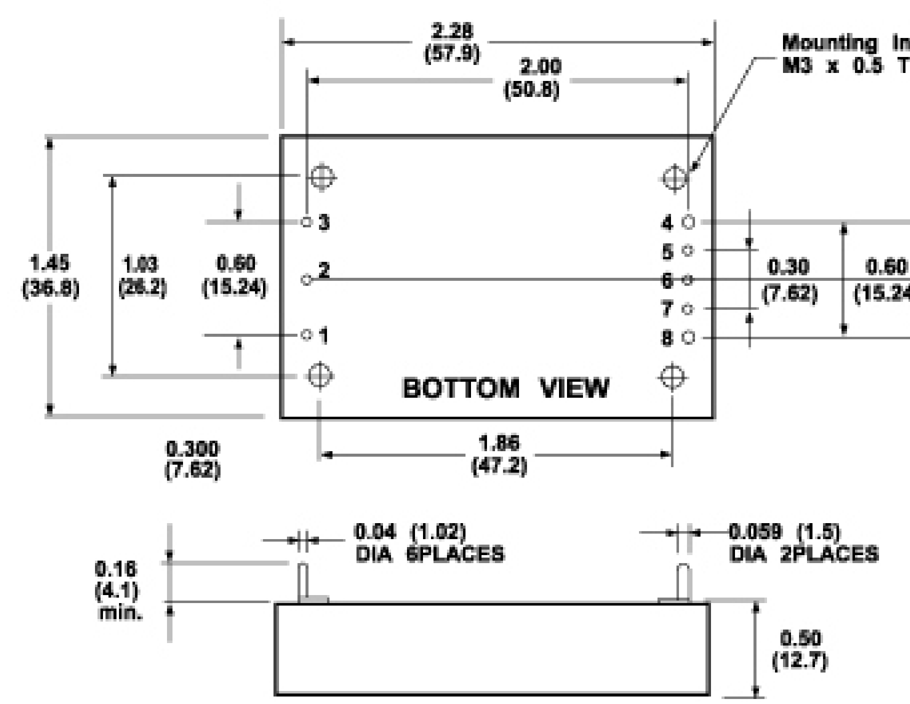
NOTE:

1. Measured From High Line to Low Line.
2. Measured From Io min. to Io max.
3. Logic Compatibility .... Open Collector ref. to -Input.
   Module ON ....Open Circuit
   Module OFF.................. <0.8Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.
5. Suffix "O" to the Model Number with Open Frame Type.

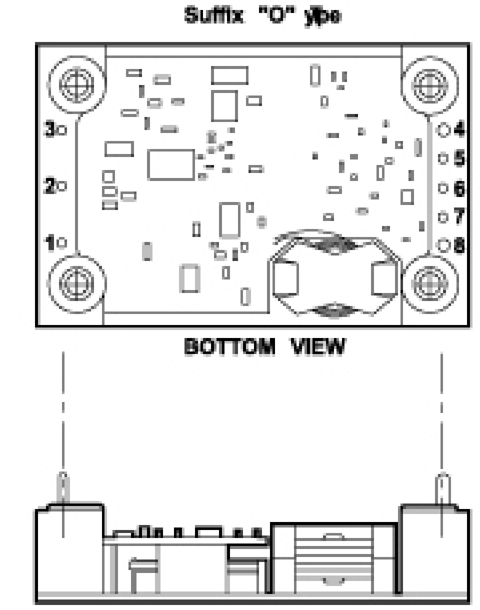
CASE QB

All Dimensions In Inches(mm)
Tolerances X.XX in.±.02 in.(X.X mm ±.5mm)
X.XXX in.±.010 in.(X.XX mm ±.25mm)

PIN CONNECTION	
Pin	Function
1.	+Vin
2.	ON/OFF
3.	-Vin
4.	-Vout
5.	-Sense
6.	Trim
7.	+Sense
8.	+Vout



Suffix "O" ype



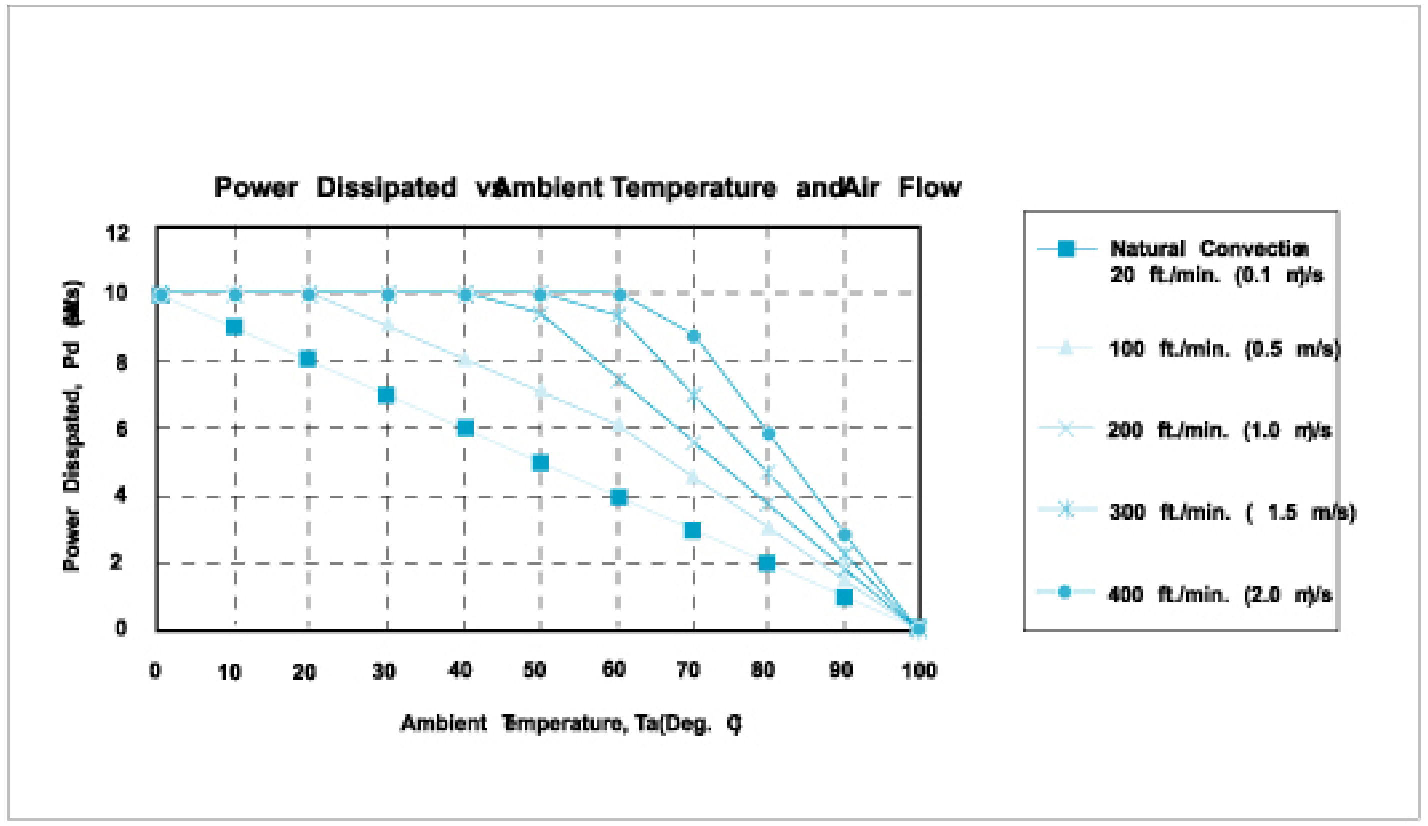
BOTTOM VIEW

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

Application Note

Derating:

The operating case temperature range of PKQ75 series is -40°C to +100°C. When operating the PKQ75 series, proper derating or cooling is needed.
Following is the derating curve of PKQ75 without heat sink.



Forced Convection Power Derating without Heat Sink

Where:

The power dissipation (Pd):

$$Pd = Pi - Po = Po\,(1-\eta)\,/\,\eta$$

The thermal resistances are list below:

Chart of Thermal Resistance vs Air Flow:

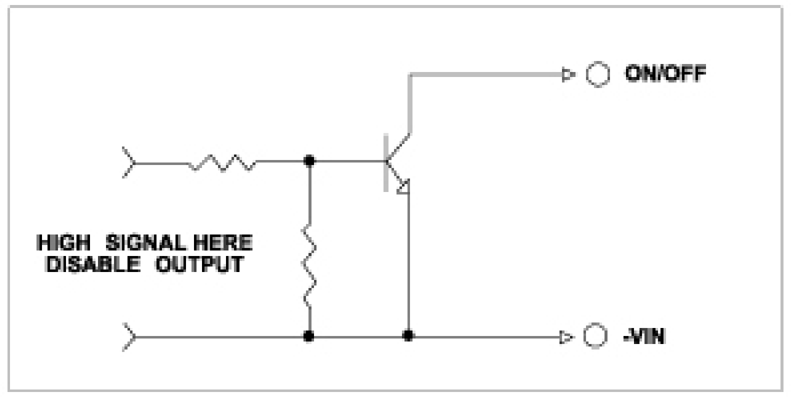
AIR FLOW RATE	TYPICAL Rca
Natural Convection 20 ft./min. (0.1m/s)	10.1 °C/W
100 ft./min. (0.5m/s)	8.0 °C/W
200 ft./min. (1.0m/s)	5.4 °C/W
300 ft./min. (1.5m/s)	4.4 °C/W
400 ft./min. (2.0m/s)	3.4 °C/W

The temperature rise (△T):

$$\triangle T = \triangle Pd * Rca$$

Remote ON/OFF Control

The PKQ75 series output allows the user to switch the module on and off electronically by remote on/off feature.
The PKQ75 series are available in "positive logic" or "negative logic" (option).

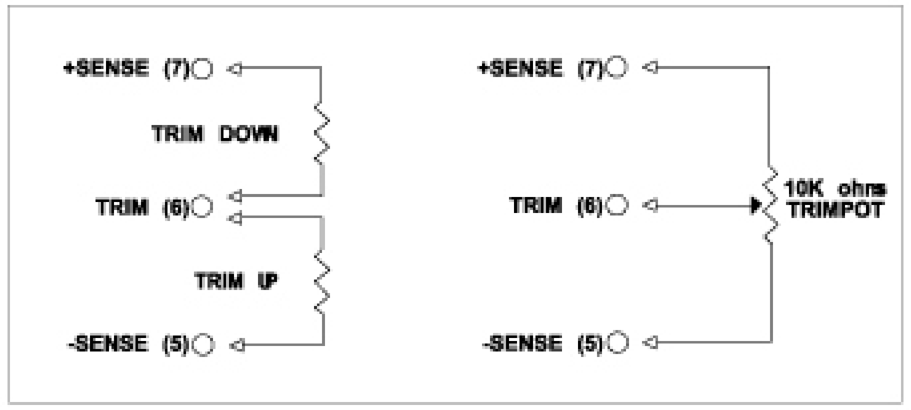


Logic Table

Logic State	Negative Logic	Positive Logic
Logic Low - Switch Closed	Module on	Module off
Logic High - Switch Open	Module off	Module on

External Output Trimming

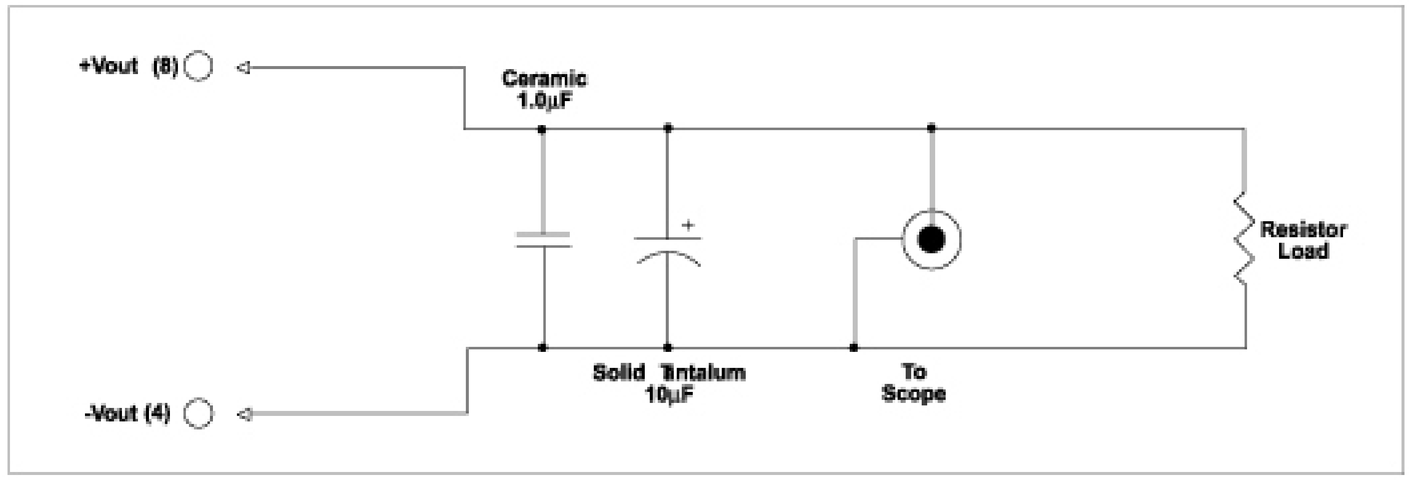
Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



External Output

Output Noise

The output noise is measured with 10μF tantalum capacitor and 1.0μF ceramic capacitor across output.



Output Noise Test Circuit schematic

PKQ75

S E R I E S

CHB50

25 TO 50 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT

E176177

BAUART GEPRÜFT TYPE APPROVED TÜV Rheinland

Only for Nominal Input Voltage 24 & 48 VDC

Features

- 25W/50W Isolated Output
- Efficiency to 85%
- 300KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Five-Sided Metal Case
- Industry Standard Half-Brick Package

MODEL NUMBER	INPUT OLTAGE V	OUTPUT OLTAGE V	OUTPUT URRENT C	NPUT CURRENT NO LOAD	ULL LOAD	%EFF	CASE
CHB50-12S25	9-18 VDC	2.5 VDC	10A	50 mA	2740 mA	76	HB
CHB50-12S33		3.3 VDC	10A		3525 mA	78	
CHB50-12S05		5 VDC	10A		5145 mA	81	
CHB50-12S12		12 VDC	4.16A		4950 mA	84	
CHB50-12S15		15 VDC	3.33A		4950 mA	84	
CHB50-12S24		24 VDC	2.08A		4950 mA	84	
CHB50-24S25	18-36 VDC	2.5 VDC	10A	50 mA	1353 mA	77	HB
CHB50-24S33		3.3 VDC	10A		1740 mA	79	
CHB50-24S05		5 VDC	10A		2540 mA	82	
CHB50-24S12		12 VDC	4.16A		2450 mA	85	
CHB50-24S15		15 VDC	3.33A		2450 mA	85	
CHB50-24S24		24 VDC	2.08A		2419 mA	86	
CHB50-48S25	36-75 VDC	2.5 VDC	10A	50 mA	676 mA	77	HB
CHB50-48S33		3.3 VDC	10A		870 mA	79	
CHB50-48S05		5 VDC	10A		1250 mA	83	
CHB50-48S12		12 VDC	4.16A		1220 mA	85	
CHB50-48S15		15 VDC	3.33A		1220 mA	85	
CHB50-48S24		24 VDC	2.08A		1209 mA	86	

NOTE : 1. Nominal Input Voltage 12, 24 & 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.......... 12V..........9-18V
24V..........18-36V
48V.......... 36-75V
Undervoltage lockout .... 12Vin power up 8.8V
power down 8V
24Vin power up 17V
power down 16V
48Vin power up 34V
power down 32.5V
Positive Logic Remote ON/OFF[3,4]
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±1% max.
Transient Response :25% Step Load Change ....<500μ sec.
External Trim Adj. Range ....±10%
Ripple & Noise, 20MHz BW, 2.5V & 3.3V & 5V .... 20mV RMS., max.
75mV pk-pk, max.
12V & 15V .... 30mV RMS., max.
100mV pk-pk, max.
24V .... 100mV RMS., max.
240mV pk-pk, max.
Temperature Coefficient.......... ±0.03%/°C
Short Circuit Protection..........Continuous
Line Regulation[1] ....±0.2% max.
Load Regulation[2] ....±0.2% max.
Over Voltage Protection trip Range, % Vo nom..........115-140%
Current Limit ....110% ~150% Nominal Output

GENERAL SPECIFICATIONS:

Efficiency..........See Table
Isolation Voltage ....Input/Output..........1500VDC min.
Input/Case..........1500VDC min.
Output/Case..........1500VDC min.
Isolation Resistance ....10^9 ohm min.
Switching Frequency ....(12/24)Vin..........400KHz, Typ.
48Vin..........300KHz, Typ.
Operating Case Temperature ....-40°C to 100°C
Storage Temperature .... -55°C to +105°C
Thermal Shutdown, Case Temp. ....100°C Typ.
Dimensions ....2.28x2.40x0.50 inches
(57.9x61.0x12.7 mm)
Case Material ....Aluminum

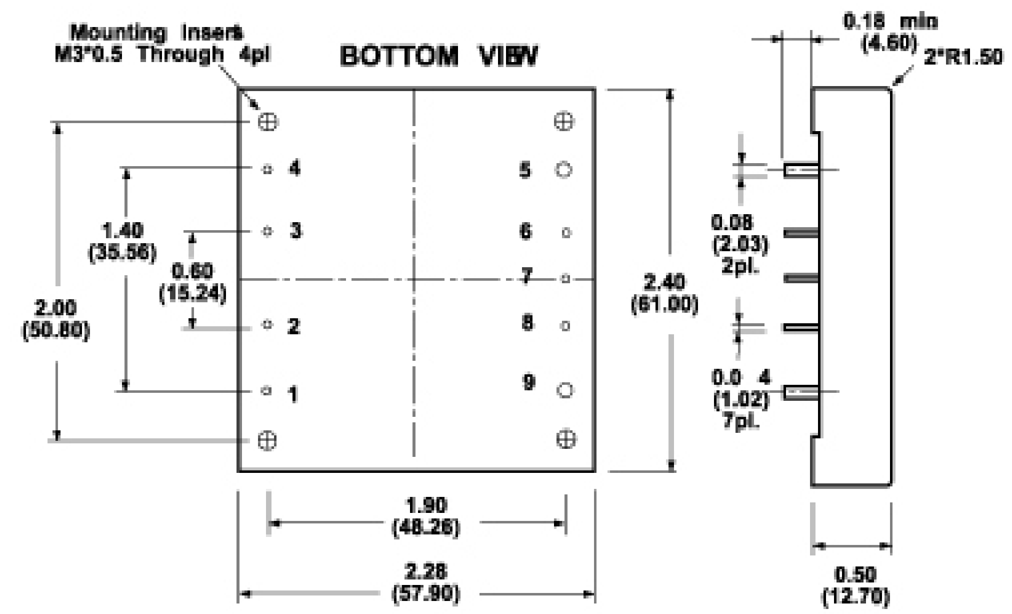
NOTE:

1. Measured From High Line to Low Line.
2. Measured From Full Load to Zero Load.
3. Logic Compatibility .... Open Collector Ref. to -Input.
   Module ON ....Open Circuit
   Module OFF.......... <0.8Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.

CASE HB

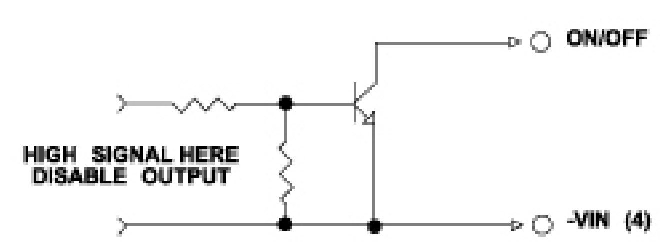
All Dimensions In Inches(mm)

Tolerances				Pin
	Inches	.XX±.02	.XXX±.01	±0.02
	Millimeters	.X±.5	.XX±.25	±0.5

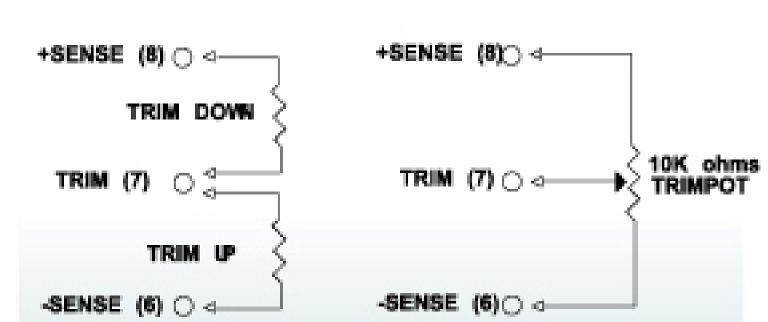


PIN CONNECTION	
Pin	Function
1.	+Vin
2.	ON/OFF
3.	CASE
4.	-Vin
5.	-Vout
6.	-Sense
7.	Trim
8.	+Sense
9.	+Vout

Remote ON/OFF Control



External Output Trim

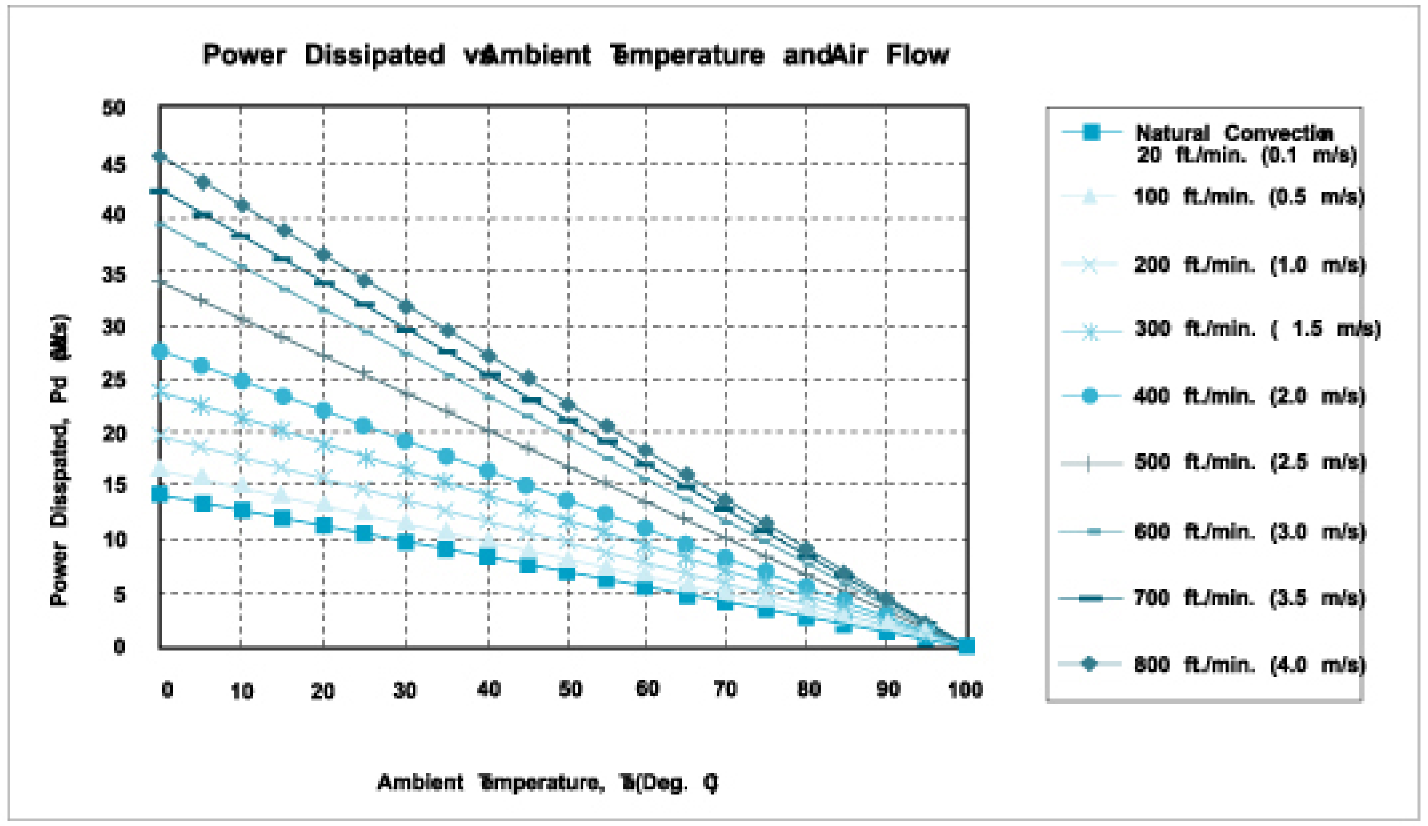


All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

Application Note

Derating:

The operating case temperature range of CHB50/75/100/150 series is -40°C to +100°C. When operating the CHB50/75/100/150 series, proper derating or cooling is needed.
The following curve is the derating curve of CHB50/75/100/150 without heat sink.



Forced Convection Power Derating without Heat Sink

Where:

The power dissipation (Pd):

$$Pd = Pi - Po = Po\,(1-\eta)\,/\,\eta$$

The thermal resistance are list below:

Chart of Thermal Resistance vs Air Flow:

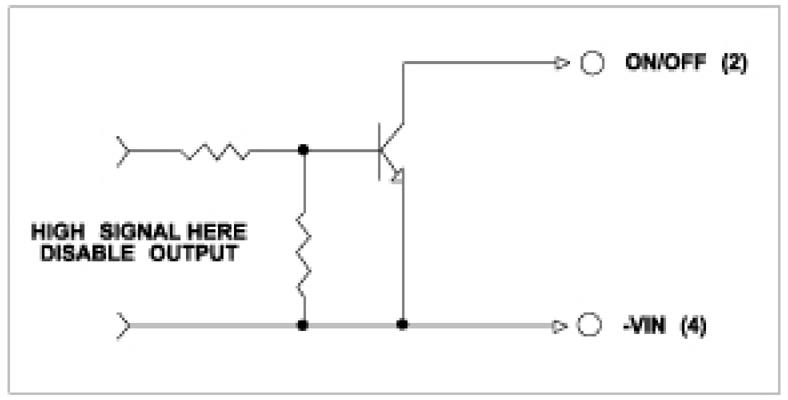
AIR FLOW RATE	TYPICAL Rca
Natural Convection 20ft./min. (0.1m/s)	7.12 °C/W
100 ft./min. (0.5m/s)	6.21 °C/W
200 ft./min. (1.0m/s)	5.17 °C/W
300 ft./min. (1.5m/s)	4.29 °C/W
400 ft./min. (2.0m/s)	3.64 °C/W
500 ft./min. (2.5m/s)	2.96 °C/W
600 ft./min. (3.0m/s)	2.53 °C/W
700 ft./min. (3.5m/s)	2.37 °C/W
800 ft./min. (4.0m/s)	2.19 °C/W

The temperature rise ($\triangle T$):

$$\triangle T = \triangle Pd * Rca$$

Remote ON/OFF Control

The CHB50 series allows the user to switch the module on and off electronically with remote on/off feature. The CHB50 series are available with "positive logic" or "negative logic" (option).

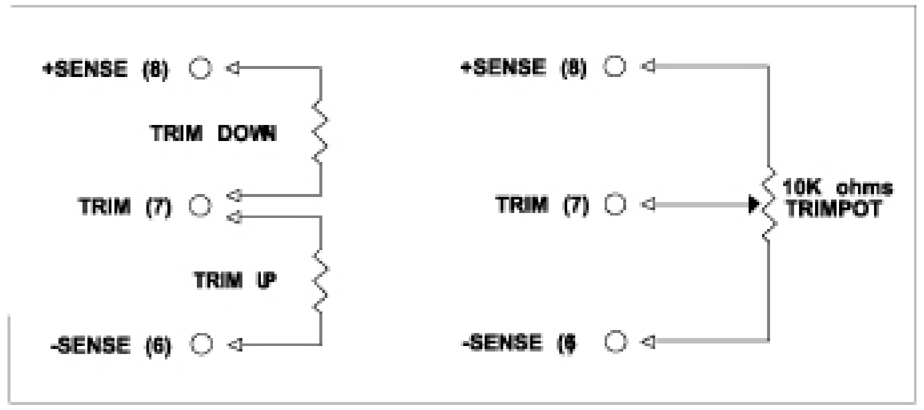


Logic Table

Logic State (PIN 2)	Negative Logic	Positive Logic
Logic Low - Switch Closed	Module on	Module off
Logic High - Switch Open	Module off	Module on

External Output Trimming

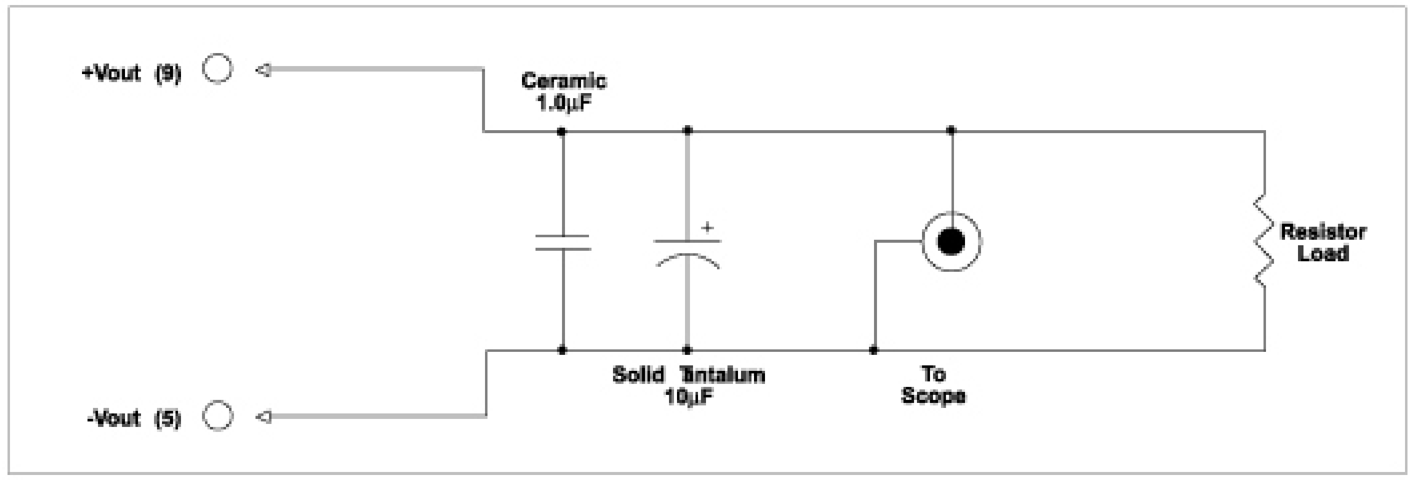
Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



External Output

Output Noise

The output noise is measured with 10µF tantalum capacitor and 1.0µF ceramic capacitor across output.



Output Noise Test Circuit schematic

S E R I E S

CHB50W

25 TO 50 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT

Features

- 25W-50W Isolated Output
- Efficiency to 84%
- 300KHz Switching Frequency
- 4 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Five-Sided Metal Case
- Industry Standard Half-Brick Package

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	%EFF	CASE
CHB50W-24S3V3		3.3 VDC	10 A		1785 mA	77	
CHB50W-24S05		5 VDC	10 A		2570 mA	81	
CHB50W-24S12	9-36 VDC	12 VDC	4.16 A	50 mA	2510 mA	83	HB
CHB50W-24S15		15 VDC	3.33 A		2510 mA	83	
CHB50W-24S24		24 VDC	2.08 A		2510 mA	83	
CHB50W-48S3V3		3.3 VDC	10 A		880 mA	78	
CHB50W-48S05		5 VDC	10 A		1270 mA	82	
CHB50W-48S12	18-75 VDC	12 VDC	4.16 A	50 mA	1240 mA	84	HB
CHB50W-48S15		15 VDC	3.33 A		1240 mA	84	
CHB50W-48S24		24 VDC	2.08 A		1240 mA	84	

NOTE : 1. Nominal Input Voltage 24, 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.......... 24V..........9-36V
48V..........18-75V
Undervoltage lockout .... 24Vin power up 8.8V
power down 8V
48Vin power up 17V
power down 16V
Positive Logic Remote ON/OFF[3,4]
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±1% max.
Transient Response :25% Step Load Change ....<500µ sec.
External Trim Adj. Range ....±10%
Ripple & Noise, 20MHz BW, 3.3V & 5V .... 40mV RMS., max.
100mV pk-pk, max.
12V & 15V .... 60mV RMS., max.
150mV pk-pk, max.
24V ....100mV RMS., max.
240mV pk-pk, max.
Temperature Coefficient.......... ±0.03%/°C
Short Circuit Protection..........Continuous
Line Regulation[1] ....±0.2% max.
Load Regulation[2] ....±0.2% max.
Over Voltage Protection trip Range, % Vo nom..........115-140%
Current Limit ....110% ~160% Nominal Output

GENERAL SPECIFICATIONS:

Efficiency..........See Table
Isolation Voltage ....Input/Output..........1500VDC min.
Input/Case..........1500VDC min.
Output/Case..........1500VDC min.
Isolation Resistance ....10^9 ohm min.
Switching Frequency ....300KHz, Typ.
Operating Case Temperature .... -40°C to 100°C
Storage Temperature ....-55°C to +105°C
Thermal Shutdown, Case Temp. ....100°C Typ.
Dimensions ....2.28x2.40x0.50 inches
(57.9x61.0x12.7 mm)
Case Material ....Aluminum

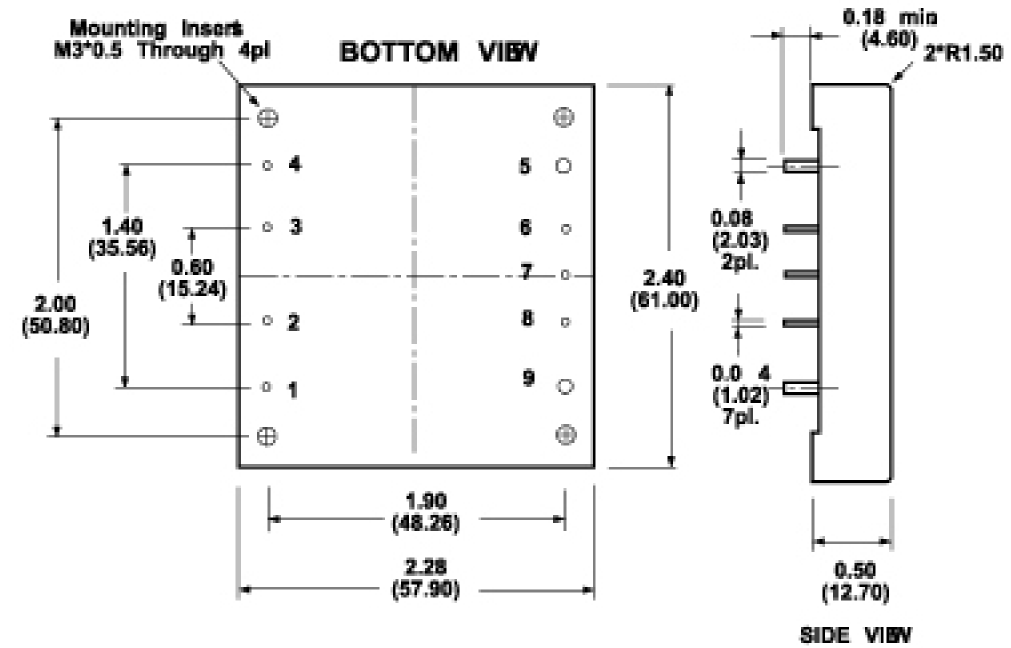
NOTE:

1. Measured From High Line to Low Line.
2. Measured From Full Load to Zero Load.
3. Logic Compatibility .... Open Collector Ref. to -Input.
   Module ON ....Open Circuit
   Module OFF.......... <0.8Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.

CASE HB

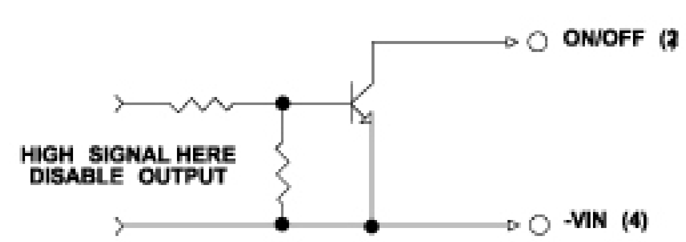
All Dimensions In Inches(mm)

Tolerances	Inches	.XX±.02	.XXX±.01	Pin ±0.02
	Millimeters	.X±.5	.XX±.25	±0.5

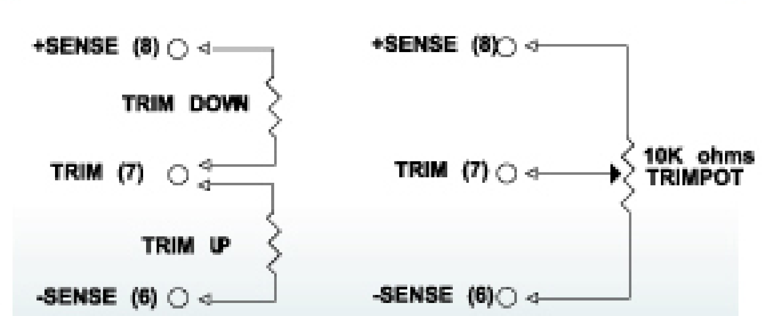


PIN CONNECTION	
Pin	Function
1.	+Vin
2.	ON/OFF
3.	CASE
4.	-Vin
5.	-Vout
6.	-Sense
7.	Trim
8.	+Sense
9.	+Vout

Remote ON/OFF Control



External Output Trim



All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

CHB75

37.5 TO 75 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT

E176177

BAUART GEPRÜFT TÜV Rheinland TYPE APPROVED

Only for Nominal Input Voltage 24 & 48 VDC

Features

- 37.5W-75W Isolated Output
- Efficiency to 85%
- 300KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Five-Sided Metal Case
- Industry Standard Half-Brick Package

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	%EFF	CASE
CHB75-12S25	9-18 VDC	2.5 VDC	15A	50 mA	4110 mA	76	HB
CHB75-12S33		3.3 VDC	15A		5290 mA	78	
CHB75-12S05		5 VDC	15A		7715 mA	81	
CHB75-12S12		12 VDC	6.25A		7440 mA	84	
CHB75-12S15		15 VDC	5A		7440 mA	84	
CHB75-12S24		24 VDC	3.13A		7440 mA	84	
CHB75-24S25	18-36 VDC	2.5 VDC	15A	50 mA	2029 mA	77	HB
CHB75-24S33		3.3 VDC	15A		2610 mA	79	
CHB75-24S05		5 VDC	15A		3810 mA	82	
CHB75-24S12		12 VDC	6.25A		3675 mA	85	
CHB75-24S15		15 VDC	5A		3675 mA	85	
CHB75-24S24		24 VDC	3.13A		3640 mA	86	
CHB75-48S25	36-75 VDC	2.5 VDC	15A	50 mA	1015 mA	77	HB
CHB75-48S33		3.3 VDC	15A		1305 mA	79	
CHB75-48S05		5 VDC	15A		1883 mA	83	
CHB75-48S12		12 VDC	6.25A		1838 mA	85	
CHB75-48S15		15 VDC	5A		1838 mA	85	
CHB75-48S24		24 VDC	3.13A		1820 mA	86	

NOTE : 1. Nominal Input Voltage 12, 24 & 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range .... 12V..........9-18V
24V..........18-36V
48V.......... 36-75V
Undervoltage lockout .... 12Vin power up 8.8V
power down 8V
24Vin power up 17V
power down 16V
48Vin power up 34V
power down 32.5V
Positive Logic Remote ON/OFF[3,4]
Input Filter .... PI Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±1% max.
Transient Response :25% Step Load Change ....<500μ sec.
External Trim Adj. Range ....±10%
Ripple & Noise, 20MHz BW, 2.5V & 3.3V & 5V .... 20mV RMS., max.
75mV pk-pk, max.
12V & 15V .... 30mV RMS., max.
100mV pk-pk, max.
24V .... 100mV RMS., max.
240mV pk-pk, max.
Temperature Coefficient.......... ±0.03%/°C
Short Circuit Protection..........Continuous
Line Regulation[1] ....±0.2% max.
Load Regulation[2] ....±0.2% max.
Over Voltage Protection trip Range, % Vo nom..........115-140%
Current Limit ....110% ~150% Nominal Output

GENERAL SPECIFICATIONS:

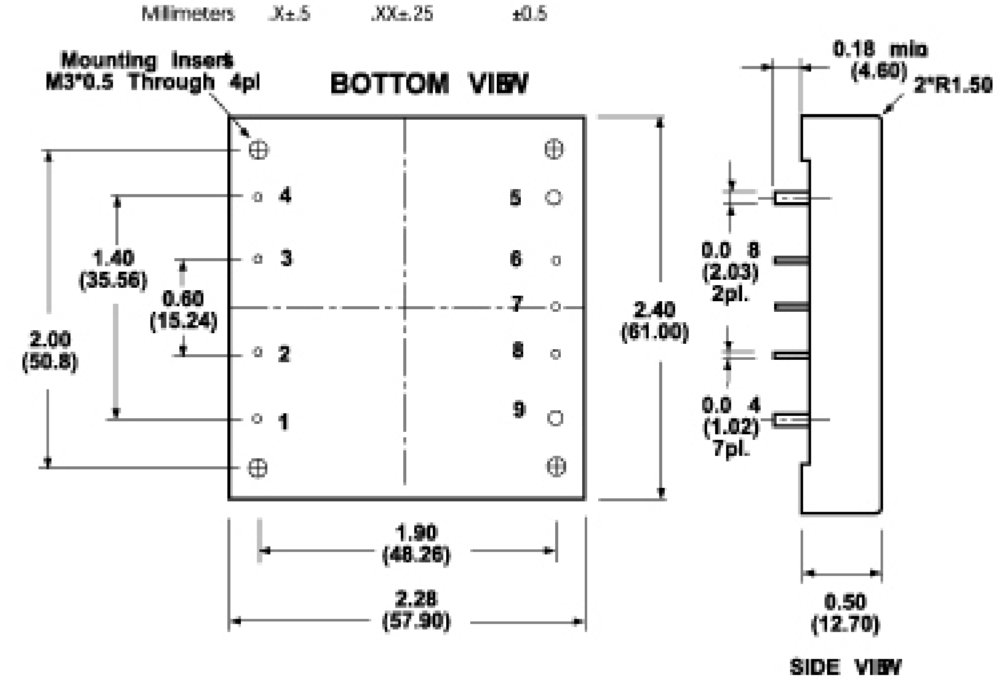
Efficiency..........See Table
Isolation Voltage ....Input/Output..........1500VDC min.
Input/Case..........1500VDC min.
Output/Case..........1500VDC min.
Isolation Resistance ....10^{9} ohm min.
Switching Frequency ....(12/24)Vin..........400KHz, Typ.
48Vin..........300KHz, Typ.
Operating case Temperature ....-40°C to 100°C
Storage Temperature ....-55°C to +105°C
Thermal Shutdown, Case Temp. ....100°C Typ.
Dimensions ....2.28x2.40x0.50 inches
(57.9x61.0x12.7 mm)
Case Material ....Aluminum

NOTE:
1. Measured From High Line to Low Line.
2. Measured From Full Load to Zero Load.
3. Logic Compatibility .... Open Collector Ref. to -Input
Module ON .... Open Circuit
Module OFF .... < 0.8Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.

CASE HB

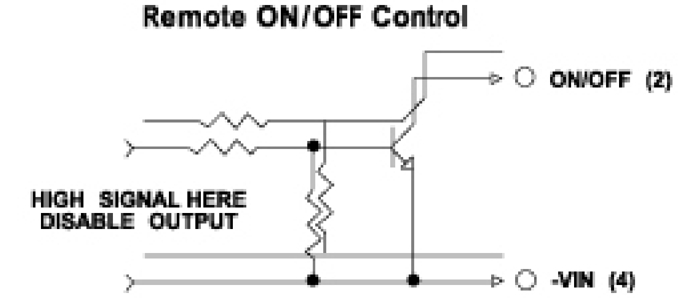
All Dimensions In Inches(mm)

Tolerances				Pin
	Inches	.XX±.02	.XXX±.010	±0.02
	Millimeters	.X±.5	.XX±.25	±0.5

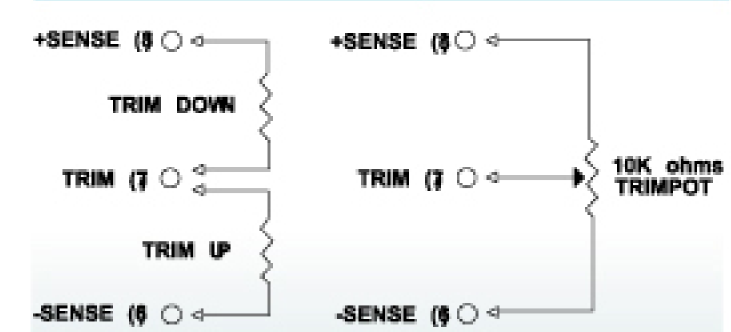


PIN CONNECTION	
Pin	Function
1.	+Vin
2.	ON/OFF
3.	CASE
4.	-Vin
5.	-Vout
6.	-Sense
7.	Trim
8.	+Sense
9.	+Vout

Remote ON/OFF Control



External Output Trim

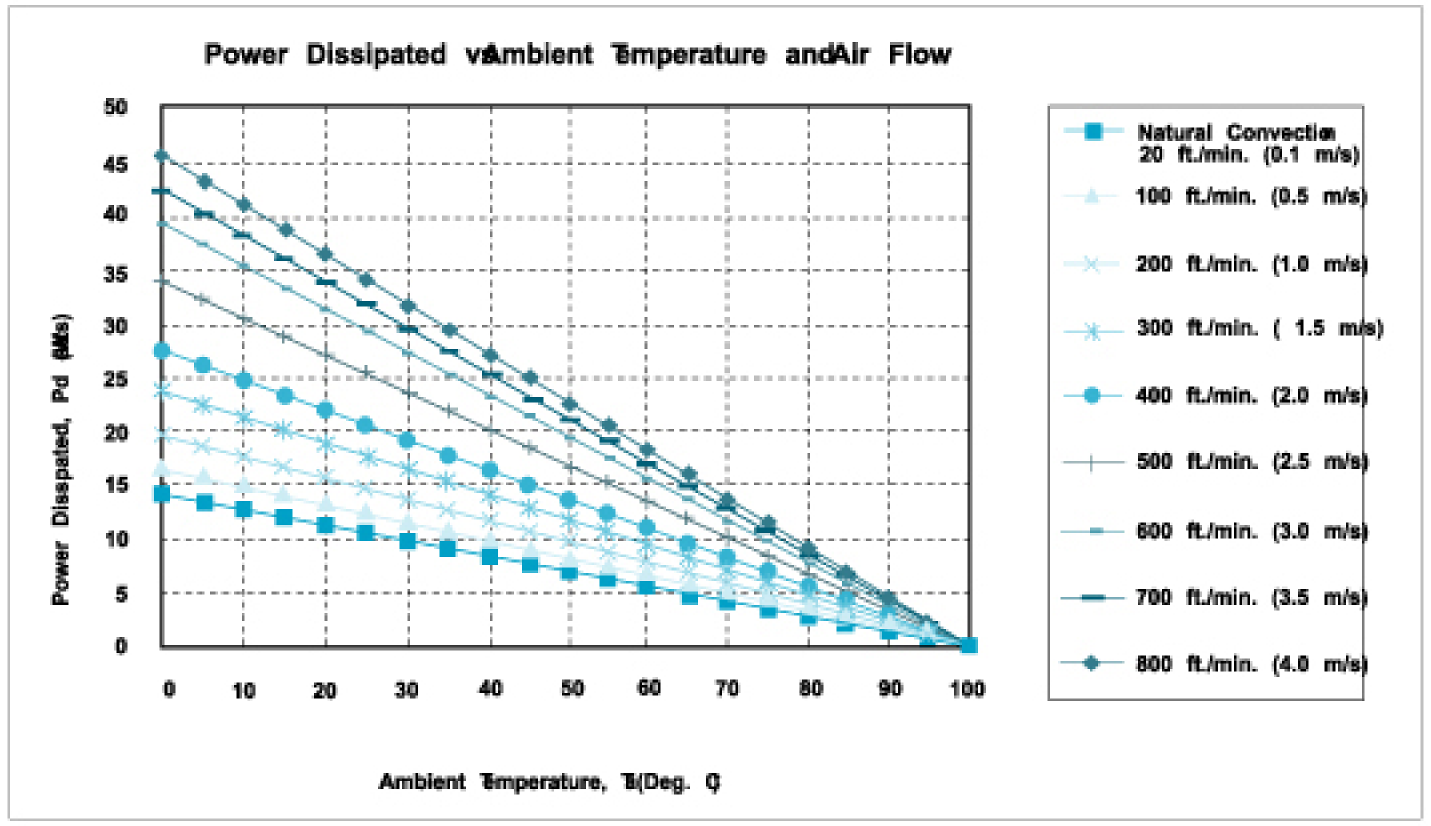


All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

Application Note

Derating:

The operating case temperature range of CHB75 series is -40°C to +100°C. When operating the CHB50/75/100/150 series, proper derating or cooling is needed.
Following curve is the derating curve of CHB50/75/100/150 without heat sink.



Forced Convection Power Derating without Heat Sink

Where:

The power dissipation (Pd):

$$Pd = Pi - Po = Po\,(1-\eta)\,/\,\eta$$

The thermal resistance are list below:

Chart of Thermal Resistance vs Air Flow:

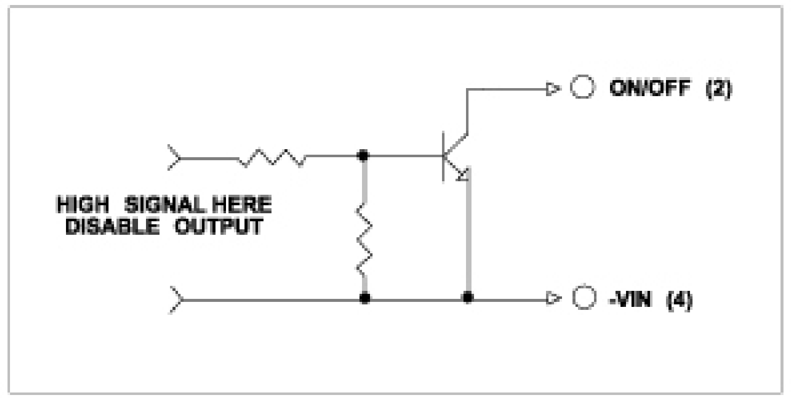
AIR FLOW RATE	TYPICAL Rca
Natural Convection 20ft./min. (0.1m/s)	7.12 °C/W
100 ft./min. (0.5m/s)	6.21 °C/W
200 ft./min. (1.0m/s)	5.17 °C/W
300 ft./min. (1.5m/s)	4.29 °C/W
400 ft./min. (2.0m/s)	3.64 °C/W
500 ft./min. (2.5m/s)	2.96 °C/W
600 ft./min. (3.0m/s)	2.53 °C/W
700 ft./min. (3.5m/s)	2.37 °C/W
800 ft./min. (4.0m/s)	2.19 °C/W

The temperature rise ($\triangle T$):

$$\triangle T = \triangle Pd * Rca$$

Remote ON/OFF Control

The CHB75 series allows the user to switch the module on and off electronically with remote on/off feature.
The CHB75 series are available with "positive logic" or "negative logic" (option).

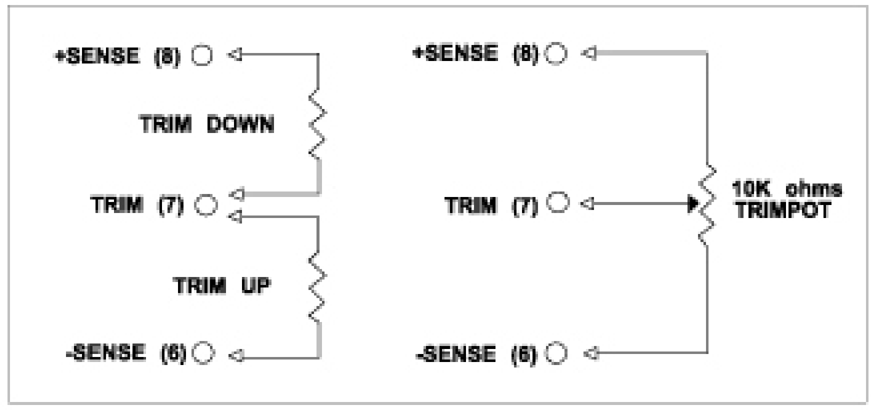


Logic Table

Logic State (PIN 2)	Negative Logic	Positive Logic
Logic Low - Switch Closed	Module on	Module off
Logic High - Switch Open	Module off	Module on

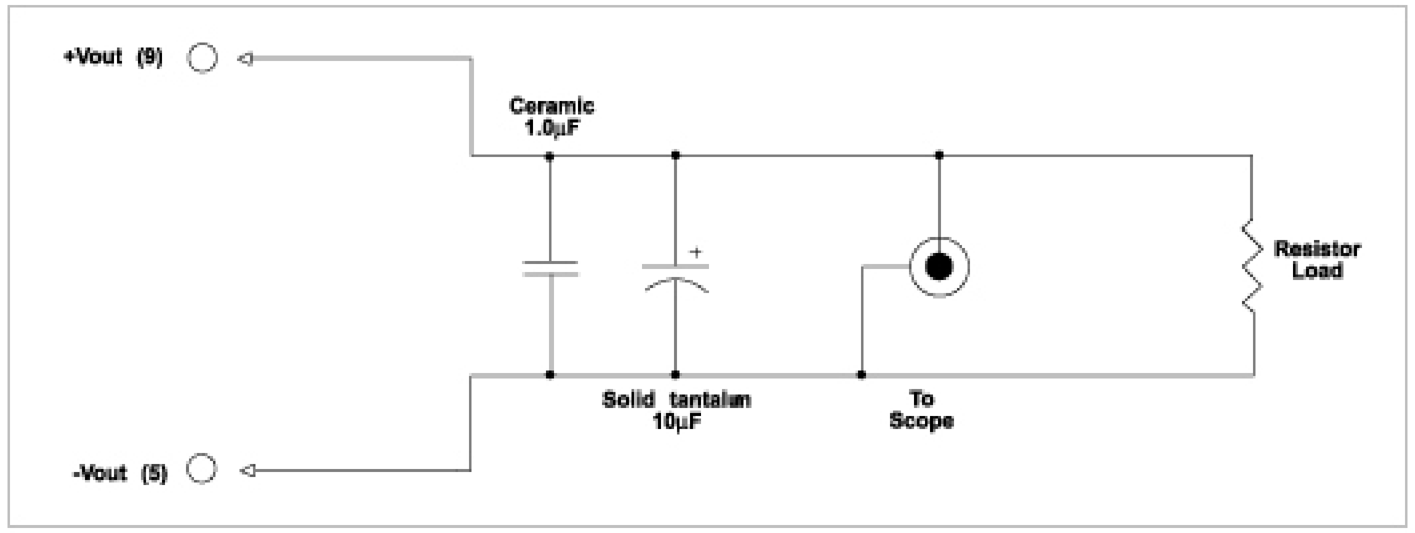
External Output Trimming

Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trim-pot as shown.



Output Noise

The output noise is measured with 10μF tantalum capacitor and 1.0μF ceramic capacitor across output.



Output Noise Test Circuit schematic

S E R I E S

CHB75W

37.5 TO 75 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT

Features

- 37.5W-75W Isolated Output
- Efficiency to 84%
- 300KHz Switching Frequency
- 4 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Five-Sided Metal Case
- Industry Standard Half-Brick Package

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	EFF	CASE
CHB75W-48S3V3	18-75 VDC	3.3 VDC	15 A	50 mA	1320 mA	78	HB
CHB75W-48S05	18-75 VDC	5 VDC	15 A	50 mA	1905 mA	82	HB
CHB75W-48S12	18-75 VDC	12 VDC	6.25 A	50 mA	1860 mA	84	HB
CHB75W-48S15	18-75 VDC	15 VDC	5 A	50 mA	1860 mA	84	HB

NOTE : 1. Nominal Input Voltage 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.......48V.......18-75V
Undervoltage lockout .... 48Vin power up.......17V
power down 16V
Positive Logic Remote ON/OFF[3,4]
Input Filter .... PI Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±1% max.
Transient Response :25% Step Load Change ....<500μ sec.
External Trim Adj. Range ....±10%
Ripple & Noise, 20MHz BW, 3.3V & 5V .... 40mV RMS., max.
100mV pk-pk, max.
12V & 15V .... 60mV RMS., max.
150mV pk-pk, max.
Temperature Coefficient....... ±0.03%/°C
Short Circuit Protection.......Continuous
Line Regulation[1] ....±0.2% max.
Load Regulation[2] ....±0.2% max.
Over Voltage Protection trip Range, % Vo nom.......115-140%
Current Limit ....110% ~160% Nominal Output

GENERAL SPECIFICATIONS:

Efficiency....... See Table
Isolation Voltage ....Input/Output.......1500VDC min.
Input/Case.......1500VDC min.
Output/Case.......1500VDC min.
Isolation Resistance ....10⁹ ohm min.
Switching Frequency ....300KHz, Typ.
Operating Case Temperature ....-40°C to 100°C
Storage Temperature ....-55°C to +105°C
Thermal Shutdown, Case Temp. ....100°C Typ.
Dimensions ....2.28x2.40x0.50 inches
(57.9x61.0x12.7 mm)
Case Material ....Aluminum

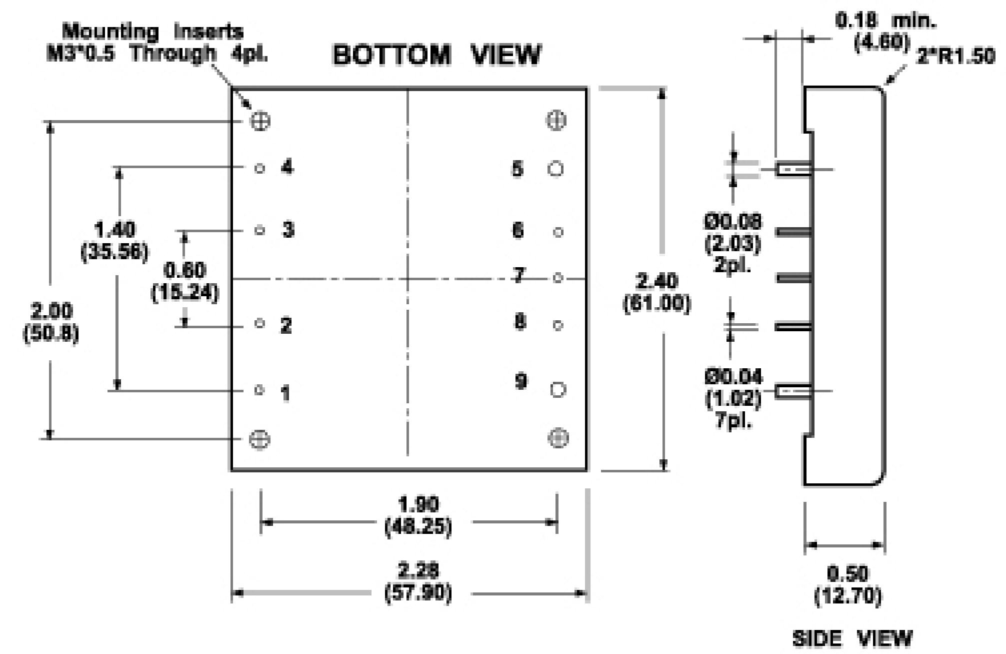
NOTE:

1. Measured From High Line to Low Line.
2. Measured From Full Load to Zero Load.
3. Logic Compatibility .... Open Collector Ref. to -Input
   Module ON .... Open Circuit
   Module OFF .... < 0.8Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.

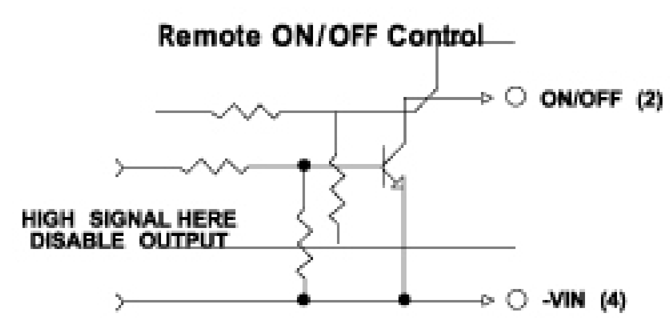
CASE HB

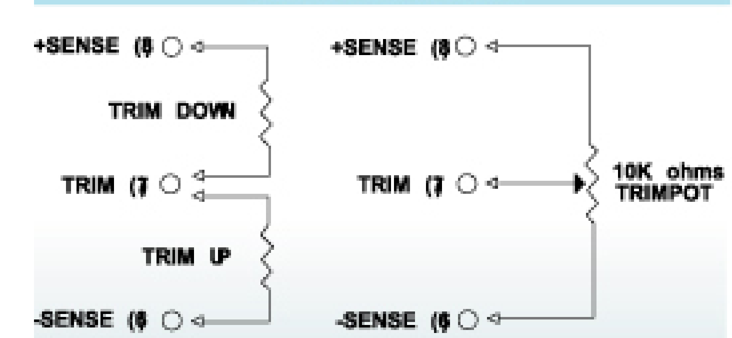
All Dimensions In Inches(mm)

Tolerances				Pin
	Inches	.XX±.02	.XXX±.010	±0.02
	Millimeters	.X±.5	.XX±.25	±0.5



PIN CONNECTION	
Pin	Function
1.	+Vin
2.	ON/OFF
3.	CASE
4.	-Vin
5.	-Vout
6.	-Sense
7.	Trim
8.	+Sense
9.	+Vout





All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

CHB75-Dual

75 WATT WIDE INPUT
DC-DC CONVERTERS
DUAL OUTPUT

E176177

Features

- 75W Isolated Output
- Efficiency to 84%
- 400KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Industry Standard Half-Brick Package
- Total Power 75W With 15A Maxinum Per Channel

* Safety meet UL 1950

MODEL NUMBER	INPU OLTAGE	UTPUT O VOLTAGE	UTPUT CURRENT MIN.	MAX.	INPUT CURRENT ONLOAD	FULL LOAD	%EFF	CASE
CHB75-24D05-3V3	18-36Vdc	Vo1=5V Vo2=3.3V	0A 0A	15A 15A	50 mA	3765 mA	83% (2)	HB
CHB75-24D05-2V5	18-36Vdc	Vo1=5V Vo2=2.5V	0A 0A	15A 15A	50 mA	3765 mA	83% (2)	HB
CHB75-48D05-3V3	36-75Vdc	Vo1=5V Vo2=3.3V	0A 0A	15A 15A	30 mA	1860 mA	84% (2)	HB
CHB75-48D05-2V5	36-75Vdc	Vo1=5V Vo2=2.5V	0A 0A	15A 15A	30 mA	1860 mA	84% (2)	HB

NOTE : 1. Nominal Input Voltage: 24 & 48 VDC
2. Measured with 15A load on Vo1

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........ 24V..........18-36V
48V..........36-75V
Undervoltage lockout .... 24Vin power up 17V
24Vin power down 15.5V
48Vin power up 34V
48Vin power down 32.5V
Positive Logic Remote ON/OFF [4,5]
Input Filter .... PI Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±2% max.
Transient Response :25% Step Load Change ....<500μ sec.
External Trim Adj. Range, Each Output ....±5%
Ripple & Noise, 20MHz BW[6]
3.3 & 5V & 2.5V .... 40mV RMS., max.
100mV pk-pk, max..
Temperature Coefficient.......... ±0.03%/˚C
Short Circuit Protection..........Continuous
Line Regulation[1] ....±0.2% max.
Load Regulation[2] ....±0.5% max.
Over Voltage Protection trip Range, % Vo nom..........115-140%
Current Limit[3] ....110% –140% Nominal Output

GENERAL SPECIFICATIONS:

Efficiency..........See Table
Isolation Voltage ....Input/Output..........1500VDC min.
Input/Case..........1500VDC min.
Output/Case..........1500VDC min.
Isolation Resistance ....10^9 ohm min.
Switching Frequency ....400KHz, Typ.
Operating case Temperature ....-40˚C to 100˚C
Storage Temperature ....-55˚C to +105˚C
Thermal Shutdown, Case Temp..........100˚C Typ.
Dimensions ....2.28x2.40x0.50 inches
(57.9x61.0x12.7 mm)
Case Material .... Aluminum Baseplate with Plastic Case

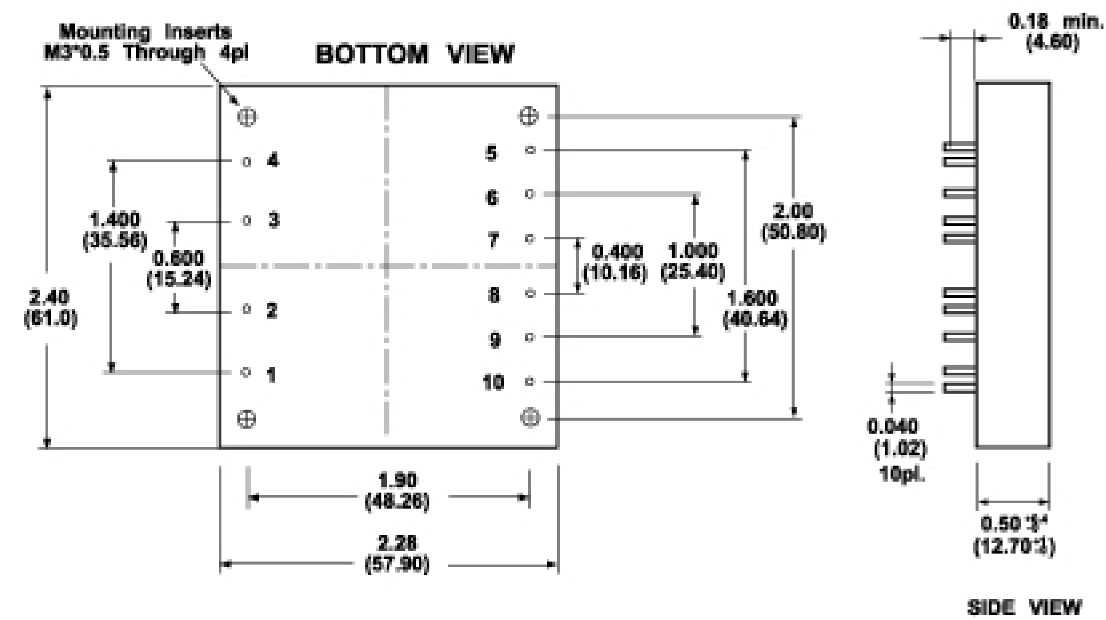
NOTE:

1. Measured From High Line to Low Line.
2. Measured From Full Load to Min. Load.
3. Measured with Output Current on Output1 (Vo1)
4. Logic Compatibility .... Open Collector Ref. to -Input
   Module ON .... Open Circuit
   Module OFF .... < 0.8Vdc
5. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.
6. The Output Noise is Measured with 10 μF Tantalum and 1μF Ceramic Capacitor across output.

CASE HB

All Dimensions In Inches(mm)

Tolerances				Pin
	Inches	.XX±.02	.XXX±.010	±0.02
	Millimeters	.X±.5	.XX±.25	±0.5



PIN CONNECTION	
Pin	unction
1.	+Vin
2.	ON/OFF
3.	CASE
4.	-Vin
5.	+Vo2
6.	-Vo2
7.	Vo2 Trim
8.	+Vo1
9.	-Vo1
10.	Vo1 Trim

F

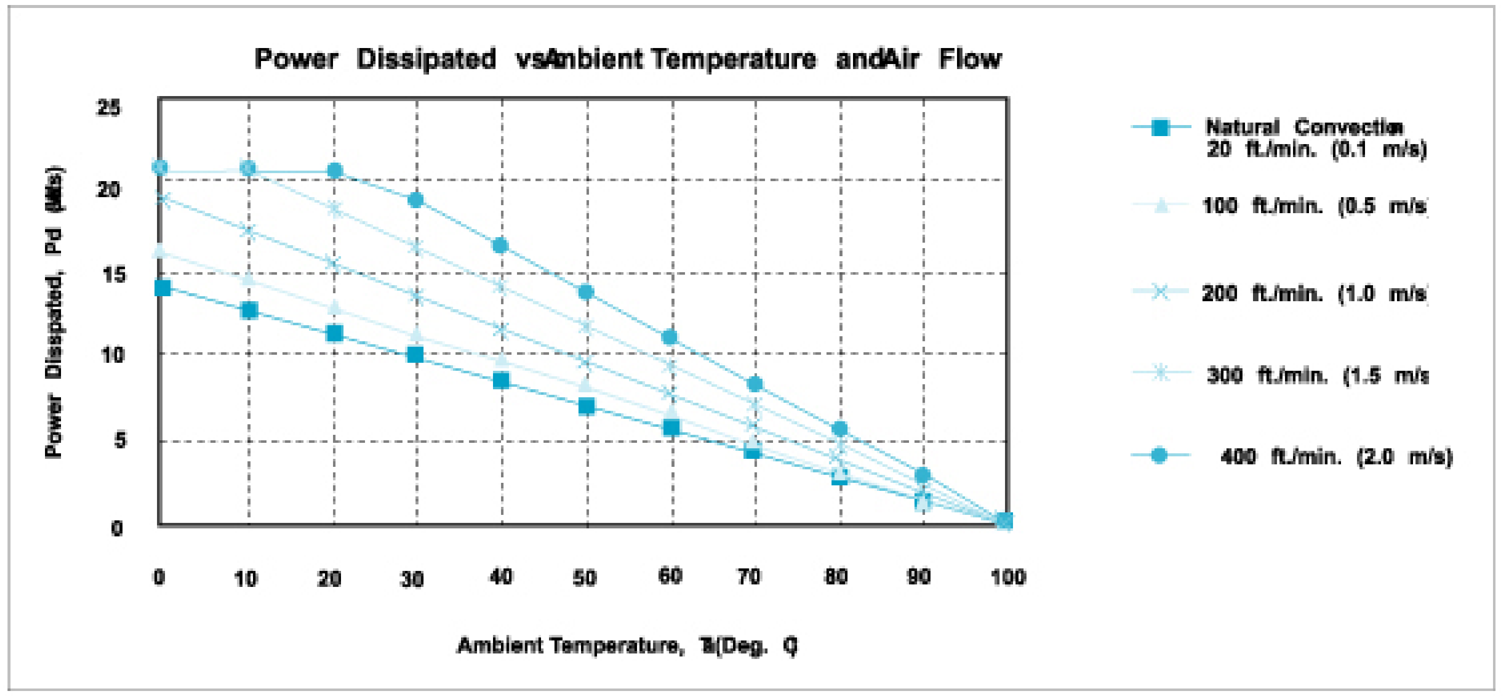
CHB75

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

Application Note

Derating:

The operating case temperature range of the CHB75 Dual series is -40°C to +100°C. When operating the CHB75 Dual series, proper derating or cooling is needed .
Following is the derating curve of CHB75 Dual without heat sink



Forced Convection Power Derating without Heat Sink

Where:

The power dissipation (Pd):

$Pd = Pi - Po = Po\ (1-\eta)\ /\ \eta$

The thermal resistance are list below:

Chart of Thermal Resistance vs Air Flow:

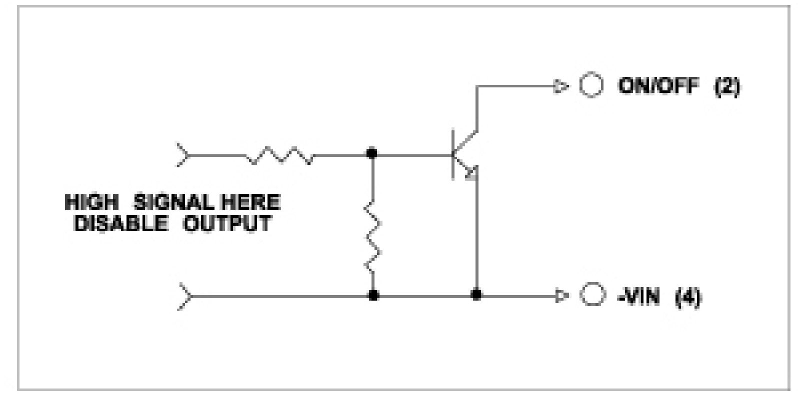
AIR FLOW RATE	TYPICAL Rca
Natural Convection 20 ft./min. (0.1 m/s)	7.12 °C/W
100 ft./min.	6.21 °C/W
200 ft./min.	5.17 °C/W
300 ft./min.	4.29 °C/W
400 ft./min.	3.64 °C/W

The temperature rise ($\triangle T$):

$\triangle T = \triangle Pd * Rca$

Remote ON/OFF Control

The CHB75 Dual series allows the user to switch the module on and off electronically with remote on/off feature.
The CHB75 Dual series are available with "positive logic" or "negative logic" (option).

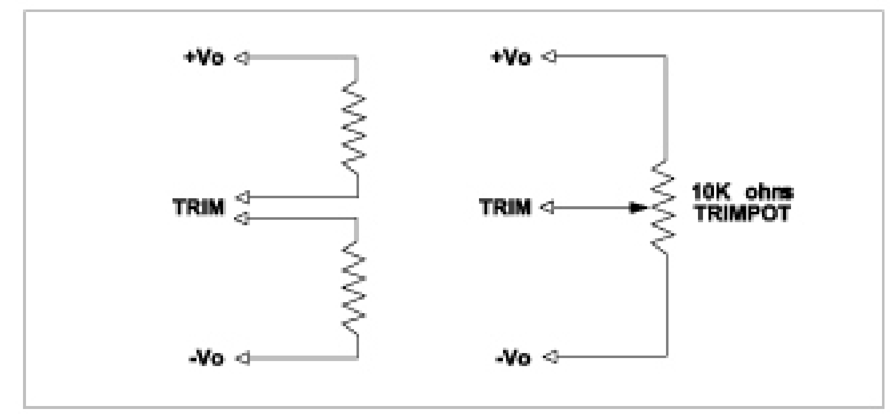


Logic Table

Logic State (PIN 2)	Negative Logic	Positive Logic
Logic Low - Switch Closed	Module on	Module off
Logic High - Switch Open	Module off	Module on

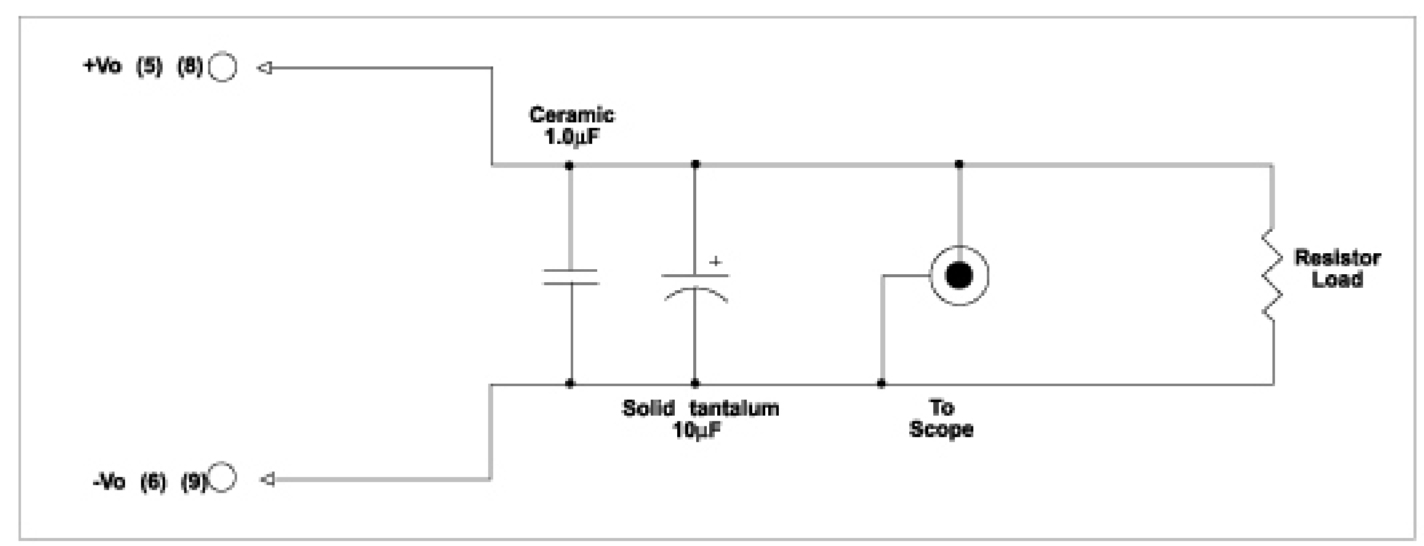
External Output Trimming

Output may optionally be externally trimmed (±5%) with a fixed resistor or an external trimpot as shown.



Output Noise

The output noise is measured with 10μF tantalum capacitor and 1.0μF ceramic capacitor across output.



Output Noise Test Circuit schematic

CHB75

S E R I E S

CHB100

50 TO 100 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT

c UL us
E176177

Only for Nominal Input Voltage 48 VDC

Features

- 50-100W Isolated Output
- Efficiency to 85%
- 500KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Five-Sided Metal Case
- Industry Standard Half-Brick Package

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	%EFF	CASE
CHB100-24S25	18-36 VDC	2.5 VDC	20A	50 mA	2705 mA	77	HB
CHB100-24S33		3.3 VDC	20A		3480 mA	79	
CHB100-24S05		5 VDC	20A		5020 mA	83	
CHB100-24S12		12 VDC	8.3A		4880 mA	85	
CHB100-24S15		15 VDC	6.7A		4925 mA	85	
CHB100-24S24		24 VDC	4.17A		4905 mA	85	
CHB100-48S25	36-75 VDC	2.5 VDC	20A	50 mA	1335 mA	78	HB
CHB100-48S33		3.3 VDC	20A		1720 mA	80	
CHB100-48S05		5 VDC	20A		2480 mA	84	
CHB100-48S12		12 VDC	8.3A		2442 mA	85	
CHB100-48S15		15 VDC	6.7A		2463 mA	85	
CHB100-48S24		24 VDC	4.17A		2463 mA	85	

NOTE : 1. Nominal Input Voltage 24 or 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.................. 24V..........18-36V
48V..........36-75V
Undervoltage lockout .... 24Vin power up 17V
24Vin power down 16V
48Vin power up 34V
48Vin power down 32.5V
Positive Logic Remote ON/OFF [3,4]
Input Filter .... PI Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±1% max.
Transient Response :25% Step Load Change ....<500μ sec.
External Trim Adj. Range ....±10%
Ripple & Noise, 20MHz BW, 2.5V & 3.3V & 5V .... 40mV RMS., max.
100mV pk-pk, max.
12V & 15V .... 60mV RMS., max.
150mV pk-pk, max.
24V .... 100mV RMS., max.
240mV pk-pk, max.
Temperature Coefficient.................. ±0.03%/°C
Short Circuit Protection..................Continuous
Line Regulation[1] ....±0.2% max.
Load Regulation[2] ....±0.2% max.
Over Voltage Protection trip Range, % Vo nom. 115-140%
Current Limit ....110% ~140% Nominal Output

GENERAL SPECIFICATIONS:

Efficiency..................See Table
Isolation Voltage ....Input/Output..........1500VDC min.
Input/Case..........1500VDC min.
Output/Case..........1500VDC min.
Isolation Resistance ....10^9 ohm min.
Switching Frequency ....500KHz, Typ.
Operating case Temperature ....-40°C to 100°C
Storage Temperature ....-40°C to +105°C
Thermal Shutdown, Case Temp. ....100°C Typ.
Dimensions ....2.28x2.40x0.50 inches
(57.9x61.0x12.7 mm)
Case Material ....Aluminum

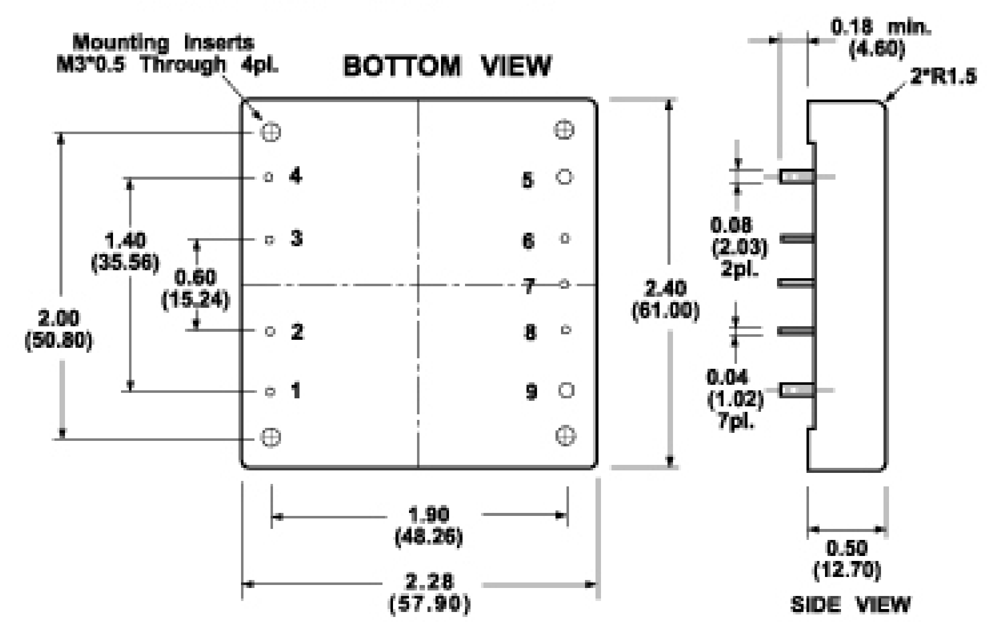
NOTE:

1. Measured From High Line to Low Line.
2. Measured From Full Load to Zero Load.
3. Logic Compatibility .... Open Collector Ref. to -Input
   Module ON .... Open Circuit
   Module OFF .... < 0.8Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.

CASE HB

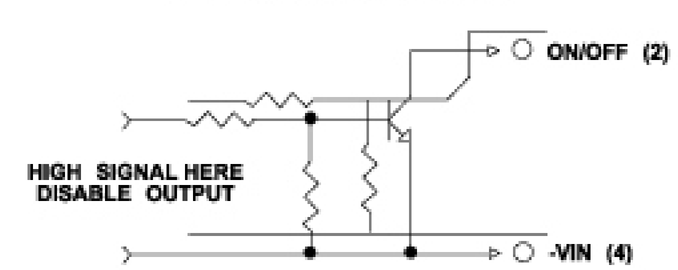
All Dimensions In Inches(mm)

				Pin
Tolerances	Inches	.XX±.02	.XXX±.010	±0.02
	Millimeters	X±.5	.XX±.250	±0.5

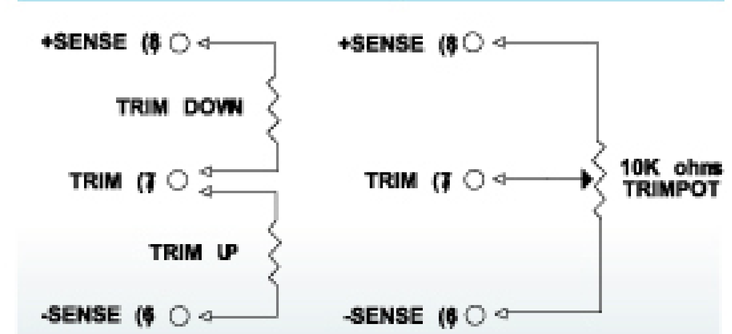


PIN CONNECTION	
Pin	Function
1.	+Vin
2.	ON/OFF
3.	CASE
4.	-Vin
5.	-Vout
6.	-Sense
7.	Trim
8.	+Sense
9.	+Vout

Remote ON/OFF Control



External Output Trim



CHB100

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

CHB150

75 TO 150 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT

c us
E176177

Features

- 75-150W Isolated Output
- Efficiency to 85%
- 500KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Five-Sided Metal Case
- Industry Standard Half-Brick Package

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT URRENT	C NPUT CURRENT NO LOAD	FULL LOAD	%EFF	CASE
CHB150-48S25		2.5 VDC	30A		2.6A	74	
CHB150-48S33		3.3 VDC	30A		2.6A	79	
CHB150-48S05		5 VDC	30A		3.7A	83	
CHB150-48S12	36-75 VDC	12 VDC	12.5A	25 mA	3.6A	85	HB
CHB150-48S15		15 VDC	10A		3.6A	85	
CHB150-48S24		24 VDC	6.25A		3.6A	85	

NOTE : 1. Nominal Input Voltage 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.......... 48V.......... 36-75V
Undervoltage lockout .... 48Vin power up 34V
48Vin power down 32.5V
Positive Logic Remote ON/OFF [3,4]
Input Filter .... PI Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±1% max.
Transient Response :25% Step Load Change ....<500μ sec.
External Trim Adj. Range ....±10%
Ripple & Noise, 20MHz BW, 2.5V & 3.3V & 5V .... 40mV RMS., max.
100mV pk-pk, max.
12V & 15V .... 60mV RMS., max.
150mV pk-pk, max.
24V .... 100mV RMS., max.
240mV pk-pk, max.
Temperature Coefficient.......... ±0.03%/°C
Short Circuit Protection..........Continuous
Line Regulation[1] ....±0.2% max.
Load Regulation[2] ....±0.2% max.
Over Voltage Protection trip Range, % Vo nom. 115-140%
Current Limit ....110% ~140% Nominal Output

GENERAL SPECIFICATIONS:

Efficiency..........See Table
Isolation Voltage ....Input/Output..........1500VDC min.
Input/Case..........1500VDC min.
Output/Case..........1500VDC min.
Isolation Resistance ....10^9 ohm min.
Switching Frequency .... 500KHz, Typ.
Operating case Temperature ....-40°C to 100°C
Storage Temperature .... -40°C to +105°C
Thermal Shutdown, Case Temp. ....100°C Typ.
Dimensions ....2.28x2.40x0.50 inches
(57.9x61.0x12.7 mm)
Case Material ....Aluminum

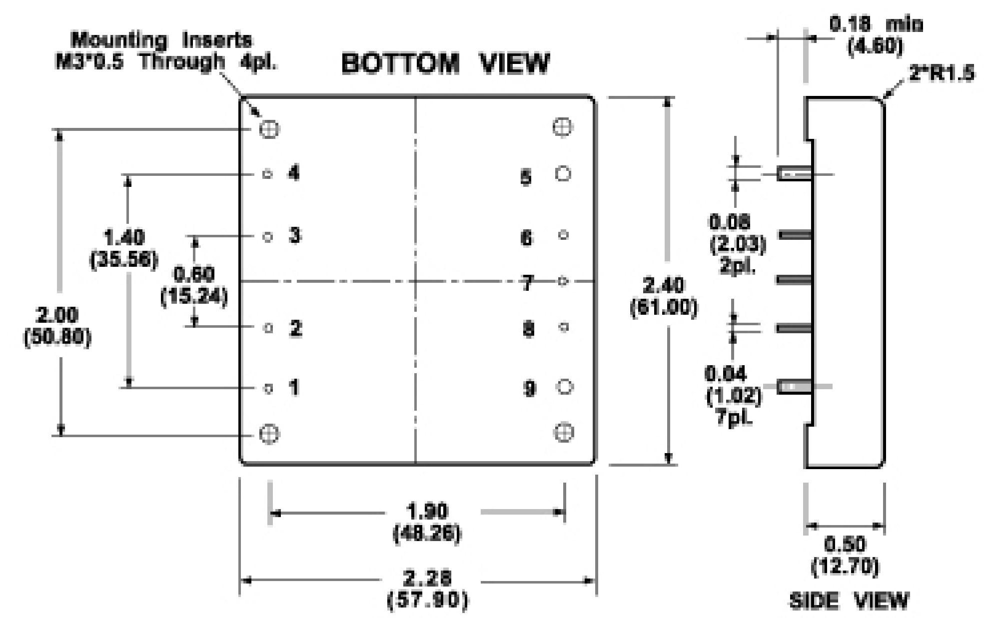
NOTE:

1. Measured From High Line to Low Line.
2. Measured From Full Load to Zero Load.
3. Logic Compatibility .... Open Collector Ref. to -Input
   Module ON .... Open Circuit
   Module OFF .... < 0.8Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.

CASE HB

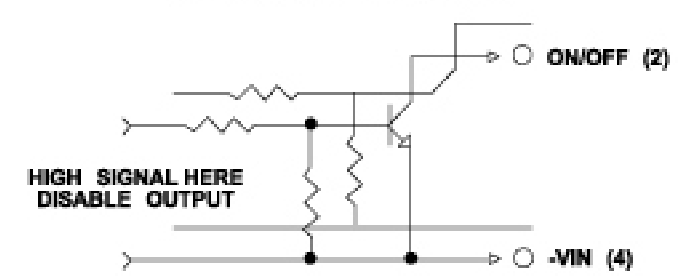
All Dimensions In Inches(mm)

Tolerances				Pin
	Inches	.XX±.02	.XXX±.010	±0.02
	Millimeters	.X±.5	.XX±.25	±0.5

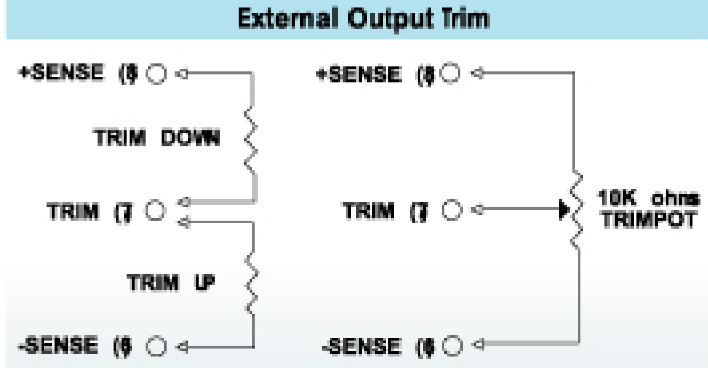


PIN CONNECTION		
Pin	unction	F
1.	+Vin	
2.	ON/OFF	
3.	CASE	
4.	-Vin	
5.	-Vout	
6.	-Sense	
7.	Trim	
8.	+Sense	
9.	+Vout	

Remote ON/OFF Control



External Output Trim

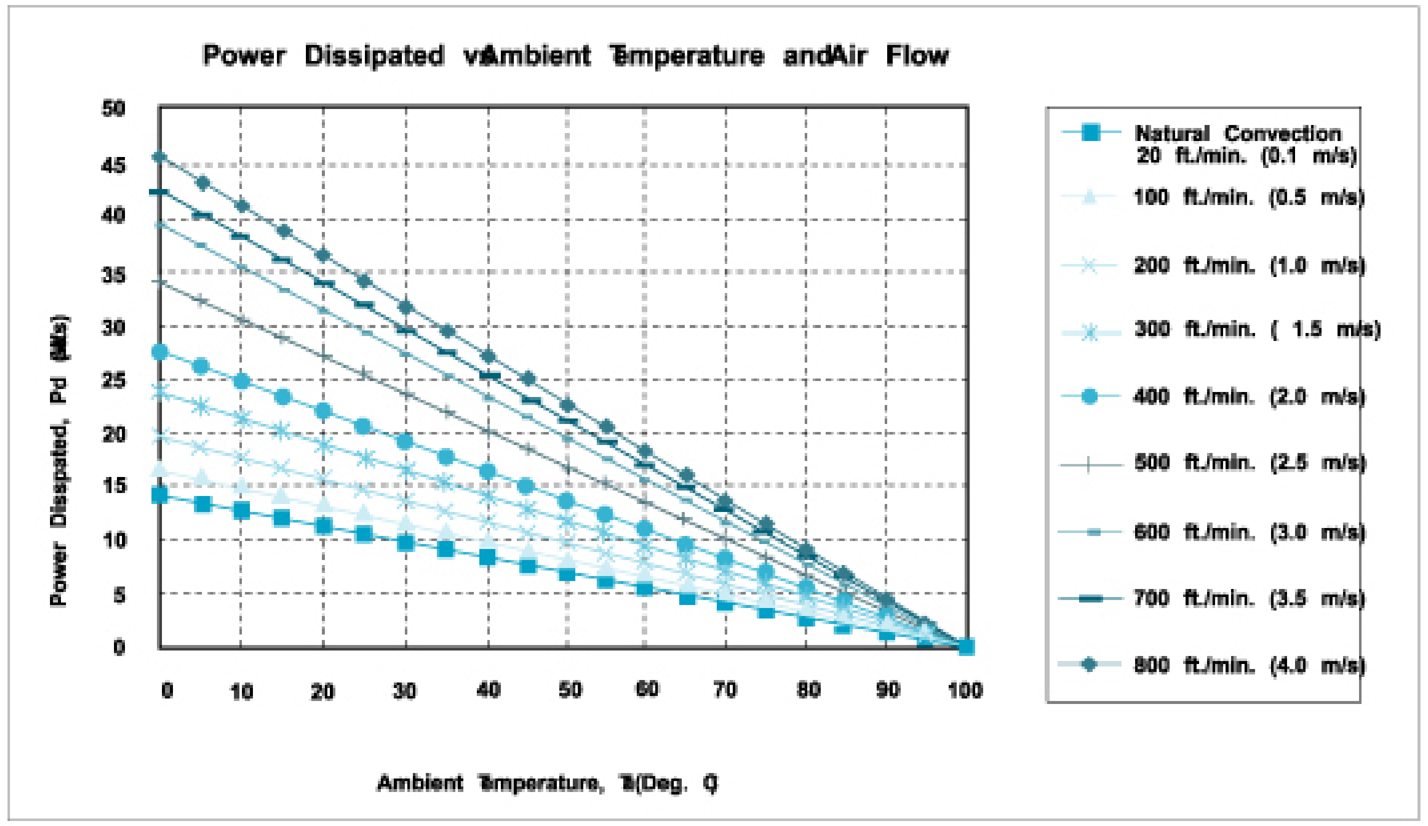


All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

Application Note

Derating:

The operating case temperature range of CHB100/150 series is -40˚C to +100˚C. When operating the CHB50/75/100/150 series, proper derating or cooling is needed.
Following is the derating curve of CHB50/75/100/150 without heat sink.



Forced Convection Power Derating without Heat Sink

Where:

The power dissipation (Pd):

$$Pd = Pi - Po = Po\,(1-\eta)\,/\,\eta$$

The thermal resistance are list below:

Chart of Thermal Resistance vs Air Flow:

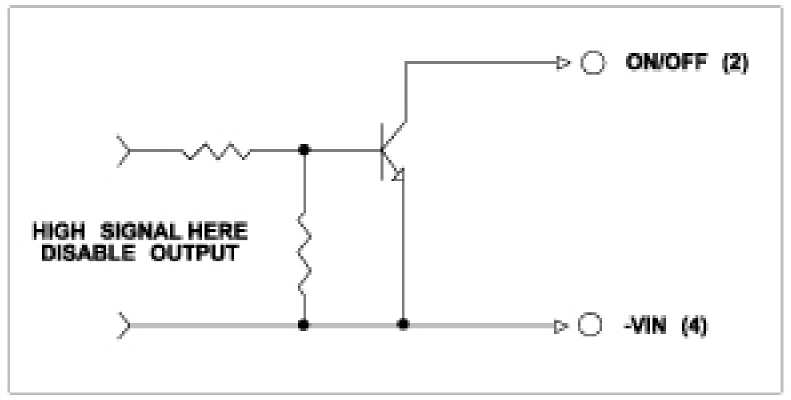
AIR FLOW RATE	TYPICAL Rca
Natural Convection 20ft./min. (0.1m/s)	7.12 ˚C/W
100 ft./min. (0.5m/s)	6.21 ˚C/W
200 ft./min. (1.0m/s)	5.17 ˚C/W
300 ft./min. (1.5m/s)	4.29 ˚C/W
400 ft./min. (2.0m/s)	3.64 ˚C/W
500 ft./min. (2.5m/s)	2.96 ˚C/W
600 ft./min. (3.0m/s)	2.53 ˚C/W
700 ft./min. (3.5m/s)	2.37 ˚C/W
800 ft./min. (4.0m/s)	2.19 ˚C/W

The temperature rise (△T):

$$\triangle T = \triangle Pd * Rca$$

Remote ON/OFF Control

The CHB100/150 Series allows the user to switch the module on and off electronically with remote on/off feature.
The CHB100/150 Series are available with "positive logic" or "negative logic" (option).

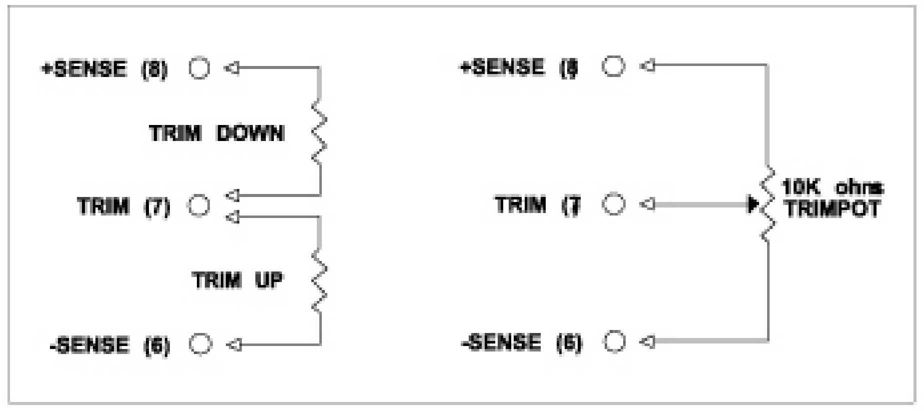


Logic Table

Logic State (Pin 2)	Negative Logic	Positive Logic
Logic Low - Switch Closed	Module on	Module off
Logic High - Switch Open	Module off	Module on

External Output Trimming

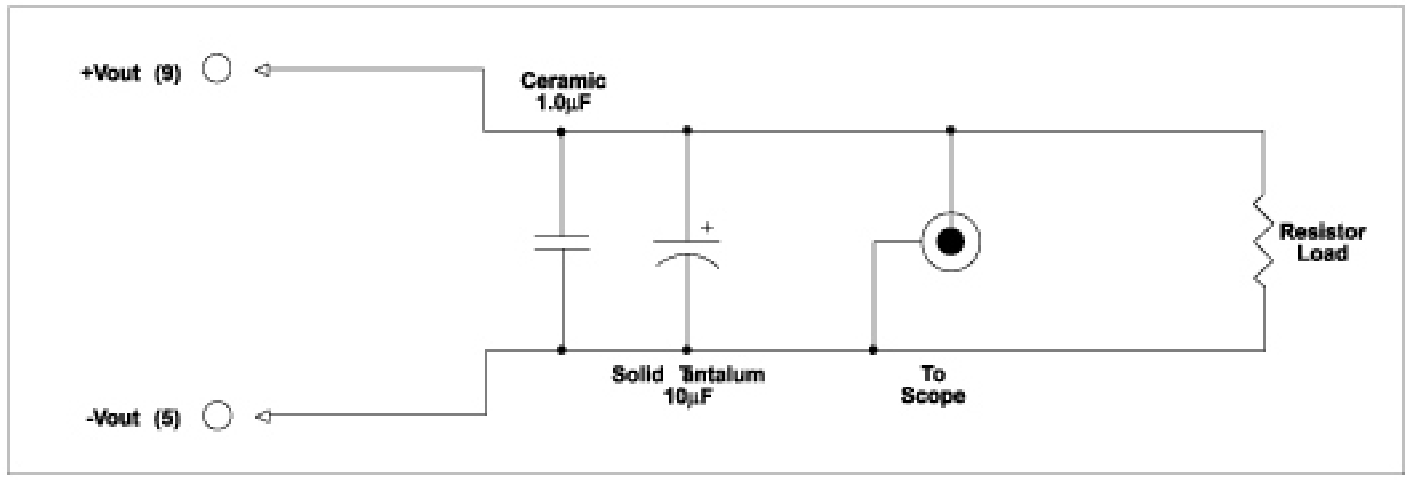
Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



External Output

Output Noise

The output noise is measured with 10μF tantalum capacitor and 1.0μF ceramic capacitor across output.



Output Noise Test Circuit schematic

S E R I E S

CFB200

200 WATT WIDE INPUT
DC-DC CONVERTERS
SINGLE OUTPUT

E176177

Features

- 100-200W Isolated Output
- Efficiency to 85%
- 300KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Industry Standard Full-Brick Package

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT URRENT C	NPUT CURRENT O LOAD	ULL LOAD	%EFF	CASE
CFB200-48S25		2.5 VDC	40A		2.8A	74	
CFB200-48S33		3.3 VDC	40A		3.5A	79	
CFB200-48S05		5 VDC	40A		5A	83	
CFB200-48S12		12 VDC	17A		5A	85	
	36-75 VDC			25 mA			FB
CFB200-48S15		15 VDC	13.3A		5A	85	
CFB200-48S24		24 VDC	8.33A		5A	85	
CFB200-48S28		28 VDC	7.14A		5A	85	
CFB200-48S48		48 VDC	4.2A		5A	85	

NOTE : 1. Nominal Input Voltage 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........................ 48V............36-75V
Undervoltage lockout .... 48Vin power up 34V
48Vin power down 32.5V
Positive Logic Remote ON/OFF[3,4]
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Voltage Accuracy : .... ±1% max.
Transient Response :25% Step Load Change ....<500μ sec.
External Trim Adj. Range ....±10%
Ripple & Noise, 20MHz BW
2.5V & 3.3V & 5V ....40mV RMS., max.
100mV pk-pk, max.
12V & 15V ....60mV RMS., max.
150mV pk-pk, max.
24V & 28V & 48V ......100mV/150mV/200mV RMS., max.
240mV/280mV/480mV pk-pk, max.
Temperature Coefficient.....................................±0.03%/°C
Short Circuit Protection...Continuous
Line Regulation[1] ....±0.2% max.
Load Regulation[2] ....±0.2% max.
Over Voltage Protection trip Range, % Vo nom. 115-140%
Current Limit ....110% ~140% Nominal Output

GENERAL SPECIFICATIONS:

Efficiency..See Table
Isolation Voltage ....Input/Output............1500VDC min.
Input/Case...............1500VDC min.
Output/Case...........1500VDC min.
Isolation Resistance ....10' ohm min.
Switching Frequency ....300KHz, Typ.
Operating case Temperature ....-40°C to 100°C
Storage Temperature ....-40°C to +105°C
Thermal Shutdown, Case Temp. ....100°C Typ.
Dimensions ....4.60x2.40x0.53 inches
(116.8x61.0x13.5 mm)
Case Material ....Aluminum Baseplate with Plastic Case

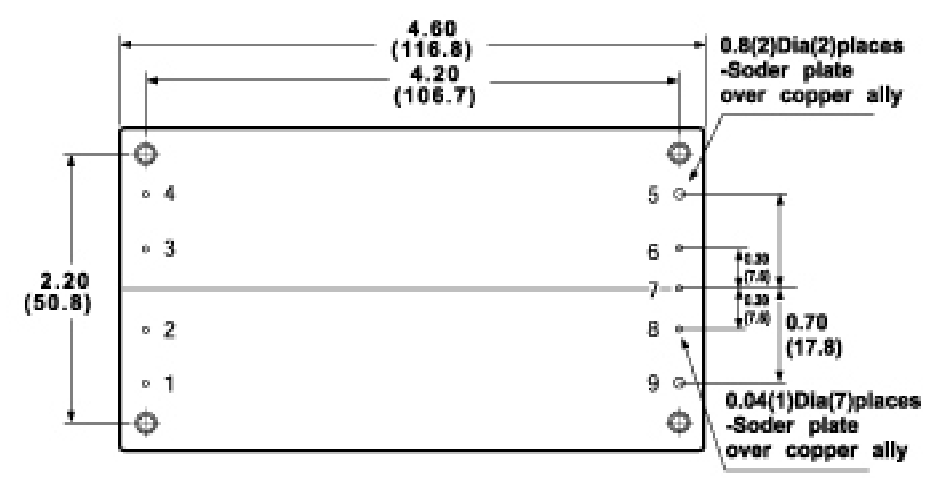
NOTE:

1. Measured From High Line to Low Line.
2. Measured From Full Load to Zero Load.
3. Logic Compatibility .... Open Collector Ref. to -Input
Module ON .... Open Circuit
Module OFF .... < 0.8Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.

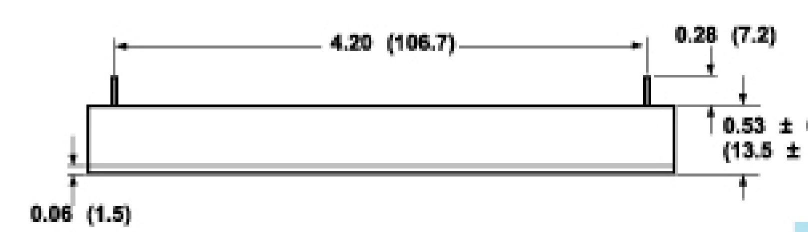
CASE FB

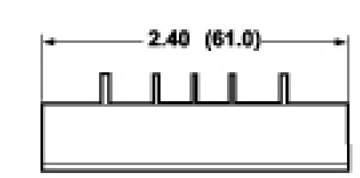
All Dimensions In Inches(mm)

Tolerances				Pin
	Inches	.XX±.02	.XXX±.010	±0.02
	Millimeters	.X±.5	.XX±.25	±0.5

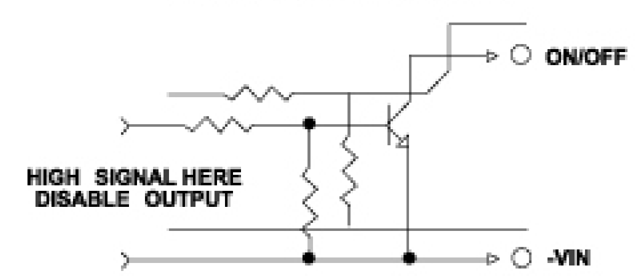


PIN CONNECTION	
Pin	Function
1.	+Vin
2.	ON/OFF
3.	NC
4.	-Vin
5.	-Vout
6.	-Sense
7.	Trim
8.	+Sense
9.	+Vout

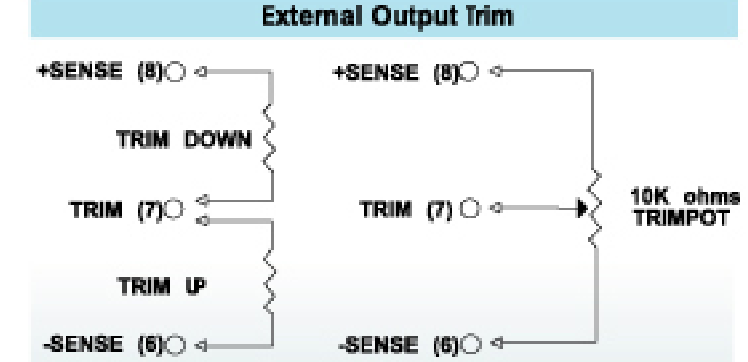




Remote ON/OFF Control



External Output Trim



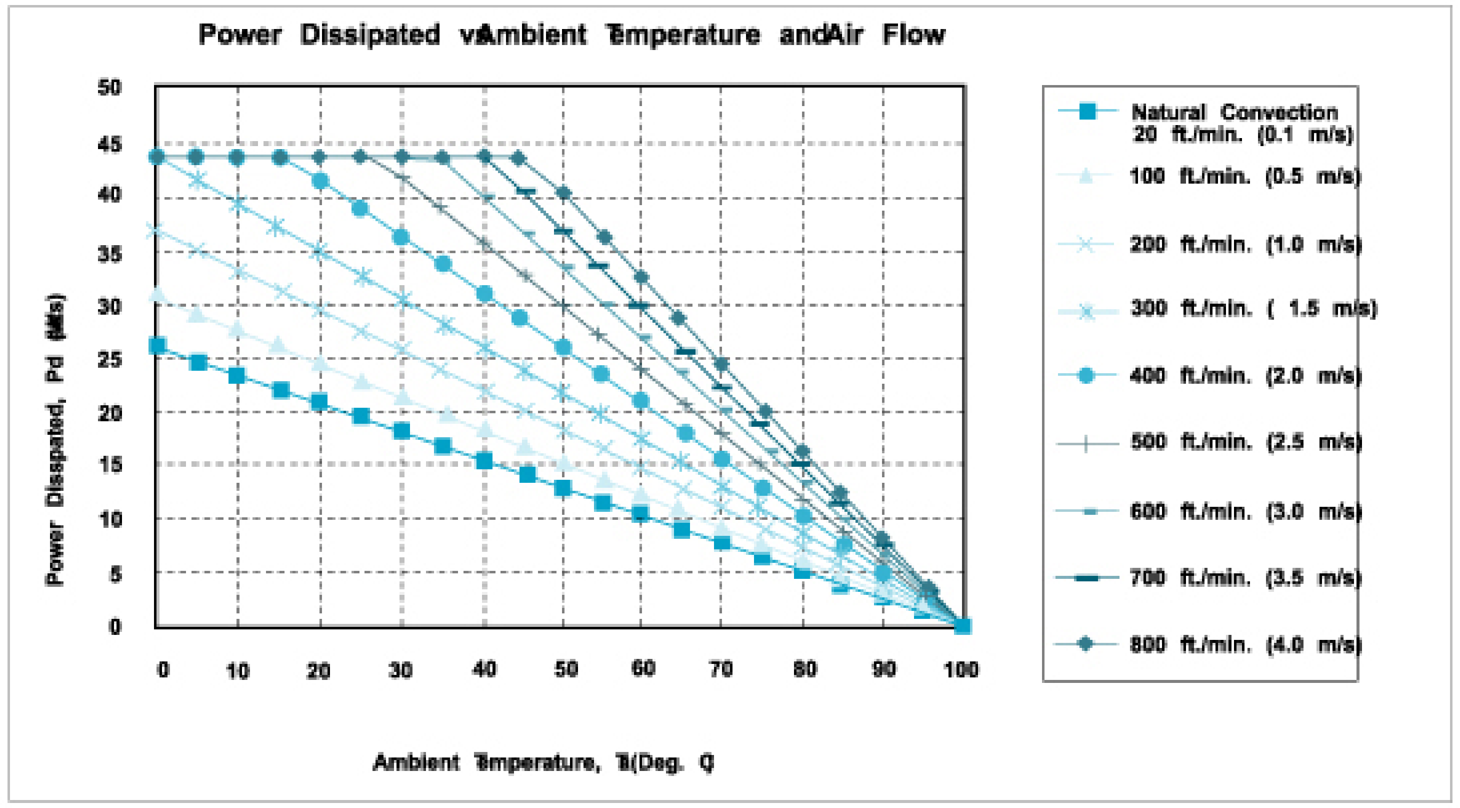
CFB200

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

Application Note

Derating:

The operating case temperature range of the CFB200 series is -40°C to +100°C. When operating the CFB200 series, proper derating or cooling is needed .
Following is the derating curve of CFB200 without heat sink; Airflow Along Width (Transverse)



Forced Convection Power Derating without Heat Sink; Airflow Along Width (Transverse)

Where:

The power dissipation (Pd):

$Pd = Pi - Po = Po\,(1-\eta)\,/\eta$

The thermal resistance are list below:

Chart of Thermal Resistance vs Air Flow:

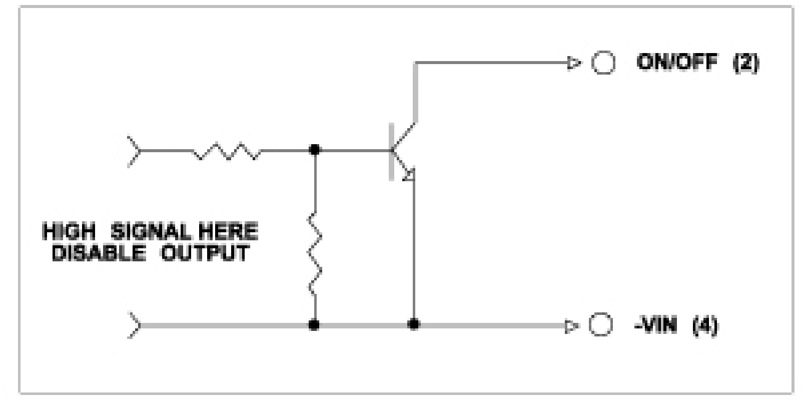
AIR FLOW RATE	TYPICAL Rca
Natural Convection 20ft./min. (0.1m/s)	3.82 °C/W
100 ft./min. (0.5m/s)	3.23 °C/W
200 ft./min. (1.0m/s)	2.71 °C/W
300 ft./min. (1.5m/s)	2.28 °C/W
400 ft./min. (2.0m/s)	1.92 °C/W
500 ft./min. (2.5m/s)	1.68 °C/W
600 ft./min. (3.0m/s)	1.50 °C/W
700 ft./min. (3.5m/s)	1.35 °C/W
800 ft./min. (4.0m/s)	1.23 °C/W

The temperature rise ($\triangle T$):

$\triangle T = Pd * Rca$

Remote ON/OFF Control

The CFB200 Series allows the user to switch the module on and off electronically with remote on/off feature.
The CFB200 Series are available in "positive logic" or "negative logic" (option).

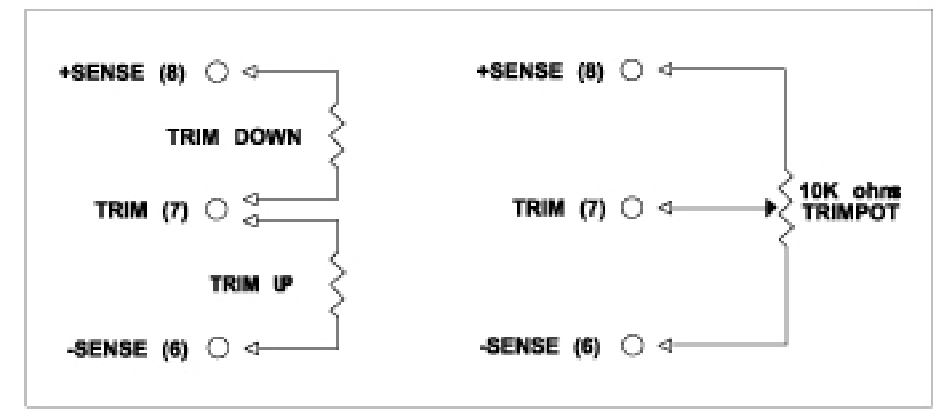


Logic Table

Logic State (Pin 2)	Negative Logic	Positive Logic
Logic Low - Switch Closed	Module on	Module off
Logic High - Switch Open	Module off	Module on

External Output Trimming

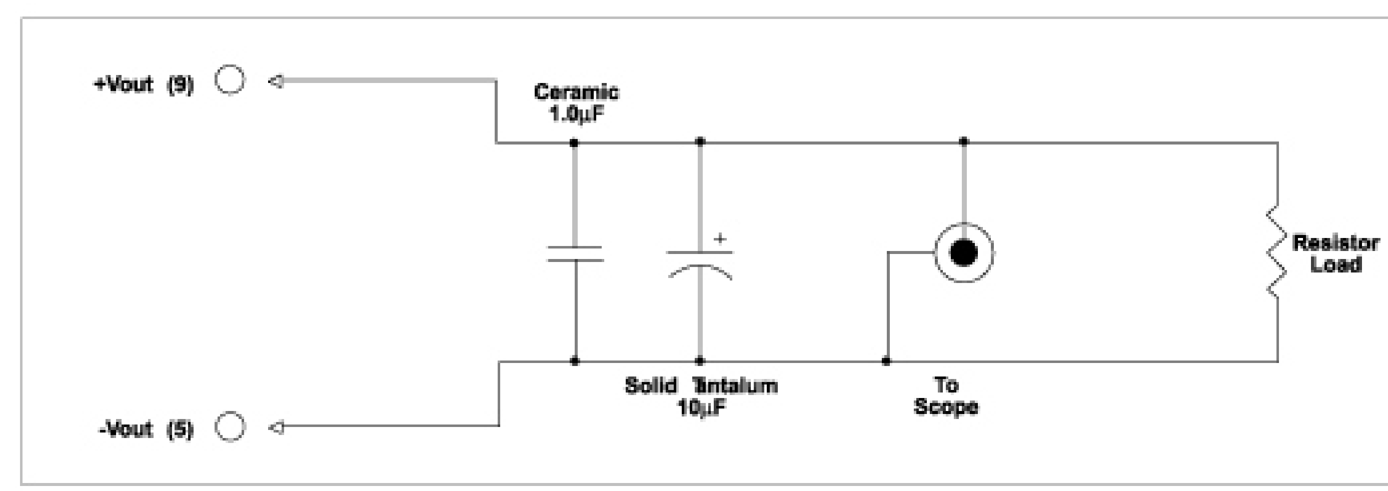
Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



External Output

Output Noise

The output noise is measured with 10μF tantalum capacitor and 1.0μF ceramic capacitor across output.

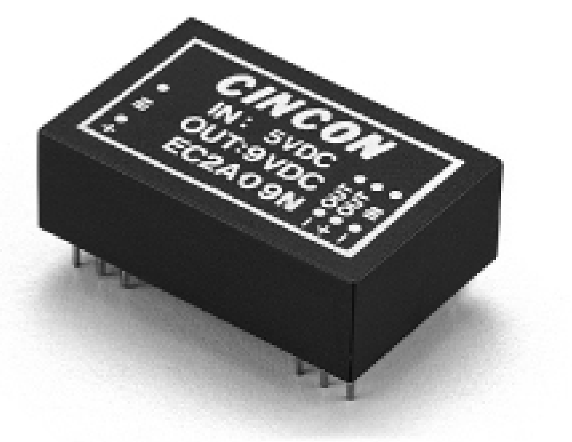


Output Noise Test Circuit schematic

S E R I E S

LAN-1

1 TO 2 WATT LAN DC-DC CONVERTERS



Features

- 24-Pin DIP Package
- Cheapernet Application
- Pi Input Filter
- 5 or 12 VDC Input
- Full Power to +71 C

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT O LOAD	N ULL LOAD	PIN CONN.	CASE
			REGULATED				
EC2A09	5 VDC	9 VDC	140 mA	120 mA	540 mA	B	A
EC2A19	12 VDC	9 VDC	140 mA	45 mA	215 mA	B	A
			UNREGULATED				
EC2A09N	5 VDC	9 VDC	250 mA	100 mA	600 mA	A	A
EC2A19N	12 VDC	9 VDC	250 mA	40 mA	260 mA	A	A

Pin	A	B
1	+V Input	+V Input
2	NC*	+V Input
3	NC*	+V Input
9	No Pin	Resistor
10	-V Output	+V Output
11	+V Output	+V Output
12	-V Input	+V Output
13	-V Input	-V Output
14	+V Output	-V Output
15	-V Output	-V Output
22	NC*	-V Input
23	NC*	-V Input
24	+V Input	-V Input

- External Resistor R1.
- C1=10.0μF 25V Tantalum Capacitor
- R1=100Ω
- NC=No Connection (With Pin)

C1 will improve output noise performance. It is not required for converter operation.

Regulated units only (EC2A09, EC2A19). Pin 9 provides a preregulated output voltage, which when used as shown above provides for a full load output current of 140 mA, when load current is less than 60 mA output voltage will rise and for a no load condition it can rise to approximately 13 volts.

Specifications

INPUT SPECIFICATIONS:

Input Voltage .... 5 or 12VDC
Input Voltage Range .... ±10%
Input Filter .... Pi Type

OUTPUT SPECIFICATIONS:

Output Voltage .... 9 VDC
.... +10 VDC
.... +5 VDC
Voltage Accuracy, 9 VDC .... +5.0% max.
+10 VDC .... ±4.0%
+5 VDC .... ±2.0%
Ripple & Noise, 20MHz BW, 9VDC .... 100mV p-p
+10 VDC .... 300mV p-p
+5 VDC .... 300mV p-p
Short Circuit Protection .... Momentary
Line Regulation
Regulated Models .... ±0.3%
Unregulated Models[1] .... ±1.2%
Load Regulation
Regulated Models[2] .... ±0.5%
Unregulated Models[3] .... ±6.0%

GENERAL SPECIFICATIONS:

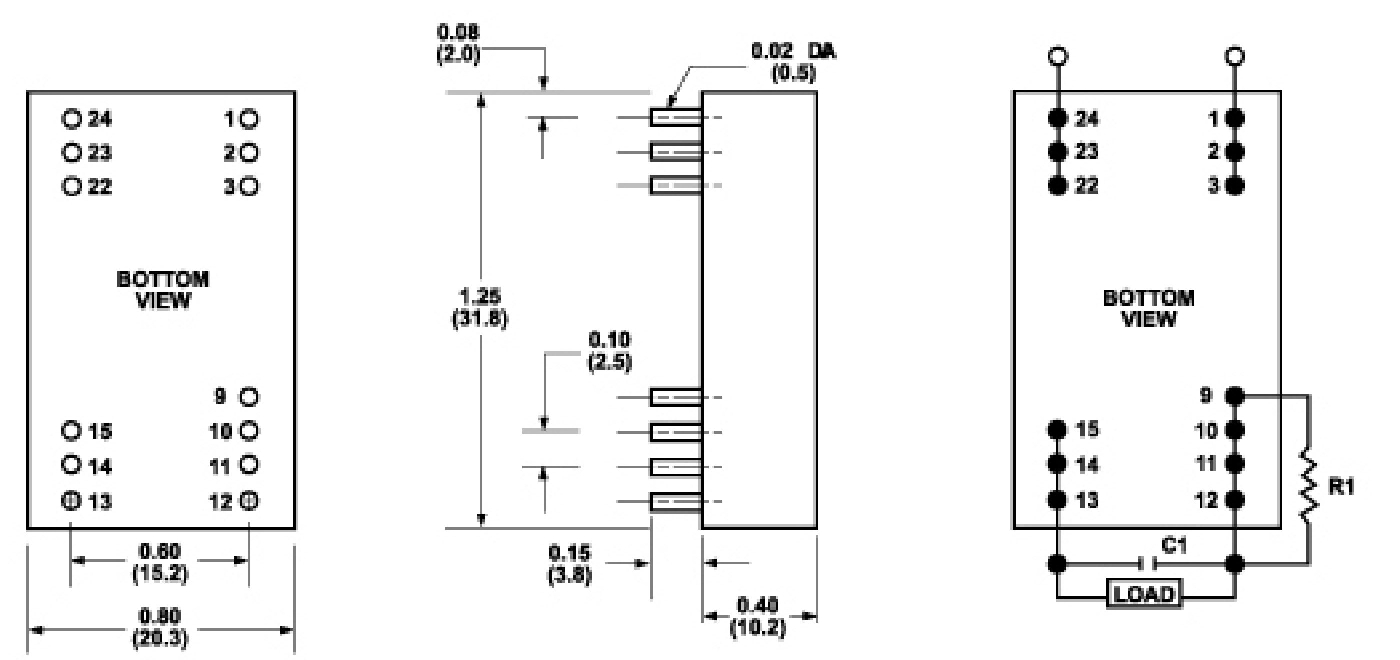
Efficiency
Regulated Models 50%
Unregulated Models 70%
Switching Frequency .... 20KHz, min.
Isolation Voltage .... 500 VDC min.
Operating Temperature Range .... -25 C to + 71 C
Case Temperature .... 95˚C max.
Cooling .... Free-Air Convection
Storage Temperature Range .... -40 C to + 85 C
Dimensions .... 1.25 x 0.8 x 0.4 inches
(31.8 x 20.3 x 10.2mm)
Case Material .... Non-Conductive Black Plastic

NOTE:
1. Per 1% Change in Input Voltage
2. For a Load Change from 60mA to 140mA.
3. For a Load Change from 100% Full Load to 20% Full Load.

CASE A

NOTE: PIN SIZE IS .020 INCH (0.5mm) DIA.
All Dimensions in Inches (mm)

PIN CONFIGURATION SUFFIX "B"

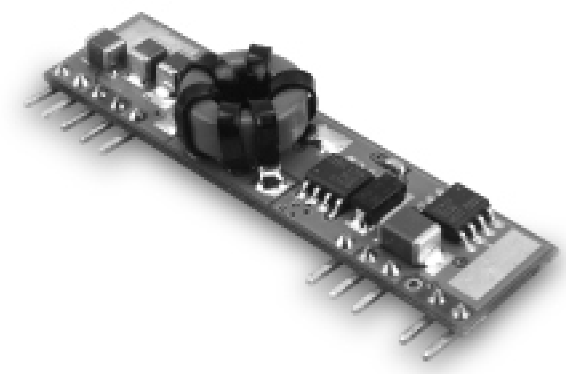


LAN-1

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

SIP10-05



10 AMP SIP PACKAGES DC-DC CONVERTERS

E176177

Features

- Industry Standard SIP Pinout
- High Efficiency to 95%
- 300KHz Switching Frequency
- 3.0 – 5.5VDC Input Range
- Over Temperature Protection
- Continuous Short Circuit Protection
- Remote ON/OFF
- Cost Efficient Open Frame Design

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	%EFF	SIZES
SIP10-05S10	3.0 –5.5 VDC	1.0 VDC	10 A	50 mA	2353mA	85	SIP
SIP10-05S12	3.0 –5.5 VDC	1.2 VDC	10 A	50 mA	2791mA	86	SIP
SIP10-05S15	3.0 –5.5 VDC	1.5 VDC	10 A	50 mA	3409mA	88	SIP
SIP10-05S18	3.0 –5.5 VDC	1.8 VDC	10 A	50 mA	4000mA	90	SIP
SIP10-05S20	3.0 –5.5 VDC	2.0 VDC	10 A	60 mA	4396mA	91	SIP
SIP10-05S25	3.0 –5.5 VDC	2.5 VDC	10 A	60 mA	5376mA	93	SIP
SIP10-05S33	4.5 –5.5 VDC	3.3 VDC	10 A	60 mA	6947mA	95	SIP

NOTE : 1. Nominal Input Voltage 5 VDC

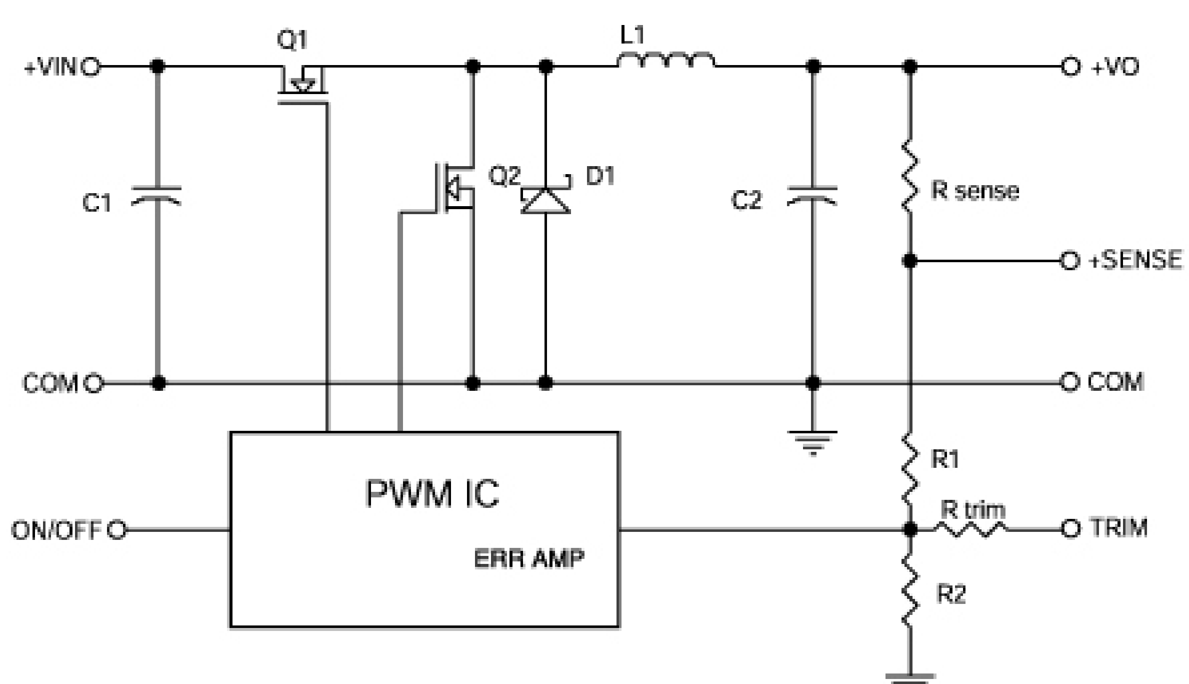


Figure 1. Simplified Schematic

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range..........5V..........3.0 – 5.5V
(SIP10-05S33 Only)..........5V..........4.5 – 5.5V
Under Voltage Lock-out..........Power up..........2.8V Typ.
Power down..........2.7V Typ.

Input Filter Type..........Capacitive
Positive Remote on/off Control :
Module ON..........Open Circuit or = Vin
Module OFF..........< 0.4 VDC

OUTPUT SPECIFICATIONS:

Voltage Accuracy..........±1.5% max.
Transient Response :25% Step Load Change..........<200μ sec.
Ripple and Noise, 20MHz BW Note3..........20mV rms max.
50mV pk-pk max.
Temperature Coefficient..........±0.03%/C max.
Short Circuit Protection..........Continuous
Line Regulation, Note1..........± 0.2% max.
Load Regulation, Note2..........± 0.5% max.

External Trim Adj. Range..........±10%

GENERAL SPECIFICATIONS:

Efficiency..........See Table
Isolation Voltage..........Non-isolation

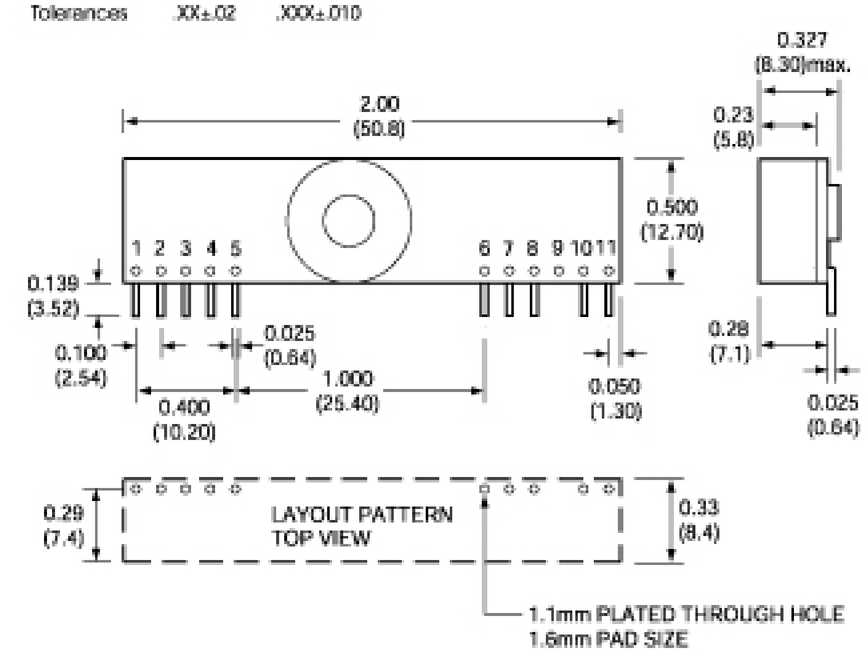
Switching Frequency..........300KHz Typ.
Over Temperature Protection..........120°C Typ.
Operating Ambient Temperature Range..........-40°C to +85°C
Derating Temperature..........see Figure 2,3
Storage Temperature Range..........-55°C to +125°C
Dimensions..........2 x 0.5 x 0.33 inches
(50.8 x 12.7x 8.3 mm)
Structure..........Non-potted With Open Frame Type

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to Zero Load
3. The output noise is measured with 10μf tantalum capacitor and 1μf ceramic capacitor across output.
4. The Input terminal recommand to parallel with 100μF Capacitor ESR<20mΩ To reduce the input ripple voltage
5. Suffix "N" to the Model Number with Negative Logic Remote on/off
Module ON..........Open Circuit or < 0.4VDC
Module OFF..........> +2.8VDC to Vin

Mechanical Specification

All Dimensions In Inches(mm)
Tolerances .XX±.02 .XXX±.010



PIN CONNECTION	
Pin	Function
1.	+Output
2.	+Output
3.	+Sense
4.	+Output
5.	Common
6.	Common
7.	+V Input
8.	+V Input
9.	No Pin
10.	Trim
11.	On/Off Control

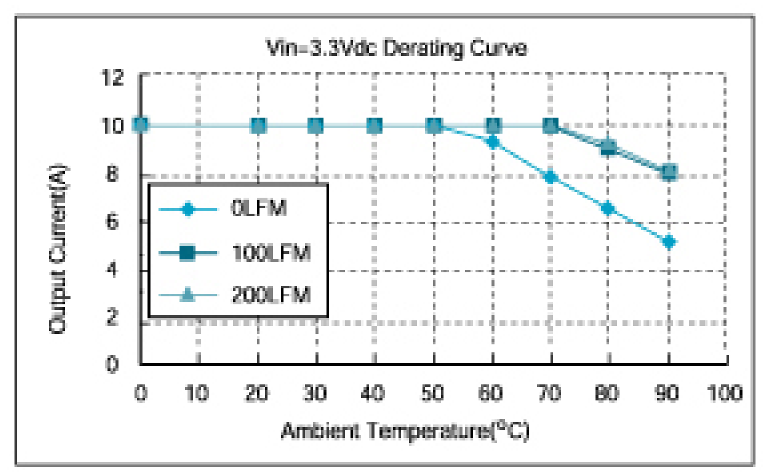


Figure 2. Typical Power Derating vs. Output Current for 3.3V IN

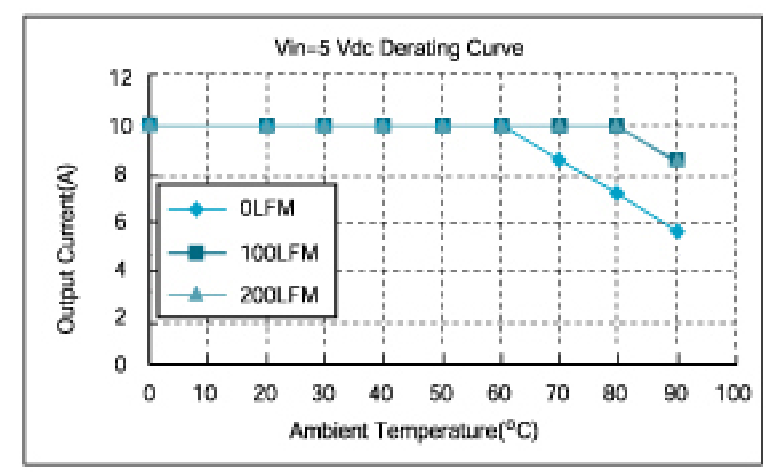


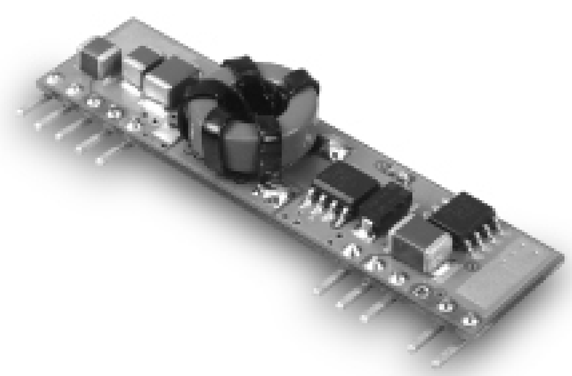
Figure 3. Typical Power Derating vs. Output Current for 5.0V IN

SIP10

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

SIP15-05



15 AMP SIP PACKAGES DC-DC CONVERTERS

E176177

Features

- Industry Standard Pinout
- High Efficiency to 94%
- 300KHz Switching Frequency
- 3.0 – 5.5VDC Input Range
- 0.9 – 3.63VDC Wide Output Range
- Over Temperature Protection
- Continuous Short Circuit Protection
- Remote ON/OFF

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	Efficiency 3.3V@15A	Connector Type	Packaging
SIP15-05S33	3.0 –5.5 VDC	0.9-3.63 VDC	15 A	94%	SIP	Tray

NOTE : 1. Nominal Input Voltage 5 VDC

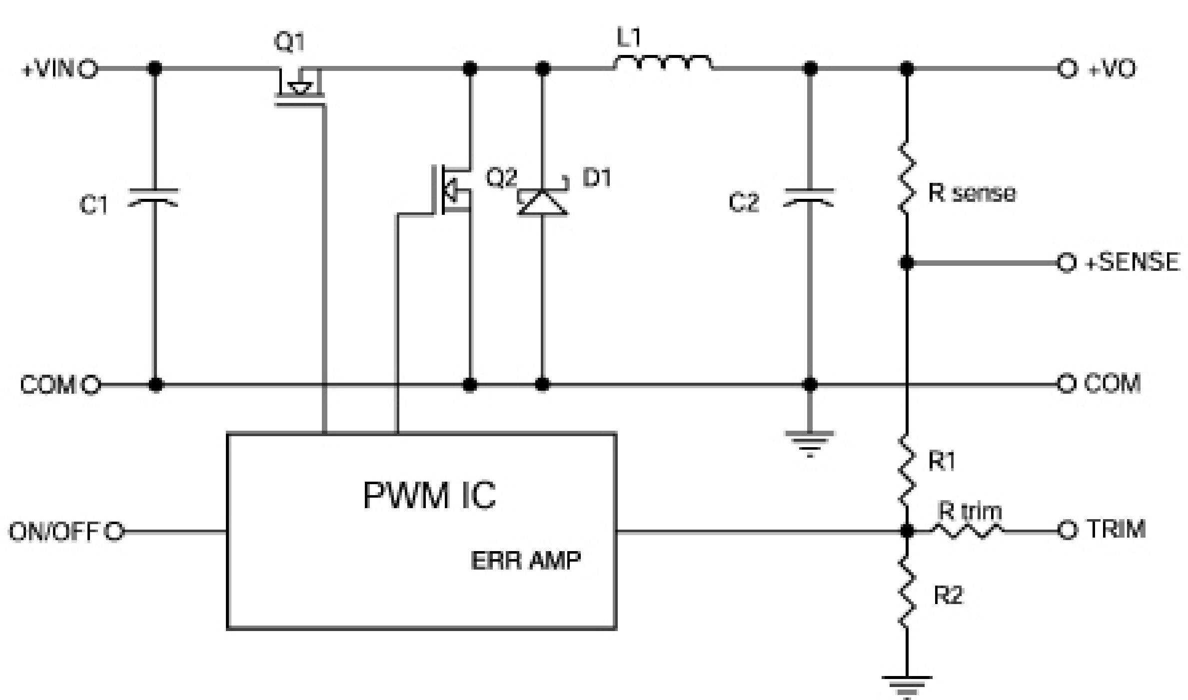


Figure 1. Simplified Schematic

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range........................5V..............3.0 – 5.5V
(Vo = 3.3 Vdc)....................5V ....4.5 – 5.5V
Under Voltage Lock-out ....Power up ....2.8V Typ.
Power down...........2.7V Typ.
Input Filter Type...Capacitive
Positive Remote on/off Control :
Module ON...Open Circuit or – Vin
Module OFF...< 0.4 VDC

OUTPUT SPECIFICATIONS:

Voltage Accuracy...±1.5% max.
Transient Response :25% Step Load Change.......................<200μ sec.
Ripple and Noise, 20MHz BW Note3..........................20mV rms max.
50mV pk-pk max.
Temperature Coefficient...±0.03%/C max.
Short Circuit Protection...Continuous
Line Regulation, Note1..±0.2% max.
Load Regulation, Note2..±0.5% max.

External Trim Adj. Range(see Table1)......................Vo=0.9 – 3.63Vdc

GENERAL SPECIFICATIONS:

Efficiency...See Table
Isolation Voltage...Non-isolation
Switching Frequency ....300KHz Typ.
Over Temperature Protection ....120°C Typ.
Operating Ambient Temperature Range.....................-40°C to +85°C
Derating Temperature ....see Figure2
Storage Temperature Range ....-55°C to +125°C
Dimensions..2 x 0.5 x 0.335 inches
(50.8 x 12.7x 8.5 mm)
Structure.................................Non-potted With Open Frame Type

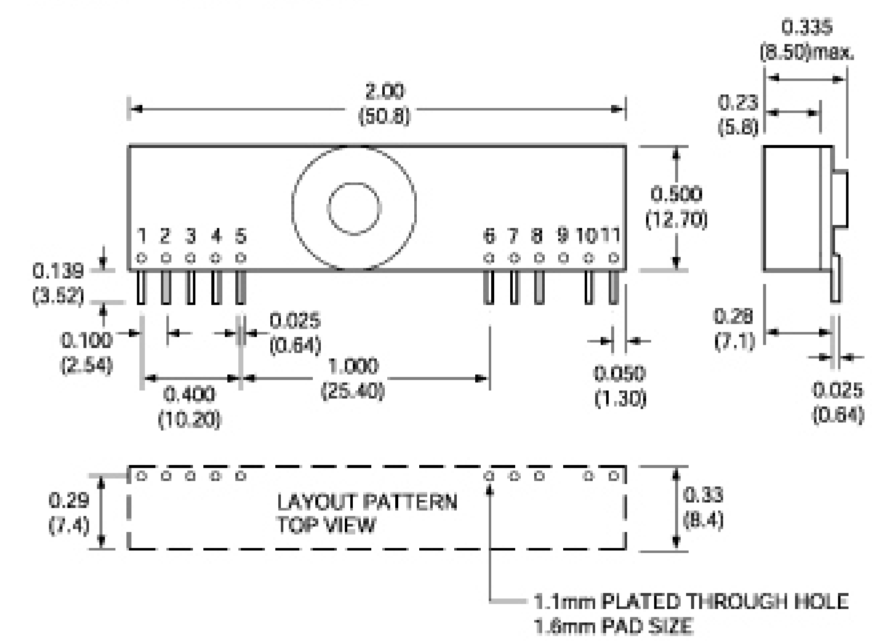
NOTE:

1. Measured From High Line to Low Line , Vo,set=1.8Vdc
2. Measured From Full Load to Zero Load , Vo,set=3.3Vdc
3. The output noise is measured with 10μf tantalum capacitor and 1μf ceramic capacitor across output.
4.The Input terminal recommand to parallel with 100μF Capacitor ESR<20mΩ To reduce the input ripple voltage
5.Suffix "N" to the Model Number with Negative Logic Remote on/off
Module ON.....................................Open Circuit or < 0.4VDC
Module OFF..> +2.8VDC to Vin

Mechanical Specification

All Dimensions In Inches(mm)

Tolerances .XX±.02 .XXX±.010



PIN CONNECTION

Pin	Function
1.	+Output
2.	+Output
3.	+Sense
4.	+Output
5.	Common
6.	Common
7.	+V Input
8.	+V Input
9.	No Pin
10.	Trim
11.	On/Off Control

Vo,set (V)	trim (KΩ)
0.90	135.36
1.00	79.17
1.20	41.71
1.50	22.98
1.80	14.96
2.00	11.75
2.50	6.93
3.30	3.15
3.63	2.20

Table 1. External Resistor Values for programming output voltage

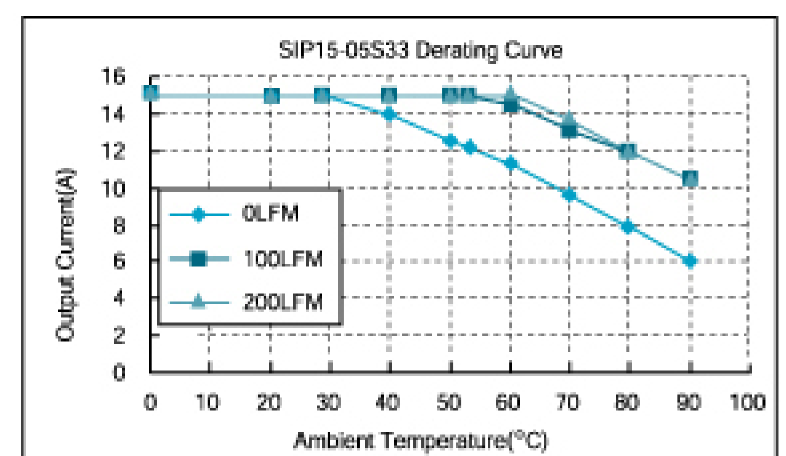


Figure 2. Typical Power Derating vs. Output Current for 5.0V IN

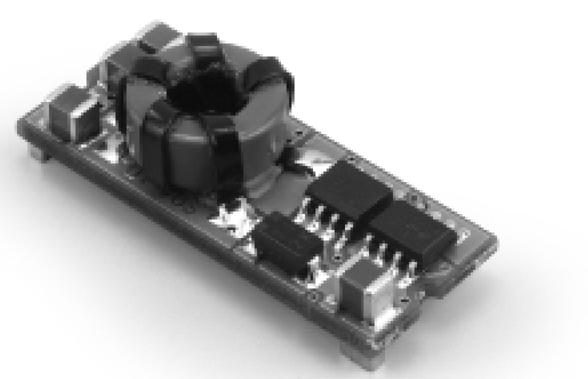
SIP15

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

SMT10-05

10A SURFACE MOUNT PACKAGES DC-DC CONVERTERS



E176177

Features

- 10Amp Surface Mount Package
- High Efficiency to 95%
- 300KHz Switching Frequency
- 3.0 – 5.5VDC Input Range
- Over Temperature Protection
- Continuous Short Circuit Protection
- Remote ON/OFF
- Cost Efficient Open Frame Design

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	%EFF	SIZE
SMT10-05S10	3.0 -5.5 VDC	1.0 VDC	10 A	50 mA	2353mA	85	SMT
SMT10-05S12	3.0 -5.5 VDC	1.2 VDC	10 A	50 mA	2791mA	86	SMT
SMT10-05S15	3.0 -5.5 VDC	1.5 VDC	10 A	50 mA	3409mA	88	SMT
SMT10-05S18	3.0 -5.5 VDC	1.8 VDC	10 A	50 mA	4000mA	90	SMT
SMT10-05S20	3.0 -5.5 VDC	2.0 VDC	10 A	60 mA	4396mA	91	SMT
SMT10-05S25	3.0 -5.5 VDC	2.5 VDC	10 A	60 mA	5376mA	93	SMT
SMT10-05S33	4.5 -5.5 VDC	3.3 VDC	10 A	60 mA	6947mA	95	SMT

NOTE : 1. Nominal Input Voltage 5 VDC

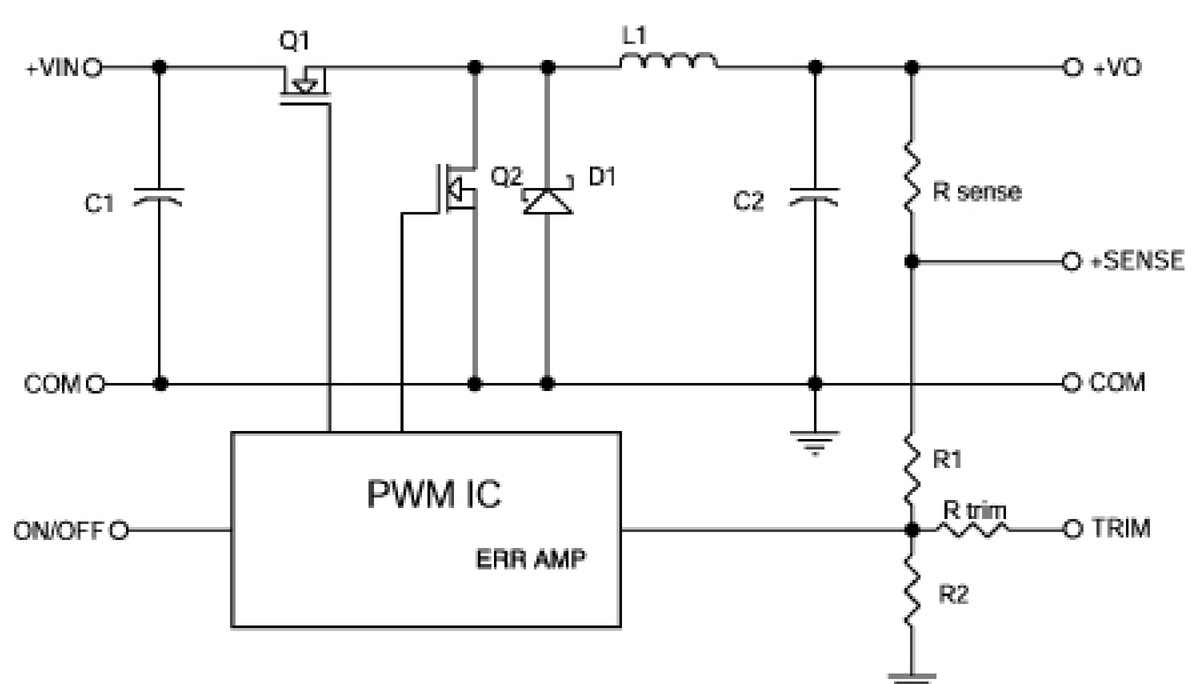


Figure 1. Simplified Schematic

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.....5V.....3.0 – 5.5V
(SMT10-05S33 Only).....5V.....4.5 – 5.5V
Under Voltage Lock-out.....Power up.....2.8V Typ.
Power down.....2.7V Typ.

Input Filter Type.....Capacitive
Positive Remote on/off Control :
Module ON.....Open Circuit or < =Vin
Module OFF.....< 0.4 Vdc

OUTPUT SPECIFICATIONS:

Voltage Accuracy.....±1.5% max.
Transient Response :25% Step Load Change.....<200μ sec.
Ripple and Noise, 20MHz BW Note3.....20mV rms max.
50mV pk-pk max.
Temperature Coefficient.....±0.03%/C max.
Short Circuit Protection.....Continuous
Line Regulation, Note1.....± 0.2% max.
Load Regulation, Note2.....± 0.5% max.

External Trim Adj. Range.....±10%

GENERAL SPECIFICATIONS:

Efficiency.....See Table
Isolation Voltage.....Non-isolation

Switching Frequency.....300KHz Typ.
Over Temperature Protection.....120°C Typ.
Operating Ambient Temperature Range.....-40°C to +85°C
Derating Temperature.....see Figure 2,3
Storage Temperature Range.....-55°C to +125°C
Dimensions.....1.30 x 0.53 x 0.366 inches
(33.00 x 13.46x 9.30 mm)
Structure.....Non-potted With Open Frame Type

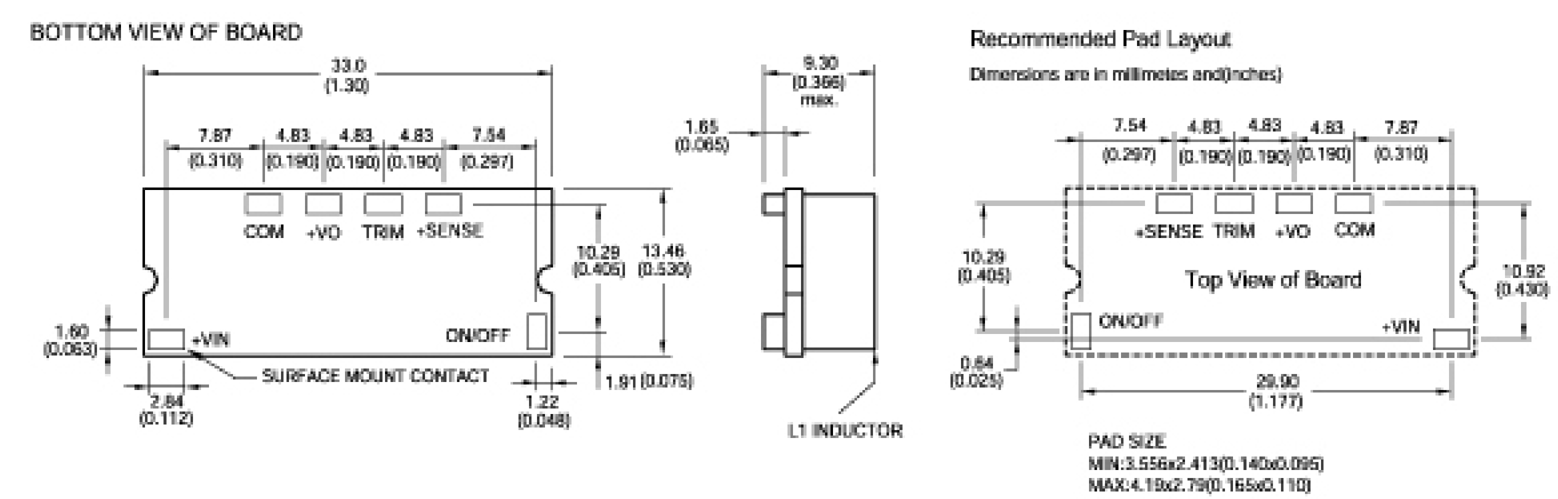
NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to Zero Load
3. The output noise is measured with 10μf tantalum capacitor and 1μf ceramic capacitor across output.
4. The input terminal recommand to parallel with 100μF Capacitor ESR<20mΩ To reduce the input ripple voltage
5. Suffix "N" to the Model Number with Negative Logic Remote on/off
Module ON.....Open Circuit or <0.4VDC
Module OFF.....>+2.8VDC to Vin

Mechanical Specification

All Dimensions In Millimeters (Inches)

Tolerances Inches .XX±.02 .XXX±.010
Millimeters .X±.5 .XX±.25



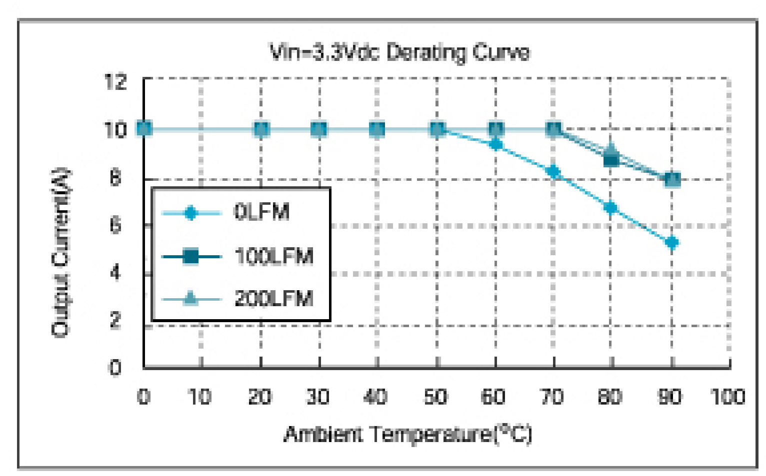


Figure 2. Typical Power Derating vs. Output Current for 3.3V IN

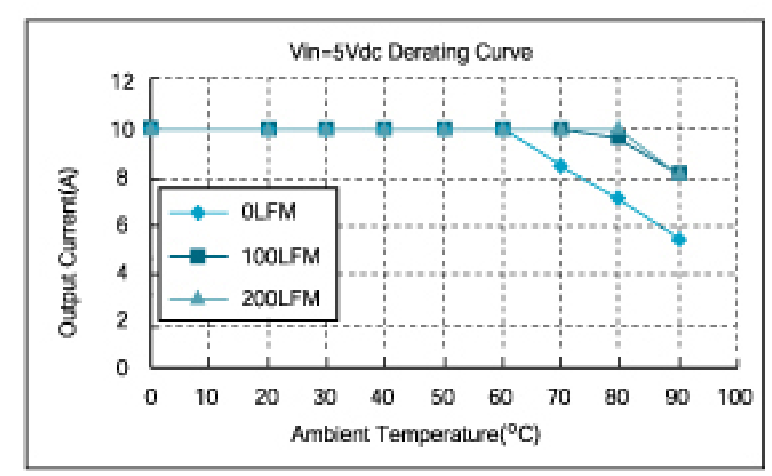


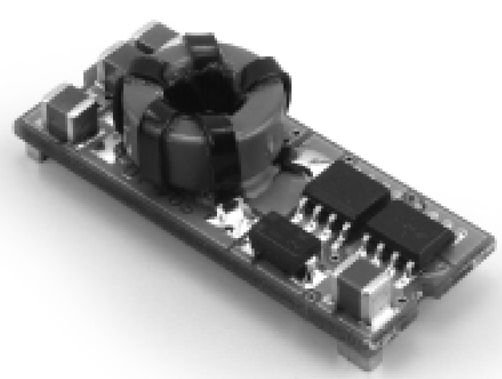
Figure 3. Typical Power Derating vs. Output Current for 5.0V IN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

SMT15-05

15A SURFACE MOUNT PACKAGES DC-DC CONVERTERS



E176177

Features

- 15Amp Surface Mount Packages
- High Efficiency to 94%
- 300KHz Switching Frequency
- 3.0 – 5.5VDC Input Range
- 0.9 – 3.63VDC Wide Output Range
- Over Temperature Protection
- Continuous Short Circuit Protection
- Remote ON/OFF

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	Efficiency 3.3V@15A	Connector Type	Packaging
SMT15-05S33	3.0 -5.5 VDC	0.9-3.63 VDC	15 A	94%	SMT	Tape & Reel

NOTE : 1. Nominal Input Voltage 5 VDC

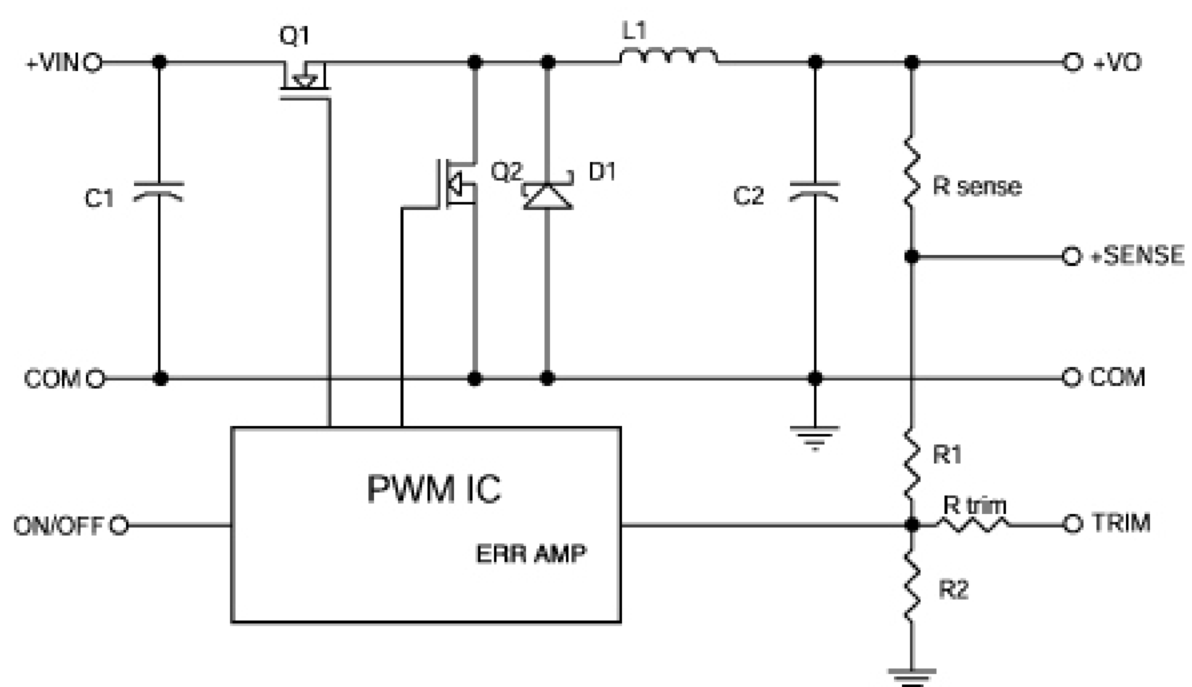


Figure 1. Smplified Schematic

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range..........5V..........3.0 – 5.5V
(Vo = 3.3 Vdc)..........5V..........4.5 – 5.5V
Under Voltage Lock-out..........Power up..........2.8V Typ.
Power down..........2.7V Typ.
Input Filter Type..........Capacitive
Positive Remote on/off Control :
Module ON..........Open Circuit or = Vin
Module OFF..........< 0.4 VDC

OUTPUT SPECIFICATIONS:

Voltage Accuracy..........±1.5% max.
Transient Response :25% Step Load Change..........<200μ sec.
Ripple and Noise, 20MHz BW Note3..........20mV rms max.
50mV pk-pk max.
Temperature Coefficient..........±0.03%/C max.
Short Circuit Protection..........Continuous
Line Regulation, Note1..........±0.4% max.
Load Regulation, Note2..........±0.5% max.

External Trim Adj. Range(see Table1)..........Vo=0.9 – 3.63Vdc

GENERAL SPECIFICATIONS:

Efficiency..........See Table
Isolation Voltage..........Non-isolation
Switching Frequency..........300KHz Typ.
Over Temperature Protection..........120˚C Typ.
Operating Ambient Temperature Range..........-40˚C to +85˚C
Derating Temperature..........see Figure2
Storage Temperature Range..........-55˚C to +125˚C
Dimensions..........1.30 x 0.53 x 0.366 inches
(33.00 x 13.46 x 9.30 mm)
Structure..........Non-potted With Open Frame Type

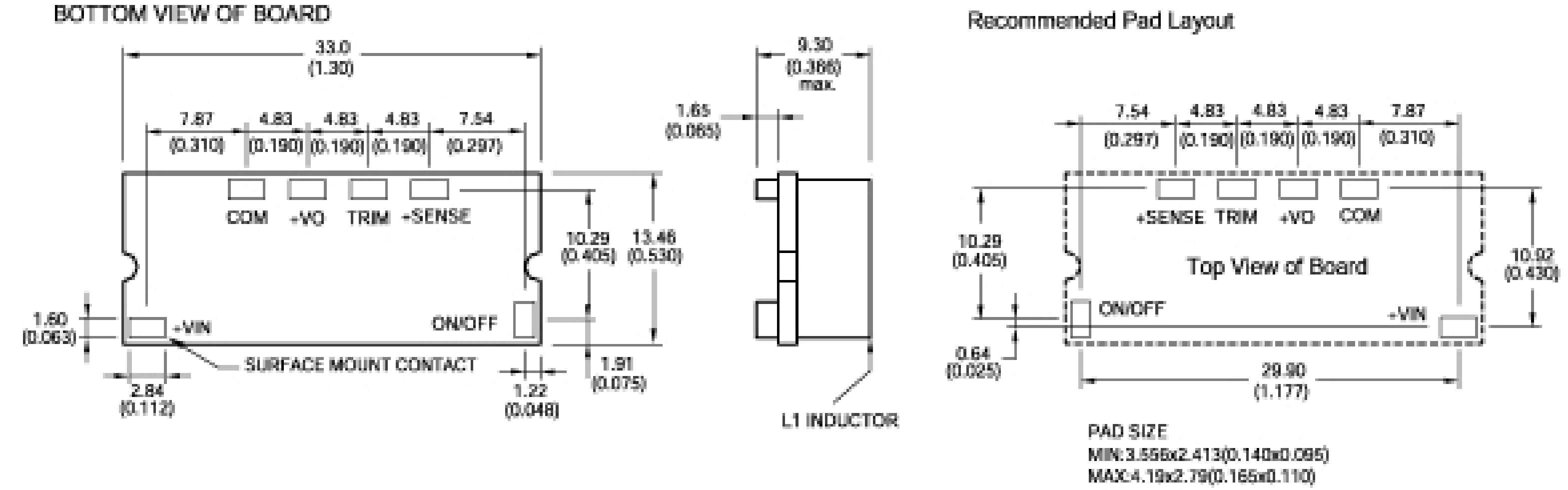
NOTE:

1. Measured From High Line to Low Line , Vo,set=1.8Vdc
2. Measured From Full Load to Zero Load , Vo,set=3.3Vdc
3. The output noise is measured with 10μf tantalum capacitor and 1μf ceramic capacitor across output.
4. The input terminal recommand to parallel with 100μF Capacitor ESR<20mΩ To reduce the input ripple voltage
5. Suffix "N" to the Model Number with Negative Logic Remote on/off
   Module ON..........Open Circuit or < 0.4VDC
   Module OFF..........> +2.8VDC to Vin

Mechanical Specification

All Dimensions In Millimeters (Inches)

Tolerances Inches .XX±.02 .XXX±.010
Millimeters .X±.5 .XX±.25



Vo,set (V)	Rtrim (K)
0.90	135.36
1.00	79.17
1.20	41.71
1.50	22.98
1.80	14.96
2.00	11.75
2.50	6.93
3.30	3.15
3.63	2.20

Table 1. External Resistor Values for programming output voltage

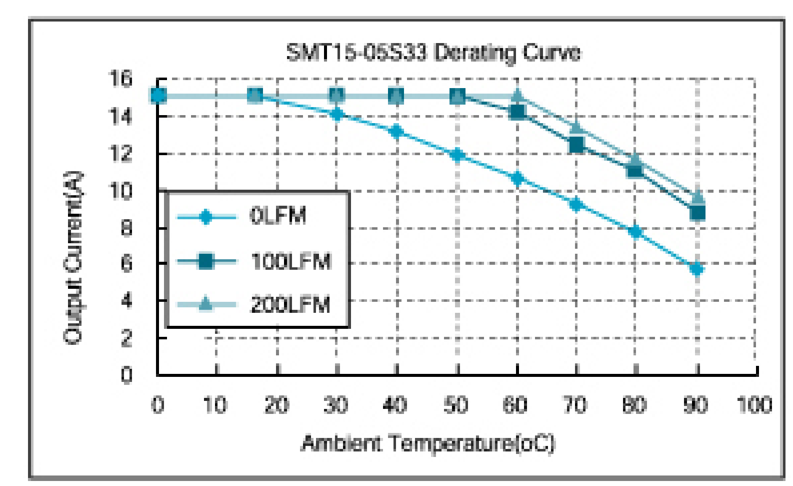


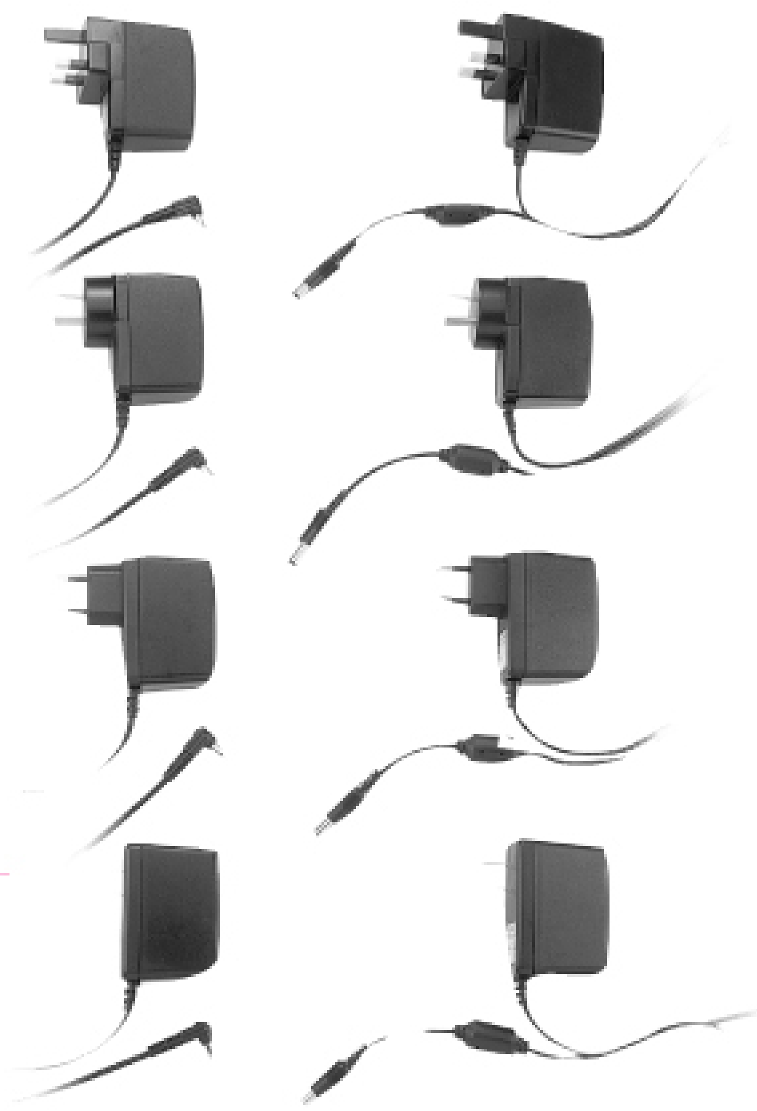
Figure 2. Typical Power Derating vs. Output Current for 5.0V IN

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

S E R I E S

TR500

6W SWITCHING ADAPTER



Features

- Universal Input: 90 ~ 264Vac
- Continuous Short Circuit Protection
- Meets EN55022 Class "B", Conducted
- Low Cost

Specifications

INPUT CHARACTERISTICS:

Voltage .... 90 ~ 264Vac
Frequency .... 47 to 63Hz
Input Current .... 0.5A max.
Inrush Current .... 30A max. @ 264Vac

OUTPUT CHARACTERISTICS:

Holdup Time .... 10mS typ. @ 115Vac
Short Circuit Protection .... Continuous (Auto Recovery)
Over Current Protection .... Constant Current type

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40°C
Storage Temperature .... -20 ~ 85°C

MECHANICAL CHARACTERISTICS:

Dimensions .... 2.83x 2.05 x 1.38 Inches
Weight .... 0.29 Pounds

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE	UTPUT CURRENT	O RIPPLE & NOISE	OLTAGE SETPOINT	LINE EGULATION	LOAD REGULATION
TR 501	12V	500mA	1%	+/- 3%	+/- 1%	+/- 2%
TR 502	10V	600mA	1%	+/- 3%	+/- 1%	+/- 2%
TR 503	9V	650mA	1%	+/- 3%	+/- 1%	+/- 2%
TR 506	8V	650mA	1%	+/- 3%	+/- 1%	+/- 3%
TR 507	7.5V	650mA	1%	+/- 3%	+/- 1%	+/- 3%
TR 508	7.0V	650mA	1%	+/- 3%	+/- 1%	+/- 3%
TR 510	6.5V	650mA	1%	+/- 3%	+/- 1%	+/- 3%
TR 511-1	6.0V	1000mA	1%	+/- 3%	+/- 1%	+/- 4%
TR 513-1	5.0V	1200mA	1%	+/- 3%	+/- 1%	+/- 4%
TR514	4.2V	1000mA	1%	+/- 3%	+/- 1%	+/- 4%

NOTE:

1. Voltage setpoint at 60% full load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation measured from 100Vac to 240Vac, full load.
4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% load)

Mechanical Specification

FIG.A

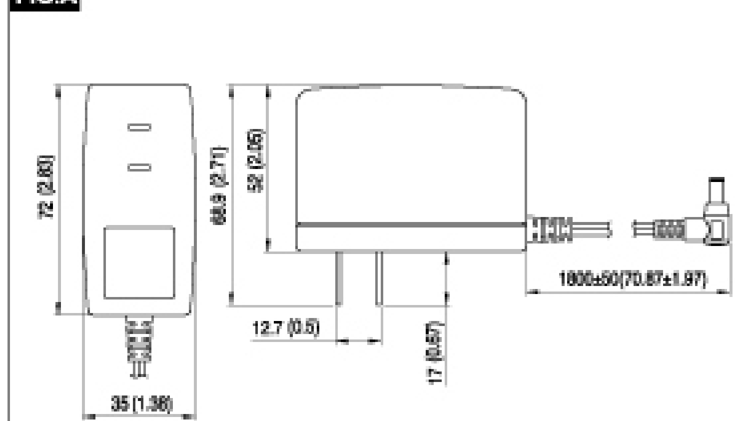


FIG.E

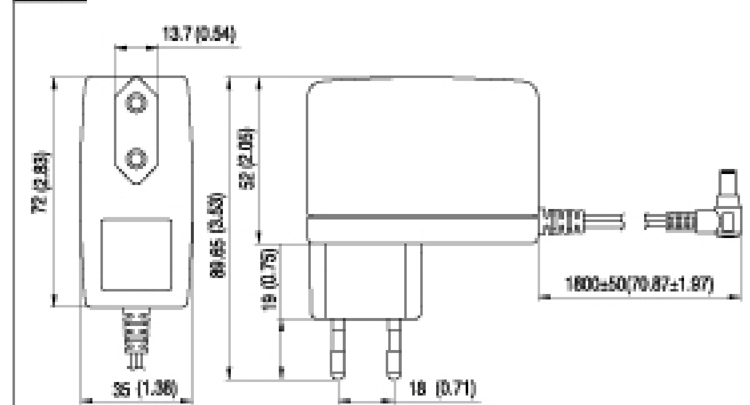


FIG.S

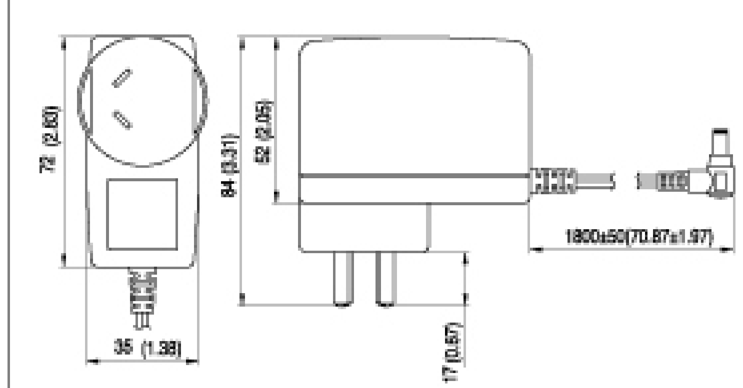
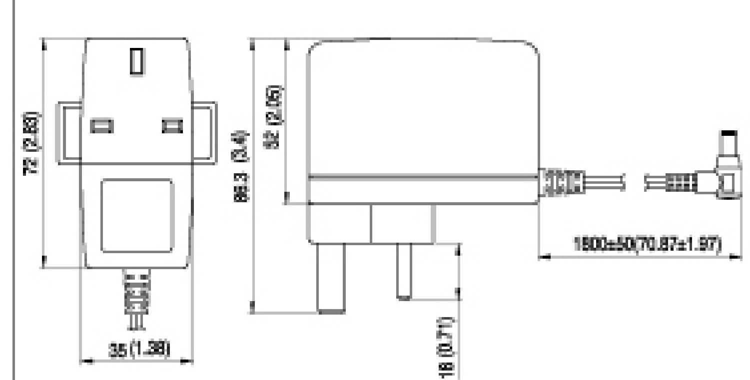


FIG.U



TR500

S E R I E S

TR10R

10W SWITCHING ADAPTER

CE GS c UL us LISTED CB

Features

- Universal Input: 90 ~ 264Vac
- Continuous Short Circuit Protection
- Conductive EMI Meets CISPR/FCC Class B
- High Efficiency, 75% Typical
- AC Plug Can Be Change

Specifications

INPUT CHARACTERISTICS:

Voltage .... 90 ~ 264Vac
Frequency .... 47 to 63Hz
Input Current .... 0.4A max.
Inrush Current .... 30A max. @ 264Vac

OUTPUT CHARACTERISTICS:

Holdup Time .... 10mS typ. @ 115Vac
Short Circuit Protection .... Continuous (Auto Recovery)
Over Cnrrent Protection .... Constant Current type

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40˚C
Storage Temperature .... -20 ~ 85˚C

MECHANICAL CHARACTERISTICS:

Dimensions .... 2.83x 1.81 x 1.38 Inches
Weight .... 0.29 Pounds

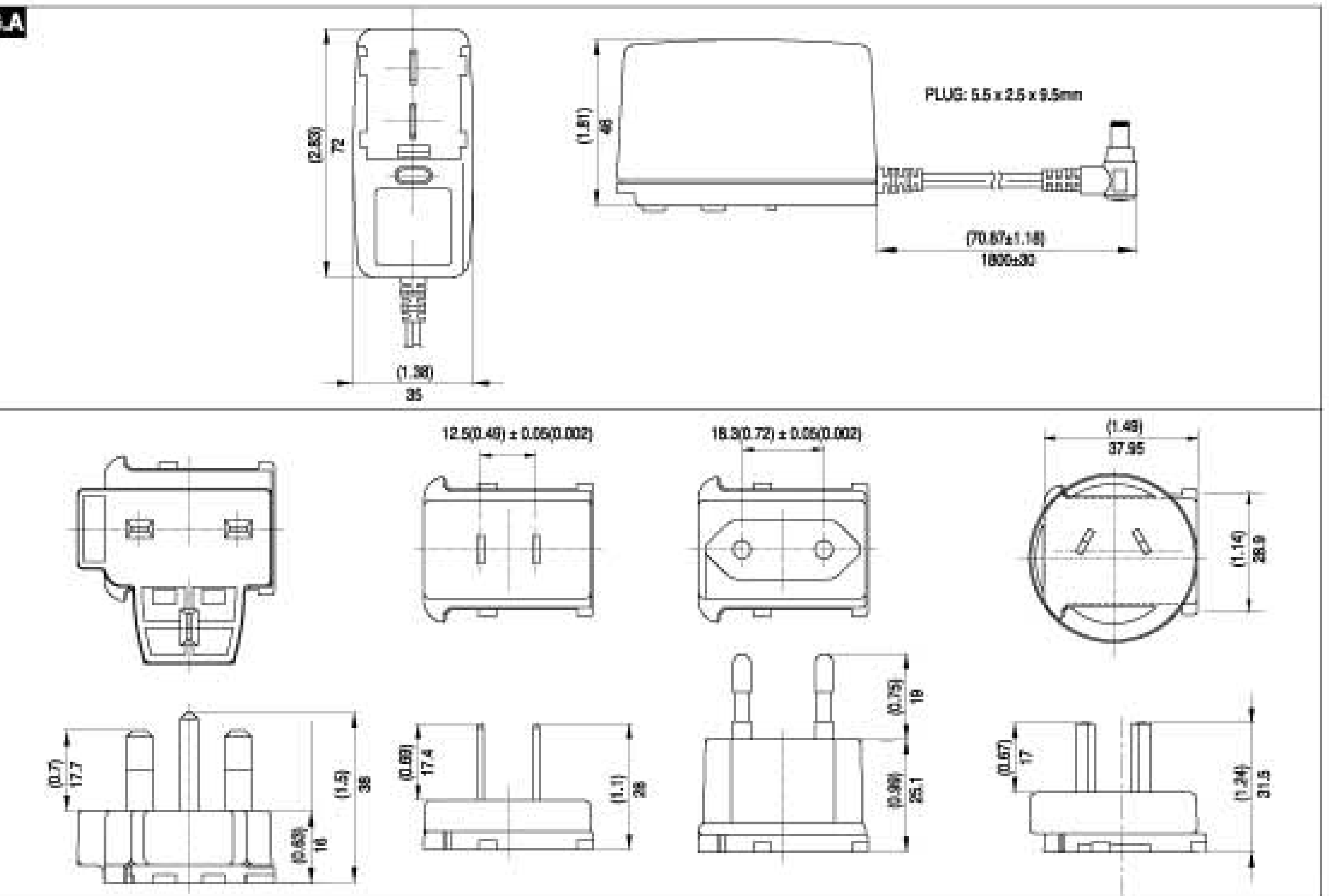
Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE	MAX. LOAD	MIN. LOAD	RIPPLE & NOISE	VOLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION
TR10R033	3.3 V	1600mA	0 A	50mV	± 3%	± 1%	± 4%
TR10R050	5 V	1600mA	0 A	50mV	± 2%	± 1%	± 4%
TR10R060	6 V	1500mA	0 A	1%	± 2%	± 1%	± 3%
TR10R075	7.5 V	1200mA	0 A	1%	± 2%	± 1%	± 3%
TR10R090	9 V	1100mA	0 A	1%	± 2%	± 1%	± 2%
TR10R120	12 V	850mA	0 A	1%	± 2%	± 1%	± 2%
TR10R136	13.6 V	750mA	0 A	1%	± 2%	± 1%	± 2%
TR10R150	15 V	700mA	0 A	1%	± 2%	± 1%	± 2%
TR10R180	18 V	550mA	0 A	1%	± 2%	± 1%	± 2%
TR10R240	24 V	400mA	0 A	1%	±2%	± 1%	± 2%

NOTE:
1. Voltage setpoint at 60% load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation measured from 100Vac to 240Vac, full load.
4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% load)

Mechanical Specification

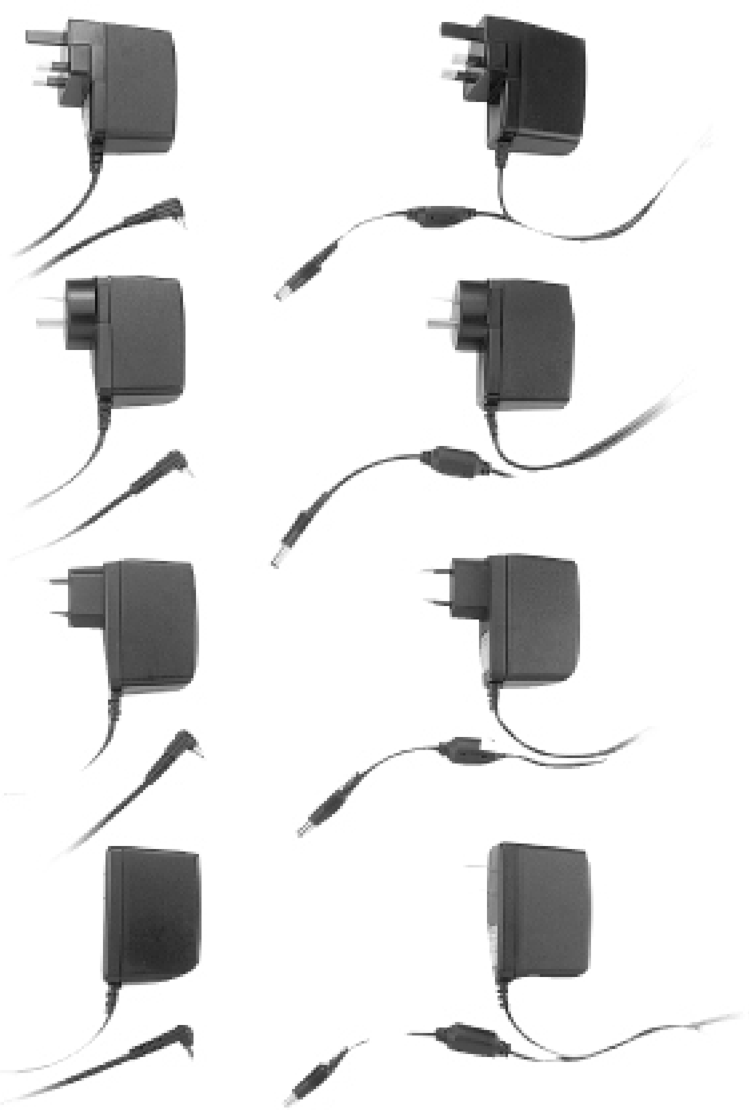
FIG.A



S E R I E S

TR15

15W SWITCHING ADAPTER



Features

- Universal Input: 90 ~ 264Vac
- Continuous Short Circuit Protection
- Meets EN55022 Class "B", Conducted
- High Efficiency, 75% Typical

Specifications

INPUT CHARACTERISTICS:

Voltage ......90 ~ 264Vac
Frequency ......47 to 63Hz
Input Current ......0.5A max.
Inrush Current......50A max. @ 264Vac

OUTPUT CHARACTERISTICS:

Holdup Time ...... 10mS typ. @ 115Vac
Short Circuit Protection ......Continuous (Auto Recovery)
Over Voltage Protection ...... Option
Over Cnrrent Protection ......Constant Current type

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature ...... 0 ~ 40°C
Storage Temperature ...... -20 ~ 85°C

MECHANICAL CHARACTERISTICS:

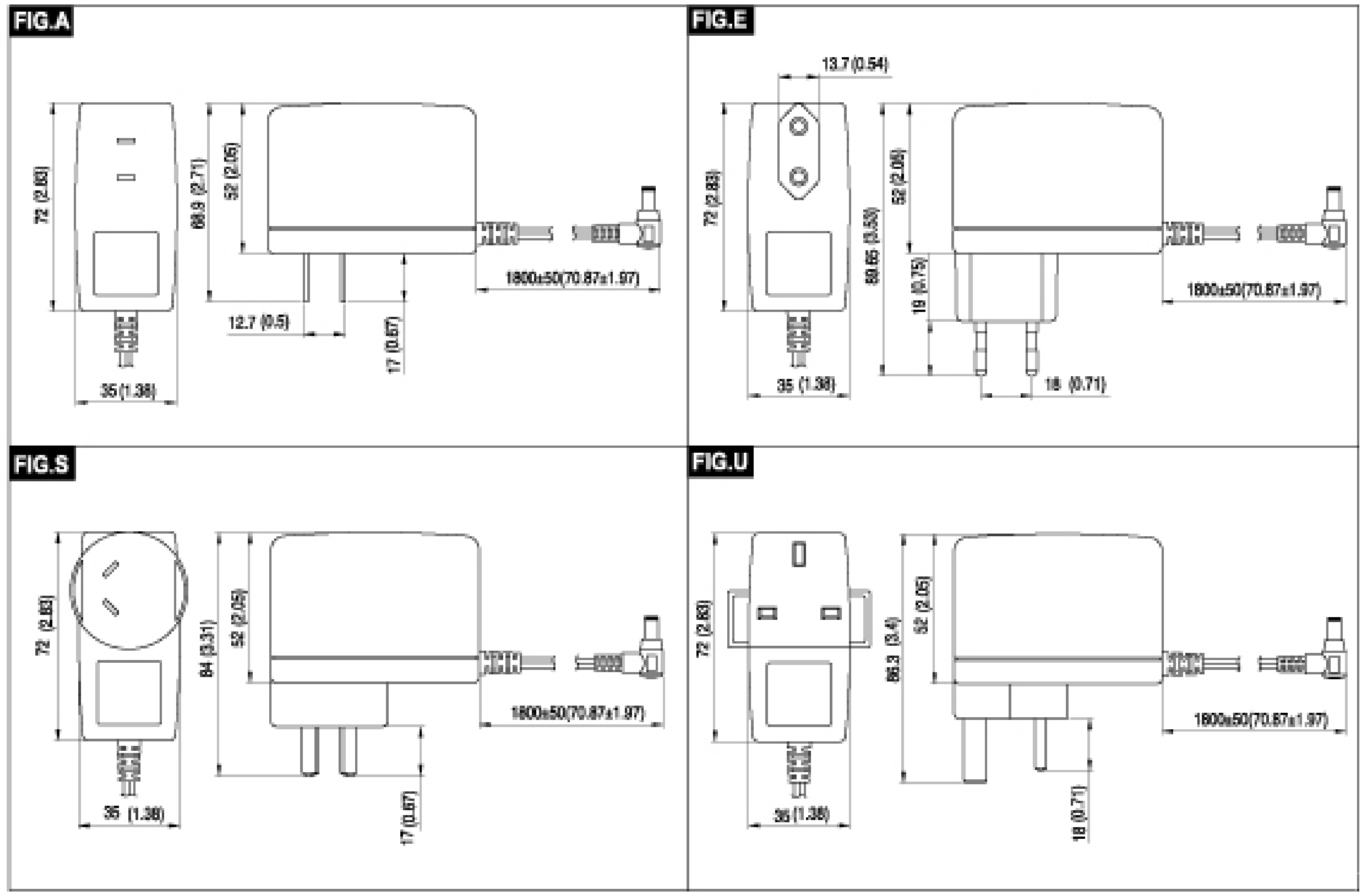
Dimensions ......2.83x 2.04 x 1.38 Inches
Weight ......0.35 Pounds

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE	UTPUT CURRENT	O RIPPLE & NOISE	OLTAGE SETPOINT	LINE EGULATION	LOAD REGULATION
TR1505	5 V	2.0 A	1%	+/- 2%	+/- 1%	+/- 4%
TR1506	6 V	1.5 A	1%	+/- 2%	+/- 1%	+/- 3%
TR1507	7.5 V	1.6 A	1%	+/- 2%	+/- 1%	+/- 3%
TR1509	9 V	1.4 A	1%	+/- 2%	+/- 1%	+/- 2%
TR1512	12 V	1.0 A	1%	+/- 2%	+/- 1%	+/- 2%
TR1512-01	13.6 V	1.0 A	1%	+/- 2%	+/- 1%	+/- 2%
TR1515	15 V	1.0 A	1%	+/- 2%	+/- 1%	+/- 2%
TR1518	18 V	0.83 A	1%	+/- 2%	+/- 1%	+/- 2%
TR1524	24 V	0.63 A	1%	+/- 2%	+/- 1%	+/- 2%

NOTE:
1. Voltage setpoint at 60% full load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation measured from 100Vac to 240Vac, full load.
4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% load)

Mechanical Specification



TR15

S E R I E S

TR25

25W SWITCHING ADAPTER

Features

- Universal Input: 90 ~ 264Vac
- Continuous Short Circuit Protection
- Meets EN55022 Class "B", Conducted
- High Efficiency, 80% Typical

Specifications

INPUT CHARACTERISTICS:

Voltage .... 90 ~ 264Vac
Frequency .... 47 to 63Hz
Input Current .... 0.7A max.
Inrush Current .... 50A max. @ 264Vac

OUTPUT CHARACTERISTICS:

Holdup Time .... 10mS typ. @ 115Vac
Short Circuit Protection .... Continuous (Auto Recovery)
Over Voltage Protection .... Option

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40°C
Storage Temperature .... -20 ~ 85°C

MECHANICAL CHARACTERISTICS:

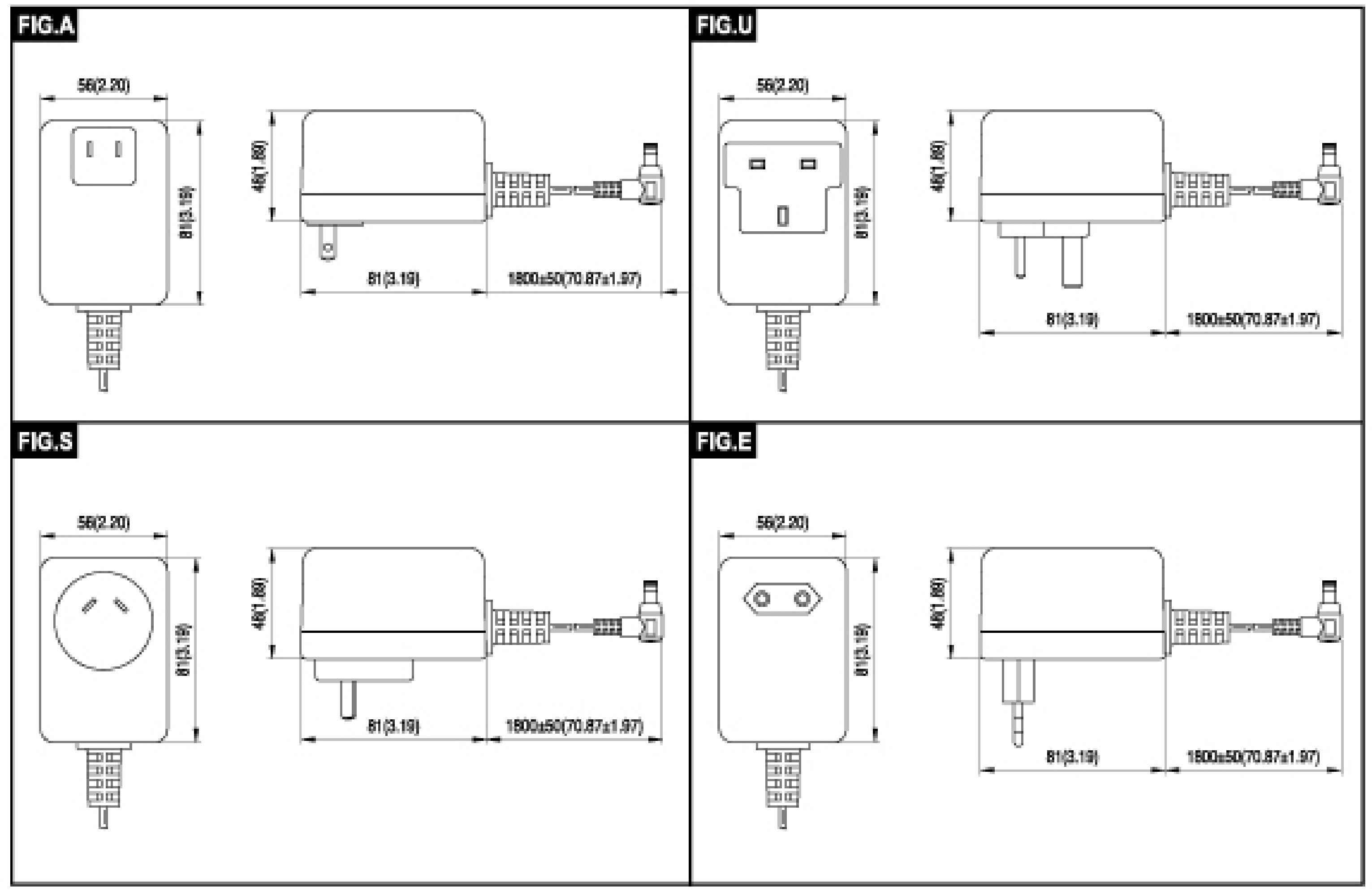
Dimensions .... 3.19x 1.89 x 2.2 Inches
Weight .... 0.48 Pounds

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE	UTPUT CURRENT	O RIPPLE & NOISE	OLTAGE SETPOINT	LINE EGULRTION	LOAD REGULATION
TR 25033	3.3V	4.0A	50m Vp-p	+/- 2%	+/- 1%	+/- 6%
TR 25050	5V	4.0A	1%	+/- 2%	+/- 1%	+/- 6%
TR 25120	12V	2.1A	1%	+/- 2%	+/- 1%	+/- 5%
TR 25150	15V	1.67A	1%	+/- 2%	+/- 1%	+/- 3%
TR 25180	18V	1.4A	1%	+/- 2%	+/- 1%	+/- 2%
TR 25240	24V	1.05A	1%	+/- 2%	+/- 1%	+/- 2%

NOTE:
1. Voltage setpoint at 60% full load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation measured from 100Vac to 240Vac, full load.
4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% load)

Mechanical Specification



S E R I E S

TR30R

30W SWITCHING ADAPTER

CE CB FC PS E

Features

- Universal Input : 90 ~ 264Vac
- Continuous Short Circuit Protection
- Over Voltage Protection
- Conductive EMI Meets CISPR/FCC Class B
- High Efficiency, 75% Typical
- AC Plug Can Be Change

Specifications

INPUT CHARACTERISTICS:

Voltage .... 90 ~ 264Vac
Frequency .... 47 to 63Hz
Input Current .... 0.7A max
Inrush Current ....50A max @264Vac

OUTPUT CHARACTERISTICS:

Holdup Time .... 10mS typ. @ 115Vac
Short Circuit Protection ....Continuous (Auto Recovery)
Over Voltage Protection .... Yes

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40˚C
Storage Temperature .... -20 ~ 85˚C

MECHANICAL CHARACTERISTICS:

Dimensions ....4.24x 2.27 x 1.32 Inches
Weight ....(0.625 Pounds)

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

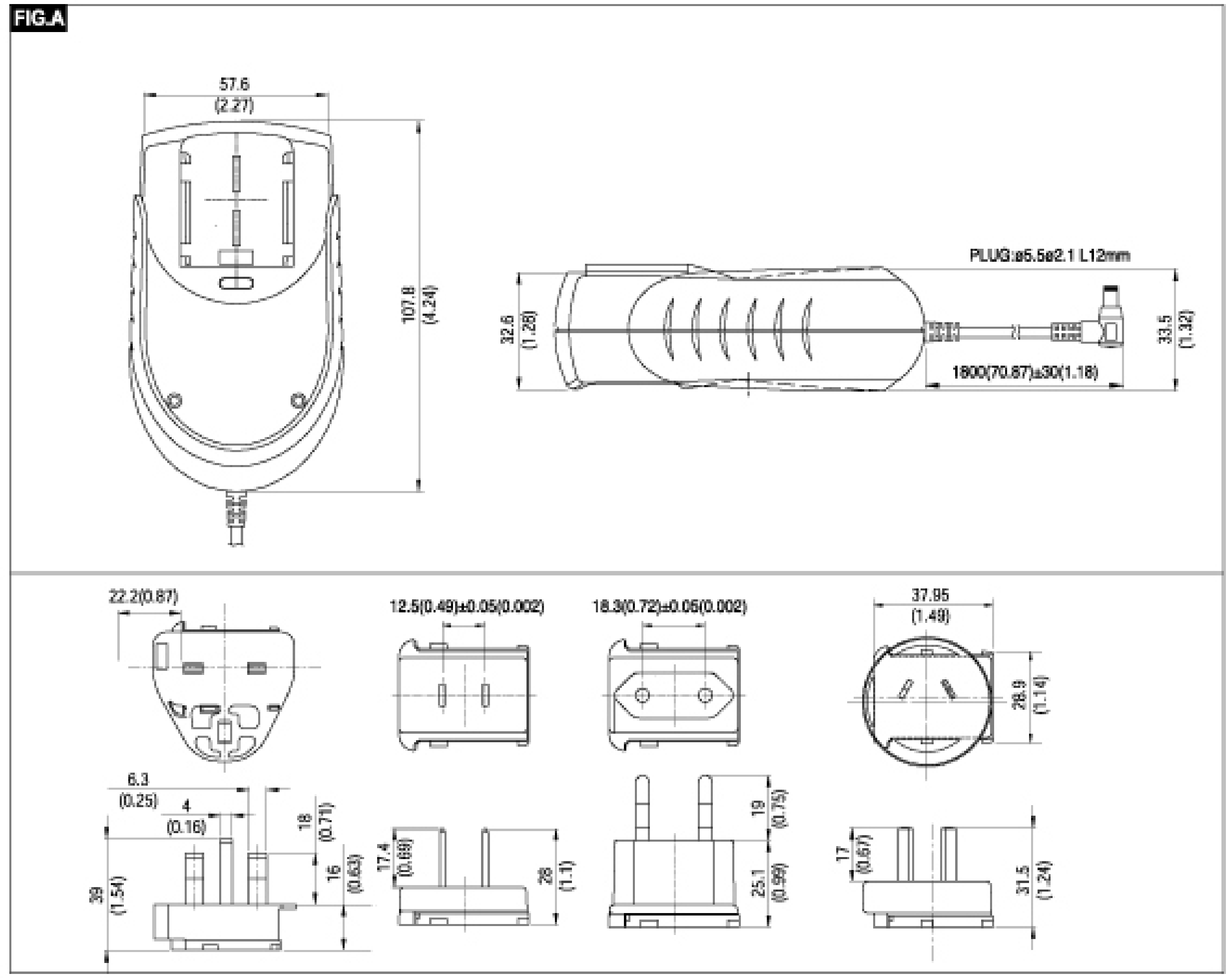
MODEL	OUTPUT VOLTAGE	MAX. LOAD	MIN. LOAD	RIPPLE & NOISE	VOLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION
TR30R050	5.0V	5.0A	0 A	1%	± 4%	± 1%	± 6%
TR30R090	9.0V	3.3A	0 A	1%	± 2%	± 1%	± 3%
TR30R120	12 V	2.5A	0 A	1%	± 2%	± 1%	± 2%
TR30R150	15V	2.0A	0 A	1%	± 2%	± 1%	± 2%
TR30R180	18 V	1.65A	0 A	1%	± 2%	± 1%	± 2%
TR30R240	24 V	1.25A	0 A	1%	± 2%	± 1%	± 2%

NOTE:
1. Voltage setpoint at 60% load.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L capacitor to output for Ripple& Noise measuring @20MHz BW
3. Line regulation measured from 100Vac to 240Vac , full load
4. Load regulation measured from 60% to full load and from 60% to 20% load(60% +/- 40% load)

Mechanical Specification

UNIT: mm(Inches)

FIG.A



S E R I E S

TR20B

20W SWITCHING ADAPTER

Features

- Universal Input: 90 ~ 264Vac
- Continuous Short Circuit Protection
- Over Voltge Protection
- Conductive EMI Meets CISPR/FCC Class B
- High Efficiency, 75% Typical
- Green Power (Input power<0.75W at no load)
  Meet "European Commission of Energy"
  2003 year Phase 2

Specifications

INPUT CHARACTERISTICS:

Voltage .... 90 ~ 264Vac
Frequency .... 47 to 63Hz
Input Current .... 0.6A max.
Inrush Current........................ 50A max. @ 264Vac
Input Power (No Load)........................ 0.75W max. @ 240Vac

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40˚C
Storage Temperature .... -20 ~ 85˚C

OUTPUT CHARACTERISTICS:

Holdup Time .... 10mS typ. @ 115Vac
Short Circuit Protection .... Continuous (Auto Recovery)
Over Voltage Protection .... Yes

MECHANICAL CHARACTERISTICS:

Dimensions .... 4.33x 1.96 x 1.18 Inches
Weight .... 0.44 Pounds

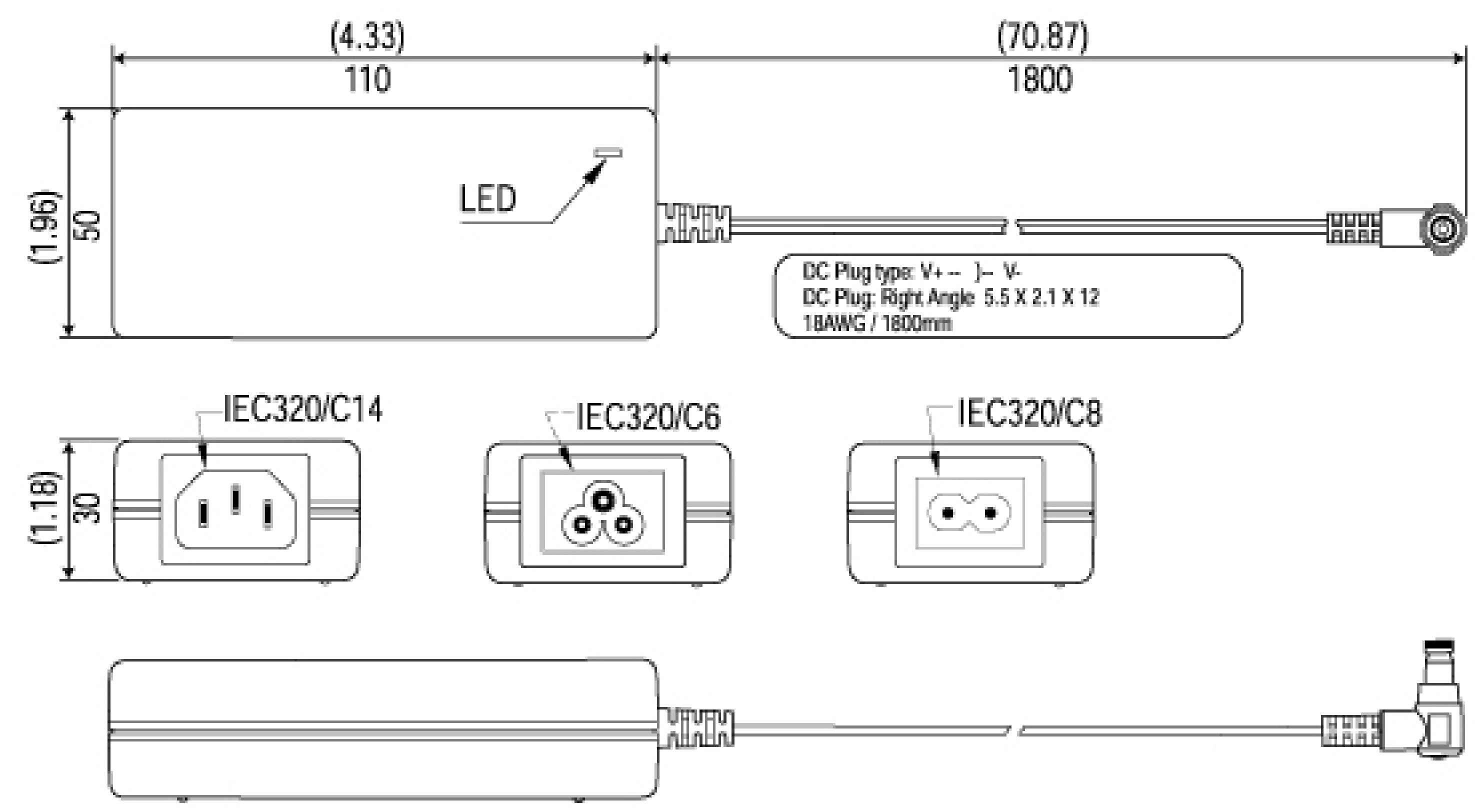
Typical at 25°C, nominal line and 75% load, unless otherwise Specified.
TR20BXXX=IEC320/C14, TR20BXXXA=IEC320/C6, TR20BXXXB=IEC320/C8

MODEL	OUTPUT VOLTAGE	MAX. LOAD	IN. LOAD	RIPPLE & NOISE	VOLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION
TR20B033	3.3 V	4500mA	0 A	50mVp-p	± 3%	± 1%	± 7%
TR20B050	5 V	4000mA	0 A	50mVp-p	± 2%	± 1%	± 6%
TR20B090	9 V	2300mA	0 A	90mVp-p	± 2%	± 1%	± 3%
TR20B120	12 V	1700mA	0 A	100mVp-p	± 2%	± 1%	± 2%
TR20B150	15 V	1400mA	0 A	100mVp-p	± 2%	± 1%	± 2%
TR20B180	18 V	1200mA	0 A	150mVp-p	± 2%	± 1%	± 2%
TR20B240	24 V	850mA	0 A	150mVp-p	± 2%	± 1%	± 2%

NOTE:
1. Voltage accuracy is set at 60% full load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
3. Line regulation is measured from 100Vac to 240Vac with full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60% +/- 40% full load)
5. TR20Bxxx=IEC320/C14, TR20BxxxA=IEC320/C6, TR20BxxxB=IEC320/C8

Mechanical Specification

Unit: mm (in)



S E R I E S

TR25D

25W SWITCHING ADAPTER DUAL OUTPUT

CB CE

Features

- Universal Input: 90 ~ 264Vac
- Continuous Short Circuit Protection
- Meets EN55022 Class "B", Conducted

Specifications

INPUT CHARACTERISTICS:

Voltage	90 ~ 264Vac
Frequency	47 to 63Hz
Inrush Current	50A Max. @ 264Vac
Conducted EMI	CISPR/FCC Class B
Isolation	Input to output =4,242Vdc
Leakage Current	1.5mA max.

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature	0 ~ 40°C
Storage Temperature	-20 ~ 85°C

OUTPUT CHARACTERISTICS:

Holdup Time	16mS typ. @ 115Vac
Short Circuit Protection	Continuous
Over Voltage Protection	Option
Over Load Protection	Option

MECHANICAL CHARACTERISTICS:

Dimensions	5.20x 2.29 x 1.18 Inches
Weight	0.77 Pounds
AC Inlet	IEC320/C14

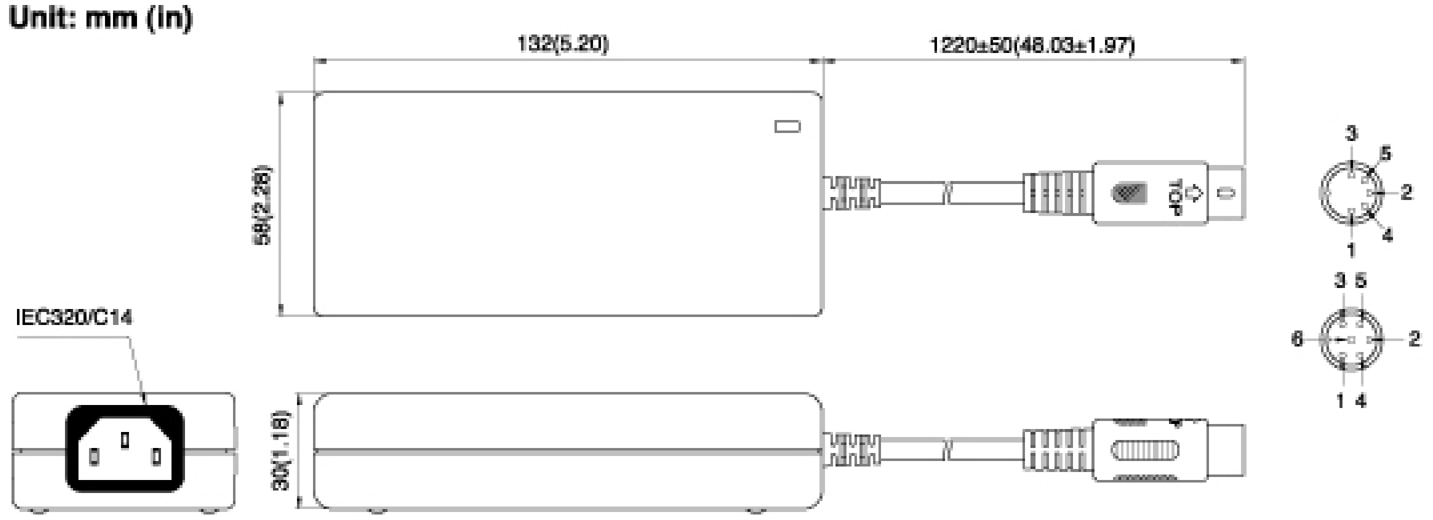
Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE (VOLTS)	OUTPUT CURRENT (AMPS) MIN.	RATED	MAX.	PEAK[1] (AMPS)	RIPPLE[2], P-P (mV)	TOTAL REGULATION[3]	O/P POWER MAX.
TR25D-01	+3.3V(V1) +5V(V2)	0.3 0.2	3 2	4 3	5 4	50 50	±7% ±5%	20W
TR25D-02	+5V(V1) +12V(V2)	0.2 0.13	2 1.3	3 2	4 3	50 120	±5% ±5%	25W
TR25D-03	+5V(V1) +15V(V2)	0.2 0.1	2 1	3 1.5	4 2	50 150	±5% ±5%	25W
TR25D-04	+5V(V1) +24V(V2)	0.2 0.1	2 0.6	3 1	4 1.5	50 240	±5% ±5%	25W

NOTE:
1. Peak output current (total output power must less than 32W) lasting less than one minute with duty factor less than 5%. During peak loading, output voltage may exceed total regulation limits.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to the output cable. Peak to peak and RMS metering equipment shall have a 20 MHz response with probes and cables maintaining frequency response from 200Hz to 100MHz bandwidth. Output ripple and spikes are measured directly at the output terminals of the power supply without the use of the probe ground clip.
3. Total regulation is defined as the static output regulation at 25°C, including initial tolerance, line voltage within stated limits. And load currents within stated limits, but when V1 exceed rated load, the total regulation will be ±10%.

Mechanical Specification

Unit: mm (in)



DC plug & pin assignment (CUSTOM DESIGN IS AVAILABLE)

OUTPUT NO.	TR25D-XX	Y	-14A02	-35A02
PIN1	GND	Option	DIN PLUG (5P 180°)	DIN PLUG (6P 240°)
PIN2	GND			
PIN3	NC			
PIN4	V1			
PIN5	V2			
PIN6	V1			

Y:SEC-GND is isolated from AC-GND.

*All dimensions in mm (inch).

S E R I E S

TR36

36W SWITCHING ADAPTER

CB CE

Features

- Universal Input: 90 ~ 264Vac
- Continuous Short Circuit Protection
- Meets EN55022 Class "B", conducted
- High Efficiency, 85% Typical

Specifications

INPUT CHARACTERISTICS:

Voltage .... 90 ~ 264Vac
Frequency .... 47 to 63Hz
Inrush Current .... 50A Max. @ 264Vac
Conducted EMI .... CISPR/FCC Class B
Isolation .... Input to output =4,242Vdc
Leakage Current .... 0.25mA max.

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40˚C
Storage Temperature .... -20 ~ 85˚C

OUTPUT CHARACTERISTICS:

Holdup Time .... 8mS typ. @ 115Vac
Short Circuit Protection .... Continuous
Over Voltage Protection .... Option

MECHANICAL CHARACTERISTICS:

Dimensions .... 4.33x 1.96 x 0.78 Inches
Weight .... 0.44 Pounds
AC Inlet IEC320/C8

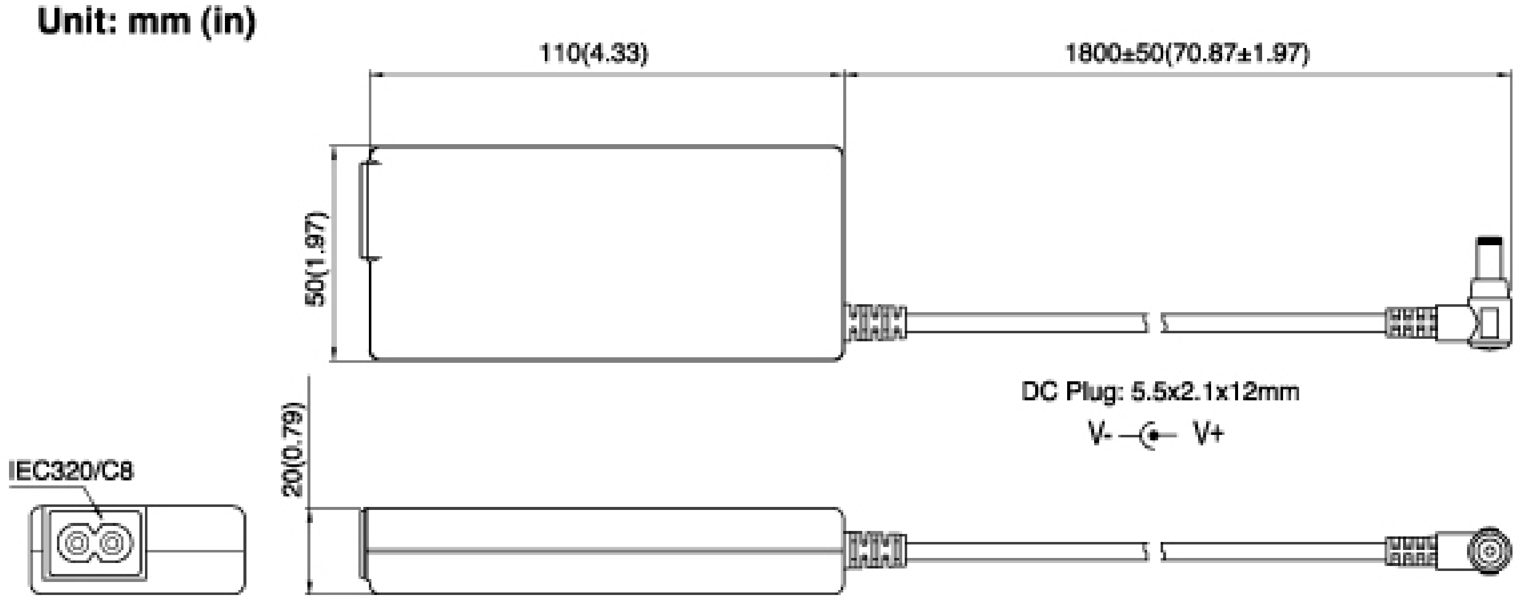
Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE	VOLTAGE SETPOINT	LINE REGULATION	LOAD REGULATION
TR36A05	5 V	4.0 A	1%	+/- 2%	+/- 1%	+/- 6%
TR36A09	9 V	3.0 A	1%	+/- 2%	+/- 1%	+/- 5%
TR36A12	12 V	2.5 A	1%	+/- 2%	+/- 1%	+/- 5%
TR36A13	13.5 V	2.4 A	1%	+/- 2%	+/- 1%	+/- 5%
TR36A15	15 V	2.4 A	1%	+/- 2%	+/- 1%	+/- 3%
TR36A18	18 V	2.0 A	1%	+/- 2%	+/- 1%	+/- 2%
TR36A24	24 V	1.5 A	1%	+/- 2%	+/- 1%	+/- 2%
TR36A48	48 V	0.75A	1%	+/- 2%	+/- 1%	+/- 2%

NOTE:
1. Voltage setpoint at 60% load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation measured from 100Vac to 240Vac, full load.
4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% full load)

Mechanical Specification

Unit: mm (in)



S E R I E S

TR45

45W SWITCHING ADAPTER

CB CE

Features

- Universal Input: 90 ~ 264Vac
- Continuous Short Circuit Protection
- Meets EN55022 Class "B", Conducted
- High Efficiency, 82% Typical

Specifications

INPUT CHARACTERISTICS:

Voltage .... 90 ~ 264Vac
Frequency .... 47 to 63Hz
Inrush Current .... 50A Max. @ 264Vac
Conducted EMI .... CISPR/FCC Class B
Isolation .... Input to output =4,242Vdc
Leakage Current .... 1.5mA max.

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40°C
Storage Temperature .... -20 ~ 85°C

OUTPUT CHARACTERISTICS:

Holdup Time .... 8mS typ. @ 115Vac
Short Circuit Protection .... Continuous
Over Voltage Protection .... Option

MECHANICAL CHARACTERISTICS:

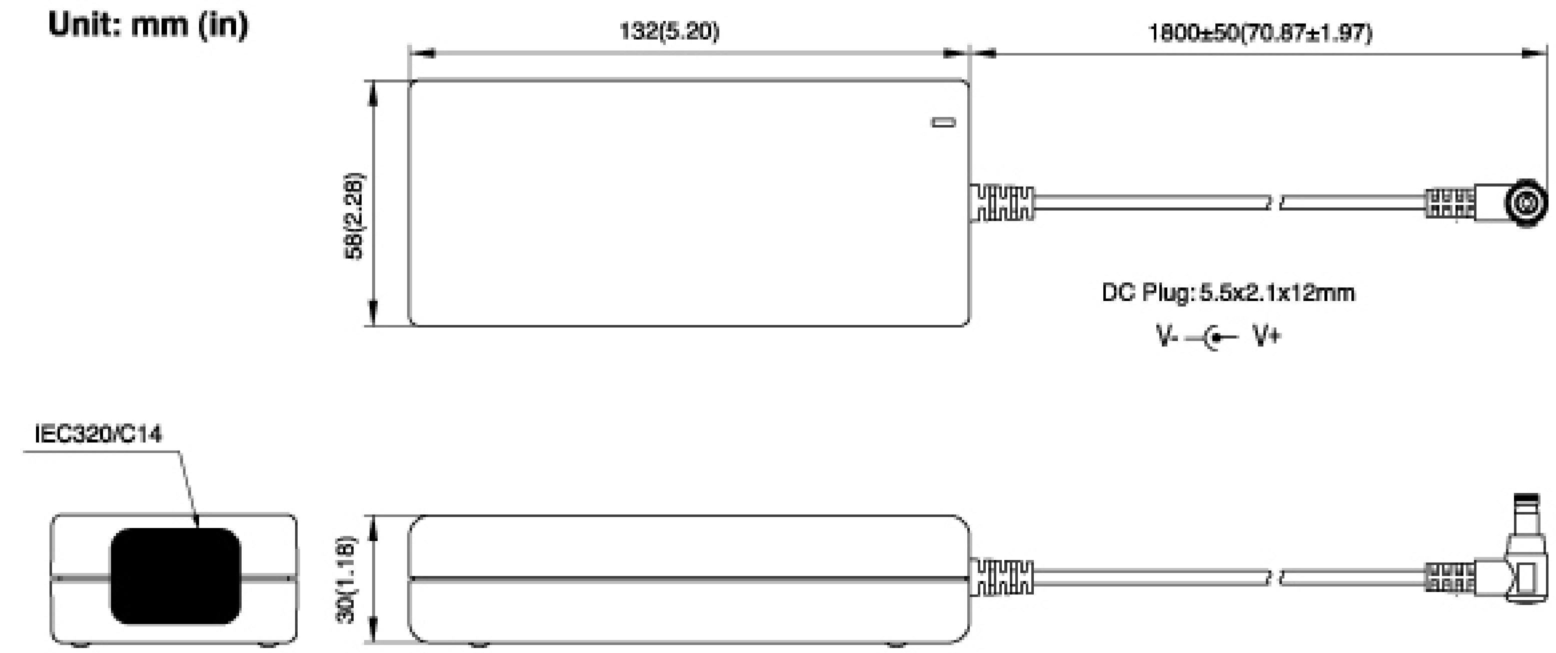
Dimensions .... 5.20 x 2.29 x 1.18 Inches
Weight .... 0.77 Pounds
AC Inlet IEC320/C14

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE	VOLTAGE SETPOINT	LINE REGULATION	LOAD REGULATION
TR45A05	5V	6.00A	1%	+/- 4%	+/- 1%	+/- 6%
TR45A12	12 V	3.75 A	1%	+/- 2%	+/- 1%	+/- 5%
TR45A15	15 V	3.00 A	1%	+/- 2%	+/- 1%	+/- 3%
TR45A18	18 V	2.50 A	1%	+/- 2%	+/- 1%	+/- 2%
TR45A19	19V	2.37A	1%	+/- 2%	+/- 1%	+/- 2%
TR45A24	24V	1.88A	1%	+/- 2%	+/- 1%	+/- 2%
TR45A48	48V	1.00A	1%	+/- 2%	+/- 1%	+/- 2%

NOTE:
1. Voltage setpoint at 60% full load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation measured from 100Vac to 240Vac, full load.
4. Load regulation measured from 60% to 100% load and from 60% to 20% load (60% +/- 40% full load)

Mechanical Specification



S E R I E S

TR70

70W SWITCHING ADAPTER

Output 12V & 15V Only

Features

- Universal Input: 90 ~ 264Vac
- Continuous Short Circuit Protection
- Meets EN55022 Class "B", Conducted
- High Efficiency, 85% Typical

Specifications

INPUT CHARACTERISTICS:

Voltage .... 90 ~ 264Vac
Frequency .... 47 to 63Hz
Inrush Current .... 50A Max. @ 264Vac
Conducted EMI .... CISPR/FCC Class B
Isolation .... Input to output =4,242Vdc
Leakage Current .... 1.5mA max.

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40˚C
Storage Temperature .... -20 ~ 85˚C

OUTPUT CHARACTERISTICS:

Holdup Time .... 8mS typ. @ 115Vac
Short Circuit Protection .... Continuous
Over Voltage Protection .... Option

MECHANICAL OUTLINE:

Dimensions .... 5.20 x 2.29 x 1.18 Inches
Weight .... 0.77 Pounds
AC Inlet IEC320/C14

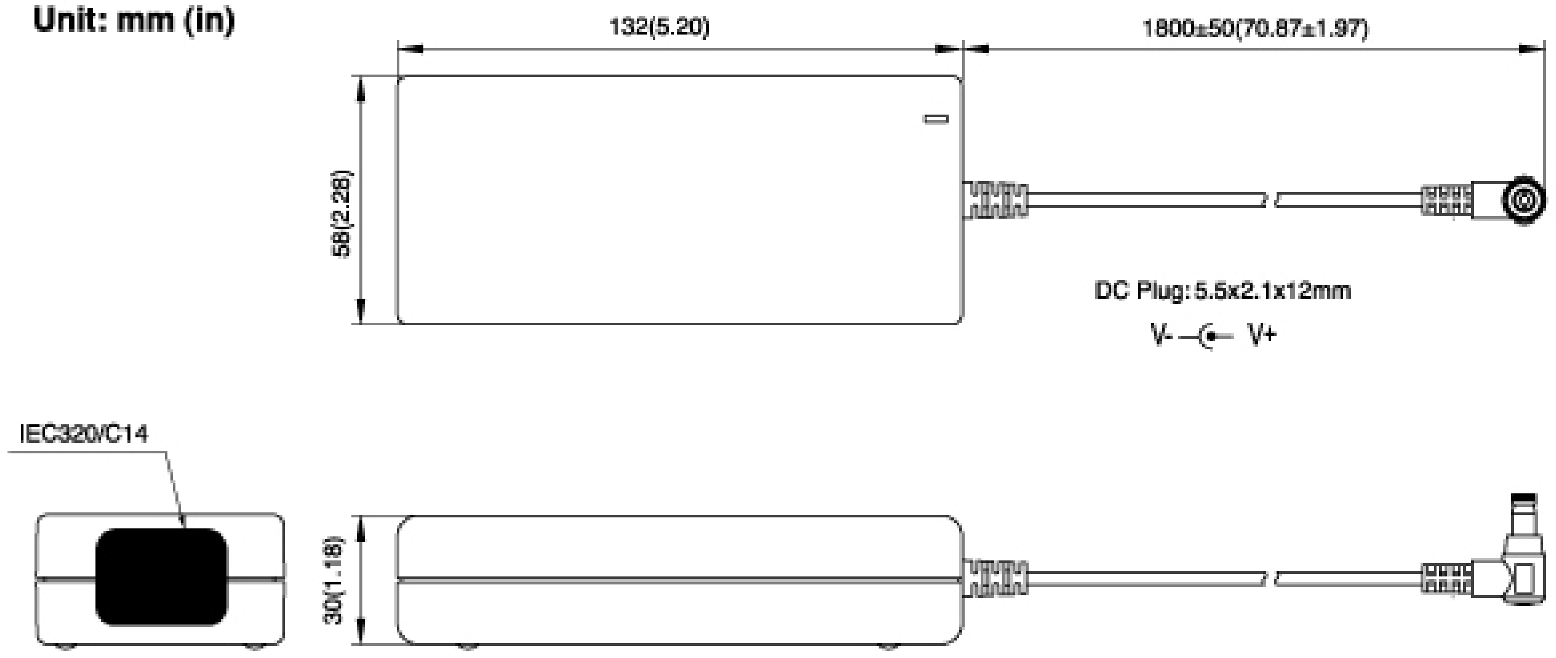
Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE & NOISE	VOLTAGE SETPOINT	LINE REGULATION	LOAD REGULATION
TR70A12	12 V	5.5 A	1%	+/- 2%	+/- 1%	+/- 5%
TR70A15	15 V	4.6 A	1%	+/- 2%	+/- 1%	+/- 3%
TR70A18	18 V	3.9 A	1%	+/- 2%	+/- 1%	+/- 2%
TR70A19	19 V	3.7 A	1%	+/- 2%	+/- 1%	+/- 2%
TR70A24	24V	3.0 A	1%	+/- 2%	+/- 1%	+/- 2%
TR70A48	48 V	1.5A	1%	+/- 2%	+/- 1%	+/- 2%

NOTE:
1. Voltage setpoint at 60% full load.
2. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation measured from 100Vac to 240Vac, full load.
4. Load regulation measured from 60% to full load and from 60% to 20% load (60% +/- 40% full load)

Mechanical Specification

Unit: mm (in)



S E R I E S

TR100

100W SWITCHING ADAPTER WITH PFC

CB CE

Features

- Universal Input: 90 ~ 264Vac
- Conductive EMI Meets CISPR/FCC Class B
- High Efficiency, 85% Typical

Specifications

INPUT CHARACTERISTICS:

Voltage ....90 ~ 264Vac
Frequency ....47 to 63Hz
Inrush Current .... 100A Max. @ 264Vac
Conducted EMI ....CISPR/FCC Class B
Isolation .... Input to output =4,242Vdc
Leakage Current..........1.5mA max.

OUTPUT CHARACTERISTICS:

Holdup Time ....20mS typ. @ 115Vac
Short Circuit Protection .... Continuous
Over Voltage Protection .... Auto Recovery

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40˚C
Storage Temperature .... -20 ~ 85˚C

MECHANICAL CHARACTERISTICS:

Dimensions ....5.91 x 2.76 x 1.38 Inches

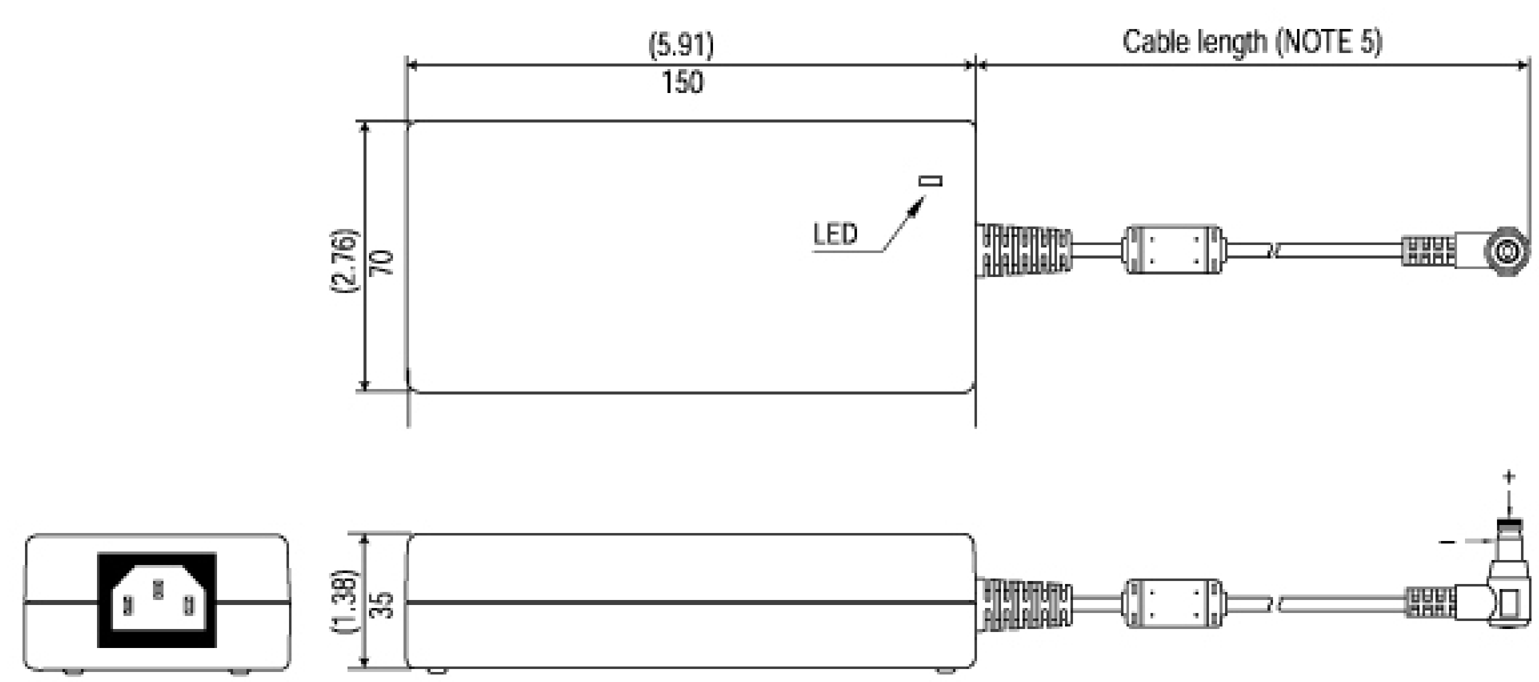
Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE	MAX. LOAD	MIN. LOAD	RIPPLE & NOISE	VOLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION
TR100A120	12 V	8.30 A	0 A	1%	± 2%	± 1%	± 4%
TR100A150	15 V	6.67 A	0 A	1%	± 2%	± 1%	± 4%
TR100A180	18 V	5.56 A	0 A	1%	± 2%	± 1%	± 2%
TR100A190	19 V	5.21 A	0 A	1%	± 2%	± 1%	± 2%
TR100A240	24 V	4.17 A	0 A	1%	± 2%	± 1%	± 2%
TR100A280	28 V	3.54 A	0 A	1%	± 2%	± 1%	± 2%
TR100A290	29 V	3.41 A	0 A	1%	± 2%	± 1%	± 2%
TR100A300	30 V	3.30 A	0 A	1%	± 2%	± 1%	± 2%
TR100A360	36 V	2.78 A	0 A	1%	± 2%	± 1%	± 2%
TR100A480	48 V	2.08 A	0 A	1%	± 2%	± 1%	± 2%

NOTE:
1. Voltage accuracy is set at 60% full load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measurement @20MHz BW.
3. Line regulation is measured from 100Vac to 240Vac, full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60% +/- 40% full load)
5. Cable Length limit for TR100A120/150:1200mm(max.)
Cable Length limit for TR100A180/190/240/480:1800mm(max.)
(For Customer Design)

Mechanical Specification

Unit: mm (in)



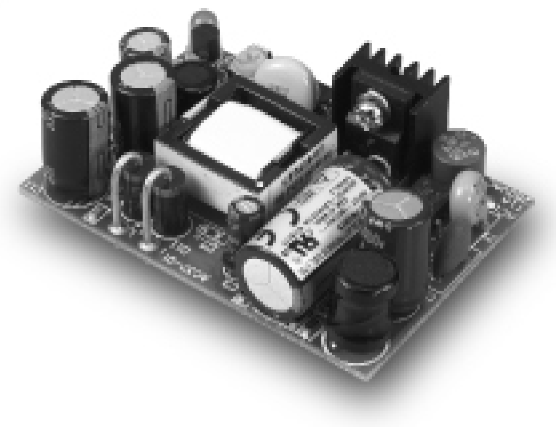
S E R I E S

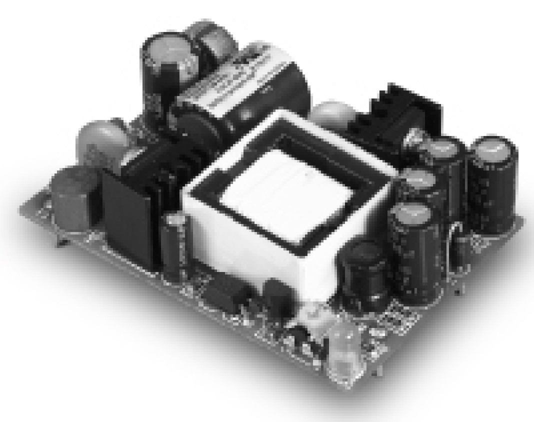
CFM10/15

10/15 WATT OPEN FRAME AC-DC MODULES

CE CB

E176177





Features

- Universal Input 85-264Vac
- Conductive EMI Meets CISPR/FCC Class B
- High Efficency at 82% Typical
- PCB Mountable

Specifications

INPUT CHARACTERISTICS:

Voltage 85-264VAC
Frequency..47-63Hz
Inrush Current..20A Max. @ 115Vac
40A Max. @ 230Vac
Conducted EMI..CISPR/FCC Class B
Isolation ....Input to Output=4,242Vdc
Leakage Current..0.25mA max.

OUTPUT CHARACTERISTICS:

Holdup Time..16mS typ. @ 115Vac
Short Circuit Protection..Continuous
Temperature Coefficient..0.05%/ C

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature ....0 C ~ 40 C
Storage Temperature ....-20 C ~ 85 C
Cooling..Free Air Convection

MECHANICAL OUTLINE:

Dimensions ....CFM10: 65 x 45 x 23mm³
CFM15: 69.9 x 48 x 23mm³

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

10 Watt Series

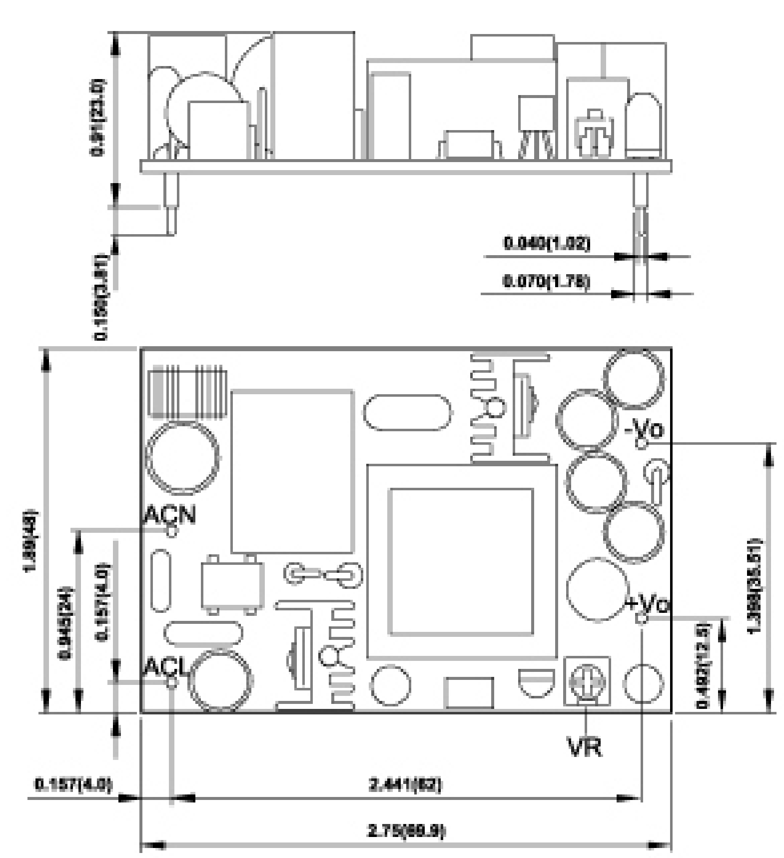
MODEL	OUTPUT VOLTAGE	MAX. LOAD	MIN. LOAD	RIPPLE & NOISE	VOLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION	EFF %
CFM1001S	5 V	2000mA	0A	1%	± 1%	± 0.5%	± 1%	70
CFM1002S	12 V	840mA	0A	1%	± 1%	± 0.5%	± 1%	75
CFM1003S	15 V	670mA	0A	1%	± 1%	± 0.5%	± 1%	75
CFM1005S	24 V	420mA	0A	1%	± 1%	± 0.5%	± 1%	78
CFM1007S	3.3 V	2500mA	0A	50mV	± 1%	± 0.5%	± 1%	65
CFM1009S	9 V	1120mA	0A	1%	± 1%	± 0.5%	± 1%	72

15 Watt Series

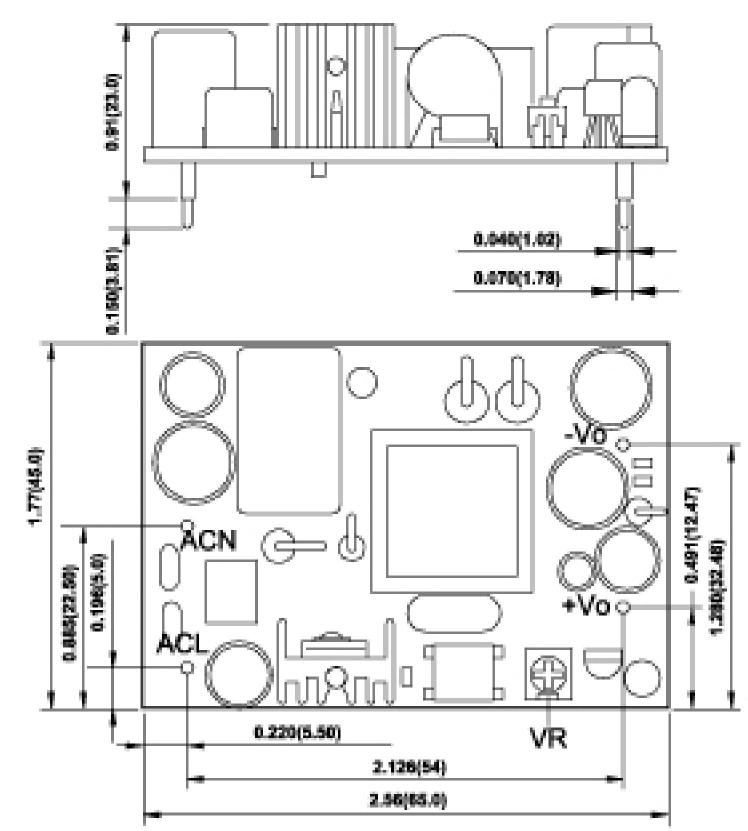
MODEL	OUTPUT VOLTAGE	MAX. LOAD	MIN. LOAD	RIPPLE & NOISE	VOLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION	EFF %
CFM1501S	5 V	3000mA	0A	1%	± 1%	± 0.5%	± 1%	73
CFM1502S	12 V	1250mA	0A	1%	± 1%	± 0.5%	± 1%	80
CFM1503S	15 V	1000mA	0A	1%	± 1%	± 0.5%	± 1%	80
CFM1505S	24 V	630mA	0A	1%	± 1%	± 0.5%	± 1%	82
CFM1507S	3.3 V	3000mA	0A	50mV	± 1%	± 0.5%	± 1%	70
CFM1509S	9 V	1670mA	0A	1%	± 1%	± 0.5%	± 1%	75

NOTE:
1. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise Measuring @ 20MHz BW.
2. Line Regulation is Measured from High Line to Low Line with Full Load.
3. Load Regulation is Measured from Full to 10% Load.

10 Watt Series



15 Watt Series



CFM10/15

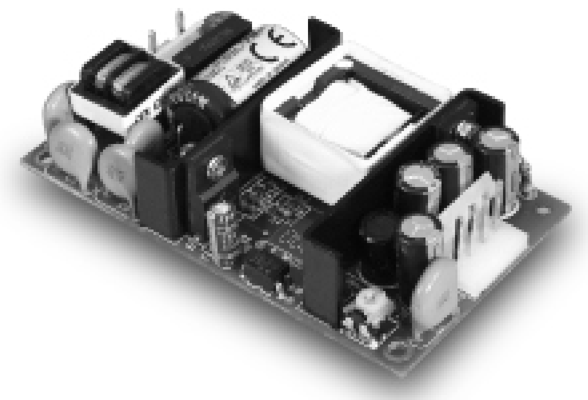
S E R I E S

CFM20

20 WATT OPEN FRAME AC-DC MODULES

E179177

CB



Features

- Universal Input 85-264Vac
- Conductive EMI Meets CISPR/FCC Class B
- High Efficiency at 82% Typical

Specifications

INPUT CHARACTERISTICS:

Voltage ....85 ~ 264Vac
Frequency ....47 to 63Hz
Inrush Current .... 40A Max. @ 230Vac
Conducted EMI ....CISPR/FCC Class B
Isolation .... Input to output =4,242Vdc
Leakage Current.......................................1.5mA max.

OUTPUT CHARACTERISTICS:

Holdup Time ....16mS typ. @ 115Vac
Short Circuit Protection .... Continuous
Temperature Coefficient .... ±0.05% / °C

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40°C
Storage Temperature .... -20 ~ 85°C
Cooling .... Free Air Convection

MECHANICAL CHARACTERISTICS:

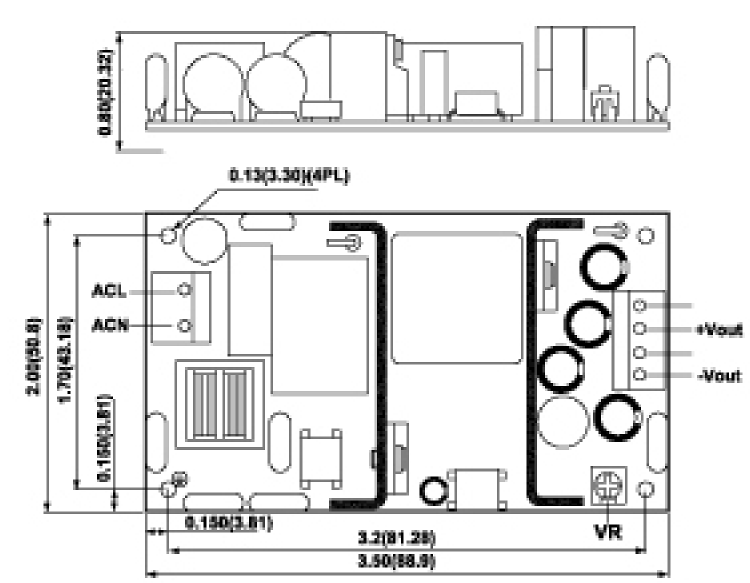
Dimensions ....88.9 x 50.8 x 20.32mm³
88.9 x 50.8 x 25.4mm³ (CFM200XS-P)

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

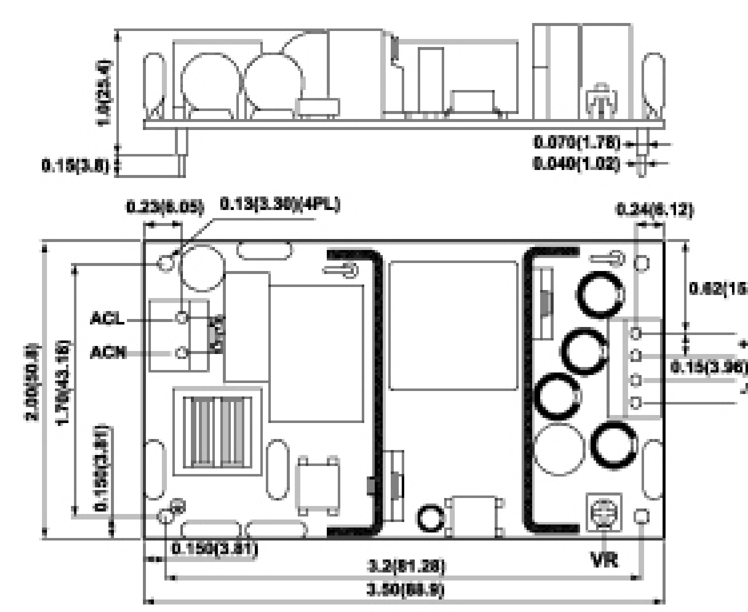
MODEL	OUTPUT VOLTAGE	MAX. LOAD	MIN. LOAD	RIPPLE & NOISE	VOLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION	EFF %
CFM2001S	5 V	4400mA	0A	1%	± 1%	± 0.5%	± 1%	73
CFM2002S	12 V	1800mA	0A	1%	± 1%	± 0.5%	± 1%	80
CFM2003S	15 V	1400mA	0A	1%	± 1%	± 0.5%	± 1%	80
CFM2005S	24 V	920mA	0A	1%	± 1%	± 0.5%	± 1%	82
CFM2007S	3.3 V	4400mA	0A	50mV	± 1%	± 0.5%	± 1%	70
CFM2009S	9 V	2450mA	0A	1%	± 1%	± 0.5%	± 1%	77

NOTE:
1. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise Measuring @ 20MHz BW.
2. Line Regulation is Measured from High Line to Low Line with Full Load.
3. Load Regulation is Measured from Full to 10% Load.
4. Input Connector Mates with Molex Housing 09-50-3031 and Molex 2878 Series Crimp Terminal.
5. Output Connector Mates with Molex Housing 09-50-3041 and Molex 2878 Series Crimp Terminal.
6. Model "**CFM200XS-P**": Connectors with PCB Mountable Type.

CFM20 Watt Series



CFM200XS-P Watt Series



S E R I E S

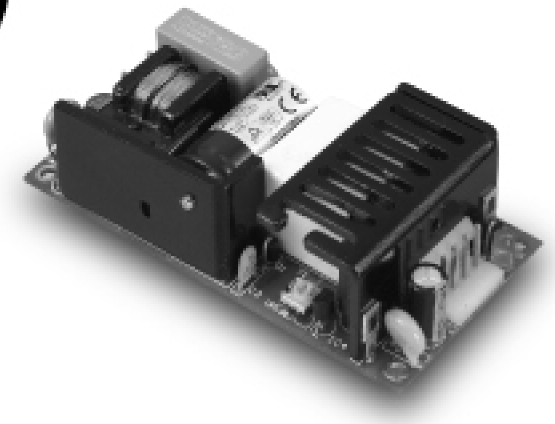
CFM40/60

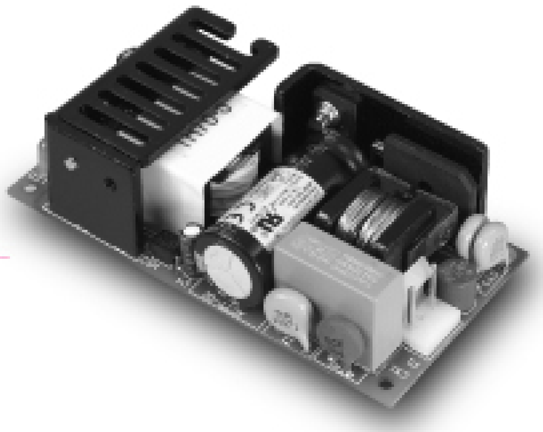
40/60 WATT OPEN FRAME AC-DC MODULES

E178177

CE

CB





Features

- Universal Input 90-264 Vac
- High Efficency at 88% Typical
- Conductive EMI Meets CISPR/FCC Class B

Specifications

INPUT CHARACTERISTICS:

Voltage 90-264Vac
Frequency 47-63Hz
Inrush Current .... 50A Max. @ 264Vac
Conducted EMI .... CISPR/FCC Class B
Isolation .... Input to Output=4,242Vdc
Leakage Current .... 1.5mA max.

OUTPUT CHARACTERISTICS:

Holdup Time[1] .... 8mS typ. @ 115Vac
Short Circuit Protection .... Continuous
Temperature Coefficient .... ±0.05%/ C

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 C – 50 C
Storage Temperature .... -20 C – 85 C
Cooling .... Free Air Convection

MECHANICAL OUTLINE:

Dimensions .... 101.6 x 50.8 x 30.48mm[3]

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

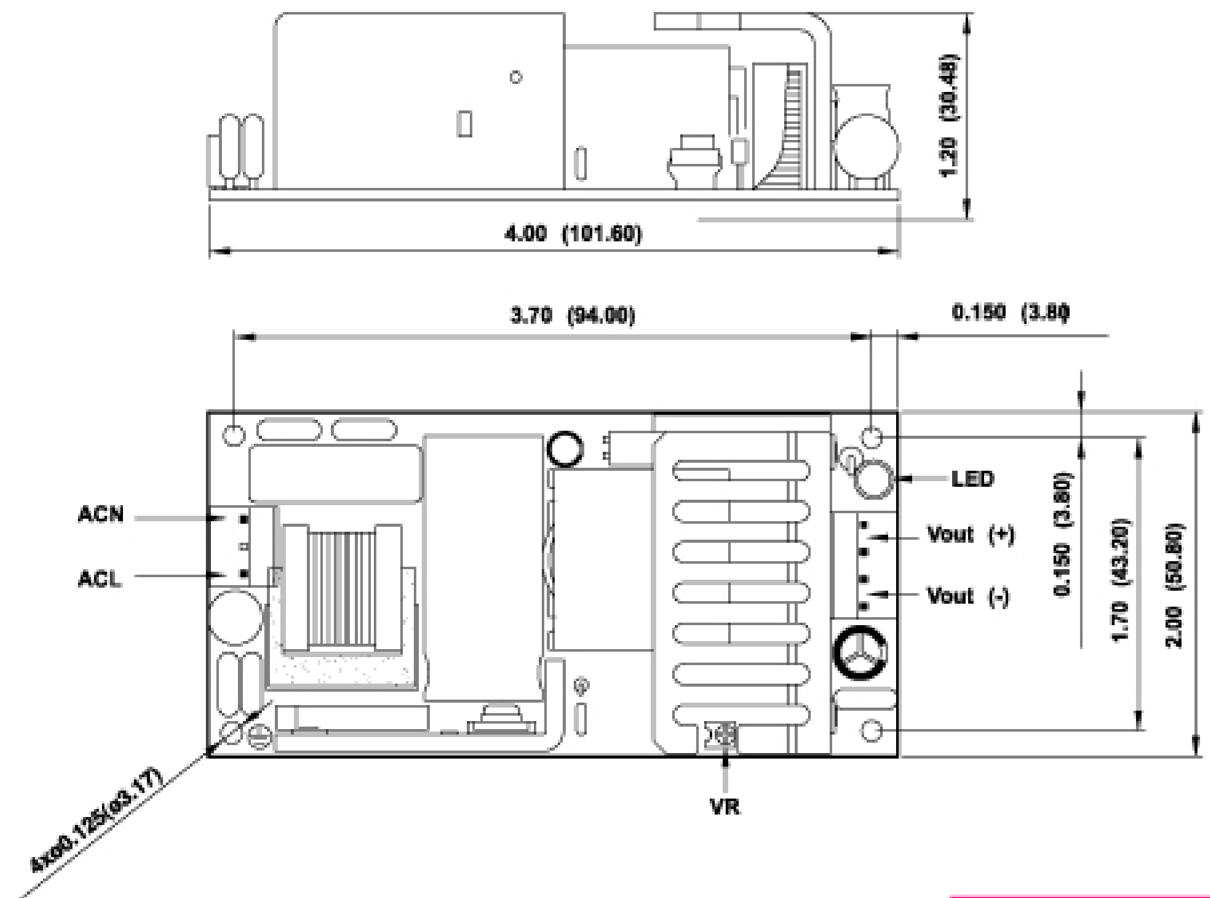
40 Watt Series

MODEL	OUTPUT VOLTAGE	MAX. LOAD	IN. LOAD	M IPPLER& NOISE	VOLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION	EFF %
CFM40S033	3.3 V	6A	0A	50mV	± 1%	± 0.5%	± 1%	74
CFM40S050	5 V	6A	0A	1%	± 1%	± 0.5%	± 1%	78
CFM40S090	9 V	4.45A	0A	1%	± 1%	± 0.5%	± 1%	82
CFM40S120	12 V	3.34A	0A	1%	± 1%	± 0.5%	± 1%	84
CFM40S150	15 V	2.67A	0A	1%	± 1%	± 0.5%	± 1%	85
CFM40S240	24 V	1.67A	0A	1%	± 1%	± 0.5%	± 1%	86
CFM40S300	30 V	1.33A	0A	1%	± 1%	± 0.5%	± 1%	86
CFM40S360	36 V	1.11A	0A	1%	± 1%	± 0.5%	± 1%	87
CFM40S480	48 V	0.834A	0A	1%	± 1%	± 0.5%	± 1%	88

60 Watt Series

MODEL	OUTPUT VOLTAGE	MAX. LOAD	IN. LOAD	M RIPPLE & NOISE	VOLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION	EFF %
CFM60S033	3.3 V	8A	0A	50mV	± 1%	± 0.5%	± 1%	74
CFM60S050	5 V	8A	0A	1%	± 1%	± 0.5%	± 1%	78
CFM60S090	9 V	6.67A	0A	1%	± 1%	± 0.5%	± 1%	82
CFM60S120	12 V	5A	0A	1%	± 1%	± 0.5%	± 1%	84
CFM60S150	15 V	4A	0A	1%	± 1%	± 0.5%	± 1%	85
CFM60S240	24 V	2.5A	0A	1%	± 1%	± 0.5%	± 1%	86
CFM60S300	30 V	2A	0A	1%	± 1%	± 0.5%	± 1%	86
CFM60S360	36 V	1.67A	0A	1%	± 1%	± 0.5%	± 1%	87
CFM60S480	48 V	1.25A	0A	1%	± 1%	± 0.5%	± 1%	88

NOTE:
1. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
2. Line regulation is measured from High Line to Low Line with full load.
3. Load regulation is measured from Full to 10% load.
4. Input connector mates with Molex housing 09-50-3031 and Molex 2878 series crimp terminal.
5. Output connector mates with Molex housing 09-50-3041 and Molex 2878 series crimp terminal.

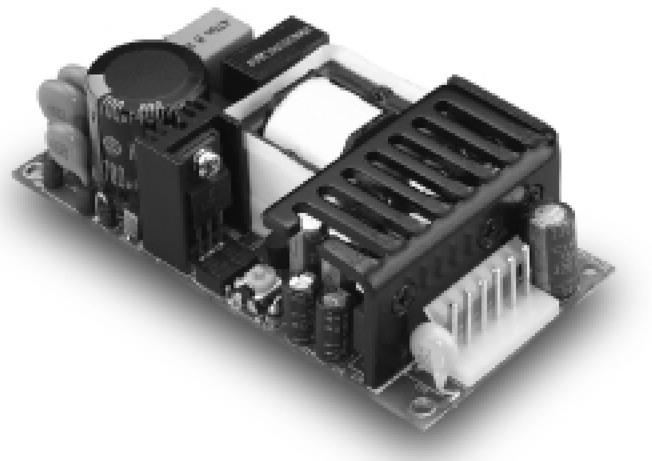


S E R I E S

CFM40D/T

40W DUAL/TRIPLE OUTPUT AC/DC OPEN FRAME

E176177



Features

- Universal Input : 90 ~ 264Vac
- 2" x 4" Footprint
- Industry-Standard Pin Out
- Efficiency at 75% Typical (70% for CFM40T-07)
- Meets UL/cUL,TUV,CE
- Conductive EMI Meets CISPR/FCC Class B

Specifications

INPUT CHARACTERISTICS:

Voltage ....90-264Vac; 120~370Vdc
Frequency........................47 to 440Hz
Inrush Current........................50A max. @264Vac
Input Current ....1A max. (RMS) @ 115Vac
Conducted EMI........................CISPR/FCC Class B
Isolation........................Input to Output=4,242Vdc
Leakage Current........................0.5mA max.

OUTPUT CHARACTERISTICS:

Maximum Power for Convection Colling..........40W (CFM40T-07, 30W)
With 30 CFM Forced Air........................50W (CFM40T-07, 40W)
Hold-up Time........................20mS typ. @115Vac
Short Circuit/ Over Load Protection......On All Outputs (Auto Recovery)
Over Voltage Protection.......3.6~4.6V/5.7~6.7V ON V1(3.3V/5V)
120%~140% ON V2(12V/15V/24V)
Adjustment Range........................±10% typ.

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature ....0 C ~ 50 C
Storage Temperature ....-20 C ~85 C

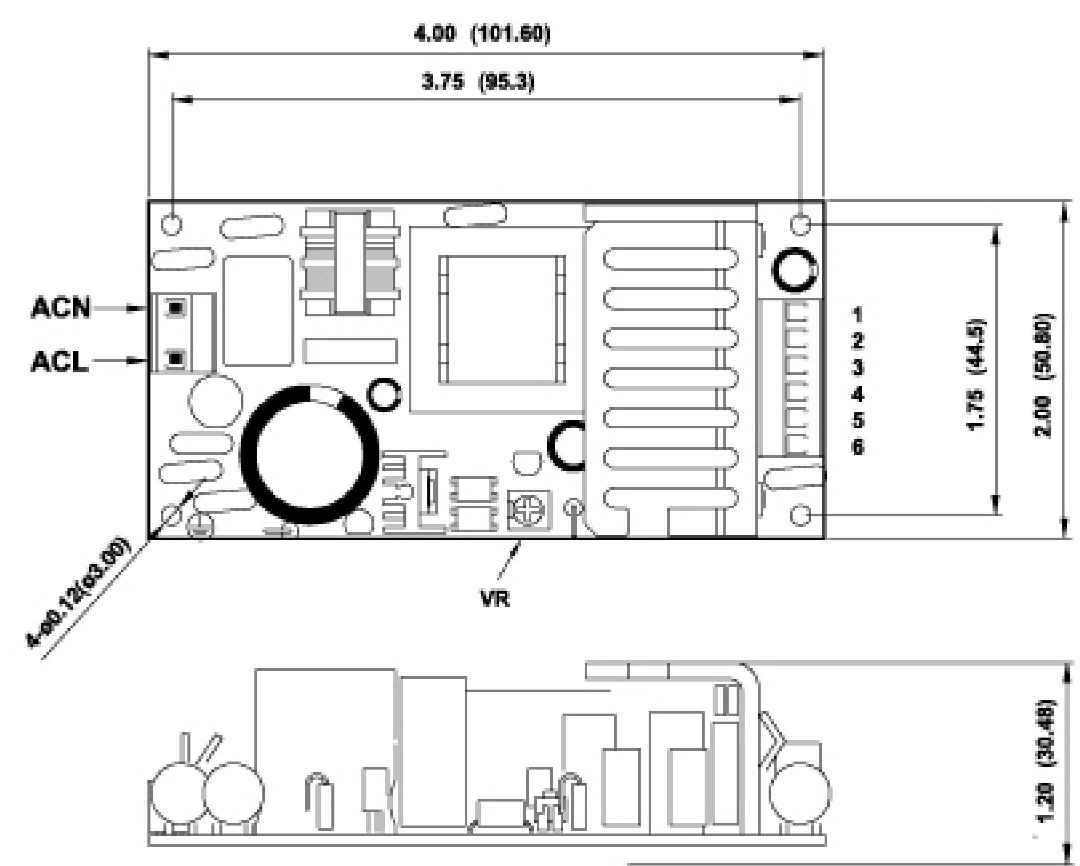
MECHANICAL OUTLINE:

Dimensions ....101.6 x 50.8 x 30.48 mm³

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	Output Voltage	Output Current (A) Min.	Rated	Max.	Ripple (mVp-p)	Voltage Accuracy	Line Reg.	Load Reg.	O/P Power Max.	EFF. (Typ.)
CFM40D-01	5V(V1)	0.4	3.2	5.0	50	±3%	±1%	±3%	40.0W	77%
	12V(V2)	0.2	2.0	2.5	120	±4%	±2%	±5%		
CFM40D-02	5V(V1)	0.4	3.2	5.0	50	±3%	±1%	±3%	40.0W	78%
	24V(V2)	0.2	1.0	1.5	240	±4%	±2%	±5%		
CFM40T-01	5V(V1)	0.4	3.0	5.0	50	±3%	±1%	±3%	40.5W	75%
	12V(V2)	0.2	2.0	2.5	120	±4%	±2%	±5%		
	-5V(V3)	0	0.3	0.5	50	±3%	±1%	±1%		
CFM40T-02	5V(V1)	0.4	3.0	5.0	50	±3%	±1%	±3%	42.6W	75%
	12V(V2)	0.2	2.0	2.5	120	±4%	±2%	±5%		
	-12V(V3)	0	0.3	0.5	120	±3%	±1%	±1%		
CFM40T-03	5V(V1)	0.4	3.0	5.0	50	±3%	±1%	±3%	42.0W	75%
	15V(V2)	0.2	1.5	2.3	150	±4%	±2%	±5%		
	-15V(V3)	0	0.3	0.5	150	±3%	±1%	±1%		
CFM40T-04	5V(V1)	0.4	3.0	5.0	50	±3%	±1%	±3%	42.6W	75%
	24V(V2)	0.2	1.0	1.5	240	±4%	±2%	±5%		
	-12V(V3)	0	0.3	0.5	120	±3%	±1%	±1%		
CFM40T-05	5V(V1)	0.4	3.0	5.0	50	±3%	±1%	±3%	40.5W	75%
	24V(V2)	0.2	1.0	1.5	240	±4%	±2%	±5%		
	-5V(V3)	0	0.3	0.5	50	±3%	±1%	±1%		
CFM40T-06	5V(V1)	0.4	3.0	5.0	50	±3%	±1%	±3%	42.6W	75%
	24V(V2)	0.2	1.0	1.5	240	±4%	±2%	±5%		
	12V(V3)	0	0.3	0.5	120	±3%	±1%	±1%		
CFM40T-07	3.3V(V1)	0.4	5.0	7.0	50	±3%	±1%	±3%	30.0W	70%
	5V(V2)	0.2	2.0	3.5	50	±4%	±2%	±5%		
	-12V(V3)	0	0.3	0.5	120	±3%	±1%	±1%		

NOTE:
1. Voltage accuracy is set at full load.
2. Add a 0.1μF ceramic capacitor and a 10μF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
3. Line regulation is measured from 100Vac to 240Vac with full load.
4. Load regulation is measured from 60% to 100% full load and from 60% to 20% full load (60% ± 40% full load)

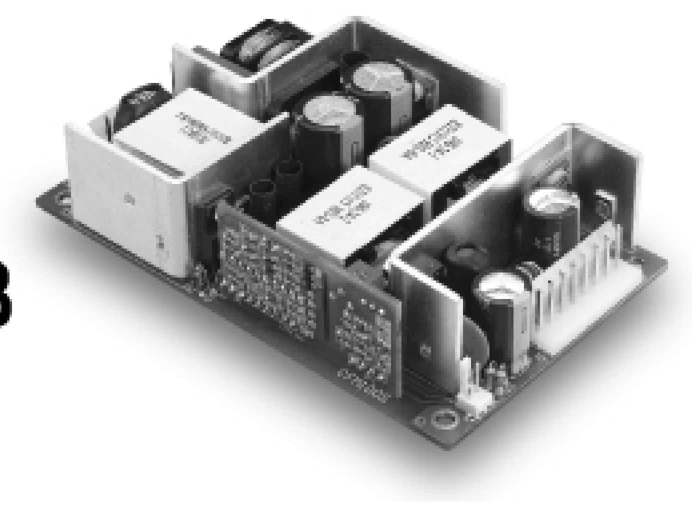


PIN CONNECTION	
Pin	CFM40D/T
1.	V2
2.	V1
3.	V1
4.	COM
5.	COM
6.	V3

S E R I E S

CFM100

100 WATT OPEN FRAME AC-DC MODULES WITH PFC



Features

- Universal Input : 90 ~ 264Vac
- Conductive EMI Meets CISPR/FCC Class B
- High Efficiency at 85% Typical

Specifications

INPUT CHARACTERISTICS:

Voltage .... 90 ~ 264Vac
Frequency .... 47 to 63Hz
Inrush Current .... 50A Max. @ 264Vac
Conducted EMI .... CISPR/FCC Class B
Isolation .... Input to output =4,242Vdc
Leakage Current .... 1.5mA max.

ENVIRONMENTAL CHARACTERISTICS:

Operating Temperature .... 0 ~ 40˚C
Storage Temperature .... -20 ~ 85˚C

OUTPUT CHARACTERISTICS:

Holdup Time .... 8mS typ. @ 115Vac
Short Circuit Protection .... Continuous
Over Voltage Protection .... Auto Recovery

MECHANICAL OUTLINE:

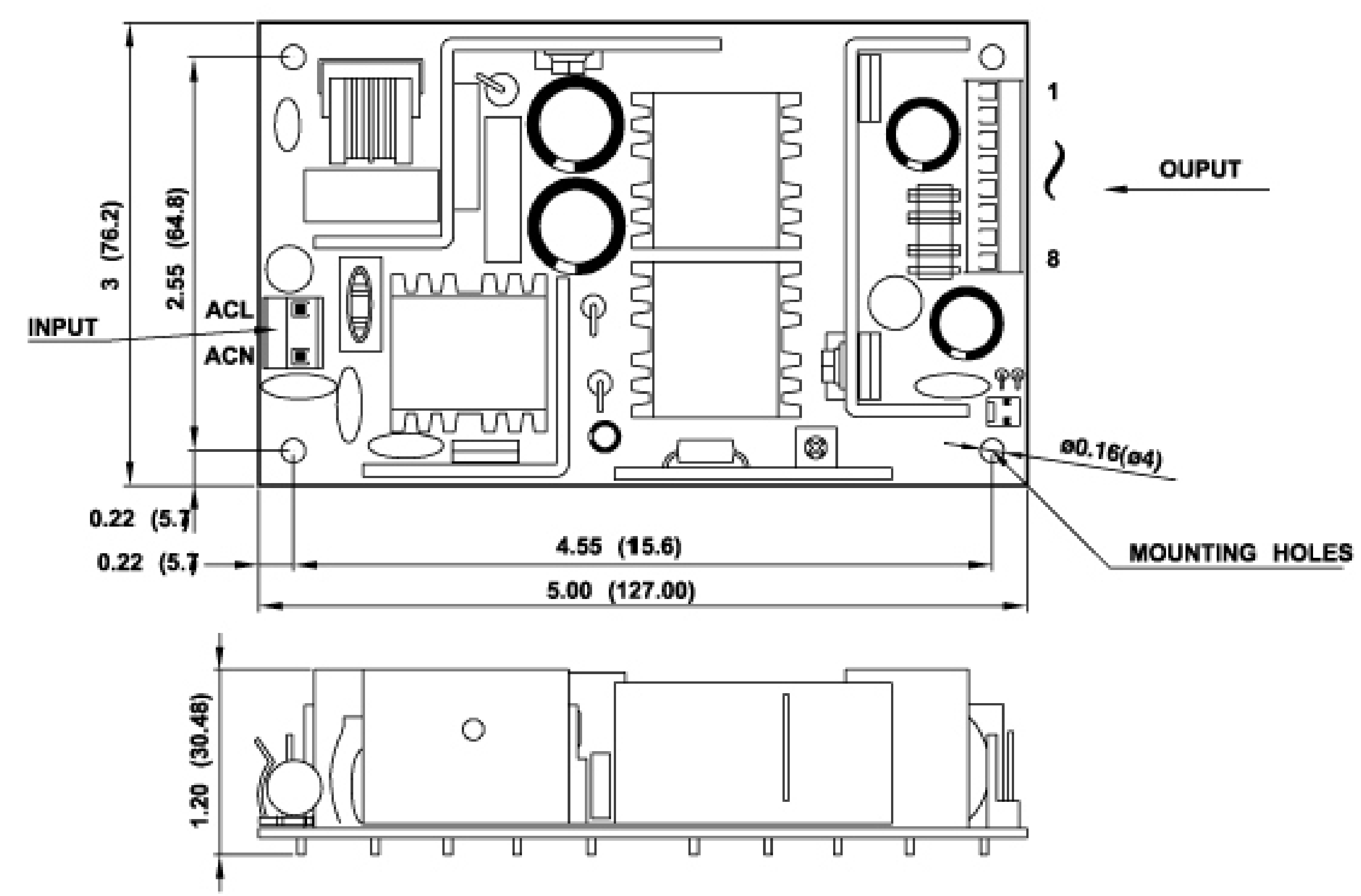
Dimensions .... 127 x 76.2 x 32.4 mm³

Typical at 25°C, nominal line and 75% load, unless otherwise Specified

MODEL	OUTPUT VOLTAGE	MAX. LOAD	IN. LOAD	RIPPLE & NOISE	OLTAGE ACCURACY	LINE REGULATION	LOAD REGULATION
CFM100S050	5 V	20 A	0A	1%	± 1%	± 0.5%	± 1%
CFM100S090	9 V	11.2 A	0A	1%	± 1%	± 0.5%	± 1%
CFM100S120	12 V	8.4 A	0A	1%	± 1%	± 0.5%	± 1%
CFM100S150	15 V	6.7 A	0A	1%	± 1%	± 0.5%	± 1%
CFM100S180	18 V	5.6 A	0A	1%	± 1%	± 0.5%	± 1%
CFM100S240	24 V	4.2 A	0A	1%	± 1%	± 0.5%	± 1%
CFM100S480	48 V	2.1 A	0A	1%	± 1%	± 0.5%	± 1%

NOTE:
1. Add a 0.1µF ceramic capacitor and a 10µF E.L. capacitor to output for Ripple & Noise measuring @20MHz BW.
2. Line regulation is measured from High Line to Low Line with full load.
3. Load regulation is measured from Full to 10% load.
4. Dimensions tolerance : +/- 1mm
5. Connectors: AC input : Molex 5277 or equivalent
   DC output : Molex 5273 or equivalent
6. DC output pin 1,2,3,4 : Vout (+)
   DC output pin 5,6,7,8 : Vout (-)

Mechanical Specification



CFM100

AC ADAPTER PART NUMBER CONFIGURATION

1. WALL MOUNT AC ADAPTER

TRXXXX-X-XXXXX

- DC Cable Length and Type
- Color of Case
- DC Plug Type
- AC Plug Type(for wall mount type)
- Model No.

2. DESK TOP AC ADAPTER

TRXXXXX-XXXXX

- DC Cable Length and Type
- Color of Case
- DC Plug Type
- Model No.

DC-Plug Type (standard Options)

01	5.5 x 2.1 x 12mm	Right Angle	Inner + Outer – + —— •) —— –
02	5.5 x 2.5 x 12mm	Right Angle	Inner + Outer – + —— •) —— –
03	5.5 x 2.1 x 12mm	Right Angle	Inner – Outer + – —— •) —— +
04	5.5 x 2.5 x 12mm	Right Angle	Inner – Outer + – —— •) —— +
11	5.5 x 2.1 x 12mm	Straight	Inner + Outer – + —— •) —— –
12	5.5 x 2.5 x 12mm	Straight	Inner + Outer – + —— •) —— –
13	5.5 x 2.1 x 12mm	Straight	Inner – Outer + – —— •) —— +
14	5.5 x 2.5 x 12mm	Straight	Inner – Outer + – —— •) —— +
21	5.5 x 2.5 x 9.5mm	Right Angle	Inner + Outer – + —— •) —— –
22	5.5 x 2.5 x 9.5mm	Right Angle	Inner – Outer + – —— •) —— +
23	5.5 x 2.1 x 9.5mm	Straight	Inner + Outer – + —— •) —— –
31	3.5 x 1.35 x 7.5mm	Right Angle	Inner + Outer – + —— •) —— –
32	5.5 x 2.1 x 7.5mm	Straight	Inner + Outer – + —— •) —— –
35	4.0 x 1.7 x 9.5mm	Straight	Inner + Outer – + —— •) —— –

Color of Case

A	Black Case	E	Black Case w/OVP

Noted: TR25Dseries DC-Plug Type part number is excluded. Please contact for further information.

Cable Length and Type for TR500/10R/15Series

01	720mm	20AWG / UL2468
02	1200mm	20AWG / UL2468
03	1800mm	20AWG / UL2468
11	720mm with Ferrite Core	20AWG / UL2468
12	1200mm with Ferrite Core	20AWG / UL2468
13	1800mm with Ferrite Core	20AWG / UL2468

AC Plug Type (for wall mount type)

A	USA 2Pin
S	Australia 2Pin
U	British 3Pin
E	Europe 2Pin

Note: The cable of TR1505/TR1506 is 18AWG/SPT1.

Cable Length and Type for TR25/20B Series

01	720mm	18AWG / SPT1
02	1200mm	18AWG / SPT1
03	1800mm	18AWG / SPT1
11	720mm with Ferrite Core	18AWG / SPT1
12	1200mm with Ferrite Core	18AWG / SPT1
13	1800mm with Ferrite Core	18AWG / SPT1

Cable Length and Type for TR36/45/70 Series

01	720mm	18AWG / UL1185
02	1200mm	18AWG / UL1185
03	1800mm	18AWG / UL1185
11	720mm with Ferrite Core	18AWG / UL1185
12	1200mm with Ferrite Core	18AWG / UL1185
13	1800mm with Ferrite Core	18AWG / UL1185

Note: The cable of TR45A05 is 16AWG/UL1185.

Cable Length and Type for TR100 Series

11	720mm with Ferrite Core	16AWG / UL2464	(Standard Type)
12	1200mm with Ferrite Core	16AWG / UL2464	(Standard Type)
13	1800mm with Ferrite Core	16AWG / UL2464	(Standard Type)
21	720mm with two Ferrite Core	16AWG / UL2464	
22	1200mm with two Ferrite Core	16AWG / UL2464	
23	1800mm with two Ferrite Core	16AWG / UL2464	

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.