CAT.No.F072-1

Semiconductor Short Form Catalog

SHINDENGEN

⚠ The level of quality of our products shown in this catalog is intended for use in standard applications requiring ordinary reliability. In the case these products are to be used in equipment or devices for special or specific applications requiring extremely high levels of quality and reliability in which failure or malfunction of a product may directly affect human life or health, always make sure to obtain confirmation by contacting our firm in advance. The quality levels of our products are classified in the manner shown below.

Standard Applications
Computers, OA and other office equipment, communication terminal equipment, measuring instruments, AV equipment, amusement equipment, home appliances, machine tools, personal equipment, industrial equiment, etc.

Special Applications
Transportation equipment (automotive, marine, etc.), trunk line communication equipment, traffic signal equipment, fire prevention/anti-theft equipment, various safety devices, health care equipment, etc.

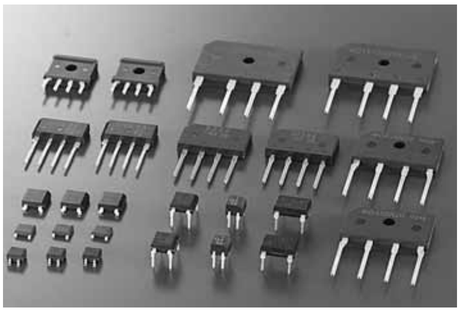
Specific Applications
Nuclear power control systems, aeronautical equipment, aerospace equipment, submarine relay equipment, devices and systems for preserving life, etc.

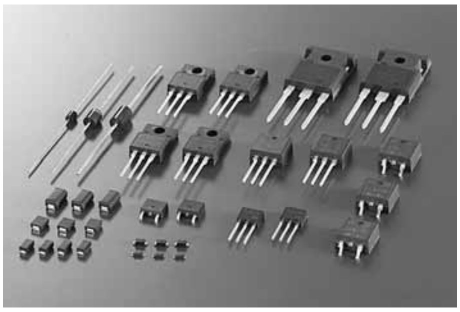
⚠ Although efforts are constantly made to improve quality and reliability, please select a product after careful examination so that personal injury, accidents and social damage can be prevented as a result of deploying measures such as a redundant design, designs that prevent the spreading of fire, designs that prevent malfunctions and so forth while taking safety into consideration as necessary.

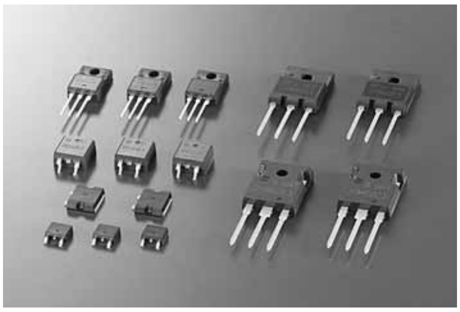
SHINDENGEN

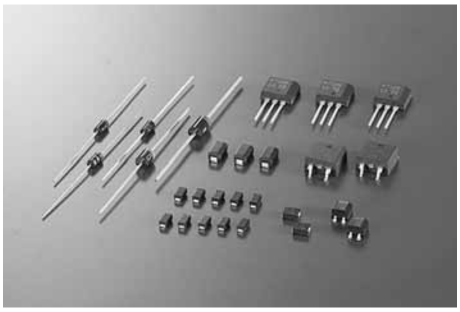
Semiconductor Short Form Catalog

CONTENTS









ALPHANUMERIC PRODUCT INDEX

Rectifier Diodes

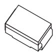
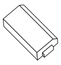
Low frequency rectifying

Single

Surface Mount


G1F

M1F

1F

M2F

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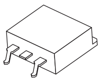
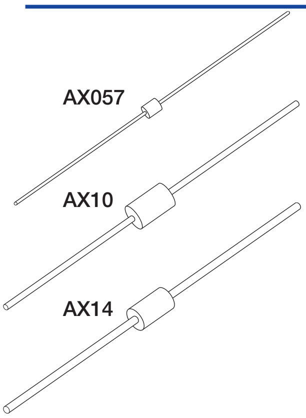

STO-220

Type No.	Absolute Maximum Ratings Io [A]	Conditions Ta [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	Electrical Characteristics VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]	Outline Package	Fig.
☆DG0R7E40*3	0.7	64	20	400	-55 to 150	150	1.1	0.7	10	20	120	—	G1F	11
☆60	Blu	59	15	600	-55 to 150	150	1.1	0.7	10	20	120	—	G1F	11
M1FE40*3	1	40	t	See	: SpeS	2	1.1	1	10	6.	1	2		S3
V	(	R	I	F00	_ee/se/7		[°[	(	j a		Typ	—		
(max)				j aa	R V V									
D1F60	1	[A	FS	I	(mmV VR	R	TsT	[	Tj	[V	(ma	—	F	[°C
D1F60A	[℃		Tj	[W			(max	1.2						
D2F60	1.4	25	60	600	O to 150	I	[A	FSM	10	24	90	—	2F	16-1
☆M2F60	1.2	51	50	600	-55 to 150	150	0.97	1.2	10	33	90	—	M2F	15-1
☆M3FE40*3	3	76*1	75	400	-55 to 150	150	1.1	3	10	25	110	25		
☆M3F60	3	100*1	90	600	-55 to 150	150	1.05	3	10	16	55	—		
D3F60	3	80*1	150	600	-55 to 150	150	1.05	3	10	23	80	—	2F	16-1
D4F60	4	68*1	200	600	-55 to 150	150	0.95	4	10	23	80	—		
DF25V60	25	136*2	400	600	-55 to 150	150	1.1	25	10	—	—	0.5	STO-220	36-2

☆: New product ∗1: Tl ∗2: Tc ∗3: High ESD Capability

Axial

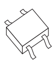


Type No.	Absolute Maximum Ratings Io [A]	Conditions Ta [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	Electrical Characteristics VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	θjl (max) [°C/W]	θja (max) [°C/W]	Outline Package	Color Code	Fig.
D1N20*1	1	25	30	200	-55 to 150	150	1.05	1	10	10	113	AX057	—	1
D1N60*2				600										
S2V20*S	1.7	40	60	200	-55 to 150	150	1.05	1.7	10	8	—	AX10	Red	6-1
S2V60*2				1										
1 *B	3.5	25	120	200	-55 to 150	150		7	Sp	20	—	AX14	Red	8
12 *M				DGG									0.7	

∗1: 10 2□□□11 ∗1-5 t o o □□□1(400 0 0 25 2 2)

Twin

Array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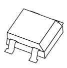
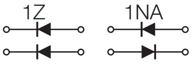
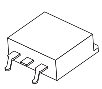

1NA (SMD)

Type No.	Absolute Maximum Ratings 1 [A]	Conditions Ta [°C]	3. 4 1 0	CTa [° C	F [A]	45 12	Electrical Characteristics Q 0 97 60	Conditions IF [A]	I1 -5 1 =VRM [μ I	θjl (max) [°C/W]	θ80 M F80 13-	Outline Package	Fig.
S1ZA20	1.1	25	30	200	-40 to 150	150	1.1	0.9	10	—	93	1Z	23-2
S1ZA60				600									
☆S1NAD80	3	102	110	800	-55 to 150	150	1.05	0.75	10	15	84	1NA	27-2

Array type 1Z 1NA



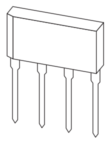
Doubler


STO-220 (SMD)

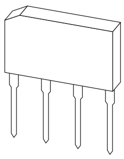
108	Absolute Maximum Ratings v F	V RM [M]	625 25	VRM [V]	1. [°C]	10 1	Electrical Characteristics V1 10 8 23	Conditions IT [° C	22 1 M = RM [μA]	θjl (max) [°C/W]	θ 2D 1 1.	Outline Package	Fig.
DF5VD60	5	140	140	600	-40 to 150	150	1.05	2.5	10	—	2	STO-220	I
DF15VD60	15	127	190	600	-40 to 150	150	1.05	7.5	10	—	1.6		

Rectifier Diodes

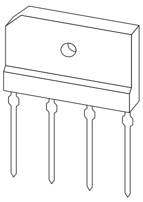
SIP Bridge Diodes



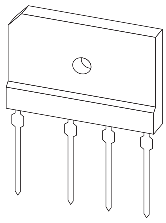
1V



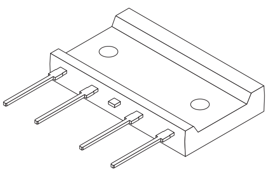
2S



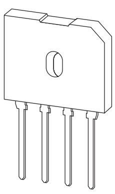
3S



5S



TSB(4PIN)



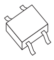
D6K

Type No.	Absolute Maximum Ratings						Electrical Characteristics						Remarks	Outline	
	Io [A]	Conditions Tc [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]		Package	Fig.
S1VB20				200											
S1VB60	1	25*1	30	600	-40 to 150	150	1.05	0.5	10	16	62	—	—	1V	55
S1VB80				800											
S1VBA20	1	25*1	50	200	-40 to 150	150	1.05	0.5	10	16	62	—	Large IFSM	1V	55
S1VBA60				600											
D2SBA20	1.5	25*1	60	200	-40 to 150	150	1.05	0.75	10	10	47	—	—	2S	56
D2SBA60				600											
D2SB20				200											
D2SB60	1.5	25*1	80	600			1.05	0.75							
D2SB80				800	-40 to 150	150			10	10	47	—	—	2S	56
D2SB60L	1.5	25*1		600			1.05	0.75							
D2SB60A	2	115*2	120	600			0.95	1							
D2SB80A	2	115*2		800			0.95	1							
D3SBA20	4	108	80	200	-40 to 150	150	1.05	2	10	6	30	5.5	UL®	3S	57
D3SBA60				600											
D3SB20				200											
D3SB60	4	108	120	600	-40 to 150	150	1.05	2	10	6	30	5.5	UL®	3S	57
D3SB80				800											
D4SB60L	4	111	150	600	-40 to 150	150	0.95	2	10	6	30	5.5	UL®	3S	57
D4SB80		108		800											
D5SBA20	6	110	120	200	-40 to 150	150	1.05	3	10	5	26	3.4	UL®	5S	58
D5SBA60				600											
D5SB20				200									UL®		
D5SB60	6	110	170	600	-40 to 150	150	1.05	3	10	5	26	3.4	UL® Large IFSM	5S	58
D5SB80				800											
D6SB60L	6	112	170	600	-40 to 150	150	1.05	3	10	5	26	3.4	UL®	5S	58
D6SB80		110		800											
D10XB20		100	120	200			1.1					2.3	UL®		
D10XB60				600											
D10XB80	10	100	120	800	-40 to 150	150	1.1	5	10	6	26	2.3	UL®	3S	57
D10XB20H		112	170	200			1.05					1.9	UL® Large IFSM		
D10XB60H				600											
D15XB20		100	200	200			1.1						UL®		
D15XB60				600											
D15XB80	15	100	200	800	-40 to 150	150	1.1	7.5	10	5	22	1.5	UL®	5S	58
D15XB20H		107	240	200			1.05						UL®		
D15XB60H				600									UL® Large IFSM		
D20XB20				200											
D20XB60	20	87	240	600	-40 to 150	150	1.1	10	10	5	22	1.5	UL®	5S	58
D20XB80				800											
D25XB20				200											
D25XB60	25	98	350	600	-40 to 150	150	1.05	12.5	10	5	22	1.0	UL®	5S	58
D25XB80				800											
☆D50XB80	50	95	600	800	-40 to 150	150	1.05	25	10	—	16	0.5	UL®	TSB (4PIN)	59
☆US4KB80R	4	125	150					2				3.5			
☆US6KB80R	6	116	175	800	-55 to 150	150	1.0	3	10	5.0	35	3.0	UL®	D6K	53
☆US8KB80R	8	108	200					4				2.8			
☆US10KB80R	10	100	150					5				2.5			
☆US15KB80R	15	101	200	800	-55 to 150	150	1.1	7.5	10	5.0	35	1.5	UL®	D6K	53
☆US30KB80R	30	97	350					15				0.8			

☆: New product　　＊1: Ta　　＊2: Tl

UL®: UL recognized (UL File No.E142422)

DIP Bridge Diodes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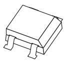
1Z (THD)

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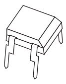
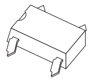

1N/1NA (THD)

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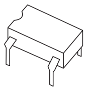
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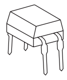
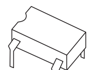

1Y (THD)

Type No.	Absolute Maximum Ratings						Electrical Characteristics					Remarks	Outline	
	Io [A]	Conditions Ta [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	θjl (max) [°C/W]	θja (max) [°C/W]		Package	Fig.
S1YB20	0.4	40	30	200	-40 to 150	150	1.05	0.2	10	—	150	—	1Y	22-1
S1YB60				600										
S1ZB20	0.8	25	30	200	-40 to 150	150	1.05	0.4	10	20	76	—	1Z	∗1
S1ZB60				600										
S1ZB80				800										
D1UBA80	1	25	30	800	-55 to 150	150	0.95	0.4	10	25	62.5	—	SOPA-4	33
S1NB20	1	25	30	200	-40 to 150	150	1.05	0.5	10	15	68	—	1N	∗2
S1NB60				600										
S1NB80				800										
S1NBB80	1	26	50	800	-40 to 150	150	1.05	0.5	10	15	68	—	1NA	∗3
S1WB(A)20	1	25	30	200	-40 to 150	150	1	0.5	10	10	65	—	1W	∗4
S1WB(A)60				600										
S1WB(A)80			30	800								—		
S1WB(A)60B			50	600								Large IFSM		
S1NBC60	1.5	105∗5	60	600	-55 to 150	150	1.05	0.75	10	15	68	Large IFSM	1NA	∗3
S1NBC80				600										

∗1: SMD Package Fig.23-1; THD Package Fig.24 ∗2: SMD Package Fig.25; THD Package Fig.26
∗3: SMD Package Fig.27-1; THD Package Fig.28 ∗4: SMD Package Fig.29; THD Package Fig.30 ∗5 : Tl

Low Noise Bridge Diodes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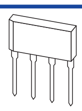
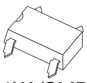

1V

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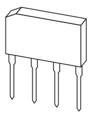
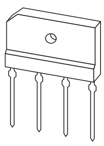
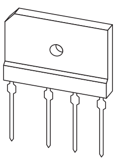

2S

3S

Type No.	Absolute Maximum Ratings						Electrical Characteristics							Remarks	Outline	
	Io [A]	Conditions Tc [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	trr (max) [μS]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]		Package	Fig.
LN1WBA60	1.1	25∗1	50	600	-40 to 150	150	1.0	0.55	10	5	10	65	—	—	1W	∗2
LN1VB60	1.2	25∗1	50				1.0	0.6			16	62	—	—	1V	55
LN2SB60	1.6	25∗1	120				1.0	0.8			10	47	—	—	2S	56
LN4SB60	4	111	150				0.95	2			6	30	5.5	UL®	3S	57
LN6SB60	6	111	170				1.05	3			5	26	3.4	UL®	5S	58
LN15XB60	15	100	200		-55 to 150	150	1.1	7.5			5	23	1.5	—	5S	58
LN15XB60H		106	290				1.05							Large IFSM		
LN25XB60	25	85	350		-55 to 150	150	1.05	12.5			5	23	1.3	—	5S	58

∗1: Ta ∗2: SMD Package Fig.29; THD Package Fig.30 UL®: UL recognized (UL File No. E142422)

Low VF Bridge Diodes

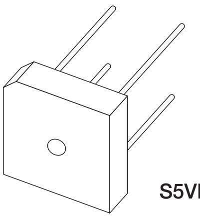

5S

Type No.	Absolute Maximum Ratings								Electrical Characteristics								Remarks	Outline	
	Io [A]	Conditions Tc [°C]	IFSM [A]	IFSM1∗ [A]	I2t [A]	VRM [V]	Tstg [°C]	Tj [°C]	VF (max) [V]	VF (typ) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	trr (max) [μS]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]		Package	Fig.
☆LL15XB60	15	124	200	630	200	600	-55 to 150	150	0.90	0.86	7.5	10	3	5	25	1	UL®	5S	58
☆LL25XB60	25	113	300	945	450	600	-55 to 150	150	0.92	0.87	12.5	10	3	5	25	0.8			

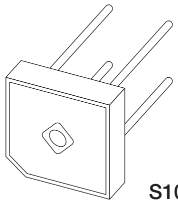
☆: New product ∗: IFSM1: Pulse width 1ms UL®: UL recognized (UL File No. E142422)

Rectifier Diodes

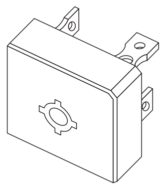
SQIP Bridge Diodes



S5VB



S10VB

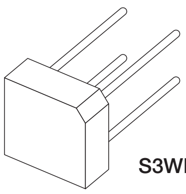


S15VB

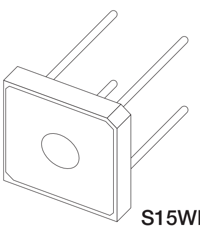
Type No.	Absolute Maximum Ratings						Electrical Characteristics						Outline	
	Io [A]	Conditions Ta [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [µA]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]	Package	Fig.
S2VB20	2	40	40	200	-40 to 150	150	1.05	1	10	7	–	–	S2VB	61
S2VB60				600										
S4VB20	4*1	40	80	200	-40 to 150	150	1.05	2	10	4.5	–	–	S4VB	62
S4VB60				600										
S5VB20	6*1	40	200	200	-40 to 150	150	1.05	3	10	3	–	–	S5VB	63
S5VB60				600										
S10VB20	10*1	40	200	200	-40 to 150	150	1.05	5	10	2.8	–	–	S10VB	64
S10VB60				600										
S15VB20	15*1	83*2	200	200	-40 to 150	150	1.05	7.5	10	–	–	2.3	S15VB	65
S15VB60				600										
S25VB20				200										
S25VB60	25*1	85*2	400	600	-40 to 150	150	1.05	12.5	10	–	–	1.5	S25VB	66
S25VB80				800										
S50VB60	50*1	95*2	500	600	-40 to 150	150	1.05	25	10	–	–	0.5	S50VB	67
S50VB80				800										

*1: With heatsink *2: Tc

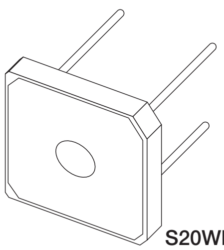
Input/Output In-line Terminal Type



S3WB



S15WB

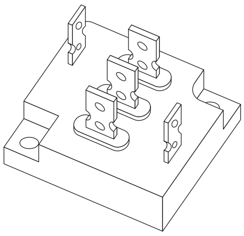


S20WB

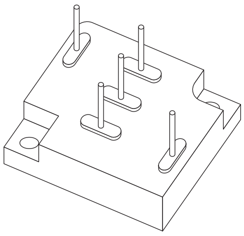
Type No.	Absolute Maximum Ratings						Electrical Characteristics						Outline	
	Io [A]	Conditions Tc [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [µA]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]	Package	Fig.
S3WB20	2.3	40*	120	200	-40 to 150	150	1.05	2	10	5.5	26.5	–	S3WB	68
S3WB60				600										
S10WB20	10	74	170	200	-40 to 150	150	1.05	5	10	4	24	3.9	S10WB	69
S10WB60				600										
S15WB20	15	77	200	200	-40 to 150	150	1.05	7.5	10	2	19	2.5	S15WB	70
S15WB60				600										
S20WB20				200										
S20WB60	20	76	500	600	-40 to 150	150	1.05	10	10	2	17	2	S20WB	71
S20WB80				800										

*: Ta

3 Phase Bridge Diode Modules



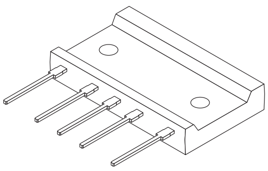
SVT



SVTA

Type No.	Absolute Maximum Ratings						Electrical Characteristics				Outline	
	Io [A]	Conditions Tc [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	θjc (max) [°C/W]	Package	Fig.
S10VT60	10	137	170	600	-40 to 150	150	1.05	3.5	10	0.65	SVT	74
S10VTA60		137	170	600	-40 to 150	150	1.05	3.5	10	0.65	SVTA	73
S10VT80		137	150	800	-40 to 150	150	1.05	3.5	10	0.65	SVT	74
S10VTA80		137	150	800	-40 to 150	150	1.05	3.5	10	0.65	SVTA	73
S15VT60	15	132	200	600	-40 to 150	150	1.05	5	10	0.6	SVT	74
S15VTA60		132	200	600	-40 to 150	150	1.05	5	10	0.6	SVTA	73
S15VT80		132	200	800	-40 to 150	150	1.05	5	10	0.6	SVT	74
S15VTA80		132	200	800	-40 to 150	150	1.05	5	10	0.6	SVTA	73
S20VT60	20	128	300	600	-40 to 150	150	1.05	7	10	0.55	SVT	74
S20VTA60		128	300	600	-40 to 150	150	1.05	7	10	0.55	SVTA	73
S20VT80		128	300	800	-40 to 150	150	1.05	7	10	0.55	SVT	74
S20VTA80		128	300	800	-40 to 150	150	1.05	7	10	0.55	SVTA	73
S30VT60	30	121	400	600	-40 to 150	150	1.05	10	10	0.5	SVT	74
S30VTA60		121	400	600	-40 to 150	150	1.05	10	10	0.5	SVTA	73
S30VT80		121	400	800	-40 to 150	150	1.05	10	10	0.5	SVT	74
S30VTA80		121	400	800	-40 to 150	150	1.05	10	10	0.5	SVTA	73
S30VTA160		116	350	1600	-40 to 150	150	1.05	10	100	0.5	SVTA	73

3 Phase SIP Bridge Diode



TSB (5PIN)

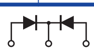
Type No.	Absolute Maximum Ratings						Electrical Characteristics						Remarks	Outline	
	Io [A]	Conditions Tc [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]		Package	Fig.
☆D30XT80	30	117	300	800	-40 to 150	150	1.05	10	10	—	16	0.5	UL®	TSB (5PIN)	60
☆D45XT80	45	101	400	800	-40 to 150	150	1.05	15	10	—	16	0.5	UL®		60

☆: New product

UL®: UL recognized (UL File No. E142422)

Twin Diode Modules

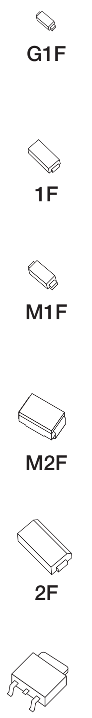
Type No.	Absolute Maximum Ratings						Electrical Characteristics						Remarks	Outline	
	Io [A]	Conditions Tc [°C]	IFSM [A]	VRM [V]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]		Package	Fig.
D30VC60	30	124	300	600	-40 to 150	150	1.05	15	10	—	—	0.9	∗	D30VC	76

∗: Center-tap 

Schottky Barrier Diodes

Single

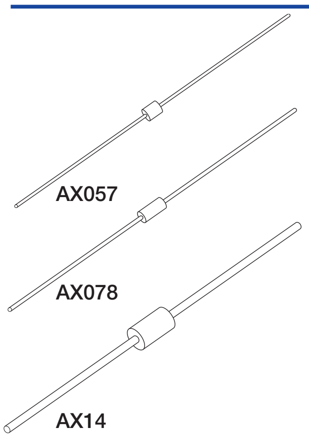
Surface Mount



Type No.	V1 1 0	Io [A]	Conditions Tc 1	1-5 t o	1 082	Tj 01	1F (max) [V]	13- 3- 1F [A]	IR (max) 19=95 DE S6	24 5 [pF]	θjE 12 5	θja (max) [°C/W]	θjc (max) [°C/W]	DG1JG0A	10
☆DG1J2A	20	1.5	15*2	2F	1. . DFD 6-	150	0.52	1.5	0.01	15	t	-5	—	1 50	00
☆DG1H3	30	1.0	113*1	20	-55 to 125	125	0.36	0.7	1.0	37	25	70	22	G1F	11
☆DG1M3		1.0	27*2	20	-55 to 150	150	0.46	0.7	0.05	36	25	70	22	G1F	11
M1FP3		1.29	25*2	30	-55 to 125	125	0.35	0.4	2.5	90	20	108	—	M1F	12
☆DG1H3A		1.5	107*1	30	-55 to 125	125	0.36	1.5	1.0	70	25	70	22	G1F	11
☆DG1M3A		1.5	37*2	30	-55 to 150	150	0.46	1.5	0.05	70	25	70	22	G1F	11
M1FH3		1.5	105	30	-55 to 125	125	0.30	0.5	1.0	80	20	80	18	M1F	12
D1FP3		2	98*1	60	-55 to 125	125	0.4	2	4.5	130	23	108	—	1F	13-1
D1FH3		3	95	60	-55 to 125	125	0.30	1.0	1.0	130	18	65	16	1F	13-1
D3FP3		3	74*1	150	-55 to 125	125	0.4	3	10	300	24	90	—	2F	16-1
M1FM3		3	100	30	-55 to 150	150	0.40	0.5	0.05	80	20	80	18	M1F	12
D1FM3		5	83	90	-55 to 150	150	0.40	1.0	0.1	130	18	65	16	1F	13-1
M2FH3		6	70	110	-55 to 125	125	0.30	2	4	240	16	55	14	M2F	15-1
M2FM3		6	99	120	-55 to 150	150	0.40	2	0.2	240	16	55	14	M2F	15-1
DE10P3		10	95	200	-55 to 125	125	0.4	8	25	600	—	—	4	E-pack	31-4
52		60	150	t o	Q . to 150	2	2	1	8	86	—	—	A	Bl ue	31-4
☆DG1S4	40	1.0	36*2	30	-55 to 150	150	0.55	0.7	0.8	37	5-	**3**	—	**S26**	11
D1FS4		1.1	51*2	30	-55 to 150	150	0.55	1.1	1	65	23	108	—	1F	13-1
M1FS4		1.33	25*2	30	-55 to 150	150	0.55	1.1	0.8	50	20	108	—	M1F	12
☆M1FJ4		1.5	31*2	30	-55 to 150	150	0.57	1	0.05	65	20	108	—	M1F	12
D1FS4A		1.5	28*2	60	-55 to 150	150	0.45	1.1	2	95	23	108	—	1F	13-1
D2FS4		1.6	34*2	60	-55 to 150	150	0.55	1.6	2.5	150	24	90	—	2F	16-1
☆D1FJ4		2.0	117*1	50	-55 to 150	150	0.57	1.5	0.2	96	23	108	—	1F	13-1
D3FS4A		2.6	34*2	150	-55 to 150	150	0.45	2.6	5	340	23	80	—	2F	16-1
DE3S4M		3	121	70	-40 to 150	150	0.55	3	2.5	150	—	55	12	E-pack	31-2
DE5S4M		5	101	80	-40 to 150	150	0.55	5	3.5	180	—	55	12	E-pack	31-2
☆DG1S6	60	1.0	30*1	30	-55 to 150	150	0.58	0.7	1	32	20	70	—	G1F	11
D1FS6		1.1	25*2	40	-55 to 150	150	0.58	1.1	1	50	23	108	—	1F	13-1
M1FS6		1.2	25*2	40	-55 to 150	150	0.58	1.1	1	53	20	108	—	M1F	12
D2FS6		1.5	31*2	60	-55 to 150	150	0.58	2	2	120	24	90	—	2F	16-1
D3FS6		3	87*1	80	-55 to 150	150	0.58	3	2.5	130	24	90	—	2F	16-1
DE3S6M		3	117	80	-40 to 150	150	0.58	3	2.5	130	—	55	12	E-pack	31-2
[m A]		R	V	R	-40 to V	150	0.58	(	j	C	—	[[	(m	l	31-2
☆Pa ckcge	Fi i	[V]	125*R	30	FSS[A] [150	I	[°C]	T	[°C	43	20	70	—	G1F	W
☆ t o t		-5	59*2	50	7002 0 283	G1F	1	[	0.2	63	23	108	—	I	ConC
☆D3FJ10		3	92*1	100	-55 to 150	150	0.74	3	0.4	143		660	—	30	1501
☆DG1N15A	150	1.4	65*2	30	-55 to 150	150	0.88	1.4	0.05	32	20	70	—	G1F	11

☆: New product ∗1: Tl ∗2: Ta

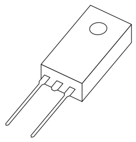
Axial



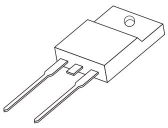
Type No.	VRM [V]	Io [A]	Conditions Ta [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [mA]	Cj (typ) [pF]	θjl (max) [°C/W]	θja (max) [°C/W]	Package	Color Code	Fig.
D1NS4*2	40	1	59	30	-55 to 150	150	0.55	1	0.8	50	10	113	AX057	—	1
D2S4M*3		2	122*1	60	-40 to 150	150	0.55	2	2	95	17	105	AX078	Silver	5-1
D3S4M*2		3	63	80	-40 to 150	150	0.55	3	3.5	150	6.5	36	AX14	Silver	8
D1NS6*2	60	1	46	30	-55 to 150	150	0.58	1	1	53	10	113	AX057	—	1
G1GF *0		1	**DE**	10	-40202124	150	-5	1	0	8	1	64	4	E-pa	6-1
D2S6M*3		2	119*1	60	-40 to 150	150	0.58	2	2	120	17	105	AX078	Blue	20
D3S6M*2		3	133*1	80	-40 to 150	150	0.58	3	2.5	130	6.5	62	AX14	Blue	8
☆D1NJ10*3	100	1	137*1	30	-55 to 150	150	0.82	1	0.1	43	10	113	AX057	—	1

☆: New product ∗1: Tl ∗2: Spec Code 5□□□ ∗3: Spec Code 7□□□
(See page 44 for the last 3 digits of the Spec Code)

Two Terminal Type



ITO-220

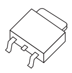


FTO-220

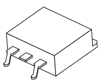
Type No.	Absolute Maximum Ratings						Electrical Characteristics					Outline	
	VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [mA]	Cj (typ) [pF]	θjc (max) [°C/W]	Package	Fig.
SF20H1R5	15	20	97	250	-55 to 125	125	0.41	20	10	960	2.0	FTO-220	47
SF30H1R5		30	89	400	-55 to 125	125	0.41	30	15	1400	2.0	FTO-220	47
D5S4M	40	5	131	100	-40 to 150	150	0.55	5	3.5	180	4.5	ITO-220	41
SF5S4		5	136	150	-40 to 150	150	0.55	5	3.5	180	3.5	FTO-220	47
D5S6M	60	5	130	100	-55 to 150	150	0.58	5	4.5	260	4.5	ITO-220	41
SF5S6		5	134	150	-55 to 150	150	0.58	5	4.5	200	3.5	FTO-220	47
D5S9M	90	5	121	100	-40 to 150	150	0.75	5	3.0	185	4.5	ITO-220	41

Center Tap, Common Cathode

Surface Mount

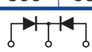


E-pack



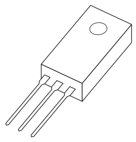
STO-220

Type No.	Absolute Maximum Ratings						Electrical Characteristics					Outline	
	VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [mA]	Cj (typ) [pF]	θjc (max) [°C/W]	Package	Fig.
DE5PC3	30	5	90	90	-55 to 125	125	0.4	2.5	6	180	12	E-pack	31-1
DE5SC3ML		5	110	90	-55 to 150	150	0.45	2.5	3.5	190	12	E-pack	31-1
DE10PC3		10	97	80	-55 to 125	125	0.4	4	10	290	4	E-pack	31-1
DE10SC3L		10	124	100	-55 to 150	150	0.45	4	5	290	4	E-pack	31-1
DF20PC3M		20	105	200	-55 to 125	125	0.4	8	35	560	1.6	STO-220	36-1
DF30PC3M		30	97	300	-55 to 125	125	0.4	10	50	840	1.6	STO-220	36-1
DF30SC3ML		30	119	350	-55 to 150	150	0.45	12.5	10	820	1.6	STO-220	36-1
DF40PC3		40	105	350	-55 to 125	125	0.4	15	45	1160	0.8	STO-220	36-1
DF40SC3L		40	112	400	-55 to 150	150	0.45	15	17	1200	1.5	STO-220	36-1
DE5SC4M	40	5	101	80	-40 to 150	150	0.55	2.5	3.5	150	12	E-pack	31-1
DE10SC4		10	132	100	-55 to 150	150	0.55	5	3.5	210	4	E-pack	31-1
DF10SC4M		10	125	100	-40 to 150	150	0.55	5	3.5	180	3	STO-220	36-1
DF15SC4M		15	129	150	-40 to 150	150	0.55	7.5	5	340	1.7	STO-220	36-1
DF20SC4M		20	122	230	-40 to 150	150	0.55	10	7.5	390	1.7	STO-220	36-1
DF30JC4		30	115	250	-55 to 150	150	0.61	15	0.7	560	1.6	STO-220	36-1
DF30SC4M		30	112	360	-40 to 150	150	0.55	15	10	590	1.6	STO-220	36-1
DF40SC4		40	106	350	-55 to 150	150	0.55	20	14	860	1.5	STO-220	36-1
DE5SC6M	60	5	92	80	-40 to 150	150	0.58	2.5	2.5	130	12	E-pack	31-1
DF10SC6		10	132	150	-55 to 150	150	0.58	5	4.5	260	2.0	STO-220	36-1
DF25SC6M		25	115	300	-40 to 150	150	0.58	12.5	10	490	1.6	STO-220	36-1
DF30JC6		30	108	250	-55 to 150	150	0.69	15	0.7	490	1.6	STO-220	36-1
DF10SC9	90	10	131	150	-55 to 150	150	0.75	5	3	185	1.2	STO-220	36-1
DF20SC9M		20	111	200	-40 to 150	150	0.75	10	10	370	1.6	STO-220	36-1
DF15JC10	100	15	126	150	-55 to 150	150	0.86	7.5	0.6	200	1.8	STO-220	36-1
DF20JC10		20	121	200	-55 to 150	150	0.86	10	0.7	260	1.6	STO-220	36-1
DF30JC10		30	116	300	-55 to 150	150	0.86	15	1.0	390	1.3	STO-220	36-1
☆DF10NC15	150	10	131	100	-55 to 150	150	0.88	5	0.2	110	2.1	STO-220	36-1
☆DF15NC15		15	126	150	-55 to 150	150	0.88	7.5	0.3	155	1.8	STO-220	36-1
☆DF20NC15		20	121	200	-55 to 150	150	0.88	10	0.4	200	1.6	STO-220	36-1
☆DF30NC15		30	115	300	-55 to 150	150	0.88	15	0.5	300	1.3	STO-220	36-1

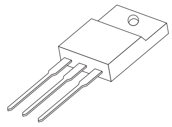
☆: New product Center-tap 

Schottky Barrier Diodes

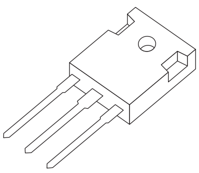
Three Terminal Type



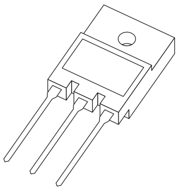
ITO-220



FTO-220/FTO220A

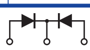


MTO-3P

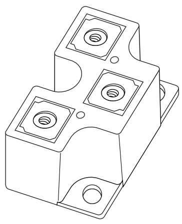


ITO-3P

Type No.	Absolute Maximum Ratings						Electrical Characteristics					Outline	
	V_{RM} [V]	I_O [A]	Conditions T_C [°C]	I_{FSM} [A]	Tstg [°C]	Tj [°C]	V_F (max) [V]	Conditions I_F [A]	I_R (max) V_R=V_{RM} [mA]	Cj (typ) [pF]	θjc (max) [°C/W]	Package	Fig.
S40HC1R5	15	40	103	350	-55 to 125	125	0.41	20	10	960	1.0	MTO-3P	46-1
S60HC1R5		60	90	500	-55 to 125	125	0.41	30	15	1400	1.0	MTO-3P	46-1
SF5SC3L	30	5	143	100	-55 to 150	150	0.45	2.5	3.5	220	2.3	FTO-220	48-1
SF10SC3L		10	139	150	-55 to 150	150	0.45	4	5	310	2.3	FTO-220	48-1
SF20SC3L		20	125	230	-55 to 150	150	0.45	8	9	570	2.0	FTO-220	48-1
SF30SC3L		30	111	350	-55 to 150	150	0.45	12.5	15	960	2	FTO-220	48-1
S40HC3		40	105	400	-55 to 125	125	0.40	20	15	800	0.7	MTO-3P	46-1
S60HC3		60	104	550	-55 to 125	125	0.40	30	20	1100	0.5	MTO-3P	46-1
S60SC3ML		60	130	500	-40 to 150	150	0.48	30	25	1600	0.5	MTO-3P	46-1
D5SC4M	40	5	136	50	-40 to 150	150	0.55	2.5	2.5	116	3.3	ITO-220	42-1
SF5SC4		5	140	80	-40 to 150	150	0.55	2.5	2.5	116	2.3	FTO-220	48-1
D10SC4M		10	123	100	-40 to 150	150	0.55	5	3.5	180	3.3	ITO-220	42-1
SF10SC4		10	131	150	-40 to 150	150	0.55	5	3.5	180	2.3	FTO-220	48-1
D15SCA4M		15	117	150	-40 to 150	150	0.55	7.5	5	340	2.8	ITO-220	42-1
SF15SC4		15	125	200	-55 to 150	150	0.55	7.5	5	340	2.0	FTO-220	48-1
S15SC4M		15	135	170	-40 to 150	150	0.55	7.5	5	340	1.2	MTO-3P	46-1
SF20SC4		20	117	230	-55 to 150	150	0.55	10	7.5	390	2.0	FTO-220	48-1
S20SC4M		20	129	170	-40 to 150	150	0.59	10	5	340	1.2	MTO-3P	46-1
SF30JC4		30	106	250	-55 to 150	150	0.61	15	0.7	560	2.0	FTO-220	48-1
SF30SC4		30	102	300	-55 to 150	150	0.55	15	10	590	2	FTO-220	48-1
S30SC4M		30	126	300	-40 to 150	150	0.55	15	10	590	1	MTO-3P	46-1
D30SC4M		30	112	300	-40 to 150	150	0.55	15	10	590	1.6	ITO-3P	44-1
S60SC4M		60	126	500	-40 to 150	150	0.55	30	25	1000	0.5	MTO-3P	46-1
D4SC6M	60	4	138	60	-40 to 150	150	0.58	2	2	120	3.3	ITO-220	42-1
D10SC6M		10	120	100	-40 to 150	150	0.58	5	4.5	200	3.3	ITO-220	42-1
SF10JC6		10	129	100	-55 to 150	150	0.69	5	0.7	200	2.3	FTO-220	48-1
SF10SC6		10	129	150	-55 to 150	150	0.58	5	4.5	260	2.3	FTO-220	48-1
SF15JC6		15	123	150	-55 to 150	150	0.69	7.5	0.7	270	2.0	FTO-220	48-1
SF15SC6		15	122	160	-55 to 150	150	0.63	7.5	6	260	2.0	FTO-220	48-1
SF20JC6		20	115	200	-55 to 150	150	0.69	10	0.7	335	2.0	FTO-220	48-1
SF20SC6		20	118	230	-55 to 150	150	0.63	10	8	370	1.8	FTO-220	48-1
S25SC6M		25	128	300	-40 to 150	150	0.58	12.5	10	490	1	MTO-3P	46-1
D25SC6M		25	117	300	-40 to 150	150	0.58	12.5	10	490	1.5	ITO-3P	44-1
SF30JC6		30	97	250	-55 to 150	150	0.69	15	0.7	490	2.0	FTO-220	48-1
SF30SC6		30	107	250	-55 to 150	150	0.63	15	10	500	1.6	FTO-220	48-1
S60SC6M		60	118	500	-40 to 150	150	0.67	30	20	850	0.5	MTO-3P	46-1
D10SC9M	90	10	111	100	-40 to 150	150	0.75	5	3.0	185	3.3	ITO-220	42-1
SF10SC9		10	120	100	-40 to 150	150	0.75	5	3.0	185	2.3	FTO-220	48-1
SF20SC9		20	100	230	-55 to 150	150	0.75	10	10	370	2.0	FTO-220	48-1
S20SC9M		20	125	200	-40 to 150	150	0.75	10	10	370	1	MTO-3P	46-1
D20SC9M		20	111	200	-40 to 150	150	0.75	10	10	370	1.6	ITO-3P	44-1
SF15JC10	100	15	124	150	-55 to 150	150	0.86	7.5	0.6	200	2.0	FTO-220	48-1
S20JC10		20	128	200	-55 to 150	150	0.86	10	0.7	260	1.2	MTO-3P	46-1
SF20JC10		20	114	200	-55 to 150	150	0.86	10	0.7	260	2.0	FTO-220	48-1
S30JC10		30	123	300	-55 to 150	150	0.86	15	1.0	390	1.0	MTO-3P	46-1
SF30JC10		30	97	300	-55 to 150	150	0.86	15	1.0	390	2.0	FTO-220	48-1
☆SF10NC15M	150	10	129	100	-55 to 150	150	0.88	5	0.2	110	2.3	FTO-220A	50-1
☆SF15NC15M		15	123	150	-55 to 150	150	0.88	7.5	0.3	155	2.0	FTO-220A	50-1
☆SF20NC15M		20	118	200	-55 to 150	150	0.88	10	0.4	200	1.8	FTO-220A	50-1
☆SF30NC15M		30	107	300	-55 to 150	150	0.88	15	0.5	300	1.6	FTO-220A	50-1
☆S30NC15		30	123	300	-55 to 150	150	0.88	15	0.5	300	1.0	MTO-3P	46-1

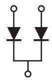
☆: New product   Center-tap 

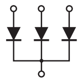
SBD Module



Module

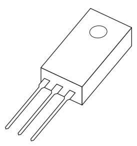
Type No.	Absolute Maximum Ratings VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	Electrical Characteristics VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [mA]	Cj (typ) [nF]	θjc (max) [°C/W]	Remarks	Outline Package	Fig.
D120SC4M	40	120	90	800	-40 to 125	125	0.58	60	40	2.1	0.34	∗1	Module	77
D180SC4M		180	83	800	-40 to 125	125	0.58	60	40	2.1	0.25	∗2	Module	79-1
D240SC4M		240	77	1600	-40 to 125	125	0.6	120	80	4.2	0.23	∗1	Module	77
D360SC4M		360	64	1600	-40 to 125	125	0.6	120	80	4.2	0.18	∗2	Module	79-1
D120SC6M	60	120	85	800	-40 to 125	125	0.67	60	40	2.2	0.34	∗1	Module	77
D180SC6M		180	78	800	-40 to 125	125	0.67	60	40	2.2	0.25	∗2	Module	79-1
D240SC6M		240	71	1600	-40 to 125	125	0.67	120	80	4.4	0.23	∗1	Module	77
D360SC6M		360	58	1600	-40 to 125	125	0.67	120	80	4.4	0.18	∗2	Module	79-1

∗1 

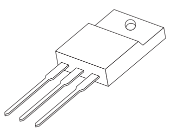
∗2 

Center Tap, Common Anode

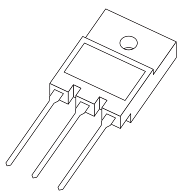
Three Terminal Type



ITO-220

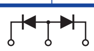


FTO-220



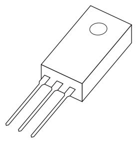
ITO-3P

Type No.	Absolute Maximum Ratings VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	Electrical Characteristics VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [mA]	Cj (typ) [pF]	θjc (max) [°C/W]	Outline Package	Fig.
D5SC4MR	40	5	136	50	-40 to 150	150	0.55	2.5	2.5	116	3.3	ITO-220	42-2
D10SC4MR		10	123	100	-40 to 150	150	0.55	5	3.5	180	3.3	ITO-220	42-2
SF10SC4R		10	131	150	-40 to 150	150	0.55	5	3.5	180	2.3	FTO-220	48-2
D10SC6MR	60	10	120	100	-40 to 150	150	0.58	5	4.5	200	3.3	ITO-220	42-2
D25SC6MR		25	117	300	-40 to 150	150	0.58	12.5	10	490	1.5	ITO-3P	44-2

Center-tap (R) 

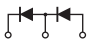
Doubler

Three Terminal Type



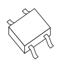
ITO-220

Type No.	Absolute Maximum Ratings VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	Electrical Characteristics VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [mA]	Cj (typ) [pF]	θjc (max) [°C/W]	Outline Package	Fig.
D10SD6M	60	10	120	100	-40 to 150	150	0.58	5	4.5	200	3.3	ITO-220	42-3

Doubler type 

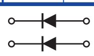
Array

Surface Mount



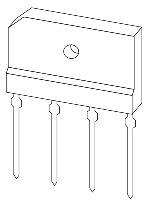
1Z

Type No.	Absolute Maximum Ratings VRM [V]	Io [A]	Conditions Ta [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	Electrical Characteristics VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [mA]	Cj (typ) [pF]	θjl (max) [°C/W]	Outline Package	Fig.
S1ZAS4	40	1.2	49	40	-40 to 150	150	0.55	1.0	1	65	93	1Z	23-2

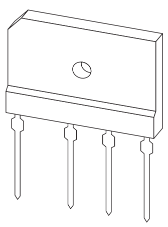
Array type 

Schottky Barrier Diode Bridges

Single Inline Package



3S



5S

Type No.	Absolute Maximum Ratings VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	Electrical Characteristics VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [mA]	Cj (typ) [pF]	θjc (max) [°C/W]	Outline Package	Fig.
D4SBS4	40	4	116	60	-55 to 150	150	0.55	2	2	95	5.5	3S	57
D4SBS6	60	4	114	60	-40 to 150	150	0.62	2	2	180	5.5		
D10SBS4	40	10	67	100	-55 to 150	150	0.55	5	3.5	180	5.5		
D15XBS6	60	15	59	150	-55 to 150	150	0.63	7.5	6	410	3.5		
☆D20XBS6	60	20	100	200	-55 to 150	150	0.63	10	8	370	1.5	5S	58
☆D4SBN20	200	4	103	60	-55 to 150	150	0.9	2	0.0015	60	6	3S	57
☆D6SBN20	200	6	110	120	-55 to 150	150	0.9	3	0.002	85	3.4	5S	58
☆D15XBN20	200	15	106	200	-55 to 150	150	0.9	7.5	0.005	190	1.5		
☆D30XBN20	200	30	91	350	-55 to 150	150	0.9	15	0.01	360	1		

☆: New product

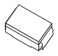
Super Fast Recovery Diodes ·················· *High frequency rectifying*

Single

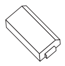
Surface Mount

M1F

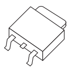
1F



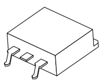
M2F



2F



E-pack

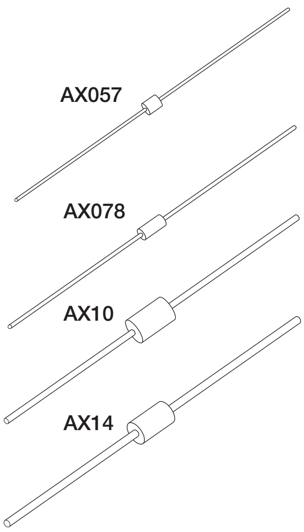


STO-220

Type No.	Absolute Maximum Ratings						Electrical Characteristics							Outline	
	VRM [V]	IO [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	trr (max) [ns]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]	Package	Fig.
M1FL20U	200	1.1	25*1	30	-55 to 150	150	0.98	1.1	10	35	20	108	–	M1F	12
D1FL20U		1.1	25*1	20	-55 to 150	150	0.98	1.1	10	35	23	108	–	1F	13-1
☆M2FL20U		1.5	32*1	50	-55 to 150	150	0.92	1.5	10	35	33	90	–	M2F	15-1
☆M3FL20U		3	75*2	75	-55 to 150	150	0.95	3	10	35	25	110	–	M2F	15-1
D2FL20U		1.5	25*1	50	-55 to 150	150	0.98	1.5	10	35	24	90	–	2F	16-1
DE3L20U		3	113	60	-55 to 150	150	0.98	3	10	35	–	55	12	E-pack	31-2
M1FL40	400	1.0	25*1	25	-55 to 150	150	1.3	1	10	50	20	80	18	M1F	12
D1FL40		0.8	25*1	25	-55 to 150	150	1.3	0.8	10	50	23	108	–	1F	13-1
D2FL40		1.3	25*1	40	-40 to 150	150	1.3	1.3	10	50	24	90	–	2F	16-1
DE3L40		3	99	50	-55 to 150	150	1.3	3	10	50	–	55	12	E-pack	31-2
☆D1FK60	600	0.8	29*1	20	-55 to 150	150	1.3	0.8	10	75	23	108	–	1F	13-1
☆D2FK60		1.5	101*2	40	-55 to 150	150	1.3	1.5	10	75	24	90	–	2F	16-1
DE5L60		5	57	60	-55 to 150	150	2	5	10	50	–	125	12	E-pack	31-2
★DF8L60US		8	*3	*3	-55 to 150	150	3.6	8	50	25	–	–	*3	STO-220	36-2
DF10L60		10	105	100	-55 to 150	150	1.9	10	10	50	–	–	2	STO-220	36-2
DF20L60		20	84	170	-55 to 150	150	1.9	20	25	70	–	–	1.5	STO-220	36-2
DF20L60U		20	93	160	-55 to 150	150	3.0	20	25	35	–	–	0.9	STO-220	36-2
☆D1FK70	700	0.8	32*1	25	-55 to 150	150	1.3	0.8	10	400	23	108	–	1F	13-1

☆: New product　＊1: Ta　＊2: Tl　＊3: Under evaluation
★: Under development

Axial



AX057

AX078

AX10

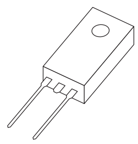
AX14

Type No.	Absolute Maximum Ratings						Electrical Characteristics						Outline		
	VRM [V]	IO [A]	Conditions Ta [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	trr (max) [ns]	θjl (max) [°C/W]	θja (max) [°C/W]	Package	Color Code	Fig.
D1NL20U*2	200	1	25	25	-55 to 150	150	0.98	1	10	35	10	113	AX057	–	1
D2L20U*3		1.5	125*1	40	-40 to 150	150	0.98	1.5	10	35	17	105	AX078	Red	5-1
S2L20U*2		1.5	25	50	-40 to 150	150	0.98	1.5	10	35	12	83	AX10	Red	6-1
S3L20U*2		3	128*1	60	-40 to 150	150	0.98	2.1	10	35	6.5	60	AX14	Red	8
D1NL40*2	400	0.9	25	25	-55 to 150	150	1.3	0.9	10	50	10	113	AX057	–	1
S2L40*2		1.1	25	40	-55 to 150	150	1.3	1.1	10	50	12	83	AX10	Yellow	6-1
D2L40*3		1.5	108*1	40	-55 to 150	150	1.3	1.1	10	50	17	105	AX078	Yellow	5-1
S3L40*2		3	123*1	60	-40 to 150	150	1.3	3	10	50	6.5	60	AX14	Yellow	8
D1NF60*2	600	0.8	25	50	-55 to 150	150	1.3	0.8	10	400	10	113	AX057	–	1
☆D1NK60*2		0.8	26	35	-55 to 150	150	1.3	0.8	10	75	10	113	AX057	–	1
S2L60*2		1.5	125*1	50	-55 to 150	150	1.5	1.5	10	50	12	83	AX10	Blue	6-1
☆S3K60*2		3	123*1	120	-55 to 150	150	1.3	3	10	100	6.5	60	AX14	Blue	8
S3L60*2		2.2	132*1	60	-55 to 150	150	1.5	2.2	10	50	6.5	60	AX14	Blue	8

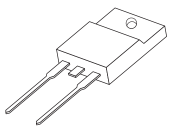
☆: New product　＊1: Tl　＊2: Spec Code 5□□□　＊3: Spec Code 7□□□
(See page 44 for the last 3 digits of the Spec Code)

Super Fast Recovery Diodes

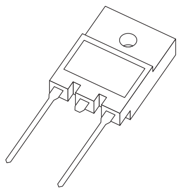
Two Terminal Type



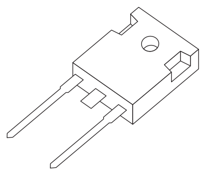
ITO-220



FTO-220



ITO-3P



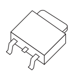
MTO-3P

Type No.	Absolute Maximum Ratings VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	Electrical Characteristics VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	trr (max) [ns]	θja (max) [°C/W]	θjc (max) [°C/W]	Outline Package	Fig.
D3L20U	200	2.5	136	45	-40 to 150	150	0.98	2.5	10	35	55	5.0	ITO-220	41
D4L20U		4	130	60	-40 to 150	150	0.98	4	10	35	–	4.5	ITO-220	41
D6L20U		6	118	80	-40 to 150	150	1.1	6	10	35	55	4.2	ITO-220	41
SF6L20U		6	126	80	-40 to 150	150	1.1	6	10	35	–	3.2	FTO-220	47
D10L20U		10	111	120	-40 to 150	150	0.98	10	10	35	–	3.5	ITO-220	41
SF5L30	300	5	130	100	-55 to 150	150	1.3	5	25	30	–	3.4	FTO-220	47
D4L40	400	4	125	60	-40 to 150	150	1.3	4	10	50	–	4.5	ITO-220	41
D3L60	600	3	127	60	-55 to 150	150	1.65	3	10	50	55	4.5	ITO-220	41
SF3L60U		3	115	40	-55 to 150	150	3.0	3	25	20	–	3.8	FTO-220	47
D5L60		5	123	100	-55 to 150	150	1.5	5	10	50	55	3.5	ITO-220	41
SF5L60		5	131	100	-55 to 150	150	1.5	5	10	50	–	2.5	FTO-220	47
SF5L60U		5	96	60	-55 to 150	150	3.0	5	25	25	–	3.6	FTO-220	47
D8L60		8	106	170	-55 to 150	150	1.5	8	25	70	–	3.5	ITO-220	41
SF8L60		8	118	170	-55 to 150	150	1.5	8	25	70	–	2.5	FTO-220	47
☆SF8L60USM		8	57	60	-55 to 150	150	3.6	8	50	25	–	3.0	FTO-220A	49
SF10L60U		10	85	120	-55 to 150	150	3.0	10	25	25	–	2.0	FTO-220	47
S16L60		16	122	300	-55 to 150	150	1.5	16	25	100	–	1.1	MTO-3P	45
SF20L60U		20	68	180	-55 to 150	150	3.0	20	25	35	–	1.3	FTO-220	47
S20L60		20	119	400	-55 to 150	150	1.5	20	25	100	–	0.9	MTO-3P	45
S30L60		30	117	600	-55 to 150	150	1.5	30	25	150	–	0.7	MTO-3P	45
D30L60		30	85	600	-55 to 150	150	1.5	30	25	150	–	1.4	ITO-3P	43

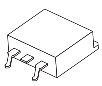
☆: New product

Center Tap, Common Cathode

Surface Mount



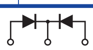
E-pack



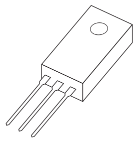
STO-220

Type No.	Absolute Maximum Ratings VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	Electrical Characteristics VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	trr (max) [ns]	θja (max) [°C/W]	θjc (max) [°C/W]	Outline Package	Fig.
DE5LC20U	200	5	81	50	-55 to 150	150	0.98	2.5	10	35	55	12	E-pack	31-1
DF10LC20U		10	127	80	-40 to 150	150	0.98	5	10	35	–	2	STO-220	36-1
DF20LC20U		20	114	140	-40 to 150	150	0.98	10	10	35	–	1.6	STO-220	36-1
☆DF10LC30	300	10	124	80	-55 to 150	150	1.3	5	25	30	–	2	STO-220	36-1
★DF10LC30S		10	122	100	-55 to 150	150	1.3	5	25	30	–	2	STO-220	36-1
DF20LC30		20	124	180	-55 to 150	150	1.3	10	25	30	–	1	STO-220	36-1
★DF20LC30S		20	105	160	-55 to 150	150	1.3	10	25	30	–	1	STO-220	36-1
DE5LC40	400	5	61	50	-55 to 150	150	1.3	2.5	10	50	55	12	E-pack	31-1

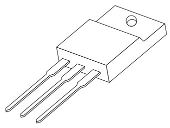
☆: New product
★: Under development

Center-tap 

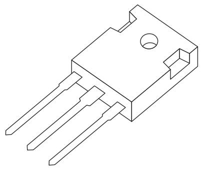
Three Terminal Type



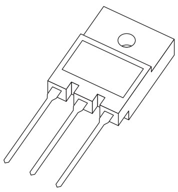
ITO-220



FTO-220/FTO-220A



MTO-3P

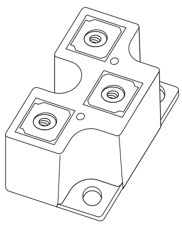


ITO-3P

Type No.	Absolute Maximum Ratings						Electrical Characteristics						Outline	
	VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	trr (max) [ns]	θja (max) [°C/W]	θjc (max) [°C/W]	Package	Fig.
D5LC20U	200	5	132	45	-40 to 150	150	0.98	2.5	10	35	50	3.3	ITO-220	42-1
SF5LC20U		5	137	45	-40 to 150	150	0.98	2.5	10	35	–	2.3	FTO-220	48-1
D8LC20U		8	122	60	-40 to 150	150	0.98	4	10	35	50	3.3	ITO-220	42-1
D10LC20U		10	114	80	-40 to 150	150	0.98	5	10	35	50	3.3	ITO-220	42-1
SF10LC20U		10	124	80	-40 to 150	150	0.98	5	10	35	–	2.3	FTO-220	48-1
D15LC20U		15	104	110	-40 to 150	150	0.98	7.5	10	35	–	2.8	ITO-220	42-1
S20LC20U		20	123	140	-40 to 150	150	0.98	10	10	35	–	1.2	MTO-3P	46-1
D20LC20U		20	112	150	-40 to 150	150	0.98	10	10	35	–	1.7	ITO-3P	44-1
SF5LC30	300	5	131	60	-55 to 150	150	1.3	2.5	25	30	–	2.8	FTO-220	48-1
☆SF10LC30SM		10	119	80	-55 to 150	150	1.3	5	25	25	–	2.3	FTO-220A	50-1
☆SF20LC30SM		20	97	140	-55 to 150	150	1.3	10	25	25	–	2.0	FTO-220A	50-1
SF20LC30		20	112	180	-55 to 150	150	1.3	10	25	30	–	1.5	FTO-220	48-1
S20LC30		20	119	180	-55 to 150	150	1.3	10	25	30	–	1.2	MTO-3P	46-1
D5LC40	400	5	125	50	-40 to 150	150	1.3	2.5	10	50	50	3.3	ITO-220	42-1
SF5LC40		5	133	50	-40 to 150	150	1.3	2.5	10	50	–	2.3	FTO-220	48-1
D8LC40		8	114	60	-40 to 150	150	1.3	4	10	50	50	3.3	ITO-220	42-1
D10LC40		10	100	80	-40 to 150	150	1.3	5	10	50	50	3.3	ITO-220	42-1
SF10LC40		10	115	80	-40 to 150	150	1.3	5	10	50	–	2.3	FTO-220	48-1
☆SF20LC40M		20	94	120	-55 to 150	150	1.3	10	10	50	–	2	FTO-220A	50-1
S20LC40		20	116	120	-40 to 150	150	1.3	10	10	50	–	1.2	MTO-3P	46-1
D20LC40		20	102	120	-40 to 150	150	1.3	10	10	50	–	1.7	ITO-3P	44-1
☆S20LC60US	600	20	63	60	-55 to 150	150	3.6	10	50	25	–	1.0	MTO-3P	46-1
☆S60L120	1200	60	40	450	-55 to 150	150	2.7	60	100	200	–	0.55	MTO-3P	46-3

☆: New product Center-tap 

Super FRD Module



Module

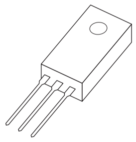
Type No.	Absolute Maximum Ratings						Electrical Characteristics							Outline	
	VRM [V]	Io [A]	Conditions Tc [°C]	IFSM [A]	Tstg [°C]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRM [μA]	trr (max) [ns]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]	Package	Fig.
D120LC40	400	120	95	650	-40 to 150	150	1.3	60	25	100	–	–	0.31	Module	79-2
D120LC40B			60										0.5		78
D200LC40B		200	52	1400				100	50	150	–	–	0.35		
D240LC40		240	77					120					0.2		79-2

Super Fast Recovery Diodes

High frequency rectifying

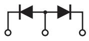
Center Tap, Common Anode

Three Terminal Type



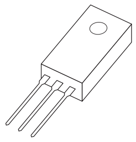
ITO-220

Type No.	Absolute Maximum Ratings						Electrical Characteristics						Outline	
	V_{RM} [V]	I_O [A]	Conditions T_c [°C]	I_{FSM} [A]	Tstg [°C]	Tj [°C]	V_F (max) [V]	Conditions I_F [A]	I_R (max) V_R=V_{RM} [μA]	trr (max) [ns]	θja (max) [°C/W]	θjc (max) [°C/W]	Package	Fig.
D5LC20UR	200	5	132	45	-40 to 150	150	0.98	2.5	10	35	50	3.3	ITO-220	42-2
D8LC20UR		8	122	60	-40 to 150	150	0.98	4	10	35	50	3.3	ITO-220	42-2
D10LC20UR		10	114	80	-40 to 150	150	0.98	5	10	35	50	3.3	ITO-220	42-2

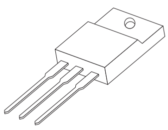
Center-tap (R) 

Doubler

Three Terminal Type

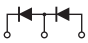


ITO-220



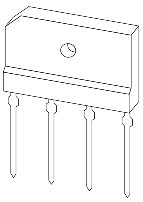
FTO-220A

Type No.	Absolute Maximum Ratings						Electrical Characteristics						Outline	
	V_{RM} [V]	I_O [A]	Conditions T_c [°C]	I_{FSM} [A]	Tstg [°C]	Tj [°C]	V_F (max) [V]	Conditions I_F [A]	I_R (max) V_R=V_{RM} [μA]	trr (max) [ns]	θja (max) [°C/W]	θjc (max) [°C/W]	Package	Fig.
D5LD20U	200	5	132	45	-40 to 150	150	0.98	2.5	10	35	50	3.3	ITO-220	42-3
D8LD20U		8	122	60	-40 to 150	150	0.98	4	10	35	50	3.3	ITO-220	42-3
D8LD40	400	8	114	60	-40 to 150	150	1.3	4	10	50	50	3.3	ITO-220	42-3
☆SF6LD60M	600	6	136	60	-55 to 150	150	1.65	3	10	50	—	2.3	FTO-220A	50-3

☆: New products   Doubler type 

Super Fast Recovery Diode Bridges

Single Inline Package

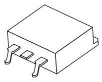


3S

Type No.	Absolute Maximum Ratings						Electrical Characteristics							Outline	
	V_{RM} [V]	I_O [A]	Conditions T_c [°C]	I_{FSM} [A]	Tstg [°C]	Tj [°C]	V_F (max) [V]	Conditions I_F [A]	I_R (max) V_R=V_{RM} [μA]	trr (max) [ns]	θjl (max) [°C/W]	θja (max) [°C/W]	θjc (max) [°C/W]	Package	Fig.
D4SBL20U	200	4	108	60	-55 to 150	150	0.98	2	10	35	6	30	5.5	3S	57
D4SBL40	400	4	91	50	-55 to 150	150	1.3	2.5	10	50	6	30	5.5		

VZ series

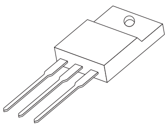
Surface Mount



STO-220

Type No.	Absolute Maximum Ratings V_{DSS} [V]	I_D [A]	P_T [W]	V_{GSS} [V]	Tch [°C]	Electrical Characteristics $R_{DS(ON)}$ (max) [Ω]	Ciss (typ) [pF]	Crss (typ) [pF]	ton (typ) [nS]	toff (typ) [nS]	Outline Package	Fig.
2SK2489	180	10	45	±30	150	0.25	720	80	50	140	STO-220	36-3
2SK2491		20	70	±30	150	0.13	1600	190	95	300		

Three Terminal Type

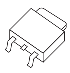


FTO-220

Type No.	Absolute Maximum Ratings V_{DSS} [V]	I_D [A]	P_T [W]	V_{GSS} [V]	Tch [°C]	Electrical Characteristics $R_{DS(ON)}$ (max) [Ω]	Ciss (typ) [pF]	Crss (typ) [pF]	ton (typ) [nS]	toff (typ) [nS]	Outline Package	Fig.
2SK2490	180	10	40	±30	150	0.25	720	80	50	140	FTO-220	48-3
2SK2492		20	60	±30	150	0.13	1600	190	95	300		
2SK2559	200	10	40	±30	150	0.30	840	80	50	140		
2SK2560		20	60	±30	150	0.18	1800	165	100	280		

VR series

Surface Mount



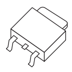
E-pack

Type No.	Absolute Maximum Ratings V_{DSS} [V]	I_D [A]	P_T [W]	V_{GSS} [V]	Tch [°C]	Electrical Characteristics $R_{DS(ON)}$ (max) [Ω]	Ciss (typ) [pF]	Crss (typ) [pF]	ton (typ) [nS]	toff (typ) [nS]	Outline Package	Fig.
2SK1861	150	4	10	±20	150	0.5	480	50	60	120	E-pack	31-3
2SK1931	200	5	20	±30	150	0.65	360	45	55	75		
2SK1194	230	0.5	6	±20	150	8	45	4.5	30	50		
2SK1195		1.5	10	±20	150	2	160	20	37	50		

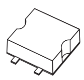
Power MOSFETs

VX-III series

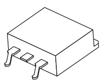
Surface Mount



E-pack



ZP

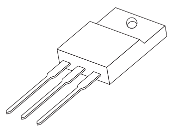


STO-220

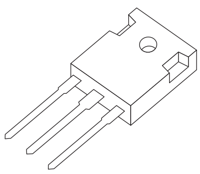
Type No.	Absolute Maximum Ratings					Electrical Characteristics							Outline	
	VDSS [V]	ID [A]	PT [W]	VGSS [V]	Tch [°C]	RDS(ON) (max) [Ω]	Ciss (typ) [pF]	Crss (typ) [pF]	td(on) (typ) [nS]	tr (typ) [nS]	td(off) (typ) [nS]	tf (typ) [nS]	Package	Fig.
☆F1E50VX3	500	1	15	±30	150	6.9	100	2	4	3	14.5	13.5	E-pack	31-3
★F2E50VX3		2	20			3.45	185	4	4.5	4.5	22	13.5		
☆F5ZP50VX3		5	25			1.4	440	9	10	18	65	25	ZP	35
☆F10S50VX3		10	(55)			1	670	12	12	33	71	38	STO-220	36-3
☆F12ZP50VX3		12	35			0.7	920	16	14	40	90	45	ZP	35
☆F5E52VX3	525	5	20			1.6	545	2	16	12	42	18	E-pack	31-3
★F4ZP60VX3	600	4	25			2.2	430	8	12	16	65	40	ZP	35
★F8ZP60VX3		8	35			1.2	860	15	18	35	115	55		

☆: New product　　( ): Reference
★: Under development

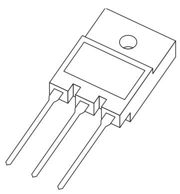
Three Terminal Type



FTO-220/FTO-220A



MTO-3P



ITO-3P

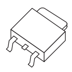
Type No.	Absolute Maximum Ratings					Electrical Characteristics							Outline	
	VDSS [V]	ID [A]	PT [W]	VGSS [V]	Tch [°C]	RDS(ON) (max) [Ω]	Ciss (typ) [pF]	Crss (typ) [pF]	td(on) (typ) [nS]	tr (typ) [nS]	td(off) (typ) [nS]	tf (typ) [nS]	Package	Fig.
★F3F50VX3M	500	3	30	±30	150	2.3	270	6	8	12	35	20	FTO-220A	50-2
☆F5F50VX3M		5	40			1.4	440	9	10	18	65	25		
☆F10F50VX3		10	45			1	670	12	12	33	71	38	FTO-220	48-3
☆F12F50VX3		12	50			0.7	920	16	14	40	90	45	FTO-220	48-3
★FP12W50VX3		12	55			0.7	920	16	14	40	90	45	ITO-3P	44-3
☆F13F50VX3		13	60			0.6	1050	17	18	50	135	55	FTO-220	48-3
★F15W50VX3		15	65			0.45	1430	25	22	65	165	70	MTO-3P	46-2
☆FP15W50VX3		15	60			0.45	1430	25	22	65	165	70	ITO-3P	44-3
☆F20W50VX3		20	75			0.35	1700	28	27	78	190	80	MTO-3P	46-2
☆FP20W50VX3		20	70			0.35	1700	28	27	78	190	80	ITO-3P	44-3
★F30W50VX3		30	90			0.25	2780	49	40	120	270	120	MTO-3P	46-2
★F4F60VX3M	600	4	30			2.2	430	8	12	16	65	40	FTO-220A	50-2
☆F8F60VX3		8	50			1.2	860	15	18	35	115	55	FTO-220	48-3

☆: New product　　★: Under development

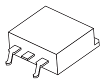
HVX-II series

N-Channel, Enhancement type

Surface Mount



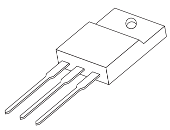
E-pack



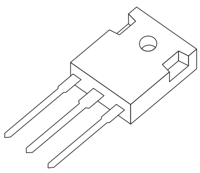
STO-220

Type No.	Absolute Maximum Ratings					Electrical Characteristics					Outline	
	V_{DSS} [V]	I_D [A]	P_T [W]	V_{GSS} [V]	Tch [°C]	$R_{DS(ON)}$ (max) [Ω]	Ciss (typ) [pF]	Crss (typ) [pF]	ton (typ) [nS]	toff (typ) [nS]	Package	Fig.
2SK2663		1	10			14.0	230	5	10	50	E-pack	31-3
2SK2665	900	3	50	±30	150	4.7	630	16	40	140	STO-220	36-3
2SK2670		5	60			2.8	1140	23	55	210		

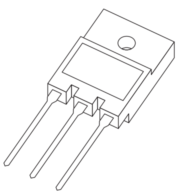
Three Terminal Type



FTO-220



MTO-3P



ITO-3P

Type No.	Absolute Maximum Ratings					Electrical Characteristics					Outline	
	V_{DSS} [V]	I_D [A]	P_T [W]	V_{GSS} [V]	Tch [°C]	$R_{DS(ON)}$ (max) [Ω]	Ciss (typ) [pF]	Crss (typ) [pF]	ton (typ) [nS]	toff (typ) [nS]	Package	Fig.
2SK2333	700	6	50			2.0	1250	250	60	160	FTO-220	48-3
2SK2666		3	30			4.7	630	16	40	140		
2SK2667		3	65			4.7	630	16	40	140	MTO-3P	46-2
2SK2668		3	40			4.7	630	16	40	140	ITO-3P	44-3
2SK2671		5	40			2.8	1140	23	55	210	FTO-220	48-3
2SK2672	900	5	80	±30	150	2.8	1140	23	55	210	MTO-3P	46-2
2SK2673		5	50			2.8	1140	23	55	210	ITO-3P	44-3
2SK2674		7	100			2.0	1450	37	95	330	MTO-3P	46-2
2SK2675		7	55			2.0	1450	37	95	330	ITO-3P	44-3
2SK2676		10	120			1.4	2150	50	140	440	MTO-3P	46-2
2SK2677		10	65			1.4	2150	50	140	440	ITO-3P	44-3

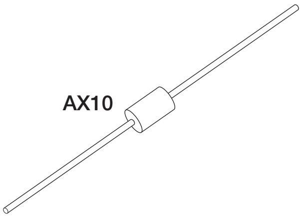
SIDAC (Bi-Directional Device)

Axial

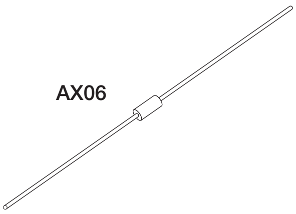
■ **Features**
1. Symmetrical characteristics.
2. Operating directly from the AC mains, and can be used in all kinds of pulse generating circuits.
3. The glass passivation ensures high reliability.

■ **Applications**
1. Pulse generation: gas igniters, HID(high intensity discharge) lamp drive circuit, etc.
2. AC switching: drive circuit for switching power supplies, voltage detecting circuits, etc.
3. Over voltage protection: AC line surge protection, capacitor rupture prevention, etc.

AX10



AX06



Type No.	Absolute Maximum Ratings									Electrical Characteristics									Outline		
	VDRM [V]	IT [A]	Conditions Tl [°C]	ITSM [A]	ITRM [A]	Conditions f [kHz]	diT/dt [A/μs]	Tstg [°C]	Tj [°C]	VBO [V]	IDRM (max) [μA]	Conditions VD [V]	IBO (max) [mA]	IH (typ) [mA]	VT (max) [V]	Conditions IT [A]	RS (min) [kΩ]	θj/l (max) [°C/W]	Package	Color Code	Fig.
K1V5	40	1	107	13	25	1	80	-40 to 125	125	45 to 60	10	40	0.5	50	1.5	1	0.1	15	AX10	Red	6-3
K1V6										55 to 65										Gold	
K1V8	70	1	107	20	25	1	80	-40 to 125	125	77 to 95	10	70	0.5	50	1.5	1	0.1	15		Silver	
K1V10	90	1	112	20	25	1	80	-40 to 125	125	95 to 113	10	90	0.5	50	1.5	1	0.1	15		Orange	
K1V11										104 to 118										Blue	
K1V12										110 to 125										Green	
K1V14	115	1	109	20	25	1	80	-40 to 125	125	125 to 150	10	115	0.5	30	1.5	1	0.1	15		Violet	
K1V16										145 to 170											
K1V18	150		108							165 to 200		150		50							
K1V22	180	1	108	20	25	1	80	-40 to 125	125	200 to 230	10	180	0.5	20	1.5	1	0.1	15		Yellow	
K1V24										220 to 250											
K1V26										240 to 270											
K1V22(W)	180	1	91	16	17	1	80	-40 to 125	125	200 to 230	10	180	0.5	50	3	1	0.1	15	AX10	Yellow	7
K1V24(W)										220 to 250											
K1V26(W)										240 to 265											
K1V33(W)	270	1	92	13	15	1	50	-40 to 125	125	309 to 355	10	270	0.5	50	3	1	0.1	15	AX10	Blue	6-3
K1V34(W)										320 to 360											
K1V36(W)										340 to 380											
K1V38(W)							80			360 to 400											7
K1V(A)10	90	1	98	16	15	1	50	-40 to 125	125	95 to 113	10	90	0.5	50	1.6	1	0.1	20	AX06	Orange	2-1
K1V(A)11										104 to 118										Blue	
K1V(A)12										110 to 125										Green	
K1V(A)14	115	1	98	16	15	1	50	-40 to 125	125	125 to 150	10	115	0.5	50	1.6	1	0.1	20		Violet	
K1V(A)16										145 to 170											

Spec Code 4□□□ (See page 44 for the last 3 digits of the Spec Code)

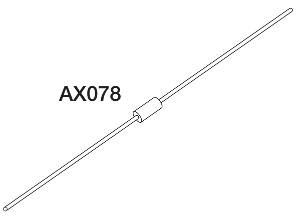
SIDAC for capacitor rupture prevention

Axial

■ **Features**
1. Compact package (AX078) with the same rating as the K1V series.
2. Low risk of firing by mistake due to noise.

■ **Applications**
1. Capacitor rupture prevention.
2. Over voltage protection.

AX078



Type No.	Absolute Maximum Ratings			Electrical Characteristics			Outline		
	VDRM [V]	Tstg [°C]	Tj [°C]	VBO [V]	IDRM (max) [μA]	VD [V]	Package	Color Code	Fig.
☆NK1V(B)24	180	-40 to 125	125	200 to 250	10	180	AX078	Yellow	5-4
☆NK1V(B)26	180	-40 to 125	125	200 to 270	10	180	AX078	Yellow	5-4
☆NK1V(B)46	400	-40 to 125	125	420 to 500	10	400	AX078	White	5-4

☆: New product Spec Code 4□□□ (See page 44 for the last 3 digits of the Spec Code)

SIDAC (Uni-Directional Device)

■ **Features**

1. Uni-directional characteristics.
2. Smaller package than bi-directional SIDAC
3. Switching operation from DC power for pulse generation
4. The glass passivation ensures high reliability.

■ **Applications**

1. Pulse generation: gas igniters, negative ion generators, HID (high intensity discharge) lamp drive circuit, etc.
2. Over voltage protection: DC line surge protection.

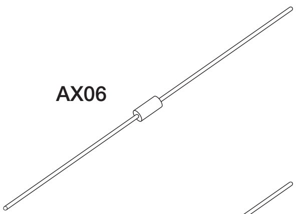
Surface Mount

1F

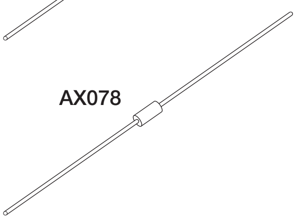
Type No.	Absolute Maximum Ratings								Electrical Characteristics									Outline	
	$V_{DRM(A)}$ [V]	I_T [A]	Conditions Tl [°C]	I_{TRM} [A]	Conditions f [Hz]	di_T/dt [A/µs]	Tstg [°C]	Tj [°C]	$V_{BO(A)}$ [V]	$I_{DRM(A)}$ (max) [µA]	Conditions V_D [V]	$I_{BO(A)}$ (max) [mA]	$I_{H(A)}$ $I_{H(K)}$ (max) [mA]	$V_{T(A)}$ $V_{T(K)}$ (max) [V]	Conditions I_T [A]	$R_{S(A)}$ (min) [kΩ]	θjl (max) [°C/W]	Package	Fig.
☆G1VL8C	70			80					75 to 90	10	70	1.0	100	1.5	1	0.1	23	1F	13-3
☆G1VL10C	90	1	98	150	60	150	-40 to 125	125	95 to 110	10	90	0.5	100	1.5	1	0.1	23	1F	13-3
☆G1VL22C	190			150					210 to 230	10	190	0.5	60	1.5	1	0.1	23	1F	13-3

☆: New product

Axial



AX06



AX078

Type No.	Absolute Maximum Ratings								Electrical Characteristics									Outline		
	$V_{DRM(A)}$ [V]	I_T [A]	Conditions Tl [°C]	I_{TRM} [A]	Conditions f [Hz]	di_T/dt [A/µs]	Tstg [°C]	Tj [°C]	$V_{BO(A)}$ [V]	$I_{DRM(A)}$ (max) [µA]	Conditions V_D [V]	$I_{BO(A)}$ (max) [mA]	$I_{H(A)}$ $I_{H(K)}$ (max) [mA]	$V_{T(A)}$ $V_{T(K)}$ (max) [V]	Conditions I_T [A]	$R_{S(A)}$ (min) [kΩ]	θjl (max) [°C/W]	Package	Color Code	Fig.
☆G1V(A)8C	70		98	80		80			75 to 90	10	70	1.0	60	1.5	1	0.1	20		Silver	
☆G1V(A)10C	90		98	80		80			95 to 110	10	90	0.5	60	1.5	1	0.1	20		Orange	
☆G1V(A)12C	100		98	80		80			110 to 130	10	100	0.5	60	1.5	1	0.1	20	AX06	Green	2-3
☆G1V(A)14C	120		98	80		80	-40 to 125	125	130 to 150	10	120	0.5	60	1.5	1	0.1	20		Brown	
☆G1V(A)15C	115		98	80		80			142 to 157	10	115	0.5	60	1.5	1	0.1	20		Violet	
☆G1V(A)20C	170	1		80	60	80			190 to 210	10	170	0.5	60	1.5	1	0.1	20		Yellow	
☆G1V(B)8C	70		102	120		100			75 to 90	10	70	1.0	60	1.5	1	0.1	17		Silver	
G1V(B)20C	170		102	120		220	-40 to 150	150	190 to 210	10	170	0.5	60	1.5	1	0.1	17		Yellow	
☆G1V(B)22C	190		102	120		80	-40 to 125	125	210 to 230	10	190	0.5	60	1.5	1	0.1	17	AX078	Yellow	5-3
☆G1V(B)23C	200		102	120		220	-40 to 150	150	220 to 240	10	200	0.5	60	1.5	1	0.1	17		Yellow	
☆G1V(B)24C	210		102	120		220			230 to 250	10	210	0.5	60	1.5	1	0.1	17		Yellow	

☆: New product Spec Code 4□□□ (See page 44 for the last 3 digits of the Spec Code)

Surge Absorbers

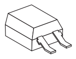
Varistors

■ **Features**
1. Bi-directional surge absorption is possible.
2. Low junction capacitance.

■ **Applications**
1. Telephone set surge absorption.
2. Digital communications circuit surge absorption.
3. ISDN terminal surge absorption.

Surface Mount

1F

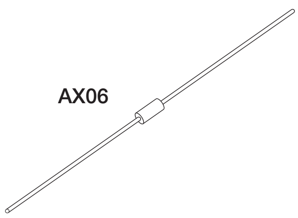


1Y

Type No.	Absolute Maximum Ratings Io [mA]	IFSM [V]	Tstg [°C]	Tj [°C]	Electrical Characteristics (Ta=25°C) VF1 [V]	IF1 [mA]	VF2 [V]	IF2 [mA]	VF3 [V]	IF3 [mA]	Outline Package	Fig.
VR-61F1 *1	370	7.5	-55 to 150	150	2.3±0.25	1	2.75±0.25	10	3.1±0.25	70	1F	14-1
VRYA6 *2	310	8	-30 to 125	125	2.3±0.25	1	2.75±0.25	10	3.1±0.25	70	1Y	*3
VRYA15 *2	140	6.5		125	5.75±0.62	1	6.875±0.625	10	7.75±0.62	70		

*1: On alumina substrate *2: On alumina substrate, 1 element operation. 2 elements in parallel
*3: SMD package Fig. 21; THD package Fig. 22-2

Axial



AX06

Type No.	Absolute Maximum Ratings Io [mA]	IFSM [V]	Tstg [°C]	Tj [°C]	Electrical Characteristics (Ta=25°C) VF1 [V]	IF1 [mA]	VF2 [V]	IF2 [mA]	VF3 [V]	IF3 [mA]	Outline Package	Color Code	Fig.
VR-60B(A)	500	16	-30 to 125	125	1.5	1000	–	–	0.2	0.02	AX06	Orange	3
VR-60BP(A)	500	16			1.5		0.58±0.03	1	0.2			Orange	
VR-51B	150	7.5			1.8±0.25	1	2.1±0.25	10	2.4±0.25	70		*1	4
VR-61B(A)	150	7.5			2.3±0.25		2.75±0.25		3.1±0.25			*2	

*1: Silver-Silver Spec Code 5□□□ (See page 44 for the last 3 digits of the Spec Code)
*2: Orange-Red

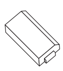
Trankillers

■ **Features**
1. High speed response.
2. Absorption energy tolerance capacity.
3. Narrow clamping voltage width.

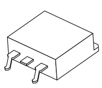
■ **Applications**
1. IC protection for telephones.
2. IC protection against abnormal voltage.
3. Protection for load dump noise.

Surface Mount

1F



2F

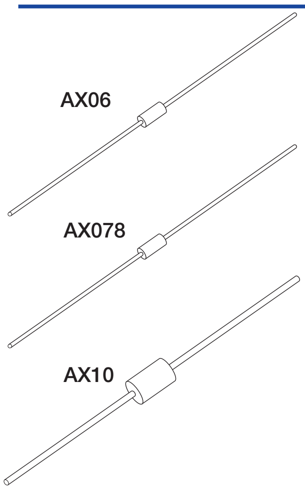


STO-220

Type No.	Absolute Maximum Ratings PRSM [W]	Tstg [°C]	Tj [°C]	Electrical Characteristics VRM (max) [V]	VBR (typ) [V]	Conditions IR [mA]	IR (max) [μA]	Conditions VR [V]	rz (max) [%/°C]	VCL (max) [V]	Conditions IPP [A]	Outline Package	Fig.
ST02D-170F2*	200	-40 to 150	150	145	170	1	5	145	–	280	0.75	2F	16-3
ST03-58F1	300	-55 to 150	150	45	58			45	–	–	–	1F	13-2
☆ST03-68F1		-55 to 175	175	58	68			58	–	100	3		
☆ST04-14F1	400	-55 to 175	175	12.4	14			12.4	–	22	16		
ST04-16F1	400	-55 to 175	175	13.6	16			13.6	–	23	15		
☆ST04-18F1	400	-55 to 175	175	15.3	18			15.3	–	26	15		
ST04-27F1	400	-55 to 175	175	23	27			23	–	37	10		
ST50V-27F	5000	-40 to 150	150	23	27			23	0.09	40	130	STO-220	36-4
ST70-27F	7000	-40 to 150	150	23	27			23	0.09	40	180	STO-220	36-6
DL04-18F1◎	400	-55 to 150	150	13	18			13	–	26	15	1F	14-2

☆: New product ◎: Bi-directional type *: Reverse blocking type

Axial



Type No.	Absolute Maximum Ratings PRSM [W]	Tstg [°C]	Tj [°C]	Electrical Characteristics VRM (max) [V]	VBR (typ) [V]	Conditions IR [mA]	IR (max) [μA]	Conditions VR [V]	rz (max) [%/°C]	VCL (max) [V]	Conditions IPP [A]	Outline Package	Color Code	Fig.
ST02D-82∗	200	-40 to 150	150	67	82	1	5	67	–	118	1.7	AX078	Silver	5-2
☆ST02D-140∗				120	145			120	–	200	0.75		Blue	
ST02D-170∗				145	170			145	–	280	0.75		Red	
ST02D-200∗				170	200			170	–	300	0.75		Yellow	
ST03D-82∗	300			67	82	1	5	67	–	118	2.5	AX10	Silver	6-2
☆ST03D-140∗				120	145			120	–	200	0.75		Blue	
ST03D-170∗				145	170			145	–	280	1.1		Red	
ST03D-200∗				170	200			170	–	300	1		Yellow	
ST04-16	400			13.6	16	1	5	13.6	0.09	23	15	AX06	Silver	2-2
ST04-27				23	27			23	0.09	37	10			

☆: New product　　Spec Code 4□□□ (See page 44 for the last 3 digits of the Spec Code)
∗: Reverse blocking type

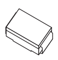
Thyristor Surge Suppressors

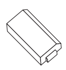
■ **Features**
1. Bi-directional or uni-directional characteristics.
2. High speed response.
3. Large surge current capacity.
4. Repetitive use against surges is possible.

■ **Applications**
1. Lightning surge adsorption for communications circuits.
2. Lightning surge adsorption for transmitters and switchboards.
3. Surge protection for ISDN terminals.

Surface Mount


1F


M2F

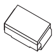

2F

Type No.	Absolute Maximum Ratings ITSM [A]	Conditions [μS]	VDRM [V]	Tstg [°C]	Tj [°C]	Electrical Characteristics VBO (min) [V]	VCL (max) [V]	IDRM (max) [μA]	Conditions VD [V]	IH (min) [mA]	Cj (max) [pF]	Outline Package	Fig.
KL3Z07	30	10/1000	5	-40 to 125	125	5.5∗	–	10	5	50	–	1F	14-3
KL3Z18			15			15.5∗	–	10	15	50	–		
KL3L07			58			65	80	10	58	100	90		
KL3N14			120			130	195	10	120	100	50		
KL3R20			175			180	250	10	175	100	30		
KP4L07	40		58			65	80	10	58	100	90	2F	16-2
KP4N12			100			110	135	10	100	100	50		
KU5N12	50		100			110	135	5	100	100	90	M2F	15-2
KU5R29N			250			275	400	5	250	100	70		
KP10L06	100		48			55	70	10	48	100	235	2F	16-2
KP10L07			58			65	80	10	58	100	180		
KU10L08			63			70	100	5	63	100	180	M2F	15-2
KP10L08			63			75	100	10	63	100	180	2F	16-2
KU10N14			120			125	195	5	120	100	140	M2F	15-2
KP10N14			120			130	195	10	120	100	140	2F	16-2
☆KU10N16			140			145	200	5	140	100	150	M2F	15-2
☆KU10R23N			190			200	260	5	190	100	90		
KP10R25			190			220	290	10	190	100	90	2F	16-2
☆KU10R27N			220			230	300	5	220	100	70	M2F	15-2
KU10R29N			250			275	400	5	250	100	90		
☆KU10S35N			275			310	450	5	275	100	90		
KU10S40N			300			350	500	5	300	100	60		
KP15L08	150		63			70	100	10	63	100	180	2F	16-2
KU15N14			120			125	195	5	120	100	110	M2F	15-2
KP15N14			120			125	195	10	120	100	200	2F	16-2
KP15R25			190			220	290	10	190	100	150		

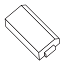
☆: New product　　∗: VBR
KU: UL497B recognized File No. E183905

Surge Absorbers

Surface Mount (Uni-Directional Type)



M2F

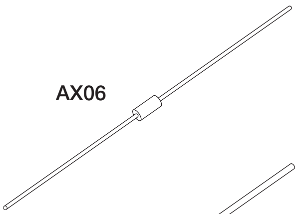


2F

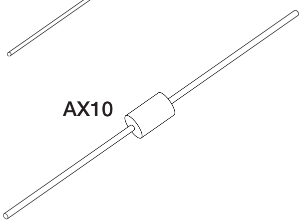
Type No.	Absolute Maximum Ratings					Electrical Characteristics						Outline	
	I_{TSM} [A]	Conditions [μS]	V_{DRM} [V]	Tstg [°C]	Tj [°C]	V_{BR} (min) [V]	V_{CL} (max) [V]	I_{DRM} (max) [μA]	Conditions V_D [V]	I_H (min) [mA]	Cj (max) [pF]	Package	Fig.
KU10LU07	100	10/1000	58	-40 to125	125	62	80	10	58	100	200	M2F	15-3
KP10LU07	100		60			62	80	10	60	100	180	2F	16-4

KU: UL497B recognized File No. E183905

Axial



AX06

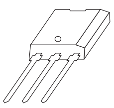


AX10

Type No.	Absolute Maximum Ratings					Electrical Characteristics						Outline		
	I_{TSM} [A]	Conditions [μS]	V_{DRM} [V]	Tstg [°C]	Tj [°C]	V_{BO} (min) [V]	V_{CL} (max) [V]	I_{DRM} (max) [μA]	Conditions V_D [V]	I_H (min) [mA]	Cj (max) [pF]	Package	Color Code	Fig.
KA3Z07	30	10/1000	5	-40 to 125	125	5.5＊2	—	10	5	50	100＊1	AX06	Red	2-1
KA3Z18	30		15			15.5＊2	—	10	15	50	100＊1		Silver	
KA10R25	100		190			220	290	10	190	100	90	AX10	Green	6-3

＊1: V_D=0V ＊2: V_{BR} Spec Code4□□□ (See page 44 for the last 3 digits of the Spec Code)

Three Terminal Type



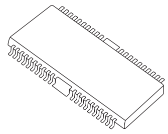
TO-221

Type No.	Absolute Maximum Ratings					Electrical Characteristics						Outline	
	I_{TSM} [A]	Conditions [μS]	V_{DRM} [V]	Tstg [°C]	Tj [°C]	V_{BO} (min) [V]	V_{CL} (max) [V]	I_{DRM} (max) [μA]	Conditions V_D [V]	I_H (min) [mA]	Cj (max) [pF]	Package	Fig.
KT10L07	100	10/1000	58	-40 to 125	125	65	80	10	58	100	180	TO-221	40
KT10L08	100		63			70	100	10	63	100	180		
KT10N14	100		120			130	195	10	120	100	140		
KT10R25	100		190			220	290	10	190	100	90		
KT15N14	150		120			130	195	10	120	100	200		
KT15R25	150		190			220	290	10	190	100	150		
KT40N14	400		120			130	195	10	120	200	300		39
	1000	15/100											

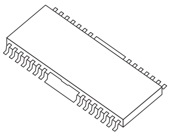
Power ICs

Stepper Motor Driver ICs

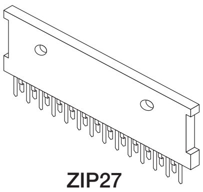
- **Outline** The MTD series is monolithic power ICs that, with fewer external components, can directly drive a motor.
- **Applications** **1.** Stepper motor drive for office equipment products.
  2. Stepper motor drive for industrial robots, automatic equipments.



HSOP40



HSOP28

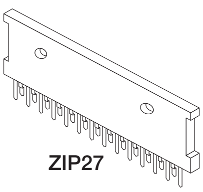


ZIP27

Type No.	Operation	Absolute Maximum Ratings(Ta=25°C)			Characteristics		Outline	
		V_{CEO} [V]	I_O [A]	P_T [W]			Package	Fig.
MTD1110	Unipolar	80	2	5	Constant-Current chopping function (4-Phase Input)		ZIP27	89
MTD1120			1.2					
MTD1120F				3			HSOP28	81
MTD1361		68	1.5	5			ZIP27	89
MTD1361F			1.2	3			HSOP28	81
MTD2001	Bipolar	60	1.5	5	Constant-Current chopping function	Dual Full Bridge	ZIP27	89
MTD2002F		35	0.8	3		Dual Full Bridge Current levels can be selected by 2 bit digital signal	HSOP28	81
MTD2003		30	1.2	5			ZIP27	89
MTD2003F				3			HSOP28	81
MTD2005		60	1.3	5		Dual Full Bridge Selectable slow/fast current decay for microstepping	ZIP27	89
MTD2005F			1.0	3			HSOP28	81
MTD2006		35	1.3	5		Dual Full Bridge Selectable slow/fast current decay for microstepping	ZIP27	89
MTD2006F				3			HSOP28	81
MTD2007F		50	1.0	3		Dual Full Bridge Current levels can be selected by 2 bit digital signal	HSOP28	81
MTD2009J		35	1.2	2.8		Tow Stepper Motor Drivers Selectable slow/fast current decay for microstepping	HSOP40	82

Power ICs for Interface

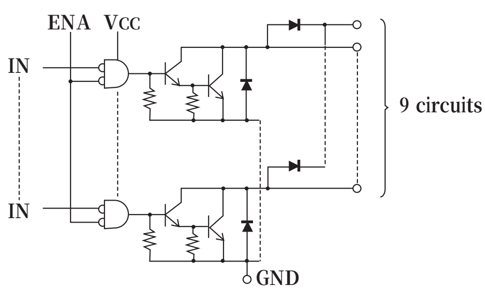
- **Outline** The MTA Series is monolithic power ICs best fit for use as needle print head drivers of dot matrix printers, and as stepping motor drivers.
- **Features** **1.** The input is TTL and CMOS compatible
  2. Large output Ic=2A or 4A, V_{CE}=60V or 80V
  3. Insulated type single in-line packaging with heatsink installed
- **Applications** **1.** Head driver for dot matrix printers, ECR and time recorders
  2. Stepping motor drive for printers, typewriters, FAX, PPC and XY plotters
  3. Driver for all types of solenoids, and displays (LED, etc.)



ZIP27

Type No.	Absolute Maximum Ratings(Ta=25°C)			Operation			Outline	
	V_{CEO} [V]	I_O [A]	P_T [W]	Input	Output	Circuits	Package	Fig.
MTA001M	80	2	5	L Active	NPN Darlington	9	ZIP27	89
MTA011				H Active				
MTA002	60			L Active	PNP Darlington			

Equivalent circuit (MTA001M)



DC-DC Converter Power ICs

■ Outline

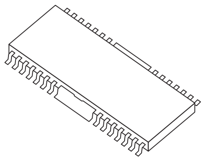
The MD Series is a non-isolated, PWM control stepdown DC-DC converter power IC whose MOSFET and drive circuit IC chip integration eliminates the complexity of power supply circuit design.
Two rectification systems are available: flywheel Schottky diode type and highly efficient synchronous rectification MOSFET type.
A high-performance power supply can be easily realized by choosing a suitable MD chip.
The MD Series is available in SMD type HSOP28, SSOP32, LSSOP26, and SOP8 packages.

■ Features

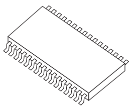
1. High-efficiency
The MD Series consists of a matched control IC and main switching MOSFET in a single package, which allows the construction of a highly efficient power supply with little switching loss and wiring loss.

2. Switching Frequency
Choose the switching frequency matched to the usage conditions from among 250kHz fixed type, 100kHz/300kHz switched type, and 100kHz to 500kHz adjustable type.

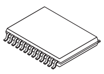
3. Protection Functions
The MD Series has overcurrent protection, thermal shutdown, undervoltage lockout (UVLO) and etc.



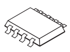
HSOP28



SSOP32



LSSOP26



SOP8

Type No.	Input Voltage [V]	Output Voltage [V]	Output Current [A]	Frequency [kHz]	Operation Temp [°C]	Rectification System	Outline	
							Package	Fig.
☆MD5001T	4.5 to 14	0.8 to 12*2	0 to 1	100 to 500*4	-40 to 85	Fly wheel SBD	SOP8	90
MD3221N	4.5 to 20	2.5/3.3*1 0.8 to 14*2	0 to 3	100/300*3	-30 to 85	Synchronous	SSOP32	83
☆MD3221R		0.8 to 14*2					LSSOP26	84
MD3222N		2.5/3.3*1 0.8 to 14*2	0 to 6				SSOP32	83
MD1222N	8 to 20	2.5 to 12*2	0 to 5	250				
MD1320F	12 to 30	3.3/5*1	0 to 3		-10 to 80	Fly wheel SBD	HSOP28	81
MD1322F	8 to 30	2.5 to 12*2						
MD1320N		3.3/5*1	0 to 1.5		-30 to 85		SSOP32	83
MD1322N		2.5 to 12*2	0 to 1.8					
☆MD1323R				100 to 500*4			LSSOP26	84
☆MD1324R		0.8 to 12*2						
☆MD1333N		2.5 to 12*2	0 to 5			Synchronous	SSOP32	83
MD1421N	8 to 40	3.3/5*1	0 to 3	250				
MD1422N		2.5 to 12*2						
MD1423N		2.5 to 12*2		100 to 500*4				
☆MD1423R							LSSOP26	84
☆MD1424R		0.8 to 12*2						
MD1620F	12 to 57	5	0 to 2	250	-10 to 80	Fly wheel SBD	HSOP28	81
MD1622N	8 to 57	2.5 to 12*2	0 to 1.2		-30 to 85		SSOP32	83

☆: New product
*1: Selectable output voltage 3.3V/5V
*2: Adjustable output voltage
*3: Selectable 100k/300kHz
*4: Adjustable from100k to 500kHz

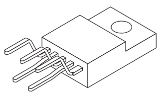
Partial Resonance Power Supply ICs : MR series

■ **Outline**

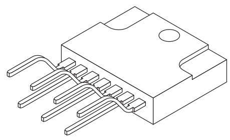
The MR series is Partial Resonance Power Supply IC modules featuring standby mode operation for very low power consumption. A main switching device and a control circuit are incorporated in a single package.
Highly efficient and low noise power supplies can easily be designed with a minimum number of external components using the MR series IC.

■ **Features**

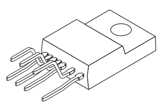
1. Burst mode operation for very low standby power
Ex. MR1521 in 100V AC main, 12V, 3.5A power supply: Pin=0. 1W at no-load
2. High efficiency, low noise
3. No start-up resistance is required
4. Over current protection
5. Over voltage protection
6. Thermal shutdown



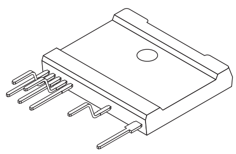
FTO-5P



MIH7



FTO-7P



MZIP-7

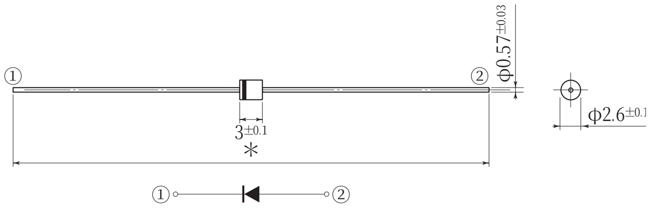
Type No.	Maximum Output[W] ∗			Main Switch		Outline	
	90 to 132V AC	180 to 276V AC	90 to 276V AC	Device	V_{DS} [V]	Package	Fig.
☆**MR1501**	12 (Peak 20)	–	–	MOSFET	500	FTO-5P	85
☆**MR1511**	25 (Peak 40)						
☆**MR1521**	50 (Peak 80)						
☆**MR1531**	80 (Peak 100)						
☆**MR1712**	–	25 (Peak 40)	12 (Peak 20)		700		
☆**MR1722**		50 (Peak 80)	25 (Peak 40)				
MR2520	100	–	–	MOSFET	500	MIH7	87
MR2540	150						
MR2920	–	150	100	1 st Generation High Speed IGBT	900		
MR2940		225	150				
☆**MR4500**	12 (Peak 20)	–	–	MOSFET	500	FTO-7P	86
☆**MR4510**	25 (Peak 40)						
☆**MR4520**	50 (Peak 80)						
☆**MR4530**	80 (Peak 100)						
☆**MR4710**	–	25 (Peak 40)	12 (Peak 20)		700		
☆**MR4720**		50 (Peak 80)	25 (Peak 40)				
☆**MR4010**		65	45	2 nd Generation High Speed IGBT	900		
☆**MR4020**		105	70				
☆**MR4030**		135	90				
☆**MR4040**		180	120				
☆**MR5040**	–	270	150	2 nd Generation High Speed IGBT	900	MZIP-7	88
☆**MR5060**		320	180				

☆: New product
∗: The value is for reference. Maximum output power varies with power supply design.

Outline Dimensions

[Unit：mm]

Fig.1 Package: AX057



∗ Please see the code No.; page 47

Fig.2 Package: AX06

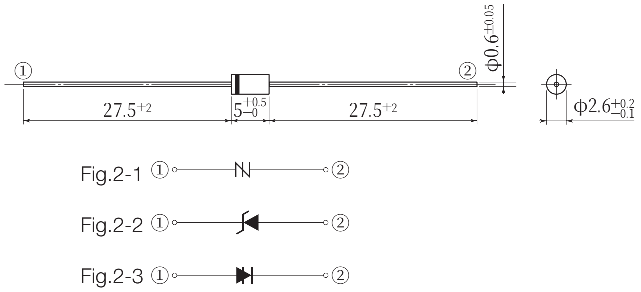


Fig.3 Package: AX06

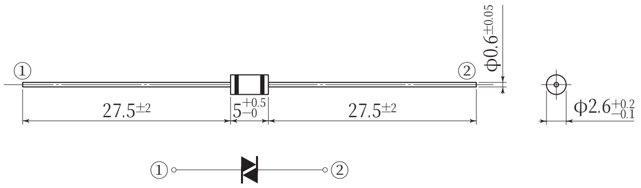


Fig.4 Package: AX06

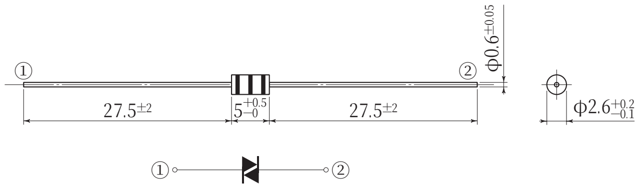


Fig.5 Package: AX078

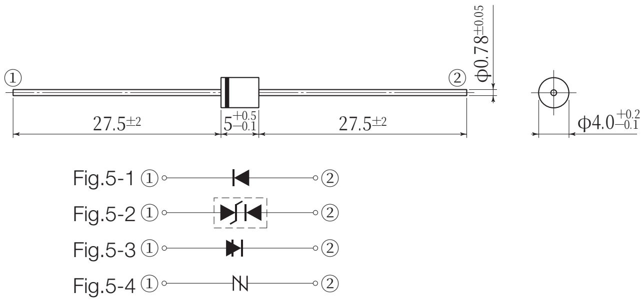


Fig.6 Package: AX10

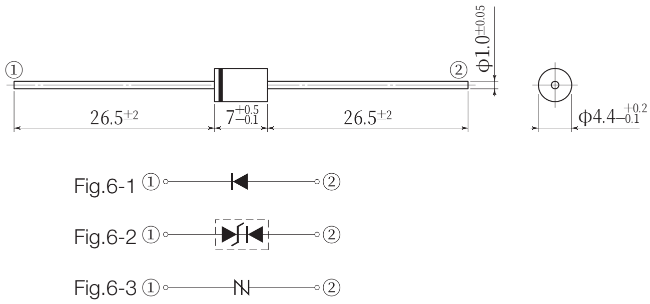


Fig.7 Package: AX10

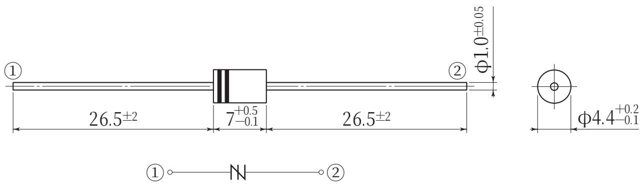
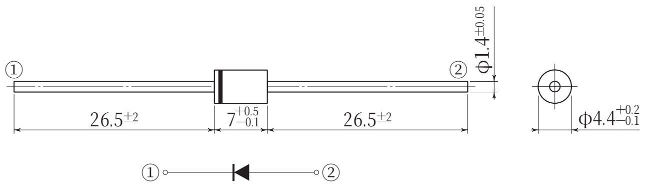


Fig.8 Package: AX14



[Unit : mm]

Fig.11 Package: G1F

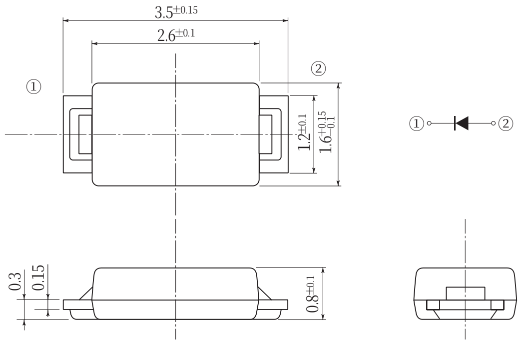


Fig.12 Package: M1F

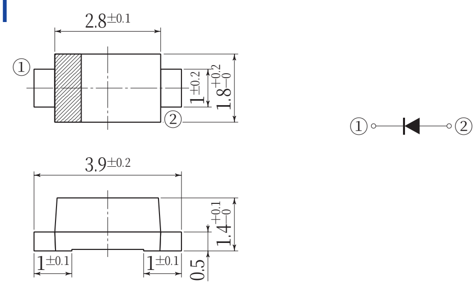


Fig.13 Package: 1F

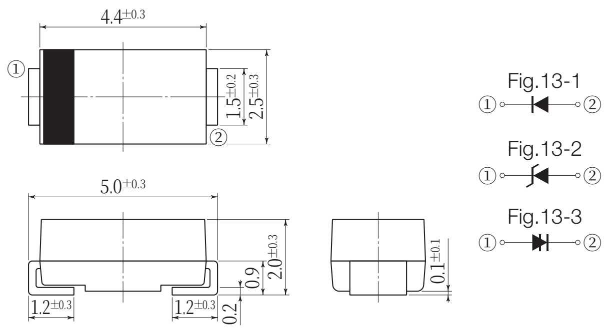


Fig.14 Package: 1F

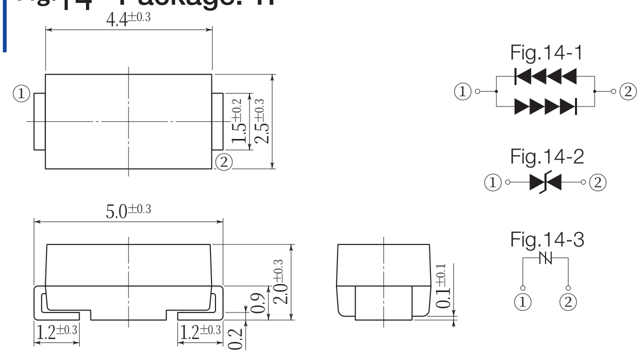


Fig.15 Package: M2F

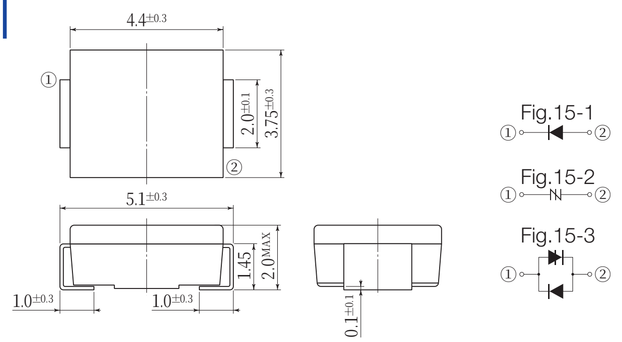


Fig.16 Package: 2F

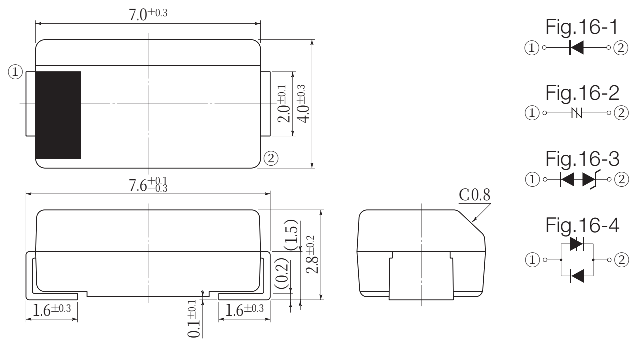


Fig.21 Package: 1Y

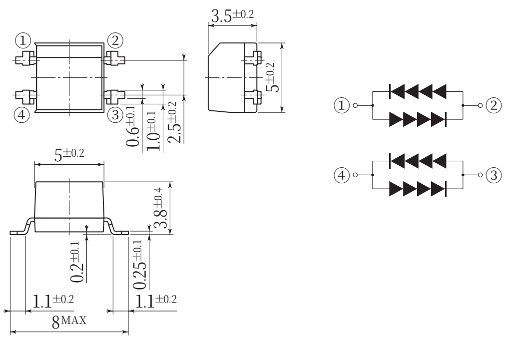


Fig.22 Package: 1Y

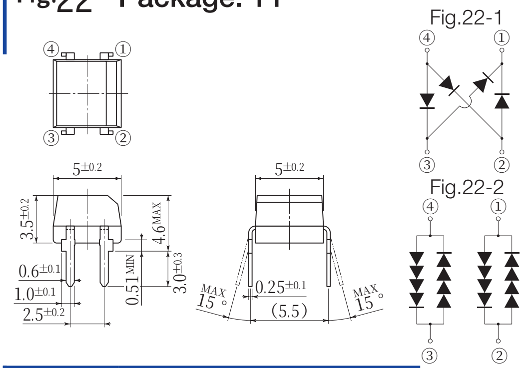


Fig.23 Package: 1Z

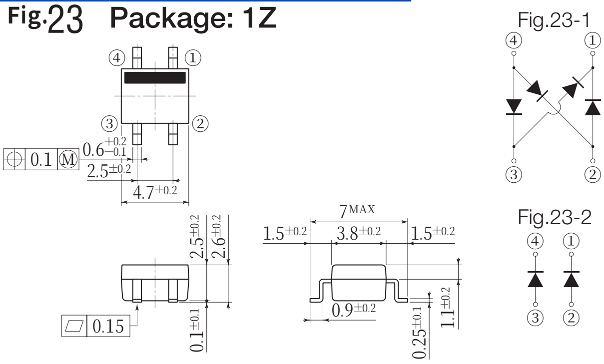
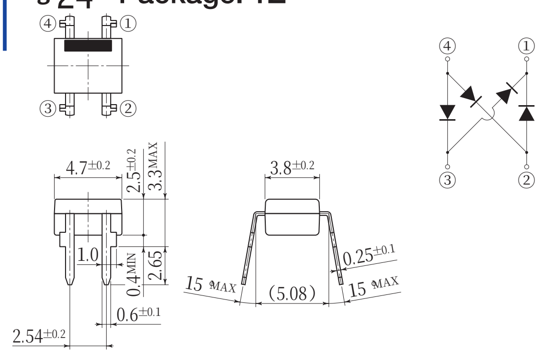


Fig.24 Package: 1Z



Outline Dimensions

[Unit : mm]

Fig.25 Package: 1N

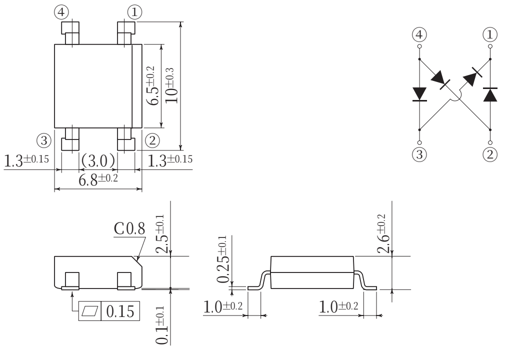


Fig.26 Package: 1N

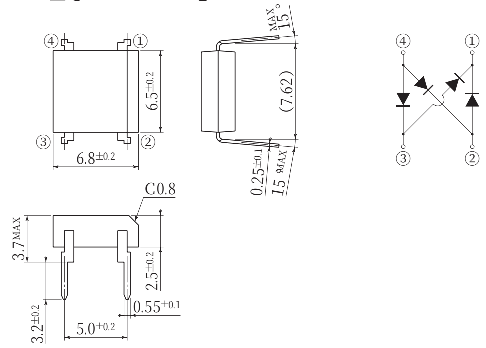


Fig.27 Package: 1NA

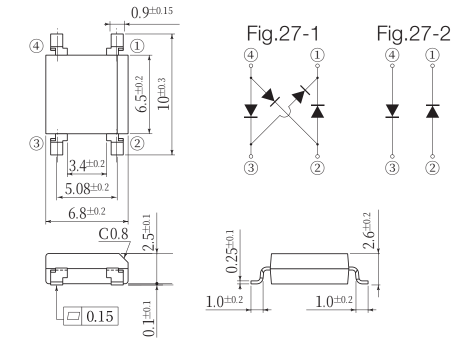


Fig.28 Package: 1NA

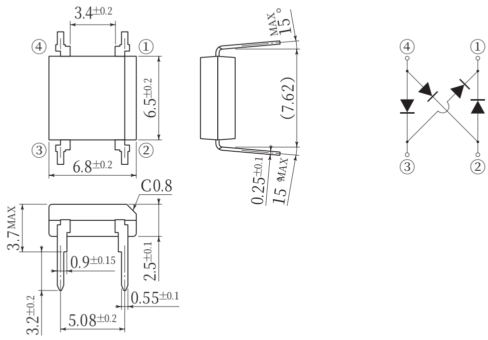


Fig.29 Package: 1W

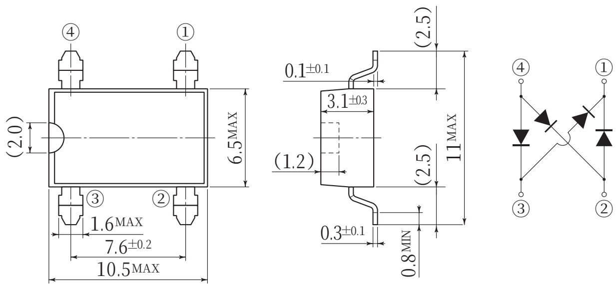


Fig.30 Package: 1W

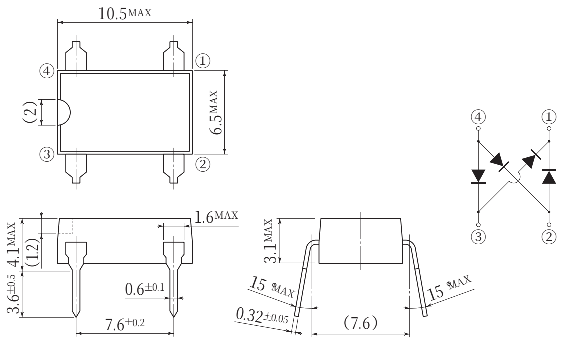


Fig.31 Package: E-pack

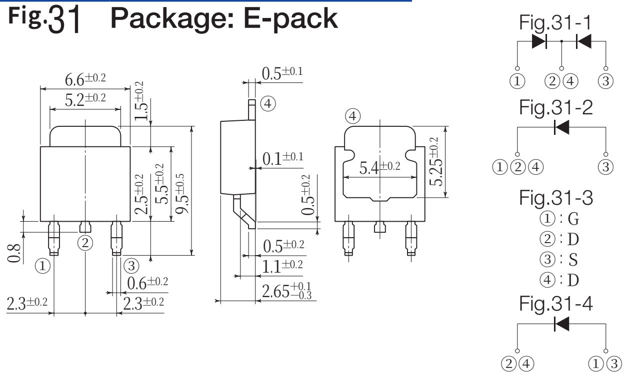


Fig.32 Package: E-pack

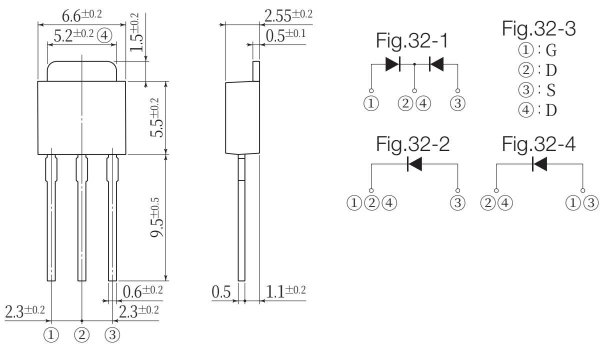
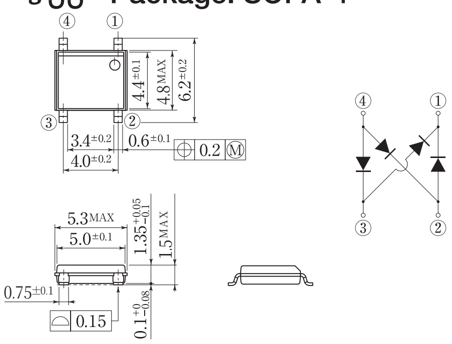


Fig.33 Package: SOPA-4



[Unit：mm]

Fig.35 Package: ZP

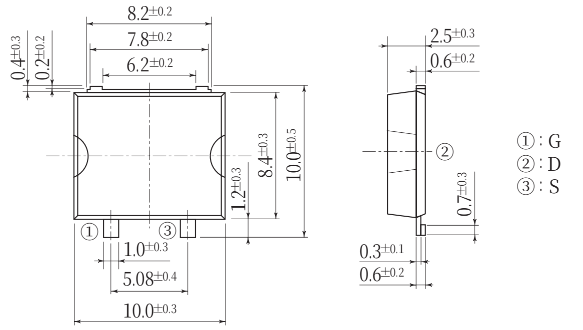
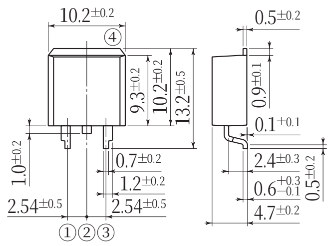


Fig.36 Package: STO-220



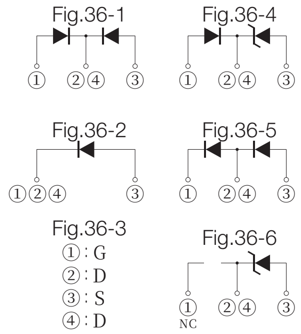


Fig.37 Package: STO-220

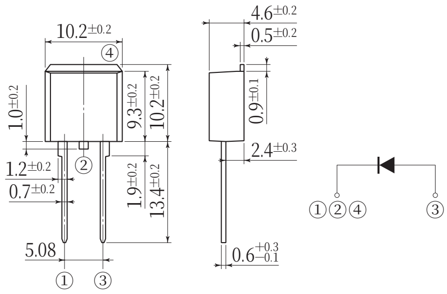
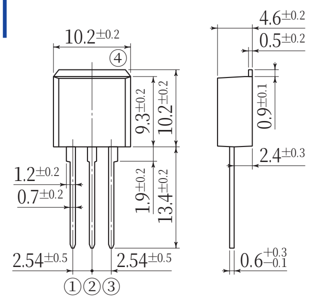


Fig.38 Package: STO-220



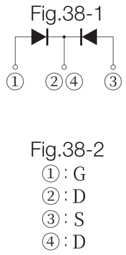


Fig.39 Package: TO-221

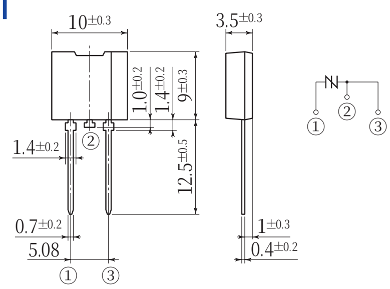


Fig.40 Package: TO-221

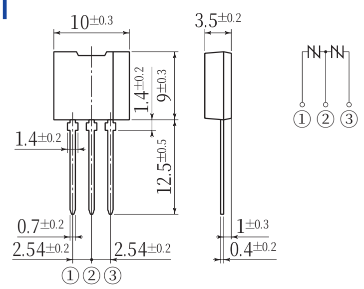


Fig.41 Package: ITO-220

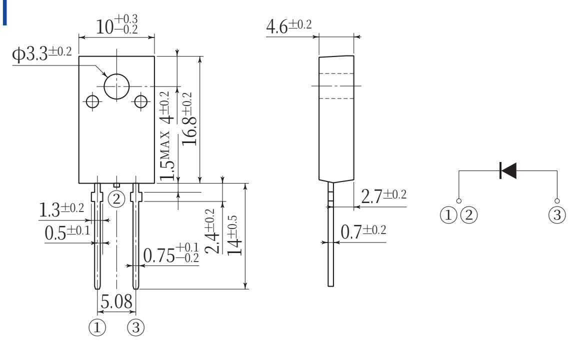
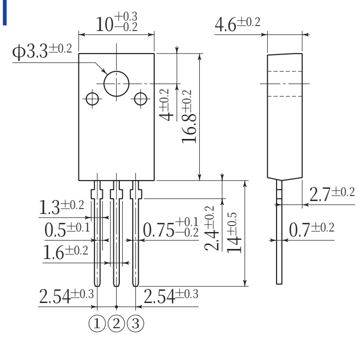
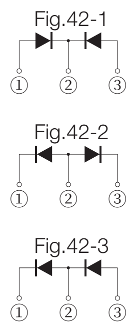


Fig.42 Package: ITO-220





Outline Dimensions

[Unit : mm]

Fig.43 Package: ITO-3P

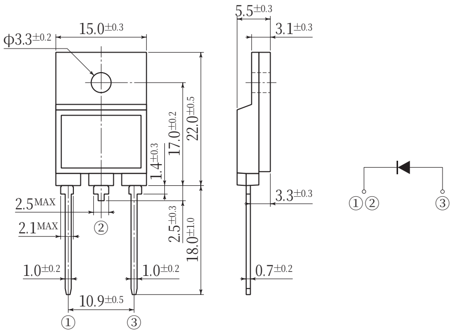


Fig.44 Package: ITO-3P

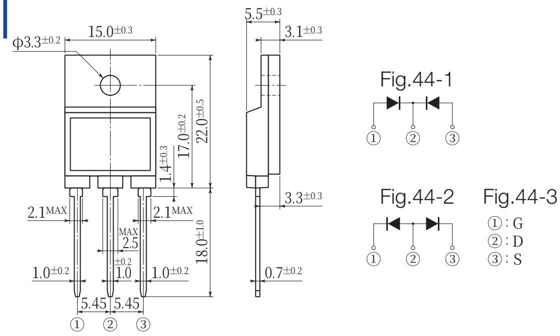


Fig.45 Package: MTO-3P

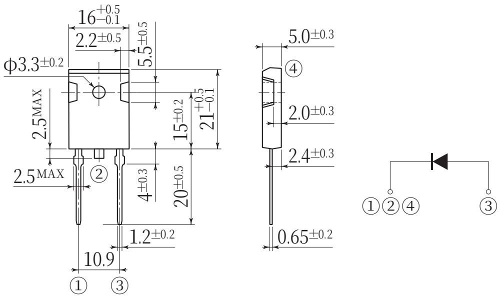


Fig.46 Package: MTO-3P

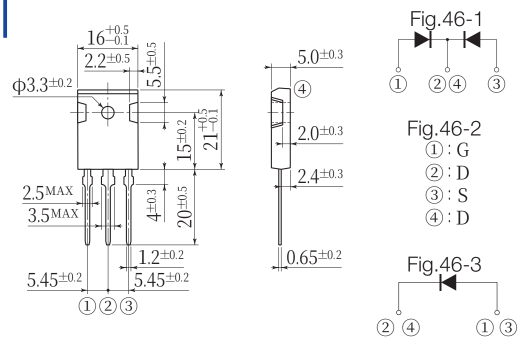


Fig.47 Package: FTO-220

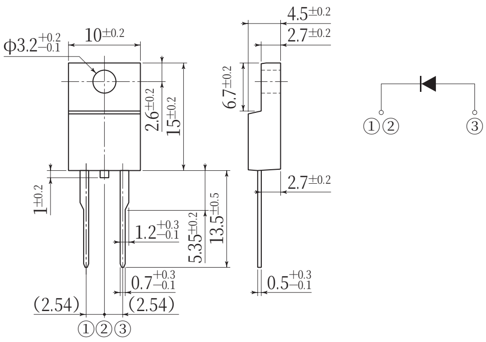


Fig.48 Package: FTO-220

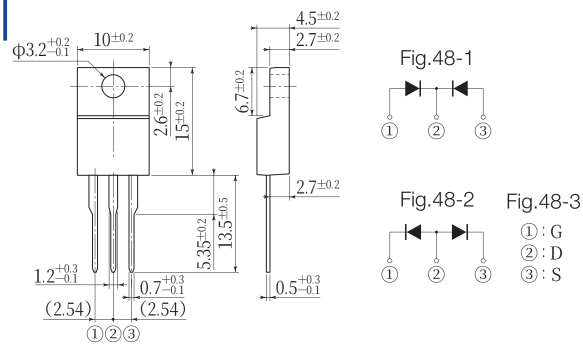


Fig.49 Package: FTO-220A

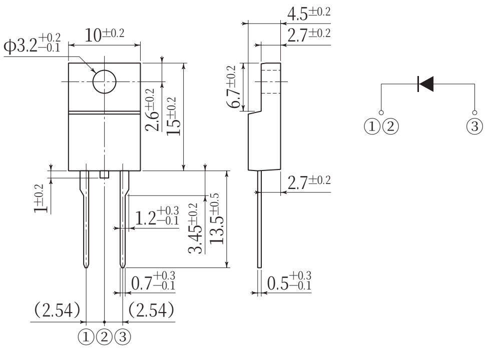
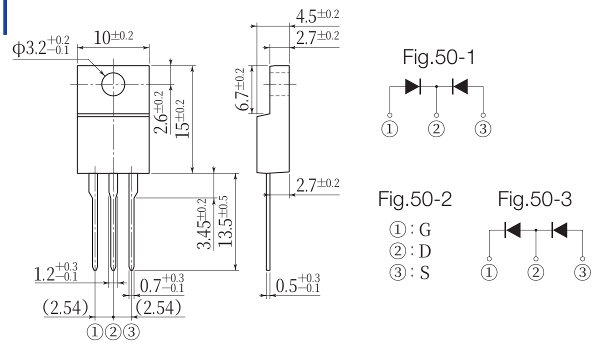


Fig.50 Package: FTO-220A



[Unit：mm]

Fig.53 Package: D6K

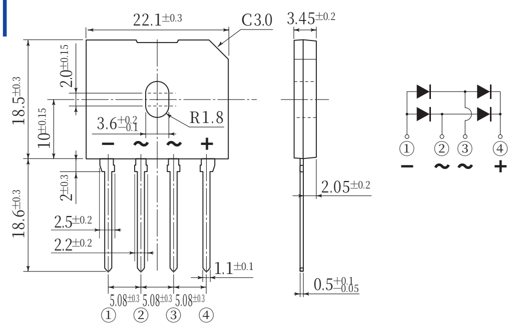


Fig.55 Package: 1V

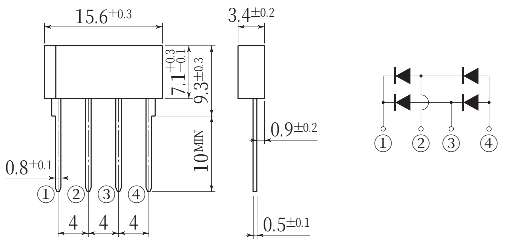


Fig.56 Package: 2S

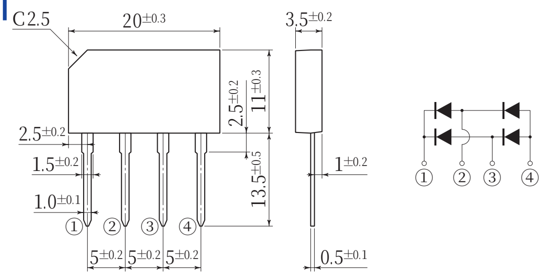


Fig.57 Package: 3S

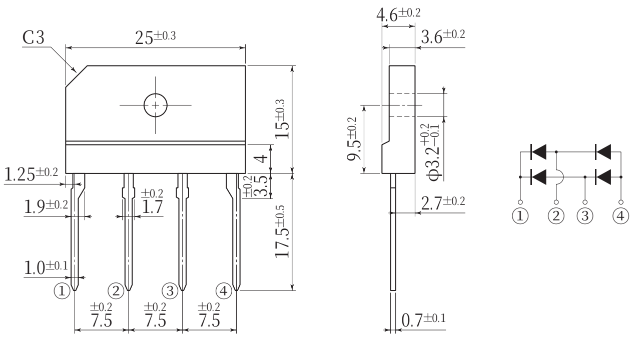


Fig.58 Package: 5S

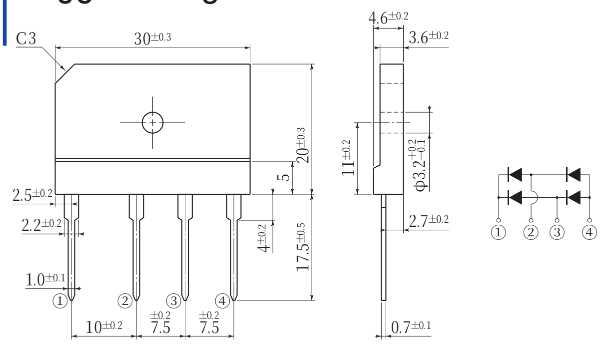


Fig.59 Package: TSB(4PIN)

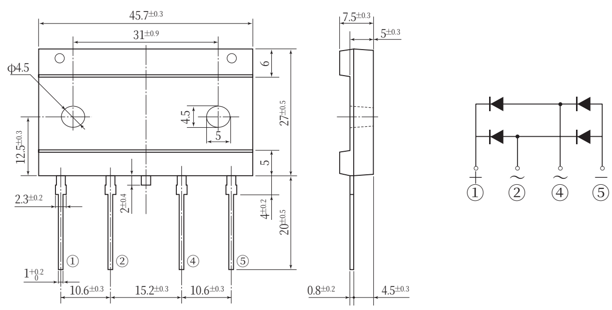


Fig.60 Package: TSB(5PIN)

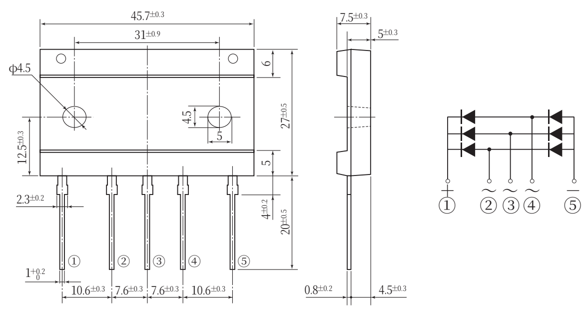


Fig.61 Package: S2VB

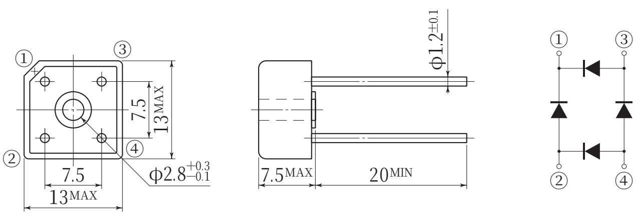
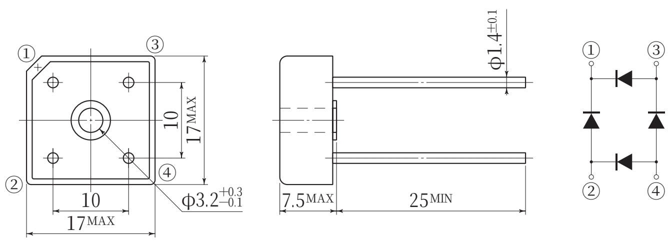


Fig.62 Package: S4VB



Outline Dimensions

[Unit：mm]

Fig.63 Package: S5VB

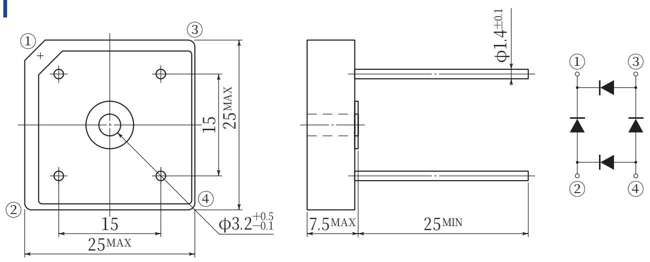


Fig.64 Package: S10VB

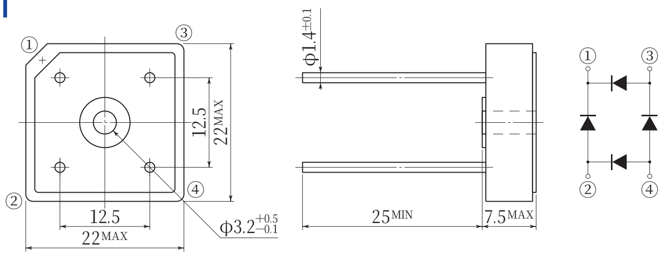


Fig.65 Package: S15VB

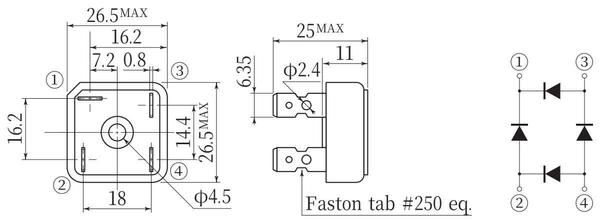


Fig.66 Package: S25VB

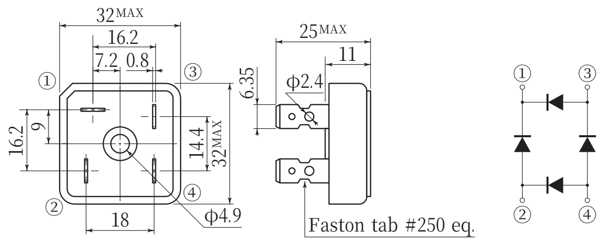


Fig.67 Package: S50VB

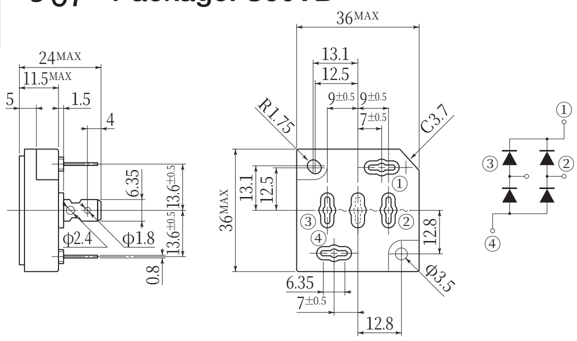


Fig.68 Package: S3WB

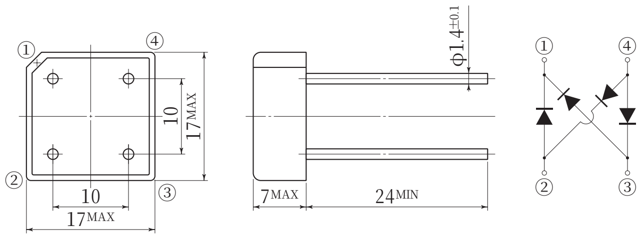


Fig.69 Package: S10WB

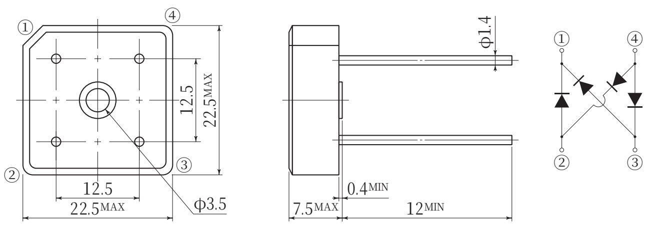


Fig.70 Package: S15WB

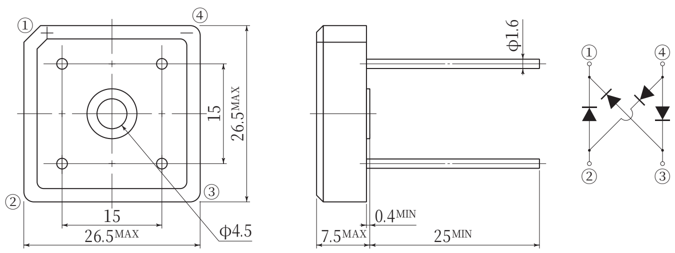
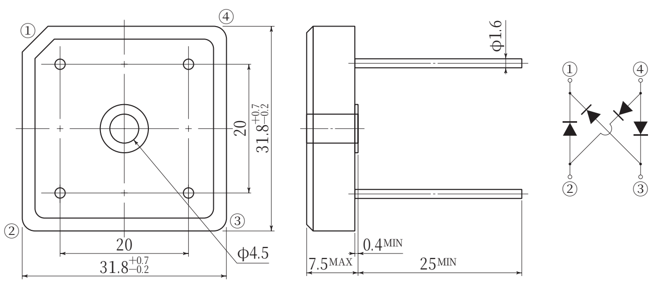


Fig.71 Package: S20WB



[Unit : mm]

Fig.73 Package: SVTA

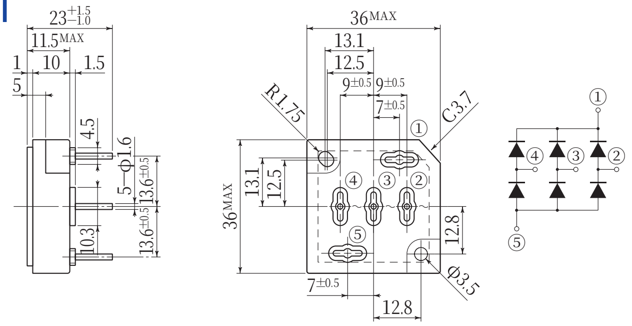


Fig.74 Package: SVT

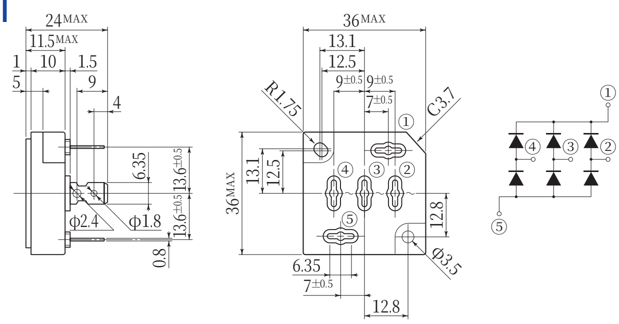


Fig.76 Package: D30VC

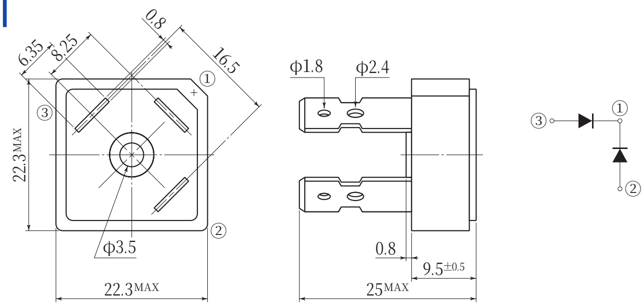


Fig.77 Package: Module

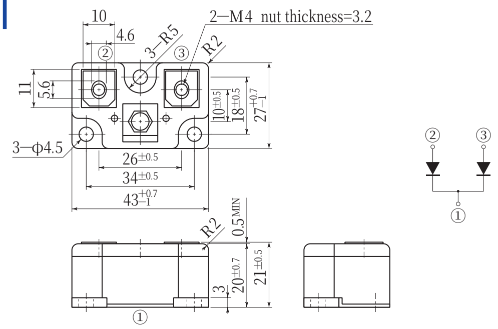


Fig.78 Package: Module

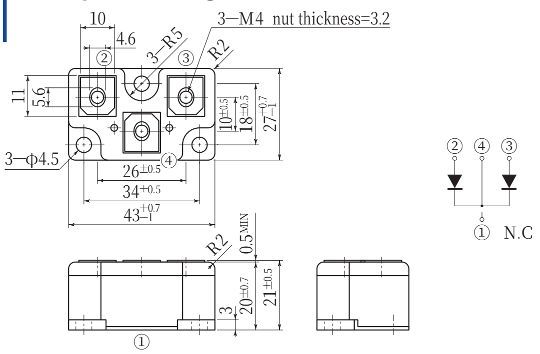


Fig.79 Package: Module

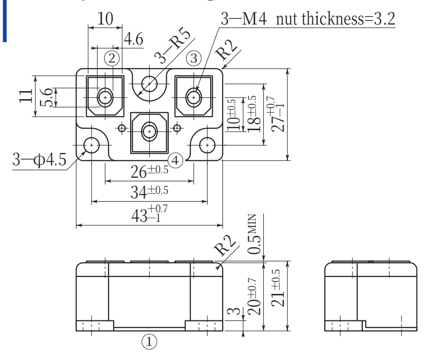


Fig.79-1

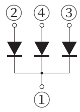
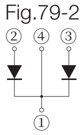


Fig.79-2



Outline Dimensions

[Unit：mm]

Fig.81 Package: HSOP28

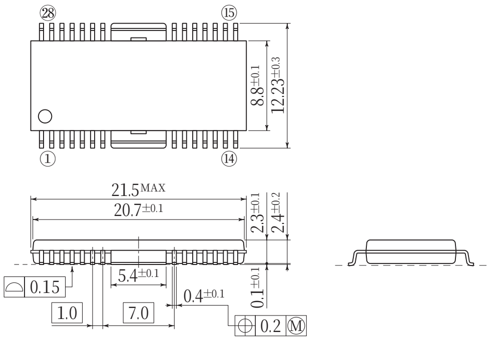


Fig.82 Package: HSOP40

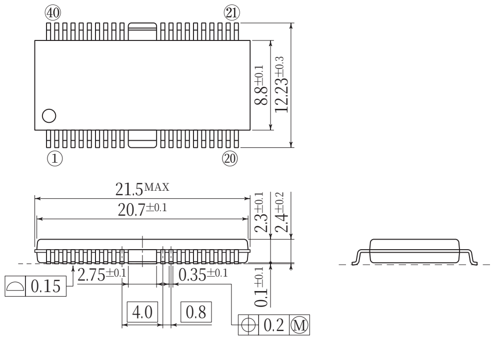


Fig.83 Package: SSOP32

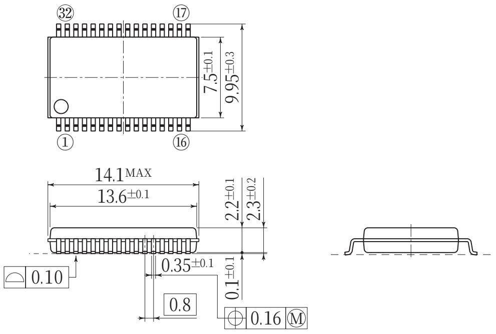


Fig.84 Package: LSSOP26

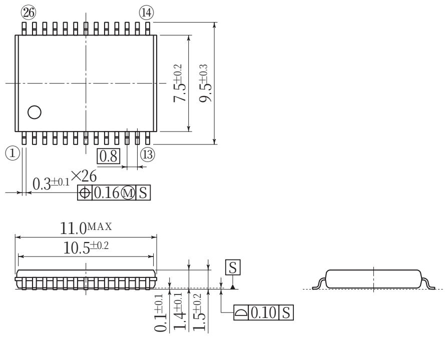


Fig.85 Package: FTO-5P

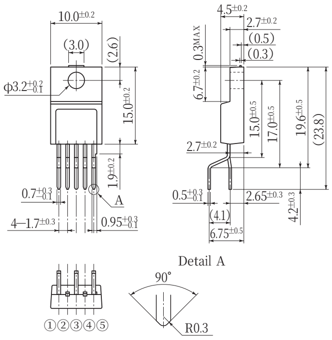


Fig.86 Package: FTO-7P

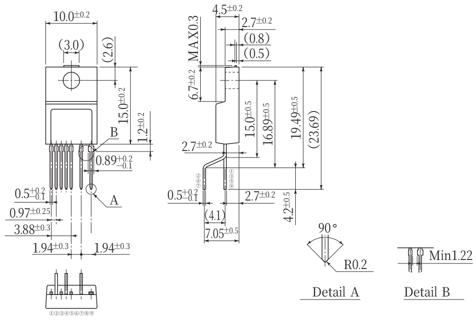


Fig.87 Package: MIH7

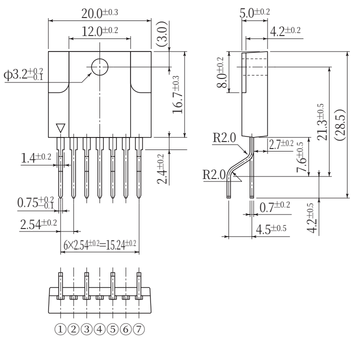


Fig.88 Package: MZIP-7

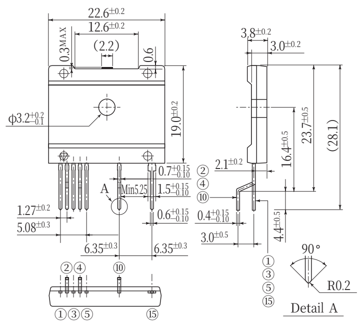


Fig.89 Package: ZIP27

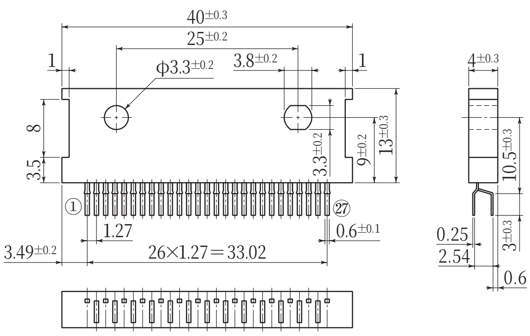
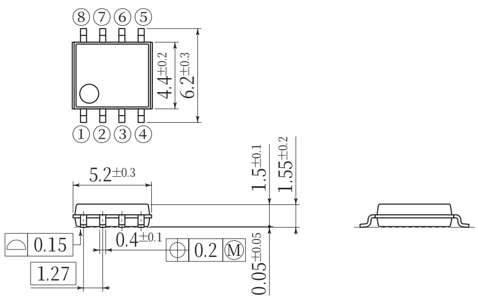


Fig.90 Package: SOP8



NAMING/OUTLINE OF PACKING FORM

ORDERING QUANTITY AND PACKING FORM

CODE NO. (TAPING)

LEAD FORMING

Naming/Outline of Packing Form

1.Indication of Spec Codes when ordering

Please specity the Spec Code (& the Forming Code) when ordering semiconductors.

Example 1 Ordering 7001 (short lead) type of S1VB60
S1VB60-7001

Example 2 Ordering 7002P5 (5mm pitch, w/kink) type of D2L20U
D2L20U-7002P5

2.Type No.

Example 1 D 1 N □

Reverse voltage divided by 10

Example 2 2 S K 2 6 6 3

JEITA No.

JEITA Classification
2SK: MOSFET

3.Spec Code

The code specifies each packing form, lead forming and terminal plate material.

Example

5 0 0 0

Terminal forming
0 : Straight terminal
1 to 9 : Each number shows type of form

In case of surface mounting devices
6 : Small reel
7 : Large reel

In case of axial devices
6 : Lead length 52mm (T52)
7 : Lead length 26mm (T26)
8 : Radial taping

Minimum packing unit
0 : Bulk, tray or taping
1 : Magazine

Terminal plate material
3 : Ni/Pd/Au
4 : Ni or Ag
5 : Sn-Ag-Cu, Sn, Ag, Sn-Cu
6 : Sn
7 : Sn-Bi

4. Minimum packing unit

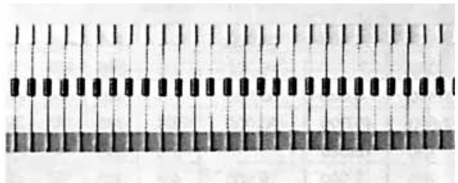
■ **Bulk:** The form in which parts are inserted into plastic bags or cardboard boxes.

■ **Tary**: The form in which parts are inserted into containers made of resin.

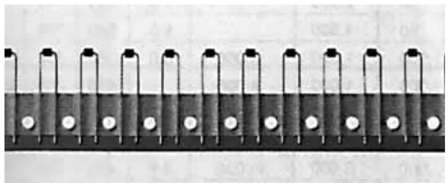
■ **Magazine**: The form in which parts are inserted into resin cartridges designated for automatic inserters.

■ **Tape & reel**

■ **Taping:** Horizontal Taping(T52, T26)



■ **Taping:** Radial Taping

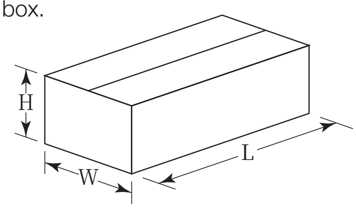


5. Packing Quantities

See the following pages for the quantity and the weight of each standard packing unit.

6. Packing Box Dimensions

See the following pages for the dimensions of each cardboard box.



Ordering Quantity and Packing Form

Package	Terminal Type	Terminal Forming	Spec Code	Minimum Packing Unit		Minimum Ordering Unit (Pcs.)	Inner Box Quantity (Pcs./Box)	Standard Packing Unit		Packing Box (mm)		
				Quantity	Packing Method			Pcs./Box	Weight (kg)	L	W	H
AX057	THD		□060	4,000	Tape, Ammo-Pack 52mm	4,000	4,000	40,000	10.0	400	270	240
			□070	3,000	Tape, Ammo-Pack 26mm	3,000	3,000	60,000	10.5	530	270	220
		w/o Kink	□083	3,000	Tape, Radial	3,000	3,000	30,000	8.6	370	350	245
		w/ Kink	□084	3,000	Tape, Radial	3,000	3,000	30,000	8.6	370	350	245
AX06	THD		□000	200	Bulk	200		5,000	1.5	340	190	115
			□060	4,000	Tape, Ammo-Pack 52mm	4,000	4,000	64,000	14.0	325	325	420
			□070	3,000	Tape, Ammo-Pack 26mm	3,000	3,000	72,000	15.7	325	325	420
			□061	4,000	Tape & Reel, Diameter 300 φ	4,000	4,000	20,000	4.9	325	325	420
			□081	5,000	Tape, Radial	5,000	5,000	20,000	8.3	350	200	335
AX078	THD		□000	200	Bulk	200	2,000	16,000	7.9	480	355	230
			□060	2,000	Tape, Ammo-Pack 52mm	2,000	2,000	32,000	14.7	325	325	420
			□070	1,500	Tape, Ammo-Pack 26mm	1,500	1,500	18,000	10.0	325	325	260
AX10	THD		□000	100	Bulk	100	2,000	16,000	11.1	480	355	235
			□000	200	Bulk	200	2,000	12,000	8.3	336	245	370
			□060	1,200	Tape, Ammo-Pack 52mm	1,200	1,200	18,000	14.4	325	325	420
			□061	2,500	Tape & Reel, Diameter 300 φ	2,500	2,500	12,500	10.8	331	331	432
AX14	THD		□000	100	Bulk	100	2,000	16,000	17.5	486	361	242
			□000	200	Bulk	200	2,000	12,000	13.1	336	245	370
			□060	1,200	Tape, Ammo-Pack 52mm	1,200	1,200	19,200	14.4	325	325	420
			□061	2,500	Tape & Reel, Diameter 300 φ	2,500	2,500	12,500	15.0	325	325	420
The initial digit of the Spec Code varies. See the remarks to each product.												
G1F	SMD		5063	4,000	Tape & Reel, Diameter 180 φ	4,000	24,000	120,000	5.0	405	210	220
M1F	SMD		5063	2,500	Tape & Reel, Diameter 180 φ	2,500	15,000	75,000	4.5	405	210	220
1F	SMD		5103	100	Magazine	300		15,000	2.3	545	145	110
			5063	1,500	Tape & Reel, Diameter 180 φ	1,500	6,000	60,000	7.0	395	350	235
			5073	7,500	Tape & Reel, Diameter 330 φ	7,500	45,000	90,000	10.8	395	245	395
M2F	SMD		5063	1,000	Tape & Reel, Diameter 180 φ	1,000	4,000	20,000	3.4	340	195	205
			5073	4,000	Tape & Reel, Diameter 330 φ	4,000	24,000	48,000	8.6	395	245	395
2F	SMD		5103	60	Magazine	120		18,000	5.2	545	145	110
			5063	750	Tape & Reel, Diameter 180 φ	750	3,000	15,000	4.2	340	195	205
			5073	3,000	Tape & Reel, Diameter 330 φ	3,000	18,000	36,000	9.2	395	245	395
1Y	THD		7101	100	Magazine	100		10,000	5.0	536	141	117
	SMD		7102	100	Magazine	100		10,000	5.0	536	141	117
			7062	1,000	Tape & Reel, Diameter 250 φ	1,000	4,000	8,000	5.3	274	219	291
			7072	2,000	Tape & Reel, Diameter 330 φ	2,000	8,000	16,000	8.8	349	244	361
1Z	THD		7101*	100	Magazine	100		10,000	2.1	545	145	110
	SMD		7102	100	Magazine	100		15,000	3.2	545	145	110
			7062	750	Tape & Reel, Diameter 180 φ	750	3,000	15,000	4.0	340	195	205
			7072	3,000	Tape & Reel, Diameter 330 φ	3,000		15,000	4.6	340	340	120
SOPA-4	SMD		7062	1,000	Tape & Reel, Diameter 180 φ	1,000	1,000	20,000	3.6	340	195	205
1N/1NA	THD		7101	70	Magazine	70		5,600	4.1	545	145	100
	SMD		7102	70	Magazine	70		5,600	4.1	545	145	100
			7062	1,000	Tape & Reel, Diameter 250 φ	1,000	2,000	10,000	5.5	275	285	295
1W	THD		7101	50	Magazine	100		4,000	4.4	545	145	110
	SMD		7102	50	Magazine	100		4,000	4.4	545	145	110
			7062	1,000	Tape & Reel, Diameter 330 φ	1,000	3,000	6,000	5.9	395	245	395
			7072	2,000	Tape & Reel, Diameter 380 φ	2,000		10,000	7.8	395	245	395
E-pack	THD		7100	80	Magazine	80		10,000	6.9	560	130	109
	SMD		7101	80	Magazine	80		10,000	6.9	560	130	109
			7061	1,500	Tape & Reel, Diameter 250 φ	1,500		6,000	2.9	260	260	99
			7071	3,000	Tape & Reel, Diameter 330 φ	3,000		12,000	5.5	335	335	99
STO-220	THD		7000	50	Tray	50	1,000	2,000	4.0	350	205	210
			7100	50	Magazine	50		2,500	7.4	555	145	110
	SMD		7102	50	Magazine	50		4,500	9.5	555	145	110
			7072	1,000	Tape & Reel, Diameter 330 φ	1,000	1,000	3,000	6.0	362	362	160
TO-221	THD		7100	50	Magazine	50		3,000	4.2	545	145	110
ZP	SMD		7072	1,500	Tape & Reel, Diameter 330 φ	1,500	1,500	7,500	8.0	345	345	154
									8.6	363	363	160

*: Only for S1ZB type

THD: Through Hole Device
SMD: Surface Mount Device

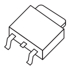
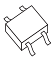
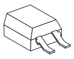
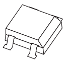
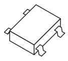
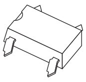
Please make your orders:
- more than inner box quantities
- a multiple of each minimum ordering unit

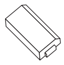
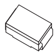
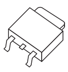
Package	Terminal Type	Terminal Forming	Spec Code	Minimum Packing Unit: Quantity	Minimum Packing Unit: Packing Method	Minimum Ordering Unit (Pcs.)	Inner Box Quantity (Pcs./Box)	Standard Packing Unit: Pcs./Box	Standard Packing Unit: Weight (kg)	Packing Box (mm): L	Packing Box (mm): W	Packing Box (mm): H
ITO-220	THD		7000	50	Tray	50		2,000	5.2	350	205	210
ITO-220	THD	Formed	7012	50	Tray	50		2,000	5.2	350	205	210
ITO-220	THD		7100	50	Magazine	50		2,000	6.7	530	145	110
ITO-220	THD	Formed	7112	50	Magazine	50		800	4.3	545	145	110
FTO-220 FTO-220A	THD		7000	50	Tray	50		2,000	4.8	350	205	210
FTO-220 FTO-220A	THD		7600	100	Bulk	100	2,000	4,000	8.3	422	244	133
FTO-220 FTO-220A	THD	Formed	7112	50	Magazine	50		1,400	4.3	526	141	102
MTO-3P	THD	∗1	7100	30	Magazine	30		900	7.6	530	145	110
MTO-3P	THD	∗2	7000	500	Bulk	100	500	1,000	6.8	351	176	123
MTO-3P	THD	Formed	7112	35	Magazine	35		1,050	9.3	635	160	168
ITO-3P	THD	∗1	7100	40	Magazine	40		1,200	8.0	624	151	92
ITO-3P	THD	∗2	7000	500	Bulk	100	500	1,000	4.9	332	188	121
ITO-3P	THD	∗2	7000	500	Bulk	100	500	2,000	9.7	362	332	121
ITO-3P	THD	Formed	7112	40	Magazine	40		1,200	7.7	635	160	168
1V	THD		7000	100	Bulk	100	2,000	8,000	9.7	395	350	235
1V	THD	Formed	7101	30	Magazine	120		3,600	5.7	508	141	99
2S	THD		7000	500	Bulk	100	500	6,000	14.4	410	380	170
3S	THD		7000	250	Bulk	50	250	1,000	4.6	283	155	183
3S	THD		7000	250	Bulk	50	250	2,000	9.5	305	280	183
5S	THD		7000	250	Bulk	50	250	2,000	14.5	330	330	205
5S	THD	Formed	7101	20	Magazine	40		1,000	8.2	670	185	95
TSB(4PIN) TSB(5PIN)	THD		7000	100	Bulk	100	100	400	9.8	351	269	164
S2VB	THD		5000	100	Tray	100		1,000	3.6	265	255	170
S4VB	THD		5000	100	Tray	50		1,000	5.9	315	285	220
S5VB	THD		5000	100	Tray	50		1,000	10.4	415	285	300
S10VB	THD		5000	100	Tray	50		1,000	9.3	375	285	270
S15VB	Faston		4000	100	Tray	50		1,000	17.0	415	285	300
S25VB	Faston		4000	60	Bulk	60	300	600	14.2	420	345	190
S50VB	Faston		4000	50	Tray	50	200	200	6.2	335	205	165
S3WB	THD		5000	100	Tray	50		1,000	6.1	315	285	220
S10WB	THD		5000	100	Tray	50		1,000	9.3	375	285	270
S15WB	THD		5000	100	Tray	50		1,000	15.1	415	285	300
S20WB	THD		5000	100	Tray	50		700	15.0	415	285	300
D30VC	Faston		4000	100	Tray	50		1,000	12.7	415	285	300
SVT	Faston		4000	200	Bulk	(45)	200	200	6.2	335	205	165
SVTA	THD		5000	50	Tray	50	250	250	7.6	400	260	255
Module	M4 nut		4000	25	Bulk	(3)	100	200	13.4	480	330	210
ZIP-27 (MTA•MTD)	THD		7101	15	Magazine	15		450	5.3	640	180	105
ZIP-27 (MTA•MTD)	THD	Formed	7102	15	Magazine	15		450	5.3	640	180	105
ZIP-27 (MTA•MTD)	THD	Formed	7103	15	Magazine	15		450	5.3	640	180	105
HSOP28 (MD□F•MTD□F)	SMD		3072	1,000	Tape & Reel, Diameter 330 ϕ	1,000	1,000	3,000	7.6	362	362	160
HSOP40 (MTD□J)	SMD		3072	1,000	Tape & Reel, Diameter 330 ϕ	1,000	1,000	3,000	7.6	362	362	160
SSOP32	SMD		3072	2,000	Tape & Reel, Diameter 330 ϕ	2,000	2,000	6,000	7.6	362	362	160
LSSOP26	SMD		3072	3,000	Tape & Reel, Diameter 330 ϕ	3,000	3,000	9,000	5.5	363	363	160
LSSOP26	SMD		3062	700	Tape & Reel, Diameter 180 ϕ	700	700	2,800	2.5	243	226	260
SOP8	SMD		7062	1,000	Tape & Reel, Diameter 180 ϕ	1,000	1,000	18,000	4.5	442	202	205
SOP8	SMD		7062	1,000	Tape & Reel, Diameter 180 ϕ	1,000	1,000	10,000	2.6	260	200	210
FTO-5P (MR1000 Series)	THD	Formed	7101	50	Magazine	50		1,400	4.3	526	141	104
FTO-7P (MR4000 Series)	THD	Formed	7101	50	Magazine	50		1,400	4.3	526	141	104
MIH7 (MR2000 Series)	THD	Formed	7109F12	30	Magazine	30		960	6.8	655	170	105
MZIP-7 (MR5000 Series)	THD	Formed	7101	20	Magazine	20		560	4.4	530	150	110
D6K	THD		4000	500	Bulk	50	500	2,000	8.0	260	220	222

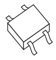
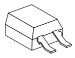
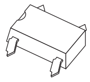
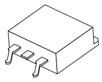
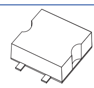
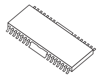
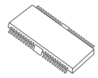
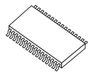
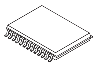
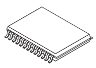
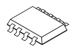
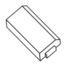
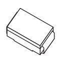
∗1: MOSFETs ∗2: Diodes

Code No. (Taping)

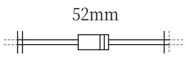
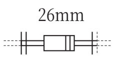
SMD

Spec Code	Outline		Reel diameter (φ)	Quantity
7061	E-pack		250	1500
7062	1Z		180	750
	1Y		250	1000
	1N		250	1000
	SOPA-4		180	1000
	1W		330	1000

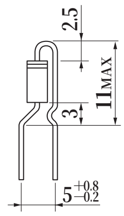
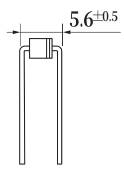
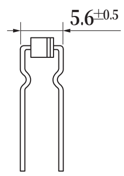
Spec Code	Outline		Reel diameter (φ)	Quantity
5063	G1F		180	4000
	1F		180	1500
	2F		180	750
	M2F		180	1000
6063	M1F		180	2500
7071	E-pack		330	3000

Spec Code	Outline		Reel diameter (φ)	Quantity
7072	1Z		330	3000
	1Y		330	2000
	1W		380	2000
	STO-220		330	1000
	ZP		330	1500
3072	HSOP28		330	1000
	HSOP40		330	1000
	SSOP32		330	2000
	LSSOP26		330	3000
3062	LSSOP26		180	700
7062	SOP8		180	1000
5073	1F		330	7500
	2F		330	3000
	M2F		330	4000

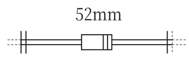
AX Ammo-Pack

Spec Code	Outline		Quantity
□060	AX057		4000
	AX06		4000
	AX078		2000
	AX10		1200
	AX14		1200
□070	AX057		3000
	AX06		3000
	AX078		1500

AX Radial-Taping

Spec Code	Outline		Quantity
□081	AX06		5000
□083	AX057		3000
□084	AX057		3000

AX Reel

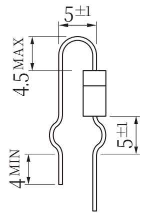
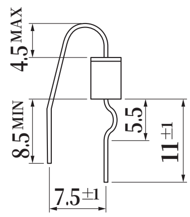
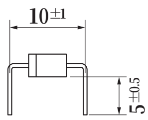
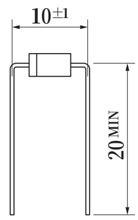
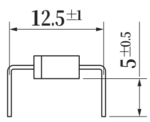
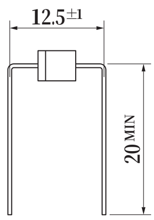
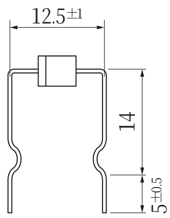
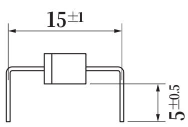
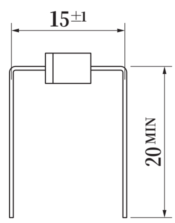
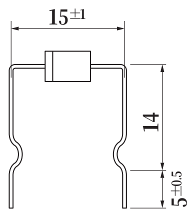
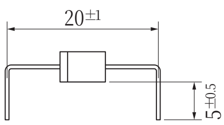
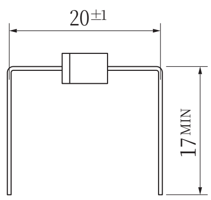
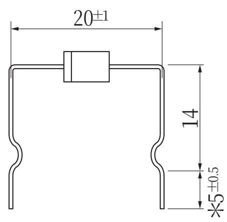
Spec Code	Outline		Reel diameter (ϕ)	Quantity
□061	AX06		300	4000
	AX10		300	2500
	AX14		300	2500

The initial digit of the Spec Code varies. See the remarks to each product.

Lead Forming

Axial type diode

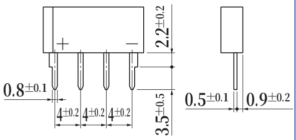
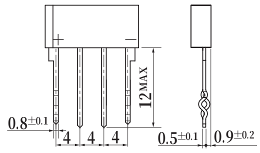
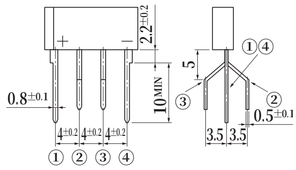
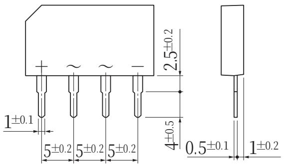
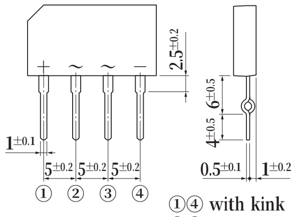
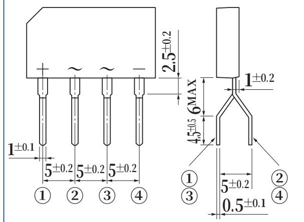
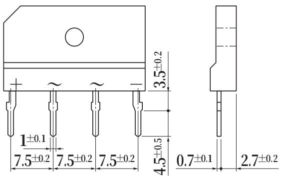
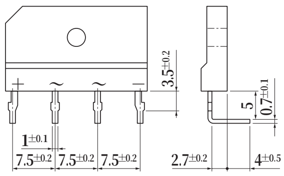
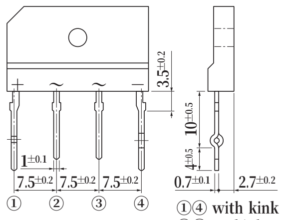
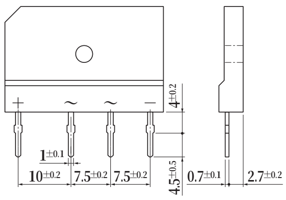
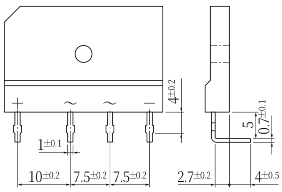
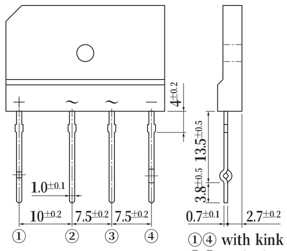
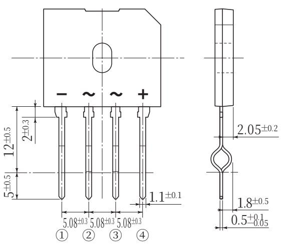
Standard forming types are configured using two codes, a spec code first and then the forming code.
Complete code example would be 5002P5. (As for details, please refer to the outline dimensions in each specification sheet.) [*Unit*:*mm*]

Forming Code \ Spec Code / Package		□001	□002	□003	□004
P5	AX078 AX10				
P7.5	AX10 AX14				
P10	AX078				
P12.5	AX078 AX10				
P15	AX078 AX10 AX14				
P20	AX10 AX14				

∗Tolerance is $5^{+0.5}_{-1.0}$ for AX14 products (ϕ 1.4mm)
The initial digit of the Spec Code varies. See the remarks to each product.

SIP Bridge Diodes

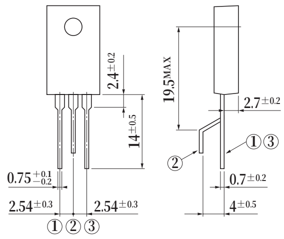
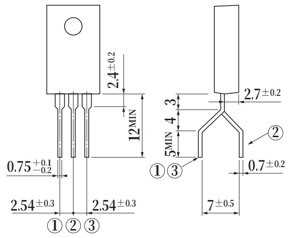
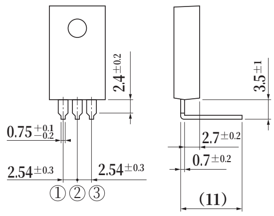
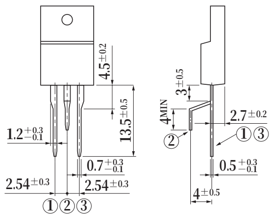
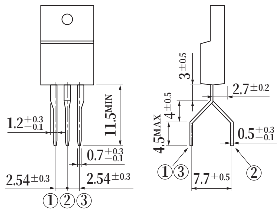
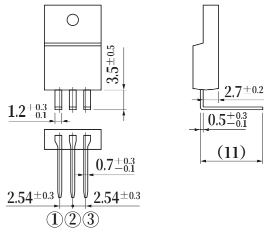
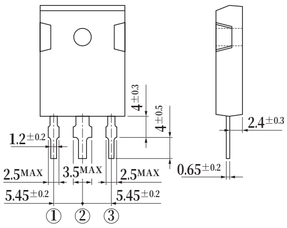
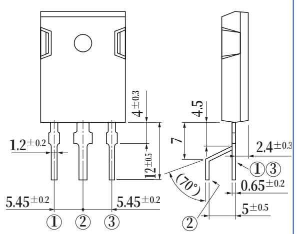
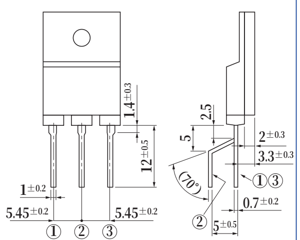
(As for details, please refer to the outline dimensions in each specification sheet.) [*Unit:mm*]

Spec Code / Package	7001 Short Lead	7002 L-Type Lead	7003 Outside Kink	7004 Zig-Zag Lead
1V				
2S			 ①④ with kink ②③ no kink	
3S			 ①④ with kink ②③ no kink	
5S			 ①④ with kink ②③ no kink	
KB				

Lead Forming

Three Terminal diodes / MOSFETs

(As for details, please refer to the outline dimensions in each specification sheet.) [Unit:mm]

Spec Code / Package	7001	7012	7015	7022
ITO-220				
FTO-220				
MTO-3P				
ITO-3P				

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- Please contact us for the latest specifications before you order.
- Please use this products after reading manuala well.

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