

**FEATURES**

- Advanced Thin Film Technology
- Superior Overall Stability
- Four Resistors per Substrate
- Green Product, supports Lead (Pb)-free soldering

PRODUCT DESCRIPTION	TYPE	PACKAGE WATTS @ 70°C	TOL ± %	RESISTANCE RANGE Ω	FEATURES
Thin Film Chip Resistor Array Surface Mount Professional	ACAC 0612	0.3	1	100-100K	Different values possible.
Precision	ACAC 0612	0.3	0.25	100-100K	Different values possible. Matching & tracking is specified.
8, 10, 16 Terminal	TRA06E	0.063	0.1-5	10-1M	8,10, 16 terminal leadless wraparound package with four or eight elements. The networks features small size
Thin Film Automotive Grade Chip Resistor Arrays Sulfur Resistant Excellent stability in critical conditions Zero ohm available in all sizes	ARA04S ARA06E ARA06S ARA12E ARA12S	0.063 0.063 0.063 0.125 0.125	2-5 1-5 1-5 1-5 1-5	10-1M 10-1M 10-1M 10-1M 10-1M	2 or 4 Nominally Equal Resistors; isolated from all others and wired directly across: Isolated or Bussed in 4, 8, 10 or 16 element package.

FEATURES

- Rugged Thick Film Materials with Established High Reliability
- Isolated and commoned Elements together with Terminator Array Configurations are available
- Standard Resistor Networks or Custom Designed Packages can be supplied
- High Profile, Low Profile and Medium Profile Styles to suit most p.c.b.

PRODUCT DESCRIPTION	TYPE	PACKAGE WATTS @ 70°C	TOL ± %	RESISTANCE RANGE Ω	FEATURES
Surface Mount Resistor Networks Small Outline Molded DIP Zero Ohm jumper available	SOGC-16 SOGC-20 SOMC-14 SOMC-16 SOMC-20	1.6 2.0 1.125 1.28 1.6	1-5 1-5 1-5 1-5 1-5	10-1M 10-1M 10-1M 10-1M 10-1M	All Styles: SOGC Only: 01 Commoned Elements 45 TTL to ECL Transistor 03 Isolated Elements 46 SCSI-BUS Signal Terminator 05 Terminator Array Custom schematics available
Chip Resistor Array for Surface Mount Thick Film Resistance Element with Wraparound Terminations	CRA06E CRA06S CRA12E CRA04P CRA04S CRA06P CRA08C CRA12S	0.063 0.063 0.125 0.063 0.063 0.063 0.063 0.125	1-5 1-5 1-5 2-5 2-5 1-5 1-5 1-5	10-1M 10-1M 10-1M 10-1M 10-1M 10-1M 10-1M 10-1M	2 or 4 Nominally Equal resistors; isolated from all others and wired directly across: Isolated or Bussed in 4, 8, 10 or 16 package
Chip Resistor/ Capacitor Arrays X7R / Y5U Dielectric Thick Film Resistance Elements with Wraparound Terminations for surface mounting	CRCA12E CRCA12S CRCC1206	0.125 0.125 0.125	5 5 5	10-1M 10-1M 10-1M	Cap Range(pF): X7R=10-270 ; Y5U=270-1800 X7R=10-270 ; Y5U=270-1800 X7R=10-270 ; Y5U=270-1800

PRODUCT DESCRIPTION	TYPE	PACKAGE WATTS @ 70°C	TOL ± %	ATTENUATION RANGE dB	FEATURES
Surface Mount Chip Resistor Attenuator Frequency range: DC to 3Ghz	CZA04S CZA06S	0.04 0.075	0.3/0.5dB 0.3/0.5dB	1-5/6-20 1-5/6-20	Impedance: 50Ω Impedance: 50, 75, 100, 300, 6900Ω

PRODUCT DESCRIPTION	TYPE	PACKAGE STYLE	NUMBER OF PINS	CIRCUIT SCHEMATIC	RESISTANCE RANGE Ω	STD TOL. ± %	RESISTOR DISSIPATION W @ 70°C
Thick Film Single-In-Line Resistor Networks Conformally Coated Temperature Coefficient 100ppm/°C [-55° to +125°]	CSCxxA-01	Low (4.95mm)	4-10	Commoned	10-2.2M	2	0.2
	CSCxxA-03	Low (4.95mm)	4-10	Isolated	10-2.2M	2	0.3
	CSCxxA-05	Low (4.95mm)	4-10	Terminator	See Data	2	0.2
	CSCxxB-01	Medium (6.35mm)	4-12	Commoned	10-2.2M	2	0.25
	CSCxxB-03	Medium (6.35mm)	4-12	Isolated	10-2.2M	2	0.4
	CSCxxB-05	Medium (6.35mm)	4-12	Terminator	See data	2	0.25

PRODUCT DESCRIPTION	TYPE	PACKAGE STYLE	NUMBER OF PINS	CIRCUIT SCHEMATIC	RES. RANGE Ω	STD TOL. $\pm \%$	RESISTOR DISSIPATION W @ 70°C
Thick Film Molded Single-In-Line Resistor Networks Temperature Coefficient 100ppm/°C [-55° to +125°]	MSPxxA-01	Low (4.95mm)	6,8,9,10	Commoned	10-2.2M	2	0.2
	MSPxxA-03	Low (4.95mm)	6,8,10	Isolated	10-2.2M	2	0.3
	MSPxxA-05	Low (4.95mm)	6,8,9,10	Terminator	See Data	2	0.2
	MSPxxC-01	High (8.89mm)	6,8,10	Commoned	10-2.2M	2	0.25
	MSPxxC-03	High (8.89mm)	6,8,10	Isolated	10-2.2M	2	0.4
	MSPxxC-05	High (8.89mm)	6,8,10	Terminator	See data	2	0.25
Thick Film Molded Single-In-Line Resistor Networks 01, 03, 05 Schematics MIL-PRF-83401 Qualified, Type RZ 100% Screen Tested per Group A, Subgroup 1 of MIL-PRF-83401 *available	MSMxxA-01	Low (4.95mm)	6,8,10	Commoned	10-1M	2(1 & 5)*	0.12
	MSMxxA-03	Low (4.95mm)	6,8,10	Isolated	10-1M	2(1 & 5)*	0.12
	MSMxxA-05	Low (4.95mm)	6,8,10	Terminator	See Data	2(1 & 5)*	0.07
	MSMxxC-01	High (8.89mm)	6,8,10	Commoned	10-1M	2(1 & 5)*	0.2
	MSMxxC-03	High (8.89mm)	6,8,10	Isolated	10-1M	2(1 & 5)*	0.2
	MSMxxC-05	High (8.89mm)	6,8,10	Terminator	See Data	2(1 & 5)*	0.07
S.I.L. Networks C & G Schematics MIL-PRF-83401/04- 6 pin MIL-PRF-83401/04- 8 pin MIL-PRF-83401/04-10 pin Standard Profile	M83401/04C	STD (8.72mm)	6,8,10	Commoned	100-1M	1, 2, 5	200
	M83401/05C						
	M83401/06C						
	M83401/07C	Low (4.88mm)	6,8,10	Commoned	27-1M	1, 2, 5	120
	M83401/08C						
	M83401/09C						
MIL-PRF-83401/07 -6 pin MIL-PRF-83401/08 -8 pin MIL-PRF-83401/09 -10 pin Low Profile	M83401/04G	STD (8.72mm)	6,8,10	Isolated	100-1M	1, 2, 5	200
	M83401/05G						
	M83401/06G						
	M83401/07G	Low (4.88mm)	6,8,10	Isolated	27-1M	1, 2, 5	120
	M83401/08G						
	M83401/09G						
Cermet Resistor Networks Conformal Coating Low Profile Non Inductive	SIL 5-4	SIL	5	Common Point	33-820K	$\pm 2\%$ or 2Ω	0.10
	SIL 6-3	SIL	6	Independent Res.	33-820K	$\pm 2\%$ or 2Ω	0.15
	SIL 6-5	SIL	6	Common Point	33-820K	$\pm 2\%$ or 2Ω	0.10
	SIL 6-8	SIL	6	Divider	33-820K	$\pm 2\%$ or 2Ω	0.10
	SIL 8-4	SIL	8	Independent Res.	33-820K	$\pm 2\%$ or 2Ω	0.15
	SIL 8-7	SIL	8	Common Point	33-820K	$\pm 2\%$ or 2Ω	0.10
	SIL 8-12	SIL	8	Divider	33-820K	$\pm 2\%$ or 2Ω	0.10
	SIL 9-8	SIL	9	Common Point	33-820K	$\pm 2\%$ or 2Ω	0.10
	SIL 10-5	SIL	10	Independent Res.	33-820K	$\pm 2\%$ or 2Ω	0.15
	SIL 10-9	SIL	10	Common Point	33-820K	$\pm 2\%$ or 2Ω	0.10
	SIL 10-16	SIL	10	Divider	33-820K	$\pm 2\%$ or 2Ω	0.10
R/2R Ladder Networks DIL "R" Model has additional pin-outs	T14L10	DIL	14	R/2R Ladder	25K, 50K, 100K	$\pm 2/\pm 1$ LSB	0.50
	T16LO8	DIL	16	R/2R Ladder	25K, 50K, 100K	$\pm 2/\pm 0.5$ LSB	0.50
	T16LR8	DIL	16	R/2R Ladder	25K, 50K, 100K	$\pm 2/\pm 0.5$ LSB	0.50
R/2R Ladder Networks SIP, Coated 4 Bits to 8 Bits For D/A and A/D Converter and Bi-polar or CMOS Switches	T06S	High(8.89mm)	6	R /2R Ladder	5K-100K	2	0.50
	T07S	High(8.89mm)	7	R /2R Ladder	5K-100K	2	0.50
	T08S	High(8.89mm)	8	R /2R Ladder	5K-100K	2	0.50
	T09S	High(8.89mm)	9	R /2R Ladder	5K-100K	2	0.50
	T10S	High(8.89mm)	10	R /2R Ladder	5K-100K	2	0.50



PRODUCT DESCRIPTION	TYPE	PACKAGE STYLE	NUMBER OF PINS	CIRCUIT SCHEMATIC	RESISTANCE RANGE Ω	STD TOL. $\pm$ %	RESISTOR DISSIPATION W @ 70°C
Molded Dual in Line Package Resistor Networks 4.06mm Seated Height Rugged Case Construction Highly Stable Thick Film Low Temperature Coefficient -55°C to + 125°C $\pm$ 100PPM	MDP14-01	DIP	14	Commoned	10-2.2M	2	0.125
	MDP14-03	DIP	14	Isolated	10-2.2M	2	0.250
	MDP14-05	DIP	14	Terminator	See Data	2	0.125
	MDP16-01	DIP	16	Commoned	10-2.2M	2	0.125
	MDP16-03	DIP	16	Isolated	10-2.2M	2	0.250
	MDP16-05	DIP	16	Terminator	See Data	2	0.125
	MDP16-45 MDP16-46	DIP DIP	16 16	TTL-ECL Trans SCSI-BUS SIG. Terminator	6x180 Ω +270 Ω +820 Ω 7x330 Ω +150 Ω +330 Ω	2 5	0.125 0.125
MIL-PRF-83401 Qualified Dual in Line package A & B Schematics	M8340101A	(2.54mm Pitch x	14 or 16	Isolated	27-1M	1,2,5	0.200
	M8340101B	7.62mm Row Spacing)	14 or 16	Commoned	27-1M	1,2,5	0.100
	M8340102A	(2.54mm Pitch x	14 or 16	Isolated	27-1M	1,2,5	0.200
	M8340102B	7.62mm Row Spacing)	14 or 16	Commoned	27-1M	1,2,5	0.100
Dual In Line Package MIL-PRF-83401 Type RZ 14 or 16 Pins *available.	MDM14-01	DIP	14	Commoned	10-1M	2 (1 & 5)*	0.100
	MDM14-03	DIP	14	Isolated	10-1M	2 (1 & 5)*	0.200
	MDM14-05	DIP	14	Terminator	See Data	2 (1 & 5)*	0.050
	MDM16-01	DIP	16	Commoned	10-1M	2 (1 & 5)*	0.100
	MDM16-03	DIP	16	Isolated	10-1M	2 (1 & 5)*	0.200
	MDM16-05	DIP	16	Terminator	See Data	2 (1 & 5)*	0.050
Flat Pack Thick Film Network DFP Commercial and DFM MIL Style *Power Rating @ 25°C **available TC 100ppm/°C MIL-PRF-83401 Qualified TYPE RZ	DFP14-11	DIP	14	Isolated	10-1M	2	0.250*
	DFP14-12	DIP	14	Commoned	10-1M	2	0.150*
	DFP16-11	DIP	16	Isolated	10-1M	2	0.250*
	DFP16-12	DIP	16	Commoned	10-1M	2	0.150*
	DFM14-11	DIP	14	Isolated	10-1M	2 (1 & 5)**	0.050
	DFM14-12	DIP	14	Commoned	10-1M	2 (1 & 5)**	0.025
	DFM14-15	DIP	14	Terminator	See Data	2 (1 & 5)**	0.015
Custom Networks DIPS, Molded SIPS Coated SIPS	SIPS-Coated SIPS-Molded DIPS	Unlimited Schematics available Resistance Range 1-20M Ω Temperature Coefficient $\pm$ 50ppm Ratio Matching $\pm$ 0.5% available Custom Resistor, Capacitor, Diode and Inductor Network combinations. Design through Production Fast Turnaround Time High Density Designs -to MIL-PRF-83401 Thick Film Resistive Element High Temperature Solder Joints 2-Sided printing and through holes Ultra-high precision laser trimming					
Quads, Surface Mount R / RC / RCD	R Quad R/C Quads	Unlimited Schematics available Resistance Range 10-10M Ω Temperature Coefficient $\pm$ 100ppm Surface Mount "J" leads or Gull Wing leads Design through Production NPO or X7R dielectric High Density Designs - 0805 to 1210 Sizes 2-Sided printing and through holes					

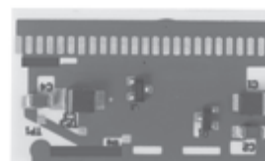
PRODUCT DESCRIPTION	TYPE	PACKAGE STYLE	NUMBER OF PINS	CIRCUIT SCHEMATIC	RES. RANGE (Ω)	STD TOL. ± %	RESISTOR DISSIPATION W @ 70 °C
Resistor/Capacitor Networks - SIL Capacitors NPO and X7R Capacitance Range:33pF-0.1μF	TRCxx01	High (8.89mm)	6-12	Commoned R / C	50-1K	R=2-5, C=5-20	50VDC
	TRCxx02	High (8.89mm)	6-12	Isolated R / C	50-1K	R=2-5, C=5-20	50VDC
	TRCxx09	High (8.89mm)	6-12	Isolated R / C	50-1K	R=2-5, C=5-20	50VDC
Res/Cap Networks - Molded SIP Capacitors NPO and X7R Capacitance Range:33pF-0.1μF	MRCN-08	High profile SIP	8	Commoned R / C	Capacitance Range:10, 20		50VDC
	MRCN-10	High profile SIP	10	Isolated R / C or Line Terminator R /C	NPO=33pF-3900pF 10, 20 X7R= 470pF- 0.1μF		50VDC
Resistor/Capacitor Networks Single in Line ECL Terminators and Line Terminator, Conformal Coated	CS206XXXA	SIP	10	2 Caps./6 Res.	All Styles : Resistor Dissipation 0.125W @ 70 °C COG = 33pF-3900pF ±10% or X&R = 470pF-0.1μF ±20%		
	CS206XXBE	SIP	4-18	1 Cap., Pin 1.			
	CS206XXBM	SIP	4-18	1 Cap., Pin N.			
	CS206XXCT	SIP	4-18	Series R/C pairs Pins 2-N			
Dual In Line Package Molded Resistor/Capacitor Networks Power Rating at 25°C	MDRC-1641	DIP	16	ECL Terminator	50-100	2 or 2Ω	0.15
	MDRC-1642	DIP	16	ECL Pull-Down	510	2 or 2Ω	0.15
	MDRC-1643	DIP	16	Thevenin Eq. Term	See Data	2 or 2Ω	0.20
Capacitor Networks Single-In-Line "D" Profile ECL and Line Terminator Schematics	CS201XXD1	SIP	4-18	Common Bus 1 Gd Leads	All Styles: COG = 33pF-3900pF ±10% or X&R = 470pF-0.1μF ±20%		
	CS201XXD3	SIP	4-18	Isolated Capacitor Sec.			
	CS201XXD4	SIP	4-18	Common Bus 2 Gd Leads			
Capacitor Networks SIP Coated 50V NPO or X7R dielectric for Line Terminator 01, 02 or 09 Schematics	TCN-06	High	6		Capacitance	10,20	na
	TCN-07	High	7		Ranges:	10,20	
	TCN-08	High	8		NPO =	10,20	
	TCN-09	High	9	commoned	33pF-3900pF	10,20	
	TCN-10	High	10	Isolated		10,20	
	TCN-11	High	11	or line terminator	X7R =	10,20	
	TCN-12	High	12		470pF-0.1μF	10,20	
Capacitor Networks Moulded SIP 50V - NPO or X7R dielectric for Line Terminator 01, 02 or 09 Schematics	MCN-05	High	05	Commoned,	Cap. Range:	10, 20	na
	MCN-08	High	08	Isolated	NPO=33pF-3900pF	10, 20	na
	MCN-09	High	09	or Line	X7R=470pF-0.1μF	10, 20	na
	MCN-10	High	10	Terminator		10, 20	na



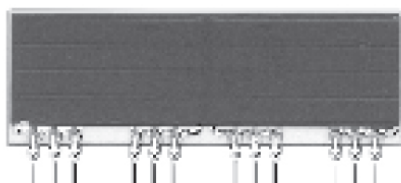
Product Design Capabilities

Multicomps, Custom Networks and Screened Substrates

MULTIPLE COMPONENT MODULES (MULTICOMPS)



CUSTOM NETWORKS AND SCREENED SUBSTRATES



APPLICATIONS

- Reduce Component Count
- Simplify Board Layout
- Reduce Cross Talk
- Filtering
- Enhance Motherboard Performance

Vishay has the extensive technical capability you need for your custom design requirements.

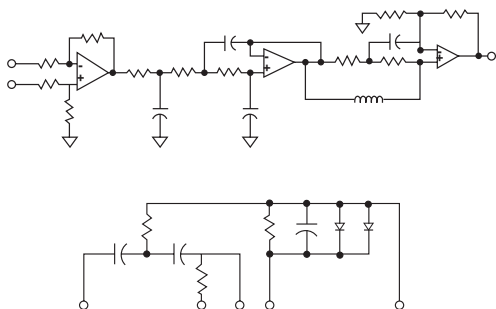
Since all custom products are unique and actual performance may vary, some examples are given on the next page. When you are ready to submit your custom design for us to review, please call or fax us; or contact your local Vishay Dale representative.

Product Design Capabilities

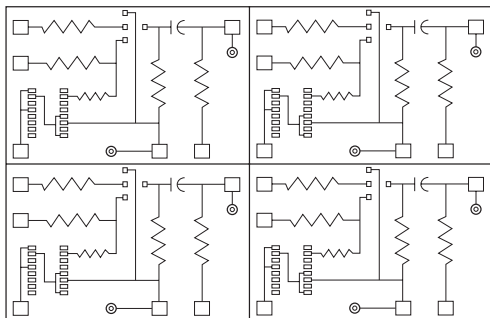
Multicomps, Custom Networks and Screened Substrates

SCHEMATICS

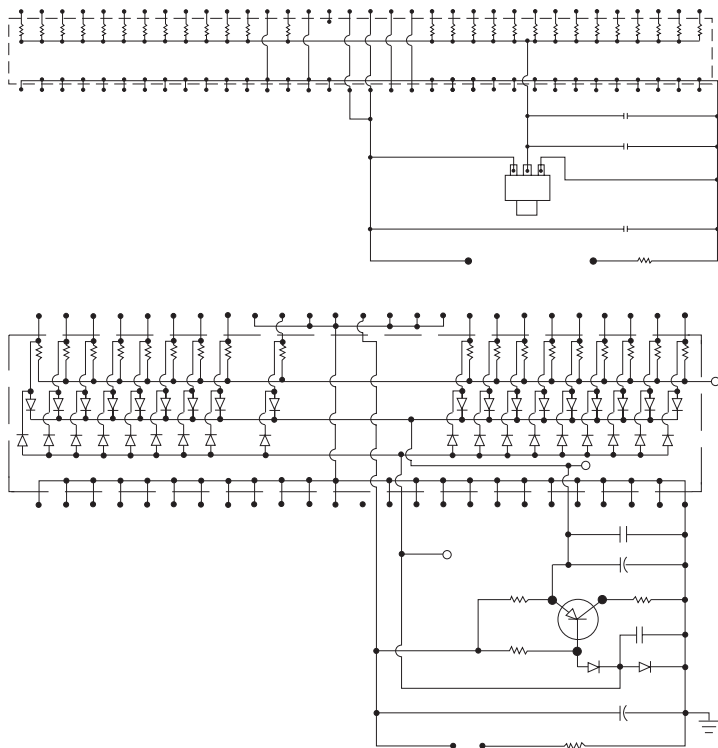
MULTIPLE COMPONENT MODULES (MULTICOMPS)



SCREENED SUBSTRATES



CUSTOM NETWORKS



FEATURES AND TYPICAL SPECIFICATIONS*

Thick Film Materials: Pd/Ag conductors, Ruthenium based cermet resistors, glass glazes, multilayer dielectric systems, polymer protective coating.

Thick Film Printing Techniques: Multi-layer printing, through-hole metallization, crossovers, double-sided designs.

Substrate Material: 96% alumina.

Substrate Thickness: .025" [.635mm], .030" [.762mm], .045" [1.143mm]. Thicker substrates for higher power applications available.

SMT Devices: Inductors, diodes, thermistors, transistors, thin film resistors, integrated circuits.

SMT Capacitors: Ceramic: X7R, COG.
Capacitance = 10pF to 0.1μF ± 10% tolerance.
Tantalum: Capacitance = .1μF to 100μF ± 10% tolerance.

Package Configurations: SIP: 4 - 22 pins. Missing pins available. Maximum length, 2.2" [55.88mm]. Maximum height, 1.0" [25.4mm]. Lead length, 0.185" [4.699mm] maximum.

Lead Spacing: .100" [2.54mm], SIP. .050" [1.27mm], SMT.

Encapsulation Method: Conformal resin. Screened silicon insulator.

* Consult factory for possible exceptions to listed specifications.

ELECTRICAL SPECIFICATIONS - RESISTORS

Resistance Range: 10 ohm to 5 Megohm, standard.
< 10 ohm, consult factory.

Tolerance:
100 ohm to 1 Megohm: ± 1%, ± 2%.
< 100 ohm: ± 2% or ± 1 ohm.
> 1 Megohm: ± 5%, standard. Specials: Consult factory.

Ratios: ± 0.5%, ± 1%. Specials: Consult factory.

Temperature Coefficient (absolute): ± 200PPM/°C, standard.
± 100PPM/°C, special.

TCR Tracking: ± 50PPM/°C (like values) and ± 100PPM/°C (mixed values).

Operating Temperature: - 55°C to + 125°C, standard.
- 55°C to + 150°C (consult factory).

ELECTRICAL SPECIFICATIONS - SCREENED CAPACITORS

Capacitance: 33pF to 270pF. Other values, consult factory.

Tolerance: ± 30%, standard. ± 20%, consult factory.

Temperature Coefficient: ± 15%, standard.

Dielectric Breakdown Voltage: 2.5 X rated voltage
@ 5 seconds, standard.

Rated Voltage: 25 volts maximum, standard.

Operating Temperature: 0°C to + 70°C, standard.