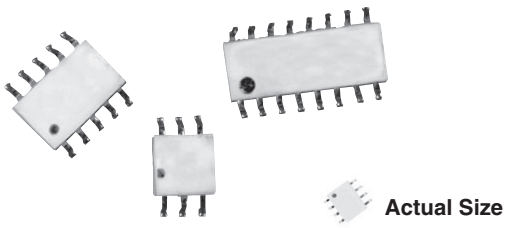
Sandwich, 50 mil Pitch, Dual In-Line Thin Film Resistor, Surface Mount Network



A dual-in-line monolithic ceramic sandwich in a variety of pin sizes (4 to 20) that allow higher resistance integration than traditional chip and wire molded construction. In addition, tighter resistance tolerances can be obtained over traditional molded networks due to the elimination of molding temperature and stress.

FEATURES

- Lead (Pb)-free gold plated terminals standard
- Gold-to-gold terminations. External leads are attached directly to gold pads on the ceramic substrate by thermo-compression bonding (no internal solder)
- Tighter tolerances than molded standards (0.01 %)
- Ceramic package with no cavity
- Flexibility of lead variations to save PC board space
- Compliant to RoHS Directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition

Pb-free Available

RoHS* COMPLIANT

HALOGEN FREE

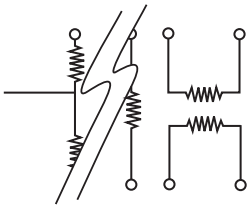
Note

* Pb containing terminations are not RoHS compliant, exemptions may apply

TYPICAL PERFORMANCE

	ABSOLUTE	TRACKING
TCR	25	5
	ABSOLUTE	RATIO
TOL.	0.1	0.02

SCHEMATIC



Custom schematics available
Please consult factory

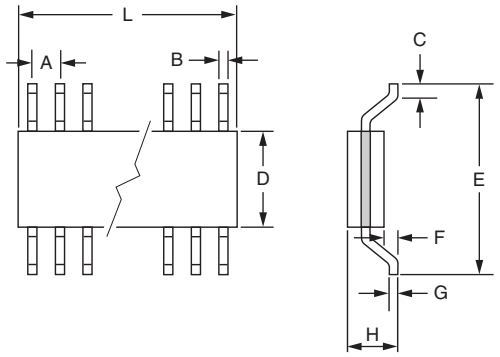
STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride or passivated nichrome (1)	-
Pin/Lead Number	4 to 20	-
Resistance Range	100 Ω to 1.5 MΩ total	-
TCR: Absolute	± 25 ppm/°C to ± 50 ppm/°C	- 55 °C to + 125 °C
TCR: Tracking	± 5 ppm/°C (typical)	- 55 °C to + 125 °C
Tolerance: Absolute	± 0.05 % to ± 1.0 %	+ 25 °C
Tolerance: Ratio	± 0.02 % to ± 0.1 %	+ 25 °C
Power Rating: Resistor	100 mW	Per element at + 70 °C
Power Rating: Package	500 mW	Maximum at + 70 °C
Stability: Absolute	ΔR ± 0.1 %	2000 h at + 70 °C
Stability: Ratio	ΔR ± 0.03 %	2000 h at + 70 °C
Voltage Coefficient	0.1 ppm/V	-
Working Voltage	100 V max. not to exceed $\sqrt{P \times R}$	-
Operating Temperature Range	- 55 °C to + 125 °C	-
Storage Temperature Range	- 55 °C to + 150 °C	-
Noise	< - 30 dB	-
Thermal EMF	0.08 µV/°C	-
Shelf Life Stability: Absolute	ΔR ± 0.01 %	1 year at + 25 °C
Shelf Life Stability: Ratio	ΔR ± 0.002 %	1 year at + 25 °C

Note

(1) Passivated nichrome is not standard film type for CSO series, consult factory if required

DIMENSIONS AND IMPRINTING in inches and millimeters



DIMENSION	INCHES	MILLIMETERS
A	0.050	1.27
B (Typ.)	0.015	0.38
C	0.017 - 0.005 + 0.0010	0.432
D (Max.)	0.157	3.99
E	0.239	6.07
F (Min.)	0.005	0.13
G (Typ.)	0.006	0.15
H (Max.)	0.070	1.72
L (6 Pins)	0.150 ± 0.01	3.81
L (8 Pins)	0.200 ± 0.01	5.08
L (10 Pins)	0.250 ± 0.01	6.35
L (12 Pins)	0.300 ± 0.01	7.62
L (14 Pins)	0.350 ± 0.01	8.89
L (16 Pins)	0.400 ± 0.01	10.16
L (18 Pins)	0.450 ± 0.01	11.43
L (20 Pins)	0.500 ± 0.01	12.70

MECHANICAL SPECIFICATIONS

Resistive Element	Passivated nichrome or tantalum nitride
Body	Ceramic
Lead Coplanarity	± 0.004
Substrate Material	Alumina
Marking Resistance to Solvents	Per MIL-PRF-83401
Terminals	Copper alloy
Plating	Nickel/gold
Model CSOG - Lead (Pb)-free Standard	Gold plated
Model CSO - Tin/Lead Solder Coated Option	Sn63
Model CSOT - Lead (Pb)-free Solder Coated Option	96.5 % Sn, 3.0 % Ag, 0.5 % Cu

ORDERING INFORMATION CHECK LIST

Special requirements should be identified in advance, but as a minimum, you should have the following information ready.

ELECTRICAL	MECHANICAL
1. Resistors, by value and tolerance 2. Reference resistor(s) and matching of which resistors to which reference resistors 3. Reference by ratio 4. Absolute temperature coefficient of resistivity 5. Temperature tracking of subordinate resistors to reference resistor(s) 6. Maximum operating voltage 7. Resistor power ratings 8. Operating temperature range	1. Maximum allowable seated height (from PC board to top of network) 2. Special marking concerns 3. Schematic pin out of package 4. Specify if solder coated leads are required

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CSOG1xx-xxxT1

C	S	O	G		1	x	x	-	x	x	x			T	1	
	C	S	O		1	x	x	-	x	x	x			T	1	
C	S	O	T	1	x	x	-	x	x	x	-	x		T	1	

GLOBAL MODEL (3 or 4 digits)	CUSTOM PART NUMBER (7 or 9 digits)	PACKAGING
CSOG (Lead (Pb)-free) (e4) **CSO** (Tin Lead) **CSOT** (Lead (Pb)-free) (e1)	**1xx-xxx** **1xx-xxx-x**	TAPE AND REEL **T0** = 100 min., 100 mult **T1** = 1000 min., 1000 mult **T3** = 300 min., 300 mult **T5** = 500 min., 500 mult **TF** = Full reel **TS** = 100 min., 1 mult **UF** = TUBED

Historical Part Number example: 1xx-xxx (for reference purposes only)

1xx-xxx
CUSTOM PART NUMBER

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