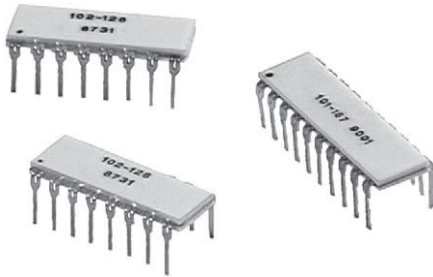


## Ceramic Sandwich, Dual-In-Line Thin Film Resistor, Through Hole Network (Custom)



A dual-in-line monolithic ceramic package in a variety of sizes and configurations. A rugged, low cost packaging technique with 4 leads to 20 leads that allows higher resistance integration than chip and wire ceramic packages.

### FEATURES

- Gold-to-gold terminations. External leads are attached directly to gold pads on the ceramic substrate by thermo-compression bonding (no internal solder)
- Monolithic construction
- Ceramic package with no cavity. 4 pins to 20 pins.
- Flexibility of lead variations to save PC board space
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS\***  
Available

**HALOGEN  
FREE**

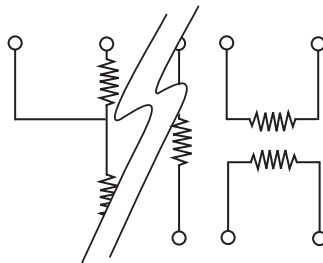
### Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

### TYPICAL PERFORMANCE

	ABSOLUTE	TRACKING
▲ TCR	10	2
	ABSOLUTE	RATIO
TOL.	0.1	0.02

### SCHEMATIC



Custom schematics available.  
Please consult factory

STANDARD ELECTRICAL SPECIFICATIONS			
TEST	SPECIFICATIONS		CONDITIONS
Material	Passivated nichrome	Tantalum nitride <sup>(1)</sup>	-
Pin/Lead Number	4 to 20		-
Resistance Range	100 Ω to 5 MΩ total		-
TCR: Absolute	± 10 ppm/°C	± 25 ppm/°C to ± 100 ppm/°C	-55 °C to +125 °C
TCR: Tracking	± 2 ppm/°C	± 5 ppm/°C	-55 °C to +125 °C
Tolerance: Absolute	± 0.1 % to ± 1.0 %		+25 °C
Tolerance: Ratio	± 0.01 % to ± 0.1 %		+25 °C
Power Rating: Resistor	100 mW (per element (typical))		Maximum at +70 °C
Power Rating: Package	500 mW		Maximum at +70 °C
Stability: Absolute	1000 ppm		2000 h at +70 °C
Stability: Ratio	300 ppm		2000 h at +70 °C
Voltage Coefficient	0.1 ppm/V		-
Working Voltage	100 V		-
Operating Temperature Range	-55 °C to +125 °C		-
Storage Temperature Range	-55 °C to +125 °C		-
Noise	< - 30 dB		-
Thermal EMF	< 0.1 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

<sup>(1)</sup> Tantalum nitride film is custom

<b>DIMENSIONS AND IMPRINTING</b> in inches and millimeters			
	<b>DIMENSION</b>	<b>INCHES</b>	<b>MILLIMETERS</b>
	A	0.260 max.	6.61
	B	0.050	1.27
	C	0.160 typical	4.06
	D	0.080	2.03
	E	0.125	3.18
	F	0.125 min.	3.18
	G	0.01	0.254
	H	0.325	8.25
	I	0.100	2.54
	J	0.020	0.51
	L (4 Pins)	0.220	5.59
	L (6 Pins)	0.320	8.13
	L (8 Pins)	0.420	10.67
	L (10 Pins)	0.520	13.21
	L (12 Pins)	0.620	15.75
	L (14 Pins)	0.720	18.29
L (16 Pins)	0.820	20.83	
L (18 Pins)	0.920	23.37	
L (20 Pins)	1.020	25.91	

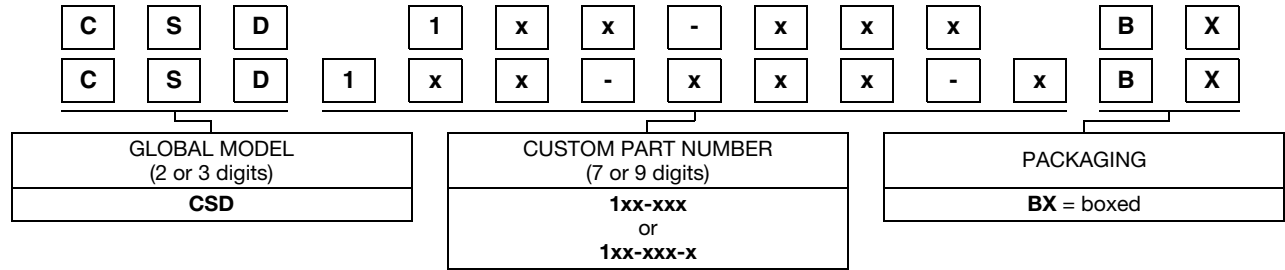
<b>MECHANICAL SPECIFICATIONS</b>	
<b>Resistive Element</b>	Passivated nichrome or tantalum nitride
<b>Substrate Material</b>	Alumina
<b>Body</b>	Ceramic
<b>Terminals</b>	Copper alloy
<b>Plating</b>	Gold
<b>Tin / Lead Option</b>	Sn63
<b>Lead (Pb)-free Option</b>	Sn96.5, Ag3.0, Cu0.5
<b>Tin / Lead and Lead (Pb)-free Finish</b>	Hot solder dip

<b>ORDERING INFORMATION CHECK LIST</b>	
Special requirements should be identified in advance, but as a minimum, you should have the following information ready.	
<b>ELECTRICAL</b> <ol style="list-style-type: none"> <li>Resistors, by value and tolerance</li> <li>Reference resistor(s) and matching of which resistors to which reference resistors</li> <li>Resistance by ratio</li> <li>Absolute temperature coefficient of resistivity</li> <li>Temperature tracking of subordinate resistors to reference resistor(s)</li> <li>Maximum operating voltage</li> <li>Resistor power ratings</li> <li>Operating temperature range</li> </ol>	<b>MECHANICAL</b> <ol style="list-style-type: none"> <li>Maximum allowable seated height (from PC board to top of network)</li> <li>Special marking concerns</li> <li>Schematic pin out of package</li> <li>Specify if lead (Pb)-free</li> </ol>
For additional assistance refer to Vishay Dale Thin Film's guide to understanding Thin Film precision. Resistor networks or application engineering. All standard products may be ordered directly from Vishay Dale Thin Film.	

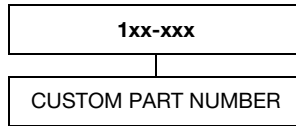


**GLOBAL PART NUMBER INFORMATION**

New Global Part Numbering: CSD1xx-xxxBX



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





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.