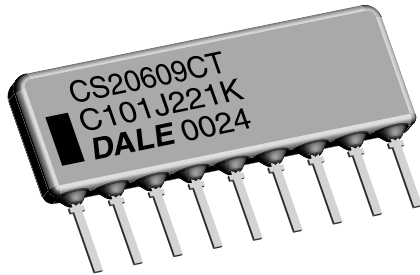


# Thick Film Resistor / Capacitor Networks, Single-In-Line, Conformal Coated SIP



## FEATURES

- 10K ECL terminators, circuits E and M
- 100K ECL terminators, circuit A
- Line terminator, circuit T
- 4 to 18 pins available
- X7R and C0G capacitors available
- Low cross talk
- Custom design capability
- "B" 0.250" (6.35 mm), "C" 0.350" (8.89 mm), and "E" 0.325" (8.26 mm) maximum seated height available, dependent on schematic
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



Available


**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.

| STANDARD ELECTRICAL SPECIFICATIONS |         |           |   |                           |                          |  |  |                           |                             |                    |
|------------------------------------|---------|-----------|---|---------------------------|--------------------------|--|--|---------------------------|-----------------------------|--------------------|
| VISHAY DALE MODEL                  | PROFILE | SCHEMATIC | RESISTOR CHARACTERISTICS                                |                           |                          |  |  | CAPACITOR CHARACTERISTICS |                             |                    |
|                                    |         |           | POWER RATING ELEMENT $P_{70} \text{ } ^\circ\text{C W}$ | RESISTANCE RANGE $\Omega$ | RESISTANCE TOL. $\pm \%$ | TEMP. COEFF. $\pm \text{ppm}/^\circ\text{C}$ | TCR TRACKING $\pm \text{ppm}/^\circ\text{C}$ | TYPE (1)                  | CAP. RANGE                  | CAP. TOL. $\pm \%$ |
| CS206                              | B       | E, M      | 0.125   | 10 to 1M                  | 2, 5                     | 200  | 100  | X7R                       | 0.01 $\mu\text{F}$          | 10, 20             |
| CS206                              | C       | T         | 0.125   | 10 to 1M                  | 2, 5                     | 200  | 100  | C0G                       | 33 pF to 3900 pF            | 10, 20             |
|                                    |         |           |   |                           |                          |  |  | X7R                       | 470 pF to 0.1 $\mu\text{F}$ |                    |
| CS206                              | E       | A         | 0.125   | 10 to 1M                  | 2, 5                     | 200  | 100  | X7R                       | 0.01 $\mu\text{F}$          | 10, 20             |

### Note

(1) C0G capacitors may be substituted for X7R capacitors.

| TECHNICAL SPECIFICATIONS                        |                  |                              |
|---|------------------|------------------------------|
| PARAMETER                                       | UNIT             | CS206                        |
| Operating voltage (at +25 °C)                   | $V_{AC}$         | 50 maximum                   |
| Dissipation factor (maximum)                    | %                | C0G = 0.15; X7R = 2.5        |
| Insulation resistance (at +25 °C/rated voltage) | $M\Omega$        | 100 000                      |
| Dielectric test                                 | V                | 2.5 x rated voltage          |
| Operating temperature range                     | $^\circ\text{C}$ | -55 to +125 $^\circ\text{C}$ |

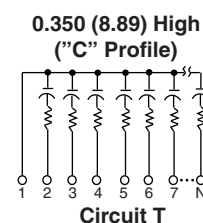
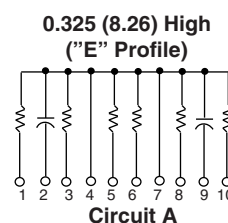
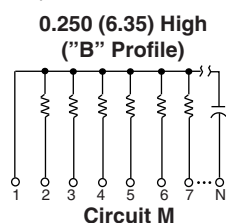
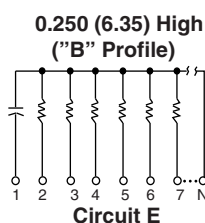
### Capacitor Temperature Coefficient:

C0G maximum 0.15 %, X7R maximum 2.5 %

### Package Power Rating (maximum at 70 °C):

8 pins = 0.80 W  
 9 pins = 0.90 W  
 10 pins = 1.00 W

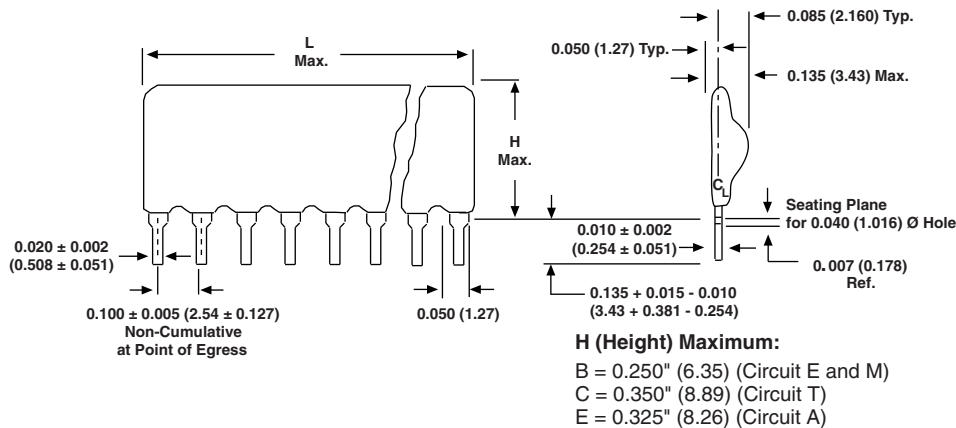
## SCHEMATICS in inches (millimeters)



| GLOBAL PART NUMBER INFORMATION   |   |   |                                   |   |                                       |   |   |  |   |   |   |   |   |   |   |   |  |  |
|--|---|---|-----------------------------------|---|---------------------------------------|---|---|--|---|---|---|---|---|---|---|---|--|--|
| New Global Part Numbering: 20608EC103G471KP (preferred part numbering format)        |   |   |                                   |   |                                       |   |   |  |   |   |   |   |   |   |   |   |  |  |
|  | 2   | 0   | 6                                 | 0   | 8                                     | E   | C                                       | 1  | 0   | 3 | G | 4 | 7 | 1 | K | P |  |  |
| GLOBAL MODEL   | PIN COUNT   | PACKAGE / SCHEMATIC                                 | CHARACT.                          | RESISTANCE VALUE  | RES. TOLERANCE                        | CAPACITANCE VALUE   | CAP. TOLERANCE VALUE                    | PACKAGING  | SPECIAL   |   |   |   |   |   |   |   |  |  |
| 206 = CS206  | 04 to 18 pin available<br>04 = 4 pin<br>08 = 8 pin<br>18 = 18 pin | E = BE<br>M = BM<br>A = EA<br>T = CT<br>S = special | C = C0G<br>X = X7R<br>S = special | 2 digit significant figure, followed by a multiplier<br>100 = 10 Ω<br>333 = 33 kΩ<br>105 = 1 MΩ | G = ± 2 %<br>J = ± 5 %<br>S = special | (in pF)<br>2 digit significant figure, followed by a multiplier<br>330 = 33 pF<br>392 = 3900 pF<br>104 = 0.1 μF | K = ± 10 %<br>M = ± 20 %<br>S = special | E = lead (Pb)-free, bulk<br>P = tin / lead, bulk | Blank = standard (dash number) (up to 2 digits) |   |   |   |   |   |   |   |  |  |
| Historical Part Number example: CS20608BEC103G471KP03 (will continue to be accepted) |   |   |                                   |   |                                       |   |   |  |   |   |   |   |   |   |   |   |  |  |
| CS206  | 08  | B   | E                                 | C   | 103                                   | G   | 471                                     | K  | P03   |   |   |   |   |   |   |   |  |  |
| HISTORICAL MODEL   | PIN COUNT   | PACKAGE HEIGHT                                      | SCHEMATIC                         | CHARACTERISTIC  | RES. VALUE                            | RES. TOLERANCE  | CAP. VALUE                              | CAP. TOLERANCE                                   | PACKAGING                                       |   |   |   |   |   |   |   |  |  |

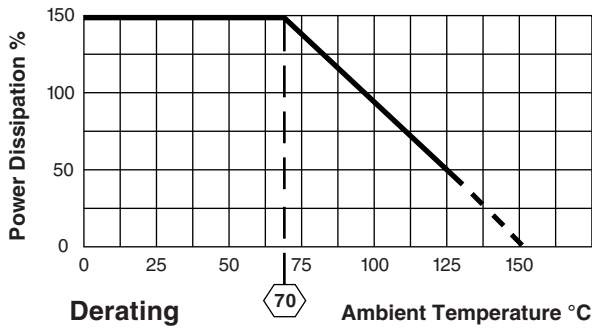
**Note**

- For additional information on packaging, refer to the "Through-Hole Network Packaging" document ([www.vishay.com/doc?31542](http://www.vishay.com/doc?31542))

**DIMENSIONS** in inches (millimeters)


Pin #1 is extreme left-hand terminal on side with marking.

| NUMBER OF PINS | L MAXIMUM     | NUMBER OF PINS | L MAXIMUM     | NUMBER OF PINS | L MAXIMUM     | NUMBER OF PINS | L MAXIMUM     | NUMBER OF PINS | L MAXIMUM     |
|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|
| 4 pin          | 0.400 (10.16) | 7 pin          | 0.700 (17.78) | 10 pin         | 1.000 (25.40) | 13 pin         | 1.300 (33.02) | 16 pin         | 1.600 (40.64) |
| 5 pin          | 0.500 (12.70) | 8 pin          | 0.800 (20.32) | 11 pin         | 1.100 (27.94) | 14 pin         | 1.400 (35.56) | 17 pin         | 1.700 (43.18) |
| 6 pin          | 0.600 (15.24) | 9 pin          | 0.900 (22.86) | 12 pin         | 1.200 (30.48) | 15 pin         | 1.500 (38.10) | 18 pin         | 1.800 (45.72) |



| MATERIAL SPECIFICATIONS |  |
|-------------------------|--|
| Flammability            | UL 94 V-0  |
| Lead material           | Phosphorus-bronze, solder plated   |
| Body material           | Epoxy coated   |
| Solderability           | Per MIL-STD-202, method 208E   |
| Part marking            | Pin #1 identification, part number (abbreviated as space allows), DALE or D, date code |
| Moisture resistance     | Meets requirements of MIL-STD-202, method 106  |

| PERFORMANCE                  |  |                              |
|------------------------------|--|------------------------------|
| TEST                         | CONDITION  | MAX. ΔR (TYPICAL TEST LOTS)  |
| Thermal shock                | Subject to 5 cycles from -65 °C to +125 °C   | ± 0.5 % ΔR                   |
| Short time overload          | 2.5 x rated working voltage for 5 s at +25 °C  | ± 0.25 % ΔR                  |
| Moisture resistance          | Cycle from +25 °C to +65 °C to +25 °C over 8 h at 90 % to 98 % relative humidity, with 10 % of rated power applied, for 20 cycles. Stop cycling after an even number of cycles and stabilize networks at high humidity for 1 h to 4 h. Condition networks at -10 °C for 3 h, then return to temperature cycling. On completion of cycling condition networks at +25 °C at 50 % R.H. for 22 h to 24 h | ± 0.5 % ΔR                   |
| Resistance to soldering heat | Immerse pins in melted solder to the lead standoffs at +350 °C for 3 s max.  | ± 0.25 % ΔR                  |
| Mechanical shock             | 18 shocks of 100 g's and 6 ms  | ± 0.25 % ΔR                  |
| Vibration                    | 12 cycles varied logarithmically from 10 Hz to 2000 Hz to 10 Hz over 20 min  | ± 0.25 % ΔR                  |
| Load life                    | 1000 h at +70 °C, rated power applied 1.5 h "ON", 0.5 h "OFF"  | ± 1.0 % ΔR                   |
| Resistance to solvents       | Immerse and scrub samples with isopropyl alcohol, trichlorethylene and Freon TMC   | Marking remains legible      |
| Solderability                | Immerse leads in 60/40 tin-lead solder using R flux at +245 °C for 5 s maximum   | Minimum 95 % solder coverage |
| Terminal strength            | Withstand 2.2 kg pull 1 min  | ± 0.25 % ΔR                  |
| Case insulation resistance   | 100 V applied between case and terminals tied together   | IR = 10 000 MΩ minimum       |



## **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.

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.

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Vishay](#) manufacturer:*

Other Similar products are found below :

[M39006/22-0577H](#) [M39006/22-0608H/96](#) [Y00892K49000BR13L](#) [VS-12CWQ10FNPBF](#) [M8340109M6801GGD03](#) [VS-MBRB1545CTPBF](#)  
[1KAB100E](#) [CCF5020K0FKR36](#) [CCF5010K0FKE36](#) [VSMF4720-GS08](#) [001789X](#) [LTO050FR0500JTE3](#) [LVR10R0200FE03](#)  
[CRCW12063K01FKEA](#) [CRCW12063K30FKEAHP](#) [009923A](#) [CRHV1206AF80M0FKET](#) [CS6600552K000B8768](#) [M39003/01-2289](#)  
[M39003/01-2784](#) [CW0106K000JE73](#) [672D826H075EK5C](#) [CWR06JC105KC](#) [CWR06NC475JC](#) [MAL202118471E3](#) [MAL213660221E3](#)  
[MAL213666102E3](#) [MAL215058102E3](#) [MAL219699001E3](#) [PTF56100K00QYEK](#) [PTN0805H1502BBTR1K](#) [RCL12252K20JNEG](#)  
[RCWL1210R130JNEA](#) [RE65G2211C02](#) [RH005220R0FE02](#) [RH005330R0FC02](#) [RH010R0500FC02](#) [132B20103](#) [RH0501R650FC02](#)  
[RH0507R000FC02](#) [RH1007R000FJ01](#) [RH2503R500FE01](#) [RH254R220FS03](#) [RH-50-40R2-1%-C02](#) [134D336X9075C6](#) [132B00301](#)  
[DG9426EDQ-T1-GE3](#) [138D685X0075C2](#) [RN55C1242FB14](#) [RN55D3010FB14](#)