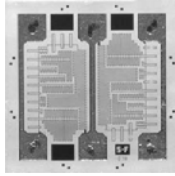


Thin Film, Center-Tapped Resistor Divider Network



Product may not be to scale

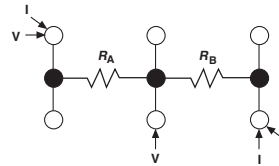
The CTQ series resistor chips offer a wide resistance range with lower shunt capacitance than can be offered with the silicon based resistors but only at a lower power level.

The CTQ offers the designer flexibility in use as either a single value resistor or as two resistor with a center tap feature. The CTQs six bonding pads allows the user increased layout flexibility.

The CTQs are manufactured using Vishay Electro-Films (EFI) sophisticated thin film equipment and manufacturing technology. The CTQs are 100 % electrically tested and visually inspected to MIL-STD-883, method 2032 class H or K.

FEATURES

- Wire bondable
- Center tap feature
- Chip size: 0.030" x 0.030"
- Case: 0303
- Resistance range total: 10 Ω to 1 M Ω
- Moisture resistant
- Quartz substrate
- Resistor material: Tantalum nitride, self-passivating
- Low shunt capacitance < 0.1 pF
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

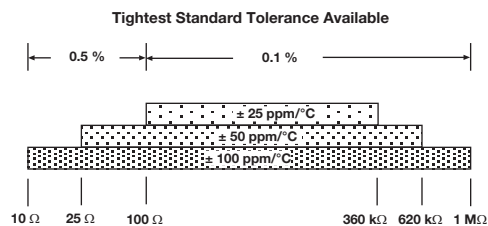


APPLICATIONS

The CTQ center-tapped resistor chips are used mainly in feedback circuits of amplifiers where ratio matching, low shunt capacitance and tracking between two resistors is critical.

For low values, the resistance of the six bonding pad configuration can vary, depending on the method of measurement used. Vishay EFI measures low-value resistors by the four-wire kelvin technique.

TEMPERATURE COEFFICIENT OF RESISTANCE, VALUES, AND TOLERANCES		
PARAMETER	VALUE	UNIT
Total Resistance Range	10 to 1M	Ω
Standard Tolerances	$\pm 0.1, \pm 0.5$	%
TCR	$\pm 25, \pm 50, \pm 100$	ppm/ $^{\circ}$ C

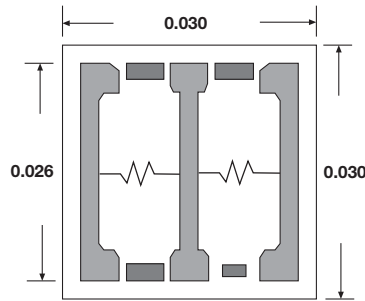
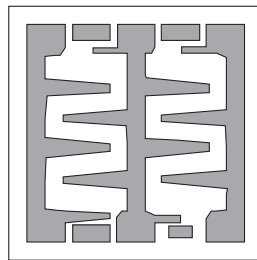
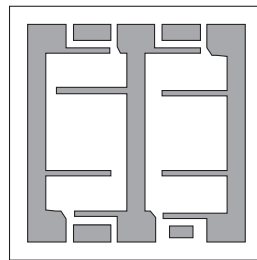
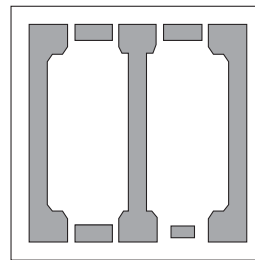


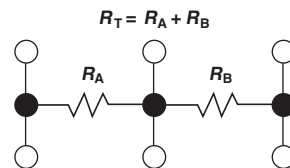
STANDARD ELECTRICAL SPECIFICATIONS

PARAMETER	VALUE	UNIT
TCR Tracking Between Halves (R_A/R_B) ⁽¹⁾	± 2	ppm/ $^{\circ}$ C
Center Tap Ratio, R_A/R_B : Tolerance	1 ± 1 standard	%
Noise, MIL-STD-202, Method 308, 100 Ω to 250 k Ω , < 100 Ω or > 251 k Ω	- 35 typ. - 20 typ.	dB
Moisture Resistance, MIL-STD-202, Method 106	± 0.5 max. $\Delta R/R$	%
Stability, 1000 h, + 125 $^{\circ}$ C, 30 mW	± 0.25 max. $\Delta R/R$	%
Operating Temperature Range	- 55 to + 125	$^{\circ}$ C
Thermal Shock, MIL-STD-202, Method 107, Test Condition F	± 0.1 max. $\Delta R/R$	%
High Temperature Exposure, + 150 $^{\circ}$ C, 100 h	± 0.2 max. $\Delta R/R$	%
Dielectric Voltage Breakdown	400	V
Insulation Resistance	10^{12} min.	Ω
Operating Voltage	200 max.	V
DC Power Rating at + 70 $^{\circ}$ C (derated to zero at + 175 $^{\circ}$ C)	0.06 max.	W
5 x Rated Power Short-Time Overload, + 25 $^{\circ}$ C, 5 s	± 0.25 max. $\Delta R/R$	%

Note

⁽¹⁾ 5 ppm/ $^{\circ}$ C for $R < 100$. 20 ppm/ $^{\circ}$ C for $R < 20$

DIMENSIONS in inches

STANDARD CONFIGURATION
 Six locations. All pads 0.005 x 0.005 inches

TYPICAL RANGE
 10 Ω to 26.9 Ω

TYPICAL RANGE
 27 Ω to 99 Ω

TYPICAL RANGE
 100 Ω to 1 MΩ

SCHEMATIC


MECHANICAL SPECIFICATIONS	
PARAMETER	VALUE
Chip Size	0.030" x 0.030" ± 0.002" (0.762 mm x 0.762 mm ± 0.05 mm)
Chip Thickness	0.010" ± 0.003" (0.254 mm ± 0.05 mm)
Chip Substrate Material	Quartz
Resistor Material	Tantalum nitride, self-passivating
Bonding Pad Size	0.005" x 0.005" (0.127 mm x 0.127 mm) min.
Number of Pads	6
Pad Material	10 kÅ minimum gold (Al optional)
Backing	None, lapped quartz

Options: Alphanumeric part marking, up to six characters.

GLOBAL PART NUMBER INFORMATION																
Global Part Number: CTQ5000KCKKGNHS																
Global Part Number Description: CTQ 5K 10 % RT 0.25 % ± 100 ppm/°C ± 10 ppm/°C Au None H WS																
C	T	Q	5	0	0	0	0	K	C	K	K	G	N	H	W	S
MODEL	RESISTANCE (R TOTAL)	RESISTANCE MULTIPLIER CODE	TOL. CODE (%)	RATIO TOL. (%)	TCR (ppm/°C)	TCR TRACK (ppm/°C)	TERMINATION	BACK METAL	VISUAL CLASS	PACKAGING CODE						
CTQ	First 4 digits are significant figures of resistance	B = 0.01 A = 0.1 0 = 1 1 = 10 2 = 100 3 = 1000	B = 0.1 C = 0.25 D = 0.5 F = 1.0 G = 2.0 J = 5.0 K = 10.0	B = 0.1 C = 0.25 D = 0.5 F = 1.0 G = 2.0 N = No	E = ± 25 C = ± 50 K = ± 100	G = ± 2 J = ± 5 K = ± 10 N = No	G = Au A = Al	N = None	H = Class H K = Class K	WS = Waffle pack 100 min., 1 mult						



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.