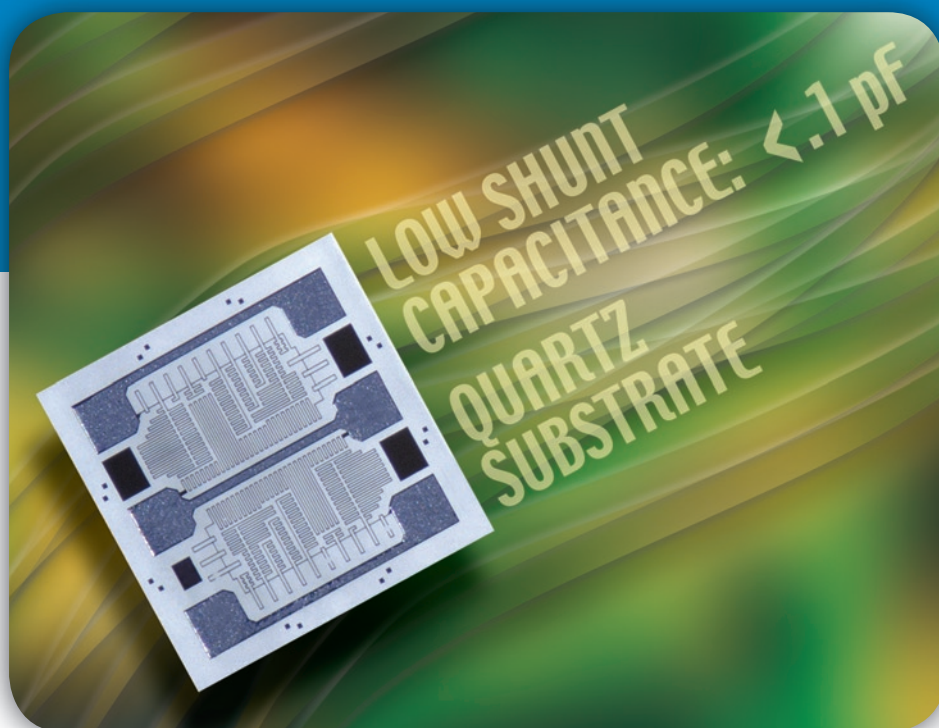




# RESISTIVE PRODUCTS – Model CTQ



## Wire-Bondable Resistors on Quartz

### FEATURES

- **Low shunt capacitance:**  $< 0.1\text{ pF}$
- **Close ratio matching:**  $\pm 2\text{ ppm}$
- **Resistance range:** 10 ohms to 1 megohm
- **Dielectric voltage:** 400 volts

### APPLICATIONS

- Precision amplifiers
- Oscillators
- Attenuators

# Thin Film Center-Tapped Resistors

## FEATURES

- Center tap feature
- Chip size: 0.030 inches square
- Resistance range total: 10 $\Omega$  to 1M $\Omega$
- Resistor material: Tantalum nitride, self-passivating
- Moisture resistant
- Quartz substrate
- Low shunt capacitance < 0.1pF



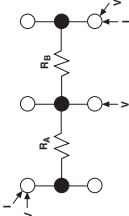
duct may not be to scale

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 resistors with a center tap feature. The CTQs six bonding pads allows the user increased layout flexibility.

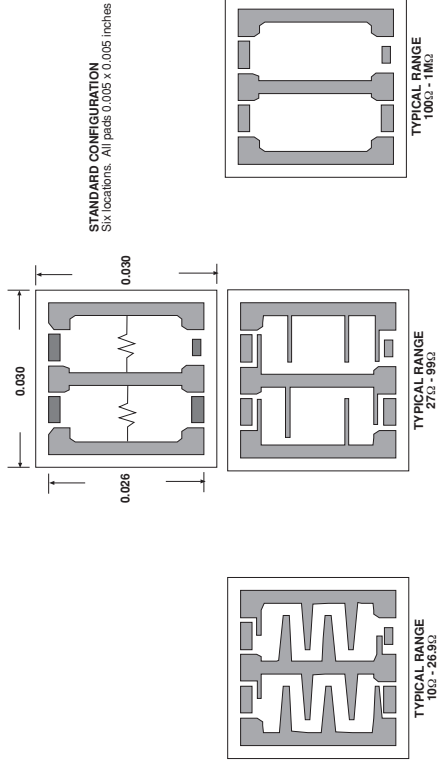
The CTQs are manufactured using Vishay Electro-Films (EFI) sophisticated thin film equipment and manufacturing technology. The CTQs are 100% electrically tested and visually inspected to MIL-STD-883.

## 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.



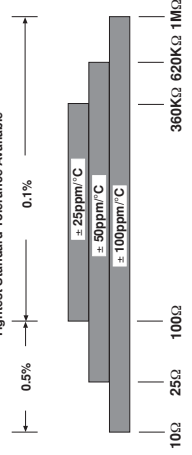
## DIMENSIONS in inches



## TEMPERATURE COEFFICIENT OF RESISTANCE. VALUES AND TOLERANCES

CLASS H*	PROCESS CODE	CLASS K*
100		130
101		131

\*MIL-PRF-38534 inspection criteria



## STANDARD ELECTRICAL SPECIFICATIONS

PARAMETER	VALUE
TCR tracking between halves (R <sub>A</sub> , R <sub>B</sub> )	± 2ppm/°C
Center tap ratio, R <sub>A</sub> /R <sub>B</sub> , Tolerance	1 ± 1% standard
Noise, MIL-STD-202, Method 308, 100 $\Omega$ - 250k $\Omega$	- 35dB typical - 20dB typical
Moisture resistance, MIL-STD-202, Method 106	± 0.5% maximum $\Delta$ R/R
Stability, 1000 hours, + 125°C, 30mW	± 0.25% maximum $\Delta$ R/R
Operating temperature range	- 55°C to + 125°C
Thermal shock, MIL-STD-202, Method 107, Test condition F	± 0.1% maximum $\Delta$ R/R
High temperature exposure, + 150°C, 100 hours	± 0.2% maximum $\Delta$ R/R
Dielectric voltage breakdown	400V
Insulation resistance	10 <sup>12</sup> minimum
Operating voltage	200V
DC power rating at + 70°C (derated to zero at + 175°C)	60mW
5 x rated power short-time overload, + 25°C, 5 seconds	± 0.25% maximum $\Delta$ R/R*

## MECHANICAL SPECIFICATIONS in inches

PARAMETER	VALUE
Chip size	0.030 x 0.030 ± 0.002 (0.762 x 0.762 ± 0.05mm)
Chip thickness	0.010 ± 0.003 (0.254 ± 0.05mm)
Chip substrate material	Quartz
Resistor material	Tantalum nitride, self-passivating
Bonding pad size	0.005 x 0.005 (0.127 x 0.127mm)
Number of pads	6
Pad material	10kA minimum aluminum
Backing	None, lapped quartz

**OPTIONS:** Alphanumeric part marking, up to six characters  
Gold bonding pads, 15kA minimum  
Center-tap ratio tolerances to 0.05%  
1 to 10 ohm values available  
Contact Applications Engineer

## ORDERING INFORMATION

W	CTQ PRODUCT FAMILY	101 PROCESS CODE Table	1000 RESISTANCE VALUE	1 MULTIPLIER CODE	F TOLERANCE CODE
Example: 100% visual, 10k $\Omega$ , ± 1%, ± 100ppm/°C TCR, Aluminum Pads, Class H Visual Inspection					
W = 100%	CTQ	See Process Code Table	Use first 4 digits significant digits of the resistance (R <sub>T</sub> )	D = 0.001 E = 0.01 F = 0.1 A = 1	B = 0.2% C = 0.5% D = 1.0% F = 2.0% H = 5.0% J = 10% K = 100%
INSPECTION	PRODUCT FAMILY	PROCESS CODE Table	RESISTANCE VALUE	MULTIPLIER CODE	TOLERANCE CODE
/PACKAGING					
W = 100% visually inspected					
MIL-STD-883 trays per					
X = Sample, visually inspected parts loaded in matrix trays (4% AQL)					

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