

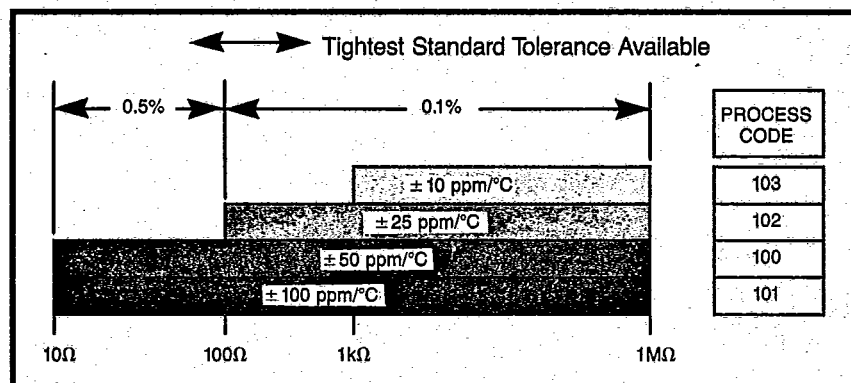
FEATURES

The CTN series of nichrome on silicon, center-tapped, single-value, resistor chips combine excellent stability and power-handling. Two bonding pads per termination allow greater flexibility in hybrid circuit layouts. By connecting to the center-tap, half the value is attainable and by connecting the two values in parallel, one quarter of the value is achieved.

These chips provide the tightest ratio tolerances, best TCR tracking and highest stability between halves available on silicon substrates. They are manufactured using state-of-the-art thin-film techniques, are 100% electrically tested for value, and are visually inspected to Mil-Std-883.

- Center tap feature
- Tight ratio tolerances
- Resistance range 10Ω to 1 MΩ
- Chip size 30 mil square
- High Stability
- Oxidized silicon substrate for good power dissipation
- Low cost
- Quick delivery
- Resistor Material NiCr

TCR VALUES AND TOLERANCES



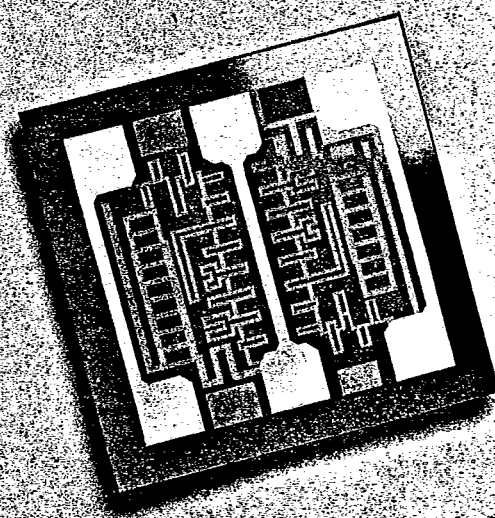
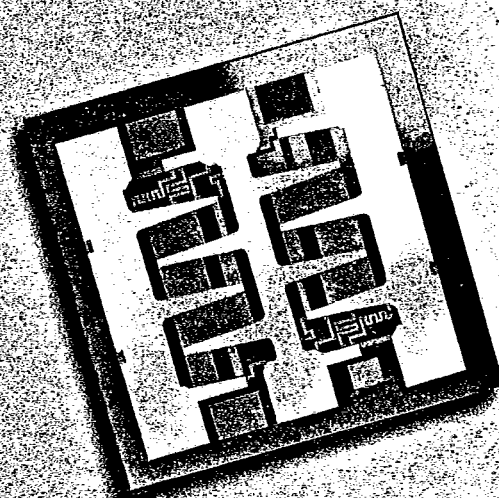
ELECTRICAL CHARACTERISTICS

TCR tracking between halves (R_A, R_B)	$\pm 1 \text{ ppm}/^\circ\text{C}^*$
Center tap ratio tolerance, R_A/R_B	$\pm 0.01\%$
Noise, MIL-STD-202, Method 308; 100Ω - 250 kΩ	- 35 dB max.
Stability, 1000 hr., +125°C, 125 mw	$\pm 0.06\% \Delta R/R$
Operating temperature range	- 55°C to +125°C
Dielectric voltage breakdown	400 V
Insulation resistance	$10^{12} \Omega \text{ min.}$
Operating voltage	100 V max.
DC power rating at +70°C, (derated to zero at +175°C)	250 mw

* 5 ppm/°C for $R < 100$
20 ppm/°C for $R < 20$

CTN SERIES THIN-FILM CENTER-TAPPED RESISTORS

T-62-05



Semi  Films
Division

P.O. Box 188
West Hurley, NY 12491
Tel. (914) 338-7714
Fax (914) 338-6329

 **Electro-Films Inc.**

MECHANICAL DATA

ELECTRO-FILMS INC/ SEMI- 24E D

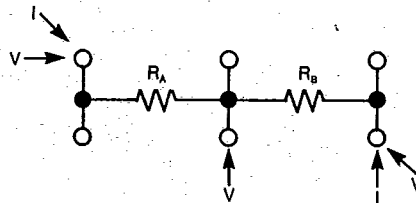
Chip size	30 × 30 ± 2 mil (0.762 × 0.762 ± 0.05 mm)
Chip thickness	8 ± 3 mil (0.203 ± 0.08 mm)
Chip substrate material	Oxidized silicon, 10 kÅ min. SiO ₂
Resistor material	NiCr.
Bonding pads	5 × 5 mil (0.127 × 0.127 mm)
No. of pads	6
Pad material	10 kÅ min. aluminum, 15 kÅ gold
Backing	None, lapped semiconductor silicon

OPTIONS: Alphanumeric part marking, up to six characters
 Gold backing for eutectic die attach
 Center-tap ratio tolerances to 0.01%

APPLICATIONS

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

For low values the resistance of the six bonding-pad configurations can vary, depending on the method of measurement used. SEMI-FILMS measures low-value resistors by the four-wire Kelvin technique. The measuring method illustrated here is critical for resistors of less than 100Ω:

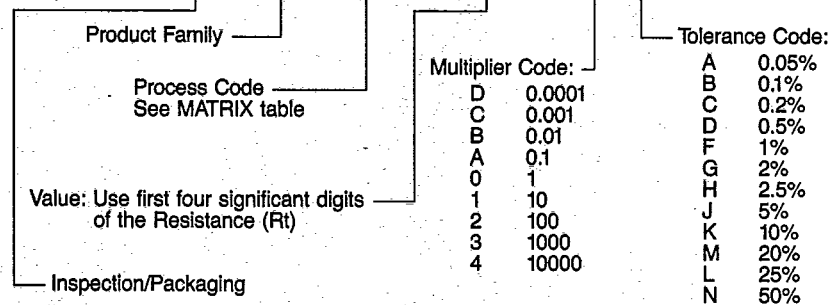


Two probes for Kelvin sensing are used on diagonally opposite bonding pads.

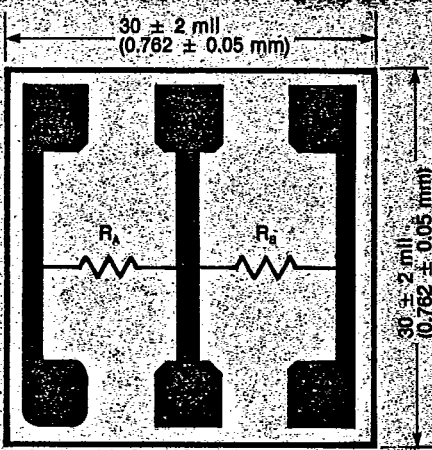
PART NUMBER DESIGNATION

Example: 100% visualled, 10kΩ, ±1%, ±100 ppm TCR

P/N: W CTR - 101 - 1000 1 F



Use - W for 100% visually inspected parts
 X for sample, visually inspected loaded in matrix trays (4% AQL)
 Y for sample, visually inspected die loaded in vials (4% AQL)



STANDARD CTN CONFIGURATION
 Six locations; All pads 5 mil × 5 mil

SCHEMATIC

$$R_T = R_A + R_B$$

