



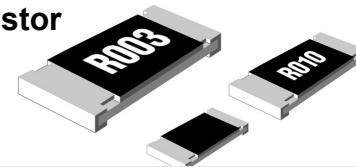
# Precision Current Sensing Chip Resistors Tin Lead Termination

## CTL05/CTL16/CTL10/CTL18/CTL12/CTL01 Series Chip Resistor

### HOW TO ORDER

<b>CTL</b>	<b>10</b>	<b>R015</b>	<b>F</b>	<b>J</b>	<b>M</b>
<b>Packaging</b>					
M = 7" Reel (10" Reel for 2512) B = Bulk					
<b>TCR (ppm/°C)</b>					
R = $\pm 15$ X = $\pm 25$ Y = $\pm 50$ J = $\pm 75$ K = $\pm 100$ L = $\pm 200$ N = $\pm 350$ O = $\pm 400$ P = $\pm 500$					
<b>Tolerance (%)</b>					
F = $\pm 1.0$ G = $\pm 2.0$ J = $\pm 5.0$					
<b>EIA Resistance Code</b>					
Three significant digits and # of zeros					
<b>Size</b>					
05 = 0402      10 = 0805      12 = 2010 16 = 0603      18 = 1206      01 = 2512					

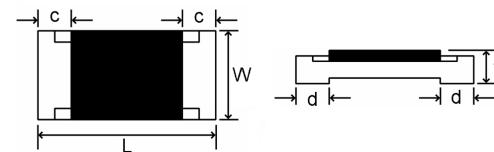
**Series**  
Precision Current Sense Resistor  
Sn/Pb Termination



### FEATURES

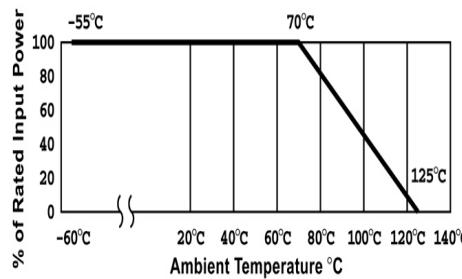
- Resistance as low as 0.001 ohm
- Ultra Precision type with high reliability, stability and quality
- Extremely Low TCR, as low as  $\pm 75$  ppm
- Wrap Around Terminal for Flow Soldering
- Anti-Leaching Nickel Barrier Terminations

### SCHEMATIC



### DIMENSIONS (mm)

Series	Size	L	W	c	t
CTL05	0402	$1.00 \pm 0.10$	$0.50 \pm 0.10$	$0.20 \pm 0.10$	$0.35 \pm 0.10$
CTL16	0603	$1.60 \pm 0.10$	$0.80 \pm 0.10$	$0.20 \pm 0.10$	$0.45 \pm 0.10$
CTL10	0805	$2.00 \pm 0.20$	$1.25 \pm 0.20$	$0.40 \pm 0.20$	$0.50 \pm 0.10$
CTL18	1206	$3.20 \pm 0.20$	$1.60 \pm 0.15$	$0.40 \pm 0.20$	$0.60 \pm 0.20$
CTL12	2010	$5.00 \pm 0.20$	$2.50 \pm 0.20$	$0.60 \pm 0.30$	$0.60 \pm 0.20$
CTL01	2512	$6.40 \pm 0.20$	$3.20 \pm 0.20$	$0.60 \pm 0.30$	$0.60 \pm 0.20$



### ELECTRICAL CHARACTERISTICS

Size	Rated Power	Tol	Max TCR (ppm/°C)					Max Working Voltage	Max Overload Voltage
			$\pm 50$ ppm	$\pm 100$ ppm	$\pm 200$ ppm	$\pm 350$ ppm	$\pm 500$ ppm		
0402	0.125W	2%			0.100 ~ 4.70			25V	50V
		5%			0.100 ~ 4.70				
0603	0.125W 0.25W	1%			0.010 ~ 0.100			50V	100V
		2%			0.010 ~ 0.100				
		5%			0.010 ~ 0.100				
0805	0.250W 0.5W	1%	0.100 ~ 0.500		0.010 ~ 0.100	0.01 ~ 0.039		150V	300V
		2%			0.010 ~ 0.100	0.01 ~ 0.039			
		5%			0.010 ~ 0.100	0.022 ~ 0.068			
1206	0.50W 1W	.5%	0.001 ~ 0.050	0.068 ~ 0.470	0.007 ~ 0.100	0.018 ~ 0.027		200V	400V
		1%	0.001 ~ 0.050	0.056 ~ 0.470	0.010 ~ 0.100	0.027			
		2%		0.056 ~ 0.470	0.010 ~ 0.100	0.018 ~ 0.027	0.01 ~ 0.015		
2010	0.75W 1W	.5%	0.003 ~ 0.10					200V	400V
		1%	0.001 ~ 0.10	0.056 ~ 0.470	0.001 ~ 0.065	0.027			
		2%	0.001 ~ 0.10	0.056 ~ 0.470	0.001 ~ 0.065	0.018 ~ 0.027	0.01 ~ 0.015		
2512	1.0W 2W	.5%	0.007 ~ 0.10	0.056 ~ 0.470	0.001 ~ 0.065	0.018 ~ 0.027		200V	400V
		1%	0.0005 ~ 0.10	0.056 ~ 0.470	0.001 ~ 0.065	0.027			
		2%	0.0005 ~ 0.10	0.056 ~ 0.470	0.001 ~ 0.065	0.018 ~ 0.027	0.01 ~ 0.015		

NOTE: The temperature range is  $-55^{\circ}\text{C} \sim +150^{\circ}\text{C}$

$$\text{Rated Voltage} = \sqrt{P \cdot R}$$

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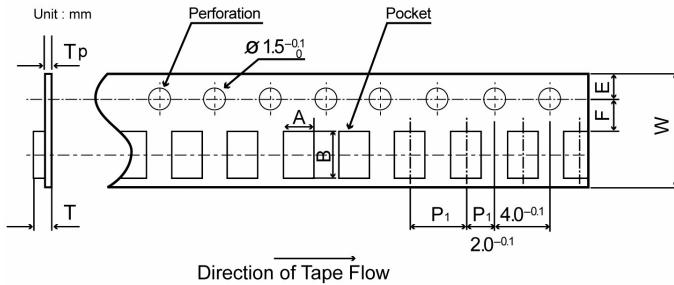
## PERFORMANCE

Test Item	Maximum $\Delta \Omega$		Condition
	F	G, J	
Short Time Overload	$\pm 0.1\%$	$\pm 0.5\%$	2.5 times of the rated voltage shall be applied for 5 seconds
Load Life	$\pm 0.25\%$	$\pm 0.5\%$	The resistor shall be subjected to rated voltage for 90 min. followed by a pause of 30 min. at a temperature of $70 \pm 3^\circ\text{C}$ . This constitutes 1 cycle. Cycles shall be repeated for 1000 hours.
Moisture Load Life	$\pm 0.25\%$	$\pm 0.5\%$	The resistor subjected to rated voltage for 90 min followed by a pause for 30 min at a temperature of $60 \pm 2^\circ\text{C}$ with relative humidity of 90% to 95%. This constitutes 1 cycles. Cycles shall be repeated for 1000 hours.
Temperature Cycle	$\pm 0.1\%$	$\pm 0.5\%$	[ $-55^\circ\text{C}$ 30 min $\rightarrow +125^\circ\text{C}$ 30 min $\rightarrow$ R.T. 3 min] The resistor shall be subjected to 5 continuous cycles
Resistance to Solder Heat	$\pm 0.1\%$	$\pm 0.5\%$	The resistor shall withstand dipped into solder for $10 \pm 1$ sec. At $260 \pm 5^\circ\text{C}$
Terminal Strength	$\pm 0.1\%$	$\pm 0.5\%$	Distance between fulcrums: 90mm; Bending width: 3 mm
Insulation Resistance	DC 500V for 1 min.		1000 Meg $\Omega$ or over
Solderability			A new uniform coating of solder shall cover minimum of 95% of surface being immersed The resistor shall be dipped into the solder of $215 \pm 5^\circ\text{C}$ for $3 \pm 0.5$ seconds

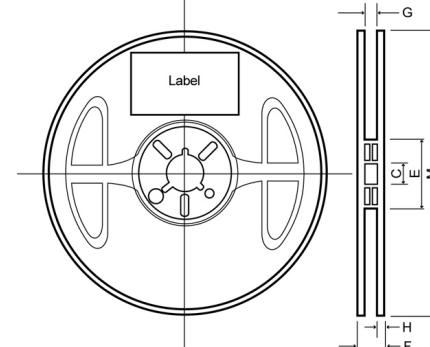
## PACKAGE QUANTITY

Package Type	CTLS05	CTLS16	CTLS10	CTLS18	CTLS12	CTLS01	CTLS1S
M	10,000	5,000	5,000	5,000	5,000	5,000	2,000

## TAPE SCHEMATIC



## REEL SCHEMATIC



## TAPE DIMENSIONS (mm)

	A	B	W	E	F	P <sub>1</sub>	T	T <sub>p</sub>
CTLS05	$0.65 \pm 0.1$	$1.15 \pm 0.1$	$8.0 \pm 0.2$	$1.75 \pm 0.10$	$3.5 \pm 0.05$	$2.0 \pm 0.05$	$0.55 \pm 0.1$	$0.20 \pm 0.05$
CTLS16	$1.1 \pm 0.2$	$1.9 \pm 0.2$	$8.0 \pm 0.2$	$1.75 \pm 0.1$	$3.5 \pm 0.05$	$4.0 \pm 0.1$	$0.70 \pm 0.1$	$0.20 \pm 0.05$
CTLS10	$1.65 \pm 0.2$	$2.4 \pm 0.2$	$8.0 \pm 0.2$	$1.75 \pm 0.1$	$3.5 \pm 0.05$	$4.0 \pm 0.1$	$0.85 \pm 0.1$	$0.20 \pm 0.05$
CTLS18	$2.0 \pm 0.15$	$3.6 \pm 0.15$	$8.0 \pm 0.2$	$1.75 \pm 0.1$	$3.5 \pm 0.05$	$4.0 \pm 0.1$	$0.85 \pm 0.1$	$0.20 \pm 0.05$
CTLS12	$2.9 \pm 0.1$	$5.3 \pm 0.1$	$12.0 \pm 0.2$	$1.75 \pm 0.1$	$5.5 \pm 0.05$	$4.0 \pm 0.1$	$1.0 \pm 0.1$	$0.25 \pm 0.1$
CTLS01	$3.4 \pm 0.1$	$6.6 \pm 0.1$	$12.0 \pm 0.2$	$1.75 \pm 0.1$	$5.5 \pm 0.05$	$4.0 \pm 0.1$	$1.0 \pm 0.1$	$0.25 \pm 0.1$
CTLS1S	$3.4 \pm 0.1$	$6.6 \pm 0.1$	$12.0 \pm 0.2$	$1.75 \pm 0.1$	$5.5 \pm 0.05$	$4.0 \pm 0.1$	$1.0 \pm 0.1$	$0.25 \pm 0.1$

## REEL DIMENSIONS (mm)

Reel	M	H	C	G	E	F
7"	$180 \pm 3.0$	1.20	$13.0 \pm 0.2$	$9.0 \pm 0.3$	$60 \pm 1.0$	$11.4 \pm 1.0$
10"						
13"						

The content of this specification may change without notification 06/08/2007

## LABEL DESCRIPTION

One side surface of a reel is marked with a label with the following items of information.

1. Chip Resistor
2. Part Number
3. Tolerance
4. Quantity
5. Lot # for production month/year/suffix L\*
6. Manufacturer's name or symbol