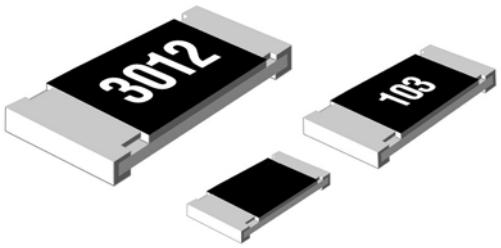
THIN FILM PRECISION CHIP RESISTORS

The content of this specification may change without notification 10/12/07

CT Series Chip Resistors – Tin / Gold Terminations Available



HOW TO ORDER

CT G 10 - 1003 B X M

Packaging
M = Std. Reel O = 1K Reel

TCR (PPM/°C)

L = ±1	P = ±5	Y = ±50
M = ±2	Q = ±10	Z = ±100
N = ±3	X = ±25	

Tolerance (%)

U=±.01	A=±.05	C=±.25	F=±1
P=±.02	B=±.10	D=±.50	

EIA Resistance Value
Standard decade values

Size

01=2512	05=0402	10=0805
10P=0805P	11=2020	12=2010
13=1217	14=1210	16=0603
16P=0603P	18=1206	18P=1206P
20=0201		

Termination Material
Sn = Leave Blank Au = G

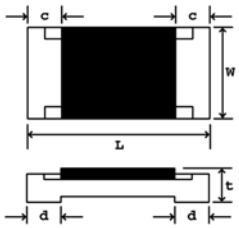
Series
CT = Thin Film Precision Resistors

FEATURES

- High Power Available 0603P 1/8W, 0805P 1/4W, 1206P 1/2W
- Nichrome Thin Film Resistor Element
- CTG type constructed with top side terminations, wire bonded pads, and Au termination material.
- Anti-Leaching Nickel Barrier Terminations
- Very Tight Tolerances, as low as ±0.01%
- Extremely Low TCR, as low as ±1ppm
- Special Sizes available 1217, 2020, and 2045
- Either ISO 9001 or ISO/TS 16949:2002 Certified
- Applicable Specifications: EIA575, IEC 60115-1, JIS C5201-1, CECC 40401, MIL-R-55342D
- Custom Designs Available.

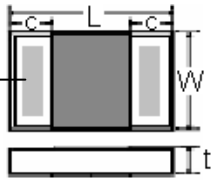
SCHEMATIC

Wraparound Termination



Top Side Termination, Bottom Isolated – CTG Type

Wire Bond Pads
Terminal Material: Au



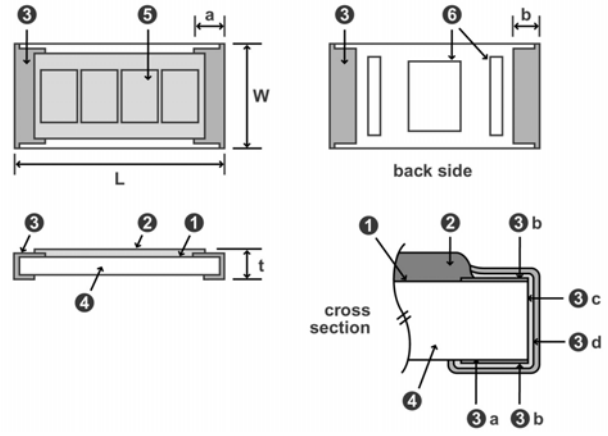
DIMENSIONS (mm)

Size	L	W	c	d	t
0201	0.60 ± 0.05	0.30 ± 0.05	0.13 ± 0.05	0.25+0.05	0.25 ± 0.05
0402	1.00 ± 0.05	$0.5+0.1^{-0.05}$	0.20 ± 0.10	$0.25+0.05^{-0.10}$	0.35 ± 0.05
0603, P	1.60 ± 0.10	0.80 ± 0.10	0.20 ± 0.10	$0.30+0.20^{-0.10}$	0.50 ± 0.10
0805, P	2.00 ± 0.15	1.25 ± 0.15	0.40 ± 0.25	$0.30+0.20^{-0.10}$	0.50 ± 0.15
1206, P	3.20 ± 0.15	1.60 ± 0.15	0.45 ± 0.25	$0.40+0.20^{-0.10}$	0.60 ± 0.15
1210	3.20 ± 0.15	2.60 ± 0.15	0.50 ± 0.30	$0.40+0.20^{-0.10}$	0.60 ± 0.10
1217	3.00 ± 0.20	4.20 ± 0.20	0.80 ± 0.30	0.80 ± 0.25	0.9 max
2010	5.00 ± 0.15	2.60 ± 0.15	0.50 ± 0.30	$0.40+0.20^{-0.10}$	0.70 ± 0.10
2020	5.08 ± 0.20	5.08 ± 0.20	0.80 ± 0.30	0.80 ± 0.30	0.9 max
2045	5.00 ± 0.15	11.5± 0.30	0.80 ± 0.30	0.80 ± 0.30	0.9 max
2512	6.30 ± 0.15	3.10 ± 0.15	0.60 ± 0.25	0.50 ± 0.25	0.60 ± 0.10

CONSTRUCTION MATERIALS

Item	Part	Material
❶	Resistor	Nichrome Thin Film
❷	Protective Film	Polymide Epoxy Resin
❸	Electrode	
❸a	Grounding Layer	Nichrome Thin Film
❸b	Electrode Layer	Copper Thin Film
❸c	Barrier Layer	Nickel Plating
❸d	Solder Layer	Solder Plating (Sn)
❹	Substrate	Alumina
❺ &	Marking	Epoxy Resin
❻	The resistance value is on the front side The production month is on the backside	

CONSTRUCTION FIGURE (Wraparound)



American Accurate Components, Inc.
188 Technology Drive, Unit H, Irvine, CA 92618
TEL: 949-453-9888 ◆ FAX: 949-453-8889

ELECTRICAL CHARACTERISTICS

Size	Power Rating at 70° (W)	Resistance Range	±% Tolerance	TCR (10^{-6}/°C)	Working Voltage	Overload Voltage	Operating Temp Range
0201	0.05	10.0 ~ 30.0	1	±100	15V	30V	-55°C ~ +125°C
		33.0 ~ 22.0K	0.5	±25			
0402	0.031 0.063	10.0 ~ 46.4	0.1, 0.5, 1	±10, ±25, ±50	50V	100V	-55°C ~ +125°C
		47.0 ~ 97.6	0.05, 0.1, 0.25, 0.5, 1	±10, ±25, ±50			
		100 ~ 2.94K	0.02, 0.05, 0.1, 0.25, 0.5, 1	±5, ±10, ±25, ±50			
		3.00K ~ 100K	0.05, 0.1, 0.25, 0.5, 1	±10, ±25, ±50			
0603	0.063 0.100	10.0 ~ 100K	0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1	1,2,3,5,10,25,50	75V	150V	-55°C ~ +125°C -55°C ~ +155°C
		102K ~ 270K	0.05, 0.1, 0.25, 0.5, 1	10, 25, 50			-55°C ~ +125°C
		274K ~ 360K	0.1, 0.25, 0.5, 1	10, 25, 50			
0603P	0.125	1.0 - 9.1	0.5, 1	±50, ±100	75V	150V	-55°C ~ +125°C
		10 - 390K	0.1, 1.0	±10, ±25, ±50, ±100			
0805	0.100	10.0 ~ 200K	0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1	1, 2, 3, 5, 10, 25, 50	100V	200V	-55°C ~ +125°C
		205K ~ 360K	0.05, 0.1, 0.25, 0.5	10, 25, 50			
		365K ~ 487K	0.05, 0.1, 0.25, 0.5	10, 25			
		499K ~ 1.00M	0.1, 0.5	25			
0805P	0.250	1.0 - 9.1	0.5, 1	±50, ±100	150V	300V	-55°C ~ +125°C
		10 - 800K	0.1, 1.0	±10, ±25, ±50, ±100			
1206	0.125	5.01 ~ 560K	0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1	1, 2, 3, 5, 10, 25, 50	150V	300V	-55°C ~ +125°C
		562K ~ 1.00M	0.05, 0.1, 0.25, 0.5	10, 25			
1206P	0.500	1.0 - 9.1	0.5, 1	±50, ±100	150V	300V	-55°C ~ +125°C
		10 ~ 1.00M	0.1, 1.0	±10, ±25, ±50, ±100			
1210	0.250	100 ~ 330K	0.1	±5, ±10	200V	400V	-55°C ~ +125°C
		51.0 ~ 2.00M	0.1, 0.5	±25			
		10.0 ~ 49.9	0.5	±50			
1217	0.250	5.10 ~ 1.00M	0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1	±1, 2, 3, 5, 10, 25	200V	400V	-55°C ~ +155°C
2010	0.250	100 ~ 20.0K	0.01, 0.05, 0.1, 0.25, 0.5	±5	150V	300V	-55°C ~ +125°C
		50.0 ~ 40.0K	0.01, 0.05, 0.1, 0.25, 0.5	±10			
		10.0 ~500K	0.01, 0.05	±25			
		4.70 -1.00M	0.1, 0.25, 0.5, 1				
		10.0 ~500K	0.01, 0.05	±50			
		1.00 ~ 1.00M	0.1, 0.25, 0.5, 1				
2020	0.500	5.10 ~ 2.00M	0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1	±1, 2, 3, 5, 10, 25	350V	700V	-55°C ~ +155°C
2045	1.000	20.0 ~ 4.99M	0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1	±1, 2, 3, 5, 10, 25	500V	1000V	-55°C ~ +155°C
2512	0.500	100 ~ 20.0K	0.01, 0.05, 0.1, 0.25, 0.5	±5	150V	300V	-55°C ~ +125°C
		50.0 ~ 40.0K	0.01, 0.05, 0.1, 0.25, 0.5	±10			
		10.0R ~ 500K	0.01, 0.05	±25			
		4.70 -1.00M	0.1, 0.25, 0.5, 1				
		10.0R ~ 500K	0.01, 0.05	±50			
		1.00 1.00M	0.1, 0.25, 0.5, 1				

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RoHS COMPLIANT 2002/95/EC

* Rated Voltage: √PxR

** 0.01% may be available under special request

PERFORMANCE & ENVIRONMENTAL SPECIFICATIONS

Test Item	Maximum Δ Ω +0.05Ω (Tolerance)			Condition
	A	B, C	D, F	
Short Time Overload	± 0.1%	± 0.1%	± 0.5%	2.5 times of the rated voltage shall be applied for 5 seconds
Load Life	± 0.1%	± 0.25%	± 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±3ºC. This constitutes 1 cycle. Cycles shall be repeated for 1000 hours.
Moisture Load Life	± 0.1%	± 0.25%	± 0.5%	The resistor subjected to rated voltage for 90 min followed by a pause for 30 min at a temperature of 60±2ºC with relative humidity of 90% to 95%. This constitutes 1 cycle. Cycles shall be repeated for 1000 hours.
Temperature Cycle	± 0.1%	± 0.1%	± 0.5%	[-55ºC 30 min → +125ºC 30 min → R.T. 3 min] The resistor shall be subjected to 5 continuous cycles
Resistance to Solder Heat	± 0.05%	± 0.1%	± 0.5%	The resistor shall withstand dipped into solder for 10±1 sec. At 260±5ºC
Terminal Strength	± 0.1%	± 0.1%	± 0.5%	Distance between fulcrums: 90mm; Bending width: 3 mm
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 235±5ºC for 3±0.5 seconds
Insulation Resistance	DC 500V for 1 minute			1000 Meg Ω or over

VALUE MARKING

For those parts ordered with an E-24 value, the product will be marked with a 3 digit code. For those products ordered with an E-96 value, the product will be marked with a 4 digit code. For those parts which fall under E-96 and E-24 values (e.g. 1K ohm is both an E-96 and E-24 value), the part will be marked with a 3 digit code; 4 digit markings for this type is available upon special request.

0201, and 0402 Size
No marking
E-24 & E-96 Values
Custom Value Any Size

0603 Size
EIA 96 Digit Code of 3.32K ohm
E-96 Values

0603 ~ 2512 Sizes
EIA 3 Digit Code of 10K ohm resistor
E-24 Values, E-96 Values

0805 ~ 2512 Sizes
EIA 4 Digit Code of 121K ohm resistor
E-96 Values

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 number for production month/year*
6. Manufacturer's name or symbol

* The suffix "L" indicates that this item is lead free. As of September 2004, all new production items of the series CR and CJ are no longer containing tin/lead (SnPb) terminals; they are lead free and in compliance with Lead Free/RoHS.

PACKAGE QUANTITY

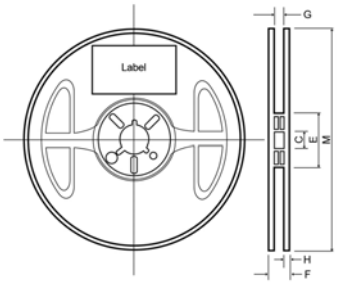
Type	0201	0402	0603	0805	1206
M	5,000	10,000	5,000	5,000	5,000
O	1,000	1,000	1,000	1,000	1,000

Type	1210	1217	2010	2020	2045	2512
B	5,000	2,000	4,000	2,000	3,000	4,000
O	1,000	1,000	1,000	1,000	1,000	1,000

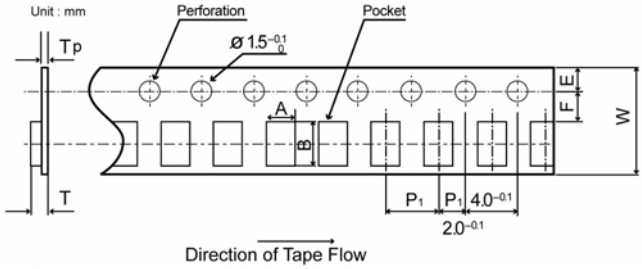
REEL SCHEMATIC & DIMENSIONS (mm)

	O & M Type	M Type
	7" Reel	13" Reel
C	∅13± 0.2	∅13±0.2
E	60±0.5	100±0.2
F	11.4±1.0	13.5±1.0
G	9.0±0.3	9.5±0.5
H	1.5±0.3	2.0±0.5
M	∅180±2.0	∅330±2.0

Reel size is dependent upon the package quantity& resistor size. Call for more info.



TAPE SCHEMATIC



TAPE DIMENSIONS (mm)

	0201	0402	0603	0805	1206
A	0.41±0.1	0.65±0.1	1.1±0.2	1.65±0.2	2.0±0.15
B	0.71±0.1	1.15±0.1	1.9±0.2	2.4±0.2	3.6±0.15
W	8.0±0.2	8.0±0.2	8.0±0.2	8.0±0.2	8.0±0.2
E	1.75±0.10	1.75±0.10	1.75±0.1	1.75±0.1	1.75±0.1
F	3.5±0.05	3.5±0.05	3.5±0.05	3.5±0.05	3.5±0.05
P_1	2.0±0.05	2.0±0.05	4.0±0.1	4.0±0.1	4.0±0.1
T	0.5_{max}	0.55±0.1	0.70±0.1	0.90±0.1	0.90±0.1
T_p	0.4±0.05	0.40±0.05	0.60±0.1	0.75±0.1	0.75±0.1

	1210	1217	2010	2020	2045	2512
A	2.9±0.1	3.5±0.1	2.9±0.1	5.5±0.1	5.4±0.1	2.9±0.1
B	3.5±0.1	4.9±0.1	5.3±0.1	5.5±0.1	11.9±0.1	5.3±0.1
W	8.0±0.2	12.0±0.2	12.0±0.2	12.0±0.2	24.0±0.2	12.0±0.2
E	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1

F	3.5±0.05	5.5±0.1	5.5±0.1	5.5±0.1	11.5±0.1	5.5±0.05
P_1	4.0±0.1	8.0±0.1	4.0±0.1	8.0±0.1	8.0±0.1	4.0±0.1
T	0.90±0.1	0.90±0.1	1.0±0.1	1.0±0.1	1.0±0.1	1.0±0.1
T_p	0.75±0.1		0.25±0.1			0.25±0.1

Call to find out if the tape material is paper or plastic