

### FEATURES:

- TCR as low as  $\pm 100\text{ppm}$
- Available Sizes 01005 to 2512
- 100% matte Tin over Nickel with wrap around termination for excellent solderability



### PART NUMBER STRUCTURE

CRG	1206	-	T	-	103	J	T	□						
<b>Series</b>	<b>Size</b>		<b>Power rating</b>		<b>Resistance</b>	<b>Tolerance</b>	<b>Packaging</b>	<b>Optional Reel Identifies</b>						
01005			M = 1/32W (0.03W)		<table border="1"> <tr> <td>3 DIGIT (J TOL.)</td> <td>2R2=2.2<math>\Omega</math> 103=10K<math>\Omega</math></td> </tr> <tr> <td>4 DIGIT (F TOL.)</td> <td>10R2=10.2<math>\Omega</math> 1002=10K<math>\Omega</math></td> </tr> <tr> <td>Jumper</td> <td>3 zeros</td> </tr> </table>	3 DIGIT (J TOL.)	2R2=2.2 $\Omega$ 103=10K $\Omega$	4 DIGIT (F TOL.)	10R2=10.2 $\Omega$ 1002=10K $\Omega$	Jumper	3 zeros	F = $\pm 1\%$ J = $\pm 5\%$	T = Tape & Reel	Leave blank if standard Reel size.  Add "-13" if "13" Reel is required
3 DIGIT (J TOL.)	2R2=2.2 $\Omega$ 103=10K $\Omega$													
4 DIGIT (F TOL.)	10R2=10.2 $\Omega$ 1002=10K $\Omega$													
Jumper	3 zeros													
0201			N = 1/20W (0.05W)			No tolerance specified for the zero ohm								
0402			P = 1/16W (0.063W)			Leave blank for zero ohm value								
0603			Q = 1/10W (0.10W)											
0805			R = 1/8W (0.125W)											
1206			T = 1/4W (0.25W)											
1210			U = 1/3W (0.33W)											
2010			V = 1/2W (0.5W)											
2512			X = 1W (1.0W)											

**Example P/N:** CRG1206-T-103JT Standard termination finish is 100% matte Tin (Sn) over Nickel.

### DIMENSIONS

Unit: inches (mm)

SIZE	L	W	T	C1	C2
01005	0.016 $\pm$ 0.0008 (0.40 $\pm$ 0.02)	0.008 $\pm$ 0.0008 (0.20 $\pm$ 0.02)	0.005 $\pm$ 0.0008 (0.13 $\pm$ 0.02)	0.003 $\pm$ 0.0012 (0.08 $\pm$ 0.03)	0.004 $\pm$ 0.0012 (0.10 $\pm$ 0.03)
0201	0.023 $\pm$ 0.0012 (0.60 $\pm$ 0.03)	0.012 $\pm$ 0.0012 (0.30 $\pm$ 0.03)	0.009 $\pm$ 0.0012 (0.23 $\pm$ 0.03)	0.004 $\pm$ 0.002 (0.10 $\pm$ 0.05)	0.005 $\pm$ 0.002 (0.15 $\pm$ 0.05)
0402	0.039 $\pm$ 0.002 (1.00 $\pm$ 0.05)	0.0191 $\pm$ 0.002 (0.50 $\pm$ 0.05)	0.013 $\pm$ 0.002 (0.35 $\pm$ 0.05)	0.007 $\pm$ 0.004 (0.20 $\pm$ 0.10)	0.010 $\pm$ 0.004 (0.25 $\pm$ 0.10)
0603	0.062 $\pm$ 0.004 (1.60 $\pm$ 0.10)	0.031 $\pm$ 0.004 (0.80 $\pm$ 0.10)	0.017 $\pm$ 0.006 (0.45 $\pm$ 0.15)	0.012 $\pm$ 0.003 (0.30 $\pm$ 0.10)	0.012 $\pm$ 0.006 (0.30 $\pm$ 0.15)
0805	0.078 $\pm$ 0.004 (2.00 $\pm$ 0.10)	0.049 $\pm$ 0.004 (1.25 $\pm$ 0.10)	0.019 $\pm$ 0.006 (0.50 $\pm$ 0.15)	0.0151 $\pm$ 0.008 (0.40 $\pm$ 0.20)	0.015 $\pm$ 0.008 (0.40 $\pm$ 0.20)
1206	0.122 $\pm$ 0.003 (3.10 $\pm$ 0.10)	0.063 $\pm$ 0.004 (1.60 $\pm$ 0.10)	0.0236 $\pm$ 0.006 (0.60 $\pm$ 0.15)	0.019 $\pm$ 0.008 (0.50 $\pm$ 0.20)	0.017 $\pm$ 0.008 (0.45 $\pm$ 0.20)
1210	0.122 $\pm$ 0.003 (3.10 $\pm$ 0.10)	0.102 $\pm$ 0.004 (2.60 $\pm$ 0.10)	0.0215 $\pm$ 0.004 (0.55 $\pm$ 0.10)	0.019 $\pm$ 0.007 (0.50 $\pm$ 0.20)	0.019 $\pm$ 0.008 (0.50 $\pm$ 0.20)
2010	0.20 $\pm$ 0.004 (5.0 $\pm$ 0.20)	0.098 $\pm$ 0.008 (2.50 $\pm$ 0.20)	0.0215 $\pm$ 0.004 (0.55 $\pm$ 0.10)	0.0256 $\pm$ 0.01 (0.65 $\pm$ 0.25)	0.0236 $\pm$ 0.01 (0.60 $\pm$ 0.25)
2512	0.252 $\pm$ 0.008 (6.4 $\pm$ 0.20)	0.126 $\pm$ 0.008 (3.20 $\pm$ 0.20)	0.24 $\pm$ 0.008 (0.60 $\pm$ 0.10)	0.0256 $\pm$ 0.008 (0.65 $\pm$ 0.25)	0.0354 $\pm$ 0.01 (0.90 $\pm$ 0.25)

### STRUCTURE

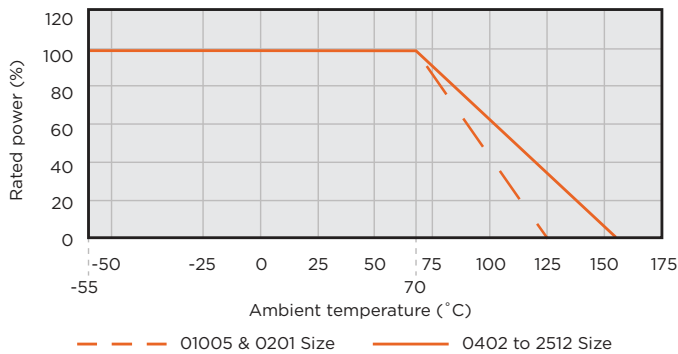
1	Alumina Substrate	6	Primary Coating
2	Backside Electrode	7	Protective Coating
3	Topside Electrode	8	Barrier Layer (Ni)
4	Edge Electrode	9	Termination-100% matte Tin
5	Resistive Layer		

### ELECTRICAL SPECIFICATIONS & RANGE

SIZE	01005	0201	0402	0603	0805	1206	1210	2010	2512	
Power Rating at 70°C (W)	0.03W (1/32W)	0.05W (1/20W)	0.063W (1/16W)	0.10W (1/10W)	0.125W (1/8W)	0.25W (1/4W)	0.33W (1/3W)	0.5W (1/2W)	1W	
Max. Working Voltage	√PR or 25V whichever is less	√PR or 25V whichever is less	√PR or 50V whichever is less	√PR or 50V whichever is less	√PR or 150V whichever is less	√PR or 200V whichever is less	√PR or 200V whichever is less	√PR or 200V whichever is less	√PR or 250V whichever is less	
Operating Temp. Range	-55 to +125°C	-55 to +125°C	-55 to +155°C	-55 to +155°C	-55 to +155°C	-55 to +155°C	-55 to +155°C	-55 to +155°C	-55 to +155°C	
<b>Zero ohm (Jumpers)</b>										
Current Rating	0.5A	0.5A	1A	1A	1.5A	2A	2.5A	3.2A	4.5A	
<b>Tolerance</b>	<b>TCR</b>	<b>Resistance Range</b>	<b>Resistance Range</b>	<b>Resistance Range</b>	<b>Resistance Range</b>	<b>Resistance Range</b>	<b>Resistance Range</b>	<b>Resistance Range</b>	<b>Resistance Range</b>	
<b>±1% (F)</b>	± 100	-	-	10.2Ω - 976KΩ	10.2Ω - 976KΩ	10.2Ω - 976KΩ	10.2Ω - 976KΩ	10.2Ω - 976KΩ	10Ω - 10MΩ	10Ω - 10MΩ
	± 200	100Ω - 1MΩ	100Ω - 1MΩ	-	1MΩ - 10MΩ	1MΩ - 10MΩ	1MΩ - 10MΩ	1MΩ - 10MΩ	1Ω - 10Ω	1Ω - 10Ω
	± 300	-	-	1MΩ - 10MΩ	-	-	-	-	-	-
	-300/+ 500	-	-	1Ω - 10Ω	1Ω - 10Ω	1Ω - 10Ω	1Ω - 10Ω	1Ω - 10Ω	-	-
	+600/-0	10Ω - 97.6Ω	10Ω - 97.6Ω	-	-	-	-	-	-	-
	+800/-100	-	1Ω - 9.76Ω	-	-	-	-	-	-	-
<b>±5% (J)</b>	± 100	-	-	-	-	-	-	-	10Ω - 10MΩ	10Ω - 10MΩ
	± 200	100Ω - 1MΩ	100Ω - 10MΩ	10.2Ω - 910KΩ	11Ω - 10MΩ	11Ω - 10MΩ	11Ω - 10MΩ	11Ω - 10MΩ	1Ω - 10Ω	1Ω - 10Ω
	± 300	-	-	1MΩ - 10MΩ	-	-	-	-	-	-
	-300/+ 500	-	-	1Ω - 10Ω	1Ω - 10Ω	1Ω - 10Ω	1Ω - 10Ω	1Ω - 10Ω	-	-
	+600/-0	10Ω - 91Ω	10Ω - 91Ω	-	-	-	-	-	-	-
	+800/-100	-	1Ω - 9.1Ω	-	-	-	-	-	-	-

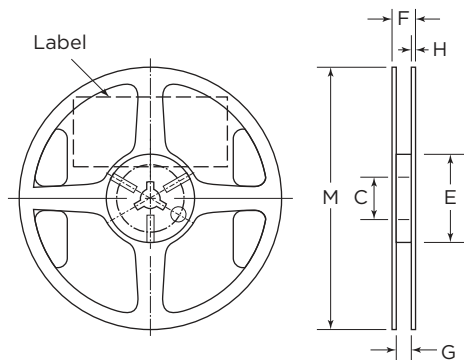
NOTE: Overload Voltage=2.5\*√(P\*R).

### DERATING CURVE



### TAPE & REEL SPECIFICATIONS

#### REEL

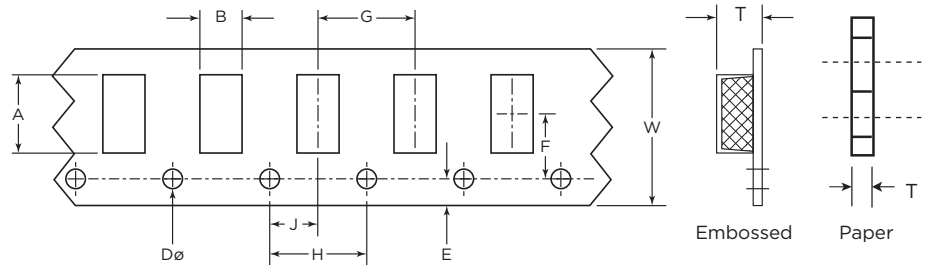


Unit: mm (inch)

C	E	F	G	H	M
13.0 ± 0.20 (0.51 ± 0.008)	60.0 ± 1.0 (2.36 ± 0.03)	11.4 ± 1.0 (0.345 ± 0.04)	9.0 ± 0.30 (0.35 ± 0.012)	1.5 ± 0.30 (0.06 ± 0.012)	178.0 ± 2.0 (7.00 ± 0.08)

Minimum of 30 empty pockets at the beginning of reel, 65 minimum empty pockets at the end.

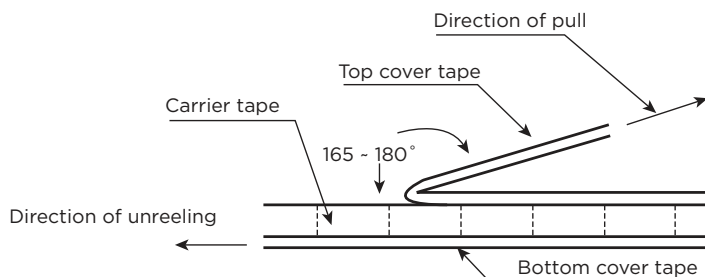
#### TAPE



All dimensions in mm

TAPE	SIZE (INCHES)	A	B	W	E	F	T	G	H	J	DØ
Paper	01005	0.45 ± 0.03	0.24 ± 0.03	8.00 ± 0.30	1.75 ± 0.10	3.50 ± 0.20	0.40 ± 0.05	2.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 + 0.1 - 0.0
	0201	0.67 ± 0.05	0.37 ± 0.05	8.00 ± 0.30	1.75 ± 0.10	3.50 ± 0.20	0.45 ± 0.05	2.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 + 0.1 - 0.0
	0402	1.20 ± 0.10	0.70 ± 0.10	8.00 ± 0.30	1.75 ± 0.10	3.50 ± 0.20	0.40 ± 0.05	2.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 + 0.1 - 0.0
	0603	1.90 ± 0.20	1.10 ± 0.20	8.00 ± 0.30	1.75 ± 0.10	3.50 ± 0.20	0.65 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 + 0.1 - 0.0
	0805	2.40 ± 0.20	1.65 ± 0.20	8.00 ± 0.30	1.75 ± 0.10	3.50 ± 0.20	1.0 ± 0.20	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 + 0.1 - 0.0
	1206	3.60 ± 0.20	2.00 ± 0.20	8.00 ± 0.30	1.75 ± 0.10	3.50 ± 0.20	1.0 ± 0.20	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 + 0.1 - 0.0
	1210	3.60 ± 0.20	3.00 ± 0.20	8.00 ± 0.30	1.75 ± 0.10	3.50 ± 0.20	1.0 ± 0.20	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 + 0.1 - 0.0
	2010	5.50 ± 0.20	2.80 ± 0.20	12.00 ± 0.30	1.75 ± 0.10	5.50 ± 0.10	1.0 ± 0.20	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 + 0.1 - 0.0
	2512	6.90 ± 0.20	3.60 ± 0.20	12.00 ± 0.30	1.75 ± 0.10	5.50 ± 0.10	1.0 ± 0.20	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 + 0.1 - 0.0

#### PEEL BACK FORCE AND DIRECTION DIAGRAM



Peel back force and direction of peel back angle should follow EIA481-1-A. Peel back force should be between 0.1N - 1.3N and peel back angle of 165° - 180°.

**ENVIRONMENTAL CHARACTERISTICS**

TEST	REQUIREMENT		TEST METHOD
	RESISTOR	OΩ	
DC resistance Clause 4.5	Within the specified tolerance	<50mΩ	DC resistance values measured at the test voltages specified below : <10W@0.1V, <100W@0.3V, <1KW@1.0V, <10KW@3V, <100KW@10V, <1MW@25V, <10MW@30V
Temperature Coefficient of Resistance (T.C.R) Clause 4.8		N/A	Natural resistance change per change in degree centigrade. R2 - R1 x 106 (ppm/°C) t1: 20 °C+5 °C-1 °C R1 (t2 - t1) R1 : Resistance at reference temperature R2 : Resistance at test temperature
Short time overload (S.T.O.L) Clause 4.13	1% tol.: ΔR/R max. ±(1%+0.10Ω) 5% tol.: ΔR/R max. ±(2%+0.10Ω)	<50mΩ	Permanent resistance change after a 5second application of a voltage 2.5 times RCWV or the maximum overload voltage specified in the above list, whichever is less.
Resistance to soldering heat (R.S.H) Clause 4.18	1% tol.: ΔR/R max. ±(0.5%+0.10Ω) 5% tol.: ΔR/R max. ±(1%+0.10Ω)	<50mΩ	Un-mounted chips completely immersed for 10±1second in a SAC solder bath at 260 °C±5 °C
Solderability Clause 4.17	95% min. cove 95% coverage min., good tinning and no visible damage rage		Un-mounted chips completely immersed for 2±0.5 second in a SAC solder bath at 235 °C±5 °C
Temperature cycling Clause 4.19	1% tol.: ΔR/R max. ±(0.5%+0.10Ω) 5% tol.: ΔR/R max. ±(1%+0.10Ω)	<50mΩ	30 minutes at -55 °C±3 °C, 2-3 minutes at 20 °C+5 °C-1 °C, 30 minutes at +155 °C±3 °C, 2-3 minutes at 20 °C+5 °C-1 °C, total 5 continuous cycles
Damp Heat (Load life in humidity) Clause 4.24	1% tol.: ΔR/R max. ±(1%+0.10Ω) 5% tol.: ΔR/R max. ±(2%+0.10Ω)	<50mΩ	1000 +48/-0 hours, loaded with RCWV or Vmax in humidity chamber controller at 40 °C±2 °C and 90-95% relative humidity, 1.5 hours on and 0.5 hours off
Load Life (Endurance) Clause 4.25	1% tol.: ΔR/R max. ±(1%+0.10Ω) 5% tol.: ΔR/R max. ±(2%+0.10Ω)	<50mΩ	1000 +48/-0 hours; loaded with RCWV or Vmax in chamber controller 70±2 °C, 1.5 hours on and 0.5 hours off
Bending strength Clause 4.33	1% tol.: ΔR/R max. ±(0.5%+0.10Ω) 5% tol.: ΔR/R max. ±(1%+0.10Ω)	<50mΩ	Resistors mounted on a 90mm glass epoxy resin PCB(FR4), bending once 3mm for 10sec, 5mm for WR04
Adhesion Clause 4.32	No remarkable damage or removal of the terminations		Pressurizing force: 5N, Test time: 10±1sec.