

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	□
Series	Size		Power rating		Resistance	Tolerance	Packaging	Optional Reel Identifies
01005			M = 1/32W (0.03W)		3 DIGIT (J TOL.)	F = $\pm 1\%$ J = $\pm 5\%$	T = Tape & Reel	Leave blank if standard Reel size.
0201			N = 1/20W (0.05W)		4 DIGIT (F TOL.)	No tolerance specified for the zero ohm		Add "-13" if "13" Reel is required
0402			P = 1/16W (0.063W)		Jumper	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

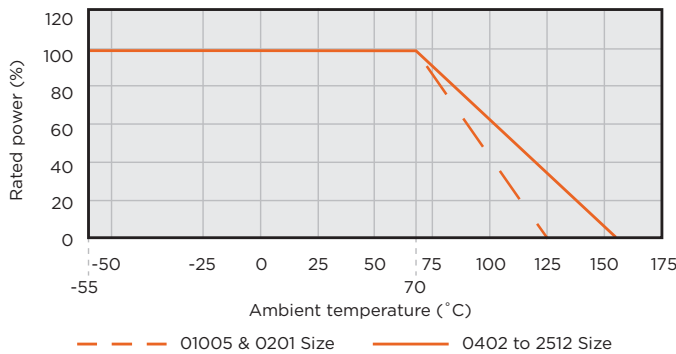
1	Alumina Substrate	6	Primary Coating
2	Backside Electrode	7	Protective Coating
3	Topside Electrode	8	Barrier Layer (Ni)
4	Edge Electrode	9	Termination-100% matte Tin
5	Resistive Layer		

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	
Zero ohm (Jumpers)										
Current Rating	0.5A	0.5A	1A	1A	1.5A	2A	2.5A	3.2A	4.5A	
Tolerance	TCR	Resistance Range	Resistance Range	Resistance Range	Resistance Range	Resistance Range	Resistance Range	Resistance Range	Resistance Range	
±1% (F)	± 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	-	-	-	-	-	-	-
±5% (J)	± 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	-	-	-	-	-	-	-

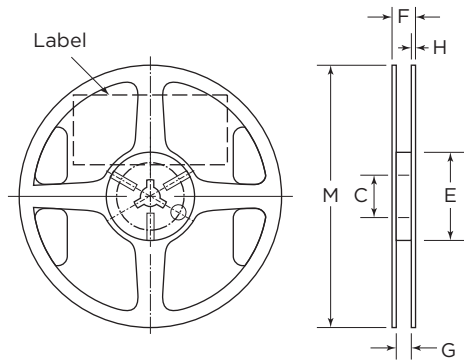
NOTE: Overload Voltage=2.5*√(P*R).

DERATING CURVE



TAPE & REEL SPECIFICATIONS

REEL

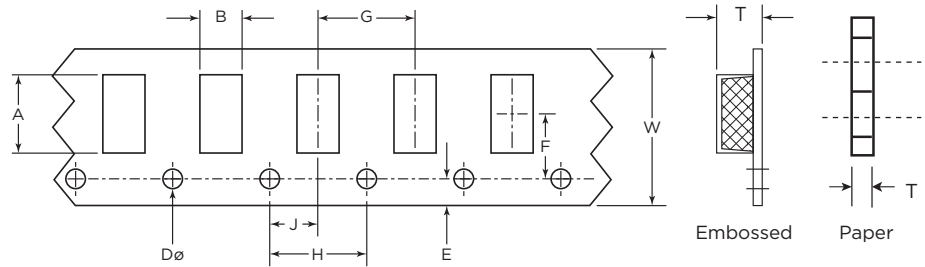


Unit: mm (inch)

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.

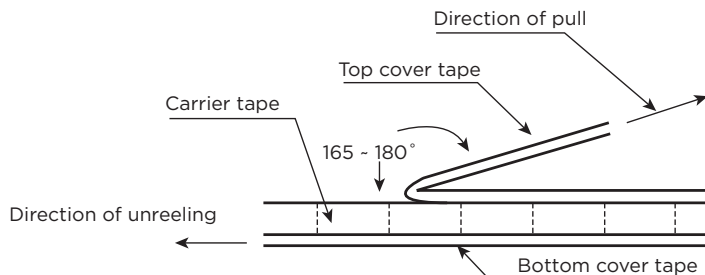
TAPE



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. $R2 - R1 \times 106 \text{ (ppm/}^\circ\text{C)}$ $t1: 20^\circ\text{C} + 5^\circ\text{C} - 1^\circ\text{C}$ $R1 (t2 - t1)$ R1 : Resistance at reference temperature R2 : Resistance at test temperature
Short time overload (S.T.O.L) Clause 4.13	1% tol.: $\Delta R/R \text{ max. } \pm(1\%+0.10\Omega)$ 5% tol.: $\Delta R/R \text{ max. } \pm(2\%+0.10\Omega)$	<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.: $\Delta R/R \text{ max. } \pm(0.5\%+0.10\Omega)$ 5% tol.: $\Delta R/R \text{ max. } \pm(1\%+0.10\Omega)$	<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.: $\Delta R/R \text{ max. } \pm(0.5\%+0.10\Omega)$ 5% tol.: $\Delta R/R \text{ max. } \pm(1\%+0.10\Omega)$	<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.: $\Delta R/R \text{ max. } \pm(1\%+0.10\Omega)$ 5% tol.: $\Delta R/R \text{ max. } \pm(2\%+0.10\Omega)$	<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.: $\Delta R/R \text{ max. } \pm(1\%+0.10\Omega)$ 5% tol.: $\Delta R/R \text{ max. } \pm(2\%+0.10\Omega)$	<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.: $\Delta R/R \text{ max. } \pm(0.5\%+0.10\Omega)$ 5% tol.: $\Delta R/R \text{ max. } \pm(1\%+0.10\Omega)$	<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.