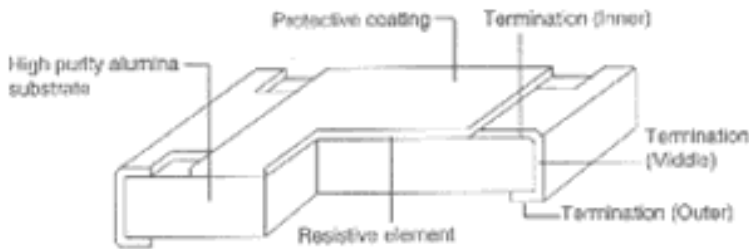


CONSTRUCTION

CHIP RESISTOR



MATERIAL

- 1 Alumina Substrate (AL2 O3)
- 2 Resistive Element (Ru2 O3)
- 3 Protective Coating (PbSiO2)
- 4 Inner Termination (Ag/Pd 5-20 μ m)
- 5 Middle Termination (Ni > 2 μ m)
- 6 Outer Termination (Sn/Pb > 2 μ m)

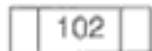
APPLICATION

Telecommunication equipment, Radio and Tape recorders, TV tuner, Video games and cameras, Watches, Calculators, Automotive Industry, Computer, Instruments and Medical equipment.

FEATURES

- Small size and light weight.
- Reduction of assembly cost and matching with placement machines.
- Reliability, High quality and Fast delivery.
- Suitable for both reflow and flow soldering.

MARKING



Resistance Values 5% marked with three digits, First two Significant, last, number of zeros. Example 1000 Ohm or 1k (EIA Standard E-24 Series).



Resistance Values 1% marked with four digits, First three Significant, last, number of zeros. Example 1000 Ohm or 1k (EIA Standard E-96 Series).

EXAMPLE

PART NUMBER SYSTEM

1206 1/4W 5% 1K

CR 1206 J 102 T1

CHIP RESISTOR	SIZE (WATT)	TOL.	VALUE	REEL SPEC
CR	0603 1/16W 0805 1/8W 1206 1/4W	J=5% G=2%	1R0=1R 100=10R 101=100R 102=1K 103=10K	T1=5K PAPER TAPE T2=10K
		F=1%	1R00=1R 10R0=10R 1000=100R 1001=1K	

LOT CODE EXAMPLE

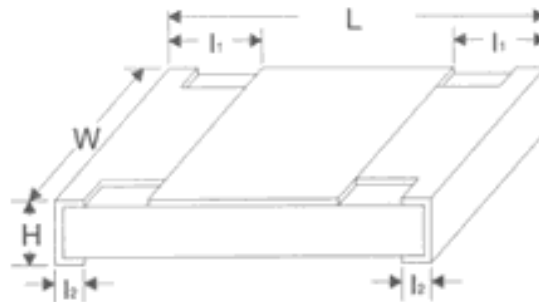
9336-02

YEAR	WEEK	BATCH
93	36	2

GENERAL SPECIFICATION



■ DIMENSION FOR ONE CHIP (mm)



TYPE	L	W	H	l ₁	l ₂	Unit Weight/PC
1206	3.1 ± 0.1	1.55 ± 0.1	0.55 ± ^{0.1} _{0.05}	0.45 ± 0.2	0.20~0.50	9mg
0805	2.0 ± 0.1	1.25 ± 0.1	0.45 ± 0.1	0.40 ± 0.2	0.20~0.50	4mg
0603	1.6 ± 0.1	0.80 ± 0.1	0.40 ± 0.1	0.30 ± 0.2	0.20~0.50	2mg

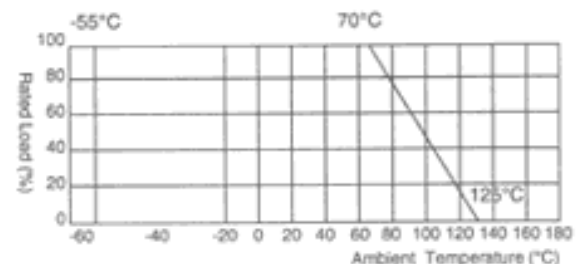
■ RATING

TYPE NO.	Power Rating at 70°C	Max. Working Voltage	Max. Overload Voltage	Resistance Tolerance (%)	Resistance Ranges (Ω)	Operation Temp (°C)	Normal* Res. value
1206 CR1206	0.25W	200V	400V	Jumper ± 1 ± 2 ± 5	50mΩ 10Ω-1MΩ 10Ω-1MΩ 1Ω-10MΩ	-55~ + 125	E24 & E96 E24 E24
0805 CR0805	0.1W	150V	300V	Jumper ± 1 ± 2 ± 5	50mΩ 10Ω-1MΩ 10Ω-1MΩ 1Ω-10MΩ	-55~ + 125	E24 & E96 E24 E24
0603 CR0603	0.0625W	50V	100V	Jumper ± 1 ± 2 ± 5	50mΩ 10Ω-1MΩ 10Ω-1MΩ 1Ω-10MΩ	-55~ + 125	E24 & E96 E24 E24

■ DERATING CURVE

For resistors operated in ambient temperatures above 70°C, power rating must be derated in accordance with the curve below.

*SPECIAL REQUEST AVAILABLE

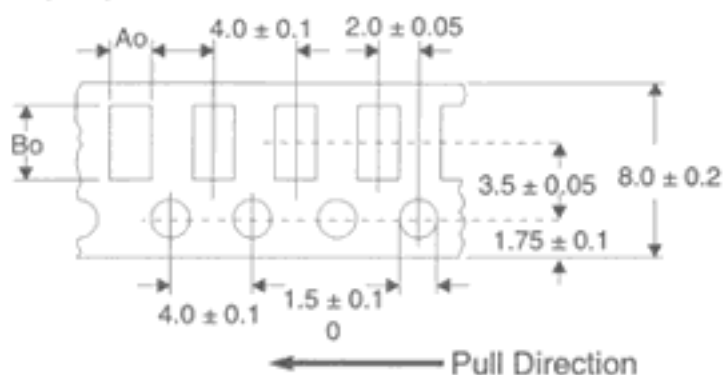


Characteristics	Specifications		Test Methods	
	Chip Resistors	Chip Jumper	Resistance nominal	Test voltage
DC Resistance (Direct Current Resistance)	DC Resistance value must be within the specified tolerance.	50mΩ lower	DC Resistance value measured at the test voltage specified below	
			<100Ω	0.3v
			< 1kΩ	1 v
			< 10kΩ	3 v
			<100kΩ	10 v
			< 1MΩ	25 v
			over1MΩ	50 v
Temperature Coefficient of Resistance	± 1% , 10Ω to 1MΩ ± 100ppm ± 2% , 10Ω to 1MΩ ± 100ppm ± 5% , 10Ω to 1MΩ ± 200ppm ± 5% , 1Ω to 9.1Ω -100~600ppm ± 5% , 1.1MΩ to 10MΩ ± 300ppm		Natural resistance change per temperature degree centigrade	
Short-Time Overload	± (1.0%+0.05Ω)Max. with no evidence of arcing, burning, or charring.	50mΩ lower	Permanent resistance change after the application of a potential of 2.5 times RCWV. or the max. overload voltage respectively specified in the above list, whichever less for 5 seconds.	
Vibration, Low Frequency	± (1.0%+0.05Ω)Max. with no evidence of mechanical damage.	50mΩ lower	Resistors shall be subject to a single vibration having an amplitude of 0.8mm, or 0.0315 inch (1.6 mm, or 0.063 inch double amplitude) for 2 hours in each of three mutually perpendicular directions for a total of 6 hours. The vibration frequency shall be varied uniformly 10 to 55 Hz and return to 10 Hz shall be traversed in 1 minute.	
Terminal Strength	± (1.0%+0.05Ω)Max. with no evidence of mechanical damage.	50mΩ lower	Bending Test : y/x=5/90mm 1 time Pulling Test : 500 gram	

Characteristics	Specifications		Test Methods
	Chip Resistors	Chip Jumper	
Solderability	Over 95% of the surface area of termination should be coated with solder.	See left	After dipping the resistor into flux for 3 ± 0.5 seconds dip in molten solder at $230 \pm 5^\circ\text{C}$ for 3 ± 0.5 seconds.

Insulation Resistance	$10^4 \text{M}\Omega$ Min.	See left	500v, 1min.
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■ TAPE DIMENSION (mm)

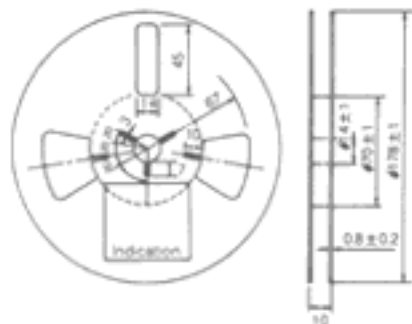


	0603	0805	1206
A_o	1.1 ± 0.15	1.65 ± 0.2	2.0 ± 0.2
B_o	1.9 ± 0.2	2.4 ± 0.2	3.5 ± 0.2

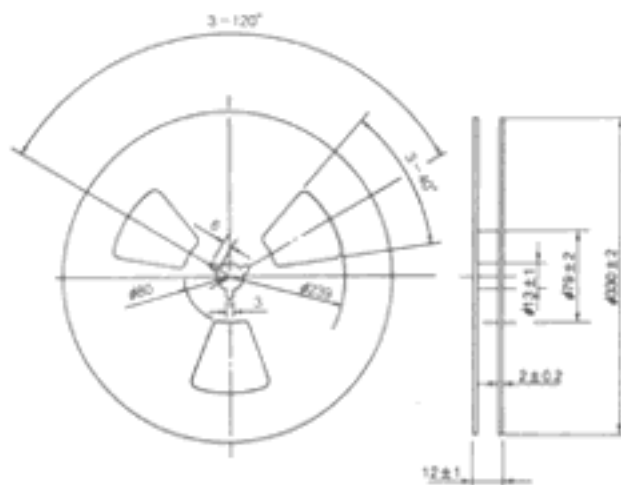
* Special Quantity under request

■ REEL DIMENSIONS (mm)

TI-5K Reel



T2-10K Reel



STANDARD 5% RESISTOR VALUES

000	1.0	3.3	10	33	100	330	1.0K	3.3K	10K	33K	100K	330K	1.0M	3.3M	10M
	1.1	3.6	11	36	110	360	1.1K	3.6K	11K	36K	110K	360K	1.1M	3.6M	
	1.2	3.9	12	39	120	390	1.2K	3.9K	12K	39K	120K	390K	1.2M	3.9M	
	1.3	4.3	13	43	130	430	1.3K	4.3K	13K	43K	130K	430K	1.3M	4.3M	
	1.5	4.7	15	47	150	470	1.5K	4.7K	15K	47K	150K	470K	1.5M	4.7M	
	1.6	5.1	16	51	160	510	1.6K	5.1K	16K	51K	160K	510K	1.6M	5.1M	
	1.8	5.6	18	56	180	560	1.8K	5.6K	18K	56K	180K	560K	1.8M	5.6M	
	2.0	6.2	20	62	200	620	2.0K	6.2K	20K	62K	200K	620K	2.0M	6.2M	
	2.2	6.8	22	68	220	680	2.2K	6.8K	22K	68K	220K	680K	2.2M	6.8M	
	2.4	7.5	24	75	240	750	2.4K	7.5K	24K	75K	240K	750K	2.4M	7.5M	
	2.7	8.2	27	82	270	820	2.7K	8.2K	27K	82K	270K	820K	2.7M	8.2M	
	3.0	9.1	30	91	300	910	3.0K	9.1K	30K	91K	300K	910K	3.0M	9.1M	

STANDARD 1% RESISTOR VALUES

10.0	17.8	31.6	56.2	100	178	316	562	1.00K	1.78K	3.16K	5.62K	10.0K	17.8K	31.6K	56.2K	100K	178K	316K	562K	1.00M
10.2	18.2	32.4	57.6	102	182	324	576	1.02K	1.82K	3.24K	5.76K	10.2K	18.2K	32.4K	57.6K	102K	182K	324K	576K	1.02M
10.5	18.7	33.2	59.0	105	187	332	590	1.05K	1.87K	3.32K	5.90K	10.5K	18.7K	33.2K	59.0K	105K	187K	332K	590K	1.05M
10.7	19.1	34.0	60.4	107	191	340	604	1.07K	1.91K	3.40K	6.04K	10.7K	19.1K	34.0K	60.4K	107K	191K	340K	604K	1.07M
11.0	19.6	34.8	61.9	110	196	348	619	1.10K	1.96K	3.48K	6.19K	11.0K	19.6K	34.8K	61.9K	110K	196K	348K	619K	1.10M
11.3	20.0	35.7	63.4	113	200	357	634	1.13K	2.00K	3.57K	6.34K	11.3K	20.0K	35.7K	63.4K	113K	200K	357K	634K	1.13M
11.5	20.5	36.5	64.9	115	205	365	649	1.15K	2.05K	3.65K	6.49K	11.5K	20.5K	36.5K	64.9K	115K	205K	365K	649K	1.15M
11.8	21.0	37.4	66.5	118	210	374	665	1.18K	2.10K	3.74K	6.65K	11.8K	21.0K	37.4K	66.5K	118K	210K	374K	665K	1.18M
12.1	21.5	38.3	68.1	121	215	383	681	1.21K	2.15K	3.83K	6.81K	12.1K	21.5K	38.3K	68.1K	121K	215K	383K	681K	1.21M
12.4	22.1	39.2	69.8	124	221	392	698	1.24K	2.21K	3.92K	6.98K	12.4K	22.1K	39.2K	69.8K	124K	221K	392K	698K	1.24M
12.7	22.6	40.2	71.5	127	226	402	715	1.27K	2.26K	4.02K	7.15K	12.7K	22.6K	40.2K	71.5K	127K	226K	402K	715K	1.27M
13.0	23.2	41.2	73.2	130	232	412	732	1.30K	2.32K	4.12K	7.32K	13.0K	23.2K	41.2K	73.2K	130K	232K	412K	732K	1.30M
13.3	23.7	42.2	75.0	133	237	422	750	1.33K	2.37K	4.22K	7.50K	13.3K	23.7K	42.2K	75.0K	133K	237K	422K	750K	1.40M
13.7	24.3	43.2	76.8	137	243	432	768	1.37K	2.43K	4.32K	7.68K	13.7K	24.3K	43.2K	76.8K	137K	243K	432K	768K	2.00M
14.0	24.9	44.2	78.7	140	249	442	787	1.40K	2.49K	4.42K	7.87K	14.0K	24.9K	44.2K	78.7K	140K	249K	442K	787K	
14.3	25.5	45.3	80.6	143	255	453	806	1.43K	2.55K	4.53K	8.06K	14.3K	25.5K	45.3K	80.6K	143K	255K	453K	806K	
14.7	26.1	46.4	82.5	147	261	464	825	1.47K	2.61K	4.64K	8.25K	14.7K	26.1K	46.4K	82.5K	147K	261K	464K	825K	
15.0	26.7	47.5	84.5	150	267	475	845	1.50K	2.67K	4.75K	8.45K	15.0K	26.7K	47.5K	84.5K	150K	267K	475K	845K	
15.4	27.4	48.7	86.6	154	274	487	866	1.54K	2.74K	4.87K	8.66K	15.4K	27.4K	48.7K	86.6K	154K	274K	487K	866K	
15.8	28.0	49.9	88.7	158	280	499	887	1.58K	2.80K	4.99K	8.87K	15.8K	28.0K	49.9K	88.7K	158K	280K	499K	887K	
16.2	28.7	51.1	90.9	162	287	511	909	1.62K	2.87K	5.11K	9.09K	16.2K	28.7K	51.1K	90.9K	162K	287K	511K	909K	
16.5	29.4	52.3	93.1	165	294	523	931	1.65K	2.94K	5.23K	9.31K	16.5K	29.4K	52.3K	93.1K	165K	294K	523K	931K	
16.9	30.1	53.6	95.3	169	301	536	953	1.69K	3.01K	5.36K	9.53K	16.9K	30.1K	53.6K	95.3K	169K	301K	536K	953K	
17.4	30.9	54.9	97.6	174	309	549	976	1.74K	3.09K	5.49K	9.76K	17.4K	30.9K	54.9K	97.6K	174K	309K	549K	976K	