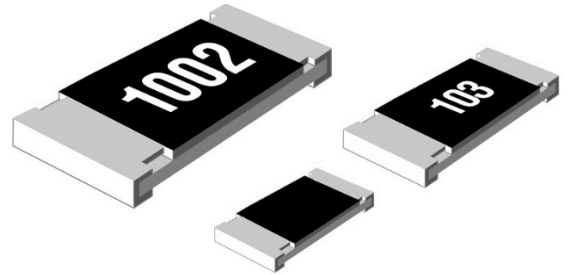


## CONDUCTIVE EPOXY BONDABLE CHIP RESISTORS

### HOW TO ORDER

<p>CR P 10 - 1003 F M</p>	<p><b>Packaging</b> M = 7" Reel    B = Bulk V = 13" Reel    K = Sample Kit</p> <p><b>Tolerance (%)</b> J = <math>\pm 5</math>      G = <math>\pm 2</math>      F = <math>\pm 1</math></p> <p><b>EIA Resistance Value</b> Standard Decade Values</p> <p><b>Size</b> 20 = 0201      18 = 1206      01P = 2512-P 20 = 0201      18 = 1206      01P = 2512-P 05 = 0402      14 = 1210 16 = 0603      12 = 2010</p> <p><b>Termination Material</b> P = AgPd</p> <p><b>Series</b> CJ=Jumper      CR=Resistor</p>
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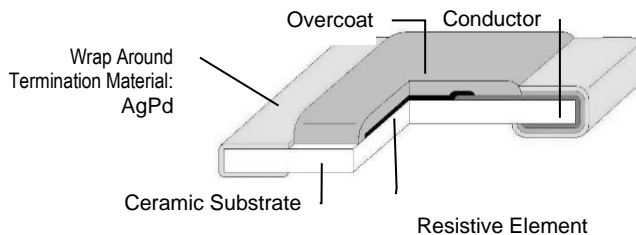
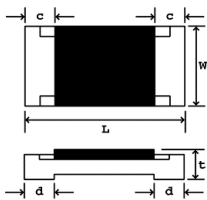


### FEATURES

- Excellent stability over a wide range of environmental conditions
- Compliance with RoHS
- CRP and CJP types constructed with AgPd Terminals, Epoxy Bondable
- Operating temperature -55°C ~ +125°C

### SCHEMATIC

**Wrap Around Terminal**  
CRP, CJP type



### DIMENSIONS (mm)

Size	Size Code	L	W	c	d	t
01005	00	0.40 ± 0.02	0.20 ± 0.02	0.08 ± 0.03	0.10 ± 0.03	0.12 ± 0.02
0201	20	0.60 ± 0.03	0.30 ± 0.03	0.10 ± 0.05	0.15 ± 0.05	0.25 ± 0.05
0402	05	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	16	1.60 ± 0.10	0.80 ± 0.10	0.20 ± 0.10	0.30+0.20-0.10	0.50 ± 0.10
0805	10	2.00 ± 0.15	1.25 ± 0.15	0.40 ± 0.25	0.30+0.20-0.10	0.50 ± 0.15
1206	18	3.20 ± 0.15	1.60 ± 0.15	0.45 ± 0.25	0.40+0.20-0.10	0.60 ± 0.15
1210	14	3.20 ± 0.20	2.60 ± 0.20	0.50 ± 0.30	0.40+0.20-0.10	0.60 ± 0.10
2010	12	5.00 ± 0.20	2.50 ± 0.20	0.50 ± 0.30	0.50+0.20-0.10	0.60 ± 0.10
2512	01	6.30 ± 0.20	3.10 ± 0.20	0.50 ± 0.30	0.50+0.20-0.10	0.60 ± 0.15
2512-P	01P	6.50 ± 0.30	3.20 ± 0.20	0.60 ± 0.30	1.50 ± 0.30	0.60 ± 0.10

### ELECTRICAL SPECIFICATIONS for CHIP RESISTORS

Size	01005	0201	0402
Power Rating (EIA 575)	0.031 (1/32) W	0.05 (1/20) W	0.063(1/16) W
Working Voltage*	15V	20V	50V
Overload Voltage	30V	50V	100V
Tolerance (%)	$\pm 5$	$\pm 1$ $\pm 2$ $\pm 5$	$\pm 1$ $\pm 2$ $\pm 5$
EIA Values	E-24	E-96	E-96    E-24
Resistance	10 ~ 1M	10~1M	10~10M    10~1M    1.0~9.1, 10~10M



TCR (ppm/°C)	± 250			± 200			± 200			± 200			± 200											
Operating Temp.	-55°C ~ +125°C						-55°C ~ +125°C						-55°C ~ +125°C											
<b>Size</b>	<b>0603</b>						<b>0805</b>						<b>1206</b>						<b>1210</b>					
Power Rating (EIA 575)	0.100 (1/10) W						0.125 (1/8) W						0.250 (1/4) W						0.250 (1/4) W					
Working Voltage*	50V						100V						200V						200V					
Overload Voltage	100V						200V						400V						400V					
Tolerance (%)	±1		±2		±5		±1		±2		±5		±1		±2		±5		±1		±2		±5	
EIA Values	E-96		E-24				E-96		E-24				E-96		E-24				E-96		E-24			
Resistance	10 ~ 1 M		1.0~9.1, 10~10M				10 ~ 1 M		1.0~9.1, 10~10M				10 ~ 1 M		1.0~9.1, 10~10M				10 ~ 1 M		1.0~9.1, 10~10M			
TCR (ppm/°C)	±100		±200				±100		±200				±100		±200				±100		±200			
Operating Temp.	-55°C ~ +125°C						-55°C ~ +125°C						-55°C ~ +125°C						-55°C ~ +125°C					

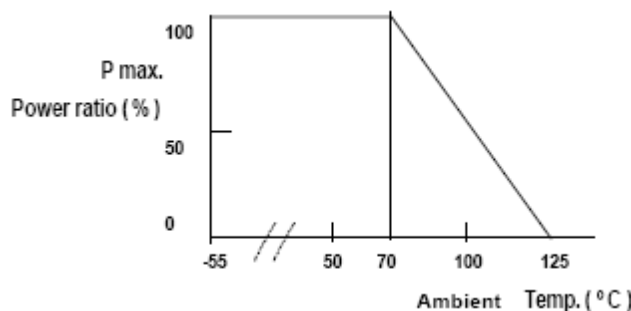
<b>Size</b>	<b>2010</b>						<b>2512</b>						<b>2512-P</b>					
Power Rating (EIA 575)	0.500 (1/2) W						1.0 W						2.0 W					
Working Voltage*	200V						200V						200V					
Overload Voltage	400V						400V						400V					
Tolerance (%)	±1		±2		±5		±1		±2		±5		±1		±2		±5	
EIA Values	E-96		E-24				E-96		E-24				E-96		E-24			
Resistance	10 ~ 1 M		1.0~9.1, 10~10M				10 ~ 1 M		1.0~9.1, 10~10M				1.0 ~ 1.0M		1.0 ~ 1.0M			
TCR (ppm/°C)	±100		±200				±100		±200				±100		±100			
Operating Temp.	-55°C ~ +125°C						-55°C ~ +125°C						-55°C ~ +155°C					

**ELECTRICAL SPECIFICATIONS for ZERO OHM JUMPERS**

Series	CJP20 (0201)	CJP05 (0402)	CJP06 (0603)	CJP10 (0805)	CJP18 (1206)	CJP14 (1210)	CJP12 (2010)	CJP01 (2512)
Rated Current	0.5A (70°C)	1A (70°C)	1A (70°C)	2A (70°C)	2A (70°C)	2A (70°C)	2A (70°C)	2A (70°C)
Resistance (Max)	50 m Ω	50 m Ω	50 m Ω	50 m Ω	50 m Ω	50 m Ω	50 m Ω	50 m Ω
Max. Overload Current	1A	2.5A	2.5A	5A	5A	5A	5A	5A
Working Temp.	-55°C ~ +125°C	-55°C ~ +125°C	-55°C ~ +125°C	-55°C ~ +125°C	-55°C ~ +125°C	-55°C ~ +125°C	-55°C ~ +125°C	-55°C ~ +125°C

**DERATING CURVE**

For resistors operated at ambient temperature over 70°, power rating shall be derated in accordance with figure 1.



**Figure 1**

The rated voltage is calculated by the following formula:

$$E = \sqrt{P \cdot R}$$

E=Rated Voltage(V)

P=Rated Power(W)

R=Resistance Value(Ω)



**CHARACTERISTICS**

Test Item	Maximum $\Delta \Omega$ +0.05 $\Omega$		Test Conditions
	$\pm 2\%$ & $\pm 5\%$ Tolerance	$\pm 1\%$ & $\pm 0.5\%$ Tolerance	
Short Time Overload	$\pm 0.75\%$	$\pm 0.50\%$	EIA Standard 575, $\pi$ 3.6 2.5 x rated voltage for 5 seconds
Load Life	$\pm 1.50\%$	$\pm 1.00\%$	EIA Standard 575, $\pi$ 3.14 90 minutes on; 30 minutes off for 1000 hours
Thermal Shock	$\pm 0.25\%$	$\pm 0.50\%$	EIA Standard 575, $\pi$ 3.5 -55°C ~ +150°C for 5 cycles
High Temperature Exposure	$\pm 0.50\%$	$\pm 1.25\%$	EIA Standard 575, $\pi$ 3.7 125°C $\pm$ 5°C continuous for 100 hours
Terminal Strength	$\pm 0.50\%$	$\pm 0.50\%$	EIA Standard 575, $\pi$ 3.9 20gms @ 90° angle for 30 seconds
Moisture Resistance	$\pm 1.00\%$	$\pm 0.50\%$	EIA Standard 575, $\pi$ 3.10
Solderability	95% minimum coverage	95% minimum coverage	EIA Standard 575, $\pi$ 3.12 3 seconds of immersion @ +215°C

**EIA Standard Values**

**Decade Values in the EIA Standard E-24 Series:**

1.0	1.1	1.2	1.3	1.5	1.6
1.8	2.0	2.2	2.4	2.7	3.0
3.3	3.6	3.9	4.3	4.7	5.1
5.6	6.2	6.8	7.5	8.2	9.1

**Decade Values in the EIA Standard E-96 Series:**

1.00	1.02	1.05	1.07	1.10	1.13
1.15	1.18	1.21	1.24	1.27	1.30
1.33	1.37	1.40	1.43	1.47	1.50
1.54	1.58	1.62	1.65	1.69	1.74
1.78	1.82	1.87	1.91	1.96	2.00
2.05	2.10	2.15	2.21	2.26	2.32
2.37	2.43	2.49	2.55	2.61	2.67
2.74	2.80	2.87	2.94	3.01	3.09
3.16	3.24	3.32	3.40	3.48	3.57
3.65	3.74	3.83	3.92	4.02	4.12
4.22	4.32	4.42	4.53	4.64	4.75
4.87	4.99	5.11	5.23	5.36	5.49
5.62	5.76	5.90	6.04	6.19	6.34
6.49	6.65	6.81	6.98	7.15	7.32
7.50	7.68	7.87	8.06	8.25	8.45
8.66	8.87	9.09	9.31	9.53	9.76

Those items in a shaded box are also E-24 values and will be marked with the EIA 3 Digit Code.

**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.



01005, 0201, and 0402 Size  
No marking  
E-24 & E-96 Values



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



0603, 0805, 1206, 1210, 2010, 2512 Sizes  
EIA 3 Digit Code of 10K ohm resistor E-24 Values,



0805, 1206, 1210, 2010, 2512 Sizes  
EIA 4 Digit Code of 121K ohm resistor  
E-96 Values

Value	Code	Value	Code	Value	Code	Value	Code
10.0	01	17.8	25	31.6	49	56.2	73
10.2	02	18.2	26	32.4	50	57.6	74
10.5	03	18.7	27	33.2	51	59.0	75
10.7	04	19.1	28	34.0	52	60.4	76
11.0	05	19.6	29	34.8	53	61.9	77
11.3	06	20.0	30	35.7	54	63.4	78
11.5	07	20.5	31	36.5	55	64.9	79
11.8	08	21.0	32	37.4	56	66.5	80
12.1	09	21.5	33	38.3	57	68.1	81
12.4	10	22.1	34	39.2	58	69.8	82
12.7	11	22.6	35	40.2	59	71.5	83
13.0	12	23.3	36	41.2	60	73.2	84
13.3	13	23.7	37	42.2	61	75.0	85
13.7	14	24.3	38	43.2	62	76.8	86
14.0	15	24.9	39	44.2	63	78.7	87
14.3	16	25.5	40	45.3	64	80.6	88
14.7	17	26.1	41	46.4	65	82.5	89
15.0	18	26.7	42	47.5	66	84.5	90
15.4	19	27.4	43	48.7	67	86.6	91
15.8	20	28.0	44	49.9	68	88.7	92
16.2	21	28.7	45	51.1	69	90.9	93
16.5	22	29.4	46	52.3	70	93.1	94
16.9	23	30.1	47	53.6	71	95.3	95
17.4	24	30.9	48	54.9	72	97.6	96

**Letter Multiplier Cross Reference**

A = 10                      C = 1,000                      E = 100,000                      X = 1  
 B = 100                      D = 10,000                      F = 1,000,000                      Y = 0.1

0603 Code	Explanation	Value
01B	01 = 10.0 & B = 100	10.0x100 = 1K $\Omega$
25C	25 = 17.8 & C = 1,000	17.8x1,000 = 17.8K $\Omega$
93D	93 = 90.9 & D = 10,000	90.9 x 10,000 = 909K $\Omega$

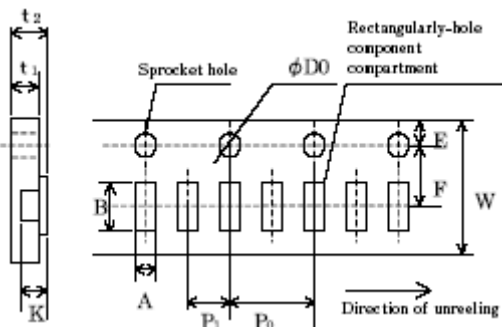
**PACKAGE QUANTITY**

Type	01005	0201	0402	0603	0805
B				25,000	10,000
M	15,000	10,000	10,000	5,000	5,000
V		40,000	40,000	20,000	20,000

**PACKAGE QUANTITY**

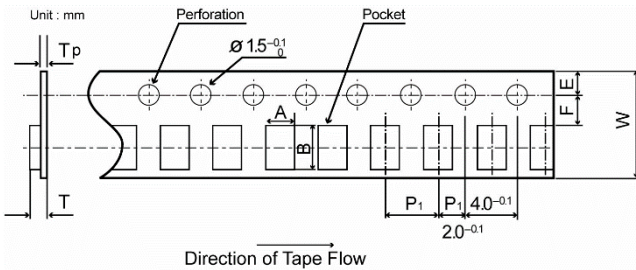
Type	01005	0201	0402	0603	0805
B				25,000	10,000
M	15,000	10,000	10,000	5,000	5,000
V		40,000	40,000	20,000	20,000
Type	1206	1210	2010	2512	
B	5,000				
M	5,000	5,000	4,000	4,000	
V	20,000	20,000	20,000	20,000	

**TAPE SCHEMATIC**



**01005 Size**

A	B	W	F	E	
0.38±0.02	0.68±0.02	8.0±0.10	3.5±0.05	1.75±0.05	
P1	P0	D0	t1	t2	K
2.0±0.05	4.0±0.10	1.55±0.03	0.42±0.05	0.5	0.27±0.02



**0201 ~ 2512 Size**

**TAPE DIMENSIONS (mm)**

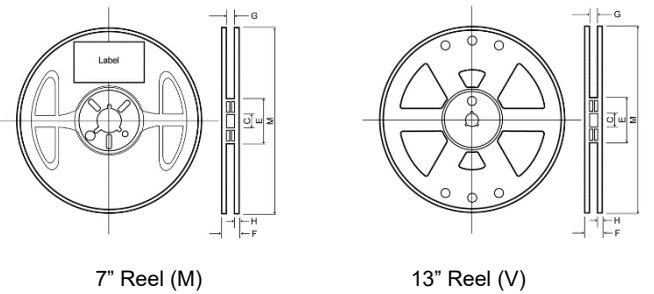
	<b>0201</b>	<b>0402</b>	<b>0603</b>	<b>0805</b>
A	0.41±0.1	0.65±0.1	1.1±0.2	1.65±0.2
B	0.71±0.1	1.15±0.1	1.9±0.2	2.4±0.2
W	8.0±0.2	8.0±0.2	8.0±0.2	8.0±0.2
E	1.75±0.10	1.75±0.10	1.75±0.1	1.75±0.1
F	3.5±0.05	3.5±0.05	3.5±0.05	3.5±0.05
P <sub>1</sub>	2.0±0.05	2.0±0.05	4.0±0.1	4.0±0.1
T	0.5 <sub>max</sub>	0.55±0.1	0.70±0.1	0.90±0.1
T <sub>p</sub>	0.4±0.05	0.40±0.05	0.60±0.1	0.75±0.1

	<b>1206</b>	<b>1210</b>	<b>2010</b>	<b>2512</b>
A	2.0±0.15	2.9±0.1	2.9±0.1	3.4±0.1
B	3.6±0.15	3.5±0.1	5.3±0.1	6.6±0.1
W	8.0±0.2	8.0±0.2	12.0±0.2	12.0±0.2
E	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1
F	3.5±0.05	3.5±0.05	5.5±0.05	5.5±0.05
P <sub>1</sub>	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1
T	0.90±0.1	0.90±0.1	1.0±0.1	1.0±0.1
T <sub>p</sub>	0.75±0.1	0.75±0.1	0.25±0.1	0.25±0.1

**TAPE**

Type	Resistor Size
Press Pocket Carrier Tape	01005
Rect. Punching Carrier Paper Tape	0201, 0402, 0603, 0805, 1206, 1210
Plastic (Embossed Tape)	2010 & 2512

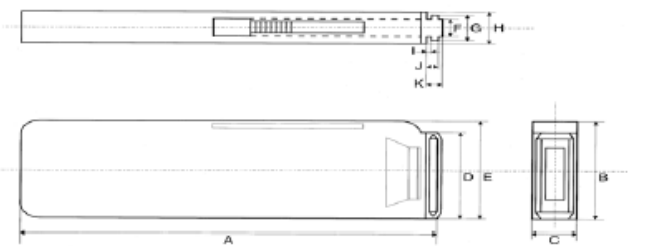
**REEL DRAWINGS**



**PACKAGE DIMENSIONS (mm)**

	<b>7" Reel (M)</b>	<b>13" Reel (V)</b>
M	180 ± 3.0	330±2.5
H	1.20	2.3± 0.5
C	13.0 ± 0.2	13.0 ± 0.2
G	9.0 ± 0.3	9.5 ± 0.5
E	60 ± 1.0	80.0 ± 1.0
F	11.4 ± 1.0	14.4

**BULK CASE SCHEMATIC**



**BULK CASE DIMENSIONS (mm)**

A	B	C	D	E	
110.0 ± 0.7	36.0 ± 0.2	12.0 ± 0.1	31.5 ± 0.2	36.0 ± 0.2	
F	G	H	I	J	K
6.8 ± 0.1	8.8 ± 0.1	12.0 ± 0.1	1.5 ± 0.1	2.0 ± 0.1	4.7 ± 0.1

**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