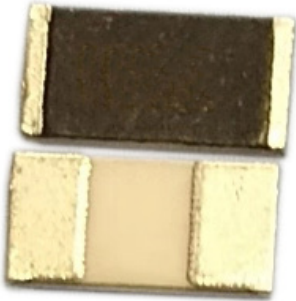


# High Power Thick Film Chip Resistors 2512

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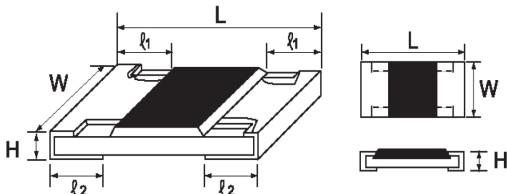
**RoHS  
Compliant**



## Specifications

Case Size	: 2512
Power Rating at 70°C	: 3W
Max. Working Voltage	: 250V
Max. Overload Voltage	: 500V
Dielectric Withstanding Voltage	: 500V
Temperature Range	: -55°C to +155°C
Ambient Temperature	: 70°C

## Dimensions and Power Rating



Type	Power Rating	L	W	H	ℓ1	ℓ2
2512	3W	6.35 ±1	3.2 ±0.15	0.55 ±0.1	0.6 ±0.25	0.5 ±0.2

Dimensions : Millimetres

Type	Power Rating at 70°C	Tolerance %	Resistance Range	Standard Series
2512	3W	± 1	1Ω to 180KΩ	E-96
		± 5		E-24

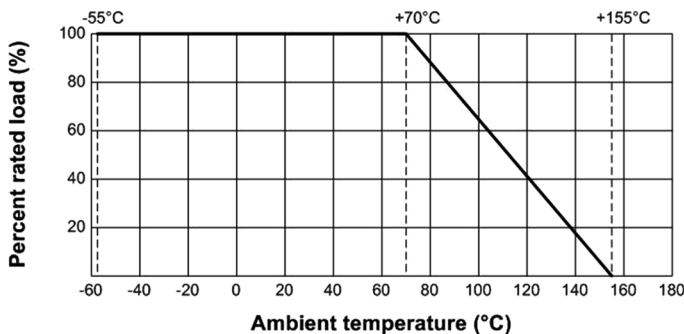
## Jumper

Type	Power Rating	L	W	H	ℓ1	ℓ2
2512	3W	6.35 ±1	3.2 ±0.15	1.1 ±0.1	0.6 ±0.25	1.8 ±0.2

Type	Power Rating	Rated Current at 70°C	Resistance Range	Max. Overload Current
2512	3W	2A	Jumper	10A

## Power Rating

Resistors shall have a power rating based on continuous load operation at an ambient temperature of 70°C. For temperature in excess of 70°C, the load shall be derate as shown in figure.



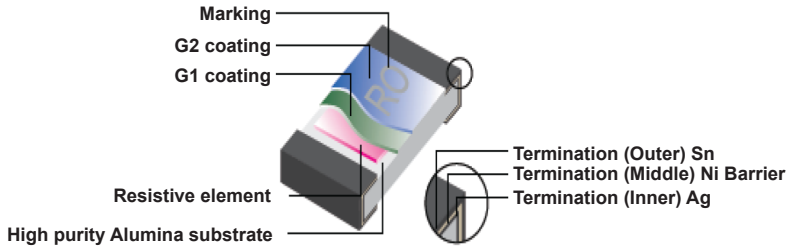
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# High Power Thick Film Chip Resistors 2512



## Construction



## Jumper Characteristics

Characteristics	Values
Max. Resistance	1% : 30mΩ
	5% : 50mΩ
Insulation Resistance	1,000MΩ or More
Dielectric-Withstanding Voltage	Apply 500V AC between protective coating and termination for 1 minute.
Solderability	245 ±3°C, 2~3 seconds 95 % Coverage Min.

## Performance Specification

Characteristics	Limits	Test Methods (JIS C 5201-1)
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down	Clamped in the trough of a 90°C metallic v-block and shall be tested at ac potential respectively specified in the type for 60-70 seconds
Temperature Coefficient	1Ω to 10Ω ≤± 200PPM/°C 10.1Ω to 10MΩ ≤± 100PPM/°C	Natural resistance change per temperature degree centigrade. $\frac{R2-R1}{R1(t2-t1)} \times 10^6 \text{ (PPM/°C)}$ R1: Resistance value at room temperature (T1) R2: Resistance value at room temp. plus 100°C (T2) Test pattern: room temp. (T1), room temp. +100°C (T2)
Short time overload	Resistance change rate is ±5% (2% +0.1Ω) Max. ±1% (1% +0.1Ω) Max.	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds
Soldering temperature reference	Electrical characteristics shall be satisfied. Without distinct deformation in appearance. (95 % coverage Min.)	<b>Wave soldering condition:</b> (2 cycles Max.) Pre-heat : 100°C to 120°C, 30 ± 5 sec. Suggestion solder temp.: 235°C to 255°C, 10 sec. (Max.) Peak temp.: 260°C <b>Reflow soldering condition:</b> (2 cycles Max.) Pre-heat : 150°C to 180°C, 90 to 120 sec. Suggestion solder temp.: 235°C to 255°C, 20 ~ 40 sec. Peak temp.: 260°C



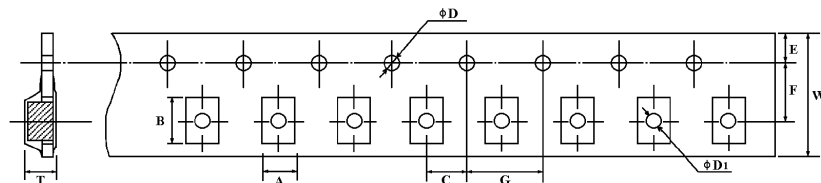
# High Power Thick Film Chip Resistors 2512



Characteristics	Limits	Test Methods (JIS C 5201-1)															
Soldering temperature reference	Electrical characteristics shall be satisfied. Without distinct deformation in appearance. (95 % coverage Min.)	<p><b>Hand soldering condition:</b> The soldering iron tip temperature should be less than 300°C and maximum contact time should be 5 sec.</p>															
Soldering heat	Resistance change rate is: $\pm (1\% + 0.05\Omega)$ Max.	Dip the resistor into a solder bath having a temperature of $260^\circ\text{C} \pm 3^\circ\text{C}$ and hold it for $10 \pm 1$ seconds.															
Humidity	Resistance change rate is $\pm 5\%$ ( $3\% + 0.1\Omega$ ) Max. $\pm 1\%$ ( $0.5\% + 0.1\Omega$ ) Max.	Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at $40 \pm 2^\circ\text{C}$ and 90-95% relative humidity															
Load life in humidity	Resistance change rate is $\pm 5\%$ ( $3\% + 0.1\Omega$ ) Max. $\pm 1\%$ ( $1.0\% + 0.1\Omega$ ) Max.	Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity chamber controlled at $40^\circ\text{C} \pm 2^\circ\text{C}$ and 90 to 95 % relative humidity															
Load Life	Resistance change rate is $\pm 5\%$ ( $3\% + 0.1\Omega$ ) Max. $\pm 1\%$ ( $1\% + 0.1\Omega$ ) Max.	Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of (1.5 hours "on", 0.5 hour "off") at $70^\circ\text{C} \pm 2^\circ\text{C}$ ambient															
Terminal bending	Resistance change rate is $\pm (1.0\% + 0.05\Omega)$ Max.	Twist of Test Board : Y/X = 3/90 mm for 60 seconds															
Temperature cycling	Resistance change rate is $\pm 5\%$ ( $1.0\% + 0.1\Omega$ ) Max. $\pm 1\%$ ( $0.5\% + 0.1\Omega$ ) Max.	Resistance change after continuous 5 cycles for duty cycle specified below : <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-55^\circ\text{C} \pm 3^\circ\text{C}</math></td> <td>30 mins</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>10 to 15 mins</td> </tr> <tr> <td>3</td> <td><math>+155^\circ\text{C} \pm 2^\circ\text{C}</math></td> <td>30 mins</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>10 to 15 mins</td> </tr> </tbody> </table>	Step	Temperature	Time	1	$-55^\circ\text{C} \pm 3^\circ\text{C}$	30 mins	2	Room temp.	10 to 15 mins	3	$+155^\circ\text{C} \pm 2^\circ\text{C}$	30 mins	4	Room temp.	10 to 15 mins
Step	Temperature	Time															
1	$-55^\circ\text{C} \pm 3^\circ\text{C}$	30 mins															
2	Room temp.	10 to 15 mins															
3	$+155^\circ\text{C} \pm 2^\circ\text{C}$	30 mins															
4	Room temp.	10 to 15 mins															

## Packing specification

### Taping Dimension



Type	A $\pm 0.2$	B $\pm 0.2$	C $\pm 0.05$	$\Phi D$ $\begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$	E $\pm 0.1$	F $\pm 0.05$	G $\pm 0.1$	W $\pm 0.2$	$\Phi D1$ $\begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$	T $\pm 0.1$
2512	3.5	6.7	2	1.5	1.75	5.5	4	12	1.5	1.35

Dimensions : Millimetres

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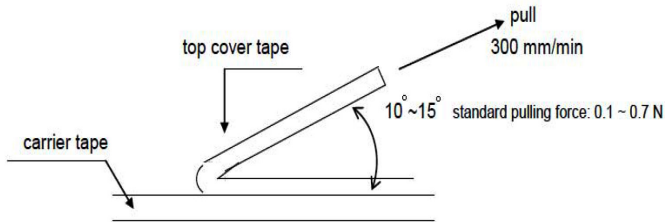


# High Power Thick Film Chip Resistors 2512

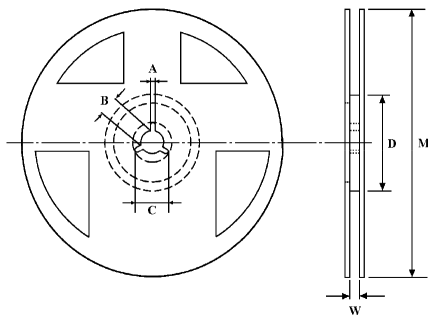
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## Peeling Strength of Top Cover Tape

Test Condition: 0.1 to 0.7 N at a peel-off speed of 300mm / min.



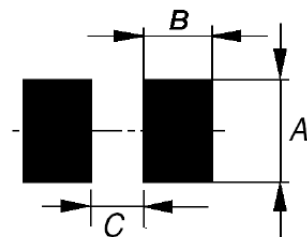
## Reel Dimension



Type	A $\pm 0.5$	B $\pm 0.5$	C $\pm 0.5$	D $\pm 1$	M $\pm 2$	W $\pm 1$
2512	2	13.5	21	60	178	13.5

Dimensions : Millimetres

## Recommended solder pad



A	B	C
3.7	2.8	2.7

Dimensions : Millimetres

## Part Number Table

Description	Part Number
Chip Resistor, Thick Film, 1%, 200R, $\pm 100\text{ppm}/^{\circ}\text{C}$ , 3W, 2512	MP001037
Chip Resistor, Thick Film, 1%, 5R1, $\pm 200\text{ppm}/^{\circ}\text{C}$ , 3W, 2512	MP001038
Chip Resistor, Thick Film, 1%, 15R, $\pm 100\text{ppm}/^{\circ}\text{C}$ , 3W, 2512	MP001039
Chip Resistor, Thick Film, 1%, 20R, $\pm 100\text{ppm}/^{\circ}\text{C}$ , 3W, 2512	MP001040
Chip Resistor, Thick Film, 1%, 33R, $\pm 100\text{ppm}/^{\circ}\text{C}$ , 3W, 2512	MP001041
Chip Resistor, Thick Film, 1%, 16R, $\pm 100\text{ppm}/^{\circ}\text{C}$ , 3W, 2512	MP001042
Chip Resistor, Thick Film, 1%, 2K, $\pm 100\text{ppm}/^{\circ}\text{C}$ , 3W, 2512	MP001043
Chip Resistor, Thick Film, 1%, 36K, $\pm 100\text{ppm}/^{\circ}\text{C}$ , 3W, 2512	MP001044

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# High Power Thick Film Chip Resistors 2512

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Description	Part Number
Chip Resistor, Thick Film, 1%, 750R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001045
Chip Resistor, Thick Film, 1%, 51R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001046
Chip Resistor, Thick Film, 1%, 390R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001047
Chip Resistor, Thick Film, 1%, 27R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001048
Chip Resistor, Thick Film, 1%, 10R, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001049
Chip Resistor, Thick Film, 1%, 12R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001050
Chip Resistor, Thick Film, 1%, 1K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001051
Chip Resistor, Thick Film, 1%, 30R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001052
Chip Resistor, Thick Film, 1%, 36R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001053
Chip Resistor, Thick Film, 1%, 150R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001054
Chip Resistor, Thick Film, 1%, 100R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001055
Chip Resistor, Thick Film, 1%, 22R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001056
Chip Resistor, Thick Film, 1%, 91R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001057
Chip Resistor, Thick Film, 1%, 3K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001058
Chip Resistor, Thick Film, 1%, 75R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001059
Chip Resistor, Thick Film, 1%, 430R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001060
Chip Resistor, Thick Film, 1%, 100K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001061
Chip Resistor, Thick Film, 1%, 120R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001062
Chip Resistor, Thick Film, 1%, 62R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001063
Chip Resistor, Thick Film, 1%, 330R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001064
Chip Resistor, Thick Film, 1%, 910R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001065
Chip Resistor, Thick Film, 1%, 18R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001066
Chip Resistor, Thick Film, 1%, 47R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001067
Chip Resistor, Thick Film, 1%, 110R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001068
Chip Resistor, Thick Film, 1%, 560R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001069
Chip Resistor, Thick Film, 1%, 2K2, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001070
Chip Resistor, Thick Film, 1%, 24K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001071
Chip Resistor, Thick Film, 1%, 33K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001072
Chip Resistor, Thick Film, 1%, 24R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001073
Chip Resistor, Thick Film, 1%, 39R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001074
Chip Resistor, Thick Film, 1%, 300R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001075
Chip Resistor, Thick Film, 1%, 680R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001076
Chip Resistor, Thick Film, 5%, 15R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001077
Chip Resistor, Thick Film, 5%, 2K2, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001079
Chip Resistor, Thick Film, 5%, 47R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001080
Chip Resistor, Thick Film, 5%, 1R, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001081
Chip Resistor, Thick Film, 5%, 4R7, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001082
Chip Resistor, Thick Film, 5%, 3R9, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001083
Chip Resistor, Thick Film, 5%, 220R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001084

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# High Power Thick Film Chip Resistors 2512



Description	Part Number
Chip Resistor, Thick Film, 5%, 120R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001085
Chip Resistor, Thick Film, 5%, 2R2, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001086
Chip Resistor, Thick Film, 5%, 33K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001087
Chip Resistor, Thick Film, 5%, 100K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001088
Chip Resistor, Thick Film, 5%, 10R, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001089
Chip Resistor, Thick Film, 5%, 470R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001090
Chip Resistor, Thick Film, 5%, 5R6, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001091
Chip Resistor, Thick Film, 5%, 2R7, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001092
Chip Resistor, Thick Film, 5%, 68R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001093
Chip Resistor, Thick Film, 5%, 15K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001094
Chip Resistor, Thick Film, 5%, 180R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001095
Chip Resistor, Thick Film, 5%, 10K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001096
Chip Resistor, Thick Film, 5%, 39K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001097
Chip Resistor, Thick Film, 5%, 27R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001098
Chip Resistor, Thick Film, 5%, 1R2, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001099
Chip Resistor, Thick Film, 5%, 3R3, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001100
Chip Resistor, Thick Film, 5%, 8R2, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001101
Chip Resistor, Thick Film, 5%, 47K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001102
Chip Resistor, Thick Film, 5%, 6R8, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001103
Chip Resistor, Thick Film, 5%, 18R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001104
Chip Resistor, Thick Film, 5%, 100R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001105
Chip Resistor, Thick Film, 5%, 1K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001106
Chip Resistor, Thick Film, 5%, 5K6, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001107
Chip Resistor, Thick Film, 5%, 560R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001108
Chip Resistor, Thick Film, 5%, 1K5, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001109
Chip Resistor, Thick Film, 5%, 12R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001110
Chip Resistor, Thick Film, 5%, 150R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001111
Chip Resistor, Thick Film, 5%, 180K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001112
Chip Resistor, Thick Film, 5%, 1R8, $\pm 200\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001113
Chip Resistor, Thick Film, 5%, 270R, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001114
Chip Resistor, Thick Film, 5%, 27K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001115
Chip Resistor, Thick Film, 5%, 12K, $\pm 100\text{ppm}/^\circ\text{C}$ , 3W, 2512	MP001116
Chip Resistor, Thick Film, Jumper, 3W, 2512	MP001078

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