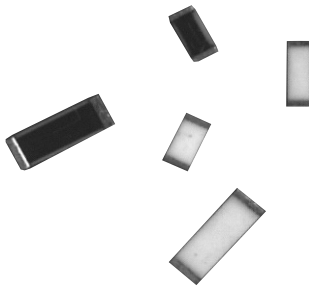


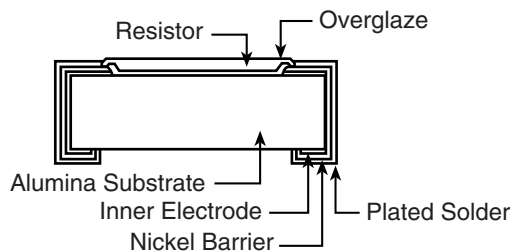
## Commercial Thick Film Chip Resistors



Actual Size  
0502

Utilizing proven expertise in thick and thin film resistors to satisfy your manufacturing needs, VISHAY provides a high rel chip with the same reliability and stability found in military grade resistors. These chips are available in the widest range of sizes, values, and performance characteristics.

### CONSTRUCTION



### FEATURES

- Lead (Pb)-free or Sn/Pb terminations available
- High purity alumina substrate for high power dissipation (2 W max.)
- Wraparound terminations featuring a thin film adhesion layer covered with a leach resistant nickel barrier layer for + 150 °C operating conditions
- High speed laser trimming for high volume requirements
- Ruthenium based cermet thick film for dependable performance
- Fired-on glass passivation
- Tape and reel packaging standard; static-free waffle pack available
- Active trim and 0 Ω chips



RoHS\*  
COMPLIANT

### TYPICAL PERFORMANCE

	ABS
TCR	100
TOL	1

### STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Ruthenium	
Resistance Range	10 Ω to 25 MΩ	
Absolute TCR	± 100 ppm/°C, ± 300 ppm/°C	- 55 °C to + 125 °C
Tolerance	± 1 %, ± 2 %, ± 5 %, ± 10 %	
Stability: ΔR Ratio	0.15 %	2000 h at + 70 °C
Operating Temperature Range	- 55 °C to + 150 °C	

CASE SIZE	RATING (mW)	WORKING VOLTAGE	MINIMUM RESISTANCE (Ω)
0402	100	25	10 - 10M
0502	100	25	10 - 25M
0504	125	40	10 - 25M
0505	125	40	10 - 25M
0603	150	40	10 - 25M
0705 <sup>(1)</sup> /0805 <sup>(1)</sup>	200	50	10 - 25M
1005	250	75	10 - 25M

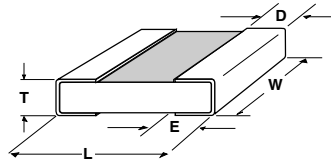
CASE SIZE	RATING (mW)	WORKING VOLTAGE	MINIMUM RESISTANCE (Ω)
1010	500	75	10 - 25M
1206	330	100	10 - 25M
1505	350	100	10 - 25M
2010	1000	175	10 - 25M
2208	750	150	10 - 25M
2512	2000	200	10 - 25M

#### Notes

<sup>(1)</sup> 0705 and 0805 are the same (only use 0805 when ordering)

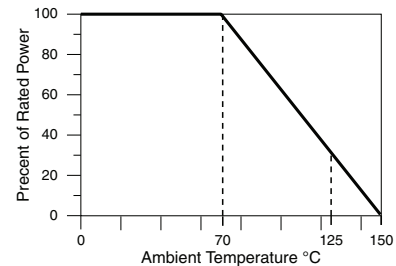
- Consult factory for nominals above 25 MΩ

\* Pb containing terminations are not RoHS compliant, exemptions may apply

**DIMENSIONS** in inches


CASE SIZE	TERM	L	W	T	D	E
0402	B	0.042 ± 0.006	0.022 ± 0.005	0.010 to 0.033	0.010 ± 0.005	0.010 ± 0.005
0502	B	0.055 ± 0.005	0.025 ± 0.005	0.020 Max.	0.010 ± 0.005	0.015 ± 0.005
0504	B	0.055 ± 0.005	0.040 ± 0.005	0.020 ± 0.005	0.010 ± 0.005	0.010 ± 0.005
0505	B	0.055 ± 0.006	0.050 ± 0.005	0.012 to 0.033	0.010 ± 0.005	0.015 ± 0.005
0603	B	0.064 ± 0.006	0.032 ± 0.005	0.010 to 0.033	0.012 ± 0.005	0.015 ± 0.005
0805 <sup>(1)</sup> , 0705 <sup>(1)</sup>	B	0.080 ± 0.006	0.050 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
1005	B	0.105 ± 0.007	0.050 ± 0.005	0.015 to 0.033	0.020 ± 0.005	0.020 ± 0.005
1010	B	0.105 ± 0.007	0.100 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
1206	B	0.126 ± 0.008	0.063 ± 0.005	0.015 to 0.033	0.020 ± 0.005, - 0.010	0.020 ± 0.005, - 0.010
1505	B	0.155 ± 0.007	0.050 ± 0.005	0.015 to 0.033	0.020 ± 0.005	0.020 ± 0.005
2010	B	0.197 ± 0.006	0.098 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
2208	B	0.230 ± 0.007	0.075 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
2512	B	0.250 ± 0.006	0.124 ± 0.005	0.015 to 0.033	0.020 ± 0.005	0.020 ± 0.005

ENVIRONMENTAL TESTS		
TEST	10 Ω ΔR ± (%)	100 kΩ ΔR ± (%)
Thermal Shock	0.02	0.03
Short Term Overload	0.02	0.02
Low Temperature Operation	0.03	0.04
Resistance to Solder Heat	0.06	0.02
Moisture Resistance	0.10	0.08
High Temperature Exposure	0.02	0.02

**DERATING CURVE**


GLOBAL PART NUMBER INFORMATION														
New Global Part Numbering: M-1206K5001GBT1 (preferred part number format)														
M	-	1	2	0	6	K	5	0	0	1	G	B	T	1
<b>GLOBAL MODEL</b> M = High Rel Cermet Thick Film Wrap-around	<b>CASE SIZE</b> 0402 0502 0504 0505 0603 0805 1005 1010 1206 1505 2010 2208 2512	<b>TCR CHARACTERISTIC</b> K = 100 ppm/°C M = 300 ppm/°C X = 0 Ω Jumper	<b>RESISTANCE</b> First 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point. Example: 10R0 = 10 Ω 1002 = 10 kΩ	<b>TOLERANCE</b> F = 1 % G = 2 % J = 5 % K = 10 % N = not trimmed	<b>TERMINATION</b> B = Wraparound Tin/lead plated solder S = Wraparound Lead (Pb)- free plated solder P = Wraparound Palladium Silver	<b>PACKAGING</b> BS = BULK 100 Min 1 Mult WS = WAFFLE 100 Min 1 Mult  TAPE AND REEL T0 = 100 Min 100 Mult T1 = 1000 Min 1000 Mult T3 = 300 Min 300 Mult T5 = 500 Min 500 Mult TF = Full Reel TS = 100 Min 1 Mult								
<b>Historical Part Number example: M0505K1003JBT (will continue to be accepted)</b>														
M	0505	K	1003	J	B	T								
STYLE	CASE SIZE	TCR CHARACTERISTIC	OHMIC VALUE	TOLERANCE	TERMINATION	PACKAGING								

**Note**
<sup>(1)</sup> 0705 and 0805 are the same (only use 0805 when ordering)



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