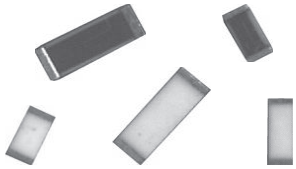
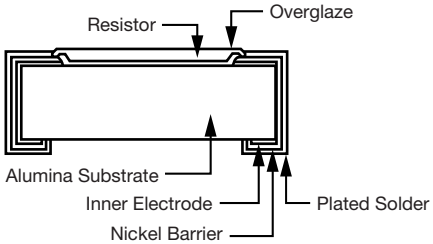
High Reliability Thick Film Resistor, Surface Mount Chip



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. And manufactured on the Mil-PRF-55342 qualified controlled production line All product is 100 % electrical tested for tolerance and after thermal shock testing and typically meet the requirements of group A in MIL-PRF-55342 performance.

CONSTRUCTION



FEATURES

- 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
- Sulfur resistant (per ASTM B809-95 humid vapor test)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS* Available

HALOGEN FREE Available

GREEN (5-2008) Available

Note

* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information/tables in this datasheet for details.

TYPICAL PERFORMANCE

◆	ABSOLUTE
TCR	100
TOL.	1

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Ruthenium	-
Resistance Range	10 Ω to 25 MΩ	-
TCR: Absolute	± 100 ppm/°C to ± 300 ppm/°C	-55 °C to +125 °C
Tolerance: Absolute	± 1 % to ± 10 %	-
Stability: Absolute	ΔR ± 0.15 %	-
Stability: Ratio	-	-
Voltage Coefficient	-	-
Working Voltage	25 V to 200 V	-
Operating Temperature Range	-55 °C to +155 °C	-
Storage Temperature Range	-55 °C to +155 °C	-
Noise	< -35 dB (typical)	-
Shelf Life Stability: Absolute	-	-

COMPONENT RATINGS

CASE SIZE (1)	POWER RATING (mW)	WORKING VOLTAGE (V)	RESISTANCE RANGE (Ω)
0402	100	25	10 to 10M
0502	100	25	10 to 25M
0504	125	40	10 to 25M
0505	125	40	10 to 25M
0603	150	40	10 to 25M
0705	200	50	10 to 25M
0805	200	50	10 to 25M
1005	250	75	10 to 25M
1010	500	75	10 to 25M
1206	330	100	10 to 25M
1505	350	100	10 to 25M
2010	1000	175	10 to 25M
2208	750	150	10 to 25M
2512	2000	200	10 to 25M

Notes

- Consult factory for nominals above 25 MΩ

(1) 0705 and 0805 are the same (only use 0805 when ordering)

For technical questions, contact: thinfilm@vishay.com

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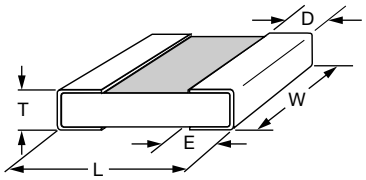
DIMENSIONS in inches



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
0705, 0805 (1)	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

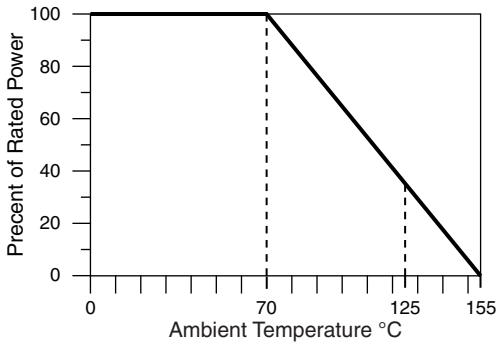
Note

(1) 0705 and 0805 are the same (only use 0805 when ordering)

ENVIRONMENTAL TESTS

ENVIRONMENTAL 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



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GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: M-1206K5001GBT1

M	-	1	2	0	6	K	5	0	0	1	G	B	T	1

GLOBAL MODEL	CASE SIZE	TCR CHARACTERISTIC	RESISTANCE	TOLERANCE	TERMINATION	PACKAGING
M- = High rel cermet thick film wraparound	**0402** **0502** **0504** **0505** **0603** **0805** **1005** **1010** **1206** **1505** **2010** **2208** **2512**	**K** = 100 ppm/°C **M** = 300 ppm/°C **X** = 0 Ω jumper	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	**F** = 1 % **G** = 2 % **J** = 5 % **K** = 10 % **N** = Not trimmed	**B** = Wraparound nickel barrier with plated tin/lead solder **S** = Wraparound nickel barrier with plated matte tin lead (pb)-free solder **G** = Epoxy bondable	**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 (1) **T3** = 300 min., 300 mult **T5** = 500 min., 500 mult **TF** = Full reel **TS** = 100 min., 1 mult

Historical Part Number example: M0505K1003JBT (for reference purposes only)

M	0505	K	1003	J	B	T
STYLE	CASE SIZE	TCR CHARACTERISTIC	OHMIC VALUE	TOLERANCE	TERMINATION	PACKAGING

Note

(1) Preferred packaging code

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