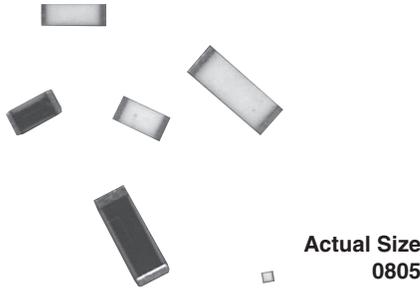
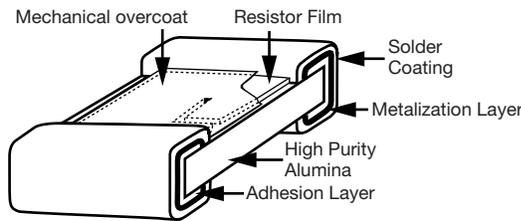


## Low Value (0.03 Ω to 10 Ω) Thin Film Resistor, Surface Mount Chip



With extremely low resistances and high power capabilities, Vishay's proven and unique ultra-low value resistors can be used in your hybrid or surface-mount applications. These resistors are available with solderable or weldable terminations.

### CONSTRUCTION



### FEATURES

- Homogeneous nickel alloy film
- No inductance for high-frequency applications
- Alumina substrates for high power handling capability (2 W maximum power rating)
- Pre-soldered or gold terminations
- Epoxy bondable termination available
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS\***  
Available  
**HALOGEN**  
**FREE**  
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  | 300      |
| TOL. | 1.0      |

### VALUE AND MINIMUM TOLERANCE

| VALUE (Ω) | MINIMUM TOLERANCE |
|-----------|-------------------|
| 0.1       | ± 2.0 %           |
| 0.25      | ± 1.0 %           |
| 0.5       | ± 1.0 %           |
| 1.0       | ± 1.0 %           |
| 2.0       | ± 1.0 %           |
| 10.0      | ± 1.0 %           |
| < 0.1     | 20 %              |

### STANDARD ELECTRICAL SPECIFICATIONS

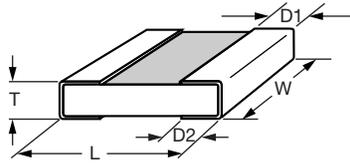
| TEST                           | SPECIFICATIONS                | CONDITIONS        |
|--------------------------------|-------------------------------|-------------------|
| Material                       | Nickel alloy                  | -                 |
| Resistance Range               | 0.03 Ω to 10 Ω                | -                 |
| TCR: Absolute                  | ± 300 ppm/°C                  | -55 °C to +125 °C |
| Tolerance: Absolute            | 1 % to 20 % (value dependent) | -                 |
| Stability: Absolute            | -                             | -                 |
| Stability: Ratio               | -                             | -                 |
| Voltage Coefficient            | -                             | -                 |
| Working Voltage                | $\sqrt{P \times R}$           | -                 |
| 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 <sup>(1)</sup> | POWER RATING (mW) | RESISTANCE RANGE (Ω) |
|--------------------------|-------------------|----------------------|
| 0505                     | 125               | 0.05 to 5.0          |
| 0508                     | 400               | 0.03 to 2.0          |
| 0603                     | 125               | 0.10 to 5.0          |
| 0612                     | 500               | 0.05 to 2.5          |
| 0705                     | 200               | 0.10 to 6.0          |
| 0805                     | 200               | 0.10 to 6.0          |
| 1005                     | 250               | 0.15 to 10.0         |
| 1020                     | 1000              | 0.03 to 3.0          |
| 1206                     | 330               | 0.10 to 10.0         |
| 1225                     | 2000              | 0.03 to 2.6          |
| 1505                     | 500               | 0.25 to 10.0         |
| 2010                     | 1000              | 0.17 to 10.0         |
| 2512                     | 2000              | 0.18 to 10.0         |

### Notes

- Resistor values beyond ranges shall be reviewed by the factory
- (1) 0705 and 0805 are the same (only use 0805 when ordering)

**DIMENSIONS** in inches


| CASE SIZE           | SIZE            |         |       |         |         |                     |
|---------------------|-----------------|---------|-------|---------|---------|---------------------|
|                     | L               | W       | T     | D1      | D2      | D1 TOPSIDE (W TERM) |
|                     | + 0.010/- 0.005 | ± 0.005 | MAX.  | ± 0.005 | ± 0.005 | ± 0.004             |
| 0505                | 0.050           | 0.050   | 0.020 | 0.010   | 0.015   | 0.008               |
| 0508                | 0.047           | 0.079   | 0.020 | 0.012   | 0.015   | 0.010               |
| 0603                | 0.061           | 0.033   | 0.020 | 0.012   | 0.015   | 0.010               |
| 0612                | 0.063           | 0.126   | 0.020 | 0.015   | 0.015   | 0.012               |
| 0705 <sup>(1)</sup> | 0.075           | 0.050   | 0.020 | 0.019   | 0.019   | 0.017               |
| 0805 <sup>(1)</sup> | 0.075           | 0.050   | 0.020 | 0.019   | 0.019   | 0.017               |
| 1005                | 0.100           | 0.050   | 0.030 | 0.015   | 0.020   | 0.017               |
| 1020                | 0.100           | 0.200   | 0.030 | 0.015   | 0.015   | 0.013               |
| 1206                | 0.120           | 0.060   | 0.030 | 0.020   | 0.020   | 0.017               |
| 1225                | 0.126           | 0.252   | 0.020 | 0.020   | 0.020   | 0.017               |
| 1505                | 0.150           | 0.050   | 0.030 | 0.020   | 0.015   | 0.018               |
| 2010                | 0.200           | 0.100   | 0.030 | 0.020   | 0.020   | 0.017               |
| 2512                | 0.250           | 0.125   | 0.030 | 0.020   | 0.020   | 0.017               |

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

**MECHANICAL SPECIFICATIONS**

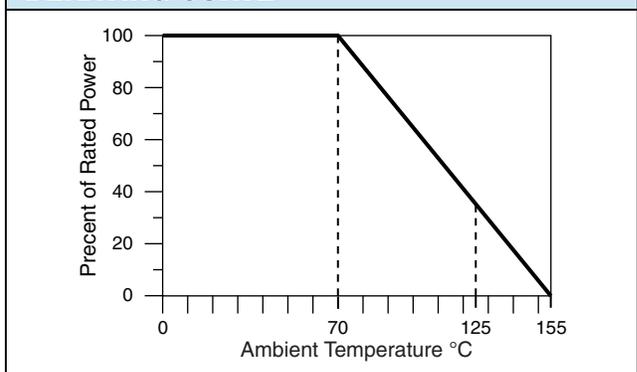
|                                      |                               |
|--------------------------------------|-------------------------------|
| Resistive Element                    | Nickel alloy                  |
| Substrate Material                   | Alumina                       |
| Terminals                            | Pre-soldered or gold          |
| Lead (Pb)-Free Option                | 96.5 % Sn, 3.0 % Ag, 0.5 % Cu |
| Tin / Lead Option                    | Sn63                          |
| Lead (Pb)-Free Finish and Tin / Lead | Hot solder dip                |

**ENVIRONMENTAL TESTS**

| ENVIRONMENTAL TEST           | LIMITS <sup>(1)</sup><br>$\Delta R \pm \%$ | TYPICAL<br>$1 \Omega \Delta R \pm \%$ |
|------------------------------|--|---------------------------------------|
| STO <sup>(2)</sup>           | 0.5  | -0.19                                 |
| LTO                          | 0.1  | -0.03                                 |
| RSH                          | 0.5  | -0.14                                 |
| Moisture                     | 0.5  | 0.07                                  |
| HTE                          | 1.0  | 0.02                                  |
| Load Life (2000 h at +70 °C) | 0.5  | 0.20                                  |
| TCR (ppm)                    | ± 300                                      | +150                                  |

**Notes**

- <sup>(1)</sup> 0.01  $\Omega$  additional allowed for measurement error
- <sup>(2)</sup> Testing conducted at 2.0 x working voltage on 2512 case size all other 2.5 x

**DERATING CURVE**




| GLOBAL PART NUMBER INFORMATION  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |
|---|--|--|--|--|--|---|---|---|---|---|---|---|---|---|
| New Global Part Numbering: L-1206M1R00GBT1                                  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |
| L   | -  | 1  | 2  | 0  | 6  | M   | 1 | R | 0 | 0 | G | B | T | 1 |
| GLOBAL MODEL  | CASE SIZE  | TCR CHARACTERISTICS  | OHMIC VALUE  | TOLERANCE  | TERMINATION  | PACKAGING   |   |   |   |   |   |   |   |   |
| L- = low value wraparound chip resistor                                     | 0505<br>0508<br>0603<br>0612<br>0805 (1)<br>1005<br>1020<br>1206<br>1225<br>1505<br>2010<br>2512 | M = 300 ppm/°C<br>N = 350 ppm/°C<br>O = 400 ppm/°C<br>P = 500 ppm/°C | First 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point.<br><br>Example:<br>R100 = 0.1 Ω<br>1R60 = 1.6 Ω | F = 1 %<br>G = 2 %<br>H = 3 %<br>J = 5 %<br>K = 10 %<br>L = 20 % | B = wraparound Sn/Pb solder<br>63 % Sn/37 % Pb w/ nickel barrier<br>G = wraparound Au over Ni (gold) termination epoxy bondable RoHS compliant - e4<br>W = top side wire bondable Au (gold) RoHS compliant - e4<br>S = wraparound lead (Pb)-free solder 96.5 % Sn/3.0 % Ag/ 0.5 % Cu RoHS compliant - e1 | BULK<br>BS = 100 min., 1 mult<br><br>WAFFLE<br>WS = 100 min., 1 mult<br>WI = 100 min., 1 mult (item single lot date code)<br><br>TAPE AND REEL<br>T0 = 100 min., 100 mult<br>T1 = 1000 min., 1000 mult (1)<br>T3 = 300 min., 300 mult<br>T5 = 500 min., 500 mult<br>TF = Full reel<br>TI = 100 min., 1 mult (item single lot date code)<br>TP = 100 min., 1 mult (package unit single lot date code)<br>TS = 100 min., 1 mult |   |   |   |   |   |   |   |   |
| Historical Part Number Example: L1206M1R00HBT (for reference purposes only) |  |  |  |  |  |   |   |   |   |   |   |   |   |   |
| L   | 1206   | M  | 1R00   | H  | B  | T   |   |   |   |   |   |   |   |   |
| STYLE   | CASE SIZE  | TCR CHARACTERISTICS  | OHMIC VALUE  | TOLERANCE  | TERMINATION  | PACKAGING   |   |   |   |   |   |   |   |   |

**Note**

(1) Preferred packaging code



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