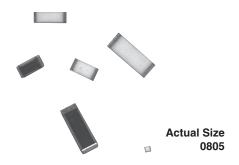
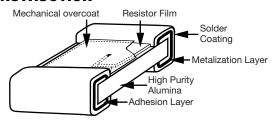


# Low Value (0.03 $\Omega$ to 10 $\Omega$ ) Thin Film Resistor, Surface Mount Chip



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?99



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

| <b>•</b> | 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 (1)     | 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         |  |  |

Revision: 22-Sep-2021

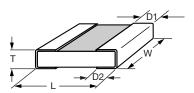
Resistor values beyond ranges shall be reviewed by the factory

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

Document Number: 60027

# Vishay Dale Thin Film

### **DIMENSIONS** in inches



|                     | SIZE            |         |       |         |         |                        |
|---------------------|-----------------|---------|-------|---------|---------|------------------------|
| CASE SIZE           | L               | w       | т     | D1      | D2      | D1 TOPSIDE<br>(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)

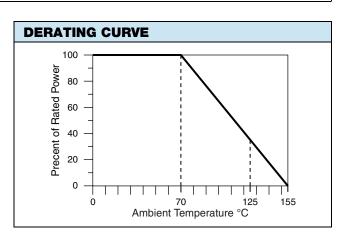
| MECHANICAL SPECIFICATIONS            |                               |  |
|--------------------------------------|-------------------------------|--|
| Resistive Element                    | Nickel alloy                  |  |
| Substrate Material                   | Alumina                       |  |
| 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>△ <i>R</i> ± % | <b>TYPICAL</b> 1 Ω Δ <b>R</b> ± % |  |  |
| STO (2)                      | 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                              |  |  |



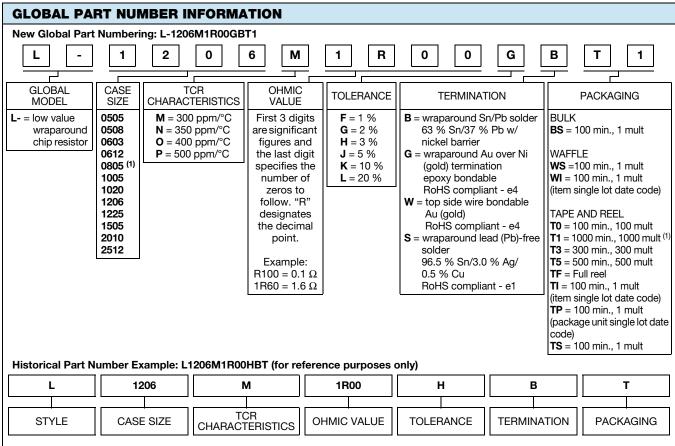
 $<sup>^{(1)}~</sup>$  0.01  $\Omega$  additional allowed for measurement error

 $<sup>^{(2)}\,</sup>$  Testing conducted at 2.0 x working voltage on 2512 case size all other 2.5 x



www.vishay.com

## Vishay Dale Thin Film



#### Note

<sup>(1)</sup> Preferred packaging code

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Vishay

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