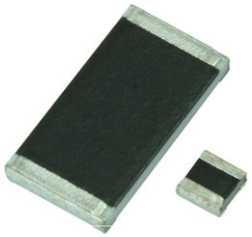
# Thick Film Chip Resistors, Military / Established Reliability MIL-PRF-55342 Qualified, Type RM



## LINKS TO ADDITIONAL RESOURCES

Related Documents

## FEATURES

HALOGEN FREE

- Fully conforms to the requirements of MIL-PRF-55342
- Established reliability - verified failure rate; M, P, R, U, S, V, and T levels
- Construction is sulfur impervious against a high sulfur environment (ASTM B 809-95 test method)
- 100 % group A screening per MIL-PRF-55342
- Termination style B - tin / lead wraparound over nickel barrier
- Operating temperature range is -65 °C to +150 °C
- For MIL-PRF-32159 zero ohm jumpers, see Vishay Dale's RCWPM Jumper (Military M32159) datasheet (www.vishay.com/doc?31028)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

| MATERIAL SPECIFICATIONS | |
|---|---|
| Resistive element | Ruthenium oxide |
| Encapsulation | Epoxy |
| Substrate | 96 % alumina |
| Termination | Solder-coated nickel barrier |
| Solder finish | Tin / lead solder alloy |

**STANDARD ELECTRICAL SPECIFICATIONS**

| VISHAY DALE MODEL | MIL-PRF-55342 STYLE | MIL SPEC. SHEET | TERM. | CASE SIZE | POWER RATING $P_{70\,°C}$ W | MAX. WORKING VOLTAGE (1) V | RESISTANCE RANGE Ω | TOLERANCE ± % | TEMPERATURE COEFFICIENT (2) ± ppm/°C |
|---|---|---|---|---|---|---|---|---|---|
| RCWPM-0502, RCWPM-0502-98 | RM0502 | 01 | B | 0502 | 0.05 | 40 | 1 to 9.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 10 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 10 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-550, RCWPM-550-98 | RM0505 | 02 | B | 0505 | 0.125 | 40 | 1 to 9.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 10 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 10 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-5100, RCWPM-5100-98 | RM1005 | 03 | B | 1005 | 0.20 | 75 | 1 to 5.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 5.6 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 5.62 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-5150, RCWPM-5150-98 | RM1505 | 04 | B | 1505 | 0.15 | 125 | 1 to 5.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 5.6 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 5.62 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-7225, RCWPM-7225-98 | RM2208 | 05 | B | 2208 | 0.225 | 175 | 1 to 5.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 5.6 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 5.62 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-575, RCWPM-575-98 | RM0705 | 06 | B | 0705 (3) | 0.15 | 50 | 1 to 5.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 5.6 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 5.62 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-1206, RCWPM-1206-98 | RM1206 | 07 | B | 1206 | 0.25 | 100 | 1 to 5.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 5.6 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 5.62 to 10M | 0.5 | 100, 200, 300 |

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|---|---|---|---|---|---|---|---|---|---|
| RCWPM-2010, RCWPM-2010-98 | RM2010 | 08 | B | 2010 | 0.80 | 150 | 1 to 5.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 5.6 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 5.62 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-2512, RCWPM-2512-98 | RM2512 | 09 | B | 2512 | 1.0 | 200 | 1 to 5.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 5.6 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 5.62 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-1100, RCWPM-1100-98 | RM1010 | 10 | B | 1010 | 0.50 | 75 | 1 to 5.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 5.6 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 5.62 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-0402, RCWPM-0402-98 | RM0402 | 11 | B | 0402 | 0.05 | 30 | 1 to 9.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 10 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 10 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-0603, RCWPM-0603-98 | RM0603 | 12 | B | 0603 | 0.10 | 50 | 1 to 5.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 5.6 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 5.62 to 10M | 0.5 | 100, 200, 300 |
| RCWPM-0302, RCWPM-0302-98 | RM0302 | 13 | B | 0302 | 0.04 | 15 | 1 to 9.1 | 2, 5, 10 | 200, 300 |
| | | | | | | | 10 to 22M | 1, 2, 5, 10 | 100, 200, 300 |
| | | | | | | | 10 to 10M | 0.5 | 100, 200, 300 |

**Notes**

- DSCC has created a series of drawings to support the need for 0201-sized product. Vishay Dale is listed as a resource on this drawing as follows:

| DSCC DRAWING NUMBER | VISHAY DALE MODEL | TERM. | POWER RATING $P_{70\,°C}$ W | RES. RANGE Ω | RES. TOL. ± % | TEMP. COEF. ± ppm/°C | MAX. WORKING VOLTAGE (1) V |
|---|---|---|---|---|---|---|---|
| 07009 | RCWP-0201 | B | 0.05 | 10 to 46.4<br>47 to 1M | 1, 5 | 200<br>100 | 30 |

This drawing can be viewed at: www.landandmaritime.dla.mil/Programs/MilSpec/ListDwgs.aspx?DocTYPE=DSCCdwg

(1) Continuous working voltage shall be $\sqrt{P \times R}$ or maximum working voltage, whichever is less

(2) Characteristics: K = ± 100 ppm/°C; L = ± 200 ppm/°C; M = ± 300 ppm/°C

(3) MIL case size 0705 and EIA case size 0805 are dimensionally the same

## GLOBAL PART NUMBER INFORMATION

**New Global Part Numbering: M55342M02B10E0RWB (preferred part number format)**

| M | 5 | 5 | 3 | 4 | 2 | M | 0 | 2 | B | 1 | 0 | E | 0 | R | W | B | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| MIL STYLE | CHARACTERISTICS | SPEC. SHEET | TERMINATION STYLE | VALUE AND TOLERANCE | FAILURE RATE | PACKAGING [1] | SPECIAL |
|---|---|---|---|---|---|---|---|
| **D55342** applies to Style 07 (RM1206) only.<br><br>**M55342** applies to all other styles. | **K** = 100 ppm<br>**L** = 200 ppm<br>**M** = 300 ppm | (see Standard Electrical Specifications table) | **B** = pre-tinned nickel barrier, wraparound | (see Tolerance and Multipliers table) | **C** = non-ER<br>**M** = 1.0 %/1000 h<br>**P** = 0.1 %/1000 h<br>**R** = 0.01 %/1000 h<br>**U** = 0.01 %/1000 h [2]<br>**S** = 0.001 %/1000 h<br>**V** = 0.001 %/1000 h [2]<br>**T** = space level | **TP** = tin / lead, T/R (full)<br>**TN** = tin / lead, T/R (full), w/ESD<br>**UL** = tin / lead, T/R single lot date code<br>**S3** = tin / lead, T/R (1000 pieces)<br>**SV** = tin / lead, T/R (1000 pieces), w/ESD<br>**WB** = tin / lead, waffle tray<br>**WA** = tin / lead, waffle tray, w/ESD<br>**WL** = tin / lead, waffle tray, single lot date code<br>**S2** = tin / lead, T/R (500 pieces)<br>**SU** = tin / lead, T/R (500 pieces), w/ESD<br>**S6** = tin / lead, T/R (300 pieces)<br>**ST** = tin / lead, T/R (300 pieces), w/ESD | Blank = standard (dash number) (up to 1 digits)<br>**D** = 0.5 % tolerance [3]<br>**S** = space level w/option 1 part marking (-97) [4]<br>**T** = space level (-98)<br>**2** = option 1 part marking (-20) [4]<br>**3** = oiptions 2 and 3 part marking (-30) [4] |

**Historical Part Numbering: M55342M02B10E0R (will continue to be accepted)**

| M55342 | M | 02 | B | 10E0 | R | WB |
|---|---|---|---|---|---|---|
| MIL STYLE | CHARACTERISTICS | SPEC. SHEET | TERMINATION STYLE | VALUE AND TOLERANCE | FAILURE RATE | PACKAGING CODE |

**Notes**

- For additional information on packaging, refer to the Surface Mount Resistor Packaging document (www.vishay.com/doc?31543)

[4] Products with space level failure rates are only offered in packaging codes with ESD overpack and labeling. For all other failure rates, the ESD pack codes are an optional type of packaging

[5] Failure rates U and V require group A and B inspection ran on each production lot

[6] Add a “D” after the packaging code at the end of the global part number to specify Vishay Dale Thick Film product with a tolerance of 0.5 %

[7] MIL spec option 1, 2, and 3 part marking is not offered for the slash sheet 01, 02, 11, and 13 sizes

## RESISTANCE TOLERANCE AND MULTIPLIERS

| TOLERANCE | | | | | MULTIPLIER | VALUE RANGE (Ω) |
|---|---|---|---|---|---|---|
| ± 0.5 % | ± 1 % | ± 2 % | ± 5 % | ± 10 % | | |
| W | D | G | J | M | 1 | 1 to 9xx |
| Y | E | H | K | N | 1000 | 1K to 9xxK |
| Z | F | T | L | P | 1 000 000 | 1M to 22M |

Examples:

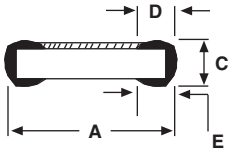
38W8 = 38.8 Ω ± 0.5 %
10Y0 = 10 kΩ ± 0.5 %
988W = 988 Ω ± 0.5 %
2Z13 = 2.13 MΩ ± 0.5 %

11D3 = 11.3 Ω ± 1 %
10E0 = 10 kΩ ± 1 %
332D = 332 Ω ± 1 %
2F21 = 2.21 MΩ ± 1 %
51G0 = 51 Ω ± 2 %
10H0 = 10 kΩ ± 2 %
33H0 = 33 kΩ ± 2 %
22T0 = 22 MΩ ± 2 %

15J0 = 15 Ω ± 5 %
10K0 = 10 kΩ ± 5 %
560K = 560 kΩ ± 5 %
8L20 = 8.2 MΩ ± 5 %
10M0 = 10 Ω ± 10 %
10N0 = 10 kΩ ± 10 %
2P70 = 2.7 MΩ ± 10 %
8P20 = 8.2 MΩ ± 10 %

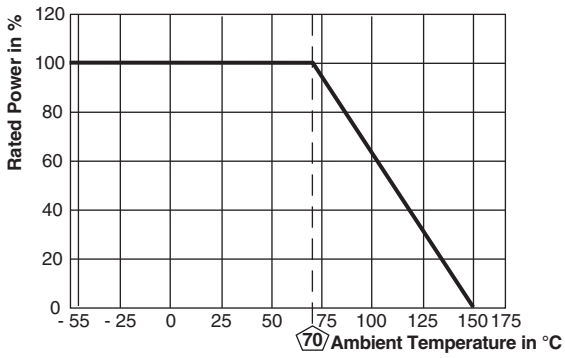

For technical questions, contact: ff2aresistors@vishay.com

## DIMENSIONS in inches (millimeters)


| VISHAY DALE MODEL | MIL-PRF-55342 STYLE | MIL SPEC. SHEET | A (LENGTH) | B (WIDTH) | C (HEIGHT) | D (TOP TERM) | E (BOTTOM TERM) |
|---|---|---|---|---|---|---|---|
| RCWPM-0502 | RM0502 | 01 | 0.055 ± 0.005 (1.40 ± 0.13) | 0.023 ± 0.003 (0.58 ± 0.08) | 0.015 ± 0.003 (0.38 ± 0.08) | 0.010 ± 0.005 (0.25 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCWPM-550 | RM0505 | 02 | 0.055 ± 0.005 (1.40 ± 0.13) | 0.050 ± 0.005 (1.27 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.010 ± 0.005 (0.25 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCWPM-5100 | RM1005 | 03 | 0.105 ± 0.005 (2.67 ± 0.13) | 0.050 ± 0.005 (1.27 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCWPM-5150 | RM1505 | 04 | 0.155 ± 0.005 (3.94 ± 0.13) | 0.050 ± 0.005 (1.27 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCWPM-7225 | RM2208 | 05 | 0.230 ± 0.005 (5.84 ± 0.13) | 0.075 ± 0.005 (1.91 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) |
| RCWPM-575 | RM0705 | 06 | 0.080 ± 0.005 (2.03 ± 0.13) | 0.050 ± 0.005 (1.27 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.016 ± 0.008 (0.41 ± 0.20) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCWPM-1206 | RM1206 | 07 | 0.125 ± 0.005 (3.18 ± 0.13) | 0.063 ± 0.005 (1.60 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCWPM-2010 | RM2010 | 08 | 0.197 ± 0.006 (5.00 ± 0.15) | 0.098 ± 0.005 (2.49 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) |
| RCWPM-2512 | RM2512 | 09 | 0.250 ± 0.005 (6.35 ± 0.13) | 0.124 ± 0.005 (3.15 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) |
| RCWPM-1100 | RM1010 | 10 | 0.105 ± 0.005 (2.67 ± 0.13) | 0.100 ± 0.005 (2.54 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCWPM-0402 | RM0402 | 11 | 0.039 ± 0.003 (0.99 ± 0.08) | 0.020 ± 0.003 (0.51 ± 0.08) | 0.013 ± 0.003 (0.33 ± 0.08) | 0.010 ± 0.005 (0.25 ± 0.13) | 0.010 ± 0.005 (0.25 ± 0.13) |
| RCWPM-0603 | RM0603 | 12 | 0.063 ± 0.005 (1.60 ± 0.13) | 0.032 ± 0.005 (0.81 ± 0.13) | 0.018 ± 0.005 (0.46 ± 0.13) | 0.012 ± 0.005 (0.30 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCWPM-0302 | RM0302 | 13 | 0.034 ± 0.004 (0.86 ± 0.10) | 0.021 ± 0.003 (0.53 ± 0.08) | 0.013 ± 0.003 (0.33 ± 0.08) | 0.007 ± 0.005 (0.18 ± 0.13) | 0.008 ± 0.005 (0.20 ± 0.13) |
| RCWP-0201 | | | 0.024 ± 0.002 (0.61 ± 0.05) | 0.012 ± 0.002 (0.30 ± 0.05) | 0.009 ± 0.002 (0.23 ± 0.05) | 0.006 ± 0.003 (0.15 ± 0.08) | 0.006 + 0.002 - 0.004 (0.15 + 0.05 - 0.10) |

## DERATING CURVE




**CAGE CODE: 91637 and 2799A (formerly SH903)**

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