



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



### 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 -55 °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](http://www.vishay.com/doc?31028))
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### MECHANICAL 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<br>$P_{70^{\circ}\text{C}}$<br>W | MAX. WORKING VOLTAGE <sup>(1)</sup><br>V | RESISTANCE RANGE<br>$\Omega$ | TOLERANCE<br>$\pm \%$ | TEMPERATURE COEFFICIENT <sup>(2)</sup><br>$\pm \text{ppm}/^{\circ}\text{C}$ |
|-------------------|---------------------|-----------------|-------|---------------------|-----------------------------------------------|------------------------------------------|------------------------------|-----------------------|-----------------------------------------------------------------------------|
| RCWPM-0502        | 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         | 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        | 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        | 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        | 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         | RM0705              | 06              | B     | 0705 <sup>(3)</sup> | 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        | 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                                                               |
| RCWPM-2010        | 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        | 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        | 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        | 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                                                               |



## STANDARD ELECTRICAL SPECIFICATIONS

| VISHAY DALE MODEL | MIL-PRF-55342 STYLE | MIL SPEC. SHEET | TERM. | CASE SIZE | POWER RATING<br>$P_{70^{\circ}\text{C}}$<br>W | MAX. WORKING VOLTAGE <sup>(1)</sup><br>V | RESISTANCE RANGE<br>$\Omega$ | TOLERANCE<br>$\pm \%$ | TEMPERATURE COEFFICIENT <sup>(2)</sup><br>$\pm \text{ppm}/^{\circ}\text{C}$ |
|-------------------|---------------------|-----------------|-------|-----------|-----------------------------------------------|------------------------------------------|------------------------------|-----------------------|-----------------------------------------------------------------------------|
| RCWPM-0603        | 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        | 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<br>$P_{70^{\circ}\text{C}}$<br>W | RES. RANGE<br>$\Omega$ | RES. TOL.<br>$\pm \%$ | TEMP. COEF.<br>$\pm \text{ppm}/^{\circ}\text{C}$ | MAX. WORKING VOLTAGE <sup>(1)</sup><br>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](http://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 =  $\pm 100 \text{ ppm}/^{\circ}\text{C}$ ; L =  $\pm 200 \text{ ppm}/^{\circ}\text{C}$ ; M =  $\pm 300 \text{ ppm}/^{\circ}\text{C}$ .  
 (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 <sup>(1)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | SPECIAL                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------|--------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D55342</b><br>applies to Style 07 (RM1206) only.<br><br><b>M55342</b><br>applies to all other styles. | <b>K</b> = 100 ppm<br><b>L</b> = 200 ppm<br><b>M</b> = 300 ppm | (see Standard Electrical Specifications table) | <b>B</b> = Pre-tinned nickel barrier, wraparound | (see Tolerance and Multipliers table) | <b>C</b> = Non-ER<br><b>M</b> = 1.0 %/1000 h<br><b>P</b> = 0.1 %/1000 h<br><b>R</b> = 0.01 %/1000 h<br><b>U</b> = 0.01 %/1000 h <sup>(2)</sup><br><b>S</b> = 0.001 %/1000 h<br><b>V</b> = 0.001 %/1000 h <sup>(2)</sup><br><b>T</b> = Space level | <b>TP</b> = Tin/lead, T/R (full)<br><b>TN</b> = Tin/lead, T/R (full), w/ESD<br><b>UL</b> = Tin/lead, T/R (1000 pieces)<br><b>S3</b> = Tin/lead, T/R (1000 pieces)<br><b>SV</b> = Tin/lead, T/R (1000 pieces), w/ESD<br><b>WB</b> = Tin/lead, waffle tray<br><b>WA</b> = Tin/lead, waffle tray, w/ESD<br><b>WL</b> = Tin/lead, waffle tray, single lot date code<br><b>S2</b> = Tin/lead, T/R (500 pieces)<br><b>SU</b> = Tin/lead, T/R (500 pieces), w/ESD<br><b>S6</b> = Tin/lead, T/R (300 pieces)<br><b>ST</b> = Tin/lead, T/R (300 pieces), w/ESD | Blank = Standard (Dash number) (Up to 1 digits)<br><b>D</b> = 0.5 % tolerance <sup>(3)</sup><br><b>S</b> = Space level w/option 1 part marking (-97) <sup>(4)</sup><br><b>T</b> = Space level (-98)<br><b>2</b> = Option 1 part marking (-20) <sup>(4)</sup><br><b>3</b> = Options 2 and 3 part marking (-30) <sup>(4)</sup> |

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

|               |                 |             |                   |                     |              |                |
|---------------|-----------------|-------------|-------------------|---------------------|--------------|----------------|
| <b>M55342</b> | <b>M</b>        | <b>02</b>   | <b>B</b>          | <b>10E0</b>         | <b>R</b>     | <b>WB</b>      |
| 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](http://www.vishay.com/doc?31543)).
- (1) 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.
- (2) Failure rates U and V require group A and B inspection ran on each production lot.
- (3) 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 %.
- (4) 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 ( $\Omega$ ) |
|-------------|-----------|-----------|-----------|------------|------------|--------------------------|
| $\pm 0.5\%$ | $\pm 1\%$ | $\pm 2\%$ | $\pm 5\%$ | $\pm 10\%$ |            |                          |
| 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 = $38.8\ \Omega \pm 0.5\%$  | 11D3 = $11.3\ \Omega \pm 1\%$  | 15J0 = $15\ \Omega \pm 5\%$    |
| 10Y0 = $10\ k\Omega \pm 0.5\%$   | 10E0 = $10\ k\Omega \pm 1\%$   | 10K0 = $10\ k\Omega \pm 5\%$   |
| 988W = $988\ \Omega \pm 0.5\%$   | 332D = $332\ \Omega \pm 1\%$   | 560K = $560\ k\Omega \pm 5\%$  |
| 2Z13 = $2.13\ M\Omega \pm 0.5\%$ | 2F21 = $2.21\ M\Omega \pm 1\%$ | 8L20 = $8.2\ M\Omega \pm 5\%$  |
|                                  | 51G0 = $51\ \Omega \pm 2\%$    | 10M0 = $10\ \Omega \pm 10\%$   |
|                                  | 10H0 = $10\ k\Omega \pm 2\%$   | 10N0 = $10\ k\Omega \pm 10\%$  |
|                                  | 33H0 = $33\ k\Omega \pm 2\%$   | 2P70 = $2.7\ M\Omega \pm 10\%$ |
|                                  | 22T0 = $22\ M\Omega \pm 2\%$   | 8P20 = $8.2\ M\Omega \pm 10\%$ |

**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 $\pm$ 0.005<br>(1.40 $\pm$ 0.13) | 0.023 $\pm$ 0.003<br>(0.58 $\pm$ 0.08) | 0.015 $\pm$ 0.003<br>(0.38 $\pm$ 0.08) | 0.010 $\pm$ 0.005<br>(0.25 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13)                |
| RCWPM-550         | RM0505              | 02              | 0.055 $\pm$ 0.005<br>(1.40 $\pm$ 0.13) | 0.050 $\pm$ 0.005<br>(1.27 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.010 $\pm$ 0.005<br>(0.25 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13)                |
| RCWPM-5100        | RM1005              | 03              | 0.105 $\pm$ 0.005<br>(2.67 $\pm$ 0.13) | 0.050 $\pm$ 0.005<br>(1.27 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13)                |
| RCWPM-5150        | RM1505              | 04              | 0.155 $\pm$ 0.005<br>(3.94 $\pm$ 0.13) | 0.050 $\pm$ 0.005<br>(1.27 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13)                |
| RCWPM-7225        | RM2208              | 05              | 0.230 $\pm$ 0.005<br>(5.84 $\pm$ 0.13) | 0.075 $\pm$ 0.005<br>(1.91 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13)                |
| RCWPM-575         | RM0705              | 06              | 0.080 $\pm$ 0.005<br>(2.03 $\pm$ 0.13) | 0.050 $\pm$ 0.005<br>(1.27 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.016 $\pm$ 0.008<br>(0.41 $\pm$ 0.20) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13)                |
| RCWPM-1206        | RM1206              | 07              | 0.125 $\pm$ 0.005<br>(3.18 $\pm$ 0.13) | 0.063 $\pm$ 0.005<br>(1.60 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13)                |
| RCWPM-2010        | RM2010              | 08              | 0.197 $\pm$ 0.006<br>(5.00 $\pm$ 0.15) | 0.098 $\pm$ 0.005<br>(2.49 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13)                |
| RCWPM-2512        | RM2512              | 09              | 0.250 $\pm$ 0.005<br>(6.35 $\pm$ 0.13) | 0.124 $\pm$ 0.005<br>(3.15 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13)                |
| RCWPM-1100        | RM1010              | 10              | 0.105 $\pm$ 0.005<br>(2.67 $\pm$ 0.13) | 0.100 $\pm$ 0.005<br>(2.54 $\pm$ 0.13) | 0.020 $\pm$ 0.005<br>(0.51 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13)                |
| RCWPM-0402        | RM0402              | 11              | 0.039 $\pm$ 0.003<br>(0.99 $\pm$ 0.08) | 0.020 $\pm$ 0.003<br>(0.51 $\pm$ 0.08) | 0.013 $\pm$ 0.003<br>(0.33 $\pm$ 0.08) | 0.010 $\pm$ 0.005<br>(0.25 $\pm$ 0.13) | 0.010 $\pm$ 0.005<br>(0.25 $\pm$ 0.13)                |
| RCWPM-0603        | RM0603              | 12              | 0.063 $\pm$ 0.005<br>(1.60 $\pm$ 0.13) | 0.032 $\pm$ 0.005<br>(0.81 $\pm$ 0.13) | 0.018 $\pm$ 0.005<br>(0.46 $\pm$ 0.13) | 0.012 $\pm$ 0.005<br>(0.30 $\pm$ 0.13) | 0.015 $\pm$ 0.005<br>(0.38 $\pm$ 0.13)                |
| RCWPM-0302        | RM0302              | 13              | 0.034 $\pm$ 0.004<br>(0.86 $\pm$ 0.10) | 0.021 $\pm$ 0.003<br>(0.53 $\pm$ 0.08) | 0.013 $\pm$ 0.003<br>(0.33 $\pm$ 0.08) | 0.007 $\pm$ 0.005<br>(0.18 $\pm$ 0.13) | 0.008 $\pm$ 0.005<br>(0.20 $\pm$ 0.13)                |
| RCWP-0201         |                     |                 | 0.024 $\pm$ 0.002<br>(0.61 $\pm$ 0.05) | 0.012 $\pm$ 0.002<br>(0.30 $\pm$ 0.05) | 0.009 $\pm$ 0.002<br>(0.23 $\pm$ 0.05) | 0.006 $\pm$ 0.003<br>(0.15 $\pm$ 0.08) | 0.006 $\pm$ 0.002 - 0.004<br>(0.15 $\pm$ 0.05 - 0.10) |



**DERATING CURVE**



**CAGE CODE: 91637 and SH903**



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