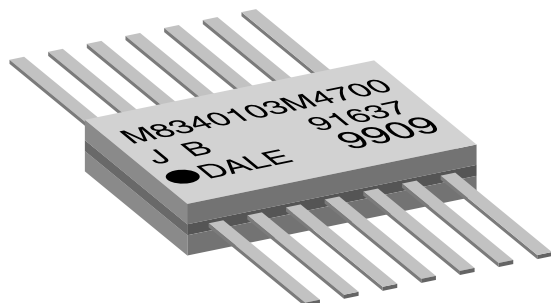




# Thick Film Resistor Networks, Military, MIL-PRF-83401 Qualified, Type RZ030, Flat Pack



## FEATURES

- Isolated, bussed and dual terminator schematics available
- Hot-solder dipped leads
- MIL-PRF-83401 qualified
- Thick film resistive elements
- TCR available in "K" ( $\pm 100$  ppm/ $^{\circ}\text{C}$ ) or "M" ( $\pm 300$  ppm/ $^{\circ}\text{C}$ ) characteristic
- 100 % screen tested per group A, subgroup 1 of MIL-PRF-83401
- 0.065" (1.65 mm) height for high density packaging

## STANDARD ELECTRICAL SPECIFICATIONS

| VISHAY DALE<br>MODEL/<br>PIN NO. | MIL<br>STYLE | MIL<br>SPEC.<br>SHEET | SCHEMATIC | POWER<br>RATING<br>ELEMENT<br>$P_{70^{\circ}\text{C}}$<br>W | POWER<br>RATING<br>PACKAGE<br>$P_{70^{\circ}\text{C}}$<br>W | RESISTANCE<br>RANGE<br>$\Omega$ | TOLERANCE <sup>(2)</sup><br>$\pm$ % | TEMPERATURE<br>COEFFICIENT <sup>(1)</sup><br>( $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ )<br>$\pm$ ppm/ $^{\circ}\text{C}$ | WEIGHT<br>g |
|----------------------------------|--------------|-----------------------|-----------|-------------------------------------------------------------|-------------------------------------------------------------|---------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------|
| DFM14                            | RZ030        | 03                    | 11 (A)    | 0.050                                                       | 0.350                                                       | 10 to 1M                        | 1, 2, 5                             | 100, 300                                                                                                                          | 0.4         |
|                                  |              |                       | 12 (B)    | 0.025                                                       | 0.325                                                       | 10 to 1M                        |                                     |                                                                                                                                   |             |
|                                  |              |                       | 15 (J)    | 0.015                                                       | 0.350                                                       | Consult factory                 |                                     |                                                                                                                                   |             |

### Notes

- Consult factory for stocked values.
- <sup>(1)</sup> K =  $\pm 100$  ppm/ $^{\circ}\text{C}$ ; M =  $\pm 300$  ppm/ $^{\circ}\text{C}$ .
- <sup>(2)</sup>  $\pm 2$  % standard,  $\pm 1$  % and  $\pm 5$  % available.

## GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: M8340103M6801GAD05 (preferred part numbering format)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 8 | 3 | 4 | 0 | 1 | 0 | 3 | M | 6 | 8 | 0 | 1 | G | A | D | 0 | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| MIL STYLE | SPEC SHEET | CHARACTERISTIC             | RESISTANCE<br>VALUE                                                                                                             | TOLERANCE                                       | SCHEMATIC                  | PACKAGING                                                             |
|-----------|------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------|-----------------------------------------------------------------------|
| M83401    | 03         | K = 100 ppm<br>M = 300 ppm | 3 digit significant<br>figure, followed by<br>a multiplier<br>10R0 = 10 $\Omega$<br>3302 = 33 k $\Omega$<br>1004 = 1 M $\Omega$ | F = $\pm 1$ %<br>G = $\pm 2$ %<br>J = $\pm 5$ % | A = Isolated<br>B = Bussed | D05 = Tin/lead, tube<br>DSL = Tin/lead, tube,<br>single lot date code |

Historical Part Number Example: M8340103M6801GA (will continue to be accepted)

| M83401    | 03         | M              | 6801                | G         | A         | D05       |
|-----------|------------|----------------|---------------------|-----------|-----------|-----------|
| MIL STYLE | SPEC SHEET | CHARACTERISTIC | RESISTANCE<br>VALUE | TOLERANCE | SCHEMATIC | PACKAGING |

New Global Part Numbering: M8340103KA001GJD05 (preferred part numbering format)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 8 | 3 | 4 | 0 | 1 | 0 | 3 | K | A | 0 | 0 | 1 | G | J | D | 0 | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

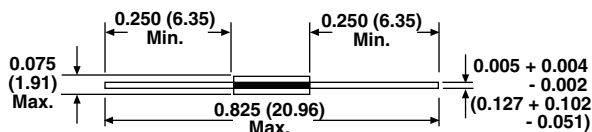
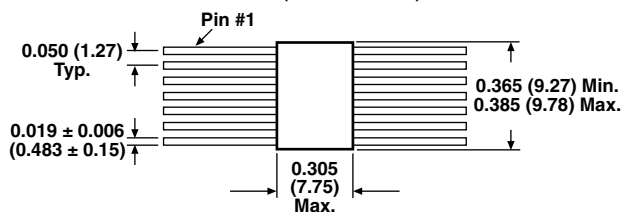
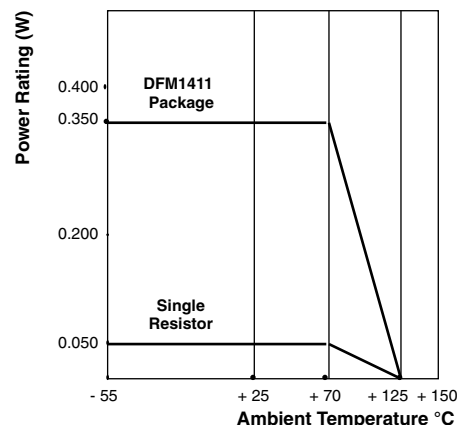
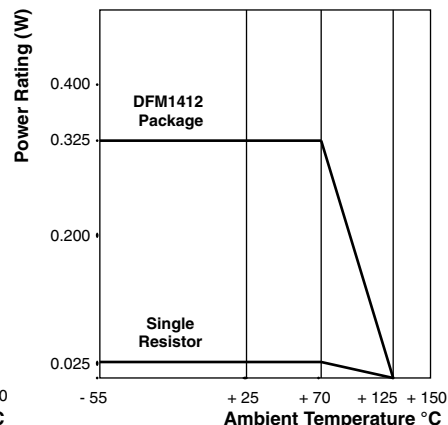
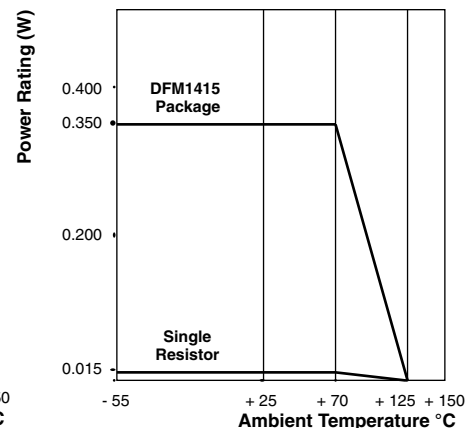
| MIL STYLE | SPEC SHEET | CHARACTERISTIC             | RESISTANCE<br>VALUE                                      | TOLERANCE                                       | SCHEMATIC           | PACKAGING                                                             |
|-----------|------------|----------------------------|----------------------------------------------------------|-------------------------------------------------|---------------------|-----------------------------------------------------------------------|
| M83401    | 03         | K = 100 ppm<br>M = 300 ppm | Per Std.<br>MIL. Spec.<br>(see Impedance<br>Codes table) | F = $\pm 1$ %<br>G = $\pm 2$ %<br>J = $\pm 5$ % | J = Dual terminator | D05 = Tin/lead, tube<br>DSL = Tin/lead, tube,<br>single lot date code |

Historical Part Number Example: M8340103KA001GJ (will continue to be accepted)

| M83401    | 03         | M              | A001                | G         | J         | D05       |
|-----------|------------|----------------|---------------------|-----------|-----------|-----------|
| MIL STYLE | SPEC SHEET | CHARACTERISTIC | RESISTANCE<br>VALUE | TOLERANCE | SCHEMATIC | PACKAGING |

### Note

- For additional information on packaging, refer to the Surface Mount Network Packaging document ([www.vishay.com/doc?31540](http://www.vishay.com/doc?31540)).

**DIMENSIONS** in inches (millimeters)**11 Schematic****12 Schematic****15 Schematic****Derating****MECHANICAL SPECIFICATIONS**

|                                |                                                                                                                                      |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Marking resistance to solvents | Permanency testing per MIL-PRF-83401                                                                                                 |
| Solderability                  | Per MIL-PRF-83401                                                                                                                    |
| Terminals                      | Per MIL-STD-1276<br>DFM1411, DFM1412 and DFM1415 = Type G (hot solder dipped)<br>Hot solder dipped leads supplied as standard finish |
| Body                           | Epoxy filled ceramic sandwich                                                                                                        |

**TECHNICAL SPECIFICATIONS**

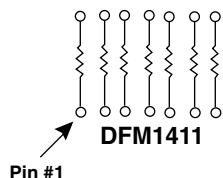
| PARAMETER                         | UNIT             | MDM SERIES  |
|-----------------------------------|------------------|-------------|
| Maximum operating voltage         | V <sub>DC</sub>  | 50          |
| Voltage coefficient of resistance | V <sub>eff</sub> | < 50 ppm    |
| Dielectric strength               | V <sub>AC</sub>  | 100 min.    |
| Insulation resistance             | Ω                | 10 000M     |
| Operating temperature range       | °C               | -55 to +125 |
| Storage temperature range         | °C               | -55 to +150 |

**IMPEDANCE CODES**

| CODE | R <sub>1</sub> (Ω) | R <sub>2</sub> (Ω) | CODE | R <sub>1</sub> (Ω) | R <sub>2</sub> (Ω) |
|------|--------------------|--------------------|------|--------------------|--------------------|
| A001 | 82                 | 130                | A010 | 330                | 470                |
| A002 | 120                | 200                | A011 | 330                | 680                |
| A003 | 130                | 210                | A012 | 1.5K               | 3.3K               |
| A004 | 160                | 260                | A013 | 3K                 | 6.2K               |
| A005 | 180                | 240                | A014 | 180                | 270                |
| A006 | 180                | 390                | A015 | 270                | 270                |
| A007 | 220                | 270                | A016 | 560                | 560                |
| A008 | 220                | 330                | A017 | 560                | 1.2K               |
| A009 | 330                | 390                | A018 | 620                | 2.7K               |

## CIRCUIT APPLICATIONS

### 11 Schematic



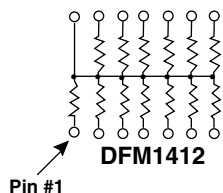
#### DFM1411 (M8340103xxxxxA)

7 isolated resistors

The DFM1411 provides the user with 7 nominally equal resistors with each resistor isolated from all others. Commonly used in the following applications:

- “Wired OR” pull-up
- Power driven pull-up
- TTL input pull-down
- Line termination
- ECL output pull-down
- Long-line impedance balancing
- LED current limiting
- Power gate pull-up

### 12 Schematic



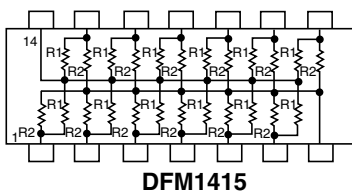
#### DFM1412 (M8340103xxxxxB)

13 resistors with one pin common

The DFM1412 provides the user with a choice of 13 nominally equal resistors, each connected to a common pin. Commonly used in the following applications:

- MOS/ROM pull-up/pull-down
- “Wired OR” pull-up
- Digital pulse squaring
- Open Collector pull-up
- Power driven pull-up
- TTL input pull-down
- TTL unused gate pull-up
- High speed parallel pull-up

### 15 Schematic



#### DFM1415 (M8340103xxxxxJ)

12 pairs of resistors

The DFM1415 provides the user with a choice of 12 pairs of R1/R2 resistor values for pulse squaring and TTL dual-line terminating requirements.

**CAGE CODE: 91637**



| <b>PERFORMANCE</b>              |                                                                                                         |                                                                        |
|---------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>TEST</b>                     | <b>CONDITIONS</b>                                                                                       | <b>MAX. <math>\Delta R</math> (TYPICAL TEST LOTS)</b>                  |
| Power conditioning              | 1.5 x rated power, applied 1.5 h "ON" and 0.5 h "OFF" for 100 h $\pm$ 4 h at +25 °C ambient temperature | $\pm$ 0.50 % $\Delta R$                                                |
| Thermal shock                   | 5 cycles between -65 °C and +125 °C                                                                     | $\pm$ 0.50 % $\Delta R$                                                |
| Short time overload             | 2.5 x rated working voltage for 5 s                                                                     | $\pm$ 0.25 % $\Delta R$ (char. K)<br>$\pm$ 0.50 % $\Delta R$ (char. M) |
| Low temperature operation       | 45 min at full rated working voltage at -65 °C                                                          | $\pm$ 0.25 % $\Delta R$ (char. K)<br>$\pm$ 0.50 % $\Delta R$ (char. M) |
| Moisture resistance             | 240 h with humidity ranging from 80 % RH to 98 % RH                                                     | $\pm$ 0.50 % $\Delta R$                                                |
| Resistance to soldering heat    | Leads immersed in +260 °C solder to within 1/16" of body for 10 s                                       | $\pm$ 0.25 % $\Delta R$                                                |
| Shock                           | Total of 18 shocks at 100 g's                                                                           | $\pm$ 0.25 % $\Delta R$                                                |
| Vibration                       | 12 h at maximum of 20 g's between 10 Hz and 2000 Hz                                                     | $\pm$ 0.25 % $\Delta R$                                                |
| Load life                       | 1000 h at +70 °C, rated power applied 1.5 h "ON", 0.5 h "OFF" for full 1000 h period                    | $\pm$ 0.50 % $\Delta R$ (char. K)<br>$\pm$ 2.0 % $\Delta R$ (char. M)  |
| Terminal strength               | 1.5 pound pull for 30 s                                                                                 | $\pm$ 0.25 % $\Delta R$                                                |
| Insulation resistance           | 10 000 M $\Omega$ (minimum)                                                                             | -                                                                      |
| Dielectric withstanding voltage | No evidence of arcing or damage (200 V <sub>RMS</sub> for 1 min)                                        | -                                                                      |



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