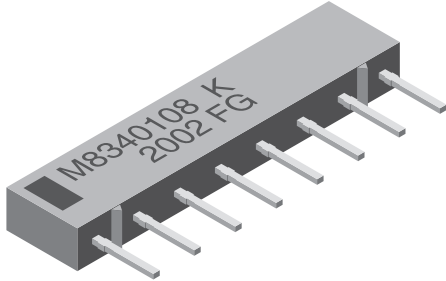


Thick Film Resistor Networks, Military, MIL-PRF-83401 Qualified, Type RZ040 to RZ090, Single-In-Line, Molded SIP



FEATURES

- Isolated, bussed and dual terminator schematics available
- MIL-PRF-83401 qualified
- 0.195" (4.95 mm) "A" and 0.350" (8.89 mm) "C" maximum seated heights
- Thick film resistive elements
- TCR available in "K" (± 100 ppm/ $^{\circ}$ C) or "M" (± 300 ppm/ $^{\circ}$ C) characteristic
- All device leads are hot-solder dipped
- Rugged molded case construction
- Compatible with automatic insertion equipment
- 100 % screen tested per group A, subgroup 1 of MIL-PRF-83401
- All devices are capable of passing the MIL-STD-202, method 210, condition D "Resistance to Soldering Heat" test
- Available in tube pack

STANDARD ELECTRICAL SPECIFICATIONS

| VISHAY DALE MODEL/ PIN NO/ PROFILE | MIL STYLE | MIL SPEC. SHEET | SCHEMATIC | POWER RATING | | RESISTANCE RANGE Ω | TOLERANCE ⁽¹⁾ \pm % | TEMPERATURE COEFFICIENT ⁽²⁾ (- 55 $^{\circ}$ C to + 125 $^{\circ}$ C) \pm ppm/ $^{\circ}$ C | WEIGHT g |
|---|--------------|-----------------------|-----------|--|--|---------------------------------|-------------------------------------|---|-------------|
| | | | | ELEMENT $P_{70^{\circ}\text{C}}$ W | PACKAGE $P_{70^{\circ}\text{C}}$ W | | | | |
| MSM06C | RZ040 | 04 | 01 (C) | 0.20 | 1.00 | 10 to 1M | 1, 2, 5 | 100, 300 | 0.7 |
| | | | 03 (G) | 0.20 | 0.60 | 10 to 1M | | | |
| | | | 05 (H) | 0.11 | 0.88 | Consult factory | | | |
| MSM08C | RZ050 | 05 | 01 (C) | 0.20 | 1.40 | 10 to 1M | 1, 2, 5 | 100, 300 | 0.9 |
| | | | 03 (G) | 0.20 | 0.80 | 10 to 1M | | | |
| | | | 05 (H) | 0.11 | 1.32 | Consult factory | | | |
| MSM10C | RZ060 | 06 | 01 (C) | 0.20 | 1.80 | 10 to 1M | 1, 2, 5 | 100, 300 | 1.1 |
| | | | 03 (G) | 0.20 | 1.00 | 10 to 1M | | | |
| | | | 05 (H) | 0.11 | 1.80 | Consult factory | | | |
| MSM06A | RZ070 | 07 | 01 (C) | 0.12 | 0.60 | 10 to 1M | 1, 2, 5 | 100, 300 | 0.4 |
| | | | 03 (G) | 0.12 | 0.36 | 10 to 1M | | | |
| | | | 05 (H) | 0.07 | 0.60 | Consult factory | | | |
| MSM08A | RZ080 | 08 | 01 (C) | 0.12 | 0.84 | 10 to 1M | 1, 2, 5 | 100, 300 | 0.5 |
| | | | 03 (G) | 0.12 | 0.48 | 10 to 1M | | | |
| | | | 05 (H) | 0.07 | 0.84 | Consult factory | | | |
| MSM10A | RZ090 | 09 | 01 (C) | 0.12 | 1.08 | 10 to 1M | 1, 2, 5 | 100, 300 | 0.6 |
| | | | 03 (G) | 0.12 | 0.60 | 10 to 1M | | | |
| | | | 05 (H) | 0.07 | 1.08 | Consult factory | | | |

Notes

⁽¹⁾ ± 2 % standard, ± 1 % and ± 5 % available

⁽²⁾ K = ± 100 ppm/ $^{\circ}$ C; M = ± 300 ppm/ $^{\circ}$ C



MSM (Military M83401)

Thick Film Resistor Networks, Military, MIL-PRF-83401
Qualified, Type RZ040 to RZ090, Single-In-Line, Molded SIP

Vishay Dale

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: M8340107K1003GCD03 (preferred part numbering format)

| | | | | | | |
|-----------|--|----------------------------|--|-------------------------------------|----------------------------|--|
| MIL STYLE | SPEC SHEET | CHARACTERISTIC | RESISTANCE VALUE | TOLERANCE | SCHEMATIC | PACKAGING |
| M83401 | 04 = 6 pin, "C" profile 05 = 8 pin, "C" profile 06 = 10 pin, "C" profile 07 = 6 pin, "A" profile 08 = 8 pin, "A" profile 09 = 10 pin, "A" profile | K = 100 ppm M = 300 ppm | 3 digit significant figure, followed by a multiplier 10R0 = 10 Ω 3302 = 33 kΩ 1004 = 1 MΩ | F = ± 1 % G = ± 2 % J = ± 5 % | C = Bussed G = Isolated | D03 = Tin/lead, tube DSL = Tin/lead, tube, single lot date code |

Historical Part Number example: M8340107K1003GC (will continue to be accepted)

| | | | | | | |
|-----------|------------|----------------|------------------|-----------|-----------|-----------|
| M83401 | 07 | K | 1003 | G | C | D03 |
| MIL STYLE | SPEC SHEET | CHARACTERISTIC | RESISTANCE VALUE | TOLERANCE | SCHEMATIC | PACKAGING |

New Global Part Numbering: M8340104KA001GHD03 (preferred part numbering format)

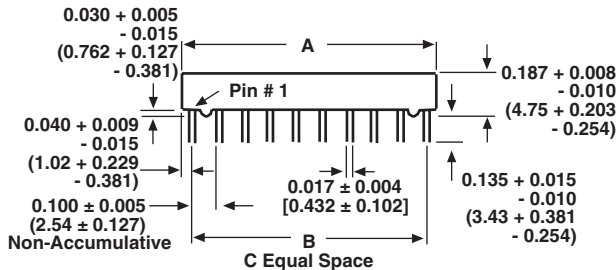
| | | | | | | |
|-----------|--|----------------------------|--|-------------------------------------|---------------------|--|
| MIL STYLE | SPEC SHEET | CHARACTERISTIC | RESISTANCE VALUE | TOLERANCE | SCHEMATIC | PACKAGING |
| M83401 | 04 = 6 pin, "C" profile 05 = 8 pin, "C" profile 06 = 10 pin, "C" profile 07 = 6 pin, "A" profile 08 = 8 pin, "A" profile 09 = 10 pin, "A" profile | K = 100 ppm M = 300 ppm | Per std. Mil. Spec (see Impedance Codes table) | F = ± 1 % G = ± 2 % J = ± 5 % | H = Dual terminator | D03 = Tin/lead, tube DSL = Tin/lead, tube, single lot date code |

Historical Part Number example: M8340104KA001GH (will continue to be accepted)

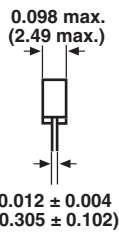
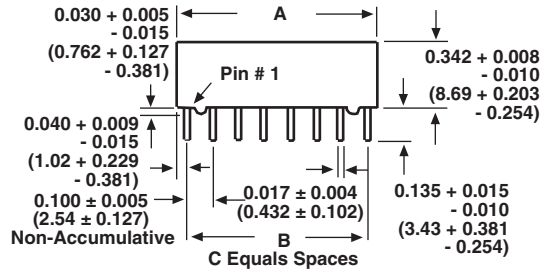
| | | | | | | |
|-----------|------------|----------------|------------------|-----------|-----------|-----------|
| M83401 | 04 | K | A001 | G | H | D03 |
| MIL STYLE | SPEC SHEET | CHARACTERISTIC | RESISTANCE VALUE | TOLERANCE | SCHEMATIC | PACKAGING |

DIMENSIONS in inches (millimeters)

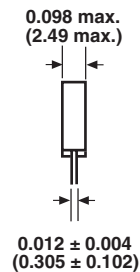
"A" Profile



"C" Profile



| VISHAY DALE MODEL | A | B | C |
|-------------------|----------------------------------|------------------|---|
| MSM06 | 0.583 ± 0.015 (14.81 ± 0.381) | 0.500 (12.70) | 5 |
| MSM08 | 0.783 ± 0.015 (19.89 ± 0.381) | 0.700 (17.78) | 7 |
| MSM10 | 0.983 ± 0.015 (24.97 ± 0.381) | 0.900 (22.86) | 9 |



| TECHNICAL SPECIFICATIONS | | |
|-----------------------------------|------------------|---------------|
| PARAMETER | UNIT | MSM SERIES |
| Maximum Operating Voltage | V _{DC} | 50 |
| Voltage Coefficient of Resistance | V _{eff} | < 50 ppm |
| Dielectric Strength | V _{AC} | 200 min. |
| Insulation Resistance | Ω | 10 000 M |
| Operating Temperature Range | °C | - 55 to + 125 |
| Storage Temperature Range | °C | - 55 to + 150 |

| MECHANICAL SPECIFICATIONS | |
|---------------------------|---------------------------------|
| Body | Molded epoxy |
| Terminals | Copper alloy, hot-solder dipped |
| Solderability | Per MIL-PRF-83401 |

CAGE CODE: 91637 and SH903

MSM (Military M83401)



Vishay Dale Thick Film Resistor Networks, Military, MIL-PRF-83401 Qualified, Type RZ040 to RZ090, Single-In-Line, Molded SIP

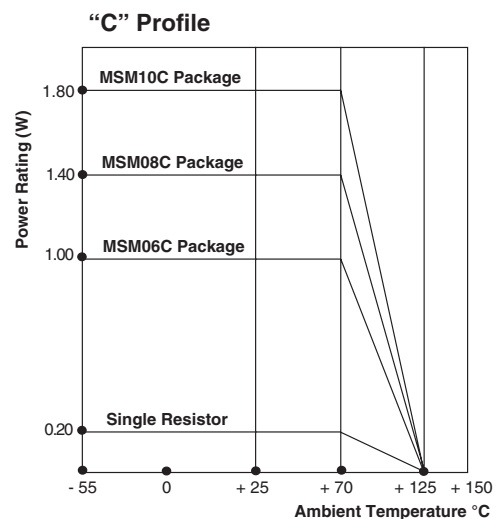
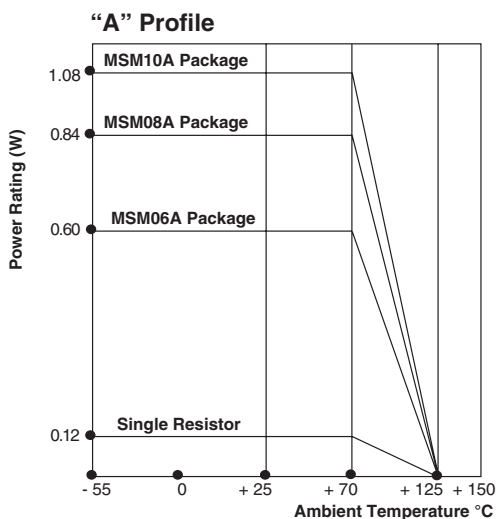
| MILITARY IMPEDANCE CODES | | | | | |
|--------------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
| CODE | R ₁ (Ω) | R ₂ (Ω) | CODE | R ₁ (Ω) | R ₂ (Ω) |
| A001 | 82 | 130 | A011 | 330 | 680 |
| A002 | 120 | 200 | A012 | 1.5K | 3.3K |
| A003 | 130 | 210 | A013 | 3K | 6.2K |
| A004 | 160 | 260 | A014 | 180 | 270 |
| A005 | 180 | 240 | A015 | 270 | 270 |
| A006 | 180 | 390 | A016 | 560 | 560 |
| A007 | 220 | 270 | A017 | 560 | 1.2K |
| A008 | 220 | 330 | A018 | 620 | 2.7K |
| A009 | 330 | 390 | A019 ⁽¹⁾ | 150 | 1K |
| A010 | 330 | 470 | A020 ⁽¹⁾ | 1K | 1K |

Note

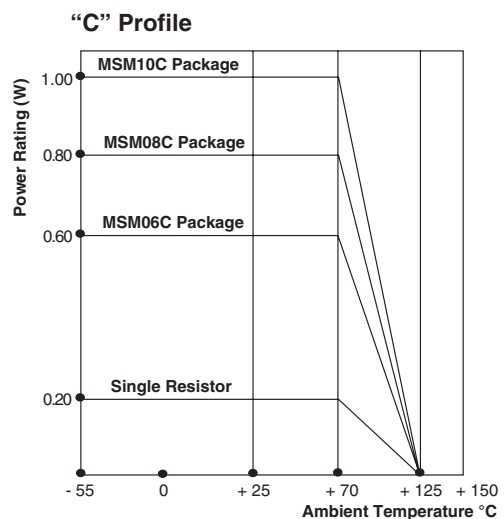
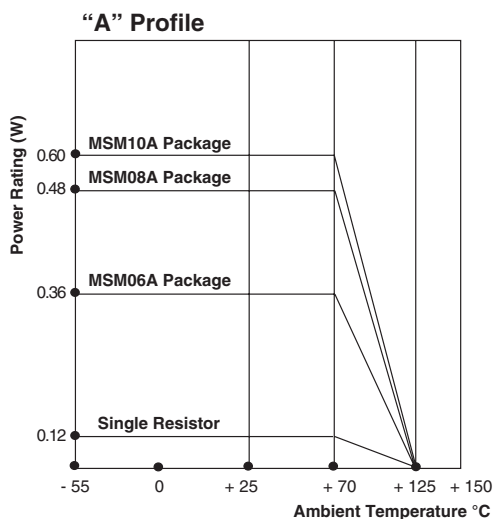
⁽¹⁾ Offered for the M83401/09 product only

DERATING

01 Schematic

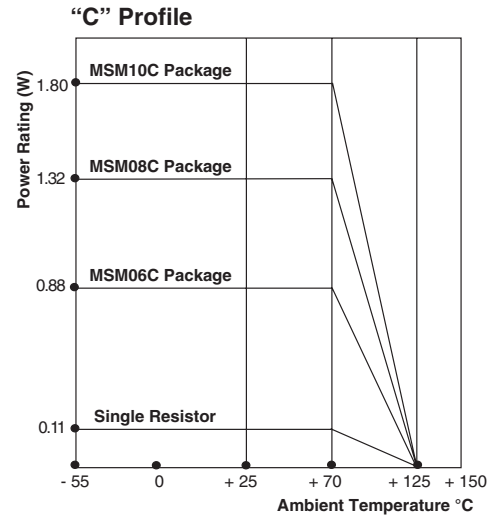
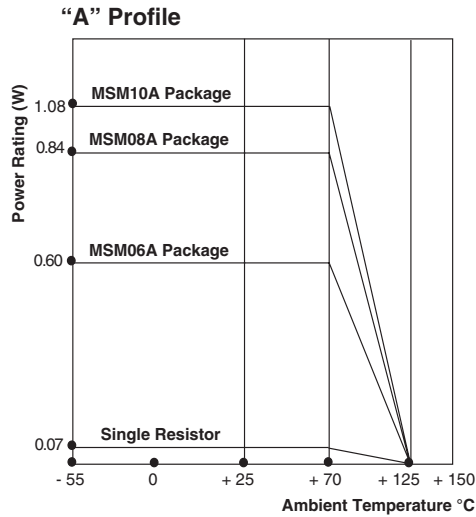


03 Schematic



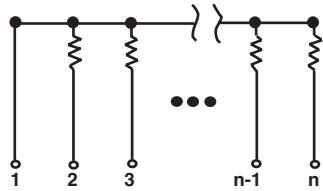


05 Schematic



CIRCUIT APPLICATIONS

01 Schematic



5, 7 or 9 resistors with one pin common

"A" Profile

MSM06A01 (M8340107xxxxxC)

MSM08A01 (M8340108xxxxxC)

MSM10A01 (M8340109xxxxxC)

"C" Profile

MSM06C01 (M8340104xxxxxC)

MSM08C01 (M8340105xxxxxC)

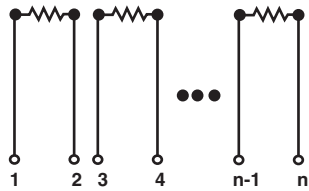
MSM10C01 (M8340106xxxxxC)

The MSM06A01, MSM08A01, MSM10A01, MSM06C01, MSM08C01 and MSM10C01 molded single-in-line resistor networks provide the user with a choice of 5, 7 or 9 nominally equal resistors, each connected to a common pin (Pin No. 1).

Commonly used in the following applications:

- "Wired OR" Pull-up
- Power Gate Pull-up
- MOS/ROM Pull-up/Pull-down
- Open Collector Pull-up
- TTL Input Pull-down
- TTL Unused Gate Pull-up

03 Schematic



3, 4 or 5 isolated resistors

"A" Profile

MSM06A03 (M8340107xxxxxG)

MSM08A03 (M8340108xxxxxG)

MSM10A03 (M8340109xxxxxG)

"C" Profile

MSM06C03 (M8340104xxxxxG)

MSM08C03 (M8340105xxxxxG)

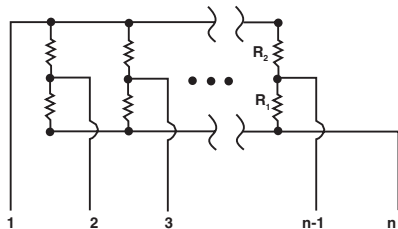
MSM10C03 (M8340106xxxxxG)

The MSM06A03, MSM08A03, MSM10A03, MSM06C03, MSM08C03 and MSM10C03 molded single-in-line resistor networks provide the user with a choice of 3, 4 or 5 nominally equal resistors. Each resistor is isolated from all others.

Commonly used in the following applications:

- "Wired OR" Pull-up
- Power Driven Pull-up
- Power Gate Pull-up
- Line Termination
- Long-Line Impedance Balance
- LED Current Limiting
- ECL Output Pull-down
- TTL Input Pull-down

05 Schematic



4, 6 or 8 resistor pairs

"A" Profile

MSM06A05 (M8340107xxxxxH)

MSM08A05 (M8340108xxxxxH)

MSM10A05 (M8340109xxxxxH)

"C" Profile

MSM06C05 (M8340104xxxxxH)

MSM08C05 (M8340105xxxxxH)

MSM10C05 (M8340106xxxxxH)

The MSM06A05, MSM08A05, MSM10A05, MSM06C05, MSM08C05 and MSM10C05 molded single-in-line resistor networks provide the user with a choice of 4, 6 or 8 pair of R1/R2 resistor values for pulse squaring and TTL dual-line terminating requirements.

MSM (Military M83401)



Vishay Dale Thick Film Resistor Networks, Military, MIL-PRF-83401 Qualified,
Type RZ040 to RZ090, Single-In-Line, Molded SIP

| PERFORMANCE | | |
|---------------------------------|--|--|
| TEST | CONDITIONS | MAX. ΔR (TYPICAL TEST LOTS) |
| 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 % ΔR |
| Thermal Shock | 5 cycles between - 65 °C and + 125 °C | \pm 0.50 % ΔR |
| Short Time Overload | 2.5 x rated working voltage for 5 s | \pm 0.25 % ΔR (Characteristic K) \pm 0.50 % ΔR (Characteristic M) |
| Low Temperature Operation | 45 min at full rated working voltage at - 65 °C | \pm 0.25 % ΔR (Characteristic K) \pm 0.50 % ΔR (Characteristic M) |
| Moisture Resistance | 240 h with humidity ranging from 80 % RH to 98 % RH | \pm 0.50 % ΔR |
| Resistance to Soldering Heat | Leads immersed in + 260 °C solder to within 1/16" of body for 10 s | \pm 0.25 % ΔR |
| Shock | Total of 18 shocks at 100 g's | \pm 0.25 % ΔR |
| Vibration | 12 h at maximum of 20 g's between 10 Hz and 2000 Hz | \pm 0.25 % ΔR |
| 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 % ΔR (Characteristic K) \pm 2.00 % ΔR (Characteristic M) |
| Terminal Strength | 4 1/2 pound pull for 30 s | \pm 0.25 % ΔR |
| Insulation Resistance | 10 000 M Ω (minimum) | - |
| Dielectric Withstanding Voltage | No evidence of arcing or damage (200 V _{RMS} for 1 min) | - |



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