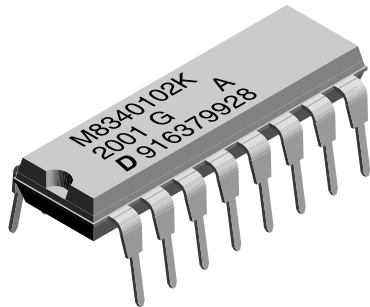




Thick Film Resistor Networks, Military, MIL-PRF-83401 Qualified, Type RZ010 and RZ020 Dual-In-Line, Molded DIP



FEATURES

- Isolated, bussed and dual terminator schematics available
- MIL-PRF-83401 qualified
- Epoxy molded construction
- All device leads are hot-solder dipped
- Available in tube pack
- TCR available in "K" ( $\pm 100$  ppm/ $^{\circ}$ C) or "M" ( $\pm 300$  ppm/ $^{\circ}$ C) depending on style
- 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

STANDARD ELECTRICAL SPECIFICATIONS									
VISHAY DALE MODEL/ PIN NO.	MIL STYLE	MIL SPEC. SHEET	SCHEMATIC	POWER RATING ELEMENT $P_{70^{\circ}\text{C}}$ W	POWER RATING PACKAGE $P_{70^{\circ}\text{C}}$ W	RESISTANCE RANGE $\Omega$	TOLERANCE $\pm$ % <sup>(2)</sup>	TEMPERATURE COEFFICIENT <sup>(1)</sup> (-55 $^{\circ}$ C to +125 $^{\circ}$ C) $\pm$ ppm/ $^{\circ}$ C	WEIGHT g
MDM14	RZ010	01	01 (B)	0.10	1.30	10 to 1M	1, 2, 5	100, 300	1.3
			03 (A)	0.20	1.40	10 to 1M			
			05 (J)	0.05	1.20	Consult factory			
MDM16	RZ020	02	01 (B)	0.10	1.50	10 to 1M	1, 2, 5	100, 300	1.5
			03 (A)	0.20	1.60	10 to 1M			
			05 (J)	0.05	1.40	Consult factory			

Notes

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

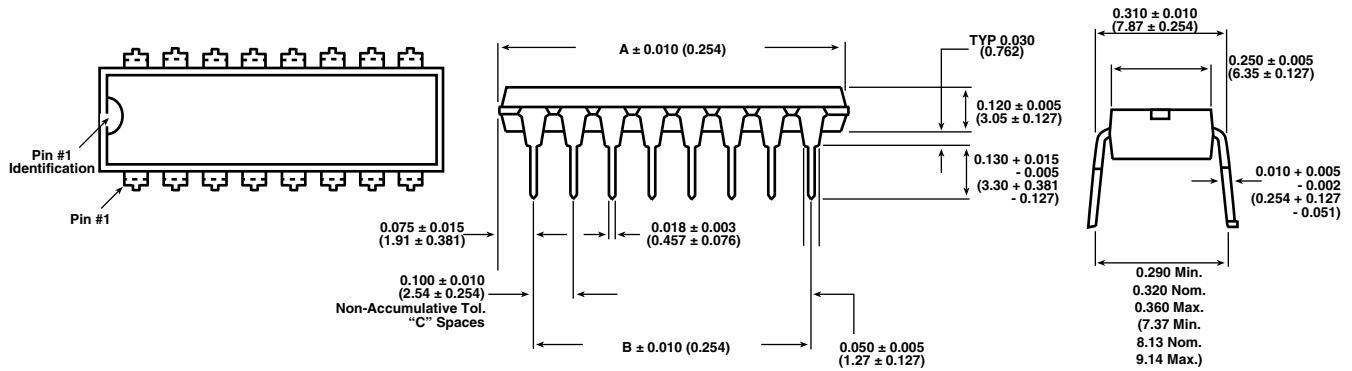
GLOBAL PART NUMBER INFORMATION																	
New Global Part Numbering: M8340101M2201GBD04 (preferred part numbering format)																	
M	8	3	4	0	1	0	1	M	2	2	0	1	G	B	D	0	4
MIL STYLE	SPEC SHEET	CHARACTERISTIC	RESISTANCE VALUE				TOLERANCE	SCHEMATIC	PACKAGING								
M83401	01 = 14 pin 02 = 16 pin	K = 100 ppm M = 300 ppm	3 digit significant figure, followed by a multiplier 10R0 = 10 $\Omega$ 3302 = 33 k $\Omega$ 1004 = 1 M $\Omega$				F = $\pm 1$ % G = $\pm 2$ % J = $\pm 5$ %	A = Isolated B = Bussed	D04 = Tin/lead, tube DSL = Tin/lead, tube, single lot date code								
Historical Part Number Example: M8340101M2201GB (will continue to be accepted)																	
M83401	01	M	2201				G	B	D04								
MIL STYLE	SPEC SHEET	CHARACTERISTIC	RESISTANCE VALUE				TOLERANCE	SCHEMATIC	PACKAGING								
New Global Part Numbering: M8340102KA001GJD04 (preferred part numbering format)																	
M	8	3	4	0	1	0	2	K	A	0	0	1	G	J	D	0	4
MIL STYLE	SPEC SHEET	CHARACTERISTIC	RESISTANCE VALUE				TOLERANCE	SCHEMATIC	PACKAGING								
M83401	01 = 14 pin 02 = 16 pin	K = 100 ppm M = 300 ppm	Per Std. MIL. Spec. (see Impedance Codes table)				F = $\pm 1$ % G = $\pm 2$ % J = $\pm 5$ %	J = Dual terminator	D04 = Tin/lead, tube DSL = Tin/lead, tube, single lot date code								
Historical Part Number Example: M8340102KA001GJ (will continue to be accepted)																	
M83401	02	K	A001				G	J	D04								
MIL STYLE	SPEC SHEET	CHARACTERISTIC	RESISTANCE VALUE				TOLERANCE	SCHEMATIC	PACKAGING								

Note

- For additional information on packaging, refer to the Through-Hole Network Packaging document ([www.vishay.com/doc?31542](http://www.vishay.com/doc?31542)).



**DIMENSIONS** in inches (millimeters)



VISHAY DALE MODEL	A	B	C
MDM14	0.750 (19.05)	0.600 (15.24)	6
MDM16	0.850 (21.59)	0.700 (17.78)	7

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

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	MDM SERIES
Maximum Operating Voltage	V <sub>DC</sub>	100
Voltage Coefficient of Resistance	V <sub>eff</sub>	< 50 ppm
Dielectric Strength	V <sub>AC</sub>	200 per min
Insulation Resistance	Ω	10 000 M
Operating Temperature Range	°C	-55 to +125
Storage Temperature Range	°C	-55 to +150

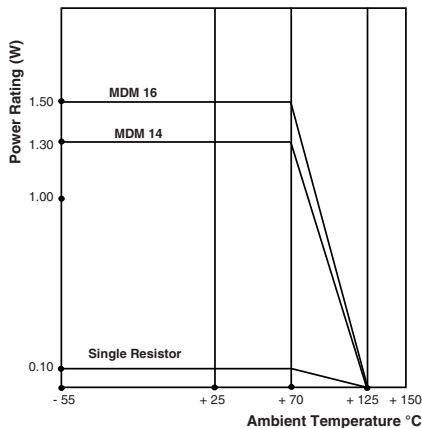
MECHANICAL SPECIFICATIONS	
Marking Resistance to Solvents	Permanency testing per MIL-PRF-83401
Solderability	Per MIL-PRF-83401
Body	Molded epoxy
Terminals	Copper alloy, hot-solder dipped

CIRCUIT APPLICATIONS	
<p><b>01 Schematic</b></p>	<p><b>MDM1401 (M8340101xxxxxB)</b>  <b>MDM1601 (M8340102xxxxxB)</b></p> <p>13 or 15 resistors with one pin common</p> <p>The MDMxx01 provides the user with a choice of 13 or 15 nominally equal resistors, each connected to a common pin. Commonly used in the following applications:</p> <ul style="list-style-type: none"> <li>• MOS/ROM Pull-up/Pull-down</li> <li>• Open Collector Pull-up</li> <li>• “Wired OR” Pull-up</li> <li>• Power Driven Pull-up</li> <li>• TTL Input Pull-down</li> <li>• Digital Pulse Squaring</li> <li>• TTL Unused Gate Pull-up</li> <li>• High Speed Parallel Pull-up</li> </ul>
<p><b>03 Schematic</b></p>	<p><b>MDM1403 (M8340101xxxxxA)</b>  <b>MDM1603 (M8340102xxxxxA)</b></p> <p>7 or 8 isolated resistors</p> <p>The MDMxx03 provides the user with a choice of 7 or 8 nominally equal resistors, with each resistor isolated from all others. Commonly used in the following applications:</p> <ul style="list-style-type: none"> <li>• “Wired OR” Pull-up</li> <li>• Power Driven Pull-up</li> <li>• Power Gate Pull-up</li> <li>• Line Termination</li> <li>• Long-line Impedance Balancing</li> <li>• LED Current Limiting</li> <li>• ECL Output Pull-down</li> <li>• TTL Input Pull-down</li> </ul>
<p><b>05 Schematic</b></p>	<p><b>MDM1405 (M8340101xxxxxJ)</b>  <b>MDM1605 (M8340102xxxxxJ)</b></p> <p>12 or 14 resistor pairs</p> <p>The MDMxx05 provides the user with a choice of 12 or 14 pairs of R1/R2 resistor values for pulse squaring and TTL dual-line terminating requirements.</p>

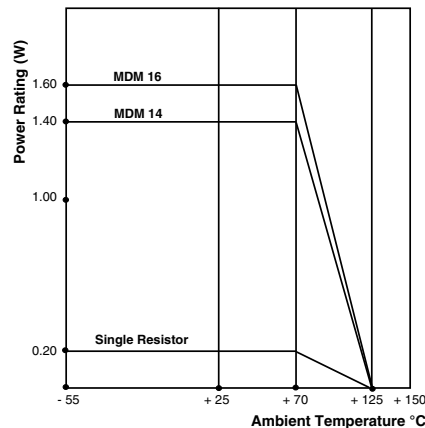
**CAGE CODE: 91637**

## DERATING

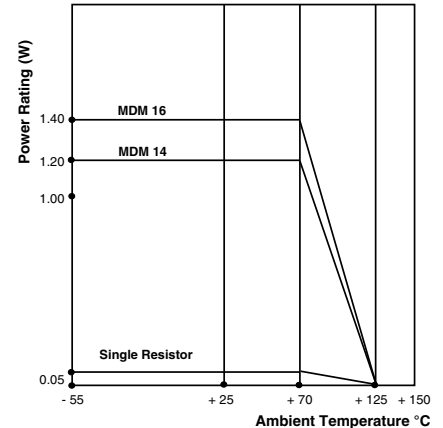
01 Schematic



03 Schematic



05 Schematic





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 ± 4 h at +25 °C ambient temperature	± 0.50 % ΔR
Thermal Shock	5 cycles between -65 °C and +125 °C	± 0.50 % ΔR
Short Time Overload	2.5 x rated working voltage for 5 s	± 0.25 % ΔR (Char. K) ± 0.50 % ΔR (Char. M)
Low Temperature Operation	45 min at full rated working voltage at -65 °C	± 0.25 % ΔR (Char. K) ± 0.50 % ΔR (Char. M)
Moisture Resistance	240 h with humidity ranging from 80 % RH to 98 % RH	± 0.50 % ΔR
Resistance to Soldering Heat	Leads immersed in +260 °C solder to within 1/16" of body for 10 s	± 0.25 % ΔR
Shock	Total of 18 shocks at 100 g's	± 0.25 % ΔR
Vibration	12 h at maximum of 20 g's between 10 Hz and 2000 Hz	± 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	± 0.50 % ΔR (Char. K) ± 2.00 % ΔR (Char. M)
Terminal Strength	4.5 pound pull for 30 s	± 0.25 % ΔR
Insulation Resistance	10 000 MΩ (minimum)	-
Dielectric Withstanding Voltage	No evidence of arcing or damage (200 V <sub>RMS</sub> for 1 min)	-



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.