Molded, SOT-23 Thin Film Resistor, Surface Mount Divider Network

Actual Size

FEATURES

- Excellent long term ratio stability (ΔR ± 0.015 %, 2000 h, +70 °C)
- Ratio tolerances to ± 0.01 %
- Low TCR tracking ± 2 ppm
- Zero ohm jumper option available
- Standard JEDEC® TO-236 package variation AB
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS* Available

HALOGEN FREE

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

LINKS TO ADDITIONAL RESOURCES

Footprints

Packages

Vishay Dale Thin Film MPM Series Dividers provide ± 2 ppm/°C tracking and a ratio tolerance as tight as 0.01 %, small size, and exceptional stability for all surface mount applications. The standard SOT-23 package format with unity and common standard resistance divider ratios provide easy selection for most applications requiring matched pair resistor elements. The ratios listed are available for off the shelf delivery. Ratios not listed but within the datasheet limits are available without NRE charge. See “Global Part Number Information” table for guidance how to create part number for ordering.

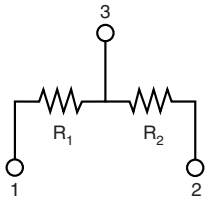
TYPICAL PERFORMANCE

	ABSOLUTE	TRACKING
TCR	25	2
	ABSOLUTE	RATIO
TOL.	0.1	0.05

Note

- Typical performance TCR and tolerance does not apply to zero ohm jumper

SCHEMATIC



STANDARD DIVIDER RATIOS (R_2/R_1) COMMONLY STOCKED BY DISTRIBUTORS

RATIO	R_2 (Ω)	R_1 (Ω)	RATIO	R_2 (Ω)	R_1 (Ω)
100:1	100K	1K	2:1	10K	5K
50:1	50K	1K	2:1	2K	1K
25:1	25K	1K	1:1	100K	100K
20:1	20K	1K	1:1	50K	50K
10:1	20K	2K	1:1	25K	25K
10:1	10K	1K	1:1	10K	10K
9:1	9K	1K	1:1	5K	5K
9:1	900	100	1:1	2.5K	2.5K
6:1	6K	1K	1:1	2K	2K
5:1	10K	2K	1:1	1K	1K
5:1	5K	1K	1:1	500	500
4:1	8K	2K	1:1	250	250
4:1	4K	1K	1:2	5K	10K
3:1	7.5K	2.5K	1:2.5	10K	25K
2:1	50K	25K	1:4	7.5K	30K
2:1	12K	6K	1:9	10K	90K

For technical questions, contact: thinfilm@vishay.com

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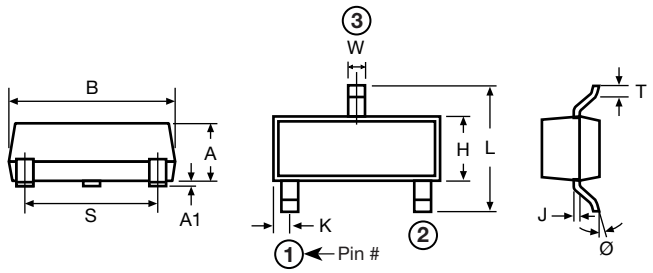
STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Passivated nichrome	-
Pin/Lead Number	3	-
Resistance Range	250 Ω to 100 kΩ per resistor	-
Resistance for Jumper	≤ 50 mΩ	-
TCR: Absolute	± 25 ppm/°C	-55 °C to +125 °C
TCR: Tracking	± 2 ppm/°C (typical)	-55 °C to +125 °C
Tolerance: Absolute	± 0.05 % to ± 1.0 %	+25 °C
Tolerance: Ratio	± 0.01 % to 0.5 %	+25 °C
Power Rating: Resistor	100 mW	Maximum at +70 °C
Power Rating: Package	200 mW	Maximum at +70 °C
Stability: Absolute	Δ*R* ± 0.05 %	2000 h at +70 °C
Stability: Ratio	Δ*R* ± 0.015 %	2000 h at +70 °C
Voltage Coefficient	0.1 ppm/V	-
Working Voltage	100 V max. not to exceed $\sqrt{P \times R}$	-
Operating Temperature Range	-55 °C to +125 °C	-
Storage Temperature Range	-55 °C to +150 °C	-
Noise	< -30 dB	-
Thermal EMF	0.2 µV/°C	-
Shelf Life Stability: Absolute	Δ*R* ± 0.01 %	1 year at +25 °C
Shelf Life Stability: Ratio	Δ*R* ± 0.002 %	1 year at +25 °C

Note

- TCR and TCR tracking are not available for parts with zero ohm jumpers

DIMENSIONS AND IMPRINTING in inches and millimeters

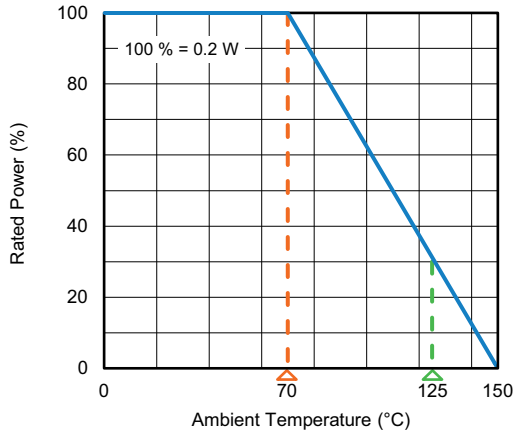


DIMENSION	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.031	0.040	0.79	1.02
A1	0.001	0.004	0.02	0.10
B	0.105	0.120	2.67	3.05
S	0.071	0.079	1.80	2.00
W	0.015	0.021	0.38	0.54
L	0.083	0.098	2.10	2.50
H	0.047	0.055	1.20	1.40
T	0.005	0.010	0.13	0.25
J	0.0035	0.0059	0.089	0.15
K	0.017	0.022	0.44	0.55
Ø	0	8°	0	8°

MECHANICAL SPECIFICATIONS

Resistive Element	Passivated nichrome
Substrate Material	Silicon
Body	Molded epoxy
Terminals	Copper alloy
Lead (Pb)-free Option	100 % matte tin
Tin Lead Option	Sn85
Tin Lead and Lead (Pb)-free Finish	Plated

DERATING CURVE



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GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: MPM1003AWS

M	P	M				1	0	0	3			A	W	S
M	P	M	T	1	0	0	1	5	0	0	1	A	T	1

GLOBAL MODEL (3 or 4 digits)

MPM
(Tin lead)

MPMT
(Lead (Pb)-free)
(e3)

RESISTANCE (4 or 8 digits)

First 3 digits are significant figures and the last digit specifies the number of zeros to follow. When like values are required use total resistance. When dual values are required list both values.
0000 = zero ohm jumper for R value
UUUU = open connection in place of R value

Example:
(List R_1 first in part number with dual values)
1002 = 10K (5K / 5K)
1003 = 100K (50K / 50K)
10011002 = 1K / 10K divider
0000UUUU = R_1 = jumper, R_2 = open
UUUU0000 = R_1 = open, R_2 = jumper
00UUUU00 = jumper connection pin 1 to pin 2
0000 = R_1 and R_2 = jumpers
00001002 = R_1 = jumper, R_2 = 10K
50010000 = R_1 = 5K, R_2 = jumper

TOLERANCE AND RATIO TOLERANCE (1)

Abs. Tol.	Ratio
A = 0.1 %	0.05 %
B = 0.1 %	0.1 %
C = 0.25 %	0.1 %
D = 0.5 %	0.1 %
F = 1 %	0.5 %
Z = 0.1 % (2)	0.025 %
Q = 0.05 % (2)	0.01 %
N = for jumpers only	

PACKAGING

BS = BULK 100 min., 1 mult.
WS = WAFFLE 100 min., 1 mult.

TAPE AND REEL
T0 = 100 min., 100 mult.
T1 = 1000 min., 1000 mult. (3)
T3 = 300 min., 300 mult.
T5 = 500 min., 500 mult.
TF = full reel 4000
TS = 100 min., 1 mult.

Historical Part Number Example: MPM1002BW (for reference purposes only)

MPM	1002	B	W
SERIES	RESISTANCE	TOLERANCE AND RATIO TOLERANCE	PACKAGING

Notes
(1) For combinations of a resistor and a zero ohm jumper only the absolute tolerance applies to the resistor value
(2) Tolerance available 1K and up equal values only
(3) Preferred packaging code

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