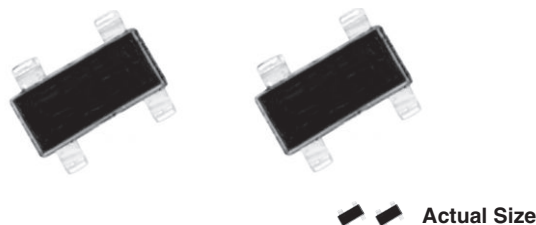


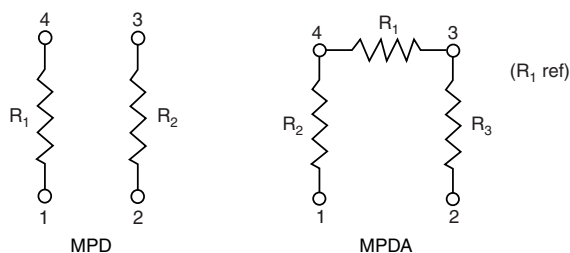


# Molded, SOT-143 Thin Film Resistor, Surface Mount Network



Vishay Dale Thin Film MPD series dividers provide  $\pm 2$  ppm/ $^{\circ}$ C tracking and a ratio tolerance as tight as  $\pm 0.05$  %, small size, and exceptional stability for all surface mount applications. The standard SOT-143 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 convenience, if you require a non-standard ratio, consult the applications engineering group as we may be able to meet your requirements.

## SCHEMATIC



## FEATURES

- Tight ratio tolerances to 0.05 %
- $\pm 2$  ppm tracking
- Standard values stocked
- Standard JEDEC<sup>®</sup> TO-253 package
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



## 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.

## TYPICAL PERFORMANCE

TCR	ABSOLUTE	TRACKING
	25	2
TOL.	ABSOLUTE	RATIO
	0.1	0.05

## STANDARD VALUES

MODEL	R <sub>1</sub> (Ω)	R <sub>2</sub> (Ω)	R <sub>3</sub> (Ω)
MPD	100K	100K	-
	50K	50K	-
	25K	25K	-
	20K	20K	-
	10K	10K	-
	5K	5K	-
	2K	2K	-
MPDA	1K	1K	-
	10K	10K	10K

## STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Passivated nichrome	-
Pin/Lead Number	4	-
Resistance Range	1000 Ω to 100 kΩ per resistor	-
TCR: Absolute	$\pm 25$ ppm/ $^{\circ}$ C	-55 $^{\circ}$ C to +125 $^{\circ}$ C
TCR: Tracking	$\pm 2$ ppm/ $^{\circ}$ C (typical)	-55 $^{\circ}$ C to +125 $^{\circ}$ C
Tolerance: Absolute	$\pm 0.1$ % to $\pm 1.0$ %	+25 $^{\circ}$ C
Tolerance: Ratio	$\pm 0.05$ % to $\pm 0.5$ %	+25 $^{\circ}$ C
Power Rating: Resistor	100 mW	Maximum at +70 $^{\circ}$ C
Power Rating: Package	200 mW	Maximum at +70 $^{\circ}$ C
Stability: Absolute	$\Delta R \pm 0.05$ %	2000 h at +70 $^{\circ}$ C
Stability: Ratio	$\Delta R \pm 0.015$ %	2000 h at +70 $^{\circ}$ C
Voltage Coefficient	0.1 ppm/V	-
Working Voltage	100 V max. not to exceed $\sqrt{P \times R}$	-
Operating Temperature Range	-55 $^{\circ}$ C to +125 $^{\circ}$ C	-
Storage Temperature Range	-55 $^{\circ}$ C to +150 $^{\circ}$ C	-
Noise	< -25 dB	-
Thermal EMF	0.2 $\mu$ V/ $^{\circ}$ C	-
Shelf Life Stability: Absolute	$\Delta R \pm 0.01$ %	1 year at +25 $^{\circ}$ C
Shelf Life Stability: Ratio	$\Delta R \pm 0.002$ %	1 year at +25 $^{\circ}$ C

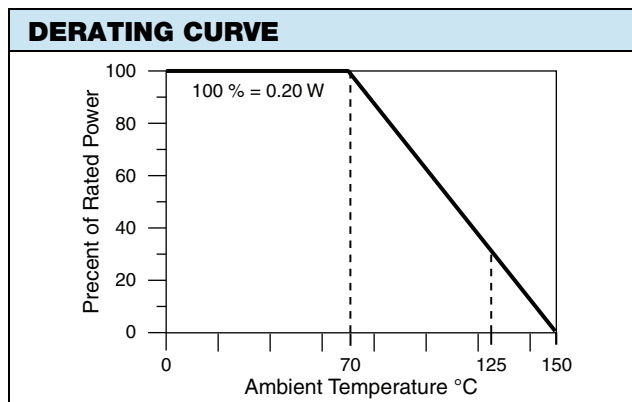
## Note

- Tantalum nitride film is available on special orders



DIMENSIONS AND IMPRINTING in millimeters				
	<b>DIMENSION</b>	<b>MIN.</b>	<b>NOM.</b>	<b>MAX.</b>
	A	0.80	-	1.22
	A1	0.05	-	0.15
	A2	0.75	0.90	1.07
	b	0.30	-	0.50
	b1	0.30	0.40	0.45
	b2	0.76	-	0.89
	b3	0.76	0.80	0.84
	c	0.08	-	0.20
	c1	0.08	0.10	0.16
	D	2.80	2.90	3.04
	E	2.10	-	2.64
	E1	1.20	1.30	1.40
	e	1.92 BSC		
	e1	0.20 BSC		
	L	0.40	0.50	0.60
L1	0.54 REF.			
N	4			
Ø	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



GLOBAL PART NUMBER INFORMATION			
New Global Part Numbering: MPD1003AWS			
M	P	D	T
1	0	0	3
A	W	S	
M	P	D	T
2	0	0	1
A	T	1	
GLOBAL MODEL (3 or 4 digits)	RESISTANCE (4 or 8 digits)	TOLERANCE AND RATIO TOLERANCE	PACKAGING
<b>MPD</b> (Two resistors, tin lead) <b>MPDT</b> (Two resistors, lead (Pb)-free) (e3)	The 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.  Example: 1002 = 10K (5K / 5K) 1003 = 100K (50K / 50K)	Abs. Tol.      Ratio <b>A</b> = ± 0.1 %      ± 0.05 % <b>B</b> = ± 0.1 %      ± 0.1 % <b>C</b> = ± 0.25 %      ± 0.1 % <b>D</b> = ± 0.5 %      ± 0.1 % <b>F</b> = ± 1 %      ± 0.5 %	<b>BS</b> = BULK 100 min., 1 mult <b>WS</b> = WAFFLE 100 min., 1 mult  TAPE AND REEL <b>T1</b> = 1000 min., 1000 mult <sup>(1)</sup>
Historical Part Number example: MPD1002BW (for reference purposes only)			
MPD	1002	B	W
SERIES	RESISTANCE	TOLERANCE AND RATIO TOLERANCE	PACKAGING

Note  
<sup>(1)</sup> Preferred packaging code



**GLOBAL PART NUMBER INFORMATION**

New Global Part Numbering: MPDAT3002AWS

M	P	D	A	3	0	0	2	A	W	S	
M	P	D	A	T	3	0	0	2	A	W	S

GLOBAL MODEL (4 or 5 digits)	RESISTANCE	TOLERANCE AND RATIO TOLERANCE	PACKAGING												
<p><b>MPDA</b> (Three equal series resistors, tin / lead)</p> <p><b>MPDAT</b> (Three equal series resistors, lead (Pb)-free) (e3)</p>	<p>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.</p> <p>Example: 3002 = three 10 kΩ resistors</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Abs. Tol.</th> <th style="width: 50%;">Ratio</th> </tr> </thead> <tbody> <tr> <td><b>A</b> = ± 0.1 %</td> <td>± 0.05 %</td> </tr> <tr> <td><b>B</b> = ± 0.1 %</td> <td>± 0.1 %</td> </tr> <tr> <td><b>C</b> = ± 0.25 %</td> <td>± 0.1 %</td> </tr> <tr> <td><b>D</b> = ± 0.5 %</td> <td>± 0.1 %</td> </tr> <tr> <td><b>F</b> = ± 1 %</td> <td>± 0.5 %</td> </tr> </tbody> </table>	Abs. Tol.	Ratio	<b>A</b> = ± 0.1 %	± 0.05 %	<b>B</b> = ± 0.1 %	± 0.1 %	<b>C</b> = ± 0.25 %	± 0.1 %	<b>D</b> = ± 0.5 %	± 0.1 %	<b>F</b> = ± 1 %	± 0.5 %	<p><b>BS</b> = BULK 100 min., 1 mult <b>WS</b> = WAFFLE 100 min., 1 mult</p> <p>TAPE AND REEL <b>T1</b> = 1000 min., 1000 mult <sup>(1)</sup></p>
Abs. Tol.	Ratio														
<b>A</b> = ± 0.1 %	± 0.05 %														
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<b>C</b> = ± 0.25 %	± 0.1 %														
<b>D</b> = ± 0.5 %	± 0.1 %														
<b>F</b> = ± 1 %	± 0.5 %														

**Historical Part Number Example: MPDA3002BT (for reference purposes only)**

MPDA	3002	B	T
SERIES	RESISTANCE	TOLERANCE AND RATIO TOLERANCE	PACKAGING

**Note**

<sup>(1)</sup> Preferred packaging code



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