

Precision Surface Mount Resistors Wirewound or Metal Film Technologies



Specially designed for surface mounting, the MSP series uses either wirewound or metal film technology. The molded package ensures mechanical and climatic protection as well as high dielectric insulation.

FEATURES

- Wide range of ohmic values (R04 to 1M)
- Low temperature coefficient (± 25 ppm/ $^{\circ}\text{C}$ available)
- Good electrical insulation
- Good mechanical strength
- High power (to 2.5 W)
- Termination = Pure Matte Tin

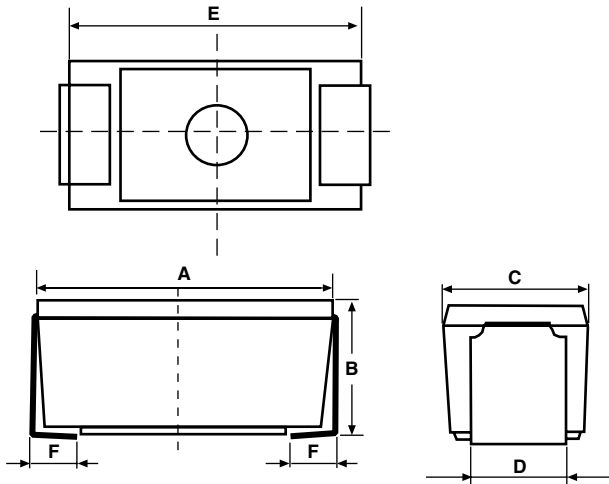


RoHS
COMPLIANT

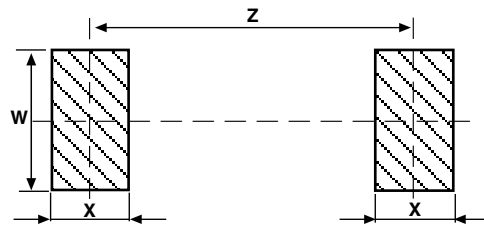
The MSP design is compatible with surface mounting equipment and can withstand wave and reflow soldering techniques.

DIMENSIONS in millimeters

MSP



RECOMMENDED SOLDERING AREAS



DIMENSIONS SERIES	A	B	C	D	E	F	W	X	Z
MSP 1	6.9	3.8	3.8	2.5	6.5	1.4	2.7	2.9	6
MSP 2	11.4	5	7	5	11	2.4	5.2	4.1	9.4
MSP 3	14.8	6.6	7	5	14.4	2.4	5.2	4.1	12.7

General tolerance: ± 0.2 mm

TECHNICAL SPECIFICATIONS

RESISTIVE TECHNOLOGY		WIREWOUND			METAL FILM	
Vishay Sfernice Series EN140400		MSP 1B RW1	MSP 2B RW2	MSP 3B RW3	MSP 1C RW1	MSP 2C RW2
Power Dissipation at + 25 $^{\circ}\text{C}$		1 W	2 W	2.5 W	0.5 W	1 W
Ohmic Range In Relation to Tolerance	$\pm 5\%$	0.04 2.2K	0.04 4.7K	0.04 13K	-	-
	$\pm 2\%$	0.04 2.2K	0.04 4.7K	0.05 13K	-	-
	$\pm 1\%$	0.04 2.2K	0.04 4.7K	0.05 13K	10 332K	10 1M
	$\pm 0.5\%$	0.4 2.2K	0.4 4.7K	0.3 13K	10 332K	10 1M
	$\pm 0.1\%$	Consult VISHAY SFERNICE			10 332K	10 332K
Limiting Element Voltage		50 V	120 V	200 V	300 V	350 V
Critical Resistance		-	-	-	180K	122.5K
Average Weight (in g)		0.2	0.8	1.5	0.2	0.8



PERFORMANCE					
TESTS	CONDITIONS		REQUIREMENTS		TEST RESULTS
	Wirewound	Metal Film	Wirewound EN140402-801	Metal Film EN140401-802	
Dielectric w/s Voltage	500 V RMS		$\pm (0.1 \% + 0.05)$	$\pm 0.25 \%$	$\pm 0.05 \%$
Short Time Overload	5 Pr/5 s		$\pm (0.25 \% + 0.05)$	$\pm 0.25 \%$	$\pm 0.15 \%$
Climatic Sequence	5 cycles - 55 °C + 200 °C - 55 °C + 125 °C		$\pm (0.5 \% + 0.05)$ Ins. resistance > 100M	$\pm 0.5 \%$ Ins. resistance > 100M	$\pm 0.2 \%$ Ins. resistance > 103M
Humidity (Steady State)	56 days 95 % RH	10 days low load	$\pm (0.5 \% + 0.05)$ Ins. resistance > 100M	$\pm 1 \%$ Ins. resistance > 100M	$\pm 0.3 \%$ Ins. resistance > 103M
Vibration	10/2000 Hz	10/500 Hz	$\pm (0.25 \% + 0.05)$	$\pm 0.25 \%$	$\pm 0.05 \%$
Load Life	Pr + 25 °C 2000 h	1000 h Pr + 25 °C 90/30 cycle	$\pm (0.5 \% + 0.05)$ Ins. resistance 1G	$\pm 1 \%$	$\pm 0.5 \%$
Thermal Shock	260 °C 10 s		$\pm (0.25 \% + 0.05)$	$\pm 0.25 \% + 0.05$	$\pm 0.2 \%$

MSP B - Wirewound Technology

TEMPERATURE COEFFICIENT IN THE TEMPERATURE RANGE - 55 °C + 200 °C		
OHMIC RANGE	NF C 83-210 LIMITS	TYPICAL VALUE
< 1	$\pm 100 \text{ ppm}/^{\circ}\text{C}$	$\pm 50 \text{ ppm}/^{\circ}\text{C}$
1 to < 10	$\pm 50 \text{ ppm}/^{\circ}\text{C}$	
10	$\pm 25 \text{ ppm}/^{\circ}\text{C}$	+ 0 to - 20 ppm/°C

MSP C - Metal Film Technology

TEMPERATURE COEFFICIENT IN THE TEMPERATURE RANGE - 55 °C + 155 °C		
OHMIC RANGE	MSP 1C	MSP 2C
10 to 332K	K3: $\pm 50 \text{ ppm}/^{\circ}\text{C}$ K4: $\pm 25 \text{ ppm}/^{\circ}\text{C}$	
> 332K	-	K3: $\pm 50 \text{ ppm}/^{\circ}\text{C}$

SURFACE MOUNTING

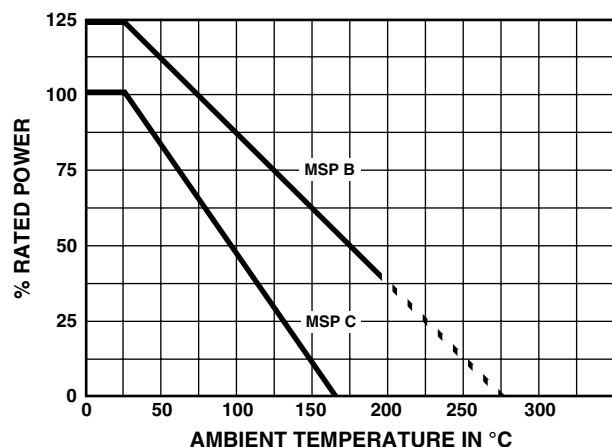
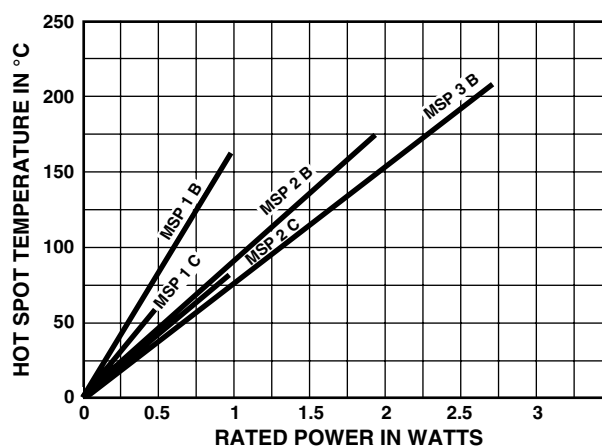
Soldering cycle: 2 minutes at 215 °C or 10 seconds at 260 °C or with an iron 40 W: 3 seconds at 350 °C.

Soldering is possible by wave, reflow and vapor phase.

NON INDUCTIVE WINDING

Non inductive (Ayrton Perry) winding available.

Please consult VISHAY SFERNICE.

POWER RATING CHART**TEMPERATURE RISE****PACKAGING**

In bulk (plastic bag of 100 units or multiples).

In tube: MSP1 70 units per tube

MSP2 50 units per tube

MSP3 40 units per tube

In reel of 500 units for MSP1 and MSP2.

MARKING

SFERNICE trademark, ohmic value (in Ω), tolerance (in %), series and style, technology, manufacturing date.

ORDERING INFORMATION

MSP	1	B		48U7	± 1 %	TC	BA100NA	e3
SERIES	STYLE	TECHNOLOGY	NON INDUCTIVE	OHMIC VALUE	TOLERANCE	Applicable only in "C" technology	PACKAGING	LEAD (Pb)-FREE
		B: Wirewound C: Metal Film	WINDING Optional					

SAP PART NUMBERING GUIDELINES

MSP	1	B	48R70	F	500	e3
MODEL	STYLE	TECHNOLOGY	OHMIC VALUE	TOLERANCE	PACKAGING	LEAD (Pb)-FREE



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