Power Metal Plate™ Current Sense Resistors, Low Value (2 mΩ to 8 mΩ), Hybrid Mount, High Power

FEATURES

- 3939 size package with Kelvin terminals
- Ideal for all types of current sensing and pulse applications including switching and linear power supplies, instruments, power amplifiers, shunts, and high power current sensing modules
- Proprietary processing technique produces low resistance values (2 mΩ to 8 mΩ)
- Solid metal manganese-copper and nickel-chromium alloy resistive element with low TCR (< 30 ppm/°C)
- Max. solder temperature up to 280 °C / 30 s or 250 °C / 5 min
- Very low inductance < 10 nH
- Finishes available for wire bonding, sintering, and soldering (backside);
  Electroless Nickel Immersion Gold (ENIG)
- Low thermal EMF (< 2 µV/°C)
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free Available

e4 RoHS* Available

HALOGEN FREE GREEN (5-2008) Available

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

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	SIZE	POWER RATING (1) W	TOLERANCE %	RESISTANCE VALUE RANGE Ω	WEIGHT (typical) g/1000 pieces
WFPA3939	3939	20 at 120 °C	± 1.0	0.002 to 0.004	437
WFPB3939	3939	20 at 120 °C	± 1.0	0.0041 to 0.008	437

Note

(1) Terminal temperature

GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: WFPA39392L000FEA

W	F	P	A	3	9	3	9	2	L	0	0	0	F	E	A		

GLOBAL MODEL (3 digits)	ELEMENT MATERIAL (1 digit)	CASE SIZE (4 digits)	RESISTANCE VALUE (5 digits)	TOLERANCE CODE (1 digit)	PACKAGING CODE (1) (2 digits)	SPECIAL (2 digits)
WFP	**A** = CuMn **B** = NiCrAl	**3939**	**L** = mΩ* **R** = decimal **2L000** = 0.002 Ω **R0100** = 0.01 Ω * Use "**L**" for resistance values < 0.01 Ω	**F** = ± 1.0 % **J** = ± 5.0 %	**EA** = lead (Pb)-free, tape / reel **EK** = lead (Pb)-free, bulk	Dash numbers **1** thru **99** as applicable

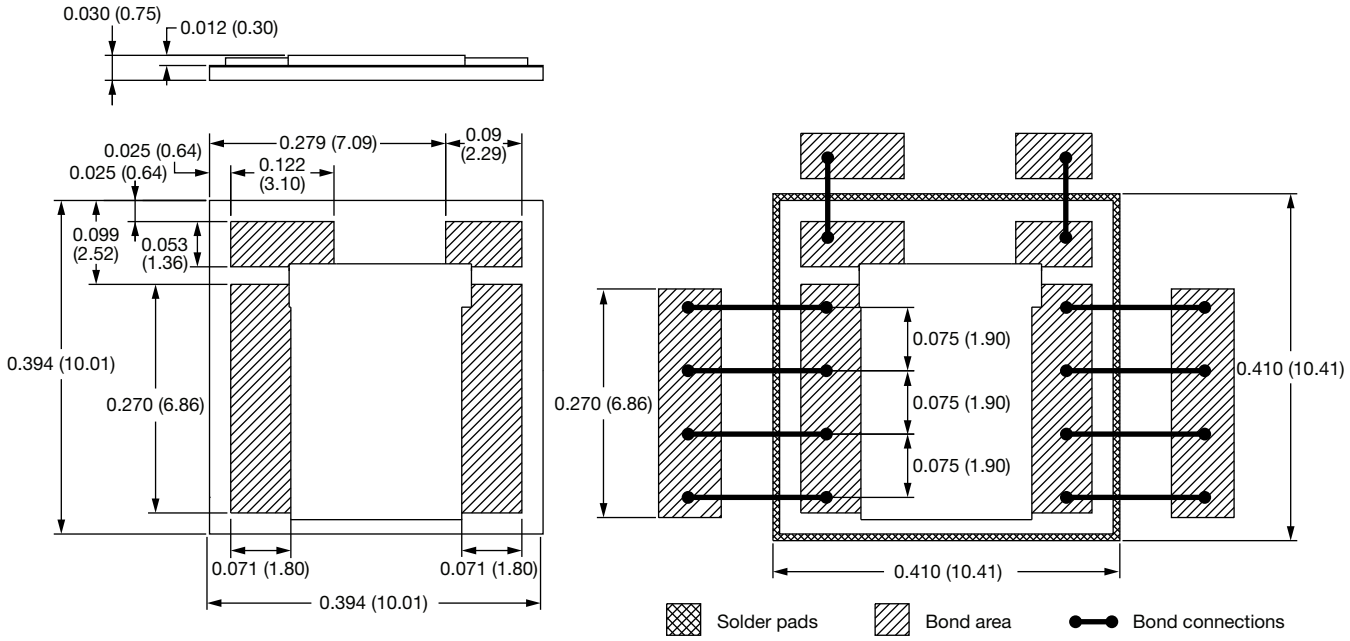
Notes

- Resistance values available per WSL decade values (www.vishay.com/doc?30117)

(1) Packaging code: EB (lead (Pb)-free) is a non-standard packaging code designating 500 piece reels. This non-standard packaging code is identical to our standard EA (lead (Pb)-free), except that it has a package quantity of 500 pieces

TECHNICAL SPECIFICATIONS		
PARAMETER	**UNIT**	**3939 RESISTOR CHARACTERISTICS**
Temperature coefficient (20 °C to 60 °C) (complete resistor)	ppm/°C	± 75
Temperature coefficient (20 °C to 60 °C) (only element material)	ppm/°C	± 30
Operating temperature range	°C	-65 to +170
Dielectric withstanding	V_{AC}	100
Maximum working voltage	V	$(P \times R)^{1/2}$
Maximum terminal temperature	°C	120

DIMENSIONS in inches (millimeters)

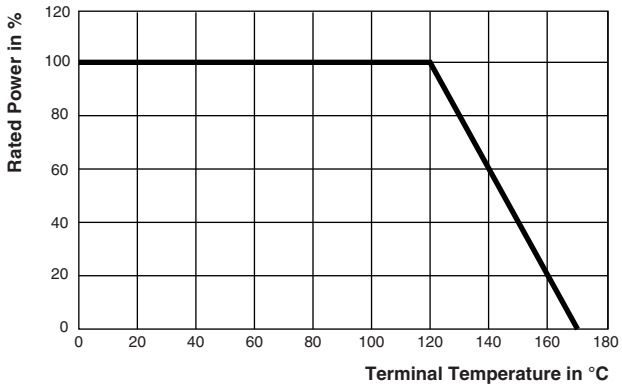


Note

- Thermal resistance (°C/W): < 2.5 °C/W

	MATERIAL	MIN. (µm)	MAX. (µm)
Backside finish	Au	0.05	0.15
	Ni	3.1	6.1
Top side termination	Au	0.05	0.15
	Ni	3.1	6.1
	Cu (reference only)	50	
	Ni (WFMB only)	< 0.01	

DERATING



PERFORMANCE				
TEST	CONDITIONS OF TEST	TEST LIMITS	TYPICAL PERFORMANCE	
			ALLOY A CuMn	ALLOY B NiCr
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 0.5 %	± 0.65 %	± 0.1 %
Short time overload	2x rated power, 5 s	± 0.5 %	± 0.05 %	± 0.05 %
Low temperature storage	-55 °C for 45 min	± 0.1 %	± 0.1 %	± 0.1 %
High temperature exposure	1000 h at +170 °C	± 1.0 %	± 0.6 %	± 0.1 %
Bias humidity	+85 °C, 85 % RH, 10 % power, 1000 h	± 0.5 %	± 0.2 %	± 0.1 %
Mechanical shock	100 *g*'s for 6 ms, 5 pulses	± 0.2 %	± 0.05 %	± 0.05 %
Vibration	Frequency varied, 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	± 0.2 %	± 0.05 %	± 0.05 %
Load life	1000 h at 125 °C, 1.5 h "ON", 0.5 h "OFF"	± 1.0 %	± 0.8 %	± 0.1 %
Resistance to solder heat	MIL-STD-202, method 210, test condition K	± 0.3 %	± 0.2 %	± 0.05 %
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7b not required	± 0.3 %	± 0.05 %	± 0.05 %

PACKAGING (1)				
MODEL	REEL			
	TAPE WIDTH	DIAMETER	PIECES/REEL	CODE
WFPA3939 WFPB3939	16 mm/embossed plastic	330 mm/13"	3000	EA

Notes

- Embossed carrier tape per EIA-481

(1) Additional packaging details at www.vishay.com/doc?20051

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