

Metal Foil Current Sense Resistors, 4-Terminal Low Value (Down to 0.001 Ω)



FEATURES

- 4-terminal design
- Ultra low sensing resistance
- Sulfur resistant according to EIA-977 test method A
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- Switching power supply
- Voltage regulation module
- DC/DC converter, adaptor, battery pack, charger
- Pad and cell phone
- Power management

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	SIZE	POWER RATING W	TOLERANCE %	RESISTANCE VALUES AVAILABLE m Ω	WEIGHT (typical) g/1000 pieces
WFK0612	0612	1	± 1	0.5, 1, 2, 3, 4, 5, 10	7.40

GLOBAL PART NUMBER INFORMATION

Global Part Numbering Example: WFK0612R0100FE66

W	F	K	0	6	1	2	R	0	1	0	0	F	E	6	6
GLOBAL MODEL (3 digits)			CASE SIZE (EIA) (4 digits)				RESISTANCE VALUE (5 digits) ⁽¹⁾					TOLERANCE CODE (1 digit)	PACKAGING CODE (3 digits)		
WFK			0612				L = m Ω ⁽²⁾ R = decimal 5L000 = 0.005 Ω R0100 = 0.01 Ω					F = ± 1.0 %	E66 = lead (Pb)-free 7" tape/reel		

Notes

- (1) Resistance values are available per E12 and E24 decades; www.vishay.com/doc?28372
(2) Use "L" for resistance values < 0.01 Ω

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	RESISTOR CHARACTERISTICS
		WFK0612
Temperature coefficient	ppm/°C	± 200 for 0.5 mΩ
		± 150 for 1 mΩ to 10 mΩ
Operating temperature range	°C	-55 to +170
Maximum working voltage	V	$(P \times R)^{1/2}$
Maximum element temperature	°C	170

DIMENSIONS in inches (millimeters)

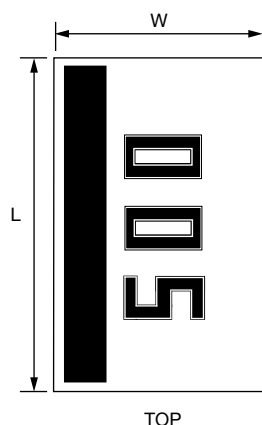
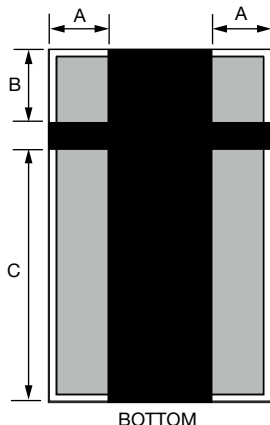


Fig. 1



BOTTOM

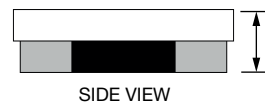


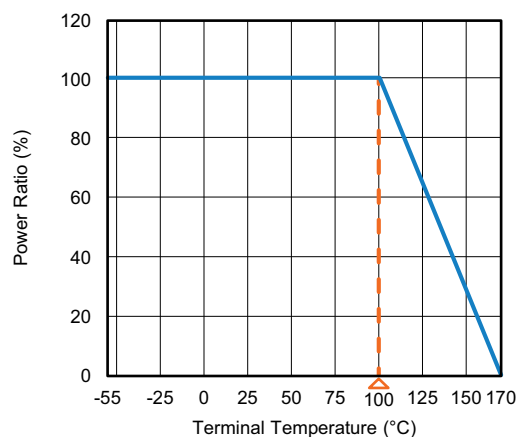
Fig. 2

TYPE (INCH SIZE)	RESISTANCE RANGE (mΩ)	DIMENSIONS (in millimeters)					
		L	W	t	A	B	C
WFK0612	0.5 to 10	3.1 ± 0.20	1.6 ± 0.20	0.5 ± 0.20	0.45 ± 0.20	0.45 ± 0.20	2.2 ± 0.20

Note

- 0402 has no marking; 0603, 0805, 1206 marking shows two digits for resistance

DERATING



**PERFORMANCES**

DESCRIPTION	AEC TEST NUMBER	TEST CONDITIONS	LIMIT
High temperature exposure (storage)	3	MIL-STD-202, Method 108, 1000 h at T = 170 °C at 0 % power, measurements at 24 h ± 4 h.	± (1.0 %)
Temperature cycling	4	JESD22 Method JA-104; 1000 cycles (-55 °C to +155 °C), measurement at 24 h ± 4 h after test conclusion. 15 min. dwell time at each temperature extreme. 1 min. maximum transition time.	± (2.0 %)
Moisture resistance	6	MIL-STD-202, Method 106, t = 24 h/cycle. Note: Steps 7a and 7b not required, 0 % power, no polo, 65 °C, measurement at 24 h ± 2 h after test.	± (1.0 %)
Biased humidity	7	MIL-STD-202, Method 103, 1000 h 85 °C/85 % RH. Note: specified conditions: 10 % of operating power. Measurement at 24 h ± 4 h after test.	± (1.0 %)
Operational life	8	MIL-STD-202 Method 108; 1000 h test; Condition D; 1.5 h "ON", 0.5 h "OFF"; terminal temperature +100 °C at rated power. Measurement 24 h ± 4 h after test conclusion.	± (1.0 %)
Resistance to solvents	12	MIL-STD-202 Method 215; Note: add aqueous wash chemical - OKEM clean or equivalent.	Marking remains legible
Mechanical shock	13	MIL-STD-202, Method 213, Condition C	± (1.0 %)
Vibration	14	MIL-STD-202 Method 204; 5 g's for 20 min., 12 cycles each of 3 orientations. Test from 10 Hz to 2000 Hz. Verify transfer load using a laser vibrometer or other adequate measuring device.	± (1.0 %)
Resistance to solder heat	15	MIL-STD-202, Method 210, Condition K	± (1.0 %)
Solderability	18	J-STD-002; Method D; 4 h at +155 °C dry heat; +260 °C lead (Pb)-free; no electrical test; 50 x mag.	> 95 % coverage
Electrical characterization	19	RTC at -55 °C and 170 °C tref. +25 °C	Refer to Technical Specifications table
Flammability	20	UL 94	V-0
Board flex	21	AEC-Q200-005; 2 mm min., 60 s hold time.	± (1.0 %)
Terminal strength (SMD)	22	AEC-Q200-006 force of 1.8 kg for 60 s.	± (1.0 %)
Short time overload		MIL-PRF-55342 paragraph 4.8.6: 5 x rated power for 5 s.	± (1.0 %)
Low temperature storage		MIL-PRF-26 Paragraph 4.7.12	± (1.0 %)

Note

- Full qualification data available upon request at ww2bresistors@vishay.com

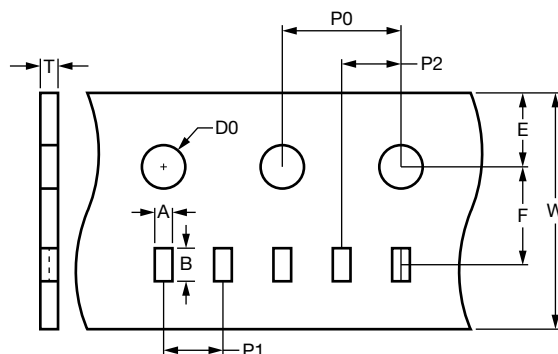
TAPE PACKAGING SPECIFICATIONS

MODEL	REEL		
	TAPE WIDTH	DIAMETER	PIECES/REEL
WFK0612	Embossed paper tape	178 mm / 7"	5000

Note

- Embossed carrier tape per EIA (EIAJ)

PAPER TAPE SPECIFICATIONS



TYPE	RESISTANCE RANGE	CARRIER DIMENSIONS (in millimeters)									
		A	B	E	F	W	P0	P1	P2	D0	T
WFK0612	0.5 mΩ to 10 mΩ	2.0 ± 0.05	3.6 ± 0.05	1.75 ± 0.1	3.5 ± 0.05	8.0 ± 0.2	4.0 ± 0.1	2.0 ± 0.1	2.0 ± 0.05	1.55 ± 0.05	0.75 ± 0.1

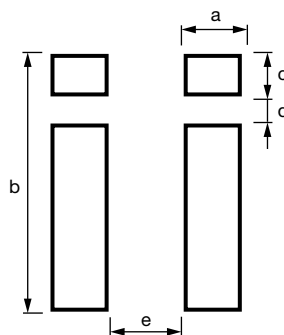
Notes

- Embossed carrier tape per EIA (EIAJ)
- Additional packaging details at www.vishay.com/doc?20051

STORAGE CONDITIONS

Temperature: 5 °C to 35 °C, humidity: 40 % to 75 %

RECOMMENDED SOLDER PAD LAYOUT



TYPE	PAD LAYOUT DIMENSIONS (in millimeters)				
	a	b	c	d	e
0612 (0.5 mΩ to 10 mΩ)	1.0	3.8	0.80	0.30	0.60

Note

- Recommend to use the steel plate which thickness > 100 μm to avoid the insufficient solder height

SOLDERING RECOMMENDATIONS

- Peak reflow temperatures and durations:
 - IR reflow peak = 260 °C max. for 10 s
 - Wave solder = 260 °C max. for 10 s
- Compatible with lead and lead (Pb)-free solder reflow processes
- Recommended IR reflow profile for surface mount devices: www.vishay.com/doc?31052



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