Power Resistors Wire Thick Film Technology



FEATURES

- AEC-Q200 qualified (pending)
- Technology: thick film deposited on ceramic
- Cooled by auxiliary heatsink (not supplied)
- Cold system without external radiation
- High power 650 W at 85 °C bottom case temperature
- Non-inductive
- Low profile
- Easy assembly, self-calibrated pressure
- Internal temperature monitoring with a NTC thermistor
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

APPLICATIONS

- Precharge, discharge, and active discharge
- Power conversion and snubber

STANDARD ELECTRICAL SPECIFICATIONS					
MODEL	RESISTANCE RANGE Ω	MAX. RATED POWER $BC_{85\ °C}$ W	TOLERANCE (1) ± %	TEMPERATURE COEFFICIENT ± ppm/°C	E-SERIES OHMIC VALUES
RPWA	6.2 to 1M	650	5, 10	150	E24

Note

(1) ± 2 % or ± 1 % on special request for limited resistance value and with reduction of maximum power and pulse rating (contact us for details)

MECHANICAL SPECIFICATIONS	
UL 94 flame classifications	Material complies with the standard UL 94 V-0
Resistive element	Cermet
Substrate	Alumina
Encapsulation	Resin filled case
Cables	Cable type: FHL2G 0.5 mm^2 (NTC) / 1.5 mm^2 (power)

Note

- Custom cable lengths, terminal type, and termination available upon request: please contact us for configuration options

TECHNICAL SPECIFICATIONS	
PARAMETER	RPWA 650
Operating temperature range resistor body	-55 °C to +155 °C
Nominal power at 85 °C bottom case temperature	650 W
Maximum operating voltage	1500 V_{DC} (1000 V_{AC}) (up to 6000 V_{DC} on request)
Dielectric strength V_{RMS} (50 Hz / 1 min)	4000 V (up to 7000 V on request)
Dielectric strength power resistor to NTC resistor	1500 V_{RMS} (50 Hz / 1 min)
Self-inductance (frequency 10 kHz)	≤ 40 nH, typical without cables (consult us for your specific cable length, e. g. < 0.7 µH with two standard cables of 250 mm)
Insulation	≥ 10 GΩ at 1000 V_{DC}
Weight (max.)	80 g
NTC characteristics (option)	Vishay NTCS0603E3103FLT Vishay NTC is AEC-Q200 qualified Temperature cycling test -55 °C / +150 °C See “Resistance Value vs. Temperature” chart

For technical questions, contact: mcbfixedresistors@vishay.com

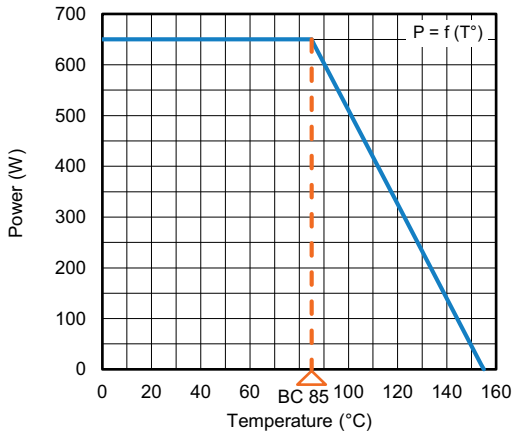
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PERFORMANCES (AEC-Q200 qualification pending)		
TESTS	**CONDITIONS**	**REQUIREMENTS**
High temperature exposure	MIL-STD-202 method 108 - 1000 h at T = 155 °C. Unpowered.	≤ ± (2 % + 0.1 Ω)
Temperature cycling	JESD22 method JA-104 - 1000 cycles (-40 °C to +125 °C)	≤ ± (2 % + 0.1 Ω)
Biased humidity	MIL-STD-202 method 103 / test cab of IEC 60068-2-78 - 1000 h 85 °C / 85 % RH, Powered to 1 W. (exception: 1 MΩ will be tested unpowered)	≤ ± (5 % + 0.1 Ω)
Operational life	MIL-STD-202 method 108 condition D Steady state T_A = 85 °C of bottom case at rated power 650 W 90' on / 30' off / 1000 h	≤ ± (5 % + 0.1 Ω)
Terminal strength (leaded)	MIL-STD-202 method 211 - test leaded device lead integrity only Conditions: A (2.27 kg cables 0.5 mm^2, 4 kg cables 1.5 mm^2)	≤ ± (0.5 % + 0.1 Ω)
Mechanical shock	MIL-STD-202 method 213 /IEC 60068-2-29 test Eb: /Ea of IEC 60068-2-27	≤ ± (0.5 % + 0.1 Ω)
Vibration	MIL-STD-202 method 204 /Fc of IEC 60068-2-6	≤ ± (0.5 % + 0.1 Ω)
ESD	AEC-Q200-002 - 6 kV to 25 kV	≤ ± (0.5 % + 0.1 Ω)

Note

- All tests were done in Vishay MCB laboratory conditions

DISSIPATION



Permanent Applicable Power (W) as a Function of Bottom Case Temperature (°C)

ENERGY

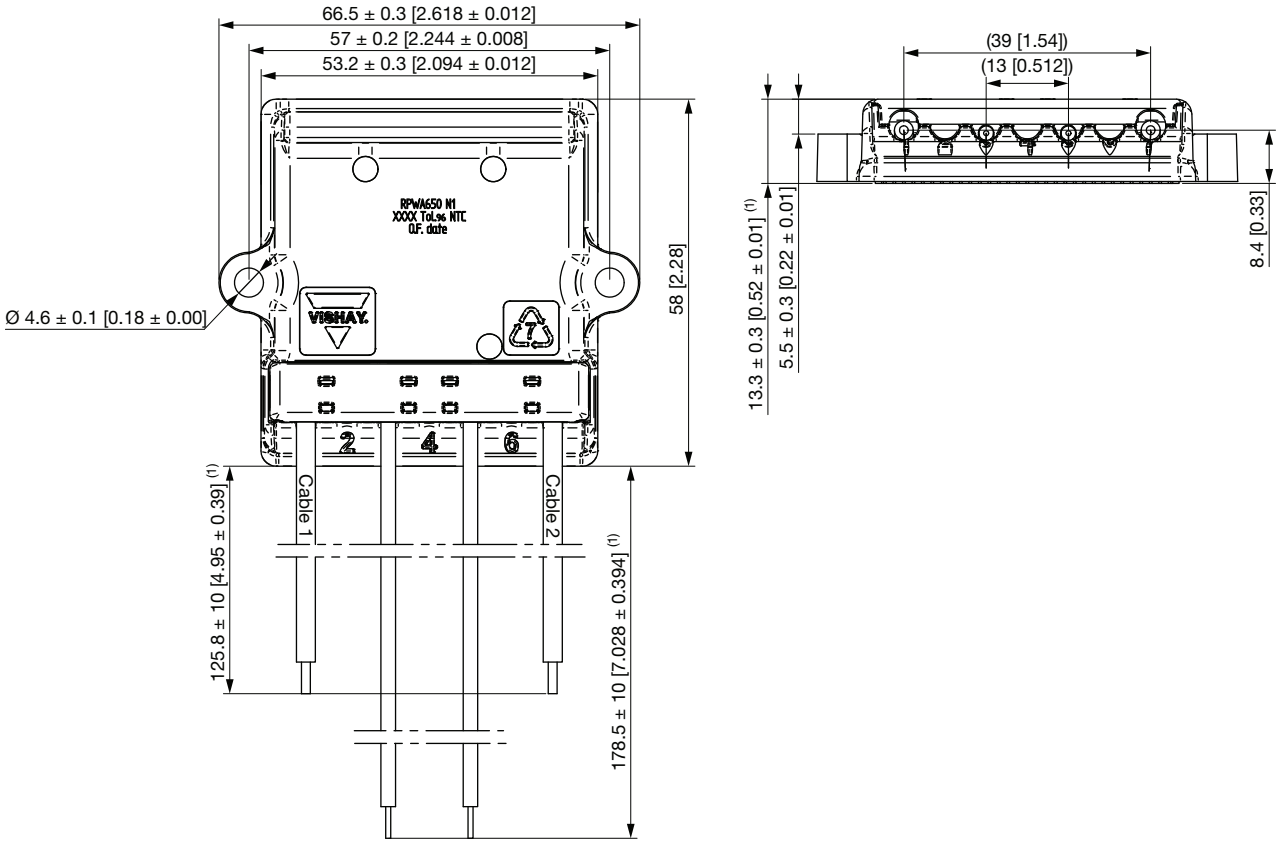
Repetitive operation: 3.5 J / pulse t = 50 µs

Other t values: contact us

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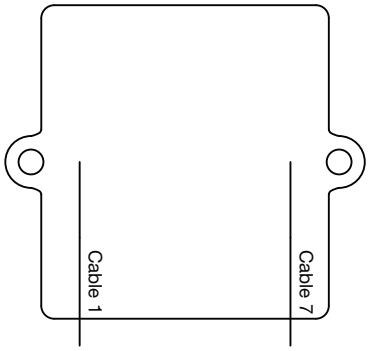
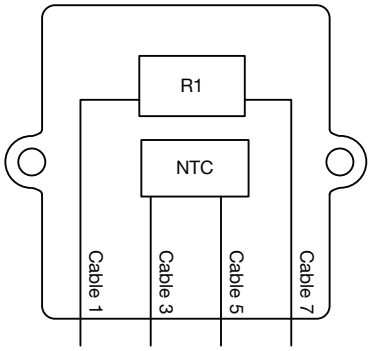
DIMENSIONS in millimeters [inches]



Note

(1) Under alumina

CONFIGURATION

CONFIGURATION R1	CONFIGURATION N1
	

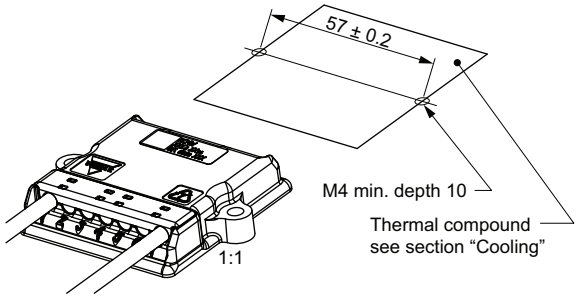
OPTIONS

- Other configuration upon request
- Thermal sensor

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ASSEMBLY



Tightening torque for mechanical mounting:
1.8 Nm ± 0.2 Nm

COOLING

The temperature of the heatsink may be maintained at the specified values with:

- Forced air ventilation or internal circulation of a liquid cooling
- Heatsink contact surface: < Ra 6.3 µ
- Evenness defect: 0.05 mm max.
- Surface temperature gradient (isotherm): 20 °C max.
- Thermal compound not supplied (resistance < 0.025 °C/W / 0.05 mm preconized)
- Mounting recommendation: www.vishay.com/doc?32586

The user must select the thermal resistance of the heatsink according to the power applied

ORDERING INFORMATION

RPWA	650	N1	XXXX	5 %	XXX	BO10
MODEL	STYLE	CONFIGURATION Single resistor or resistor and NTC	RESISTANCE VALUE	TOLERANCE	CUSTOM DESIGN (optional on request)	PACKAGING

GLOBAL PART NUMBER INFORMATION

R	P	W	A	6	5	0	N	1	1	8	0	2	J	B	X	X	X
1							2		3				4	5	6		

1	2	3	4	5	6
GLOBAL MODEL	CONFIGURATION	OHMIC VALUE	TOLERANCE	PACKAGING	INDUSTRIALIZATION NUMBER
RPWA 650	**R1: resistor only N1: resistor and NTC**	**The first three digits are significant figures and the last specifies the number of zeros to follow, R designates decimal point. 1802 = 18 kΩ**	**J = 5 % K = 10 %**	**B = box**	**3 specific digits (if applicable)**

EXAMPLE

MODEL	DESCRIPTION	PART NUMBER
RPWA 650	RPWA 650 N1 6U20 5 % xxx BOxx	RPWA650N16R20JBxxx

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