POWER RESISTORS

OTR - Series, OTR2620

Power - Thick Film Resistors

FEATURES

- Resistance from 0,02Ω
- Temperature Coefficients ±100ppm/°C
- Resistance Tolerances ±5%
- Power up to 20Watts (cooled)
- TO - 127 Style
- Low Inductance
- RoHS - compliant

RATED VALUES (IEC 60115-1)

Resistance Range	Ω	0,02Ω to 510KΩ
Resistance Tolerance	%	5%
Temperature Coefficient	ppm/°C	±300ppm°C < 0,05Ω; ±250ppm°C < 0,1Ω; ±100ppm°C ≥ 0,1Ω
Operating Voltage (U_{max})	V	500V or √(P x R)
Insulation Resistance (R_{ins})	Ω	>1G
Capacitance	F	1 pF
Inductance	H	8,25 nH
Operating Temperature Range (T)	°C	-55°C - 175°C

Type	U_{max}	Power P_{25}	Power P_{70}	Heat Resistance	Tolerance- /Resistance Range	
	(V)	(W)	(W)	(°C/W)	(Ω) E6	(Ω) E24
OTR2620	500	20*	14*	5,9	0R02 - 0R09	0R1 - 510K0
						* Power without additional cooling 1 Watt

PERFORMANCE

IEC 60115-1	Test	Conditions of Test	Specification ΔR
4.23	Moisture Resistance	+40°C, 90-95% R.H., Rated Voltage at Power 0,1W, 1000h	±(1,0% R +0,05Ω)
4.19	Thermal Shock	-55°C 30 Minutes, +155° 30 Minutes, 1000h	±(0,52% R +0,05Ω)
4.6	Dielectric Strength	U_{ins} 2000VAC, 60 Seconds, 1mA	
4.25	Endurance	+25°C, U_{max} 1,5h „ON“ and 0,5h ”OFF”, 1000h	±(1,0% R +0,05Ω)
4.22	Vibration	Frequency 100Hz - 2000Hz, 10 Cycles, 90 Minutes	±(0,25% R +0,05Ω)
4.18	Soldering Resistance	350°C, max. 3s	±(1,0% R +0,05Ω)

CONSTRUCTION

Resistance Material	Ruthenium-based Thick Film Layer
Housing	Insulation-proof Plastic
Terminals	Tin Plated Copper
Thermal Flange Plate	Nickel Plated Copper, electrical isolated

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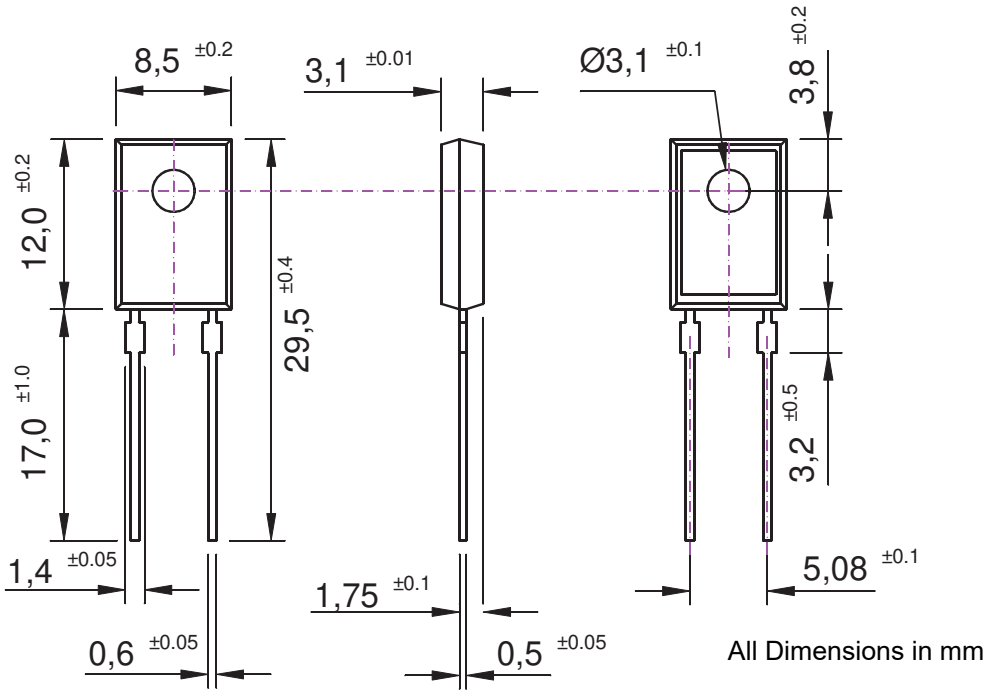
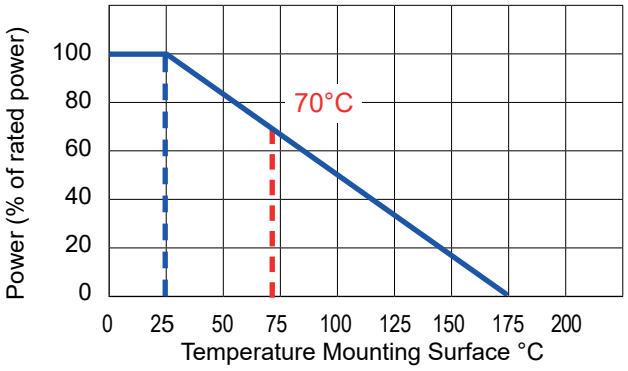
DIMENSIONS



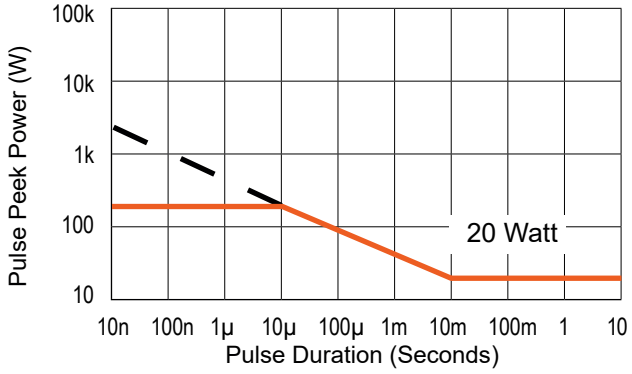
- Mounting instructions: Resistor and cooling surface (body) must be free of grease and contamination. Cooling surface or heat sink should not have unevennesses (max. 0.05mm / 50mm²). For better heat dissipation it is recommended to use suitable thermal compounds. The tightening torque for fixing the resistor to the heat sink must be selected according to the thermal paste used. About 0.6Nm are recommended.

POWER DERATING CURVE



- Temperature profile with mounted heat sink, with specific thermal resistance of 2.8°C/W.

PULSE ENERGY DURABILITY



— — expected value

The pulse test was performed with a pulse repeat rate of 100Hz. The specifications are typical test values, they do not describe any specification.

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CALCULATION / DIMENSIONING OF A SUITABLE COOLING

The power resistors of the OTR series must be combined with a sufficiently dimensioned cooling system. Suitable are heat sinks, housing surfaces, active cooling by means of fans or water cooling. It is recommended that these power resistors are not constantly operated at maximum continuous load. Operating at approx. 80 - 85% of the rated power ensures the stability of the resistance tolerance, the nominal resistance values and the load live especially under load changing conditions.

The maximum surface temperature of the OTR resistors must not exceed 125 ° C. When calculating the cooling, the ambient temperature must be taken into account. This factor is directly included in the calculation, so it is advisable not to disregard the use in the field. Typical example: Use in the control cabinet, if it is not temperature-controlled, heat build-up in the convective air flow is possible, this can negatively influence the assumed values of the original calculation.

Calculation of the heat resistance of the heat sink:

P_θ - Power of the Resistor in Watts
R_θ - Thermal Resistance K/W
$R_{\theta JC}$ - Thermal Resistance of the Resistor in K/W
$R_{\theta S}$ - Thermal Resistance of the Heat Sink in K/W

Example:

$P_\theta = 15W$; $R_{\theta JC} = 5{,}9$ K/W; $T_J = 120$ °C; $T_A = 25$ °C

Calculation:

$\Delta T = T_J - T_A = 120°C - 25°C = 95K$

$$R_\theta = \frac{\Delta T}{P_\theta} = \frac{95K}{15W} = 6{,}33K/W$$

$R_{\theta S} = R_\theta - R_{\theta JC} = 6{,}33K/W - 5{,}9K/W = 0{,}433K/W$

Result: $R_{\theta S} \leq 0{,}433$K/W max. Thermal Resistance of the Heat Sink

Remark: K/W = °C/W

ORDERING INFORMATION

OTR2620 100R00 5% TK100 (OTR2620; 100Ω; ±5%; ±100ppm/°C)

Type	Special	Resistance Value	Tolerance	Temperature Coefficient	Power	Options	Packaging
OTR2620	- XXX	0R1000 100R00 10K000	5%	TK300 TK250 TK100	-	-	-

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