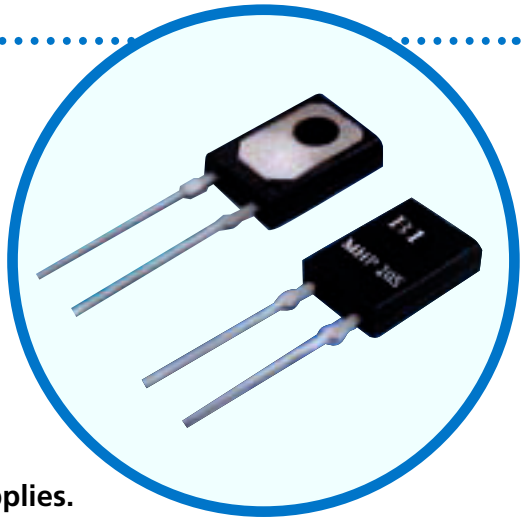
20W TO126
High Power Resistors

MHP 20 S



- **Non-Inductive, Small, 20 Watt high power resistor.**
- **TO-126 style package offering a very low thermal resistance of 5.9 °C/W.**
- **Complete thermal flow design available for easy implementation.**
- **Superior vibration durability.**
- **Small thin package for high density PCB installation.**
- **RoHS compliant**

Applications

- **High frequency emitter resistors in switching power supplies.**
- **High precision CRT color video amplifiers.**
- **High frequency snubber and pulse handling circuits.**
- **VHF amplifiers.**
- **Pulse generator load resistors.**

Specifications

Items	Specification			Conditions
Power Rating	20 Watts			@ Tab Temp < 25°C
Power Rating	1 Watts			Free air.
Thermal Resistance	5.9°C/W			From hot spot to tab.
Resistance Range	0.01-0.09 Ω	0.1-9.1 Ω	10-220 Ω	Extended resistance range to 51KΩ available
Nominal Resistance Series	E6	E24	E24	Additional 2.0Ω and 5.0 Ω also available
TCR	250 ppm/°C	100 ppm/°C	50 ppm/°C	For -55 to +155°C
Tolerance	+/-5%	+/- 5% and 1%	+/- 1%	
Operation Temp. Range	-55 to +155 °C			
Dielectric Withstand Voltage	2000 Volts DC			60 seconds. between terminals and flange
Load Life	ΔR +/- (1.0 %+0.05 Ω)			25°C, 90 min. ON, 30 min.OFF, 1000 hours.
Humidity	ΔR +/- (1.0 %+0.05 Ω)			60°C, 90-95% RH, DC 0.1W, 1000 hours.
Soldering Heat (Max)	ΔR +/- (1.0 %+0.05 Ω)			250+/-5°C, 3 seconds,
Solderability	Min 95% coverage			230+/-5°C, 3 seconds.
Insulation Resistance	Over 1000 MΩ			Between terminals and metal back plate.
Vibration	ΔR +/- (0.25 % Ω)			

Specifications subject to change without notice

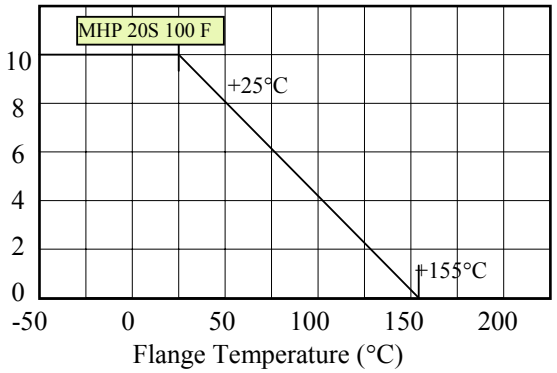
Note:
1. Electrically isolated metal tab.
2. Recommend the use of thermal grease between metal tab and heat sink.
3. Thermal design should account for a thermal resistance between resistor and tab of 5.9°C/W and a maximum resistor temperature of 155°C.
4. Current rating: 25A maximum.
5. For the resistance range 220Ω to 51KΩ, the power rating is restricted to 10W.

Electrical Performance

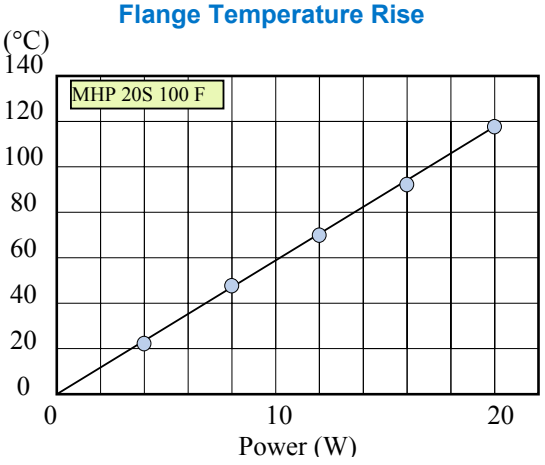
Electrical Performance

Derating Curve

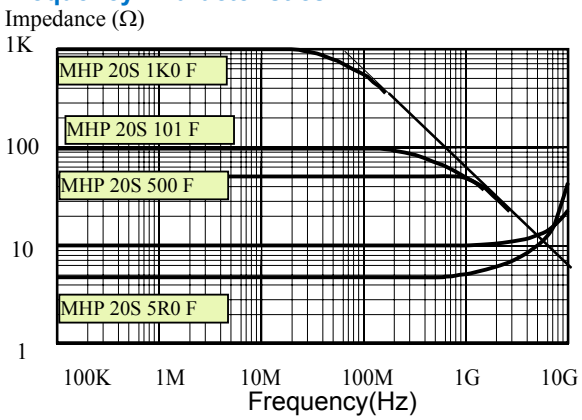
Rating Power (W), with 2.8°C/W heat sink.



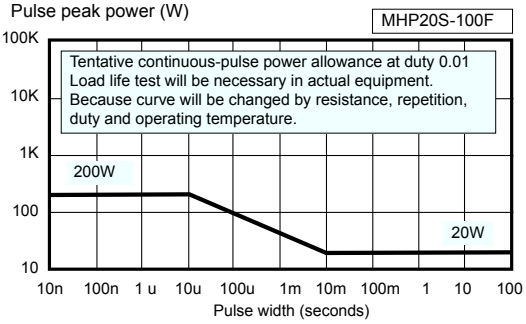
Flange Temperature Rise



Frequency Characteristics



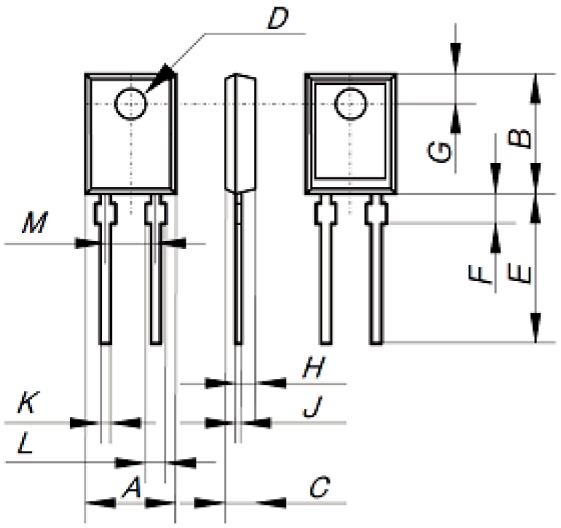
Pulse Energy Durability



20W TO126 High Power Resistors

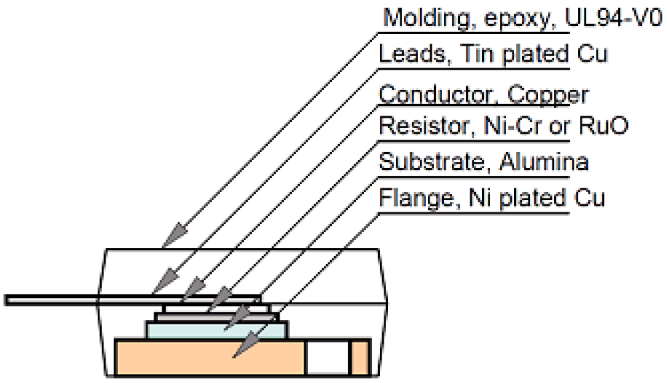
MHP 20 S

Dimensions



	MHP100	
	mm	± mm
A	8.5	± 0.2
B	12.0	± 0.2
C	3.1	± 0.2
D	3.1	± 0.1
E	17.0	± 1.0
F	3.2	± 0.5
G	3.8	± 0.2
H	1.75	± 0.1
J	0.5	± 0.05
K	0.6	± 0.05
L	1.4	± 0.05
M	5.08	± 0.1

Materials



Resistor is electrically isolated from flange

Ordering Information

MHP 20S 500 F

Model

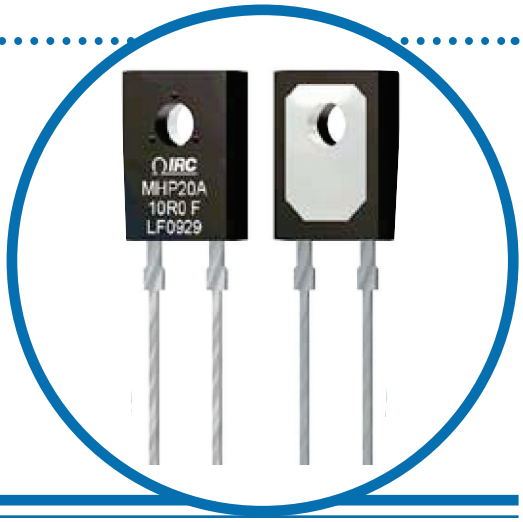
Power Rating
0.1Ω : 0R100
50 Ω : 500 First two digits significant, last digit: number of trailing zeros

Tolerance
J = 5% Tol
F = 1% Tol

MHP20S Series Power Resistor

MHP20S Series

- **TO-126 housing**
- **Low inductance and capacitance for high frequency circuits**
- **20W power rating**
- **High stability film resistance elements**
- **RoHS compliant**



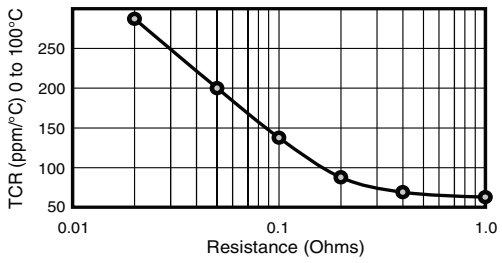
IRC's MHP20S series resistors satisfy demanding applications for accurate and stable power resistors housed in the convenient TO-126 case. The resistance element is isolated from the mounting tab by an alumina ceramic layer, providing very low thermal resistance and ensuring high insulation resistance between terminals and tab. The non-inductive design makes these products especially useful in high frequency and high speed pulse applications.

Electrical Data

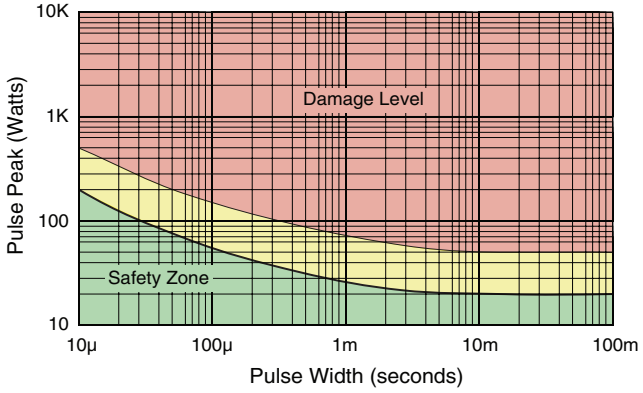
Power Rating[1]		Voltage Rating[4]	Thermal Resistance	Resistance Range		Tolerances	Nominal Resistance Series[5]	Typ. TCR (ppm/°C)	Inductance	Capacitance
Heatsink[2]	Free Air[3]			Min	Max					
20W	1.0W	500 V	5.9°C/W	0.01Ω 0.1Ω 10Ω	0.09Ω 9.1Ω 51KΩ	±1%, ±5%	E24 Includes 2.5 & 5.0 multiplier	See Chart	<10nH	<2pF

[1]Maximum current 25 amps
[2]Power rating based on 25°C case temperature
[3]Power rating based on 25°C ambient temperature
[4]Maximum voltage 500V or √P x R
[5]Contact factory for availability of resistance or tolerance values outside this range

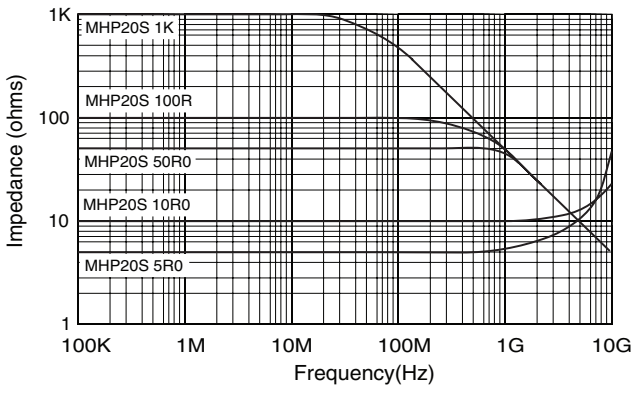
Typical TCR For Low Values



Pulse Energy Durability



Frequency Characteristics



General Note

TT electronics reserves the right to make changes in product specification without notice or liability.
All information is subject to TT electronics' own data and is considered accurate at time of going to print.

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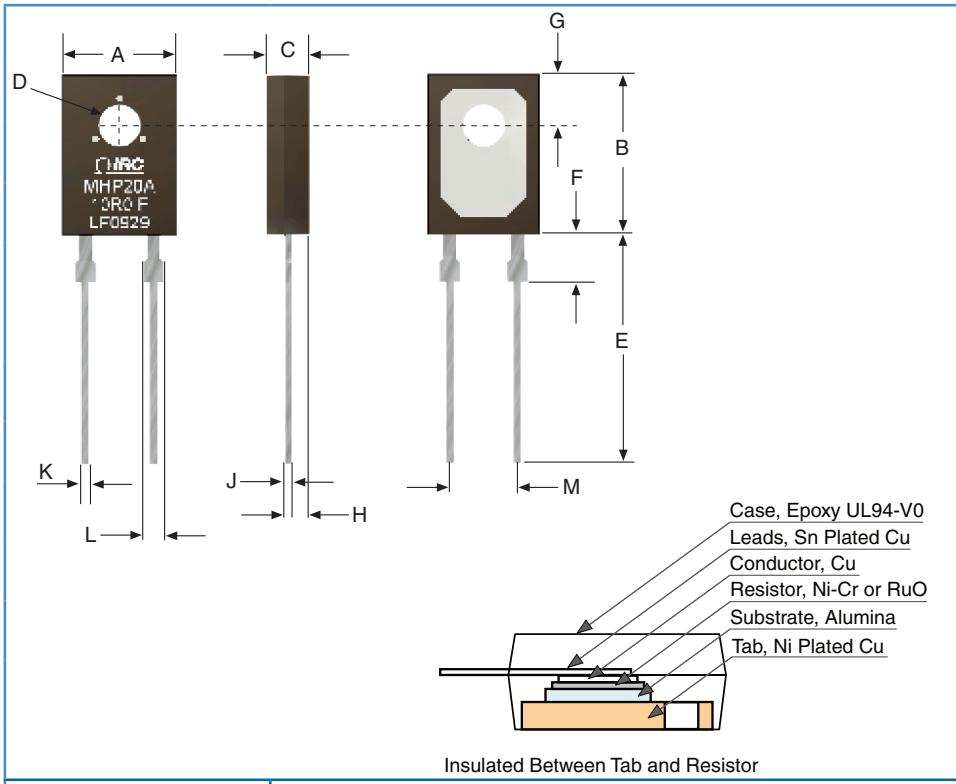
Physical Data



Dim	In (nom)	mm
A	0.335	8.5 ±0.2
B	0.472	12.0 ±0.2
C	0.122	3.1 ±0.2
D	0.122	3.1 ±0.1
E	0.669	17.0 ±1.0
F	0.126	3.2 ±0.5
G	0.150	3.8 ±0.2
H	0.069	1.75 ±0.1
J	0.020	0.5 ±0.05
K	0.024	0.6 ±0.05
L	0.055	1.4 ±0.05
M	0.200	5.08 ±0.1

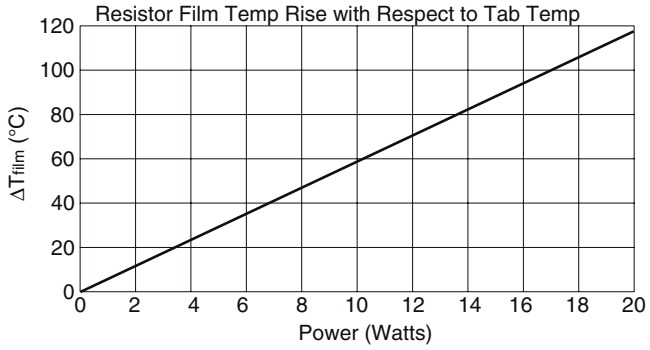
Lead & Tab Material	Tin Plated Copper
Part Weight	0.9g

Environmental Data

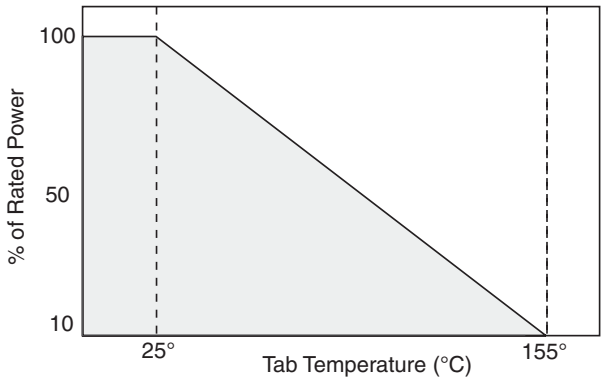
Test	Method	Specification - Performance
Load Life	1,000 Hours @ 25°C; 90 minutes on, 30 minutes off	±(1.0% + 1mΩ)
Humidity	1000 hours; 40°C, 90-95% RH, 0.1W DC	±(1.0% + 1mΩ)
Short Time Overload	2X Rated Power, not to exceed 1.5X Rated Voltage for 5 seconds, 25° w/ Heat Sink	±(0.25% + 1mΩ)
Vibration	10 cycles; X, Y, Z axis, amplitude 0.75mm, 100-2000Hz sweep/min	±(0.25% + 1mΩ)
Insulation Resistance	Between terminals and tab	>1000MΩ
Dielectric Withstanding Voltage	Terminals to tab; 60sec, 1mA	2000 volts AC
Resistance to Solder Heat	350 ± 5°C for 3 seconds	±(0.10% + 1mΩ)
Solderability	230 ± 5°C, 3sec.	>95% coverage
Operating Temperature Range		-55°C to +155°C

MHP20S Series

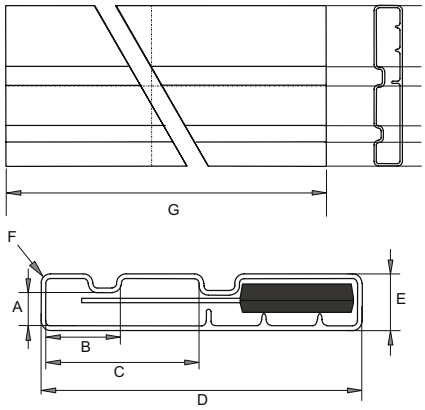
Temperature Rise Data



Power Derating Data



Tube Packaging Data



Tube Dimensions		
Dim	Nom. (mm)	Tol. (mm)
A	3.25	0.15
B	8.0	0.15
C	16.25	0.15
D	34.4	(34.0)
E	6.4	(6.0)
F	R0.7	(R0.5)
G	535.0	1.0

Application Notes

1. Insulating material is unnecessary between the heat sink and the tab, as the resistor film is isolated by the internal alumina substrate.

2. When mounting with a fastener, thermal grease is recommended.

3. Thermal design should satisfy the following equation: Tab Temperature (T_T) + [Thermal Resistance ($R_{\theta JT}$) x Power applied (Watts)] ≤ 155°C over the full operating temperature of the application.

4. Resistor film temperature is not to exceed 155°C during operation.

5. This product is RoHS compliant by exemption according to RoHS directive 2002/95/EC exemptions 5 & 7, as they apply to lead in glass and internal solder connections.

Ordering Data

Prefix TFP - MHP20SLF - 1R50 - J - L04

Style
MHP20SLF = 20W, TO-126 style power resistor

Resistance Code
4-digit resistance code.
Ex: 0R05 = 0.05Ω, 10R0 = 10Ω, 1K00 = 1KΩ

Absolute Tolerance Code
J = ±5%; F = ±1%

Packaging Code
L04 = RoHS compliant tube (50 pcs per tube)

For additional information or to discuss your specific requirements, please contact our Applications Team using the contact details below.

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