

140W TO247 **OBSOLETE** High Power Resistors

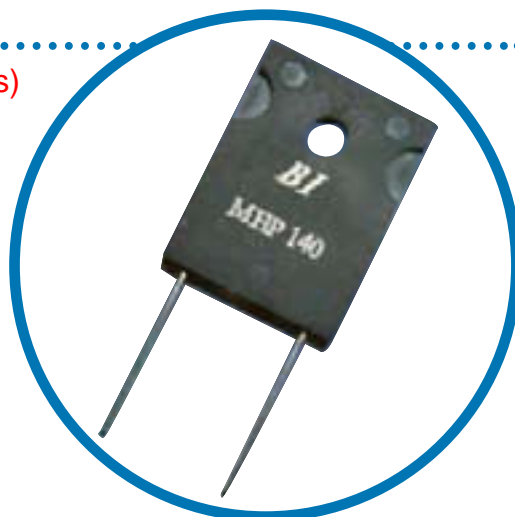
MHP 140

(Combined BI & IRC Datasheets)

- Non-inductive, high power resistor.
- Thermally enhanced Industry standard TO-247 package.
- Extremely Low thermal resistance, 0.9 °C/W resistor hot spot to metal tab.
- Complete thermal flow design available for easy implementation.
- Small thin package for high density PCB installation.
- RoHS compliant.

Applications

- High frequency circuits and RF power amplifiers.
- UPS and power supply circuits
- Motor control and power/RF power amplifiers.
- Industrial power equipment.
- PLC drivers.
- Inrush current protection.



Specifications

Items	Specification			Conditions
Power Rating	140 Watts			@ Tab Temp < 25°C
Power Rating	2.0 Watts			Free air.
Resistance Range	0.01-0.09 Ω	0.1-9.1 Ω	10-220 Ω	Extended resistance range to 51KΩ avail.
Nominal Resistance Series	E6	E12	E24	2.0 Ω 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 - +155 °C			
Rated Voltage (Max).	700V or $\sqrt{P \cdot R}$			
Dielectric Withstand Voltage	2500 Volt			60 seconds.
Load Life	$\Delta R \pm (1.0 \% + 0.05 \Omega)$			25°C, 90 min. ON, 30 min.OFF, 1000 hours.
Humidity	$\Delta R \pm (1.0 \% + 0.05 \Omega)$			40°C, 90-95% RH, DC 0.1W, 1000 hours.
Temperature Cycle	$\Delta R \pm (0.25 \% + 0.05 \Omega)$			-55°C, 30 min., +155°C 30min., 5cycles.
Soldering Heat (Max)	$\Delta R \pm (0.25 \% + 0.05 \Omega)$			250+/-5°C, 3 seconds,
Solderability	Min 75% coverage			230+/-5°C, 3 seconds.
Insulation Resistance	Over 1000 MΩ			Between terminals and metal back plate.
Vibration	$\Delta R \pm (0.25 \% + 0.05 \Omega)$			

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 0.9°C/W and a maximum resistor temperature of 155°C.
4. Resistances greater than 220Ω are available, please call factory.
5. Current rating: 25A maximum.

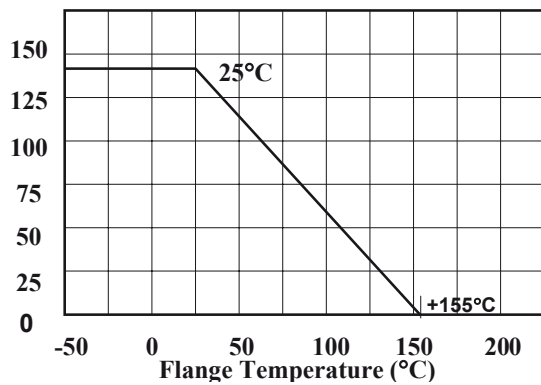
General Note

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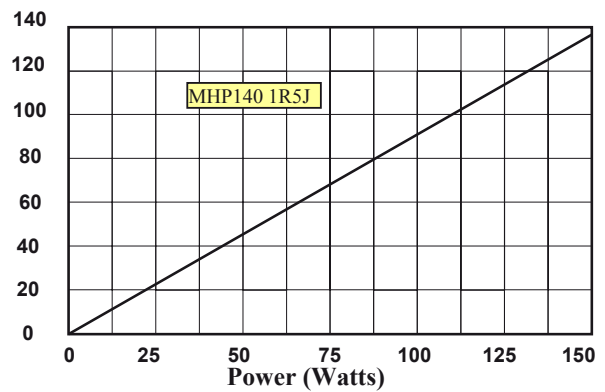
Electrical Performance

Derating Curve

Power rating (Watts)

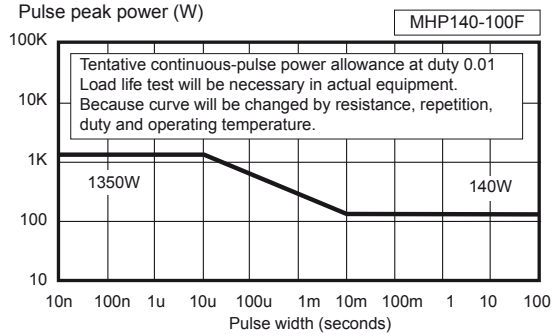


Temperature Rise



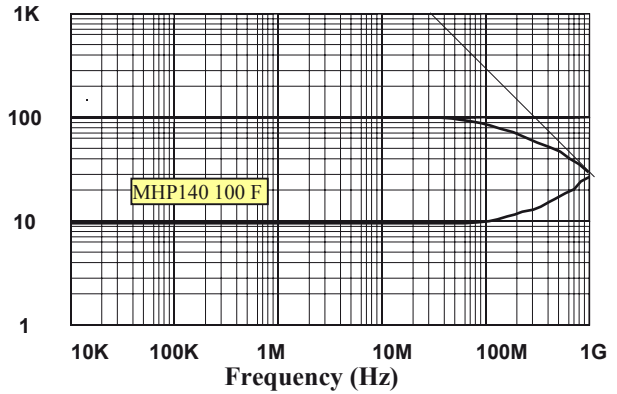
Pulse Energy Durability

Pulse peak power (W)



Frequency Characteristics

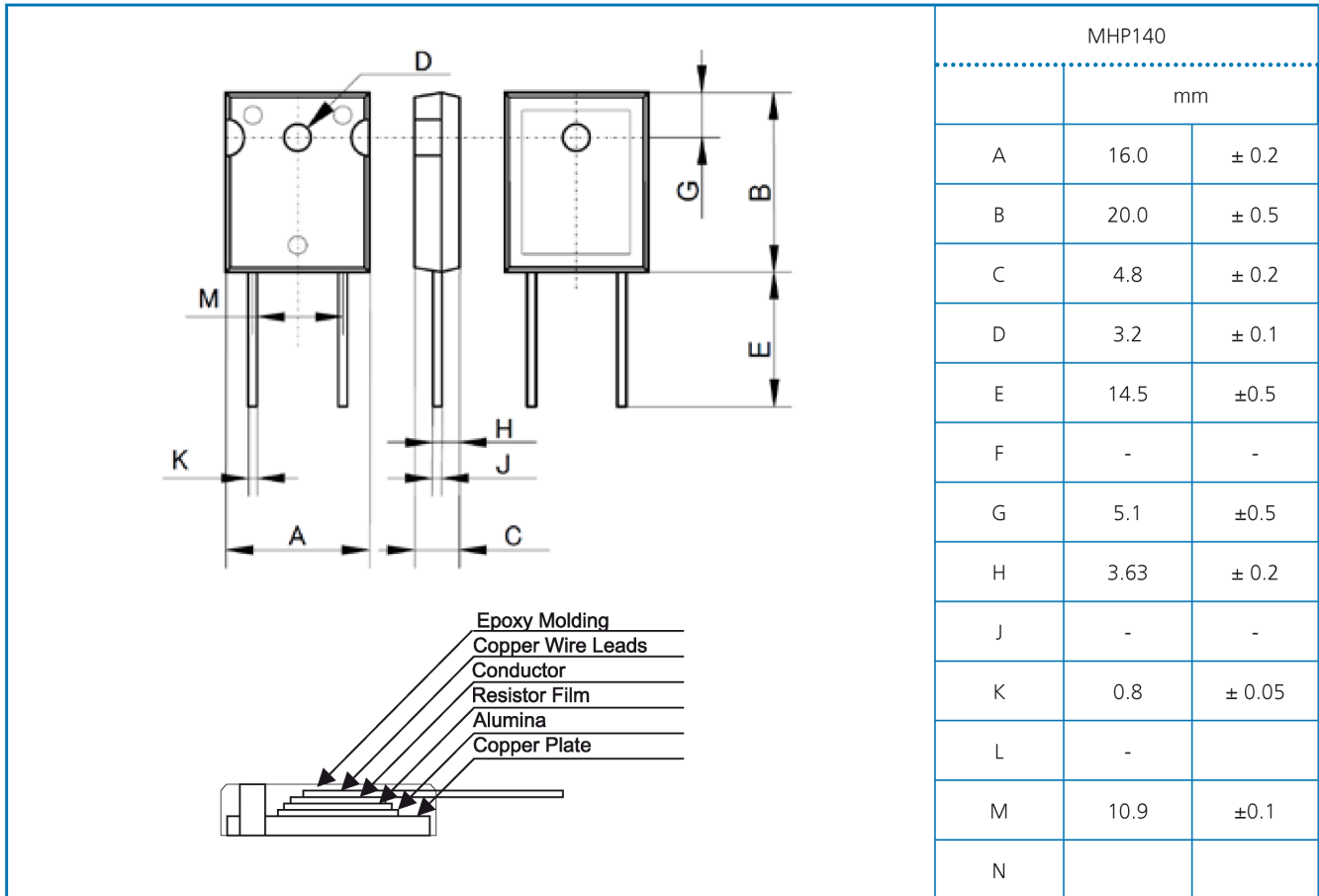
Impedance (Ω)



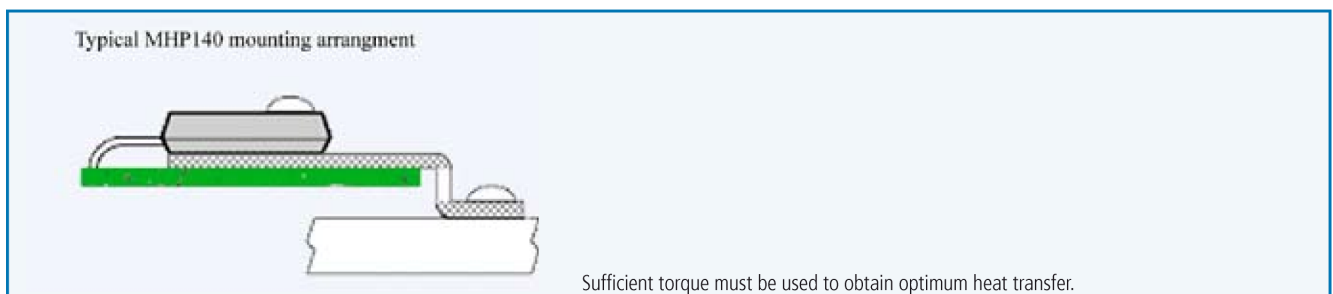
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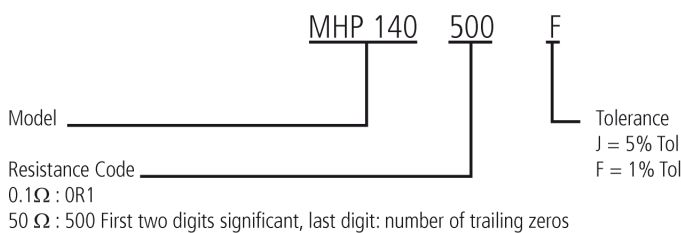
Dimensions



Mounting Recommendations



Ordering Information



General Note

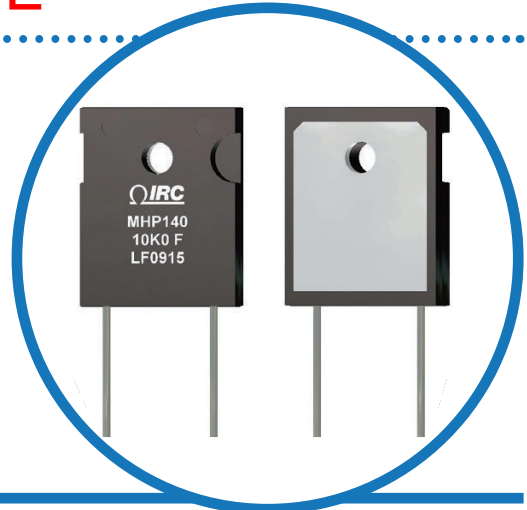
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MHP TO-247 Series

Power Resistor **OBSOLETE**

MHP TO-247 Series

- TO-247 housing
- Low inductance and capacitance for high frequency circuits
- Available in 100W or 140W
- High stability film resistance elements
- RoHS compliant terminations
- Insulated metal back plate
- Approved to DSCC drawing 07019



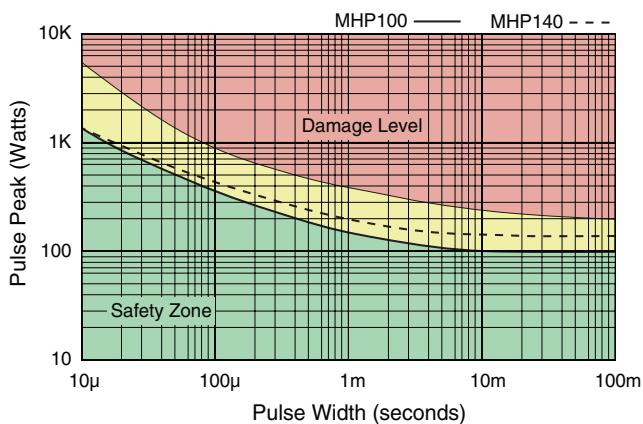
IRC's MHP series resistors satisfy demanding applications for accurate and stable power resistors housed in the convenient TO-247 case. The resistance element is isolated from the mounting tab by an alumina ceramic layer, providing very low thermal resistance and ensuring high insulation resistance between terminals and metal back plate. The non-inductive design makes these products especially useful in high frequency and high speed pulse applications.

Electrical Data

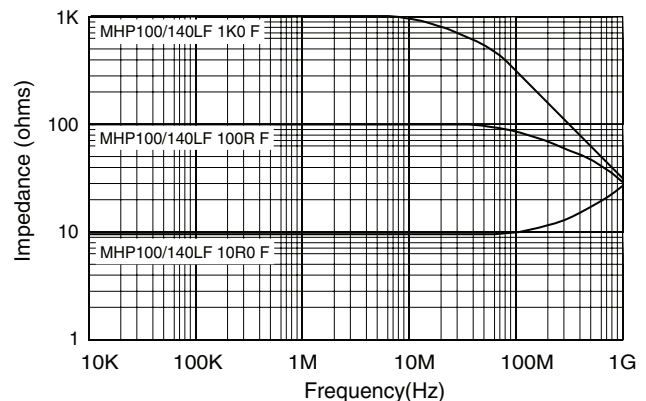
Type	Power Rating ¹		Voltage Rating ⁴	Thermal Resistance	Resistance Range		Tolerances	Nominal Resistance Series ⁵	Typ. TCR (ppm/°C)	Inductance	Capacitance
	Heatsink ²	Free Air ³			Min	Max					
MHP100	100W	3W	700V	1.3°C/W	0.01Ω	0.09Ω	±1%, ±5%	E24 Includes 2.5 & 5.0 multiplier	See Chart	<12nH	<3pF
					0.1Ω	9.1Ω					
					10Ω	51KΩ					
MHP140	140W	3W	700 V	0.9°C/W	0.01Ω	0.09Ω	±1%, ±5%	E24 Includes 2.5 & 5.0 multiplier	See Chart	<13nH	<4pF
					0.1Ω	9.1Ω					
					10Ω	51KΩ					

¹Maximum current 25 amps
²Power rating based on 25°C case temperature
³Power rating based on 25°C ambient temperature-
⁴Maximum voltage 700V or $\sqrt{P \times R}$
⁵Contact factory for availability of resistance or tolerance values outside this range

Pulse Energy Durability



Frequency Characteristics

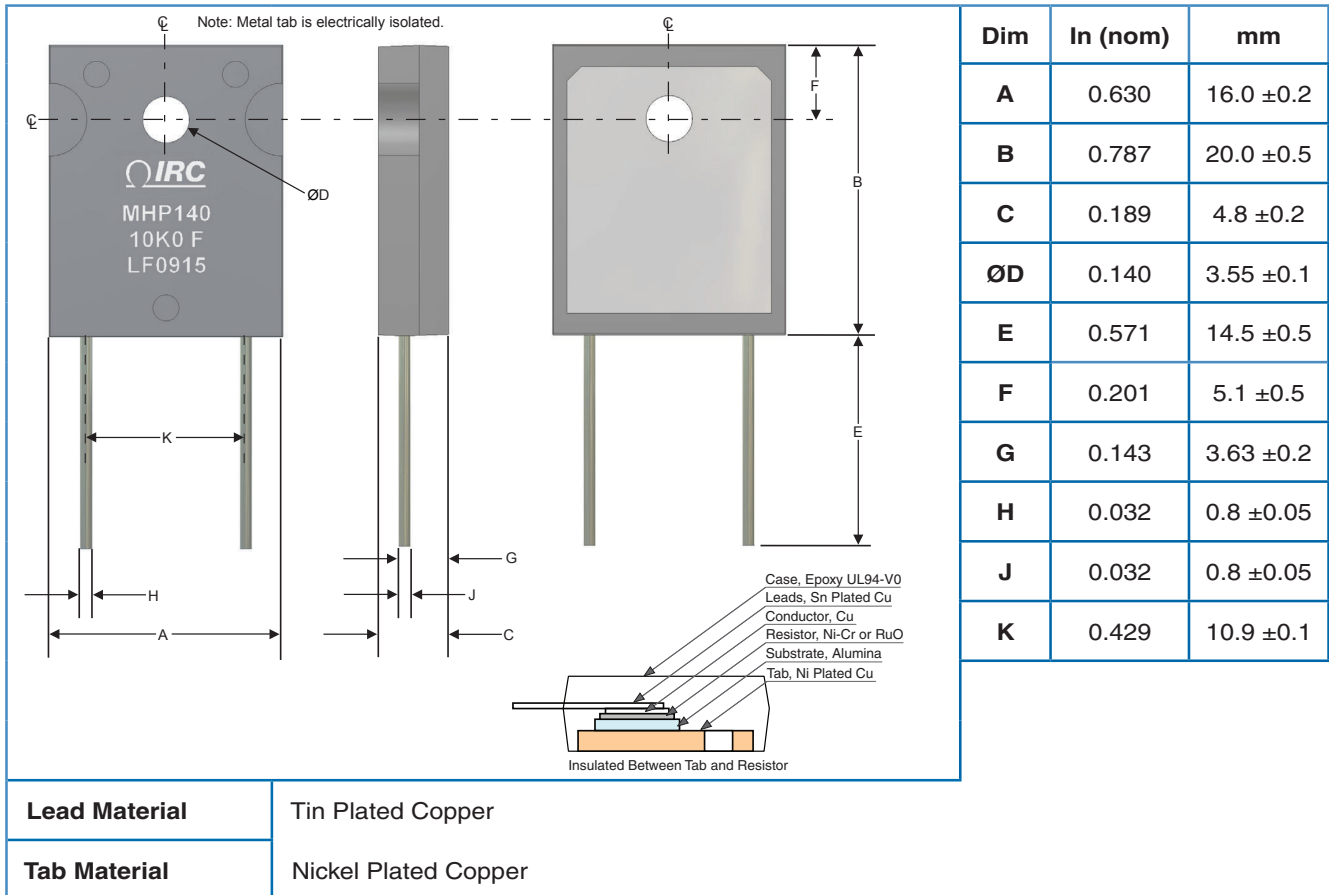


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Physical Data



Environmental Data

Test	Method	Specification - Performance
Thermal Shock	MIL-STD-202 Method 107 Condition F	±0.30% + 50mΩ
Moisture Resistance	MIL-STD-202 Method 106	±1.0% + 50mΩ
Vibration	MIL-STD-202 Method 204 Condition D	±0.25% + 50mΩ
Load Life	MIL-STD-202 Method 108 1,000 Hours	±1.0% + 50mΩ
Resistance to Solder Heat	MIL-STD-202 Method 210 Condition B	±0.25% + 50mΩ
Dielectric Withstanding Voltage	MIL-STD-202 Method 301	2200 volts DC or 2500 volts AC; 60 seconds
Insulation Resistance (between terminal and tab)	MIL-STD-202 Method 302	>1000MΩ>
Solderability	230 ± 5°C, 3sec.	>75% coverage
Operating Temperature Range		-55°C to +155°C

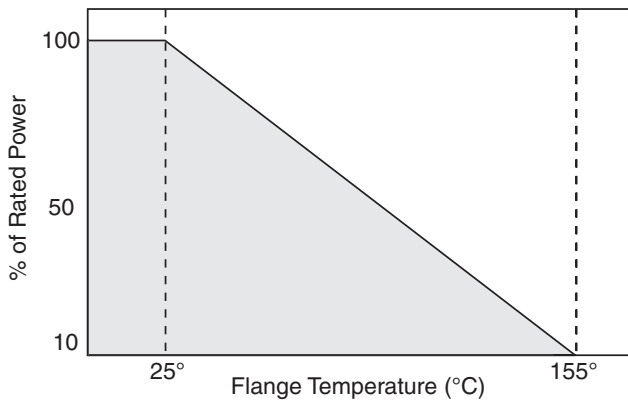
* During soldering, the soldering temperature profile must not cause the metal tab of this device to exceed 220°C.

General Note

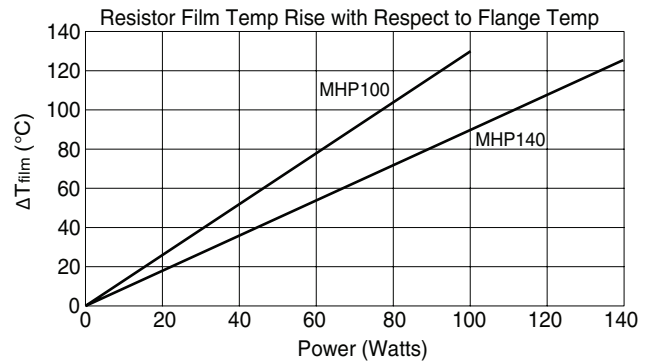
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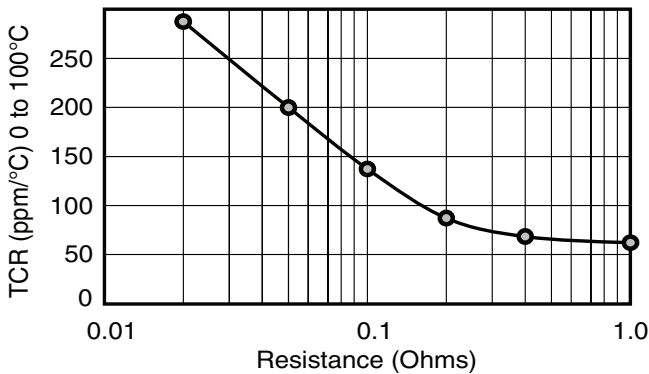
Power Derating Data



Temperature Rise Data



Typical TCR For Low Values



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)] \leq 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** - **MHP100LF** - **1R50** - **J** - **L07**

Style
MHP100LF = 100W, TO-247 style power resistor
07019 = DSCC drawing (07019) ver. of above
MHP140LF = 140W, TO-247 style power resistor

Resistance Code
4-digit resistance code.
Ex: 10R0 = 10 , 1K00 = 1K

Absolute Tolerance Code
J = $\pm 5\%$; F = $\pm 1\%$

Standard Packaging
L07 = RoHS compliant PET tube (30 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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