MPM20 Kool-Tab® Power Film Resistors

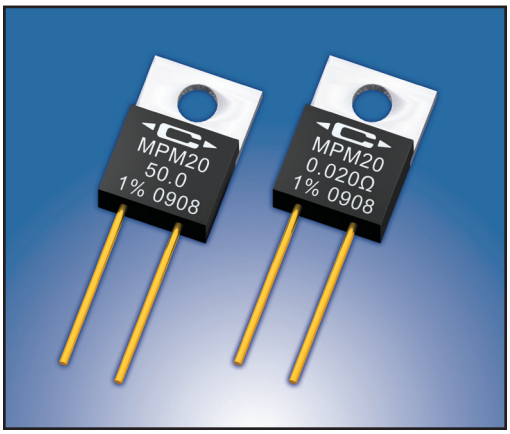
New

"Pure Tin Free" design for High Performance Industrial and Military Applications
TO-220 Style Power Package with Metal Mounting Tab

MPM20 Kool-Tab® Power Film Resistors introduce a "Pure Tin Free" design for High Performance Applications. Our proven Micronox® resistance film system is utilized in the widely accepted TO-220 Power Package to provide a compact 20 watt heat sink mountable resistor. The non-inductive design makes this resistor ideal in high frequency communications, power switching circuits and snubbers. The special performance features of the series MPM20 Kool-Tab® Power Film Resistors include:

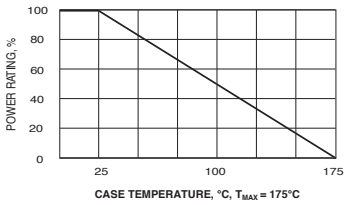
- **Up to 20 Watt power rating at +25°C case temperature.**
- **Resistance values as low as 0.020 ohm for current sense applications.**
- **Non-Inductive Design.**
- Single screw mounting simplifies resistor attachment to the heat sink.
- Low profile provides an easier fit in tight places.
- A molded case for environmental protection.
- Resistor element is electrically isolated from the metal heat sink tab.

Use your thermal design experience with power semiconductors in TO-220 style power packages. This experience will help you get the most out of this unique family of power resistors. The thermal design issues are the same where power handling capability is based on the case temperature which is maintained in your design.



Model No.	Resistance		Power Rating	Max. Voltage	Thermal Resistance $R_{\theta JC}$ Film (J) to Case (C)	Dielect. Strength V_{RMS} AC	Leadwire
	Min.	Max.					
MPM20	0.020 Ω	10.0 K	20 Watts *	300	7.50°C/Watt	1,500	Solderable

DERATING CURVE



*** Derating Using Case Temperature (T_C):**

All power and associated overload ratings are derated based upon case temperature using the derating curve. The case temperature is measured at the center of the metal mounting surface, with the part properly mounted and under electrical load. Without a heat sink, when in free air at +25°C, the MPM20 is rated for 2.25 watts.

The thermal design should satisfy the following equation:

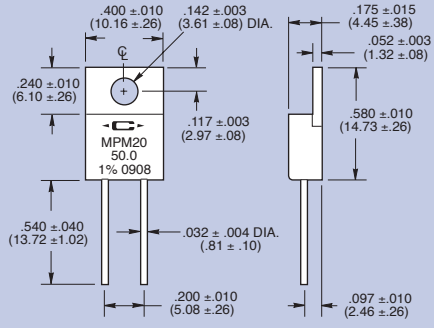
Case Temperature (T_C) + [Thermal Resistance ($R_{\theta JC}$) x power applied (Watts)] ≤ T_{MAX} considering the full operating temperature range of the application.

Mounting Note: Mount on a smooth, clean and flat heat sink surface with a thermal interface material, such as thermal grease. The entire exposed metal backface portion must be in thermal contact with the heat sink. When screw mounting, use a compression washer which provides a mounting force of 150 to 300 pounds (665 to 1330 N). This will provide sufficient pressure on the package over time and through large temperature variations to maintain the maximum power dissipation capability. Mounting torque to avoid package damage is 8 in-lbs (0.90 N-m).

For additional applications information regarding mounting and pulse handling see the Caddock Applications Notes at caddock.com or contact Applications Engineering.

Non-Inductive Design: MPM20 Kool-Tab® Power Film Resistors are constructed with our Micronox® resistance film fired onto a flat substrate which is thermally bonded to the copper heat sink tab. The resistor body is then molded to finish the TO-220 style package. The lead wire attachment and resistance element geometry are configured to provide outstanding non-inductive performance.

Metal Tab
TO-220 Style
MPM20



DIMENSIONS IN INCHES AND (MILLIMETERS)

Specifications:

Temperature Coefficient:
TC referenced to +25°C, ΔR taken at +175°C
5.00 ohms and above, -20 to +50 ppm/°C
1.00 ohm to 4.99 ohms, -20 to +80 ppm/°C
0.050 ohm to 0.99 ohm, 0 to +200 ppm/°C
0.020 ohm to 0.049 ohm, 0 to +300 ppm/°C

Resistance Tolerance: ±1% (±0.5% is available for most resistance values).

Insulation Resistance: 10,000 Megohms, min. Resitor element is electrically isolated from the mounting surface.

Terminal Strength: Mil-Std-202, Method 211, Cond. A (Pull Test) 5 lbs., ΔR ±(0.2 percent + 0.001 ohm) max.

Thermal Shock: Mil-Std-202, Method 107, Cond.F, ΔR ±(0.3 percent + 0.001 ohm) max.

Momentary Overload: 2 times rated power with applied voltage not to exceed 1.5 times maximum continuous operating voltage for 5 seconds, ΔR ±(0.3 percent + 0.001 ohm) max.

Moisture Resistance: Mil-Std-202, Method 106, ΔR ±(0.5 percent + 0.001 ohm) max.

Load Life: 2,000 hours at rated power, ΔR ±(1.0 percent + 0.001 ohm) max. Power rating dependent upon case temperature. See derating curve.

Shock: 100G, Mil-Std-202, Method 213, Cond. I, ΔR ±(0.2 percent + 0.001 ohm) max.

Vibration, High Frequency: Mil-Std-202, Method 204, Cond. D, ΔR ±(0.2 percent + 0.001 ohm) max.

Measurement Note: For these specifications, resistance measurement shall be made at a point 0.2 inch (5 mm) from the resistor body.

Ordering Information:

MPM20 - 50.0 - 1%
Model Number: MPM20
Resistor Value: 50.0
Tolerance: 1%

Distributor

CADDOCK ELECTRONICS, INC.