

## High Power Precision Shunt Resistor, Up to 500W



**RoHS**  
COMPLIANT



**CAUTION** — tighten screws at  
 • current terminals:  $<5.2\text{N} \cdot \text{m}$   
 • voltage terminals:  $<0.0195\text{N} \cdot \text{m}$

### CONSTRUCTION OF MATERIALS

- Base plate: Nickel-plated Copper
- Current terminal: Nickel-plated Copper (T = 1.0 mm)
- Voltage and Pt terminals: Nickel-plated Copper (T = 0.5 mm)
- Package: PPS Injection-molded case

### COMPOSITION OF TYPE NUMBER

Example:

**FNP Z R0100 B**

— Tolerance  
 — Resistance Value\*  
 — TCR  
 — Type

\* R is a dual-purpose letter that designates both the value range (R for ohmic) and the location of decimal point.

### TCR—RESISTANCE VS. TOLERANCE

Tolerance of Built-in Pt100 Sensor:  
 $\pm[0.8 + 0.008(t)]^{\circ}\text{C}$

TCR (ppm/°C)	Resistance Range (Ω)	Tolerance (%)	Rated Power (W)
$0 \pm 1$ (Z) $0 \pm 2.5$ (Y) (+25°C to +60°C) $0 \pm 5$ (X) (-25°C to +125°C)	0.001 to 10**	$\pm 0.05$ (A) $\pm 0.1$ (B) $\pm 0.5$ (D) $\pm 1.0$ (F)	500 (on heat sink*)

\* Keep temperature of element surface less than 125°C.

\*\* Please contact us for higher resistance value

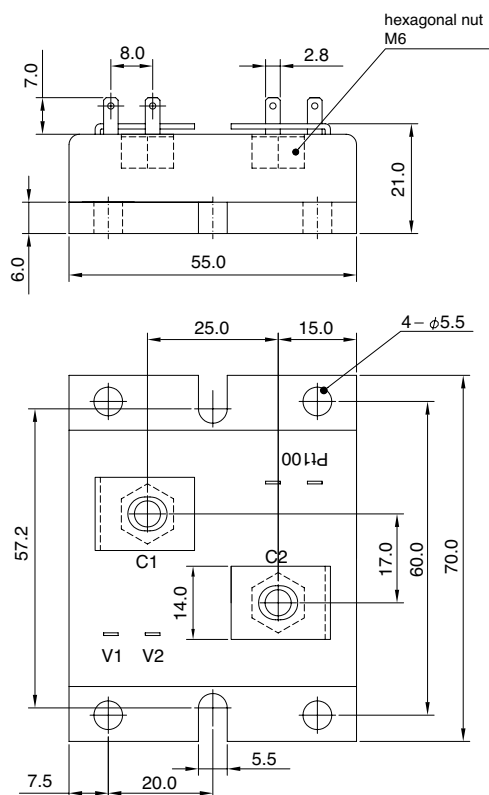
### FEATURES

- Temperature coefficient of resistance (TCR)  
 +25°C to +60°C, +25°C ref.:  $0 \pm 1$  ppm/°C  
 -25°C to +125°C, +25°C ref.:  $0 \pm 5$  ppm/°C
- Utilizing Ni-Cr Bulk Metal® Foil Technology for realizing low TCR
- Low thermal resistance with Copper plate
  - Improved to 0.1°C/W from 0.3°C/W (conventional model)
  - Maximum rated power up to 500W on heat sink
- Extended max. ambient temperature to 125°C (85°C with conventional model)
- Built-in Pt100 sensor monitor temperature of resistive element
  - Easily define size of suitable heat sink
  - As safety function for continuous operation

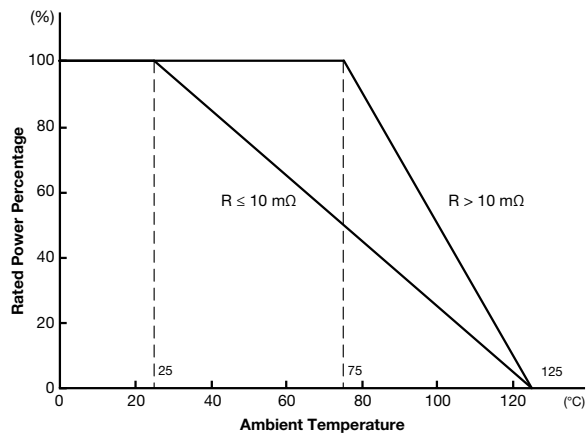
### APPLICATIONS

- Output reference of precision power supply
- Reference of charge-discharge test for high capacity batteries

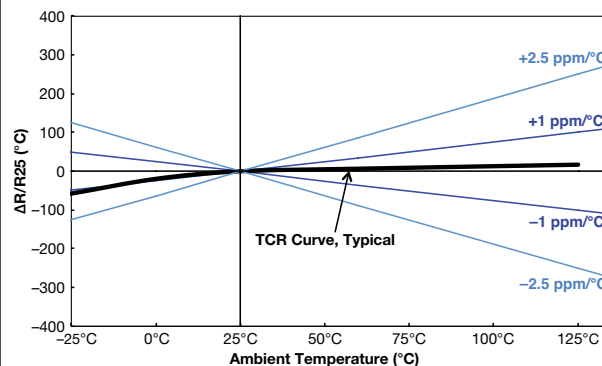
### CONFIGURATION—Dimensions in mm



### POWER DERATING CURVE



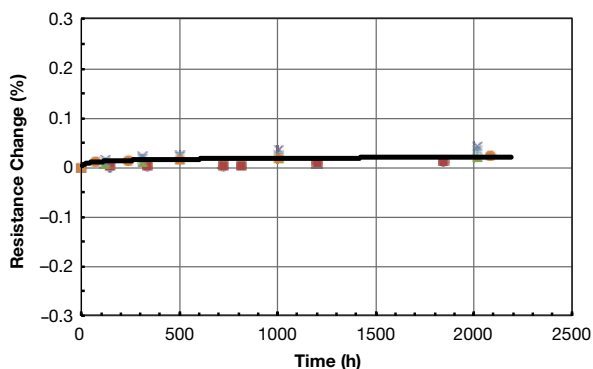
### TEMPERATURE CHARACTERISTICS OF RESISTANCE



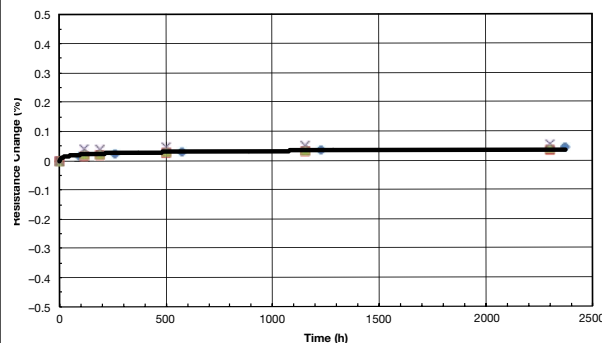
**TABLE 2—PERFORMANCE**

PARAMETERS	SPECIFICATION	
Maximum Rated Operating Temperature	25°C ( $R \leq 10 \text{ m}\Omega$ )	75°C ( $R > 10 \text{ m}\Omega$ )
Working Temperature Range	-55°C to +125°C	
Maximum Working Current	320 A	
Single Pulse Power Load	50 J (tp < 10 msec)	
Dielectric Withstanding Voltage	AC 500 V	
Inductance	< 10 nH	
Internal Thermal Resistance (element/base plate)	$R_{\theta} < 0.1^{\circ}\text{C/W}$ ( $R > 10 \text{ m}\Omega$ )	
	$R_{\theta} < 0.2^{\circ}\text{C/W}$ ( $R \leq 10 \text{ m}\Omega$ )	
Life (200 W, Element Temperature 100°C)	$\pm 0.2\%$ (2000 h)	
High Temperature Exposure (125°C)	$\pm 0.2\%$ (2000 h)	

### LIFE (200 W, ELEMENT TEMPERATURE +100°C)



### HIGH TEMPERATURE EXPOSURE (+125°C)



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