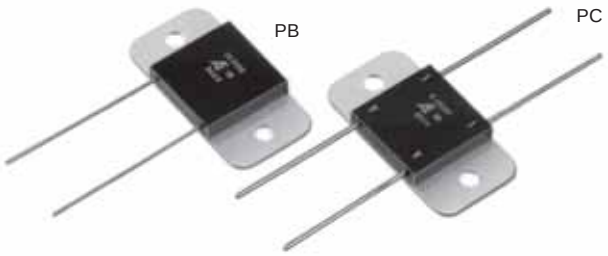
Ultra-Precision Power Resistor (10 Watts)



Composition of Type Number

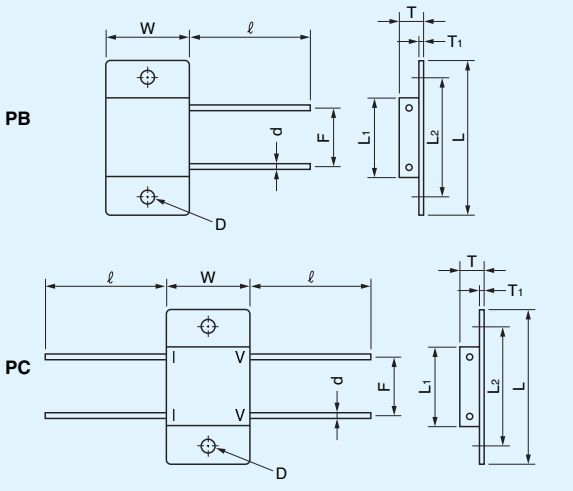
Example:

PB X 50R000 B

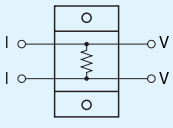
- B — Tolerance
- 50R000 — Resistance Value
- X — TCR
- PB — Type

Resistance value, in ohm, is expressed by a series of six characters, five of which represent significant digits. The sixth R or K is a dual-purpose letter that designates both the value range (R for ohmic; K for kilo-ohm) and the location of decimal point.

Configuration



Schematic of PC



4-Terminal Connection

Type	PB	PC
L	40.0±0.2	
L_1	20.0±0.2	
L_2	30.0±0.5	
W	20.0±0.2	
T	5.0±0.2	
T_1	1.0±0.1	
F	15.0±0.5	
ℓ	30±10	
D	ϕ0.4	
d	ϕ0.8±0.05	ϕ1.2±0.05

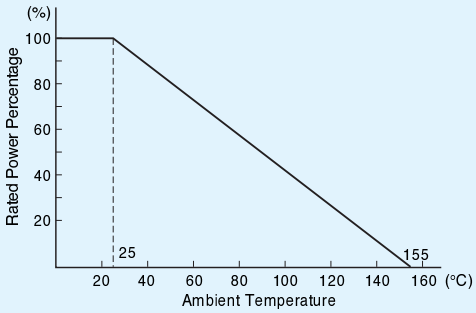
Dimensions in mm

TCR, Resistance Range, Tolerance, Rated Power

Type	TCR (ppm/°C) -55°C to +125°C	Resistance Range (Ω)	Resistance Tolerance (%)*	Rated Power (W) at 25°C
PB	0±15 (W)	0.4 to 1	±1 to ±5 (F, G, J)	2 On heat sink** 10
	0±15 (W) 0±5 (X) 0±2.5 (Y)	1 to 5	±0.5 to ±5 (D, F, G, J)	
		5 to 10	±0.1 to ±5 (B, D, F, G, J)	
		10 to 25	±0.05 to ±5 (A, B, D, F, G, J)	
		25 to 50	±0.02 to ±5 (Q, A, B, D, F, G, J)	
		50 to 50k	±0.01 to ±5 (T, Q, A, B, D, F, G, J)	
PC	0±15 (W)	0.002 to 0.05	±0.5 to ±5 (D, F, G, J)	
	0±15 (W) 0±5 (X)	0.05 to 0.1	±0.5 to ±5 (D, F, G, J)	
	0±15 (W) 0±5 (X) 0±2.5 (Y)	0.1 to 5	±0.1 to ±5 (B, D, F, G, J)	
		5 to 10	±0.05 to ±5 (A, B, D, F, G, J)	
		10 to 25	±0.02 to ±5 (Q, A, B, D, F, G, J)	
		25 to 100	±0.01 to ±5 (T, Q, A, B, D, F, G, J)	

Symbols in parentheses are for type number composition.
*Resistance figures for type PB are the values obtained by measuring the leads at point 12.7±3.2mm away from the root, but in case of resistance below 10 ohm, the values at 5.08±0.6mm away.
**For heat sinking, an aluminum chassis in 152.4 (L) x 101.6 (W) x 50.8 (H) x 1.0mm (T) shall be used.

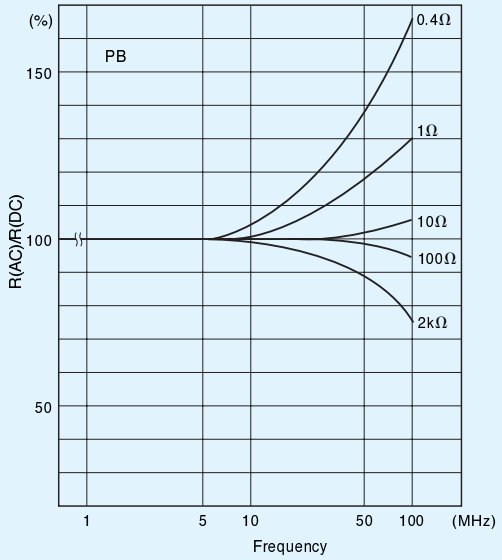
Power Derating Curve



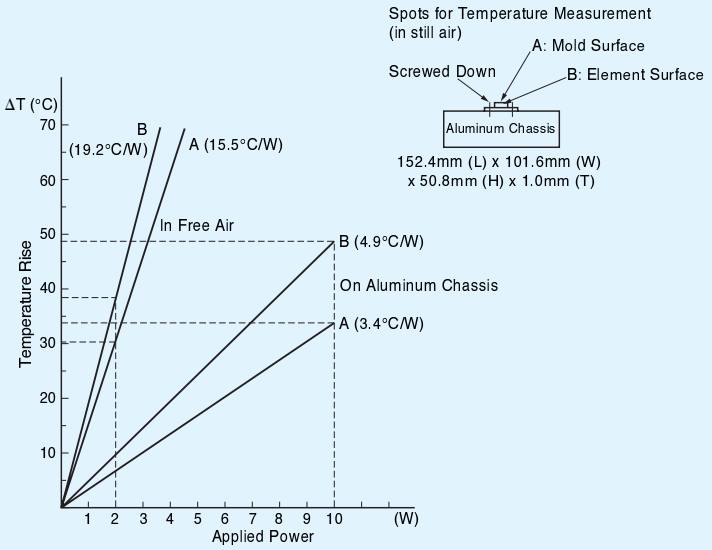
Performance

Parameters	Test Condition	MIL-R-39009 Specification	ALPHA Typical Test Data
Maximum Rated Operating Temperature Working Temperature Range Maximum Working Voltage Maximum Working Current		25°C -55°C to +155°C 750V PB=5A, PC=32A	
Power Conditioning	25°C, Rated Voltage, 96 hrs.	±0.2%	±0.02%
Low Temperature Storage Dielectric Withstanding Voltage Insulation Resistance Low Temperature Operation Overload Moisture Resistance Terminal Strength	-55°C, No Load, 24 hrs. Atmospheric: AC 1KV, 1 min. Barometric: AC 500V, 1min. DC 500V, 2 min. -55°C, Rated Voltage Rated Voltage x 2.5, 5 sec. +65°C to -10°C, 90% RH to 98% RH, Rated Voltage, 10 cycles (240 hrs.) 2.27kg (5 pounds),10 sec.	±0.3% ±0.2% over 10,000MΩ ±0.3% ±0.3% ±0.5% ±0.2%	±0.005% ±0.005% over 10,000MΩ ±0.005% ±0.01% ±0.05% ±0.005%
Shock Vibration, High Frequency	100G, 6ms., Sawtooth Wave, X, Y, Z, each 3 shocks 20G, 10Hz to 2,000Hz to 10Hz, 20 min., X, Y, Z, each 4 hrs.	±0.2% ±0.2%	±0.005% ±0.005%
Life	25°C, Rated Power, 1.5 hr. – ON, 0.5 hr. – OFF, 2,000 hrs.	±1.0%	±0.01%
High Temperature Exposure	155°C, No Load, 2,000 hrs.	±1.0%	±0.01%
Solderability	245°C, 5 sec.	over 95% coverage	over 95% coverage

Frequency Characteristics



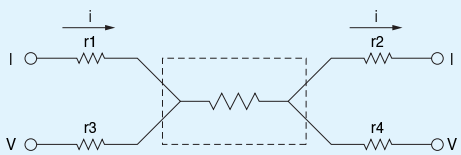
Temperature of Resistor Surface



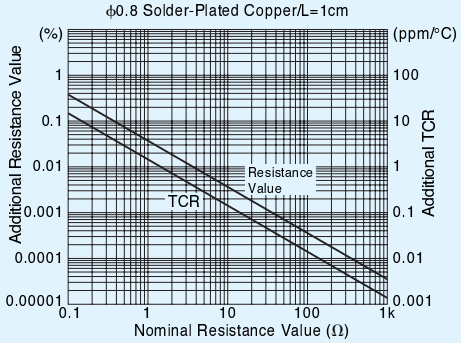
Four-Terminal Resistor

For low ohmic resistor (less than 10 ohm), the resistance value and TCR of the copper lead increases overall resistance value. Four-terminal (Kelvin) connection is recommended per the following figure. Loading current at voltage and current terminals (V, I) causes measurement error.

Four-Terminal Resistor



Affect of PB type lead for resistance value and TCR



Resistance Value of Lead: 0.36Ω/cm
TCR of Lead: 3,900ppm/°C