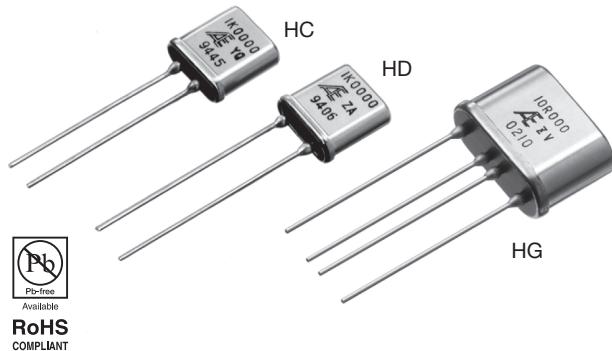


## Ultra Precision Resistor (Hermetically Sealed)



COMPOSITION OF TYPE NUMBER			
Example: <b>HC Y 30K000 T</b>			
			<ul style="list-style-type: none"> <li>— Tolerance</li> <li>— Resistance Value</li> <li>— TCR</li> <li>— Type</li> </ul>

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.

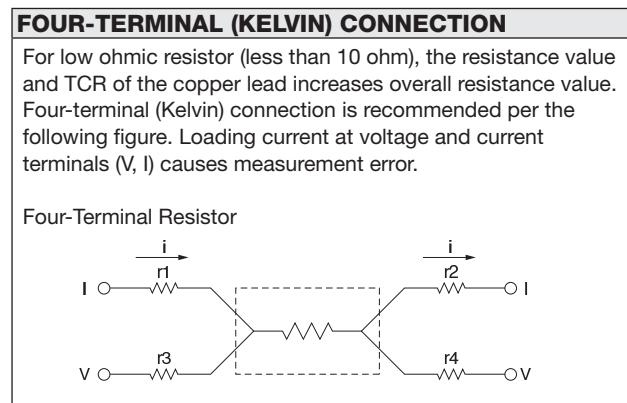
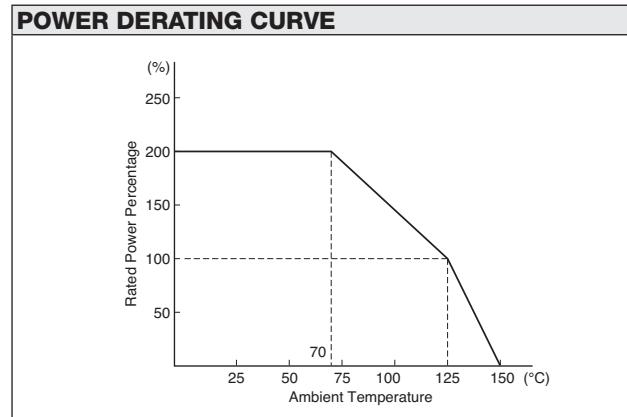
CONFIGURATION (DIMENSIONS IN mm)			
Type	HC	HD	HG
L	10.7±0.3	19.0±0.3	
W	10.7±0.3	12.8±0.3	
T	4.3±0.3	8.8±0.3	
F	3.81±0.25	5.08±0.25	2.54±0.25
F1	—	—	5.08±0.25
ℓ	30±10		
d	Dia. 0.65±0.05		
d1	Dia. 0.8±0.05		

TCR, RESISTANCE RANGE, TOLERANCE, RATED POWER				
Type	TCR (ppm/°C) -55°C to +125°C*	Resistance Range (Ω)	Resistance Tolerance (%)*†	Rated Power (W) at 125°C
HC	0±15 (W)	1 to 5	±0.5 (D) ±1 (F)	0.3
	0±5 (X)	5 to 30	±0.1 (B) ±0.5 (D) ±1 (F)	
	0±5 (X) 0±2.5 (Y) 0±1 (Z)**	30 to 120k	±0.005 (V) ±0.01 (T) ±0.02 (Q) ±0.05 (A) ±0.1 (B) ±0.5 (D) ±1 (F)	
HG	0±2.5 (Y) 0±1 (Z)**	1 to 10	±0.01 (T) ±0.02 (Q) ±0.05 (A) ±0.1 (B) ±0.5 (D) ±1 (F)	0.3
		10 to 10k	±0.005 (V) ±0.01 (T) ±0.02 (Q) ±0.05 (A) ±0.1 (B) ±0.5 (D) ±1 (F)	

\* Symbols in parentheses are for type number composition.

† Resistance figures are obtained by measuring the leads at point 12.7±3.2 mm away from the base for type HC and HD, but, in case of resistance below 10 ohm, the value at 1.6±0.6 mm away from the base for all types.

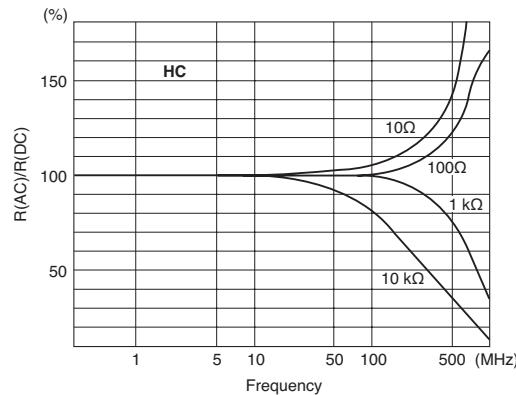
\*\*Temperature characteristic Z is applicable for temperature range between 0°C and 60°C.



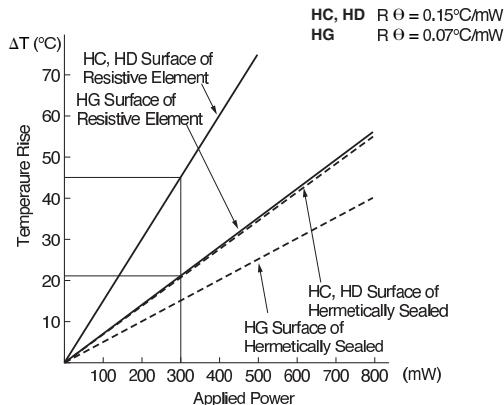
**PERFORMANCE**

Parameters	Test Condition	MIL-PRF-55182/9 Specification	ALPHA Typical Test Data
<b>Maximum Rated Operating Temperature</b>		125°C	
<b>Working Temperature Range</b>		-65°C to +150°C	
<b>Maximum Working Voltage</b>		300V	
<b>Power Conditioning</b>	125°C, Rated Power, 100 hrs.	±(0.20% +0.01Ω)	±0.0025%
<b>Thermal Shock</b>	-65°C/30 min. ↔ +150°C/30 min., 5 cycles	±0.05%	±0.0025%
<b>Overload</b>	Rated Voltage x 6.25, 5 sec.	±0.05%	±0.0025%
<b>Solderability</b>	Steam Aging 8 hrs., 245°C, 5 sec.	over 95% coverage	
<b>Resistance to Solvents</b>	① Isopropyl Alcohol + Mineral Spirits ② Water + Butyl Cellosolve + Monoethanolamine	no damage	
<b>Low Temperature Storage</b>	-65°C, 24 hrs.	±0.05%	±0.0025%
<b>Low Temperature Operation</b>	-65°C Rated Voltage, 45 min.	±0.05%	±0.0025%
<b>Terminal Strength</b>	0.908 kg (2 pounds), 10 sec.	±0.02%	±0.001%
<b>Dielectric Withstanding Voltage</b>	Atom. Pres.: 300V rms. Baro. Pres. 8 mHg: 200V rms.	±0.02%	±0.0025%
<b>Insulation Resistance</b>	DC 100V, 2 min.	over 10,000 MΩ	over 10,000 MΩ
<b>Resistance to Soldering Heat</b>	260°C, 10 sec. ±2 sec.	±0.02%	±0.0025%
<b>Moisture Resistance</b>	+65°C to -10°C, 90% RH to 98% RH, Rated Voltage, 10 cycles (240 hrs.)	±0.05%	±0.0025%
<b>Shock (Specified Pulse)</b>	100G, 6 ms, Sawtooth Wave, X, Y, Z, each 10 shocks	±0.01%	±0.0025%
<b>Vibration, High Frequency</b>	20G, 10 Hz to 2,000 Hz to 10 Hz, 20 min., X, Y, each 4 hrs.	±0.02%	±0.0025%
<b>Life</b>	125°C, Rated Power, 1.5 hr. - ON, 0.5 hr. - OFF, 2,000 hrs.	±0.05%	±0.01%
<b>70°C Power Rating</b>	70°C, Rated Voltage x 2, 1.5 hrs. - ON, 0.5 hr. - OFF, 2,000 hrs.	±0.05%	±0.01%
<b>Storage Life</b>	15°C to 35°C, 15% RH to 75% RH, No Load, 10,000 hrs.	±0.005%	±0.0005%
<b>High Temperature Exposure</b>	175°C, No Load, 2,000 hrs.	±0.5%	±0.01%
<b>Current Noise</b>		-32 dB	-42 dB
<b>Voltage Coefficient</b>		0.0001%/V	0.00003%/V
<b>Thermal EMF</b>		1.0 µV/°C	0.1 µV/°C

**FREQUENCY CHARACTERISTICS**



**TEMPERATURE OF RESISTOR SURFACE**



**PRECAUTION IN USING HC, HD OR HG RESISTORS**

When soldering to mount HC, HD or HG on a board, keep the resistor over 10 mm away from the board surface by using an insulating tube.