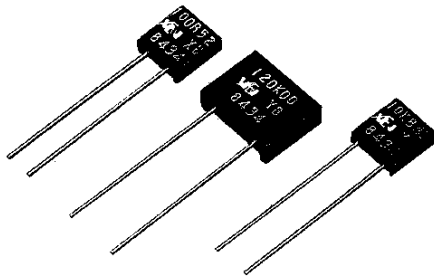


# Ultra-Precision Resistor (Transfer Molded)



## Composition of Type Number

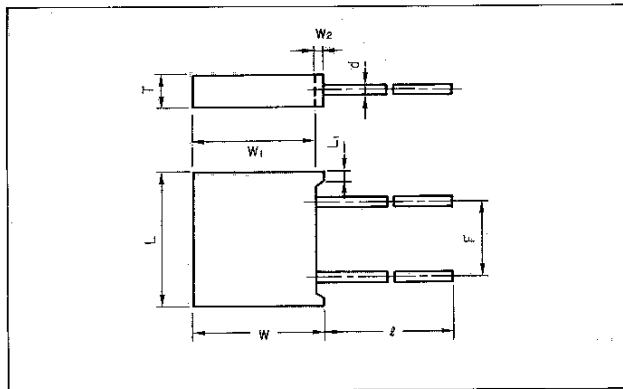
Example:  
**MA Y 10K000 A**

Diagram showing the breakdown of the type number MA Y 10K000 A:

- MA: Type
- Y: TCR
- 10K000: Resistance Value\* (5 significant digits, 6th character K indicates value range and decimal point location)
- A: Tolerance

\*Resistance value, in ohm, is expressed by a series of 6 characters, 5 of which represent significant digits while the 6th R or K is a dual purpose letter that designates both the value range (R for ohmic; K for kilo-ohmic) and the location of decimal point.

## Configuration



Type	MA	MC	MB	MD
L	7.9 ± 0.2 ✓	✓	13.0 ± 0.3	7.4 ± 0.2
L <sub>1</sub>	1.0 max		1.5 max	0.8 max
W	8.3 ± 0.2 ✓	✓	10.0 ± 0.3	6.0 ± 0.2
W <sub>1</sub>	8.0 ± 0.2 ✓	✓	9.5 ± 0.3	5.7 ± 0.2
W <sub>2</sub>	0.3 max		0.5 max	0.4 max
T	2.8 ± 0.2 ✓	2.3 ± 0.2	4.0 ± 0.3	2.3 ± 0.2
F	3.81 ± 0.25	5.08 ± 0.25	7.5 ± 0.5	5.08 ± 0.25
L		25 ± 10		10 ± 3
d		φ0.65 ± 0.05		0.65 ± 0.05

Type MA meets requirements of MIL-R-122.

Dimensions in mm

## TCR, Resistance Range, Tolerance, Rated Power

Type	TCR	Resistance Range (Ω)	Resistance Tolerance (%)*	Rated Power (W) at 125° C
MA MC	Char. W	1~5	± 0.5 (D) ± 1 (F)	0.3 (0.2 at 150KΩ) or above
	Char. X	5~30	± 0.1 (B) ± 0.5 (D) ± 1 (F)	
	Char. X Char. Y Char. Z	30~200K	± 0.005 (V) ± 0.01 (T) ± 0.02 (Q) ± 0.05 (A) ± 0.1 (B) ± 0.5 (D) ± 1 (F)	
MB	Char. X	5~30	± 0.1 (B) ± 0.5 (B) ± 1 (F)	0.3 (0.3 at 200KΩ) or above
	Char. X Char. Y Char. Z	30~400K	± 0.005 (V) ± 0.01 (T) ± 0.02 (Q) ± 0.05 (A) ± 0.1 (B) ± 0.5 (D) ± 1 (F)	
	Char. X	5~30	± 0.1 (B) ± 0.5 (D) ± 1 (F)	
MD	Char. X Char. Y Char. Z	30~100	± 0.05 (A) ± 0.1 (B) ± 0.5 (D) ± 1 (F)	0.125
	Char. X	5~30	± 0.1 (B) ± 0.5 (D) ± 1 (F)	
	Char. X Char. Y Char. Z	100~120K	± 0.01 (T) ± 0.02 (Q) ± 0.05 (A) ± 0.1 (B) ± 0.5 (D) ± 1 (F)	

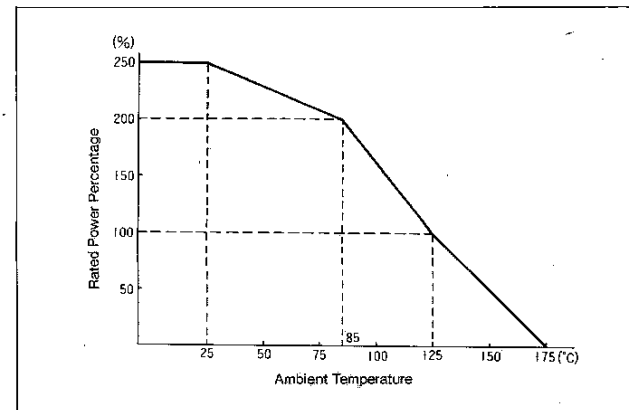
\*Symbols parenthesized are for type number composition. Resistance figures are the values obtained by measuring the leads at point 12.7 ± 3.2mm away from the root, but, in case of resistance below 10 ohm, the value at 1.6 ± 0.6mm.

## Temperature Characteristics of Resistance

Temperature (°C)	Characteristics (ppm/°C)			
	W	X	Y	Z
-55	+1.5 ± 15	+1.5 ± 5	+1.5 ± 2.5	
-25	+0.9 ± 15	+0.9 ± 5	+0.9 ± 2.5	
0	+0.4 ± 15	+0.4 ± 5	+0.4 ± 2.5	+0.4 ± 1
+50	-0.4 ± 15	-0.4 ± 5	-0.4 ± 2.5	
+60				-0.57 ± 1
+75	-0.9 ± 15	-0.9 ± 5	-0.9 ± 2.5	
+100	-1.3 ± 15	-1.3 ± 5	-1.3 ± 2.5	
+125	-1.8 ± 15	-1.8 ± 5	-1.8 ± 2.5	

Reference Temperature +25°C

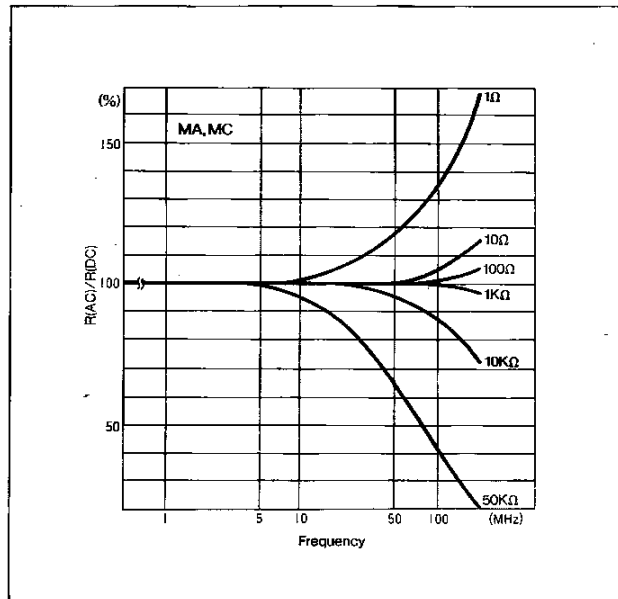
## Power Derating Curve



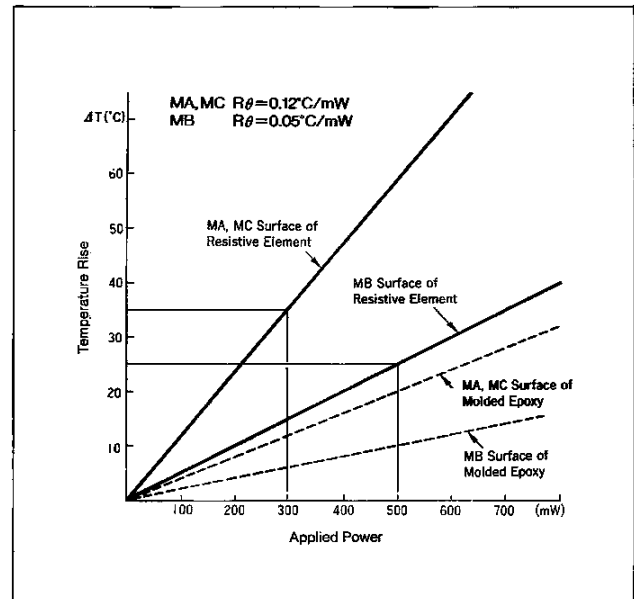


WILBRECHT ELECTRONICS

Frequency Characteristics



Temperature of Resistor Surface



Performance

Parameters	Test Condition	MIL-R-122 Specification	Typical Test Data
Max. Rated Operating Temperature Working Temperature Range Max. Working Voltage		125°C -65°C ~ +175°C MA = MC = 300V, MB = 350V	
Power Conditioning Thermal Shock Overload	25°C, Rated Voltage, 96hrs -65°C/30min. ↔ +175°C/30min., 5cycles Rated Voltage × 2.5, 5sec.	±0.02%	±0.005%
Solderability Resistance to Solvents	245°C, 5sec. ①Isopropyl Alcohol + Mineral Spirits ②Water + Butyl Cellosolve + Monoethanolamine	over 95% coverage no damage	over 95% coverage no damage
Low Temperature Storage and Operation Terminal Strength	-65°C, No Load, 24hrs → Rated Voltage, 45min. 0.908Kg(2pounds), 10sec.	±0.01% ±0.01%	±0.0025% ±0.0025%
Dielectric Withstanding Voltage Insulation Resistance Resistance to Soldering Heat Moisture Resistance	Atmospheric: AC300V, 1min. Barometric: 8mmHg, AC200V, 1min. DC500V, 2min. 350°C, 3sec. +65°C ~ -10°C, 90%RH ~ 88%RH, Rated Voltage, 10cycles (240hrs)	±0.01% over 10,000MΩ ±0.01% ±0.05%	±0.0025% over 10,000MΩ ±0.0025% ±0.01%
Shock Vibration, High Frequency	100G, 6ms, Sawtooth Wave, X, Y, Z, each 10 shocks 20G, 10Hz ~ 2000Hz ~ 10Hz, 20min., X, Y, Z, each 2.5hrs	±0.01% ±0.01%	±0.0025% ±0.0025%
Life	125°C, Rated Power, 1.5hr.-ON, 0.5hr.-OFF, 2000hrs	±0.05%	±0.015%
Life 85°C Power Rating	85°C, Rated Power × 2, 1.5hr.-ON, 0.5hr.-OFF, 2000hrs	±0.05%	±0.015%
Life 25°C Power Rating	25°C, Rated Power × 2.5, 1.5hr.-ON, 0.5hr.-OFF, 2000hrs	±0.05%	±0.015%
Storage Life	15°C ~ 35°C, 15%RH ~ 75%RH, No Load, 10000hrs	±0.005%	±0.0025%
High Temperature Exposure	175°C, No Load, 2000hrs	±0.05%	±0.015%
Current Noise Thermal EMF Voltage Coefficient		-32dB 0.0001%/V 1.0μV/°C	-42dB 0.0003%/V 0.1μV/°C