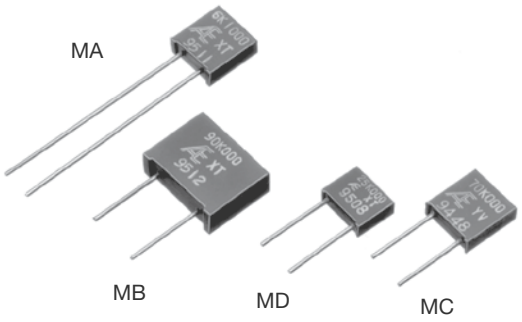
Alpha Electronics
A VPG Brand

Ultra Precision Resistor (Transfer Molded)



Pb-free Available
RoHS COMPLIANT

COMPOSITION OF TYPE NUMBER

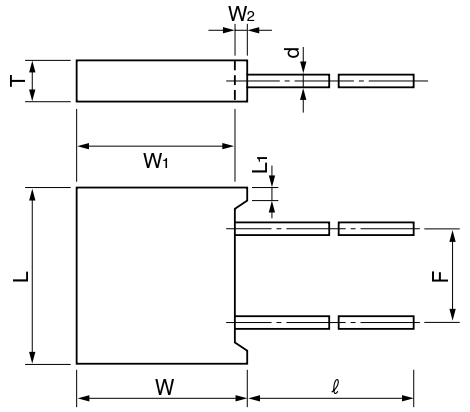
Example:

MA Y 10K000 A

- A — Tolerance
- 10K000 — Resistance Value
- Y — TCR
- MA — Type

Resistance value, in ohm, is expressed by a series of six characters, five of which represent significant digits. 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	MA	MC	MB	MD
L	7.9±0.2		13.0±0.3	7.4±0.2
L_1	1.0 max.		1.5 max.	0.8 max.
W	8.3±0.2		10.0±0.3	6.0±0.2
W_1	8.0±0.2		9.5±0.3	5.7±0.2
W_2	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	Dia. 0.65±0.05			

TCR, RESISTANCE RANGE, TOLERANCE, RATED POWER

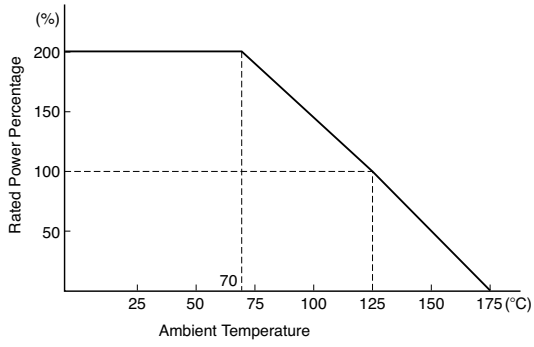
Type	TCR (ppm/°C) –55°C to +125°C*	Resistance Range (Ω)	Resistance Tolerance (%)*†	Rated Power (W) at 125°C
MA MC	0±15 (W)	1 to 5	±0.5 (D) ±1 (F)	0.3 (0.2 at 150 kΩ or above)
	0±5 (X)	5 to 30	±0.1 (B) ±0.5 (D) ±1 (F)	
	0±5 (X) 0±2.5 (Y) 0±1 (Z)**	30 to 200k	±0.005 (V) ±0.01 (T) ±0.02 (Q) ±0.05 (A) ±0.1 (B) ±0.5 (D) ±1 (F)	
MB	0±5 (X)	5 to 30	±0.1 (B) ±0.5 (D) ±1 (F)	0.5 (0.3 at 200 kΩ or above)
	0±5 (X) 0±2.5 (Y) 0±1 (Z)**	30 to 400k	±0.005 (V) ±0.01 (T) ±0.02 (Q) ±0.05 (A) ±0.1 (B) ±0.5 (D) ±1 (F)	
MD	0±5 (X)	5 to 30	±0.1 (B) ±0.5 (D) ±1 (F)	0.125
	0±5 (X) 0±2.5 (Y)	30 to 100	±0.05 (A) ±0.1 (B) ±0.5 (D) ±1 (F)	
	0±5 (X) 0±2.5 (Y) 0±1 (Z)**	100 to 80k	±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 the values obtained by measuring the leads at point 12.7±3.2 mm away from the base for Type MA and at point 5.0±1.0 mm for Types MC, MB and MD, 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.

POWER DERATING CURVE



DSCC SPECIFICATIONS

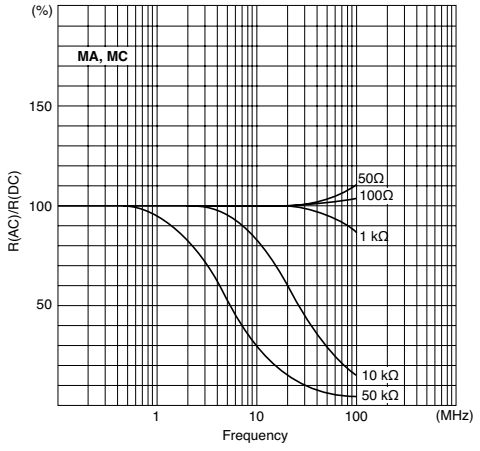
97009
97010
97011

PERFORMANCE

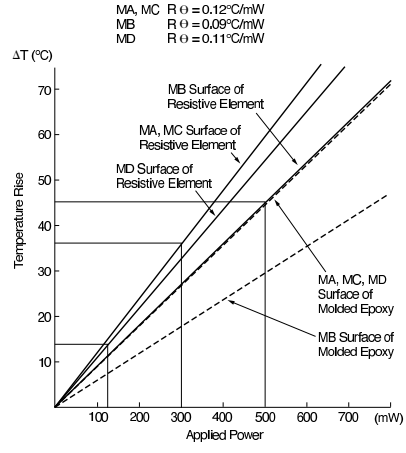
Parameters	Test Condition	MIL-PRF-55182/9 Specification	ALPHA Typical Test Data
Maximum Rated Operating Temperature **Working Temperature Range** **Maximum Working Voltage**		125°C –65°C to +175°C MA, MC=300V, MB=350V, MD=250V	
Power Conditioning **Thermal Shock** **Overload**	125°C, Rated Power, 100 hrs. –65°C/30 min. ↔ +150°C/30 min., 5 cycles Rated Power x 6.25, 5 sec.	±(0.20%+0.01Ω) ±0.05% ±0.05%	±0.005% ±0.005% ±0.005%
Solderability **Resistance to Solvents**	Steam Aging 8 hrs., 245°C, 5 sec. ❶ Isopropyl Alcohol + Mineral Spirits ❷ Water + Butyl Cellosolve + Monoethanolamine	over 95% coverage no damage	over 95% coverage no damage
Low Temperature Storage **Low Temperature Operation** **Terminal Strength**	–65°C, 24 hrs. –65°C, Rated Voltage, 45 min. 0.908 kg (2 pounds), 10 sec	±0.05% ±0.05% ±0.02%	±0.0025% ±0.0025% ±0.0025%
Dielectric Withstanding Voltage **Insulation Resistance** **Resistance to Soldering Heat** **Moisture Resistance**	Atmo.Pres.: 300V rms. Baro. Pres. 8 mHg: 200V rms. DC 100V, 2 min. +260°C, 10 sec. +65°C to –10°C, 90% RH to 98% RH, Rated Voltage, 10 cycles (240 hrs.)	±0.02% over 10,000 MΩ ±0.02% ±0.05%	±0.0025% over 10,000 MΩ ±0.0025% ±0.01%
Shock (Specified Pulse) **Vibration, High Frequency**	100G, 6 ms, Sawtooth Wave, X, Y, each 10 shocks 20G, 10 Hz to 2,000 Hz to 10 Hz, 20min., X, Y, each 4 hrs.	±0.01% ±0.02%	±0.0025% ±0.0025%
Life	125°C, Rated Voltage, 1.5 hr. – ON, 0.5 hr. – OFF, 2,000 hrs.	±0.05%	±0.015%
Life 70°C Power Rating	70°C, Rated Voltage x 2, 1.5 hr. – ON, 0.5 hr. – OFF, 2,000 hrs.	±0.05%	±0.015%
Storage Life	15°C to 35°C, 15% RH to 75% RH, No Load, 10,000 hrs.	±0.005%	±0.0025%
High Temperature Exposure	175°C, No Load, 2,000 hrs.	±0.5%	±0.015%
Current Noise **Voltage Coefficient** **Thermal EMF**		-32 dB 0,0005%/V 1.0 µV/°C	-42 dB 0,00003%/V 1.0 µV/°C

Type MA meets requirements of MIL-PRF-55182/9.

FREQUENCY CHARACTERISTICS



TEMPERATURE OF RESISTOR SURFACE



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MAX2K5000T MAX64K000B MAY100K00T MAX100K00T MAY7K8000A MAW1R0055D MDZ20K000T MDZ25K000A MDY1K5000Q MDY350R00T MDY3K6500Q MDY475R00B MDY7K8700Q MDZ100K00T MCZ62R000A MDX5R0000B MDY100R00T MDY120R00T MDY13K000T MDY1K0000T MCZ200R00A MCZ300R00A MCZ300R00T MCZ300R00V MCZ315R00T MCZ400R00T MCY8K7020T MCY92R123Q MCY935R20T MCY99R995T MCZ100R00A MCZ1K3500T MCY7K5000T MCY7K7000B MCY820R00T MCY8K0890T MCY8K2500B MCY8K4375T MCY500R00T MCY50K000T MCY5K2500T MCY6K2500T MCY75K000B MCY7K0000B MCY3K0648T MCY3K8350T MCY3K8450T MCY40R000B MCY499R00B MCY4K9000T MCY2K0000T MCY2K2140T MCY2K5000T MCY2K6800T MCY345R06T MCY350R00T MCY212R052T MCY24K950T MCY250R00T MCY25K000T MCY280R978T MCY2K0000F MCY1K0924T MCY1K2980T MCY1K9110T MCY200K00F MCY200K00T MCY20K000T MCY15K000T MCY15K910B MCY16K760B MCY180K00T MCY1K0000T MCY1K09244T MCY11K300B MCY120R00T MCY125R00T MCY12K500T MCY138R505T MCY150K00T MCY100K00T MCY100R00T MCY10K000B MCY10K000T MCY10K750T MCY119R40T MCX6K2000B MCX6K2000B-H1 MCX702R00B MCX71K500B MCX75K000T-H1 MCX80K000B MCX56K200B MCX56K200B-H1 MCX5K0000B-H1 MCX5K0000T MCX5R0000B MCX6K0900B MCX500R00T MCX50K000B