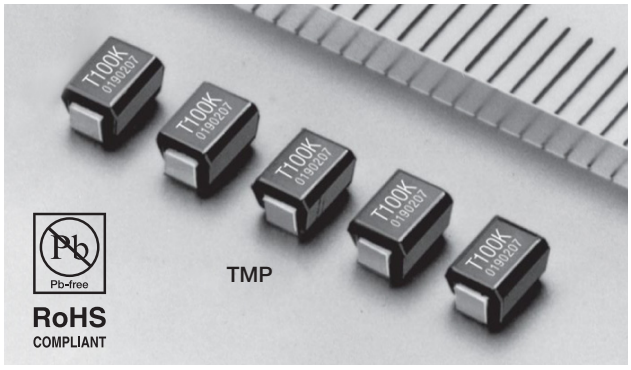
Alpha Electronics
A VPG Brand

Precision SMD Thin Film Resistor (Molded, J-Lead Terminal)

High accuracy thin film resistor manufactured by Bulk Metal® Foil resistor production
TCR: ±5.0ppm/°C (available <±5.0ppm/°C by custom)



FEATURES

- Internal and external strain relief constructions due to flexible J lead and gold wire bonding
- High liability transfer molded package ensure minimal stress from ambient environment
- TCR: ±5.0 ppm/C° (-55C° to +125C°)
- Tolerance: ±0.02% (available ±0.01% per request)

APPLICATIONS

- ATE, Precision Instrumentation, Electric Scale, Medical, etc

COMPOSITION OF TYPE NUMBER

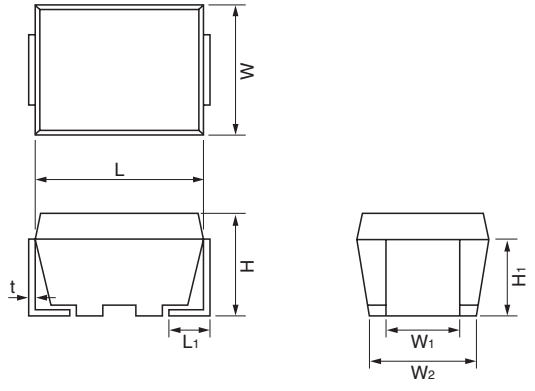
Example:

TMP 1M0000 Q L

- L — Tape & Reel Package Required
- Q — Tolerance
- 1M0000 — Resistance Value
- TMP — Type

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

CONFIGURATION (DIMENSIONS IN mm)



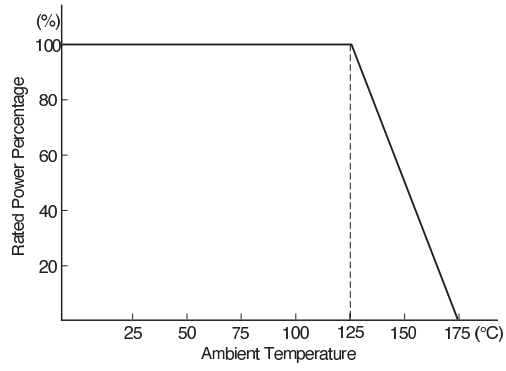
Type	TMP
L	3.2 ±0.2
W	2.5 ±0.2
H	2.0 ±0.2
L_1	0.6 ±0.2
W_1	1.4 ±0.3
W_2	2.3 ±0.2
H_1	1.5 ±0.3
t	0.15 ±0.05

TCR, RESISTANCE RANGE, TOLERANCE, RATED POWER

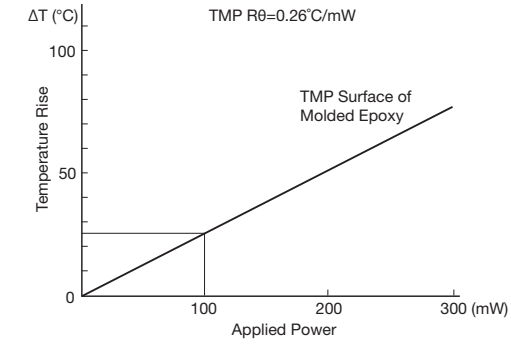
Type	TCR (ppm/°C) –55°C to +125°C	Resistance Range (Ω)	Resistance Tolerance (%)*	Rated Power (W) at 125°C
TMP	0±5	30k to 1M	±0.05 (A) ±0.02 (Q)	0.1

* Please contact us for tighter tolerances.

POWER DERATING CURVE



TEMPERATURE OF RESISTOR SURFACE

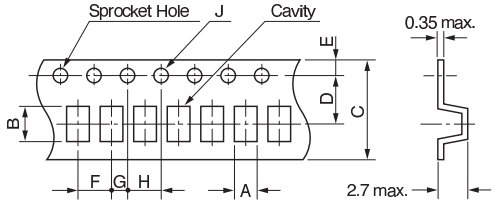


PERFORMANCE

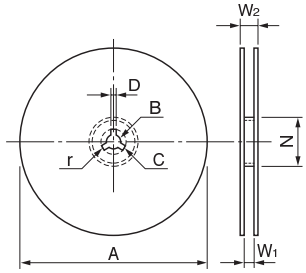
Parameters	Test Condition	ALPHA Specification	ALPHA Typical Test Data
Maximum Rated Operating Temperature		+125°C	
Working Temperature Range		-65°C to +175°C	
Maximum Working Voltage		150 V	
Thermal Shock Overload	-65°C/30 min. ↔ +175°C/30 min., 10 cycles Rated Voltage x 2.5, 5 sec.	±0.05%	±0.01%
Low Temperature Storage and Operation Substrate Bending Test	–65°C, No Load, 24 hrs. → Rated Voltage, 45 min. Substrate Bent 3 mm, 60 sec.	±0.05%	±0.01%
Dielectric Withstanding Voltage	Atmospheric: AC200 V, 1 min.	±0.01 %	±0.05%
Insulation Resistance	DC100 V, 1 min.	over 10,000 MΩ	over 10,000 MΩ
Resistance to Soldering Heat	260°C, 10 sec.	±0.05%	±0.01%
Moisture Resistance	+65°C to -10°C, 90%RH to 98%RH, Rated Voltage, 10 cycles (240 hrs.)	±0.05%	±0.01%
Moisture Load Life	+85°C, 85%RH, Rated Power x 10%, 1.5 hrs. - ON, 0.5 hrs. - OFF, 1,000 hrs.	±0.05%	±0.01%
	+85°C, 85%RH, Rated Power, 1.5 hrs. - ON, 0.5 hrs. - OFF, 1,000 hrs.		
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.	±0.05%	±0.01%
Life (Load Life)	125°C, Rated Voltage, 1.5 hrs. - ON, 0.5 hrs. - OFF, 2,000 hrs.	±0.05%	±0.01%

TAPE AND REEL PACKAGE (BASED ON EIA-481-1) (DIMENSIONS IN mm)

Tape Dimensions



Reel Dimensions



Type	A	B	C	D	E	F	G	H	J
TMP	2.8 ±0.2	3.9 ±0.2	12.0 ±0.3	5.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	4.0 ±0.1	Dia. 1.5 ±0.1-0

A	N	B	C	D	W1	W2	r
Dia. 178 ±2	Dia. 60 min.	Dia. 13 ±0.5	Dia. 21 ±0.8	2 ±0.5	12.4 +2.0-0	18.4 max.	1.0 ±0.5

Reel Capacity
TMP: 1,200 pieces/reel

PRECAUTION IN USING FACE-BONDED CHIP RESISTORS

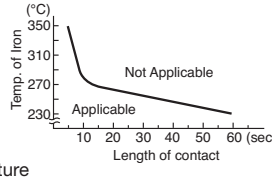
1. Storage

Storage conditions or environment may adversely affect solderability of the exterior terminals. Do not store in high temperature and humidity. The recommended storage environment is lower than 40°C, has less than 70% RH humidity and is free from harmful gases such as sulphur and chlorine.

2. Caution in Soldering

❶ Hand Soldering

Hand soldering is applicable as shown at right.
Recommended
- Temp. of iron tip: 240°C to 270°C
- Power of iron: 20W or less
- Diameter of tip: dia. 3 mm max.



❷ Solder Reflow in Furnace

Recommended
- Peak temperature: 250+0/-5°C
- Holding time: 10 sec. max.
- To cool gradually at room temperature

❸ Dipping in Solder (Wave or Still)

Recommended
- Temp. of solder: 260°C max
- Length of dipping: 10 seconds
- To cool gradually at room temperature

❹ Other

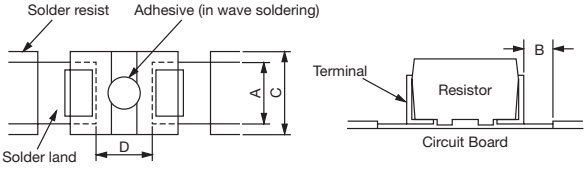
Corrosion-free flux, such as rosin, is recommended. Do not apply pressure to the molded housing immediately after soldering.

3. Cleaning

Use volatile cleaner such as methylalcohol or propyl alcohol.

4. Circuit Board Design

The dimensions of solder land must be determined in conformity with the size of resistors and with the soldering method. They are also subject to the mounting machine and the material of the substrate. See example below.

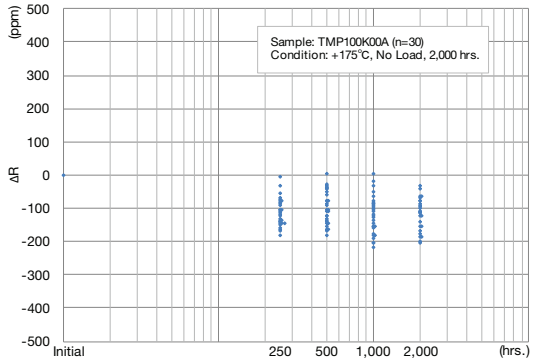


Type	A	B	C	D
TMP	1.6 to 2.0	0.5 to 1.5	2.2 to 2.6	1.8

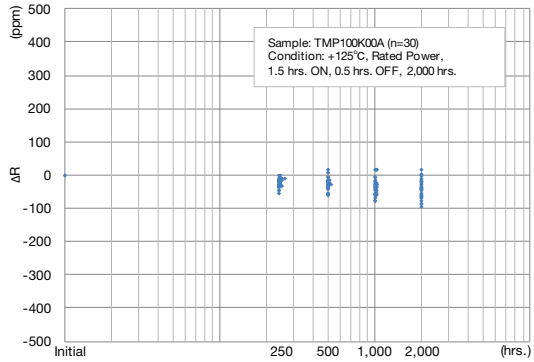
Dimensions in mm

When parts are mounted on a board in high density, solder can possibly attach to the resistors in an excessive amount to affect performance or reliability of the resistors. To prevent this effect, the use of solder resist is recommended to isolate solder lands.

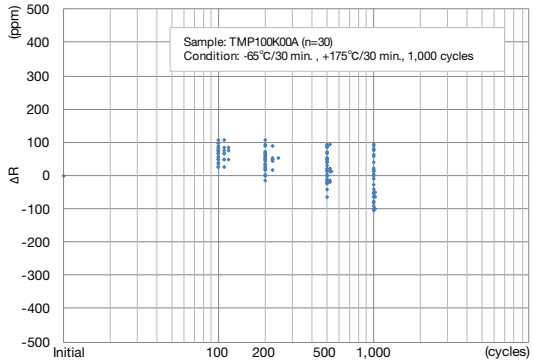
HIGH TEMPERATURE EXPOSURE



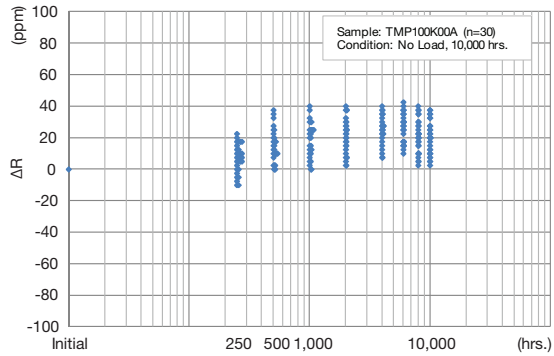
LIFE (LOAD LIFE)



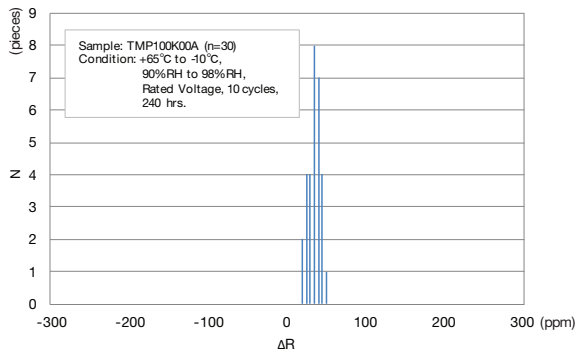
THERMAL SHOCK



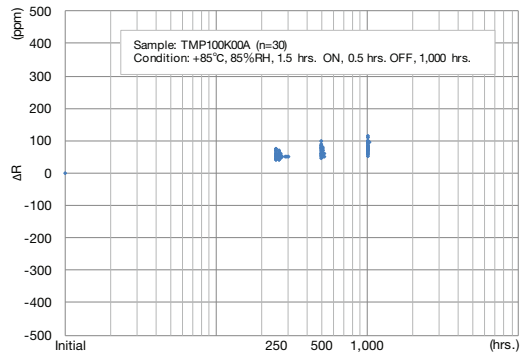
STORAGE LIFE



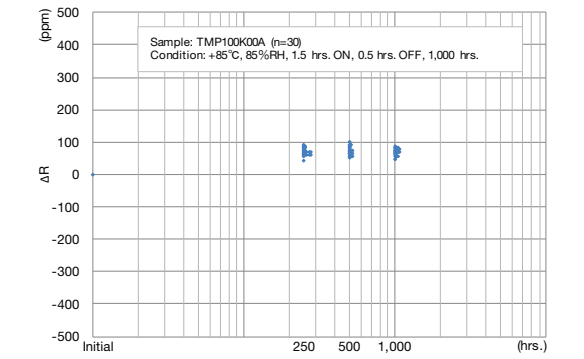
MOISTURE RESISTANCE



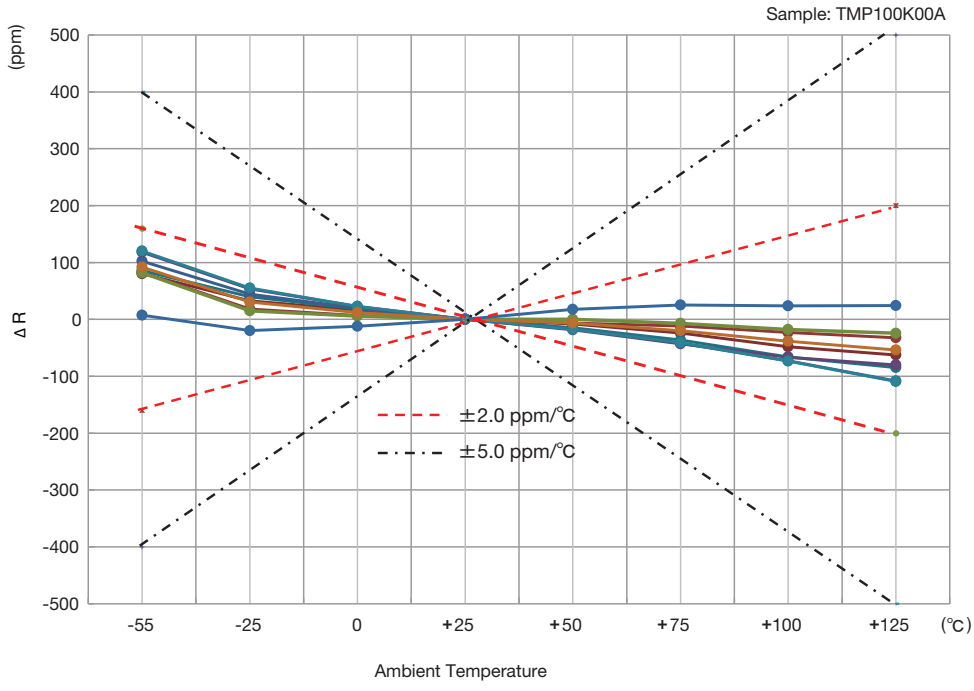
MOISTURE LOAD LIFE (10% X RATED POWER)



MOISTURE LOAD LIFE (RATED POWER)



TCR (TYPICAL)



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