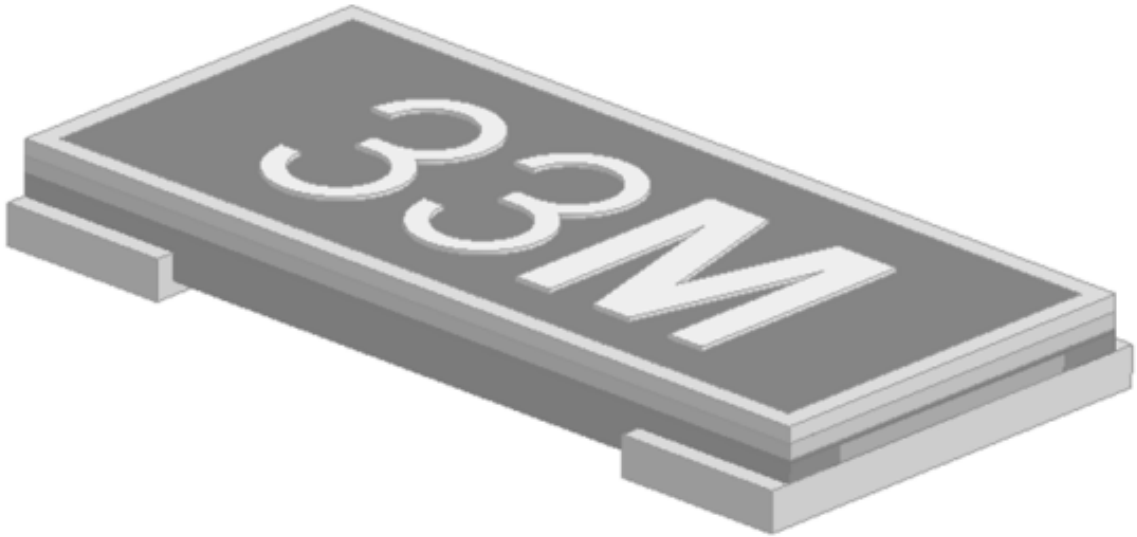
Panasonic

Current Sense Solution
- ERJ-MP Series -



1. Features

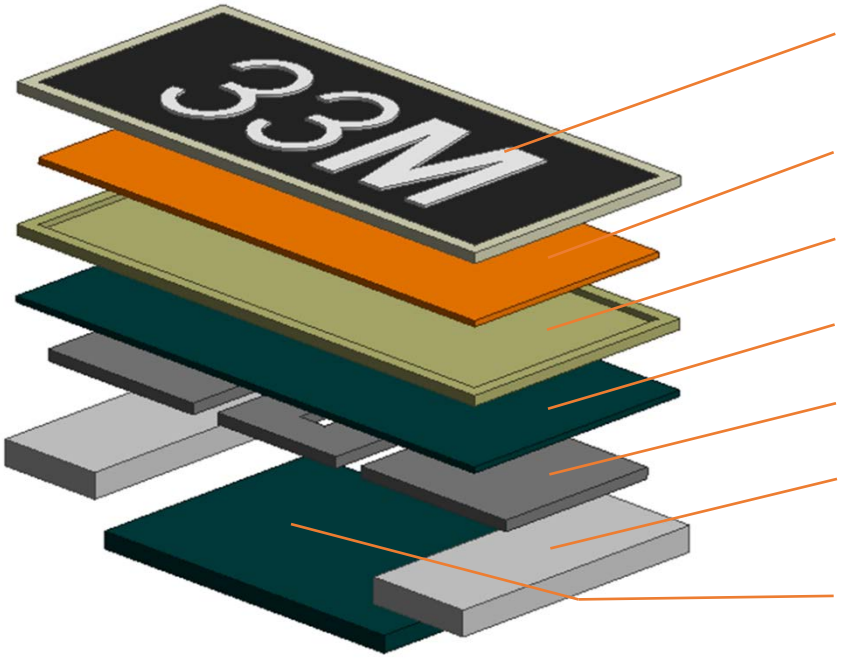
- Metal plate bonding technology with excellent long term stability
- Outer resin with high heat dissipation realized wide temperature range (-65°C to +170°C)

2. Part description

Part No.	Size (Inch)	Power Rating at 70℃	Resistance Range	Resistance Tolerance	T.C.R.	Category Temperature Range (°C)
		(W)	(mΩ)	(%)	(×10-6/℃)	
ERJ-MP2G	1206	0.25	1 ~ 10	F : ±1%	±75	-65 to +170
ERJ-MP2K	1206	0.5				
ERJ-MP3K	2010	0.5	1 ~ 10	F : ±1%	±75	-65 to +170
ERJ-MP3M	2010	1				
ERJ-MP4M	2512	1	1 ~ 10	F : ±1%	±75	-65 to +170
ERJ-MP4P	2512	2				

New Shunt Structure (1mΩ to 500mΩ)

Why Panasonic can achieve wide resistance range with High power in smaller case size…



Protective coating (Top side) with Resistance value marking

Copper foil

Insulating substrate

Bonding layer

Resistive material

Terminal with Plating(Ni/Sn)

Protective coating (Bottom side)

1. Resistive material control

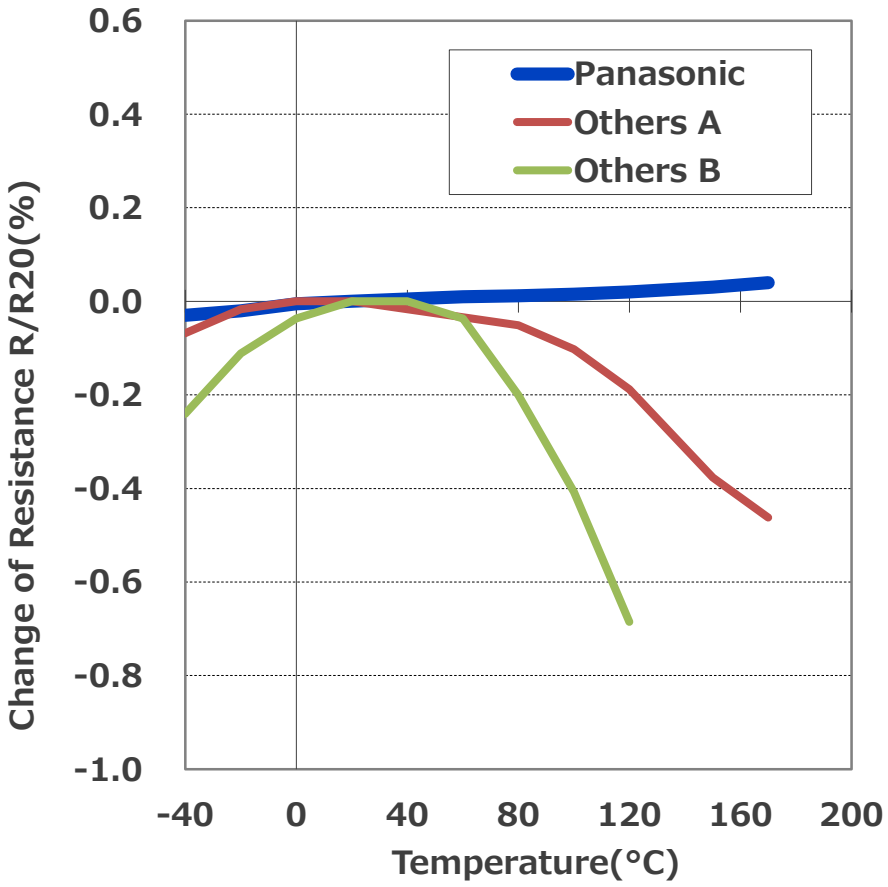
-Taking advantage of patterning process which we had acquired as Thick film & Thin film R technology

2. Thermal diffusion & radiation

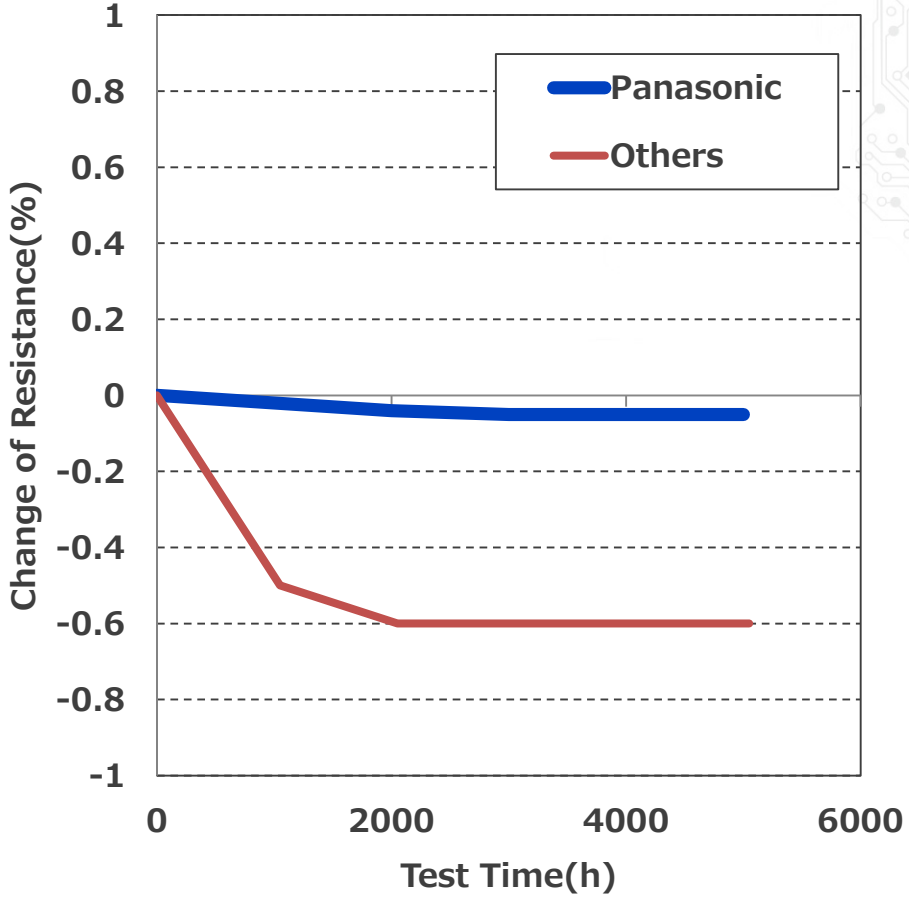
-Using Printed Circuit Board (FR4) technology as heat sink method

Panasonic Advantage

TCR Characteristic



High temperature exposure 170°C



Panasonic shunt has…

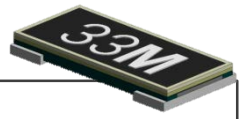
- Linear TCR characteristic (Easy to compensate)
- Long stability at high temperature condition

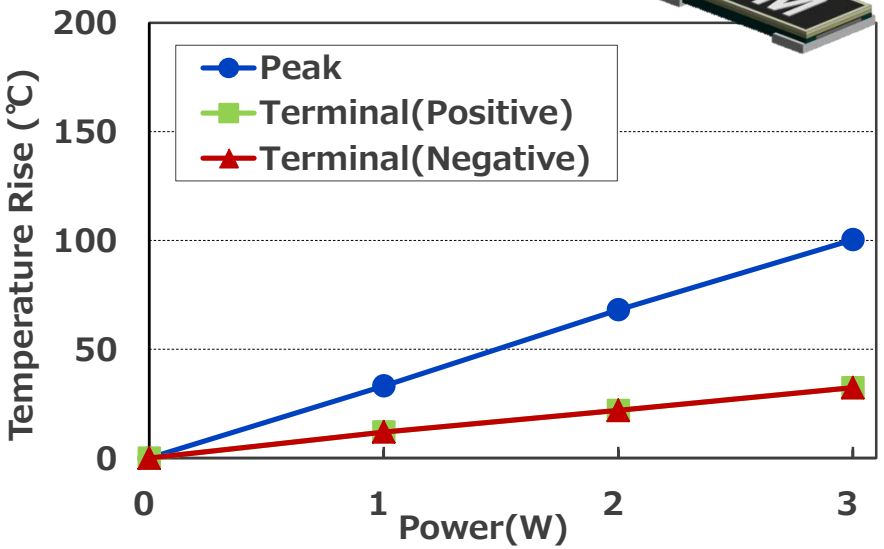
Panasonic

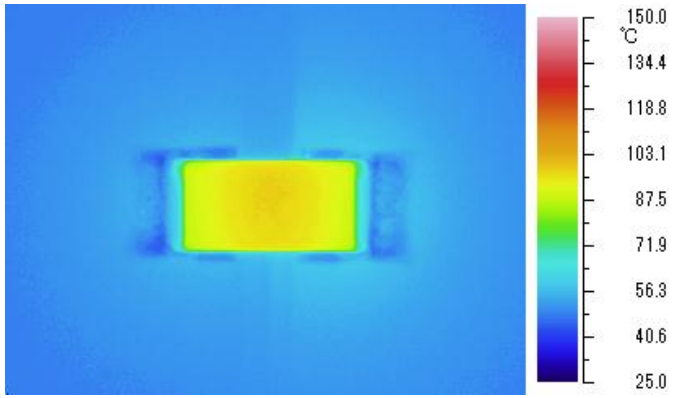
Panasonic Advantage

Temperature Rise Comparison (2512 size, 10mΩ)

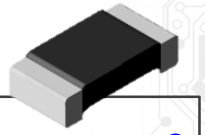
Panasonic (ERJMP4)

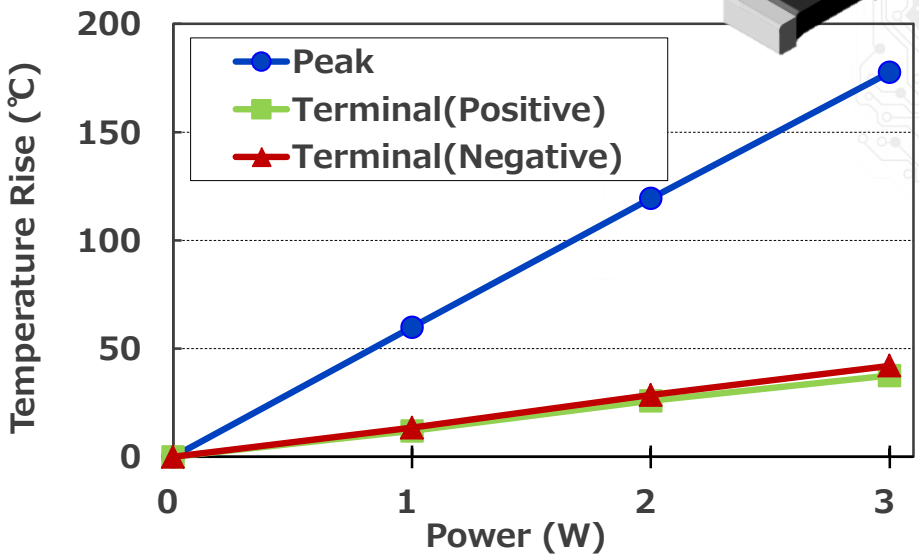


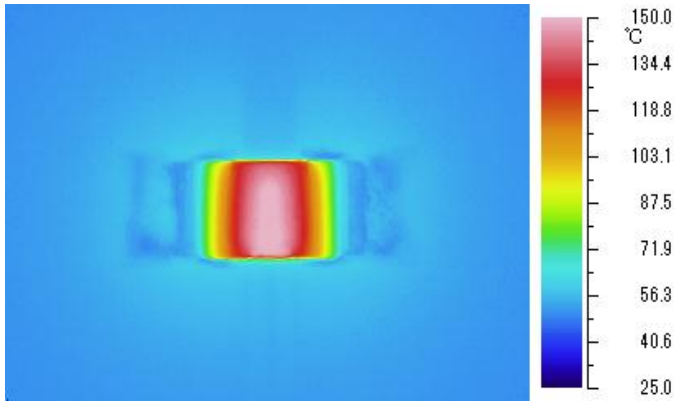




Others (WSL2512)



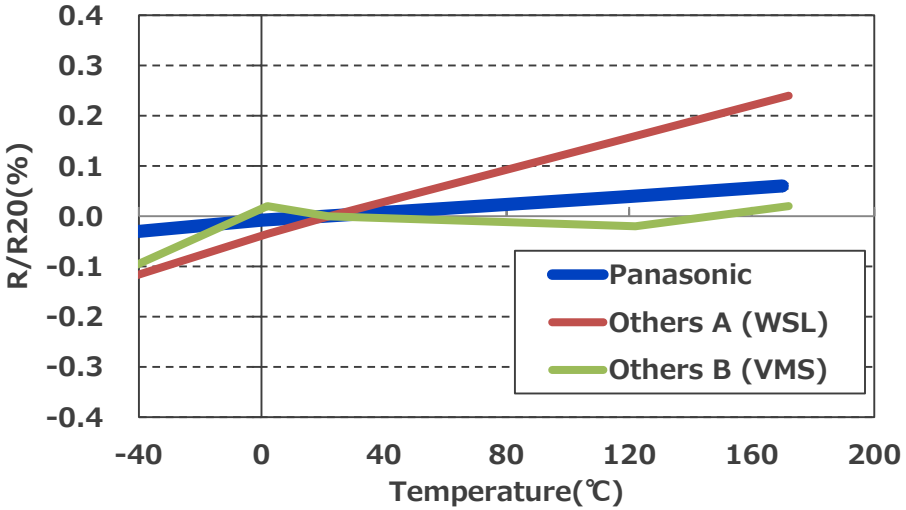




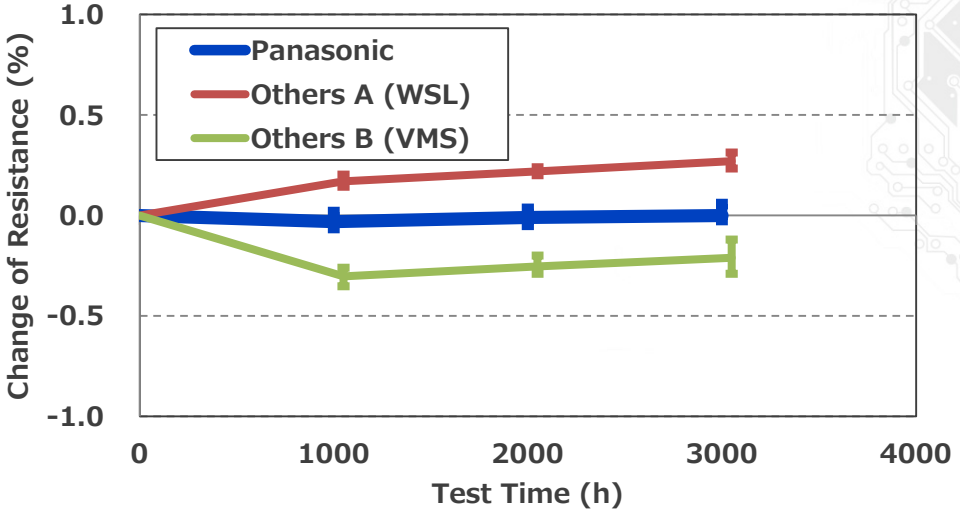
Prevent peak heat generation by heat sink method

Reliability Performance Comparison (2512 size, 5mΩ)

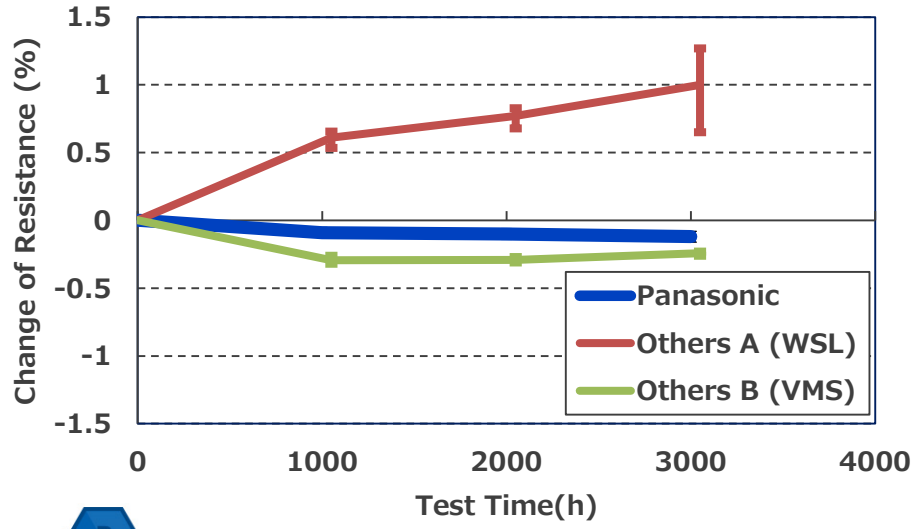
TCR Characteristic



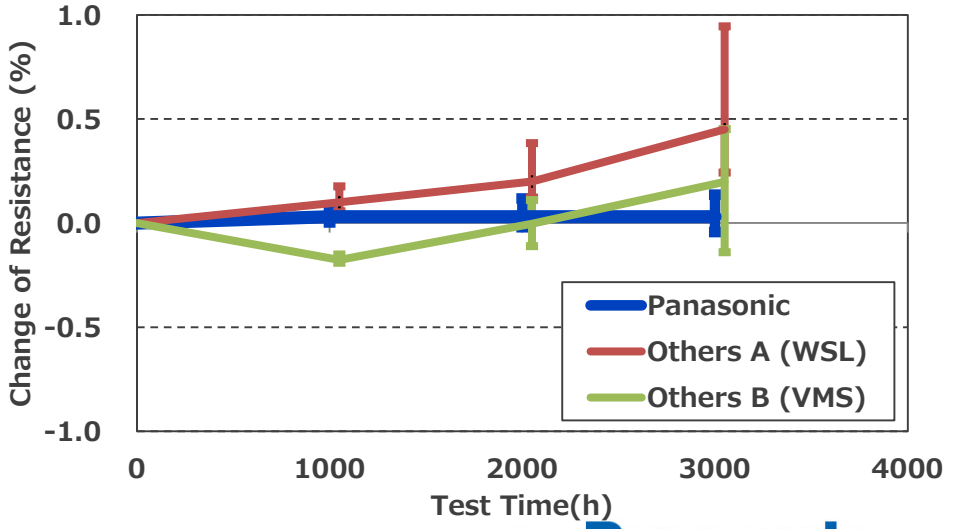
High temperature exposure (170°C)



Operational Life (170°C, 3W)



Temperature Cycle (Liquid -55°C,155°C)



Target Performance AEC-Q200

Test Item	Test Condition (AEC-Q200)	Target Specification
Thermal Shock	MIL-STD-202 method 107 (-55 °C / +125 °C, 25 cycle)	±0.5%
Overload	MIL-R-26E (5 x rated power, 5 sec)	±0.5%
Solderability	MIL-STD-202 method 208	>95% coverage
Resistance to Solvents	MIL-STD-202 method 215, 2.1a, 2.1d	No damage
Low Temperature Storage and Operation	MIL-STD-26E (-65 °C, 24 h)	±0.5%
Resistance to Solder Heat	MIL-STD-202 method 210 (260 °C, 10s)	±0.5%
Moisture Resistance	MIL-STD-202 method 106	±0.5%
Shock	MIL-STD-202 method 213-A	±0.5%
Vibration, High Frequency	MIL-STD-202 method 204-B	±0.5%
Life	MIL-STD-26E (Rated Power, 1.5 h-ON, 0.5 h-OFF, 2000 h)	±1%
Storage Life at Elevated Temperature	MIL-STD-202 method 108-F (170 °C, 2000 h)	±1%
High Temperature Characteristics	140 °C, 2000 h	±0.5%
Frequency Characteristics	Inductance	<2nH