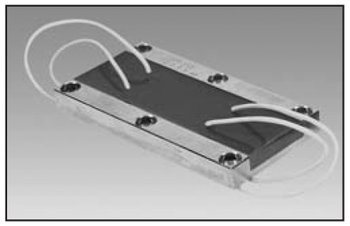
HPF 250

Non-Inductive High Power Thick Film Resistors

These are 250W, chassis mounted, non-inductive, high power resistors. The small and thin size is ideal for high density, compact instruments. Theses models exhibit superior vibration characteristics. The thermal resistance between the element and heat sink is excellent. Superior dielectric strength is achieved by using a 96% aluminum substrate as an insulator between the element and metal base.
Applications include: Snubber and attenuator resistors.



■ GENERAL SPECIFICATIONS

Model	Wattage Rating on Heat Sink	Resistance Range[Ω]	Tolerance(%)	Weight
HPF250	250W(see note)	5 ~ 1K	K [±10]	312g

*Note: The base of this resistor should be kept below 100℃.

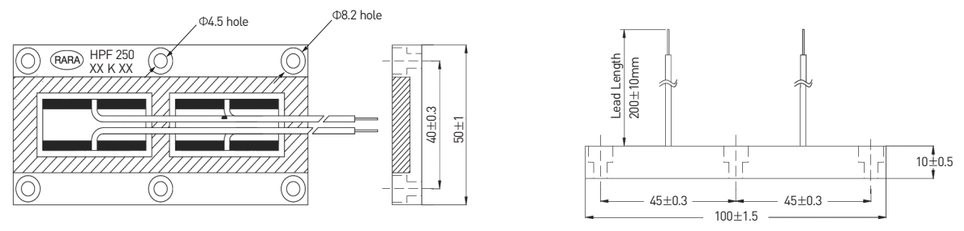
■ CHARACTERISTICS

Values in [ ] mean change in Ω after test

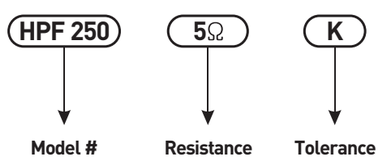
Temperature Range		-55℃~+125℃
Insulation Resistance		Over 1GΩ between two terminals and tab
Dielectric Withstanding Voltage		DC 5000V 1minute
Temp. Coefficient		±250ppm/℃
Moisture Resistance	±[2.00%+0.05Ω]	60℃, 90 to 95%RH, DC 1W, 1000hours
Vibration	±[0.5%+0.5Ω]	JIS-C-5202
Load Life	±[2.00%+0.05Ω]	25℃, Power rating 1.5hours on, 30minutes off, 1,000 hours
Thermal Resistance		0.1℃/W From resistor surface to fin
Mounting Torque		15kgf/cm²
Max. Applied Voltage		1000V is in accordance with E= $\sqrt{P*R}$
Temperature Cycle	±[0.5%+0.05Ω]	-55℃, 30minutes, +120℃ 30minutes, 20cycles

* Note: Applied voltage: AC RMS voltage

■ DIMENSIONS(mm)



■ ORDERING PROCEDURE EXAMPLE



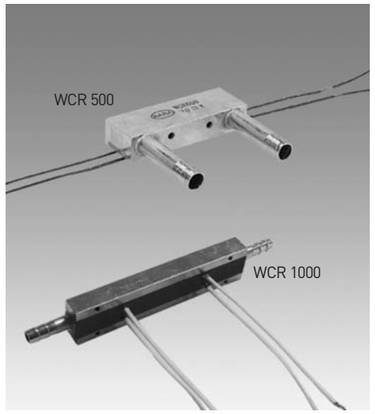
If you require more detailed technical information, please contact the RARA design team using the contact information on top of each page.

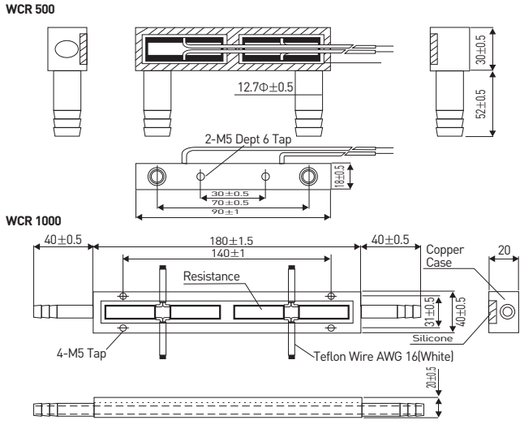
Water Cooled High Power Resistors WCR

These are 500W, 1000W high power resistors exhibiting very low operating temperatures. This model offers very bw inductance and high surge handling capacity. It consists of a flat resistive element with twisted air leads. A 5kV dielectric strength is ensured with an alumina substrate. The low operating temperature of the element gives a low failure rate in high-density, compact instruments and equipment. This model can be used in snubber resistors, GTO and IGBT in electric power conversion systems.

■ DIMENSIONS(mm)

WCR 500, 1000





■ CHARACTERISTICS

Rated Power	WCR500:500W(Water cooling)	WCR1000: 1000W(Water cooling)
Resistance Range	Stock Values: 10, 20, 40, 120Ω(Custom Values MOQ: 100pcs./ value)	
T.C.R	±250ppm/℃	
Resistance Tolerance	K(±10%)	
Dielectric Withstanding Voltage	AC 2,000V Between terminals and fin. Option: DC 5000V between terminals and fin	
Series Inductance	40nH / dual resistor(typical)	0.1 μH
Volume of Water Flow	2l / 1Minute(minimum)	6l / 1Minute(minimum)
Water Temp.	41℃ at Maximum at inlet, more than the dew point	
Case Temp. Rise	14℃	
Water Temp. Rise	1.4℃	
House Mouth	Standard: Nipple, any types are available	
Surface Temp. Rise	50.0℃	
Max. Element Surf. Temp	110℃	
Water Pressure Loss	0.06 kgf/㎠	0.1 kgf/㎠
Weight	355(g)	750(g)

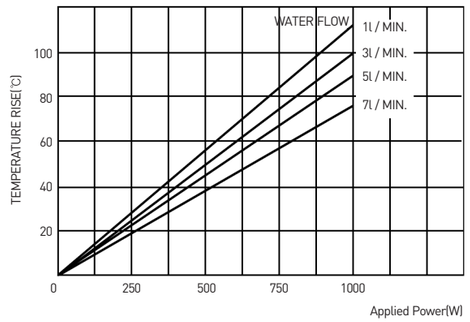
■ ORDERING PROCEDURE EXAMPLE

WCR500	H	*10+10Ω	K
Model #	T.C.R (H=250ppm/℃)	Resistance (*10+10Ω)	Tolerance (K= ±10%)

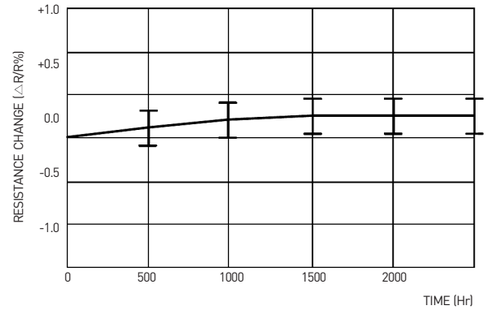
RARA WCR500, 1000 Pb Pb-free Available

■ TEMPERATURE INCREASE VERSUS POWER LOAD (WCR500)

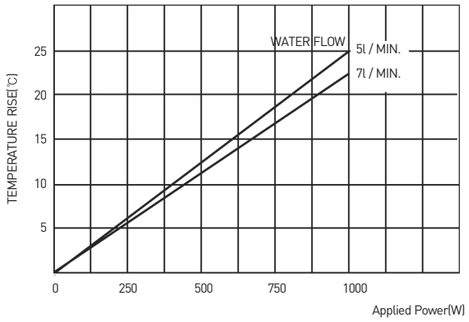
Element Surface Temperature Rise



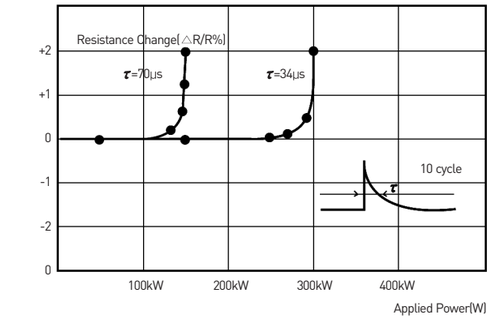
Load Life Characteristics



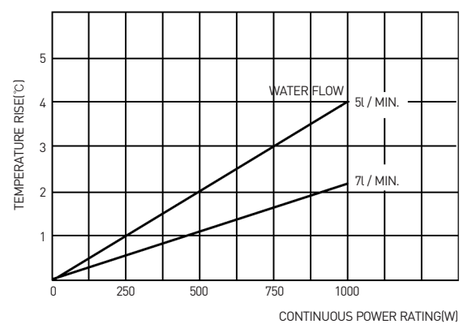
Case Temperature Rise



Impulse Test (Typical)



Cooling Water Temperature Rise vs. Power Rating



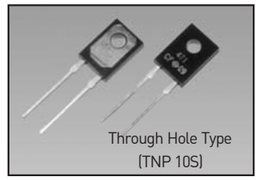
Note: The standard circuit consists of two elements(each with two leads),independently.
All measuring data was taken by connecting two elements in parallel.

Power Thin Film Resistors(TO126)

A small, 20 Watt, 5.9 /W heat resistance(hot spot to flange), high power resistor in a TO-126 package. Noninductive design is suitable for high speed SW power sources, high precision CRT and high speed pulse handling circuits. The thin style and small package is ideal for high density electronic instruments. Designed for superior vibration durability with heat sink mounting. Complete thermal flow designs are available. Applications include: Color video amplifier for CRTs, emitter resistors of power SW circuits, snubber circuits, VHF amplifiers, load resistor for pulse generators.

GENERAL SPECIFICATIONS

Model	Resistanc Range [Ω]	TCR [ppm/℃]	Tolerance(%)	Rating Power[W] (See Note 1)	Heat Resistance (See Note 2)
TNP10S	0.1 to 0.09	±250	J [±5]	20W 1W(at free air)	5.9℃/W
	0.1 to 9.1	±100	F [±1], J [±5]		
	10 to 51K	±50	F [±1]		


Through Hole Type (TNP 10S)

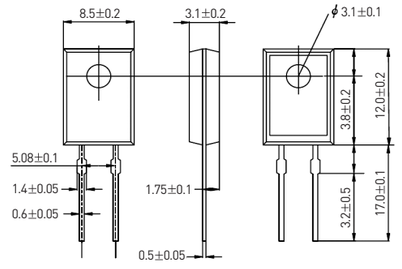
Note: 1) TNP 10S (TMP 10S) Rating power 20W: Flange Temperature of -55 to +25 ℃
2) From hot spot to Flange

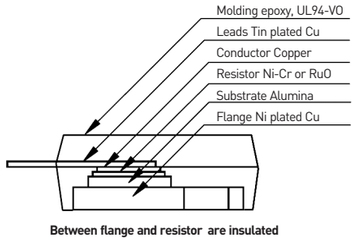
CHARACTERISTICS

Values in [ ] mean change in Ω after test

Temperature Range		-55℃ to +155℃
Insulation Resistance	[Over 1000MΩ]	Between terminals and flange
Dielectric Withstanding Voltage	[2000 Volt AC]	For 60seconds Between terminals and flange
Moisture Resistance	±[1.0 %+0.05Ω]	60℃, 90 to 95%RH, DC 0.1W, 1000hours.
Soldering Heat	±[1.0 %+0.05Ω]	350±5℃, 3sec.
Solderability	[Over 95% of surface]	230±5℃, 3sec.
Vibration	±[0.25 %]	IEC 60068-2-6
Load Life	±[1.0 %+0.05Ω]	25℃, 90 minutes on, 30minutes off, 1000hours.

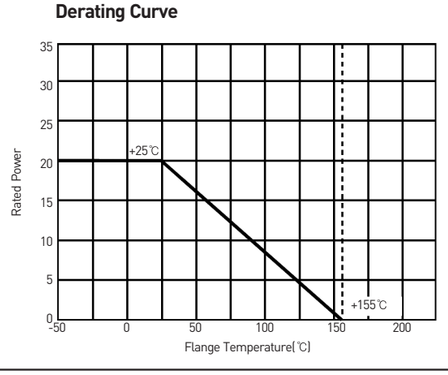
DIMENSIONS (mm) AND STRUCTURE

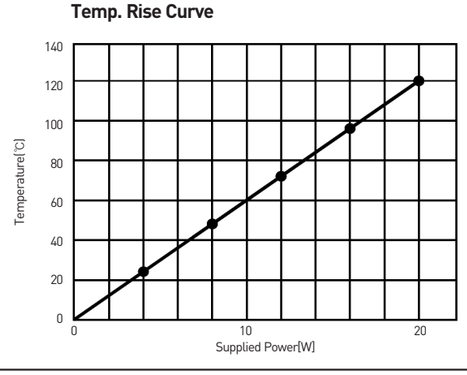




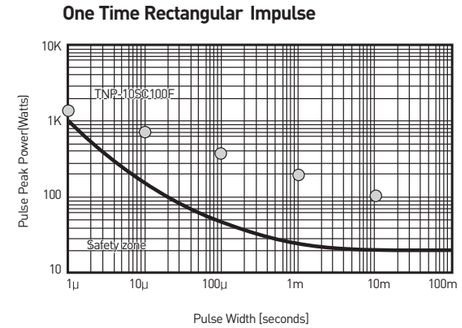
Between flange and resistor are insulated

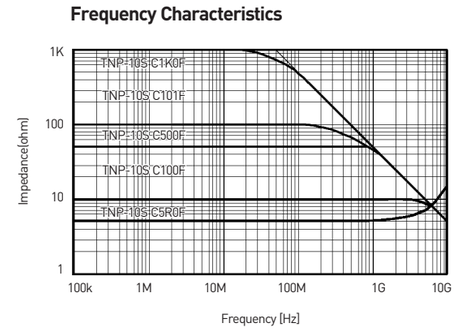
DERATING CURVE AND TEMP RISE CURVE





PULSE ENERGY DURABILITY AND FREQUENCY CHARACTERISTICS





ORDERING PROCEDURE EXAMPLE

TNP10S	C	50Ω	F	000
Model #	T.C.R H(250ppm/℃) A(100ppm/℃) C(50ppm/℃)	Resistance	Tolerance F(1%) J(5%)	Packaging Z00 Through hole type

Note:
(1) Insulation material is unnecessary between flange and heat-sink, because flange and resistor are separated by alumina insulated substrate. When mounting resistor on heat-sink, screw, clip and pressure strip with using heat conduction grease on back side of resistor are recommended. Recommended screw torque is 0.5-0.6Nm.
(2) Resistance measurement shall be made at a point 5.27mm±0.6mm from the resistor body.
(3) TCR of low resistance will be increased as 300ppm/0.02ohm, 200ppm/0.05ohm, 140ppm/0.1ohm and 80ppm/0.2ohm typically. Testing point is at 5.27mm from bottom of molding of terminals.
(4) Test method is IEC60068-2-6, and specification is sine sweep wave form, 100Hz-2000Hz, 10 cycles, amplitude 0.75mm or 100m/s², 90minutes. direction x-y-z, Amplitude 0.75mm will be applied under break point Frequency (about 60Hz) and 100m/s² over break point.
(5) When mounting resistor on heat-sink by screw, clip and pressure strip with using heat conduction grease on back side of resistor are recommended. Recommended screw torque is 0.5-0.6Nm.
(6) 0.1% tolerance resistors is available.

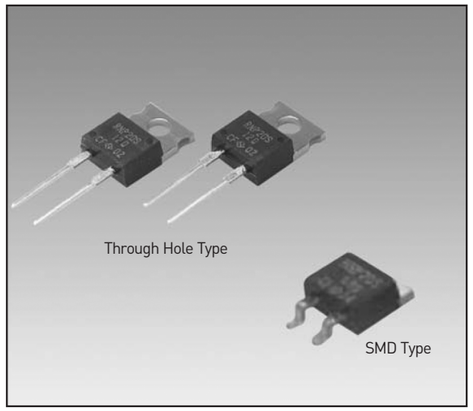
RoHS COMPLIANT

Power Thin Film Resistors(TO220)

This series of TO-220 resistors offers many possibilities. The TNP10 in TO220 style molded package for throughole(20W)and surface mount(10W). The TNP20S in TO220 style molded package for throughole(35W) and surface mount(20W). The TNP50U in TO220 style molded package for throughole and surface mount. This model has a large resistance range of 10mΩ to51kΩ The TNP10 is suitable for high frequency application and high-speed pulse circuits. The TNP20S is suitable for power unit of machines, motor control, drive circuits, automobiles and measurements. The TNP50U's low 2.3 /W heat resistance from the resistor hot spot to the flange is made possible with thin film metallization technology. All of these models are non-inductive and offer excellent heat dissipation.

GENERAL SPECIFICATIONS

Model	Resistance Range [Ω]	TCR [ppm/℃]	Tolerance(%)	Power Rating [See Note 1]	Heat Resistance [See Note 1]
TNP10	0.01 to 0.091	±250	J [±5]	20W 10W(SMD) 1W (At Free Air)	5.9℃/W
	0.1 to 9.1	±100	F [±1], J [±5]		
	10 to 51K	±50	F [±1]		
TNP20S	0.01 to 0.091	±250	J [±5]	35W 1W (At Free Air)	3.3℃/W
	0.1 to 9.1	±100	J [±5], F [±1]		
	10 to 51K	±50	F [±1]		
TNP50U	0.01 to 0.091	±250	J [±5]	50W 1W (At Free Air)	2.3℃/W
	0.1 to 9.1	±100	J [±5], F [±1]		
	10 to 51K	±50	F [±1]		



Note: 1) Rating power: Flange Temperature of -55 to +25℃
2) From hot spot to Flange

CHARACTERISTICS

Values in [ ] mean change in Ω after test

Temperature Range		-55℃ to +155℃
Insulation Resistance	[Over 1000 MΩ]	Between terminals and flange
Dielectric Withstanding Voltage	[2000 Volt AC]	Between terminals and flangef or 60 sec.
Moisture Resistance	±[1.0%]	40℃, 90 to 95% RH, DC 0.1W, 1000hours
Soldering Heat	±[0.1%]	350±5℃, 3sec.
Solderability	[Over 95% of surface]	250±5℃, 3sec.
Vibration	±[0.25%]	IEC 60068-2-6
Temperature Cycle	±[0.25%]	-55℃ 30minutes + 155℃ 30minutes 5cycle
Working Voltage		500V or sqrt P x R
Load Life	±[1.0%]	25℃, 90minutes on, 30minutes off, 1000hours

ORDERING PROCEDURE EXAMPLE

TNP20S — C — 50Ω — F — 000

Model #

T.C.R
A: 100ppm/℃
C: 50ppm/℃
H: 250ppm/℃

Resistance

Tolerance

Packaging
Z00: Through hole type
Z10: SMD type

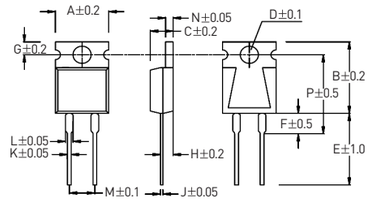
TNP10, TNP20S, TNP50U

RoHS COMPLIANT

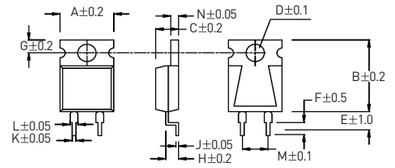
DIMENSIONS(mm) AND STRUCTURE

TNP 10, TNP 20S, TNP 50U

Through-hole type

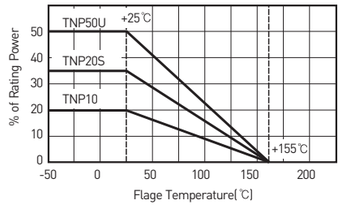


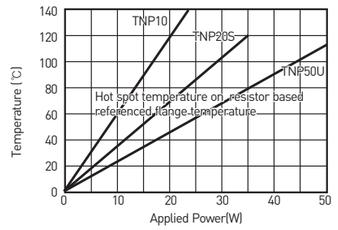
SMD type



Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P
TNP10	10.1	15.0	4.5	3.6	15.5	4.0	3.0	2.75	0.5	0.75	1.5	5.08	1.5	16.0
TNP20S	10.1	15.0	4.5	3.6	15.5	4.0	3.0	2.75	0.5	0.75	1.5	5.08	1.5	16.0
TNP50U	10.1	15.0	4.5	3.6	15.5	4.0	3.0	2.75	0.5	0.75	1.5	5.08	1.5	16.0

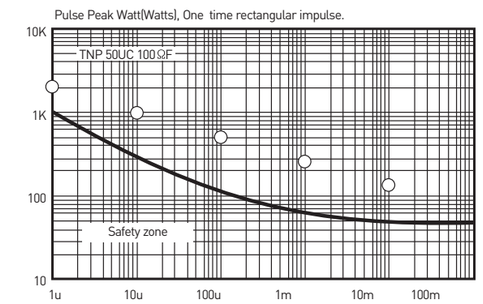
DERATING CURVES AND TEMP RISE CURVES





PULSE ENERGY DURABILITY

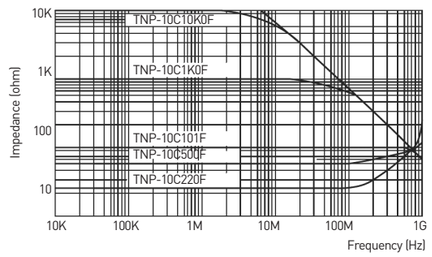
TNP10, TNP20S, TNP50U



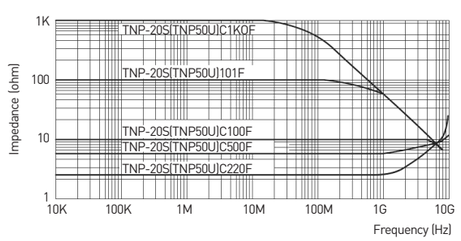
Note:
(1) Insulation material is unnecessary between flange and heat-sink, flange and resistor is separated by alumina substrate.
(2) Resistance measurem ent shall be made at a point 5.27mm±0.6mm from the resistor body.
(3) TCR of low resistance will be increased as 300ppm/0.02ohm, 200ppm/0.05ohm, 140ppm/0.1ohm and 80ppm/0.2ohm typically.
Testing point is at 5.27mm from bottom of molding of terminals.
(4) Test method is IEC60068-2-6, and specification is sine sweep wave form, 100Hz-2000Hz, 10 cycles, amplitude 0.75mm or 100m/s² 90minutes. direction x-y-z, Amplitude 0.75mm will be applied under break point Frequency(about 60Hz) and 100m/s² over break point
(5) When mounting resistor on heat-sink by screw, clip and pressure strip with using heat conduction grease on back side of resistor are recommended. Recommended screw torque is 0.5-0.6Nm.
(6) Standard packaging is anti-static PE tray, which contains 100pcs/tray.

P FREQUENCY CHARACTERISTICS

TNP10



TNP20S, TNP50U

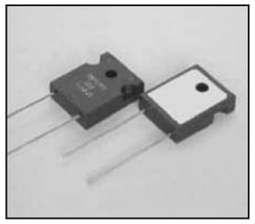


Power Thin Film Resistors(TO247)

This series of power film resistors offers a high power handling capability in a compact, non-inductive format. Both the TNP50S and the TNP100S are TO-247 models handling 100W and 140W respectively, depending on the ohmic value. This entire range is constructed using high thermal conduction alloys resulting in excellent heat transfer when mounted on heatsinks. Applications for these models include: UPS, power unit of machines, motor control, drive circuits, automotive, measurements, industrial computers and high frequency electronics.

GENERAL SPECIFICATIONS

Model	Resistance Range [Ω]	TCR [ppm/C]	Tolerance(%)	Rating Power[W]
TNP50S	0.01 ~ 0.09	±250	J [±5]	100W 3W(in free air)
	0.1 ~ 9.1	±100	F [±1], J [±5]	
	10 ~ 51K	±50	F [±1]	
TNP100S	0.01 ~ 0.09	±250	J [±5]	140W 2W(in free air)
	0.1 ~ 9.1	±100	F [±1], J [±5]	
	10 ~ 51K	±50	F [±1]	



CHARACTERISTICS

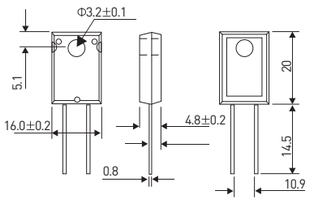
Values in [ ] mean change in Ω after test

Operation Temp. Range	-55℃ ~ +155℃
Insulation Resistance	[Over 1000 MegΩ] TNP 100S: Between terminals and metal back plate. TNP 50S: Between terminals and flange
Dielectric Withstanding Voltage	AC 2000V terminal and flange for 60 sec, 1mt
Moisture Resistance	±[1.0 %+0.05Ω] 40℃, 90-95% RH, DC 0.1W, 1000hours.
Soldering Heat	±[0.25%+0.05Ω] 350±5℃, 3 sec.
Solderability	[Over 3/4 of round] 230±5℃, 3 sec.
Vibration	±[0.25%+0.05Ω] IEC60068-2-6
Max. Working Voltage	500V or $E = \sqrt{P \cdot R}$
Temperature Cycle	±[0.25%+0.05Ω] -55℃, 30 minutes, +155℃ 30 minutes, 5cycles.
Load Life	±[1%+0.05Ω] 25℃, 90 minutes on, 30minutes off, 1000hours.

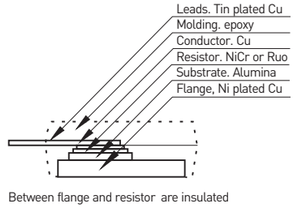
ORDERING PROCEDURE EXAMPLE

TNP50S	C	50Ω	F	Z00
Model #	**T.C.R** C(50ppm) A(100ppm)	**Resistance**	**Tolerance** F(1%) J(5%)	**Lead Type** Z00 Through hole

DIMENSIONS [mm] AND STRUCTURE

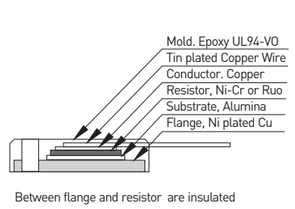


TNP50S



Between flange and resistor are insulated

TNP100S



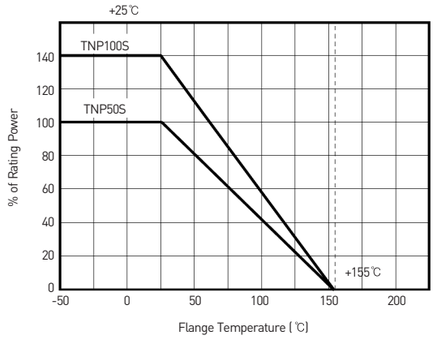
Between flange and resistor are insulated

*TNP50S and TNP100S have the same dimensions.

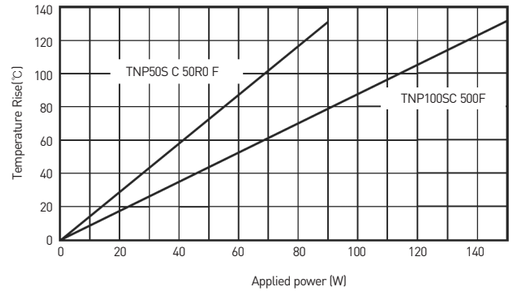
TNP50S, TNP100S

DERATING CURVES AND TEMPERATURE RISE CURVES

Derating Curves

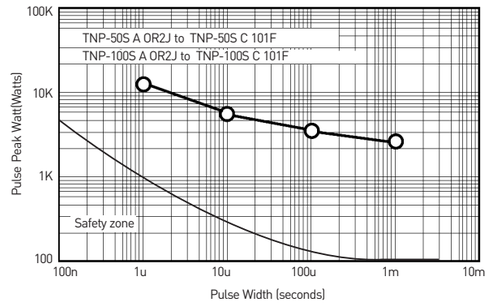


Resistor film temperature rise based on flange(℃)

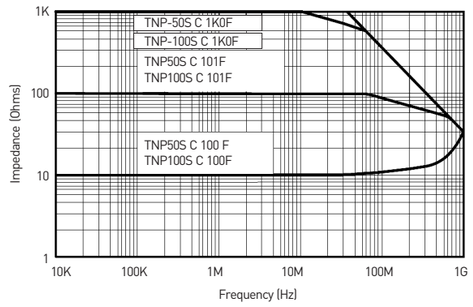


CHARACTERISTIC CURVES

Pulse Energy Durability(one time rectangular impulse)



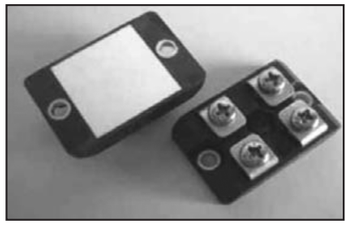
Frequency Characteristics



Note:
(1) Insulating material is unnecessary between flange and heat-sink, flange and resistor is separated by alumina substrate.
(2) Resistance measurement shall be made at a point 2.54mm+/-1.0mm from the resistor body.
(3) TCR of low resistance will be increased as 300ppm/0.02ohm, 200ppm/0.05ohm, 140ppm/0.1ohm and 80ppm/0.2ohm typically. Testing point is at 2.54mm from bottom of molding of terminals.
(4) Test method is IEC60068-2-6, and specification is sine sweep wave form, 100Hz-2000Hz, 10 cycles, amplitude 0.75mm or 100m/s, 90minutes. direction x-y z, Amplitude 0.75mm will be applied under break point Frequency (about 60Hz) and 100m/s over break point.
(5) When mounting resistor on heat-sink by screw, clip and pressure strip with using heat conduction grease on back side of resistor are recommended. Recommended screw torque is 0.5-0.6Nm. In case of screw mount, ISO M3 screw is necessary, 1/8" screw cannot be acceptable.
(6) Standard packaging is anti-static PE tray, which contains 50pcs/tray.

Chassis Mounting Non-Inductive High Power Resistor(SOT227)

These are small sized, TO227, 150W & 200W high power resistors. Mounting on an air-cooled heat sink or water-cooling is recommended. Rated power is 200W(one element) or 150W (two elements). These units have M4 screw terminals and exhibit very low series inductance. Other features are low vibration, superior heat dissipation and 0.5℃/W thermal resistance. Applications include: Snubber resistors for power supplies, gate resistors, pulse generators, high frequency amplifiers, dumping resistors for theatre audio equipment and dividing networks for loud speaker systems.



■ GENERAL SPECIFICATIONS

Model	Power Rating[W] (see note 1)	Resistance Range [Ω]	TCR [ppm/℃]	Tolerance(%)	Maximum Working Voltage[V]
TPJ150	Two elements 75+75	0.1 to 1K (Dual)	±100	J [±5]	$E=\sqrt{P \cdot R}$
TPJ200	One element 200	0.1 to 1K (Single)			

See note:1. With heat sink, 0.9K/W.

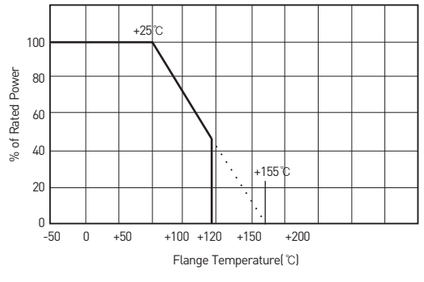
■ CHARACTERISTICS

Values in [ ] mean change in Ω after test

Operation Temp. Range		-55℃ ~ +155℃
Insulation Resistance	[Over 1000 MΩ]	Between terminals and flange
Dielectric Withstanding Voltage		2500VDC 60 sec.
Temperature Cycle	±[1.0 %+0.05Ω]	-55℃, 30 minutes, +155℃ 30minutes, 20cycles.
Short Time Overload	±[0.25 %+0.05Ω]	Rating watt x 2.5, 2.5 sec., with heat sink.
Soldering Heat	±[0.25 %+0.05Ω]	350±5℃, 3 sec.
Solderability		Soldering is not available
Vibration	±(0.25% + 0.05Ω)	
Moisture Resistance	±[1.0 %+0.05Ω]	70℃, 90~95%RH, DC 0.1W, 1000hours.
Load Life	±[1.0 %+0.05Ω]	25℃, 90 minutes on, 30minutes off, 1000hours.

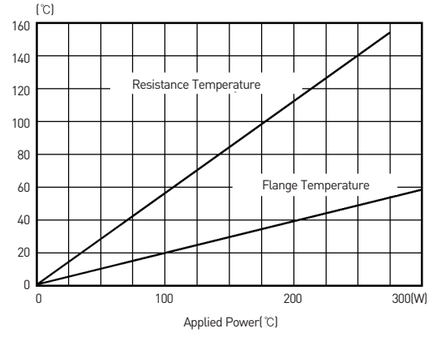
■ DERATING CURVES

Derating Curve, TPJ150, TPJ200



■ TEMPERATURE RISE

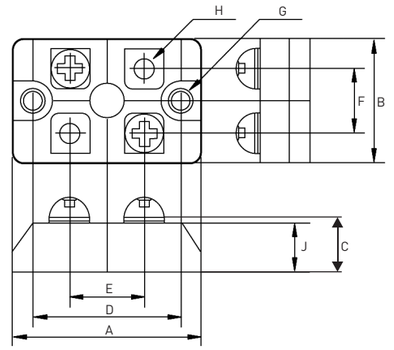
Temperature Rise, TPJ200 on 0.2K/W heat sink



RARA TPJ 150, 200 RoHS COMPLIANT

■ DIMENSIONS(mm) AND STRUCTURE

Dimensions

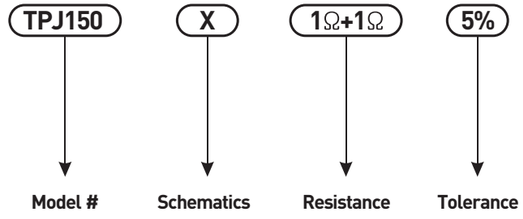


Symbols	(mm)	Note
A	38±0.5	
B	25±0.5	
C	13±0.5	
D	30±0.2	
E	15±0.5	
F	13±0.5	
G	2-4.2dia	
H	4-M4.0	
J	10±0.2	

Schematics

TPJ200X TPJ200Y TPJ200Z TPJ150X TPJ150Y

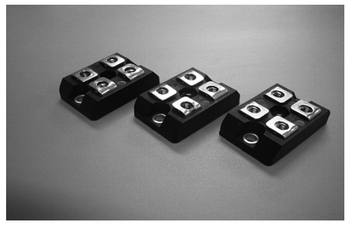
■ ORDERING PROCEDURE EXAMPLE



Power Film Resistors

Chassis Mounting Non-Inductive High Power Resistors

These are compact SOT227, 150W~600W high power resistors. attachment to an air cooled or water cooled heat sink is necessary. These units exhibit M4 screw terminals. very low series inductance, high density installation, are vibration proof and exhibit perfect heat dissipation. Applications include: Sunbber resistors for power supplies, gate resistors, pulse generators, high frequency amplifiers, dumping resistors for theater audio equipment (i.e. Dividing networks for loud speaker systems)



■ GENERAL SPECIFICATIONS

Model	1) Power Rating[W]	Weight[g]	Resistance Range[Ω]	2) TCR [ppm/℃]	Tolerance[%]	Maximum Working Voltage[V]
TPM150	150	20.0	0.1 to 1K (Dual)	±100	±5	$E=\sqrt{P\cdot R}$
TPM250	250	30.0				
TPM200	200	20.0	0.1 to 1K (Single)			
TPM300	300	30.0				
TPM550	600	30.0	50 to 300 (Dual)			
TPM600	600	30.0	50 to 1.5K (Single)			

1) Conditions: At Flange -55 to +25℃
2) For -55 to+120℃

■ CHARACTERISTICS

Values in [ ]mean change in Ω after test

Operation Temp. Range		-55℃ ~ +120℃
Insulation Resistance	[Over 1000MΩ]	Between terminals and flange.
Dielectric Withstanding Voltage		DC2500V for 60 secs.
Short Time Overload	±(0.25%+0.05Ω)	Power rating x 2.5, 2.5seconds, with heat sink.
Temperature Cycle	±(1.0%+0.05Ω)	-55℃, 30minutes,+120℃, 30minutes, 20cycles.
Humidity	±(1.0%+0.05Ω)	40℃, 90~95%RH, DC 0.1W, 1000hours.
Vibration	±(0.25%+0.05Ω)	
Flammability	UL94V-0	
Load Life	±(1.0%+0.05Ω)	25℃, 90minutes on, 30minutes off, 1000hours.

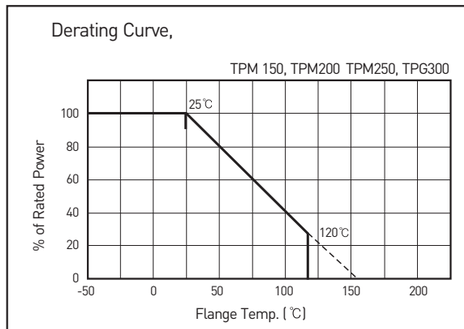
Note: IEC60068-2-6, displacement 0.75mm or acceleration 100m/sec², 10Hz-54Hz sweep, 10 cycles X-Y-Z direction

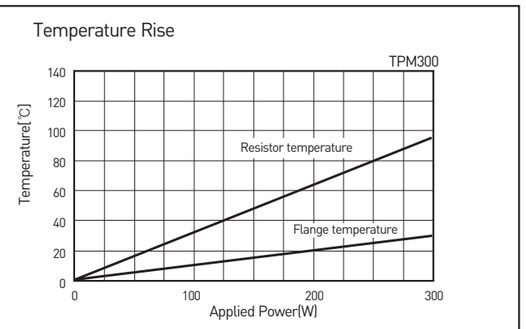
■ ORDERING PROCEDURE EXAMPLE

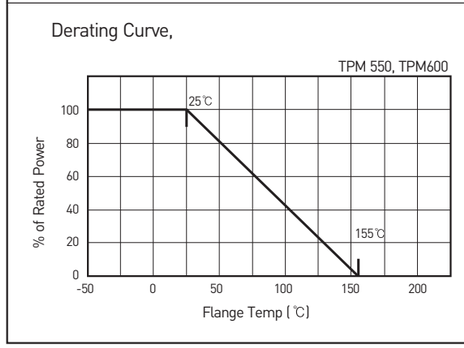
P/N	TYPE	TCR	Resistance	Tolerance(%)	Note
TPM250XA10+10Ω J	TPM250X	A(100ppm/K)	10+10Ω	J (5)	Two Resistors
TPM250YA50+50Ω J	TPM250Y	A(100ppm/K)	50+50Ω	J (5)	Two Resistors
TPM300YA50Ω J	TPM300Y	A(100ppm/K)	50Ω	J (5)	One Resistors
TPM300Z100Ω J	TPM300Z	A(100ppm/K)	100Ω	J (5)	One Resistors
TPM550XA100+100Ω J	TPM550X	A(100ppm/K)	100+100Ω	J (5)	Two Resistors
TPM550YA50+50Ω J	TPM550Y	A(100ppm/K)	50+50Ω	J (5)	Two Resistors
TPM600YA500Ω J	TPM600Y	A(100ppm/K)	500Ω	J (5)	One Resistors
TPM600ZA100Ω J	TPM600Z	A(100ppm/K)	100Ω	J (5)	One Resistors

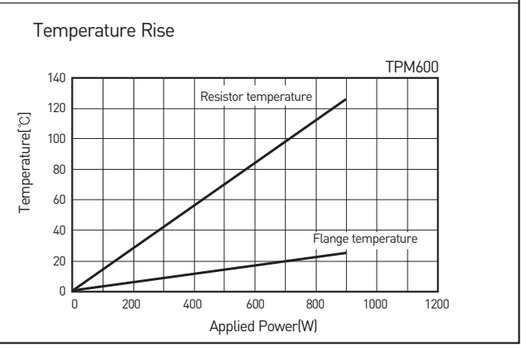
TPM150~600 RoHS COMPLIANT

■ DERATING CURVES AND TEMPERATURE RISE CURVES

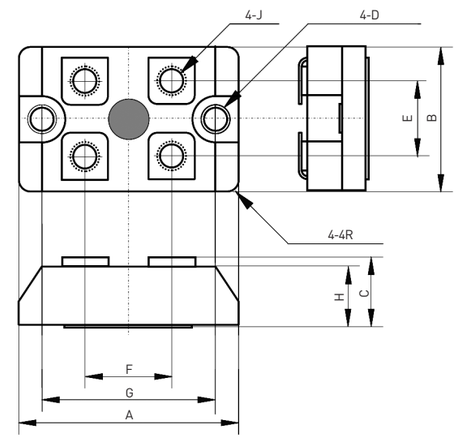




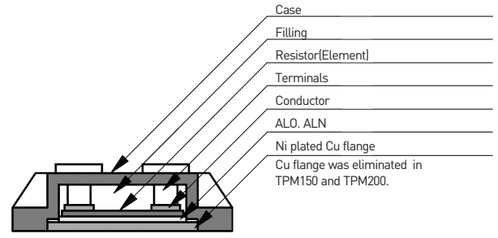




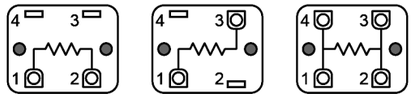
■ DIMENSIONS [mm] AND STRUCTURE



	mm	+/-mm
A	38.0	+/-0.2
B	25.0	+/-0.2
C	11.8	+/-0.5
D	4.2	+/-0.1
E	13.0	+/-0.3
F	15.0	+/-0.4
G	30.0	+/-0.1
H	10.0	+/-0.2
J	M4	



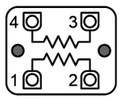
Schematics



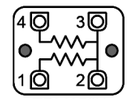
TPM200X TPM300X TPM600X

TPM200Y TPM300Y TPM600Y

TPM200Z TPM300Z TPM600Z



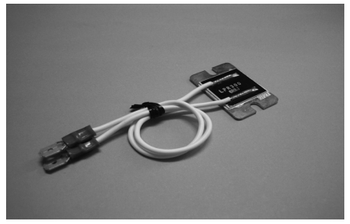
TPM150X TPM250X TPM550X



TPM150Y TPM250Y TPM550Y

Chassis Mounting Non-inductive High Power Resistors

These are compact, low profile, 250W and 300W high power resistors. An air-cooled heat sink or water-cooling is necessary. The rated power is 250W (single resistor) and 300W (two resistors). Units have M4 screw mounts, wire leads and very low series inductance. Resistors are also vibration-pro of and exhibit perfect heat dissipation. Applications include: Sunbber resistors for power supplies, gate resistors, pulse generators, high frequency amplifiers, dumping resistors of theater audio equipment of dividing network of loud speaker systems, etc.



■ GENERAL SPECIFICATIONS

Model	1) Power Rating[W]	Resistance Range[Ω]	2) TCR	3) Tolerance(%)
TPL250	250W	0.1Ω to 51KΩ Dual	±100ppm/℃	J (±5)
TPL300	300W	0.1Ω to 51KΩ Single		

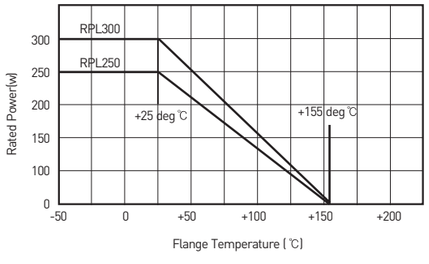
1) Conditions: AT Flange temperature -55 to +25℃, per resistor unit
2) For -55 ℃ to +155 ℃
3) F(±1%) is abailable optionally

■ CHARACTERISTICS

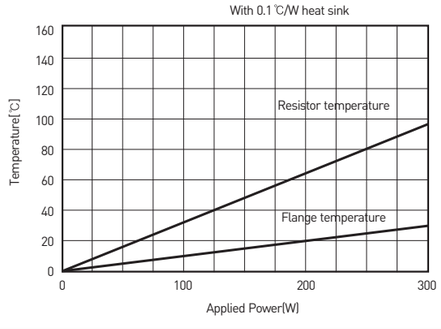
Operation Temp. Range		-55℃ ~ +155℃
Insulation Resistance	Over 1000MΩ	Between terminals and flange.
Dielectric Withstanding Voltage	2000V AC	60seconds. Between terminals and flange
Max. Applied Voltage		$E = \sqrt{P \cdot R}$
Short Time Overload		Same as rated power
Thermal Shock	±(1.0%+0.05Ω)	-55℃, 30minutes, +155 ℃, 30minutes, 20cycles.
Humidity	±(1.0%+0.05Ω)	40℃, 90~95%RH, DC 0.1W, 1000hours.
Vibration	±(0.25%+0.05Ω)	IEC60068-2-6, and specification in sin-wave sweep wave form, 10Hz-55Hz, 10cycles, amplitude 0.75mm, 45min. direction x-y z.
Load Life	±(1.0%+0.05Ω)	25℃, 90minutes on, 30minutes off, 1000hours.

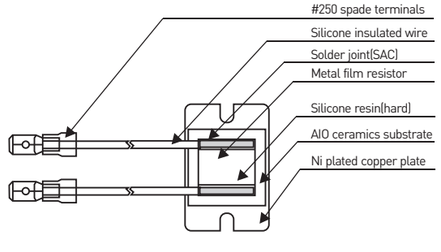
■ DERATING CURVE AND TEMPERATURE RISE CURVE

Derating Curve, TPL300, TPL250



Temperature Rise, TPL300

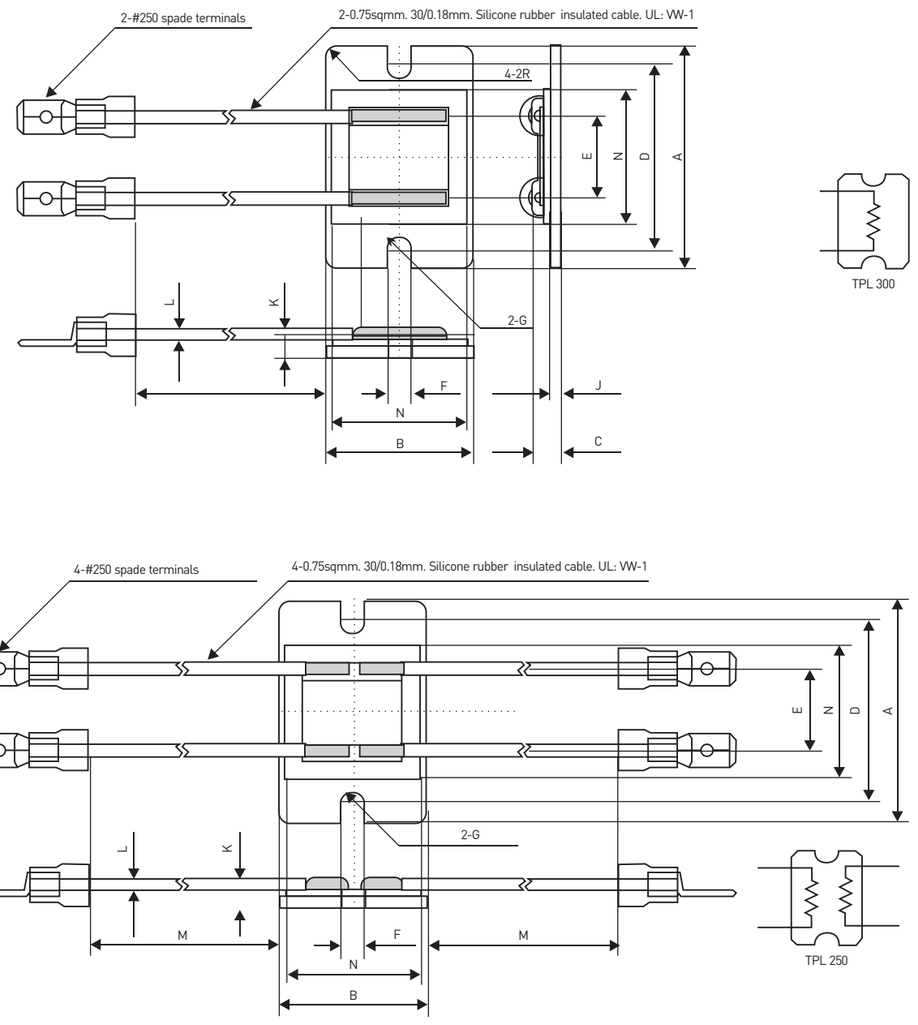




Note:
Natural air cooling, cooling with blower and a water cooled system can be used for cooling resistor.
When attach a resistor to a cooler, please apply heat conduction grease to the back side of a resistor, and attach it on cooler.
Please finish flatly the surface of a cooler to which a resistor is attached.
M4 screw is used with bolting torque of 1.5 N.
When you use resistor with steady rated power, please maintain the temperature of a flange at +25 degrees C.
Please refer load derating, when flange temperature goes to +25 degrees C or more according to the cooling capacity of a cooling system.

TPL250, TPL300 RoHS COMPLIANT

■ DIMENSIONS [mm]



A	B	C	D	E	F	G	J	K	L	M	N
38±0.5	25±0.5	4.0±0.5	32±0.5	14±0.5	4.5±0.5	2-2.1R	1.5±0.2	25±0.5	2.1 Dia.	150±10	23.0

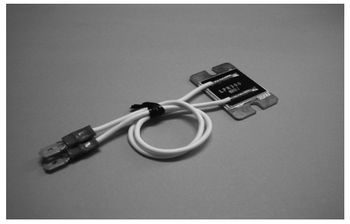
■ ORDERING PROCEDURE EXAMPLE

Ordering Example	Model	TCR	Resistance	Tolerance(%)	Note
TPL300A20ohmJ	TPL300	A(100ppm/℃)	20Ω	J (±5)	One resistor
TPL300A100ohmJ	TPL300	A(100ppm/℃)	100Ω	J (±5)	One resistor
TPL250A50+50ohmJ	TPL250	A(100ppm/℃)	50+50Ω	J (±5)	Two resistor
TPL250A1K+1KohmJ	TPL250	A(100ppm/℃)	1K+1KΩ	J (±5)	Two resistor

Chassis Mounting Non-inductive High Power Resistors

Features and Applications

These are compact, low profile, 1200W high power resistors. An air-cooled heat sink or water-cooling is necessary. The rated power is 1200W. Units have M4 screw mounts, wire leads and very low series inductance. Resistors are also vibration-proof and exhibit perfect heat dissipation. Applications include: Sunbber resistors for power supplies, gate resistors, pulse generators, high frequency amplifiers, dumping resistors of theater audio equipment of dividing network of loud speaker systems, etc.



■ GENERAL SPECIFICATIONS

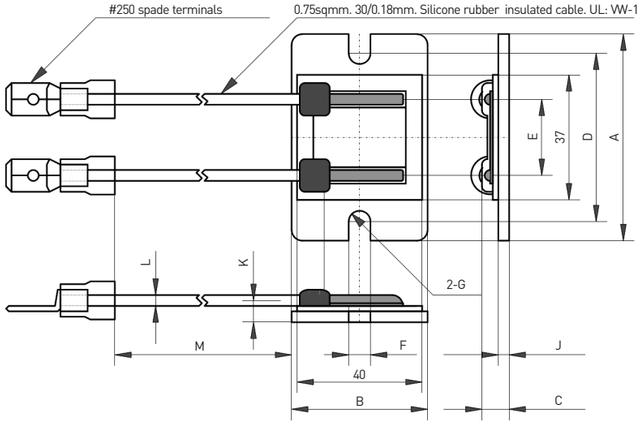
Model	1) Power Rating[W]	Resistance Range[Ω]	2) TCR	3) Tolerance(%)
TPL1200	1200W	1Ω to 51KΩ Single	±100ppm/℃	J (±5)

1) Conditions: AT Flange temperature -55 to +25℃, per resistor unit
2) For -55℃ to +155℃
3) F(±1%) is abailable optionally

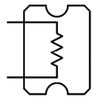
■ CHARACTERISTICS

Operation Temp. Range		-55℃ ~ +155℃
Insulation Resistance	Over 1000MΩ	Between terminals and flange.
Dielectric Withstanding Voltage	2000V AC	60seconds. Between terminals and flange
Max. Applied Voltage		$E = \sqrt{P \cdot R}$
Short Time Overload		Same as rated power
Thermal Shock	±(1.0%+0.05Ω)	-55℃, 30min.,+155℃, 30min., 20cycles.
Humidity	±(1.0%+0.05Ω)	40℃, 90 to 95%RH, DC 0.1W, 1000hours.
Vibration	±(0.25%+0.05Ω)	IEC60068-2-6 and specification in sin-wave sweep wave form, 10Hz-55Hz, 10cycles, amplitude 0.75mm, 45min. direction x-y z.
Load Life	±(1.0%+0.05Ω)	25℃, 90min on, 30min off, 1000hours.

■ DIMENSIONS [mm]



Schematics



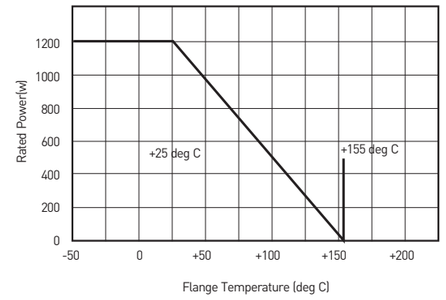
TPL1200

A	B	C	D	E	F	G	J	K	L	M
60±0.5	40±0.5	8.0±0.5	50±0.2	28±1	4.8±0.2	2-2.4R	3.0±0.2	4.5±0.5	2.1 Dia.	150.0±10

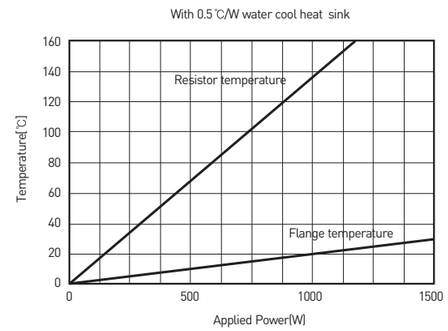
RARA TPL1200 RoHS COMPLIANT

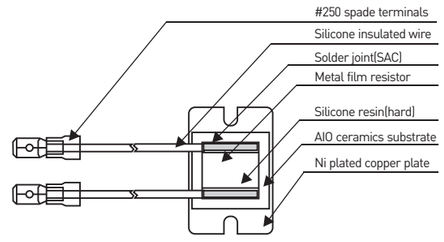
■ DERATING CURVE AND TEMPERATURE RISE CURVE

Derating Curve, TPL1200



Temperature Rise, TPL1200





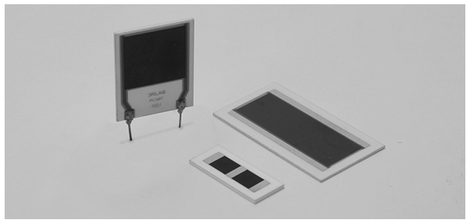
Note:
Natural air cooling, cooling with blower and a water cooled system can be used for cooling resistor.
When attach a resistor to a cooler, please apply heat conduction grease to the back side of a resistor, and attach it on cooler.
Please finish flatly the surface of a cooler to which a resistor is attached.
M4 screw is used with bolting torque of 1.5N.
When you use resistor with steady rated power, please maintain the temperature of a flange at +25 degrees C.
Please refer load derating, when flange temperature goes to + 25 degrees C or more according to the cooling capacity of a cooling system.

■ ORDERING PROCEDURE EXAMPLE

Ordering Example	Model	TCR	Resistance	Tolerance(%)	Note
TPL1200A20ohmJ	TPL1200	A(100ppm/℃)	20Ω	J (±5)	
TPL1200A100ohmJ	TPL1200	A(100ppm/℃)	100Ω	J (±5)	
TPL1200A50ohmJ	TPL1200	A(100ppm/℃)	50Ω	J (±5)	
TPL1200A51KohmJ	TPL1200	A(100ppm/℃)	51KΩ	J (±5)	

Power Chip Resistors

- Light weight
- High power density
- Non inductive
- In rush current Limiters
- Snubber circuits
- Power is able to be on PCB
- Wide Resistance Range
- Very lower cost
- Power supply preloads
- UPS systems



GENERAL SPECIFICATIONS

Model	Resistance[Ω]		Power Rating[W]	Max Working Voltage	Tolerance(%)	TCR
	Min from	Max up to				
PC203	1	1M	3.0	350VAC, 500VDC	F (±1) G (±2) J (±5)	±50ppm/℃ ~±100ppm/℃ Referenced to 25℃
PC205	1	1M	5.0	350VAC, 500VDC		
PC207	1	1M	7.5	350VAC, 500VDC		
PC015	1	1M	15.0	350VAC, 500VDC		
PC025	1	1M	25.0	350VAC, 500VDC		
PC050	1	1M	50.0	350VAC, 500VDC		
PC0100	1	1M	100.0	350VAC, 500VDC		

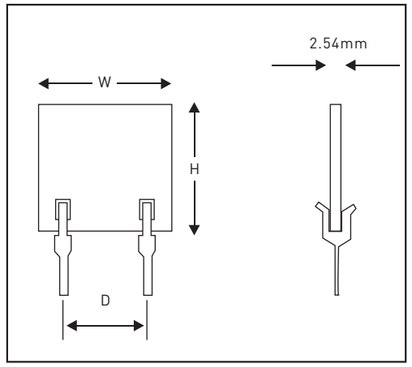
CHARACTERISTICS

Values in [ ] mean change in Ω after test

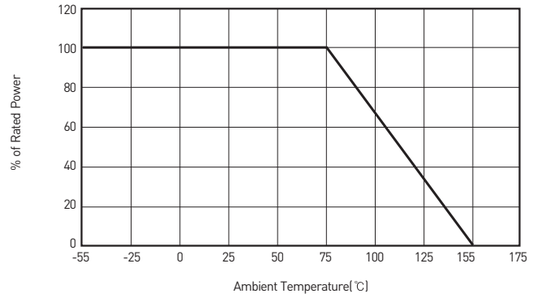
Operating Temperature Range		-55℃ to +150℃
Overload		5×power rating as long as the one sec average dissipation dose not exceed the power rating
Thermal Shock	≤±0.5%	-55℃↔+150℃ 5cycles
Moisture Resistance	≤±0.5%	at 40℃, 95% humidity for 1000hours
Long-term Stability	≤±0.5%	at nornmal temperature and humidity for 1000hours
Resistance to Solder Heat	≤±0.5%	260℃±5℃ 10sec.

DIMENSIONS [mm]

Model	P	W	H
PC203	5.08±0.254	12.7±0.381	15.24±0.381
PC205	5.08±0.254	12.7±0.381	25.4±0.381
PC207	5.08±0.254	19.05±0.381	25.4±0.381
PC015	26.4±0.5	31.75±0.381	30.48±0.381
PC025	48.26±0.5	54.356±0.381	27.94±0.381
PC050	48.26±0.5	54.356±0.381	54.356±0.381
PC0100	104.14±0.5	111.76±0.381	55.88±0.381



DERATING CURVES AND MATERIALS



Materials	
Substrate	96% Al203
Resitor	Rethenium Oxide
Costing	Glass
Terminal	Solder Plated Brass (at Models 1W~10W)

ORDERING PROCEDURE EXAMPLE