ROYALOHM

C O N F I D E N T I A L D O C U M E N T

SPECIFICATION FOR APPROVAL

Description: Power Dissipation Mount Fixed Resistors

Royalohm Part no.:

PDMT50xxxxxxxx (PDMT 50W +/-1%, +/-5% Seires)

Approved by

RoHS V3 Compliant (EU) 2015/863

REACH Compliant

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Issue Date: 2025/01/20

CHANGE NOTIFICATION HISTORY

Version	Date of Version	History	Remark
1	2025/01/22	1. Resistance Value 1% ： 0.1Ω~25KΩ	
		2. Resistance Value 5% ： 0.05Ω~47KΩ	
		3. Plastic molding compound	

Power Dissipation Mount Fixed Resistors

1. Scope:

This specification for approval relates to Power Dissipation Mount Fixed Resistors manufactured by ROYALOHM 's specifications.

2. Type designation:

The type designation shall be in the following form:

(Ex.)	PDMT	50 W	F	0.1Ω-25KΩ
	Type	Power Rating	Resistance Tolerance	Nominal Resistance

3. Ratings:

Ratings shall be shown in the table 1.

Table 1

Type	PDMT	
Rated Power at 25℃	50 W	
Max. Working Voltage	1,250 V	
Dielectric Withstanding Voltage	2,000 V	
Rated Ambient Temp.	25 ℃	
Operating Temp. Range	-55℃ --- +275℃	
Tolerance	1%	5%
Resistance Range	0.1Ω~25KΩ	0.05Ω~47KΩ
Highest OhmicValue	25KΩ	47KΩ

3.1 Power rating:

Resistors shall have a power rating based on continuous full load operation at an ambient temperature of 25 ℃

3.2 Voltage rating:

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating , as determined from the following formula:

$$RCWV = \sqrt{P \times R}$$

Note : Max. Working Voltage or $\sqrt{P \times R}$ whichever is lesser

Max. Overload Voltage or 2.5 $\sqrt{P \times R}$ whichever is lesser

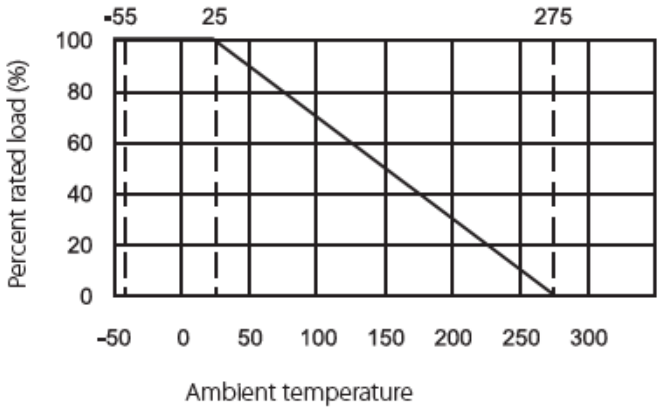
Where : RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (volt)

P = Power Rating (watt)

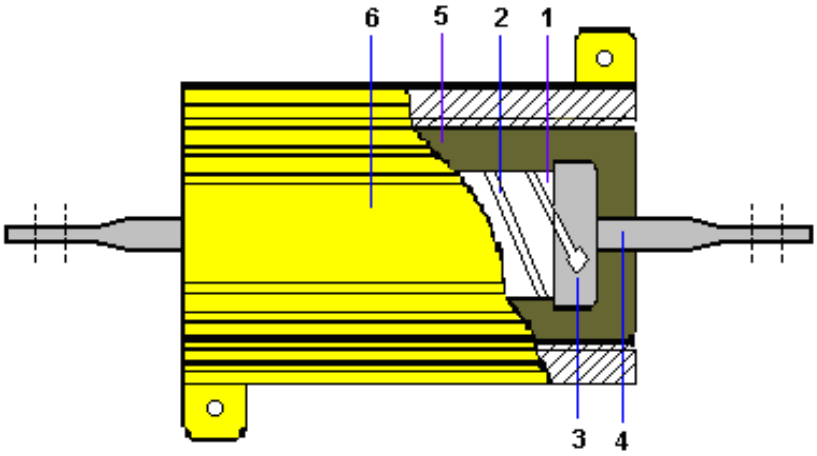
R = Nominal Resistance (ohm)

Power Dissipation Mount Fixed Resistors

Derating Curve:



4. Construction:



Confirmation List of Material

No.	Material Generic Name
1	Ceramic Rod
2	Resistance Wire
3	Cap
4	Terminal Lead
5	Plastic Molding Compound
6	Aluminium Shell

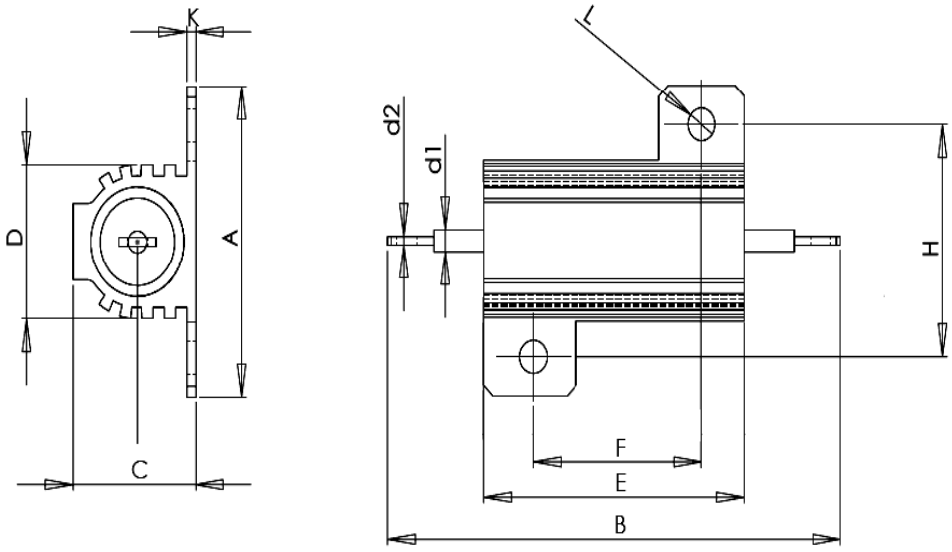
Power Dissipation Mount Fixed Resistors		
5. Characteristic :		
Characteristics	Limits	Test Methods (JIS C 5201-1, MIL 18546)
Dielectric withstanding voltage	± (0.2 % + 0.05 Ω) ΔR	Tested at AC potential respectively for 1 min. (MIL 18546)
Temperature coefficient	<0.18Ω : ± 1600 PPM/℃ 0.18Ω - 0.2Ω : ± 450 PPM/℃ 0.22Ω - 0.39Ω : ± 200 PPM/℃ 0.43Ω - 65Ω : ± 100 PPM/℃ >66Ω : ± 180 PPM/℃	4.8 Natural resistance change per temp. degree centigrade. $\frac{R2-R1}{R1(t2-t1)} \times 10^6$ (PPM/℃) R1: Resistance value at room temperature (t1) R2: Resistance value at room temp. plus 100 ℃ (t2) (JIS C 5201-1)
Short time overload	± (0.5 % + 0.05 Ω) ΔR	5 x rated power for 5 s (MIL 18546)
Terminal strength	± (0.2 % + 0.05 Ω) ΔR	30 sec, 10 pound pull test torque test - applicable for screw threads (MIL 18546)
Temperature	± (0.5 % + 0.05 Ω) ΔR	250 °C for 2 h
Vibration High Frequency	± (0.2 % + 0.05 Ω) ΔR	Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each (MIL 18546)
Solderability	95 % coverage Min.	4.17 The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temp. of solder : 245℃ ± 3℃ Dwell time in solder : 2 ~ 3 seconds (JIS C 5201-1)
Resistance to soldering heat	Resistance change rate is ± (1% + 0.05Ω) Max. with no evidence of mechanical damage	4.18 Permanent resistance change when leads immersed to 2.0 - 2.5 mm from the body in 260℃ ± 5 ℃ solder for 10 ± 1 seconds (JIS C 5201-1)

Power Dissipation Mount Fixed Resistors

<table>
<tr><th>Characteristics</th><th>Limits</th><th>Test Methods
(JIS C 5201-1, MIL 18546)</th></tr>
<tr><td rowspan="2">Temperature
cycling</td><td rowspan="2">Resistance change rate
is ± (5% + 0.05Ω) Max.</td><td>4.19 Resistance change after continuous
100 cycles for duty shown below:
<table>
<tr><th>Step</th><th>Temperature</th><th>Time</th></tr>
<tr><td>1</td><td>-55℃ ± 3℃</td><td>30 mins</td></tr>
<tr><td>2</td><td>Room temp.</td><td>10～15 mins</td></tr>
<tr><td>3</td><td>+155℃ ± 2℃</td><td>30 mins</td></tr>
<tr><td>4</td><td>Room temp.</td><td>10～15 mins</td></tr>
</table>
(JIS C 5201-1)</td></tr>
<tr><td>Humidity
(Steady state)</td><td>Resistance change rate is
± (3% + 0.05Ω) Max. with no
evidence of mechanical damage</td><td>4.24 Temporary resistance change after a 240 hours
exposure in a humidity test chamber controlled at
40℃ ± 2℃ and 90 to 95% relative humidity.
(JIS C 5201-1)</td></tr>
<tr><td>Load life</td><td>± (1.0 % + 0.05 Ω) ΔR</td><td>1000 h at rated power, +25 °C, 1.5 h “ON”, 0.5 h “OFF”
(JIS C 5201-1)</td></tr>
<tr><td>Load life in
humidity</td><td>Resistance change rate is
± (5% + 0.05Ω) Max. with no
evidence of mechanical damage</td><td>4.24.2.1 Resistance change after 1,000 hours
operating at RCWV with duty cycle of
(1.5 hours "on", 0.5 hour "off") in a humidity test
chamber controlled at 40 ℃ ± 2 ℃ and 90 to 95 %
relative humidity.
(JIS C 5201-1)</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

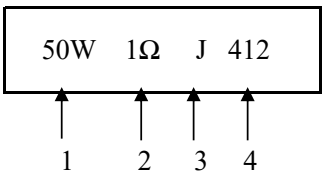
Power Dissipation Mount Fixed Resistors

6. Dimension : Unit : mm



Type	A±0.5	B±1.5	C±1	D±1	E±1	F±0.5	H±0.5	K max	L±0.5	d1 ±0.1	d2 ±0.2
PDMT 50W	30	75	15.7	15.5	50.5	40	21.5	3.2	3.5	2	0.8

7.1 Marking :



Code description and regulation

1. Wattage rating.
2. Nominal resistance value.
3. Resistance tolerance.

   J : ± 5 %
4. Date manufactured.

First code:	1 : The year 2021	4 : The year 2024	7 : The year 2027
	2 : The year 2022	5 : The year 2025	8 : The year 2028
	3 : The year 2023	6 : The year 2026	9 : The year 2029
Second code:	1 : January	5 : May	9 : September
	2 : February	6 : June	O : October
	3 : March	7 : July	N : November
	4 : April	8 : August	D : December

Third code:
1 : First 10 days of a month
2 : Second 10 days of a month
3 : Third 10 days of a month

Color of marking: Black ink

Power Dissipation Mount Fixed Resistors

7.2 Label :

Label shall be marked with following items:

(1) P/NO:
(2) Wattage
(3) Nominal resistance
(4) Quantity
(5) Resistance tolerance
(6) Lot number
(7) PPM

Example :

Power Dissipation Mount Fixed Resistors			
Watt :	50W	Val :	1R
Q'TY :		Tol :	1%
Lot :	319022	PPM :	400
	ROYALOHM	Pb Free	

Part Number System

Explanation of Part Number System

(Power Dissipation Mount Fixed Resistors)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
P	D	M	T	5	0	F	1	0	0	K	B	0	0

Resistor Type:
PDM = PDM

Special Feature:
T = Standard Product:
Plastic Molding Compound

Wattage:
50 = 50W

Tolerance:
F ~ ± 1%
J ~ ± 5%

Resistance Value:
5% series: the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th indicate the number of zeros following;
1% series: the 1st to 3rd digits are for the significant figures of the resistance and the 4th digit indicate the number of zeros following.
Decimal point is expressed :
"J"~ 0.1,**"K"**~0.01,**"L"**~0.001
Ex: 2Ω26 ~226K, 226Ω ~2260

Packing Quantity:
0 = for Bulk/Box packing

Packing Type:
B = Bulk /Box

Special Feature:
0 = NIL

Sample: PDMT 50W +/- 1% 1Ω B/B → PDMT50F100KB00

Power Dissipation Mount Fixed Resistors

Environment Related Substance

This product complies to EU RoHS directive, EU PAHs directive, EU PFOS directive and Halogen free.

Ozone layer depleting substances.

Ozone depleting substances are not used in our manufacturing process of this product.
This product is not manufactured using Chloro fluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs), Hydrobromofluorocarbons (HBFCs) or other ozone depleting substances in any phase of the manufacturing process.

Storage Condition (MSL1)

The performance of these products, including the solderability, is guaranteed for a year from the date of arrival at your company, provided that they remain packed as they were when delivered and stored at a temperature of 25°C ± 10°C and a relative humidity of 60%RH ± 10%RH, chemical and dust free atmosphere

Even within the above guarantee periods, do not store these products in the following conditions. Otherwise, their electrical performance and/or solderability may be deteriorated, and the packaging materials (e.g. taping materials) may be deformed or deteriorated, resulting in mounting failures.

1. In salty air or in air with a high concentration of corrosive gas, such as Cl_2, H_2S, NH_3, SO_2, or NO_2
2. In direct sunlight

Power Dissipation Mount Fixed Resistors

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Regardless of the application of ROYALOHM products, it is recommended to carry out safety tests while using measures such as protective circuits and redundant circuits to protect the safety of equipment.