

# ROYALOHM

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

SPECIFICATION FOR APPROVAL

**TRELIK**

Description: Power Dissipation Mount Fixed Resistors

**Royalohm Part no.:**

PDM050FxxxxB00 (PDM 50W +/-1% B/B)

Approved by

**Parts corresponding to RoHS Compliant: 2005-Apr.-1**

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Approved	Checked	Prepared
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Issue Date: 2013/10/11

<b>CHANGE NOTIFICATION HISTORY</b>			
<b>Version</b>	<b>Date of Version</b>	<b>History</b>	<b>Remark</b>
1	2013/10/11	1. Resistance Range: $5.1\Omega \sim 20K\Omega$	
		2. Plastic molding compound	

**Customer: TRELIK**

**Part No.: PDM050FxxxxB00**

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.)  $\frac{\text{PDM}}{\text{Type}}$        $\frac{50 \text{ W}}{\text{Power Rating}}$        $\frac{\text{F}}{\text{Resistance Tolerance}}$        $\frac{5.1\Omega}{\text{Nominal Resistance}}$

3. Ratings:

Ratings shall be shown in the table 1.

Table 1

Type	PDM
Rated Power at 70°C	50W
Rated Ambient Temp.	25 °C
Operating Temp. Range	-55°C --- +275°C
Resistance Range	5.1Ω ~ 20KΩ

3.1 Power rating:

Resistors shall have a power rating based on continuous full load operation at an ambient temperature of 70 °C

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:

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

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)

3.3 Storage Condition

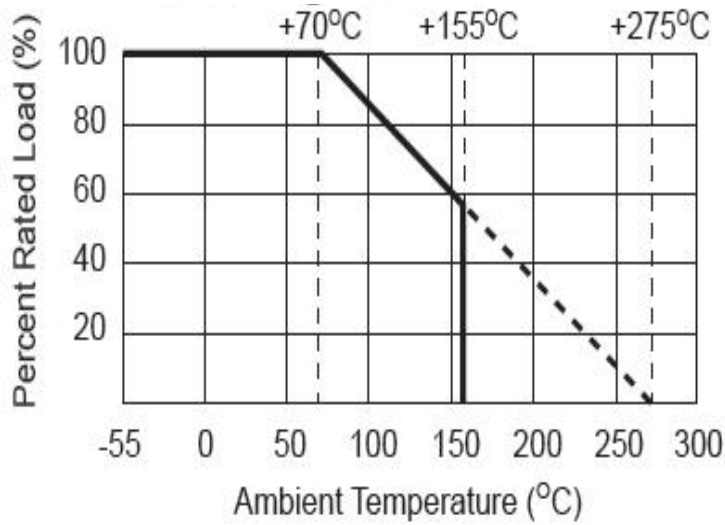
The performance of these products, including the solderability, is guaranteed for a year from the date of arrival at your company, provided that they remain packed as they were when delivered and stored at a temperature of 25°C ± 5°C and a relative humidity of 60%RH ± 10%RH

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.

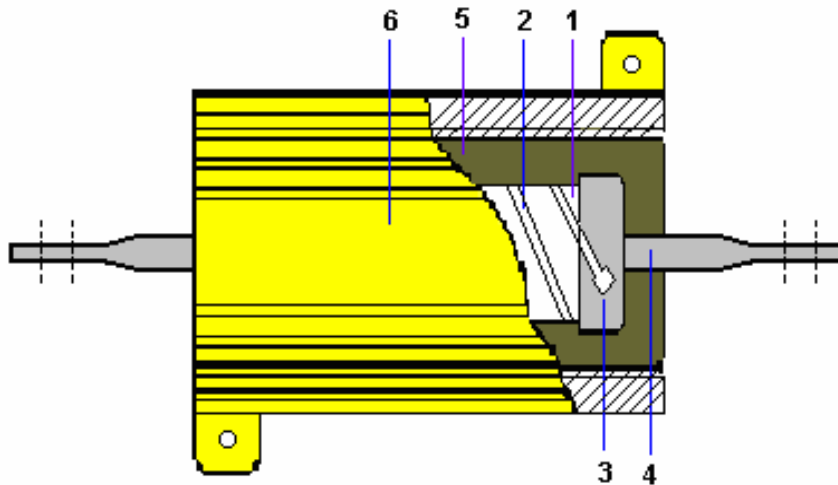
1. In salty air or in air with a high concentration of corrosive gas, such as Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, or NO<sub>2</sub>
2. In direct sunlight

### 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

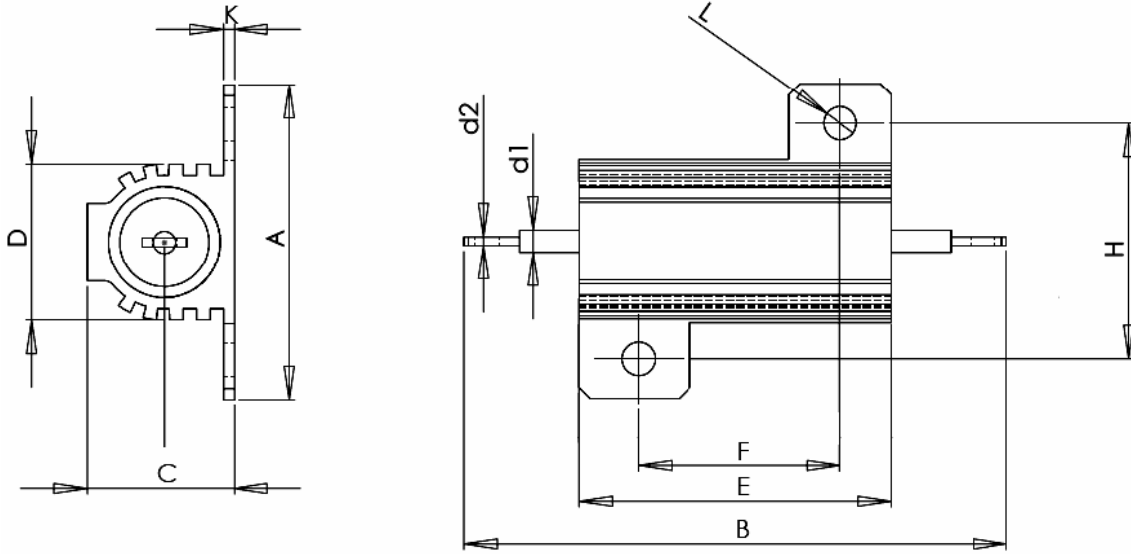
<b>Power Dissipation Mount Fixed Resistors</b>		
5. Characteristic :		
Characteristics	Limits	Test Methods ( JIS C 5201-1 )
Dielectric withstanding voltage	No evidence of flashover, mechanical damage, arcing or insulation break down.	4.7 Resistors shall be clamped in the trough of a 90° metallic V-block and shall be tested at AC potential respectively for 60 +10/ -0 secs.
Temperature coefficient	$< 20 \Omega \pm 400 \text{ PPM}/^\circ\text{C}$ $\geq 20 \Omega \pm 350 \text{ PPM}/^\circ\text{C}$	4.8 Natural resistance change per temp. degree centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C)}$ R1: Resistance value at room temperature (t1) R2: Resistance value at room temp. plus 100 °C (t2)
Short time overload	Resistance change rate is $\pm (5.0\% + 0.05 \Omega)$ Max. with no evidence of mechanical damage	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.
Terminal strength	No evidence of mechanical damage	4.16 <b>Direct load :</b> Resistance to a 2.5 kgs direct load for 10 secs. in the direction of the longitudinal axis of the terminal leads <b>Twist test :</b> Terminal leads shall be bent through 90 ° at a point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations
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 : $245^\circ\text{C} \pm 3^\circ\text{C}$ Dwell time in solder : 2 ~ 3 seconds
Resistance to soldering heat	Resistance change rate is $\pm (1.0\% + 0.05\Omega)$ 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 $260^\circ\text{C} \pm 5^\circ\text{C}$ solder for $10 \pm 1$ seconds

<b>Power Dissipation Mount Fixed Resistors</b>				
Characteristics	Limits	Test Methods ( JIS C 5201-1 )		
Temperature cycling	Resistance change rate is $\pm (5.0\% + 0.05 \Omega)$ Max.	4.19 Resistance change after continuous 5 cycles for duty shown below:		
		<b>Step</b>	<b>Temperature</b>	<b>Time</b>
		1	-55°C $\pm$ 3°C	30 mins
		2	Room temp.	10~15 mins
		3	+155°C $\pm$ 2°C	30 mins
		4	Room temp.	10~15 mins
Humidity (Steady state)	Resistance change rate is $\pm (3.0\% + 0.05\Omega)$ Max. with no evidence of mechanical damage	4.24 Temporary resistance change after a 240 hours exposure in a humidity test chamber controlled at 40°C $\pm$ 2°C and 90 to 95% relative humidity.		
Load life	Resistance change rate is $\pm (5.0\% + 0.05\Omega)$ Max. with no evidence of mechanical damage	4.25.1 Permanent resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours "on", 0.5 hour "off") at 70°C $\pm$ 2°C ambient.		

### Power Dissipation Mount Fixed Resistors

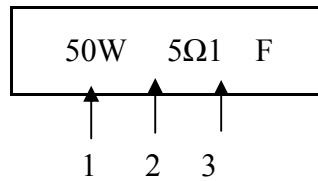
6. Dimension :

Unit : mm



Type	A±0.5	B±1	C±0.5	D±2	E±0.5	F±0.2	H±0.2	K max	L±0.5	D1 ±0.05	D2 ±0.2
PDM 50W	30.3	78.5	16.3	16.5	50.5	40.2	20.2	3.2	3	2	0.8

7.1 Marking :



Code description and regulation

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

F : ± 1 %      J : ± 5 %      K : ± 10 %      M : ± 20%

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 :

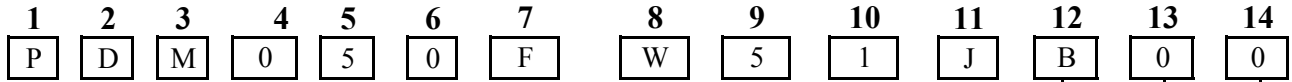
Power Dissipation Mount Fixed Resistors

Watt :50W	Val 5E1
Q'TY :400	Tol 1%
Lot :319022	PPM :
ROYALOHM	Pb Free



**Part Number System**

**Explanation of Part Number System  
( Power Dissipation Mount Fixed Resistors )**



**Resistor Type:**  
PDM = PDM

**Special Feature:**  
0 = Standard Product:  
Plastic Molding Compound  
W = Special Product:  
Silicones Molding Compound

**Tolerance:**  
F ~ ± 1%  
J ~ ± 5%  
K ~ ± 10%

**Wattage:**  
5W = 5W  
AW = 10W  
25 = 25W  
35 = 35W  
50 = 50W  
75 = 75W  
A0 = 100W  
A5 = 150W  
B0 = 200W  
B5 = 250W  
C0 = 300W

**Resistance Value:**  
E-24,E-96 series: the 1<sup>st</sup> digit to denote production type of the product:  
**W** = Wire wound type  
  
The 2<sup>nd</sup> and 3<sup>rd</sup> digits are for the significant figures of the resistance and the 4<sup>th</sup> digit denote number of zeros following  
**Decimal point is expressed by:**  
"J" ~ 0.1, "K" ~ 0.01  
Ex.: 5.1 Ω ~ 51J, 4.7K Ω ~ 472

**Packing Quantity:**  
0 = for Bulk/Box packing

**Packing Type:**  
B = Bulk /Box

**Special Feature:**  
0 = NLT

Sample: PDM 50W +/- 1% 5.1Ω B/B → PDM050FW51JB00