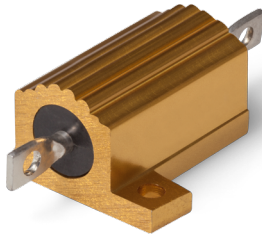


Data Sheet for Precision Resistors

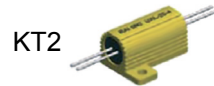
Power Resistor (wirewound)

Series MAL



MAL (standard)

Options 4 pole
Kelvin
connection



- Power rating up to 50 Watt (with heat-sink not included in delivery)
- Resistance range from 0,01Ω to 250kΩ
- Resistance tolerances from ±0,01%
- Standard TCR ±20ppm/°C
- Aluminium housing
- Low inductive windings (option)
- Numerous connection variants with 4-pole (Kelvin) connection (option)

Electrical Specification	MAL			
	5	10	25	50
Resistance range	0,01Ω..22kΩ	0,01Ω..47kΩ	0,01Ω..90kΩ	0,01Ω..250kΩ
Resistance tolerance	±0,01%..±10%			
Power rating without heat-sink @25°C (0W @ +275°C)	4,5W	7,5W	12W	20W
Power rating with heat-sink @25°C (0W @ +275°C)	7,5W	10W	25W	50W
Max. working voltage	160V	265V	550V	1250V
TCR-rate	±20ppm/°C @ R > 10Ω, ±50ppm/°C @ R ≥ 1Ω..10Ω (±90ppm/°C @ R < 1Ω on request)			
Working temperature range (max.)	-55..+275°C			

Mechanical Specification	
Resistance technology / material	Wirewound / wire alloy
Housing material	Aluminium
Connections	Axial copper tinned
Connection variants	2 pol. solder tail, optional 4 pole Kelvin connection variants

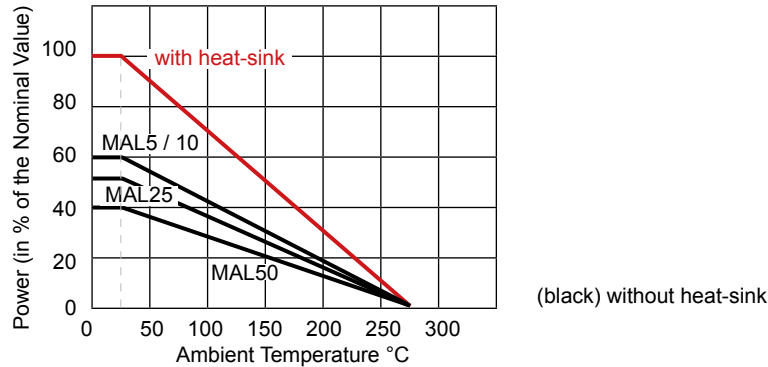
Parameters	Test Conditions (MIL-STD 202)	Specifications
Dielectric	See norm	±0,2% +0,05Ω
Load Life	See norm	±1% +0,05Ω
Storage	See norm	±0,2% +0,05Ω
Moisture Resistance	See norm	±0,2% +0,05Ω
Thermal Shock	See norm	±0,2% +0,05Ω
5 x Overload (5s)	See norm	±0,2% +0,05Ω
Shock	See norm	±0,1% + 0,05Ω
Vibration	See norm	±0,1% + 0,05Ω
Dielectric Strength	MAL5..10: 1500 VAC; MAL25: 2500 VAC; MAL50: 3500VAC	

Data Sheet for Precision Resistors

Power Resistor (wirewound)

Series MAL

Power Derating Curve



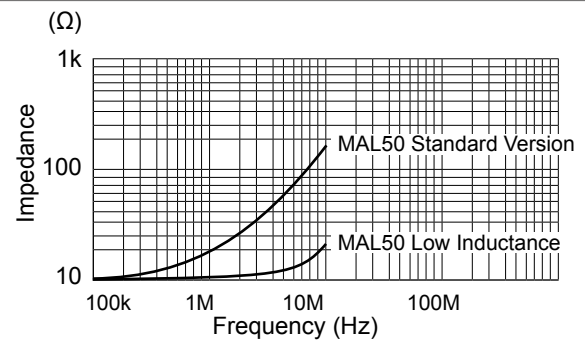
Examples for Heat-Sink Dimensions

	Surface (cm ²)	Thickness (mm)
MAL5	832	1
MAL10	832	1
MAL25	1077	1
MAL50	1877	1,5

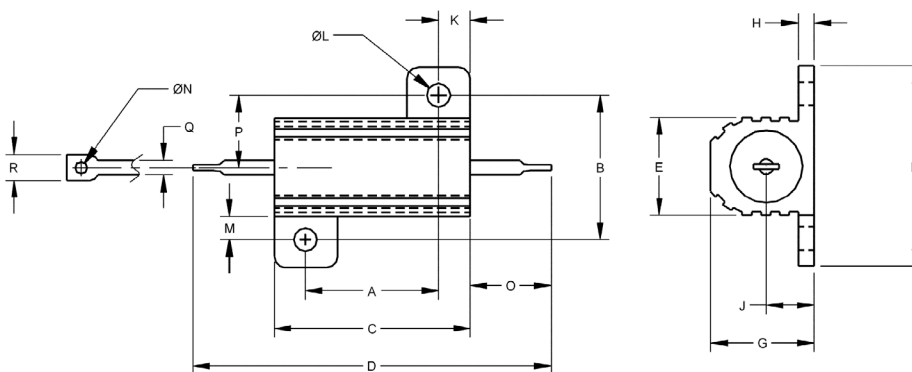
Mounting Notes:

For the mounting of the resistor a special thermal grease has to be used.

Frequency Characteristics



Technical Drawing MAL solder tail (standard)



Typ	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R
(tolerance)	±0,13	±0,13	±0,8	±1,6	±0,4	±0,4	±0,4	±0,25	±0,25	±0,25	±0,13	±0,4	±0,15	±1,6	±0,8	±0,05	±0,8
MAL 5	11,3	12,4	15,2	28,5	8,5	16,4	8,1	1,7	3,6	2,0	2,4	2,0	1,3	6,8	6,2	1,3	2,2
MAL 10	14,3	15,9	19,1	33,5	10,9	20,3	10,2	1,9	4,8	2,4	2,4	2,6	2,0	7,9	7,9	2,49	4,0
MAL 25	18,3	19,8	27,0	47,5	13,5	27,4	14,2	2,2	6,6	4,4	3,2	3,2	2,0	11,1	9,9	2,49	4,7
MAL 50	39,7	21,4	50	70	15,6	29,0	15,6	2,2	7,6	5,0	3,2	3,2	2,0	11,1	10,7	2,49	4,7

Data Sheet for Precision Resistors

Power Resistor (wirewound)

Series MAL

Order code

Description		Selection: standard=black/bold, possible options=grey/cursive					
Series:	MAL						
Type / size:							
5 (from 0,01Ω to max. 22kΩ)		5					
10 (from 0,01Ω to max. 47kΩ)		10					
25 (from 0,01Ω to max. 90kΩ)		25					
50 (from 0,01Ω to max. 250kΩ)		50					
Resistance tolerance:							
±1%				W1%			
±2%				W2%			
±3%				W3%			
±5%				W5%			
±10%				W10%			
<i>Option <±1..±0,01%</i>				<i>W0,xx%</i>			
Temperature coefficient:							
±20ppm/°C @ R >10Ω					TK20		
±50ppm/°C @ R ≥ 1Ω..10Ω					TK50		
<i>Option ±90ppm/°C @ R < 1Ω</i>					<i>TK90</i>		
Resistance value - please choose:							
From 10Ω to see type						xxkxxx	
<i>Option low inductance:</i>							
<i>max. resistance / 2</i>							<i>N</i>
Connection:							
Standard							-
<i>Option 4 pol. Kelvin solder tail</i>							<i>KT1</i>
<i>Option 4 pol. Kelvin strand</i>							<i>KT2</i>
<i>Option 4 pol. Kelvin, solder tail thereof 2 pol. angled</i>							<i>KT3</i>

Order Example	Series	Type	Resistance tolerance	Temperature coefficient	Resistance value	Inductance	Connection
Choice	MAL	25	±1%	20ppm/°C	10,1kΩ	Standard	4 pol. solder tail
Code	MAL	25	W1%	TK20	10k100	-	KT1