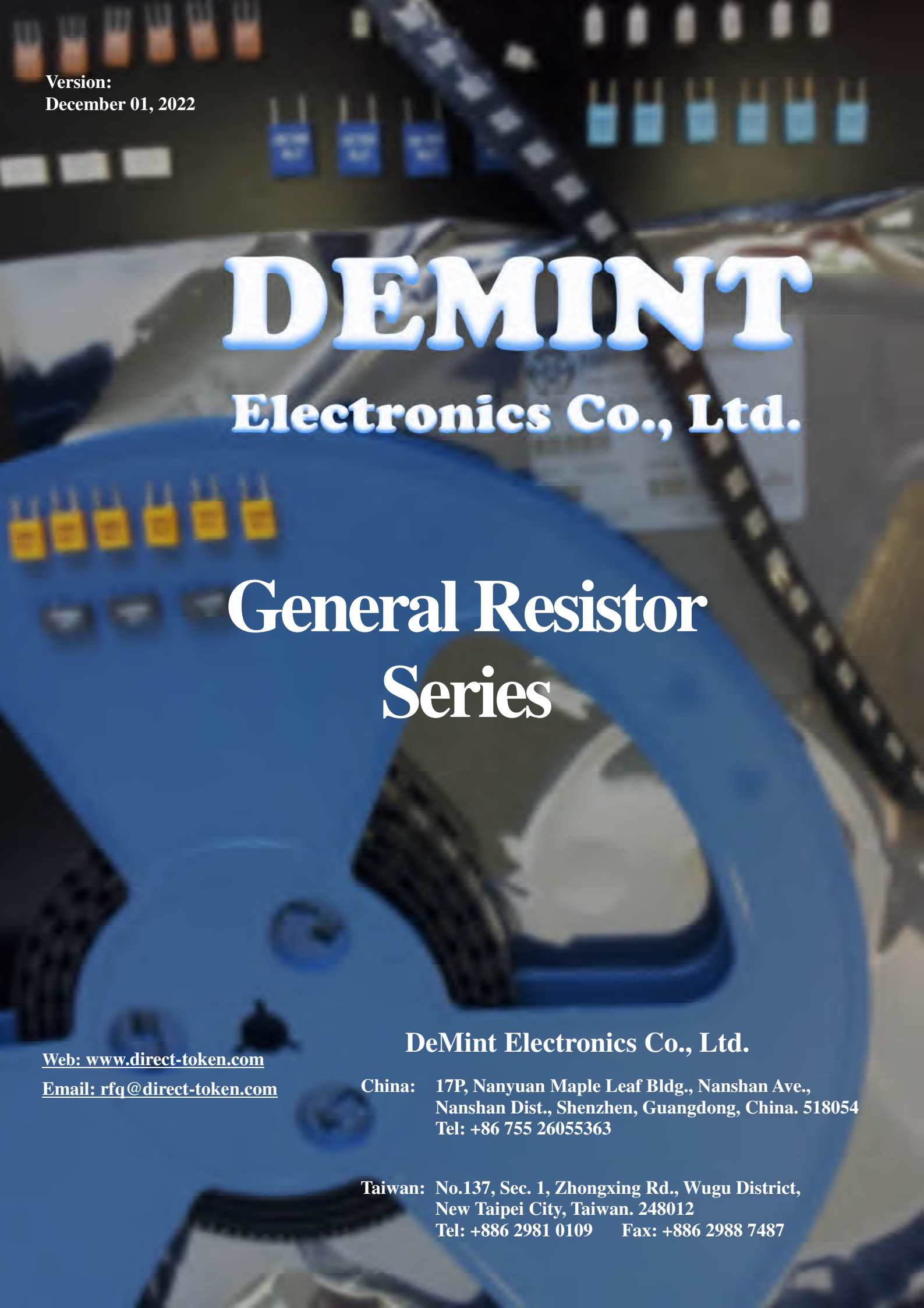

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DEMINT
Electronics Co., Ltd.

General Resistor Series

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Production Index

General Resistor Series

Resistor Glossary & Terminology

Glossary & Terminology

Resistor Glossary & Terminology

Fusible Resistor (Fuse Resistor, Circuit Protect Resistor)

A resistor designed to protect a circuit against overload; its resistance limits current flow and thereby protects against surges when power is first applied to a circuit; its fuse characteristic opens the circuit when current drain exceeds design limits.

Thermal Cutoff Resistor

A thermal fuse is a cutoff which uses a one-time fusible link. Unlike the thermostat which automatically resets itself when the temperature drops, the thermal fuse is more like an electrical fuse: a single-use device that cannot be reset and must be replaced when it fails or is triggered. A thermal fuse is most useful when the overheating is a result of a rare occurrence, such as failure requiring repair (which would also replace the fuse) or replacement at the end of service life.

DeMint offers "Thermal Cut-off Resistor", a thermal Cut-offs is a fusible alloy and a resistor is a voltage divider, both are surrounded by ceramic cement with special resin. Under normal operating temperatures the fusible alloy joins the two lead wires within the body of the cutoff and the power resistor acts as a normal function resistor. When the preset temperature of the cutoff is reached, the fusible alloy melts and with the aid of the special resin, complete cutoff is ensured.

Thermal fuse resistors are usually found in heat-producing electrical appliances such as coffeemakers and hair dryers. They function as safety devices to disconnect the current to the heating element in case of a malfunction (such as a defective thermostat) that would otherwise allow the temperature to rise to dangerous levels, possibly starting a fire.

Anti-Surge Resistor (RCR)

Surges in electronic circuits are caused by internal conditions — switching operations from other electronic components or due to external conditions on the AC power mains — switching operations in the power grid or from nearby lightning strikes, either directly to the power distribution system or to nearby ground. Electronic products have to be surge immune to ensure their continued reliable operation if subjected to realistic levels of surge voltages, and they are required to comply with safety requirements. DeMint's RCR series is a perfect fit when an anti-surge resistor is required.

Light Dependent Resistor (LDR)

A photoresistor or light dependent resistor or cadmium sulfide (CdS) cell is a resistor whose resistance decreases with increasing incident light intensity. It can also be referenced as a photoconductor.

A photoresistor is made of a high resistance semiconductor. If light falling on the device is of high enough frequency, photons absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. The resulting free electron (and its hole partner) conduct electricity, thereby lowering resistance.

Carbon Composition Resistor (CCR)

CCR is made up of a solid rod of conductive composite material, the chemical composition of which is altered to produce different resistance values. The general composition consists of the carbon conductor and ceramic filler materials. By altering the ratio of filler to conductor it is possible to change the resistance value. Interference-fit end caps are attached to the rods, leads are welded onto these caps, and the resistor body is then protected with a specially formulated epoxy coating. The resistors are then color code marked.

Ayrton-Perry Winding

Winding of two wires in parallel but opposite directions to give better cancellation of magnetic fields than is obtained with a single winding.

Wire wound technology has long been known as a leading technology for power resistor needs. The most critical drawback with this technology is that it is inherently inductive. This is logical given that a wire wound inductor and wire wound resistors are made with essentially the same materials and processes. This fact limits the use of wire wounds for applications with high switching speeds, which require low inductance.

Now the same standard wire wounds can be used for these applications by using a non-inductively wound version. This manufacturing method greatly reduces the inductance of any given resistor size and value combination, however it does not completely eliminate the inductance. A non-inductively wound wire wound has one winding in one direction and one in the other direction; known as Ayrton Perry winding. This non-inductive winding is available in all DeMint standard wire-wound resistor series.

Select Optimum Resistors

Select Optimum Resistors

Select Resistors with Optimum Technology to Best Match the Performance

Comparison of Axial Lead Resistor Functions Table		
Class	**Advantage**	**Disadvantage**
Carbon Resistors	Cheap, General Purposes	High TCR,
Metal Film Resistors	Low TCR, Tight Tolerance, High Stability	Fair Withstanding Voltage
Metal Oxide Resistors	Replace high resistance wire wound resistor, Good withstanding voltage	Resistance Range Limitation, Fair Tolerance
Wire wound Resistors	High Pulse Load, Anti-Surge, High Stability	High Inductance, Resistance Range Limitation
Non-Inductive Resistors	High Pulse Load, Anti-Surge, High Stability	Resistance Range Limitation, High Cost
Ceramic Housed Cement Resistors	Rugged, excellent heat dissipation, withstanding high temperature	Heavy Weight, Big Volume
Metal Glaze Resistors	High Pulse Load, Anti-Surge, High Stability	High TCR, Fair Tolerance
Alloy Strip	Low TCR, Low Ohmic	Fair Tolerance

Comparison of Axial Lead Resistor Characteristics Table								
Characteristics		Thin Film		Thick Film		Wire Wound		Alloy Strip
		Carbon Film	Metal Film	Metal Oxide Film	Metal Glaze Film	Standard	Non -Inductive	
Tolerance (%)	±0.01		√			√		
	±0.02		√			√		
	±0.05		√			√		
	±0.1		√			√		
	±0.25		√			√		
	±0.5		√			√		
	±1.0		√		√	√	√	√
	±2.0	√		√	√	√	√	√
	±5.0	√		√	√	√	√	√
	±10	√		√	√	√	√	√
Temperature Coefficient (PPM/℃)	5		√					
	10		√					
	15		√					
	25		√			√		√
	50		√			√	√	√
	100		√		√	√	√	√
	200	√		√	√	√	√	
	400	√		√	√	√	√	
	1,000	√						
Operating Temperature Range (℃)	200			√				√
	165		√	√	√	√	√	√
	125	√	√	√	√	√	√	√
	70	√	√	√	√	√	√	√
	40	√		√	√	√	√	√
	10	√		√	√	√	√	√
Wattage (W)	1/16							
	1/8	√	√					
	1/4	√	√	√	√	√		
	1/2	√	√	√	√	√	√	√
	1	√	√	√	√	√	√	√
	2	√	√	√	√	√	√	√
	3	√	√	√	√	√	√	√
	5			√	√	√	√	
	10			√	√	√		
Resistance Range (Ω)	0.1							
	1		√			√		√
	10	√	√	√	√	√	√	
	100	√	√	√	√	√	√	
	1K	√	√	√	√	√	√	
	10K	√	√	√	√	√		
	100K	√	√		√	√		
	1M	√	√		√	√		
	10M	√			√	√		
Volume Size		Standard	Standard	Standard	Standard	Standard	Bigger	Compact
High Frequency		Available	Available	Available	Available	None	Available	Available
Cost		Cheap	Fair	Fair	Fair	High	High	Fair
Noise		Fair	Good	Fair	Fair	Fair	Good	Good
Stability		Fair	Excellent	Good	Good	Excellent	Good	Excellent

Pulse Load Anti-Surge Resistors (RCR)

Product Introduction

Thick-film anti-surge resistor handles large pulse loading.

Features :

- High power at small sizes
- Max working voltage up to 3000V
- Lead (Pb)-free and RoHS compliant
- Operating temperature range: -20℃~+155℃
- Metal glaze power film, axial leaded type
- Max overload voltage 5000V, Tolerances: J (±5%)

Applications :

- Ballasts
- Amplifiers
- Industrial power supplies
- Telecommunications
- Household appliances
- Automotive circuits, Computer, Instrumentation

A new range of anti-surge axial leaded power resistors, metal glaze resistive element on ceramic substrates, from DeMint Electronics.

A carbon film resistor replacement, the new RCR series thick-film style resistors offer numerous benefits over the previous style devices, namely reduced costs, excellent thermal compliance, optimized a variety of surge capabilities and better solder joint reliability against temperature cycles.

DeMint succeeded in commercializing the compact thick-film type leaded resistors with high power and high anti surge characteristics, meeting latest design engineer requirements and making the parts suitable for industrial, measurement and telecommunication applications as well as for automotive circuits, like Electrical Control Units (ECU) and Air-Bag Systems.

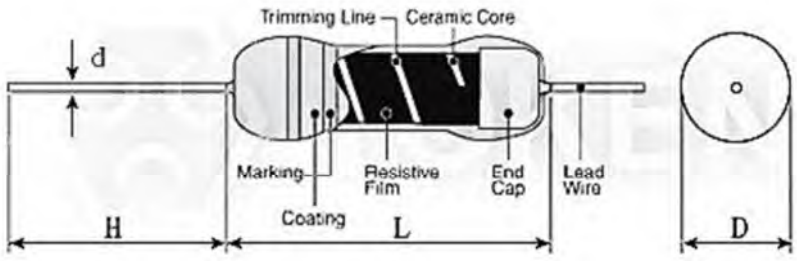
The anti-surge characteristics of DeMint's latest metal glaze power film style resistors are superior to standard metal film resistors. The power film types of RCR resistors are available: 0.25W to 10W power rating, max working voltage up to 3000V and max overload voltage 5000V. The resistance range is 1Ω ~ 100MΩ at operating temperature range -20℃~+155℃.

All RCR series devices are RoHS-compliant, and compatible with high temperature soldering processes normally employed for lead free solders. Resistors are also available in various forming styles and different leads for different applications. Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

General Specifications

General Specifications (RCR) (Unit: mm)

Type	Power Rating	L	D	d ± 0.05	H
RCR25	1/4W	6.5±1	2.3±0.5	0.5 ~ 0.6	26±3
RCR50	1/2W	9.5±1	3.4±0.5		
RCR100	1W	12.0±1	4.0±0.5	0.7 ~ 0.8	
RCR200	2W	16.0±1	6.1±0.5		
RCR300	3W	17.5±1	6.0±0.5		
RCR500	5W	24.0±1	8.0±0.5		
RCR1000 *	10W	Max..50	Max..10		



Anti-Surge (RCR) Dimensions (Unit: mm)

- **Remark: RCR1000 is custom design and on request.**

Power Rating

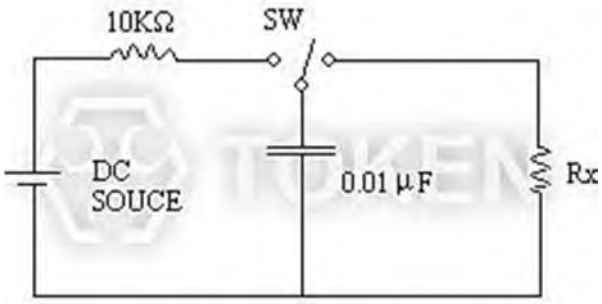
Anti-Surge Resistors (RCR)

Type	Power Rating	Max Working Voltage	Max Overload Voltage	Dielectric With-standing Voltage	TCR.(ppm/℃)	Resistance Range E24.J(±5%)(Ω)	Operating Temperance
RCR25	1/4W	500V	700V	500V	±350	1 ~ 33M	-20℃ ~+155℃
RCR50	1/2W	1000V	1500V	600V	±350	1 ~ 68M	
RCR100	1W	1500V	2500V	800V	±350	1 ~ 100M	
RCR200	2W	2000V	3000V	800V	±350	1 ~ 100M	
RCR300	3W	2500V	4000V	1000V	±350	1 ~ 100M	
RCR500	5W	3000V	5000V	1000V	±350	1 ~ 100M	

Loading Conditions

Anti-Surge Resistors (RCR)

Power	Resistance Range (Ω)	Surge Voltage	Anti-Surge Characteristics	Surge Test Condition
0.25 W	50K < R	3KV	(2.5 Sec. ON + 2.5 Sec. Off) × 10 Cycles ; ΔR ≤ ±(50%R+0.1Ω)	In accordance with IEC 65 Safety specification.
0.5 W	10K ≤ R < 100K	3KV		
	100K ≤ R < 360K	5KV		
	360K ≤ R < 1M	7KV		
	1M ≤ R	10KV		



Test Circuit

Anti-Surge (RCR) Test Circuit

Order Codes

Anti-Surge Resistors (RCR)

RCR50	1/2W	220KR	J	TB
Part Number	Rated Power (W)	Resistance Value (Ω)	Resistance Tolerance (%)	Package
RCR		1R0 1.0Ω	J ±5%	P Bulk
		100R 100Ω		TB Taping Box
		220K 220KΩ		
		22M 22MΩ		

Carbon Film Resistors (CF)

Product Introduction

Pulse load carbon film resistor is the cost-effective option.

Features :

- Tolerances: G (±2%), J (±5%)
- Power wattages up to 5W at +25℃
- Lead (Pb)-free and RoHS compliant
- Operating temperature range: -55℃~+155℃
- Axial leaded type, high power at small sizes

Applications :

- Consumer Electronic
- Telecommunications
- Household Appliances
- Automotive, Computer, Instrumentation

Providing design engineers with an economical power resistor with high quality performance, DeMint Electronics now offers commercial grade low power carbon film resistors.

Designated the CF series, the resistors are available in both standard CF and miniature CFS sizes, the conformal coated resistors offer high quality performance for applications that do not require surge protection or precision tolerances.

The commercial grade carbon CF series is available in flame retardant packaging and have ideal specifications for consumer electronic or electrical devices. The CF devices offer a wide resistance range for devices with power ratings up to 3W in standard CF size, and 5W in miniature CFS sizes, delivering high quality performance for general purpose applications.

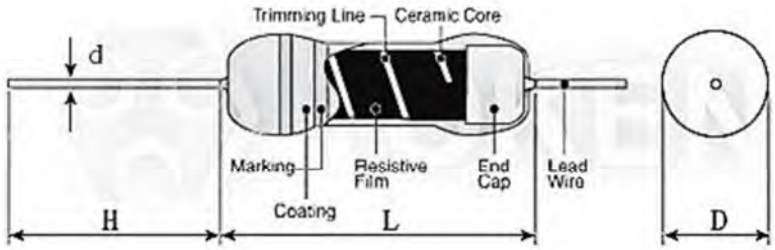
The CF series resistors are ideal for general use applications including electrical equipment, small appliances and consumer electronics, such as televisions and other high-volume products. The CF series feature standard tolerances is G (±2%) and J (±5%), with a resistance range from 0.5Ω to 22MΩ.

All CF series devices are RoHS-compliant, and compatible with high temperature soldering processes normally employed for lead free solders. Also, CF resistors are available in various forming styles and different leads for different applications. Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

Dimensions & Specifications

Dimensions & Specifications (Unit: mm) (CF)

Type		Dimension (mm)				Maximum Working Voltage	Maximum Overload Voltage	Resistance Tolerance	
CF	CFS	L	D	H	d±0.05			± 2%(G)	± 5%(J)
1/8 W	.	3.2±0.2	1.5±0.2	26±1	0.40~0.45	200	400	10Ω-470K	1Ω-4.7M
1/6 W	**1/4 W**	3.2±0.2	1.5±0.2	26±1	0.40~0.45	200	400	1Ω-10M	0.5Ω-22M
1/4 W	**1/2 W**	6.2±0.5	2.3±0.3	26±1	0.40~0.50	250	500	1Ω-10M	0.5Ω-22M
1/3 W	**1/2 W**	8.5±0.5	2.8±0.3	26±1	0.50~0.55	250	500	1Ω-10M	0.5Ω-22M
1/2 W	**1 W**	9.0±0.5	3.0±0.5	26±1	0.50~0.55	350	700	1Ω-10M	0.5Ω-22M
1 W	**2 W**	11±1.0	4.0±0.5	35±3	0.75~0.80	500	1000	1Ω-10M	0.5Ω-22M
2 W	**3 W**	15±1.0	5.0±0.5	35±3	0.75~0.80	500	1000	1Ω-10M	0.5Ω-22M
3 W	**5 W**	17±1.0	6.0±0.5	35±3	0.75~0.80	500	1000	1Ω-10M	0.5Ω-22M



Carbon Film (CF) Dimensions (Unit: mm)

Electrical Performance

Electrical Performance (CF)

Test Items	Condition	Spec
Operating Temp.range	-55℃ ~ +155℃	
Short Time Over Load	2.5 Times of rated voltage for 5sec.	± 1%
Load Life	70 ℃ on-off cycle 1,000hrs.	± 5%
Moisture-Proof Load Life	40 ℃ 95% RH on-off cycle 1,000hrs	± 5%
Soldering After Resistance	350 ℃ for 3sec.	± 0.5%
Temperature Cycle	-30 ℃~85 ℃ 5cycles	± 2%
Resistance Temperature Coefficient	1Ω~22KΩ 22KΩ~510KΩ 510KΩ~1MΩ 1MΩ~2.2MΩ 2.2MΩ~5.1MΩ	± 300PPM / ℃ ± 450PPM / ℃ ± 800PPM / ℃ ± 1000PPM / ℃ ± 1400PPM / ℃

Order Codes

Order Codes (CF)

CF	0.125W	100R	J	TB

Part Number	Rated Power (W)	Resistance Value (Ω)		Resistance Tolerance (%)		Package	
CF		1R	1Ω	G	±2%	TB	Taping Box
CFS		10R	10Ω	J	±5%		
		100R	100Ω				
		10K	10KΩ				
		10M	10MΩ				
		22M	22MΩ				

Light Dependent Resistors (PGM)

Product Introduction

Light-Dependent Photoresistors for Sensor Applications.

Features :

- Quick Response
- Reliable Performance
- Epoxy or hermetical package
- Good Characteristic of Spectrum

Applications :

- Photoswitch
- Photoelectric Control
- Auto Flash for Camera
- Electronic Toys, Industrial Control

The cadmium sulfide (CdS) or light dependent resistor (LDR) whose resistance is inversely dependent on the amount of light falling on it is known by many names including the photo resistor, photoresistor, photoconductor, photoconductive cell, or simply the photocell.

A typical structure for a photoresistor uses an active semiconductor layer that is deposited on an insulating substrate. The semiconductor is normally lightly doped to enable it to have the required level of conductivity. Contacts are then placed either side of the exposed area.

The photo-resistor, CdS, or LDR finds many uses as a low cost photo sensitive element and was used for many years in photographic light meters as well as in other applications such as smoke, flame and burglar detectors, card readers and lighting controls for street lamps.

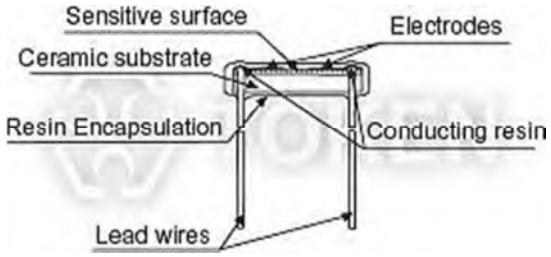
Providing design engineers with an economical CdS or LDR with high quality performance, DeMint Electronics now offers commercial grade PGM photoresistor. Designated the PGM Series, the photoresistors are available in 5mm, 12mm and 20mm sizes, the conformal epoxy or hermetical package offer high quality performance for applications that require quick response and good characteristic of spectrum.

DeMint has been designing and manufacturing high performance light dependent resistors for decades. Our product offerings are extensive and our experience with custom photoresistor is equally extensive. Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

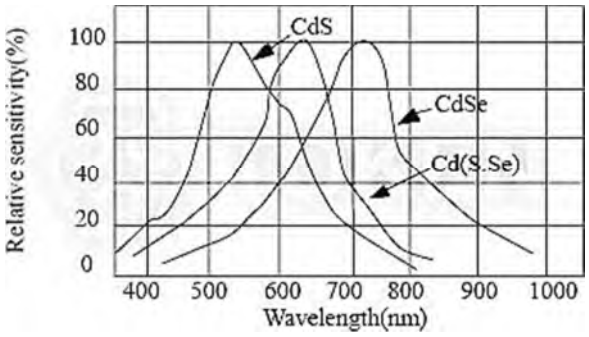
Terminology

Terminology (PGM)

- **Light Resistance** :
  Measured at 10 lux with standard light A (2854K-color temperature) and 2hr. preillumination at 400-600 lux prior testing.
- **Dark Resistance** :
  Measured at 10th seconds after closing 10 lux.
- **Gamma characteristic** :
  Under 10 lux and 100 lux and given by
  $\gamma = \log(R10/R100) / \log(100/10) = \log(R10/R100)$
  R10, R100: resistance at 10 lux and 100 lux.
  The tolerance of γ is ±0.1.
- **PMax.** :
  Max. power dissipation at ambient temperature of 25℃.At higher ambient temperature,the maximum power permissible may be lowered.
- **VMax.** :
  Max. voltage in darkness that may be applied to the device continuously.
- **Spectral peak** :
  Spectral sensitivity of photoresistors depends on the wavelength of light they are exposed to and in accordance with figure 'Spectral Response'. The tolerance of spectral peak is ±50nm.



CdS Photoresistor (Light Dependent Resistors) - PGM Series



CdS Photoresistors (PGM) Spectral Response

Physical and Environmental Characteristics

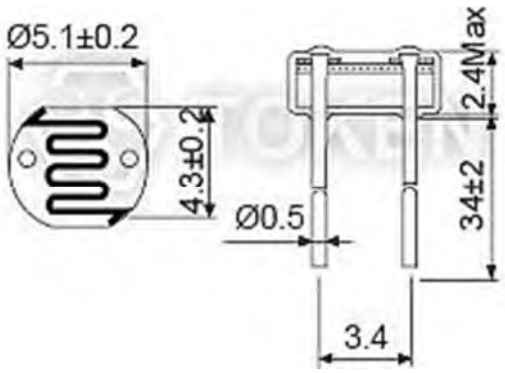
Physical and Environmental Characteristics (PGM)

ITEM	CONDITIONS	PERFORMANCE
Solderability	Put the terminals into welding tank at temp. 230±5℃ for 2±0.5s (terminal roots are 5mm away from the tin surface).	wetting>95%
Temperature Changing	Change of temperature in accordance with: TA: -40℃ TB: +60 ℃ Number of cycles: 5 Exposure duration: 30min	Drift of R10 = ± 20% No visible damage
Constant humidity and heat	1. Put the device in test box at Temperature: 60±5℃ Humidity: 90-95% IlluMin.ation: 0lux Duration: 100h 2. Take the device and measure after24h at normal temperature and humidity.	Drift of R10= ± 30% No visible damage
Constant load Temperature	At 25±5℃ Illumination: 150lux at rated power Duration: 600h	No visible damage
Wire Terminals Strength	Bend the wire terminal at its root to 90 degree, and then bend it to a opposite direction.	No visible damage
Vibration	Frequency: 50Hz Swing: 1.5mm with Directions: parallel to ceramic substrate normal to ceramic substrate. Duration:2h	No visible damage

Configurations & Dimensions

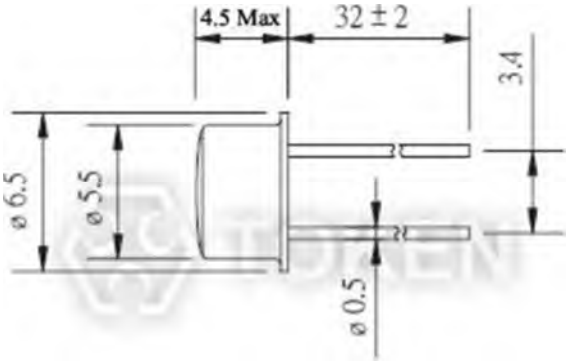
5mm CdS Photo Resistors (PGM) Configurations & Dimensions

Epoxy resin package
5mm CdS Photoresistors
Appearance PGM5** series**



Epoxy resin package
5mm PGM5** series**
Dimensions (Unit: mm)

Hermetical package
5mm CdS Photoresistors
Appearance PGM55-MP series**



Hermetical package
5mm PGM55-MP series**
Dimensions (Unit: mm)

- **Note: All dimensions are in mm and NTS.**

PGM5**** Electronics Characteristics

Epoxy resin package 5mm CdS (PGM5****) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)Min.	γ Min.	Response Time (ms)	
								Rise	Decay
PGM5506	100	90	-30 ~ +70	540	2 ~ 6	0.15	0.6	30	40
PGM5516	100	90	-30 ~ +70	540	5 ~ 10	0.2	0.6	30	40
PGM5526	150	100	-30 ~ +70	540	8 ~ 20	1.0	0.6	20	30
PGM5537	150	100	-30 ~ +70	540	16 ~ 50	2.0	0.7	20	30
PGM5539	150	100	-30 ~ +70	540	30 ~ 90	5.0	0.8	20	30
PGM5549	150	100	-30 ~ +70	540	45 ~ 140	10.0	0.8	20	30
PGM5616D	150	100	-30 ~ +70	560	5 ~ 10	1.0	0.6	20	30
PGM5626D	150	100	-30 ~ +70	560	8 ~ 20	2.0	0.6	20	30
PGM5637D	150	100	-30 ~ +70	560	16 ~ 50	5.0	0.7	20	30
PGM5639D	150	100	-30 ~ +70	560	30 ~ 90	10.0	0.8	20	30
PGM5649D	150	100	-30 ~ +70	560	50 ~ 160	20.0	0.8	20	30
PGM5659D	150	100	-30 ~ +70	560	150 ~ 300	20.0	0.8	20	30

PGM55** Electronics Characteristics

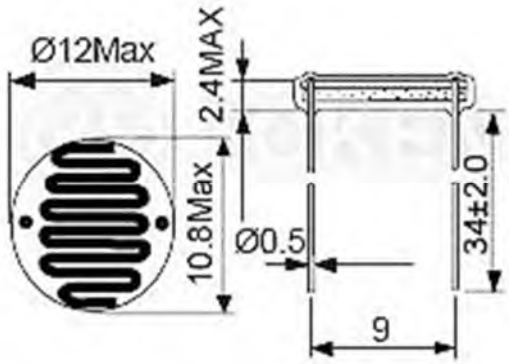
Hermetical package 5mm CdS (PGM55**-MP) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)Min.	γ Min.	Response Time (ms)	
								Rise	Decay
PGM5506-MP	100	90	-30 ~ +70	540	2 ~ 6	0.15	0.6	30	40
PGM5516-MP	100	90	-30 ~ +70	540	5 ~ 10	0.2	0.6	30	40
PGM5526-MP	150	100	-30 ~ +70	540	8 ~ 20	1.0	0.6	20	30
PGM5537-MP	150	100	-30 ~ +70	540	16 ~ 50	2.0	0.7	20	30
PGM5539-MP	150	100	-30 ~ +70	540	30 ~ 90	5.0	0.8	20	30
PGM5549-MP	150	100	-30 ~ +70	540	45 ~ 140	10.0	0.8	20	30

Configurations & Dimensions

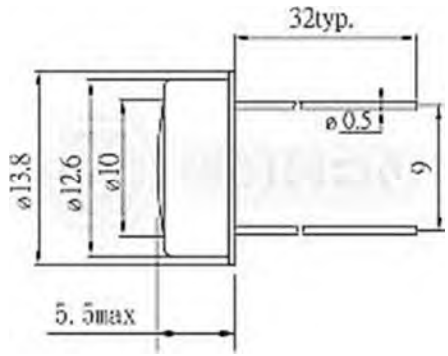
12mm Cds Photo Resistors (PGM) Configurations & Dimensions

Epoxy resin package
12mm CdS Photo Resistors Appearance PGM12 series**



Epoxy resin package
12mm Cds PGM12 series Dimensions (Unit: mm)**

Hermetical package
12mm CdS Photo Resistors Appearance PGM12-MP series**



Hermetical package
12mm Cds PGM12-MP series Dimensions (Unit: mm)**

- **Note : All dimensions are in mm and NTS.**

PGM12** Electronics Characteristics

Cds - (PGM12**) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)Min.	γ Min.	Response Time (ms)	
								Rise	Decay
PGM1200	250	250	-30 ~ +70	560	2~5	1.0	0.6	30	40
PGM1201	250	250	-30 ~ +70	560	4~10	2.0	0.7	30	30
PGM1202	250	250	-30 ~ +70	560	8~20	5.0	0.7	30	30
PGM1203	250	250	-30 ~ +70	560	18~50	10	0.8	30	30
PGM1204	250	250	-30 ~ +70	560	45~150	20	0.8	30	30
PGM1205	250	250	-30 ~ +70	560	140~300	20	0.8	30	30

PGM12**-MP Electronics Characteristics

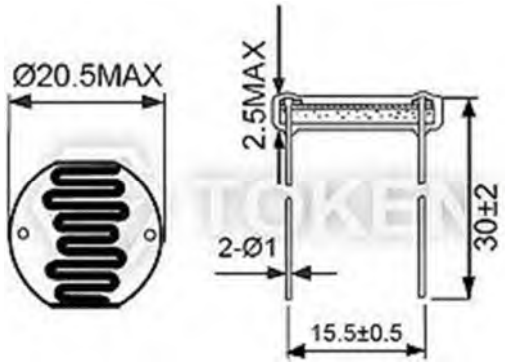
Cds - (PGM12**-MP) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)Min.	γ Min.	Response Time (ms)	
								Rise	Decay
PGM1200-MP	250	250	-30 ~ +70	560	2~5	1.0	0.6	30	40
PGM1201-MP	250	250	-30 ~ +70	560	4~10	2.0	0.7	30	30
PGM1202-MP	250	250	-30 ~ +70	560	8~20	5.0	0.7	30	30
PGM1203-MP	250	250	-30 ~ +70	560	18~50	10	0.8	30	30
PGM1204-MP	250	250	-30 ~ +70	560	45~150	20	0.8	30	30
PGM1205-MP	250	250	-30 ~ +70	560	140~300	20	0.8	30	30

Configurations & Dimensions

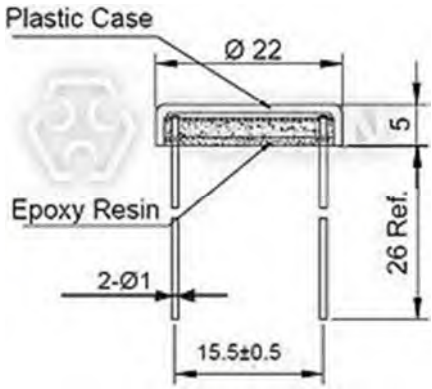
20mm CDS Photo Resistors (PGM) Configurations & Dimensions

Epoxy resin package
20mm CDS Photo Resistors Appearance PGM20 series**



Epoxy resin package
20mm CdS PGM20 series Dimensions (Unit: mm)**

Hermetical package
20mm CDS Photo Resistors Appearance PGM20-PP series**



Hermetical package
20mm CdS PGM20-PP series Dimensions (Unit: mm)**

- **Note: All dimensions are in mm and NTS.**

PGM20** Electronics Characteristics

CdS - (PGM20**) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)Min.	γ Min.	Response Time (ms)	
								Rise	Decay
PGM2000	500	500	-30 ~ +70	560	2~5	1.0	0.6	30	40
PGM2001	500	500	-30 ~ +70	560	4~10	2.0	0.7	30	30
PGM2002	500	500	-30 ~ +70	560	8~20	5.0	0.7	30	30
PGM2003	500	500	-30 ~ +70	560	18~50	10	0.8	30	30
PGM2004	500	500	-30 ~ +70	560	45~150	20	0.8	30	30
PGM2005	500	500	-30 ~ +70	560	140~300	20	0.8	30	30

PGM20**-PP Electronics Characteristics

CdS - (PGM20**-PP) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)Min.	γ Min.	Response Time (ms)	
								Rise	Decay
PGM2000-PP	500	500	-30 ~ +70	560	2~5	1.0	0.6	30	40
PGM2001-PP	500	500	-30 ~ +70	560	4~10	2.0	0.7	30	30
PGM2002-PP	500	500	-30 ~ +70	560	8~20	5.0	0.7	30	30
PGM2003-PP	500	500	-30 ~ +70	560	18~50	10	0.8	30	30
PGM2004-PP	500	500	-30 ~ +70	560	45~150	20	0.8	30	30
PGM2005-PP	500	500	-30 ~ +70	560	140~300	20	0.8	30	30

Order Codes

Order Codes (PGM)

PGM5516	P
Part Number	Package

Ceramic Housed Cement Resistors (SQ)

Product Introduction

Low-cost Ceramic Encased Cement Resistors Suit High Volumes and High Temperatures.

Features :

- Low cost, space saving
- RoHS compliant with 100% lead free
- Direct mounting on printed circuit board
- Circuit board lock-in mounting tabs available
- High performance for power required applications
- High power to size ratio, Special inorganic potting compound
- Ceramic case provide high thermal conductivity in a fireproof package

Applications :

- Power supplies
- Voltage dividers
- Motor controllers
- Automotive applications
- Power electronics circuits

DeMint electronics offers commercial grade ceramic-housed power wire wound and film resistors. For medium to high rated power (2W...50W), SQ resistors provide full electrical insulation mounted in a ceramic case.

Axial, radial, vertical styles and several mounting techniques of wire leads or quick disconnects are available from DeMint's SQP, SQM, SQZ, and SQH.

The SQ series power resistors feature ideal specifications for high volume and high-temperature applications. Frequently used in power supplies, motor controllers, and automotive applications, these products can be custom tailored to individual needs.

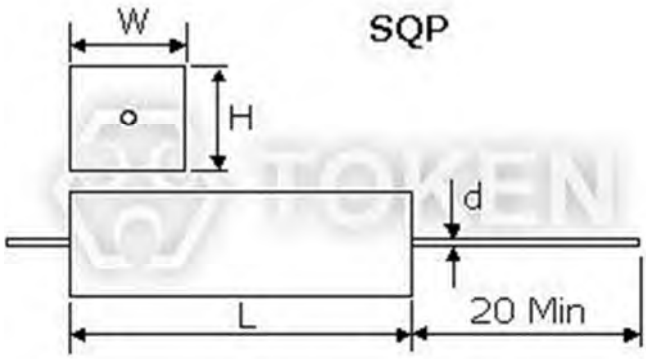
With the extended resistance range and high-temperature rating, the resistors can be specified for operation in harsh environments. The SQ series wire wound resistors feature a resistance range from 0.1Ω to 3KΩ, while the SQ series power film resistors have a resistance range of 80Ω to 150KΩ.

Standard tolerances for both devices are to ±5%, with TCRs of ±300ppm/℃ and above. DeMint is equipped to design and produce custom components to meet many design and reliability demands. Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

SQP Dim.

Dimensions (SQP)

Type	Dimension (mm)				Resistance Range (Ω)	
SQP	W±1	H±1	L±1.5	d±0.05	SQP	RS+SQP
2W	7	7	18	0.5~0.6	0.1~82	
3W	8	8	22	0.7~0.8	0.1~180	181~33K
5W	10	9	22	0.7~0.8	0.1~180	181~50K
7W	10	9	35	0.7~0.8	0.1~430	431~50K
10W	10	9	48	0.7~0.8	0.1~470	471~50K
15W	12.5	11.5	48	0.7~0.8	0.5~600	601~150K
20W-25W	14	13.5	60	0.7~0.8	0.8~1K	1.1~150K

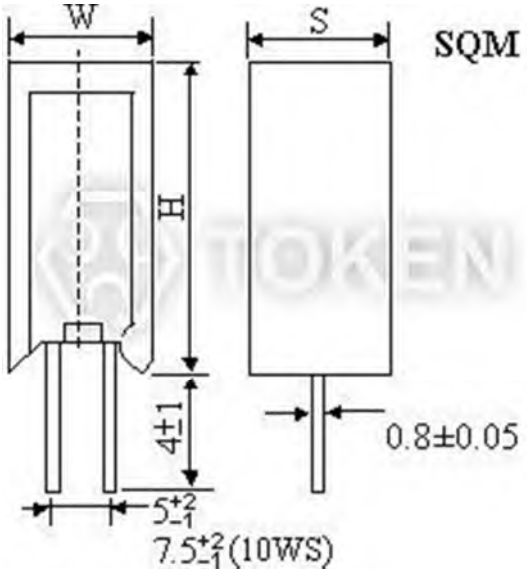


Cement Ceramic Housed (SQP) Dimensions

SQM Dim.

Dimensions (SQM)

Type	Dimension (mm)			Resistance Range (Ω)	
SQM	H±1.5	W±1	S±1	SQM	RS+SQM
2W	20	12	8	0.1-8.0	81-50K
3W	25	12	8	0.1-180	181-50K
5W	25	13	9	0.1-180	181-50K
7W	39	13	9	0.1-430	431-47K
10W	51	13	12	0.1-470	471-47K
10WS	35	16	12	0.1-430	431-47K

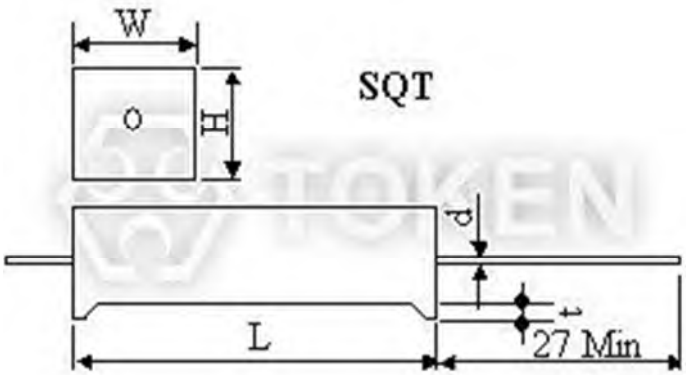


Ceramic Housed (SQM) Dimensions

SQT Dim.

Dimensions (SQT)

Type	Dimension (mm)				Resistance Range (Ω)	
SQT	H±1.5	W±1	L±1	t±1	SQT	RS+SQM
3W	9	10	22	1.5	0.1-180	181-50K
5W	9	10	22	1.5	0.1-180	181-50K
7W	9	10	35	3.0	0.1-430	431-47K
10W	9	10	48	3.0	0.1-470	471-47K

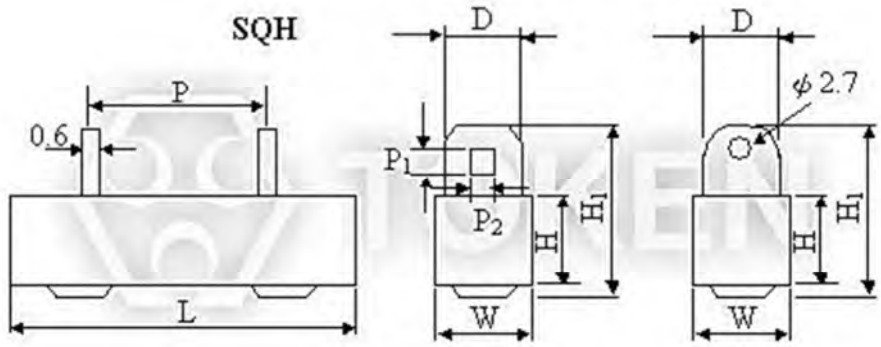


Cement Ceramic Encased (SQT) Dimensions

SQH Dim.

Dimensions (SQH)

Type	Dimension (mm)								Resistance Range (Ω)		Max Working Voltage
SQH	W±1	H±1	L±1.5	P±1	H1±1	D±0.5	P1±0.2	P2±0.2	SQH	RS+SQH	
10W	10	9	48	32	21	5	2.5	2	0.1~500	500~50K	500V
15W	12.5	11.5	48	32	21	5	2.5	2	1~1K	1K~150K	600V
20W	14.5	13.5	60	43	24	6	3.0	2.5	1~2K	2K~150K	700V
30W	19	19	75	56	29	6	3.0	2.5	1~2K		700V
40W	19	19	90	67	29	6	3.0	2.5	2~3K		700V
50W	19	19	90	67	29	6	3.0	2.5	2~3K		700V

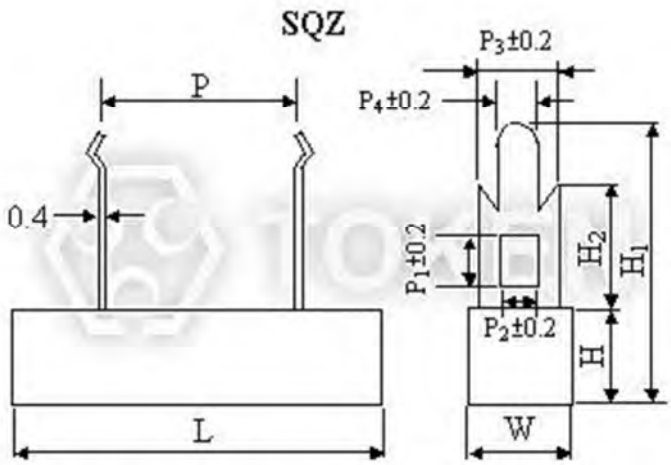


Cement Ceramic Encased (SQH) Dimensions

SQZ Dim.

Dimensions (SQZ)

Type	Dimension (mm)										Resistance Range (Ω)	
SQZ	L±1.5	W±1	H±1	P±1.5	P1	P2	P3	P4	H1±1	H2±1	SQZ	RS+SQZ
5W	25(28)	10	10	9.5(15)	4.2	2	5	1.5	25	10.5	0.1-130	131-50K
7W	36	10	10	20	4.2	2	5	1.5	25	10.5	0.1-430	431-50K
10W	48	10	10	32	4.2	2	5	1.5	25	10.5	0.2-470	471-50K
15W	48	12.5	12	32	4.2	2	5	1.5	26	10.5	1-600	601-150K
20.25W	60	15	13	42	7	6	10	2.7	36	15.0	1-1K	1.1K-150K



Cement Ceramic Encased (SQZ) Dimensions

Electrical Performance

Electrical Performance (SQ)

TEST ITEMS	CONDITION	SPEC.
Resistance Temp Coeff.	-30℃ ~ 200℃	±300ppm / ℃
Short Time Over Load	2.5 times of rated wattage for 5 sec.	±2 %
Rated Load	Rated wattage for 30 Min..	±1 %
Voltage Withstanding	800 v AC 1 Min..	no charge
Temp. Cycle	-30℃ ~ 85℃ for 5 cycles	±1 %
Load Life	70℃ on-off cycle 1000hrs.	±5 %
Moisture-proof Load Life	40℃ 95% RH on-off cycle 500 hrs.	±5 %
Incombustibility	16 times of rated wattage for 5 Min..	not flamed

Material Specifications

Material Specifications (SQ)

- **Core** :
  High purity grade alumina ceramic rod.
- **Terminals** :
  Tin/lead plated (Lead (Pb)-free will be 100 % tin).
- **Body** :
  Steatite ceramic case with inorganic potting compound.
- **Element** :
  Copper-nickel alloy, nickel-chrome alloy, resistive wirewound or power film depending on resistance value.

Order Codes

Order Codes (SQ)

SQP	5W	100R		J		Bulk
Part Number	Rated Power (W)	Resistance Value (Ω)		Resistance Tolerance (%)		Package
SQP		0R1	0.1Ω	J	±5%	
SQM		100R	100Ω			
SQT		1K	1KΩ			
SQH		100K	100KΩ			
SQZ						

Carbon Composition Resistors (CCR)

Product Introduction

High pulse withstanding carbon composition resistors handle big peaks and pulses.

Features :

- Low inductance
- Solid rod carbon composition
- Power rating 1/4W and 2W
- Resistance range 1.8Ω ~ 22KΩ
- Resistance tolerance J(±5%), K(±10%) and M(±20%)
- High pulse withstanding and high energy capability
- Products with Pb-free Terminations and RoHS compliant

Applications :

- Strobe Lighting
- High Power Lighting
- Medical defibrillators
- Welding, Automotive
- Inrush Current Limiting
- High Voltage Power Supplies
- Protection (e.g. Discharge Circuits, Surge Protection)

The high pulse withstanding capability of the CCR series of carbon composition resistors from DeMint Electronics offers designers a compact solution for applications involving high voltages and high-energy pulses.

Though, many resistor manufacturers claim to offer carbon composition replacements. However, these wire wound or thick film alternatives do not fully match the pulse performance and low inductance of carbon composition.

DeMint's CCR series now offers the industry a carbon composition resistor made up of a solid rod of conductive composite material, the chemical composition of which is altered to produce different resistance values.

The main advantage of carbon composition is their pulse handling capability. This is due to the fact that the entire rod conducts and so the thermal mass is far higher, which results in a higher energy capability. Due to the need for higher peak voltages, the CCR range is perfect for vehicle ignition system applications, medical monitoring equipment and as output resistors in defibrillators.

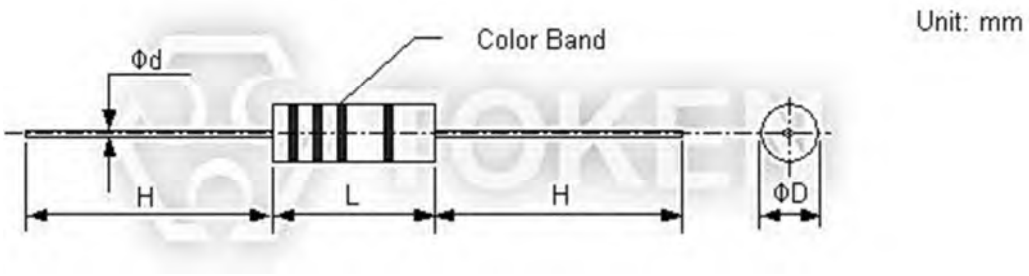
The standard carbon composition CCR resistor offers a power rating of 1/4W, 1/2W, 1W and 2W at 25 ℃ and is made up of a solid rod of conductive composition material, which can be altered to produce different resistance values. With a typical resistance range of 1.8Ω ~ 22KΩ, resistance tolerance is J(±5%), K(±10%) and M(±20%). Resistors with 5%, 10% and 20% tolerance have four bands indicating value and tolerance in accordance with IEC62.

Our custom solutions are designed to address your need for technical and economic success in a timely manner. Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

Dimensions

Dimensions (Unit: mm) (CCR)

Type	Power Rating	L		Φ D	H	Φ d
CCR	1/4W	6.3	+1.0 -1.0	2.3±0.3	27±2	0.60±0.02
CCR	1/2W	9.5	+0.5 -1.5	3.5±0.3	27±2	0.70±0.02
CCR	1W	15	+1.5 -0.5	6.0±0.3	28±2	0.80±0.02
CCR	2W	18	+0.5 -1.5	8.0±0.3	27±2	1.00±0.02



Carbon Composition (CCR) Dimensions (Unit: mm)

Ratings Specifications

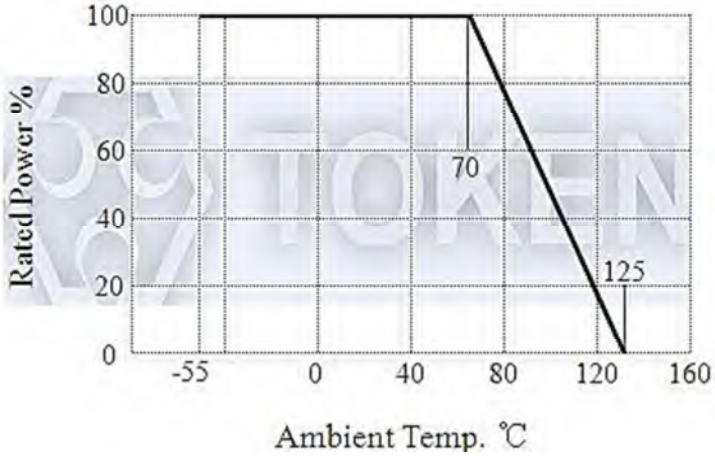
Ratings Specifications (CCR)

Type	Power Rating	Resistance Range	Tolerance E12,E24	Max Working voltage	Max overload Voltage	Rated Ambient Temp.	Operating Temp. Range
CCR	1/4W	2.2Ω ~ 12MΩ	J(±5%) K±10% M±20%	250V	400V	+70℃	-55℃ ~ +125℃
CCR	1/2W	2.2Ω ~ 22MΩ		350V	700V	+70℃	-55℃ ~ +125℃
CCR	1W	2.2Ω ~ 22KΩ		500V	1000V	+70℃	-55℃ ~ +125℃
CCR	2W	1.8Ω ~ 10KΩ		500V	1000V	+70℃	-55℃ ~ +125℃

- **Rated Voltage = $\sqrt{\text{Power Rating} * \text{Resistance Value}}$ or Max. Working voltage, whichever is lower.**

Derating Curve

Derating Curve (CCR)



(CCR) Derating Curve

Performance

Performance (CCR)

Description		Performance Requirements			Test Method
Resistance Temperature Coefficient		Resistance Range	Maximum Resistance Value Change %		Test Temperature +20℃ /-40℃ /+20℃ /+100℃ /+20℃
			-40~+20℃	+20~+100℃	
		<1KΩ	±6.5%	±5.0%	
		1.1KΩ ~10KΩ	±10%	±6.0%	
		11KΩ ~100KΩ	±13%	±7.5%	
		11KΩ ~1MΩ	±15%	±10%	
		1.1MΩ ~10MΩ	±20%	±15%	
		>11MΩ	±25%	±20%	
Short-time Overload		Δ R≤±2.5%			Rate Voltage*2.5 or Max.imum overload voltage (the lower)5sec.
With Standing Voltage		No flashover or breakdown			2times maximum working voltage 1 minute
Terminal Strength	Pulled	ΔR≤±2% No visible damage			Load 10N 10s
	Winded				Load 10N 4*90°
	Twisted				3*360° in opposite direction
Resistance to vibration		No visible damage			10~50Hz 3 direction 2 hours each
Solder-heat Resistance		ΔR≤±5% Marks legible, no visible damage			350℃ 4mm from the body,3 seconds
Solderability		At least 95% if the dipping surface must be covered by new solder, no flaws gathered.			235℃ 2mm from the body,2 seconds
Temperature Cycle		ΔR≤±2% No visible damage			-40℃(30Min..)/85℃(30Min..)5 cycles
Humidity		ΔR≤±10% No visible damage			40℃ 95% RH 240 hours
Load Life		ΔR≤±10% No visible damage, marks legible			Rated voltage or maximum working voltage, 1.5 hours on, 0.5 hours off, 40℃ 1000 hours

Order Codes

Order Codes (CCR)

CCR	1/2W	120R	K	P
Part Number	Rated Power (W)	Resistance Value (Ω)	Resistance Tolerance (%)	Package
CCR		2R2 2.2Ω 120R 120Ω 1M2 1.2MΩ 22M 22MΩ	J ±5% K ±10% M ±20	P Bulk

Fusible Resistors (FRN, FKN, FSQ)

Product Introduction

Fusible resistor features best of both worlds.

Features :

- Low Cost
- Low Noise
- Reduced numbers of parts used in circuits
- Products with Pb-free Terminations and RoHS compliant

Applications :

- Telecommunications
- Household appliances
- Inrush Pulse protection
- Lightning strike protection
- Input protection for small power supplies and battery chargers

Designers of small power supplies and battery chargers for consumer products can benefit from a fusible resistor with superior lightning strike and pulse abilities in a cost effective package.

DeMint Electronics offers a combination resistor/fuses series of metal/carbon film fusible resistor (FRN), wire wound fuse resistor (FKN) and cement encased fusing resistors (FSQ). DeMint offers fusible FRN series a low-cost alternative to traditional solutions for applications that require surge protection.

The robust ceramic encased cement resistor (FSQ) and wire wound resistor (FKN) are ideal for power supply applications across the telecoms, military and industrial markets which require a replacement for carbon composition resistors within the circuit design.

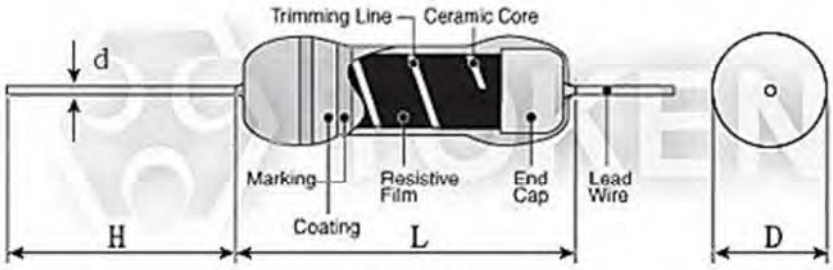
As part of the DeMint input protection range, this resistor provides a key fusible solution and is completely customizable to suit the individual application design requirements. Key design engineers with a need for a robust resistor, will find the FRN, FKN and FSQ series are a multifaceted product, providing comparable pulse performance with added fusing capabilities.

Our custom solutions are designed to address your need for technical and economic success in a timely manner. Contact us with your specific needs. Or link to DeMint official website "General Purpose Resistors" for more information.

Specifications (FRN)

Specifications & Dimensions (Unit: mm) Thin-Film Fusible Resistor (FRN)

Type	Rated Wattage	Dimension (mm)				Resistance Range	Dielectric Withstanding Voltage
		L ± 1.5	D ± 1	H ± 3	d ± 0.05		
FRN	1/4W	6	2.3	26	0.40~0.50	0.22Ω~100KΩ	300V
	1/2W	6	2.3	26	0.50~0.55	0.22Ω~100KΩ	300V
	1W	9	3.0	26	0.50~0.55	0.22Ω~100KΩ	350V
	2W	11	4.0	26	0.75~0.80	0.3Ω~100KΩ	500V
	3W	15	5,0	35	0.75~0.80	0.3Ω~100KΩ	500V

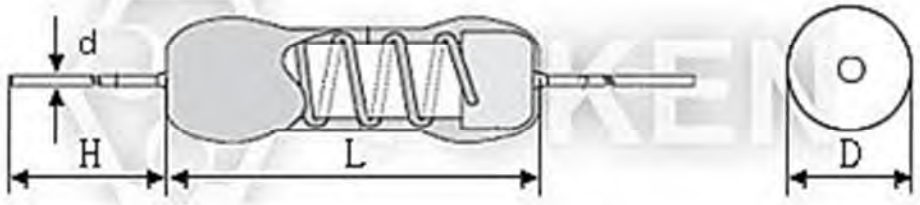


Thin-Film Fusible Resistor (FRN) Dimensions (Unit: mm)

Specifications (FKN)

Specifications & Dimensions (Unit: mm) Wire wound Fuse Resistor (FKN)

Type	Rated Wattage	Dimension (mm)				Resistance Range	Dielectric Withstanding Voltage
		L ± 1.5	D ± 1	H ± 3	d ± 0.05		
FKN	1W	9	4.5	26	0.50~0.55	0.1Ω~22Ω	500V
	2W	11	5.0	26	0.75~0.80	0.1Ω~60Ω	500V
	3W	15	5.5	35	0.75~0.80	0.1Ω~100Ω	500V
	5W	17	6.5	35	0.75~0.80	0.2Ω~200Ω	500V
	6W	24	8.5	38	0.75~0.80	0.3Ω~250Ω	500V

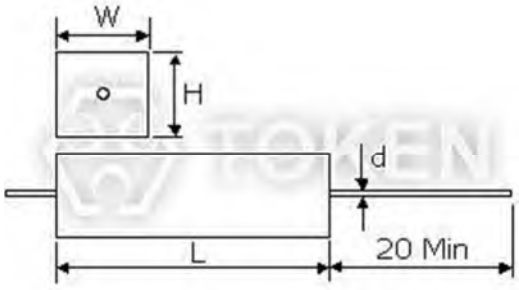


Wirewound Fuse Resistor (FKN) Dimensions (Unit: mm)

Specifications (FSQ)

Specifications & Dimensions (Unit: mm) Cement Fusing Resistor (FSQ)

Type	Rated Wattage	Dimension (mm)					Resistance Range	Dielectric Withstanding Voltage
		L ± 1.5	H ± 0.5	W ± 0.5	H ± 3	d ± 0.05		
FSQ	2W	18	7	7	35	0.50~0.55	0.1Ω~22Ω	1000V
	3W	22	8	8	35	0.75~0.80	0.1Ω~120Ω	1000V
	5W	22	9	10	35	0.75~0.80	0.2Ω~120Ω	1000V
	7W	35	9	10	35	0.75~0.80	0.3Ω~250Ω	1000V
	10W	48	9	10	35	0.75~0.80	0.3Ω~500Ω	1000V



Ceramic Encased Cement Fusing Resistor (FSQ) Dimensions (Unit: mm)

Characteristics

Electrical Characteristics (FRN, FKN, FSQ)

Test Items	Condition	Spec.
Operating Temp.	-30℃~155℃	
Resistance Temp. Coeff.	-30℃~150℃	± 200PPM / ℃
Short Time Overload	2 times of rated voltage for 5 sec.	± 2 %
Temp. Cycle	-30℃~85℃ for 5 cycles	± 1 %
Load Life	25℃ on-off cycle 1,000 hrs.	± 5 %
Moisture-Proof Load Life	40℃ 95℃ RH on-off cycle 1,000 hrs.	± 5 %
Solder Pot	270℃ for 3 sec.	± 1 %
Incombustibility	16 times of rated wattage for 5 Min..	not flamed

Fusing Characteristics (FRN, FKN, FSQ)

POWER WATTAGE	FUSING TIME
16 × Rated Wattage	Within 2 Min.
24 × Rated Wattage	Within 1 Min.
32 × Rated Wattage	Within 30 sec.

Application Notes

Application Notes of Fusible Resistors (FRN, FKN, FSQ)

For fusible resistors, unlike fuses, fusing performance is given in terms of power rather than current.

The power can be calculated:

Power = Amperes ^{2} × Ohms

Fusing Device Application Notes

- When using, it shall be made sure that the overload conditions at unusual moments lie within the fusing territory.
- Consult with DeMint in advance when overloaded higher than the rated voltage under an ordinary situation since such an overload may store up damages on resistors.
- Use at the maximum open-circuit voltage or lower as an arc phenomenon may arise when high voltage is applied again after fusing by an over current.
- Consult with us for the maximum open- circuit voltage because it varies with applications.

Order Codes

Order Codes (FRN, FKN, FSQ)

FRN	1/2W	0.47R	J	TB

Part Number
FRN
FKN
FSQ

Rated Power (W)

Resistance Value (Ω)	
R47	0.47Ω
47R	47Ω
470R	470Ω
4K7	4.7KΩ
47K	47KΩ

Resistance Tolerance (%)	
J	±5%

Package	
P	Bulk
TB	Taping Box

Metal Oxide Resistors (RSS, RSN)

Product Introduction

Metal Oxide Resistors on the pulse in various forming styles for different applications.

Features :

- Tolerances: G (±2%), J (±5%)
- Lead (Pb)-free and RoHS compliant
- Power wattages up to 10W at + 25 ℃
- Operating temperature range: -55℃~200℃
- Axial leaded type, high power at compact sizes
- Replace carbon composition components in some applications

Applications :

- Ballasts
- Amplifiers
- Power supplies
- Telecommunications
- Household appliances
- Automotive, Computer, Instrumentation

Now available from DeMint Electronics is a new range of highly stable and reliable metal oxide resistors providing high power in a small package with various forming styles and different leads for different applications.

New RS series resistors are ideal for pulse applications in adverse conditions and are available in different sizes with power ratings of 0.5W to 10W for a power voltage range from 200V to 850V. Highly temperature resistant the devices feature a resistance range from 10Ω to 47KΩ.

RS series resistors are available in various forming styles and different leads for different applications like power supplies, amplifiers, household appliances and ballasts.

Manufactured by depositing a homogeneous oxide film of metal alloy onto a high-grade ceramic body, the metal oxide resistors are coated with a nonflammable lacquer providing mechanical, electrical and climatic protection.

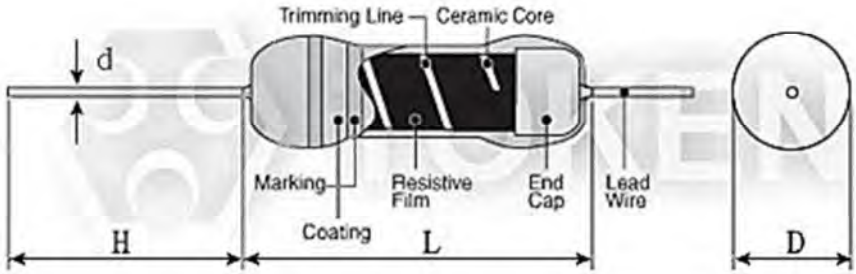
The devices come packaged in ammo pack boxed or tape and reel format. All RS Series devices are RoHS-compliant, and compatible with high temperature soldering processes normally employed for lead free solders.

Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

Specifications & Dimensions

Specifications & Dimensions (Unit: mm) (RSS, RSN)

Type		Dimensions (Unit: mm)				Resistance Range	Tolerance E24	MAX Working Voltage		Dielectric Withstanding Voltage	
RSS	RSN	L	D	H	d ± 0.05	(Ω)	(%)	RSS	RSN	RSS	RSN
1/2W	**1/4W**	6.0± 0.3	2.3 ± 0.3	26 ± 1	0.40~0.50	10Ω ~ 22KΩ	±2%, ±5%	200V	300V	400V	500V
1W	**1/2W**	9.0± 0.5	3.0 ± 0.5	26 ± 1	0.50~0.55	10Ω ~ 33KΩ	±2%, ±5%	250V	350V	500V	600V
2W	**1W**	11 ± 1.0	4.0 ± 0.5	26 ± 3	0.75~0.80	10Ω ~ 47KΩ	±2%, ±5%	300V	350V	600V	700V
3W	**2W**	15 ± 1.0	5.0 ± 0.5	35 ± 3	0.75~0.80	10Ω ~ 47KΩ	±2%, ±5%	350V	350V	700V	700V
5W	**3W**	17± 1.0	6.0 ± 0.5	35 ± 3	0.75~0.80	10Ω ~ 47KΩ	±2%, ±5%	350V	500V	700V	1000V
-	**5W**	24 ± 1.0	8.0 ± 0.5	38 ± 3	0.75~0.80	10Ω ~ 47KΩ	±2%, ±5%	500V	700V	800V	1000V
7W	**6W**	24 ± 1.0	8.0 ± 0.5	38 ± 3	0.75~0.80	10Ω ~ 47KΩ	±2%, ±5%	500V	700V	800V	1000V
10W	**7W**	41 ± 1.0	8.0 ± 0.5	38 ± 3	0.75~0.80	10Ω ~ 47KΩ	±2%, ±5%	750V	850V	850V	1000V
	10W	53 ± 1.0	8.0 ± 0.5	38 ± 3	0.75~0.80	10Ω ~ 47KΩ	±2%, ±5%	750V	850V	850V	1000V



Metal Oxide Film (RSS, RSN) Dimensions (Unit: mm)

Electrical Performance

Electrical Performance (RSS, RSN)

Requirements		Characteristics	Test Method	
			JIS C 5202	MIL-R-22684B
Operating Temp.Range		-55℃~200℃		
Temp.Coefficient (ppm/℃)		± 300	5.2	4.6.11
Max. Resistance Changes	Short Time Overload	± (1%+0.05Ω)	5.2A	4.6.5
	Effect of Soldering	± (1%+0.05Ω)	6.4 350℃ 2Sec	4.6.9
	Temp.Cycling	± (1%+0.05Ω)	7.4-55℃ / 85℃	4.6.3
	Moisture Resistance	± 5%	7.9 1,000hr	4.6.10
	Load Life	± 5%	7.10 1,000hr	4.6.12
Dielectric Withstanding Voltage		± (0.5%+0.05Ω)	5.7A	4.6.7
Non-Combustibility		The resistor shall withstand Overload test in accordance with Artice UL492.2 13 without producing a fire hazard.		
Resistance to Solvents		No damage on the appearance, co. or bands.		

Application Notes

Non-flammable Resistor Application Notes (RSS, RSN)

- Never use organic solvents to clean non-flammable resistors.
- Maintaining a surface temperature of 200℃ or less will extend resistors service life.
- Although the hardness exceeds that of a 3H pencil lead, do not nick the coating with screwdrivers or other pointed objects.
- Smoke emitted from non-flammable resistors on initial use in powered circuits is a normal phenomenon and the component can be safely utilized.
- Non-flammable resistors cannot be utilized in oil. Non-flammable resistors cannot be used in high frequency machinery because of the inductance produced by the grooving.
- Avoid touching non-flammable resistors in operation; the surface temperature ranges from approximately 350 ℃ to 400℃ when utilized at the full rated value.
- All metal oxide film resistors (RSS, RSN) manufactured by DeMint Electronics Co., Ltd. comply with the U.S. UL-94 non-flammability test, Class V-0, a continuous combustion period of zero seconds.
- Less resistant against external shocks than ordinary resistors due to special flame retardant coating. So, never give shocks or vibrations on the resistors. Also never damage them by picking up the coated films with pliers, tweezers, etc.
- After cleaning, no external power should be put on the coated films before they are well dried.

Order Codes

Order Codes (RSS, RSN)

RSS	0.5W	1KR	J	TB

Part Number
RSS
RSN

Rated Power (W)

Resistance Value (Ω)	
10R	10Ω
100R	100Ω
1K	1KΩ
10K	10KΩ

Resistance Tolerance (%)	
G	±2%
J	±5%

Package	
TB	Taping Box

Precision Resistors (MF)

Product Introduction

Precision metal-film resistors for low-cost uses.

Features :

- Low cost, low noise, operating temperature range -55℃ ~ 155℃
- Precision tighted tolerance available in ±0.1%, ±0.25%, ±0.5%, ±1%
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes

Applications :

- Telecom
- Test and measurement
- All general purpose applications

DeMint offers a low-cost alternative commercial metal film resistor for precision applications. The MF series offers tight tolerances and low TCRs over a wide resistance range and are suitable for applications where long-term stability is paramount.

The MF is available in a resistance range of 10Ω to 1MΩ with a standard resistance tolerance of ±1% and a temperature coefficient of resistance (TCR) of +15/-25ppm/℃, although other tolerances and TCRs are available.

The resistance element in these devices is a precisely controlled thin film of metal alloy deposited on a high quality alumina rod. Plated caps are force-fitted before the assembly is trimmed using advanced trimming techniques to ensure excellent performance and low electrical noise.

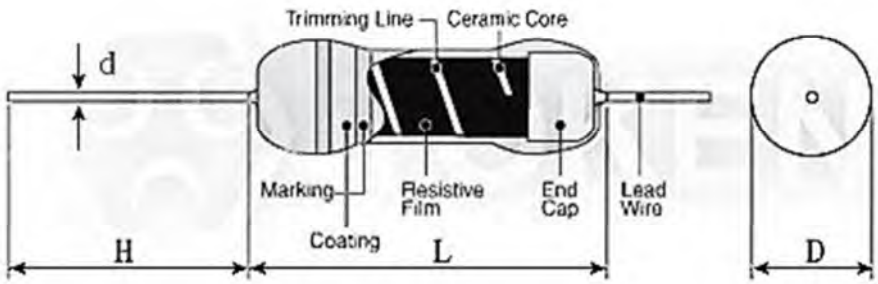
Leads are welded to the end caps prior to the resistor being coated with epoxy, and color band marking applied. A variety of standard lead forms are available for use where auto-insertion is not available or practical. This gives the advantage of the value being shown, even if the resistor is machine preformed or auto-inserted.

The MF is RoHS compliant with 100% lead free; Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

Dimensions & Specifications

Dimensions & Specifications (Unit: mm) (MF)

STYLE	MIL STYLE	POWER RATING(W)		DIMENSION (mm)				MAX WORKING VOLTAGE		MAX OVERLOAD VOLTAGE	
		RN	RNS	L	D	H	d ± 0.05	RN	RNS	RN	RNS
MF - 12	RN-50	1/8W	1/4W	3.2± 0.2	1.5 ± 0.2	26 ± 1.0	0.40~0.45	200	150	400	300
MF - 25	RN-55	1/4W	1/2W	6.0 ± 0.3	2.3 ± 0.3	26 ± 1.0	0.40~0.50	250	200	500	400
MF - 50	RN-60	1/2W	1W	9.0 ± 0.5	3.0 ± 0.5	26 ± 1.0	0.50~0.55	350	250	700	500
MF - 100	RN-65	1W	2W	11 ± 1.0	4.0 ± 0.5	35 ± 3.0	0.75~0.80	500	300	1000	600
MF - 200	RN-70	2W	3W	15 ± 1.0	5.0 ± 0.5	35 ± 3.0	0.75~0.80	500	350	1000	700



Metal Film Resistors (MF) Dimensions (Unit: mm)

Resistance Range

Resistance Range (MF)

STYLE	MIL STYLE	TOLERANCE	TC+15-25PPM	TC+50PPM	TC+100PPM	REMARK
MF-12	RN-50	±1% ±0.5% ±0.25%	100Ω-100KΩ 100Ω-100KΩ 100Ω-100KΩ	10Ω-1MΩ	10Ω-1MΩ	* Standard resistance is 10Ω-1MΩ, below or over this resistance on request.
MF-25	RN-55	±1% ±0.5% ±0.25% ±0.1%	51.1Ω-511KΩ 51.1Ω-511KΩ 100Ω-300KΩ 100Ω-300KΩ	10Ω-1MΩ	10Ω-1MΩ	
MF-50	RN-60	±1% ±0.5% ±0.25% ±0.1%	51.1Ω-1KΩ 51.1Ω-1KΩ 100Ω-551KΩ 100Ω-330KΩ	10Ω-1MΩ	10Ω-1MΩ	
MF-100	RN-65	±1% ±0.5% ±0.25% ±0.1%	51.1Ω-1KΩ 51.1Ω-1KΩ 100Ω-551KΩ 100Ω-330KΩ	10Ω-1MΩ	10Ω-1MΩ	
MF-200	RN-70	±1% ±0.5% ±0.25% ±0.1%	51.1Ω-1KΩ 51.1Ω-1KΩ 100Ω-551KΩ 100Ω-330KΩ	10Ω-1MΩ	10Ω-1MΩ	

Electrical Performance

Electrical Performance (MF)

REQUIREMENTS	CHARACTERISTICS	JIS C 5202	MIL-R-10509F
Operating Temp. Range	-55℃ ~ 155℃		
Temp Coefficient (℃)	±25 ±50 ±100	5.2	4.6.12
Short Time Overload	±(0.5%%+0.05Ω)	5.5 A	4.6.6
Dielectric Withstanding V	±(0.5%+0.05Ω)	5.7 A	4.6.8
Effect of Soldering	±(0.5%+0.05Ω)	6.4 350℃ 3 sec	4.6.10
Temperature Cycling	±(0.5%+0.05Ω)	7.4	4.6.4
Low Temp Operation	±(0.5%+0.05Ω)		4.6.5
Terminal Strength	±(0.5%+0.05Ω)	6.1	4.6.7
Moisture Resistance	±(1%+0.05Ω)	7.9 1,000hr	MIL R-22684 4.6.10
Load Life	±(1%+0.05Ω)	7.10 1,000hr	4.6.13
Storage	±(0.2%+0.05Ω)	Shelved one year in a room of normal temperature and humidity	

Order Codes

Order Codes (MF)

MF-25	1/4W	100R	F	TB

Part Number	Rated Power (W)	Resistance Value (Ω)		Resistance Tolerance (%)		Package	
MF		10R	10Ω	B	±0.10%	P	Bulk
		100R	100Ω	C	±0.25%	TB	Taping Box
		1K	1KΩ	D	±0.5%		
		1M	1MΩ	F	±1.0%		

Thermal Cut-offs Resistors (FKU, FRU)

Product Introduction

Ultimate Protection Thermal Cutoffs For High Power Applications.

Features :

- Miniature size
- Radial leaded form
- Accurate fusing temperature
- Various temperature settings
- Current Rating: Up to 10Amp
- Products with Pb-free Terminations and RoHS compliant
- Economical by combining both function of a thermal fuse and a pulse resistor

Applications :

- Motors - fans, copiers, washing machines, air conditioners, compressors.
- Electronics - TVs, tape recorders, stereos, video recorders, fluorescent lamps, transformers, surge suppressors, computers, telecommunication equipment.
- Appliances - electric blankets, space heaters, stoves, irons, hair dryers, cookers, toaster ovens, clothes dryers, toasters, mixers, microwave ovens, crock pots.

Fast-acting protection device for high-power applications combines thermal fuse element and resistor on a single substrate.

DeMint offers FKU (Wire wound Resistor + Thermal Cut-offs) and FRU (Metal Oxide Film Resistor + Thermal Cut-offs) two Series, both are a new concept in thermal fuse technology and are designed to protect against over-heating in electrical products.

The two active components, a thermal cutoff is a fusible alloy and a resistor is a voltage divider, both are surrounded by ceramic cement with special resin. Under normal operating temperatures the fusible alloy joins the two lead wires within the body of the cutoff and the power resistor acts as a normal function resistor. When the preset temperature of the cutoff is reached, the fusible alloy melts and with the aid of the special resin, complete cutoff is ensured.

By combining a thermal fuse element and resistor on a single substrate, DeMint has created a fast-acting ultimate protection device for high power applications up to 10A/250V.

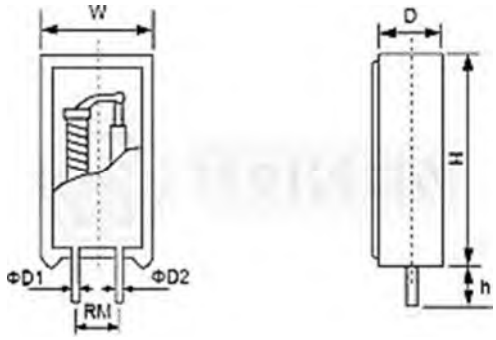
Resistance range of FKU Wire wound Type Thermal Cut-offs is 1Ω~100Ω and FRU Metal Oxide Film Type Thermal Cut-offs is 110Ω~10KΩ. Both standard precision tolerances are J (±5%).

Our custom solutions are designed to address your need for technical and economic success in a timely manner. Contact us with your specific needs. Or link to DeMint official website "General Purpose Resistors" for more information.

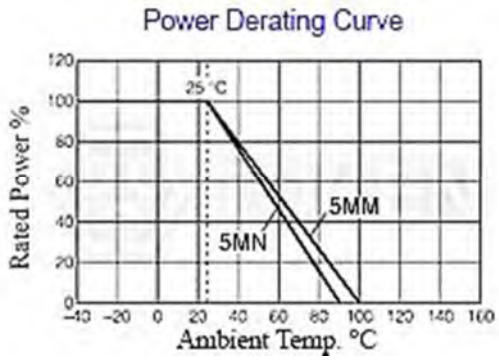
General Specifications

General Specifications (FKU, FRU)

Type	Dimension (Unit: mm)						
	W ± 1	D ± 1	H ± 1.5	RM+2/-1	h	D1(R terminal)	D2(F terminal)
FKU/FRU-5M	13	9	25	5	4.5±1	0.8±0.1	2A:0.6 ±0.1 10A:1.0 ±0.1
FKU/FRU-7M	13	9	38	5			
FKU/FRU-10M	16	12	35	7.5			



Thermal Cut-offs (FKU/FRU) Dimensions



(FKU/FRU) Power Derating Curve

Electrical Performance

Electrical Performance (FKU, FRU)

Fusing Temperature Protector				Rated Power at 25℃ (W)			Resistance Range (Ω)		Tolerance (%)	
MARK	Fusing Temperature(℃)	Standard Current(A)	Standard Voltage(V)	5M	7M	10M	FKU	FRU	FKU	FRU
A	109+1/-3	10	250	1.2	1.4	2.0	1~100	110~10K	J(±5) K(±10)	J(±5)
B	129±4			1.6	2.0	2.5				
C	152±4			1.6	2.0	2.5				
D	188+3/-1			2.0	2.4	3.5				
E	226+1/-3			2.0	2.4	3.5				
F	95+3/-0	2		0.8	1.2					
G	110±4			1.2	1.4					
H	126±4			1.4	1.6					
N	130±4			1.6	2.0					
M	145±4			2.1	2.4					

Order Codes

Order Codes (FKU, FRU)

FRU	-	5M	A	10R	K	P

Part Number	
FRU	Metal Oxide type Thermal Cut-offs
FKU	Wire wound type Thermal Cut-offs

Rated Power (W)
5M
7M
10M

Thermal Cut-offs	
A	109+1/-3℃
B	129±4℃
C	152±4℃
D	188+3/-1℃
E	226+1/-3℃
F	95+3/-0℃
G	110±4℃
H	126±4℃
N	130±4℃
M	145±4℃

Resistance Value (Ω)	
1R	1Ω
10R	10Ω
100R	100RΩ
1K	1000Ω

Resistance Tolerance (%)	
J	±5%
K	±10%

Package	
P	Bulk

Wire Wound Resistors (KNP)

Product Introduction

Wire Wound Resistors are Getting Economical Solution to Board Population.

Features :

- Low cost
- Excellent pulse load capability
- A wide resistance range 0.1 Ω to 3 kΩ
- Operating temperature range -55℃ ~ 155℃
- A wide range of power ratings 0.5W to 12.5W
- Products with Pb-free Terminations and RoHS compliant.

Applications :

- Ballast
- Power tools
- Consumer applications
- Power supplies, Welders
- High voltage applications
- Home entertainment, appliances

DeMint has launched its commercial wire wound resistor yet with the introduction of the various package sizes. Matching price with size to provide an economical solution to board population, DeMint's wire wound resistors are available in 15 standard size powers ranging from 0.5W to 12.5W, all at 1%, 2%, and 5% tolerance.

The KNP series has been designed to give enhanced pulse handling capability and increased flameproof protection. The series is RoHS compliant with Pb-free terminations, and KNP wire-wound series can also be supplied with radial, goalpost or lancet preformed leads.

The KNP drive to miniaturize is as widespread within industrial process control and circuit break products as it is in the consumer sector. These resistors are ideal for high reliability industrial application as the technology removes the excessive temperature risk.

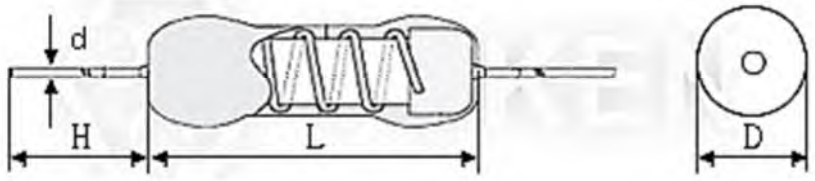
Produced on a high purity ceramic substrate, the resistor is assembled with interference-fit end caps to which are welded terminations. The resistive element is wound on the substrate and welded to the caps. Flameproof silicone cement coating is applied prior to marking with indelible link. The components are then lead formed, if required.

To address your need for technical and economic success in a timely manner, our custom solutions are available. Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

General Specifications

General Specifications (KNP)

Type		Rated Watts	Dimensions (mm)				Resistance Range (Ω)	Tolerance
			D ± 0.5	L ± 1	H ± 3	d ± 0.05		
KNP	KNP-50	1/2W	4	9.0	26	0.50~0.55	0.1-50 Ω	± 1% ± 2% ± 5%
	KNP-100	1W	4	9.0	26	0.50~0.55	0.1-50 Ω	
	KNP-100B	1W	4.5	11.5	26	0.75~0.80	0.1-100 Ω	
	KNP-200	2W	4.5	11.5	26	0.75~0.80	0.1-100 Ω	
	KNP-200B	2W	5.5	15.5	35	0.75~0.80	0.1-200 Ω	
	KNP-300	3W	5.5	15.5	35	0.75~0.80	0.1-200 Ω	
	KNP-400	4W	6.5	17.5	35	0.75~0.80	0.1-300 Ω	
	KNP-500	5W	6.5	17.5	35	0.75~0.80	0.1-400 Ω	
	KNP-500B	5W	8.5	24.5	38	0.75~0.80	0.1-400 Ω	
	KNP-600	6W	8.5	24.5	38	0.75~0.80	0.1-1K Ω	
	KNP-700	7W	8.5	24.5	38	0.75~0.80	0.1-1.5K Ω	
	KNP-800	8W	8.5	42	38	0.75~0.80	0.1-2K Ω	
	KNP-1000	10W	8.5	42	38	0.75~0.80	0.1-2K Ω	
	KNP-1000B	10W	8.5	54	38	0.75~0.80	0.1-3K Ω	
	KNP-1250	12.5W	8.5	54	38	0.75~0.80	0.1-3K Ω	

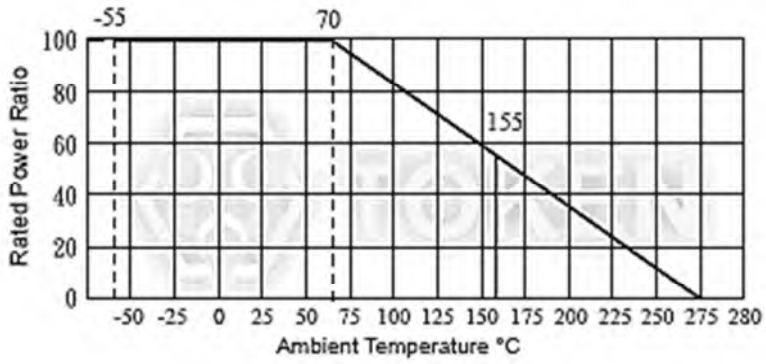


Wire Wound (KNP) Dimensions (Unit: mm)

Electrical Performance

Electrical Performance (KNP)

TEST ITEMS	CONDITION	SPEC
Operating Temperature Range	-55℃ ~ 275℃(0W)	
Resistance Temp. Coeff.	Room temperature/100℃ up	± 300 PPM / ℃
Short Time Overload	10 times of rated wattage for 5 sec.	± 2 %
Rated Load	Rated wattage 30 Min..	± 1 %
Voltage Withstanding	500VAC 1 Min.	± 1 %
Temperature Cycling	-20℃ ~ 85℃ 5 cycles	± 1 %
Load Life	70℃ on ~ off cycle 1000 hrs.	± 5 %
Moisture-Proof Load Life	40℃ 95% RH on ~ off cycle 500 hrs.	± 3 %
Incombustibility	16 times of rated wattage for 5 Min.	not flamed



(KNP) Power derating curve

Application Notes

Application Notes of Wire wound Resistors (KNP)

- When being used in AC circuits, some wirewound structures give inductance ingredients or parasitic capacity, so they may cause unusual phenomena such as oscillations etc. Quorum deviations of other components should be carefully taken into account for use.
- Application and Placement: Wire wound resistors use different gauges of wire as resistance elements. Sometimes the gauge is extremely thin (finer than a strand of human hair) and very susceptible to breakage in environments containing salts, ash, dust and corrosives. Avoid utilization in such environments.
- Do not install in dusty areas because the accumulation will cause shorts and poor conductance.

Order Codes

Order Codes (KNP)

KNP-100	1W	10R	J	P

Part Number	Rated Power (W)	Resistance Value (Ω)		Resistance Tolerance (%)		Package	
KNP		0R1	0.1Ω	F	±1%	P	Bulk
		1R	1RΩ	G	±2%	TB	Taping Box
		10R	10RΩ	J	±5%		
		100R	100RΩ				
		1K	1KΩ				

Non-Inductive Wire wound Resistor (KNPN)

Product Introduction

Non-inductive Wire Wound Resistor Improves Inductance for High Frequency Applications.

Features :

- Low cost
- Excellent pulse load capability
- Non-inductive Ayrton Perry winding
- A wide resistance range 0.1Ω to 50Ω
- A wide range of power ratings 0.5W to 6W
- Operating temperature range -55℃ ~ 155℃
- Products with Pb-free Terminations and RoHS compliant

Applications :

- Power tools
- Current sensing
- Consumer applications
- Power supplies, Welders
- High voltage applications
- High-switching applications
- Home entertainment, appliances

DeMint Electronics has introduced a non-inductive version KNPN resistor of conformal coated, leaded wire wounds. The KNPN non-inductive wire wound resistor offers the expected performance with the added characteristic of vastly improved inductance, making it suitable for high-switching applications.

Wire wound technology has long been known as a leading technology for power resistor needs though it is inherently inductive. Known as Ayrton Perry winding, a non-inductively wound has one winding in one direction and one in the other direction.

By using a non-inductively wound version this greatly reduces the inductance of any given resistor size and value combination; however, it does not completely eliminate the inductance.

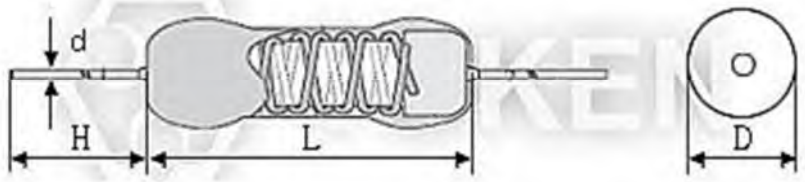
This non-inductive winding is available in all standard KNPN sizes from 0.5 watts up to 6 watts with options 1%, 2% and 5% tolerance. The KNPN series is RoHS compliant and also can be supplied with radial, goalpost or lancet preformed leads.

To address your need for technical and economic success in a timely manner, our custom solutions are available. Contact us with your specific needs. Or link to DeMint official website "General Purpose Resistors" for more information.

General Specifications

General Specifications (KNPN)

Type		Rated Watts	Dimensions (Unit: mm)				Resistance Range (Ω)	Tolerance
			D ± 0.5	L ± 1	H ± 3	d ± 0.05		
KNPN	KNPN-50	1/2W	4	9.0	26	0.50~0.55	0.1-10 Ω	± 1% ± 2% ± 5%
	KNPN-100	1W	4	9.0	26	0.50~0.55	0.1-10 Ω	
	KNPN-100B	1W	4.5	11.5	26	0.75~0.80	0.1-10 Ω	
	KNPN-200	2W	4.5	11.5	26	0.75~0.80	0.1-10 Ω	
	KNPN-200B	2W	5.5	15.5	35	0.75~0.80	0.1-20 Ω	
	KNPN-300	3W	5.5	15.5	35	0.75~0.80	0.1-20 Ω	
	KNPN-400	4W	6.5	17.5	35	0.75~0.80	0.1-30 Ω	
	KNPN-500	5W	6.5	17.5	35	0.75~0.80	0.1-30 Ω	
	KNPN-500B	5W	8.5	24.5	38	0.75~0.80	0.1-50 Ω	
	KNPN-600	6W	8.5	24.5	38	0.75~0.80	0.1-50 Ω	

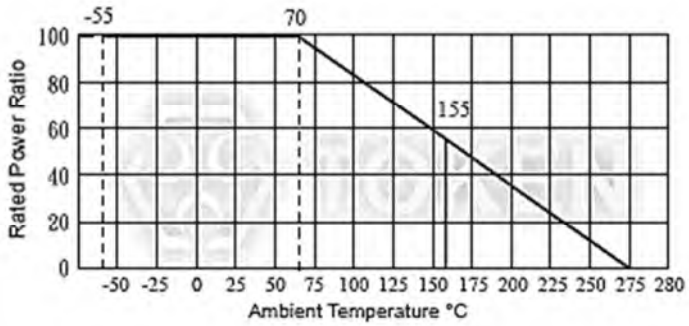


Non-inductive Resistor (KNPN) Dimensions

Electrical Performance

Electrical Performance (KNPN)

TEST ITEMS	CONDITION	SPEC
Operating Temperature Range	-55℃ ~ 275℃ (0W)	
Resistance Temp. Coeff.	Room temperature/100℃ up	± 300 PPM /℃
Short Time Overload	10 times of rated wattage for 5 sec.	± 2 %
Rated Load	Rated wattage 30 Min..	± 1 %
Voltage Withstanding	500VAC 1 Min.	± 1 %
Temperature Cycling	-20℃ ~ 85℃ 5 cycles	± 1 %



(KNPN) Power derating curve

Application Notes

Application Notes of Non-inductive Wire Wounds (KNPN)

- When being used in AC circuits, some wirewound structures give inductance ingredients or parasitic capacity, so they may cause unusual phenomena such as oscillations etc.
  Quorum deviations of other components should be carefully taken into account for use.
- Application and Placement: Wire wound resistors use different gauges of wire as resistance elements. Sometimes the gauge is extremely thin (finer than a strand of human hair) and very susceptible to breakage in environments containing salts, ash, dust and corrosives. Avoid utilization in such environments.
- Do not install in dusty areas because the accumulation will cause shorts and poor conductance.

Order Codes

Order Codes (KNPN)

KNPN-100	1W	10R	J	P

Part Number	Rated Power (W)	Resistance Value (Ω)		Resistance Tolerance (%)		Package	
KNPN		0R1	0.1Ω	F	±1%	P	Bulk
		1R	1Ω	G	±2%	TB	Taping Box
		1R2	1.2Ω	J	±5%		
		10R	10Ω				
		12R	12Ω				

Power Wire wound Resistor (KNP-R)

Product Introduction

Power Wire Wound Resistors Boast Consistent Precision Power Operation.

Features :

- Excellent load life stability
- High Precision and reliability
- Axial ceramic-silicone coated
- Meets the Standards of MIL-R-26E
- RoHS compliant with 100% lead free

Applications :

- Radar, Ground Vehicles
- Communications systems
- Bias supply, Current shunts, Voltage dropping
- Motor speed controls, Voltage divider networks
- Medical instrumentation and Medical implantables

DeMint's highest quality conformal axial terminal ceramic-silicone coated KNP-R power resistors for applications requiring high stability and precision. The KNP-R wire-wound has a low temperature coefficient and maintain a high degree of stability under demanding conditions.

The power precision KNP-R series meeting MIL-R-26E (U and V characteristics) and surface temperature (hot spot) 375℃ Max.. Resistors with a wide range of 0.01Ω ~ 82kΩ, covering applications from precision to power. Products with lead-free terminations meet EU RoHS and China RoHS requirements.

Operating temperature range is -55℃ ~ +375℃ and derated power at high ambient temperatures as according to the chart below. DeMint is equipped to design and produce custom components to meet many design and reliability demands. In addition to standard military-grade resistor products, we also have many resistive products designed to meet various source-controlled drawings.

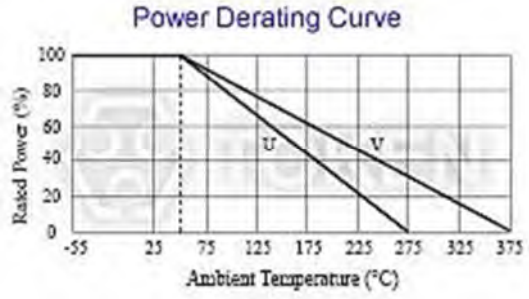
Contact us with your specific needs. Or link to DeMint official website "General Purpose Resistors" for more information.

Characteristics U:
275℃ Maximum hot spot temperature. 1% Maximum ΔR in 1000 hours load life.
Characteristics V:
375℃ Maximum hot spot temperature. 3% Maximum ΔR in 1000 hours load life.

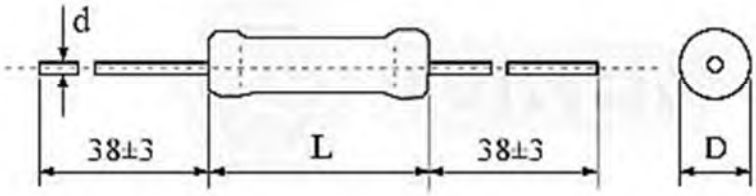
Technical Specifications

Technical Specifications (KNP-R)

Type	MIL - R-26E	Power Rating (W)		Max. Working Voltage (V)		Resistance Range (Ω)		Dimensions (Unit: mm)		
		U (275℃)	V (375℃)	U (275℃)	V (375℃)	0.1%, 0.25%, 0.5%	1%, 2%, 3%, 5%	L±0.81	D±0.81	d±0.1
KNP-R1/4	-	0.40	-	20	-	10~950	1~3.4K	6.35	1.98	0.51
KNP-R1/2	RW70	0.75	-	29	-	10~1.3K	1~4.9K	7.92	1.98	0.51
KNP-R1A	-	1.00	-	53	-	1~2.7K	0.1~10.4K	10.31	2.36	0.64
KNP-R1	RW69	1.10	-	62	-	1~4.0K	0.1~15K	13.49	2.36	0.64
KNP-R2A	-	2.50	3.25	138	157	1~8.6K	0.01~32.3K	12.70	5.33	0.81
KNP-R2	RW79	3.00	3.75	135	148	1~5K	0.01~2K	13.49	4.06	0.81
KNP-R3A	-	3.00	3.75	135	148	1~6.5K	0.01~34.5K	14.27	5.33	0.81
KNP-R3	-	3.25	4.75	185	220	1~11.4K	0.01~42.1K	20.62	5.33	1.02
KNP-R4	RW67	4.00	5.50	210	250	1~12.7K	0.01~47.1K	15.88	7.62	1.02
KNP-R5	RW74	5.00	6.50	330	376	0.5~24.5K	0.01~51K	22.22	7.62	1.02
KNP-R7	RW68	7.00	9.00	504	576	0.5~41.4K	0.01~75K	30.94	9.52	1.02
KNP-R10	RW78	10.00	13.00	799	911	0.5~71.3K	0.01~82K	45.21	9.52	1.02



KNP-R Power Derating Curve



Power Precision Wire wound Resistor (KNP-R) Dimensions

- **Temperature Coefficient: 1 Ω and below ± 150 ppm/℃, 1 Ω to 9.9 Ω ± 100 ppm/℃, 10 Ω and above ± 100 ppm/℃, (50 ppm/℃ on request)**

Electrical Performance

Electrical Performance (KNP-P)

Test Items	Test Method	Specifications
Short Time Overload	2.5 times of rated voltage 5 sec.	ΔR±(2%+0.05Ω)
Rated Load	Rated wattage 30 minutes.	ΔR±(1%+0.05Ω)
Voltage Withstanding	500VAC 1 minute.	ΔR±(1%+0.05Ω)
Insulation Resistance	500V	20MΩ
Temp. Cycle	-20℃ ~ 85℃ 5 cycles	ΔR±(1%+0.05Ω)
Soldering After Resistance	235℃ for 3 sec	ΔR±(0.5%+0.05Ω)
Incombustibility	16 times of rated wattage for 5 Min..	Not flamed
Load Life	+25℃, 1.5Hrs on ~ 0.5Hrs off cycle, 1000 Hrs.	U: ΔR±(1%+0.05Ω) V: ΔR±(3%+0.05Ω)

Application Notes

Application Notes of Wire wounds (KNP-R)

- When being used in AC circuits, some wirewound structures give inductance ingredients or parasitic capacity, so they may cause unusual phenomena such as oscillations etc. Quorum deviations of other components should be carefully taken into account for use.
- Application and Placement: Wirewound resistors use different gauges of wire as resistance elements. Sometimes the gauge is extremely thin (finer than a strand of human hair) and very susceptible to breakage in environments containing salts, ash, dust and corrosives. Avoid utilization in such environments.
- Do not install in dusty areas because the accumulation will cause shorts and poor conductance.

Order Codes

Order Codes (KNP-R)

KNP-R3A	U	100R	B	P

Part Number
KNP-R

Characteristic (℃)	
U	275℃
V	375℃

Resistance Value (Ω)	
0R1	1.0Ω
1R	1Ω
100R	100Ω
1K	1000Ω

Resistance Tolerance (%)	
B	±0.1%
C	±0.25%
D	±0.5%
F	±1%
G	±2%
H	±3%
J	±5%

Package	
P	Bulk
TB	Taping Box

High Precision Wire wound Resistor (BWW)

Product Introduction

(BWW) Precision Power Resistors Operate in Harsh Environments.

Features :

- Axial Moulded
- Excellent load life stability
- Insulation, Moisture Proof
- High Precision and reliability
- Meets the Standards of MIL-R-93
- RoHS compliant with 100% lead free

Applications :

- Electrical loads, Filament dropping
- DC/DC converters, AC/DC inverters
- High-voltage bleeders, Dynamic braking
- Capacitor charging/discharging regulation
- Motor speed controls, Voltage divider networks
- Bias supply, Current shunts, Voltage dropping, Crow-bar circuits

The new BWW series moulded axial leaded wire wound resistors from DeMint use high-purity alumina ceramic cores with wire winding which spot are welded by precision CNC machine tools to ensure total operational consistency throughout.

Also, using advanced encapsulation die/mould technologies, these precision power resistors are encapsulated with epoxy molding compound.

The BWW models possess a wide resistance value from 0.1Ω to 39KΩ and meet the stringent requirements of MIL-R-93. Ayrton Perry non-inductive windings are available on request. The BWW precision version has low Ohmic values for current sensing applications.

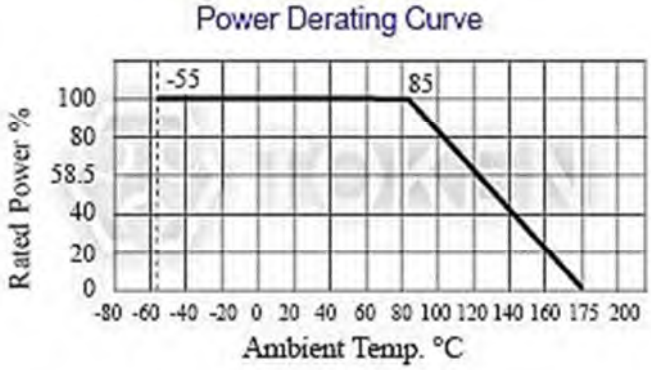
All versions are miniaturized for better power to dimension ratios and are available in 0.5W to 10W rated power at 25℃. Tolerance is available in ±0.1%, ±0.25%, ±0.5%, ±1% and ±2% with TCR ±25PPM/℃, ±50PPM/℃ and ±150PPM/℃ which makes them ideally suited for use in precision applications.

The BWW series is RoHS compliant with 100% Sn (lead free) coated terminals. To address your need for technical and economic success in a timely manner, our custom solutions are the best option. Contact us with your specific needs. Or link to DeMint official website "General Purpose Resistors" for more information.

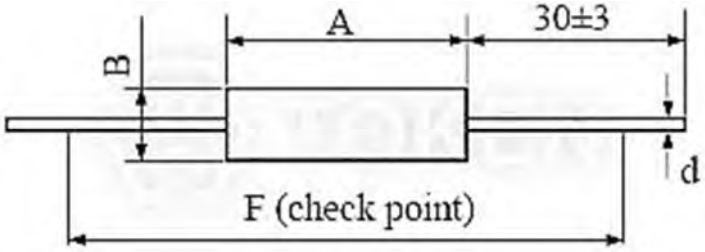
Technical Specifications

Technical Specifications (BWW)

Type	Rated Watts at 25℃ (W)	Resistance Range (Ω)		Tolerance (%)	TCR (PPM/℃)	Dimensions (Unit: mm)			
		Min	Max			A±0.25	ΦB±0.25	Φd	F
BWW-0.5	0.5	0.1	100	±0.1 ±0.25 ±0.5 ±1 ±2 ±5	±25 ±50 ±150	7.0	3.0	0.6	27.0
BWW-1	1.0	0.1	1K			11.0	3.0	0.6	31.0
BWW-3	3.0	0.1	10K			15.0	5.2	0.8	34.0
BWW-4	4.0	0.1	15K			18.0	6.5	0.8	38.0
BWW-5	5.0	1	24K			24.0	8.4	1.0	44.0
BWW-10	10.0	1	39K			46.5	10.0	1.0	66.0



(BWW) Power Derating Curve



Precision Wire wound (BWW) Dimensions

Electrical Performance

Electrical Performance (BWW)

Test Items	Test Conditions	Specifications
Operating Temp. Range		-55℃ ~ 175℃
Insulation Resistance	500V	>1GΩ
Dielectric Withstanding Voltage	500V AC 1 Min.	ΔR ≤ ±0.1%R
Load Life	70℃ on~off cycle 1000 Hrs.	ΔR ≤ ±1%R
Moisture-Proof Load Life	40℃ 95% RH on~off cycle 21 Hrs.	ΔR ≤ ±0.2%R
Resistance to soldering heat	350℃, 3.5s	ΔR ≤ ±0.1%R
Solderability	235±5℃, 5s(solder bath method)	IEC68-2-20(1968)

Application Notes

Application Notes of Wire wounds (BWW)

- When being used in AC circuits, some wirewound structures give inductance ingredients or parasitic capacity, so they may cause unusual phenomena such as oscillations etc. Quorum deviations of other components should be carefully taken into account for use.
- Application and Placement: Wire wound resistors use different gauges of wire as resistance elements. Sometimes the gauge is extremely thin (finer than a strand of human hair) and very susceptible to breakage in environments containing salts, ash, dust and corrosives. Avoid utilization in such environments.
- Do not install in dusty areas because the accumulation will cause shorts and poor conductance.

Order Codes

Order Codes (BWW)

BWW	-	1W	100R	F	D	P

Part Number	Rated Power (W)	Resistance Value (Ω)		Resistance Tolerance (%)		TCR (PPM/℃)		Package	
BWW	1W	0R1	0.1Ω	B	±0.1%	C	±25PPM/℃	P	Bulk
		100R	100Ω	C	±0.25%	D	±50PPM/℃		
		1K	1000Ω	D	±0.5%	K	±150PPM/℃		
				F	±1%				
				G	±2%				

Zero Ohm & Jumper Wire Resistors (ZO, JW)

Product Introduction

A Quick Solution to PCB Board Connections.

Features :

- Maximum resistance 0.05Ω
- RoHS compliant with 100% lead free
- Lead Material: Tin-plated copper lead
- Ideal straight - through between point on PC Boards
- Packing: Tape/Reeled or Bulk

Applications :

- Interrupt processing
- Input and output distribution
- Ideal connection for circuit boards
- Dummy components on a PCB test board

Jumper Wire (JW series a zero-ohm link) and zero-ohm resistor (ZO series) are a link used to connect traces on a printed circuit board that is packaged in the same format as a resistor.

The resistance of JW and ZO series is only approximately zero; only a maximum 0.05Ω is specified. Thus, a fractional tolerance (as a percentage of the zero-ohm ideal value) would be infinite and is not specified.

Axial through-hole zero-ohm resistors are especially suited for automatic machine insertion and generally marked with a single black band.

DeMint's JW and ZO Series offer a quick solution to the following problems:

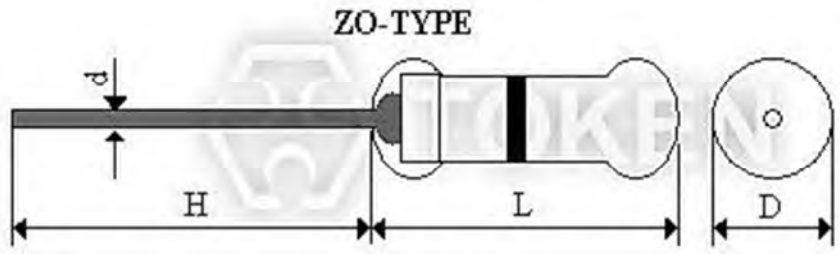
1. Circuit tuning by changing point connections.
2. An "after the fact design" the requires new point connections.
3. Inability to connect two points on a PCB board due to other circuit paths which must be crossed over.

Allowing customers to standardize on the PCB layout and use jumper wire and zero ohm resistor for required model variations, DeMint has developed a wider version for the interconnection device between points on a PCB board as jumper wires or crossovers. Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

ZO General Specification

General Specification (Unit: mm) Zero Ohm Resistor (ZO)

Type	Rating	Dimension (mm)			
		L Max.	D Max.	H ± 3	d+0.02-0.04
ZO - 1/8	0.125W	4.2	2.0	28	0.5
ZO- 1/4	0.25W	6.8	2.5	28	0.5

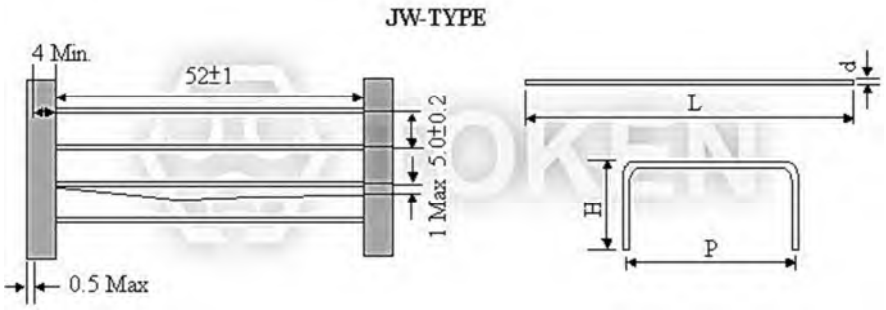


Zero Ohm Resistors (ZO) Dimensions

JW General Specification

General Specification (Unit: mm) Jumper Wire (JW)

Type	L±1	d+0.02 -0.04	H	P
JW-A	61.5	0.5	3 - 10	5 - 30
JW-B	61.5	0.6	3 - 10	5 - 30



Jumper Wire (JW) Dimensions

Electrical Performance

Electrical Performance (ZO, JW)

Requirements	Characteristics
Maximum Resistance	0.05Ω
Lead Material	tin-plead copper
Body Material	Electrical grade, high performance molding compound
Dielectric Withstanding Voltage	Atomspheric-500V RMS, Reduced-325V RMS
Insulation Flammability	Resistor Insulation is self-extinguishing within 10 seconds after externally applied flame is removed.
Current Rating	25 AMPS at 25℃, dreading to 0 AMPS at 150℃

Order Codes

Order Codes (ZO, JW)

ZO-1/4	0.25W	TB

Part Number	Rated Power (W)	Package	
ZO-1/4	0.25W	P	Bulk
ZO-1/8	0.125W	TB	Taping Box
JW-A			
JW-B			

Wirewound Resistor (KNP-VE/LF)

Product Introduction

RoHS Vitreous Enamel Coated Wirewound Resistors (KNP-VE/LF) Boost High Energy.

Features :

- Excellent pulse load capability, Axial leads, All-welded construction
- Power ratings 1W to 30W, Resistance range 0.1Ω to 47KΩ, Tolerance ±2%, ±5%
- Products with Pb-free Terminations and RoHS compliant, rugged vitreous enamel coating withstands high humidity and temperature cycling

Applications :

- Consumer applications, Power supplies, Welders, High voltage applications
- Power tools, High-switching applications, Home entertainment, appliances

The KNP-VE/LF Series of vitreous enamel coated power resistors from DeMint offers a cost-competitive alternative over the 1W-30W power range. The range is available with resistance values of 0.1Ω to 47KΩ in working voltage of 75V to 1000V, and with body sizes that match the industry standards.

Vitreous enamelled resistors were introduced at a time when alternative directly applied coatings could not withstand the thermal stresses caused by the resistors' high body temperatures.

DeMint offers the durability of a lead free conformal vitreous enamel coating, permits the KNP-VE/LF Series resistors to maintain a hard coating while operating at high temperatures. Mechanical integrity is enhanced by the all-welded construction.

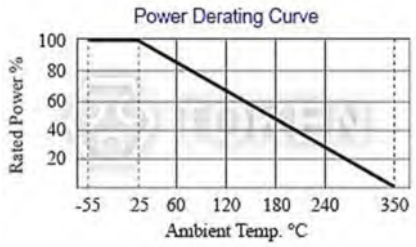
Power KNP-VE/LF Wirewound Series are ideal for computer, communications and industrial applications in which cost, quality, and reliability are key considerations. The KNP-VE/LF series is RoHS compliant and Ayrton Perry noninductive windings are available on request.

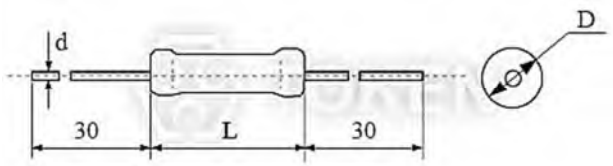
To address your need for technical and economic success in a timely manner, our custom solutions are the best choice. Contact us with your specific needs. Or link to DeMint official website "General Purpose Resistors" for more information.

Technical Specifications

RoHS Vitreous Enamelled Wirewound (KNP-VE/LF) Technical Specifications

Type	70℃ Wattage (W)	25℃ Wattage (W)	Resistance (Ω)		Working Voltage (V)	Temperature Coefficient (PPM/℃)	Surface Temperature (℃)	Dimensions (mm)		
			J (±5%)	G (±2%)				L Max.	D ±1	d ±0.2
KNP-VE/LF	0.5	1	0.1 ~ 510	1 ~ 300	75	≤ 250	≤ 450℃	10	3.5±1	0.8
	1	2	0.1 ~ 1K	1 ~ 680	100			12	4.5±1	0.8
	2.6	3	0.1 ~ 5K1	1 ~ 1K5	120			12.7	5.6±1	0.8
	4.5	5	0.1 ~ 10K	1 ~ 6K8	300			22	7±1	0.8
	6	7	0.1 ~ 12K	1 ~ 8K2	350			24	7.4±1	0.8
	7	8	0.5 ~ 20K	1 ~ 15K	500			33	8±1	0.8
	9.5	11	0.5 ~ 27K	1 ~ 20K	650			38.1	8±1	1
	15	18	0.5 ~ 36K	1 ~ 24K	700			45.8	9.5±1	1
	20	23	1 ~ 51K	10 ~ 39K	800			54	9±1	1
	25.8	30	0.5 ~ 47K	1 ~ 36K	1000			64	12±1	1





Electrical Performance

Vitreous Enamelled Wirewound (KNP-VE/LF) Performance

Test Item	Characteristics	Test Methods SJ1330-78
Solderability	Free flow of solder	235±5℃, 2s Groove welding
Terminal strength	ΔR ≤ ± (1%R+0.05Ω)	≤4.3W 10N, ≥6W 20N
Overloading	ΔR ≤ ± (1%R+0.05Ω)	θ A=-55℃ θ B=+200℃, 5 Cycles
Temperature Change	ΔR ≤ ± (1%R+0.05Ω)	235±5℃, 2s Groove welding
Collision Test	ΔR ≤ ± (1%R+0.05Ω)	Acceleration 390m/s2, 4000 times
Impact Test	ΔR ≤ ± (1%R+0.05Ω)	Acceleration 490m/s2, 11ms, 18 times
Vibration Test	ΔR ≤ ± (1%R+0.05Ω)	Frequency 10-500Hz, Acceleration 98m/s2, 6h
Temperature Rise	≤245℃	Apply rated power Load
Constant Damp Heat	ΔR ≤ ± (5%R+0.05Ω)	Temperature 40±2℃, Temperature 93+2/-3%, 56h
Room temperature Durability	ΔR ≤ ± (5%R+0.05Ω)	Rated power load at room temperature 1000h

Order Codes

RoHs Vitreous Enamelled Resistors - (KNP-VE/LF) Order Code

KNP-VE	-	11W	10R	J	P

Type	
KNP-VE	Vitreous Enamelled
KNP-LF	RoHs Vitreous Enamelled

Rated Power (W) @25℃	
2W	2W
5W	5W
11W	11W
30W	30W

Resistance (Ω)	
1R	1Ω
110R	110Ω
1K1	1.1KΩ
10K	10KΩ

Resistance Tolerance	
G	±2%
J	±5%

Package	
TB	Taping Box
P	Bulk

Power Wirewound Vitreous Enameled Resistors (DRB20)

Product Introduction

Token (DRB20) Vitreous Enameled Resistors - strong moisture-proof characteristics, high energy power.

Features :

- Small size, high power.
- Glaze coating, simple structure, easy to install.
- Fixed resistance and adjustable resistance optional.

Applications :

- Electric tools, Consumer product applications.
- Power supply, high voltage applications.
- Welding machine, switch applications.

Power Wirewound Enameled Resistor (DRB20) Is a cylindrical ceramic tube at both ends clips to fixed terminals. Ceramic tube winding copper nickel or nickel-chromium alloy resistance wire. Surface coated with moisture-resistant, heat-resistant, non-corrosive, non-flammable coatings (such as silicone, epoxy, cement, glazed porcelain, etc.). After high temperature treatment, the resistor dried and insulation fixed, then fitted with fixed foot frame.

Due to good flexibility, (DRB20) can be made of multi-terminal, low inductive resistance, semi-adjustable type of various types of resistors. Resistance range from 1.7Ω to 75KΩ, with power ranges from 8W to 500W, and optional tolerance accuracy of ±1%、±5%、±10%. Size of cylindrical ceramic tube matches with industry standards .

Tubular series power-glaze wire wound resistor (DRB20) widely used as brake resistors, bleeder resistors, aging resistors, brake resistors. According to different occasions, but also can be called brake resistors, discharge resistors, load resistors, current limiting resistors, charging resistors or discharge resistors. Non-inductance series adopts Ayrton Perry winding method to eliminate inductance parasitic effect, so as to minimize inductance, suitable for high energy consumption, high-temperature environment.

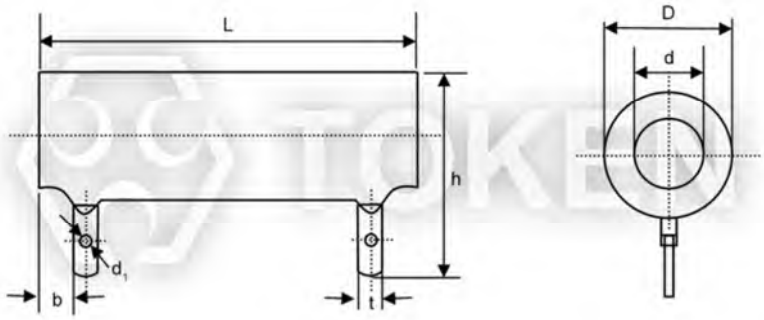
Be glazed coating protection, not afraid of external mechanical strength and dust environment. Not only large power and strong, shock-resistant, but also features good heat dissipation. This (DRB20) is easy to install and use. This is suitable for a variety of applications. More than 1.2 times the same specifications or requirements of peer production, more power, can be long time loading and impact. Applications include industrial machinery, load testing, power distribution, instrumentation and automation control devices.

DeMint Electronics (DRB20) vitreous enameled power wirewound resistors meet RoHS compliant, lead-free standard and short production cycle. Those Products widely used in power tools, switch applications, power supplies, welding machines, high voltage applications, consumer product applications, home entertainment, home appliances products. For the customized special applications, please contact our sales to discuss the details. Or link to DeMint official website "General Purpose Resistors" for more information.

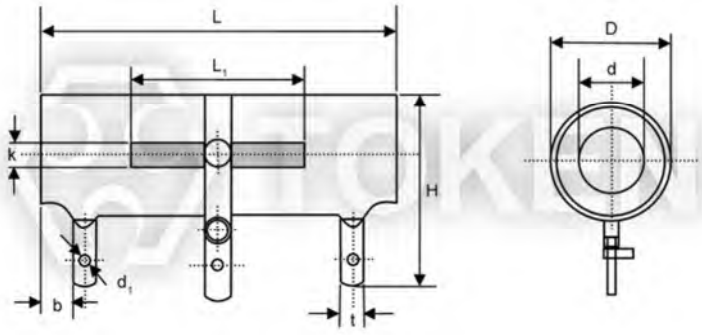
Technical Specifications

Power Wirewound Glaze Resistors (DRB20) Dimensions (Unit: mm)

Type	Dimensions (mm)									
	L	D	d	H	h	L1	K	b	t	d1
DRB20(T*)-8	35±1.5	14±2	5.5±0.5		28.5±2.5			3.5±0.8	4.5±1	2±0.8
DRB20(T)-10	41±1.5	14±2	5.5±0.5	31±3	28.5±2.5	20±2	6±2	3.5±0.8	4.5±1	2±0.8
DRB20(T)-16	45±1.5	17±2	8±0.5	34±3	31±2.5	23±2	6±2	3.5±0.8	4.5±1	2±0.8
DRB20(T)-20	51±2	17±2	8±0.5	34±3	31±2.5	30±3	6±2	3.5±0.8	4.5±1	2±0.8
DRB20(T)-25	51±2	21±2.5	12±0.6	39±3	35±2.5	30±3	6±2	3.5±0.8	4.5±1	2±0.8
DRB20(T)-30	71±2.2	21±2.5	12±0.6	39±3	35±2.5	44±3	6±2	3.5±0.8	4.5±1	2±0.8
DRB20(T)-40	87±2.2	21±2.5	12±0.6	39±3	35±2.5	57±3		3.5±0.8	4.5±1	2±0.8
DRB20(T)-50	91±2.4	29±3	20±1.1	47±3	43±2.5	60±3	7±2	4.5±1	6±1	2.5±0.8
DRB20(T)-75	140±3.2	29±3	20±1.1	47±3	43±2.5	110±3	7±2	4.5±1	6±1	2.5±0.8
DRB20(T)-100	170±3.5	29±3	20±1.1	47±3	43±2.5	140±3	7±2	4.5±1	6±1	2.5±0.8
DRB20(T)-150	215±4	29±3	20±1.1	47±3	43±2.5	185±3	7±2	4.5±1	6±1	4±0.8
DRB20(T)-200	215±4	38±3	38±3	61±3	58±2	160±3	7±2	8±1	9±1	4±0.8
DRB20(T)-250	266±4	30±2	30±2	50±3	50±2	210±4	7±2	8±1	9±1	4±0.8
DRB20(T)-300	266±4	36±2	36±2	58±3	58±2	210±4	8±2	8±1	9±1	4±0.8
DRB20(T)-400	250±4	54±2	54±2	76±3	77±3	180±4	10±2	8±1	16±1	8±1
DRB20(T)-500	300±4	54±2	30±2	76±3	77±3	230±4	10±2	8±1	16±1	8±1



Power Wirewound Glaze Resistors (DRB20) Dimensions (Unit: mm)



Power Wirewound Glaze Adjustable Resistors (DRB20-T) Dimensions (Unit: mm)

- T* : Adjustable Wirewound Resistors。

Specification

Power Wirewound Vitreous Enameled Resistors (DRB20) Specification

Type	Rating Power (W)	Resistance (Ω)		Weight (g)	
		DRB20	DRB20-T	Fixed	Adjustable
DRB20 (DRB20T)	8	5.1-3.3K		23	
	10	5.1-10K	5.1-200	17	34
	16	5.1-15K	5.1-220	36	42
	20	5.1-20K	5.1-430	44	52
	25	10-24	10-510	57	68
	30	10-30K	10-1K	80	90
	40	20-51K	20-1.2K	98	110
	50	24-56K	20-1.5K	132	150
	75	20-51K	24-2K	253	270
	100	24-62K	20-4.3K	286	200
	150	20-75K	20-4.3K	385	300
	200	4.7-68K	5.1-4.3K	475	400
	250	4.7-68K	5.1-4.3K	510	530
	300	1.7-68K	5.1-4.3K	630	650
	400	4.7-75K	6.2-5.1K	1000	1050
	500	4.7-75K	6.2-5.1K	1340	1400

Electrical Performance

Power Wirewound Enameled Resistor (DRB20) Performance

Test Item	Characteristics	Test Methods
Solderability	Even sticky tin	HiSnPb39, 75W Soldering iron method, tinning
Insulation resistance	>20MΩ/cm2	500V DC test voltage
Insulation voltage	No breakdown, arcing	2000V DC or 50Hz AC peak with the same
Body strength	ΔR ≤ ± (1%R + 0.05Ω)	≤40W Loading 30N, ≥50W Loading 100N
Vibration	ΔR ≤ ± (1%R + 0.05Ω)	Frequency 10-500Hz, Acceleration 98m/s2, 1h
Collision test	ΔR ≤ ± (1%R + 0.05Ω)	Frequency 40-80 次/Min., Acceleration 245m/s2, 2000 times
Temperature Rise	<325°C	Apply rated power Load
Rapid temperature changes	ΔR ≤ ± (2%R + 0.1Ω)	θ A=-55°C θ B=+200°C, 5 Cycles
Constant Damp Heat	ΔR ≤ ± (2%R + 0.1Ω)	Temperature 40±2°C, Temperature 93±2%RH, 96h
Over loading	ΔR ≤ ± (2%R + 0.1Ω)	Apply 10 times the rated power load 5s
Room temperature durability	ΔR ≤ ± (5%R + 0.1Ω)	Apply rated power load 1000h

Application Notes

Adjustable Wirewound Application Notes

Determination of End Resistance Value of (DRB20-T):

1. Resistance Range means you can choose one maximum resistance value (Max. Pickable Resistance / End resistance value) at one of DRB20-T, FVR, DQS, DSRA, DSRB, BSR, BSQ, VR (Variable Resistor) type.

2. After End Resistance Value confirmed, the minimum resistance (start resistance value) will be determined by depending on resistance of wire and wirewound type.

Power Rating of Variable Resistor:

The part Nunber formation of DRB20-T:

Product type	-	Rated Wattage	-	Max. Pickable Resistance (Ω)	-	Resistance Tolerance

Product type means one of FVR, DQS, DSRA, DSRB, BSR, BSQ, DRB20-T.
Rated Wattage means power rating at End Resistance Value.
Resistance Value (Ω) means maximum resistance value (End Resistance Value).
Resistance Tolerance means precision range of End Resistance Value.

1. Power Rating of VR (Variable Resistor) is determined by the maximum resistance value (End Resistance Value).
2. Resistance and Power Rating should be decreased while you are adjusting the screw.

Notes:

1. Adjustability is 10% to 90% of full resistance value.
2. Wattage is proportional to this adjusted resistance value.

Power Rating:

1. Based on 25°C free air rating. The stated wattage rating applies only when the entire resistance is in the circuit.
2. Setting the lug at an intermediate point reduces the wattage rating by approximately the same proportion.
3. Example: If the lug is set at half resistance, the wattage is reduced by approximately one-half.

If you need current constant type or special specifications, please feel free to contact us.

Order Codes

Power Wirewound Vitreous Glaze Resistors - (DRB20) Order Codes

DRB20	-	T	8W	100R	J	

Type
DRB20

Adjustable Resistance	
	Fixed Resistance
T	Adjustable Resistance

Rating Power (W)	
8W	8W
20W	20W
100W	100W
500W	500W

Resistance Value (Ω)	
10R	10 Ω
110R	110 Ω
1K1	1.1K Ω
10K	10K Ω

Resistance Tolerance	
F	±1%
J	±5%
K	±10%

Inductance	
	Inductance
N	Non-Inductance

Long Lead Wirewound Enameled Resistors (DRB16)

Product Introduction

DeMint (DRB16) provides vertical lead and horizontal lead for easy installation, small size, and high resistance.

Features :

- Small size, high resistance.
- Simple structure, easy to install.
- Vertical lead and horizontal lead two kinds of installation methods.

Applications :

- Welding machine, power supply.
- Electric tools, high voltage applications.
- Consumer product application, switch application.

DeMint Electonics provides (DRB16) Long Lead Wirewound Enameled Resistor. Long leads give two types of installation in vertical and horizontal leads with competitive prices. Resistance range from 1Ω to 10KΩ, power range from 3W ~ 20W, and the highest operating voltage from 120V to 750V are availible. Size and specification match the industry standard.

The vertical and horizontal lead type glass glaze resistor is the resistance wiring around the heat-resistant porcelain body. Surface coated with wet-resistant, heat-resistant, non-corrosive coatings (such as silicone, epoxy resin, cement, glaze porcelain, etc.) for protection. Its characteristics are: small temperature coefficient, excellent heat resistance, light weight, low noise, overload resistance, low resistance change rate, and better heat transfer characteristics than conventional wire-wound power resistors. Lead-free product (DRB16) meets RoHS Standard and lead-free standard.

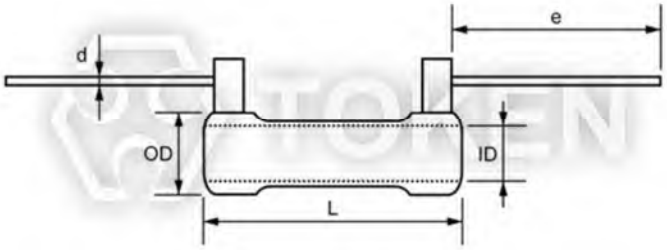
The vitreous enamelled resistor (DRB16) is used to replace the traditional paint of the resistance body, and the resistance caused by the unbearable thermal stress "high temperature". (DRB16) provides durable lead-free enameled coatings that allow wirewound resistors to maintain a hardened coating that can be worked in high temperature environments. The fully welded structure strengthens the mechanical integrity.

When cost, quality, and reliability are key factors, the power type (DRB16) line winding is the best choice. It can provide Ayrton Perry line-winding application requirements. These (DRB16) come with short production cycle, and widely used in power tools, switch applications, power supplies, welding machines, high voltage applications, consumer product applications, home entertainment, home appliances products. For the customized special applications, please contact our sales to discuss the details. Or link to DeMint official website "General Purpose Resistors" for more information.

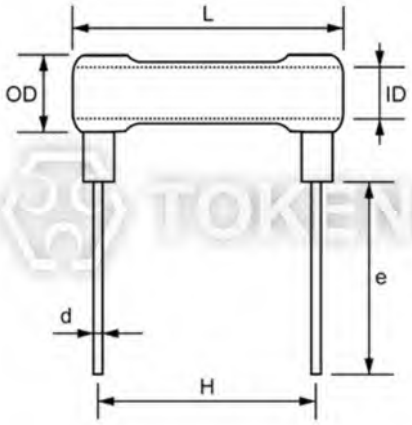
Technical Specifications

Enameled Wirewound Resistor Long Leads (DRB16) - Specifications (Unit: mm)

Type	Rating Power (W)	Resistance (Ω)	Resistance Tolerance (%)	Temperature Coefficient (ppm/°C)	Working Voltage (V)	Dimensions (mm)					
						L ±1	OD ±1	ID ±1	e ±3	d ±0.2	H ±1
DRB16-3	3W	1 ~ -1k	±5% (J) ±10% (K)	250	120	11	7.5	3.6	38±3	0.8	7
DRB16-5	5W	5 ~ -1.5k			150	16	8.5	3.6	38±3	0.8	11
DRB16-6	6W	6 ~ -4.7k			250	25	10.5	4.8	38±3	1	19
DRB16-12	12W	12 ~ -4.7k			600	44.5	10.5	4.8	38±3	1	36.5
DRB16-20	20W	20 ~ -10k			750	51	14.3	7.9	38±3	1	43



Horizontal Long Lead Enameled Wirewound Resistor (DRB16)



Vertical Long Lead Enameled Wirewound Resistor (DRB16)

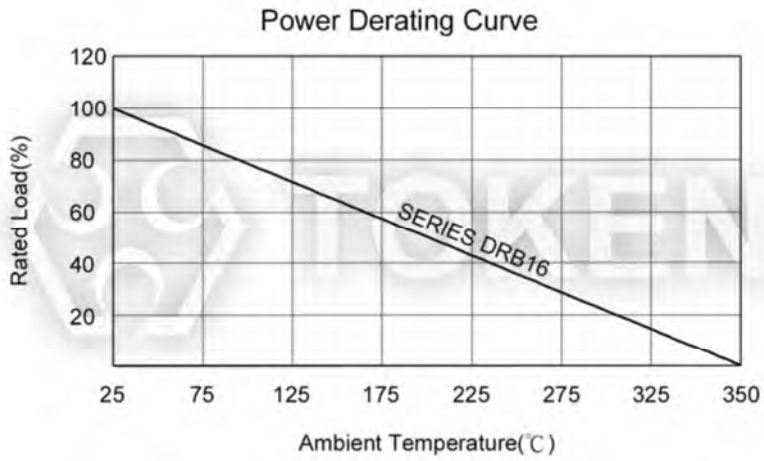
Electrical Performance

Vitreous Enamelled Resistor (DRB16) Performance

Test Item	Characteristics	Test Methods
Solderability	Free flow of solder	235°C ± 5°C, 2s Groove welding
Terminal strength	ΔR ≤ ± (1%R + 0.05Ω)	≤4.3W 10N, ≥6W 20N
Overloading	ΔR ≤ ± (1%R + 0.05Ω)	Applied 10 times the rated power load 5s
Rapid temperature Change	ΔR ≤ ± (1%R + 0.05Ω)	θ A=-55°C θ B=+200°C, 5 Cycles
Collision Test	ΔR ≤ ± (1%R + 0.05Ω)	Acceleration 390m/s2, 4000 times
Impact Test	ΔR ≤ ± (1%R + 0.05Ω)	Acceleration 490m/s2, 11ms, 18 times
Vibration Test	ΔR ≤ ± (2%R + 0.1Ω)	Frequency 10-500Hz, Acceleration 98m/s2, 6h
Temperature Rise	<245°C	Apply rated power Load
Constant Damp Heat	ΔR ≤ ± (5%R + 0.1Ω)	Temperature 40±2°C, Temperature 93+2/-3%, 56h
Room temperature Durability	ΔR ≤ ± (5%R + 0.1Ω)	Rated power load at room temperature 1000h

Derating Curve

Derating Curve (DRB16)



Order Codes

Long Lead Enameled Wirewound Resistor - (DRB16) Order Codes

DRB16	-	3	10R	J	VL	VE

Type
DRB16

Rating Power (W)	
3	3W
5	5W
6	6W
12	12W
20	20W

Resistance Value (Ω)	
10R	10Ω
110R	110Ω
1K1	1.1KΩ
10K	10KΩ

Resistance Tolerance	
G	±2%
J	±5%

Lead Type	
VL	Vertical Lead
HL	Horizontal Lead

Coating	
VE	Vitreous Enamelled
LF	RoHS Enamelled
NF	Nonflammable Epoxy

Power Metal Film Flame-Proof Resistors (FMF)

Product Introduction

Flame Proof Resistor (FMF), low TCR, low noise and high precision for telecommunication, comsumer products.

Features :

- High power in small packages, Low electrical noise.
- Outstanding stability under a wide range of electrical and environmental stresses.
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes.
- Compatible with “Restriction of the use of Hazardous Substances” (RoHS) directive 2011/65/EU.

Applications :

- Ballasts, Amplifiers, Power Supplies, Telecommunications
- Household Appliances, Automotive, Computer, Precision Controls
- Test Equipment and Instrumentation, Medical Equipment, Security Monitoring

DeMint Electronics is a global engineering electronics supplier for performance-critical applications, introducing the (FMF) series of Power Metal Film Flame-Proof Resistors. Offering a combination of high precision and handling high power conditions, this resistor is ideal for measuring power line voltage for power condition and energy metering monitoring.

DeMint (FMF) Flame-Proof Resistor is desogned to provide an alternative options between Power Metal Oxide Resistors (RSS, RSN) and Precision Metal-Film Resistors (MF). The (FMF) takes the power handling with flame-proof advantage of metal oxide resistors and inherits the precision tolerance of (MF) metal film resistors to provide a solution for customers looking for an industrial grade flame-proof resistors.

The power of Flame-Proof Resistor (FMF) is rated at 1/4, 1/2WS, 1/2W, 1W, 2WS, 2W, 3WS, 3W, 5WS, 5W, and 7WS respectively. Standard values from 0.1Ω to 10MΩ are available, E24, E-96, and E-192 nominal standard series provides adequate "‘close value match" choice for designers. Maximum overload voltage specifies up to 1000V at 5W normal size or 7WS minimum size.

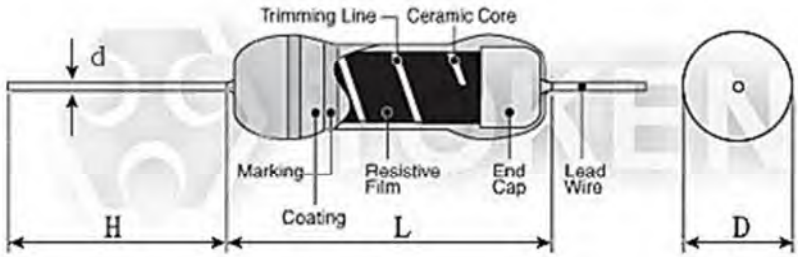
The (FMF) resistors have excellent high power characteristics to improve reliability and reduce faults. With precision levels of ±0.1% resistance tolerance and ±15ppm/°C TCR they free up designers’ error budgets, enabling savings elsewhere in the circuit. Accuracy is ± 0.1%, ± 0.25%, ± 0.5%, ± 1%, ± 2%, and ± 5% precision tolerance, which saves the designer's error budget and free up other parts of the circuit.

Structurally the resistors include a homogeneous sputtered metal alloy film on a high-aluminum ceramic rod and protect with flame-proof coating. The resistance value in the film was adjusted to the final value by laser spiral cutting. The terminals on both ends of the resistor are covered with a pure tin coating to avoid aging the contacts and a low melting point solder can be used thereon. Contact us with your specific needs. For more information, please link to DeMint official website "General Purpose Resistors".

Dimensions & Specifications

Specifications & Dimensions (Unit: mm) (FMF)

Style FMF		Dimensions (Unit: mm)				Operating Temp. Range (℃)	Max Working Voltage (V)		Max Overload Voltage (V)	
Normal	Mini	L	D	H	d ± 0.1		Normal	Mini	Normal	Mini
1/4W	1/2WS	6.3±0.5	2.3±0.3	28±2.0	0.55	-55 ~ +155	300	200	500	400
1/2W	1WS	9.0±1.0	3.2±0.5	26±3.0	0.65		350	250	600	500
1W	2WS	11.5±1.0	4.5 ±0.5	33 ±3.0	0.78		350	300	700	600
2W	3WS	15.5±1.0	5.0±0.5	32±3.0	0.78		350	350	700	700
3W	5WS	17.5±1.0	6.5±0.5	35±3.0	0.78		500	350	1000	700
5W	7WS	24.5±1.0	8.5±0.5	35±3.0	0.78		600	500	1000	800



Specifications & Dimensions (Unit: mm) (FMF)

- **Remark:**
  The maximum value of D.C. voltage or A.C. voltage (commercial frequency effective value) capable of being applied continuously to resistors at the rated ambient temperature. Rated voltage shall be calculated from the following formula. However, it shall not exceed the maximum working voltage.
  Rated Voltage (RCWV) = √Rated Power (W) x Nominal Resistance Value (Ω)

Resistance & TCR

Resistance & TCR Range (FMF)

Style		Tolerance(%)	TCR (ppm/℃)/ Ω				
Normal	Mini		±15	±25	±50	±100	±200
1/4W	1/2WS	±5%					0.1Ω~10MΩ
		±2%					0.1Ω~10MΩ
		±1%	10Ω~1MΩ	10Ω~10MΩ	10Ω~10M	0.1Ω~10MΩ	0.1Ω~10MΩ
		±0.5%	10Ω~1MΩ	10Ω~10MΩ	10Ω~10M	0.1Ω~10MΩ	
		±0.25%	10Ω~1MΩ	10Ω~1MΩ	10Ω~1MΩ	0.1Ω~1MΩ	
		±0.1%	10Ω~1MΩ	10Ω~1MΩ	10Ω~1MΩ		
1/2W	1WS	±5%					0.1Ω~10MΩ
		±2%					0.1Ω~10MΩ
		±1%		10Ω~1MΩ	10Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ
		±0.5%		10Ω~1MΩ	10Ω~10MΩ	0.1Ω~10MΩ	
		±0.25%		10Ω~1MΩ	10Ω~1MΩ	0.1Ω~1MΩ	
		±0.1%		10Ω~1MΩ	10Ω~1MΩ		
1W	2WS	±5%					0.1Ω~10M
		±2%					0.1Ω~10M
		±1%		10Ω~1MΩ	10Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10M
		±0.5%		10Ω~1MΩ	10Ω~10MΩ	0.1Ω~10MΩ	
		±0.25%		10Ω~1MΩ	10Ω~1MΩ	0.1Ω~1MΩ	
		±0.1%		10Ω~1MΩ	10Ω~1MΩ		
2W	3WS	±5%					0.1Ω~10MΩ
		±2%					0.1Ω~10MΩ
		±1%		10Ω~1MΩ	10Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ
		±0.5%		10Ω~1MΩ	10Ω~10MΩ	0.1Ω~10MΩ	
		±0.25%		10Ω~1MΩ	10Ω~1MΩ	0.1Ω~1MΩ	
		±0.1%		10Ω~1MΩ	10Ω~1MΩ		
3W	5WS	±5%					0.1Ω~10MΩ
		±2%					0.1Ω~10MΩ
		±1%				0.1Ω~100KΩ	0.1Ω~10MΩ
		±0.5%				10Ω~100KΩ	
5W	7WS	±5%					0.1Ω~100KΩ
		±2%					0.1Ω~100KΩ
		±1%				0.1Ω~100KΩ	0.1Ω~100KΩ
		±0.5%				10Ω~100KΩ	

* Resistance standard decade values E-24, E-96, E-192.

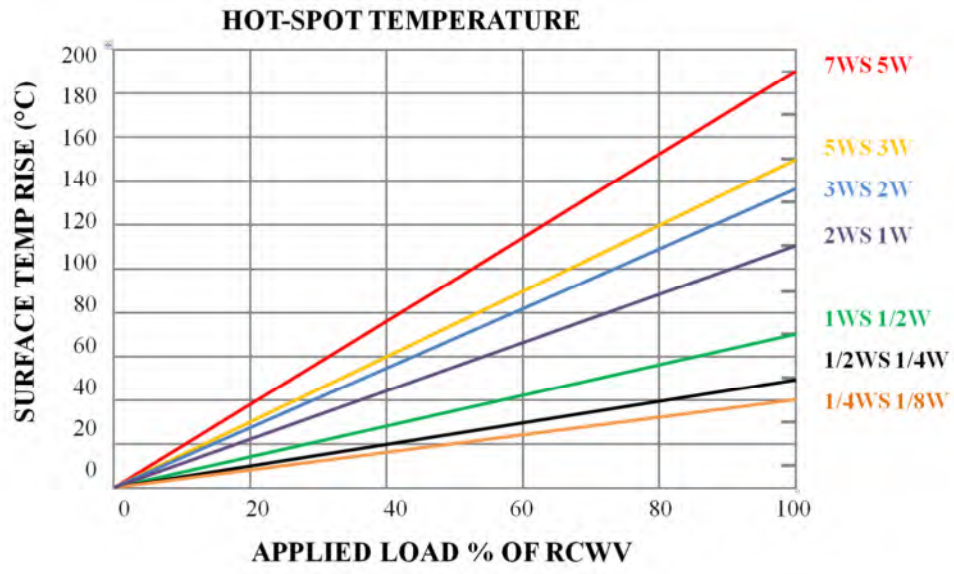
Electrical Performance

Electrical Performance (FMF)

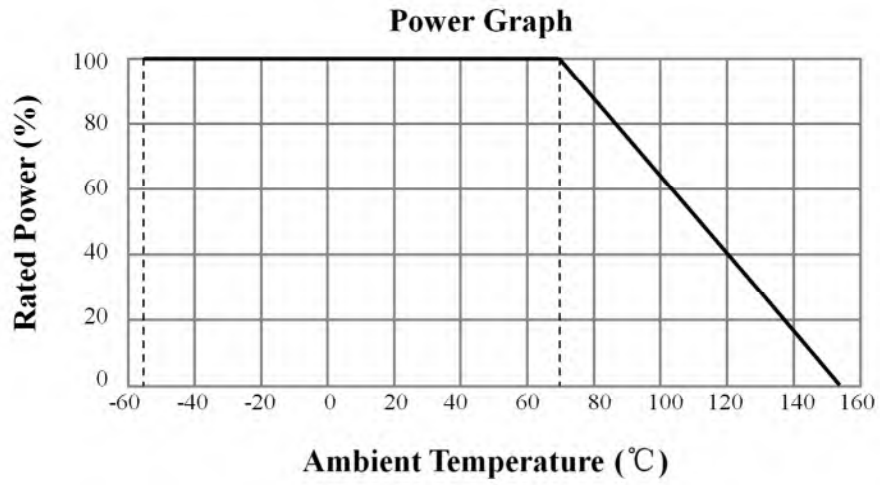
Test Characteristics	Test Methods	Performance Requirement
Resistance	Measuring points at 10mm±1mm from the end cap.	Within regulated tolerance
T.C.R.	Room temperature /100°C up.	± 15, ± 25, ± 50, ± 100,± 200ppm/℃
Short Time Overload	Rated voltageX2.5 or Max. overload voltage for 5s whichever less.	±(2%+0.1Ω)
Solderability	260°C±5°C, 2s±0.5s	90% Coverage Min.
Terminal strength	Direct load: 25N, 10s Twist test:360°, 5 times Bending test:5N, 90°, 2 times	No mechanical damages
Moisture resistance	40°C±2°C, 90%~95%RH, 1000Hrs, 1.5Hrs on/0.5Hr off cycle	±(5%+0.1Ω)
Load Life	70°C±2°C, 1000Hrs, 1.5Hr on/0.5Hr off cycle.	±(5%+0.1Ω)

Derating Curve & Temperature

Hot-Spot Temperature (FMF)



Derating Curve (FMF)



Order Codes

Order Codes (MF)

FMF	-	1/2W	100R	J		T52

Part Number
FMF

Rated Power (W)
1/4W
1/2WS
1/2W
1W
2WS
2W
3WS
3W
5WS
5W
7WS

Resistance Value (Ω)	
10R	10Ω
100R	100Ω
1K	1KΩ
10K	10KΩ

Resistance Tolerance (%)	
J	±5%
G	±2%
F	±1%
D	±0.5%

TCR(ppm/℃)	
	±200ppm/℃
C1	±100ppm/℃
C2	±50ppm/℃
C3	±25ppm/℃
C5	±15ppm/℃

Package	
T52	Taping 52mm/Box.
T73	Taping 73mm/Box.
T88	Taping 88mm/Box.

General Information

General Purpose Resistors with Customized Service

DeMint Electronics is expanding business to include a broad range of General Purpose Resistor products designed for high volume applications. This expanded range of commercial resistor presents a more comprehensive product offering for Customer Experience Management (CEM) and other high volume customers that require quality products at competitive pricing.

Backed by the same customer service, technical support and quality assurance that DeMint has always provided, these new commercial products enable you the opportunity to source a wider range of resistors from a trusted supplier.

General Use

When an ambient temperature exceeds a rated ambient temperature, resistor shall be applied on the derating curve by derating the load power. General purpose resistor under overloads is not combustion resistant and is likely to emit, flame, gas, smoke, red heat, etc. Flame retardant resistor generally emits smoke and red heat in a certain power and over but do not emit fire or flame.

When resistors are shielded or coated with resin etc., stress from the storage heat and the resins are applied. So, performance and reliability should be checked well before use.

When a voltage higher than rated is applied in a short time (single pulse, repeated pulses, surge, etc.), it does not necessarily ensure safety that an effective wattage is not higher than a rated wattage. Then consult with us with your specified pulse wave shape. Resistors shall be used in a condition causing no dew condensation.

Keep temperature from rising by choosing resistor with a higher rated capacity; do not use a component having the exact load value required. For considerations of safety in extended period applications, the rating should be more than four times higher than the actual wattage involved, but never use resistors at less than 25% of its rated power.

In applications where resistors are subject to intermittent current surges and spikes, be sure in advance that the components selected are capable of withstanding brief durations of increased load.

Do not exceed the recommended rated load. Resistor must use within the rated voltage range to prevent the shortening of service life and/or failure of the wound resistance elements.

Minimum load: Resistor must be utilized at 1/10 or more of the rated voltage to prevent poor conductance due to oxidation build-up. For basic particulars for cautions, refer to EIAJ Technical Report RCR-2121 "Guidance for care note on fixed-resistors".