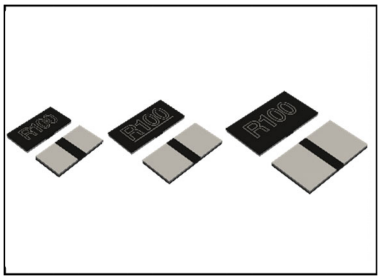
High power metal plate shunt resistors
GMR series

Datasheet

●Features

1) High power (4W to 10W)
2) High heat dissipation
3) Excellent TCR characteristics
4) Low ohmic (5mΩ to 220mΩ)
5) ROHM resistors have obtained ISO9001 / IATF16949 certification
6) Corresponds to AEC-Q200



●Products list

Part No.	Size		Rated power	Rated terminal Temperature	Tolerance	Temperature*1 coefficient	Resistance*2 range	Operating temperature range	Automotive grade available (AEC-Q200)
	(mm)	(inch)	(W)	(°C)		(ppm/°C)	(Ω)	(°C)	
GMR50	5025	2010	4	90	F (±1%)	0～+25	5m≦R<10m	-65 ～ +170	Yes
						±25	10m≦R≦220m		
GMR100	6432	2512	7	70	F (±1%)	0～+50	5m≦R<10m	-65 ～ +170	Yes
						±20	10m≦R≦220m		
			5	110	F (±1%)	0～+50	5m≦R<10m		
						±20	10m≦R≦220m		
GMR320	7142	2817	10	70	F (±1%)	0～+50	5m≦R<10m	-65 ～ +170	Yes
						±25	10m≦R≦100m		
			7	110	F (±1%)	0～+50	5m≦R<10m		
						±25	10m≦R≦100m		

Design and specifications are subject to change without notice. Carefully check the specification sheet supplied with the product before using or ordering it.
*1 (+20/+60°C)
*2 Development schedule will vary depending on resistance value. Please contact us for resistance values.

●Part number description

GMR	320	H	JA	A	F	D	5L00
①	②	③	④	⑤	⑥	⑦	⑧

①

Part No.
GMR
High pow er metal plate shunt resistors

②

Size	(mm)	[inch]
50	(5025)	[2010]
100	(6432)	[2512]
320	(7142)	[2817]

③

Packing specifications code			
Part No.	Code	Packing specifications	Quantity pcs/reel
GMR50	H	Embossed tape(4mm Pitch)	2,000
GMR100	H	Embossed tape(8mm Pitch)	2,000
GMR320	H	Embossed tape(8mm Pitch)	2,000

④

Product code	
JA	5mΩ≦R<10mΩ
JB	10mΩ≦R<100mΩ
JC	100mΩ≦R≦220mΩ

⑤

Product other than E24 series
A

⑥

Tolerance
F (±1%)

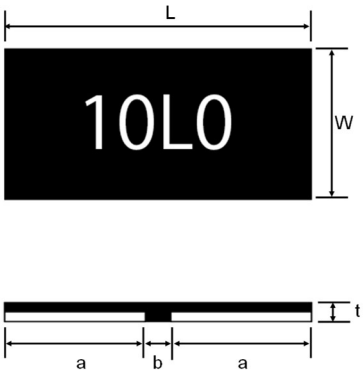
⑦

Special part code	
A	10mΩ,40mΩ,100mΩ
B	50mΩ
D	5mΩ
E	15mΩ,150mΩ
G	18mΩ
H	20mΩ,200mΩ
I	22mΩ,220mΩ
K	27mΩ
M	33mΩ
O	39mΩ
Q	47mΩ
S	56mΩ
W	82mΩ

⑧

Nominal resistance	
Resistance	F Class
10mΩ	10L0
15mΩ	R015
100mΩ	R100

●Chip resistor dimensions and markings



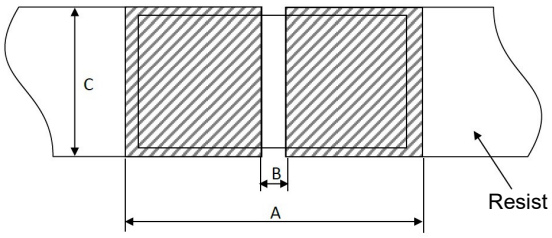
<Marking method>
There are four digits used for the calculation number.
“L” means decimal point of mΩ unit in case resistance value is 0.01Ω or less.
“R” means decimal point of Ω unit in case resistance value is above 0.01Ω.
Example : 4digits……10mΩ=10L0, 100mΩ=R100

GMR100 : Marked with an underbar under the resistance

(Unit : mm)

Part No.	(mm)	(inch)	L	W	t	a	b	Marking existence
GMR50	5025	2010	5.00±0.25	2.50±0.25	0.40±0.15	2.05±0.25	0.90±0.25	Yes
GMR100	6432	2512	6.40±0.25	3.20±0.25	0.40±0.15	2.75±0.25	0.90±0.25	Yes
GMR320	7142	2817	7.10±0.25	4.20±0.25	0.40±0.15	3.10±0.25	0.90±0.25	Yes

●Land pattern example



(Unit : mm)

Part No.	A	B	C
GMR50	6.0	0.6	3.0
GMR100	6.8	0.6	3.6
GMR320	7.4	0.6	4.6

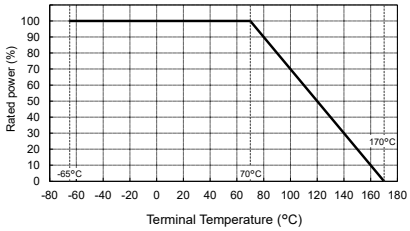
●Derating curve

<When the terminal temperature exceeds 70°C>
■GMR100 : Rated power 7W
■GMR320 : Rated power 10W

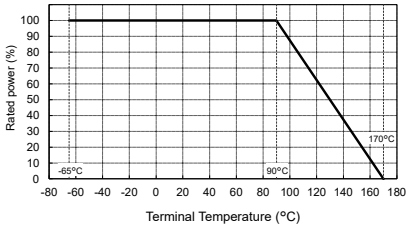
<When the terminal temperature exceeds 90°C>
■GMR50 : Rated power 4W

<When the terminal temperature exceeds 110°C>
■GMR100 : Rated power 5W
■GMR320 : Rated power 7W

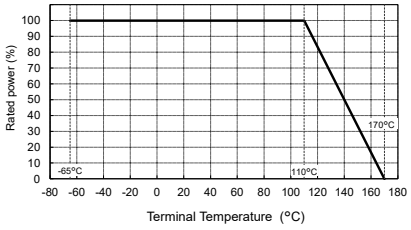
Derating curve (70℃)



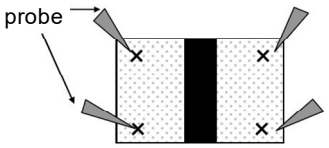
Derating curve (90℃)



Derating curve (110℃)



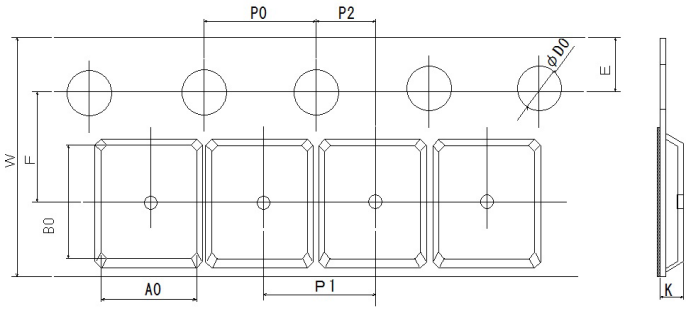
●Characteristics

Test items	Guaranteed value	Test conditions
Resistance	See P.1	20°C Measuring method : Measure Bottom terminal by 4 probes. 
Variation of resistance with temperature	See P.1	Measurement : +20/+60°C
Overload	±0.5%	Rated power×4.0 Test time : 5s
Solderability	A new uniform coating of minimum of 95% of the surface being immersed and no soldering damage.	Rosin-ethanol solution 25% (mass) Soldering condition : 245±5°C Duration of immersion : 2.0±0.5s
Resistance to soldering heat	±0.5% No remarkable abnormality on the appearance.	Soldering condition : 260±5°C Duration of immersion : 10±1s
Rapid change of temperature	±0.5%	Test temperature : -55°C～+155°C Test time : 1,000cycles
Damp heat, steady state	±1.0%	Test temperature : 85°C Relative humidity : 85% Test time : 1,000h
Endurance at Terminal temperature	±1.0%	Terminal temperature : 90°C (GMR50) : 70°C (GMR100/320) : 110°C (GMR100/320) Rated power : 1.5h:ON-0.5h:OFF Test time : 1,000h
Endurance	±1.0%	Test temperature : 170°C Test time : 1,000h
Resistance to solvent	±0.5%	23±5°C, Immersion cleaning, 5±0.5min Solvent : Isopropyl alcohol
Bend strength of the end face plating	±1.0% Without mechanical damage such as breaks.	Endurance with 90mm width Deflection : 3mm

Compliance Standards : IEC 60115-1 / IEC 60115-8
JIS C 5201-1 / JIS C 5201-8

●Tape dimensions

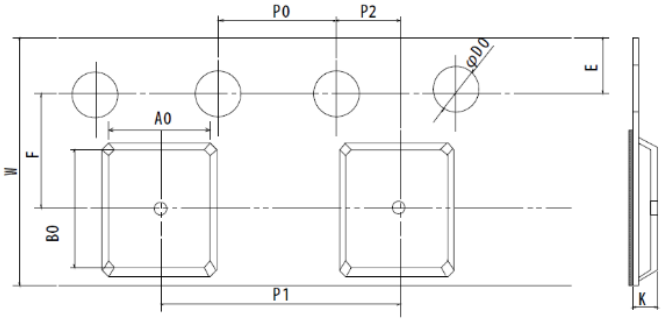
■GMR50



(Unit : mm)

Part No.	W	F	E	A0	B0	D0	P0	P1	P2	K
GMR50	12.0±0.3	5.5±0.05	1.75±0.1	2.9±0.1	5.3±0.1	Φ1.55±0.05	4.0±0.1	4.0±0.1	2.0±0.05	MAX1.1

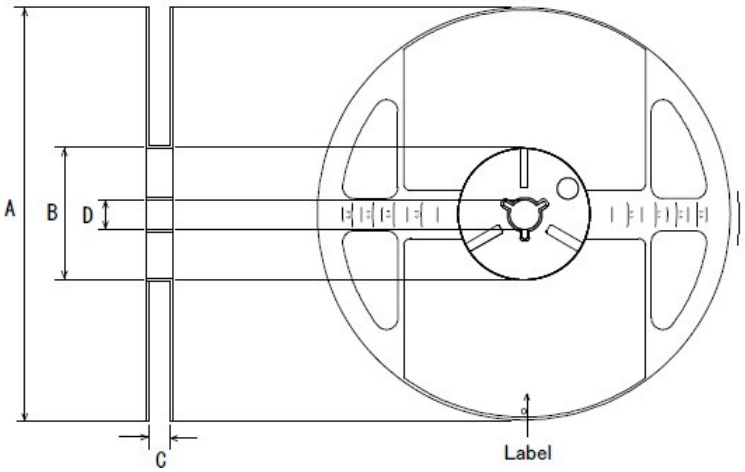
■GMR100 / 320



(Unit : mm)

Part No.	W	F	E	A0	B0	D0	P0	P1	P2	K
GMR100	12.0±0.3	5.5±0.05	1.75±0.1	3.5±0.2	6.7±0.2	Φ1.55±0.05	4.0±0.1	8.0±0.1	2.0±0.05	MAX1.1
GMR320	12.0±0.3	5.5±0.05	1.75±0.1	4.5±0.2	7.5±0.2	Φ1.55±0.05	4.0±0.1	8.0±0.1	2.0±0.05	MAX1.1

●Reel dimensions



(Unit : mm)

Part No.	A	B	C	D
GMR50	Φ180 0 -1.5	Φ60 +1.0 0	13+1.0 0	Φ13±0.2
GMR100				
GMR320				

Notice

Precaution on using ROHM Products

1. If you intend to use our Products in devices requiring extremely high reliability (such as medical equipment (Note 1), aircraft/spacecraft, nuclear power controllers, etc.) and whose malfunction or failure may cause loss of human life, bodily injury or serious damage to property ("Specific Applications"), please consult with the ROHM sales representative in advance. Unless otherwise agreed in writing by ROHM in advance, ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of any ROHM's Products for Specific Applications.

(Note1) Medical Equipment Classification of the Specific Applications

JAPAN	USA	EU	CHINA
CLASSⅢ	CLASSⅢ	CLASSⅡb	CLASSⅢ
CLASSⅣ		CLASSⅢ	

2. ROHM designs and manufactures its Products subject to strict quality control system. However, semiconductor products can fail or malfunction at a certain rate. Please be sure to implement, at your own responsibilities, adequate safety measures including but not limited to fail-safe design against the physical injury, damage to any property, which a failure or malfunction of our Products may cause. The following are examples of safety measures:
   [a] Installation of protection circuits or other protective devices to improve system safety
   [b] Installation of redundant circuits to reduce the impact of single or multiple circuit failure

3. Our Products are not designed under any special or extraordinary environments or conditions, as exemplified below. Accordingly, ROHM shall not be in any way responsible or liable for any damages, expenses or losses arising from the use of any ROHM's Products under any special or extraordinary environments or conditions. If you intend to use our Products under any special or extraordinary environments or conditions (as exemplified below), your independent verification and confirmation of product performance, reliability, etc, prior to use, must be necessary:
   [a] Use of our Products in any types of liquid, including water, oils, chemicals, and organic solvents
   [b] Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
   [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl_2, H_2S, NH_3, SO_2, and NO_2
   [d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
   [e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
   [f] Sealing or coating our Products with resin or other coating materials
   [g] Use of our Products without cleaning residue of flux (Exclude cases where no-clean type fluxes is used. However, recommend sufficiently about the residue.); or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
   [h] Use of the Products in places subject to dew condensation

4. The Products are not subject to radiation-proof design.

5. Please verify and confirm characteristics of the final or mounted products in using the Products.

6. In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse, is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

7. De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.

8. Confirm that operation temperature is within the specified range described in the product specification.

9. ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

Precaution for Mounting / Circuit board design

1. When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.

2. In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

Precautions Regarding Application Examples and External Circuits

1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.

2. You agree that application notes, reference designs, and associated data and information contained in this document are presented only as guidance for Products use. Therefore, in case you use such information, you are solely responsible for it and you must exercise your own independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of such information.

Precaution for Electrostatic

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of Ionizer, friction prevention and temperature / humidity control).

Precaution for Storage / Transportation

1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
   [a] the Products are exposed to sea winds or corrosive gases, including Cl_2, H_2S, NH_3, SO_2, and NO_2
   [b] the temperature or humidity exceeds those recommended by ROHM
   [c] the Products are exposed to direct sunshine or condensation
   [d] the Products are exposed to high Electrostatic

2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.

3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.

4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

Precaution for Product Label

A two-dimensional barcode printed on ROHM Products label is for ROHM's internal use only.

Precaution for Disposition

When disposing Products please dispose them properly using an authorized industry waste company.

Precaution for Foreign Exchange and Foreign Trade act

Since concerned goods might be fallen under listed items of export control prescribed by Foreign exchange and Foreign trade act, please consult with ROHM in case of export.

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