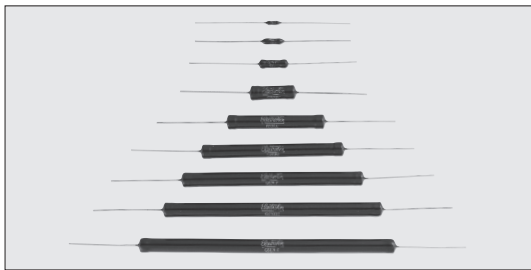
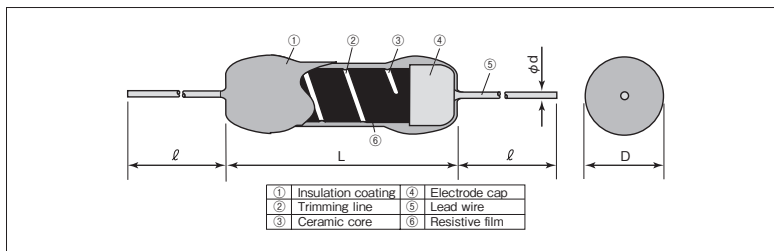


## GS High Voltage High Resistance Thick Film Resistors



Coating color : Brown  
Marking : Alphanumeric

### Construction



### Features

- Miniature construction endurable to high voltage and high power.
- Resistors excellent in anti-surge characteristics.
- Wide resistance range of  $500k\Omega \sim 10G\Omega$  and small T.C.R.
- Products meet EU-RoHS requirements. EU-RoHS regulation is not intended for Pb-glass contained in resistor element and Pb contained in Brass cap.

### Applications

- Copying machines.
- LBPs.
- Charging and discharging resistors for power supply circuits.
- High voltage dividing resistors.

### Dimensions

Type	Dimensions (mm)				Weight (g) (1000pcs)
	L	D	d (Nominal)	ℓ	
GS 1/4	6.3±1.0	2.3±0.5	0.65	38±3	320
GS 1/2	9.5±1.0	3.5±0.6	0.8		590
GS 1	15.0±1.5	4.5±1.0			1,230
GS 2	24.0±1.5	7.9±1.0	1.0		4,190
GS 3	52.0±2.0				7,750
GS 5	76.0±2.0				10,790
GS 7	97.0±3.0				13,350
GS 10	117.0±3.0				16,180
GS 12	137.0±3.0				18,440

### Type Designation

Example

GS	1/2	L	C	106	J
Product Code	Power Rating	T.C.R. ( $\times 10^{-6}/K$ )	Terminal Surface Material	Nominal Resistance	Resistance Tolerance
	1/4 : 0.25W 1/2 : 0.5W 1 : 1W 2 : 2W 3 : 3W 5 : 5W 7 : 7W 10 : 10W 12 : 12W	D : $\pm 100$ L : $\pm 200$	C : SnCu	D, F : 4 digits G, J, K : 3 digits	D : $\pm 0.5\%$ F : $\pm 1\%$ G : $\pm 2\%$ J : $\pm 5\%$ K : $\pm 10\%$

Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.

Custom forming for all of items and custom taping for GS1/4 · GS1/2 are available on request.

### Ratings

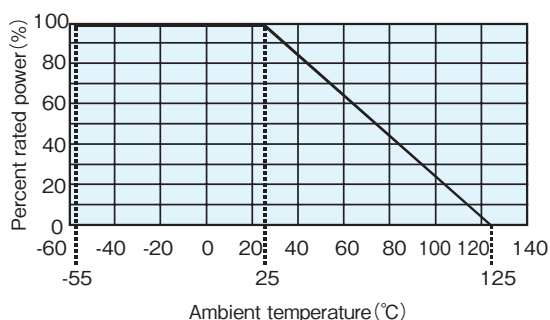
Type	Power Rating	T.C.R. ( $\times 10^{-6}/K$ )	Resistance Range ( $\Omega$ )					Max. Working Voltage	Max. Overload Voltage	Impulse Withstand Voltage
			D : $\pm 0.5\%$ E24·25×10 <sup>3</sup> ·50×10 <sup>3</sup>	F : $\pm 1\%$ E24·25×10 <sup>3</sup> ·50×10 <sup>3</sup>	G : $\pm 2\%$ E24·25×10 <sup>3</sup> ·50×10 <sup>3</sup>	J : $\pm 5\%$ E24·25×10 <sup>3</sup> ·50×10 <sup>3</sup>	K : $\pm 10\%$ E24·25×10 <sup>3</sup> ·50×10 <sup>3</sup>			
GS 1/4DC	0.25W	D : $\pm 100$	500k~20M	500k~100M	500k~100M	500k~100M	500k~100M	0.5kV	1kV	1.25kV
GS 1/4LC		L : $\pm 200$								
GS 1/2DC	0.5W	D : $\pm 100$	500k~50M	500k~100M	500k~100M	500k~100M	500k~100M	1kV	2kV	2.5kV
GS 1/2LC		L : $\pm 200$								
GS 1DC	1W	D : $\pm 100$						3kV	4.5kV	6kV
GS 1LC		L : $\pm 200$								
GS 2DC	2W	D : $\pm 100$						5kV	7.5kV	10kV
GS 2LC		L : $\pm 200$								
GS 3DC	3W	D : $\pm 100$						15kV	20kV	30kV
GS 3LC		L : $\pm 200$								
GS 5DC	5W	D : $\pm 100$						20kV	30kV	40kV
GS 5LC		L : $\pm 200$								
GS 7DC	7W	D : $\pm 100$	1M~50M	1M~100M	1M~500M	1M~500M	1M~500M	30kV	40kV	50kV
GS 7LC		L : $\pm 200$	500k~50M	500k~100M	500k~1G	500k~10G	500k~10G			
GS 10DC	10W	D : $\pm 100$	1M~50M	1M~100M	1M~500M	1M~500M	1M~500M	35kV	50kV	60kV
GS 10LC		L : $\pm 200$	500k~50M	500k~100M	500k~1G	500k~10G	500k~10G			
GS 12DC	12W	D : $\pm 100$	1M~50M	1M~100M	1M~500M	1M~500M	1M~500M	40kV	60kV	70kV
GS 12LC		L : $\pm 200$	500k~50M	500k~100M	500k~1G	500k~10G	500k~10G			

Rated Ambient Temperature : +25°C

Operating Temperature Range : -55°C ~ +125°C

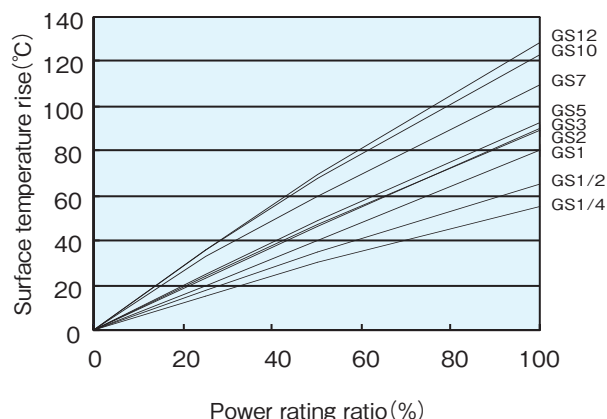
Rated voltage =  $\sqrt{\text{Power Rating} \times \text{Resistance value}}$  or Max. working voltage, whichever is lower.

## Derating Curve



For resistors operated at an ambient temperature of 25°C or higher, the power shall be derated in accordance with the above derating curve.

## Surface Temperature Rise



## Performance

Test Items	Performance Requirements $\Delta R \pm \%$	Test Methods
Resistance	Within specified tolerance	25°C
T.C.R.	Within specified T.C.R.	+25°C / +125°C
Overload (Short time)	2 : TCR $200 \times 10^{-6}/K$ 0.5 : TCR $100 \times 10^{-6}/K$	Rated voltage $\times 2.5$ (GS1/4, GS1/2), Rated voltage $\times 2$ (GS1~GS12) or Max. overload voltage, whichever is lower, for 5s
Resistance to soldering heat	2 : TCR $200 \times 10^{-6}/K$ 0.5 : TCR $100 \times 10^{-6}/K$	350°C $\pm 10^\circ C$ , 3s $\pm 0.5s$ or 260°C $\pm 5^\circ C$ , 10s $\pm 1s$
Rapid change of temperature	2 : TCR $200 \times 10^{-6}/K$ 0.5 : TCR $100 \times 10^{-6}/K$	-55°C (30min.) / +125°C (30min.) , 5 cycles
Moisture resistance	5 : TCR $200 \times 10^{-6}/K$ 2 : TCR $100 \times 10^{-6}/K$	40°C, 90%~95%RH, 1000h
Endurance at 25°C	3 : TCR $200 \times 10^{-6}/K$ 2 : TCR $100 \times 10^{-6}/K$	25°C, 1000h 1.5h ON/0.5h OFF cycle
Voltage coefficient	$\pm 50 \times 10^{-6}/V$ : TCR $200 \times 10^{-6}/K$ $\pm 10 \times 10^{-6}/V$ : TCR $100 \times 10^{-6}/K$	GS1/4, 1/2 only Rated voltage or max. working voltage, whichever is lower and 1/10 of its voltage.
Voltage characteristics	5 : TCR $200 \times 10^{-6}/K$ 3 : TCR $100 \times 10^{-6}/K$	GS1~12 Rated voltage or max. working voltage, whichever is lower and 1/10 of its voltage.
Resistance to solvent	No evidence of damage to protective coating and marking.	Soaking in IPA for 1min and brushing 10 times -3 cycles- liquid temp. 25°C $\pm 5^\circ C$
Impulse withstand voltage	No abnormality in appearance and flash-over.	An impulse voltage shall be applied 5 times at an interval of 1min.

## Precautions for Use

- Impulse withstanding voltage is specified for waveform of 1/40 $\mu s$  or 1.2/50 $\mu s$  as a standard. Please inquire of us in advance when using other than the standard waveform, since the specified value may change, depending on time constant or length of wave tail.
- Use the components under less dusty places, as continual applying of high voltage makes dust adhere to the surface of the resistors and causes surface leakage and corona. Also periodic cleaning of the surface of resistors is needed.
- Use them at 50% or under of the rated power for stable use for a long time.
- Do not touch the resistors with high resistance value by hand to prevent surface-leakage current.
- Set the products away from near electric conductors 1cm or over per 3kVd.c. to avoid occurrence of corona and short-circuit by discharge, if there are electric conductors near to.
- Ceramic is used for the core of these resistors. Pay attention to the handling as the characteristics may be deteriorated by damage and inner crack when they are fallen or shocked.
- In case of using in oil, inquire of us in advance.
- Take care that the resistors may become instable in resistance value by absorption of humidity when they are stored or used in high humidity environment.