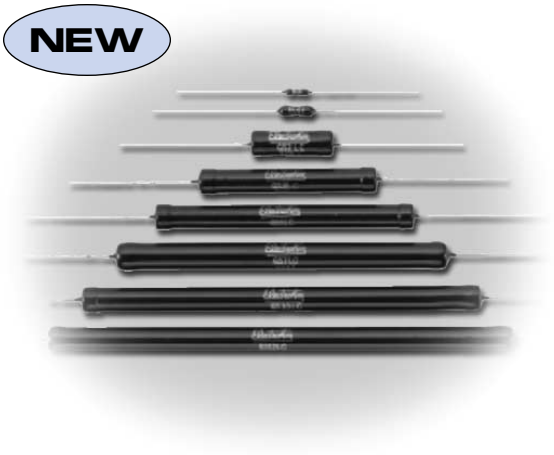
KOA SPEER ELECTRONICS, INC.

GS

high voltage high resistance thick film resistors

RoHS COMPLIANT

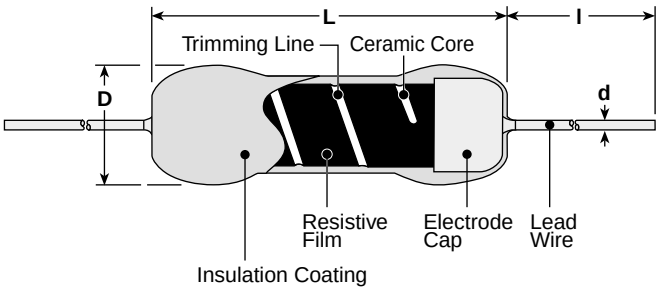
NEW



features

- Miniature construction endurable to high voltage and high power
- Resistors excellent in anti-surge characteristics
- Wide resistance range of 0.5MΩ - 10GΩ and small T.C.R.
- Marking: Brown body color with alpha/numeric marking
- Products with lead-free terminations meet RoHS requirements. RoHS regulation is not intended for Pb-glass contained in resistor element and Pb contained in Brass cap.

dimensions and construction



Type	Dimensions inches *(mm)* L	D	d (Nominal)	l
GS 1/4	.248±.039 *(6.3±1.0)*	.091±.020 *(2.3±0.5)*	.026 *(0.65)*	1.50±.118 *(38.0±3.0)*
GS 1/2	.374±.039 *(9.5±1.0)*	.138±.024 *(3.5±0.6)*	.031 *(0.8)*	
GS 1	.591±.059 *(15.0±1.5)*	.177±.039 *(4.5±1.0)*		
GS 2	.945±.059 *(24.0±1.5)*	.311±.039 *(7.9±1.0)*	.039 *(1.0)*	
GS 3	2.05±.079 *(52.0±2.0)*			
GS 5	2.99±.079 *(76.0±2.0)*			
GS 7	3.82±.118 *(97.0±3.0)*			
GS 10	4.61±.118 *(117.0±3.0)*			
GS 12	5.39±.118 *(137.0±3.0)*			

NEW

ordering information

New Part #

GS	1/2	L	C	106	J
Type	Power Rating	T.C.R.	Termination Surface Material	Nominal Resistance	Resistance Tolerance
	1/4: 0.25W	D(B): ±100	C: SnCu	D, F: 4 digits	D: ±0.5%
	1/2: 0.5W	L(A): ±200		G, J, K: 3 digits	F: ±1%
	1: 1W				G: ±2%
	2: 2W				J: ±5%
	3: 3W				K: ±10%
	5: 5W				
	7: 7W				
	10: 10W				
	12: 12W				

For further information on packaging, please refer to Appendix C.

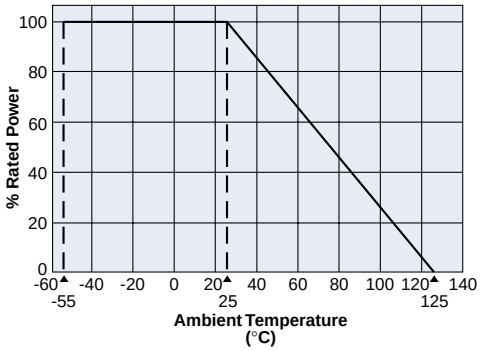
Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

applications and ratings

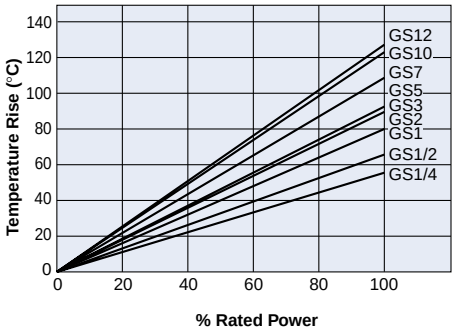
Part Designation	Power Rating	T.C.R. (ppm/°C) Max.	Resistance Range (Ω) E-24, E-25 (D±0.5%)	E-24, E-25 (F±1%)	E-24, E-25 (G±2%)	E-24, E-25 (J±5%)	E-12 (K±10%)	Max. Working Voltage	Max. Overload Voltage	Impulse Withstand Voltage	Rated Ambient Temperature	Operating Temperature Range
GS1/4*	0.25W	D: ±100	0.5M-20M	0.5M -100M	0.5M-100M	0.5M-100M	0.5M-100M	0.5kV	1kV	1.25kV	+25°C	-55°C to +125°C
		L: ±200										
GS1/2*	0.5W	D: ±100	0.5M-50M		0.5M-200M	0.5M-200M	0.5M-200M	1kV	2kV	2.5kV		
		L: ±200			0.5M-500M	0.5M-500M	0.5M-500M					
GS1	1W	D: ±100			0.5M-500M	0.5M-500M	0.5M-500M	3kV	4.5kV	6kV		
		L: ±200			0.5M-1G	0.5M-5G	0.5M-5G					
GS2	2W	D: ±100			0.5M-500M	0.5M-500M	0.5M-500M	5kV	7.5kV	10kV		
		L: ±200			0.5M-1G	0.5M-5G	0.5M-5G					
GS3	3W	D: ±100			0.5M-500M	0.5M-500M	0.5M-500M	15kV	20kV	30kV		
		L: ±200			0.5M-1G	0.5M-10G	0.5M-10G					
GS5	5W	D: ±100			0.5M-500M	0.5M-500M	0.5M-500M	20kV	30kV	40kV		
		L: ±200			0.5M-1G	0.5M-10G	0.5M-10G					
GS7	7W	D: ±100			1M-500M	1M-500M	1M-500M	30kV	40kV	50kV		
		L: ±200			0.5M-1G	0.5M-10G	0.5M-10G					
GS10	10W	D: ±100			1M-500M	1M-500M	1M-500M	35kV	50kV	60kV		
		L: ±200			0.5M-1G	0.5M-10G	0.5M-10G					
GS12	12W	D: ±100			1M-500M	1M-500M	1M-500M	40kV	60kV	70kV		
		L: ±200			0.5M-1G	0.5M-10G	0.5M-10G					

environmental applications

Derating Curve



Surface Temperature Rise



environmental applications

Performance Characteristics

Parameter	Requirement Δ R ±%	Test Method
Resistance	Within regulated tolerance	25°C
T.C.R.	Within specified T.C.R.	+25°C/125°C
Overload (Short time)	2: TCR $200x10^{-6}$/K 0.5: TCR $100x10^{-6}$/K	Rated voltage x 2.5 (GS1/4, GS1/2), rated voltage x 2 (GS1-GS12) or Max. overload voltage, whichever is lower for 5 seconds
Resistance to Solder Heat	2: TCR $200x10^{-6}$/K 0.5: TCR $100x10^{-6}$/K	350°C ± 10°C, 3 seconds ± 0.5 seconds or 260°C ± 5°C, 10 seconds ± 1 second
Rapid Change of Temperature	2: TCR $200x10^{-6}$/K 0.5: TCR $100x10^{-6}$/K	-55°C (30 minutes)/ +125°C (30 minutes), 5 cycles
Moisture Resistance	5: TCR $200x10^{-6}$/K 2: TCR $100x10^{-6}$/K	40°C, 90% - 95%RH, 1000h
Endurance @ 25°C	3: TCR $200x10^{-6}$/K 2: TCR $100x10^{-6}$/K	25°C, 1000 hours 1.5 hr ON/0.5 hr OFF cycle
Voltage Coefficient	$\pm 50x10^{-6}$/V: TCR $200x10^{-6}$/K $\pm 10x10^{-6}$/V: TCR $100x10^{-6}$/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 $200x10^{-6}$/K 3: TCR $100x10^{-6}$/K	GS1 - 12, Rated voltage or max. working voltage, whichever is lower and 1/10 of its voltage
Resistance tp Solvent	No evidence of damage to protective coating and marking	Soaking in IPA for 1 minute and brushing 10 times -3 cycles - liquid temperature 25°C ±5°C
Impulse Withstand Voltage	No abnormality in appearance and flash-over	An impulse voltage shall be applied 5 times at an interval of 1 minute