KOA SPEER ELECTRONICS, INC.

GS

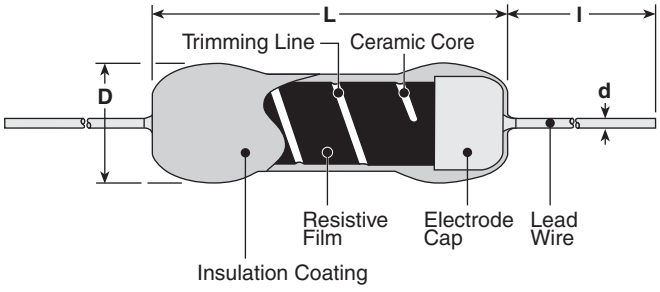
high voltage high resistance thick film resistors

EU RoHS COMPLIANT

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 EU RoHS requirements. Pb located in glass material, electrode and resistor element is exempt per Annex 1, exemption 5 of EU directive 2005/95/EC

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)			

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 1/2: 0.5W 1: 1W 2: 2W 3: 3W 5: 5W 7: 7W 10: 10W 12: 12W	D(B): ±100 L(A): ±200	C: SnCu	±2%, ±5%, ±10%: 2 significant figures + 1 multiplier ±0.5%, ±1%: 3 significant figures + 1 multiplier	D: ±0.5% F: ±1% G: ±2% J: ±5% K: ±10%

Packaging quantity:
GS1/4: 100 pieces
GS1/2: 50 pieces
GS1: 20 pieces
GS2 ~ 12: 10 pieces

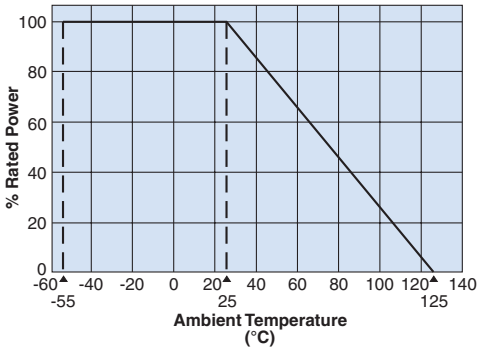
applications and ratings

Part Designation	Power Rating	T.C.R. (ppm/°C) Max.	Resistance Range (Ω) E-24 & 25, 50x10^n (D±0.5%)	(F±1%)	(G±2%)	(J±5%)	(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					

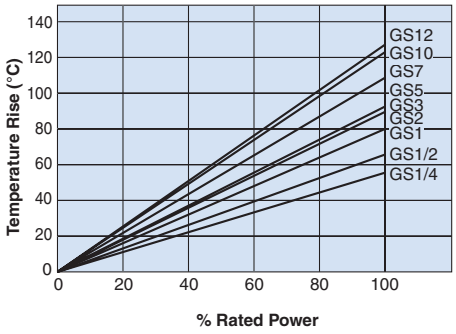
Taping packaging is available for GS1/4 and GS1/2. Please contact factory.

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	±50x10^{-6}/V: TCR 200x10^{-6}/K ±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