

Precision Metal Film Resistors

NOT RECOMMENDED FOR NEW DESIGNS

GP Series

- Meets requirements of MIL-R-10509
- Flame-retardant coatings are standard
- 10 ohm - 10 megohm resistance range
- Resistance range tolerance of $\pm 0.1\%$ - 1%
- Temperature coefficients from ± 25 to $\pm 100\text{ppm}/^\circ\text{C}$



 All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

Electrical Data

IRC Type	IRC Power Rating (watts)		MIL Reference	Maximum Working Voltage	Resistance Temperature Coefficient ($\pm\text{ppm}/^\circ\text{C}$)	Tolerance & Resistance Range		
	@ 70°C	@ 125°C				+1%	$\pm 0.5\%$	± 0.25 and $\pm 0.1\%$
GP-50 (T0)	1/8	1/10	RN50	200	100	10 - 2.37 Meg	10 ohm - 499K ohm	100 ohm - 100K ohm
GP-50 (T2)	1/8	1/10	RN50	200	50	10 ohm - 1 Meg	10 ohm - 499K ohm	100 ohm - 100K ohm
GP-50 (T9)	1/8	1/10	RN50	200	25	49.9 ohm - 499K ohm	49.9 ohm - 499K ohm	100 ohm - 100K ohm
GP-55 (T0)	1/4	1/8	RN55	250	100	10 ohm - 10 Meg	10 ohm - 499K ohm	30 ohm - 300K ohm
GP-55 (T2)	1/4	1/8	RN55	250	50	10 ohm - 4.99 Meg	10 ohm - 499K ohm	30 ohm - 300K ohm
GP-55 (T9)	1/4	1/8	RN55	250	25	30 ohm - 499K ohm	30 ohm - 499K ohm	30 ohm - 300K ohm
GP-60 (T0)	1/2	1/4	RN60	350	100	10 ohm - 10 Meg	10 ohm - 499K ohm	100 ohm - 100K ohm
GP-60 (T2)	1/2	1/4	RN60	350	50	10 ohm - 4.99 Meg	10 ohm - 499K ohm	100 ohm - 100K ohm
GP-60 (T9)	1/2	1/4	RN60	350	25	49.9 ohm - 499K ohm	49.9 ohm - 499K ohm	100 ohm - 100K ohm

General Note

TT Electronics reserves the right to make changes in product specification without notice or liability.
All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

BI Technologies IRC Welwyn

www.ttelectronics.com/resistors

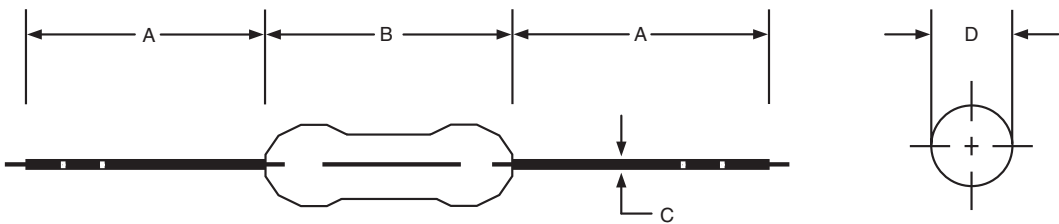
Environmental Data

Environmental (%ΔR)	MIL-R-10509		Char. C	EIA RS-196 Class 1
	Typical	Char. D		
Moisture Resistance	±0.5	±1.5	±0.5	±1.5
Thermal Shock	±0.25	±0.5	±0.25	-
Load life @ 70°C - 1000 hours	±0.5	±1.0	±0.5	±2.0
Shock and Vibration	±0.25	±0.5	±0.25	-
Resistance to Soldering Heat	±0.1	±0.5	±0.1	-
Terminal Strength	±0.2	±0.2	±0.2	-
Dielectric Withstand Voltage	±0.25	±0.5	±0.25	±0.5
Short Time Overload	±0.25	±0.5	±0.25	±0.5
Operating Temperature Range	-55°C to +165°C	-55°C to +165°C	-55°C to +165°C	
Maximum Pulse Voltage	GP50 400V, GP55 500V, GP60 600V			
Insulation Resistance	10,000 meg min.			
Voltage Coefficient	100ppm/V			

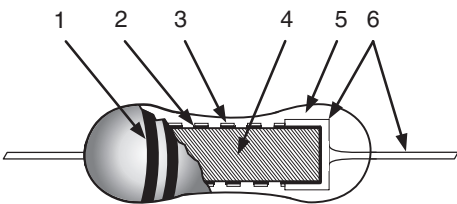
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Physical Data

			
Dimensions (inches and (mm))			
Dimension	GP50	GP55	GP60
A	1.10 ± .08 (28.0 ± 2.0)	1.10 ± .08 (28.0 ± 2.0)	1.10 ± .08 (28.0 ± 2.0)
B	0.13 + .01/-0.00 (3.2 + 0.2/-0.0)	0.24 ± .01 (6.0 ± 0.3)	0.33 ± .02 (8.5 ± 0.5)
C	0.018 ± .001 (0.45 ± 0.02)	0.023 ± .002 (0.60 ± 0.05)	0.027 ± .002 (0.70 ± 0.05)
D	0.073 ± .006 (1.85 ± 0.15)	0.09 ± .01 (2.4 ± 0.2)	0.11 ± .01 (2.8 ± 0.3)

Construction

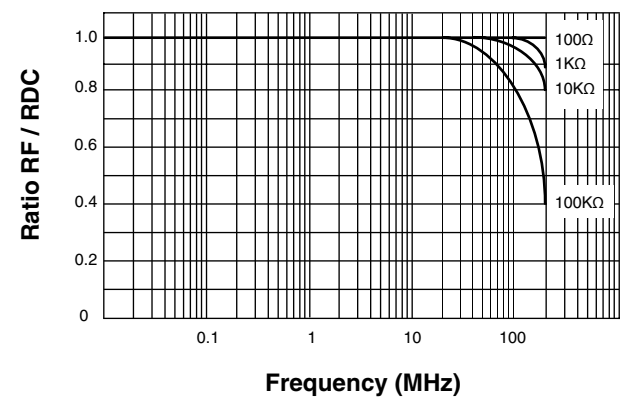
	
1. COLOR BANDS.	The resistors are permanently color banded for resistance value and tolerance in accordance with EIA specifications.
2. HELIXING.	The units are helixed to a predetermined base to final value ratio to obtain the best TCR, noise and stability characteristics.
3. FILM.	Metal-film resistors have a homogeneous film of metal alloy applied by vacuum deposition.
4. SUBSTRATES.	The substrates are of a proprietary non alkaline ceramic, prepared and processed under exacting conditions to guarantee the utmost in uniformity and surface characteristics.
5. INSULATION.	The resistors are coated with multiple layers of a baked-on fire-retardant synthetic resin which provides the units with a high degree of mechanical and electrical protection in the most adverse operating conditions.
6. TERMINATIONS.	Positive contact is provided to the resistance element by precision-made end caps. The lead wires are attached by using proprietary welding techniques.

General Note

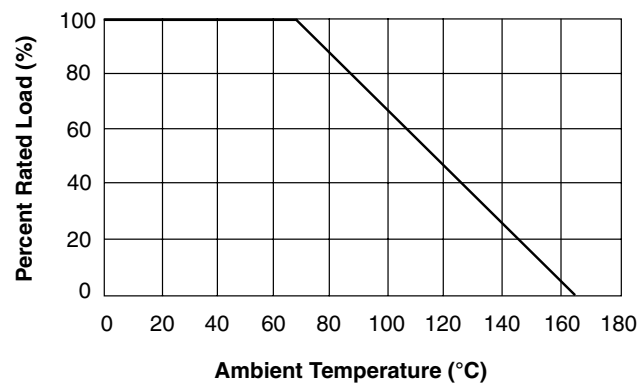
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Performance Curves

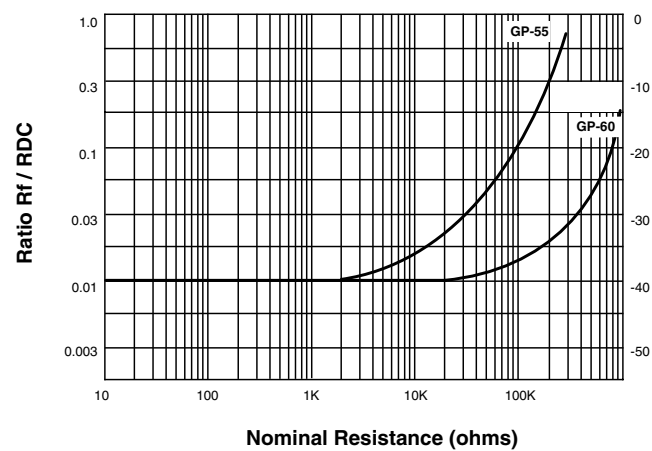
High-Frequency Characteristics (Typical)



Derating Curve (Typical)



Current Noise (Typical)



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Ordering Procedure

Example: GP551001001FLFLTR (GP55 with TCR = ±100ppm/°C at 1 kilohm ±1%, Pb-free)

G	P	5	5	1	0	0	1	0	0	1	F	L	F	L	T	R	
1		2		3		4		5		6							

1 Type	2 TCR	3 Value	4 Tolerance	5 Finish	6 Packing
GP50	25 = 25ppm/°C	3 digits + multiplier	B = ±0.1%	LF = Pb-free	LTR = Tape & reel
GP55	50 = 50ppm/°C	R = ohms for values < 100 ohms	C = ±0.25%		
GP60	100 = 100ppm/°C		D = ±0.5%		
			F = ±1%		

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