



SOLITRONICS ENGINEERING LTD.

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RESISTOR SPECIFICATIONS

Date: 23rd July, 1997

RoHS COMPLIANT PRECISION METAL FILM RESISTOR

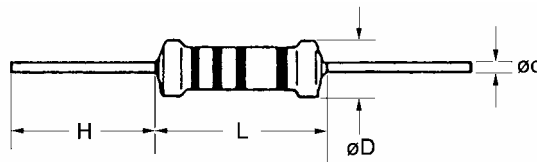
Data Sheet:

SEL-RGD-1002(1)

1. MATERIALS & FEATURES

- Meet US military specification MIL-R-10509F and JIS-C-5202 5.2
- Nichrome resistor element provides stable performance in various environments
- Wide precision range in small package
- Multiple epoxy coating on vacuum-deposited metal film provides superior moisture protection
- Low T. C. of R.
- Flame retardant type available
- Low noise & voltage coefficient
- EIA standard color coding
- Too low or too high ohmic value can be supplied only case by case.
- **RoHS Compliant**

2. DIMENSIONS



Normal Size

Style	Rating	MIL-R 10509F	Dimension (mm)			
			L Max.	D Max.	d ^{+0.02} / _{-0.05}	H ± 3
MF-12	0.125W	RN50	4.2	2.0	0.45	28
MF-25	0.250W	RN55	6.8	2.5	0.54	28
MF-50	0.500W	RN60	10.0	3.5	0.54	28
MF-100	1.000W	RN65	12.0	5.0	0.70	28
MF-200	2.000W	RN70	16.0	5.5	0.70	28

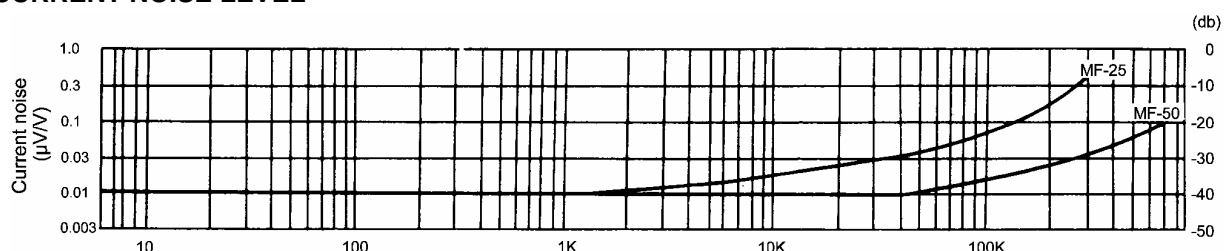
Small Size

Style	Rating	Dimension (mm)			
		L Max.	D Max.	d ^{+0.02} / _{-0.05}	H ± 3
MF-25-SS	0.25W	3.7	1.9	0.45	28
MF-40-SS	0.40W	3.7	1.9	0.45	28
MF-50-S	0.50W	9.0	3.0	0.54	28
MF-50-SS	0.50W	6.8	2.5	0.54	28
MF-60-S	1.00W	6.8	2.5	0.70	28

3. GENERAL SPECIFICATION

Style	Rating Wattle	Max. Working V. (At 70°C)	Max. Overload V. (At 70°C)	Resistance Tolerance	T.C.R.	Resistance Range	Special order		
							Resistance Tolerance	T.C.R.	Resistance Range
MF-12	0.125W	200V	400V	± 5%	± 200ppm/°C	10.0Ω – 1MΩ	± 0.25%	± 15 ppm	51.1Ω-200KΩ
MF-25-SS	0.250W	250V		± 2%	± 100ppm/°C		± 25 ppm	51.1Ω-511KΩ	
MF-40-SS	0.400W	350V		± 1%	± 50ppm/°C		± 50 ppm	51.1Ω-511KΩ	
MF-25	0.250W	250V	500V	± 5%	± 200ppm/°C	1.0Ω – 1MΩ	± 0.10%	± 15 ppm	100Ω-100KΩ
MF-50-SS	0.500W			± 2%	± 100ppm/°C	2.2Ω – 1MΩ	± 0.25%	± 25 ppm	51.1Ω-330KΩ
MF-60-S	0.600W			± 1%	± 50ppm/°C	10.2Ω – 1MΩ	± 0.50%	± 50 ppm	10Ω-1MΩ
MF-50	0.500W	350V	700V	± 5%	± 200ppm/°C	10.0Ω – 1MΩ	± 0.10%	± 15 ppm	100Ω-330KΩ
MF-50-SS				± 2%	± 100ppm/°C	2.2Ω – 1MΩ	± 0.25%	± 25 ppm	51.1Ω-511KΩ
MF-50-S				± 1%	± 50ppm/°C	10.0Ω – 1MΩ	± 0.50%	± 50 ppm	10Ω-1MΩ
MF-100	1.000W	500V	1000V	± 5%	± 200ppm/°C	10.0Ω – 1MΩ	± 0.10%	± 15 ppm	100Ω-330KΩ
				± 2%	± 100ppm/°C	51.1Ω – 1MΩ	± 0.25%	± 25 ppm	51.1Ω-511KΩ
				± 1%	± 50ppm/°C	51.1Ω – 1MΩ	± 0.50%	± 50 ppm	10Ω-1MΩ
MF-200	2.000W	500V	1000V	± 5%	± 200ppm/°C	10.0Ω – 1MΩ	± 0.10%	± 15 ppm	100Ω-330KΩ
				± 2%	± 100ppm/°C	51.1Ω – 1MΩ	± 0.25%	± 25 ppm	51.1Ω-511KΩ
				± 1%	± 50ppm/°C	51.1Ω – 1MΩ	± 0.50%	± 50 ppm	10Ω-1MΩ

4. CURRENT NOISE LEVEL





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RESISTOR SPECIFICATIONS

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PRECISION METAL FILM FIXED RESISTOR

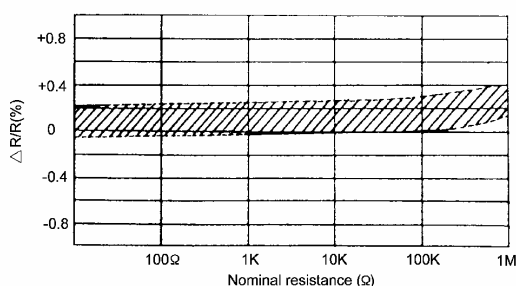
Data Sheet:

SEL-RGD-1002(2)

6. PERFORMANCE SPECIFICATIONS

Characteristics	Limits	Test Methods															
Temperature coefficient JIS-C 5202 5.2	Within the temperature coefficient specified below	Natural resistance change per temp. degree centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (ppm/}^\circ\text{C)}$ R ₁ : Resistance value at room temperature (t ₁) R ₂ : Resistance value at room temp. plus 100°C (t ₂) Test Pattern: Room temp., Room temp. + 100°C															
	Max. T: C. R. ± 25 ppm/°C ± 100 ppm/°C ± 25 ppm/°C ± 200 ppm/°C ± 50 ppm/°C																
Dielectric withstanding voltage JIS-C-5202 5.7	No evidence of flashover, mechanical damage, arcing or insulation breakdown.	Resistor shall be clamped in the trough of a 90° metallic V-block and shall be tested at AC potential respectively specified in the above list for 60+10/-0 seconds.															
Temperature cycling JIS-C-5202 7.4	Resistance change rate is ± (1% + 0.05Ω) Max. with no evidence of mechanical damage.	Resistance change after continuous five cycles for duty cycle specified below.															
		<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55°C ± 3°C</td> <td>30 minutes</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>10 – 15 minutes</td> </tr> <tr> <td>3</td> <td>+155°C ± 2°C</td> <td>30 minutes</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>10 – 15 minutes</td> </tr> </tbody> </table>	Step	Temperature	Time	1	-55°C ± 3°C	30 minutes	2	Room temp.	10 – 15 minutes	3	+155°C ± 2°C	30 minutes	4	Room temp.	10 – 15 minutes
		Step	Temperature	Time													
		1	-55°C ± 3°C	30 minutes													
		2	Room temp.	10 – 15 minutes													
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4	Room temp.	10 – 15 minutes															
Temporary resistance change after a 240 hours exposure in a humidity test chamber controlled at 40°C ±2°C and at 90 to 95% relative humidity.																	
Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.																	
Resistance change after 10,000 cycles (1 second "ON", 25 seconds "OFF") at 4 times RCWV.																	
Load life in humidity JIS-C-5202 7.9	Resistance change rate is ± (5% + 0.05Ω) Max. with no evidence of mechanical damage.	Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity test chamber controlled at 40°C ± 2°C and at 90 to 95% relative humidity.															
		Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of 1.5 hours "on", 0.5 hour "off" at 70°C ±2°C ambient temperature.															
Load life JIS-C-5202 7.10	Resistance change rate is ± (5% + 0.05Ω) Max. with no evidence of mechanical damage.	Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of 1.5 hours "on", 0.5 hour "off" at 70°C ±2°C ambient temperature.															
Terminal strength JIS-C-5202 6.1	With no evidence of mechanical damage	Direct load: Resistance to a 2.5kg direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads. Twist test: Terminal leads shall be bent through 90° at a point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations.															
Solderability JIS-C-5202 6.5	95% coverage Min.	The area covered total with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temp. of solder: 235°C ± 5°C Dwell time in solder: 3 + 0.5/-0 seconds															
Resistance to solvent JIS-C-5202 6.9	No deterioration of protective coatings and markings	Specimens shall be immersed in a bath of trichloroethane completely for 3 minutes with ultrasonic.															

Load Life



Derating Curve

