



# SOLITRONICS ENGINEERING LTD.

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## RESISTOR SPECIFICATIONS

Date: 19<sup>th</sup> June, 1997

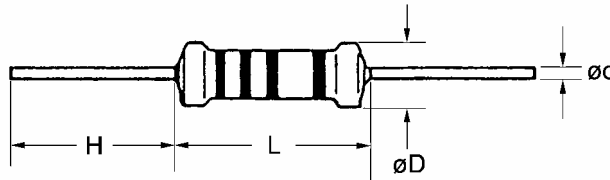
### WELDABLE-LEAD CARBON FILM FIXED RESISTOR

Data Sheet:  
**SEL-RGD-1003-(1)**

#### 1. FEATURES

- Weldable-Leads
- High quality at competitive prices
- Meet JIS-C-5202 & USA MIL-R-22684B specifications
- Flame retardant type available on request
- Automatically insertable, also available pre-cut and formed for Panasert/Avisert
- Can be bulk-packed, tape/box or tape/reel
- Resistor with special weldable-leads and 38mm lead length available on request
- Too low or too high ohmic value can be supplied only case by case
- Tolerance available:  $\pm 5\%$ ,  $\pm 2\%$ ,  $\pm 1\%$

#### 2. DIMENSION



##### Sub-Miniature-Size Resistor

Style	Dimension (mm)				
	Rating	L	D	d <sup>+0.02</sup> / <sub>-0.02</sub>	H $\pm 3$
CP-12	1/8W	3.5 $\pm$ 0.2	1.5 $\pm$ 0.2	0.50 $\emptyset$	28 $\pm$ 3.0
CP-12S	1/6W	3.5 $\pm$ 0.2	1.5 $\pm$ 0.2	0.50 $\emptyset$	28 $\pm$ 3.0
CP-25S	1/4W	3.5 $\pm$ 0.5	1.5 $\pm$ 0.2	0.50 $\emptyset$	28 $\pm$ 3.0
CP-25	1/4W	6.5 $\pm$ 0.5	2.5 Max.	0.50 $\emptyset$	28 $\pm$ 3.0
CP-25-38	1/4W	6.5 $\pm$ 0.5	2.5 Max.	0.50 $\emptyset$	38 $\pm$ 3.0

##### Miniature-Size Resistor

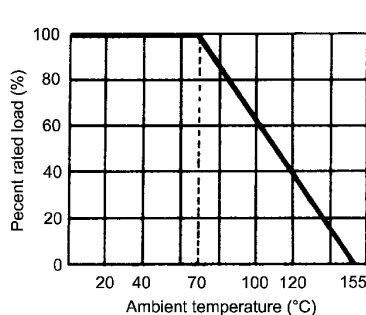
Style	Dimension (mm)				
	Rating	L	D	d <sup>+0.02</sup> / <sub>-0.02</sub>	H $\pm 3$
CP-33S	1/3W	6.5 $\pm$ 0.5	2.5 Max.	0.50 $\emptyset$	28 $\pm$ 3.0
CP-33S-38	1/3W	6.5 $\pm$ 0.5	2.5 Max.	0.50 $\emptyset$	38 $\pm$ 3.0
CP-33	1/3W	9.0 $\pm$ 1.0	3.0 Max.	0.50 $\emptyset$	35 $\pm$ 3.0
CP-50S	1/2W	9.0 $\pm$ 1.0	3.0 Max.	0.50 $\emptyset$	35 $\pm$ 3.0

#### 3. VOLTAGE & RATING

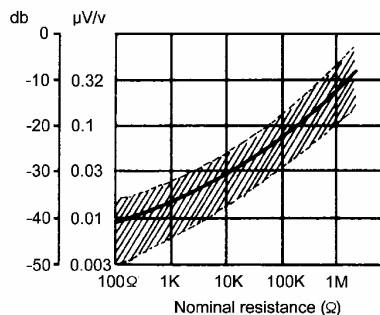
Style	Rating Wattage	Max. Working Voltage	Max. Overload Voltage	Resistance Range
CP-12	1/8W	200V	400V	1 $\Omega$ - 1Meg $\Omega$
CP-12S CP-25S CP-25	1/4W	250V	500V	1 $\Omega$ - 10Meg $\Omega$
CP-33 CP-33S	1/3W	300V	600V	1 $\Omega$ - 10Meg $\Omega$
CR-50-S	1/2W	350V	700V	1 $\Omega$ - 10Meg $\Omega$

#### 4. OTHER PHYSICAL PROPERTIES

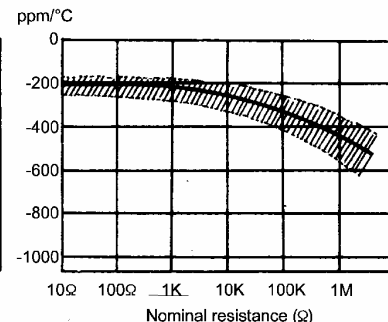
Derating Curve



Current Noise



Temp Coefficient





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## RESISTOR SPECIFICATIONS

Date: 19<sup>th</sup> June, 1997

### WELDABLE-LEAD CARBON FILM FIXED RESISTOR

Data Sheet:

**SEL-RGD-1003-(2)**

#### 5. PERFORMANCE SPECIFICATION

Characteristics	Limits		Test Methods															
	RANGE	T.C.R.																
T.C.R. JIS-C 5202 5.2	1E – 91K 100K – 1M 1.1M – 10M	0 – -450ppm/°C 0 – -700ppm/°C -800 – -1500ppm/°C	Natural resistance change per temp. degree centigrade.  $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (ppm/°C)}$ R <sub>1</sub> : Resistance value at room temperature (t <sub>1</sub> ) R <sub>2</sub> : Resistance value at room temp. plus 100°C (t <sub>2</sub> ) Test Pattern: Room temp., Room temp. + 100°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																
3	+155°C ± 2°C	30 minutes																
4	Room temp.	10 – 15 minutes																
Short-time overload JIS-C-5202 5.5	Resistance change rate is ± (1% + 0.05Ω) Max. with no evidence of mechanical damage.		Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.															
Load Life in humidity JIS-C-5202 5.9	Resistance value		Resistance change after 1,000 hours operating at RCWV with duty cycle of 1.5 hours "on", 0.5 hour "off" in a humidity test chamber controlled at 40°C ± 2°C and 90 to 95% relative humidity.															
	Normal type	Less than 100KΩ		ΔR/R ± 3%														
		100KΩ or more		± 5%														
	Flame retardant type	Less than 100K		± 5%														
100KΩ or more		± 10%																
Load life JIS-C-5202 7.10	Resistance value		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% ambient.															
	Normal type	Less than 56KΩ		± 2%														
		56KΩ or more		± 3%														
	Flame retardant type	Less than 100K		± 5%														
100KΩ or more		± 10%																
Insulation resistance JIS-C-5202 5.6	Insulation resistance is 10,000 MΩ Min.		Resistors shall be clamped in the trough of 90° metallic V-block and shall be tested at DC. potential respectively specified in the above list for 60 +10/-0 seconds.															
Terminal strength JIS-C-5202 6.1	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.															
Resistance to soldering heat JIS-C-5202 6.4	Resistance change rate is ± (1% + 0.05Ω) Max. with no evidence of mechanical damage.		Permanent resistance change when leads immersed to 3.2 – 4.8mm from the body in 350°C ± 10°C solder for 3 ± 0.5 seconds.															
Solderability JIS-C-5202 6.5	95% coverage Min.		The area covered 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															