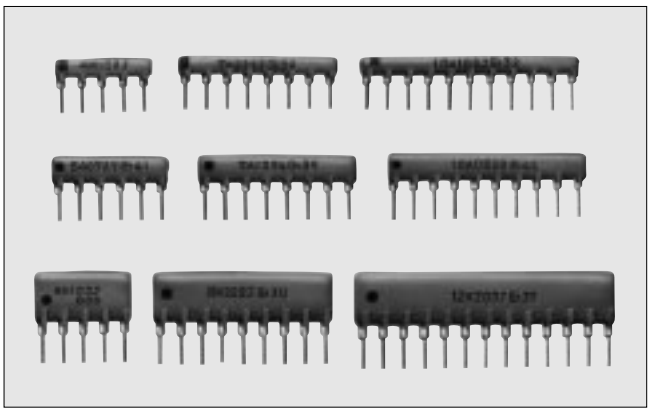
SIP Resistor Network

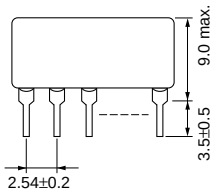
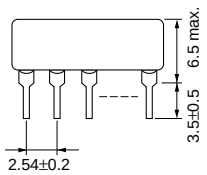
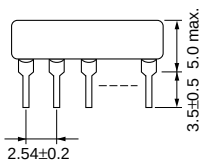
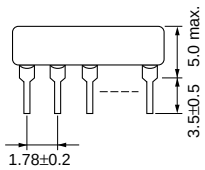
Custom Resistor Network Series

■Features

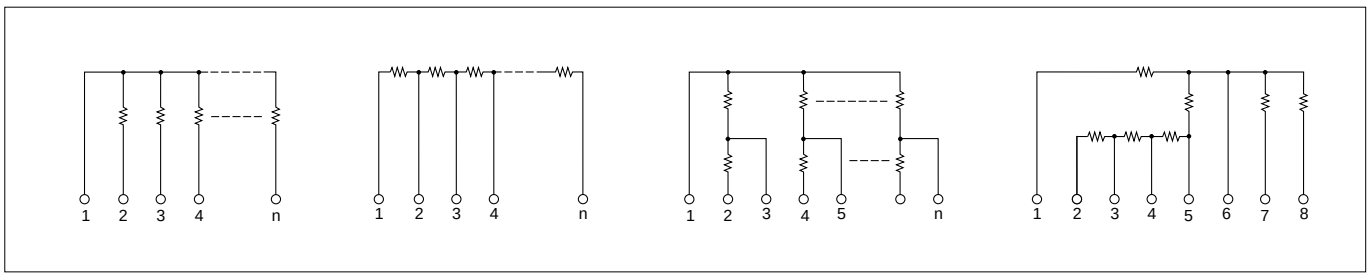
1. The profiles of custom resistor network series products range from high profile (9.0mm) to low profile (5.0mm). All R-network needs can be accommodated.
2. High accuracy performance on resistance tolerance, temperature coefficient etc, is available with high technology and high grade materials.
3. Also, on the relative precision of the performance between resistor elements, the high accuracy is available.



■Standard Series

Series Name	RGHD Series	RGSD Series	RGLD Series	RGLE Series
Dimensions (in mm)				
Standard No. of pins	4 to 14	4 to 14	4 to 14	4 to 16

■Example Custom Circuits

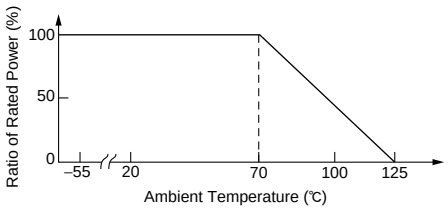


■Rating

	RGHD Series	RGSD Series	RGLD Series	RGLE Series
Power Rating Each Resistor *1	to 1/2W	to 1/4W		to 1/8W
Total Rated Power *1	1/5×(Number of pins-1)W	1/8×(Number of pins-1)W		1/16×(Number of pins-1)W
Rated Voltage *2	Rated voltage (V) $=\sqrt{\text{Power rating (W)} \times \text{Nominal resistance value (Ω)}}$			
Resistance Range	10Ω to 10MΩ			
Resistance Tolerance	D : ±0.5%,(100Ω to 100kΩ), F : ±1%,(47Ω to 220kΩ), ±2% (22Ω Over), J : ±5%			
Resistance Value Ratio	±0.5%, ±1%, ±2% (Per customer's specifications)			
Temp.Coeff.of Resistance	±200ppm/°C (±100ppm/°C is also available)			
Max. Operating Voltage	to 500V			
Operating Temperature	−55 to +125°C			

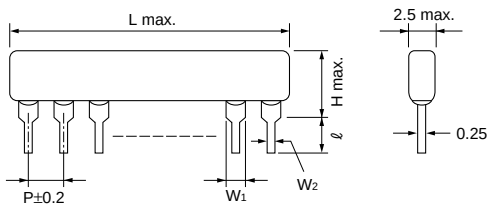
*1 Derating Curve

The rated power per element and the total rated power are derated according to the following curve.



*2 When rated voltage exceeds the max. operating voltage, the max. operating voltage shall be regarded as the rated voltage.

■Dimensions



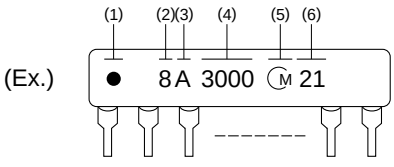
Dimension \ Series	RGHD	RGSD	RGLD	RGLE
H	9.0	6.5	5.0	5.0
ℓ	3.5±0.5			

Series \ Dimension	P	W1	W2
RGLE	1.78	1.0	0.4
Others	2.54	1.2	0.5

Series \ Number of Pins		4	5	6	7	8	9	10	11	12	13	14	15	16
L	RGLE	7.7	9.5	11.2	12.9	14.6	16.4	18.2	20.0	21.8	23.5	25.3	27.1	28.9
	Others	10.1	12.6	15.1	17.6	20.2	22.7	25.3	27.8	30.5	33.0	35.5	—	—

(in mm)

■Marking



(1) Pin 1 identification
(2) Number of Resistors
(3) Type (Circuit) Designation
(4) Murata's design No.
(5) Manufacturer's Code
(6) Date Code (Year, Month)

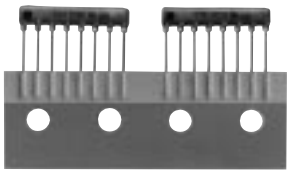
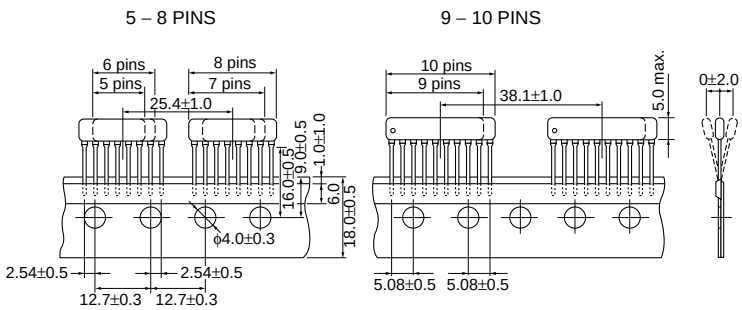
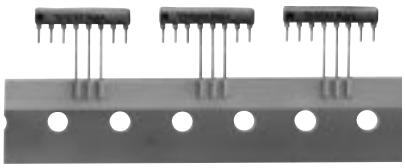
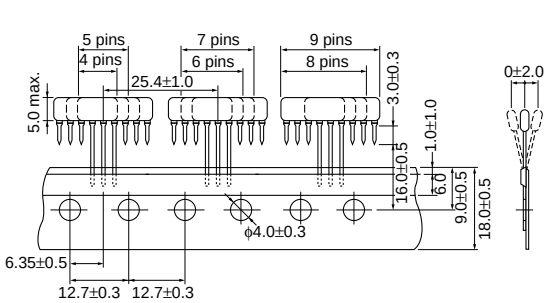
Performance and Test Method

<table>
<tr><th colspan="2">Test Item</th><th>Performance</th><th>Test Method</th></tr>
<tr><td colspan="2">DC Resistance value</td><td>Within the specified Value</td><td>Based on JIS C 5202 5.1. Maximum applied voltage is shown in the table below.
<table>
<tr><th>Nominal Resistance Range(Ω)</th><th>Max. Applied Voltage (V)</th></tr>
<tr><td><100</td><td>0.3</td></tr>
<tr><td>100≦R<1k</td><td>1</td></tr>
<tr><td>1k≦R<10k</td><td>3</td></tr>
<tr><td>10k≦R<100k</td><td>10</td></tr>
<tr><td>100k≦R<1M</td><td>25</td></tr>
<tr><td>≧1M</td><td>50</td></tr>
</table></td></tr>
<tr><td colspan="2">Temperature Coefficient of Resistance</td><td>Within ±200ppm/℃</td><td>Based on JIS C 5202 5.2. Measure after maintaining for over 30 minutes at each stage shown in the table below, Calculation shall be made with the formula shown below.
<table>
<tr><th>Stage</th><th>Temp.°C</th><th>Remarks</th></tr>
<tr><td>1</td><td>20^{+5}_{-1}</td><td>Standard temp. on low-temp. side</td></tr>
<tr><td>2</td><td>−55±3</td><td></td></tr>
<tr><td>3</td><td>20^{+5}_{-1}</td><td>Standard temp. on high-temp. side</td></tr>
<tr><td>4</td><td>125±3</td><td></td></tr>
</table>
R : Actual measured resistance value(Ω) at t ℃
R_0 : Actual measured resistance value(Ω) at t_0 ℃
t : Actual measured value of test temperature (℃)
t_0 : Actual measured value of standard temperature (℃)
$TCR(ppm/℃)=\frac{R-R_0}{R_0}\times\frac{1}{t-t_0}\times10^6$</td></tr>
<tr><td colspan="2">Short Time Overload</td><td>No noticeable abnormalities in appearance.
ΔR : Within ±1.0%</td><td>Apply 2.5 times the rated voltage for 5 seconds to each resistor in the network, one at a time. Maintain at room temperature for 30 minutes after remove the voltage, then measure.</td></tr>
<tr><td rowspan="2">Terminal Strength</td><td>Pull Test</td><td rowspan="2">There shall be no broken or loose pins.</td><td>Fix the sample body and apply a load of 10N gradually to the pin in the axial direction. Maintain the force for 10 seconds.</td></tr>
<tr><td>Bend Test</td><td>Bend the pin by 90° in the vertical direction and return to the previous position under applying a load of 5N. And repeat a similar operation in the opposite direction.</td></tr>
<tr><td colspan="2">Resistance to Soldering Heat</td><td>There shall be neither mechanical damage nor noticeable change in appearance.
ΔR : Within ±0.5%</td><td>Immerse the pin in melted solder at 260±5℃ up to the level of the seating plane of pin for 10±1 second and raise. Then maintain at room temperature for over 1 hour and measure.</td></tr>
<tr><td colspan="2">Solderability</td><td>Over 95% of the immersed part of the pins is covered with new solder.</td><td>Immerse the pin in a flux comprising methanol and resin (weight ratio 25%) up to the level of the seating plane of pin for 5−10seconds. Then, immerse in melted solder at 235±5℃ for 2±0.5 second and raise slowly.</td></tr>
<tr><td colspan="2">Temperature Cycling</td><td>There shall be no mechanical damage.
ΔR : Within ±0.5%</td><td>Based on JIS C 5202 7.4 After repeating the 5 cycles shown in the table below, maintain at room temperature for 1−2 hours, then measure.
<table>
<tr><th>Stage</th><th>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>Temp.(℃)</td><td>−55±3</td><td>Room Temp.</td><td>125±2</td><td>Room Temp.</td></tr>
<tr><td>Time (min.)</td><td>30</td><td>2 to 3</td><td>30</td><td>2 to 3</td></tr>
</table></td></tr>
<tr><td colspan="2">Humidity</td><td>There shall be no noticeable abnormalities in appearance.
ΔR : Within ±2.0%</td><td>Maintain without load at a constant temperature 40±2℃ and constant humidity of 90−95% for 1000^{+48}_{0} hours. Remove and maintain at room temperature for over 1 hour, then measure.</td></tr>
<tr><td colspan="2">Humidity Load</td><td>There shall be no noticeable abnormalities in appearance.
ΔR : Within ±2.0%</td><td>Apply the rated voltage intermittently, 1.5 hours on and 0.5 hours off in a chamber at a constant temperature of 40±2℃ and constant humidity of 90−95% for 1000^{+48}_{0} hours. Remove and maintain at room temperature for over 1 hour, then measure.</td></tr>
<tr><td colspan="2">Load Life</td><td>There shall be no noticeable abnormalities in appearance.
ΔR : Within ±2.0%</td><td>Apply the rated voltage intermittently, 1.5 hours on and 0.5 hours off in a high-temperature chamber at 70±3℃ for 1000^{+48}_{0} hours. Remove and maintain at room temperature for over 1 hour, then measure.</td></tr>
</table>

Packaging

1. R-networks are available in two types of taping : 3-pin taping and all-pin taping.
2. 3-pin taping type is applicable to automatic insertion equivalent to 5mm pitch radial taping parts. The tips of untaped terminals are shaped by a V-cut for high accuracy insertion.

■Taping Dimensions

Series	Taping Type Code	Taping Dimensions (in mm)
RGLD	T1	 
	T2	 

■Standard Ammo Pack Package Quantity

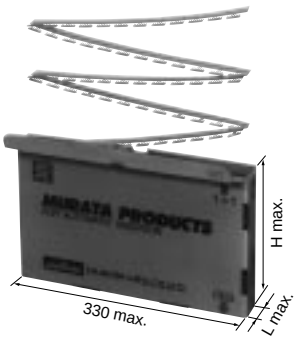
1000pcs./case

■Package and Marking

• H, L (Height and Length)

Type	Number of pins	H	L
T1	5 to 8	200	40
	9 to 10	290	
T2	4 to 9	210	45

(in mm)



■Minimum Quantity

1000pcs.

⚠Caution/Notice

■⚠Caution

Use within rated voltage

To avoid resistor burning or breakdown, do not use beyond the rated voltage calculated by taking the square root of the product or rated power and nominal resistance value.

■Notice

1. Handling after mounting to PCB

   Do not bend the product after mounting and soldering the product. If subjected to mechanical stress, the resistor may become damaged.

2. Confirmation of resistor operation in application

   Ensure proper performance of the product in your application.

3. Environmental conditions

   Do not use or store the product in locations containing corrosive gasses (Cl_2, H_2S, NH_3, SO_2, NO_X, etc.) or having such high humidity as will dew as the product's resin coating does not form a perfect seal.