



**THE DATASHEET OF  
RG1608P-4022-B-T5**



## Ultra precision 0.02%, 0.05%, 0.1%, 0.25%, 0.5%, tolerance Thin Film Chip Resistor



### FEATURES

- High Reliability and Excellent Stability at different environmental conditions
- Low noise, THIN FILM(NiCr) construction
- EIA Standard case size(0402, 0603, 0805, 1206)
- RoHS Compliance and 100% Lead-Free (Matte Sn termination finished)

### APPLICATIONS

- Automotive
- Test & Measurement
- Optical & Telecommunication
- Medical and Industrial Equipment

## Electrical Specification

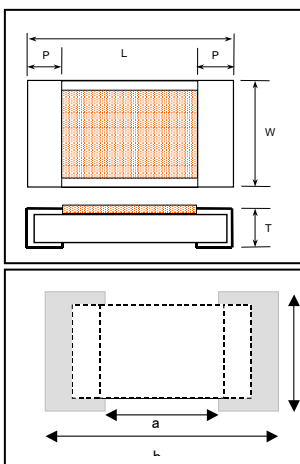
| Type       | Size      | Power Rating ar 85 °C |                    |                    | Resistance Tolerance (Code) | Resistance Range (ohm) | Temperature Coefficient (Code) |              | Max. operating Voltage | Resistance Values (E-series) |
|------------|-----------|-----------------------|--------------------|--------------------|-----------------------------|------------------------|--------------------------------|--------------|------------------------|------------------------------|
|            |           | Low (ultra precision) | Regular            | High               |                             |                        | (ohm)                          | (ppm/°C)     |                        |                              |
| RG1005     | 0402      | 0.032W                | 0.063W             | 0.125W             | ±0.5% (D)                   | 10-100K                | 10-46.4                        | 100(R)       | 25V                    | E-24, E-96                   |
|            |           |                       |                    |                    |                             |                        | 47-100K                        | 25(P), 10(N) |                        |                              |
|            |           |                       |                    |                    |                             |                        | 100-2.94K                      | 5(V)         |                        |                              |
|            |           |                       |                    |                    | ±0.25% (C)                  | 47-100K                | 47-100K                        | 25(P), 10(N) |                        |                              |
|            |           |                       |                    |                    |                             |                        | 100-2.94K                      | 5(V)         |                        |                              |
| ±0.1% (B)  | 47-100K   | 47-100K               | 25(P), 10(N)       |                    |                             |                        |                                |              |                        |                              |
| ±0.05% (W) |           | 100-2.94K             | 5(V)               |                    |                             |                        |                                |              |                        |                              |
| ±0.02% (V) | 100-2.94K | 100-2.94K             | 25(P), 10(N), 5(V) |                    |                             |                        |                                |              |                        |                              |
| RG1608     | 0603      | 0.063W                | 0.1W               | 0.166W             | ±0.5% (D)                   | 10-360K                | 10-46.4                        | 50(Q)        | 75V                    | E-24, E-96                   |
|            |           |                       |                    |                    |                             |                        | 47-360K                        | 25(P)        |                        |                              |
|            |           |                       |                    |                    |                             |                        | 47-274K                        | 10(N)        |                        |                              |
|            |           |                       |                    |                    | ±0.25% (C)                  | 47-274K                | 47-274K                        | 25(P), 10(N) |                        |                              |
|            |           |                       |                    |                    |                             |                        | 100-4.99K                      | 5(V)         |                        |                              |
| ±0.1% (B)  | 47-332K   | 47-332K               | 25(P)              |                    |                             |                        |                                |              |                        |                              |
|            |           | 47-274K               | 10(N)              |                    |                             |                        |                                |              |                        |                              |
| ±0.05% (W) | 47-332K   | 100-4.99K             | 5(V)               |                    |                             |                        |                                |              |                        |                              |
| ±0.02% (V) |           | 100-4.99K             | 100-4.99K          | 25(P), 10(N), 5(V) |                             |                        |                                |              |                        |                              |
| RG2012     | 0805      | 0.1W                  | 0.125W             | 0.25W              | ±0.5% (D)                   | 10-1M                  | 10-46.4                        | 50(Q)        | 100V                   | E-24, E-96                   |
|            |           |                       |                    |                    |                             |                        | 47-1M                          | 25(P)        |                        |                              |
|            |           |                       |                    |                    |                             |                        | 47-475K                        | 10(N)        |                        |                              |
|            |           |                       |                    |                    | ±0.25% (C)                  | 47-1M                  | 47-1M                          | 25(P), 10(N) |                        |                              |
|            |           |                       |                    |                    |                             |                        | 100-10K                        | 5(V)         |                        |                              |
| ±0.1% (B)  | 47-1M     | 47-1M                 | 25(P)              |                    |                             |                        |                                |              |                        |                              |
|            |           | 47-475K               | 10(N)              |                    |                             |                        |                                |              |                        |                              |
| ±0.05% (W) | 47-475K   | 100-10K               | 5(V)               |                    |                             |                        |                                |              |                        |                              |
|            |           | 47-475K               | 25(P)              |                    |                             |                        |                                |              |                        |                              |
| ±0.02% (V) | 100-10K   | 47-475K               | 10(N)              |                    |                             |                        |                                |              |                        |                              |
|            |           | 100-10K               | 5(V)               |                    |                             |                        |                                |              |                        |                              |
| RG3216     | 1206      | 0.125W                | 0.25W              |                    | ±0.5% (D)                   | 47-1M                  | 10-46.4                        | 50(Q)        | 150V                   | E-24, E-96                   |
|            |           |                       |                    |                    |                             |                        | 10-1M                          | 25(P), 10(N) |                        |                              |
|            |           |                       |                    |                    |                             |                        | 100-33.2K                      | 5(V)         |                        |                              |
|            |           |                       |                    |                    | ±0.25% (C)                  | 47-1M                  | 47-1M                          | 25(P), 10(N) |                        |                              |
|            |           |                       |                    |                    |                             |                        | 100-33.2K                      | 5(V)         |                        |                              |
| ±0.1% (B)  | 47-1M     | 47-1M                 | 25(P), 10(N)       |                    |                             |                        |                                |              |                        |                              |
|            |           | 100-33.2K             | 5(V)               |                    |                             |                        |                                |              |                        |                              |
| ±0.05% (W) | 47-1M     | 47-1M                 | 25(P), 10(N)       |                    |                             |                        |                                |              |                        |                              |
|            |           | 100-33.2K             | 5(V)               |                    |                             |                        |                                |              |                        |                              |
| ±0.02% (V) | 100-33.2K | 100-33.2K             | 25(P), 10(N), 5(V) |                    |                             |                        |                                |              |                        |                              |

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Thin Film Chip Resistor

Performance

| Item                      | Test Method   | Specification: drift limits for each power rating |        |         |        |      |        | (Typical) |
|---------------------------|---|---|--------|---------|--------|------|--------|-----------|
|                           |   | Low   |        | Regular |        | High |        |           |
|                           |   | ≤47Ω  | ≥47Ω   | ≤47Ω    | ≥47Ω   | ≤47Ω | ≥47Ω   |           |
| Short time Overload       | Applied voltage : 2.5 times. Test duration: 5 seconds. (When maximum operating voltage: 2 times or less)                                  | ±0.10%  | ±0.05% | ±0.10%  | ±0.05% | -    | ±0.10% | ±(0.01%)  |
| Load Life                 | Test temperature : 85°C (When high voltage : 70°C). Applied voltage : rated voltage. Repeat 1000 hours as follow : 90 mins on/30mins off. | ±0.25%  | ±0.10% | ±0.50%  | ±0.25% | -    | ±0.50% | ±(0.01%)  |
| Moisture load life        | Test condition: 85°C, 85% RH. Applied power : 1/10 rated power. Repeat 1000 hours as follow : 90 mins on/30mins off.                      | ±0.25%  | ±0.10% | ±0.50%  | ±0.25% | -    | ±0.50% | ±(0.05%)  |
| Temperature Cycle         | Repeat 1000 cycle as follow :<br>-55°C (30 min.)/Room Temp.(2 min.) / +125°C (30min.)/Room Temp.(2min.)                                   | ±0.25%  | ±0.10% | ±0.25%  | ±0.10% | -    | ±0.10% | ±(0.01%)  |
| High temperature Exposure | +155°C for 1000 hours with no load  | ±0.25%  | ±0.10% | ±0.25%  | ±0.10% | -    | ±0.10% | ±(0.01%)  |

Dimensions & Footprints



Dimensions inch (mm)

|         | L                           | W                           | P                          | T                            |
|---------|-----------------------------|-----------------------------|----------------------------|------------------------------|
| RG 1005 | .040 ± .002<br>(1.0 ± 0.05) | .020 ± .002<br>(0.5 ± 0.05) | .008 ± .004<br>(0.2 ± 0.1) | .014 ± .002<br>(0.35 ± 0.05) |
| RG 1608 | .063 ± .008<br>(1.6 ± 0.2)  | .031 ± .008<br>(0.8 ± 0.2)  | .012 ± .008<br>(0.3 ± 0.2) | 0.016 ± .004<br>(0.4 ± 0.1)  |
| RG 2012 | .079 ± .008<br>(2.0 ± 0.2)  | .049 ± .008<br>(1.25 ± 0.2) | .016 ± .008<br>(0.4 ± 0.2) | 0.016 ± .004<br>(0.4 ± 0.1)  |
| RG 3216 | .126 ± .008<br>(3.2 ± 0.2)  | .063 ± .008<br>(1.6 ± 0.2)  | .02 ± .01<br>(0.5 ± 0.25)  | 0.016 ± .004<br>(0.4 ± 0.1)  |

Dimensions (mm)

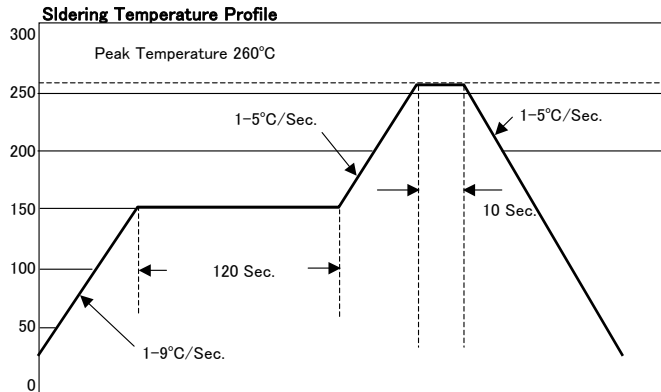
|         | a   | b   | c   |
|---------|-----|-----|-----|
| RG 1005 | 0.5 | 1.6 | 0.6 |
| RG 1608 | 1.0 | 3.0 | 1.2 |
| RG 2012 | 1.2 | 4.0 | 1.7 |
| RG 3216 | 2.0 | 5.0 | 2.0 |

Power Derating Curve

:For operation above 85degC, power rating must be derated according to the following chart



Recommended Reflow Curve



Ordering information

|      |                              |  |   |  |   |   |   |                    |
|------|------------------------------|--|---|--|---|---|---|--------------------|
| RG   | 1608                         | N  | - | 104  | - | W   | - | T5                 |
| TYPE | Size                         | TCR  |   | R-Values   |   | Tolerance   |   | Package            |
|      | 1005<br>1608<br>2012<br>3216 | V=5ppm/°C<br>N=10ppm/°C<br>P=25ppm/°C<br>Q=50ppm/°C<br>R=100ppm/°C |   | 3 digits for E24 series<br>(Ex.104=100K ohm)<br>4 digits for E96 series<br>(Ex.4992=49.9K ohm) |   | P=0.02%<br>W=0.05%<br>B=0.1%<br>C=0.25%<br>D=0.5% |   | T1=1000<br>T5=5000 |

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Reliability Test Data

●Moisture and life test (THB 85°C 85%)



●Load life test (85°C)



●Temperature cycle test

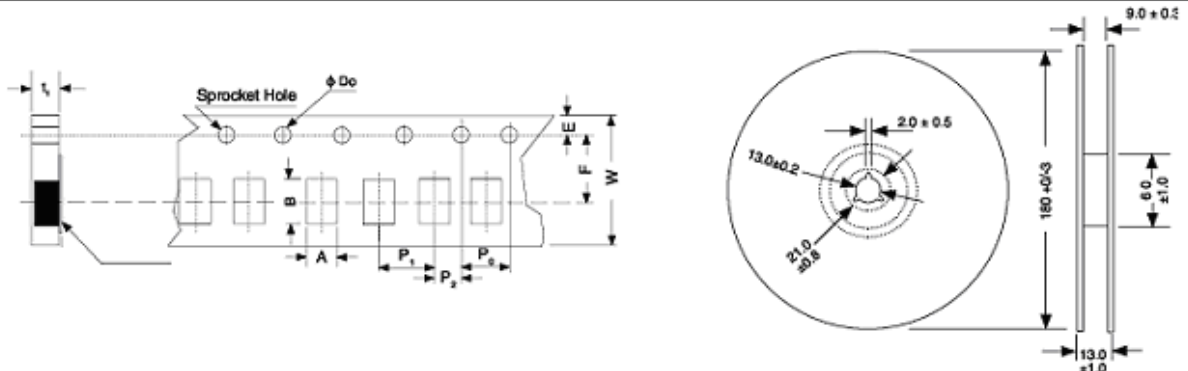


●High temperature expose test (155°C)





Tape & Reel Dimensions (mm)

| Type   | A           | B           | E          | F          | W         | P <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | t <sub>1</sub> |
|--------|-------------|-------------|------------|------------|-----------|----------------|----------------|----------------|----------------|
| RG1005 | 0.63 ± 0.05 | 1.13 ± 0.05 | 1.75 ± 0.1 | 3.5 ± 0.05 | 8.0 ± 0.3 | 4.0 ± 0.1      | 2.0 ± 0.05     | 2.0 ± 0.05     | 0.43 ± 0.05    |
| RG1608 | 1.1 ± 0.1   | 1.9 ± 0.1   |            |            |           |                | 4.0 ± 0.1      |                | 0.6 ± 0.05     |
| RG2012 | 1.65 ± 0.2  | 2.4 ± 0.2   |            |            |           |                | 4.0 ± 0.1      |                | 0.75 ± 0.05    |
| RG3216 | 1.9 ± 0.1   | 3.5 ± 0.1   |            |            |           |                | 4.0 ± 0.1      |                | 1.0 ± 0.2      |



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