



**THE DATASHEET OF  
RG2012N-4023-D-T5**



# Metal thin film chip resistors (the highest precision)

■ RG series

AEC-Q200 Compliant

## Features

- Long term stability with inorganic passivation
- Less than  $\pm 0.1\%$  drift after 10000 hours of reliability test
- High precision resistance tolerance:  $\pm 0.05\%$ , very small TCR:  $\pm 5\text{ppm}/^\circ\text{C}$
- Thin film structure enabling low noise and anti-sulfur

## Applications

- Automotive electronics
- Industrial measurement instrumentation, industrial machines
- Various sensors, medical electronics



Thin film surface mount resistors



## ◆ Part numbering system

**RG 1608 N - 102 - B - T5**

Series code

Size: RG0603, RG1005, RG1608, RG2012, RG3216

Temperature coefficient of resistance

Packaging quantity:  
T5(5,000pcs), T10(10,000pcs)

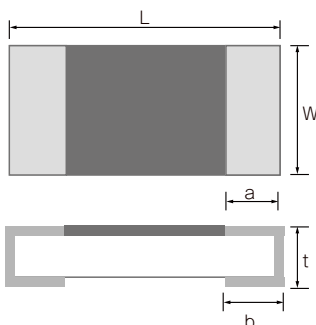
Resistance tolerance

Nominal resistance value  
(E-24: 3 digit, E-96: 4 digit, RG3216: all 4 digit)

## ◆ Electrical Specification

Type	Power ratings			Temperature coefficient of resistance (ppm/ $^\circ\text{C}$ )	Resistance range ( $\Omega$ ) Resistance tolerance (%)			Maximum voltage	Resistance value series	Operating temperature	Pakaging quantity
	Low	Regular	High		$\pm 0.05\%$ (W)	$\pm 0.1\%$ (B)	$\pm 0.5\%$ (D)				
RG0603	1/20W	1/16W	—	$\pm 10$ (N)	—	$100 \leq R \leq 22\text{k}$		30V	E-24, E-96	$-55^\circ\text{C} \sim 155^\circ\text{C}$	T10
				$\pm 25$ (P)							
				$\pm 50$ (Q)		$47 \leq R \leq 56\text{k}$					
				$\pm 100$ (R)		$10 \leq R < 47$					
RG1005	1/32W	1/16W	1/8W	$\pm 5$ (V)	$100 \leq R < 3\text{k}$		75V	E-24, E-96	$-55^\circ\text{C} \sim 155^\circ\text{C}$	T5 T10	
				$\pm 10$ (N)	$47 \leq R \leq 100\text{k}$						
				$\pm 25$ (P)	$47 \leq R \leq 150\text{k}$						
				$\pm 100$ (R)	—	—					$10 \leq R < 47$
RG1608	1/16W	1/10W	1/6W	$\pm 5$ (V)	$100 \leq R < 5.1\text{k}$		100V	E-24, E-96	$-55^\circ\text{C} \sim 155^\circ\text{C}$	T5	
				$\pm 10$ (N)	$47 \leq R \leq 274\text{k}$						
				$\pm 25$ (P)	$47 \leq R \leq 274\text{k}$	$47 \leq R \leq 1\text{M}$					
				$\pm 50$ (Q)	—	—					$10 \leq R < 47$
RG2012	1/10W	1/8W	1/4W	$\pm 5$ (V)	$100 \leq R < 10.2\text{k}$		150V	E-24, E-96	$-55^\circ\text{C} \sim 155^\circ\text{C}$	T5	
				$\pm 10$ (N)	$47 \leq R \leq 475\text{k}$						
				$\pm 25$ (P)	$47 \leq R \leq 475\text{k}$	$47 \leq R \leq 2.7\text{M}$					
				$\pm 50$ (Q)	—	—					$10 \leq R < 47$
RG3216	1/8W	1/4W	—	$\pm 5$ (V)	$100 \leq R \leq 33.2\text{k}$		200V	E-24, E-96	$-55^\circ\text{C} \sim 155^\circ\text{C}$	T5	
				$\pm 10$ (N)	$47 \leq R \leq 1\text{M}$						
				$\pm 25$ (P)	$47 \leq R \leq 5.1\text{M}$						
				$\pm 50$ (Q)	—	—					$10 \leq R < 47$

## ◆ Dimensions



Type	Size (inch)	L	W	a	b	t
RG0603	0201	$0.60 \pm 0.05$	$0.30 \pm 0.05$	$0.13 \pm 0.05$	$0.15 \pm 0.05$	$0.23 \pm 0.03$
RG1005	0402	$1.0 \pm 0.05$	$0.50 \pm 0.05$	$0.20 \pm 0.10$	$0.25 \pm 0.05$	$0.35 \pm 0.05$
RG1608	0603	$1.60 \pm 0.20$	$0.80 \pm 0.20$	$0.30 \pm 0.20$	$0.30 \pm 0.20$	$0.40 \pm 0.10$
RG2012	0805	$2.00 \pm 0.20$	$1.25 \pm 0.20$	$0.40 \pm 0.20$	$0.40 \pm 0.20$	$0.40 \pm 0.10$
RG3216	1206	$3.20 \pm 0.20$	$1.60 \pm 0.20$	$0.50 \pm 0.25$	$0.50 \pm 0.20$	$0.40 \pm 0.10$

(unit : mm)

### ◆ Reliability specification

Test Items	Condition (test methods)	Low		Regular		High		Typical
		≤47Ω	≥47Ω	≤47Ω	≥47Ω	≤47Ω	≥47Ω	Low
Short time overload	2.5 x rated voltage, *1 5 seconds	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	—	±(0.05%+0.01Ω)	±(0.01%)
Life (biased)	70°C, rated voltage, *1 90min on 30min off, 1000hours	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	±(0.5%+0.05Ω)	±(0.25%+0.05Ω)	—	±(0.5%+0.01Ω)	±(0.01%)
High temperature high humidity	85°C, 85%RH, 1/10 of rated power, 90min on 30min off, 1000hours	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	±(0.5%+0.05Ω)	±(0.25%+0.05Ω)	—	±(0.5%+0.01Ω)	±(0.05%)
Temperature shock	-55°C (30min) ~ 125°C (30min) 1000cycles	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	—	±(0.1%+0.01Ω)	±(0.01%)
High temperature exposure	155°C, no bias, 1000hours	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)	—	±(0.1%+0.01Ω)	±(0.01%)
Resistance to soldering heat	260±5°C, 10 seconds (reflow)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	±(0.05%+0.01Ω)	—	±(0.05%+0.01Ω)	±(0.01%)

\*1 Rated voltage is given by  $E = \sqrt{R \times P}$  E= rated voltage (V), R=nominal resistance value(Ω), P=rated power(W)  
If rated voltage exceeds maximum voltage /element, maximum voltage/element is the rated voltage.

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RG series

### ◆ 10000 hour reliability test data

#### ○ Biased life test



#### ○ High temperature high humidity (biased)



#### ○ Temperature shock



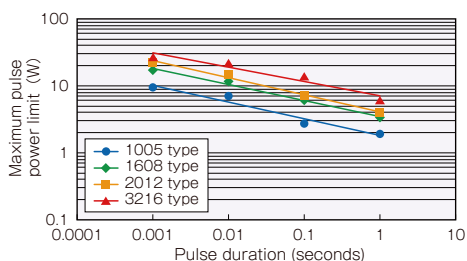
#### ○ High temperature exposure



### ◆ Derating Curve



### ◆ Maximum pulse power limit





#### Test procedure

Voltage pulse is applied to the test samples mounted on the test board.  
After each pulse, resistance drift is measured. Pulse voltage is increased until the drift exceeds +/-0.5%.  
The power at that voltage is defined as the maximum pulse power.

## Looking for pricing, stock, or lifecycle information?

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