

Non-magnetic metal thin film chip resistors

NRG series

Features

- Thin film chip resistors using non-magnetic materials
- Long term stability with inorganic passivation
- 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

- Medical electronics, industrial measurement instrumentation
- equipment/devices under magnetic field



Thin film surface mount resistors



NRG series

◆ Part numbering system

NRG 2012 V - 104 - W - T1

Series code

Size: NRG1608, NRG2012, NRG3216

Temperature coefficient of resistance

Packaging quantity:
T1(1,000pcs), T5(5,000pcs)

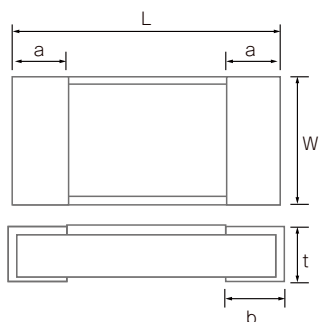
Resistance tolerance

Nominal resistance value
(E-24: 3 digit, E-96: 4 digit, NRG6432: all 4 digit)

◆ Electrical Specification

Type	Power ratings	Temperature coefficient of resistance (ppm/ $^\circ\text{C}$)	Resistance range(Ω) Resistance tolerance			Maximum voltage	Resistance value series	Operating temperature	Packaging quantity
			$\pm 0.05\%$ (W)	$\pm 0.1\%$ (B)	$\pm 0.5\%$ (D)				
NRG1608	1/10W	± 5 (V)	100 \leq R<5.1k			100V			
		± 10 (N)	47 \leq R \leq 270k						
		± 25 (P)	47 \leq R \leq 270k	47 \leq R \leq 332k	47 \leq R \leq 360k				
		± 50 (Q)	—	—	10 \leq R<47				
NRG2012	1/8W	± 5 (V)	100 \leq R<10.2k			150V	E-24,E-96	-55 $^\circ\text{C}$ ~ 155 $^\circ\text{C}$	T1 T5
		± 10 (N)	47 \leq R \leq 475k						
		± 25 (P)	47 \leq R \leq 475k	47 \leq R \leq 1M					
		± 50 (Q)	—	—	10 \leq R<47				
NRG3216	1/4W	± 5 (V)	100 \leq R<33.2k			200V			
		± 10 (N)	47 \leq R \leq 1M						
		± 25 (P)	47 \leq R \leq 1M						
		± 50 (Q)	—	—	10 \leq R<47				

◆ Dimensions



形名	L	W	a	b	t
NRG1608	1.60 \pm 0.20	0.80+0.25/-0.20	0.30 \pm 0.20	0.30 \pm 0.20	0.40+0.15/-0.10
NRG2012	2.00 \pm 0.20	1.25+0.25/-0.20	0.40 \pm 0.20	0.40 \pm 0.20	0.40+0.15/-0.10
NRG3216	3.20 \pm 0.20	1.60 \pm 0.25	0.50 \pm 0.25	0.50 \pm 0.20	0.40+0.15/-0.10

(unit : mm)

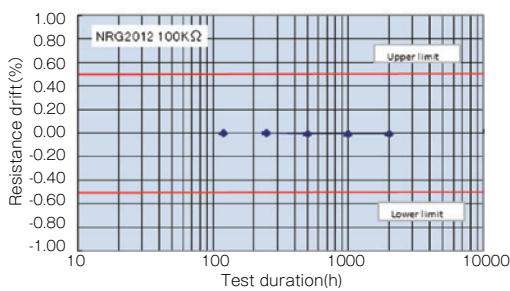
◆ Reliability specification

Test items	Condition (test methods (MIL-PRF-55342/JIS C5201-1))	Standard
Short time overload	2.5 x rated voltage, ^{*1} 5seconds	±0.5%
Life (biased)	70°C, rated voltage, ^{*1} 90min on 30min off, 2000hours	±0.5%
High temperature high humidity	85°C, 85%RH, 1/10 of rated power, 90min on 30min off, 2000hours	±0.5%
Temperature shock	-65°C (30min) ~ 150°C (30min) 100cycles	±0.5%
High temperature exposure	155°C, no bias, 1000hours	±0.5%
Resistance to soldering heat	260±5°C, 10 seconds (reflow)	±0.05%

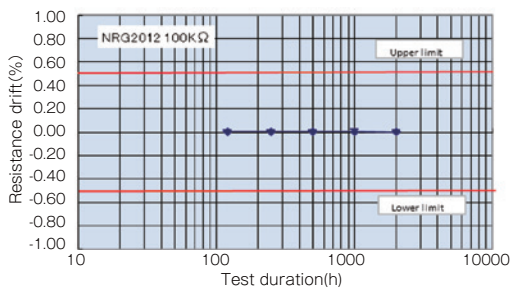
*1 Rated voltage is given by $E = \sqrt{R \times P}$ E= rated voltage (V), R=nominal resistance value(Ω), P=rated power(W)
If rated voltage exceeds maximum voltage /element, maximum voltage/element is the rated voltage.

◆ Reliability test data

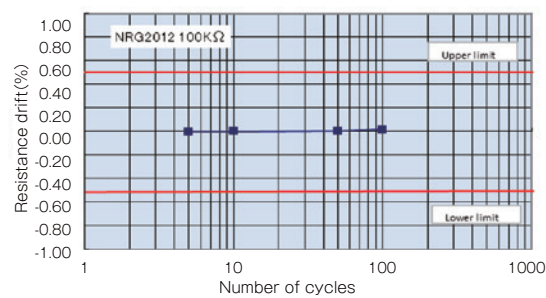
○ Biased life test



○ High temperature high humidity (biased)



○ Temperature shock



◆ Derating Curve

