



High power thin film chip resistors (short side terminal)

■HRG series

AEC-Q200 Compliant

Features

- Wider bottom terminal enabling higher power capability (short side terminal)
- Significantly larger power handling capability than existing same size resistors
Size: 3216, Power rating: 1.0W, Resistance range: 10 ~ 100K Ω
- Precision resistance tolerance: $\pm 0.1\%$, very small TCR: $\pm 25\text{ppm}/^\circ\text{C}$
- Thin film structure enabling low noise and anti-sulfur

Applications

- Power source related devises
- DC motors, inverters
- Robotics, Industrial control system

◆Part numbering system

HRG 3216 P - 1001 - B - T5

Series code

Size: HRG3216

Temperature coefficient of resistance

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

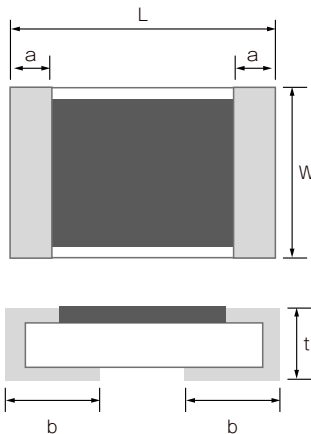
Resistance tolerance

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

◆Electrical Specification

Type	Power ratings	Temperature coefficient of resistance	Resistance range(Ω) Resistance tolerance		Maximum voltage	Resistance value series	Operating temperature	Packaging quantity
		(ppm/ $^\circ\text{C}$)	$\pm 0.1\%$ (B)	$\pm 0.5\%$ (D)				
HRG3216	1.0W	± 25 (P)	$47 \leq R \leq 100\text{k}$		200V	E-24, E-96	$-55^\circ\text{C} \sim 155^\circ\text{C}$	T1 T5
		± 50 (Q)	$47 \leq R \leq 100\text{k}$	$10 \leq R \leq 100\text{k}$				

◆Dimensions



Type	Size (inch)	L	W	a	b	t
HRG3216	1206	3.20 ± 0.20	1.60 ± 0.20	0.50 ± 0.25	1.10 ± 0.20	0.45 ± 0.10

(unit : mm)

◆ Reliability specification

Test items	Condition (test methods (JIS C5201-1))	Standard	
		$\leq 47\Omega$	$\geq 47\Omega$
Life (biased)	70°C, rated voltage,*1 90min on 30min off, 1000hours	$\pm(0.5\%+0.05\Omega)$	$\pm(0.25\%+0.01\Omega)$
High temperature high humidity	85°C, 85%RH, 1/10 of rated power, 90min on 30min off, 1000hours	$\pm(0.25\%+0.05\Omega)$	$\pm(0.1\%+0.01\Omega)$
Temperature shock	-55°C (30min) ~ 125°C (30min) 1000cycles	$\pm(0.25\%+0.05\Omega)$	$\pm(0.1\%+0.01\Omega)$
High temperature exposure	155°C, no bias, 1000hours	$\pm(0.25\%+0.05\Omega)$	$\pm(0.1\%+0.01\Omega)$
Resistance to soldering heat	260 $\pm$ 5°C, 10 seconds (reflow)	$\pm(0.25\%+0.05\Omega)$	$\pm(0.1\%+0.01\Omega)$

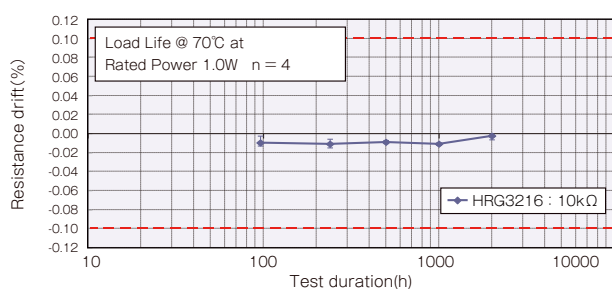
*1 Rated voltage is given by $E=\sqrt{R \times P}$

E= rated voltage (V), R=nominal resistance value(Ω), P=rated power(W)

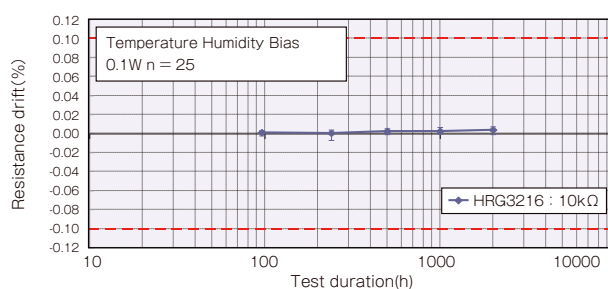
If rated voltage exceeds maximum voltage /element, maximum voltage/element is the rated voltage.

◆ Reliability test data

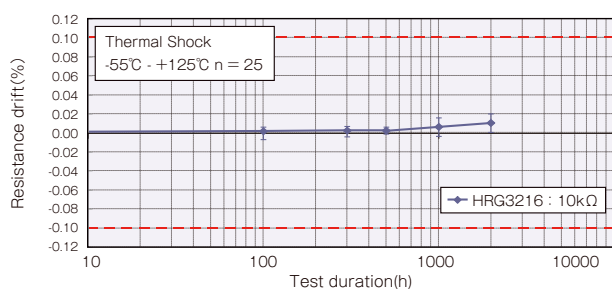
○ Biased life test



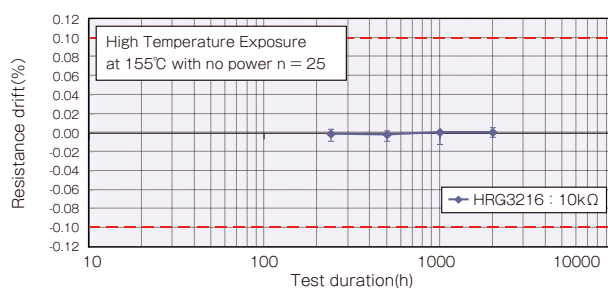
○ High temperature high humidity (biased)



○ Temperature shock



○ High temperature exposure



◆ Derating Curve

