

# 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 $\Omega$
- 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 devices
- DC motors, inverters
- Robotics, Industrial control system



Thin film surface mount resistors

HRG series

## ◆ 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)

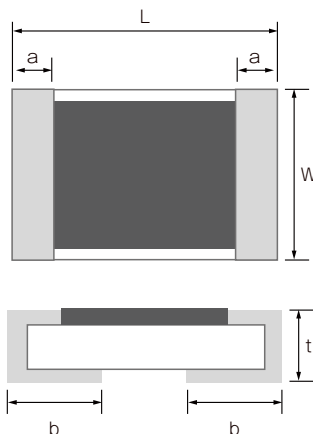
Resistance tolerance

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

## ◆ Electrical Specification

Type	Power ratings	Temperature coefficient of resistance (ppm/ $^\circ\text{C}$ )	Resistance range( $\Omega$ ) Resistance tolerance		Maximum voltage	Resistance value series	Operating temperature	Packaging quantity
			$\pm 0.1\%$ (B)	$\pm 0.5\%$ (D)				
HRG3216	1.0W	$\pm 25$ (P)	$47 \leq R \leq 100\text{k}$		200V	E-24, E-96	$-55^\circ\text{C} \sim 155^\circ\text{C}$	T1 T5
		$\pm 50$ (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	$3.20 \pm 0.20$	$1.60 \pm 0.20$	$0.50 \pm 0.25$	$1.10 \pm 0.20$	$0.45 \pm 0.10$

(unit : mm)

## ◆ Reliability specification

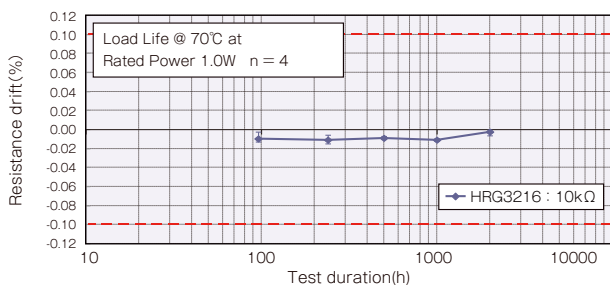
Test items	Condition (test methods (JIS C5201-1))	Standard	
		≤47Ω	≥47Ω
Life (biased)	70°C, rated voltage, <sup>*1</sup> 90min on 30min off, 1000hours	±(0.5%+0.05Ω)	±(0.25%+0.01Ω)
High temperature high humidity	85°C, 85%RH, 1/10 of rated power, 90min on 30min off, 1000hours	±(0.25%+0.05Ω)	±(0.1%+0.01Ω)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

\*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.

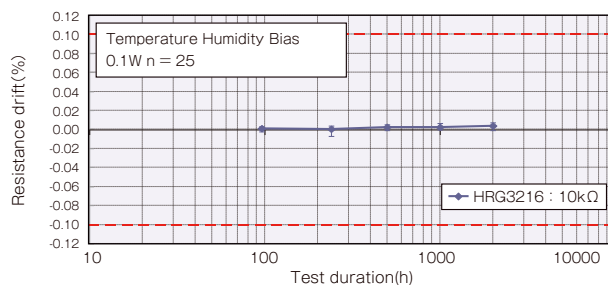
Thin film surface mount resistors

## ◆ Reliability test data

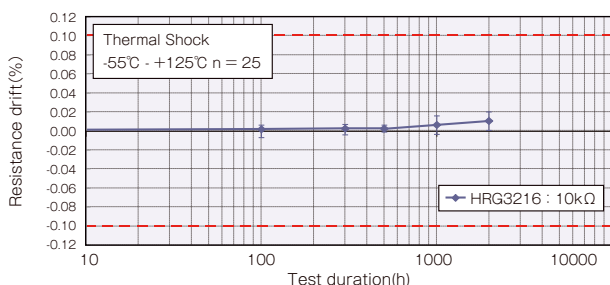
### ○ Biased life test



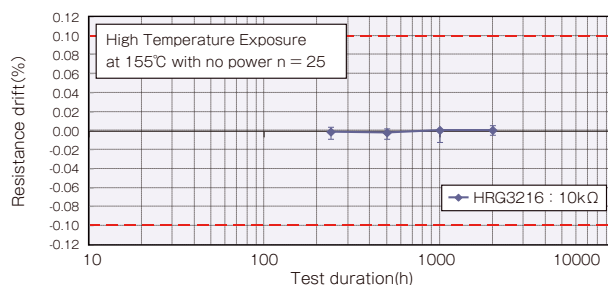
### ○ High temperature high humidity (biased)



### ○ Temperature shock

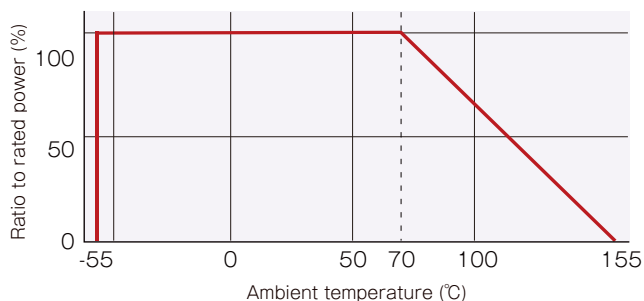


### ○ High temperature exposure



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## ◆ Derating Curve



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