

RN SERIES

MILITARY STANDARD RESISTORS MEET MIL-R-55182 MOLD TYPE

Feature

- Advanced thin film technology
- Excellent overall stability: Class 0.5%
- Very low noise and voltage coefficient
- Compliant to RoHS directive 2011/65/EU
- Compliant to REACH (EC No. 1907/2006)) (last updated: 27/06/2018)

Description

Production is strictly controlled and follows an extensive set of instructions established in production procedure for reproducibility. A homogeneous film of metal alloy is deposited on the surface of **CeramTec**'s ceramic cores (96% Al_2O_3) and conditioned to achieve the desired stability and the temperature coefficients.

A professional laser is pressed on the metalized rods to not only achieve the target value but also perfect electronics performance by smoothly cutting a helical groove in the resistance layer on the ceramic rods without damaging the ceramics. The resistance layers are covered by a protective coating and hard Bakelite designed for electrical, mechanical and climatic protection.

The resistors are tested in accordance with MIL-R-10509F.

The established reliability meet the requirement of MIL-R-55182F.

1. PRODUCT:

MIL standard resistors for full MIL-R-55182 performance with established reliability

2. PART NUMBER:

Part number of the resistor is identified by the series name, power rating, tolerance, temperature coefficient, packing type and resistance value.

Example:

RN	55	C	E	B	1002
Series Name	power rating	Resistance Tolerance	Temperature Coefficient	Packing Type	Resistance Value

(1) Style: RN SERIES

(2) Power Rating below 70°C:

55=0.125W、60=0.25W、65=0.50W、70=0.75W

Power Rating at 125°C:

55=0.10W、60=0.125W、65=0.25W、70=0.5W

(3) Tolerance: B=±0.1%; C=±0.25%; D=±0.5%; F=±1%

(4) T.C.R.: E(±25ppm/°C); C(±50ppm/°C)

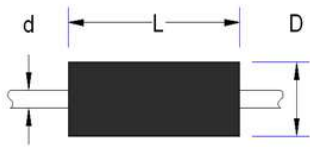
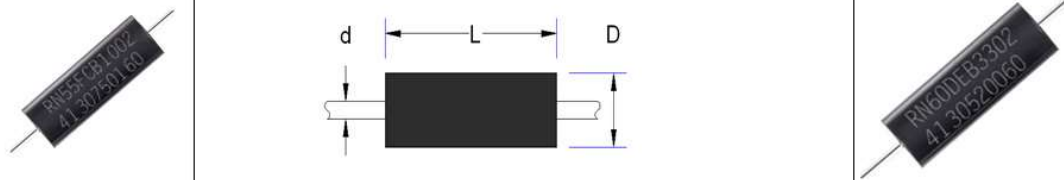
(5) Packaging Type: B=BULK/BOX; T=Tape/Box

(6) Resistance Value: 1R00、20R0、1000、1001、1002、3303、1004.....

3. Marking:

Digital marking including type, power rating, value, Tol., TCR, batch number

4. ELECTRICAL CHARACTERISTICS

THUNDER type	RN50	RN55	RN60	RN65	RN70		型号	
STANDARD APPLIED	GJB1929-1994; GJB244A-2001; MIL-PRF-55182; Q/SLC002-1995						执行标准	
MIL-PRF-55182	RNC50	RNC55	RNC60	RNC65	RNC70		美国军标型号	
DIN-44061	0204	0207	0414	0617	0719		德国工业标准型号	
Cross to VISHAY's	ERC50	ERC55	ERC60	ERC65	ERC70		对应美国 VISHAY 公司型号	
Cross to PRP's	PR1/20B	PR1/10	PR1/8	PR1/4A	PR1/4		对应PRP 公司型号	
Cross to AAC's		SRN55	SRN60	SRN65	SRN70		对应AAC 公司型号	
Cross to TEPRO's	RNF50	RNF55	RNF60	RNF65			对应TEPRO 公司型号	
Cross to IRC/TT's	LM2	LM3	LM4	LM5			对应IRC/TT 公司型号	
Cross to WELWYN/TT's		CAR5	CAR6	CAR7			对应WELWYN/TT 公司型号	
Cross to EBG's	RN50	RN55	RN60	RN65	RN70		对应EBG 公司型号	
Resistance tolerance	F($\pm 1\%$); D($\pm 0.5\%$); C($\pm 0.25\%$); B($\pm 0.10\%$)						精度	
Temperature coefficient	E($\pm 25\text{ppm}/^\circ\text{C}$); C($\pm 50\text{ppm}/^\circ\text{C}$)						温度系数	
Resistance range	10 Ω to 499K Ω	10 Ω to 1M Ω	10 Ω to 1M Ω	10 Ω to 1M Ω	10 Ω to 1M Ω		阻值范围	
Climatic category(LCT/UCT/days)	55/125/56						(LCT/UCT/days) 气候顺序	
Rated dissipation at 70 $^\circ\text{C}$ P_{70}	0.10W	0.125W	0.25W	0.50W	0.75W	P_{70}	70 $^\circ\text{C}$ 以下功率	
Rated dissipation at 125 $^\circ\text{C}$ P_{125}	0.05W	0.10W	0.125W	0.25W	0.50W	P_{125}	125 $^\circ\text{C}$ 以下功率	
Operating voltage U_{\max}	200V	200V	250V	300V	300V	U_{\max}	最大工作电压	
Short time overload voltage	400V	400V	500V	600V	600V		最大短时间过载电压	
Operating Temperature range	-65 $^\circ\text{C}$ to 175 $^\circ\text{C}$						工作温度范围	
Insulation voltage	400V	500V	500V	700V	700V		绝缘耐压	
Noise	<0.05 $\mu\text{V}/\text{V}$						电压噪声	
Dimension	$\pm 0.40(\text{mm})$	L=3.9, D=1.8	L=6.8, D=2.5	L=10, D=3.7	L=14.8, D=5.2	L=18.3, D=6.5	$\pm 0.40(\text{mm})$	外型尺寸
	$\pm 0.05(\text{mm})$	d=0.45	d=0.6	d=0.6	d=0.6	d=0.8	$\pm 0.05(\text{mm})$	
Outlines								外观

Unless otherwise specified, all values are tested at the following condition:

Temperature: 21 $^\circ\text{C}$ to 25 $^\circ\text{C}$; Relative humidity: 45% to 60%

5. ENVIRONMENTAL CHARACTERISTICS

(1) Insulation Resistance

IEC 60115-1, 4.6: in V-block for 60 seconds, the test resistance should be high than 10,000 M Ohm.

(2) Dielectric Withstanding Voltage

IEC 60115-1 4.7: Place resistors in V-block for 60 Seconds, no breakdown or flashover.

(3) Temperature Coefficient Test

IEC 60115-1, 4.8: Test of resistors at room temperature and 60°C or 100°C on request above room temperature. Then measure the resistance. The Temperature Coefficient is calculated by the following equation and its value should be within the range requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \times \frac{1}{t - t_0} \times 10^6$$

R = Resistance value under the testing temperature

R₀ = Resistance value at the room temperature

t = the 2nd testing temperature

t₀ = Room temperature

(4) Short Time Over Load Test

IEC60115-1 4.13: At 10 times rated voltage or 2 times the maximum working voltage whichever is lower for 5 seconds, the resistor should be free from defects. The change of the resistance value should be within ± (0.1%+0.05Ω) as compared with the value before the test.

(5) Terminal Strength

IEC 60115-1, 4.16: Direct Load – Resistors shall be held by one terminal and the load shall be gradually applied in the direction of the longitudinal axis of the resistor unit the applied load reaches 5 pounds. The load shall be held for 10 seconds. The load of weight shall be ≥2.5kg(24.5N).

(6) Solderability

IEC 60115-1, 4.17: $235\pm 5^{\circ}\text{C}$ for 3 ± 0.5 Seconds, there are at least 95% solder coverage on the termination.

(7) Resistance to soldering heat:

IEC 60115-1, 4.18: $260\pm 3^{\circ}\text{C}$ for 10 ± 1 Seconds, immersed to a point $3\pm 0.5\text{mm}$ from the body. The change of the resistance value should be within $\pm(0.1\%+0.05\ \Omega)$ as compared with the value before the test.

(8) Climatic sequence

IEC 60115-1, 4.19: -55°C to Room Temp. to $+155^{\circ}\text{C}$ to Room Temp. (5 cycles). The change of the resistance value shall be within $\pm(0.5\%+0.05\ \Omega)$ as compared with the value before the load. After the test the resistors shall be free from the electrical or mechanical damage.

(9) Damp Heat Steady State

IEC 60115-1, 4.24: $40\pm 2^{\circ}\text{C}$, 90-95% RH for 56 days, loaded with 0.1 times RCWV or the maximum working voltage whichever is lower. The change of the resistance value should be within $\pm(0.5\%+0.05\ \Omega)$ as compared with the value before the load.

(10) Load Life Test

IEC 60115-1, 4.25: $70\pm 2^{\circ}\text{C}$ at RCWV or the maximum working voltage whichever is lower for $1,000+48/-0$ Hr. (1.5Hr. on, 0.5Hr. off). The resistors shall be arranged not much effected mutually by the temperature of others and the excessive ventilation shall not be performed.

The change of the resistance value should be within $\pm(0.5\%+0.05\ \Omega)$ as compared with the value before the load.

(11) Periodic-pulse high-voltage overload test

IEC 60115-1, 4.28 Apply 4 times of rated voltage to the specimen at the 1 second on and 25 seconds off cycle, subjected to voltage application cycles specified in 10000. The change of the resistance value shall be within $\pm(0.10\%+0.05\Omega)$.

(12) Resistance to Solvent

IEC 60115-1, 4.30: IPA for 5 ± 0.5 min. with ultrasonic. No deterioration occurred.

(13) Intermittent Overload

IEC 60115-1 4.39: 2.5 times of rated voltage or maximum overload voltage whichever is less for 1 second on and 25 seconds off; total 10,000 cycles. The change of the resistance value should be within $\pm (0.5\%+0.05\Omega)$ as compared with the value before the test.

(14) High Temperature Exposure/ Endurance at Upper Category Temperature

IEC 60068-2-2 1,000 hours at 125 ± 5 °C, unpowered. The change of the resistance value should be within $\pm (0.5\%+0.05\Omega)$ as compared with the value before the test.

Disclaimer

All products, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.

Thunder Precision Resistors makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product to the maximum extent permitted by applicable law.

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