FRC-Series
Thick Film Chip Resistor
FRC 系列常规厚膜晶片电阻

FOSAN SEMICONDUCTOR
FOJAN 富捷电阻

常规系列厚膜晶片电阻
Thick FilmChip Resistor
FRC Series

▪应用（Application）

- Entertainment：Stereo,TV tuners，Tape recorder
- Appliance: Air conditioner, Refrigerator
- Computer & relative products : Main board, PDA
- Communication equipment: Cell phone, Fax machine
- Power equipment: Power supply , II Lumination equipment
- Measuring instrument: Electric meter,Navigation equipment

- 娱乐：立体声、电视调谐器、录音机
- 电器：空调、冰箱
- 电脑及相关产品：主板、PDA
- 通讯设备：手机、传真机
- 电源设备：电源、二级照明设备
- 测量仪器：电表、导航设备

▪特点（Features）

- small size and light weight
- Reliability, high quality

- 体积小、重量轻
- 可靠性，高质量

▪产品料号（Parts Number Explanation）

示例（Example）： FRC1206F1001 TSD

F 公司名	R 产品别	C 功能别	1206 尺寸	F 公差	1001 字码	T 包装别	S 端电极	D 特殊码
FOJAN	R:Resistor	C:Normal	0201	B:±0.1%	±5%:E24	T: 7 inch reel	S：Sn	N:Normal
	C:Capacitor	P:Hi-Power	0402	C:±0.25%	3-digits+blank	Q:10 inch reel	C：Cu	D：LED
	L:Inductor	L:Lowohmic	0603	D:±0.5%	102=1KΩ	R:13 inch reel	A：Au	
	D:Diode	A:Array	0805	F:±1%	1R0=1Ω	B:Bulk		
	A:Audion	S:Surge	1206	J:±5%				
		H:Hi-Precision	1210	P: Jumper	±1%&Below：			
		V:Hi-Voltage	1218		E24+E96：			
		Q:Auto-motive	1812		4-digits			
		R:Anti-sulfur	2010		1001=1KΩ			
		M:Metal	2512		1R00=1Ω			
		D: LED						
Company code	Type code	Functional code	Size code	Tolerance code	Resistance code	Packaging code	Termination code	Special Case

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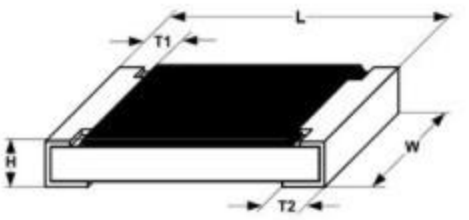
▪尺寸 (Dimension)

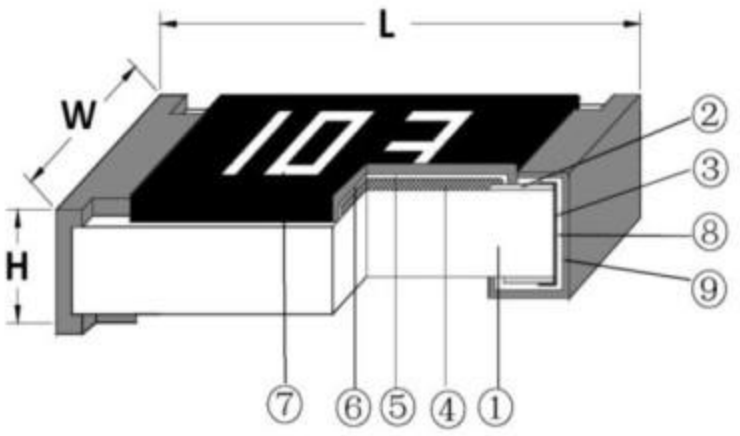
尺寸
dimension



单位（unit）: mm

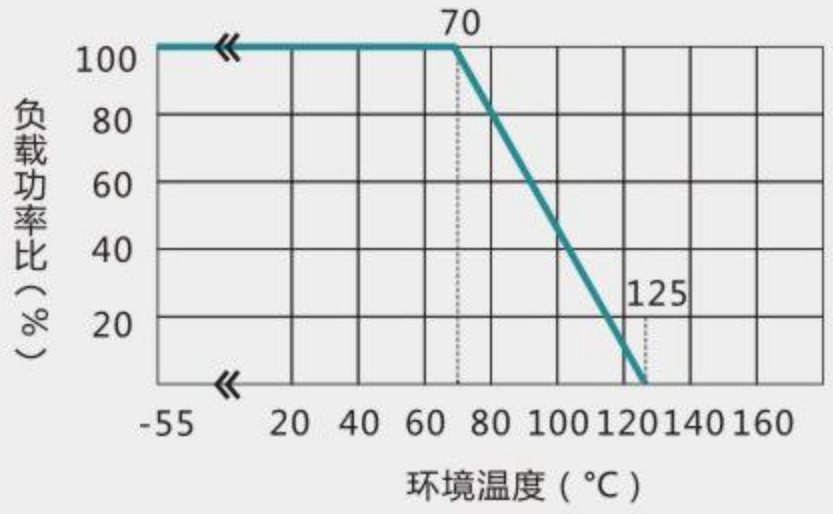
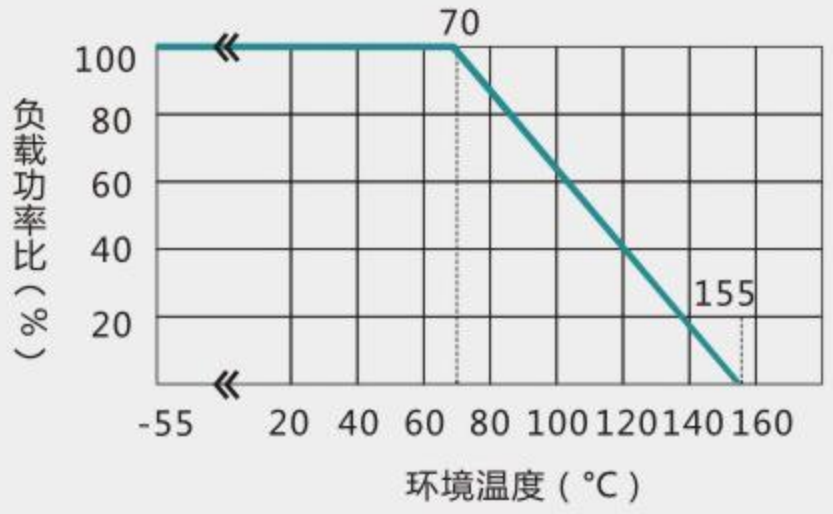
型别（Type）	L	W	H	T1	T2
0201	0.60±0.03	0.30±0.03	0.23±0.03	0.10±0.05	0.15±0.05
0402	1.00±0.05	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10
0603	1.60±0.10	0.80±0.10	0.45±0.10	0.25±0.15	0.25±0.15
0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.35±0.20
1206	3.10±0.10	1.60±0.10	0.55±0.10	0.45±0.20	0.40±0.20
1210	3.10±0.10	2.60±0.15	0.55±0.10	0.45±0.15	0.50±0.20
1218	3.10±0.10	4.60±0.10	0.55±0.10	0.45±0.20	0.40±0.20
1812	4.50±0.20	3.10±0.20	0.55±0.10	0.55±0.20	0.70±0.20
2010	5.00±0.10	2.50±0.15	0.55±0.10	0.45±0.15	0.50±0.20
2512	6.35±0.10	3.10±0.15	0.55±0.10	0.60±0.20	0.50±0.20

▪电阻结构（Construction）



NO.	结构 construction	主要材料 Major material
1	陶瓷基板 Ceramic substrate	三氧化二铝 Al_2O_3
2	银电极 Conductive layer	银 Ag
3	侧电极 Side conductive layer	镍铬合金 NiCr
4	阻体层 Resistive layer	氧化钌+玻璃 RuO_2 + glass
5	内保护层 Inner protective layer	玻璃 Glass
6	外保护层 Outer Protective layer	环氧树脂 Epoxy
7	文字 Marking	环氧树脂 Epoxy
8	镍电极 Ni plating layer	镍 Ni
9	锡电极 Sn plating layer	锡 Matte Tin

▪功率衰减曲线（ Derating Curve ）

使用温度范围	-55°C~+125°C(0201)	-55°C~+155°C
说明	周围温度若超过70°C至125°C之间,功率可照下图曲线予以修订	周围温度若超过70°C至155°C之间,功率可照下图曲线予以修订
功率衰减曲线图		

▪电气特性（Electrical characteristics ）

型别 Type	**0201**	**0402**	**0603**	**0805**	**1206**	**1210**	**1218**	**1812**	**2010**	**2512**
绝缘耐压 Dielectric Withstanding Voltage	-	100V	100V	300V	500V	500V	500V	500V	500V	500V
零欧姆阻值 ±1% Resistance Value of Jumper ±1%	-	<30mΩ	<30mΩ	<30mΩ	<30mΩ	<30mΩ	<30mΩ	<30mΩ	<30mΩ	<30mΩ
零欧姆阻值 ±5% Resistance Value of Jumper ±5%	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ
零欧姆额定电流 Rated Current of Jumper	0.5A	1A	1A	2A	2A	2A	6A	2A	2A	2A
零欧姆电阻最大电流 Max Current of Jumper	1A	2A	2A	5A	10A	10A	10A	10A	10A	10A

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▪电性规格（Standard Electrical Specifications）

型别 Type	**额定功率**（PowerRating at 70℃）	**最高工作电压** Max. RCWV	**最大过负荷电压** Max. Overload Voltage	**T.C.R.** (PPM/℃)	**阻值范围** Resistance Range
0201	1/20W	25V	50V	± 400	1Ω~10Ω
				± 200	10Ω~10MΩ
0402	1/16W	50V	100V	±200	1Ω~10Ω
					10MΩ~100MΩ
				± 100	10Ω~10MΩ
0603	1/10W	75V	150V	± 200	1Ω~10Ω
					10MΩ~100MΩ
				± 100	10Ω~10MΩ
0805	1/8W	150V	300V	± 200	1Ω~10Ω
					10MΩ~100MΩ
				± 100	10Ω~10MΩ
1206	1/4W	200V	400V	± 200	1Ω~10Ω
					10MΩ~100MΩ
				± 100	10Ω~10MΩ
1210	1/3W	200V	400V	± 200	1Ω~10Ω
					10MΩ~100MΩ
				± 100	10Ω~10MΩ
1218	1W	200V	500V	± 200	1Ω~10Ω
				± 100	10Ω~1MΩ
1812	3/4W	200V	400V	± 200	1Ω~10Ω
				± 100	10MΩ~100MΩ
2010	3/4W	200V	400V	± 200	1Ω~10Ω
					10MΩ~100MΩ
				± 100	10Ω~10MΩ
2512	1W	200V	400V	± 200	1Ω~10Ω
					10MΩ~100MΩ
				± 100	10Ω~10MΩ

如有非标准品的需求,请联系我们的业务部门 For non-standard parts, please contact our sales dept.

▪性能（Performance Specifications）

内容 Item	**测试方法** Test Methods	**测试条件** Test Conditions	**规格** Specification
温度系数 Temperature Coefficient	JIS C 5201 4.8	TCR=（R-R_0）/（t-t_0）R_0 ×10^6（ppm） R_0 电阻在室温下的阻值(resistance at room temperature) R 电阻在 125℃或-55℃下的阻值(resistance at 125℃ or -55℃) t_0 室温(room temperature) t 测试温度（test temperature 125℃ or -55℃）	0201 规格： 1Ω≦R≦10Ω: ±400 PPM/℃ 10Ω<R≦10MΩ: ±200 PPM/℃ 0402~2512 规格： 1Ω≦R≦10Ω: ±200 PPM/℃ 10Ω<R≦10MΩ: ±100 PPM/℃ 10MΩ<R≦100MΩ: ±200PPM/℃
短时间过负荷 Short-time overload	JIS C 5201 4.13	加载 2.5 倍的额定电压，时间 5 秒后测量试验前后的阻值变化率。 Applied 2.5 times of rated voltage for 5 second. Measure the variation of resistance.	±(1.00% +0.05Ω)
焊锡性 Solderability	JIS C 5201 4.17	沾助焊剂后浸入锡炉，锡炉温度 245±5℃，时间 3±0.5 秒。 Dip the terminal in a flux and then dip into a soldering bath at 245±5℃ for 3±0.5sec.	> 95%面积上锡 (> 95% coverage)
抗焊锡热 Resistto soldering heat	JIS C 5201 4.18	沾助焊剂后浸入锡炉，锡炉温度 260±5℃，时间 10±0.5 秒，测量试验前后的阻值变化率。 Dip the terminal in a flux and then dip into a soldering bath at 260±5℃ for 10±0.5sec. Measure the variation of resistance.	±(1.00% +0.05Ω)
绝缘电阻 Insulation resistance	JIS C 5201 4.6	电阻本体上加载绝缘耐压 60±5 秒后 ,测量绝缘阻抗。 Applied the dielectric withstanding voltage on the center of body for 60±5seconds. Then measure insulation resistance.	>10GΩ
绝缘耐压 Dielectric withstanding voltage	JIS C 5201 4.7	电阻本体上加载绝缘耐压 60±5 秒。 Applied the dielectric withstanding voltage on the center of body for60±5seconds.	无击穿、飞弧及可见机械性损伤 No evidence of flashover, mechanical damage arcing or insulation breakdown

内容 Item	**测试方法** Test Methods	**测试条件** Test Conditions	**规格** Specification
端子弯曲 Terminalbending	JIS C 5201 4.33	电阻焊接在测试板上进行弯折,弯折保持时间 20±1 秒 ,1206(含) 以下的尺寸弯曲 5+0.2/0 mm; 1206 以上的尺寸弯曲 2+0.2/0 mm; 量测试验前后阻值变化率 Specimen shall be mounted on test board, then bend the board and maintained for 20±1s. the distance of bending is 5+0.2/0 mm for resistors which size no larger than 1206 or 2+0.2/0 mm which size larger than 1206. Measure the variation of resistance.	±(1.00% +0.05Ω)
温度循环 Temperature Cycling	JIS C 5201 4.19	电阻放入温度循环机中，温度 155±2℃至 -55±3℃ ,共 5 个循环。量测试验前后阻值变化率. Put specimen in a chamber which temperature can be changed to 155±2℃ or -55±3℃, repeated 5 times. Measure the variation of resistance.	±(2.00% +0.05Ω)
耐湿特性 Humidity	JIS C 5201 4.24	电阻放入恒温恒湿箱，温度 40±2℃，湿度 90~95 %RH;通电额定电压 1.5 小时 ,断电 0.5 小时；重复通断电至试验时间 1000 $^{+48}/_{-0}$ 小时. 量测试验前后阻值变化率. Put the specimen in a chamber at 40±2℃ temperature and 90~95% relative humidity, then applied rated voltage for1.5H and rested for 0.5H repeatedly till total test time is 1000$^{+48}/_{-0}$ H. Measure the variation of resistance.	±(2.00% +0.05Ω)
负荷寿命 Load life	JIS C 5201 4.25.1	电阻放入恒温箱中，温度 70±2℃，ON TIME:1.5H ,OFF TIME:0.5H 通电额定电压 1000 $^{+24}/_{-0}$ 小时，量测试验前后阻值变化率. Put the specimen in a chamber at 70±2℃ temperature, ON TIME:1.5H，OFF TIME:0.5H，and applied rated voltage for 1000 $^{+24}/_{-0}$H. Measure the variation of resistance.	±(2.00% +0.05Ω)
温湿循环 Moisture resistance	MIL-STD-202 METHOD 106	25°C~65°C,90~100%RH, 2.5 小时; 65°C 90~100%RH, 3 小时; 65°C~25°C,80~100%RH,2.5 小时,10 个循环,试验结束 24±4 小时后进行测试. 25°C~65°C,90~100%RH, 2.5H; 65°C 90~100%RH, 3H; 65°C~25°C 80~100%RH, 2.5H, 10 cycles, Measurement at 24±4 hours after test conclusion.	±(2.00% +0.05Ω)