

# SUSUMU Thin Film Chip Resistors



NEW SUPPLIER

## RG SERIES

Susumu's proprietary NiCr based alloy exhibits excellent TCR Characteristics as compared to other resistive materials such as tantalum nitride. Despite the belief that NiCr thin film has reliability issues, especially in humid environment, Susumu has developed technologies to apply an inorganic passivation that acts as a hermetic seal, and our ultimate thin-film resistors, RG series, far exceed thick film resistor reliability, reaching 0.01fit(=10 parts per trillion) RG series thin-film chip resistors boast high precision, near zero TCR and unprecedented reliability with all the benefits of thin film resistors!

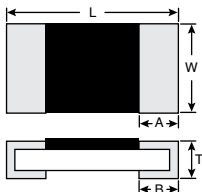
Susumu's typical resistive thin film is 20-200nm thick whereas thick film resistors can be up to 50um thick. Moreover, thin film is deposited using molecular processes such as sputtering and plasma enhanced chemical vapor deposition, whereas thick film is made of screen printed metal particles suspended in polymer. This fundamental difference results in the clear advantage of thin film resistors in performance. Susumu's thin film resistors has better high frequency characteristics (no skin effect: resistance change due to high frequency), low noise due to the evenness of thin film, and high resistance accuracy due to precise trimming of the thin film. The RG series combines the merit of such thin film performance with robustness and reliability that exceed thick film resistors.

### Features:

- Various standard sizes: 0402, 0603, 0805
- Operating Temperature Range: -55C to +155C (100% power at 85C)
- Tolerance/TCR: 0.02%/5ppm, 0.05%/10ppm, 0.1%/25ppm

### Environmental Tolerance:

- Superior reliability: less than 0.1% drift after 10000 hours of high temp.exposure (155C) or high temp/humidity bias (85C/85%RH)
- Can be used in 3 different power ratings (low, regular, and high) based on customer needs
- Sulfur resistant
- High Operating temperature
- Dust/oil/chemical resistance
- Vibration resistant



Dimensions: (in.)	RG1005 (0402)	RG1608 (0603)	RG2012 (0805)
L	1.0±0.05	1.6±0.2	2.0±0.2
W	0.5±0.05	0.8±0.2	1.25±0.2
A	0.2±0.10	0.3±0.2	0.4±0.2
B	0.25±0.05	0.3±0.2	0.4±0.2
T	0.35±0.05	0.4±0.1	0.4±0.1

Table 1: Power & Reliability (Reliability depends on the power rating customers choose.)

Item	Test Method	Drift Limits for Power Rating			(Typical)
		Low	Regular	High	
Short Time Overload	Applied Voltage: 2.5 rated voltage or 2 max. operating voltage which ever is less test duration: 5 seconds	±0.05%	±0.05%	±0.25%	±0.01%
Load Life	Test Temperature: 85°C; Applied Voltage: rated voltage; Test Period: Repeat 1000 cycles as follows - 90min. / 30min. off cycled	±0.1%	±0.25%	±0.5%	±0.01%
Moisture Load Life	Test Condition: 85°C 85%RH; Applied Power: 1/10 rated power; Test Period: Repeat 1000 cycles as follows - 90min. / 30min. off cycled	±0.05%	±0.25%	±0.5%	±0.05%
Temperature Cycle	Repeat 1000 cycles as follows - -55°C (30min.) / Room Temp. (2min.) / +125°C (30min.) / Room Temp. (2min.)	±0.1%			±0.01%
Hi Temp. Exposure	+155°C for 1000 hours with no load				±0.01%

### Current Noise Comparison

Electrons move smoothly without much dispersion that creates noise.

Electrons move randomly creating noise.

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### Power Derating Curve

SMD Resistors

Susumu

\*Insert Value Code from Table of Stocked Values

For quantities of 250 and up, call for quote.

Size	MOUSER STOCK NO.		Susumu Part No.	Resistance (ohms)	Tolerance	Power Rating (See Table 1 for Reliability for Each Power Rating)			Temperature Coefficient	Price Each		
	Value	Suffix				Low	Regular	High		1	10	100
0402	754-RG1005P-Code-B-T5		RG1005P-Code-B-T5	49.9 - 100K	0.1%	0.0312W (1/32W)	0.0625W (1/16W)	0.125 W (1/8 W)	±25 PPM / C			
0603	754-RG1608P-Code-B-T5		RG1608P-Code-B-T5	47 - 332K	0.1%	0.0625W (1/16W)	0.125W (1/8W)	0.166 W (1/6 W)	±25 PPM / C			
0805	754-RG2012P-Code-B-T5		RG2012P-Code-B-T5	100 - 1M	0.1%	0.1W (1/10W)	0.125W (1/8W)	0.25 W (1/4 W)	±25 PPM / C			
0603	754-RG1608N-Code-W-T1		RG1608N-Code-W-T1	75 - 270K	0.05%	0.0625W (1/16W)	0.125W (1/8W)	0.166 W (1/6 W)	±10 PPM / C			
0805	754-RG2012N-Code-W-T1		RG2012N-Code-W-T1	47 - 470K	0.05%	0.1W (1/10W)	0.125W (1/8W)	0.25 W (1/4 W)	±10 PPM / C			
0603	754-RG1608V-Code-P-T1		RG1608V-Code-P-T1	100 - 1.5K	0.02%	0.0625W (1/16W)	0.125W (1/8W)	0.166 W (1/6 W)	±5 PPM / C			
0805	754-RG2012V-Code-P-T1		RG2012V-Code-P-T1	100 - 10K	0.02%	0.1W (1/10W)	0.125W (1/8W)	0.25 W (1/4 W)	±5 PPM / C			

TABLE OF STOCKED VALUES																											
Value	Case Size			Value	Case Size			Value	Case Size			Value	Case Size			Value	Case Size			Value	Case Size						
	Value Code *	0 4 6 8	0 0 0 0		Value Code *	0 4 6 8	0 0 0 0		Value Code *	0 4 6 8	0 0 0 0		Value Code *	0 4 6 8	0 0 0 0		Value Code *	0 4 6 8	0 0 0 0		Value Code *	0 4 6 8	0 0 0 0	Value Code *	0 4 6 8	0 0 0 0	
47	470	X	X	953	102	X	X	2.61K	2611	X	X	7.5K	752	X	X	16.5K	1652	X	X	42.2K	4222	X	X	180K	184	X	X
49.9	49R9	X	X	1K	102	X	X	2.74K	2741	X	X	7.87K	7871	X	X	17.8K	1782	X	X	43.2K	4322	X	X	191K	1913	X	X
51	510	X	X	1.02K	1021	X	X	2.87K	2871	X	X	8.06K	8061	X	X	18.7K	1872	X	X	45.3K	4532	X	X	200K	204	X	X
75	750	X	X	1.05K	1051	X	X	3K	302	X	X	8.25K	8251	X	X	19.1K	1912	X	X	47K	473	X	X	220K	224	X	X
100	101	X	X	1.07K	1071	X	X	3.01K	3011	X	X	8.45K	8451	X	X	20K	203	X	X	47.5K	4752	X	X	226K	2263	X	X
110	111	X	X	1.1K	112	X	X	3.16K	3161	X	X	8.66K	8661	X	X	21K	2102	X	X	49.9K	4992	X	X	232K	2323	X	X
120	121	X	X	1.2K	122	X	X	3.24K	3241	X	X	8.87K	8871	X	X	22K	223	X	X	51K	513	X	X	240K	244	X	X
124	1240	X	X	1.21K	1211	X	X	3.3K	332	X	X	9.09K	9091	X	X	22.1K	2212	X	X	53.6K	5362	X	X	249K	2493	X	X
150	151	X	X	1.24K	1241	X	X	3.32K	3321	X	X	9.31K	9311	X	X	23.2K	2322	X	X	60.4K	6042	X	X	270K	274	X	X
180	181	X	X	1.3K	132	X	X	3.92K	3921	X	X	9.53K	9531	X	X	24K	243	X	X	66.5K	6652	X	X	300K	304	X	X
200	201	X	X	1.33K	1331	X	X	4.02K	4021	X	X	10K	103	X	X	24.3K	2432	X	X	68K	683	X	X	301K	3013	X	X
220	221	X	X	1.4K	1401	X	X	4.22K	4221	X	X	10.2K	1022	X	X	24.9K	2492	X	X	75K	753	X	X	330K	334	X	X
249	2490	X	X	1.5K	152	X	X	4.3K	432	X	X	10.5K	1052	X	X	25.5K	2552	X	X	76.8K	7682	X	X	332K	3323	X	X
270	271	X	X	1.54K	1541	X	X	4.32K	4321	X	X	10.7K	1072	X	X	26.1K	2612	X	X	80.6K	8062	X	X	390K	394	X	X
300	301	X	X	1.62K	1621	X	X	4.64K	4641	X	X	11K	113	X	X	27K	273	X	X	86.6K	8662	X	X	470K	474	X	X
330	331	X	X	1.65K	1651	X	X	4.7K	472	X	X	12K	123	X	X	27.4K	2742	X	X	88.7K	8872	X	X	499K	4993	X	X
374	3740	X	X	1.8K	182	X	X	4.75K	4751	X	X	12.1K	1212	X	X	30K	303	X	X	90.9K	9092	X	X	510K	514	X	X
402	4020	X	X	1.82K	1821	X	X	4.99K	4991	X	X	12.4K	1242	X	X	30.1K	3012	X	X	93.1K	9312	X	X	750K	754	X	X
470	471	X	X	1.91K	1911	X	X	5.1K	512	X	X	12.7K	1272	X	X	31.6K	3162	X	X	100K	104	X	X	820K	824	X	X
475	4750	X	X	2K	202	X	X	5.6K	562	X	X	13K	133	X	X	32.4K	3242	X	X	102K	1023	X	X	1M	105	X	X
499	4990	X	X	2.05K	2051	X	X	5.62K	5621	X	X	13.7K	1372	X	X	33.2K	3322	X	X	113K	1133	X	X				
510	511	X	X	2.2K	222	X	X	5.9K	5901	X	X	14.3K	1432	X	X	35.7K	3572	X	X	120K	124	X	X				
604	6040	X	X	2.32K	2321	X	X	6.04K	6041	X	X	14.7K	1472	X	X	36K	363	X	X	127K	1273	X	X				
649	6490	X	X	2.4K	242	X	X	6.19K	6191	X	X	15K	153	X	X	39K	393	X	X	130K	134	X	X				
750	751	X	X	2.49K	2491	X	X	6.2K	622	X	X	15.4K	1542	X	X	40.2K	4022	X	X	140K	1403	X	X				
820	821	X	X	2.55K	2551	X	X	7.15K	7151	X	X	16.2K	1622	X	X	41.2K	4122	X	X	150K	154	X	X				

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