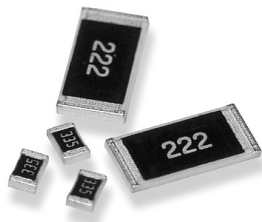


Type CRG Series

Type CRG Series



Precious metal terminations are screen printed onto a ceramic base and fired. The resistive element is screen printed and fired and the passivation layer added. Each resistor is trimmed to tolerance by laser. The pre-scribed tile is broken into strips, the end plating is fired on and the strips broken into individual components. Final termination is made by electroplating.

Key Features

- Thick film resistors with a high power to size ratio, ideally suited to industrial and general purpose use. A range from 1 ohm to 10M and tolerances of 1% and 5%. Also including zero ohm links.
- Suitable for most applications, including high frequency operation, owing to the short lead structure and low capacitance.
- Six Package Sizes

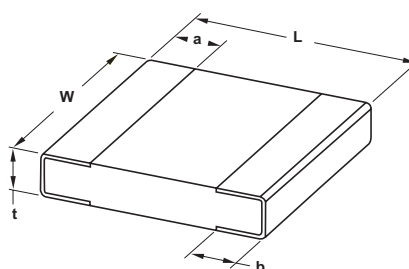
Characteristics - Electrical

		0402			0603				0805			
Rated Power @ 70 °C (W)		0.063			0.1				0.125			
Resistance Range (Ohms)	Min	10	1	11	1	101	1	11	1	101	1	11
	Max	1M0	10	3M3	100	1M0	10	10M	100	1M0	10	10M
Tolerance (%)		1	5	5	1	1	5	5	1	1	5	5
Code letter		F	J	J	F	F	J	J	F	F	J	J
Selection Series		E24	E24	E24	E24	E24 E96	E24	E24	E24	E24 E96	E24	E24
Temp. Coefficient (ppm/°C)		±100	±400	±200	±200	±100	±200	±200	±200	±100	±400	±200

		1206				2010				2512			
Rated Power @ 70 °C (W)		0.25				0.5				1			
Resistance Range Ohms	Min	1	101	1	11	1	101	1	11	1	101	1	11
	Max	100	1M0	10	10M	100	1M0	10	10M	100	1M0	10	10M
Tolerance (%)		1	1	5	5	1	1	5	5	1	1	5	5
Code letter		F	F	J	J	F	F	J	J	F	F	J	J
Selection Series		E24	E24 E96	E24	E24	E24	E24 E96	E24	E24	E24	E24 E96	E24	E24
Temp. Coefficient (ppm/°C)		±200	±100	±400	±200	±200	±100	±400	±200	±200	±100	±400	±200

	0402	0603	0805	1206	2010	2512
Working Voltage (V)	50	50	150	200	200	200
Max. Overload Voltage (V)	50	100	300	400	400	400
Operating Temp. Range (°C)	-55 to +125					
Climatic Category (°C)	55/125/56					
Insulation Resistance Dry Min (Mohms)	1000					
Stability (%)	3					
Surface Temp. Rise Max (°C/W)	480	300	280	190	100	65
Zerohm (A) Current Max	1	1	2	2	2	2
Resistance Max			<20 mohm			

Dimensions



Style	L	W	t	a	b
0402	1.0 ±0.1	0.5 ±0.05	0.35 ±0.05	0.2 ±0.1	0.25 ±0.1
0603	1.6 ±0.1	0.8 ±0.15	0.45 ±0.1	0.3 ±0.2	0.3 ±0.1
0805	2.0 ±0.15	1.25 ±0.15	0.55 ±0.1	0.4 ±0.2	0.4 ±0.2
1206	3.1 ±0.15	1.55 ±0.15	0.55 ±0.1	0.45 ±0.2	0.45 ±0.2
2010	5.0 ±0.1	2.5 ±0.15	0.55 ±0.1	0.6 ±0.25	0.5 ±0.2
2512	6.35 ±0.1	3.2 ±0.15	0.55 ±0.1	0.6 ±0.25	0.5 ±0.2

Type CRG Series

Marking Codes - Case Sizes 0805 to 2512

IEC 4 Digit Marking

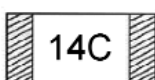
Resistance	100Ω	2.2KΩ	10KΩ	49.9KΩ	100KΩ
Marking Code	1000	2201	1002	4992	1003

Case Sizes 0603

E24 3 Digit Marking - Example: 101=100ff 102=1Kff

E24	10	11	12	13	15	16	18	20	22	24	27	30
	33	36	39	43	47	51	56	62	68	75	82	91

E96 3 Digit Marking - Examples: 14C=13K7ff, 13C=13K3ff, 68B=4K99ff, 68X=49.9ff

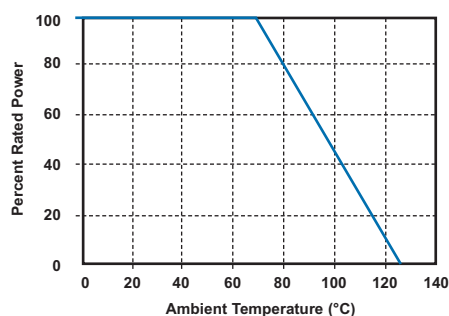


0603 E96 Marking Code Table

Code	E96		Code	E96		Code	E96		Code	E96	
01	100		25	178		49	316		73	562	
02	102		26	182		50	324		74	576	
03	105		27	187		51	332		75	590	
04	107		28	191		52	340		76	604	
05	110		29	196		53	348		77	619	
06	113		30	200		54	357		78	634	
07	115		31	205		55	365		79	649	
08	118		32	210		56	374		80	665	
09	121		33	215		57	383		81	681	
10	124		34	221		58	392		82	698	
11	127		35	226		59	402		83	715	
12	130		36	232		60	412		84	732	
13	133		37	237		61	422		85	750	
14	137		38	243		62	432		86	768	
15	140		39	249		63	442		87	787	
16	143		40	255		64	453		88	806	
17	147		41	261		65	464		89	825	
18	150		42	267		66	475		90	845	
19	154		43	274		67	487		91	866	
20	158		44	280		68	499		92	887	
21	162		45	287		69	511		93	909	
22	165		46	294		70	523		94	931	
23	169		47	301		71	536		95	953	
24	174		48	309		72	549		96	976	
Code	A	B	C	D	E	F	G	H	X	Y	Z
Multiplier	10 ⁰	10 ¹	10 ²	10 ³	10 ⁴	10 ⁵	10 ⁶	10 ⁷	10 ⁻¹	10 ⁻²	10 ⁻³

Type CRG Series

Derating Curve



Mounting

The resistors are suitable for processing on automatic insertion equipment.

Marking

CRG0805, CRG1206, CRG2010, CRG2512

E24 series resistors are marked with a three digit code.

E96 series resistors are marked with a four digit code.

Zerohm components are marked '0'.

CRG0603

E24 5% series are marked with a three digit code.

E24 1% series are marked with a three digit code.

E96 series are marked with the international alphanumeric three character code (available on request).

EXCEPT 10, 11, 13, 15, 20 & 75 decades which are marked as the E24 series.

CRG0402 series unmarked.

Performance Characteristics

The evaluation of the performance characteristics is carried out with reference to IECQ specifications QC 400 000 and QC 400 100.

TEST REF	Long Term Tests $\pm(3\% + 0.1 \text{ ohm})$
4.23	Climatic sequence
4.24	Damp heat, steady state
4.25.1	Endurance at 70 °C
4.25.3	Endurance at 125 °C
TEST REF	Short Term Tests $\pm(1\% + 0.05 \text{ ohm})$
4.13	Overload
4.32	Adhesion
4.33	Bond strength of end face plating
4.19	Rapid change of temperature
4.18	Resistance to soldering heat

Storage

Unopened reels should be stored within a temperature range of +5 °C to +25 °C, separated from any dust, chemicals and solvent based materials. Non-adherence to this procedure could effect the solderability of this product.

How to Order

CRG	0603	J	1K0
Common Part	Size	Tolerance	Resistance Value
CRG - Thick Film Chip Resistor	0402 0603 0805 1206 2512	F - $\pm 1\%$ J - $\pm 5\%$	1 ohm (1 ohm) 1R0 1K ohm (1000 ohms) 1K 100K ohm (100000 ohms) 100K 1M ohm (1000000 ohms) 1M