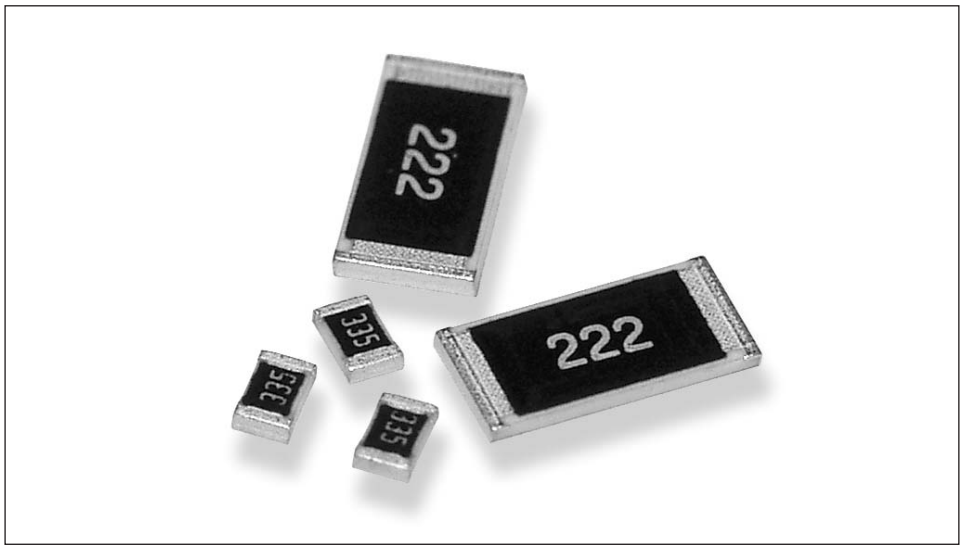
Type CRG Series

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**



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.

Characteristics - Electrical

		0402			0603				0805			
Rated Power @ 70 °C (W)		0.063			0.1				0.125			
Resistance Range	**Min**	10	1	11	1	101	1	11	1	101	1	11
(Ohms)	**Max**	2M0	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	**Min**	1	101	1	11	1	101	1	11	1	101	1	11
Ohms	**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

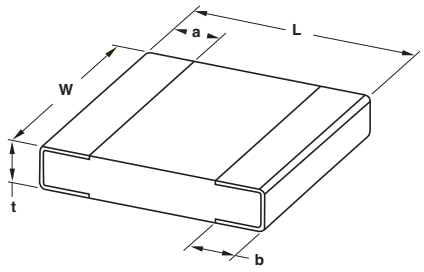
	0402	0603	0805	1206	2010	2512
Working Voltage (V)	50	50	150	200	200	200
Max. Overload Voltage (V)	50	100	300	400	400	400
Operating Temp. Range (°C)	-55 to +125					
Climatic Category (°C)	55/125/56					
Insulation Resistance Dry Min (Mohms)	1000					
Stability (%)	3					
Surface Temp. Rise Max (°C/W)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

Dimensions are in millimeters and inches unless otherwise specified. Values in brackets are standard equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

Type CRG Series

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

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=100Ω 102=1KΩ

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=13K7Ω, 13C=13K3Ω, 68B=4K99Ω, 68X=49.9Ω

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}

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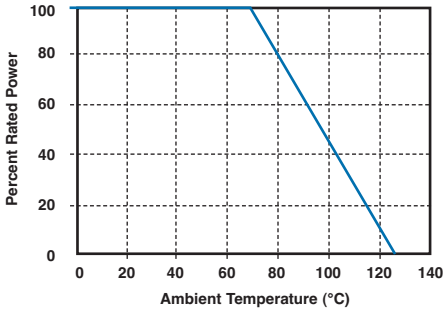
Type CRG Series

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 ±(3% + 0.1 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 ±(1% + 0.05 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 - ±1% J - ±5%	1 ohm (1 ohm) 1R0 1K ohm (1000 ohms) 1K 100K ohm (100000 ohms) 100K 1M ohm (1000000 ohms) 1M