

## **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.
- Seven Package Sizes
- **■** Terminal finish: Matte Sn
- MSL Level 2



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**

			0201			0402			06	03			08	05	
Rated Power @ 70 °C	(W)	0.05			0.063		0.1				0.125				
Resistance Range	Min	10	1	11	10	1	11	1	101	1	11	1	101	1	11
(Ohms)	Max	1M0	10	1M0	2M0	10	3M3	100	1M0	10	10M	100	1M0	10	10M
Tolerance (%)		1	5	5	1	5	5	1	1	5	5	1	1	5	5
Code letter		F	J	J	F	J	J	F	F	J	J	F	F	J	J
Selection Series		E24	E24	E24	E24	E24	E24	E24	E24	E24	E24	E24	E24	E24	E24
		E96			E96				E96				E96		
Temp. Coefficient (pp	m/°C)	±200	±400	±200	±100	±400	±200	±200	±100	±200	±200	±200	±100	±400	±200

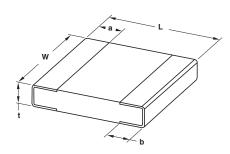
			12	06			20	10			25	12	
Rated Power @ 70 °C (W)			0.5	25			0	.5			1	1	
Resistance Range	Min	1	101	1	11	1	101	1	11	1	101	1	11
Ohms	Max	100	1M0	10	10M	100	1M0	10	10M	100	1M0	10	10M
Tolerance (%)		1	1	5	5	1	1	5	5	1	1	5	5
Code letter		F	F	J	J	F	F	J	J	F	F	J	J
Selection Series		E24											
			E96				E96				E96		
Temp. Coefficient (p	pm/°C)	±200	±100	±400	±200	±200	±100	±400	±200	±200	±100	±400	±200

	0201	0402	0603	0805	1206	2010	2512					
Working Voltage (V)	25	50	50	150	200	200	200					
Max. Overload Voltage (V)	50	100	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								
Zerohm (A) Current Max	0.5	1	1	2	2	2	2					
Resistance Max	<50 mOhm			<50 n	nOhm							



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## **Dimensions**



Style	L	W	t	а	b
0201	0.6 ±0.03	0.3 ±0.03	0.23 ±0.03	0.10 ±0.05	0.15 ±0.05
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	2.2ΚΩ	10ΚΩ	49.9ΚΩ	100ΚΩ
Marking Code	1000	2201	1002	4992	1003

## Case Sizes 0603

E24 3 Digit Marking - Example:  $101=100\Omega$   $102=1K\Omega$ 

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=13K7 $\Omega$ , 13C=13K3 $\Omega$ , 68B=4K99 $\Omega$ , 68X=49.9 $\Omega$ 



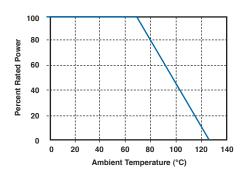
## 0603 E96 Marking Code Table

Code	E9	96	Code	E	96	Code	Е	96	Code	E	96	
01	10	00	25	17	78	49	3	16	73	5	62	
02	10	)2	26	18	32	50	3	24	74	5	76	
03	10	)5	27	18	37	51	3	32	75	5	590	
04	10	)7	28	19	91	52	3	40	76	6	04	
05	11	10	29	19	96	53	3	48	77	6	19	
06	11	13	30	20	00	54	3	57	78	6	34	
07	11	15	31	20	)5	55	3	65	79	6	49	
08	11	18	32	2	10	56	3	74	80	6	65	
09	12	21	33	2	15	57	3	83	81	6	81	
10	12	24	34	22	21	58	3	92	82	698		
11	12	27	35	22	26	59	402		83	715		
12	13	30	36	23	32	60	412		84	7	32	
13	13	33	37	237		61	422		85	7	50	
14	13	37	38	24	43	62	432		86	7	68	
15	14	10	39	24	19	63	4	42	87	7	87	
16	14	13	40	25	55	64	4	53	88	8	06	
17	14	17	41	26	31	65	4	64	89	8	25	
18	15	50	42	26	67	66	4	75	90	8	45	
19	15	54	43	27	74	67	4	87	91	8	66	
20	15	58	44	28	30	68	4	99	92	8	87	
21	16	52	45	28	37	69	5	11	93	9	09	
22	16	35	46	294		70	5	23	94	9	31	
23	16	59	47	30	)1	71	5	36	95	9	53	
24	17	74	48	30	)9	72	5	49	96	9	76	
Code	Α	В	С	D	Е	F	G	Н	Х	Υ	Z	
Multiplier	10º	10¹	10 <sup>2</sup>	10³	104	10⁵	10 <sup>6</sup>	10 <sup>7</sup>	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.

CRG0201 & CRG0402 series unmarked.

#### **Performance Characteristics**

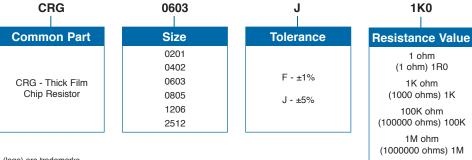
The evaluation of the performance characteristics is carried out with reference to IECQ specifications QC 400 000 and QC 400 100.

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**



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