

Type CRGH Series

Thick Film Resistors with high power to size ratio, ideally suited to industrial and general purpose use

Value range from 1Ω to $10M\Omega$

Seven package sizes

Terminal finish matte Sn over Ni



The resistive element is screen printed and fired, and a passivation layer added. Each resistor is trimmed to tolerance by laser. The pre-scribed tile is then broken into strips, the end plating fired on, and the strips broken into individual components. Final termination finish is electroplated matte Sn over a Ni barrier layer.

Characteristics – Electrical

Size	0402	0603	0805	1206	1210	2010	2512				
Power Rating (W) @70°C	0.1	0.2	0.33	0.5	0.75	1	2				
Resistance Range	1R0 ~ 10M	R10 ~ 10M	R10~10M	R10~10M	R10 ~ 10M	R10~10M	R10 ~ 10M				
Tolerance		1% 5%									
Max. Working Voltage (V)	50	50	150	200	200	200	250				
Max. Overload Voltage (V)	100	100	300	400	500	500	500				
Dielectric strength	100	300	500	500	500	500	500				
Temperature Range	-55°C ~ 155°C										

Key Features

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Dimensions in millimetres unless otherwise specified Dimensions Shown for reference purposes only. Specifications subject to change



Power Rating:

Resistors shall have a power rating based on continuous load operation at an ambient temperature of 70 $^{\rm o}{\rm C}$. For temperature in excess of 70 $^{\rm o}{\rm C}$, The load shall be derated as shown below:



Voltage Rating

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating, as determined from the following formula:

$$RCWV = VP \times R$$

Where:

RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (volt)

P = Power Rating (watt)

R = Nominal Resistance (ohm)

In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value.

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Construction:



Dimensions:



Tura e			Dir	nensions (mm)	
туре	L	W		Н	<i>l</i> 1	<i>l</i> 2
CRGH0402	1.00 ±0.10	0.50	±0.05	0.35 ±0.05	0.20 ±0.10	0.25 ±0.10
CRGH0603	1.60 ±0.10	0.80	±0.10	0.45 ±0.10	0.30 ±0.20	0.30 ±0.20
CRGH0805	2.00 ±0.15	1.25	+0.15 -0.10	0.55 ±0.10	0.40 ±0.20	0.40 ±0.20
CRGH1206	3.10 ±0.15	1.55	+0.15 -0.10	0.55 ±0.10	0.45 ±0.20	0.45 ±0.20
CRGH1210	3.10 ±0.10	2.60	±0.20	0.55 ±0.10	0.50 ±0.20	0.50 ±0.20
CRGH2010	5.00 ±0.10	2.50	±0.20	0.55 ±0.10	0.60 ±0.25	0.50 ±0.20
CRGH2512	6.35 ±0.10	3.20	±0.20	0.55 ±0.10	0.60 ±0.25	0.50 ±0.20

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Performance Specification

Characteristic	Limits		Test Methods (JIS C 5201-1)		
Dielectric Withstand Voltage	No evidence of flashover mechanical damage, arcing or insulation break down	4.7 Clamped metallic v-bl potential res type for 60-	l in the trough of ock and shall be t spectively specifie 70 seconds	a 90°C rested at ac ed in the	
Temperature Coefficient	0.1Ω≤R≤0.976Ω ±100 (CRGH0603 = ±200) 1Ω ~ 10Ω: ±200PPM/°C 10.1Ω ~ 10MΩ: ±100PPM/°C CRGH0402 : 1Ω ~ 10Ω: ± 400PPM/°C 10.1Ω ~ 100Ω: ±200PPM/°C >100Ω: ±100PPM/°C	4.8 Natural degree cent R2 -R1 x R1(t2-t1) R1: Resistan temperature R2: Resistan 100 °C(T2) Test pattern temp. +100°	resistance change igrade 10 ⁶ (PPM/°C ce value at room e (T1) ce value at room :: room temp. (T1) C(T2)	per temp. temp. plus), room	
Short time overload	Resistance change rate is \pm 5% (2.0% + 0.1 Ω) Max. \pm 1% (1.0% + 0.1 Ω) Max.	4.13 Permar the applicat RCWV for 5	nent resistance ch ion of a potential seconds	ange after of 2.5 times	
		Wave Solder: Test temperature of solder: 245°C ±3°C dipping time in solder : 2-3 seconds.			
Solderability	95 % coverage Min.	250 200 1 150 1 100 50	к тице трогнатие: 245° - 250° 50°С 50°С 90±30s 20±10s 607 UP ТИКЕ SOLDER	Пид	
Soldering heat	Resistance change rate is: \pm (1.0%+0.05 Ω) Max.	4.18 Dip the having a ten hold it for 10	resistor into a so nperature of 260° 0±1 seconds.	lder bath C±3°C and	
		4.19 Resista 5 cycles for	nce change after duty cycle specifie	continuous ed below :	
		Step	Temperature	Time	
	Resistance change rate is	1	-55°C ± 3°C	30 mins	
Temperature cycling	\pm 5% (1.0% + 0.05Ω) Max. + 1% (0.5% ± 0.05Ω) Max.	2	Room temp.	10 ~ 15 mins	
	170 (0.570 + 0.0512) Wax.	3	+155°C ± 2°C	30 mins	
		4	Room temp.	10~15 mins	
Humidity	Resistance change rate is ± 5% (3.0% + 0.1Ω) Max. ± 1% (0.5% + 0.1Ω) Max.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40±2°C and 90- 95% relative humidity			
Load life in humidity	Resistance change rate is ± 5% (3.0% + 0.1Ω) Max. ± 1% (1.0% + 0.1Ω) Max.	7.9 Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity chamber controlled at 40°C ± 2°C and 90 to 95 % relative humidity			

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Performance Specification (continued)

	A 25-1 Permanent resistance change after
(3.0% + 0.1 Ω) Max. (1.0% + 0.1 Ω) Max.	1,000 hours operating at RCWV, with duty cycle of (1.5 hours"on", 0.5 hour"off") at $70^{\circ}C \pm 2^{\circ}C$ ambient
tance change rate is	4.33 Twist of Test Board:
((3.0% + 0.1Ω) Max. 1.0% + 0.1Ω) Max. ance change rate is % + 0.05Ω) Max.

Marking

E24 series 0603 – 2512 3 Digits – first two digits denote significant figures of resistance and third digit denotes number of zeros thereafter. EG

Marking for E96 Series 0805 – 2512 4 digits – First three digits denote significant figures of resistance and fourth digit denotes number of zeros thereafter. EG.

For ohmic values below 100R letter "R" denotes decimal point. EG

1R8 / 1.8Ω

0402 size chips are not marked

0603 E96 3 digit marking.

Resistance Code from table on next page, and Multiplier code from table below

Multiplier Code

- ·		-	_	-	-	- 1	-				-
Code	A	В	C	D	Ł	F	G	Н	Х	Y	Z
Mult.	10°	10 ¹	10²	10 ³	104	10 ⁵	10 ⁶	107	10-1	10-2	10-3

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Resistance Code

Value	Code								
100	01	162	21	261	41	422	61	681	81
102	02	165	22	267	42	432	62	698	82
105	03	169	23	274	43	442	63	715	83
107	04	174	24	280	44	453	64	732	84
110	05	178	25	287	45	464	65	750	85
113	06	182	26	294	46	475	66	768	86
115	07	187	27	301	47	487	67	787	87
118	08	191	28	309	48	499	68	806	88
121	09	196	29	316	49	511	69	825	89
124	10	200	30	324	50	523	70	845	90
127	11	205	31	332	51	536	71	866	91
130	12	210	32	340	52	549	72	887	92
133	13	215	33	348	53	562	73	909	93
137	14	221	34	357	54	576	74	931	94
140	15	226	35	365	55	590	75	953	95
143	16	232	36	374	56	604	76	976	96
147	17	237	37	383	57	619	77	8 8	
150	18	243	38	392	58	634	78		
154	19	249	39	402	59	649	79		
158	20	255	40	412	60	665	80	5	

Label

Label shall be marked with the following item :

A. Nominal Resistance and Resistance Tolerance

- B. Power Rating and Size
- C. Quantity and description
- D. Part No.
- E. Lot No.
- Ex.



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Packing Specification:

Tape dimensions (mm)

A. Paper Taping

						ф []-[]- -		= W	
Туре	A±0.2	B±0.2	C±0.05	ØD+0.1	E±0.1	F±0.05	G±0.1	W±0.2	T±0.1
				-0					
0402	0.65	1.15	2.0	1.5	1.75	3.5	4.0	8.0	0.45



Туре	A±0.2	B±0.2	C±0.05	ØD+0.1	E±0.1	F±0.05	G±0.1	W±0.2	T±0.1
				-0					
0603	1.10	1.90	2.0	1.5	1.75	3.5	4.0	8.0	0.67
0805	1.65	2.40	2.0	1.5	1.75	3.5	4.0	8.0	0.81
1206	2.00	3.60	2.0	1.5	1.75	3.5	4.0	8.0	0.81
1210	2.80	3.50	2.0	1.5	1.75	3.5	4.0	8.0	0.75

B. Embossed Taping



Туре	Α	В	С	ØD+0.1	ØD1+0.1	E	F	G	W	Т
	±0.2	±0.2	±0.05	-0	-0	±0.1	±0.05	±0.1	±0.2	±0.1
2010	2.90	5.60	2.0	1.5	1.5	1.75	5.5	4.0	12.0	1.0
2512	3.50	6.70	2.0	1.5	1.5	1.75	5.5	4.0	12.0	1.0

* Peeling Strength of Top Cover Tape

Test Condition: 0.1 to 0.7 N at a peel-off speed of 300 mm / min.



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Reel Dimension (mm)



Туре	Taping	Reel	A ±0.5	B ±0.5	C ±0.5	D ±1	M ±1	W ±1
		Quantity						
0402	Paper	10,000	2	13	21	60	178	10
0603	Paper	5,000	2	13	21	60	178	10
0805	Paper	5,000	2	13	21	60	178	10
1206	Paper	5,000	2	13	21	60	178	10
1210	Paper	5,000	2	13	21	60	178	10
2010	Embossed	4,000	2	13	21	60	178	13.8
2512	Embossed	4,000	2	13	21	60	178	13.8

How To Order

CRGH	0603	J	10K
Common Part	Size	Tolerance	Resistance Value
CRGH - High Power Thick Film Chip Resistor	0402 0603 0805 1206 1210 2010 2512	F - ±1% J - ±5%	1 ohm (1Ω) 1R0 1K ohm (1000Ω) 1K0 100K ohm (100000Ω) 100K 1M ohm (1000000Ω) 1M0

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TE Connectivity: CRGH0603F11K8