

Thick Film Chip Resistor Lead (Pb) Free Type

CRG Series

MERITEK

FEATURE

- Small Size and Light Weight
- Reliability, High Quality
- Lead (Pb) Free, Green type
- Application: Entertainment, Appliance, Computer and Relative Products, Communication Equipment, Power Equipment, Illumation Equipment, Measuring Instrument, Navigation Equipment



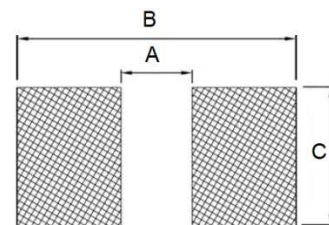
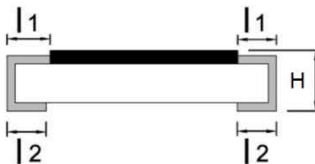
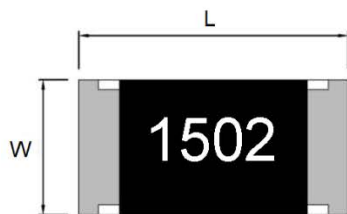
PART NUMBERING SYSTEM

CRG 10 1002 F - 13
(1) (2) (3) (4) (5)



No	Item	Code	Description	
(1)	Meritek Series	CRG	Thick Film Chip Resistor series, Lead (Pb) Free Type	
(2)	Size Code	10	10:0805	01: 2512, 02: 2010, 03: 1812, 04: 1210 08: 1206, 16: 0603, 20: 0402
(3)	Resistance	1002	1002: 10KΩ	First two digits: significant, Third: Multiplier First three digits: significant, Fourth: Multiplier
(4)	Tolerance	F	F:±1%	B: ±0.1%, C: ±0.25%; D: ±0.5%, G: ±2%, J: ±5%
(5)	Packaging	13	13:13" reel	Blank: Standrd 7"reel

DIMENSIONS



Size	L	W	H	l1	l2	A	B	C
0402	1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.15 ± 0.10	0.20 ± 0.10	0.60	1.60	0.70
0603	1.60 ± 0.20	0.80 ± 0.15	0.40 ± 0.10	0.30 ± 0.20	0.30 ± 0.10	0.80	2.40	1.00
0805	2.00 ± 0.20	1.25 ± 0.15	0.50 ± 0.15	0.30 ± 0.15	0.40 ± 0.15	1.30	2.90	1.40
1206	3.05 ± 0.10	1.60 ± 0.20	0.55 ± 0.15	0.40 ± 0.20	0.50 ± 0.20	2.20	4.20	1.70
1210	3.05 ± 0.10	2.50 ± 0.20	0.55 ± 0.15	0.50 ± 0.20	0.50 ± 0.20	2.00	4.40	2.70
1812	4.50 ± 0.10	3.10 ± 0.20	0.55 ± 0.05	0.55 ± 0.20	0.70 ± 0.20	3.11	5.91	3.00
2010	5.00 ± 0.20	2.50 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20	3.80	6.60	2.70
2512	6.30 ± 0.20	3.20 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20	4.90	8.10	3.40

Unit: mm

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ELECTRICAL CHARACTERISTICS

STANDARD TYPE

Size	Rated Power	Rated Voltage	Overload Voltage	TCR	Resistance Range		
					±0.1%, ±0.25%	±0.5%, ±1%	±2%, ±5%
	(W), 70°C	(V) Max	(V) Max	(PPM/°C)	(Ω)	(Ω)	
0402	0.063	50	100	±400	--	1≤R<10	
				±250	10≤R<100K	10≤R<100K	
				±100	100K≤R≤1M	100K≤R≤10M	
0603	0.1	75	150	±100	--	1≤R≤10	
				±250	10<R<100K	10<R<100K	
				±100	100K≤R≤1M	100K≤R≤10M	
0805	0.125	150	300	±100	--	1≤R≤10	
				±200	10<R<100K	10<R<100K	
				±100	100K≤R≤1M	100K≤R≤10M	
1206	0.25	200	400	±100	--	1≤R≤10	
				±200	10<R<100K	10<R<100K	
				±100	100K≤R≤1M	100K≤R≤10M	
1210	0.5	200	400	±100	--	1≤R≤10	
				±200	10<R<100K	10<R<100K	
				±100	100K≤R≤1M	100K≤R≤10M	
1812	0.75	200	400	±100	--	1≤R≤10	
				±200	10<R<100K	10<R<100K	
				±100	100K≤R≤1M	100K≤R≤10M	
2010	0.75	200	400	±100	--	1≤R≤10	
				±200	10<R<100K	10<R<100K	
				±100	100K≤R≤1M	100K≤R≤10M	
2512	1.0	200	400	±100	--	1≤R≤10	
				±200	10<R<100K	10<R<100K	
				±100	100K≤R≤1M	100K≤R≤10M	

LOW OHM TYPE

Size	Rated Power	Rated Voltage	Overload Voltage	TCR	Resistance Range	
					±1%, ±5%	
	(W) 70°C	(V)	(V) Max	(PPM/°C)	(mΩ)	
1206	0.25	0.05~0.5	1.25	±1800	10≤R<50	
				±800	50≤R<100	
				±600	100≤R<1000	
1210	0.5	0.07~0.7	1.75	±600	100≤R<1000	
1812	0.75	0.08~0.8	2.15	±600	100≤R<1000	
2010	0.75	0.08~0.8	2.15	±600	100≤R<1000	
2512	1.0	0.1~0.99	2.475	±1800	10≤R<50	
				±800	50≤R<100	
				±600	100≤R<1000	

Notes: For non-standard parts, please contact our sales dept. Operating Temperature Range : -55°C ~ +155°C

Thick Film Chip Resistor

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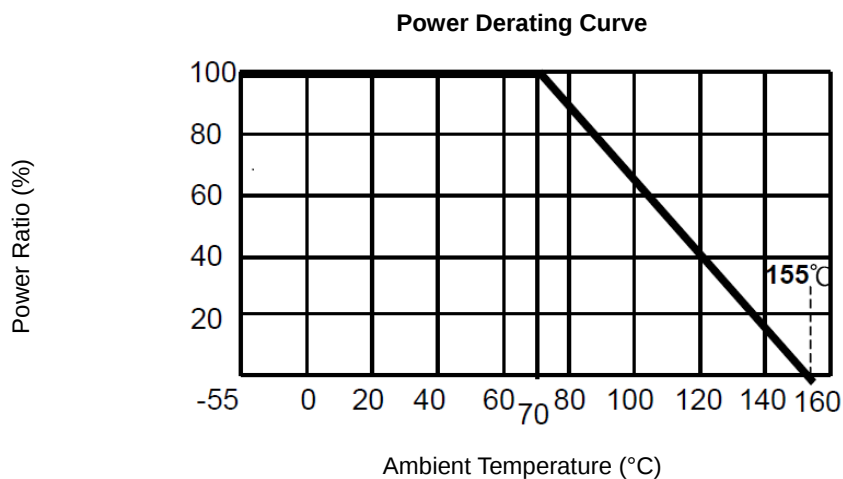
CRG Series

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RELIABILITY TEST CONDITION AND REQUIREMENT

Item	Standard	Condition	Requirement	
			$\leq \pm 1\%$	$\pm 2\%, \pm 5\%$
Temperature Coefficient of Resistance (T.C.R)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	At 25 / -55°C and 25°C / +155°C, 25°C is the reference temperature	As Specified	As Specified
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	2.5 times RCWV or Max. Overload voltage whichever is less for 5 sec.	$\pm(1.0\%+0.05\Omega)$	$\pm(2.0\%+0.10\Omega)$
Leaching	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1	260 $\pm$ 5°C for 30 seconds.	Individual leaching area $\leq 5\%$ Total leaching area $\leq 10\%$	
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260 $\pm$ 5°C for 10 seconds.	$\pm(0.5\%+0.05\Omega)$	$\pm(1.0\%+0.05\Omega)$
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	Apply 100VDC for 1 minute.	$\geq 10G\Omega$	$\geq 10G\Omega$
Rapid Change of Temperature	JIS-C-5201-1 4.19 IEC-60115-1 4.19	5 Cycles (-55°C to +155°C)	$\pm(0.5\%+0.05\Omega)$	$\pm(1.0\%+0.10\Omega)$
Resistance to Solvent	JIS-C-5201-1 4.29	The tested resistor is immersed into isopropyl alcohol of 20~25°C for 60 sec. Leave to rest at room temp for 48 hrs.	$\pm(0.5\%+0.05\Omega)$	$\pm(0.5\%+0.05\Omega)$
Damp Heat with Load	JIS-C-5201-1 4.24 IEC-60115-1 4.24	40 $\pm$ 2°C, 90~95% R.H. RCWV or Max. working voltage whichever is less for 1000hrs with 1.5hrs "ON" and 0.5hr "OFF"	Value $>1\Omega$: $\pm(1.0\%+0.05\Omega)$, Value $<1\Omega$: $\pm(2.0\%+0.05\Omega)$	$\pm(2.0\%+0.05\Omega)$
Load Life	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70 $\pm$ 2°C, RCWV or Max. working voltage whichever is less for 1000hrs with 1.5hrs "ON" and 0.5hr "OFF"	Value $>1\Omega$: $\pm(1.0\%+0.05\Omega)$ Value $<1\Omega$: $\pm(3.0\%+0.10\Omega)$	$\pm(3.0\%+0.10\Omega)$
Board Flex	JIS-C-5201-1 4.33 IEC-60115-1 4.33	Bending once for 5 seconds 0402/0603/0805: 5mm; 1206/1210/1812: 3mm; 2010/2512 sizes: 2mm	$\pm(1.0\%+0.05\Omega)$	$\pm(1.0\%+0.05\Omega)$

POWER DERATING CURVE

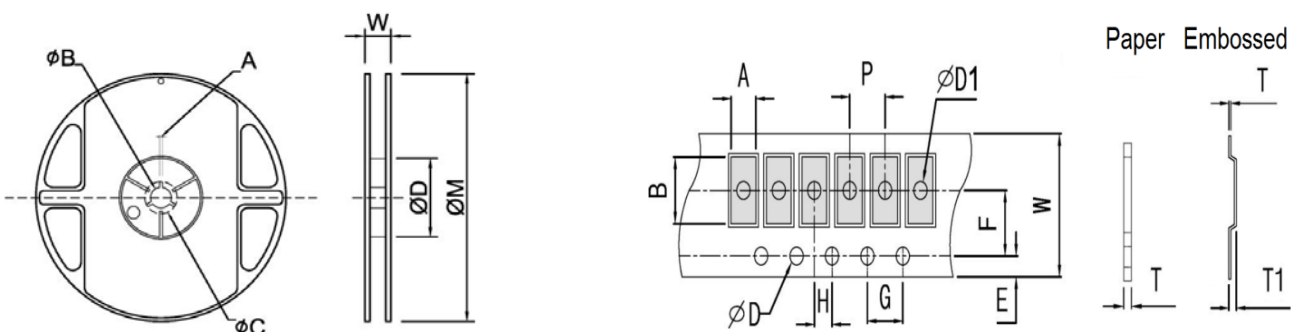


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PACKAGING SPECIFICATIONS



Size	Reel Dimension (mm)								
	Type	Quantity	Reel Diameter	A ±0.5	φB ±1.0	φC ±1.0	φD ±1.0	W ±2.0	φM ±2.0
0402	Paper	10K	7"	2.0	13.5	21	60	11.5	178
	Paper	40K/50K	13"	2.0	13.5	21	100	11.5	330
0603 0805 1206	Paper	5K	7"	2.0	13.5	21	60	11.5	178
	Paper	10K	10"	2.0	13.5	21	100	11.5	254
	Paper	20K	13"	2.0	13.5	21	100	11.5	330
1210	Paper	5K	7"	2.0	13.5	21	60	11.5	178
1812	Plastic	4K	7"	2.0	13.5	21	60	16.0	178
2010	Plastic	4K	7"	2.0	13.5	21	60	16.0	178
2512	Plastic	4K	7"	2.0	13.5	21	60	16.0	178

Size	Tape Dimension (mm)												
	A	B	W ±0.2	E ±0.10	F ±0.05	G ±0.10	H ±0.05	T ±0.10	ΦD ₀ ±0.05	ΦD ₁ ±0.1	T1 ±0.15	P ±0.10	Type
0402	0.70±0.10	1.20±0.10	8.00	1.75	3.50	4.00	2.00	0.45	1.55	--	--	2.00	Paper
0603	1.05±0.20	1.80±0.20	8.00	1.75	3.50	4.00	2.00	0.60	1.55	--	--	4.00	Paper
0805	1.55±0.20	2.30±0.20	8.00	1.75	3.50	4.00	2.00	0.75	1.55	--	--	4.00	Paper
1206	1.90±0.20	3.50±0.20	8.00	1.75	3.50	4.00	2.00	0.75	1.55	--	--	4.00	Paper
1210	2.85±0.20	3.50±0.20	8.00	1.75	3.50	4.00	2.00	0.75	1.55	--	--	4.00	Paper
1812	3.30±0.20	4.60±0.20	12.0	1.75	5.50	4.0	2.0	0.23	1.55	1.50	0.85	4.00	Plastic
2010	2.80±0.20	5.60±0.20	12.0	1.75	5.50	4.0	2.0	0.23	1.55	1.50	0.85	4.00	Plastic
2512	3.40±0.20	6.70±0.20	12.0	1.75	5.50	4.0	2.0	0.23	1.55	1.50	0.85	4.00	Plastic

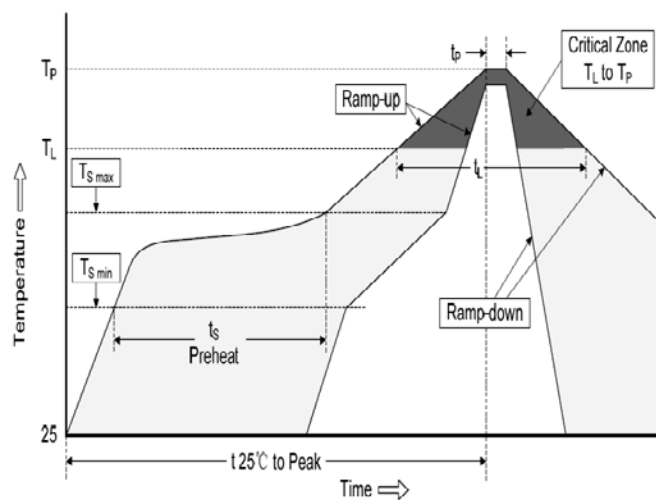
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SOLDERING RECOMMENDATION

Reflow Condition		
Pre Heat	Temp. Min $T_{s(min)}$	150°C
	Temp. Max $T_{s(max)}$	180°C
	Time (min. to max.) (t_s)	90s ~ 120s
Average ramp up rate (T_L) to peak		3°C/s max.
$T_{s(max)}$ to T_L (Ramp-up rate)		3°C/s max.
Reflow	Temp. (T_L)	220°C
	Time (min. to max.) (t_L)	60s max.
Peak Temperature (T_P)		265°C
Time within 5°C of T_P (t_p)		10s
Ramp-down Rate		6°C/s



*Specifications subject to change without notice.