Surface Mounted Resistors



CR Series

- CECC released products
- 100% high temperature and overload screened versions available for high reliability applications
- Terminations available for wire bonding or soldering
- Available in sizes down to 0503
- Resistance range 1 ohm to100M ohms
- Tolerances down to 0.1%
- Solder terminations have a nickel barrier layer
- Shorting Links available



Electrical Data

Commercial		CR0503	CR0805	CR1005	CR1206	CR2010	CR2512	Notes	
Power rating at 70°C	watts	0.063	0.125	0.125	0.25	0.5	1.0		
Resistance range	ohms	1R to 10M		1R to 100M		1R to	o 1M		
Limiting element voltage	volts	50	100	150	200	400	500		
TCR -55° to +155°C	ppm/°C		<10 ohms 350: 10 to 100 ohms 200:						
			100	to 1M ohm 1	00: >1M ohn	า 250			
Resistance tolerance	%		0.1, 0.25, 0.5, 1, 2, 5						
Ambient temperature range	°C			-55 to	o 155				

CECC 40401-004 Requirements		CR0805	CR12	206			
Power rating at 70°C	watts	0.125	0.2	5	•		
Resistance range	ohms	1R to 10M					
Limiting element voltage	volts	100	20	0			
TCR -55°C to +125°C	ppm/°C	<10 ohms 200: 10 to 1M 100: >1M 200					
TCR +20°C to +70°C	ppm/°C	<10 ohms 200: 10 to 1M 50: >1M 100					
Resistance tolerance	%	0.5, 1, 2, 5					See table of value ranges
Ambient temperature range	°C		-55 to +125				

		67.0			67470 6	CDD040	CD0540	
CECC 40401-008 Requirements		CR08	305		CR1206	CR2010	CR2512	
Power rating at 70°C	watts	0.12	25		0.25	0.5	1.0	
Resistance range	ohms	1R to	10M		1R to 10M	1R to 1M	1R to 1M	
Limiting element voltage	volts	10	0		200	400	500	
TCR -55°C to +155°C	ppm/°C		<10 ohms	200: 10	to 1M ohms	100:		
				>1M oh	ms 250			
Resistance tolerance	%	6 0.1, 0.25, 0.5, 1, 2, 5						See table of value range
Ambient temperature range	°C		-55 to 155					

CECC 40401-003 Requirements		CR0805	CR1206					
Power rating at 70°C	watts	0.063 0.125						
Resistance range	ohms	1R to 3M	1R to 5M					
Limiting element voltage	volts	100	200					
TCR -55°C to +125°C	ppm/°C	<5	<5 ohms 500: 5 to 10 ohms 350:					
		10 to	10 to 3M ohms 100: >3M ohms 250					
Resistance tolerance	%		See table of value ranges					
Ambient temperature range	°C		-55 to 125					

These tables indicate the CECC specification requirements, and these are met or exceeded by the corresponding CR series products

Values		E24 & E96 preferred					Any value to order
Thermal impedance °C/wat	800	360	290	200	80	70	Mounted on custom designed PCB's

General Note

TT electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT electronics' own data and is considered accurate at time of going to print.



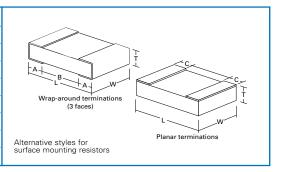
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CR Series



Physical Data

Dimens	Dimensions of Standard Styles (mm) & Weight (g)										
	Wrap around										
Style	L	W	T max	А	B⁺	C	Wt				
0503	1.25±0.2	0.63±.15	0.5	Not available		0.20±0.1	0.005				
0805	2.0±0.2	1.25±0.15	0.6	0.3±0.15	0.9 min	0.3±0.1	0.009				
1005	2.5±0.3	1.25±0.2	0.7	Not av	/ailable	0.4±0.15	0.015				
1206	3.2±0.2	1.6±0.2	0.7	0.4±0.2	1.7 min	0.4±0.15	0.020				
2010	5.1±0.3	2.5±0.2	0.7	0.6±0.3	3.0 min	N/A	0.036				
2512	6.5±0.3	3.2±0.2	0.7	0.6±0.3	4.4 min	N/A	0.055				



[†]This dimension determines the number of conductors which may pass under the surface mounted device.

Construction

Thick film resistor material, overglaze and organic protection are screen printed on a 96% alumina substrate.

Terminations

Planar (or single-sided) termination is gold and suitable for wire-bonding; wrap-around is suitable for soldering.

Solderability

Wrap-around terminations have an electroplated nickel barrier and solder coating, this ensures excellent 'leach' resistance properties and solderability. They will withstand immersion in solder at 260°C for 30 seconds.

Marking

All relevant information recorded on the primary package or reel.

Performance Data

		CECC 40401-008	CECC40401-004	CECC40401-003	Act	tual
		Requirements	Requirements	Requirements	Maximum	Typical
Load at rated power: 1000 hours at 70°C	∆R%	2	2	≤ 3M3 2	2	0.25
				>3M3 3		
Shelf life: 12 months at room temp.	ΔR%	-	-	-	0.1	0.02
Derating from rated power at 70°C		Zero at 155°C	Zero at 125°C	Zero at 125°C		
Overload	ΔR%	0805:1 1206:0.5	0.5	2	1	0.1
Dry Heat: 1000 hours at UCT	Δ R%	2	1	≤ 3M3 2	to 10M 1	0.2
(125°C for 003 & 004 - 155°C for 008)				>3M3 3	>10M 2	>10M 1
Long term damp heat	ΔR%	2	2	2	1	0.25
Temperature rapid change	ΔR%	0.5	0.5	1	0.25	0.05
Resistance to solder heat	ΔR%	0.5	0.5	2	0.25	0.05
Voltage proof	volts	080!	5:200 1206:	300	0503	: 100
		2010	0:400 2512:	500	All othe	ers : 500

Note: An 0.01 ohm addition to be added to the performance of all resistors <10 ohms

Value Ranges (ohms)

Tolerance		%								
Size	5	2	1	0.5	0.25	0.1				
0503	1 to 10M	1 to 10M	10 to 10M	100 to 1M	N/A	N/A				
0805	1 to 100M	1 to 50M	1 to 20M	10 to 10M	100 to 1M	100 to 1M				
1005	1 to 100M	1 to 50M	1 to 20M	10 to 10M	100 to 1M	100 to 1M				
1206	1 to 100M	1 to 50M	1 to 25M	10 to 10M	100 to 1M	100 to 1M				
2010	1 to 1M	1 to 1M	1 to 1M	10 to 10M	100 to 1M	N/A				
2512	1 to 1M	1 to 1M	1 to 1M	10 to 10M	100 to 1M	N/A				

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CR Series



Application Notes

Operating Temperature Range

The chips themselves can operate at a maximum temperature of 155°C (see performance claims above). For soldered chips, the joint temperature should not exceed 110°C. This condition is met when the stated power levels at 70°C are used.

Mounting

This chip resistor is ideally suited for handling by automatic methods due to its rectangular shape and the small dimensional tolerances. Electrical connection to a ceramic substrate or to a printed circuit board can be made by wire bonding (eg suffix 'G' in CR0805G) or by reflow soldering of wrap-around terminations (eg suffix 'F' in CR0805F).

The 'F' terminations provide good leach properties and ensure reliable contact. Due to the robust construction the resistor chip can be immersed in the solder bath for 30 seconds at 260°C. This enables the resistor to be mounted on one side of a printed circuit board and other wire-leaded components on the other side.

Packaging

Wrap-around Termination

Chip resistors are supplied taped and reeled on standard 8mm tape to IEC 286-3.

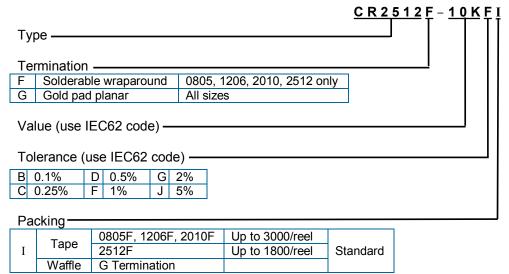
Quantity per reel; 3000 max.

Planar Terminations

Resistor chips are supplied in waffle packs.

Ordering Procedure

Example: CR2512 with solderable wraparound terminations at 10 kilohms and 1% tolerance on a reel of up to 1800 pieces -



For CECC released product state on order the CECC number. Example: CR2512F-10KFI CECC40401-008 For SnPb finish instead of Pb-free replace the packing suffix with PB. Example: CR2512F-10KFPB For zero-ohm jumper chips use the dummy value & tolerance code R005J

General Note