

RESISTOR Material Composition

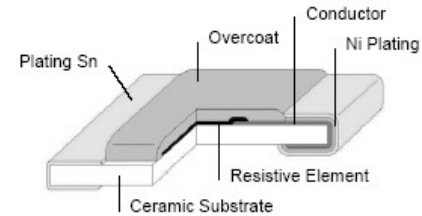
The contents of this specification may change without notice 1/23/2014



CR, CJ Series - Thick Film Chip Resistor (non precision type)

This statement pertains to the following directive 2011/65/EC of the European Parliament and of the Council of the European Union on the restriction of the use of certain hazardous substances in electrical and electronic equipment. The definition of LEAD-FREE products is external terminal meet Lead Free.

RoHS exemption 7 (c)-1, Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronics devices, or in a glass or ceramic matrix compound (2011/65/EU)



CAS no.	Material	Substance	CR20		CR05		CR16		CR10		CR18		CR14		CR12		CR01	
			Mass mg	%	Mass mg	%	Mass mg	%	Mass mg	%	Mass mg	%	Mass mg	%	Mass mg	%	Mass mg	%
1344-28-1	Ceramic Substrate	Al2O3	0.1349	80.59%	0.4109	80.61%	1.5952	83.02%	3.6667	86.04%	7.4778	87.54%	12.4631	84.80%	19.5421	87.33%	32.4533	86.64%
60676-86-0		SiO2	0.0056	3.36%	0.0171	3.36%	0.0665	3.46%	0.1528	3.58%	0.3116	3.65%	0.5193	3.53%	0.8143	3.64%	1.3522	3.61%
7440-22-4	Conductor Layer (Bottom)	Ag	0.0017	1.05%	0.0053	1.05%	0.0121	0.63%	0.0233	0.55%	0.0266	0.31%	0.0581	0.40%	0.0581	0.26%	0.0775	0.21%
65997-17-3		Glass	0.0001	0.06%	0.0003	0.06%	0.0006	0.03%	0.0012	0.03%	0.0014	0.02%	0.0031	0.02%	0.0031	0.01%	0.0041	0.01%
7440-22-4	Conductor Layer (Top)	Ag	0.0013	0.80%	0.0041	0.80%	0.0252	1.31%	0.0456	1.07%	0.0919	1.08%	0.1801	1.23%	0.2203	0.98%	0.3416	0.91%
7440-05-03		Pd	0.0000	0.01%	0.0001	0.01%	0.0003	0.02%	0.0006	0.01%	0.0012	0.01%	0.0023	0.02%	0.0028	0.01%	0.0043	0.01%
65997-17-3		Glass	0.0003	0.20%	0.0010	0.20%	0.0064	0.33%	0.0116	0.27%	0.0233	0.27%	0.0456	0.31%	0.0558	0.25%	0.0865	0.23%
12036-10-1	Resistive Element	RuO2	0.0004	0.23%	0.0012	0.23%	0.0033	0.17%	0.0049	0.11%	0.0109	0.13%	0.0227	0.15%	0.0373	0.17%	0.0653	0.17%
7440-22-4		Ag	0.0006	0.37%	0.0019	0.37%	0.0053	0.27%	0.0078	0.18%	0.0174	0.20%	0.0363	0.25%	0.0596	0.27%	0.1045	0.28%
1317-36-8		Pb	0.0002	0.14%	0.0007	0.14%	0.0020	0.10%	0.0029	0.07%	0.0065	0.08%	0.0136	0.09%	0.0224	0.10%	0.0392	0.10%
65997-17-3		Glass	0.0003	0.18%	0.0009	0.18%	0.0026	0.14%	0.0039	0.09%	0.0087	0.10%	0.0182	0.12%	0.0298	0.13%	0.0523	0.14%
25068-38-6	Over-Coating	Epoxy	0.0034	2.05%	0.0105	2.05%	0.0304	1.58%	0.0665	1.56%	0.1121	1.31%	0.2100	1.43%	0.3943	1.76%	0.6565	1.75%
25068-38-6	Marking	Epoxy	0.0000	0.00%	0.0000	0.00%	0.0031	0.16%	0.0036	0.08%	0.0115	0.13%	0.0115	0.08%	0.0244	0.11%	0.0421	0.11%
7440-02-0	End Terminal	Ni	0.0005	0.29%	0.0015	0.29%	0.0020	0.10%	0.0027	0.06%	0.0038	0.04%	0.0076	0.05%	0.0074	0.03%	0.0095	0.03%
7440-47-3		Cr	0.0001	0.07%	0.0004	0.07%	0.0005	0.03%	0.0007	0.02%	0.0010	0.01%	0.0019	0.01%	0.0018	0.01%	0.0024	0.01%
7440-02-0	Ni Plating	Ni	0.0094	5.60%	0.0285	5.60%	0.0877	4.57%	0.1411	3.31%	0.2310	2.70%	0.5835	3.97%	0.5835	2.61%	1.1447	3.06%
7440-31-5	Sn Plating	Sn	0.0084	4.99%	0.0255	4.99%	0.0783	4.07%	0.1259	2.95%	0.2060	2.41%	0.5205	3.54%	0.5205	2.33%	1.0213	2.73%
All of the above are approximate values by the component parts of the material			0.1674	100	0.5098	100	1.9216	100	4.2617	100	8.5426	100	14.6973	100	22.3774	100	37.4572	100

