



Material Declaration Data Sheet

RVC0402

Medium Voltage Thick Film Chip Resistor

Date: **January 7, 2013** Max Temp: **260°C** (Contact factory for detailed soldering recommendations.)
 Component Weight (mg): **0.6196**

BOM Item	Material	CAS Number	Material Weight (mg)	Material PPM of Component	Material % of BOM Item	BOM Item Weight (mg)	BOM Item % of Component
Ceramic substrate	aluminum oxide	1344-28-1	0.4884	788,150	96.00%	0.5087	82.10%
	silicon dioxide	14808-60-7	0.0153	24,630	3.00%		
	magnesium oxide	1309-48-4	0.0051	8,210	1.00%		
Inner termination layer	silver	7440-22-4	0.0098	15,773	48.33%	0.0202	3.26%
	palladium	7440-05-3	0.0001	111	0.34%		
	terpineol	8000-41-7	0.0016	2,611	8.00%		
	copper oxide	1317-38-0	0.0007	1,087	3.33%		
	butyl carbitol	112-34-5	0.0013	2,177	6.67%		
	nickel	7440-02-0	0.0037	5,982	18.33%		
	chromium	7440-47-3	0.0030	4,895	15.00%		
Resistive element	ruthenium oxide	12036-10-1	0.0019	2,998	25.00%	0.0074	1.20%
	terpineol	8000-41-7	0.0019	2,998	25.00%		
	lead borosilicate glass	undefined	0.0022	3,597	30.00%		
	silver	7440-22-4	0.0015	2,398	20.00%		
Pre-coat	glass	65997-18-4	0.0026	4,214	70.00%	0.0037	0.60%
	butyl carbitol acetate	124-17-4	0.0009	1,505	25.00%		
	resin	9004-57-3	0.0001	241	4.00%		
	chromium oxide	1308-38-9	0.0000	60	1.00%		
Over-coat	epoxy	67762-95-2	0.0047	7,510	35.00%	0.0133	2.15%
	carbon black	1333-86-4	0.0007	1,073	5.00%		
	silicon dioxide	60676-86-0	0.0053	8,583	40.00%		
	butyl carbitol	112-34-5	0.0027	4,291	20.00%		
Middle termination layer	nickel	7440-02-0	0.0331	53,443	100.00%	0.0331	5.34%
Side termination	nickel	7440-02-0	0.00001	12	55.00%	0.0000	0.00%
	chromium	7440-47-3	0.00001	9	45.00%		
Outer termination layer	tin	7440-31-5	0.0331	53,443	100.00%	0.0331	5.34%
Total Weight			0.6196				

Note: Lead oxide contained in glass frit is part of the thick film formulations. This lead content is covered by exemption 7c-1 of the Directive Annex ("... electronic components containing lead in a glass..."). Weights are approximate.



Material Declaration Data Sheet

RVC0603

Medium Voltage Thick Film Chip Resistor

Date: **January 7, 2013**
 Component Weight (mg): **2.0422**

Max Temp: **260°C** (Contact factory for detailed soldering recommendations.)

BOM Item	Material	CAS Number	Material Weight (mg)	Material PPM of Component	Material % of BOM Item	BOM Item Weight (mg)	BOM Item % of Component
Ceramic substrate	aluminum oxide	1344-28-1	1.7392	851,649	96.00%	1.8117	88.71%
	silicon dioxide	14808-60-7	0.0544	26,614	3.00%		
	magnesium oxide	1309-48-4	0.0181	8,871	1.00%		
Inner termination layer	silver	7440-22-4	0.0151	7,382	48.33%	0.0312	1.53%
	palladium	7440-05-3	0.0001	52	0.34%		
	terpineol	8000-41-7	0.0025	1,222	8.00%		
	copper oxide	1317-38-0	0.0010	509	3.33%		
	butyl carbitol	112-34-5	0.0021	1,019	6.67%		
	nickel	7440-02-0	0.0057	2,800	18.33%		
	chromium	7440-47-3	0.0047	2,291	15.00%		
Resistive element	ruthenium oxide	12036-10-1	0.0034	1,677	25.00%	0.0137	0.67%
	terpineol	8000-41-7	0.0034	1,677	25.00%		
	lead borosilicate glass	undefined	0.0041	2,013	30.00%		
	silver	7440-22-4	0.0027	1,342	20.00%		
Pre-coat	glass	65997-18-4	0.0053	2,571	70.00%	0.0075	0.37%
	butyl carbitol acetate	124-17-4	0.0019	918	25.00%		
	resin	9004-57-3	0.0003	147	4.00%		
	chromium oxide	1308-38-9	0.0001	37	1.00%		
Over-coat	epoxy	67762-95-2	0.0097	4,750	35.00%	0.0277	1.36%
	carbon black	1333-86-4	0.0014	679	5.00%		
	silicon dioxide	60676-86-0	0.0111	5,429	40.00%		
	butyl carbitol	112-34-5	0.0055	2,715	20.00%		
Middle termination layer	nickel	7440-02-0	0.0742	36,319	100.00%	0.0742	3.63%
Side termination	nickel	7440-02-0	0.00002	11	55.00%	0.0000	0.00%
	chromium	7440-47-3	0.00002	9	45.00%		
Outer termination layer	tin	7440-31-5	0.0762	37,298	100.00%	0.0762	3.73%
Total Weight			2.0422				

Note: Lead oxide contained in glass frit is part of the thick film formulations. This lead content is covered by exemption 7c-I of the Directive Annex ("... electronic components containing lead in a glass..."). Weights are approximate.



Material Declaration Data Sheet

RVC0805

Medium Voltage Thick Film Chip Resistor

Date: **January 7, 2013**
 Component Weight (mg): **4.3677**

Max Temp: **260°C** (Contact factory for detailed soldering recommendations.)

BOM Item	Material	CAS Number	Material Weight (mg)	Material PPM of Component	Material % of BOM Item	BOM Item Weight (mg)	BOM Item % of Component
Ceramic substrate	aluminum oxide	1344-28-1	3.7245	852,723	96.00%	3.8797	88.83%
	silicon dioxide	14808-60-7	0.1164	26,648	3.00%		
	magnesium oxide	1309-48-4	0.0388	8,883	1.00%		
Inner termination layer	silver	7440-22-4	0.0420	9,621	48.33%	0.0869	1.99%
	palladium	7440-05-3	0.0003	68	0.34%		
	terpineol	8000-41-7	0.0070	1,593	8.00%		
	copper oxide	1317-38-0	0.0029	663	3.33%		
	butyl carbitol	112-34-5	0.0058	1,328	6.67%		
	nickel	7440-02-0	0.0159	3,649	18.33%		
	chromium	7440-47-3	0.0130	2,986	15.00%		
Resistive element	ruthenium oxide	12036-10-1	0.0072	1,648	25.00%	0.0288	0.66%
	terpineol	8000-41-7	0.0072	1,648	25.00%		
	lead borosilicate glass	undefined	0.0086	1,977	30.00%		
	silver	7440-22-4	0.0058	1,318	20.00%		
Pre-coat	glass	65997-18-4	0.0087	1,986	70.00%	0.0124	0.28%
	butyl carbitol acetate	124-17-4	0.0031	709	25.00%		
	resin	9004-57-3	0.0005	113	4.00%		
	chromium oxide	1308-38-9	0.0001	28	1.00%		
Over-coat	epoxy	67762-95-2	0.0189	4,336	35.00%	0.0541	1.24%
	carbon black	1333-86-4	0.0027	619	5.00%		
	silicon dioxide	60676-86-0	0.0216	4,956	40.00%		
	butyl carbitol	112-34-5	0.0108	2,478	20.00%		
Middle termination layer	nickel	7440-02-0	0.1519	34,772	100.00%	0.1519	3.48%
Side termination	nickel	7440-02-0	0.00006	13	55.00%	0.0001	0.00%
	chromium	7440-47-3	0.00005	10	45.00%		
Outer termination layer	tin	7440-31-5	0.1539	35,230	100.00%	0.1539	3.52%
Total Weight			4.3677				

Note: Lead oxide contained in glass frit is part of the thick film formulations. This lead content is covered by exemption 7c-I of the Directive Annex ("... electronic components containing lead in a glass..."). Weights are approximate.



Material Declaration Data Sheet

RVC1206

Medium Voltage Thick Film Chip Resistor

Date: **January 7, 2013** Max Temp: **260°C** (Contact factory for detailed soldering recommendations.)
 Component Weight (mg): **8.9467**

BOM Item	Material	CAS Number	Material Weight (mg)	Material PPM of Component	Material % of BOM Item	BOM Item Weight (mg)	BOM Item % of Component
Ceramic substrate	aluminum oxide	1344-28-1	7.8159	873,611	96.00%	8.1416	91.00%
	silicon dioxide	14808-60-7	0.2442	27,300	3.00%		
	magnesium oxide	1309-48-4	0.0814	9,100	1.00%		
Inner termination layer	silver	7440-22-4	0.0571	6,377	48.33%	0.1181	1.32%
	palladium	7440-05-3	0.0004	45	0.34%		
	terpineol	8000-41-7	0.0094	1,056	8.00%		
	copper oxide	1317-38-0	0.0039	439	3.33%		
	butyl carbitol	112-34-5	0.0079	880	6.67%		
	nickel	7440-02-0	0.0216	2,419	18.33%		
	chromium	7440-47-3	0.0177	1,979	15.00%		
Resistive element	ruthenium oxide	12036-10-1	0.0188	2,101	25.00%	0.0752	0.84%
	terpineol	8000-41-7	0.0188	2,101	25.00%		
	lead borosilicate glass	undefined	0.0226	2,521	30.00%		
	silver	7440-22-4	0.0150	1,681	20.00%		
Pre-coat	glass	65997-18-4	0.0289	3,236	70.00%	0.0414	0.46%
	butyl carbitol acetate	124-17-4	0.0103	1,156	25.00%		
	resin	9004-57-3	0.0017	185	4.00%		
	chromium oxide	1308-38-9	0.0004	46	1.00%		
Over-coat	epoxy	67762-95-2	0.0347	3,883	35.00%	0.0992	1.11%
	carbon black	1333-86-4	0.0050	555	5.00%		
	silicon dioxide	60676-86-0	0.0397	4,437	40.00%		
	butyl carbitol	112-34-5	0.0198	2,219	20.00%		
Middle termination layer	nickel	7440-02-0	0.2335	26,102	100.00%	0.2335	2.61%
Side termination	nickel	7440-02-0	0.00011	12	55.00%	0.0002	0.00%
	chromium	7440-47-3	0.00009	10	45.00%		
Outer termination layer	tin	7440-31-5	0.2375	26,549	100.00%	0.2375	2.65%
Total Weight			8.9467				

Note: Lead oxide contained in glass frit is part of the thick film formulations. This lead content is covered by exemption 7c-I of the Directive Annex ("... electronic components containing lead in a glass..."). Weights are approximate.



Material Declaration Data Sheet

RVC2010

Medium Voltage Thick Film Chip Resistor

Date: **January 7, 2013**
 Component Weight (mg): **24.2411**

Max Temp: **260°C** (Contact factory for detailed soldering recommendations.)

BOM Item	Material	CAS Number	Material Weight (mg)	Material PPM of Component	Material % of BOM Item	BOM Item Weight (mg)	BOM Item % of Component
Ceramic substrate	aluminum oxide	1344-28-1	20.9988	866,247	96.00%	21.8737	90.23%
	silicon dioxide	14808-60-7	0.6562	27,070	3.00%		
	magnesium oxide	1309-48-4	0.2187	9,023	1.00%		
Inner termination layer	silver	7440-22-4	0.2883	11,893	48.33%	0.5965	2.46%
	palladium	7440-05-3	0.0020	84	0.34%		
	terpineol	8000-41-7	0.0477	1,969	8.00%		
	copper oxide	1317-38-0	0.0199	819	3.33%		
	butyl carbitol	112-34-5	0.0398	1,641	6.67%		
	nickel	7440-02-0	0.1093	4,511	18.33%		
	chromium	7440-47-3	0.0895	3,691	15.00%		
Resistive element	ruthenium oxide	12036-10-1	0.0760	3,136	25.00%	0.3040	1.25%
	terpineol	8000-41-7	0.0760	3,136	25.00%		
	lead borosilicate glass	undefined	0.0912	3,763	30.00%		
	silver	7440-22-4	0.0608	2,508	20.00%		
Pre-coat	glass	65997-18-4	0.1442	5,950	70.00%	0.2060	0.85%
	butyl carbitol acetate	124-17-4	0.0515	2,125	25.00%		
	resin	9004-57-3	0.0082	340	4.00%		
	chromium oxide	1308-38-9	0.0021	85	1.00%		
Over-coat	epoxy	67762-95-2	0.1063	4,386	35.00%	0.3038	1.25%
	carbon black	1333-86-4	0.0152	627	5.00%		
	silicon dioxide	60676-86-0	0.1215	5,013	40.00%		
	butyl carbitol	112-34-5	0.0608	2,506	20.00%		
Middle termination layer	nickel	7440-02-0	0.4744	19,569	100.00%	0.4744	1.96%
Side termination	nickel	7440-02-0	0.00013	5	55.00%	0.0002	0.00%
	chromium	7440-47-3	0.00010	4	45.00%		
Outer termination layer	tin	7440-31-5	0.4824	19,899	100.00%	0.4824	1.99%
Total Weight			24.2411				

Note: Lead oxide contained in glass frit is part of the thick film formulations. This lead content is covered by exemption 7c-I of the Directive Annex ("... electronic components containing lead in a glass..."). Weights are approximate.



Material Declaration Data Sheet

RVC2512

Medium Voltage Thick Film Chip Resistor

Date: **January 7, 2013** Max Temp: **260°C** (Contact factory for detailed soldering recommendations.)
 Component Weight (mg): **39.4488**

BOM Item	Material	CAS Number	Material Weight (mg)	Material PPM of Component	Material % of BOM Item	BOM Item Weight (mg)	BOM Item % of Component
Ceramic substrate	aluminum oxide	1344-28-1	34.4400	873,031	96.00%	35.8750	90.94%
	silicon dioxide	14808-60-7	1.0763	27,282	3.00%		
	magnesium oxide	1309-48-4	0.3588	9,094	1.00%		
Inner termination layer	silver	7440-22-4	0.4154	10,531	48.33%	0.8596	2.18%
	palladium	7440-05-3	0.0029	74	0.34%		
	terpineol	8000-41-7	0.0688	1,743	8.00%		
	copper oxide	1317-38-0	0.0286	726	3.33%		
	butyl carbitol	112-34-5	0.0573	1,453	6.67%		
	nickel	7440-02-0	0.1576	3,994	18.33%		
	chromium	7440-47-3	0.1289	3,268	15.00%		
Resistive element	ruthenium oxide	12036-10-1	0.1435	3,638	25.00%	0.5741	1.46%
	terpineol	8000-41-7	0.1435	3,638	25.00%		
	lead borosilicate glass	undefined	0.1722	4,366	30.00%		
	silver	7440-22-4	0.1148	2,911	20.00%		
Pre-coat	glass	65997-18-4	0.2609	6,614	70.00%	0.3727	0.94%
	butyl carbitol acetate	124-17-4	0.0932	2,362	25.00%		
	resin	9004-57-3	0.0149	378	4.00%		
	chromium oxide	1308-38-9	0.0037	94	1.00%		
Over-coat	epoxy	67762-95-2	0.1889	4,788	35.00%	0.5396	1.37%
	carbon black	1333-86-4	0.0270	684	5.00%		
	silicon dioxide	60676-86-0	0.2159	5,472	40.00%		
	butyl carbitol	112-34-5	0.1079	2,736	20.00%		
Middle termination layer	nickel	7440-02-0	0.6072	15,392	100.00%	0.6072	1.54%
Side termination	nickel	7440-02-0	0.00017	4	55.00%	0.0003	0.00%
	chromium	7440-47-3	0.00014	3	45.00%		
Outer termination layer	tin	7440-31-5	0.6202	15,722	100.00%	0.6202	1.57%
Total Weight			39.4488				

Note: Lead oxide contained in glass frit is part of the thick film formulations. This lead content is covered by exemption 7c-I of the Directive Annex ("... electronic components containing lead in a glass..."). Weights are approximate.