



Material Declaration Data Sheet

RMCF0201 (Formerly RMCF 1/20)

General Purpose Thick Film Chip Resistor

Date: **December 5, 2012**
 Component Weight (mg): **0.1509**

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	0.1261	835,922	96.00%	0.1314	87.08%
	silicon dioxide	14808-60-7	0.0039	26,123	3.00%		
	magnesium oxide	1309-48-4	0.0013	8,708	1.00%		
Inner termination layer	silver	7440-22-4	0.0014	8,946	67.50%	0.0020	1.33%
	alpha-terpineol	98-55-5	0.0002	1,325	10.00%		
	resin	9004-57-3	0.0001	663	5.00%		
	lead borosilicate glass	undefined	0.0004	2,319	17.50%		
Resistive element	ruthenium oxide	12036-10-1	0.0003	1,657	25.00%	0.0010	0.66%
	resin	9004-57-3	0.00035	2,319	35.00%		
	lead borosilicate glass	undefined	0.00040	2,651	40.00%		
Pre-coat	lead borosilicate glass	undefined	0.0010	6,892	80.00%	0.0013	0.86%
	alcohol ester solvent	25265-77-4	0.0003	1,723	20.00%		
Over-coat	epoxy	9016-00-6	0.0006	3,645	25.00%	0.0022	1.46%
	bisphenol a epoxy resin	25068-38-6	0.0003	2,187	15.00%		
	silicon dioxide	60676-86-0	0.0010	6,560	45.00%		
	talc	14807-96-6	0.0001	729	5.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0002	1,458	10.00%		
Middle termination layer	nickel	7440-02-0	0.0072	47,712	100.00%	0.0072	4.77%
Side termination	nickel	7440-02-0	0.000002	15	55.00%	0.000004	0.003%
	chromium	7440-47-3	0.000002	12	45.00%		
Outer termination layer	tin	7440-31-5	0.0058	38,435	100.00%	0.0058	3.84%
Total Weight			0.1509				

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

RMCF0402 (Formerly RMCF 1/16S)

General Purpose Thick Film Chip Resistor

Date: **December 5, 2012**
 Component Weight (mg): **0.5561**

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	0.4746	853,559	96.00%	0.4944	88.91%
	silicon dioxide	14808-60-7	0.0148	26,674	3.00%		
	magnesium oxide	1309-48-4	0.0049	8,891	1.00%		
Inner termination layer	silver	7440-22-4	0.0092	16,631	67.50%	0.0137	2.46%
	alpha-terpineol	98-55-5	0.0014	2,464	10.00%		
	resin	9004-57-3	0.0007	1,232	5.00%		
	lead borosilicate glass	undefined	0.0024	4,312	17.50%		
Resistive element	ruthenium oxide	12036-10-1	0.0006	1,034	25.00%	0.0023	0.41%
	resin	9004-57-3	0.0008	1,448	35.00%		
	lead borosilicate glass	undefined	0.00092	1,655	40.00%		
Pre-coat	lead borosilicate glass	undefined	0.0029	5,179	80.00%	0.0036	0.65%
	alcohol ester solvent	25265-77-4	0.0007	1,295	20.00%		
Over-coat	epoxy	9016-00-6	0.00001	18	25.00%	0.00004	0.01%
	bisphenol a epoxy resin	25068-38-6	0.00001	11	15.00%		
	silicon dioxide	60676-86-0	0.00002	32	45.00%		
	talc	14807-96-6	0.000002	4	5.00%		
	diethylene glycol monobutyl ether	112-34-5	0.000004	7	10.00%		
Middle termination layer	nickel	7440-02-0	0.0210	37,766	100.00%	0.0210	3.78%
Side termination	nickel	7440-02-0	0.00001	13	55.00%	0.0000	0.00%
	chromium	7440-47-3	0.00001	11	45.00%		
Outer termination layer	tin	7440-31-5	0.0210	37,766	100.00%	0.0210	3.78%
Total Weight			0.5561				

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

RMCF0603 (Formerly RMCF 1/16)

General Purpose Thick Film Chip Resistor

Date: **December 5, 2012**
 Component Weight (mg): **2.3385**

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	1.7568	751,238	96.00%	1.8300	78.25%
	silicon dioxide	14808-60-7	0.0549	23,476	3.00%		
	magnesium oxide	1309-48-4	0.0183	7,825	1.00%		
Inner termination layer	silver	7440-22-4	0.1055	45,115	67.50%	0.1563	6.68%
	alpha-terpineol	98-55-5	0.0156	6,684	10.00%		
	resin	9004-57-3	0.0078	3,342	5.00%		
	lead borosilicate glass	undefined	0.0274	11,696	17.50%		
Resistive element	ruthenium oxide	12036-10-1	0.0117	4,992	25.00%	0.0467	2.00%
	resin	9004-57-3	0.0163	6,989	35.00%		
	lead borosilicate glass	undefined	0.01868	7,988	40.00%		
Pre-coat	lead borosilicate glass	undefined	0.0336	14,368	80.00%	0.0420	1.80%
	alcohol ester solvent	25265-77-4	0.0084	3,592	20.00%		
Over-coat	epoxy	9016-00-6	0.0190	8,125	25.00%	0.0760	3.25%
	bisphenol a epoxy resin	25068-38-6	0.0114	4,875	15.00%		
	silicon dioxide	60676-86-0	0.0342	14,625	45.00%		
	talc	14807-96-6	0.0038	1,625	5.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0076	3,250	10.00%		
Middle termination layer	nickel	7440-02-0	0.0665	28,437	100.00%	0.0665	2.84%
Side termination	nickel	7440-02-0	0.00002	9	55.00%	0.00004	0.00%
	chromium	7440-47-3	0.00002	8	45.00%		
Outer termination layer	tin	7440-31-5	0.1210	51,742	100.00%	0.1210	5.17%
Total Weight			2.3385				

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

RMCF0805 (Formerly RMCF 1/10)

General Purpose Thick Film Chip Resistor

Date: **December 5, 2012**
 Component Weight (mg): **5.0335**

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	3.6960	734,280	96.00%	3.8500	76.49%
	silicon dioxide	14808-60-7	0.1155	22,946	3.00%		
	magnesium oxide	1309-48-4	0.0385	7,649	1.00%		
Inner termination layer	silver	7440-22-4	0.2356	46,815	67.50%	0.3491	6.94%
	alpha-terpineol	98-55-5	0.0349	6,936	10.00%		
	resin	9004-57-3	0.0175	3,468	5.00%		
	lead borosilicate glass	undefined	0.0611	12,137	17.50%		
Resistive element	ruthenium oxide	12036-10-1	0.0217	4,306	25.00%	0.0867	1.72%
	resin	9004-57-3	0.0303	6,029	35.00%		
	lead borosilicate glass	undefined	0.03468	6,890	40.00%		
Pre-coat	lead borosilicate glass	undefined	0.0953	18,929	80.00%	0.1191	2.37%
	alcohol ester solvent	25265-77-4	0.0238	4,732	20.00%		
Over-coat	epoxy	9016-00-6	0.0398	7,897	25.00%	0.1590	3.16%
	bisphenol a epoxy resin	25068-38-6	0.0239	4,738	15.00%		
	silicon dioxide	60676-86-0	0.0716	14,215	45.00%		
	talc	14807-96-6	0.0080	1,579	5.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0159	3,159	10.00%		
Middle termination layer	nickel	7440-02-0	0.1665	33,078	100.00%	0.1665	3.31%
Side termination	nickel	7440-02-0	0.00006	11	55.00%	0.0001	0.00%
	chromium	7440-47-3	0.00005	9	45.00%		
Outer termination layer	tin	7440-31-5	0.3030	60,197	100.00%	0.3030	6.02%
Total Weight			5.0335				

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

RMCF1206 (Formerly RMCF 1/8)

General Purpose Thick Film Chip Resistor

Date: **December 5, 2012**
 Component Weight (mg): **10.2570**

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	7.9968	779,643	96.00%	8.3300	81.21%
	silicon dioxide	14808-60-7	0.2499	24,364	3.00%		
	magnesium oxide	1309-48-4	0.0833	8,121	1.00%		
Inner termination layer	silver	7440-22-4	0.4710	45,921	67.50%	0.6978	6.80%
	alpha-terpineol	98-55-5	0.0698	6,803	10.00%		
	resin	9004-57-3	0.0349	3,402	5.00%		
	lead borosilicate glass	undefined	0.1221	11,906	17.50%		
Resistive element	ruthenium oxide	12036-10-1	0.0448	4,365	25.00%	0.1791	1.75%
	resin	9004-57-3	0.0627	6,111	35.00%		
	lead borosilicate glass	undefined	0.07164	6,984	40.00%		
Pre-coat	lead borosilicate glass	undefined	0.1431	13,953	80.00%	0.1789	1.74%
	alcohol ester solvent	25265-77-4	0.0358	3,488	20.00%		
Over-coat	epoxy	9016-00-6	0.0768	7,483	25.00%	0.3070	2.99%
	bisphenol a epoxy resin	25068-38-6	0.0461	4,490	15.00%		
	silicon dioxide	60676-86-0	0.1382	13,469	45.00%		
	talc	14807-96-6	0.0154	1,497	5.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0307	2,993	10.00%		
Middle termination layer	nickel	7440-02-0	0.2000	19,499	100.00%	0.2000	1.95%
Side termination	nickel	7440-02-0	0.00011	11	55.00%	0.0002	0.00%
	chromium	7440-47-3	0.00009	9	45.00%		
Outer termination layer	tin	7440-31-5	0.3640	35,488	100.00%	0.3640	3.55%
Total Weight			10.2570				

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

RMCF1210 (Formerly RMCF 1/4)

General Purpose Thick Film Chip Resistor

Date: **December 5, 2012**
 Component Weight (mg): **16.6243**

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	12.7968	769,765	96.00%	13.3300	80.18%
	silicon dioxide	14808-60-7	0.3999	24,055	3.00%		
	magnesium oxide	1309-48-4	0.1333	8,018	1.00%		
Inner termination layer	silver	7440-22-4	0.7350	44,213	67.50%	1.0889	6.55%
	alpha-terpineol	98-55-5	0.1089	6,550	10.00%		
	resin	9004-57-3	0.0544	3,275	5.00%		
	lead borosilicate glass	undefined	0.1906	11,463	17.50%		
Resistive element	ruthenium oxide	12036-10-1	0.0998	6,000	25.00%	0.3990	2.40%
	resin	9004-57-3	0.1397	8,400	35.00%		
	lead borosilicate glass	undefined	0.15960	9,600	40.00%		
Pre-coat	lead borosilicate glass	undefined	0.3294	19,812	80.00%	0.4117	2.48%
	alcohol ester solvent	25265-77-4	0.0823	4,953	20.00%		
Over-coat	epoxy	9016-00-6	0.1608	9,670	25.00%	0.6430	3.87%
	bisphenol a epoxy resin	25068-38-6	0.0965	5,802	15.00%		
	silicon dioxide	60676-86-0	0.2894	17,405	45.00%		
	talc	14807-96-6	0.0322	1,934	5.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0643	3,868	10.00%		
Middle termination layer	nickel	7440-02-0	0.2665	16,031	100.00%	0.2665	1.60%
Side termination	nickel	7440-02-0	0.00011	7	55.00%	0.0002	0.00%
	chromium	7440-47-3	0.00009	5	45.00%		
Outer termination layer	tin	7440-31-5	0.4850	29,174	100.00%	0.4850	2.92%
Total Weight			16.6243				

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

RMCF2010 (Formerly RMCF 1/2)

General Purpose Thick Film Chip Resistor

Date: **December 5, 2012**
 Component Weight (mg): **26.2066**

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	20.2656	773,300	96.00%	21.1100	80.55%
	silicon dioxide	14808-60-7	0.6333	24,166	3.00%		
	magnesium oxide	1309-48-4	0.2111	8,055	1.00%		
Inner termination layer	silver	7440-22-4	1.2940	49,378	67.50%	1.9171	7.32%
	alpha-terpineol	98-55-5	0.1917	7,315	10.00%		
	resin	9004-57-3	0.0959	3,658	5.00%		
	lead borosilicate glass	undefined	0.3355	12,802	17.50%		
Resistive element	ruthenium oxide	12036-10-1	0.1846	7,044	25.00%	0.7384	2.82%
	resin	9004-57-3	0.2584	9,862	35.00%		
	lead borosilicate glass	undefined	0.29536	11,270	40.00%		
Pre-coat	lead borosilicate glass	undefined	0.5687	21,701	80.00%	0.7109	2.71%
	alcohol ester solvent	25265-77-4	0.1422	5,425	20.00%		
Over-coat	epoxy	9016-00-6	0.2210	8,433	25.00%	0.8840	3.37%
	bisphenol a epoxy resin	25068-38-6	0.1326	5,060	15.00%		
	silicon dioxide	60676-86-0	0.3978	15,179	45.00%		
	talc	14807-96-6	0.0442	1,687	5.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0884	3,373	10.00%		
Middle termination layer	nickel	7440-02-0	0.3000	11,447	100.00%	0.3000	1.14%
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	0.5460	20,834	100.00%	0.5460	2.08%
Total Weight			26.2066				

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

RMCF2512 (Formerly RMCF 1)

General Purpose Thick Film Chip Resistor

Date: **December 5, 2012**
 Component Weight (mg): **44.0065**

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	32.8608	746,726	96.00%	34.2300	77.78%
	silicon dioxide	14808-60-7	1.0269	23,335	3.00%		
	magnesium oxide	1309-48-4	0.3423	7,778	1.00%		
Inner termination layer	silver	7440-22-4	2.0183	45,863	67.50%	2.9900	6.79%
	alpha-terpineol	98-55-5	0.2990	6,794	10.00%		
	resin	9004-57-3	0.1495	3,397	5.00%		
	lead borosilicate glass	undefined	0.5233	11,890	17.50%		
Resistive element	ruthenium oxide	12036-10-1	0.3382	7,685	25.00%	1.3528	3.07%
	resin	9004-57-3	0.4735	10,759	35.00%		
	lead borosilicate glass	undefined	0.54112	12,296	40.00%		
Pre-coat	lead borosilicate glass	undefined	1.9339	43,946	80.00%	2.4174	5.49%
	alcohol ester solvent	25265-77-4	0.4835	10,987	20.00%		
Over-coat	epoxy	9016-00-6	0.4015	9,124	25.00%	1.6060	3.65%
	bisphenol a epoxy resin	25068-38-6	0.2409	5,474	15.00%		
	silicon dioxide	60676-86-0	0.7227	16,423	45.00%		
	talc	14807-96-6	0.0803	1,825	5.00%		
	diethylene glycol monobutyl ether	112-34-5	0.1606	3,649	10.00%		
Middle termination layer	nickel	7440-02-0	0.5000	11,362	100.00%	0.5000	1.14%
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	0.9100	20,679	100.00%	0.9100	2.07%
Total Weight			44.0065				

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.