Material Declaration Data Sheet

RGC0402 (Formerly RGC 1/16S)

Semi-Precision Thick Film Chip Resistor

Date: **January 7, 2013**
Component Weight (mg): **0.6196**

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	0.4586	740,169	96.00%	0.4777	77.10%
	silicon oxide	7631-86-9	0.0096	15,420	2.00%		
	magnesium oxide	1309-48-4	0.0048	7,710	1.00%		
	calcium oxide	1305-78-8	0.0048	7,710	1.00%		
Inner termination layer	silver	7440-22-4	0.0311	50,265	76.33%	0.0408	6.59%
	palladium	7440-05-3	0.0004	674	1.02%		
	lead borosilicate glass	undefined	0.0092	14,916	22.65%		
Resistive element	ruthenium oxide	12036-10-1	0.0033	5,351	27.19%	0.0122	1.97%
	silver	7440-22-4	0.0018	2,907	14.78%		
	palladium	7440-05-3	0.0005	843	4.28%		
	lead borosilicate glass	undefined	0.0066	10,576	53.75%		
Pre-coat	lead borosilicate glass	undefined	0.0190	30,726	94.43%	0.0202	3.25%
	copper oxide	1317-38-0	0.0005	801	2.46%		
	magnesium oxide	1309-48-4	0.0006	1,011	3.11%		
Over-coat	epoxy	67762-95-2	0.0198	32,021	100.00%	0.0198	3.20%
Middle termination layer	nickel	7440-02-0	0.0174	28,019	100.00%	0.0174	2.80%
Side termination	nickel	7440-02-0	0.00000	5	55.00%	0.0000	0.00%
	chromium	7440-47-3	0.00000	4	45.00%		
Outer termination layer	tin	7440-31-5	0.0315	50,870	100.00%	0.0315	5.09%
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-I of the Directive Annex ("… electronic components containing lead in a glass…"). Weights are approximate.

Material Declaration Data Sheet

RGC0603 (Formerly RGC 1/16)

Semi-Precision Thick Film Chip Resistor

Date: **January 7, 2013**
Max Temp: **260°C** (Contact factory for detailed soldering recommendations.)
Component Weight (mg): **2.3385**

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 oxide	7631-86-9	0.0366	15,651	2.00%		
	magnesium oxide	1309-48-4	0.0183	7,825	1.00%		
	calcium oxide	1305-78-8	0.0183	7,825	1.00%		
Inner termination layer	silver	7440-22-4	0.1193	51,015	76.33%	0.1563	6.68%
	palladium	7440-05-3	0.0016	684	1.02%		
	lead borosilicate glass	undefined	0.0354	15,138	22.65%		
Resistive element	ruthenium oxide	12036-10-1	0.0127	5,431	27.19%	0.0467	2.00%
	silver	7440-22-4	0.0069	2,951	14.78%		
	palladium	7440-05-3	0.0020	855	4.28%		
	lead borosilicate glass	undefined	0.0251	10,733	53.75%		
Pre-coat	lead borosilicate glass	undefined	0.0377	16,121	89.76%	0.0420	1.80%
	copper oxide	1317-38-0	0.0019	812	4.52%		
	magnesium oxide	1309-48-4	0.0024	1,026	5.71%		
Over-coat	epoxy	67762-95-2	0.0760	32,499	100.00%	0.0760	3.25%
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%	0.0000	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-I of the Directive Annex ("… electronic components containing lead in a glass…"). Weights are approximate.

Material Declaration Data Sheet

RGC0805 (Formerly RGC 1/10)

Semi-Precision Thick Film Chip Resistor

Date: **January 7, 2013**
Max Temp: **260°C** (Contact factory for detailed soldering recommendations.)
Component Weight (mg): **5.0335**

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 oxide	7631-86-9	0.0770	15,298	2.00%		
	magnesium oxide	1309-48-4	0.0385	7,649	1.00%		
	calcium oxide	1305-78-8	0.0385	7,649	1.00%		
Inner termination layer	silver	7440-22-4	0.2630	52,250	75.34%	0.3491	6.94%
	palladium	7440-05-3	0.0035	695	1.00%		
	lead borosilicate glass	undefined	0.0826	16,410	23.66%		
Resistive element	ruthenium oxide	12036-10-1	0.0221	4,391	25.49%	0.0867	1.72%
	silver	7440-22-4	0.0120	2,384	13.84%		
	palladium	7440-05-3	0.0030	596	3.46%		
	lead borosilicate glass	undefined	0.0496	9,854	57.21%		
Pre-coat	lead borosilicate glass	undefined	0.1067	21,198	89.59%	0.1191	2.37%
	copper oxide	1317-38-0	0.0055	1,093	4.62%		
	magnesium oxide	1309-48-4	0.0069	1,371	5.79%		
Over-coat	epoxy	67762-95-2	0.1590	31,588	100.00%	0.1590	3.16%
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-I of the Directive Annex ("… electronic components containing lead in a glass…"). Weights are approximate.

Material Declaration Data Sheet

RGC1206 (Formerly RGC 1/8)

Semi-Precision Thick Film Chip Resistor

Date: **January 7, 2013**
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 oxide	7631-86-9	0.1666	16,243	2.00%		
	magnesium oxide	1309-48-4	0.0833	8,121	1.00%		
	calcium oxide	1305-78-8	0.0833	8,121	1.00%		
Inner termination layer	silver	7440-22-4	0.5370	52,354	76.96%	0.6978	6.80%
	palladium	7440-05-3	0.0072	702	1.03%		
	lead borosilicate glass	undefined	0.1536	14,975	22.01%		
Resistive element	ruthenium oxide	12036-10-1	0.0463	4,514	25.85%	0.1791	1.75%
	silver	7440-22-4	0.0252	2,457	14.07%		
	palladium	7440-05-3	0.0073	712	4.08%		
	lead borosilicate glass	undefined	0.1003	9,779	56.00%		
Pre-coat	lead borosilicate glass	undefined	0.1604	15,638	89.66%	0.1789	1.74%
	copper oxide	1317-38-0	0.0082	799	4.58%		
	magnesium oxide	1309-48-4	0.0103	1,004	5.76%		
Over-coat	epoxy	67762-95-2	0.3070	29,931	100.00%	0.3070	2.99%
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-I of the Directive Annex ("… electronic components containing lead in a glass…"). Weights are approximate.

Material Declaration Data Sheet

RGC1210 (Formerly RGC 1/4)

Semi-Precision Thick Film Chip Resistor

Date: **January 7, 2013**
Component Weight (mg): **15.9589**

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	12.6915	795,266	96.00%	13.2204	82.84%
	silicon oxide	7631-86-9	0.2644	16,568	2.00%		
	magnesium oxide	1309-48-4	0.1322	8,284	1.00%		
	calcium oxide	1305-78-8	0.1322	8,284	1.00%		
Inner termination layer	silver	7440-22-4	0.6779	42,480	76.96%	0.8809	5.52%
	palladium	7440-05-3	0.0091	570	1.03%		
	lead borosilicate glass	undefined	0.1939	12,150	15.53%		
Resistive element	ruthenium oxide	12036-10-1	0.0720	4,514	25.85%	0.2787	1.75%
	silver	7440-22-4	0.0392	2,457	14.07%		
	palladium	7440-05-3	0.0114	712	4.08%		
	lead borosilicate glass	undefined	0.1561	9,781	45.51%		
Pre-coat	lead borosilicate glass	undefined	0.2003	12,551	76.97%	0.2234	1.40%
	copper oxide	1317-38-0	0.0102	642	4.58%		
	magnesium oxide	1309-48-4	0.0129	806	5.76%		
Over-coat	epoxy	67762-95-2	0.4777	29,931	100.00%	0.4777	2.99%
Middle termination layer	nickel	7440-02-0	0.3112	19,499	100.00%	0.3112	1.95%
Side termination	nickel	7440-02-0	0.00016	10	55.00%	0.0003	0.00%
	chromium	7440-47-3	0.00013	8	45.00%		
Outer termination layer	tin	7440-31-5	0.5663	35,488	100.00%	0.5663	3.55%
Total Weight			15.9589				

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

RGC2010 (Formerly RGC 1/2)

Semi-Precision Thick Film Chip Resistor

Date: **January 7, 2013**
Component Weight (mg): **24.2412**

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	19.1639	790,550	96.00%	19.9624	82.35%
	silicon oxide	7631-86-9	0.3992	16,470	2.00%		
	magnesium oxide	1309-48-4	0.1996	8,235	1.00%		
	calcium oxide	1305-78-8	0.1996	8,235	1.00%		
Inner termination layer	silver	7440-22-4	1.0820	44,634	76.96%	1.4060	5.80%
	palladium	7440-05-3	0.0145	598	1.03%		
	lead borosilicate glass	undefined	0.3095	12,766	22.01%		
Resistive element	ruthenium oxide	12036-10-1	0.1065	4,395	25.85%	0.4121	1.70%
	silver	7440-22-4	0.0580	2,392	14.07%		
	palladium	7440-05-3	0.0168	693	4.08%		
	lead borosilicate glass	undefined	0.2308	9,520	56.00%		
Pre-coat	lead borosilicate glass	undefined	0.3717	15,332	89.66%	0.4145	1.71%
	copper oxide	1317-38-0	0.0190	784	4.58%		
	magnesium oxide	1309-48-4	0.0239	985	5.76%		
Over-coat	epoxy	67762-95-2	0.7224	29,800	100.00%	0.7224	2.98%
Middle termination layer	nickel	7440-02-0	0.4727	19,500	100.00%	0.4727	1.95%
Side termination	nickel	7440-02-0	0.00018	7	55.00%	0.0003	0.00%
	chromium	7440-47-3	0.00015	6	45.00%		
Outer termination layer	tin	7440-31-5	0.8509	35,100	100.00%	0.8509	3.51%
Total Weight			24.2412				

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.

Stackpole Electronics, Inc.
Resistive Product Solutions

Material Declaration Data Sheet

RGC2512 (Formerly RGC 1)

Semi-Precision Thick Film Chip Resistor

Date: **January 7, 2013**
Component Weight (mg): **39.4485**

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	31.4856	798,146	96.00%	32.7975	83.14%
	silicon oxide	7631-86-9	0.6559	16,628	2.00%		
	magnesium oxide	1309-48-4	0.3280	8,314	1.00%		
	calcium oxide	1305-78-8	0.3280	8,314	1.00%		
Inner termination layer	silver	7440-22-4	1.8184	46,097	76.96%	2.3630	5.99%
	palladium	7440-05-3	0.0244	618	1.03%		
	lead borosilicate glass	undefined	0.5201	13,184	22.01%		
Resistive element	ruthenium oxide	12036-10-1	0.1744	4,421	25.85%	0.6746	1.71%
	silver	7440-22-4	0.0949	2,406	14.07%		
	palladium	7440-05-3	0.0275	697	4.08%		
	lead borosilicate glass	undefined	0.3778	9,576	56.00%		
Pre-coat	lead borosilicate glass	undefined	0.6048	15,332	89.66%	0.6746	1.71%
	copper oxide	1317-38-0	0.0309	784	4.58%		
	magnesium oxide	1309-48-4	0.0388	985	5.76%		
Over-coat	epoxy	67762-95-2	1.0967	27,800	100.00%	1.0967	2.78%
Middle termination layer	nickel	7440-02-0	0.7574	19,200	100.00%	0.7574	1.92%
Side termination	nickel	7440-02-0	0.00020	5	55.00%	0.0004	0.00%
	chromium	7440-47-3	0.00017	4	45.00%		
Outer termination layer	tin	7440-31-5	1.0844	27,490	100.00%	1.0844	2.75%
Total Weight			39.4484				

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.