

PRODUCTION IDENTIFICATION

- **PRODUCT NAME:** General Purpose Thick Film Chip Resistor - RM02
 - **COMPONENT WEIGHT (mg):** 0.1509
 - **MAX TEMP:** 260°C (Contact factory for detailed soldering recommendations)
 - **MSL:** 1

- **MANUFACTURE NAME:** Cal-Chip Electronics, Inc
 - **ADDRESS:** 59 Steamwhistle Drive Ivyland, PA 18974
 - **RESPONSIBLE PERSON NAME:** Frank Salamone
 - **TELEPHONE:** 215.942.8900

GENERAL COMPOSITION

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%		
	Silicon Dioxide	14808-60-7	0.0003	1,657	12.50%		
	Lead Oxide	1317-36-8	0.001	663	5.00%		
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%		
	Silicon Dioxide	14808-60-7	0.0003	1,988	30.00%		
	Lead Oxide	1317-36-8	0.0001	663	10.00%		
Pre-Coat	Silicone Dioxide	14808-60-7	0.0009	6,030	70.00%	0.0013	0.86%
	Lead Oxide	1317-36-8	0.0001	861	10.00%		
	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				

PRODUCTION IDENTIFICATION

- PRODUCT NAME:	General Purpose Thick Film Chip Resistor - RM04	- MANUFACTURE NAME:	Cal-Chip Electronics, Inc
- COMPONENT WEIGHT (mg):	0.5561	- ADDRESS:	59 Steamwhistle Drive Ivyland, PA 18974
- MAX TEMP:	260°C (Contact factory for detailed soldering recommendations)	- RESPONSIBLE PERSON NAME:	Frank Salamone
- MSL:	1	- TELEPHONE:	215.942.8900

GENERAL COMPOSITION

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%		
	Silicon Dioxide	14808-60-7	0.0017	3,080	12.50%		
	Lead Oxide	1317-36-8	0.0007	1,232	5.00%		
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%		
	Silicon Dioxide	14808-60-7	0.0007	1,241	30.00%		
	Lead Oxide	1317-36-8	0.0002	414	10.00%		
Pre-Coat	Silicone Dioxide	14808-60-7	0.0025	4,532	70.00%	0.0036	0.65%
	Lead Oxide	1317-36-8	0.0004	647	10.00%		
	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				



PRODUCTION IDENTIFICATION

- **PRODUCT NAME:** General Purpose Thick Film Chip Resistor - RM06
 - **COMPONENT WEIGHT (mg):** 2.3385
 - **MAX TEMP:** 260°C (Contact factory for detailed soldering recommendations)
 - **MSL:** 1

- **MANUFACTURE NAME:** Cal-Chip Electronics, Inc
 - **ADDRESS:** 59 Steamwhistle Drive Ivyland, PA 18974
 - **RESPONSIBLE PERSON NAME:** Frank Salamone
 - **TELEPHONE:** 215.942.8900

GENERAL COMPOSITION

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%		
	Silicon Dioxide	14808-60-7	0.0195	8,355	12.50%		
	Lead Oxide	1317-36-8	0.0078	3,342	5.00%		
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%		
	Silicon Dioxide	14808-60-7	0.0140	5,991	30.00%		
	Lead Oxide	1317-36-8	0.0047	1,997	10.00%		
Pre-Coat	Silicon Dioxide	14808-60-7	0.0294	12,572	70.00%	0.0420	1.80%
	Lead Oxide	1317-36-8	0.0042	1,796	10.00%		
	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				

MATERIAL DECLARATION

RM10 - 0805

 PRODUCTION IDENTIFICATION

- PRODUCT NAME:	General Purpose Thick Film Chip Resistor - RM10	- MANUFACTURE NAME:	Cal-Chip Electronics, Inc
- COMPONENT WEIGHT (mg):	5.0335	- ADDRESS:	59 Steamwhistle Drive Ivyland, PA 18974
- MAX TEMP:	260°C (Contact factory for detailed soldering recommendations)	- RESPONSIBLE PERSON NAME:	Frank Salamone
- MSL:	1	- TELEPHONE:	215.942.8900

 GENERAL COMPOSITION

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%		
	Silicon Dioxide	14808-60-7	0.0436	3,468	12.50%		
	Lead Oxide	1317-36-8	0.0175	8,669	5.00%		
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%		
	Silicon Dioxide	14808-60-7	0.0260	5,167	30.00%		
	Lead Oxide	1317-36-8	0.0087	1,722	10.00%		
Pre-Coat	Silicone Dioxide	14808-60-7	0.0834	16,563	70.00%	0.1191	2.37%
	Lead Oxide	1317-36-8	0.0119	2,366	10.00%		
	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 Chromium	7440-02-0	0.00006	11	55.00%	0.0001	0.00%
		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				



PRODUCTION IDENTIFICATION

- PRODUCT NAME:	General Purpose Thick Film Chip Resistor - RM12	- MANUFACTURE NAME:	Cal-Chip Electronics, Inc
- COMPONENT WEIGHT (mg):	10.2570	- ADDRESS:	59 Steamwhistle Drive Ivyland, PA 18974
- MAX TEMP:	260°C (Contact factory for detailed soldering recommendations)	- RESPONSIBLE PERSON NAME:	Frank Salamone
- MSL:	1	- TELEPHONE:	215.942.8900

GENERAL COMPOSITION

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%		
	Silicon Dioxide	14808-60-7	0.0872	8,504	12.50%		
	Lead Oxide	1317-36-8	0.0349	3,402	5.00%		
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%		
	Silicon Dioxide	14808-60-7	0.0537	5,238	30.00%		
	Lead Oxide	1317-36-8	0.0179	1,746	10.00%		
Pre-Coat	Silicone Dioxide	14808-60-7	0.1252	12,209	70.00%	0.1789	1.74%
	Lead Oxide	1317-36-8	0.0179	1,744	10.00%		
	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				

MATERIAL DECLARATION

PRODUCTION IDENTIFICATION

- PRODUCT NAME:	General Purpose Thick Film Chip Resistor - RM12	- MANUFACTURE NAME:	Cal-Chip Electronics, Inc
- COMPONENT WEIGHT (mg):	16.6243	- ADDRESS:	59 Steamwhistle Drive Ivyland, PA 18974
- MAX TEMP:	260°C (Contact factory for detailed soldering recommendations)	- RESPONSIBLE PERSON NAME:	Frank Salamone
- MSL:	1	- TELEPHONE:	215.942.8900

GENERAL COMPOSITION

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%		
	Silicon Dioxide	14808-60-7	0.1361	8,188	12.50%		
	Lead Oxide	1317-36-8	0.0544	3,275	5.00%		
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%		
	Silicon Dioxide	14808-60-7	0.1197	7,200	30.00%		
	Lead Oxide	1317-36-8	0.0399	2,400	10.00%		
Pre-Coat	Silicone Dioxide	14808-60-7	0.2882	17,335	70.00%	0.4117	2.48%
	Lead Oxide	1317-36-8	0.0412	2,476	10.00%		
	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 Chromium	7440-02-0	0.00011	7	55.00%	0.0002	0.00%
		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				



PRODUCTION IDENTIFICATION

- PRODUCT NAME:	General Purpose Thick Film Chip Resistor - RM20	- MANUFACTURE NAME:	Cal-Chip Electronics, Inc
- COMPONENT WEIGHT (mg):	26.2066	- ADDRESS:	59 Steamwhistle Drive Ivyland, PA 18974
- MAX TEMP:	260°C (Contact factory for detailed soldering recommendations)	- RESPONSIBLE PERSON NAME:	Frank Salamone
- MSL:	1	- TELEPHONE:	215.942.8900

GENERAL COMPOSITION

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%		
	Silicon Dioxide	14808-60-7	0.2396	9,144	12.50%		
	Lead Oxide	1317-36-8	0.0959	3,658	5.00%		
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%		
	Silicon Dioxide	14808-60-7	0.2215	8,453	30.00%		
	Lead Oxide	1317-36-8	0.0738	2,818	10.00%		
Pre-Coat	Silicone Dioxide	14808-60-7	0.4976	18,989	70.00%	0.7109	2.71%
	Lead Oxide	1317-36-8	0.0711	2,713	10.00%		
	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 Chromium	7440-02-0	0.00013	5	55.00%	0.0002	0.00%
		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				

PRODUCTION IDENTIFICATION

- PRODUCT NAME:	General Purpose Thick Film Chip Resistor - RM25	- MANUFACTURE NAME:	Cal-Chip Electronics, Inc
- COMPONENT WEIGHT (mg):	44.065	- ADDRESS:	59 Steamwhistle Drive Ivyland, PA 18974
- MAX TEMP:	260°C (Contact factory for detailed soldering recommendations)	- RESPONSIBLE PERSON NAME:	Frank Salamone
- MSL:	1	- TELEPHONE:	215.942.8900

GENERAL COMPOSITION

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%		
	Silicon Dioxide	14808-60-7	0.3738	8,493	12.50%		
	Lead Oxide	1317-36-8	0.1495	3,397	5.00%		
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%		
	Silicon Dioxide	14808-60-7	0.4058	9,222	30.00%		
	Lead Oxide	1317-36-8	0.1353	3,074	10.00%		
Pre-Coat	Silicone Dioxide	14808-60-7	1.6922	38,453	70.00%	2.4174	5.49%
	Lead Oxide	1317-36-8	0.2417	5,493	10.00%		
	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 Chromium	7440-02-0	0.00017	4	55.00%	0.0003	0.00%
		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				

