MATERIAL DECLARATION THICK FILM CHIP RESISTORS
- CN SERIES -

CN22

NO.	BREAKDOWN OF COMPONENT	MATERIAL NAME	CAS NO.	SUBSTANCE MASS (mg/pc)	PERCENTAGE OF HOMOGENEOUS MATERIAL	REMARK
1	Substrate	Aluminium Trioxide	1344-28-1	0.8713300	96.60%	
		Silicon Dioxide	14808-60-7	0.0189400	2.10%	
		Magnesium Oxide	1309-48-4	0.0099200	1.10%	
		Calcium Oxide	1305-78-8	0.0018000	0.20%	
2	Termination Inner (C1)	Silver	7440-22-4	0.0115900	81.39%	
		Palladium	7440-05-3	0.0006600	4.63%	
		Glass	65997-18-4	0.0019900	13.98%	
3	Termination Inner (C2)	Silver	7440-22-4	0.0296568	85.29%	
		Glass	65997-18-4	0.0051132	14.71%	
4	Termination Inner (C3)	Silver	7440-22-4	0.0166000	100.00%	
5	Resistive Element	Silver	7440-22-4	0.0030189	25.16%	RoHS Exemption No.: 7(c)-I (Pb in glass of electronic components)
		Palladium	7440-05-3	0.0015094	12.58%	
		Ruthenium Oxide	12036-10-1	0.0022642	18.87%	
		Glass	65997-18-4	0.0045283	37.73%	
		Copper (II) Oxide	1317-38-0	0.0000755	0.63%	
		Manganese Oxide	1317-35-7	0.0001509	1.25%	
		Niobium (V) Oxide	1313-96-8	0.0002264	1.89%	
		Tantalum (V) Oxide	1314-61-0	0.0002264	1.89%	
6	Protective Coating (G1)	Bismuth (III) Oxide	1304-76-3	0.0101030	60%	
		Silicon Dioxide	14808-60-7	0.0042096	25%	
		Chromium (III) Oxide	1308-38-9	0.0025258	15%	
7	Protective Coating (G2)	Epoxy Resin	25068-38-6	0.0132480	45.00%	
		Silicon Dioxide	60676-86-0	0.0147200	50.00%	
		Talc	14807-96-6	0.0014720	5.00%	
8	Termination Between	Nickel	7440-02-0	0.0452300	100%	
9	Termination Outer	Tin	7440-31-5	0.0452500	100%	
			TOTAL	1.11636		

MATERIAL DECLARATION THICK FILM CHIP RESISTORS
- CN SERIES -

CN24

NO.	BREAKDOWN OF COMPONENT	MATERIAL NAME	CAS NO.	SUBSTANCE MASS (mg/pc)	PERCENTAGE OF HOMOGENEOUS MATERIAL	REMARK
1	Substrate	Aluminium Trioxide	1344-28-1	0.4235232	96%	
		Silicon Dioxide	14808-60-7	0.0088234	2%	
		Magnesium Dioxide	1309-48-4	0.0088234	2%	
2	Termination Inner (C1)	Silver	7440-22-4	0.0364140	95.65%	
		Glass	65997-18-4	0.0016560	4.35%	
3	Termination Inner (C2)	Silver	7440-22-4	0.0182529	86.96%	
		Glass	65997-18-4	0.0027371	13.04%	
4	Termination Inner (C3)	Silver	7440-22-4	0.0179983	80.71%	
		Epoxy Resin	25068-38-6	0.0029570	13.26%	
		Phenolic Resin	9003-35-4	0.0001383	0.62%	
		Carbon	7782-42-5	0.0012064	5.41%	
5	Resistive Element	Ruthenium Oxide	12036-10-1	0.0004580	5.00%	RoHS Exemption No.: 7(c)-I (Pb in glass of electronic components)
		Silver	7440-22-4	0.0022900	25.00%	
		Palladium	7440-05-3	0.0009160	10.00%	
		Glass	65997-18-4	0.0054960	60.00%	
6	Protective Coating (G1)	Glass	65997-18-4	0.0150616	67%	
		Ethyl Cellulose	9004-57-3	0.0006744	3%	
		Turpentine Alcoholize	10482-56-1	0.0067440	30%	
7	Protective Coating (G2)	Resin	25068-38-6	0.0116064	48.00%	
		Color Pigment	68186-91-4	0.0032232	13.33%	
		Silicon Dioxide	60676-86-0	0.0080592	33.33%	
		Talc	14807-96-6	0.0012912	5.34%	
8	Termination Between	Nickel	7440-02-0	0.0971800	100%	
9	Termination Outer	Tin	7440-31-5	0.0956600	100%	
			TOTAL	0.771190		

59 Steamwhistle Drive, Ivyland, PA 18974 | p. 215.942.8900 | www.calchip.com | quotes@calchip.com

MATERIAL DECLARATION THICK FILM CHIP RESISTORS
- CN SERIES -

CN32

NO.	BREAKDOWN OF COMPONENT	MATERIAL NAME	CAS NO.	SUBSTANCE MASS (mg/pc)	PERCENTAGE OF HOMOGENEOUS MATERIAL	REMARK
1	Substrate	Aluminum Trioxide	1344-28-1	4.3178150	90.67%	
		Silicon Dioxide	14808-60-7	0.0799500	1.68%	
		Magnesium Oxide	1309-48-4	0.3555300	7.46%	
		Calcium Oxide	1305-78-8	0.0088840	0.19%	
2	Termination Inner (C1)	Silver	7440-22-4	0.0436600	91.55%	
		Palladium	7440-05-3	0.0006700	1.40%	
		Glass	65997-18-4	0.0033600	7.05%	
3	Termination Inner (C2)	Silver	7440-22-4	0.0125660	86.96%	
		Glass	65997-18-4	0.0018850	13.04%	
4	Termination Inner (C3)	Silver	7440-22-4	0.0000560	100.00%	
5	Resistive Element	Silver	7440-22-4	0.0072730	25.16%	RoHS Exemption No.: 7(c)-I (Pb in glass of electronic components)
		Palladium	7440-05-3	0.0036365	12.58%	
		Ruthenium Oxide	12036-10-1	0.0054547	18.87%	
		Glass Frits	65997-18-4	0.0109094	37.74%	
		Copper Oxide	1317-38-0	0.0001818	0.64%	
		Manganese Oxide	1317-35-7	0.0003636	1.26%	
		Niobium Pentoxide	1313-96-8	0.0005455	1.89%	
		Tantalum Pentoxide	1314-61-0	0.0005455	1.89%	
6	Protective Coating (G1)	Glass	1304-76-3	0.0266070	63.49%	
		Silicon dioxide	14808-60-7	0.0133030	31.75%	
		Chromium(III) Oxide	1308-38-9	0.0019950	4.76%	
7	Protective Coating (G2)	Resin	25068-38-6	0.0227880	38.46%	
		Silica	60676-86-0	0.0273450	46.15%	
		Talc	14807-96-6	0.0091150	15.38%	
8	Termination Between	Nickel	7440-02-0	0.0356000	100%	
9	Termination Outer	Tin	7440-31-5	0.0350400	100%	
			TOTAL	5.02508		

MATERIAL DECLARATION THICK FILM CHIP RESISTORS - CN SERIES -

CN34

NO.	BREAKDOWN OF COMPONENT	MATERIAL NAME	CAS NO.	SUBSTANCE MASS (mg/pc)	PERCENTAGE OF HOMOGENEOUS MATERIAL	REMARK
1	Substrate	Aluminium Trioxide	1344-28-1	7.3084800	96%	
		Silicon Dioxide	14808-60-7	0.1522600	2%	
		Magnesium Dioxide	1309-48-4	0.1522600	2%	
2	Termination Inner (C1)	Silver	7440-22-4	0.0522632	95.65%	
		Glass	65997-18-4	0.0023768	4.35%	
3	Termination Inner (C2)	Silver	7440-22-4	0.0315317	86.96%	
		Glass	65997-18-4	0.0047283	13.04%	
4	Termination Inner (C3)	Silver	7440-22-4	0.0364000	80.71%	
		Epoxy Resin	25068-38-6	0.0059800	13.26%	
		Phenolic Resin	9003-35-4	0.0002800	0.62%	
		Carbon	7782-42-5	0.0024400	5.41%	
5	Resistive Element	Ruthenium Oxide	12036-10-1	0.0009325	5.00%	RoHS Exemption No.: 7(c)-I (Pb in glass of electronic components)
		Silver	7440-22-4	0.0046625	25.00%	
		Palladium	7440-05-3	0.0018650	10.00%	
		Glass	65997-18-4	0.0111900	60.00%	
6	Protective Coating (G1)	Glass	65997-18-4	0.0484410	67%	
		Ethyl Cellulose	9004-57-3	0.0021690	3%	
		Turpentine Alcoholize	10482-56-1	0.0216900	30%	
7	Protective Coating (G2)	Resin	25068-38-6	0.0346224	48.00%	
		Color Pigment	68186-91-4	0.0096149	13.33%	
		Silicon Dioxide	60676-86-0	0.0240409	33.33%	
		Talc	14807-96-6	0.0038517	5.34%	
8	Termination Between	Nickel	7440-02-0	0.1958000	100%	
9	Termination Outer	Tin	7440-31-5	0.1927000	100%	
10	Marking	Epoxy Resin	25085-99-8	0.0000700	52.63%	
		Barium Sulfate	7727-43-7	0.0000210	15.79%	
		Titanium Dioxide	13463-67-7	0.0000420	31.58%	
			TOTAL	8.300713		

Cal-Chip Electronics Inc.

MATERIAL DECLARATION THICK FILM CHIP RESISTORS
- CN SERIES -

CN48

NO.	BREAKDOWN OF COMPONENT	MATERIAL NAME	CAS NO.	SUBSTANCE MASS (mg/pc)	PERCENTAGE OF HOMOGENEOUS MATERIAL	REMARK
1	Substrate	Aluminium Trioxide	1344-28-1	4.7413200	96.46%	
		Silicon Dioxide	14808-60-7	0.1110544	2.26%	
		Magnesium Dioxide	1309-48-4	0.0532670	1.08%	
		Calcium Oxide	1305-78-8	0.0096430	0.20%	
2	Termination Inner (C1)	Silver	7440-22-4	0.1973600	85.58%	
		Palladium	7440-05-3	0.0134800	5.85%	
		Glass	65997-18-4	0.0197630	8.57%	
3	Termination Inner (C2)	Silver	7440-22-4	0.5897300	100.00%	
4	Termination Inner (C3)	Silver	7440-22-4	0.3470000	93.61%	
		Epoxy Resin	25068-38-6	0.0236700	6.39%	
5	Resistive Element	Silver	7440-22-4	0.0311732	25.16%	RoHS Exemption No.: 7(c)-I (Pb in glass of electronic components)
		Palladium	7440-05-3	0.0155866	12.58%	
		Ruthenium Oxide	12036-10-1	0.0233799	18.87%	
		Glass Frits	65997-18-4	0.0467599	37.74%	
		Copper (II) Oxide	1317-38-0	0.0007806	0.63%	
		Manganese Oxide	1317-35-7	0.0015611	1.26%	
		Niobium Oxide	1313-96-8	0.0023293	1.88%	
		Tantalum (V) Oxide	1314-61-0	0.0023293	1.88%	
6	Protective Coating (G1)	Bismuth Trioxide	1304-76-3	0.0842300	63.95%	
		Silicon Dioxide	14808-60-7	0.0293400	3.00%	
		Chromium (III) Oxide	1308-38-9	0.0181500	30.00%	
7	Protective Coating (G2)	Epoxy Resin	25068-38-6	0.0416520	45.00%	
		Silica	60676-86-0	0.0462800	50.00%	
		Talcum	14807-96-6	0.0046280	5.00%	
8	Termination Between	Nickel	7440-02-0	1.1583400	100%	
9	Termination Outer	Tin	7440-31-5	1.1409200	100%	
10	Marking	Epoxy Resin	25085-99-8	0.0101800	50.00%	
		Barium Sulfate	7727-43-7	0.0061100	30.00%	
		Titanium Dioxide	13463-67-7	0.0040600	20.00%	
			TOTAL	8.774077		

MATERIAL DECLARATION THICK FILM CHIP RESISTORS - CN SERIES -

CNK22

NO.	BREAKDOWN OF COMPONENT	MATERIAL NAME	CAS NO.	SUBSTANCE MASS (mg/pc)	PERCENTAGE OF HOMOGENEOUS MATERIAL	REMARK
1	Substrate	Aluminum Trioxide	1344-28-1	0.9752733	96.60%	
		Silicon Dioxide	14808-60-7	0.0212013	2.10%	
		Magnesium Oxide	1309-48-4	0.0111053	1.10%	
		Calcium Oxide	1305-78-8	0.0020200	0.20%	
2	Termination Inner (C1)	Silver	7440-22-4	0.0521774	81.40%	
		Palladium	7440-05-3	0.0029807	4.65%	
		Glass	65997-18-4	0.0089420	13.95%	
3	Termination Inner (C2)	Silver	7440-22-4	0.0344648	81.40%	
		Palladium	7440-05-3	0.0019688	4.65%	
		Glass	65997-18-4	0.0059064	13.95%	
4	A1	Bismuth (III) Oxide	1304-76-3	0.0590200	65.00%	
		Silicon Dioxide	14808-60-7	0.0272400	30.00%	
		Chromium (III) Oxide	1308-38-9	0.0045400	5.00%	
5	Resistive Element	Silver	7440-22-4	0.0147925	25.16%	RoHS Exemption No.: 7(c)-I (Pb in glass of electronic components)
		Palladium	7440-05-3	0.0073962	12.58%	
		Ruthenium Oxide	12036-10-1	0.0110943	18.87%	
		Glass	65997-18-4	0.0221887	37.73%	
		Copper (II) Oxide	1317-38-0	0.0003698	0.63%	
		Manganese Oxide	1317-35-7	0.0007396	1.25%	
		Niobium (V) Oxide	1313-96-8	0.0011094	1.89%	
		Tantalum (V) Oxide	1314-61-0	0.0011094	1.89%	
6	Protective Coating (G1)	Bismuth (III) Oxide	1304-76-3	0.0277550	60%	
		Silicon Dioxide	14808-60-7	0.0128100	25%	
		Chromium (III) Oxide	1308-38-9	0.0021350	15%	
7	Protective Coating (G2)	Epoxy Resin	25068-38-6	0.0120150	45.00%	
		Silicon Dioxide	60676-86-0	0.0133500	50.00%	
		Talc	14807-96-6	0.0013350	5.00%	
8	Termination Between	Nickel	7440-02-0	0.0452300	100%	
9	Termination Outer	Tin	7440-31-5	0.0452500	100%	
			TOTAL	1.42552		

Cal-Chip Electronics Inc.

MATERIAL DECLARATION THICK FILM CHIP RESISTORS
- CN SERIES -

CNK24

NO.	BREAKDOWN OF COMPONENT	MATERIAL NAME	CAS NO.	SUBSTANCE MASS (mg/pc)	PERCENTAGE OF HOMOGENEOUS MATERIAL	REMARK
1	Substrate	Aluminum Trioxide	1344-28-1	1.7957935	96.60%	
		Silicon Dioxide	14808-60-7	0.0390385	2.10%	
		Magnesium Oxide	1309-48-4	0.0204485	1.10%	
		Calcium Oxide	1305-78-8	0.0037195	0.20%	
2	Termination Inner (C1)	Silver	7440-22-4	0.1739518	81.40%	
		Palladium	7440-05-3	0.0099371	4.65%	
		Glass	65997-18-4	0.0298112	13.95%	
3	Termination Inner (C2)	Silver	7440-22-4	0.0420024	81.40%	
		Palladium	7440-05-3	0.0023994	4.65%	
		Glass	65997-18-4	0.0071982	13.95%	
4	A1	Bismuth (III) Oxide	1304-76-3	0.2360800	65.00%	
		Silicon Dioxide	14808-60-7	0.1089600	30.00%	
		Chromium (III) Oxide	1308-38-9	0.0181600	5.00%	
5	Resistive Element	Silver	7440-22-4	0.0403270	25.16%	RoHS Exemption No.: 7(c)-I (Pb in glass of electronic components)
		Palladium	7440-05-3	0.0201635	12.58%	
		Ruthenium Oxide	12036-10-1	0.0302453	18.87%	
		Glass	65997-18-4	0.0604906	37.73%	
		Copper (II) Oxide	1317-38-0	0.0010082	0.63%	
		Manganese Oxide	1317-35-7	0.0020164	1.25%	
		Niobium (V) Oxide	1313-96-8	0.0030245	1.89%	
		Tantalum (V) Oxide	1314-61-0	0.0030245	1.89%	
6	Protective Coating (G1)	Bismuth (III) Oxide	1304-76-3	0.0347100	60%	
		Silicon Dioxide	14808-60-7	0.0160200	25%	
		Chromium (III) Oxide	1308-38-9	0.0026700	15%	
7	Protective Coating (G2)	Epoxy Resin	25068-38-6	0.0192150	45.00%	
		Silicon Dioxide	60676-86-0	0.0213500	50.00%	
		Talc	14807-96-6	0.0021350	5.00%	
8	Termination Between	Nickel	7440-02-0	0.1795800	100%	
9	Termination Outer	Tin	7440-31-5	0.1907400	100%	
			TOTAL	3.11422		

MATERIAL DECLARATION THICK FILM CHIP RESISTORS
- CN SERIES -

CNK34

NO.	BREAKDOWN OF COMPONENT	MATERIAL NAME	CAS NO.	SUBSTANCE MASS (mg/pc)	PERCENTAGE OF HOMOGENEOUS MATERIAL	REMARK
1	Substrate	Aluminium Trioxide	1344-28-1	8.0992320	96%	
		Silicon Dioxide	14808-60-7	0.1687340	2%	
		Magnesium Dioxide	1309-48-4	0.1687340	2%	
2	Termination Inner (C1)	Silver	7440-22-4	0.6867718	81.40%	
		Palladium	7440-05-3	0.0392321	4.65%	
		Glass	65997-18-4	0.1176962	13.95%	
3	Termination Inner (C2 & C3)	Silver	7440-22-4	0.0225000	50.00%	
		Aluminum	7429-90-5	0.0225000	50.00%	
4	Resistive Element	Ruthenium Oxide	12036-10-1	0.0248150	5.00%	RoHS Exemption No.: 7(c)-I (Pb in glass of electronic components)
		Silver	7440-22-4	0.1240750	25.00%	
		Palladium	7440-05-3	0.0496300	10.00%	
		Glass	65997-18-4	0.2977800	60.00%	
5	Protective Coating (G1)	Glass	65997-18-4	0.0498480	67%	
		Ethyl Cellulose	9004-57-3	0.0022320	3%	
		Turpentine Alcoholize	10482-56-1	0.0223200	30%	
6	Protective Coating (G2)	Resin	25068-38-6	0.0476640	48.00%	
		Color Pigment	68186-91-4	0.0132367	13.33%	
		Silicon Dioxide	60676-86-0	0.0330967	33.33%	
		Talc	14807-96-6	0.0053026	5.34%	
7	Termination Between	Nickel	7440-02-0	0.1958000	100%	
8	Termination Outer	Tin	7440-31-5	0.1927000	100%	
9	Marking	Epoxy Resin	25085-99-8	0.0130522	52.63%	
		Barium Sulfate	7727-43-7	0.0039159	15.79%	
		Titanium Dioxide	13463-67-7	0.0078318	31.58%	
			TOTAL	10.408700		