



Material Declaration Data Sheet

CSR0402 (Formerly CSR 1/8S)

Thick Film Current Sense Chip Resistor

Date: **November 6, 2012**

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

Component Weight (mg): **0.6960**

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	aluminum oxide	1344-28-1	0.5664	813,793	96.00%	0.5900	84.77%
	silicon dioxide	14808-60-7	0.0177	16,954	3.00%		
	magnesium oxide	1309-48-4	0.0059	8,477	1.00%		
Element	silver	7440-22-4	0.00319	4,583	55.00%	0.0058	0.83%
	palladium	7440-05-3	0.00006	83	1.00%		
	alpha-terpineol	98-55-5	0.00139	2,000	24.00%		
	epoxy resin	9004-57-3	0.00116	1,667	20.00%		
Inner termination	silver	7440-22-4	0.00360	5,172	90.00%	0.0040	0.57%
	alpha-terpineol	98-55-5	0.00040	575	10.00%		
Middle termination	nickel	7440-02-0	0.0150	21,551	100.00%	0.0150	2.16%
Side termination	nickel	7440-02-0	0.00001	10	55.00%	0.0000	0.00%
	chromium	7440-47-3	0.00001	8	45.00%		
Termination plating	tin	7440-31-5	0.0260	37,356	100.00%	0.0260	3.74%
Under-coat	isobutyrate	25265-77-4	0.0460	66,091	100.00%	0.0460	6.61%
Over-coat	color pigments	13463-67-7	0.0021	3,046	40.00%	0.0053	0.76%
	epoxy resin	9004-57-3	0.0013	1,904	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0011	1,523	20.00%		
	diethylene glycol monobuthyl ether	112-34-5	0.0008	1,142	15.00%		
Marking	epoxy resin	9004-57-3	0.00312	4,483	80.00%	0.0039	0.56%
	color pigments	13463-67-7	0.00078	1,121	20.00%		

Total Weight 0.6960

* Weights are approximate



Material Declaration Data Sheet

CSR0603 (Formerly CSR 1/8)

Thick Film Current Sense Chip Resistor

Date: **November 6, 2012**

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

Component Weight (mg): **1.9931**

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	aluminum oxide	1344-28-1	1.6320	813,793	96.00%	1.7000	85.29%
	silicon dioxide	14808-60-7	0.0510	16,954	3.00%		
	magnesium oxide	1309-48-4	0.0170	8,477	1.00%		
Element	silver	7440-22-4	0.00825	4,139	55.00%	0.0150	0.75%
	palladium	7440-05-3	0.00015	75	1.00%		
	alpha-terpineol	98-55-5	0.00360	1,806	24.00%		
	epoxy resin	9004-57-3	0.00300	1,505	20.00%		
Inner termination	silver	7440-22-4	0.00990	4,967	90.00%	0.0110	0.55%
	alpha-terpineol	98-55-5	0.00110	552	10.00%		
Middle termination	nickel	7440-02-0	0.0400	20,069	100.00%	0.0400	2.01%
Side termination	nickel	7440-02-0	0.00002	11	55.00%	0.0000	0.00%
	chromium	7440-47-3	0.00002	9	45.00%		
Termination plating	tin	7440-31-5	0.0750	37,629	100.00%	0.0750	3.76%
Under-coat	isobutyrate	25265-77-4	0.1300	65,224	100.00%	0.1300	6.52%
Over-coat	color pigments	13463-67-7	0.0052	2,609	40.00%	0.0130	0.65%
	epoxy resin	9004-57-3	0.0033	1,631	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0026	1,304	20.00%		
	diethylene glycol monobuthyl ether	112-34-5	0.0020	978	15.00%		
Marking	epoxy resin	9004-57-3	0.00728	3,653	80.00%	0.0091	0.46%
	color pigments	13463-67-7	0.00182	913	20.00%		
Total Weight			1.9931				

* Weights are approximate



Material Declaration Data Sheet

CSR0805 (Formerly CSR 1/4)

Thick Film Current Sense Chip Resistor

Date: **November 6, 2012**

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

Component Weight (mg): **5.3001**

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	aluminum oxide	1344-28-1	4.3200	813,793	96.00%	4.5000	84.90%
	silicon dioxide	14808-60-7	0.1350	16,954	3.00%		
	magnesium oxide	1309-48-4	0.0450	8,477	1.00%		
Element	silver	7440-22-4	0.02200	4,151	55.00%	0.0400	0.75%
	palladium	7440-05-3	0.00040	75	1.00%		
	alpha-terpineol	98-55-5	0.00960	1,811	24.00%		
	epoxy resin	9004-57-3	0.00800	1,509	20.00%		
Inner termination	silver	7440-22-4	0.02700	5,094	90.00%	0.0300	0.57%
	alpha-terpineol	98-55-5	0.00300	566	10.00%		
Middle termination	nickel	7440-02-0	0.1100	20,754	100.00%	0.1100	2.08%
Side termination	nickel	7440-02-0	0.00006	10	55.00%	0.0001	0.00%
	chromium	7440-47-3	0.00005	8	45.00%		
Termination plating	tin	7440-31-5	0.2000	37,735	100.00%	0.2000	3.77%
Under-coat	isobutyrate	25265-77-4	0.3500	66,036	100.00%	0.3500	6.60%
Over-coat	color pigments	13463-67-7	0.0160	3,019	40.00%	0.0400	0.75%
	epoxy resin	9004-57-3	0.0100	1,887	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0080	1,509	20.00%		
	diethylene glycol monobuthyl ether	112-34-5	0.0060	1,132	15.00%		
Marking	epoxy resin	9004-57-3	0.02400	4,528	80.00%	0.0300	0.57%
	color pigments	13463-67-7	0.00600	1,132	20.00%		
Total Weight			5.3001				

* Weights are approximate



Material Declaration Data Sheet

CSR1206 (Formerly CSR 1/2)

Thick Film Current Sense Chip Resistor

Date: **November 6, 2012**

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

Component Weight (mg): **8.8172**

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	aluminum oxide	1344-28-1	7.2000	813,793	96.00%	7.5000	85.06%
	silicon dioxide	14808-60-7	0.2250	16,954	3.00%		
	magnesium oxide	1309-48-4	0.0750	8,477	1.00%		
Element	silver	7440-22-4	0.03630	4,117	55.00%	0.0660	0.75%
	palladium	7440-05-3	0.00066	75	1.00%		
	alpha-terpineol	98-55-5	0.01584	1,796	24.00%		
	epoxy resin	9004-57-3	0.01320	1,497	20.00%		
Inner termination	silver	7440-22-4	0.04410	5,002	90.00%	0.0490	0.56%
	alpha-terpineol	98-55-5	0.00490	556	10.00%		
Middle termination	nickel	7440-02-0	0.1800	20,415	100.00%	0.1800	2.04%
Side termination	nickel	7440-02-0	0.00011	12	55.00%	0.0002	0.00%
	chromium	7440-47-3	0.00009	10	45.00%		
Termination plating	tin	7440-31-5	0.3300	37,427	100.00%	0.3300	3.74%
Under-coat	isobutyrate	25265-77-4	0.5800	65,781	100.00%	0.5800	6.58%
Over-coat	color pigments	13463-67-7	0.0248	2,813	40.00%	0.0620	0.70%
	epoxy resin	9004-57-3	0.0155	1,758	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0124	1,406	20.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0093	1,055	15.00%		
Marking	epoxy resin	9004-57-3	0.04000	4,537	80.00%	0.0500	0.57%
	color pigments	13463-67-7	0.01000	1,134	20.00%		
Total Weight			8.8172				

* Weights are approximate



Material Declaration Data Sheet

CSRN0815 (Formerly CSRN 1S)

Thick Film Current Sense Chip Resistor



Date: **November 6, 2012** Max Temp: **260°C** (Contact factory for detailed soldering recommendations.)
 Component Weight (mg): **5.6722**

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	aluminum oxide	1344-28-1	4.6224	813,793	96.00%	4.8150	84.89%
	silicon dioxide	14808-60-7	0.1445	16,954	3.00%		
	magnesium oxide	1309-48-4	0.0482	8,477	1.00%		
Element	silver	7440-22-4	0.02338	4,121	55.00%	0.0425	0.75%
	palladium	7440-05-3	0.00043	75	1.00%		
	alpha-terpineol	98-55-5	0.01020	1,798	24.00%		
	epoxy resin	9004-57-3	0.00850	1,499	20.00%		
Inner termination	silver	7440-22-4	0.02844	5,014	90.00%	0.0316	0.56%
	alpha-terpineol	98-55-5	0.00316	557	10.00%		
Middle termination	nickel	7440-02-0	0.1250	22,037	100.00%	0.1250	2.20%
	nickel	7440-02-0	0.00006	10	55.00%		
Side termination	chromium	7440-47-3	0.00005	8	45.00%	0.0001	0.00%
	tin	7440-31-5	0.2050	36,141	100.00%		
Termination plating	tin	7440-31-5	0.2050	36,141	100.00%	0.2050	3.61%
Under-coat	isobutyrate	25265-77-4	0.3800	66,993	100.00%	0.3800	6.70%
Over-coat	color pigments	13463-67-7	0.0172	3,032	40.00%	0.0430	0.76%
	epoxy resin	9004-57-3	0.0108	1,895	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0086	1,516	20.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0065	1,137	15.00%		
Marking	epoxy resin	9004-57-3	0.02400	4,231	80.00%	0.0300	0.53%
	color pigments	13463-67-7	0.00600	1,058	20.00%		
Total Weight			5.6722				

* Weights are approximate



Material Declaration Data Sheet

CSR2010 (Formerly CSR 1)

Thick Film Current Sense Chip Resistor

Date: **November 6, 2012**

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

Component Weight (mg): **27.0303**

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	aluminum oxide	1344-28-1	22.0320	813,793	96.00%	22.9500	84.90%
	silicon dioxide	14808-60-7	0.6885	16,954	3.00%		
	magnesium oxide	1309-48-4	0.2295	8,477	1.00%		
Element	silver	7440-22-4	0.11220	4,151	55.00%	0.2040	0.75%
	palladium	7440-05-3	0.00204	75	1.00%		
	alpha-terpineol	98-55-5	0.04896	1,811	24.00%		
	epoxy resin	9004-57-3	0.04080	1,509	20.00%		
Inner termination	silver	7440-22-4	0.13770	5,094	90.00%	0.1530	0.57%
	alpha-terpineol	98-55-5	0.01530	566	10.00%		
Middle termination	nickel	7440-02-0	0.5610	20,754	100.00%	0.5610	2.08%
Side termination	nickel	7440-02-0	0.00013	5	55.00%	0.0002	0.00%
	chromium	7440-47-3	0.00010	4	45.00%		
Termination plating	tin	7440-31-5	1.0200	37,735	100.00%	1.0200	3.77%
Under-coat	isobutyrate	25265-77-4	1.7850	66,037	100.00%	1.7850	6.60%
Over-coat	color pigments	13463-67-7	0.0816	3,019	40.00%	0.2040	0.75%
	epoxy resin	9004-57-3	0.0510	1,887	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0408	1,509	20.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0306	1,132	15.00%		
Marking	epoxy resin	9004-57-3	0.12248	4,531	80.00%	0.1531	0.57%
	color pigments	13463-67-7	0.03062	1,133	20.00%		
Total Weight			27.0303				

* Weights are approximate



Material Declaration Data Sheet

CSRN2010 (Formerly CSRN 1)

Thick Film Current Sense Chip Resistor

Date: **November 6, 2012**

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

Component Weight (mg): **26.5435**

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	aluminum oxide	1344-28-1	22.0320	813,793	96.00%	22.9500	86.46%
	silicon dioxide	14808-60-7	0.6885	16,954	3.00%		
	magnesium oxide	1309-48-4	0.2295	8,477	1.00%		
Element	silver	7440-22-4	0.11220	4,227	55.00%	0.2040	0.77%
	palladium	7440-05-3	0.00204	77	1.00%		
	alpha-terpineol	98-55-5	0.04896	1,845	24.00%		
	epoxy resin	9004-57-3	0.04080	1,537	20.00%		
Inner termination	silver	7440-22-4	0.12897	4,859	90.00%	0.1433	0.54%
	alpha-terpineol	98-55-5	0.01433	540	10.00%		
Middle termination	nickel	7440-02-0	0.2440	9,192	100.00%	0.2440	0.92%
	nickel	7440-02-0	0.00013	5	55.00%		
Side termination	chromium	7440-47-3	0.00010	4	45.00%	0.0002	0.00%
	tin	7440-31-5	0.8600	32,400	100.00%		
Termination plating	tin	7440-31-5	0.8600	32,400	100.00%	0.8600	3.24%
Under-coat	isobutyrate	25265-77-4	1.7850	67,248	100.00%	1.7850	6.72%
Over-coat	color pigments	13463-67-7	0.0816	3,074	40.00%	0.2040	0.77%
	epoxy resin	9004-57-3	0.0510	1,921	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0408	1,537	20.00%		
	diethylene glycol monobuthyl ether	112-34-5	0.0306	1,153	15.00%		
Marking	epoxy resin	9004-57-3	0.12240	4,611	80.00%	0.1530	0.58%
	color pigments	13463-67-7	0.03060	1,153	20.00%		
Total Weight			26.5435				

* Weights are approximate



Material Declaration Data Sheet

CSR2512 (Formerly CSR 2)

Thick Film Current Sense Chip Resistor

Date: **November 6, 2012**

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

Component Weight (mg): **43.0813**

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	aluminum oxide	1344-28-1	35.1168	813,793	96.00%	36.5800	84.91%
	silicon dioxide	14808-60-7	1.0974	16,954	3.00%		
	magnesium oxide	1309-48-4	0.3658	8,477	1.00%		
Element	silver	7440-22-4	0.17875	4,149	55.00%	0.3250	0.75%
	palladium	7440-05-3	0.00325	75	1.00%		
	alpha-terpineol	98-55-5	0.07800	1,811	24.00%		
	epoxy resin	9004-57-3	0.06500	1,509	20.00%		
Inner termination	silver	7440-22-4	0.21870	5,076	90.00%	0.2430	0.56%
	alpha-terpineol	98-55-5	0.02430	564	10.00%		
Middle termination	nickel	7440-02-0	0.8940	20,751	100.00%	0.8940	2.08%
Side termination	nickel	7440-02-0	0.00017	4	55.00%	0.0003	0.00%
	chromium	7440-47-3	0.00014	3	45.00%		
Termination plating	tin	7440-31-5	1.6260	37,743	100.00%	1.6260	3.77%
Under-coat	isobutyrate	25265-77-4	2.8450	66,038	100.00%	2.8450	6.60%
Over-coat	color pigments	13463-67-7	0.1300	3,018	40.00%	0.3250	0.75%
	epoxy resin	9004-57-3	0.0813	1,886	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0650	1,509	20.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0488	1,132	15.00%		
Marking	epoxy resin	9004-57-3	0.19440	4,512	80.00%	0.2430	0.56%
	color pigments	13463-67-7	0.04860	1,128	20.00%		
Total Weight			43.0813				

* Weights are approximate



Material Declaration Data Sheet

CSRN2512 (Formerly CSRN 2)

Thick Film Current Sense Chip Resistor

Date: **November 6, 2012**

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

Component Weight (mg): **42.3859**

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	aluminum oxide	1344-28-1	35.1168	813,793	96.00%	36.5800	86.30%
	silicon dioxide	14808-60-7	1.0974	16,954	3.00%		
	magnesium oxide	1309-48-4	0.3658	8,477	1.00%		
Element	silver	7440-22-4	0.17875	4,217	55.00%	0.3250	0.77%
	palladium	7440-05-3	0.00325	77	1.00%		
	alpha-terpineol	98-55-5	0.07800	1,840	24.00%		
	epoxy resin	9004-57-3	0.06500	1,534	20.00%		
Inner termination	silver	7440-22-4	0.18684	4,408	90.00%	0.2076	0.49%
	alpha-terpineol	98-55-5	0.02076	490	10.00%		
Middle termination	nickel	7440-02-0	0.6100	14,392	100.00%	0.6100	1.44%
Side termination	nickel	7440-02-0	0.00017	4	55.00%	0.0003	0.00%
	chromium	7440-47-3	0.00014	3	45.00%		
Termination plating	tin	7440-31-5	1.2500	29,491	100.00%	1.2500	2.95%
Under-coat	isobutyrate	25265-77-4	2.8450	67,121	100.00%	2.8450	6.71%
Over-coat	color pigments	13463-67-7	0.1300	3,067	40.00%	0.3250	0.77%
	epoxy resin	9004-57-3	0.0813	1,917	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0650	1,534	20.00%		
	diethylene glycol monobutyl ether	112-34-5	0.0488	1,150	15.00%		
Marking	epoxy resin	9004-57-3	0.19440	4,586	80.00%	0.2430	0.57%
	color pigments	13463-67-7	0.04860	1,147	20.00%		
Total Weight			42.3859				

* Weights are approximate



Material Declaration Data Sheet

CSR1225 (Formerly CSR 3)

Thick Film Current Sense Chip Resistor

Date: **November 6, 2012**

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

Component Weight (mg): **73.1998**

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	aluminum oxide	1344-28-1	57.1872	813,793	96.00%	59.5700	81.38%
	silicon dioxide	14808-60-7	1.7871	16,954	3.00%		
	magnesium oxide	1309-48-4	0.5957	8,477	1.00%		
Element	silver	7440-22-4	0.28655	3,915	55.00%	0.5210	0.71%
	palladium	7440-05-3	0.00521	71	1.00%		
	alpha-terpineol	98-55-5	0.12504	1,708	24.00%		
	epoxy resin	9004-57-3	0.10420	1,424	20.00%		
Inner termination	silver	7440-22-4	0.68535	9,363	90.00%	0.7615	1.04%
	alpha-terpineol	98-55-5	0.07615	1,040	10.00%		
Middle termination	nickel	7440-02-0	3.0610	41,817	100.00%	3.0610	4.18%
Side termination	nickel	7440-02-0	0.00017	2	55.00%	0.0003	0.00%
	chromium	7440-47-3	0.00014	2	45.00%		
Termination plating	tin	7440-31-5	5.6810	77,610	100.00%	5.6810	7.76%
Under-coat	isobutyrate	25265-77-4	3.0450	41,598	100.00%	3.0450	4.16%
Over-coat	color pigments	13463-67-7	0.1260	1,721	40.00%	0.3150	0.43%
	epoxy resin	9004-57-3	0.0788	1,076	25.00%		
	bisphenol epoxy resin	25068-38-6	0.0630	861	20.00%		
	diethylene glycol monobuthyl ether	112-34-5	0.0473	645	15.00%		
Marking	epoxy resin	9004-57-3	0.19600	2,678	80.00%	0.2450	0.33%
	color pigments	13463-67-7	0.04900	669	20.00%		
Total Weight			73.1998				

* Weights are approximate