

AUTO GRADE CURRENT SENSING CHIP RESISTOR


- CRS SERIES -

■ CRS02 (0201) | CRS04 (0402)

NO.	BREAKDOWN OF PART	MATERIAL NAME	SUBSTANCE NAME	CAS NO.	%	CRS02 (0201)				CRS04 (0402)							
						TOTAL (g)		0.000180		TOTAL (g)		0.000700					
						WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)	WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)				
1	Substrate	Ceramics	Al ₂ O ₃	1344-28-1	96		0.12283		68.23		0.52566		75.11				
			SiO ₂	14808-60-7	3	0.12795	0.00384	71.07	2.13	0.54756	0.01643	78.24	2.35				
			MgO	1309-48-4	1		0.00128		0.71		0.00548		0.78				
2	Upside Electrode	Paste	Ag	7440-22-4	99	0.00908	0.00899	5.05	5.00	0.03294	0.03261	4.71	4.66				
			Pd	7440-05-3	1									0.00009	0.05	0.00033	0.05
3	Backside Electrode	Paste	Ag	7440-22-4	100	0.00077	0.00077	0.43	0.43	0.00689	0.00689	0.98	0.98				
4	Edge Electrode	Alloy	Ni	7440-02-0	55	0.00012	0.00007	0.07	0.04	0.00030	0.00017	0.04	0.02				
			Cr	7440-47-3	45									0.00005	0.03	0.00014	0.02
5	Resistive Element	Paste	R ₂ O ₂	12036-10-1	35	0.00965	0.00338	5.36	1.88	0.02271	0.00795	3.24	1.13				
			PbO	1317-36-8	1									0.00010	0.05	0.00023	0.03
			Ag	7440-22-4	55									0.00531	2.95	0.01249	1.78
			Silicon Dioxide	7631-86-9	9									0.00087	0.48	0.00204	0.29
6	Nickel Plating	Nickel	Ni	7440-02-0	100	0.01305	0.01305	7.25	7.25	0.03564	0.03564	5.09	5.09				
7	Tin Plating	Tin	Sn	7440-31-5	100	0.01305	0.01305	7.25	7.25	0.03564	0.03564	5.09	5.09				
8	Primary Overcoat	Paste	Glass Frit	65997-18-4	100	0.00077	0.00077	0.43	0.430	0.00401	0.00401	0.57	0.57				
9	Secondary Overcoat	Paste	Bisphenol A Type Epoxy Resin	25068-38-6	38	0.00556	0.00211	3.09	1.17	0.01431	0.00544	2.04	0.78				
			Carbon black	1333-86-4	6									0.00033	0.19	0.00086	0.12
			Silicon Dioxide	60676-86-0	50									0.00278	1.55	0.00716	1.02
			Additives	-	6									0.00033	0.19	0.00086	0.12
10	Marking	Ink	Bisphenol A Type Epoxy Resin	25068-38-6	80	0.00000	0.00000	0.00	0.00	0.00000	0.00000	0.00	0.00				
			TiO ₂	13463-67-7	20									0.00000	0.00	0.00000	0.00

AUTO GRADE CURRENT SENSING CHIP RESISTOR

- CRS SERIES -

 CRS06 (0603) | CRS10 (0805)

NO.	BREAKDOWN OF PART	MATERIAL NAME	SUBSTANCE NAME	CAS NO.	%	CRS06 (0603)				CRS10 (0805)			
						TOTAL (g)		0.001990		TOTAL (g)		0.005300	
						WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)	WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)
1	Substrate	Ceramics	Al ₂ O ₃	1344-28-1	96	1.70806	1.63974	85.84	82.41	4.51672	4.33605	85.22	81.81
			SiO ₂	14808-60-7	3		0.05124		2.58		0.13550		2.56
			MgO	1309-48-4	1		0.01708		0.86		0.04517		0.85
2	Upside Electrode	Paste	Ag	7440-22-4	99	0.05203	0.05151	2.61	2.58	0.19664	0.19467	3.71	3.67
			Pd	7440-05-3	1		0.00052		0.03		0.00197		0.04
3	Backside Electrode	Paste	Ag	7440-22-4	100	0.00549	0.00549	0.28	0.28	0.02098	0.02098	0.40	0.40
4	Edge Electrode	Alloy	Ni	7440-02-0	55	0.00054	0.00030	0.03	0.02	0.00117	0.00064	0.02	0.01
			Cr	7440-47-3	45		0.00024		0.01		0.00053		0.01
5	Resistive Element	Paste	R ₂ O ₂	12036-10-1	35	0.04893	0.01713	2.46	0.86	0.13109	0.04588	2.47	0.86
			PbO	1317-36-8	1		0.00049		0.02		0.00131		0.02
			Ag	7440-22-4	55		0.02691		1.35		0.07210		1.36
			Silicon Dioxide	7631-86-9	9		0.00440		0.22		0.01180		0.22
6	Nickel Plating	Nickel	Ni	7440-02-0	100	0.06993	0.06993	3.51	3.51	0.17682	0.17682	3.34	3.34
7	Tin Plating	Tin	Sn	7440-31-5	100	0.06993	0.06993	3.51	3.51	0.17682	0.17682	3.34	3.34
8	Primary Overcoat	Paste	Glass Frit	65997-18-4	100	0.00707	0.00707	0.36	0.360	0.01443	0.01443	0.27	0.270
9	Secondary Overcoat	Paste	Bisphenol A Type Epoxy Resin	25068-38-6	38	0.02613	0.00993	1.31	0.50	0.06300	0.02394	1.19	0.45
			Carbon black	1333-86-4	6		0.00157		0.08		0.00378		0.07
			Silicon Dioxide	60676-86-0	50		0.01307		0.66		0.03150		0.60
			Additives	-	6		0.00157		0.08		0.00378		0.07
10	Marking	Ink	Bisphenol A Type Epoxy Resin	25068-38-6	80	0.00189	0.00151	0.09	0.07	0.00233	0.00186	0.04	0.03
			TiO ₂	13463-67-7	20		0.00038		0.02		0.00047		0.01



AUTO GRADE CURRENT SENSING CHIP RESISTOR

- CRS SERIES -

■ CRS12 (1206) | CRS12 (1206) 1WATT

NO.	BREAKDOWN OF PART	MATERIAL NAME	SUBSTANCE NAME	CAS NO.	%	CRS12 (1206)				CS12 (1206) 1WATT			
						TOTAL (g)		0.008820		TOTAL (g)		0.012150	
						WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)	WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)
1	Substrate	Ceramics	Al ₂ O ₃	1344-28-1	96	7.64973	7.34374	86.73	83.26	7.64973	7.34374	86.73	83.26
			SiO ₂	14808-60-7	3		0.22949		2.60		0.22949		2.60
			MgO	1309-48-4	1		0.07650		0.87		0.07650		0.87
2	Upside Electrode	Paste	Ag	7440-22-4	99	0.26609	0.26343	3.02	2.99	2.12483	2.10359	3.02	2.99
			Pd	7440-05-3	1		0.00266		0.03		0.02125		0.03
3	Backside Electrode	Paste	Ag	7440-22-4	100	0.03391	0.03391	0.38	0.38	0.03391	0.03391	0.38	0.38
4	Edge Electrode	Alloy	Ni	7440-02-0	55	0.00128	0.00070	0.01	0.006	0.00128	0.00070	0.01	0.006
			Cr	7440-47-3	45		0.00058		0.005		0.00058		0.005
5	Resistive Element	Paste	R ₂ O ₂	12036-10-1	35	0.29428	0.10300	3.34	1.17	1.74676	0.61137	3.34	1.17
			PbO	1317-36-8	1		0.00294		0.03		0.01747		0.03
			Ag	7440-22-4	55		0.16185		1.84		0.96072		1.84
			Silicon Dioxide	7631-86-9	9		0.02649		0.30		0.15721		0.30
6	Nickel Plating	Nickel	Ni	7440-02-0	100	0.21942	0.21942	2.49	2.49	0.21942	0.21942	2.49	2.49
7	Tin Plating	Tin	Sn	7440-31-5	100	0.21942	0.21942	2.49	2.49	0.21942	0.21942	2.49	2.49
8	Primary Overcoat	Paste	Glass Frit	65997-18-4	100	0.03886	0.03886	0.44	0.440	0.04275	0.04275	0.44	0.440
9	Secondary Overcoat	Paste	Bisphenol A Type Epoxy Resin	25068-38-6	38	0.09325	0.03544	1.06	0.40	0.11190	0.04252	1.10	0.42
			Carbon black	1333-86-4	6		0.00560		0.06		0.00671		0.07
			Silicon Dioxide	60676-86-0	50		0.04663		0.53		0.05595		0.55
			Additives	-	6		0.00560		0.06		0.00671		0.07
10	Marking	Ink	Bisphenol A Type Epoxy Resin	25068-38-6	80	0.00376	0.00301	0.04	0.03	0.00000	0.00000	0.00	0.00
			TiO ₂	13463-67-7	20		0.00075		0.01		0.00000		0.00

AUTO GRADE CURRENT SENSING CHIP RESISTOR

- CRS SERIES -

 CRS14 (1210) | CRS20 (2010)

NO.	BREAKDOWN OF PART	MATERIAL NAME	SUBSTANCE NAME	CAS NO.	%	CRS14 (1210)				CRS20 (2010)			
						TOTAL (g)		0.015500		TOTAL (g)		0.027030	
						WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)	WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)
1	Substrate	Ceramics	Al ₂ O ₃	1344-28-1	96	13.21667	12.68800	85.26	81.85	23.37691	22.44183	86.49	83.03
			SiO ₂	14808-60-7	3		0.39650		2.56		0.70131		2.59
			MgO	1309-48-4	1		0.13217		0.85		0.23377		0.86
2	Upside Electrode	Paste	Ag	7440-22-4	99	0.49403	0.48909	3.19	3.16	0.80966	0.80156	3.00	2.97
			Pd	7440-05-3	1		0.00494		0.03		0.00810		0.03
3	Backside Electrode	Paste	Ag	7440-22-4	100	0.07618	0.07618	0.49	0.49	0.08633	0.08633	0.31	0.31
4	Edge Electrode	Alloy	Ni	7440-02-0	55	0.00208	0.00114	0.01	0.006	0.00231	0.00127	0.01	0.006
			Cr	7440-47-3	45		0.00094		0.005		0.00104		0.005
5	Resistive Element	Paste	R ₂ O ₂	12036-10-1	35	0.58122	0.20343	3.75	1.31	1.18745	0.41561	4.39	1.54
			PbO	1317-36-8	1		0.00581		0.04		0.01187		0.04
			Ag	7440-22-4	55		0.31967		2.06		0.65310		2.41
			Silicon Dioxide	7631-86-9	9		0.05231		0.34		0.10687		0.40
6	Nickel Plating	Nickel	Ni	7440-02-0	100	0.43636	0.43636	2.82	2.82	0.50697	0.50697	1.88	1.88
7	Tin Plating	Tin	Sn	7440-31-5	100	0.43636	0.43636	2.82	2.82	0.50697	0.50697	1.88	1.88
8	Primary Overcoat	Paste	Glass Frit	65997-18-4	100	0.08062	0.08062	0.52	0.52	0.22019	0.22019	0.81	0.81
9	Secondary Overcoat	Paste	Bisphenol A Type Epoxy Resin	25068-38-6	38	0.16895	0.06420	1.09	0.41	0.32466	0.12337	1.20	0.46
			Carbon black	1333-86-4	6		0.01014		0.07		0.01948		0.07
			Silicon Dioxide	60676-86-0	50		0.08448		0.55		0.16233		0.60
			Additives	-	6		0.01014		0.07		0.01948		0.07
10	Marking	Ink	Bisphenol A Type Epoxy Resin	25068-38-6	80	0.00753	0.00602	0.05	0.04	0.00855	0.00684	0.03	0.02
			TiO ₂	13463-67-7	20		0.00151		0.01		0.00171		0.01



AUTO GRADE CURRENT SENSING CHIP RESISTOR

- CRS SERIES -

■ CRS25 (2512) | CRS25 (2512) 2 WATT

NO.	BREAKDOWN OF PART	MATERIAL NAME	SUBSTANCE NAME	CAS NO.	%	CRS25 (2512)				CRS25 (2512) 2WATT			
						TOTAL (g)		0.043080		TOTAL (g)		0.053080	
						WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)	WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)
1	Substrate	Ceramics	Al ₂ O ₃	1344-28-1	96	37.71506	36.20646	87.55	84.05	48.18914	46.26157	90.78	87.15
			SiO ₂	14808-60-7	3		1.13145		2.63		1.44567		2.72
			MgO	1309-48-4	1		0.37715		0.88		0.48189		0.91
2	Upside Electrode	Paste	Ag	7440-22-4	99	1.08462	1.07377	2.52	2.49	0.98877	0.97888	1.86	1.84
			Pd	7440-05-3	1		0.01085		0.03		0.00989		0.02
3	Backside Electrode	Paste	Ag	7440-22-4	100	0.10885	0.10885	0.25	0.25	0.09923	0.09923	0.19	0.19
4	Edge Electrode	Alloy	Ni	7440-02-0	55	0.00293	0.00161	0.01	0.006	0.00267	0.00147	0.01	0.006
			Cr	7440-47-3	45		0.00132		0.005		0.00120		0.005
5	Resistive Element	Paste	R ₂ O ₂	12036-10-1	35	1.91903	0.67166	4.45	1.56	1.74945	0.61231	3.30	1.16
			PbO	1317-36-8	1		0.01919		0.04		0.01749		0.03
			Ag	7440-22-4	55		1.05547		2.45		0.96220		1.82
			Silicon Dioxide	7631-86-9	9		0.17271		0.40		0.15745		0.30
6	Nickel Plating	Nickel	Ni	7440-02-0	100	0.63834	0.63834	1.48	1.48	0.58194	0.58194	1.10	1.10
7	Tin Plating	Tin	Sn	7440-31-5	100	0.63834	0.63834	1.48	1.48	0.58194	0.58194	1.10	1.10
8	Primary Overcoat	Paste	Glass Frit	65997-18-4	100	0.39184	0.39184	0.91	0.91	0.35721	0.35721	0.67	0.67
9	Secondary Overcoat	Paste	Bisphenol A Type Epoxy Resin	25068-38-6	38	0.56732	0.21558	1.32	0.50	0.51719	0.19653	0.97	0.37
			Carbon black	1333-86-4	6		0.03404		0.08		0.03103		0.06
			Silicon Dioxide	60676-86-0	50		0.28366		0.66		0.25860		0.49
			Additives	-	6		0.03404		0.08		0.03103		0.06
10	Marking	Ink	Bisphenol A Type Epoxy Resin	25068-38-6	80	0.01367	0.01094	0.03	0.02	0.01246	0.00997	0.02	0.016
			TiO ₂	13463-67-7	20		0.00273		0.01		0.00249		0.004

AUTO GRADE CURRENT SENSING CHIP RESISTOR

- CRS SERIES -

 CRS21 (1225) | CRS37 (3720)

NO.	BREAKDOWN OF PART	MATERIAL NAME	SUBSTANCE NAME	CAS NO.	%	CRS21 (1225)				CRS37 (3720)			
						TOTAL (g)		0.064880		TOTAL (g)		0.019960	
						WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)	WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)
1	Substrate	Ceramics	Al ₂ O ₃	1344-28-1	96		56.33878		86.83		16.38188		82.07
			SiO ₂	14808-60-7	3	58.68623	1.76059	90.45	2.71	17.06446	0.51193	85.49	2.56
			MgO	1309-48-4	1		0.58686		0.90		0.17064		0.85
2	Upside Electrode	Paste	Ag	7440-22-4	99	1.64463	1.62818	2.53	2.50	0.42320	0.41897	2.12	2.10
			Pd	7440-05-3	1		0.01645		0.03		0.00423		0.02
3	Backside Electrode	Paste	Ag	7440-22-4	100	0.10217	0.10217	0.16	0.16	0.08413	0.08413	0.42	0.42
4	Edge Electrode	Alloy	Ni	7440-02-0	55	0.00549	0.00302	0.01	0.006	0.00386	0.00212	0.02	0.01
			Cr	7440-47-3	45		0.00247		0.005		0.00174		0.01
5	Resistive Element	Paste	R ₂ O ₂	12036-10-1	35	1.56628	0.54820	2.41	0.84	0.52033	0.18212	2.61	0.91
			PbO	1317-36-8	1		0.01566		0.02		0.00520		0.03
			Ag	7440-22-4	55		0.86145		1.33		0.28618		1.44
			Silicon Dioxide	7631-86-9	9		0.14097		0.22		0.04683		0.23
6	Nickel Plating	Nickel	Ni	7440-02-0	100	1.19832	1.19832	1.85	1.85	0.84250	0.84250	4.22	4.22
7	Tin Plating	Tin	Sn	7440-31-5	100	1.19832	1.19832	1.85	1.85	0.84250	0.84250	4.22	4.22
8	Primary Overcoat	Paste	Glass Frit	65997-18-4	100	0.3677	0.36779	0.57	0.57	0.04819	0.04819	0.24	0.240
9	Secondary Overcoat	Paste	Bisphenol A Type Epoxy Resin	25068-38-6	38	0.09794	0.03722	0.15	0.06	0.11568	0.04396	0.58	0.22
			Carbon black	1333-86-4	6		0.00588		0.01		0.00694		0.03
			Silicon Dioxide	60676-86-0	50		0.04897		0.08		0.05784		0.29
			Additives	-	6		0.00588		0.01		0.00694		0.03
10	Marking	Ink	Bisphenol A Type Epoxy Resin	25068-38-6	80	0.01283	0.01026	0.02	0.016	0.01515	0.01212	0.08	0.06
			TiO ₂	13463-67-7	20		0.00257		0.004		0.00303		0.02



AUTO GRADE CURRENT SENSING CHIP RESISTOR

- CRS SERIES -

■ CRS75 (7520)

NO.	BREAKDOWN OF PART	MATERIAL NAME	SUBSTANCE NAME	CAS NO.	%	CRS75 (7520)			
						TOTAL (g)		0.064880	
						WEIGHT (mg)	SUBSTANCE MASS (mg/pc)	PERCENTAGE (%)	SUBSTANCE PERCENTAGE (%)
1	Substrate	Ceramics	Al ₂ O ₃	1344-28-1	96	31.38506	30.12966	87.91	84.39
			SiO ₂	14808-60-7	3		0.94155		2.64
			MgO	1309-48-4	1		0.31385		0.88
2	Upside Electrode	Paste	Ag	7440-22-4	99	1.13320	1.12187	3.17	3.14
			Pd	7440-05-3	1		0.01133		0.03
3	Backside Electrode	Paste	Ag	7440-22-4	100	0.16167	0.16167	0.45	0.45
4	Edge Electrode	Alloy	Ni	7440-02-0	55	0.00742	0.00408	0.02	0.01
			Cr	7440-47-3	45		0.00334		0.01
5	Resistive Element	Paste	R ₂ O ₂	12036-10-1	35	1.33321	0.46662	3.73	1.31
			PbO	1317-36-8	1		0.01333		0.04
			Ag	7440-22-4	55		0.73327		2.05
			Silicon Dioxide	7631-86-9	9		0.11999		0.34
6	Nickel Plating	Nickel	Ni	7440-02-0	100	0.67999	0.67999	1.90	1.90
7	Tin Plating	Tin	Sn	7440-31-5	100	0.67999	0.67999	1.90	1.90
8	Primary Overcoat	Paste	Glass Frit	65997-18-4	100	0.09261	0.09261	0.26	0.260
9	Secondary Overcoat	Paste	Bisphenol A Type Epoxy Resin	25068-38-6	38	0.22229	0.08447	0.62	0.24
			Carbon black	1333-86-4	6		0.01334		0.04
			Silicon Dioxide	60676-86-0	50		0.11115		0.31
			Additives	-	6		0.01334		0.04
10	Marking	Ink	Bisphenol A Type Epoxy Resin	25068-38-6	80	0.01456	0.01165	0.04	0.03
			TiO ₂	13463-67-7	20		0.00291		0.01