1.5CE6.8A THRU 1.5CE440A
1.5CE6.8CA THRU 1.5CE440CA

UNI-DIRECTIONAL AND BI-DIRECTIONAL SILICON TRANSIENT VOLTAGE SUPPRESSORS

1500 WATTS, 6.8 THRU 440 VOLTS

Central™
Semiconductor Corp.
www.centralsemi.com

Specified by
BREAKDOWN VOLTAGE

DO-201 CASE

DESCRIPTION:

The CENTRAL SEMICONDUCTOR 1.5CE6.8A (Uni-Directional) and 1.5CE6.8CA (Bi-Directional) Series types are Transient Voltage Suppressors designed to protect voltage sensitive components from high voltage transients.

THIS DEVICE IS MANUFACTURED WITH A GLASS PASSIVATED CHIP FOR OPTIMUM RELIABILITY.

Note: For Uni-Directional devices add suffix “A” to part number. For Bi-Directional devices add suffix “CA” to part number.

MARKING: FULL PART NUMBER
Bi-directional devices shall not be marked with a Cathode band.

MAXIMUM RATINGS: (T_L=25°C unless otherwise noted)	**SYMBOL**		**UNITS**
Peak Power Dissipation (Note 1)	P_{PK}	1500	W
Steady State Power Dissipation (T_L=75°C, L.L.=3/8”)	P_D	5.0	W
Forward Surge Current (Uni-Directional only)	I_{FSM}	200	A
Operating and Storage Junction Temperature	T_J, T_{stg}	-65 to +175	°C

ELECTRICAL CHARACTERISTICS: (T_A=25°C unless otherwise noted)

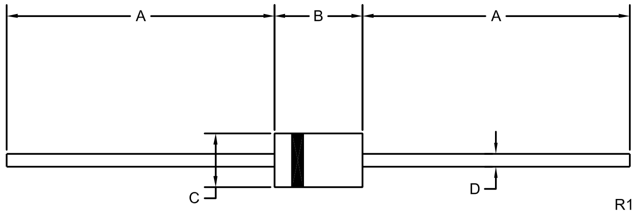
TYPE	BREAKDOWN VOLTAGE V_{BR} @ I_T			TEST CURRENT I_T	WORKING PEAK REVERSE VOLTAGE V_{RWM}	MAXIMUM REVERSE LEAKAGE CURRENT I_R @ V_{RWM}	MAXIMUM CLAMPING VOLTAGE V_C @ I_{PP}	PEAK PULSE CURRENT (Note 1) I_{PP}	MAXIMUM TEMPERATURE COEFFICIENT ΘV_{BR}
	MIN V	NOM V	MAX V	mA	V	µA	V	A	% / °C
1.5CE6.8	6.45	6.8	7.14	10	5.8	1000	10.5	143	0.057
1.5CE7.5	7.13	7.5	7.88	10	6.4	500	11.3	132	0.061
1.5CE8.2	7.79	8.2	8.61	10	7.02	200	12.1	124	0.065
1.5CE9.1	8.65	9.1	9.55	1.0	7.78	50	13.4	112	0.068
1.5CE10	9.5	10	10.5	1.0	8.55	10	14.5	103	0.073
1.5CE11	10.5	11	11.6	1.0	9.4	5.0	15.6	96	0.075
1.5CE12	11.4	12	12.6	1.0	10.2	5.0	16.7	90	0.078
1.5CE13	12.4	13	13.7	1.0	11.1	5.0	18.2	82	0.081
1.5CE15	14.3	15	15.8	1.0	12.8	5.0	21.2	71	0.084
1.5CE16	15.2	16	16.8	1.0	13.6	5.0	22.5	67	0.086
1.5CE18	17.1	18	18.9	1.0	15.3	5.0	25.2	59.5	0.088
1.5CE20	19.0	20	21.0	1.0	17.1	5.0	27.7	54	0.090
1.5CE22	20.9	22	23.1	1.0	18.8	5.0	30.6	49	0.092
1.5CE24	22.8	24	25.2	1.0	20.5	5.0	33.2	45	0.094
1.5CE27	25.7	27	28.4	1.0	23.1	5.0	37.5	40	0.096
1.5CE30	28.5	30	31.5	1.0	25.6	5.0	41.4	36	0.097
1.5CE33	31.4	33	34.7	1.0	28.2	5.0	45.7	33	0.098
1.5CE36	34.2	36	37.8	1.0	30.8	5.0	49.9	30	0.099
1.5CE39	37.1	39	41	1.0	33.3	5.0	53.9	28	0.100
1.5CE43	40.9	43	45.2	1.0	36.8	5.0	59.3	25.3	0.101

Notes: (1) Non-repetitive 10x1,000µs pulse.

ELECTRICAL CHARACTERISTICS - Continued: (T_A=25°C unless otherwise noted)

TYPE	BREAKDOWN VOLTAGE V_{BR} @ I_T			TEST CURRENT I_T	WORKING PEAK REVERSE VOLTAGE V_{RWM}	MAXIMUM REVERSE LEAKAGE CURRENT I_R @ V_{RWM}	MAXIMUM CLAMPING VOLTAGE V_C @ I_{PP}	PEAK PULSE CURRENT (Note 1) I_{PP}	MAXIMUM TEMPERATURE COEFFICIENT ΘV_{BR}
	MIN V	NOM V	MAX V	mA	V	μA	V	A	% / °C
1.5CE47	44.7	47	49.4	1.0	40.2	5.0	64.8	23.2	0.101
1.5CE51	48.5	51	53.6	1.0	43.6	5.0	70.1	21.4	0.102
1.5CE56	53.2	56	58.8	1.0	47.8	5.0	77	19.5	0.103
1.5CE62	58.9	62	65.1	1.0	53.0	5.0	85	17.7	0.104
1.5CE68	64.6	68	71.4	1.0	58.1	5.0	92	16.3	0.104
1.5CE75	71.3	75	78.8	1.0	64.1	5.0	103	14.6	0.105
1.5CE82	77.9	82	86.1	1.0	70.1	5.0	113	13.3	0.105
1.5CE91	86.5	91	95.5	1.0	77.8	5.0	125	12	0.106
1.5CE100	95.0	100	105	1.0	85.5	5.0	137	11	0.106
1.5CE110	104.5	110	115.5	1.0	94.0	5.0	152	9.9	0.107
1.5CE120	114	120	126	1.0	102	5.0	165	9.1	0.107
1.5CE130	123.5	130	136.5	1.0	111	5.0	179	8.4	0.107
1.5CE150	142.5	150	157.5	1.0	128	5.0	207	7.2	0.108
1.5CE160	152	160	168	1.0	136	5.0	219	6.8	0.108
1.5CE170	161.5	170	178.5	1.0	145	5.0	234	6.4	0.108
1.5CE180	171	180	189	1.0	154	5.0	246	6.1	0.108
1.5CE200	190	200	210	1.0	171	5.0	274	5.5	0.108
1.5CE220	209	220	231	1.0	185	5.0	328	4.6	0.108
1.5CE250	237.5	250	262.5	1.0	214	5.0	344	5.0	0.110
1.5CE300	285	300	315	1.0	256	5.0	414	5.0	0.110
1.5CE350	332.5	350	367.5	1.0	300	5.0	482	4.0	0.110
1.5CE400	380	400	420	1.0	342	5.0	548	4.0	0.110
1.5CE440	418	440	462	1.0	376	5.0	600	2.6	0.110

DO-201 CASE - MECHANICAL OUTLINE



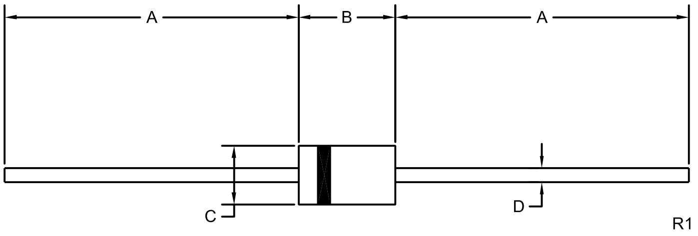
DIMENSIONS				
	INCHES		MILLIMETERS	
SYMBOL	MIN	MAX	MIN	MAX
A	1.000	-	25.40	-
B	0.285	0.375	7.24	9.53
C	0.188	0.210	4.78	5.33
D	0.037	0.042	0.94	1.07

DO-201(REV: R1)

MARKING: FULL PART NUMBER
Bi-directional devices shall not be marked with a Cathode band.

Package Details - DO-201

Mechanical Drawing



DIMENSIONS				
	INCHES		MILLIMETERS	
SYMBOL	MIN	MAX	MIN	MAX
A	1.000	-	25.40	-
B	0.285	0.375	7.24	9.53
C	0.188	0.210	4.78	5.33
D	0.037	0.042	0.94	1.07

DO-201(REV: R1)

Lead Code:
Cathode band

Packing options:

Bulk - Packing Code: D
D = White corrugated box with black conductive coating (surface resistivity of <10^5 ohms per square).
Bulk Packing Quantity: 500

Tape and Reel - Packing Code: A
A = Axial taped and reeled in accordance with EIA-296-E. If required, individual reels placed in poly antistatic coated bags (surface resistivity of >10^9 and <10^{13} ohms per square).
Tape and Reel Packing Quantity: 1,400

Material Composition Specification

DO-201 Epoxy Case

Central Semiconductor Corp.

Device average mass . . . . . 881 mg
Fluctuation margin . . . . +/-10%

Component	Material	Material		Substance	CAS No.	Substance		
		(%wt)	(mg)			(%wt)	(mg)	(ppm)
active device	doped Si	0.43%	3.78	Si	7440-21-3	0.43%	3.78	4,291
die attach	high temperature solder	0.47%	4.12	Pb	7439-92-1	0.43%	3.81	4,325
				Sn	7440-31-5	0.02%	0.206	234
				Ag	7440-22-4	0.01%	0.103	117
leadframe	metal alloy	60.16%	530	Fe	7439-89-6	0.06%	0.53	602
				Cu	7440-50-8	60.1%	529.47	600,987
encapsulation*	EMC	33.26%	293.057	SiO_2	14808-60-7	25.91%	228.25	259,080
				epoxy resin	29690-82-2	3.35%	29.55	33,541
				phenol resin	9003-35-4	3.35%	29.55	33,541
				Sb_2O_3	1309-64-4	0.32%	2.854	3,239
				Br	7726-95-6	0.32%	2.854	3,239
	EMC GREEN	33.26%	293.057	silica (fused)	60676-86-0	25.62%	225.71	256,197
				epoxy resin	29690-82-2	3.27%	28.777	32,664
				phenol resin	9003-35-4	3.27%	28.777	32,664
				carbon black	1333-86-4	0.1%	0.887	1,007
				aluminum hydroxide	1309-42-8	1.01%	8.905	10,108
plating**	tin/lead process	5.68%	50	Sn	7440-31-5	4.54%	40	45,403
				Pb	7439-92-1	1.14%	10	11,351
	matte tin	5.68%	50	Sn	7440-31-5	5.68%	50	56,754
ink	N/A	0.005%	0.045	2-propenic acid	53192-18-0	0.0023%	0.02	23
				Al	7429-90-5	0.0007%	0.006	7
				silica	112945-52-5	0.0001%	0.001	1
				methanone	947-19-3	0.0001%	0.001	1
				isoamyl 4-benzoate	21245-01-2	0.0019%	0.017	19

*EMC GREEN molding compound is Halogen-Free.
**For Lead Free plating, add suffix “PB FREE” to part number.
For Tin/Lead plating, add suffix “TIN/LEAD” to part number.
No suffix designation allows for the supply of either lead-free or tin/lead plated product depending on availability.

Material Composition Specification

DO-201 Epoxy Case

Central Semiconductor Corp.

Device average mass . . . . . 881 mg

Fluctuation margin . . . . +/-10%

Component	Material	Material		Substance	CAS No.	Substance		
		(%wt)	(mg)			(%wt)	(mg)	(ppm)
active device	doped Si	0.43%	3.78	Si	7440-21-3	0.43%	3.78	4,291
die attach	high temperature solder	0.47%	4.12	Pb	7439-92-1	0.43%	3.81	4,325
				Sn	7440-31-5	0.02%	0.206	234
				Ag	7440-22-4	0.01%	0.103	117
leadframe	metal alloy	60.16%	530	Fe	7439-89-6	0.06%	0.53	602
				Cu	7440-50-8	60.1%	529.47	600,987
encapsulation*	EMC	33.26%	293.057	SiO_2	14808-60-7	25.91%	228.25	259,080
				epoxy resin	29690-82-2	3.35%	29.55	33,541
				phenol resin	9003-35-4	3.35%	29.55	33,541
				Sb_2O_3	1309-64-4	0.32%	2.854	3,239
				Br	7726-95-6	0.32%	2.854	3,239
	EMC GREEN	33.26%	293.057	silica (fused)	60676-86-0	25.62%	225.71	256,197
				epoxy resin	29690-82-2	3.27%	28.777	32,664
				phenol resin	9003-35-4	3.27%	28.777	32,664
				carbon black	1333-86-4	0.1%	0.887	1,007
				aluminum hydroxide	1309-42-8	1.01%	8.905	10,108
plating**	tin/lead process	5.68%	50	Sn	7440-31-5	4.54%	40	45,403
				Pb	7439-92-1	1.14%	10	11,351
	matte tin	5.68%	50	Sn	7440-31-5	5.68%	50	56,754
ink	N/A	0.005%	0.045	2-propenic acid	53192-18-0	0.0023%	0.02	23
				Al	7429-90-5	0.0007%	0.006	7
				silica	112945-52-5	0.0001%	0.001	1
				methanone	947-19-3	0.0001%	0.001	1
				isoamyl 4-benzoate	21245-01-2	0.0019%	0.017	19

*EMC GREEN molding compound is Halogen-Free.

**For Lead Free plating, add suffix "PB FREE" to part number.
For Tin/Lead plating, add suffix "TIN/LEAD" to part number.
No suffix designation allows for the supply of either lead-free or tin/lead plated product depending on availability.

Disclaimer
The information provided in this Material Composition data sheet is, to the best of our knowledge, correct. However, there is no guarantee to completeness or accuracy, as some information is derived from data sources outside the company.

R3 (16-July 2018)