

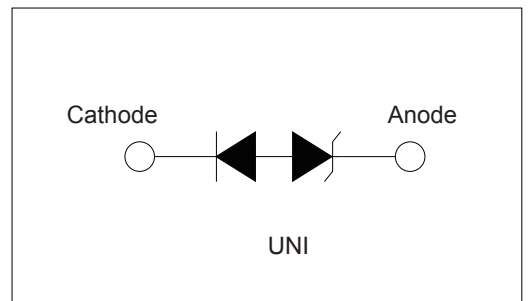
Transient Voltage Suppressors

LCE Series

Transient Voltage Suppressors - LCE Series

Features

1. Halogen-free
2. Rohs compliant
3. Typical maximum temperature coefficient
4. $\Delta V_{BR} = 0.1\% \times V_{BR} @ 25^{\circ}C \times \Delta T$
5. Glass passivated Chip junction in P600 package
6. 1500W peak pulse capability at 10x1000 μ s waveform, repetition rate (duty cycles): 0.01%
7. Fast response time: typically less than 1.0ps from 0 Volts to BV min
8. Excellent clamping capability
9. Low incremental surge resistance
10. Typical IR less than 5 μ A above 12V
11. High temperature soldering guaranteed: 260 $^{\circ}$ C/40 seconds / 0.375", (9.5mm) lead length, 5lbs., (2.3kg)tension
12. Plastic package has underwriters laboratory flammability classification 94v-0



Applications

TVS devices are ideal for the protection of I/O interfaces, VCC bus and other vulnerable circuits used in telecom, computer, industrial and consumer electronic applications.

Mechanical Characteristics

Rating	Symbol	Value	Units
Peak Pulse Power Dissipation by 10x1000 μ s test waveform (Fig.1)(Note 1)	P_{PPM}	30000	Watts
Steady State Power Dissipation on infinite heat sink at TL=75 $^{\circ}$ C (Fig. 5)	P_D	8	Watts
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55 $^{\circ}$ C to 175 $^{\circ}$ C	$^{\circ}$ C

Notes:

Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25^{\circ}C$ per Fig. 2.

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Electrical Characteristics

Type Number	Reverse Stand-Off Voltage	Breakdown Voltage		Test Current	Maximum Clamping Voltage@ I _{PP}	Peak Pulse Current	Reverse Leakage @V _{RWM}	Maximum Junction Capacitance @ 0 Volts	Working Inverse Blocking Voltage	Inverse Blocking Leakage Current at	Peak Inverse Blocking Voltage
	V _{RWM} (V)	V _{BR.MIN.} (V)	V _{BR.MAX.} (V)	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (μA)	(pF)	V _{WB}	I _{IB} @V _{WIB} (MA)	V _{pib} (V)
LCE6.5A	6.5	7.22	7.98	10	11.2	100.0	1000	100	75	1.0	100
LCE7.0A	7.0	7.78	8.60	10	12.0	100.0	500	100	75	1.0	100
LCE7.5A	7.5	8.33	9.21	10	12.9	100.0	200	100	75	1.0	100
LCE8.0A	8.0	8.89	9.83	1	13.6	100.0	50	100	75	1.0	100
LCE8.5A	8.5	9.44	10.40	1	14.4	100.0	10	100	75	1.0	100
LCE9.0A	9.0	10.00	11.10	1	15.4	97.0	1	100	75	1.0	100
LCE10A	10.0	11.10	12.30	1	17.0	88.0	1	100	75	1.0	100
LCE11A	11.0	12.20	13.50	1	18.2	82.0	1	100	75	1.0	100
LCE12A	12.0	13.30	14.70	1	19.9	75.0	1	100	75	1.0	100
LCE13A	13.0	14.40	15.90	1	21.5	70.0	1	100	75	1.0	100
LCE14A	14.0	15.60	17.20	1	23.2	65.0	1	100	75	1.0	100
LCE15A	15.0	16.70	18.50	1	24.4	61.0	1	100	75	1.0	100
LCE16A	16.0	17.80	19.70	1	26.0	57.0	1	100	75	1.0	100
LCE17A	17.0	18.90	20.90	1	27.6	54.0	1	100	75	1.0	100
LCE18A	18.0	20.00	22.10	1	29.2	51.0	1	100	75	1.0	100
LCE20A	20.0	22.20	24.50	1	32.4	46.0	1	100	75	1.0	100
LCE22A	22.0	24.40	26.90	1	35.5	42.0	1	100	75	1.0	100
LCE24A	24.0	26.70	29.50	1	38.9	39.0	1	100	75	1.0	100
LCE26A	26.0	28.90	31.90	1	42.1	36.0	1	100	75	1.0	100
LCE28A	28.0	31.10	34.40	1	45.5	33.0	1	100	75	1.0	100
LCE30A	30.0	33.30	36.80	1	48.4	31.0	1	100	75	1.0	100
LCE33A	33.0	36.70	40.60	1	53.3	28.1	1	100	75	1.0	100
LCE36A	36.0	40.00	44.20	1	58.1	25.8	1	100	75	1.0	100
LCE40A	40.0	44.40	49.10	1	64.5	23.3	1	100	75	1.0	100
LCE43A	43.0	47.80	52.80	1	69.4	21.6	1	100	75	1.0	100
LCE45A	45.0	50.00	55.30	1	72.7	20.6	1	100	75	1.0	100
LCE48A	48.0	53.30	58.90	1	77.4	19.4	1	100	75	1.0	100
LCE51A	51.0	56.70	62.70	1	82.4	18.2	1	100	75	1.0	100
LCE54A	54.0	60.00	66.30	1	87.1	17.2	1	100	100	1.0	125
LCE58A	58.0	64.40	71.20	1	93.6	16.0	1	100	100	1.0	125
LCE60A	60.0	66.70	73.70	1	96.8	15.5	1	100	100	1.0	125
LCE64A	64.0	71.10	78.60	1	103.0	14.6	1	100	100	1.0	125
LCE70A	70.0	77.80	86.00	1	113.0	13.3	1	100	125	1.0	150
LCE75A	75.0	83.80	92.10	1	121.0	12.4	1	100	125	1.0	150
LCE85A	85.0	94.40	104.00	1	129.0	11.6	1	100	125	1.0	150
LCE90A	90.0	100.00	111.00	1	146.0	10.3	1	100	125	1.0	150

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Ratings and Characteristic Curves

Figure 1 - Peak Pulse Power Rating Curve

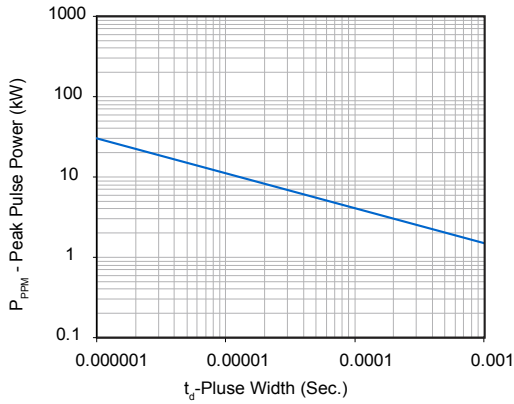


Figure 2 - Pulse Derating Curve

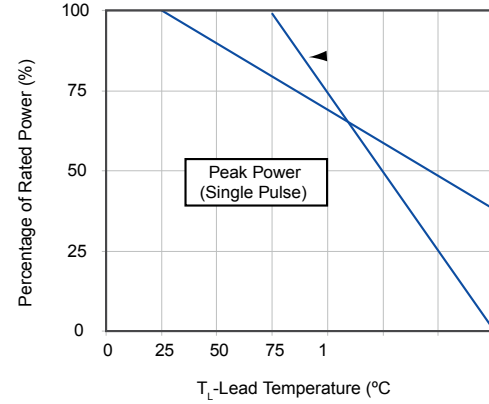


Figure 3 - Pulse Waveform

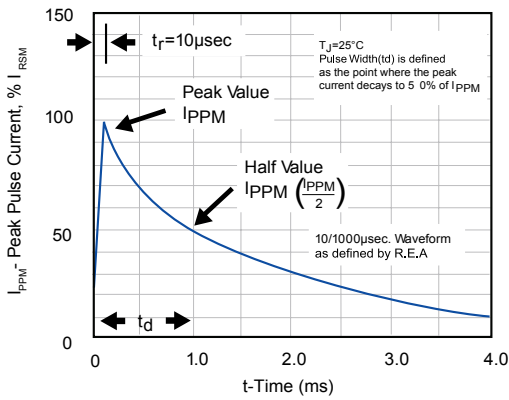
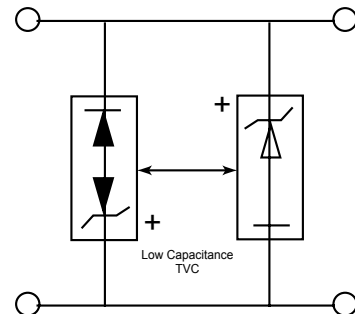
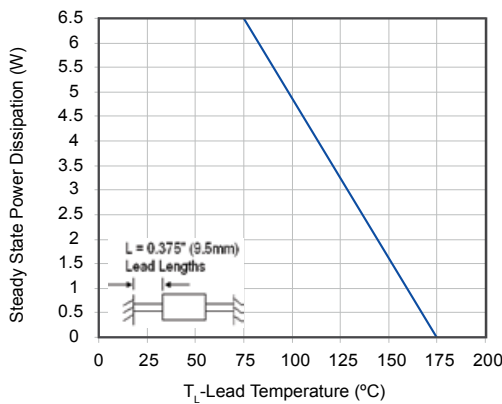


Figure 4 - Typical Junction Capacitance



Application Note: Device must be used with two units in parallel, opposite in polarity as shown on circuit for AC signal line protection.

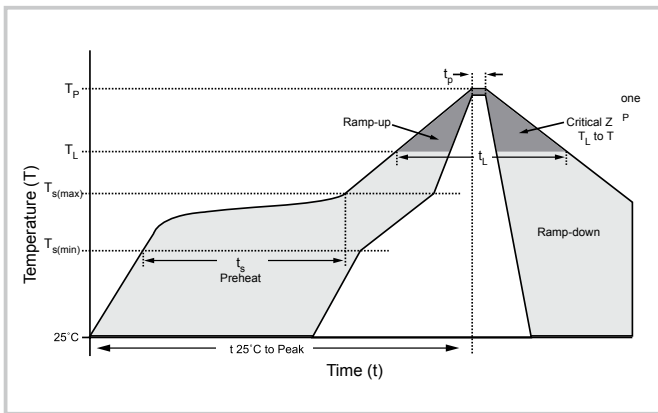
Figure 5 - Steady State Power Derating Curve



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Soldering Parameters

	Reflow Condition	Lead-free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60-180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_s)	60-150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20-40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes Max.
Do not exceed		280°C



Physical Specifications

Weight	0.045oz., 1.2g
Case	JEDEC DO-201 molded plastic body over passivated junction.
Polarity	Color band denotes the cathode except Bipolar.
Termina	Matte Tin axial leads, solderable per JESD22-B102D.

Environmental Specifications

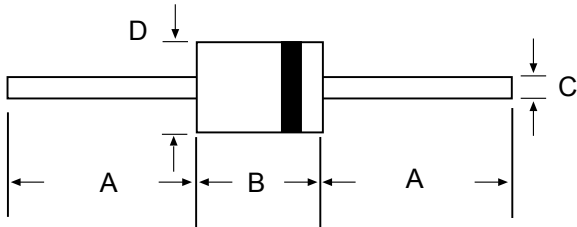
Temperature Cycle	JESD22-A104
Pressure Cooker	JESD 22-A102
High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Thermal Shock	JESD22-A106

Flow/Wave Soldering

Peak Temperature :	265°C
Dipping Time :	10 seconds
Soldering :	1 time

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Dimensions



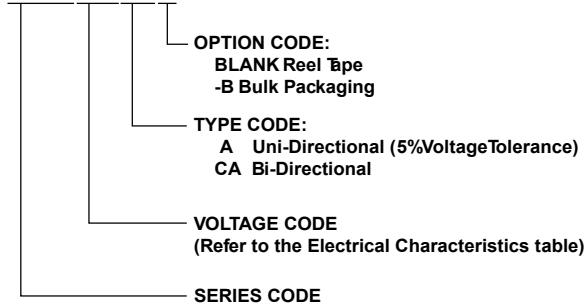
DO-201

Unit:mm

DIM	Inches		Millimeters	
	Min	Max	Min	Max
A	1.000	-	25.40	-
B	0.285	0.375	7.20	9.50
C	0.038	0.042	0.96	1.07
D	0.190	0.210	4.80	5.30

Part Numbering System

LCE xxxXXX



Packaging

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
LCExxxXX	DO-201	1000	Tape & Reel	ELA STD RS-296E
LCExxxXX-B	DO-201	500	BULK	Concord Packing Spec

Warehouse Storage Conditions of Products

- Storage Conditions:
 - Storage Temperature: -10°C~+40°C
 - Relative Humidity: ≤75%RH
 - Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year

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