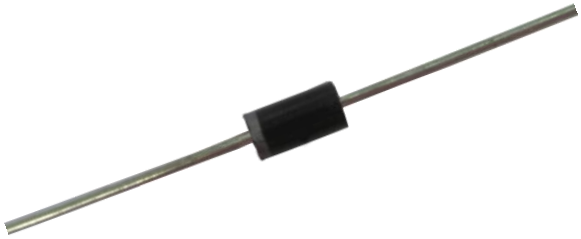
Microsemi
Shanghai

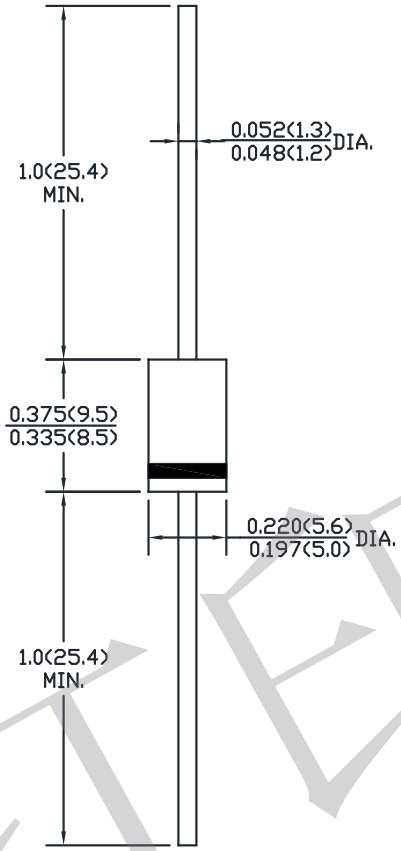
LCE6.5 thru LCE170A



Transient Voltage Suppressor

Breakdown Voltage 6.5 to 170 Volts
Peak Pulse Power 1500 Watts

CASE: DO-204AL (DO-27)



Dimensions in inches and (millimeters)

Features

- Breakdown Voltages (V_{BR})from 6.5 to 170V
- 1500W peak pulse power capability with a 10/1000μs waveform, repetitive rate (duty cycle):0.01%
- Low capacitance
- Fast Response Time
- Excellent clamping capability
- High temperature soldering guaranteed: 265℃ /10 seconds, 0.375" (9.5mm) lead length, 5lbs. (2.3kg) tension

Application

- Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on IC_S, MOSFE, signal lines of sensor units for consumer, computer, industrial, automotive and telecommunication

Mechanical Data

- **Case:** Void-free transfer molded thermosetting epoxy body meeting UL94V-O
- **Terminals:** Tin-Lead or ROHS Compliant annealed matte-Tin plating readily solderable per MIL-STD-750, Method 2026
- **Marking:** Part number and cathode band
- **Polarity:** Cathode indicated by band
- **Weight:** 1.2g（Approximately）

Maximum Ratings and Electrical Characteristics @ 25°C unless otherwise specified

Symbol	Conditions	Value	Unit
P_{PPM}	Peak pulse power capability with a 10/1000μs	1500	W
I_{PPM}	Peak pulse current with a 10/1000μs	SEE TABLE1	A
$P_{M(AV)}$	Steady state power dissipation at T_L=40℃ ,Lead lengths 0.375"(10mm)	5	W
	Steady state power dissipation at T_A=25℃ when mounted on FR4 PC described for thermal resistance	1.52	W
V_F	Maximum instantaneous forward voltage at 100A	3.5	V
$R_{\theta JL}$	Thermal resistance junction to lead	22	℃/W
$R_{\theta JA}$	Thermal resistance junction to ambient	82	℃/W
T_J, T_{STG}	Operating and Storage Temperature	-65 to +150	℃

Electrical Characteristics @ 25°C (Unless Otherwise Noted) TABLE1

Microsemi Part Number	Breakdown Voltage V_{BR} @ I_{BR}			Reverse Stand Off Voltage	Maximum Standby current I_D @ V_{WM}	Maximum Peak Pulse Current I_{PP} @ 10/1000μs	Maximum Clamping Voltage V_C @ I_{PP}	Maximum Capacitance @ 0V f=1MHz	Working Inverse Blocking Voltage II_B @V_{WIB}		Peak Inverse Blocking Voltage
	MIN	MAX	I_{BR} (mA)	V_{WM}(V)	I_D(μA)	I_{PP} (A)	V_C(V)	pF	V_{WIB}(V)	I_{IB}(μA)	V_{PIB}(V)
	V_{BR}(V)										
LCE6.5	7.22	8.82	10	6.5	1000	100.0	12.3	100	75	10	100
LCE6.5A	7.22	7.98	10	6.5	1000	100.0	11.2	100	75	10	100
LCE7.0	7.78	9.51	10	7.0	500	100.0	13.3	100	75	10	100
LCE7.0A	7.78	8.60	10	7.0	500	100.0	12.0	100	75	10	100
LCE7.5	8.33	10.2	10	7.5	250	100.0	14.3	100	75	10	100
LCE7.5A	8.33	9.21	10	7.5	250	100.0	12.9	100	75	10	100
LCE8.0	8.89	10.9	1	8.0	100	100.0	15.0	100	75	10	100
LCE8.0A	8.89	9.83	1	8.0	100	100.0	13.6	100	75	10	100
LCE8.5	9.44	11.5	1	8.5	50	94.0	15.9	100	75	10	100
LCE8.5A	9.44	10.4	1	8.5	50	100.0	14.4	100	75	10	100
LCE9.0	10.0	12.2	1	9.0	10	89.0	16.9	100	75	10	100
LCE9.0A	10.0	11.1	1	9.0	10	97.0	15.4	100	75	10	100
LCE10	11.1	13.6	1	10.0	5	80.0	18.8	100	75	10	100
LCE10A	11.1	12.3	1	10.0	5	88.0	17.0	100	75	10	100
LCE11	12.2	14.9	1	11.0	5	74.0	20.1	100	75	10	100
LCE11A	12.2	13.5	1	11.0	5	82.0	18.2	100	75	10	100
LCE12	13.3	16.3	1	12.0	5	68.0	22.0	100	75	10	100
LCE12A	13.3	14.7	1	12.0	5	75.0	19.9	100	75	10	100
LCE13	14.4	17.6	1	13.0	5	63.0	23.8	100	75	10	100
LCE13A	14.4	15.9	1	13.0	5	70.0	21.5	100	75	10	100
LCE14	15.6	19.1	1	14.0	5	58.0	25.8	100	75	10	100
LCE14A	15.6	17.2	1	14.0	5	65.0	23.2	100	75	10	100
LCE15	16.7	20.4	1	15.0	5	56.0	26.9	100	75	10	100
LCE15A	16.7	18.5	1	15.0	5	61.0	24.4	100	75	10	100
LCE16	17.8	21.8	1	16.0	5	52.0	28.8	100	75	10	100
LCE16A	17.8	19.7	1	16.0	5	57.0	26.0	100	75	10	100
LCE17	18.9	23.1	1	17.0	5	49.0	30.5	100	75	10	100
LCE17A	18.9	20.9	1	17.0	5	54.0	27.6	100	75	10	100
LCE18	20.0	24.4	1	18.0	5	46.0	32.2	100	75	10	100
LCE18A	20.0	22.1	1	18.0	5	51.0	29.2	100	75	10	100
LCE20	22.2	27.1	1	20.0	5	42.0	35.8	100	75	10	100
LCE20A	22.2	24.5	1	20.0	5	46.0	32.4	100	75	10	100
LCE22	24.4	29.8	1	22.0	5	38.0	39.4	100	75	10	100
LCE22A	24.4	26.9	1	22.0	5	42.0	35.5	100	75	10	100
LCE24	26.7	32.6	1	24.0	5	35.0	43.0	100	75	10	100
LCE24A	26.7	29.5	1	24.0	5	39.0	38.9	100	75	10	100
LCE26	28.9	35.3	1	26.0	5	32.0	46.6	100	75	10	100
LCE26A	28.9	31.9	1	26.0	5	36.0	42.1	100	75	10	100
LCE28	31.1	38.0	1	28.0	5	30.0	50.0	100	75	10	100
LCE28A	31.1	34.4	1	28.0	5	33.0	45.4	100	75	10	100
LCE30	33.3	40.7	1	30.0	5	28.0	53.5	100	75	10	100
LCE30A	33.3	36.8	1	30.0	5	31.0	48.4	100	75	10	100
LCE33	36.7	44.9	1	33.0	5	25.4	58.0	100	75	10	100
LCE33A	36.7	40.6	1	33.0	5	28.1	53.3	100	75	10	100
LCE36	40.0	48.9	1	36.0	5	23.3	64.3	100	75	10	100
LCE36A	40.0	44.2	1	36.0	5	25.8	58.1	100	75	10	100
LCE40	44.4	54.3	1	40.0	5	21.0	71.4	100	75	10	100
LCE40A	44.4	49.1	1	40.0	5	23.0	64.5	100	75	10	100
LCE43	47.8	58.4	1	43.0	5	19.5	76.7	100	150	10	200
LCE43A	47.8	52.8	1	43.0	5	21.6	69.4	100	150	10	200
LCE45	50.0	61.1	1	45.0	5	18.7	80.3	100	150	10	200
LCE45A	50.0	55.3	1	45.0	5	20.6	72.7	100	150	10	200
LCE48	53.3	65.1	1	48.0	5	17.5	85.5	100	150	10	200
LCE48A	53.3	58.9	1	48.0	5	19.4	77.4	100	150	10	200
LCE51	56.7	69.3	1	51.0	5	16.5	91.1	100	150	10	200
LCE51A	56.7	62.7	1	51.0	5	18.2	82.4	100	150	10	200

Microsemi Part Number	Breakdown Voltage V_{BR} @ I_{BR}			Reverse Stand Off Voltage	Maximum Standby current I_D @ V_{WM}	Maximum Peak Pulse Current I_{PP} @ 10/1000μs	Maximum Clamping Voltage V_C @ I_{PP}	Maximum Capacitance @ 0V f=1MHz	Working Inverse Blocking Voltage II_{IB} @V_{WIB}		Peak Inverse Blocking Voltage
	MIN	MAX	I_{BR} (mA)								
	V_{BR}(V)			V_{WM}(V)	I_D(μA)	I_{PP} (A)	V_C(V)	pF	V_{WIB}(V)	IIB(μA)	V_{PIB}(V)
LCE54	60.0	73.3	1	54.0	5	15.6	96.3	100	150	10	200
LCE54A	60.0	66.3	1	54.0	5	17.2	87.1	100	150	10	200
LCE58	64.4	78.7	1	58.0	5	14.6	103.0	100	150	10	200
LCE58A	64.4	71.2	1	58.0	5	16.0	93.6	100	150	10	200
LCE60	66.7	81.5	1	60.0	5	14.0	107.0	90	150	10	200
LCE60A	66.7	73.7	1	60.0	5	15.5	96.8	90	150	10	200
LCE64	71.1	86.9	1	64.0	5	13.2	114.0	90	150	10	200
LCE64A	71.1	78.6	1	64.0	5	14.6	103.0	90	150	10	200
LCE70	77.8	95.1	1	70.0	5	12.0	125.0	90	150	10	200
LCE70A	77.8	86.0	1	70.0	5	13.3	113.0	90	150	10	200
LCE75	83.3	102	1	75.0	5	11.2	134.0	90	150	10	200
LCE75A	83.3	92.1	1	75.0	5	12.4	121.0	90	150	10	200
LCE80	88.7	108	1	80.0	5	10.6	142.0	90	150	10	200
LCE80A	88.7	98.0	1	80.0	5	11.6	129.0	90	150	10	200
LCE90	100	122	1	90.0	5	9.4	160.0	90	300	10	200
LCE90A	100	111	1	90.0	5	10.3	146.0	90	300	10	200
LCE100	111	136	1	100.0	5	8.4	179.0	90	300	10	200
LCE100A	111	123	1	100.0	5	9.3	162.0	90	300	10	200
LCE110	122	149	1	110.0	5	7.7	196.0	90	300	10	400
LCE110	122	135	1	110.0	5	8.4	178.0	90	300	10	400
LCE120	133	163	1	120.0	5	7.0	214.0	90	300	10	400
LCE120A	133	147	1	120.0	5	7.8	193.0	90	300	10	400
LCE130	144	176	1	130.0	5	6.5	231.0	90	300	10	400
LCE130A	144	159	1	130.0	5	7.2	209.0	90	300	10	400
LCE150	167	204	1	150.0	5	5.6	268.0	90	300	10	400
LCE150A	167	185	1	150.0	5	6.2	243.0	90	300	10	400
LCE160	178	218	1	160.0	5	5.2	287.0	90	300	10	400
LCE160A	178	197	1	160.0	5	5.8	259.0	90	300	10	400
LCE170	189	231	1	170.0	5	4.9	304.0	90	300	10	400
LCE170A	189	209	1	170.0	5	5.4	275.0	90	300	10	400

Note1: A transient voltage suppressor is normally selected according to voltage (V_{WM}), which should be equal to or greater than the dc or continuous peak operating voltage level.

Characteristic Curve

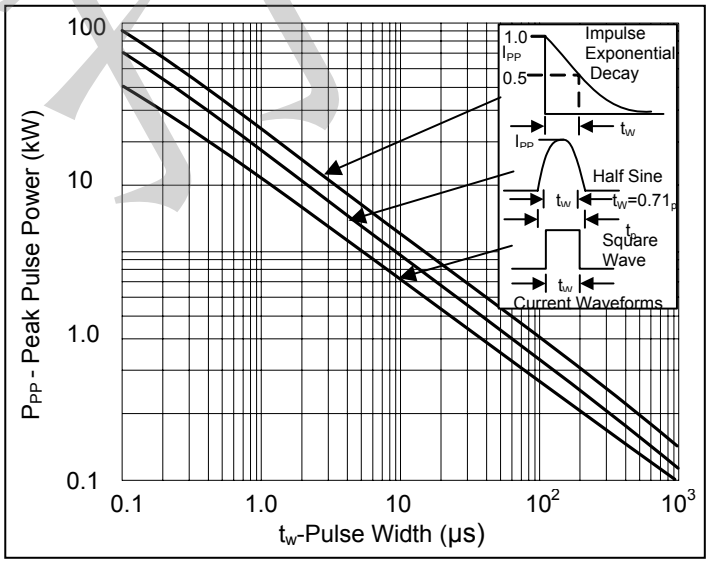


Fig. 1 Peak Pulse Power vs. Pulse Time

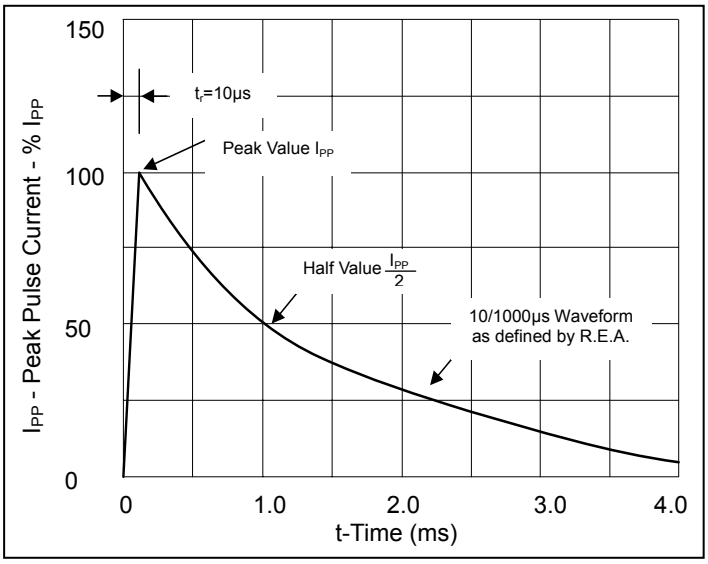


Fig.2 Pulse Waveform for Exponential Surge

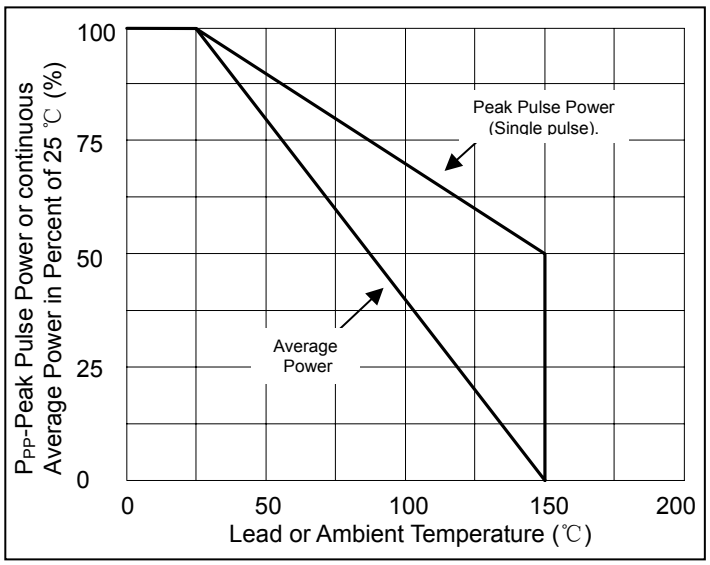


Fig.3 Derating Curve

Schematic Applications

The TVS low capacitance device configuration is shown in Fig.4. As a further option for unidirectional applications, an additional low capacitance rectifier diode may be used in parallel in the sane polarity direction as the TVS as shown in Fig.5. In applications where random high voltage transients occur, this will prevent reverse transients from damaging the internal low capacitance rectifier diode and also provide a low voltage conducting direction. The added rectifier diode should be of similar low capacitance and also have a higher reverse voltage rating than the TVS clamping voltage $V_{C.}$ If using two (2) low capacitance TVS devices in also provided. The unidirectional and bidirectional configurations in Fig.5 and 6 will both in twice the capacitance of Fig.4

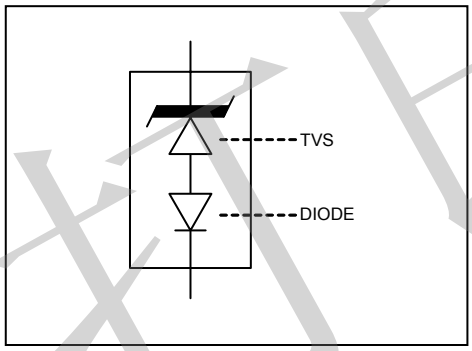


Fig.4 TVS with internal Low Capacitance Diode

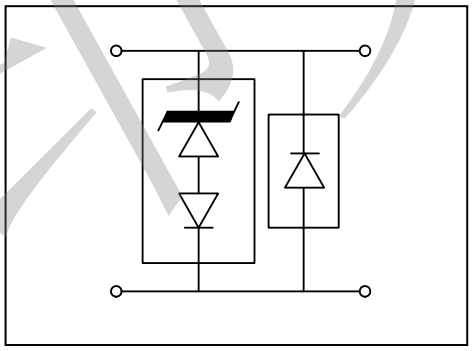


Fig.5 Optional Unidirectional configuration (TVS and separate rectifier diode in parallel)

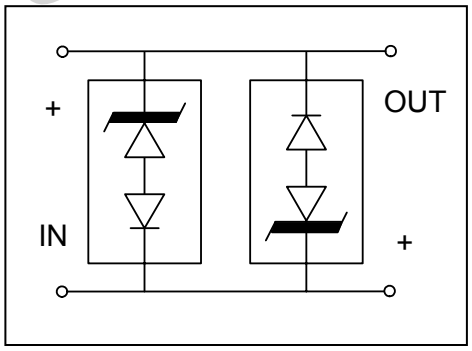


Fig.6 Optional Bidirectional configuration (two TVS and devices in anti-parallel)