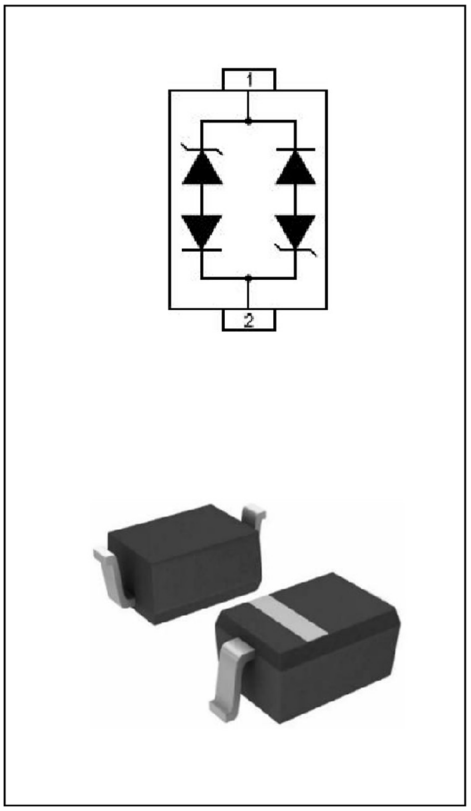
LCXXCI

1-Line Low Capacitance Bi-directional TVS Diode

DESCRIPTION

LCXXCI a 3.3V-30V bi-directional TVS diode , utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making his device an ideal solution for protecting voltage sensitive high-speed data lines. The LCX XCI has a low capacitance with a typical value at 1pF,and com -plies with the IEC61000-4-2(ESD) standard with ±30kV air and ±30kV contact discharge. It is assembled into a lead free SOD-323 package. The small size, low capacitance and high ESD su rge protection make LCXXCI an idea choice to protect cell phon -e, wireless systems, and communication equipment.



APPLICATIONS

- ✧ USB Ports.
- ✧ Smart Phones.
- ✧ Wireless Systems.
- ✧ Ethernet 10/100/1000 Base T.

FEATURES

- ✧ 350W peak pulse power (8/20μs).
- ✧ Ultra low capacitance: 1.2pF typical.
- ✧ Ultra low leakage: nA leel.
- ✧ Low operating :3.3V ,5V,8V,12V,15V,18V,24V,30V.
- ✧ Low clamping voltage.
- ✧ Protects one power line or data line.
- ✧ Complies with following standards:
  – IEC 61000-4-2 (ESD) immunity test Air discharge: ±30kV Contact discharge: ±30kV.
- ✧ – IEC61000-4-4 (EFT) 40A (5/50ns).
- ✧ RoHS Compliant.
- ✧ Package: SOD-323.

ORDERING INFORMATION

Part NO	packaging	Reel Size
LC03CI	3000/Tape & Reel	7 inch
LC05CI	3000/Tape & Reel	7 inch
LC08CI	3000/Tape & Reel	7 inch
LC12CI	3000/Tape & Reel	7 inch
LC15CI	3000/Tape & Reel	7 inch
LC18CI	3000/Tape & Reel	7 inch
LC24CI	3000/Tape & Reel	7 inch
LC30CI	3000/Tape & Reel	7 inch

DEVICE CHARACTERISTICS

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppp	350	W
Peak Pulse Current (8/20μs)	Ipp	22-6	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−40 to +85	°C
Storage Temperature Range	Tstg	−55 to +150	°C

ELECTRICAL CHARACTERISTICS(TA=25°C unless otherwise specified)

LCO3CI

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				3.3	V
Breakdown Voltage	V_{BR}	I_T = 1mA	4		6	V
Reverse Leakage Current	I_R	V_{RWM} = 3.3 V			0.2	μA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse)			5	V
Clamping Voltage	V_C	I_{PP} = 22A (8 x 20μs pulse)			16	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz		1.2		pF

LC05CI

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				5.0	V
Breakdown Voltage	V_{BR}	I_T = 1mA	6.2	6.8	8.0	V
Reverse Leakage Current	I_R	V_{RWM} = 5.0 V			0.5	μA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse)		8.5		V
Clamping Voltage	V_C	I_{PP} = 22A (8 x 20μs pulse)		17.0	20	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz		1. 0	1.5	pF

LC08CI						
Parameter	**Symbol**	**Test Condition**	**Min**	**Typ**	**Max**	**Unit**
Reverse Working Voltage	V_{RWM}				8.0	V
Breakdown Voltage	V_{BR}	I_T = 1mA	8.5			V
Reverse Leakage Current	I_R	V_{RWM}= 8 V			0.2	μA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse)			13	V
Clamping Voltage	V_C	I_{PP} = 18A (8 x 20μs pulse)			19.5	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz		1		pF

LC12CI						
Parameter	**Symbol**	**Test Condition**	**Min**	**Typ**	**Max**	**Unit**
Reverse Working Voltage	V_{RWM}				12.0	V
Breakdown Voltage	V_{BR}	I_T = 1mA	13.3			V
Reverse Leakage Current	I_R	V_{RWM} = 12 V			0.2	μA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse)			18	V
Clamping Voltage	V_C	I_{PP} = 12A (8 x 20μs pulse)			29	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz		1.2		pF

LC15CI						
Parameter	**Symbol**	**Test Condition**	**Min**	**Typ**	**Max**	**Unit**
Reverse Working Voltage	V_{RWM}				15.0	V
Breakdown Voltage	V_{BR}	I_T = 1mA	16.7			V
Reverse Leakage Current	I_R	V_{RWM} = 15 V			0.2	μA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse)			22	V
Clamping Voltage	V_C	I_{PP} = 10A (8 x 20μs pulse)			32	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz		1.2		pF

LC18CI

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				18.0	V
Breakdown Voltage	V_{BR}	I_T = 1mA	20			V
Reverse Leakage Current	I_R	V_{RWM} = 18 V			0.2	μA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse)			26	V
Clamping Voltage	V_C	I_{PP} = 10A (8 x 20μs pulse)			35	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz		1		pF

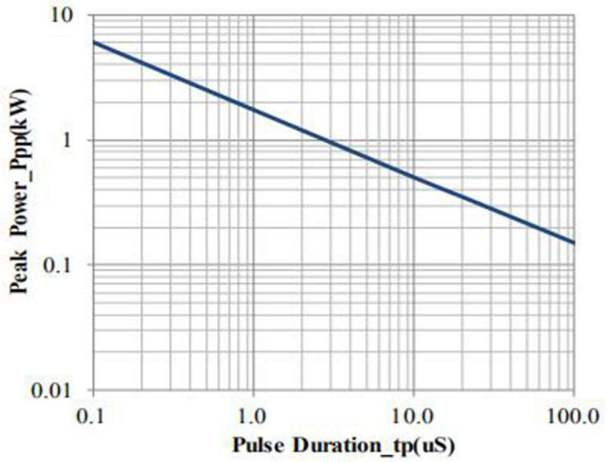
LC24CI

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				24.0	V
Breakdown Voltage	V_{BR}	I_T = 1mA	26.7			V
Reverse Leakage Current	I_R	V_{RWM} = 24 V			0.2	μA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse)			43	V
Clamping Voltage	V_C	I_{PP} = 8A (8 x 20μs pulse)			55	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz		1.2		pF

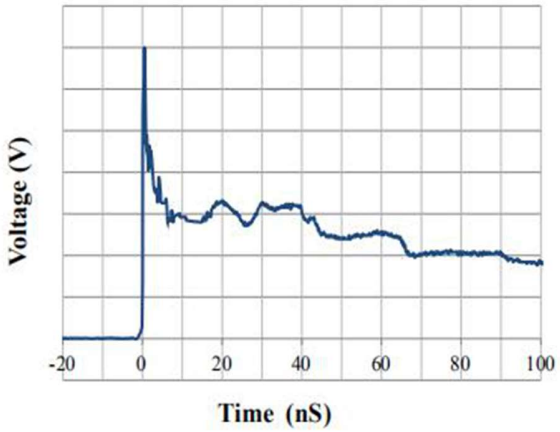
LC30CI

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				30.0	V
Breakdown Voltage	V_{BR}	I_T = 1mA	33.3			V
Reverse Leakage Current	I_R	V_{RWM} = 30 V			0.2	μA
Clamping Voltage	V_C	I_{PP} = 1A (8 x 20μs pulse)			50	V
Clamping Voltage	V_C	I_{PP} = 10A (8 x 20μs pulse)			75	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz		1.2		pF

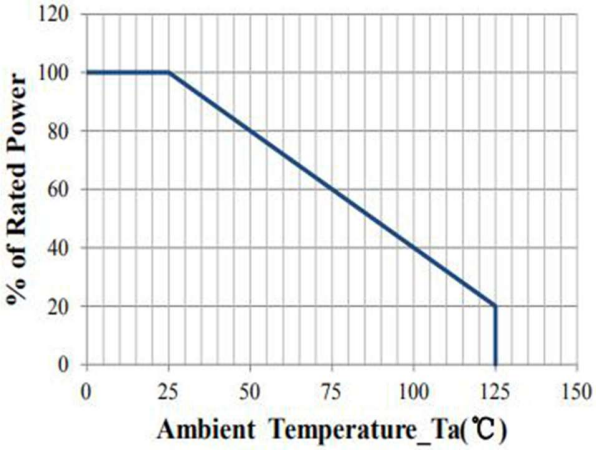
TYPICAL CHARACTERISTICS(T_A=25°C unless otherwise Specified)



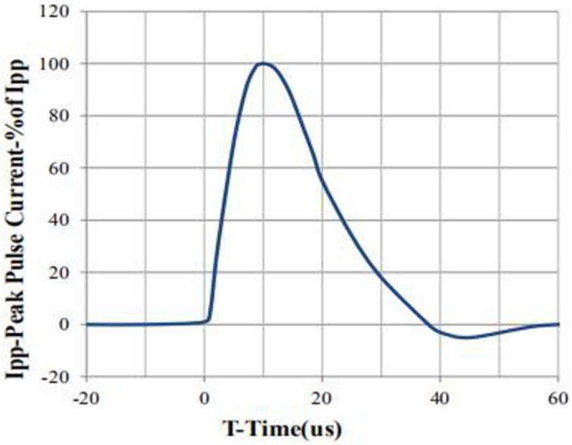
Peak Pulse Power vs. Pulse Time



IEC61000-4-2 Pulse Waveform

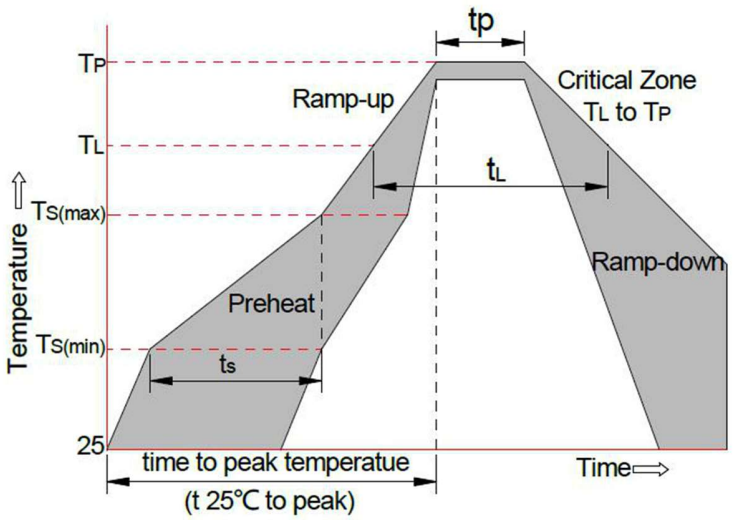


Power Derating Curve



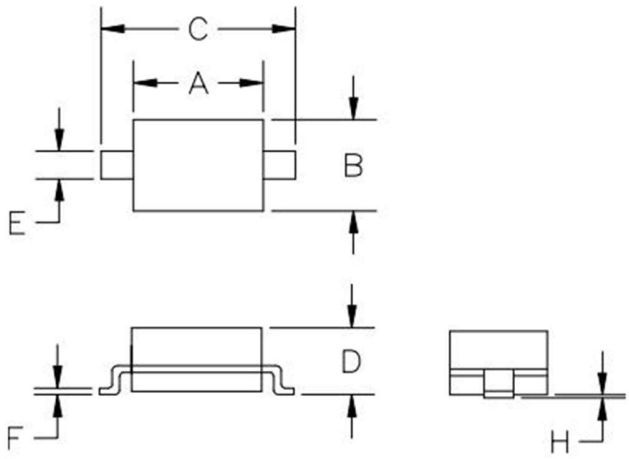
8 X 20us Pulse Waveform

SOLDERING PARAMETERS



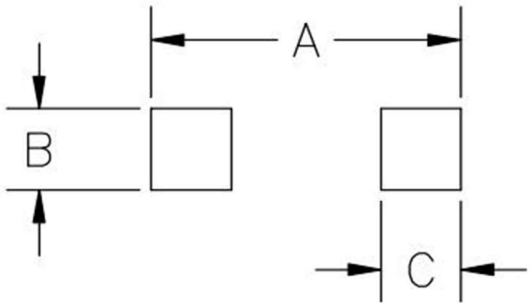
	Reflow Condition	Pb-Free Assembly
Pre-heat	-Temperature Min ($T_{s\ (min)}$)	+150°C
	-Temperature Max ($T_{s\ (max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs
Average ramp up rate(Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{S\ (max)}$ to T_L-Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature (T_L) (Liquid us)	+217°C
	-Temperature (t_L)	60-150 secs
Peak Temp (Tp)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (tp)		30 secs. Max
Ramp-down Rate		6 °C/secs. Max
xTime 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

SOD-323 PACKAGE OUTLINE DRAWING



SYM	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.50	1.80	0.060	0.071
B	1.20	1.40	0.045	0.054
C	2.30	2.70	0.090	0.107
D	-	1.10	-	0.043
E	0.30	0.40	0.012	0.016
F	0.10	0.25	0.004	0.010
H	-	0.10	-	0.004

SUGGESTED LAND PATTERN



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
A	3.15	0.120
B	0.80	0.031
C	0.80	0.031