Bi-directional ESD protection Devices

Features

- 100 Watts peak pulse power (tp = 8/20μs)
- Capacitance 15pF Typ
- Transient protection for low speed data lines to
  IEC 61000-4-2 (ESD) ±30kV (air), ±30kV (contact)
  IEC 61000-4-4 (EFT) 40A(5/50ns)
  IEC61000-4-5 (lightning) 8A (8/20μs)
- Protects one power or I/O port
- Working voltage:5.0V
- Low leakage current
- Low operating and clamping voltages
- Solid-state silicon avalanche technology
- These are Pb−free devices

Product Description

LT5C051V is a design which includes a Bi-directional surge rated clamping cell to protect one power line, or one control line, or one low speed data line in an electronic systems. The PT5C051V has been specifically designed to protect sensitive components which are connected to power and control line from over-voltage damage and latch-up caused by electrostatic discharging (ESD), electrical fast transients (EFT), lightning, and cable discharge event (CDE).

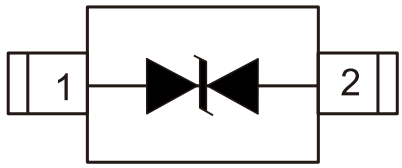
Applications

- Computer interfaces protection
- Microprocessors protection
- Serial and parallel ports protection
- Control signal lines protection
- Power lines on PCB protection
- Latch-up protection

Mechanical Characteristics

- SOD-523 package
- Molding compound flammability rating: UL 94V-0
- Lead finish: lead free

Circuit Diagram



SOD-523 (Top View)

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Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20μs)	P_{PP}	100	Watts
Peak Pulse Current (tp = 8/20μs) (note1)	I_{PP}	8.0	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	30 30	kV
Lead Soldering Temperature	T_L	260(10 sec)	℃
Junction Temperature	T_J	- 55 to +125	℃
Storage Temperature	T_{STG}	- 55 to +125	℃

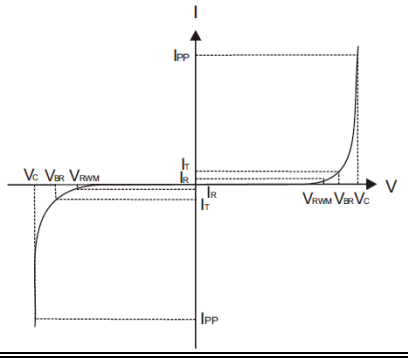
Note1: 8/20μs pulse waveform.

Electrical Characteristics

Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse working Voltage	V_{RWM}				5.0	V
Reverse Breakdown Voltage	V_{BR}	I_T = 1mA	5.5	7.0	8.5	V
Reverse leakage current	I_R	V_{RWM} =5.0V, TA = 25°C			0.1	uA
Clamping Voltage	V_C	I_{PP} = 1.0A, t_P = 8/20μs		7.0	10	V
Clamping Voltage	V_C	I_{PP} = 8.0A, t_P = 8/20μs		11	13	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz		15	18	pF

Electrical Parameters (TA = 25°C unless otherwise noted)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current



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Typical Characteristics

Figure.1 Non-Repetitive Peak Pulse Power vs. Pulse Time

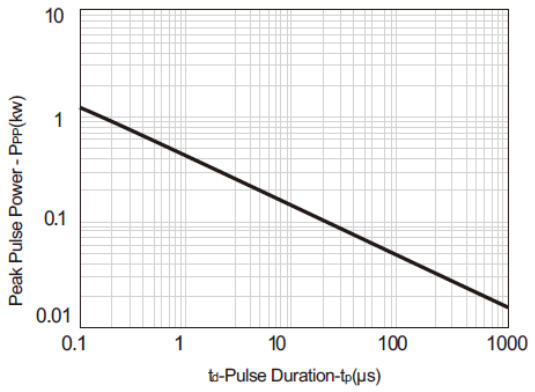


Figure.2 Power Derating Curve

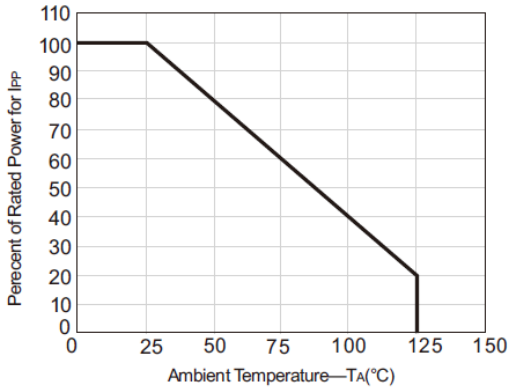


Figure.3 Pulse Waveform

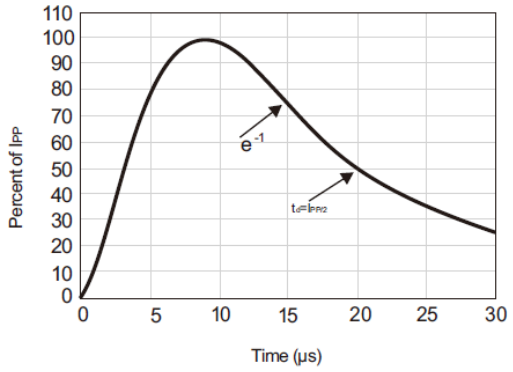
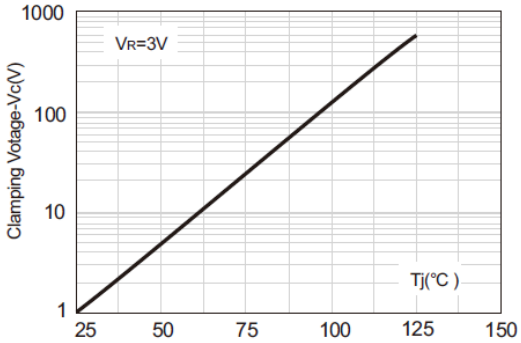
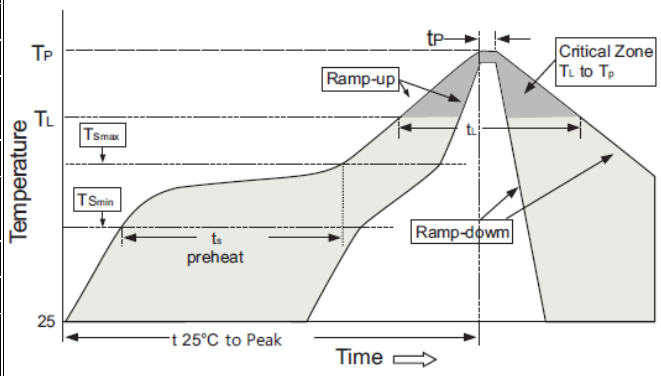


Figure.4 $I_R[T_j]$ / $I_R[T_j=25°C]$



Soldering Parameters

Reflow Condition		Fb-Free assembly
Pre Heat	- Temperature Min ($T_{S(Min)}$)	150°C
	- Temperature Max ($T_{S(Max)}$)	200°C
	- Temperature Max (T_S)	60-180 secs
Average ramp up rate (Liquidus)Temp (T_L) To peak		3°C/second Max
$T_{S(Max)}$ to TL-Ramp-up Rate		3°C/second Max
Reflow	- Temperature (T_L)(Liquidus)	217°C
	- Temperature (t_L)	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-dowm Rate		6°C/second Max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		260°C



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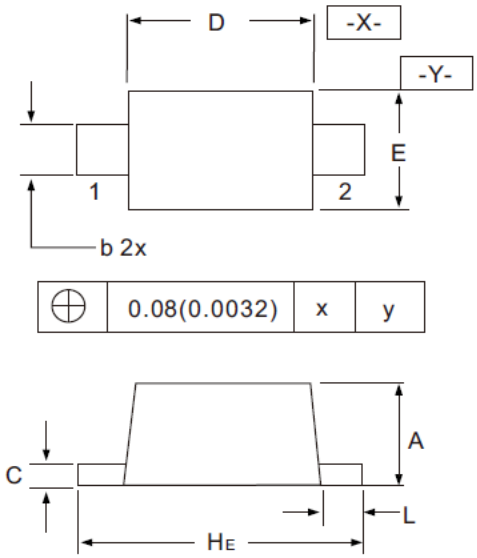
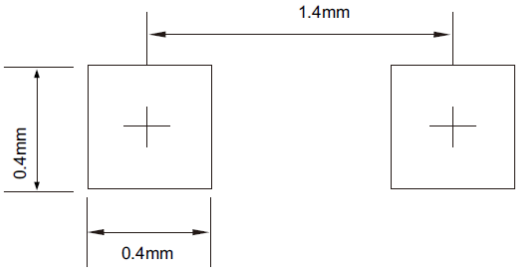
Outline Drawing - SOD-523



SYMBOL	DIMENSIONS			
	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	0.50	0.70	0.020	0.028
b	0.25	0.35	0.010	0.014
C	0.07	0.20	0.0028	0.0079
D	1.10	1.30	0.043	0.051
E	0.70	0.90	0.028	0.035
H_E	1.50	1.70	0.059	0.067
L	0.15	0.25	0.006	0.010

1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).



Marking Codes

Ordering Information

Part number	Package	MPQ (PCS)	Packaging Option
LT5C051V	SOD-523	3000	Tape and reel

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