

为您的产品保驾护航

PRODUCT DATASHEET

Electro-Static Discharge

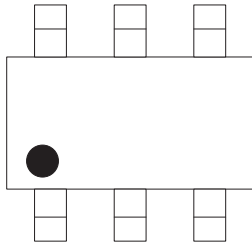
JET236-5V-UL4 ESD

Features

- Package: SOT-23 6L
- Ultra low capacitance: 0.3pF typical (I/O to I/O)
- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- Up to four data lines and one power line protects
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: $\pm 25\text{kV}$
Contact discharge: $\pm 20\text{kV}$
 - IEC61000-4-5 (Lightning) 5A (8/20 μs)

- RoHS compliant

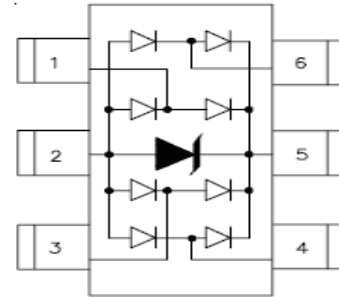
Pin Description



Applications

- USB 2.0 Power and Data lines protection
- Digital Visual Interface (DVI)
- Monitors and Flat Panel Displays
- Video Graphic Cards
- Notebook and PC Computers

Schematic Diagram



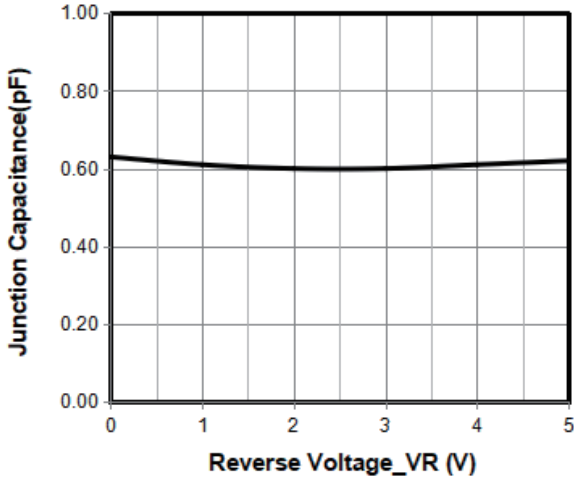
Limiting Values($T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter	Conditions	Value	Unit
V _{ESD}	Electrostatic Discharge Voltage	IEC 61000-4-2;Contact Discharge	± 20	kV
		IEC 61000-4-2;Air Discharge	± 25	kV
P _{PP}	Peak Pulse Power	t _P =8/20 μs	75	W
I _{PP}	Peak Pulse Current	t _P =8/20 μs	5	A
T _J	Operating Temperature Range	-	-55 to +125	$^\circ\text{C}$
T _{stg}	Storage Temperature Range	-	-55 to +150	$^\circ\text{C}$

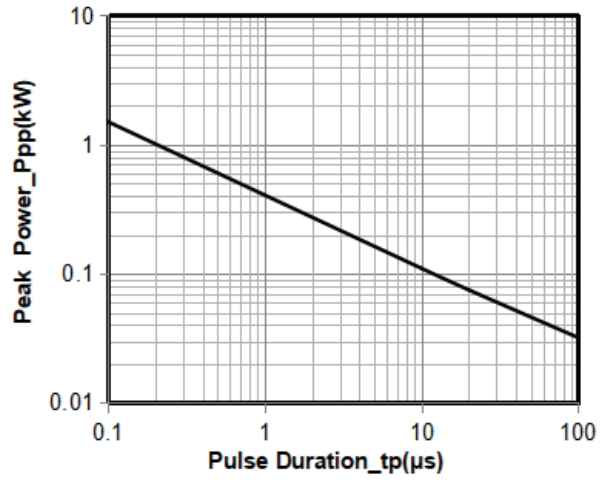
Electrical Characteristics($T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ.	Max	Unit
V _{RWM}	Reverse Working Voltage	Any I/O pin to ground	-	-	5	V
V _{BR}	Breakdown Voltage	I _T =1mA,any I/O pin to ground	6.0	-	-	V
I _R	Reverse Leakage Current	V _{RWM} =5V;any I/O pin to ground	-	-	0.5	μA
V _C	Clamping Voltage	I _{PP} =1A(8x20 μs pulse);any I/O pin to ground	-	-	10	V
V _C	Clamping Voltage	I _{PP} =5A(8x20 μs pulse);any I/O pin to ground	-	-	15	V
C _J	Junction Capacitance	V _R =0V,f=1 MHZ,between I/O pins	-	0.3	0.4	pF
C _J	Junction Capacitance	V _R =0V,f=1 MHZ,bany I/O pin to ground	-	-	0.8	pF

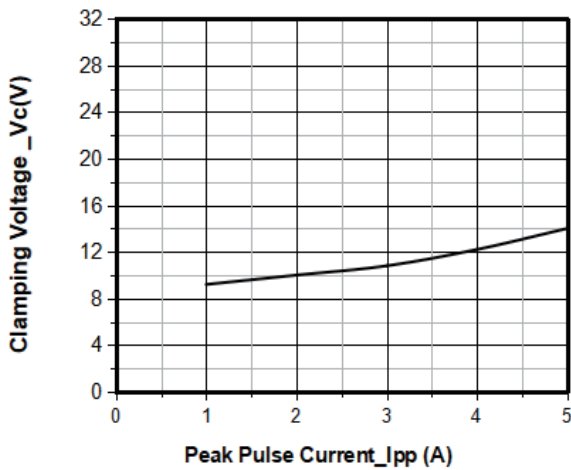
Typical Characteristics



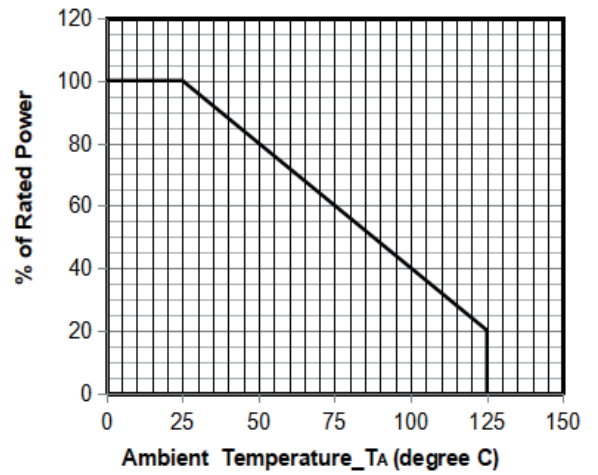
Junction Capacitance vs. Reverse Voltage



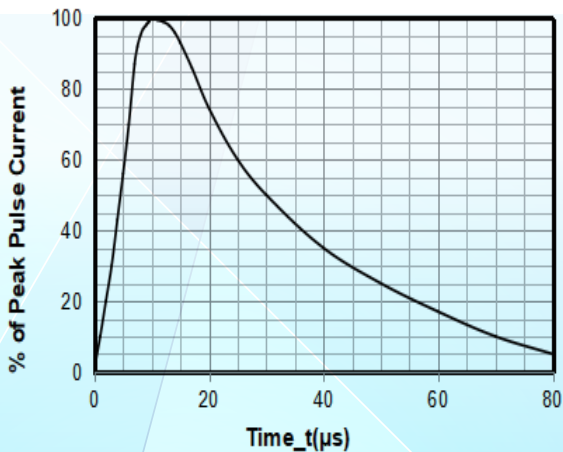
Peak Pulse Power vs. Pulse Time



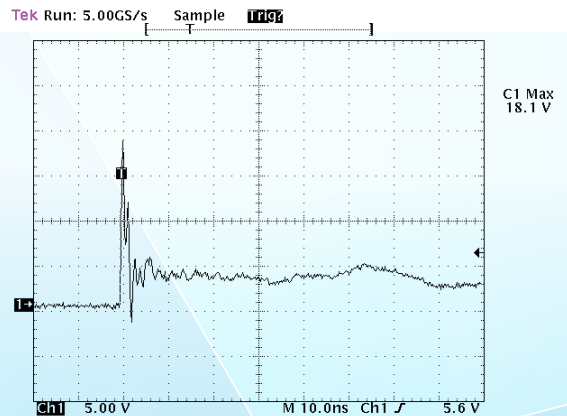
Clamping Voltage vs. Peak Pulse Current ($t_p = 8/20 \mu s$)



Power Derating Curve



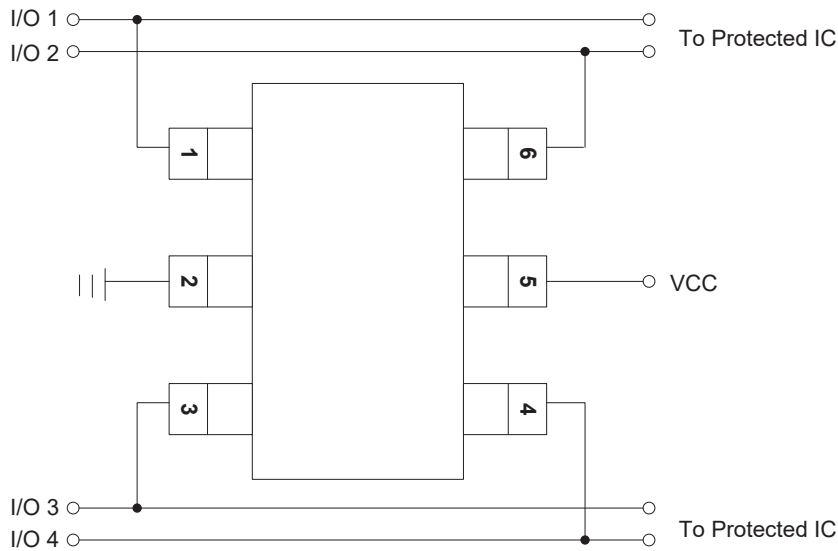
8x20 μs Pulse Waveform



Note: Data is taken with a 10x attenuator
ESD Clamping Voltage
8 kV Contact per IEC61000-4-2

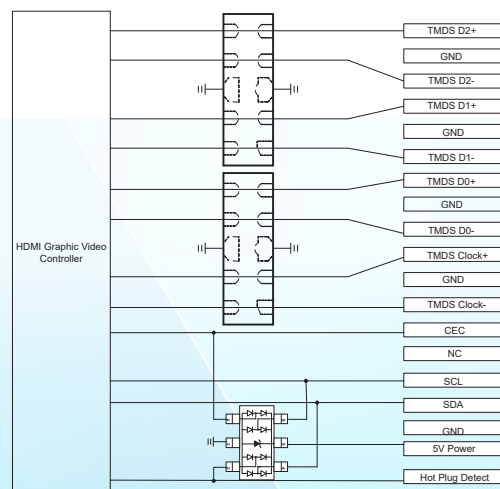
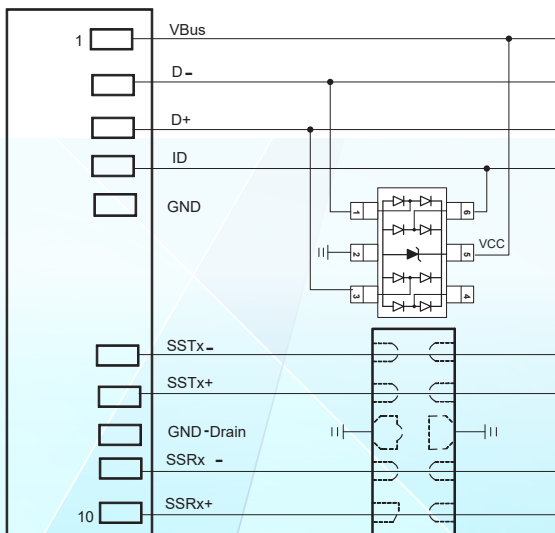
Typical Application

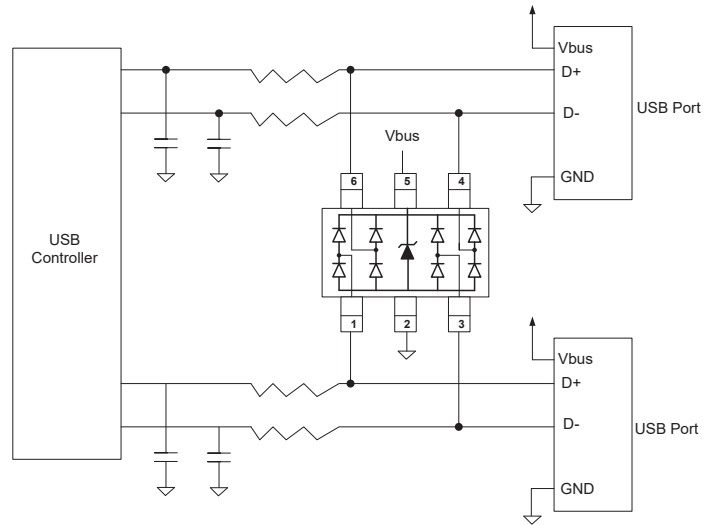
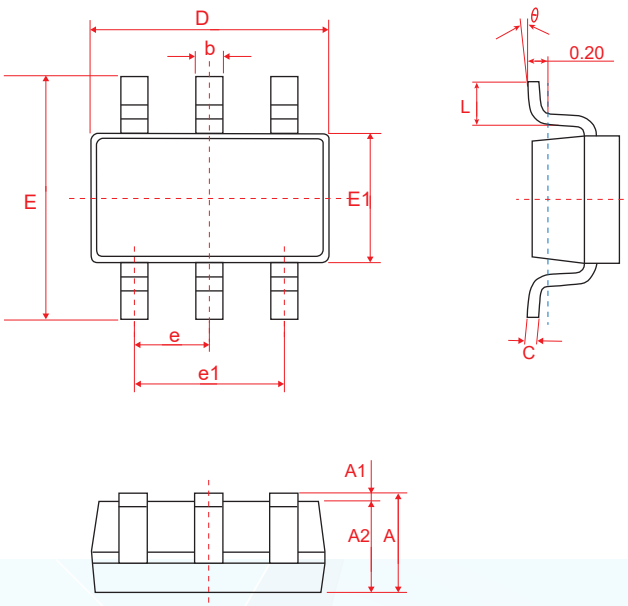
The JET236-5V-UL is designed to protect four data lines from transient over-voltages by clamping them to fixed reference. When the voltage on the protected line exceeds the reference voltage (plus diode VF) the steering diodes are forward biased, conducting the transient current away from the sensitive circuitry. Data lines are connected at pins 1, 3, 4 and 6. The negative reference (REF1) is connected at pin 2. This pin should be connected directly to a ground plane on the board for best results. The path length is kept as short as possible to minimize parasitic inductance.



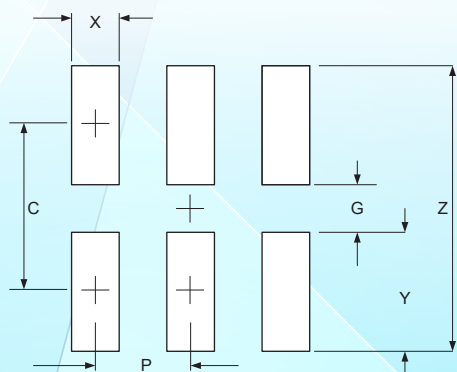
JET236-5V-UL on USB 3.0 Port Application

JET236-5V-UL on HDMI Port Application



JET236-5V-UL on USB Port Application

Physical Dimensions(mm.)


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
∅	0°	8°	0°	8°

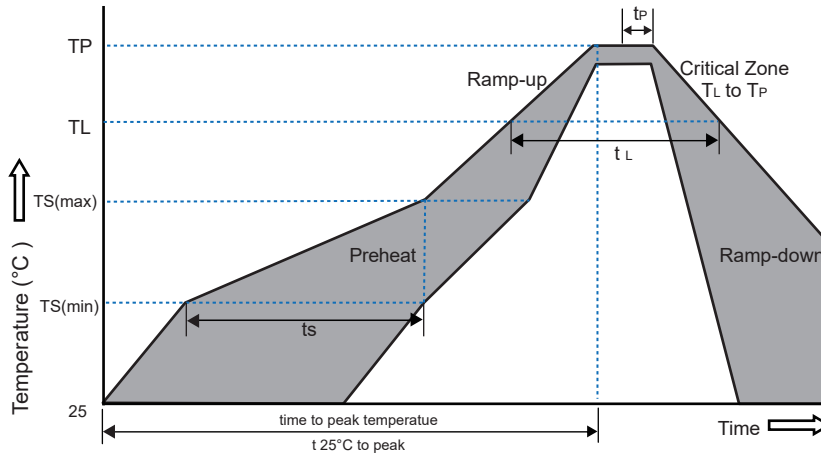
Suggested Land Pattern


Symbol	Dimensions	
	Millimeters	Inches
C	2.50	0.098
G	1.40	0.055
P	0.95	0.037
X	0.60	0.024
Y	1.10	0.043
Z	3.60	0.141

Packaging Quantity

Part Number	Delivery Form	Delivery Quantity
JET236-5V-UL4	7"T&R	3,000

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)(t_s)	60~180 secs.
Average ramp up rate (Liquid us Temp(T_L) to peak)		3°C/sec. Max
Ts(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 (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
xTime 25°C to Peak Temp (TP)		8 min. Max
Do not exceed		+260°C

Part Number System

JE T236 - 5V - UL 4

