

## ECELCAB3V3B

Ultra-low Capacitance Bidirectional Micro Packaged TVS Diodes for ESD Protection

The ECELCAB3V3B is an Bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines.

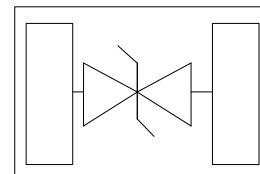
The ECELCAB3V3B has an low capacitance with a typical value at 0.4pF, and complies with the IEC 61000-4-2 (ESD) with  $\pm 25\text{kV}$  air and  $\pm 20\text{kV}$  contact discharge. It is assembled into an ultra-small 1.0x0.6x0.5mm lead-free DFN package. The small size, Low capacitance and high ESD surge protection make ECELCAB3V3B an ideal choice to protect cell phone, digital video interfaces, HDMI, DVI, USB2.0 and other high speed ports.

### Features

- Peak Power Dissipation – 90 W (8 x 20 us Waveform)
- Stand-off Voltage: 3.3 V
- Low capacitance (<0.6pF) for high-speed interfaces
- Replacement for MLV (0402)
- Protects I/O Port
- Low Clamping Voltage
- Low Leakage
- Low Capacitance
- Meets MSL 1 Requirements
- ROHS compliant



**DFN1006**



### Main applications

- High Speed Line :USB1.0/2.0
- High Definition Multi-Media Interface (HDMI1.3/1.4/2.0)
- Serial and Parallel Ports
- Notebooks, Desktops, Servers
- Projection TV
- Cellular handsets and accessories
- Portable instrumentation
- Peripherals

### Protection solution to meet

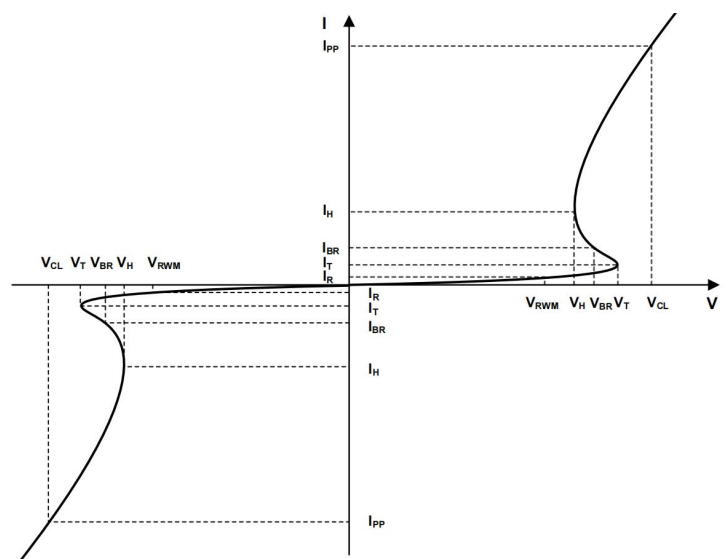
- IEC61000-4-2 (ESD)  $\pm 25\text{kV}$  (air),  $\pm 20\text{kV}$  (contact)

### Ordering Information

Device	Qty per Reel	Reel Size
ECELCAB3V3B	10000	7 Inch

Maximum ratings (Tamb=25°C Unless Otherwise Specified)			
Parameter	Symbol	Value	Unit
Peak Pulse Power (tp=8/20µs waveform)	P <sub>PPP</sub>	90	Watts
Peak Pulse Current (tp=8/20µs waveform)	I <sub>PP</sub>	10	A
ESD Rating per IEC61000-4-2:	Contact	20	KV
	Air	25	
Lead Soldering Temperature	T <sub>L</sub>	260 (10 sec.)	°C
Operating Temperature Range	T <sub>J</sub>	-55 ~ 125	°C
Storage Temperature Range	T <sub>STG</sub>	-55 ~ 150	°C
Lead Solder Temperature – Maximum (10 Second Duration)	T <sub>L</sub>	260	°C

Symbol	Parameter
V <sub>BR</sub>	Reverse Breakdown Voltage
I <sub>BR</sub>	Reverse Breakdown Current
V <sub>RWM</sub>	Reverse Stand-off Voltage
I <sub>R</sub>	Reverse Leakage Current
V <sub>H</sub>	Holding Voltage
I <sub>H</sub>	Holding Current
V <sub>T</sub>	Trigger Voltage
I <sub>T</sub>	Trigger Current
I <sub>PP</sub>	Peak Pulse Current
V <sub>CL</sub>	Clamping Voltage

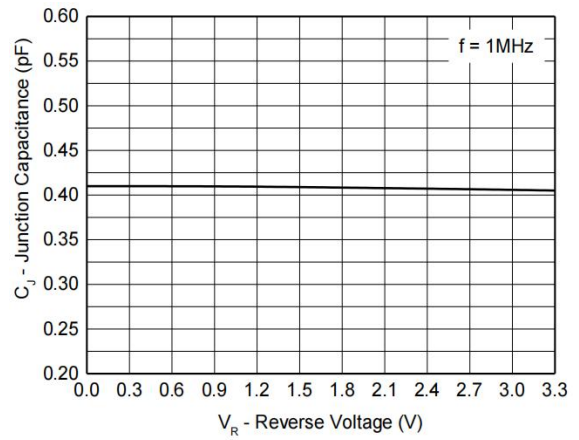
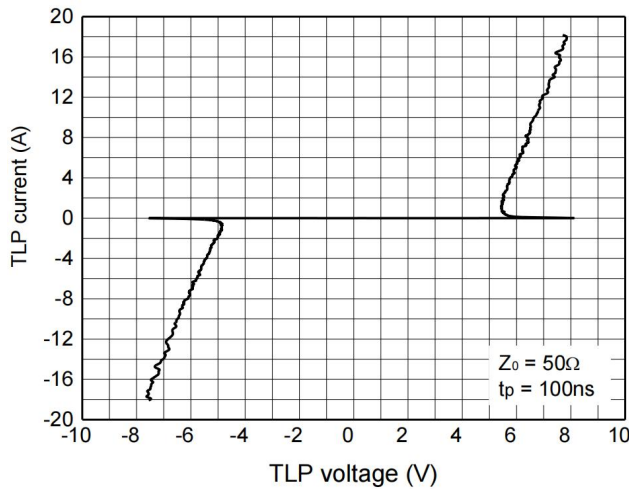


Parameter	Symbol	Test Condition	Min	Typical	Max	Unit
Reverse Stand-Off	V <sub>RWM</sub>				3.3	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	4.0		8.5	V
Reverse Leakage	I <sub>R</sub>	V <sub>RWM</sub> =3.3V			0.5	µA
Holding Voltage	V <sub>H</sub>	I <sub>H</sub> =50mA	4.0			V
Clamp Voltage A	V <sub>CL</sub>	I <sub>PP</sub> =16A, tp=100ns		7.5		V
Dynamic Resistance	R <sub>DYH</sub>			0.16		Ω
Clamp Voltage	V <sub>CL</sub>	V <sub>ESD</sub> =+/-8KV		7.5		V
Clamp Voltage	V <sub>CL</sub>	I <sub>PP</sub> =1A, tp=8/20uS		5.5	7	V
	V <sub>CL</sub>	I <sub>PP</sub> =10A, tp=8/20uS		7.5	9	V
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f =1MHz		0.4	0.6	pF

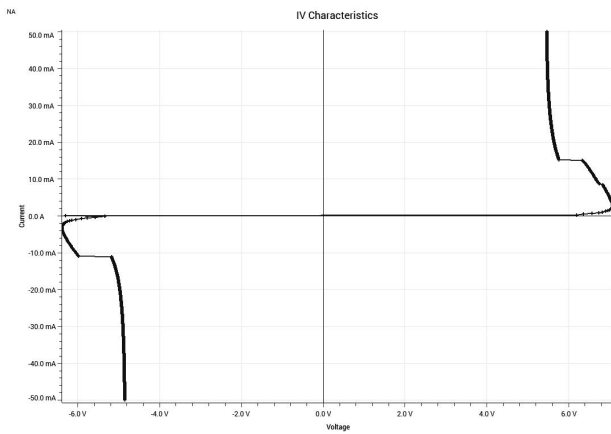
Notes:

A: Clamping Voltage was measured by Transmission Line Pulse Test (TLP), TLP conditions: Z<sub>0</sub> = 50 Ω, tr = 0.6ns, tp = 100ns, ITLP and VTLP averaging window from 70ns to 90ns. RDYN is calculated from 4A to 16A

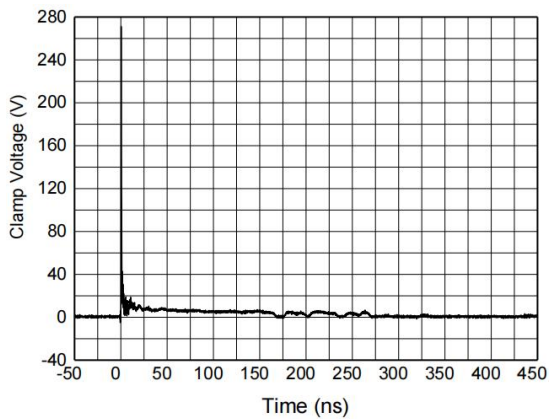
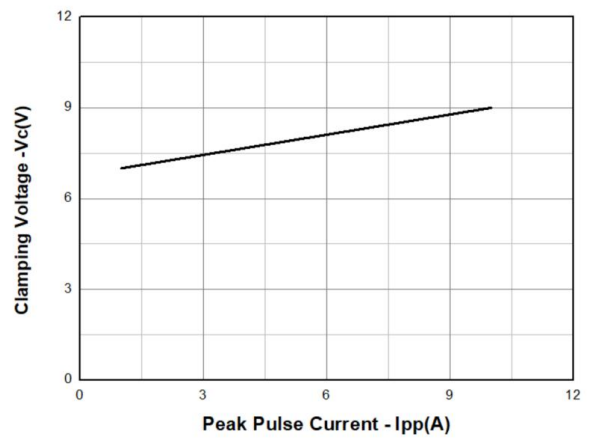
**Typical electrical characterist applications**



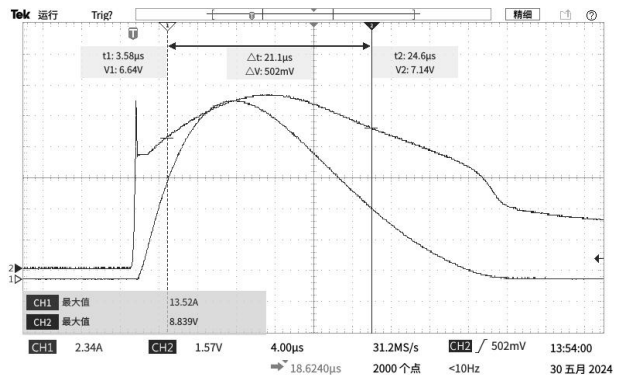
**Capacitance vs. Reverse Voltage**



**I-V Curve current sweep from -50mA to 50mA**



**+8kV contact discharge per IEC61000-4-2**



**Clamping Characteristic (1.2/50μs  $V_{in}=34V$ )**

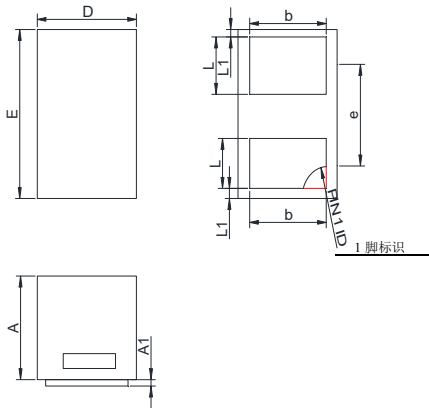
**Package Information**

**DFN-1006**

**Mechanical Data**

Case:DFN1006

Case Material: Molded Plastic. UL Flammability



DIM	Millimeters	
	Min	Max
A	0.30	0.50
A1	0.00	0.05
D	0.55	0.65
E	0.95	1.05
b	0.25	0.60
e	0.65TYP	
L	0.15	0.35
L1	0.05REF	

**Recommended Pad outline**

