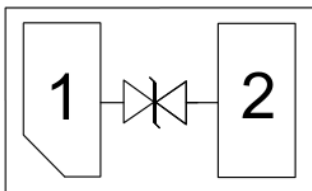


1-Line Bi-directional TVS Diode

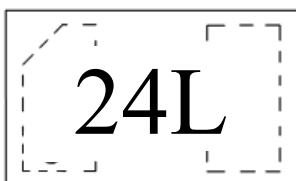
Features

- * Ultra small package: 1.0x0.6x0.45mm
- * Ultra low capacitance: 0.5pF typical
- * Ultra low leakage: nA level
- * Low operating voltage: 24V
- * Low clamping voltage
- * 2-pin leadless package
- * Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 15\text{kV}$
 - Contact discharge: $\pm 15\text{kV}$
 - IEC61000-4-5 (Lightning) 5A (8/20 μs)
- * RoHS Compliant
- * AEC-Q101 qualified (Automotive grade with suffix "Q".)
 - Exsemi technology

Circuit Diagram



Marking Diagram



Transparent top view

24L: Device Marking Code

Description

The EP2413D2 is a 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 EP2413D2 has an ultra-low capacitance with a typical value at 0.5pF, and complies with the IEC 61000-4-2 (ESD) standard with $\pm 15\text{kV}$ air and $\pm 8\text{kV}$ contact discharge. It is assembled into an ultra-small 0.6x0.3x0.3mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make EP2413D2 an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

Applications

- * Smart phones
- * Display Ports
- * MDDI Ports
- * USB Ports
- * Digital Video Interface (DVI)
- * PCI Express and Serial SATA Ports

Ordering Information

Part Number	Packaging	Reel Size
EP2413D2	10000/Tape & Reel	7 inch

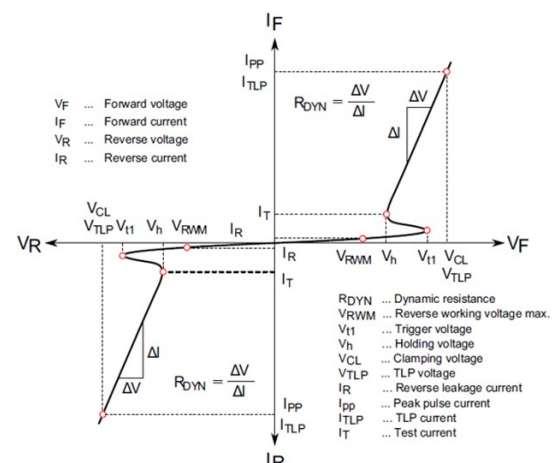
Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	Ppk	35	W
Peak Pulse Current (8/20 μs)	IPP	5	A
ESD per IEC 61000-4-2 (Air)	VESD	± 15	kV
ESD per IEC 61000-4-2 (Contact)		± 15	
Operating Temperature Range	TJ	-40 to +125	$^\circ\text{C}$
Storage Temperature Range	Tstg	-55 to +150	$^\circ\text{C}$

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

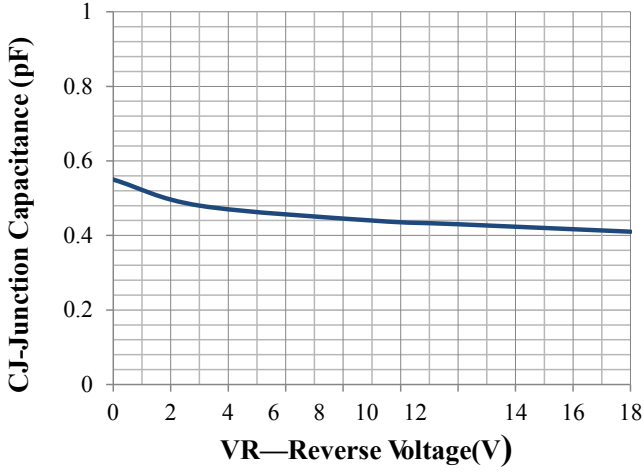
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				24	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	26.0	30.0		V
Holding Voltage	V_h	$I_T = 100\text{mA}$	2.0	2.9		V
Reverse Leakage Current	I_R	$V_{RWM} = 18\text{V}$			0.2	μA
Clamping Voltage	V_C	$I_{PP} = 1\text{A}$ (8 x 20 μs pulse)		4.0		V
Clamping Voltage	V_C	$I_{PP} = 5\text{A}$ (8 x 20 μs pulse)		6.0	8.0	V
Clamping Voltage	V_C	TLP = 16A (ESD=8KV)		8.2		V
Junction Capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$		0.5	0.7	pF

Symbol	Parameter
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_C

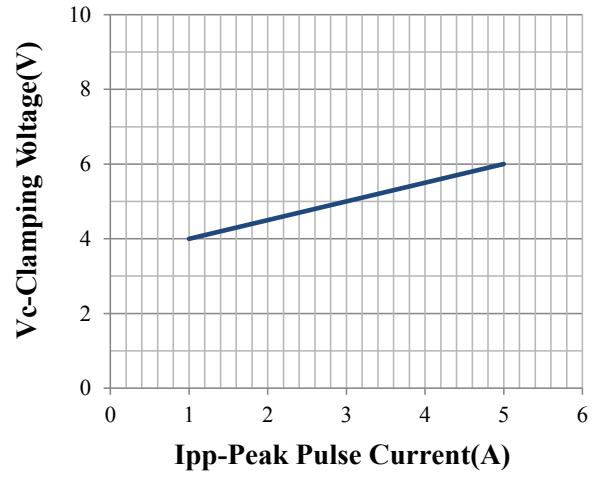


Portion Electronics Parameter

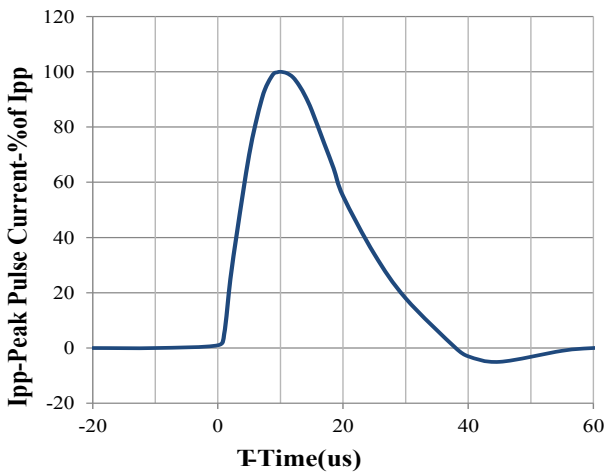
Typical Performance Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise Specified)



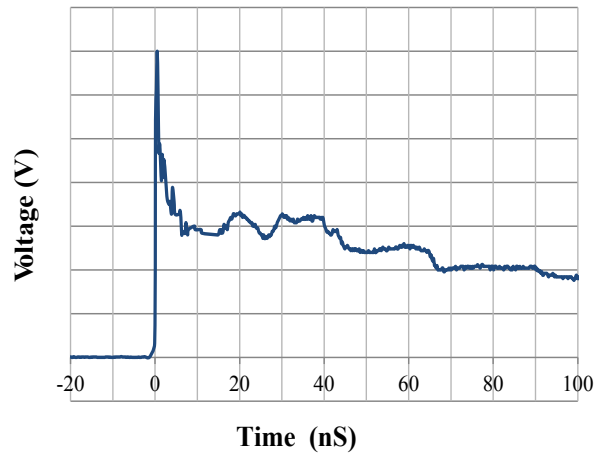
Junction Capacitance vs. Reverse Voltage



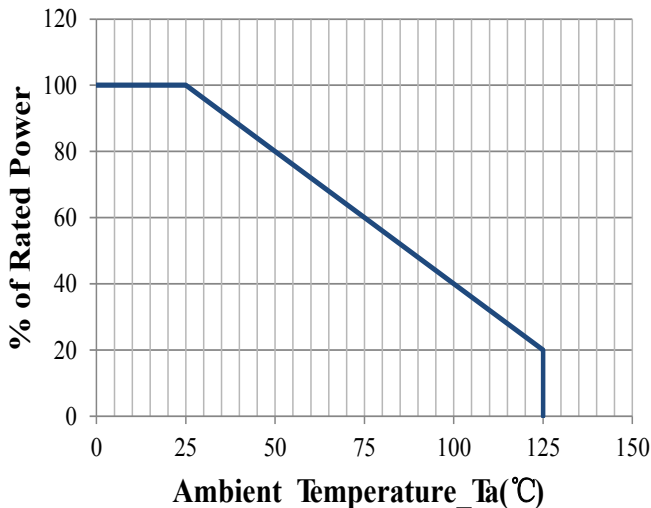
Clamping Voltage vs. Peak Pulse Current



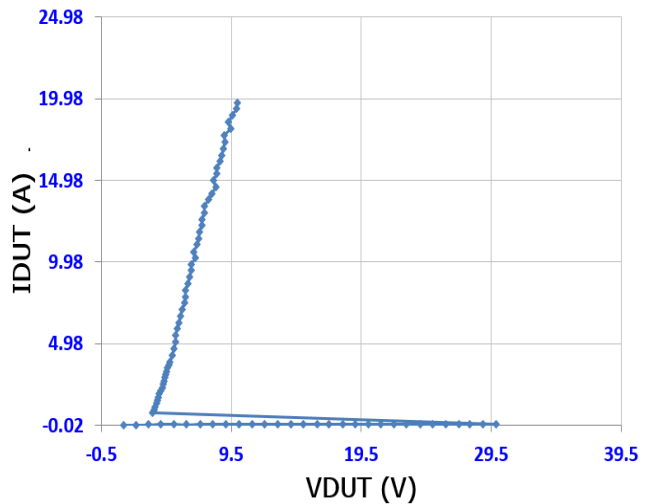
8 X 20us Pulse Waveform



IEC61000-4-2 Pulse Waveform

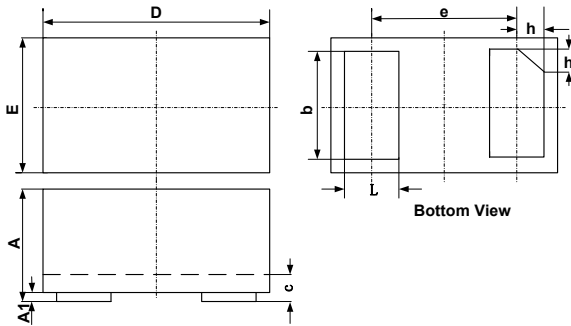


Power Derating Curve



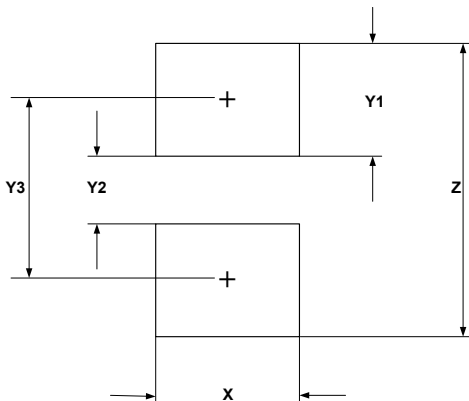
TLP Curve

DFN1006-2 (0402) Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.40	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
c	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
L	0.20	0.25	0.30	0.008	0.010	0.012
h	0.07	0.12	0.17	0.003	0.005	0.007

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.60	0.024
Y1	0.50	0.020
Y2	0.30	0.012
Y3	0.80	0.032
Z	1.30	0.052