

## Description

The XT3N12VU TVS diode is designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebooks, and PDA's. It offers superior electrical characteristics such as low clamping voltage, low leakage current and high surge capability. It is designed to protect sensitive electronic components which are connected to power lines, from over-stress caused by ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lighting.

The XT3N12VU is in a DFN2x2-3L package and will protect one unidirectional line. It may be used to provide ESD protection up to  $\pm 30\text{kV}$  (Contact and air discharge) according to IEC61000-4-2 , and used to protect USB voltage bus pin (8/20 us) according to IEC61000-4-5.

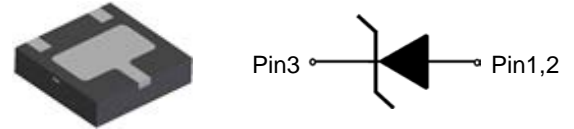
## Features

- ◆ Working voltage: 12V
- ◆ DFN2x2-3L Package
- ◆ 4500 Watts peak pulse power ( $t_p=8/20\mu\text{s}$ )
- ◆ Transient protection for data lines to IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (air),  $\pm 30\text{kV}$  (contact)  
IEC 61000-4-5 (Surge)180A (8/20us)
- ◆ Low leakage current
- ◆ Low clamping voltage
- ◆ Solid-state silicon-avalanche technology

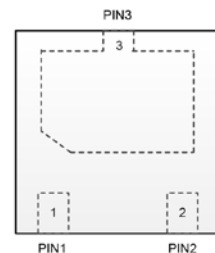
## Applications

- ◆ Power lines
- ◆ Personal digital assistants (PDA's)
- ◆ Microprocessors based equipment
- ◆ Notebooks, Desktops, and Servers
- ◆ Cell phone Handsets and Accessories
- ◆ Portable Electronics
- ◆ Peripherals

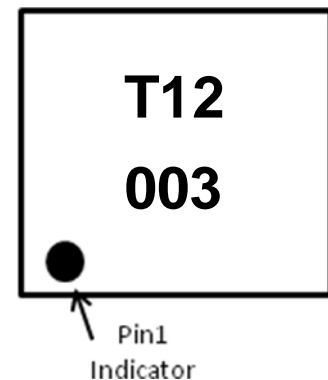
<http://www.xihangsemi.com>



## Circuit Diagram



## Pin Configuration (Top View)



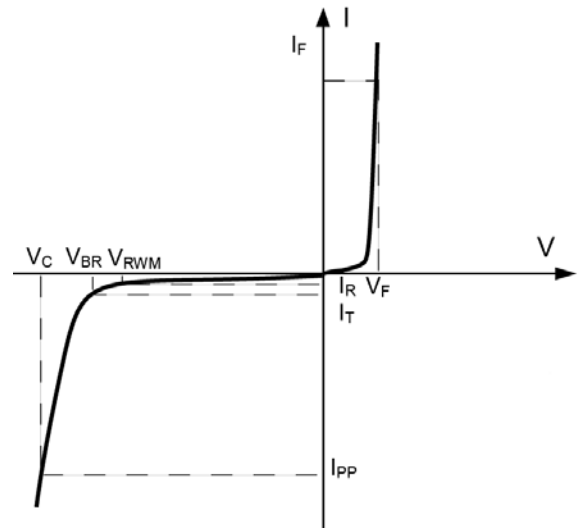
## Marking

## Order Information

Device	Package	Shipping
XT3N12VU	DFN2x2-3L	3000/Tape&Reel

## Definitions of electrical characteristics

Symbol	Parameter
$V_{RWM}$	Reverse Stand-off Voltage
$I_R$	Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Reverse Breakdown Voltage @ $I_T$
$I_T$	Test Current
$I_{PP}$	Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$
$C_j$	Junction Capacitance
$I_{PP}$	Peak Pulse Current



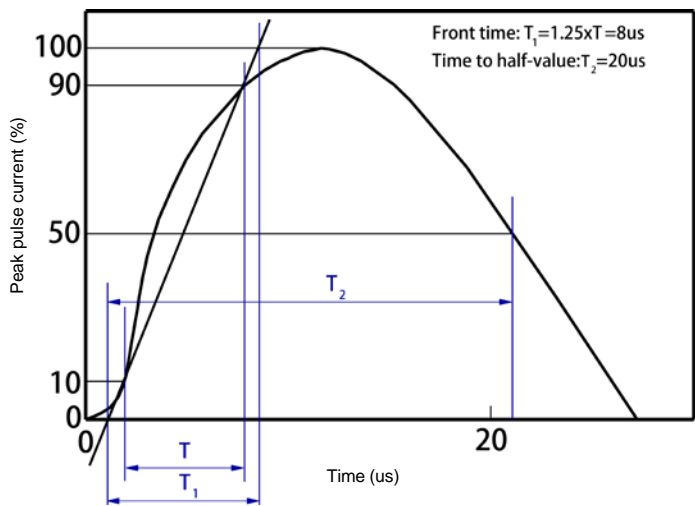
## Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power ( $t_P = 8/20\mu S$ )	$P_{PK}$	4500	W
ESD according to IEC61000-4-2 air discharge	$V_{ESD}$	$\pm 30$	kV
ESD according to IEC61000-4-2 contact discharge		$\pm 30$	kV
Lead Soldering Temperature	$T_L$	260 (10 sec)	$^{\circ}C$
Operating Temperature	$T_{OP}$	-55 to +125	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55 to +150	$^{\circ}C$

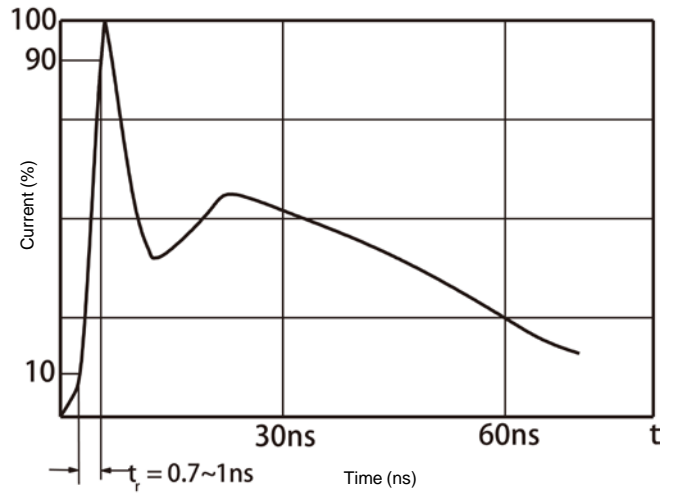
## Electrical Characteristics ( $T_a=25^{\circ}C$ , unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	$V_{RWM}$				12	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$	13.5	14.5	15.5	V
Reverse Leakage Current	$I_R$	$V_{RWM}=5V$			1	$\mu A$
Peak Pulse Current	$I_{PP}$	$t_P = 8/20\mu s$			180	A
Clamping Voltage	$V_C$	$I_{PP}=50A$ $t_P = 8/20\mu s$			20	V
Clamping Voltage	$V_C$	$I_{PP}=100A$ $t_P = 8/20\mu s$			23	V
Clamping Voltage	$V_C$	$I_{PP}=180A$ $t_P = 8/20\mu s$			29	V
Junction Capacitance	$C_j$	$V_R=0V$ $f = 1MHz$	900	950	1200	pF

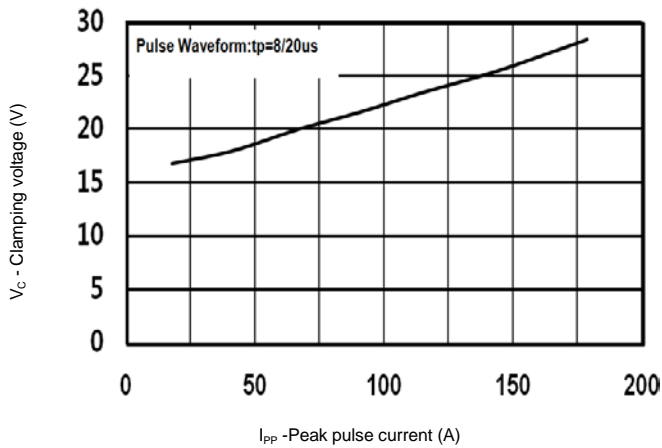
Typical Characteristics (Ta=25°C, unless otherwise noted)



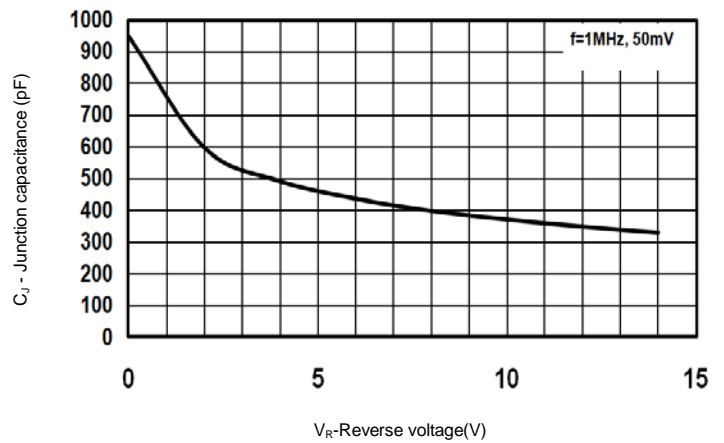
8/20 us waveform per IEC61000-4-5



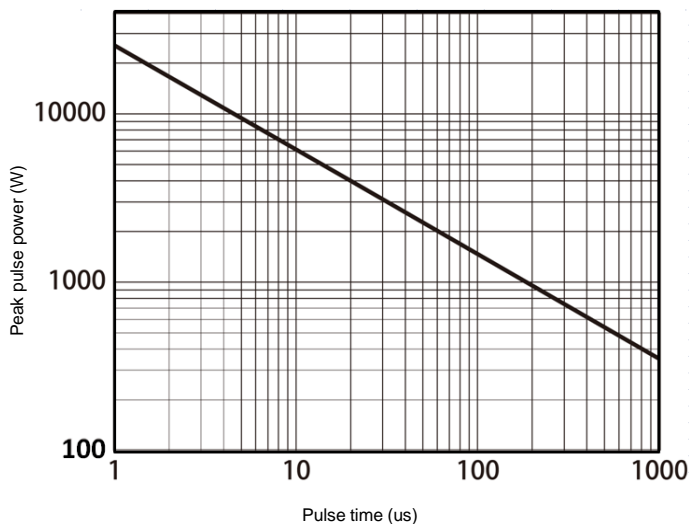
Contact discharge current waveform per IEC61000-4-2



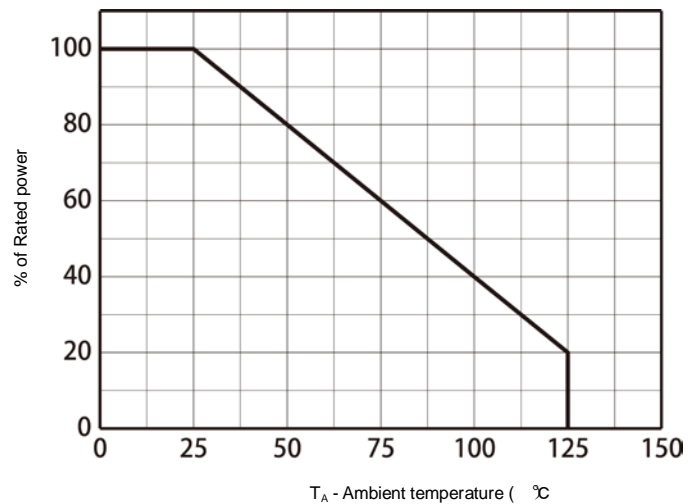
Clamping Voltage vs. Peak pulse current



Capacitance vs. Reverse voltage



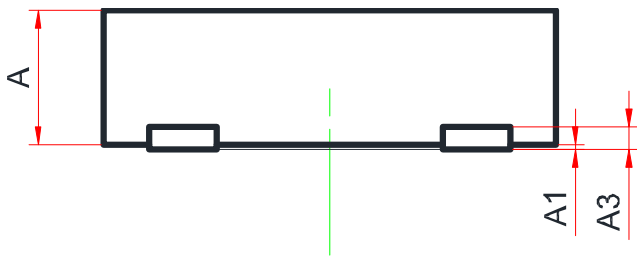
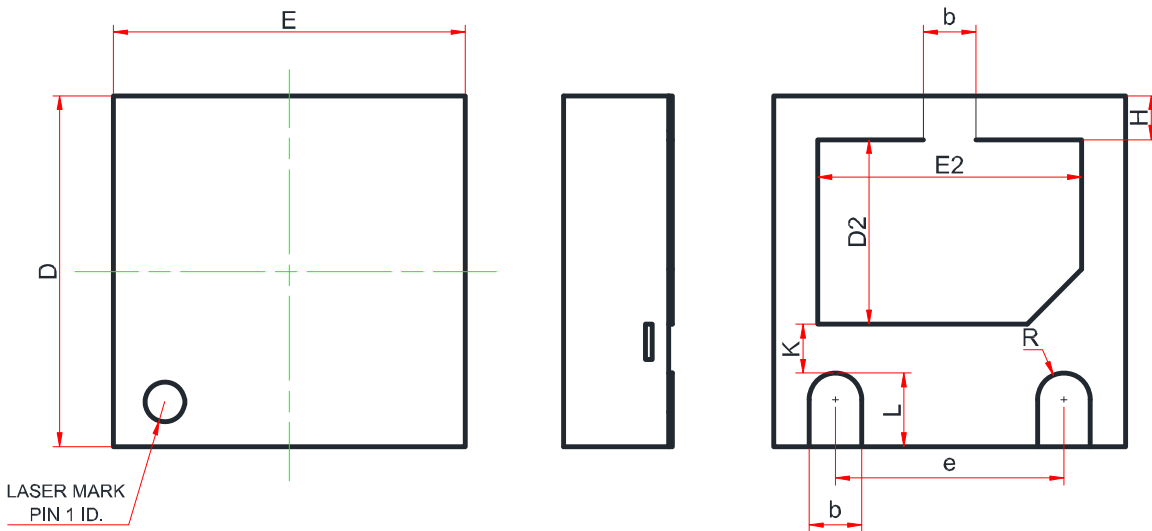
Non-repetitive peak pulse power vs. Pulse time



Power derating vs. Ambient temperature

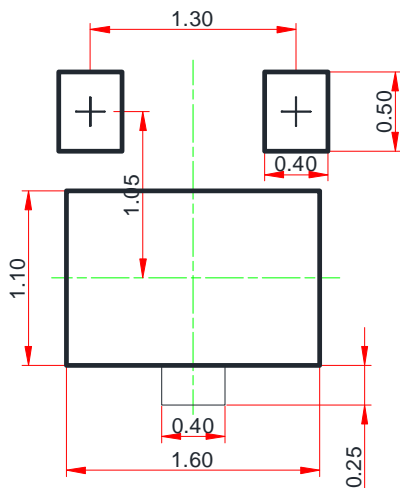
Package Outline Dimensions (DFN2x2-3L)

DFN2.0x2.0-3L



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.51	0.55	0.60
A1	0.00	0.02	0.05
A3	0.15 REF.		
b	0.25	0.30	0.35
D	1.90	2.00	2.10
E	1.90	2.00	2.10
D2	0.85	1.00	1.10
E2	1.35	1.50	1.60
e	1.20	1.30	1.40
H	0.20	0.25	0.30
K	0.20	0.30	0.40
L	0.35	0.40	0.45
R	0.15	-	-

Recommend Land Pattern (Unit: mm)



Note:  
This recommended land pattern is for reference purpose only.