

# UT817ZB

## BIDIRECTIONAL ▲ TVS DIODE

TVS DIODE ▲ SMD type

ESD Protection for line

Bidirectional protection

Ultra-low junction capacitance ▲ 0.18pF

0.6mm x 0.3mm x 0.3mm ▲ DFN0603-2L package

**Especially to protect sensitive components**

## SPECIFICATION

Item		Characteristics
Operating Junction Temperature Range	$T_J$	-55°C to +125°C
Storage Temperature Range	$T_S$	-55°C to +150°C
Peak Pulse Current (8/20μs)	$I_{PP}$	4A
ESD Rating (Per IEC 61000-4-2 ▲ Contact)	$V_{ESD}$	±12kV
ESD Rating (Per IEC 61000-4-2 ▲ Air)	$V_{ESD}$	±15kV

## DESCRIPTION






The UT817ZB designed as a bidirectional ultra-low capacitance Transient Voltage Suppressor (TVS) makes this device an ideal solution for protecting voltage sensitive high speed data lines.

It provides low clamping voltage has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from over voltage caused by ESD (Electrostatic Discharge) and CDE (Cable Discharge Events).

## EMC STANDARDS

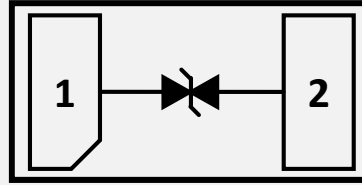
- ▲ IEC 61000-4-2 (ESD): ±12kV (Contact)
- ▲ IEC 61000-4-2 (ESD): ±15kV (Air)
- ▲ IEC 61000-4-5 (Lightning): 4A (8/20μs)

## APPLICATIONS

Data and I/O Lines Protection	Display Port Interface	Thunderbolt Interface	USB 3.1, 3.2 & 4.0	5V Systems
				

## PIN DESCRIPTION

Circuit Diagram ▪ Bottom View



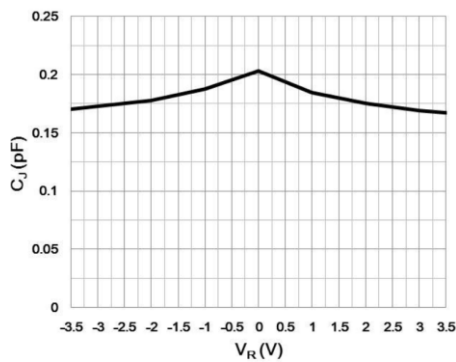
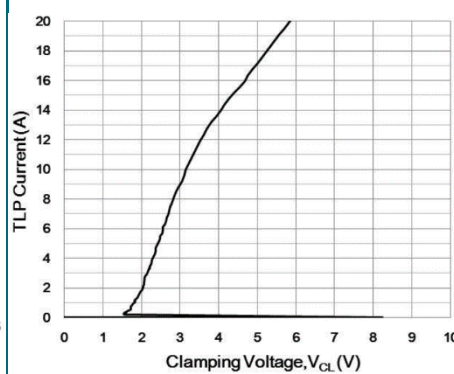
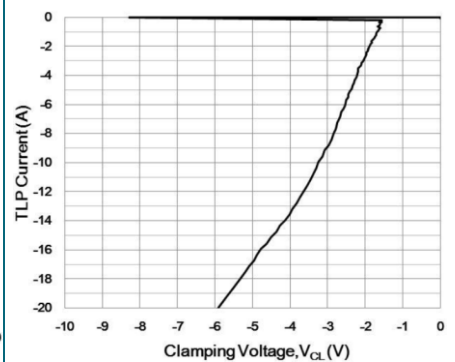
## ELECTRICAL CHARACTERISTICS ▲ $T_J = 25^{\circ}\text{C}$ , unless otherwise noted

Item	Condition	Symbol	Min.	Typ.	Max.	Unit
Reverse Working Voltage	Pin 1 to Pin 2	$V_{RWM}$	-5		5	V
Breakdown Voltage	$I_{BR} = 1\text{mA}$ , Pin 1 to Pin 2	$V_{BR}$	6			V
Reverse Leakage Current	$V_{RWM} = \pm 5\text{V}$ , Pin 1 to Pin 2	$I_R$	-1		1	$\mu\text{A}$
TLP Clamping Voltage <sup>Note1</sup>	$I_{TLP} = 16\text{A}$ , Pin 1 to Pin 2	$V_C$		4.7		V
Junction Capacitance	$V_R = 1\text{V}$ , $f = 1\text{MHz}$ , Pin 1 to Pin 2	$C_J$		0.18		pF

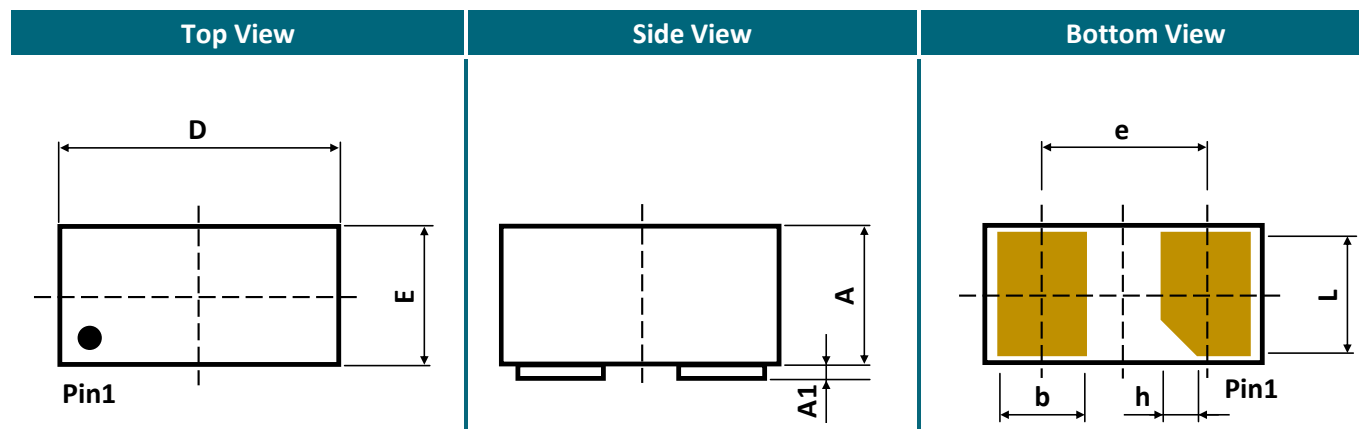
### Note

1:  $t_{\text{period}} = 100\text{ns}$ ,  $t_r = 1\text{ns}$

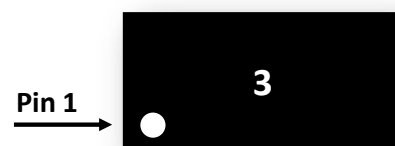
## TYPICAL OPERATING CHARACTERISTICS

Fig. 1 ▪ Junction Capacitance  
(Pin 1 to Pin 2)

Fig. 2 ▪ Positive TLP Clamping Voltage  
( $t_{\text{period}} = 100\text{ns}$ ,  $t_r = 1\text{ns}$ )

Fig. 3 ▪ Negative TLP Clamping Voltage  
( $t_{\text{period}} = 100\text{ns}$ ,  $t_r = 1\text{ns}$ )


## PACKAGE OUTLINE AND PART MARKING



Sym	Millimeters (Min.)	Millimeters (Typ.)	Millimeters (Max.)
A	0.25	0.30	0.35
A1	0.00	0.02	0.05
b	0.13	0.18	0.24
D	0.55	0.60	0.65
E	0.25	0.30	0.35
e	0.35 BSC		
L	0.20	0.25	0.30
h	0.00	0.05	0.10



Marking:

3: Product code  
UT817ZB

### Note

- Package Outline Unit Description:  
BSC: Basic. Represents theoretical exact dimension or dimension target.  
MIN: Minimum dimension specified  
MAX: Maximum dimension specified  
REF: Reference. Represents dimension for reference use only. This value is not a device specification.  
TYP: Typical. Provided as a general value. This value is not a device specification.
- Dimensions in Millimeters
- Drawing not to scale
- These dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm.

## ORDERING INFORMATION

Part Number	Package Type	Package Code	Part Marking	Parameter
UT817ZBD42	DFN0603-2L	D42	3	3 = Product Code

Package Type	Vacuum Package			
DFN0603-2L	Packing	Reel 180mm (7")	Inner Box (3 Reels)	Carton (12 Boxes)
	Tape and Reel	12 000pcs	36 000pcs	432 000pcs

## TYPICAL APPLICATION CIRCUIT

Fig. 4 ▪ Thunderbolt Protection

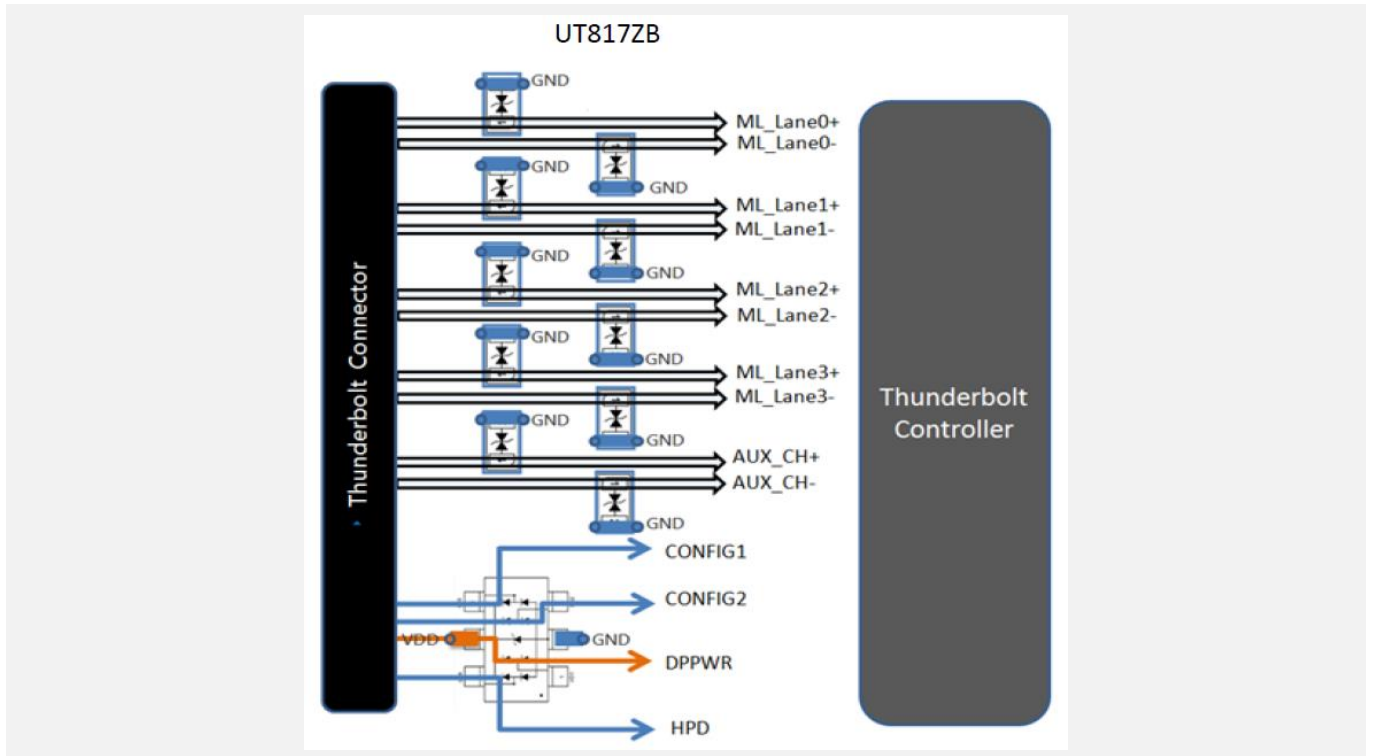
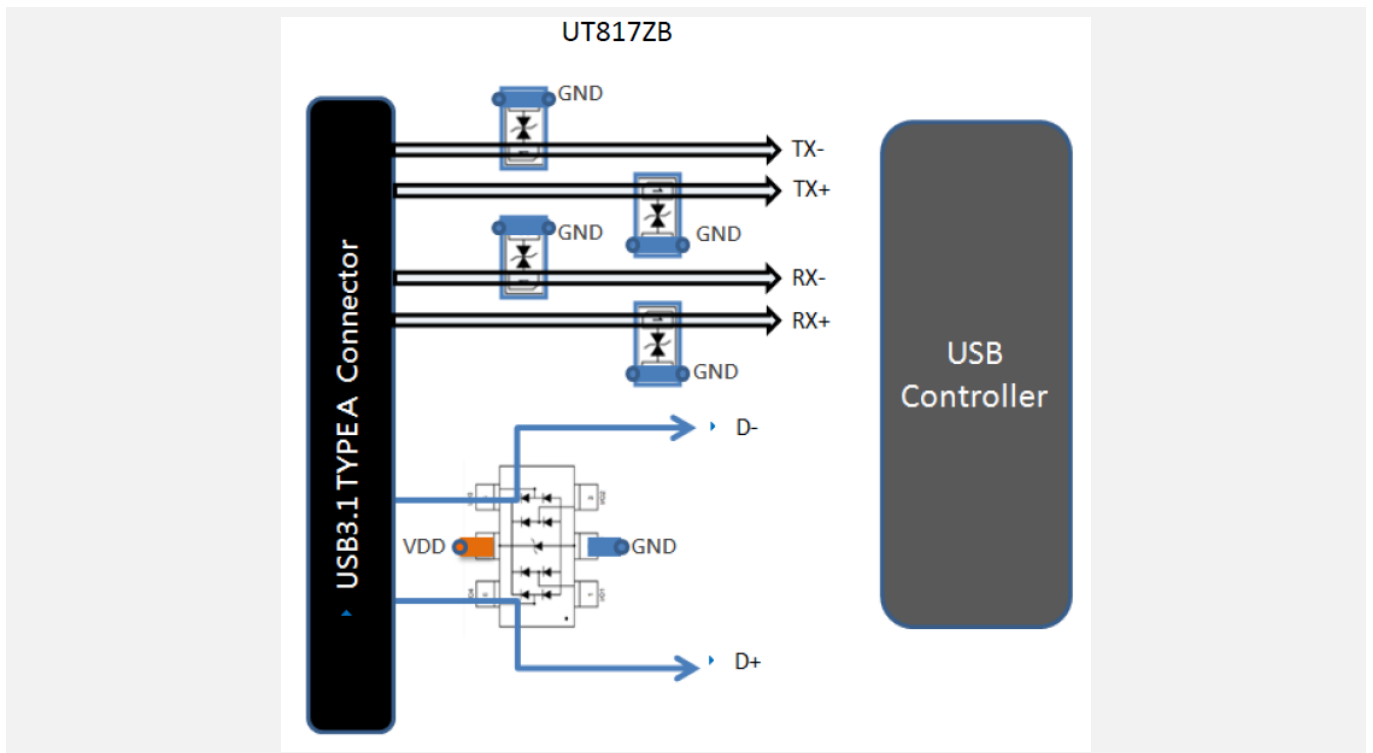
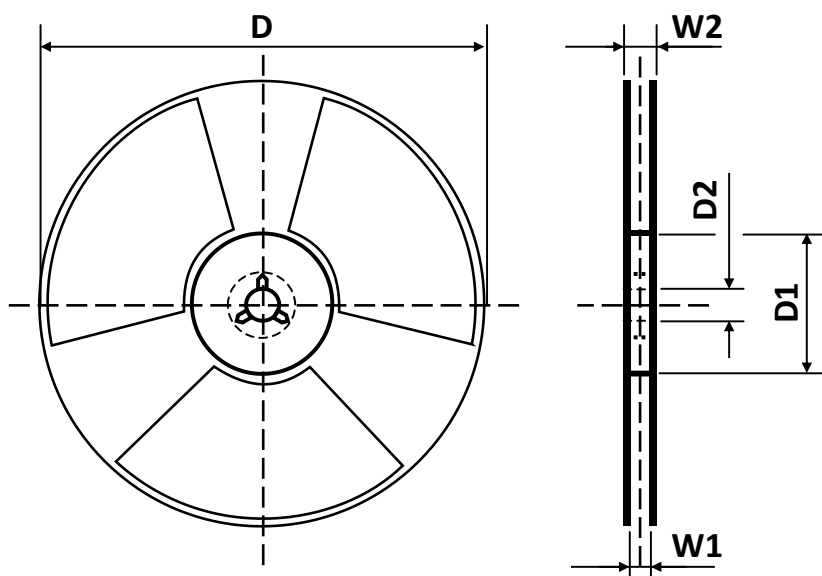


Fig. 5 ▪ USB 3.1 Type A Protection

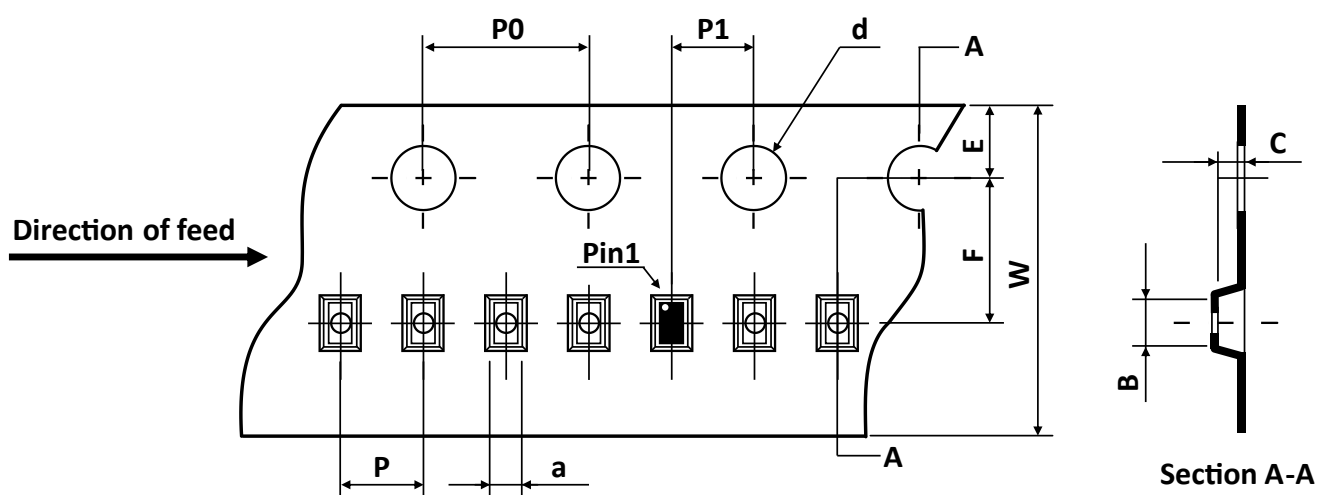


## REEL DIMENSIONS ▲ All dimensions in mm



Tape Size	Reel Size	D	D1	D2	W1	W2
8mm	7 inch	Ø178.00	54.40	13.00	9.50	12.30

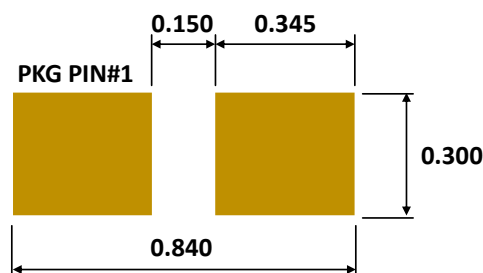
## TAPE DIMENSIONS ▲ All dimensions in mm



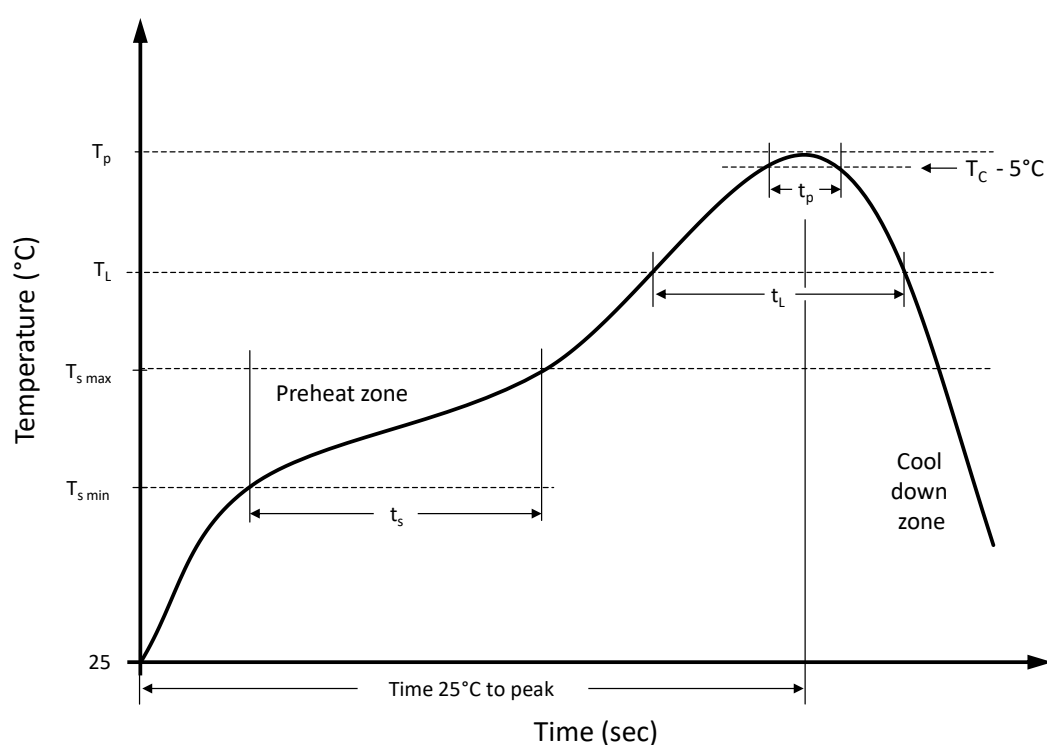
Package	a	B	C	d	E	F	P0	P	P1	W
DFN0603-2L	0.41	0.70	0.38	1.50	1.75	3.50	4.00	2.00	2.00	8.00

**Note:** All dimensions meet EIA-481-D requirements.

## RECOMMENDED PAD LAYOUT FOR DFN0603-2L ▲ All dimensions in mm



## RECOMMENDED REFLOW SOLDERING PROFILE



## Recommended reflow soldering conditions ▲ Refer to JEDEC J-STD-020E

Profile Features		Sn-Pb Eutetic Assembly	Pb-Free Assembly
Preheat temperature min.	$T_{s \min}$	100 °C	150 °C
Preheat temperature max.	$T_{s \max}$	150 °C	200 °C
Preheat time $t_s$ from $T_{s \min}$ to $T_{s \max}$	$t_s$	120 seconds	120 seconds
Ramp-up rate ( $T_L$ to $T_p$ )		max. 3 °C/second	max. 3 °C/second
Liquidous temperature	$T_L$	183 °C	217 °C
Time $t_L$ maintained above $T_L$	$t_L$	150 seconds max.	150 seconds max.
Peak package body temperature	$T_p$	235°C	260°C
Timeframe of within 5°C below and up to max actual peak body temperature	$t_p$	20 seconds max.	30 seconds max.
Ramp-down rate ( $T_L$ to $T_p$ )		max. 6 °C/second	max. 6 °C/second
Time 25°C to peak temperature		max. 6 minutes	max. 8 minutes

## REVISION TABLE

Revision	Date	Status	Notes
001	29/03/2022	Initial release	Initial publication

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