

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 (8/20 μ s)	I_{PP}	4A
ESD Rating (Per IEC 61000-4-2 ▲ Contact)	V_{ESD}	± 12 kV
ESD Rating (Per IEC 61000-4-2 ▲ Air)	V_{ESD}	± 15 kV

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

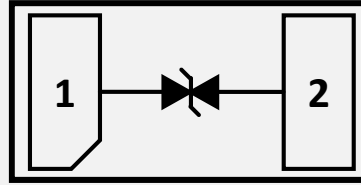
- ▲ IEC 61000-4-2 (ESD): ± 12 kV (Contact)
- ▲ IEC 61000-4-2 (ESD): ± 15 kV (Air)
- ▲ IEC 61000-4-5 (Lightning): 4A (8/20 μ s)

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



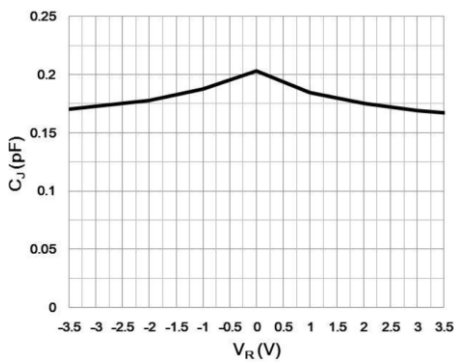
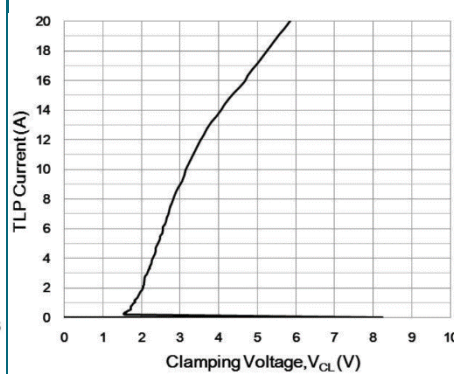
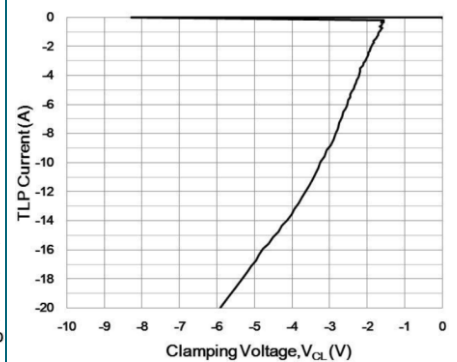
ELECTRICAL CHARACTERISTICS ▲ $T_J = 25^\circ\text{C}$, unless otherwise noted

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	μA
TLP Clamping Voltage ^{Note1}	$I_{TLP} = 16\text{A}$, 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

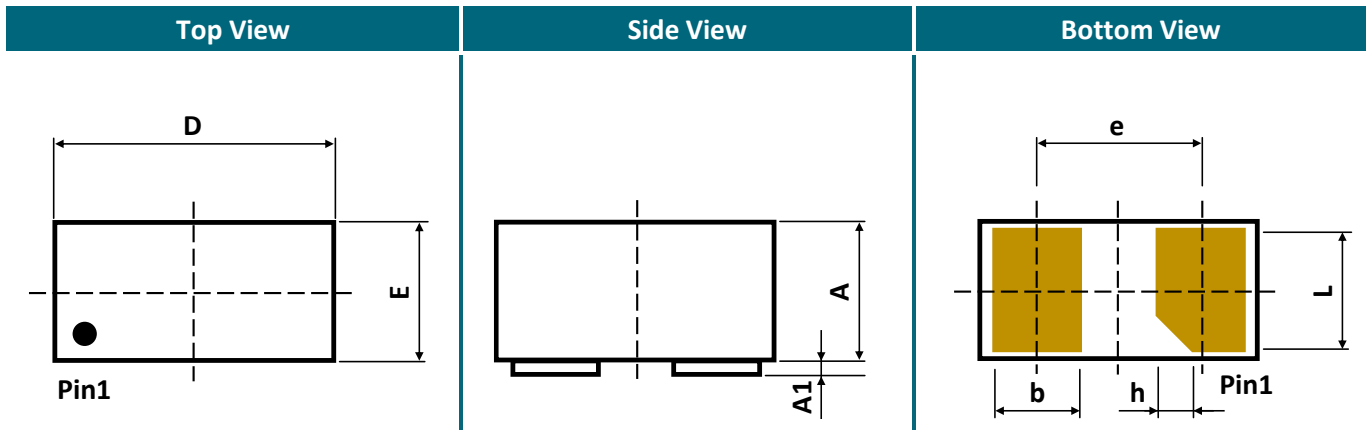
Note

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

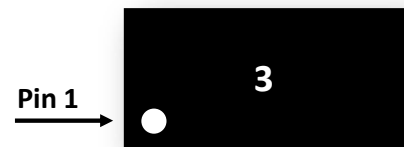
TYPICAL OPERATING CHARACTERISTICS

 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

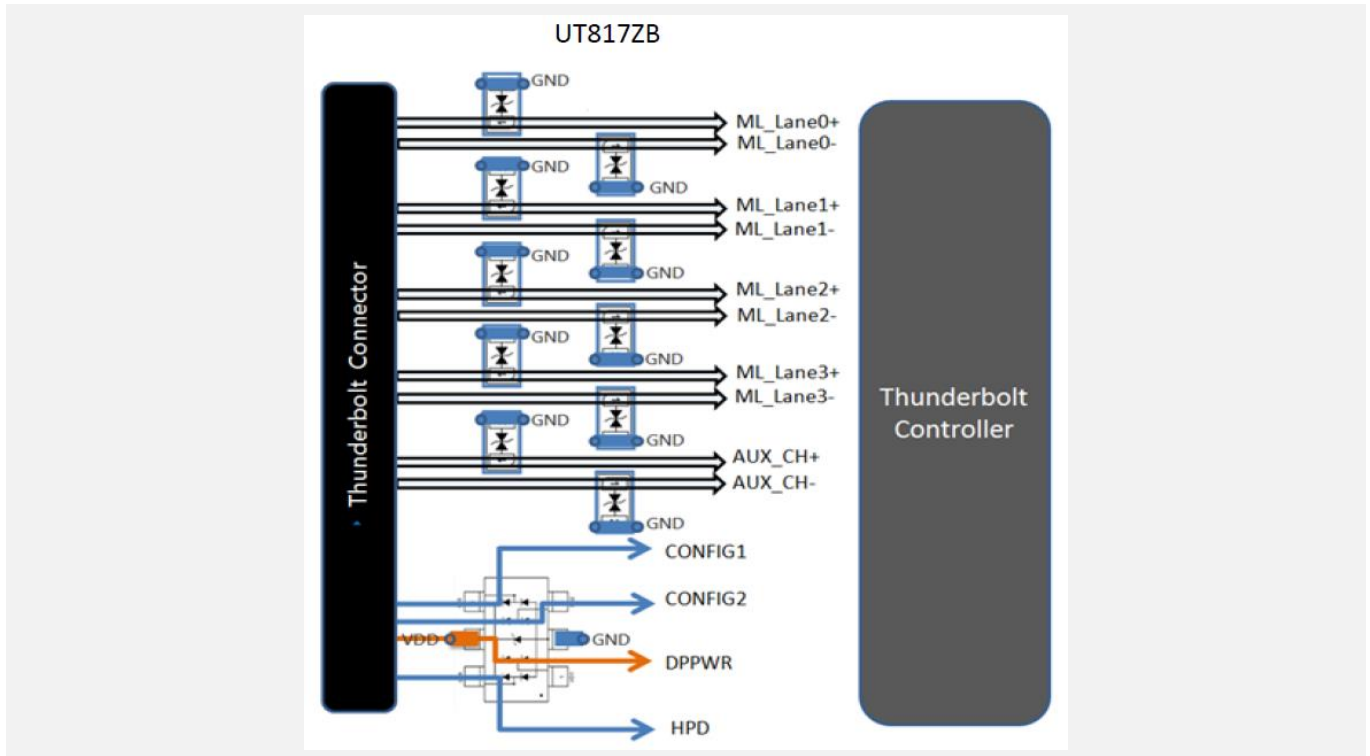
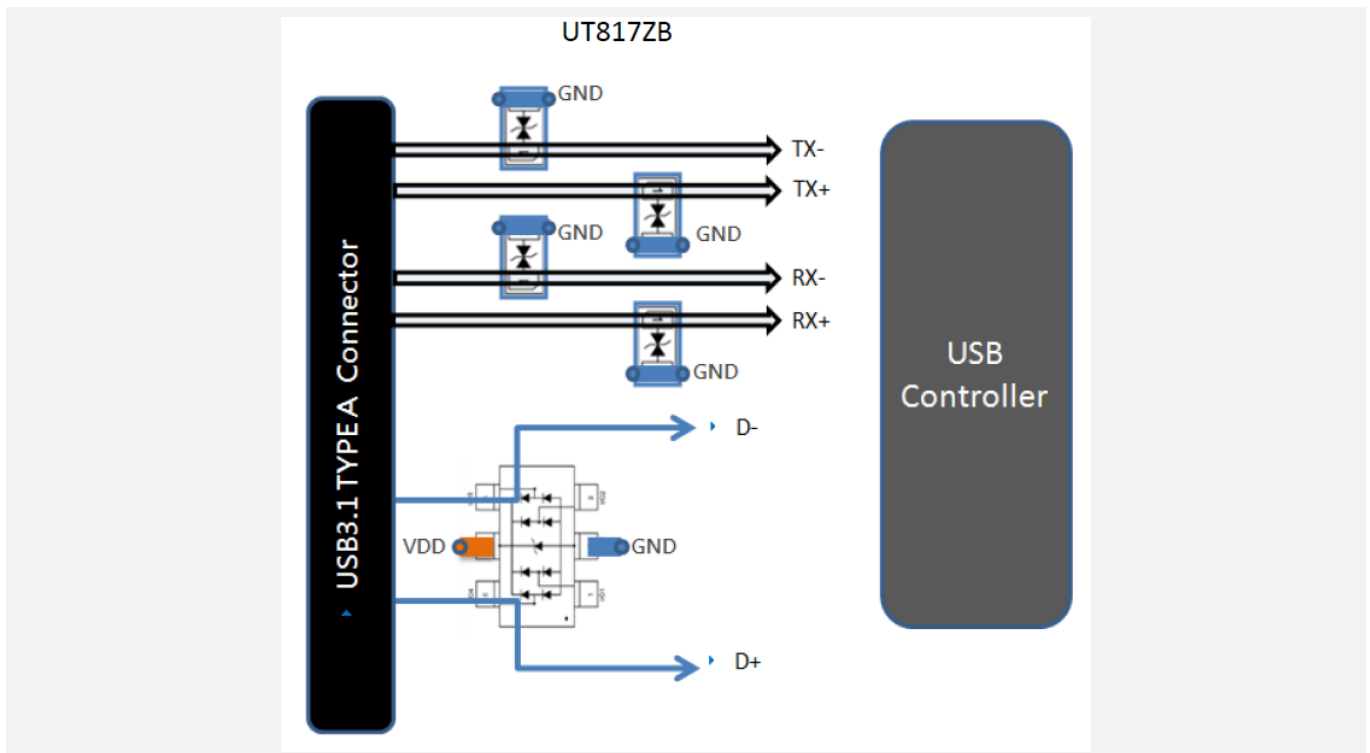
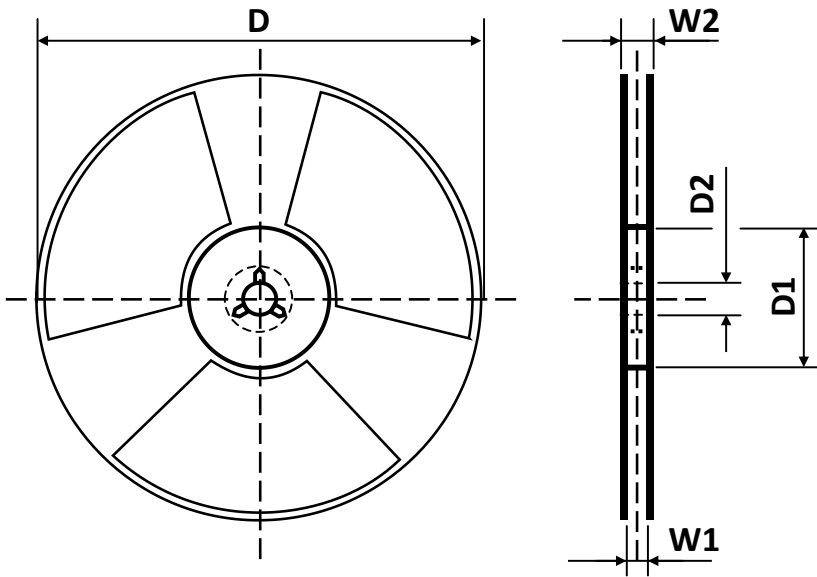
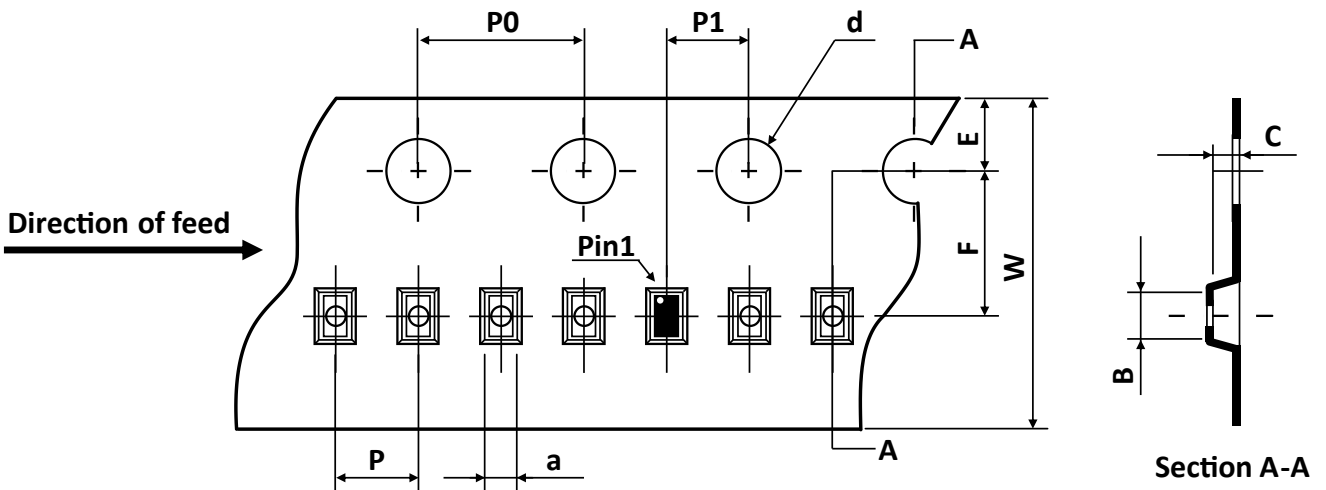


Fig. 5 • USB 3.1 Type A Protection



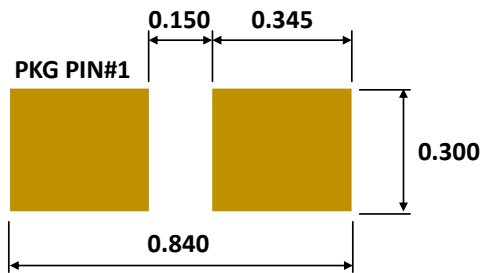
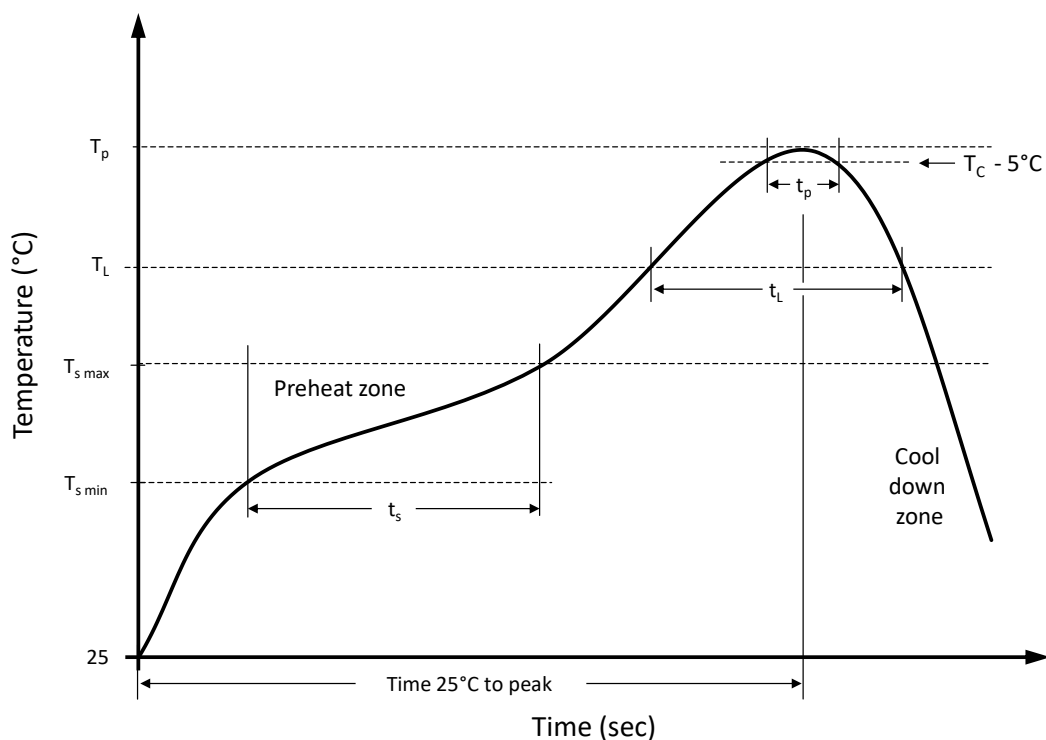
REEL DIMENSIONS ▲ All dimensions in mm


Tape Size	Reel Size	D	D1	D2	W1	W2
8mm	7 inch	$\varnothing 178.00$	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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