

# UT8005B

## BIDIRECTIONAL ▲ TVS DIODE

TVS DIODE ▲ SMD type

ESD Protection for line

Bidirectional protection

Junction capacitance ▲ 15pF

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

AEC-Q101 qualified

### 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 $\mu$ s)	$I_{PP}$	12.5A
ESD Rating (Per IEC 61000-4-2 ▲ Contact)	$V_{ESD}$	±30kV
ESD Rating (Per IEC 61000-4-2 ▲ Air)	$V_{ESD}$	±30kV

### DESCRIPTION

The UT8005B is a bidirectional Transient Voltage Suppressor (TVS) designed to protect 5.0V circuits from transient events such as high Electrostatic Discharge (ESD) and Cable Discharge Event (CDE).

This device uses a proprietary clamping cell technology. During transient events, these cells clamp transient over-voltages on power, control data signals and protect sensitive circuitry.

### EMC STANDARDS

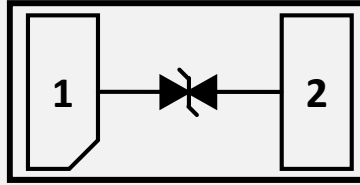
- ▲ IEC 61000-4-2 (ESD): ±30kV (Contact)
- ▲ IEC 61000-4-2 (ESD): ±30kV (Air)
- ▲ IEC 61000-4-4 (EFT): 50A (5/50ns)
- ▲ IEC 61000-4-5 (Lightning): 12.5A (8/20 $\mu$ s)

### APPLICATIONS

Automotive	Battery Contacts	Computer Equipment	Digital Cameras	5V Systems

## PIN DESCRIPTION

Circuit Diagram - Bottom View



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

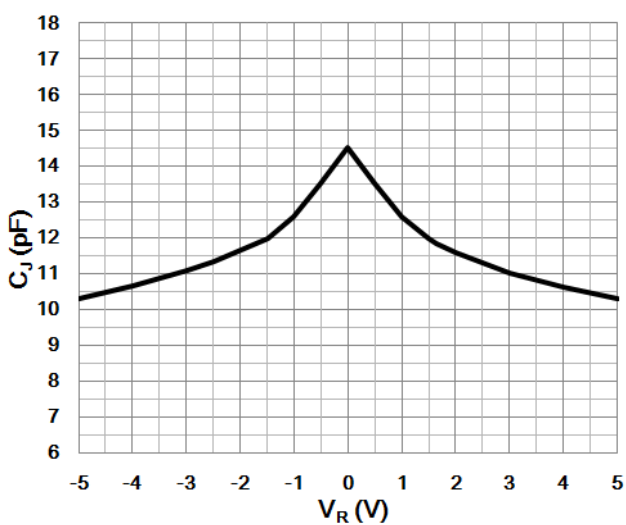
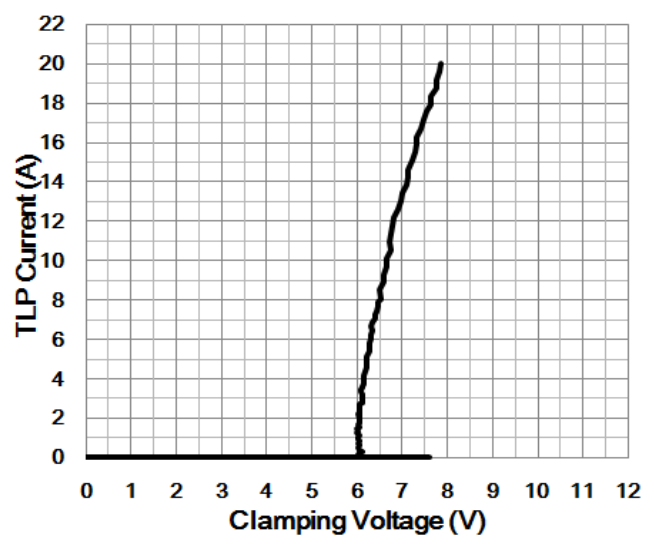
Item	Condition	Symbol	Min.	Typ.	Max.	Unit
Reverse Working Voltage	Pin 1 to Pin 2	$V_{RWM}$	-5		5	V
Breakdown Voltage	$I_{BR} = 1\text{mA}$ , Pin 1 to Pin 2	$V_{BR}$	6		9	V
Reverse Leakage Current	$V_{RWM} = 5\text{V}$ , Pin 1 to Pin 2	$I_R$			1	$\mu\text{A}$
TLP Clamping Voltage <sup>Note1</sup>	$I_{TLP} = 16\text{A}$ , Pin 1 to Pin 2	$V_C$		7.2		V
TLP Dynamic Resistance <sup>Note2</sup>	Pin 1 to Pin 2	$R_{DYN}$		0.1		$\Omega$
Junction Capacitance	$V_R = 0\text{V}$ , $f = 1\text{MHz}$ , Pin 1 to Pin 2	$C_J$		15		pF

### Note

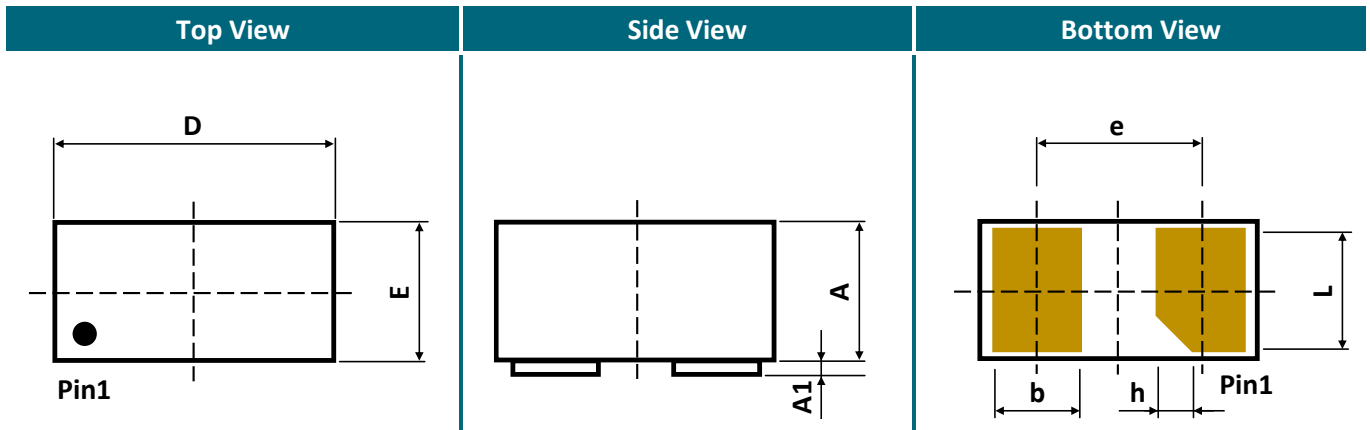
- 1:  $t_{\text{period}} = 100\text{ns}$ ,  $t_r = 1\text{ns}$   
 2:  $t_{\text{period}} = 100\text{ns}$ ,  $t_r = 1\text{ns}$

## TYPICAL OPERATING CHARACTERISTICS

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


 Fig. 2 - 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:

7: Product code  
UT8005B

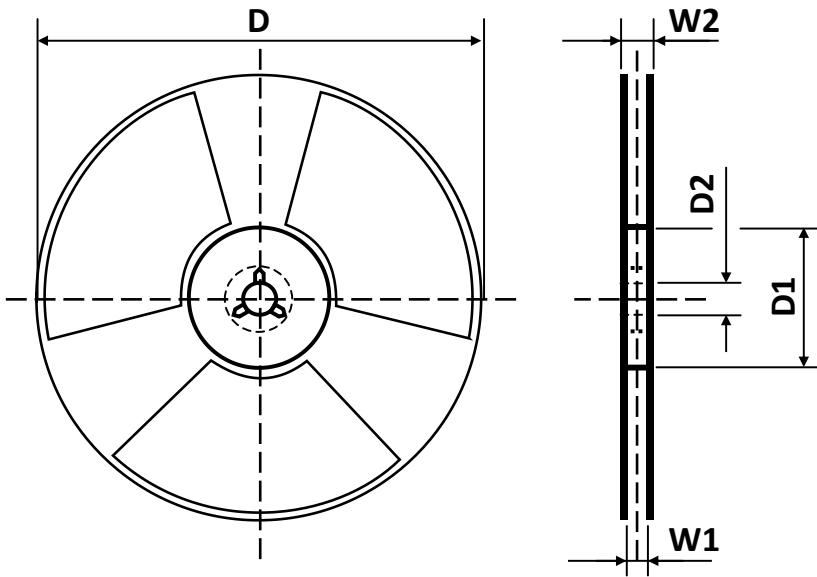
### Note

- 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.

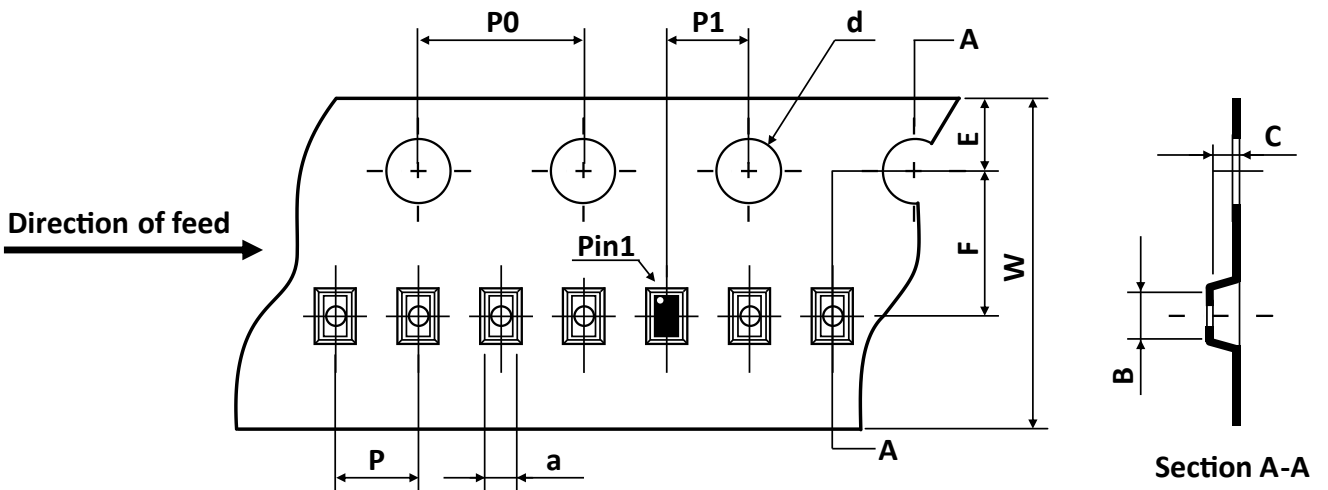
## ORDERING INFORMATION

Part Number	Package Type	Package Code	Part Marking	Parameter
UT8005BD42	DFN0603-2L	D42	7	7 = 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

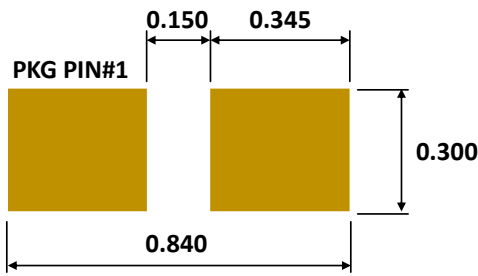
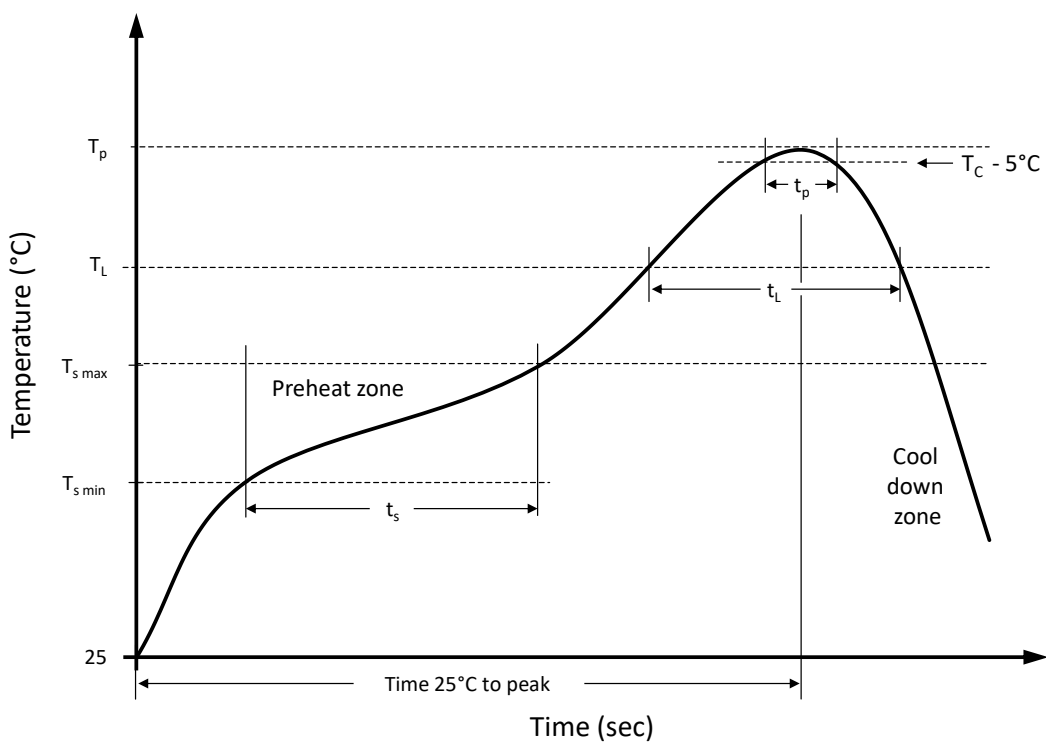
**REEL DIMENSIONS** ▲ All dimensions in mm


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	01/10/2021	Initial release	Initial publication

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