

## 1. Description

The PESD2USB3UX-TR(ES) is Transient Voltage Suppressor that designed to protect components which are connected to data and transmission lines against electrostatic discharge (ESD), electrical fast transient (EFT), and lightning. All pins are rated to withstand 15kV ESD pulses using the IEC61000-4-2 air discharge method.

## 2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - ±15kV Contact Discharge
  - ±15kV Air Discharge
- 50W Peak pulse Power (8/20us)
- Low clamping voltage
- Working voltage: 5V
- Low leakage current
- RoHS compliant
- Protecting 2 unidirectional lines
- Ultra Low Junction capacitance: 0.54pF Typ. (IO-GND)

## 3. Applications

- USB & HDMI Interfaces
- Portable electronics
- Servers, notebooks, and desktop PCs
- Set-top box
- Communication systems
- PoE

## 4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
PESD2USB3UX-TR(ES)	SOT-23	5V2US	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7inches

Table-1 Ordering information

## 5. Pin Configuration and Functions

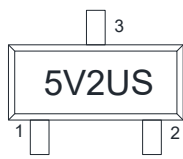
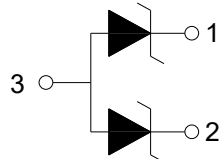
Pin	Name	Description	Outline	Circuit Diagram
1	IO	Connect to IO		
2	IO	Connect to IO		
3	GND	Connect to GND		

Table-2 Pin configuration

## 6. Specification

### 6.1. Absolute Maximum rating

Over operating free-air temperature range (unless otherwise noted)

Parameters	Symbol	Min.	Max.	Unit
Peak pulse power (tp=8/20us)@25°C	$P_{pk}$	-	50	W
Peak pulse current (tp=8/20us)@25°C	$I_{PP}$	-	8	A
ESD (IEC61000-4-2 air discharge) @25°C	$V_{ESD}$	-	$\pm 15$	kV
ESD (IEC61000-4-2 contact discharge) @25°C	$V_{ESD}$	-	$\pm 15$	kV
Junction temperature	$T_J$	-	150	°C
Operating temperature	$T_{OP}$	-40	125	°C
Storage temperature	$T_{STG}$	-55	150	°C
Lead temperature	$T_L$	-	260	°C

Table-3 Absolute Maximum rating

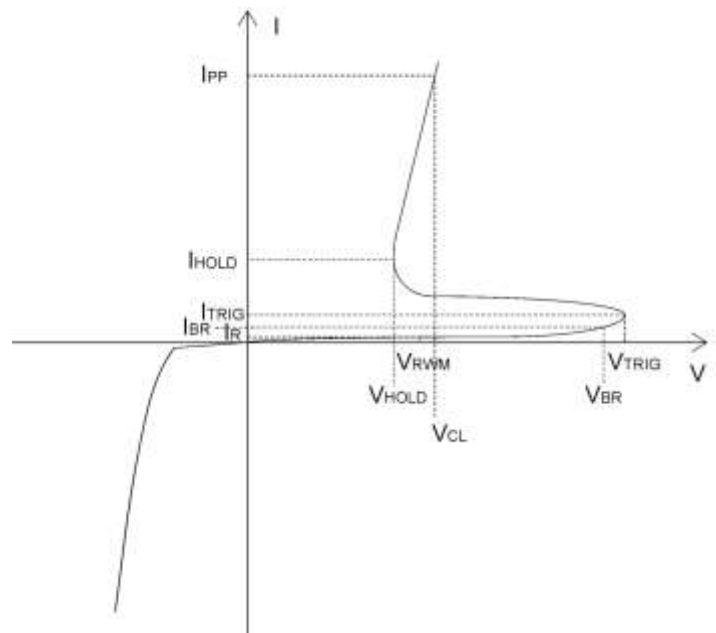
## 6.2. Electrical Characteristics

At TA = 25°C unless otherwise noted

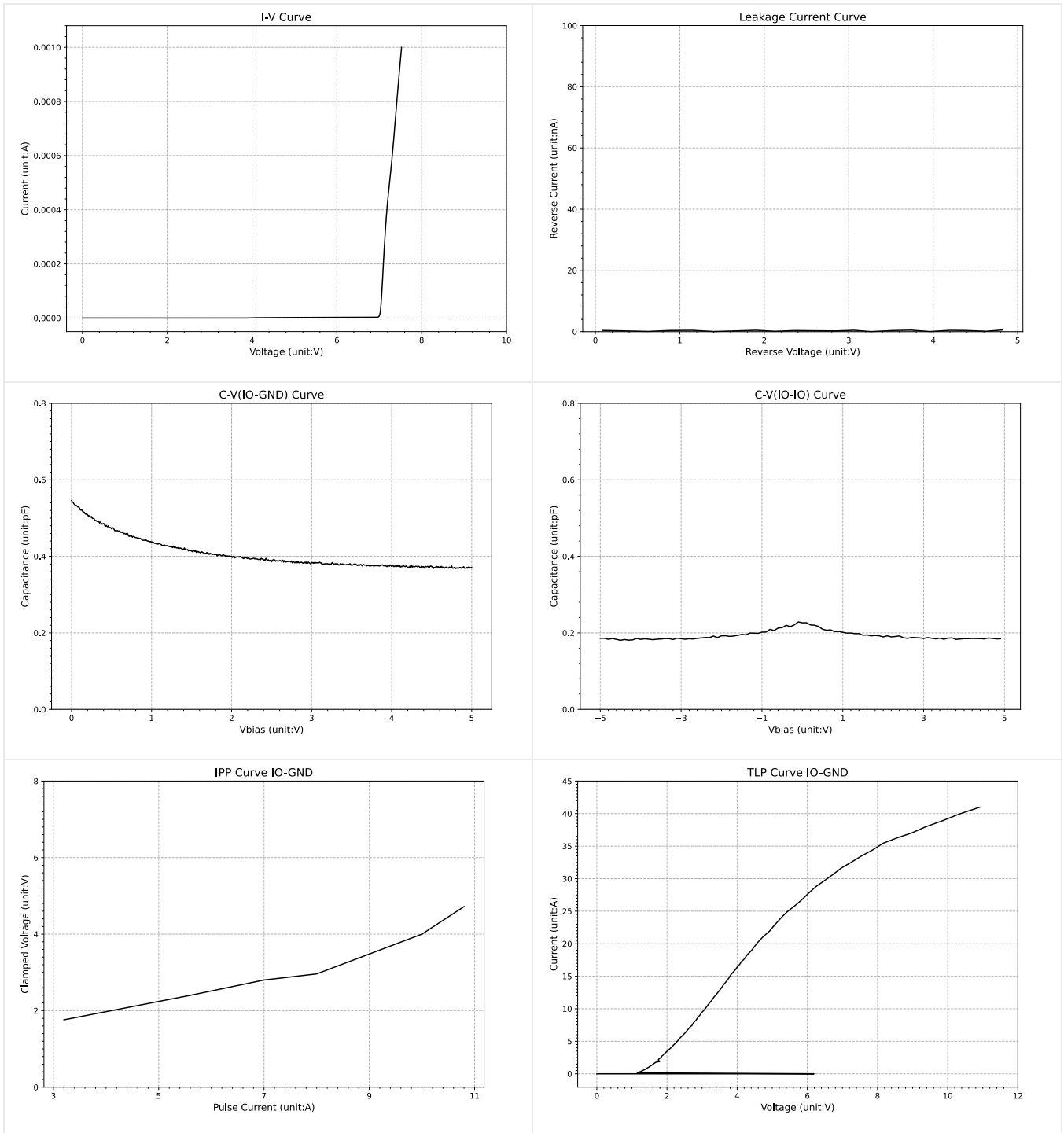
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	$V_{RWM}$				5	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$	5.5	7.5		V
Reverse Leakage Current	$I_R$	$V_{RWM}=5V$			100	nA
Clamping Voltage	$V_{CL}$	$I_{PP}=1A$ ; $t_p=8/20\mu s$		1.5		V
Clamping Voltage	$V_{CL}$	$I_{PP}=8A$ ; $t_p=8/20\mu s$		3.5		V
Dynamic Resistance	$R_{dyn}$	$I_R = 10A$ ; $T_{amb} = 25^\circ C$		0.15		$\Omega$
Junction Capacitance	$C_J$	$V_R=0V$ ; $f=1MHz$ ; IO-GND		0.54		pF
		$V_R=1.5V$ ; $f=1MHz$ ; IO-GND		0.42		
		$V_R=0V$ ; $f=1MHz$ ; IO-IO		0.22		

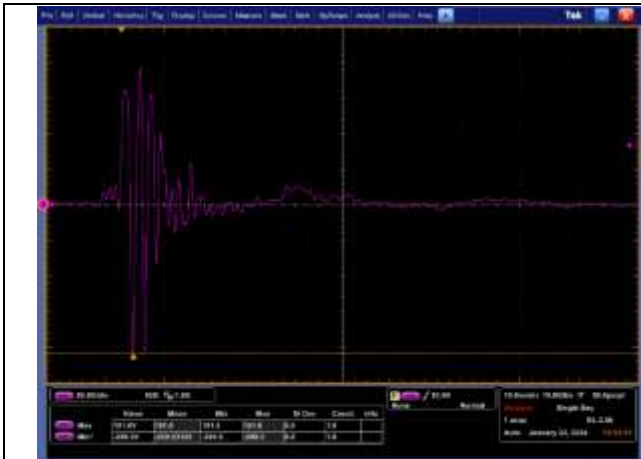
Table-4 Electrical Characteristics

Symbol	Parameters
$V_{RWM}$	Reverse stand-off voltage
$I_R$	Reverse leakage current
$V_{BR}$	Reverse breakdown voltage
$I_{BR}$	Reverse breakdown current
$V_{CL}$	Clamping voltage
$V_{TRIG}$	Reverse trigger voltage
$I_{TRIG}$	Reverse trigger current
$V_{HOLD}$	Reverse holding voltage
$I_{HOLD}$	Reverse holding current
$I_{PP}$	Peak pulse current



## 7. Typical Characteristic

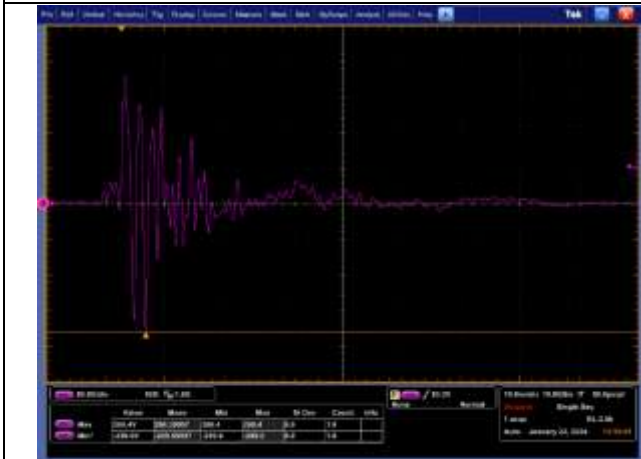




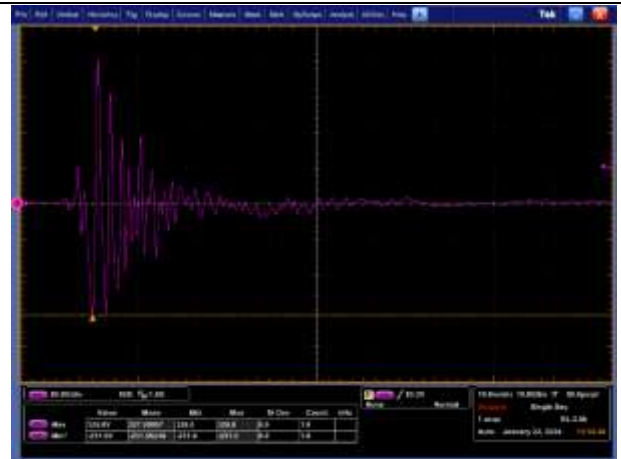
IEC6100-4-2 +8kV IO-GND



IEC6100-4-2 -8kV IO-GND



IEC6100-4-2 +15kV IO-GND



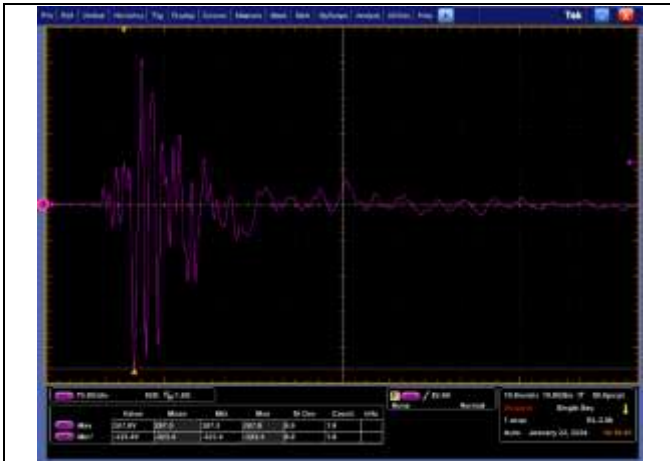
IEC6100-4-2 -15kV IO-GND



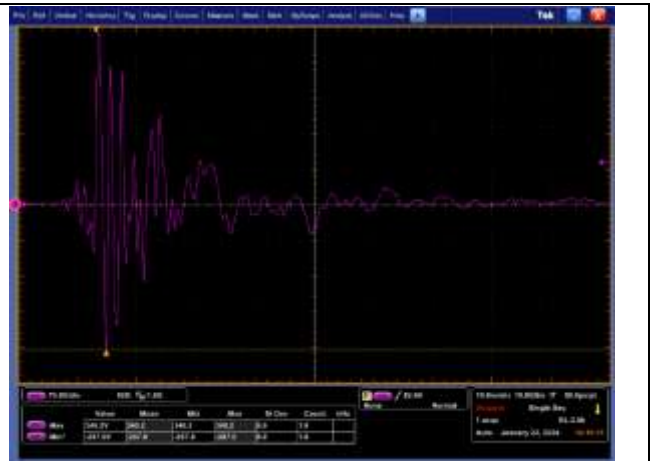
IEC6100-4-2 +8kV IO-IO



IEC6100-4-2 -8kV IO-IO

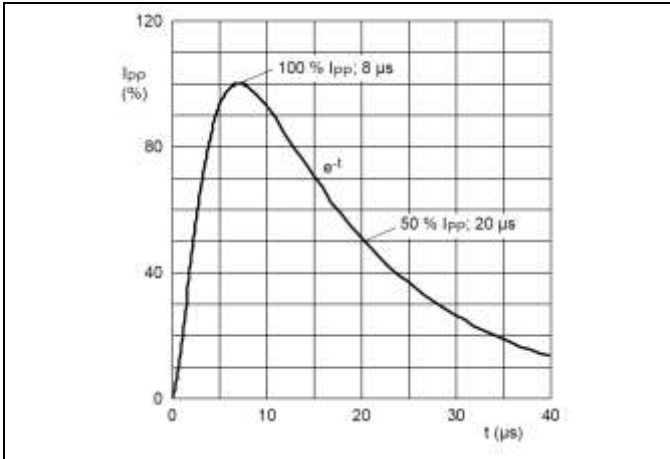


IEC6100-4-2 +15kV IO-IO

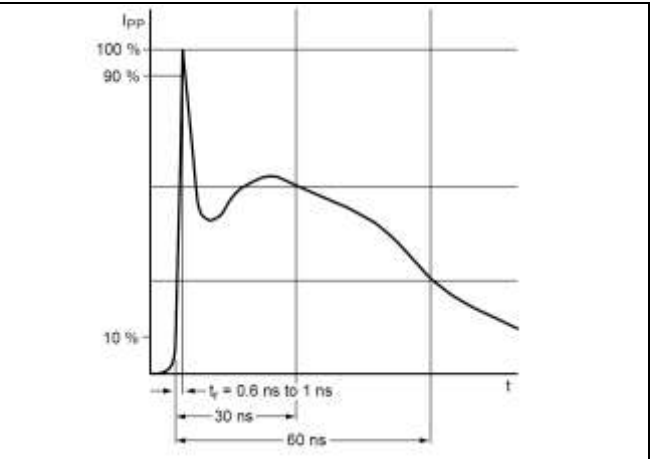


IEC6100-4-2 -15kV IO-IO

Measurement Wave According to IEC Standard



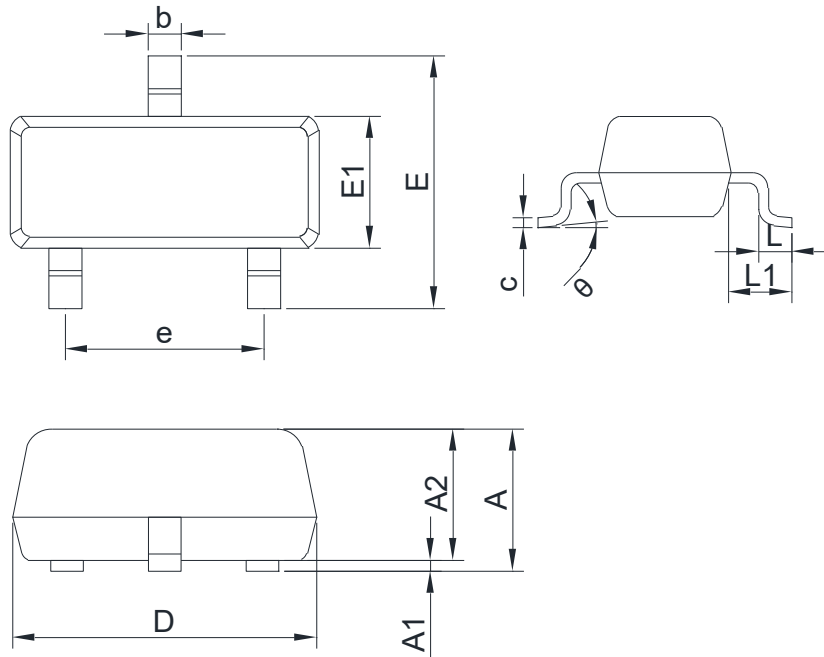
8/20  $\mu$ s pulse waveform according to  
IEC 61000-4-5



ESD pulse waveform according to  
IEC 61000-4-2

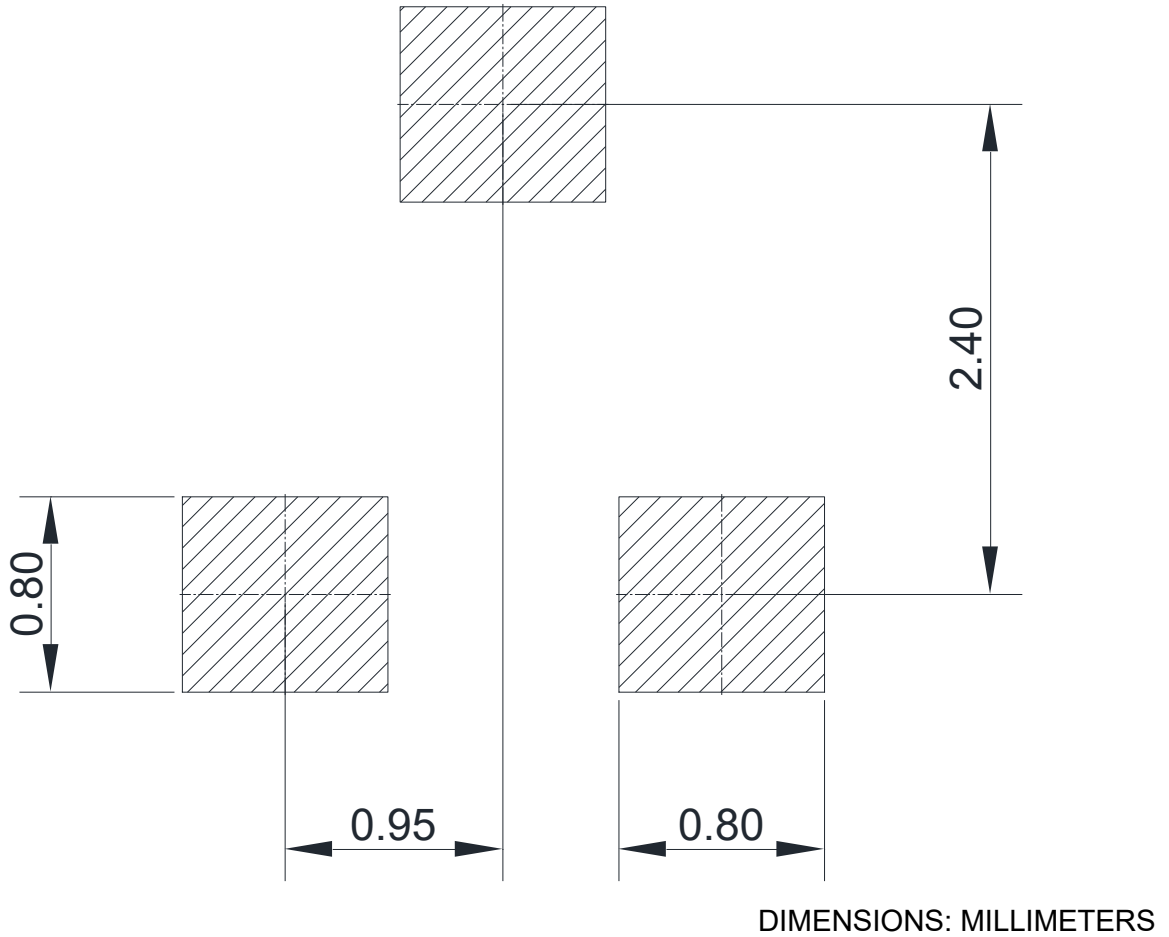
8. Dimension (SOT-23)

POD(Z)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	0.90	1.20	E	2.25	2.55
A1	0.00	0.10	E1	1.20	1.40
A2	0.90	1.10	e	1.80	2.00
b	0.30	0.50	L	0.30	0.50
c	0.07	0.18	L1	0.475	0.625
D	2.80	3.04	theta	0°	8°

### 9. Recommended Soldering Footprint



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