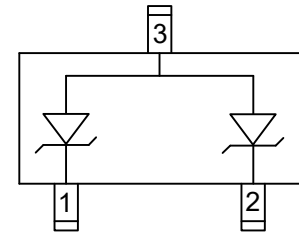


## Description

The 23BA05UL is a uni-directional TVS diode to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. It complies with IEC 61000-4-2 (ESD), ±25kV air and ±20kV contact discharge. It is assembled into a lead-free SOT-23 package. The small size, ultra-low capacitance and high ESD surge protection make it an ideal choice to protect cell phone, digital video interfaces and other high speed ports.



Circuit and Pin Schematic

## Features

- Low clamping voltage
- Ultra low leakage current
- Operating voltage: 5V
- IEC-61000-4-2 ESD ±25kV Air, ±20kV Contact
- Packaging: 7 inch reel, 3000pcs/reel

## Applications

- Cellular Handsets and Accessories
- Portable Instrumentation
- Personal Digital Assistants
- Notebooks and Handhelds
- Digital Cameras
- Peripherals

**Absolute Maximum Ratings (T<sub>A</sub>=25°C )**

Parameter	Symbol	Value
Peak Pulse Power (8/20μs)	P <sub>PP</sub>	80W
Peak Pulse Current (8/20μs)	I <sub>PP</sub>	5A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V <sub>ESD</sub>	±25kV ±20kV
Ambient Temperature Range	T <sub>A</sub>	-55°C to +125°C
Storage Temperature Range	T <sub>STG</sub>	-55°C to +150°C

**Electrical Characteristics (T<sub>A</sub>=25 °C )**

Parameter	Symbol	Test Condition	Min.	Typ.	Max.
Reverse Working Voltage	V <sub>RWM</sub>				5V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> = 1mA	6V		
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> = 5V			0.5μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1A (8/20μs)			9V
		I <sub>PP</sub> = 5A (8/20μs)			16V
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz			0.8pF

Typical Characteristic Curves ( $T_A=25^\circ\text{C}$ )

Figure 1. Peak Pulse Power Rating Curve

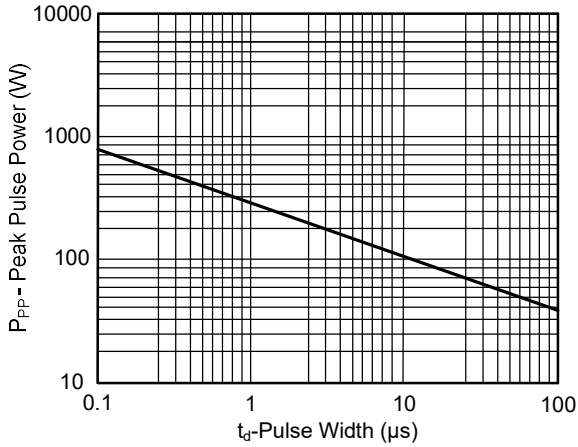


Figure 2. Pulse Derating Curve

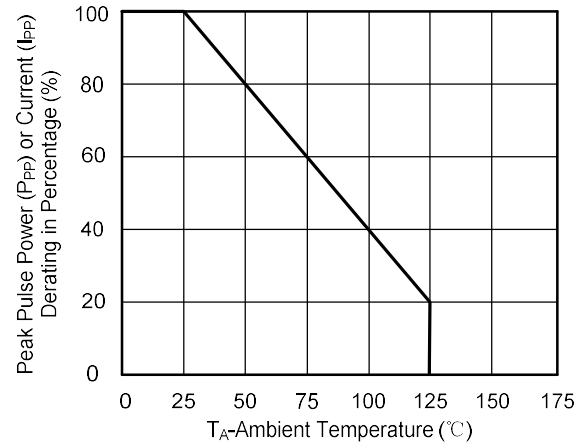


Figure 3. Clamping Voltage vs. Peak Pulse Current

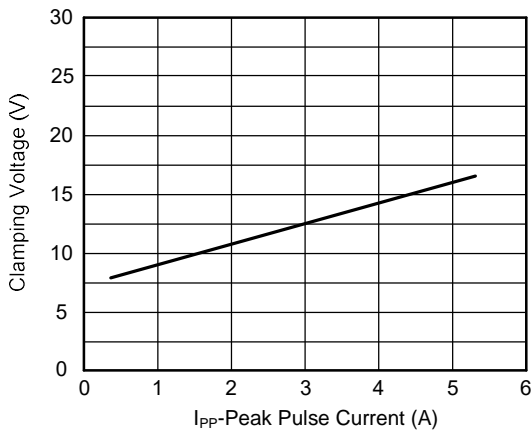


Figure 4. Junction Capacitance vs. Reverse Voltage

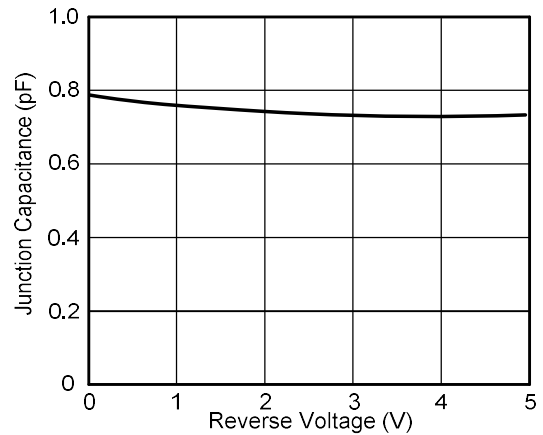


Figure 5. Pulse Waveform (8/20 $\mu\text{s}$ )

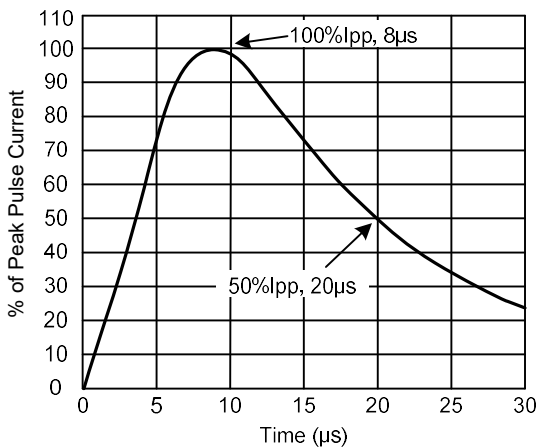
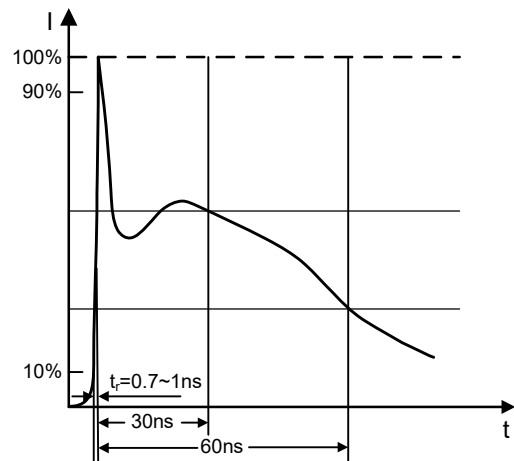
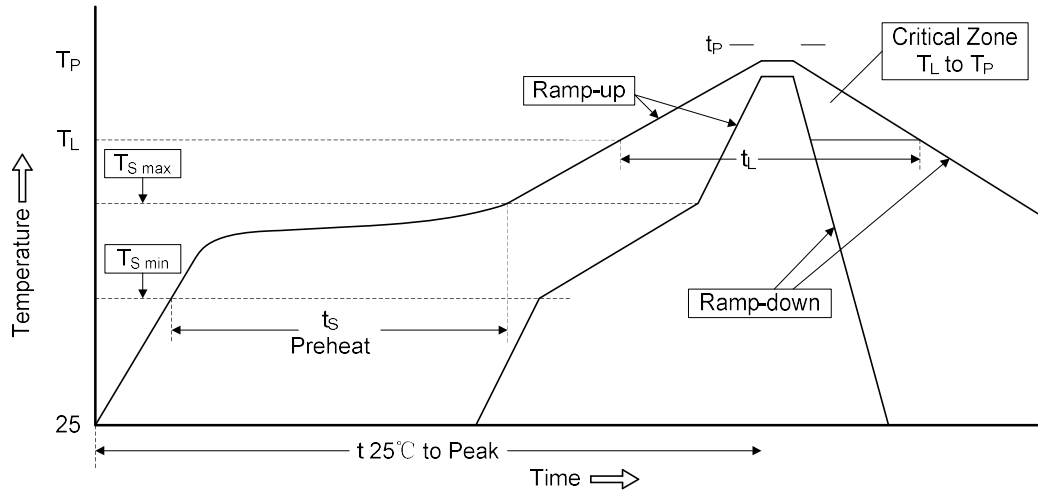


Figure 6. Pulse Waveform (IEC61000-4-2)



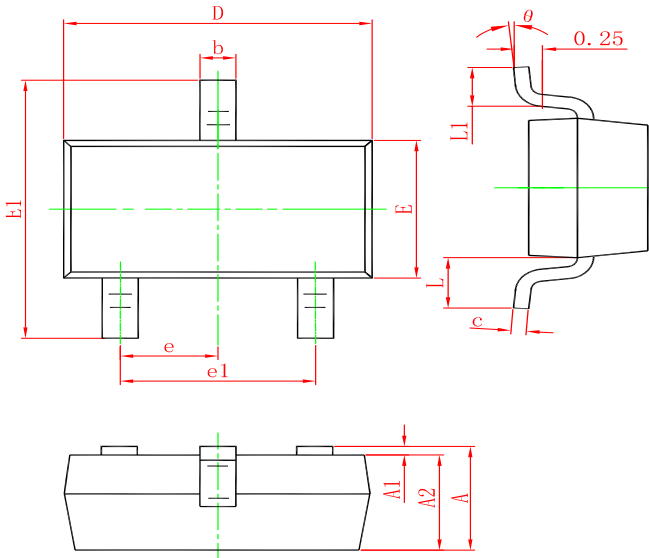
## Soldering Parameters

### Reflow Soldering



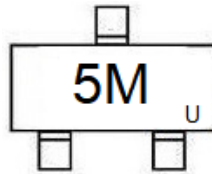
Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat -Temperature Min ( $T_{S\ min}$ ) -Temperature Max ( $T_{S\ max}$ ) -Time (min to max) ( $t_s$ )	150°C 200°C 60-180 seconds
$T_{S\ max}$ to $T_L$ -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature ( $T_L$ ) -Time ( $t_L$ )	217°C 60-150 seconds
Peak Temperature ( $T_P$ )	260°C
Time within 5°C of actual Peak Temperature ( $t_p$ )	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

**SOT-23 PACKAGE OUTLINE DIMENSIONS**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	8°

**Marking**



**Ordering information**

Order code	Package	Baseqty	Deliverymode
UMW 23BA05UL	SOT-23	3000	Tape and reel