

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

UAD33A05L06 is a ultra low capacitance TVS array designed to protect high speed data interfaces. This series has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from over-voltage caused by electrostatic discharge (ESD), cable discharge events (CDE), and electrical fast transients (EFT). They may be used to meet the ESD immunity requirements of IEC61000-4-2.

They are designed for easy PCB layout by allowing the traces to run straight through the device. The combination of small size, low capacitance, and high level of ESD protection makes them a flexible solution for applications such as HDMI, UDI, Display Port™, MDDI, Serial ATA and Infiniband circuits.



Contact : ±10kV  
Air : ±10kV

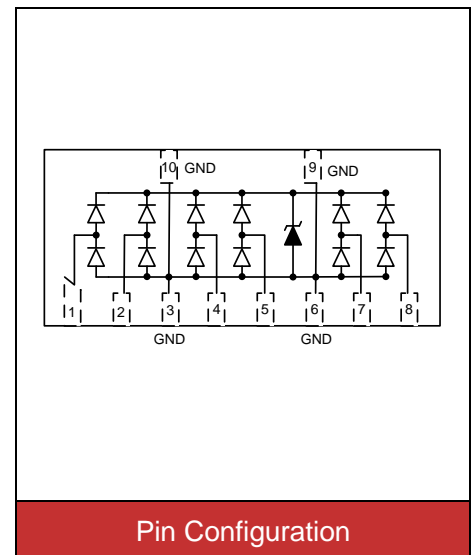


### Features

- IEC61000-4-2 ESD 10kV Air, 10kV contact compliance
- DFN3310 (3.3×1.0×0.5mm) surface mount package
- Protects Six I/O lines
- Working voltage: 5V
- Low leakage current
- Low operating and clamping voltages
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270°C
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020
- Marking: B X56

### Applications

- High Definition Multimedia Interface (HDMI 1.4)
- Digital Visual Interface (DVI)
- Unified Display Interface (UDI)
- Display Port Interface
- MDDI Ports
- PCI Express
- Serial ATA



## Maximum Ratings

Rating	Symbol	Value	Unit
Peak Pulse Current (tp=8/20μs)	$I_{PP}$	2	A
ESD voltage (Contact discharge)	$V_{ESD}$	±10	kV
ESD voltage (Air discharge)		±10	
Storage & operating temperature range	$T_{STG}, T_J$	-55~+150	°C

## Electrical Characteristics (T<sub>J</sub>=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				5	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1mA$	6			V
Reverse leakage current	$I_R$	$V_R=5V$ Each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	$V_C$	$I_{PP}=2A$		10		V
Off state junction capacitance	$C_J$	0Vdc, f=1MHz I/O pin to GND		0.4		pF
		0Vdc, f=1MHz Between I/O pins		0.2		pF

**Typical Characteristics Curves**

Figure 1. Capacitance vs. Bias Voltage

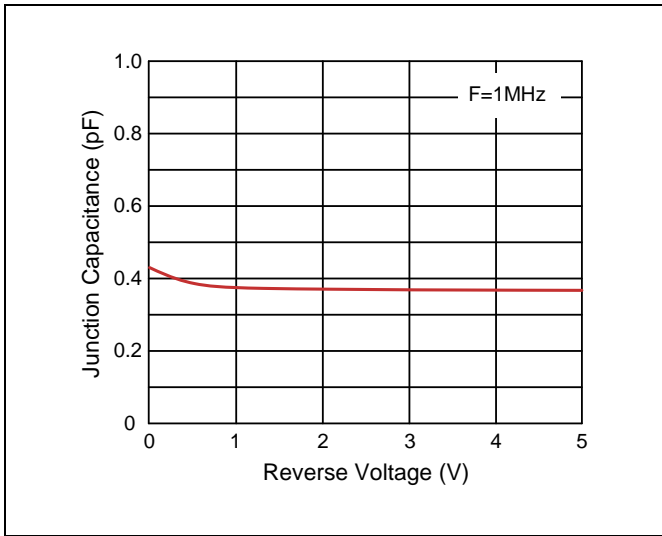


Figure 2. Insertion Loss (S21) I/O to GND

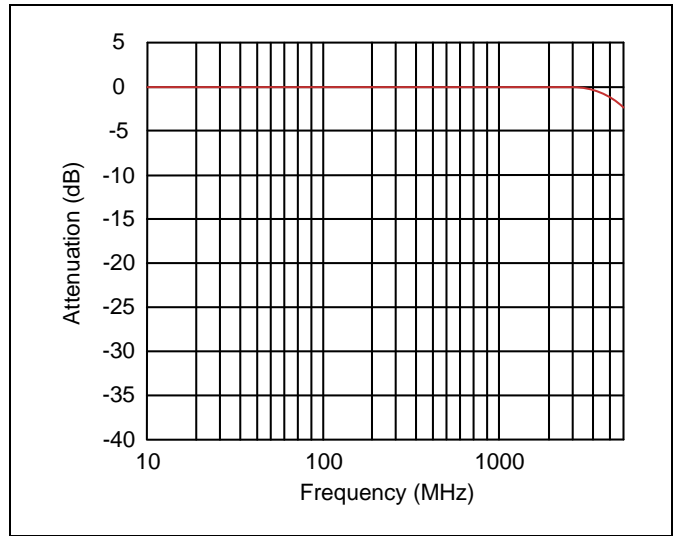


Figure 3. Pulse Waveform

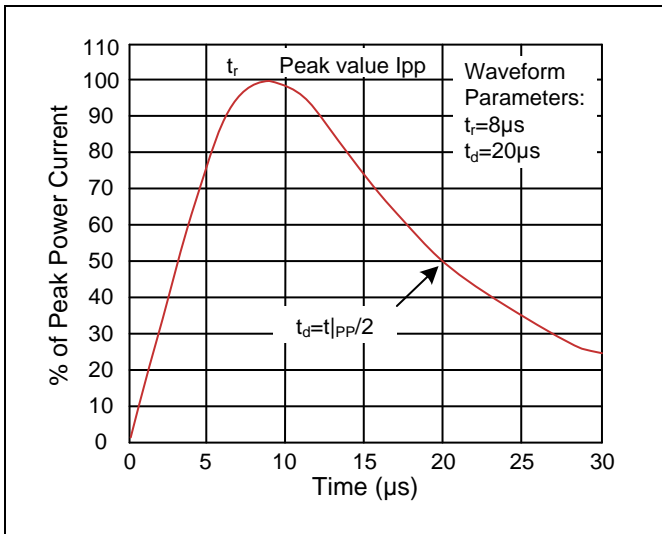
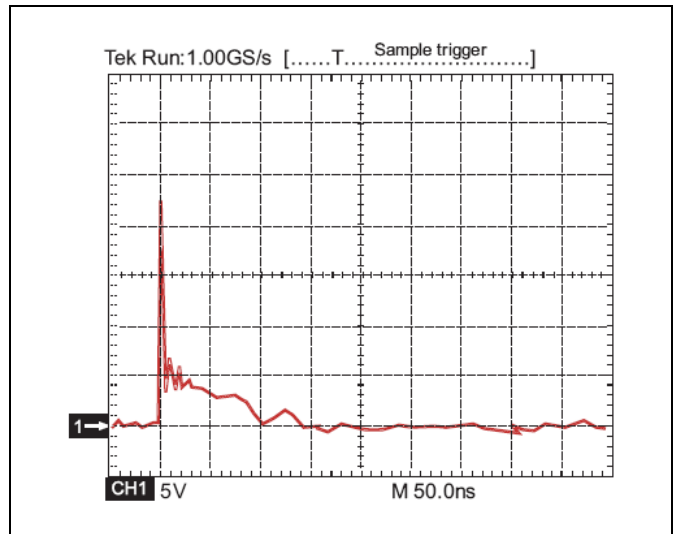
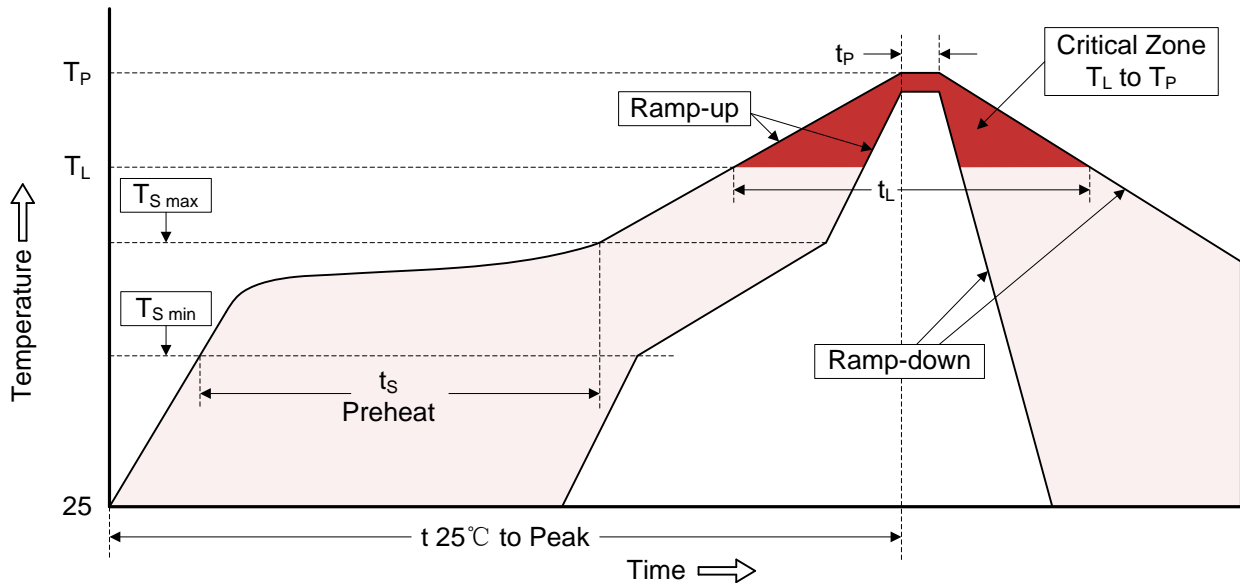


Figure 4. ESD Clamping (8kV Contact IEC61000-4-2)



**Recommended Soldering Conditions**

Reflow Soldering



Recommended Conditions

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.

**Dimensions (DFN3310)**

Symbol	Dimension					
	Millimeters			Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	-	0.02	0.05	-	0.001	0.002
b	0.15	0.20	0.25	0.006	0.008	0.010
c	0.100	0.152	0.200	0.004	0.006	0.008
D	3.25	3.30	3.35	0.128	0.130	0.132
D2	0.30	0.35	0.40	0.012	0.014	0.016
D3	1.19BSC			0.005		
e	0.40BSC			0.016		
Nd	2.80BSC			0.110		
E	0.95	1.00	1.05	0.037	0.039	0.041
E2	0.45	0.50	0.55	0.018	0.020	0.022
L	0.20	0.25	0.30	0.008	0.010	0.012
L2	0.30	0.35	0.40	0.012	0.014	0.016
h	0.05	0.10	0.15	0.002	0.004	0.006

**Packaging**

Tape		Symbol	Dimension (mm)		
		W	12.00+0.30/-0.1		
		P0	4.00±0.10		
		P1	4.00±0.10		
		P2	2.00±0.10		
		D0	Φ1.55±0.05		
		D1	Φ1.00MIN		
		E	1.75±0.10		
		F	5.50±0.05		
		A0	1.25±0.10		
		B0	3.55±0.10		
		K0	0.65±0.05		
		T	0.30±0.05		
				D	Φ180±1.0
				B	Φ60
W1	12.8				
Quantity: 3000PCS					