

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

The UCQ06A05L05 is an ultra low capacitance TVS array designed to Protect high speed data interfaces. It has been specifically Designed to protect sensitive components which is connected to data an transmission lines from overvoltage caused by electrostatic discharge (ESD),cable discharge events (CDE) and lightning.

The unique design incorporates surge rated, low capacitance steering diodes and a TVS diode in a single package. During transient conditions, the steering diodes direct the transient current to ground. The internal TVS diode clamps the transient voltage to a safe level. The ultra low capacitance array configuration allows the user to protect up to the high speed data lines. This device is in a signal package, RoHS/WEEE compliant, DFN1616 package. It measures 1.60x1.60x0.55mm. This device may be used to meet the immunity requirements of IEC61000-4-2 (ESD), IEC61000-4-4 (EFT) and IEC61000-4-5 (Surge).

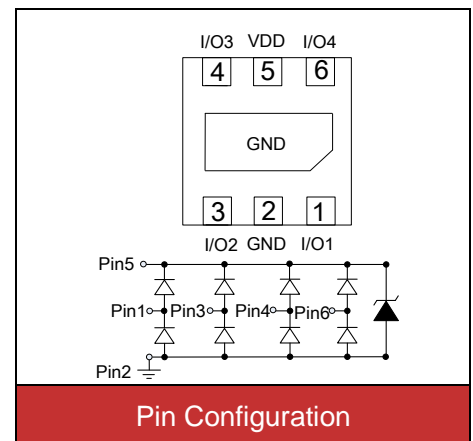


Contact :  $\pm 30\text{kV}$   
Air :  $\pm 30\text{kV}$



### Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- DFN1616 surface mount package
- 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:B5



### Applications

- USB power and data line protection
- SD Card Interfaces
- SIM ports
- 10/100/1000 Ethernet
- WAN/LAN equipment
- Multi Media Card(MMC) Interfaces
- MDDI Ports

## Maximum Ratings

Rating	Symbol	Value	Unit
ESD voltage (Contact discharge)	$V_{ESD}$	$\pm 30$	kV
ESD voltage (Air discharge)		$\pm 30$	
Storage & operating temperature range	$T_{STG}, T_J$	-55~+150	°C

## Electrical Characteristics ( $T_A=25^\circ\text{C}$ )

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				5	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	6			V
Reverse leakage current	$I_R$	$V_R=5\text{V}$ Each I/O pin			1	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=5\text{A}$ Any I/O to GND			15	V
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=12\text{A}$ Any I/O to GND			25	V
Peak pulse current ( $t_p=8/20\mu\text{s}$ )	$I_{PP}$				12	A
Clamping voltage (TLP)	$V_C$	$I_{PP}=8.0\text{A}$		10.9		V
Clamping voltage (TLP)	$V_C$	$I_{PP}=16\text{A}$		13.8		V
Off state junction capacitance	$C_J$	0Vdc, f=1MHz Any I/O to GND		1.5	2	pF
		0Vdc, f=1MHz Between I/O pins		0.7	1	pF

Typical Characteristics Curves

Figure 1. Pulse Waveform

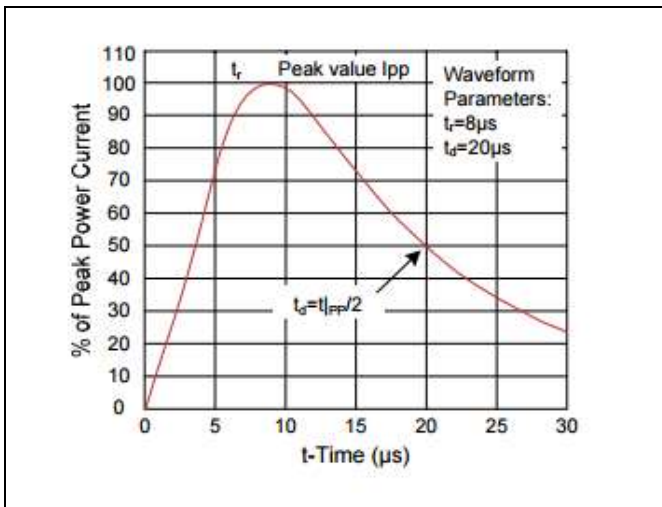


Figure 2. Insertion Loss (S21) I/O to GND

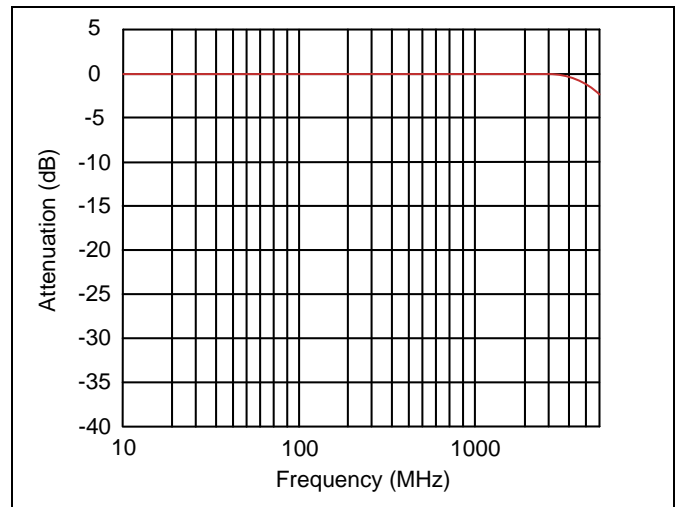


Figure 3. Capacitance vs. Reverse Voltage  
(Any I/O to GND)

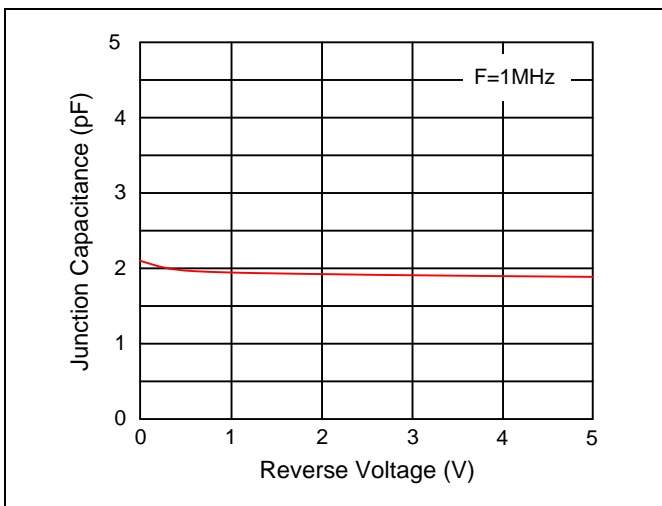


Figure 4. Clamping Voltage vs. Peak Pulse Current  
(Any I/O to GND)

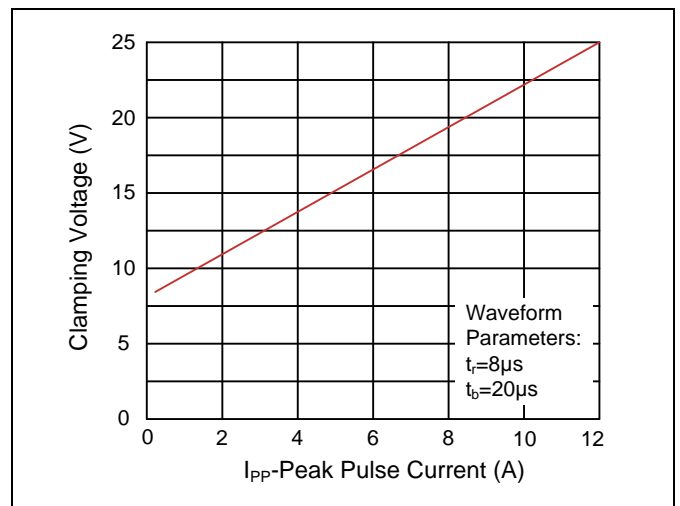


Figure 5. ESD Clamping (8kV Contact IEC61000-4-2)

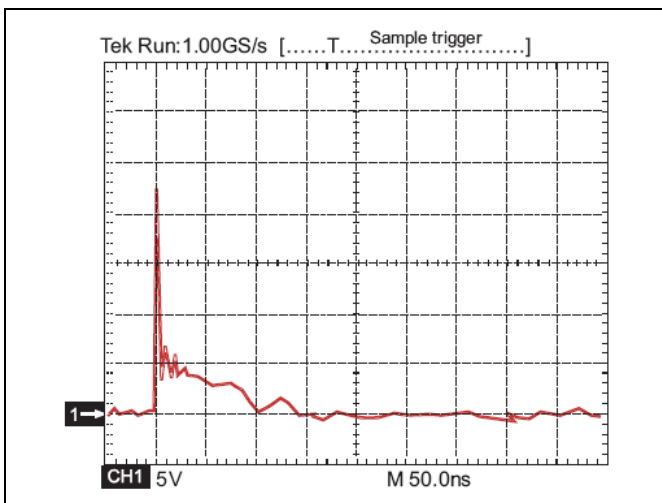
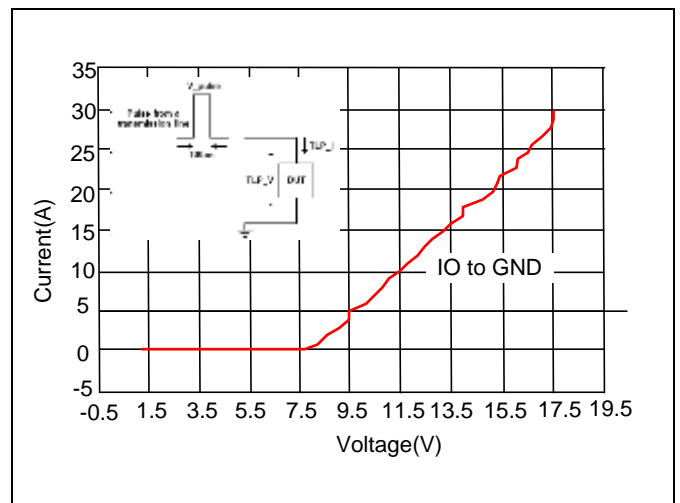
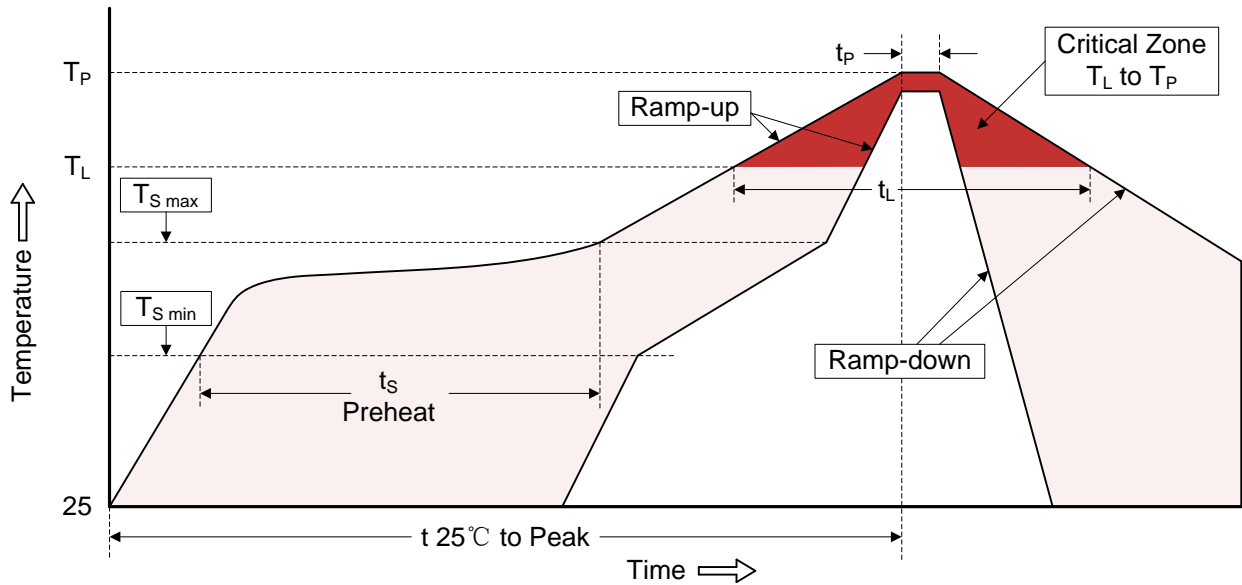


Figure 6. Transmission Line Pulsing (TLP) Measurement



**Recommended Soldering Conditions**

Reflow Soldering



Recommended Condition

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 (DFN1616)**

Symbol	Dimension			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
D	1.55	1.65	0.061	0.065
E	1.55	1.65	0.061	0.065
D1	1.15	1.25	0.045	0.049
E1	0.50	0.60	0.020	0.024
L	0.28	0.38	0.011	0.015
b	0.20	0.30	0.008	0.012
e	0.50BSC		0.020BSC	
A	0.45	0.65	0.018	0.024
A1	0.20REF		0.008REF	
A2	0.00	0.05	0.000	0.002

**Packaging**

Tape		Symbol	Dimension (mm)		
		W	8.00+0.30/-0.10		
		P0	4.00±0.10		
		P1	4.00±0.10		
		P2	2.00±0.05		
		D0	Φ1.50+0.10		
		D1	Φ1.00+0.25		
		E	1.75±0.10		
		F	3.50±0.05		
		A0	1.80±0.10		
		B0	1.80±0.10		
		K0	0.70±0.10		
		T	0.20±0.02		
		Reel		D	Φ178.0±2.0
				D2	Φ13.0
W1	9.5				
Quantity: 3000PCS					