

Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

The UCQ06A05L05 is an 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 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. These devices are in a signal package, RoHS/WEEE compliant, DFN1616 package. It measures 1.60x1.60x0.55mm.

The series devices may be used to meet the immunity requirements of IEC61000-4-2 (ESD), IEC61000-4-4 (EFT) and IEC61000-4-5 (Surge).

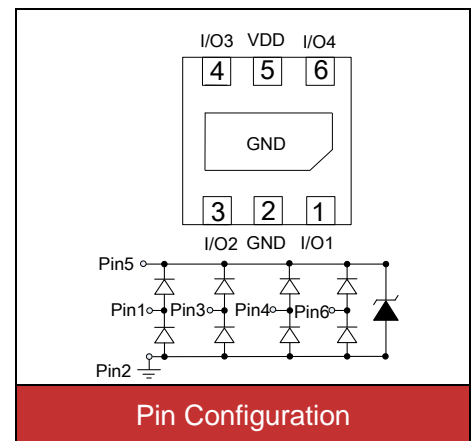


Contact : $\pm 30\text{kV}$
Air : $\pm 30\text{kV}$



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
- AEC-Q101 qualified
- 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
Peak pulse current (tp=8/20μs waveform)	I_{PP}	12	A
ESD voltage (Contact discharge)	V_{ESD}	±30	kV
ESD voltage (Air discharge)		±30	
Storage & operating temperature range	T_{STG}, T_J	-55~+150	°C

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

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	$I_{PP}=5A$ Any I/O to GND			15	V
Clamping voltage (tp=8/20μs)	V_C	$I_{PP}=12A$ Any I/O to GND			25	V
Clamping voltage (TLP)	V_C	$I_{PP}=8.0A$		10.9		V
Clamping voltage (TLP)	V_C	$I_{PP}=16A$		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

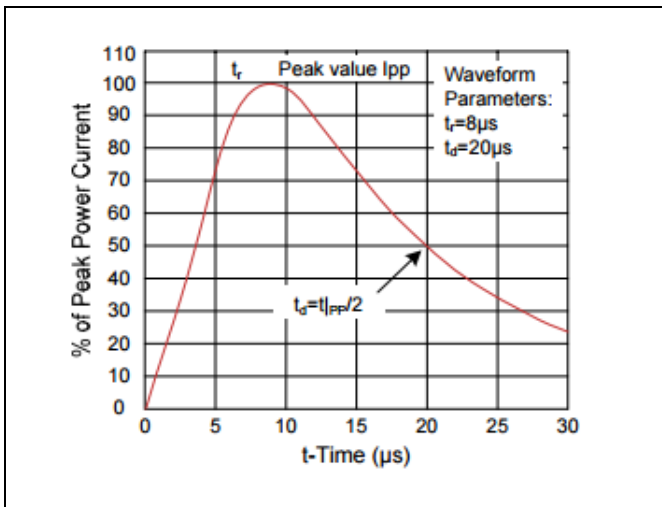


Figure 2. Insertion Loss (S21) I/O to GND

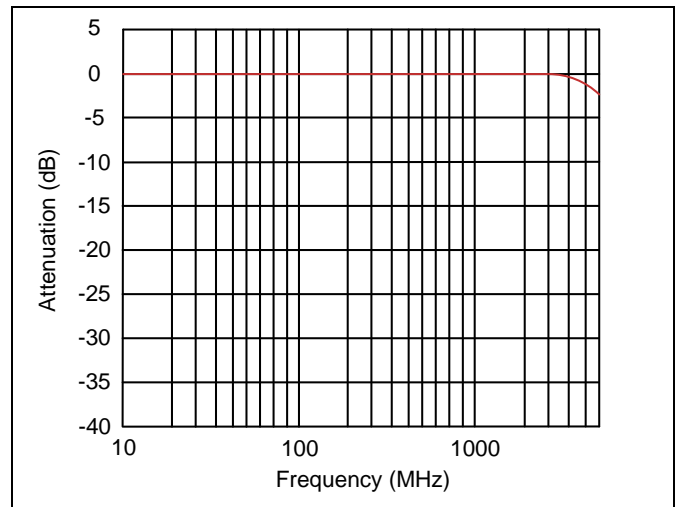


Figure 3. Capacitance vs. Reverse Voltage
(Any I/O to GND)

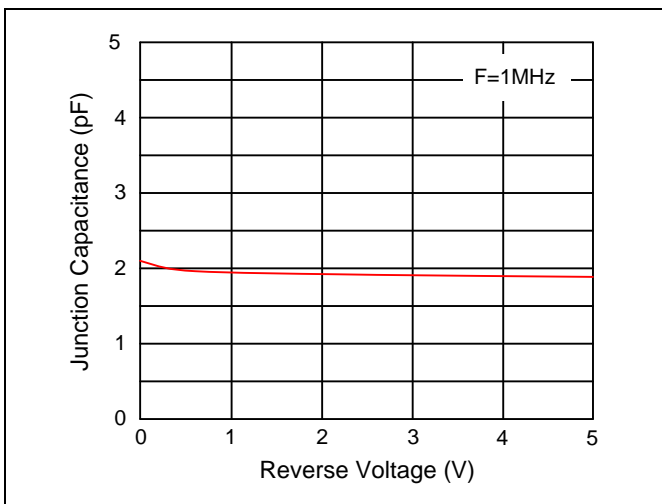


Figure 4. Clamping Voltage vs. Peak Pulse Current
(Any I/O to GND)

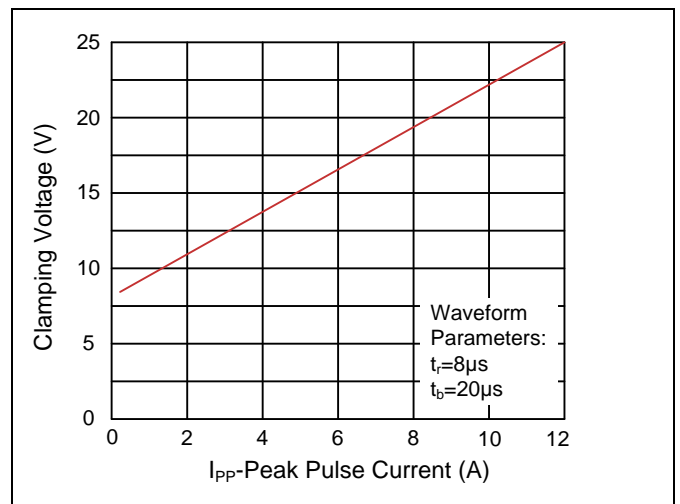


Figure 5. ESD Clamping (8kV Contact IEC61000-4-2)

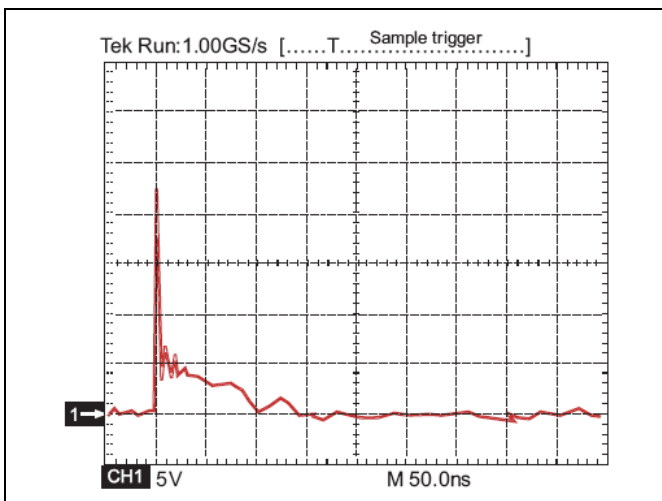
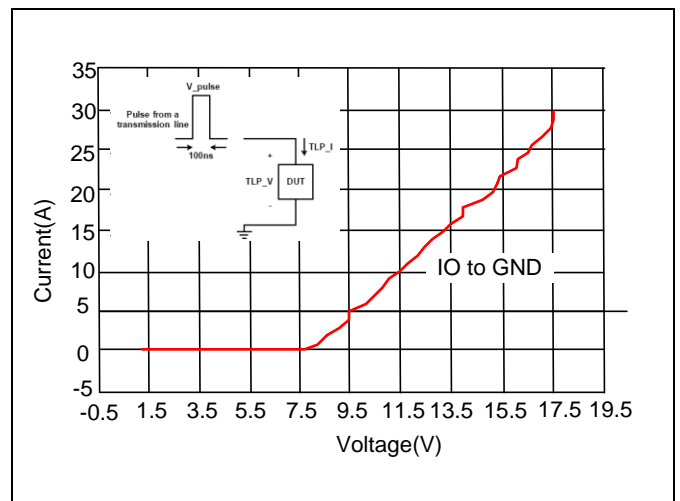
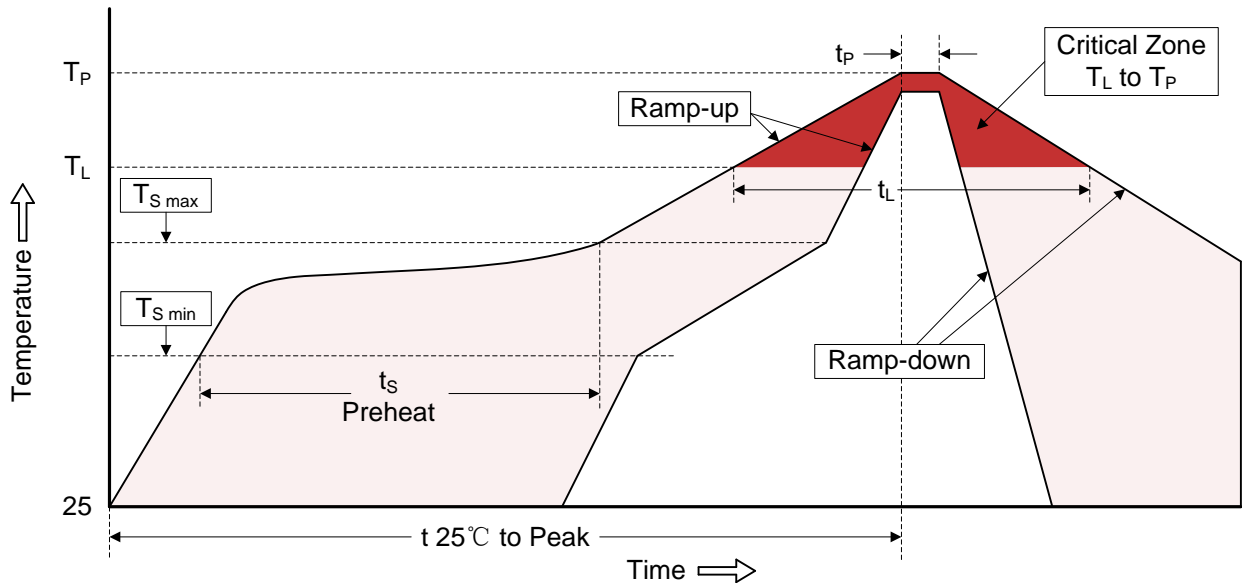


Figure 6. Transmission Line Pulsing (TLP) Measurement



Recommended Soldering Conditions

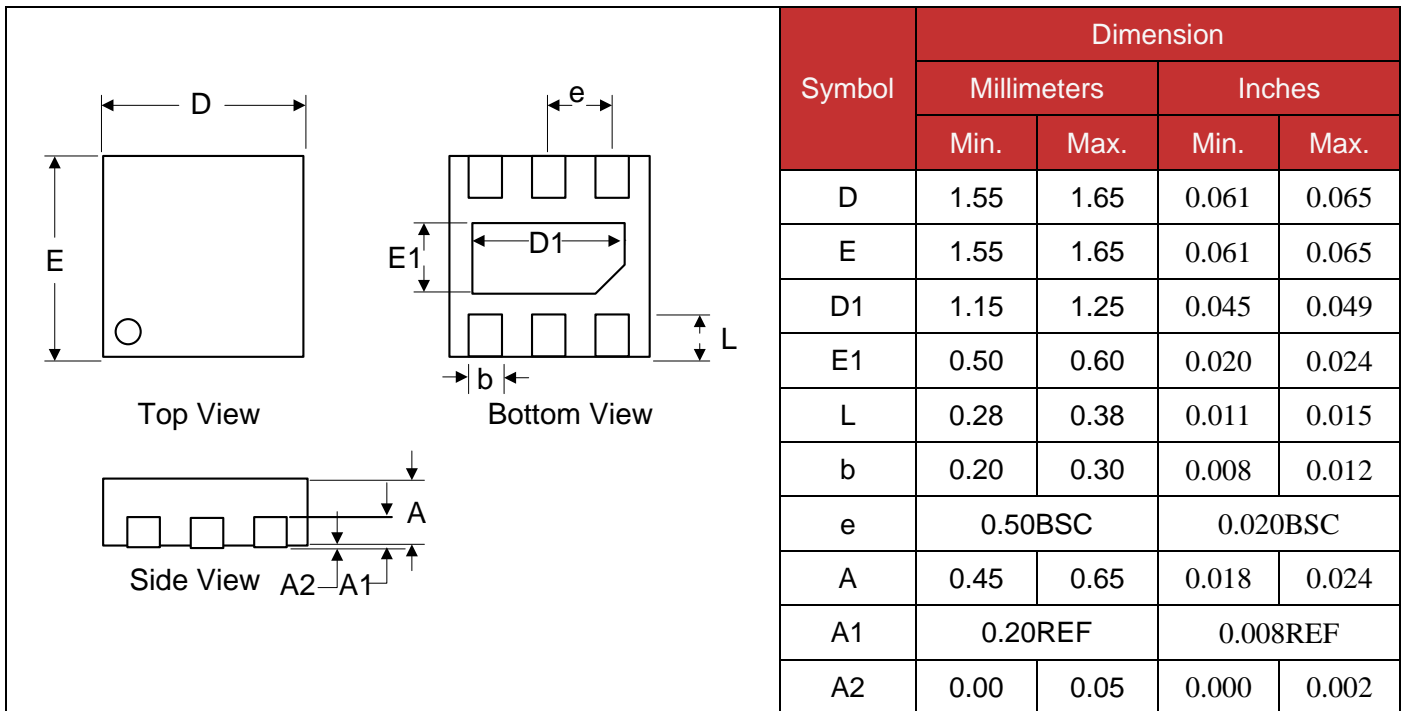
Reflow Soldering



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)



Packaging

