

Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

UBQ10A05L04 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). It has a typical capacitance of only 0.5pF between I/O pins. This allows it to be used on circuits operating in excess of 3GHz without signal attenuation. They may be used to meet the ESD immunity requirements of IEC61000-4-2, Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge). 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 : $\pm 8\text{kV}$
Air : $\pm 15\text{kV}$

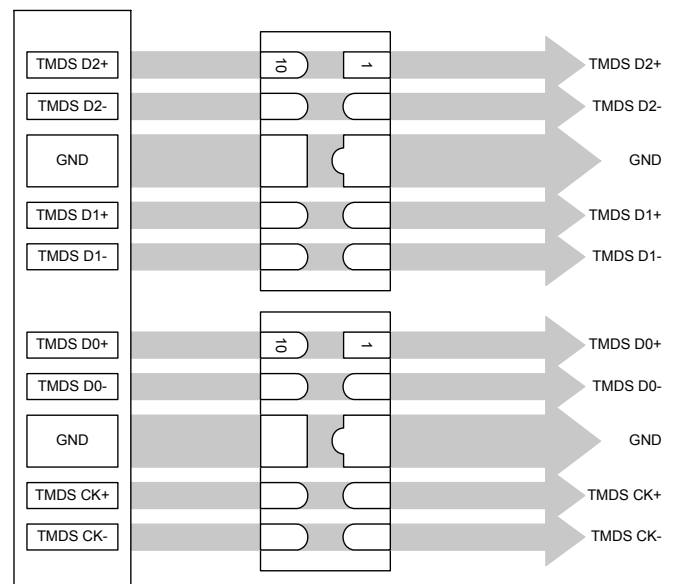
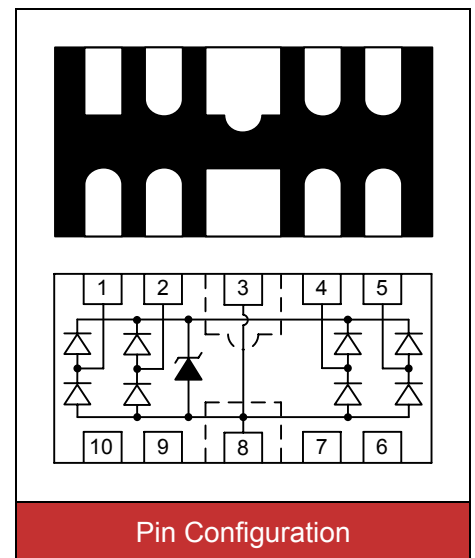


Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- QFN-10 (2.5×1.0×0.5mm) surface mount package
- Protects four 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 54 or 0524P

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

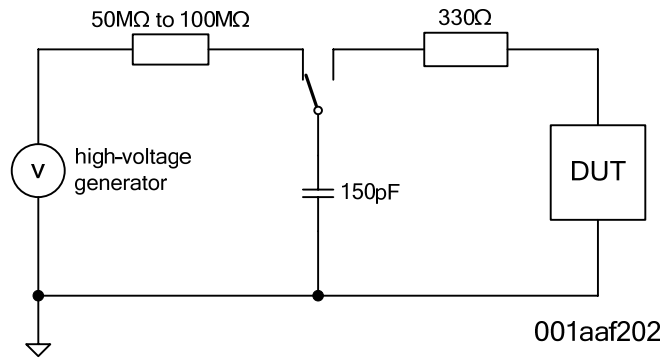
Rating	Symbol	Value	Unit
ESD voltage (Contact discharge)	V_{ESD}	± 8	kV
ESD voltage (Air discharge)		± 15	
Lead soldering temperature	T_L	260	$^{\circ}C$
Storage & operating temperature range	T_{STG}, T_J	-55~+150	$^{\circ}C$

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

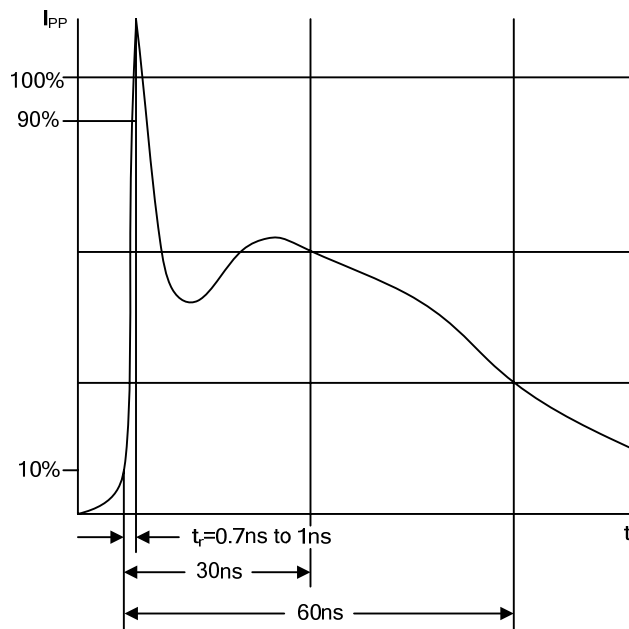
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				5	V
Reverse breakdown voltage	V_{BR}	$I_{BR}=1mA$	6			V
Reverse leakage current	I_R	$V_R=5V$ Each I/O pin			1	μA
Clamping voltage ($t_p=8/20\mu s$)	V_C	$I_{PP}=1A$		9.8		V
Off state junction capacitance	C_J	0Vdc, f=1MHz I/O pin to GND		0.6		pF
		0Vdc, f=1MHz Between I/O pins		0.3		pF

IEC61000-4-2

Interfaces of consumer electronic equipment are widely specified according to the International Electrotechnical Commission standard IEC61000-4-2. This standard is not targeted towards particular devices but towards general equipment, systems and subsystems that may be involved in electrostatic discharge. consists of a 150pF capacitor and a 330Ω series resistor representing the counterpart to the Device Under Test (DUT).



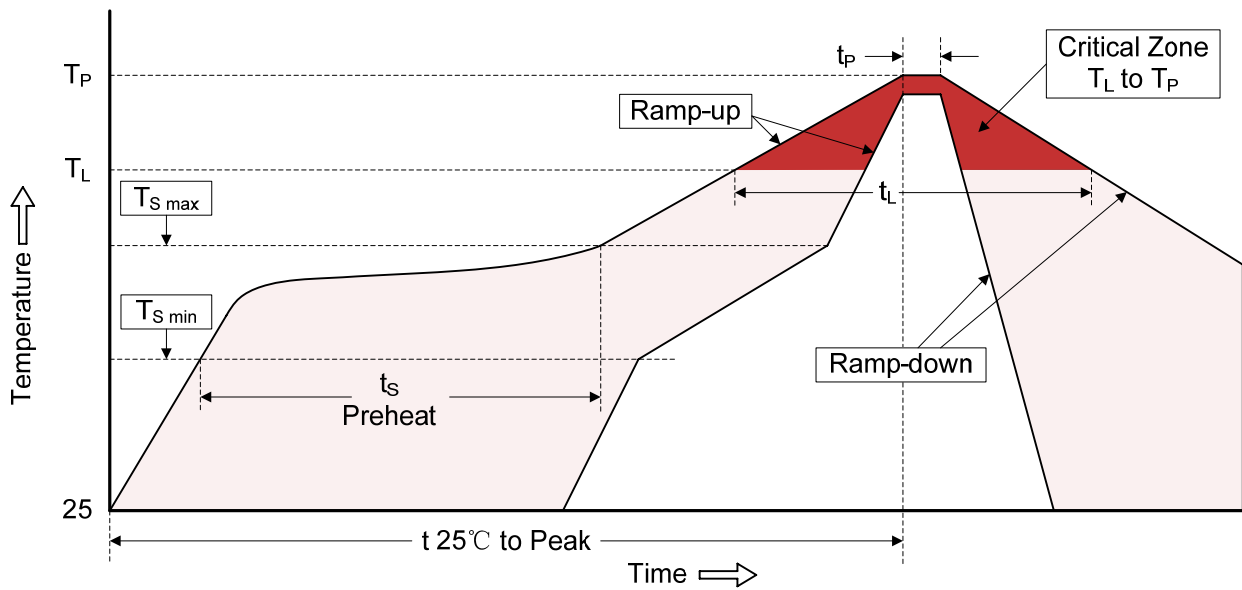
Test circuit according IEC61000-4-2



ESD surge according IEC61000-4-2

Recommended Soldering Conditions

Reflow Soldering

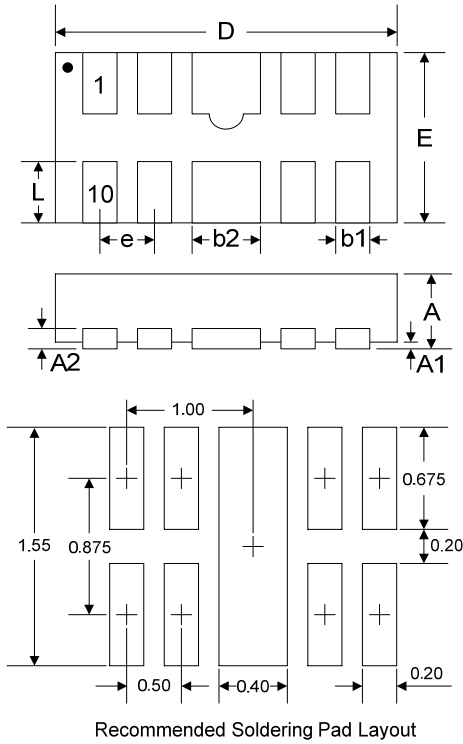


Recommended Conditions

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 (QFN-10)

Symbol	Dimension					
	Millimeters			Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.45	0.55	0.65	0.018	0.022	0.026
A1	-	0.03	0.05	-	0.001	0.002
A2	0.13REF			0.005REF		
b1	0.15	0.20	0.25	0.006	0.008	0.010
b2	0.35	0.40	0.45	0.014	0.016	0.018
D	2.40	2.50	2.60	0.094	0.098	0.102
E	0.90	1.00	1.10	0.035	0.039	0.043
e	0.50BSC			0.020BSC		
L	0.30	0.38	0.43	0.012	0.015	0.017



Packaging

Tape		Symbol	Dimension (mm)		
		W	8.00±0.30		
		P0	4.00±0.10		
		P1	4.00±0.10		
		P2	2.00±0.10		
		D0	Φ1.55±0.10		
		D1	Φ0.80±0.05		
		E	1.75±0.10		
		F	3.50±0.10		
		A	1.22±0.10		
		B	2.70±0.10		
		K	0.70±0.05		
		t	0.25±0.05		
		Reel		D	Φ178.0±2.0
				D2	Φ13.0
W1	9.5				
Quantity: 3000PCS					