

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

UBQ10A03L04 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 0.3pF 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 :  $\pm 20\text{kV}$   
Air :  $\pm 25\text{kV}$

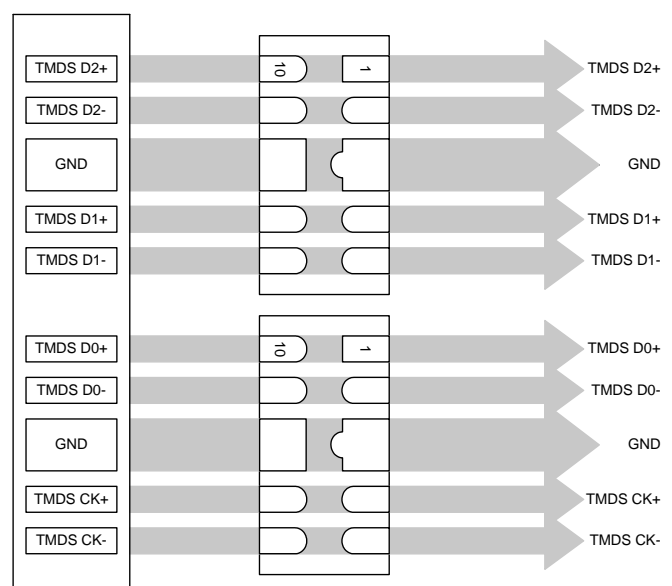
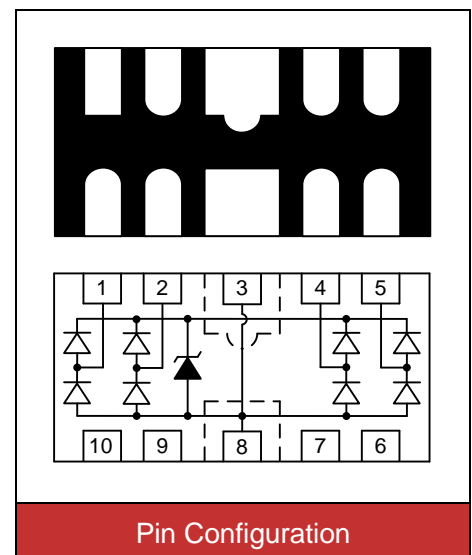


### Features

- QFN-10 (2.5x1.0x0.5mm) surface mount package
- Protects four I/O lines
- Working voltage: 3.3V
- 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 34

### 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 <sub>PP</sub>	4	A
ESD voltage (Contact discharge)	V <sub>ESD</sub>	±20	kV
ESD voltage (Air discharge)		±25	
Storage & operating temperature range	T <sub>STG</sub> , T <sub>J</sub>	-55~+150	°C

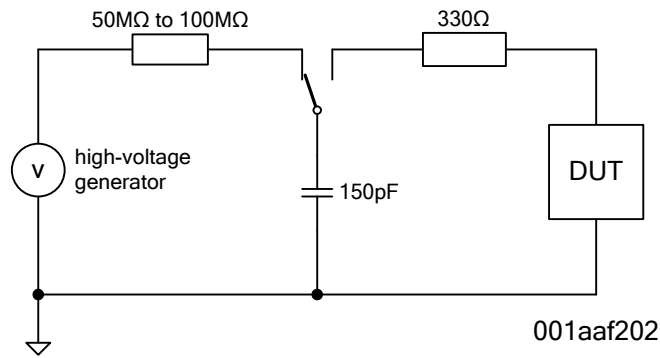
## Electrical Characteristics (T<sub>J</sub>=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				3.3	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	4.5			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =3.3V Each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =1A			8.5	V
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =4A			15	V
Off state junction capacitance	C <sub>J</sub>	0Vdc, f=1MHz I/O pin to GND		0.6		pF
		0Vdc, f=1MHz Between I/O pins		0.3		pF

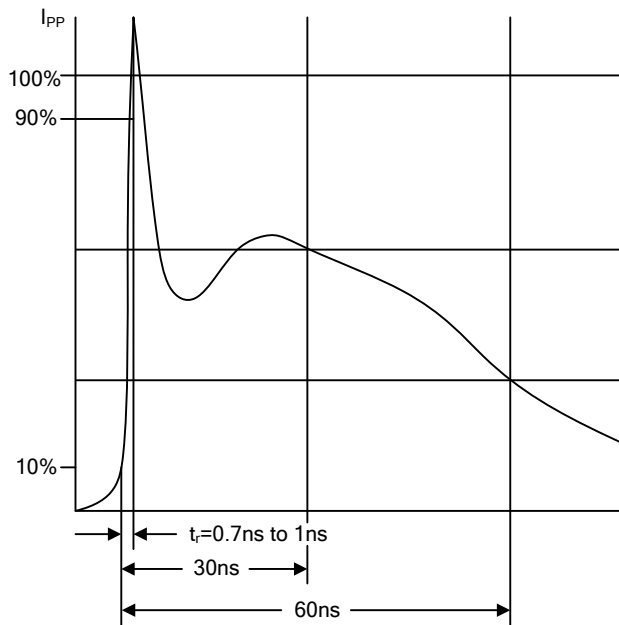
## ESD Protection Standards

### 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).

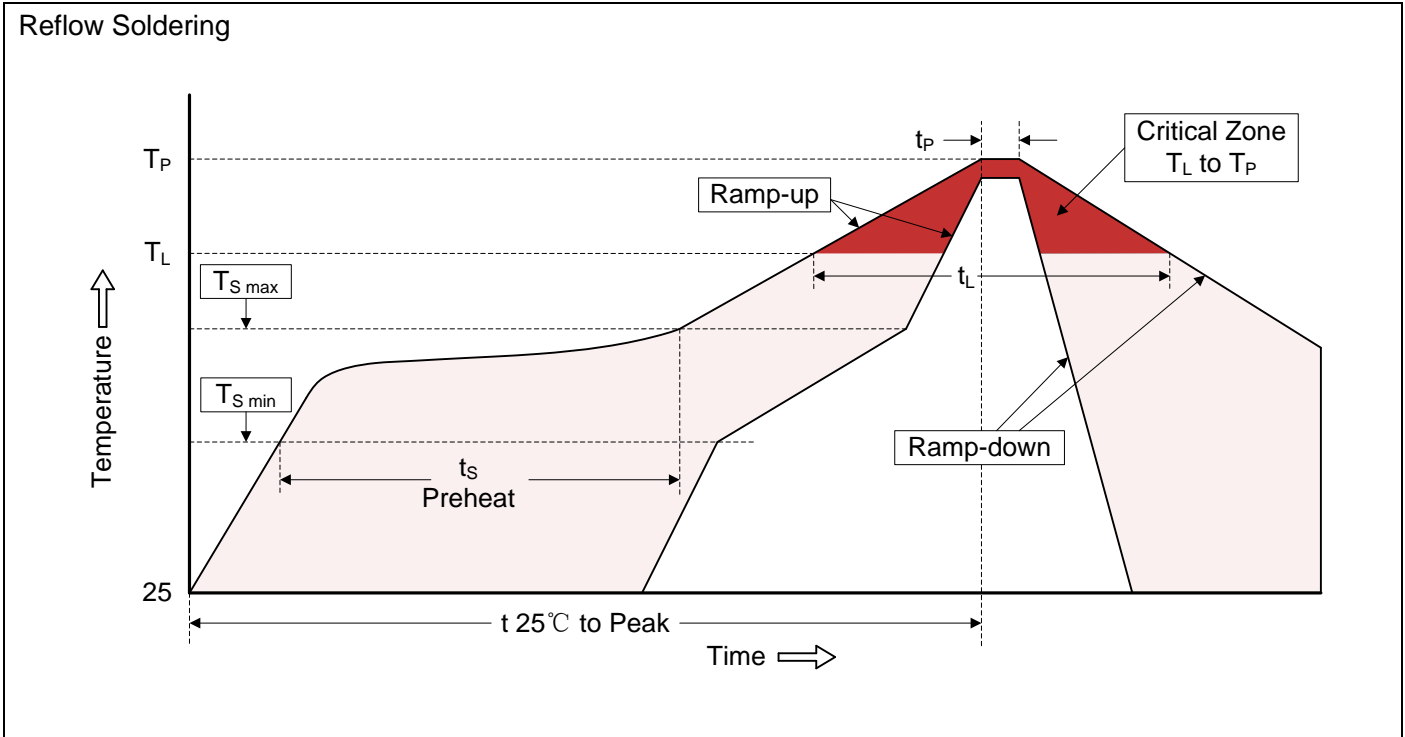


Test circuit according IEC61000-4-2



ESD surge according IEC61000-4-2

**Recommended Soldering Conditions**

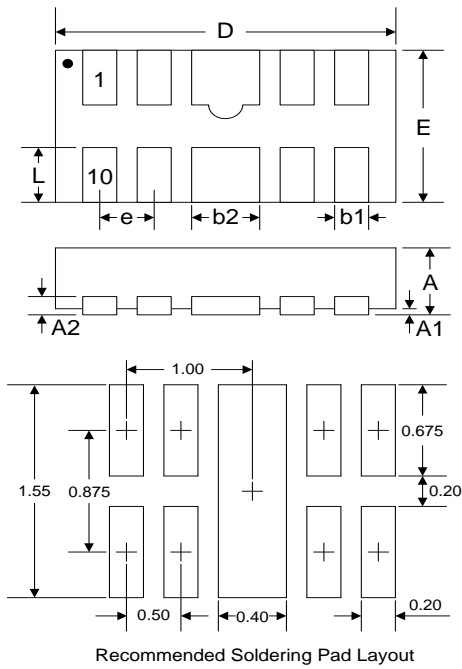


**Recommended Conditions**

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat <ul style="list-style-type: none"> <li>-Temperature Min (<math>T_{S\ min}</math>)</li> <li>-Temperature Max (<math>T_{S\ max}</math>)</li> <li>-Time (min to max) (<math>t_s</math>)</li> </ul>	150°C 200°C 60-180 seconds
$T_{S\ max}$ to $T_L$ <ul style="list-style-type: none"> <li>-Ramp-up Rate</li> </ul>	3°C/second max.
Time maintained above: <ul style="list-style-type: none"> <li>-Temperature (<math>T_L</math>)</li> <li>-Time (<math>t_L</math>)</li> </ul>	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			