

## Electro Static Discharged Protection Devices (ESD) Data Sheet

### Description

The UAQ02C05L01-R0.5 includes back-to-back TVS diodes fabricated in a proprietary silicon avalanche technology to provide protection for electronic equipment that may experience destructive electrostatic discharge (ESD). These robust diodes can safely absorb repetitive ESD strikes up to the maximum level specified in the IEC61000-4-2 international standard without performance degradation.

The back-to-back configuration provides symmetrical ESD protection for data lines when AC signals are present.

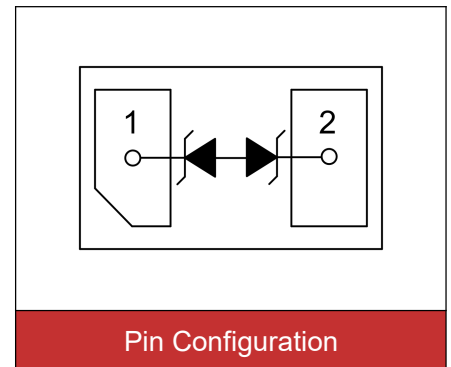


Contact : ±15kV  
Air : ±20kV



### Features

- IEC61000-4-2 ESD 20KV Air, 15KV contact compliance
- SOD882 surface mount package
- Working voltage: 5V
- Low leakage current
- Low operating and clamping voltages
- Lead Free/RoHS compliant
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020
- Marking: 3L



### Applications

- USB 3.0/USB 2.0
- MHL/MIPI/MDDI
- HDMI, Video Port, eSATA
- Set Top Boxes, Game Consoles
- Smart Phones
- External Storage
- Ultrabooks, Notebooks
- Tablets, eReaders

### Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse current (tp=8/20µs)	I <sub>PP</sub>	3.0	A
ESD voltage (Contact discharge)	V <sub>ESD</sub>	±15	kV
ESD voltage (Air discharge)		±20	
Lead soldering temperature	T <sub>L</sub>	260	°C
Storage & operating temperature range	T <sub>STG</sub> , T <sub>J</sub>	-50~+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>				5.0	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1.0mA	6.0			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =5.0V			1.0	μA
Clamping voltage (t <sub>p</sub> =8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =3.0A		15		V
Off state junction capacitance	C <sub>J</sub>	0Vdc,f=1MHz		0.4	0.5	pF

### Typical Characteristics Curves

Figure 1. Pulse Waveform

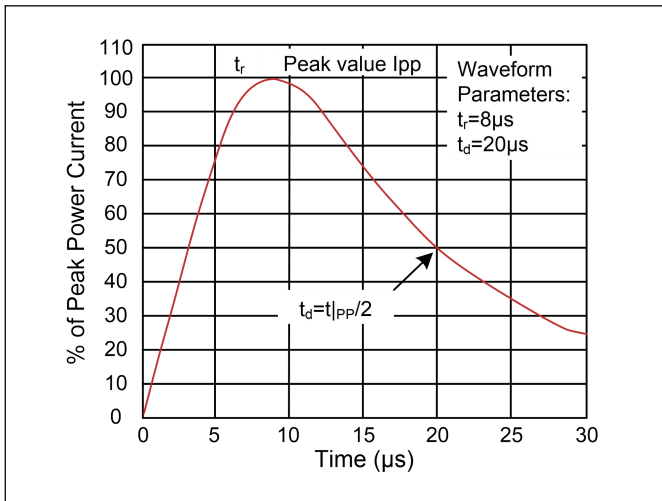


Figure 2. Clamping Voltage vs. Peak Pulse Current

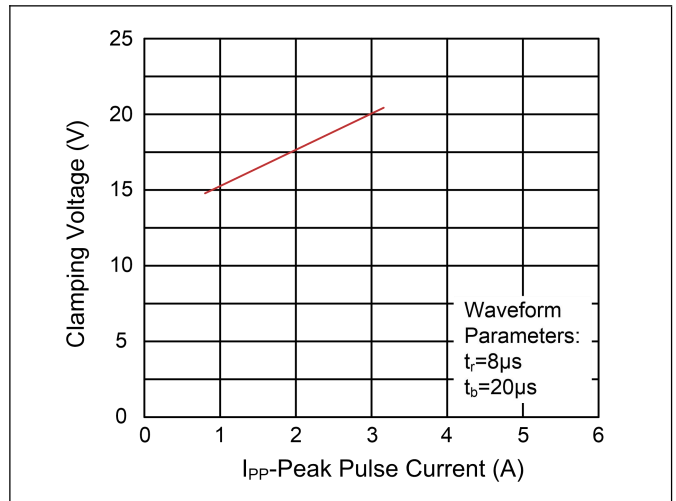


Figure 3. Capacitance vs. Reverse Voltage

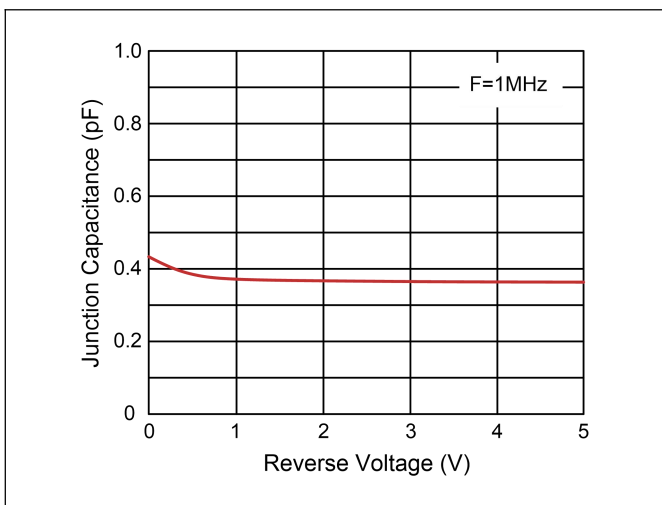
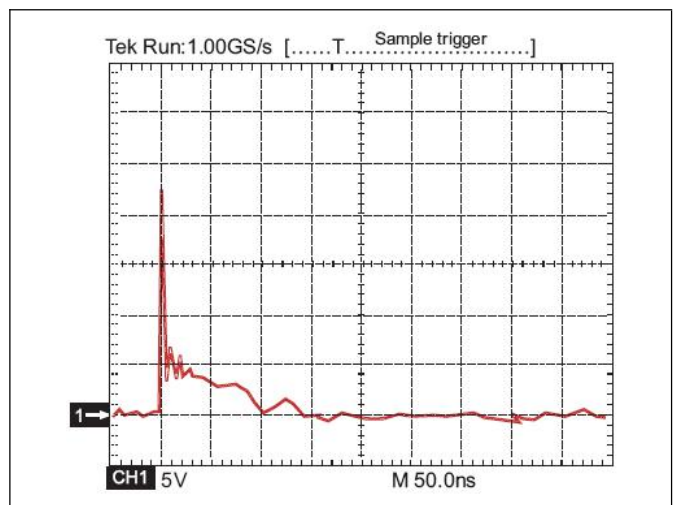
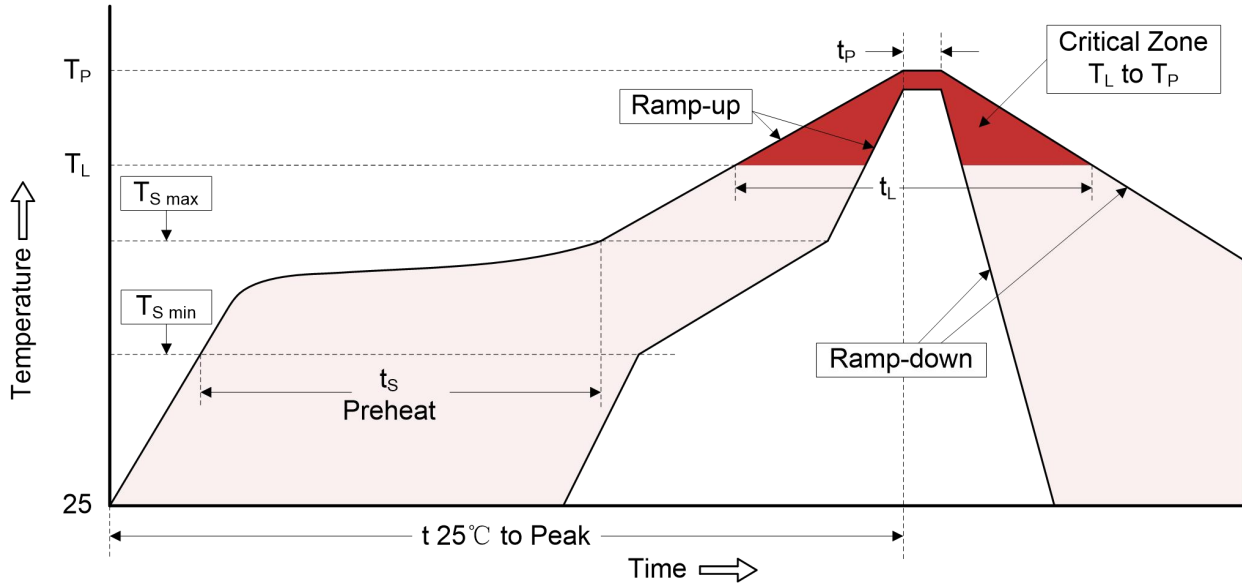


Figure 4. ESD Clamping (8kV Contact IEC61000-4-2)



**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 (DFN0603/QFN-0201)**

Symbol	Dimension (mm)			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.57	0.63	0.022	0.025
B	0.27	0.33	0.011	0.013
C	0.22	0.28	0.009	0.011
D	0.12	0.18	0.005	0.007
E	0.40		0.016	
F	0.24	0.30	0.009	0.012
G	-	0.01	-	0.0004

**Packaging**

Tape	Symbol	Dimension (mm)	
	W	8.00±0.30	
	P0	4.00±0.10	
	P1	2.00±0.10	
	P2	2.00±0.10	
	D0	Φ1.55±0.10	
	D1	Φ0.20±0.05	
	E	1.75±0.10	
	F	3.50±0.10	
	A	0.50±0.10	
	B	0.75±0.10	
	K	0.40±0.05	
	t	0.20±0.05	
	Reel	D	Φ178.0±2.0
		D2	Φ13.00.
	W1	9.50	
Quantity: 10000PCS			

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