Innovative Service Around the Globe YAGEO

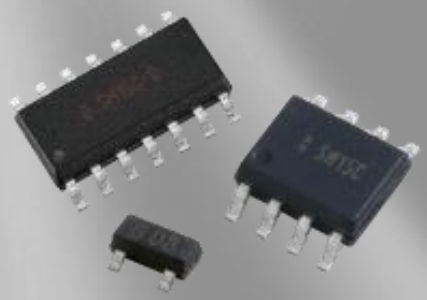
DATA SHEET

ELECTROSTATIC DISCHARGE PROTECTION DEVICES

INDUSTRIAL / CONSUMER

UAQ02C01L01

RoHS compliant & Halogen free



Product specification– July 04, 2023 V.1

Electrostatic Discharged Protection Devices (ESD) Data Sheet

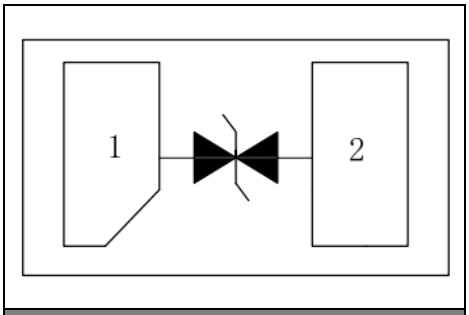
Description

UAQ02C01L01 is a ultra low capacitance ESD protection devices designed to protect high speed data interfaces. They are designed to replace 0201 size mul-tilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and other portable electronics. This device offers desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation. UAQ02C01L01 has a typical capacitance of only 0.13pF. This allows it to be used on circuits operating

Contact: ±8KV
Air: ±8KV

Features

- Transient protection for high-speed data lines IEC 61000-4-2 (ESD) ±8kV (Air) ±8kV (Contact)
- Protects one high-speed data line
- Low reverse current:＜10nA typica1（VR=1.0V）
- Working voltage: 1.0V
- Low capacitance: 0.13pF(Typical)
- Solid-state silicon-avalanche technology
- Marking: T2



Pin Configuration

Applications

- HDMI 1.3/1.4 and HDMI 2.0
- USB 2.0 and USB 3.0/3.1/4.0
- MHL
- LVDS Interfaces
- FM Antenna
- PCI Express
- eSATA Interfaces

Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse power (tp=8/20μs waveform)	P_{PP}	20	W
ESD voltage (Contact discharge)	V_{ESD}	±8	KV
ESD voltage (Air discharge)		±8	
Operating temperature range	T_J	-55~+125	℃
Storage temperature range	T_{STG}	-55~+150	℃

Electrical Characteristics (T_J=25℃)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				1.0	V
Reverse breakdown voltage	V_{BR}	I_{BR}=1mA	1.2			V
Reverse leakage current	I_R	V_R=1V			0.1	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A		3.5		V
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=4A		6.5		V
Clamping Voltage	VC	I_{TLP} = 8A, tp =100ns		5.5		V
Clamping Voltage	VC	I_{TLP} = 16A, tp =100ns		8.5		V
Peak Pulse Current(tp=8/20μs)	I_{PP}				4	A
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND		0.13		pF

Notes

1) ESD gun return path connected to ESD ground reference plane.
2) Transmission Line Pulse Test (TLP) Settings: tp= 100ns, tr= 0.2ns, ITLP and VTLP averaging window: t1 = 70ns to t2= 90ns.
3) Dynamic resistance calculated from I_{TLP} = 4A to I_{TLP} = 16A
4) Guaranteed by design. Not production tested

Typical Characteristics Curves

Figure 1. Pulse Waveforms

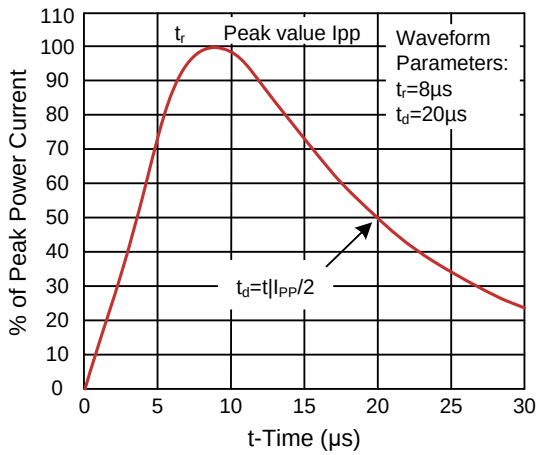


Figure 2. Clamping Voltage vs. Peak Pulse Current

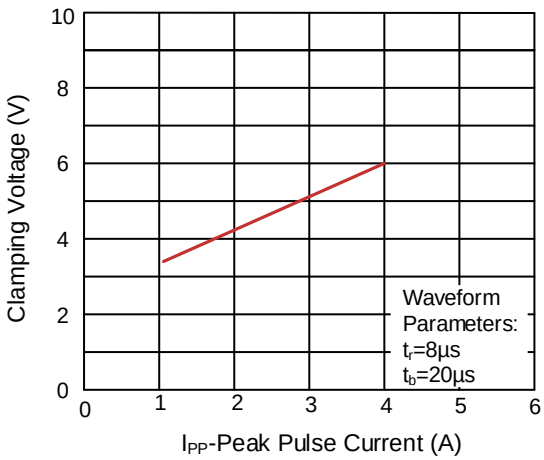


Figure 3. Transmission Line Pulsing (TLP) Plot

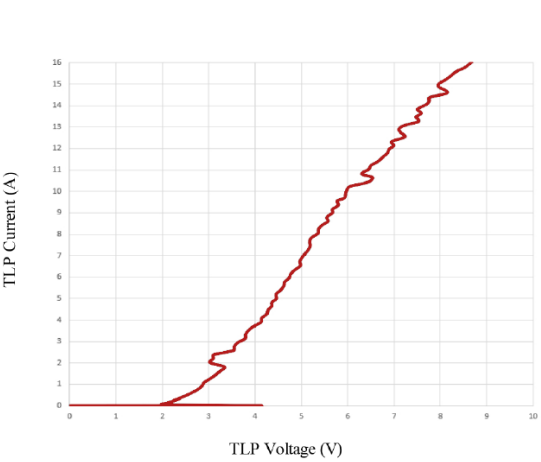
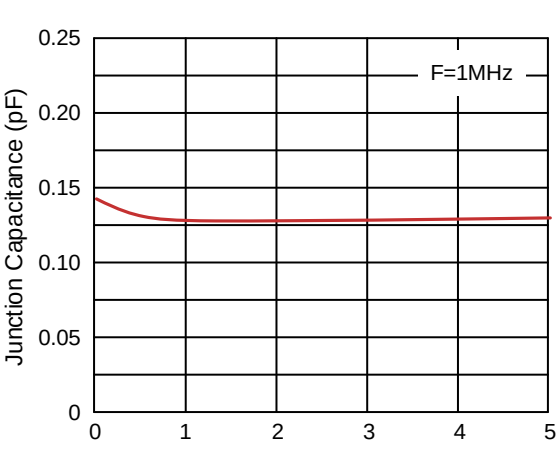
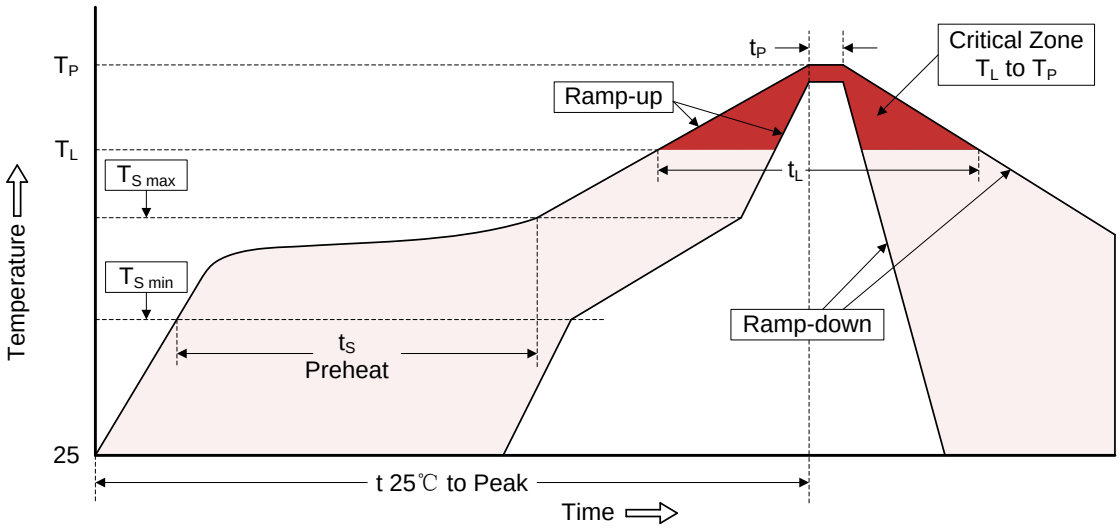


Figure 4. Capacitance vs. Bias Voltage



Recommended Soldering Conditions

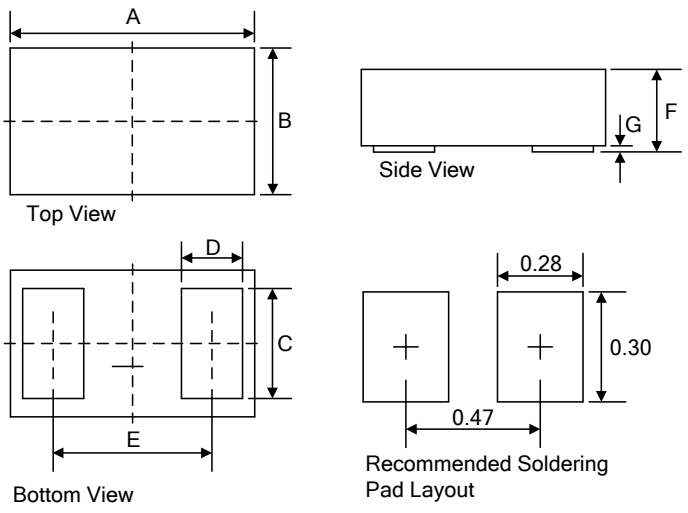
Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\,min}$) -Temperature Max ($T_{S\,max}$) -Time (min to max) (ts)	 150℃ 200℃ 60-180 seconds
$T_{S\,max}$ to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max.

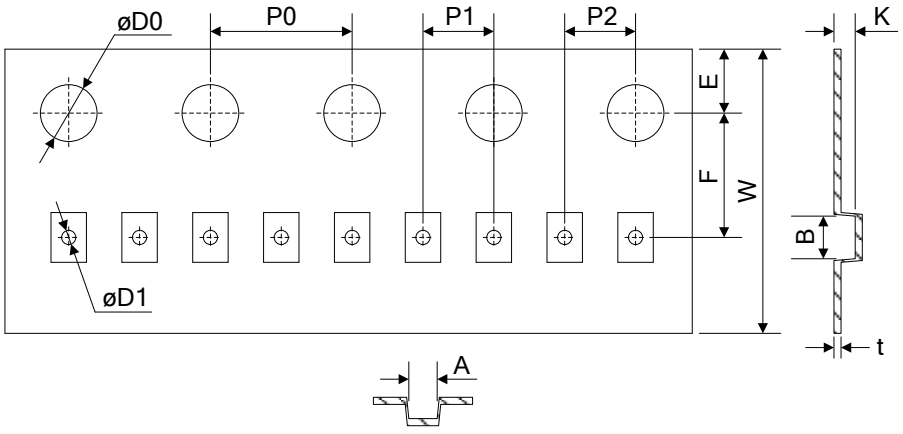
Dimensions (DFN0603/QFN-0201)



Symbol	Dimension (mm)			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.57	0.65	0.022	0.025
B	0.27	0.35	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	0.34	0.009	0.012
G	-	0.05	-	0.0004

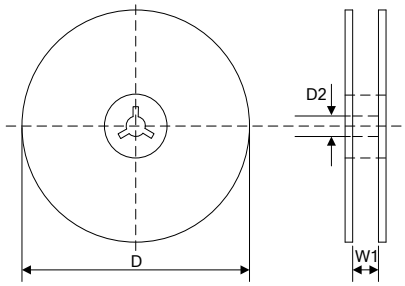
Packaging

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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