

Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

This is ultra low capacitance TVS arrays designed to protect high speed data interfaces. It has been specifically designed to protect sensitive components which is connected to high-speed data and transmission lines from overvoltage caused by electrostatic discharge (ESD), cable discharge events (CDE) and electrical fast transients (EFT). It has a typical capacitance of only 1.5 pF(typ.). This means it can be used on circuits operating in excess of 1GHz without signal attenuation.

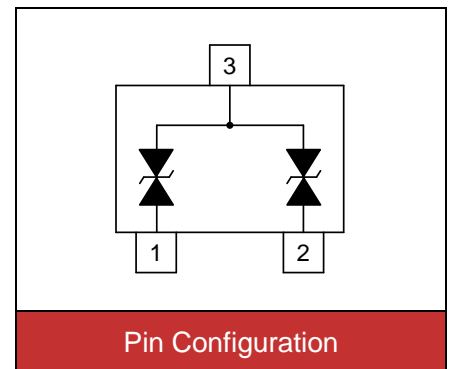


Contact : $\pm 30\text{kV}$
Air : $\pm 30\text{kV}$



Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- SOT-23 surface mount package
- Protects two high speed data lines
- Working voltage: 3.3V, 5V
- Ultra low capacitance and clamping voltages
- Low leakage current
- 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



Applications

- Mobile display digital interface
- RF/Antenna circuits
- USB 2.0 & Firewire ports
- GaAs photodetector protection
- HBT power Amp protection
- Infiniband transceiver protection

Maximum Ratings

Rating	Symbol	Value	Unit
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°C)
UCT23C03L02 (Marking: B U03)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V _{RWM}				3.3	V
Reverse breakdown voltage	V _{BR}	I _{BR} =1mA	3.5			V
Reverse leakage current	I _R	V _R =3.3V Each I/O pin			500	nA
Clamping voltage (tp=8/20μs)	V _C	I _{PP} =1A		9.8		V
Clamping voltage (tp=8/20μs)	V _C	I _{PP} =11A		13		V
Off state junction capacitance	C _J	0Vdc, f=1MHz Between I/O pins and GND		1.5	2.5	pF

UCT23C05L02 (Marking: B U05)

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			500	nA
Clamping voltage (tp=8/20μs)	V _C	I _{PP} =1A		9.8		V
Clamping voltage (tp=8/20μs)	V _C	I _{PP} =12A		15		V
Off state junction capacitance	C _J	0Vdc, f=1MHz Between I/O pins and GND		1.5	2.5	pF

Typical Characteristics Curves

Figure 1. Pulse Waveforms

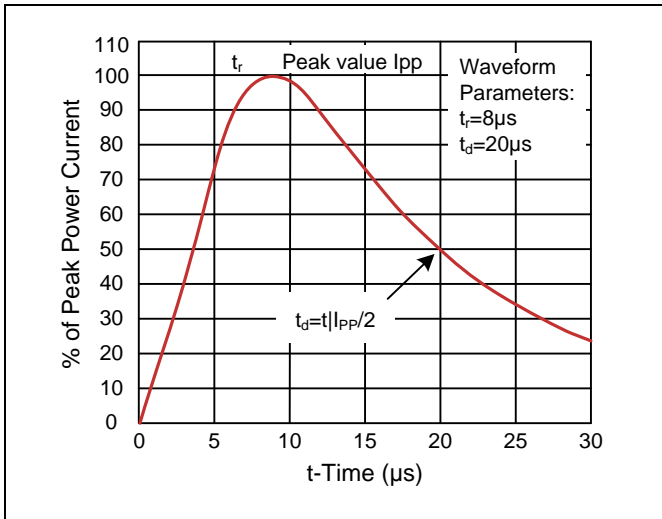


Figure 2. Capacitance vs. Reverse Voltage

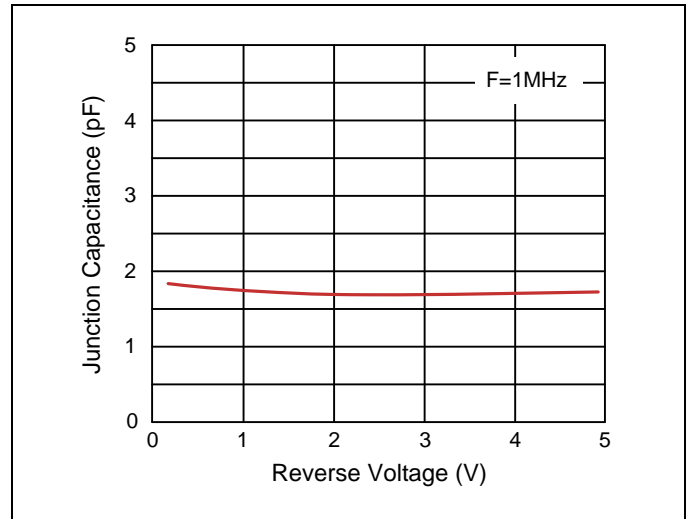
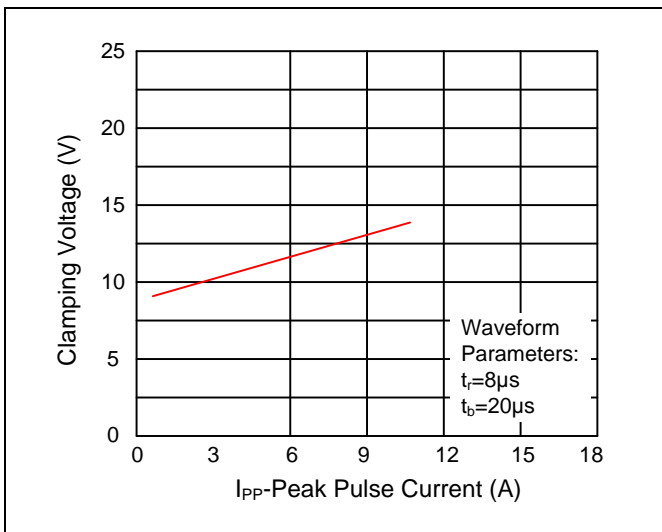
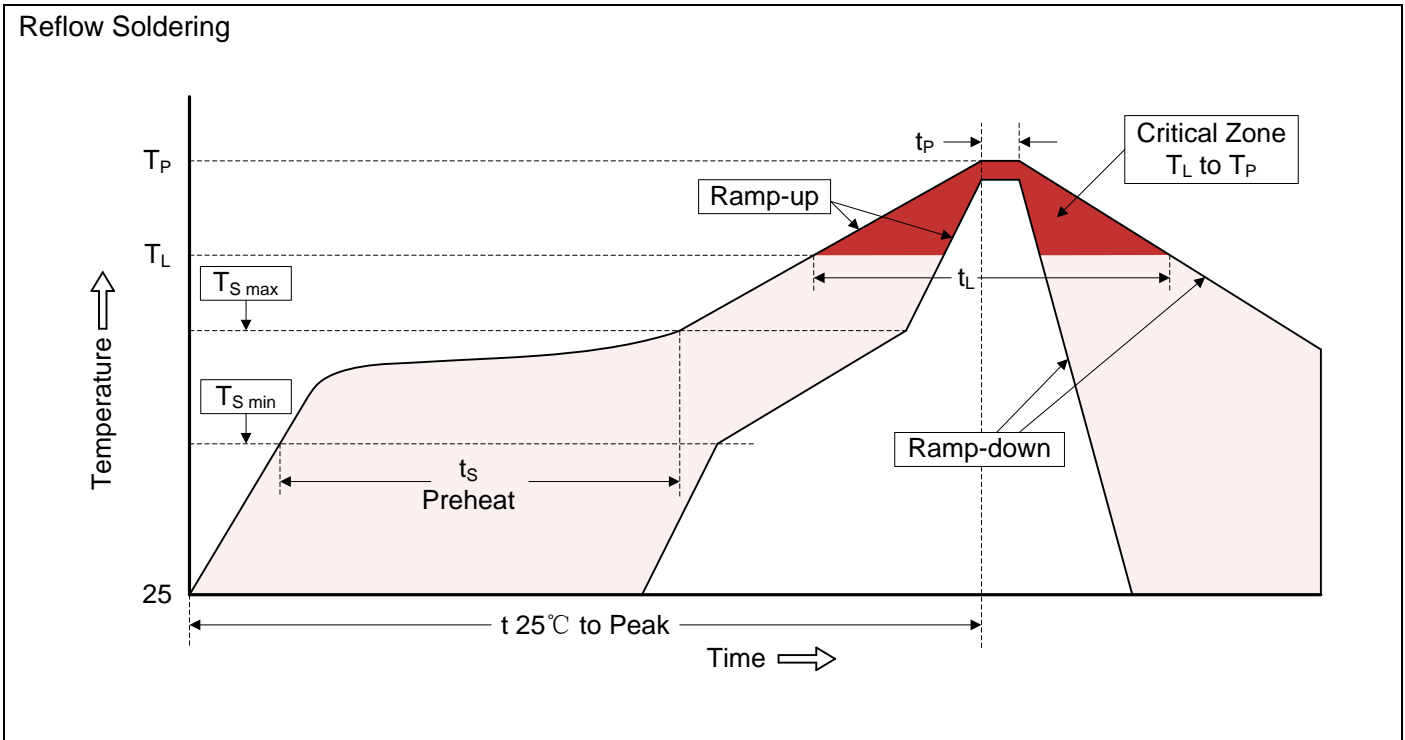


Figure 2. Clamping Voltage vs. Peak Pulse Current



Recommended Soldering Conditions

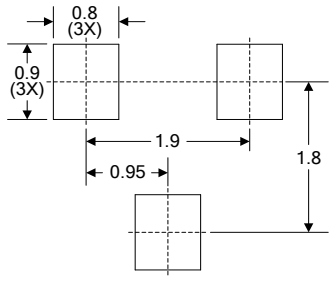
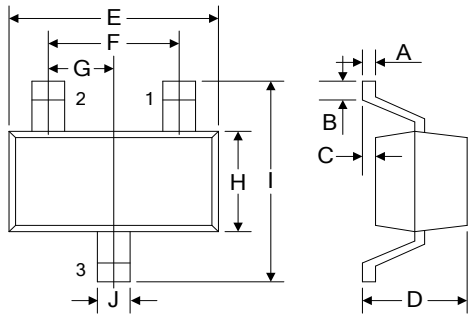


Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat	150°C
-Temperature Min ($T_{S\ min}$)	200°C
-Temperature Max ($T_{S\ max}$)	60-180 seconds
-Time (min to max) (t_s)	
$T_{S\ max}$ to T_L	3°C/second max
-Ramp-up Rate	
Time maintained above:	217°C
-Temperature (T_L)	60-150 seconds
-Time (t_L)	
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 (SOT-23)

Symbol	Dimension			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.08	0.18	0.003	0.007
B	0.15	-	0.006	-
C	-	0.13	-	0.005
D	0.89	1.09	0.035	0.043
E	2.80	3.05	0.110	0.120
F	1.90		0.075	
G	0.95		0.037	
H	1.19	1.40	0.047	0.055
I	2.10	2.49	0.083	0.098
J	0.35	0.50	0.014	0.020

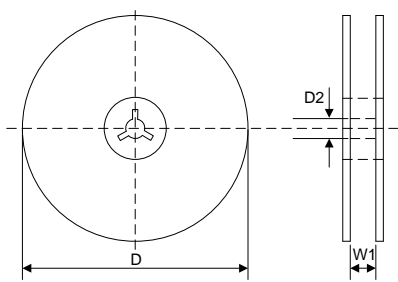
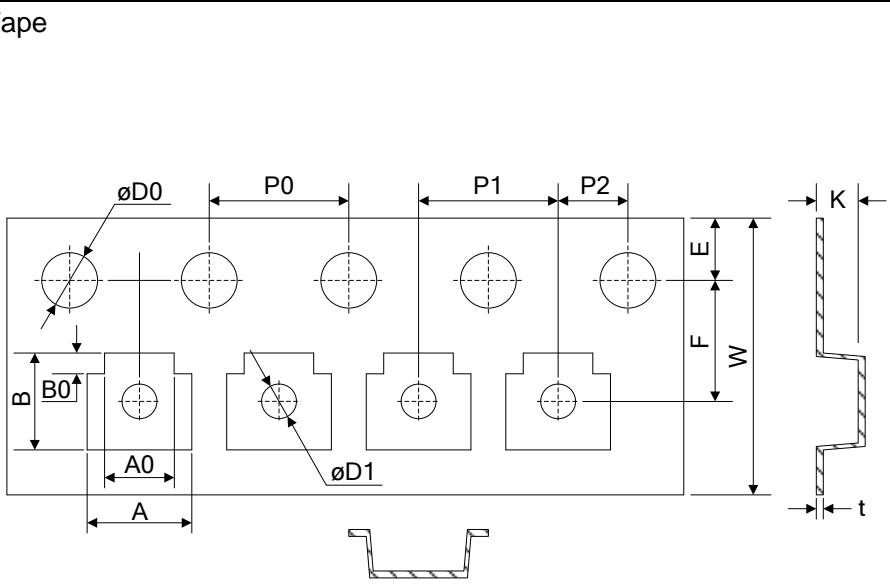


Recommended Soldering Pad Layout

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	Φ1.00±0.05	
E	1.75±0.10	
F	3.50±0.10	
A	3.10±0.10	
A0	2.10±0.10	
B	2.75±0.10	
B0	0.65±0.10	
K	1.10±0.10	
t	0.20±0.05	

Reel	D	Φ178.0±2.0
	D2	Φ13.0
	W1	9.5
	Quantity: 3000PCS	



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