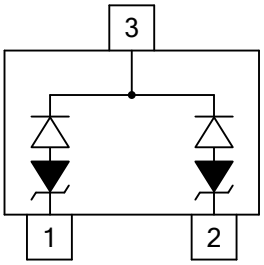
Description

The UDT23AXXL02 series are ultra low capacitance TVS arrays 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 overvoltage caused by electrostatic discharge (ESD), cable discharge events(CDE) and electrical fast transients(EFT).The series has a typical capacitance of only 0.8pF. This means it can be used on circuits operating in excess of 3GHz without signal attenuation.



Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- SOT-23 surface mount package
- Protects two high speed data line
- Peak power dissipation of 400W under 8/20μs waveform
- Working voltage: 3.3V, 5V, 12V, 15V and 24V
- Low leakage current
- Ultra low capacitance and clamping voltage
- Solder reflow temperature: Pure Tin-Sn, 260~270℃

Applications

- HDMI interface protection
- 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
Peak pulse power (tp=8/20μs waveform)	P_{PP}	400	W
ESD voltage (Contact discharge)	V_{ESD}	±8	kV
ESD voltage (Air discharge)		±15	
Storage & operating temperature range	T_{STG} ,T_J	-55~+150	℃

Electrical Characteristics (T_J=25℃)

UDT23A03L02

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				3.3	V
Reverse breakdown voltage	V_{BR}	I_{BR}=1mA	4			V
Reverse leakage current	I_R	V_R=3.3V each I/O pin			20	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A			10	V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND		0.8		pF

UDT23A05L02

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			5	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A			12	V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND		0.8		pF

UDT23A12L02

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				12	V
Reverse breakdown voltage	V_{BR}	I_{BR}=1mA	13.3			V
Reverse leakage current	I_R	V_R=12V each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A			25	V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND		0.8		pF

UDT23A15L02

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				15	V
Reverse breakdown voltage	V_{BR}	I_{BR}=1mA	16.7			V
Reverse leakage current	I_R	V_R=15V each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A			30	V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND		0.8		pF

Electrical Characteristics (T_J=25℃)

UDT23A24L02

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				24	V
Reverse breakdown voltage	V_{BR}	I_{BR}=1mA	26.7			V
Reverse leakage current	I_R	V_R=24V each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V_C	I_{PP}=1A			48	V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND		0.8		pF

Typical Characteristics Curves

Figure 1. Power Derating Curve

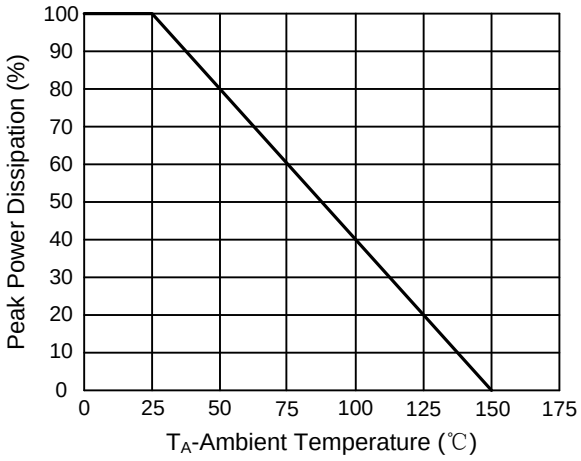


Figure 2. Pulse Waveforms

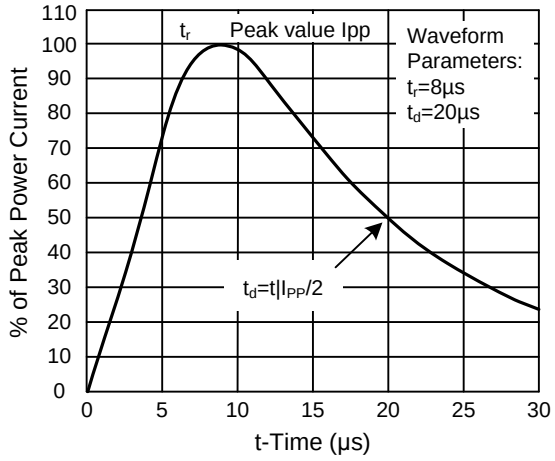


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

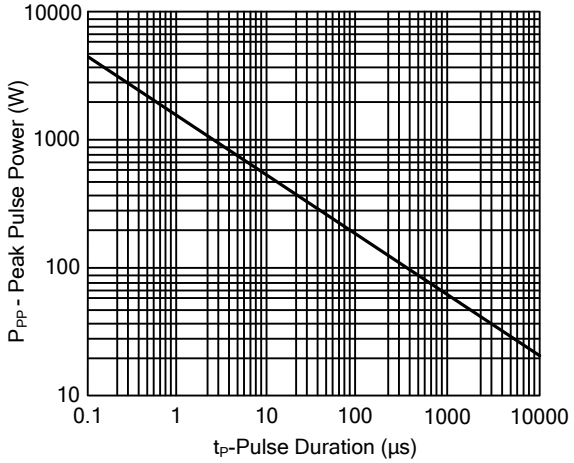
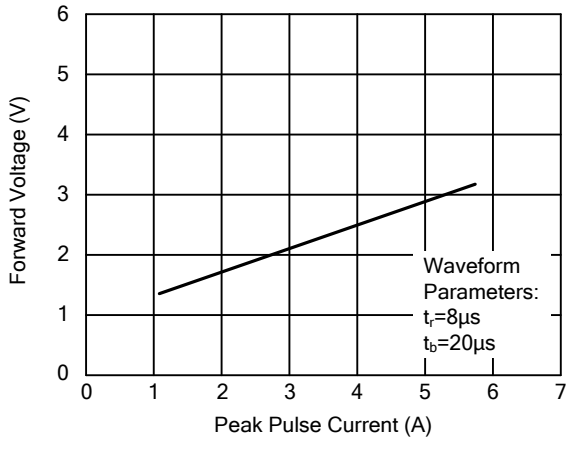
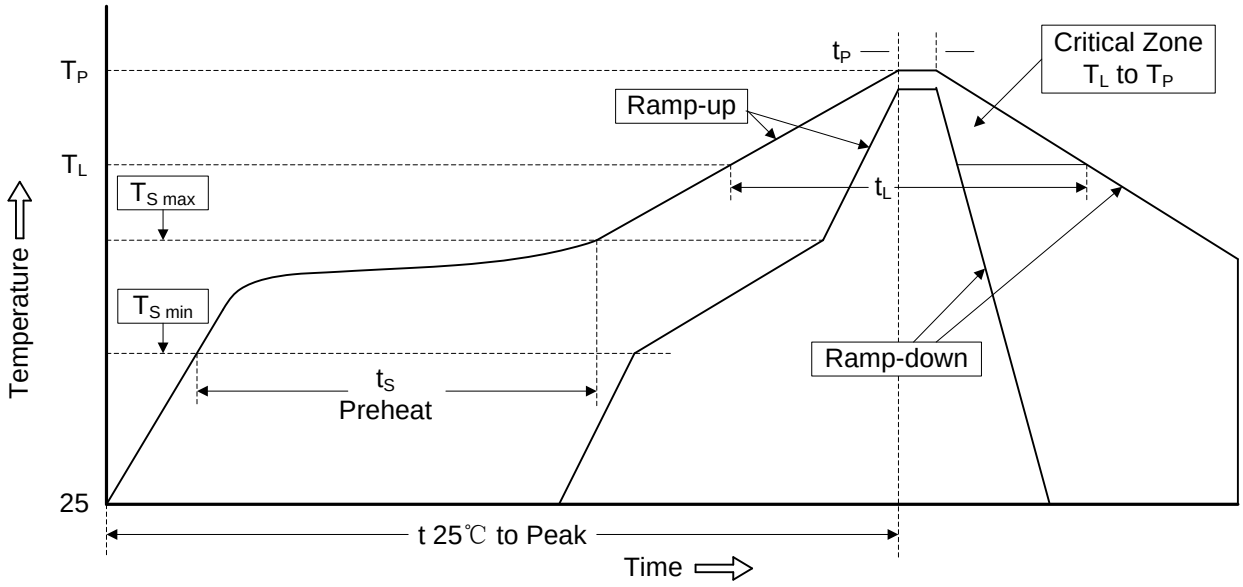


Figure 4. Forward Voltage vs. Forward Current



Recommended Soldering Conditions

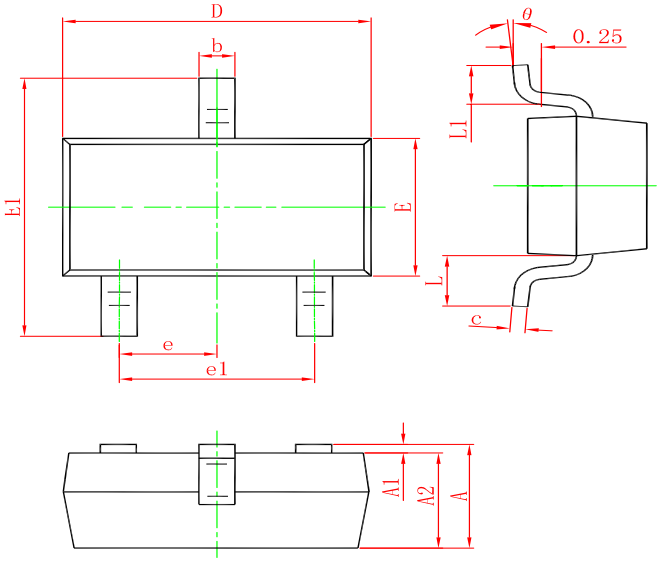
Reflow Soldering



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.

SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Marking

Ordering information

Order code	Package	Baseqty	Deliverymode	Marking
UMW UDT23A03L02	SOT-23	3000	Tape and reel	B LSC U
UMW UDT23A05L02	SOT-23	3000	Tape and reel	B LTC U
UMW UDT23A12L02	SOT-23	3000	Tape and reel	B LUC U
UMW UDT23A15L02	SOT-23	3000	Tape and reel	B LWC U
UMW UDT23A24L02	SOT-23	3000	Tape and reel	B LXC U

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