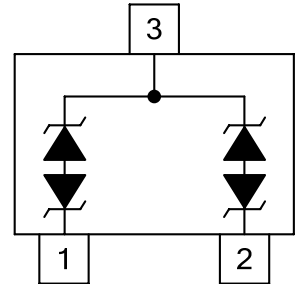


## Description

SDT23CXXL02 series are designed to protect sensitive electronics from damage or latch-up due to ESD and other voltage induced transient events. They are designed for use in applications where board space is at a premium. The devices will protect up to two lines. They are bidirectional devices and may be used on lines where the signal polarities are above ground. The size SOT-23 package makes them ideal for use in portable electronics such as RS-422 I/Os, RS-232 I/Os, notebook computers, and servers.



## Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- SOT-23 surface mount package
- Protects bidirectional two I/O lines
- Peak power dissipation of 350W under 8/20 $\mu$ s waveform
- Working voltage: 5V, 12V & 15V
- Low leakage current
- Low operating and clamping voltages
- Solder reflow temperature: Pure Tin-Sn, 260~270 $^{\circ}$ C

## Applications

- Microprocessor based equipment
- LAN/WAN equipment
- Desktops PC and servers
- Notebook, Laptop and Palmtop computers
- Set Top Box
- Peripherals
- Serial and Parallel ports

**Maximum Ratings**

Rating	Symbol	Value	Unit
Peak pulse power (tp=8/20μs waveform)	P <sub>PP</sub>	350	W
ESD voltage (Contact discharge)	V <sub>ESD</sub>	±8	kV
ESD voltage (Air discharge)		±15	
Storage & operating temperature range	T <sub>STG</sub> ,T <sub>J</sub>	-55~+150	°C

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

SDT23C05L02

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				5	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	6			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =5V Each I/O pin			5	μA
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =1A			9.8	V
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =10A			18	V
Off state junction capacitance	C <sub>J</sub>	0Vdc, f=1MHz Between I/O pins and GND		150		pF

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

SDT23C12L02

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				12	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	13.3			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =12V Each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =1A			19	V
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =5A			32	V
Off state junction capacitance	C <sub>J</sub>	0Vdc, f=1MHz Between I/O pins and GND		65		pF

SDT23C15L02

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				15	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	16.7			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =15V each I/O pin			1	μA
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =1A			24	V
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =5A			38	V
Off state junction capacitance	C <sub>J</sub>	0Vdc, f=1MHz Between I/O pins and GND		60		pF

Typical Characteristics Curves

Figure 1. Power Derating Curve

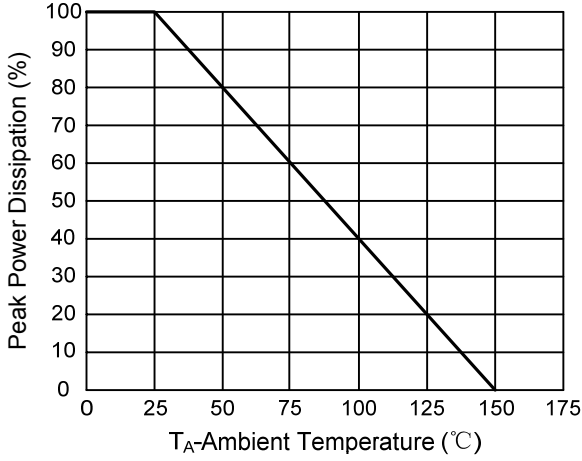


Figure 2. Pulse Waveforms

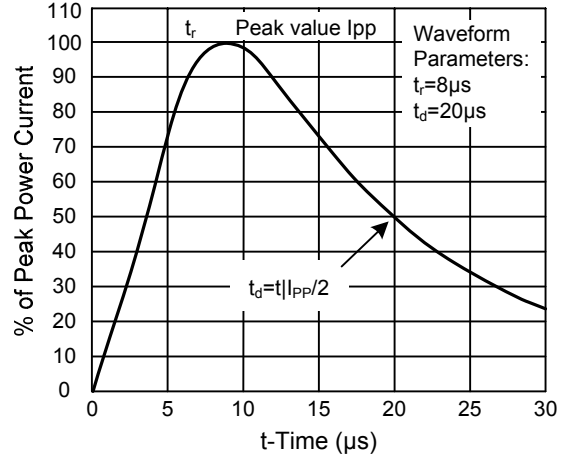


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

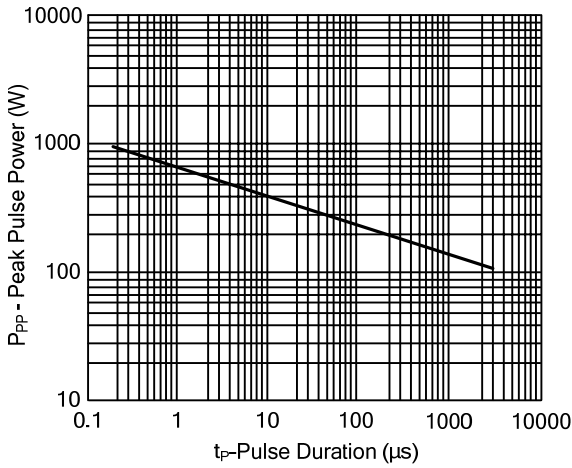


Figure 4. Normalized Capacitance vs. Reverse Voltage

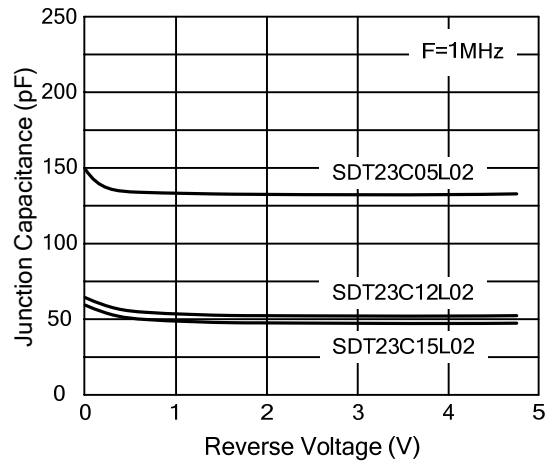


Figure 5. ESD Clamping(8kV Contact IEC61000-4-2)

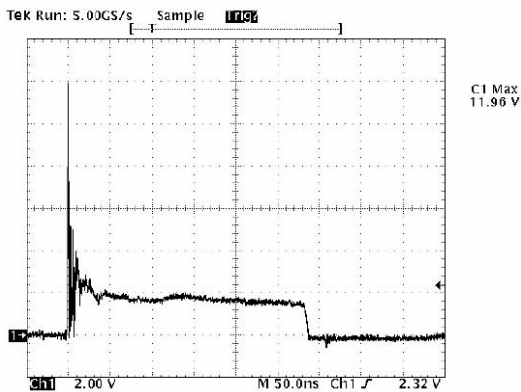
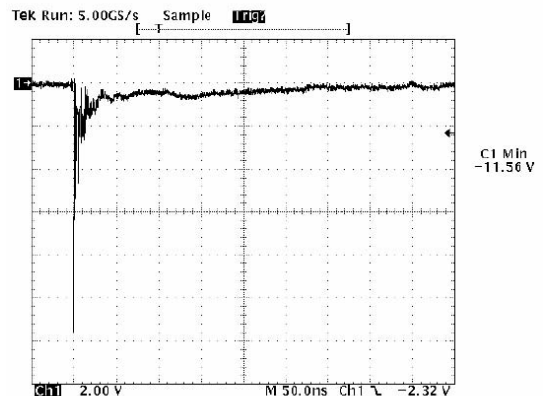
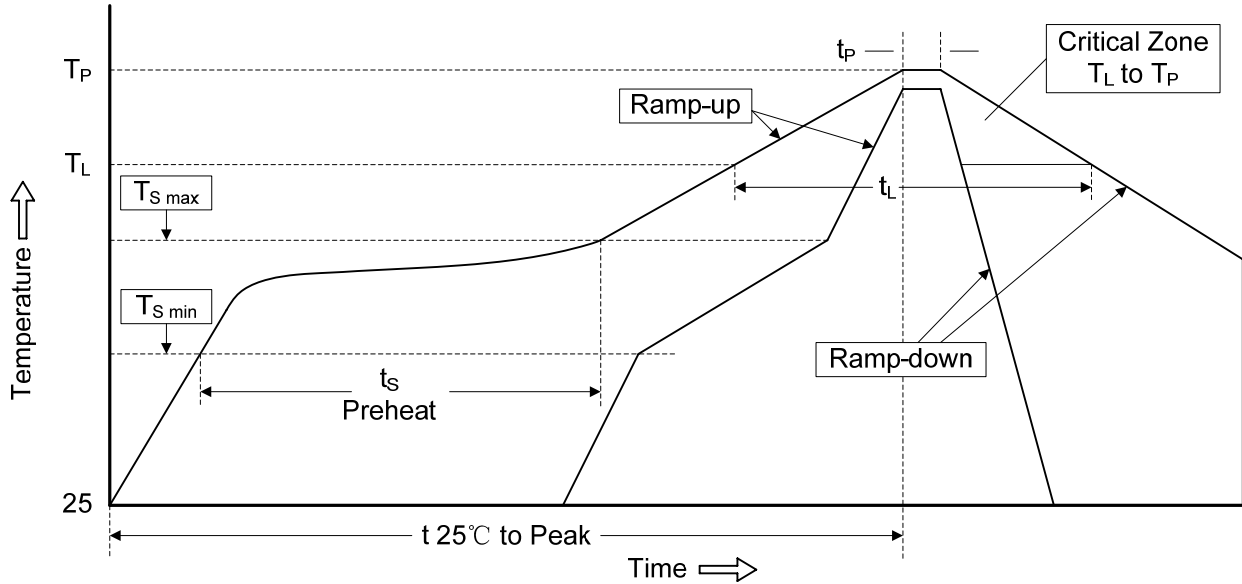


Figure 6. ESD Clamping(-8kV Contact IEC61000-4-2)



### Recommended Soldering Conditions

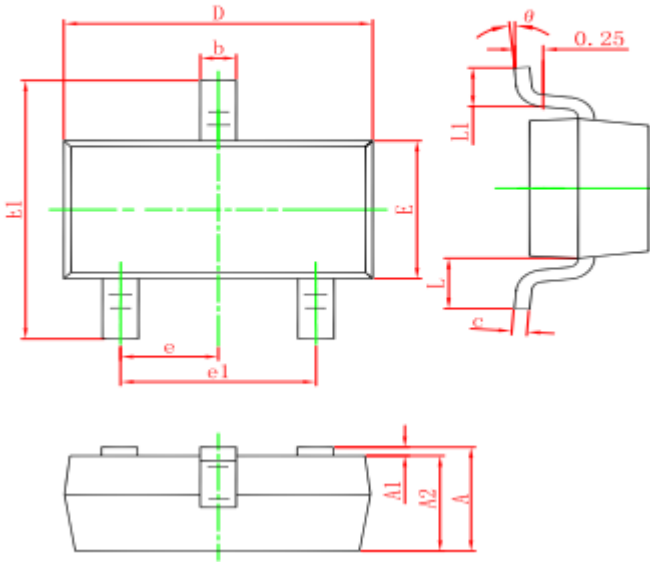
Reflow Soldering



Recommended Conditions

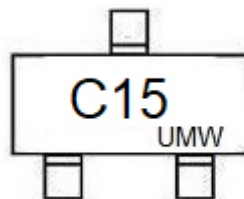
Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat -Temperature Min ( $T_{S\ min}$ ) -Temperature Max ( $T_{S\ max}$ ) -Time (min to max) ( $t_s$ )	150°C 200°C 60-180 seconds
$T_{S\ max}$ to $T_L$ -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature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

**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 SDT23C05L02	SOT-23	3000	Tape and reel	C05 UMW
UMW SDT23C12L02	SOT-23	3000	Tape and reel	C12 UMW
UMW SDT23C15L02	SOT-23	3000	Tape and reel	C15 UMW