

Descriptions

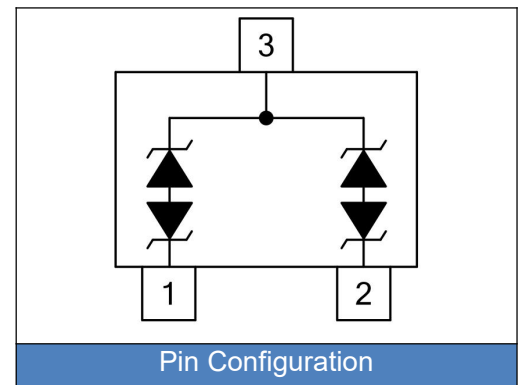
SP3PT23CXXP02 series are designed to protect sensitive electronics from damage or latch-up due to ESD and other voltage induced transient events. They are designed for use in applications where board space is at a premium. The devices will protect up to two lines. They are bi-directional devices and may be used on lines where the signal polarities are above ground. TVS diodes are solid state device designed specifically for transient suppression. They feature large cross-sectional area junctions for conduction high transient currents. They offer desirable characteristics for board level protection including fast response time, low and clamping voltage, and no device degradation. The devices may be used to meet the immunity requirements of IEC61000-4-2, level 4.



Features

- ◆ IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- ◆ SOT-23 surface mount package
- ◆ Protects bidirectional two I/O lines
- ◆ Peak power dissipation of 300W under 8/20 μ s waveform
- ◆ Working voltage: 5V, 12V, 15V, 24V
- ◆ Low leakage current
- ◆ Low operating and clamping voltages
- ◆ 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

Schematic



Applications

- ◆ RS-232 and RS-422 data lines
- ◆ Microprocessor based equipment
- ◆ LAN/WAN equipment
- ◆ Desktops PC and servers
- ◆ Notebook, Laptop and Palmtop computers
- ◆ Set Top Box
- ◆ Peripherals
- ◆ Serial and Parallel ports

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

Maximum Ratings($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Peak pulse power ($t_p=8/20\mu\text{s}$ waveform)	P_{PP}	300	W
ESD voltage (Contact discharge)	V_{ESD}	± 30	kV
ESD voltage (Air discharge)		± 30	
Storage & operating temperature range	T_{STG}, T_J	$-55\sim+150$	$^{\circ}\text{C}$

Electrical Characteristics($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Part Number	Reverse Stand-Off Voltage	Breakdown Voltage @ I_T	Test Current	Maximum Clamping Voltage @ I_{PP}	Peak Pulse Current @ $t_p=8/20\mu\text{s}$	Reverse Leakage Current @ V_{RWM}	Capacitance At 1MHZ 0V
	$V_{RWM}(V)$	$V_{BR}(V)\text{min}$	$I_T(\text{mA})$	$V_C(V)$	$I_{PP}(A)$	$I_R(\mu A)$	$C_j(\text{PF})$
SP3PT23C05P02	5.0	6.0	1	18	17	5	150
SP3PT23C12P02	12	13.3	1	27	11	1	65
SP3PT23C15P02	15	16.7	1	38	10	1	60
SP3PT23C24P02	24	26.7	1	52	5	1	40

Typical Characteristics Curves(T_A=25°C unless otherwise noted)

Figure 1. Power Derating Curve

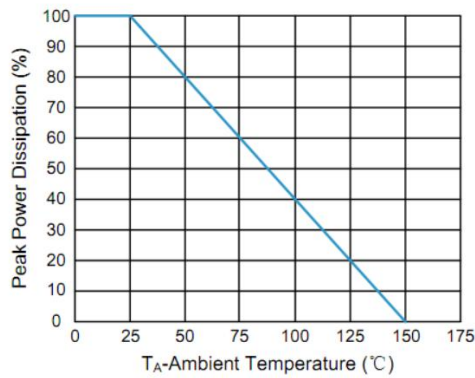


Figure 2. Pulse Waveforms

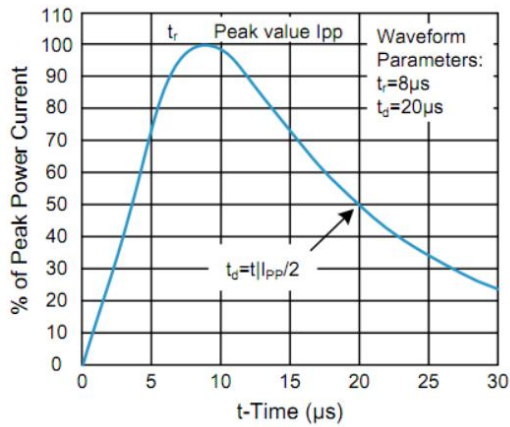


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

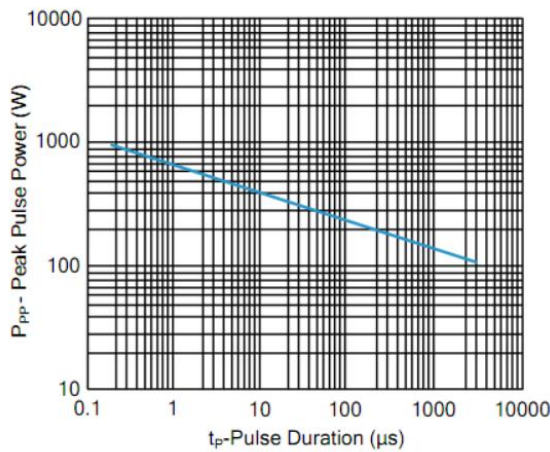


Figure 4. Normalized Capacitance vs. Reverse Voltage

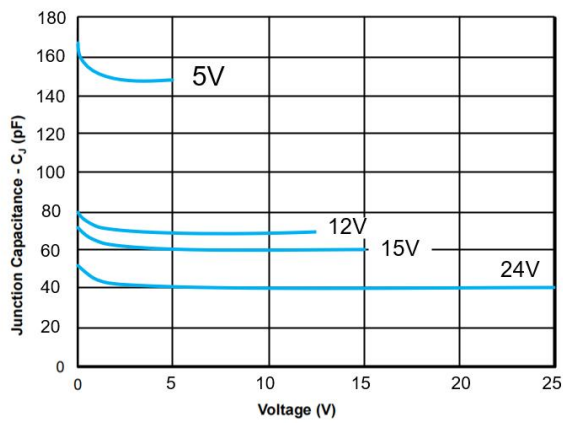


Figure 5. ESD Clamping(8kV Contact IEC61000-4-2)

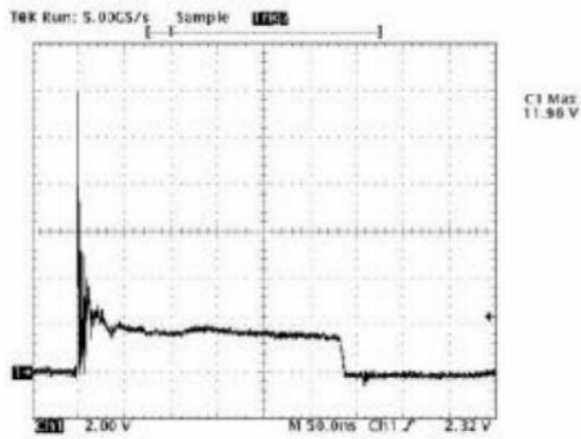
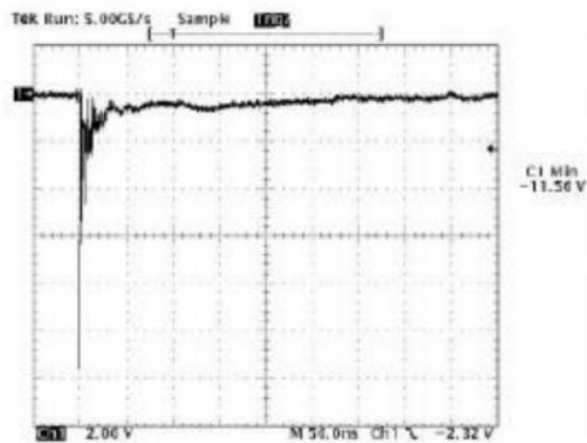
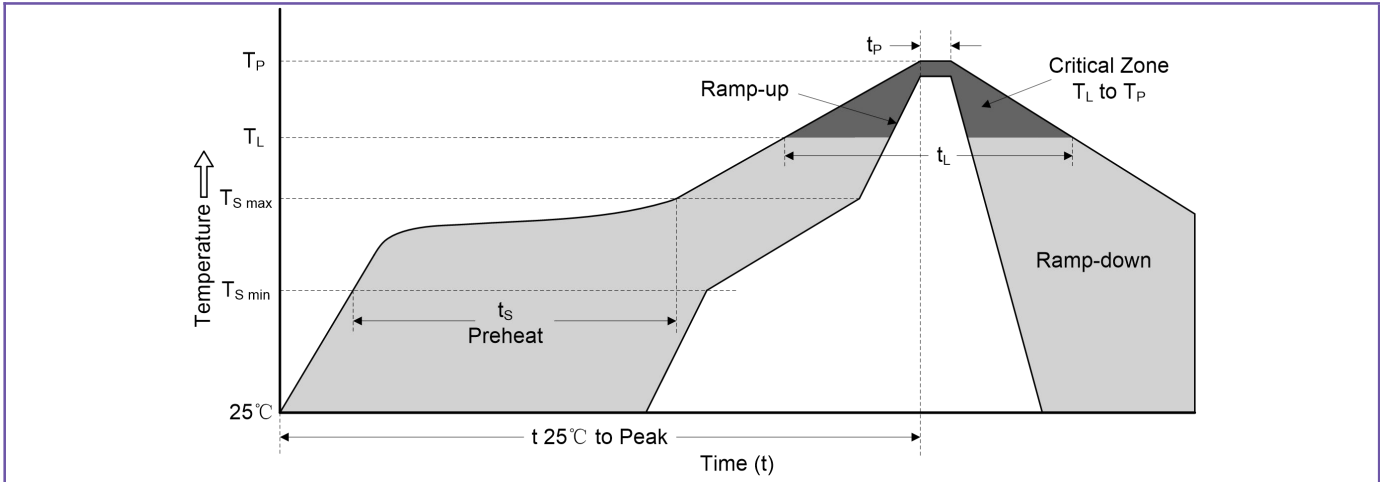


Figure 6. ESD Clamping(-8kV Contact IEC61000-4-2)



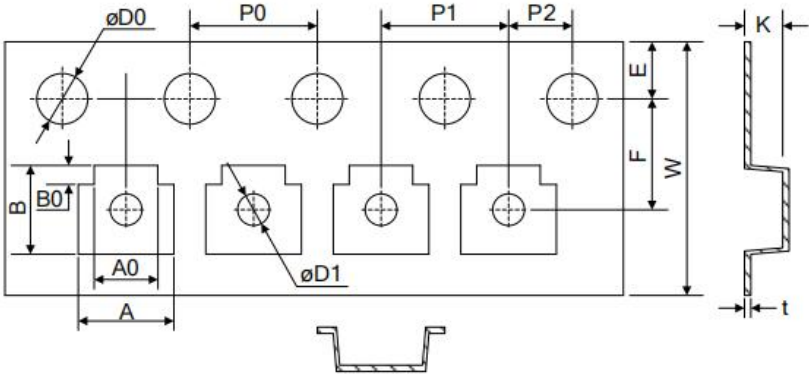
Reflow Soldering Parameters



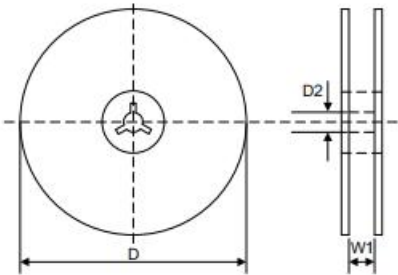
Reflow Condition		Lead-free Assembly
Pre heat	-Temperature Min ($T_{S\ min}$)	150°C
	-Temperature Max ($T_{S\ max}$)	200°C
	-Time (min to max) (t_s)	60-180 seconds
Average ramp-up rate (T_L to T_P)		3°C/second max.
$T_{S\ max}$ to T_L -Ramp-up Rate		3°C/second max.
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Time (min to max) (t_s)	60-150 seconds
Peak Temperature (T_P)		260(+0/-5)°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(T_P)		8 minutes max.
Do not exceed		260°C

Packaging

Tape



Reel



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