

Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

Brightking's SDT23C24L02-AT component is designed to protect sensitive electronics from damage or latch-up due to ESD and other voltage induced transient events. It is designed for use in applications where board space is at a premium. The device will protect up to two lines. It is bidirectional 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. It feature large cross-sectional area junctions for conduction high transient currents. It offer desirable characteristics for board level protection including fast response time, low and clamping voltage, and no device degradation. The device may be used to meet the immunity requirements of IEC61000-4-2, level 4. 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.

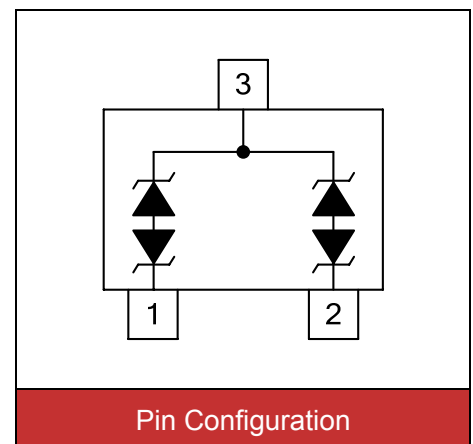


Contact: $\pm 15\text{kV}$
Air: $\pm 25\text{kV}$



Features

- SOT-23 surface mount package
- Protects bidirectional two I/O lines
- Peak power dissipation of 350W under 8/20 μs waveform
- Working voltage: 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 $^{\circ}\text{C}$
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020
- AEC-Q101 qualified
- Marking: C24



Applications

- | | |
|---|---|
| <ul style="list-style-type: none"> ● RS-232 and RS-422 data lines ● Microprocessor based equipment ● LAN/WAN equipment ● Desktops PC and serves | <ul style="list-style-type: none"> ● Notebook, Laptop and Palmtop computers ● Set Top Box ● Peripherals ● Serial and Parallel ports |
|---|---|

Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse power (tp=8/20 μs waveform)	P_{PP}	350	W
ESD voltage (Contact discharge)	V_{ESD}	± 15	kV
ESD voltage (Air discharge)		± 25	
Storage & operating temperature range	T_{STG}, T_J	-55~+150	$^{\circ}\text{C}$

Electrical Characteristics ($T_J=25^\circ\text{C}$)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				24	V
Reverse breakdown voltage	V_{BR}	$I_{BR}=1\text{mA}$	26.7			V
Reverse leakage current	I_R	$V_R=24\text{V}$ Each I/O pin			1	μA
Clamping voltage ($t_p=8/20\mu\text{s}$)	V_C	$I_{PP}=1\text{A}$			43	V
Clamping voltage ($t_p=8/20\mu\text{s}$)	V_C	$I_{PP}=5\text{A}$			52	V
Off state junction capacitance	C_J	0Vdc, f=1MHz Between I/O pins and GND		40		pF

Typical Characteristics Curves

Figure 1. Power Derating Curve

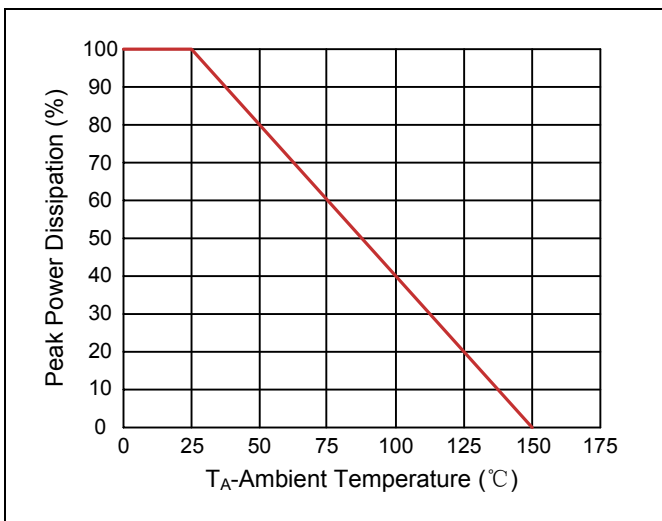


Figure 2. Pulse Waveforms

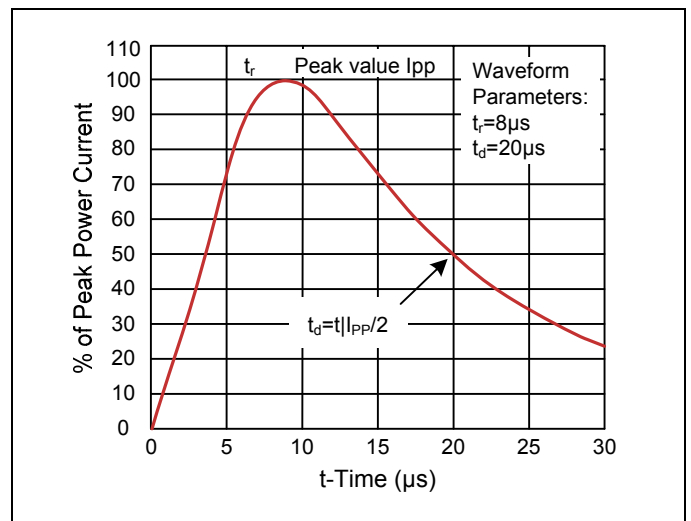


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

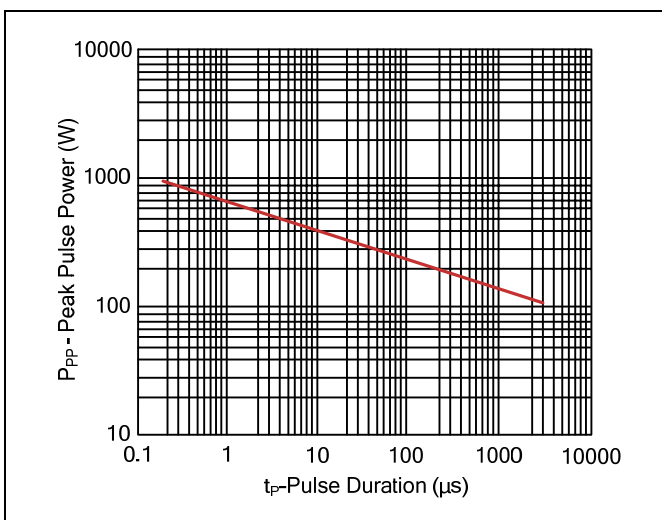
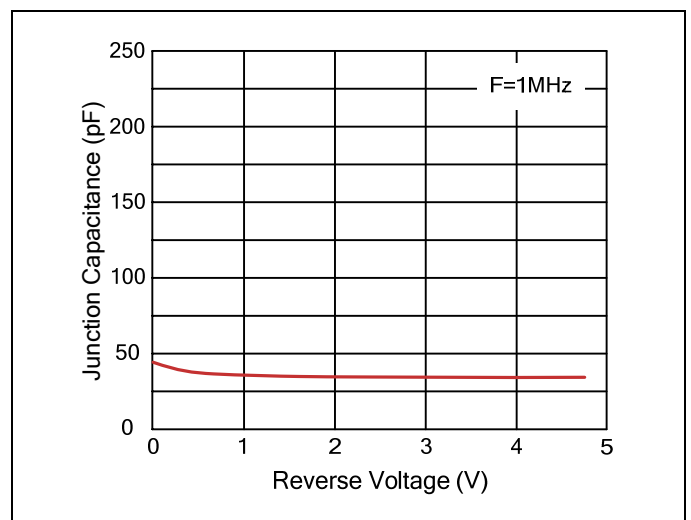
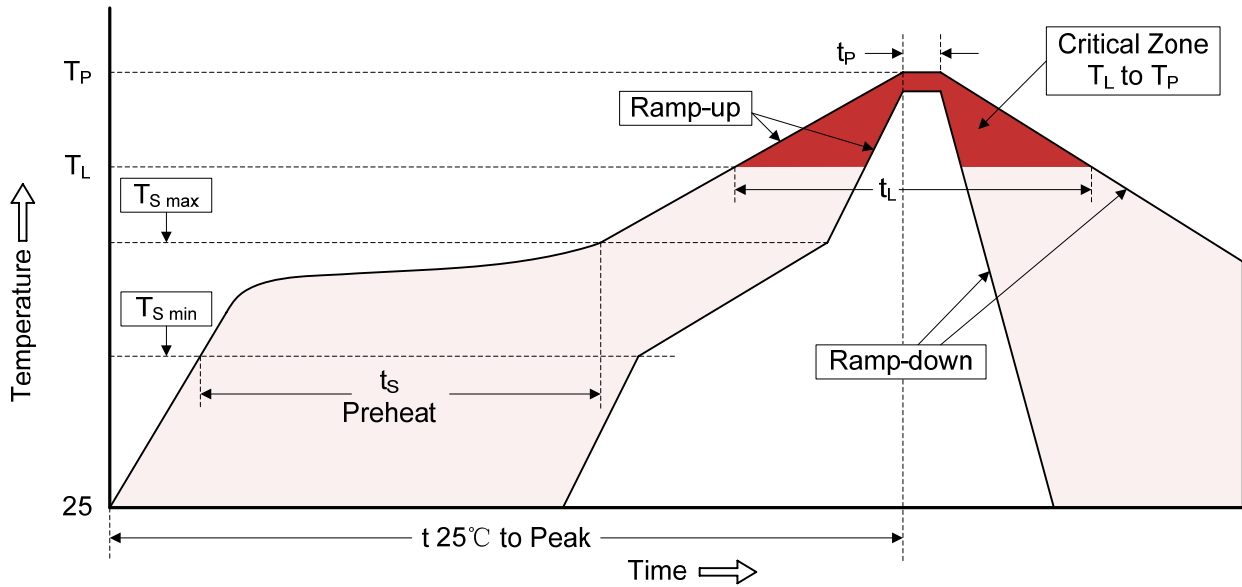


Figure 4. Normalized Capacitance vs. Reverse Voltage



Recommended Soldering Conditions

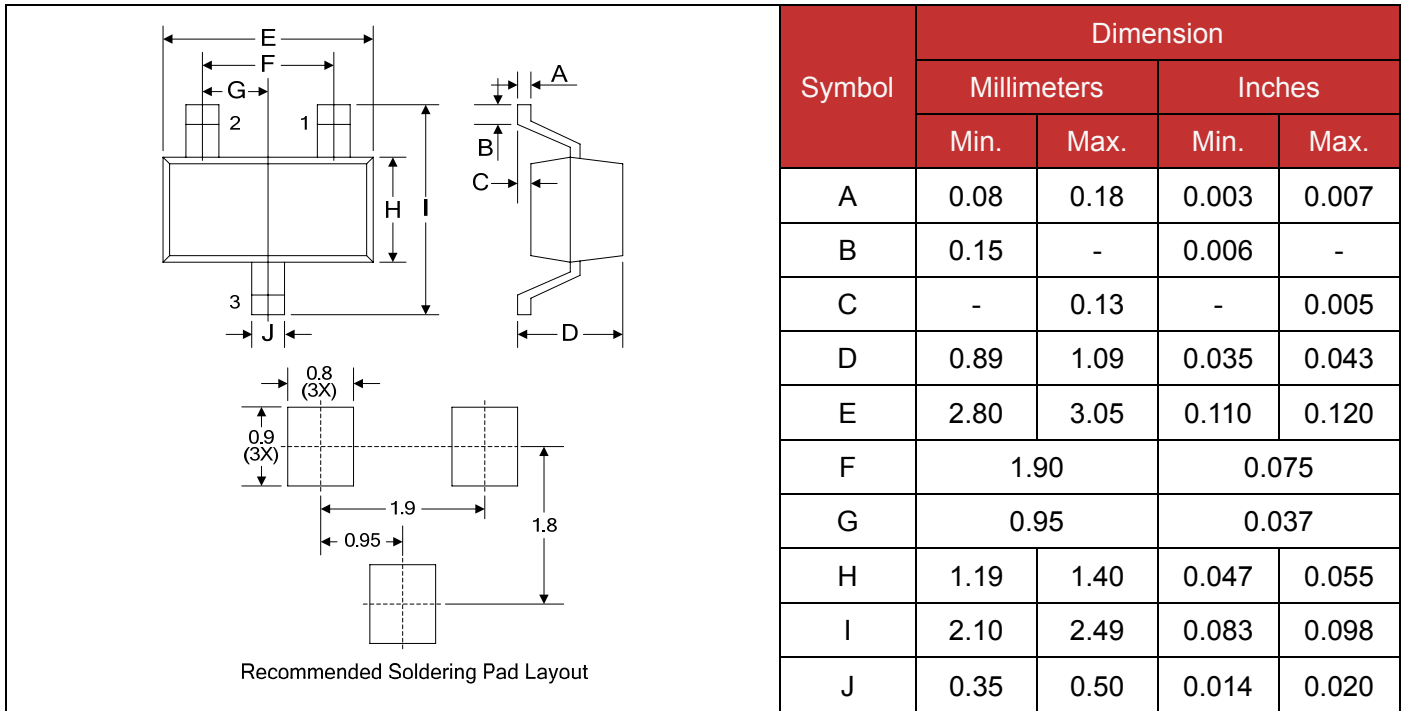
Reflow Soldering



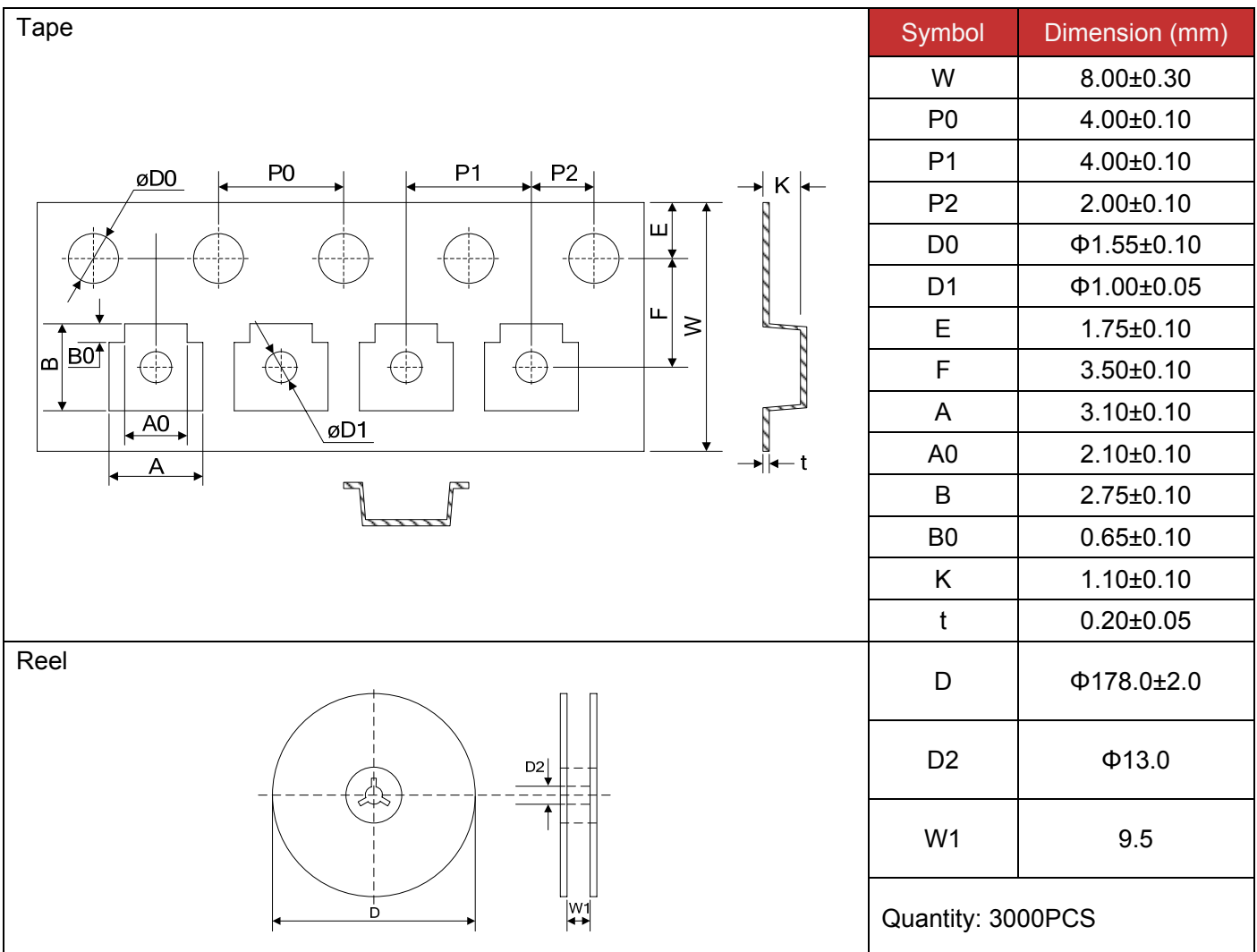
Recommended Conditions

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.

Dimensions (SOT-23)



Packaging



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