

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

The SFD52AxxL01 of Transient Voltage Suppressors (TVS) are designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computer, and PDAs. They offer superior electrical characteristics such as lower clamping voltage and no device degradation when compared to MLVs. They are designed to protect sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD), lightning, electrical fast transients (EFT), and cable discharge events (CDE).

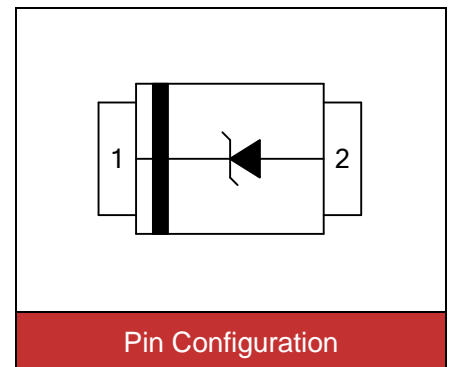


Contact : ±30kV  
Air : ±30kV



### Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- SOD-523 surface mount package
- Protects one I/O line
- Working voltage: 5V,7V
- 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



### Applications

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>● Cellular handsets &amp; Accessories</li> <li>● Cordless phones</li> <li>● Personal digital assistants (PDAs)</li> <li>● Notebooks &amp; Handhelds</li> </ul> | <ul style="list-style-type: none"> <li>● Portable instrumentation</li> <li>● Digital cameras</li> <li>● Peripherals</li> <li>● MP3 players</li> </ul> |
|---|---|

### 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 ( $T_J=25^{\circ}\text{C}$ )**
**SFD52A05L01 (Marking: BG)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				5.0	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	6.0			V
Reverse leakage current	$I_R$	$V_R=5\text{V}$			1.0	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			9.8	V
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=18\text{A}$			25.0	V
Peak pulse current ( $t_p=8/20\mu\text{s}$ )	$I_{PP}$				18	A
Off state junction capacitance	$C_J$	$0\text{Vdc}, f=1\text{MHz}$		200		pF

**SFD52A07L01 (Marking: BH)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				7.0	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	7.5			V
Reverse leakage current	$I_R$	$V_R=7\text{V}$			1.0	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			12.0	V
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=16\text{A}$			25.0	V
Peak pulse current ( $t_p=8/20\mu\text{s}$ )	$I_{PP}$				16	A
Off state junction capacitance	$C_J$	$0\text{Vdc}, f=1\text{MHz}$		190		pF

**Typical Characteristics Curves**

Figure 1. Power Derating Curve

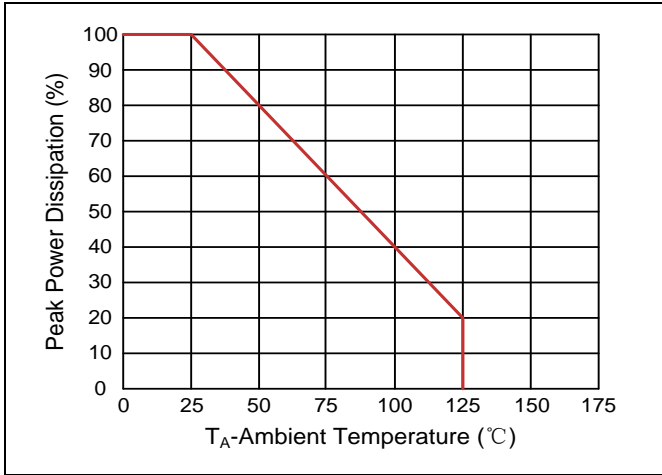


Figure 2. Pulse Waveforms

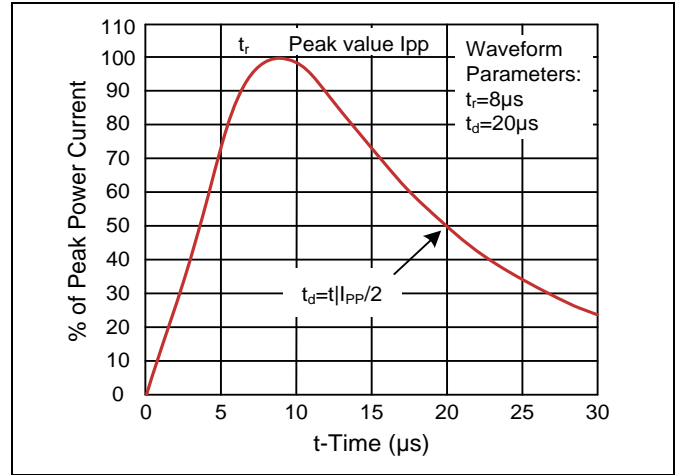
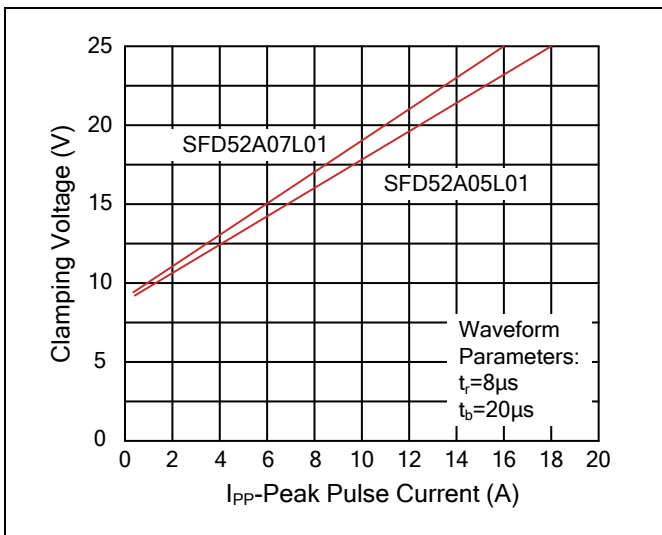
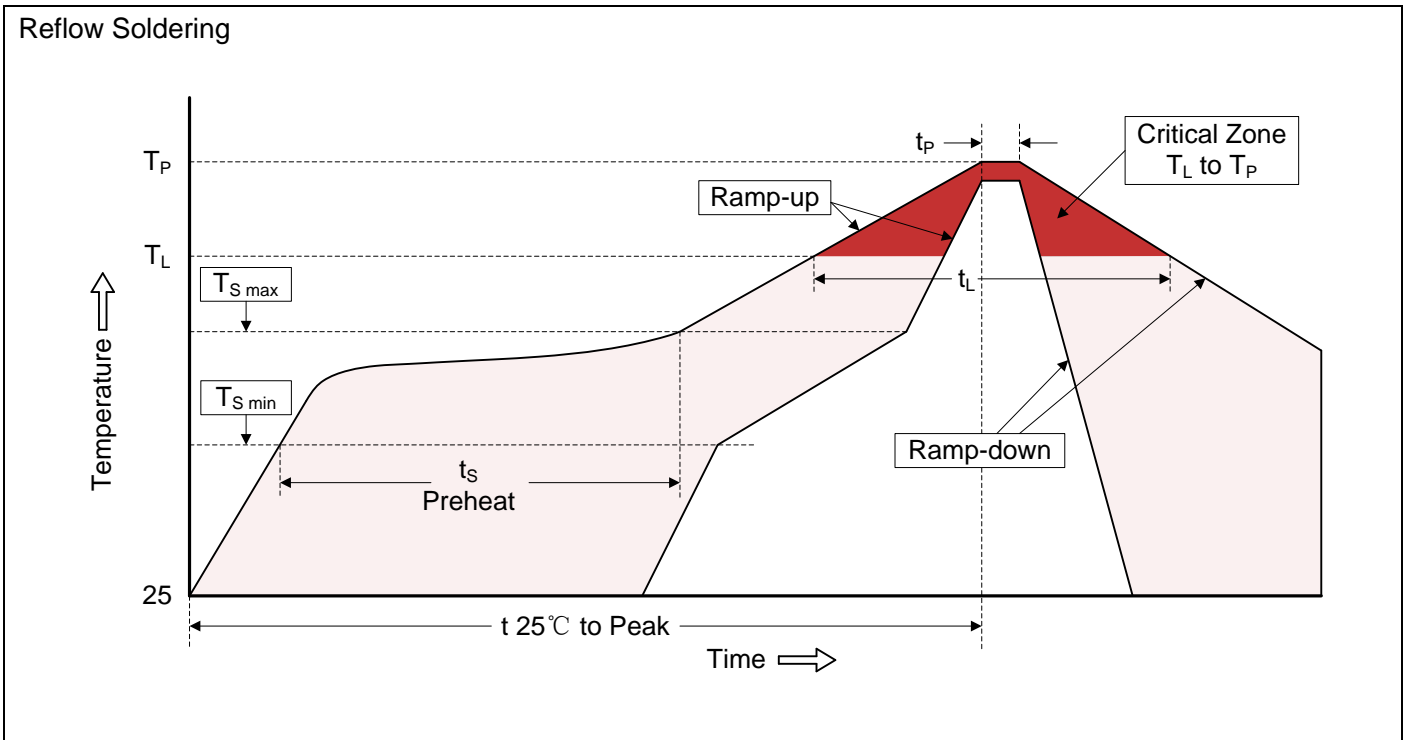


Figure 3. Clamping Voltage vs. Peak Pulse Current



**Recommended Soldering Conditions**



**Recommended Conditions**

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat -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 (SOD-523)**

Symbol	Dimension (mm)			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.50	0.70	0.020	0.028
B	0.07	0.20	0.003	0.008
C	0.70	0.90	0.028	0.035
D	0.25	0.35	0.010	0.014
E	1.10	1.30	0.043	0.051
F	1.50	1.70	0.059	0.067
G	0.15	0.25	0.006	0.010

**Packaging**

Tape		Symbol	Dimension (mm)
		W	8.00±0.30
		P0	4.00±0.10
		P1	2.00±0.10
		P2	2.00±0.10
		D0	Φ1.55±0.10
		D1	Φ0.50±0.05
		E	1.75±0.10
		F	3.50±0.10
		A	1.00±0.10
		A0	0.50±0.10
		B	1.80±0.10
		B0	1.30±0.10
		K	0.65±0.10
t	0.20±0.05		
Reel		D	Φ178.0±2.0
		D2	Φ13.0
		W1	9.5
		Quantity: 3000PCS	