

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

Brightking's SDD32CXXL01 series are designed to protect low voltage sensitive components from ESD and transient voltage events. Excellent clamping capability, low leakage, and fast response time, make these parts ideal for ESD protection on designs where board space is at a premium. Because of their small size, they are suited for use in cellular phones, portable devices, digital cameras, power supplies and many other portable applications. They are designed to protect sensitive semiconductor components from damage or upset due to electrostatic discharge(ESD), electrical fast transients(EFT), and cable discharge events(CDE).

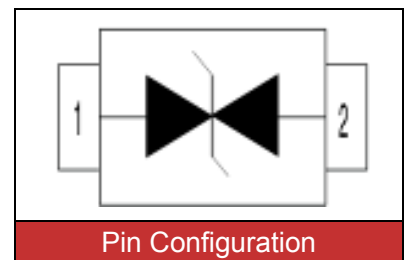


Contact : ±30kV  
Air : ±30kV



### Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance, ESD 15KV Air, 8KV contact compliance for SDD32C30L01&SDD32C36L01
- SOD-323 surface mount package
- Protects bi-directional line
- Peak power dissipation of 320W under 8/20µs waveform
- Working voltage: 5V, 15V, 18V, 24V, 36V
- Low leakage current
- Low clamping voltage
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270□
- 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> </ul> |
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### Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse power (tp=8/20µs waveform)	P <sub>PP</sub>	320	W
ESD voltage (Contact discharge)	V <sub>ESD</sub>	±30	kV
ESD voltage (Air discharge)		±30	
Storage & operating temperature range	T <sub>STG</sub> ,T <sub>J</sub>	-55~+150	°C

**Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ )**
**SDD32C05L01 (Marking: 2B)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				5	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	6			V
Reverse leakage current	$I_R$	$V_R=5\text{V}$			1	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			9.8	V
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=10\text{A}$		15		V
Peak Pulse Current( $t_p=8/20\mu\text{s}$ )	$I_{PP}$				19	A
Off state junction capacitance	$C_J$	$0\text{Vdc}, f=1\text{MHz}$		100		pF

**SDD32C15L01 (Marking: 2N)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				15	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	16.7			V
Reverse leakage current	$I_R$	$V_R=15\text{V}$			1	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=8\text{A}$		30		V
Peak Pulse Current( $t_p=8/20\mu\text{s}$ )	$I_{PP}$				8	A
Off state junction capacitance	$C_J$	$0\text{Vdc}, f=1\text{MHz}$		35		pF

**SDD32C18L01 (Marking: 2K)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				18	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	20			V
Reverse leakage current	$I_R$	$V_R=18\text{V}$			1	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			29	V
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=5\text{A}$			40	V
Peak Pulse Current( $t_p=8/20\mu\text{s}$ )	$I_{PP}$				5	A
Off state junction capacitance	$C_J$	$0\text{Vdc}, f=1\text{MHz}$		40		pF

**SDD32C24L01 (Marking: 2H)**

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	$I_R$	$V_R=24\text{V}$			1	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			43	V
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=5\text{A}$			56	V
Peak Pulse Current( $t_p=8/20\mu\text{s}$ )	$I_{PP}$				5	A
Off state junction capacitance	$C_J$	$0\text{Vdc}, f=1\text{MHz}$		37		pF

SDD32C36L01 (Marking: 36C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				36	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1mA$	40			V
Reverse leakage current	$I_R$	$V_R=36V$			1	$\mu A$
Clamping voltage ( $t_p=8/20\mu s$ )	$V_C$	$I_{PP}=1A$			56	V
Clamping voltage ( $t_p=8/20\mu s$ )	$V_C$	$I_{PP}=5A$			75	V
Peak Pulse Current( $t_p=8/20\mu s$ )	$I_{PP}$				5	A
Off state junction capacitance	$C_J$	0Vdc, f=1MHz		30		pF

### Typical Characteristics Curves

Figure 1. Power Derating Curve

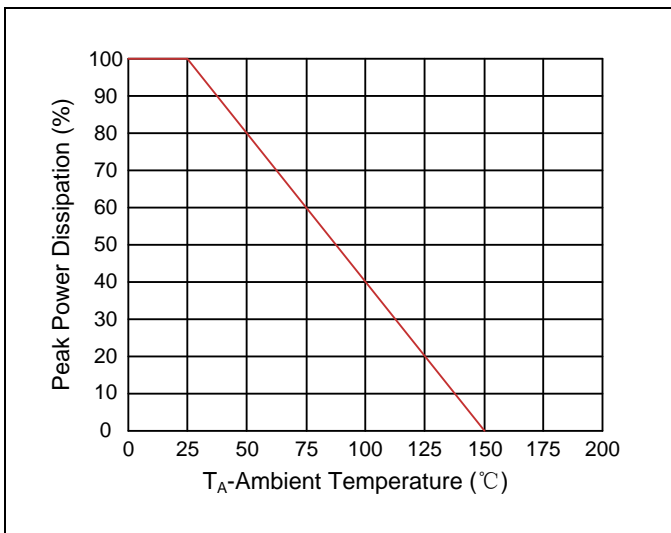


Figure 2. Pulse Waveform

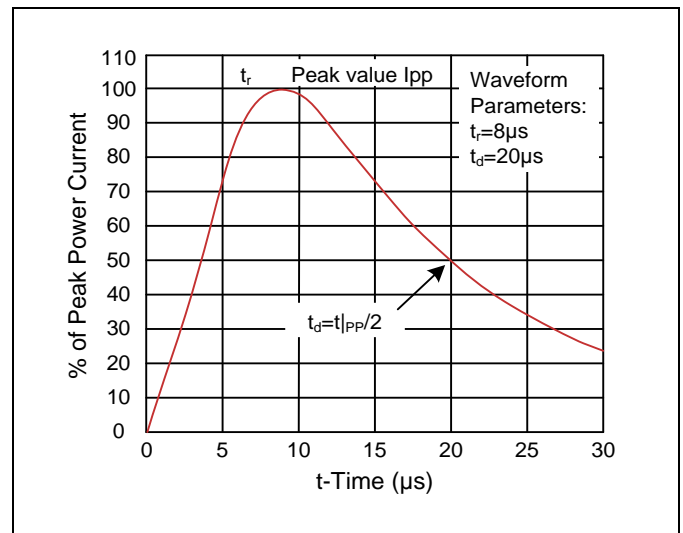
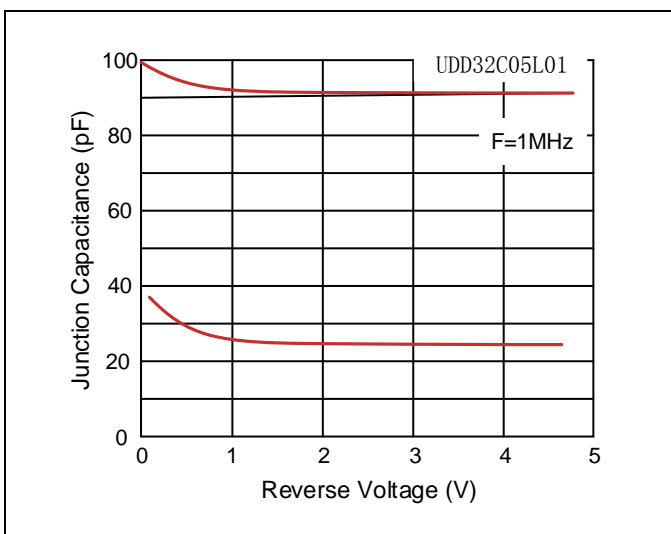
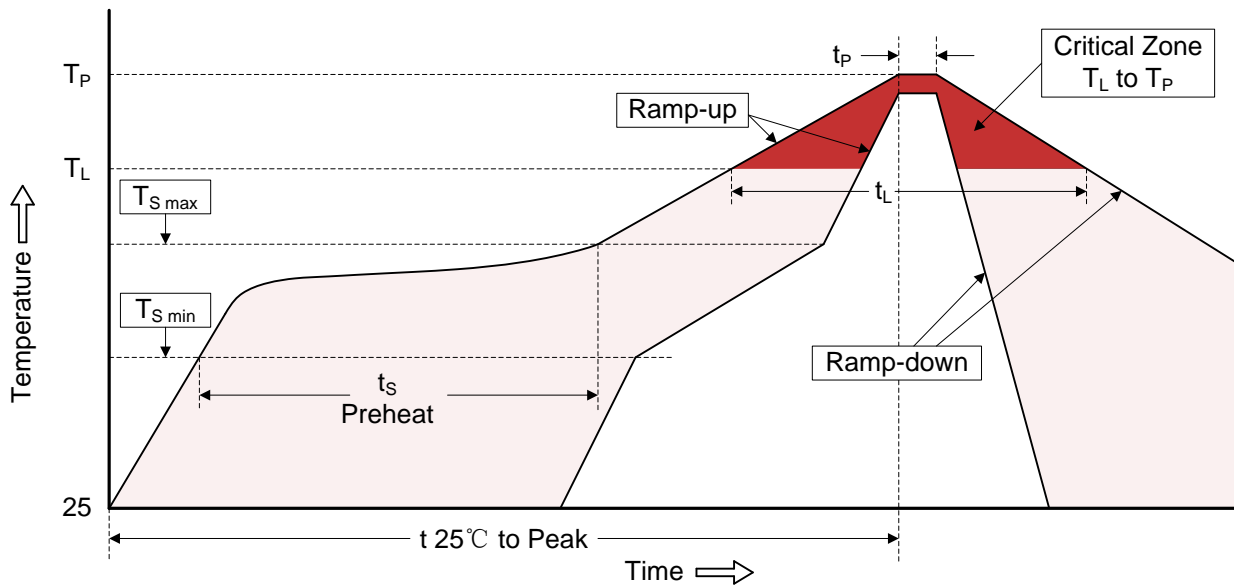


Figure 3. Capacitance vs. Reverse Voltage



**Recommended Soldering Conditions**

Reflow Soldering



Recommended Condition

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat	
-Temperature Min ( $T_{S\ min}$ )	150°C
-Temperature Max ( $T_{S\ max}$ )	200°C
-Time (min to max) ( $t_s$ )	60-180 seconds
$T_{S\ max}$ to $T_L$	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature ( $T_L$ )	217°C
-Time ( $t_L$ )	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-323)**

	Dimension				
	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
	A	0.80	1.10	0.031	0.043
B	-	0.10	-	0.004	
C	0.20	-	0.008	-	
D	0.11	0.20	0.004	0.008	
E	1.15	1.35	0.045	0.053	
F	-	0.35	-	0.014	
G	1.60	1.80	0.063	0.071	
H	2.40	2.70	0.094	0.102	

**Packaging**

<p>Tape</p>	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	1.48±0.10
	A0	0.80±0.10
	B	3.00±0.10
	B0	1.80±0.10
	K	1.05±0.10
t	0.25±0.05	
<p>Reel</p>	D	Φ178.0±2.0
	D2	Φ13.0
	W1	9.5
	Quantity: 3000PCS	