

Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

Brightking's SJD16AXXL01 is designed to protect power port and the chip Vbus interfaces. It has been specifically designed to protect sensitive components which are connected to power lines from overvoltage caused by electrostatic discharge (ESD), cable discharge events (CDE) and lightning.

These devices integrate a high power transient voltage suppressor(TVS) and small package. It features solid-state silicon-avalanche technology for unmatched transient protection without device degradation. It offers superior electrical characteristics including fast response time, low clamping voltage and no device degradation. This allows the designer maximum flexibility and reduces parts count.

The series devices may be used to meet the immunity requirements of IEC61000-4-2 (ESD), IEC61000-4-4 (EFT) , IEC61000-4-5 (Surge).

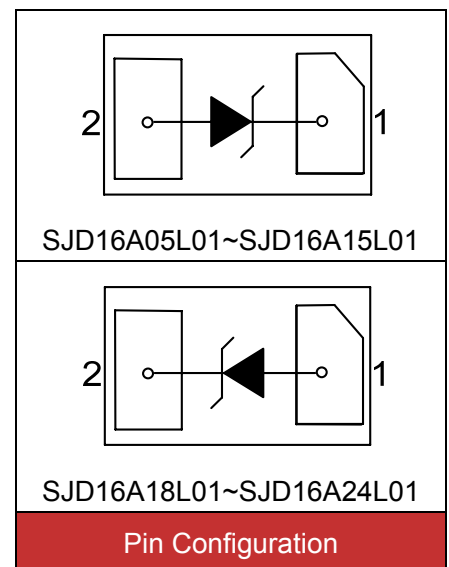


Contact : ±30kV
Air : ±30kV



Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- DFN1610 surface mount package
- Protects power line
- Working voltage: 5V,7V,10V,12V,15V,18V,24V
- SJD16A05L01~SJD16A15L01, Cathode rays on the Pin1
- SJD16A18L01~SJD16A24L01, Cathode rays on the Pin2
- Low leakage current
- Low clamping voltage
- Solid-state silicon avalanche technology
- 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

- Power port
- I²C bus protection

Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse power (tp=10/1000μs waveform)	Ppp	120	W
Peak pulse power(tp=8/20μs waveform) SJD16A05L01~SJD16A15L01	Ppp	2000	W
Peak pulse power(tp=8/20μs waveform) SJD16A18L01~SJD16A24L01	Ppp	1000	W
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°C)

SJD16A05L01 (Marking: J05)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V _{RWM}				5.0	V
Reverse breakdown voltage	V _{BR}	I _{BR} =1.0mA	6.0			V
Reverse leakage current	I _R	V _R =5.0V			1.0	μA
Clamping voltage (tp=8/20μs)	V _C	I _{PP} =90A		25		V
Off state junction capacitance	C _J	0Vdc, f=1MHz Between I/O pins and GND		350		pF

SJD16A07L01(Marking: J07)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V _{RWM}				7.0	V
Reverse breakdown voltage	V _{BR}	I _{BR} =1.0mA	7.3			V
Reverse leakage current	I _R	V _R =7.0V			1.0	μA
Clamping voltage (tp=8/20μs)	V _C	I _{PP} =70A		30		V
Off state junction capacitance	C _J	0Vdc, f=1MHz Between I/O pins and GND		650		pF

SJD16A10L01(Marking: J10)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				10	V
Reverse breakdown voltage	V_{BR}	$I_{BR}=1.0mA$	11			V
Reverse leakage current	I_R	$V_R=10V$			1.0	μA
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=60A$		35		V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND		400		pF

SJD16A12L01 (Marking: J12)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				12	V
Reverse breakdown voltage	V_{BR}	$I_{BR}=1.0mA$	13			V
Reverse leakage current	I_R	$V_R=12V$			1.0	μA
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=47A$		43		V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND		365		pF

SJD16A15L01(Marking: J15)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				15	V
Reverse breakdown voltage	V_{BR}	$I_{BR}=1.0mA$	16			V
Reverse leakage current	I_R	$V_R=15V$			1.0	μA
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=45A$		45		V
Off state junction capacitance	C_J	0Vdc,f=1MHz Between I/O pins and GND		300		pF

SJD16A18L01(Marking: J18)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				18	V
Reverse breakdown voltage	V_{BR}	$I_{BR}=1.0mA$	19			V
Reverse leakage current	I_R	$V_R=18V$			1.0	μA
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=25A$		50		V
Off state junction capacitance	C_J	0Vdc, f=1MHz Between I/O pins and GND		220		pF

SJD16A24L01(Marking: J24)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V_{RWM}				24	V
Reverse breakdown voltage	V_{BR}	$I_{BR}=1.0mA$	25			V
Reverse leakage current	I_R	$V_R=24V$			1.0	μA
Clamping voltage (tp=8/20 μs)	V_C	$I_{PP}=20A$		55		V
Off state junction capacitance	C_J	0Vdc, f=1MHz Between I/O pins and GND		165		pF

Typical Characteristics Curves

Figure 1. Power Derating Curve

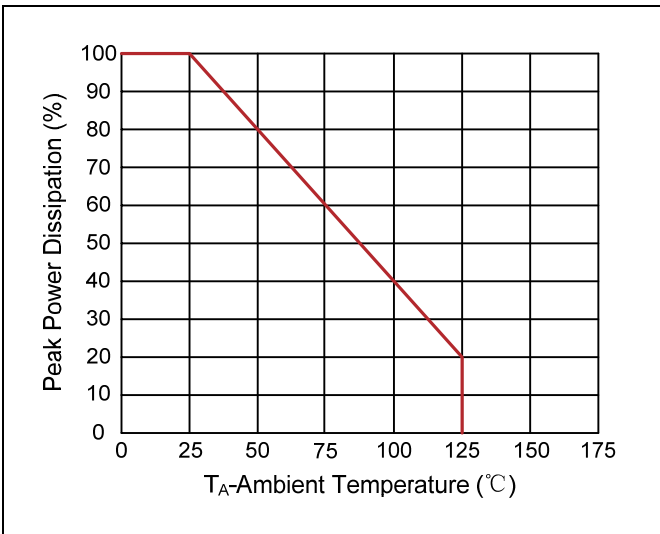


Figure 2. 8/20µs Pulse Waveforms

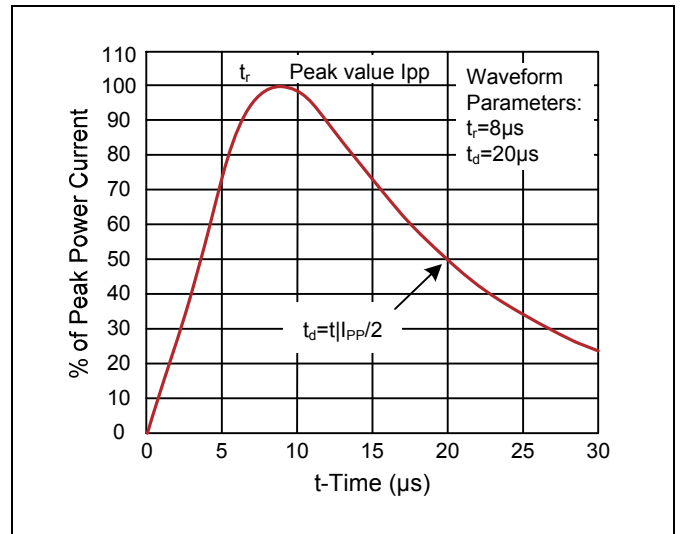


Figure 3. Clamping Voltage vs. Peak Pulse Current

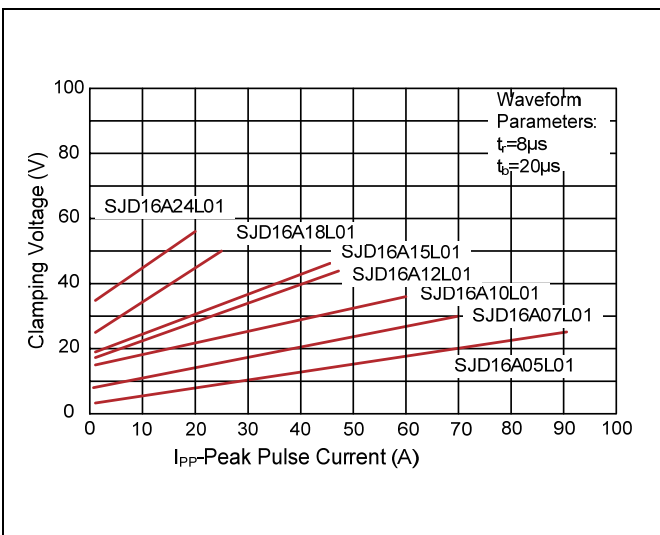


Figure 4. ESD Clamping (8kV Contact IEC61000-4-2)

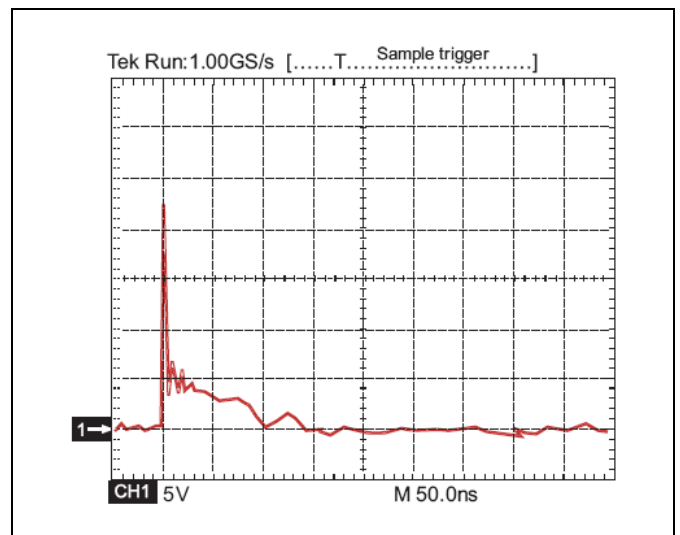


Figure 5. 10/1000µs Pulse Waveform

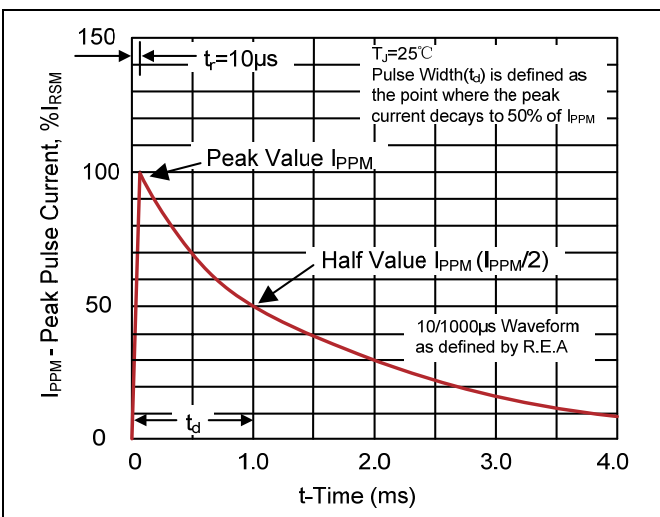
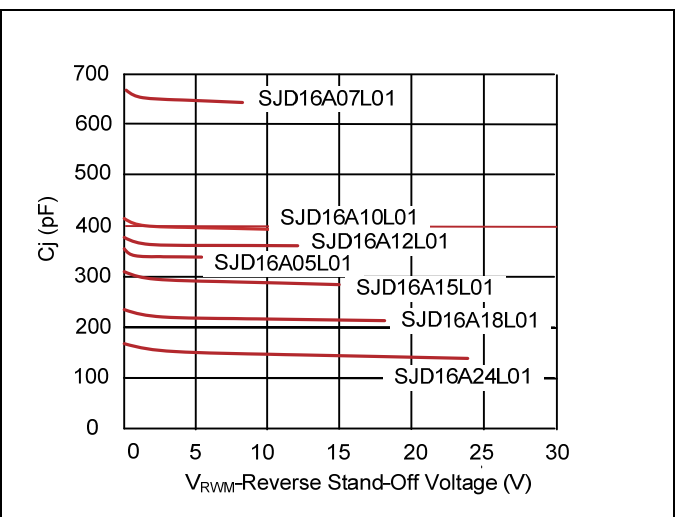
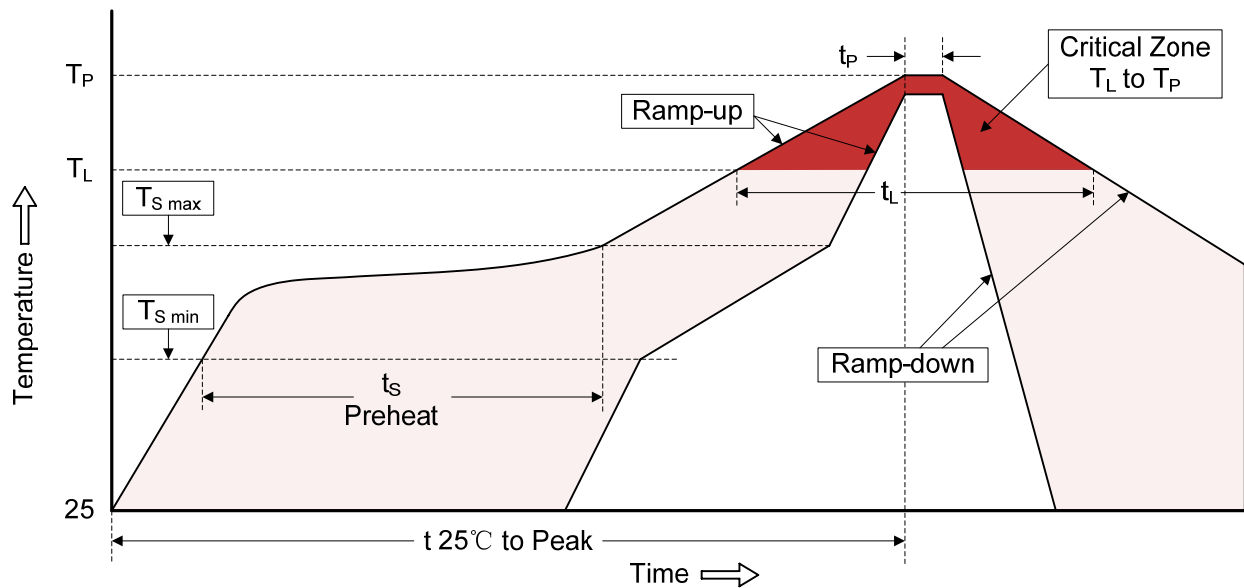


Figure 6. Typical Junction Capacitance



Recommended Soldering Conditions

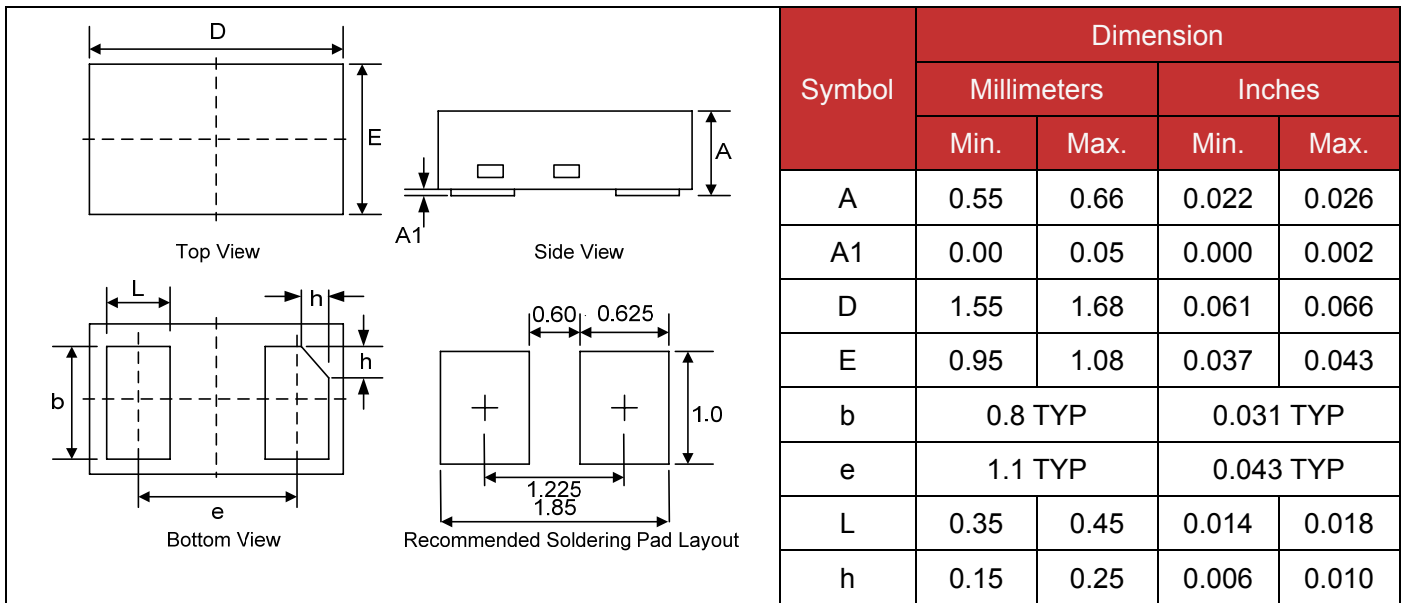
Reflow Soldering



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 (DFN1610)



Packaging

