

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

The series of STD22AXXL01 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).

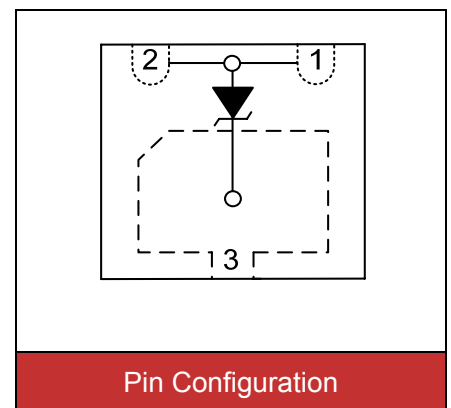


Contact :  $\pm 8\text{kV}$   
Air :  $\pm 15\text{kV}$



### Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- DFN2020 surface mount package
- Protects power line
- Working voltage: 7V & 12V
- 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
- I<sup>2</sup>C bus protection

**Maximum Ratings**

Rating	Symbol	Value	Unit
Peak pulse power (tp=10/1000μs waveform)	Ppp	400	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<sub>J</sub>=25°C)**

STD22A07L01 (Marking: T07)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				7	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	7.3			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =7V			1	μA
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =1A			15	V
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =180A			35	V
Off state junction capacitance	C <sub>J</sub>	0Vdc, f=1MHz Between I/O pins and GND		2500	2800	pF

STD22A12L01 (Marking: T12)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				12	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	13.0			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =12V			1	μA
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =1A			25	V
Clamping voltage (tp=8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =130A			45	V
Off state junction capacitance	C <sub>J</sub>	0Vdc, f=1MHz Between I/O pins and GND		1200	2000	pF

Typical Characteristics Curves

Figure 1. Power Derating Curve

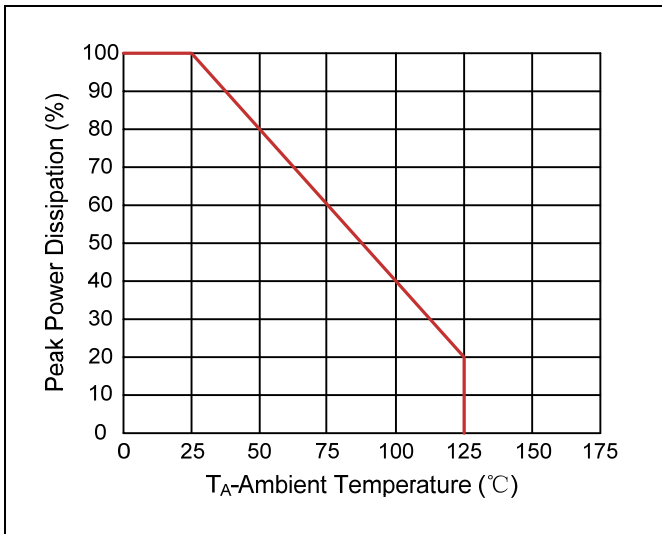


Figure 2. Pulse Waveforms

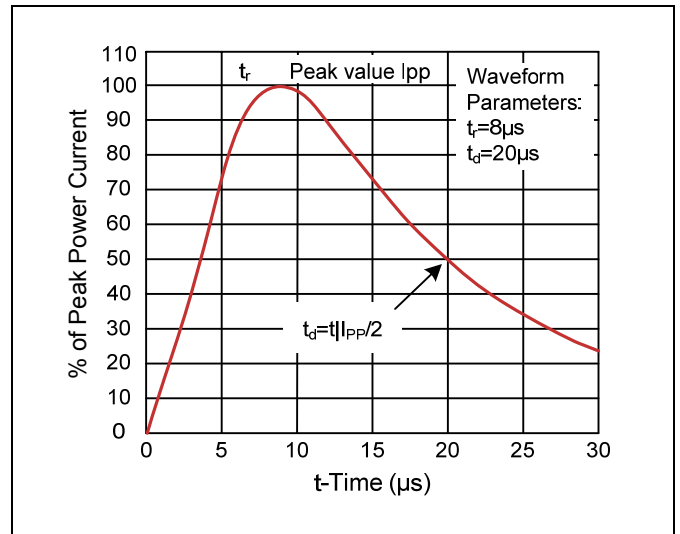
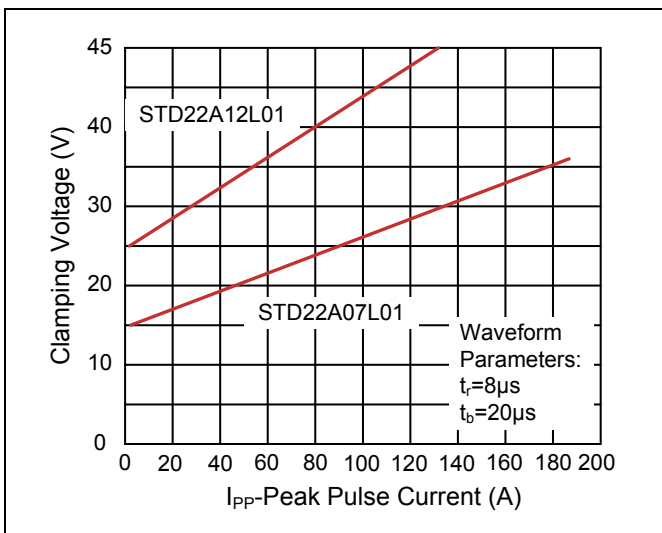
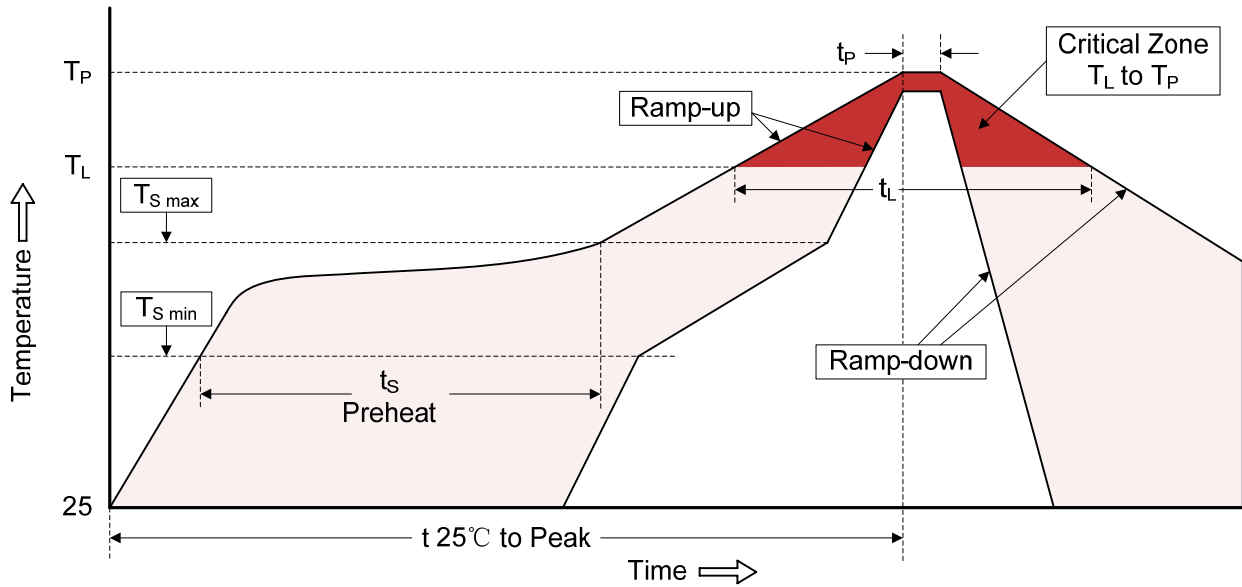


Figure 3. Clamping Voltage vs. Peak Pulse Current



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 (DFN-2020)**

Symbol	Dimension			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.50	0.60	0.020	0.024
D	1.90	2.10	0.075	0.083
D1	1.40	1.60	0.055	0.063
E	1.90	2.10	0.075	0.083
E1	0.90	1.15	0.035	0.045
e	1.30 BSC		0.051 BSC	
L1	0.324	0.476	0.013	0.019
L2	0.20	0.30	0.008	0.012
k	0.20	0.45	0.008	0.018
h	0.30 BSC		0.012 BSC	

**Packaging**

Tape		Symbol	Dimension (mm)
		W	8.00±0.30
		P0	4.00±0.10
		P1	4.00±0.10
		P2	2.00±0.10
		D0	Φ1.50±0.10
		E	1.75±0.10
		F	3.50±0.10
		A0	2.25±0.1
		B0	2.25±0.1
		Reel	
		D2	Φ54.50±1
		W1	9.5±2
		W2	Φ12.30±1.5
		Quantity: 3000PCS	