

## DESCRIPTION

JKS0512S3 is a 5.0V bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The JKS0512S3 has a low capacitance with a typical value at 1.0pF, and complies with the IEC61000-4-2 (ESD) standard with  $\pm 30\text{kV}$  air and  $\pm 30\text{kV}$  contact discharge. It is assembled into a lead free SOD-323 package. The small size, low capacitance and high ESD surge protection make JKS0512S3 an ideal choice to protect cell phone, wireless systems, and communication equipment.

## APPLICATIONS

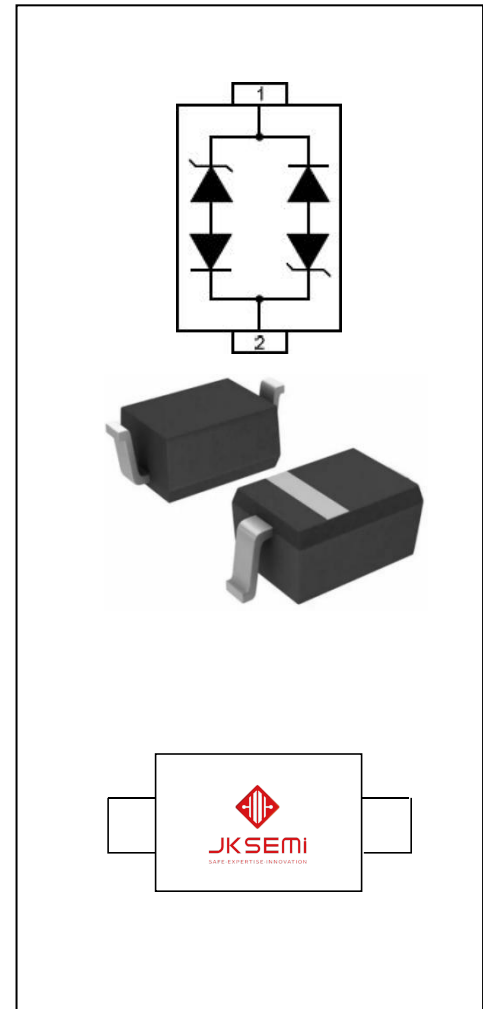
- ✧ USB Ports.
- ✧ Smart Phones.
- ✧ Wireless Systems.
- ✧ Ethernet 10/100/1000 Base T.

## FEATURES

- ✧ 350W peak pulse power (8/20 $\mu\text{s}$ ).
- ✧ Ultra low capacitance: 1pF typical.
- ✧ Ultra low leakage: nA level.
- ✧ Low operating 5V.
- ✧ Low clamping voltage.
- ✧ Protects one power line or data line.
- ✧ Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 30\text{kV}$ .
  - IEC61000-4-4 (EFT) 80A (5/50ns)
  - IEC61000-4-5 (Lightning) 20A (8/20 $\mu\text{s}$ )
- ✧ RoHS Compliant.
- ✧ Package: SOD-323.
- ✧ Lead Finish: Matte Tin.

## ORDERING INFORMATION

- ✧ SOD-323 Package.
- ✧ Tape & Reel : 3,000pcs.
- ✧ Reel Size : 7 inch.





## DEVICE CHARACTERISTICS

### Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

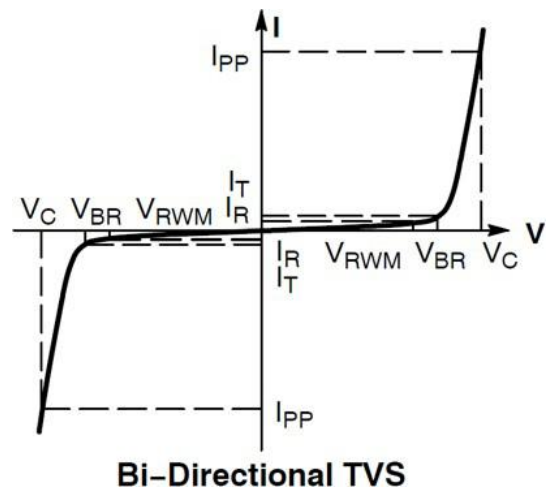
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 $\mu\text{s}$ )	P <sub>pp</sub>	350	W
Peak Pulse Current (8/20 $\mu\text{s}$ )	I <sub>pp</sub>	20	A
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	$\pm 30$	kV
ESD per IEC 61000-4-2 (Contact)		$\pm 30$	
Operating Temperature Range	T <sub>J</sub>	-40 to +85	$^{\circ}\text{C}$
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	$^{\circ}\text{C}$

### ELECTRICAL CHARACTERISTICS( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

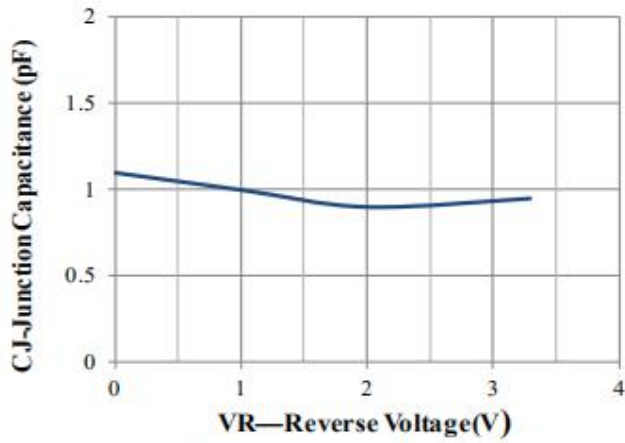
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V <sub>RWM</sub>				5.0	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> = 1mA	6.2	6.8	8.0	V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> = 5.0 V			0.5	$\mu\text{A}$
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1A (8 x 20 $\mu\text{s}$ pulse)		8.5		V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 22A (8 x 20 $\mu\text{s}$ pulse)		17.0	20	V
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz		1.0	1.5	pF

## ELECTRICAL PARAMETER

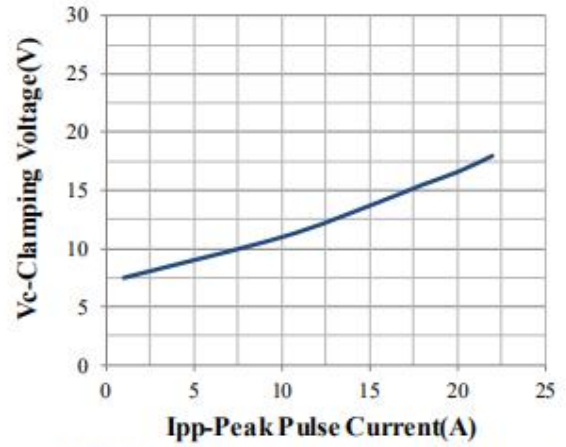
Symbol	Parameter
V <sub>RWM</sub>	Peak Reverse Working Voltage
I <sub>R</sub>	Reverse Leakage Current @ V <sub>RWM</sub>
V <sub>BR</sub>	Breakdown Voltage @ I <sub>T</sub>
I <sub>T</sub>	Test Current
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current
V <sub>C</sub>	Clamping Voltage @ I <sub>PP</sub>



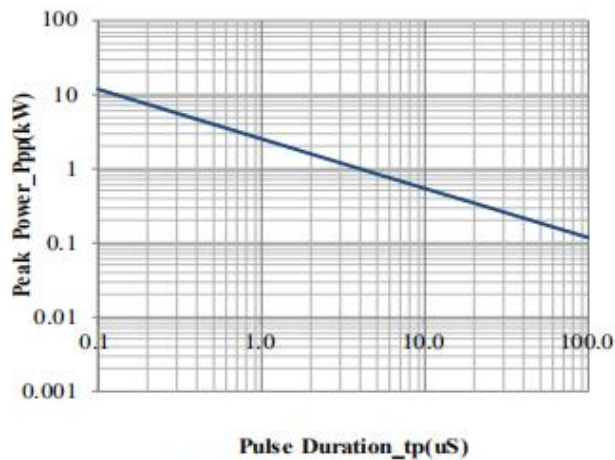
**TYPICAL CHARACTERISTICS**( $T_A=25^{\circ}\text{C}$  unless otherwise Specified)



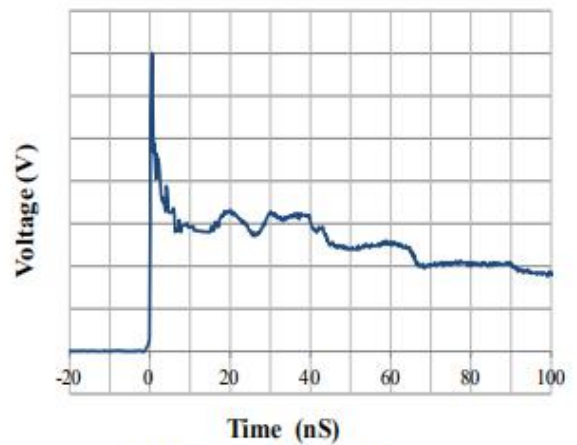
Junction Capacitance vs. Reverse Voltage



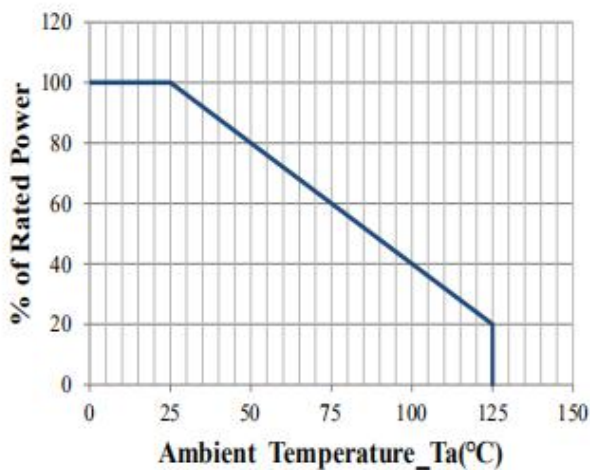
Clamping Voltage vs. Peak Pulse Current



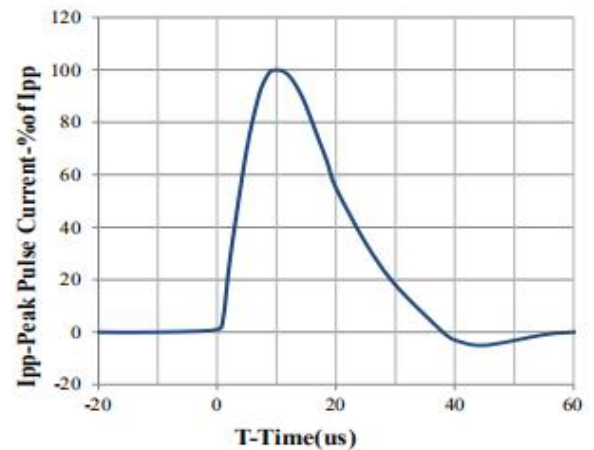
Peak Pulse Power vs. Pulse Time



IEC61000-4-2 Pulse Waveform



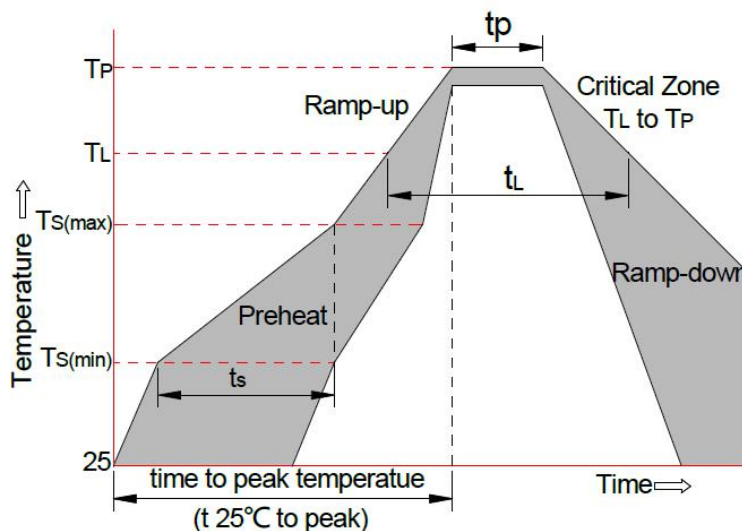
Power Derating Curve



8 X 20us Pulse Waveform

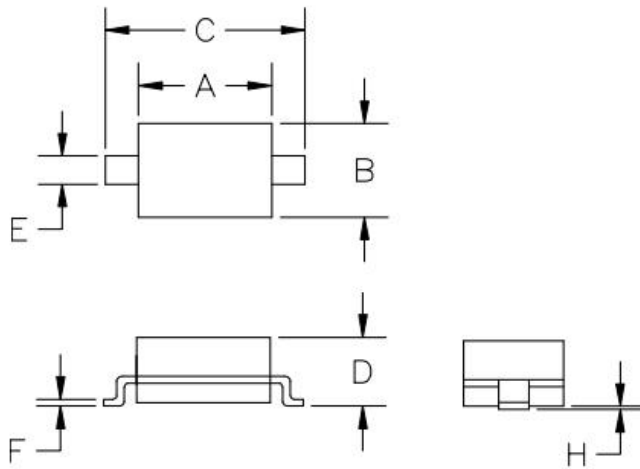


## SOLDERING PARAMETERS



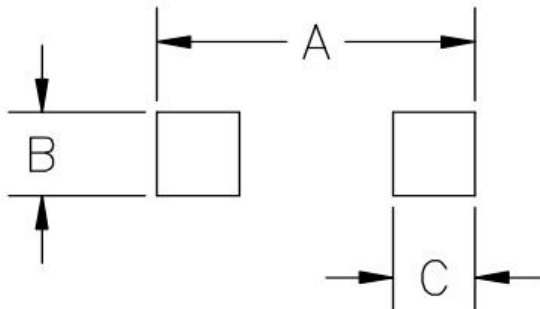
Reflow Condition		Pb-Free Assembly
Pre-heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max ( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) ( $t_s$ )	60-180 secs
Average ramp up rate( Liquid us Temp ( $T_L$ ) to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ -Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature ( $T_L$ ) (Liquid us)	+217°C
	-Temperature ( $t_L$ )	60-150 secs
Peak Temp ( $T_P$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		30 secs. Max
Ramp-down Rate		6 °C/secs. Max
xTime 25°C to Peak Temp ( $T_P$ )		8 min. Max
Do not exceed		+260°C

## SOD-323 PACKAGE OUTLINE DRAWING



SYM	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.50	1.80	0.060	0.071
B	1.20	1.40	0.045	0.054
C	2.30	2.70	0.090	0.107
D	-	1.10	-	0.043
E	0.30	0.40	0.012	0.016
F	0.10	0.25	0.004	0.010
H	-	0.10	-	0.004

## SUGGESTED LAND PATTERN



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
A	3.15	0.120
B	0.80	0.031
C	0.80	0.031