

**SPD9231A**
**1-Line, Bi-directional, Thyristor Surge Suppressors**
<http://www.sh-willsemi.com>
**Descriptions**

The SPD9231A is a bi-directional TSS (Thyristor Surge Suppressors) which can provide ESD protection for IC. It is specifically designed to protect telecom equipments from damaging overvoltage transients.

The SPD9231A is used to enable equipments to meet various regulatory requirements including ITU-T K.20, K.21 and IEC 61000-4-5

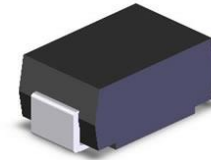
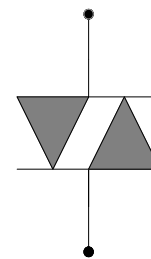
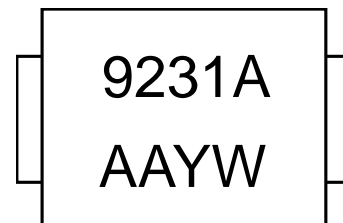
The SPD9231A is available in SMA package. Standard products are Pb-free and Halogen-free.

**Features**

- Peak off-state voltage:  $\pm 6.0V$  Max
- Excellent capability of absorbing transient surge
- Quick response to surge voltage
- Eliminate voltage overshoot caused by fast-rising transients
- Low leakage current:
- Solid-state silicon technology, non degenerative

**Applications**

- Audio/Video line
- Network and telecom
- Data lines and security systems
- Serial ports
- BNC interface
- DVR


**SMA**

**Schematic Diagram**


AA = Device code  
 Y = Year code  
 W = Week code

**Marking (Top View)**
**Order information**

Device	Package	Shipping
SPD9231A-2/TR	SMA	5000/Tape&Reel

**Electrical characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)**

Part Number	$V_{\text{DRM}}$	$I_{\text{DRM}}$	$V_S$	$V_{\text{BR}}^1$	$I_S$	$I_H$	$V_T$	$I_T$	$C_o^2$
	V	$\mu\text{A}$	V	V	mA	mA	V	A	pF
		Max.	Max.	Min.		Max.	Max.		Max.
SPD9231A	6.0	1	12.5	6.2	800	150	4	2.2	100

Notes:

- 1)  $V_{\text{BR}}$  is measured at  $I_{\text{BR}}=1\text{mA}$ .
- 2) Off-state capacitance is measured at  $f = 1\text{MHz}$ ,  $V_{\text{DC}} = 2\text{V}$ .

**Surge Ratings**

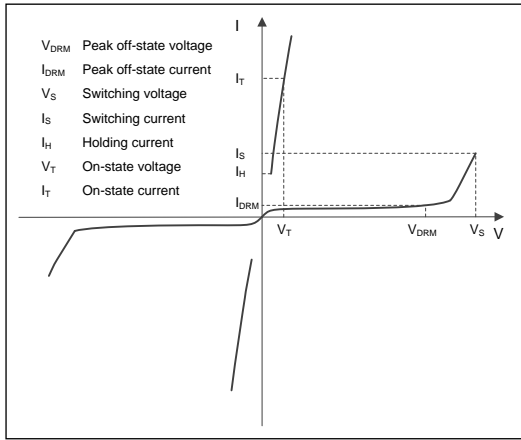
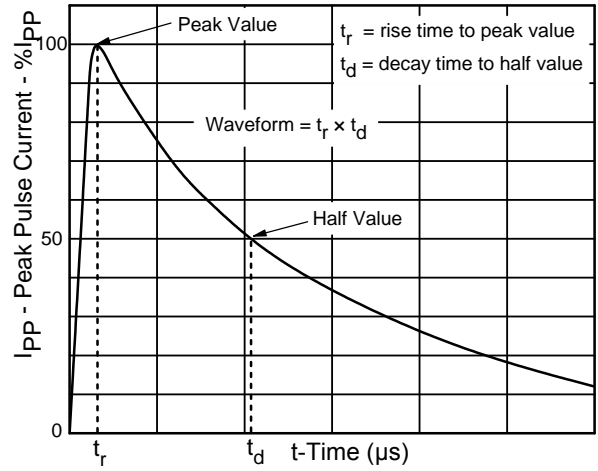
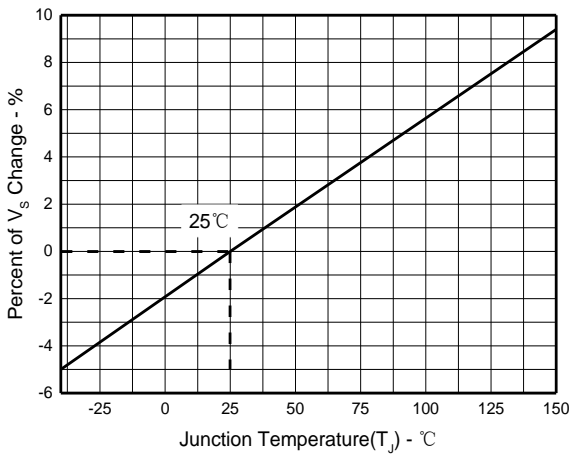
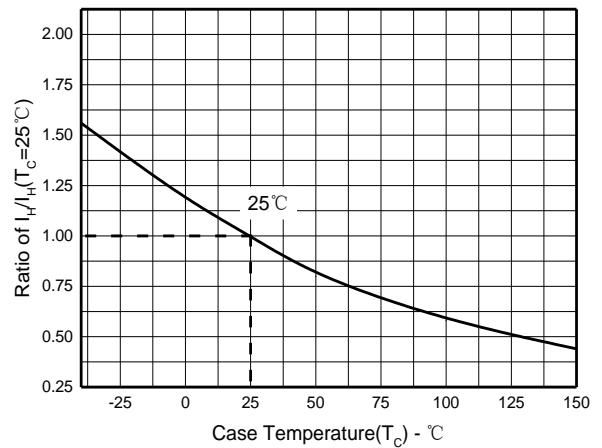
Part Number	$5/320\mu\text{s}^1$
	$10/700\mu\text{s}^2$
SPD9231A	4000 V

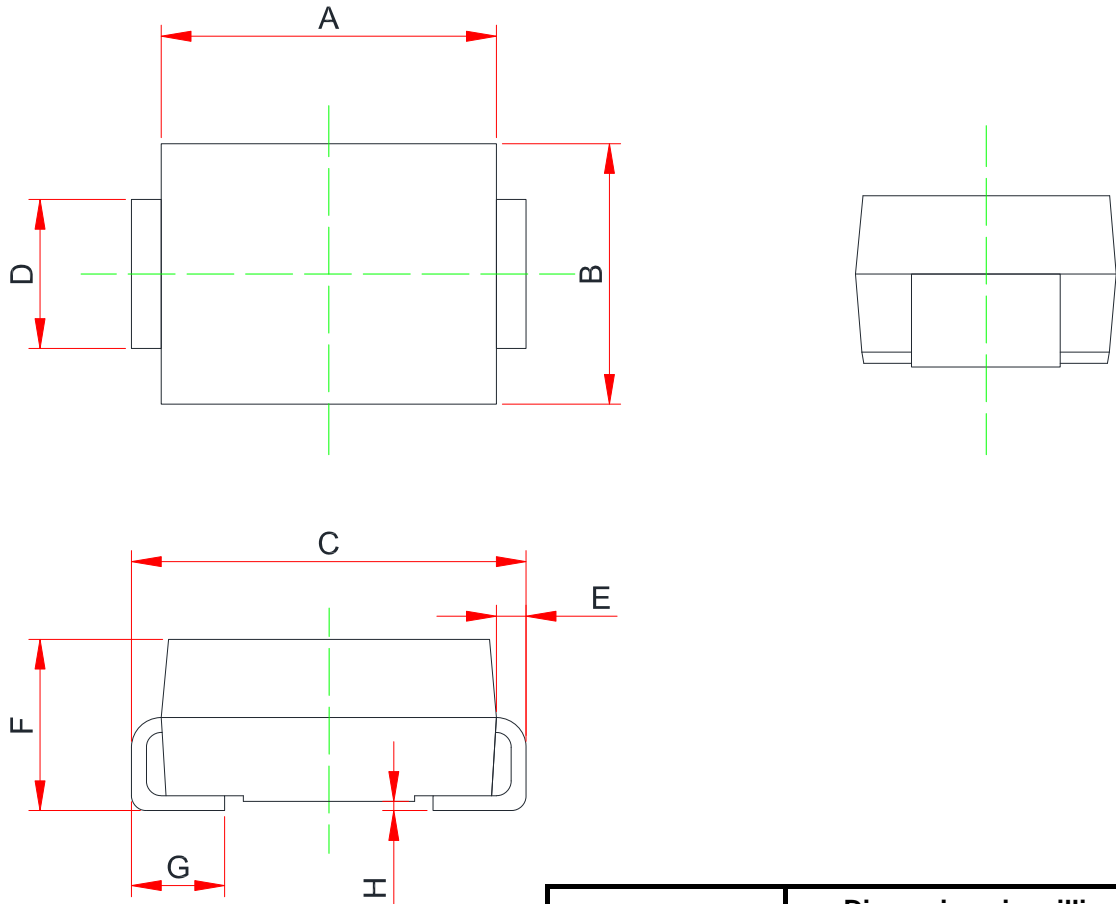
Notes:

- 1) Current waveform.
- 2) Voltage waveform.

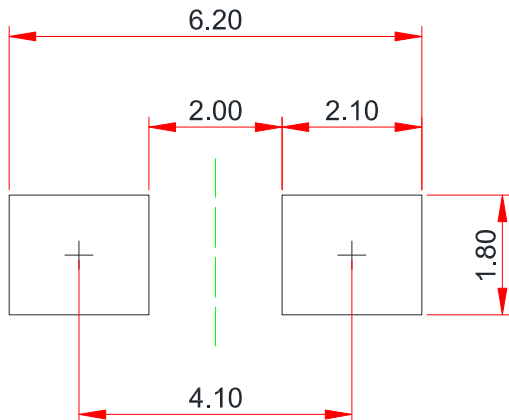
**Thermal considerations Thermal considerations**

Parameter	Symbol	Rating	Unit
Operation junction temperature	$T_J$	-40~150	$^\circ\text{C}$
Storage temperature	$T_{\text{STG}}$	-55~150	$^\circ\text{C}$
Lead temperature	$T_L$	260	$^\circ\text{C}$
Junction to ambient thermal resistance	$R_{\theta\text{JA}}$	90	$^\circ\text{C/W}$

**Typical characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)**

**Definitions of electrical characteristics**

**Peak pulse current waveform**

**Normalized  $V_S$  Change vs. Junction Temperature**

**Normalized Holding Current vs. Case Temperature**

**Package outline dimensions**
**SMA**


Symbol	Dimensions in millimeter	
	Min.	Max.
A	3.990	4.500
B	2.540	2.790
C	4.930	5.280
D	1.250	1.650
E	0.152	0.305
F	1.980	2.290
G	0.780	1.520
H	-	0.203

**Recommend land pattern (Unit: mm)**

**Notes:**

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.