

# Switching Gas Discharge Tubes

## Gas Plasma Voltage Dependent Switches

### RoHS VS Series

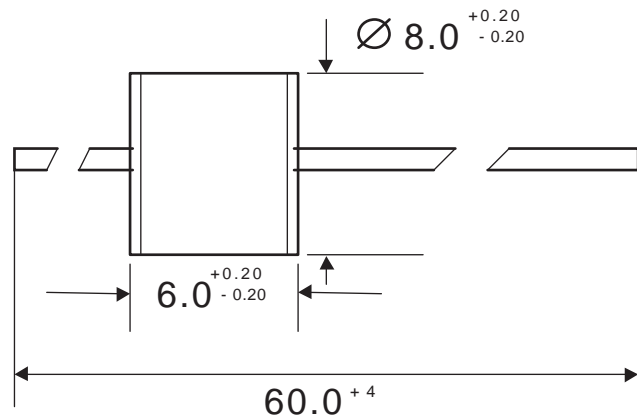
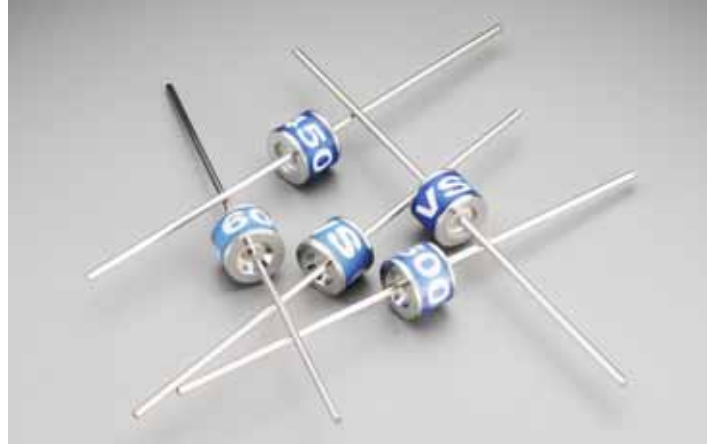
The VS Series is a 2-terminal bi-directional, voltage triggered switch designed for gas fuel ignition systems and similar circuits. Switching voltages for the devices are fixed depending on the part number selected. The gas plasma trigger technology offers very fast switching speeds, resulting in significantly better di/dt values when compared to silicon based SIDAC devices. Due to the high switching voltage of the devices, step-up transformer sizes and specifications can be reduced saving cost, size and weight.

#### Features

- RoHS compliant
- Ceramic chamber for ultimate reliability.
- Very high switching speed once switching voltage has been reached, resulting in high di/dt to be generated enabling the best performance to be extracted from ignition transformers.

#### Applications

- For switching stored electrical energy (such as capacitive discharge) at predetermined voltages.
- Designed for in gas fuel ignition systems and similar circuits.



#### Mechanical Specifications:

- Weight:** 1.42g (0.049oz.)  
**Materials:** Electrode Base: Copper alloy  
 Electrode Plating material: Bright Sn  
 Body: Ceramic  
**Device Marking:** Littelfuse 'LF' marking, voltage and product code

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#### Device Ratings and Specifications

Part Number	$V_{BO}^{(1)}$ (V)	$V_T @ 5A$ (V)	$I_{DRM}^{(2)}$ (A)	$I_{BO}^{(3)}$ (mA)	$C_O^{(4)}$ (pF)	$V_{BO}$ to $V_T$ (nS)
VS230	200 - 255	15	1.0	50	2.0	25
VS450	350 - 550	15	1.0	50	2.0	25
VS600	400 - 750	15	1.0	50	2.0	25

#### Electrical Life:

Maximum Increase in  $V_{BO}^{(1)}$  ..... 25 V  
 Switching Operations <sup>(6)</sup> ..... 2,000,000

#### Maximum Ratings:

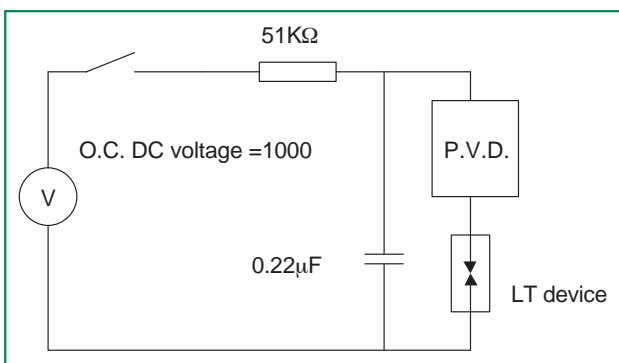
Surge On-State Current <sup>(5)</sup> ..... 1000A  
 Storage Temperature  $T_{STG}$  ..... -40 - +150°C  
 Operating Temperature ..... -40 - +150°C

#### Notes:

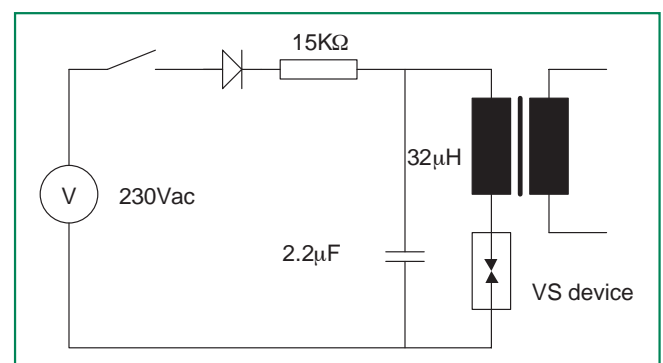
- (1) Measured on recommended test circuit (fig 1.)
- (2) Measured @ 300 Volts DC
- (3) Current required for transition to on-state
- (4) Measured @ 1 MHz, zero Volt bias
- (5) Using 8/20μs double exponential pulse
- (6) Measured on recommended test circuit (fig 2.)

#### Definitions:

- $V_{BO}$  – Breakover Voltage
- $V_T @ 5A$  – Nominal Off-state Voltage at 5A
- $I_{DRM}$  – Off-state Current
- $I_{BO}$  – Nominal Breakover Current
- $C_O$  - Max Capacitance
- $V_{BO}$  to  $V_T$  – Max switching time from  $V_{BO}$  to  $V_T$



**Fig 1.** Recommended breakover voltage test circuit  
 (Discharge current = 10-20mA; Sensitivity of peak voltage detect = 10-30mA)



**Fig 2.** Recommended Life Test Circuit