




Switching Gas Discharge Tubes

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Switching Gas Discharge Tubes

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Switching Gas Discharge Tubes

Gas Plasma Voltage Dependent Switches

RoHS LT Series

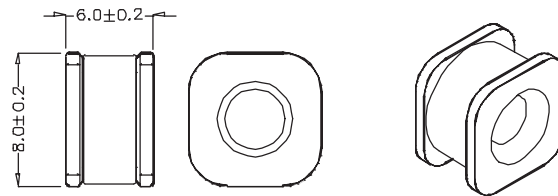
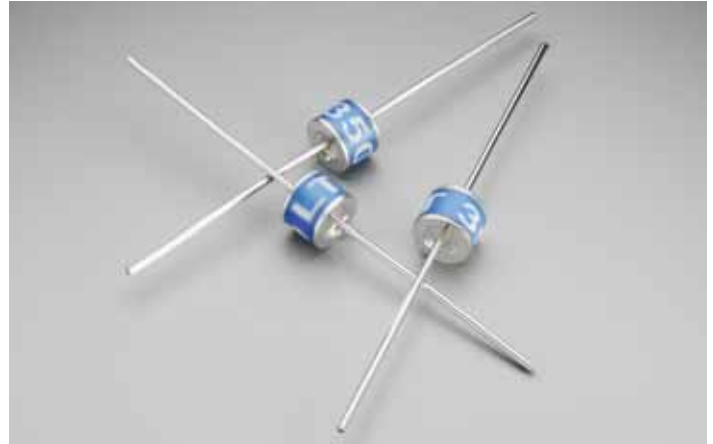
The LT Series is a 2-terminal bi-directional, voltage triggered switch is designed for ignition circuits used in high pressure HID lighting. Switching voltages for the devices are fixed depending on the part number selected. The gas plasma trigger technology offers very fast switching speeds, resulting 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

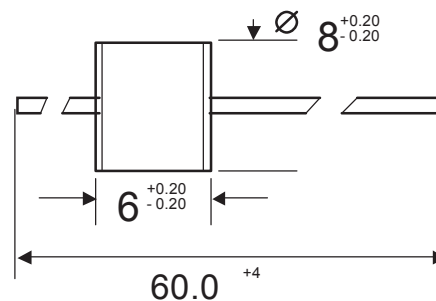
- RoHS compliant
- Ceramic chamber for ultimate reliability.
- Very high switching speed once switching voltage has been reached, resulting in high di/dt to be generated enabling the best performance to be extracted from ignition transformers.
- Tape and reel to EIA 481-1

Applications

- For switching stored electrical energy (such as capacitive discharge) at predetermined voltages.
- Designed for ignition circuits used in high pressure HID lighting.



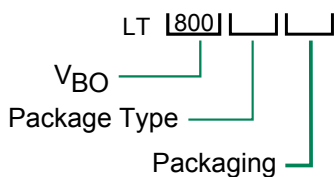
LT xxx SM



LTxxx A

Dimensions in mm

ORDERING INFORMATION



Mechanical Specifications:

- Weight (ballast circuit only):** 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 (red print)

A= Axial lead, tape and Reel
SM= Surface Mount

Switching Gas Discharge Tubes

Gas Plasma Voltage Dependent Switches

RoHS LT Series

Device Ratings and Specifications

Part Number	$V_{BO}^{(1)}$ (V)	V_S (V)	$V_T @ 5A$ (V)	$I_{DRM}^{(2)}$ (A)	$I_{BO}^{(3)}$ (mA)	$C_O^{(4)}$ (pF)	V_{BO} to V_T (nS)
LT230	195 - 265	184 - 276	15	1.0	50	2.0	25
LT800	680 - 920	640 - 960	15	1.0	50	2.0	25

Electrical Life:

Switching Cycles ⁽⁵⁾ 400,000
 Peak Discharge Current ⁽⁵⁾ 400 A

Maximum Ratings:

Max Switching Frequency 100 Hz
 Storage Temperature T_{STG} -40 - +150°C
 Operating Temperature -40 - +150°C

Notes:

- (1) Measured on recommended test circuit (fig 1.)
- (2) Measured @ 100 Volts DC
- (3) Current required for transition to on-state
- (4) Measured @ 1 MHz, zero Volt bias
- (5) Measured on recommended test circuit (fig 2.)

Definitions:

- V_{BO} – Breakover Voltage
- V_S – Switching 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

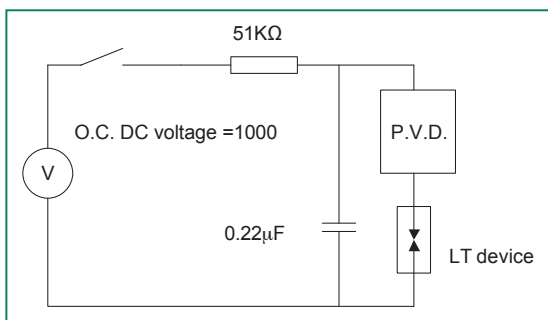


Fig 1. Recommended breakover voltage test circuit
 (Discharge current = 10-20mA, sensitivity of Peak Voltage Detect = 10-30mA)

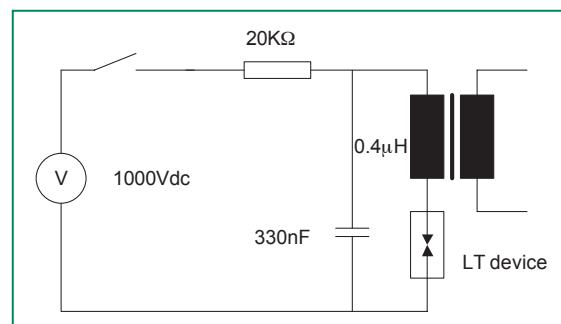


Fig 2. Recommended Life Circuit

Switching Gas Discharge Tubes

Gas Plasma Voltage Dependent Switches

RoHS VS Series

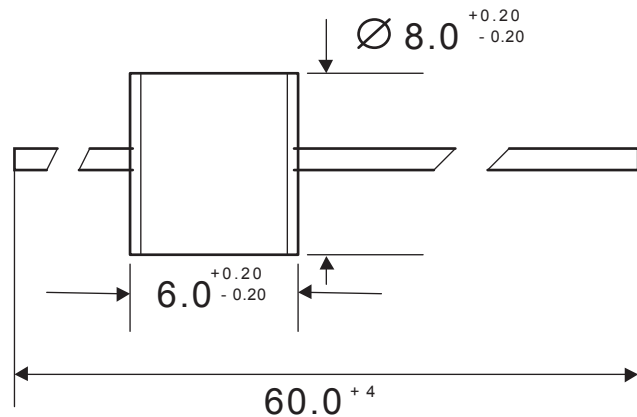
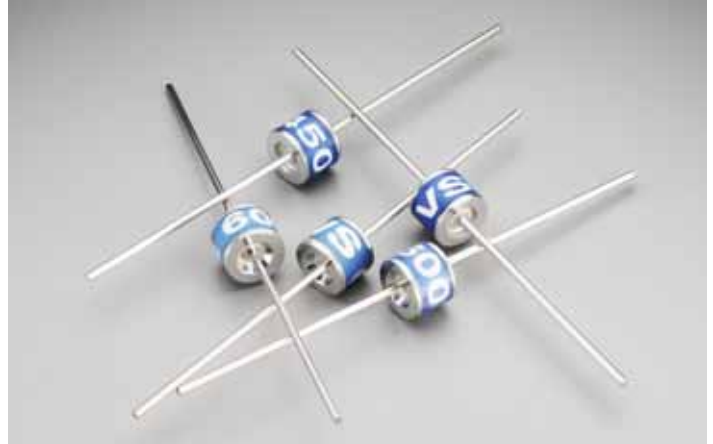
The VS Series is a 2-terminal bi-directional, voltage triggered switch designed for gas fuel ignition systems and similar circuits. Switching voltages for the devices are fixed depending on the part number selected. The gas plasma trigger technology offers very fast switching speeds, resulting in significantly 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

Switching Gas Discharge Tubes

Gas Plasma Voltage Dependent Switches

RoHS VS Series

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 ⁽⁶⁾ 2,000,000

Maximum Ratings:

Surge On-State Current ⁽⁵⁾ 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

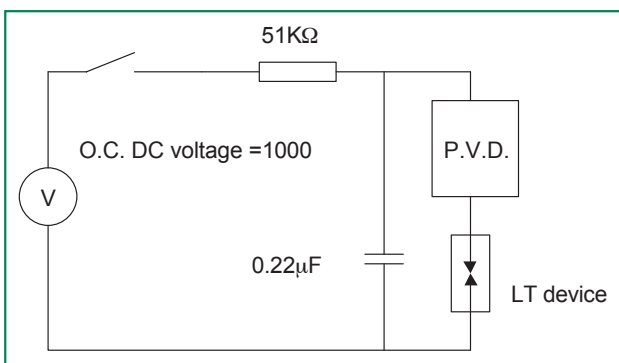


Fig 1. Recommended breakover voltage test circuit
 (Discharge current = 10-20mA; Sensitivity of peak voltage detect = 10-30mA)

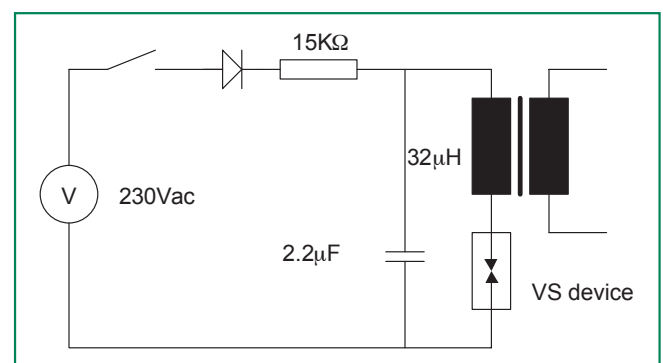


Fig 2. Recommended Life Test Circuit

Switching Gas Discharge Tubes

Gas Plasma Voltage Dependent Switches

RoHS XT Series

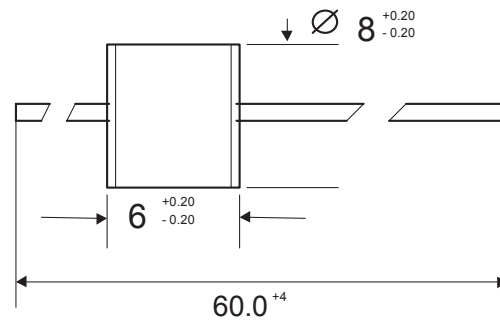
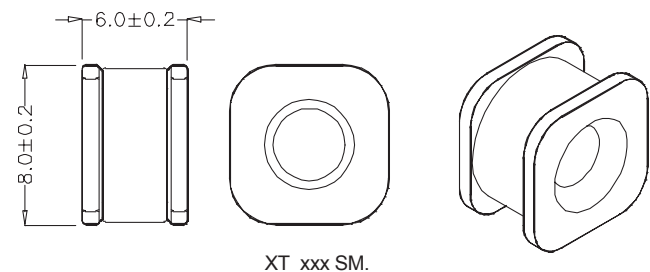
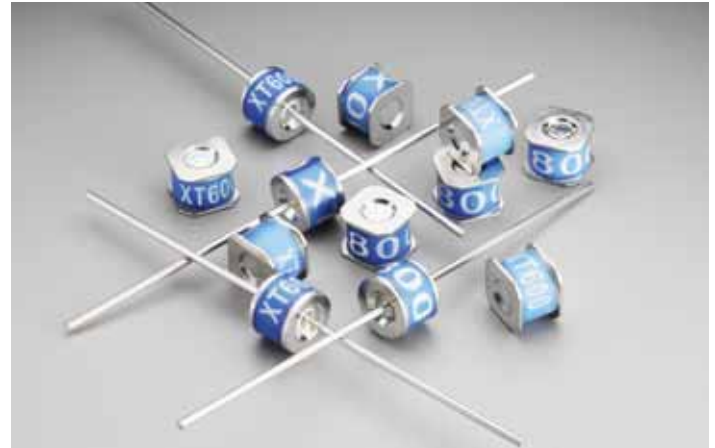
The XT Series is a 2-terminal bi-directional, voltage triggered switch designed for Xenon HID 'hot re-strike' circuits such as those found in automobiles. Switching voltages for the devices are fixed depending on the part number selected. The gas plasma trigger technology offers very fast switching speeds, 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
- 2 terminal configuration.
- 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.
- High lifetime and stability.
- Switching performance is virtually unaffected by changes in ambient temperature.
- Tape and Reel to EIA 481-1

Applications

- This product is optimised for Xenon HID 'Hot re-strike' circuits which require a very high number of operations at high current levels. The switching time is typically 10nS for the best possible efficiency.

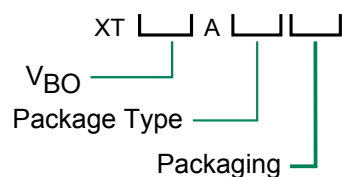


Dimensions in mm

Mechanical Specifications:

Weight (ballast circuit only): 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

ORDERING INFORMATION



A= Axial lead tape and reel
 SM= Surface Mount

Switching Gas Discharge Tubes

Gas Plasma Voltage Dependent Switches

XT Series

Device Ratings and Specifications

Part Number	V _{BO} ^{(1) (7)} (V)	Max Ignition	V _T @ 5A (V)	I _{DRM} ⁽²⁾ (A)	I _{BO} ⁽²⁾ (mA)	C _O ⁽⁴⁾ (pF)	V _{BO} to V _T (ns)	R _S (M)
XT350	297 – 403	463	15	1.0	5	1.5	25	>1
XT600	510 – 690	750	15	1.0	5	1.5	25	>1
XT800	680 – 920	1000	15	1.0	5	1.5	25	>1

Electrical Life:

Switching Cycles⁽⁵⁾ 150,000

Maximum Ratings:

Max Switching Frequency⁽⁶⁾ 400 Hz

Storage Temperature TSTG -40 - +150°C

Operating Temperature -40 - +150°C

Notes:

- (1) Measured on recommended test circuit (fig 1.)
- (2) Measured @ 100 Volts DC
- (3) Current required for transition to on-state
- (4) Measured @ 1 MHz, zero Volt bias
- (5) Measured on recommended test circuit (fig 2.)
- (6) Duty Cycle: 1sec on, 10 sec off.
- (7) Will retain these limits during life cycle

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

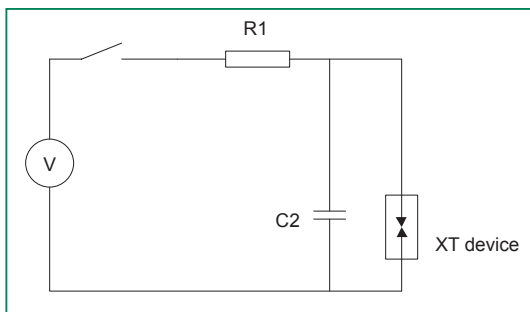


Fig 1. Recommended breakover voltage test circuit

V: open circuit DC voltage =500 (1000V for 600 and 800Vparts)
 R1 =51KΩ
 C1 =220nF

Discharge current =10 mAmps (approx)

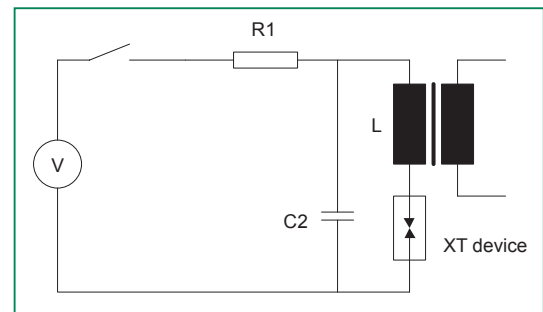


Fig 2. Recommended life test circuit

V: open circuit DC voltage =500 (1000V for 600 and 800V parts)
 R1 =10KΩ
 C1 =680nF
 L =0.5μH

Discharge current =500Amps (approx)