SH Series









Agency Approvals

Agency	Agency File Number
7U	E128662

Two Electrode GDT Graphical Symbol



Additional Information







Samples

Description

The Littelfuse SH Gas Discharge Tubes (GDT) series provides high levels of protection against fast rising transients caused by lightning disturbances. It has a surge rating of 5kA, 8/20µs. Offered in a Squared Surface Mount package, which helps to make pick and place on PCB process easier.

This GDT series is perfectly suited for broadband equipment applications. The GDT's low off-state capacitance is compatible with high bandwidth applications and this capacitance loading value does not vary if the voltage across the GDT changes.

The Littelfuse SH Gas Discharge Tube (GDT) series are specifically designed for protection of electrical, multimedia, and communication equipment against over voltage transients in surface mount assembly applications.

Features

- Excellent response to fast rising transients
- GHz working frequency
- 5kA, 8/20µs surge capability as defined by IEC 61000-4-5 2nd Edition
- UL recognized

- Offered with squared body package
- Non-Radioactive
- Ultra Low capacitance (<0.7pF)
- Lead-free and RoHS compliant

Applications

- CATV equipment
- Antennas
- RS 485
- Telecom Base Station
- Power Supply AC Main
- G.fast
- EV power Charging
- Inverter/Variable Frequency Drivers (VFDs)

- IEEE 802.3 compliant Ethernet interfaces
- Broad Band equipment
- xDSL, ADSL, ADSL2, VDSL, and VDSL2
- Medical Electronics
- Test Equipment
- General Telecom Equipment
- Renewable Energy

Gas Discharge Tubes SH Series

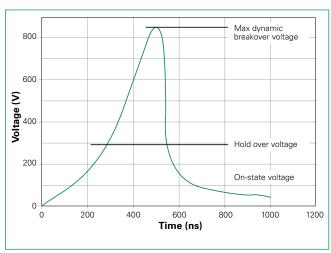
Electrical Characteristics

	Component Specifications (at 25°C)							Life Ratings								
Part Number		Breakdo in Volts @ 100V/		lmp Break	mum ulse -down tage	Maximum Impulse Discharge Current (8/20µs)	Insulation Resistance	Capaci- tance (@1MHz)	Impulse Discharge Current (8/20µs)	AC Dischage Current (50Hz, 1sec)	AC Dischage Current (9 Cycles @50Hz)	DC Holdover Voltage (<150ms)*	Impulse Life (10/1000µs) (100A)			
	MIN	ТҮР	MAX	@100V/ μs	1000V/μs	1 Time	MIN	MAX	MAX	MIN	MIN		MIN			
SH75	60	75	90	600	700	1GΩ @50V 1GΩ @100V 1GΩ @250V							52V			
SH90	72	90	108	600	700		0001					52V				
SH145	116	145	174	600	700		6kA								52V	
SH230	186	230	276	600	700				100		10 Shots @			80V		
SH250	200	250	300	600	700				0.75	(5kA)	5A	15 /	135V	300		
SH300	240	300	360	650	800			@100V	0.7pf	4.01) DA	15A	135V	Shots		
SH350	280	350	420	750	900				1 Shot at 6kA**			135V				
SH400	360	400	480	850	1000			400					135V			
SH470	376	470	564	900	1100			_					150V			
SH600	480	600	720	1000	1200		@200V					150V				

Note:

Product Characteristics Device Tin Plated 17.5 ± 12.5 Microns Construction: Ceramic Insulator Storage and Operational Temperature -40 to +90°C

Voltage Vs. Time Characteristic



Note: Tested per 1kV/µs waveform

Typical	Insertion Loss	

@1.0GHz = 0.08dB
@1.4GHz = 0.16dB
@1.8GHz = 0.26dB
@2.0GHz = 0.33dB
@2.4GHz = 0.47dB
@2.8GHz = 0.59dB
@3.1GHz = 0.70dB
@3.5GHz = 0.89dB
@4.0GHz = 1.24dB

Note: Insertion data for customer reference only, application testing needed for verification.

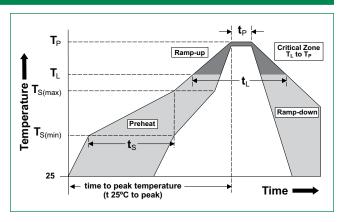
^{*} Reference REA PE-80, 0.2A, tested to ITU-T Rec K.12 and REA PE 80 <150 ms.

^{**} DC spark-over may exceed ± 25% after discharge, but will continue to protect without venting

Gas Discharge Tubes SBIS & eieiss

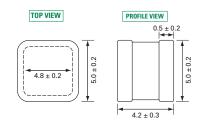
Soldering Parameters - Reflow Soldering (Surface Mount Devices)

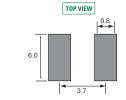
dition	Pb – Free assembly			
-Temperature Min (T _{s(min)})	150°C			
-Temperature Max (T _{s(max)})	200°C			
-Time (Min to Max) (t _s)	60 – 180 secs			
np up rate (Liquidus Temp (T _L) to	3°C/second max			
Ramp-up Rate	5°C/second max			
-Temperature (T _L) (Liquidus)	217°C			
-Temperature (t _L)	60 – 150 seconds			
rature (T _P)	260+0/-5 °C			
n 5°C of actual peak Temperature	10 – 30 seconds			
n Rate	6°C/second max			
o peak Temperature (T _P)	8 minutes Max.			
eed	260°C			
	- Temperature Min (T _{s(min)}) - Temperature Max (T _{s(max)}) - Time (Min to Max) (t _s) np up rate (Liquidus Temp (T _L) to Ramp-up Rate - Temperature (T _L) (Liquidus) - Temperature (t _L) rature (T _p) n 5°C of actual peak Temperature n Rate to peak Temperature (T _p)			



Product Dimensions

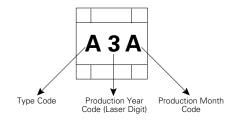
Dimensions in millimeters





Recommended Soldering Pad Layout

Product Marking

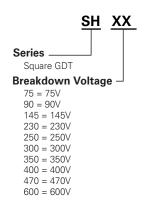


Type Code				
SH75				
SH90				
SH145				
SH230				
SH250				
SH300				
SH350				
SH400				
SH470				
SH600				

Month Code					
Α	January				
В	February				
С	March				
D	April				
E	May				
F	June				
G	July				
Н	August				
I	September				
J	October				
K	November				
L	December				

Gas Discharge Tubes SH Series

Part Numbering System and Ordering Information



Taping and Reel Specifications

Taping

Unit = mm

Item	Spec	Item	Spec		
Р	12.0±0.1	D	Ø1.55±0.05		
P0	4.0±0.1	W	16.0±0.3		
Α	5.4±0.1	K0	5.4±0.1		
В	4.6±0.1	t	0.5±0.05		

