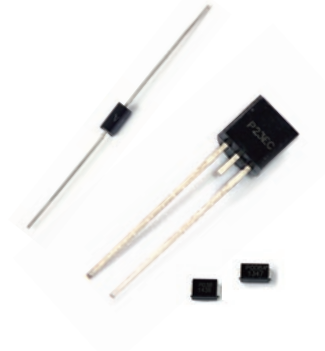


半导体放电管 TSS (Thyristor Surge Suppressors)

TSS是一种PNPN型的器件，可以看作一个没有门极的晶闸管。当一个浪涌电压超过TSS的关断电压时（VDRM），TSS将电压限制在转折电压以下，这时，当通过TSS的电流超过开关电流，TSS将处于短路的状态。当通过TSS的电流低于去维持电流 I_H ，TSS将重置恢复到高阻抗状态。

TSS is a PNPN type device that can be regarded as a thyristor without a gate. When a surge voltage exceeds the peak off-state voltage of TSS (VDRM), TSS limits the voltage below the break-over voltage. At this time, When the current flowing through TSS exceeds the switching current, the TSS will be in a short-circuit condition. When the current flowing through TSS lower than the holding current (I_H), the TSS will reset to a high-impedance state.



应用注意 Restrictions

因为TSS是一个开关型的器件，故不能直接在AC线上使用，他必须放在负载后面，如果不这样做，将会导致TSS击穿损坏。

Because the TSS device is a crowbar device, it cannot be used directly across the AC line; it must be placed behind a load. Failing to do so will result in exceeding the TSS device's maximum on-state current rating, which may cause the device to enter a permanent short-circuit condition.

特点 Advantages

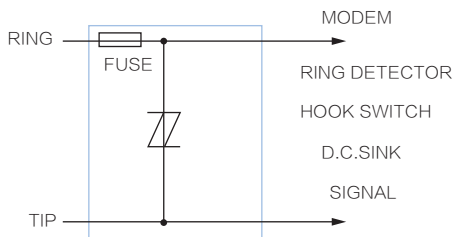
响应速度快，电气特性稳定，高可靠性，低电容，并且因为TSS是一个开关型器件，他不会过电压损坏。

Advantages of the TSS device include its fast response time, stable electrical characteristics, long term reliability, and low capacitance. Also, because the TSS device is a crowbar device, it cannot be damaged by voltage.

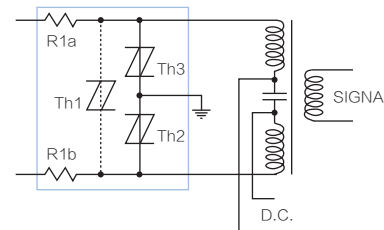
应用 Applications

TSS主要应用于电信行业和数据通信的过压保护，其他领域的应用，应该参考TSS选型指南。

TSS devices are primarily used as the principle overvoltage protector in telecommunications and data communications circuits. For applications outside this realm, follow the design criteria in "TSS Device Selection Criteria".

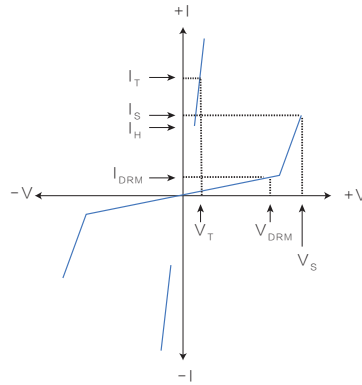


Modem Inter-wire Protection



ISDN Protection

V-I Characteristics



V_{DRM}	Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state. The V_{DRM} of the TSS device must be greater than the maximum operating voltage of the circuit that the TSS device is protecting.	最大关断电压-使TSS保持关断状态的最大电压。 V_{DRM} 必须大于被保护电路的最大操作电压。
V_S	Switching Voltage - maximum voltage prior to switching to on state. The V_S of the TSS device should be equal to or less than the instantaneous peak voltage rating of the component it is protecting.	转折电压-使TSS切换到导通状态的最大电压。TSS的 V_S 必须大于被保护设备能够耐受的瞬时峰值电压。
V_T	On-state Voltage-maximum voltage measured at rated on-state current.	通态电压-TSS处于导通状态是两端的最大电压
I_{DRM}	Leakage Current-maximum peak off-state current measured at V_{DRM}	漏电流-TSS处于关断状态时的最大漏电流
I_S	Switching Current-maximum current required to switch to on state	转折电流-TSS切换到导通状态所需的最大电流。
I_T	On-state Current - maximum rated continuous on-state current	通态电流-最大连续通态电流
I_H	Holding Current-minimum current required to maintain on state. Because TIA-968-A 4.4.1.7.3 specifies that registered terminal equipment not exceed 140 mA dc per conductor under short-circuit conditions, the holding current of the TSS device is set at 150 mA. For specific design criteria, the holding current (I_H) of the TSS device must be greater than the DC current that can be supplied during an operational and short circuit condition.	保持电流-使TSS维持在导通状态的最小电流。因为TIA-968-A 4.4.1.7.3指定终端设备的半导体短路状态下电流不能超过140mA,故TSS的保持电流设置在150mA。 特定的设计标准, TSS的 I_H 必须大于DC供电端操作和短路电流。
C_o	Off-state Capacitance - typical capacitance measured in off state. Assuming that the critical point of insertion loss is 70 percent of the original signal value, the TSS device can be used in most applications with transmission speeds up to 30 MHz.	关断状态下电容-关断状态下测量的典型电容。假定插入损耗的临界点是70%原始信号值, TSS最多可以应用于30MHz的信号线上。
I_{PP}	Peak Pulse Current-maximum rated peak impulse current. For circuits that do not require additional series resistance, the surge current rating (IPP) of the TSS device should be greater than or equal to the surge currents associated with the lightning immunity tests of the applicable regulatory requirement (IPK). For circuits that use additional series resistance, the surge current rating (IPP) of the TSS device should be greater than or equal to the available surge currents associated with the lightning immunity tests of the applicable regulatory requirement (IPK)(available)	脉冲峰值电流-TSS能承受的最大脉冲峰值电流。对于不需要额外串连电阻的电路, TSS的IPP必须大于等于相关标准要求防浪涌等级。对于可增加串连电阻的电路, TSS的IPP必须大于等于放浪涌测试时实际的电流。

SMA/DO-214AC -----TA Series



Surge Ratings

Series	Ipp 2/10μS Amps	Ipp 8/20μS Amps	Ipp 10/160μS Amps	Ipp 10/560μS Amps	Ipp 10/1000μS Amps	ITSM 60HZ Amps	DI/Dt Amps /μS
SMA/TA	150	150	90	50	45	20	500

Summary Electrical Characteristics, T a = 25 °C (Unless Otherwise Noted)

Parameter Description		IDRM@VDRM		VS @IS		VT@IT		IH	CO
Unit		μA	V	V	mA	V	A	mA	pF
Type	ENV	max	min	max	max	max	max	min	max
P0080TA	L	5	6	25	800	4	2.2	50	80
P0220TA	L	5	15	32	800	4	2.2	50	60
P0300TA	L	5	25	40	800	4	2.2	50	60
P0640TA	L	5	58	77	800	4	2.2	150	50
P0720TA	L	5	65	87	800	4	2.2	150	50
P0900TA	L	5	75	98	800	4	2.2	150	50
P1100TA	L	5	90	130	800	4	2.2	150	45
P1300TA	L	5	120	160	800	4	2.2	150	45
P1500TA	L	5	140	180	800	4	2.2	150	45
P1800TA	L	5	170	220	800	4	2.2	150	35
P2300TA	L	5	190	260	800	4	2.2	150	35
P2600TA	L	5	220	300	800	4	2.2	150	35
P3100TA	L	5	275	350	800	4	2.2	150	35
P3500TA	L	5	320	400	800	4	2.2	150	35

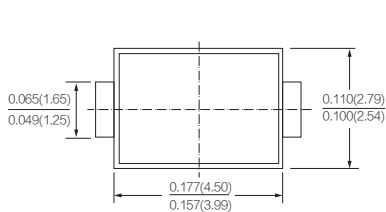
L : Lead-free

①Vs is measured at 100KV/s

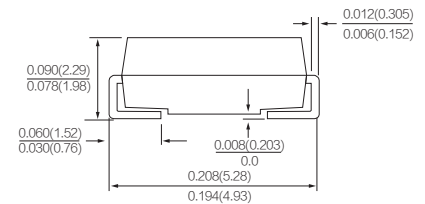
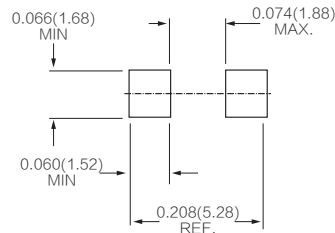
②Off-state capacitance is measured in VDC=2V, VRMS=1V, f=1MHz

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC(SMA)



Mounting Pad Layout



SMB/DO-214AA -----S Series



Surge Ratings

Series	Ipp 2/10µS Amps	Ipp 8/20µS Amps	Ipp 10/160µS Amps	Ipp 10/560µS Amps	Ipp 10/1000µS Amps	ITSM 60HZ Amps	Di/Dt Amps /µS
A	150	150	90	50	45	20	500
B	250	250	150	100	80	30	500
C	500	400	200	150	100	50	500

Summary Electrical Characteristics, T a = 25 °C (Unless Otherwise Noted)

Parameter Description		IDRM@VDRM		VS @IS		VT@IT		IH	CO		
Unit		µA	V	V	mA	V	A	mA	A	B	C
Type	ENV	max	min	max	max	max	max	min	max		
P0080S	L	5	6	25	800	4	2.2	50	80	130	130
P0220S	L	5	18	30	800	4	2.2	50	60	120	120
P0300S	L	5	25	40	800	4	2.2	50	60	120	100
P0640S	L	5	58	77	800	4	2.2	150	50	80	200
P0720S	L	5	66	87	800	4	2.2	150	50	75	150
P0900S	L	5	75	98	800	4	2.2	150	50	70	140
P1100S	L	5	90	130	800	4	2.2	150	45	70	110
P1300S	L	5	120	160	800	4	2.2	150	45	60	100
P1500S	L	5	140	180	800	4	2.2	150	45	55	90
P1800S	L	5	170	220	800	4	2.2	150	35	50	90
P2300S	L	5	190	260	800	4	2.2	150	35	50	80
P2600S	L	5	220	300	800	4	2.2	150	35	45	80
P3100S	L	5	275	350	800	4	2.2	150	35	45	75
P3500S	L	5	320	400	800	4	2.2	150	35	40	60

For individual "SA" "SB" "SC" Surge ratings, see table above
L : Lead-free

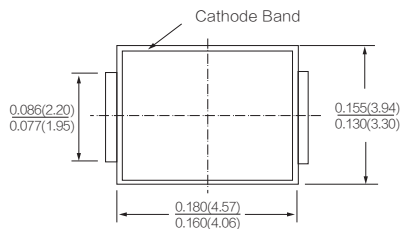
①Vs is measured at 100KV/s

②Off-state capacitance is measured in VDC=2V, VRMS=1V, f=1MHz

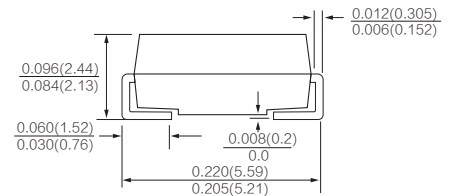
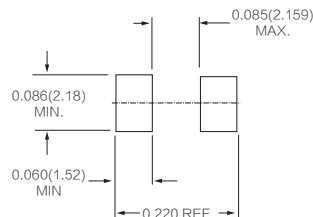
TSS

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA(SMB)



Mounting Pad Layout



TO-92 -----E Series



Surge Ratings

Series	I _{pp} 2/10μS Amps	I _{pp} 8/20μS Amps	I _{pp} 10/160μS Amps	I _{pp} 10/560μS Amps	I _{pp} 10/1000μS Amps	ITSM 60HZ Amps	Di/Dt Amps /μS
A	150	150	90	50	45	20	500
B	250	250	150	100	80	30	500
C	500	400	200	150	100	50	500

 Summary Electrical Characteristics, T_a = 25 °C (Unless Otherwise Noted)

Parameter Description		I _{DRM} @V _{DRM}		V _S @I _S		V _T @ I _T		I _H	C _O		
Unit		μA	V	V	mA	V	A	mA	A	B	C
Type	ENV	max	min	max	max	max	max	min	max		
P0080E	L	5	6	25	800	4	2.2	50	80	130	130
P0220E	L	5	18	30	800	4	2.2	50	60	120	120
P0300E	L	5	25	40	800	4	2.2	50	60	120	100
P0640E	L	5	58	77	800	4	2.2	150	50	80	200
P0720E	L	5	66	87	800	4	2.2	150	50	75	150
P0900E	L	5	75	98	800	4	2.2	150	50	70	140
P1100E	L	5	90	130	800	4	2.2	150	45	70	110
P1300E	L	5	120	160	800	4	2.2	150	45	60	100
P1500E	L	5	140	180	800	4	2.2	150	45	55	90
P1800E	L	5	170	220	800	4	2.2	150	35	50	90
P2300E	L	5	190	260	800	4	2.2	150	35	50	80
P2600E	L	5	220	300	800	4	2.2	150	35	45	80
P3100E	L	5	275	350	800	4	2.2	150	35	45	75
P3500E	L	5	320	400	800	4	2.2	150	35	40	60

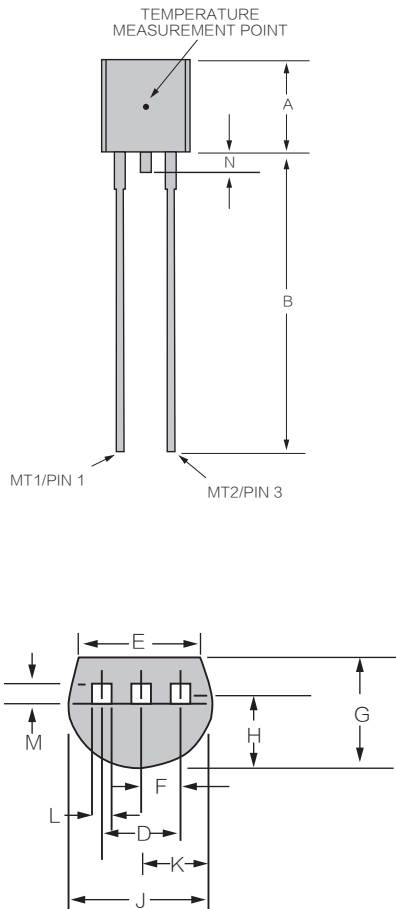
For individual "LA" "LB" "LC" Surge ratings, see table above

L : Lead-free

①V_s is measured at 100KV/s

②Off-state capacitance is measured in VDC=2V, VRMS=1V, f=1MHz

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



DIM	Inches		Millimeters	
	Min	Max	Min	Max
A	0.176	0.196	4.47	4.98
B	0.500	-	12.70	-
D	0.095	0.105	2.41	2.67
E	0.150	-	3.81	-
F	0.046	0.054	1.16	1.37
G	0.135	0.145	3.43	3.68
H	0.088	0.096	2.23	2.44
J	0.176	0.186	4.47	4.73
K	0.088	0.096	2.23	2.44
L	0.013	0.019	0.33	0.48
M	0.013	0.017	0.33	0.43
N	-	0.060	-	1.52

The TO-92 is designed to meet mechanical standards as set forth in JEDEC publication number 95.

DO-15/DO-27 -----L Series



Surge Ratings

Series	Ipp 2/10μS Amps	Ipp 8/20μS Amps	Ipp 10/160μS Amps	Ipp 10/560μS Amps	Ipp 10/1000μS Amps	ITSM 60HZ Amps	Di/Dt Amps /μS
A	150	150	90	50	45	20	500
B	250	250	150	100	80	30	500
C	500	400	200	150	100	50	500

Summary Electrical Characteristics, T a = 25 °C (Unless Otherwise Noted)

Parameter Description		IDRM@VDRM		VS @IS		VT@IT		IH	CO		
Unit		μA	V	V	mA	V	A	mA	A	B	C
Type	ENV	max	min	max	max	max	max	min	max		
P0080L	L	5	6	25	800	4	2.2	50	80	130	130
P0220L	L	5	18	30	800	4	2.2	50	60	120	120
P0300L	L	5	25	40	800	4	2.2	50	60	120	100
P0640L	L	5	58	77	800	4	2.2	150	50	80	200
P0720L	L	5	66	87	800	4	2.2	150	50	75	150
P0900L	L	5	75	98	800	4	2.2	150	50	70	140
P1100L	L	5	90	130	800	4	2.2	150	45	70	110
P1300L	L	5	120	160	800	4	2.2	150	45	60	100
P1500L	L	5	140	180	800	4	2.2	150	45	55	90
P1800L	L	5	170	220	800	4	2.2	150	35	50	90
P2300L	L	5	190	260	800	4	2.2	150	35	50	80
P2600L	L	5	220	300	800	4	2.2	150	35	45	80
P3100L	L	5	275	350	800	4	2.2	150	35	45	75
P3500L	L	5	320	400	800	4	2.2	150	35	40	60

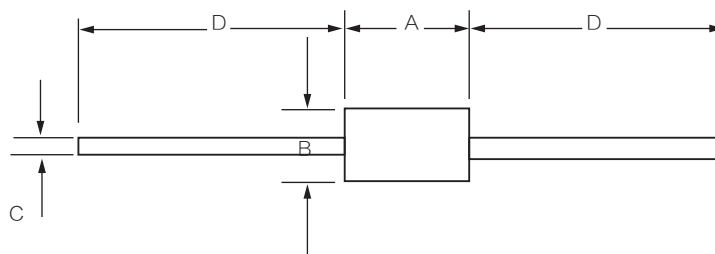
For individual "LA" "LB" "LC" Surge ratings, see table above

L : Lead-free

①Vs is measured at 100KV/s

②Off-state capacitance is measured in VDC=2V, VRMS=1V, f=1MHz

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



DO-15 / DO-27

DO-15 LA&LB Series

DIM	Inches		Millimeters	
	Min	Max	Min	Max
A	0.230	0.300	5.80	7.60
B	0.104	0.140	2.60	3.60
C	0.026	0.034	0.70	0.90
D	1.000	-	25.40	-

DO-27 LC Series

DIM	Inches		Millimeters	
	Min	Max	Min	Max
A	-	0.370	-	9.50
B	-	0.250	-	6.40
C	0.048	0.052	1.20	1.30
D	1.000	-	25.40	-

TSS