Description

SP0080SDT TSS is a type of protection semiconductor component.It is designed to protect RS485 application from damaging overvoltage transients (up to 6.6 kV@1.2 / 50 μs, 2 Ω). Compared to traditional GDT and TVS combination solution, SP0080SDT is a surface mount device with small dimension, low capacitance and fast response etc.

Schematic Symbol

Features

- Lower capacitance
- Low profile package
- Low on-state voltage
- Excellent capability of absorbing transient surge
- Quick response to surge voltage (ns Level)
- Eliminates overvoltage caused by fast rising transients
- Moisture sensitivity level: Level 1
- Non degenerative
- Flammability Rating: UL 94 V-0
- Halogen free and RoHS compliant

Order Information

Type	Package	Marking Code	Delivery Form	Delivery Quantity
SP0080SDT	DO-214AB(SMC)	P08T	13” T&R	3000 PCS

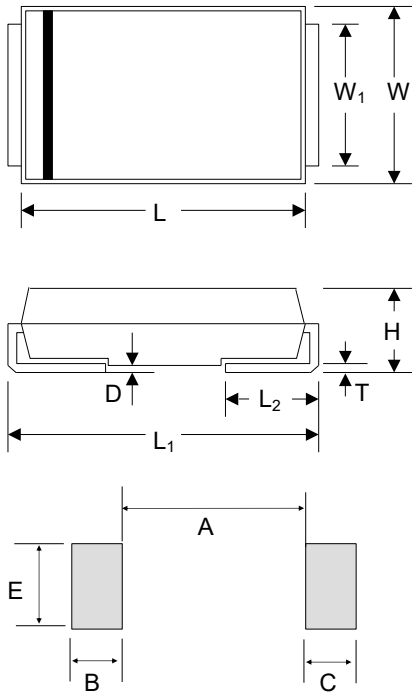
Limiting Values

(T_A = 25 °C, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Max	Unit
I_{PP}	Repetitive peak pulse current	8 / 20 μs [1]	3300	-	A
T_J	Operating Temperature Range	-	-40	150	℃
T_{stg}	Storage Temperature Range	-	-55	150	℃

[1] Surge test in compliance with IEC61000-4-5, Voltage waveform 1.2 / 50 μs @ 2 Ω, Current waveform 8 / 20 μs @ 2 Ω

Package Dimensions



Mounting Pad Layout

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	6.60	7.11	0.260	0.280
W	5.59	6.22	0.220	0.245
W_1	2.90	3.20	0.114	0.126
H	2.06	2.62	0.079	0.103
T	0.152	0.305	0.006	0.012
L_1	7.75	8.13	0.305	0.320
L_2	0.76	1.52	0.030	0.060
D	-	0.203	-	0.008
A	-	4.20	-	0.165
B	2.40	-	0.094	-
C	2.40	-	0.094	-
E	3.30	-	0.129	-

Part Numbering System

SP 008 0 S DT

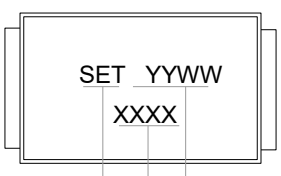
SP: SET Protection Thyristor
008: Median Voltage

0: Bi-directional

Package Type

DT: Surge Rating 6 kV
(1.2 / 50 μs)

Marking



Trademark

Marking Code

Trace Code Marking
YY-Year Code: 19 denote 2019
WW-Week Code: 38 denote the 38th week of 2019

Electrical Characteristics

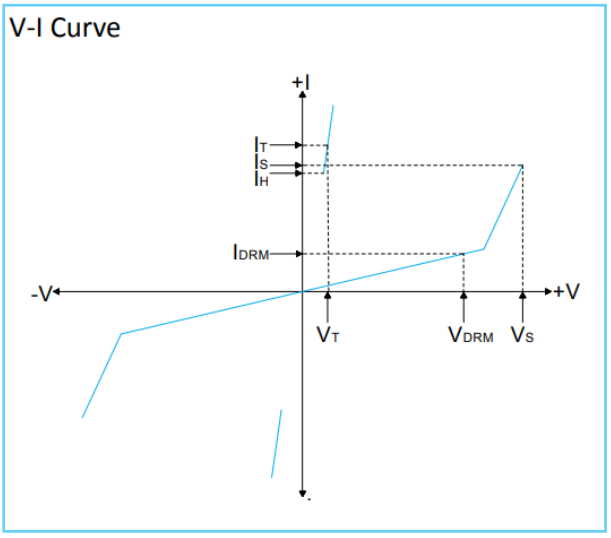
(T_A = 25 °C, unless otherwise specified)

Part Number	I_{DRM}@V_{DRM}		V_S [1]@I_S		V_T@ I_T		I_H	Capacitance [2]
	μA	V	V	mA	V	A	mA	pF
	max		max	max	max	max	min	max
SP0080SDT	1	6	15	800	4	2.2	50	500

[1] Vs is measured at 100 kV / s

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

Symbol	Parameter
V_{DRM}	Peak off-state voltage
I_{DRM}	Off-state current
V_S	Switching voltage
I_S	Switching current
V_T	On-state voltage
I_T	On-state current
I_H	Holding current
C_O	Off-state capacitance



Performance Curve for Reference

(T_A=25 °C unless otherwise noted)

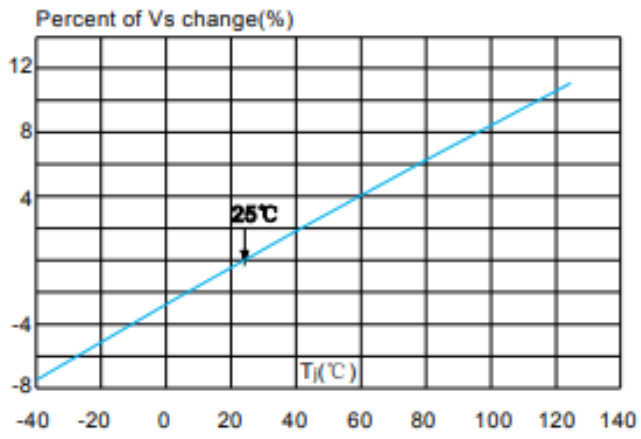


FIGURE 1
Normalized VS. Change VS. Junction Temperature

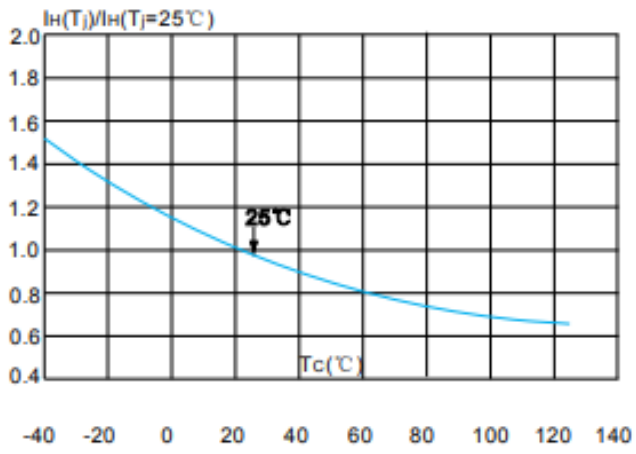


FIGURE 2
Normalized DC Holding Current VS. Case Temperature

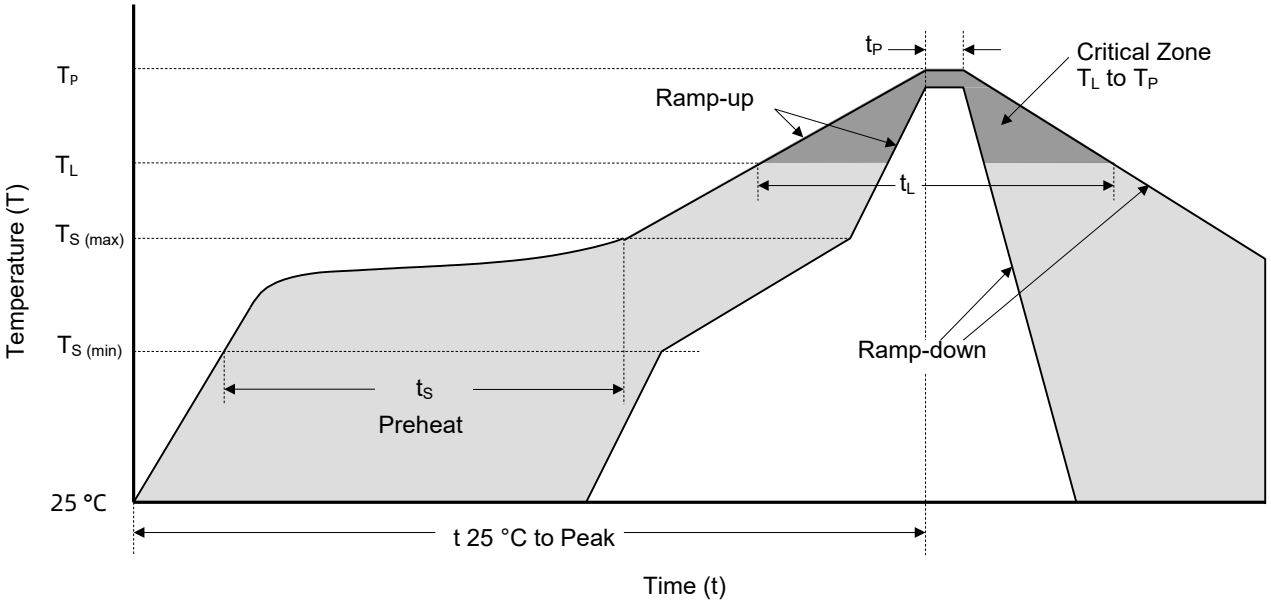
Environmental Specifications

High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
MSL	JESDEC-J-STD-020, Level 1
Temperature Cycling	JESD22-A104
H3TRB	JESD22-A101
RSH	JESD22-A111

Physical Specifications

Weight	0.007 ounce,0.21 grams
Case	JESD22DO214AB. Molded plastic body over glass passivated junction
Polarity	Color band denotes positive end (cathode) except Bidirectional
Terminal	Matte Tin-plated leads, Solderability per JESD22-B102

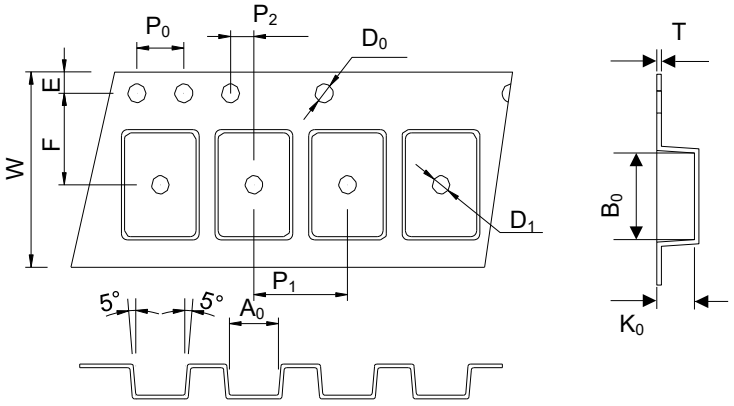
Soldering Parameters

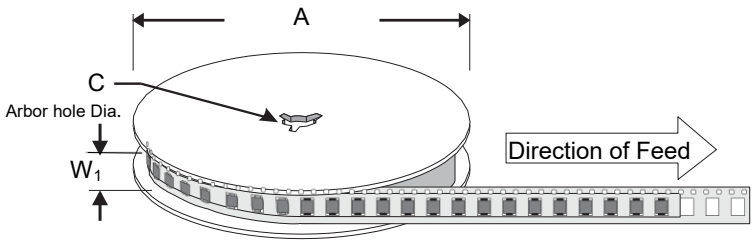


Reflowing Condition

Reflow Soldering Parameters		Lead-Free Assembly
Pre-heat	Temperature Min ($T_{S\ (min)}$)	150 °C
	Temperature Max ($T_{S\ (max)}$)	200 °C
	Time (min to max) (t_s)	60 ~ 120 seconds
Average Ramp Up Rate (Liquidus Temp (T_L) to Peak Temp (T_P))		3 °C / second max.
T_S (max) to T_L-Ramp-up Rate		3 °C / second max.
Reflow	Temperature (T_L)	217 °C
	Time (t_L)	60 ~ 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time of within 5 °C of Actual Peak Temperature (t_P)		30 seconds
Ramp-down Rate		6 °C / second max.
Time From 25 °C to Peak Temperature		8 Minutes max.
Do Not Exceed		260 °C

Packaging Information

Tape	Symbol	Dimension (mm)
	W	16.00 + 0.3 / -0.1
	P_0	4.00 ± 0.10
	P_1	8.00 ± 0.10
	P_2	2.00 ± 0.10
	D_0	1.55 ± 0.05
	D_1	1.55 ± 0.05
	E	1.75 ± 0.10
	F	7.50 ± 0.10
	A_0	6.15 ± 0.10
	B_0	8.30 ± 0.10
	K_0	2.48 ± 0.10
	T	0.30 ± 0.05

Reel Size	13” Reel	
	A	330 mm
	C	13.2 mm
	W_1	12.5 mm

Part Number	Package	QTY (Reel)	Packaging Option	Packaging Specification
SP0080SDT	DO-214AB	3000 PCS	Tape & Reel – 12mm tape/13” reel	EIA STD RS-481

ATTENTION

Usage

1. TSS must be operated in the specified ambient temp..
2. Do not clean the TSS with strong polar solvent such as ketone, esters, benzene and halogenated hydrocarbon, to avoid damaging the encapsulating layer.
3. Please do not apply severe vibration, shock or pressure to TSS, to avoid element cracking.

Replacement

1. If TSS is visually damaged, please replace it.
2. TSS is a non-repairable product. For safety sake, please use equivalent TSS for replacement.

Storage

1. Storage Temp. Range: (-55 to 150) °C.
2. Do not store the TSS at the high temp., high humidity or corrosive gas environment, to avoid influencing the solder- ability of the lead wires. The product shall be used up within 1 year after receiving the goods.

Environmental Conditions

1. TSS should not be exposed to the open air, nor direct sunshine.
2. TSS should avoid rain, water vapor or other condition of high temp. and high humidity.
3. TSS should avoid sand dust, salt mist, or other harmful gases.

Max. Typical Capacitance of TSS

The typical capacitance of TSS is listed in the specifications. Designers may refer to it when designing TSS in High frequency circuit.

Installation Mechanical Stress

1. Do not knock TSS when installing, to avoid mechanical damage.
2. Please do not apply severe vibration, shock or pressure to TSS, to avoid surface resin or element cracking.