

**Description**

DO-214AA P Series solid state protection thyristor protect telecommunications equipment such as modems, line cards, fax machines, and other CPE.

P Series devices are used to enable equipment to meet various regulatory requirements including GR 1089, ITU K.20, K.21 and K.45, IEC 60950, UL 60950, and TIA-968 (formerly known as FCC Part 68).

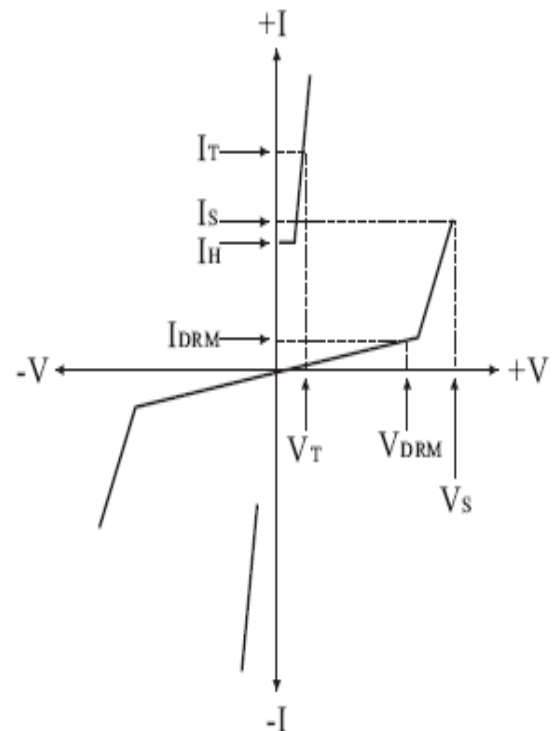


Compared to surge suppression using other technologies, P Series devices offer absolute surge protection regardless of the surge current available and the rate of applied voltage (dv/dt). P Series devices:

- Cannot be damaged by voltage
- Eliminate hysteresis and heat dissipation typically found with clamping devices
- Eliminate voltage overshoot caused by fast-rising transients
- Are non-degenerative
- Will not fatigu
- Have low capacitance, making them ideal for high-speed transmission equipment

**Electrical Parameters**

Parameter	Definition
$C_0$	<b>Off-state Capacitance</b> — typical capacitance measured in off state
di/dt	<b>Rate of Rise of Current</b> — maximum rated value of the acceptable rate of rise in current over time
$I_S$	<b>Switching Current</b> — maximum current required to switch to on state
$I_{DRM}$	<b>Leakage Current</b> — maximum peak off-state current measured at $V_{DRM}$
$I_H$	<b>Holding Current</b> — minimum current required to maintain on state
$I_{PP}$	<b>Peak Pulse Current</b> — maximum rated peak impulse current
$I_T$	<b>On-state Current</b> — maximum rated continuous on-state current
$I_{TSM}$	<b>Peak One-cycle Surge Current</b> — maximum rated one-cycle AC current
$V_S$	<b>Switching Voltage</b> — maximum voltage prior to switching to on state
$V_{DRM}$	<b>Peak Off-state Voltage</b> — maximum voltage that can be applied while maintaining off state
$V_F$	<b>On-state Forward Voltage</b> — maximum forward voltage measured at rated on-state current
$V_T$	<b>On-state Voltage</b> — maximum voltage measured at rated on-state current



**Over-voltage Protection Thyristor**
**SP4000SA**

ROHS

**Electrical Characteristics**

Part Number*	V <sub>DRM</sub> Volts	V <sub>S</sub> Volts	V <sub>T</sub> Volts	I <sub>DRM</sub> μ Amps	I <sub>S</sub> mAmps	I <sub>T</sub> Amps	I <sub>H</sub> mAmps	C <sub>O</sub> pF
SP4000SA	360	460	4	5	800	2.2	150	20

\* For surge ratings, see table below.


Notes:

- All measurements are made at an ambient temperature of 25°C. I<sub>PP</sub> applies to -40°C through +85°C temperature range.
- Off-state capacitance (C<sub>O</sub>) is measured at 1 MHz with a 2 V bias and is typical value.

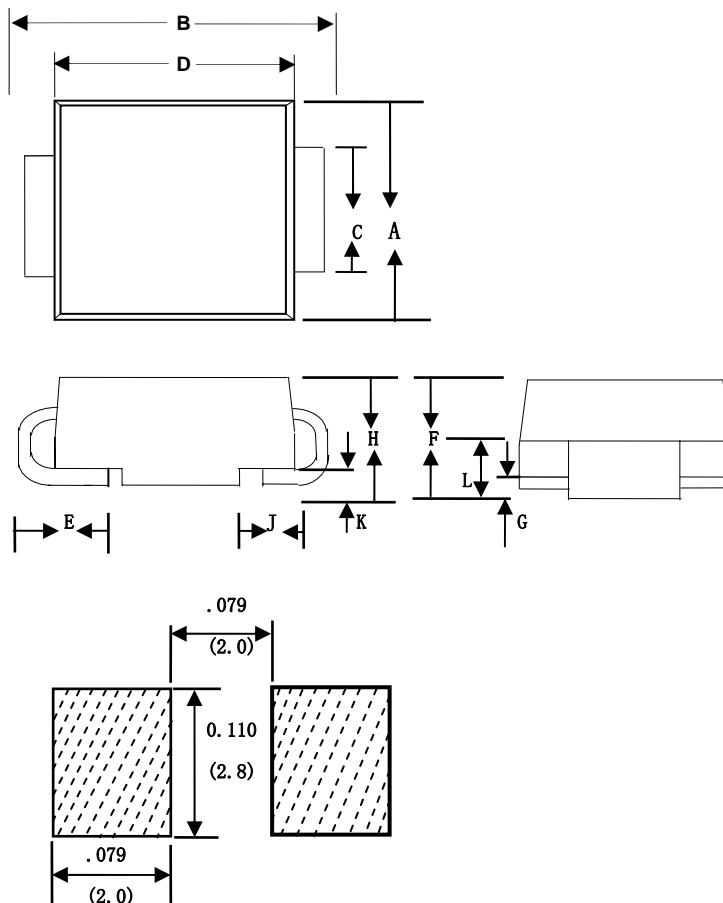
**Surge Ratings**

Series	I <sub>PP</sub> 2/10 μ s Amps	I <sub>PP</sub> 8/20 μ s Amps	I <sub>PP</sub> 10/160 μ s Amps	I <sub>PP</sub> 10/560 μ s Amps	I <sub>PP</sub> 10/1000 μ s Amps	I <sub>TSM</sub> 60 Hz Amps	di/dt Amps/μ s
A	150	150	90	50	45	20	500

**Thermal Considerations**

Package	DO-214AA/SMB	Symbol	Parameter	Value	Unit
		T <sub>J</sub>	Operating Junction Temperature	-40 to +150	°C
		T <sub>S</sub>	Storage Temperature Range	-40 to +150	°C
		R <sub>θJA</sub>	Junction to Ambient on printed circuit	120	°C/W

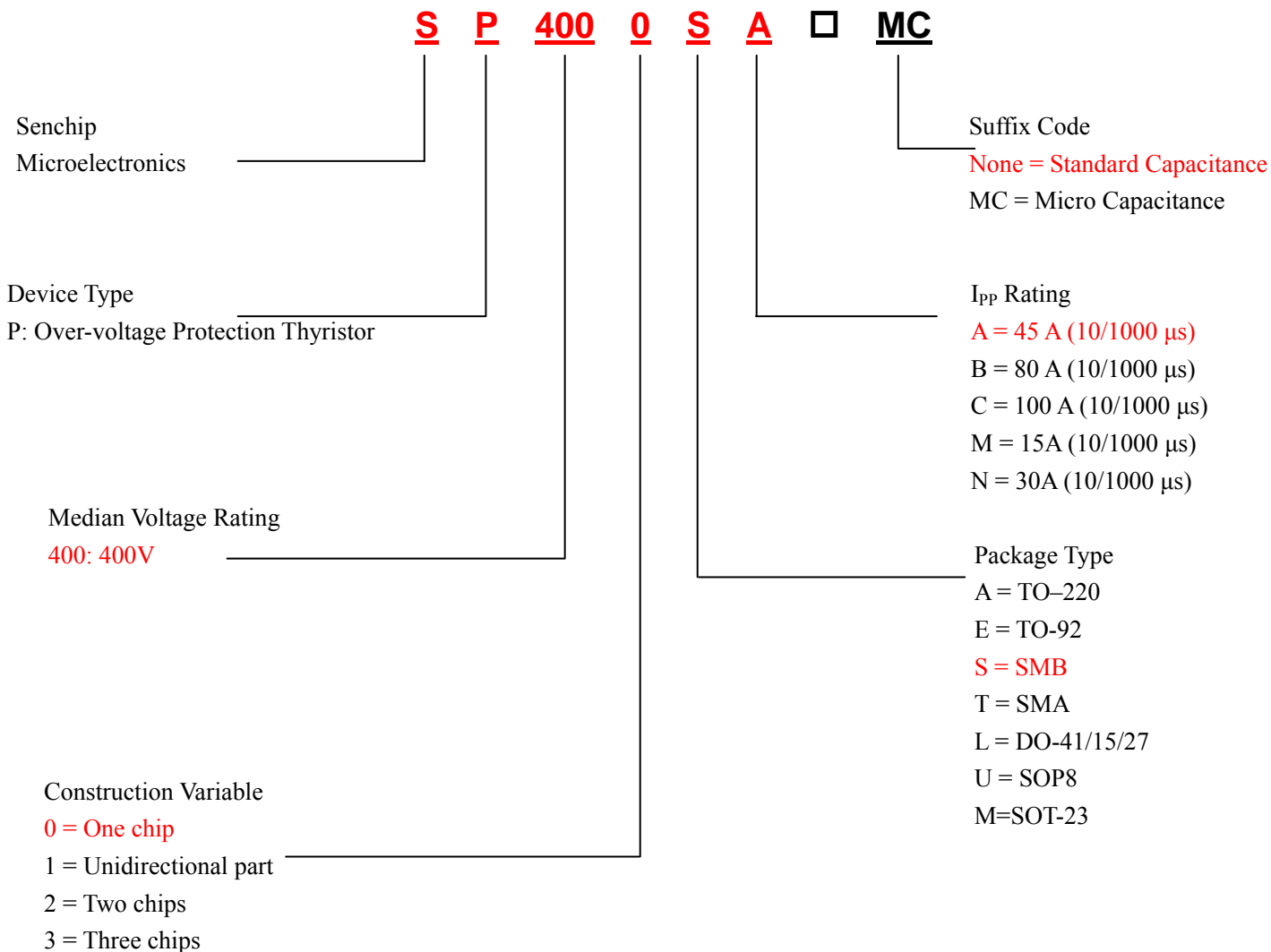
Dimensions



SMB

Dimension	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.134	0.155	3.40	3.94
B	0.205	0.22	5.21	5.59
C	0.075	0.083	1.90	2.11
D	0.166	0.185	4.22	4.70
E	0.036	0.056	0.91	1.42
F	0.073	0.087	1.85	2.2
G	0.002	0.008	0.05	0.20
H	0.077	0.094	1.95	2.40
J	0.043	0.053	1.09	1.35
K	0.008	0.014	0.20	0.35
L	0.039	0.049	0.99	1.24

Description of Part Number



Description of Marking

S:  
Senchip Over-voltage  
Protection Thyristor

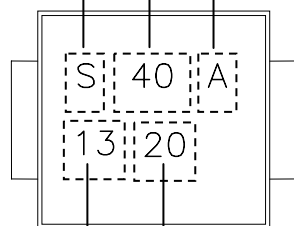
40: 400V (VBR Median  
Voltage Rating)

I<sub>pp</sub> Rating

A = 45 A (10/1000 μs)

B = 80 A (10/1000 μs)


C = 100 A (10/1000 μs)



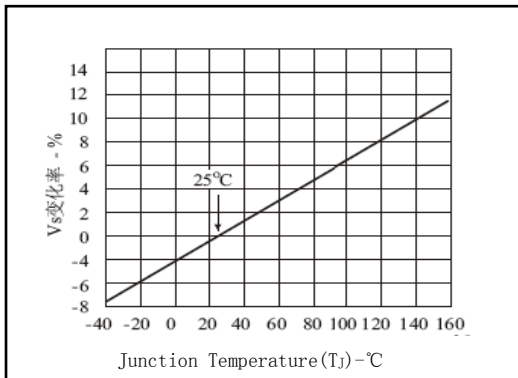
13: 2013  
The last two numbers of  
year.

20: the 20th week.  
The week order.

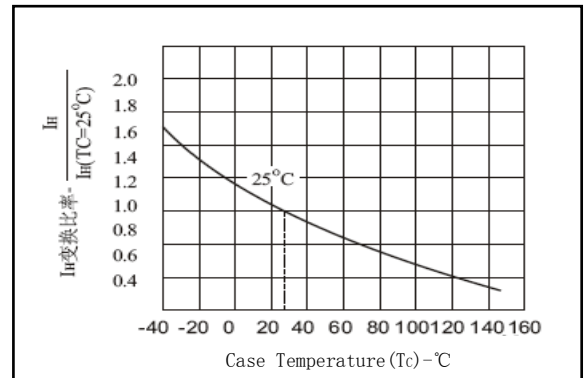
Summary of Packing Options

Package Type	Description	Packing Quantity	Industry Standard
DO-214AA SMB 	Embossed Carrier Reel Pack	2500 PCS	EIA RS-481

Thermal Derating Curves



Normalized VS Change versus Junction Temperature



Normalized DC Holding Current versus Case Temperature



E313687