

## 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 fatigue
- 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**
**SP0720SB**
**ROHS**
**Electrical Characteristics**

| Part Number* | V <sub>DRM</sub><br>Volts | V <sub>S</sub><br>Volts | V <sub>T</sub><br>Volts | I <sub>DRM</sub><br>μ Amps | I <sub>S</sub><br>mAmps | I <sub>T</sub><br>Amps | I <sub>H</sub><br>mAmps | C <sub>o</sub><br>pF |
|--------------|---------------------------|-------------------------|-------------------------|----------------------------|-------------------------|------------------------|-------------------------|----------------------|
| SP0720SB     | 65                        | 88                      | 4                       | 5                          | 800                     | 2.2                    | 150                     | 45                   |

\* For surge ratings, see table below.


Notes:

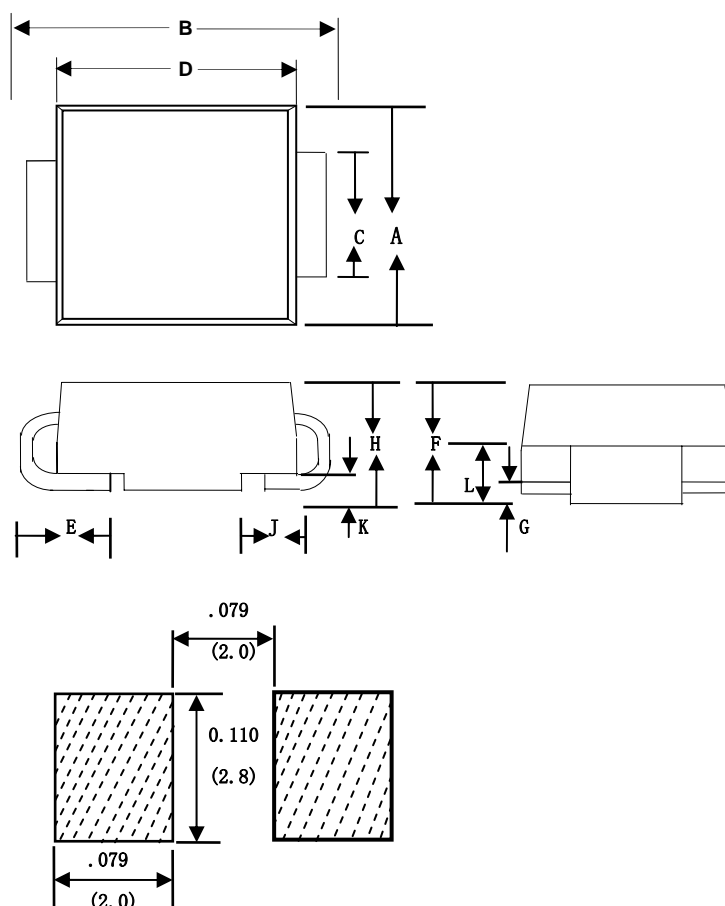
- All measurements are made at an ambient temperature of 25°C. I<sub>PP</sub> applies to -40°C through +85°C temperature range.
- Off-state capacitance (C<sub>o</sub>) is measured at 1 MHz with a 2 V bias and is typical value.

**Surge Ratings**

| Series | I <sub>PP</sub><br>2/10 μ s<br>Amps | I <sub>PP</sub><br>8/20 μ s<br>Amps | I <sub>PP</sub><br>10/160 μ s<br>Amps | I <sub>PP</sub><br>10/560 μ s<br>Amps | I <sub>PP</sub><br>10/1000 μ s<br>Amps | I <sub>TSM</sub><br>60 Hz<br>Amps | di/dt<br>Amps/μ s |
|--------|-------------------------------------|-------------------------------------|---------------------------------------|---------------------------------------|--|-----------------------------------|-------------------|
| B      | 250                                 | 250                                 | 150                                   | 100                                   | 80                                     | 30                                | 500               |

**Thermal Considerations**

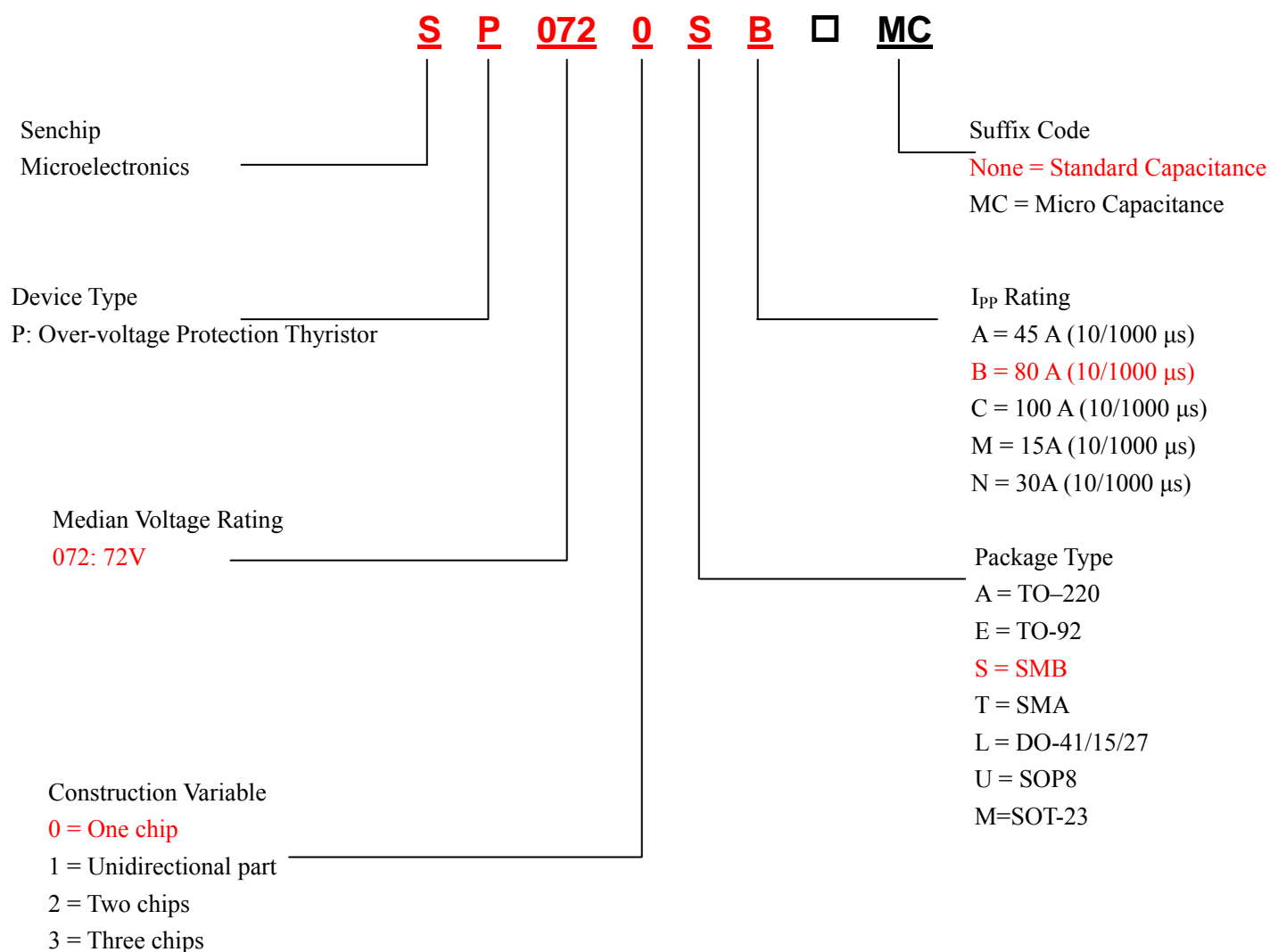
| Package   | DO-214AA/SMB | Symbol           | Parameter                              | Value       | Unit |
|---|--------------|------------------|--|-------------|------|
|  |              | T <sub>J</sub>   | Operating Junction Temperature         | -40 to +150 | °C   |
|   |              | T <sub>S</sub>   | Storage Temperature Range              | -40 to +150 | °C   |
|   |              | R <sub>θJA</sub> | Junction to Ambient on printed circuit | 90          | °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 |

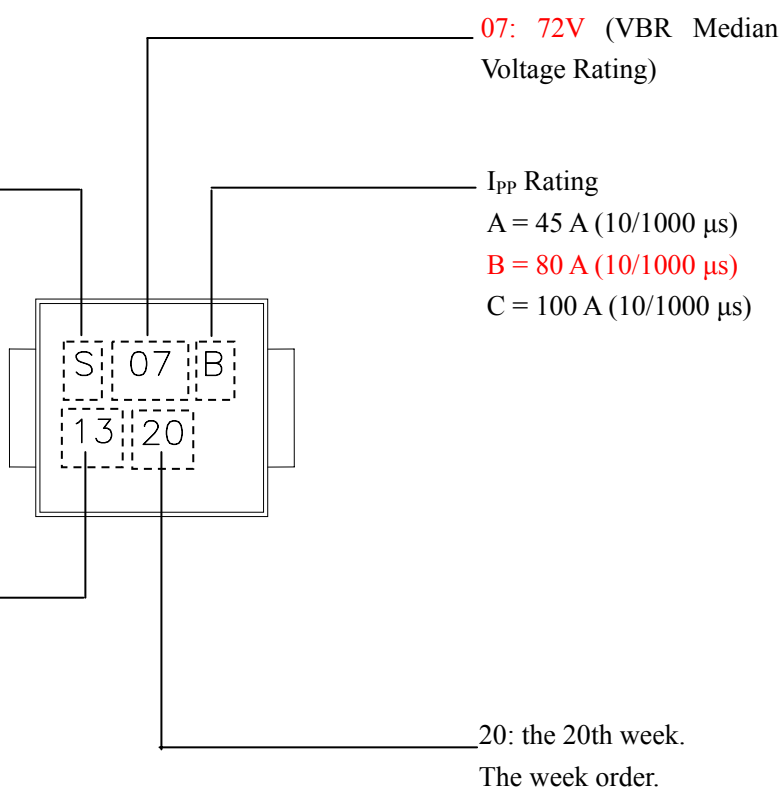
Description of Part Number



Description of Marking

S:  
Senchip Over-voltage  
Protection Thyristor


13: 2013  
The last two numbers of  
year.

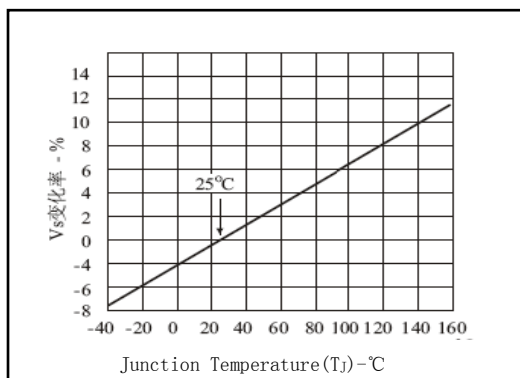


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**SP0720SB**

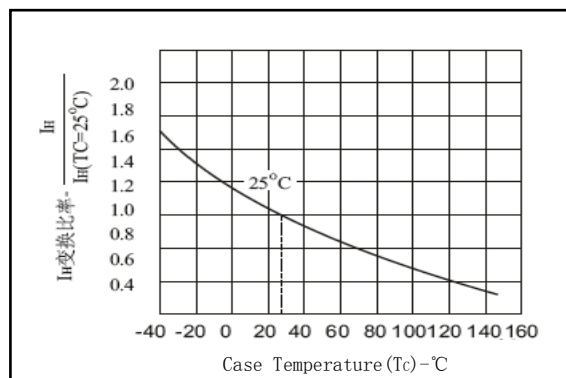
ROHS

**Summary of Packing Options**

| Package Type   | Description                | Packing Quantity | Industry Standard |
|--|----------------------------|------------------|-------------------|
| DO-214AA<br>SMB<br> | 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**