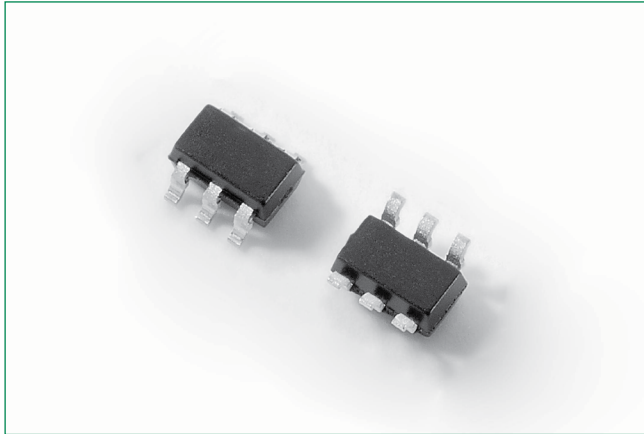


# SDP Biased Series - SOT23-6

## Broadband Optimized™ Protection



### Description

This new SDP Biased series provides overvoltage protection for applications such as VDSL2, ADSL2, and ADSL2+ with minimal effect on data signals. This silicon design innovation results in a capacitive loading characteristic that is compatible with these high bandwidth applications. This surface mount SOT23-6 package provides a surge capability that exceeds most worldwide standards and recommendations for lightning surge withstand capability of tertiary protectors.

### Features & Benefits

- Compatible with VDSL2 (30MHz) and with G.fast (106MHz)
- Balanced overvoltage protection
- Low distortion
- Low insertion loss
- Low profile
- Response time under 500ns
- RoHS Compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)

### Additional Information



Resources

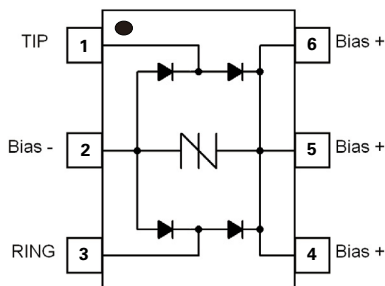


Accessories



Samples

### Pinout Designation & Schematic Symbol



### Applicable Global Standards

- ANSI C62.41
- IEC 61000-4-12
- IEC 61000-4-5, 30A (tP=8/20µs) 2nd edition
- IEC 61000-4-2 level 4
- 15kV (air discharge)
- 8kV (contact discharge)

### Agency Approvals

Agency	Agency File Number
	E133083

### Absolute Maximum Ratings between pin1 and pin 3, Ta= 25°C (Unless otherwise noted)

Part Number	Marking	Maximum Junction Temperature	Storage Temperature Range	$I_{pp}$ 8/20µs
		°C	°C	A Max
SDP0240T023G6RP	P24	150	-65 to 150	30 <sup>1</sup>

Notes: 1. The device must be in thermal equilibrium at 25°C

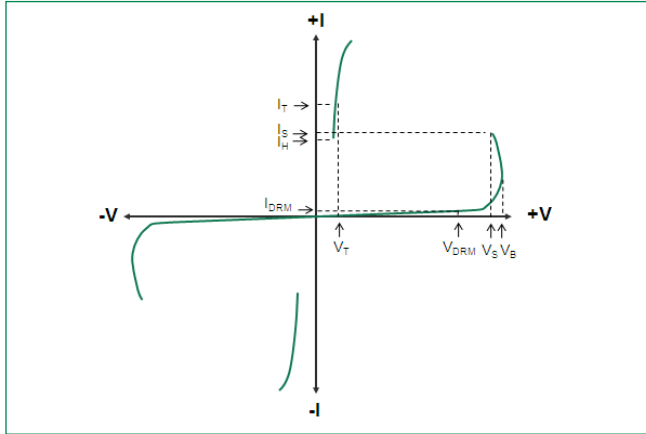
### Electrical Characteristics between pin 1 and pin 3, Ta = 25°C

Part Number	Marking	$V_{DRM}$ @ $I_{DRM}=100nA$	$I_{DRM}$ @ $V_{DRM}=19V$	$V_s$ @1V/µs	$I_H$	$I_s$	Co@f=1MHz,2V	Delta Co@ Line Bias = 1V to 19V
		V min	pA typ	V max	mA typ	mA min	pF max	pF max
SDP0240T023G6RP	P24	19	300	29	40	10	3.0	0.5

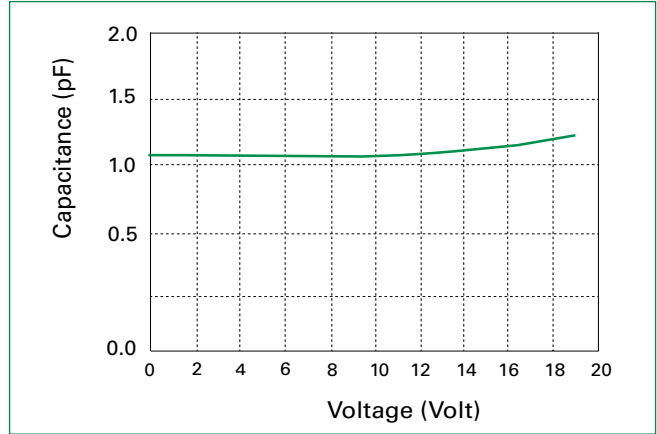
# SDP Biased Series - SOT23-6

## Broadband Optimized™ Protection

**V-I: Characteristics**



**Typical capacitance against line voltage (without external bias)**



**Surge Ratings**

Series	$I_{PP}$
	$1.2/50\mu s^1 / 8/20\mu s^2$
A min	
G	30

**Notes:**

1. Voltage waveform in  $\mu s$
2. Current waveform in  $\mu s$

- Peak pulse current rating ( $I_{pp}$ ) is repetitive and guaranteed for the life of the product that remains in thermal equilibrium.  
 - The component must be in thermal equilibrium at 25°C.

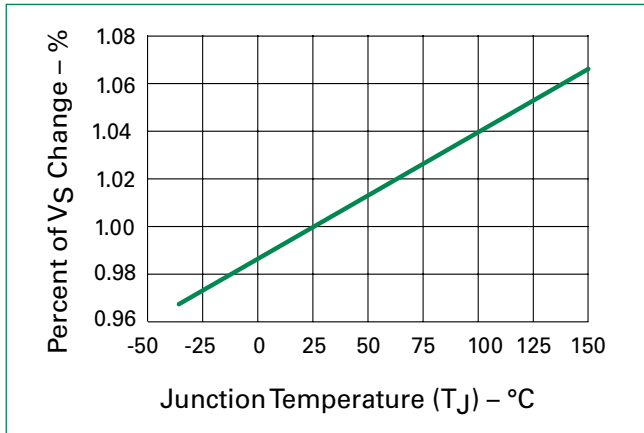
**Thermal Information**

Parameter	Rating	Units
Storage Temperature Range	-65 to 150	°C
Maximum Junction Temperature	150	°C
Maximum Lead Temperature (Soldering 10s)	260	°C

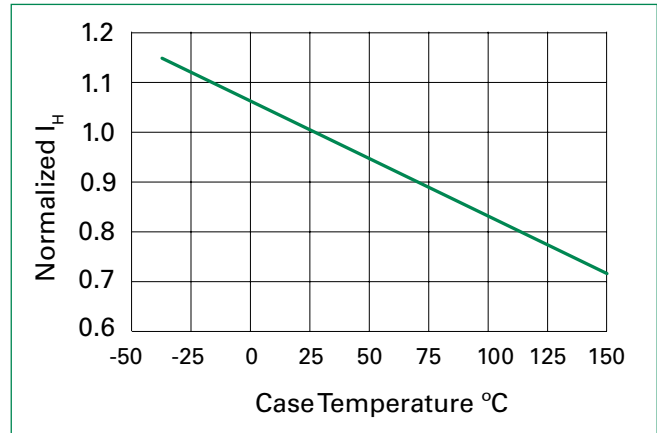
# SDP Biased Series - SOT23-6

## Broadband Optimized™ Protection

Normalized VS Change vs. Junction Temperature

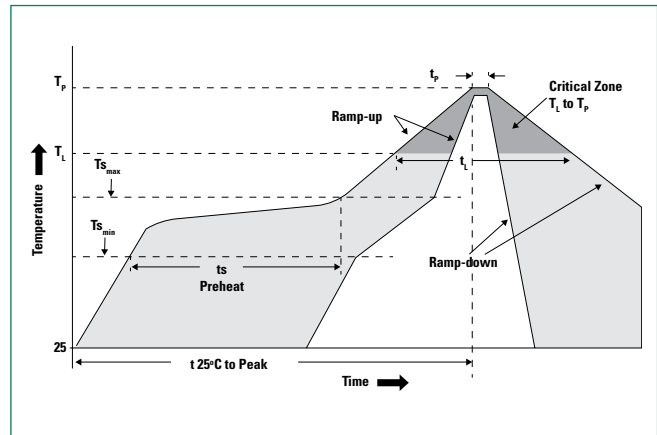


Normalized Holding Current vs. Case Temperature



### Soldering Parameters

<b>Reflow Condition</b>		Pb-Free assembly
<b>Pre Heat</b>	- Temperature Min (T <sub>s(min)</sub> )	150°C
	- Temperature Max (T <sub>s(max)</sub> )	200°C
	- Time (Min to Max) (t <sub>s</sub> )	60-180 secs.
<b>Average ramp up rate (Liquidus Temp (T<sub>L</sub>) to peak)</b>		3°C/sec. Max.
<b>T<sub>S(max)</sub> to T<sub>L</sub> - Ramp-up Rate</b>		3°C/sec. Max.
<b>Reflow</b>	- Temperature (T <sub>L</sub> ) (Liquidus)	+217°C
	- Temperature (t <sub>l</sub> )	60-150 secs.
<b>Peak Temp (T<sub>p</sub>)</b>		250(+0/-5)°C
<b>Time within 5°C of actual Peak Temp (t<sub>p</sub>)</b>		20-40 secs.
<b>Ramp-down Rate</b>		6°C/sec. Max.
<b>Time 25°C to Peak Temp (T<sub>p</sub>)</b>		8 min. Max.
<b>Do not exceed</b>		260°C



# SDP Biased Series - SOT23-6

## Broadband Optimized™ Protection

### Physical Specifications

<b>Lead Plating</b>	SOT23: Matte Tin
<b>Lead Material</b>	Copper Alloy
<b>Lead Coplanarity</b>	0.0004 inches (0.102mm)
<b>Substrate Material</b>	Silicon
<b>Body Material</b>	Molded Epoxy
<b>Flammability</b>	V-0

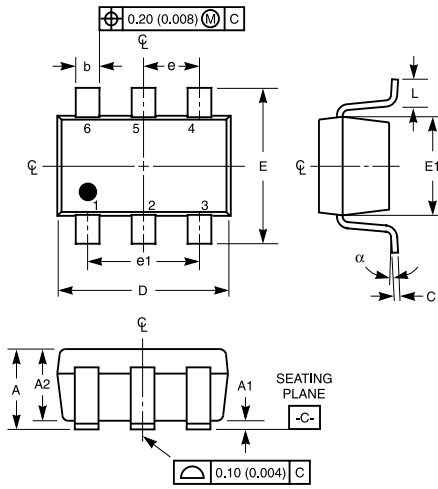
**Notes:**

1. All dimensions are in millimeters.
2. Dimensions include solder plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. All specifications comply to JEDEC MO-178
5. Blo is facing up for mold and facing down for trim/form, i.e. reverse trim/form.
6. Package surface matte tine

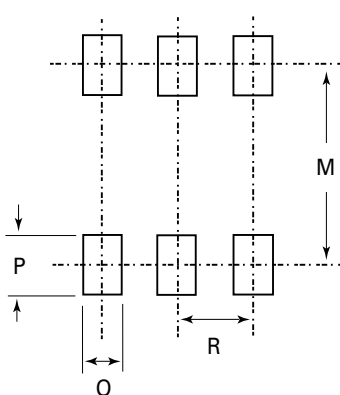
### Environmental Specifications

<b>Temp Cycling</b>	Mil-STD-883, Method 1010.8 Condition C, -65°C to +150°C 168 Hrs, 85°C /60%RH+3IR-Reflow, 260°C +5V, -0°C
<b>Bias Humidity</b>	JESD 22-A101 85°C , 85%CRH. 50V 168 Hrs, 85°C /60%RH+3IR-Reflow, 260°C +5V, -0°C
<b>Pressure Cooker</b>	JEDEC 22-A102 No Bias, 121°C, 100%RH 96Hrs/192Hrs. 168 Hrs, 85°C /60%RH+3IR-Reflow, 260°C +5V, -0°C
<b>High Temp Storage</b>	JESD 22-A103 Con B. 150°C, no bias 1000Hrs
<b>HTRB</b>	JESD 22-108 168 Hrs, 85°C /60%RH+3IR-Reflow, 260°C +5V, -0°C
<b>Thermal Shock</b>	Mil-STD-883, Method 1011.9 Condition A, 0°C to 100°C 168 Hrs, 85°C /60%RH+3IR-Reflow, 260°C +5V, -0°C
<b>C-SAM</b>	As per flow, JSTD-020 pre&post preconditioning test.
<b>Wet Humidity (Tin only)</b>	JESD 201 standard: 55°C/85%RH

### Dimensions - SOT23-6



Recommended Solder Pad Layout



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.041	0.057	1.050	1.450
A1	0.000	0.006	0.000	0.150
A2	0.035	0.051	0.900	1.300
b	0.012	0.020	0.300	0.500
C	0.003	0.008	0.080	0.220
D	0.110	0.118	2.800	3.000
E	0.102	0.118	2.600	3.000
E1	0.057	0.069	1.450	1.750
e	0.037 (BSC)		0.950 (BSC)	
e1	0.074(BSC)		1.900(BSC)	
L (note 4.5)	0.012	0.023	0.300	0.600
N (note 6)	6		6	
α	0°C	8°C	0°C	8°C
M	-	0.102	-	2.590
O	-	0.027	-	0.690
P	-	0.039	-	0.990
R	-	0.038	-	0.950

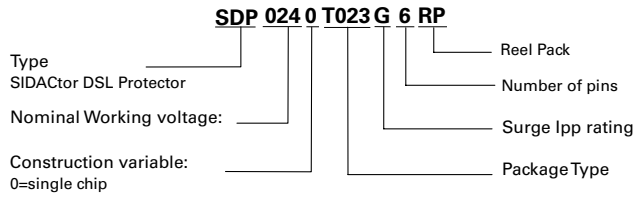
**Notes:**

1. Dimensioning and tolerances per ANSI 14.5M-1982.
2. Package conforms to JEDEC MO-178
3. Dimensions D and E1 are exclusive of mold flash, protrusions, or gate burrs.
4. Foot length L measured at reference to seating plane.
5. "L" is the length of flat foot surface for soldering to substrate.
6. "N" is the number of terminal positions.
7. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

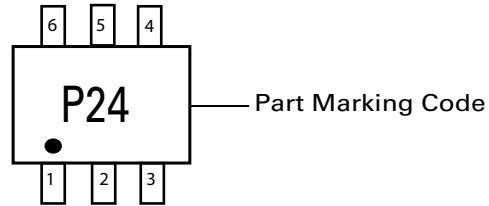
# SDP Biased Series - SOT23-6

## Broadband Optimized™ Protection

### Part Numbering



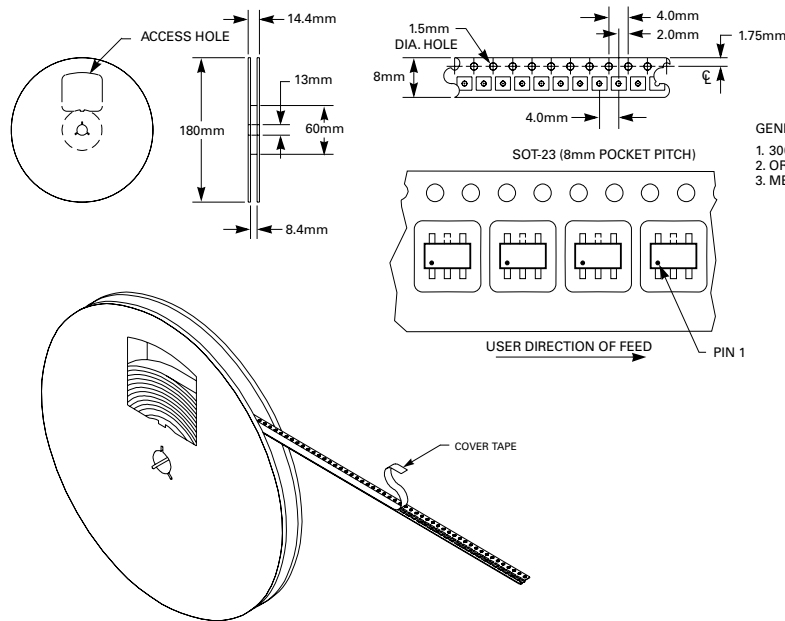
### Part Marking



### Packing Options

Package Type	Description	Quantity
SOT23-6	Tape and Reel	3000

### Embossed Carrier Tape & Reel Specification - SOT23-6



- GENERAL INFORMATION
- 3000 PIECES PER REEL.
  - ORDER IN MULTIPLES OF FULL REELS ONLY.
  - MEETS EIA-481 REVISION "A" SPECIFICATIONS.

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