

### Description

This new SIDACtor series provides overvoltage protection for applications such as VDSL2, ADSL2+, and 1000BaseT with minimal affect on the data signal. This latest silicon design innovation results in a capacitive loading characteristic that is compatible with these high bandwidth applications. This QFN package is a surface mount solution offered with a surge capability that meets or exceeds most worldwide inter-building standards and recommendations for lightning surge withstand capability of secondary protectors.

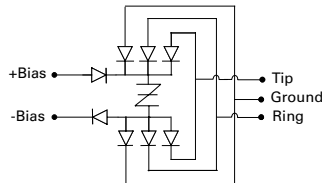
### Agency Approvals

Agency	Agency File Number
	E133083

### Pinout Designation

Tip in	<b>1</b>	<b>8</b>	Tip out
- Bias	<b>2</b>	<b>7</b>	+ Bias
Ground	<b>3</b>	<b>6</b>	Ground
Ring in	<b>4</b>	<b>5</b>	Ring out

### Schematic Symbol



### Features & Benefits

- RoHS compliant
- QFN (Quad Flatpak No-lead) surface mount package
- Low insertion loss
- Low log linear voltage dependent capacitance
- Bidirectional transient voltage protection
- Crowbarring speed of nanoseconds
- Teccor branded SIDACtor technology
- Balanced longitudinal load capacitance
- Balanced OV protection

### Protection Solution for

- YD/T 950
- YD/T 993
- YD/T 1082
- GR 1089 Intra-building
- GR 1089 Inter-building
- IEC 61000-4-5
- ITU K.20/21 Basic Level
- ITU K.20/21 Enhanced Level
- TIA-968-A

### Electrical Characteristics

Part Number	Marking	$V_{DRM} @ I_{DRM}=5\mu A$	$V_s @ 100V/\mu S$	$I_H$	$I_s$	$I_T @ V_T$	$V_T @ I_T=2.2 \text{ amp}$	Capacitance @ 1MHz @ 2V bias
		Volts	Volts	mAmps	mAmps	Amps	Volts	
		Min	Max	Min			Max	
SDP0080Q38CB	SDP-8C	6	25	50	800	2.2	8	See Capacitance vs. Bias Voltage Graph
SDP0640Q38CB	SDP06C	58	77	150	800	2.2	8	
SDP0720Q38CB	SDP07C	65	88	150	800	2.2	8	
SDP0900Q38CB	SDP09C	75	98	150	800	2.2	8	
SDP1100Q38CB	SDP10C	90	130	150	800	2.2	8	
SDP1300Q38CB	SDP13C	120	160	150	800	2.2	8	
SDP1800Q38CB	SDP18C	170	220	150	800	2.2	8	
SDP2600Q38CB	SDP26C	220	300	150	800	2.2	8	
SDP3100Q38CB	SDP31C	275	350	150	800	2.2	8	
SDP3500Q38CB	SDP35C	320	400	150	800	2.2	8	

- All measurements are made at an ambient temperature of 25°C.  $I_{pp}$  applies to -40°C through +85°C temperature range.
- Listed SIDACtor devices are bidirectional. All electrical parameters and surge ratings apply to forward and reverse polarities.
- Specifications are subject to change without notice.

## 50/60 Hz Ratings

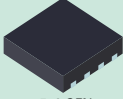
Parameter Name	Test Conditions	Value	Units
$I_{TSM}$ Maximum non-repetitive on-state current, 50/60 Hz	0.5s	6.5	A
	1s	4.6	
	2s	3.4	
	5s	2.3	
	30s	1.3	
	900s	0.73	

## Surge Ratings

Series	$I_{PP}$				$I_{TSM}$
	2x10 $\mu$ s	1.2x50 $\mu$ s/8x20 $\mu$ s	10x700/5x310 $\mu$ s	10x1000 $\mu$ s	600V <sub>RMS</sub> 1 cycle
	Amps	Amps	Amps	Amps	A <sub>RMS</sub>
C	Min	Min	Min	Min	Min
	500	400	200	100	45

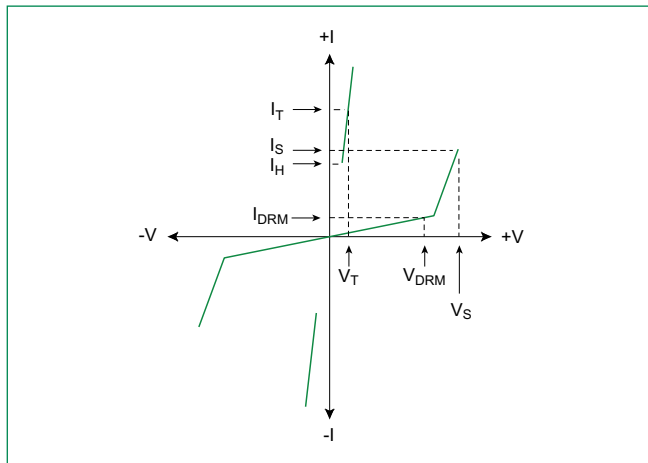
Note: The lightning surge may be repeated after the device returns to its initial conditions.  
The device must initially be in thermal equilibrium with  $-40^{\circ}\text{C} \geq T_J \geq 150^{\circ}\text{C}$

## Thermal Considerations

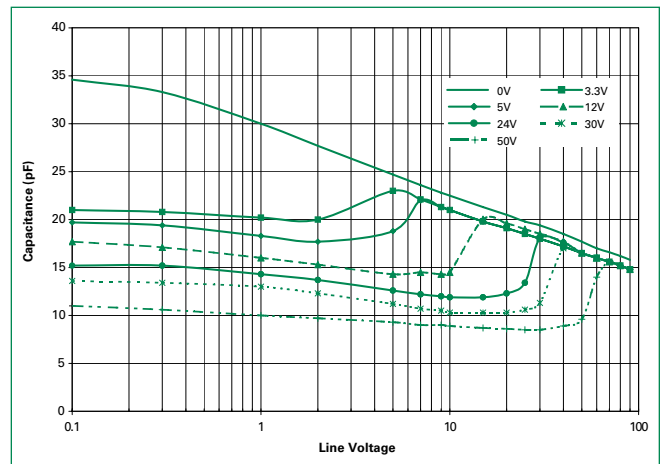
Package	Symbol	Parameter	Value	Unit
 5x6 QFN	$T_J$	Junction Temperature	-65 to +150	$^{\circ}\text{C}$
	$T_{STG}$	Storage Temperature Range	-65 to +150	$^{\circ}\text{C}$
	$R_{\theta JA}$	Thermal Resistance: Junction to Ambient	100	$^{\circ}\text{C}/\text{W}$

Note : The device must initially be in thermal equilibrium with  $-40^{\circ}\text{C} \geq T_J \geq 150^{\circ}\text{C}$

## V-I Characteristics

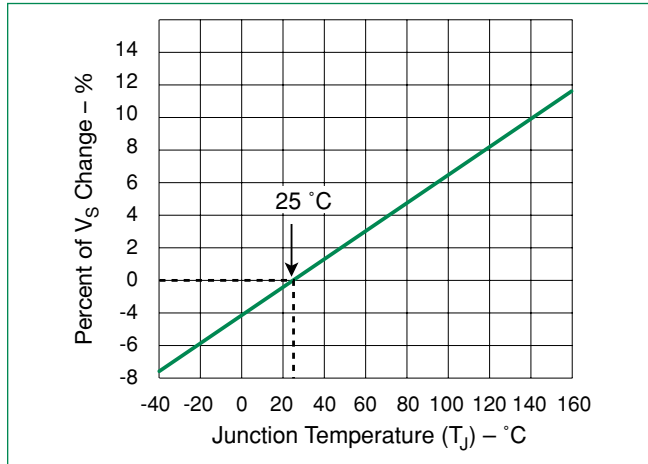


## Capacitance vs. Voltage\*

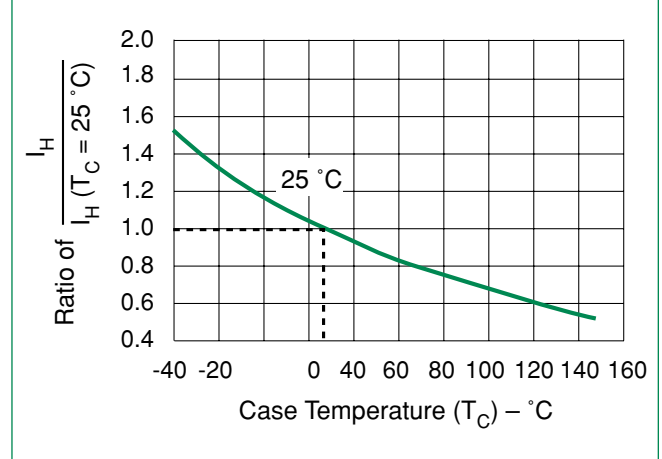


\* bias voltage must be lower than  $V_{DRM}$

### Normalized $V_S$ Change vs. Junction Temperature

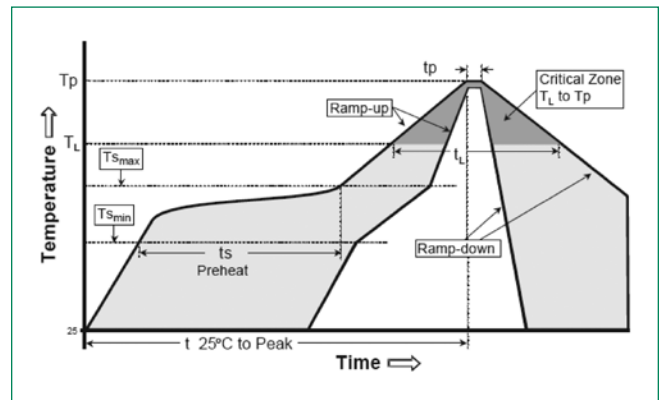


### Normalized DC Holding Current vs. Case Temperature



### Soldering Parameters

Reflow Condition	Pb – Free assembly (see Figure1)	
Pre Heat	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 – 180 secs
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)	3°C/second max	
$T_{s(max)}$ to $T_L$ - Ramp-up Rate	3°C/second max	
Reflow	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Temperature ( $t_L$ )	60 – 150 seconds
Peak Temperature ( $T_p$ )	260 <sup>+0.5</sup> °C	
Time within 5°C of actual peak Temperature ( $t_p$ )	20 – 30 seconds	
Ramp-down Rate	6°C/second max	
Time 25°C to peak Temperature ( $T_p$ )	8 minutes max	
Do not exceed	260°C	



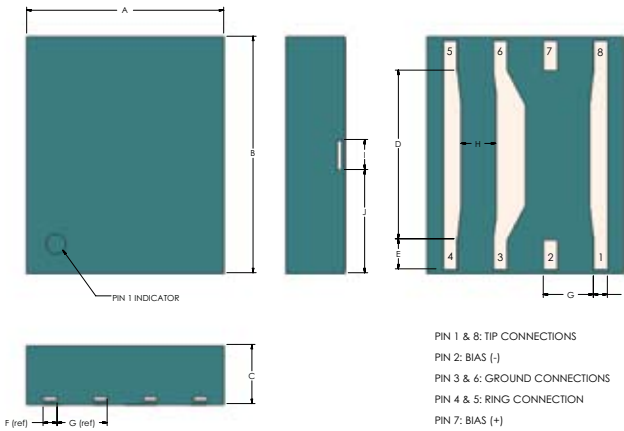
### Physical Specifications

Terminal Material	Copper Alloy
Terminal Finish	100% Matte Tin Plated
Body Material	UL recognized epoxy meeting flammability classification 94V-0

### Environmental Specifications

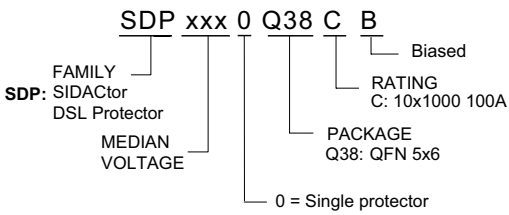
High Temperature Voltage Blocking	MIL-STD-750: Method 1040, Condition A 80% min $V_{DRM}$ (VAC-peak), 150°C, 504 hours
Temperature Cycling	MIL-STD-750: Method 1051 -65°C to 150°C, 15-minute dwell, 100 cycles
Biased Temperature & Humidity	EIA/JEDEC: JESD22-A101 52VDC, 85°C, 85%RH, 1008 hours
High Temp. Storage	MIL-STD-750: Method 1031 150°C, 1008 hours
Low Temp. Storage	-65°C, 1008 hours
Thermal Shock	MIL-STD-750: Method 1056 0°C to 100°C, 5-minute dwell, 10-second transfer, 10 cycles
Autoclave (Pressure Cooker Test)	EIA/JEDEC: JESD22-A102 121°C, 100%RH, 2atm, 168 hours
Resistance to Solder Heat	MIL-STD-750: Method 2031 260°C, 10 seconds

## Dimensions

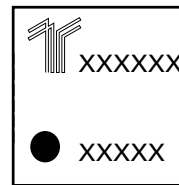


Dimension	Inches			Millimeters		
	Min	Typ	Max	Min	Typ	Max
A	0.187	0.197	0.207	4.745	5.000	5.253
B	0.226	0.236	0.246	5.745	6.000	6.253
C	0.054	0.059	0.064	1.374	1.500	1.628
D	0.165	0.168	0.171	4.199	4.275	4.351
E	0.027	0.030	0.033	0.686	0.762	0.838
F	0.011	0.014	0.017	0.279	0.356	0.432
G	0.047	0.050	0.053	1.194	1.270	1.346
H	0.032	0.035	0.038	0.800	0.876	0.953
I	0.027	0.030	0.033	0.686	0.762	0.838
J	0.100	0.103	0.106	2.540	2.616	2.692

## Part Numbering System



## Part Marking System

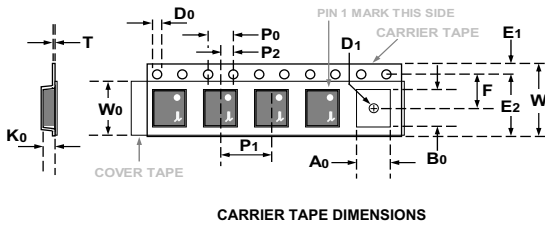
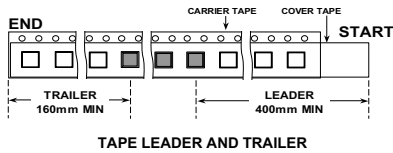
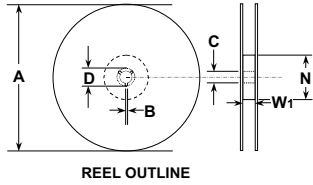


First Line: Part number  
 Second Line: Date code

## Packaging Options

Package Type	Description	Packaging Quantity	Added Suffix	Industry Standard
QFN	5x6x1.5	4,000	RP	12mm Embossed Carrier Tape & Reel

## Tape and Reel Specifications



ITEM	DESCRIPTION	Inches			Millimeters		
		Min	Typ	Max	Min	Typ	Max
A	Reel Diameter	N/A		12.992	N/A		330.0
B	Drive Spoke Width	0.059		N/A	1.50		N/A
C	Arbor Hole Diameter	0.504		0.531	12.80		13.50
D	Drive Spoke Diameter	0.795		N/A	20.20		N/A
N	Hub Diameter	1.969		N/A	50.00		N/A
W1	Reel Inner Width at Hub	0.488		0.567	12.40		14.40
A0	Pocket Width at bottom	0.204	0.208	0.212	5.20	5.30	5.40
B0	Pocket Length at bottom	0.244	0.248	0.252	6.20	6.30	6.40
A1	Pocket Width at opening		0.212			5.40	
B1	Pocket Length at opening		0.252			6.40	
D0	Feed Hole Diameter	0.059	0.061	0.063	1.50	1.55	1.60
D1	Pocket Hole Diameter	0.059	0.063	N/A	1.50	1.60	N/A
E1	Feed hole position 1	0.065	0.069	0.073	1.65	1.75	1.85
E2	Feed hole position 2	0.400	0.404	0.408	10.15	10.25	10.35
F	Feed hole center-Pocket hole center 2	0.212	0.216	0.220	5.40	5.50	5.60
K0	Pocket Depth	0.067	0.071	0.075	1.70	1.80	1.90
P0	Feed Hole Pitch	0.153	0.157	0.161	3.90	4.00	4.10
P1	Component Spacing	0.311	0.315	0.319	7.90	8.00	8.10
P2	Feed hole center-Pocket hole center 1	0.077	0.079	0.081	1.90	2.00	2.10
T	Carrier Tape Thickness	0.010	0.012	0.014	0.25	0.30	0.35
W	Embossed Carrier Tape Width	0.460	0.472	0.484	11.70	12.00	12.30
W0	Cover Tape Width	0.358	0.362	0.366	9.10	9.20	9.30