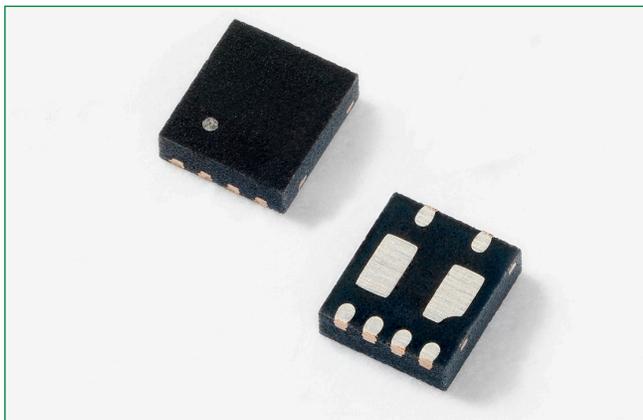


# SC1230-01UTG

## 30 V, 100 A, Unidirectional TVS, Lightning Surge Protection

**HF** **RoHS** **Pb**

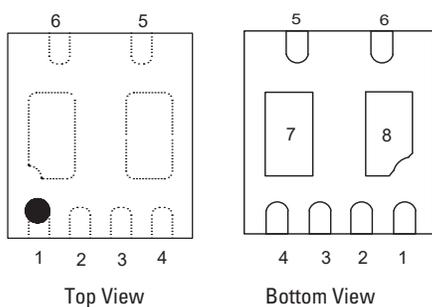
### Description

The SC1230-01UTG is a TVS diode designed to provide protection against ESD (electrostatic discharge) and lightning induced surges. This robust device can safely absorb repetitive ESD strikes at the maximum level specified in the IEC 61000-4-2 international standard (Level 4,  $\pm 8$  kV contact discharge) without performance degradation and safely dissipate 100 A of 8/20  $\mu$ s surge current (IEC61000-4-5 2<sup>nd</sup> edition).

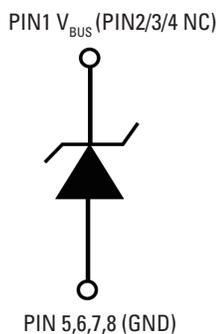
### Features

- ESD, IEC 61000-4-2,  $\pm 30$  kV contact/air
- EFT, IEC 61000-4-4, 40 A (5/50 ns)
- Maximum surge tolerance, IEC 61000-4-5, 2<sup>nd</sup> edition, 100 A (8/20  $\mu$ s)
- Low leakage current of 0.02  $\mu$ A (TYP) at 30 V
- Low clamping voltage
- Halogen-free, lead-free and RoHS compliant
- Moisture sensitivity level (MSL -1)

### Pinout



### Functional Block Diagram



Note: Recommend connecting PIN1/2/3/4 together on PCB

### Applications

- Protection for the PD3.1  $V_{BUS}$  during fast charging
- Laptop/ pad
- Mobile phones
- Portable medical

#### Life Support Note:

Not Intended for Use in Life Support or Life Saving Applications

The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.

# SC1230-01UTG

## 30 V, 100 A, Unidirectional TVS, Lightning Surge Protection

### Absolute Maximum Ratings

Symbol	Parameter	Value	Units
$I_{PP}$ (Pin 1)	Peak Current ( $t_p = 8/20 \mu s$ )	100	A
$T_{OP}$	Operating Temperature	-40 to 125	°C
$T_{STOR}$	Storage Temperature	-55 to 150	°C

**CAUTION:** Stresses at or above those listed in "Absolute Maximum Ratings" may cause permanent damage to the component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied. Also due to variations in test equipment stresses shown above are averages.

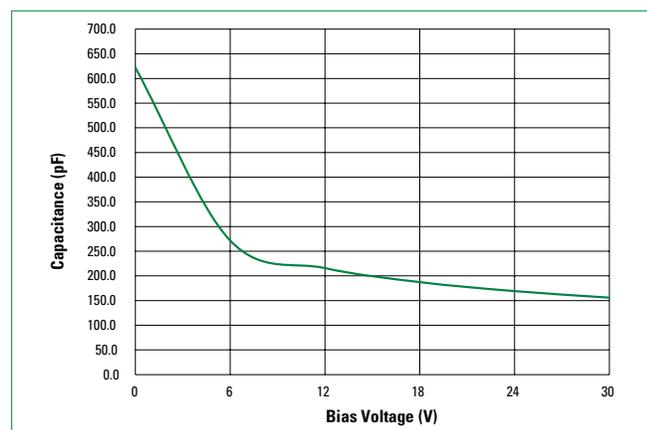
### Electrical Characteristics ( $T_{OP} = 25 \text{ }^\circ\text{C}$ )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	$V_{RWM}$				30	V
Breakdown Voltage	$V_{BR}$	$I_R = 1 \text{ mA}$ , Pin 1 to GND	30.5		35	V
Reverse Leakage Current	$I_{LEAK}$	$V_R = 30 \text{ V}$ , Pin 1 to GND		0.02	0.5	$\mu\text{A}$
Clamp Voltage <sup>1</sup>	$V_C$	$I_{PP} = 40 \text{ A}$ , $t_p = 8/20 \mu s$		37		V
Dynamic Resistance <sup>2</sup>	$R_{DYN}$	TLP, $t_p = 100 \text{ ns}$ , Pin1 to GND		0.03		$\Omega$
ESD Withstand Voltage <sup>3</sup>	$V_{ESD}$	IEC 61000-4-2 (Contact Discharge)	$\pm 30$			kV
		IEC 61000-4-2 (Air Discharge)	$\pm 30$			kV
Diode Capacitance <sup>1</sup>	$C_D$	Reverse Bias = 0 V, $f = 1 \text{ MHz}$		620		pF

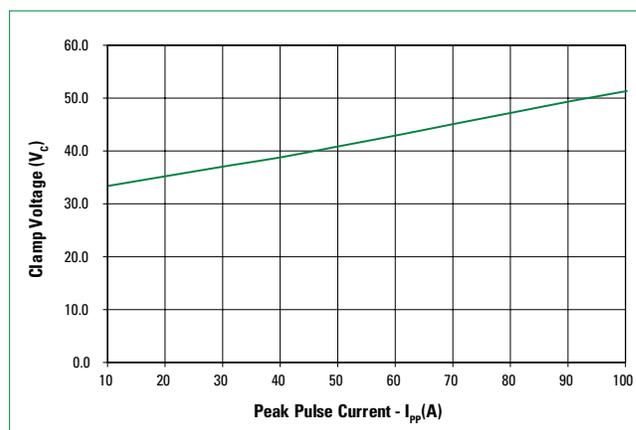
**Note:**

- Parameter is guaranteed by design and/or component characterization.
- Transmission Line Pulse (TLP) with 100 ns width, 0.2 ns rise time, and average window  $t_1 = 70 \text{ ns}$  to  $t_2 = 90 \text{ ns}$ .
- Device stressed with ten non-repetitive ESD pulses.

#### Capacitance vs. Reverse Bias



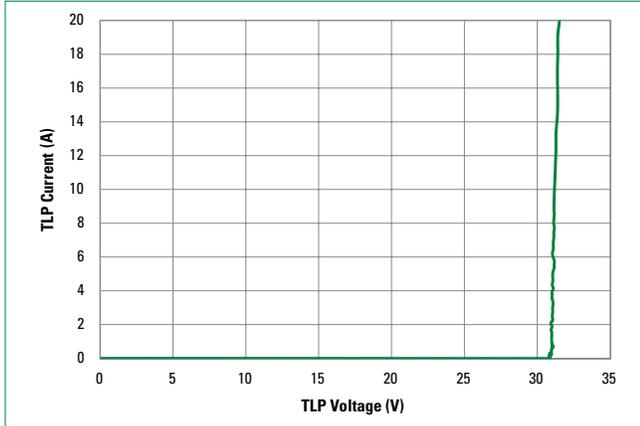
#### Clamping Voltage vs $I_{PP}$



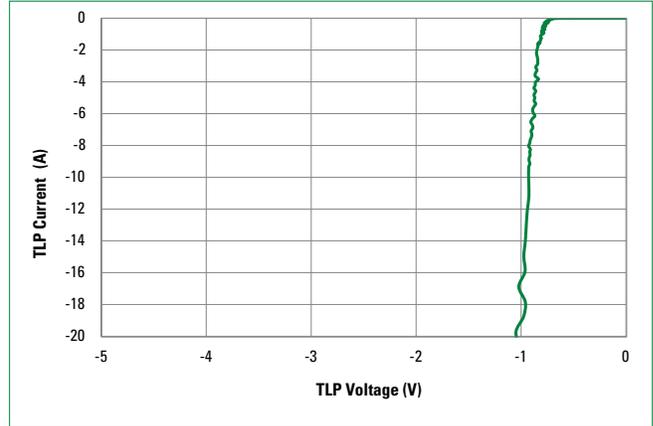
# SC1230-01UTG

30 V, 100 A, Unidirectional TVS, Lightning Surge Protection

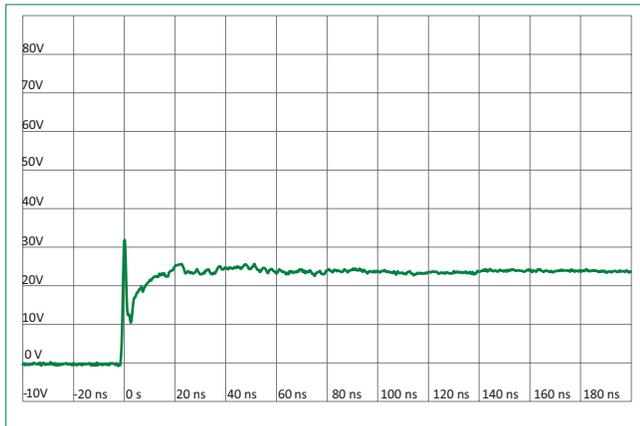
**Positive Transmission Line Pulsing (TLP) Plot**



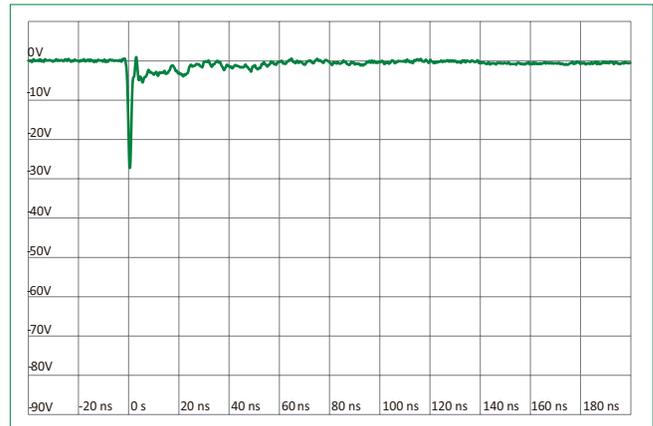
**Negative Transmission Line Pulsing (TLP) Plot**



**IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage**



**IEC 61000-4-2 -8 kV Contact ESD Clamping Voltage**

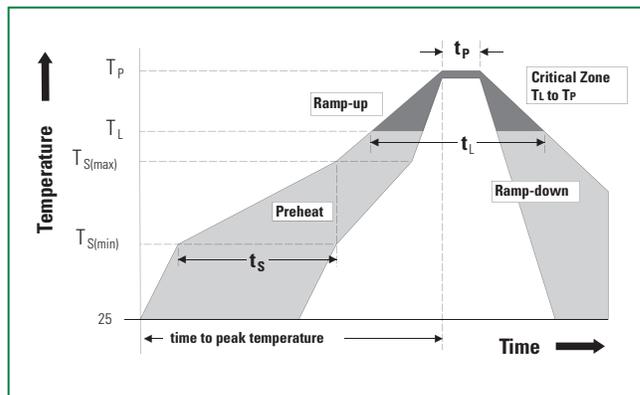


# SC1230-01UTG

## 30 V, 100 A, Unidirectional TVS, Lightning Surge Protection

### Soldering Parameters

<b>Reflow Condition</b>		Pb – free assembly
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	150 °C
	- Temperature Max ( $T_{s(max)}$ )	200 °C
	- Time (min to max) ( $t_s$ )	60 – 120 seconds
<b>Average Ramp Up Rate (Liquidus) Temp (<math>T_L</math>) to Peak</b>		3 °C/second max
<b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>		3 °C/second max
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquidus)	217 °C
	- Temperature ( $t_L$ )	60 – 150 seconds
<b>Peak Temperature (<math>T_p</math>)</b>		260 <sup>+0/-5</sup> °C
<b>Time Within 5 °C of Actual Peak Temperature (<math>t_p</math>)</b>		30 seconds max
<b>Ramp-down Rate</b>		6 °C/second max
<b>Time 25 °C to Peak Temperature (<math>T_p</math>)</b>		8 minutes max
<b>Do Not Exceed</b>		260 °C



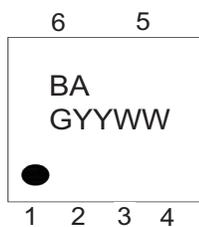
### Ordering Information

Part Number	Package	Min. Order Qty.
SC1230-01UTG	μDFN-6	3000

### Product Characteristics

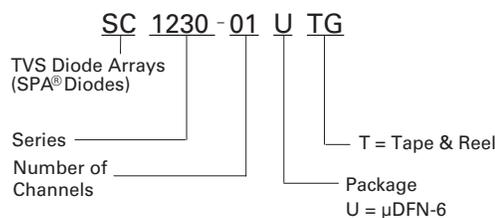
<b>Lead Plating</b>	Pre-plated frame
<b>Lead Material</b>	Copper alloy
<b>Body Material</b>	Molded compound
<b>Flammability</b>	UL recognized compound meeting flammability rating V-0

### Part Marking System



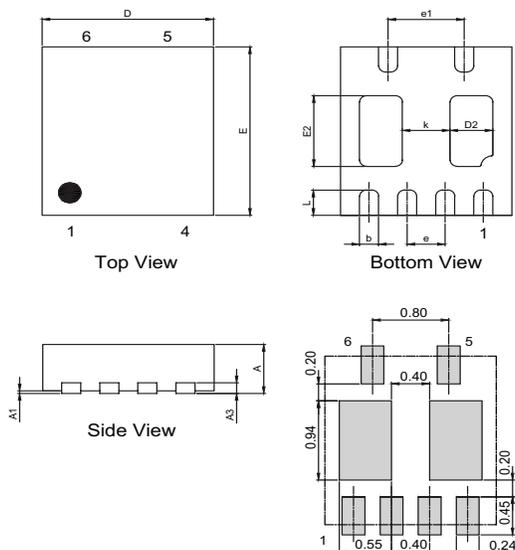
BA = Part Code  
 G = Assembly Code  
 YY = Year Code  
 WW = Date Code

### Part Numbering System



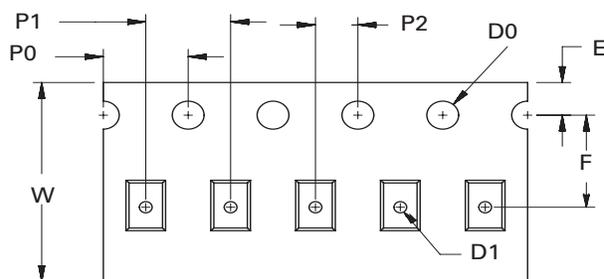
**SC1230-01UTG**

30 V, 100 A, Unidirectional TVS, Lightning Surge Protection

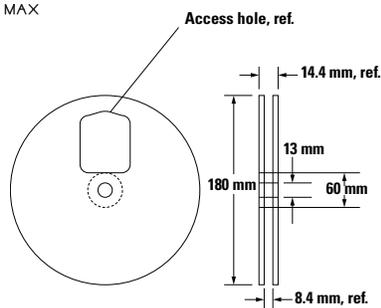
**Package Dimensions —  $\mu$ DFN6**

Recommended soldering pad layout (Unit : mm)

Symbol	$\mu$ DFN6 (1.8x2.0x0.5 mm)					
	Millimeters			Inches		
	Min	Typ	Max	Min	Typ	Max
A	0.50	0.55	0.60	0.020	0.022	0.024
A1	0.00	0.02	0.05	0.000	0.001	0.002
A3	0.125 REF			0.005 REF		
b	0.15	0.20	0.25	0.006	0.008	0.010
D	1.75	1.80	1.85	0.069	0.071	0.073
E	1.95	2.00	2.05	0.077	0.079	0.081
D2	0.35	0.45	0.55	0.014	0.018	0.022
E2	0.74	0.84	0.94	0.029	0.033	0.037
e	0.40 BSC			0.016 BSC		
e1	0.80 BSC			0.031 BSC		
L	0.20	0.30	0.40	0.008	0.012	0.016
K	0.50 REF			0.020 REF		

**Embossed Carrier Tape & Reel Specification —  $\mu$ DFN6**

Symbol	Millimeters
A0	1.95 +/- 0.05
B0	2.30 +/- 0.05
D0	1.50 + 0.10
D1	Ø 0.60 + 0.05
E	1.75 +/- 0.10
F	3.50 +/- 0.05
K0	0.75 +/- 0.05
P0	4.00 +/- 0.10
P1	4.00 +/- 0.10
P2	2.00 +/- 0.05
T	0.25 +/- 0.02
W	8.00 + 0.30 /- 0.10



8 mm Tape and Reel

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