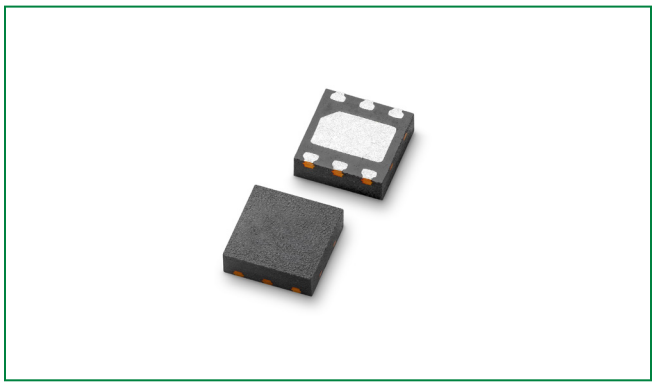
SC3000-01UTG

30 V, 100 A, DFN2020-6L, Unidirectional Discrete TVS Diode, Lightning Surge Protection

HF RoHS Pb

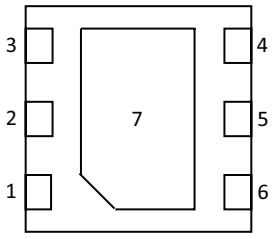


Description

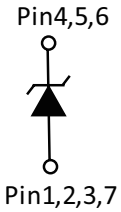
The SC3000-01UTG is a TVS diode designed to provide protection against ESD (electrostatic discharge) and lightning induced surges.

This robust device can safely absorb repetitive ESD strikes at the maximum level specified in the IEC 61000-4-2 international standard (Level 4, ±8 kV contact discharge) without performance degradation and safely dissipate 100 A of 8/20 µs surge current (IEC61000-4-5 2nd edition).

Pinout



Functional Block Diagram



Features

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

Applications

- Protection for the V_{BUS} circuit on USB2.0 by PD 3.1fast charging

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.

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Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP} (Pin4,5,6)	Peak Current (t_p = 8/20 µs)	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.

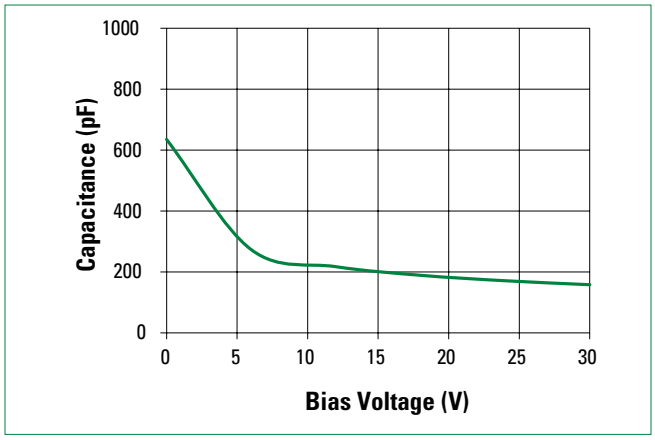
Electrical Characteristics (T_{OP} = 25 °C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}				30	V
Breakdown Voltage	V_{BR}	I_R = 1 mA, Pin4,5,6 to GND	30.5		35	V
Reverse Leakage Current	I_{LEAK}	V_R = 30 V, Pin4,5,6 to GND		20	500	nA
Clamp Voltage[1]	V_C	I_{PP} = 40 A, t_p = 8/20 µs, Pin4,5,6 to GND		37		V
Dynamic Resistance[2]	R_{DYN}	TLP, t_P = 100 ns, Pin4,5,6 to GND		0.03		Ω
ESD Withstand Voltage[3]	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	±30			kV
		IEC 61000-4-2 (Air Discharge)	±30			kV
Diode Capacitance[1]	C_D	Reverse Bias = 0 V, f = 1 MHz, Pin4,5,6 to GND		620		pF

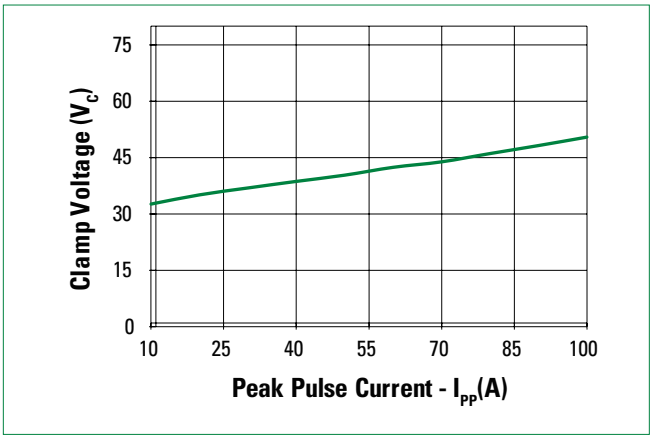
Note:

1. Parameter is guaranteed by design and/or component characterization.
2. Transmission Line Pulse (TLP) with 100 ns width, 0.2 ns rise time, and average window t1 = 70 ns to t2 = 90 ns.
3. Device stressed with ten non-repetitive ESD pulses.

Capacitance vs. Reverse Bias



Clamping Voltage vs I_{PP}



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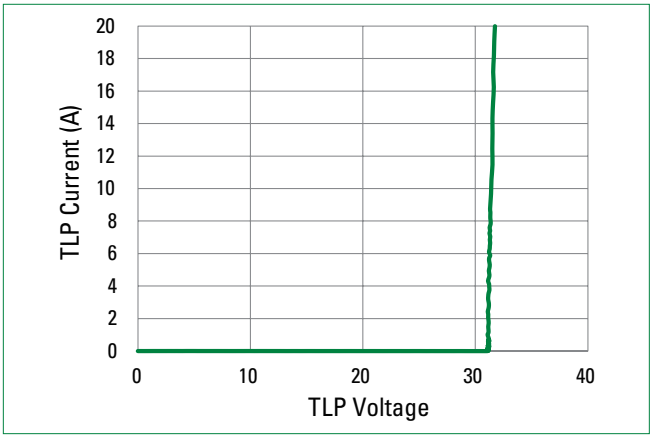
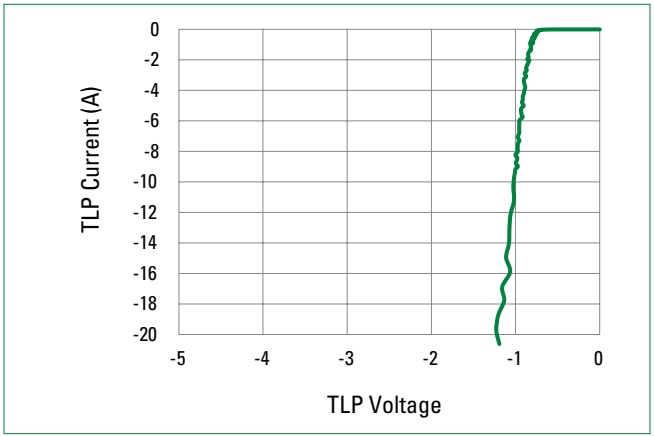
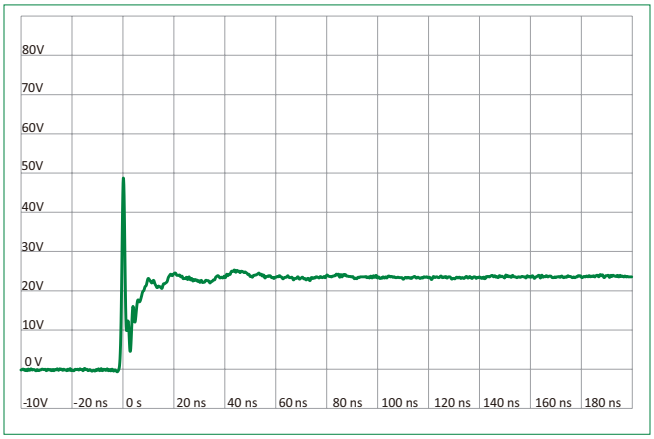
Positive Transmission Line Pulsing (TLP) Plot



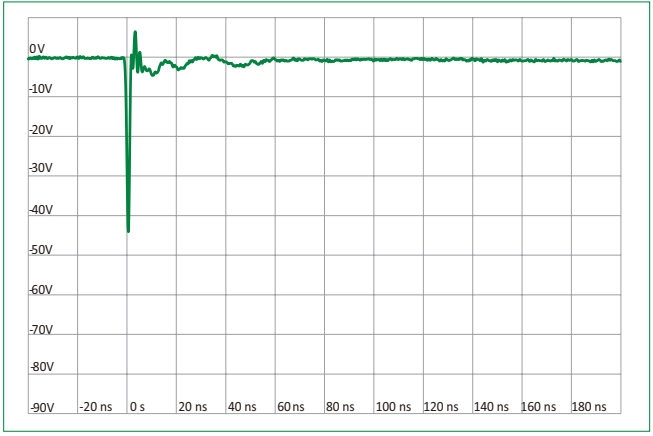
Negative Transmission Line Pulsing (TLP) Plot



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



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



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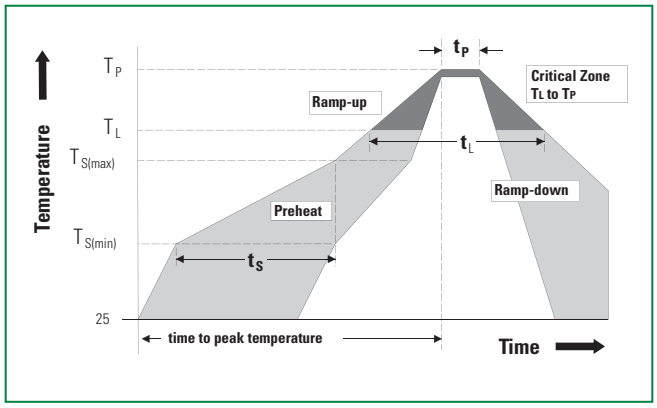
Soldering Perameters

Reflow Condition		Pb – free assembly
Pre Heat	**- Temperature Min ($T_{s(min)}$)**	150 °C
	- Temperature Max ($T_{s(max)}$)	200 °C
	- Time (min to max) (t_s)	60 – 120 seconds
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)		$260^{+0/-5}$ °C
Time Within 5 °C of Actual Peak Temperature (t_p)		30 seconds max
Ramp-down Rate		6 °C/second max
Time 25 °C to Peak Temperature (T_P)		8 minutes max
Do Not Exceed		260 °C



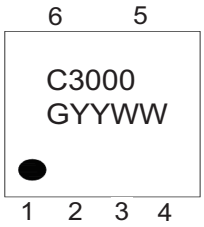
Ordering Information

Part Number	Package	Min. Order Qty.
SC3000-01UTG	DFN-6P	3000

Product Characteristics

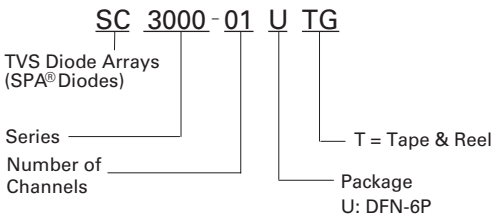
Lead Plating	Matte tin
Lead Material	Copper alloy
Body Material	Molded compound
Flammability	UL recognized compound meeting flammability rating V-0

Part Marking System



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

Part Numbering System



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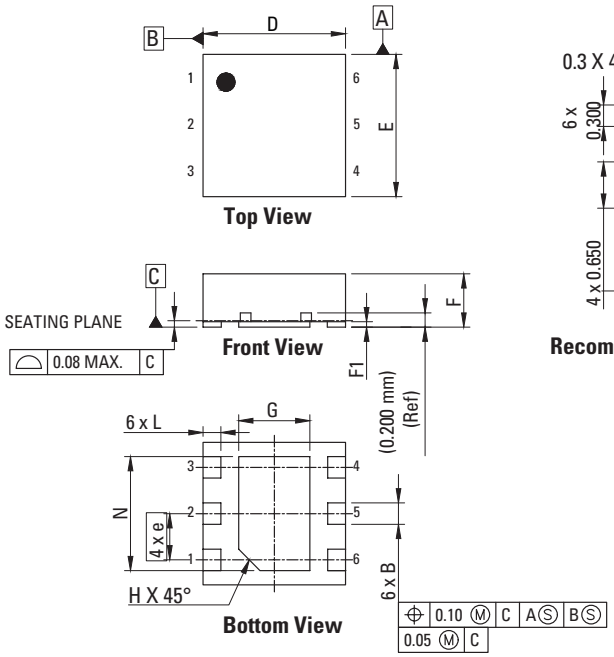
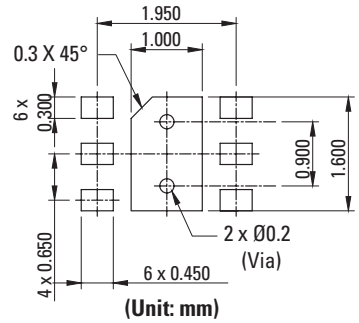
Package Dimensions — DFN-6P

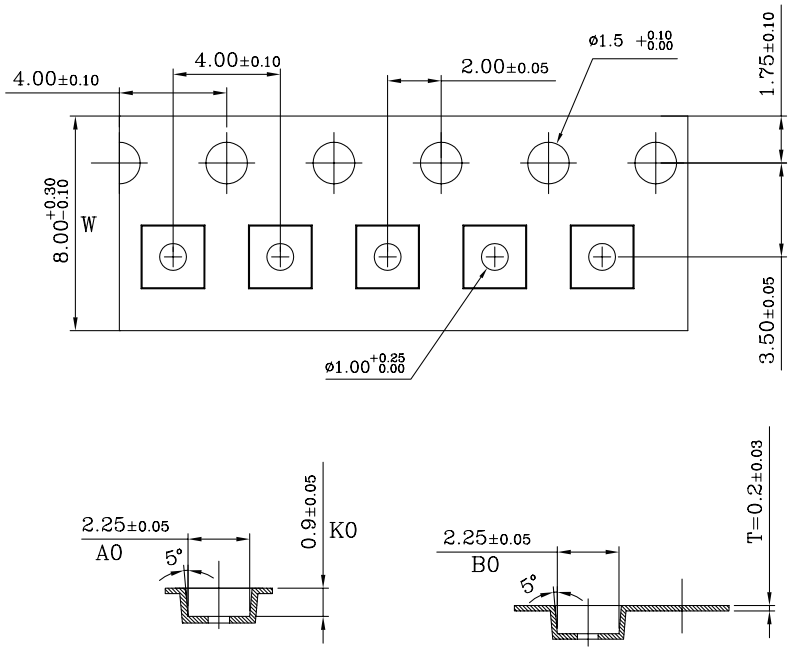


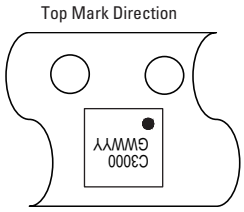


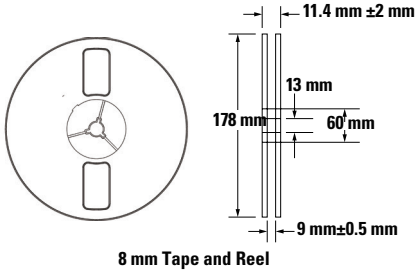
Recommended Soldering Pad Layout

Symbol	Millimeters	
	Min	Max
F	0.700	0.800
F1	0.000	0.050
B	0.250	0.350
D	1.900	2.100
E	1.900	2.100
L	0.200	0.300
G	0.900	1.100
N	1.500	1.700
H	0.250	0.350
e	0.650 BSC	

Embossed Carrier Tape & Reel Specification — DFN-6P







8 mm Tape and Reel

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