

PROTECTION PRODUCTS

Description

The SDC36C is a high-surge transient voltage suppressor (TVS) optimized for protection of sensitive digital sensors used in proximity switches and industrial control applications. The SDC36C protects the components from over-voltages caused by electrostatic discharge (ESD), electrical fast transients (EFT), and tertiary lightning. The unique design of the SDC36C incorporates two TVS diodes in a compact package for applications where board space is at a premium. The single package provides protection for the I/O line and power supply rail with high surge capabilities (4 Amps at $t_p=1.2/50\mu s$) and an exceptionally low clamping voltage of $<47V$.

The SDC36C replaces up to two large discrete diodes providing the designer an easy to implement integrated solution. The SDC36C is in a 3-pin, RoHS/WEEE compliant, SOT-23 package. The small size and unique features of the SDC36C make it ideal for protection of two, three, and four wire DC high-side proximity switches.

Features

- Transient Protection to
 - ♦ IEC 61000-4-2 (ESD): 15kV (Air), 8kV (Contact)
 - ♦ IEC 61000-4-4 (EFT): 40A (5/50ns)
 - ♦ IEC 61000-4-5 (Lightning): 4A (8/20 μs)
- Replaces Two Discrete Devices
- Protects Two Lines
- Working Voltage: 33V
- High Surge capability
- Solid-State Silicon-Avalanche Technology

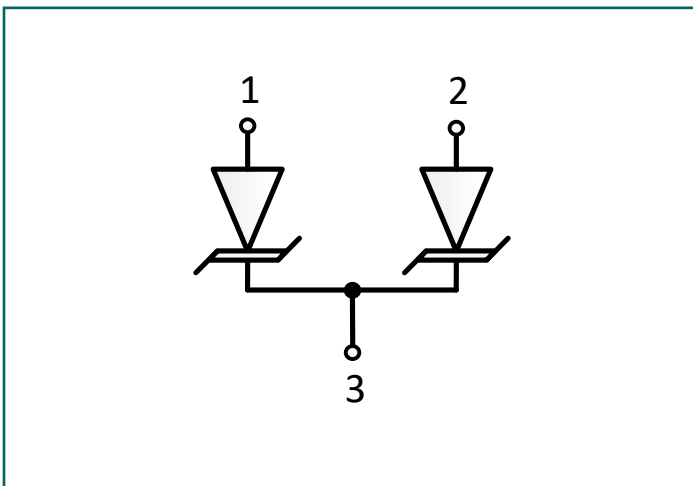
Mechanical Characteristics

- JEDEC SOT-23 Package
- Pb-Free, Halogen Free, RoHS/WEEE Compliant
- Molding Compound Flammability Rating: UL 94V-0
- Marking : Marking Code
- Packaging : Tape and Reel

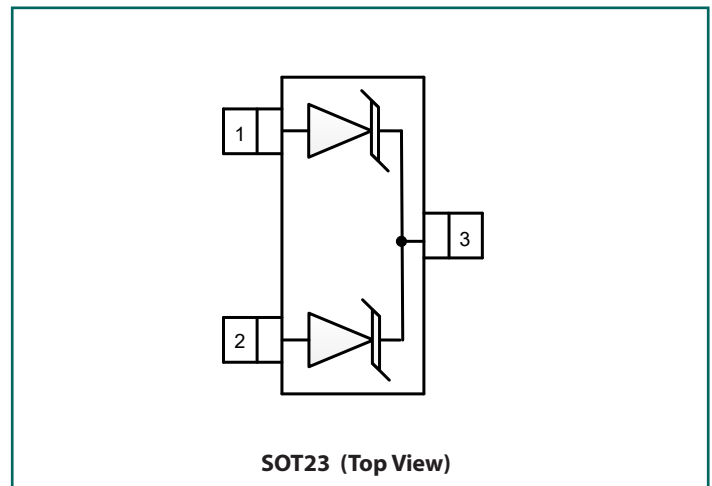
Applications

- Two, Three, and Four Wire DC High-Side Proximity Switch
- I/O Link
- Digital Sensor Input Protection
- Industrial Equipment

Circuit Diagram



Schematic and Pin Configuration



Absolute Maximum Ratings

Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20μs)	P _{PK}	350	W
Peak Pulse Power (tp = 1.2/50μs)	P _{PK}	225	W
Peak Pulse Current (tp = 1.2/50μs)	I _{PP}	4	A
Non-Repetitive Peak Forward Current (tp = 100μs)	I _{F5MAX}	4	A
Operating Temperature	T _J	-55to +125	°C
Storage Temperature	T _{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C unless otherwise specified)

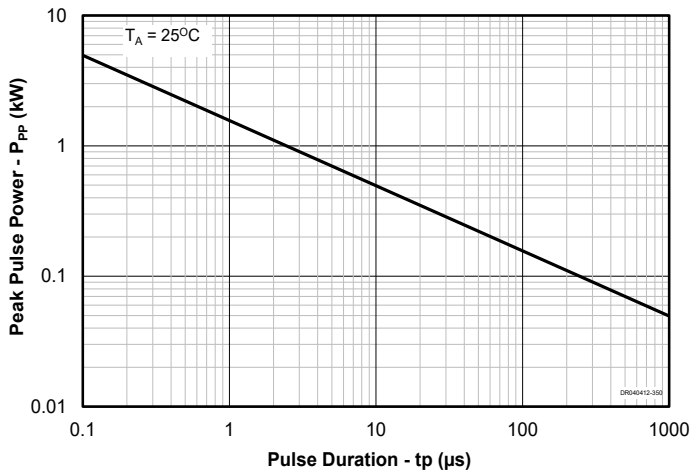
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V _{RWM}	-40°C to 125°C, Pin 3 to Pin 1 or 2			33	V
Reverse Breakdown Voltage	V _{BR}	I _t = 1mA, Pin 3 to Pin 1 or 2	35			V
Reverse Leakage Current	I _R	V _{RWM} = 33V	T = 25°C		5	μA
			T = 85°C		25	μA
Clamping Voltage	V _C	I _{PP} = 2A, tp = 1.2/50μs			47	V
Forward Voltage	V _F	I _F = 100mA			1.3	V
Junction Capacitance	C _J	V _R = 0V, f = 1MHz, Pin 3 to Pin 1 or 2			120	pF

Notes:

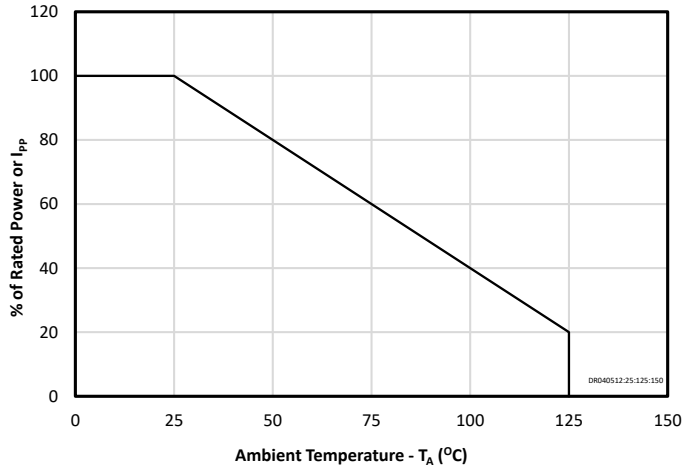
- (1): ESD Gun return path to Ground Reference Plane (GRP)
- (2): Transmission Line Pulse Test (TLP) Settings: tp = 100ns, tr = 0.2ns, I_{TLP} and V_{TLP} averaging window: t₁ = 70ns to t₂ = 90ns.
- (3): Dynamic resistance calculated from I_{TLP} = 4A to I_{TLP} = 16A.

Typical Characteristics

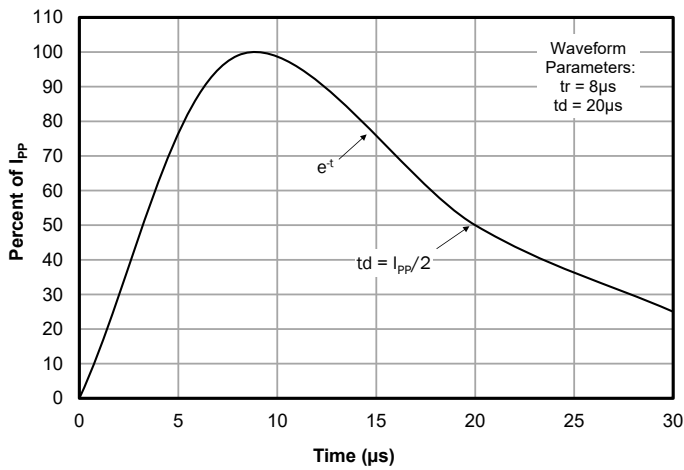
Non-Repetitive Peak Pulse Power vs. Pulse Time



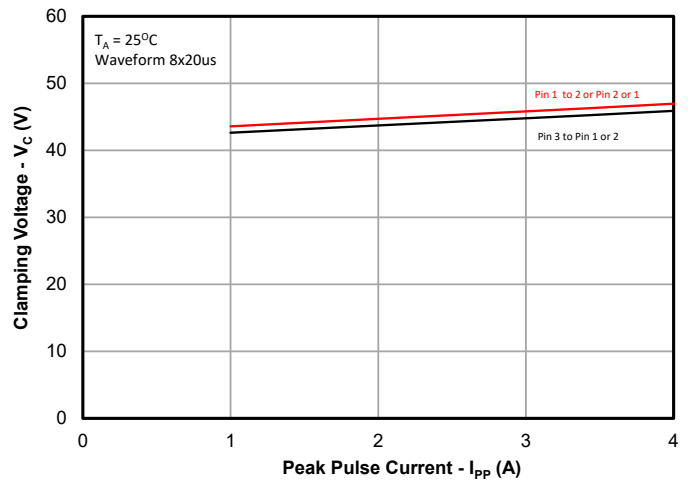
Power Derating Curve



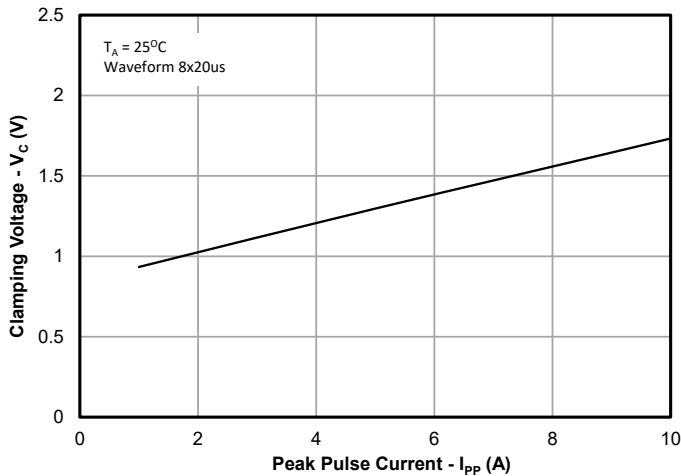
Pulse Waveform



Clamping Voltage vs. Peak Pulse Current (8/20 μ s Pulse)



Forward Voltage vs. Peak Pulse Current (8/20 μ s Pulse)



Application Information

Device Connection for Protection of Two, Three, and Four Wire Proximity Switches

Digital sensors help to bridge the gap between the physical world and the digital world in applications such as computer controlled factory automation. In such environments, transient voltages can easily disrupt or damage sensitive sensor inputs. The SDC36C provides transient voltage protection for the digital sensors to ensure their operation is not disrupted by the physical world.

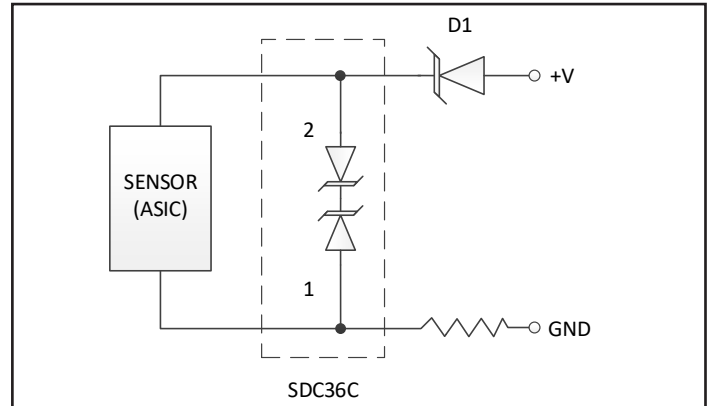
The SDC36C is designed to meet the high surge capability and low clamping voltage needed to protect the ASIC and control logic used in proximity switches. The SDC36C provides protection for the power and I/O lines. Typical configurations for the protection of two, three, and four wire switches are as follows:

- 1. Two-Wire Switch:** Connect pin 1 to the I/O line and pin 2 to the DC supply (since the device is symmetrical, these connections can be reversed). Pin 3 is not connected.
- 2. Three-Wire Switch:** Either pin 1 or pin 2 is connected to the I/O line with the other connected to ground. Pin 3 must be connected to the DC supply.
- 3. Four-Wire Switch:** Two devices are required to protect four wire switches. Pin 3 of each device is connected to the DC supply line. Pins 1 and 2 are connected to the I/O lines and ground as shown.

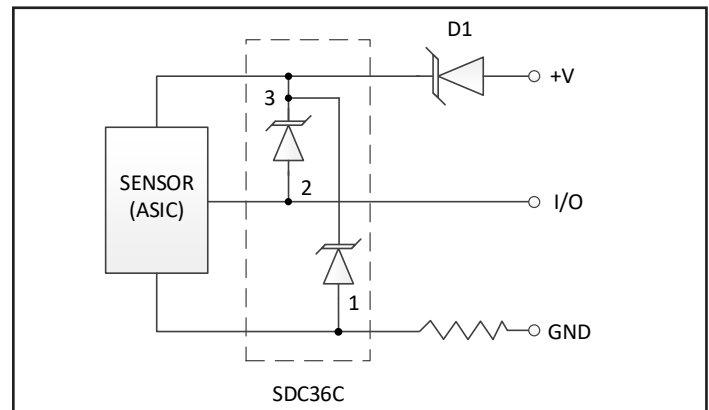
Matte Tin Lead Finish

Matte tin has become the industry standard lead-free replacement for SnPb lead finishes. A matte tin finish is composed of 100% tin solder with large grains. Since the solder volume on the leads is small compared to the solder paste volume that is placed on the land pattern of the PCB, the reflow profile will be determined by the requirements of the solder paste. Therefore, these devices are compatible with both lead-free and SnPb assembly techniques. In addition, unlike other lead-free compositions, matte tin does not have any added alloys that can cause degradation of the solder joint.

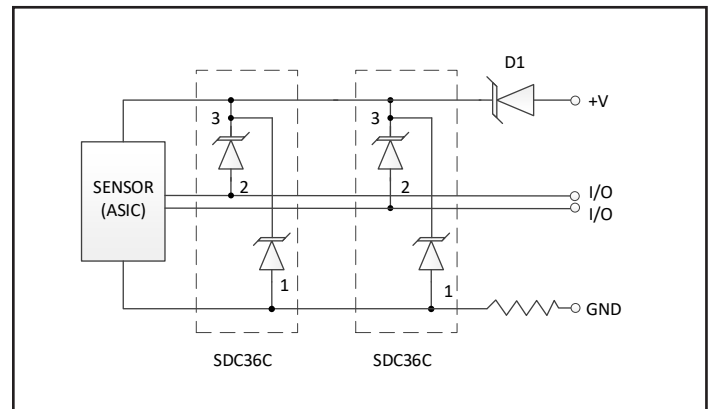
2-Wire DC Proximity Switch Application



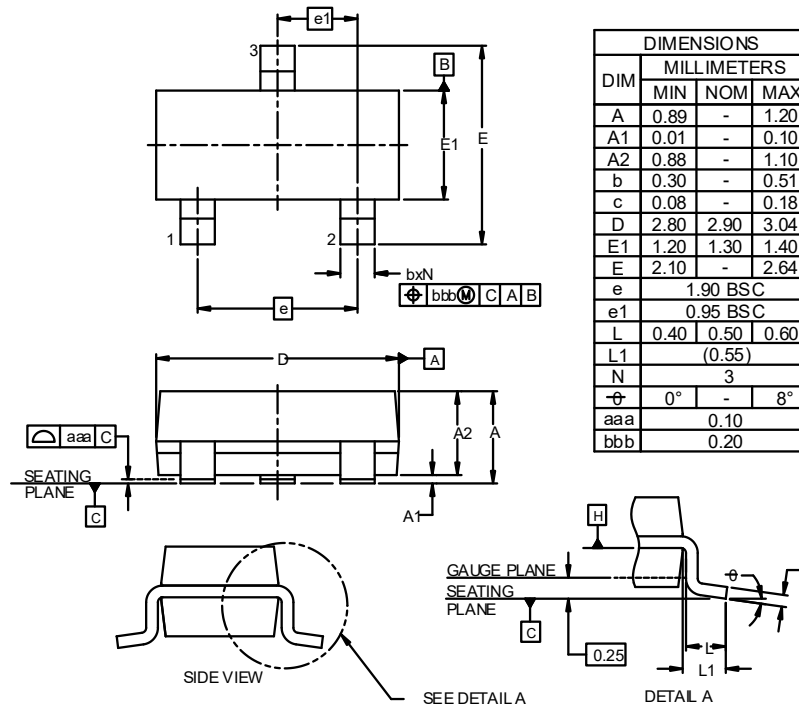
3-Wire DC Proximity Switch Application



4-Wire DC Proximity Switch Application



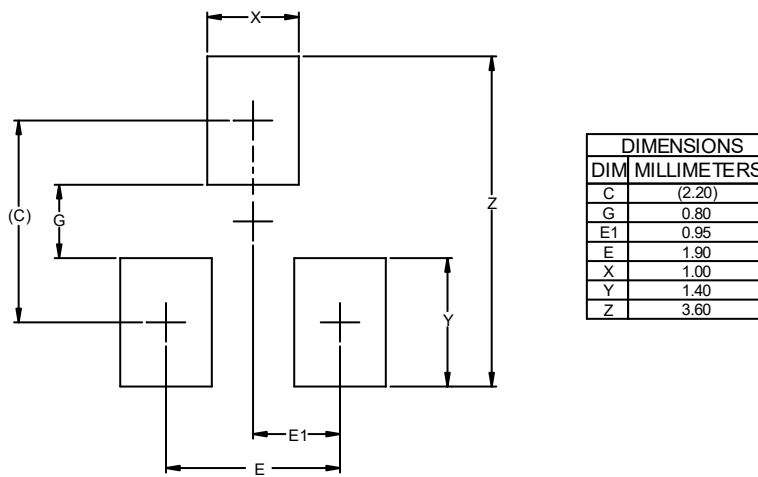
Outline Drawing - SOT23-3L



DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.89	-	1.20
A1	0.01	-	0.10
A2	0.88	-	1.10
b	0.30	-	0.51
c	0.08	-	0.18
D	2.80	2.90	3.04
E1	1.20	1.30	1.40
E	2.10	-	2.64
e	1.90 BSC		
e1	0.95 BSC		
L	0.40	0.50	0.60
L1	(0.55)		
N	3		
theta	0°	-	8°
aaa	0.10		
bbb	0.20		

- NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
 2. DATUMS $\boxed{-A}$ AND $\boxed{-B}$ TO BE DETERMINED AT DATUM PLANE $\boxed{-H}$
 3. DIMENSIONS "E1" AND "D" DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

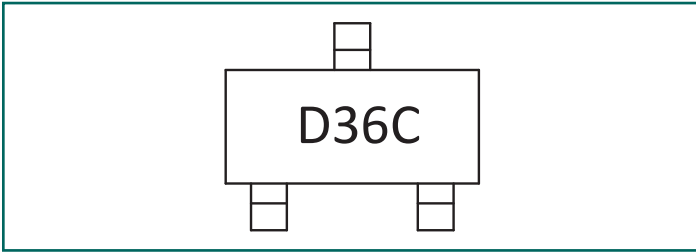
Land Pattern - SOT23-3L



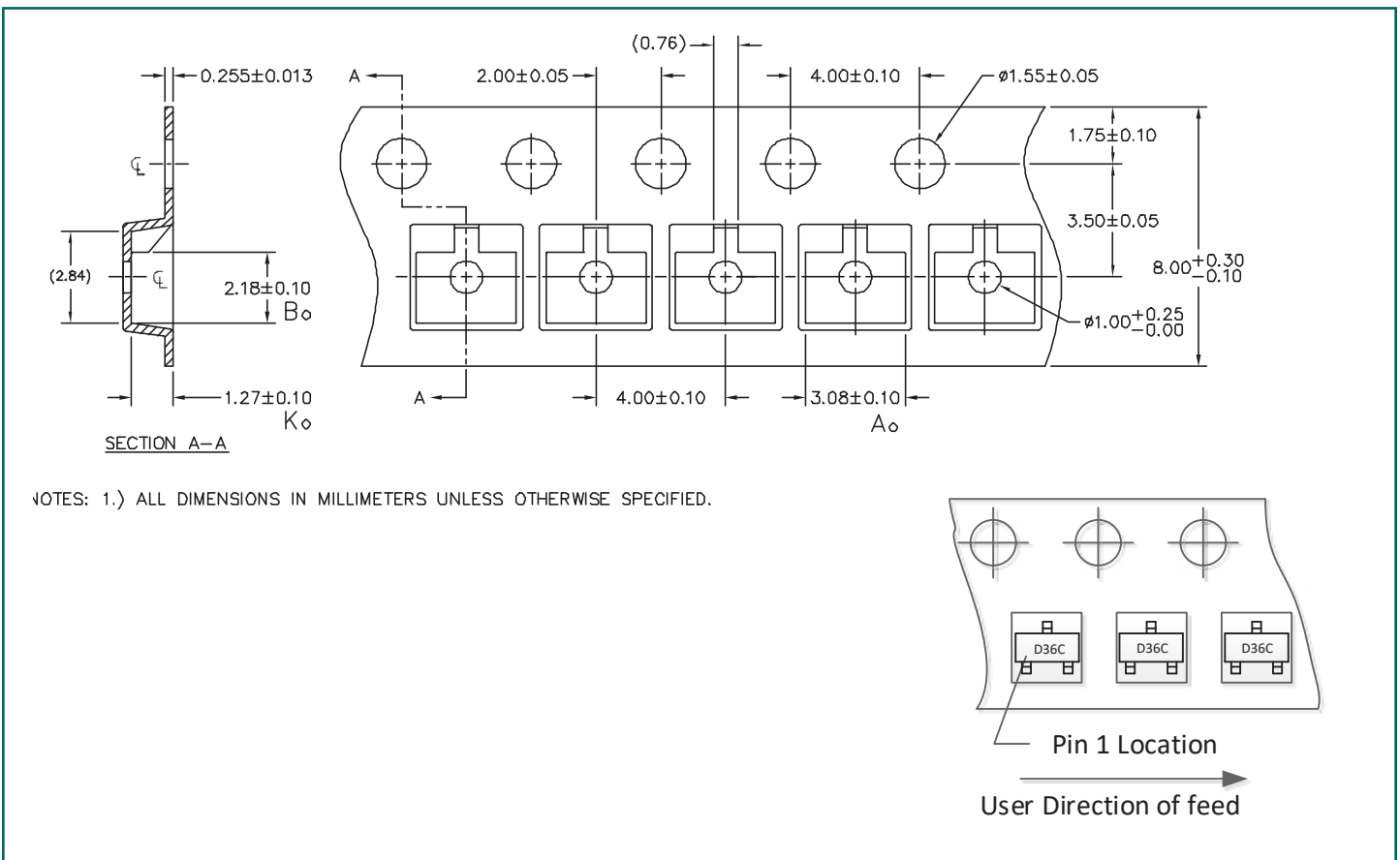
DIMENSIONS	
DIM	MILLIMETERS
C	(2.20)
G	0.80
E1	0.95
E	1.90
X	1.00
Y	1.40
Z	3.60

- NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
 2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.
 3. REFERENCE IPC-SM-782A.

Marking Code



Tape and Reel Specification



Ordering Information

Part Number	Qty per Reel	Reel Size	Pitch
SDC36C.TCT	3000	7 Inch	4mm



Important Notice

Information relating to this product and the application or design described herein is believed to be reliable, however such information is provided as a guide only and Semtech assumes no liability for any errors in this document, or for the application or design described herein. Semtech reserves the right to make changes to the product or this document at any time without notice. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. Semtech warrants performance of its products to the specifications applicable at the time of sale, and all sales are made in accordance with Semtech's standard terms and conditions of sale.

SEMTECH PRODUCTS ARE NOT DESIGNED, INTENDED, AUTHORIZED OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT APPLICATIONS, DEVICES OR SYSTEMS, OR IN NUCLEAR APPLICATIONS IN WHICH THE FAILURE COULD BE REASONABLY EXPECTED TO RESULT IN PERSONAL INJURY, LOSS OF LIFE OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. INCLUSION OF SEMTECH PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE UNDERTAKEN SOLELY AT THE CUSTOMER'S OWN RISK. Should a customer purchase or use Semtech products for any such unauthorized application, the customer shall indemnify and hold Semtech and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs damages and attorney fees which could arise.

The Semtech name and logo are registered trademarks of the Semtech Corporation. All other trademarks and trade names mentioned may be marks and names of Semtech or their respective companies. Semtech reserves the right to make changes to, or discontinue any products described in this document without further notice. Semtech makes no warranty, representation or guarantee, express or implied, regarding the suitability of its products for any particular purpose. All rights reserved.

© Semtech 2017

Contact Information

Semtech Corporation
200 Flynn Road, Camarillo, CA 93012
Phone: (805) 498-2111, Fax: (805) 498-3804
www.semtech.com

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [ESD Suppressors / TVS Diodes](#) category:

Click to view products by [Semtech](#) manufacturer:

Other Similar products are found below :

[60KS200C](#) [D12V0H1U2WS-7](#) [D18V0L1B2LP-7B](#) [82356050220](#) [D5V0M5U6V-7](#) [NTE4902](#) [P4KE27CA](#) [P6KE11CA](#) [P6KE39CA-TP](#)
[P6KE8.2A](#) [SA110CA](#) [SA60CA](#) [SA64CA](#) [SMBJ12CATR](#) [SMBJ8.0A](#) [SMLJ30CA-TP](#) [ESD101-B1-02ELS E6327](#) [ESD112-B1-02EL E6327](#)
[ESD119B1W01005E6327XTSA1](#) [ESD5V0L1B02VH6327XTSA1](#) [ESD7451N2T5G](#) [19180-510](#) [CPDT-5V0USP-HF](#) [3.0SMCJ33CA-F](#)
[3.0SMCJ36A-F](#) [HSPC16701B02TP](#) [D3V3Q1B2DLP3-7](#) [D55V0M1B2WS-7](#) [DESD5V0U1BL-7B](#) [DRTR5V0U4SL-7](#) [SCM1293A-04SO](#)
[ESD200-B1-CSP0201 E6327](#) [ESD203-B1-02EL E6327](#) [SM12-7](#) [SMF8.0A-TP](#) [SMLJ45CA-TP](#) [CEN955 W/DATA](#) [82350120560](#)
[82356240030](#) [VESD12A1A-HD1-GS08](#) [CPDUR5V0R-HF](#) [CPDUR24V-HF](#) [CPDQC5V0U-HF](#) [CPDQC5V0USP-HF](#) [CPDQC5V0-HF](#)
[D1213A-01LP4-7B](#) [D1213A-02WL-7](#) [ESDLIN1524BJ-HQ](#) [5KP100A](#) [5KP15A](#)