Technical Data
Data Sheet N1741, REV. A

SMP3022-01ETG TVS Arrays

Description

The SMP3022 includes back-to-back TVS diodes fabricated in a proprietary silicon avalanche technology to provide protection for electronic equipment that may experience destructive electrostatic discharges (ESD). These robust diodes can safely absorb repetitive ESD strikes up to the maximum level specified in the IEC61000-4-2 international standard (± 20kV contact discharge) without performance degradation. The back-to-back configuration provides symmetrical ESD protection for data lines when AC signals are present and the low loading capacitance makes it ideal for protecting high speed data lines such as HDMI, USB2.0, USB3.0 and eSATA.

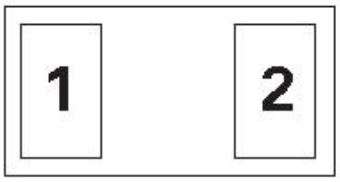
Features

- ESD protection in accordance with:
  IEC 61000-4-2 (ESD) ±30kV (air), ±20kV (contact)
  IEC 61000-4-5 (lightning) 3A (8/20 μs)
  IEC 61000-4-4 (EFT) 40A (5/50ns)
- Low capacitance of 0.35pF @ VR=0V (TYP)
- Low leakage current of 100nA at 5.3V(MAX)
- Extremely low dynamic resistance (0.7Ω TYP)

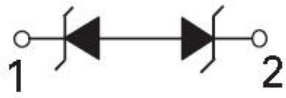
Applications

- USB 3.0/USB 2.0/MHL
- MIPI Camera and Display
- HDMI 2.0, DisplayPort 1.3, eSATA
- Set Top Boxes, Game Consoles
- Smart Phones
- External Storage
- Ultrabooks, Notebooks
- Tablets, eReaders
- High Speed Serial Interfaces

Pinout



Functional Block Diagram



Technical Data
Data Sheet N1741, REV. A

RoHS

Ordering Information

Device	Package	Packaging Options	P0/P1	Packaging Speciications	Min. Order Qty.
SMP3022-01ETG	SOD882	Tape & Reel - 8mm tape/7" reel	4mm/2mm	EIA RS-481	10000

Absolute Maximum Ratings @T_A=25°C unless otherwise specified

Parameter	Symbol	Value	Units
Peak Pulse Current (tp=8/20μs)	I_{PP}	3.0	A
Operating Temperature	T_{OP}	-40 to + 125	°C
Peak Pulse Power (tP=8/20μs)	P_{PK}	20	W

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Thermal Information

Parameter	Value	Units
Storage Temperature Range	-55 to + 150	°C
Maximum Junction Temperature	150	°C
Maximum Lead Temperature (Soldering 20-40s)	260	°C

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

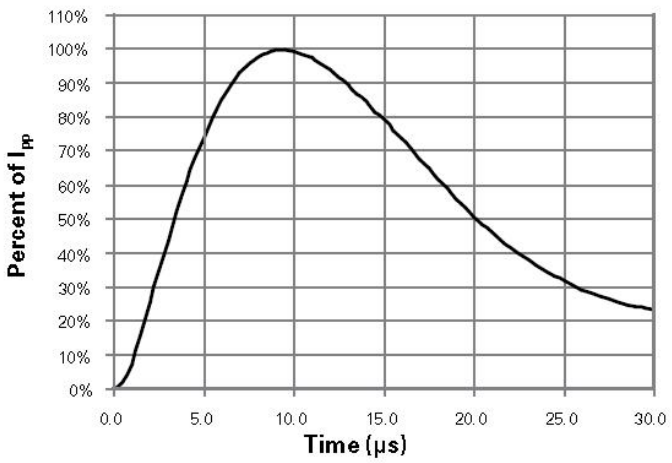
Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}	-	-	-	5.3	V
Reverse Breakdown Voltage	V_{BR}	I_R=1mA	6.8	7.8	9.0	V
Reverse Leakage Current	I_{LEAK}	V_R =5.3V	-	<10	100	nA
Clamping Voltage[1]	V_C	I_{PP} = 1A, tp=8/20μs, Fwd	-	-	12.0	V
Dynamic Resistance[2]	R_{DYN}	TLP, tp=100ns, I/O to GND	-	0.7	-	Ω
ESD With stand Voltage[1]	V_{ESD}	IEC61000-4-2 (Contact)	±20	-	-	kV
		IEC61000-4-2 (Air)	±30	-	-	kV
Junction Capacitance[1]	C_D	Reverse Bias=0V, f=1 MHz	-	0.35	0.5	pF

Note: 1 Parameter is guaranteed by design and/or device characterization.
2 Transmission Line Pulse (TLP) with 100ns width and 200ps rise time.

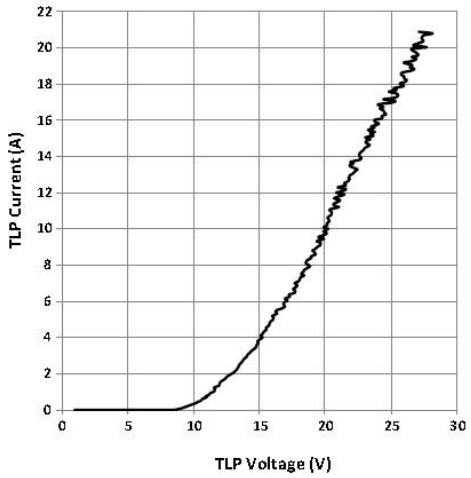
Technical Data
Data Sheet N1741, REV. A

Ratings and Characteristics Curves

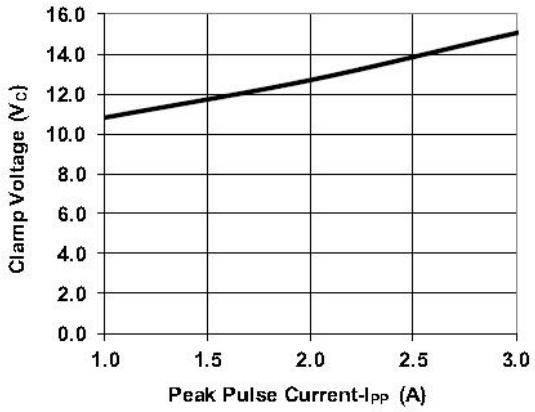
Pulse Waveform



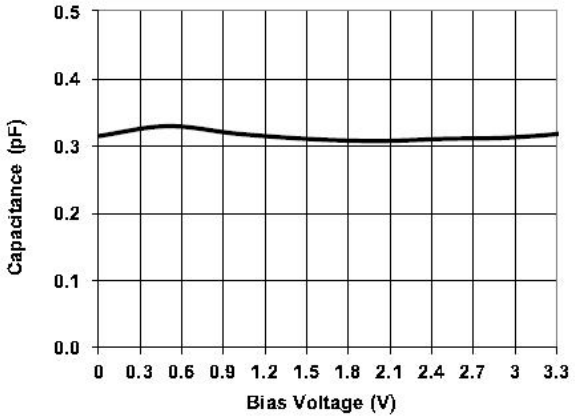
Transmission Line Pulsing (TLP) Plot



Clamping Voltage vs I_{PP}



Capacitance vs. Reverse Bias



Part Name Information

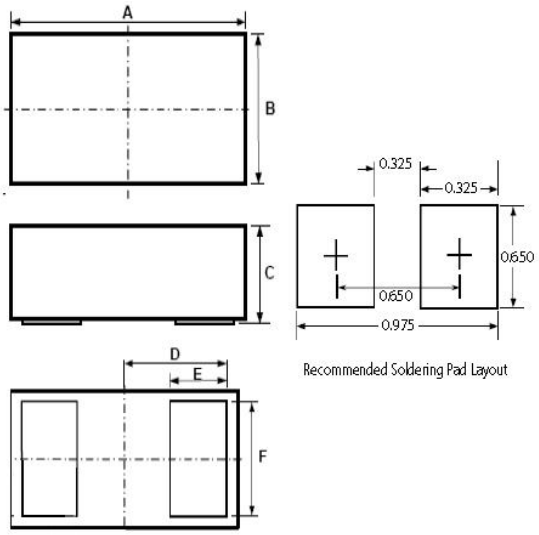
SMP 3022 - 01 E T G

- G= Green
- T= Tape & Reel
- Package
  E: SOD882
- Number of Channels
- Series
- TVS Arrays Product

Marking Diagram

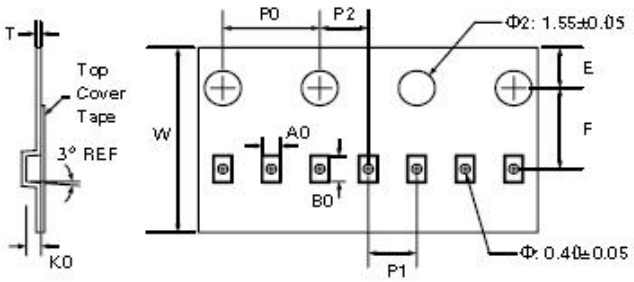
Technical Data
Data Sheet N1741, REV. A

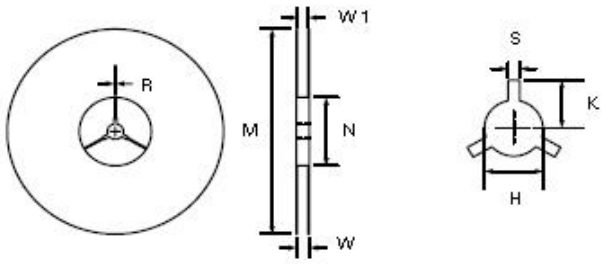
Mechanical Dimensions SOD882

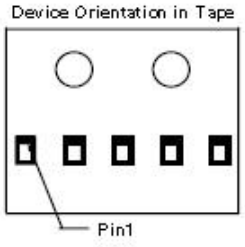


Symbol	Package			SOD882		
	JEDEC			MO-236		
	Millimeters			Inches		
	Min	Typ	Max	Min	Typ	Max
A	0.90	1.00	1.10	0.037	0.039	0.041
B	0.50	0.60	0.70	0.022	0.024	0.026
C	0.40	0.50	0.60	0.016	0.020	0.024
D	0.45			0.018		
E	0.20	0.25	0.35	0.008	0.010	0.012
F	0.45	0.50	0.55	0.018	0.020	0.022

Embossed Carrier Tape & Reel Speciication — SOD882







Symbol	Tape Dimensions	
	Millimeters	
	Min	Max
A0	0.65	0.75
B0	1.10	1.20
K0	0.50	0.60
E	1.65	1.85
F	3.45	3.55
P0	3.90	4.10
P1	1.90	2.10
P2	1.95	2.05
T	1.95	2.05
W	7.90	8.10

Symbol	Reel Dimensions (Size ϕ178)	
	Millimeters	
	Min	Max
M	177.0	179.0
N	59.0	61.0
W	11.0	12.0
W1	8.5	9.5
H	12.5	13.5
S	1.9	2.1
K	10.8	11.2
R	0.95	1.05

Technical Data
Data Sheet N1741, REV. A

DISCLAIMER:
1- The information given herein, including the specifications and dimensions, is subject to change without prior notice to improve product characteristics. Before ordering, purchasers are advised to contact the SMC - Sangdest Microelectronics (Nanjing) Co., Ltd sales department for the latest version of the datasheet(s).
2- In cases where extremely high reliability is required (such as use in nuclear power control, aerospace and aviation, traffic equipment, medical equipment , and safety equipment) , safety should be ensured by using semiconductor devices that feature assured safety or by means of users' fail-safe precautions or other arrangement .
3- In no event shall SMC - Sangdest Microelectronics (Nanjing) Co., Ltd be liable for any damages that may result from an accident or any other cause during operation of the user's units according to the datasheet(s). SMC - Sangdest Microelectronics (Nanjing) Co., Ltd assumes no responsibility for any intellectual property claims or any other problems that may result from applications of information, products or circuits described in the datasheets.
4- In no event shall SMC - Sangdest Microelectronics (Nanjing) Co., Ltd be liable for any failure in a semiconductor device or any secondary damage resulting from use at a value exceeding the absolute maximum rating.
5- No license is granted by the datasheet(s) under any patents or other rights of any third party or SMC - Sangdest Microelectronics (Nanjing) Co., Ltd.
6- The datasheet(s) may not be reproduced or duplicated, in any form, in whole or part, without the expressed written permission of SMC - Sangdest Microelectronics (Nanjing) Co., Ltd.
7- The products (technologies) described in the datasheet(s) are not to be provided to any party whose purpose in their application will hinder maintenance of international peace and safety nor are they to be applied to that purpose by their direct purchasers or any third party. When exporting these products (technologies), the necessary procedures are to be taken in accordance with related laws and regulations..