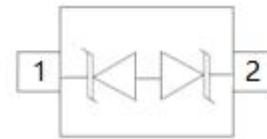


SD05C THRU SD24C TVS ARRAY



Schematic & Pin Configuration



Description

The SDxxC TVS diodes are designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and PDA's. They offer superior electrical characteristics such as lower clamping voltage and no device degradation when compared to MLVs. The SDxxC series TVS diodes are designed to protect sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events.

The SDxxC is in a SOD-323 package and will protect one unidirectional line. These devices will fit on the same PCB pad area as an 0805 MLV device. They give the designer the flexibility to protect one line in applications where arrays are not practical. Additionally, it may be "sprinkled" around the board in applications where board space is at a premium.

They may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge).

Application

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Personal Digital Assistants (PDA' s)
- Notebooks, Desktops, and Servers
- Portable Instrumentation
- Pagers Peripherals

Mechanical Characteristics

- SOD-323 package
- Molding compound flammability rating: UL 94V-0
- Marking : Marking code
- Packaging : Tape and Reel

Features

- 350 Watts peak pulse power ($t_p = 8/20 \mu\text{s}$)
- Transient protection for data lines to IEC 61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact) IEC 61000-4-4 (EFT) 40A (5/50ns) IEC 61000-4-5 (Lightning) 24A (8/20 μs)
- Small package for use in portable electronics
- Suitable replacement for MLV' s in ESD protection applications
- Protects one I/O or power line
- Low clamping voltage
- Working voltages: 5V and 24V
- Low leakage current
- Solid-state silicon-avalanche technology
- Terminals finish: 100% Pure Tin

Maximum Ratings@T_A=25° C unless otherwise specified

Parameter	Symbol	Value	Units
Peak Pulse Power (tp =8/20 μ s)	P _{PK}	350	W
Peak Pulse Current (tp =8/20 μ s)	I _{PP}	24	A
ESD Voltage (HBM Waveform per IEC 61000-4-2)	V _{ESD}	30	KV
Lead Soldering Temperature	T _L	260(10 sec.)	°C
Operating Temperature	T _J	-55 to + 125	°C
Storage Temperature	T _{STG}	-55 to + 150	°C

Electrical Characteristics@T_A=25°C unless otherwise specified

SD05C	Marking code	D05C				
Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V _{RWM}	-	-	-	5	V
Reverse Breakdown Voltage	V _{BR}	@ I _t =1mA	6	-	-	V
Reverse Leakage Current	I _R	@V _{RWM} = 5V, T = 25 °C	-	-	10	μA
Clamping Voltage	V _C	@I _{PP} = 5A, tp=8/20μs	-	-	9.8	V
Clamping Voltage	V _C	@I _{PP} = 24A, tp=8/20μs	-	-	14.5	V
Junction Capacitance	C _j	@V _R = 0V, f _{SIG} = 1MHz	-	-	200	pF

SD12C	Marking code	D12C				
Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V _{RWM}	-	-	-	12	V
Reverse Breakdown Voltage	V _{BR}	@ I _t =1mA	13.3	-	-	V
Reverse Leakage Current	I _R	@V _{RWM} = 12V, T = 25 °C	-	-	1	μA
Clamping Voltage	V _C	@I _{PP} = 5A, tp=8/20μs	-	-	19	V
Clamping Voltage	V _C	@I _{PP} = 15A, tp=8/20μs	-	-	24	V
Junction Capacitance	C _j	@V _R = 0V, f _{SIG} = 1MHz	-	-	100	pF

SD15C	Marking code	D15C				
Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V _{RWM}	-	-	-	15	V
Reverse Breakdown Voltage	V _{BR}	@ I _t =1mA	16.7	-	-	V
Reverse Leakage Current	I _R	@V _{RWM} = 15V, T = 25 °C	-	-	1	μA
Clamping Voltage	V _C	@I _{PP} = 5A, tp=8/20μs	-	-	24	V
Clamping Voltage	V _C	@I _{PP} = 12A, tp=8/20μs	-	-	29	V
Junction Capacitance	C _j	@V _R = 0V, f _{SIG} = 1MHz	-	-	75	pF

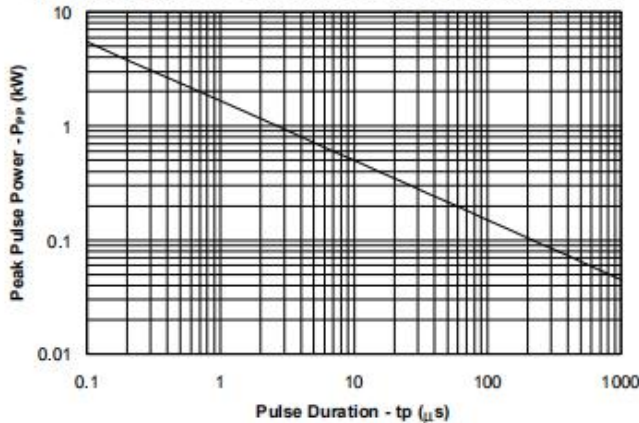


SD18C	Marking code	D18C				
Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}	-	-	-	18	V
Reverse Breakdown Voltage	V_{BR}	@ $I_t=1mA$	20	-	24	V
Reverse Leakage Current	I_R	@ $V_{RWM} = 18V, T = 25^\circ C$	-	-	1	μA
Clamping Voltage	V_C	@ $I_{PP} = 1A, t_p=8/20\mu s$	-	-	29	V
Clamping Voltage	V_C	@ $I_{PP} = 9A, t_p=8/20\mu s$	-	-	40	V
Junction Capacitance	C_j	@ $V_R = 0V, f_{SIG} = 1MHz$	-	-	60	pF

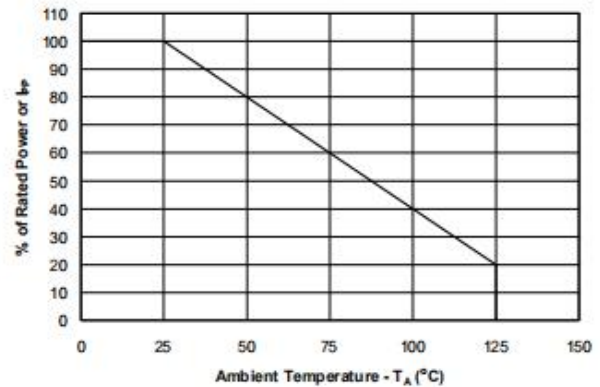
SD24C	Marking code	D24C				
Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}	-	-	-	24	V
Reverse Breakdown Voltage	V_{BR}	@ $I_t=1mA$	26.7	-	-	V
Reverse Leakage Current	I_R	@ $V_{RWM} = 24V, T = 25^\circ C$	-	-	1	μA
Clamping Voltage	V_C	@ $I_{PP} = 5A, t_p=8/20\mu s$	-	-	40	V
Clamping Voltage	V_C	@ $I_{PP} = 8A, t_p=8/20\mu s$	-	-	44	V
Junction Capacitance	C_j	@ $V_R = 0V, f_{SIG} = 1MHz$	-	-	50	pF

Ratings and Characteristics Curves

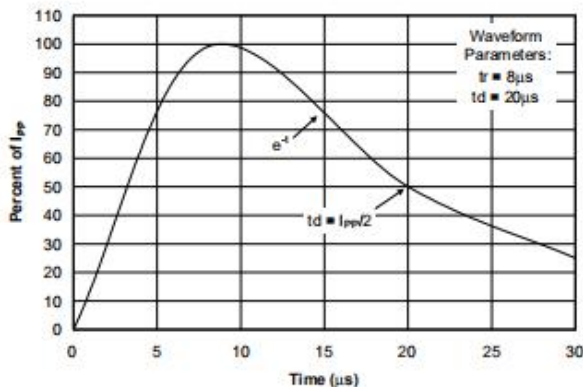
Non-Repetitive Peak Pulse Power vs. Pulse Time



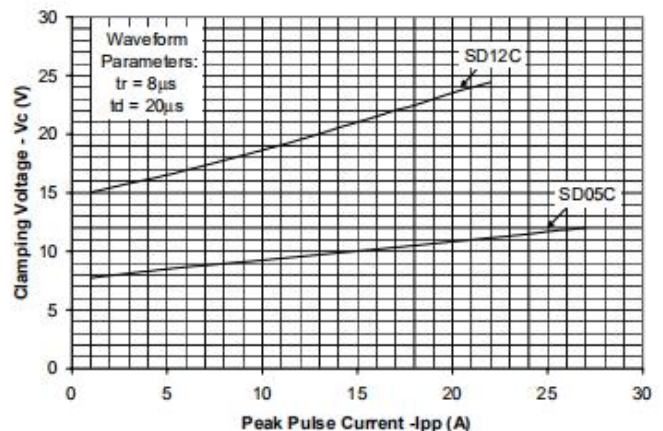
Power Derating Curve



Pulse Waveform



Clamping Voltage vs. Peak Pulse Current



- China - Germany - Korea - Singapore - United States •
- <http://www.smc-diodes.com> - sales@smc-diodes.com •

Ordering Information

Device	Package	Shipping
SD05C THRU SD24C	SOD-323 (Pb-Free)	3000pcs / reel

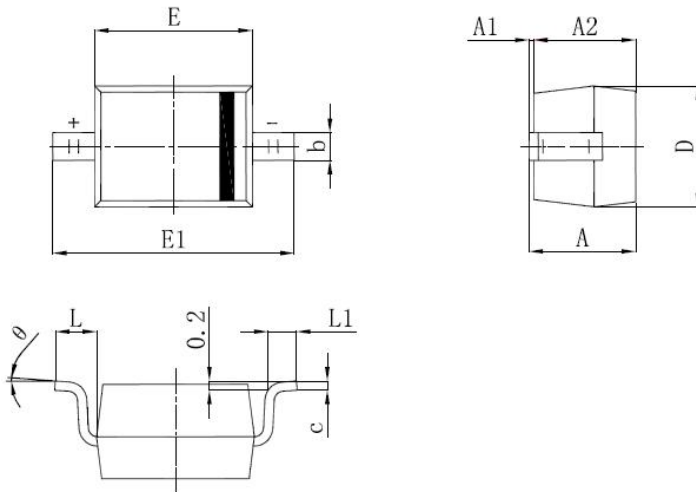
For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

Marking Diagram



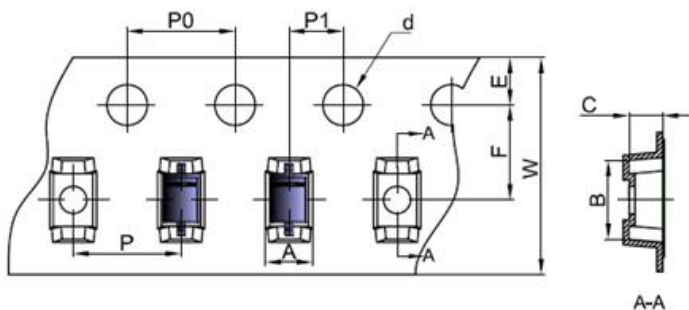
Marking code = D05C

Mechanical Dimensions SOD-323



SYMBOL	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	-	1.000	-	0.039
A1	0.000	0.100	0.000	0.004
A2	0.800	0.900	0.031	0.035
b	0.250	0.350	0.010	0.014
c	0.080	0.150	0.003	0.006
D	1.200	1.400	0.047	0.055
E	1.600	1.800	0.063	0.071
E1	2.500	2.700	0.098	0.106
L	0.475 REF.		0.019 REF.	
L1	0.250	0.400	0.010	0.016
θ	0°	8°	0°	8°

Carrier Tape Specification SOD-323



SYMB OL	Millimeters	
	Min.	Max.
B	2.85	2.95
C	1.20	1.30
d	1.40	1.60
E	1.65	1.85
F	3.40	3.60
P	3.90	4.10
P0	3.90	4.10
P1	1.90	2.10
W	7.90	8.30



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 Diode Solutions 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 Diode Solutions 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 Diode Solution 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 Diode Solutions 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 Diode Solutions.
- 6- The datasheet(s) may not be reproduced or duplicated, in any form, in whole or part, without the expressed written permission of SMC Diode Solutions.
- 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..