

SR05 Low Capacitance TVS Diode Array

Description

TVS diodes are surge rated diode arrays designed to protect high speed data interfaces. The SR series has been specifically designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by ESD (electrostatic discharge), EFT (electrical fast transients), and lightning.

The unique design of the SR series devices incorporates four surge rated, low capacitance steering diodes and a TVS diode in a single package. During transient conditions, the steering diodes direct the transient to either the positive side of the power supply line or to ground. The internal TVS diode prevents over-voltage on the power line, protecting any downstream components.

The low capacitance array configuration allows the user to protect two high-speed data or transmission lines. The low inductance construction minimizes voltage overshoot during high current surges.

Features

- ESD protection to IEC 61000-4-2, Level 4
- Array of surge rated diodes with internal TVS Diode
- Protects two I/O lines
- Low capacitance (<10pF) for high-speed interfaces
- Low clamping voltage
- Low operating voltage: 5.0V
- Solid-state silicon-avalanche technology

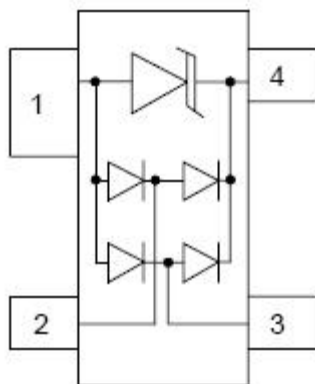
Mechanical Characteristics

- JEDEC SOT-143 package
- Molding compound flammability rating: UL 94V-0
- Marking : R05

Applications

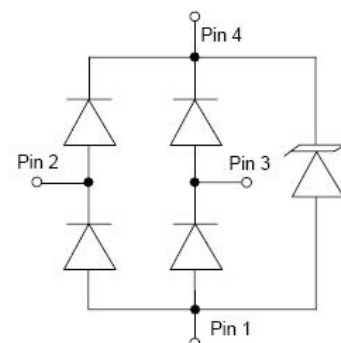
- USB Power & Data Line Protection
- Ethernet 10BaseT
- I²C Bus Protection
- Video Line Protection
- T1/E1 secondary IC Side Protection
- Portable Electronics
- Microcontroller Input Protection
- WAN/LAN Equipment ISDN
- S/T Interface

Pin Configuration



SOT-143 (Top View)

Circuit Diagram



Ordering Information

Device	Package	Shipping
SR05	SOT-143(Pb-Free)	3000pcs / reel
SR05TR	SOT-143(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.

Maximum Ratings @T_A=25°C unless otherwise specified

Parameter	Symbol	Value	Units
Peak Pulse Current (tp=8/20μs)	I _{PP}	25	A
Peak Pulse Power (tp = 8/20μs)	P _{PK}	500	W
Peak Forward Voltage (I _F =1A, tp=8/20μs)	V _{FP}	1.5	V
Lead Soldering Temperature	T _L	260(10 sec.)	°C
Operating Junction Temperature Range	T _J	-55 to + 125	°C
Storage Temperature Range	T _{STG}	-55 to + 150	°C

Electrical Characteristics

Characteristics	Symbol	Condition	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V _{RWM}	-	-	-	5	V
Reverse Breakdown Voltage	V _{BR}	@ I _i =1mA	6	-	-	V
Reverse Leakage Current	I _R	@V _{RWM} = 5V, T = 25 °C	-	-	5	μA
Clamping Voltage	V _C	@I _{PP} = 1A, tp=8/20μs, Between I/O pins and Gnd	-	-	9.8	V
Clamping Voltage	V _C	@I _{PP} = 10A, tp=8/20μs, Between I/O pins and Gnd	-	-	12	V
Clamping Voltage	V _C	@I _{PP} = 25A, tp=8/20μs, Between I/O pins and Gnd	-	-	20	V
Junction Capacitance	C _j	Between I/O pins and Gnd VR = 0V, f = 1MHz	-	6.5	10	pF
		Between I/O pins VR = 0V, f = 1MHz	-	3.3	-	pF

Ratings and Characteristics Curves

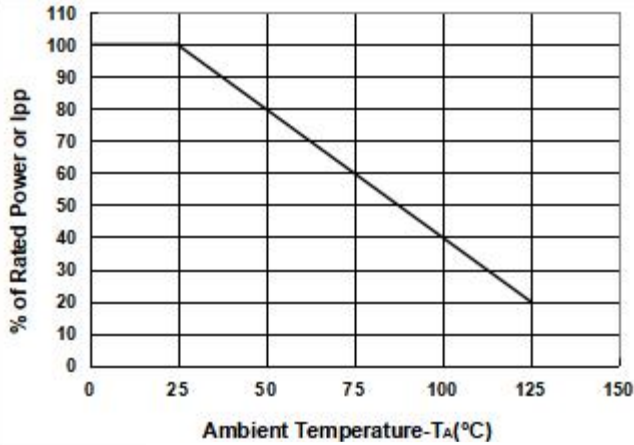


Fig.1 Power Derating Curve

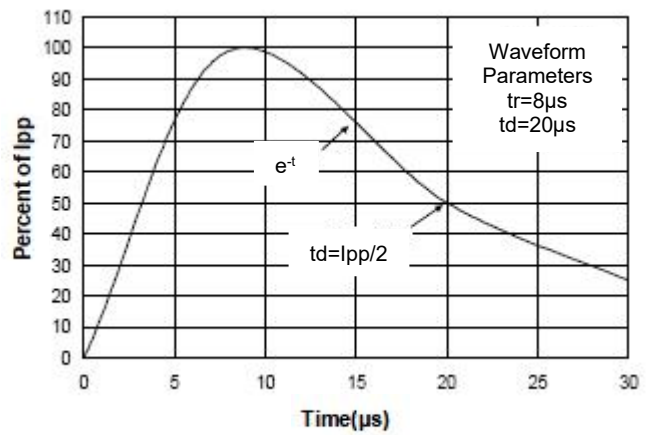


Fig.2 Pulse Waveform

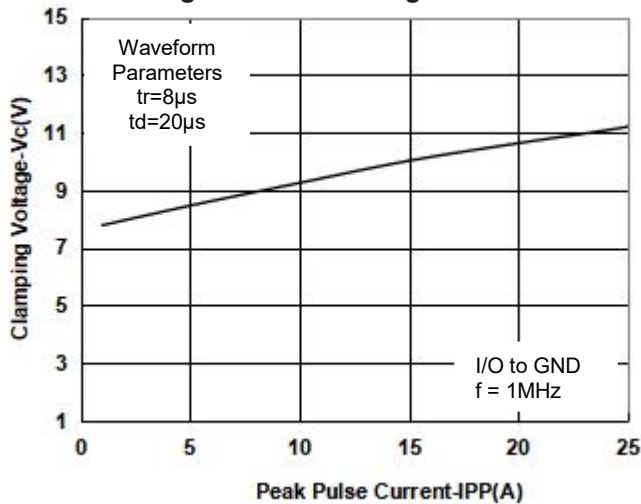


Fig. 3 Typical Clamping Voltage vs. Peak Pulse Current

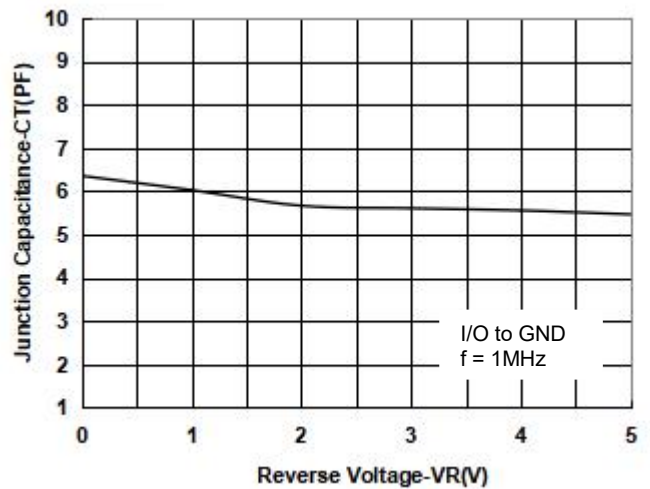


Fig. 4 Typical Capacitance vs. Reverse Voltage

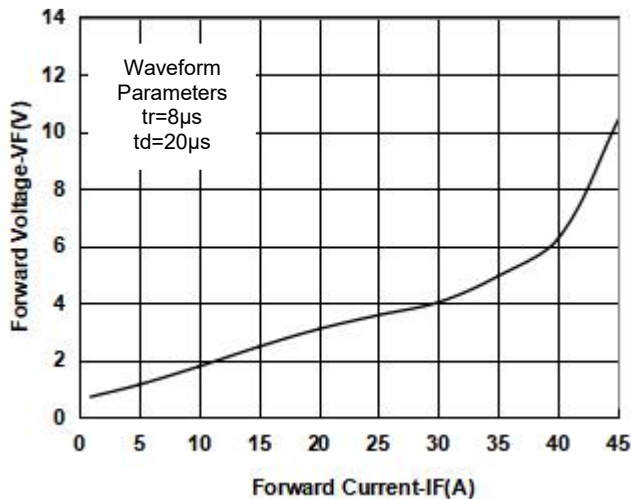
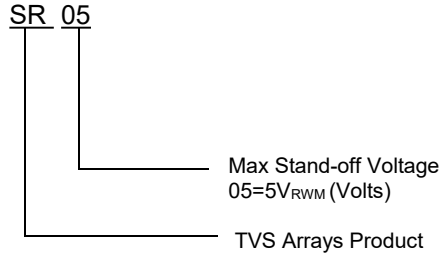
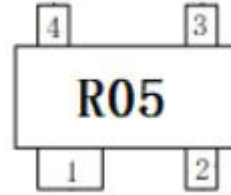


Fig. 5 Typical Forward Voltage vs. Forward Current

Part Name Information

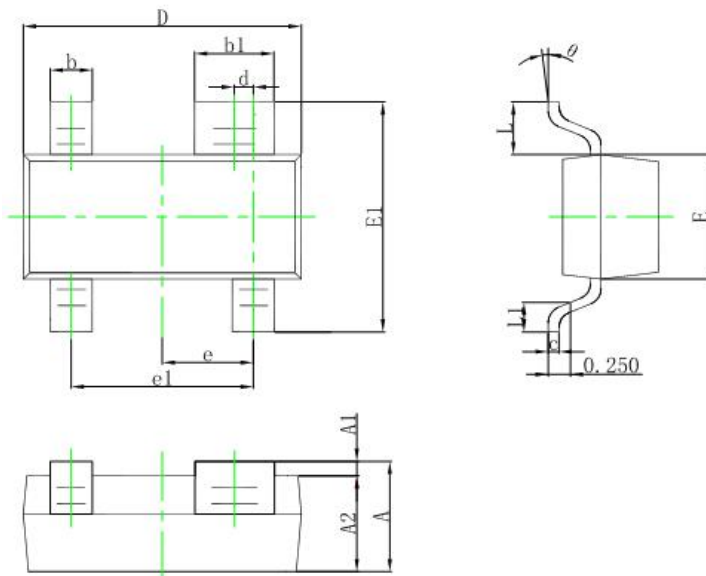


Marking Diagram



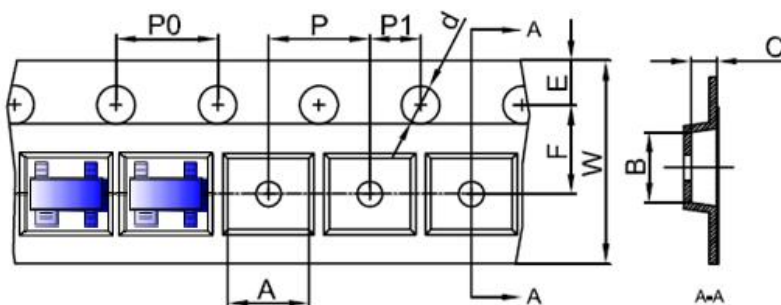
Where R05 is SR05
R05 =Marking code

Mechanical Dimensions SOT-143



SYMBOL	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.890	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.076	0.170	0.003	0.007
D	2.650	3.050	0.104	0.120
E	1.190	1.400	0.047	0.055
E1	2.100	2.550	0.083	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.780	2.050	0.070	0.081
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Mechanical Dimensions SOT-143



SYMBOL	Millimeters	
	Min.	Max.
A	3.09	3.29
B	2.70	2.90
C	1.21	1.41
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	8.10

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..