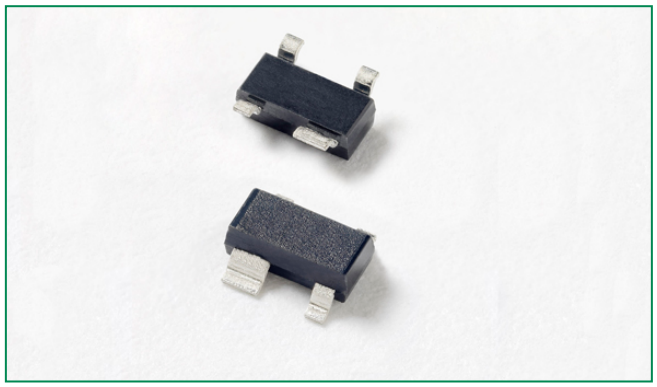
SR05 Series 5V 25A Diode Array

RoHS Pb GREEN

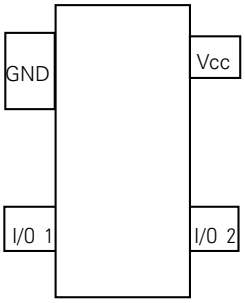


Description

The SR05 consists of four, low capacitance steering diodes and a low voltage TVS diode that provide protection against ESD and lightning surge events. Each channel or I/O pin can safely absorb up to 25A (tp=8/20µs) and repetitive ESD strikes above the maximum level (Level 4) specified in the IEC 61000-4-2 international standard without performance degradation.

The low loading capacitance makes it ideal for protecting high-speed telecommunication data lines.

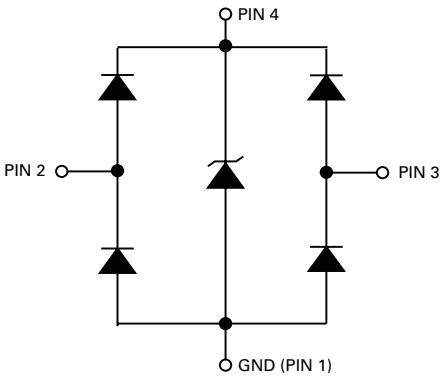
Pinout



Features

- ESD, IEC61000-4-2 , ±30kV contact discharge, ±30kV air discharge
- EFT, IEC61000-4-4, 80A (t_p=5/50ns)
- Lightning protection, IEC61000-4-5, 25A (t_p=8/20µs)
- Low capacitance of 6.0pF (TYP) per I/O
- Low clamp voltage
- Small SOT143 (JEDEC TO-253) packaging
- Moisture Sensitivity Level (MSL-1)

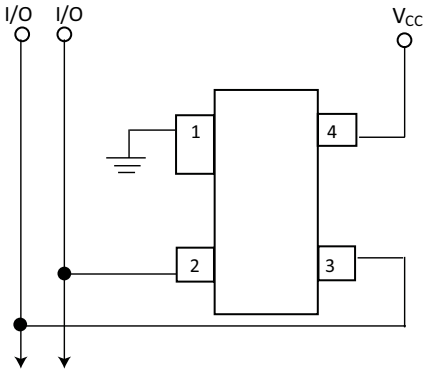
Functional Block Diagram



Applications

- T1/E1 IC/Secondary Protection
- Ethernet 10BaseT
- WAN/LAN Equipment
- ISDN S/T Interface
- Video Lines
- Microcontroller Input Protection

Application Example



The SR05 integrates a TVS Diode between the Vcc and Gnd pins. This allows the array to protect the power supply against ESD and lighting surges when these pins are both connected in the application.

Additional Information

Datasheet | **Resources** | **Samples**

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}	Peak Current (t_p=8/20μs)	25.0	A
P_{Pk}	Peak Pulse Power (t_p=8/20μs)	450	W
T_{OP}	Operating Temperature	–40 to 125	°C
T_{STOR}	Storage Temperature	–55 to 150	°C

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

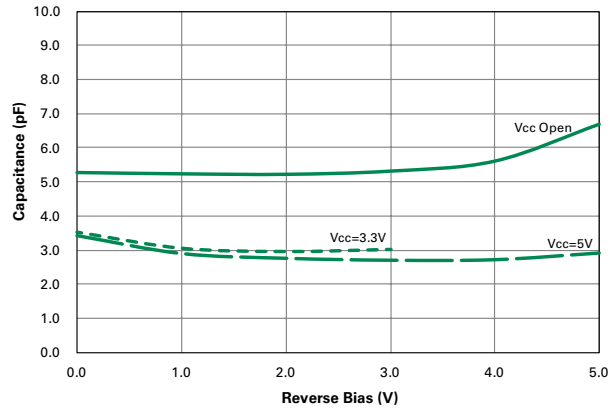
Parameter	Rating	Units
Storage Temperature Range	–55 to 150	°C
Maximum Junction Temperature	150	°C
Maximum Lead Temperature (Soldering 20-40s)	260	°C

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

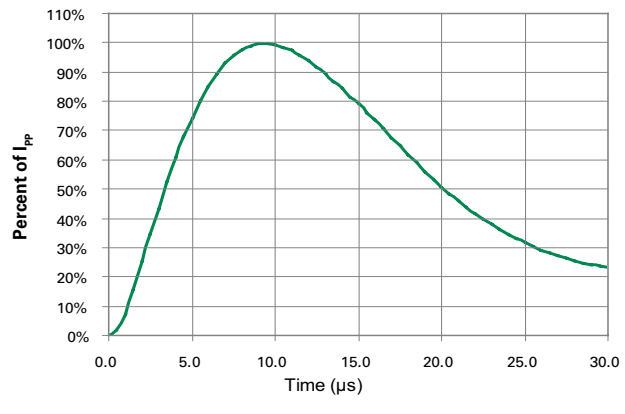
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Stand-Off Voltage	V_{RWM}		-	-	5.0	V
Reverse Leakage Current	I_R	V_R= 5V, I/O to GND	-	-	5.0	μA
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA	6.0	-	-	V
Clamping Voltage, Line-Ground[1]	V_C	I_{PP}= 1A, t_p=8/20 μs	-	-	9.8	V
Clamping Voltage, Line-Ground[1]	V_C	I_{PP}= 10A, t_p=8/20 μs	-	-	12.0	V
Clamping Voltage, Line-Ground[1]	V_C	I_{PP}= 25A, t_p=8/20 μs	-	-	18.0	V
Dynamic Resistance, Line-Ground[1]	R_{DYN}	$(V_{C2}-V_{C1})/(I_{PP2}-I_{PP1})$	-	0.3	-	Ω
ESD Withstand Voltage[1]	V_{ESD}	IEC61000-4-2 (Contact Discharge)	±30	-	-	kV
		IEC61000-4-2 (Air Discharge)	±30			kV
Diode Capacitance[1]	$C_{I/O-I/O}$	Reverse Bias=0V	-	3.0	-	pF
	$C_{I/O-GND}$	Reverse Bias=0V	-	6.0	10.0	pF

Note: 1. Parameter is guaranteed by design and/or device characterization.

Capacitance vs. Reverse Bias



8/20μs Pulse Waveform



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TVS Diode Arrays (SPA® Diodes)

Lightning Surge Protection- SR05 Series

Clamping Voltage vs. I_{PP}

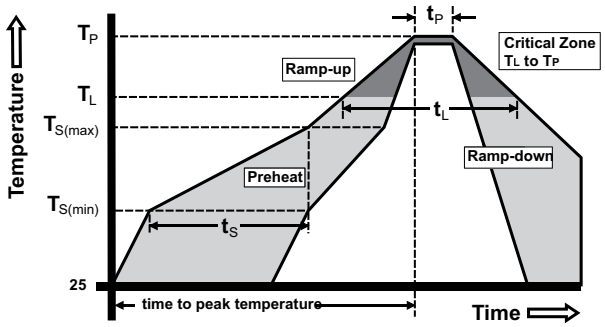
Product Characteristics

Lead Plating	Matte Tin
Lead Material	Copper Alloy
Lead Coplanarity	0.0004 inches (0.102mm)
Substitute Material	Silicon
Body Material	Molded Epoxy
Flammability	UL 94 V-0

Notes :
1. All dimensions are in millimeters
2. Dimensions include solder plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. Blo is facing up for mold and facing down for trim/form, i.e. reverse trim/form.
5. Package surface matte finish VDI 11-13.

Soldering Parameters

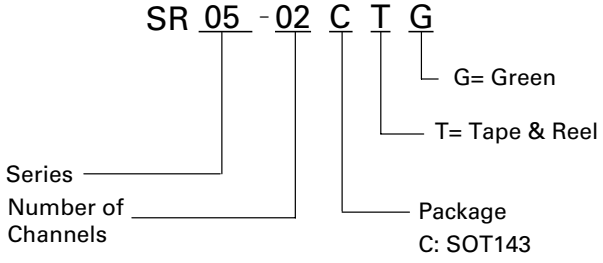
Reflow Condition		Pb – Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	-Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus) Temp (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	-Temperature (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)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C



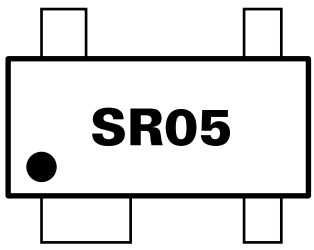
Ordering Information

Part Number	Package	Marking	Min. Order Qty.
SR05-02CTG	SOT143	SR05	3000

Part Numbering System



Part Marking System



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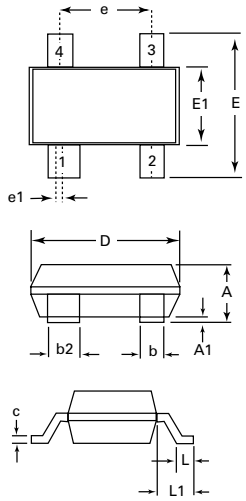
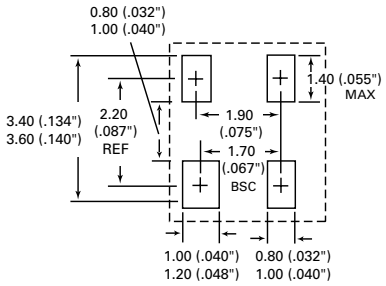
Package Dimensions—SOT143

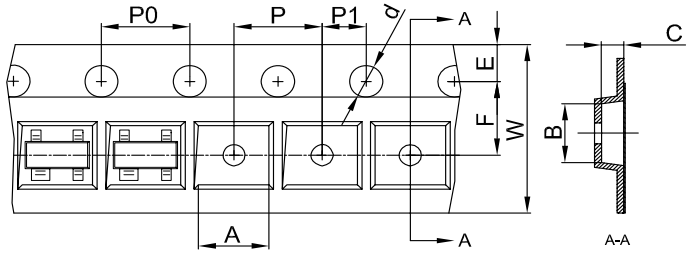


Recommended Pad Layout

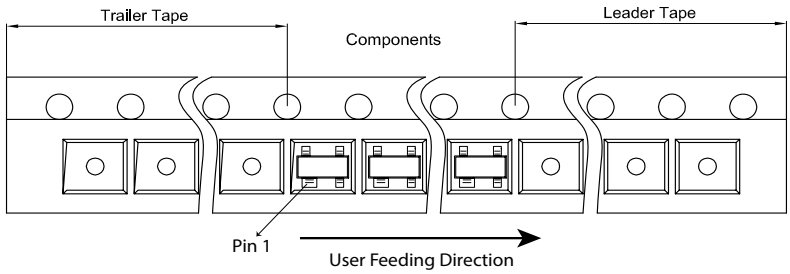


Package	SOT143			
Pins	4			
JEDEC	TO-253			
	Millimeters		Inches	
	Min	Max	Min	Max
A	0.8	1.22	0.03	0.048
A1	0.05	0.15	0.002	0.006
b	0.30	0.50	0.012	0.020
b2	0.76	0.89	0.030	0.035
c	0.08	0.20	0.003	0.008
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.082	0.104
E1	1.20	1.40	0.047	0.055
e	1.92 BSC		0.076 BSC	
e1	0.20 BSC		0.008 BSC	
L	0.4	0.6	0.016	0.024
L1	0.550 REF		0.022 REF	

Embossed Carrier Tape & Reel Specification—SOT143



Symbol	Millimeters
A	3.19±0.10
B	2.8±0.10
C	1.31±0.10
d	ø 1.50±0.10
E	1.75±0.10
F	3.50±0.10
P0	4.00±0.10
P	4.00±0.10
P1	2.00±0.10
W	8.00±0.10



Notes :
1. All dimensions are in millimeters

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