

Description

The ASR05 is a low capacitance TVS diode array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting sensitive semiconductor components from damage. The ASR05 complies with the IEC 61000-4-2 (ESD) with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into a lead-free SOT-143 package. It is designed to protect components which are connected to high speed interfaces and transmission lines from voltage surges.

Features

- 500W peak pulse power (8/20 μs)
- Ultra low leakage: nA level
- Operating voltage: 5V
- Low capacitance for high-speed data line
- Low clamping voltage
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 30\text{kV}$
 - Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-5 (Lightning) 20A (8/20 μs)
- RoHS Compliant

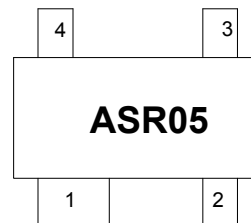
Mechanical Characteristics

- Package: SOT-143
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

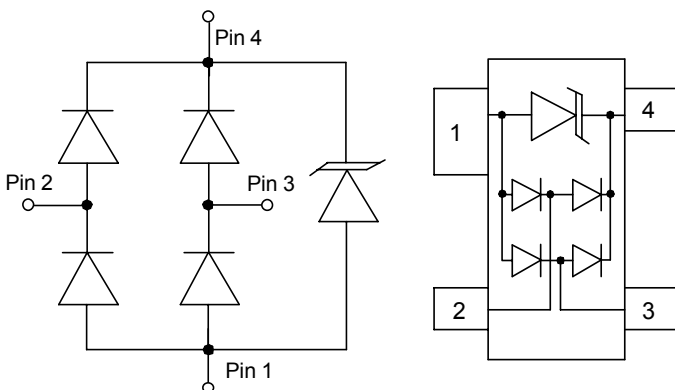
Applications

- Video Line Protection
- Wireless Systems
- Ethernet 10BaseT
- I2C Bus Protection
- Portable Instrumentation
- LAN/WAN equipment
- High-Speed Data Lines
- Multi-Protocol Serial Transceivers
- ISDN S/T Interface

Marking Information



Dimensions and Pin Configuration



Circuit Diagram

Pin Schematic

Ordering Information

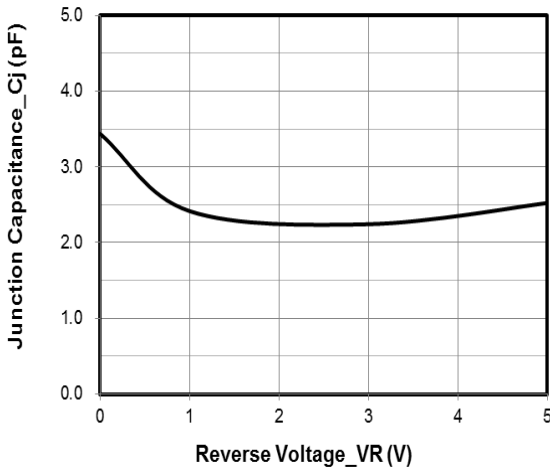
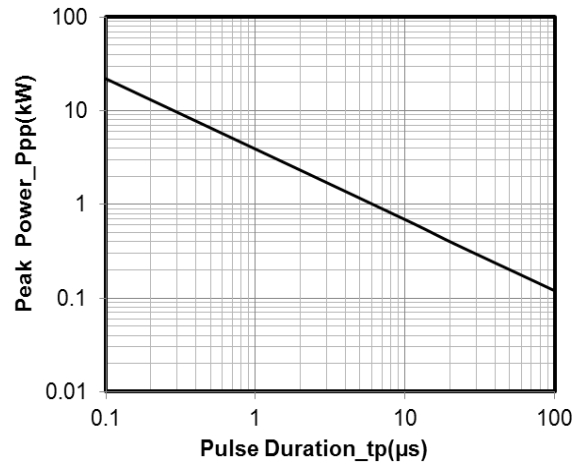
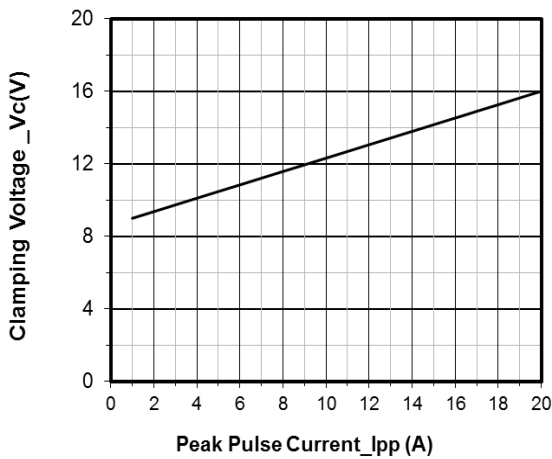
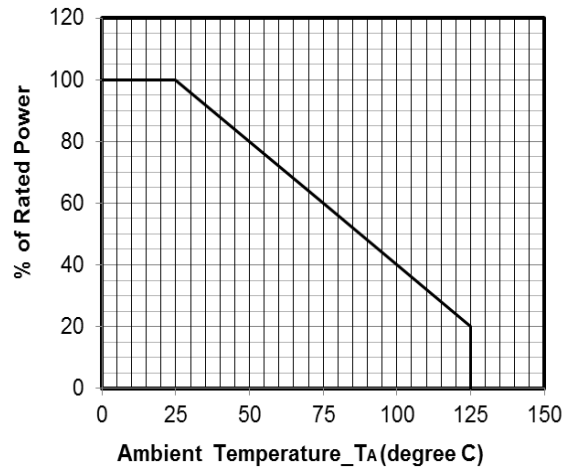
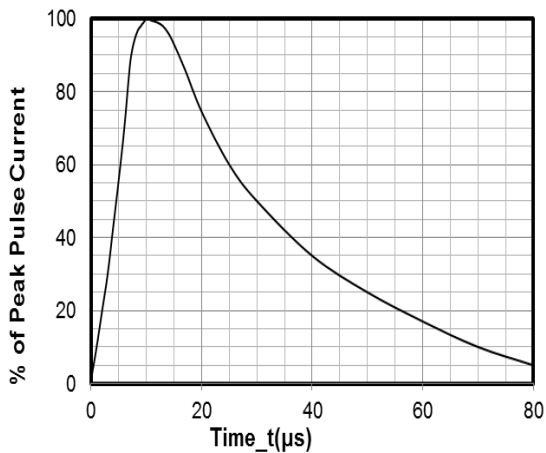
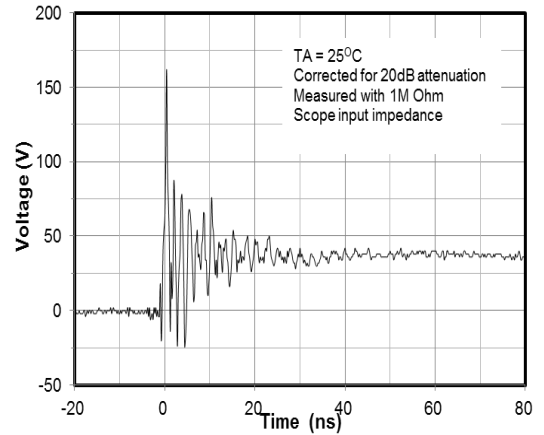
Part Number	Packaging	Reel Size
ASR05	3000/Tape & Reel	7 inch

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

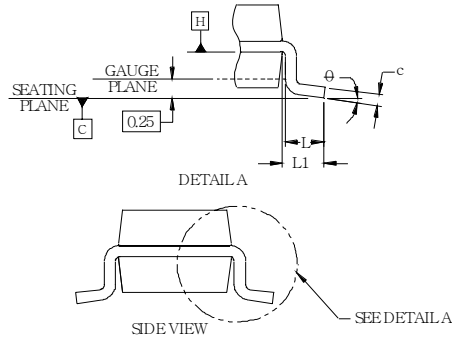
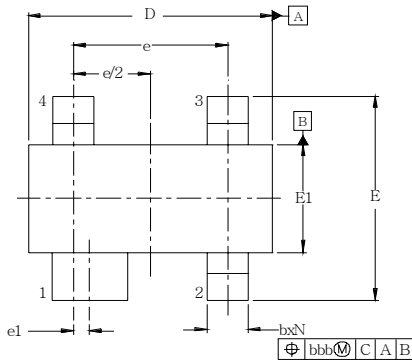
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	Ppk	400	W
Peak Pulse Current (8/20 μs)	I _{PP}	20	A
ESD per IEC 61000-4-2 (Air)	VESD	± 30	kV
ESD per IEC 61000-4-2 (Contact)		± 30	
Operating Temperature Range	T _J	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T _{stg}	-55 to +150	$^{\circ}\text{C}$

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

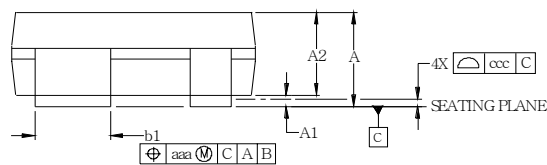
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			5	V	
Breakdown Voltage	V _{BR}	6			V	I _T = 1mA
Reverse Leakage Current	I _R			0.5	μA	V _{RWM} = 5V
Clamping Voltage	V _C			10	V	I _{PP} = 1A (8 x 20 μs pulse)
Clamping Voltage	V _C			20	V	I _{PP} = 20A (8 x 20 μs pulse)
Junction Capacitance	C _J		3	6	pF	V _R = 0V, f = 1MHz, between I/O pins and GND
Junction Capacitance	C _J			3	pF	V _R = 0V, f = 1MHz, between I/O pins

Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise Specified)

Junction Capacitance vs. Reverse Voltage

Peak Pulse Power vs. Pulse Time

Clamping Voltage vs. Peak Pulse Current

Power Derating Curve

8 X 20 μs Pulse Waveform

**ESD Clamping Voltage
8 kV Contact per IEC61000-4-2**

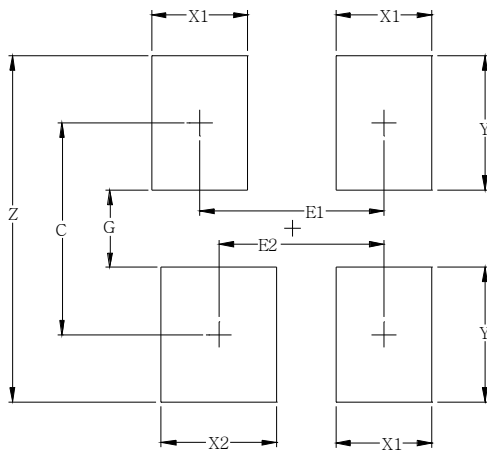
SOT-143 Package Outline Drawing



DIM	INCHES		MILLIMETERS	
	MIN	NOM	MIN	NOM
A	.091	-.048	0.80	1.22
A1	.00	-.006	0.00	0.15
A2	.029	.085	0.76	0.90
b	.011	-.020	0.30	0.51
b1	.029	-.037	0.76	0.94
c	.008	-.008	0.08	0.20
D	.110	.114	2.80	2.90
E	.082	.083	2.10	2.37
E1	.047	.061	1.20	1.40
e	.075		1.92	RSC
e1	.018		0.20	RSC
L	.015	.020	0.40	0.50
L1		(0.2)		(0.54)
N		4		4
theta	0°	-	8°	0°
aaa		.006		0.15
bbb		.008		0.20
ccc		.004		0.10



Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.20	0.087
E1	1.92	0.076
E2	1.72	0.068
G	0.80	0.031
X1	1.00	0.039
X2	1.20	0.047
Y	1.40	0.055
Z	3.60	0.141

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