

Description

The AR0502P1SC is a uni-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The AR0502P1SC has a low capacitance with a typical value at 0.2pF(I/O to I/O), and complies with the IEC 61000-4-2 (ESD) with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. The small size, low capacitance and high ESD surge protection make AR0502P1SC an ideal choice to protect cell phone, digital visual interfaces, HDMI, DVI, USB2.0, USB3.0, and other high speed ports.

Features

- low capacitance: 0.2pF typical (I/O to I/O)
- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- 2-pin leadless package
- 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) 12A (8/20 μs)
- RoHS Compliant

Mechanical Characteristics

- Package: DFN1006-3
- Case Material: “Green” Molding Compound.
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- Cellular Handsets and Accessories
- Display Ports
- MDDI / MHL
- USB 2.0 / USB 3.0
- Digital Visual Interface (DVI)
- PCI Express and Serial SATA Ports

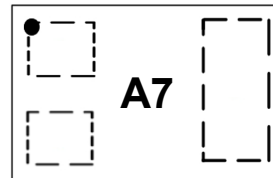
Caution:



This Device is designed for signal line protection only.

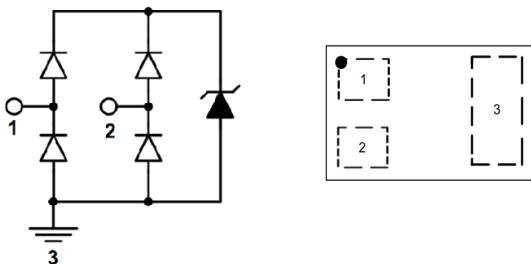
Not intended to be used under bias, not for application with a power line.

Marking Information



A7 = Device Marking Code

Equivalent Circuit and Pin Configuration



Circuit and Pin Schematic

Ordering Information

Part Number	Packaging	Reel Size
AR0502P1SC	10000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	65	W
Peak Pulse Current (8/20μs)	I _{PP}	13	A
ESD per IEC 61000-4-2 (Air)	V _{ESD}	±30	kV
ESD per IEC 61000-4-2 (Contact)		±30	
Operating Temperature Range	T _J	-55 to +125	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C

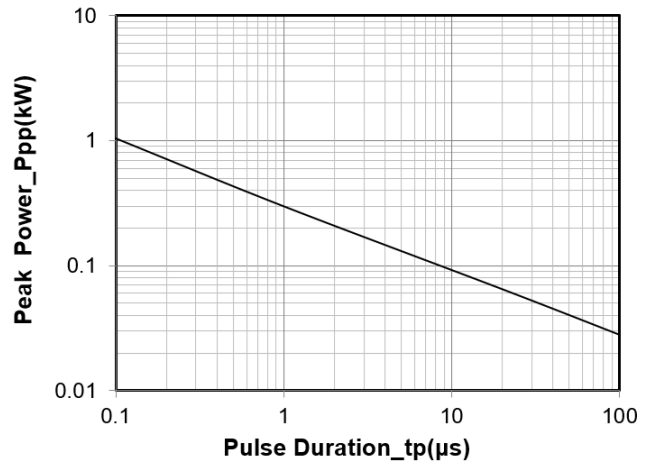
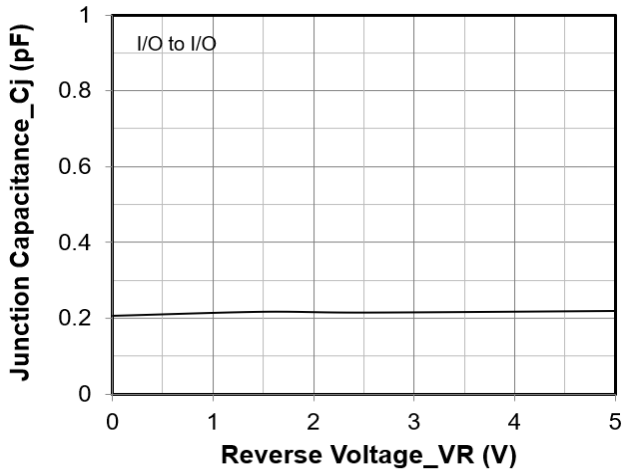
Electrical Characteristics (T_A=25°C unless otherwise specified)

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			0.2	μA	V _{RWM} = 5V
Clamping Voltage	V _C		4.2	5	V	I _{PP} = 13A (8 x 20μs pulse)
ESD Clamping Voltage ⁽¹⁾	V _C		2.1		V	I _{PP} = 4A, tp = 0.2/100ns (TLP)
			3.9		V	I _{PP} = 16A, tp = 0.2/100ns (TLP)
Dynamic Resistance ⁽²⁾	R _{DYN}		0.15		Ohm	tp = 0.2/100ns (TLP)
Junction Capacitance	C _J		0.65	1	pF	V _{pin3} =0V, V _R = 1.5V, f = 1MHz, any I/O pin to ground
Junction Capacitance	C _J		0.2	0.5	pF	V _{pin3} =0V, V _R = 1.5V, f = 1MHz, between I/O pins

(1) Transmission Line Pulse Test (TLP) Settings: tp = 100ns, tr = 0.2ns.

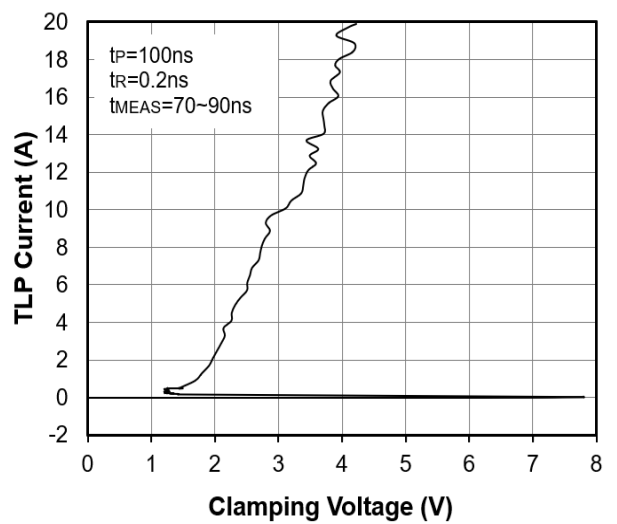
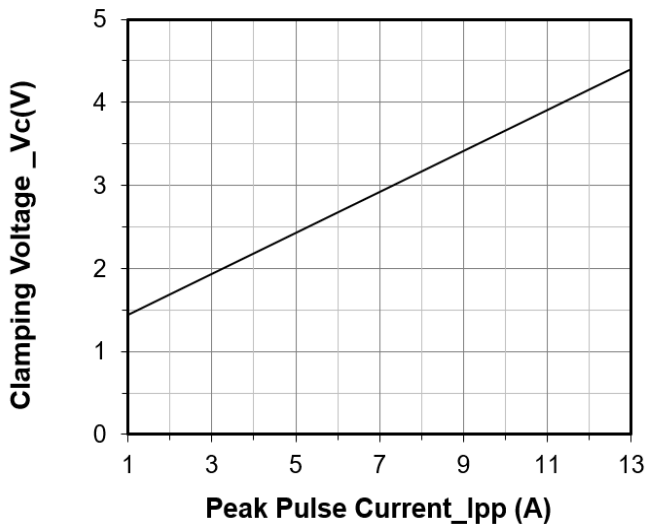
(2) Dynamic resistance calculated from I_{TLP} = 4A to I_{TLP} = 16A.

Typical Performance Characteristics (T_A=25°C unless otherwise Specified)



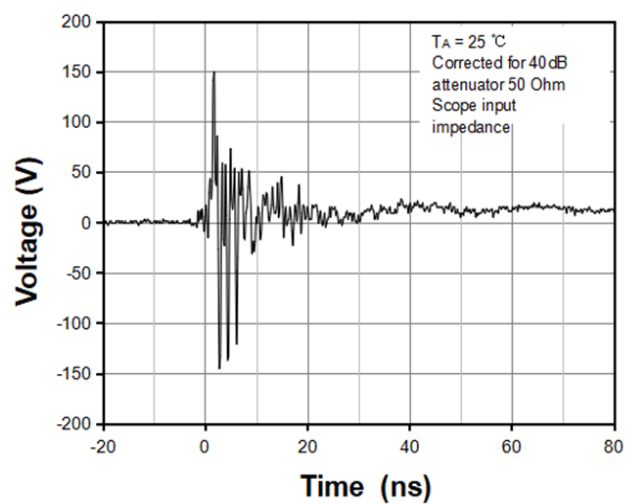
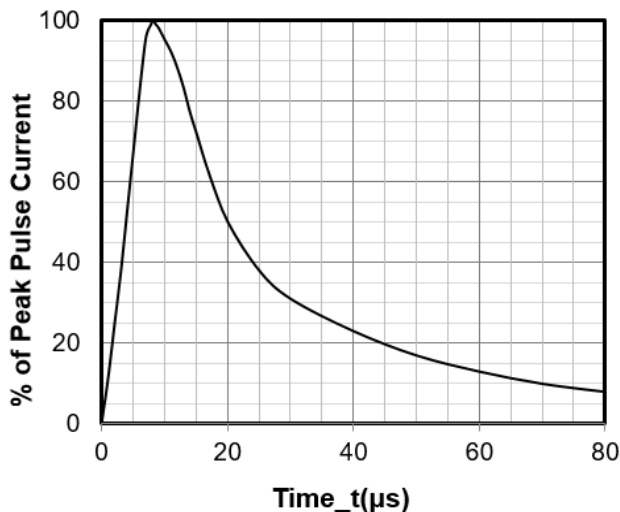
Junction Capacitance vs. Reverse Voltage

Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current (tp = 8/20μs)

TLP Measurement

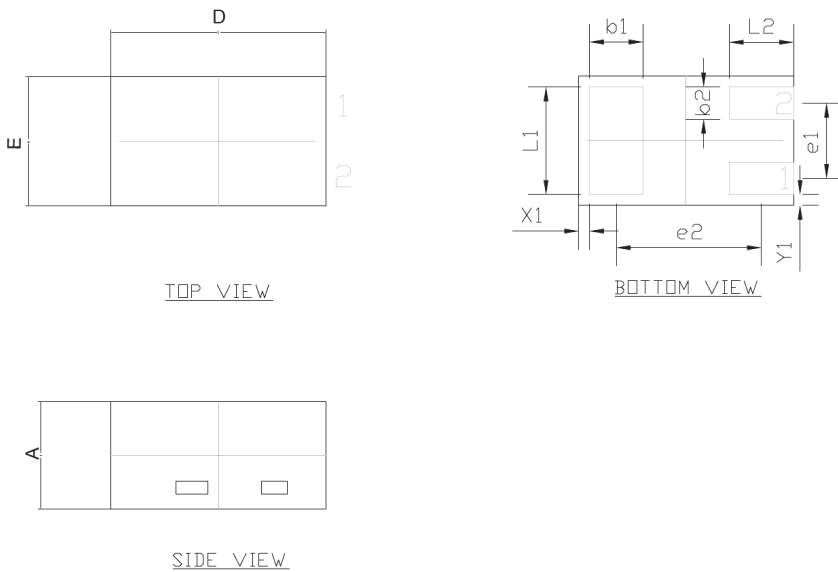


8 X 20μs Pulse Waveform

ESD Clamping Voltage

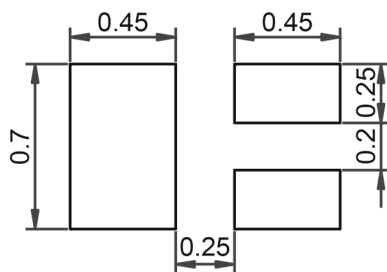
8 kV Contact per IEC61000-4-2

DFN1006-3 Package Outline Drawing



SYM	DIMENSIONS		
	MILLIMETERS		
	MIN	NOM	MAX
A	0.45	0.50	0.55
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b1	0.20	0.25	0.30
b2	0.10	0.15	0.20
L1	0.45	0.50	0.55
L2	0.25	0.30	0.35
e1	0.350 BSC		
e2	0.675 BSC		
X1	0.025	-	0.065
Y1	0.025	-	0.065

Suggested Land Pattern



Unit: mm

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