

### Description

The AR0504S2L is an ultra low capacitance TVS array, 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 AR0504S2L has an ultra-low capacitance with a typical value at 0.5pF, and complies with the IEC 61000-4-2 (ESD) with  $\pm 20\text{kV}$  air and  $\pm 15\text{kV}$  contact discharge. It is assembled into a 6-Pin lead-free SOT23-6 package. The low capacitance array make it ideal for four high speed data and transmission line. This device is optimized for ESD protection of portable electronics.

### Features

- Ultra low capacitance: 0.5pF typical (I/O to GND)
- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- Up to four data lines and one power line protects
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 20\text{kV}$
    - Contact discharge:  $\pm 15\text{kV}$
  - IEC61000-4-5 (Lightning) 3A (8/20 $\mu\text{s}$ )
- RoHS Compliant

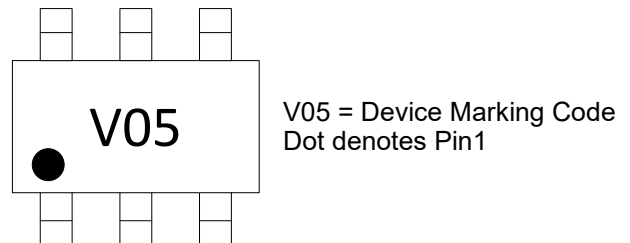
### Mechanical Characteristics

- Package: SOT23-6
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- Terminal Connections: See Diagram Below
- Marking Information: See Below

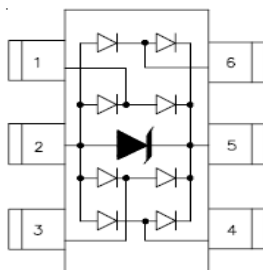
### Applications

- USB 2.0 Power and Data lines protection
- Digital Visual Interface (DVI)
- Monitors and Flat Panel Displays
- Video Graphic Cards
- Notebook and PC Computers

### Marking Information



### Dimensions and Pin Configuration



**SOT-23 6L (Top View)**

Circuit and Pin Schematic

### Ordering Information

Part Number	Packaging	Reel Size
AR0504S2L	3000/Tape & Reel	7 inch

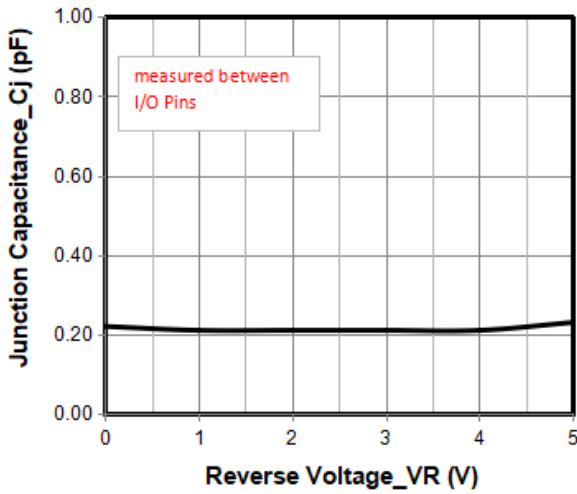
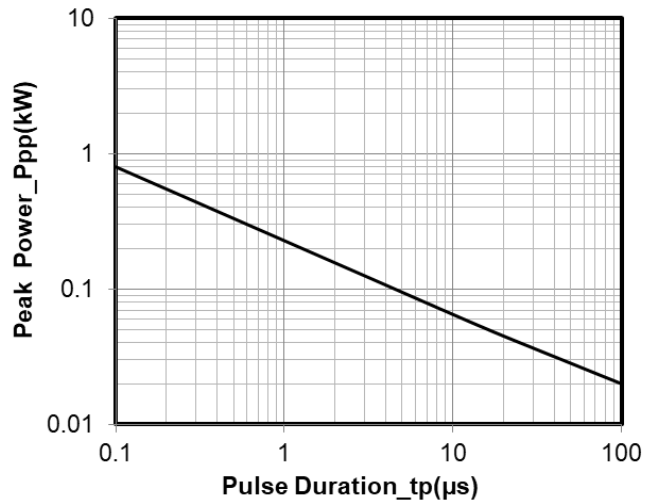
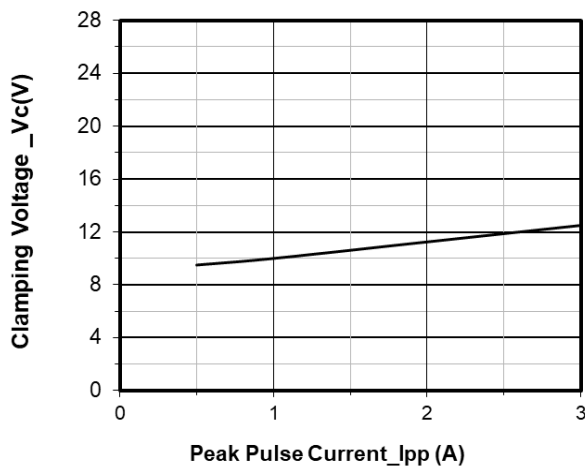
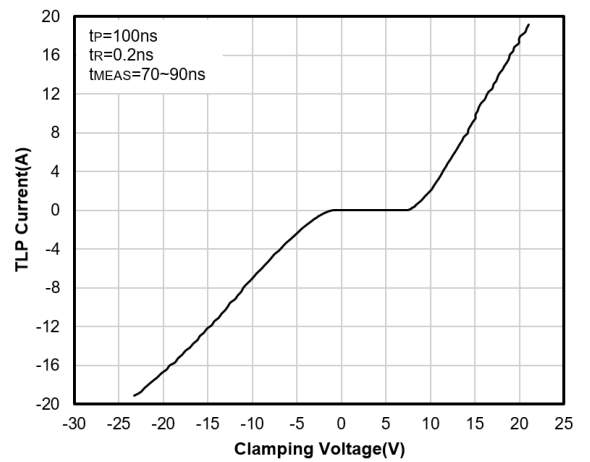
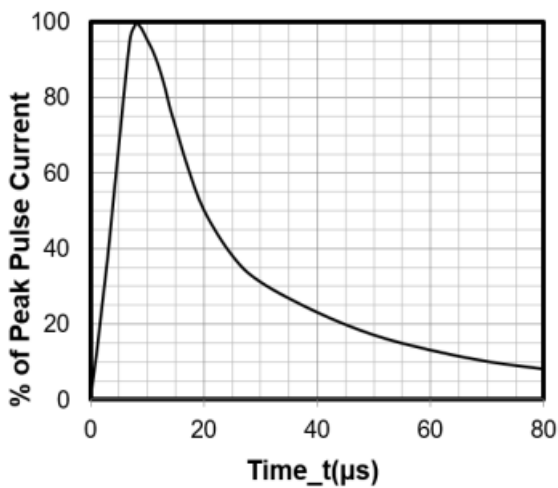
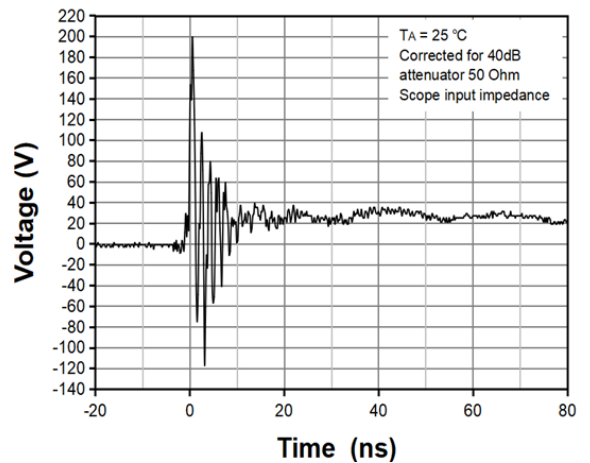
**Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 $\mu\text{s}$ ), VCC pin to ground	Ppk	160	W
Peak Pulse Power (8/20 $\mu\text{s}$ ), any I/O pin to ground	Ppk	45	W
Peak Pulse Current (8/20 $\mu\text{s}$ ), VCC pin to ground	I <sub>PP</sub>	10	A
Peak Pulse Current (8/20 $\mu\text{s}$ ), any I/O pin to ground	I <sub>PP</sub>	3	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V <sub>ESD</sub>	$\pm 20$ $\pm 15$	kV
Operating Temperature Range	T <sub>J</sub>	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	$^{\circ}\text{C}$

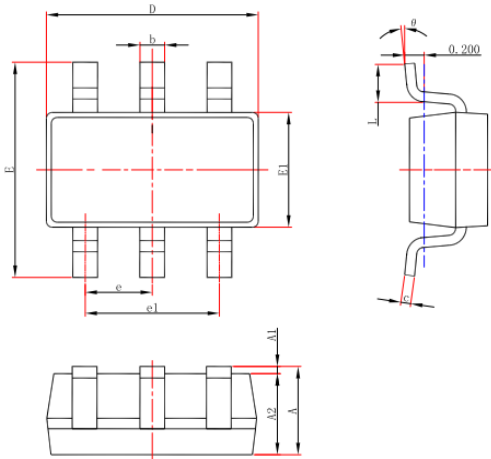
**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V <sub>RWM</sub>			5	V	Any I/O pin to ground
Breakdown Voltage	V <sub>BR</sub>	6			V	I <sub>T</sub> = 1mA, any I/O pin to ground
Reverse Leakage Current	I <sub>R</sub>			0.2	$\mu\text{A}$	V <sub>RWM</sub> = 5V, any I/O pin to ground
Clamping Voltage	V <sub>C</sub>			11	V	I <sub>PP</sub> = 1A (8 x 20 $\mu\text{s}$ pulse), any I/O pin to ground
Clamping Voltage	V <sub>C</sub>			15	V	I <sub>PP</sub> = 3A (8 x 20 $\mu\text{s}$ pulse), any I/O pin to ground
Clamping Voltage	V <sub>C</sub>			16	V	I <sub>PP</sub> = 10A (8 x 20 $\mu\text{s}$ pulse), VCC pin to ground
Junction Capacitance	C <sub>J</sub>		0.25		pF	V <sub>R</sub> = 0V, f = 1MHz, between I/O pins
Junction Capacitance	C <sub>J</sub>		0.5		pF	V <sub>R</sub> = 0V, f = 1MHz, any I/O pin to ground

Note 1: I/O pins are Pin 1, 3, 4 and 6

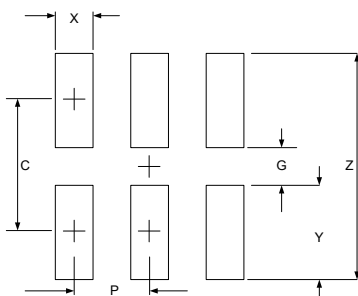
**Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)**

**Junction Capacitance vs. Reverse Voltage**

**Peak Pulse Power vs. Pulse Time**

**Clamping Voltage vs. Peak Pulse Current**

**TLP Curve**

**8 X 20μs Pulse Waveform**

**Note: Data is taken with a 10x attenuator**  
**ESD Clamping Voltage**
**8 kV Contact per IEC61000-4-2**

### SOT23-6 Package Outline Drawing



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

### Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	2.50	0.098
G	1.40	0.055
P	0.95	0.037
X	0.60	0.024
Y	1.10	0.043
Z	3.60	0.141

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