

### DESCRIPTION

The AC199-04S provides a typical line to line capacitance of 0.3pF and low insertion loss up to 3GHz providing greater signal integrity making it ideally suited for USB 2.0 applications, such as Digital TVs, DVD players, Computing, set-top boxes and MDDI applications in mobile computing devices.

This series has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from overvoltage caused by ESD(electrostatic discharge), CDE (Cable Discharge Events),and EFT (electrical fast transients).

### FEATURES

- ✧ Protects four I/O lines and one Vcc line
- ✧ Low capacitance
- ✧ Working voltages : 5V
- ✧ Low leakage current
- ✧ Low capacitance (<1.0pF) for high-speed interfaces
- ✧ No insertion loss to 3.0GHz
- ✧ Response Time is < 1 ns
- ✧ Meets MSL 1 Requirements
- ✧ Solid-state silicon avalanche technology
- ✧ ROHS compliant

### MACHANICAL DATA

- ✧ SOT-23-6L package
- ✧ Flammability Rating: UL 94V-0
- ✧ Terminal: Matte tin plated.
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranteed:260°C/10s
- ✧ Reel size: 7 inch

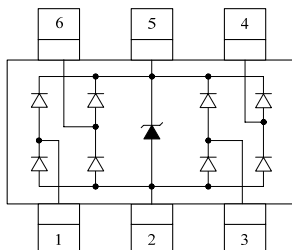
### ORDERING INFORMATION

- ✧ Device:AC199-04S
- ✧ Package: SOT-23-6L
- ✧ Marking: Y B05
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 3,000pcs

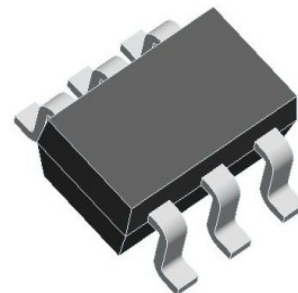
### APPLICATIONS

- ✧ High Definition Multi-Media Interface (HDMI)
- ✧ Digital Visual Interface (DVI)
- ✧ USB 1.1/2.0/3.0/OTG
- ✧ IEEE 1394 Firewire Ports
- ✧ Notebooks & Handhelds
- ✧ Projection TV & Monitors
- ✧ Set-top box
- ✧ Flat Panel Displays
- ✧ PCI Express

### PIN CONFIGURATION



### PACKAGE OUTLINE



**ABSOLUTE MAXIMUM RATING**

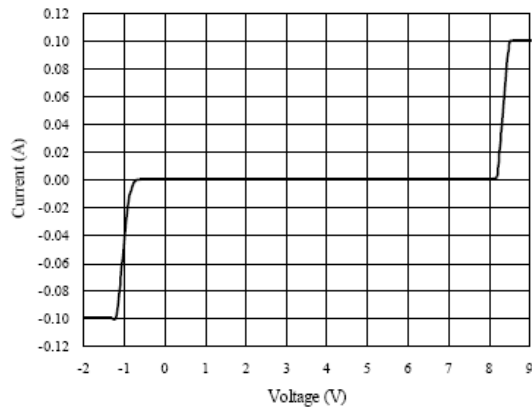
| Symbol    | Parameter                                                      | Value                | Units |
|-----------|----------------------------------------------------------------|----------------------|-------|
| $I_{PP}$  | Peak Pulse Current (8/20 $\mu$ s)                              | 2                    | A     |
| $V_{ESD}$ | ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $\pm 27$<br>$\pm 16$ | kV    |
| $T_{OPT}$ | Operating Temperature                                          | -55/+125             | °C    |
| $T_{STG}$ | Storage Temperature                                            | -55/+150             | °C    |

**ELECTRICAL CHARACTERISTICS ( $T_{amb}=25^{\circ}\text{C}$ )**

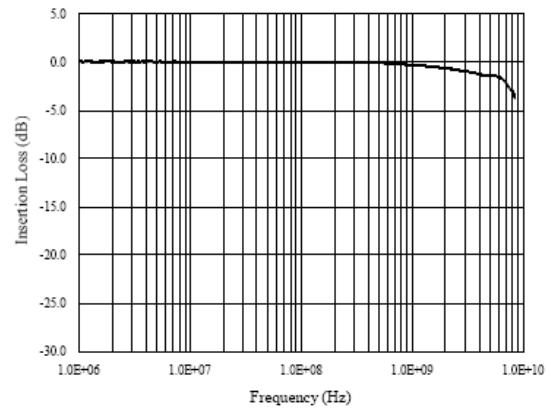
| Symbol    | Parameter                 | Test Condition                                                       | Min | Typ  | Max  | Units         |
|-----------|---------------------------|----------------------------------------------------------------------|-----|------|------|---------------|
| $V_{RWM}$ | Reverse Working Voltage   | Any I/O pin to GND                                                   |     |      | 5.0  | V             |
| $V_{BR}$  | Reverse Breakdown Voltage | $I_T = 1\text{mA}$<br>Any I/O pin to GND                             | 6.0 |      | 10.0 | V             |
| $I_R$     | Reverse Leakage Current   | $V_{RWM} = 5\text{V}$<br>Any I/O pin to GND                          |     |      | 1    | $\mu\text{A}$ |
| $V_C$     | Clamping Voltage          | $I_{PP} = 1\text{A}$ , $t_p = 8/20\mu\text{s}$<br>Any I/O pin to GND |     |      | 12   | V             |
| $C_{J1}$  | Junction Capacitance 1    | $V_R = 0\text{V}$ , $f = 1\text{MHz}$<br>Between I/O pins            |     | 0.30 | 0.40 | pF            |
| $C_{J2}$  | Junction Capacitance 2    | $V_R = 0\text{V}$ , $f = 1\text{MHz}$<br>Any I/O pin to GND          |     | 0.60 | 0.80 | pF            |

## ELECTRICAL CHARACTERISTICS CURVE

**Voltage Sweeping of I/O to GND**

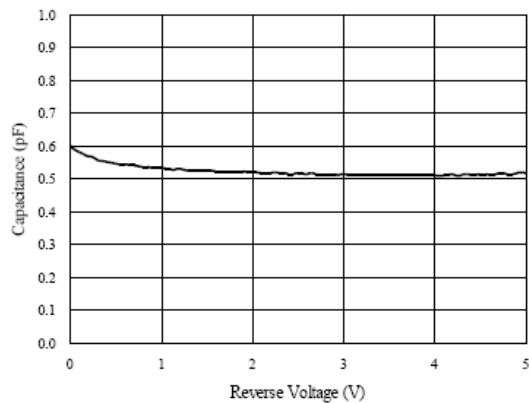


**Insertion Loss S21 of I/O to GND**

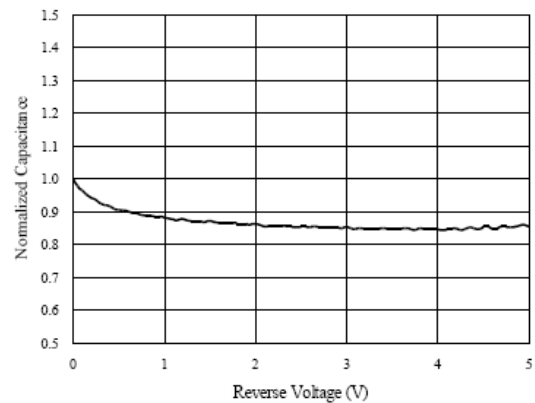


**Capacitance vs. Voltage of I/O to GND (f = 1MHz)**

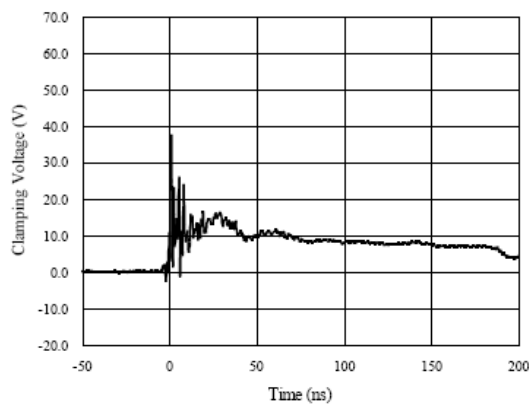
Capacitance vs. Reverse Voltage



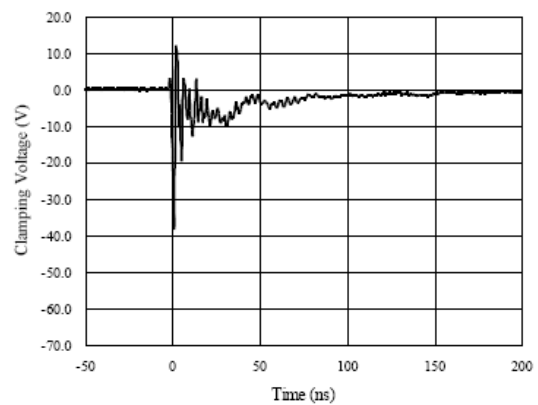
Normalized Capacitance vs. Reverse Voltage



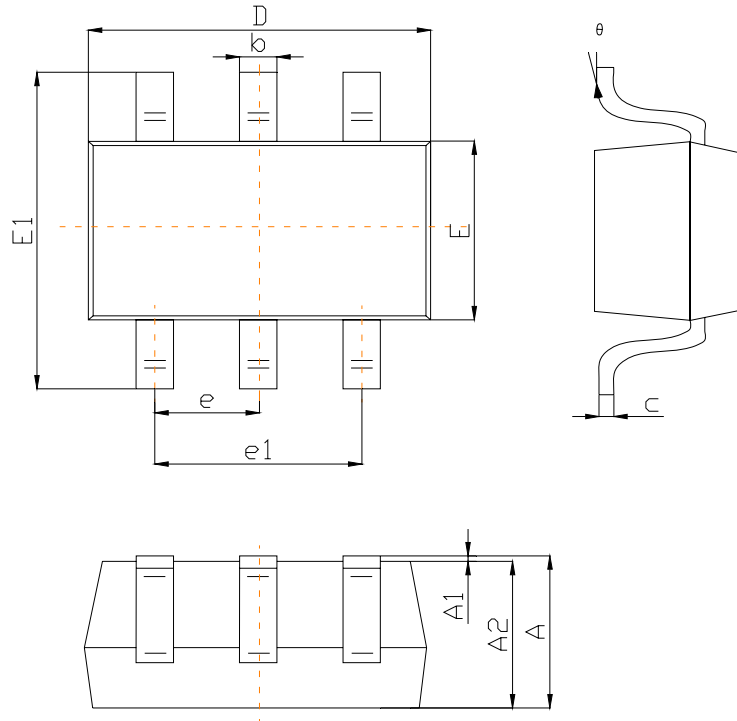
**ESD Clamping of I/O to GND  
(+8kV Contact per IEC 61000-4-2)**



**ESD Clamping of I/O to GND  
(-8kV Contact per IEC 61000-4-2)**



## SOT-23-6L PACKAGE OUTLINE DIMENSIONS



| 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 |                      | 0.004 |
| 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      | 1.500                     | 1.700 | 0.059                | 0.067 |
| E1     | 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 |
|        | 0°                        | 8°    | 0°                   | 8°    |