



ACE00584A

Ultra Low Capacitance 4 -Line ESD Protection Array

Description

The ACE00584A is 4-channel very low capacitance ESD transient voltage suppressor which provides a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge. It is particularly well-suited to protect systems with high speed communication lines from ESD, EFT, and lightning.

The ACE00584A consists of two low capacitance steering diodes and a TVS diode in SOT-23-6 package. Each channel of ACE00584A could safely dissipate ESD strikes of $\pm 15\text{kV}$ air discharge as well as $\pm 8\text{kV}$ contact discharge, meeting the requirement of the IEC 61000-4-2 international standard. Using the MIL-STD-883 (Method 3015) specification for Human Body Model (HBM) ESD, the device provides protection for contact discharges to greater than $\pm 15\text{kV}$.

Features

- Transient protection for data lines to IEC 61000-4-2 (ESD)
 - $\pm 15\text{kV}$ (air)
 - $\pm 8\text{kV}$ (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- Protects five bidirectional I/O lines
- Working voltage: 5V
- Low leakage current
- Low operating and clamping voltages
- Low capacitance: 0.35 pF typical

Applications

- Cellular Handsets and Accessories
- Cordless Phone
- PDA
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- MP3 Player High Definition Multi-Media Interface Protection
- HDMI/USB Power and Data Line
- Monitors and Notebook Computers
- HDSL, IDSL Secondary IC Side Protection
- 10/100/1000 Ethernet



ACE00584A

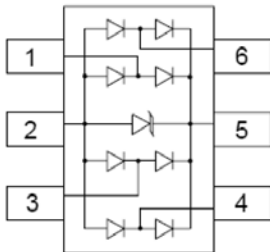
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Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Peak Pulse Power ($t_p = 8/20 \mu s$)	P _{pk}	100	W
Maximum Peak Pulse Current ($t_p = 8/20 \mu s$)	I _{pp}	4	A
ESD per IEC 61000 – 4 – 2 (Air)	V _{pp}	±15	KV
ESD per IEC 61000 – 4 – 2 (Contact)	V _{pp}	±8	KV
Operating Junction Temperature	T _J	-55 ~ 125	°C
Storage Temperature Range	T _{STG}	-55 ~ 150	°C
Lead Soldering Temperature	T _L	260 (10sec)	°C

Packaging Type

SOT-23-6



Ordering information

ACE00584A XX + H

- Halogen - free
- Pb - free
- GM: SOT-23-6



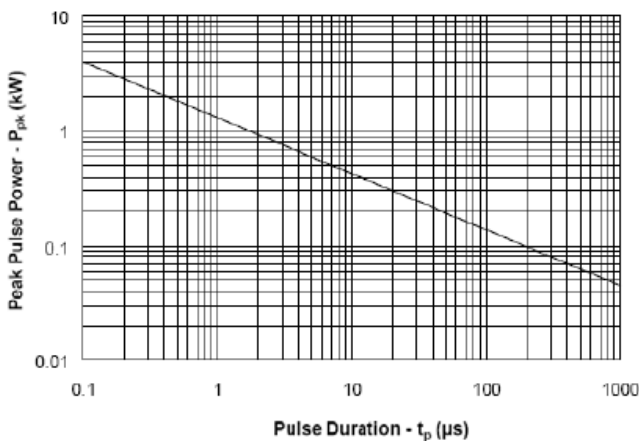
Electrical Characteristics

$T_A=25^{\circ}\text{C}$, unless otherwise specified.

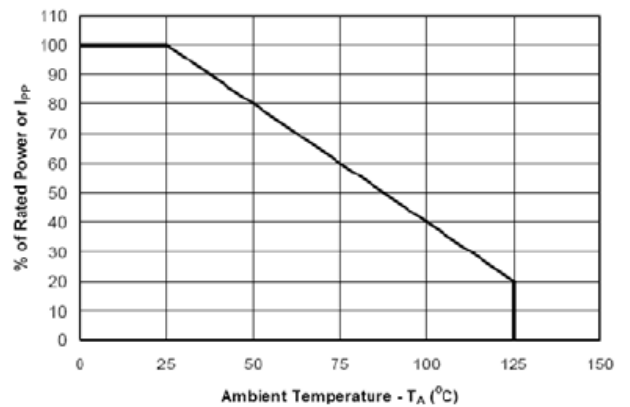
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Reverse Stand – Off Voltage	V_{RWM}				5	V
Forward Voltage @ I_F	V_F	$I_F = 10\text{mA}$			1.15	V
Reverse Breakdown Voltage	V_{BR}	$I_t = 1\text{mA}$	6.0	7.0		V
Reverse Leakage Current	I_R	$V_{RWM} = 5\text{V}, T=25^{\circ}\text{C}$			1	μA
Clamping Voltage	V_C	$I_{pp} = 1\text{A}, t_p = 8/20 \mu\text{s}$			15	V
Junction Capacitance	C_j	$V_R = 0\text{V}, f = 1\text{MHz}$ Any I/O pin to Ground			0.8	pF
		$V_R = 0\text{V}, f = 1\text{MHz}$ Between I/O pins			0.35	

Typical Performance Characteristics

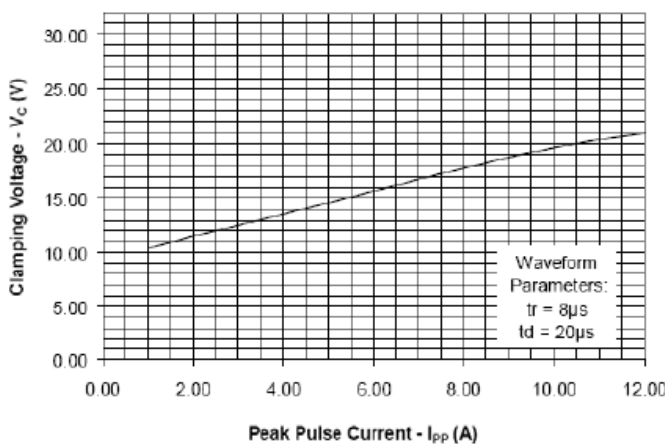
Non-Repetitive Peak Pulse Power vs. Pulse Time



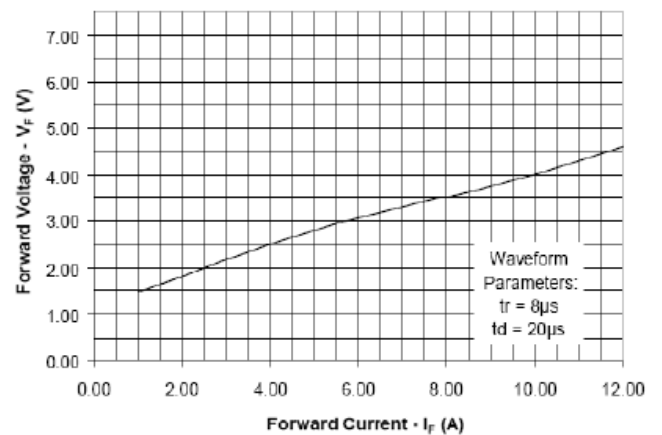
Power Derating Curve



Clamping Voltage vs. Peak Pulse Current



Forward Voltage vs. Forward Current





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Application Note

ACE00584A Device Connection for Protection of Four Data Lines

This device is designed to protect data lines by clamping them to fixed reference. When the voltage on the protected line exceeds the reference voltage the steering diodes are forward biased, conducting the transient current away from the sensitive circuitry. Data lines are connected at pins 1, 3, 4 and 6. Pin 2 should be connected directly to a ground plane.

The path length is kept as short as possible to minimize parasitic inductance. The positive reference is connected at pin 5. The options for connecting the positive reference are as follows:

1. To protect data lines and the power line, connect pin 5 directly to the positive supply rail (VCC). In this configuration the data lines are referenced to the supply voltage. The internal TVS diode prevents over-voltage on the supply rail.
2. In applications where the supply rail does not exit the system, the internal TVS may be used as the reference. In the case, pin 5 is not connected. The steering diodes will begin to conduct when the voltage on the protected line exceeds the working of the TVS (plus one diode drop).
3. In applications where complete supply isolation is desired, the internal TVS is again used as the reference and VCC is connected to one of the I/O inputs. An example of this configuration is the protection of a SIM port. The Clock, Reset, I/O and VCC lines are connected at pins 1, 3, 4 and 6. Pin 2 is connected to ground and pin 5 is not connected.

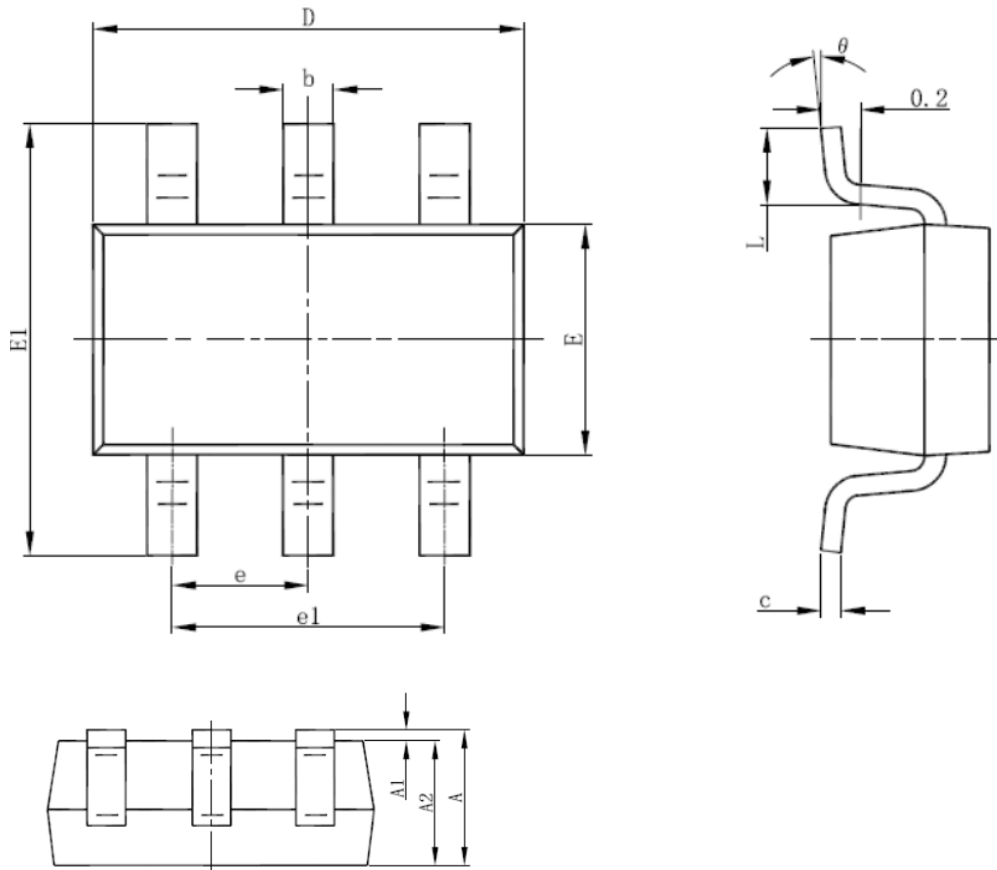


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Packing Information

SOT-23-6



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	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
θ	0°	8°	0°	8°



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Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.