

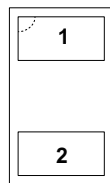
AQ1005 Series 30pF 30kV Bidirectional Discrete TVS     



Description

The includes back-to-back Zener diodes fabricated in a proprietary silicon avalanche technology to provide protection for electronic equipment that may experience destructive electrostatic discharges (ESD). These robust diodes can safely absorb repetitive ESD strikes above the maximum level specified in the IEC 61000-4-2 international standard (Level 4, ±8kV contact discharge) without performance degradation. The back-to-back configuration provides symmetrical ESD protection for data lines when AC signals are present.

Pinout



Features

- ESD, IEC 61000-4-2, ±30kV contact, ±30kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, IEC 61000-4-5 2nd edition, 10A (t_p=8/20µs)
- Low capacitance of 30pF (@ V_R=0V)
- Low leakage current of 0.1µA at 5V
- Space efficient 0402 footprint
- Backcoating used for flipchip package
- AEC-Q101 qualified

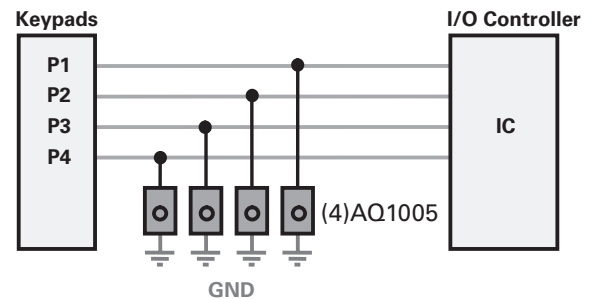
Applications

- Mobile Phones
- Smart Phones
- Camcorders
- Portable Medical
- Digital Cameras
- MP3/PMP
- Portable Navigation Devices
- Tablets
- Point of Sale Terminals

Functional Block Diagram



Application Example



Life Support Note:

Not Intended for Use in Life Support or Life Saving Applications

The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current ($t_p=8/20\mu s$)	10.0 ¹	A
		8.0 ²	
T_{OP}	Operating Temperature	-40 to 125	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

Notes:

1. "1" indicates SP1005-01WTG, while "2" indicates SP1005-01ETG

2. CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Thermal Information

Parameter	Rating	Units
Storage Temperature Range	-55 to 150	°C
Maximum Junction Temperature	150	°C
Maximum Lead Temperature (Soldering 20-40s)	260	°C

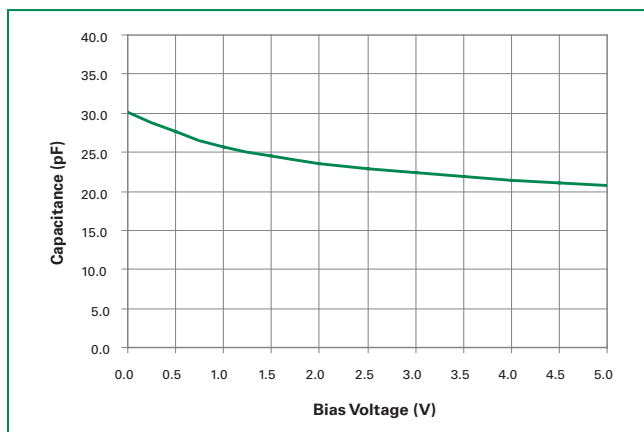
Electrical Characteristics ($T_{OP}=25^\circ C$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}				6.0	V
Breakdown Voltage	V_{BR}	$I_R=1mA$		8.5	9.5	V
Leakage Current	I_{LEAK}	$V_R=3.3V$ with 1 pin at GND			10	nA
Clamp Voltage ¹	V_C	$I_{PP}=1A, t_p=8/20\mu s, Fwd$		9.3		V
		$I_{PP}=2A, t_p=8/20\mu s, Fwd$		10.0		V
		$I_{PP}=10A, t_p=8/20\mu s, Fwd$		15.6		V
Dynamic Resistance	R_{DYN}	$(V_{C2} - V_{C1}) / (I_{PP2} - I_{PP1})$		0.7		Ω
ESD Withstand Voltage ¹	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	± 30			kV
		IEC 61000-4-2 (Air Discharge)	± 30			kV
Diode Capacitance ¹	C_D	Reverse Bias=0V		30		pF
		Reverse Bias=2.5V		23		pF

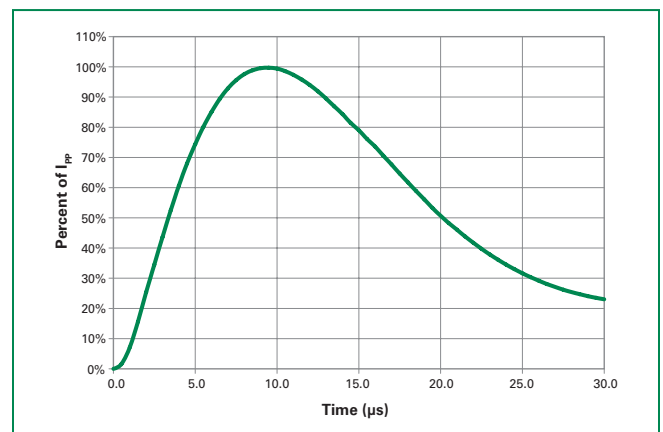
Note:

1. Parameter is guaranteed by design and/or device characterization.

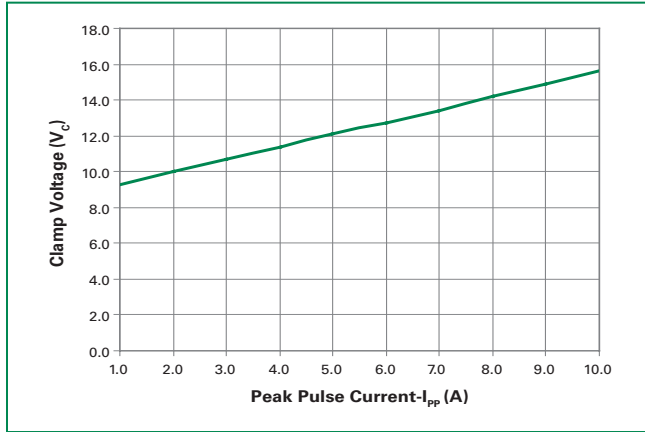
Capacitance vs. Reverse Bias



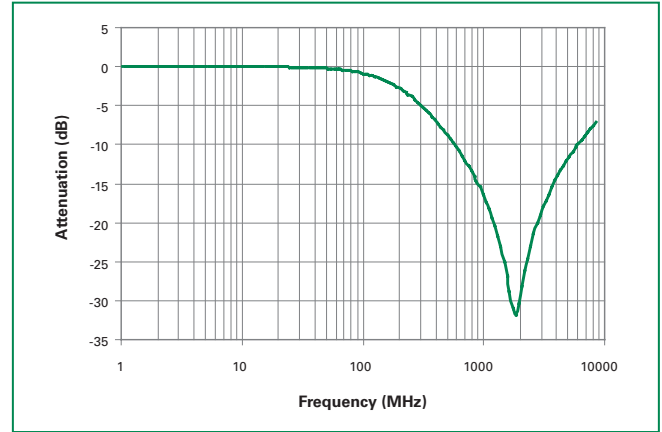
8/20 μ S Pulse Waveform



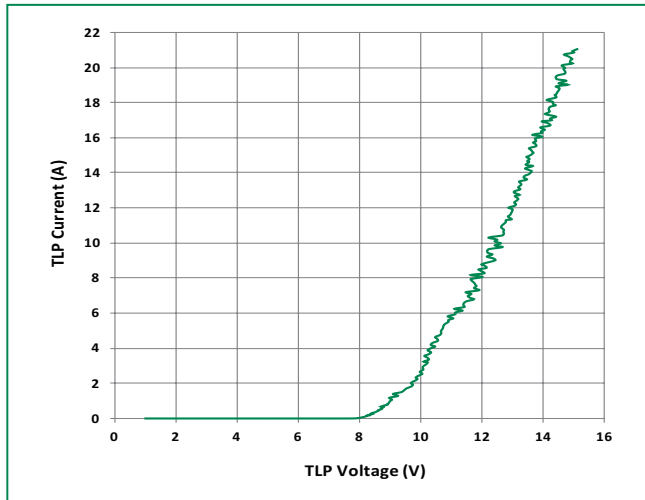
Clamping Voltage vs. I_{PP}



Insertion Loss (S21) I/O to GND



Transmission Line Pulsing (TLP) Plot



Soldering Parameters

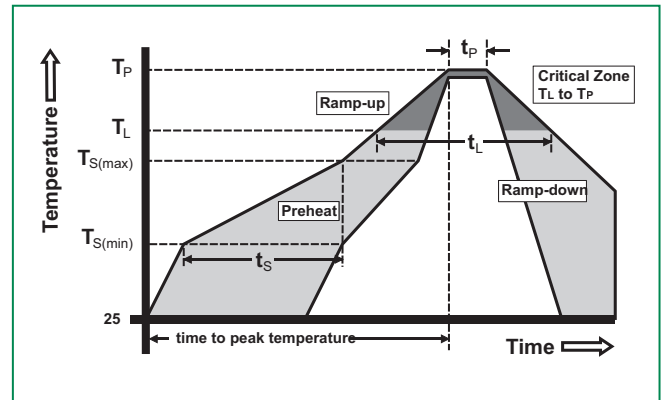
Reflow Condition	Pb – Free assembly	
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus) Temp (T_L) to peak	3°C/second max	
$T_{s(max)}$ to T_L - Ramp-up Rate	3°C/second max	
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_p)	260 ^{+0/-5} °C	
Time within 5°C of actual peak Temperature (t_p)	20 – 40 seconds	
Ramp-down Rate	6°C/second max	
Time 25°C to peak Temperature (T_p)	8 minutes Max.	
Do not exceed	260°C	

Product Characteristics

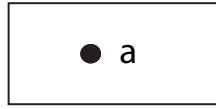
Lead Plating	Pre-Plated Frame
Lead Material	Copper Alloy
Lead Coplanarity	0.004 inches(0.102mm)
Substrate material	Silicon
Body Material	Molded Epoxy
Flammability	UL 94 V-0

Notes :

- All dimensions are in millimeters.
- Dimensions include solder plating.
- Dimensions are exclusive of mold flash & metal burr.
- Blo is facing up for mold and facing down for trim/form, i.e. reverse trim/form.
- Package surface matte finish VDI 11-13.



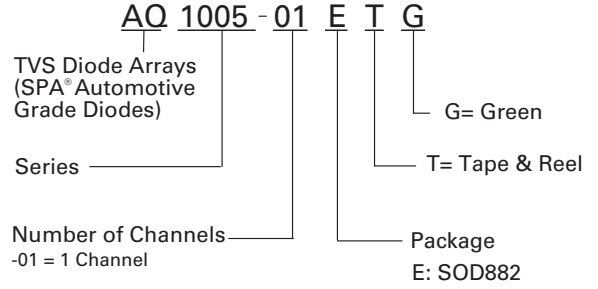
Part Marking System



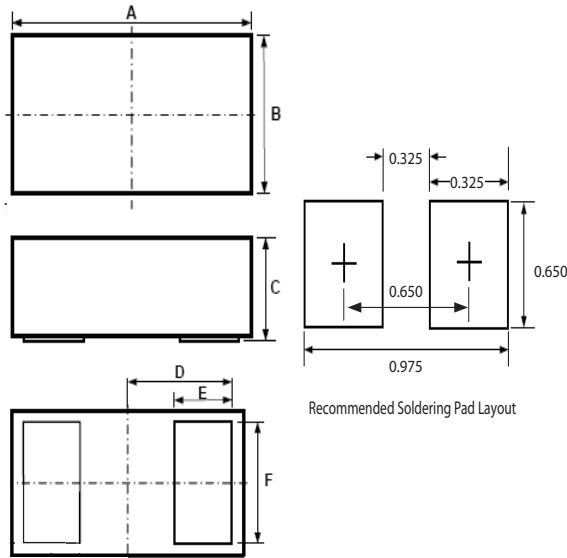
Ordering Information

Part Number	Package	Marking	Min. Order Qty.
AQ1005-01ETG	SOD882	•a	10000

Part Numbering System

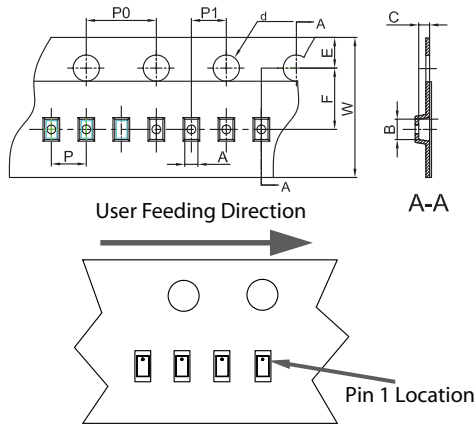


Package Dimensions — SOD882



Symbol	Package	SOD882			
	JEDEC	MO-236			
		Millimeters		Inches	
		Min	Max	Min	Max
A		0.95	1.05	0.037	0.041
B		0.55	0.65	0.022	0.026
C		0.40	0.50	0.016	0.020
D		0.45		0.018	
E		0.20	0.30	0.008	0.012
F		0.45	0.55	0.018	0.022

Embossed Carrier Tape & Reel Specification — SOD882



Symbol	Millimetres		Inches	
	Min	Max	Min	Max
A	0.65	0.70	0.026	0.028
B	1.10	1.20	0.043	0.047
C	0.50	0.60	0.020	0.024
dØ	1.40	1.60	0.055	0.063
E	1.65	1.85	0.065	0.073
F	3.40	3.60	0.134	0.142
P0	3.90	4.10	0.154	0.161
P	1.90	2.10	0.075	0.083
P1	1.90	2.10	0.075	0.083
W	7.90	8.10	0.311	0.319