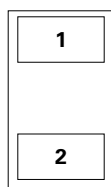


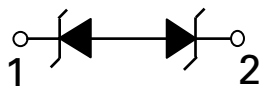
AQ1005 Series 30pF 30kV Bidirectional Discrete TVS



Pinout



Functional Block Diagram



Description

The AQ1005 TVS includes back-to-back Avalanche breakdown 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 IEC 61000-4-2 international standard (Level 4, ± 8 kV contact discharge and ± 15 kV air discharge) without performance degradation. The back-to-back configuration provides symmetrical ESD protection for data lines when AC signals are present.

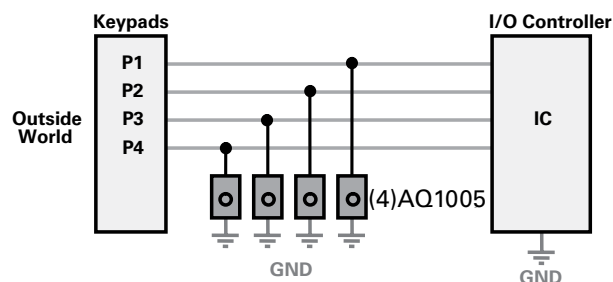
Features

- ESD, IEC 61000-4-2, ± 30 kV contact, ± 30 kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, IEC 61000-4-5 2nd edition, 8A ($t_p=8/20\mu s$)
- Low capacitance of 30pF (@ $V_R=0V$)
- Low leakage current of 0.1 μA at 5V
- SOD882 footprint compatible to 0402 footprint
- AEC-Q101 qualified
- Halogen free, Lead free and RoHS compliant
- PPAP capable

Applications

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

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 ($t_p=8/20\mu s$)	8.0	A
T_{OP}	Operating Temperature	-40 to 150	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

Notes:

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

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

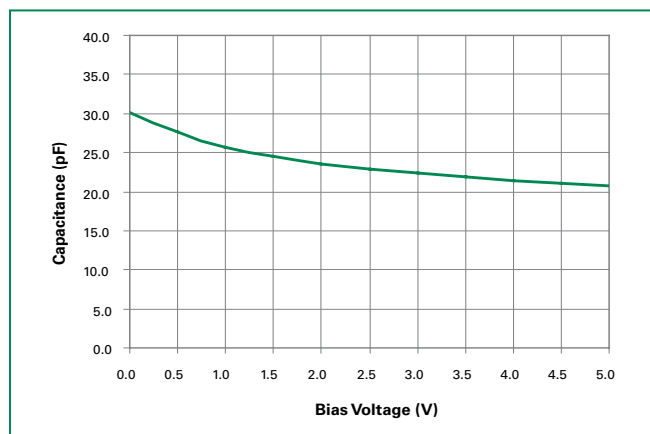
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}	$I_R \leq 1\mu A$			6.0	V
Breakdown Voltage	V_{BR}	$I_R = 1mA$		8.5	9.5	V
Leakage Current	I_{LEAK}	$V_R = 5V$ with 1 pin at GND		0.1	0.5	μA
Clamp Voltage ¹	V_C	$I_{PP} = 1A$, $t_p = 8/20\mu s$, Fwd		9.3		V
		$I_{PP} = 2A$, $t_p = 8/20\mu s$, Fwd		10.0		V
Dynamic Resistance ²	R_{DYN}	TLP, $t_p = 100ns$		0.25		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:

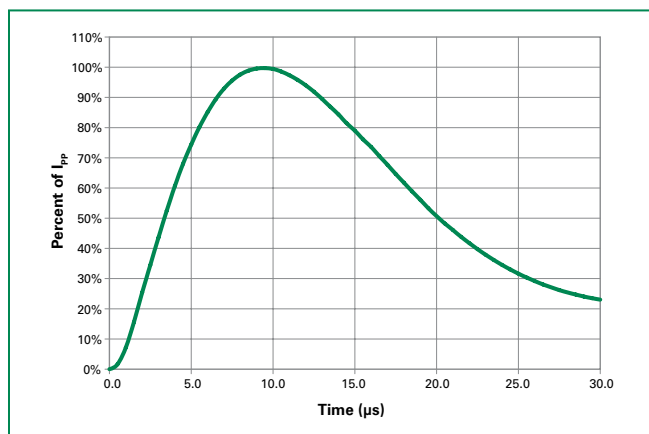
1. Parameter is guaranteed by design and/or component characterization.

2. Transmission Line Pulse (TLP) with 100ns width, 2ns rise time, and average window $t_1=70ns$ to $t_2=90ns$

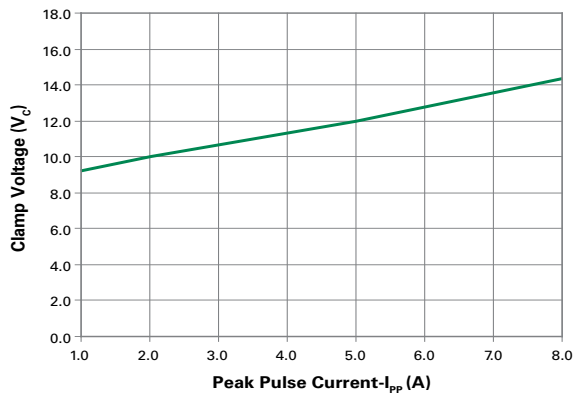
Capacitance vs. Reverse Bias



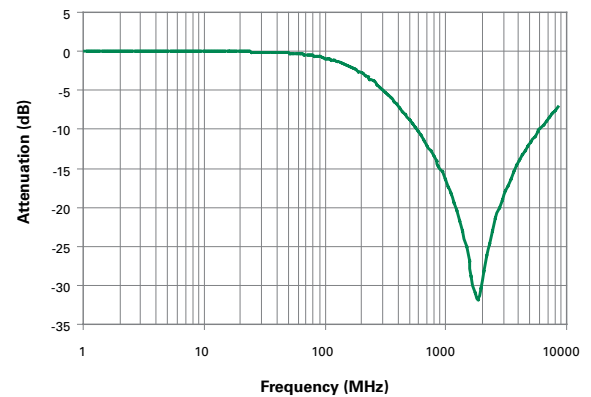
8/20 μs Pulse Waveform



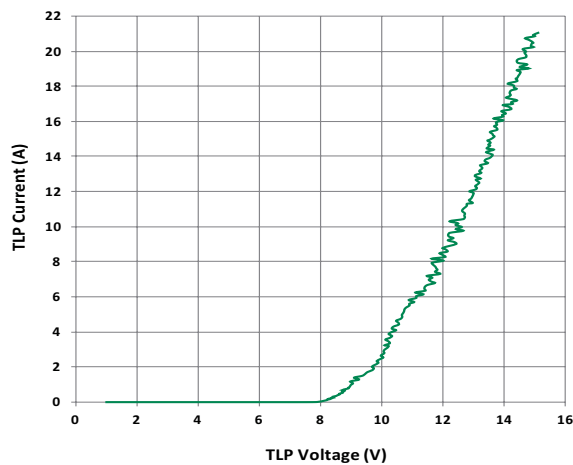
Clamping Voltage vs. I_{PP}



Insertion Loss (S21) I/O to GND



Transmission Line Pulsing (TLP) Plot



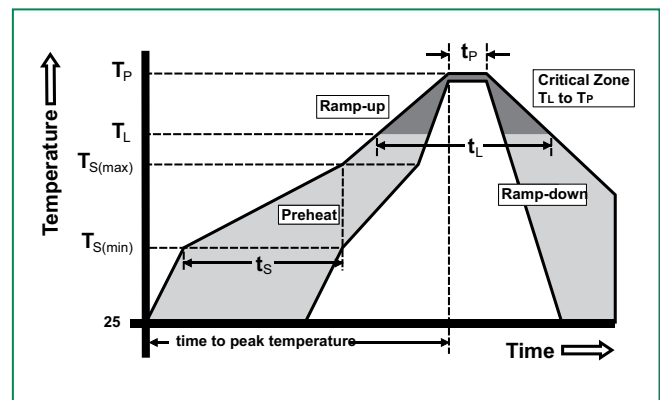
Soldering Parameters

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

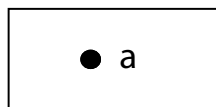
Product Characteristics

Lead Plating	Pre-Plated Frame
Lead Material	Copper Alloy
Substrate material	Silicon
Body Material	Molded Compound
Flammability	UL Recognized compound meeting flammability rating V-0.

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



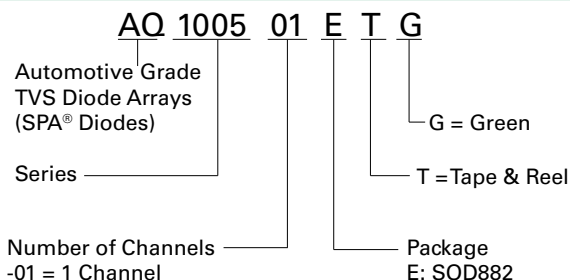
Part Marking System



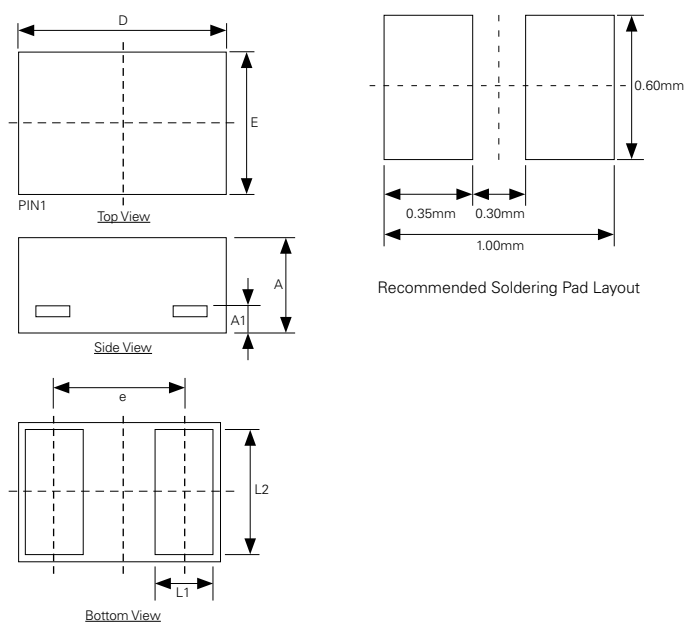
Ordering Information

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

Part Numbering System

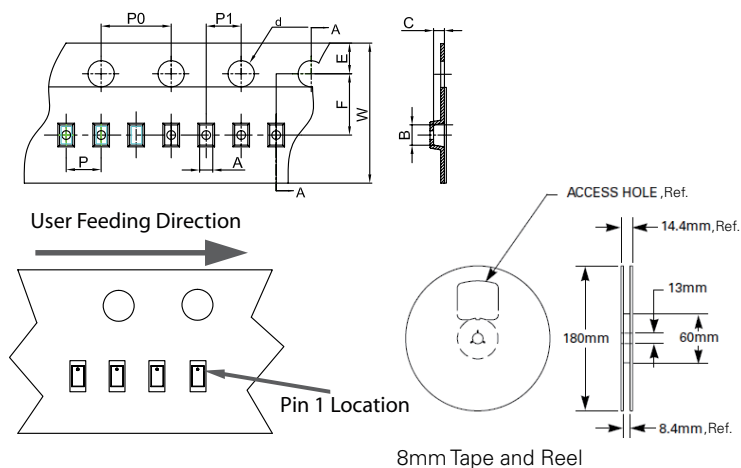


Package Dimensions — SOD882



Symbol	DIMENSIONS (mm)		
	Min.	Nor.	Max.
A	0.36	0.39	0.42
A1	0.127 REF		
L1	0.20	0.25	0.30
L2	0.45	0.50	0.55
D	0.93	1.00	1.07
E	0.53	0.60	0.67
e	0.65 BSC		

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

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