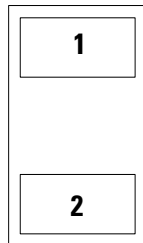


AQ1003-01ETG Series - 30pF 30kV Unidirectional TVS

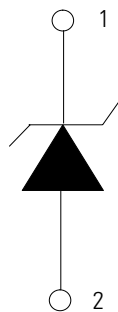
AUTOMOTIVE GRADE **HF** **RoHS** **PD** **GREEN**



Pinout



Functional Block Diagram



Description

This TVS diode is fabricated in a proprietary silicon avalanche technology that offers each I/O pin a high level of protection for electronic equipment that may experience destructive electrostatic discharges (ESD). These robust TVS diodes can safely absorb repetitive ESD strikes at $\pm 30\text{kV}$ (contact discharge, IEC 61000-4-2) without performance degradation. Additionally, the TVS diode can safely dissipate 7A of 8/20 μs surge current (IEC 61000-4-5 2nd Edition) with very low clamping voltages.

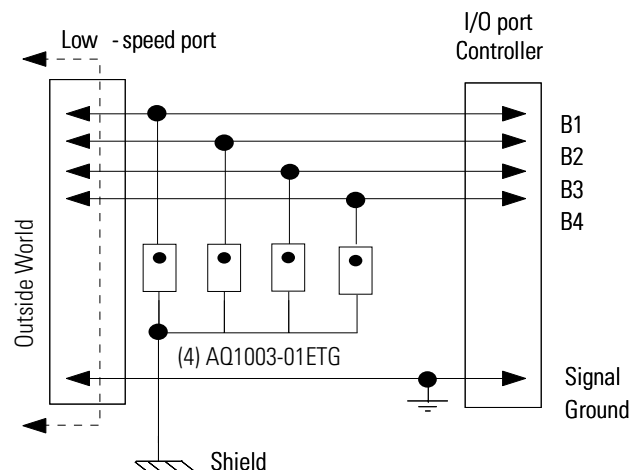
Features

- ESD, IEC 61000-4-2, $\pm 30\text{kV}$ contact, $\pm 30\text{kV}$ air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, 7A (8/20 μs as defined in IEC 61000-4-5 2nd edition)
- Low leakage current of 100nA (MAX) at 5V
- PPAP Capable
- Small SOD882 (JEDEC MO-236) package saves board space
- Fits solder footprint of industry standard 0402 (1005) components
- AEC-Q101 qualified
- Halogen free, Lead free and RoHS compliant
- Moisture Sensitivity Level (MSL -1)
- ESD, ISO 10605, 330pF 330 Ω , $\pm 29\text{kV}$ contact, $\pm 30\text{kV}$ air

Applications

- Mobile phones
- Smart phones
- PDAs
- Portable navigation components
- Digital cameras
- Portable medical components
- 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 Pulse Current ($t_p=8/20\mu s$)	7.0	A
T_{OP}	Operating Temperature	-40 to 150	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

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.

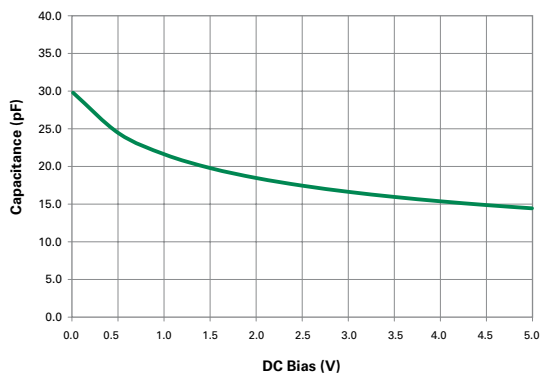
Electrical Characteristics ($T_{OP}=25^{\circ}C$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Forward Voltage Drop	V_F	$I_F = 10mA$		0.8	1.2	V
Breakdown Voltage	V_{BR}	$I_R = 1mA$	6.0	7.8	8.5	V
Reverse Standoff Voltage	V_{RWM}	$I_R = 1\mu A$			5.0	V
Reverse Leakage Current	I_{LEAK}	$V_R = 5V$			100	nA
Clamp Voltage ¹	V_C	$I_{PP} = 6A$ $t_p = 8/20\mu s$		11.4		V
		$I_{PP} = 7A$ $t_p = 8/20\mu s$		12.0		V
Dynamic Resistance ²	R_{DYN}	TLP, $t_p = 100ns$, I/O to GND		0.25		Ω
ESD Voltage ¹	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	± 30			kV
		IEC 61000-4-2 (Air Discharge)	± 30			kV
Diode Capacitance ¹	$C_{I/O-GND}$	Reverse Bias=0V $f=1MHz$		30		pF

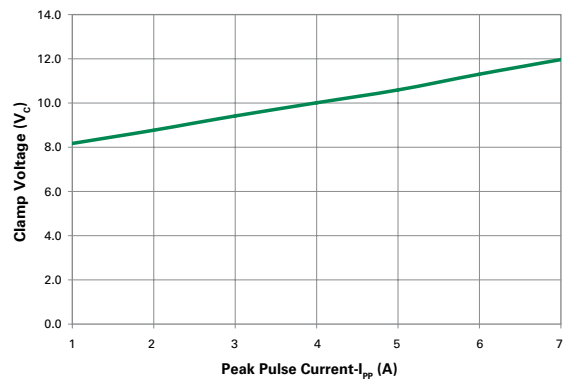
Note: 1 Parameter is guaranteed by design and/or component characterization.

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



Clamping Voltage vs. I_{PP}



The graph shows the TLP current-voltage characteristics. The x-axis is TLP Voltage (V) from 0 to 18, and the y-axis is TLP Current (A) from 0 to 20. The curve is flat at 0A until about 7.5V, then rises steeply, passing through approximately (9V, 4A), (10V, 10A), and (11V, 16A), ending near (11.5V, 18A).

Temperature (°C)	Leakage Current (nA)
0	20.0
10	22.0
20	24.0
30	26.0
40	28.0
50	30.0

The graph shows the percentage of peak current (I_{pr}) versus time in microseconds (μs) for a 100 pF capacitor. The curve starts at (0, 0), reaches a maximum of 100% at 10 μs , and then decays to about 25% at 30 μs .

Time (μs)	Percent of I_{pr}
0.0	0%
2.5	40%
5.0	75%
7.5	95%
10.0	100%
12.5	95%
15.0	85%
17.5	75%
20.0	60%
22.5	45%
25.0	35%
27.5	30%
30.0	25%

10.0div/div 20.0ns/div 5.0V

22.0mV 16.93V 16.93mV

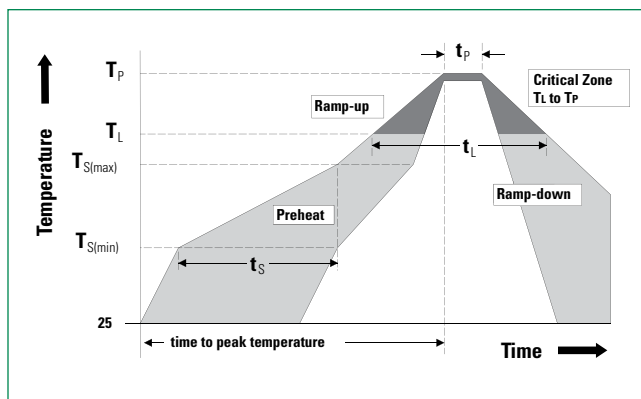
20.0ns/div 0.250Gbps 160ps/div

Single Seq 1 trace 0.125s 14.97.00

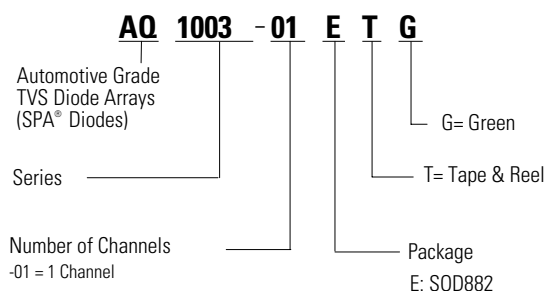
Auto Oscilloscope 05.2018

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



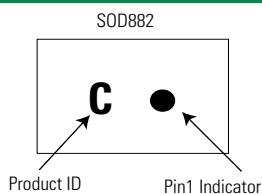
Part Numbering System



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

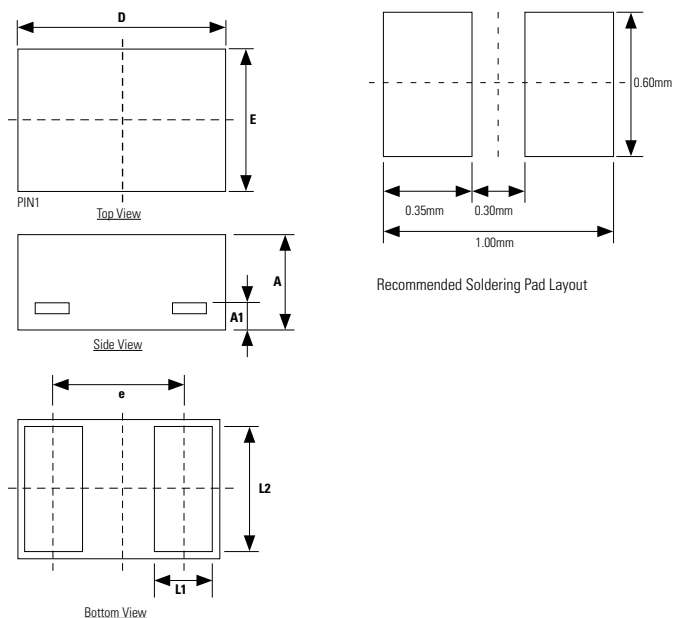
Part Marking System



Ordering Information

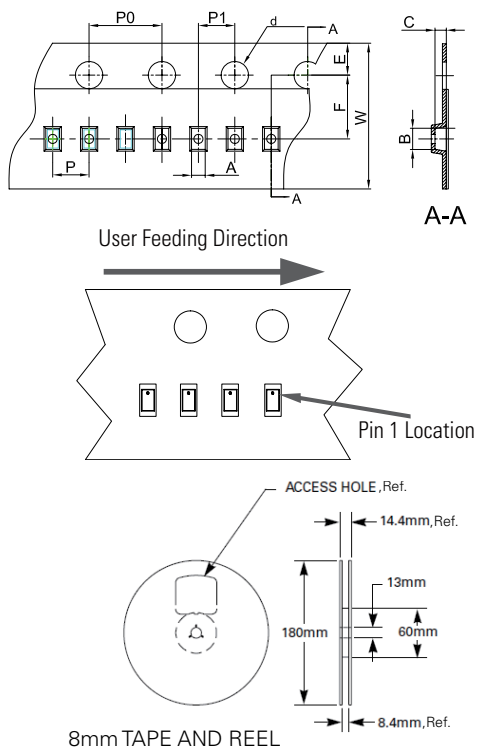
Part Number	Package	Min. Order Qty.
AQ1003-01ETG	SOD882	10000

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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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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