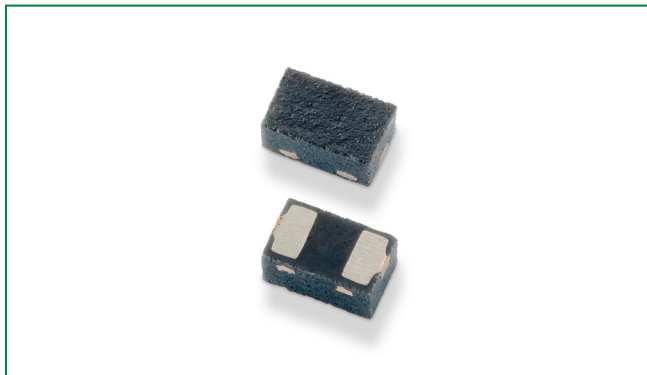


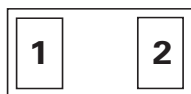
AQ4324-01ETG

24 V, 0.4 pF, 12 kV, Bidirectional TVS, Ultra Low Capacitance ESD protection

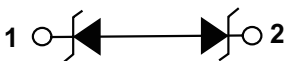


Note: This package image is for example and reference only. for detail package drawing, please refer to the package section in this datasheet.

Pinout



Functional Block Diagram



Description

The AQ4324-01ETG provides ultra-low capacitance, bidirectional and a high level of protection for 1 channel electronic equipment that may experience destructive electrostatic discharges (ESD). The typical capacitance of 0.4 pF helps ensure excellent signal integrity on the most challenging consumer electronics interfaces, such as DisplayPort interfaces, Thunderbolt and high speed USB. It can safely absorb repetitive ESD strikes at ± 12 kV (contact, IEC 61000-4-2 and ISO10605) without performance degradation.

Features

- ESD, IEC 61000-4-2, ± 12 kV contact, ± 22 kV air pF (Typ @ $V_R = 0$ V)
- ESD, ISO10605 330 pF 330 Ω , ± 12 kV contact, ± 15 kV air
- EFT, IEC 61000-4-4, 40 A (5/50 ns)
- Low leakage current of 50 nA (MAX) at 24 V
- Ultra low capacitance of 0.4
- Halogen-free, lead-free and RoHS compliant
- AEC-Q101 qualified and PPAP capable

Applications

- Automotive Antenna ESD Protection
- RF Signal ESD Protection
- Near Field Communications (NFC)
- Automotive SerDes w/Power over Coax
- USB Type-C (short-to-VBUS tolerant)

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.

AQ4324-01ETG

24 V, 0.4 pF, 12 kV, Bidirectional TVS, Ultra Low Capacitance ESD protection

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current ($t_p = 8/20 \mu s$)	6	A
T_{OP}	Operating Temperature	-40 to 150	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

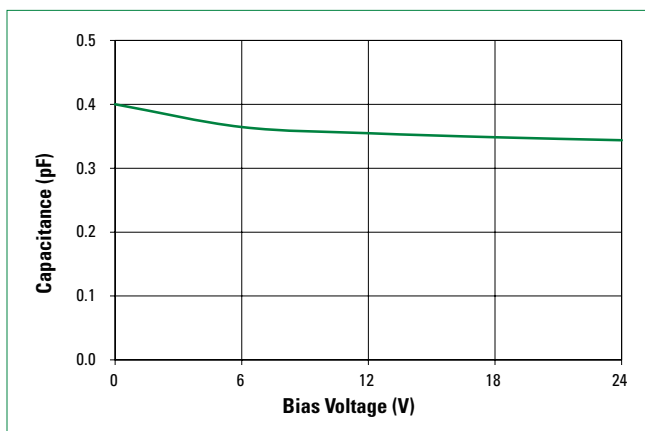
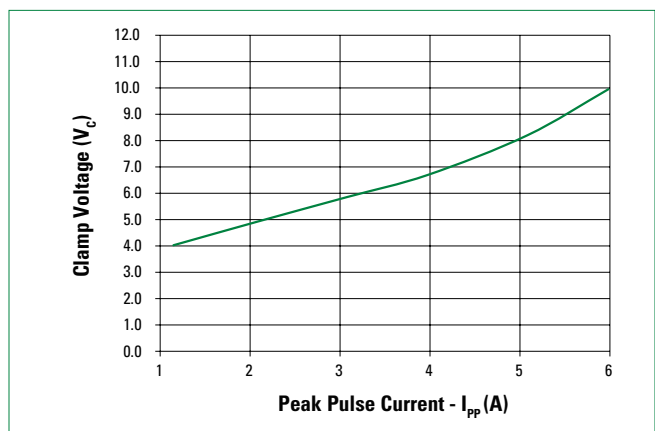
Caution: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}				24	V
Breakdown Voltage	V_{BR}	$I_R = 1 \text{ mA}$	26	28		V
Reverse Leakage Current	I_{LEAK}	$V_R = 24 \text{ V}$		10	50	nA
Clamp Voltage ¹	V_C	$I_{PP} = 1 \text{ A}, t_p = 8/20 \mu s$		4.0		V
		$I_{PP} = 6 \text{ A}, t_p = 8/20 \mu s$		10.0		V
Dynamic Resistance ²	R_{DYN}	TLP, $t_p = 100 \text{ ns}$		0.7		Ω
ESD Withstand Voltage ^{1,3}	V_{ESD}	IEC 61000-4-2 (Contact Discharge) ⁴	±12			kV
		IEC 61000-4-2 (Air Discharge)	±22			kV
		ISO10605 (Contact discharge)	±12			kV
		ISO10605 (Air discharge)	±15			kV
Diode Capacitance ¹	$C_{IO-I/O}$	Reverse Bias = 0 V, $f = 1 \text{ MHz}$		0.4		pF

Note:

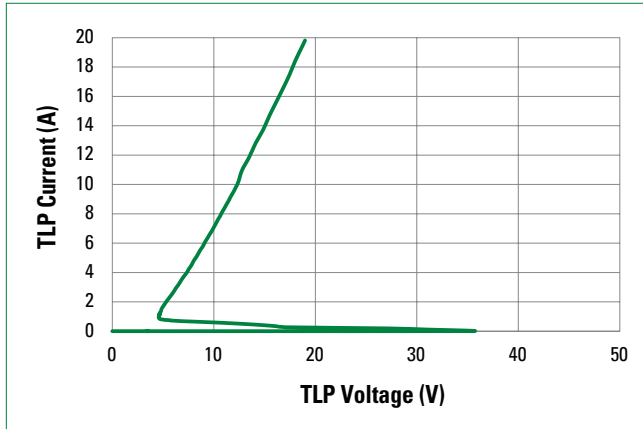
- Parameter is guaranteed by design and/or component characterization.
- Transmission Line Pulse (TLP) with 100 ns width, 0.2 ns rise time, and average window $t_1 = 70 \text{ ns}$ to $t_2 = 90 \text{ ns}$
- Device stressed with ten non-repetitive ESD pulses.
- Device stressed minimum number with >1000 contact discharges ESD pulses

Capacitance vs. Reverse Bias**Clamping Voltage vs I_{PP}** 

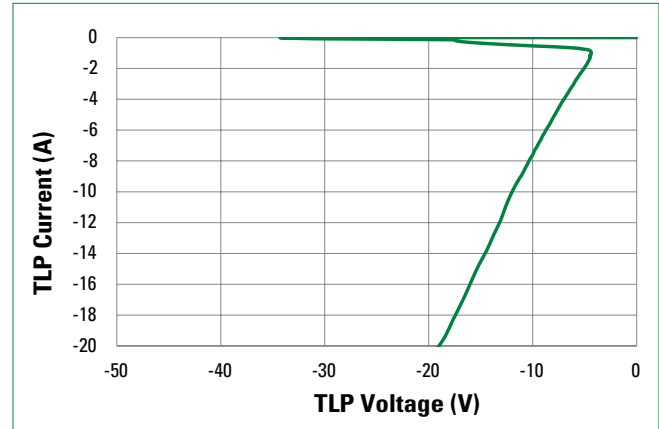
AQ4324-01ETG

24 V, 0.4 pF, 12 kV, Bidirectional TVS, Ultra Low Capacitance ESD protection

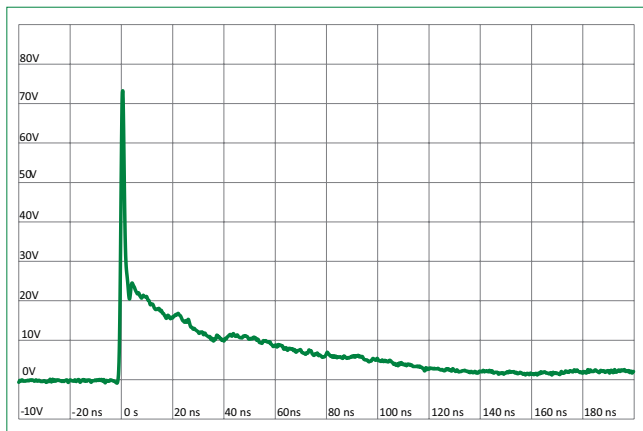
Positive Transmission Line Pulsing (TLP) Plot



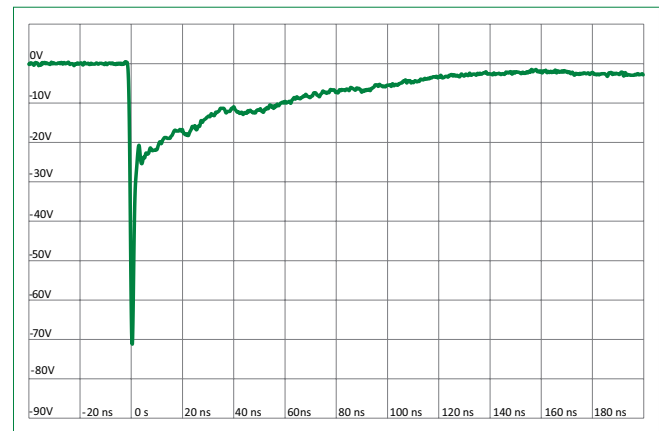
Negative Transmission Line Pulsing (TLP) Plot



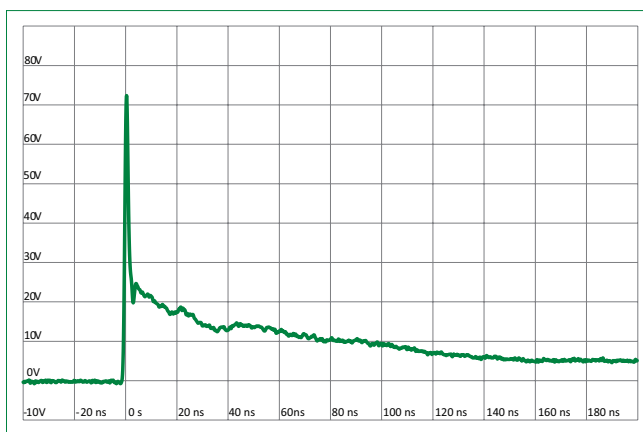
IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage



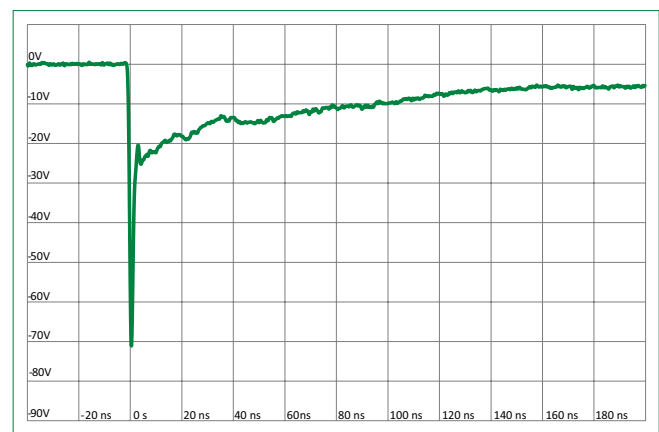
IEC 61000-4-2 -8 kV Contact ESD Clamping Voltage



ISO10605 Contact Discharge Plot at +8 kV



ISO10605 Contact Discharge Plot at -8 kV

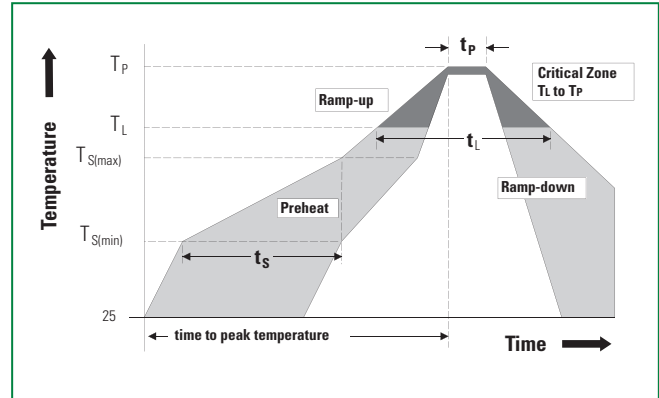


AQ4324-01ETG

24 V, 0.4 pF, 12 kV, Bidirectional TVS, Ultra Low Capacitance ESD protection

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 – 120 seconds
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)		30 seconds
Ramp-down Rate		6 °C/second max
Time 25 °C to Peak Temperature (T_p)		8 minutes max
Do Not Exceed		260 °C



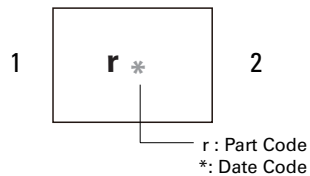
Ordering Information

Part Number	Package	Min. Order Qty.
AQ4324-01ETG	SOD882	10000

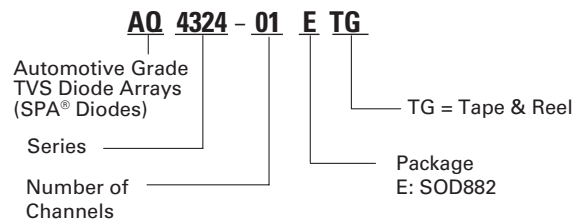
Product Characteristics

Lead Plating	Pre-plated frame, NIPDAU
Lead Material	Copper alloy
Body Material	Molded compound
Flammability	UL recognized compound meeting flammability rating V-0

Part Marking System

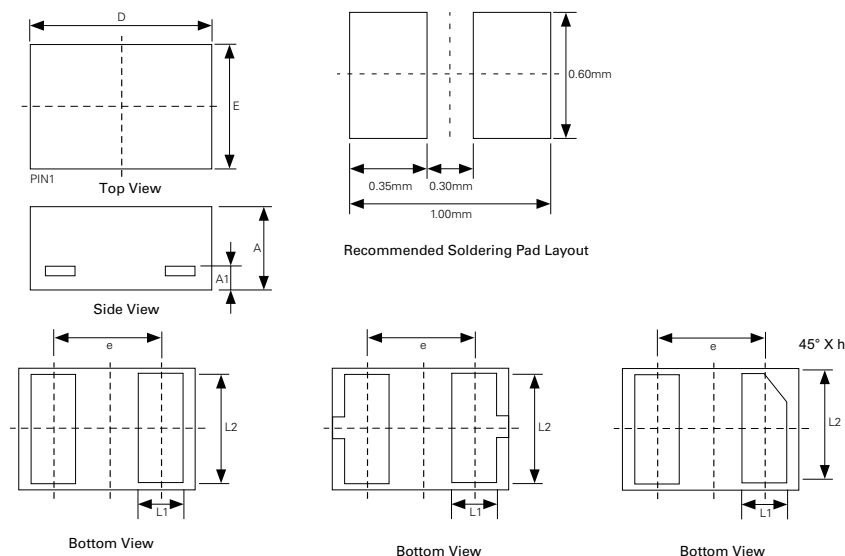


Part Numbering System

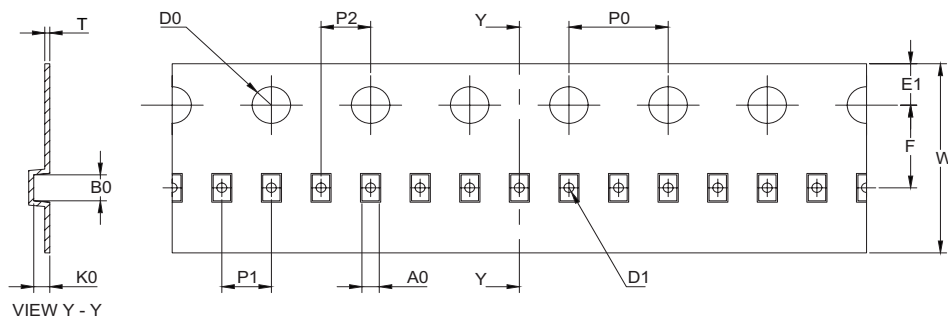


AQ4324-01ETG

24 V, 0.4 pF, 12 kV, Bidirectional TVS, Ultra Low Capacitance ESD protection

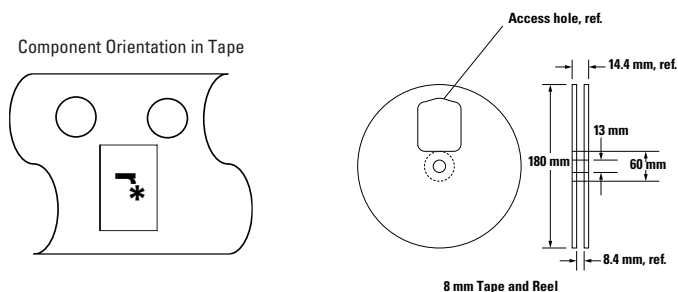
Package Dimensions — SOD882

Symbol	Millimeters		
	Min	Nor	Max
A	0.36	0.45	0.55
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		
h	0.07	0.12	0.17

Embossed Carrier Tape & Reel Specification — SOD882

Symbol	Millimeters
A0	0.70+/-0.045
B0	1.10+/-0.045
D0	1.55+/-0.050
D1	0.40+/-0.050
E1	1.75+/-0.100
F	3.50+/-0.050
K0	0.65+/-0.045
P0	4.00+/-0.100
P1	2.00+/-0.100
P2	2.00+/-0.050
T	0.20+/-0.050
W	8.00+0.30/-0.10

Component Orientation in Tape



8 mm Tape and Reel

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