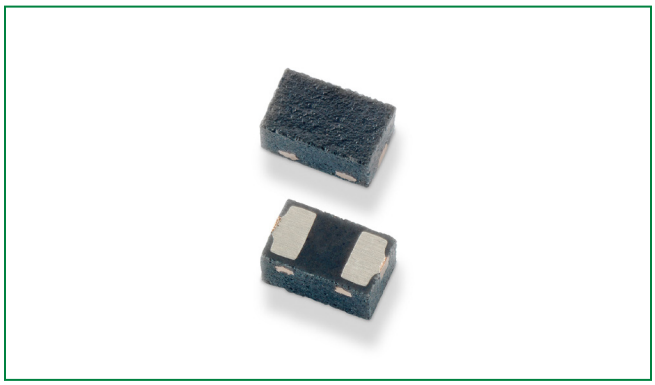
AQ4337-01ETG

0.25pF, 7A, Low Clamping Voltage, Bidirectional TVS, Ultra Low Capacitance ESD Protection

AUTOMOTIVE GRADE HF RoHS Pb

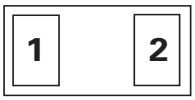


Description

The AQ4337-01ETG provides ultra-low capacitance, bidirectional and a high level of protection for electronic equipment that may experience destructive electrostatic discharges (ESD). The typical capacitance of 0.25pF helps ensure excellent signal integrity on the most challenging consumer electronics interfaces, such as High-Definition Multimedia Interface (HDMI) and DisplayPort interfaces, Thunderbolt and USB 3.1 Gen 1.

It can safely absorb repetitive ESD strikes at ±15kV (contact discharge, IEC 61000-4-2) without performance degradation and safely dissipate 7A of 8/20µs surge current (IEC 61000-4-5 2nd edition).

Pinout



Features

- ESD, IEC 61000-4-2, ±15kV contact/air
- ESD, ISO10605 330pF 330Ω, ±15kV contact/air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Maximum surge tolerance, IEC 61000-4-5, 2nd Edition, 7A (8/20µs)
- Low leakage current of 0.1µA (MAX) at 5V
- Ultra low capacitance of 0.25pF (Typ @ V_R=0V)
- Small SOD882 packaging helps save board space
- Halogen-free, lead-free and RoHS compliant
- Moisture Sensitivity Level (MSL-1)
- AEC-Q101 Qualified and PPAP Capable

Functional Block Diagram

Applications

- Automotive ADAS
- Automotive DisplayPort
- GMSL
- GVIF
- LVDS
- 2.5/5G/10G Ethernet

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.

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Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current (t_p=8/20µs)	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.

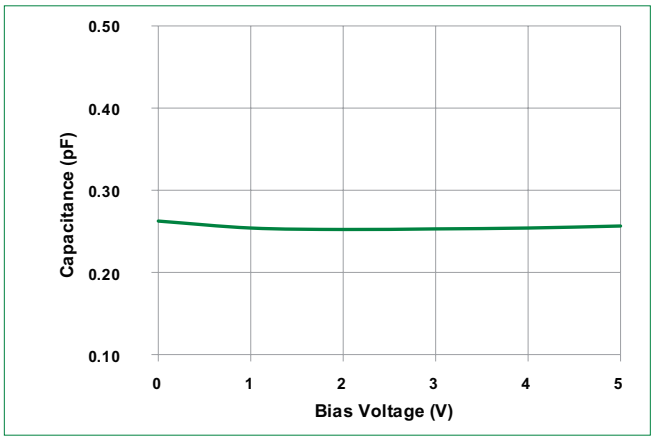
Electrical Characteristics (T_{OP}=25ºC)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}				5	V
Breakdown Voltage	V_{BR}	I_R=1mA		8.0		V
Reverse Leakage Current	I_{LEAK}	V_R=5V		10	100	nA
Clamp Voltage[1]	V_C	I_{PP}=1A, t_p=8/20µs, I/O to GND		3.8		V
		I_{PP}=7A, t_p=8/20µs, I/O to GND		6.5		V
Dynamic Resistance[2]	R_{DYN}	TLP, t_P=100ns, I/O to GND		0.35		Ω
ESD Withstand Voltage[1,3]	V_{ESD}	IEC 61000-4-2 (Contct Discharge)	±15			kV
		IEC 61000-4-2 (Air Discharge)	±15			kV
		ISO10605 (Contact Discharge)	±15			kV
		ISO10605 (Air Discharge)	±15			kV
Diode Capacitance[1]	C_{IO-GND}	Reverse Bias=0V, f=1MHz, I/O to GND		0.25		pF

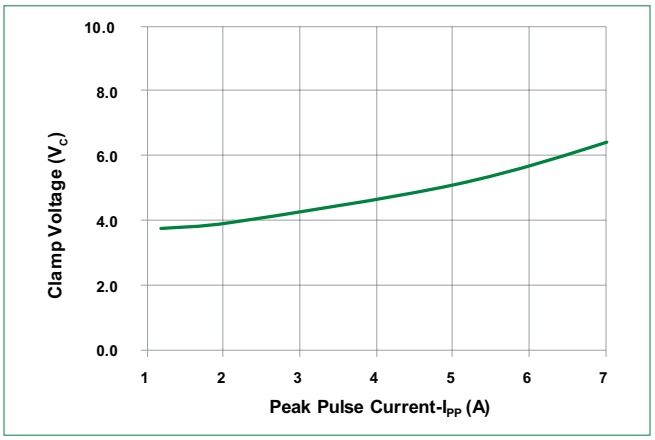
Note:

1. Parameter is guaranteed by design and/or component characterization.
2. Transmission Line Pulse (TLP) with 100ns width, 0.2ns rise time, and average window t1=70ns to t2= 90ns
3. Device stressed with ten non-repetitive ESD pulses.

Capacitance vs. Reverse Bias



Clamping Voltage vs I_{PP}



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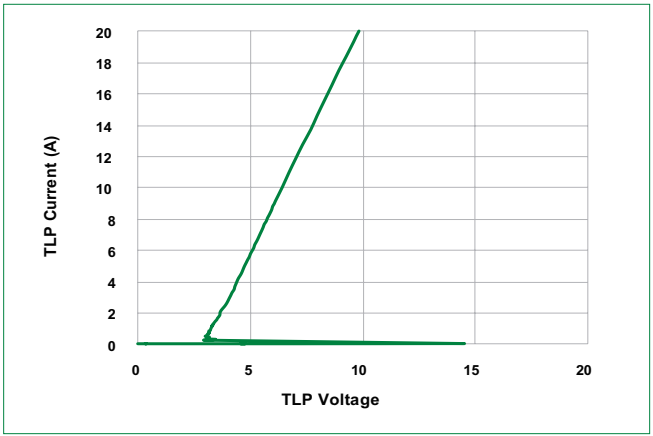
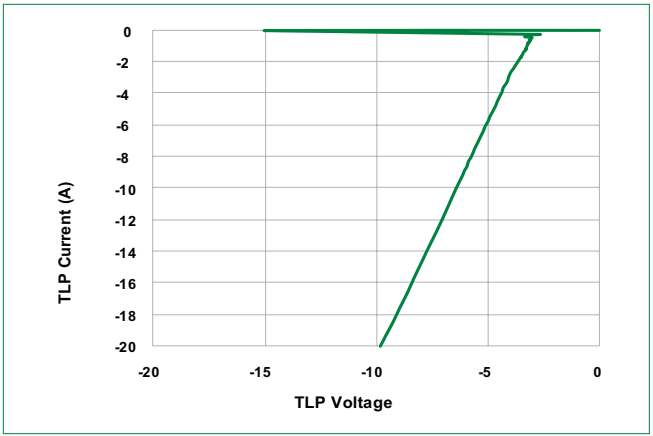
Positive Transmission Line Pulsing (TLP) Plot

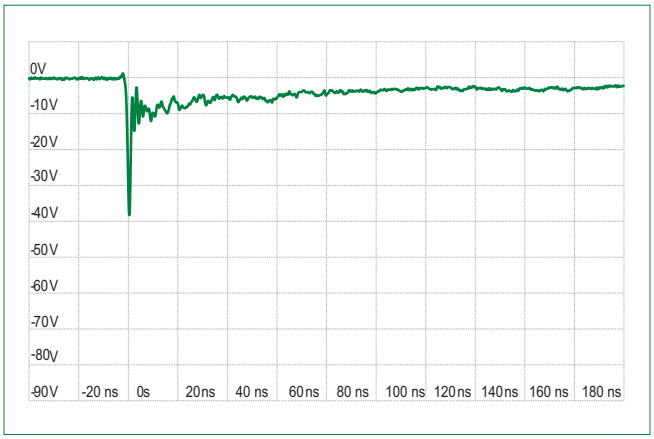


Negative Transmission Line Pulsing (TLP) Plot



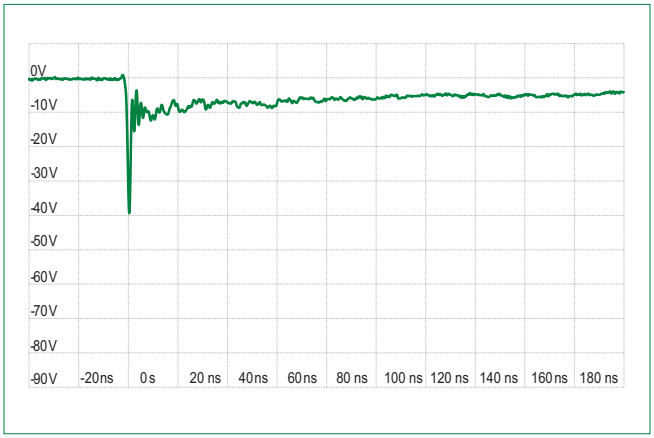
IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage

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



ISO10605 Contact Discharge Plot at +8 kV

ISO10605 Contact Discharge Plot at -8 kV



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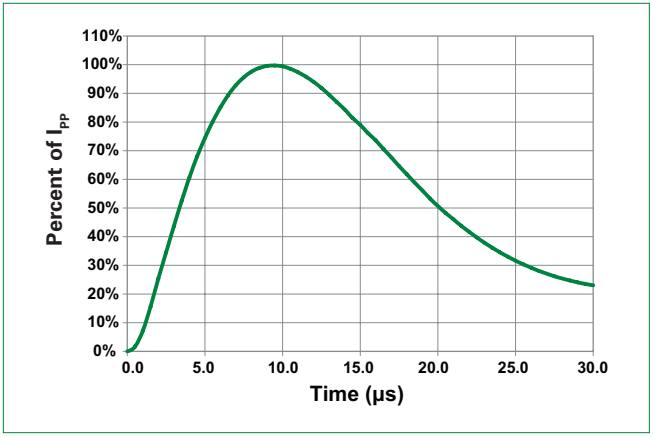
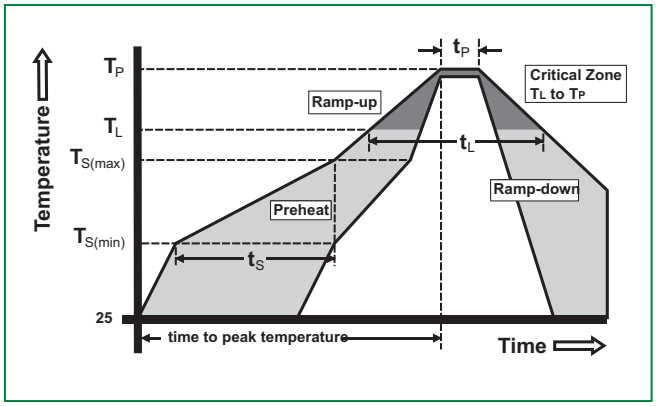
8/20µs Pulse Waveform



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 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)		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



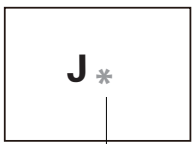
Ordering Information

Part Number	Package	Min. Order Qty.
AQ4337-01ETG	SOD882	10000

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



J : Part Code
*: Date Code

Part Numbering System

AQ 4337 - 01 E TG

- AQ: Automotive Grade TVS Diode Arrays (SPA® Diodes)
- 4337: Series
- 01: Number of Channels
- E: Package E: SOD882
- TG: TG= Tape & Reel

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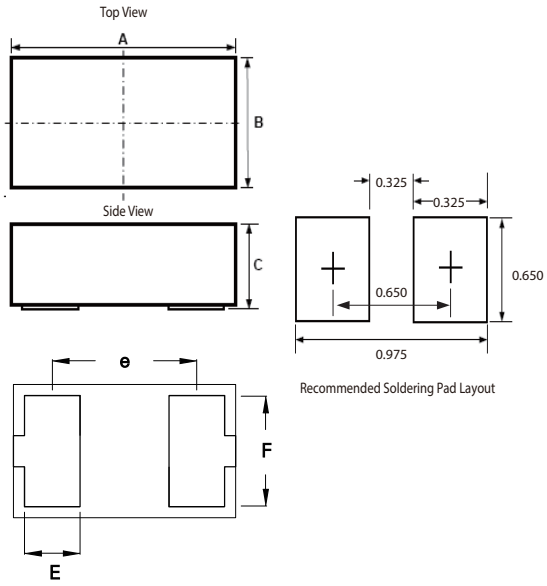
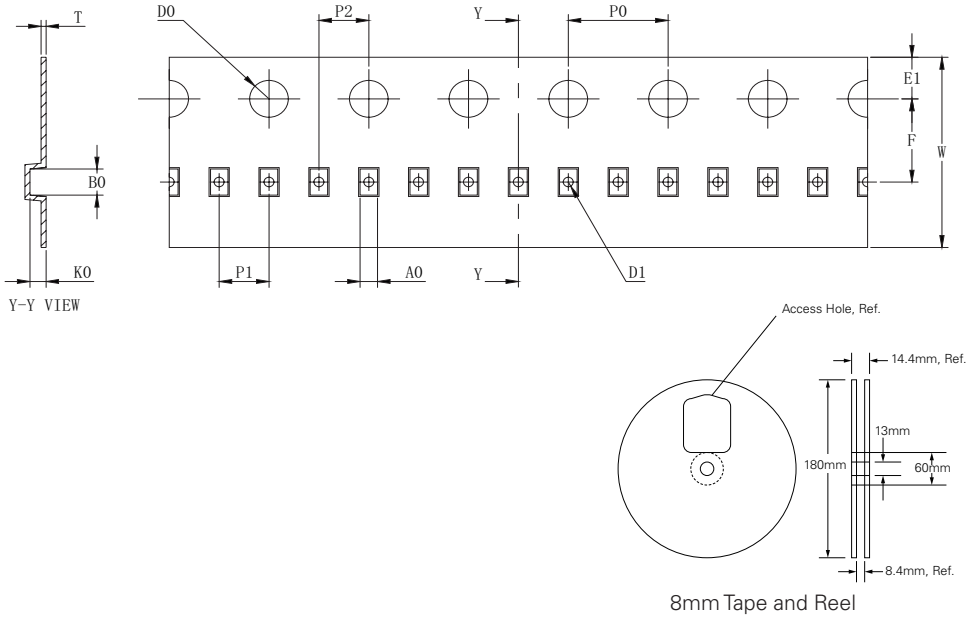
Package Dimensions — SOD882



Symbol	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.90	1.00	1.10	0.035	0.039	0.043
B	0.50	0.60	0.70	0.020	0.024	0.028
C	0.40	0.50	0.60	0.016	0.020	0.024
e	-	0.65	-	-	0.026	-
E	0.20	0.25	0.30	0.008	0.010	0.012
F	0.45	0.50	0.55	0.018	0.020	0.022

Embossed Carrier Tape & Reel Specification — SOD882



8mm Tape and Reel

Symbol	Millimeters
A0	0.70+/-0.045
B0	1.10+/-0.045
D0	1.55+/-0.05
D1	0.40+/-0.05
E1	1.75+/-0.10
F	3.50+/-0.05
K0	0.65+/-0.045
P0	4.00+/-0.10
P1	2.00+/-0.10
P2	2.00+/-0.05
T	0.20+/-0.05
W	8.00+0.30/ -0.10

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