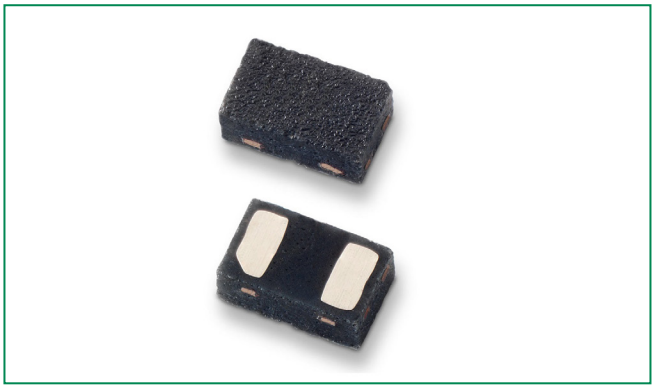
AQ3130 Series 0.3pF 10KV Bidirectional Discrete TVS

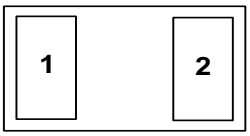
AUTOMOTIVE GRADE HF RoHS Pb GREEN



Description

The AQ3130 includes back-to-back TVS 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 up to the maximum level specified in IEC 61000-4-2 international standard without performance degradation. The back-to back configuration provides symmetrical ESD protection for data lines.

Pinout



Features

- ESD protection of ±10kV contact discharge, ±15kV air discharge, (IEC 61000-4-2)
- EFT protection, IEC 61000-4-4, 40A (tp=5/50ns)
- Lightning Protection, IEC 61000-4-5 2nd edition, 2A (t_p=8/20µs)
- Low capacitance of 0.3pF @ V_R=0V
- Low leakage current of 50nA (max) at 28V
- Space efficient 0402 footprint
- AEC-Q101 qualified
- Halogen free, lead free and RoHS compliant
- Moisture Sensitivity Level(MSL -1)

Functional Block Diagram

Applications

- Tablets
- Ultrabook
- eReader
- Smart Phones
- Digital Cameras
- MP3/ PMP
- Set Top Boxes
- Portable Medical
- NFC and FeliCa
- Automotive Applications

Revision: 11/09/17

TVS Diode Arrays (SPA® Diodes)

Low Capacitance ESD Protection - AQ3130Series

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current (t_p=8/20μs)	2.0	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.

Thermal Information

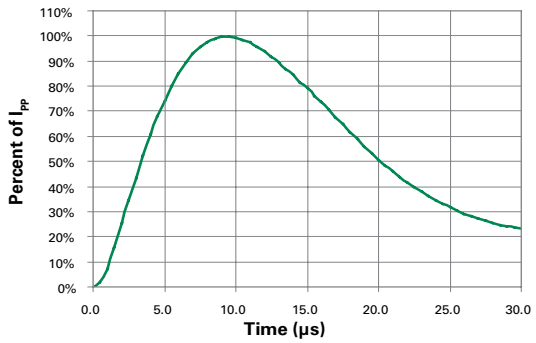
Parameter	Rating	Units
Maximum Lead Temperature (Soldering 20-40s)	260	°C

Electrical Characteristics (T_{OP}=25°C)

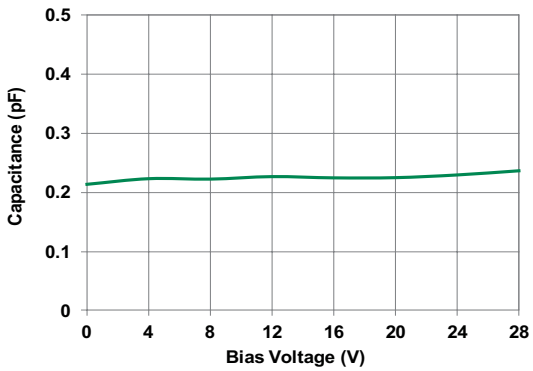
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}				28	V
Reverse Leakage Current	I_{LEAK}	V_R=28V with 1pin at GND		1	50	nA
Clamp Voltage[1]	V_C	I_{PP}=1A, t_p=8/20μs, Fwd		39	44	V
		I_{PP}=2A, t_p=8/20μs, Fwd		42	48	V
ESD Withstand Voltage[1]	V_{ESD}	IEC 61000-4-2 (Contact)	±10			kV
		IEC 61000-4-2 (Air)	±15			kV
Dynamic Resistance[2]	R_{DYN}	TLP, t_p=100ns, I/O to GND		1.0		Ω
Diode Capacitance[1]	$C_{I/O-I/O}$	Reverse Bias=0V, f=1 MHz		0.3	0.45	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 t1=70ns to t2= 90ns

8/20μs Pulse Waveform



Capacitance vs. Reverse Bias



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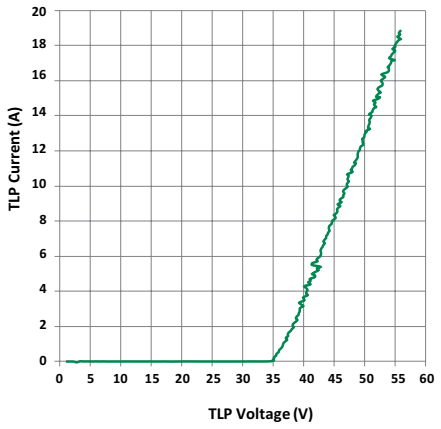
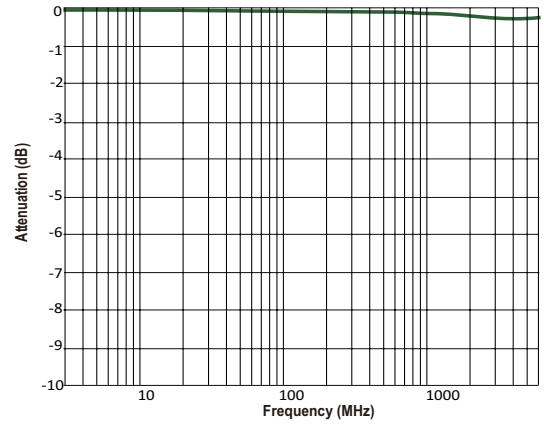
TVS Diode Arrays (SPA® Diodes)

Low Capacitance ESD Protection - AQ3130Series

Transmission Line Pulsing (TLP) Plot

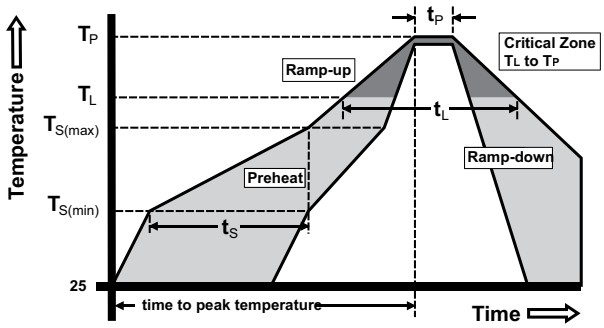


Insertion Loss (S21)



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

AQ 3130 - 01 E T G

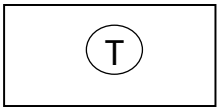
- AQ 3130: Automotive Grade TVS Diode Arrays (SPA® Diodes) — Series
- 01: Number of Channels, -01 = 1 Channel
- E: Package, E: SOD882
- T: T= Tape & Reel
- G: G= Green

Product Characteristics

Lead Plating	Pre-Plated Frame
Lead Material	Copper Alloy
Substrate material	Silicon
Body Material	Molded Epoxy
Flammability	UL Recognized epoxy 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. Blo 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.	Packaging Option	P0/P1	Packaging Specification
AQ3130-01ETG	SOD882	T	10000	Tape & Reel – 8mm tape/7" reel	4mm/2mm	EIA RS-481

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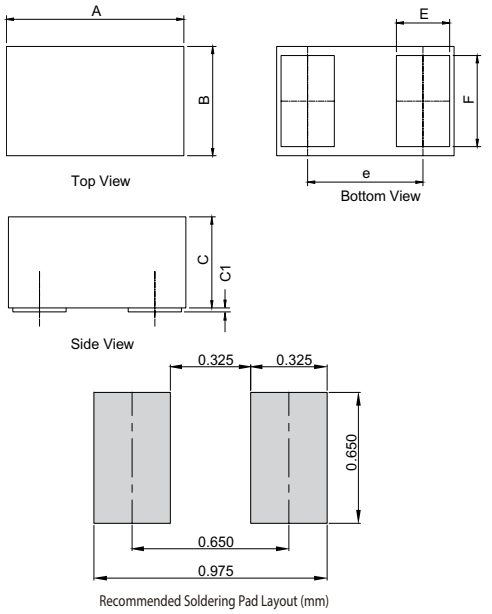
TVS Diode Arrays (SPA® Diodes)

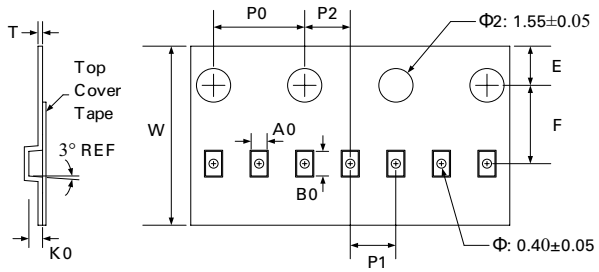
Low Capacitance ESD Protection - AQ3130Series

Package Dimensions — SOD882

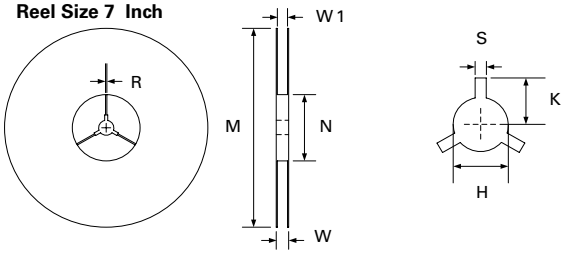


Symbol	Package	SOD882		
	JEDEC	MO-236		
	Millimeters		Inches	
	Min	Max	Min	Max
A	0.90	1.10	0.035	0.043
B	0.50	0.70	0.020	0.028
C	0.40	0.60	0.016	0.024
C1	0.00	0.05	0.000	0.002
E	0.20	0.35	0.008	0.014
F	0.45	0.55	0.018	0.022
e	0.65 BSC		0.026 BSC	

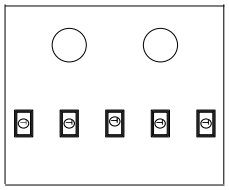
Embossed Carrier Tape & Reel Specification — SOD882



Reel Size 7 Inch



Device Orientation in Tape



Tape Dimensions		
Symbol	Millimetres	
	Min	Max
A0	0.65	0.75
B0	1.10	1.20
K0	0.50	0.60
E	1.65	1.85
F	3.45	3.55
P0	3.90	4.10
P1	1.90	2.10
P2	1.95	2.05
T	1.95	2.05
W	7.90	8.10

Reel Dimensions (Size Φ178)		
Symbol	Millimetres	
	Min	Max
M	177.0	179.0
N	59.0	61.0
W	11.0	12.0
W1	8.5	9.5
H	12.5	13.5
S	1.9	2.1
K	10.8	11.2
R	0.95	1.05

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