

AQ3118 Series

0.3pF 10 kV Bidirectional Discrete TVS



Additional Information



Resources

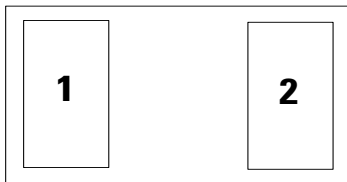


Accessories

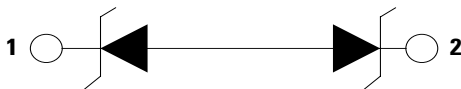


Samples

Pinout



Functional Block Diagram



Description

The AQ3118 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 when.

Features

- ESD protection of $\pm 10\text{kV}$ contact discharge, $\pm 15\text{kV}$ air discharge, (IEC 61000-4-2)
- EFT protection, IEC 61000-4-4, 40A ($t_p=5/50\text{ns}$)
- Lightning, 2A (8/20 μs as defined in IEC 61000-4-5 2nd edition)
- Low capacitance of 0.3pF @ VR=0V
- Low leakage current of 50nA (max) at 18V
- Space efficient 0402 footprint
- AEC-Q101 Qualified
- Halogen free, lead free and RoHS compliant
- Moisture Sensitivity Level(MSL -1)
- PPAP capable

Applications

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

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Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current ($t_p=8/20\mu s$)	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.

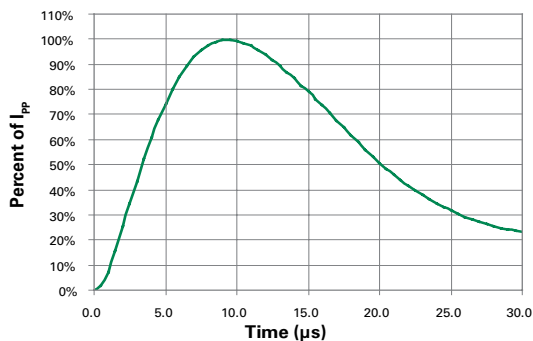
Electrical Characteristics ($T_{OP}=25^\circ\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Breakdown Voltage	V_{BR}	$I_R=1\text{mA}$	20	-	30	V
Reverse Standoff Voltage	V_{RWM}	-	-	-	18	V
Reverse Leakage Current	I_{LEAK}	$V_R=18\text{V}$ with 1 pin at GND	-	1	50	nA
Clamp Voltage ¹	V_C	$I_{PP}=1\text{A}$, $t_p=8/20\mu s$, Fwd	-	31	35	V
		$I_{PP}=2\text{A}$, $t_p=8/20\mu s$, Fwd	-	34	38	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, $t_p=100\text{ns}$, I/O to GND	-	0.75	-	Ω
Diode Capacitance ¹	$C_{I/O-I/O}$	Reverse Bias=0V, $f=1\text{MHz}$	-	0.3	0.45	pF

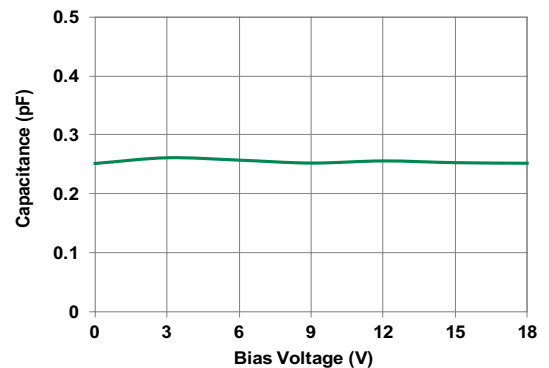
Note: 1. Parameter is guaranteed by design and/or component characterization.

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

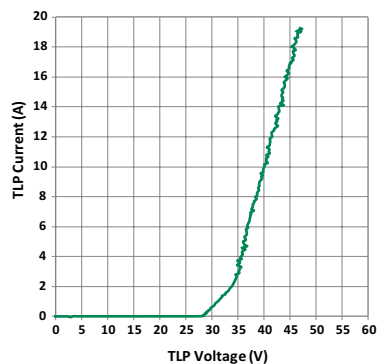
8/20 μs Pulse Waveform



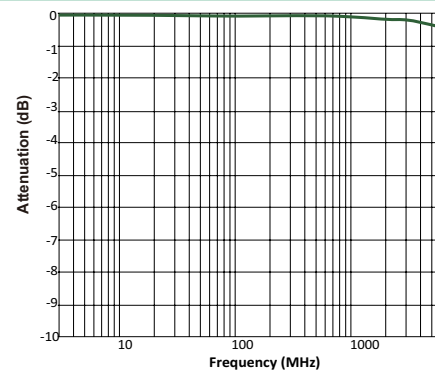
Capacitance vs. Reverse Bias



Transmission Line Pulsing (TLP) Plot



Insertion Loss (S21)

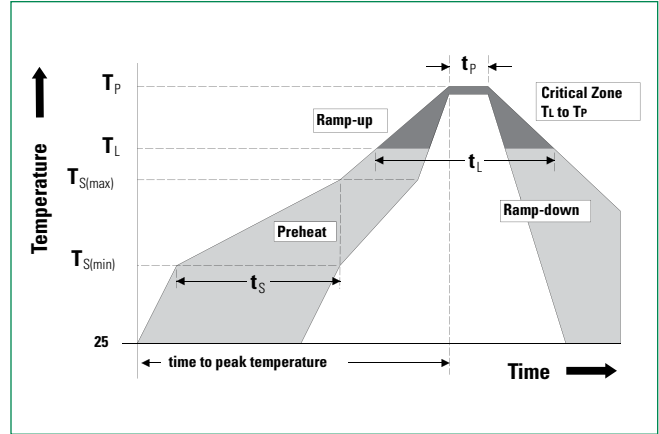


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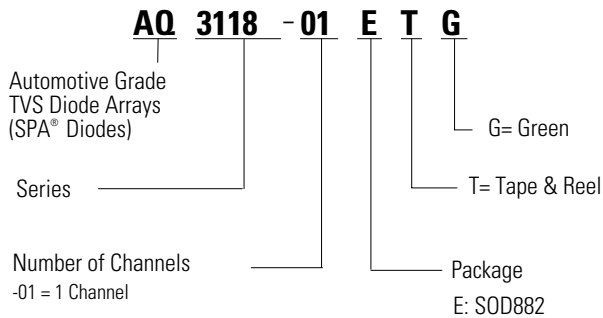
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Soldering Parameters

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



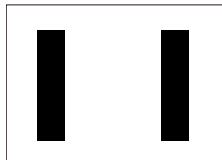
Part Numbering System



Product Characteristics

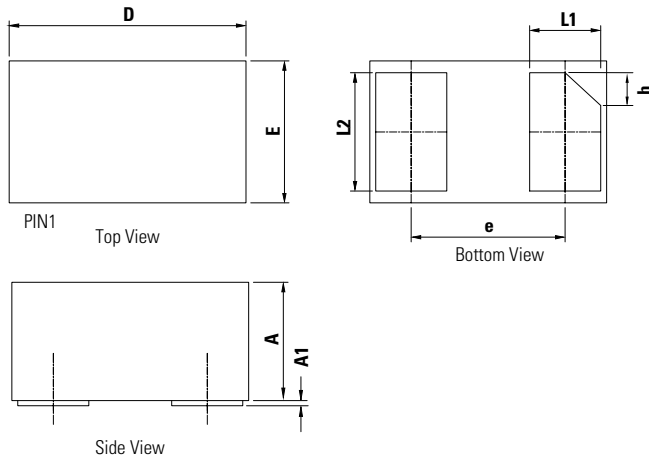
Lead Plating	Pre-Plated Frame
Lead Material	Copper Alloy
Substrate material	Silicon
Body Material	Molded Compound
Flammability	UL Recognized compound meeting flammability rating V-0

Part Marking System

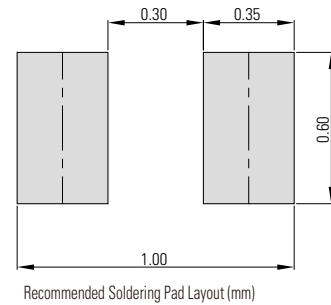
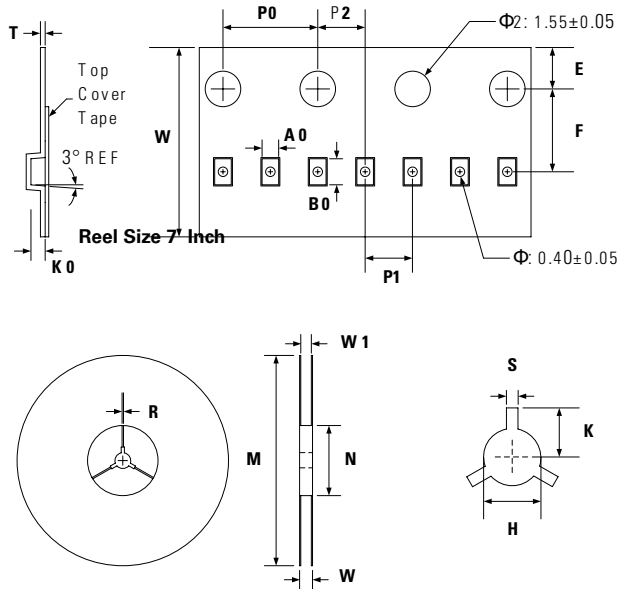


Ordering Information

Part Number	Package	Min. Order Qty.
AQ3118-01ETG	SOD882	10000

AQ3118 Series**0.3pF 10 kV Bidirectional Discrete TVS****Package Dimensions — SOD882**

Symbol	Dimensions		
	Min	Nor.	Max
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
L1	0.20	0.25	0.30
L2	0.45	0.50	0.55
D	0.95	1.00	1.05
E	0.55	0.60	0.65
e	0.65BSC		
h	0.07	0.12	0.17

**Embossed Carrier Tape & Reel Specification — SOD882**

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 $\phi 178$)		
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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