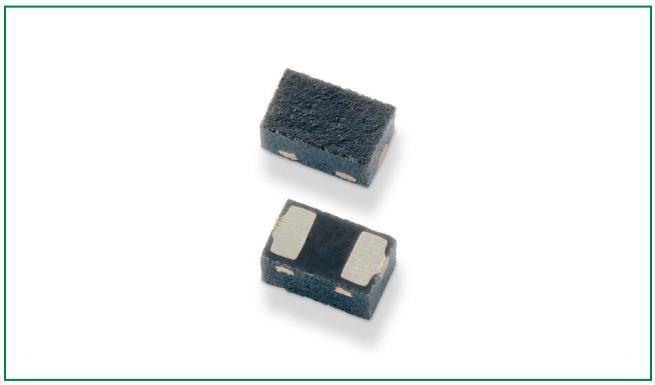
AQ3118E-01ETG

18V, 0.3pF, 30kV, SOD882, Bidirectional TVS, Ultra Low Capacitance ESD Protection

AUTOMOTIVE GRADE HF RoHS Pb

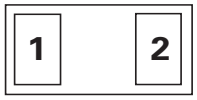


Description

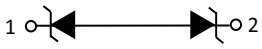
The AQ3118E-01ETG provides ultra-low capacitance, bidirectional and a high level of protection for electronic equipment that may experience destructive electrostatic discharges (ESD). The typical capacitance of 0.3pF helps ensure excellent signal integrity on the most challenging consumer electronics interfaces.

It can safely absorb repetitive ESD strikes at ±30kV (contact discharge, IEC 61000-4-2) without performance degradation and safely dissipate 3.5A of 8/20µs surge current (IEC 61000-4-5 2nd edition).

Pinout



Functional Block Diagram



Features

- ESD, IEC 61000-4-2, ±30 kV contact/air
- ESD, ISO10605 330pF 330Ω, ±25kV contact, ±28kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Maximum surge tolerance, IEC 61000-4-5 2nd Edition, 3.5A (8/20µs)
- Ultra low capacitance of 0.3pF(TYP@V_R=0V)
- Low leakage current of 1nA (TYP) at 18V
- Halogen-free, lead-free and RoHS compliant
- Moisture Sensitivity Level (MSL-1)
- AEC-Q101 Qualified and PPAP Capable

Applications

- Automotive
- USB 2.0, USB 3.0
- Near Field Communications
- RF Signal ESD Protection
- RF Switching, Power Amplifier and Antenna ESD Protection

Revised: FW.12/28/22

AQ3118E-01ETG

18V, 0.3pF, 30kV, SOD882, Bidirectional TVS, Ultra Low Capacitance ESD Protection

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current (t_p=8/20µs)	3.5	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.

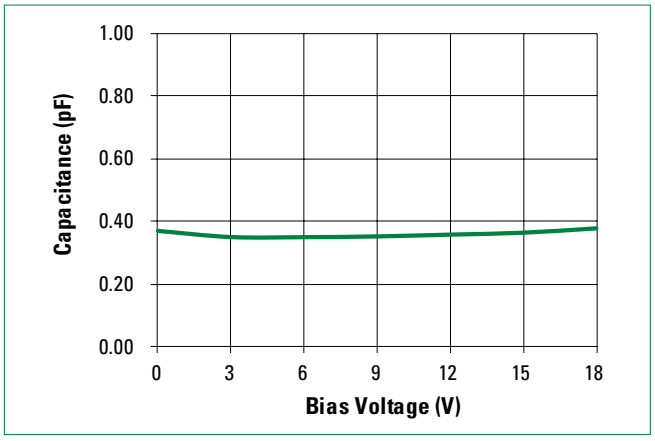
Electrical Characteristics (T_{OP}=25ºC)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}				18	V
Breakdown Voltage	V_{BR}	I_R=1mA	20	25	30	V
Reverse Leakage Current	I_{LEAK}	V_R= 18V		1	50	nA
Clamp Voltage[1]	V_C	I_{PP}=1 A, tp=8/20µs, I/O to GND		31	35	V
		I_{PP}=3.5A, tp=8/20µs, I/O to GND		34	38	V
Dynamic Resistance [1,2]	R_{DYN}	TLP, t_P=100ns, I/O to GND		0.65		Ω
ESD Withstand Voltage[1,3,4]	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	±30			kV
		IEC 61000-4-2 (Air Discharge)	±30			kV
		ISO10605 (Contact Discharge)	±25			kV
		ISO10605 (Air Discharge)	±28			kV
Diode Capacitance[1]	C_{IO-GND}	Reverse Bias=0V, f=1MHz, I/O to GND		0.30	0.45	pF

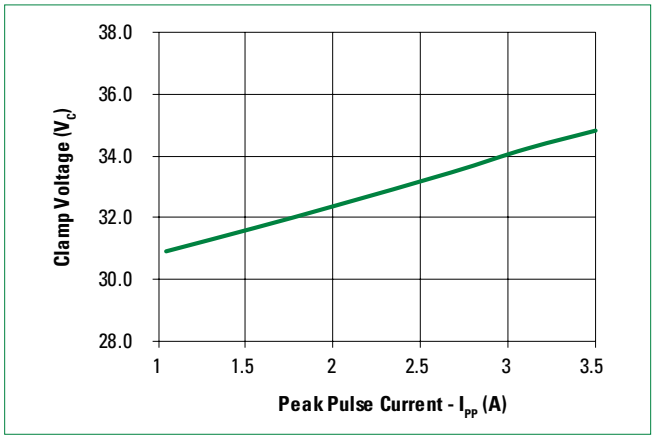
Note:

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 according to IEC61000-4-2 (R =330 Ω, C =150 pF).
4. Device stressed with three non-repetitive ESD pulses according to ISO10605 (R =330 Ω, C =330 pF).

Capacitance vs. Reverse Bias



Clamping Voltage vs I_{PP}

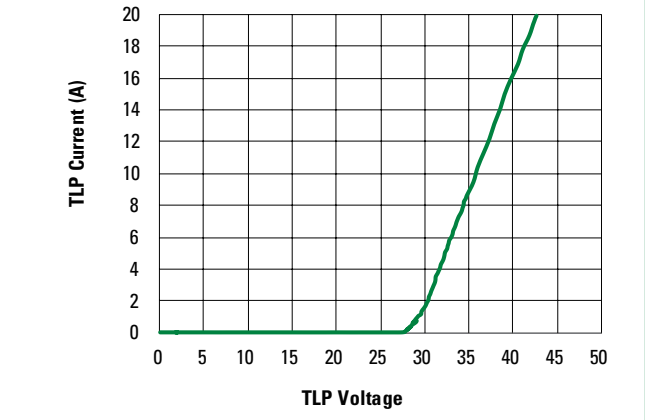


Revised: FW.12/28/22

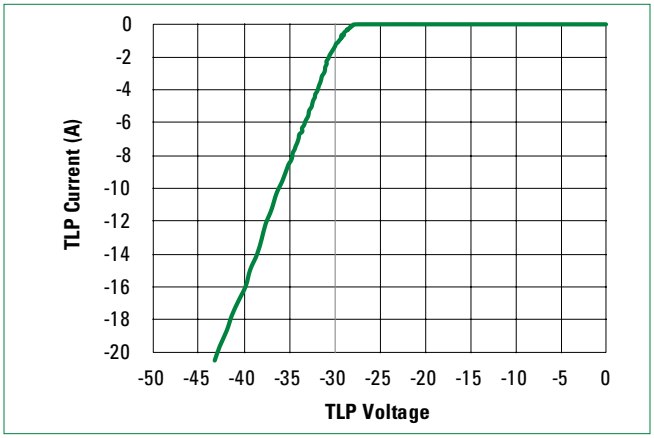
AQ3118E-01ETG

18V, 0.3pF, 30kV, SOD882, Bidirectional TVS, Ultra Low Capacitance ESD Protection

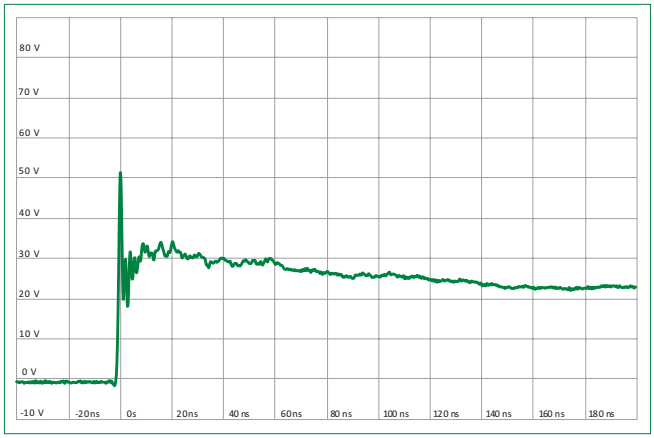
Positive Transmission Line Pulsing (TLP) Plot



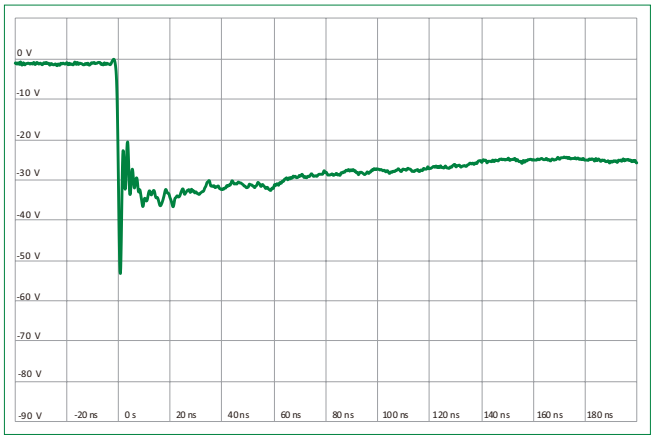
Negative Transmission Line Pulsing (TLP) Plot



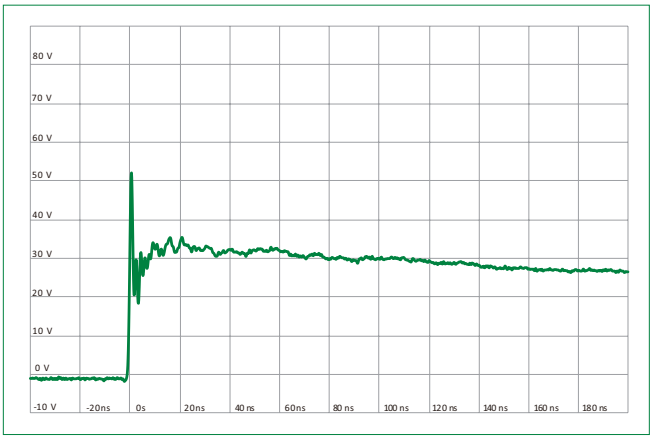
IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage



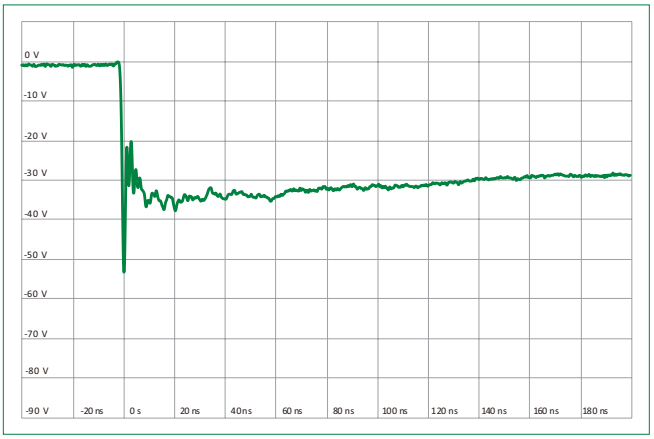
IEC 61000-4-2 -8 kV Contact ESD Clamping Voltage



ISO10605 Contact Discharge Plot at +8 kV



ISO10605 Contact Discharge Plot at -8 kV

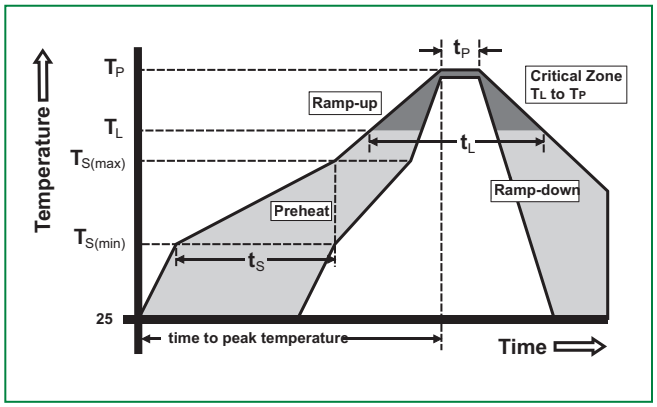


AQ3118E-01ETG

18V, 0.3pF, 30kV, SOD882, 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 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



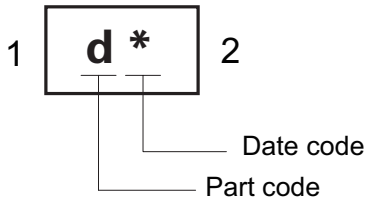
Ordering Information

Part Number	Package	Min. Order Qty.
AQ3118E-01ETG	SOD882	10,000

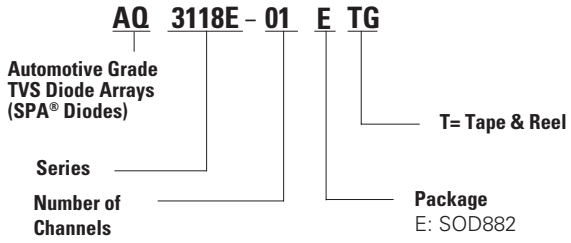
Product Characteristics

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

Part Marking System



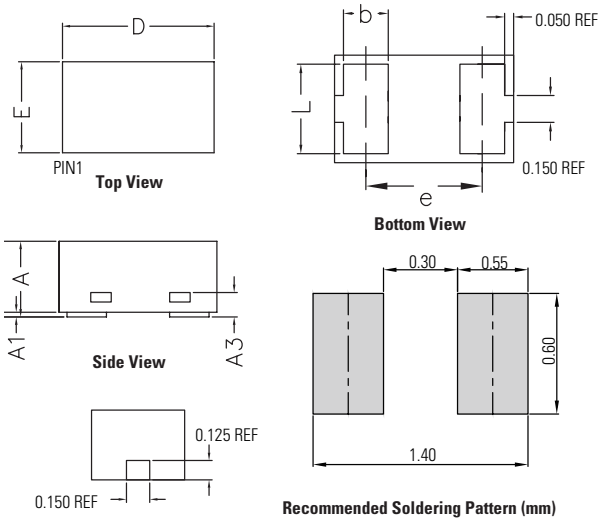
Part Numbering System



AQ3118E-01ETG

18V, 0.3pF, 30kV, SOD882, Bidirectional TVS, Ultra Low Capacitance ESD Protection

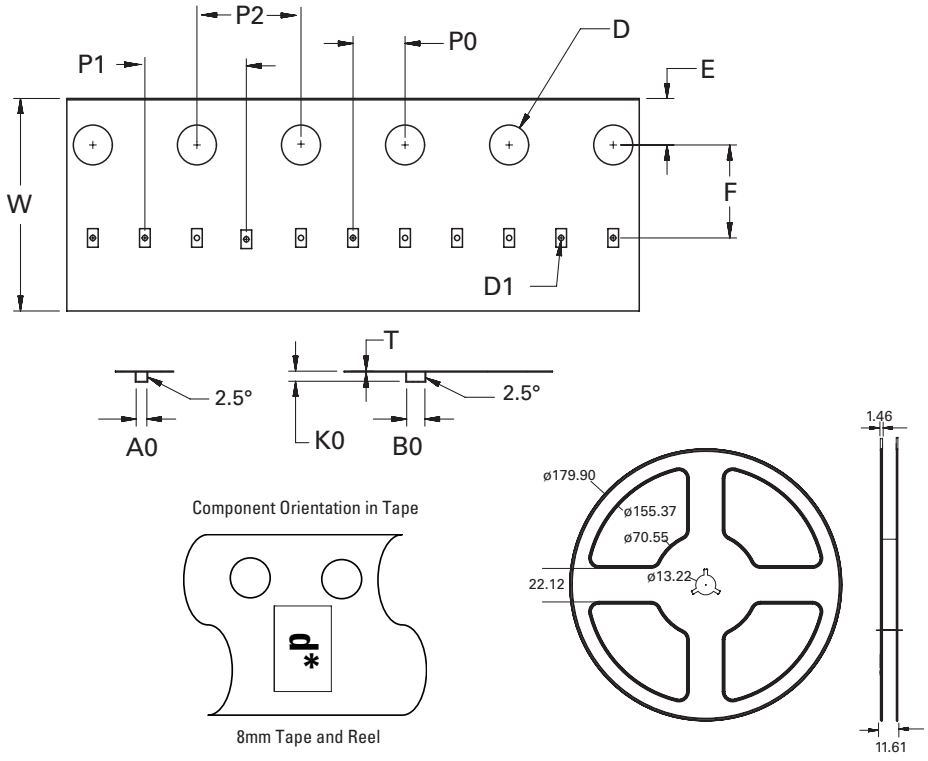
Package Dimensions — SOD882



Symbol	Millimeters	
	Min	Max
A	0.40	0.50
A1	0.00	0.05
A3	0.125 REF	
b	0.20	0.30
L	0.45	0.55
D	0.95	1.05
E	0.55	0.65
e	0.6 5BSC	

*Note: rectangular shape of recommended solder pattern can completely cover the whole ⊓ shape from the package's exposed pin.

Embossed Carrier Tape & Reel Specification — SOD882



Symbol	Millimeters
A0	0.70+/-0.05
B0	1.15+/-0.05
D	1.50+0.10
D1	0.40+/-0.10
E	1.75+/-0.10
F	3.50+/-0.05
K0	0.55+/-0.05
P0	2.00+/-0.05
P1	4.00+/-0.10
P2	4.00+/-0.10
T	0.20+/-0.03
W	8.00+0.30/-0.10

Revised: FW.12/28/22