AQW05C-01FTG

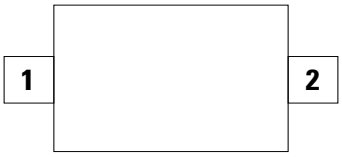
30A Bidirectional Discrete TVS, General Purpose ESD Protection

AUTOMOTIVE GRADE HF RoHS Pb

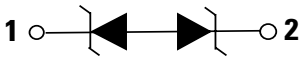


Note: This package image is for example and reference only. for detail package drawing, please refer to the package section in this datasheet.

Pinout



Functional Block Diagram



Description

The AQW05C-01FTG bidirectional TVS is fabricated in a proprietary silicon avalanche technology. These diodes provide a high ESD (electrostatic discharge) protection level for electronic equipment.

The AQW05C-01FTG TVS can safely absorb repetitive ESD strikes of ±30kV (contact and air discharge as defined in IEC 61000-4-2) without any performance degradation. In addition, it can safely dissipate a 30A 8/20µs surge event as defined in IEC 61000-4-5, 2nd Edition.

Features & Benefits

- ESD, IEC 61000-4-2, ±30kV contact/air
- ESD, ISO10605 330pF 330Ω, ±30kV contact/air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Maximum surge tolerance, IEC 61000- 4-5 2nd Edition, 30A (8/20µs)
- Halogen-free, lead-free and RoHS-compliant
- Moisture Sensitivity Level (MSL-1)
- AEC-Q101 qualified and PPAP capable

Applications

- Automotive Applications
- Battery Protection
- Computer Peripherals
- Medical Equipment
- Notebooks / Desktops / Servers
- Point-of-Sale Terminals
- Switches / Buttons
- Test Equipment / Instrumentation

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)	30	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.

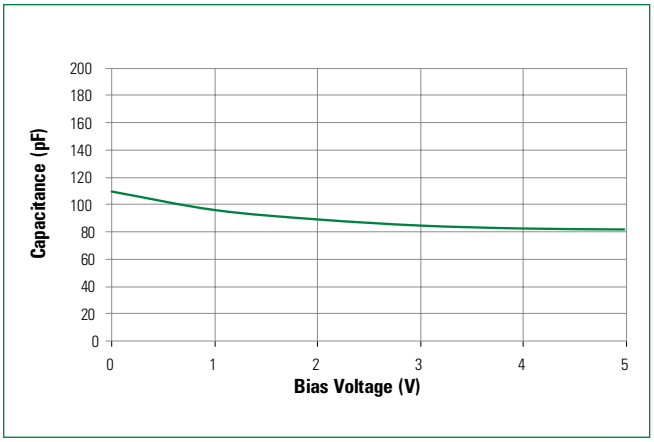
Electrical Characteristics (T_{OP}=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}				5	V
Breakdown Voltage	V_{BR}	I_R=1mA, I/O to GND	6			V
Reverse Leakage Current	I_{LEAK}	V_R=5V, I/O to GND			1	µA
Clamp Voltage[1]	V_C	I_{PP}=1A, t_p=8/20µs, I/O to GND		8.0		V
		I_{PP}=30A, t_p=8/20µs, I/O to GND		15.0		V
Dynamic Resistance[2]	R_{DYN}	TLP, t_P=100ns, I/O to GND		0.16		Ω
ESD Withstand Voltage[1,3]	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	±30			kV
		IEC 61000-4-2 (Air Discharge)	±30			kV
		ISO10605 (Contact Discharge)	±30			kV
		ISO10605 (Air Discharge)	±30			kV
Diode Capacitance[1]	C_{IO-GND}	Reverse Bias=0V, f=1MHz, I/O to GND		115		pF

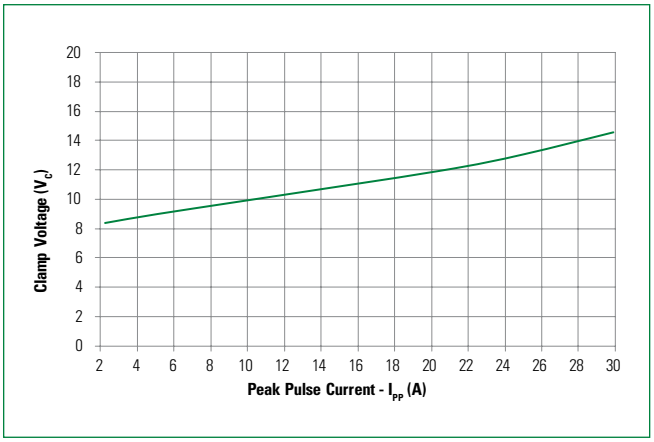
Note:

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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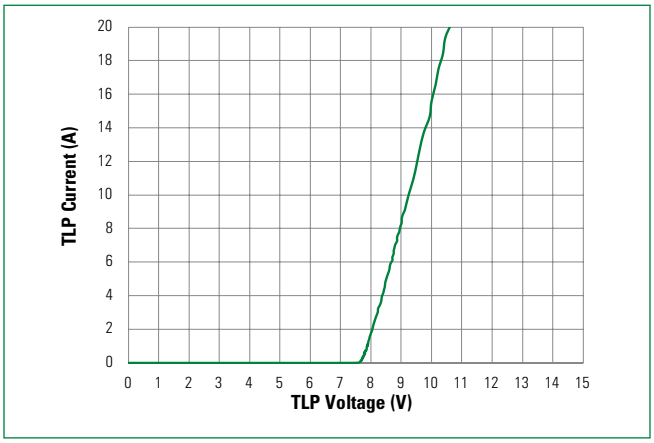
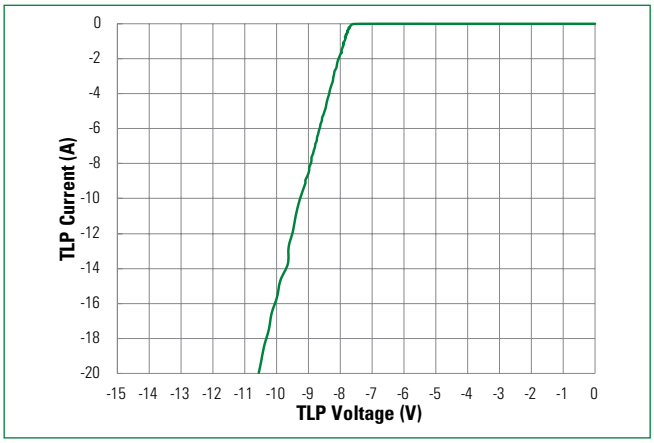
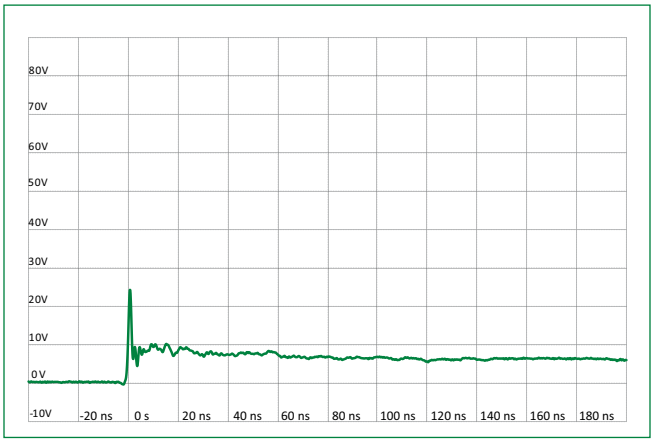
Positive Transmission Line Pulsing (TLP) Plot



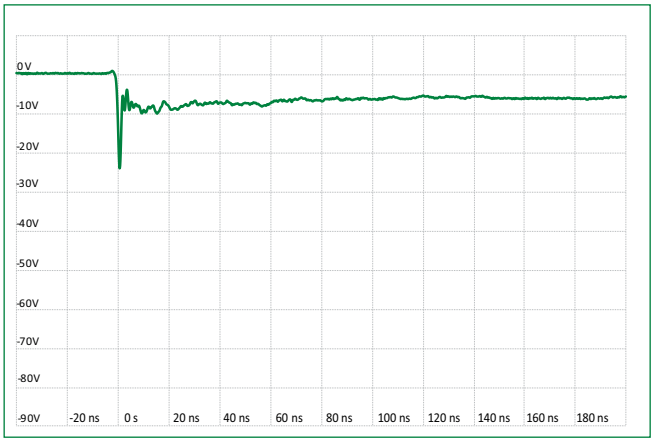
Negative Transmission Line Pulsing (TLP) Plot



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



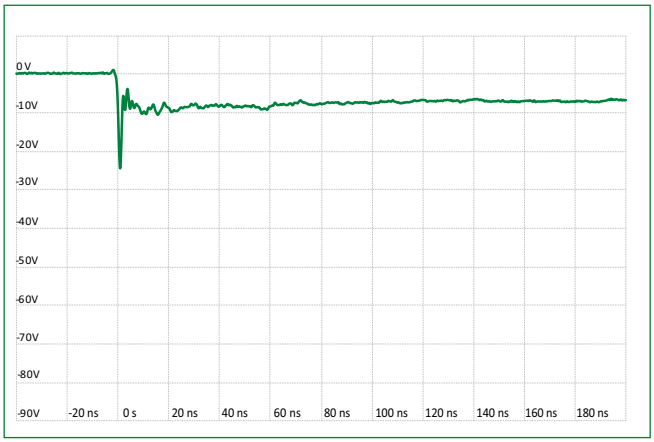
IEC 61000-4-2 -8 kV Contact ESD Clamping Voltage



ISO10605 Contact Discharge Plot at +8 kV



ISO10605 Contact Discharge Plot at -8 kV



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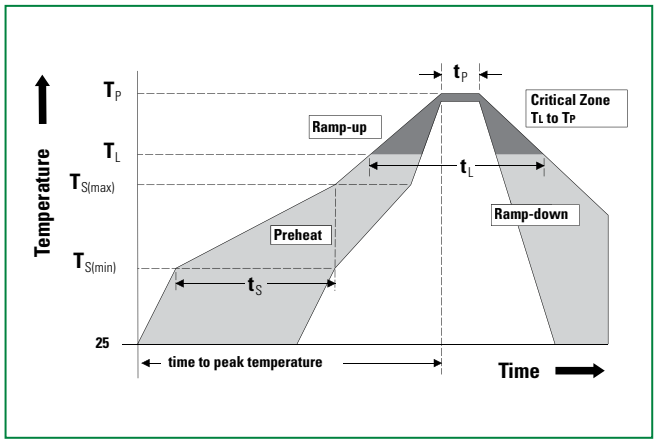
Soldering Parameters

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



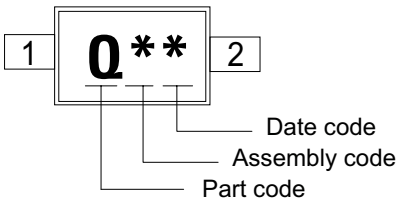
Ordering Information

Part Number	Package	Min. Order Qty.
AQW05C-01FTG	SOD323	3000

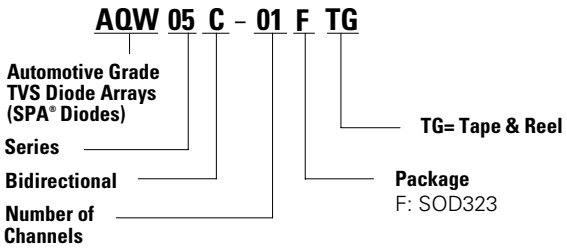
Product Characteristics

Lead Plating	Matte Tin
Lead material	Alloy 42
Body Material	Molded Compound
Flammability	UL Recognized compound meeting flammability rating V-0

Part Marking System



Part Numbering System



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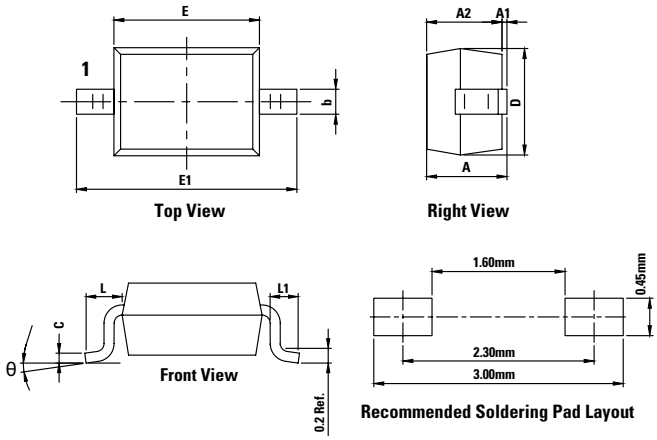
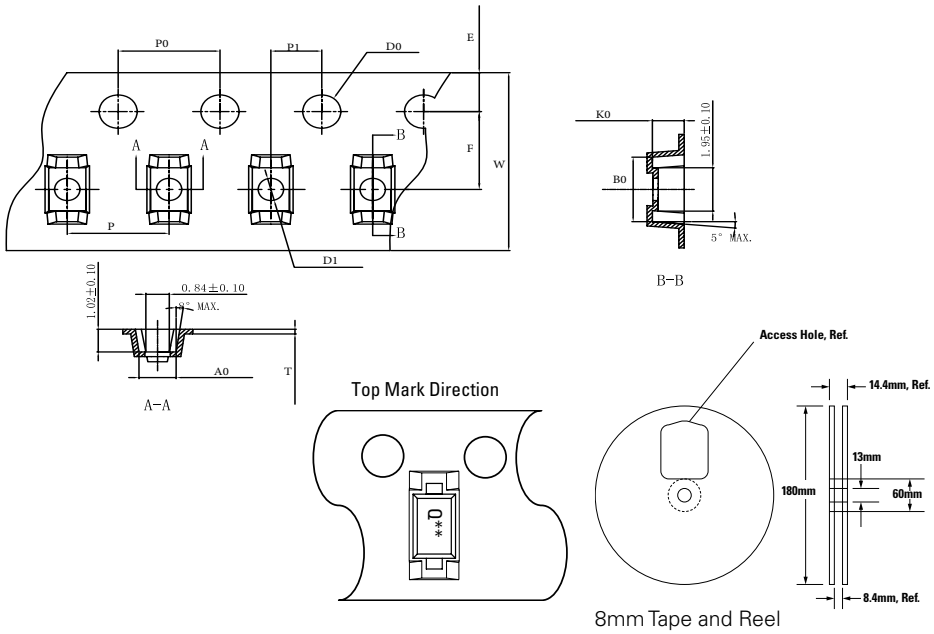
Package Dimensions — SOD323



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A2	0.80	0.90	0.031	0.035
b	0.25	0.35	0.010	0.014
c	0.08	0.15	0.003	0.006
D	1.20	1.40	0.047	0.055
E	1.60	1.80	0.063	0.071
E1	2.50	2.75	0.098	0.108
L1	0.25	0.40	0.010	0.016
L	0.475 REF		0.019 REF	
θ	0°	8°	7°	8°

Embossed Carrier Tape & Reel Specification — SOD323



Symbol	Millimeters
A0	1.36min/1.62max
B0	2.85min/3.40max
W	8.0+0.3/-0.10
D0	1.40min/1.60max
D1	ø0.95min/ø1.25max
E	1.75+/-0.10
F	3.50+/-0.10
P0	4.00+/-0.10
P	4.00+/-0.10
P1	2.00+/-0.10
K0	1.15min/1.45max
T	0.254+/-0.02

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