

AQ4022 Series 1.3pF, 15A Discrete TVS Diode





Description

The AQ4022 series integrates low capacitance steering diodes with one or two avalanche breakdown diodes for unidirectional or bidirectional protection, respectively, to protect against ESD and lightning induced surge events. These components can safely absorb up to 15A per IEC 61000-4-5 $2^{\rm nd}$ edition (t $_{\rm p}$ =8/20 μ s) without performance degradation and a minimum $\pm 30 \rm kV$ ESD per IEC 61000-4-2 International Standard. The low loading capacitance and high surge capability make it ideal for protecting telecommunication ports such as xDSL and other high voltage, high speed legacy interfaces.

Pinout



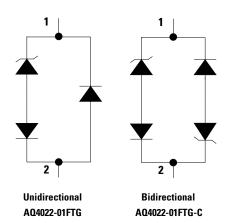
Cathode polarity for unidirectional only

Features

- ESD, IEC 61000-4-2, ±30kV contact, ±30kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, IEC 61000-4-5 2nd edition, 15A (t_p=8/20µs)
- Low capacitance of 1.3pF (@ V_R=0V)
- Low leakage current

- Unidirectional and bidirectional configuration
- Small SOD323 package fits 0805 footprints
- AEC-Q101 Qualified
- Moisture Sensitivity Level(MSL -1)
- Halogen free, lead free and RoHS compliant

Functional Block Diagram



Applications

- xDSL Interfaces
- RS-232
- RS-485
- Power Ports
- Security Equipment
- Instrumentation

- Medical Equipment
- Computers and Peripherals
- CAN Bus protection
- Automotive applications

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.



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I _{pp}	Peak Current (t _p =8/20µs)	15	А
P_{pk}	Peak Pulse Power (t _p =8/20µs)	500	W
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.

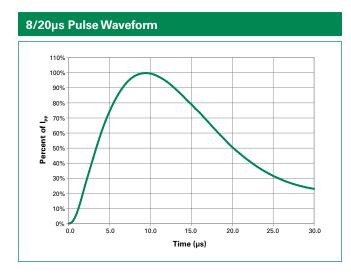
Electrical Characteristics (T_{OP}=25°C)

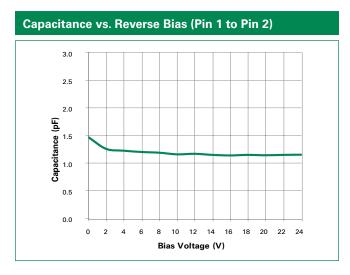
Parameter	Symbol	Test Conditions	Min	Тур	Max	Units
Reverse Standoff Voltage	V _{RWM}	I _R ≤1μA with Pin 1 to Pin 2	-	-	12	V
Breakdown Voltage	V _{BD}	I _T =1mA with Pin 1 to Pin 2	13.3	-	-	V
Leakage Current	I _{LEAK}	V _R =12V with Pin 1 to Pin 2	-	-	0.1	μA
Clamp Voltage ¹	V _c	I _{pp} =1A, t _p =8/20μs, Fwd	-	19	-	V
		I _{pp} =2A, t _p =8/20μs, Fwd	-	20	-	V
		$I_{pp} = 10A$, $t_{p} = 8/20 \mu s$, Fwd	-	28	-	V
		I _{pp} =15A, t _p =8/20μs, Fwd	-	33	-	V
Dynamic Resistance ²	R _{DYN}	TLP t _o =100ns, Pin 1 to Pin 2	-	0.5	-	Ω
ESD Withstand Voltage ¹	V _{ESD} -	IEC 61000-4-2 (Contact Discharge)	±30	-	-	kV
		IEC 61000-4-2 (Air Discharge)	±30	-	-	kV
Diode Capacitance ¹	C _D	Reverse Bias=0V, f=1MHz, Pin 1 to Pin 2	-	1.3	2	pF

Note:

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

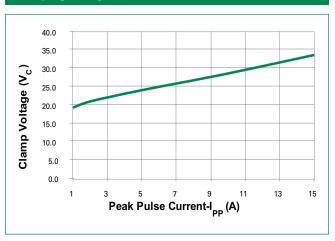
2. Transmission Line Pulse (TLP) test setting: Std.TDR(50Ω),tp=100ns, tr=0.2ns ITLP and VTLP averaging window: start 1=70ns to end t2=80ns



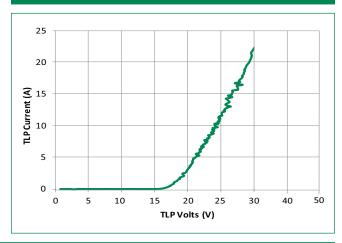




Clamping Voltage vs. Peak Pulse Current (Pin 1 to Pin 2)

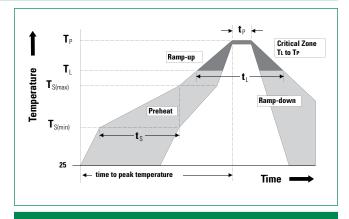


Transmission Line Pulsing (TLP) Plot (Pin 1 to Pin2)

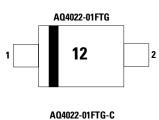


Soldering Parameters

Reflow Condition		Pb – Free assembly	
	-Temperature Min (T _{s(min)})	150°C	
Pre Heat	-Temperature Max (T _{s(max)})	200°C	
	-Time (min to max) (t _s)	60 – 180 secs	
Average ram	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 exce	260°C		



Part Marking System





Ordering Information

Part Number	Package	Marking	Min. Order Qty.
AQ4022-01FTG	SOD323	12	3000
AQ4022-01FTG-C	SOD323	12C	3000

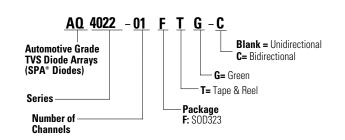
Product Characteristics

Lead Plating	Matte tin	
Lead Material	Copper Alloy	
Lead Coplanarity	0.0004 inches (0.102mm)	
Substrate material	Silicon	
Body Material	Molded Compound	
Flammability	UL Recognized compound meeting flammability rating V-0	

Notes:

- 1. All dimensions are in millimeters
- Dimensions include solder plating.
 Dimensions are exclusive of mold flash & metal burn.

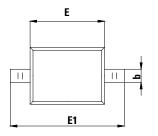
Part Numbering System

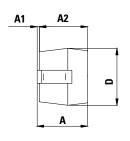


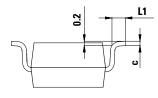
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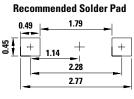


Package Dimensions -SOD323





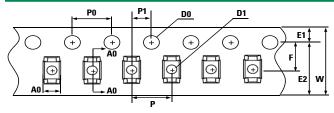


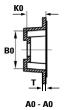


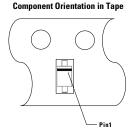
Unit: mm

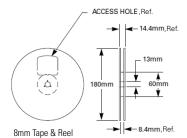
	SOD323				
Symbol	Millimeters		Inches		
	Min	Max	Min	Max	
Α	0.80	1.00	0.031	0.039	
A 1	0.00	0.10	0.000	0.004	
A2	0.80	0.90	0.031	0.035	
b	0.25	0.35	0.010	0.014	
С	0.08	0.15	0.003	0.006	
D	1.20	1.40	0.047	0.055	
E	1.60	1.80	0.063	0.071	
E1	2.50	2.70	0.098	0.106	
L1	0.25	0.40	0.010	0.016	

Embossed Carrier Tape & Reel Specification — SOD323









Symbol	Millimeters
A0	1.46+/-0.10
В0	2.90+/-0.10
W	8.0+0.3/-0.10
D0	1.50+0.10
D1	0.45min/1.15max
E1	1.75+/-0.10
E2	-
F	3.50+/-0.10
P0	4.00+/-0.10
P	4.00+/-0.10
P1	2.00+/-0.05
КО	1.25+/-0.10
Т	0.254+/-0.02

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