

AQ4023 Series 1.3pF, 12A Discrete TVS Diode

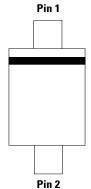




Description

The AQ4023 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 12A 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



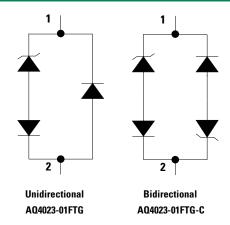
Cathode polarity for unidirectional only

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, 12A (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)	12	А
P_{pk}	Peak Pulse Power (t _p =8/20µs)	450	W
T _{OP}	Operating Temperature	-40 to 150	°C
T _{STOR}	Storage Temperature	-55 to 150	°C

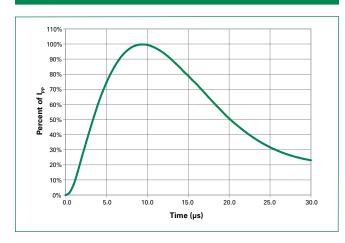
CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied.

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

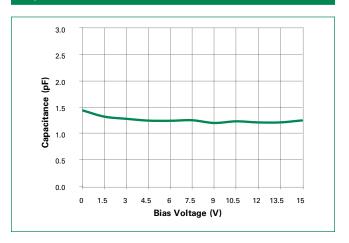
Parameter	Symbol	Test Conditions	Min	Тур	Max	Units
Reverse Standoff Voltage	V _{RWM}	I _R ≤1μA with Pin 1 to Pin 2	-	-	15	V
Breakdown Voltage	V _{BD}	I _T =1mA with Pin 1 to Pin 2	16	-	-	V
Leakage Current	LEAK	V _R =15V with Pin 1 to Pin 2	-	-	0.1	μА
	V _c	I _{pp} =1A, t _p =8/20μs, Fwd	-	23	-	V
Clause Nalka es 1		I _{pp} =2A, t _p =8/20μs, Fwd	-	24	-	V
Clamp Voltage ¹		$I_{pp}=10A, t_{p}=8/20\mu s, Fwd$	-	35	-	V
		I _{pp} =12A, t _p =8/20μs, Fwd	-	37.5	-	V
Dynamic Resistance ²	R _{DYN}	TLP t _p =100ns, Pin 1 to Pin 2	-	0.55	-	Ω
=======================================	.,	IEC 61000-4-2 (Contact Discharge)	±30	-	-	kV
ESD Withstand Voltage ¹	V _{ESD}	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

- 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

8/20µs Pulse Waveform

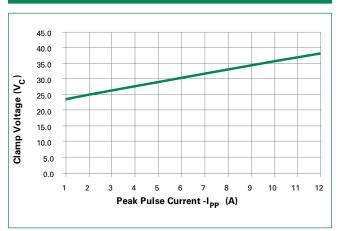


Capacitance vs. Reverse Bias (Pin 1 to Pin 2)

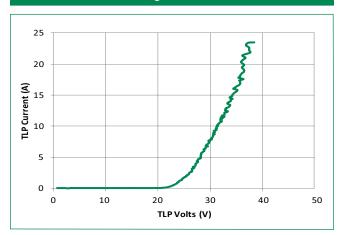




Clamping Voltage vs. Peak Pulse Current (Pin 1 to Pin 2)

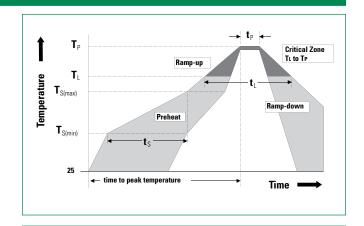


Transmission Line Pulsing (TLP) Plot (Pin 1 to Pin2)



Soldering Parameters

Reflow Cond	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 ram	3°C/second max		
T _{S(max)} to T _L -	3°C/second max		
Reflow	-Temperature (T _L) (Liquidus)	217°C	
	-Temperature (t _L)	60 – 150 seconds	
Peak Temper	260 ^{+0/-5} °C		
Time within	20 - 40 seconds		
Ramp-down	6°C/second max		
Time 25°C to	8 minutes Max.		
Do not exce	260°C		



Part Marking System





Ordering Information

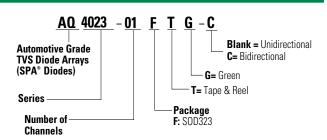
Part Number	Package	Marking	Min. Order Qty.
AQ4023-01FTG	SOD323	15	3000
AQ4023-01FTG-C	SOD323	15C	3000

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	

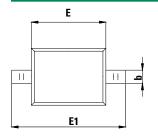
- 1. All dimensions are in millimeters
- 2. Dimensions include solder plating.
 3. Dimensions are exclusive of mold flash & metal burn.

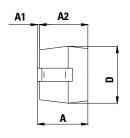
Part Numbering System

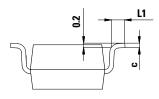


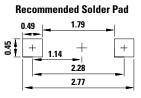


Package Dimensions -SOD323





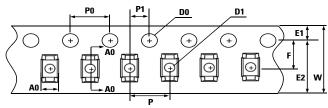


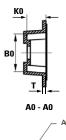


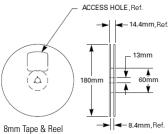
Unit: mm

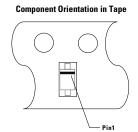
	SOD323			
Symbol Millin		meters	Inc	hes
	Min	Max	Min	Max
Α	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A2	0.80	0.90	0.031	0.035
b	0.25	0.35	0.010	0.014
С	0.08	0.15	0.003	0.006
D	1.20	1.40	0.047	0.055
E	1.60	1.80	0.063	0.071
E1	2.50	2.70	0.098	0.106
L1	0.25	0.40	0.010	0.016

Embossed Carrier Tape & Reel Specification — SOD323









Symbol	Millimeters	
Α0	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	
K0	1.25+/-0.10	
Т	0.254+/-0.02	