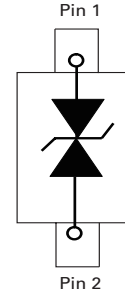


Description

The AQ3522-01FTG integrates ultra low capacitance diodes to provide protection for electronic equipment that may experience destructive electrostatic discharges (ESD). This robust component can safely absorb repetitive ESD strikes above the maximum level specified in the IEC 61000-4-2 international standard (Level 4, $\pm 8\text{kV}$ contact discharge) without performance degradation. The extremely low loading capacitance also makes it ideal for protecting high speed signal pins such as V-By-One[®], HDMI, USB3.0 and USB2.0.



Features

- ESD, IEC 61000-4-2, $\pm 22\text{kV}$ contact, $\pm 30\text{kV}$ air
- EFT, IEC 61000-4-4, 40A ($t_p=5/50\text{ns}$)
- Lightning, 2.5A (8/20 μs as defined in IEC 61000-4-5 2nd edition)
- Low capacitance of 0.15pF (TYP) at 3GHz
- ESD, ISO 10605, 330pF 330 Ω , $\pm 20\text{kV}$ contact, $\pm 20\text{kV}$ air
- Facilitates excellent signal integrity
- PPAP capable

Applications

- Ultra-high speed data lines
- USB 3.1, 3.0, 2.0
- HDMI 2.0, 1.4a, 1.3
- DisplayPort^(TM)
- V-by-One[®]
- LVDS interfaces
- Automotive application
- Consumer, mobile and portable electronics
- Tablet PC and external storage with high speed interfaces
- Applications requiring high ESD performance in small packages

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current ($t_p=8/20\mu s$)	2.5	A
T_{OP}	Operating Temperature	-40 to 150	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

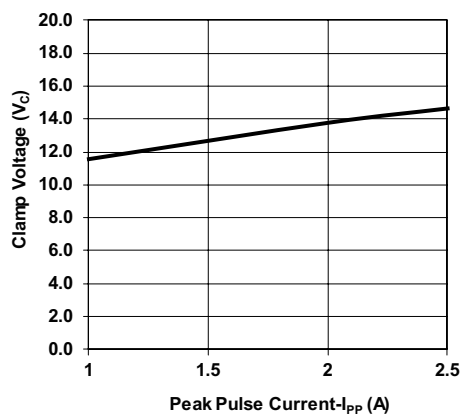
Electrical Characteristics^① ($T_{OP}=25\text{ C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}	$I_R=1\mu A$			5	V
Breakdown Voltage	V_{BR}	$I_R=1\text{ mA}$	8.5	9.2		V
Reverse Leakage Current	I_{LEAK}	$V_R=5\text{ V}$		0.02	0.1	μA
Clamp Voltage ¹	V_C	$I_{PP}=2.5\text{ A}$, $t_p=8/20\mu s$, I/O to GND		15.5	18	V
Dynamic Resistance ²	R_{DYN}	TLP, $t_p=100\text{ ns}$, I/O to GND		1.2		Ω
ESD Withstand Voltage ¹	V_{ESD}	IEC 61000-4-2 (Contact)	± 22			kV
		IEC 61000-4-2 (Air)	± 30			kV
Diode Capacitance ^{1,3}	$C_{I/O-GND}$	Reverse Bias=0V, f= 3 GHz		0.15		pF

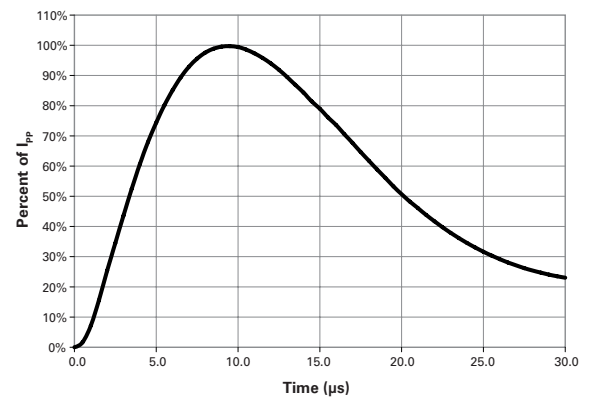
Note:

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 $t_2=90\text{ ns}$.
3. Package sizes larger than 0201 can add parasitic capacitance, inductance and resistance.

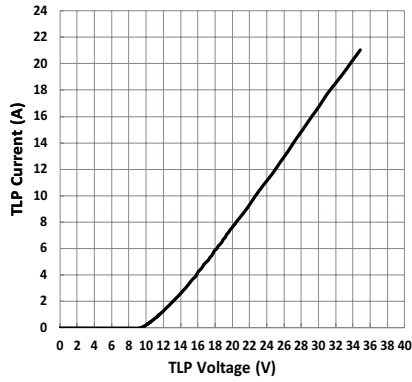
Clamping voltage vs. I_{PP} for 8/20 μs waveshape



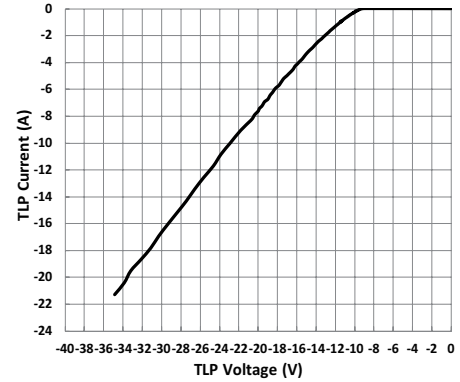
8/20 μs Pulse Waveform



Positive Transmission Line Pulsing (TLP) Plot



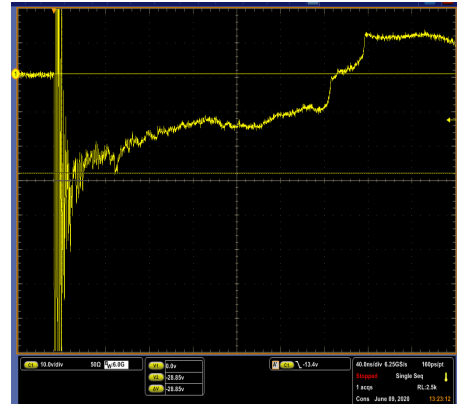
Negative Transmission Line Pulsing (TLP) Plot



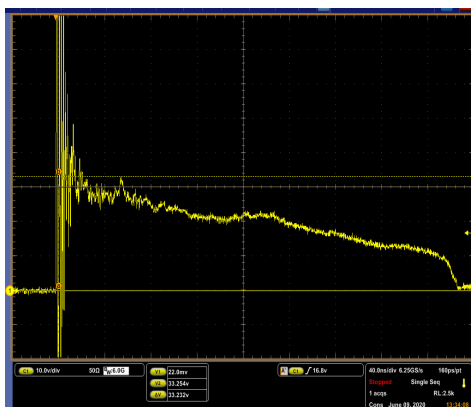
IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage



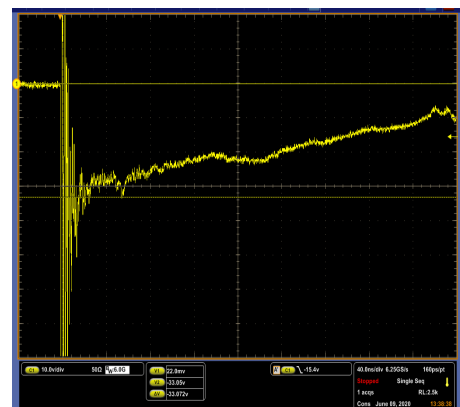
IEC 61000-4-2 -8 kV Contact ESD Clamping Voltage



ISO10605 (C:330pF, R:330Ω) contact discharge plot at +8kV

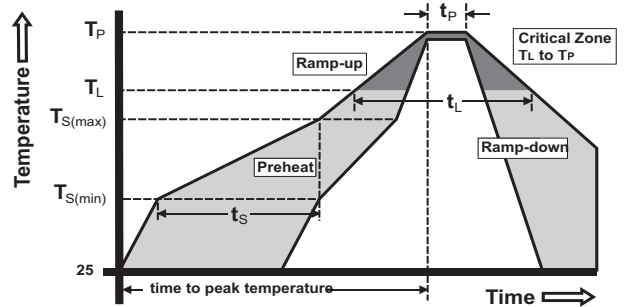


ISO10605 (C:330pF, R:330Ω) contact discharge plot at -8kV



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 – 180 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)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes Max.
Do not exceed		260°C



Product Characteristics

Lead Plating	Matte Tin
Lead Material	Copper Alloy
Lead Coplanarity	0.004 inches(0.102mm)
Substrate Material	Silicon
Body Material	Molded Compound
Flammability	UL Recognized compound meeting flammability rating V-0

Marking

Ordering information

Order code	Package	Base qty	Delivery mode
UMW AQ3522-01FTG	SOD-323	3000	Tape and reel

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