



aAM3202 / aAM3203

ULTRA LOW POWER, DUAL-SPDT
CMOS ANALOG SWITCHES

Preliminary Specification

PRODUCT SPECIFICATION

General Description

The aAM3202 and aAM3203 are precision CMOS analog dual-SPDT switches or 2:1 multiplexers offering low on-resistance of less than 4Ω , with better than 0.4Ω matching between channels and on-resistance flatness of less than 1.2Ω over the specified analog input voltage range. The aAM3202 and aAM3203 have very fast turn-on switching speed of less than 16nS over the full operating temperature range of -40°C to 85°C . The aAM3202 and aAM3203 also consume a minimal amount of power, making them ideal for portable equipment.

The aAM3202 and aAM3203 connect 1-of-2 inputs to a common output by control of a select pin in a dual configuration. The aAM3202 has an inverted switch logic compared to the aAM3203. The parts are available in a 10-contact leadless QFN package and operate over the range from 1.8V to 5.5V .

Features (at $5\text{V } V_{DD}$)

- Low On-Resistance: 4Ω Max
- Guaranteed On-Resistance Match Between Channels, $< 0.4\Omega$
- Guaranteed Flat On-Resistance Over Specified Signal Range, $< 1.2\Omega$.
- Turn-On Time: 12nS at 25°C
- Turn-Off Time: 5nS at 25°C
- Break Before Make Interval: 7nS typ
- Temperature Range: -40°C to 85°C
- Uses a Single Supply, 3V to 5V Nominal

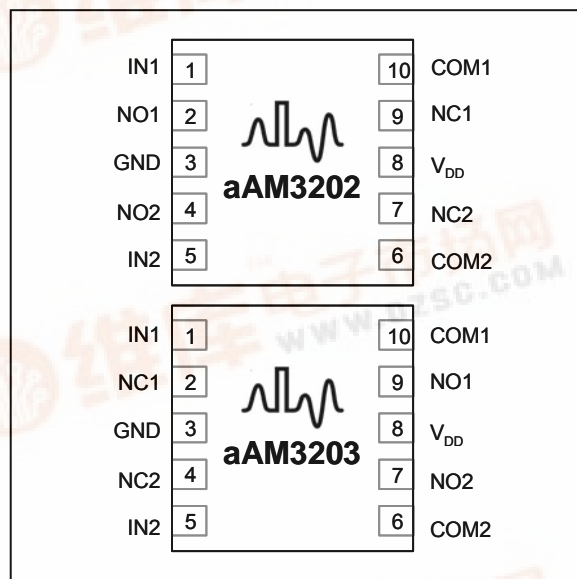
Applications

- Mobile Communications
- Computers and Peripherals
- Battery Management
- FAX Machines/Printers/Copiers
- Portable Medical Instruments

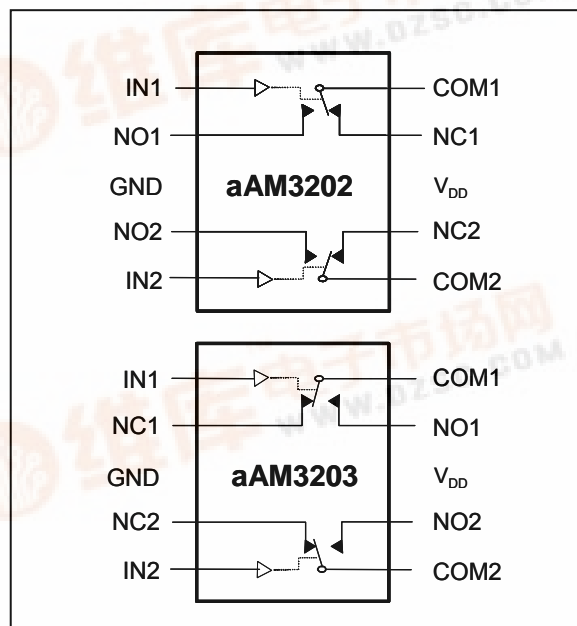
Ordering Information

Part Number	Package	Temperature Range	Part Marking	How Supplied
aAM3202Q10	10-Lead QFN	-40°C to $+85^\circ\text{C}$	aAM3202	3000 units on T&R
aAM3203Q10	10-Lead QFN	-40°C to $+85^\circ\text{C}$	aAM3203	3000 units on T&R

Pin Configuration



Functional Diagrams





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Absolute Maximum Ratings¹

Parameter	Rating
Supply Voltage	+7V
Analog Input/Output Voltage	-0.5V to $V_{DD} + 0.5V$
IN1/IN2 Input Voltage	-0.5V to +7V
Continuous Current, any terminal	50mA
Storage Temperature Range	-60°C to +150°C
Lead Soldering Temperature	260°C
ESD ²	Human Body Model
	Machine Model
Thermal Resistance - θ_{JA}	TBD
Lead Temperature	260°C

NOTES:

1. Absolute maximum ratings are limits beyond which operation may cause permanent damage to the device. These are stress ratings only; functional operations at or above these limits is not implied.
2. Human Body Model: 100pF capacitor discharged through a 1.5k Ω resistor into each pin. Machine Model: 200pF capacitor discharged directly into each pin.
3. These specifications are guaranteed only for the test conditions listed.

Recommended Operating Ratings

Symbol	Parameter	Min	Max	Units
V_{DD}	Supply Voltage	+1.8	+6	V
V_{NO} , V_{NC} , V_{COM}	Analog Signal Level	0	V_{DD}	V
T_A	Operating Temperature Range	-40	+85	°C

DC Electrical Characteristics (Digital section)³

Limits apply for $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ and $V_{DD} = +5.0V$ unless otherwise noted.

Parameter	Symbol	Conditions	Min	Max	Units
Min Hi-Level Input Voltage	V_{IH}	$-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ $V_{DD} = +2.7V$ $V_{DD} = +4.5V$	2.0V 2.4V		V
Max Low-Level Input Voltage	V_{IL}	$-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ $V_{DD} = +2.7V$ $V_{DD} = +4.5V$		0.4V 0.8V	V
Digital Input Leakage	I_{IN}	$V_{ADD} \& V_{EN} = 0V \text{ or } +5.5V$ $V_{DD} = +5.5V$ $T_A = +25^\circ\text{C}$ $T_A = -40^\circ\text{C to } +85^\circ\text{C}$	-0.1 -1.0	0.1 1.0	μA
Digital Input Power OFF Leakage	I_{OFF}	$V_{ADD} \& V_{EN} = 0V \text{ or } +5.5V$ $V_{DD} = 0V$ $T_A = +25^\circ\text{C}$ $T_A = -40^\circ\text{C to } +85^\circ\text{C}$	-0.1 -1.0	0.1 1.0	μA

DC Electrical Characteristics (Analog Section)³

Limits apply for $-40^\circ\text{C} \leq T_A \leq +85^\circ\text{C}$ and $V_{DD} = +5.0V$ unless otherwise noted.

Parameter	Symbol	Conditions	Min	Typ	Max	Units
ON-Resistance	R_{ON}	$I_{NO} = -10mA$ $V_{COM} = 0V \text{ to } +5V$ $T_A = +25^\circ\text{C}$ $T_A = -40^\circ\text{C to } +85^\circ\text{C}$		2	4	Ω
		$I_{NO} = -10mA$ $V_{COM} = 0V \text{ to } +3V$ $T_A = +25^\circ\text{C}$ $T_A = -40^\circ\text{C to } +85^\circ\text{C}$		4	7	Ω
ON-Resistance channel matching	ΔR_{ON}	$I_{NO} = -10mA$, $V_{DD} = +4.5V$ $V_{COM} = 0 \text{ to } V_{DD}$ $T_A = +25^\circ\text{C}$ $T_A = -40^\circ\text{C to } +85^\circ\text{C}$		0.1	0.4	Ω
		$I_{NO} = -10mA$, $V_{DD} = +2.7V$ $V_{COM} = 0 \text{ to } V_{DD}$ $T_A = +25^\circ\text{C}$ $T_A = -40^\circ\text{C to } +85^\circ\text{C}$		0.1	0.4	Ω
ON-Resistance Flatness	R_{FLAT}	$I_{NO} = -10mA$, $V_{DD} = +5V$ $V_{COM} = +1V, +2.5V, +4V$ $T_A = +25^\circ\text{C}$ $T_A = -40^\circ\text{C to } +85^\circ\text{C}$		0.5	1.2	Ω
		$I_{NO} = -10mA$, $V_{DD} = 3V$ $V_{COM} = +.6V, +1.5V, +2.4V$ $T_A = +25^\circ\text{C}$ $T_A = -40^\circ\text{C to } +85^\circ\text{C}$		1.5	2.5	Ω
Supply Current	I_{DD}	$V_{DD} = +3.3V \text{ or } +5.5V$, $V_{ADD} \& V_{EN} = 0V$ $T_A = +25^\circ\text{C}$ $T_A = -40^\circ\text{C to } +85^\circ\text{C}$		0.1	1	μA



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Dynamic Electrical Characteristics³

Limits apply for $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ and $V_{DD} = +5.0\text{V}$ unless otherwise noted.

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Turn-On Time	$t_{ON(EN)}$	$V_{DD} = +5\text{V}, V_{NO} = 3\text{V}$ $C_L = 35\text{pF}, R_L = 300\Omega$	$T_A = +25^{\circ}\text{C}$ $T_A = -40^{\circ}\text{C to } +85^{\circ}\text{C}$		12	16	ns
		$V_{DD} = +3\text{V}, V_{NO} = 2\text{V}$ $C_L = 35\text{pF}, R_L = 300\Omega$	$T_A = +25^{\circ}\text{C}$ $T_A = -40^{\circ}\text{C to } +85^{\circ}\text{C}$		14	20	ns
Turn-Off Time	$t_{OFF(EN)}$	$V_{DD} = +5\text{V}, V_{NO} = 3\text{V}$ $C_L = 35\text{pF}, R_L = 300\Omega$	$T_A = +25^{\circ}\text{C}$ $T_A = -40^{\circ}\text{C to } +85^{\circ}\text{C}$		5	8	ns
		$V_{DD} = +3\text{V}, V_{NO} = 2\text{V}$ $C_L = 35\text{pF}, R_L = 300\Omega$	$T_A = +25^{\circ}\text{C}$ $T_A = -40^{\circ}\text{C to } +85^{\circ}\text{C}$		6	10	ns
Break-Before-Make Interval	t_{OPEN}	$V_{DD} = +5\text{V}, V_{NO} = 3\text{V}$ $C_L = 35\text{pF}, R_L = 300\Omega$	$T_A = +25^{\circ}\text{C}$ $T_A = -40^{\circ}\text{C to } +85^{\circ}\text{C}$	1	7		ns
		$V_{DD} = +3\text{V}, V_{NO} = 2\text{V}$ $C_L = 35\text{pF}, R_L = 300\Omega$	$T_A = +25^{\circ}\text{C}$ $T_A = -40^{\circ}\text{C to } +85^{\circ}\text{C}$	1	7		ns
Logic Input Cap.	C_{IN}	$f = 1\text{MHz}$	$T_A = +25^{\circ}\text{C}, f = 1\text{MHz}$		8		pF
NO-off, NC-off-ch Cap.	$C_{NO(OFF)}$	$f = 1\text{MHz}; V_{EN} = V_{NO} = 0\text{V}$	$T_A = +25^{\circ}\text{C}, f = 1\text{MHz}$		8		pF
COM-On-ch Cap	$C_{COM(ON)}$	$V_{EN} = +2.4\text{V}; V_{COM} = 0\text{V}$	$T_A = +25^{\circ}\text{C}, f = 1\text{MHz}$		32		pF

Test Circuits / Timing Diagrams

Figure 1. Switching Time

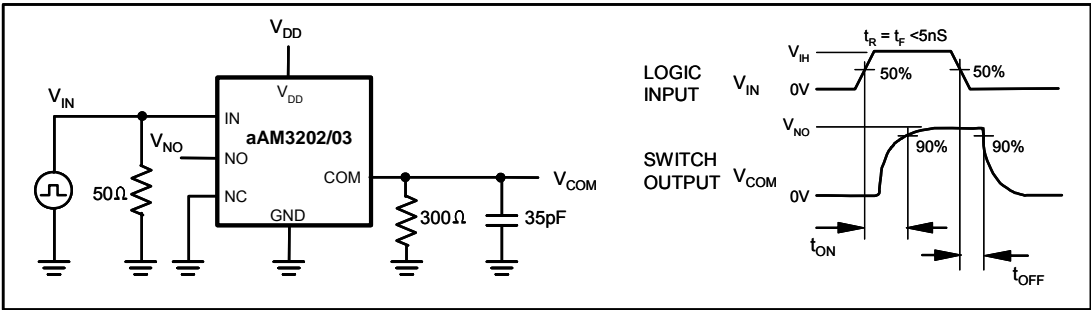
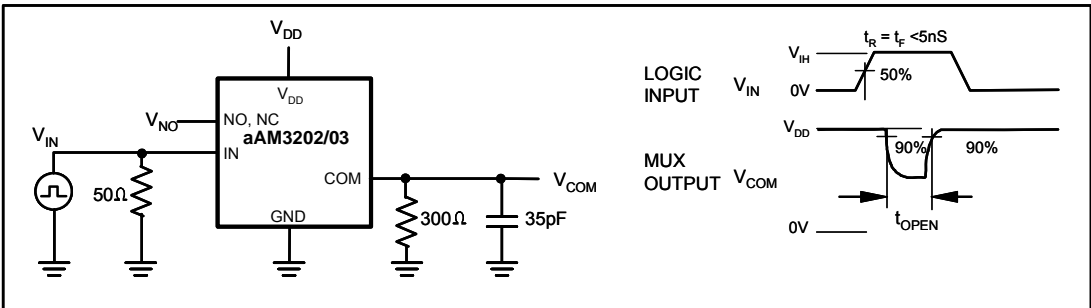


Figure 2. Break-Before-Make Interval

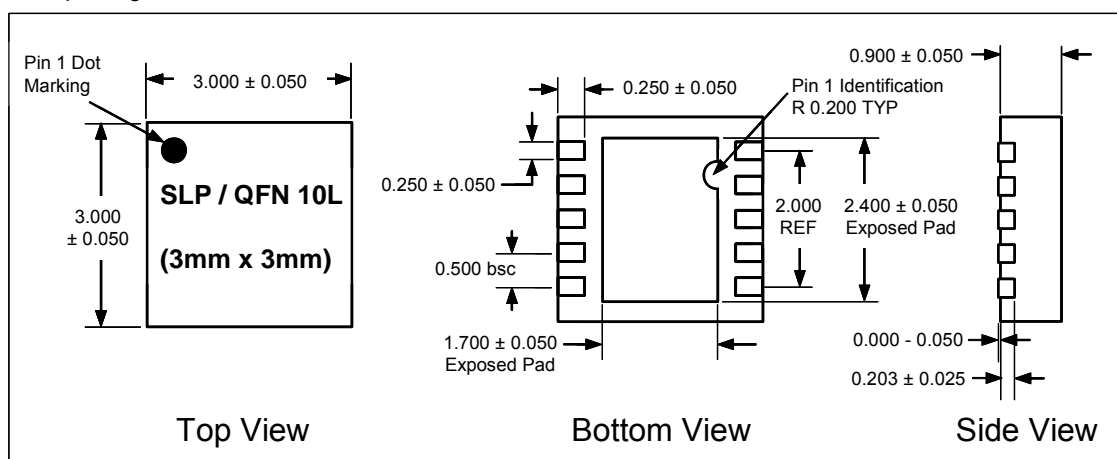


Truth Table - aAM3202 or aAM3203

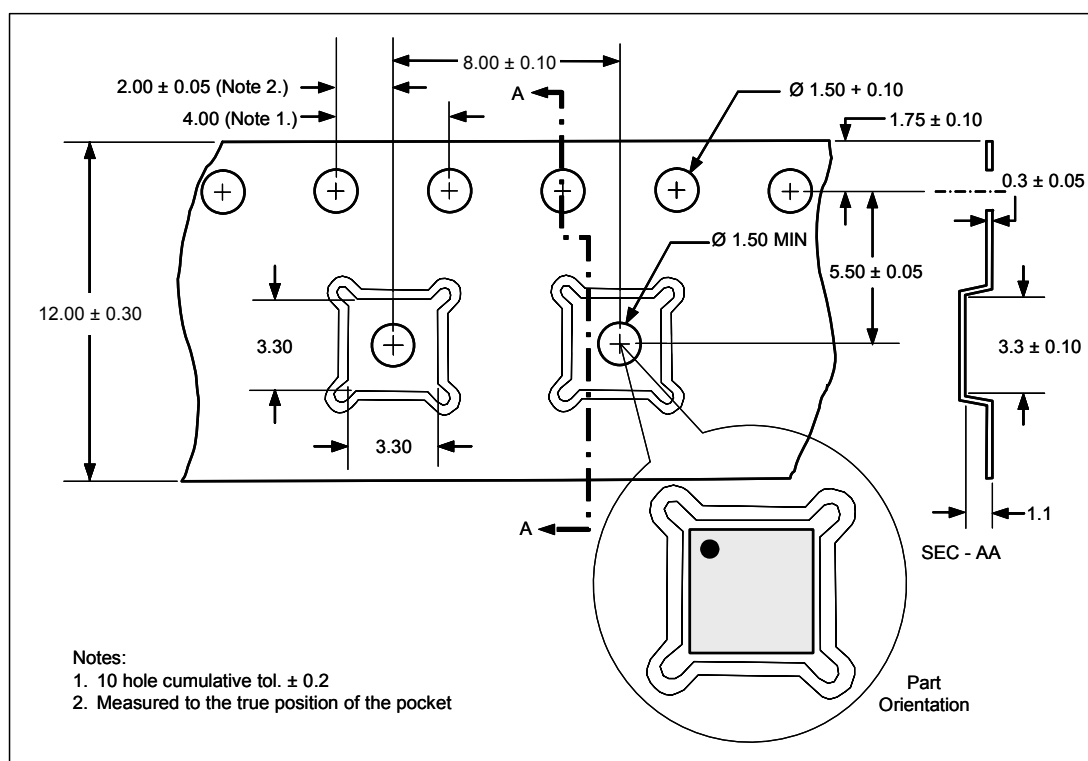
IN1	COM1 Connection	IN2	COM2 Connection
0	NC1	0	NC2
1	NO1	1	NO2

Packaging Information

This QFN package is lead-free.



Tape & Reel Dimensions





Data Sheet Classifications

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This classification is shown on the heading of each page of a specification for products that are either under development (design and qualification), or in the formative planning stages. Andigilog reserves the right to change or discontinue these products without notice.

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