PCN 14_0067

ADG5208/ADG5209 Data Sheet Changes

Rev. A to Rev. B

This document highlights the performance differences between the Rev.A and Rev.B data sheet for the ADG5208 and ADG5209 Analog Multiplexers.

For full product information and changes to Typical Performance Characteristics plots please refer to the ADG5208/09 Rev.B data sheet.

1. HBM ESD

HBM ESD	Rev A	Rev B
I/O Port to Supplies	4kV	8kV
I/O Port to I/O Port	1kV	2kV
All other pins	4kV	8kV

2. Datasheet specification changes from Rev. A to Rev. B

Tables 1 to 4 outline a datasheet specification comparison of Rev. A to Rev. B material. The changed specifications are highlighted in red font.

SPECIFICATION CHANGES FROM Rev. A to Rev. B

Table 1. V_{DD} = +15 V ± 10%, V_{SS} = −15 V ± 10%, GND = 0 V, unless otherwise noted.

Parameter	Rev.A 25°C	Rev.A −40°C to +85°C	Rev.A −40°C to +125°C	Rev. B 25°C	Rev. B −40°C to +85°C	Rev. B −40°C to +125°C	Unit	Test Conditions/ Comments
ANALOG SWITCH								
Analog Signal Range			V_{DD} to V_{SS}			V_{DD} to V_{SS}	V	
On Resistance, R_{ON}	160			160			Ω typ	V_S = ±10 V, I_S = −1 mA
	200	250	280	200	250	280	Ω max	V_{DD} = +13.5 V, V_{SS} = −13.5 V
On-Resistance Match Between Channels, ΔR_{ON}	3.5			3.5			Ω typ	V_S = ±10 V, I_S = −1 mA
	8	9	10	8	9	10	Ω max	
On-Resistance Flatness, $R_{FLAT (ON)}$	40			40			Ω typ	V_S = ±10 V, I_S = −1 mA
	50	65	70	50	65	70	Ω max	
LEAKAGE CURRENTS								V_{DD} = +16.5 V, V_{SS} = −16.5 V
Source Off Leakage, I_S (Off)	±0.005			±0.005			nA typ	V_S = ±10 V, V_D = ±10 V
	±0.1	±0.2	±0.4	±0.1	±0.2	±0.4	nA max	
Drain Off Leakage, I_D (Off)	±0.005			±0.005			nA typ	V_S = ±10 V, V_D = ±10 V
	±0.1	±0.4	±1.4	±0.1	±0.4	±1.4	nA max	
Channel On Leakage, I_D (On), I_S (On)	±0.01			±0.01			nA typ	± V_S = V_D = ±10 V
	±0.2	±0.5	±1.4	±0.2	±0.5	±1.4	nA max	
DIGITAL INPUTS								
Input High Voltage, V_{INH}			2			2	V min	
Input Low Voltage, V_{INL}			0.8			0.8	V max	
Input Current, I_{INL} or I_{INH}	0.002			0.002			μA typ	V_{IN} = V_{GND} or V_{DD}
			±0.1			±0.1	μA max	
Digital Input Capacitance, C_{IN}	3			3			pF typ	
Dynamic Characteristics[1]								
Transition Time, $t_{TRANSITION}$	170			150			ns typ	R_L = 300 Ω, C_L = 35 pF
	205	245	275	180	210	245	ns max	V_S = 10 V
t_{ON} (EN)	145			125			ns typ	R_L = 300 Ω, C_L = 35 pF
	185	220	245	150	185	215	ns max	V_S = 10 V
t_{OFF} (EN)	120			160			ns typ	R_L = 300 Ω, C_L = 35 pF
	145	165	180	185	210	230	ns max	V_S = 10 V
Break-Before-Make Time Delay, t_D	65			55			ns typ	R_L = 300 Ω, C_L = 35 pF
			30			25	ns min	V_{S1} = V_{S2} = 10 V
Charge Injection, Q_{INJ}	0.4			0.2			pC typ	V_S = 0 V, R_S = 0 Ω, C_L = 1 nF
Off Isolation	−90			−86			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz
Channel-to-Channel Crosstalk	−90			−80			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz
−3 dB Bandwidth								R_L = 50 Ω, C_L = 5 pF
ADG5208	54			110			MHz typ	
ADG5209	133			240			MHz typ	
Insertion Loss	−6.4			−6.4			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz
C_S (Off)	5.5			2.9			pF typ	V_S = 0 V, f = 1 MHz
C_D (Off)								
ADG5208	52			34			pF typ	V_S = 0 V, f = 1 MHz
ADG5209	26			17			pF typ	V_S = 0 V, f = 1 MHz
C_D (On), C_S (On)								
ADG5208	58			37			pF typ	V_S = 0 V, f = 1 MHz
ADG5209	31			21			pF typ	V_S = 0 V, f = 1 MHz
POWER REQUIREMENTS								V_{DD} = +16.5 V, V_{SS} = −16.5 V
I_{DD}	45			45			μA typ	Digital inputs = 0 V or V_{DD}
	55		70	55		70	μA max	
I_{SS}	0.001			0.001			μA typ	Digital inputs = 0 V or V_{DD}
			1			1	μA max	
V_{DD}/V_{SS}			±9/±22			±9/±22	V min/V max	GND = 0 V

1 Guaranteed by design, not subject to production test.

Table 2. V_{DD} = +20V ± 10%, V_{SS} = −20 V ± 10%, GND = 0 V, unless otherwise noted.

Parameter	Rev.A 25°C	Rev.A −40°C to +85°C	Rev.A −40°C to +125°C	Rev. B 25°C	Rev. B −40°C to +85°C	Rev. B −40°C to +125°C	Unit	Test Conditions/ Comments
ANALOG SWITCH								
Analog Signal Range			V_{DD} to V_{SS}			V_{DD} to V_{SS}	V	
On Resistance, R_{ON}	140			140			Ω typ	V_S = ±15 V, I_S = −1 mA
	160	200	230	160	200	230	Ω max	V_{DD} = +18 V, V_{SS} = −18 V
On-Resistance Match Between Channels, ΔR_{ON}	3.5			3.5			Ω typ	V_S = ±15 V, I_S = −1 mA
	8	9	10	8	9	10	Ω max	
On-Resistance Flatness, $R_{FLAT (ON)}$	34			34			Ω typ	V_S = ±15 V, I_S = −1 mA
	45	55	60	45	55	60	Ω max	
LEAKAGE CURRENTS								V_{DD} = +22 V, V_{SS} = −22 V
Source Off Leakage, I_S (Off)	±0.005			±0.005			nA typ	V_S = ±15 V, V_D = ±15 V
	±0.1	±0.2	±0.4	±0.1	±0.2	±0.4	nA max	
Drain Off Leakage, I_D (Off)	±0.005			±0.005			nA typ	V_S = ±15 V, V_D = ±15 V
	±0.1	±0.4	±1.4	±0.1	±0.4	±1.4	nA max	
Channel On Leakage, I_D (On), I_S (On)	±0.01			±0.01			nA typ	± V_S = V_D = ±15 V
	±0.2	±0.5	±1.4	±0.2	±0.5	±1.4	nA max	
DIGITAL INPUTS								
Input High Voltage, V_{INH}			2			2	V min	
Input Low Voltage, V_{INL}			0.8			0.8	V max	
Input Current, I_{INL} or I_{INH}	0.002			0.002			μA typ	V_{IN} = V_{GND} or V_{DD}
			±0.1			±0.1	μA max	
Digital Input Capacitance, C_{IN}	3			3			pF typ	
DYNAMIC CHARACTERISTICS[1]								
Transition Time, $t_{TRANSITION}$	160			140			ns typ	R_L = 300 Ω, C_L = 35 pF
	195	225	255	170	195	220	ns max	V_S = 10 V
t_{ON} (EN)	145			120			ns typ	R_L = 300 Ω, C_L = 35 pF
	170	200	225	140	170	195	ns max	V_S = 10 V
t_{OFF} (EN)	120			160			ns typ	R_L = 300 Ω, C_L = 35 pF
	140	155	170	185	205	220	ns max	V_S = 10 V
Break-Before-Make Time Delay, t_D	55			45			ns typ	R_L = 300 Ω, C_L = 35 pF
			30			20	ns min	V_{S1} = V_{S2} = 10 V
Charge Injection, Q_{INJ}	0.3			0.4			pC typ	V_S = 0 V, R_S = 0 Ω, C_L = 1 nF
Off Isolation	−90			−86			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz
Channel-to-Channel Crosstalk	−90			−80			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz
−3 dB Bandwidth								R_L = 50 Ω, C_L = 5 pF
ADG5208	60			121			MHz typ	
ADG5209	130			255			MHz typ	
Insertion Loss	−5.6			−5.6			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz; see
C_S (Off)	5.5			2.8			pF typ	V_S = 0 V, f = 1 MHz
C_D (Off)								
ADG5208	51			33			pF typ	V_S = 0 V, f = 1 MHz
ADG5209	26			17			pF typ	V_S = 0 V, f = 1 MHz
C_D (On), C_S (On)								
ADG5208	57			36			pF typ	V_S = 0 V, f = 1 MHz
ADG5209	31			21			pF typ	V_S = 0 V, f = 1 MHz
POWER REQUIREMENTS								V_{DD} = +22 V, V_{SS} = -22 V
I_{DD}	50			50			μA typ	Digital inputs = 0 V or V_{DD}
	70		110	70		110	μA max	
I_{SS}	0.001			0.001			μA typ	Digital inputs = 0 V or V_{DD}
			1			1	μA max	
V_{DD}/V_{SS}			±9/±22			±9/±22	V min/V max	GND = 0 V

1 Guaranteed by design, not subject to production test.

Table 3. V_{DD} = +12V ± 10%, V_{SS} = 0V GND = 0 V, unless otherwise noted.

Parameter	Rev.A 25°C	Rev.A −40°C to +85°C	Rev.A −40°C to +125°C	Rev. B 25°C	Rev. B −40°C to +85°C	Rev. B −40°C to +125°C	Unit	Test Conditions/ Comments
ANALOG SWITCH								
Analog Signal Range			0 V to V_{DD}			0 V to V_{DD}	V	
On Resistance, R_{ON}	350			350			Ω typ	V_S = 0 V to 10V, I_S = −1 mA
	500		610	700	500	610	700	Ω max	V_{DD} = +10.8V, V_{SS} = 0 V
On-Resistance Match Between Channels, ΔR_{ON}	5			5			Ω typ	V_S = 0 V to 10V, I_s = −1 mA
	20		22	24	20	22	24	Ω max	
On-Resistance Flatness, $R_{FLAT (ON)}$	160			160			Ω typ	V_S = 0 V to 10V, I_S = −1 mA
	280		335	370	280	335	370	Ω max	
LEAKAGE CURRENTS								V_{DD} = 13.2 V, V_{SS} = 0V
Source Off Leakage, I_S (Off)	±0.005			±0.005			nA typ	V_s = 1V/10V, V_D = +10 V/1V
	±0.1	±0.2	±0.4	±0.1	±0.2	±0.4	nA max	
Drain Off Leakage, I_D (Off)	±0.005			±0.005			nA typ	V_s = 1V/10V, V_D = +10 V/1V
	±0.1	±0.4	±1.4	±0.1	±0.4	±1.4	nA max	
Channel On Leakage, I_D (On), I_S (On)	±0.01			±0.01			nA typ	± V_S = V_D = 1 V/10V
	±0.2	±0.5	±1.4	±0.2	±0.5	±1.4	nA max	
DIGITAL INPUTS								
Input High Voltage, V_{INH}			2			2	V min	
Input Low Voltage, V_{INL}			0.8			0.8	V max	
Input Current, I_{INL} or I_{INH}	0.002			0.002			µA typ	V_{IN} = V_{GND} or V_{DD}
			±0.1			±0.1	µA max	
Digital Input Capacitance, C_{IN}	3			3			pF typ	
DYNAMIC CHARACTERISTICS[1]								
Transition Time, $t_{TRANSITION}$	210			200			ns typ	R_L = 300 Ω, C_L = 35 pF
	270	330	380	250	295	335	ns max	V_S = 8 V
t_{ON} (EN)	215			180			ns typ	R_L = 300 Ω, C_L = 35 pF
	275	345	400	225	280	320	ns max	V_S = 8 V
t_{OFF} (EN)	115			165			ns typ	R_L = 300 Ω, C_L = 35 pF
	140	160	175	200	225	245	ns max	V_S = 8 V
Break-Before-Make Time Delay, t_D	135			95			ns typ	R_L = 300 Ω, C_L = 35 pF
			70			50	ns min	V_{S1} = V_{S2} = 8 V
Charge Injection, Q_{INJ}	0.3			0.2			pC typ	V_S = 6 V, R_S = 0 Ω, C_L = 1 nF
Off Isolation	−90			−86			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz
Channel-to-Channel Crosstalk	−90			−80			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz
−3 dB Bandwidth								R_L = 50 Ω, C_L = 5 pF
ADG5208	60			95			MHz typ	
ADG5209	120			180			MHz typ	
Insertion Loss	−8.8			−8.9			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz; see
C_S (Off)	6			3.3			pF typ	V_S = 0 V, f = 1 MHz
C_D (Off)								
ADG5208	56			38			pF typ	V_S = 0 V, f = 1 MHz
ADG5209	28			19			pF typ	V_S = 0 V, f = 1 MHz
C_D (On), C_S (On)								
ADG5208	63			41			pF typ	V_S = 0 V, f = 1 MHz
ADG5209	35			24			pF typ	V_S = 0 V, f = 1 MHz
POWER REQUIREMENTS								V_{DD} = 13.2
I_{DD}	40			40			µA typ	Digital inputs = 0 V or V_{DD}
	50		65	50		65	µA max	
V_{DD}			9/40			9/40	V min/V max	GND = 0 V, Vss=0V

1 Guaranteed by design, not subject to production test.

Table 4. V_{DD} = +36V ± 10%, V_{SS} = 0V GND = 0 V, unless otherwise noted.

Parameter	Rev.A 25°C	Rev.A −40°C to +85°C	Rev.A −40°C to +125°C	Rev. B 25°C	Rev. B −40°C to +85°C	Rev. B −40°C to +125°C	Unit	Test Conditions/ Comments
ANALOG SWITCH								
Analog Signal Range			0 V to V_{DD}			0 V to V_{DD}	V	
On Resistance, R_{ON}	150			150			Ω typ	V_S = ±10 V, I_S = −1 mA
	170	215	245	170	215	245	Ω max	V_{DD} = +13.5 V, V_{SS} = −13.5 V
On-Resistance Match Between Channels, ΔR_{ON}	3.5			3.5			Ω typ	V_S = ±10 V, I_S = −1 mA
	8	9	10	8	9	10	Ω max	
On-Resistance Flatness, $R_{FLAT (ON)}$	35			35			Ω typ	V_S = ±10 V, I_S = −1 mA
	55	65	70	55	65	70	Ω max	
LEAKAGE CURRENTS								V_{DD} = +16.5 V, V_{SS} = −16.5 V
Source Off Leakage, I_S (Off)	±0.005			±0.005			nA typ	V_S = ±10 V, V_D = ±10 V
	±0.1	±0.2	±0.4	±0.1	±0.2	±0.4	nA max	
Drain Off Leakage, I_D (Off)	±0.005			±0.005			nA typ	V_S = ±10 V, V_D = ±10 V
	±0.1	±0.4	±1.4	±0.1	±0.4	±1.4	nA max	
Channel On Leakage, I_D (On), I_S (On)	±0.01			±0.01			nA typ	V_S = V_D = ±10 V;
	±0.2	±0.5	±1.4	±0.2	±0.5	±1.4	nA max	
DIGITAL INPUTS								
Input High Voltage, V_{INH}			2			2	V min	
Input Low Voltage, V_{INL}			0.8			0.8	V max	
Input Current, I_{INL} or I_{INH}	0.002			0.002			µA typ	V_{IN} = V_{GND} or V_{DD}
			±0.1			±0.1	µA max	
Digital Input Capacitance, C_{IN}	3			3			pF typ	
DYNAMIC CHARACTERISTICS[1]								
Transition Time, $t_{TRANSITION}$	185			170			ns typ	R_L = 300 Ω, C_L = 35 pF
	230	245	259	205	225	235	ns max	V_S = 10 V
t_{ON} (EN)	170			150			ns typ	R_L = 300 Ω, C_L = 35 pF
	210	230	255	180	195	215	ns max	V_S = 10 V
t_{OFF} (EN)	125			180			ns typ	R_L = 300 Ω, C_L = 35 pF
	180	180	180	225	225	230	ns max	V_S = 10 V
Break-Before-Make Time Delay, t_D	70			55			ns typ	R_L = 300 Ω, C_L = 35 pF
			35			25	ns min	V_{S1} = V_{S2} = 10 V
Charge Injection, Q_{INJ}	0.4			0.3			pC typ	V_S = 0 V, R_S = 0 Ω, C_L = 1 nF
Off Isolation	−90			−86			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz
Channel-to-Channel Crosstalk	−90			−80			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz
−3 dB Bandwidth								R_L = 50 Ω, C_L = 5 pF
ADG5208	65			105			MHz typ	
ADG5209	130			195			MHz typ	
Insertion Loss	−6			−6.2			dB typ	R_L = 50 Ω, C_L = 5 pF, f = 1 MHz; see
C_S (Off)	5.5			2.7			pF typ	V_S = 0 V, f = 1 MHz
C_D (Off)								
ADG5208	51			32			pF typ	V_S = 0 V, f = 1 MHz
ADG5209	25			16			pF typ	V_S = 0 V, f = 1 MHz
C_D (On), C_S (On)								
ADG5208	57			35			pF typ	V_S = 0 V, f = 1 MHz
ADG5209	32			20			pF typ	V_S = 0 V, f = 1 MHz
POWER REQUIREMENTS								V_{DD} = +16.5 V, V_{SS} = −16.5 V
I_{DD}	80			80			µA typ	Digital inputs = 0 V or V_{DD}
	100		130	100		130	µA max	
V_{DD}			9/40			9/40	V min/V max	GND = 0 V, Vss=0V

1 Guaranteed by design, not subject to production test.