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 $V \pm 10\%$, V_{SS} = -15 $V \pm 10\%$, GND = 0 V, unless otherwise noted.

Parameter	25°C	Rev.A -40°C to +85°C	−40°C to +125°C		25°C	R -40°C to +85°C	lev. B	-40°C to +125°C		Unit	Test Conditions/ Comments
ANALOG SWITCH										v	
Analog Signal Range	160		V_{DD} to V_{SS}		160			V _{DD} to V _{SS}		ν Ωtyp	$V_S = \pm 10 \text{ V, } I_S = -1 \text{ mA}$
On Resistance, R _{ON}	200	250		280	200		250		280	Ω max	V _{DD} = +13.5 V, V _{SS} = -13.5 V
On-Resistance Match	3.5				3.5					Ωtyp	$V_s = \pm 10 \text{ V}, I_s = -1 \text{ mA}$
Between Channels, ΔR _{ON}	8	9		10	8		9		10	Ωmax	V 110 V I 1 A
On-Resistance Flatness, R _{FLAT (ON)}	40 50	65		70	40 50		65		70	Ω typ Ω max	$V_S = \pm 10 \text{ V, } I_S = -1 \text{ mA}$
LEAKAGE CURRENTS											V _{DD} = +16.5 V, V _{SS} = -16.5 V
	±0.00				±0.00					nA typ	$V_s = \pm 10 \text{ V}, V_D = \pm 10 \text{ V}$
Source Off Leakage, I₅ (Off)	5	±0.2	10.4		5	10.2		10.4			VS-110 V, VD-110 V
	±0.1 ±0.00	±0.2	±0.4		±0.1 ±0.00	±0.2		±0.4		nA max nA typ	$V_S = \pm 10 \text{ V}, V_D = \pm 10 \text{ V}$
Drain Off Leakage, I _D (Off)	5 ±0.1	±0.4	±1.4		5 ±0.1	±0.4		±1.4		nA max	VS - 110 V, VD - 110 V
Channel On Leakage, I _D (On),	±0.1 ±0.01	±0.4	II.4		±0.1 ±0.01	±0.4		II.4			$\pm V_S = V_D = \pm 10 \text{ V}$
Is (On)		105	.1.4			.0.5		.1.4		nA typ	
DIGITAL INPUTS	±0.2	±0.5	±1.4		±0.2	±0.5		±1.4		nA max	
Input High Voltage, V _{INH}				2					2	V min	
Input Low Voltage, V _{INL} Input Current, I _{INL} or I _{INH}	0.002			8.0	0.002				8.0	V max μΑ typ	V _{IN} = V _{GND} or V _{DD}
•			±0.1					±0.1		μA max	VIN — VGND OI VDD
Digital Input Capacitance, C _{IN} Dynamic Characteristics ¹	3				3					pF typ	
Transition Time, transition	170				150					ns typ	$R_L = 300 \Omega$, $C_L = 35 pF$
Transition Time, transition	205 145	245		275	180		210		245	ns max	$V_S = 10 \text{ V}$ $R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
t _{on} (EN)	185	220		245	125 150		185		215	ns typ ns max	$V_S = 10 \text{ V}$
t _{OFF} (EN)	120	165		100	160		210		220	ns typ	$R_L = 300 \Omega, C_L = 35 pF$ $V_S = 10 V$
Break-Before-Make Time	145 65	165		180	185 55		210		230	ns max ns typ	$V_S = 10 \text{ V}$ $R_L = 300 \Omega, C_L = 35 \text{ pF}$
Delay, t₀				30					25	ns min	$V_{S1} = V_{S2} = 10 \text{ V}$
Charge Injection, Q _{NJ}	0.4				0.2					pC typ	$V_S = 0 \text{ V}, R_S = 0 \Omega, C_L = 1 $ nF
Off Isolation	-90				-86					dB typ	$R_L = 50 \Omega, C_L = 5 pF, f = 1 MHz$
Channel-to-Channel	-90				-80					dB typ	$R_L = 50 \Omega$, $C_L = 5 pF$, $f =$
Crosstalk –3 dB Bandwidth											1 MHz $R_L = 50 \Omega$, $C_L = 5 pF$
ADG5208 ADG5209	54 133				110 240					MHz typ MHz typ	, ,
Insertion Loss	-6.4				-6.4					dB typ	$R_L = 50 \Omega$, $C_L = 5 pF$, $f =$
Cs (Off)	5.5				2.9					pF typ	1 MHz V _s = 0 V, f = 1 MHz
C _D (Off)										' ' '	
ADG5208 ADG5209	52 26				34 17					pF typ pF typ	$V_S = 0 \text{ V, } f = 1 \text{ MHz}$ $V_S = 0 \text{ V, } f = 1 \text{ MHz}$
C_D (On), C_S (On)											
ADG5208 ADG5209	58 31				37 21					pF typ pF typ	$V_S = 0 \text{ V, } f = 1 \text{ MHz}$ $V_S = 0 \text{ V, } f = 1 \text{ MHz}$
POWER REQUIREMENTS											$V_{DD} = +16.5 \text{ V}, V_{SS} = -16.5 \text{ V}$
	45				45					uA tun	Digital inputs = 0 V or
loo				70					70	μΑ typ	V _{DD}
	55			70	55				70	μA max	Digital inputs = 0 V or
lss	0.001			1	0.001				1	μA typ	V _{DD}
V _{DD} /Vss			±9/±22	1				±9/±22	1	μΑ max V min/V	GND = 0 V
V DD/ VSS			エラ/エZZ					エラ/ エZZ		max	GIAD = 0 A

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	25°C	Rev.A -40°C to	-40°C to		25°C	−40°C to	Rev. B	-40°C to		Unit	Test Conditions/
ANALOG SWITCH		+85°C	+125°C			+85°C		+125℃			Comments
Analog Signal Range			V _{DD} to V _{SS}					V _{DD} to V _{SS}		٧	
	140				140					Ω typ	$V_s = \pm 15 \text{ V}, I_s = -1 \text{ mA}$
On Resistance, R _{ON}	160	200		230	160		200		230	Ω max	$V_{DD} = +18 \text{ V}, V_{SS} = -18 \text{ V}$
On-Resistance Match	3.5				3.5					Ωtyp	$V_s = \pm 15 \text{ V, } I_s = -1 \text{ mA}$
Between Channels, ∆Ron On-Resistance Flatness,	8 34	9		10	8 34		9		10	Ω max	$V_s = \pm 15 \text{ V, } I_s = -1 \text{ mA}$
R _{FLAT (ON)}	45	55		60	45		55		60	Ω typ Ω max	VS=±13 V, IS=-1 IIIA
LEAKAGE CURRENTS											$V_{DD} = +22 \text{ V}, V_{SS} = -22$
	±0.00				±0.00						V
Source Off Leakage, I _s (Off)	5				5					nA typ	$V_S = \pm 15 \text{ V}, V_D = \pm 15 \text{ V}$
	±0.1	±0.2	±0.4		±0.1	±0.2		±0.4		nA max	
Drain Off Leakage, I _D (Off)	±0.00 5				±0.00 5					nA typ	$V_S = \pm 15 \text{ V}, V_D = \pm 15 \text{ V}$
3, 1, 1,	±0.1	±0.4	±1.4		±0.1	±0.4		±1.4		nA max	., .,
Channel On Leakage, I _D (On),	±0.01				±0.01					nA typ	$\pm V_{S} = V_{D} = \pm 15 \text{ V}$
ls (On)	±0.2	±0.5	±1.4		±0.2	±0.5		±1.4		nA max	
DIGITAL INPUTS				2							
Input High Voltage, V _{INH} Input Low Voltage, V _{INL}				2 0.8					2 0.8	V min V max	
Input Current, InL or InH	0.002			0.0	0.002				0.0	μA typ	$V_{IN} = V_{GND} \text{ or } V_{DD}$
Digital Input Capacitance, C _N	3		±0.1		3			±0.1		μΑ max pF typ	
DYNAMIC CHARACTERISTICS ¹	,				,					рг тур	
Transition Time, trransition	160				140					ns typ	$R_L = 300 \Omega$, $C_L = 35 pF$
	195 145	225		255	170 120		195		220	ns max ns typ	$V_s = 10 \text{ V}$ $R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
t _{ON} (EN)	170	200		225	140		170		195	ns max	$V_S = 10 \text{ V}$
toff (EN)	120 140	155		170	160 185		205		220	ns typ	$R_L = 300 \Omega, C_L = 35 pF$ $V_S = 10 V$
Break-Before-Make Time	55	133		170	45		203		220	ns max ns typ	$V_S = 10 \text{ V}$ $R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
Delay, t₀				30					20	ns min	$V_{S1} = V_{S2} = 10 \text{ V}$
Charge Injection, Q _{NJ}	0.3				0.4					pC typ	$V_S = 0 \text{ V}, R_S = 0 \Omega, C_L = 1 \text{ nF}$
Off Isolation	-90				-86					dB typ	$R_L = 50 \Omega, C_L = 5 pF, f = 1 MHz$
Channel-to-Channel Crosstalk	-90				-80					dB typ	$R_L = 50 \Omega, C_L = 5 pF, f = 1 MHz$
-3 dB Bandwidth											$R_L = 50 \Omega$, $C_L = 5 pF$
ADG5208 ADG5209	60 130				121 255					MHz typ MHz typ	
	-5.6				-5.6						$R_L = 50 \Omega, C_L = 5 pF, f =$
Insertion Loss										dB typ	1 MHz; see
C _s (Off) C _D (Off)	5.5				2.8					pF typ	$V_S = 0 V, f = 1 MHz$
ADG5208	51				33					pF typ	$V_S = 0 \text{ V, } f = 1 \text{ MHz}$
ADG5209 C_D (On), C_S (On)	26				17					pF typ	$V_S = 0 V, f = 1 MHz$
ADG5208	57				36					pF typ	$V_S = 0 V, f = 1 MHz$
ADG5209	31				21					pF typ	$V_S = 0 \text{ V, } f = 1 \text{ MHz}$
POWER REQUIREMENTS											$V_{DD} = +22 \text{ V}, V_{SS} = -22 \text{ V}$ Digital inputs = 0 V or
loo	50				50					μA typ	V _{DD}
	70			110	70				110	μA max	Digital inputs = 0 V or
lss	0.001				0.001					μA typ	V _{DD}
				1					1	μA max	
V _{DD} /V _{SS}			±9/±22					±9/±22		V min/V max	GND = 0 V

Guaranteed by design, not subject to production test.

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

Parameter	25°C	Rev.A -40°C to +85°C	-40°C to +125°C		25°C	Rev. -40°C to +85°C	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	
	350				350		0 1 10 100		Ωtyp	$V_S = 0 \text{ V to } 10V, I_S = -1 \text{ mA}$
On Resistance, R _{ON}	500	610	7	700	500	610)	700	Ω max	$V_{DD} = +10.8V, V_{SS} = 0$
On-Resistance Match	5				5				Ωtyp	$V_S = 0 \text{ V to } 10V, I_S = -1$ mA
Between Channels, ΔR _{ON}	20	22		24	20	22	2	24	Ω max	$V_S = 0 \text{ V to } 10 \text{ V, } I_S =$
On-Resistance Flatness, R _{FLAT (ON)}	160	225	2	170	160	227	-	270	Ωtyp	-1 mA
LEAKAGE CURRENTS	280	335	3	370	280	335)	370	Ω max	$V_{DD} = 13.2 \text{ V}, V_{SS} = 0 \text{ V}$
	±0.00				±0.00				nA typ	$V_s = 1V/10V, V_D = +10$
Source Off Leakage, Is (Off)	5 ±0.1	±0.2	±0.4		5 ±0.1	±0.2	±0.4		nA max	V/1V
Drain Off Leakage, I _D (Off)	±0.00 5				±0.00 5				nA typ	$V_s = 1V/10V, V_D = +10$ V/1V
Drain on Leanage, ip (on)	±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	$\pm V_S = V_D = 1 \text{ V}/10\text{V}$
DIGITAL INPUTS	±0.2	±0.5	±1.4		±0.2	±0.5	±1.4		nA max	
Input High Voltage, V _{INH} Input Low Voltage, V _{INL} Input Current, I _{INL} or I _{INH}	0.002		±0.1	2 0.8	0.002		±0.1	2 0.8	V min V max μA typ	$V_{IN} = V_{GND}$ or V_{DD}
Digital Input Capacitance, C _{IN}	3		±0.1		3		±0.1		μA max pF typ	
DYNAMIC CHARACTERISTICS ¹										
Transition Time, t _{TRANSITION}	210	220	2	200	200	201		225	ns typ	$R_L = 300 \Omega, C_L = 35 pF$
t _{ON} (EN)	270 215	330		380	250 180	295		335	ns max ns typ	$V_S = 8 \text{ V}$ $R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
	275 115	345	4	100	225 165	280)	320	ns max ns typ	$V_S = 8 \text{ V}$ $R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
t _{OFF} (EN) Break-Before-Make Time	140 135	160	1	175	200 95	225	i	245	ns max	$V_S = 8 \text{ V}$ $R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
Delay, t _D	133			70	93			50	ns typ ns min	$V_{S1} = V_{S2} = 8 \text{ V}$
Charge Injection, Q _{INJ}	0.3				0.2				pC typ	$V_S = 6 \text{ V}, R_S = 0 \Omega, C_L = 1 \text{ nF}$
Off Isolation	-90				-86				dB typ	$R_L = 50 \Omega, C_L = 5 pF, f$ = 1 MHz
Channel-to-Channel Crosstalk –3 dB Bandwidth	-90				-80				dB typ	$R_L = 50 \Omega$, $C_L = 5 pF$, $f = 1 MHz$ $R_L = 50 \Omega$, $C_L = 5 pF$
ADG5208 ADG5209	60 120				95 180				MHz typ MHz typ	·
Insertion Loss	-8.8				-8.9				dB typ	$R_L = 50 \Omega, C_L = 5 pF, f$
C _s (Off)	6				3.3				pF typ	= 1 MHz; see $V_S = 0 V$, $f = 1 MHz$
C _D (Off) ADG5208 ADG5209	56 28				38 19				pF typ pF typ	$V_S = 0 V, f = 1 MHz$ $V_S = 0 V, f = 1 MHz$
C _D (On), C _S (On) ADG5208 ADG5209	63 35				41 24				pF typ pF typ	$V_S = 0 V, f = 1 MHz$ $V_S = 0 V, f = 1 MHz$
POWER REQUIREMENTS										$V_{DD} = 13.2$
I_{DD}	40			65	40			<i>c</i> =	μA typ	Digital inputs = 0 V or V_{DD}
V_{DD}	50		9/40	65	50		9/40	65	μΑ max V min/V max	GND = 0 V, Vss=0V

Guaranteed by design, not subject to production test.

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

Parameter	25°C	Rev.A -40°C to +85°C	-40°C to +125°C		25°C	-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	
Analog Signal hange	150		O V LO VDD		150			O V LO VDD		ν Ωtyp	$V_S = \pm 10 \text{ V, } I_S = -1 \text{ mA}$
On Resistance, R _{ON}	170	215	2	45	170		215		245	Ω max	$V_{DD} = +13.5 \text{ V}, V_{SS} = -13.5 \text{ V}$
On-Resistance Match	3.5				3.5					Ωtyp	$V_S = \pm 10 \text{ V}, I_S = -1 \text{ mA}$
Between Channels, ΔR _{ON} On-Resistance Flatness,	8 35	9		10	8 35		9		10	Ω max Ω typ	$V_S = \pm 10 \text{ V, } I_S = -1 \text{ mA}$
R _{FLAT} (ON)	55	65		70	55 55		65		70	Ω max	
LEAKAGE CURRENTS											$V_{DD} = +16.5 \text{ V}, V_{SS} = -16.5 \text{ V}$
	±0.00				±0.00					nA typ	$V_S = \pm 10 \text{ V}, V_D = \pm 10 \text{ V}$
Source Off Leakage, Is (Off)	5 ±0.1	±0.2	±0.4		5 ±0.1	±0.2		±0.4		nA max	13 =10 1, 10 =10 1
2 . 0	±0.00				±0.00					nA typ	$V_S = \pm 10 \text{ V}, V_D = \pm 10 \text{ V}$
Drain Off Leakage, I _D (Off)	5 ±0.1	±0.4	±1.4		5 ±0.1	±0.4		±1.4		nA max	.5,.5
Channel On Leakage, I _D (On	±0.01				±0.01					nA typ	$V_S = V_D = \pm 10 \text{ V};$
), I _S (On)	±0.2	±0.5	±1.4		±0.2	±0.5		±1.4		nA max	
DIGITAL INPUTS				2					2	V main	
Input High Voltage, V _{INH} Input Low Voltage, V _{INL}			(2 0.8					2 0.8	V min V max	
Input Current, I _{INL} or I _{INH}	0.002		.01		0.002			.01		μA typ	$V_{IN} = V_{GND}$ or V_{DD}
Digital Input Capacitance,	3		±0.1		3			±0.1		μA max	
CIN	3				3					pF typ	
DYNAMIC CHARACTERISTICS ¹											
Transition Time, trransition	185	245	า	EO	170		225		225	ns typ	$R_L = 300 \Omega$, $C_L = 35 pF$
	230 170	245	2	!59	205 150		225		235	ns max ns typ	$V_S = 10 \text{ V}$ $R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
ton (EN)	210 125	230	2	255	180 180		195		215	ns max	$V_S = 10 \text{ V}$ $R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
t _{OFF} (EN)	180	180	1	80	225		225		230	ns typ ns max	$V_S = 10 \text{ V}$
Break-Before-Make Time Delay, t _D	70			35	55				25	ns typ ns min	$R_L = 300 \Omega$, $C_L = 35 pF$ $V_{S1} = V_{S2} = 10 V$
Charge Injection, Q _{INJ}	0.4			رر	0.3				23	pC typ	$V_S = 0 V$, $R_S = 0 \Omega$, $C_L =$
<i>y</i> ,											1 nF R _L = 50 Ω, C _L = 5 pF, f
Off Isolation	-90				-86					dB typ	= 1 MHz
Channel-to-Channel Crosstalk	-90				-80					dB typ	$R_L = 50 \Omega$, $C_L = 5 pF$, $f = 1 MHz$
-3 dB Bandwidth											$R_L = 50 \Omega$, $C_L = 5 pF$
ADG5208 ADG5209	65 130				105 195					MHz typ MHz typ	
Insertion Loss	-6				-6.2					dB typ	$R_L = 50 \Omega, C_L = 5 pF, f$
Cs (Off)	5.5				2.7					pF typ	= 1 MHz; see V _s = 0 V, f = 1 MHz
C _D (Off)											
ADG5208 ADG5209	51 25				32 16					pF typ pF typ	$V_S = 0 \text{ V, } f = 1 \text{ MHz}$ $V_S = 0 \text{ V, } f = 1 \text{ MHz}$
C_D (On), C_S (On)					25						
ADG5208 ADG5209	57 32				35 20					pF typ pF typ	$V_S = 0 \text{ V, } f = 1 \text{ MHz}$ $V_S = 0 \text{ V, } f = 1 \text{ MHz}$
POWER REQUIREMENTS										• •	$V_{DD} = +16.5 \text{ V}, V_{SS} =$
	90				90					uA tura	-16.5 V Digital inputs = 0 V or
lod	80 100		1	30	80 100				130	μA typ	V _{DD}
V_DD	100		9/40	3 ∪	100			9/40	130	μΑ max V min/V	GND = 0 V, Vss=0V
Guaranteed by design not su								<i>3 4</i> 0		max	011D - 0 v, v55=0v

Guaranteed by design, not subject to production test.