PCN 14_0066

ADG5233/ADG5234 Data Sheet Changes

Rev. B to Rev. C

This document highlights the performance differences between the Rev.B and Rev.C Transfer for the ADG5233 and ADG5234 Analog Multiplexers.

For full product information and changes to Typical Performance Characteristics plots please refer to the ADG5233/34 Rev.C data sheet.

1. HBM ESD

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

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

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

SPECIFICATION CHANGES FROM Rev. B to Rev. C

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

Table 1. $v_{DD} = +15 v \pm 10\%, v$		Rev. B	Rev. C								
Parameter	25°C	–40°C to +85°C	–40°C to +125°C		25°C	–40°C +85°C		–40°C to +125°C		Unit	Test Conditions/ Comments
ANALOG SWITCH											
Analog Signal Range	160		V_{DD} to V_{SS}		160			V _{DD} to V _{SS}		V Ωtyp	$V_s = \pm 10 V$, $I_s = -1 mA$
On Resistance, R _{ON}		250									$V_{DD} = +13.5 \text{ V}, V_{SS} = -11174$
,,	200	250		280	200		250		280	Ωmax	–13.5 V
On-Resistance Match Between	3.5	0		10	3.5		0		10	Ωtyp	$V_s = \pm 10 V$, $I_s = -1 mA$
Channels, ΔR_{ON} On-Resistance Flatness, R _{FLAT}	8 38	9		10	8 38		9		10	Ω max Ω typ	$V_s = \pm 10 V$, $I_s = -1 mA$
(ON)	50	65		70	50		65		70	Ωmax	vs=±10 v,1s= 111/1
LEAKAGE CURRENTS											$V_{DD} = +16.5 V, V_{SS} = -16.5 V$
Source Off Leakage, ls (Off)	±0.02				±0.02					nA typ	$V_{S} = \pm 10 V, V_{D} = \pm 10 V$
-	±0.1	±0.2	±0.4		±0.1	±0.2		±0.4		nA max	
Drain Off Leakage, I₀ (Off)	±0.02				±0.02					nA typ	$V_{s} = \pm 10 V, V_{D} = \pm 10 V$
	±0.1	±0.2	±0.4		±0.1	±0.2		±0.4		nA max	·
Channel On Leakage, I _D (On), I _S (±0.08				±0.08					nA typ	$\pm V_{\text{S}} \!=\! V_{\text{D}} \!=\! \pm 10 \text{ V}$
On)	±0.2	±0.3	±0.9		±0.2	±0.3		±0.9		nA max	
DIGITAL INPUTS											
Input High Voltage, V _{INH}				2					2	V min	
Input Low Voltage, V _{INL} Input Current, I _{INL} or I _{INH}	0.002			0.8	0.002				0.8	V max µA typ	$V_{IN} = V_{GND} \text{ or } V_{DD}$
	0.002		±0.1		0.002			±0.1		μA typ μA max	VIN - VGND OI VDD
Digital Input Capacitance, C _{IN}	3				3					pF typ	
Dynamic Characteristics ¹	170				105						
Transition Time, transition	170 210	250		280	125 160		190		215	ns typ ns max	$R_L = 300 \Omega, C_L = 35 pF$ $V_S = 10 V$
	175	250		200	145		150		215	ns typ	$R_L = 300 \Omega, C_L = 35 pF$
t _{on} (EN)	215	255		290	175		210		240	ns max	$V_{s} = 10 V$
t _{off} (EN)	80 100	115		125	125		170		180	ns typ	$R_L = 300 \Omega, C_L = 35 pF$ $V_S = 10 V$
Break-Before-Make Time Delay,	60	115		125	155 45		170		160	ns max ns typ	$V_{S} = 10 V$ $R_{L} = 300 \Omega, C_{L} = 35 pF$
t _D				30					25	ns min	$V_{s_1} = V_{s_2} = 10 V$
Charge Injection, Q _{INJ}	-0.6				0.4					pC typ	$V_{s} = 0 V, R_{s} = 0 \Omega, C_{L} =$
Off Isolation	-75				-76					dB typ	1 nF R _L = 50 Ω, C _L = 5 pF, f
Channel-to-Channel Crosstalk	-80				-87					dB typ	= 1 MHz $R_L = 50 \Omega$, $C_L = 5 pF$, f
–3 dB Bandwidth	205				355					MHz typ	= 1 MHz R _L = 50 Ω, C _L = 5 pF
Insertion Loss	-6.3				-6.4					dB typ	$R_L = 50 \Omega, C_L = 5 pF, f$
											= 1 MHz
C₅ (Off) C₀ (Off)	4.5 10				2.8 9					pF typ pF typ	$V_s = 0 V, f = 1 MHz$ $V_s = 0 V, f = 1 MHz$
C_D (On), C_s (On)	15				13					pF typ	$V_{s} = 0 V, f = 1 MHz$
POWER REQUIREMENTS											$V_{DD} = +16.5 \text{ V}, \text{ V}_{SS} = -16.5 \text{ V}$
	45				45					µA typ	Digital inputs = 0 V or
DD	55			70	55				70	μA max	V _{DD}
	55			,,,					, 0	put that	
	0.001				0.001					uA two	Digital inputs = 0 V or
Iss	0.001			1	0.001				1	μΑ typ μΑ max	Digital inputs = $0 V \text{ or}$ V _{DD}

Guaranteed by design, not subject to production test.

Table 2. $V_{DD} = +20V \pm 10\%$	$V_{ss} = -20 V \pm 10\%$, GNE	D = 0 V, unless otherwise noted.
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Parameter	25°C	Rev.B –40°C to +85°C	–40°C to +125°C		25°C	F –40°C to +85°C	Rev. C	–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	
	140				140					Ωtyp	$V_s = \pm 15 V$, $I_s = -1 mA$
On Resistance, Ron	160	200		230	160		200		230	Ω max	$V_{DD} = +18 V, V_{SS} = -18$
On Desistance Match Dataset				200					200		V
On-Resistance Match Between Channels, ΔR_{ON}	3.5 8	9		10	3.5 8		9		10	Ω typ Ω max	$V_{s} = \pm 15 V$, $I_{s} = -1 mA$
On-Resistance Flatness, R _{FLAT}	33	2		10	33		9		10	Ωtyp	$V_{s} = \pm 15 V$, $I_{s} = -1 mA$
(ON)	45	55		60	45		55		60	Ωmax	V3 213 V/13 111/1
LEAKAGE CURRENTS											$V_{DD} = +22 V, V_{SS} = -22$
LEARAGE CURRENTS											V
Source Off Leakage, ls (Off)	±0.02				±0.02					nA typ	$V_{s} = \pm 15 V, V_{D} = \pm 15 V$
	±0.1	±0.2	±0.4		±0.1	±0.2		±0.4		nA max	
Drain Off Leakage, I _D (Off)	±0.02 ±0.1	±0.2	±0.4		±0.02 ±0.1	±0.2		±0.4		nA typ nA max	$V_{s} = \pm 15 V, V_{D} = \pm 15 V$
		±0.2	10.4			±0.2		10.4			$\pm V_{s} = V_{D} = \pm 15 V$
Channel On Leakage, I _D (On), I _S (±0.08				±0.08					nA typ	1,13,10,113,1
On)	±0.2	±0.3	±0.9		±0.2	±0.3		±0.9		nA max	
DIGITAL INPUTS											
Input High Voltage, VINH				2					2	Vmin	
Input Low Voltage, V _{INL}	0.000			0.8	0.000				0.8	V max	N N
Input Current, I _{INL} or I _{INH}	0.002		±0.1		0.002			±0.1		µA typ	$V_{IN} = V_{GND} \text{ or } V_{DD}$
Digital Input Capacitance, C _{IN}	3		±0.1		3			±0.1		μA max pF typ	
Dynamic Characteristics ¹	5				5					prop	
•	170				125					ns typ	$R_L = 300 \Omega, C_L = 35 pF$
Transition Time, transition	200	235		260	155		180		200	ns max	$V_{\rm S} = 10 \text{ V}$
t _{on} (EN)	165				145					ns typ	$R_L = 300 \Omega$, $C_L = 35 pF$
	200	240		265	170		200		220	ns max	$V_{\rm S} = 10 \rm V$
t _{off} (EN)	80 95	105		115	125 155		160		170	ns typ ns max	$R_L = 300 \Omega, C_L = 35 pF$ $V_S = 10 V$
Break-Before-Make Time Delay,	50	105		115	40		100		170	ns typ	$R_L = 300 \Omega, C_L = 35 pF$
$t_{\rm D}$	50			30					20	ns min	$V_{s_1} = V_{s_2} = 10 V$
Charge Injection, Q _{INJ}	0				0.7					nC tun	$V_{S} = 0 V, R_{S} = 0 \Omega, C_{L} =$
	U				0.7					pC typ	1 nF
Off Isolation	-75				-76					dB typ	$R_L = 50 \Omega, C_L = 5 pF, f$
										<i>,</i> ,	= 1 MHz R _L = 50 Ω, C _L = 5 pF, f
Channel-to-Channel Crosstalk	-80				-87					dB typ	$R_{L} = 50 \Omega_{2}, C_{L} = 5 \text{ pr}, 1$ = 1 MHz
–3 dB Bandwidth	210				370					MHz typ	$R_{L} = 50 \Omega, C_{L} = 5 pF$
Insertion Loss	-5.5				-5.6						$R_L = 50 \Omega, C_L = 5 pF, f$
										dB typ	= 1 MHz
Cs (Off)	4.5				2.8					pF typ	$V_{s} = 0 V, f = 1 MHz$
$C_{\rm D}$ (Off)	10 15				9 13					pF typ	$V_s = 0 V, f = 1 MHz$
C _D (On), C _s (On)	15				15					pF typ	$V_s = 0 V, f = 1 MHz$ $V_{DD} = +22 V, V_{SS} = -22$
POWER REQUIREMENTS											V - +22 v, vss = -22
	50				50						Digital inputs = 0 V or
DD	50				50					μA typ	V _{DD}
	70			110	70				110	μA max	
lss	0.001				0.001					μA typ	Digital inputs = 0 V or
				1					1		V _{DD}
V _{DD} /V _{SS}	1		±9/±22	1	I			±9/±22	1	μA max	

1 Guaranteed by design, not subject to production test.

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

		Rev.B			Rev.	C				
Parameter	25°C	–40°C to +85°C	–40°C t +125°C		25°C	–40°C to +85°C	-40°C t +125°C		Unit	Test Conditions/ Comments
ANALOG SWITCH			0.11++.11				0.1/1-0.1/	,	M	
Analog Signal Range	200		0 V to V	DD	200		0 V to V	DD	V	$V_{s} = 0 V \text{ to } 10V, I_{s} =$
On Resistance, Ron	360				360				Ωtyp	-1 mA
	500	610		700	500	610		700	Ωmax	$V_{DD} = +10.8V, V_{SS} = 0$ V
On-Resistance Match Between	5.5				5.5				Ωtyp	$V_s = 0 V$ to 10V, $I_s = -1 mA$
Channels, ΔR_{ON}	20	21		22	20	21		22	Ωmax	
On-Resistance Flatness, R _{FLAT}	170				170				Ωtyp	Vs = 0 V to 10V, ls = -1 mA
(ON)	280	335		370	280	335		370	Ωmax	
LEAKAGE CURRENTS										$V_{DD} = 13.2 \text{ V}, \text{V}_{SS} = 0 \text{V}$
Source Off Leakage, Is (Off)	±0.02				±0.02				nA typ	$V_s = 1V/10V, V_D = +10 V/1V$
Source on Leakage, is (on)	±0.1	±0.2	±0.4		±0.1	±0.2	±0.4		nA max	
Drain Off Leakage, I _D (Off)	±0.02				±0.02				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	
Channel On Leakage, I _D (On), Is (±0.08				±0.08				nA typ	$\pm V_{S} = V_{D} = 1 V/10V$
On)	±0.2	±0.3	±0.9		±0.2	±0.3	±0.9		nA max	
DIGITAL INPUTS Input High Voltage, V _{INH} Input Low Voltage, V _{INL} Input Current, I _{INL} or I _{INH} Digital Input Capacitance, C _{IN}	0.002		±0.1	2 0.8	0.002		±0.1	2 0.8	V min V max μA typ μA max pF typ	$V_{\text{IN}} = V_{\text{GND}} \text{ or } V_{\text{DD}}$
	5				5				ргтур	
Transition Time, transition	235				165				ns typ	$R_L = 300 \Omega, C_L = 35 pF$
	295	365		410	215	260		300	ns max	$\dot{V}_{S} = 8 V$
t _{on} (EN)	240				200				ns typ	$R_L = 300 \Omega, C_L = 35 pF$
	305	380		430	245	305		350	ns max	$\dot{V}_{S} = 8 V$
t _{off} (EN)	70				130				ns typ	$R_L = 300 \Omega, C_L = 35 pF$
	90	105		115	165	180		200	ns max	$V_{\rm S} = 8 V$
Break-Before-Make Time Delay,	125				85				ns typ	$R_L = 300 \Omega, C_L = 35 pF$
to				65				45	ns min	$V_{S1} = V_{S2} = 8 V$ $V_S = 6 V, R_S = 0 \Omega, C_L$
Charge Injection, Q _{INJ}	0				0				pC typ	= 1 nF
Off Isolation	-75				-76				dB typ	$R_L = 50 \Omega$, $C_L = 5 pF$, f = 1 MHz
Channel-to-Channel Crosstalk	-80				-87				dB typ	$R_L = 50 \Omega$, $C_L = 5 pF$, f = 1 MHz
–3 dB Bandwidth	172				260				MHz typ	$R_L = 50 \Omega$, $C_L = 5 pF$
Insertion Loss	-8.7				-9				dB typ	$R_L = 50 \Omega$, $C_L = 5 pF$, f = 1 MHz
Cs (Off) Cp (Off)	5 11				3 10				pF typ pF typ	$V_{s} = 0 V, f = 1 MHz$ $V_{s} = 0 V, f = 1 MHz$
C _D (On), C _S (On) POWER REQUIREMENTS	16				14				pF typ	$V_{s} = 0 V, f = 1 MHz$ $V_{DD} = 13.2$
	40				40				μA typ	Digital inputs = 0 V
DD	50			65	50			65	μΑ typ μΑ max	or V _{DD}
V _{DD}	50		9/40	05	50		9/40	05	V min/V max	GND = 0 V, Vss=0V

 ${\scriptstyle 1}\,{\rm Guaranteed}$ by design, not subject to production test.

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

		Rev.B			Rev. C		1		
Parameter	25°C	–40°C to +85°C	–40°C to +125°C	25°C	–40°C to +85°C	–40°C to +125°C	Unit	Test Conditions/ Comments	
ANALOG SWITCH			0.V.L. V.			0.14			
Analog Signal Range	140		0 V to V _{DD}	140		0 V to V _{DD}	V	$V_{s} = \pm 10 V$, $I_{s} = -1$	
On Resistance, Ron	140			140			Ωtyp	mA	
	170	215	245	170	215	245	Ωmax	$V_{DD} = +13.5 V, V_{SS} = -13.5 V$	
On-Resistance Match Between	3.5			3.5			Ωtyp	$V_s = \pm 10 V$, $I_s = -1 mA$	
Channels, ΔR_{ON}	8	9	10	8	9	10	Ωmax		
On-Resistance Flatness, R _{FLAT}	35			35			Ωtyp	$V_{s} = \pm 10 V, I_{s} = -1 mA$	
(ON)	50	60	65	50	60	65	Ωmax		
LEAKAGE CURRENTS								$V_{DD} = +16.5 V, V_{SS} = -16.5 V$	
	±0.02			±0.02			nA typ	$V_{s} = \pm 10 V, V_{D} =$	
Source Off Leakage, Is (Off)	±0.1	±0.2	±0.4	±0.1	±0.2	±0.4	nA max	±10 V	
Drain Off Leakage, lo (Off)	±0.02			±0.02			nA typ	$V_{S} = \pm 10 V, V_{D} = \pm 10 V$	
Dialit Off Leakage, (Off)	±0.1	±0.2	±0.4	±0.1	±0.2	±0.4	nA max	TOV	
Channel On Leakage, I _D (On), I _s (On)	±0.08 ±0.2	±0.3	±0.9	±0.08 ±0.2	±0.3	±0.9	nA typ nA max	$\pm V_S = V_D = \pm 10 \text{ V}$	
DIGITAL INPUTS	±0.2	±0.5	10.9	±0.2	10.5	10.9	TIA IIIdx		
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		0.0	0.002		0.8	μA typ	$V_{IN} = V_{GND} \text{ or } V_{DD}$	
Digital Input Capacitance, C _{IN}	3		±0.1	3		±0.1	μA max pF typ		
Dynamic Characteristics ¹									
Transition Time, transition	205			155			ns typ	$R_L = 300 \Omega, C_L = 35 pF$	
Transition Time, dransition	255	275	290	200	215	230	ns max	$V_{s} = 10 V$	
t _{on} (EN)	200			180			ns typ	$R_L = 300 \Omega, C_L = 35 pF$	
	240	265	290	215	235	250	ns max	$\dot{V}_{s} = 10 V$	
t _{off} (EN)	85			150			ns typ	$R_L = 300 \Omega, C_L = 35 pF$	
	115	115	115	190	190	190	ns max	$\dot{V}_{s} = 10 V$	
Break-Before-Make Time Delay,	65			50			ns typ	$R_L = 300 \Omega, C_L = 35 pF$	
t _D			35			25	ns min	$V_{s_1} = V_{s_2} = 10 V$	
Charge Injection, Q _{INJ}	-0.6			0.5			pC typ	$V_{S} = 0 V, R_{S} = 0 \Omega, C_{L}$ = 1 nF	
Off Isolation	-75			-76			dB typ	$R_L = 50 \Omega$, $C_L = 5 pF$, f = 1 MHz	
Channel-to-Channel Crosstalk	-80			-87			dB typ	$R_L = 50 \Omega, C_L = 5 pF,$ f = 1 MHz	
–3 dB Bandwidth	190			275			MHz typ	$R_L = 50 \Omega, C_L = 5 pF$	
Insertion Loss	-5.9			-6.2			dB typ	$R_L = 50 \Omega, C_L = 5 pF,$ f = 1 MHz	
Cs (Off)	4.5			2.8			pF typ	$V_s = 0 V, f = 1 MHz$	
C _D (Off) C _D (On), C _S (On)	10 15			9 13			pF typ pF typ	$V_s = 0 V$, $f = 1 MHz$ $V_s = 0 V$, $f = 1 MHz$	
POWER REQUIREMENTS				,5			אט יא	$V_{DD} = +16.5 \text{ V}, V_{SS} = -16.5 \text{ V}$	
	80			80			μA typ	Digital inputs = 0 V	
DD	100		130	100		130	μA max	or V _{DD}	
VDD			Sep-40			Sep-40	V min/V max	GND = 0 V, Vss=0V	

1 Guaranteed by design, not subject to production test.