

# <0.5 $\Omega$ CMOS, 1.65 V to 3.6 V, Quad SPST Switches

**Data Sheet** 

**ADG811/ADG812** 

## **FEATURES**

0.5 Ω typical on resistance
0.8 Ω maximum on resistance at 125°C
1.65 V to 3.6 V operation

Automotive temperature range: -40°C to +125°C High current carrying capability: 300 mA continuous Rail-to-rail switching operation

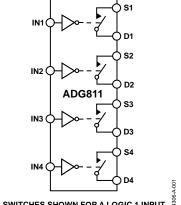
Fast switching times: <25 ns

Typical power consumption <0.1  $\mu$ W

## **APPLICATIONS**

Cellular phones
MP3 players
Power routing
Battery-powered systems
PCMCIA cards
Modems
Audio and video signal routing
Communications systems

## **FUNCTIONAL BLOCK DIAGRAMS**



SWITCHES SHOWN FOR A LOGIC 1 INPUT

Figure 1.

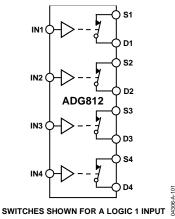


Figure 2.

## **GENERAL DESCRIPTION**

The ADG811/ADG812 are low voltage complementary metal-oxide semiconductor (CMOS) devices containing four independently selectable switches. These switches offer an ultralow on resistance of less than 0.8  $\Omega$  over the full temperature range. The digital inputs can handle 1.8 V logic with a 2.7 V to 3.6 V supply.

These devices contain four independent single-pole/single-throw (SPST) switches. The ADG811 and ADG812 differ only in that the digital control logic is inverted. The ADG811 switches are turned on with a logic low on the appropriate control input, while a logic high is required to turn on the switches of the ADG812. Each switch conducts equally well in both directions when on and has an input signal range that extends to the supplies.

The ADG811/ADG812 are fully specified for 3.3 V, 2.5 V, and 1.8 V supply operation. The ADG811 is available in a 16-lead LFCSP, and the ADG812 is available in a 16-lead TSSOP.

## **PRODUCT HIGHLIGHTS**

- 1. <0.8  $\Omega$  on resistance over the full temperature range of -40°C to +125°C.
- 2. Single 1.65 V to 3.6 V operation.
- 3. Operational with 1.8 V CMOS logic.
- 4. High current handling capability (300 mA continuous current at 3.3 V).
- 5. Low total harmonic distortion plus noise (THD + N) (0.02% typical).
- 6. Small,  $3 \text{ mm} \times 3 \text{ mm}$ , 16-lead LFCSP and 16-lead TSSOP.

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## 11/2003—Revision 0: Initial Version

# **SPECIFICATIONS**

 $V_{DD}$  = 2.7 V to 3.6 V, GND = 0 V, unless otherwise noted. The temperature range for the Y version is  $-40^{\circ}$ C to  $+125^{\circ}$ C.

Table 1.

Parameter	+25°C	-40°C to +85°C	-40°C to +125°C	Unit	Test Conditions/Comments
ANALOG SWITCH					
Analog Signal Range			0 V to V <sub>DD</sub>	٧	
On Resistance, R <sub>ON</sub>	0.5			Ωtyp	$V_{DD} = 2.7 \text{ V}, V_S = 0 \text{ V to } V_{DD}, I_S = 10 \text{ mA};$ see Figure 20
	0.75	0.85	0.9	Ωmax	
On-Resistance Match Between Channels, ΔRo <sub>N</sub>	0.04			Ωtyp	$V_{DD} = 2.7 \text{ V}, V_S = 0.5 \text{ V}, I_S = 10 \text{ mA}$
·	0.095	0.095	0.1	Ω max	
On-Resistance Flatness, R <sub>FLAT (ON)</sub>	0.1			Ωtyp	$V_{DD} = 2.7 \text{ V}, V_S = 0 \text{ V to } V_{DD}, I_S = 10 \text{ mA}$
	0.18	0.18	0.19	Ω max	, , , , , , , , , , , , , , , , , , , ,
LEAKAGE CURRENTS					VDD = 3.6 V
Source Off Leakage, Is (Off)	±0.2			nA typ	$V_S = 0.6 \text{ V}/3.3 \text{ V}, V_D = 3.3 \text{ V}/0.6 \text{ V};$ see Figure 21
	±1	±8	±80	nA max	
Drain Off Leakage, I <sub>D</sub> (Off)	±0.2			nA typ	$V_S = 0.6 \text{ V}/3.3 \text{ V}, V_D = 3.3 \text{ V}/0.6 \text{ V};$ see Figure 21
	±1	±8	±80	nA max	
Channel On Leakage, ID, IS (On)	±0.2			nA typ	$V_S = V_D = 0.6 \text{ V or } 3.3 \text{ V; see Figure } 22$
-	±1	±15	±90	nA max	_
DIGITAL INPUTS					
Input High Voltage, V <sub>INH</sub>			2	V min	
Input Low Voltage, V <sub>INL</sub>			0.8	V max	
Input Current, I <sub>INL</sub> or I <sub>INH</sub>	0.005			μA typ	V <sub>IN</sub> = V <sub>INL</sub> or V <sub>INH</sub>
, , ,			±0.1	μA max	
Digital Input Capacitance, C <sub>IN</sub>	6			pF typ	
DYNAMIC CHARACTERISTICS <sup>1</sup>				F: -7 F	
ton	21			ns typ	$R_L = 50 \Omega$ , $C_L = 35 pF$
2017	25	26	28	ns max	$V_s = 1.5 \text{ V/0 V}$ ; see Figure 23
toff	4			ns typ	$R_L = 50 \Omega$ , $C_L = 35 pF$
COTT	5	6	7	ns max	$V_s = 1.5 \text{ V}$ ; see Figure 23
Charge Injection	30		,	pC typ	$V_S = 1.5 \text{ V}$ , Sec Figure 25 $V_S = 1.5 \text{ V}$ , $R_S = 0 \Omega$ , $C_L = 1 \text{ nF}$ ; see Figure 24
Off Isolation	-67			dB typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ , $f = 100 kHz$ ; see Figure 25
Channel-to-Channel Crosstalk	-90			dB typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ , $f = 100 kHz$ ; see Figure 27
Total Harmonic Distortion Plus Noise (THD + N)	0.02			%	$R_L = 32 \Omega$ , $f = 20 \text{ Hz to } 20 \text{ kHz}$ , $V_S = 2 \text{ V p-p}$
Insertion Loss	-0.05			dB typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ , $f = 100 kHz$
–3 dB Bandwidth	90			MHz typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ ; see Figure 26
C <sub>s</sub> (Off)	30			pF typ	
C <sub>D</sub> (Off)	35			pF typ	
C <sub>D</sub> , C <sub>S</sub> (On)	60			pF typ	
POWER REQUIREMENTS				. /	VDD = 3.6 V
IDD	0.003			μA typ	Digital inputs = 0 V or 3.6 V

 $<sup>^{\</sup>mbox{\tiny 1}}$  Guaranteed by design, but not subject to production test.

 $V_{DD}$  = 2.5 V  $\pm$  0.2 V, GND = 0 V, unless otherwise noted. The temperature range for the Y version is  $-40^{\circ}$ C to  $+125^{\circ}$ C.

Table 2.

Parameter	+25°C	-40°C to +85°C	-40°C to +125°C	Unit	Test Conditions/Comments
ANALOG SWITCH					
Analog Signal Range			0 V to V <sub>DD</sub>	٧	
On Resistance, R <sub>ON</sub>	0.65			Ωtyp	$V_{DD} = 2.3 \text{ V}, V_S = 0 \text{ V to } V_{DD}, I_S = 10 \text{ mA};$ see Figure 20
	0.84	0.92	1.0	Ω max	
On-Resistance Match Between Channels, ΔR <sub>ON</sub>	0.04			Ωtyp	$V_{DD} = 2.3 \text{ V}, V_S = 0.55 \text{ V}, I_S = 10 \text{ mA}$
,	0.1	0.1	0.105	Ω max	
On-Resistance Flatness, R <sub>FLAT (ON)</sub>	0.16			Ωtyp	$V_{DD} = 2.3 \text{ V}, V_S = 0 \text{ V to } V_{DD}, I_S = 10 \text{ m}$
on nesistance hadress, men (on)	0.25	0.25	0.26	Ω max	2.5 1, 15 0 1 10 100, 15
LEAKAGE CURRENTS	0.23	0.23	0.20	1211107	$V_{DD} = 2.7 \text{ V}$
Source Off Leakage, Is (Off)	±0.2			nA typ	$V_S = 0.6 \text{ V}/2.4 \text{ V}, V_D = 2.4 \text{ V}/0.6 \text{ V};$ see Figure 21
	±1	±6	±35	nA max	see rigure 21
Drain Off Leakage, I <sub>D</sub> (Off)	±0.2			nA typ	$V_S = 0.6 \text{ V}/2.4 \text{ V}, V_D = 2.4 \text{ V}/0.6 \text{ V};$ see Figure 21
	±1	±6	±35	nA max	_
Channel On Leakage, ID, Is (On)	±0.2			nA typ	$V_S = V_D = 0.6 \text{ V or } 2.4 \text{ V; see Figure } 22$
5	±1	±11	±70	nA max	
DIGITAL INPUTS					
Input High Voltage, V <sub>INH</sub>			1.7	V min	
Input Low Voltage, V <sub>INL</sub>			0.7	V max	
Input Current, I <sub>INL</sub> or I <sub>INH</sub>	0.005			μA typ	V <sub>IN</sub> = V <sub>INL</sub> or V <sub>INH</sub>
input current, int or inti	0.005		±0.1	μA max	VIN VINE OF VINIT
Digital Input Capacitance, C <sub>IN</sub>	6			pF typ	
DYNAMIC CHARACTERISTICS <sup>1</sup>				pi typ	
ton	22			ns typ	$R_L = 50 \Omega$ , $C_L = 35 pF$
CON	27	29	30	ns max	$V_S = 1.5 \text{ V/ 0 V}$ ; see Figure 23
toff	4	29	30	ns typ	$R_L = 50 \Omega, C_L = 35 pF$
COFF	6	7	8	ns max	$V_s = 1.5 \text{ V}$ ; see Figure 23
Charge Injection	25	,		pC typ	$V_S = 1.25 \text{ V}$ , $R_S = 0 \Omega$ , $C_L = 1 \text{ nF}$ ; see Figure 24
Off Isolation	-67			dB typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ , $f = 100 kHz$ ; see Figure 25
Channel-to-Channel Crosstalk	-90			dB typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ , $f = 100 kHz$ ; see Figure 27
Total Harmonic Distortion Plus Noise (THD + N)	0.022			%	$R_L = 32 \Omega$ , $f = 20 Hz$ to 20 kHz, $V_S = 1.5 V p-p$
Insertion Loss	-0.06			dB typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ , $f = 100 kHz$
–3 dB Bandwidth	90			MHz typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ ; see Figure 26
C <sub>s</sub> (Off)	32			pF typ	
C <sub>D</sub> (Off)	37			pF typ	
C <sub>D</sub> , C <sub>s</sub> (On)	60			pF typ	
POWER REQUIREMENTS				F: -7 P	$V_{DD} = 2.7 \text{ V}$
I <sub>DD</sub>	0.003			μΑ typ	Digital inputs = 0 V or 2.7 V
יטט	0.003	1.0	4	μΑ typ μΑ max	

<sup>&</sup>lt;sup>1</sup> Guaranteed by design, but not subject to production test.

 $V_{DD}$  = 1.65 V to 1.95 V, GND = 0 V, unless otherwise noted. The temperature range for the Y version is  $-40^{\circ}$ C to  $+125^{\circ}$ C.

Table 3.

Parameter	+25°C	-40°C to +85°C	-40°C to +125°C	Unit	Test Conditions/Comments
ANALOG SWITCH					
Analog Signal Range			0 V to V <sub>DD</sub>	٧	
On Resistance, R <sub>ON</sub>	1			Ωtyp	$V_{DD} = 1.8 \text{ V}, V_S = 0 \text{ V to } V_{DD}, I_S = 10 \text{ mA};$ see Figure 20
	1.6	2.4	2.4	Ωmax	
	2.7	4.2	4.2	Ω max	$V_{DD} = 1.65 \text{ V}, V_S = 0 \text{ V to } V_{DD}, I_S = 10 \text{ mA}$
On-Resistance Match Between Channels, $\Delta R_{\text{ON}}$	0.1			Ωtyp	$V_{DD} = 1.65 \text{ V}, V_S = 0.7 \text{ V}, I_S = 10 \text{ mA}$
LEAKAGE CURRENTS					V <sub>DD</sub> = 1.95 V
Source Off Leakage Is (Off)	±0.2			nA typ	$V_S = 0.6 \text{ V}/1.65 \text{ V}, V_D = 1.65 \text{ V}/0.6 \text{ V};$ see Figure 21
	±1	±5	±30	nA max	
Drain Off Leakage I <sub>D</sub> (Off)	±0.2			nA typ	$V_S = 0.6 \text{ V}/1.65 \text{ V}, V_D = 1.65 \text{ V}/0.6 \text{ V};$ see Figure 21
	±1	±5	±30	nA max	
Channel On Leakage ID, IS (On)	±0.2			nA typ	$V_S = V_D = 0.6 \text{ V or } 1.65 \text{ V; see Figure } 22$
	±1	±9	±60	nA max	
DIGITAL INPUTS					
Input High Voltage, V <sub>INH</sub>			0.65V <sub>DD</sub>	V min	
Input Low Voltage, V <sub>INL</sub>			0.35V <sub>DD</sub>	V max	
Input Current, I <sub>INL</sub> or I <sub>INH</sub>	0.005			μA typ	$V_{IN} = V_{INL}$ or $V_{INH}$
			±0.1	μA max	
Digital Input Capacitance, CIN	6			pF typ	
DYNAMIC CHARACTERISTICS <sup>1</sup>					
ton	27			ns typ	$R_L = 50 \Omega$ , $C_L = 35 pF$
	35	36	37	ns max	$V_S = 1.5 \text{ V/ 0 V}$ ; see Figure 23
toff	6			ns typ	$R_L = 50 \Omega$ , $C_L = 35 pF$
	8	9	10	ns max	V <sub>s</sub> = 1.5 V; see Figure 23
Charge Injection	15			pC typ	$V_S = 1 \text{ V, } R_S = 0  \Omega, C_L = 1 \text{ nF;}$ see Figure 24
Off Isolation	-67			dB typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ , $f = 100 kHz$ ; Figure 25
Channel-to-Channel Crosstalk	-90			dB typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ , $f = 100 kHz$ ; see Figure 27
Total Harmonic Distortion Plus Noise (THD + N)	0.14			%	$R_L = 32 \Omega$ , $f = 20 Hz$ to 20 kHz, $V_S = 1.2 V p-p$
Insertion Loss	-0.08			dB typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ , $f = 100 kHz$
–3 dB Bandwidth	90			MHz typ	$R_L = 50 \Omega$ , $C_L = 5 pF$ ; see Figure 26
C <sub>S</sub> (Off)	32			pF typ	
C <sub>D</sub> (Off)	38			pF typ	
$C_D$ , $C_S$ (On)	60			pF typ	
POWER REQUIREMENTS					$V_{DD} = 1.95 \text{ V}$
I <sub>DD</sub>	0.003			μA typ	Digital inputs = 0 V or 1.95 V
		1.0	4	μA max	

 $<sup>^{\</sup>rm 1}$  Guaranteed by design, but not subject to production test.

## **ABSOLUTE MAXIMUM RATINGS**

 $T_A = 25$ °C, unless otherwise noted.

Table 4.

1 aut 1.	
Parameter	Rating
V <sub>DD</sub> to GND	-0.3 V to +4.6 V
Analog Inputs <sup>1</sup>	$-0.3 \text{ V to V}_{DD} + 0.3 \text{ V}$
Digital Inputs <sup>1</sup>	GND – 0.3 V to 4.6 V or 10 mA, whichever occurs first
Peak Current, S or D	(Pulsed at 1 ms, 10% duty-cycle maximum)
3.3 V Operation	500 mA
2.5 V Operation	460 mA
1.8 V Operation	420 mA
Continuous Current, S or D	
3.3 V Operation	300 mA
2.5 V Operation	275 mA
1.8 V Operation	250 mA
Operating Temperature Range, Automotive (Y Version)	−40°C to +125°C
Storage Temperature Range	−65°C to +150°C
Junction Temperature	150°C
Thermal Impedance	
TSSOP	
$\Theta_{JA}$	150°C/W
$\Theta_{JC}$	27°C/W
LFCSP	
$\Theta_{JA}$	70°C/W
IR Reflow, Peak Temperature < 20 sec	235℃

<sup>&</sup>lt;sup>1</sup> Overvoltages at IN, S, or D are clamped by internal diodes. Current should be limited to the maximum ratings given.

Stresses at or above those listed under Absolute Maximum Ratings may cause permanent damage to the product. This is a stress rating only; functional operation of the product at these or any other conditions above those indicated in the operational section of this specification is not implied. Operation beyond the maximum operating conditions for extended periods may affect product reliability.

Only one absolute maximum rating may be applied at any one time.

Table 5. ADG811/ADG812 Truth Table

ADG811 IN	ADG812 IN	Switch Condition
0	1	On
1	0	Off

## **ESD CAUTION**



**ESD** (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

# PIN CONFIGURATIONS AND FUNCTION DESCRIPTIONS

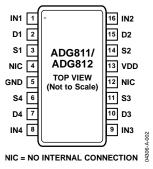


Figure 3. ADG811/ADG812 Pin Configuration (16-Lead TSSOP)

Table 6. ADG811/ADG812 Pin Function Descriptions (16-Lead TSSOP)

Pin N	lo.		
TSSOP	LFCSP	Mnemonic	Description
1	15	IN1	Logic control input.
2	16	D1	Drain Terminal. This pin may be an input or output.
3	1	S1	Source Terminal. This pin may be an input or output.
4, 12	2, 10	NIC	No Internal Connection.
5	3	GND	Ground (0 V) reference.
6	4	S4	Source Terminal. This pin may be an input or output.
7	5	D4	Drain Terminal. This pin may be an input or output.
8	6	IN4	Logic Control Input.
9	7	IN3	Logic Control Input.
10	8	D3	Drain Terminal. This pin may be an input or output.
11	9	S3	Source Terminal. This pin may be an input or output.
13	11	VDD	Most Positive Power Supply Potential.
14	12	S2	Source Terminal. This pin may be an input or output.
15	13	D2	Drain Terminal. This pin may be an input or output.
16	14	IN2	Logic Control Input.
Not applicable	17	EPAD	Exposed Pad. Connect exposed pad to GND.

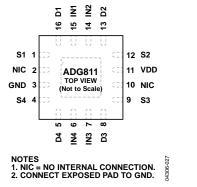


Figure 4. ADG811 Pin Configuration (16-Lead LFCSP)

Table 7. ADG811 Pin Function Descriptions (16-Lead LFCSP)

Pin No.	Mnemonic	Description
1	S1	Source Terminal. This pin may be an input or output.
2, 10	NIC	No Internal Connection.
3	GND	Ground (0 V) reference.
4	S4	Source Terminal. This pin may be an input or output.
5	D4	Drain Terminal. This pin may be an input or output.
6	IN4	Logic Control Input.
7	IN3	Logic Control Input.
8	D3	Drain Terminal. This pin may be an input or output.
9	S3	Source Terminal. This pin may be an input or output.
11	VDD	Most Positive Power Supply Potential.
12	S2	Source Terminal. This pin may be an input or output.
13	D2	Drain Terminal. This pin may be an input or output.
14	IN2	Logic Control Input.
15	IN1	Logic control input.
16	D1	Drain Terminal. This pin may be an input or output.
17	EPAD	Exposed Pad. Connect exposed pad to GND.

## TYPICAL PERFORMANCE CHARACTERISTICS

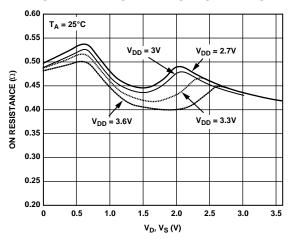


Figure 5. On Resistance vs.  $V_D$  ( $V_S$ ),  $V_{DD} = 2.7 \text{ V}$  to 3.6 V

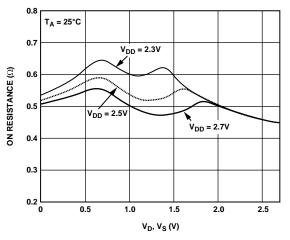


Figure 6. On Resistance vs.  $V_D$  ( $V_S$ ),  $V_{DD}$  = 2.5  $V \pm 0.2 V$ 

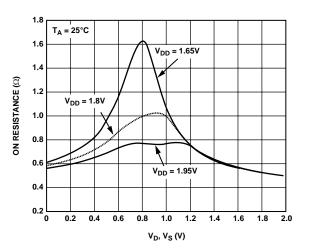


Figure 7. On Resistance vs.  $V_D$  ( $V_S$ ),  $V_{DD} = 1.8 \text{ V} \pm 0.15 \text{ V}$ 

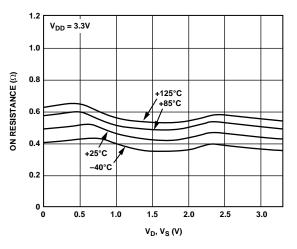


Figure 8. On Resistance vs.  $V_D$  ( $V_S$ ) for Different Temperatures,  $V_{DD} = 3.3 \text{ V}$ 

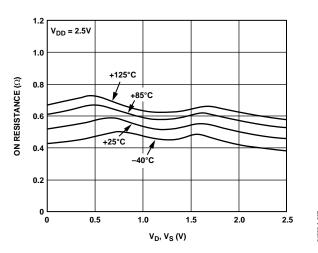


Figure 9. On Resistance vs.  $V_D$  ( $V_S$ ) for Different Temperatures,  $V_{DD} = 2.5 \text{ V}$ 

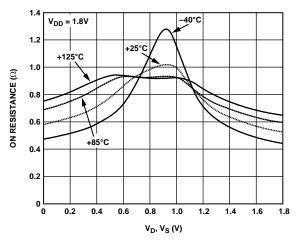


Figure 10. On Resistance vs.  $V_D$  ( $V_S$ ) for Different Temperatures,  $V_{DD} = 1.8 \text{ V}$ 

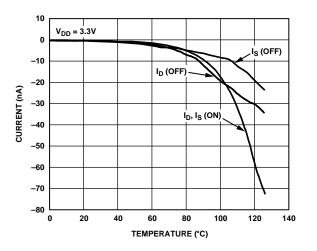


Figure 11. Leakage Current vs. Temperature,  $V_{DD} = 3.3 \text{ V}$ 

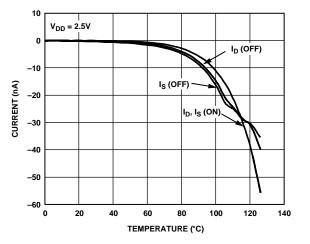


Figure 12. Leakage Current vs. Temperature,  $V_{DD} = 2.5 \text{ V}$ 

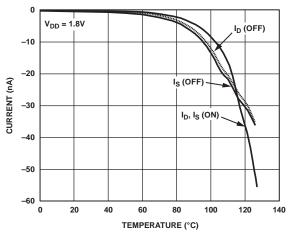


Figure 13. Leakage Current vs. Temperature,  $V_{DD} = 1.8 \text{ V}$ 

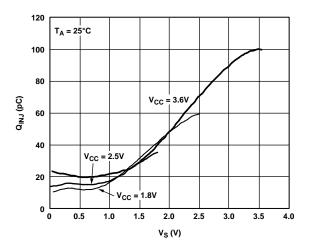


Figure 14. Charge Injection (Q<sub>INJ</sub>) vs. Source Voltage (V<sub>S</sub>)

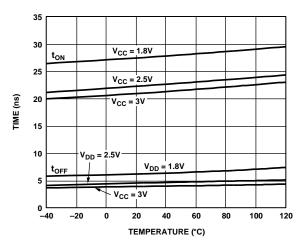


Figure 15. t<sub>ON</sub>/t<sub>OFF</sub> Times vs. Temperature

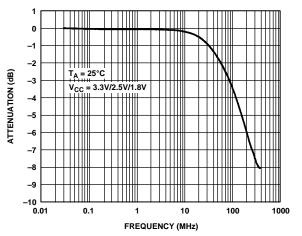


Figure 16. Bandwidth vs. Frequency

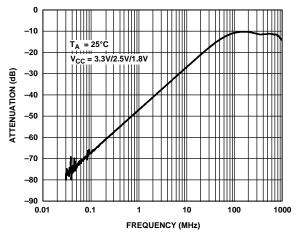


Figure 17. Crosstalk vs. Frequency

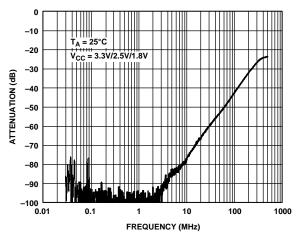


Figure 18. Off Isolation vs. Frequency

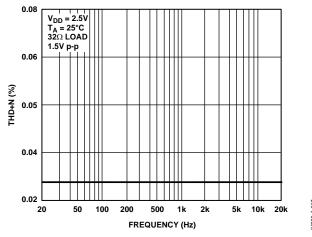


Figure 19. Total Harmonic Distortion Plus Noise (THD + N) vs. Frequency

# **TEST CIRCUITS**

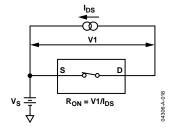


Figure 20. On Resistance

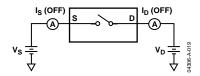


Figure 21. Off Leakage

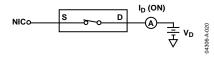
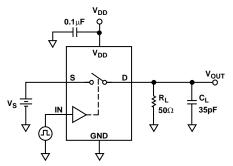


Figure 22. On Leakage



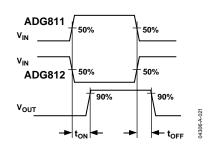


Figure 23. Switching Times

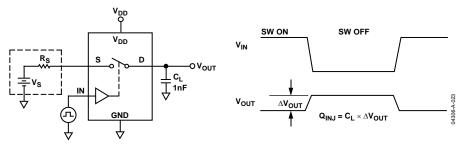


Figure 24. Charge Injection

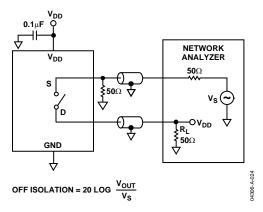


Figure 25. Off Isolation

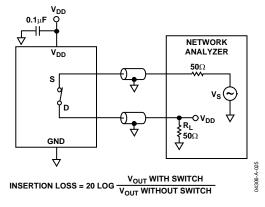


Figure 26. Bandwidth

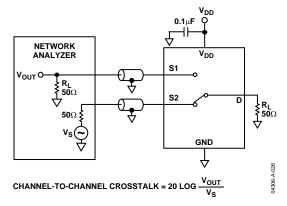


Figure 27. Channel-to-Channel Crosstalk

## **TERMINOLOGY**

 $I_{DD}$ 

Positive supply current.

 $V_D, V_S$ 

Analog voltage on Terminal D and Terminal S.

RON

Ohmic resistance between Terminal D and Terminal S.

R<sub>FLAT</sub> (ON)

Flatness is defined as the difference between the maximum and minimum value of on resistance as measured over the specified analog signal range.

 $\Delta R_{\text{ON}}$ 

On-resistance match between any two channels, that is,

 $R_{\mathrm{ON}}$  maximum –  $R_{\mathrm{ON}}$  minimum.

Is (Off)

Source leakage current with the switch off.

I<sub>D</sub> (Off)

Drain leakage current with the switch off.

 $I_D$ ,  $I_S$  (On)

Channel leakage current with the switch on.

 $V_{INI}$ 

Maximum input voltage for Logic 0.

 $\mathbf{V}_{\text{INH}}$ 

Minimum input voltage for Logic 1.

 $I_{INL}(I_{INH})$ 

Input current of the digital input.

Cs (Off)

Off switch source capacitance. Measured with reference to ground.

C<sub>D</sub> (Off)

Off switch drain capacitance. Measured with reference to ground.

## $C_D$ , $C_S$ (On)

On switch capacitance. Measured with reference to ground.

 $C_{IN}$ 

Digital input capacitance.

to

Delay time between the 50% and the 90% points of the digital input and switch on condition.

tofi

Delay time between the 50% and the 90% points of the digital input and switch off condition.

#### $t_{BBN}$

On or off time measured between the 80% points of both switches, when switching from one to another.

## **Charge Injection**

A measure of the glitch impulse transferred from the digital input to the analog output during on-to-off switching.

#### Off Isolation

A measure of unwanted signal coupling through an off switch.

#### Crosstalk

A measure of unwanted signal that is coupled through from one channel to another because of parasitic capacitance.

## -3 dB Bandwidth

The frequency at which the output is attenuated by 3 dB.

## On Response

The frequency response of the on switch.

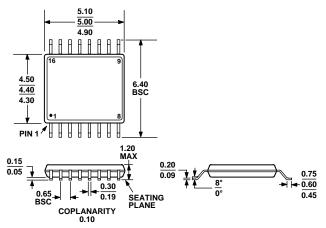
## **Insertion Loss**

The loss due to the on resistance of the switch.

## Total Harmonic Distortion Plus Noise (THD + N)

The ratio of the harmonic amplitudes plus the noise of a signal to the fundamental.

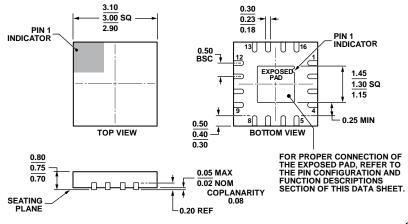
## **OUTLINE DIMENSIONS**



#### **COMPLIANT TO JEDEC STANDARDS MO-153-AB**

Figure 28. 16-Lead Thin Shrink Small Outline Package [TSSOP] (RU-16)

Dimensions shown in millimeters



COMPLIANT TO JEDEC STANDARDS MO-220-WEED.

Figure 29. 16-Lead Lead Frame Chip Scale Package [LFCSP] 3 mm × 3 mm Body and 0.75 mm Package Height (CP-16-21) Dimensions shown in millimeters

## **ORDERING GUIDE**

Temperature Range	Package Description	Package Option			
-40°C to +125°C	16-Lead Thin Shrink Small Outline [TSSOP]	RU-16			
-40°C to +125°C	16-Lead Lead Frame Chip Scale Package [LFCSP]	CP-16-21			
-40°C to +125°C	16-Lead Thin Shrink Small Outline [TSSOP]	RU-16			
-40°C to +125°C	16-Lead Thin Shrink Small Outline [TSSOP]	RU-16			
	-40°C to +125°C -40°C to +125°C -40°C to +125°C	-40°C to +125°C 16-Lead Thin Shrink Small Outline [TSSOP] -40°C to +125°C 16-Lead Lead Frame Chip Scale Package [LFCSP] -40°C to +125°C 16-Lead Thin Shrink Small Outline [TSSOP]			

<sup>&</sup>lt;sup>1</sup> Z = RoHS Compliant Part.

