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ADG1419BCPZ-REEL7

Analog Devices

Analog Switch ICs 2:1 135MHz 2.1 Ohm iCMOS SPDT

Any questions, please feel free to contact us.

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FEATURES

- 2.1 Ω on resistance
- 0.5 Ω maximum on-resistance flatness at 25°C
- Up to 390 mA continuous current
- Fully specified at +12 V, ± 15 V, ± 5 V
- No V_L supply required
- 3 V logic-compatible inputs
- Rail-to-rail operation
- 8-lead MSOP and 8-lead, 3 mm \times 2 mm LFCSP

APPLICATIONS

- Automatic test equipment
- Data acquisition systems
- Battery-powered systems
- Relay replacements
- Sample-and-hold systems
- Audio signal routing
- Video signal routing
- Communication systems

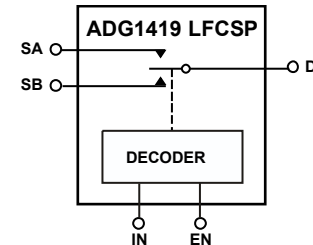
GENERAL DESCRIPTION

The **ADG1419** is a monolithic *i*CMOS® device containing a single-pole/double-throw (SPDT) switch. An EN input on the LFCSP is used to enable or disable the device. When disabled, all channels are switched off.

The industrial CMOS (*i*CMOS) modular manufacturing process combines high voltage, complementary metal-oxide semiconductor (CMOS) and bipolar technologies. It enables the development of a wide range of high performance analog ICs capable of 33 V operation in a footprint that no other generation of high voltage parts has achieved. Unlike analog ICs using conventional CMOS processes, *i*CMOS components can tolerate high supply voltages while providing increased performance, dramatically lower power consumption, and reduced package size.

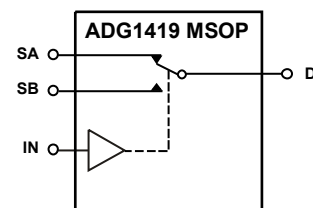
The on-resistance profile is very flat over the full analog input range, ensuring excellent linearity and low distortion when switching audio signals. The *i*CMOS construction ensures ultralow power dissipation, making the part ideally suited for portable and battery-powered instruments.

FUNCTIONAL BLOCK DIAGRAMS



SWITCHES SHOWN FOR A LOGIC 0 INPUT. 00485-001

Figure 1. 8-Lead LFCSP (CP-8-4)



SWITCHES SHOWN FOR A LOGIC 0 INPUT. 00485-002

Figure 2. 8-Lead MSOP (RM-8)

Each switch conducts equally well in both directions when on and has an input signal range that extends to the supplies. In the off condition, signal levels up to the supplies are blocked. The **ADG1419** exhibits break-before-make switching action for use in multiplexer applications.

PRODUCT HIGHLIGHTS

1. 2.4 Ω maximum on resistance at 25°C.
2. Minimum distortion.
3. 3 V logic-compatible digital inputs: $V_{INH} = 2.0$ V, $V_{INL} = 0.8$ V.
4. No V_L logic power supply required.
5. 8-lead MSOP and 8-lead, 3 mm \times 2 mm LFCSP.

Rev. A

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REVISION HISTORY

6/2016—Rev. 0 to Rev. A

Changes to Table 7.....	8
Deleted Table 9; Renumbered Sequentially	8
Change to Figure 6	9

10/2009—Revision 0: Initial Version

SPECIFICATIONS

±15 V DUAL SUPPLY

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

Table 1.

Parameter	25°C	-40°C to +85°C	-40°C to +125°C	Unit	Test Conditions/Comments
ANALOG SWITCH					
Analog Signal Range			V_{DD} to V_{SS}	V	
On Resistance, R_{ON}	2.1 2.4	2.8	3.2	Ω typ Ω max	$V_S = \pm 10\text{ V}$, $I_S = -10\text{ mA}$; see Figure 22 $V_{DD} = +13.5\text{ V}$, $V_{SS} = -13.5\text{ V}$
On-Resistance Match Between Channels, ΔR_{ON}	0.05			Ω typ	$V_S = \pm 10\text{ V}$, $I_S = -10\text{ mA}$
On-Resistance Flatness, $R_{FLAT(ON)}$	0.2 0.4 0.5	0.25 0.6	0.3 0.65	Ω max Ω typ Ω max	$V_S = \pm 10\text{ V}$, $I_S = -10\text{ mA}$
LEAKAGE CURRENTS					
Source Off Leakage, I_S (Off)	± 0.1 ± 0.5	± 2	± 75	nA typ nA max	$V_{DD} = +16.5\text{ V}$, $V_{SS} = -16.5\text{ V}$ $V_S = \pm 10\text{ V}$, $V_D = \pm 10\text{ V}$; see Figure 23
Drain Off Leakage, I_D (Off)	± 0.2 ± 0.6	± 3	± 100	nA typ nA max	$V_S = \pm 10\text{ V}$, $V_D = \pm 10\text{ V}$; see Figure 23
Channel On Leakage, I_D , I_S (On)	± 0.2 ± 1	± 3	± 100	nA typ nA max	$V_S = V_D = \pm 10\text{ V}$; see Figure 24
DIGITAL INPUTS					
Input High Voltage, V_{INH}			2.0	V min	
Input Low Voltage, V_{INL}			0.8	V max	
Input Current, I_{INL} or I_{INH}	0.005		± 0.1	μA typ μA max	$V_{IN} = V_{GND}$ or V_{DD}
Digital Input Capacitance, C_{IN}	4			pF typ	
DYNAMIC CHARACTERISTICS¹					
Transition Time, $t_{TRANSITION}$	130 155	190	220	ns typ ns max	$R_L = 300\ \Omega$, $C_L = 35\text{ pF}$ $V_S = +10\text{ V}$; see Figure 25
t_{ON} (EN)	85 110	125	140	ns typ ns max	$R_L = 300\ \Omega$, $C_L = 35\text{ pF}$ $V_S = 10\text{ V}$; see Figure 27
t_{OFF} (EN)	115 140	160	180	ns typ ns max	$R_L = 300\ \Omega$, $C_L = 35\text{ pF}$ $V_S = 10\text{ V}$; see Figure 27
Break-Before-Make Time Delay, t_D	15		8	ns typ ns min	$R_L = 300\ \Omega$, $C_L = 35\text{ pF}$ $V_{S1} = V_{S2} = 10\text{ V}$; see Figure 26
Charge Injection	-16			pC typ	$V_S = 0\text{ V}$, $R_S = 0\ \Omega$, $C_L = 1\text{ nF}$; see Figure 28
Off Isolation	-64			dB typ	$R_L = 50\ \Omega$, $C_L = 5\text{ pF}$, $f = 1\text{ MHz}$; see Figure 29
Channel-to-Channel Crosstalk	-64			dB typ	$R_L = 50\ \Omega$, $C_L = 5\text{ pF}$, $f = 1\text{ MHz}$; see Figure 30
Total Harmonic Distortion Plus Noise (THD + N)	0.016			% typ	$R_L = 10\text{ k}\Omega$, 5 V rms , $f = 20\text{ Hz}$ to 20 kHz ; see Figure 32
-3 dB Bandwidth	135			MHz typ	$R_L = 50\ \Omega$, $C_L = 5\text{ pF}$; see Figure 31
Insertion Loss	0.16			dB typ	$R_L = 50\ \Omega$, $C_L = 5\text{ pF}$, $f = 1\text{ MHz}$; see Figure 31
C_S (Off)	19			pF typ	$f = 1\text{ MHz}$; $V_S = 0\text{ V}$
C_D (Off)	44			pF typ	$f = 1\text{ MHz}$; $V_S = 0\text{ V}$
C_D , C_S (On)	114			pF typ	$f = 1\text{ MHz}$; $V_S = 0\text{ V}$

Parameter	25°C	-40°C to +85°C	-40°C to +125°C	Unit	Test Conditions/Comments
POWER REQUIREMENTS					
I_{DD}	0.002		1.0	$\mu\text{A typ}$ $\mu\text{A max}$	$V_{DD} = +16.5\text{ V}$, $V_{SS} = -16.5\text{ V}$ Digital inputs = 0 V or V_{DD}
I_{DD} , 8-Lead MSOP	58		95	$\mu\text{A typ}$ $\mu\text{A max}$	Digital inputs = 5 V
I_{DD} , 8-Lead LFCSP	120		190	$\mu\text{A typ}$ $\mu\text{A max}$	Digital inputs = 5 V
I_{SS}	0.002		1.0	$\mu\text{A typ}$ $\mu\text{A max}$	Digital inputs = 0 V, 5 V, or V_{DD}
V_{DD}/V_{SS}			$\pm 4.5/\pm 16.5$	V min/max	Ground = 0 V

¹ Guaranteed by design, not subject to production test.

+12 V SINGLE SUPPLY

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

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_{DD}	V	
On Resistance, R_{ON}	4			Ω typ	$V_S = 0\text{ V to }10\text{ V}$, $I_S = -10\text{ mA}$; see Figure 22
On-Resistance Match Between Channels, ΔR_{ON}	4.6 0.08	5.5	6.2	Ω max Ω typ	$V_{DD} = +10.8\text{ V}$, $V_{SS} = 0\text{ V}$ $V_S = 0\text{ V to }10\text{ V}$, $I_S = -10\text{ mA}$
On-Resistance Flatness, $R_{FLAT(ON)}$	0.25 1.2 1.5	0.3	0.35	Ω max Ω typ Ω max	$V_S = 0\text{ V to }10\text{ V}$, $I_S = -10\text{ mA}$
LEAKAGE CURRENTS					
Source Off Leakage, I_S (Off)	± 0.1			nA typ	$V_{DD} = +13.2\text{ V}$, $V_{SS} = 0\text{ V}$ $V_S = 1\text{ V}/10\text{ V}$, $V_D = 10\text{ V}/1\text{ V}$; see Figure 23
Drain Off Leakage, I_D (Off)	± 0.5 ± 0.2	± 2	± 75	nA max nA typ	$V_S = 1\text{ V}/10\text{ V}$, $V_D = 10\text{ V}/1\text{ V}$; see Figure 23
Channel On Leakage, I_D , I_S (On)	± 0.6 ± 0.2 ± 1	± 3 ± 3	± 100 ± 100	nA max nA typ nA max	$V_S = V_D = 1\text{ V or }10\text{ V}$; see Figure 24
DIGITAL INPUTS					
Input High Voltage, V_{INH}			2.0	V min	
Input Low Voltage, V_{INL}			0.8	V max	
Input Current, I_{INL} or I_{INH}	0.005		± 0.1	$\mu\text{A typ}$ $\mu\text{A max}$	$V_{IN} = V_{GND}$ or V_{DD}
Digital Input Capacitance, C_{IN}	4			pF typ	
DYNAMIC CHARACTERISTICS¹					
Transition Time, $t_{TRANSITION}$	200 255			ns typ ns max	$R_L = 300\ \Omega$, $C_L = 35\text{ pF}$ $V_S = 8\text{ V}$; see Figure 25
t_{ON} (EN)	145	265	370	ns typ	$R_L = 300\ \Omega$, $C_L = 35\text{ pF}$ $V_S = 8\text{ V}$; see Figure 27
t_{OFF} (EN)	190 130	220	245	ns max ns typ	$V_S = 8\text{ V}$; see Figure 27
Break-Before-Make Time Delay, t_D	170 55	205	220	ns max ns typ	$V_S = 8\text{ V}$; see Figure 27
Charge Injection	13		33	ns typ ns min	$R_L = 300\ \Omega$, $C_L = 35\text{ pF}$ $V_{S1} = V_{S2} = 8\text{ V}$; see Figure 26
Off Isolation	-60			pC typ dB typ	$V_S = 6\text{ V}$, $R_S = 0\ \Omega$, $C_L = 1\text{ nF}$; see Figure 28 $R_L = 50\ \Omega$, $C_L = 5\text{ pF}$, $f = 1\text{ MHz}$; see Figure 29

Parameter	25°C	-40°C to +85°C	-40°C to +125°C	Unit	Test Conditions/Comments
Channel-to-Channel Crosstalk	-60			dB typ	$R_L = 50\ \Omega$, $C_L = 5\ \text{pF}$, $f = 1\ \text{MHz}$; see Figure 30
-3 dB Bandwidth	95			MHz typ	$R_L = 50\ \Omega$, $C_L = 5\ \text{pF}$; see Figure 31
Insertion Loss	0.3			dB typ	$R_L = 50\ \Omega$, $C_L = 5\ \text{pF}$, $f = 1\ \text{MHz}$; see Figure 31
C_S (Off)	32			pF typ	$f = 1\ \text{MHz}$; $V_S = 6\ \text{V}$
C_D (Off)	72			pF typ	$f = 1\ \text{MHz}$; $V_S = 6\ \text{V}$
C_D , C_S (On)	123			pF typ	$f = 1\ \text{MHz}$; $V_S = 6\ \text{V}$
POWER REQUIREMENTS					
I_{DD}	0.001		1.0	μA typ μA max	$V_{DD} = 13.2\ \text{V}$ Digital inputs = 0 V or V_{DD}
I_{DD} , 8-Lead MSOP	58		95	μA typ μA max	Digital inputs = 5 V
I_{DD} , 8-Lead LFCSP	120		190	μA typ μA max	Digital inputs = 5 V
V_{DD}			5/16.5	V min/max	Ground = 0 V, $V_{SS} = 0\ \text{V}$

¹ Guaranteed by design, not subject to production test.

±5 V DUAL SUPPLY

$V_{DD} = +5\ \text{V} \pm 10\%$, $V_{SS} = -5\ \text{V} \pm 10\%$, GND = 0 V, unless otherwise noted.

Table 3.

Parameter	25°C	-40°C to +85°C	-40°C to +125°C	Unit	Test Conditions/Comments
ANALOG SWITCH					
Analog Signal Range			V_{DD} to V_{SS}	V	
On Resistance, R_{ON}	4.5 5.2	6.2	7	Ω typ Ω max	$V_S = \pm 4.5\ \text{V}$, $I_S = -10\ \text{mA}$; see Figure 22 $V_{DD} = +4.5\ \text{V}$, $V_{SS} = -4.5\ \text{V}$
On-Resistance Match Between Channels, ΔR_{ON}	0.1			Ω typ	$V_S = \pm 4.5\ \text{V}$, $I_S = -10\ \text{mA}$
On-Resistance Flatness, $R_{FLAT(ON)}$	0.3 1.3 1.6	0.35 1.85	0.4 2	Ω max Ω typ Ω max	$V_S = \pm 4.5\ \text{V}$, $I_S = -10\ \text{mA}$
LEAKAGE CURRENTS					
Source Off Leakage, I_S (Off)	± 0.1 ± 0.5	± 2	± 75	nA typ nA max	$V_{DD} = +5.5\ \text{V}$, $V_{SS} = -5.5\ \text{V}$ $V_S = \pm 4.5\ \text{V}$, $V_D = \mp 4.5\ \text{V}$; see Figure 23
Drain Off Leakage, I_D (Off)	± 0.1 ± 0.6	± 3	± 100	nA typ nA max	$V_S = \pm 4.5\ \text{V}$, $V_D = \mp 4.5\ \text{V}$; see Figure 23
Channel On Leakage, I_D , I_S (On)	± 0.1 ± 1	± 3	± 100	nA typ nA max	$V_S = V_D = \pm 4.5\ \text{V}$; see Figure 24
DIGITAL INPUTS					
Input High Voltage, V_{INH}			2.0	V min	
Input Low Voltage, V_{INL}			0.8	V max	
Input Current, I_{INL} or I_{INH}	0.001		± 0.1	μA typ μA max	$V_{IN} = V_{GND}$ or V_{DD}
Digital Input Capacitance, C_{IN}	4			pF typ	

Parameter	25°C	-40°C to +85°C	-40°C to +125°C	Unit	Test Conditions/Comments
DYNAMIC CHARACTERISTICS¹					
Transition Time, $t_{\text{TRANSITION}}$	310			ns typ	$R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
	410	495	560	ns max	$V_S = 3 \text{ V}$; see Figure 25
$t_{\text{ON}} (\text{EN})$	230			ns typ	$R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
	305	355	390	ns max	$V_S = 3 \text{ V}$; see Figure 27
$t_{\text{OFF}} (\text{EN})$	220			ns typ	$R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
	290	335	365	ns max	$V_S = 3 \text{ V}$; see Figure 27
Break-Before-Make Time Delay, t_D	65			ns typ	$R_L = 300 \Omega$, $C_L = 35 \text{ pF}$
			31	ns min	$V_{S1} = V_{S2} = 3 \text{ V}$; see Figure 26
Charge Injection	59			pC typ	$V_S = 0 \text{ V}$, $R_S = 0 \Omega$, $C_L = 1 \text{ nF}$; see Figure 28
Off Isolation	-60			dB typ	$R_L = 50 \Omega$, $C_L = 5 \text{ pF}$, $f = 1 \text{ MHz}$; see Figure 29
Channel-to-Channel Crosstalk	-60			dB typ	$R_L = 50 \Omega$, $C_L = 5 \text{ pF}$, $f = 1 \text{ MHz}$; see Figure 30
Total Harmonic Distortion Plus Noise	0.04			% typ	$R_L = 10 \text{ k}\Omega$, 5 V p-p , $f = 20 \text{ Hz to } 20 \text{ kHz}$; see Figure 32
-3 dB Bandwidth	105			MHz typ	$R_L = 50 \Omega$, $C_L = 5 \text{ pF}$; see Figure 31
Insertion Loss	0.28			dB typ	$R_L = 50 \Omega$, $C_L = 5 \text{ pF}$, $f = 1 \text{ MHz}$; see Figure 31
C_S (Off)	26			pF typ	$V_S = 0 \text{ V}$, $f = 1 \text{ MHz}$
C_D (Off)	62			pF typ	$V_S = 0 \text{ V}$, $f = 1 \text{ MHz}$
C_D , C_S (On)	128			pF typ	$V_S = 0 \text{ V}$, $f = 1 \text{ MHz}$
POWER REQUIREMENTS					
I_{DD}	0.001		1.0	$\mu\text{A typ}$ $\mu\text{A max}$	$V_{\text{DD}} = +5.5 \text{ V}$, $V_{\text{SS}} = -5.5 \text{ V}$ Digital inputs = 0 V or V_{DD}
I_{SS}	0.001		1.0	$\mu\text{A typ}$ $\mu\text{A max}$	Digital inputs = 0 V or V_{DD}
$V_{\text{DD}}/V_{\text{SS}}$			$\pm 4.5/\pm 16.5$	V min/max	Ground = 0 V

¹ Guaranteed by design, not subject to production test.

CONTINUOUS CURRENT PER CHANNEL, S OR D

Table 4.

Parameter	25°C	85°C	125°C	Unit	Test Conditions/Comments
CONTINUOUS CURRENT PER CHANNEL¹					
$\pm 15 \text{ V Dual Supply}$					$V_{\text{DD}} = +13.5 \text{ V}$, $V_{\text{SS}} = -13.5 \text{ V}$
8-Lead MSOP ($\theta_{\text{JA}} = 206^\circ\text{C/W}$)	215	135	80	mA maximum	
8-Lead LFCSP ($\theta_{\text{JA}} = 50.8^\circ\text{C/W}$)	390	215	100	mA maximum	
$+12 \text{ V Single Supply}$					$V_{\text{DD}} = 10.8 \text{ V}$, $V_{\text{SS}} = 0 \text{ V}$
8-Lead MSOP ($\theta_{\text{JA}} = 206^\circ\text{C/W}$)	175	115	70	mA maximum	
8-Lead LFCSP ($\theta_{\text{JA}} = 50.8^\circ\text{C/W}$)	320	185	95	mA maximum	
$\pm 5 \text{ V Dual Supply}$					$V_{\text{DD}} = +4.5 \text{ V}$, $V_{\text{SS}} = -4.5 \text{ V}$
8-Lead MSOP ($\theta_{\text{JA}} = 206^\circ\text{C/W}$)	165	110	70	mA maximum	
8-Lead LFCSP ($\theta_{\text{JA}} = 50.8^\circ\text{C/W}$)	310	180	95	mA maximum	

¹ Guaranteed by design, not subject to production test.

ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$, unless otherwise noted.

Table 5.

Parameter	Rating
V_{DD} to V_{SS}	35 V
V_{DD} to GND	-0.3 V to +25 V
V_{SS} to GND	+0.3 V to -25 V
Analog Inputs ¹	$V_{SS} - 0.3\text{ V}$ to $V_{DD} + 0.3\text{ V}$ or 30 mA, whichever occurs first
Digital Inputs ¹	GND - 0.3 V to $V_{DD} + 0.3\text{ V}$ or 30 mA, whichever occurs first
Peak Current, S or D (Pulsed at 1 ms, 10% Duty-Cycle Maximum)	
8-Lead MSOP (4-Layer Board)	400 mA
8-Lead LFCSP	600 mA
Continuous Current per Channel, S or D	Data in Table 4 + 15% mA
Operating Temperature Range Industrial	-40°C to +125°C
Storage Temperature Range	-65°C to +150°C
Junction Temperature	150°C
Reflow Soldering Peak Temperature, Pb Free	260°C

¹ Over voltages 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.

THERMAL RESISTANCE

Table 6. Thermal Resistance

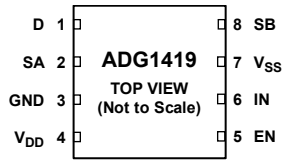
Package Type	θ_{JA}	θ_{JC}	Unit
8-Lead MSOP (4-Layer Board)	206	44	°C/W
8-Lead LFCSP	50.8		°C/W

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



NOTES
1. EXPOSED PAD TIED TO SUBSTRATE, V_{SS} .

Figure 3. 8-Lead LFCSP Pin Configuration

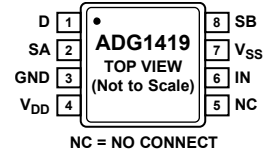


Figure 4. 8-Lead MSOP Pin Configuration

Table 7. Pin Function Descriptions

Pin No.		Mnemonic	Description
LFCSP	MSOP		
1	1	D	Drain Terminal. This pin can be an input or output.
2	2	SA	Source Terminal. This pin can be an input or output.
3	3	GND	Ground (0 V) Reference.
4	4	V_{DD}	Most Positive Power Supply Potential.
5	Not applicable	EN	Active High Digital Input. When this pin is low, the device is disabled and all switches are turned off. When this pin is high, the IN logic input determines which switch is turned on.
Not applicable	5	NC	No Connect.
6	6	IN	Logic Control Input.
7	7	V_{SS}	Most Negative Power Supply Potential.
8	8	SB	Source Terminal. This pin can be an input or output.
0	Not applicable	EPAD	Exposed Pad. Exposed pad tied to substrate, V_{SS} .

Table 8. 8-Lead LFCSP Truth Table

EN	IN	Switch A	Switch B
0	X	Off	Off
1	0	On	Off
1	1	Off	On

Table 9. 8-Lead MSOP Truth Table

IN	Switch A	Switch B
0	On	Off
1	Off	On

TYPICAL PERFORMANCE CHARACTERISTICS

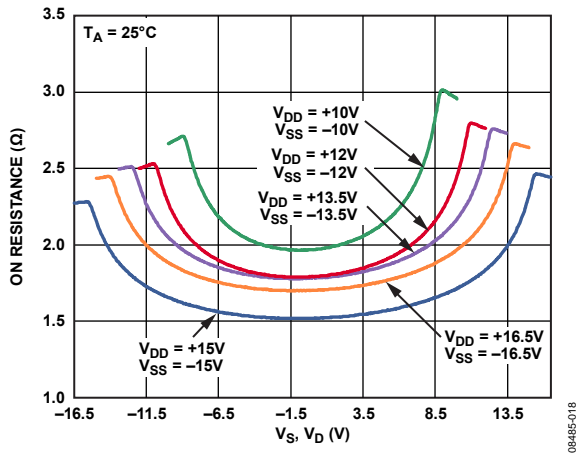


Figure 5. On Resistance as a Function of V_D (V_S) for Dual Supply

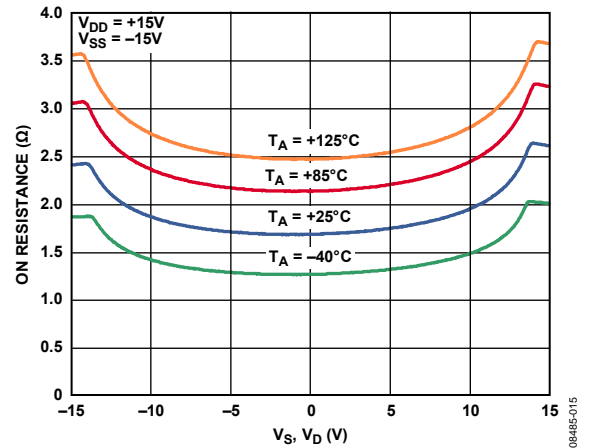


Figure 8. On Resistance as a Function of V_D (V_S) for Different Temperatures, ± 15 V Dual Supply

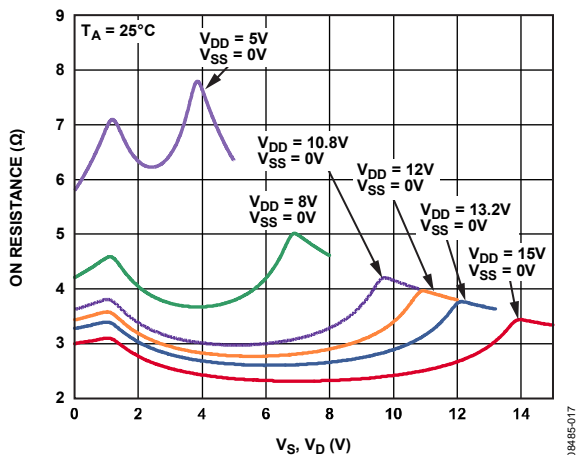


Figure 6. On Resistance as a Function of V_D (V_S) for Single Supply

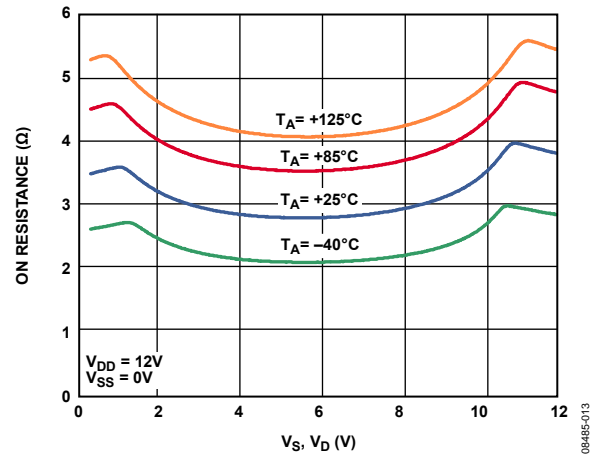


Figure 9. On Resistance as a Function of V_D (V_S) for Different Temperatures, +12 V Single Supply

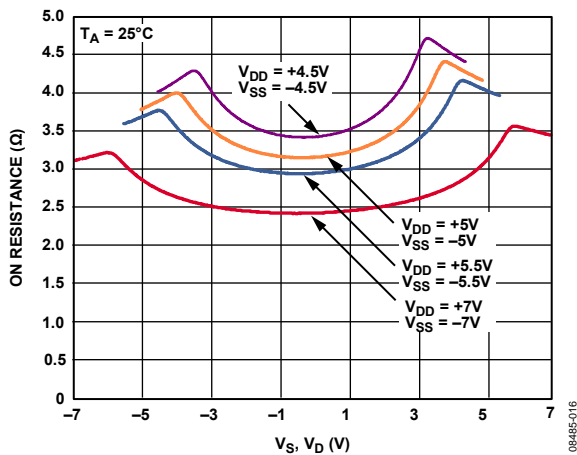


Figure 7. On Resistance as a Function of V_D (V_S) for Dual Supply

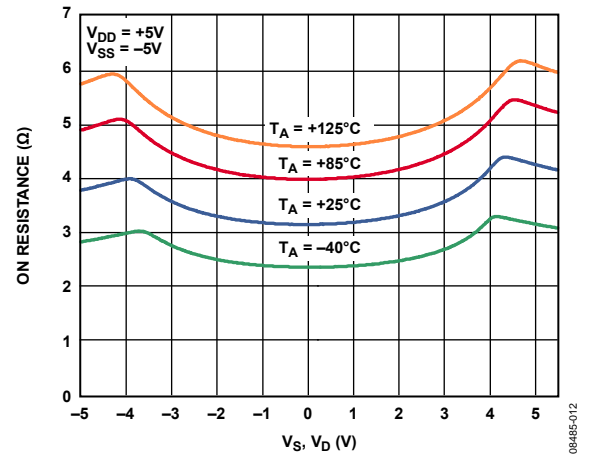


Figure 10. On Resistance as a Function of V_D (V_S) for Different Temperatures, ± 5 V Dual Supply

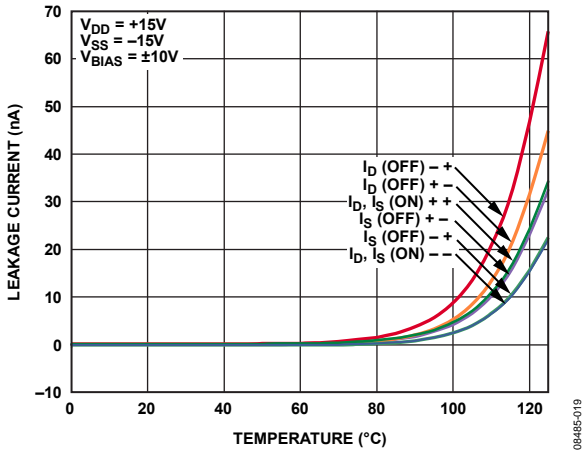


Figure 11. Leakage Currents as a Function of Temperature, ±15V Dual Supply

08485-019

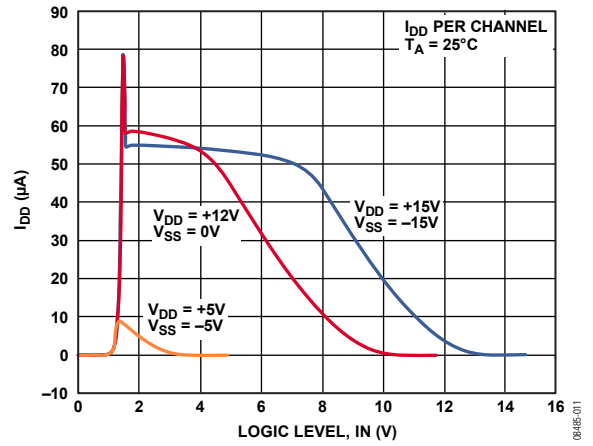


Figure 14. I_{DD} vs. Logic Level

08485-011

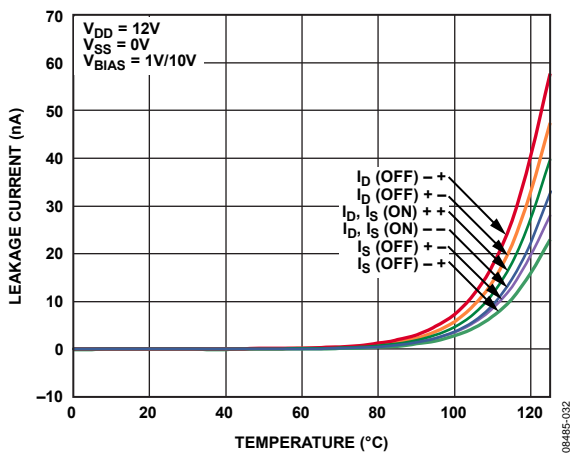


Figure 12. Leakage Currents as a Function of Temperature, +12V Single Supply

08485-032

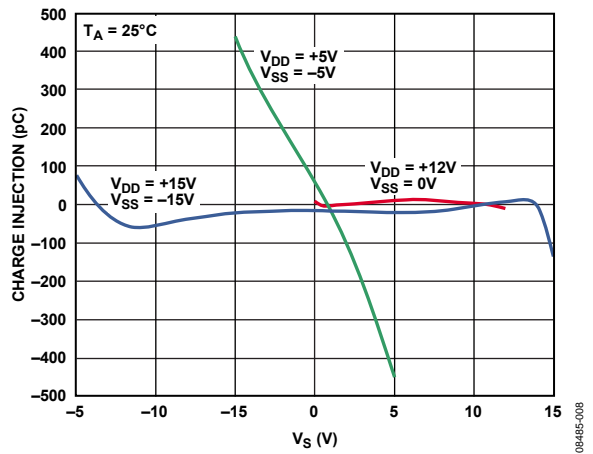


Figure 15. Charge Injection vs. Source Voltage

08485-008

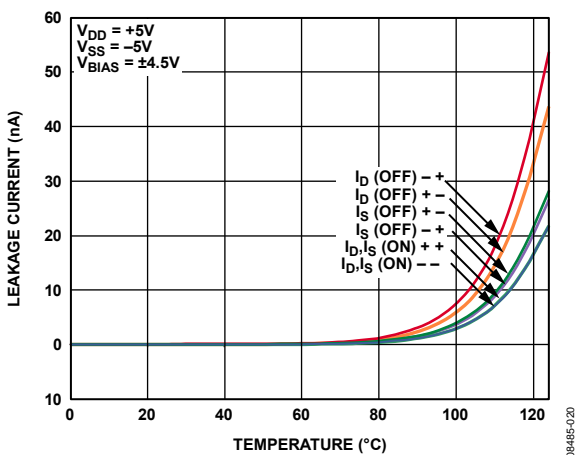


Figure 13. Leakage Currents as a Function of Temperature, ±5V Dual Supply

08485-020

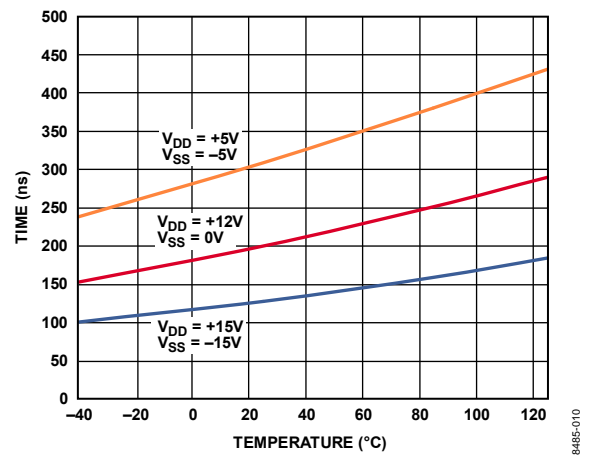


Figure 16. $t_{TRANSITION}$ Times vs. Temperature

08485-010

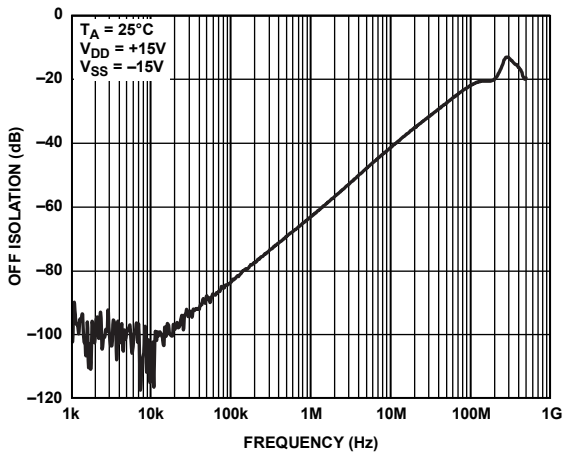


Figure 17. Off Isolation vs. Frequency

08485-006

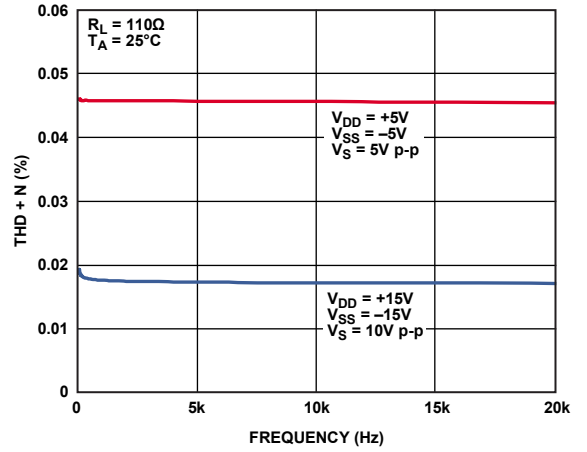


Figure 20. THD + N vs. Frequency

08485-009

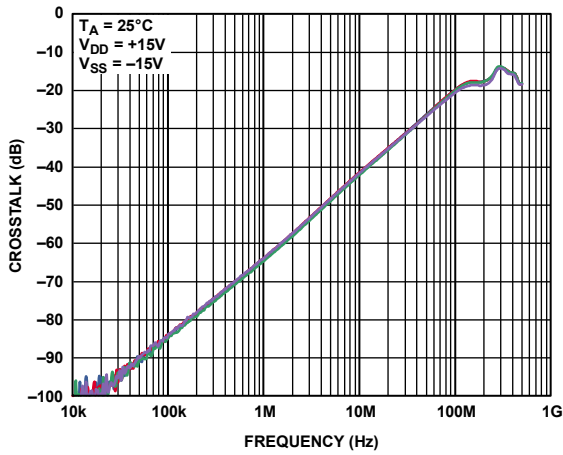


Figure 18. Crosstalk vs. Frequency

08485-033

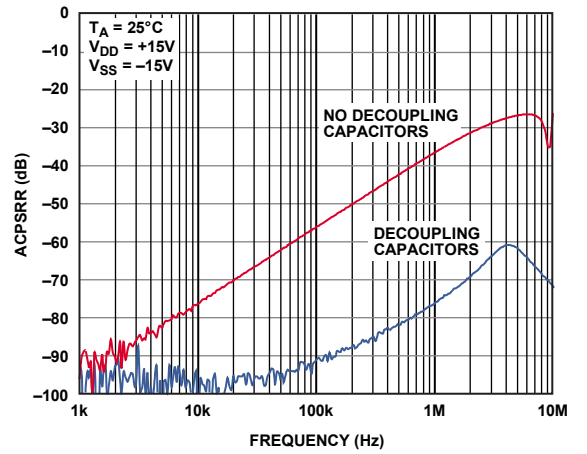


Figure 21. ACPSRR vs. Frequency

08485-007

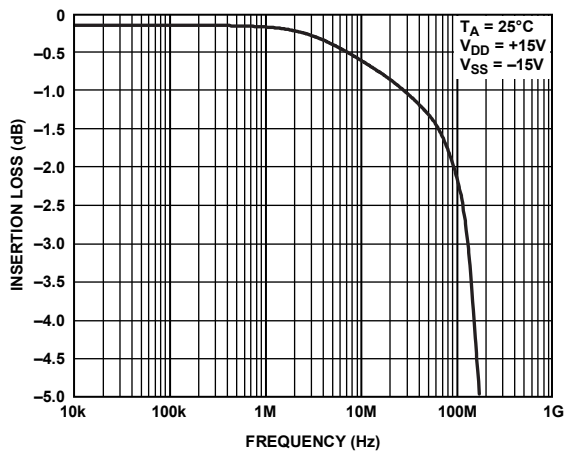


Figure 19. On Response vs. Frequency

08485-005

TEST CIRCUITS

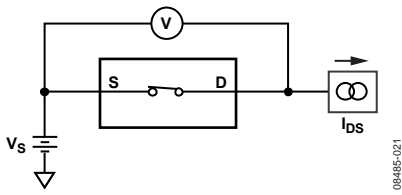


Figure 22. On Resistance

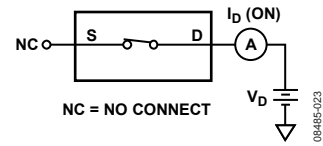


Figure 24. On Leakage

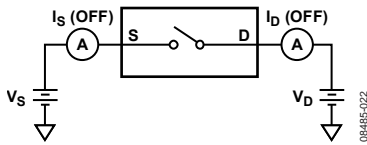


Figure 23. Off Leakage

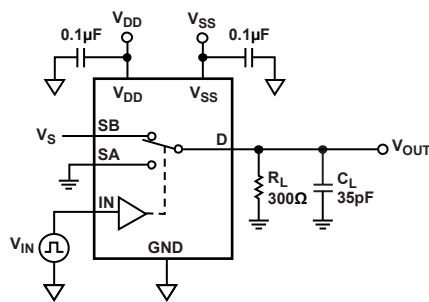


Figure 25. Switching Times, t_{ON} and t_{OFF}

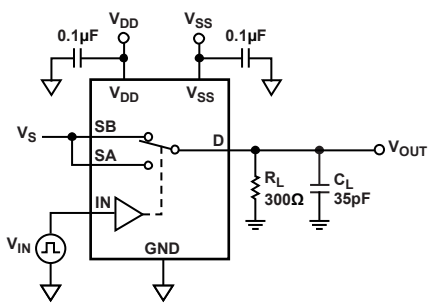
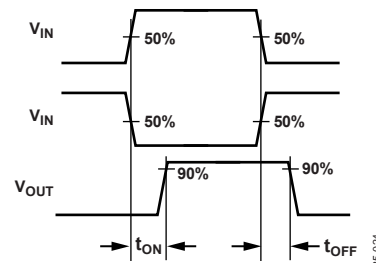


Figure 26. Break-Before-Make Time Delay

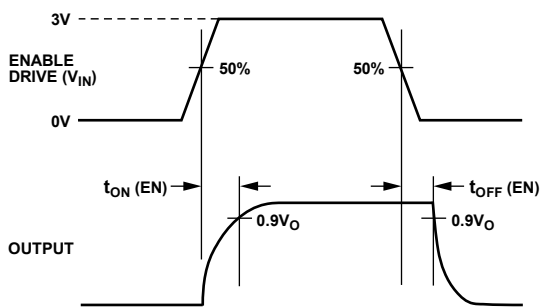
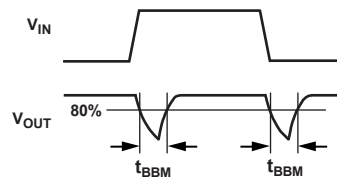
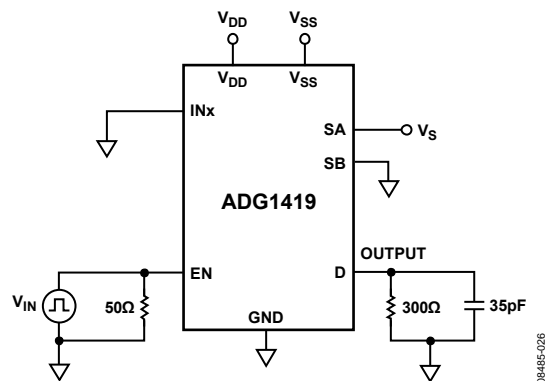


Figure 27. Enable Delay, $t_{ON} (EN)$, $t_{OFF} (EN)$



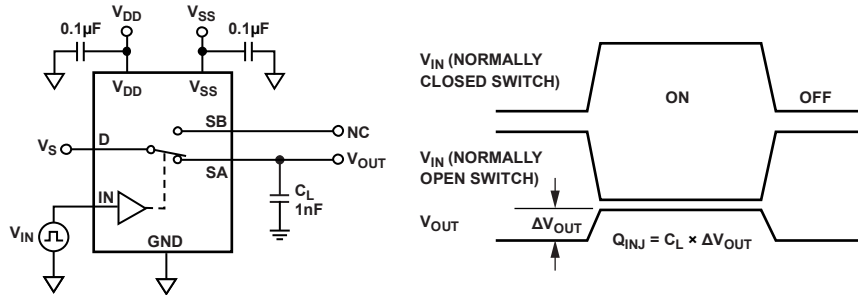
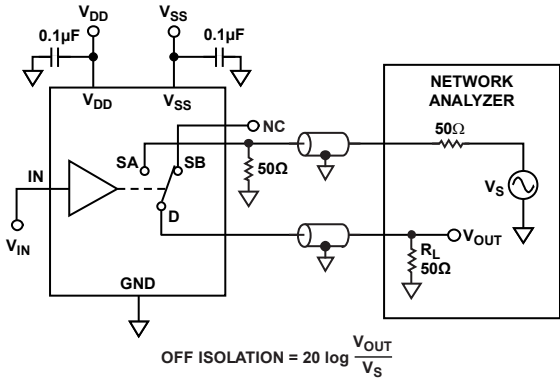


Figure 28. Charge Injection

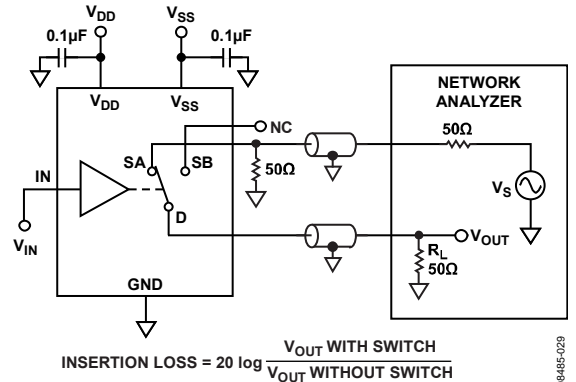
09485-027



$$\text{OFF ISOLATION} = 20 \log \frac{V_{\text{OUT}}}{V_S}$$

Figure 29. Off Isolation

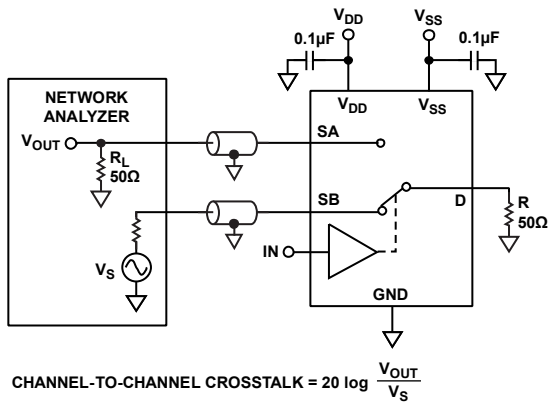
09485-028



$$\text{INSERTION LOSS} = 20 \log \frac{V_{\text{OUT WITH SWITCH}}}{V_{\text{OUT WITHOUT SWITCH}}}$$

Figure 31. Bandwidth

09485-029



$$\text{CHANNEL-TO-CHANNEL CROSSTALK} = 20 \log \frac{V_{\text{OUT}}}{V_S}$$

Figure 30. Channel-to-Channel Crosstalk

09485-030

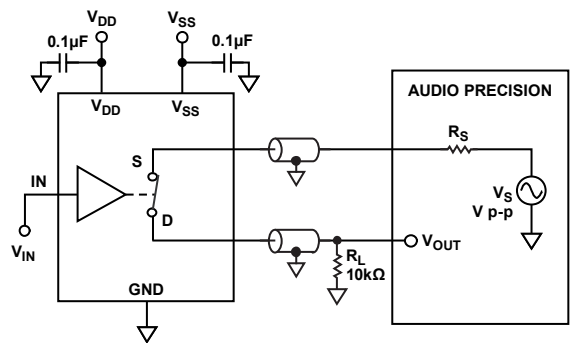


Figure 32. THD + N

09485-031

TERMINOLOGY

I_{DD}

The positive supply current.

I_{SS}

The negative supply current.

V_D (V_S)

The analog voltage on Terminal D and Terminal S.

R_{ON}

The ohmic resistance between Terminal D and Terminal S.

R_{FLAT} (ON)

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

I_S (Off)

The source leakage current with the switch off.

I_D (Off)

The drain leakage current with the switch off.

I_D, I_S (On)

The channel leakage current with the switch on.

V_{INL}

The maximum input voltage for Logic 0.

V_{INH}

The minimum input voltage for Logic 1.

I_{INL} (I_{INH})

The input current of the digital input.

C_S (Off)

The off switch source capacitance, measured with reference to ground.

C_D (Off)

The off switch drain capacitance, measured with reference to ground.

C_D, C_S (On)

The on switch capacitance, measured with reference to ground.

C_{IN}

The digital input capacitance.

t_{ON} (EN)

Delay time between the 50% and 90% points of the digital input and switch on condition. See Figure 27.

t_{OFF} (EN)

Delay time between the 50% and 90% points of the digital input and switch off condition. See Figure 27.

$t_{TRANSITION}$

Delay time between the 50% and 90% points of the digital inputs and the switch on condition when switching from one address state to another.

T_{BBM}

Off time measured between the 80% point of both switches when switching from one address state to another. See Figure 26.

Charge Injection

A measure of the glitch impulse transferred from the digital input to the analog output during switching. See Figure 28.

Off Isolation

A measure of unwanted signal coupling through an off switch. See Figure 29.

Crosstalk

A measure of unwanted signal that is coupled through from one channel to another as a result of parasitic capacitance. See Figure 30.

Bandwidth

The frequency at which the output is attenuated by 3 dB. See Figure 31.

On Response

The frequency response of the on switch.

Insertion Loss

The loss due to the on resistance of the switch. See Figure 31.

THD + N

The ratio of the harmonic amplitude plus noise of the signal to the fundamental. See Figure 32.

AC Power Supply Rejection Ratio (ACPSRR)

ACPSRR measures the ability of a part to avoid coupling noise and spurious signals that appear on the supply voltage pin to the output of the switch. The dc voltage on the device is modulated by a sine wave of 0.62 V p-p. The ratio of the amplitude of signal on the output to the amplitude of the modulation is the ACPSRR. See Figure 21.

OUTLINE DIMENSIONS

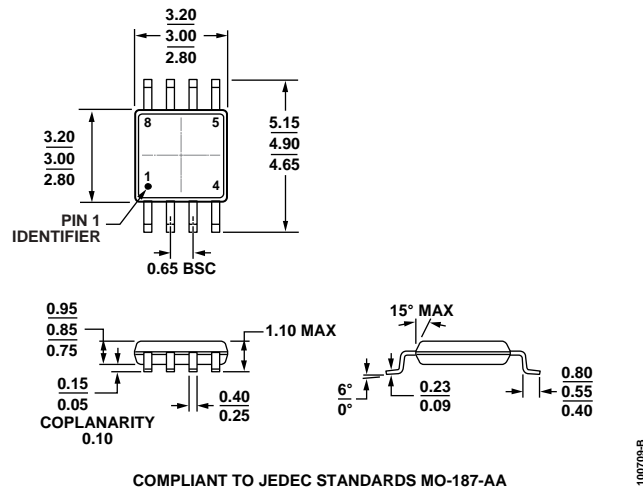


Figure 33. 8-Lead Mini Small Outline Package [MSOP] (RM-8)
Dimensions shown in millimeters

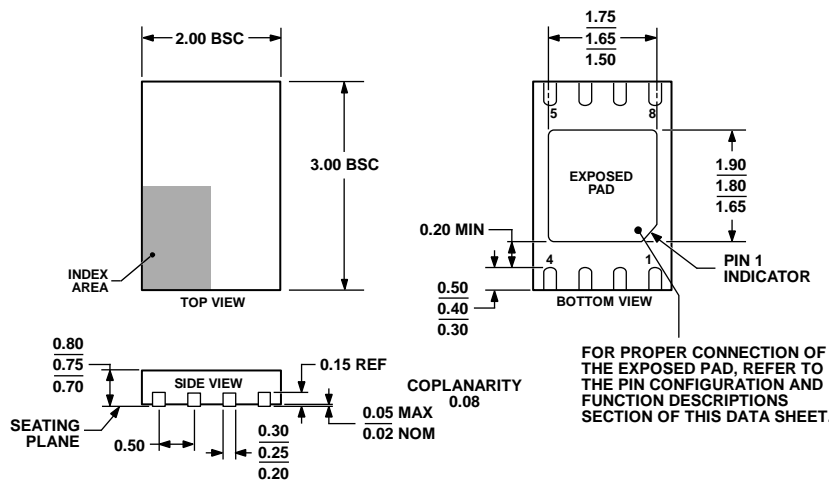


Figure 34. 8-Lead Lead Frame Chip Scale Package [LFCS_P_WD] 3 mm x 2 mm Body, Very Very Thin, Dual Lead (CP-8-4)
Dimensions shown in millimeters

ORDERING GUIDE

Model ¹	Temperature Range	Package Description	Package Option	Branding
ADG1419BRMZ	-40°C to +125°C	8-Lead Mini Small Outline Package [MSOP]	RM-8	S1L
ADG1419BRMZ-REEL7	-40°C to +125°C	8-Lead Mini Small Outline Package [MSOP]	RM-8	S1L
ADG1419BCPZ-REEL7	-40°C to +125°C	8-Lead Lead Frame Chip Scale Package [LFCS_P_WD]	CP-8-4	1C

¹ Z = RoHS Compliant Part.

NOTES

Mouser Electronics

Authorized Distributor

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[ADG1419BCPZ-REEL7](#) [ADG1419BRMZ](#) [ADG1419BRMZ-REEL7](#)