



Wideband, 43dB Isolation @ 1GHz, CMOS 1.65 V to 2.75V, 2:1 Mux/SPDT Switches

Preliminary Technical Data

ADG918/ADG919

FEATURES

Wideband DC to 2GHz
ADG918/ADG919 Absorptive/Reflective Switches
High Off Isolation (43 dB @ 1 GHz)
Low Insertion Loss (1 dB DC to 900 MHz)
Single 1.65 to 2.75 V power supply
CMOS/LVTTL Control Logic
8 Lead MSOP & Tiny 3 x 3mm CSP Packages
Low Power Consumption (5 μ A)

APPLICATIONS

Wireless Communications
General Purpose RF switching
Dual Band Applications
Filter Selection
Antenna Switch
Digital Transceiver Front-End Switch
IF Switching

GENERAL DESCRIPTION

The ADG918/ADG919 are wideband switches using a CMOS process to provide high isolation and low insertion loss to 1GHz. The ADG918 is an absorptive switch having 50 ohm terminated shunt legs, while the ADG919 is a reflective switch. These devices are designed such that the isolation is high over the DC to 1GHz frequency range. They have on board CMOS control logic, thus eliminating the need for external controlling circuitry. The control inputs are both CMOS and LVTTL compatible. The low power consumption of these CMOS devices makes them ideally suited to wireless applications and general purpose high frequency switching.

FUNCTIONAL BLOCK DIAGRAM

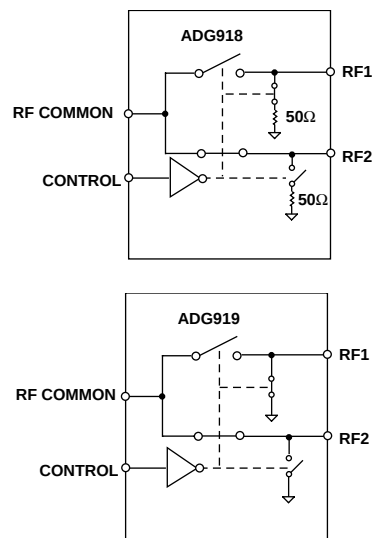


Table 1. Truth Table

Control	Signal Path
0	RF2 to RF Common
1	RF1 to RF Common

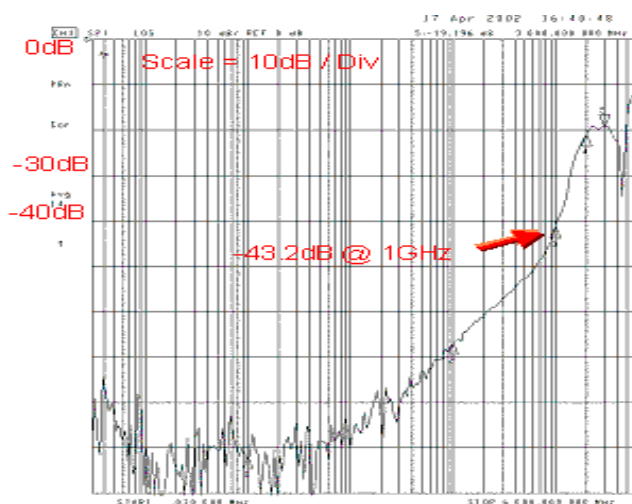


Figure 1. Isolation vs Frequency

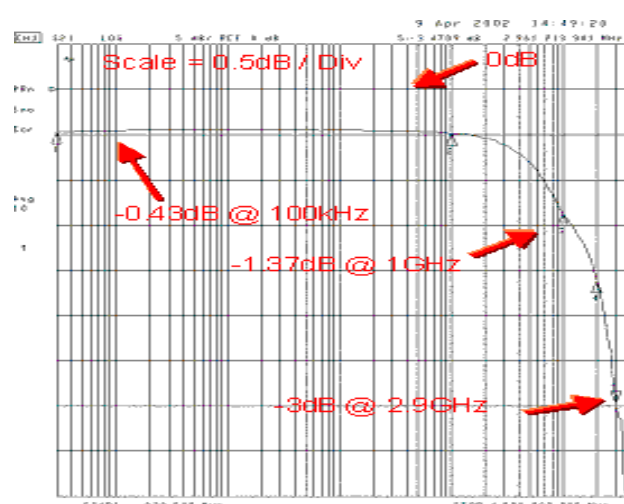


Figure 2. Loss vs Frequency

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ADG918/ADG919—SPECIFICATIONS¹

($V_{DD} = +1.65\text{ V}$ to $+2.75\text{ V}$, $GND = 0\text{ V}$, All specifications T_{MIN} to T_{MAX} unless otherwise noted)

Parameter	Symbol	Conditions	B Version			Units
			Min	Typ ²	Max	
AC ELECTRICAL CHARACTERISTICS						
Operating Frequency	S ₂₁ , S ₁₂	DC		2	GHz	
Insertion Loss		0.4		dB		
		500 MHz	0.65		dB	
		900 MHz	1.0		dB	
Isolation- RF to RF1/RF2	S ₂₁ , S ₁₂	1 MHz		100	dB	
		100 MHz		55	dB	
		500 MHz			dB	
		1000 MHz		43	dB	
Isolation - RF1 to RF2	S ₂₁ , S ₁₂	1 MHz		100	dB	
		100 MHz		55	dB	
		500 MHz			dB	
		1000 MHz		30	dB	
Return Loss (On Channel)	S ₁₁ , S ₂₂	DC - 100 MHz		26	dB	
		500 MHz			dB	
		1000 MHz		23	dB	
		50% Control to 90% RF		5	ns	
On switching Time	t _{ON}	50% Control to 90% RF		5	ns	
Off Switching Time	t _{OFF}	50% Control to 10% RF		4	ns	
1 dB Compression	P _{-1dB}	DC to 1000 MHz		20	dBm	
Third Order Intermodulation intercept	IP ₃	900MHz, 5dBm		35	dBm	
DC ELECTRICAL CHARACTERISTICS						
Input High Voltage	V _{INH}	V _{DD} = 2.3 V to 2.75 V	1.7		V	
	V _{INH}	V _{DD} = 1.65 V to 1.95 V	0.65V _{CC}		V	
Input Low Voltage	V _{INL}	V _{DD} = 2.3 V to 2.75 V		0.7	V	
	V _{INL}	V _{DD} = 1.65 V to 1.95 V		0.35V _{CC}	V	
Input Leakage Current	I _I	0 ≤ V _{IN} ≤ 2.75 V		±1	μA	
CAPACITANCE ³						
RF1/RF2, RF Port On Capacitance	C _{RF ON}	f = 1 MHz		2	pF	
Control Input Capacitance	C _{IN}	f = 1 MHz		2	pF	
POWER REQUIREMENTS						
V _{DD}	I _{DD}	Digital Inputs = 0 V or V _{DD}	1.65	2.75	V	
Quiescent Power Supply Current				1	5	μA

NOTES

¹Temperature range is as follows: B Version: -40°C to $+85^\circ\text{C}$.

²Typical values are at $+25^\circ\text{C}$ unless otherwise stated.

³Guaranteed by design, not subject to production test.

Specifications subject to change without notice.

ABSOLUTE MAXIMUM RATINGS¹(T_A = +25°C unless otherwise noted)

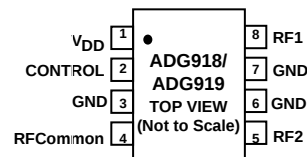
V _{DD} to GND	-0.5 V to +4 V
Inputs to GND	-0.5 V to V _{DD} + 0.3V
Input Power	TBD dBm
Operating Temperature Range	
Industrial (B Version)	-40°C to +85°C
Storage Temperature Range	-65°C to +150°C
Junction Temperature	+150°C
MSOP Package	
θ _{JA} Thermal Impedance	206°C/W
CSP Package	
θ _{JA} Thermal Impedance	TBD°C/W
Lead Temperature, Soldering (10seconds)	300°C
IR Reflow, Peak Temperature (<20 seconds)	+235°C

NOTES

¹Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those listed in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. Only one absolute maximum rating may be applied at any one time.

PIN CONFIGURATION

8-Lead MSOP (RM-8)
3x3mm CSP (CP-8)

**ORDERING GUIDE**

Model	Temperature Range	Package Descriptions	Branding	Package Options
ADG918BRM	-40°C to +85°C	MSOP (Micro Small Outline Package)		RM-8
ADG918BCP	-40°C to +85°C	Chip Scale Package		CP-8
ADG919BRM	-40°C to +85°C	MSOP (Micro Small Outline Package)		RM-8
ADG919BCP	-40°C to +85°C	Chip Scale Package		CP-8

CAUTION

ESD (electrostatic discharge) sensitive device. Electrostatic charges as high as 4000 V readily accumulate on the human body and test equipment and can discharge without detection. Although the ADG919 features proprietary ESD protection circuitry, permanent damage may occur on devices subjected to high energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.



Dimensions shown in inches and (mm).

TBD