

ADG201A/ADG202A—SPECIFICATIONS ($V_{DD} = +15V$, $V_{SS} = -15V$, unless otherwise specified)

Parameter	K Version – 40°C to		B Version – 40°C to		T Version – 55°C to		Units	Test Conditions
	25°C	+ 85°C	25°C	+ 85°C	25°C	+ 125°C		
ANALOG SWITCH								
Analog Signal Range	± 15	± 15	± 15	± 15	± 15	± 15	Volts	– 10V ≤ V _S ≤ + 10V I _{DS} = 1.0mA Test Circuit 1
R _{ON}	60		60		60		Ω typ	
	90	145	90	145	90	145	Ω max	
R _{ON} vs. V _D (V _S)	20		20		20		% typ	V _S = 0V, I _{DS} = 1mA
R _{ON} Drift	0.5		0.5		0.5		%/°C typ	
R _{ON} Match	5		5		5		% typ	
I _S (OFF)	0.5		0.5		0.5		nA typ	V _D = ± 14V; V _S = ± 14V; Test Circuit 2
OFF Input Leakage	2	100	2	100	1	100	nA max	
I _D (OFF)	0.5		0.5		0.5		nA typ	V _D = ± 14V; V _S = ± 14V; Test Circuit 2
OFF Output Leakage	2	100	2	100	1	100	nA max	
I _D (ON)	0.5		0.5		0.5		nA typ	V _D = ± 14V; Test Circuit 3
ON Channel Leakage	2	200	2	200	1	200	nA max	
DIGITAL CONTROL								
V _{INH} , Input High Voltage		2.4		2.4		2.4	V min	
V _{INL} , Input Low Voltage		0.8		0.8		0.8	V max	
I _{INL} or I _{INH}		1		1		1	μA max	
DYNAMIC CHARACTERISTICS								
t _{OPEN}	30		30		30		ns typ	Test Circuit 4 Test Circuit 4 V _S = 10V(p-p); f = 100kHz R _L = 75Ω; Test Circuit 6 Test Circuit 7
t _{ON} ¹	300		300		300		ns max	
t _{OFF} ¹	250		250		250		ns max	
OFF Isolation	80		80		80		dB typ	
Channel-to-Channel Crosstalk	80		80		80		dB typ	R _S = 0Ω; C _L = 1000pF; V _S = 0V Test Circuit 5
C _S (OFF)	5		5		5		pF typ	
C _D (OFF)	5		5		5		pF typ	
C _D , C _S (ON)	16		16		16		pF typ	
C _{IN} Digital Input Capacitance	5		5		5		pF typ	
Q _{INJ} Charge Injection	20		20		20		pC typ	
POWER SUPPLY								
I _{DD}	0.6		0.6		0.6		mA typ	Digital Inputs = V _{INL} or V _{INH}
I _{DD}		2		2		2	mA max	
I _{SS}	0.1		0.1		0.1		mA typ	
I _{SS}		0.2		0.2		0.2	mA max	
Power Dissipation		33		33		33	mW max	

NOTES

¹Sample tested at 25°C to ensure compliance.

Specifications subject to change without notice.

ABSOLUTE MAXIMUM RATINGS*

($T_A = +25^\circ C$ unless otherwise stated)

V_{DD} to V_{SS}	44V
V_{DD} to GND	25V
V_{SS} to GND	–25V
Analog Inputs ¹	
Voltage at S, D	$V_{SS} - 0.3V$ to $V_{DD} + 0.3V$
Continuous Current, S or D	30mA
Pulsed Current S or D	
1ms Duration, 10% Duty Cycle	70mA
Digital Inputs ¹	
Voltage at IN	$V_{SS} - 2V$ to $V_{DD} + 2V$ or 20mA, Whichever Occurs First

Power Dissipation (Any Package)

Up to +75°C	470mW
Derates above +75°C by	6mW/°C

Operating Temperature

Commercial (K Version)	–40°C to +85°C
Industrial (B Version)	–40°C to +85°C
Extended (T Version)	–55°C to +125°C
Storage Temperature Range	–65°C to +150°C
Lead Temperature (Soldering 10sec)	+300°C

NOTE

¹Overvoltage at IN, S or D will be clamped by diodes. Current should be limited to the Maximum Rating above.

*COMMENT: Stresses 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 indicated 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.

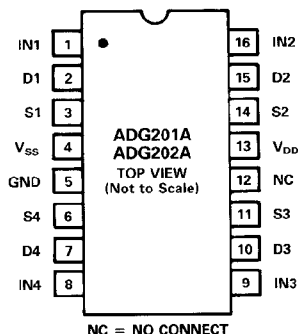
ESD (electrostatic discharge) sensitive device. The digital control inputs are diode protected; however, permanent damage may occur on unconnected devices subject to high energy electrostatic fields. Unused devices must be stored in conductive foam or shunts. The protective foam should be discharged to the destination socket before devices are removed.

Model¹	Temperature Range	Package Option²
ADG201AKN	−40°C to +85°C	N-16
ADG201AKR	−40°C to +85°C	R-16A
ADG201AKP	−40°C to +85°C	P-20A
ADG201ABQ	−40°C to +85°C	Q-16
ADG201ATQ	−55°C to +125°C	Q-16
ADG201ATE	−55°C to +125°C	E-20A
ADG202AKN	−40°C to +85°C	N-16
ADG202AKR	−40°C to +85°C	R-16A
ADG202AKP	−40°C to +85°C	P-20A
ADG202ABQ	−40°C to +85°C	Q-16
ADG202ATQ	−55°C to +125°C	Q-16
ADG202ATE	−55°C to +125°C	E-20A

¹To order MIL-STD-883, Class B processed parts, add/883B to T grade part numbers. See Analog Devices Military Products Databook (1990) for military data sheet.

²E = Leadless Ceramic Chip Carrier (LCCC); N = Plastic DIP; R = 0.15" Small Outline IC (SOIC); P = Plastic Leaded Chip Carrier (PLCC); Q = Cerdip.

DIP, SOIC



Pin configuration diagram for the ADG201A/ADG202A in a 20-pin DIP package. The diagram shows a top view of the package with pins numbered 1 through 20. Pin 1 is at the top center, and pin 20 is at the top right. Pin 19 is at the top left. Pin 18 is on the right side. Pin 17 is on the right side. Pin 16 is on the right side. Pin 15 is on the right side. Pin 14 is on the right side. Pin 13 is on the right side. Pin 12 is on the right side. Pin 11 is on the right side. Pin 10 is on the right side. Pin 9 is on the right side. Pin 8 is on the right side. Pin 7 is on the right side. Pin 6 is on the right side. Pin 5 is on the right side. Pin 4 is on the right side. Pin 3 is on the right side. Pin 2 is on the right side. Pin 1 is on the right side. The diagram also shows the internal connections for the ADG201A and ADG202A comparators. The ADG201A has inputs IN1 and IN2, and output OUT1. The ADG202A has inputs IN1 and IN2, and output OUT2. The diagram is labeled 'TOP VIEW (Not to Scale)'.

PLCC

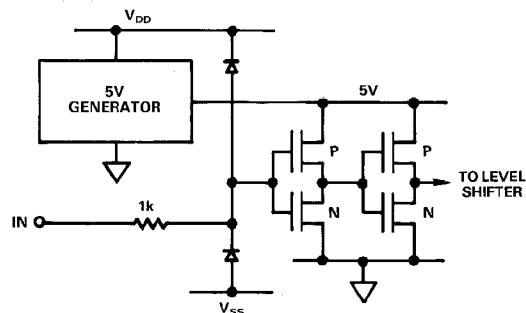
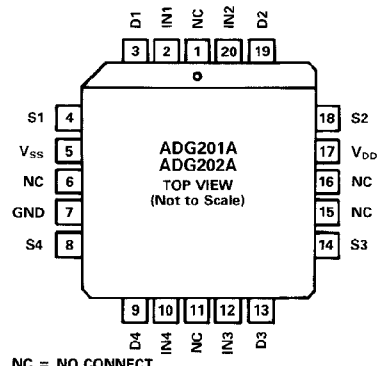
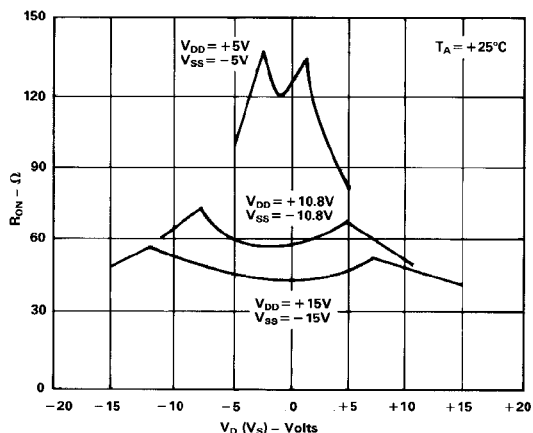


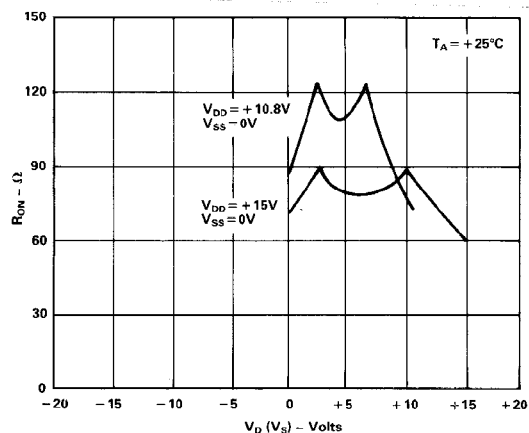
Figure 1. Typical Digital Input Cell

ADG201A/ADG202A—Typical Performance Characteristics

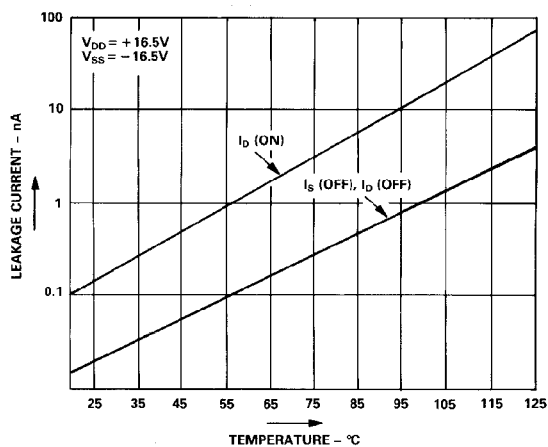
The switches are guaranteed functional with reduced single or dual supplies down to 4.5V.



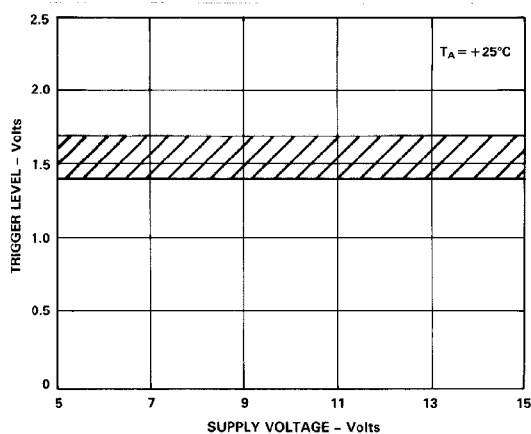
R_{ON} as a Function of V_D (V_S): Dual Supply Voltage



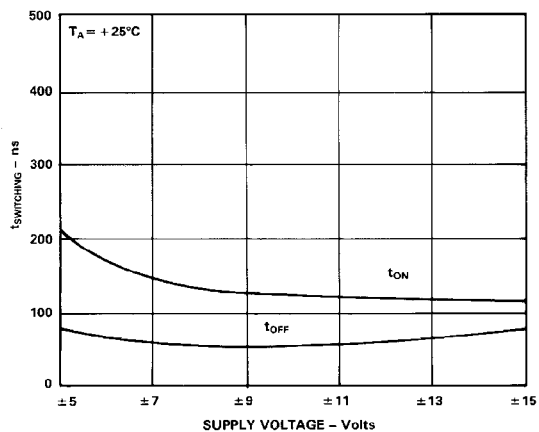
R_{ON} as a Function of V_D (V_S): Single Supply Voltage



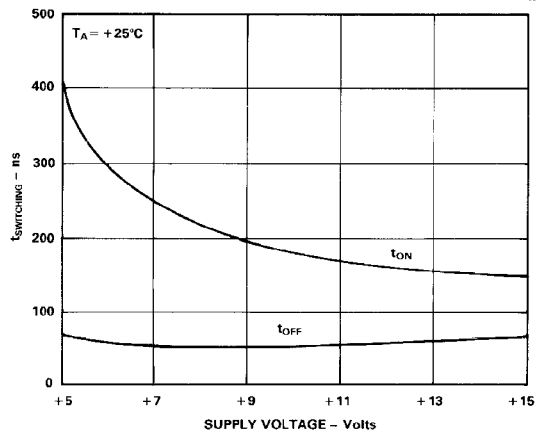
Leakage Current as a Function of Temperature (Note: Leakage Currents Reduce as the Supply Voltages Reduce)



Trigger Level vs. Power Supply Voltage: Dual or Single Supply Voltage

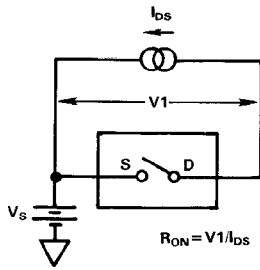


Switching Time vs. Supply Voltage (Dual Supply)

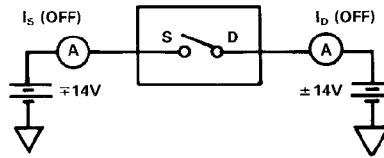


Switching Time vs. Supply Voltage (Single Supply)

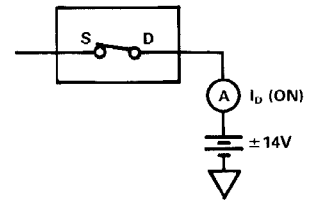
Test Circuits—ADG201A/ADG202A



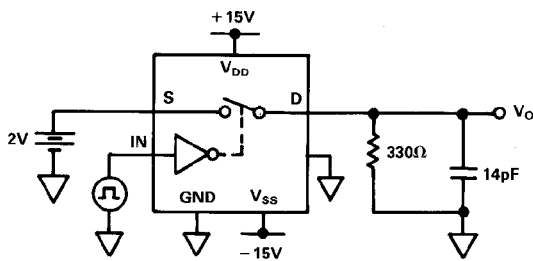
Test Circuit 1



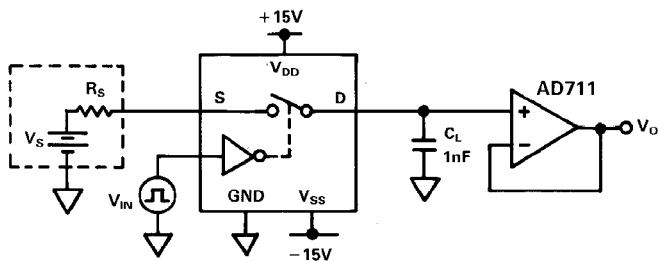
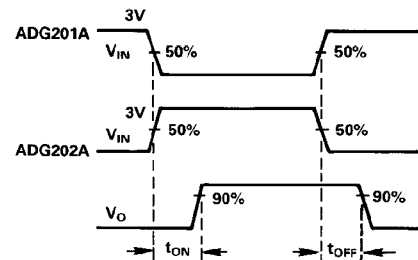
Test Circuit 2



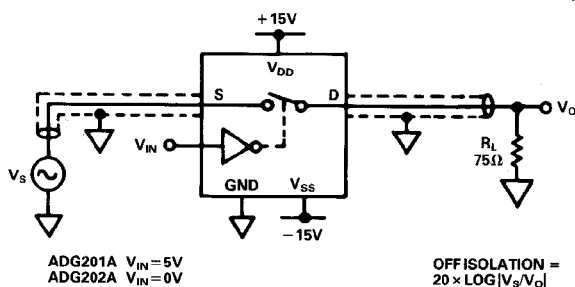
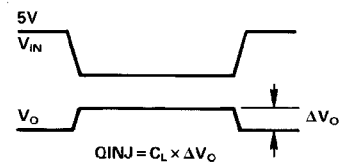
Test Circuit 3



Test Circuit 4



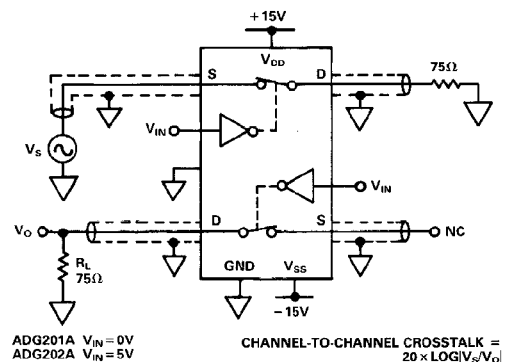
Test Circuit 5. Charge Injection



Test Circuit 6. Off Isolation

ADG201A $V_{IN} = 5V$
ADG202A $V_{IN} = 0V$

OFF ISOLATION =
 $20 \times \text{LOG} |V_S/V_O|$



Test Circuit 7. Channel-to-Channel Crosstalk

ADG201A $V_{IN} = 0V$
ADG202A $V_{IN} = 5V$

CHANNEL-TO-CHANNEL CROSSTALK =
 $20 \times \text{LOG} |V_S/V_O|$

ADG201A/ADG202A

TERMINOLOGY

R_{ON}	Ohmic resistance between terminals OUT and S
R_{ON} Match	Difference between the R_{ON} of any two channels
I_S (OFF)	Source terminal leakage current when the switch is off
I_D (OFF)	Drain terminal leakage current when the switch is off
I_D (ON)	Leakage current that flows from the closed switch into the body
V_D (V_S)	Analog voltage on terminal D, S
C_S (OFF)	Switch input capacitance "OFF" condition
C_D (OFF)	Switch output capacitance "OFF" condition
C_{IN}	Digital input capacitance
C_D, C_S (ON)	Input or output capacitance when the switch is on

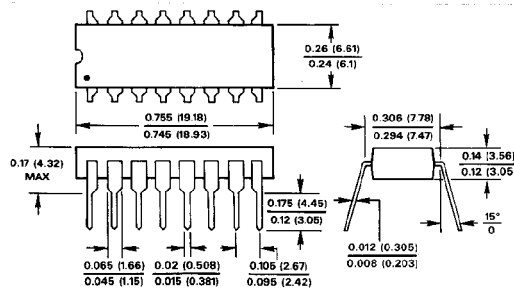
t_{ON}	Delay time between the 50% and 90% points of the digital input and switch "ON" condition
t_{OFF}	Delay time between the 50% and 90% points of the digital input and switch "OFF" condition
t_{OPEN}	"OFF" time measured between 50% points of both switches, which are connected as a multiplexer, when switching from one address state to another
V_{INL}	Maximum Input Voltage for a Logic Low
V_{INH}	Minimum Input Voltage for a Logic High
I_{INL} (I_{INH})	Input current of the digital input
V_{DD}	Most positive voltage supply
V_{SS}	Most negative voltage supply
I_{DD}	Positive supply current
I_{SS}	Negative supply current

MECHANICAL INFORMATION

OUTLINE DIMENSIONS

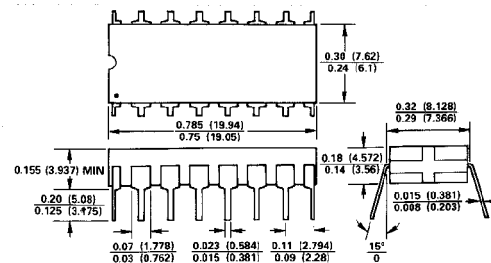
Dimensions shown in inches and (mm).

16-Pin Plastic (N-16)

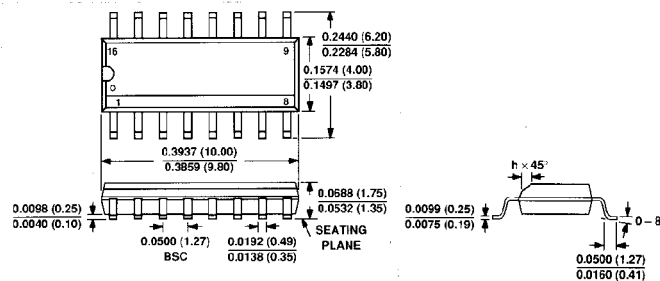


LEAD NO. 1 IDENTIFIED BY DOT OR NOTCH
LEADS ARE SOLDER OR TIN-PLATED KOVAR OR ALLOY 42

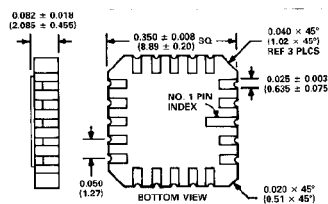
16-Pin Cerdip (Q-16)



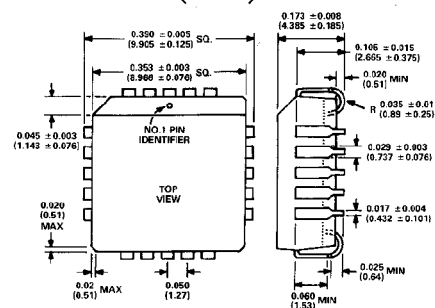
SOIC Package (R-16A)



20-Terminal Leadless Ceramic Chip Carrier (E-20A)



20-Terminal Plastic Leaded Chip Carrier (P-20A)



Package/Price Information

For detailed packaging information, please select the **Datasheets** button.

60 Ohm, Quad SPST Switch (Normally Closed Switches, DG201A replacement)

Model	Status	Package Description	Pin Count	Temperature Range	Price* (100-499)
ADG201ABCHIPS	PRODUCTION	CHIPS/DIE SALES	16	INDUSTRIAL	\$3.22
ADG201ABQ	PRODUCTION	CERDIP GLASS SEAL	16	INDUSTRIAL	\$3.71
ADG201AKN	PRODUCTION	PLASTIC/EPOXY DIP	16	COMMERCIAL	\$1.91
ADG201AKN/+	OBSOLETE	PLASTIC/EPOXY DIP	16	COMMERCIAL	-
ADG201AKP	PRODUCTION	PLASTIC LEAD CHIP CARRIER	20	COMMERCIAL	\$2.17
ADG201AKP-REEL	PRODUCTION	PLASTIC LEAD CHIP CARRIER	20	COMMERCIAL	-
ADG201AKR	PRODUCTION	SO NARROW .150" - 2mm thick	16	COMMERCIAL	\$1.91
ADG201AKR-REEL	PRODUCTION	SO NARROW .150" - 2mm thick	16	COMMERCIAL	-
ADG201AKR-REEL7	PRODUCTION	SO NARROW .150" - 2mm thick	16	COMMERCIAL	-
ADG201ATCHIPS	PRODUCTION	CHIPS/DIE SALES	16	MILITARY	\$4.40
ADG201ATE	PRODUCTION	CER. LEADLESS CHIP CARRIER	20	MILITARY	\$14.36
ADG201ATE/883B	PRODUCTION	CER. LEADLESS CHIP CARRIER	20	MILITARY	\$18.70
ADG201ATQ	PRODUCTION	CERDIP GLASS SEAL	16	MILITARY	\$8.21
ADG201ATQ/883B	PRODUCTION	CERDIP GLASS SEAL	16	MILITARY	\$11.48

* This price is provided for budgetary purposes as recommended list price in U.S. Dollars per unit the stated volume. Pricing displayed for Evaluation Boards and Kits is based on 1-piece pricing. View [Pricing and Availability](#) (currently available to North American customers) for further information.