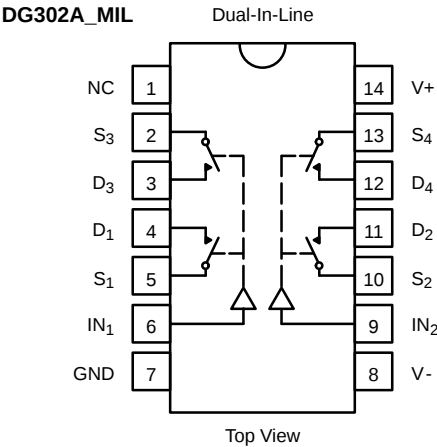




FUNCTIONAL BLOCK DIAGRAM AND PIN CONFIGURATION



TRUTH TABLE	
Logic	Switch
0	OFF
1	ON

Logic "0" ≤ 0.8 V
Logic "1" ≥ 4 V

ORDERING INFORMATION		
Temp Range	Package	Part Number
DG300A_MIL		
-55 to 125°C	14-Pin CerDIP	DG300AAK
		DG300AAK/883
		JM38510/11601BCA
	14-Pin Sidebraz	JM38510/11601BCC
	10-Pin Metal Can	DG300AAA/883
		JM38510/11601BIA
DG301A_MIL		
-55 to 125°C	14-Pin CerDIP	DG301AAK/883
		JM38510/11602BCA
	14-Pin Sidebraz	JM38510/11602BCC
	10-Pin Metal Can	DG301AAA
		DG301AAA/883
		JM38510/11602BIA
DG302A_MIL		
-55 to 125°C	14-Pin CerDIP	DG302AAK
		DG302AAK/883
		JM38510/11603BCA
	14-Pin Sidebraz	JM38510/11603BCC

**ABSOLUTE MAXIMUM RATINGS**

Voltages Referenced to V-

V+ 44 V

GND 25 V

Digital Inputs^a, V_S, V_D (V-) -2 V to (V+) +2V or
30 mA, whichever occurs first

Current, Any Terminal 30 mA

Continuous Current, S or D

(Pulsed at 1 ms, 10% duty cycle max) 100 mA

Storage Temperature -65 to 150°C

Power Dissipation^b14-Pin CerDIP^c 825 mW10-Pin Metal Can^d 450 mW

Notes:

a. Signals on S_X, D_X, or IN_X exceeding V+ or V- will be clamped by internal diodes. Limit forward diode current to maximum current ratings.

b. All leads welded or soldered to PC Board.

c. Derate 11 mW/°C above 75°C

d. Derate 6 mW/°C above 75°C

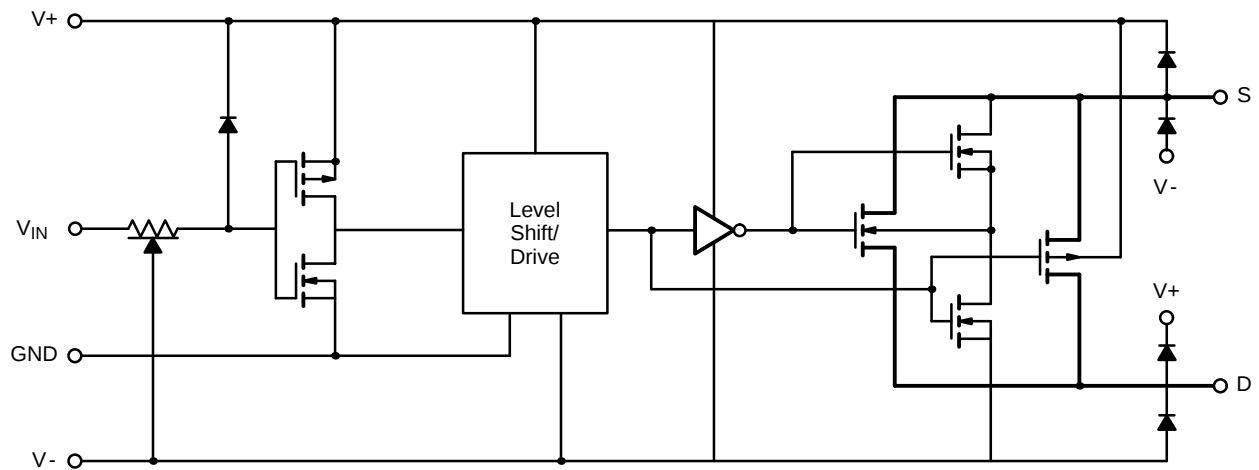
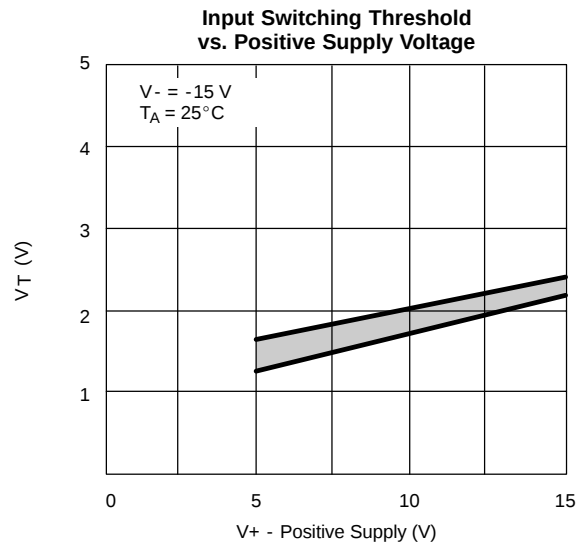
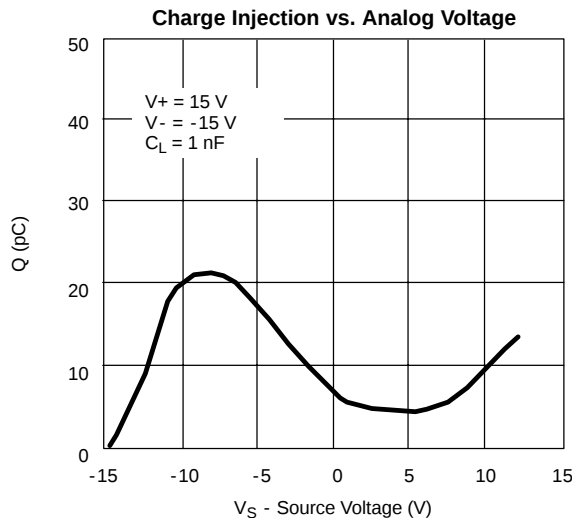
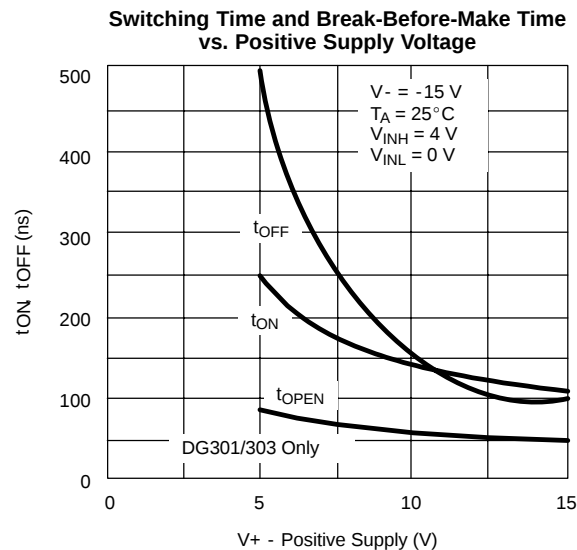
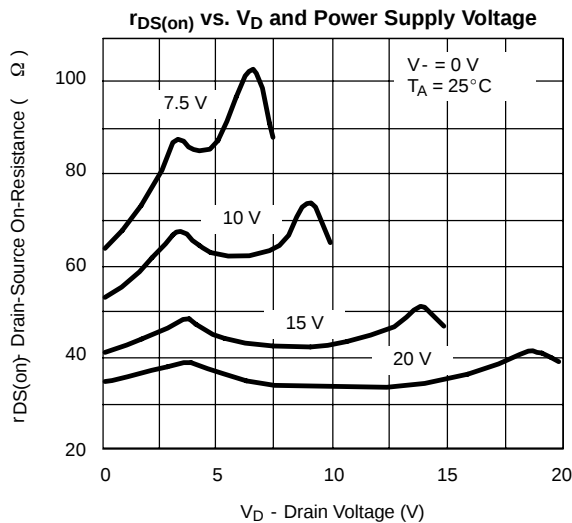
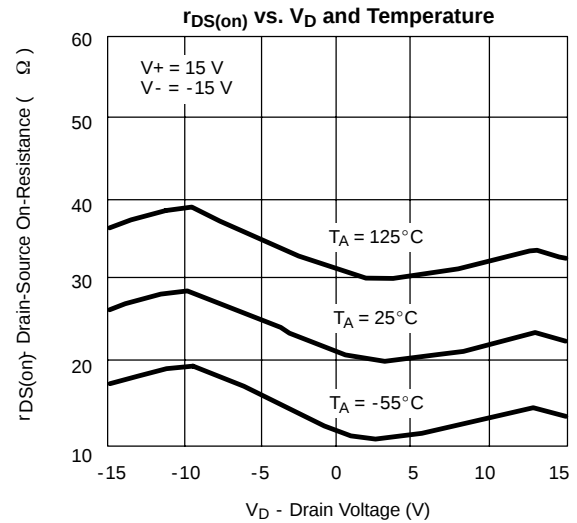
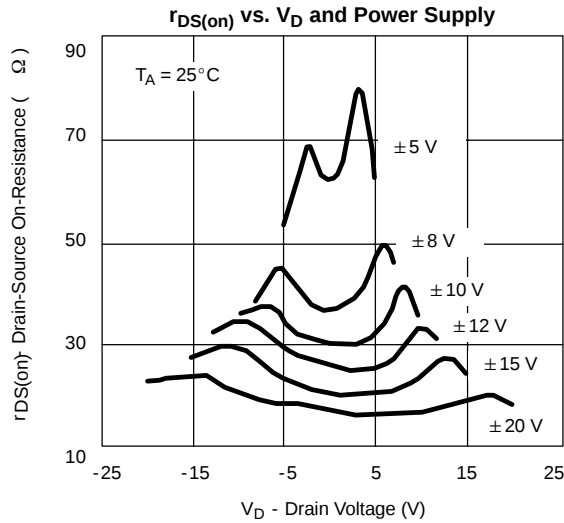
SCHEMATIC DIAGRAM (TYPICAL CHANNEL)

FIGURE 1.

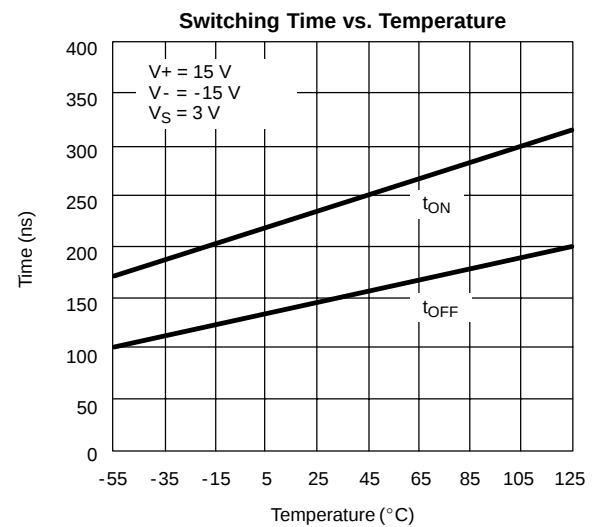
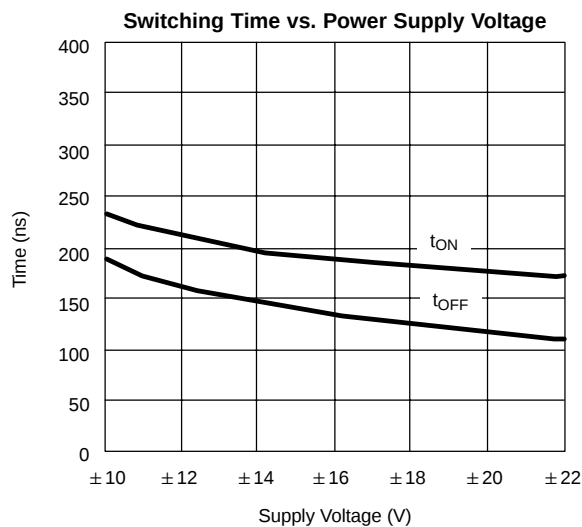
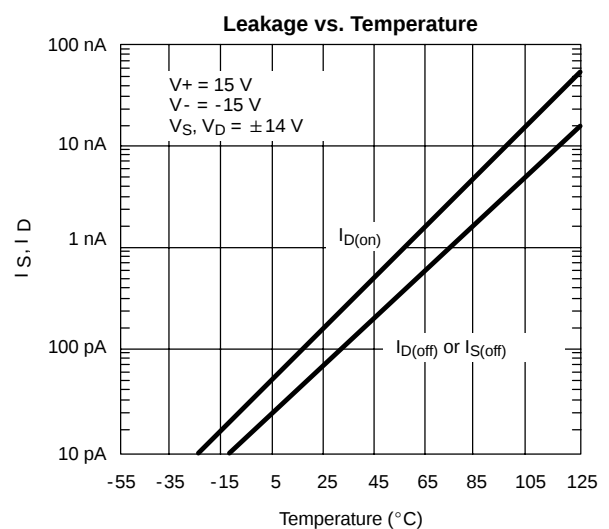
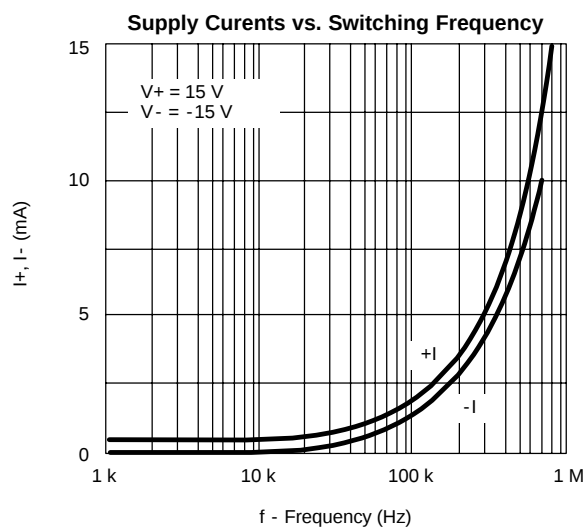
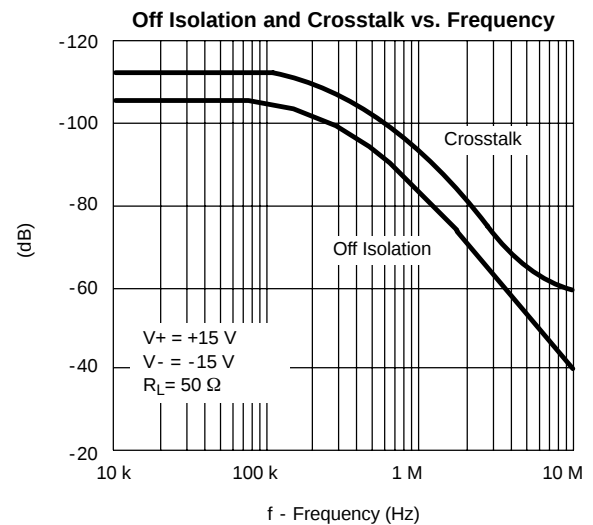
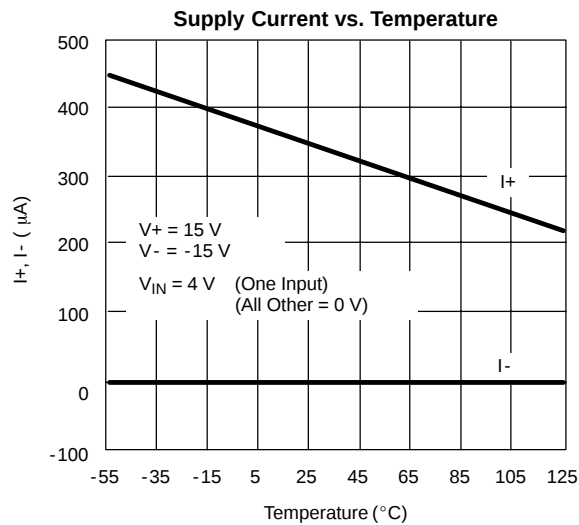
SPECIFICATIONS ^a							
Parameter	Symbol	Test Conditions Unless Specified V ₊ = 15 V, V ₋ = -15 V V _{IN} = 0.8 V or V _{IN} = 4 V ^f	Temp ^b	Limits			Unit
				Min ^c	Typ ^d	Max ^c	
Analog Switch							
Analog Signal Range ^e	V _{ANALOG}		Full	-15		15	V
Drain-Source On-Resistance	r _{DS(on)}	V _D = ±10 V, I _S = -10 mA	Room Full		30	50 75	Ω
Source Off Leakage Current	I _{S(off)}	V _S = ±14 V, V _D = ∓14 V	Room Hot	-1 -100	±0.1	1 100	nA
Drain Off Leakage Current	I _{D(off)}		Room Hot	-1 -100	±0.1	1 100	
Drain On Leakage Current	I _{D(on)}	V _D = V _S = ±14 V	Room Hot	-1 -100	±0.1	1 100	
Digital Control							
Input Current with Input Voltage High	I _{INH}	V _{IN} = 5 V	Room Full	-1 -1	-0.001		μA
		V _{IN} = 15 V	Room Full		0.001	1 1	
Input Current with Input Voltage Low	I _{INL}	V _{IN} = 0 V	Room Full	-1 -1	-0.001		
Dynamic Characteristics							
Turn-On Time	t _{ON}	See Figure 2	Room		150	300	ns
Turn-Off Time	t _{OFF}		Room		130	250	
Break-Before-Make Time	t _{OPEN}	DG301A_MIL Only Figure 3	Room		50		
Charge Injection	Q	C _L = 1 nF, R _{gen} = 0 Ω V _{gen} = 0 V, Figure 4	Room		8		pC
Source-Off Capacitance	C _{S(off)}	V _S , V _D = 0 V, f = 1 MHz	Room		14		pF
Drain-Off Capacitance	C _{D(off)}		Room		14		
Channel-On Capacitance	C _{D(on)}		Room		40		
Input Capacitance	C _{in}	f = 1 MHz					
			V _{IN} = 0 V	Room		6	
			V _{IN} = 15 V	Room		7	
Off-Isolation	OIRR	V _{IN} = 0 V, R _L = 1 kΩ V _S = 1 V _{rms} , f = 500 kHz	Room		62		dB
Crosstalk (Channel-to-Channel)	X _{TALK}		Room		74		
Power Supplies							
Positive Supply Current	I ₊	V _{IN} = 4 V (One Input) All Others = 0 V	Room Full		0.23	0.5 1	mA
Negative Supply Current	I ₋		Room Full	-10 -100	-0.001		
Positive Supply Current	I ₊	V _{IN} = 0.8 V (All Inputs)	Room Full		0.001	10 100	μA
Negative Supply Current	I ₋		Room Full	-10 -100	-0.001		

Notes:

- Refer to PROCESS OPTION FLOWCHART.
- Room = 25°C , Full = as determined by the operating temperature suffix.
- The algebraic convention whereby the most negative value is a minimum and the most positive a maximum, is used in this data sheet.
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- Guaranteed by design, not subject to production test.
- V_{IN} = input voltage to perform proper function.

**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



TEST CIRCUITS

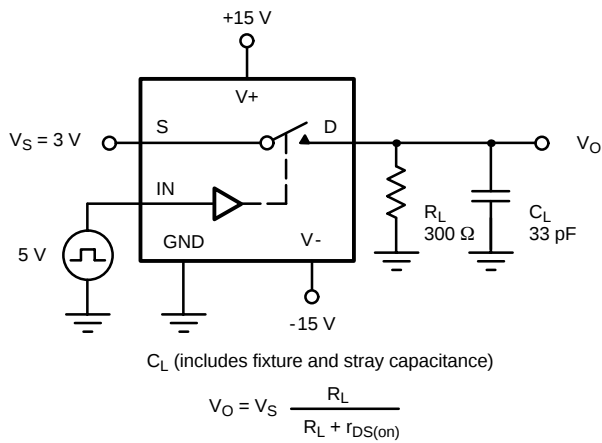


FIGURE 2. Switching Time

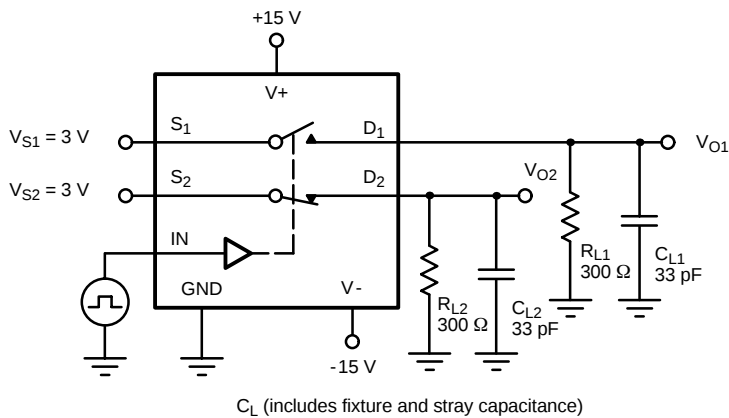
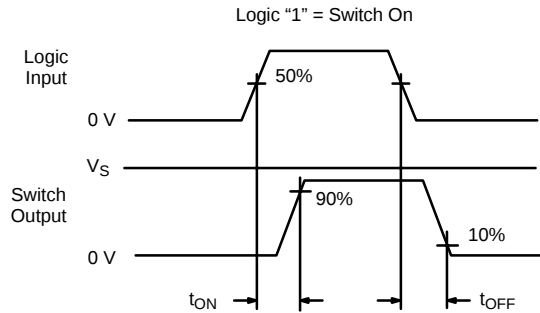


FIGURE 3. Break-Before-Make SPDT (DG301A_MIL)

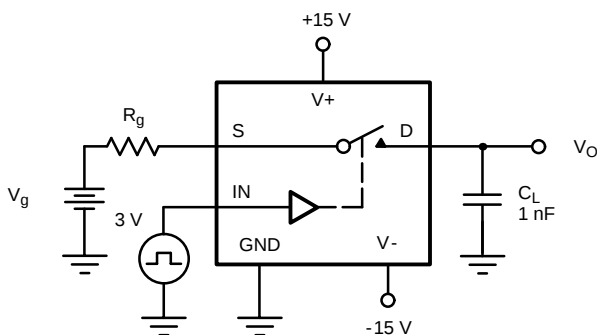
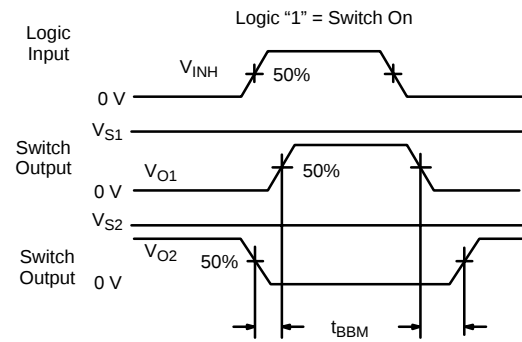
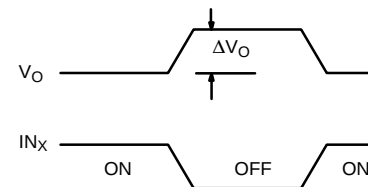


FIGURE 4. Charge Injection



APPLICATION HINTS^a

V+ Positive Supply Voltage (V)	V- Negative Supply Voltage (V)	GND Voltage (V)	V _{IN} Logic Input Voltage V _{INH(min)} /V _{INL(max)} (V)	V _S or V _D Analog Voltage Range (V)
15	-15	0	4/0.8	-15 to 15
20	-20	0	4/0.8	-20 to 20
15	0	0	4/0.8	0 to 15

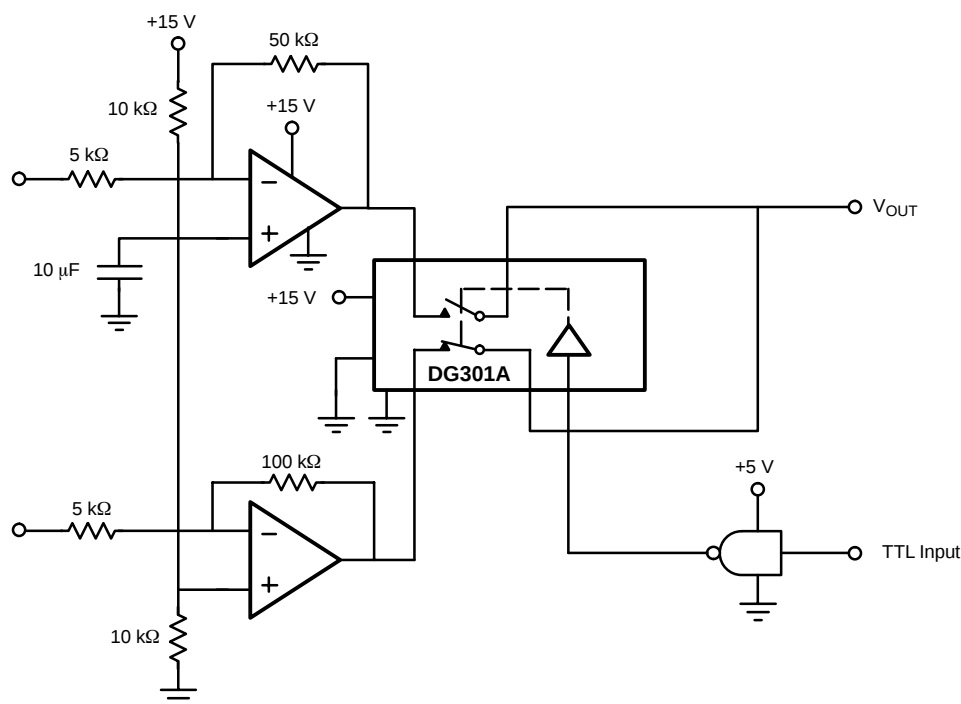
Note:

a. Application Hints are for DESIGN AID ONLY, not guaranteed and not subject to production testing.

APPLICATIONS

The DG300A_MIL series of analog switches will switch positive analog signals while using a single positive supply. This facilitates their use in applications where only one supply is available. The trade-offs of using single supplies are:

1) Increased $r_{DS(on)}$; 2) slower switching speed. The analog voltage should not go above or below the supply voltages which in single operation are V+ and 0 V. (See Input Switching Threshold vs. Positive Supply Voltage Curve.)

**FIGURE 5.** Single Supply Op Amp Switching

APPLICATIONS

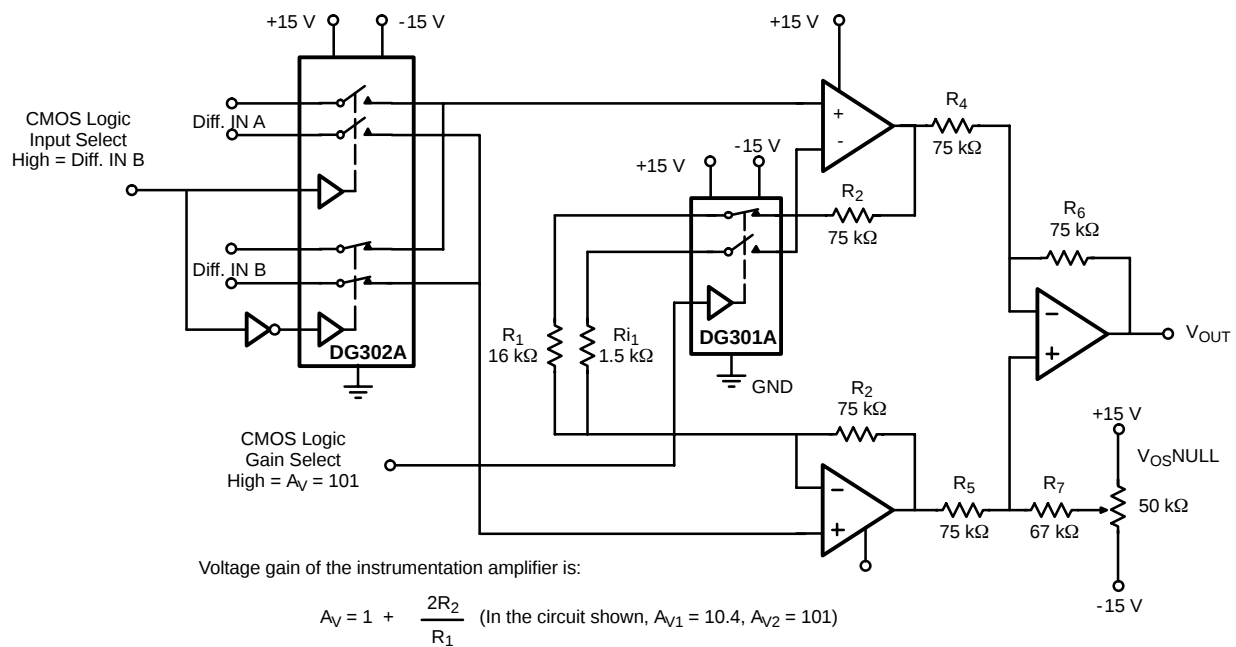


FIGURE 6. Low Power Instrumentation Amplifier with Digitally Selectable Inputs and Gain



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