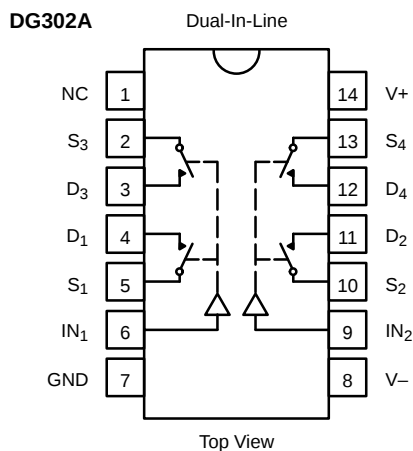


FUNCTIONAL BLOCK DIAGRAM AND PIN CONFIGURATION



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		
0 to 70°C	14-Pin Plastic DIP	DG300ACJ
-55 to 125°C	14-Pin CerDIP	DG300AAK
		DG300AAK/883
		JM38510/11601BCA
	14-Pin Sidebrazed	JM38510/11601BCC
	10-Pin Metal Can	DG300AAA/883
		JM38510/11601BIA
DG301A		
0 to 70°C	14-Pin Plastic DIP	DG301ACJ
-55 to 125°C	14-Pin CerDIP	DG301AAK/883
		JM38510/11602BCA
	14-Pin Sidebrazed	JM38510/11602BCC
	10-Pin Metal Can	DG301AAA
		DG301AAA/883
		JM38510/11602BIA
DG302A		
0 to 70°C	14-Pin Plastic DIP	DG302ACJ
-55 to 125°C	14-Pin CerDIP	DG302AAK
		DG302AAK/883
		JM38510/11603BCA
	14-Pin Sidebrazed	JM38510/11603BCC

ABSOLUTE MAXIMUM RATINGS

Voltages Referenced to V–

V+ 44 V

GND 25 V

Digital Inputs^{NO TAG}, 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 (A Suffix) –65 to 150°C
(C Suffix) –65 to 125°C

Power Dissipation^{NO TAG}

14-Pin Plastic DIP^{NO TAG} 470 mW

14-Pin CerDIP^{NO TAG} 825 mW

10-Pin Metal Can^{NO TAG} 450 mW

Notes:

- 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.
- All leads welded or soldered to PC Board.
- Derate 6.5 mW/°C above 25°C
- Derate 11 mW/°C above 75°C
- Derate 6 mW/°C above 75°C

SCHEMATIC DIAGRAM (TYPICAL CHANNEL)

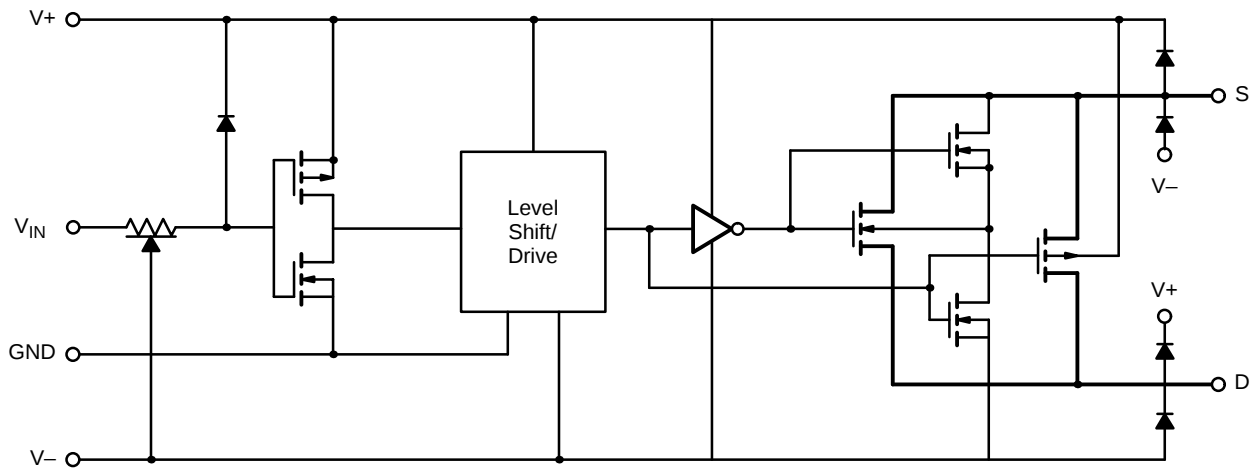


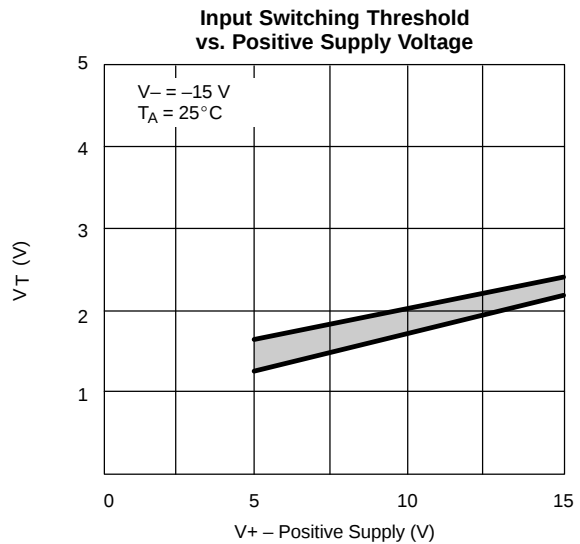
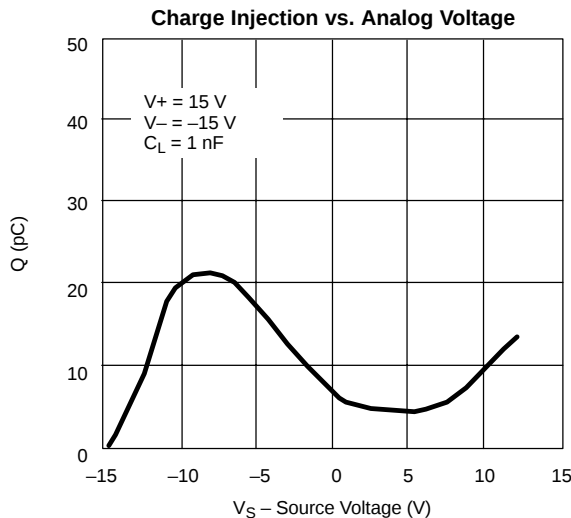
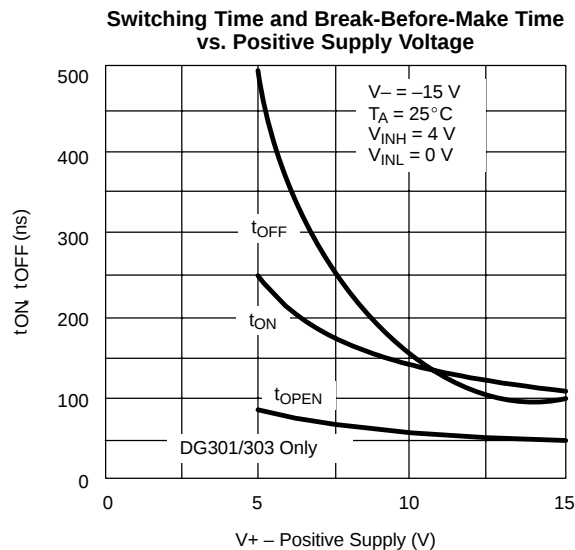
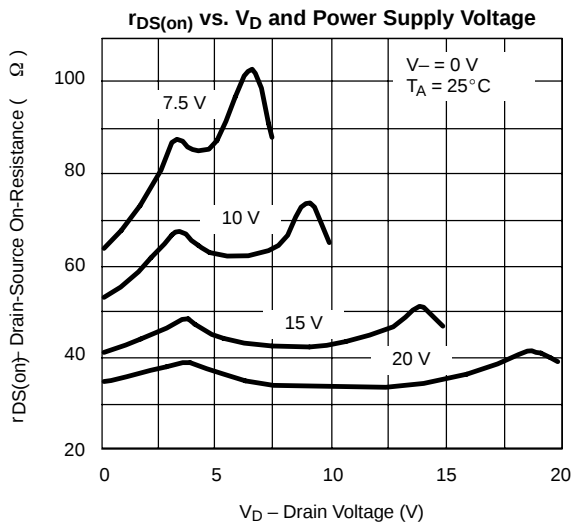
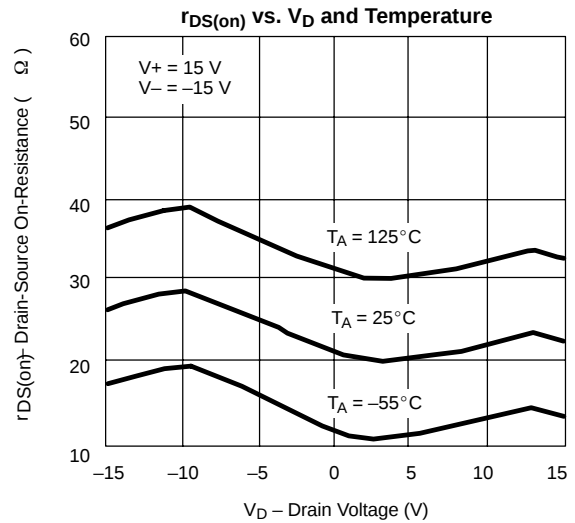
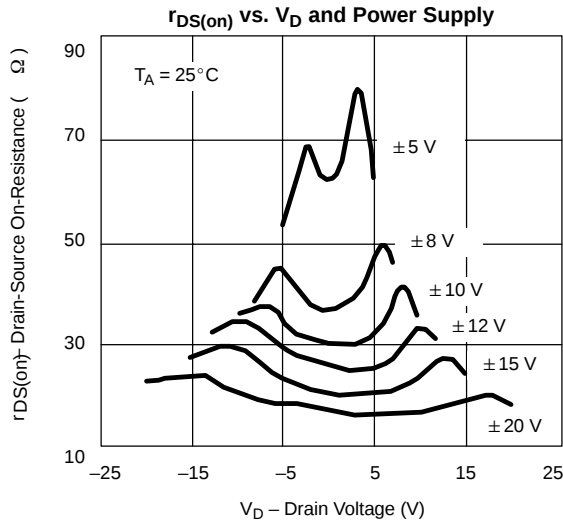
FIGURE 1.

SPECIFICATIONS^a

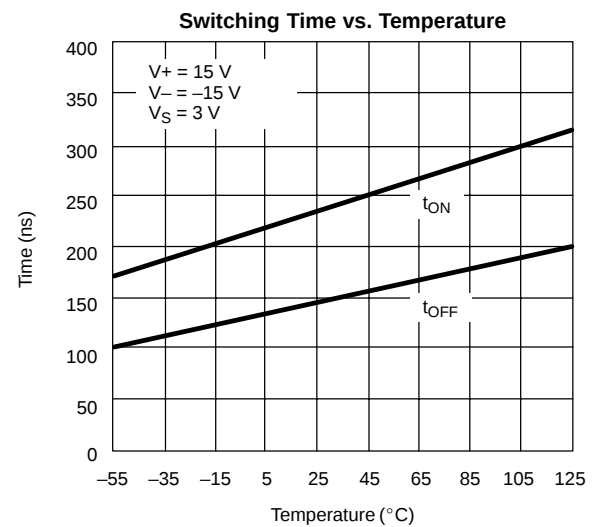
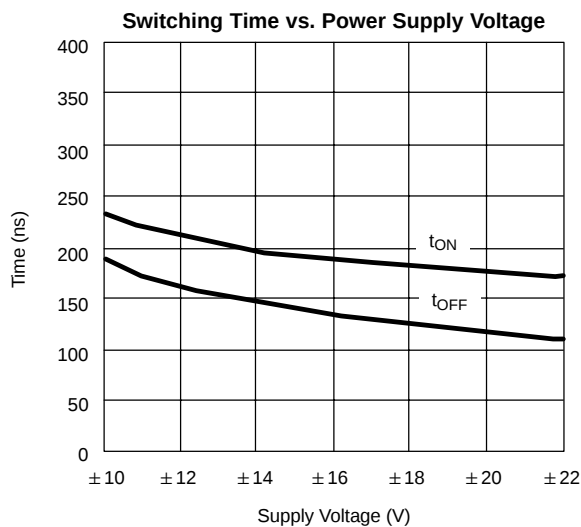
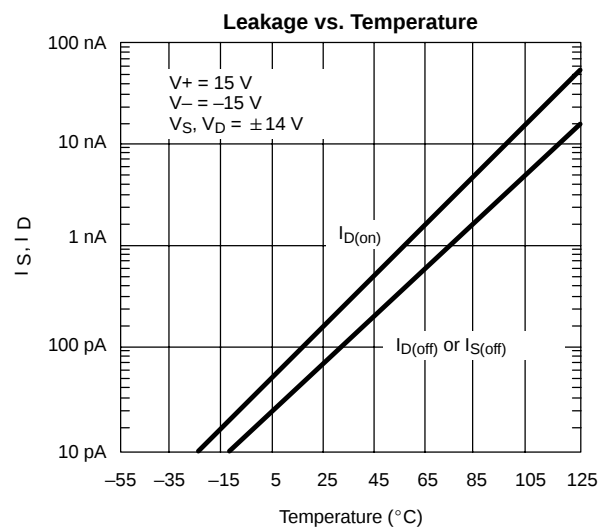
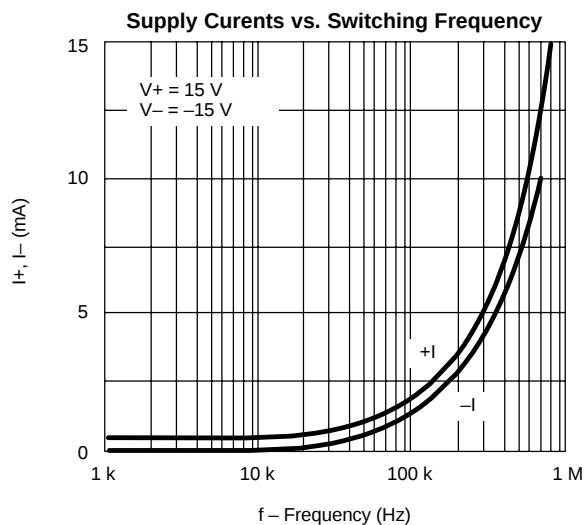
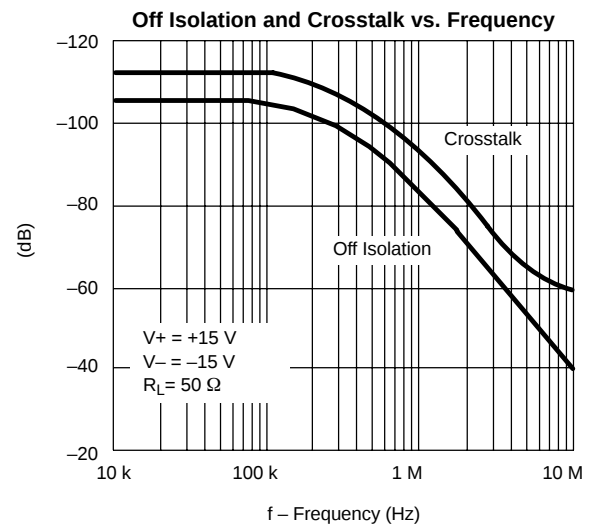
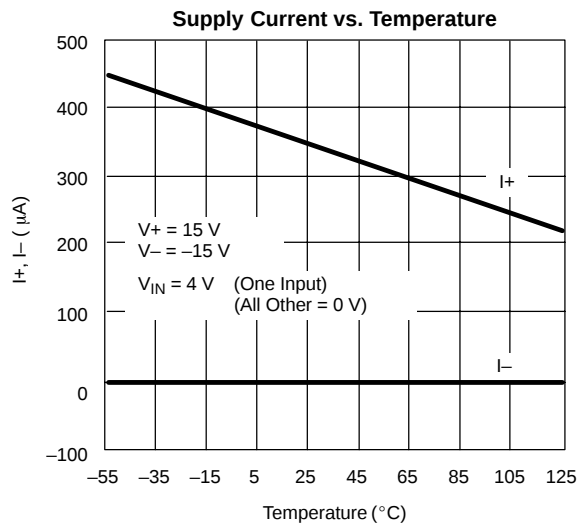
Parameter	Symbol	Test Conditions Unless Specified V ₊ = 15 V, V ₋ = -15 V V _{IN} = 0.8 V or V _{IN} = 4 V ^f	Temp ^b	Typ ^c	A Suffix -55 to 125°C		C Suffix 0 to 70°C		Unit
					Min ^d	Max ^d	Min ^d	Max ^d	
Analog Switch									
Analog Signal Range ^e	V _{ANALOG}		Full		-15	15	-15	15	V
Drain-Source On-Resistance	r _{DS(on)}	V _D = ±10 V, I _S = -10 mA	Room Full	30		50 75		50 75	Ω
Source Off Leakage Current	I _{S(off)}	V _S = ±14 V, V _D = ∓14 V	Room Hot	±0.1	-1 -100	1 100	-5 -100	5 100	nA
Drain Off Leakage Current	I _{D(off)}		Room Hot	±0.1	-1 -100	1 100	-5 -100	5 100	
Drain On Leakage Current	I _{D(on)}	V _D = V _S = ±14 V	Room Hot	±0.1	-1 -100	1 100	-5 -100	5 100	
Digital Control									
Input Current with Input Voltage High	I _{INH}	V _{IN} = 5 V	Room Full	-0.001	-1 -1		-1		μA
		V _{IN} = 15 V	Room Full	0.001		1 1		1	
Input Current with Input Voltage Low	I _{INL}	V _{IN} = 0 V	Room Full	-0.001	-1 -1		-1		
Dynamic Characteristics									
Turn-On Time	t _{ON}	See Figure NO TAG	Room	150		300			ns
Turn-Off Time	t _{OFF}		Room	130		250			
Break-Before-Make Time	t _{OPEN}	DG301A Only Figure NO TAG	Room	50					
Charge Injection	Q	C _L = 1 nF, R _{gen} = 0 Ω V _{gen} = 0 V, Figure NO TAG	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		1	mA
Negative Supply Current	I ₋		Room Full	-0.001	-10 -100		-100		
Positive Supply Current	I ₊	V _{IN} = 0.8 V (All Inputs)	Room Full	0.001		10 100		100	μA
Negative Supply Current	I ₋		Room Full	-0.001	-10 -100		-100		

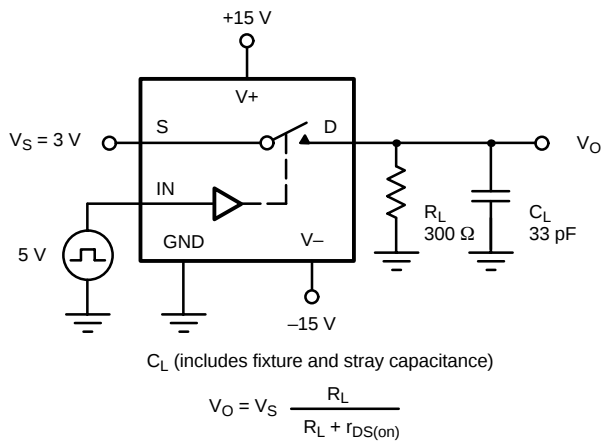
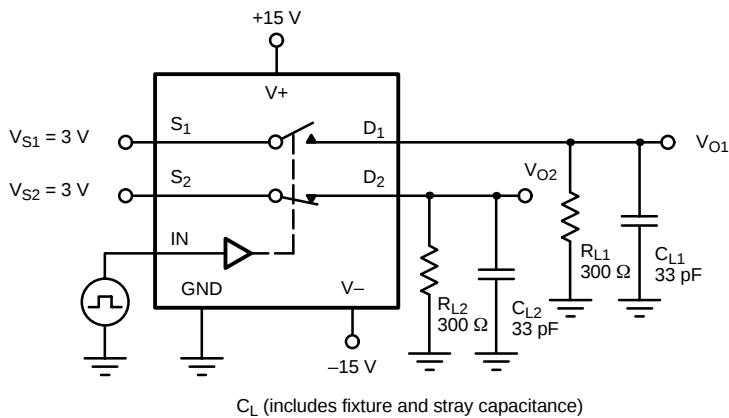
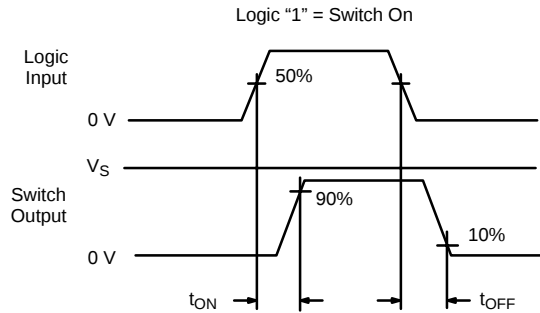
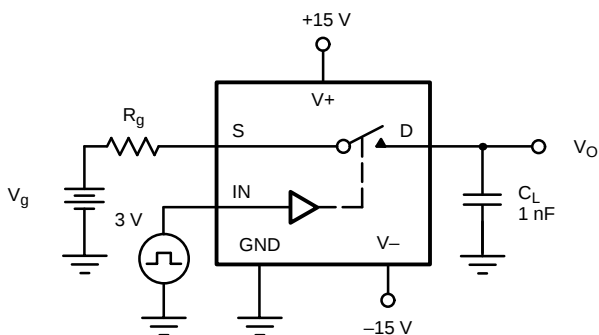
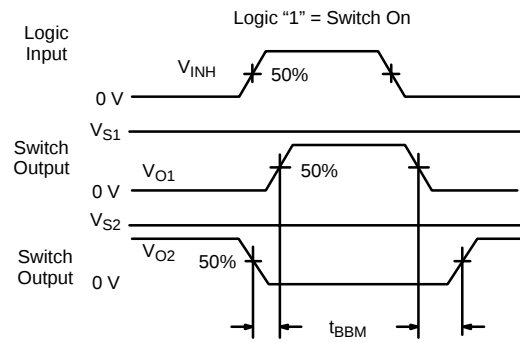
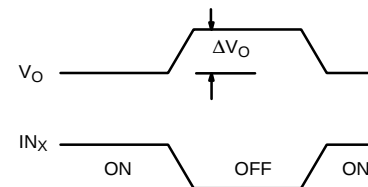
Notes:

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

FIGURE 4. Charge Injection


APPLICATION HINTS NO TAG

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 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.)

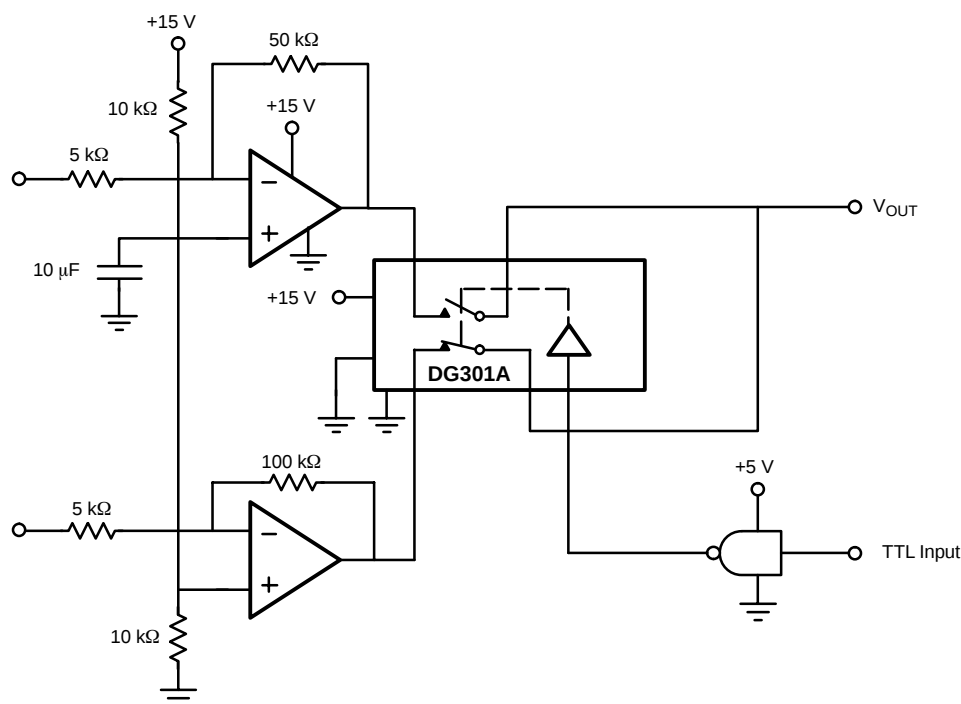


FIGURE 5. Single Supply Op Amp Switching

APPLICATIONS

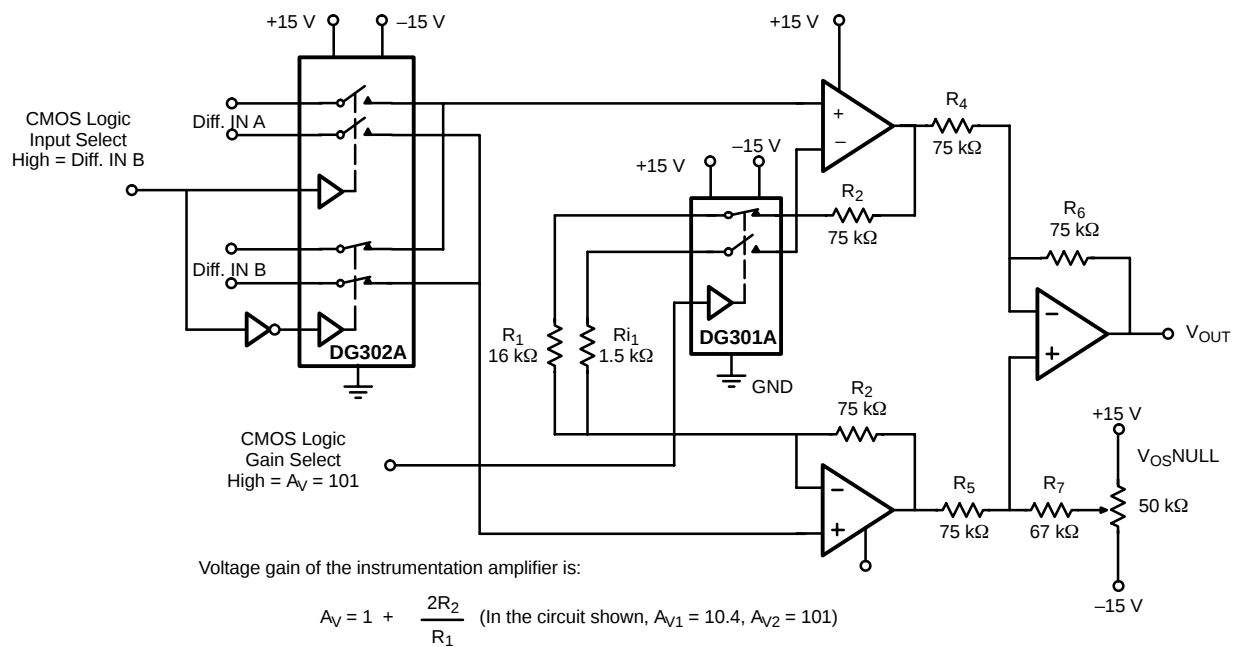


FIGURE 6. Low Power Instrumentation Amplifier with Digitally Selectable Inputs and Gain



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