

**ABSOLUTE MAXIMUM RATINGS** ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

PARAMETER	LIMIT	UNIT
V_+ to V_-	44	V
GND to V_-	25	
V_L	(GND - 0.3) to (V_+) +0.3	
Digital Inputs ^a , V_S , V_D	(V_-) -2 to (V_+) +2 or 30 mA, whichever occurs first	
Continuous Current (Any Terminal)	30	mA
Current, S or D (Pulsed at 1 ms, 10 % Duty Cycle)	100	
Storage Temperature	-65 to 125	$^{\circ}\text{C}$
Power Dissipation (Package) ^b	16-Pin Plastic DIP ^c	mW
	16-Pin Narrow Body SOIC ^d	

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 6 mW/ $^{\circ}\text{C}$ above 75 $^{\circ}\text{C}$.
d. Derate 8 mW/ $^{\circ}\text{C}$ above 75 $^{\circ}\text{C}$.

SPECIFICATIONS for Dual Supplies

PARAMETER	SYMBOL	TEST CONDITIONS UNLESS OTHERWISE SPECIFIED V+ = 15 V, V- = -15 V VL = 5 V, VIN = 2.4 V, 0.8 V ^e	TEMP. ^a	D SUFFIX -40 °C TO 85 °C			UNIT	
				MIN. ^b	TYP. ^c	MAX. ^b		
Analog Switch								
Analog Signal Range ^d	V _{ANALOG}		Full	-15	-	15	V	
Drain-Source On-Resistanc ^e	R _{DS(on)}	IS = -10 mA, VD = ± 8.5 V V+ = 13.5 V, V- = -13.5 V	Room	-	50	85	Ω	
			Full	-	-	100		
Switch Off Leakage Current	IS(off)	V+ = 16.5, V- = -16.5 V VD = ± 15.5 V, VS = ± 15.5 V	Room	-0.5	± 0.01	0.5	nA	
			Full	-5	± 0.01	5		
	ID(off)		Room	-0.5	± 0.01	0.5		
			Full	-5	± 0.01	5		
Channel On Leakage Current	ID(on)	V+ = 16.5 V, V- = -16.5 V VS = VD = ± 15.5 V	Room	-0.5	± 0.08	0.5		
			Full	-10	± 0.08	10		
Digital Control								
Input Current VIN Low	IL	VIN under test = 0.8 V All Other = 2.4 V	Full	-500	-0.01	500	nA	
Input Current VIN High	I _{IH}	VIN under test = 2.4 V All Other = 0.8 V	Full	-500	0.01	500		
Dynamic Characteristics								
Turn-On Time	t _{ON}	RL = 1 kΩ, CL = 35 pF VS = ± 10 V, See Figure 2	Room	-	120	250	ns	
Turn-Off Time	t _{OFF}		DG444	Room	-	110		140
			DG445	Room	-	160		210
Charge Injection ^e	Q	CL = 1 nF, VS = 0 V Vgen = 0 V, Rgen = 0 Ω	Room	-	-1	-	pC	
Off Isolation ^e	OIRR	RL = 50 Ω , CL = 5 pF, f =1 MHz	Room	-	60	-	dB	
Crosstalk (Channel-to-Channel) ^d	XTALK		Room	-	100	-		
Source Off Capacitance	CS(off)	f = 1 MHz	Room	-	4	-	pF	
Drain Off Capacitance	CD(off)		Room	-	4	-		
Channel On Capacitance	CD(on)	VANALOG = 0 V	Room	-	16	-		



SPECIFICATIONS for Dual Supplies							
PARAMETER	SYMBOL	TEST CONDITIONS UNLESS OTHERWISE SPECIFIED V ₊ = 15 V, V ₋ = -15 V V _L = 5 V, V _{IN} = 2.4 V, 0.8 V ^e	TEMP. ^a	D SUFFIX -40 °C TO 85 °C			UNIT
				MIN. ^b	TYP. ^c	MAX. ^b	
Power Supplies							
Positive Supply Current	I ₊	V ₊ = 16.5 V, V ₋ = -16.5 V V _{IN} = 0 V or 5 V	Room	-	0.001	1	μA
			Full	-	-	5	
Negative Supply Current	I ₋		Room	-1	-0.0001	-	
			Full	-5	-	-	
Logic Supply Current	I _L		Room	-	0.001	1	
			Full	-	0.001	5	
Ground Current	I _{GND}		Room	-1	-0.001	-	
			Full	-5	-0.001	-	

SPECIFICATIONS for Unipolar Supplies							
PARAMETER	SYMBOL	TEST CONDITIONS UNLESS OTHERWISE SPECIFIED V ₊ = 12 V, V ₋ = 0 V V _L = 5 V, V _{IN} = 2.4 V, 0.8 V ^e	TEMP. ^a	LIMITS -40 °C °C TO 85 °C			UNIT
				MIN. ^b	TYP. ^c	MAX. ^b	
Analog Switch							
Analog Signal Range ^d	V _{ANALOG}		Full	0	-	12	V
Drain-Source On-Resistance ^d	R _{DS(on)}	I _S = -10 mA, V _D = 3 V, 8 V V ₊ = 10.8 V, V _L = 5.25 V	Room	-	100	160	Ω
			Full	-	-	200	
Dynamic Characteristics							
Turn-On Time	t _{ON}	R _L = 1 kΩ, C _L = 35 pF, V _S = 8 V See Figure 2	Room	-	300	450	ns
Turn-Off Time	t _{OFF}		Room	-	60	200	
Charge Injection	Q	C _L = 1 nF, V _{gen} = 6 V, R _{gen} = 0 Ω	Room	-	2	-	pC
Power Supplies							
Positive Supply Current	I ₊	V ₊ = 13.2 V, V _{IN} = 0 V or 5 V	Room	-	0.001	1	μA
			Full	-	-	5	
Negative Supply Current	I ₋	V _{IN} = 0 V or 5 V	Room	-1	-0.0001	-	
			Full	-5	-	-	
Logic Supply Current	I _L	V _L = 5.25 V, V _{IN} = 0 V or 5 V	Room	-	0.001	1	
			Full	-	-	5	
Ground Current	I _{GND}	V _{IN} = 0 V or 5 V	Room	-1	-0.001	-	
			Full	-5	-	-	

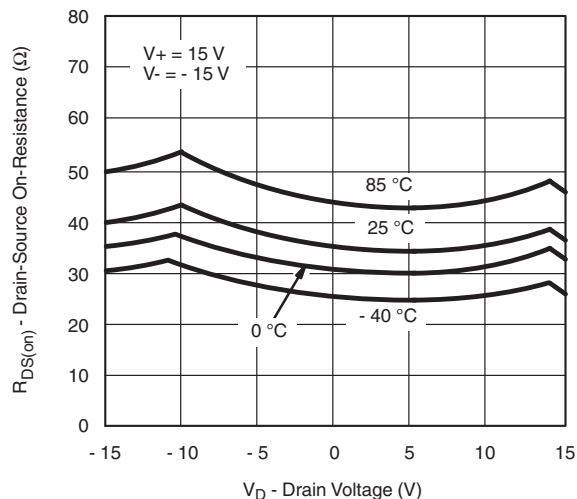
Notes

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

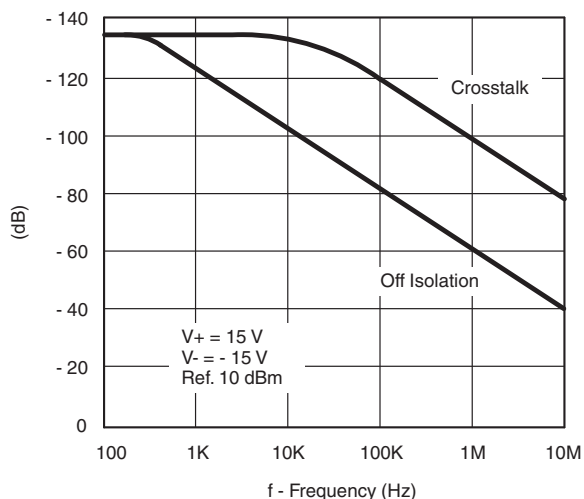
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



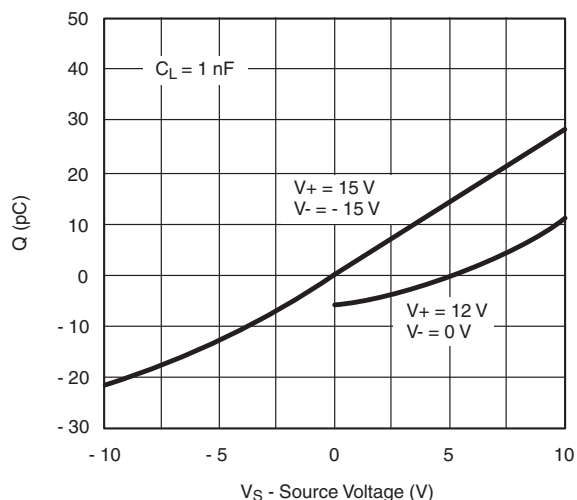
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)



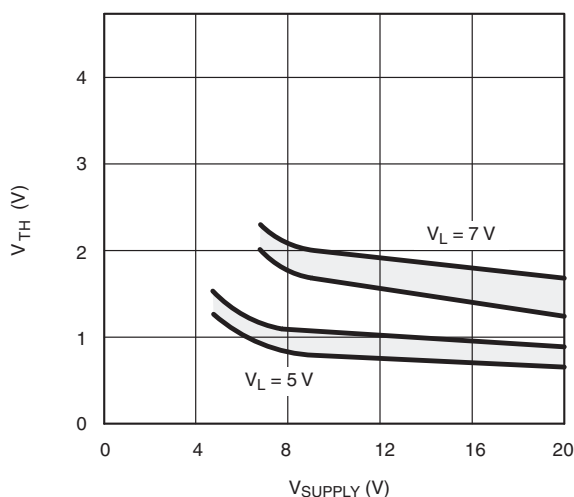
$R_{DS(on)}$ vs. V_D and Temperature



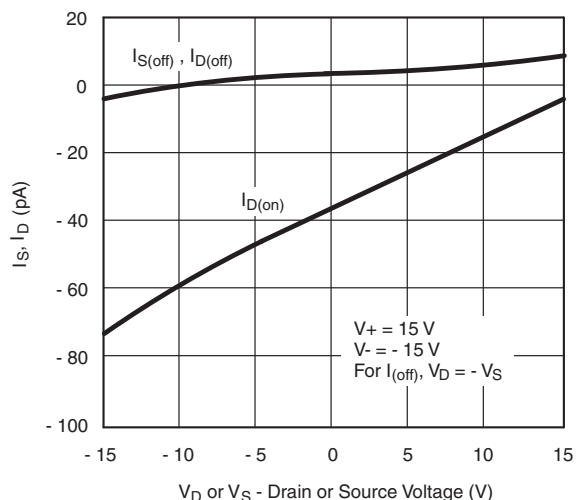
Crosstalk and Off Isolation vs. Frequency



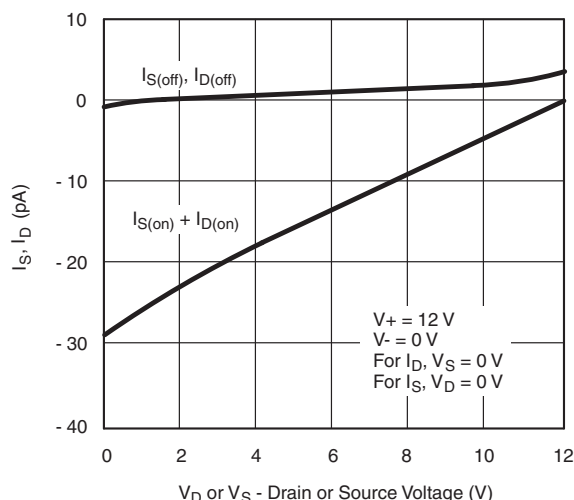
Charge Injection vs. Source Voltage



Switching Threshold vs. Supply Voltage



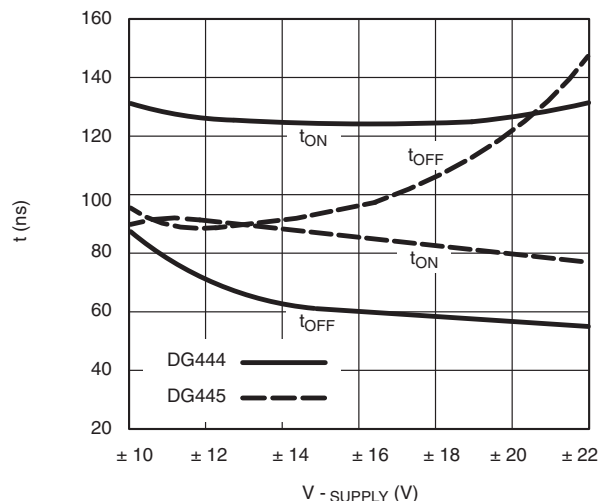
Source/Drain Leakage Currents



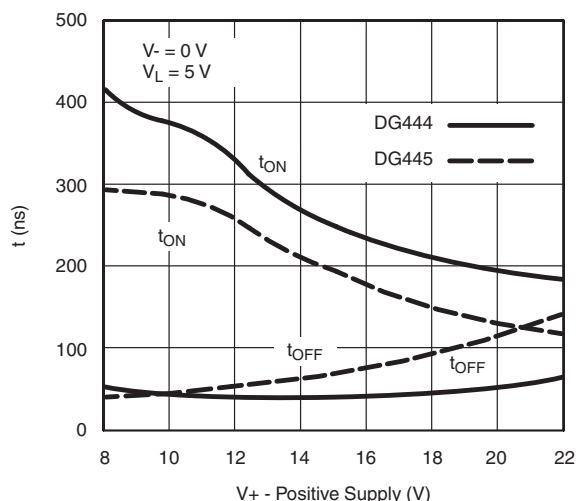
Source/Drain Leakage Currents (Single 12-V Supply)



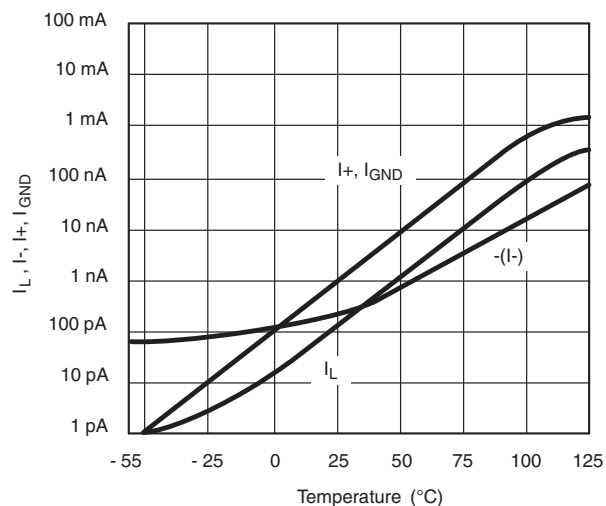
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)



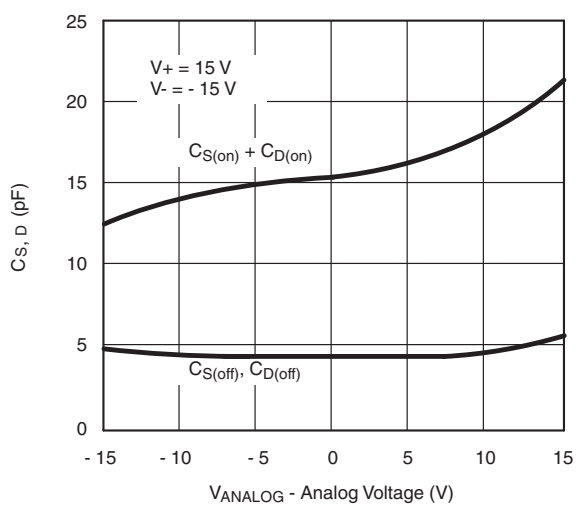
Switching Time vs. Power Supply Voltage



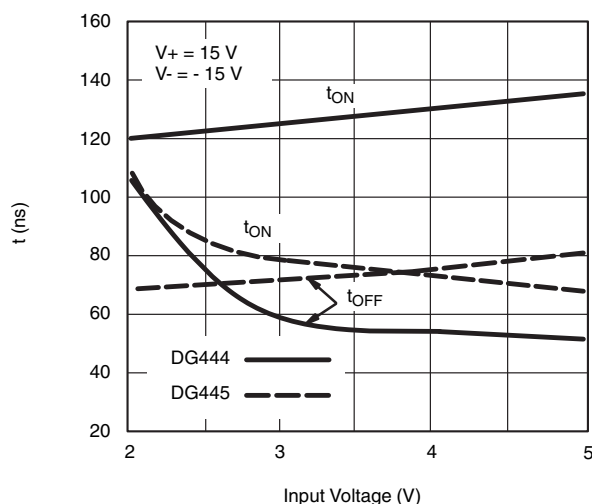
Switching Times vs. Power Supply Voltage



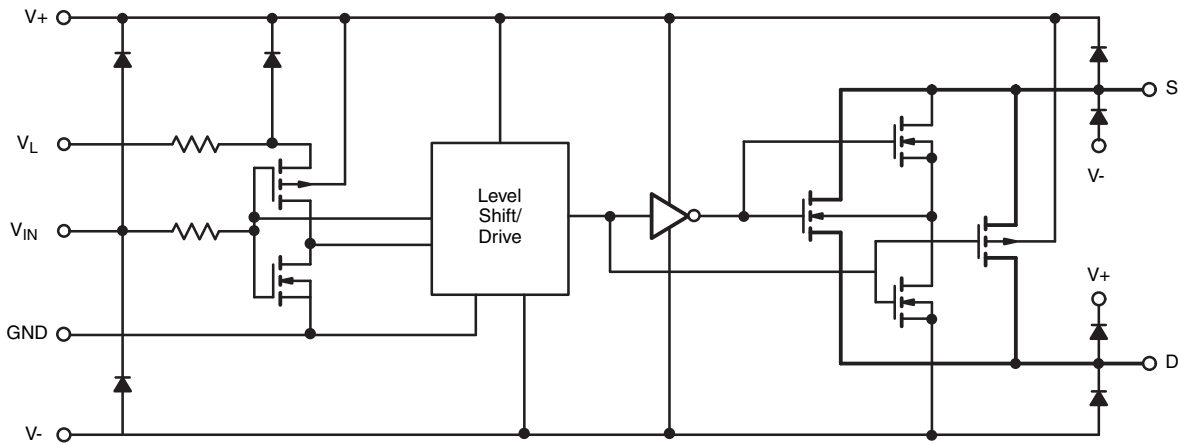
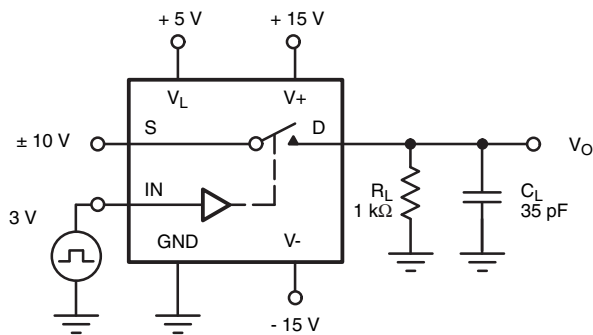
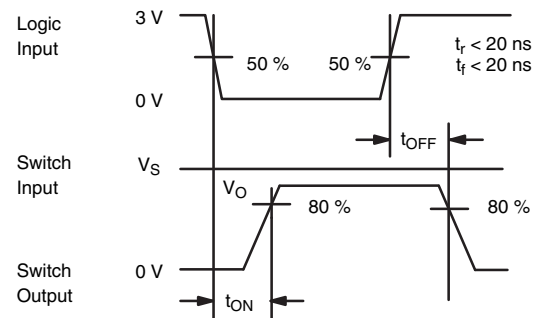
Supply Current vs. Temperature



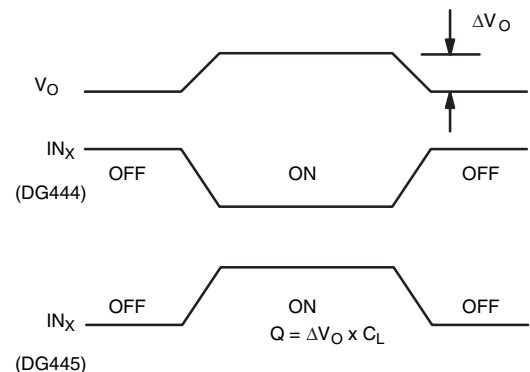
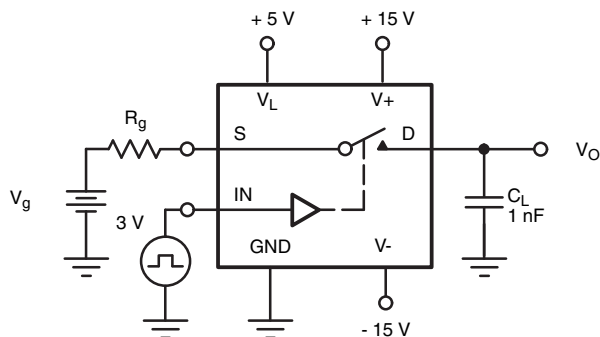
Source/Drain Capacitance vs. Analog Voltage



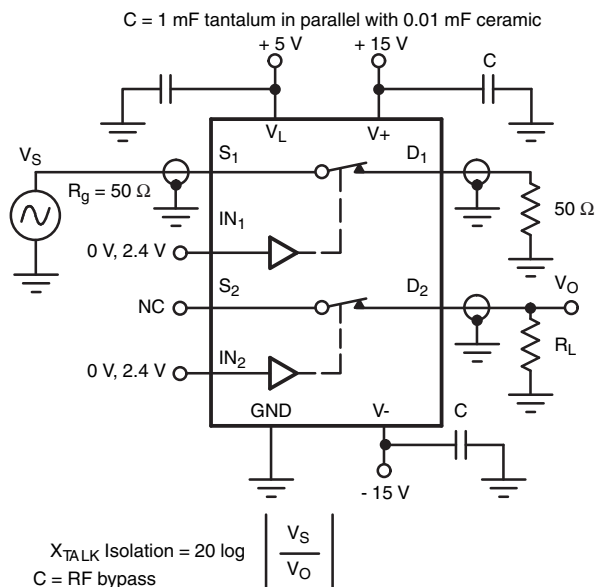
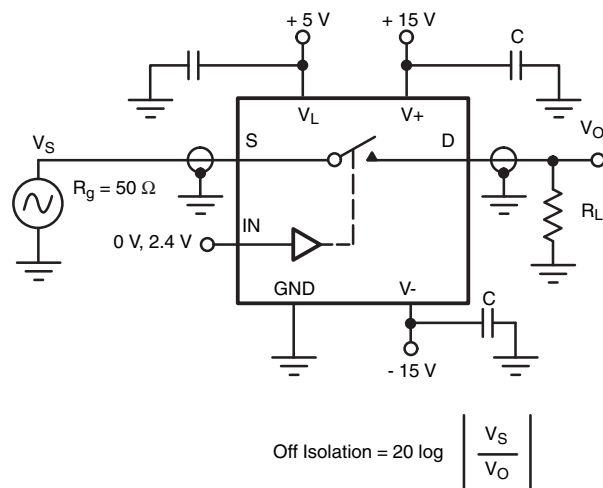
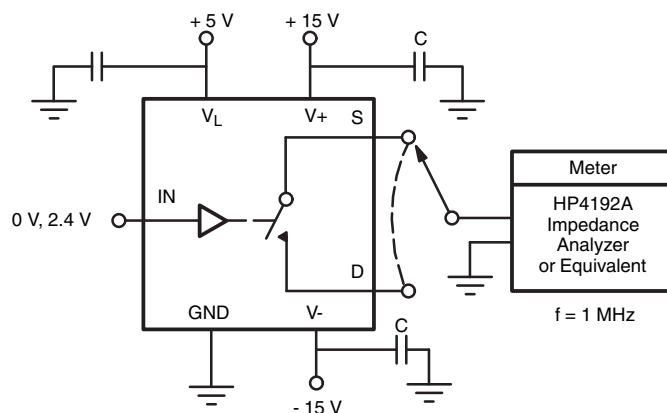
Switching Time vs. Input Voltage

SCHEMATIC DIAGRAM TYPICAL CHANNEL

Fig. 1
TEST CIRCUITS

 C_L (includes fixture and stray capacitance)


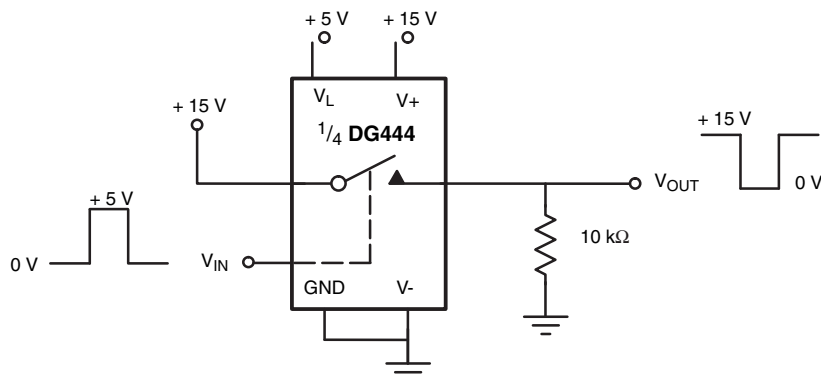
Note: Logic input waveform is inverted for DG445.

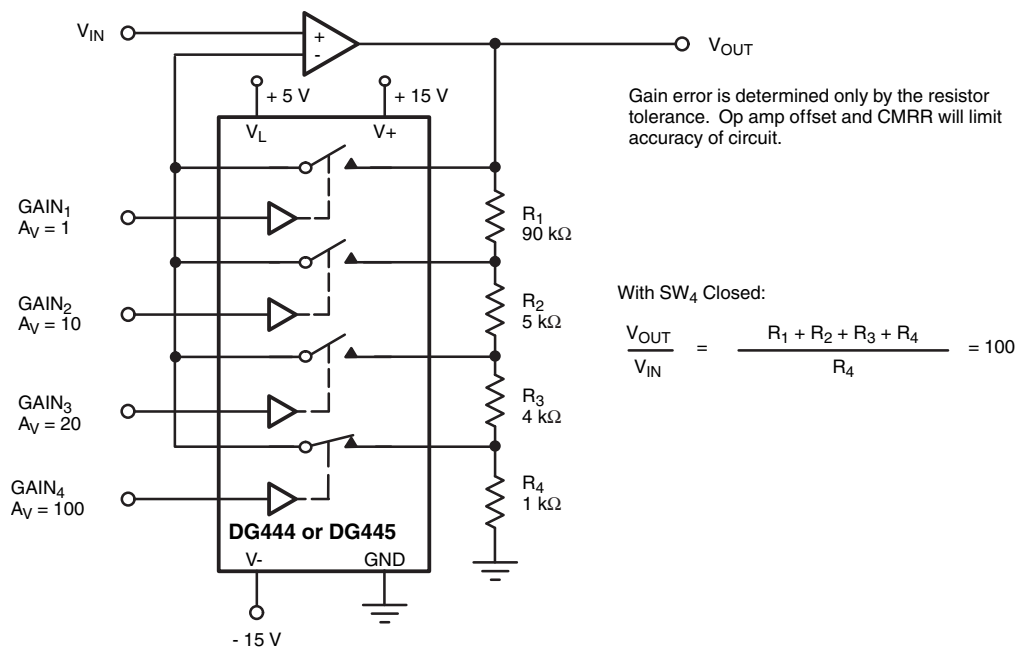
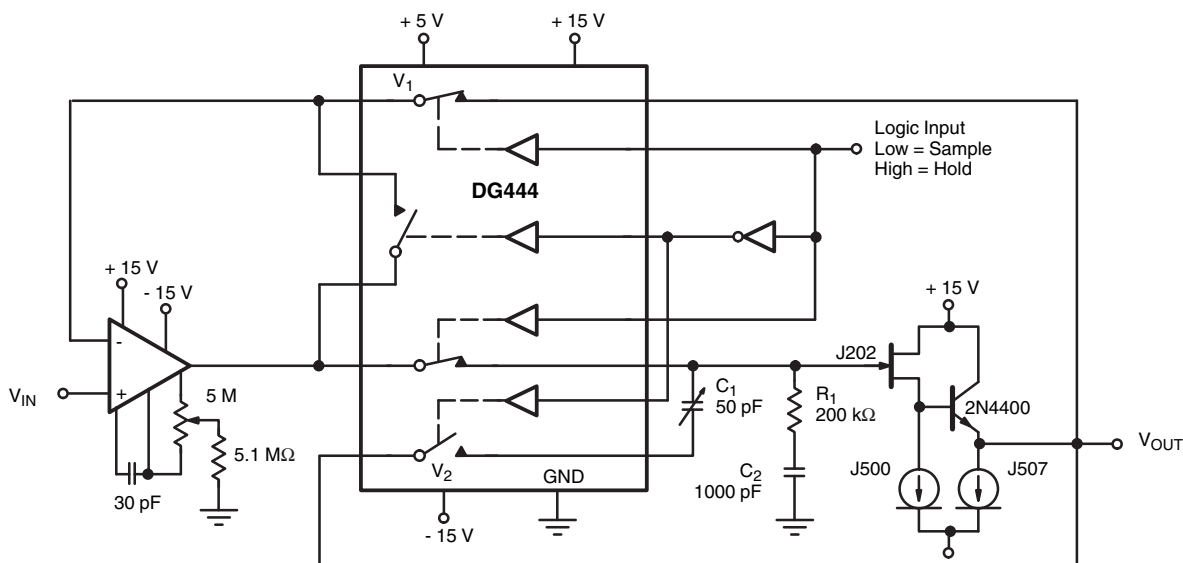
Fig. 2 - Switching Time

Fig. 3 - Charge Injection

TEST CIRCUITS


Fig. 4 - Crosstalk

Fig. 5 - Off Isolation

Fig. 6 - Source/Drain Capacitances

APPLICATIONS


Fig. 7 - Level Shifter

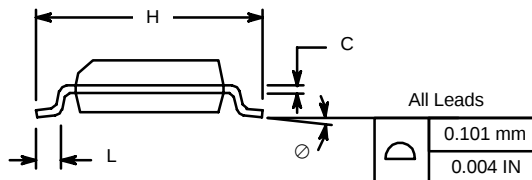
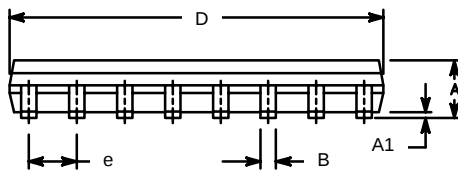
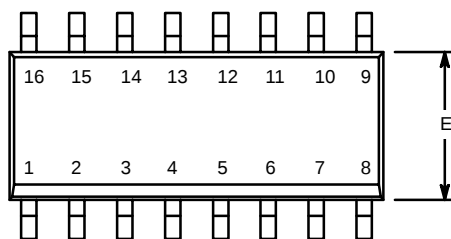
APPLICATIONS

Fig. 8 - Precision-Weighted Resistor Programmable-Gain Amplifier

Fig. 9 - Precision Sample-and-Hold

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SOIC (NARROW): 16-LEAD

JEDEC Part Number: MS-012

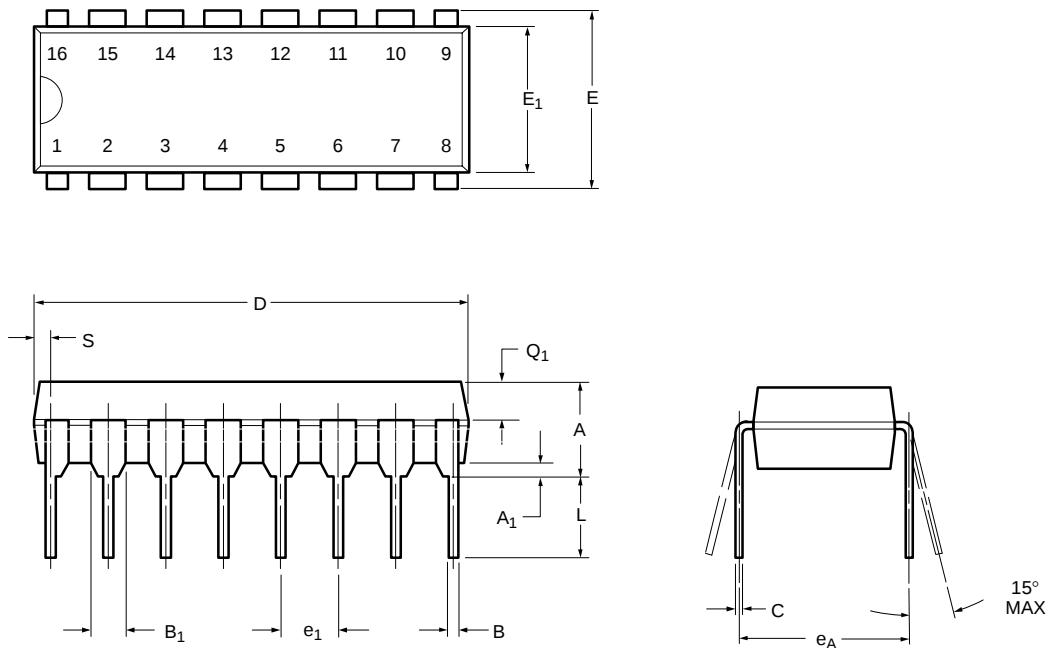


Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A ₁	0.10	0.20	0.004	0.008
B	0.38	0.51	0.015	0.020
C	0.18	0.23	0.007	0.009
D	9.80	10.00	0.385	0.393
E	3.80	4.00	0.149	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
L	0.50	0.93	0.020	0.037
Ø	0°	8°	0°	8°

ECN: S-03946—Rev. F, 09-Jul-01
DWG: 5300



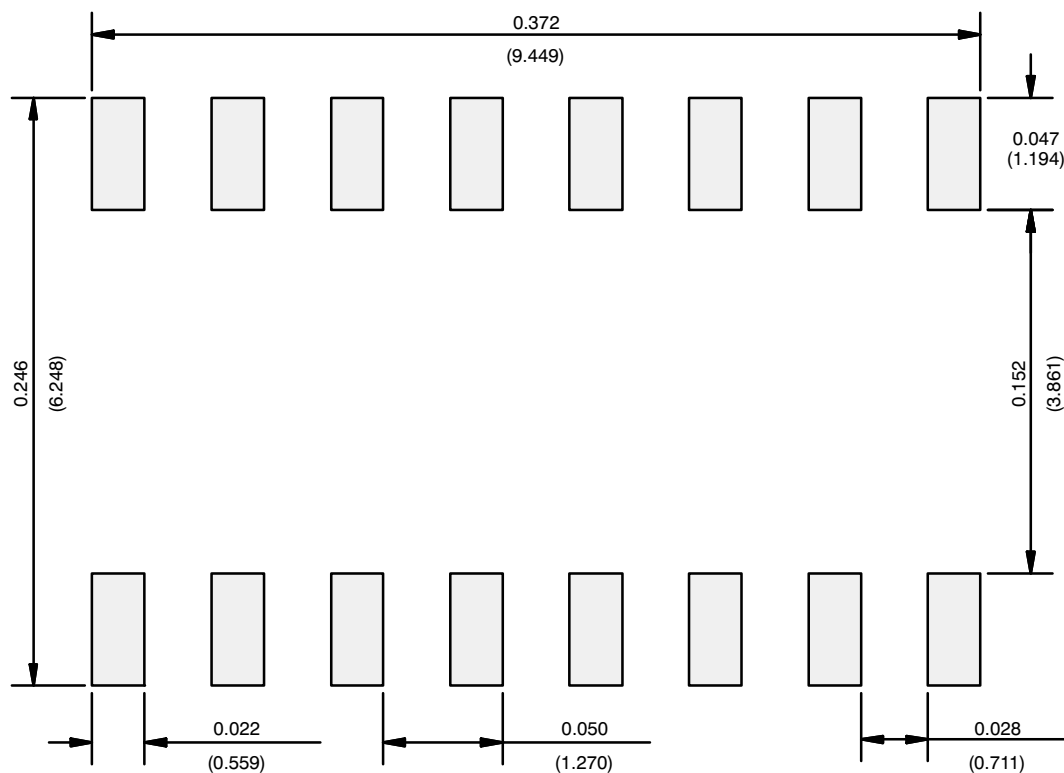
PDIP: 16-LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	3.81	5.08	0.150	0.200
A ₁	0.38	1.27	0.015	0.050
B	0.38	0.51	0.015	0.020
B ₁	0.89	1.65	0.035	0.065
C	0.20	0.30	0.008	0.012
D	18.93	21.33	0.745	0.840
E	7.62	8.26	0.300	0.325
E ₁	5.59	7.11	0.220	0.280
e ₁	2.29	2.79	0.090	0.110
e _A	7.37	7.87	0.290	0.310
L	2.79	3.81	0.110	0.150
Q ₁	1.27	2.03	0.050	0.080
S	0.38	1.52	.015	0.060

ECN: S-03946—Rev. D, 09-Jul-01
DWG: 5482

RECOMMENDED MINIMUM PADS FOR SO-16



Recommended Minimum Pads
Dimensions in Inches/(mm)

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