

ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)			
Parameter	Symbol	Limit	Unit
V+ to V-		44	V
GND to V-		25	
V_L		(GND - 0.3 V) to (V+) + 0.3 V	
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	470	mW
	16-pin Narrow Body SOIC ^d	640	
	QFN-16	850	

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 V _L = 5 V, V _{IN} = 2.4 V, 0.8 V ^e	Temp. ^a	Limits - 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-Resistance	R _{DS(on)}	I _S = 1 mA, V _D = ± 10 V	Room Full		45	80 95	Ω
Switch Off Leakage Current	I _{S(off)}	V _D = ± 14 V, V _S = ± 14 V	Room Full	- 0.5 - 5	± 0.01	0.5 5	nA
	I _{D(off)}		Room Full	- 0.5 - 5	± 0.01	0.5 5	
Channel On Leakage Current	I _{D(on)}	V _S = V _D = ± 14 V	Room Full	- 0.5 - 10	± 0.02	0.5 10	
Digital Control							
Input Voltage Low	V _{INL}		Full			0.8	V
Input Voltage High	V _{INH}		Full	2.4			
Input Current V _{IN} Low	I _{INL}	V _{IN} under test = 0.8 V All Other = 2.4 V	Full	- 1	- 0.01	1	μA
Input Current V _{IN} High	I _{INH}	V _{IN} under test = 2.4 V All Other = 0.8 V	Full	- 1	0.01	1	
Dynamic Characteristics							
Turn-On Time	t _{ON}	R _L = 1 kΩ, C _L = 35 pF V _S = ± 10 V, See Figure 2	Room			300	ns
Turn-Off Time	t _{OFF}		Room			200	
Charge Injection ^e	Q	C _L = 1 nF, V _S = 0 V V _{gen} = 0 V, R _{gen} = 0 Ω	Room		1		pC
Off Isolation ^e	OIRR	R _L = 50 Ω , C _L = 15 pF V _S = 1 V _{RMS} , f = 100 kHz	Room		- 90		dB
Crosstalk (Channel-to-Channel) ^d	X _{TALK}		Room		- 95		
Source Off Capacitance	C _{S(off)}	V _S = 0 V, f = 100 kHz	Room		5		pF
Drain Off Capacitance	C _{D(off)}		Room		5		
Channel On Capacitance	C _{D(on)}	V _S = V _D = 0 V, f = 1 MHz	Room		16		
Power Supplies							
Positive Supply Current	I ₊	V _{IN} = 0 V or 5 V	Room Full			1 5	μA
Negative Supply Current	I ₋		Room Full	- 1 - 5			
Logic Supply Current	I _{IN}		Room Full			1 5	

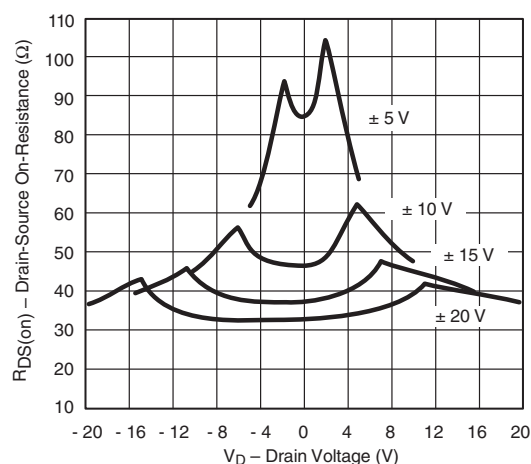
SPECIFICATIONS (for unipolar supplies)							
Parameter	Symbol	Test Conditions Unless Otherwise Specified V+ = 12 V, V- = 0 V VL = 5 V, VIN = 2.4 V, 0.8 V ^e	Temp. ^a	D Suffix - 40 °C to 85 °C			Unit
				Min. ^b	Typ. ^c	Max. ^b	
Analog Switch							
Analog Signal Range ^d	VANALOG		Full	0		12	V
Drain-Source On-Resistance ^d	RDS(on)	IS = 1 mA, VD = 3 V, 8 V	Room Full		90	160 200	Ω
Dynamic Characteristics							
Turn-On Time	tON	RL = 1 kΩ, CL = 35 pF, VS = 8 V See Figure 2	Room		120	300	ns
Turn-Off Time	tOFF		Room		60	200	
Charge Injection	Q	CL = 1 nF, Vgen = 6 V, Rgen = 0 Ω	Room		4		pC
Power Supplies							
Positive Supply Current	I+	VIN = 0 or 5 V	Room Full			1 5	μA
Negative Supply Current	I-		Room Full	- 1 - 5			
Logic Supply Current	IIN	VL = 5.25 V, VIN = 0 or 5 V	Room Full			1 5	

Notes:

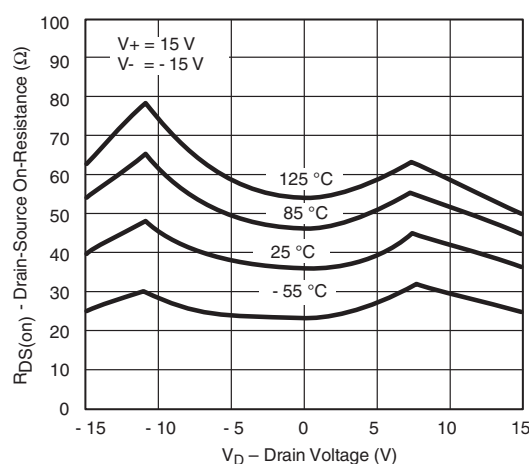
- Room = 25 °C, Full = as determined by the operating temperature suffix.
- The algebraic convention whereby the most negative value is a minimum and the most positive a maximum, is used in this data sheet.
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
-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

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.

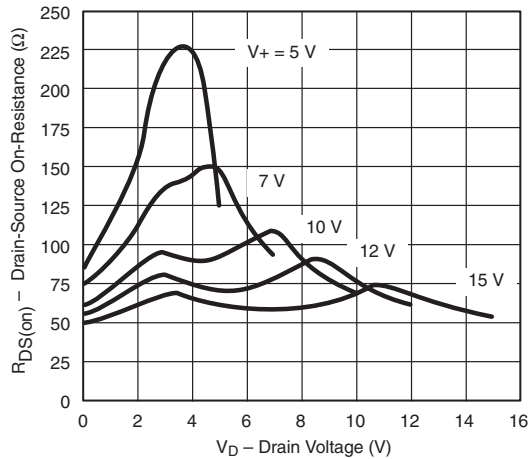
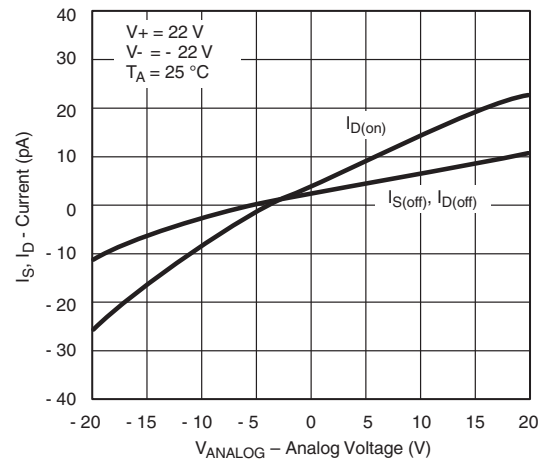
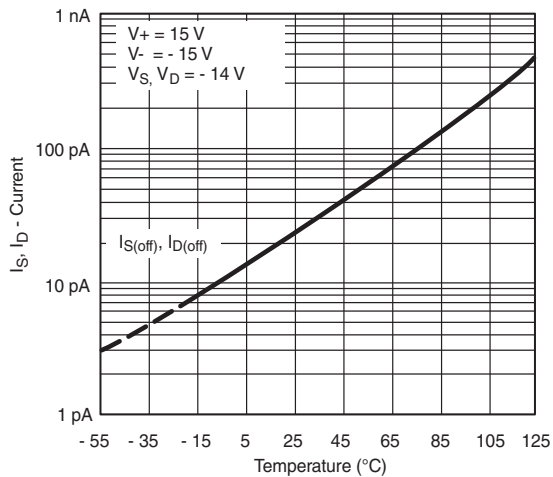
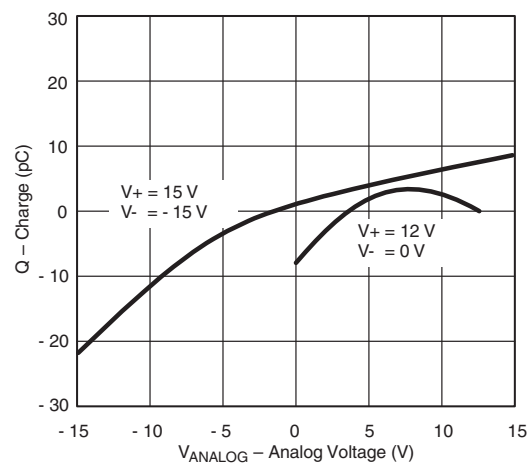
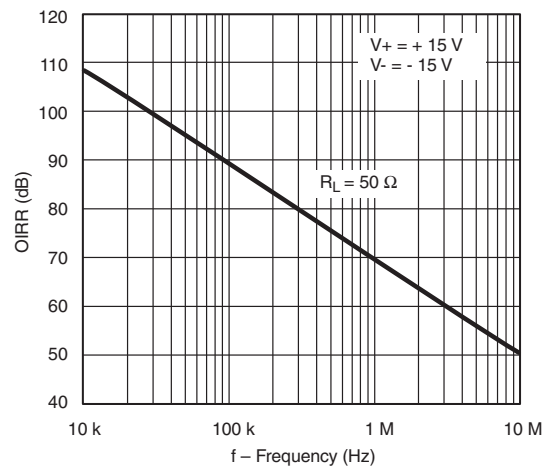
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



$R_{DS(on)}$ vs. V_D and Power Supply Voltages



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

**TYPICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$, unless otherwise noted) **$R_{DS(on)}$ vs. V_D and Single Power Supply Voltages****Leakage Currents vs. Analog Voltage****Leakage Current vs. Temperature** **Q_S , Q_D - Charge Injection vs. Analog Voltage****Off Isolation vs. Frequency**

SCHEMATIC DIAGRAM (typical channel)

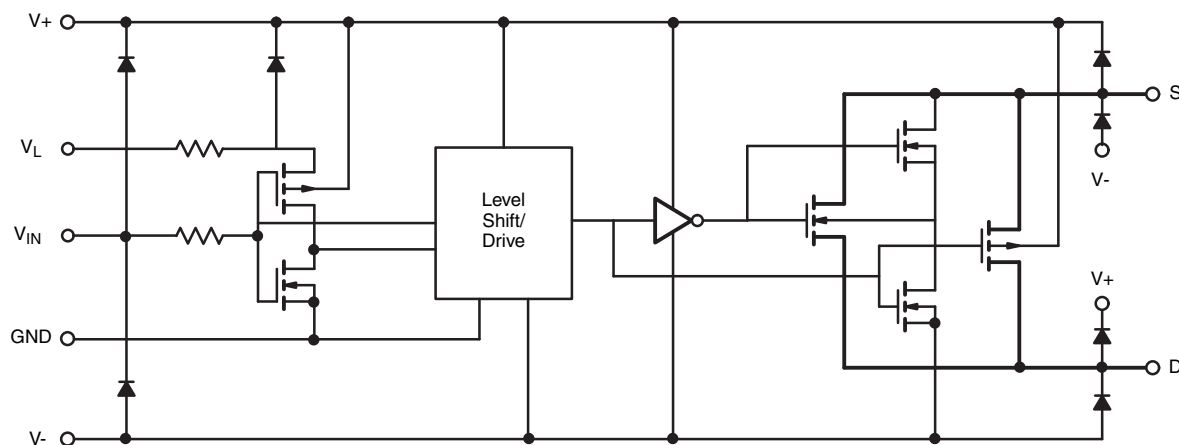
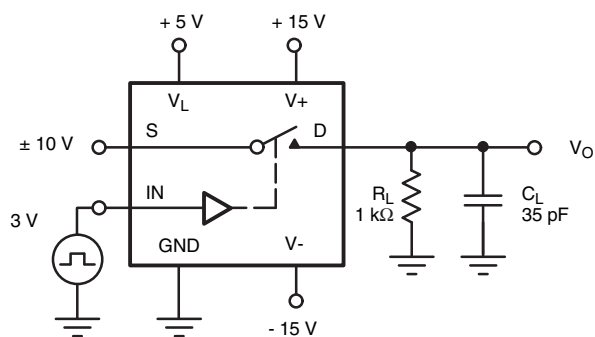
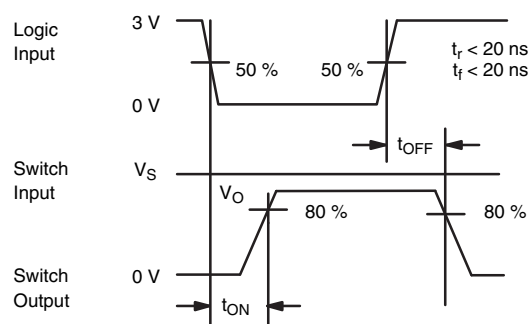


Figure 1.

TEST CIRCUITS



C_L (includes fixture and stray capacitance)



Note: Logic input waveform is inverted for DG445.

Figure 2. Switching Time

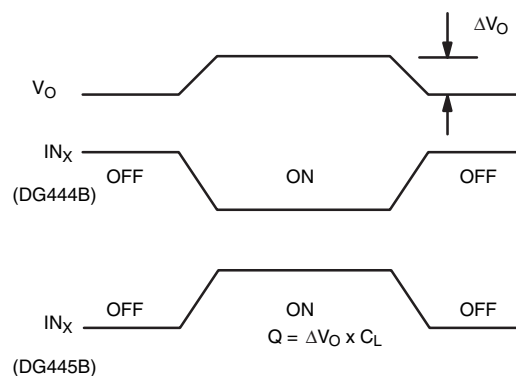
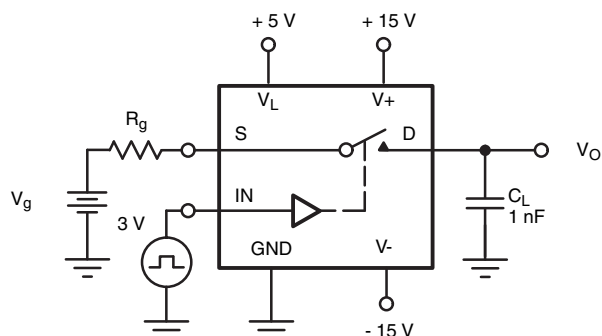


Figure 3. Charge Injection

TEST CIRCUITS

C = 1 mF tantalum in parallel with 0.01 mF ceramic

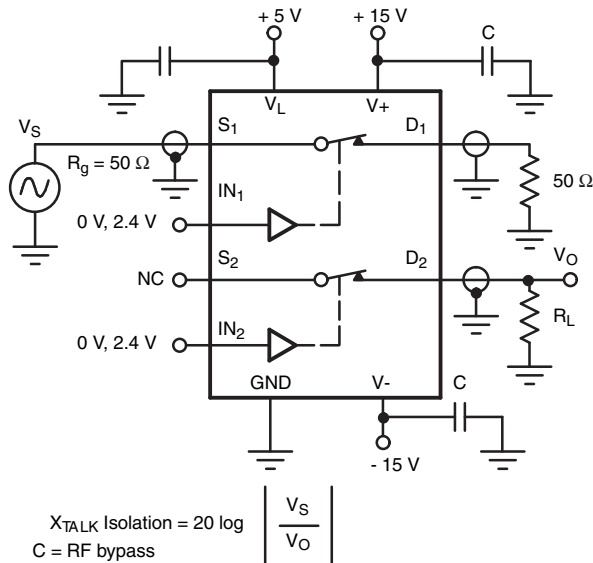


Figure 4. Crosstalk

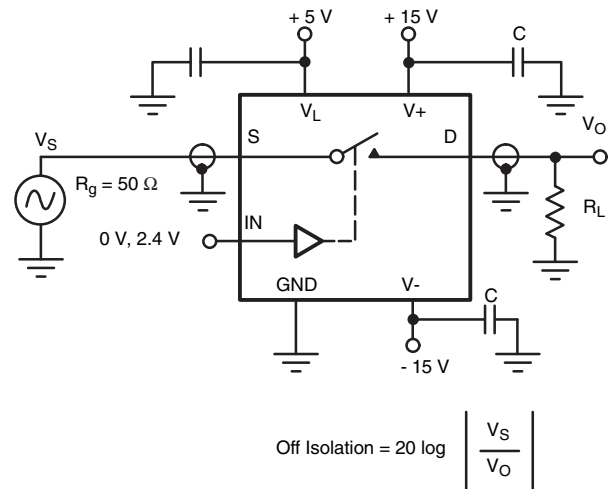


Figure 5. Off Isolation

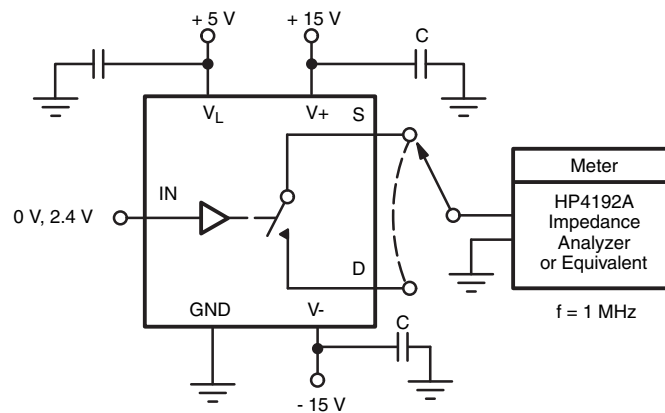


Figure 6. Source/Drain Capacitances

APPLICATIONS

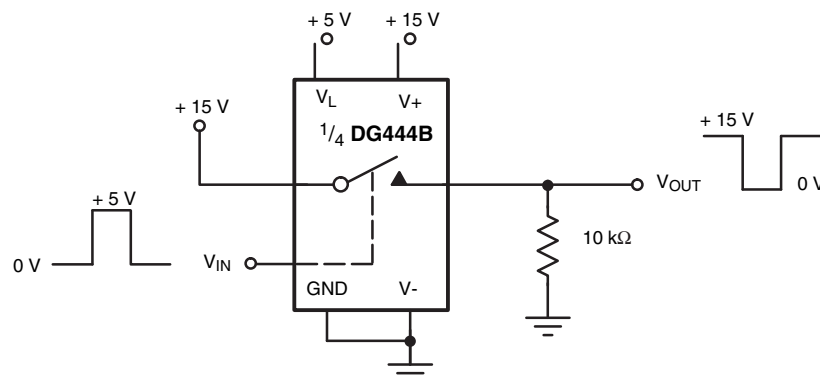


Figure 7. Level Shifter

APPLICATIONS

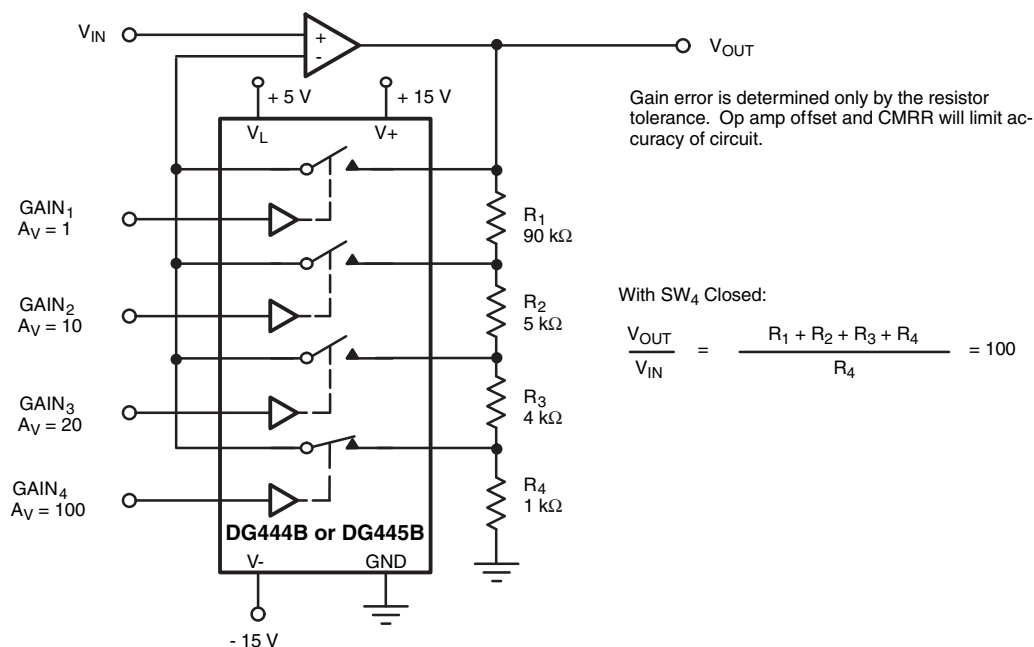


Figure 8. Precision-Weighted Resistor Programmable-Gain Amplifier

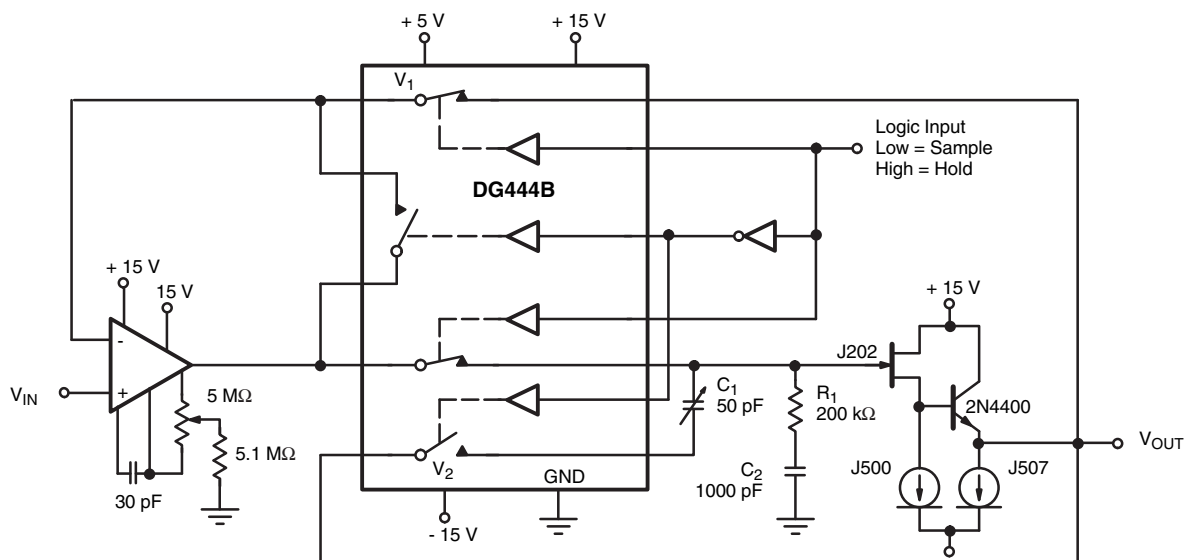
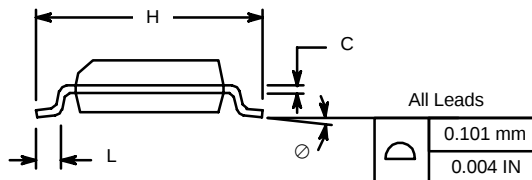
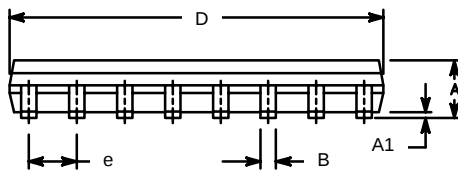
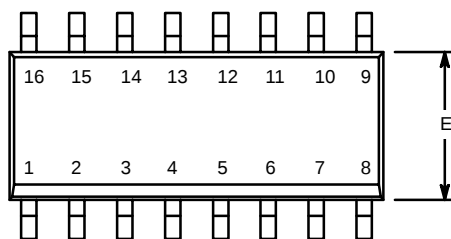


Figure 9. Precision Sample-and-Hold

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?72626.



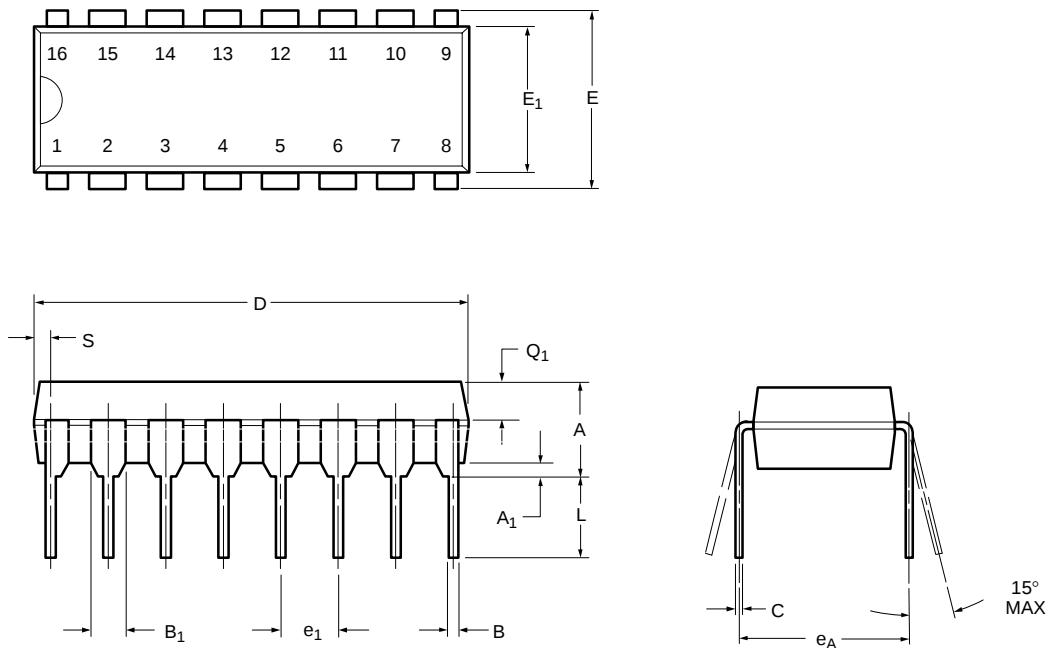
SOIC (NARROW): 16-LEAD
JEDEC Part Number: MS-012



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				



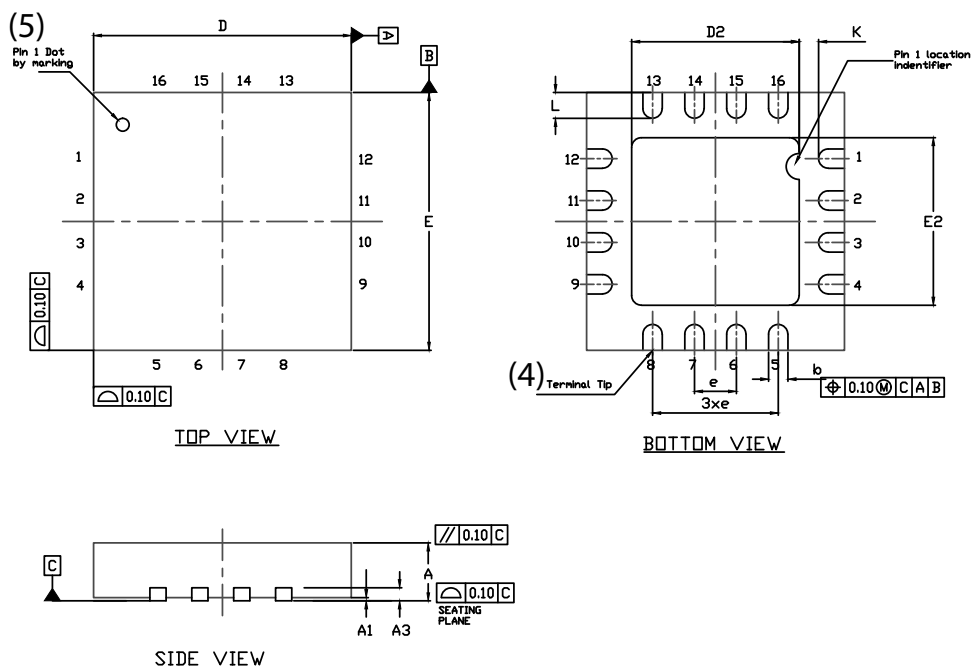
PDIP: 16-LEAD



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

QFN 4x4-16L Case Outline



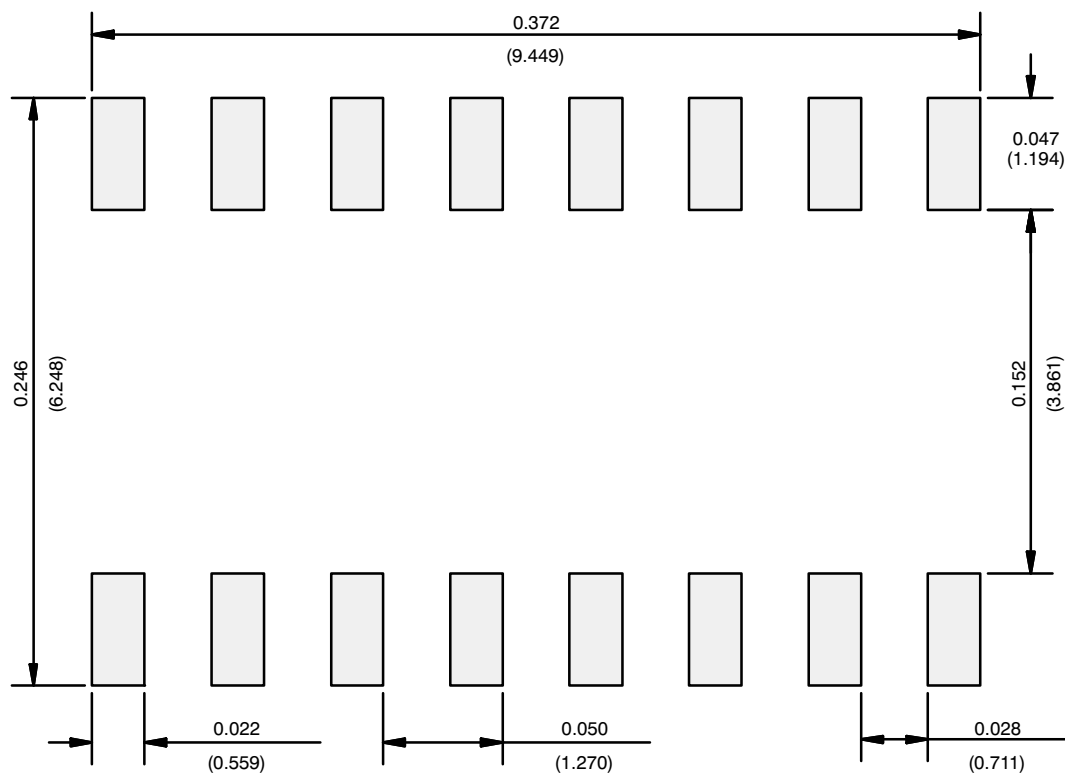
DIM	VARIATION 1						VARIATION 2					
	MILLIMETERS ⁽¹⁾			INCHES			MILLIMETERS ⁽¹⁾			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.75	0.85	0.95	0.029	0.033	0.037	0.75	0.85	0.95	0.029	0.033	0.037
A1	0	-	0.05	0	-	0.002	0	-	0.05	0	-	0.002
A3	0.20 ref.			0.008 ref.			0.20 ref.			0.008 ref.		
b	0.25	0.30	0.35	0.010	0.012	0.014	0.25	0.30	0.35	0.010	0.012	0.014
D	4.00 BSC			0.157 BSC			4.00 BSC			0.157 BSC		
D2	2.0	2.1	2.2	0.079	0.083	0.087	2.5	2.6	2.7	0.098	0.102	0.106
e	0.65 BSC			0.026 BSC			0.65 BSC			0.026 BSC		
E	4.00 BSC			0.157 BSC			4.00 BSC			0.157 BSC		
E2	2.0	2.1	2.2	0.079	0.083	0.087	2.5	2.6	2.7	0.098	0.102	0.106
K	0.20 min.			0.008 min.			0.20 min.			0.008 min.		
L	0.5	0.6	0.7	0.020	0.024	0.028	0.3	0.4	0.5	0.012	0.016	0.020
N ⁽³⁾	16			16			16			16		
Nd ⁽³⁾	4			4			4			4		
Ne ⁽³⁾	4			4			4			4		

Notes

- (1) Use millimeters as the primary measurement.
- (2) Dimensioning and tolerances conform to ASME Y14.5M. - 1994.
- (3) N is the number of terminals. Nd and Ne is the number of terminals in each D and E site respectively.
- (4) Dimensions b applies to plated terminal and is measured between 0.15 mm and 0.30 mm from terminal tip.
- (5) The pin 1 identifier must be existed on the top surface of the package by using identification mark or other feature of package body.
- (6) Package warpage max. 0.05 mm.

ECN: S13-0893-Rev. B, 22-Apr-13
DWG: 5890

RECOMMENDED MINIMUM PADS FOR SO-16



Recommended Minimum Pads
Dimensions in Inches/(mm)

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