ORDERING INFORMATION

Temp. Range	Package	Part Number
- 40 °C to 85 °C	16-pin plastic DIP	DG441DJ DG441DJ-E3
		DG442DJ DG442DJ-E3
	16-pin narrow SOIC	DG441DY DG441DY-E3 DG441DY-T1 DG441DY-T1-E3
		DG442DY DG442DY-E3 DG442DY-T1 DG442DY-T1-E3

ABSOLUTE MAXIMUM RATINGS

Parameter		Limit	Unit
V+ to V-		44	V
GND to V-		25	
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	(AK suffix)	- 65 to 150	°C
	(DJ, DY suffix)	- 65 to 125	
Power Dissipation (Package)[b]	16-pin plastic DIP[c]	450	mW
	16-pin CerDIP[d]	900	
	16-pin narrow SOIC[d]	900	
	LCC-20[d]	1200	

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/°C above 75 °C.
d. Derate 12 mW/°C above 75 °C.

SCHEMATIC DIAGRAM Typical Channel

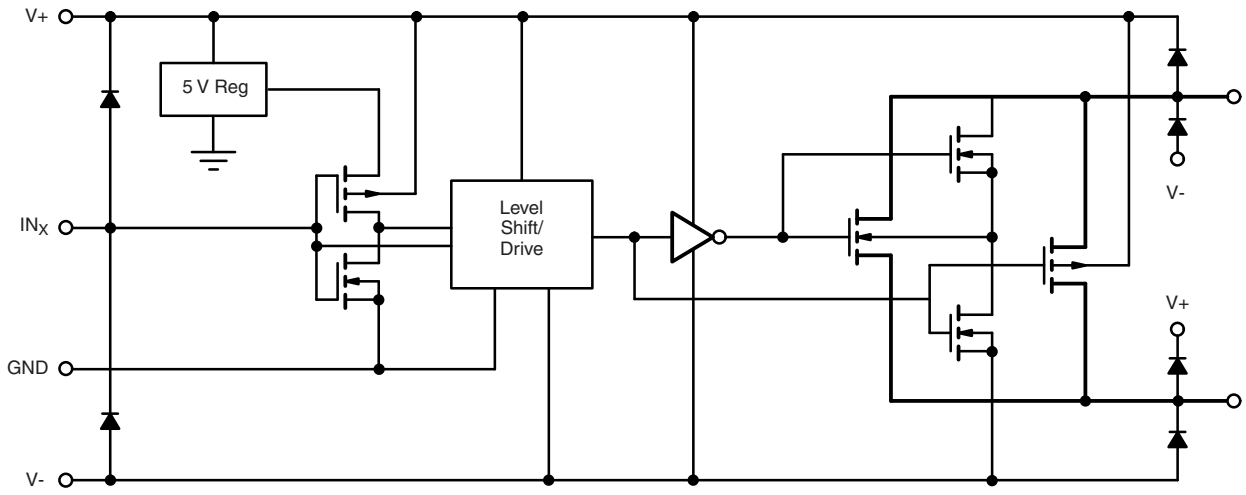


Figure 1.

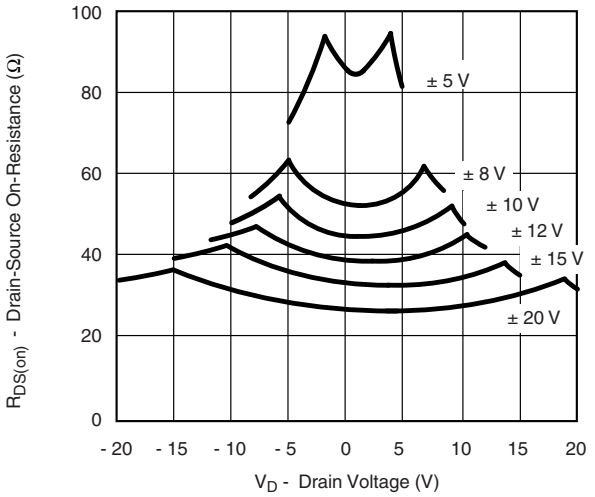
SPECIFICATIONS[a] (Dual Supplies)									
Parameter	**Symbol**	**Test Conditions Unless Otherwise Specified** V+ = 15 V, V- = - 15 V V_{IN} = 2.4 V, 0.8 V[f]	**Temp.**[b]	**Typ.**[c]	**A Suffix** - 55 °C to 125 °C **Min.**[d]	**A Suffix** - 55 °C to 125 °C **Max.**[d]	**D Suffix** - 40 °C to 85 °C **Min.**[d]	**D Suffix** - 40 °C to 85 °C **Max.**[d]	**Unit**
Analog Switch									
Analog Signal Range[e]	V_{ANALOG}		Full		- 15	15	- 15	15	V
Drain-Source On-Resistance	$R_{DS(on)}$	I_S = - 10 mA, V_D = ± 8.5 V V+ = 13.5 V, V- = - 13.5 V	Room Full	50		85 100		85 100	Ω
On-Resistance Match Between Channels[e]	$\Delta R_{DS(on)}$	I_S = - 10 mA, V_D = ± 10 V V+ = 15 V, V- = - 15 V	Room Full			4 5		4 5	Ω
Switch Off Leakage Current	$I_{S(off)}$	V+ = 16.5, V- = - 16.5 V V_D = ± 15.5 V, V_S = ± 15.5 V	Room Full	± 0.01	- 0.5 - 20	0.5 20	- 0.5 - 5	0.5 5	nA
	$I_{D(off)}$		Room Full	± 0.01	- 0.5 - 20	0.5 20	- 0.5 - 5	0.5 5	nA
Channel On Leakage Current	$I_{D(on)}$	V+ = 16.5 V, V- = - 16.5 V V_S = V_D = ± 15.5 V	Room Full	± 0.08	- 0.5 - 40	0.5 40	- 0.5 - 10	0.5 10	nA
Digital Control									
Input Current V_{IN} Low	I_{IL}	V_{IN} under test = 0.8 V, All Other = 2.4 V	Full	- 0.01	- 500	500	- 500	500	nA
Input Current V_{IN} High	I_{IH}	V_{IN} under test = 2.4 V All Other = 0.8 V	Full	0.01	- 500	500	- 500	500	nA
Dynamic Characteristics									
Turn-On Time	t_{ON}	R_L = 1 kΩ, C_L = 35 pF V_S = ± 10 V See Figure 2	Room	150		250		250	ns
Turn-Off Time DG441	t_{OFF}		Room	90		120		120	ns
Turn-Off Time DG442			Room	110		210		210	ns
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 = 5 pF f = 1 MHz	Room	60					dB
Crosstalk (Channel-to-Channel)	X_{TALK}		Room	100					dB
Source Off Capacitance[e]	$C_{S(off)}$	f = 1 MHz	Room	4					pF
Drain Off Capacitance[e]	$C_{D(off)}$		Room	4					pF
Channel On Capacitance[e]	$C_{D(on)}$	V_{ANALOG} = 0 V	Room	16					pF
Power Supplies									
Positive Supply Current	I+	V+ = 16.5 V, V- = - 16.5 V V_{IN} = 0 or 5 V	Full	15		100		100	µA
Negative Supply Current	I-		Room Full	- 0.0001	- 1 - 5		- 1 - 5		µA
Ground Current	I_{GND}		Full	- 15	- 100		- 100		µA

SPECIFICATIONS[a] (Single Supply)									
		Test Conditions Unless Otherwise Specified V+ = 12 V, V- = 0 V V_{IN} = 2.4 V, 0.8 V[f]			**A Suffix** - 55 °C to 125 °C		**D Suffix** - 40 °C to 85 °C		
Parameter	**Symbol**		**Temp.**[b]	**Typ.**[c]	**Min.**[d]	**Max.**[d]	**Min.**[d]	**Max.**[d]	**Unit**
Analog Switch									
Analog Signal Range[e]	V_{ANALOG}		Full		0	12	0	12	V
Drain-Source On-Resistance	$R_{DS(on)}$	I_S = - 10 mA, V_D = 3 V, 8 V V+ = 10.8 V	Room Full	100		160 200		160 200	Ω
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		450	ns
Turn-Off Time	t_{OFF}		Room	60		200		200	
Charge Injection	Q	C_L = 1nF, V_{gen} = 6 V, R_{gen} = 0 Ω	Room	2					pC
Power Supplies									
Positive Supply Current	I+	V+ = 13.2 V, V- = 0 V V_{IN} = 0 or 5 V	Full	15		100		100	µA
Negative Supply Current	I-		Room Full	- 0.0001	- 1 - 100		- 1 - 100		
Ground Current	I_{GND}		Full	- 15	- 100		- 100		

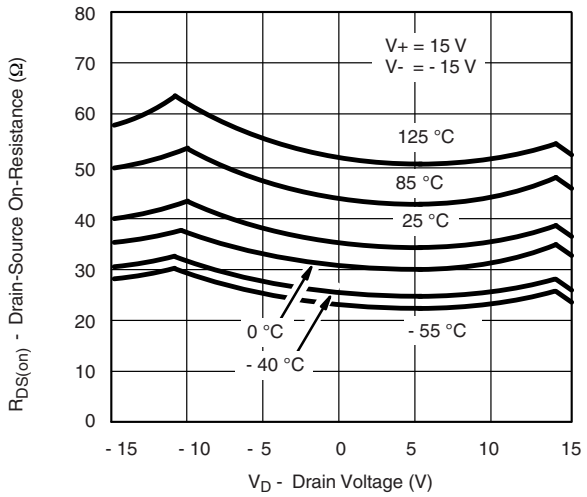
Notes:
a. Refer to PROCESS OPTION FLOWCHART.
b. Room = 25 °C, Full = as determined by the operating temperature suffix.
c. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
d. The algebraic convention whereby the most negative value is a minimum and the most positive a maximum, is used in this datasheet.
e. Guaranteed by design, not subject to production test.
f. 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.

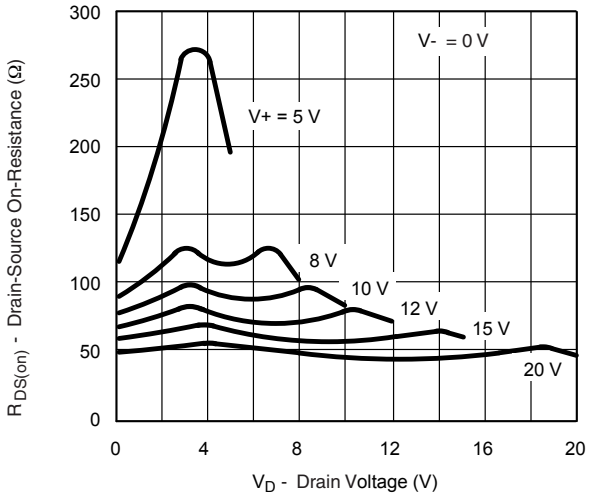
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



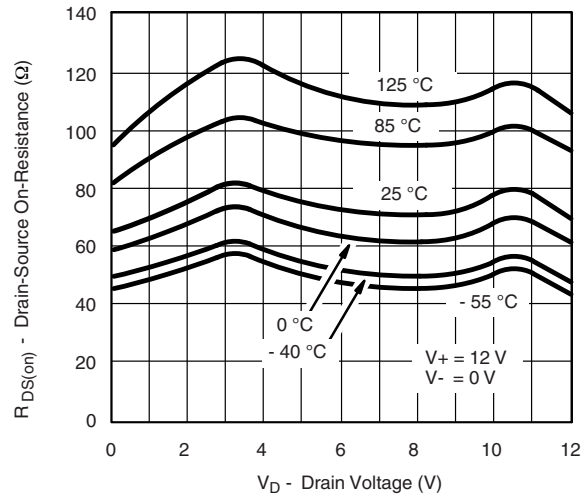
$R_{DS(on)}$ vs. V_D and Power Supply Voltage



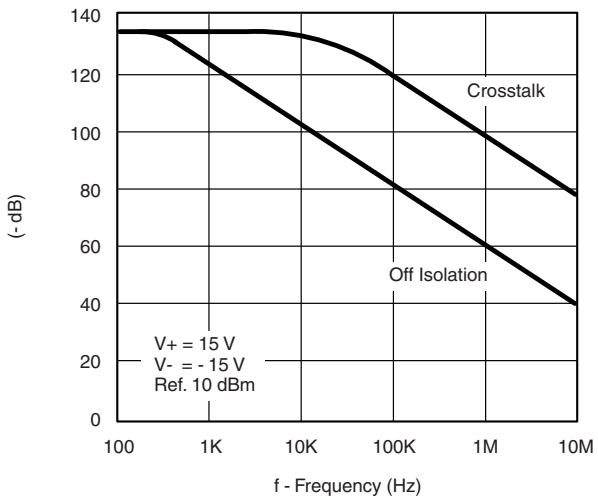
$R_{DS(on)}$ vs. V_D and Temperature



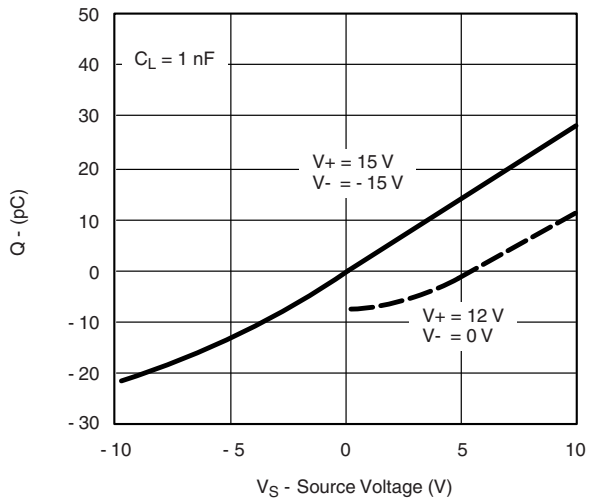
$R_{DS(on)}$ vs. V_D and Unipolar Power Supply Voltage



$R_{DS(on)}$ vs. V_D and Temperature (Single 12-V Supply)

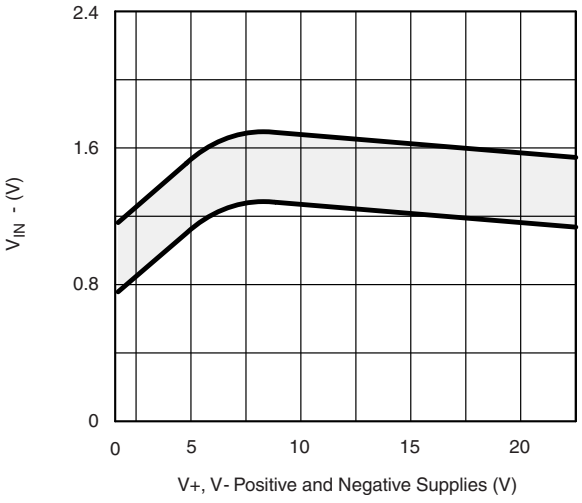


Crosstalk and Off Isolation vs. Frequency

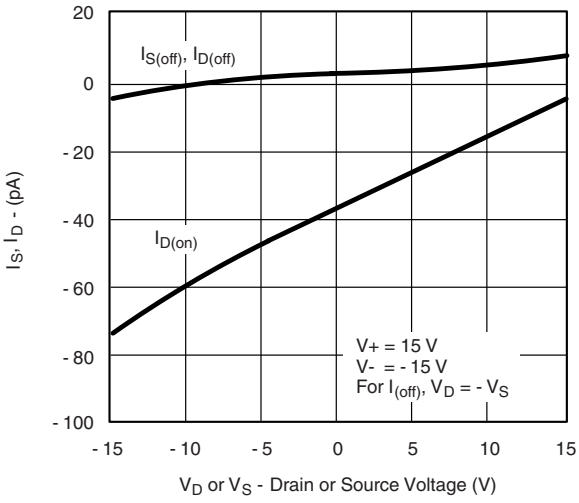


Charge Injection vs. Source Voltage

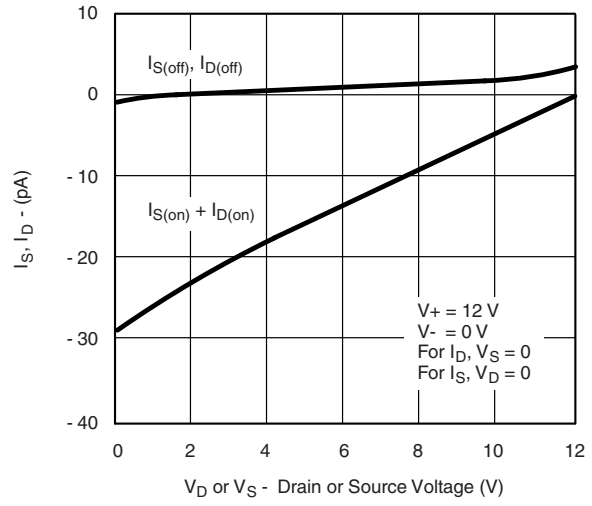
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



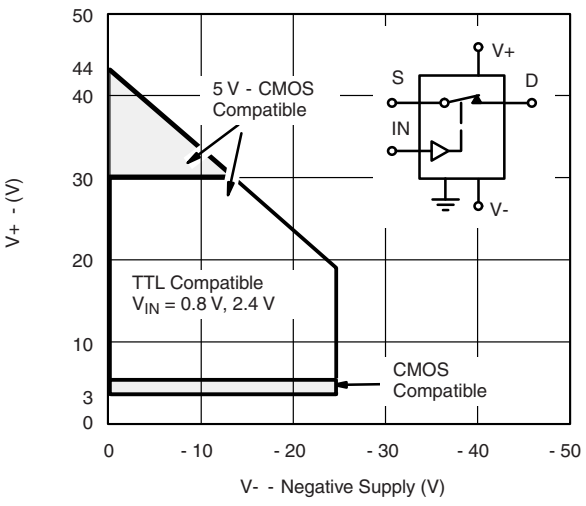
Switching Threshold vs. Supply Voltage



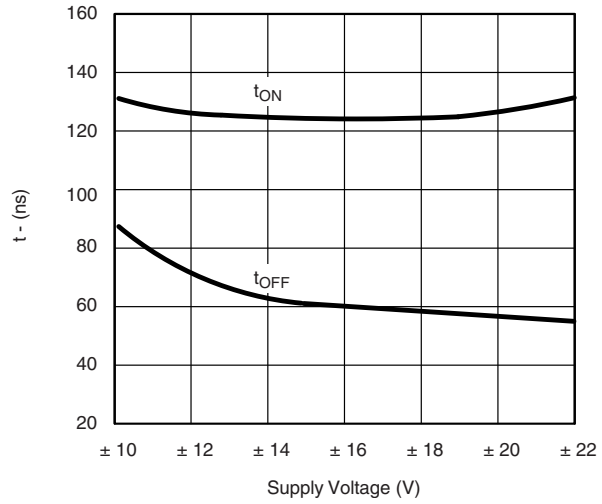
Source/Drain Leakage Currents



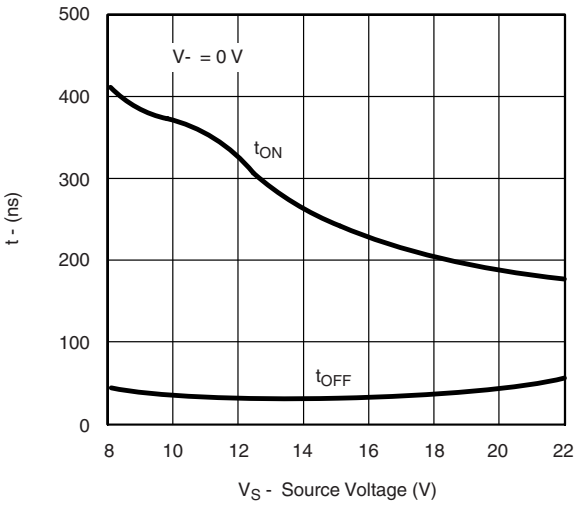
Source/Drain Leakage Currents (Single 12 V Supply)



Operating Voltage

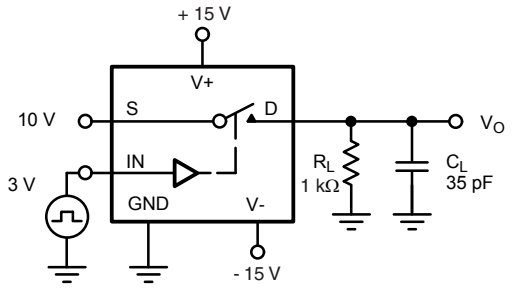


Switching Time vs. Power Supply Voltage

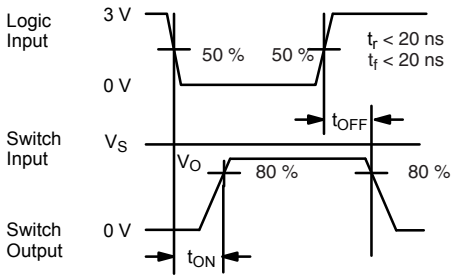


Switching Time vs. Power Supply Voltage

TEST CIRCUITS

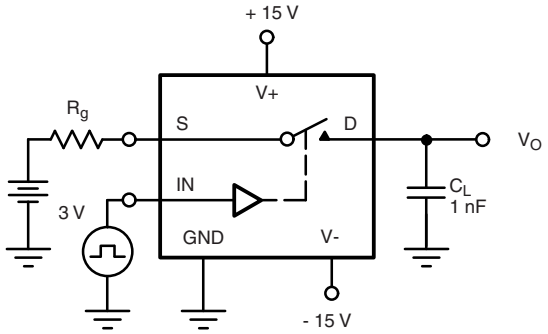


C_L (includes fixture and stray capacitance)



Note: Logic input waveform is inverted for DG442.

Figure 2. Switching Time



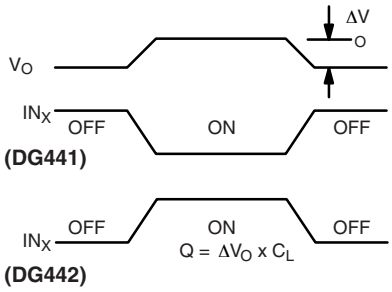
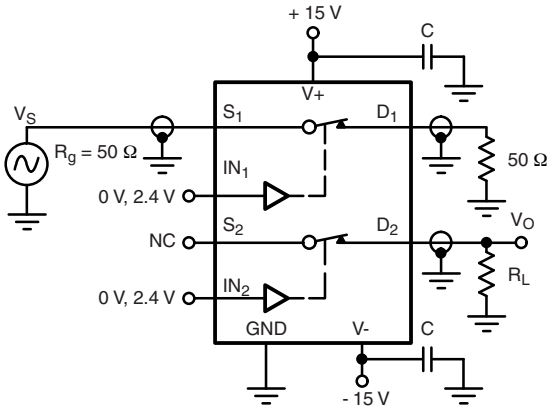


Figure 3. Charge Injection

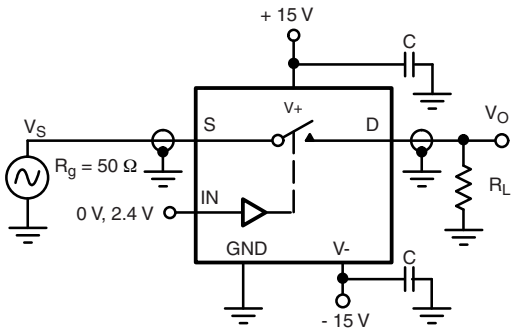
C = 1 mF tantalum in parallel with 0.01 mF ceramic



X_{TALK} Isolation = 20 log $\left|\frac{V_S}{V_O}\right|$

C = RF bypass

Figure 4. Crosstalk



Off Isolation = 20 log $\left|\frac{V_S}{V_O}\right|$

Figure 5. Off Isolation

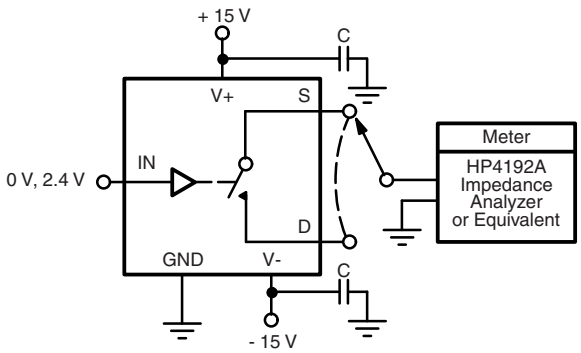


Figure 6. Source/Drain Capacitances

APPLICATIONS

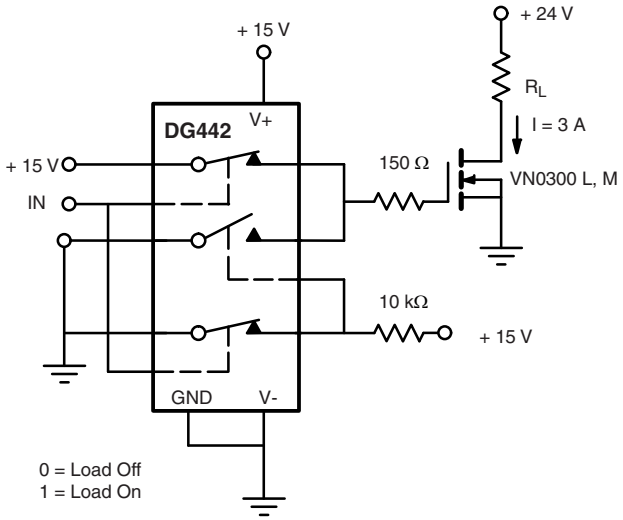


Figure 7. Power MOSFET Driver

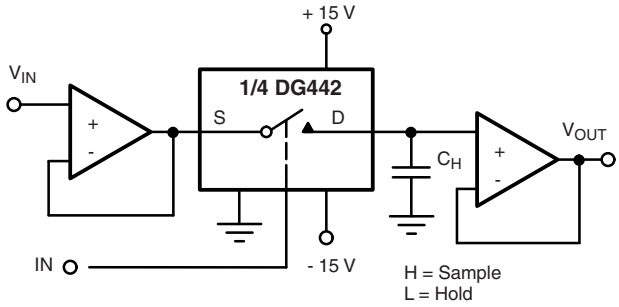


Figure 8. Open Loop Sample-and-Hold

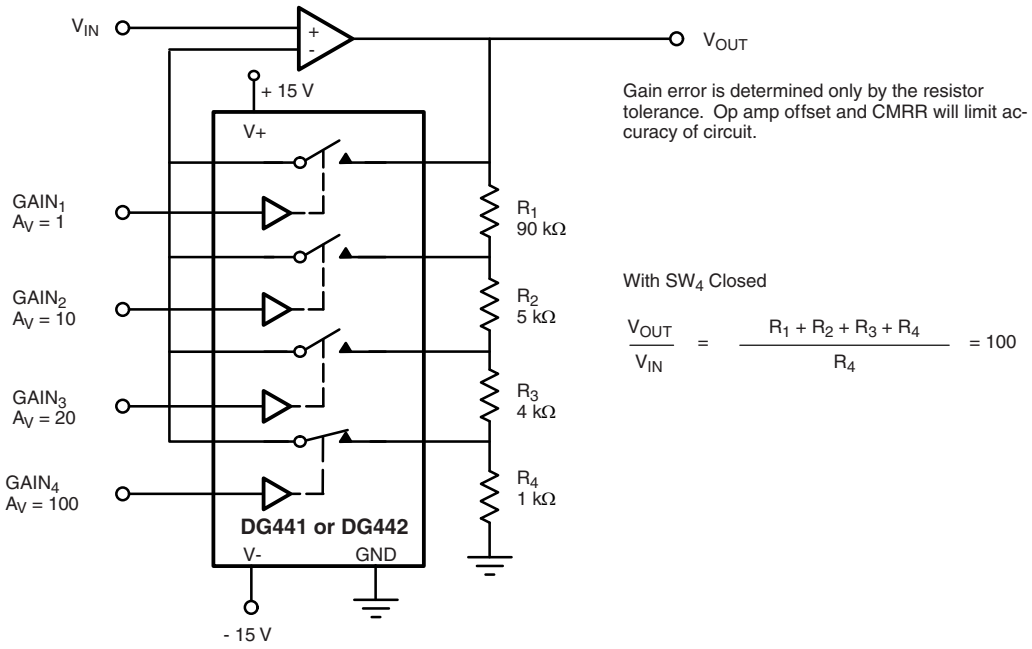


Figure 9. Precision-Weighted Resistor Programmable-Gain Amplifier

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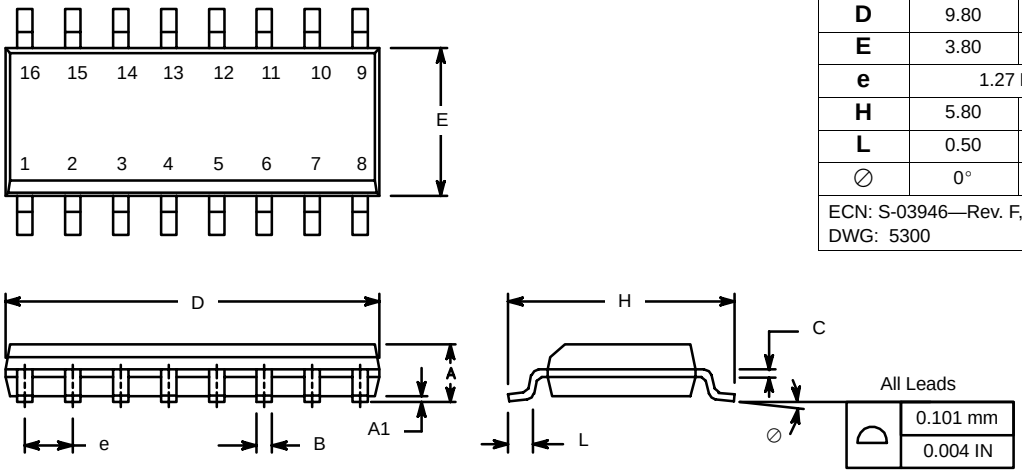
SOIC (NARROW): 16-LEAD

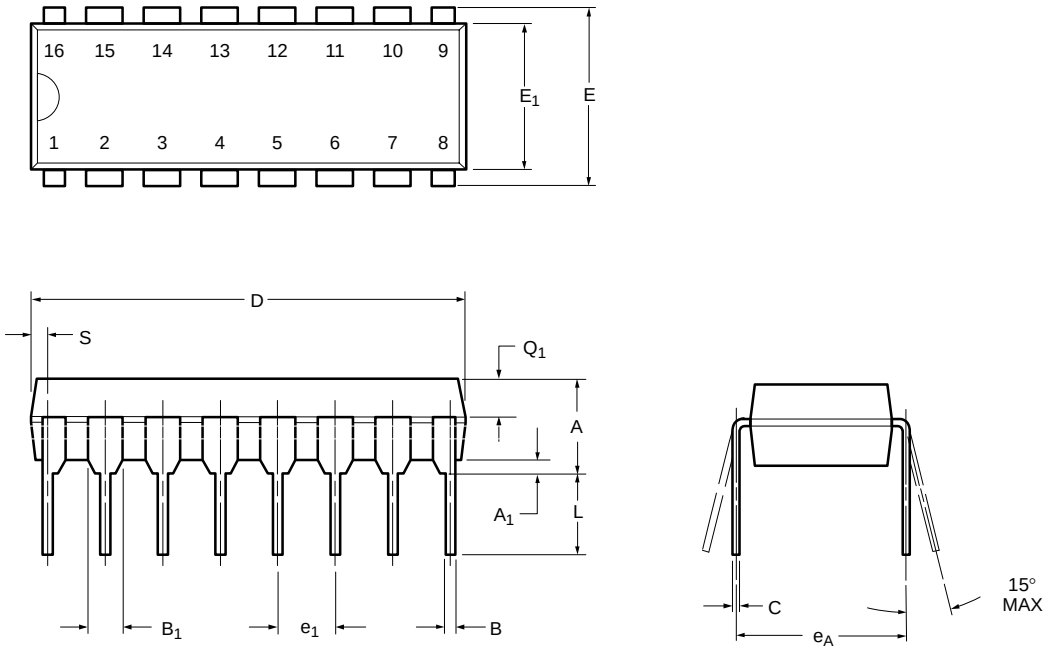
JEDEC Part Number: MS-012



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
⊘	0°	8°	0°	8°

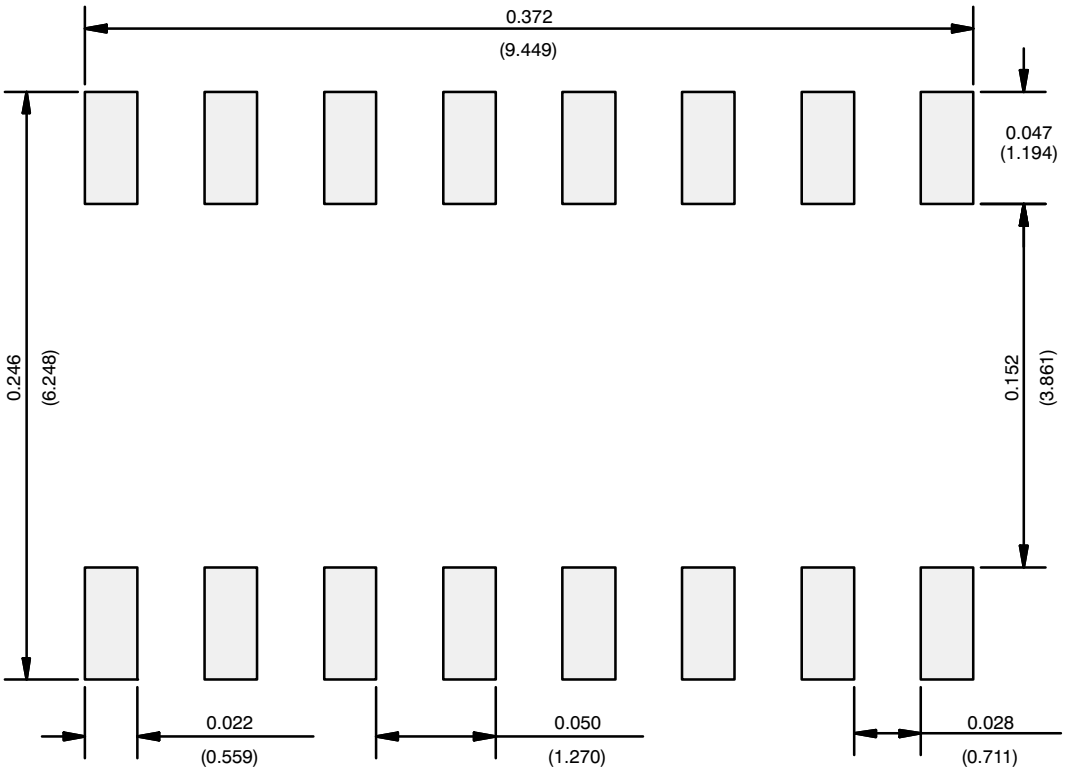
ECN: S-03946—Rev. F, 09-Jul-01
DWG: 5300

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)

Return to Index

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