

TRUTH TABLE			
Logic	EN (DG2733 only)	NC1, 2	NO1, 2
0	1	ON	OFF
1	1	OFF	ON
0	0	OFF	OFF
1	0	OFF	OFF

ORDERING INFORMATION		
Temp Range	Package	Part Number
-40 to 85°C	MSOP-10	DG2731DQ-T1-E3 DG2732DQ-T1-E3 DG2733DQ-T1-E3
	DFN-10	DG2731DN-T1-E4 DG2732DN-T1-E4 DG2733DN-T1-E4

ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$, unless otherwise noted				
Parameter		Symbol	Limit	Unit
Reference to GND	V+		-0.3 to 5.0	V
	IN, COM, NC, NO ^a		-0.3 to (V ⁺ + 0.3)	
Current (Any terminal except NO, NC or COM)			30	mA
Continuous Current (NO, NC, or COM)			±250	
Peak Current (Pulsed at 1 ms, 10 % duty cycle)			±500	
Storage Temperature (D Suffix)			-65 to 150	°C
Package Solder Reflow Conditions ^d	10-PIN MSOP			
	10-PIN DFN			
Power Dissipation (Packages) ^b	MSOP-10 ^c		320	mW
	DFN-10 ^d		1191	

Notes

- Signals on NC, NO, or COM or IN exceeding V₊ will be clamped by internal diodes. Limit forward diode current to maximum current ratings.
- All leads welded or soldered to PC Board.
- Derate 4.0 mW/°C above 70°C
- Derate 14.9 mW/°C above 70°C
- Manual soldering with iron is not recommended for leadless components. The QFN is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper lip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.

SPECIFICATIONS (V+ = 1.8 V)							
Parameter	Symbol	Test Condition Otherwise Unless Specified V+ = 1.8 V, VIN = 0.4 or 1.4 V ^e	Temp ^a	Limits –40 to 85°C			Unit
				Min ^b	Typ ^c	Max ^b	
Analog Switch							
Analog Signal Range ^d	VNO, VNC, VCOM		Full	0		V+	V
On-Resistance	rON	V+ = 1.8 V, VCOM = 0.9 V, INO, INC = 100 mA	Room		0.7	1.0	Ω
			Full		1.2		
Digital Control							
Input High Voltage	VINH		Full	1.4			V
Input Low Voltage	VINL		Full			0.4	
Input Capacitance	Cin		Full		4		pF
Power Supply							
Power Supply Current	I+	VIN = 0 or V+	Full			1.0	μA



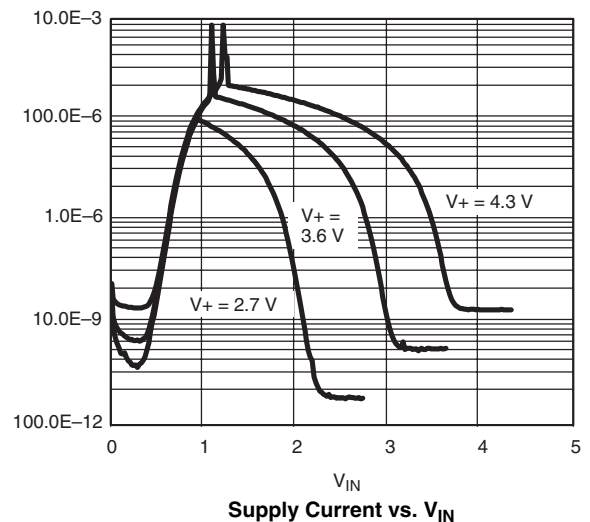
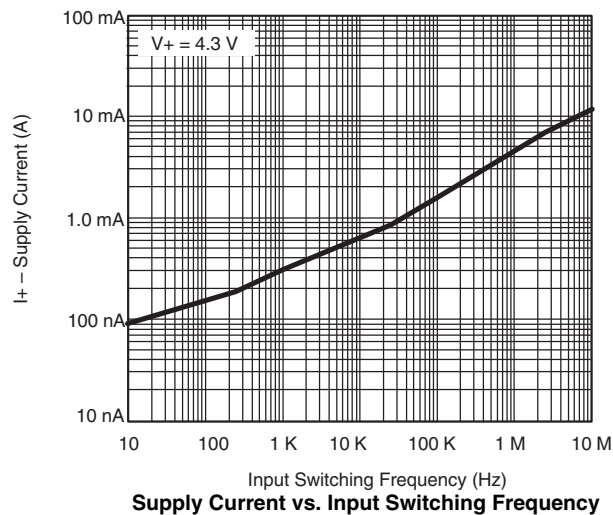
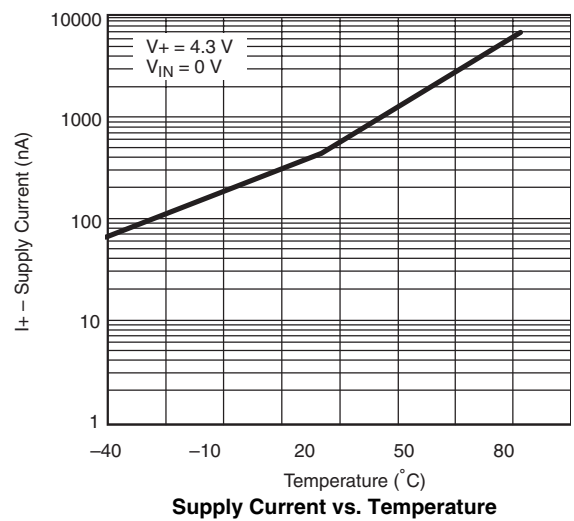
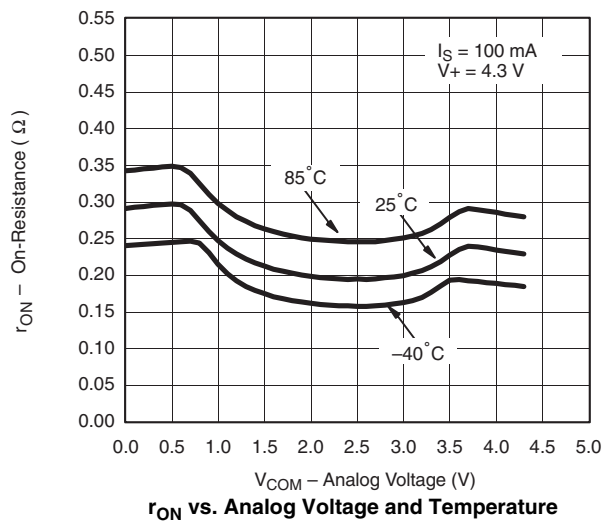
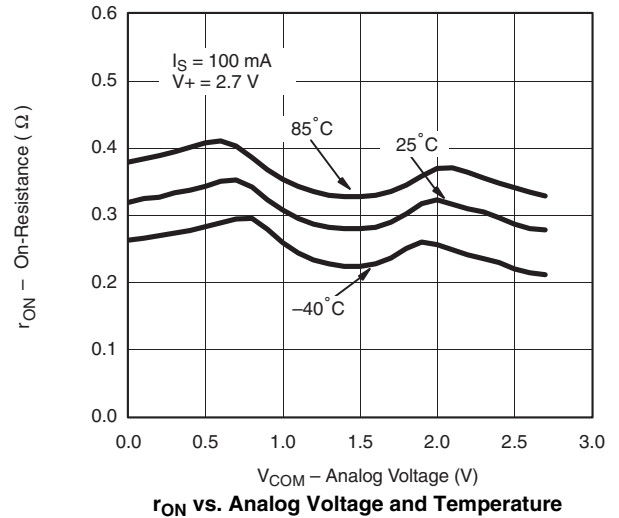
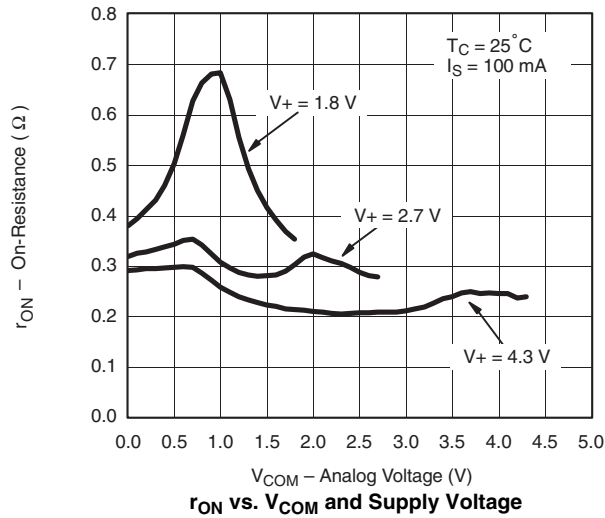
SPECIFICATIONS (V+ = 3 V)							
Parameter	Symbol	Test Condition Otherwise Unless Specified V+ = 3 V, ±10 %, VIN = 0.5 or 1.4 V ^e	Temp ^a	Limits –40 to 85°C			Unit
				Min ^b	Typ ^c	Max ^b	
Analog Switch							
Analog Signal Range ^d	VNO, VNC, VCOM		Full	0		V+	V
On-Resistance	rON	V+ = 2.7 V, VCOM = 0.5 V, INO, INC = 100 mA	Room		0.35	0.45	Ω
		V+ = 2.7 V, VCOM = 1.5 V, INO, INC = 100 mA			0.3		
				Full			
rON Match ^d	ΔrON	V+ = 2.7 V, VCOM = 0.5 to 1.5 V, INO, INC = 100 mA	Room		0.03	0.06	
Switch Off Leakage Current	INO(off), INC(off)	V+ = 3.3 V, VNO, VNC = 0.3 V / 4.0 V, VCOM = 3.0 V / 0.3 V	Room Full	–1 –10		1 10	nA
	ICOM(off)		Room Full	–1 –10		1 10	
Channel-On Leakage Current	ICOM(on)	V+ = 3.3 V, VNO, VNC = VCOM = 3.0 V / 0.3 V	Room Full	–1 –10		1 10	
Digital Control							
Input High Voltage	VINH		Full	1.4			V
Input Low Voltage	VINL		Full			0.5	
Input Capacitance	Cin		Full		5		pF
Input Current	IINL or IINH	VIN = 0 or V+	Full	–1		1	μA
Dynamic Characteristics							
Turn-On Time	tON	V+ = 3.6 V VNO or VNC = 1.5 V, RL = 50 Ω, CL = 35 pF	Room Full		85	110 140	ns
Turn-Off Time	tOFF		Room Full		17	30 35	
Break-Before-Make Time	tBBM		Full	10			
Charge Injection ^d	QINJ	CL = 1 nF, VGEN = 0 V, RGEN = 0 Ω	Room		9		pC
Off-Isolation ^d	OIRR	RL = 50 Ω, CL = 5 pF, f = 100 kHz	Room		–75		dB
Crosstalk ^d	XTALK		Room		–75		
NO, NC Off Capacitance ^d	CNO(off)	VIN = 0 or V+, f = 1 MHz	Room		104		pF
	CNC(off)		Room		104		
Channel On Capacitance ^d	CNO(on)		Room		230		
	CNC(on)		Room		230		
Power Supply							
Power Supply Range	V+			2.7		3.3	V
Power Supply Current	I+	VIN = 0 or V+	Full			1.0	μA
Turn-On Time DG2733 (EN)	tON(EN)	V+ = 3.6 V	Room Full		79	105 135	ns
Turn-Off Time DG2733 (EN)	tOFF(EN)	VNO or VNC = 1.5 V, RL = 50 Ω, CL = 35 pF	Room Full		17	29 35	

SPECIFICATIONS (V+ = 4.3 V)							
Parameter	Symbol	Test Condition Otherwise Unless Specified V+ = 4.3 V, V _{IN} = 0.5 or 1.6 V ^e	Temp ^a	Limits –40 to 85°C			Unit
				Min ^b	Typ ^c	Max ^b	
Analog Switch							
Analog Signal Range ^d	V _{NO} , V _{NC} , V _{COM}		Full	0		V+	V
On-Resistance	r _{ON}	V+ = 4.3 V, V _{COM} = 0.9 V, I _{NO} , I _{NC} = 100 mA	Room		0.29	0.4	Ω
		V+ = 4.3 V, V _{COM} = 2.5 V, I _{NO} , I _{NC} = 100 mA			0.21		
				Full			
r _{ON} Match ^d	Δr _{ON}	V+ = 4.3 V, V _{COM} = 0.9 to 2.5 V+, I _{NO} , I _{NC} = 100 mA	Room		0.03	0.06	
Switch Off Leakage Current ^d	I _{NO(off)} , I _{NC(off)}	V+ = 4.3 V, V _{NO} , V _{NC} = 0.3 V / 4.0 V, V _{COM} = 4.0 V / 0.3 V	Full	–20		20	nA
	I _{COM(off)}		Full	–20		20	
Channel-On Leakage Current ^d	I _{COM(on)}	V+ = 4.3 V, V _{NO} , V _{NC} = V _{COM} = 3.0 V / 4.0 V	Full	–20		20	
Digital Control							
Input High Voltage	V _{IN}		Full	1.6			V
Input Low Voltage	V _{INL}		Full			0.5	
Input Capacitance	C _{in}		Full		–4		pF
Input Current	I _{INL} or I _{INH}	V _{IN} = 0 or V+	Full	–1		1	μA
Dynamic Characteristics							
Break-Before-Make Time	t _{BBM}	V _{NO} or V _{NC} = 1.5 V, R _L = 50 Ω, C _L = 35 pF	Full	5			ns
Power Supply							
Power Supply Range	V+					4.3	V
Power Supply Current	I+	V _{IN} = 0 or V+	Full			1.0	μA

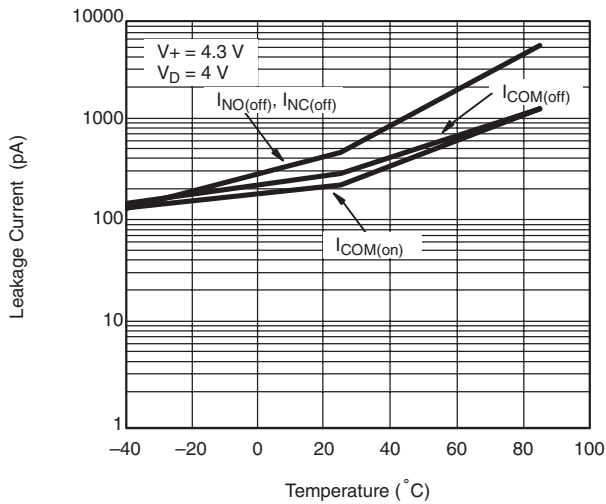
Notes

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

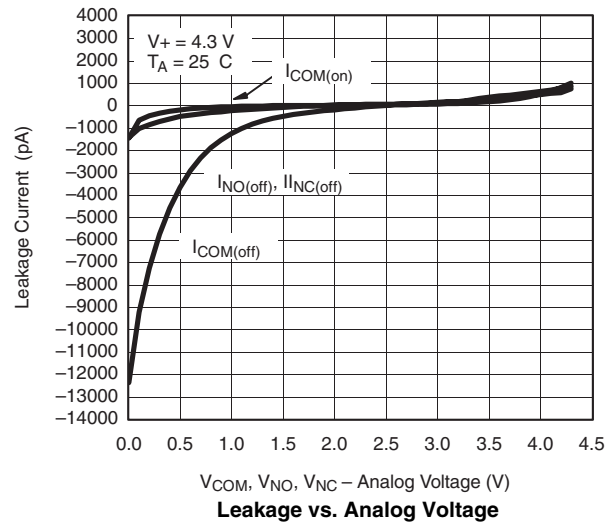
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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


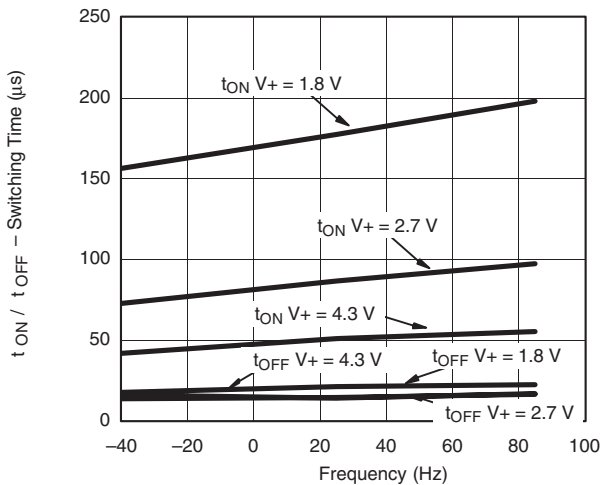
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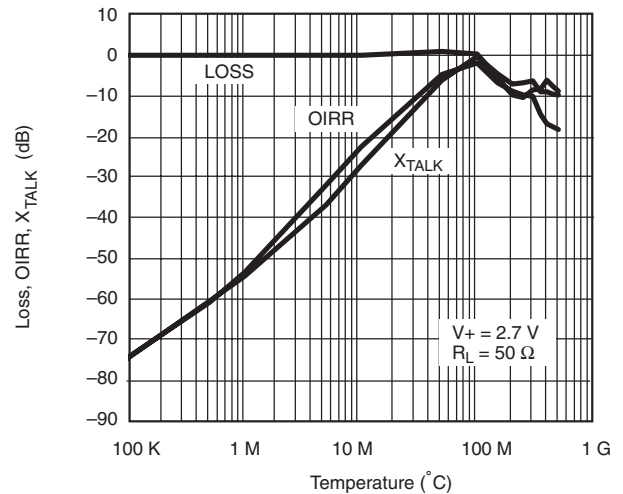
Leakage Current vs. Temperature



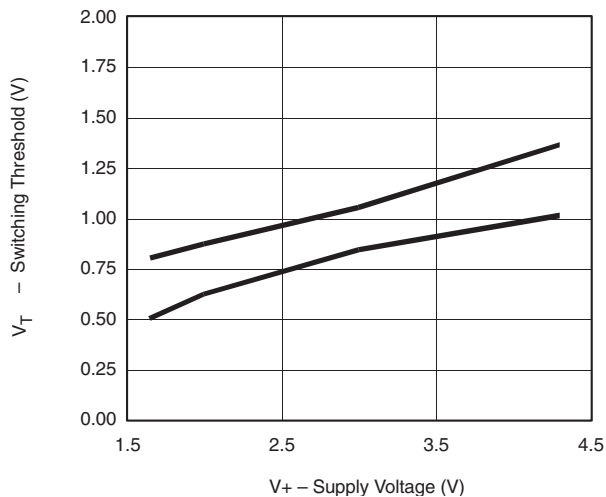
Leakage vs. Analog Voltage



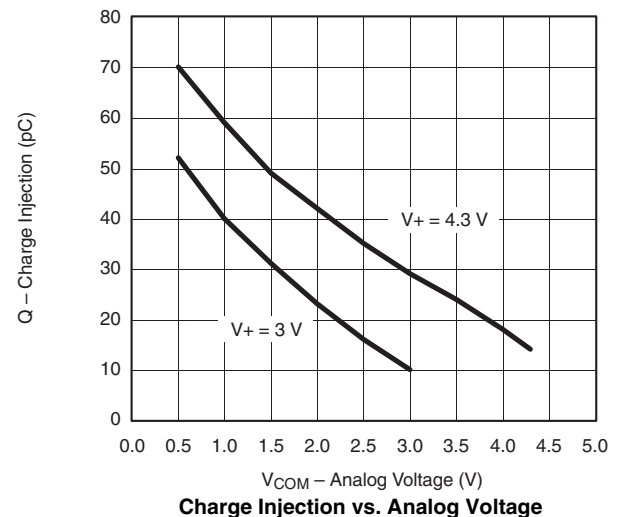
Switching Time vs. Temperature



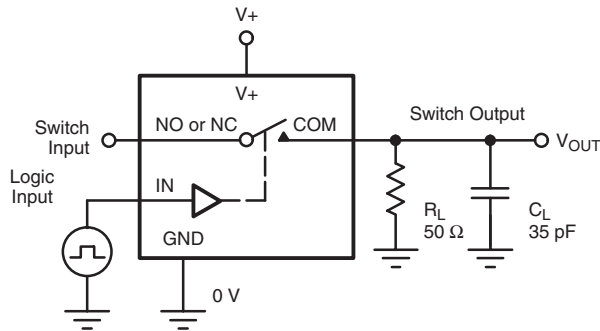
Insertion Loss, Off-Isolation Crosstalk vs. Frequency



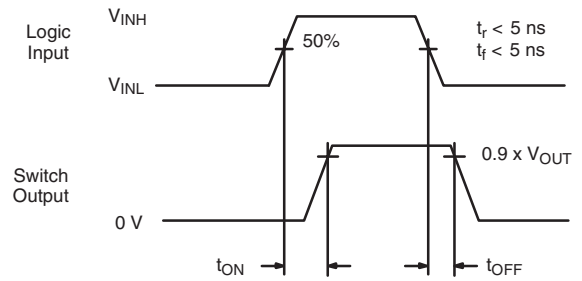
Switching Threshold vs. Supply Voltage



Charge Injection vs. Analog Voltage

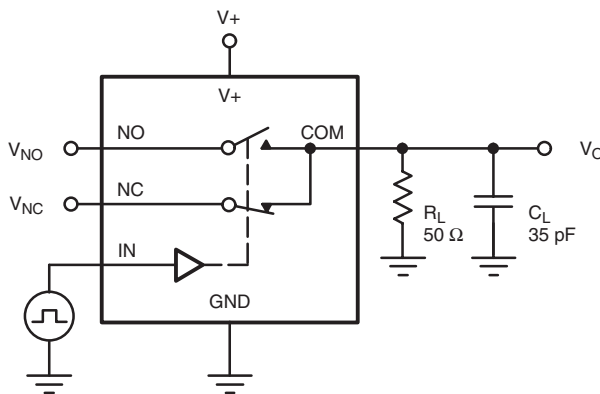
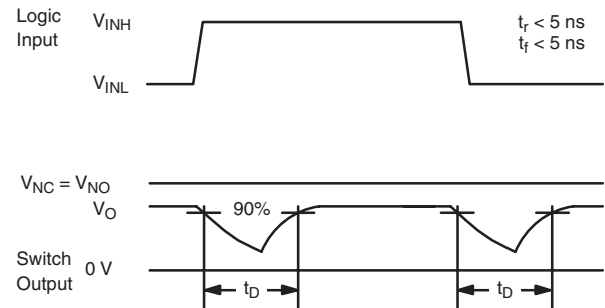
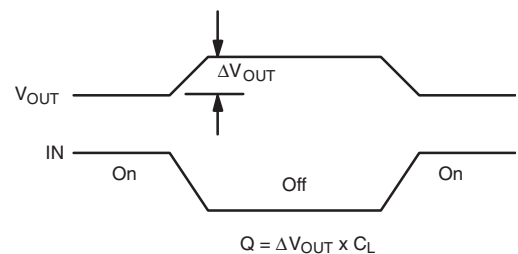
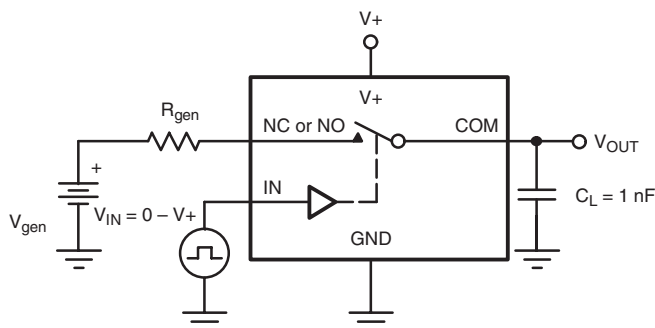
TEST CIRCUITS

 C_L (includes fixture and stray capacitance)

$$V_{OUT} = V_{COM} \left(\frac{R_L}{R_L + R_{ON}} \right)$$



Logic "1" = Switch On

Logic input waveforms inverted for switches that have the opposite logic sense.

Figure 1. Switching Time

 C_L (includes fixture and stray capacitance)

Figure 2. Break-Before-Make Interval


IN depends on switch configuration: input polarity determined by sense of switch.

Figure 3. Charge Injection

TEST CIRCUITS

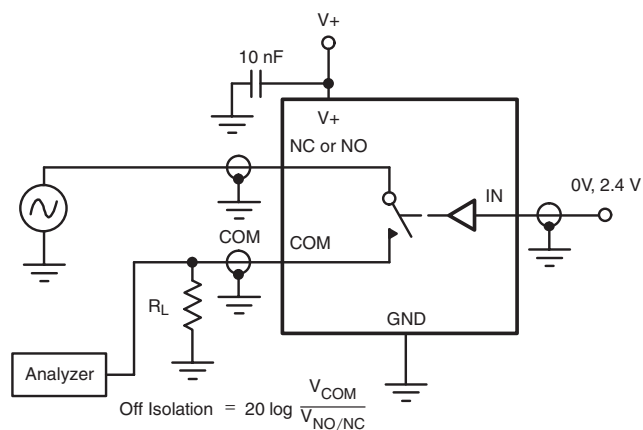


Figure 4. Off-Isolation

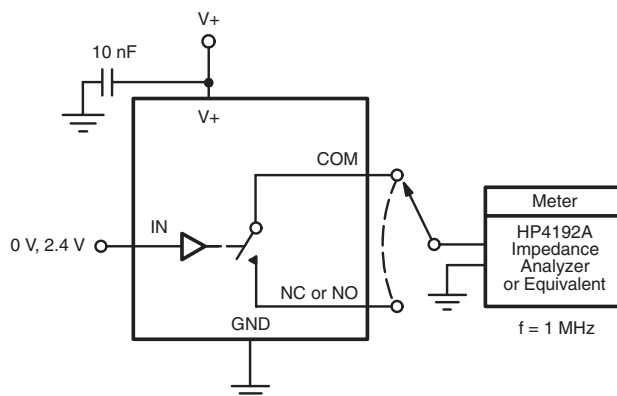


Figure 5. Channel Off/On Capacitance

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