

Absolute Maximum Ratings

Voltages Referenced to GND

V+ -0.3V to +17V

V_{IN}, V_{COM}, V_{NC}, V_{NO} (Note 1) -2V to (V+) +2V
or 30mA, whichever occurs first

Current (any terminal) 30mA

Peak Current, COM, NO, NC

(pulsed at 1ms, 10% duty cycle) 100mA

ESD per Method 3015.7 >2000V

Thermal Information

Continuous Power Dissipation (T_A = +70°C)

Plastic DIP (derate 10.5mW/°C above +70°C) 800mW

SO and QSOP (derate 8.7mW/°C above +70°C) 650mW

Storage Temperature -65°C to +150°C

Lead Temperature (soldering, 10s) +300°C

Note

Signals on NC, NO, COM, or IN exceeding V+ or GND are clamped by internal diodes. Limit forward diode current to 30mA.

Caution: Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied.

Electrical Specifications - Single +12V Supply

(V+ = 12V ±10%, GND = 0V, V_{INH} = 4V, V_{INL} = 0.8V)

Parameter	Symbol	Conditions	Temp. (°C)	Min ⁽¹⁾	Typ ⁽²⁾	Max ⁽¹⁾	Units
Analog Switch							
Analog Signal Range ⁽³⁾	V _{ANALOG}		Full	0		V+	V
On Resistance	R _{ON}	V+ = 12V, I _{COM} = 2mA, V _{NO} = 10V	25		12	45	Ω
			Full			55	
On-Resistance Match Between Channels ⁽⁴⁾	ΔR _{ON}	V+ = 12V, I _{COM} = 2mA V _{NO} = 10V	25		0.5 0.5	4 2	
			Full			6	
On-Resistance Flatness ⁽⁵⁾	R _{FLAT(ON)}	V+ = 12V, I _{COM} = 2mA, V _{NO} = 10V, 5V, 1V	25		2	4	nA
			Full			6	
NO or NC Off Leakage Current ⁽⁶⁾	I _{NO(OFF)} OR I _{NC(OFF)}	V+ = 12V, V _{COM} = 0V, V _{NO} = 10V	25	-1 -0.1		1 0.1	
			Full	-6		6	
COM Off Leakage Current ⁽⁶⁾	I _{COM(OFF)}	V+ = 12V, V _{COM} = 0V, V _{NO} = 10V	25	-1 -0.1		1 0.1	nA
			Full	-6		6	
COM On Leakage Current ⁽⁶⁾	I _{COM(ON)}	V+ = 12V, V _{COM} = 10V, V _{NO} = 10V	25	-2 -0.2		2 0.2	
			Full	-12		12	

Electrical Specifications - Single +12V Supply (continued)
(V+ = 12V ±10%, GND = 0V, V_{INH} = 4V, V_{INL} = 0.8V)

Parameter	Symbol	Conditions	Temp (°C)	Min ⁽¹⁾	Typ ⁽²⁾	Max ⁽¹⁾	Units
Logic Input							
Input Current with Input Voltage High	I _{INH}	IN =5V, all others = 0.8V	Full	-0.5	0.005	0.5	μA
Input Current with Input Voltage Low	I _{INL}	IN = 0.8V, all others =5V		-0.5	0.005	0.5	
Dynamic							
Turn-On Time	t _{ON}	V _{COM} = 10V, Figure 2	25		45	100	ns
			Full			150	
Turn-Off Time	t _{OFF}		25		17	75	
			Full			100	
On-Channel Bandwidth	BW	Signal = 0dbm Figure 4, 50Ω in and out	25		100		MHz
Charge Injection ⁽³⁾	Q	C _L =1nF, V _{GEN} = 0V, R _{GEN} = 0Ω, Figure 3			2	10	pC
Off Isolation	OIRR	R _L = 50Ω, C _L = 5pF, f= 1 MHz, Figure 4			-58		dB
Crosstalk ⁽⁸⁾	X _{TALK}	R _L = 50Ω, C _L = 5pF, f= 1 MHz, Figure 5			-86		
NO Capacitance	C _(OFF)	f=1 MHz, Figure 6			9		pF
COM Off Capacitance		f=1 MHz, Figure 6			9		
COM On Capacitance	C _{COM(ON)}	f=1MHz, Figure 7			22		
Supply							
Positive Supply Current	I+	V _{IN} = 0V or V+, all channels on or off	Full	-1	0.001	1	μA
Total Harmonic Distortion	THD				0.03		%

Notes:

1. The algebraic convention, where the most negative value is a minimum and the most positive is a maximum, is used in this data sheet.
2. Typical values are for DESIGN AID ONLY, not guaranteed or subject to production testing.
3. Guaranteed by design
4. ΔR_{ON} = ΔR_{ON} max - ΔR_{ON} min
5. Flatness is defined as the difference between the maximum and minimum value of on-resistance measured.
6. Leakage parameters are 100% tested at maximum rated hot temperature and guaranteed by correlation at +25°C.
7. Off Isolation = 20log₁₀ [V_{COM} / (V_{NO} or V_{NO})], V_{COM} = output, V_{NC} / V_{NO} = input to off switch
8. Between any two switches.

Electrical Specifications - Single +5V Supply

(V+ = +5V ±10%, GND = 0V, V_{INH} = 2.4V, V_{INL} = 0.8V)

Parameter	Symbol	Conditions	Temp (°C)	Min ⁽¹⁾	Typ ⁽²⁾	Max ⁽¹⁾	Units
Analog Switch							
Analog Signal Range ⁽³⁾	V _{ANALOG}		Full	0		V+	V
On-Resistance	R _{ON}	V+ = 4.5V, I _{COM} = -1mA, V _{NO} = 3.5V	25		22	75	Ω
			Full			100	
On-Resistance Match Between Channels ⁽⁴⁾	ΔR _{ON}	V+ = 5V, I _{COM} = -1mA, V _{NO} = 3V	25		0.3	4	
			Full			12	
On-Resistance Flatness ^(3,5)	R _{FLAT(ON)}	V+ = 5V, I _{COM} = -1mA, V _{NO} = 1V, 3V	25		4	6	
			Full			8	
NO Off Leakage Current ⁽⁹⁾	I _{NO(OFF)}	V+ = 5.5V, V _{COM} = 0V, V _{NO} = 4.5V	PS4066 PS4066A	25	-1 -0.1	1 0.1	nA
				Full	-6		
COM Off Leakage Current ⁽⁹⁾	I _{COM(OFF)}	V+ = 5.5V, V _{COM} = 0V, V _{NO} = 4.5V	PS4066 PS4066A	25	-1 -0.1	1 0.1	
				Full	-6		
COM On Leakage Current ⁽⁶⁾	I _{COM(ON)}	V+ = 5.5V, V _{COM} = 5V V _{NO} = 4.5V	PS4066 PS4066A	25	-2 -0.2	2 0.2	
				Full	-12		
Dynamic							
Turn-On Time	t _{ON}	V _{NO} = 3V	25		65	125	ns
			Full			175	
Turn-Off Time	t _{OFF}		25		30	75	
			Full			125	
On-Channel Bandwidth	BW	Signal = 0dBm, 50Ω in and out Figure 4	25		100		MHz
Charge Injection ⁽³⁾	Q	C _L = 1nF, V _{GEN} = 0V, R _{GEN} = 0V, Figure 3	25		1	10	pC
Supply							
Positive Supply Current	I+	V+ = 5.5V, V _{IN} = 0V or V+, all channels on or off	Full	-1		1	μA

Electrical Specifications - Single +3V Supply

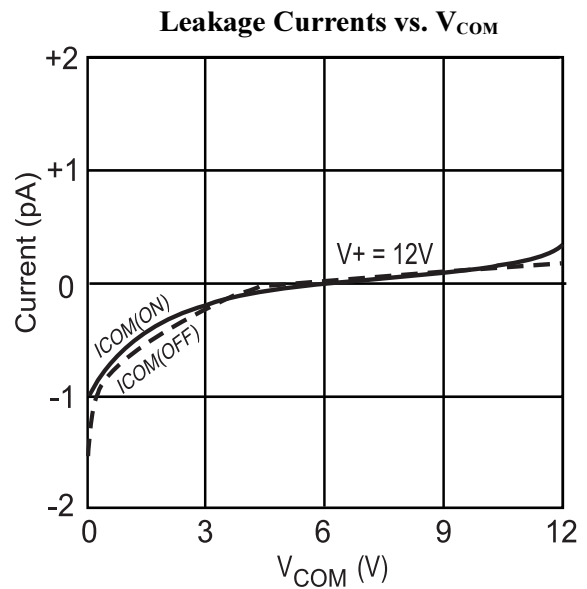
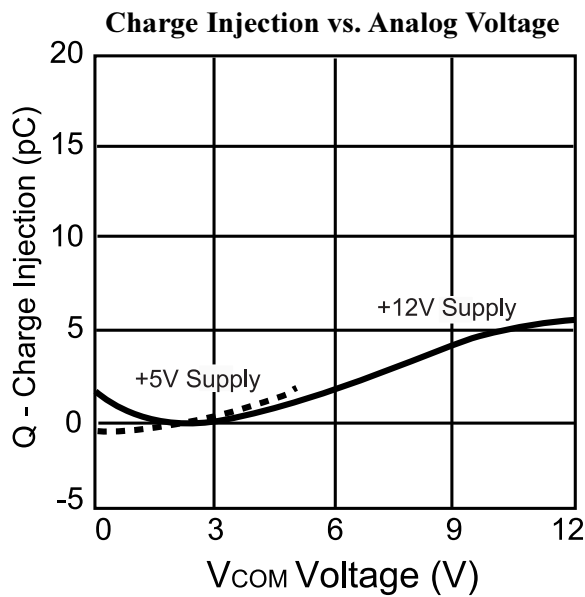
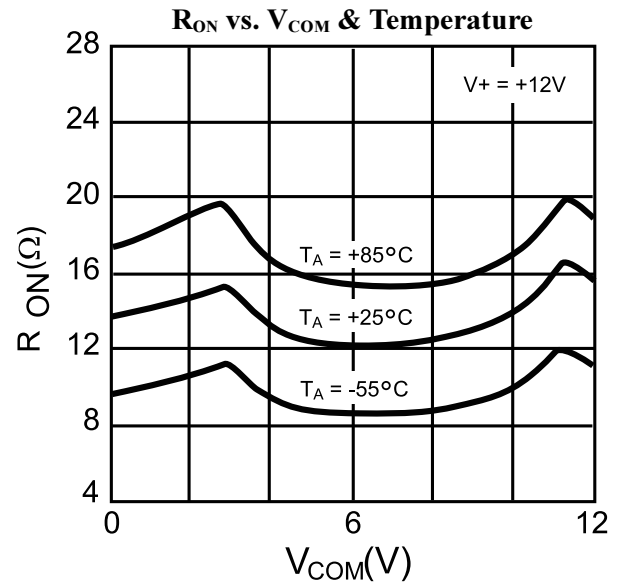
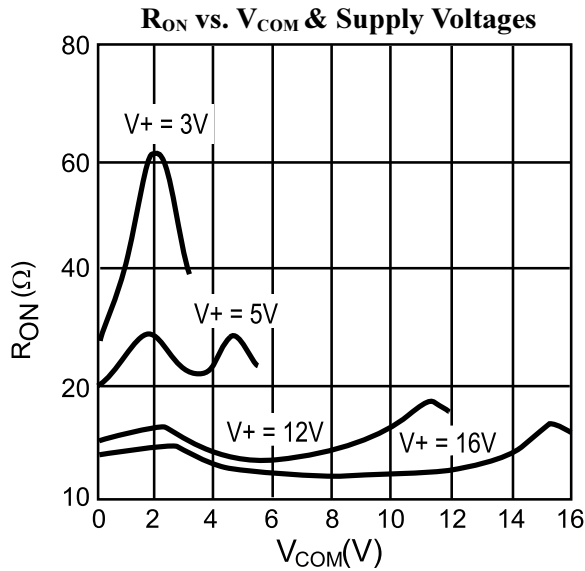
(V+ = +2.7V to 3.3V, GND = 0V, V_{INH} = 2.4V, V_{INL} = 0.8V)

Parameter	Symbol	Conditions	Temp°C	Min. ⁽¹⁾	Typ ⁽²⁾	Max. ⁽¹⁾	Units
Analog Switch							
Analog Signal Range ⁽³⁾	V _{ANALOG}			0		V+	V
Channel On-Resistance	R _{ON}	V+ = 3V, I _{COM} = -1mA, V _{NO} = 1.5V	25			170	Ω
			Full			225	
Dynamic							
Turn-On-Time ⁽³⁾	t _{ON}	V+ =3V, V _{NO} = 1.5V	25		80	185	ns
			Full			230	
Turn-Off-Time ⁽³⁾	t _(OFF)	V+ =3V, V _{NO} = 1.5V	25		40	150	
			Full			200	
Charge Injection ⁽³⁾	Q	C _L = 1nF, V _{GEN} = 0V, R _{GEN} = 0V	25		2	10	pC
Supply							
Positive Supply Current	I+	V+ = 3.3V, V _{IN} = 0V or V+, all channels on or off	Full	-1	0.001	1	μA

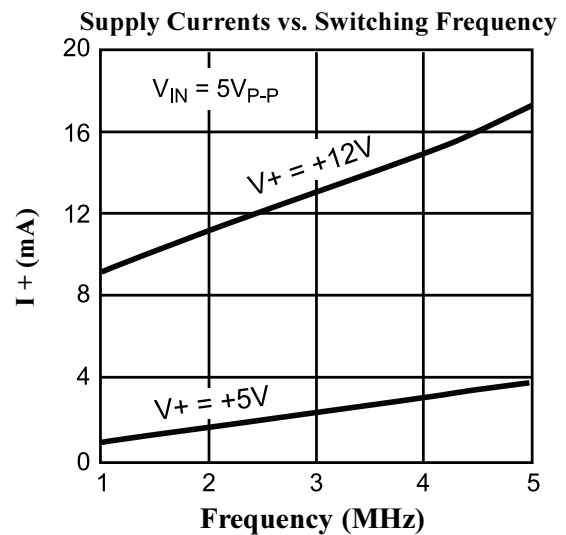
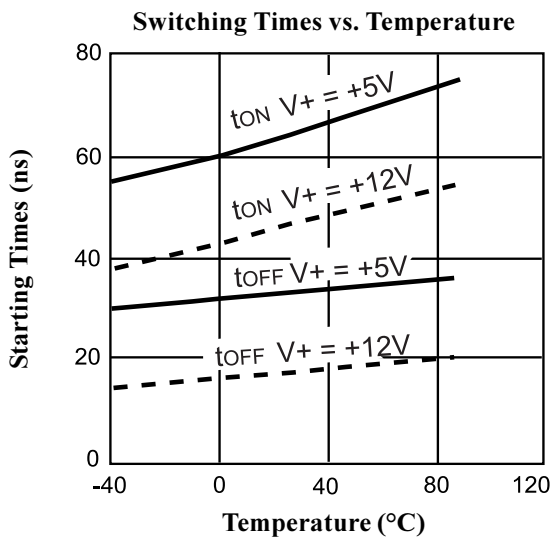
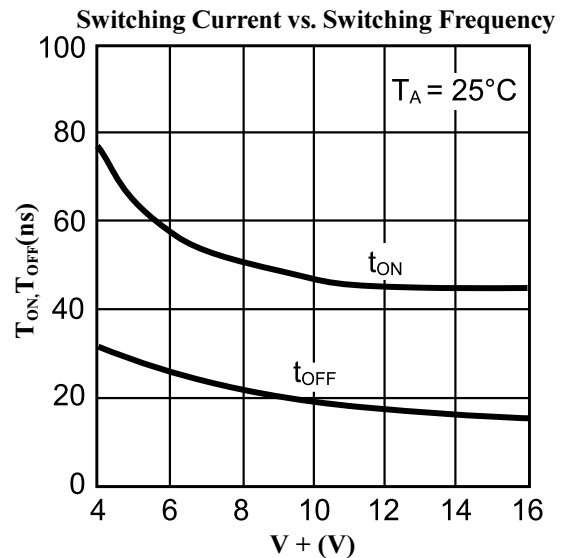
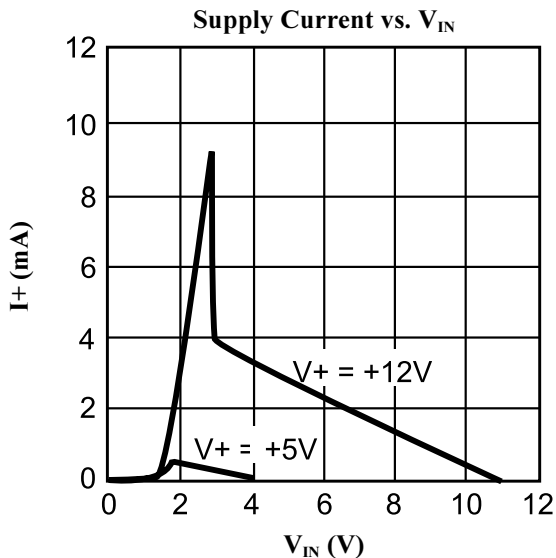
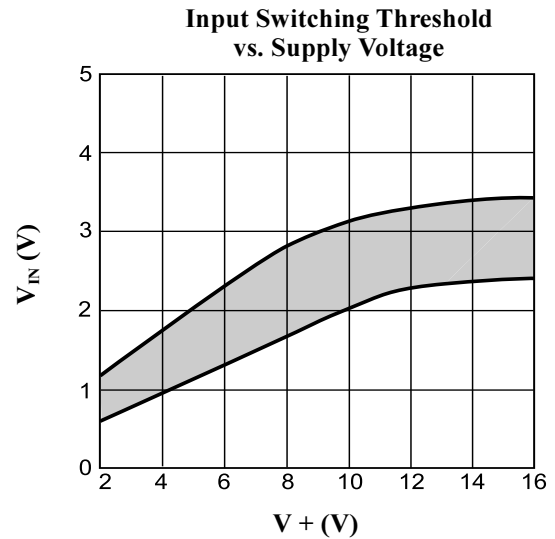
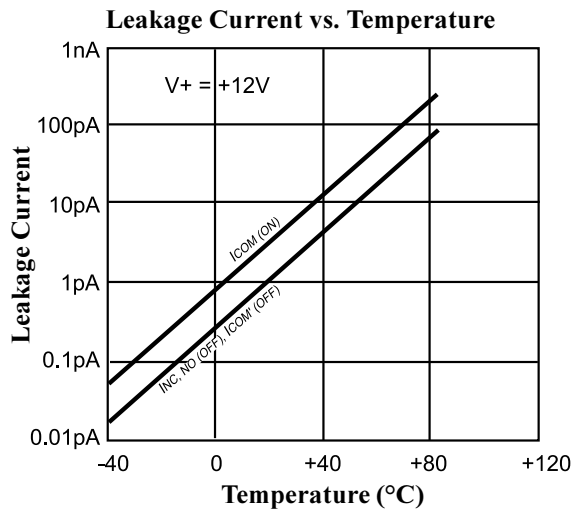
Notes:

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2. Typical values are for DESIGN AID ONLY, not guaranteed or subject to production testing.
3. Guaranteed by design
4. $\Delta R_{ON} = \Delta R_{ON \text{ max}} - \Delta R_{ON \text{ min}}$
5. Flatness is defined as the difference between the maximum and minimum value of on-resistance measured.
6. Leakage parameters are 100% tested at maximum rated hot temperature and guaranteed by correlation at +25°C.
7. Off Isolation = $20\log_{10} [V_{COM} / (V_{NO} \text{ or } V_{NO})]$, V_{COM} = Output, V_{NC}/V_{NO} = input to off switch
8. Between any two switches.

Typical Operating Characteristics (TA = +25°C, unless otherwise noted)



Typical Operating Characteristics (TA = +25°C, unless otherwise noted)



Pin Description

Applications Information

Overvoltage Protection

Proper power-supply sequencing is recommended for all CMOS devices. Do not exceed the absolute maximum ratings, because stresses beyond the listed ratings may cause permanent damage to the devices. Always sequence V₊ on first, and then the logic inputs. If power-supply sequencing is not possible, add a small signal diode or current limiting resistor in series with the supply pin for overvoltage protection (Figure 1). Adding a diode reduces the analog signal range, but low switch resistance and low leakage characteristics are unaffected.

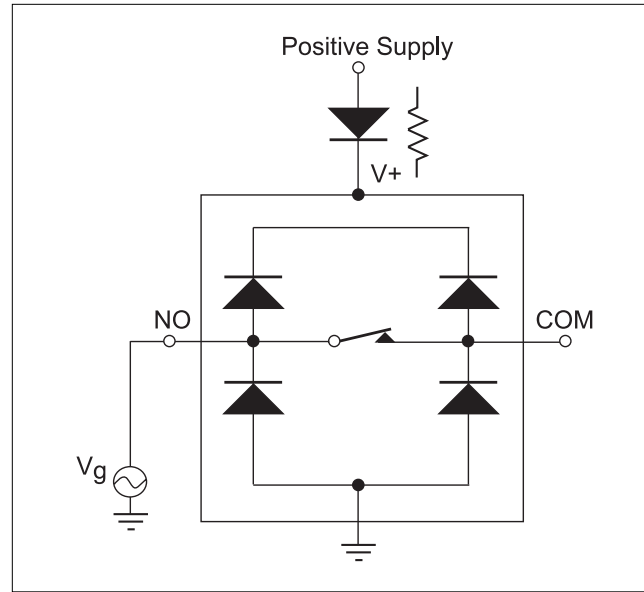


Figure 1. Overvoltage protection is accomplished using an external blocking diode or a current limiting resistor .

Test Circuits/Timing Diagrams

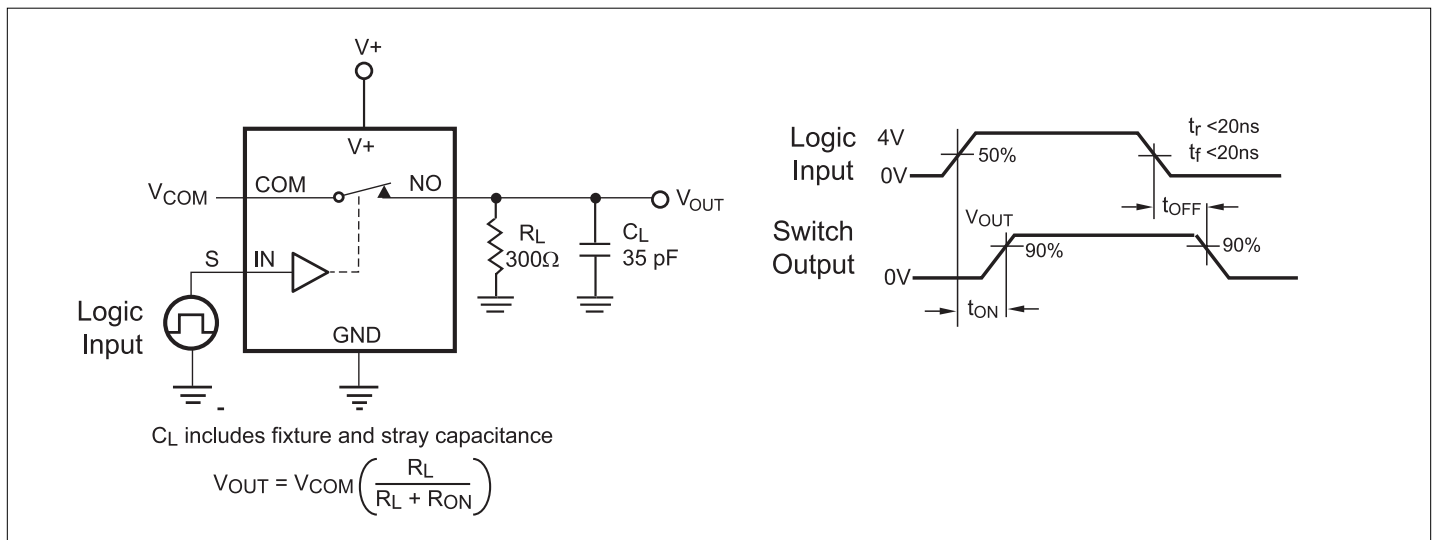


Figure 2. Switching Times

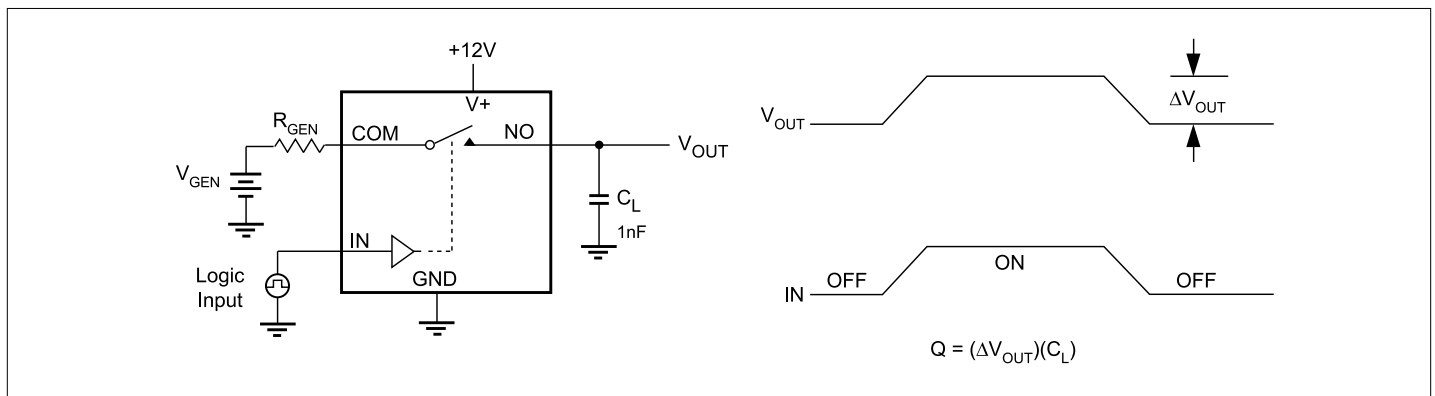


Figure 3. Charge Injection

Test Circuits/Timing Diagrams (continued)

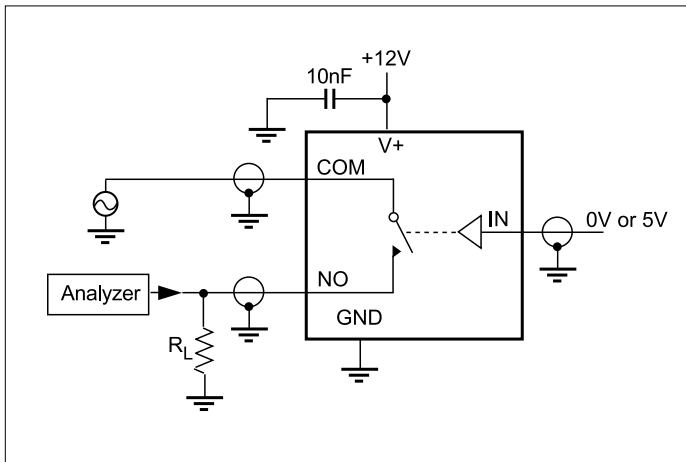


Figure 4. Off Isolation, BW

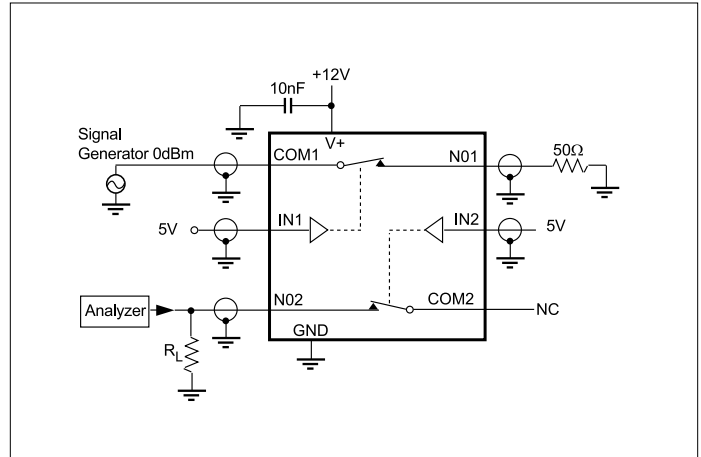


Figure 5. Crosstalk

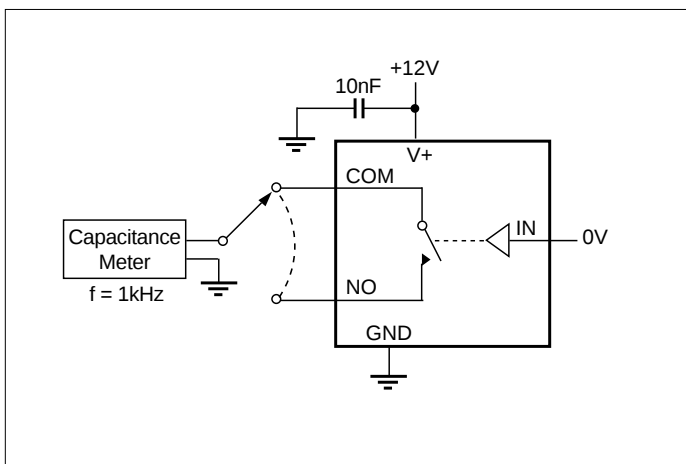


Figure 6. Channel-Off Capacitance

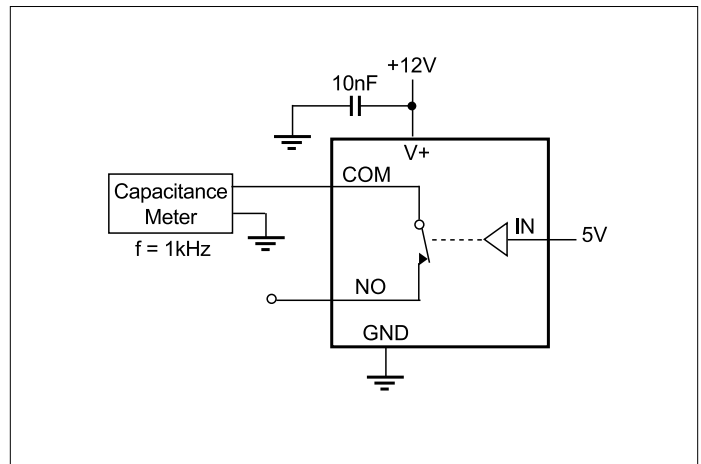


Figure 7. Channel-On Capacitance

Ordering Information

Part Number	Temperature - Range	Package
PS4066CPD	0°C to + 70°C	14 Plastic DIP
PS4066CSD	0°C to + 70°C	14 Narrow SO
PS4066CEE	0°C to + 70°C	16 QSOP
PS4066EPD	-40°C to + 85°C	14 Plastic DIP
PS4066ESD	-40°C to + 85°C	14 Narrow SO
PS4066ACPD	0°C to + 70°C	14 Plastic DIP
PS4066ACSD	0°C to + 70°C	14 Narrow SO
PS4066ACEE	0°C to + 70°C	16 QSOP
PS4066AEPD	-40°C to + 85°C	14 Plastic DIP
PS4066AESD	-40°C to + 85°C	14 Narrow SO
PS4066AEEE	-40°C to + 85°C	16 QSOP

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