

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted)				
PARAMETER	SYMBOL	LIMIT	UNIT	
Reference to GND	V+	-0.3 to 5	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)		± 300		
Peak Current (Pulsed at 1 ms, 10 % duty cycle)		± 500		
Storage Temperature (D suffix)		-65 to 150	°C	
Package Solder Reflow Conditions ^d	miniQFN-16	250		
Power Dissipation (Packages) ^b	miniQFN-16 ^c	525	mW	

Notes

- a. Signals on NC, NO, or COM, or IN exceeding 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 6.6 mW/°C above 70 °C.
- d. Manual soldering with iron is not recommended for leadless components. The miniQFN-16 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.

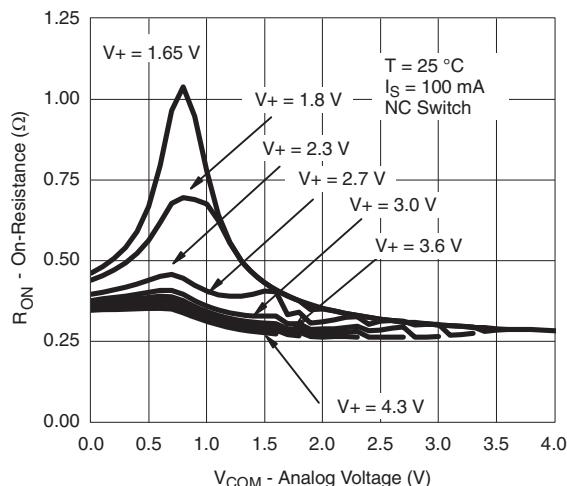
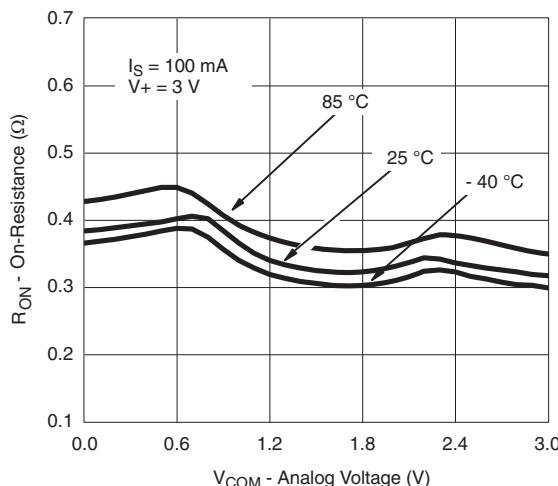
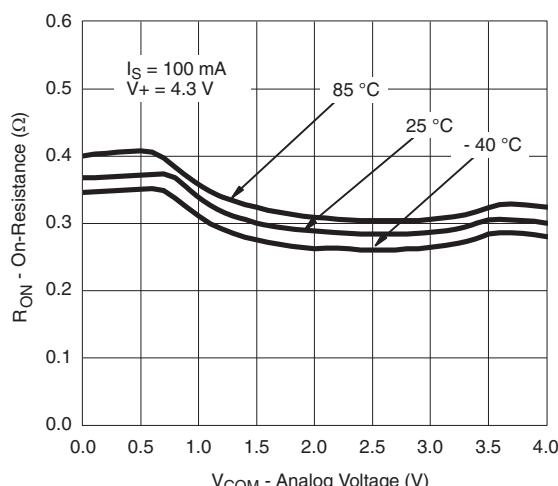
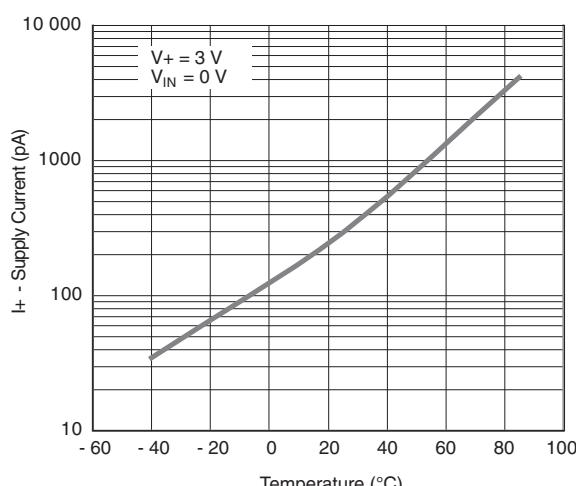
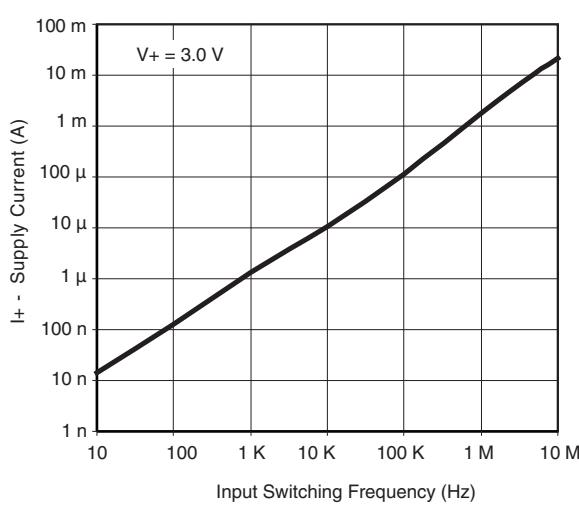
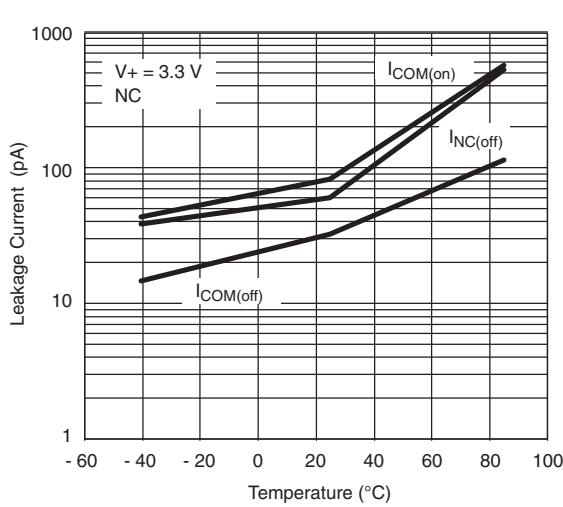
SPECIFICATIONS (V ₊ = 3 V)		TEST CONDITIONS UNLESS OTHERWISE SPECIFIED V ₊ = 3 V, ± 10 %, V _{IN} = 0.5 or 1.4 V ^e	TEMP.^a	LIMITS -40 °C to 85 °C			UNIT	
PARAMETER	SYMBOL			MIN.^b	TYP.^c	MAX.^b		
Analog Switch								
Analog Signal Range ^d	V _{NO} , V _{NC} , V _{COM}		Full	0	-	V ₊	V	
On-Resistance	R _{ON}	V ₊ = 2.7 V, V _{COM} = 0.5 V, I _{NO} , I _{NC} = 100 mA	Room	-	0.4	0.5	Ω	
		V ₊ = 2.7 V, V _{COM} = 1.5 V, I _{NO} , I _{NC} = 100 mA		-	0.33			
			Full	-	-	0.56		
R _{ON} Flatness ^d	R _{ON} Flatness	V ₊ = 2.7 V, V _{COM} = 0 to V ₊ , I _{NO} , I _{NC} = 100 mA	Room	-	0.1	0.15	nA	
R _{ON} Match ^d	ΔR _{ON}		Room	-	0.05	-		
Switch Off Leakage Current	I _{NO(off)} , I _{NC(off)}	V ₊ = 3.3 V, V _{NO} , V _{NC} = 0.3 V/3 V, V _{COM} = 3 V/0.3 V	Room	-1	-	1	nA	
	I _{COM(off)}		Full	-10	-	10		
			Room	-1	-	1		
			Full	-10	-	10		
Channel-On Leakage Current	I _{COM(on)}	V ₊ = 3.3 V, V _{NO} , V _{NC} = V _{COM} = 0.3 V/3 V	Room	-1	-	1	nA	
			Full	-10	-	10		
Digital Control								
Input High Voltage	V _{INH}		Full	1.4	-	-	V	
Input Low Voltage	V _{INL}		Full	-	-	0.5		
Input Capacitance	C _{IN}		Full	-	6	-	pF	
Input Current	I _{INL} or I _{INH}	V _{IN} = 0 or V ₊	Full	-1	-	1	μA	
Dynamic Characteristics								
Turn-On Time	t _{ON}	V _{NO} or V _{NC} = 1.5 V, R _L = 50 Ω, C _L = 35 pF	Room	-	47	72	ns	
			Full	-	-	75		
Turn-Off Time	t _{OFF}		Room	-	15	43		
			Full	-	-	45		
Break-Before-Make Time	t _d		Full	1	-	-	pC	
Charge Injection ^d	Q _{INJ}	C _L = 1 nF, V _{GEN} = 0 V, R _{GEN} = 0 Ω	Room	-	87	-		
Off-Isolation ^d	OIRR	R _L = 50 Ω, C _L = 5 pF, f = 100 kHz	Room	-	-69	-	dB	
		R _L = 50 Ω, C _L = 5 pF, f = 1 MHz		-	-49	-		
Crosstalk ^{d, f}	X _{TALK}	R _L = 50 Ω, C _L = 5 pF, f = 100 kHz	Room	-	-106	-		
		R _L = 50 Ω, C _L = 5 pF, f = 1 MHz		-	-96	-		
NO, NC Off Capacitance ^d	C _{NO(off)}	f = 1 MHz	Room	-	81	-	pF	
	C _{NC(off)}		Room	-	81	-		
Channel-On Capacitance ^d	C _{NO(on)}		Room	-	186	-		
	C _{NC(on)}		Room	-	186	-		
Power Supply								
Power Supply Range	V ₊			1.65	-	4.3	V	
Power Supply Current	I ₊	V _{IN} = 0 or V ₊	Full	-	-	1	μA	

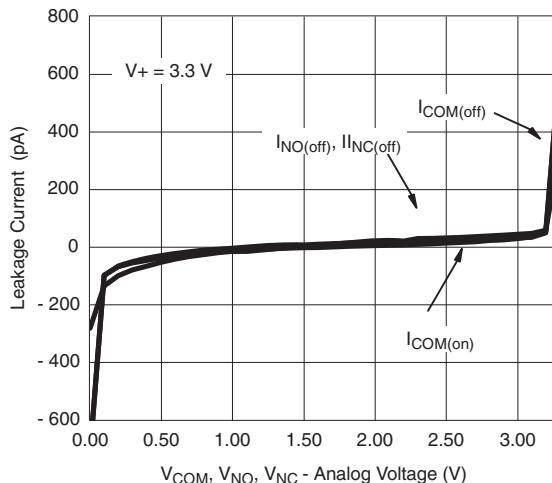
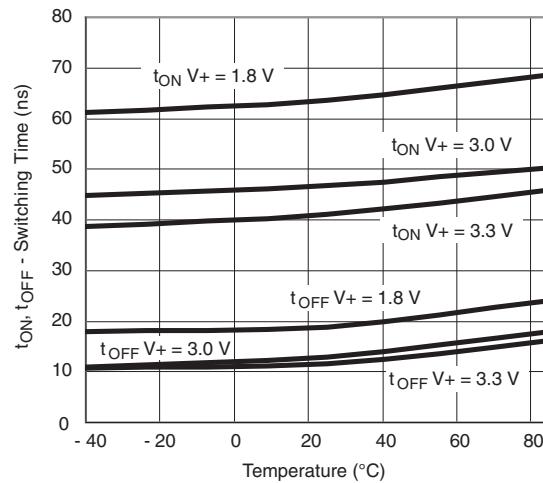
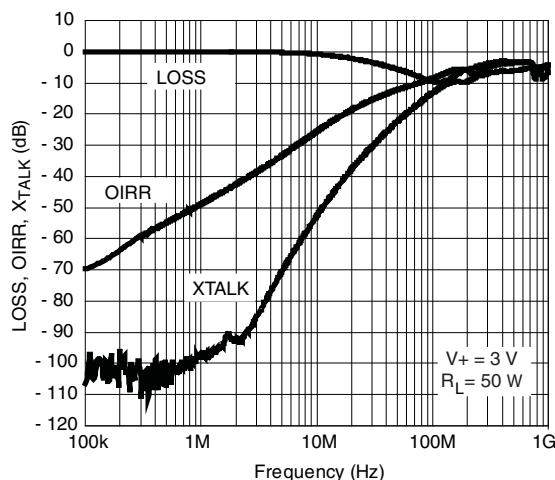
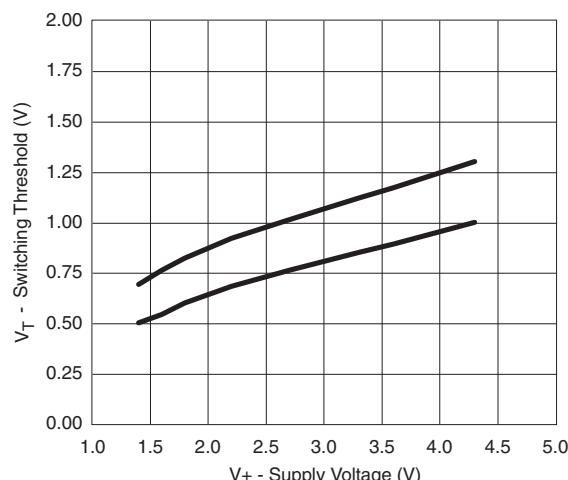
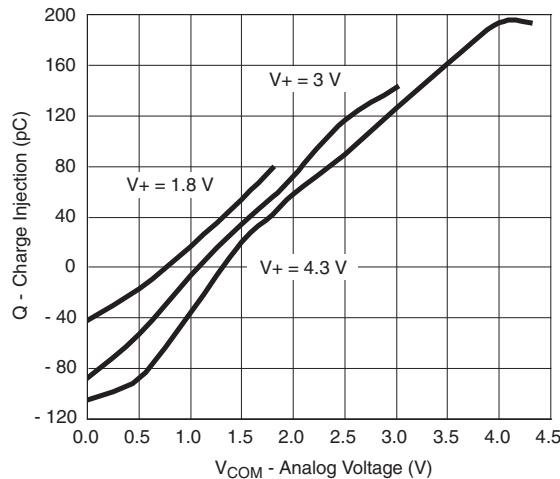
SPECIFICATIONS ($V_+ = 3$ V)								
PARAMETER	SYMBOL	TEST CONDITIONS UNLESS OTHERWISE SPECIFIED $V_+ = 3$ V, $\pm 10\%$, $V_{IN} = 0.5$ or 1.4 V ^e	TEMP.^a	LIMITS -40 °C to 85 °C			UNIT	
				MIN.^b	TYP.^c	MAX.^b		
Analog Switch								
Analog Signal Range ^d	V_{NO} , V_{NC} , V_{COM}		Full	0	-	V_+	V	
On-Resistance	R_{ON}	$V_+ = 4.3$ V, $V_{COM} = 0.9$ V, I_{NO} , $I_{NC} = 100$ mA	Room	-	0.32	0.45	Ω	
		$V_+ = 4.3$ V, $V_{COM} = 2.5$ V, I_{NO} , $I_{NC} = 100$ mA		-	0.27			
			Full	-	-	0.5		
R_{ON} Flatness ^d	R_{ON} Flatness	$V_+ = 4.3$ V, $V_{COM} = 0$ to V_+ , I_{NO} , $I_{NC} = 100$ mA	Room	-	0.1	0.15		
R_{ON} Match ^d	ΔR_{ON}		Room	-	0.03	-		
Switch-Off Leakage Current ^d	$I_{NO(off)}$, $I_{NC(off)}$	$V_+ = 4.3$ V, V_{NO} , $V_{NC} = 0.3$ V/4 V, $V_{COM} = 4$ V/0.3 V	Room	-10	-	10	nA	
			Full	-100	-	100		
	$I_{COM(off)}$		Room	-10	-	10		
			Full	-100	-	100		
Channel-On Leakage Current ^d	$I_{COM(on)}$	$V_+ = 4.3$ V, V_{NO} , $V_{NC} = V_{COM} = 3$ V/4 V	Room	-10	-	10		
			Full	-100	-	100		
Digital Control								
Input High Voltage	V_{INH}		Full	1.6	-	-	V	
Input Low Voltage	V_{INL}		Full	-	-	0.5		
Input Capacitance	C_{IN}		Full	-	6	-		
Input Current	I_{INL} or I_{INH}	$V_{IN} = 0$ or V_+	Full	-1	-	1	μ A	
Dynamic Characteristics								
Charge Injection ^d	Q_{INJ}	$C_L = 1$ nF, $V_{GEN} = 0$ V, $R_{GEN} = 0$ Ω	Room	-	105	-	pC	
N _O , N _C Off Capacitance ^d	$C_{NO(off)}$	$f = 1$ MHz	Room	-	79	-	pF	
	$C_{NC(off)}$		Room	-	79	-		
Channel-On Capacitance ^d	$C_{NO(on)}$		Room	-	183	-		
	$C_{NC(on)}$		Room	-	183	-		
Power Supply								
Power Supply Range	V_+			1.65	-	4.3	V	
Power Supply Current	I_+	$V_{IN} = 0$ or V_+	Full	-	-	1	μ A	

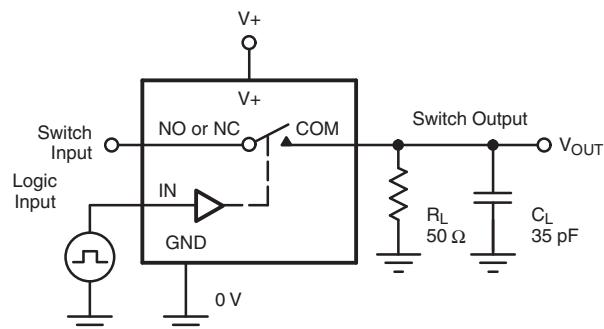
Notes

- Room = 25 °C, Full = as determined by the operating 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.
- Guarantee by design, not subjected to production test.
- V_{IN} = input voltage to perform proper function.
- Crosstalk measured between channels.

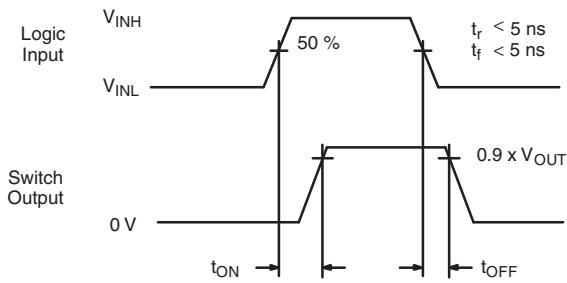
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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

 R_{ON} vs. V_{COM} and Supply Voltage

 R_{ON} vs. Analog Voltage and Temperature

 R_{ON} vs. Analog Voltage and Temperature

Supply Current vs. Temperature

Supply Current vs. Input Switching Frequency

Leakage Current vs. Temperature

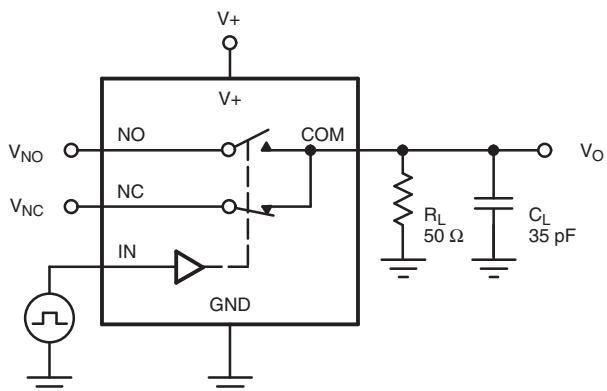
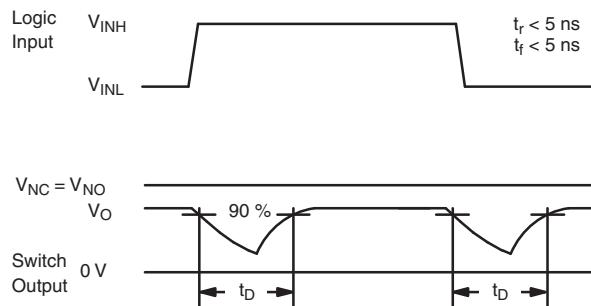
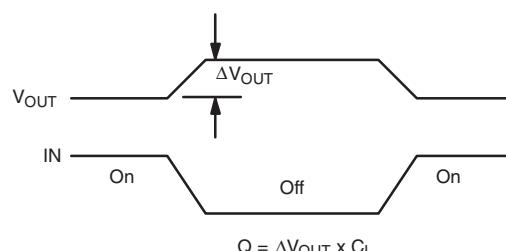
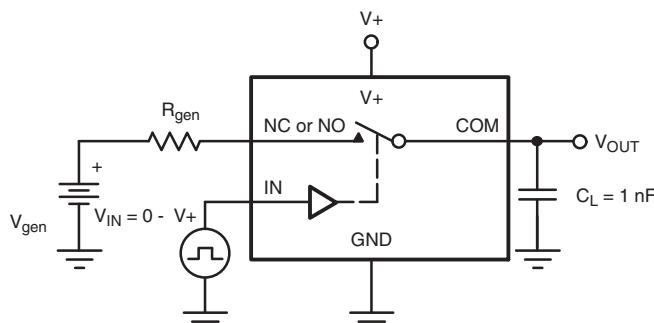
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

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)

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

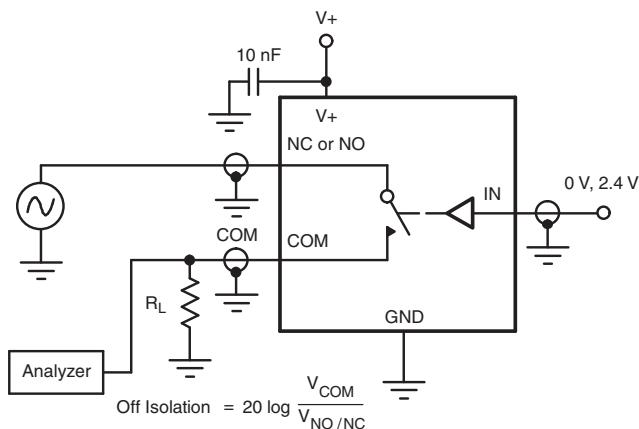
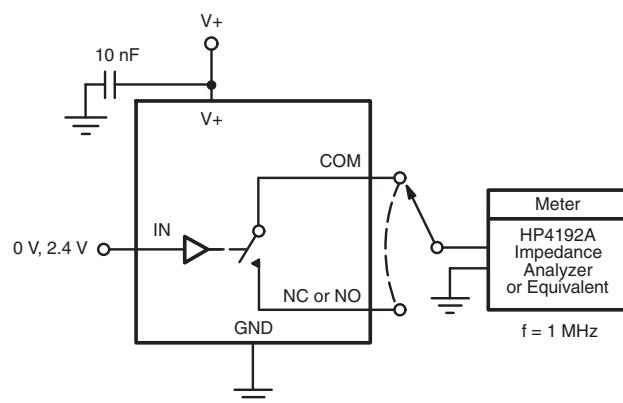


Logic "1" = Switch On
 Logic input waveforms inverted for switches that have the opposite logic sense.

Fig. 1 - Switching Time

 C_L (includes fixture and stray capacitance)

Fig. 2 - Break-Before-Make Interval


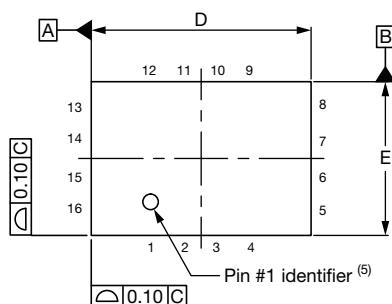
IN depends on switch configuration: input polarity determined by sense of switch.

Fig. 3 - Charge Injection

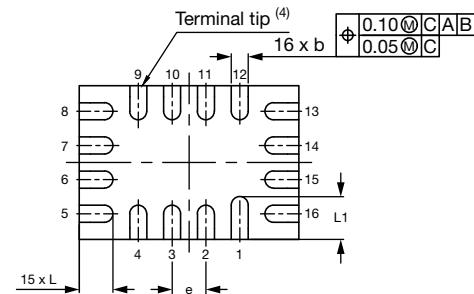
TEST CIRCUITS

Fig. 4 - Off-Isolation

Fig. 5 - Channel Off/On Capacitance

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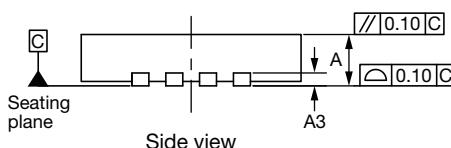
Thin miniQFN16 Case Outline



Top view



Bottom view



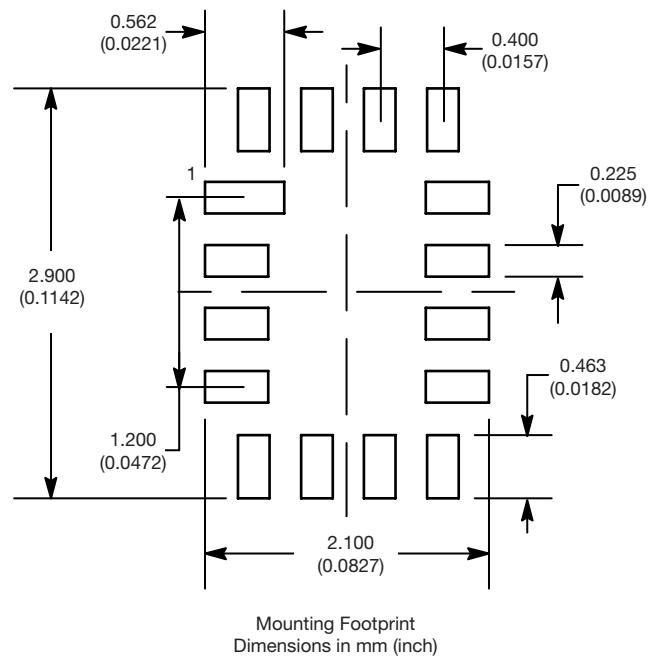
Side view

DIMENSIONS	MILLIMETERS (1)			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.50	0.55	0.60	0.020	0.022	0.024
A1	0	-	0.05	0	-	0.002
A3	0.15 ref.			0.006 ref.		
b	0.15	0.20	0.25	0.006	0.008	0.010
D	2.50	2.60	2.70	0.098	0.102	0.106
e	0.40 BSC			0.016 BSC		
E	1.70	1.80	1.90	0.067	0.071	0.075
L	0.35	0.40	0.45	0.014	0.016	0.018
L1	0.45	0.50	0.55	0.018	0.020	0.022
N ⁽³⁾	16			16		
Nd ⁽³⁾	4			4		
Ne ⁽³⁾	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.

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DWG: 6023

RECOMMENDED MINIMUM PADS FOR MINI QFN 16L

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