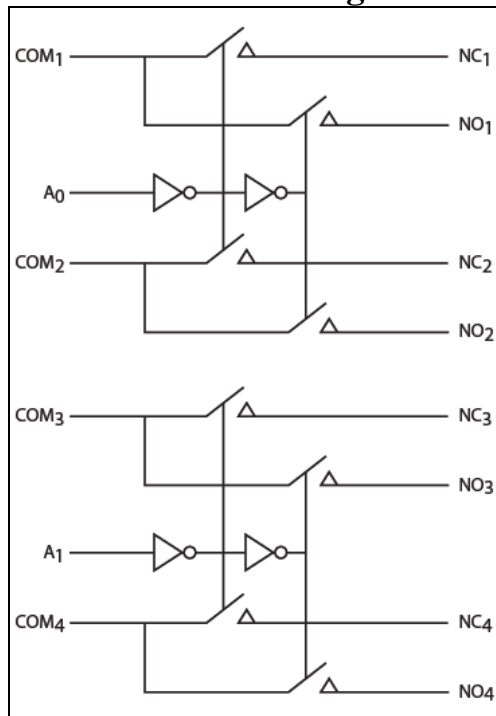


High Speed, Dual DPDT Analog Switch

Features

- CMOS Technology for Analog Applications
- Low On-Resistance: 2.0Ω
- Wide VCC Range: +1.65V to +4.3V
- ICC Maximum 1μA @ TA = +25 °C
- Rail-to-Rail Switching Throughout Signal Range
- Fast Switching Speed: 10ns TYP. at 3.0V
- High Off Isolation: -67dB@1MHz
- Crosstalk Rejection: -100dB@1MHz
- Wide Bandwidth: 330MHz
- Interfaces with 1.8V Chipset
- High ESD performance : 8kV for I/O to GND
- Extended Industrial Temperature Range: -40 °C to 85 °C
- Packaging (Pb-free & Green): UQFN16
1.8mmx2.6mm

Functional Block Diagram



Function Truth Table

| A ₀ | Function | A ₁ | Function |
|----------------|---|----------------|---|
| 0 | NC _{1,2} Connected to COM _{1,2} | 0 | NC _{3,4} Connected to COM _{3,4} |
| 1 | NO _{1,2} Connected to COM _{1,2} | 1 | NO _{3,4} Connected to COM _{3,4} |

Description

The PI3A3899 is a dual double-pole double-throw (DPDT) CMOS switch. It can be used as low power audio and dual SIM card applications. Specified over a

wide operating power supply voltage range, +1.65V to +4.3V, the switch has a low On-Resistance of 2.4Ω at 3.0V.

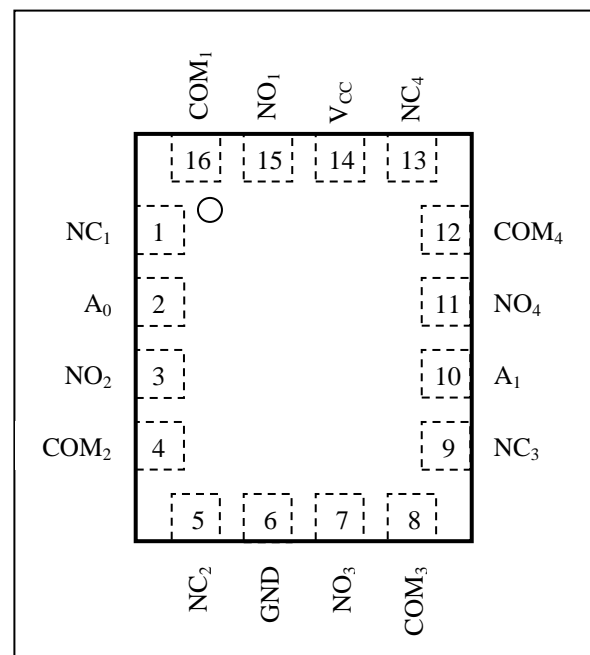
Control inputs, A_x, tolerate input drive signals up to 5V, independent of supply voltage.

Applications

- Cell Phones
- PDAs
- Portable Instrumentation Battery Powered
- Computer Peripherals
- Dual SIM Card Switching

Pin Assignment

UQFN16 1.8mmx2.6mm Package (Top View)



Pin Description

| Pin No | Name | Description |
|--------------|---------------------------------|------------------------------|
| 4, 8, 12, 16 | COM _x | Common Output / Data Port |
| 1, 5, 9, 13 | NC _x | Data Port (normally connect) |
| 3, 7, 11, 15 | NO _x | Data Port (normally open) |
| 2, 10 | A ₀ , A ₁ | Logic Input Control |
| 6 | GND | Ground |
| 14 | VCC | Positive Power Supply |

Notes: X = 1, 2, 3, or 4

Maximum Ratings

| | |
|---|--|
| Storage Temperature | -65°C to +150°C |
| Ambient Temperature | -40°C to +85°C |
| ESD(HBM) | 4kV for All Pins 8kV for I/O to GND |
| Supply Voltage V_{CC} | -0.5V to +4.6V |
| Control Input Voltage (V_{INX}) | 0 to +5.0V |
| DC Input Voltage (V_{INPUT}) | -0.5V to +4.6V |
| Continuous Current NO/NC/COM | ±400mA |
| Peak Current NO/NC/COM (Pulse at 1ms 10% duty cycle)..... | ±500mA |

Note:

Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Recommended Operating Conditions

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------|--------------------------|---|------|------|----------|------|
| V_{CC} | Supply Voltage | - | 1.65 | - | 4.3 | V |
| V_{INX} | Control Input Voltage | - | 0 | - | 4.3 | V |
| V_{INPUT} | Switch Input Voltage | - | -0.3 | - | V_{CC} | V |
| T_A | Operating Temperature | - | -40 | 25 | 85 | °C |
| t_r, t_f | Input Rise and Fall Time | Control Input pins $V_{CC} = 2.3V$ to $3.6V$ | 0 | - | 10 | ns/V |

Note: Control input must be held HIGH or LOW; it must not float.

DC Electrical Characteristics

($V_{CC} = 1.65$ to $4.3V$, $GND=0V$, $V_{IH}=+1.6V$, $V_{IL}=+0.4V$, $T_A = -40$ °C to 85 °C, unless otherwise noted. Typical values are at $3V$ and $+25$ °C.)

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Units | |
|---|---------------------------------------|--|-------------------|------|----------|---------|----------|
| Analog Signal Range | V_{NO}, V_{NC}, V_{COM} | - | 0 | - | V_{CC} | V | |
| On-Resistance | R_{ON} | $I_{COM} = 100mA, V_{NO}$ or $V_{NC} = 1V$, Test Circuit 1 | $V_{CC} = 2.7V$, | - | 2.2 | 3.6 | Ω |
| | | | $V_{CC} = 3.0V$, | - | 2.0 | 3 | |
| | | | $V_{CC} = 4.3V$ | - | 1.6 | 2.4 | |
| On-Resistance Match Between Channels | ΔR_{ON} | $I_{COM} = 100mA, V_{NO}$ or $V_{NC} = 1V$, Test Circuit 1 | $V_{CC} = 3.0V$ | - | 0.2 | - | Ω |
| | | | $V_{CC} = 4.3V$ | - | 0.2 | - | |
| On-Resistance Flatness | R_{ONF} | $I_{COM} = 100mA, V_{NO}$ or $V_{NC} = 0 \sim V_{CC}$, Test Circuit 1 | $V_{CC} = 3.0V$ | - | 0.6 | - | Ω |
| | | | $V_{CC} = 4.3V$ | - | 0.5 | - | |
| Source Off Leakage Current | $I_{OFF(NO)}$ or $I_{OFF(NC)}$ | $V_{CC}=4.3V, V_{NO}$ or $V_{NC} = 4.3V/0V, V_{COM} = 0V/4.3V$ | - | - | 1 | μA | |
| Channel On Leakage Current | $I_{NC(ON)}, I_{NO(ON)}, I_{COM(ON)}$ | $V_{CC}=4.3V, V_{NO}$ or $V_{NC} = 4.3V/0V, V_{COM} = 0V/4.3V$ or floating | - | - | 1 | | |
| Input Logic High | V_{IH} | $V_{CC} = 3.0V$ | 1.2 | - | - | V | |
| | | $V_{CC} = 4.3V$ | 1.3 | - | - | | |
| Input Logic Low | V_{IL} | $V_{CC} = 3.0V$ | - | - | 0.5 | V | |
| | | $V_{CC} = 4.3V$ | - | - | 0.6 | | |
| IN Input Leakage Current | I_{IN} | $V_{CC} = 4.3V, V_{IN}=0 \sim 4.3V$ | - | - | +/-1 | μA | |
| Turn-On Time | t_{ON} | $R_L=50\Omega, C_L=35pF, T_A=25$ °C, See Test Circuit Figure 2 | - | 8 | - | ns | |
| Turn-Off Time | t_{OFF} | | - | 12 | - | ns | |
| Break-Before-Make Delay | t_D | $T_A=25$ °C, See Test Circuit Figure 3 | - | 9 | - | ns | |
| NC-NO and COM-NC/NO Off-Isolation | O_{ISO} | $V_{BIAS} = 1.5V, V_{IN}=0dBm, T_A=25$ °C, See Test Circuit Figure 4 | 1MHz | - | -67 | - | dB |
| Channel-to-Channel Crosstalk | X_{TALK} | $V_{BIAS} = 1.5V, V_{IN}=0dBm, T_A=25$ °C, See Test Circuit Figure 5 | 1MHz | - | -100 | - | dB |
| 3dB Bandwidth | f_{3dB} | $C_L=5pF$, See Test Circuit Figure 6 | - | 330 | - | MHz | |
| Total Harmonic Distortion | THD | $V_{CC}=3.0V, f=20$ Hz to 20 kHz, $R_L = 32\Omega, V_{IN} = 1.0$ VPP | - | 0.03 | - | % | |
| Charge Injection Select Input to Common I/O | Q | $V_{IN} = GND, R_S = 0, C_L = 1nF, T_A=25$ °C, See Test Circuit Figure 7 | - | 13 | - | pC | |
| Off Capacitance | $C_{NC(OFF)}$ $C_{NO(OFF)}$ | $f=1MHz, T_A=25$ °C, See Test Circuit Figure 8 | - | 7 | - | pF | |
| | | | - | 7 | - | | |
| On Capacitance | C_{ON} | $f=1MHz, T_A=25$ °C, See Test Circuit Figure 9 | - | 15 | - | pF | |
| Power Supply Current | I_{CC} | $V_{CC}=4.3V, V_{IN}=0V$ or V_{CC} | - | - | 1 | μA | |

Test Circuits and Timing Diagrams

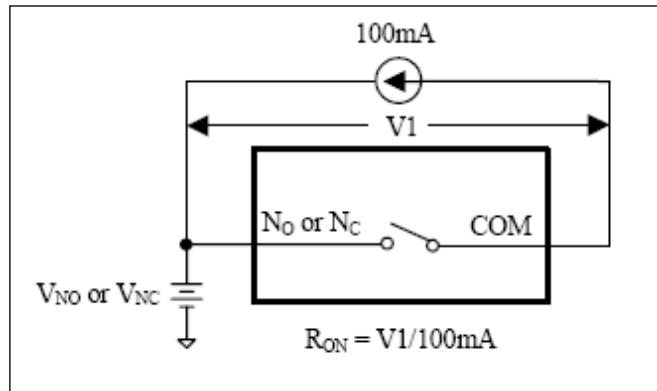


Figure 1. On Resistance

Notes: Unused input (NC or NO) must be grounded.

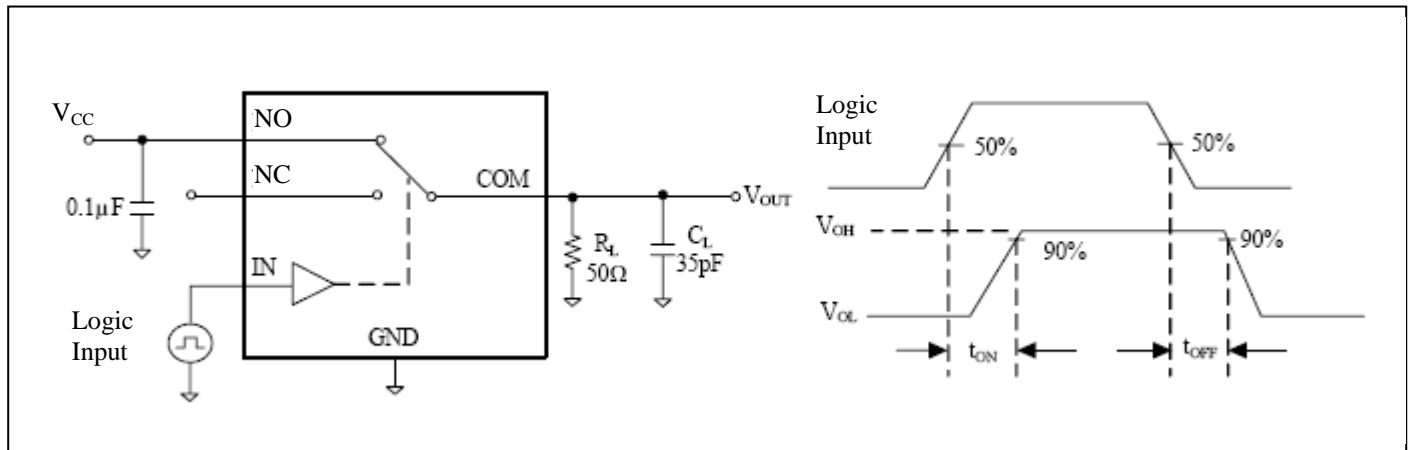


Figure 2. Switching Times

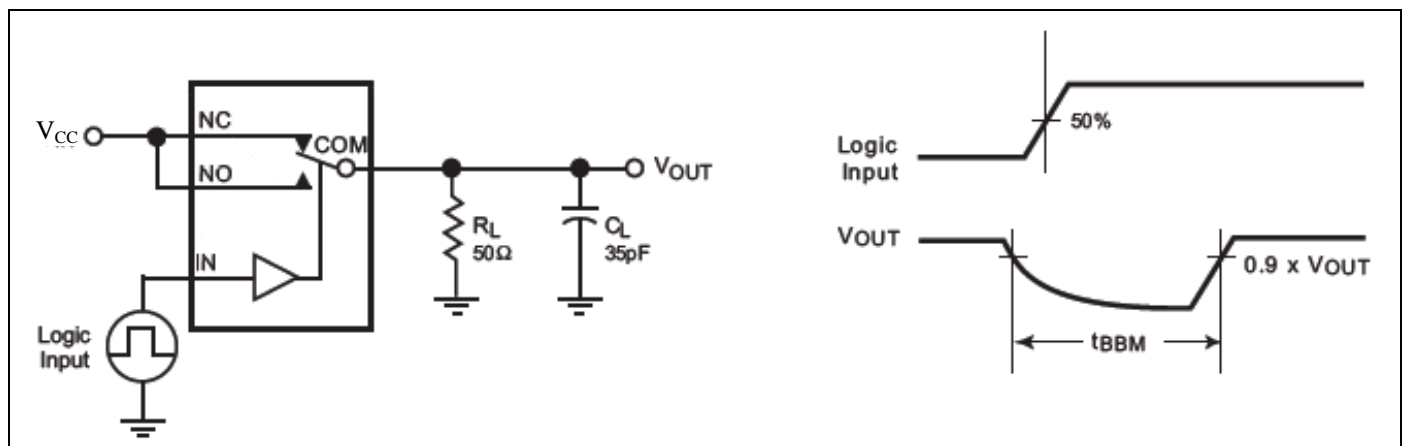


Figure 3. Break Before Make Interval Timing

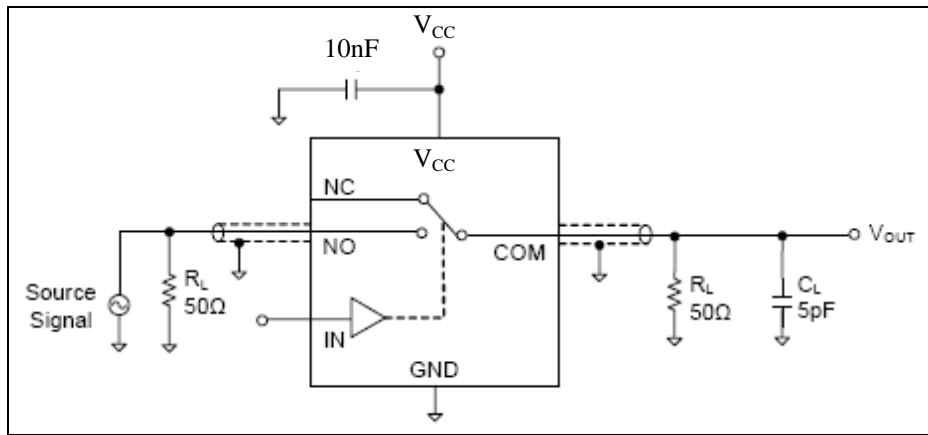


Figure 4. Off Isolation Test

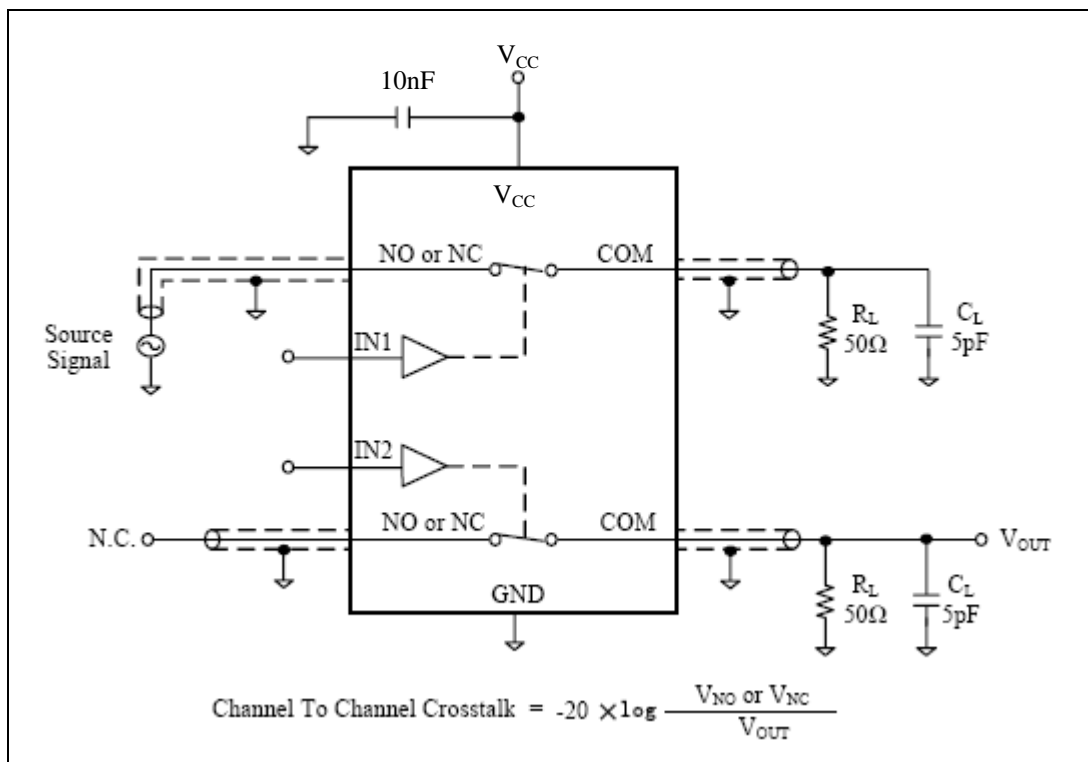


Figure 5. Channel-to-Channel Cross talk

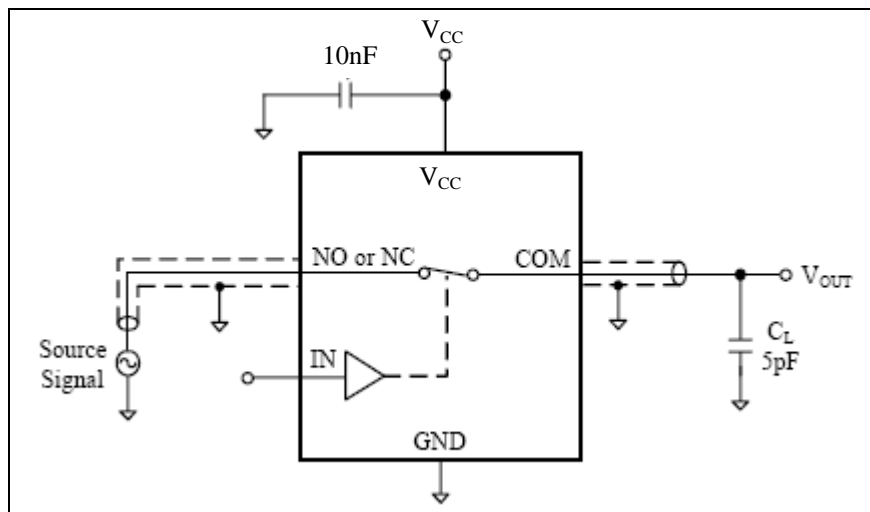


Figure 6. Bandwidth

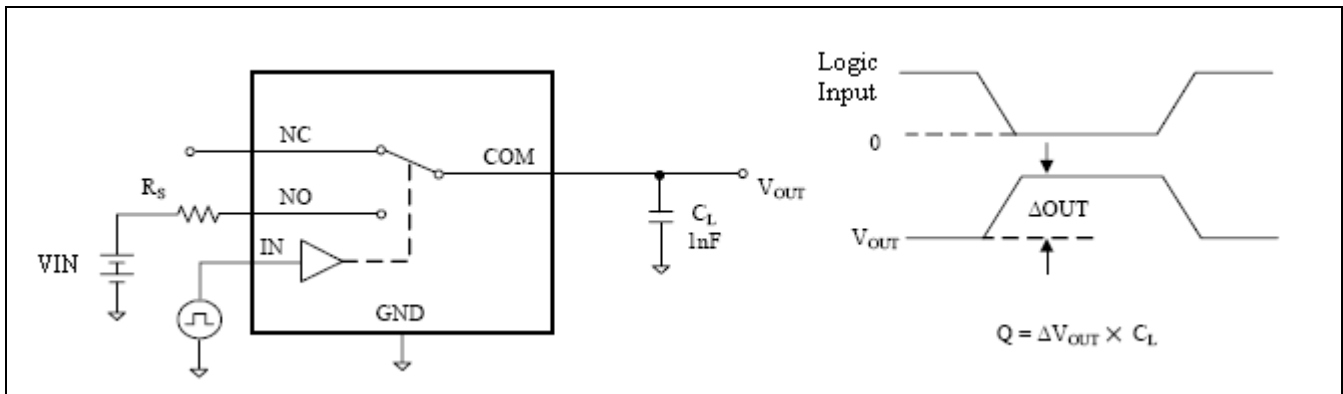


Figure 7. Charge Injection (Q)

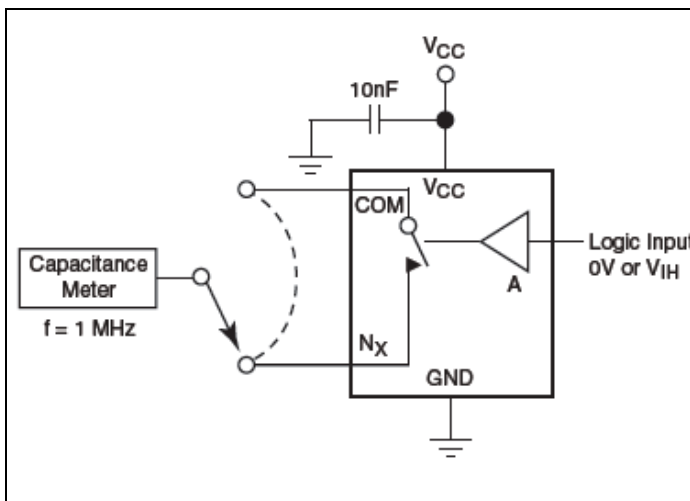


Figure 8. Channel Off Capacitance

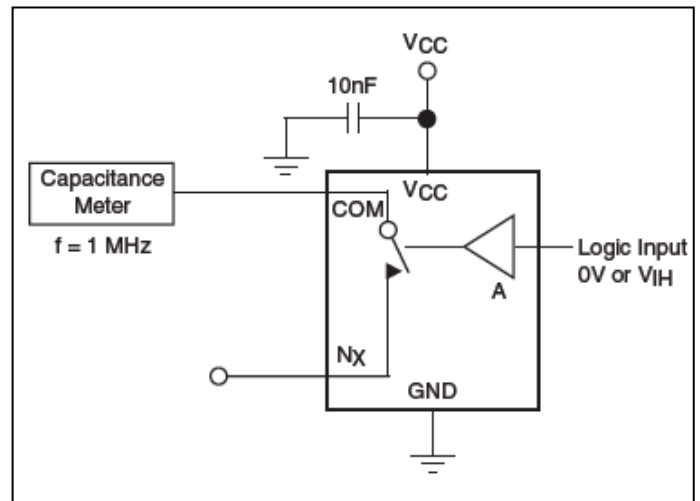
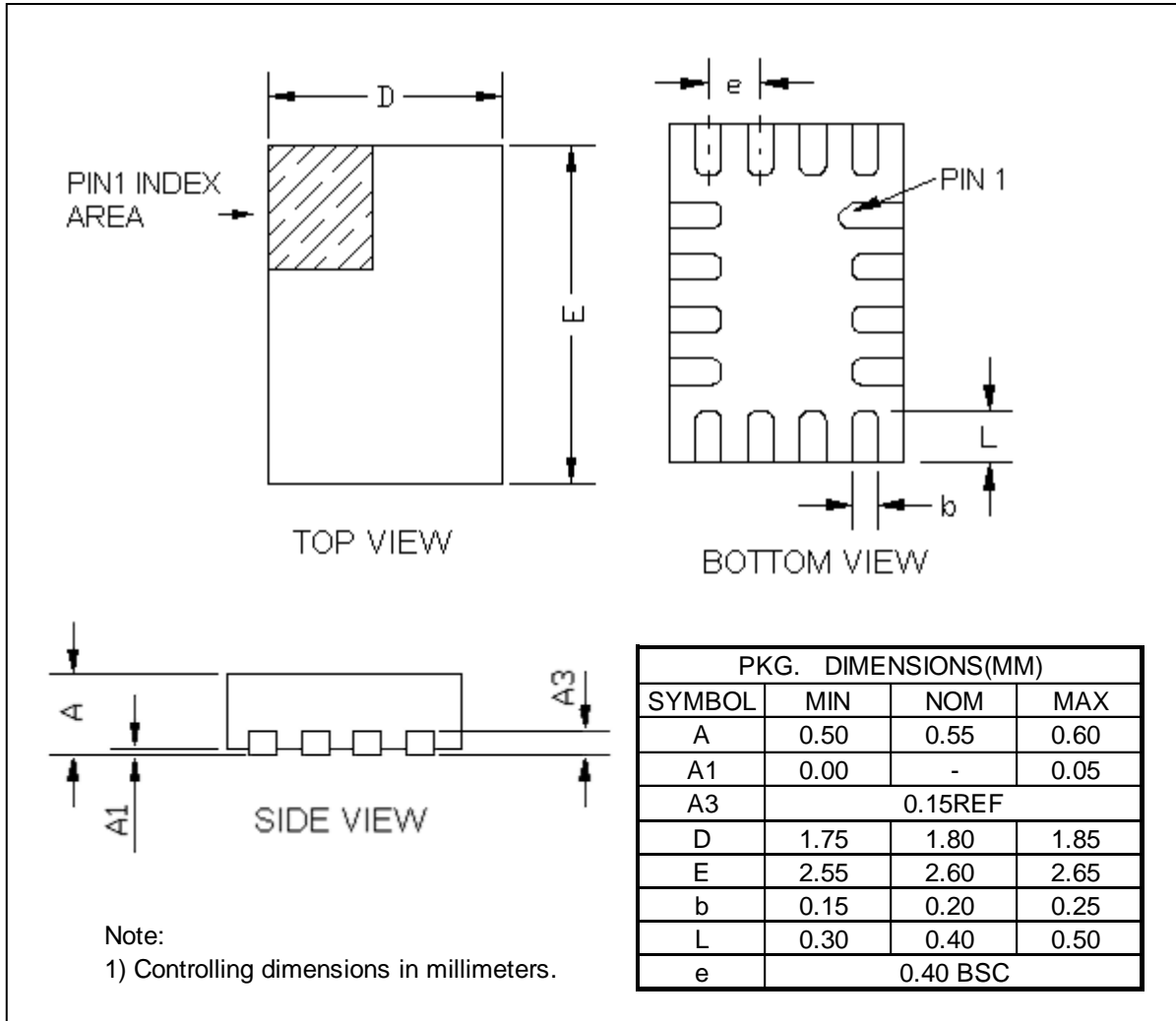


Figure 9. Channel On Capacitance

Mechanical Information

UQFN-16 1.8mmx2.6mm



Ordering Information

| Part Number | Package Code | Package |
|-------------|--------------|--|
| PI3A3899ZTE | ZT | Lead Free and Green UQFN-16 1.8mmx2.6mm (ZT) |

Notes:

- E = Pb-free and Green
- Adding X Suffix= Tape/Reel

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