High Speed, Dual DPDT Analog Switch

Description

The DIODES 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, Ax, tolerate input drive signals up to 5V, independent of supply voltage.

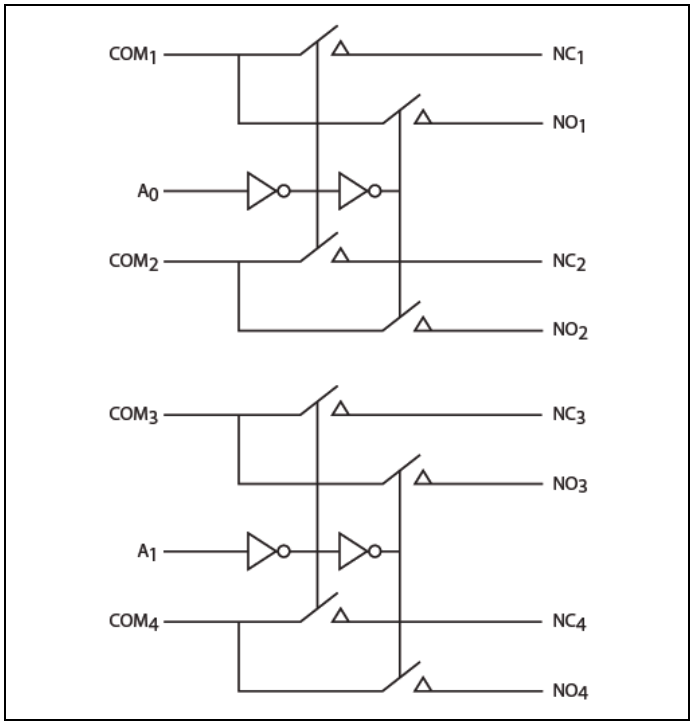
Application(s)

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

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 $COM_{3,4}$

Block Diagram



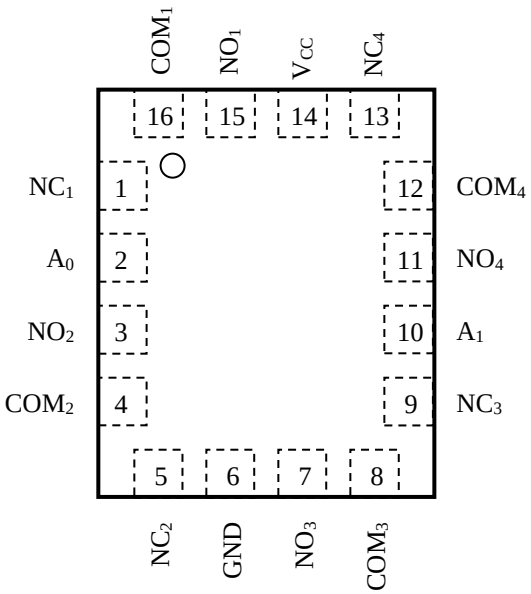
Features

- 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
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative.
  https://www.diodes.com/quality/product-definitions/
- Packaging (Pb-free & Green):
  - 16-pin, UQFN 1.8mmx2.6mm (ZTA)

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

Pin Configuration

UQFN16 1.8mmx2.6mm Package (Top View)



Pin Description

Pin#	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	V_{CC}	Positive Power Supply

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

Maximum Ratings

Storage Temperature	-65℃ to +150℃
Ambient Temperature	-40℃ to +85℃
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.

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units
V_{NO}, V_{NC}, V_{COM}	Analog Signal Range	-		0	-	V_{CC}	V
R_{ON}	On-Resistance	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	
ΔR_{ON}	On-Resistance Match Between Channels	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	-	
R_{ONF}	On-Resistance Flatness	I_{COM} = 100mA, V_{NO} or V_{NC} = 0~ V_{CC}, Test Circuit 1	V_{CC} = 3.0V	-	0.6		Ω
			V_{CC} = 4.3V	-	0.5		
$I_{OFF (NO)}$ or $I_{OFF (NC)}$	Source Off Leakage Current	V_{CC} = 4.3V, V_{NO} or V_{NC} = 4.3V/0V, V_{COM} = 0V/4.3V		-	-	1	µA
$I_{NC(ON)}$, $I_{NO(ON)}$, $I_{COM (ON)}$	Channel On Leakage Current	V_{CC} = 4.3V, V_{NO} or V_{NC} = 4.3V/0V, V_{COM} = 0V/4.3V or floating		-	-	1	
V_{IH}	Input Logic High	V_{CC} = 3.0V		1.2	-	-	V
		V_{CC} = 4.3V		1.3	-	-	
V_{IL}	Input Logic Low	V_{CC} = 3.0V		-	-	0.5	
		V_{CC} = 4.3V		-	-	0.6	
I_{IN}	IN Input Leakage Current	V_{CC} = 4.3V, V_{IN} = 0~4.3V		-	-	+/-1	µA
t_{ON}	Turn-On Time	R_L = 50Ω, C_L = 35pF, T_A = 25°C, See Test Circuit Figure 2		-	8	-	ns
t_{OFF}	Turn-Off Time			-	12	-	ns
t_D	Break-Before-Make Delay	T_A = 25°C, See Test Circuit Figure 3		-	9	-	ns

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units
O_{ISO}	NC-NO and COM-NC/NO Off-Isolation	V_{BIAS} = 1.5V, V_{IN} = 0dBm, T_A = 25°C, See Test Circuit Figure 4	1MHz	-	-67	-	dB
X_{TALK}	Channel-to-Channel Crosstalk	V_{BIAS} = 1.5V, V_{IN} = 0dBm, T_A = 25°C, See Test Circuit Figure 5	1MHz	-	-100	-	dB
f_{3dB}	3dB Bandwidth	C_L = 5pF, See Test Circuit Figure 6		-	330	-	MHz
THD	Total Harmonic Distortion	V_{CC} = 3.0V, f = 20 Hz to 20 kHz, RL = 32Ω, V_{IN} = 1.0 VPP		-	0.03	-	%
Q	Charge Injection Select Input to Common I/O	V_{IN} = GND, R_S = 0, C_L = 1nF, T_A = 25°C, See Test Circuit Figure 7		-	13	-	pC
$C_{NC(OFF)}$	Off Capacitance	F = 1MHz, TA = 25°C, See Test Circuit Figure 8		-	7	-	pF
$C_{NO(OFF)}$				-	7	-	
C_{ON}	On Capacitance	F = 1MHz, TA = 25°C, See Test Circuit Figure 9		-	15	-	
I_{CC}	Power Supply Current	V_{CC} = 4.3V,V_{IN} = 0V or V_{CC}		-	-	1	µA

Test Circuits and Timing Diagrams

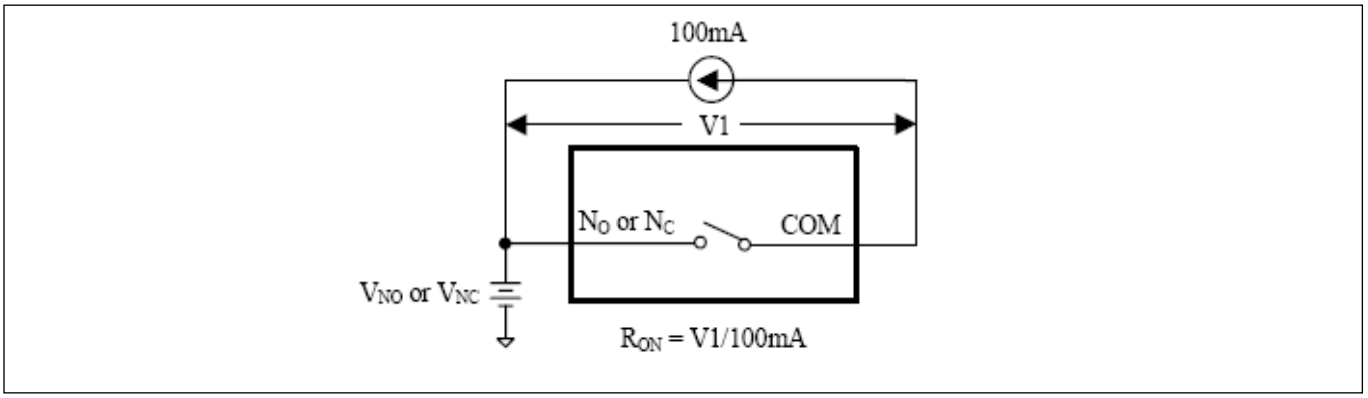


Figure 1. On Resistance

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

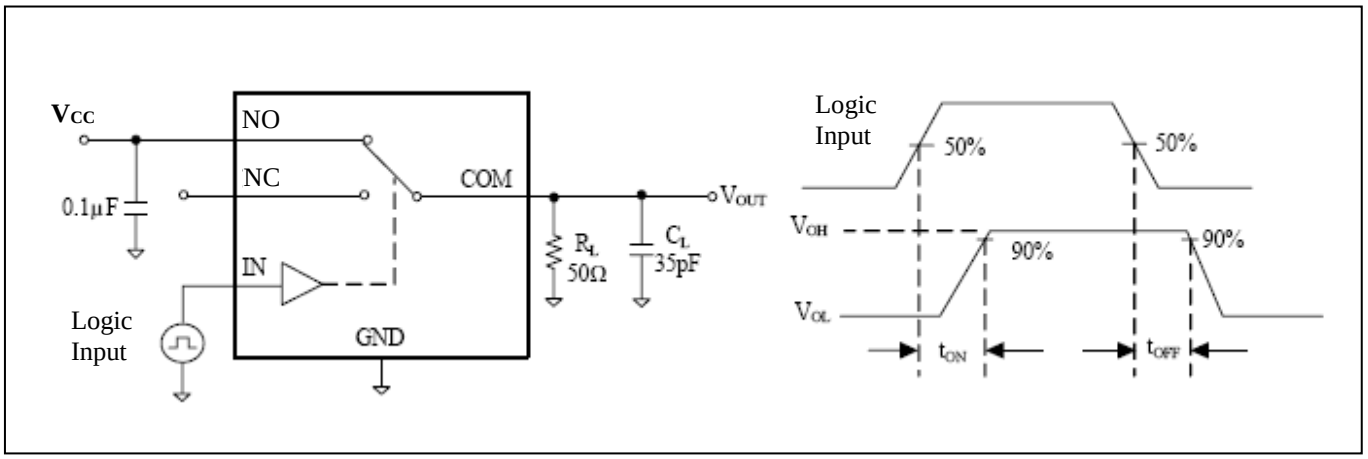


Figure 2. Switching Times

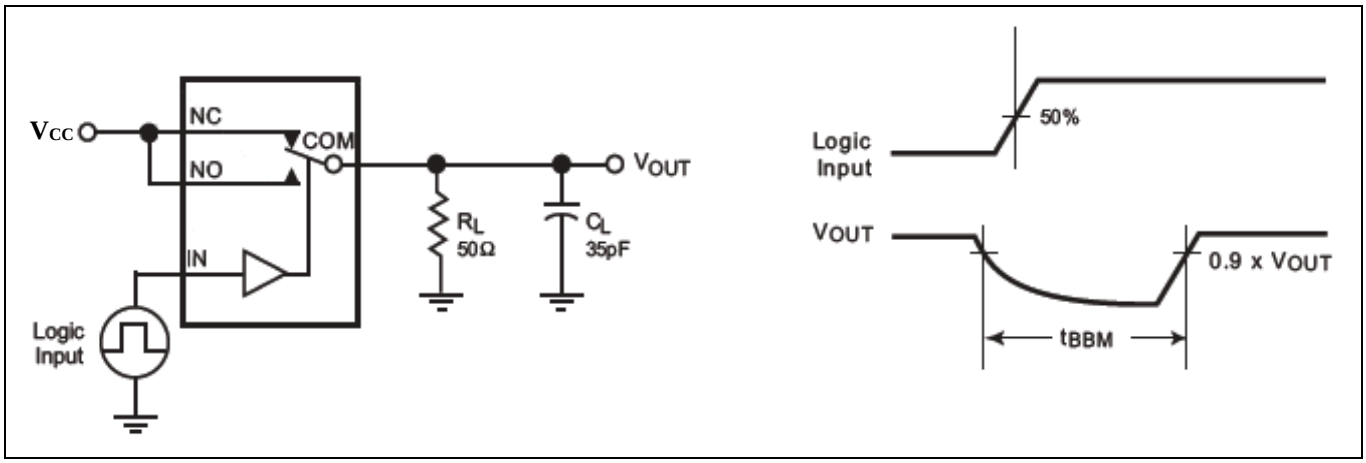


Figure 3. Break Before Make Interval Timing

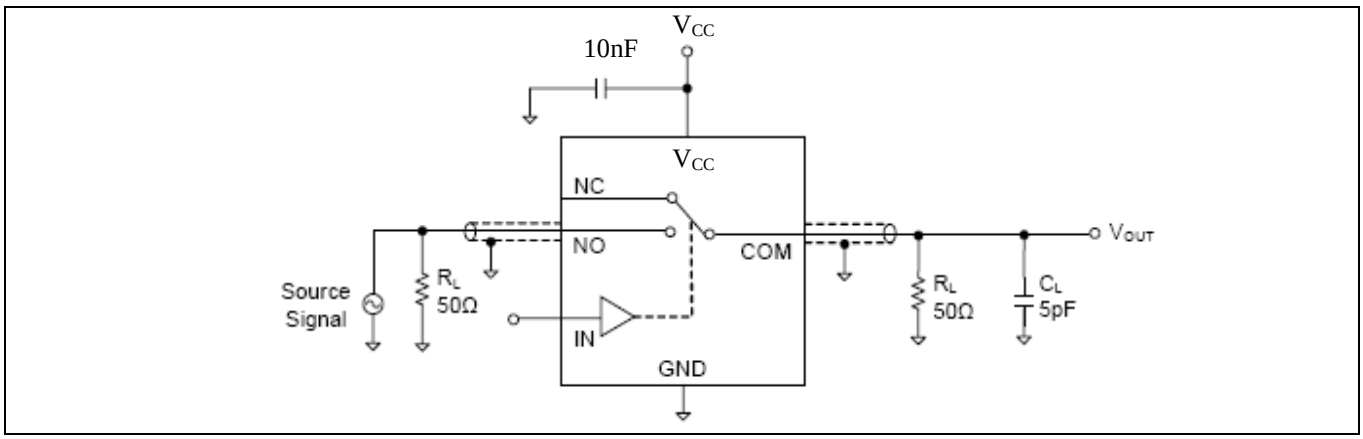


Figure 4. Off Isolation Test

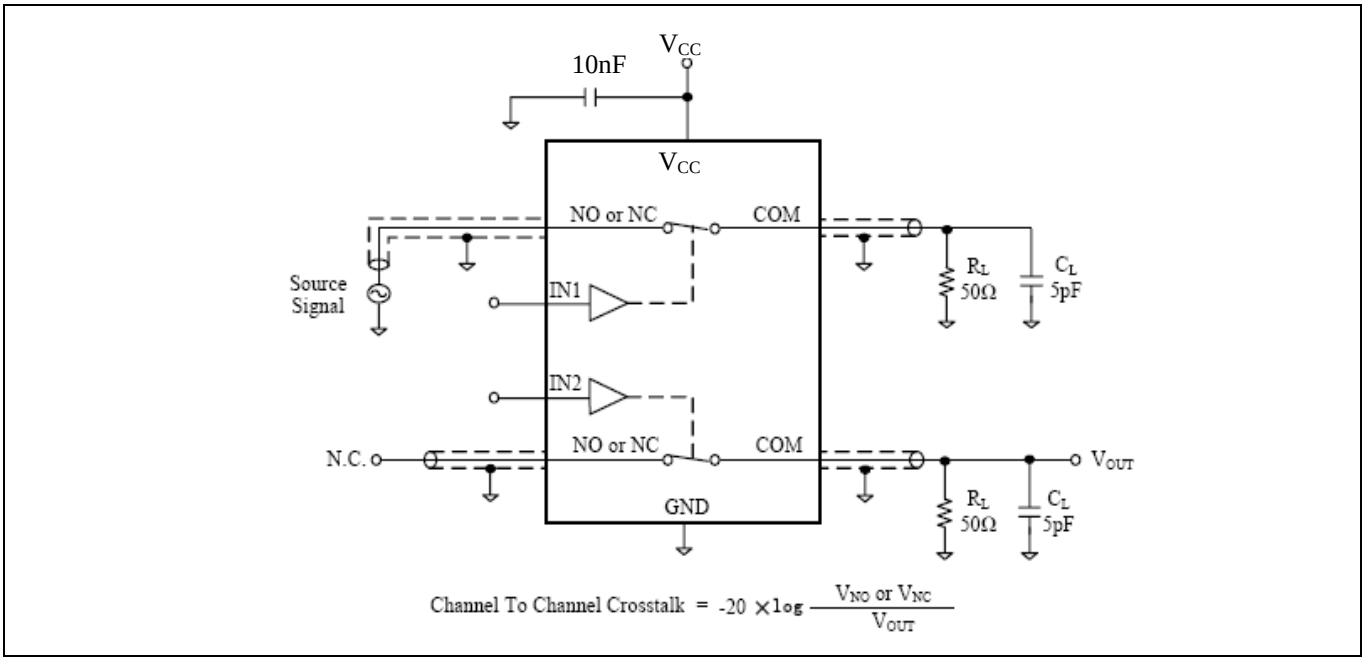


Figure 5. Channel-to-Channel Cross Talk

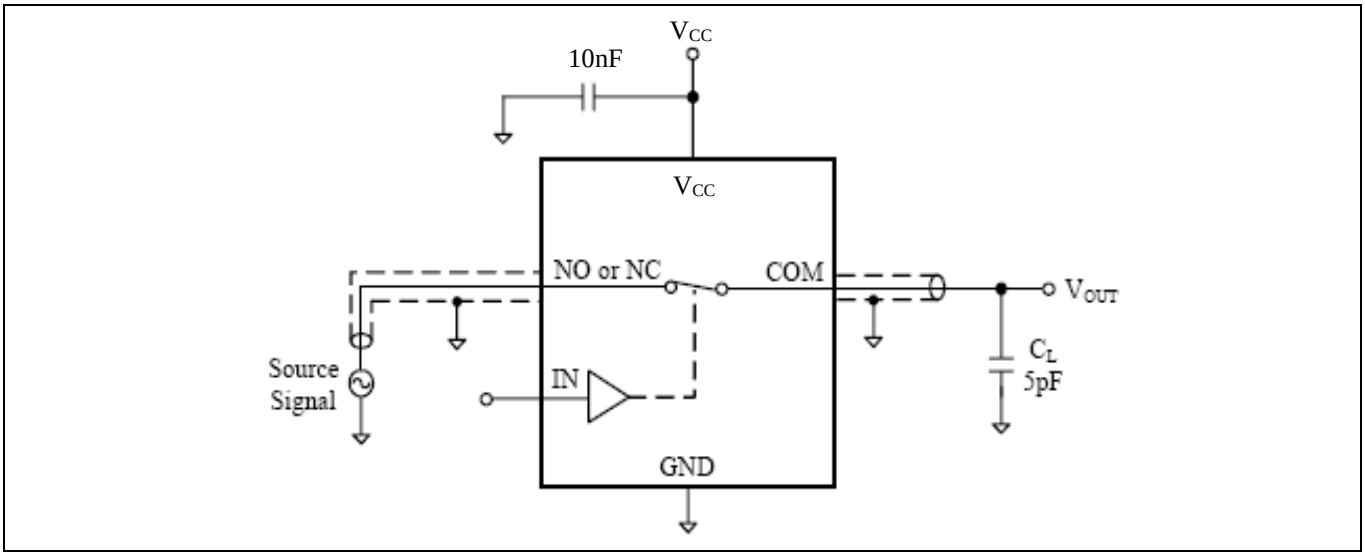


Figure 6. Bandwidth

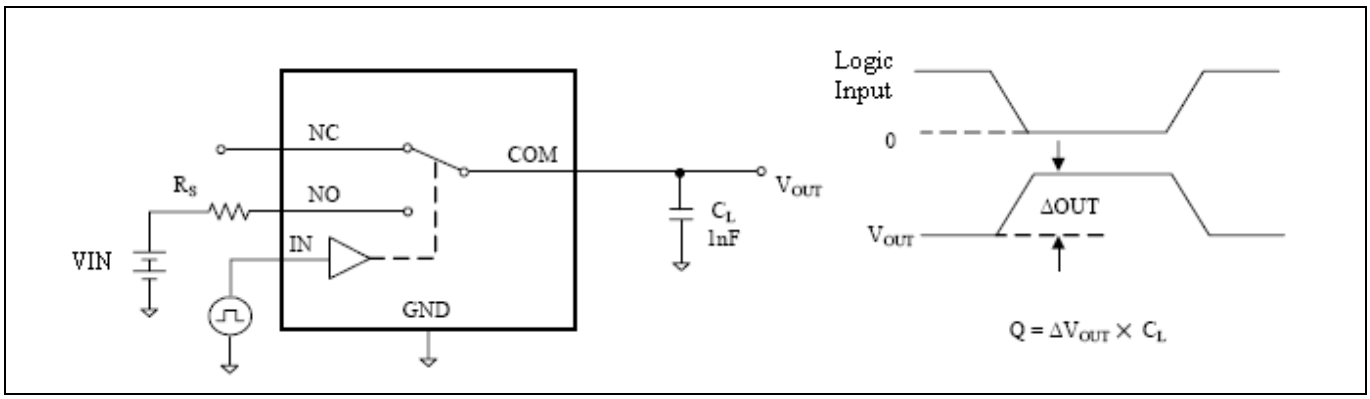


Figure 7. Charge Injection (Q)

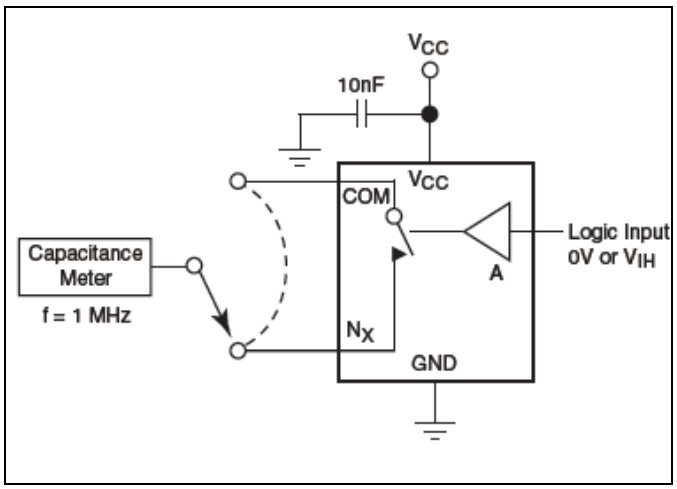


Figure 8. Channel Off Capacitance

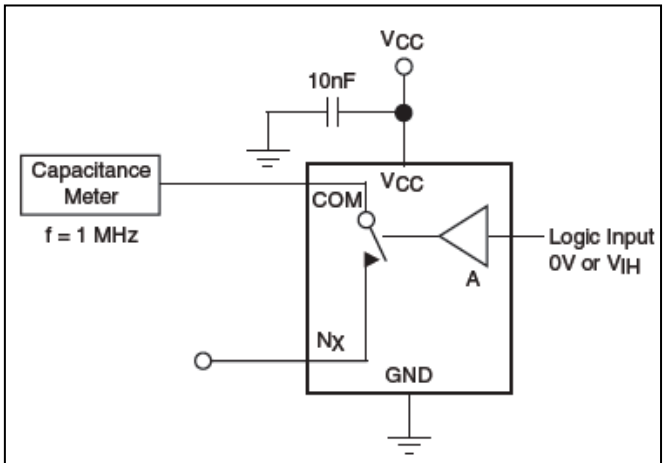
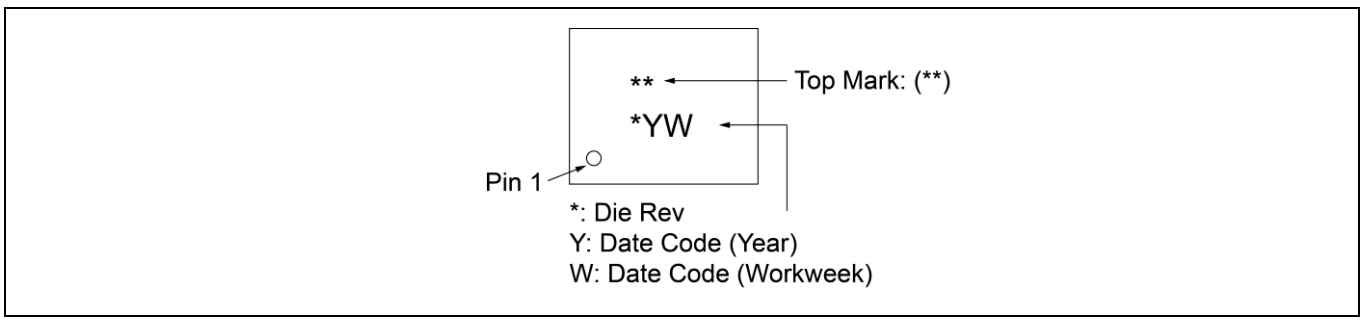


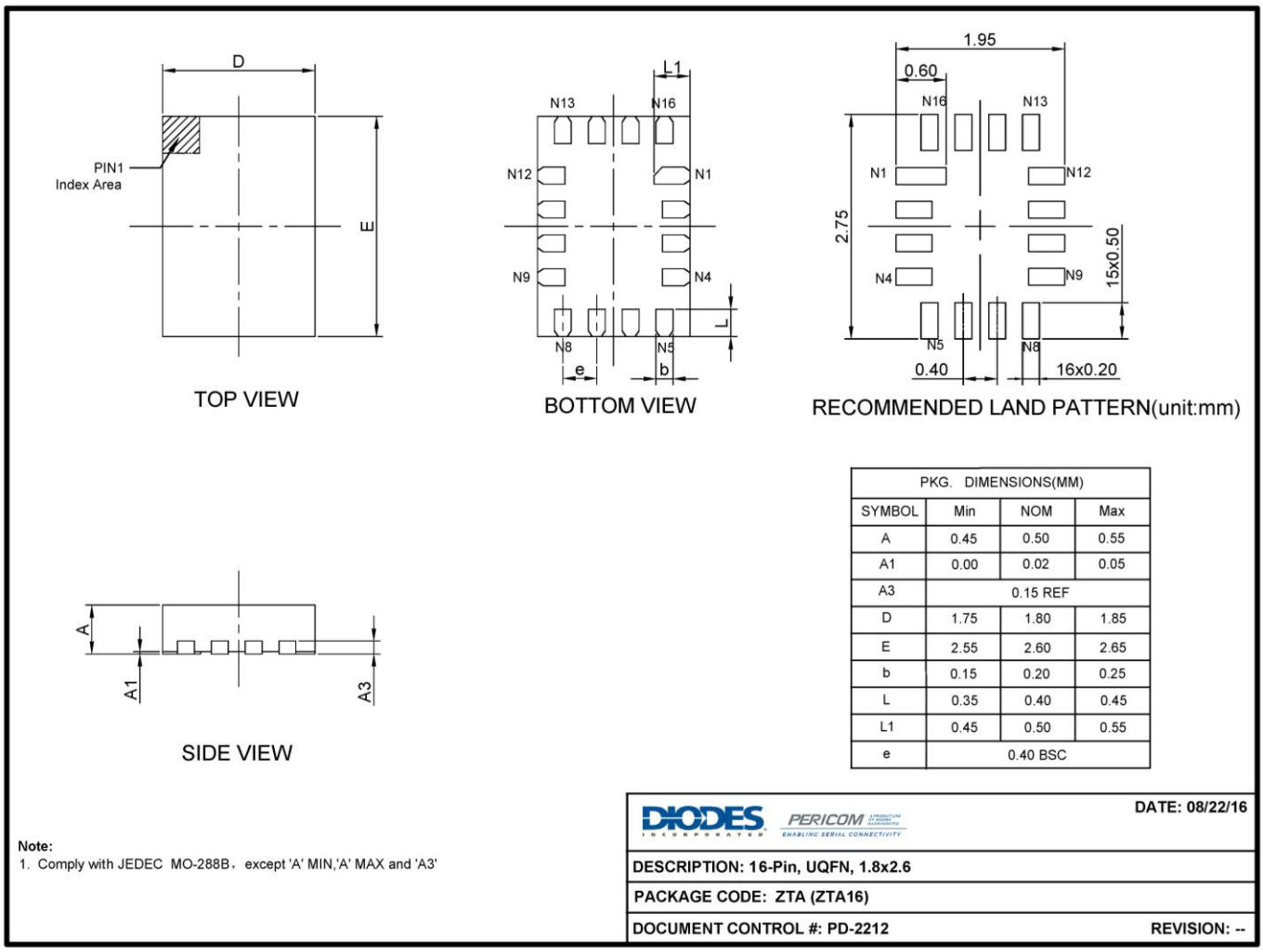
Figure 9. Channel On Capacitance

Part Marking



Packaging Mechanical

16-UQFN (ZTA)



PKG. DIMENSIONS(MM)			
SYMBOL	Min	NOM	Max
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
A3		0.15 REF	
D	1.75	1.80	1.85
E	2.55	2.60	2.65
b	0.15	0.20	0.25
L	0.35	0.40	0.45
L1	0.45	0.50	0.55
e		0.40 BSC	

Note:
1. Comply with JEDEC MO-288B, except 'A' MIN,'A' MAX and 'A3'

DATE: 08/22/16

DESCRIPTION: 16-Pin, UQFN, 1.8x2.6

PACKAGE CODE: ZTA (ZTA16)

DOCUMENT CONTROL #: PD-2212 REVISION: --

16-0164

For latest package info.

please check: http://www.diodes.com/design/support/packaging/pericom-packaging/packaging-mechanicals-and-thermal-characteristics/

Ordering Information

Part Number	Package Code	Package Description
PI3A3899ZTAEX	ZTA	16-Pin, 1.8x2.6 (UQFN)

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. E = Pb-free and Green
5. X suffix = Tape/Reel

IMPORTANT NOTICE

1. DIODES INCORPORATED (Diodes) AND ITS SUBSIDIARIES MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes' products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes' products. Diodes' products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of Diodes' products for their intended applications, (c) ensuring their applications, which incorporate Diodes' products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.

3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.

4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.

5. Diodes' products are provided subject to Diodes' Standard Terms and Conditions of Sale (https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

6. Diodes' products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes' products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.

7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.

8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

9. This Notice may be periodically updated with the most recent version available at https://www.diodes.com/about/company/terms-and-conditions/important-notice

www.diodes.com

单击下面可查看定价，库存，交付和生命周期等信息

>>Diodes Incorporated(达迩科技（美台）)