A Product Line of
Diodes Incorporated

PSMUX154

ESD-Protected, Low Capacitance, 2-Channel, 2:1 Switch, With Powered-off Protection

Features

- CMOS Technology for Bus and Analog Applications
- Low On-Resistance: 4.3Ω @VDD = 3.0V
- Wide VDD Range: 1.8V to 4.3V
- Rail-to-Rail Signal Range
- High Off Isolation: -80dB @ 1MHz
- Crosstalk Rejection Reduces Signal Distortion: -90dB @ 1MHz
- Wide -3dB Bandwidth: 850MHz
- Near-Zero propagation delay: 250ps
- Support for 1.8V/2.5V/3.3V Logic on Control pins
- Channel On Capacitance: 6.0pF
- Extended Industrial Temperature Range: -40°C to 85°C
- ESD protection : 8kV(HBM)
- 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):
  - 10-pin UQFN (ZM), 1.4mm x 1.8mm

Applications

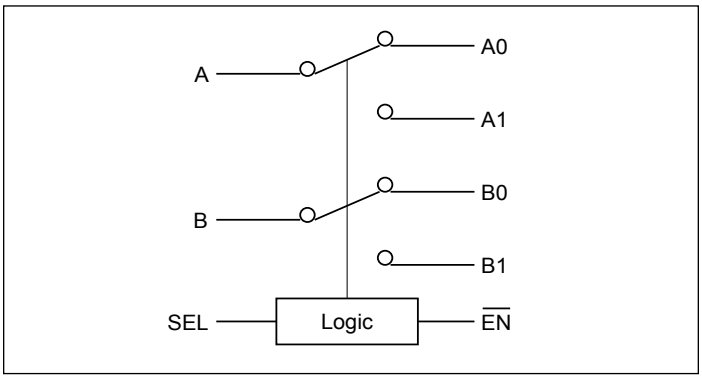
- Portable Instrumentation
- Computer Peripherals
- Server

Description

PSMUX154 is a High-bandwidth dual fast single-pole double throw (SPDT) CMOS switch. It can be used as an analog switch or as a low-delay bus switch. Specified over a wide operating power supply voltage, 1.8V to 4.3V, the PSMUX154 has an On-Resistance of 4.3Ω at V_{DD} = 3.0V.

Break-before-make switching prevents both switches being enabled simultaneously. This eliminates signal disruption during switching.

Block Diagram



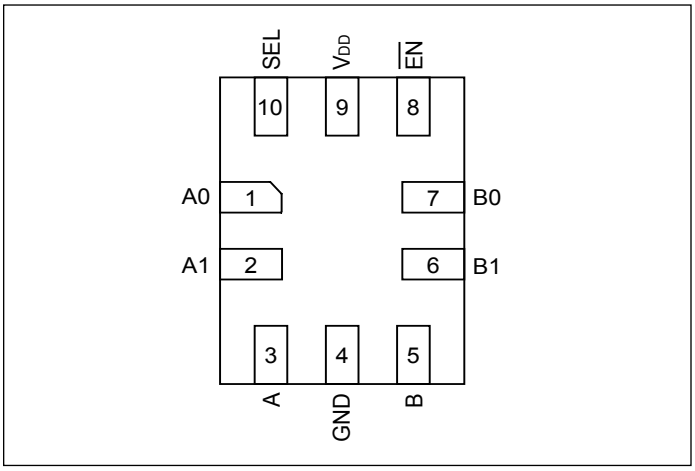
Function Table

$\overline{EN}$	SEL	Function
H	X	I/O's = Hi-Z
L	L	A0, B0 Connected to A, B
L	H	A1, B1 Connected to A, B

Note: x = 1 or 2

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



Pin Description

Pin#	Pin Name	Type	Description
1	A0	I/O	Data Port 0
2	A1	I/O	Data Port 1
3	A	I/O	Common Output / Data Port
4	GND	—	Ground
5	B	I/O	Common Output / Data Port
6	B1	I/O	Data Port 1
7	B0	I/O	Data Port 0
8	$\overline{EN}$	Input	Switch Enable
9	VDD	—	Positive Power Supply
10	SEL	Input	Switch Select

Absolute Maximum Ratings

(Above which useful life may be impaired. For user guidelines, not tested.)

Storage Temperature	-65°C to +150°C
Ambient Temperature with Power Applied	-40°C to +85°C
Supply Voltage, V_{DD}	-0.5V to +4.6V
Control Input Voltage, $V_{SEL, EN}$	0V to +4.6V
DC Input Voltage, V_{INPUT}	-0.5V to +4.6V
DC Continuous Current Ax, Bx, A/B	100mA
ESD (HBM)	8kV
ESD(CDM)	1kV

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	Description	Test Conditions	Min.	Typ.	Max.	Units
V_{DD}	Operating Voltage		1.8	-	4.3	V
V_{IH}	High-Level Control Input Voltage	V_{DD} = 1.8V to 4.3V	1.2	-	V_{DD}	V
V_{IL}	Low-Level Control Input Voltage	V_{DD} = 1.8V to 3.6V	0	-	0.5	V
		V_{DD} = 4.3V	0	-	0.7	
$V_{I/O}$	Switch Input Voltage		-0.5	-	V_{DD}	V
T_A	Operating Temperature		-40	25	85	°C

DC Electrical Characteristics

V_{DD} = 3.0V to 4.4V, TA = –40°C to 85°C.

Symbol	Parameter	Test Conditions	Temp.	Min.	Typ.	Max.	Units
Analog Switch							
$V_{Ax/Bx}$, $V_{A/B}$	Analog Signal Range		-40°C to 85°C	0		V_{DD}	V
R_{ON}	On-Resistance	V_{DD} = 3V, V_I = 0V to 0.4V, I_O = -40mA	-40°C to 85°C		4.3	6.5	Ω
ΔR_{ON}	On-Resistance Match Between Channels	V_{DD} = 3V, V_I = 0V to 0.4V, I_O = -40mA	-40°C to 85°C		0.1	1.0	Ω
R_{ONF}	On-Resistance Flatness	V_{DD} = 3V, V_I = 0V to 0.4V, I_O = -40mA	-40°C to 85°C		0.25		Ω
I_{DD}	Supply Current	V_{DD} = 4.3V, $I_{I/O}$ = 0, Switch ON or OFF				1	uA
ΔI_{DD}	Difference of supply current due to control input voltage not V_{DD} or GND	V_{DD} = 4.3V, V_{SEL}, V_{EN} = 2.6V				10	uA
I_{SEL}, I_{EN}	Control Inputs	V_{DD} = 4.3V, 0V, V_{SEL},V_{EN} = 0 to 4.3V		-1		1	uA
I_{OZ}	Output leakage current when port is off	V_{DD} = 4.3V, 0 ≤ $V_{A,B}$ ≤ 3.6V , V_I = 0V, Switch OFF	-40°C to 85°C	-1		1	µA

DC Electrical Characteristics Cont.

Symbol	Parameter	Test Conditions	Temp.	Min.	Typ.	Max.	Units
I_{OFF}	Power Off Leakage Current	V_{DD} = 0V, $V_{An,Bn}$ = 0V, $V_{A,B}$ = 0V to 4.3V, V_{SEL} , V_{EN} = V_{DD} or GND	-40°C to 85°C			2	µA
Dynamic Characteristics							
t_{PD}	Propagation Delay	See Test Circuit for Electrical Characteristics	+25°C		0.25		ns
t_{ON}	Turn-On Time	See Test Circuit for Electrical Characteristics	+25°C		25		ns
t_{OFF}	Turn-Off Time	See Test Circuit for Electrical Characteristics	+25°C		4		ns
t_D	Break-Before-Make Delay		+25°C		7		ns
X_{TALKD}	Channel-to-Channel Crosstalk	R_L = 50Ω, f = 1MHz	+25°C		-90		dB
O_{ISO}	OFF Isolation	R_L = 50Ω, f = 1MHz	+25°C		-80		dB
f_{3dB}	3dB Bandwidth	R_L = 50Ω, C_L = 5pF	+25°C		850		MHz

Capacitance

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
C_{SEL}, C_{EN}	Control inputs digital input capacitance	f = 1MHz		6		pF
$C_{I/O\ (ON)}$	ON-state input capacitance	f = 1MHz		6		pF
$C_{I/O\ (OFF)}$	OFF-state input capacitance	f = 1MHz		1.9		pF

Test Circuits and Timing Diagrams

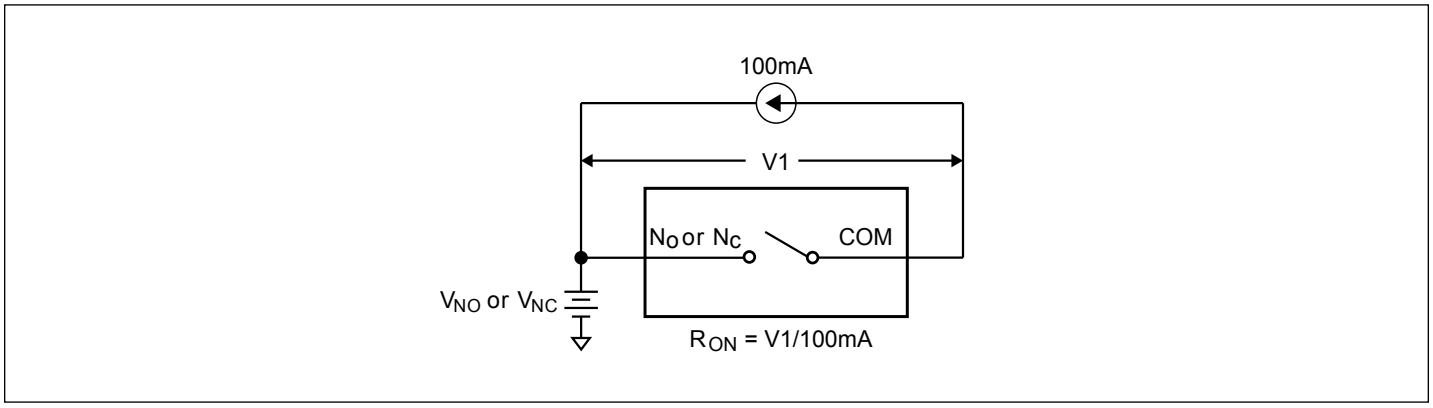


Figure 1. On Resistance

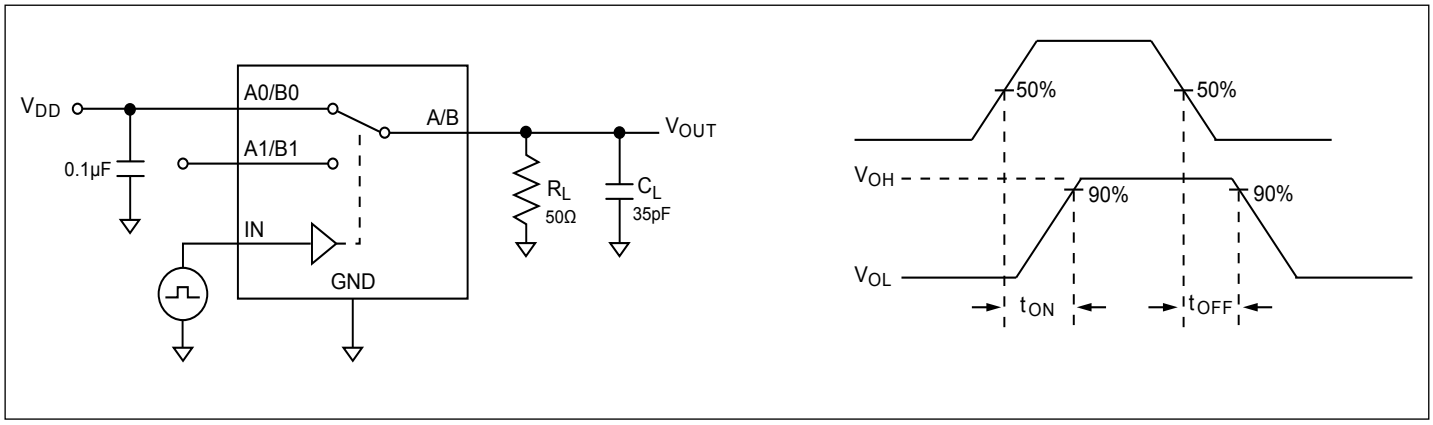


Figure 2. Switching Times

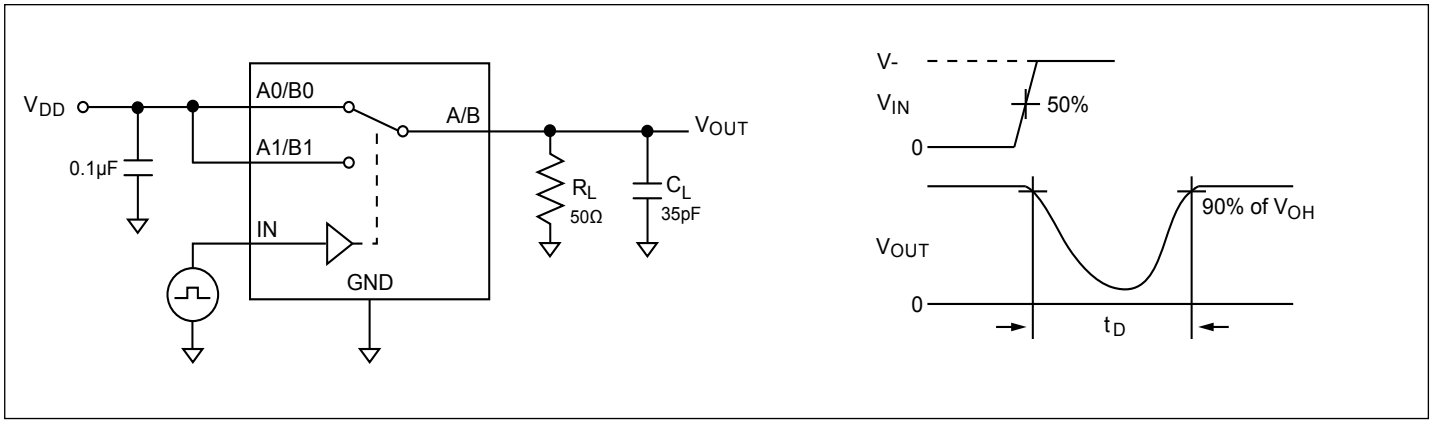


Figure 3. Break Before Make Interval Timing

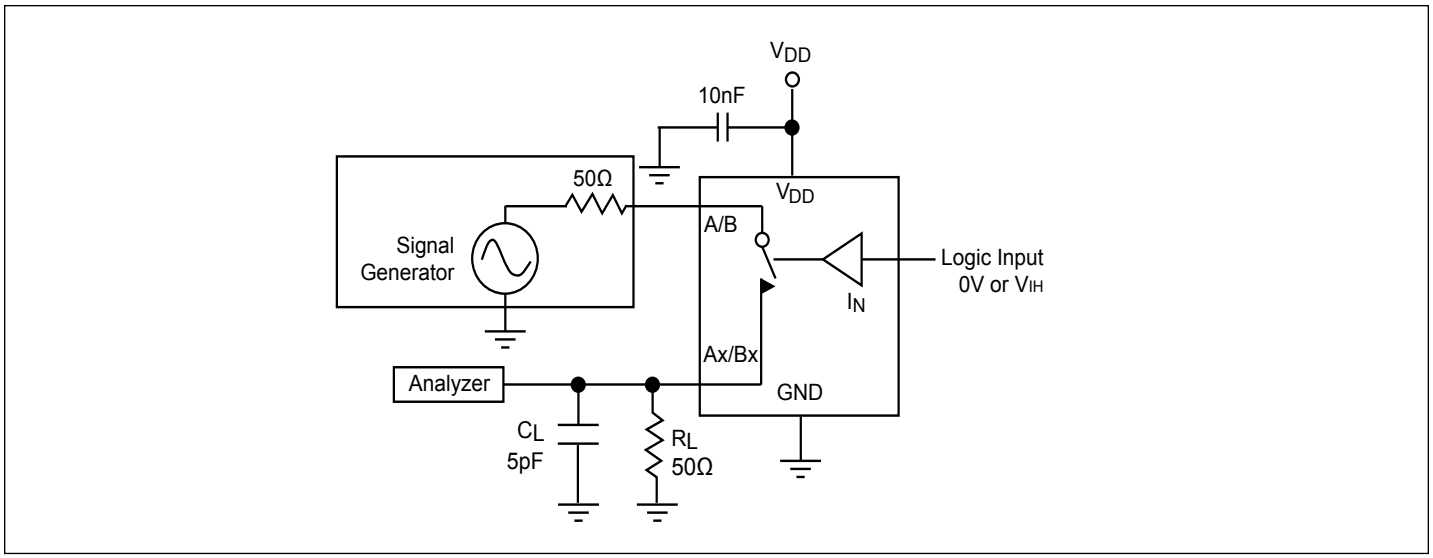


Figure 4. COM-NC/NO Isolation

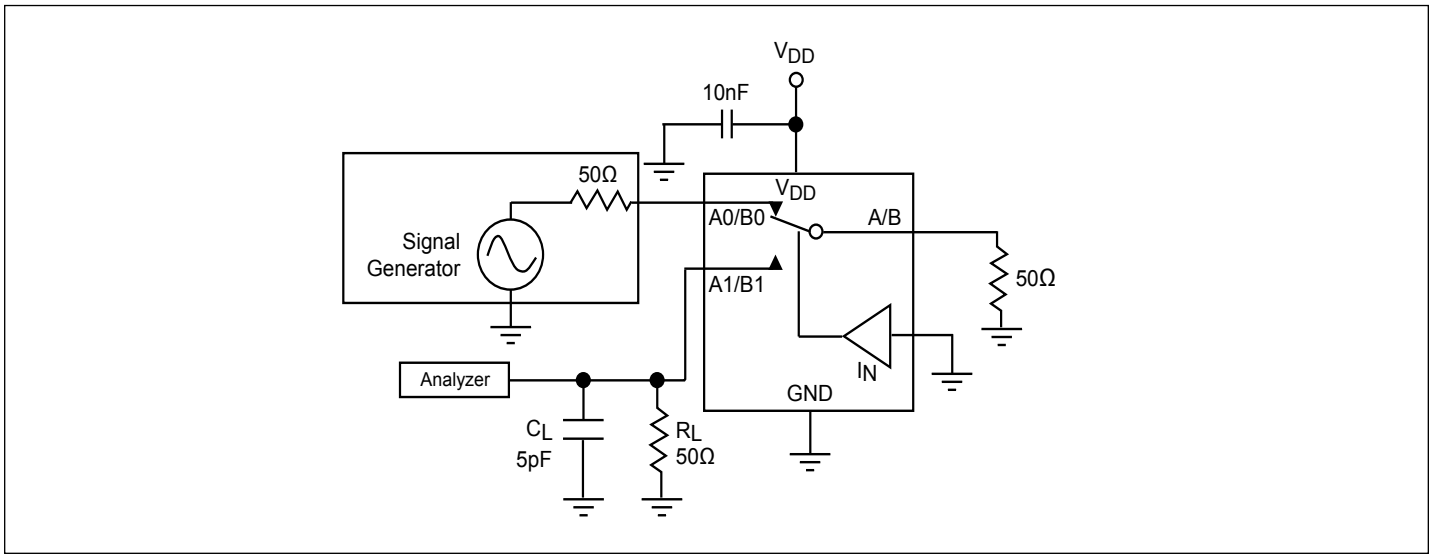


Figure 5. Input Isolation

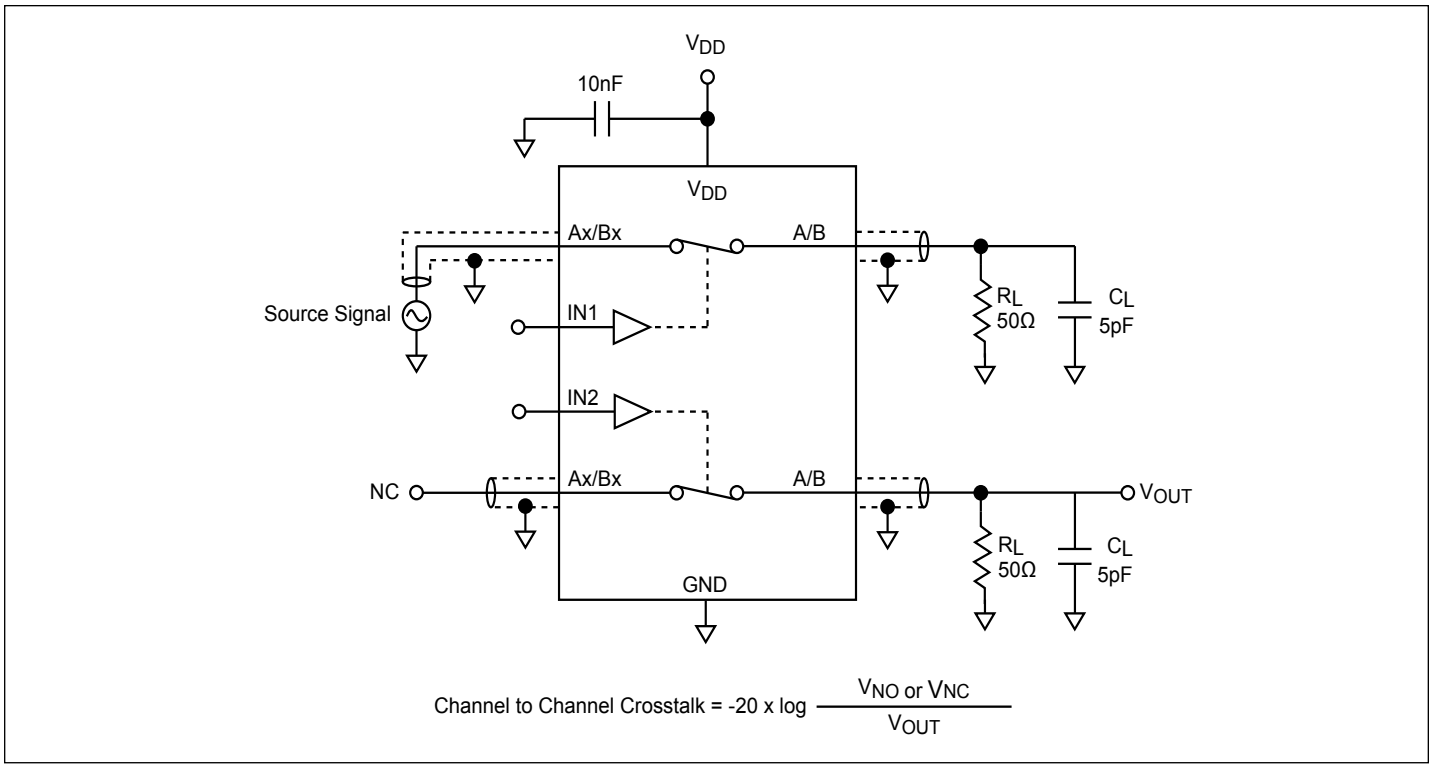


Figure 6. Channel-to-Channel Crosstalk

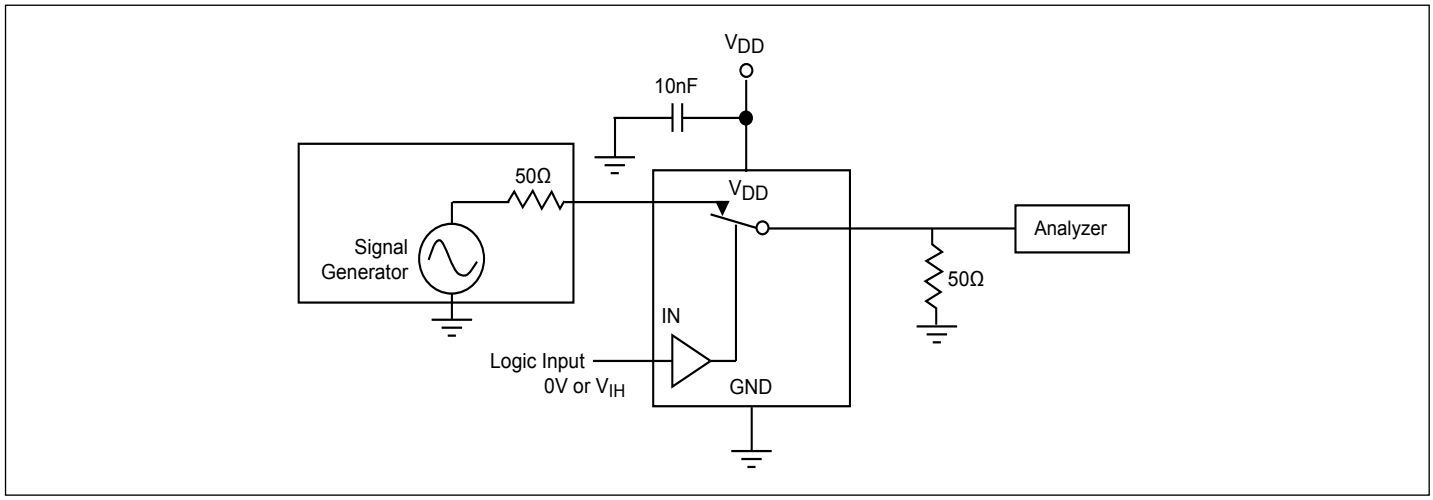


Figure 7. Bandwidth

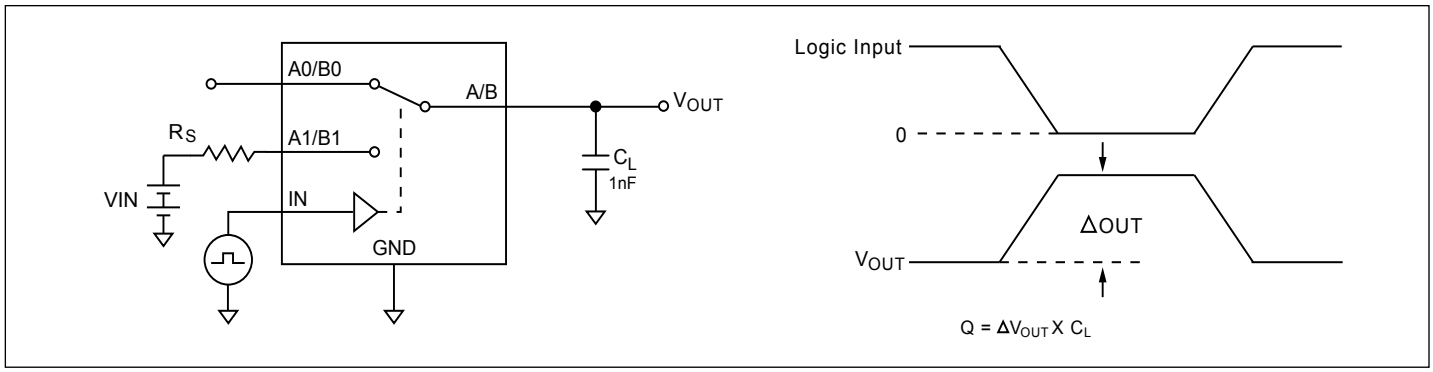


Figure 8. Charge Injection

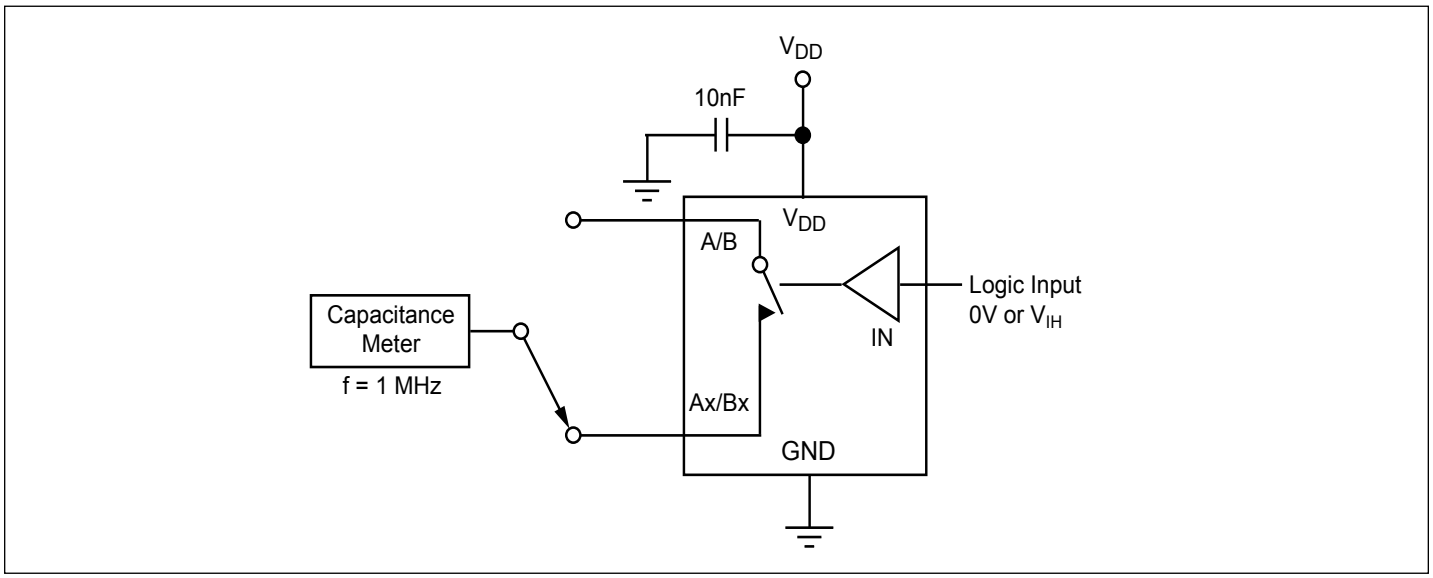


Figure 9. Channel Off Capacitance

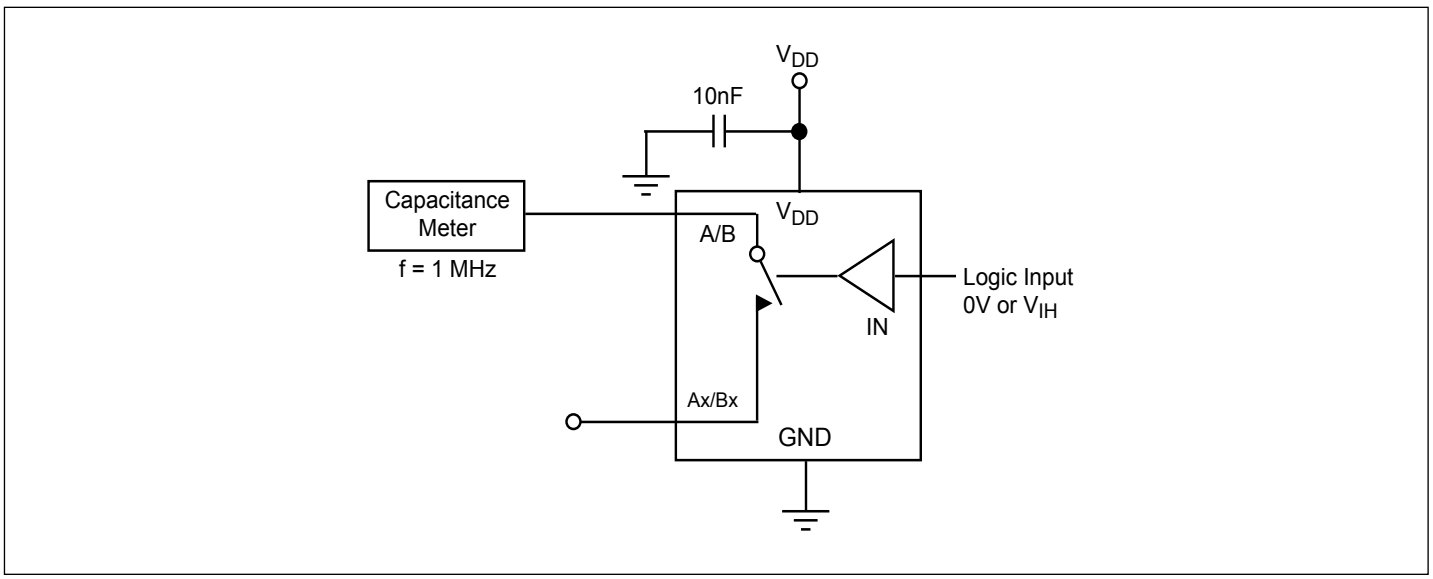
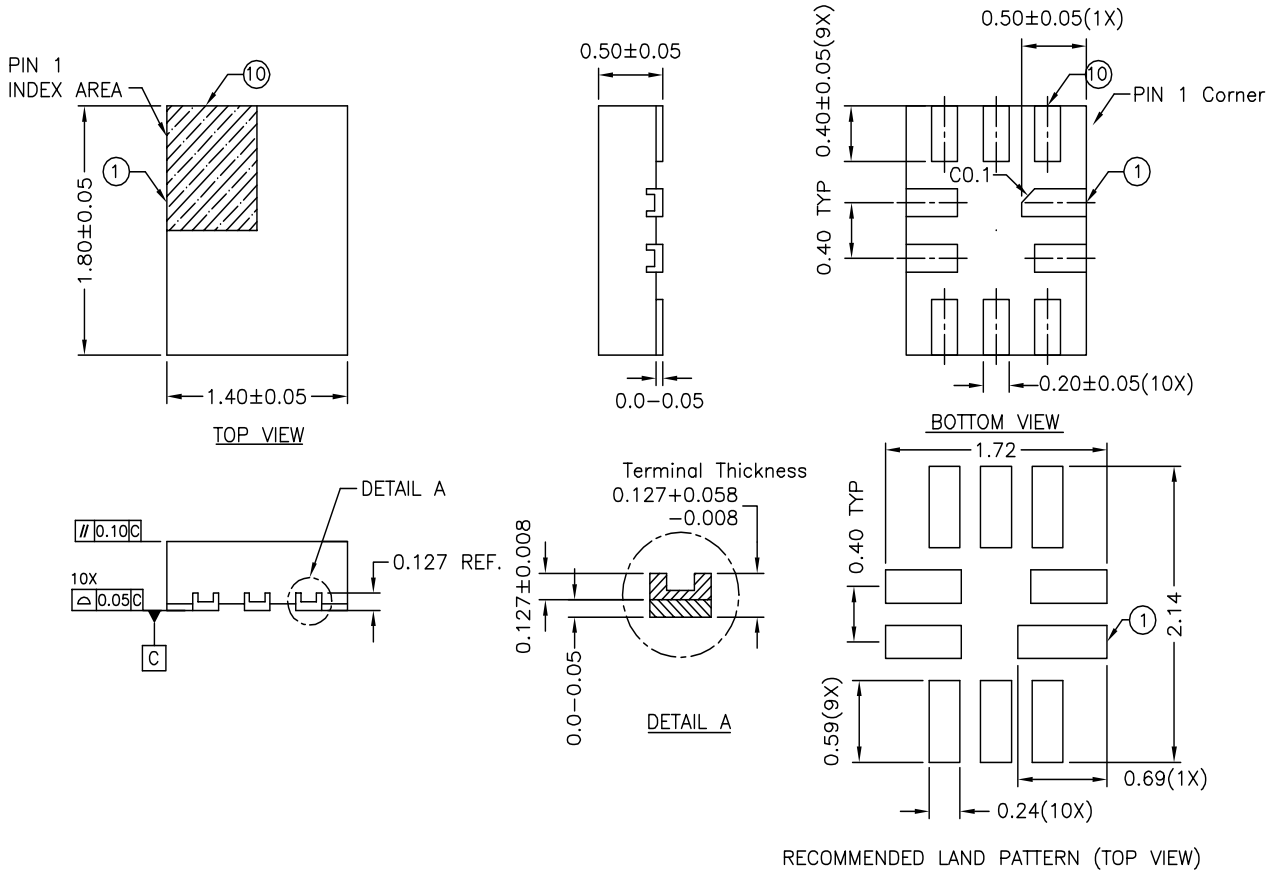


Figure 10. Channel On Capacitance

Part Marking

Y: Date Code (Year)
W: Date Code (Workweek)
Bar above the first “x” means pin1

Packaging Mechanical: 10-UQFN (ZM)



NOTE :

1. ALL DIMENSIONS ARE IN mm. ANGLES IN DEGREES.
2. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
3. REFER JEDEC MO−236/MO−248
4. RECOMMENDED LAND PATTERN IS FOR REFERENCE ONLY.

PERICOM Semiconductor Corporation

DATE: 01/29/09

DESCRIPTION: 10-contact, Ultra-thin Quad Flat No-Lead (UQFN)

PACKAGE CODE: ZM10

DOCUMENT CONTROL #: PD-2066 REVISION: A

09-0072

For latest package info.

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

Ordering Information

Ordering Code	Package Code	Package Description
PSMUX154ZMEX	ZM	10-Contact, Ultra-thin Quad Flat No-Lead (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

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