![Chipsmall logo]

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

PERICOM®

SOTINY™ Low-Voltage, Single-Supply, 1-Ohm SPST CMOS Analog Switches

Features

- 1-ohm max. On-Resistance
- 0.15-ohm max. On-Resistance Flatness at +25°C
- Fast Switching
    - t_{ON} = 50ns max.
    - t_{OFF} = 50ns max.
- +1.8V to +5.5V Single-Supply Operation
- TTL/CMOS-Logic Compatible
- –57dB Off-Isolation at 1MHz
- 4nA max. Off-Leakage at +25°C
- Packaging:
    - 5-Pin SOT-23 (T)

Description

PI5A4626/PI5A4629, single-pole/single-throw (SPST) analog switches that operate from a single +1.8V to +5.5V supply, are normally open (NO). The PI5A4629 pinout is optimized for the highest SOT-23 package off-isolation available.

These switches have 1-ohm max On-resistance (R_{ON}), with 0.12-ohm max R_{ON} flatness over the analog signal range when powered from a +5V supply. Leakage currents are 0.5nA and fast switching times are less than 50ns. They are packaged in a compact 5-pin SOT-23 package.

Applications

- Cellular Phones • Communications Circuits
- Battery-Operated Equipment • DSL Modems
- Audio and Video Signal Routing • PCMCIA Cards

Pin Description

Pin 4626	Pin 4629	Name	Function
1	2	COM	Analog Switch, Common
2	4	NO	Analog Switch, Normally Open
3	3	GND	Ground
4	1	IN	Digital Control Input
5	5	V+	Positive Supply Voltage

Note:
NO, NC, and COM pins are identical and interchangeable. Any pin may be considered as an input or an output; signals pass

Functional Block Diagrams/Pin Configurations

Top Views

Switches shown for Logic "0" input.
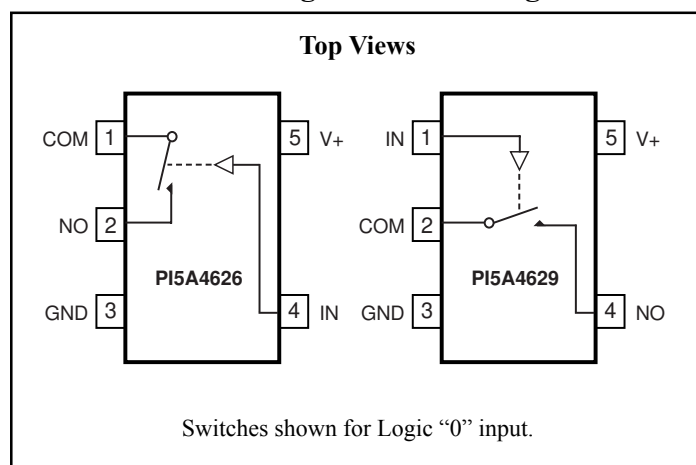
Truth Table

Input	Switch State PI5A4626 / PI5A4629
LOW	OFF
HIGH	ON

Absolute Maximum Ratings

Voltages Referenced to GND
V+ .... –0.5V to +5.5V

V_{IN}, V_{COM}, V_{NC}, V_{NO} (Note 1) .... –0.5V to V_+ +0.3V
or 30mA, whichever occurs first

Current (any terminal) ....±200mA

Peak Current, COM, NO, NC
(Pulsed at 1ms, 10% duty cycle) ....±400mA

Thermal Information

Continuous Power Dissipation

SOT-23 (derate 7.1mW/ºC above +70ºC) 0.5W

Storage Temperature .... –65ºC to +150ºC

Lead Temperature (soldering, 10s) .... +300ºC

Note:
1. 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 +5V Supply

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

Paramenter	Description	Test 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} = –30mA, V_{NO} or V_{NC} = –2.5V	25		0.5	0.9	Ohm
			Full			1.1	
On-Resistance Match Between Channels [4]	ΔR_{ON}		25		0.03	0.05	
			Full			0.10	
On-Resistance Flatness[5]	$R_{FLAT(ON)}$	V+ =5V, I_{COM} = –30mA, V_{NO} or V_{NC} =1V, –2.5V, 4V	25		0.08	0.12	
			Full			0.15	
NO or NC Off Leakage Current[6]	$I_{COM(OFF)}$ or $I_{NC(OFF)}$	V+ =5.5V, V_{COM} = 0V, V_{NO} or V_{NC} = 4.5V	25	2	0.01	2	nA
			Full	–20		20	
COM On Leakage Current[6]	$I_{COM(ON)}$	V+ =5.5V, V_{COM} = +4.5 V_{NO} or V_{NC} =+ 4.5V	25	–4		4	
			Full	–40	0.3	40	

Electrical Specifications - Single +5V Supply (continued)

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

Parameter	Symbol	Conditions	Temp(ºC)	Min.[1]	Typ.[2]	Max.[1]	Units
Logic Input							
Input High Voltage	V_{IH}	Guaranteed logic High Level	Full	2.4			V
Input Low Voltage	V_{IL}	Guaranteed logic Low Level				0.8	
Input Current with Voltage High	I_{INH}	V_{IN} = 2.4V, all others = 0.8V		−1	0.005	1	μA
Input Current with Voltage Low	I_{INL}	V_{IN} = 0.8V, all others = 2.4V		−1	0.005	1	
Dynamic							
Turn-On Time	t_{ON}	V+= 5V, V_{NO} or V_{NC} = 2.5V, Figure 1	25		20	35	ns
			Full			40	
Turn-Off Time	t_{OFF}		25		15	20	
			Full			35	
Charge Injection[3]	Q	C_L = 1nF, V_{GEN} = 0V, R_{GEN} = 0 Ohm, Figure 2	25		40		pC
Off Isolation	OIRR	R_L = 50 Ohms, f = 1MHz, Figure 3			−57		dB
Crosstalk[8]	X_{TALK}	R_L = 50 Ohms, f = 1MHz, Figure 4			−57		
NC or NO Capacitance	$C_{(OFF)}$	f = 1MHz, Figure 5			83		pF
COM Off Capacitance	$C_{COM(OFF)}$				83		
COM On Capacitance	$C_{COM(ON)}$	f = 1MHz, Figure 6			170		
Supply							
Power-Supply Range	V+		Full	1.8		5.5	V
Positve Supply Current	I+	V_{CC} = 5.5V, V_{IN} = 0V or V+			0.5	1	μA

Notes:
1. The algebraic convention, where most negative value is a minimum and 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. $\Delta R_{ON} = R_{ON}$ max. - R_{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 +25ºC.
7. Off Isolation = $20\log_{10}$ [V_{COM} / (V_{NO} or V_{NC})]. See Figure 3.
8. Between any two switches. See Figure 4.

Electrical Specifications - Single +3.3V Supply

(V+ = +3.3V ± 10%, GND = 0V, V_{INH} = 2.0V, V_{INL} = 0.6V)

Paramenter	Description	Test Conditions	Temp.(°C)	Min.[1]	Typ.[2]	Max.[1]	Units
Analog Switch							
Analog Signal Range[3]	V_{ANALOG}			0		V+	V
On Resistance	R_{ON}	V+=3V, I_{COM} = –24mA, V_{NO} or V_{NC} = 2.0V	25		1.0	1.8	Ohm
			Full			2.2	
On-Resistance Match Between Channels [4]	ΔR_{ON}	V+=3.3V, I_{COM} = –24mA, V_{NO} or V_{NC} = 0.8V, 2.0V	25		0.04	0.5	
			Full		0.11		
On-Resistance Flatness[3,5]	$R_{FLAT(ON)}$		25		0.17	0.2	
			Full		0.25		
Dynamic							
Turn-On Time	t_{ON}	V+=3.3V, V_{NO} or V_{NC} = 2.0V, Figure 1	25		30	40	ns
			Full			55	
Turn-Off Time	t_{OFF}		25		20	25	
			Full			40	
Charge Injection[3]	Q	C_L = 1nF, V_{GEN} = 0V, R_{GEN} = 0V, Figure 2	25		30		pC
Supply							
Positive Supply Current	I+	V+=3.6V, V_{IN} = 0V or V+ All channels on or off	Full		0.5	1	μA
Logic Input							
Input HIGH Voltage	V_{IH}	Guaranteed logic high level	Full	2			V
Input LOW Voltage	V_{IL}	Guaranteed logic Low level	Full			0.6	
Input HIGH Current	I_{INH}	V_{IN} =2.4V, all others = 0.8V	Full	–1		1	μA
Input HIGH Current	I_{INL}	V_{IN} =0.8V, all others =2.4V	Full	–1		1	

Notes:
1. The algebraic convention, where most negative value is a minimum and 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. $\Delta R_{ON} = R_{ON}$ max. - R_{ON} min.
5. Flatness is defined as the difference between the maximum and minimum value of On-resistance measured.

Electrical Specifications - Single +2.5V Supply

(V+ = +2.5V ± 10%, GND = 0V, V_{INH} = 1.8V, V_{INL} = 0.6V)

Paramenter	Description	Test Conditions	Temp.(°C)	Min.[1]	Typ.[2]	Max.[1]	Units
Analog Switch							
Analog Signal Range[3]	V_{ANALOG}			0		V+	V
On Resistance	R_{ON}	V+=2.5V, I_{COM} = −8mA, V_{NO} or V_{NC} = 1.8V	25		1.5	2	Ohm
			Full			2.7	
On-Resistance Match Between Channels [4]	ΔR_{ON}	V+=2.5V, I_{COM} = −8mA, V_{NO} or V_{NC} = 0.8V,1.8V	25		0.13	0.16	
			Full		0.2		
On-Resistance Flatness[3,5]	$R_{FLAT(ON)}$		25		0.25	0.3	
			Full		0.45		
Dynamic							
Turn-On Time	t_{ON}	V+=2.5V, V_{NO} or V_{NC} = 1.8V, Figure 1	25		40	55	ns
			Full			70	
Turn-Off Time	t_{OFF}		25		30	40	
			Full			55	
Charge Injection[3]	Q	C_L = 1nF, V_{GEN} = 0V, R_{GEN} = 0V, Figure 2	25		20		pC
Supply							
Positive Supply Current	I+	V+=2.75V, V_{IN} = 0V or V+ All channels on or off	Full		0.5	1	μA
Logic Input							
Input HIGH Voltage	V_{IH}	Guaranteed logic high level	Full	1.8			V
Input LOW Voltage	V_{IL}	Guaranteed logic Low level	Full			0.6	
Input HIGH Current	I_{INH}	V_{IN} =2.0V, all others = 0.8V	Full	−1		1	μA
Input HIGH Current	I_{INL}	V_{IN} =0.8V, all others =2.0V	Full	−1		1	

Notes:
1. The algebraic convention, where most negative value is a minimum and 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} = R_{ON} max. - R_{ON} min.
5. Flatness is defined as the difference between the maximum and minimum value of On-resistance measured.

Electrical Specifications - Single +1.8V Supply

(V+ = +1.8V ± 10%, GND = 0V, V_{INH} = 1.5V, V_{INL} = 0.6V)

Paramenter	Description	Test Conditions	Temp.(°C)	Min.[1]	Typ.[2]	Max.[1]	Units
Analog Switch							
Analog Signal Range[3]	V_{ANALOG}			0		V+	V
On Resistance	R_{ON}	V+=1.8V, I_{COM} = −2mA, V_{NO} or V_{NC} = 1.5V	25		2.0	4	Ohm
			Full			5	
On-Resistance Match Between Channels [4]	ΔR_{ON}	V+=1.8V, I_{COM} = −2mA, V_{NO} or V_{NC} = 0.6V,1.5V	25		0.44	0.6	
			Full		0.7		
On-Resistance Flatness[3,5]	$R_{FLAT(ON)}$		25		0.5	0.6	
			Full		0.9		
Dynamic							
Turn-On Time	t_{ON}	V+=1.8V, V_{NO} or V_{NC} = 1.5V, Figure 1	25		65	70	ns
			Full			95	
Turn-Off Time	t_{OFF}		25		40	55	
			Full			70	
Charge Injection[3]	Q	C_L = 1nF, V_{GEN} = 0V, R_{GEN} = 0V, Figure 2	25		10		pC
Supply							
Positive Supply Current	I+	V+=2.0V, V_{IN} = 0V or V+ All channels on or off	Full		0.5	1	µA
Logic Input							
Input HIGH Voltage	V_{IH}	Guaranteed logic high level	Full	1.5			V
Input LOW Voltage	V_{IL}	Guaranteed logic Low level	Full			0.6	
Input HIGH Current	I_{INH}	V_{IN} =1.5V, all others = 0.8V	Full	−1		1	µA
Input HIGH Current	I_{INL}	V_{IN} =0.8V, all others =1.5V	Full	−1		1	

Notes:

1. The algebraic convention, where most negative value is a minimum and 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} = R_{ON} max. - R_{ON} min.
5. Flatness is defined as the difference between the maximum and minimum value of On-resistance measured.
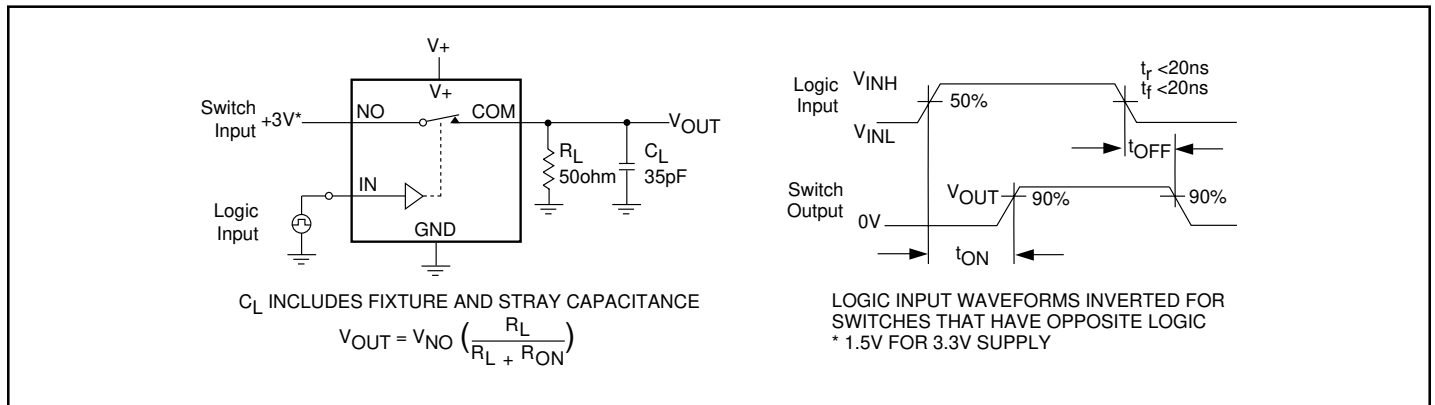
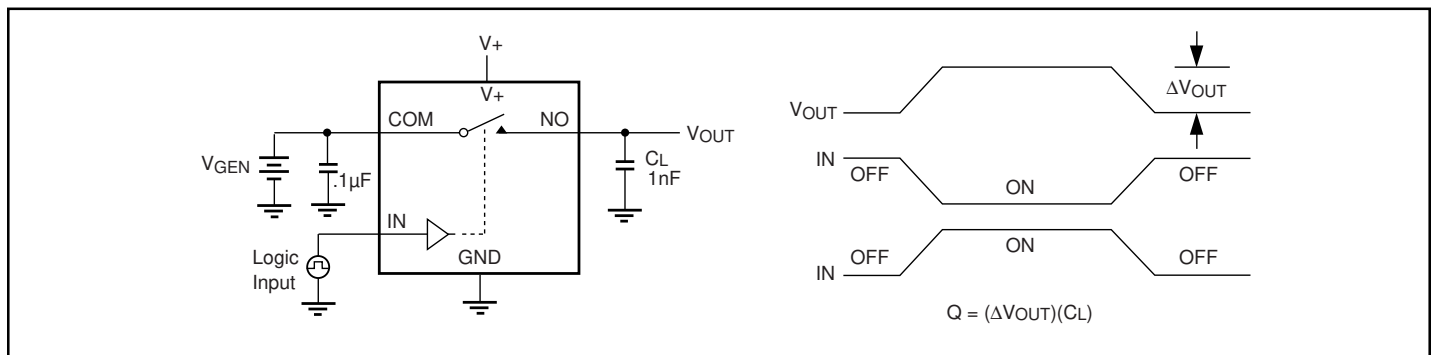## Test Circuits/Timing Diagrams

Figure 1. Switching Time

C_L INCLUDES FIXTURE AND STRAY CAPACITANCE

$$V_{OUT} = V_{NO} \left(\frac{R_L}{R_L + R_{ON}} \right)$$

LOGIC INPUT WAVEFORMS INVERTED FOR
SWITCHES THAT HAVE OPPOSITE LOGIC
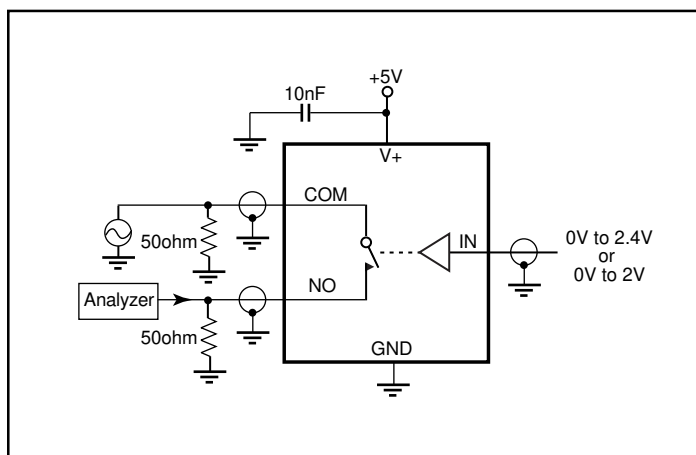* 1.5V FOR 3.3V SUPPLY

Figure 2. Charge Injection

$$Q = (\Delta V_{OUT})(C_L)$$
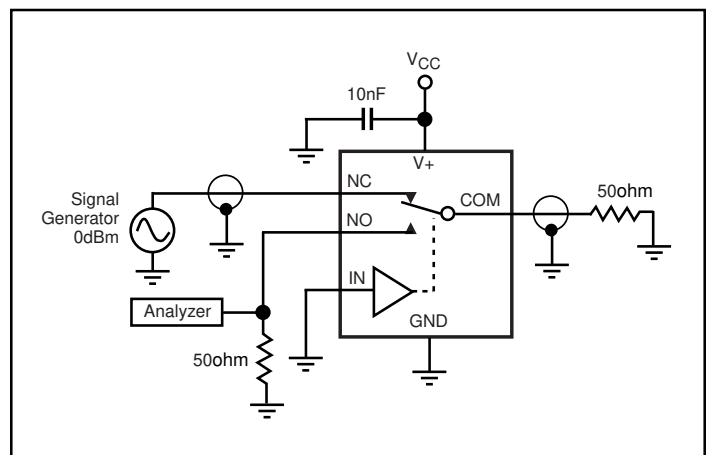

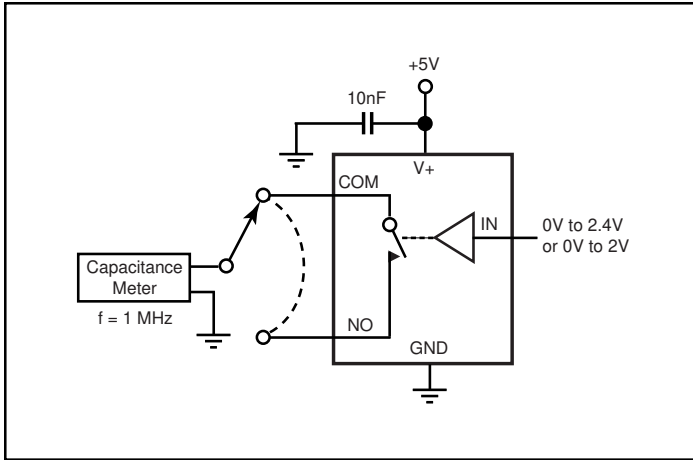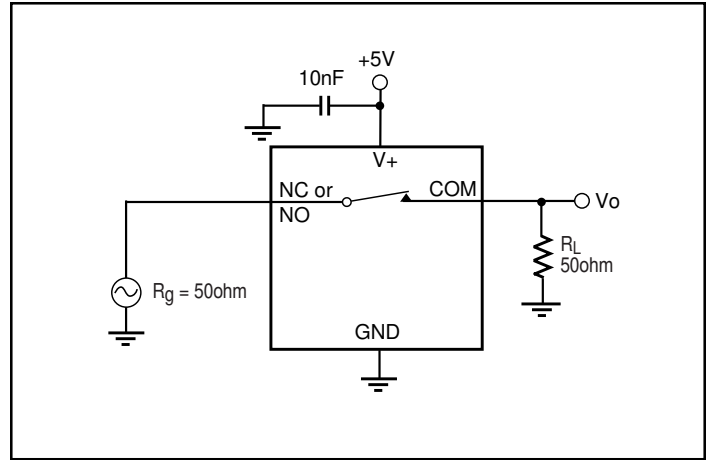**Figure 3. Off Isolation/On-Channel Bandwidth**

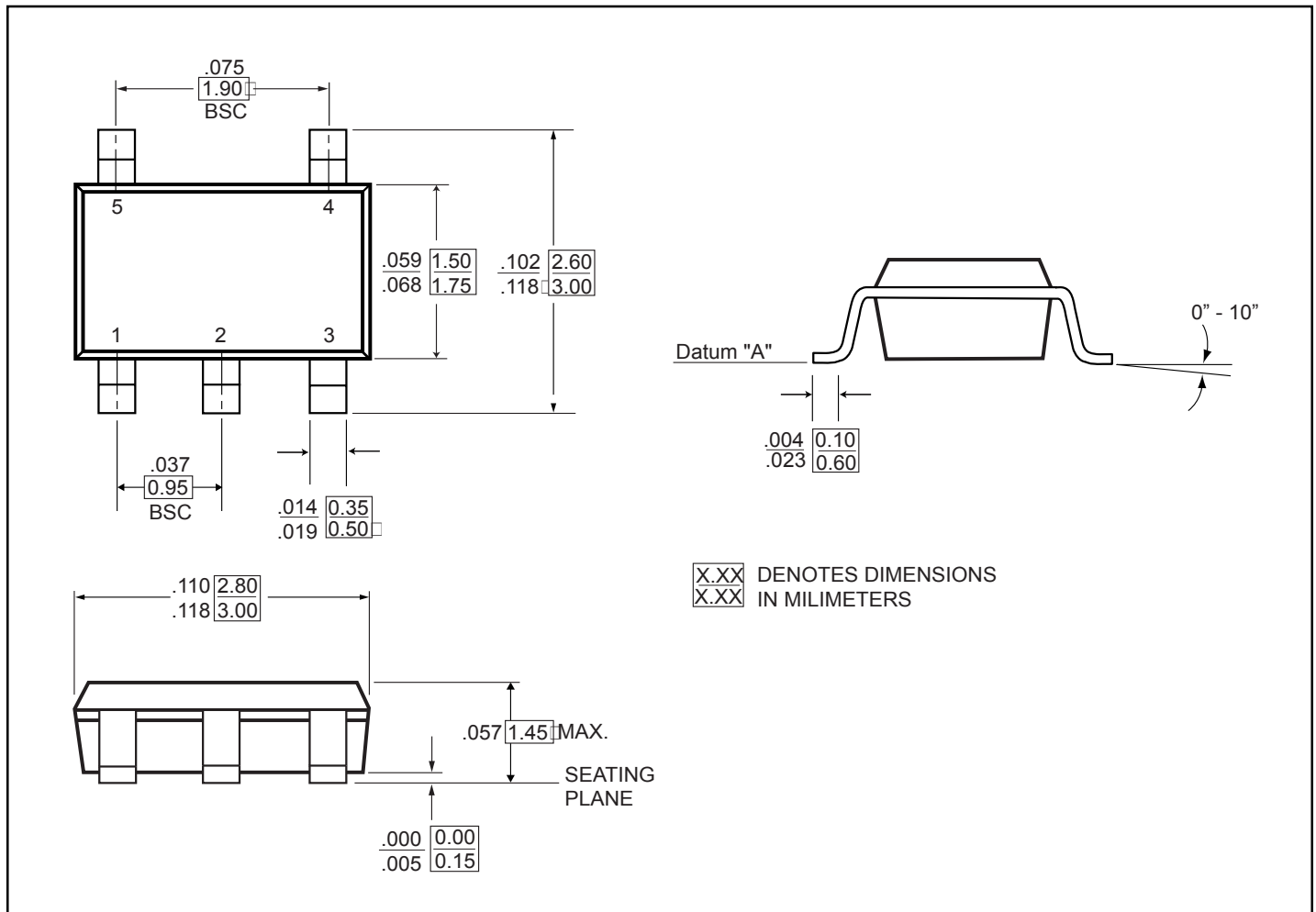**Figure 4. Crosstalk**

Test Circuits/Timing Diagrams (continued)

Figure 5. Channel On/Off Capacitance

Figure 6. Bandwidth

Packaging Mechanical: 5-Pin SOT-23 (T)

.075
1.90
BSC

5   4

.059 1.50   .102 2.60
.068 1.75   .118 3.00

1   2   3

.037
0.95
BSC

.014 0.35
.019 0.50

.110 2.80
.118 3.00

.057 1.45 MAX.

SEATING
PLANE

.000 0.00
.005 0.15

Datum "A"

0" - 10"

.004 0.10
.023 0.60

X.XX   DENOTES DIMENSIONS
X.XX   IN MILIMETERS

Ordering Information

Ordering Code	Package Code	Package Description	Top Marking
PI5A4626TX	T	5-pin SOT-23	ZI
PI5A4629TX	T	5-pin SOT-23	ZH

Notes:

1. Thermal characteristics can be found on the company web site at www.pericom.com/packaging/
2. X = Tape and reel
3. Number of transistors: 604 (both devices)