



AOS
SEMICONDUCTOR

产品规格说明书

Product Data Sheet

AOS2057Xx

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电源管理IC



通信接口芯片



二三极管



LDO稳压器



逻辑器件



MOSFETs



运算放大器



显示驱动



MCU单片机



光电器件



4.5 Low Voltage SPDT Analog Switch

DESCRIPTIONS

The AOS2057 is a single-pole double-throw (SPDT) analog switch that is designed to operate from 1.8 V to 5.5 V.

The AOS2057 device can handle both analog and digital signals. It features high-bandwidth (300MHz) and low on-resistance (4.5 TYP).

Applications include signal gating, chopping, modulation or demodulation (modem), and signal multiplexing for analog-to-digital and digital-to-analog conversion systems.

FEATURES

- High Bandwidth: 300MHz
- ★ High Speed, Typically 30ns
- ★ Supply Range: +1.8V to +5.5V
- ★ Low ON-State Resistance, 4.5 (TYP)
- ★ Low Power Consumption: 650μA /op amp
- ★ Rail-to-Rail Operation
- ★ TTL/CMOS Compatible
- ★ Extended Industrial Temperature Range: -40°C to +125°C
- ★ MicroSIZE PACKAGES: SOT363 (SC70-6), SOT23-6

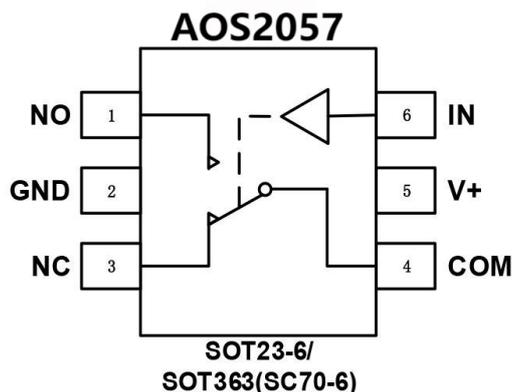
APPLICATIONS

- Wearable Devices
- Battery-Operated Equipment
- ★ Signal Gating, Chopping, Modulation or Demodulation (Modem)
- ★ Portable Computing
- ★ Cell Phones

FUNCTION TABLE

LOGIC	NO	NC
0	OFF	ON
1	ON	OFF

PIN CONFIGURATIONS



NOTE: NO, NC and COM terminals may be an input or output

PIN DESCRIPTION

NAME	PIN	FUNCTION
NO	1	Normally-Open Terminal
GND	2	Ground
NC	3	Normally-Closed Terminal
COM	4	Common Terminal
V+	5	Power Supply
IN	6	Digital Control Pin



ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

V+, IN to GND.....	-0.3V to 7.0V
Analog, Digital Voltage Range ⁽²⁾	- 0.3 to (V+) + 0.3V
Continuous Current NO, NC, or COM.....	±300mA
Peak Current NO, NC, or COM.....	±500mA
Storage Temperature	-65°C to +150°C
Operating Temperature	-40°C to +125°C
Junction Temperature.....	150°C
Package Thermal Resistance @ T _A = +25°C	
SOT23-5, SOT23-6.....	200°C/W
MSOP-10, SOIC-8 ,TSSOP-8.....	150°C/W
SOIC-14, TSSOP-14.....	100°C/W
Lead Temperature (Soldering, 10s)	260°C
ESD Susceptibility	
HBM	1000V
MM	100V



ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

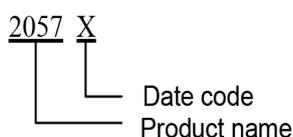
- (1) Stresses above these ratings may cause permanent damage. Exposure to absolute maximum conditions for extended periods may degrade device reliability. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those specified is not implied.
- (2) Input terminals are diode-clamped to the power-supply rails. Input signals that can swing more than 0.3V beyond the supply rails should be current-limited to 10mA or less.

PACKAGE/ORDERING INFORMATION

PRODUCT	ORDERING NUMBER	TEMPRANGE	PACKAGE	PACKAGE MARKING	TRANSPORT MEDIA, QUANTITY
AOS2057	AOS2057XC6	-40 ~125	SOT363 (SC70-6)	2057X	Tape and Reel , 3000
	AOS2057XH	-40 ~125	SOT23-6	2057	Tape and Reel , 3000

NOTE: X = Date Code

MARKING INFORMATION





ELECTRICAL CHARACTERISTICS

V₊ = 5.0V, T_A = -40°C to 125°C (unless otherwise noted)

PARAMETER	SYMBOL	CONDITIONS	V ₊	T _A	MIN	TYP	MAX	UNITS
ANALOG SWITCH								
Analog Signal Range	V _{NO} , V _{NC} , V _{COM}			FULL	0		V ₊	V
On-Resistance	R _{ON}	V _{NO} or V _{NC} = V ₊ /2, I _{COM} = -10mA, Switch ON, See Figure 1	5V	+25		4.5	8	
				FULL			8.5	
			3.3V	+25		7	10	
				FULL			10.5	
On-Resistance Match Between Channels	R _{ON}	V _{NO} or V _{NC} = V ₊ /2, I _{COM} = -10mA, Switch ON, See Figure 1	5V	+25		0.15	0.3	
				FULL			0.4	
			3.3V	+25		0.15	0.3	
				FULL			0.4	
On-Resistance Flatness	R _{FLAT(ON)}	0 (V _{NO} or V _{NC}) V ₊ /2, I _{COM} = -10mA, Switch ON, See Figure 1	5V	+25		2	3	
				FULL			3.3	
			3.3V	+25		3	4	
				FULL			4.3	
NC, NOOFF Leakage Current	I _{NC(OFF)} , I _{NO(OFF)}	V _{NO} or V _{NC} = 0.3V, V ₊ /2V _{COM} = V ₊ /2, 0.3V See Figure 2	1.8 to 5.5V	FULL			1	μA
NC, NO, COMON Leakage Current	I _{NC(ON)} , I _{NO(ON)} , I _{COM(ON)}	V _{NO} or V _{NC} = 0.3V, Open V _{COM} = Open, 0.3V See Figure 2	1.8 to 5.5V	FULL			1	μA
DIGITAL CONTROL INPUTS⁽¹⁾								
Input High Voltage	V _{INH}		5V	FULL	1.5			V
			3.3V	FULL	1			V
Input Low Voltage	V _{INL}		5V	FULL			0.6	V
			3.3V	FULL			0.5	V
Input Leakage Current	I _{IN}	V _{IN} = V _{IO} or 0	1.8 to 5.5V	FULL			1	μA

(1) All unused digital inputs of the device must be held at V_{IO} or GND to ensure proper device operation.



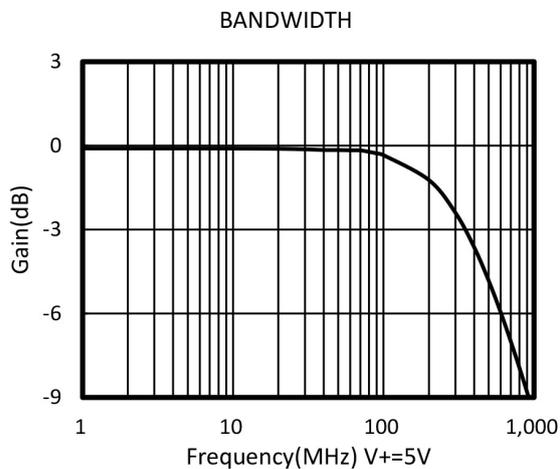
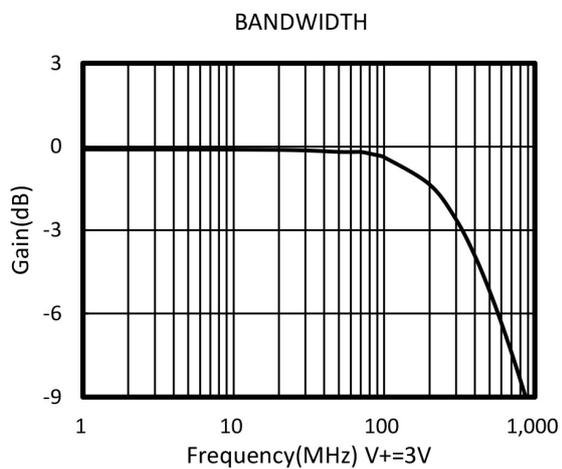
ELECTRICAL CHARACTERISTICS(continued)

V+ = 5.0V, TEMP= - 40°C to 125°C (unless otherwise noted))

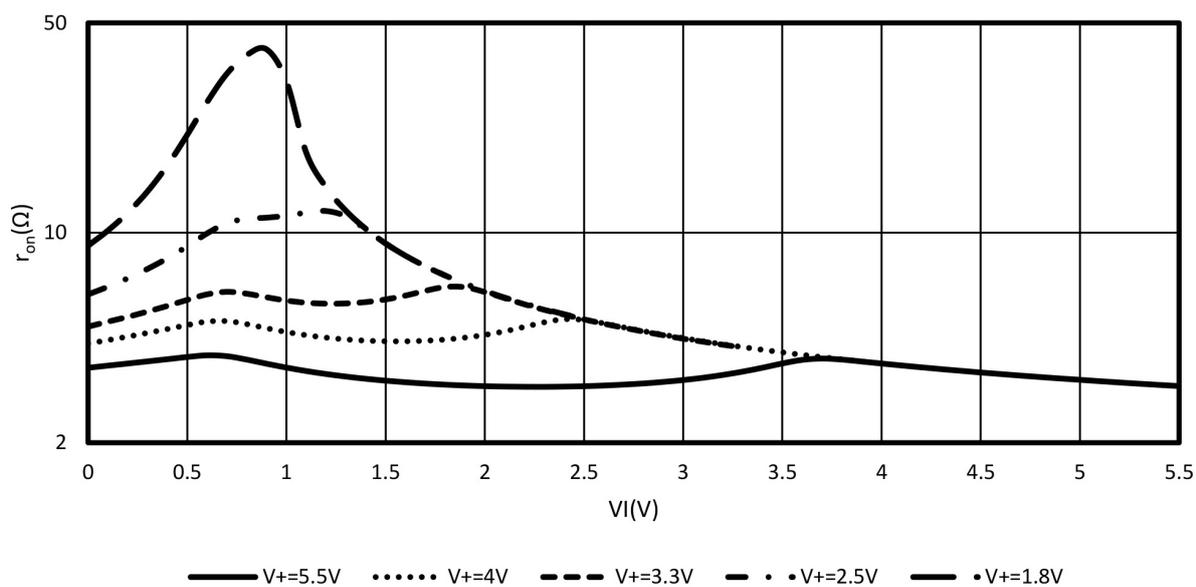
PARAMETER	SYMBOL	CONDITIONS	V+	TEMP	MIN	TYP	MAX	UNITS
DYNAMIC CHARACTERISTICS								
Turn-On Time	t _{ON}	V _{COM} = V+, R _L = 300 Ω, C _L = 35pF, See Figure 5	5V	+25		30		ns
			3.3V			30		
Turn-Off Time	t _{OFF}	V _{COM} = V+, R _L = 300 Ω, C _L = 35pF, See Figure 5	5V	+25		25		ns
			3.3V			40		
Break-Before-Make Time Delay	t _{BBM}	V _{NO1} =V _{NC1} = V _{NO2} =V _{NC2} = 3V, R _L = 300 Ω, C _L = 35pF, See Figure 6	5V	+25		5		ns
			3.3V			8		
Off Isolation	O _{ISO}	R _L = 50 Ω, Switch OFF, See Figure 8		+25		-52		dB
					f = 1MHz		-71	
-3dB Bandwidth	BW	Switch ON, R _L = 50 Ω See Figure 7		+25		300		MHz
NC, NOOFF Capacitance	C _{NC(OFF)} , C _{NO(OFF)}	V _{NC} or V _{NO} =V+/2 or GND, Switch OFF See Figure 4		+25		5		pF
NC, NO, COMON Capacitance	C _{NC(ON)} , C _{NO(ON)} , C _{COM(ON)}	V _{NC} or V _{NO} =V+/2 or GND, Switch ON See Figure 4		+25		15		pF
POWER REQUIREMENTS								
Power Supply Range	V+			FULL	1.8		5.5	V
Power Supply Current	I+	V _{IN} = GND or V+	5.5V	FULL			1	μA



TYPICAL CHARACTERISTICS



Typical r_{on} as a Function of Input Voltage (V_I) for $V_I = 0$ to V_+





Parameter Measurement Information

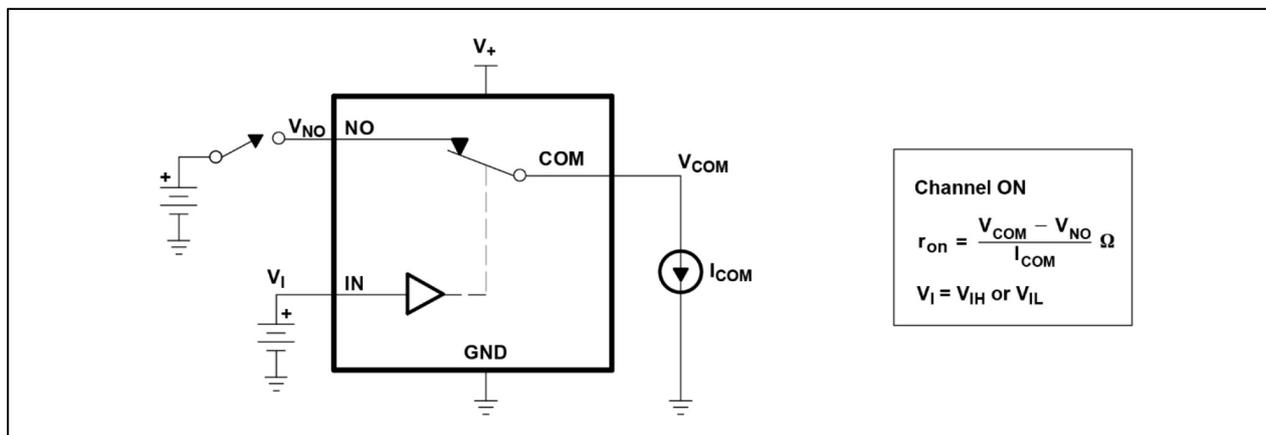


Figure 1.ON-State Resistance (r_{on})

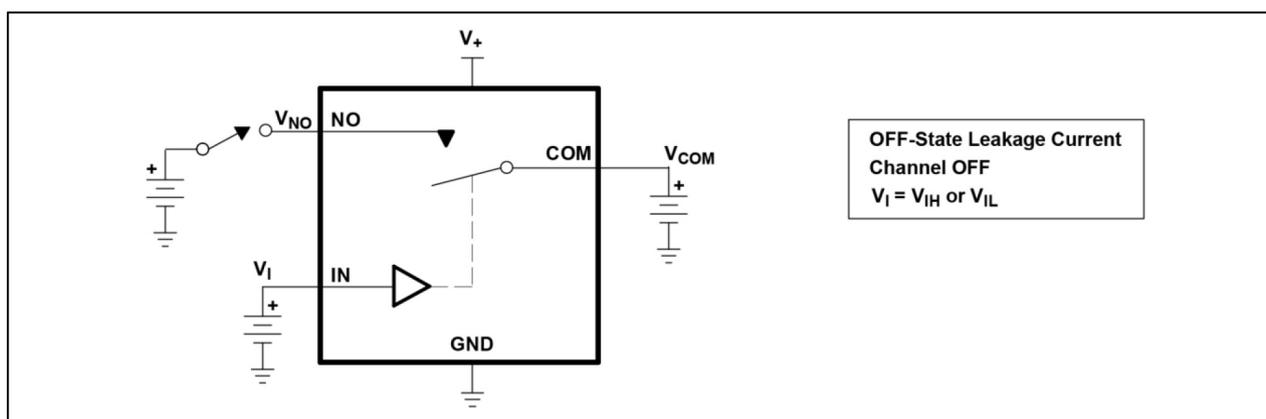


Figure 2.OFF-State Leakage Current ($I_{COM(OFF)}$, $I_{NO(OFF)}$)

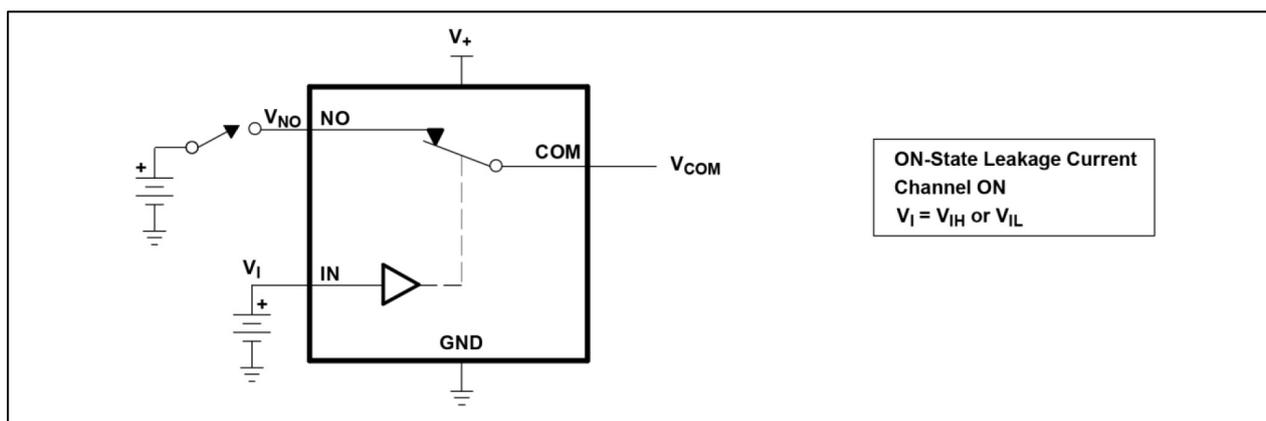


Figure 3.ON-State Leakage Current ($I_{COM(ON)}$, $I_{NO(ON)}$)

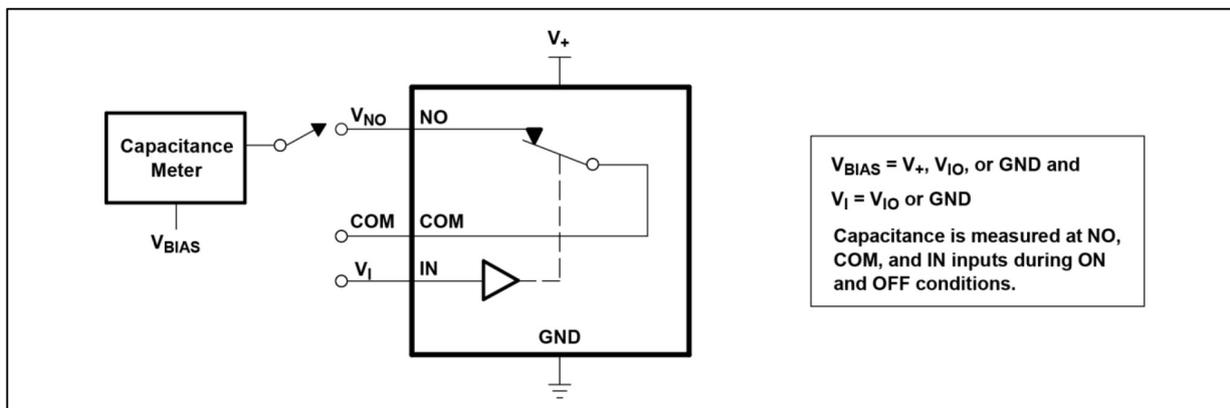


Figure 4. Capacitance (C_I , $C_{COM(OFF)}$, $C_{COM(ON)}$, $C_{NO(OFF)}$, $C_{NO(ON)}$)

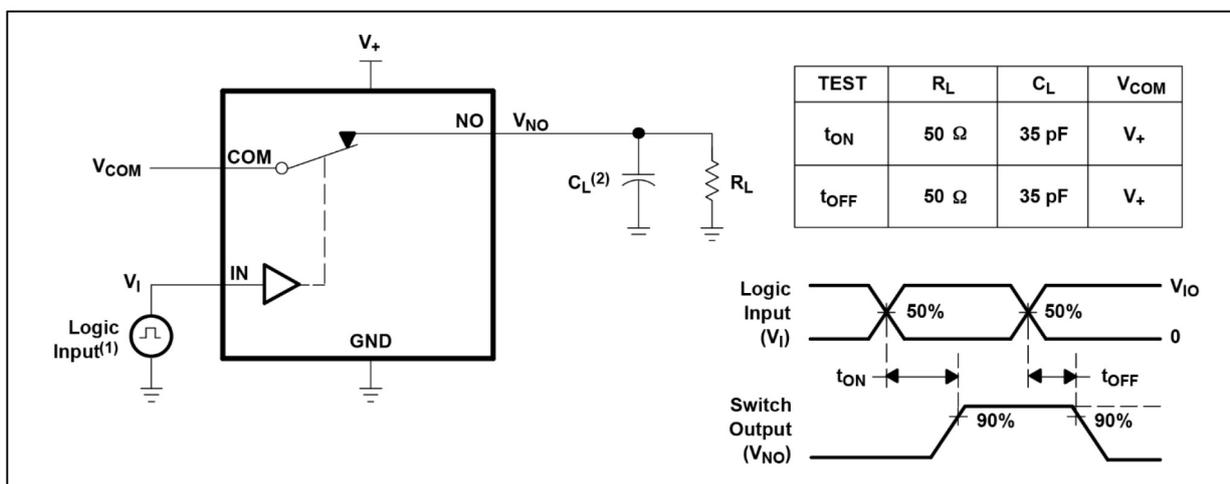


Figure 5. Turn-On (t_{ON}) and Turn-Off Time (t_{OFF})

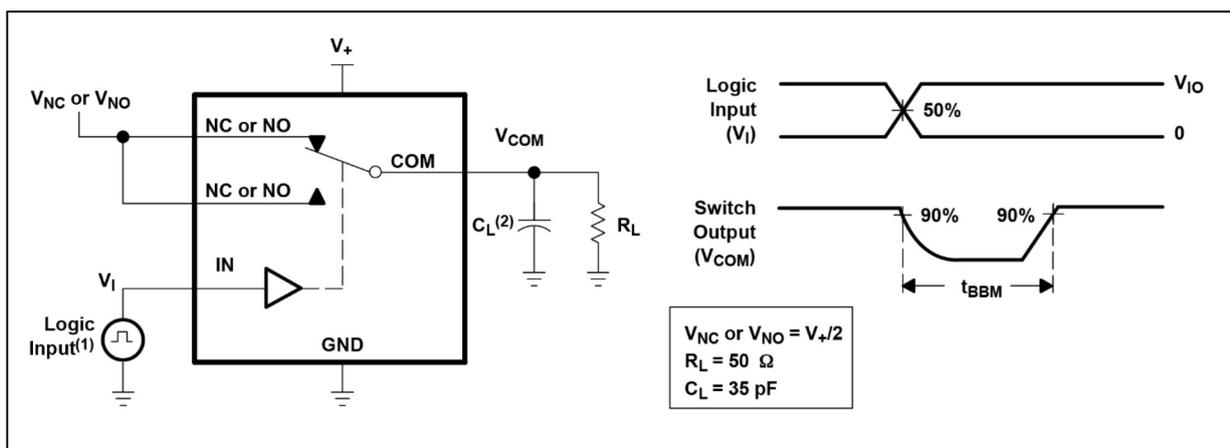


Figure 6. Break-Before-Make Time (t_{BBM})

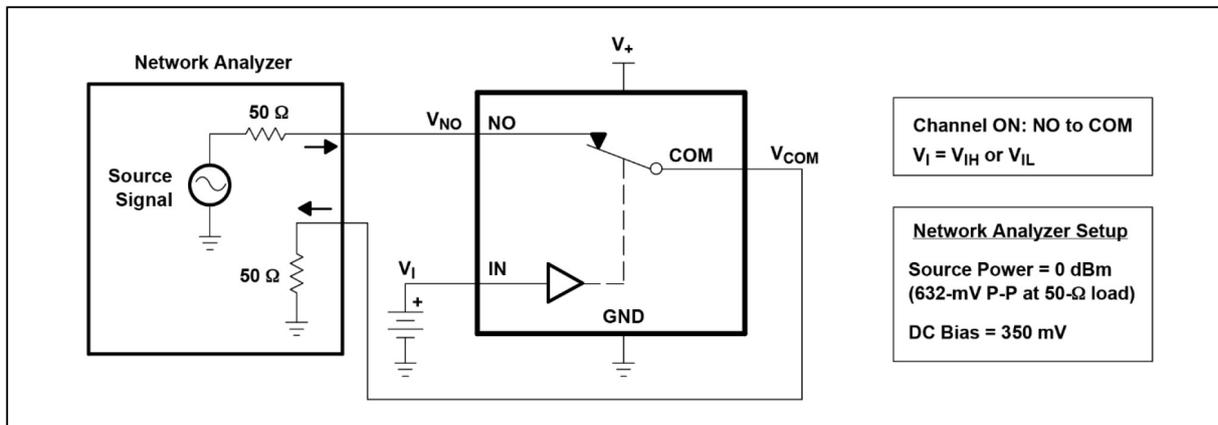


Figure 7. Bandwidth (BW)

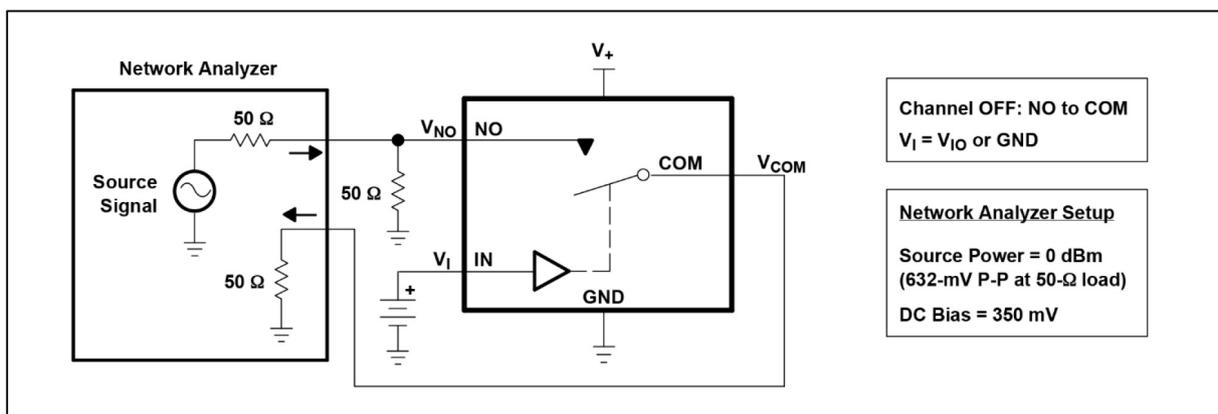


Figure 8. OFF Isolation (O_{ISO})

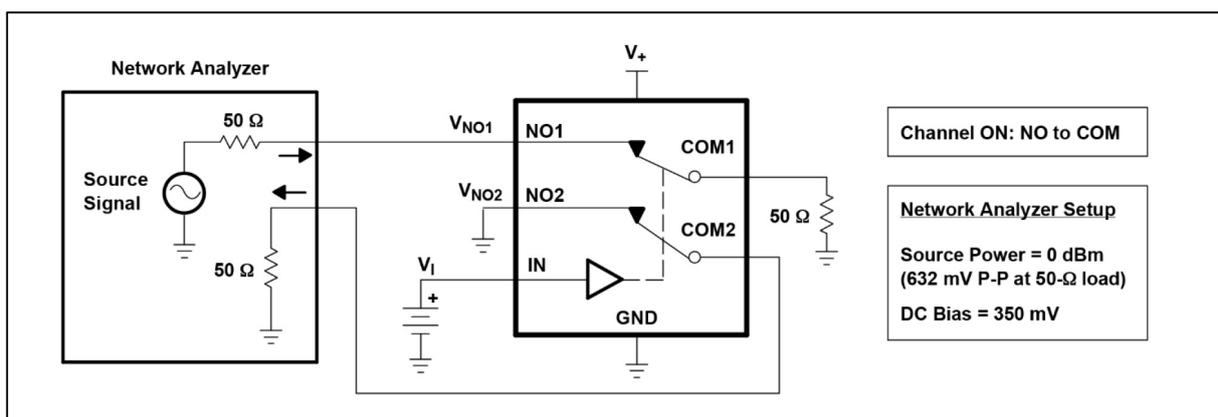


Figure 9. Crosstalk (X_{TALK})

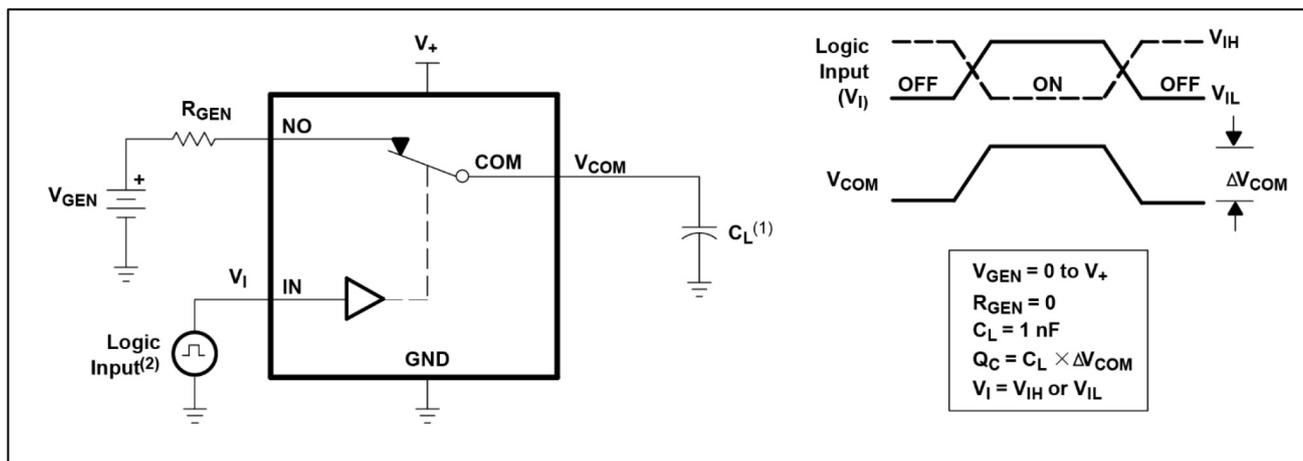


Figure 10. Charge Injection (Q_C)

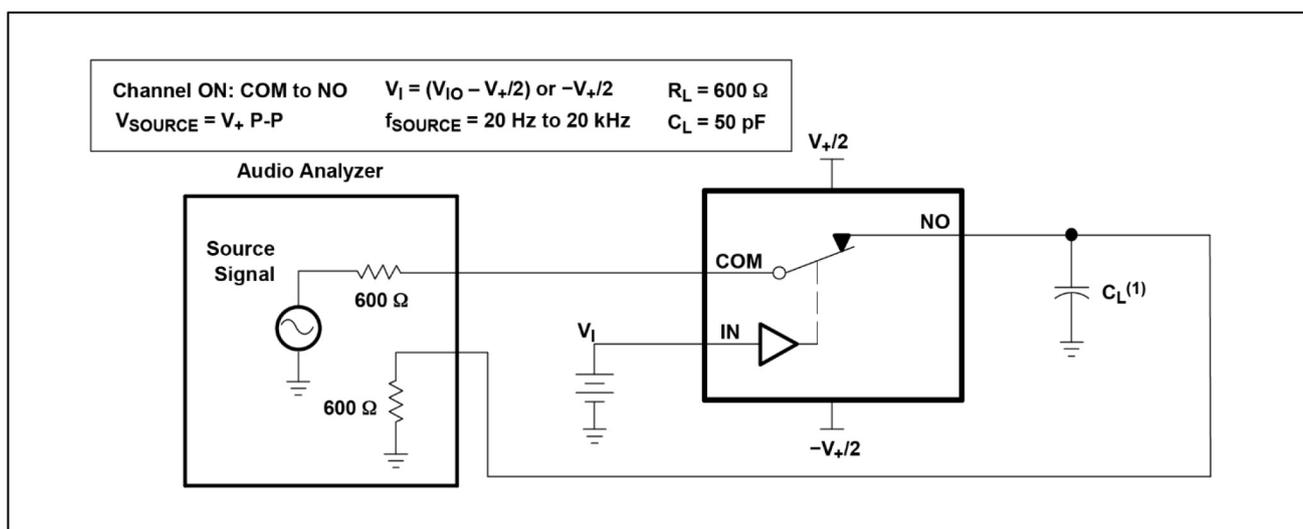
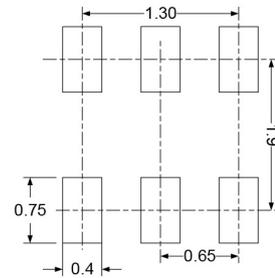
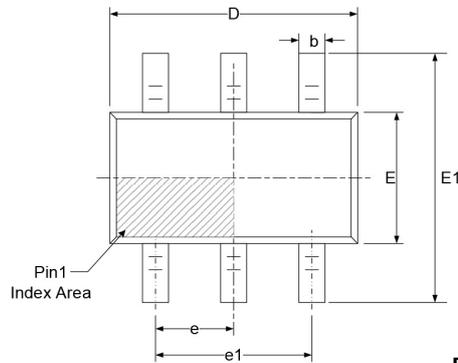


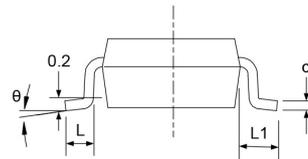
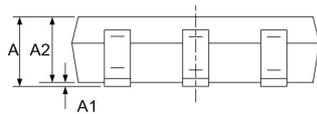
Figure 11. Total Harmonic Distortion (THD)



PACKAGE OUTLINE DIMENSIONS
SOT363(SC70-6)



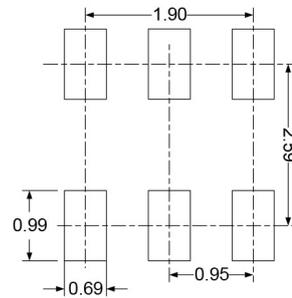
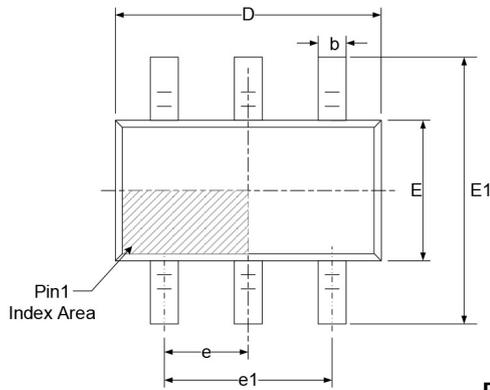
RECOMMENDED LAND PATTERN (Unit: mm)



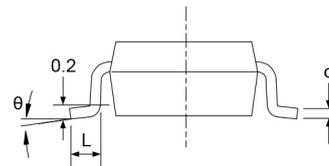
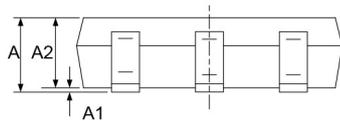
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650(BSC)		0.026(BSC)	
e1	1.300(BSC)		0.051(BSC)	
L	0.260	0.460	0.010	0.018
L1	0.525		0.021	
	0°	8°	0°	8°



SOT23-6



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 (BSC)		0.037 (BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
	0°	8°	0°	8°