DESCRIPTION

The A4759 is a single-pole double-throw (SPDT) analog switch that is designed to operate from 1.8V to 5.5V.

The A4759 can handle both analog and digital signals and offers a low on-resistance (4.5Ω TYP) and excellent ON-state resistance matching, with the break-before-make feature to prevent signal distortion during the transferring of a signal from one channel to another. The A4759 has excellent total harmonic distortion (THD) performance and consumes very low power, these features make A4759 suitable for portable audio applications.

The A4759 is available in SOT-26 and SC70-6 packages.

ORDERING INFORMATION

Package Type	Part Number	
SOT-26 SPQ: 3,000pcs/Reel	E6	A4759E6R
		A4759E6VR
SC70-6 SPQ: 3,000pcs/Reel	C6	A4759C6R
		A4759C6VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

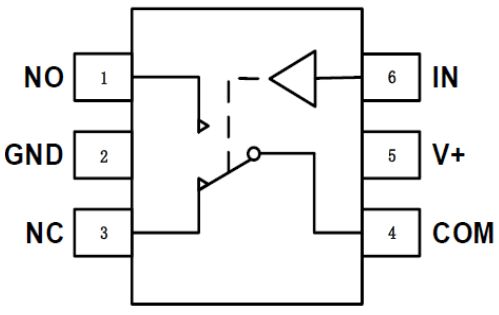
FEATURES

- Supply Range: +1.8V to +5.5V
- Low ON-State Resistance, 4.5Ω(TYP)
- High Bandwidth: 300MHz
- High Speed, Typically 30ns
- Break-Before-Make Switching
- Rail-to-Rail Operation
- TTL/CMOS Compatible
- Extended Industrial Temperature Range: -40°C to +125°C
- Available in SOT-26 and SC70-6 packages

APPLICATION

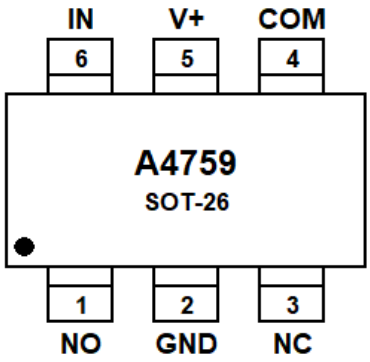
- Mobile Phones
- Portable Instrumentation
- Consumer and Computing
- Battery-Operated Equipment
- Signal Gating, Chopping, Modulation or Demodulation (Modem)

TYPICAL APPLICATION

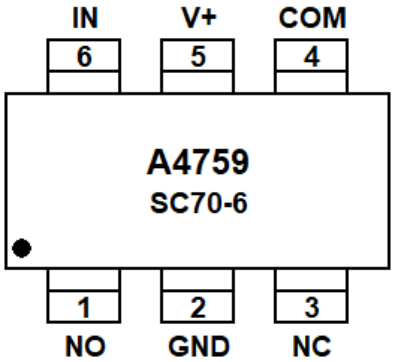


NOTE: NO, NC and COM terminals may be an input or output

PIN DESCRIPTION



Top View



Top View

Pin #		Symbol	Function
SOT-26	SC70-6		
1	1	NO	Normally-Open Terminal
2	2	GND	Ground
3	3	NC	Normally-Closed Terminal
4	4	COM	Common Terminal
5	5	V+	Power Supply
6	6	IN	Digital Control Pin

FUNCTION TABLE

LOGIC	NO	NC
0	OFF	ON
1	ON	OFF

ABSOLUTE MAXIMUM RATINGS

V+, IN to GND		-0.3V ~ 6.0V
Analog, Digital Voltage Range[NOTE1]		-0.3 ~ (V+) + 0.3V
Continuous Current NO, NC, or COM		±300mA
Peak Current NO, NC, or COM		±500mA
Storage Temperature		-65℃ ~ +150℃
Operating Temperature		-40°C ~ +125°C
Junction Temperature		150℃
Package Thermal Resistance @ T_A = +25°C	SOT-26	200℃/W
	SC70-6	250℃/W
Lead Temperature (Soldering, 10s)		260℃
ESD Susceptibility	HBM	1000V
	MM	100V

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: 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.

ELECTRICAL CHARACTERISTICS

V+ = 5.0 V, T_A= –40°C to 125°C, unless otherwise noted

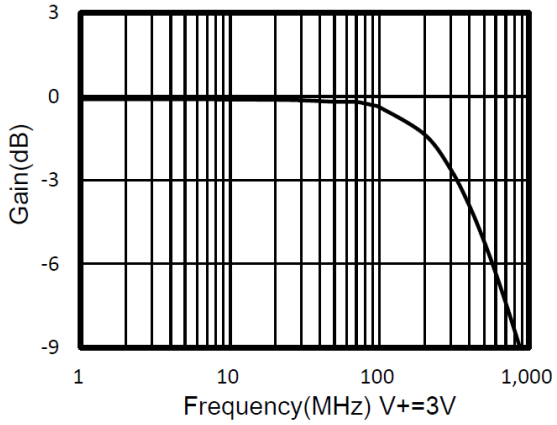
Parameter	Symbol	Conditions	V+	T_A	Min	Typ	Max	Unit
Analog Switch								
Analog Signal Range	V_{NO}, V_{NC}, V_{COM}			-40°C to 125°C	0	-	V+	V
On-Resistance	R_{ON}	V_{NO} or V_{NC} = V+/2, I_{COM} = -10mA, Switch ON, See Figure 1	5V	+25℃	-	4.5	8	Ω
				-40°C to 125°C	-	-	8.5	
			3.3V	+25℃	-	7	10	Ω
				-40°C to 125°C	-	-	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	Ω
				-40°C to 125°C	-	-	0.4	
			3.3V	+25℃	-	0.15	0.3	Ω
				-40°C to 125°C	-	-	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	Ω
				-40°C to 125°C	-	-	3.3	
			3.3V	+25℃	-	3	4	Ω
				-40°C to 125°C	-	-	4.3	
NC,NO OFF Leakage Current	$I_{NC(OFF)}$, $I_{NO(OFF)}$	V_{NO} or V_{NC} = 0.3V, V+/2 V_{COM} = V+/2, 0.3V See Figure 2	1.8 to 5.5V	-40°C to 125°C	-	-	1	μA
NC,NO,COM ON 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	-40°C to 125°C	-	-	1	μA
Digital Control Inputs[NOTE2]								
Input High Voltage	V_{INH}		5V	-40°C to 125°C	1.5	-	-	V
			3.3V		1.3	-	-	
Input Low Voltage	V_{INL}		5V	-40°C to 125°C	-	-	0.6	V
			3.3V		-	-	0.5	
Input Leakage Current	I_{IN}	V_{IN} = V_{IO} or 0	1.8 to 5.5V	-40°C to 125°C	-	-	1	μA

Parameter	Symbol	Conditions	V+	T_A	Min	Typ	Max	Unit
DYNAMIC CHARACTERISTICS								
Turn-On Time	t_{ON}	V_{COM} = V+, R_L = 300Ω, C_L = 35pF, See Figure 5	5V	+25℃	-	30	-	ns
			3.3V		-	40	-	
Turn-Off Time	t_{OFF}	V_{COM} = V+, R_L = 300Ω, C_L = 35pF, See Figure 5	5V	+25℃	-	25	-	ns
			3.3V		-	30	-	
Break-Before-Make Time Delay	t_{BBM}	V_{NO1}=V_{NC1}=V_{NO2}=V_{NC2}=3V, R_L = 300Ω, C_L = 35pF, See Figure 6	5V	+25℃	-	5	-	ns
			3.3V		-	8	-	
Off Isolation	O_{ISO}	R_L = 50Ω, Switch OFF, See Figure 8, f = 10MHz		+25℃	-	-52	-	dB
		R_L = 50Ω, Switch OFF, See Figure 8, f = 1MHz		+25℃	-	-71	-	dB
-3dB Bandwidth	BW	Switch ON, R_L = 50Ω See Figure 7		+25℃	-	300	-	MHz
NC,NO OFF 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,COM ON 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+			-40°C to 125°C	1.8	-	5.5	V
Power Supply Current	I+	V_{IN} = GND or V+	5.5V	-40°C to 125°C	-	-	1	μA

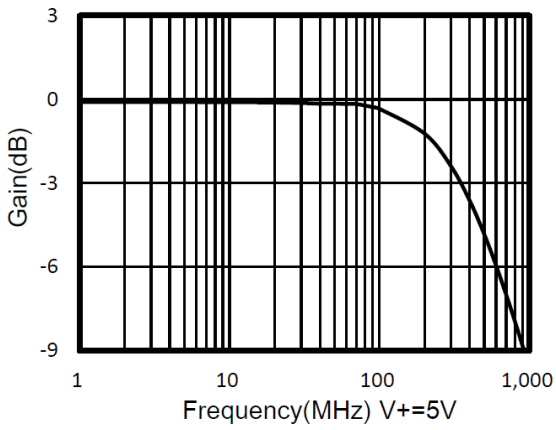
NOTE2: All unused digital inputs of the device must be held at VIO or GND to ensure proper device operation.

TYPICAL PERFORMANCE CHARACTERISTICS

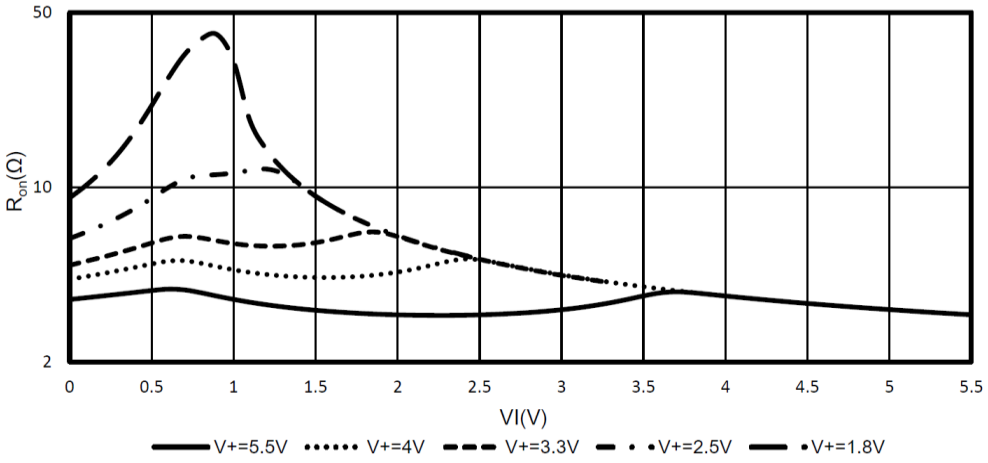
1. BANDWIDTH



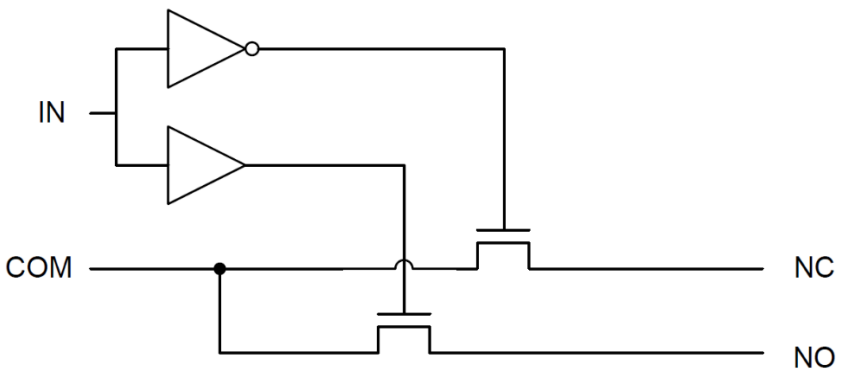
2. BANDWIDTH



3. Typical R_{on} as a Function of Input Voltage (VI) for VI = 0 to V+

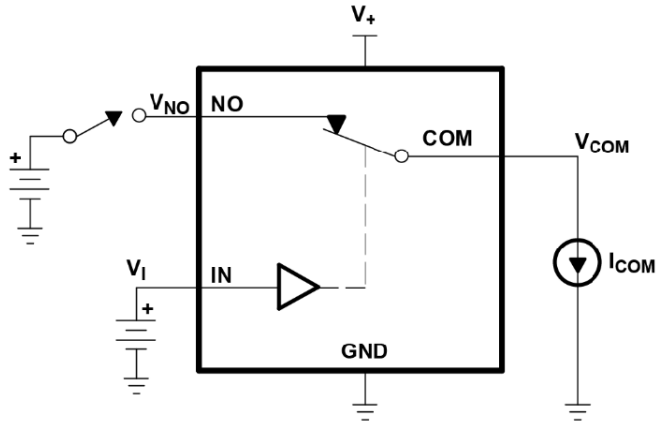


BLOCK DIAGRAM



Parameter Measurement Information

Figure 1. ON-State Resistance (R_{ON})

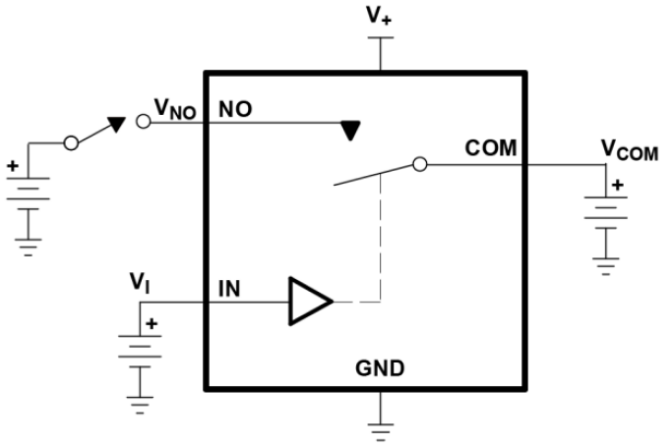


Channel ON

$$r_{on} = \frac{V_{COM} - V_{NO}}{I_{COM}} \Omega$$

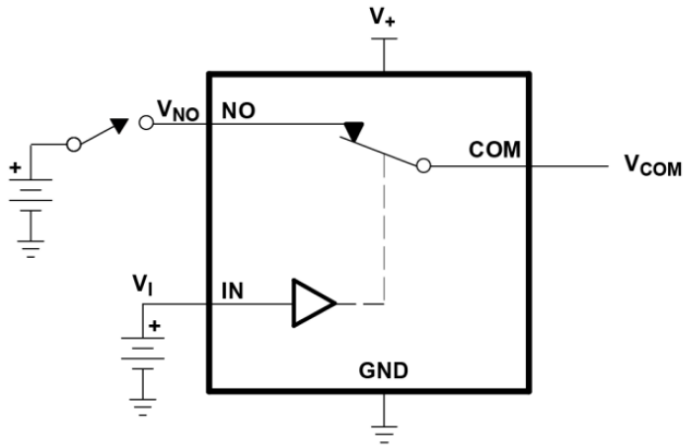
$V_I = V_{IH}$ or V_{IL}

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



OFF-State Leakage Current
Channel OFF
$V_I = V_{IH}$ or V_{IL}

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



ON-State Leakage Current
Channel ON
$V_I = V_{IH}$ or V_{IL}

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

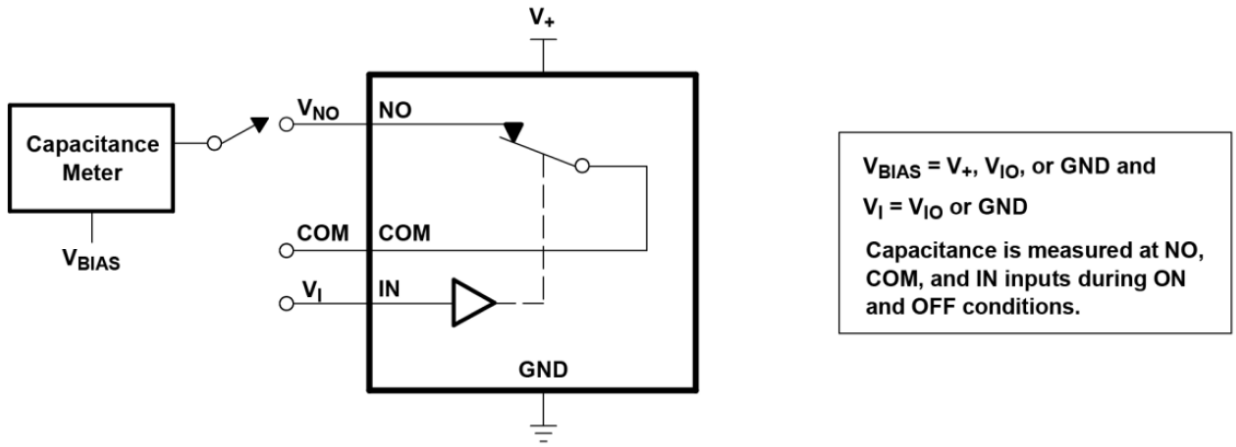
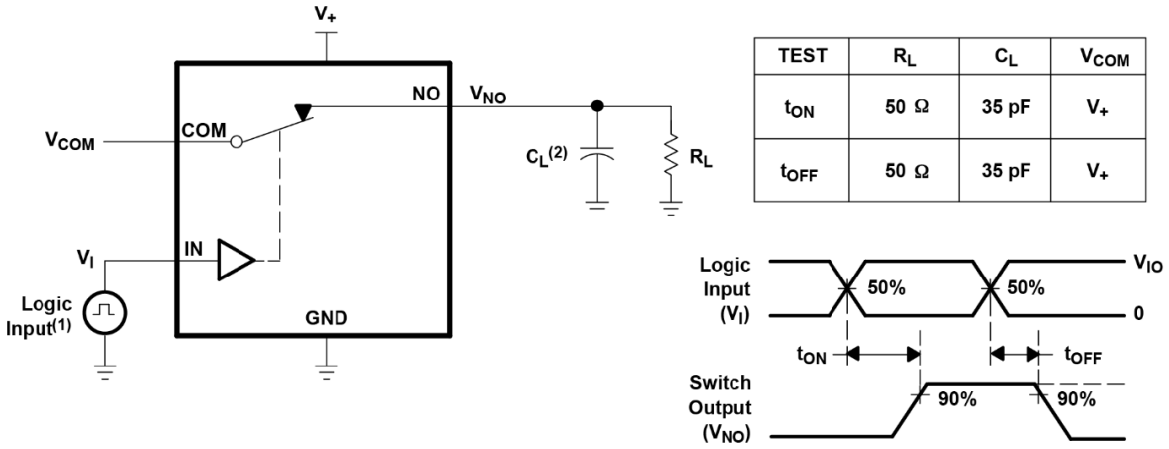


Figure 5. Turn-On (t_{ON}) and Turn-Off Time (t_{OFF})



TEST	R_L	C_L	V_{COM}
t_{ON}	50 Ω	35 pF	V_+
t_{OFF}	50 Ω	35 pF	V_+

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

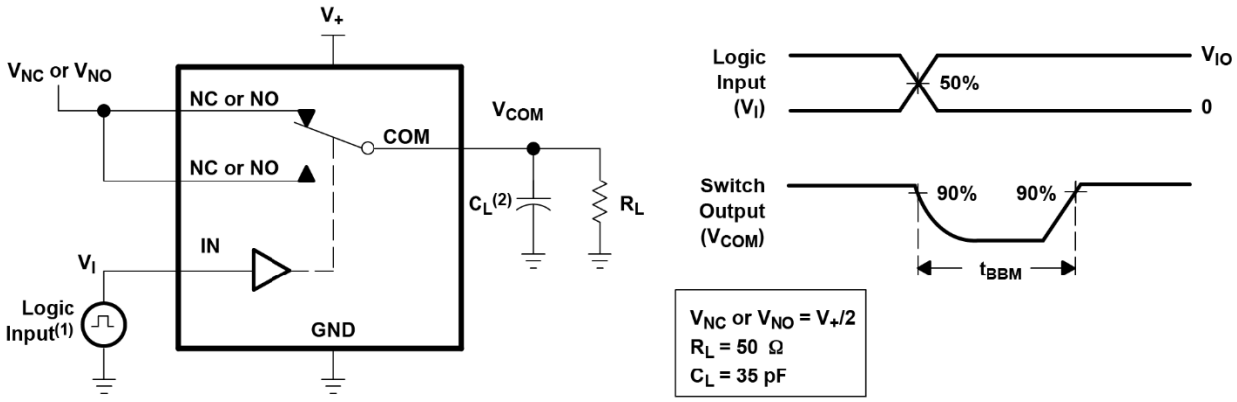


Figure 7. Bandwidth (BW)

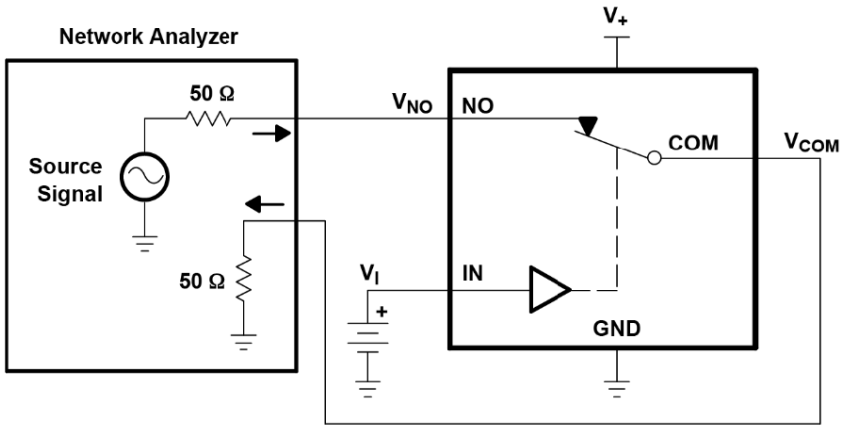


Figure 8. OFF Isolation (O_{ISO})

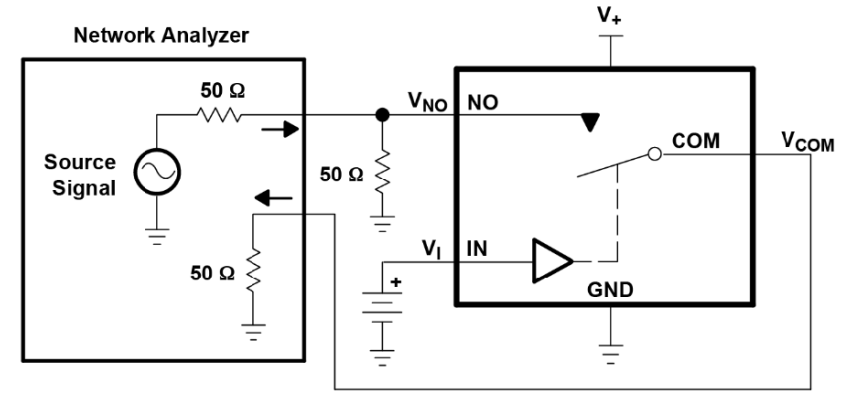


Figure 9. Crosstalk (X_{TALK})

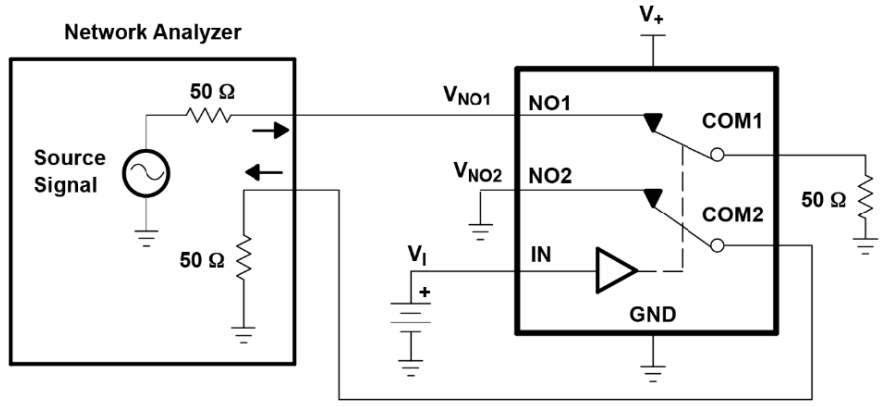


Figure 10. Charge Injection (Q_C)

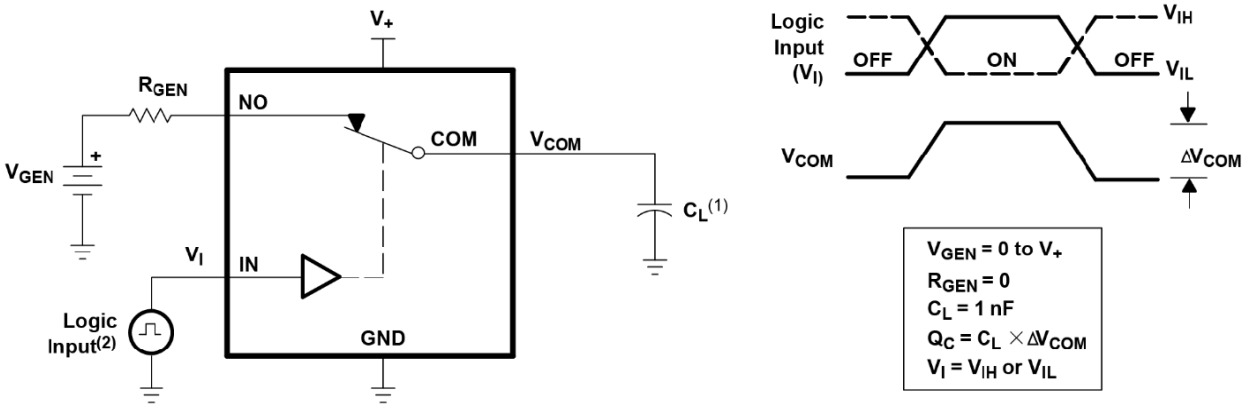
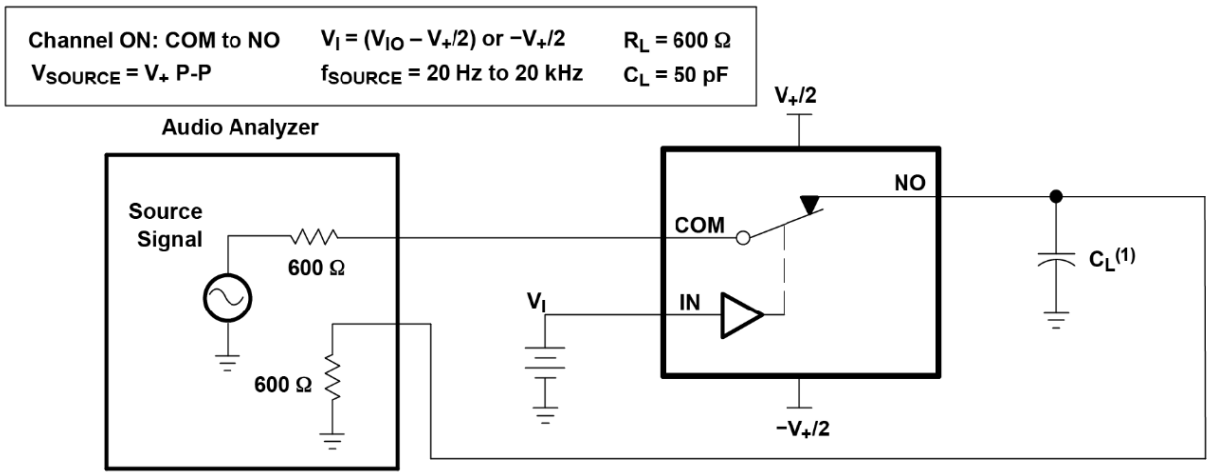
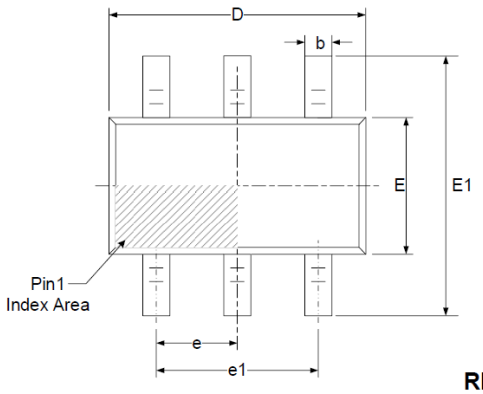


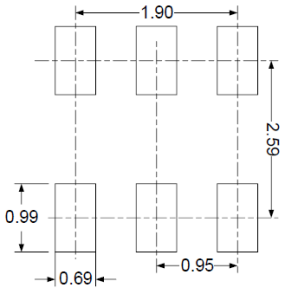
Figure11. Total Harmonic Distortion (THD)



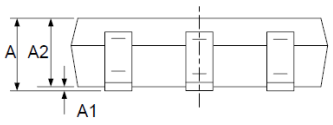
PACKAGE INFORMATION

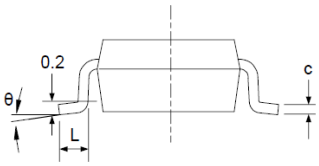
Dimension in SOT-26 (Unit: mm)





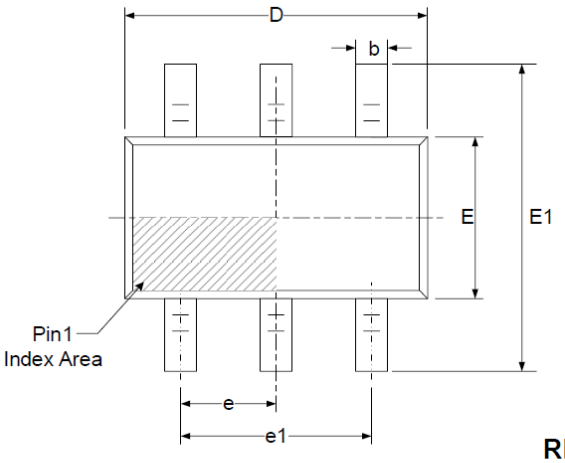
RECOMMENDED LAND PATTERN (Unit: mm)

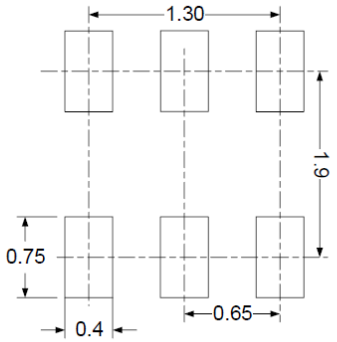




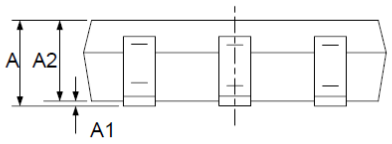
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.800	2.000	0.071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

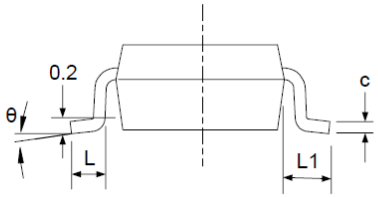
Dimension in SC70-6 (Unit: mm)





RECOMMENDED LAND PATTERN (Unit: mm)





Symbol	Millimeters		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	
θ	0°	8°	0°	8°

IMPORTANT NOTICE

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