



SV74157A

Low-Voltage, Low-Quiescent Current,
0.75 Single SPDT Analog Switch

v0.96

SAVITECH Corporation

SV74157A

Low Voltage, Low Quiescent Current, 0.75 Ω Single SPDT Analog Switch

Features

- Suitable for both analog and digital applications
- Low Switch-ON Resistance: 0.75 Ω TYP
- -3dB BW at 110MHz, exceeding industry standard
- Low quiescent current: 1 μ A
- Wide V_{CC} operating range: 1.8V to 6.6V
- High impedance, power down control input
- Rail-to-Rail signal handling
- 0.6V+ V_{CC} over-voltage tolerance at control input
- Reliable Break-before-Make switching
- Available in SC70-6, Lead (Pb) free package

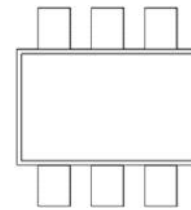
Description

The SV74157A is a bidirectional, single-pole/double-throw (SPDT) CMOS analog switch that is designed to operate from a single +1.8V to +6.6V supply. It features 110MHz bandwidth and 0.75 Ω (typ.) low on-resistance, targeted on high-speed switching applications.

SV74157A offers guaranteed 0.05 Ω (max.) on-resistance matching between channels and 0.2 Ω (typ.) on-resistance flatness over the signal range. This ensures excellent linearity and low distortion when switching high-speed signals. The SV74157A is available in a SC70-6 package.

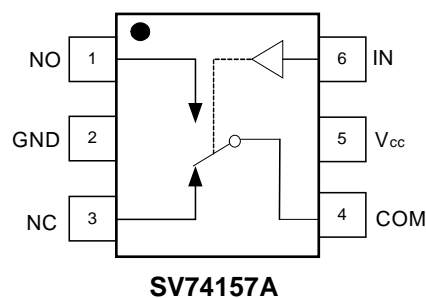
Function Table

IN	NO to COM	NC to COM
0	OFF	ON
1	ON	OFF



SC-70-6

Pin Configuration



Order codes

Order Number	Package Type	Packing Method
SV74157A-06SC-TR3	6L- SC70	Tape & Reel, 3000 pcs

Absolute maximum ratings

Parameter	Value	Unit
V _{cc} to GND, Supply Voltage,	+7.5	V
Input Voltage	GND - 0.3 to (V _{cc}) +0.3	V
Storage Temperature Range	-65 to +150	°C
Continuous current through COM to NC or COM to NO	250	mA
ESD Susceptibility: HBM	8000	V
ESD Susceptibility: MM	400	V

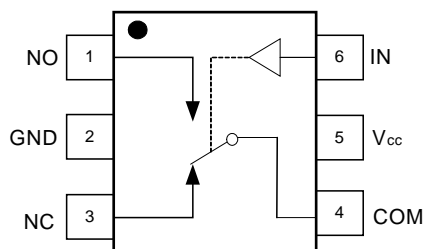
Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. SAVITECH recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

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

Pin Description



Pin Number	Pin Name	Description
1	NO	Switch normal open terminal
2	GND	Ground
3	NC	Switch normal close terminal
4	COM	Switch common terminal
5	VCC	Positive power supply
6	IN	Digital control input of switch conduct terminal selection

Electrical characteristics

($V_{CC} = +4.5V$ to $+5.5V$, $GND = 0V$, $V_{IH} = +2.0V$, $V_{IL} = +0.8V$, $T_A = -40^{\circ}C$ to $+85^{\circ}C$. Typical values are at $V_{CC} = +5.0V$, $T_A = +25^{\circ}C$, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS
ANALOG SWITCH							
Analog Signal Range	V_{NO}, V_{NC}, V_{COM}		$-40^{\circ}C$ to $+85^{\circ}C$	0		V_{CC}	V
On-Resistance	R_{ON}	$V_{CC} = 4.5V$, V_{NO} or $V_{NC} = 3.5V$, $I_{COM} = -10mA$	$+25^{\circ}C$		0.75	1.00	
On-Resistance Match Between Channels	R_{ON}	$V_{CC} = 4.5V$, V_{NO} or $V_{NC} = 3.5V$, $I_{COM} = -10mA$	$+25^{\circ}C$		0.09	0.13	
On-Resistance Flatness	$R_{FLAT(ON)}$	$V_{CC} = 4.5V$, V_{NO} or $V_{NC} = 1.0V, 2.0V, 3.5V$, $I_{COM} = -10mA$	$+25^{\circ}C$		0.20	0.30	
Source OFF Leakage Current	$I_{NC(OFF)}, I_{NO(OFF)}$	$V_{CC} = 5.5V$, V_{NO} or $V_{NC} = 1.0V, 4.5V$, $V_{COM} = 4.5V, 1.0V$	$-40^{\circ}C$ to $+85^{\circ}C$		0.01	1.00	μA
Channel ON Leakage Current	$I_{NC(ON)}, I_{NO(ON)}, I_{COM(ON)}$	$V_{CC} = 5.5V$, $V_{COM} = 1.0V, 4.5V$, V_{NO} or $V_{NC} = 1.0V, 4.5V$, or floating	$-40^{\circ}C$ to $+85^{\circ}C$		0.01	1.00	μA
DIGITAL INPUTS							
Input High Voltage	V_{INH}		$-40^{\circ}C$ to $+85^{\circ}C$	1.6			V
Input Low Voltage	V_{INL}		$-40^{\circ}C$ to $+85^{\circ}C$			0.5	V
Input Leakage Current	I_{IN}	$V_{CC} = 5.5V$, $V_{IN} = 0V$ or $5.5V$	$-40^{\circ}C$ to $+85^{\circ}C$		0.01	1	μA
DYNAMIC CHARACTERISTICS							
Turn-On Time	t_{ON}	V_{NO} or $V_{NC} = 5.0V$, $V_{IH} = 3.3V$, $V_{IL} = 0V$, $R_L = 300 \Omega$, $C_L = 35pF$	$+25^{\circ}C$		25		ns
Turn-Off Time	t_{OFF}		$+25^{\circ}C$		570		ns
Break-Before-Make Time Delay	t_D	V_{NO1} or $V_{NC1} = V_{NO2}$ or $V_{NC2} = 5.0V$, $R_L = 300 \Omega$, $C_L = 35pF$	$+25^{\circ}C$		545		ns
Skew	t_{SKEW}	$R_S = 39 \Omega$, $C_L = 50pF$	$+25^{\circ}C$		0.25		ns
Off Isolation	O_{ISO}	$R_L = 50 \Omega$, $C_L = 5pF$, Signal = 0dBm	$f = 10MHz$	$+25^{\circ}C$		-40	dB
			$f = 1MHz$	$+25^{\circ}C$		-60	
-3dB Bandwidth	BW	Signal = 0dBm	$+25^{\circ}C$		110		MHz
Channel ON Capacitance	$C_{NC(ON)}, C_{NO(ON)}, C_{COM(ON)}$	$f = 1MHz$	$+25^{\circ}C$		58		pF
Total Harmonic Distortion	THD+N	$R_L = 600 \Omega$, $C_L = 200pF$, $f = 22Hz$ to $20kHz$, -6 dB signal	$+25^{\circ}C$		0.0005		%
POWER REQUIREMENTS							
Power Supply Range	V_{CC}		$-40^{\circ}C$ to $+85^{\circ}C$	1.8		6.6	V
Power Supply Current	I_{CC}	$V_{CC} = +5.5V$, $V_{IN} = 0V$ or V_{CC}	$-40^{\circ}C$ to $+85^{\circ}C$		1		μA

Specifications are subject to change without notice.

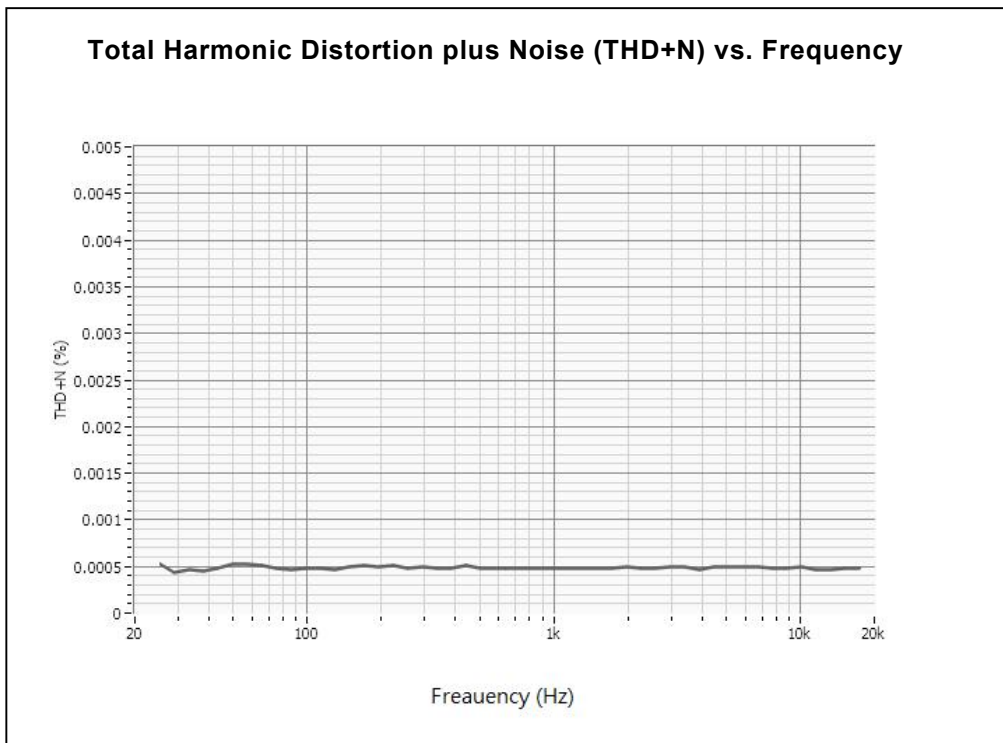
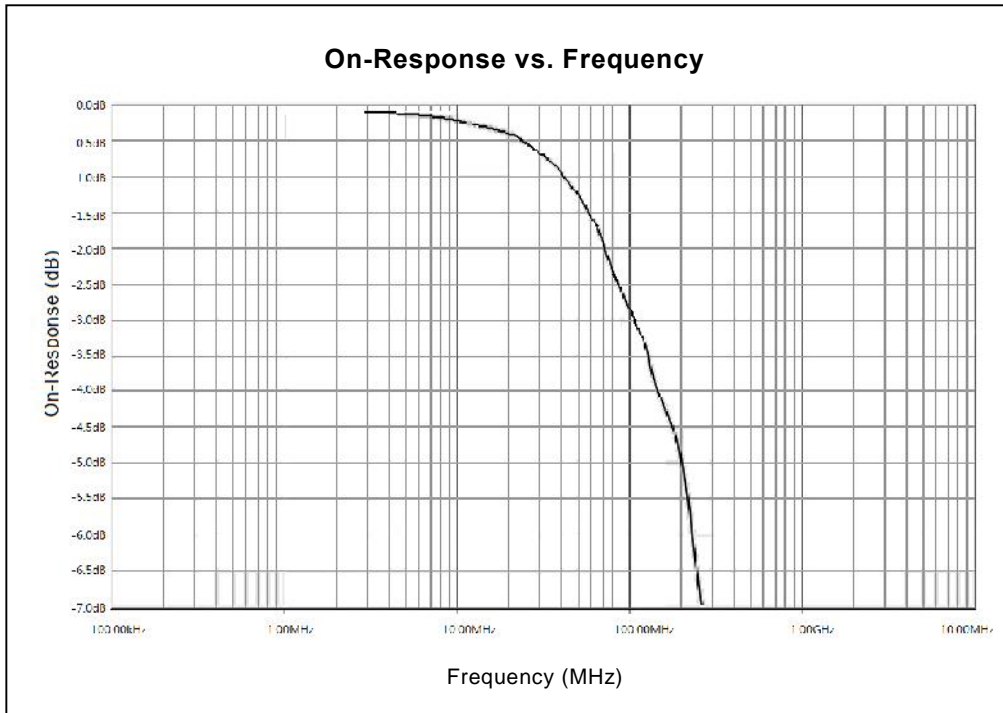
Electrical characteristics

($V_{CC} = +2.7V$ to $+3.6V$, $GND = 0V$, $V_{IH} = +1.4V$, $V_{IL} = +0.5V$, $T_A = -40^\circ C$ to $+85^\circ C$. Typical values are at $V_{CC} = +3.0V$, $T_A = +25^\circ C$, unless otherwise noted.)

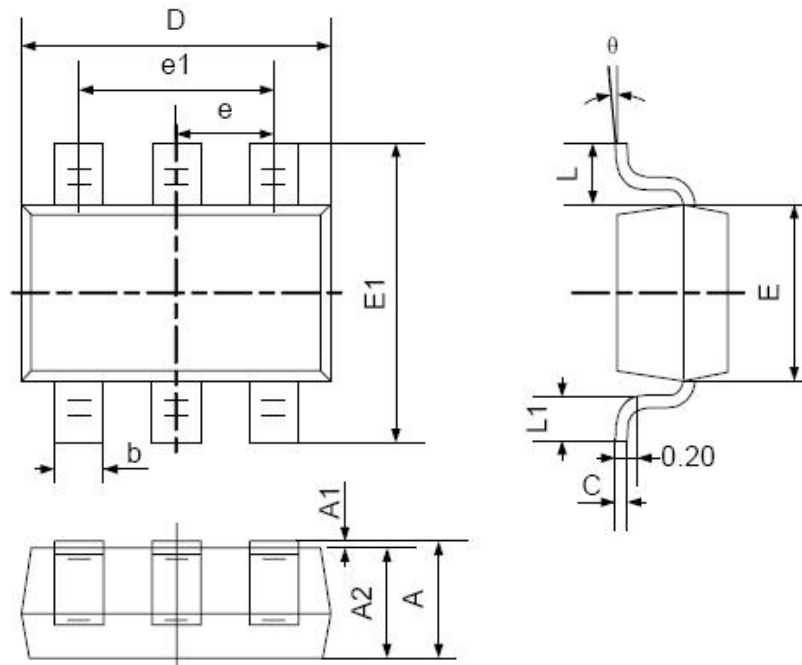
PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS
ANALOG SWITCH							
Analog Signal Range	V_{NO}, V_{NC}, V_{COM}		$-40^\circ C$ to $+85^\circ C$	0		V_{CC}	V
On-Resistance	R_{ON}	$V_{CC} = 4.5V$, V_{NO} or $V_{NC} = 3.5V$, $I_{COM} = -10mA$	$+25^\circ C$		1.2	1.6	
On-Resistance Match Between Channels	R_{ON}	$V_{CC} = 4.5V$, V_{NO} or $V_{NC} = 3.5V$, $I_{COM} = -10mA$	$+25^\circ C$		0.1	0.13	
On-Resistance Flatness	$R_{FLAT(ON)}$	$V_{CC} = 2.7V$, V_{NO} or $V_{NC} = 1.0V, 1.5V, 2.0V$, $I_{COM} = -10mA$	$+25^\circ C$		0.6	1.60	
Source OFF Leakage Current	$I_{NC(OFF)}, I_{NO(OFF)}$	$V_{CC} = 5.5V$, V_{NO} or $V_{NC} = 1.0V, 4.5V$, $V_{COM} = 4.5V, 1.0V$	$-40^\circ C$ to $+85^\circ C$			1	μA
Channel ON Leakage Current	$I_{NC(ON)}, I_{NO(ON)}, I_{COM(ON)}$	$V_{CC} = 5.5V$, $V_{COM} = 1.0V, 4.5V$, V_{NO} or $V_{NC} = 1.0V, 4.5V$, or floating	$-40^\circ C$ to $+85^\circ C$			1	μA
DIGITAL INPUTS							
Input High Voltage	V_{INH}		$-40^\circ C$ to $+85^\circ C$	1.5			V
Input Low Voltage	V_{INL}		$-40^\circ C$ to $+85^\circ C$			0.4	V
Input Leakage Current	I_{IN}	$V_+ = 5.5V$, $V_{IN} = 0V$ or $5.5V$	$-40^\circ C$ to $+85^\circ C$		0.01	1	μA
DYNAMIC CHARACTERISTICS							
Turn-On Time	t_{ON}	V_{NO} or $V_{NC} = 3.3V$, $V_{IH} = 1.5V$, $V_{IL} = 0V$, $R_L = 300 \Omega$, $C_L = 35pF$	$+25^\circ C$		30		ns
Turn-Off Time	t_{OFF}		$+25^\circ C$		750		ns
Break-Before-Make Time Delay	t_D	V_{NO1} or $V_{NC1} = V_{NO2}$ or $V_{NC2} = 3.3V$, $R_L = 300 \Omega$, $C_L = 35pF$	$+25^\circ C$		720		ns
Skew	t_{SKEW}	$R_S = 39 \Omega$, $C_L = 50pF$	$+25^\circ C$		0.5		ns
Off Isolation	O_{ISO}	$R_L = 50 \Omega$, $C_L = 5pF$, Signal = 0dBm	$f = 10MHz$	$+25^\circ C$		-40	dB
			$f = 1MHz$	$+25^\circ C$		-60	
-3dB Bandwidth	BW	Signal = 0dBm	$+25^\circ C$		110		MHz
Channel ON Capacitance	$C_{NC(ON)}, C_{NO(ON)}, C_{COM(ON)}$	$f = 1MHz$	$+25^\circ C$		58		pF
POWER REQUIREMENTS							
Power Supply Range	V_{CC}		$-40^\circ C$ to $+85^\circ C$	1.8		6.6	V
Power Supply Current	I_{CC}	$V_{CC} = 5.5V$, $V_{IN} = 0V$ or V_{CC}	$-40^\circ C$ to $+85^\circ C$		1		μA

Specifications are subject to change without notice.

Typical performance characteristics



SC70-6 MECHANICAL DATA



Symbol	Dimension in MM		Dimension in Inch	
	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	0.650TYP		0.026TYP	
e1	1.200	1.400	0.085	0.096
L	0.525REF		0.021REF	
L1	0.260	0.460	0.010	0.018
Θ	0*	8*	0*	8*

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