

TPMAX4646EUK+T

SINGLE-CHANNEL 2.5Ω SPST ANALOG SWITCH

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Features

- Low On-resistance, $R_{on}=2.5\Omega$
- 1.8V Logic Compatible Control Pin
- Overrides V+ to Achieve True Isolation Even When Supply Is Dead
- High Off-Isolation: -100dB @ 100KHz
- Low Channel-to-Channel Crosstalk: -97dB @ 100KHz
- High Bandwidth (-3dB @ 700MHz) Suitable For USB2.0 High-Speed Routing
- Low Quiescent Current (<2uA) With Very Wide Supply Range (1.5V ~ 5.5V)

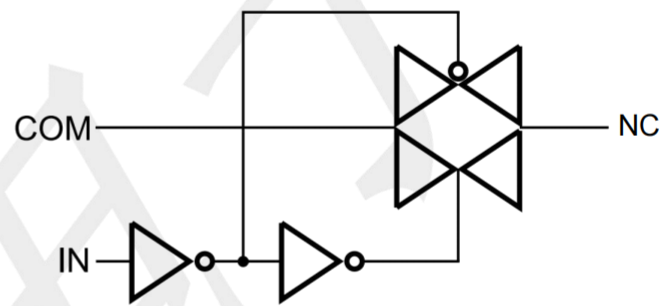
General Description

The is a low voltage single-pole,double-throw (SPDT) analog switch intending for use in chopping,modem, signal gating, and signal multiplexing for analog-to-digital and digital -to-analog conversion systems.

Applications

- Cell phones and TWS headset
- Audio, Video, UART, USB2.0 Signal and Supply Routing

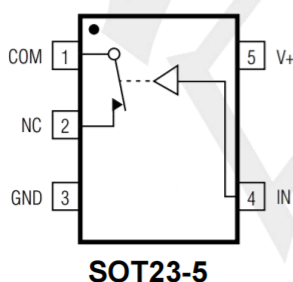
Logic Diagram



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	COM	Analog Switch—Common
2	NC	Analog Switch—Normally Close
3	GND	Ground
4	IN	Digital control pin to connect COM to NC
5	V+	Supply voltage

Pin Configuratio



SOT23-5

Function Table

INPUT(IN)	NC TO COM, COM TO NC
L	ON
H	OFF

Note:H: HIGH voltage level;L: LOW voltage level.

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Absolute Maximum Ratings

(Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V+	-0.3 ~ +6.5	V
Switch Voltage	Vs	-0.3 ~ +6.5	V
Input Voltage	VIN	-0.3 ~ +6.5	V
Continuous Current Through IN, COM, NC		±60	mA
Peak Current Through IN, COM, NC (pulsed at 1ms 50% duty cycle)		±100	mA
Continuous Current Through V+&GND		±100	mA
Storage Temperature Range	TSTG	-55 ~ +150	°C
Operating Junction Temperature	TJ	150	°C
Junction to Ambient	RθJA	280	°C/W

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

Recommend operating ratings

(Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Operating	V+	1.6 ~ 5.5	V
Control Input Voltage	VSEL	-0.3 ~ 5.5	V
Input Signal Voltage	VA	-0.3 ~ 5.5	V
Operating Temperature	TA	-40 ~ +85	°C

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Electrical Characteristics (TA = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
High-Level Input Voltage	VIH	V+=3.3V ~ 5.5V	1.6	--	--	V
		V+=1.5V ~ 3.3V	1.4	--	--	V
Low-Level Input Voltage	VIL	V+=3.3V ~ 5.5V	--	--	0.6	V
		V+=1.5V ~ 3.3V	--	--	0.4	V
Supply quiescent current	ICC	IA=0, VSEL=0 or VSEL=V+	--	--	1.0	uA
Increase in ICC per input	ICCT	IA=0, V+=4.5V VSEL>1.8 or VSEL<0.5	--	--	1.0	uA
Off state leakage from IN to COM (or NC)	IA	VA = 5.5V, VB0(or B1) = 0V	--	--	±2.0	uA
On-Resistance	RON1	VA=0 ~ 0.5V, IA=30mA	--	5.6	9.9	Ω
	RON2	VA=0.5 ~ 2.0V, IA=30mA	--	4.6	8.0	Ω
	RON3	VA=2.0 ~ 4.0V, IA=30mA	--	4.0	6.0	Ω
	RON4	VA=4.0 ~ 5.5V, IA=30mA	--	2.5	5.5	Ω
On-Resistance Flatness	RFLAT1	VA=0 ~ 0.5V, IA=30mA	--	1.6	--	Ω
	RFLAT2	VA=0.5 ~ 2.0V, IA=30mA	--	0.7	--	Ω
	RFLAT3	VA=2.0 ~ 4.0V, IA=30mA	--	0.5	--	Ω
	RFLAT4	VA=4.0 ~ 5.5V, IA=30mA	--	0.3	--	Ω
On-Resistance Matching Between Channels	Δ RON	VA=0~5.5V, IA=30mA	--	0.1	0.2	Ω

AC Electronics Characteristics (Ta=25oC, VCC=3.3V, unless otherwise noted)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Turn-On Time	TON	VA=1.5V, CL=35pF, RL=50Ω	--	200	--	ns
Turn-Off Time	TOFF	VA=1.5V, CL=35pF, RL=50Ω	--	200	--	ns
Break-Before-Make time	TBBM	VA=1.5V, CL=35pF, RL=50Ω	--	500	--	ns
-3dB Bandwidth	BW	RL=50Ω, CL=0pF	--	700	--	MHz
Off isolation	OIRR	F=1KHz, RL=50Ω	--	-81	--	dB
		F=10KHz, RL=50Ω	--	-80	--	dB
Crosstalk	Xtalk	F=1KHz, RL=50Ω	--	-83	--	dB
		F=10KHz, RL=50Ω	--	-82	--	dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz VA=600mVp-p @RL=32Ω	--	-80	--	dB

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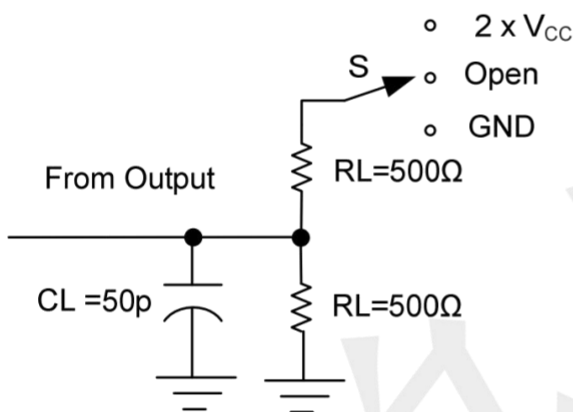
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Capacitance (Ta=25oC unless otherwise noted)

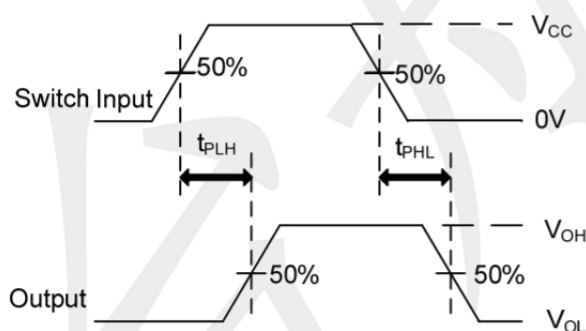
PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Off capacitance	C _{OFF}	F=100KHz, V+=3.3	--	5.0	--	pF
On capacitance	C _{ON}	F=100KHz, V+=3.3	--	7.0	--	pF

TEST CIRCUIT AND WAVEFORMS



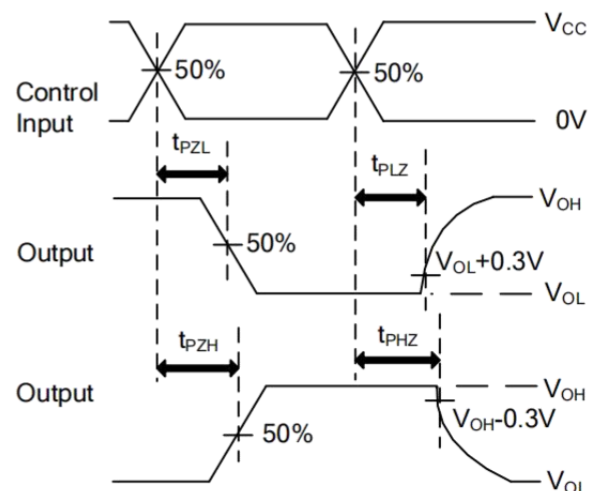
TEST CIRCUIT

TEST	S
t _{PLH} /t _{PHL}	Open
t _{PHZ} /t _{PZH}	GND
t _{PLZ} /t _{PZL}	2 x V _{CC}



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

Note: C_L includes probe and jig capacitance.
PRR ≤ 1MHz, Z_O = 50Ω, t_R ≤ 2.5ns, t_F ≤ 2.5ns.



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES

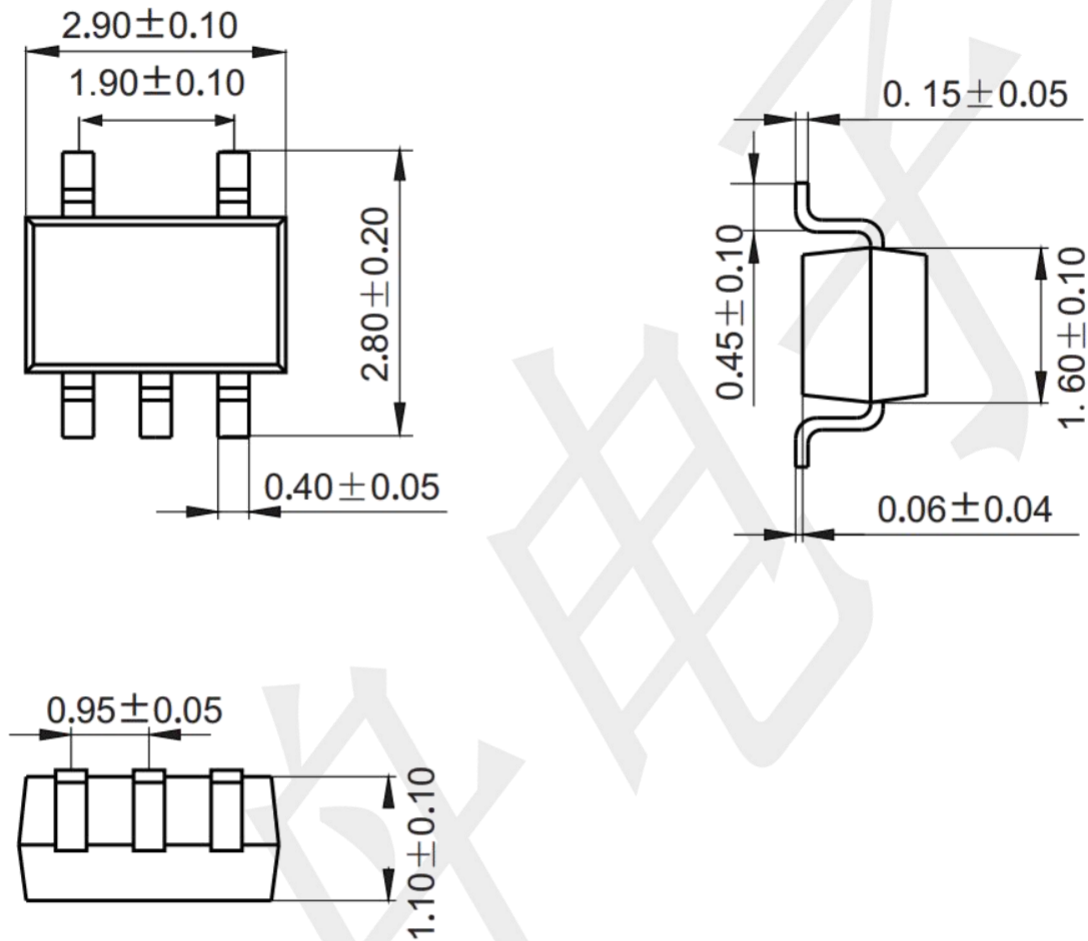
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Package informantion

SOT23-5 (Unit: mm)



Mounting Pad Layout (Unit: mm)

