

TPMAX4597DBVR

SINGLE-CHANNEL 10Ω SPST ANALOG SWITCH

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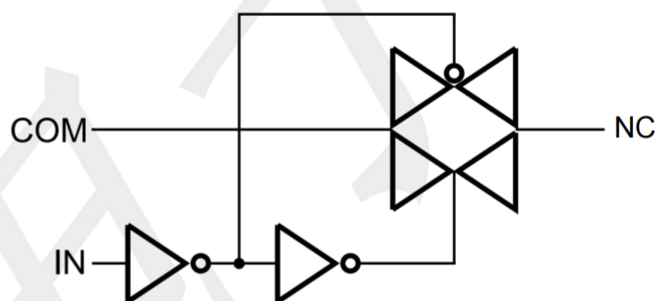
Features

- Low On-resistance, $R_{on}=10\Omega$
- 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 @300MHz) Suitable For USB2.0 High-Speed Routing
- Low Quiescent Current (<2uA) With Very Wide Supply Range (1.5V ~ 5.5V)

Applications

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

Logic Diagram



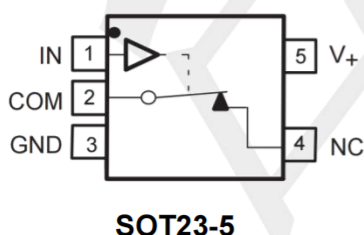
General Description

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.

PIN DESCRIPTION

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

Pin Configuratio



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		±20	mA
Peak Current Through IN, COM, NC (pulsed at 1ms 50% duty cycle)		±50	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	10	Ω
	RON2	VA=0.5 ~ 2.0V, IA=30mA	--	4.6	9.0	Ω
	RON3	VA=2.0 ~ 4.0V, IA=30mA	--	4.0	8.0	Ω
	RON4	VA=4.0 ~ 5.5V, IA=30mA	--	3.5	7.0	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	--	300	--	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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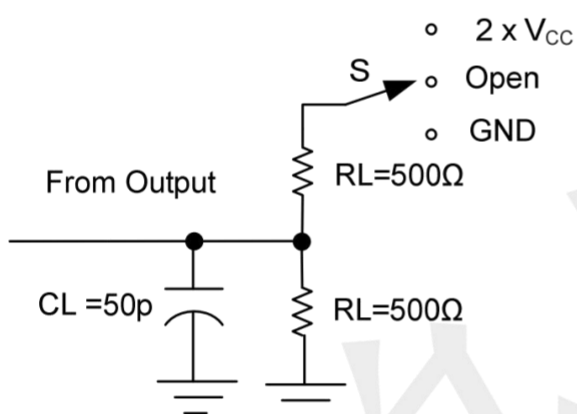
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Capacitance (Ta=25oC unless otherwise noted)

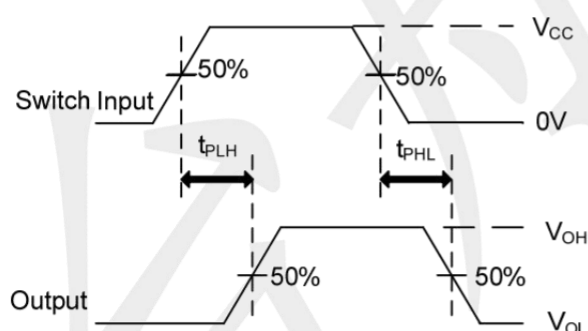
PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Off capacitance	C _{OFF}	F=100KHz, V+=3.3	--	5.0	--	pF
On capacitance	C _{ON}	F=100KHz, V+=3.3	--	7.0	--	pF

TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

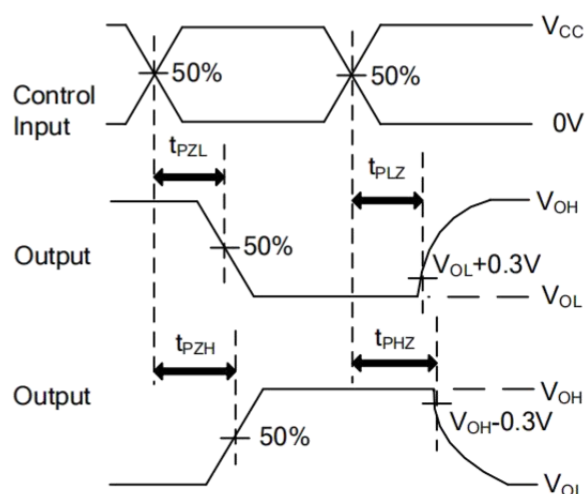
TEST	S
t _{PLH} /t _{PHL}	Open
t _{PHZ} /t _{PZH}	GND
t _{PLZ} /t _{PZL}	2 x V _{CC}



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

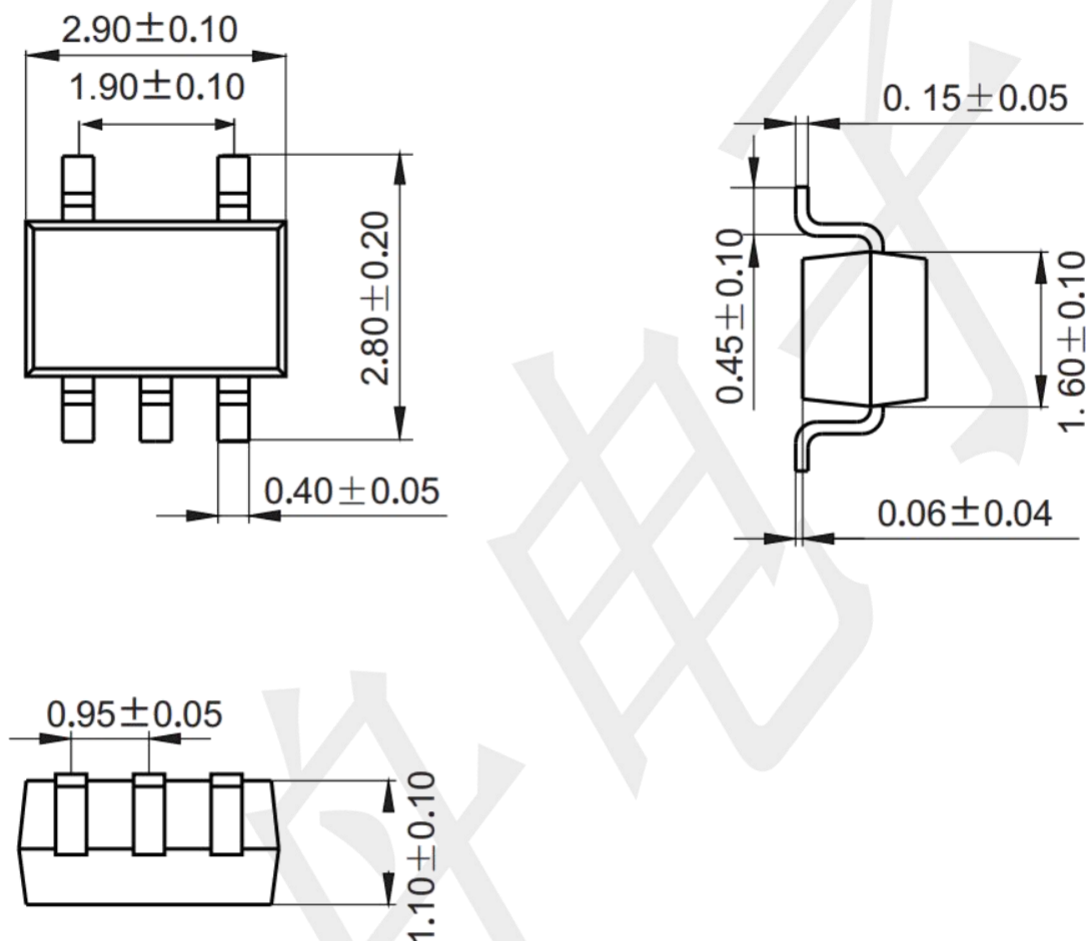
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Package informantion

SOT23-5 (Unit: mm)



Mounting Pad Layout (Unit: mm)

