TECH PUBLIC
台舟电子

TPSGM331A-YS16G

Low On Resistance, Quad SPDT Analog Switch

WWW.TECHPUBLIC.COM

Features

- Supply voltage: 1.5 ~ 5.5V
- ultra-low On Resistance: 6.0 Ω
- -3dB Bandwidth :500MHz
- Rail-to-Rail Signal Range
- Break-Before-Make Switching
- Low quiescent current over an Expanded Control Input Range
- Standard Products are Pb-free and halogen-free
- Packaging: SOP-16

General Description

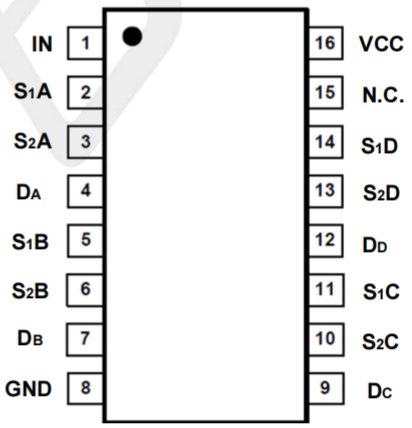
The is a high performance, quad, Single Pole Double Throw (SPDT) analog switch that features ultra-low Ron of 6.0 Ω (typical) at 4.5V VCC. The operates over a wide VCC range of 2.3V to 4.5V and is designed for break-before-make operation. The select input is TTL-level compatible.

The is also featured with smart circuitry to minimize VCC leakage current even when the control voltage is lower than VCC supply voltage. This feature suits mobile handset applications by allowing direct interface with baseband processor general-purpose IO with minimal battery consumption. In other word, there is no need of additional device to shift control level to be the same as that of VCC in real application.

Applications

- Other electronics equipment
- Audio and Video Signal Routing
- LCD Monitor, TV and Set-Top Box
- Cell phones, PDA, Digital Camera and Notebook

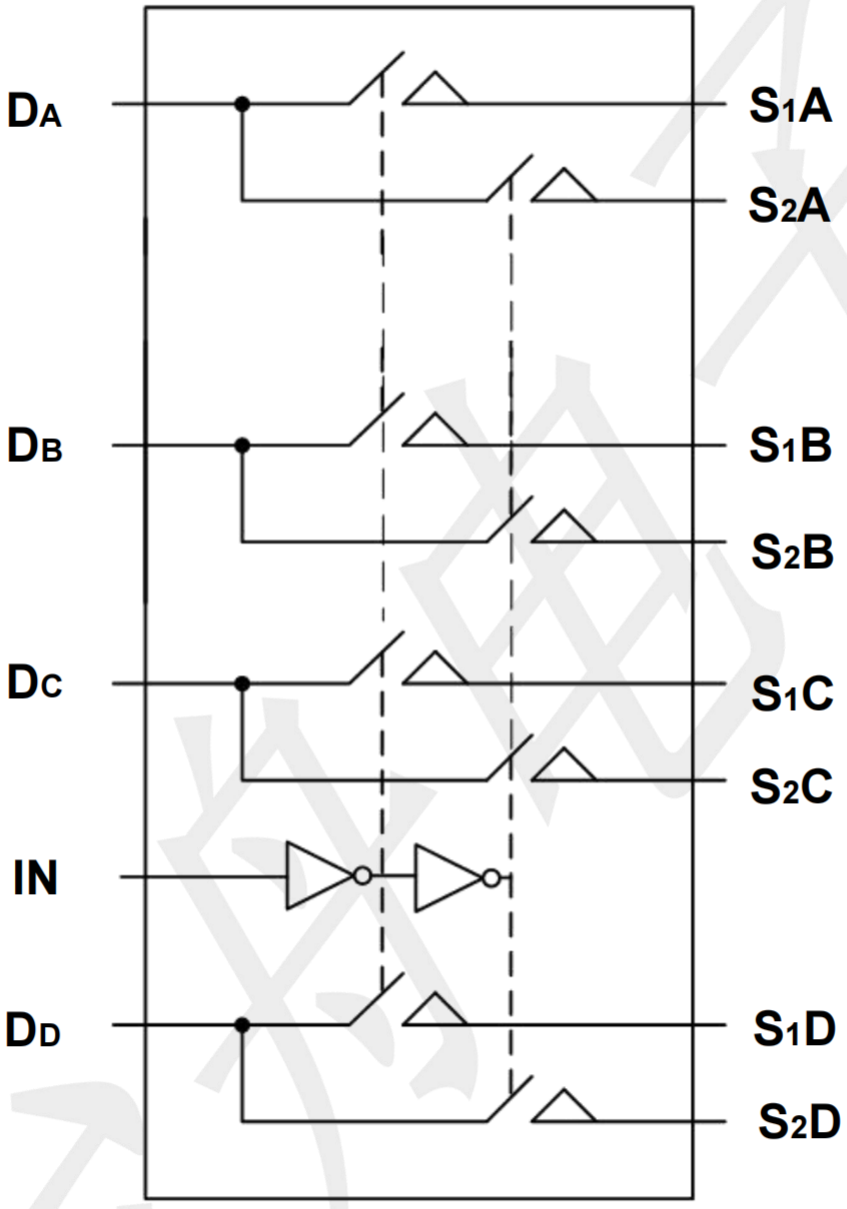
PIN CONFIGURATIONS (Top view)



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION	PIN NO.	PIN NAME	DESCRIPTION
1	IN	Logic Input Control	9	D_C	Common Data Port
2	S_1A	Data Port (Normally closed)	10	S_2C	Data Port (Normally open)
3	S_2A	Data Port (Normally open)	11	S_1C	Data Port (Normally closed)
4	D_A	Common Data Port	12	D_D	Common Data Port
5	S_1B	Data Port (Normally closed)	13	S_2D	Data Port (Normally open)
6	S_2B	Data Port (Normally open)	14	S_1D	Data Port (Normally closed)
7	D_B	Common Data Port	15	N.C.	No Internal Connection
8	GND	Ground	16	VCC	Positive Power Supply

BLOCK DIAGRAM



Function Descriptions

IN	Function
0	S1A Connected to DA, S1B Connected to DB S1C Connected to DC, S1D Connected to DD
1	S2A Connected to DA, S2B Connected to DB S2C Connected to DC, S2D Connected to DD

Absolute Maximum Ratings

(Unless otherwise specified) (1)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	-0.3 ~ 6.5	V
Control Input Voltage	V_{IN}	-0.3 ~ 6.5	V
DC Input Voltage (2)	V_{INPUT}	-0.3 ~ 6.5	V
Continuous Current $S_1X\_S_2X\_DX\_$		±100	mA
Peak Current $S_1X\_S_2X\_DX\_$ (pulsed at 1ms 50% duty cycle)		±200	mA
Peak Current $S_1X\_S_2X\_DX\_$ (pulsed at 1ms 10% duty cycle)		±200	mA
Storage Temperature Range	T_{STG}	-65 ~ 150	°C
Junction Temperature under Bias	T_J	150	°C
Lead Temperature (Soldering, 10 seconds)	T_L	260	°C
Power Dissipation	P_D	250	mW

Recommend operating ratings

(Unless otherwise specified)(3)

Parameter	Symbol	Value	Unit
Supply Voltage Operating	V_{CC}	1.5 ~ 5.5	V
Control Input Voltage	V_{IN}	0.0 ~ V_{CC}	V
Input Signal Voltage	V_{IS}	0.0 ~ V_{CC}	V
Operating Temperature	T_A	-40 ~ 85	°C
Input Raise and Fall Time(Control Input V_{CC}=2.3~3.6V)	t_r,t_f	0 ~ 10	ns/V
Thermal Resistance	$R_{\theta JA}$	350	°C/W

Note:

1. "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied.
2. The input and output negative voltage ratings may be exceeded if the input and output diode current ratings are observed.
3. Control input must be held high or Low, it must not float.

DC Electronics Characteristics

(Ta=25°C, VCC=4.5V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input logic high level	V_{IH}	VCC: 3.0 ~ 4.5	1.6	--	--	V
		VCC: 2.3 ~ 3.0	1.4	--	--	V
Input logic low level	V_{IL}	VCC: 3.0 ~ 4.5	--	--	0.6	V
		VCC: 2.3 ~ 3.0	--	--	0.4	V
Supply quiescent current	I_{CC}	I_{OUT}=0, V_{IN} =0 or V_{IN} =VCC	--	--	1.0	uA
Increase in I_{CC} per input	I_{CCT}	I_{OUT}=0, VCC=4.5 V_{IN}>1.8 or V_{IN}<0.5	--	--	2.0	uA
Input leakage current	I_{IN}	V_{SEL}=VCC	--	--	±1.0	uA
Off state switch leakage current	I_{OFF}		--	--	±1.0	uA
On state switch leakage current	I_{ON}		--	--	±1.0	uA
On-Resistance	R_{ON}	VCC=4.5V, V_{IS}=0~4.5V, I_{ON}=100mA,	--	6.0	--	Ω
		VCC=3.0V, V_{IS}=0~3.0V, I_{OUT}=100mA,	--	8.0	--	Ω
On-Resistance Matching Between Channels	ΔR_{ON}	VCC=4.5V, V_{IS}=0.8V, I_{OUT}=100mA,	--	0.1	--	Ω
		VCC=3.0V, V_{IS}=0.8V, I_{OUT}=100mA,	--	0.14	--	Ω
On-Resistance Flatness	$R_{FLAT(ON)}$	VCC=4.5V, V_{IS}=0~4.5V, I_{OUT}=100mA,	--	--	0.5	Ω
		VCC=3.0V, V_{IS}=0~3.0V, I_{OUT}=100mA,	--	--	0.8	Ω

AC Electronics Characteristics

(Ta=25°C, VCC=4.5V, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Time	T_{ON}	VCC=4.5V, V_{IS}=1.5V, C_L=35pF, R_L=50Ω	--	200	--	ns
Turn-Off Time	T_{OFF}	VCC=4.5V, V_{IS}=1.5V, C_L=35pF, R_L=50Ω	--	200	--	ns
Break-Before-Make time	T_{BBM}	Generate by design	--	100	--	ns
-3dB Bandwidth	BW	R_L=50Ω, C_L=0pF	--	500	--	MHz
Off isolation (Per Channel)	OIRR	F=100KHz, R_L=50Ω	--	-50	--	dB
Crosstalk (Channel to Channel)	Xtalk	F=100KHz, R_L=50Ω	--	-50	--	dB
Total Harmonic Distortion	THD	F=20Hz to 20KHz R_L=32Ω, V_{IS}=0.5Vp-p	--	-80	--	dB

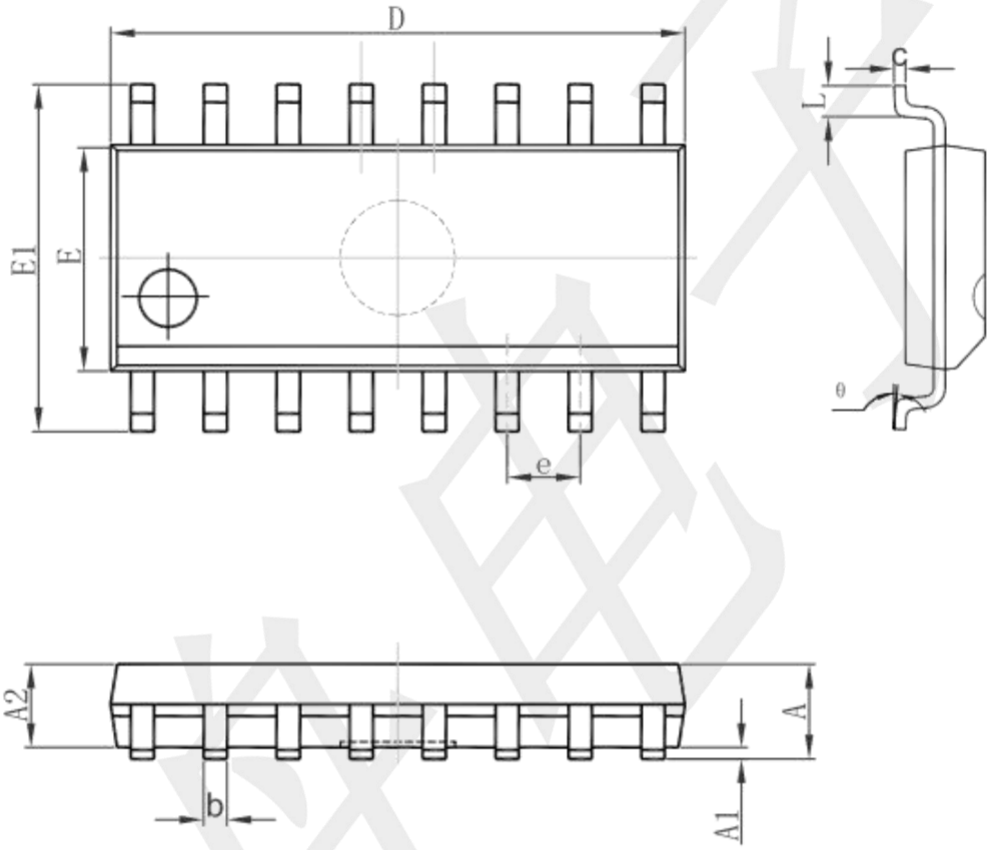
Capacitance

(Ta=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off capacitance	C_{OFF}	F=1MHz, VCC=3.3V	--	5	--	pF
On capacitance	C_{ON}	F=1MHz, VCC=3.3V	--	8	--	pF

Package information

SOP-16



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	9.800	10.200	0.386	0.402
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°