TPSGM44603YD

5Ω，High Speed，LowVoltage Quad SPDT Analog Switch

GENERAL DESCRIPTION

The is a high-speed, low-voltage,quad, bidirectional, single–pole double-throw (SPDT) COMS analog switch that is designed to operate from a single +1.8V to +5.5V power supply. It features high-bandwidth (500MHz) and low on-resistance (5Ω TYP).

The is configured as a quad single-pole double-throw(SPDT) device with one logic control inputs that control two multiplexer/demultiplexer each. The configuration can also be used as a dual differential 2-to-1 multiplexer/demultiplexer.

The is available in QFN2.6X1.8-16L packages.

FEATURES

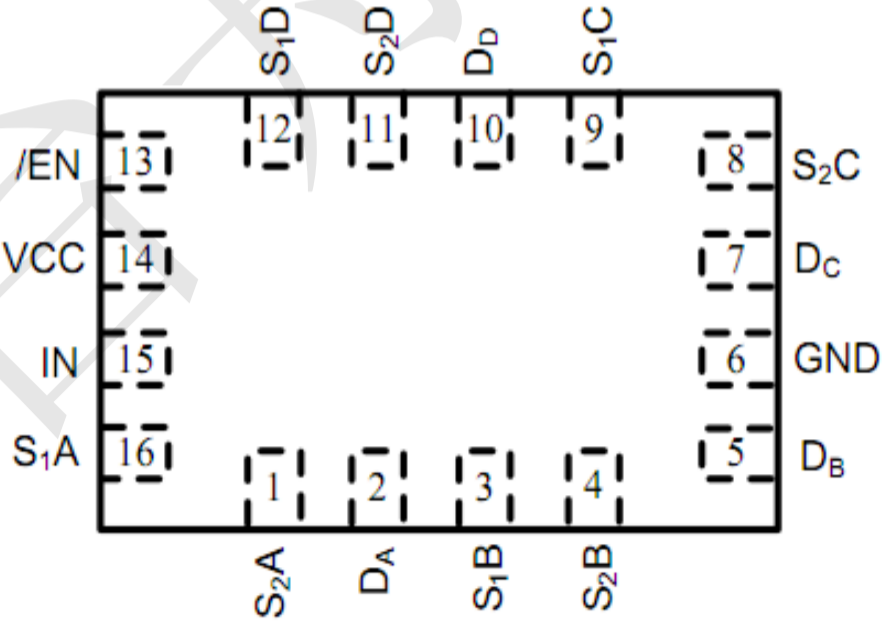
- Low Voltage Operation: 1.8V to 5.5V
- On-Resistance: 5Ω(TYP)
- -3dB Bandwidth: 500MHz
- Rail-to-Rail Input and Output Operation
- High Off-Isolation: -55dB at 10MHz
- Low Crosstalk: -60dB at 10MHz
- Low Power Consumption(＜0.01uW)
- -40℃ to +85℃ Operating Temperature Range

APPLICATIONS

- Communication Systems
- Portable Instrumentation
- Audio and Video Switching
- PCMCIA Cards
- Computer Peripherals
- Modems
- PDAs

PIN CONFIGURATION (Top View)

QFN2.6X1.8-16L



PIN DESCRIPTIONS

PIN	Name	Function
1	S_2A	Normally Open Terminal Switch 1
2	D_A	Common Terminal Switch 1
3	S_1B	Normally Closed Terminal Switch 2
4	S_2B	Normally Open Terminal Switch 2
5	D_B	Common Terminal Switch 2
6	GND	Ground
7	D_C	Common Terminal Switch 3
8	S_2C	Normally Open Terminal Switch 3
9	S_1C	Normally Closed Terminal Switch 3
10	D_D	Common Terminal Switch 4
11	S_2D	Normally Open Terminal Switch 3
12	S_1D	Normally Closed Terminal Switch 4
13	/EN	Switch-Enable Input
14	VCC	Positive Power Supply
15	IN	Select Input
16	S_1A	Normally Closed Terminal Switch 1

LOGIC DIAGRAM

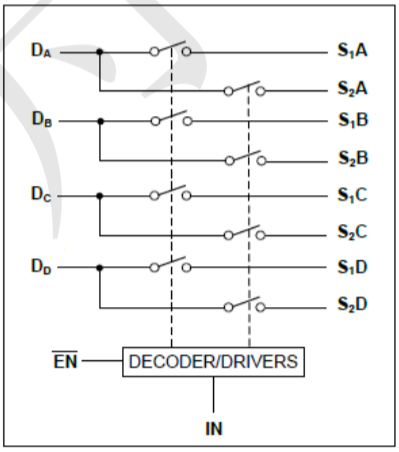


Figure1. Block Diagram

TRUTH TABLE

/EN	IN	SWITCH STATE
0	0	D_A= S_1A, D_B= S_1B, D_C= S_1C, D_D= S_1D
0	1	D_A= S_2A, D_B= S_2B, D_C= S_2C, D_D= S_2D
1	X	Disabled

ABSOLUTE MAXIMUM RATINGS

VCC, IN, /EN, to GND.....-0.3V to +6.0V
All Other Pins to GND (Note 1).....-0.3V to (VCC + 0.3V)
Continuous Current (NOx, NCx, COM_)..... ±100mA
Operating Temperature Range.....-40°C to +85°C
Storage Temperature Range.....-65°C to +150°C
Junction Temperature.....+150°C
Lead Temperature (soldering, 10s).....+260°C
Package Thermal Resistance @ TA = +25℃
QFN2.6X1.8-16L,θ_{JA}.....117.6°C/W

CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. Broadchip 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.

Broadchip reserves the right to make any change in circuit design, specification or other related things if necessary without notice at any time. Please contact Broadchip sales office to get the latest datasheet.

RECOMMENDED OPERATING CONDTIONS

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications.

Symbol	Parameter	Min.	Max.	Unit
V_{CC}	Supply Voltage	1.8	5.5	V
V_{CTRL}	Control Input Voltage(IN)(2)	0	VCC	V
V_{SW}	Switch I/O Voltage	0	VCC	V
T_A	Operating Temperature	-40	+85	℃

Notes：
1. The input and output negative ratings maybe exceed if the input and output diode current ratings are observed.
2. The control input must be held HIGH or LOW; it must not float.

DC ELECTRICAL CHARACTERISTICS

Unless otherwise noted. TA = +25°C. (Note 1)

PARAMETER	SYM	CONDITIONS	V_{CC} (V)	MIN	TYP	MAX	UNITS
Supply Voltage	V_{CC}			1.8		5.5	V
Quiescent Supply Current	I_{CC}	/EN=0V, IN=0V or V_{CC}, I_{OUT}=0	5.5			1	uA
Switch On Resistance	R_{ON}	0V≤V_{SW}≤V_{CC}, I_{SW}=10mA,	4.5		5.0	8.0	Ω
			2.7		12	24	Ω
On Resistance Matching Between Channels	ΔR_{ON}	V_{SW}=0V, I_{SW}=10mA,	4.5		0.3	1.0	Ω
			2.7		1.0	3.0	Ω
Flatness for On Resistance	ΔR_{ON}	0V ≤V_{SW}≤V_{CC}, I_{SW}=10mA,	4.5		2.0	3.0	Ω
			2.7		12	20	Ω
Off leakage Current of Open Data Paths (NCx and NOx Pin)	I_{OFF}	0V≤V_{SW}≤V_{CC}	1.8 to 5.5	-1		1	uA
On leakage Current of Close Data Paths (NCx,NOx and COMx Pin)	I_{ON}	0V≤V_{SW}≤V_{CC}	1.8 to 5.5	-1		1	uA
Input Voltage High (IN,/EN)	VIH		1.8 to 5.5	1.5			V
Input Voltage Low (IN, /EN)	VIL		1.8 to 5.5			0.4	V

AC ELECTRICAL CHARACTERISTICS

Unless otherwise noted. TA = +25°C. (Note 1)

PARAMETER	SYM	CONDITIONS	V_{CC} (V)	MIN	TYP	MAX	UNITS
Turn-On Time	t_{ON}	R_L=300Ω, C_L=35pF, V_{SW}=0 to 1.5 V	3.0		35		ns
Turn-Off Time	t_{OFF}	R_L=300Ω, C_L=35pF, V_{SW}=0 to 1.5 V	3.0		45		ns
Break-Before-Make Time	t_{BBM}	V_{NC}= V_{NC} =1.5 V , R_L=300Ω, C_L=35pF	3.0		6		ns
Charge Injection	Q	V_G = 0V, R_G = 0Ω, CL = 1nF	3.0		5		pC
-3db Bandwidth(2)	BW	V_S=0dBm,R_L=50Ω, C_L=5pF	3.0		500		MHz
Off Isolation (2)	O_{IRR}	V_S=0dBm,f=10MHz, R_L=50Ω	3.0		-55		dB
Crosstalk (2)	X_{TALK}	V_S=0dBm,f=10MHz, R_L=50Ω	3.0		-60		dB
Output On Capacitance(2)	C_{ON}	/OE=0V, f=1MHz	3.0		10		pF
Output Off Capacitance(2)	C_{OFF}	/OE=3.3V, f=1MHz	3.0		6		pF

Note 1: Devices are 100% tested at TA = +25°C. Limits across the full temperature range are guaranteed by design and correlation.
Note 2:Guaranteed by characterization.

TEST CIRCUITS

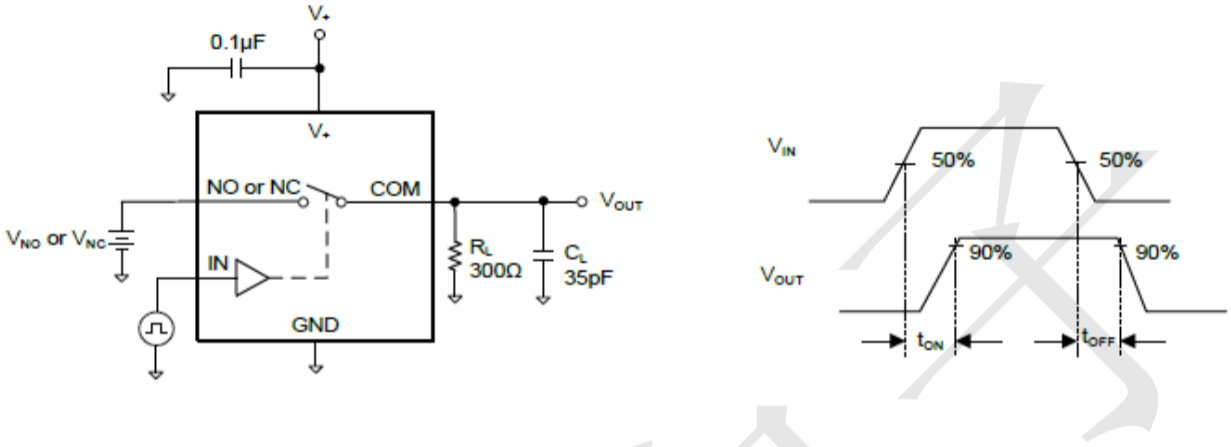


Figure 2. Switching Time

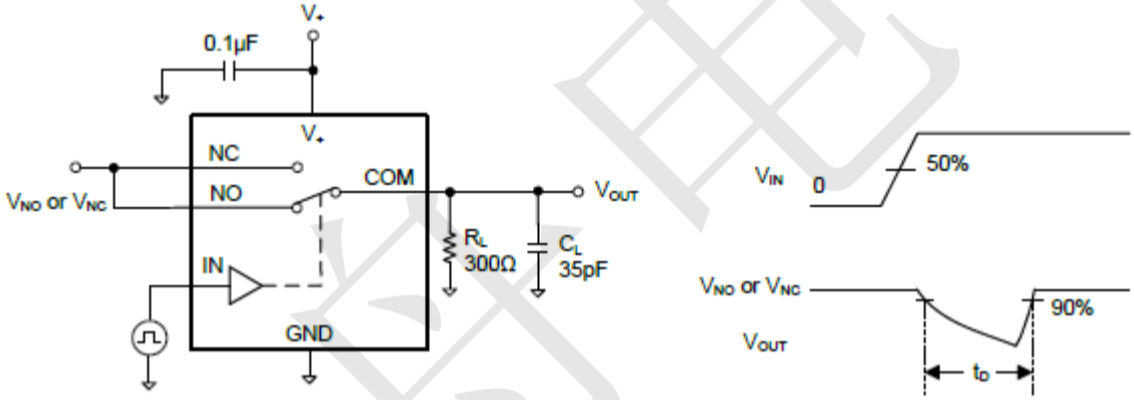


Figure 3. Break-Before-Make Interval

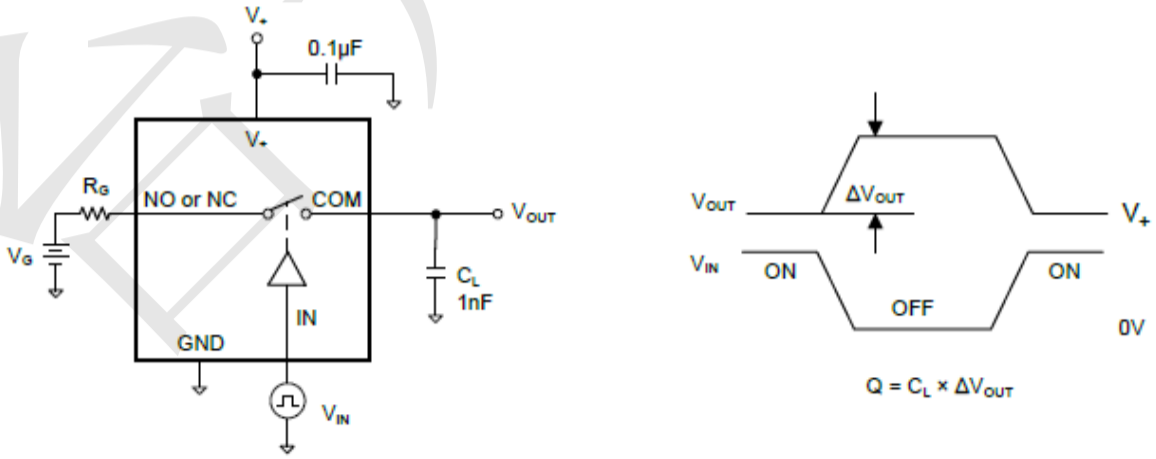


Figure 4. Charge Injection

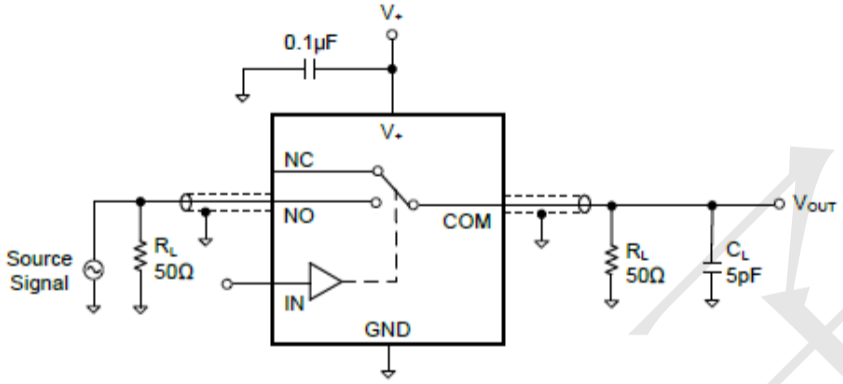


Figure 5. Off Isolation

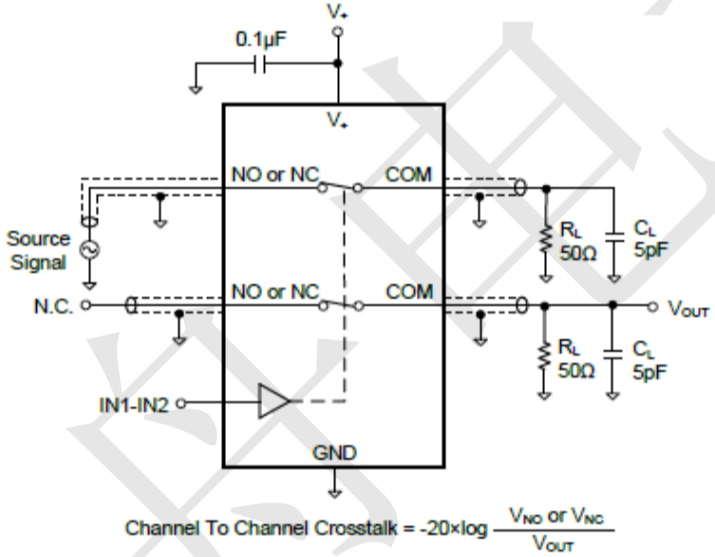


Figure 6. Channel-to-Channel Crosstalk

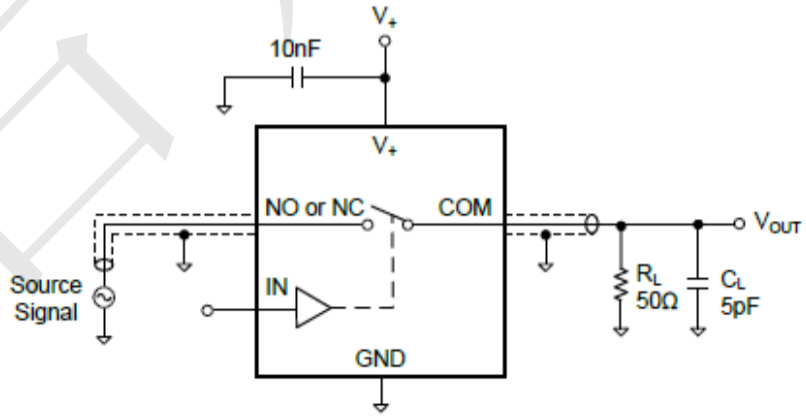
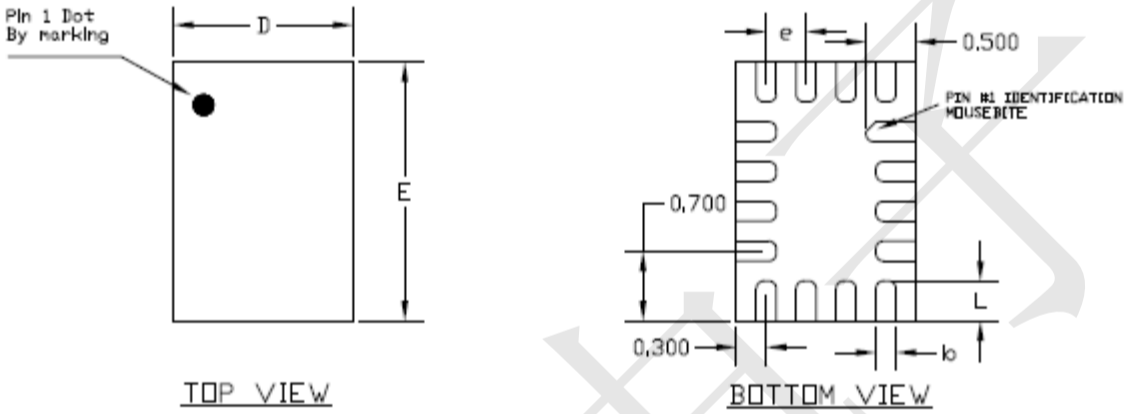
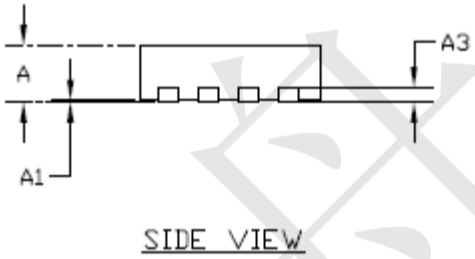


Figure 7. -3dB Bandwidth

PACKAGE OUTLINE DIMENSIONS

QFN2.6x1.8-16L





COMMON DIMENSIONS(MM)			
PKG.	UT:ULTRA THIN		
REF.	MIN.	NOM.	MAX
A	>0.50	0.55	0.60
A1	0.00	-	0.05
A3	0.15 REF.		
D	1.75	1.80	1.85
E	2.55	2.60	2.65
L	0.30	0.40	0.50
b	0.15	0.20	0.25
e	0.40 BSC		