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TPG1567YD

Dual DPDT SIM Card Analog Switch

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Features

- Low On-resistance, Ron=2.5Ω
- Break-Before-Make Switching
- Rail-to-Rail Signal Range
- Low quiescent current over an Expanded Control Input Range
- High Bandwidth (-3dB @500MHz) Suitable For USB2.0 High-Speed Routing
- Wide Supply Range (1.5V ~ 5.5V)

Applications

- Mobile Phones, Tablets and Notebooks
- Anywhere a USB Type-C™ or Micro-B Connector is Used
- Audio and Video Signal Routing

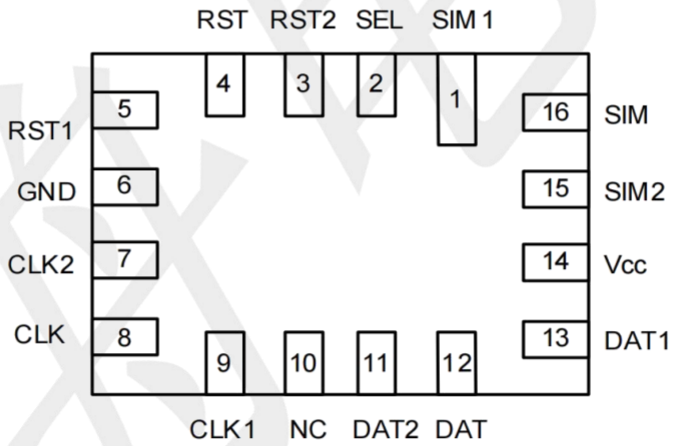
General Description

The is a dual Double-Pole, Double-Throw (DPDT) analog switch targeted at dual SIM card multiplexing. operates from a single 1.5V to 5.5V supply and features an ultra-low on resistance of 2.5Ω at path to ensure minimal voltage drop in other path. This device is fabricated with sub-micron CMOS technology to achieve fast switching speeds and is designed for break-before-make operation.

features very low quiescent current even when the control voltage is lower than the VCC supply. This processor general-purpose I/Os.

PIN CONFIGURATIONS

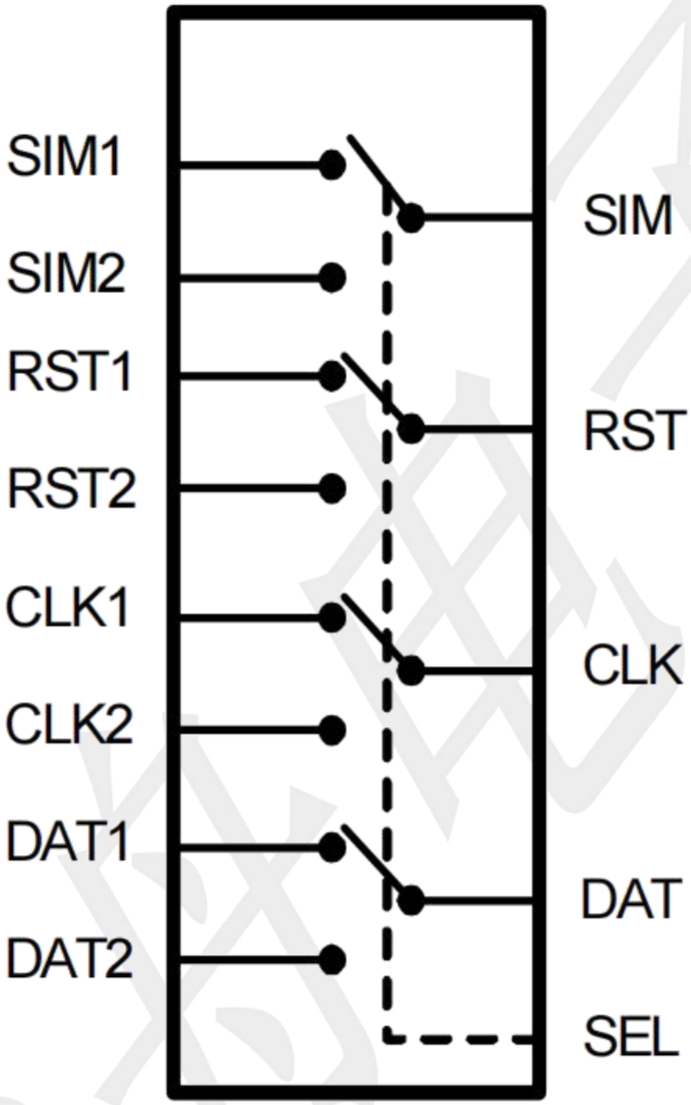
QFN1826-16L (TOP VIEW)



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION	PIN NO.	PIN NAME	DESCRIPTION
1	SIM1	Data Port (Normally closed)	9	CLK1	Data Port (Normally closed)
2	SEL	Logic Input Control	10	NC	NO Connected
3	RST2	Data Port (Normally open)	11	DAT2	Data Port (Normally open)
4	RST	Common Data Port	12	DTA	Common Data Port
5	RST1	Data Port (Normally closed)	13	DAT1	Data Port (Normally closed)
6	GND	Ground	14	VCC	Positive Power Supply
7	CLK2	Data Port (Normally open)	15	SIM2	Data Port (Normally open)
8	CLK	Common Data Port	16	SIM	Common Data Port

BLOCK DIAGRAM



Function Table

SEL	Function
0	SIM1 Connected to SIM, RST1 Connected to RST CLK1 Connected to CLK, DAT1 Connected to DAT
1	SIM2 Connected to SIM, RST2 Connected to RST CLK2 Connected to CLK, DAT2 Connected to DAT

Absolute Maximum Ratings (Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.3 ~ +6.5	V
Input Voltage	V_{IN}	-0.3 ~ +6.5	V
DC Input Voltage (2)	V_{INPUT}	-0.3 ~ +6.5	V
Continuous Current Through SIM, RST,CLK, DAT		±100	mA
Peak Current Through SIM, RST,CLK, DAT (pulsed at 1ms 50% duty cycle)		±200	mA
Storage Temperature Range	T_{STG}	-65 ~ +150	℃
Operating Junction Temperature	T_J	150	℃
Lead Temperature (Soldering, 10 seconds)	T_L	260	℃
Power Dissipation	P_D	250	mW

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

(Control input must be held high or Low, it must not float)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Operating	V_{CC}	1.5 ~ 5.5	V
Control Input Voltage	V_{IN}	0 ~ VCC	V
Input Signal Voltage	V_{IS}	0 ~ VCC	V
Operating Temperature	T_A	-40 ~ +85	℃
Junction to Ambient	$R\theta_{JA}$	350	℃/W
Input Raise and Fall Time(Control Input V_{CC}=2.3~3.6V)	t_r, t_f	0 ~ 10	ns/V

DC Electrical Characteristics

(TA =25°C，VC=4.5V,unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	VCC=3.0V ~ 5.5V	1.6	--	--	V
		VCC=2.3V ~ 3.0V	1.4	--	--	V
Low-Level Input Voltage	V_{IL}	VCC=3.0V ~ 5.5V	--	--	0.6	V
		VCC=2.3V ~ 3.0V	--	--	0.4	V
Supply quiescent current	I_{CC}	I_A=0, V_{SEL} =0 or V_{SEL} =VCC	--	--	1.0	uA
Increase in ICC per input	I_{CCT}	I_A=0, VCC=4.5V V_{SEL}>1.8 or V_{SEL}<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,	--	1.5	--	Ω
		VCC=3.0V, V_{IS}=0~3.0V, I_{OUT}=100mA,	--	2.5	--	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
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

AC Electronics Characteristics

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

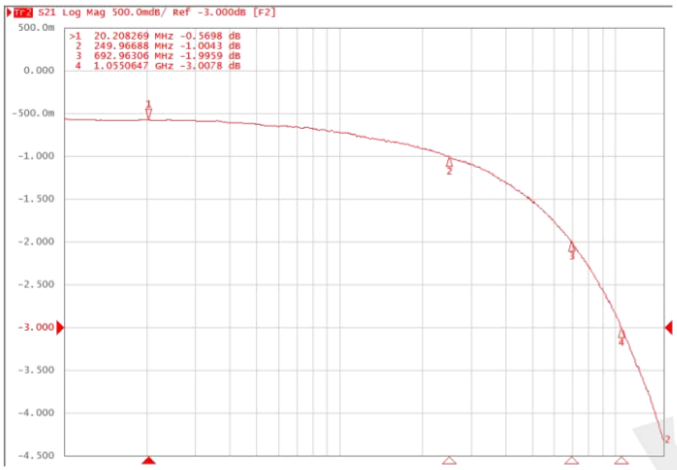
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Turn-On Time	T_{ON}	VCC=4.5V, V_{IS}=1.5V, C_L=35pF, R_L=50Ω	--	200	--	ns
Turn-Off Time	T_{OFF}	VCC=4.5V, V_{IS}=1.5V, C_L=35pF, R_L=50Ω	--	200	--	ns
Break-Before-Make time	T_{BBM}	Generate by design	--	100	--	ns
-3dB Bandwidth	BW	R_L=50Ω, C_L=0pF	--	500	--	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

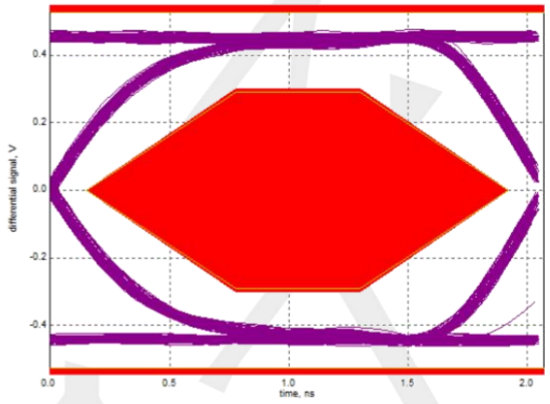
(Ta=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Off capacitance	C_{OFF}	F=1MHz, VCC=3.3V	--	5.0	--	pF
On capacitance	C_{ON}	F=1MHz, VCC=3.3V	--	8.0	--	pF

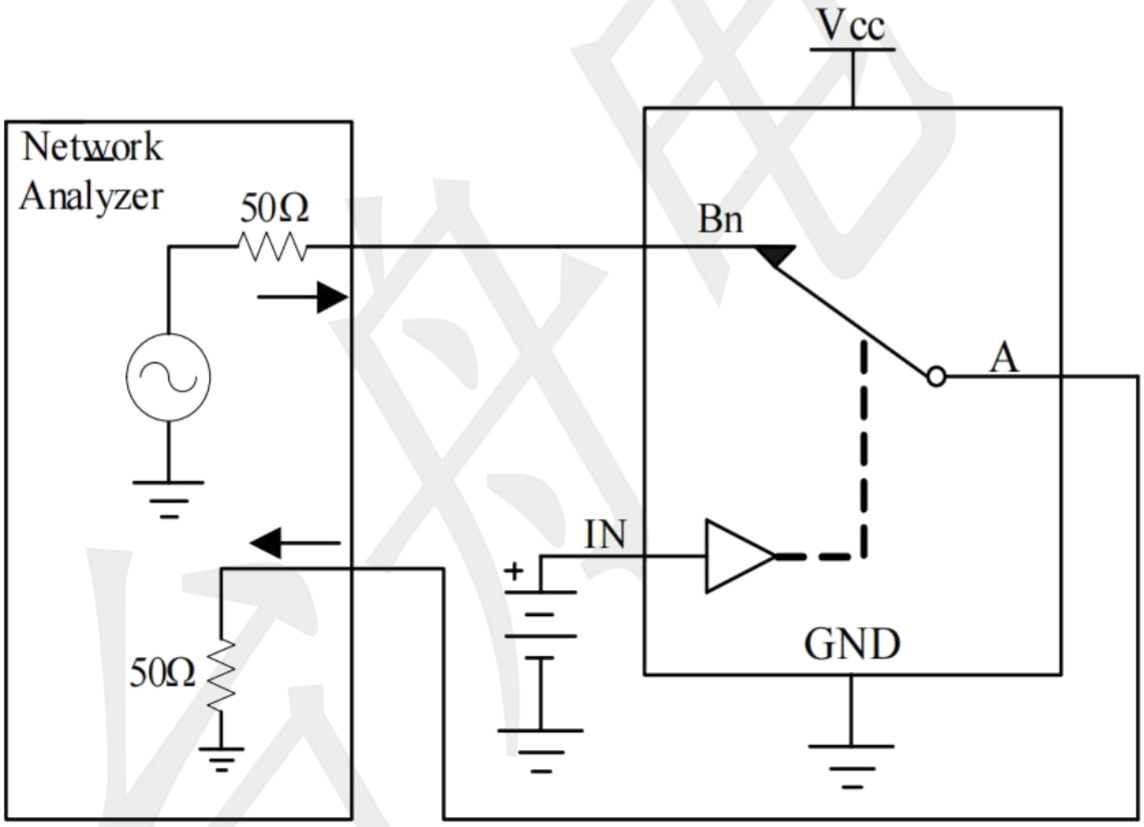
Typical Characteristics (Ta=25℃, VCC=3.3V, unless otherwise noted)



Bandwidth

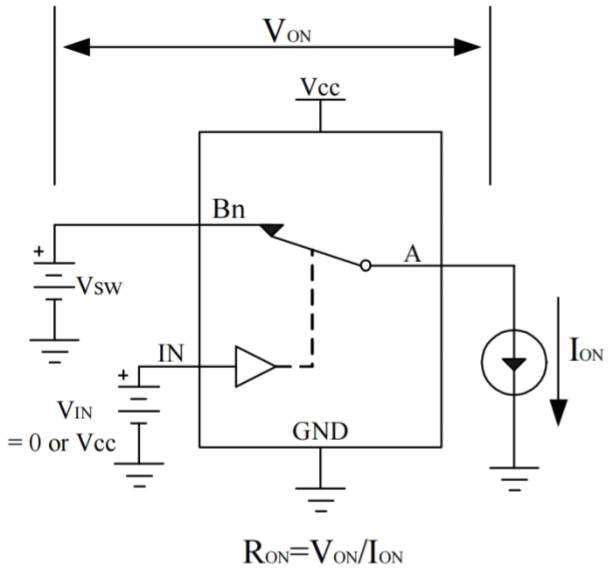


Eye Diagram (480Mbps)



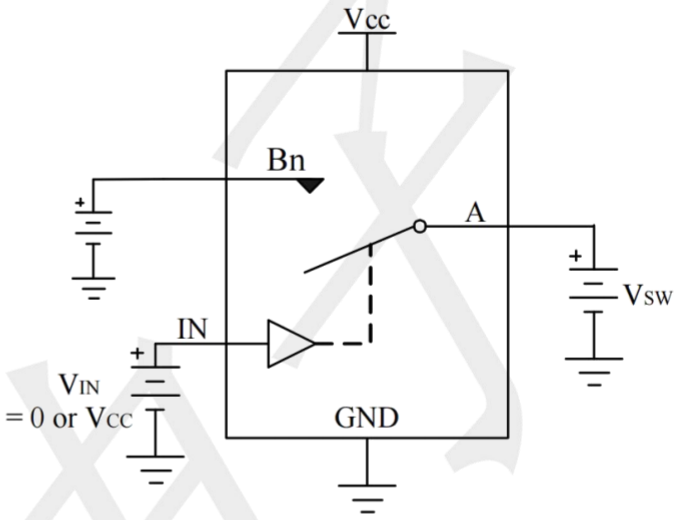
Bandwidth

Typical Characteristics (Ta=25℃, VCC=3.3V, unless otherwise noted)

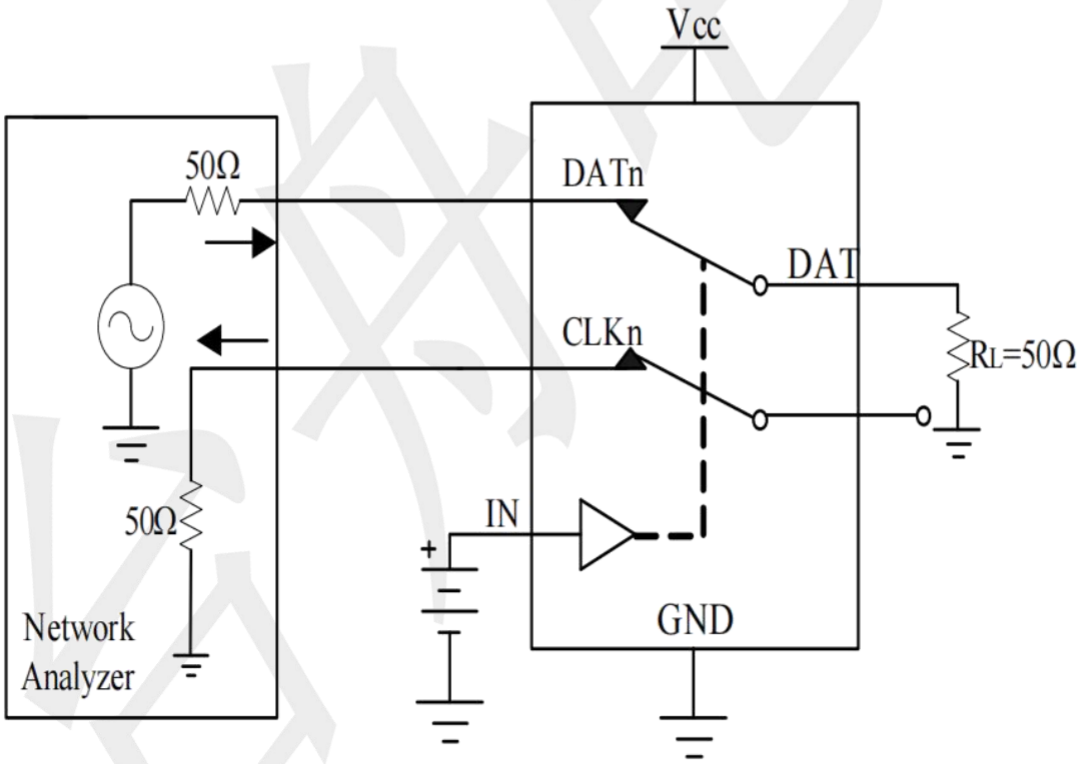


RON=VON/ION

Switch on resistor



Switch Off Leakage



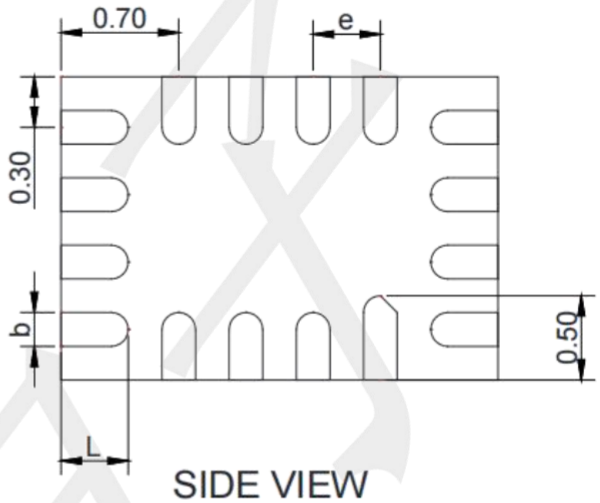
Channel-to-channel crosstalk

Package information

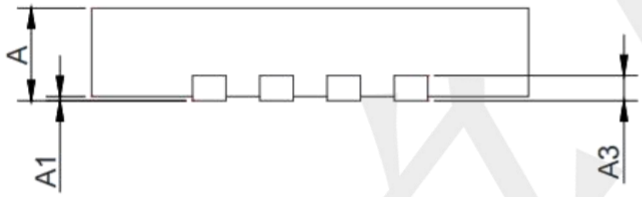
QFN1826-16L (Unit: mm)



TOP VIEW



SIDE VIEW



SIDE VIEW

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.50	0.55	0.60
A1	0.00	-	0.05
A3	0.15 Ref.		
D	2.55	2.60	2.65
E	1.75	1.80	1.85
L	0.30	0.40	0.50
b	0.15	0.20	0.25
e	0.40 BSC		