DIO1717

2.8Ω, 300MHz Dual-SPDT Analog Switch with Negative Swing Audio Capability

Features

- Voltage Operation: 2.5V to 5.5V
- -2.0V to V+ Signal Passing Ability
- On-Resistance: 2.8Ω (TYP) at 4.5V
- High Bandwidth: 300MHz
- Fast Switching Times: t_{ON} 1.8μs
  t_{OFF} 350ns
- High Off-Isolation: -49dB at 10MHz
- Low Crosstalk: -52dB at 10MHz
- Negative signal handling:
  the lowest -2.0V negative signal pass
- TTL/CMOS Compatible
- Break-Before-Make Switching
- Extended Industrial Temperature Range:
  -40℃ to 85℃

Applications

- Cell Phone, and Digital Camera
- PDA , and Notebook
- LCD Monitor
- TV, and Set-Top Box

Descriptions

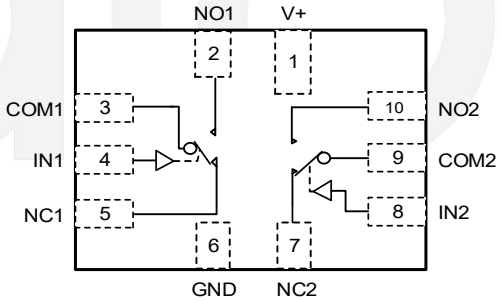
The DIO1717 is a dual, bidirectional, single-pole/ double-throw (SPDT) CMOS analog switch designed to operate from a single 2.5V to 5.5V supply. It features high-bandwidth (300MHz) and low on-resistance (2.8Ω TYP), the lowest -2.0V negative signal can pass switch.

DIO1717 features guaranteed on-resistance matching (0.05Ω TYP) between switches. This ensures excellent linearity and low distortion when switching audio signals.

The DIO1717 is a committed dual single-pole/ double-throw (SPDT) that consist of two normally open (NO) and two normally close (NC) switches. This configuration can be used as a dual 2-to-1 multiplexer.

DIO1717 is available in DQFN-10 and MSOP-10 packages.

Block Diagram



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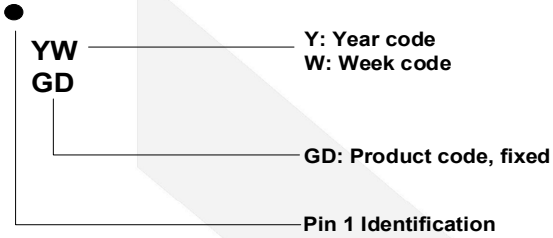
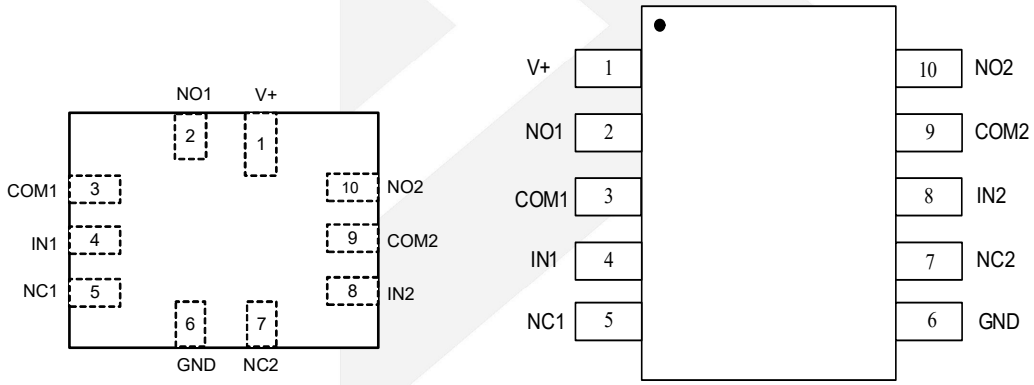
Ordering Information

Order Part Number	Top Marking		T_A	Package	
DIO1717LP10	YWGD	Green	-40 to 85°C	DQFN-10	Tape & Reel, 3000
DIO1717MP10	DIO1717	Green	-40 to 85°C	MSOP-10	Tape & Reel, 3000

Marking Definition



Pin Assignments



DQFN-10 **MSOP-10**

Figure 1 Pin Assignment (Top View)

Pin Description

Pin Name	Description
V_+	Supply Voltage
NO1	Data Ports
COM1	Data Ports
IN1	Switch Select Pins
NC1	Data Ports
GND	Ground
NC2	Data Ports
IN2	Switch Select Pins
COM2	Data Ports
NO2	Data Ports

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Truth Table

LOGIC	NO	NC
0	OFF	ON
1	ON	OFF

Absolute Maximum Ratings

Stresses beyond those listed under “Absolute Maximum Rating” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Parameter		Rating	Unit
Supply Voltage (V+)		-0.3 to 6	V
Switch I/O Voltage (NO，NC，COM Pins)		-2 to V+	V
Control Input Voltage (IN1，IN2 Pins)		-0.5 to （V+）+0.3	V
Switch I/O Current (Continuous)		±50	mA
Peak Switch Current (Pulsed at 1ms Duration,<10 Duty Circle)		±80	mA
Storage Temperature Range (TSTG)		-65 to 150	°C
Junction Temperature		150	°C
Lead Temperature Range		260	°C
ESD	HBM, I/O to GND, JEDEC: JESD22-A114	8000	V

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation to ensure optimal performance to the datasheet specifications. DIOO does not recommend exceeding them or designing to Absolute Maximum Ratings.

Parameter	Rating	Unit
Supply Voltage	2.5 to 5.5	V
Control Input Voltage (IN1，IN2 Pins)	0 to V+	V
Switch I/O Voltage (NO，NC，COM Pins)	-2 to V+	V
Operating Temperature Range	-40 to 85	°C

Note: For 4.5V operation, SEL frequency (pins IN1 & IN2) should not exceed 100Hz and 50ns edge rate.

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Electrical Characteristics

(V+ = 2.5V to 5.5V, T_A = 25℃, unless otherwise noted.)

Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
ANALOG SWITCH							
R_{ON}	Switch On Resistance	V+ = 4.5V, V_{NO} or V_{NC} = 2V,I_{COM} = -10mA,			2.8		Ω
		V+ = 3.6V, V_{NO} or V_{NC} = 2V,I_{COM} = -10mA,					
		V+ = 2.7V, V_{NO} or V_{NC} = 2V,I_{COM} = -10mA,					
ΔR_{ON}	On resistance matching between channels	V+ = 4.5V, V_{NO} or V_{NC} = 2V,I_{COM} = -10mA,			0.05		Ω
$R_{FLAT(ON)}$	On resistance flatness	V+ = 4.5V, 0V ≤ V_{NO} or V_{NC} ≤ V+,I_{COM} = -10mA,			1.6		Ω
		V+ = 3.6V, 0V ≤ V_{NO} or V_{NC} ≤ V+,I_{COM} = -10mA,			1.2		
		V+ = 2.7V, 0V ≤ V_{NO} or V_{NC} ≤ V+,I_{COM} = -10mA,			1.4		
$I_{NC(OFF)}$, $I_{NO(OFF)}$	Source off leakage current	V+ = 3.6V, V_{NO} or V_{NC} = 0.3V, 3.3V, V_{COM} = 3.3V, 0.3V			0.1		μA
$I_{NC(ON)}$, $I_{NO(ON)}$, $I_{COM(ON)}$	Channel ON leakage current	V+ = 3.6V, V_{COM} = 0.3V, 3.3V, V_{NO} or V_{NC} = 0.3V, 3.3V, or floating			0.1		μA
I_{OFF}	Power off leakage current	V+ = 0V, NO/NC floating, V_{COM} = 3V			0.1		μA
DIGITAL INPUT							
V_{IH}	Input voltage high			1.5			V
V_{IL}	Input voltage low					0.5	V
I_{IN}	Input leakage current	V+ = 3.6V, V_{IN} = 0V or 3.6V			0.5		μA
I_+	Power Supply Current	V+ = 3.6V, V_{IN} = 0V or V+			30		μA
DYNAMIC CHARACTERISTICS							
ton	Turn on time	V_{NO} or V_{NC} = 1.5V, V_{IH} = 1.8V, V_{IL} = 0V, R_L = 50Ω, C_L = 35pF,			1.8		μs
toff	Turn off time	V_{NO} or V_{NC} = 1.5V, V_{IH} = 1.8V, V_{IL} = 0V, R_L = 50Ω, C_L = 35pF,			350		ns
t_{BBM}	Break before make time	$V_{NO}1$ or $V_{NC}1$ = $V_{NO}2$ or $V_{NC}2$ = 1.5V, R_L = 50Ω, C_L = 35pF,			1.4		μs
O_{IRR}	Off Isolation	Signal = 0dBm, R_L = 50Ω,C_L = 5pF,	f = 10MHz		-49		dB
			f = 1MHz		-70		
X_{TALK}	Crosstalk	Signal = 0dBm, R_L = 50Ω,C_L = 5pF,	f = 10MHz		-52		dB
			f = 1MHz		-72		
BW	-3dB bandwidth	Signal = 0dBm, R_L = 50Ω, C_L = 5pF,			300		MHz
C_{OFF}	Off capacitance				9		pF
C_{ON}	On capacitance				24		pF
THD	Total Harmonic Distortion	V+ =3.6V,$V_{NC/NO}$=2Vpp, f=20Hz to 20kHz,	R_L=32Ω		0.05		%
SNR	Signal-to-Noise Ratio	f=20Hz to 20kHz, A-weighted filter, Inputs ground, RL=32Ω or 20K			125		dBV

Specifications subject to change without notice.

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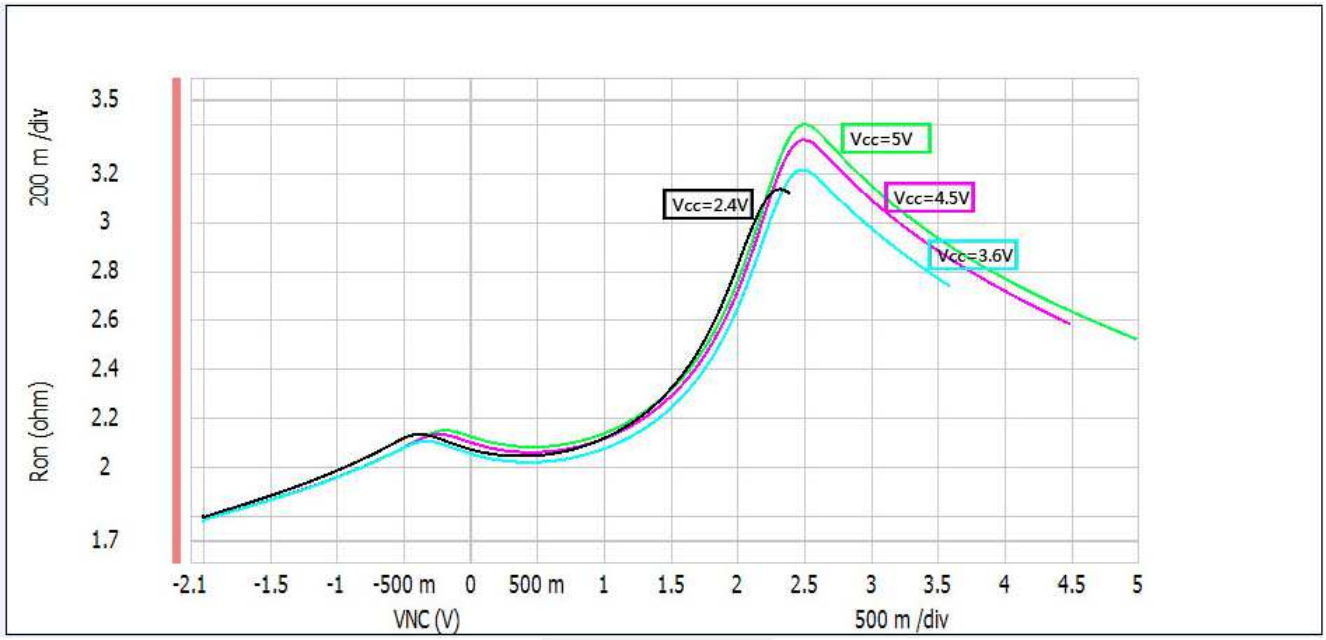
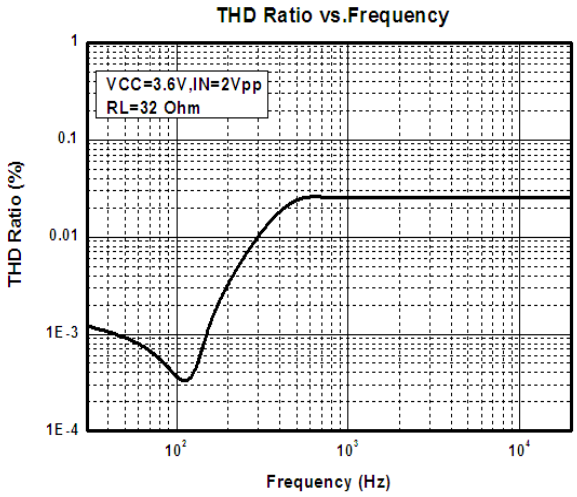
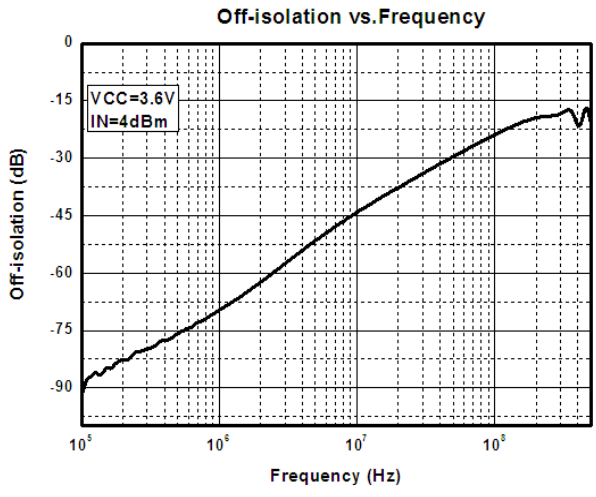
Typical Performance Characteristics

R_{ON} vs V_{NC}

I_{ON}=100mA, V_{CC}=V_{NC}(max)







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Test Diagrams

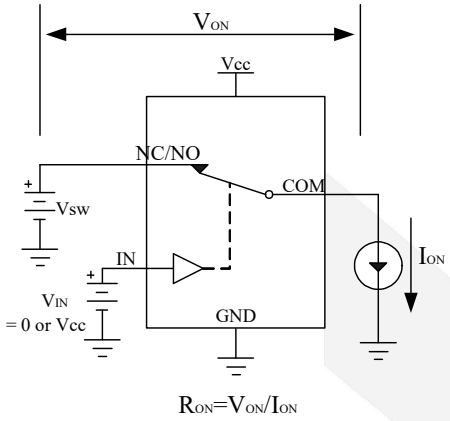

Figure 2 Switch on resistor

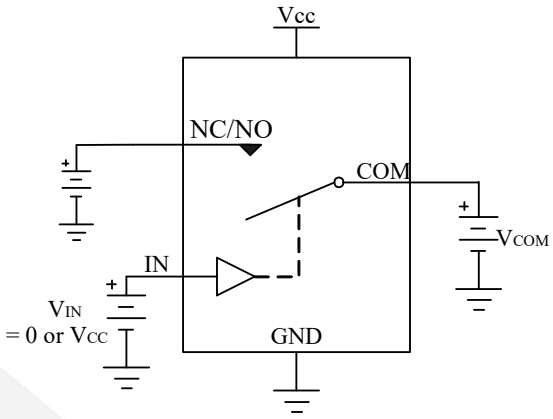

Figure 3 Switch Off Leakage

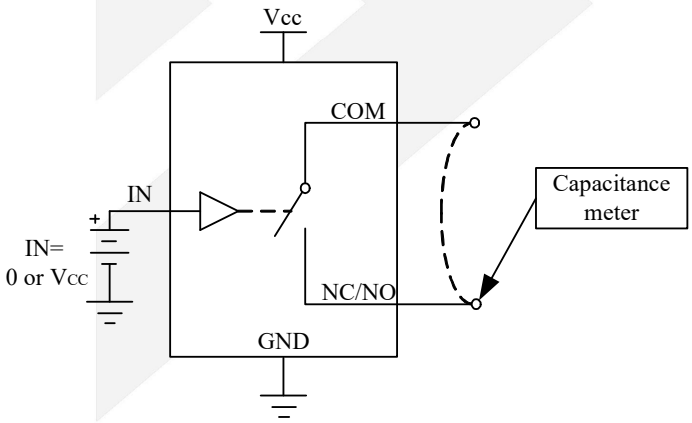

Figure 4 On/off Capacitance test

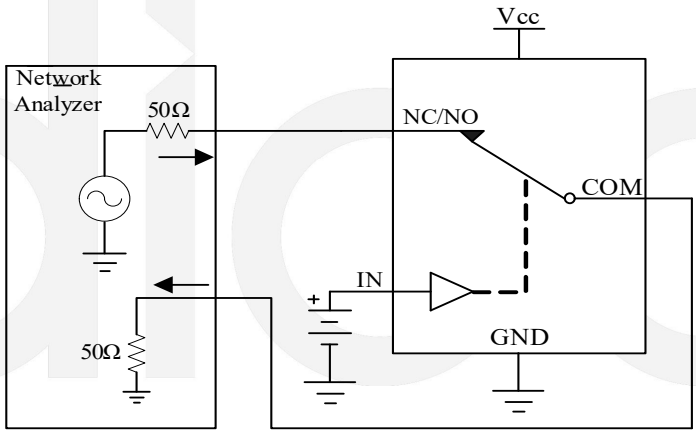

Figure 5 Bandwidth

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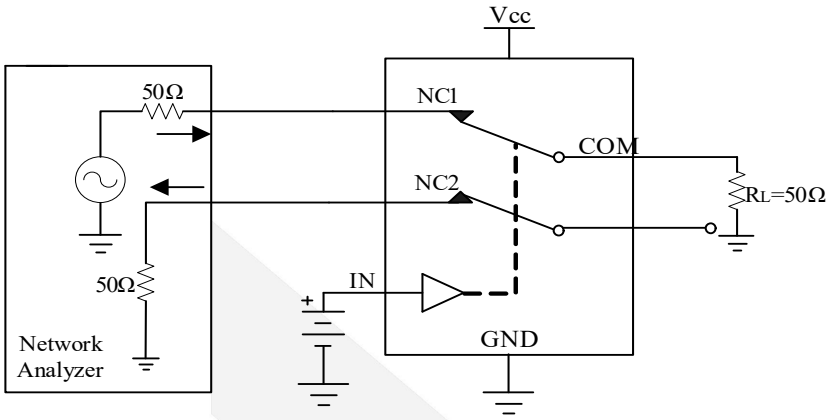

Figure 6 Channel-to-channel crosstalk

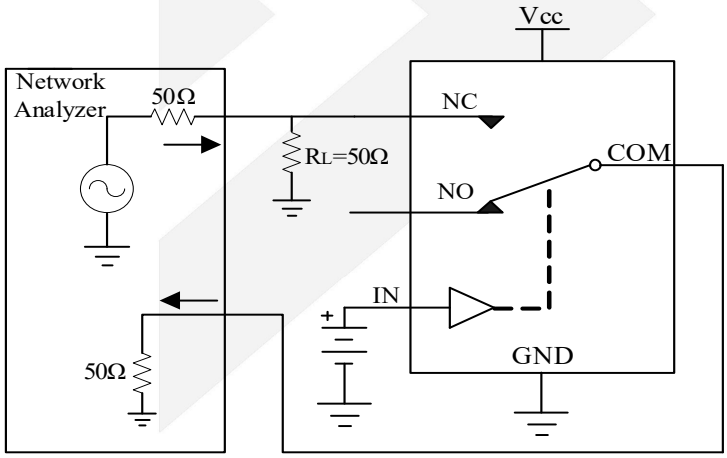

Figure 7 Off-isolation

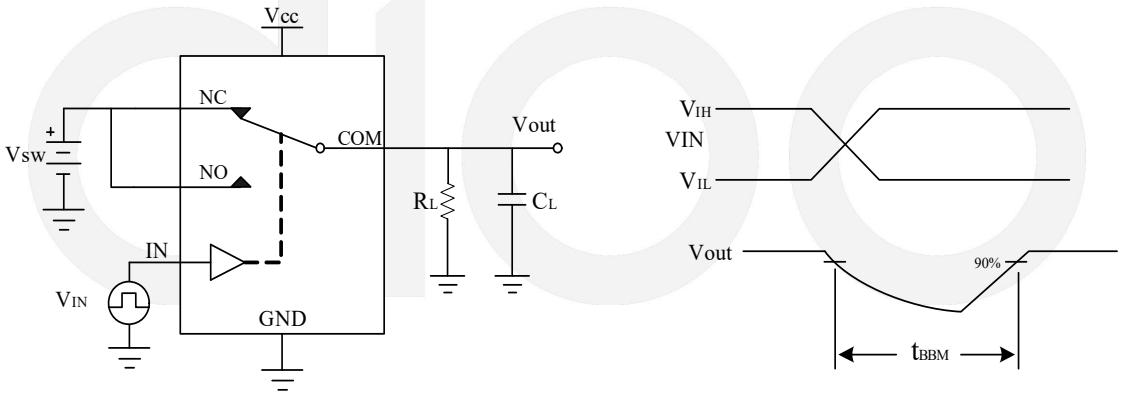

Figure 8 Break-Before-Make

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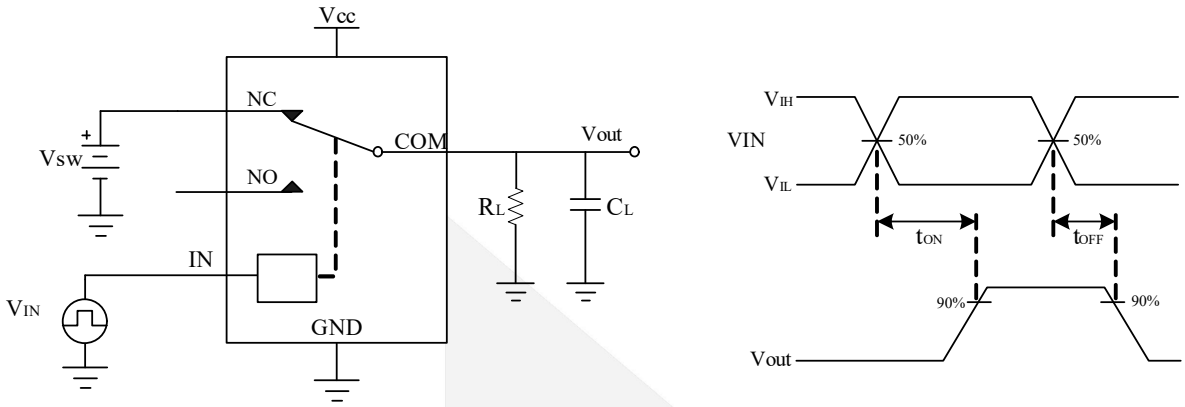

Figure 9 Turn-On/Turn-Off

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CONTACT US

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