

DIO1159B

Low On-Resistance, Low THD Analog Switch

Features

- 5.5 tolerant on control pin
- Voltage Operation: 1.65V to 5.5V
- Low On Resistance: 1Ω @ 5V V_{CC}
- Excellent On Resistance Matching
- Low Total Harmonic Distortion (THD)
- Low Charge Injection
- Low power consumption
- Green or RoHS Packaged:
SC70-6, SOT23-6 and DFN-6
- 1.5KV CDM ESD Rating,
8kV HBM ESD

Descriptions

The DIO1159B is a low power, single pole double throw analog switch, which is designed to operate from a single 1.65V to 5.5V supply.

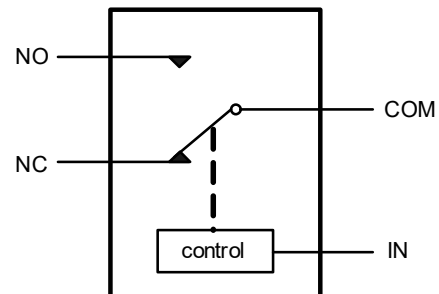
DIO1159B has low on resistance, excellent on resistance matching and very low total harmonic distortion performance to prevent signal distortion during signals transferring. All these features make DIO1159B suitable for portable audio applications.

DIO1159B is available in two type packages: SC70-6, SOT23-6 and DFN 1.6*1.6-6.

Applications

- Cell Phones
- PDAs and MP3s
- Portable Instrumentation
- Battery Powered Communications
- Computer Peripherals

Block Diagram



Ordering Information

Order Part Number	Top Marking		T_A	Package	
DIO1159BSC6	YW(X)Z	Green or RoHS	-40 to +85 °C	SC70-6	Tape & Reel, 3000
DIO1159BST6	YW(X)Z	Green or RoHS	-40 to +85 °C	SOT23-6	Tape & Reel, 3000
DIO1159BFN6	YW(X)Z	Green or RoHS	-40 to +85 °C	DFN-6	Tape & Reel, 3000

Note: Y: Year, W: week, XZ: internal code



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Pin Assignment

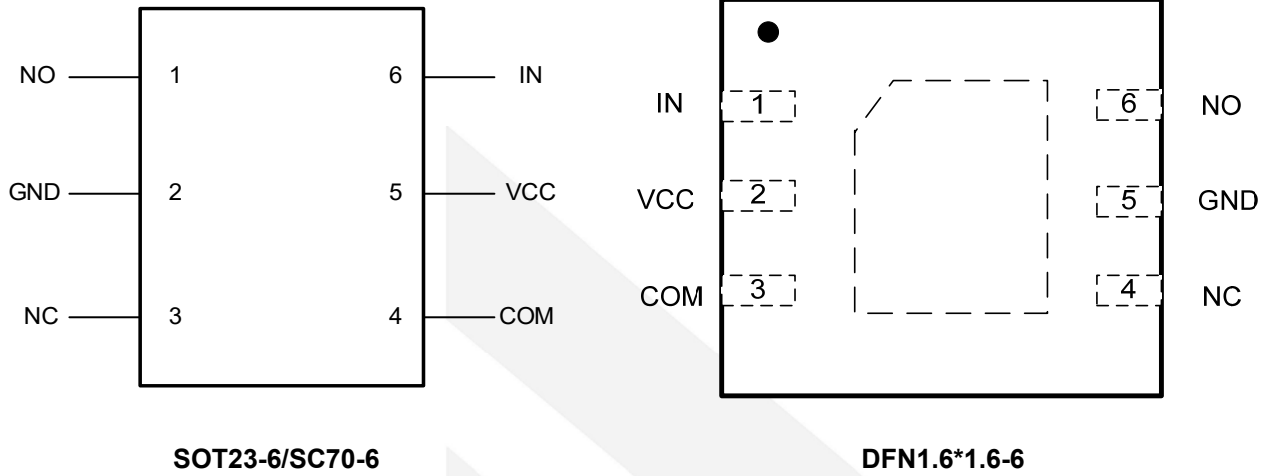


Figure 1 Top View

Pin Descriptions

Pin Name	Description
NO	Normally open
GND	Ground
NC	Normally closed
COM	Common
V _{cc}	Power supply
IN	Control

Truth Table

IN	Function
L	COM to NC
H	COM to NO



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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		Min.	Max.	Unit
Supply Voltage(V _{CC})		-0.5	6.5	V
DC Switch Voltage(V _{SW})		-0.5	V _{CC} +0.5	V
DC Control Voltage(V _{IN})		-0.5	6.5	V
On-state Switch Current (I _{sw})		-300	300	mA
On-state peak Switch Current (I _{sw})		-400	400	
Continuous current through GND		-100	100	mA
Storage Temperature Range (T _{STG})		-65	150	°C
ESD	HBM, JEDEC :JESD22-A114		8	kV
	CDM, JEDEC : JESD22-C101		1.5	

Recommend 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		Min.	Max.	Unit
Supply Voltage (V _{CC})		1.65	5.5	V
Control Input Voltage (V _{IN})		0	5.5	V
Switch Input Voltage (V _{SW} , V _{COM})		0	V _{CC}	V
Operating Temperature (T _A)		-40	85	°C



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Electrical Characteristics

All typical value are at $V_{CC}=5V$; $T_A = 25^{\circ}C$, unless otherwise specified.

Symbol	Parameter	Conditions	Temp.	Min	Typ	Max	Unit
V_{IH}	Input voltage high		-40 to 85°C	1.65			V
V_{IL}	Input voltage low		-40 to 85°C			0.6	V
I_{IN}	Control input leakage	$V_{IN}=5V$ or $0V$, $V_{CC}=5V$	25°C	-2		2	nA
			-40 to 85°C	-100		100	
$I_{NC(OFF)}$ $I_{NO(OFF)}$	NC, NO, COM off leakage current See Figure 3	$V_{SW}=0.3V, 3.3V$, $V_{COM}=3.3V, 0.3V$, $V_{CC}=5V$	25°C	-20	2	20	nA
			-40 to 85°C	-100		100	
$I_{COM(ON)}$	COM on leakage current	$V_{COM}=0.3V, 3.3V$, $V_{SW}=0.3V, 3.3V$, or floating, $V_{CC}=5V$	25°C	-20	2	20	nA
			-40 to 85°C	-100		100	
I_{CC}	Quiescent supply current	$V_{CC}=5V$, $V_{IN}=V_{CC}$ or GND, Switch ON or OFF	25°C		10	50	nA
			-40 to 85°C			500	
I_{CCT}	Increase in I_{CC} input	$V_{CC}=5V$, $V_{IN}=1.8V$	25°C		46		μA
		$V_{CC}=5V$, $V_{IN}=2.8V$			22		
R_{ON}	Switch on Resistance See Figure 2	$V_{CC}=5V$, $V_{SW}=1V$, $I_{SW}=-100mA$	25°C		1	1.5	Ω
			-40 to 85°C			2.0	
ΔR_{ON}	On Resistance Matching between Channels	$V_{CC}=5V$, $V_{SW}=1V$, $I_{SW}=-100mA$	25°C		0.05	0.2	Ω
			-40 to 85°C			0.3	
$R_{FLT(ON)}$	On Resistance Flatness	$V_{CC}=5V$, $V_{SW}=1V, 3.5V$, $I_{SW}=-100mA$	-40 to 85°C		0.8	1.2	Ω
T_{ON}	Turn-On Time See Figure 9	$V_{SW}=1.5V$ or $0V$, $R_L = 50\Omega$, $C_L = 35pF$ See Figure 9	25°C			35	ns
T_{OFF}	Turn-Off Time See Figure 9	$V_{SW}=1.5V$ or $0V$, $R_L = 50\Omega$, $C_L = 35pF$ See Figure 9	25°C			30	ns
T_{BBM}	Break before make time See Figure 8	$V_{SW}=V_{CC}$, $R_L = 50\Omega$, $C_L = 35pF$ See Figure 9	25°C			20	ns
OIRR	Off Isolation See Figure 7	$R_L = 50\Omega$, Signal=0dBm, f=1MHz See Figure 7	25°C		-60		dB
BW	-3dB bandwidth See Figure 5	$R_L = 50\Omega$, Signal=0dBm, See Figure 5	25°C		100		MHz
THD	Total harmonic distortion	$R_L = 600\Omega$, $C_L=50pF$, f=20Hz to 20kHz, See Figure 5	25°C		0.002		%
C_{IN}	Control Pin input Capacitance	$V_{IN}=V_{CC}$ or $0V$	25°C		1.5		pF
C_{OFF}	OFF Capacitance See Figure 4	Switch Off $V_{SW}=V_{CC}$ or $0V$ See Figure 4	25°C		22		pF
C_{ON}	On Capacitance See Figure 4	Switch On $V_{COM}=V_{CC}$ or $0V$ See Figure 4	25°C		49		pF

Test Diagrams

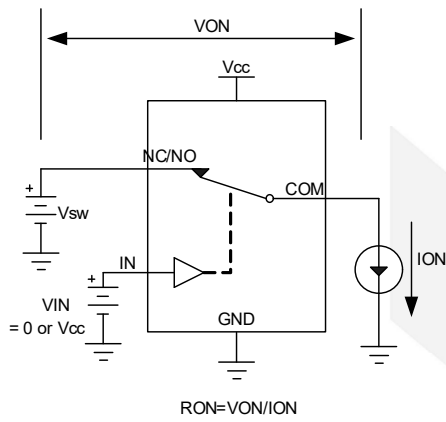


Figure 2 Switch on resistor

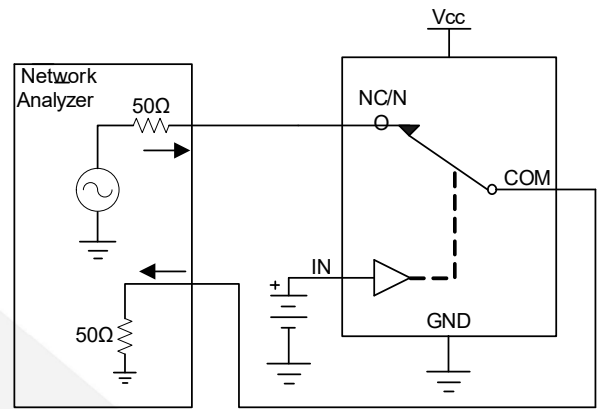


Figure 5 Bandwidth

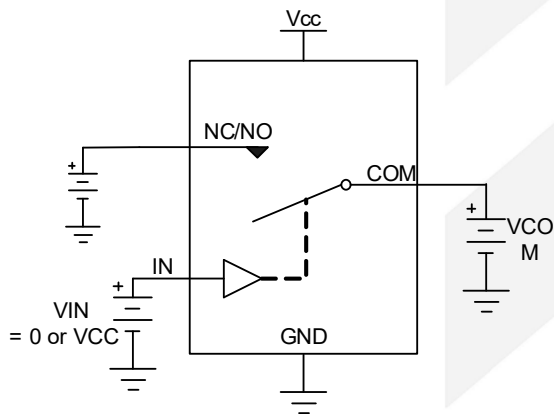


Figure 3 Switch Off Leakage

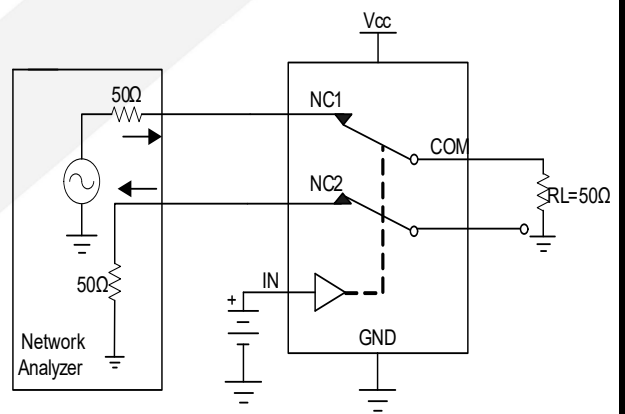


Figure 6 Channel-to-channel crosstalk

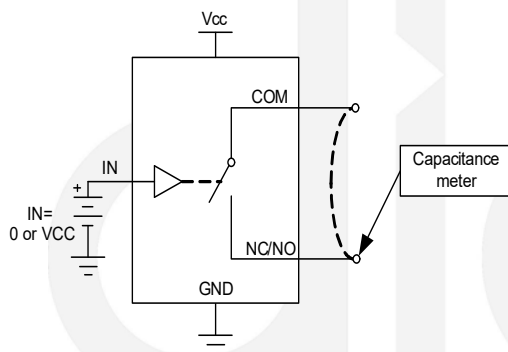


Figure 4 On/off Capacitance test

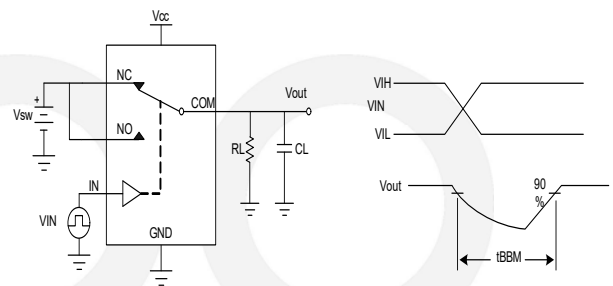


Figure 8 Break-Before-Make

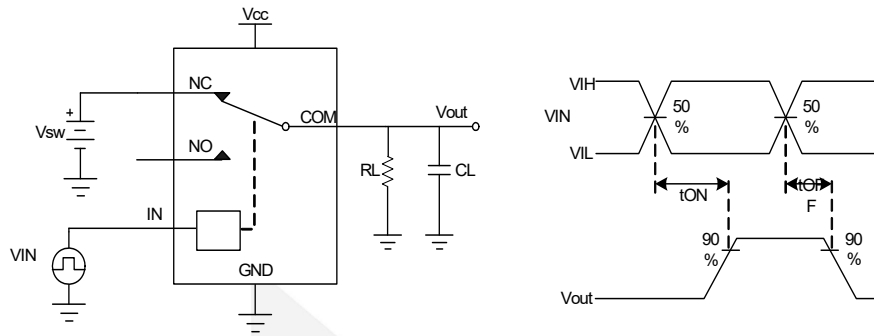


Figure 9 Turn-On/Turn-Off



CONTACT US

Dioo is a professional design and sales corporation for high-quality and performance analog semiconductors. The company focuses on industry markets, such as, cell phone, handheld products, laptop, and medical equipments and so on. Dioo's product families include analog signal processing and amplifying, LED drivers and charger IC. Go to <http://www.dioo.com> for a complete list of Dioo product families.

For additional product information, or full datasheet, please contact with our Sales Department or Representatives.

A large, light gray watermark of the Dioo logo is centered on the page. It consists of a stylized arrow pointing right followed by the word "dioo" in a lowercase, sans-serif font.