

DIO1628

Three Port, 6GHz, High-Speed Differential MIPI Switch

Features

- Supply voltage: 1.65V to 5.5V
- Quiescent Current: 17uA
- Low On Resistance: 10Ω
- -3dB differential Bandwidth: 6GHz(typ.)
- Package: LGA1.7*2.4-24

Applications

- Dual Camera for Cell Phones
- Dual LCD Monitor, Digital Camera Displays

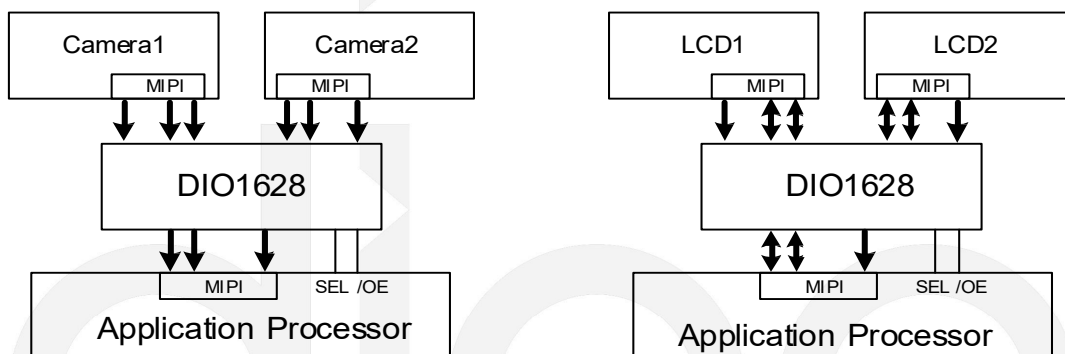
Descriptions

The DIO1628 is a high-speed analog switch. The pin out is designed to ease differential signal layout and is configured as triple-pole, double-throw switch (TPDT). The DIO1628 is optimized for switching between two MIPI devices, such as cameras or LCD displays and on-board MAP.

The DIO1628 is compatible with the requirements of MIPI. The low-capacitance design allows the device to switch signals that exceed 6GHz in frequency. Superior channel-to-channel crosstalk immunity minimizes the interference and allows the transmission of high-speed differential signals and single-ended signals, as described by the MIPI specification.

The DIO1628 is available in LGA1.7*2.4-24 package. Standard Products are Pb-free and halogen-free.

Typical Application



Ordering Information

Order Part Number	Top Marking		T _A	Package	
DIO1628LG24	DF2H	Green	-40 to 85°C	LGA1.7*2.4-24	Tape & Reel, 3000

Pin Assignments

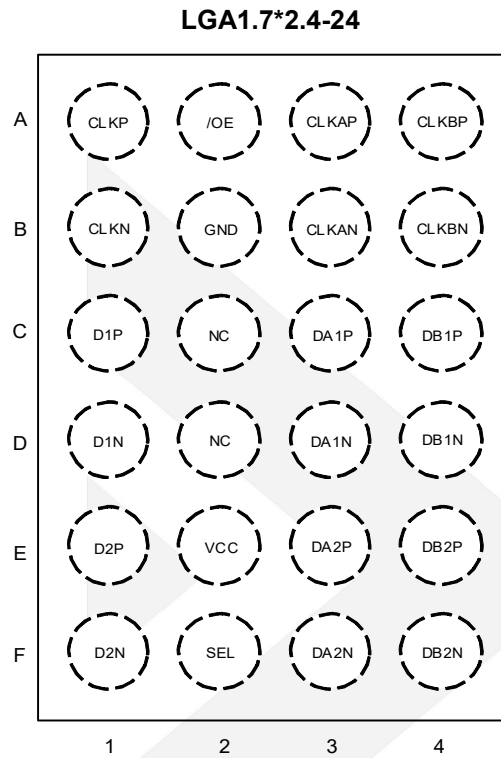


Figure 1. Top View

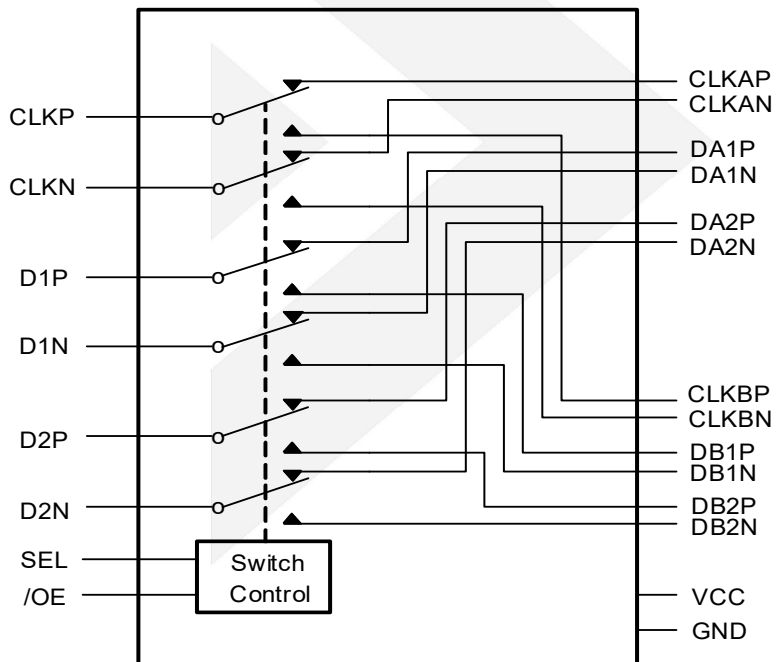
Pin Description

Pin Name	Description
CLKP/N	Clock Paths (CLKP, CLKN)
D1P/N	Data Paths 1 (D1P, D1N)
D2P/N	Data Paths 2 (D2P, D2N)
/OE	Output Enable (Active Low)
GND	Ground
VCC	Power Supply
SEL	Select (0=A, 1=B)
DA2P/N	Data Paths (DA2P, DA2N)
DA1P/N	Data Paths (DA1P, DA2N)
CLKAP/N	Clock Paths (CLKAP, CLKAN)
DB2P/N	Data Paths (DB2P, DB2N)
DB1P/N	Data Paths (DB1P, DB2N)
CLKBP/N	Clock Paths (CLKBP, CLKBN)
NC	No Connect

Truth Table

SEL	/OE	Function
X	H	Bus switch disconnected
L	L	D1,D2,CLK = DA1,DA2,CLKA
H	L	D1,D2,CLK = DB1,DB2,CLKB

Function Diagram



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.

Symbol	Parameter	Rating	Unit
VCC	Supply voltage range	-0.5 to 6.5	V
V _{DATA}	Data input/output voltage range	-0.5 to 6.5	V
V _{SEL}	Select input voltage range	-0.5 to 6.5	V
I _{OUT}	Continues output current	±50	mA
T _J	Junction temperature range	150	°C
T _L	Lead temperature range	260	°C
T _{STG}	Storage temperature range	-65 to 150	°C
R _{θJA}	Thermal resistance	250	°C/W

Recommended Operating Conditions

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. DIOO does not Recommend exceeding them or designing to Absolute Maximum Ratings.

Symbol	Parameter	Rating	Unit
VCC	Supply voltage range	1.65 to 5.5	V
V _{DATA}	Data input/output voltage range	0 to VCC	V
V _{SEL}	Select input voltage range	0 to VCC	V
V _{IOE}	Enable control input voltage range	0 to VCC	V
T _A	Operating temperature range	-40 to 85	°C



DIO1628

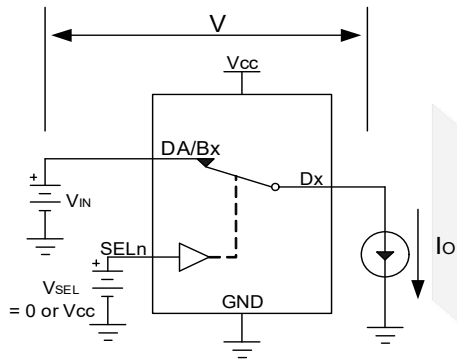
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Electrical Characteristics

T_A=25°C, V_{CC}=2.5V, unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{IH}	Select and /OE logic high level	V _{CC} =3.6 to 4.5V	1.5			V
		V _{CC} =2.3 to 3.6V	1.3			V
V _{IL}	Select and /OE logic low level	V _{CC} =3.6 to 4.5V			0.6	V
		V _{CC} =2.3 to 3.6V			0.4	V
I _{CC}	Supply quiescent current	I _{OUT} =0, V _{SEL} >1.5V or V _{SEL} < 0.7V		17	35	uA
I _{SEL}	Select input leakage current	V _{SEL} =V _{CC}			±1.0	uA
I _{OFF}	Off state switch leakage current				±1.0	uA
R _{ON}	On-Resistance	V _{CC} =3.0V, V _{DATA} =0 to 0.4V, I _{OUT} =8mA		10	13	Ω
Δ R _{ON}	On-Resistance match	V _{CC} =3.0V, V _{DATA} =0 to 0.4V, I _{OUT} =8mA		0.1		Ω
R _{FLAT(ON)}	On-Resistance flatness	V _{CC} =3.0V, V _{DATA} =0 to 1.0V, I _{OUT} =8mA		1		Ω
T _{PD}	Propagation delay time	C _L =5pF, R _L =50Ω		0.2		ns
T _{ON}	Select input to switch on time	C _L =10pF, R _L =50Ω		90	120	ns
T _{OFF}	Select input to switch off time	C _L =10pF, R _L =50Ω		40	80	ns
T _{BBM}	Break-Before-Make time	Generated by design		50		ns
BW	-3dB differential Bandwidth	R _L =50Ω, C _L =0pF	5	6		GHz
OIRR	Off isolation	R _L =50Ω, F=100MHz		-40		dB
Xtalk	Crosstalk	R _L =50Ω, F=100MHz		-44		dB
C _{IN}	Select pin input capacitance	V _{CC} =0V		6		pF
C _{OFF}	D1n, D2n, Dn Off capacitance	V _{CC} =3.3V, /OE=3.3V		5		pF
C _{ON}	D1n, D2n, Dn On capacitance	V _{CC} =3.3V, /OE=0V		4		pF

Application Information



$$R_{ON} = V / I_o$$

Figure 2. ON Resistance

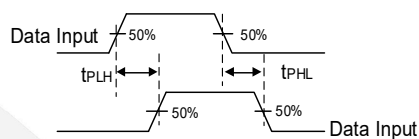
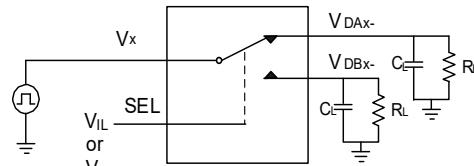


Figure 3. Propagation delay time

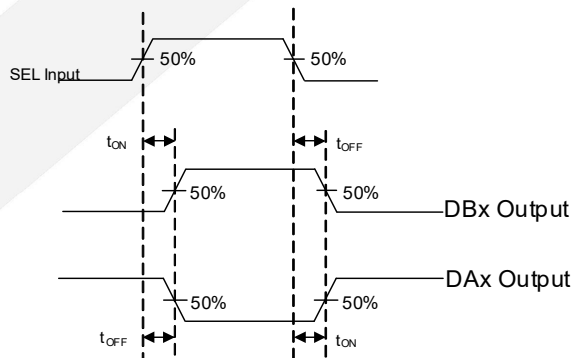
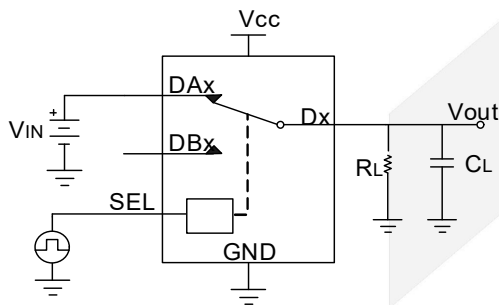
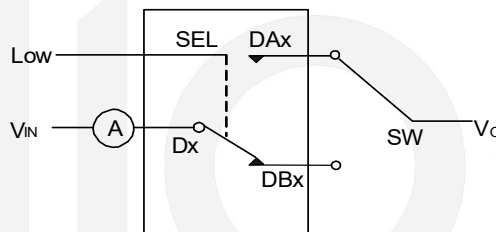


Figure 4. Select input to switch on/off time



Conditions $V_{IN} = 4.5V$ $V_0 = GND$

Figure 5. Off state switch leakage current

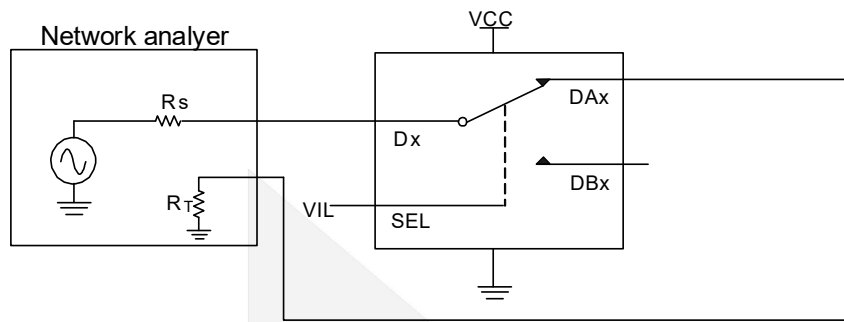


Figure 6. Bandwidth (BW)

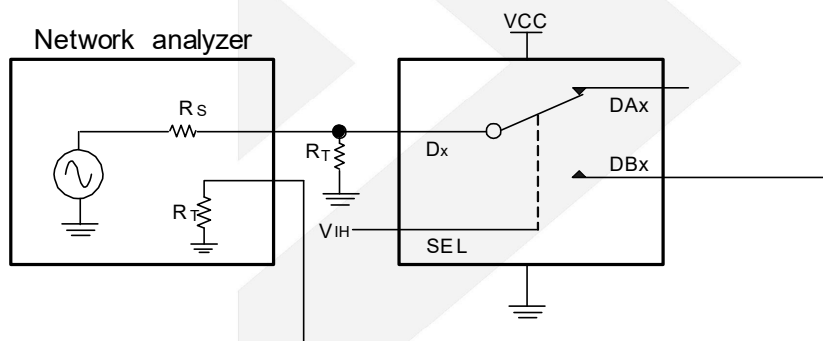


Figure 7. Off isolation (OIRR)

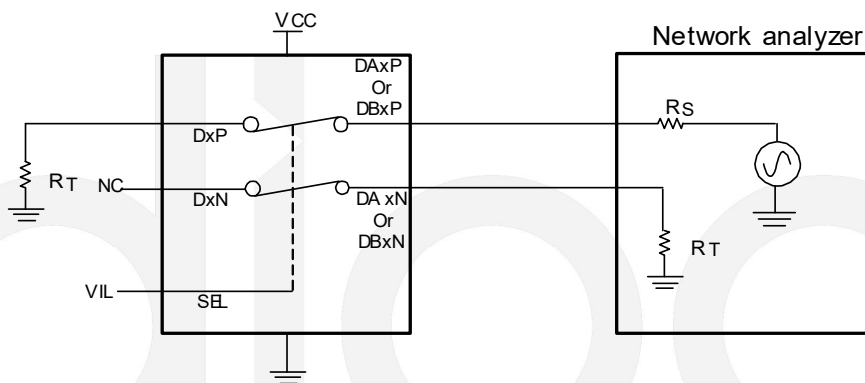


Figure 8. Crosstalk (Xtalk)

Typical Performance Characteristics

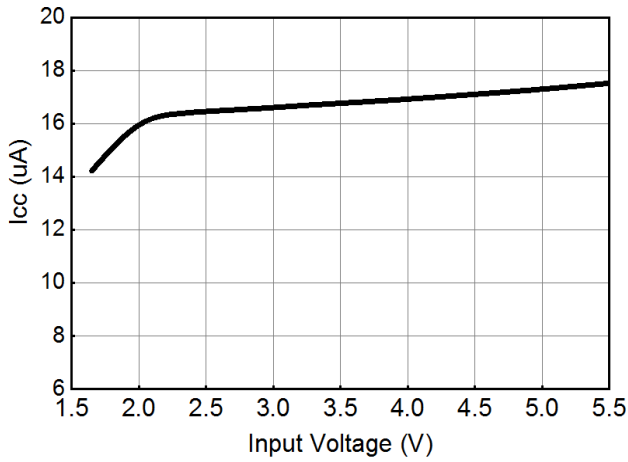


Figure 9. Supply quiescent current Vs. Vcc

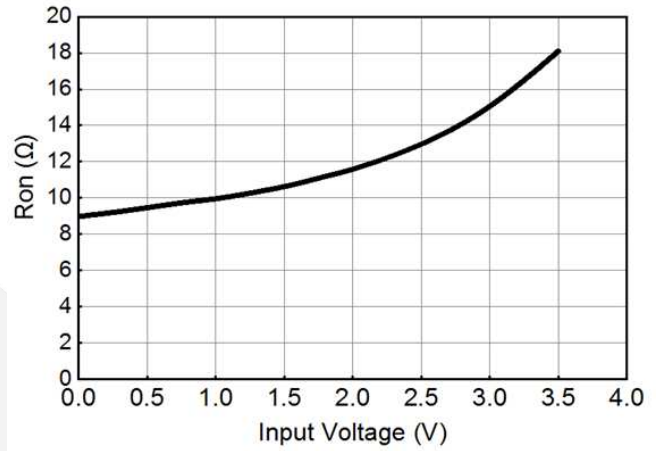


Figure 10. Ron Vs. Vi

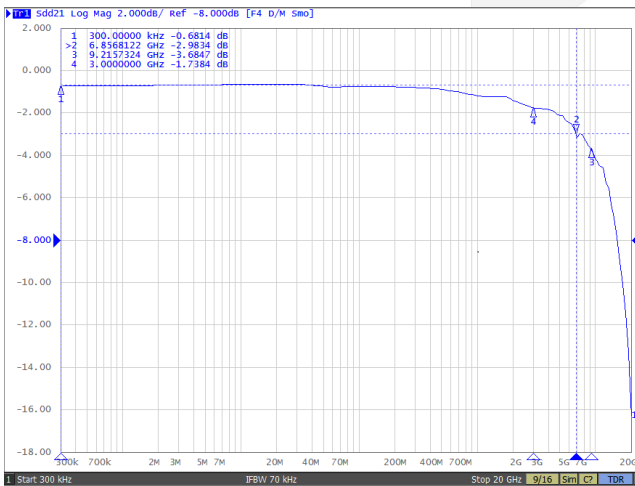


Figure 11. Bandwidth Vs. Frequency

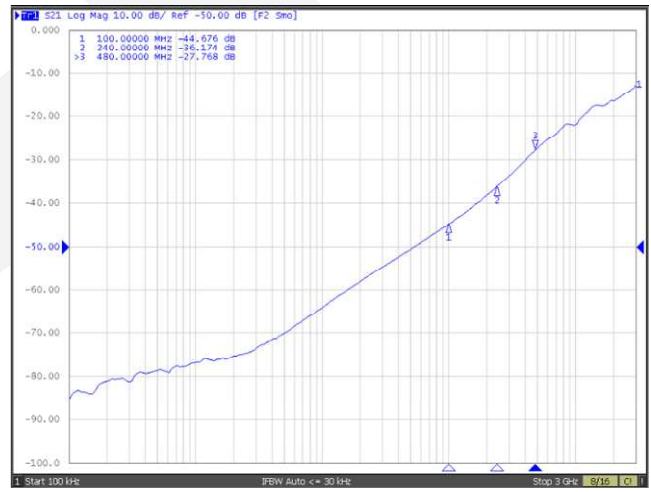


Figure 12. Cross Talk Vs. Frequency

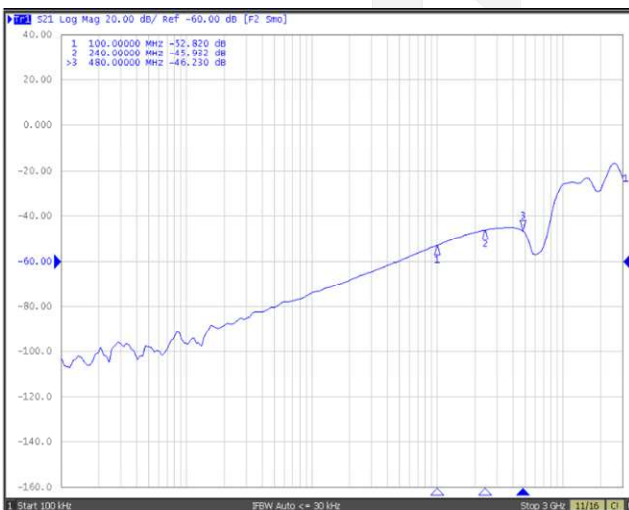
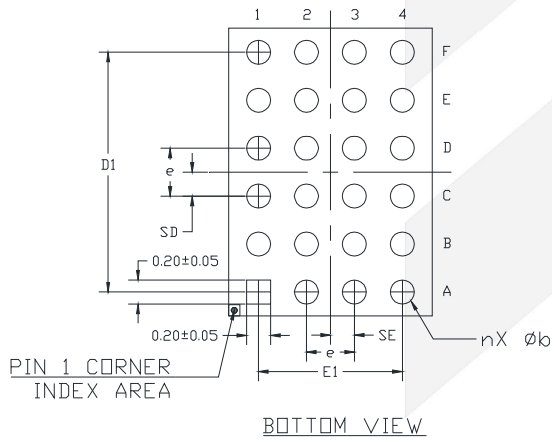
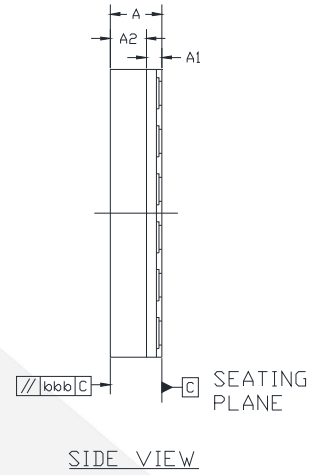
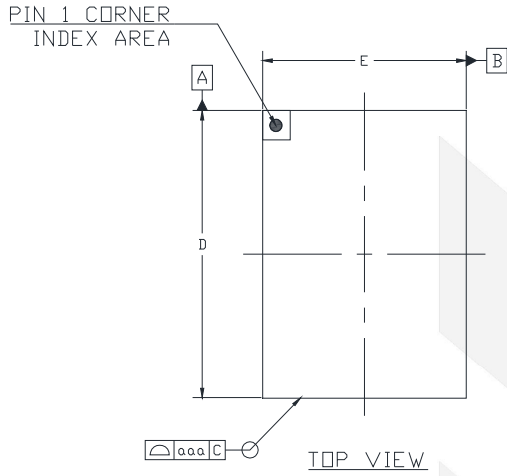


Figure 13. Off Isolation Vs. Frequency

Physical Dimensions: LGA1.7*2.4-24



	SYMBOL	DIMENSION (MM)		
		MIN.	NOM.	MAX.
TOTAL THICKNESS	A	---	---	0.50
SUBSTRATE THICKNESS	A1	0.13 REF		
MOLD THICKNESS	A2	0.26	0.30	0.34
BODY SIZE	D	2.30	2.40	2.50
	E	1.60	1.70	1.80
LEAD OPENING	b	0.15	0.20	0.25
LEAD PITCH	e	0.35	0.40	0.45
LEAD COUNT	n	23		
EDGE LEAD CENTER TO CENTER	D1	2.00 BSC		
BODY CENTER TO CONTACT LEAD	SD	0.20 BSC		
	SE	0.20 BSC		
PACKAGE EDGE TOLERANCE	aaa	0.05		
MOLD FLATNESS	bbb	0.1		





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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 equipment 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.

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