

4 Channel High-Speed - Robust-EMC Reinforced Digital Isolators

The project described here is a high-performance, quad-channel digital isolator with a 5000VRMS isolation rating as per UL1577. The ISO7740 IC provides high electromagnetic immunity and low emissions at low power consumption while isolating CMOS or LVCMOS digital I/O s. Each isolation channel has a logic input and output buffer separated by a double capacitive silicon dioxide (SiO2) insulation barrier. The project comes with enable pins that can be used to put the respective outputs in high impedance for multi-master driving applications and to reduce power consumption. The project is based on the ISO7740 chip that has all four channels in the same direction. If the input power or signal is lost, the output becomes high by default.

Used in conjunction with isolated power supplies, this project helps reduce noise currents on data buses, such as RS-485, RS-232, and CAN, or other interfaces, from entering the local ground and interfering with or damaging sensitive circuitry. Through innovative chip design and layout techniques, electromagnetic compatibility of the ISO7740 device has been significantly enhanced to ease system-level ESD, EFT, surge, and emissions compliance.

Connections and Other Details

- CN1: Pin1= VCC1 (VCC Input Side 2.25V TO 5.5V), Pin2= Input 1, Pin3=Input 2, Pin4= Input 3, Pin5= Input 4, Pin6= NC (Not Connected), GND1
- CN2: Pin1=VCC2 (VCC Output Side 2.25V to 5.5V), Pin2=Output 1, Pin3=Output 2, Pin4=Output 3, Pin5=Output 4, Pin6=Enable, Pin7=GND2
- LED D1 Power LED Input Side
- LED D2 Power LED Output Side

Note Project is default enabled, and all outputs are normally HIGH, Connecting Enable pin to GND disables the outputs and outputs are Low.

Features

- Wide Supply Range: 2.25 V to 5.5 V Output Side
- Wide Supply Range: 2.25 V to 5.5 V Input Side
- Level Translation Range: 2.25V to 5.5V
- 2 X Power LED Input Side and Output Side
- 100 Mbps Data Rate
- Robust Isolation Barrier
- 100-year projected lifetime at 1500 VRMS working voltage
- Up to 5000 VRMS isolation rating
- Up to 12.8 kV surge capability
- ±100 kV/µs typical CMTI
- Default output high
- Wide temperature range: -55°C to 125°C
- Low power consumption, typical 1.5 mA per channel at 1 Mbps









- Low propagation delay: 10.7 ns typical (5-V Supplies)
- Robust electromagnetic compatibility (EMC)
- System-level ESD, EFT, and surge immunity
- ±8 kV IEC 61000-4-2 contact discharge protection across isolation barrier
- Low emissions
- PCB Dimensions 40.64MM X 27.94MM
- 2.5MM X 4 Mounting Holes









BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	2	CN1,CN2	7 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5320-ND
2	2	C1,C3	10uF/10V SMD SIZE 1206	YAGEO/MURATA	DIGIKEY	
3	2	C2,C4	0.1uF/50V SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
4	2	D1,D2	LED RED SMD SIZE 0805	LITE ON INC	DIGIKEY	160-1427-1-ND
5	2	R1,R2	1K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	1	R3	4.7K 5% SMD SIZE 0895	YAGEO/MURATA	DIGIKEY	
7	1	U1	ISO7740DWR	TI	DIGIKEY	296-44607-1-ND



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PCB DIMENSIONS 40.64MM X 27.94MM





