



DATA SHEET

DRTB

MIPI D-PHY Reference Termination Board

C SERIES

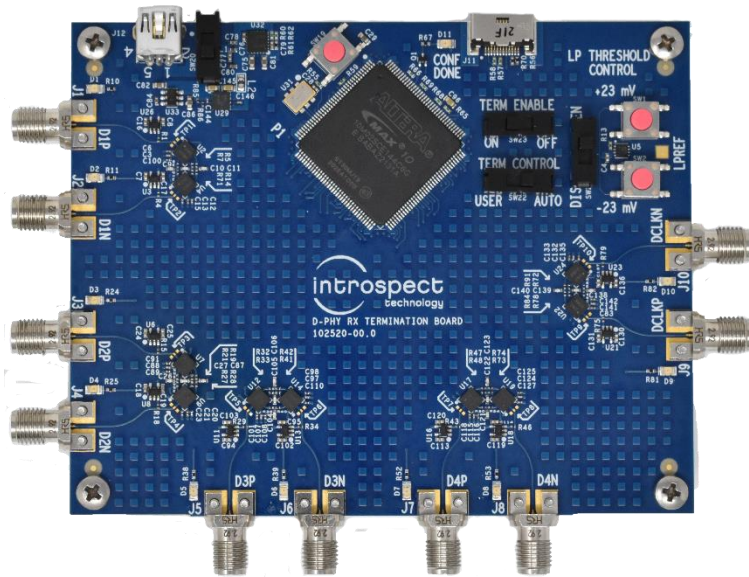


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Introduction

OVERVIEW

Introspect Technology’s DRTB MIPI D-PHY Reference Termination Board (RTB) allows users to emulate the behavior of a MIPI D-PHY receiver at data rates of up to 9.0 Gbps. The RTB engages termination upon the reception of a valid MIPI D-PHY high-speed signal and releases termination when high-speed transmissions are complete, thus creating a test bench for MIPI D-PHY transmitter evaluation. The RTB receives MIPI D-PHY signals via 2.92 mm connectors and uses a single USB 2.0 mini B cable connection for power, allowing users to quickly get up and running.

APPLICATIONS

- MIPI D-PHY transmitter evaluation at up to 9.0 Gbps
- MIPI D-PHY transmitter evaluation where direct receiver probe points are required

ORDERING INFORMATION

TABLE 1: ITEM NUMBERS FOR THE DRTB AND RELATED PRODUCTS

PART NUMBER	NAME	KEY DIFFERENTIATORS
6356	DRTB	9.0 Gbps MIPI D-PHY reference termination board
7123	PV1 Universal Active Probe	Universal probe system for 5 GHz applications
7154	PV2 Universal Active Probe	Universal probe system for 8 GHz applications
5782	SV5C-DPTX	9.0 Gbps MIPI D-PHY transmitter

RELATED DOCUMENTATION

CRTB MIPI C-PHY Reference Termination Board: Data Sheet

- EN-D032E-E-21245 CRTB MIPI C-PHY Termination Board Data Sheet

PHYSICAL CONNECTIONS

Figure 1 shows a diagram of the physical ports of the DRTB MIPI D-PHY RTB.

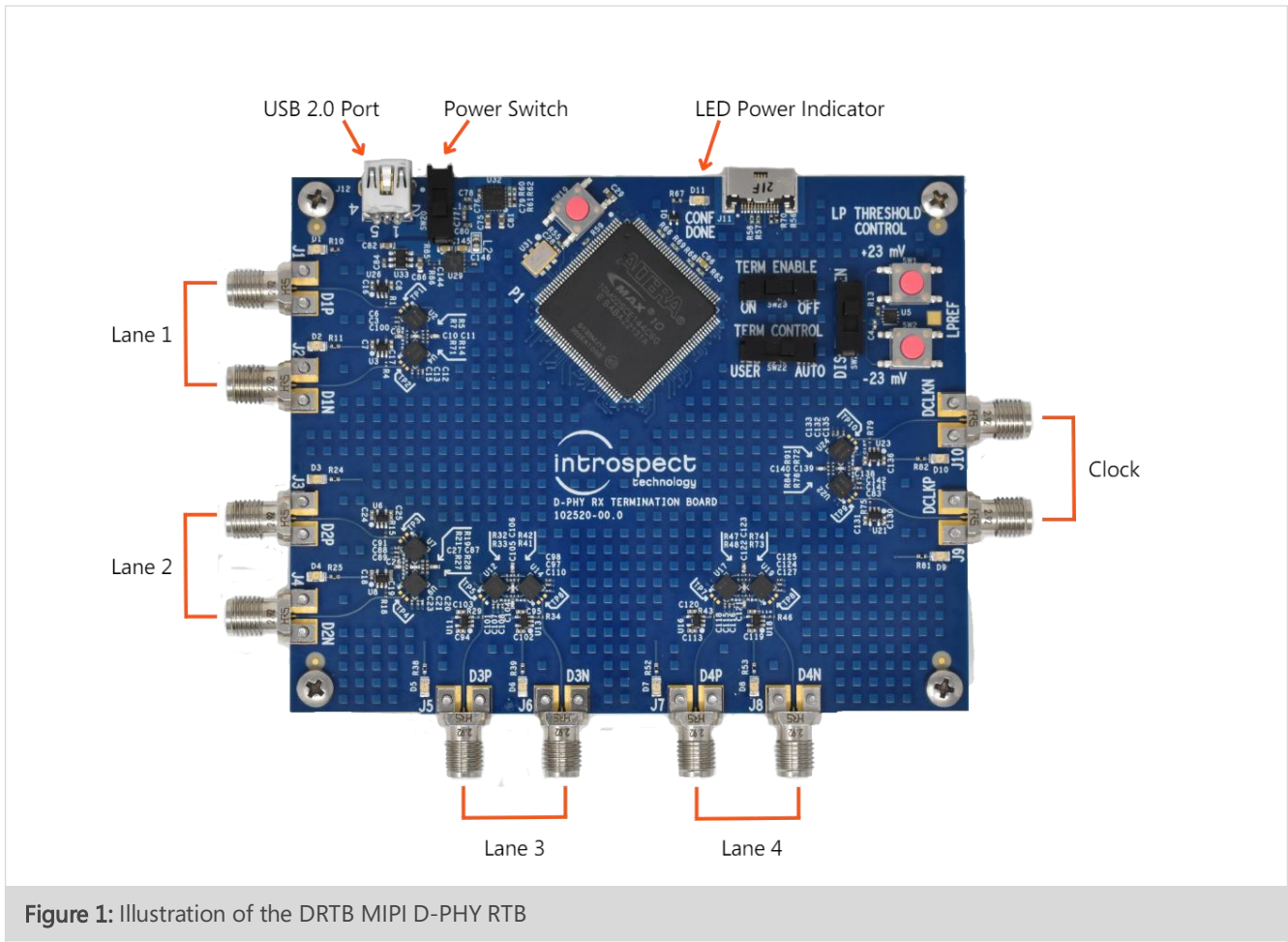


Figure 1: Illustration of the DRTB MIPI D-PHY RTB

The RTB has three user configurable sections, as shown in Figure 2 below:

- Impedance Control
- Termination Control
- LP Threshold Control

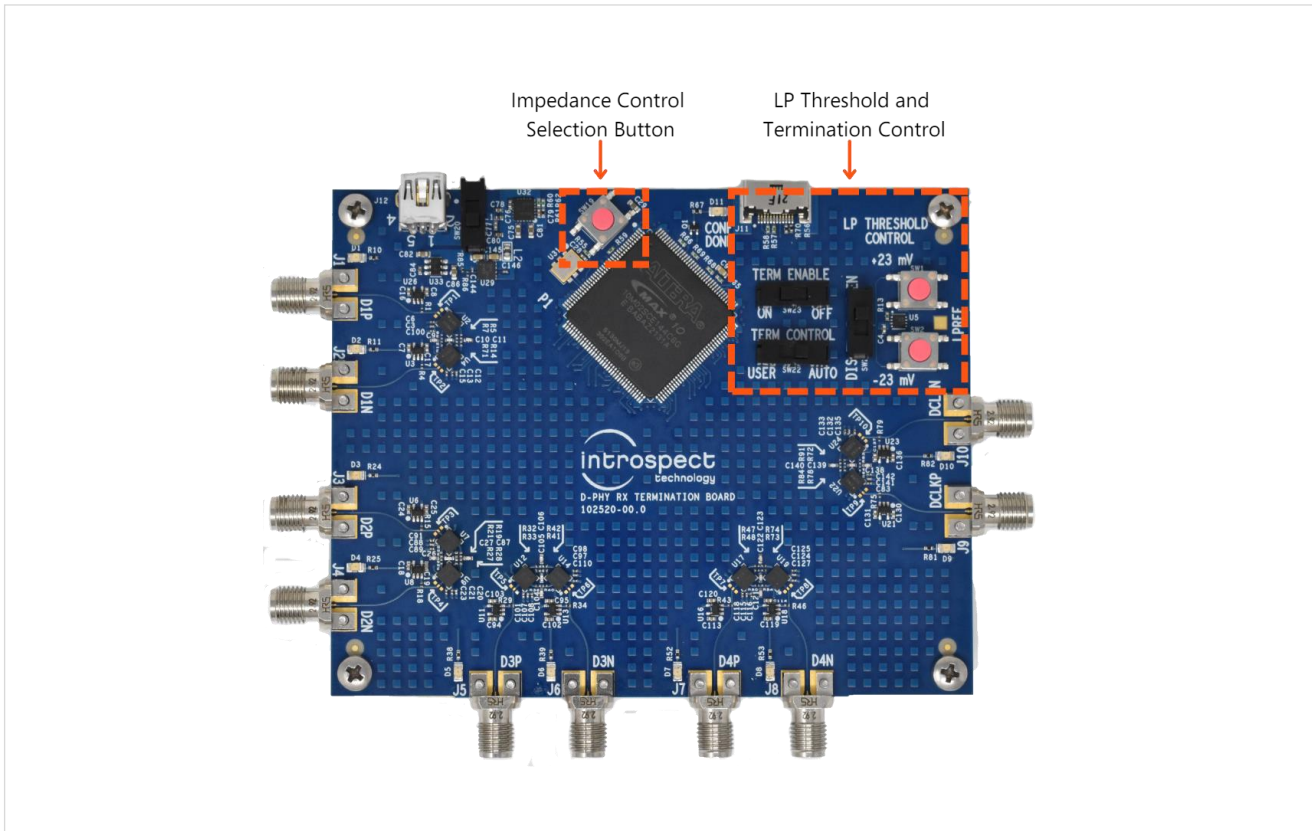


Figure 2: Impedance, termination, and LP threshold controls in the DRTB MIPI D-PHY RTB

IMPEDANCE CONTROL

The termination impedance for high-speed signals may be selected as either 50 ohms (the default on power up), 40 ohms, or 62 ohms. By pressing the impedance control selection button, as shown in Figure 2, the user may switch between these three impedance settings. A single value of 40, 50, or 62 ohms is applied to each of the lanes and clock.

There are two LEDs associated with each lane and the clock. The flashing LEDs (J1, J3, J5, J7 and J9) indicate the termination impedance selection. The selected impedance of 40 ohms, 50 ohms, or 62 ohms is indicated by these LEDs flashing 4, 5, or 6 times in a row respectively. The non-flashing LEDs (J2, J4, J6, J8 and J10) indicate the termination status, as described in the section below.

TERMINATION CONTROL

The termination control section of the RTB allows users to switch between automatic or user-controlled termination. This is done by sliding the "TERM CONTROL" switch to either the "AUTO" or "USER" position. In "AUTO" mode, any time that termination is engaged on a channel, the corresponding LED indicators (J2, J4, J6, J8 and J10) will light up, allowing users to easily identify which channels are being terminated. These LEDs are either on or off, and unlike the flashing impedance control LEDs.

AUTOMATIC TERMINATION MODE

When operating in the automatic mode, the RTB will automatically terminate a channel when an incoming high-speed MIPI D-PHY signal is detected.

USER-CONTROLLED TERMINATION MODE

When operating in the user-controlled mode, the RTB will always terminate all MIPI D-PHY lanes, regardless of receiving a high-speed signal or not. Users can engage or disengage termination by sliding the "TERM ENABLE" switch to "ON" or "OFF".

NOTE

The "TERM ENABLE" slide switch is only used when operating in "USER" mode.

LP THRESHOLD CONTROL

The LP threshold control section of the DRTB MIPI D-PHY RTB allows users to adjust the LP threshold voltage used to detect the start and end of a high-speed transmission.

Users can enable this adjustment by sliding the "LP THRESHOLD CONTROL" switch to the "EN" position. They can then adjust the threshold voltage by pushing the "+23mV" or "-23mV" buttons to raise or lower the threshold voltage in 23mV increments. Users can measure the LP threshold level by probing the "LPREF" pad located between the LP threshold adjustment buttons.

Users can also set the threshold to 0 mV by sliding the "LP THRESHOLD CONTROL" switch to "DIS".

Specifications

TABLE 2: GENERAL AND ELECTRICAL SPECIFICATIONS

PARAMETER	VALUE	UNITS	DESCRIPTION AND CONDITIONS
Application / Protocol Support			
Physical layer interface	D-PHY		
LP/HS handling	Automatic		
Ports			
D-PHY Lanes	4 Lanes and Clock		2.92 mm connectors
Power requirement	5	Volts	Provided through USB 2.0 mini B connector from a PC
LP Threshold Range			
Maximum	1500	mV	
Minimum	0	mV	
Resolution	23	mV	
Switching Characteristics			
Minimum T_{LP}	50	ns	
Minimum $T_{HS-PREPARE} / T_{CLK-PREPARE}$	40	ns	
Input Impedance			
Input impedance	40 50 62	ohms	Input impedance for HS transmissions, single ended. The termination value may be selected by pressing the impedance control selection button, as described on pages 5 and 6.
Input impedance	Hi-Z		LP transmission

TABLE 3: MECHANICAL SPECIFICATIONS

PARAMETER	VALUE	UNITS	DESCRIPTION AND CONDITIONS
Physical Dimensions			
Length	104	mm	
Width	83	mm	
Height	14	mm	Board height without stand-offs



REVISION NUMBER	HISTORY	DATE
1.0	Document release	September 27, 2022
1.1	Updated the images of the DRTB	May 9, 2023
1.2	Adjusted reference to Auto mode on p.6	September 19, 2023

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