

BRD1553SPI-P

With

PMOD adaptor

Hardware Interface Manual

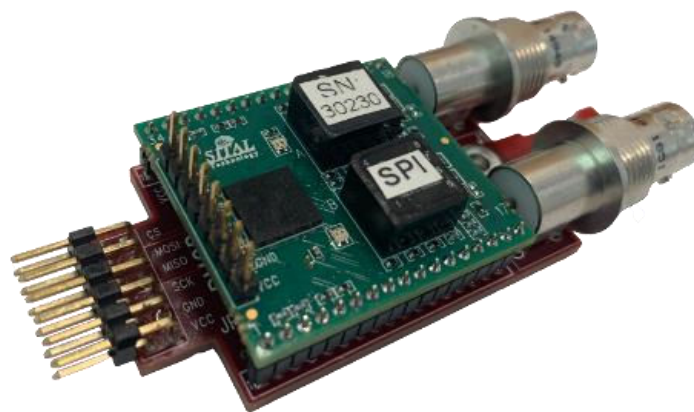
PMOD adaptor for BRD1553SPI

Mil-Std-1553 Board

With Triax connectors

USER'S MANUAL

Rev 1.0



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1 KEY FEATURES AND BENEFITS

- Complete Dual-Redundant Mil-Std-1553B BC RT MT with Bus transceiver and transformer
- Incorporates Sital Technology's BRM1553D with 8K x 16 RAM
- Easily connects with PMOD header in SPI mode on most FPGA evaluation boards
- Standard MIL-STD-1553 Triax connectors.
- Single 3.3Vdc supply operation
- Less than 0.3W maximum power dissipation during 1553 transmission
- Mechanical connectors for ruggedized applications
- Build from standard of the shelf components, no ASICs
- RoHS Compliant

1.1 RELEVANT DOCUMENTS

BRM1553SPI_HSID.pdf – Hardware Software document that describes the SPI interface definitions. This document is intended for users that would like to program the SPI master with the appropriate format in order to read and write to the BRM1553D IP through the SPI channel. This document is essential for developers of the low level driver.

BRM1553DO254_HSID_Verxx.pdf – Hardware Software Interface document that provides a detailed description of the registers, memory, modes of operations that are available with Sital Technology well known BRM1553D IP. This document is essential for the API development and might be useful for user code development that uses an API set of functions.

2 ABOUT THIS MANUAL

This document is intended for users that would like to connect a MIL-STD-1553 transceiver + transformers + Triax connectors to a 12 pin PMOD header.

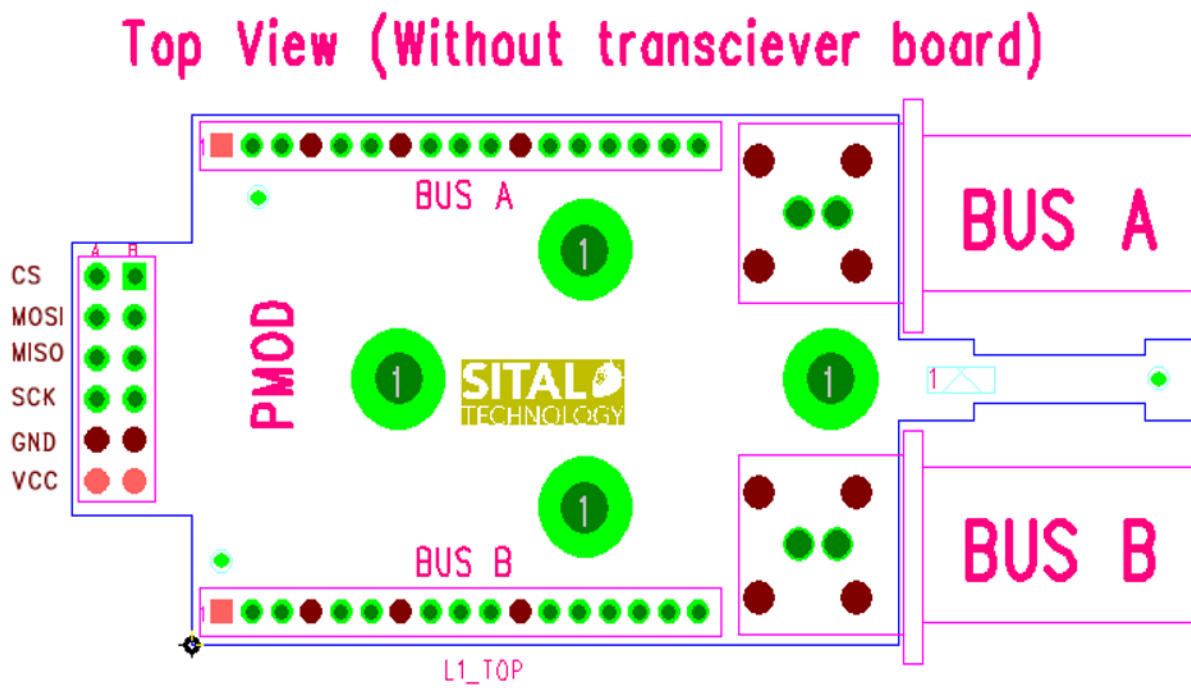


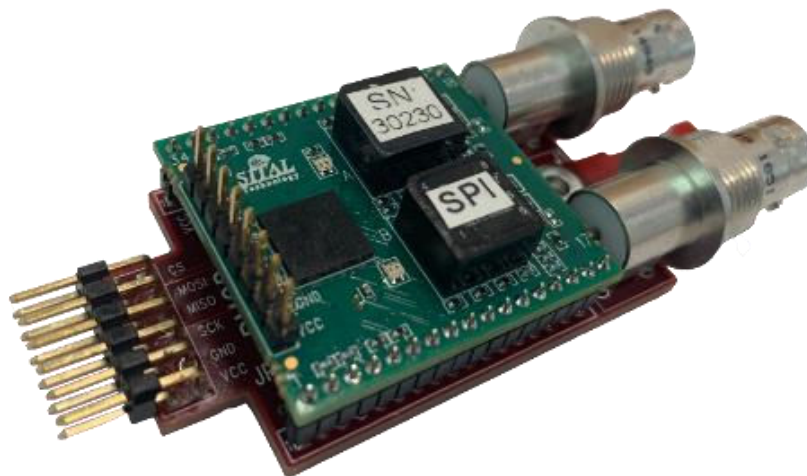
Figure 1: BRD1553SPI-P Board – Top View

3 BRD1553SPI-P ADAPTOR BOARD

The BRD1553SPI-P unit is intended for field Mil-Std-1553/1760 applications, testing or evaluation of Sital's IP cores Transceivers, and transformers.

Users who develop 1553 applications often require a working module long before the actual system's hardware is available. Either if it is for the development of software, evaluation of the 1553 IP core or transceiver components, the BRD1553SPI-P and BRD1553SPI units can be used for the evaluation and development of the 1553 interface.

The BRD1553SPI_P board is a carrier for the BRD1553SPI card. The BRD1553SPI-P provides standard connectors for the headers pins of the BRM1553SPI daughter board. On the front end it provides Triax connectors, and on the backend, a standard PMOD SPI connector.



3.1 TRIAX CONNECTORS

Two standard Triax connectors are provided.

The default coupling is transformer coupling. This coupling implies that the Triax connectors should be connected to bus stubs of a standard MIL-STD-1553 coupler.

It is also possible with BRD1553SPI to request direct coupling, please contact Sital Technology sales for this option.

3.2 PMOD HEADER PINOUT

A standard PMOD header is a 6 or 12 pin header, 2.54mm pitch, typically used for SPI interfaces and general purpose connections. PMOD connectors are commonly available on many FPGA development boards. It is thus simple to setup a working 1553 node with the digital IP inside the FPGA, and the transceiver + transformer pair connected to it through the PMOD header.

BRD1553SPI-P comes with a right angle connector for its PMOD header interface. However the BRD1553SPI-P can be connected with a vertical header as well. Please make sure that if right angle connector is used, the SPI signaling would connect to the appropriate pins in the connector as described in figure 1.

The top view of the SPI PMOD header pinout:

SPI chip select active low	CS	
Master Out Slave In SERIAL data	MOSI	
Master In Slave Out Serial Data	MISO	
SPI CLOCK	SCK	
Ground	GND	GND
3v3 Supply	VCC	VCC

4 CARD DIMENSIONS

This is a top view of the BRD1553SPI-P adaptor.

Kindly note that if any of the four screw headers are used, it is required to detach the BRD1553SPI from the BRD1553SPI-P adaptor.

For rugged environments, it might be required to solder the PMOD header, and connect mechanical screw connections to the 4 holes provided.

The right angle Triax connectors may be replaced with standard 1553 cable in cases that the Triax connectors are required to be mounted somewhere else in the enclose.

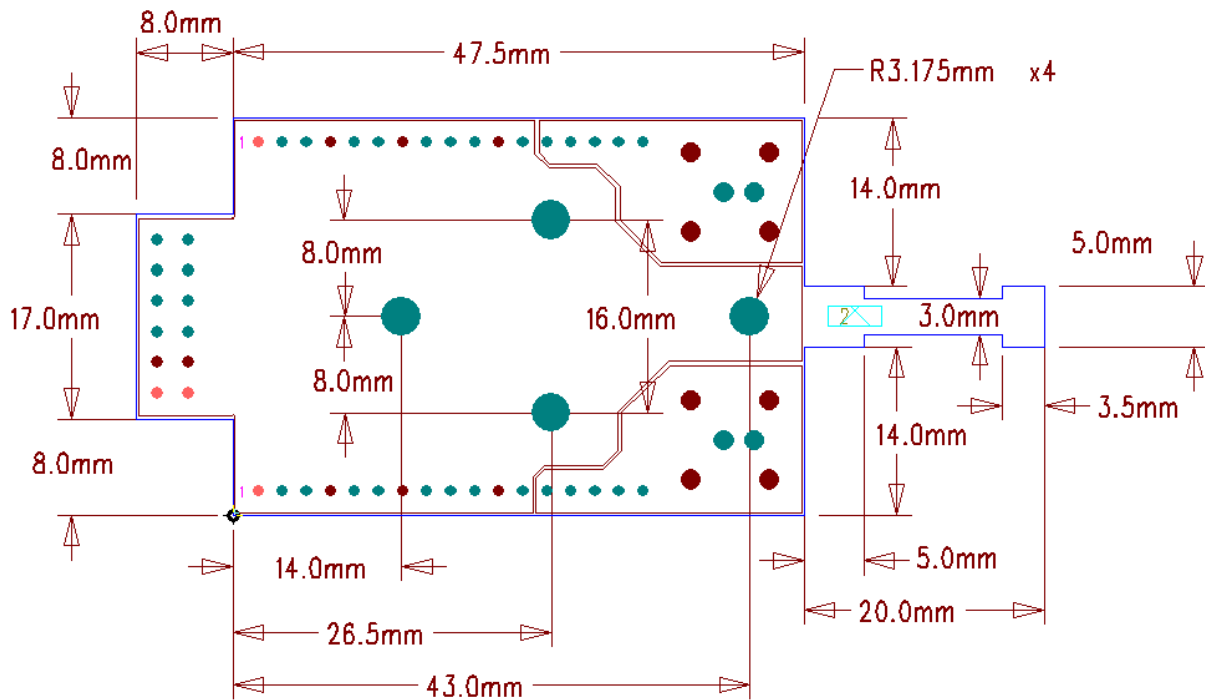


Figure 2: BRD1553SPI-P dimensions in mm

5 DC AND SWITCHING CHARACTERISTICS FOR BRM1553SPI

5.1 ABSOLUTE MAXIMUM RATINGS ^{1, 2}

Supply Voltage VCC	-0.5 to 3.75V
Input or I/O Tristate Voltage Applied ³	-0.5 to 3.75V
Storage Temperature (Ambient)	-65 to 150°C
Operating Temperature	-40°C to +85°C
Junction Temperature Under Bias (Tj)	+125°C

1. Stress above those listed under the “Absolute Maximum Ratings” may cause permanent damage to the device. Functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.
2. All voltages referenced to GND.
3. Overshoot and undershoot of -2V to (VIHMAX + 2) volts is permitted for a duration of <20 ns.

5.2 RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min.	Max.	Units
VCC	Board Supply Voltage	3.20	3.40	V
tJIND	Junction Temperature, Industrial Operation	-40	100	°C

5.3 DC ELECTRICAL CHARACTERISTICS

Recommended Operating Conditions:

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
VOH	Logic '1' Output Voltage		VCCIO - 0.4	-	-	V
VOL	Logic '0' Output Voltage		-	-	0.4	V
VIH	Logic '1' Input Voltage		2.0	-	3.6	V
VIL	Logic '0' Input Voltage		-0.3	-	0.8	V





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