

TC1-DESIQ-SBB User Guide

User's Guide



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TC1-DESIQ-SBB User Guide

1 Board Overview

Thank you for your interest in TI's TC1-DESIQ-SBB. These boards are not included with the GSPS ADC Reference Board hardware kit, but are separately available in order to evaluate DESIQ Mode performance. The TC1-DESIQ-SBB uses the TC1-1-13MA+ from Mini-Circuits, which is designed for wide-band functionality and low cost, see [Figure 1](#).

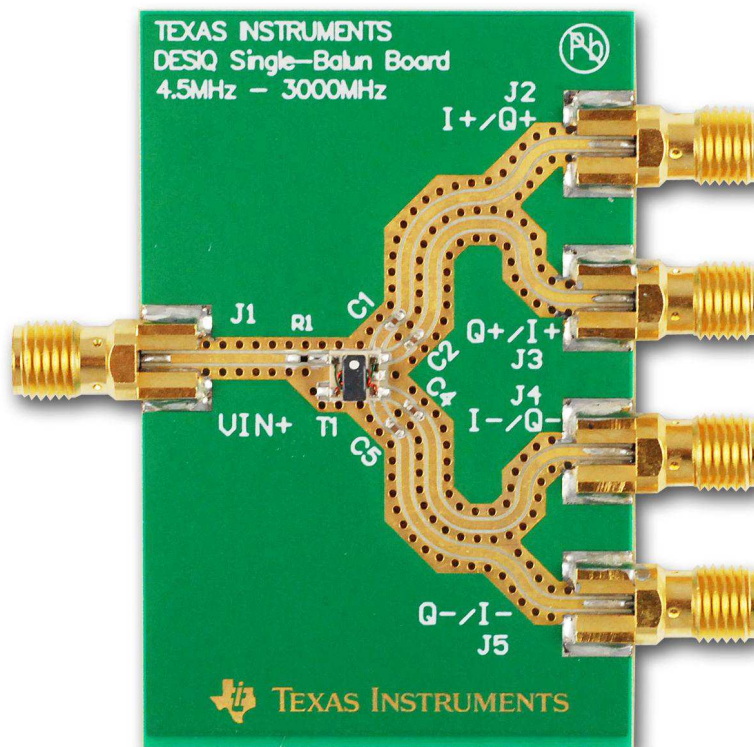


Figure 1. TC1-DESIQ-SBB Board

- Board: TC1-DESIQ-SBB
- Balun: TC1-1-13MA+
- Balun Manufacturer: Mini-Circuits
- Frequency range: {4.5MHz, 3GHz}
- Impedance ratio: 1:1
- Features: wire-wound construction, wide-band functionality, good return loss
- Datasheet: <http://www.minicircuits.com/pdfs/TC1-1-13MA+.pdf>

2 Board Schematics

Since the composite input impedance of the GPS ADCs in DESIQ Mode are 50Ω , and the impedance of most signal generators are 50Ω , the 1:1 impedance ratio of this balun is ideal for the application, see [Figure 2](#). The balun board includes capacitors for AC-coupling, so DC blocks to the ADC are not necessary.

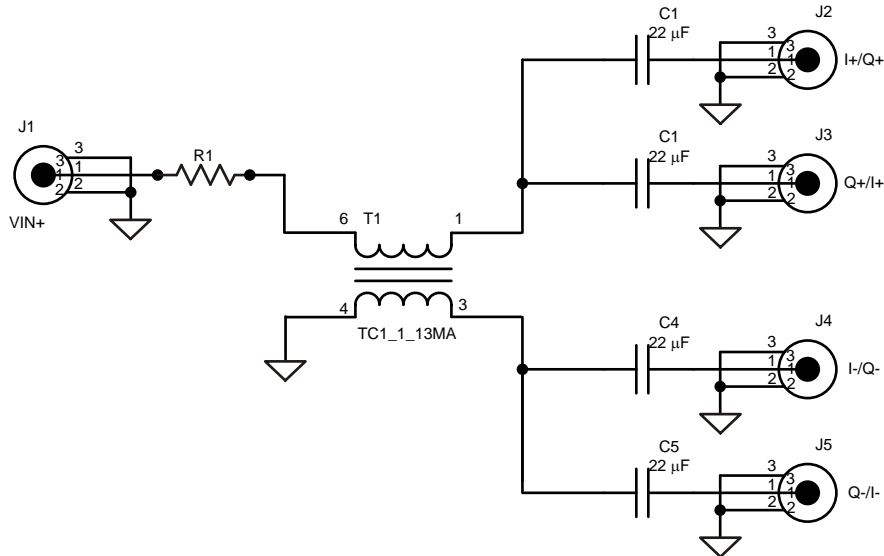


Figure 2. TC1-DESIQ-SBB Schematic

3 Connections in Setup

The connection between the TC1-DESIQ-SBB and the ADC1xDxxxx(RF) Reference Board should be made as shown in [Figure 3](#). These connections can be made with the 6" SMA to SMA cables which are included in the Reference Board hardware kit. Note that the connections are not directly across; care must be taken to make the correct connections.

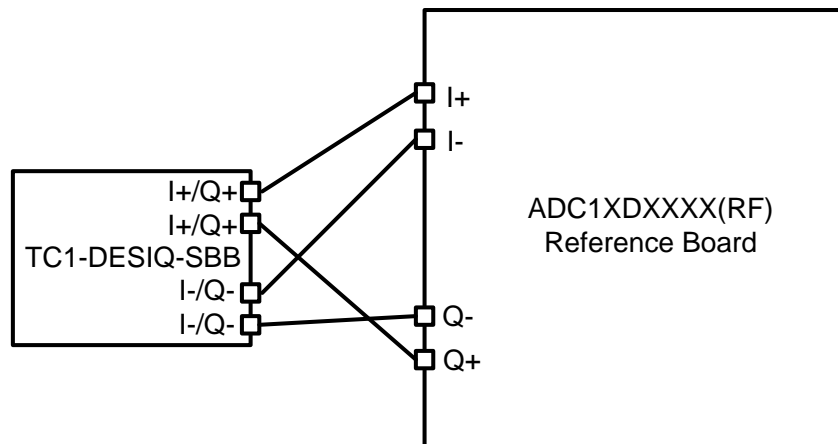


Figure 3. Connection Diagram to GPS ADC Reference Board

4 Limitations and Debug Tips

Please note that this board cannot be used to drive the DESCLKIQ Mode. This is because the DESCLKIQ Mode requires I- and Q-channel inputs to be balanced more precisely than can be achieved by two separate boards attached by cables. Using this board to drive the DESCLKIQ Mode is functionally possible, but there will be a large interleaving spur, which cannot be minimized to achieve reasonable SFDR performance.

Debug tips:

- Use (4) cables of the same length to make the connection between the TC1-DESIQ-SBB and the GPS ADC Reference Board. Different cable lengths will result in a phase difference which will degrade performance.
- All the interleaved modes (DES Mode) have an interleaving spur located at $F_s/2 - F_{in}$ which is due to timing skew and gain mismatch. This spur may be manually adjusted, i.e. reduced, using the DES Timing Adjust feature and the I/Q-channel FSR Adjust feature. The DES Timing Adjust feature will achieve the greater reduction in spur magnitude. These features are accessible via the WaveVision5 GUI.
- If the magnitude is very low as compared to DESI, DESQ or the Non-DES Mode, the most likely cause is that connections between the balun board and the ADC reference board are incorrect.

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

3.2 Canada

3.2.1 For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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http://www.tij.co.jp/lstds/ti_ja/general/eStore/notice_01.page

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3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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