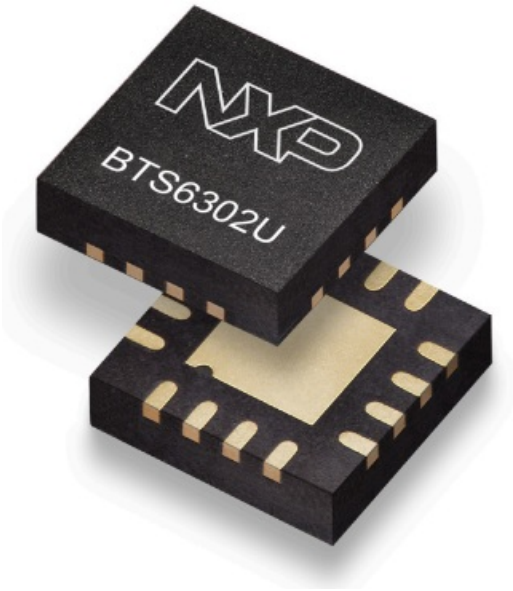
NXP BTS6302U Evaluation Board User Guide

Contents

UM11645

BTS6302U Evaluation Board Quick Start Guide

Rev. 1.2 — 15 April 2024 **User manual**



1 Introduction

This document describes the use, design, and test results of the BTS6302U EVB.

1.1 BTS6302U product description

The BTS6302U is a wideband, high linearity, pre-driver amplifier for 5G massive MIMO infrastructure applications, with fast on-off switching to support TDD systems. The amplifier is designed to operate from 2.3 GHz to 5 GHz.

It is housed in a 3 mm × 3 mm × 0.85 mm 16-terminal HVQFN package.

The amplifier is ESD protected on all terminals.

BTS6302U key features and benefits

- High saturated output power $P_{o(sat)}$ = 27.9 dBm
- High power-gain G_p = 38 dB
- High linearity performance ACLR = -43 dBc
- Unconditionally stable
- Fast switching to support TDD systems
- 5 V single supply, quiescent current 68 mA
- Small 16-terminal leadless package 3 mm x 3 mm x 0.85 mm
- ESD protection on all terminals
- Moisture sensitivity level 1

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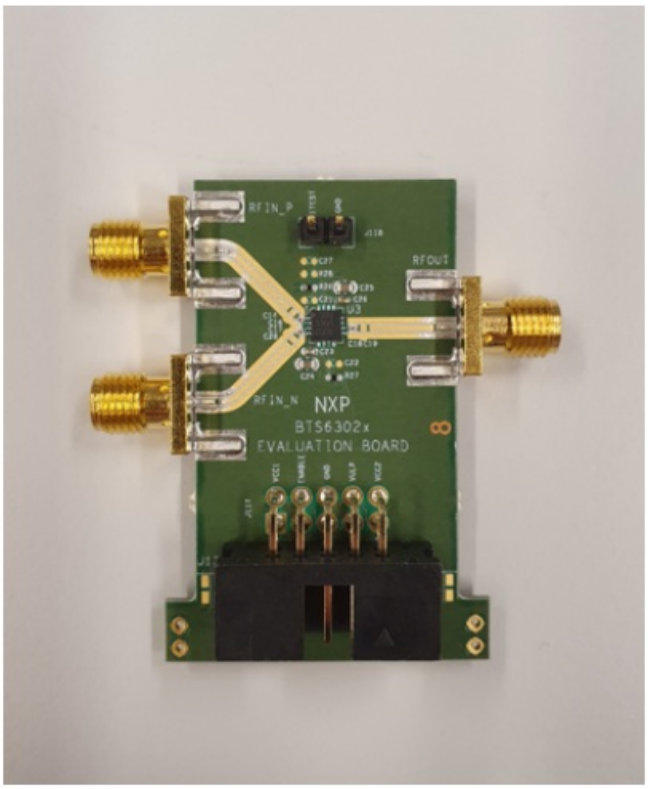
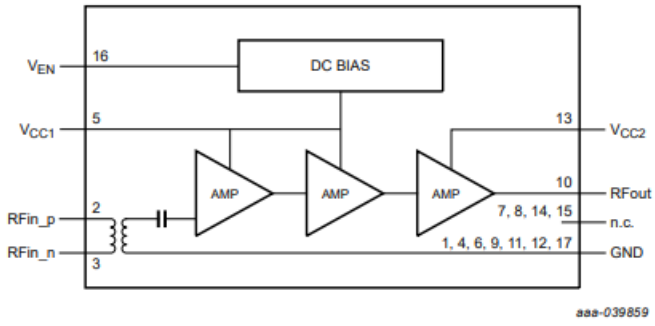
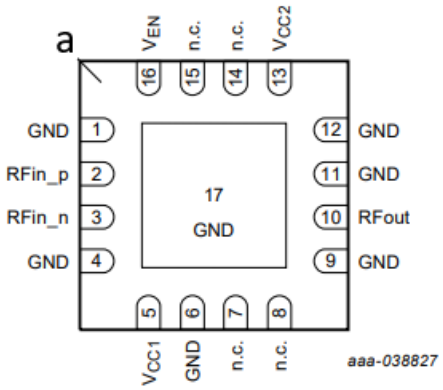






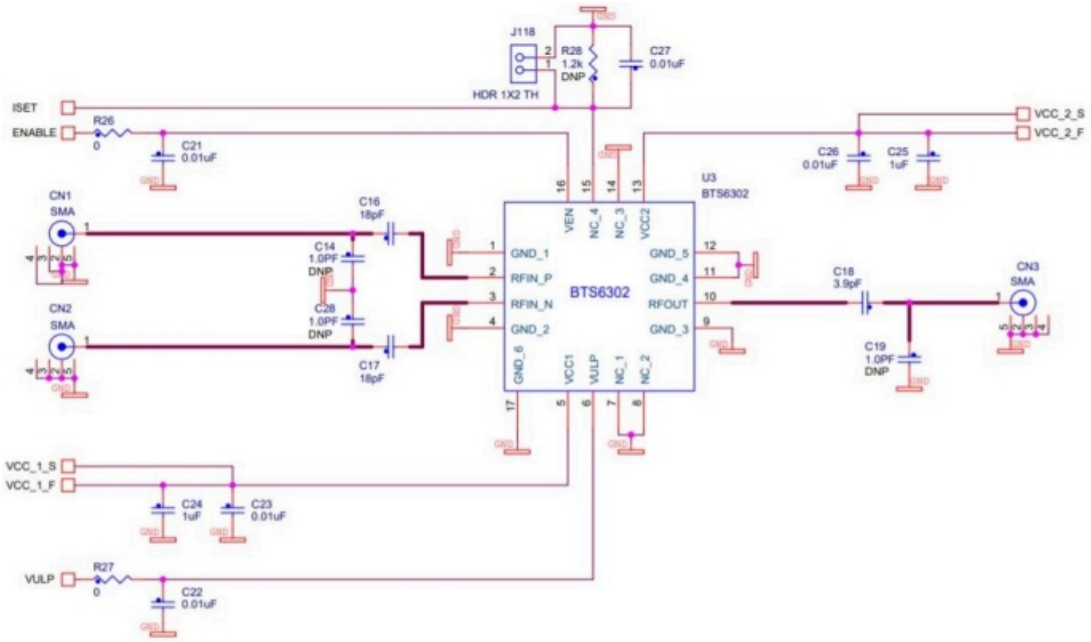
Transparent top view

Figure 1. EVB board

a: terminal 1 index area

2 BTS6302U EVB properties

2.1 Schematic



DNP = not used components, reserved location. See Figure 1 for the location of the components.
Figure 2.EVB schematic

2.2 DC and control connections

Figure 3 shows the DC and enable connection, at the main header (J117). The connector can be straight or 90 degrees. The text is also on the EVB. Figure 4 shows connectors J118 GND, and J1 ISET. J1 (ISET) on the EVB has no functionality for BTS6302U and should be left open.

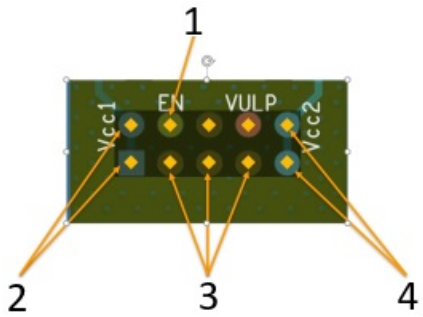


Figure 3.Main header J117

1. Enable pin (nom. 1.8V for active mode)
2. Vcc1 (5V nom.)
3. Ground Connections
4. Vcc2 (5V nom.)

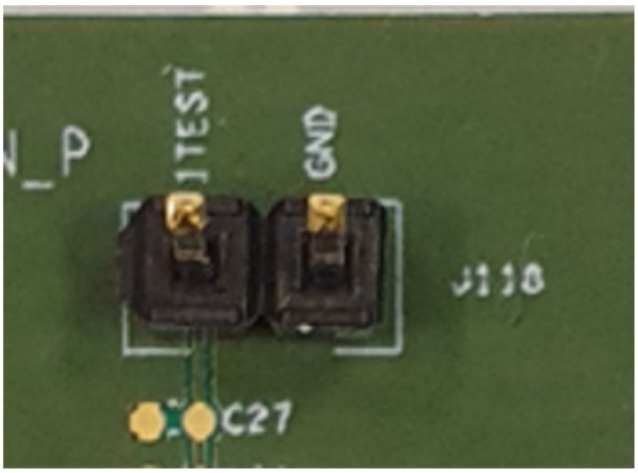


Figure 4. J118/J1

2.3 Operations

Figure 5 shows the connections in a single ended to single ended operation. Figure 6 shows the connections on differential to single ended operation.

If only single ended to single ended operation is needed, NXP refers to UM11646 of the BTS6303U.

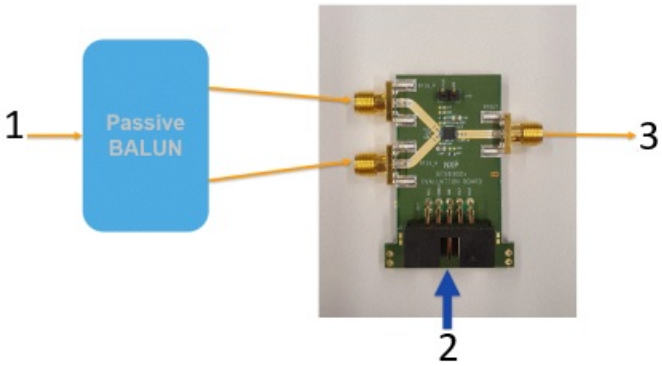


Figure 5.Single ended to single ended operation

1. Pre-Driver single ended RF in
2. DC and control
3. Pre-Driver single ended RF out

For example, from 4 port Network Analyzer

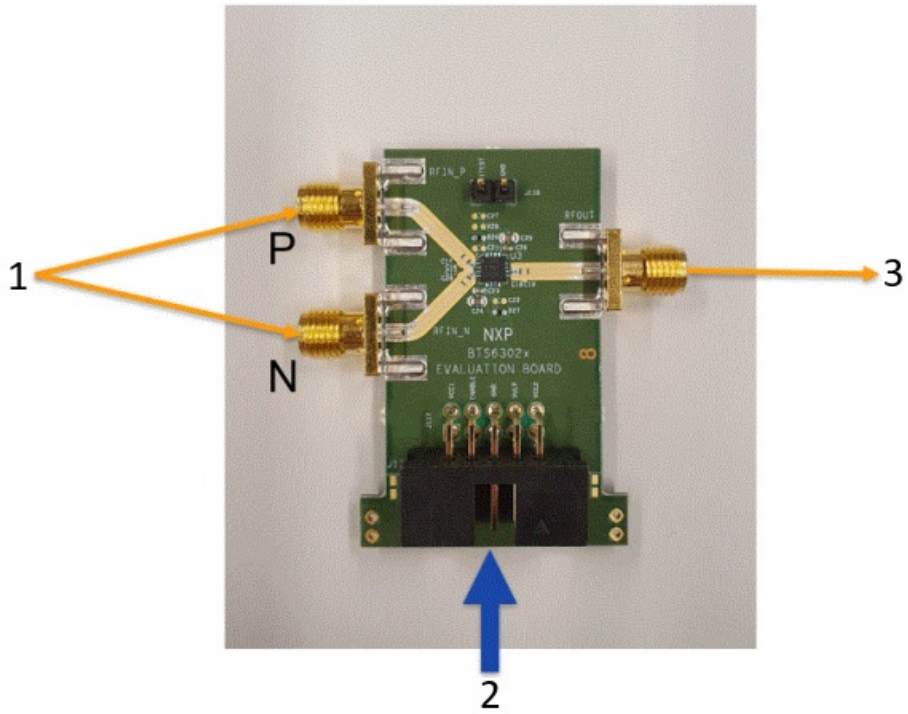


Figure 6.differential to single ended operation

1. Pre-Driver differential RF in
2. DC and control
3. Pre-Driver single ended RF out

3 Measurements results

In the below graphics, the Spar measurements are shown. Measured at nominal conditions V_{cc} = 5 V, $T_{case=25}$ °C.

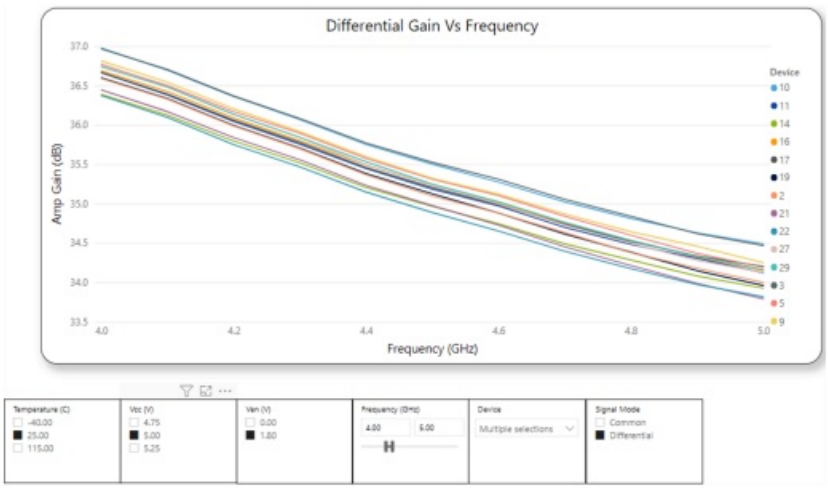


Figure 7.Gain at nominal conditions

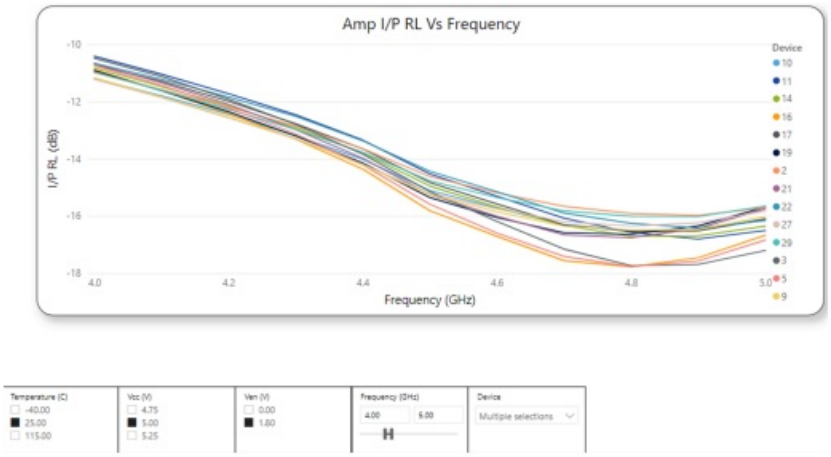


Figure 8.RL_i at nominal conditions

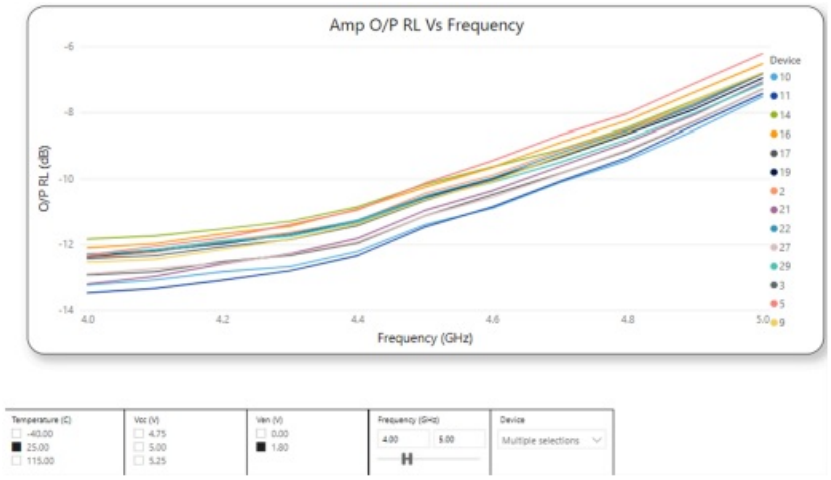


Figure 9.RL_o at nominal conditions

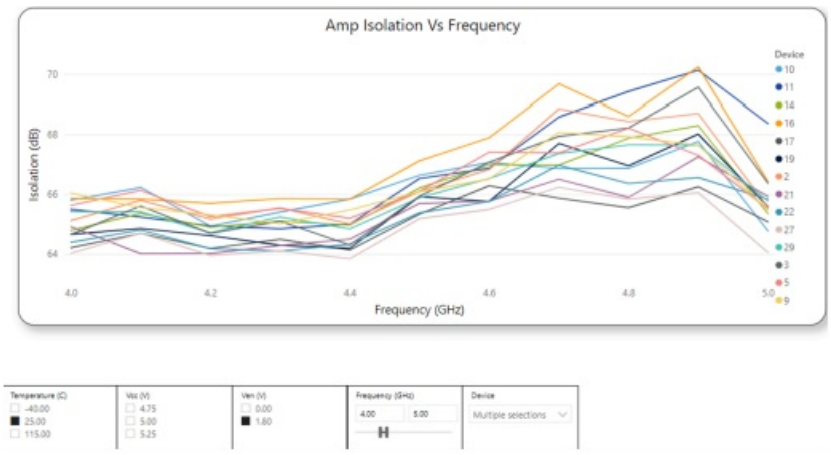


Figure 10.ISL_r (Gain mode) at nominal conditions

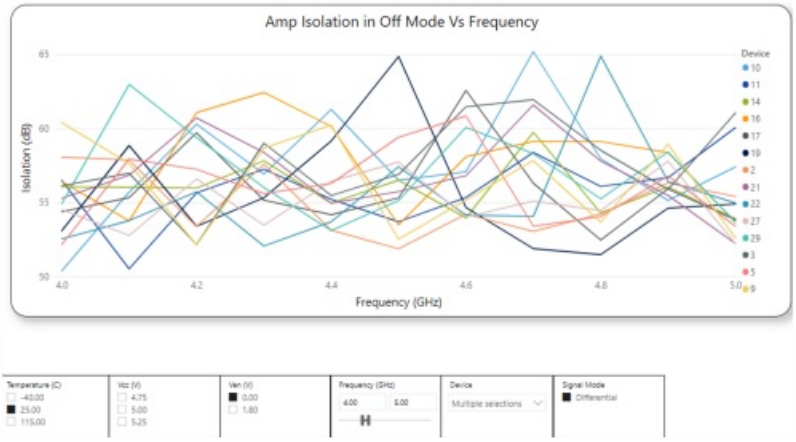


Figure 11.ISL_r (off mode) at nominal conditions

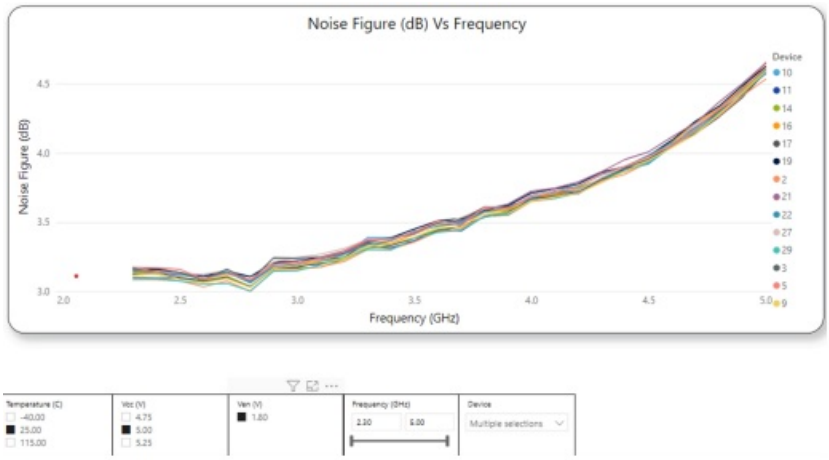


Figure 12.NF at nominal conditions

4 Abbreviations

Table 1.Abbreviations

Acronym	Description
ACLR	adjacent channel leakage ratio
ESD	electrostatic discharge
EVB	evaluation board
mMIMO	massive multiple-input multiple-output
RF	radio frequency
TDD	time-division duplexing

5 EMC information

CAUTION

This product has not undergone formal EMC assessment. It is the responsibility of the user to ensure that any finished assembly complies with applicable regulations on EMC interference. EMC testing, and other testing requirements for CE is the responsibility of the user.

6 Revision history

Table 2.Revision history

Document ID	Release date	Description
UM11645 Rev. 1.2	29 March 2024	• Updated Legal information and brought to current standard
UM11645 Rev. 1.1	7 December 2022	• Added EMC information
UM11645 Rev. 1	23 July 2021	• Initial release of user manual

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References

- **User Manual**