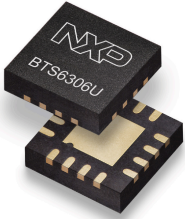


UM11972

BTS6306U Evaluation Board Quick Start Guide

Rev. 1.1 — 15 April 2024

User manual



1 Introduction

This document describes the use, design, and test results of the BTS6306U EVB.

1.1 BTS6306U product description

The BTS6306U is a wideband high linearity pre-driver amplifier with differential input for 5G massive MIMO infrastructure applications, with fast on-off switching to support TDD systems. The amplifier is designed to operate between 3.3 GHz and 4.2 GHz. The BTS6306U is housed in a 3 mm x 3 mm x 0.85 mm 16-terminal HVQFN package.

BTS6306U key features and benefits

- High saturated output power $P_{o(sat)} = 28.5$ dBm
- High power-gain $G_p = 38$ dB
- High linearity performance ACLR better than -45 dBc
- Unconditionally stable
- Fast switching to support TDD systems
- 5 V single supply, quiescent current 100 mA
- Small 16-terminal leadless package 3 mm x 3 mm x 0.85 mm
- ESD protection on all terminals
- Moisture sensitivity level 1



1.1 BTS6306U product description...continued

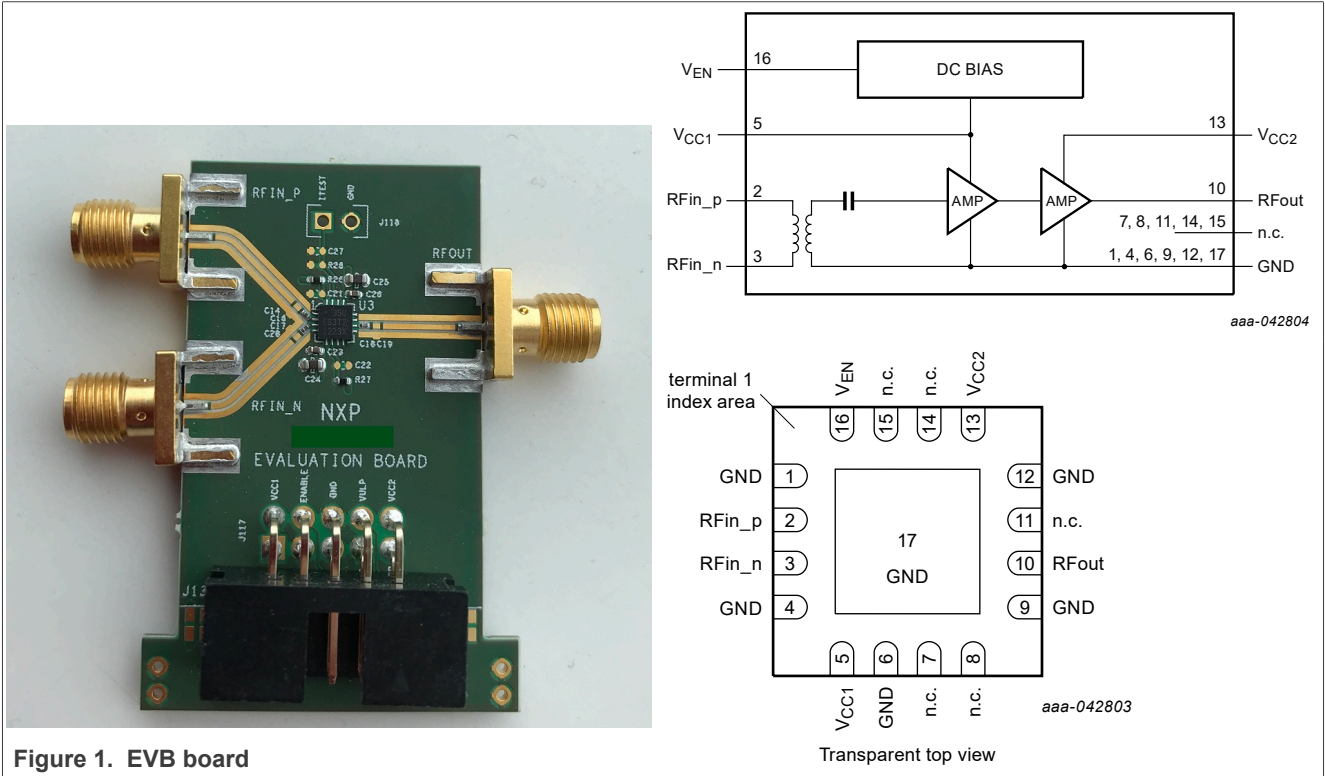
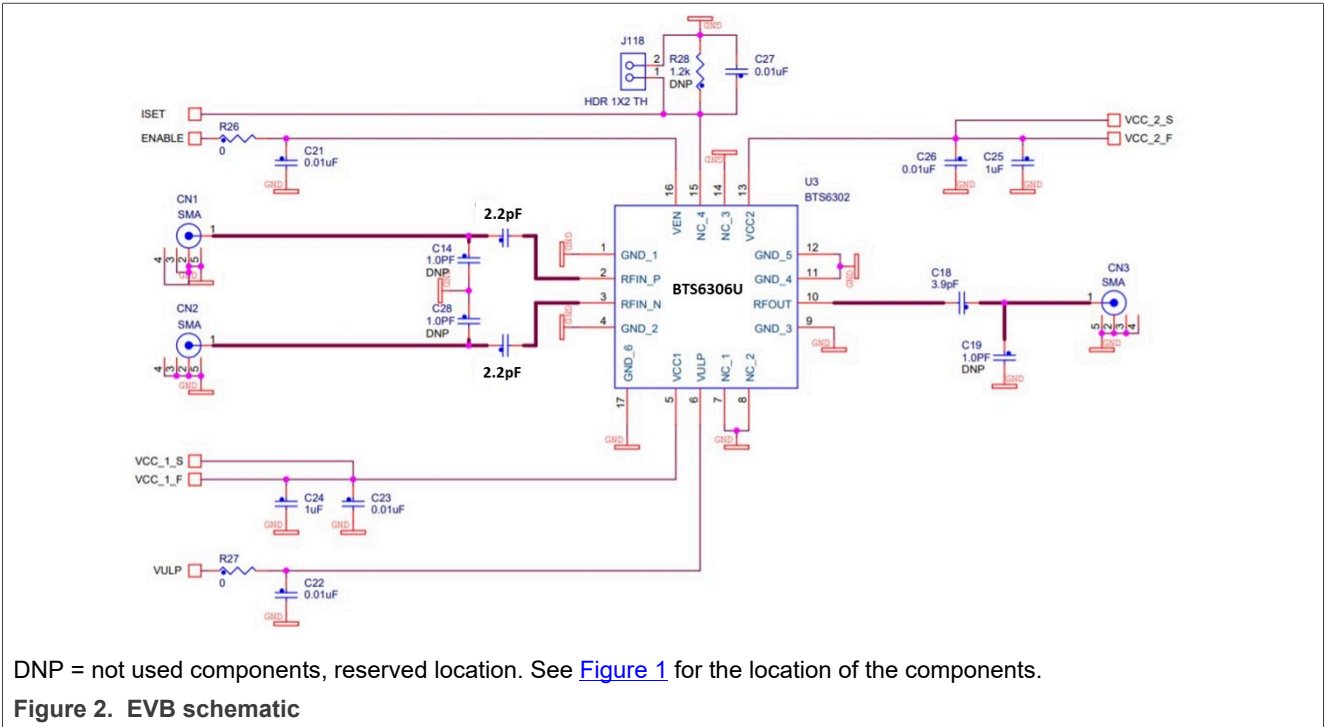


Figure 1. EVB board

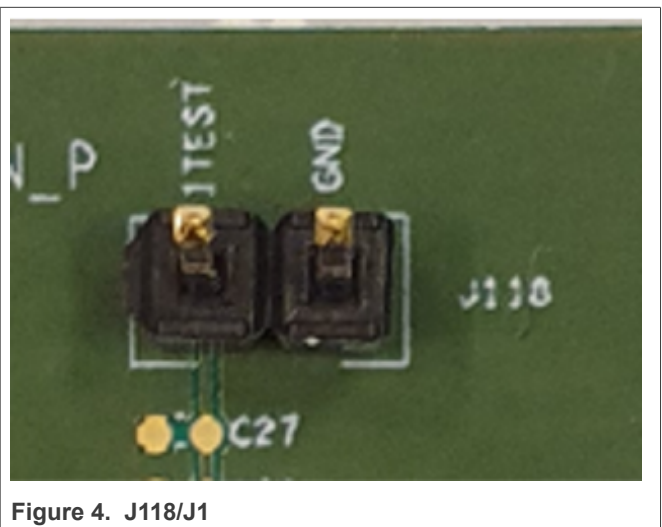
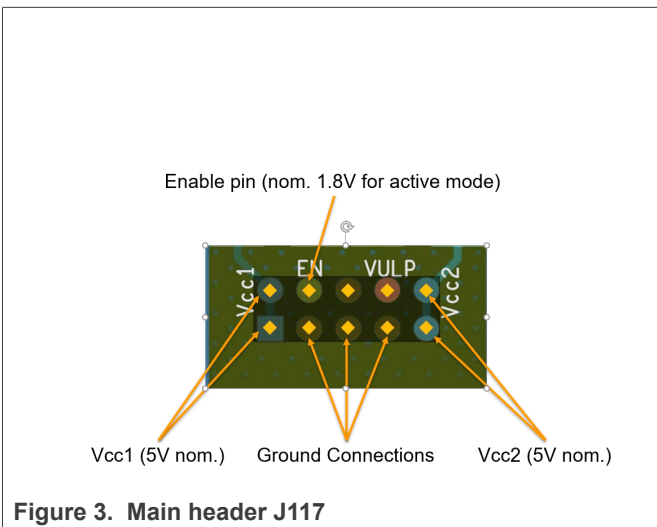
2 BTS6306U EVB properties

2.1 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 BTS6306U and should be left open.



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.

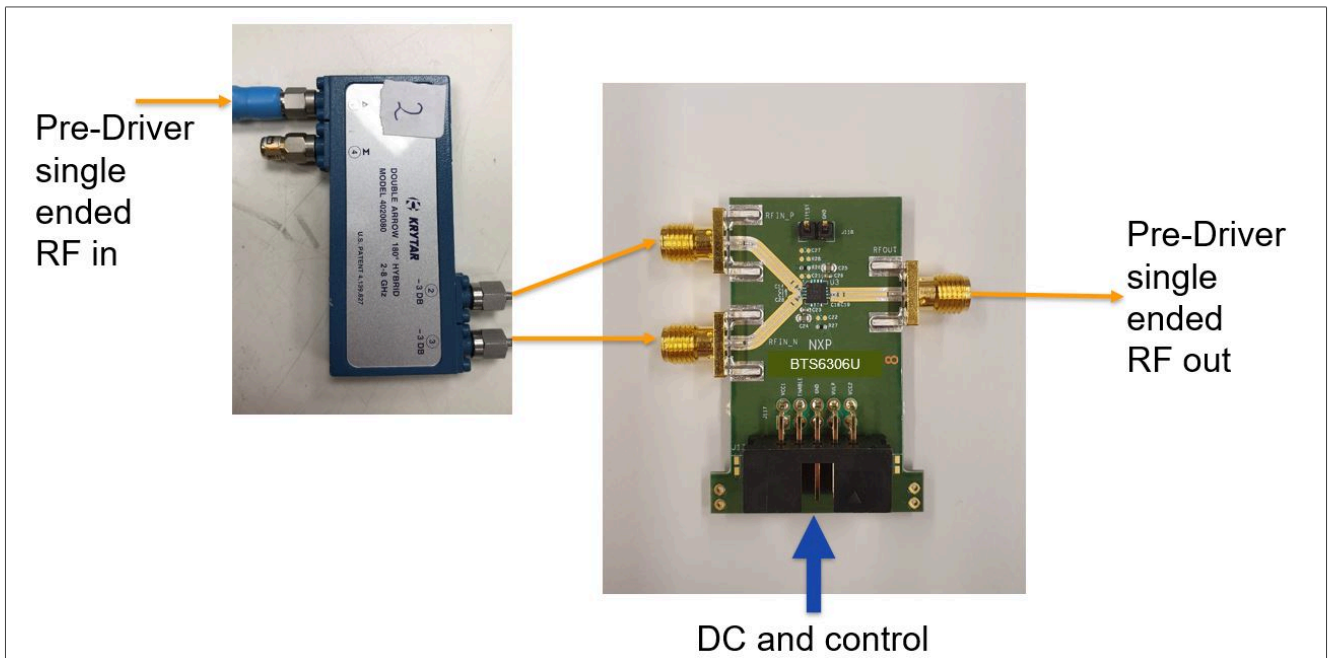


Figure 5. Single ended to single ended operation

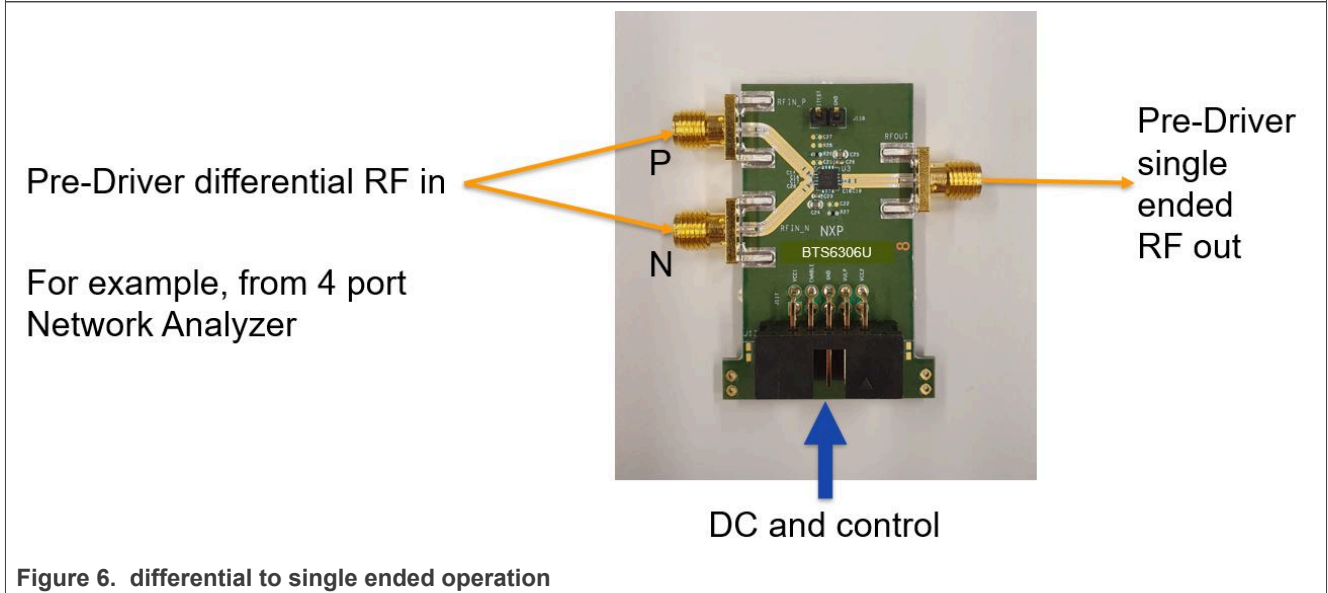


Figure 6. differential to single ended operation

3 Measurements results

In the below graphics, the Spar measurements are shown. Measured at nominal conditions $V_{CC} = 5\text{ V}$, $T_{case} = 25\text{ }^{\circ}\text{C}$.

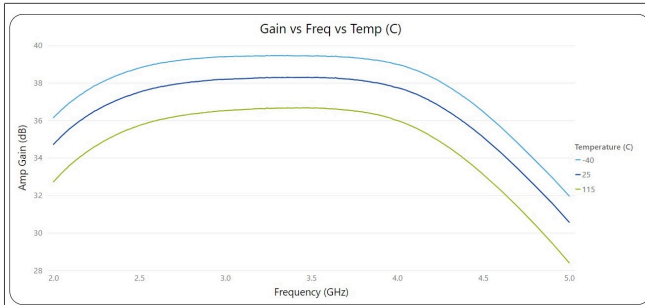


Figure 7. Differential gain at (typical values). $V_{CC} = 5\text{ V}$, $P_i = -25\text{ dBm}$

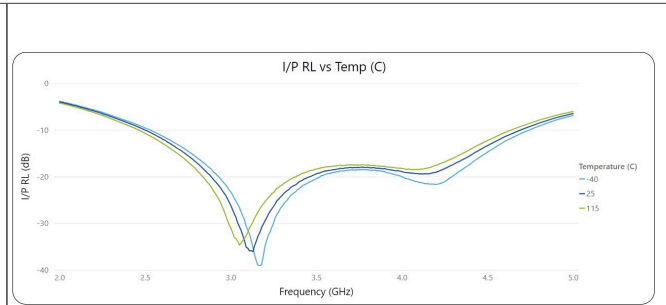


Figure 8. Differential RL_i (typical values). $V_{CC} = 5\text{ V}$, $P_i = -25\text{ dBm}$

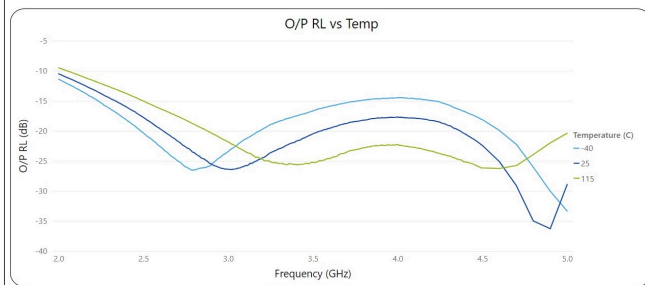


Figure 9. RL_o (typical values). $V_{CC} = 5\text{ V}$, $P_i = -25\text{ dBm}$

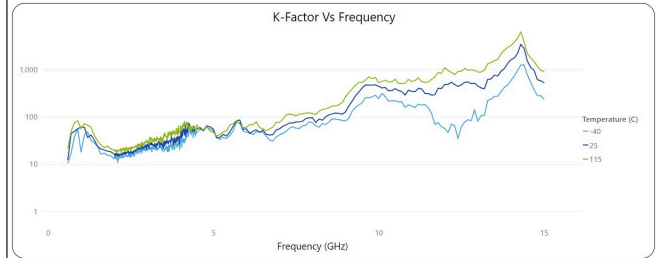


Figure 10. K-factor (typical values). $V_{CC} = 5\text{ V}$, $P_i = -25\text{ dBm}$

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 |
|------------------|------------------|---|
| UM11972 Rev. 1.1 | 15 April 2024 | <ul style="list-style-type: none"> Updated Legal information and brought to current standard |
| UM11972 Rev. 1 | 8 September 2023 | <ul style="list-style-type: none"> Initial release of user manual |

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