
Bill of Materials and Implementation of the Transceiver Base Station Board ATAB5811/12-x-B

The ATA5811/12 is part of Atmel®'s RF transceiver family dedicated to unlicensed frequency bands.

This document describes the bill of materials (BOM) required to operate the ATA5811/12, allowing use of this RF transceiver in the popular ISM bands 315/433/868 MHz.

Most of the components values are the same regardless of the frequency bands; only the matching of the antenna and the quartz crystal should take into account the frequency that is targeted.

This BOM relates to the implementation of our demo boards. The two-layer layout that is provided is recommended. Nevertheless, it is possible to use a different layout, which might require some minor change of values for optimal use.

1. Schematic and Layout

The schematic of the demo board is illustrated in [Figure 1-1 on page 2](#), and the layout is shown in [Figure 1-2 on page 3](#), [Figure 1-3 on page 3](#), [Figure 1-4 on page 4](#) and [Figure 1-5 on page 4](#).



Transceiver Base Station Board ATAB5811-x-B/ ATAB5812-x-B

Application Note



Figure 1-2. Board Layout Front Face

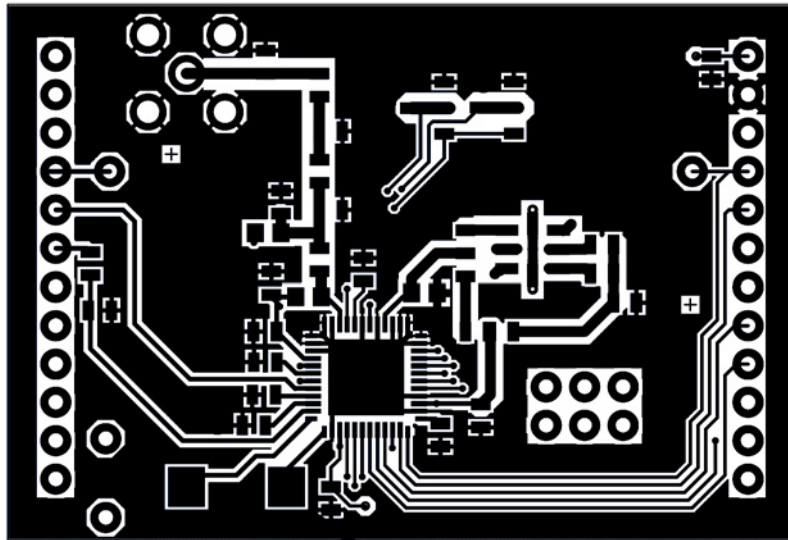


Figure 1-3. Board Layout Rear Face

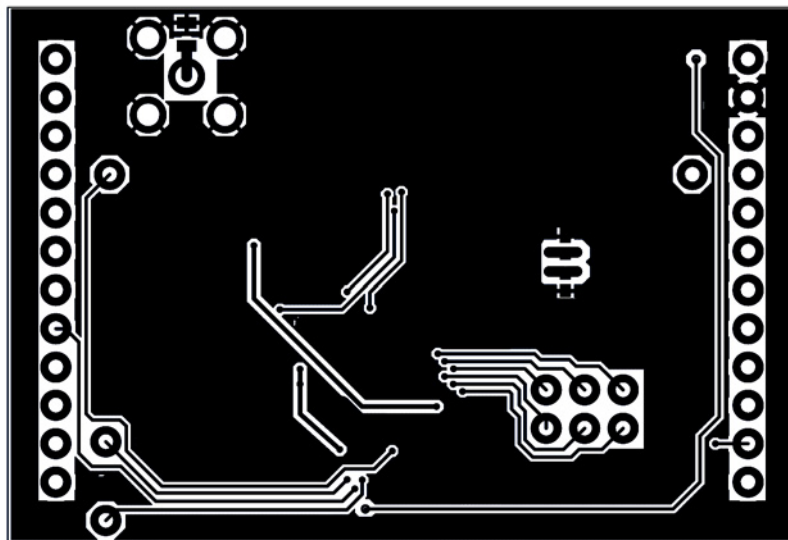


Figure 1-4. Component Placement Front Face

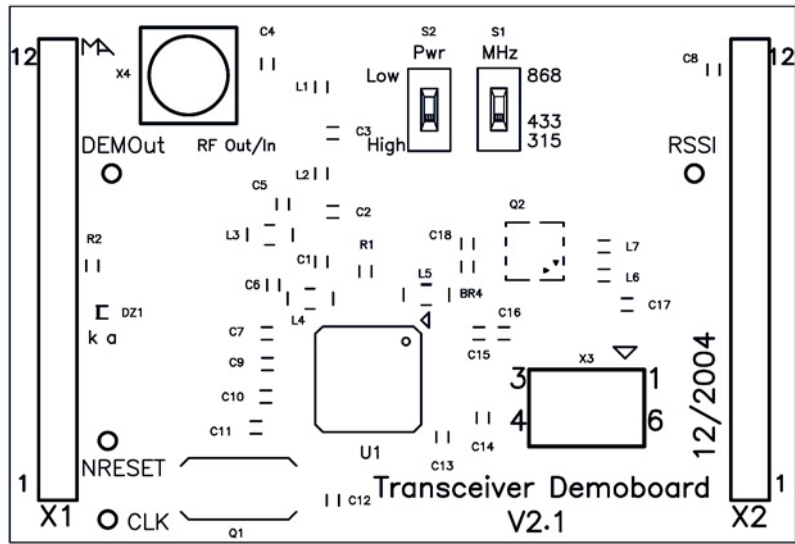
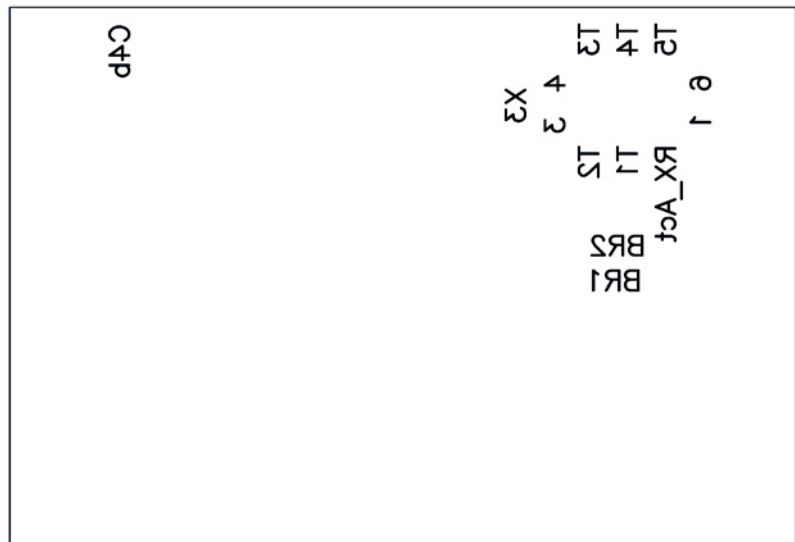


Figure 1-5. Component Placement Rear Face



2. Board Versions and Bill of Material

The transceiver base station board is available for 315 MHz, 433.92 MHz and 868.3 MHz in high power mode, that is, with an RF output power of approximately 10 dBm at 50Ω. The board ordering numbers for the different frequency versions are given in [Table 2-1](#).

Table 2-1. Board Versions

| RF Frequency | Board Ordering Number |
|--------------|-----------------------|
| 315 MHz | ATAB5812-3-B |
| 433.92 MHz | ATAB5811-4-B |
| 868.3 MHz | ATAB5811-8-B |

Each application operating in a given frequency band must be set to correspond to [Table 2-2](#) to get the best performance from the transceiver.

Table 2-2. Components List Transceiver Demoboard ATAB5811/12-x-B V2.1

| Component | Pcs | ATAB5812-3-B | ATAB5811-4-B | ATAB5811-8-B | Value | Tol. (±) | Material/Series | Housing | Manufacturer/Distributor |
|-----------|-----|--------------|--------------|--------------|---------------|----------|---------------------------|-----------------|--------------------------|
| U1 | 1 | | X | X | ATA5811 | | | QFN48 | Atmel |
| | | X | | | ATA5812 | | | | |
| Q1 | 1 | X | | | 12.731930 MHz | | 4730008074 KB101-05187 | U2G CX-8045G | ACAL AVX Kyocera® |
| | | | X | | 13.253110 MHz | | 4730008075 KB101-05189 | | |
| | | | | X | 13.411910 MHz | | 4730008076 KB101-05188 | | |
| C1 | 1 | | | X | 1.5 pF/50V | 0.1 pF | C0G | Size 0603 | E.g., Murata® |
| | | | X | | 4.7 pF/50V | | | | |
| | | X | | | 5.0 pF/50V | | | | |
| C2 | 1 | | | X | 4.0 pF/50V | 0.1 pF | C0G | Size 0603 | E.g., Murata |
| | | | X | | 15 pF/50V | | | | |
| | | X | | | 18 pF/50V | | | | |
| C3 | | | | | Not mounted | | | | |
| C4 | 1 | | | X | 3.0 pF/50V | 0.1 pF | C0G | Size 0603 | E.g., Murata |
| | | X | X | | 4.0 pF/50V | | | | |
| C4b | | | | | Not mounted | | | | |
| C5 | | | | | Not mounted | | | | |

Table 2-2. Components List Transceiver Demoboard ATAB5811/12-x-B V2.1 (Continued)

| Component | Pcs | ATAB5812-3-B | ATAB5811-4-B | ATAB5811-8-B | Value | Tol. (±) | Material/Series | Housing | Manufacturer/Distributor |
|-----------|-----|--------------|--------------|--------------|-------------|----------|-----------------|-----------|--------------------------|
| C6 | 1 | X | X | X | 10 nF/ 50V | 10% | X7R | Size 0603 | E.g., Murata |
| C7 | 1 | X | X | X | 68 nF/16BV | 10% | X7R | Size 0603 | E.g., Murata |
| C8 | 1 | X | X | X | 4.7 μF/6.3V | 20% | JMK107BJ475MA | Size 0603 | Taiyo Yuden® |
| C9 | 1 | X | X | X | 2.2 μF/6.3V | 10% | JMK107BJ225KA | Size 0603 | Taiyo Yuden |
| C10 | 1 | X | X | X | 68 nF/16V | 10% | X7R | Size 0603 | E.g., Murata |
| C11 | 1 | X | X | X | 2.2 μF/6.3V | 10% | JMK107BJ225KA | Size 0603 | Taiyo Yuden |
| C12 | 1 | X | X | X | 68 nF/16V | 10% | X7R | Size 0603 | E.g., Murata |
| C13 | 1 | X | X | X | 15 nF/50V | 10% | X7R | Size 0603 | E.g., Murata |
| C14 | | | | | Not mounted | | | | |
| C15 | 1 | X | X | X | 1.8 pF/50V | 0.1 pF | C0G | Size 0603 | E.g., Murata |
| C16 | | | | | Not mounted | | | | |
| C17 | | | | | Not mounted | | | | |
| C18 | | | | | Not mounted | | | | |
| R1 | 1 | X | | X | 15 kΩ/0.1W | 5% | | Size 0603 | E.g., Vishay® |
| | | | X | | 18 kΩ/0.1W | | | | |
| R2 | 1 | X | X | X | 2.2 kΩ/0.1W | 5% | | Size 0603 | E.g., Vishay |
| BR1 | | | | | Not mounted | | | | |
| BR2 | | | | | Not mounted | | | | |
| BR4 | 1 | X | X | X | 0Ω | | | Size 0603 | E.g., Vishay |
| DZ1 | 1 | X | X | X | 3.9V | | BZX284C3V9 | SOD110 | Philips® |
| L1 | 1 | X | X | X | 0Ω | | | Size 0603 | E.g., Vishay |
| L2 | 1 | | | X | 10 nH | | 744 786 11 | Size 0603 | Würth® |
| | | | X | | 18 nH | | 744 786 118 | | |
| | | X | | | 27 nH | | 744 786 121 | | |
| L3 | 1 | X | X | X | 0Ω | | | Size 0603 | E.g., Vishay |
| L4 | 1 | | | X | 15 nH | | 744 760 115 | Size 0805 | Würth |
| | | | X | | 30 nH | | 744 768 130 | | |
| | | X | | | 56 nH | | 744 760 15 | | |
| L5 | 1 | | | X | 5.6 nH | | 744 768 056 | Size 0805 | Würth |
| | | | X | | 27 nH | | 744 768 127 | | |
| | | X | | | 56 nH | | 744 760 15 | | |

Table 2-2. Components List Transceiver Demoboard ATAB5811/12-x-B V2.1 (Continued)

| Component | Pcs | ATAB5812-3-B | ATAB5811-4-B | ATAB5811-8-B | Value | Tol. (±) | Material/Series | Housing | Manufacturer/ Distributor |
|-----------|-----|--------------|--------------|--------------|-------------------------------|-------------|-------------------|---------------------------|------------------------------|
| L6 | | | | | Not mounted | | | | |
| L7 | | | | | Not mounted | | | | |
| Q2 | | | | | Not mounted | | | | |
| X1 | 1 | X | X | X | Row connector | | 800-10-012-10-001 | 12 pins/ 0.1 in. pitch | CAB |
| X2 | 1 | X | X | X | Row connector | | 800-10-012-10-001 | 12 pins/ 0.1 in. pitch | CAB |
| X3 | 1 | X | X | X | 6-pin header | | 1002-1171-006 | 2×3 pin | CAB |
| X4 | 1 | X | X | X | SMB connector | | R114 426 000 | | Radial [®] |
| S1-VCC | 1 | X | X | | 0Ω | | | Size 0603 | E.g., Vishay |
| S1-GND | 1 | | | X | 0Ω | | | Size 0603 | E.g., Vishay |
| S2-VCC | 1 | X | X | X | 0Ω | | | Size 0603 | E.g., Vishay |
| S2-GND | 1 | | | | 0Ω | | | Size 0603 | E.g., Vishay |
| PCB | 1 | X | X | X | Transceiver demoboard V2.1 | | FR4 | Thickness 1.5 mm | |



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