Bill of Materials and Implementation of the Transceiver Base Station Board ATAB542x-x-B

The ATA542x is part of Atmel®'s RF multichannel transceiver family dedicated to unlicensed frequency bands.

This document describes the bill of materials (BOM) required to operate the ATA5423/28, 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 ATAB542x-x-B

Application Note

4945A–WIRE–08/06

Figure 1-1. Schematic of the Transceiver Board

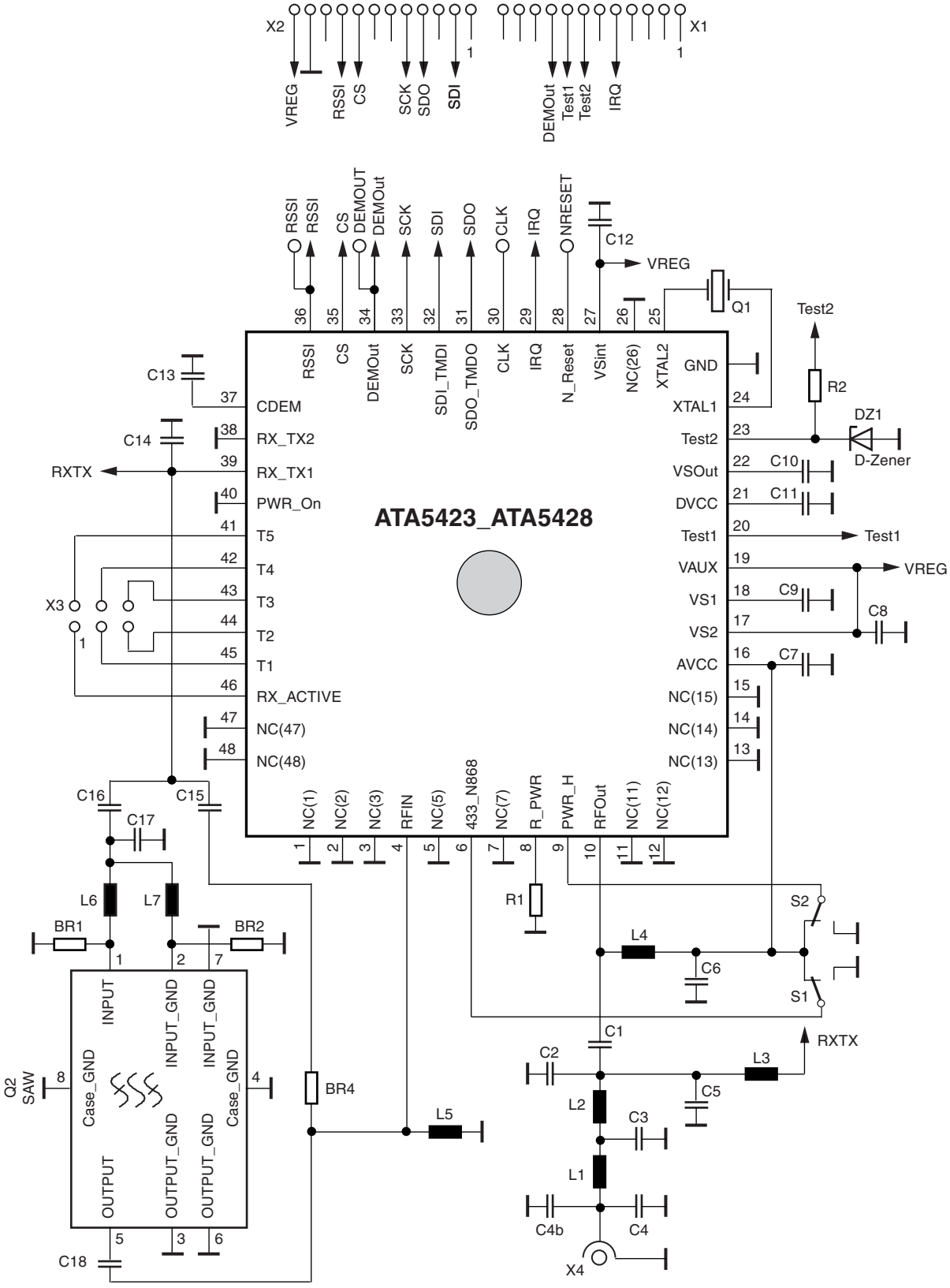


Figure 1-2. Board Layout Front Face

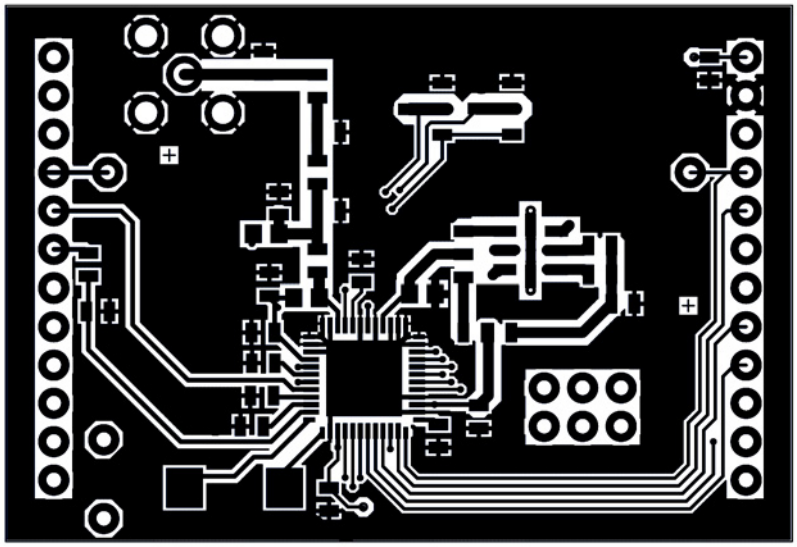


Figure 1-3. Board Layout Rear Face

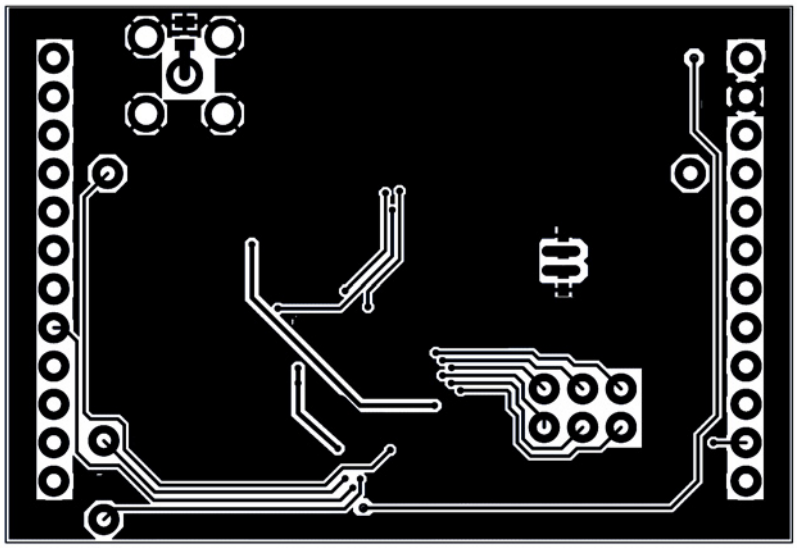


Figure 1-4. Component Placement Front Face

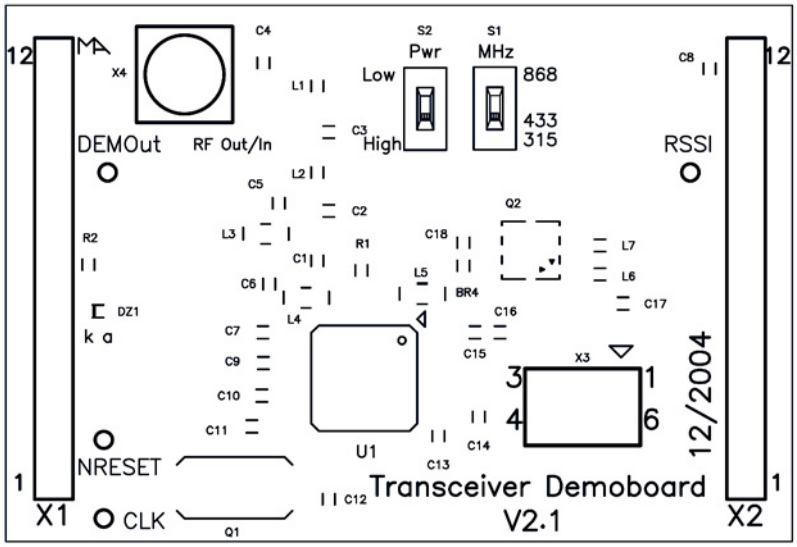
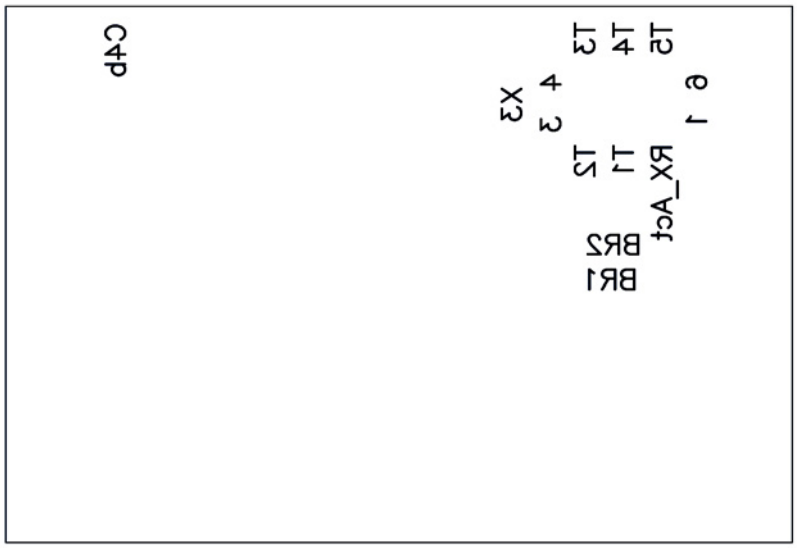


Figure 1-5. Component Placement Rear Face



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	ATAB5423-3-B
433.92 MHz	ATAB5428-4-B
868.3 MHz	ATAB5428-8-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 ATAB5423/28-x-B V2.1

Component	Pcs	ATAB5423-3-B	ATAB5428-4-B	ATAB5428-8-B	Value	Tol. (±)	Material/Series	Housing	Manufacturer/ Distributor
U1	1		X	X	ATA5428			QFN48	Atmel
		X			ATA5423				
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	5%			
		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 ATAB5423/28-x-B V2.1 (Continued)

Component	Pcs	ATAB5423-3-B	ATAB5428-4-B	ATAB5428-8-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 ATAB5423/28-x-B V2.1 (Continued)

Component	Pcs	ATAB5423-3-B	ATAB5428-4-B	ATAB5428-8-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		Radiall®
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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