

Bill of Materials and Implementation of the Transceiver Base Station Board ATAB5823/24-x-B

The ATA5823/24 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 ATA5823/24, 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 ATAB5823-x-B/ ATAB5824-x-B

Application Note



Figure 1-1. Schematic of the Transceiver Board

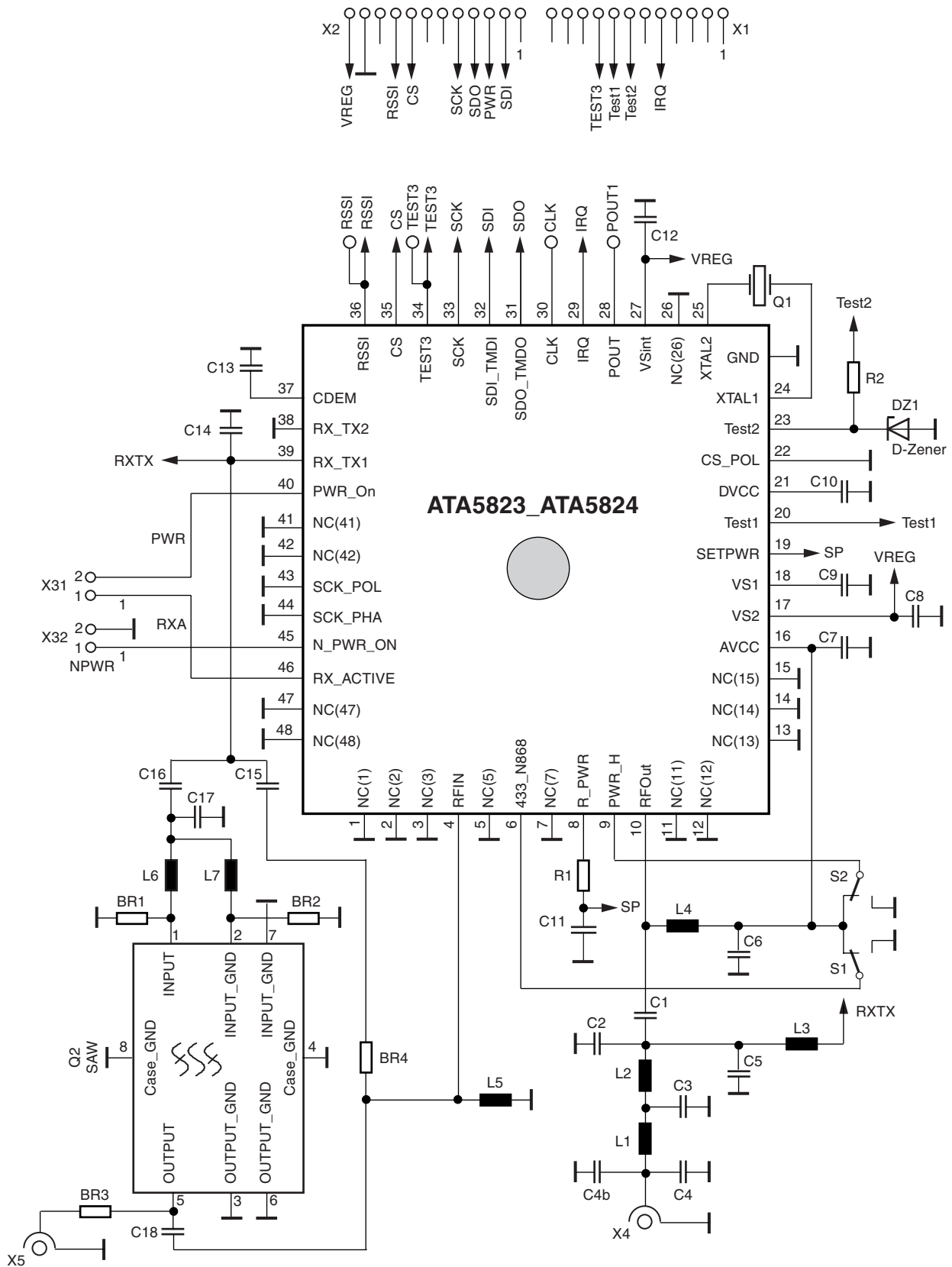


Figure 1-2. Board Layout Front Face

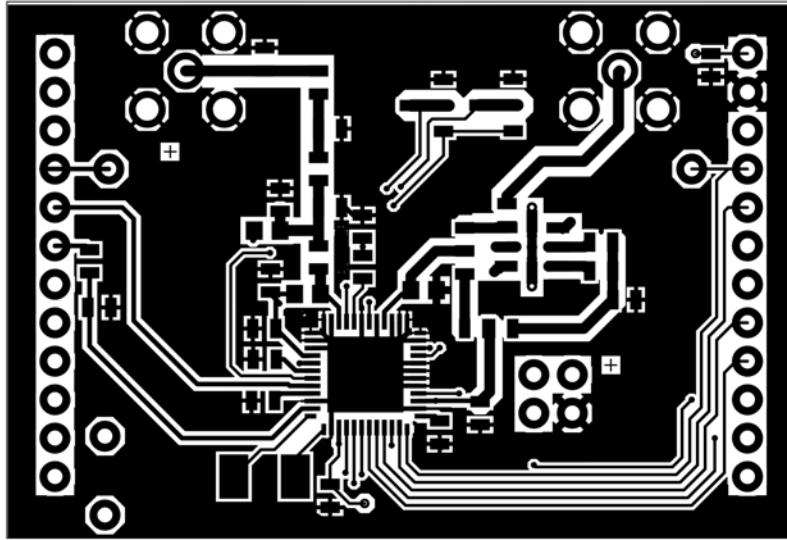


Figure 1-3. Board Layout Rear Face

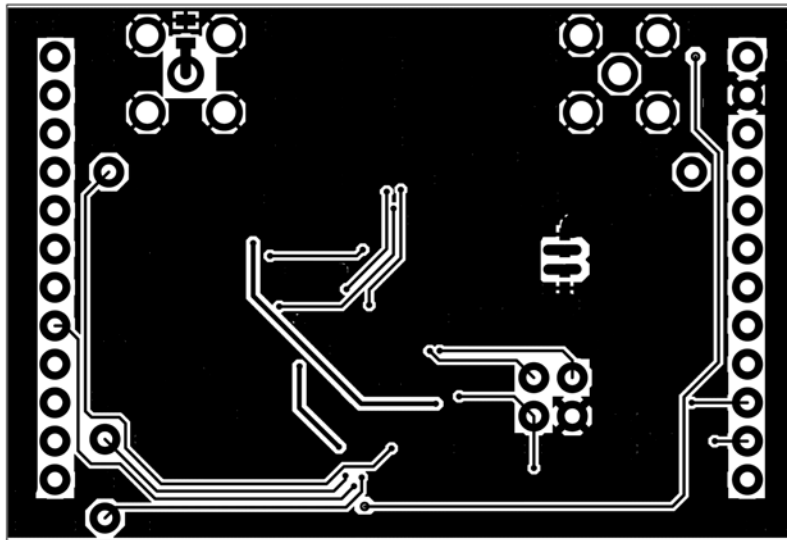


Figure 1-4. Component Placement Front Face

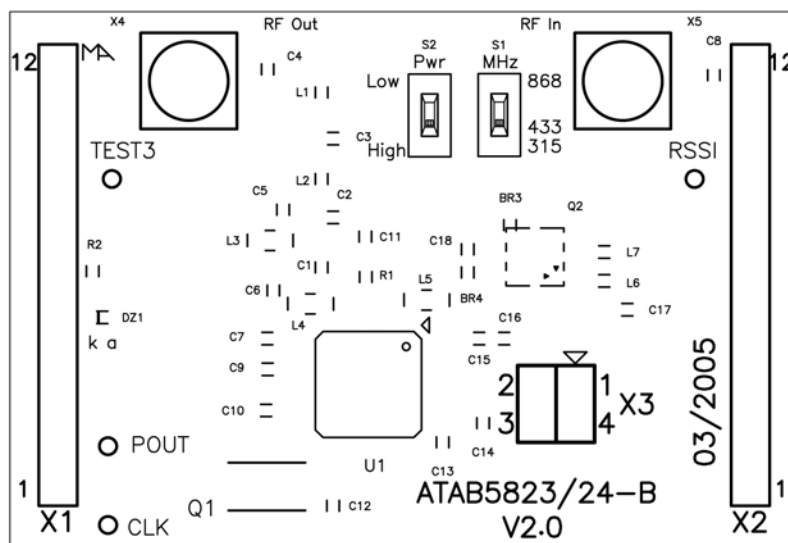
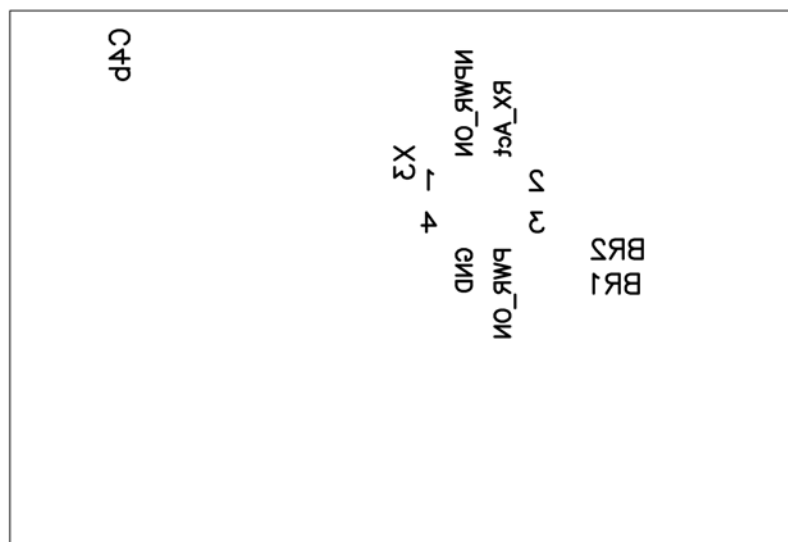


Figure 1-5. Component Placement Rear Face



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	ATAB5823-3-B
433.92 MHz	ATAB5824-4-B
868.3 MHz	ATAB5824-8-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	ATAB5823-3-B	ATAB5824-4-B	ATAB5824-8-B	Value	Tol. (±)	Material/Series	Housing	Manufacturer/ Distributor
U1	1	X			ATA5823			QFN48	Atmel
			X	X	ATA5824				
Q1	1	X			12.731930 MHz		KB101-04161-401	CX-53G	AVX Kyocera®
			X		13.253110 MHz		KB101-04162-401	CX-53G	AVX Kyocera
				X	13.411910 MHz		K1101-03542-402	CX-53G	AVX Kyocera
Q2		X	X	X	n.m.				
C1	1			X	1.8 pF/50V	0.1 pF	C0G	Size 0603	e.g. Murata®
			X		3.3 pF/50V				
		X			3.9 pF/50V				
C2, C4	2			X	3.9 pF/50V	0.1 pF	C0G	Size 0603	e.g. Murata
		X	X		10 pF/50V	0.25 pF			
C3, C4b, C5, C14, C15, C16, C17		X	X	X	n.m.				
C6, C11	2	X	X	X	10 nF/50V	10%	X7R	Size 0603	e.g. Murata
C7, C10, C12	3	X	X	X	68 nF/16V	10%	X7R	Size 0603	e.g. Murata
C8, C9	2	X	X	X	1.0 μF/10V	10%	LMK107BJ105KA-T	Size 0603	Taiyo Yuden®
C13	1	X	X	X	15 nF/50V	10%	X7R	Size 0603	e.g. Murata
C18	1			X	1.2 pF/50V	0.1 pF	C0G	Size 0603	e.g. Murata
			X		1.5 pF/50V				
		X			2.0 pF/50V	0.25 pF	UMK107CK020CZ		Taiyo Yuden
R1	1			X	15 kΩ/0.1W	5%		Size 0603	e.g. Vishay®
			X		22 kΩ/0.1W				
		X			27 kΩ/0.1W				

Table 2-2. Components List Transceiver Demoboard ATAB5423/28-x-B V2.1 (Continued)

Component	Pcs	ATAB5823-3-B	ATAB5824-4-B	ATAB5824-8-B	Value	Tol. (±)	Material/Series	Housing	Manufacturer/ Distributor
R2	1	X	X	X	2.2 k Ω /0.1W	5%		Size 0603	e.g. Vishay
BR1, BR2, BR4		X	X	X	n.m.				
BR3	1	X	X	X	0 Ω			Size 0603	e.g. Vishay
DZ1	1	X	X	X	3.9V		BZX284C3V9	SOD110	e.g. Philips®
L1	1	X	X	X	0 Ω			Size 0603	e.g. Vishay
L2	1			X	5.6 nH		744 786 05	Size 0603	Würth®
			X		10 nH		744 786 11		
		X			22 nH		744 786 12		
L3, L6, L7		X	X	X	n.m.				
L4	1			X	12 nH		744 760 112	Size 0805	Würth
			X		33 nH		744 760 13		
		X			56 nH		744 760 15		
L5	1			X	8.2 nH		744 760 082	Size 0805	Würth
			X		33 nH		744 760 13		
		X			56 nH		744 760 15		
X1, X2	2	X	X	X	Row connector		800-10-012-10-001	12 pins/0.1 in. pitc	e.g. CAB
X3	1	X	X	X	4 Pin Header		1002-171-004	2×2 pin	e.g. CAB
X4, X5	2	X	X	X	SMB connector		R114 426 000		e.g. Radiall®
S1-VCC	1	X	X		0 Ω			Size 0603	e.g. Vishay
S1-GND	1			X	0 Ω			Size 0603	e.g. Vishay
S2-VCC	1	X	X	X	0 Ω			Size 0603	e.g. Vishay
S2-GND		X	X	X	n.m.				
RSSI, CLK, POUT, TEST3		X	X	X	n.m.				
PCB	1	X	X	X	ATAB5823/24-B V2.0	FR4	Thickness 1.5 mm		



Atmel Corporation

2325 Orchard Parkway
San Jose, CA 95131, USA
Tel: 1(408) 441-0311
Fax: 1(408) 487-2600

Regional Headquarters

Europe

Atmel Sarl
Route des Arsenaux 41
Case Postale 80
CH-1705 Fribourg
Switzerland
Tel: (41) 26-426-5555
Fax: (41) 26-426-5500

Asia

Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimshatsui
East Kowloon
Hong Kong
Tel: (852) 2721-9778
Fax: (852) 2722-1369

Japan

9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
Tel: (81) 3-3523-3551
Fax: (81) 3-3523-7581

Atmel Operations

Memory

2325 Orchard Parkway
San Jose, CA 95131, USA
Tel: 1(408) 441-0311
Fax: 1(408) 436-4314

Microcontrollers

2325 Orchard Parkway
San Jose, CA 95131, USA
Tel: 1(408) 441-0311
Fax: 1(408) 436-4314

La Chantrerie
BP 70602
44306 Nantes Cedex 3, France
Tel: (33) 2-40-18-18-18
Fax: (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards

Zone Industrielle
13106 Rousset Cedex, France
Tel: (33) 4-42-53-60-00
Fax: (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906, USA
Tel: 1(719) 576-3300
Fax: 1(719) 540-1759

Scottish Enterprise Technology Park
Maxwell Building
East Kilbride G75 0QR, Scotland
Tel: (44) 1355-803-000
Fax: (44) 1355-242-743

RF/Automotive

Theresienstrasse 2
Postfach 3535
74025 Heilbronn, Germany
Tel: (49) 71-31-67-0
Fax: (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906, USA
Tel: 1(719) 576-3300
Fax: 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/ High-Speed Converters/RF Datacom

Avenue de Rochepleine
BP 123
38521 Saint-Egreve Cedex, France
Tel: (33) 4-76-58-30-00
Fax: (33) 4-76-58-34-80

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9