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## Si4312 DEMO BOARD USER'S GUIDE

### 1. Overview

The Silicon Laboratories Si4312-DEMO board provides a complete OOK radio design with numerous selectable features that demonstrate the capabilities of the Silicon Laboratories Si4312 OOK receiver. The Si4312-DEMO board can be configured to receive OOK data from an SMA connector or wirelessly with an on-board printed circuit board (PCB) antenna. The demodulated output data from the Si4312-DEMO board can be measured via an SMA connector and/or observed with an LED and/or heard with an audio buzzer. The system is powered by a 9 V battery or an external 3.3 V power supply.

### 2. Features

- Single chip OOK receiver
- Selectable 315/433.92 MHz carrier frequency
- Selectable data rate, threshold hold time

### 3. Description

Figures 1 and 2 show the physical layout of the board with key components indicated.



Figure 1. Si4312 DEMO Board Top Side



**Figure 2. Si4312 DEMO Board Bottom Side with 9 V Battery**

## **Power Supply Connector**

J1: Jumper to select external 3.3 V supply. This is a solderable jumper and should be shorted when used.

J7: External 3.3 V supply connector: +3.3 V with the jumper on the right side and GND on the left side.

J3: 9 V battery supply connector: Power on with the jumper on the right side and power off with the jumper on the left side.

J8: Jumper used to measure Si4311 current consumption.

- Jumper connected (shorted) is normal operation.
- Jumper connected with an ammeter in series to measure current.

D3: Power-on indicator. LED lights up when powered on.

## **RF Input**

J4: SMA connector for an external RF input. Ensure inductor L3 is open to remove the PCB antenna when using the SMA input.

## **Demodulated Data Output**

J5: SMA connector for demodulated data output.

## **External Clock Driver**

J9/J17: These solder jumpers should be shorted when an external clock driver is used.

J10: External clock connection point.

## **Ratio Setting**

J11: Jumper used to select ratio setting.

- Logic High (left side connection) for ratio = 10.
- Logic Low (right side connection) for ratio = 5.

## **Carrier Frequency Selection**

J12: Jumper used to select 315 or 433.92 MHz carrier frequency.

- Logic High (left side connection) for 315 MHz.
- Logic Low (right side connection) for 433.92 MHz.

## Bit Time Selection

J13/J14: Two jumpers used for bit time selection.

**Table 1. Bit Time Selection**

J13	J14	Bit Time [ $\mu$ s]
0	0	1000
0	1	500
1	0	200
1	1	100

## Frequency Deviation Selection

J15/J16: Two jumpers used for frequency deviation selection.

**Table 2. Frequency Deviation Selection**

J13	J14	Threshold Hold Time [ms]
0	0	70
0	1	100
1	0	300
1	1	700

## Key Components

U4: Si4312 single chip OOK receiver.

X1: 16 MHz crystal.

D1: LED lights up when data output present.

B2: Audio buzzer sounds when data output is present.

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## 4. Schematic

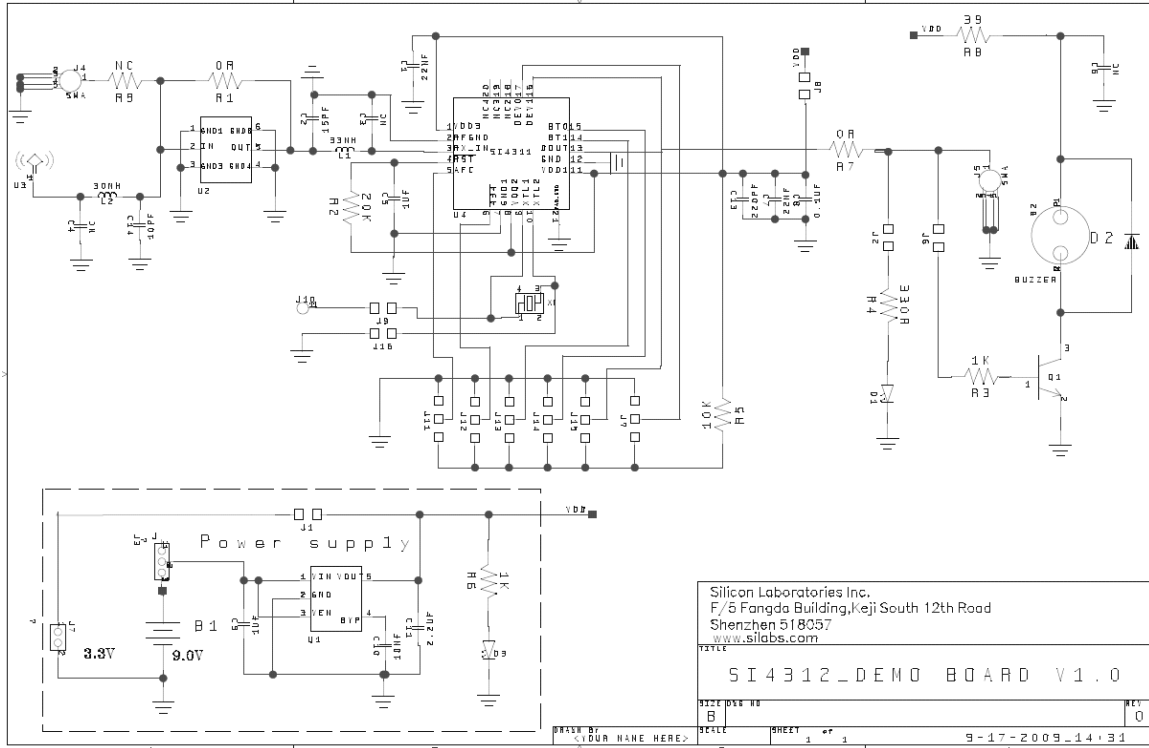


Figure 3. Si4312-DEMO Schematic

## 5. PCB Layout

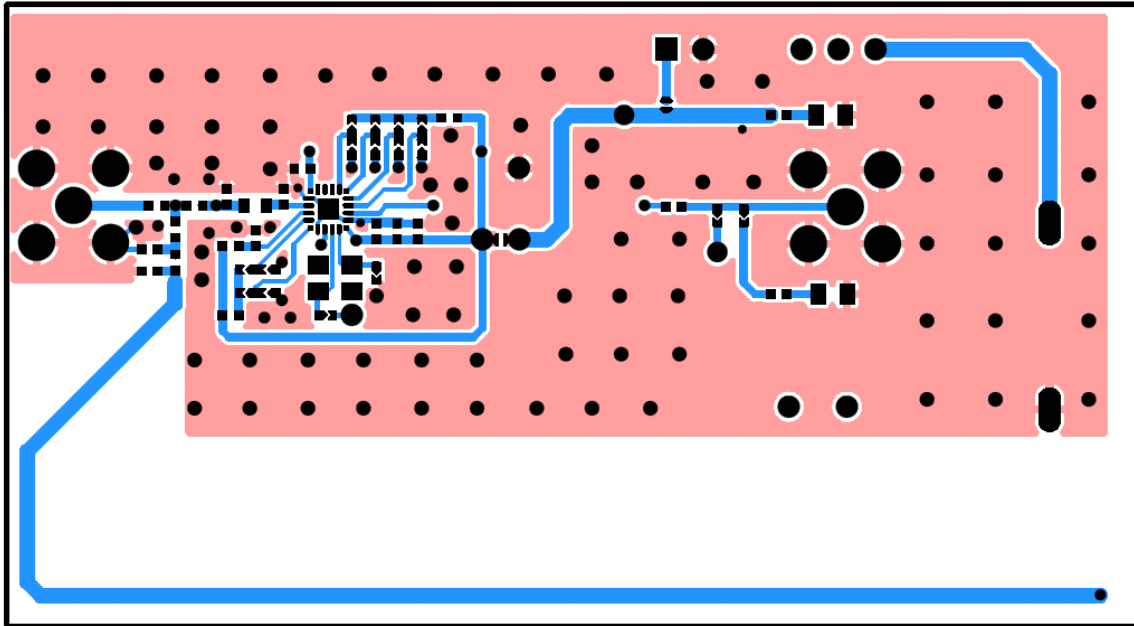


Figure 4. Si4312 PCB Top Layer

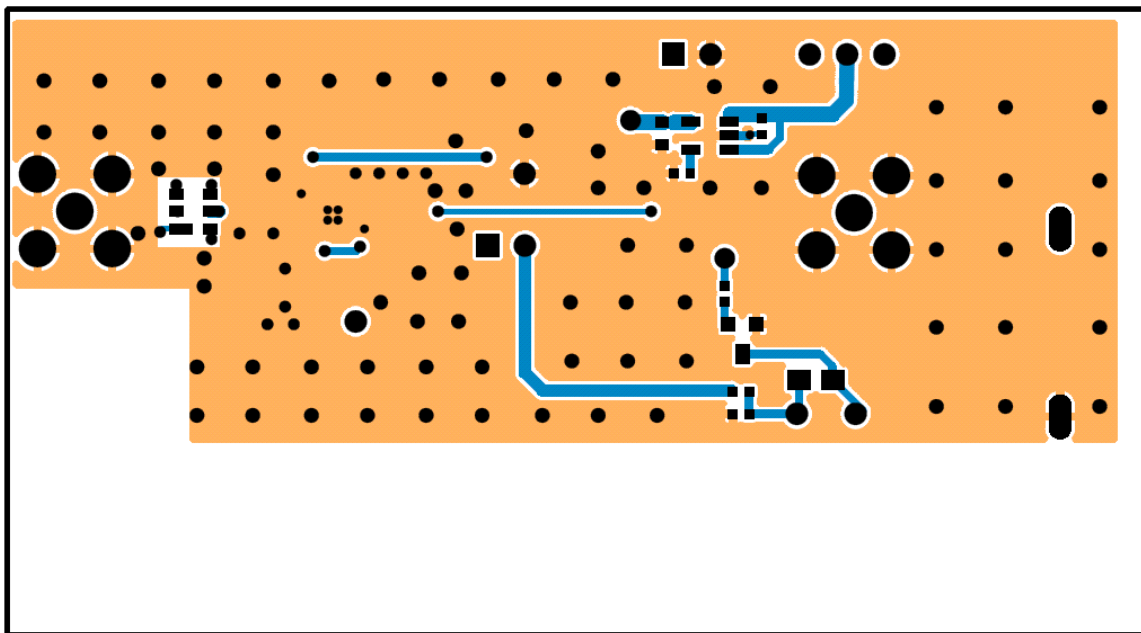


Figure 5. Si4312 PCB Bottom Layer

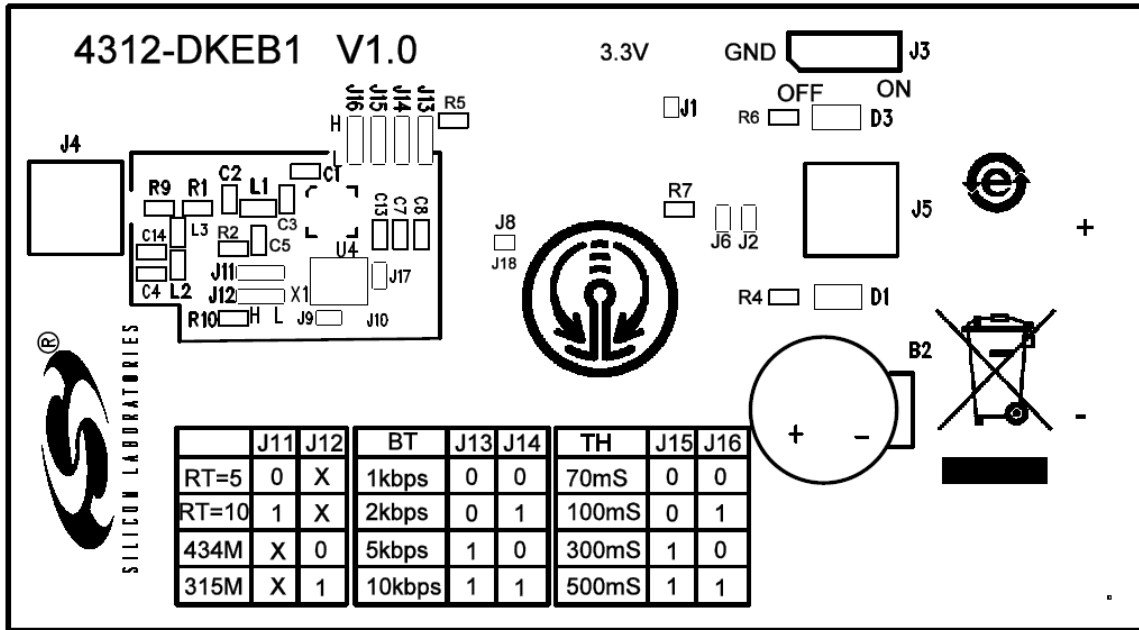


Figure 6. Si4312 PCB Top Silkscreen

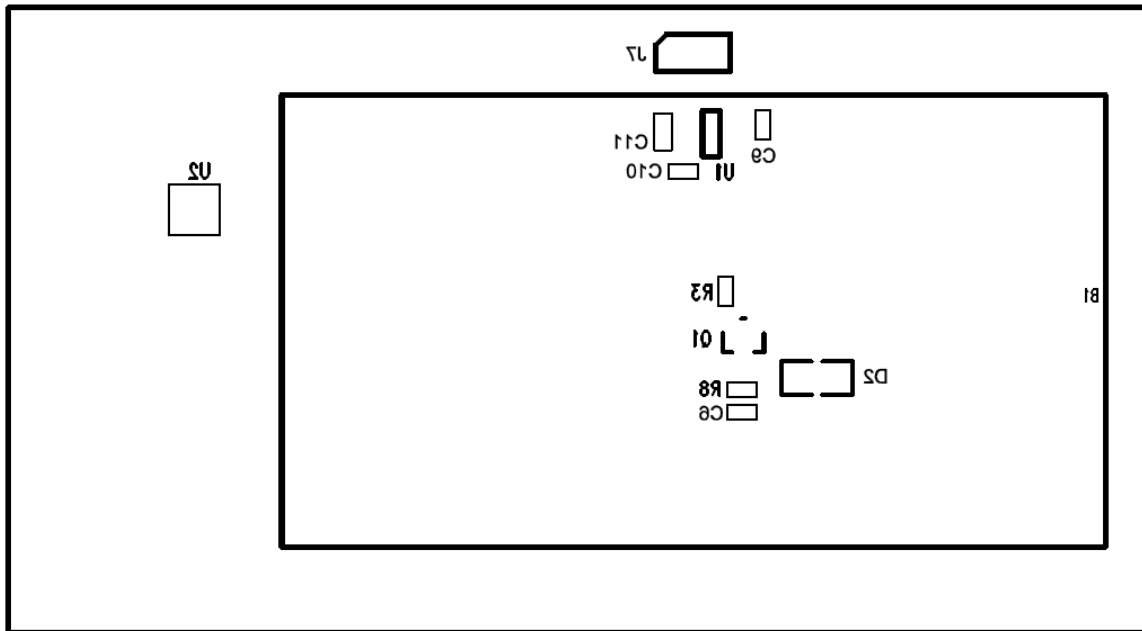


Figure 7. Si4312 PCB Bottom Silkscreen

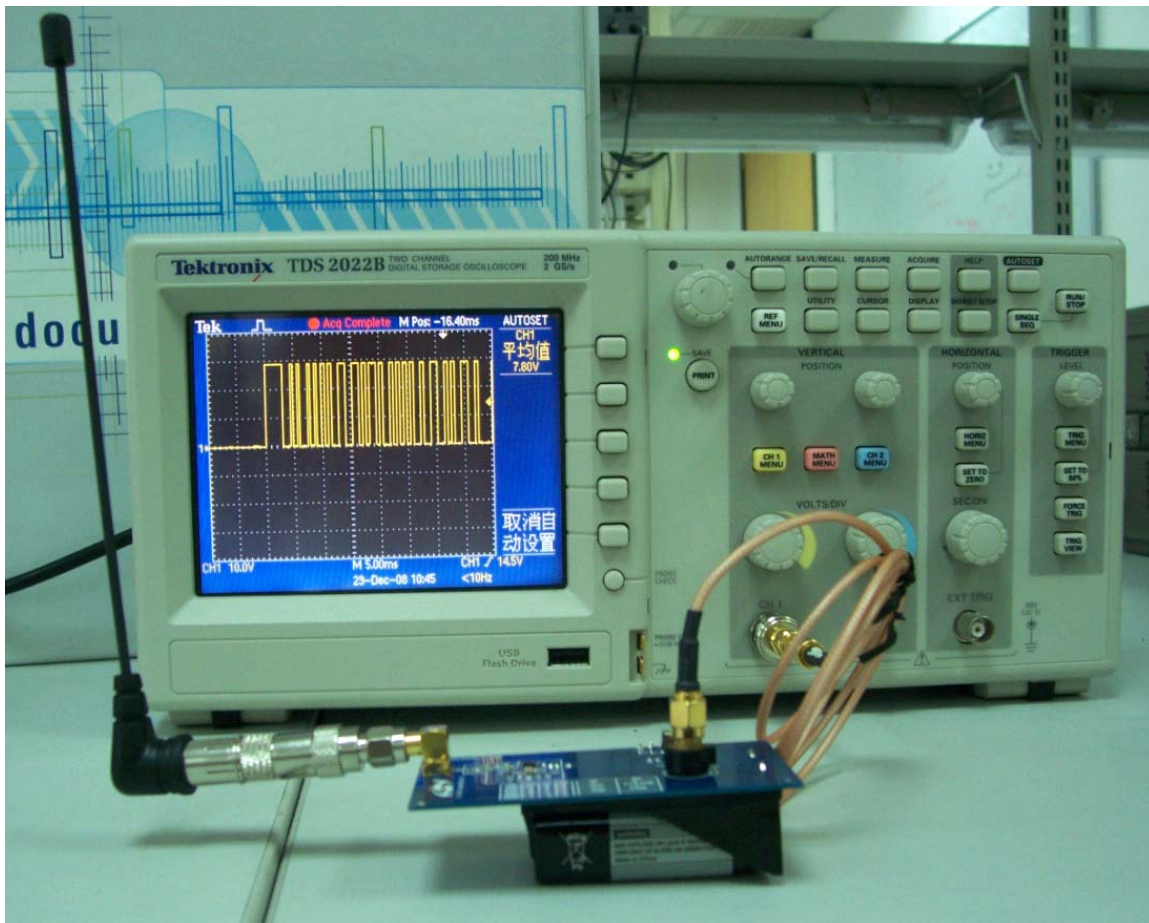
## 6. Bill of Materials

Reference	Qty	Package	Value
B1	1	AA_BATTERY	9.0 V
B2	1	BUZZER2	
C1,C7	2	CMS0402	22 nF
C2	1	CMS0603	15 pF
C3,C4	2	CMS0603	NC
C5,C9	2	CMS0402	1 $\mu$ F
C6	1	CMS0402	NC
C8	1	CMS0402	0.1 $\mu$ F
C10	1	CMS0402	10 nF
C11	1	CMS0603	2.2 $\mu$ F
C13	1	CMS0402	220 pF
C14	1	CMS0603	TBD
D1,D3	2	CMS0805	LED
D2	1	CMS0805	IN4148
J3	1	DIP SWITCH	
J4,J5	2	SMA	
J7	1	HEADER2	
L1	1	CMS0402	33 nH
L2	1	CMS0402	TBD
L3	1	CMS0402	0R/NC
Q1	1	SOT23	9013
R1	1	CMS0603	0R
R2	1	CMS0402	20 k $\Omega$
R3,R6	2	CMS0402	1 k $\Omega$
R4	1	CMS0402	330R
R5	1	CMS0402	10 k $\Omega$
R7	1	CMS0402	0R
R8	1	CMS0402	39R
R9	1	CMS0603	NC
U1	1	SOT-23-5	LP2985
U2	1	SC33	SAW filter
U3	1	ANT	
U4	1	MLP20-3MM	Si4312
X1	1	XTAL_32X25	16 MHz



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## 7. Receiving Data Status



## 8. References

- Si4312 Data Sheet

**NOTES:**

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