UM0672
User manual

CRX14 and CR14 reference design PCB Gerber files

Introduction

The purpose of this user manual is to give printed-circuit board references to ease design in the case of STMicroelectronics CRX14 and CR14 RFID reader ICs. The three sets of Gerber files that are provided offer a boosted, a standard and a small antenna design solution, respectively, for the CRX14 and CR14.

This document should be read in conjunction with user manual UM0080 “Reader USB CRX14 (V4.0) demonstration software” and application note AN1806 “Antenna (and associated components) matching-circuit calculation for the CRX14 coupler”, both available from the *www.st.com* website.

1 Printed-circuit board references

1.1 Printed-circuit board references of a boosted solution for CRX14/CR14

Figure 1 and *Figure 2* show the top and bottom layers of the PCB, respectively. The top overlay is presented in *Figure 3*. *Figure 4* provides the circuit and *Table 1* gives the bill of materials.

Figure 1. Top layer of first PCB

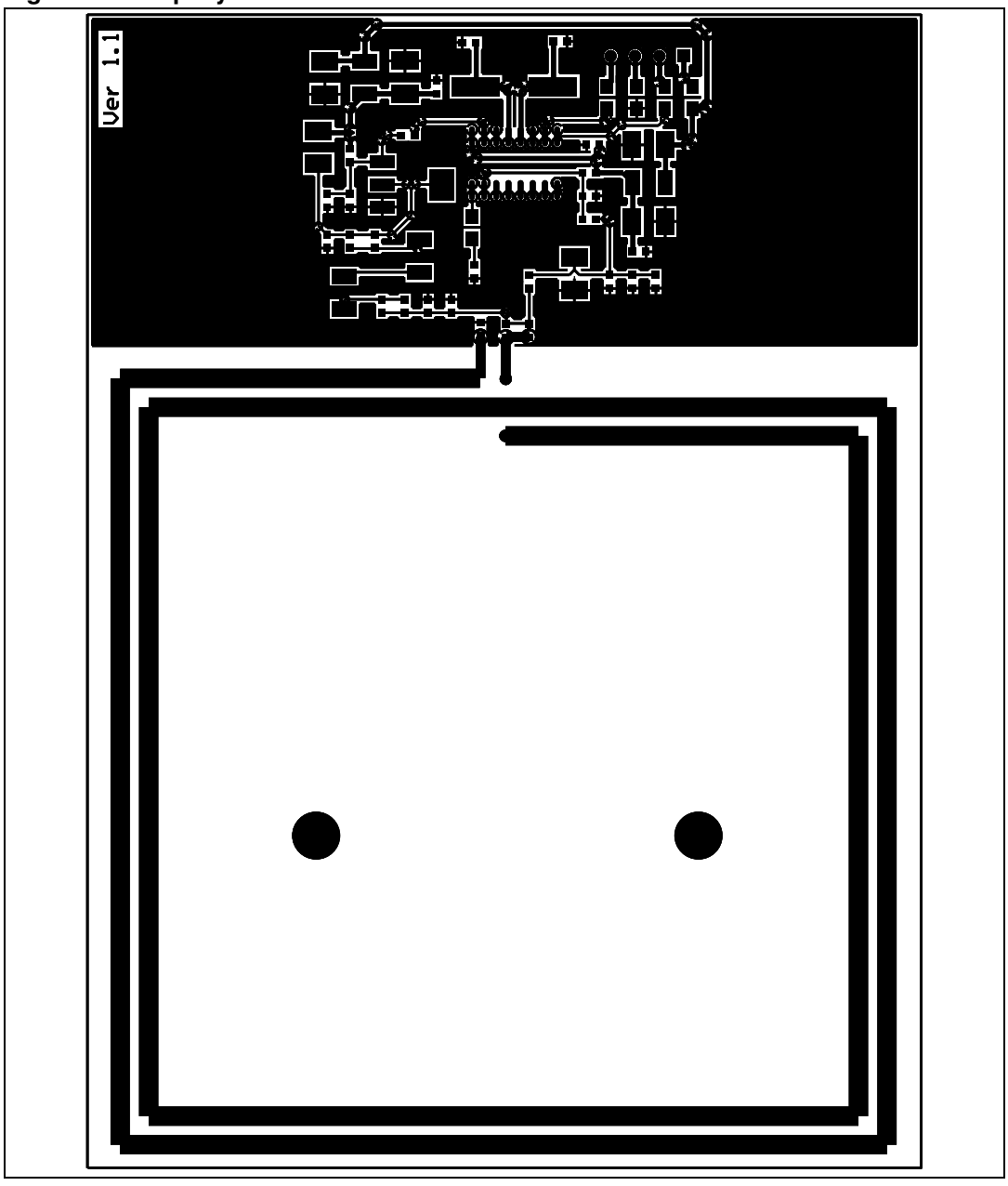

Figure 2. Bottom layer of first PCB

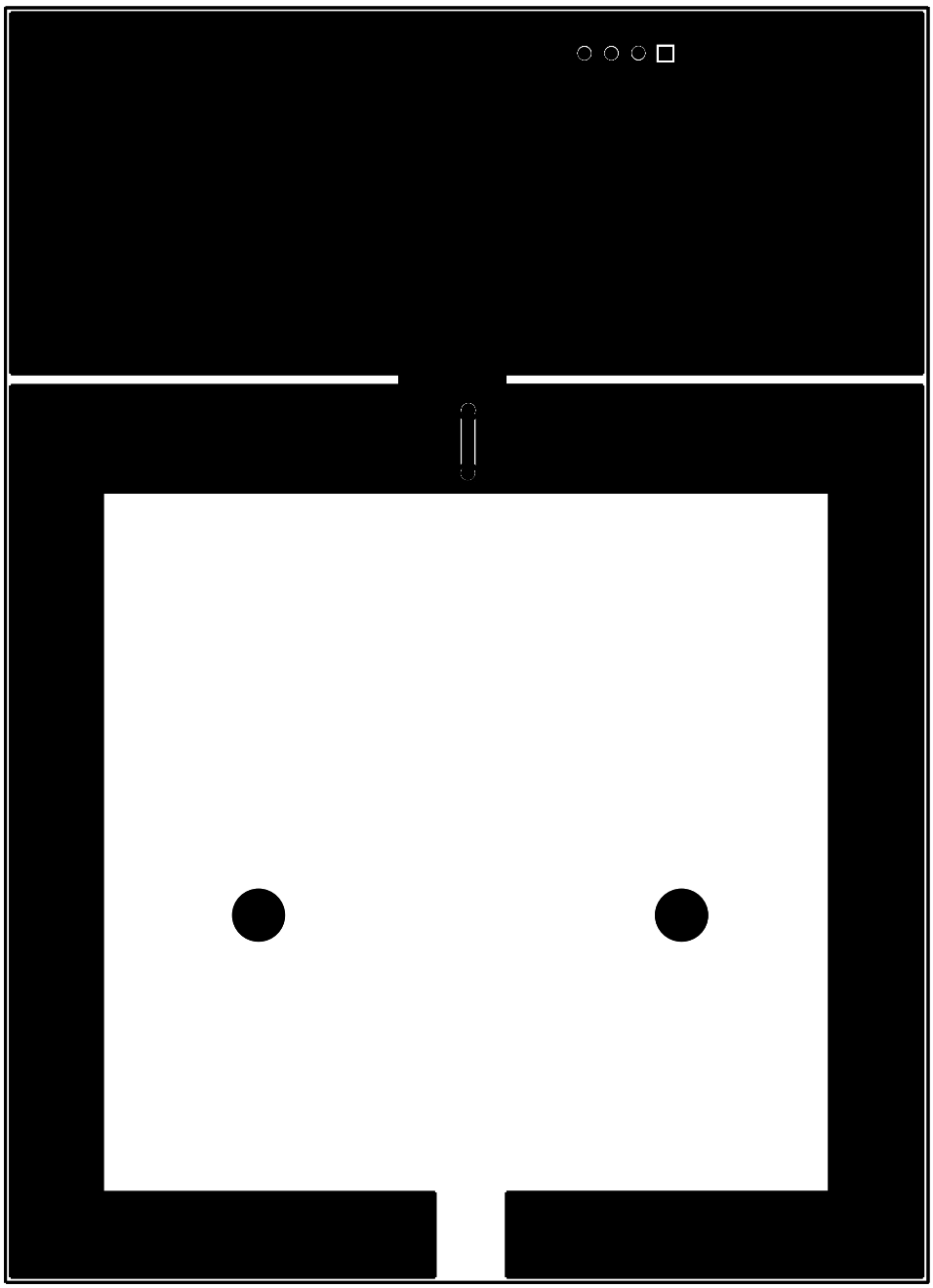

Figure 3. Top overlay of first PCB

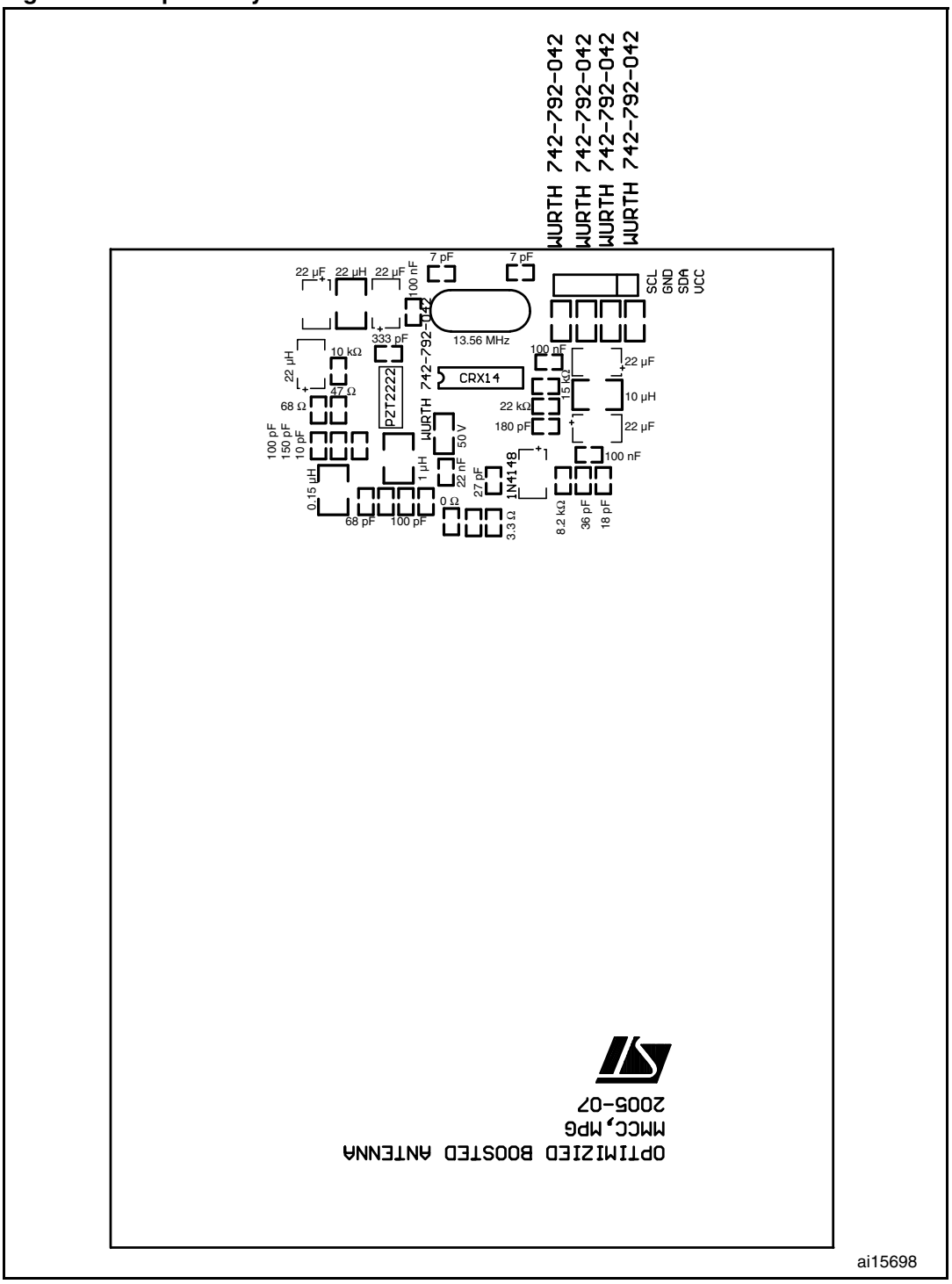

Figure 4. First PCB

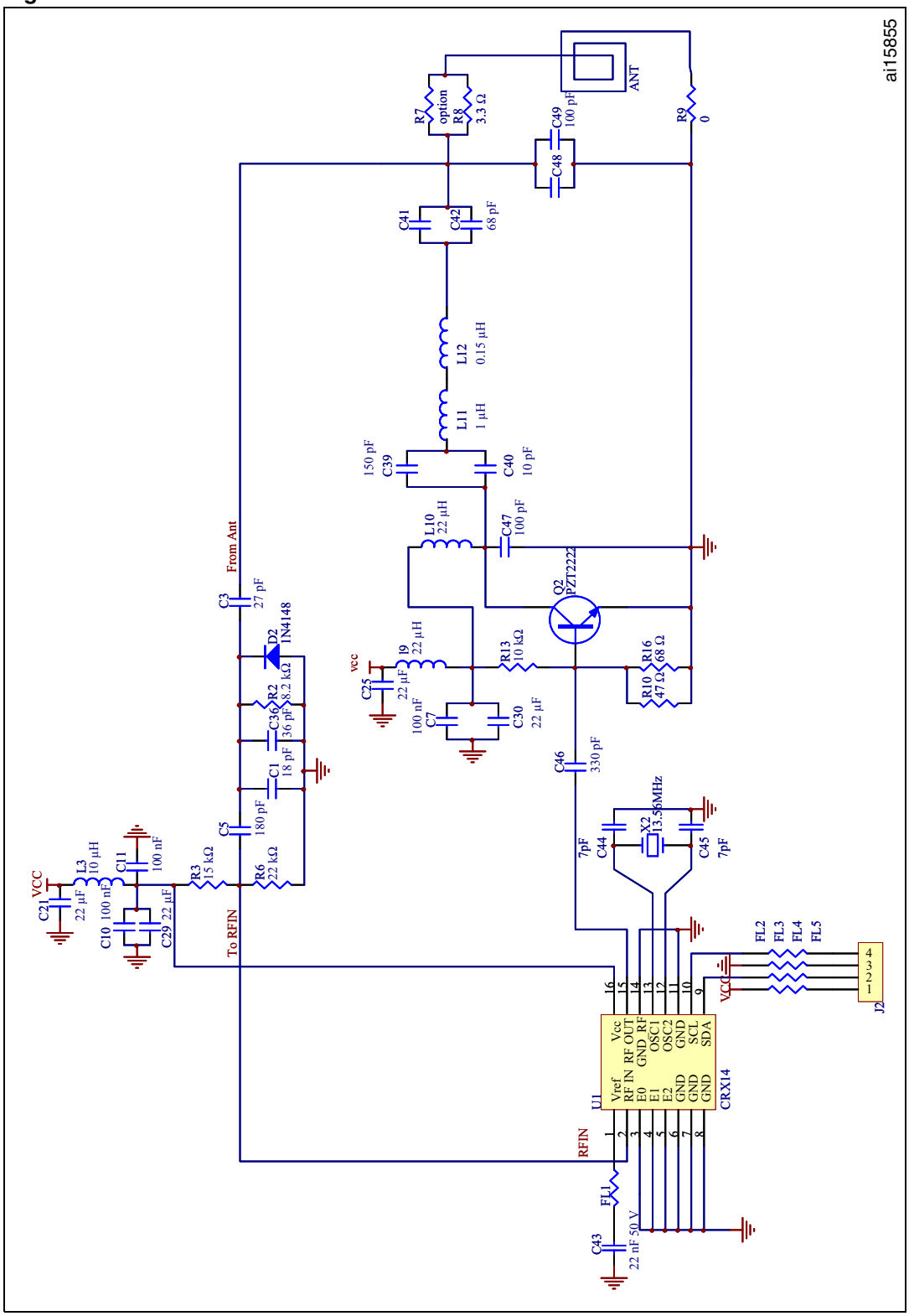

Table 1. Bill of materials for first PCB

Designator	Part type	Footprint	Description
0 Ω	R9	603	Resistor
0.15 µH	L12	1210	Inductor
1N4148	D2	3528	Diode
1 µH	L11	1210	Inductor
3.3	R8	603	Resistor
7 pF	C45	603	Capacitor
7 pF	C44	603	Capacitor
8.2 kΩ	R2	603	Resistor
10 kΩ	R13	603	Resistor
10p	C40	603	Capacitor
10 µH	L3	1210	Inductor
13.56 MHz	X2	XTALCMS	Crystal
15 kΩ	R3	603	Resistor
18 pF	C1	603	Capacitor
22 kΩ	R6	603	Resistor
22 nF 50 V	C43	603	Capacitor
22 µF	C29	3528	Capacitor
22 µF	C30	3528	Capacitor
22 µF	C21	3528	Capacitor
22 µF	C25	3528	Capacitor
22 µH	l9	1210	Inductor
22 µH	L10	3528	Inductor
27 pF	C3	603	Capacitor
36 pF	C36	603	Capacitor
47 Ω	R10	603	Resistor
68 Ω	R16	603	Resistor
68 pF	C42	603	Capacitor
100 nF	C7	603	Capacitor
100 nF	C10	603	Capacitor
100 nF	C11	603	Capacitor
100 pF	C49	603	Capacitor
100 pF	C47	603	Capacitor
150 pF	C39	603	Capacitor
180 pF	C5	603	Capacitor
330 pF	C46	603	Capacitor

Table 1. Bill of materials for first PCB (continued)

Designator	Part type	Footprint	Description
CRX14	U1	SO-16	ST card read coupler (type-B)
PZT2222	Q2	SOT-223	NPN transistor
WURTH 742-792-042	FL3	805	
WURTH 742-792-042	FL4	805	
WURTH 742-792-042	FL5	805	
WURTH 742-792-042	FL1	805	
WURTH 742-792-042	FL2	805	
option	R7	603	Resistor

1.2 Printed-circuit board references of a standard solution for CRX14/CR14

Figure 5 and *Figure 6* show the top and bottom layers of the PCB, respectively. *Figure 7* provides the circuit and *Table 2* gives the bill of materials.

Figure 5. Top layer of second PCB

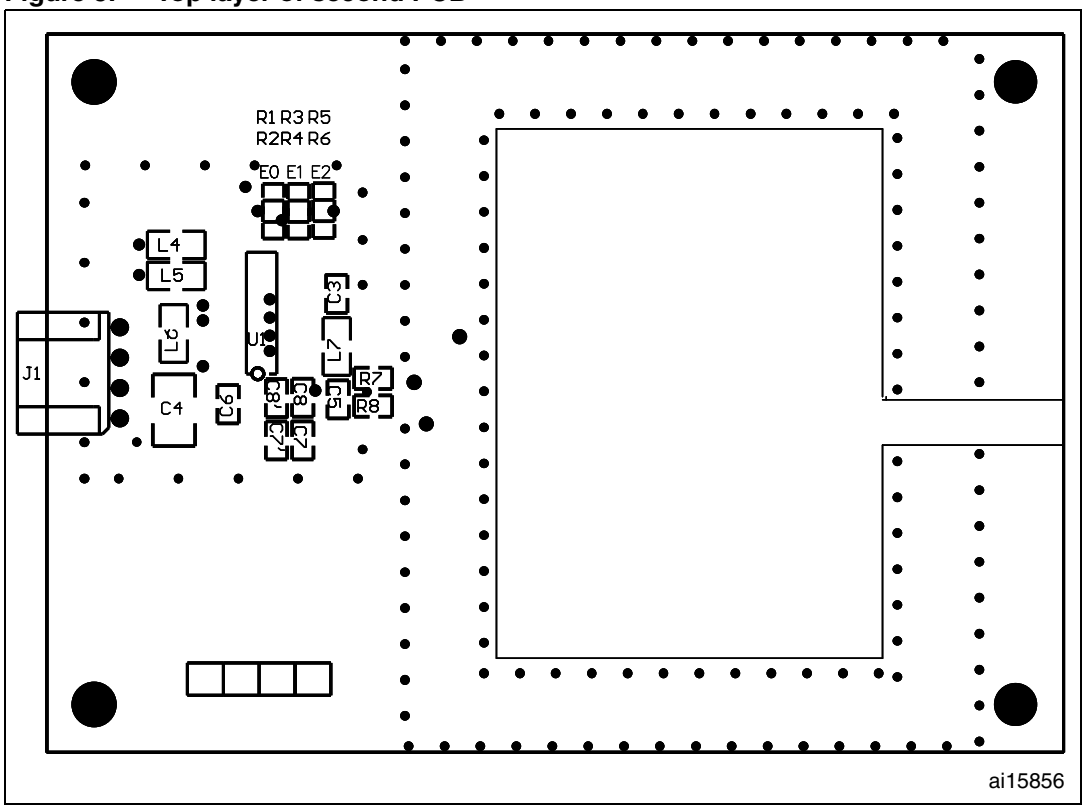

Figure 6. Bottom layer of second PCB

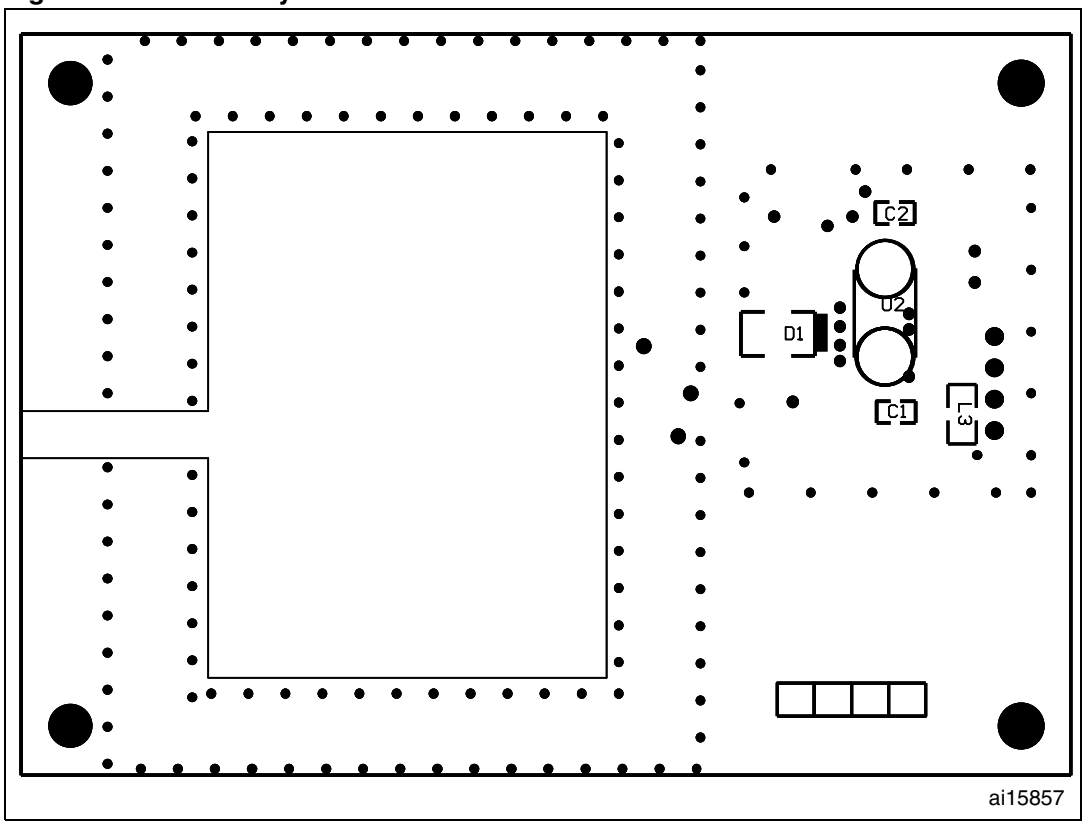

Figure 7. Second PCB

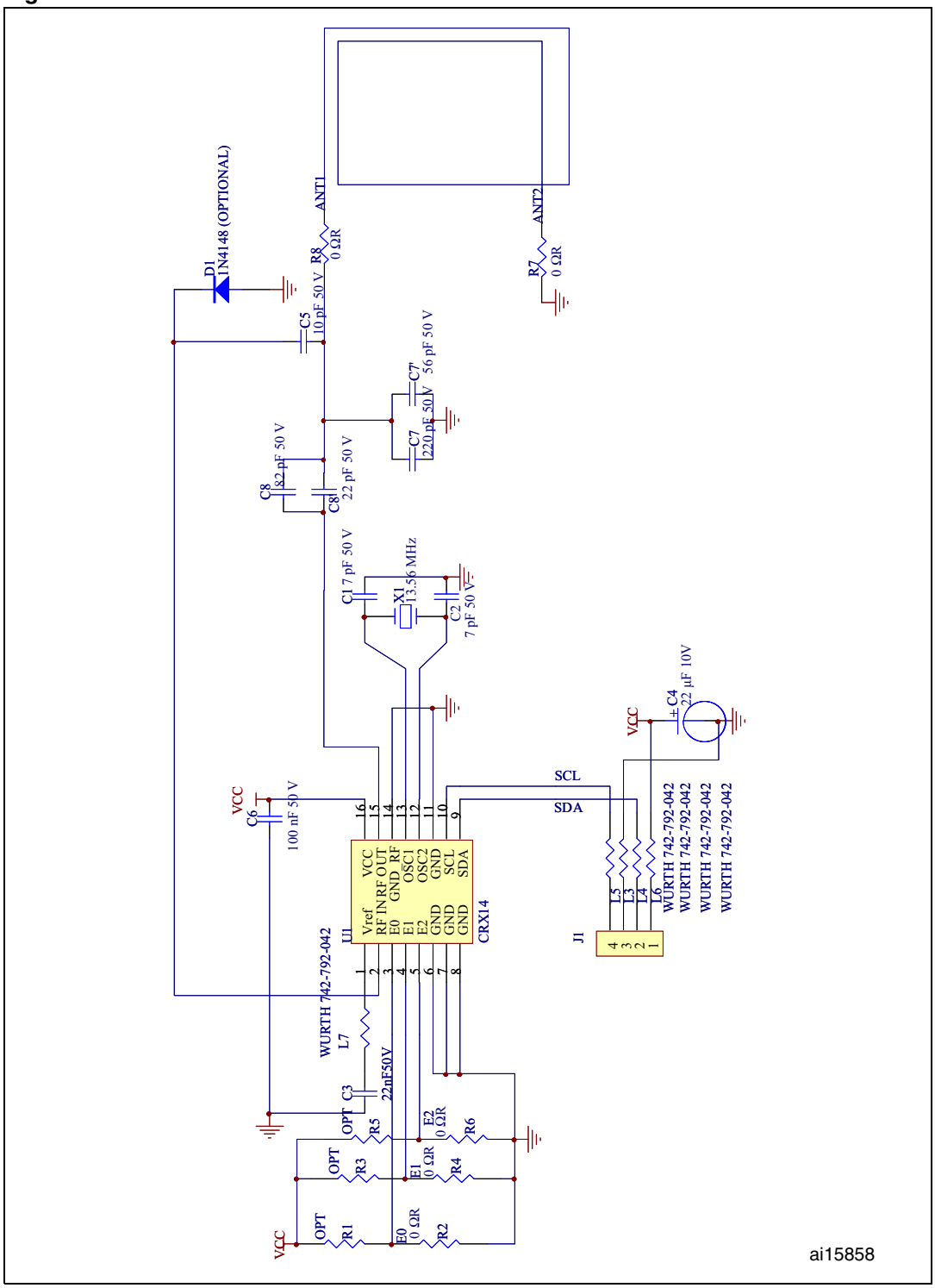

Table 2. Bill of materials for second PCB

Designators	Part value or reference	Part type	Footprint
C1	7 pF	Capacitor	0603
C2	7 pF	Capacitor	0603
C3	22 nF	Capacitor	0603
C4	22 µF	Capacitor	0603
C5	5 pF 50 V	Capacitor	0603
C6	100 nF	Capacitor	0603
C7	220 pF 50 V	Capacitor	0603
C7'	56 pF 50 V	Capacitor	0603
C8	82 pF 50 V	Capacitor	0603
C8	22 pF 50 V	Capacitor	0603
D1		Diode (optional, NC)	1210
J1		Connector	HE14_4H
L3	WURTH 742-792-042	LED	0805
L4	WURTH 742-792-042	LED	0805
L5	WURTH 742-792-042	LED	0805
L6	WURTH 742-792-042	LED	0805
L7	WURTH 742-792-042	LED	0805
R1	Option	Resistor	0603
R2	0 Ω	Resistor	0603
R3	Option	Resistor	0603
R4	0 Ω	Resistor	0603
R5	Option	Resistor	0603
R6	0 Ω	Resistor	0603
R7	0 Ω	Resistor	0603
R8	0 Ω	Resistor	0603
U1	CRX14	RFID tag	SO16
U2	13.56 MHz	Crystal	XTALCMS

1.3 Printed-circuit board references of a small antenna solution for CRX14/CR14

Figure 8 and *Figure 9* show the top and bottom layers of the PCB, respectively. *Figure 10* provides the circuit and *Table 3* gives the bill of materials.

Figure 8. Top layer of third PCB

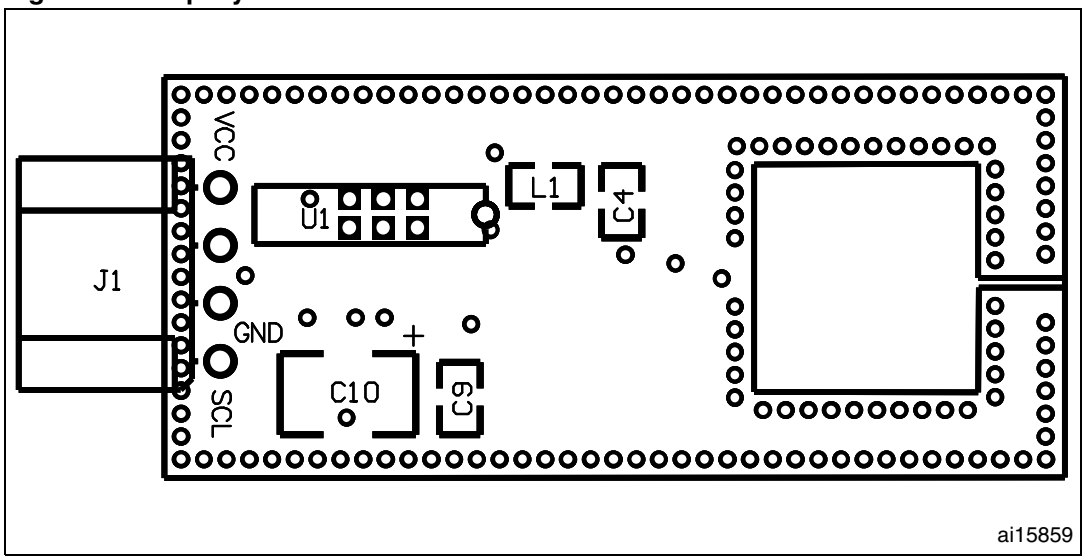

Figure 9. Bottom layer of third PCB

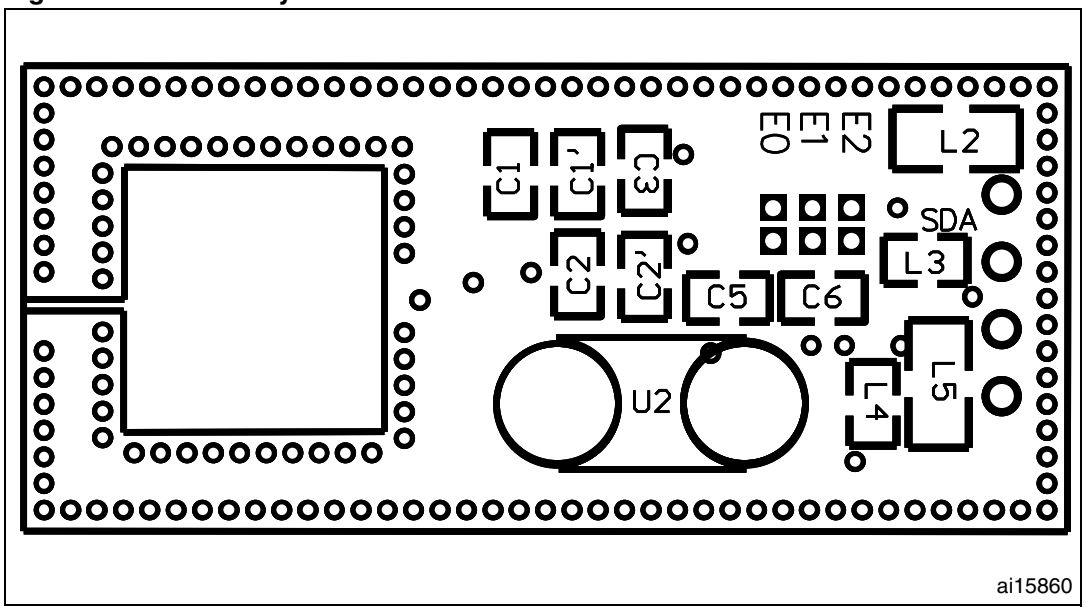

Figure 10. Third PCB

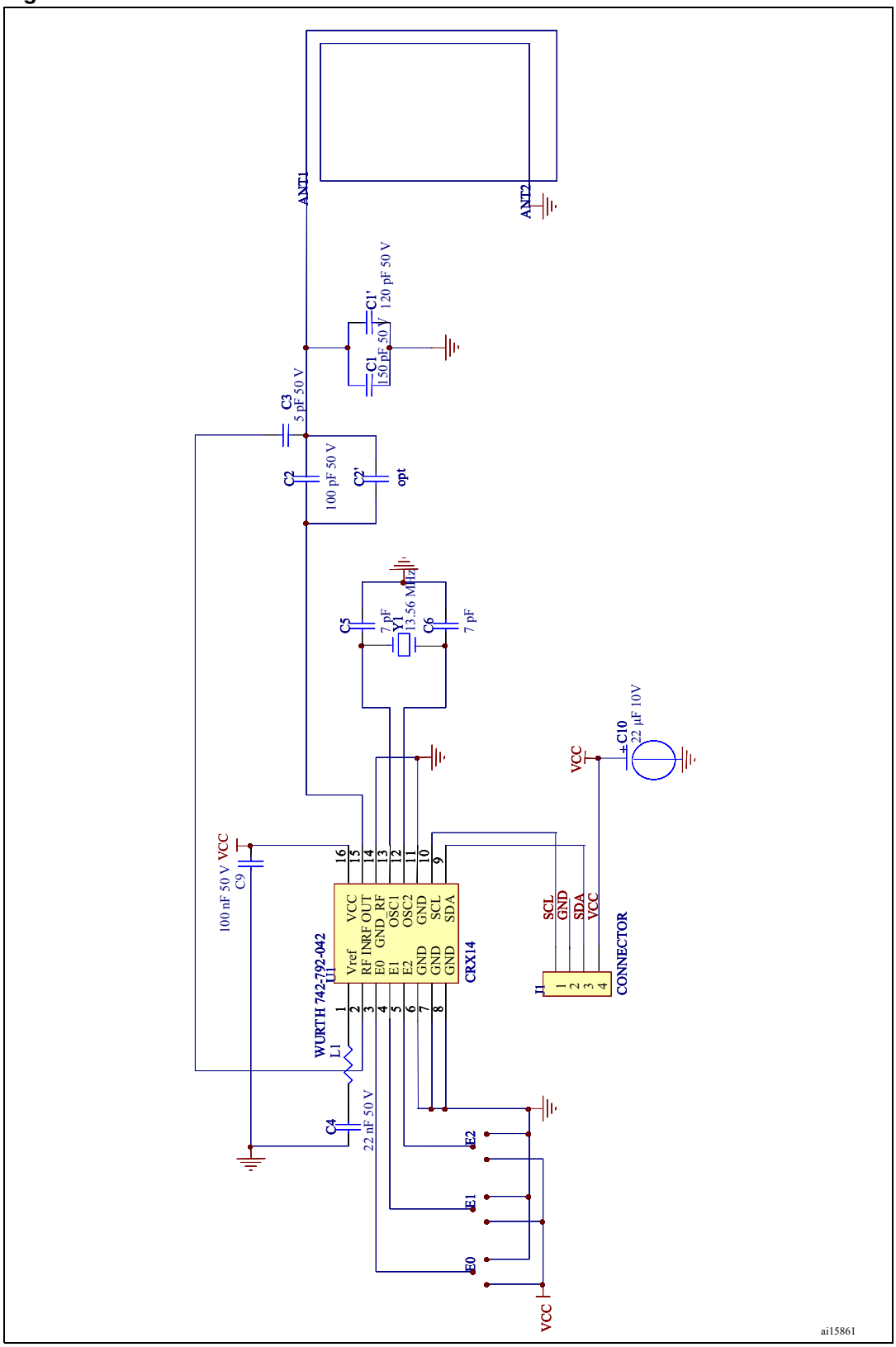

Table 3. Bill of materials for third PCB

Designators	Part value or reference	Part type	Footprint
C1	150 pF 50 V	Capacitor	0603
C1	120 pF 50 V	Capacitor	0603
C2	100 pF 50 V	Capacitor	0603
C2	option	Capacitor	0603
C3	5 pF 50V	Capacitor	0603
C4	22 nF 50 V	Capacitor	0603
C5	7 pF	Capacitor	0603
C6	7 pF	Capacitor	0603
C9	100 nF 50 V	Capacitor	0603
C10	22 µF 10 V	Capacitor	1210
L1	WURTH 742-792-042	LED	0603
L2	WURTH 742-792-042	LED	0805
L3	WURTH 742-792-042	LED	0603
L4	WURTH 742-792-042	LED	0603
L5	WURTH 742-792-042	LED	0805
J1		Connector	HE14_4H
U1	CRX14	RFID tag	SO16
U2	13.56 MHz	Crystal	XTALCMS

2 Revision history

Table 4. Document revision history

Date	Version	Changes
23-Jan-2009	1	Initial release.

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