EVB90121
MLX90121 Evaluation Board

Features and Benefits

❑ Output power up to 200miliwatts
❑ Complies with standard ISO15693 and ISO 14443B protocols
❑ Programmable encoder for custom protocol
❑ Short to medium reading range applications
❑ Matching network optimized for 50 ohm antenna impedance
❑ 10 pins connector for communication with a microcontroller
❑ Board voltage supplied by a jack connector from 6 to 9 Volts DC
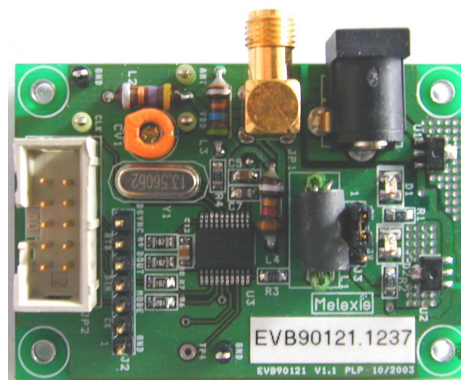❑ Internal power supply of the board between 3 Volts and 5 Volts DC

Ordering Information

Part No.
EVB90121

Applications Examples

❑ Freight identification systems
❑ Smart labels and write systems
❑ Access control systems

Evaluation Board EVB90121

General Description

The EVB90121 is an assembled module that allows to evaluate the advantages of the MLX90121 13MHz transceiver IC and to facilitate the development of RFID applications.

The board voltage is supplied by a jack connector from 6 to 9 Volts DC. The internal power supply of the board can be chosen between 3 Volts and 5 Volts DC by putting the corresponding jumper up or down. A suppression choke reduces the supply noise.
The matching network can be adjusted through CV1 capacitor and thus can be optimized to transmit full electromagnetic power up to 200mWatt to a 50-ohm load antenna connected on a SMA connector.

All digital inputs/outputs from the MLX90121 are connected to a standard 10 pins connector. This allows easy connection to a microcontroller.

Table of Contents

1 Schematic

The schematic if the MLX90121 evaluation board is shown in figure 1.
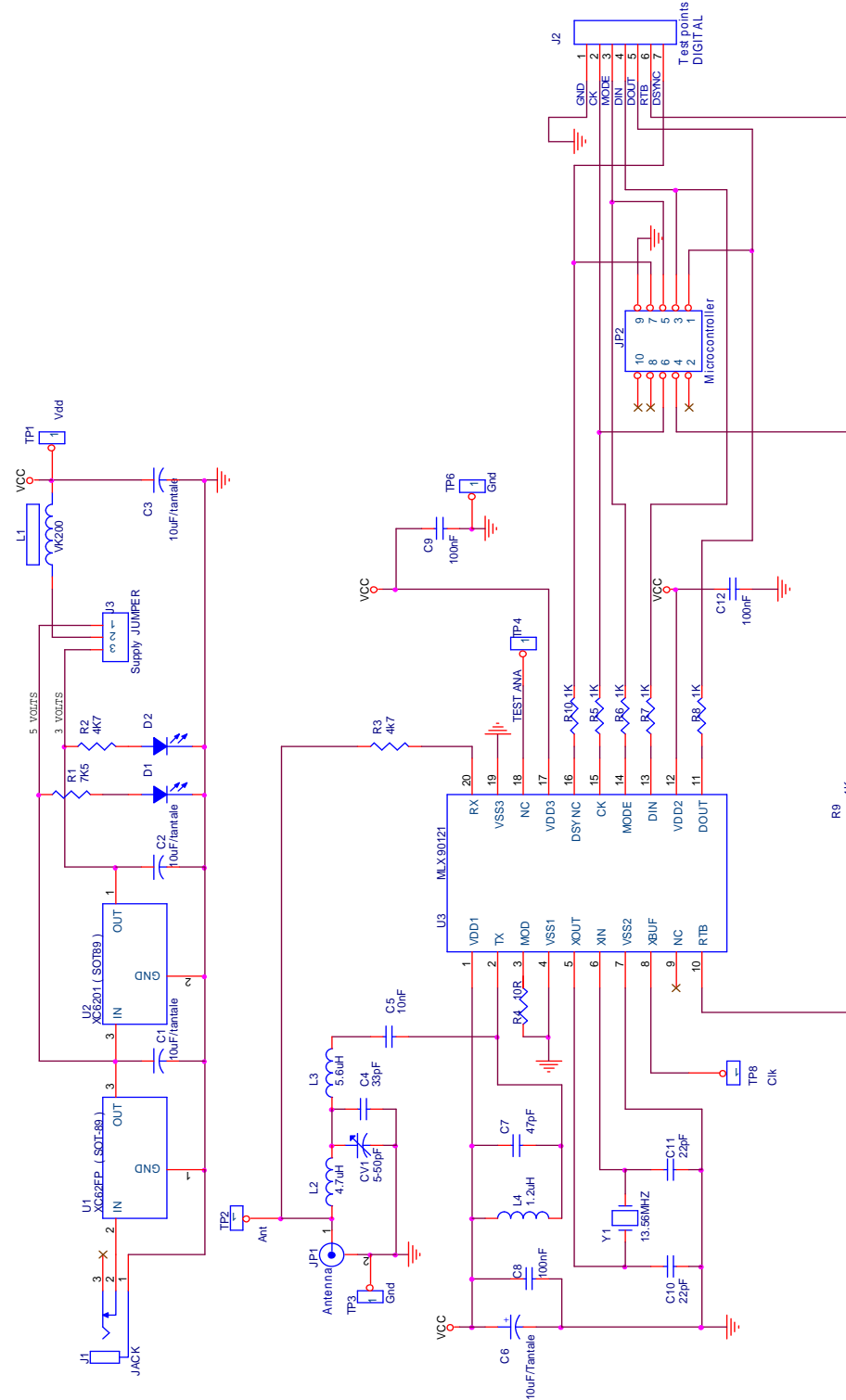

Figure 1: Schematic of the evaluation board EVB90121

2 Physical outline

Figures 2 and 3 show the outline of the MLX90121 evaluation board.
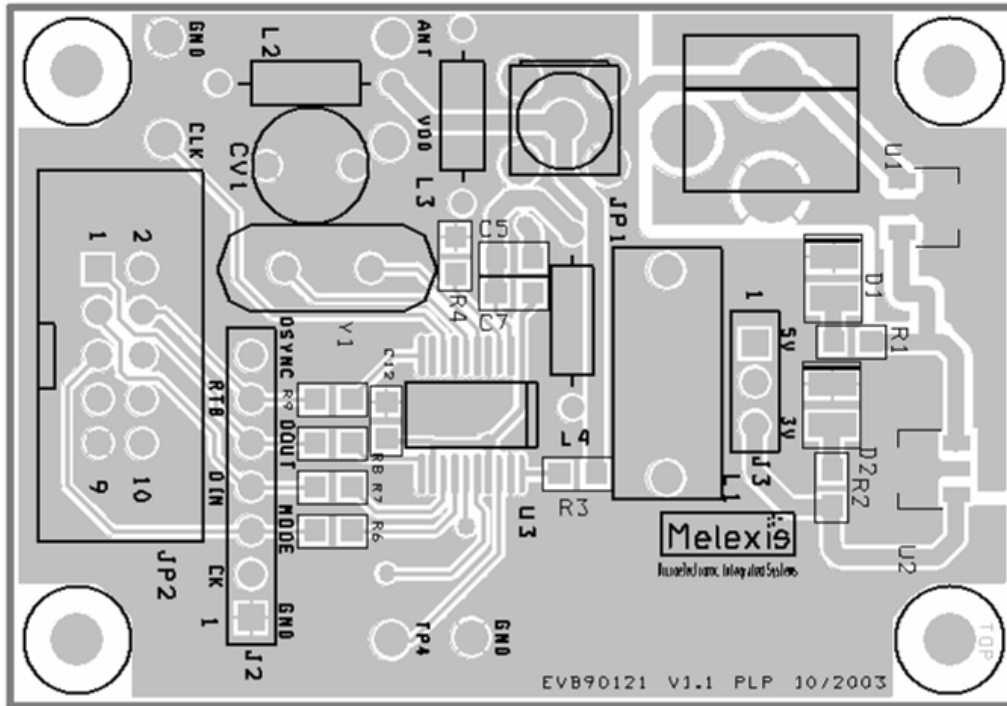

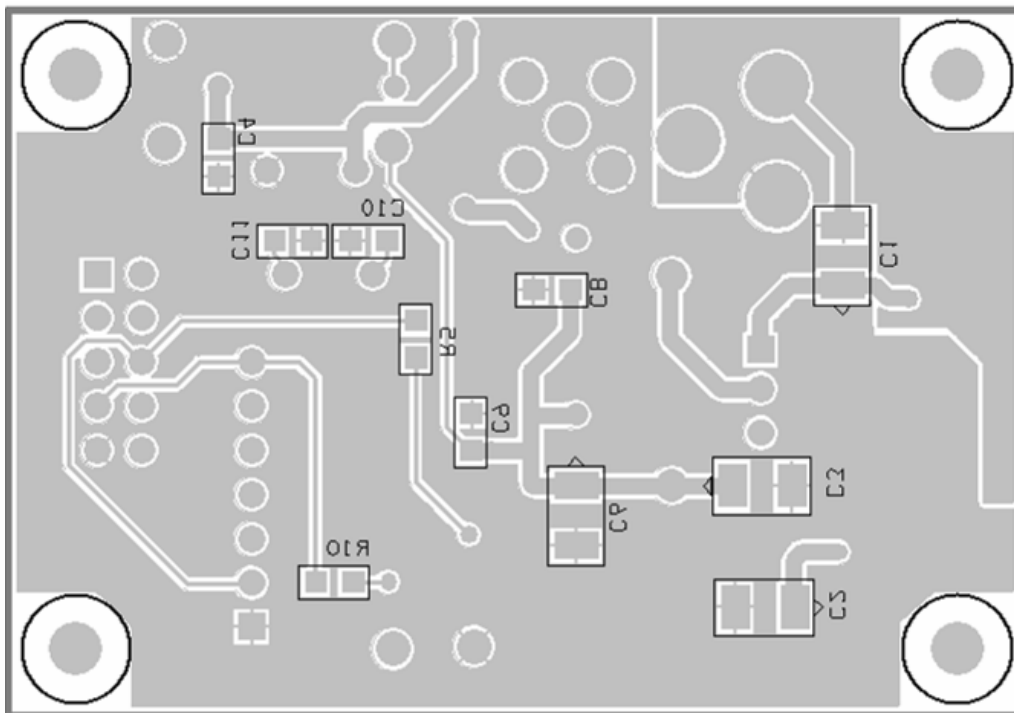Figure 2: MLX90121 evaluation board outline: top side

Figure 3: MLX90121 evaluation board outline: bottom side

3 Components

The table below gives an overview of all components that composed the evaluation board EVB90121.

Reference	Value	Description
R1	7,5 kΩ	
R2	4,7 kΩ	
R3	4,7 kΩ	
R4	10 Ω	
R5,R6,R7,R8,R9,	1 kΩ	
CV1	5-50 pF	Tuned capacitor used to adjust the matching network to 50-ohm
C1,C2,C3,C6	10uF	Decoupling capacitors, Tantalum type
C4	33 pF	
C5	10 nF	
C7	47 pF	
C8,C9,C12	100 nF	
C10,C11	22 pF	
D1,D2	-	Red LEDs
JP1	SMA connector	Connection to a 50 ohms antenna
JP2	DIL10 connector	Connection to a microcontroller
J1	Jack connector	Power supply connection
J2	Debug connector	
L1	VK200	Noise suppressor choke
L2	4,7 µH	Through hole RF chokes type B78108S from EPCOS
L3	5,6 µH	Through hole RF chokes type B78108S from EPCOS
L4	1,2 µH	Through hole RF chokes type B78108S from EPCOS
U1	XC62FP	+5Volts regulator, package SOT23
U2	XC6201	+3Volts regulator, package SOT23
U3	MLX90121	MLX90121CA device, package SSO20
Y1	Crystal	Crystal oscillator

Table 1: Components

4 Guidelines

This chapter describes all connections and jumpers available on the EVB90121 circuit to be able to use it in the most efficient way.

4.1 Power supply

- The circuit can be supplied with a standard DC supply block (transformer or switch mode power supplies) connected to the jack connector **J1**. The input supply can be selected from 6 to **maximum 9 volts** DC to avoid permanent damage of the evaluation board.

- The internal power supply of the board can be selected between 3 Volts and 5 Volts DC by changing the position of the jumper **J3**.

4.2 Antenna connection

- The SMA screw connector **JP1** allows the connection of a 50-ohm antenna. The matching network is adjusted with **CV1** capacitor on a prefect 50-ohm load. This will give maximum power up to 250mWatt to the connected antenna.

4.3 Connection to a microcontroller

- All digital Inputs/Outputs of the MLX90121 device are available on the JP2 connector. This allows easy connection to a microcontroller. Following table is the description of JP2 connector.

Pin number (connector JP2)	Name	Description
1	DOUT	Data Output
2	-	Not connected
3	DIN	Data Input
4	RTB	Reception or Transmission selection Input
5	MODE	Configuration or Communication selection Input
6	CK	Serial Clock Input
7	DSYNC	Synchronization Output
8	-	Not connected
9	GND	Ground
10	-	Not connected

Table 2: Connector JP2

4.4 Digital connector

- All digital Inputs/Outputs of MLX90121 device are also available on the connector **J2** and can be used to connect digital probes of an oscilloscope.

Pin number	Name	Description
1	GND	Ground
2	CK	Serial Clock Input
3	MODE	Configuration or Communication selection Input
4	DIN	Data Input
5	DOUT	Data Output
6	RTB	Reception or Transmission selection Input
7	DSYNC	Synchronization Output

Table 3: Connector J2

4.5 Analogue outputs

- Some analogue outputs are foreseen on the evaluation board as test pins referenced from **TP1** to **TP8**. These test pins can be used to measure analogue information. The following table describes all test pins available on the evaluation board.

Test pins number	Name	Description
TP1	VDD	Supply Voltage
TP2	Ant	Antenna
TP3,TP6	GND	Ground
TP8	CLK	Output XBUF of MLX90121 device

Table 4: Test pins

5   Disclaimer

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