XMC 2Go evaluation kit user guide

About this document

Scope and purpose

This document describes the features and hardware details of the XMC 2Go equipped with the ARM® Cortex™-M0 based XMC1100 microcontroller from Infineon Technologies AG.

Intended audience

This document is intended for users who use XMC 2Go kit with the XMC1100 microcontroller.

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1 Overview

The XMC 2Go is designed to evaluate the capabilities of the XMC1100 microcontroller and the powerful, free of charge tool chain DAVE™.

This board is not cost optimized and does not serve as a reference design.

1.1 Key features

Table 1 summarizes the features of the XMC 2Go.

Table 1 **Features of the XMC 2Go kit with XMC1100**

| Topic	Features
Processor	XMC1100 microcontroller (ARM® Cortex™-M0 based) in a 4 x 4 mm VQFN-24 package
Flash	32 KB or 64 KB
RAM	16 kB
Clock generation	Internal oscillator
Frequencies	32 MHz CPU clock, 64 MHz timer clock
Dimensions	14.0 x 38.5 mm
Power supply	from USB via Debug probe (J-Link) or 3.3 V external power
Connectors	Two 8-pin header (pin pitch: 2.54 mm ≙ 0.1" / between rows: 10.16 mm ≙ 0.4") Pin header fits to breadboard
Debugger	Onboard J-Link debugger supports Serial wire debug (SWD, ARM standard) Single pin debug (SPD) UART-to-USB bridge (virtual COM)
Peripherals	Mapped to pin header X1/X2: 2 Channel USIC (UART, SPI, I2C, I2S, LIN) 6 Channel analog to digital converter (12-bit resolution) 4 x 16-bit timer External interrupts (via ERU) Others: Real time clock Random number generator
Others	2 User LEDs @ P1.0 and P1.1

1.2 Block diagram

The block diagram in **Figure 1** shows the main components of the XMC 2Go kit including the power supply concept. There are following main building blocks:

- XMC1100 microcontroller in a 4x4mm VQFN24 package

Overview

- Onboard USB debugger realized with a XMC4200 microcontroller for serial wire debug (SWD) and UART-to-USB Bridge
- Two 8-pin header X1 and X2
- Onboard power generation for power supply of the XMC1100 microcontroller and the debug IC
- 2 User LEDs
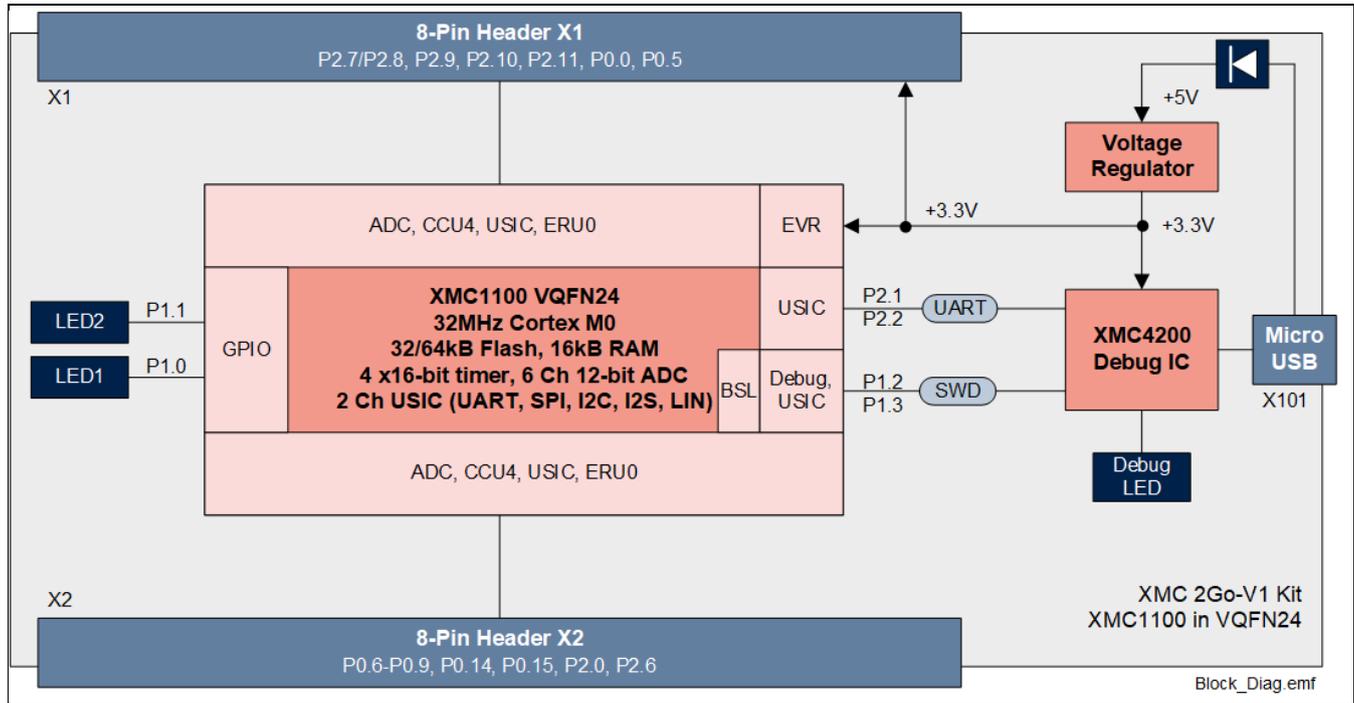
Figure 1   **Block diagram of the XMC 2Go kit**

2 Hardware description

The following sections give a detailed description of the board hardware and how it can be used. **Figure 2** shows the components of the XMC 2Go kit with XMC1100.
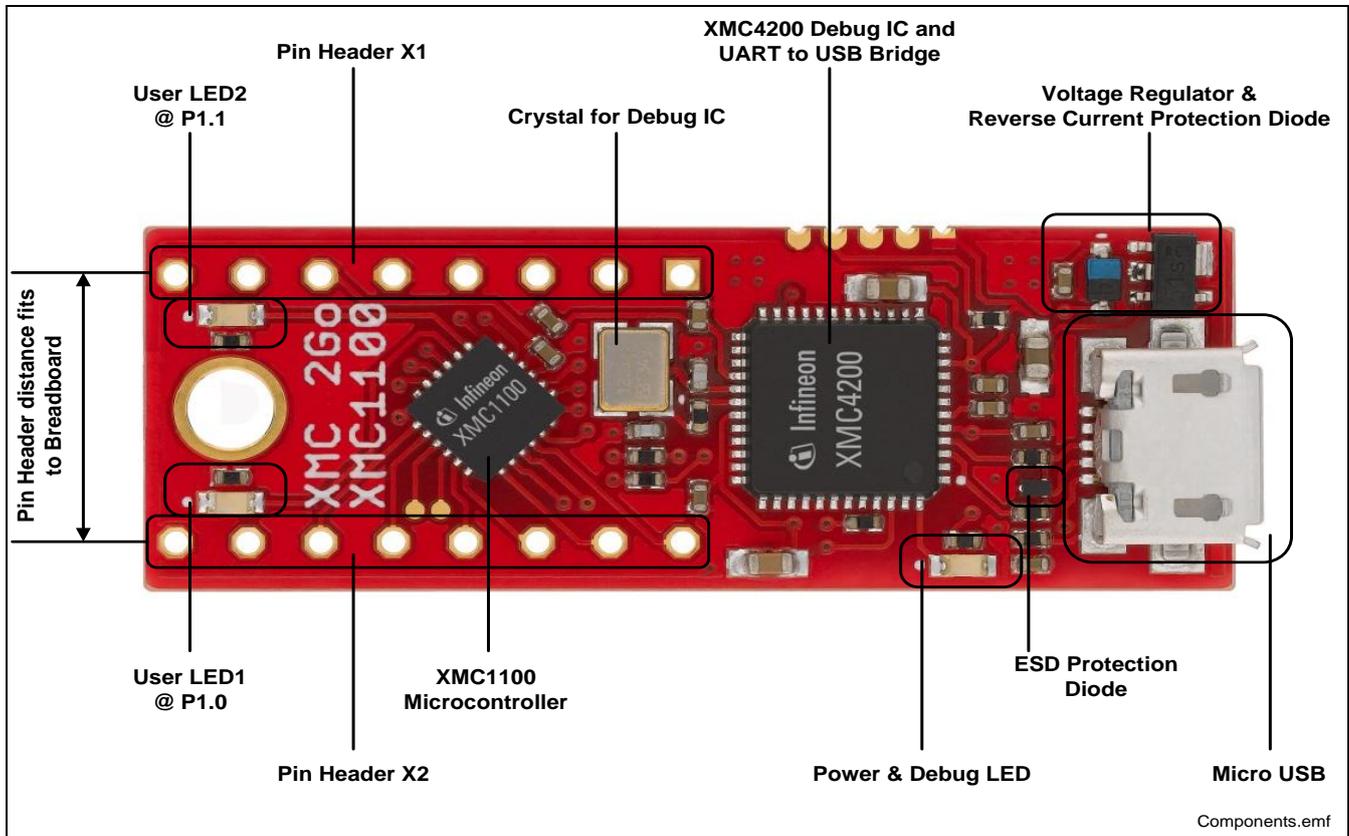

Figure 2   XMC 2Go kit with XMC1100

2.1 Power supply

The XMC 2Go kit must be supplied by an external 5 Volt DC power supply connected to the Micro USB plugs (X101). Out of the box with the preprogrammed application and the onboard debugger in operation the XMC 2Go typically draws about 75 mA. This current can be delivered via the USB plug of a PC, which is specified to deliver up to 500 mA. The Power&Debug LED indicates the presence of the generated 3.3V supply voltage.

An onboard reverse current protection diode will ensure safe operation and protects the USB port of the Laptop/PC in case power is provided through the pin header X1.

If the board is powered via the USB plug, it is not recommended to apply an additional power supply to the VDD pin of X1 (3.3V), because this power supply could drive against the onboard power supply. The VDD pin can be used to power an external circuit. But care must be taken not to draw more current than 150 mA, which is the maximum current the onboard voltage regulator can deliver.

After power-up the Debug LED starts blinking. In case there is a connection to a PC via the Debug USB plug X101 and the USB Debug Device drivers are installed on this PC, the Debug LED will turn from blinking to constant illumination.

2.2 Pin header connector

The pin headers X1 and X2 can be used to extend the evaluation board or to perform measurements on the XMC1100. The order of pins available at X1 and X2 corresponds to the pinning schema of the XMC1100 microcontroller in the TSSOP-16 pin package. The pinning table is also printed onto the bottom side of the PCB.
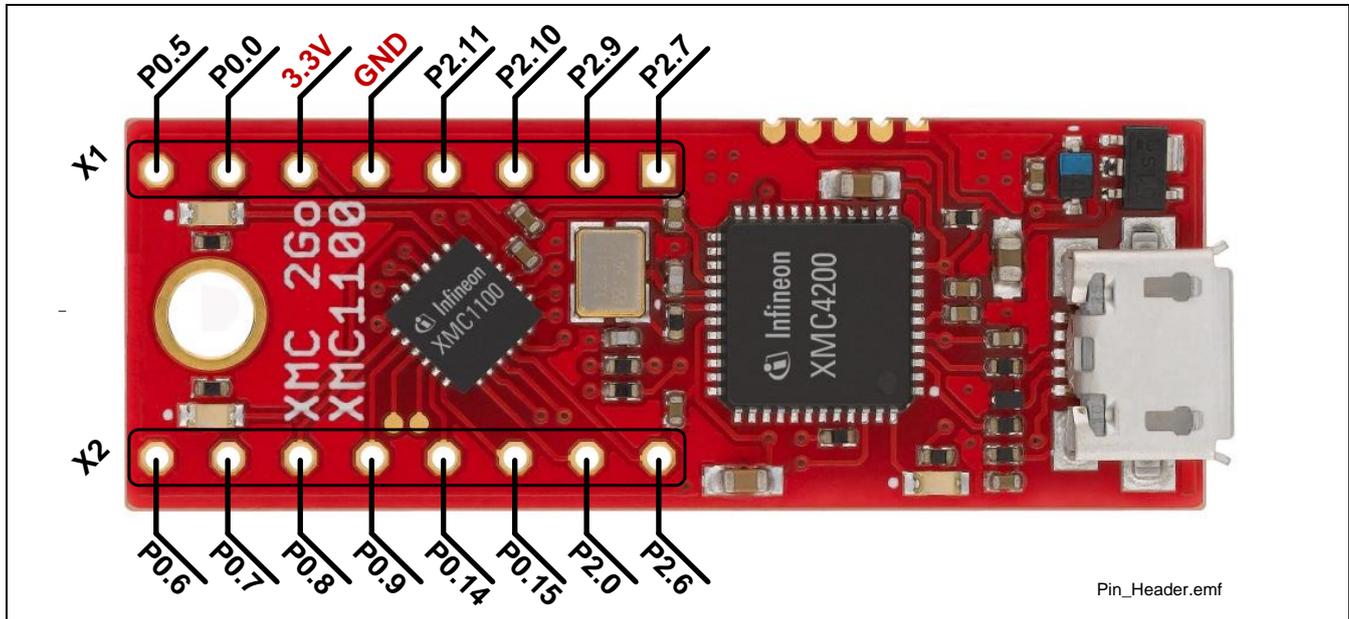

Figure 3   **Pinning of pin header**

2.3 User LEDs

The port pins P1.0 and P1.2 of the XMC1100 on the XMC 2Go Kit are connected to LEDs exclusively.

Table 2   **Pins used for the user LEDs**

LED	Port pin
LED1	P1.1
LED2	P1.0

2.4 Debugging and UART communication

The onboard debugger supports 2-pin serial wire debug (SWD), single pin debug (SPD) and UART communication. Both require the installation of Segger's J-Link Driver which is part of the DAVE™ installation. DAVE™ is a high productivity development platform for the XMC microcontroller families to simplify and shorten SW development. It can be downloaded at **www.infineon.com/dave**. The latest Segger J-Link Driver can be downloaded at **https://www.segger.com/jlink-software.html**.

During installation of the J-Link driver, you will be asked for the installation of optional components. For support of the UART communication, take care to install the CDC USB driver (Composite device class). Therefore, select the option "Install USB Driver for J-Link-OB with CDC" as shown in **Figure 4**.
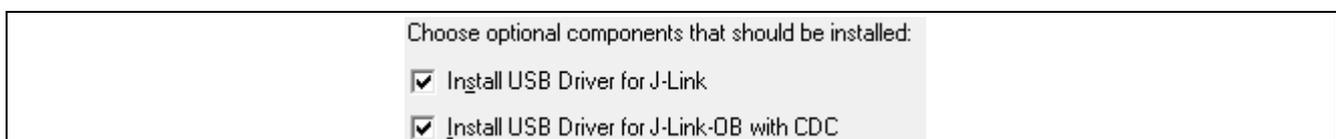

Figure 4   **Recommended installation options for the J-Link driver**

Hardware description

The XMC1100 on the XMC 2Go kit is configured to SWD1 mode. Use the "BMI Get Set" tool integrated into DAVE™ to configure the XMC1100 to e.g., SPD1 mode if required.

Note: *Unintended use of the "BMI Get Set" tool can cause the XMC 2Go Kit not to work anymore, e.g., when configuring the XMC1100 to SWD0, SPD0 mode or to productive user mode.*

Note: *Do not configure the XMC1100 on the XMC 2Go kit to SWD0, SPD0 or to productive user mode.*

Table 3 shows the pin assignment of the XMC1100-VQFN24 used for debugging and UART communication.

Table 3   **XMC1100 pins used for debugging and UART communication**

Pin function	Input / output	Port pin
Data pin for debugging via SWD/SPD	I/O	P1.3
Clock pin for debugging via SWD	O	P1.2
Transmit pin for UART communication	O	P2.1
Receive pin for UART communication	I	P2.2

3 Production data

3.1 Schematics

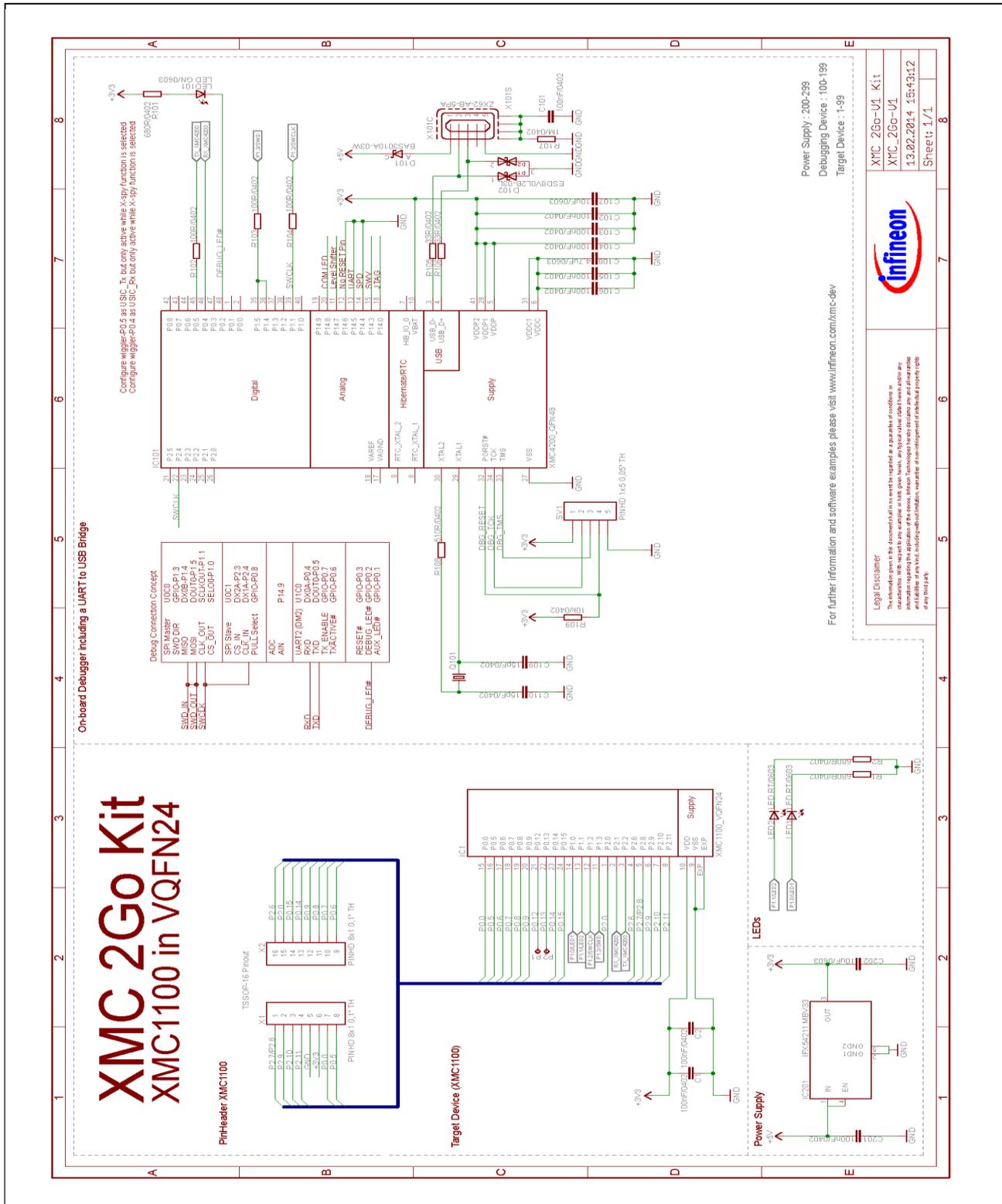The schematic of the XMC 2Go kit can be found in **Figure 5**.

Figure 5 **Schematic of the XMC 2Go kit with XMC1100**
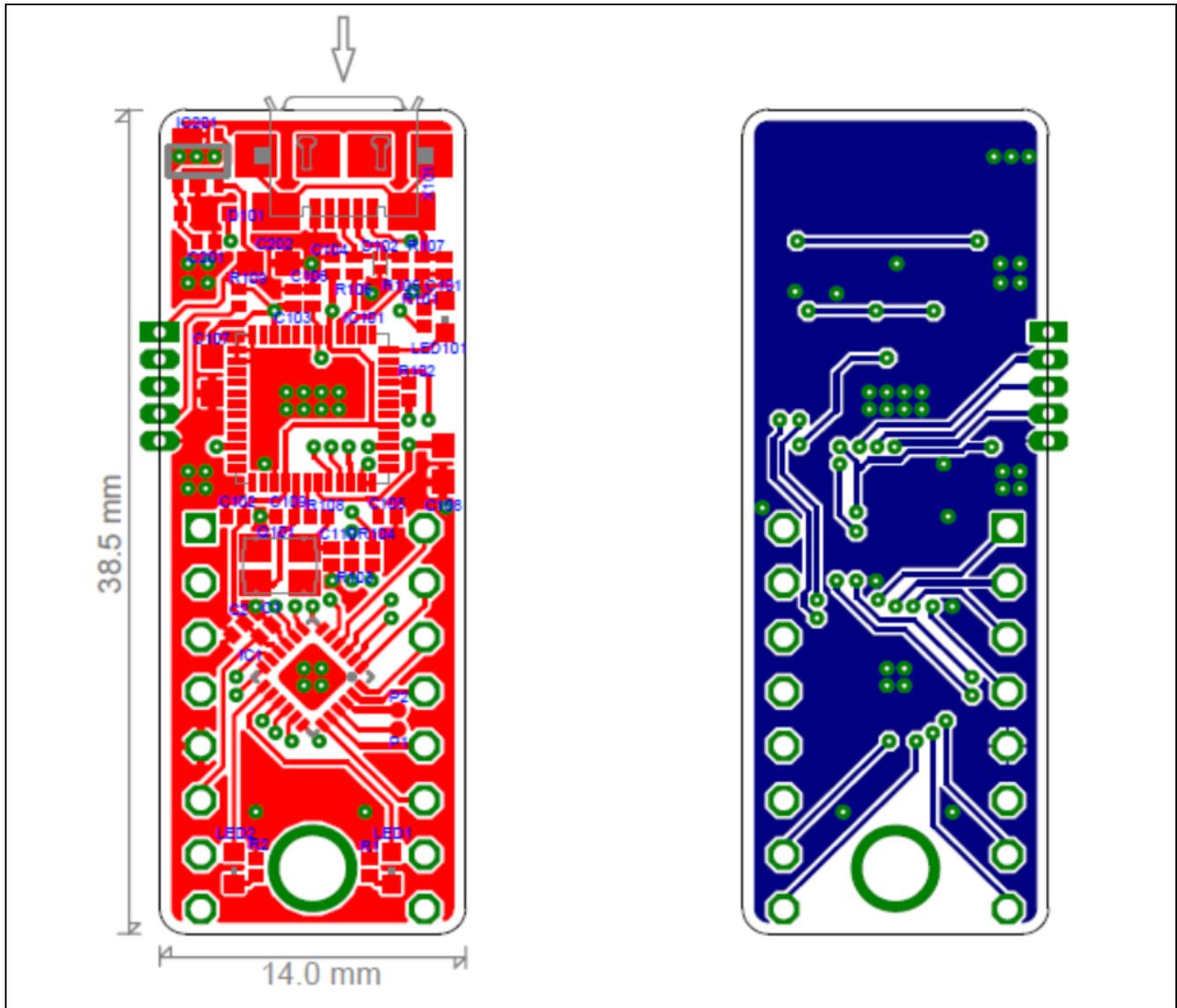
3.2 Components placement and geometry

Figure 6 Components placement and geometry

3.3 List of material

The list of material is valid for the XMC 2Go kit with XMC1100 version 1.

Table 4 List of material

No.	Qty	Value	Device	Reference designator
1	9	100nF 50V 0402 10% X5R CER	Capacitor	C1 C2 C101 C102 C103 C104 C105 C106 C201
2	2	15pF 50V 0402 10% COG CER	Capacitor	C109 C110
3	2	10uF 10V 0603 10% X5R CER	Capacitor	C107 C202
4	1	4.7uF 10V 0603 10% X7R CER	Capacitor	C108
5	1	NX3225SA 12MHZ AT-W 3.2X2.5	Crystal, NDK	Q101

Production data

No.	Qty	Value	Device	Reference designator
6	3	100R 0402 1%	Resistor	R102 R103 R104
7	1	10k 0402 1%	Resistor	R109
8	1	1M 0402 1%	Resistor	R107
9	2	33R 0402 1%	Resistor	R105 R106
10	1	510R 0402 1%	Resistor	R108
11	3	680R 0402 1%	Resistor	R1 R2 R101
12	2	LED RT 0603 D 110mcd LSQ976-Z	LED red	LED1 LED2
13	1	LED GN 0603 D 110mcd LGQ971-Z	LED green	LED101
14	1	ZX62-AB-5PA	Connector, Micro-USB, Hirose	X101
15	1	IFX54211 MBV33 SCT595	Linear Voltage Regulator, Vout = 3.3V, Infineon	IC201
16	1	XMC1100-Q024F0032 or XMC1100-Q024F0064	Microcontroller, XMC1100, Cortex M0, Infineon	IC1
17	1	XMC4200_QFN48	Microcontroller, XMC4200, Cortex M4F, Infineon	IC101
18	1	BAS3010A-03W SOD323-R	Diode, Infineon	D101
19	1	ESD8V0L2B-03L TSLP-3-1	TVS Diode, Infineon	D102
20	2	PINHD 8x1 0,1" TH	Pin Header, 8-pin, 0.1" TH	X1 X2

Revision history

Date	Version	Description
2022-04-26	**	Initial release

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