

# 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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Overview

# 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")<br>Pin header fits to breadboard   |
| Debugger         | Onboard J-Link debugger supports<br>Serial wire debug (SWD, ARM standard)<br>Single pin debug (SPD)<br>UART-to-USB bridge (virtual COM)   |
| Peripherals      | Mapped to pin header X1/X2:<br>2 Channel USIC (UART, SPI, I2C, I2S, LIN)<br>6 Channel analog to digital converter (12-bit resolution)<br>4 x 16-bit timer<br>External interrupts (via ERU)<br>Others:<br>Real time clock<br>Random number generator |
| Others           | 2 User LEDs @ P1.0 and P1.1   |

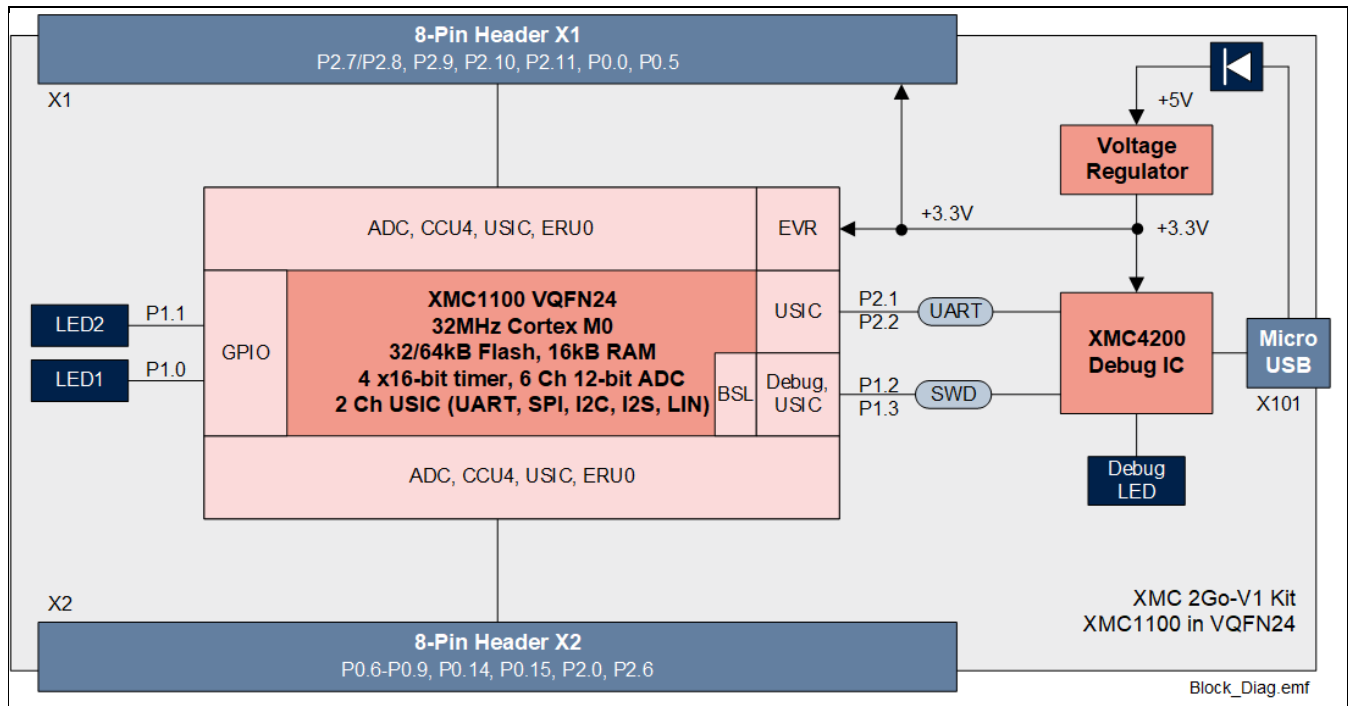
## 1.2 Block diagram

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

Hardware description

## 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.

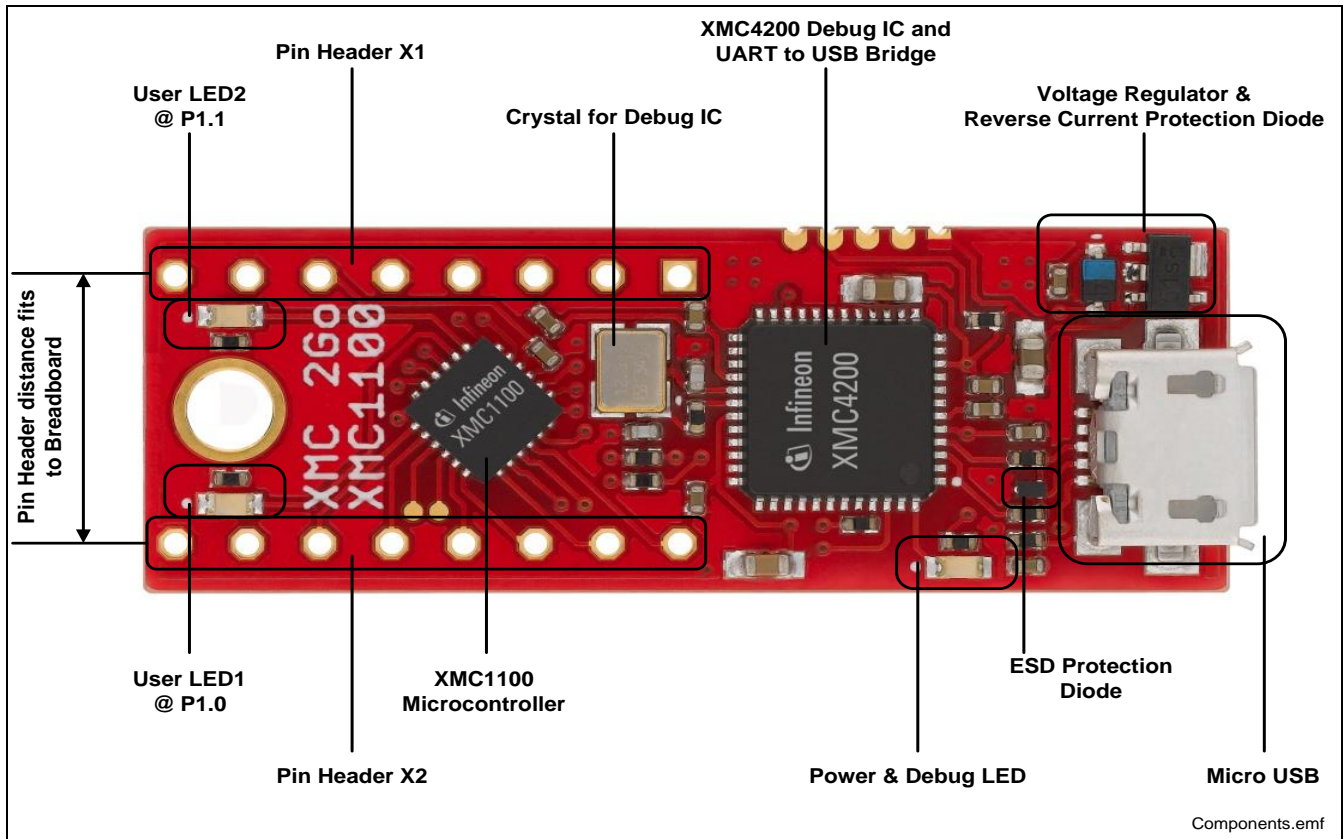


Figure 2 XMC 2Go kit with XMC1100

### 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.

Hardware description

## 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.

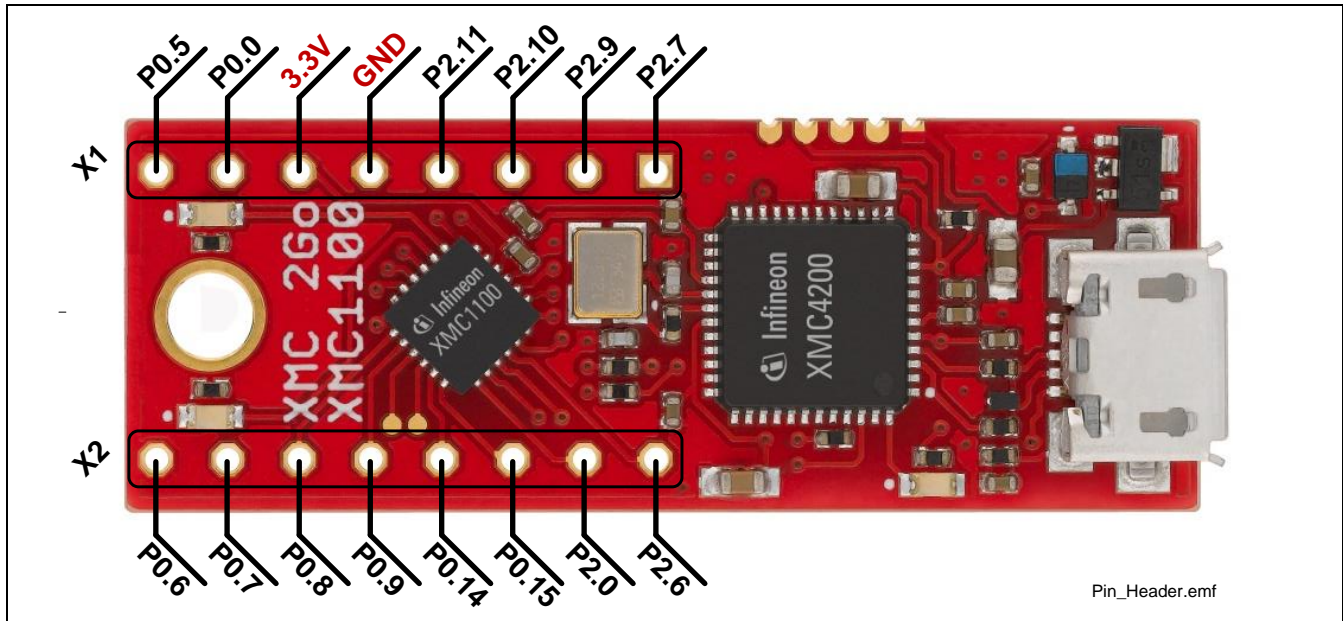


Figure 3 Pinning of pin header

## 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](http://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**.

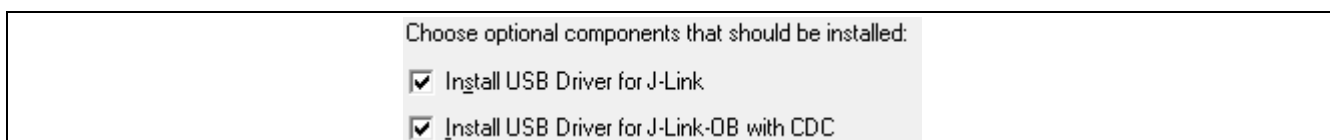


Figure 4 Recommended installation options for the J-Link driver

## 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**

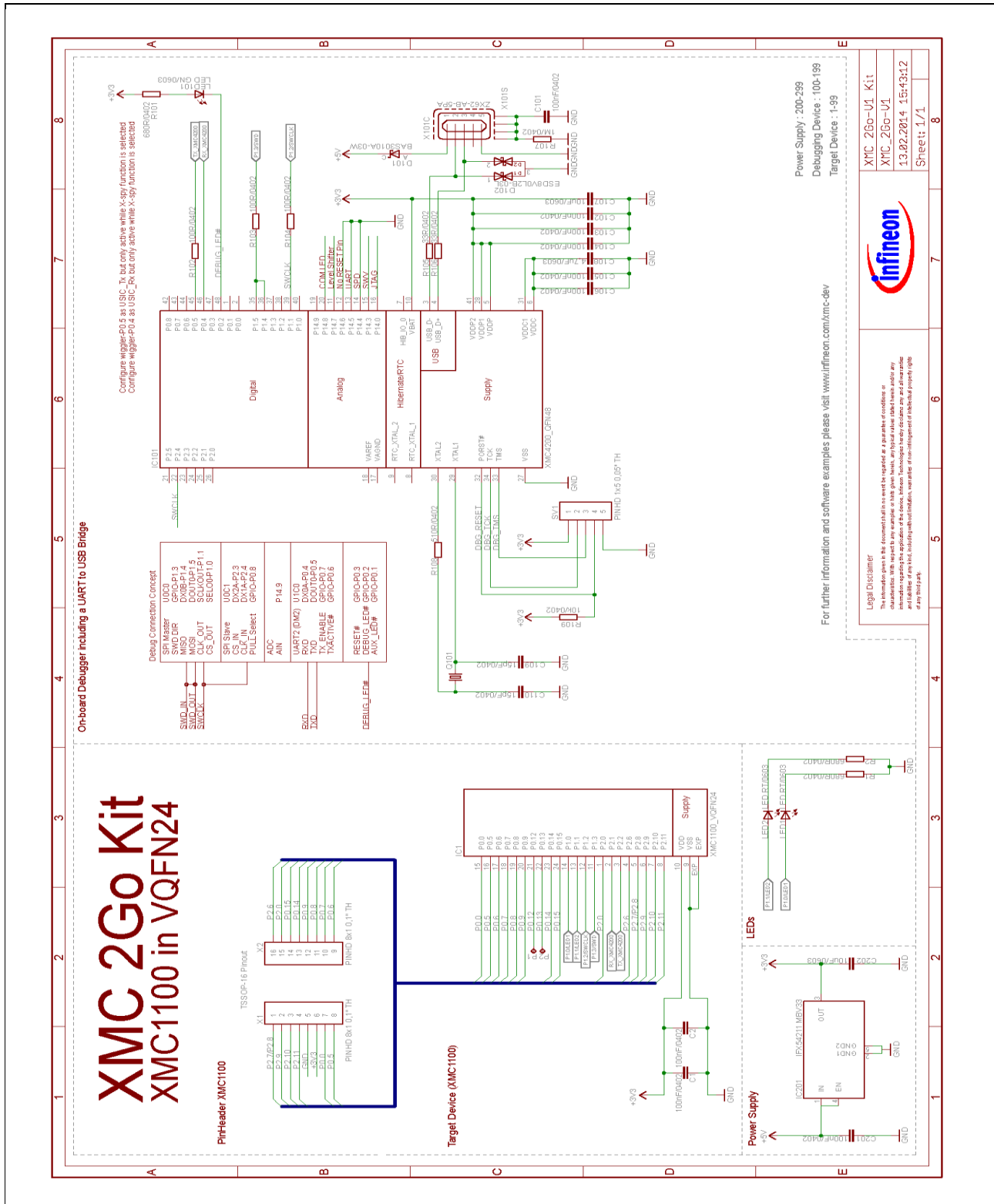
| Pin function                        | Input / output | Port pin |
|-------------------------------------|----------------|----------|
| Data pin for debugging via SWD/SPD  | I/O            | P1.3     |
| Clock pin for debugging via SWD     | O              | P1.2     |
| Transmit pin for UART communication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

Production data

3 Production data

3.1 Schematics

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





Production data

### 3.2 Components placement and geometry

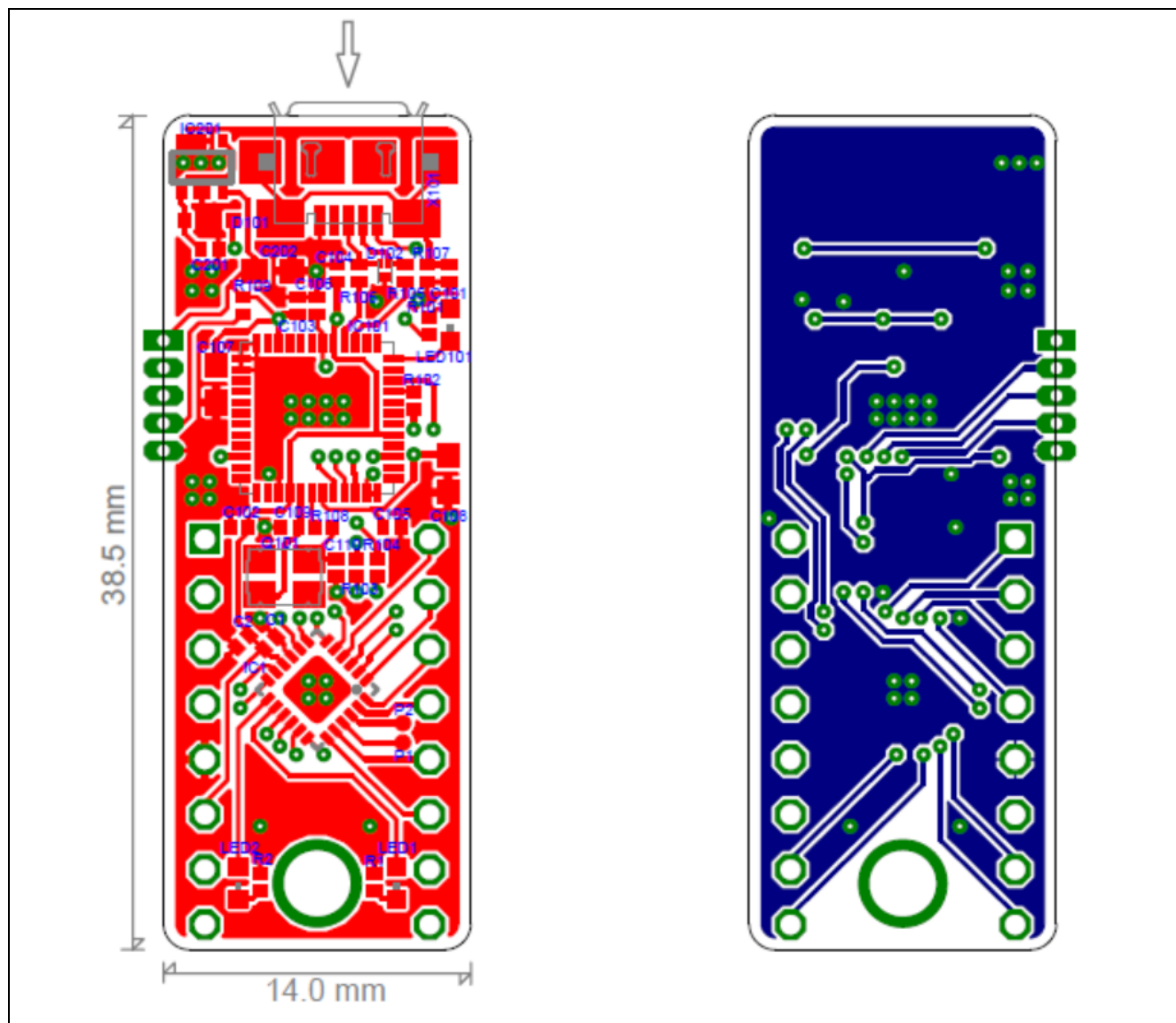


Figure 6 Components placement and geometry

### 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<br>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<br>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<br>LSQ976-Z          | LED red  | LED1 LED2            |
| 13  | 1   | LED GN 0603 D 110mcd<br>LGQ971-Z          | LED green  | LED101               |
| 14  | 1   | ZX62-AB-5PA                               | Connector, Micro-USB,<br>Hirose                      | X101                 |
| 15  | 1   | IFX54211 MBV33 SCT595                     | Linear Voltage Regulator,<br>Vout = 3.3V, Infineon   | IC201                |
| 16  | 1   | XMC1100-Q024F0032 or<br>XMC1100-Q024F0064 | Microcontroller,<br>XMC1100, Cortex M0,<br>Infineon  | IC1                  |
| 17  | 1   | XMC4200_QFN48                             | Microcontroller,<br>XMC4200, Cortex M4F,<br>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                |

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## Revision history

### Revision history

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