



# Evaluation Board

For XMC1000 Family

## XMC 2Go Kit with XMC1100

Kit Version 1.0

# Board User's Manual

Revision 1.0, 2014-02-20

Microcontroller

**Edition 2014-02-20**

**Published by  
Infineon Technologies AG  
81726 Munich, Germany**

**© 2014 Infineon Technologies AG  
All Rights Reserved.**

### **Legal Disclaimer**

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

### **Information**

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

### **Warnings**

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

**Revision History**

Page or Item	Subjects (major changes since previous revision)
Revision 1.0, 2014-02-20	Initial release

**Trademarks of Infineon Technologies AG**

AURIX™, C166™, CanPAK™, CIPOS™, CIPURSE™, EconoPACK™, CoolMOS™, CoolSET™, CORECONTROL™, CROSSAVE™, DAVE™, EasyPIM™, EconoBRIDGE™, EconoDUAL™, EconoPIM™, EiceDRIVER™, eupec™, FCOS™, HITFET™, HybridPACK™, I<sup>2</sup>RF™, ISOFACE™, IsoPACK™, MIPAQ™, ModSTACK™, my-d™, NovalithIC™, OptiMOS™, ORIGA™, PRIMARION™, PrimePACK™, PrimeSTACK™, PRO-SIL™, PROFET™, RASIC™, ReverSave™, SatRIC™, SIEGET™, SINDRION™, SIPMOS™, SmartLEWIS™, SOLID FLASH™, TEMPFET™, thinQ!™, TRENCHSTOP™, TriCore™.

**Other Trademarks**

Advance Design System™ (ADS) of Agilent Technologies, AMBA™, ARM™, MULTI-ICE™, KEIL™, PRIMECELL™, REALVIEW™, THUMB™, μVision™ of ARM Limited, UK. AUTOSAR™ is licensed by AUTOSAR development partnership. Bluetooth™ of Bluetooth SIG Inc. CAT-iq™ of DECT Forum. COLOSSUS™, FirstGPS™ of Trimble Navigation Ltd. EMV™ of EMVCo, LLC (Visa Holdings Inc.). EPCOS™ of Epcos AG. FLEXGO™ of Microsoft Corporation. FlexRay™ is licensed by FlexRay Consortium. HYPERTERMINAL™ of Hilgraeve Incorporated. IEC™ of Commission Electrotechnique Internationale. IrDA™ of Infrared Data Association Corporation. ISO™ of INTERNATIONAL ORGANIZATION FOR STANDARDIZATION. MATLAB™ of MathWorks, Inc. MAXIM™ of Maxim Integrated Products, Inc. MICROTEC™, NUCLEUS™ of Mentor Graphics Corporation. Mifare™ of NXP. MIPI™ of MIPI Alliance, Inc. MIPS™ of MIPS Technologies, Inc., USA. muRata™ of MURATA MANUFACTURING CO., MICROWAVE OFFICE™ (MWO) of Applied Wave Research Inc., OmniVision™ of OmniVision Technologies, Inc. Openwave™ Openwave Systems Inc. RED HAT™ Red Hat, Inc. RFMD™ RF Micro Devices, Inc. SIRIUS™ of Sirius Satellite Radio Inc. SOLARIS™ of Sun Microsystems, Inc. SPANSION™ of Spansion LLC Ltd. Symbian™ of Symbian Software Limited. TAIYO YUDEN™ of Taiyo Yuden Co. TEAKLITE™ of CEVA, Inc. TEKTRONIX™ of Tektronix Inc. TOKO™ of TOKO KABUSHIKI KAISHA TA. UNIX™ of X/Open Company Limited. VERILOG™, PALLADIUM™ of Cadence Design Systems, Inc. VLYNQ™ of Texas Instruments Incorporated. VXWORKS™, WIND RIVER™ of WIND RIVER SYSTEMS, INC. ZETEX™ of Diodes Zetex Limited.

Last Trademarks Update 2011-02-24

## Table of Contents

<b>Introduction</b> .....	<b>7</b>
<b>1 Overview</b> .....	<b>7</b>
1.1 Key Features .....	7
1.2 Block Diagram .....	8
<b>2 Hardware Description</b> .....	<b>9</b>
2.1 Power Supply .....	9
2.2 Pin Header Connector .....	10
2.3 User LEDs .....	10
2.4 Debugging and UART Communication .....	11
<b>3 Production Data</b> .....	<b>11</b>
3.1 Schematics .....	11
3.2 Components Placement and Geometry .....	13
3.3 List of Material .....	14

## List of Figures

Figure 1	Block Diagram of the XMC 2Go Kit.....	8
Figure 2	XMC 2Go Kit with XMC1100.....	9
Figure 3	Pinning of Pin Header .....	10
Figure 4	Recommended Installation Options for the J-Link driver .....	11
Figure 5	Schematic of the XMC 2Go Kit with XMC1100.....	12
Figure 6	Components Placement and Geometry .....	13

## List of Tables

Table 1	Features of the XMC 2Go Kit with XMC1100 .....	7
Table 2	Pins used for the User LEDs.....	10
Table 3	XMC1100 Pins used for Debugging and UART Communication.....	11
Table 4	List of Material .....	14

## Introduction

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.

## 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	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	<ul style="list-style-type: none"> <li>• from USB via Debug probe (J-Link) or</li> <li>• 3.3V external power</li> </ul>
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	On-Board J-Link Debugger supports <ul style="list-style-type: none"> <li>• Serial Wire Debug (SWD, ARM Standard)</li> <li>• Single Pin Debug (SPD)</li> <li>• UART-to-USB bridge (virtual COM)</li> </ul>
Peripherals	Mapped to pin header X1/X2: <ul style="list-style-type: none"> <li>• 2 Channel USIC (UART, SPI, I2C, I2S, LIN)</li> <li>• 6 Channel Analog to Digital Converter (12-Bit resolution)</li> <li>• 4 x 16-Bit Timer</li> <li>• External Interrupts (via ERU)</li> </ul> Others: <ul style="list-style-type: none"> <li>• Real Time Clock</li> <li>• Random Number Generator</li> </ul>
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
- On-board USB debugger realized with a XMC4200 Microcontroller for serial wire debug (SWD) and UART-to-USB Bridge
- Two 8 pin header X1 and X2
- On-board power generation for power supply of the XMC1100 Microcontroller and the debug IC
- 2 User LEDs

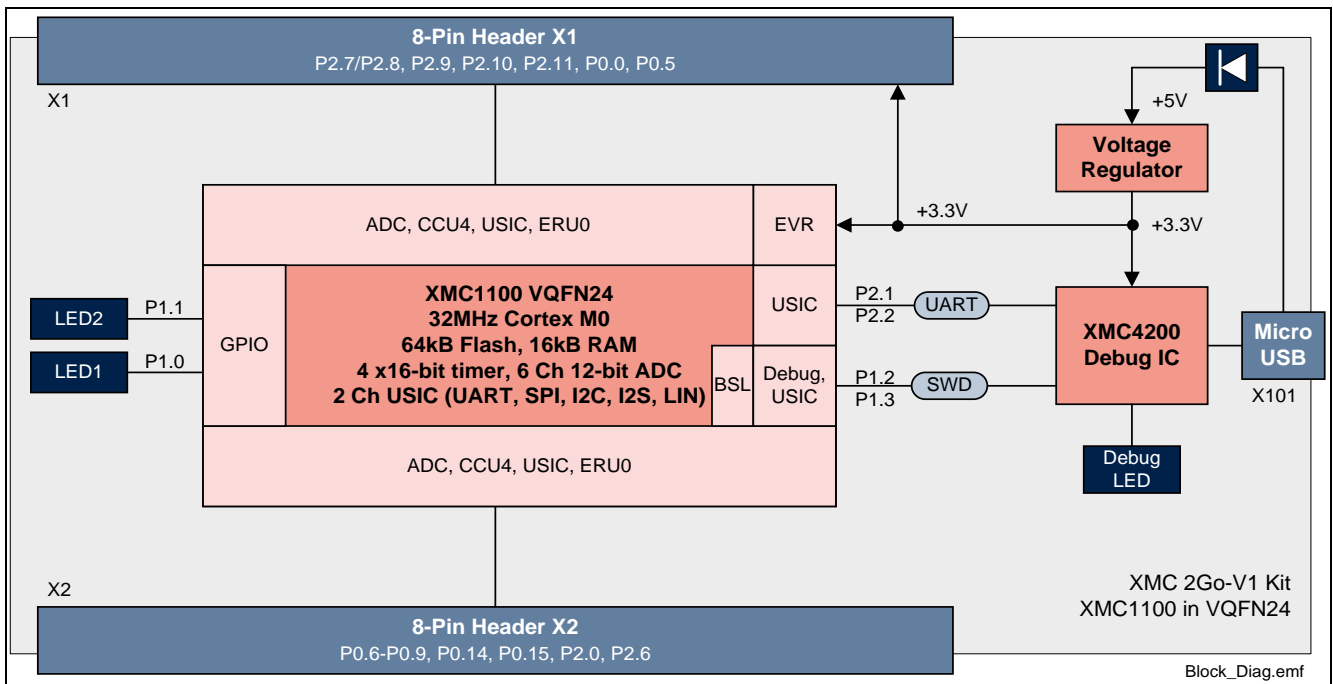
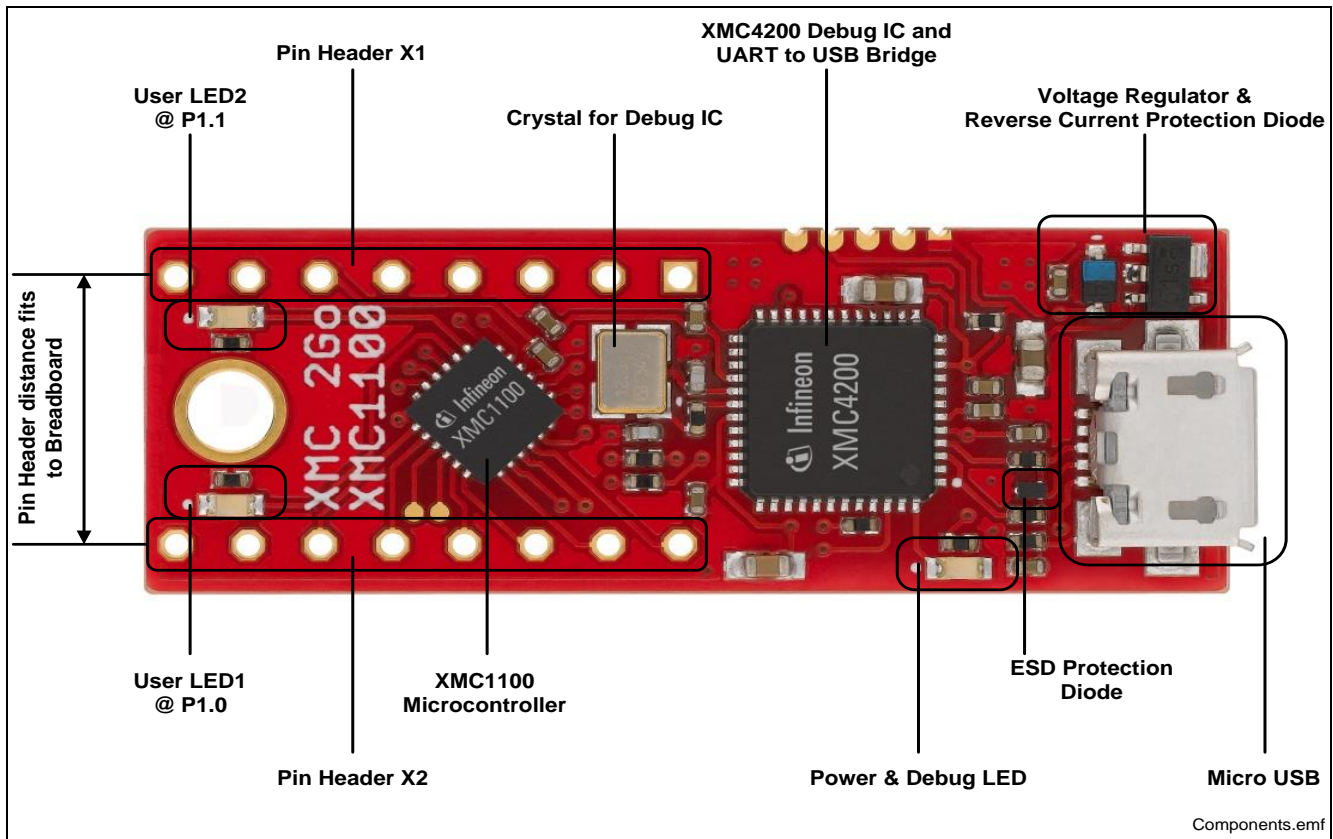


Figure 1 Block Diagram of the XMC 2Go Kit



## 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 UBS plugs (X101). Out of the box with the pre-programmed application and the on-board 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 on-board 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's not recommended to apply an additional power supply to the VDD pin of X1 (3.3V), because this power supply could drive against the on-board 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 on-board 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.

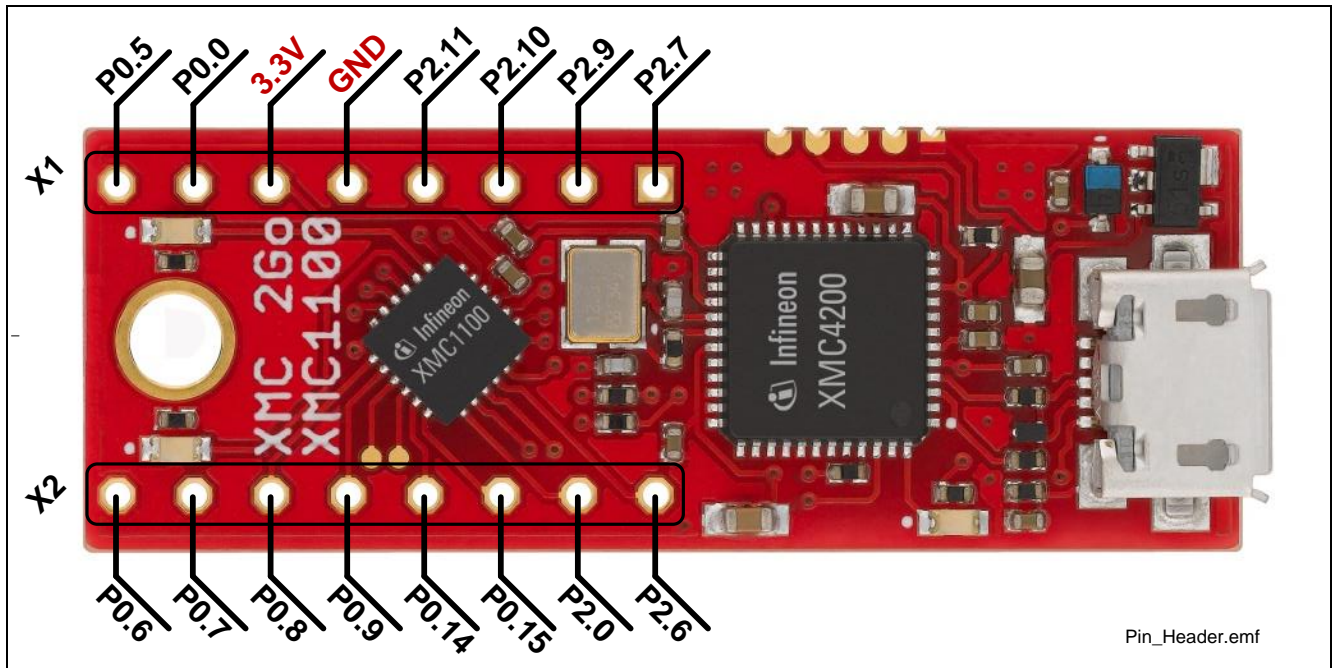


Figure 3 Pinning of Pin Header

## 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.

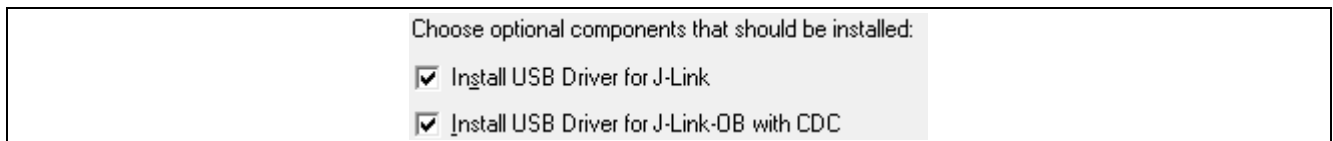
Table 2 Pins used for the User LEDs

LED	Port Pin
LED1	P1.1
LED2	P1.0

## 2.4 Debugging and UART Communication

The on-board 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 <http://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**

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. Take care: 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.

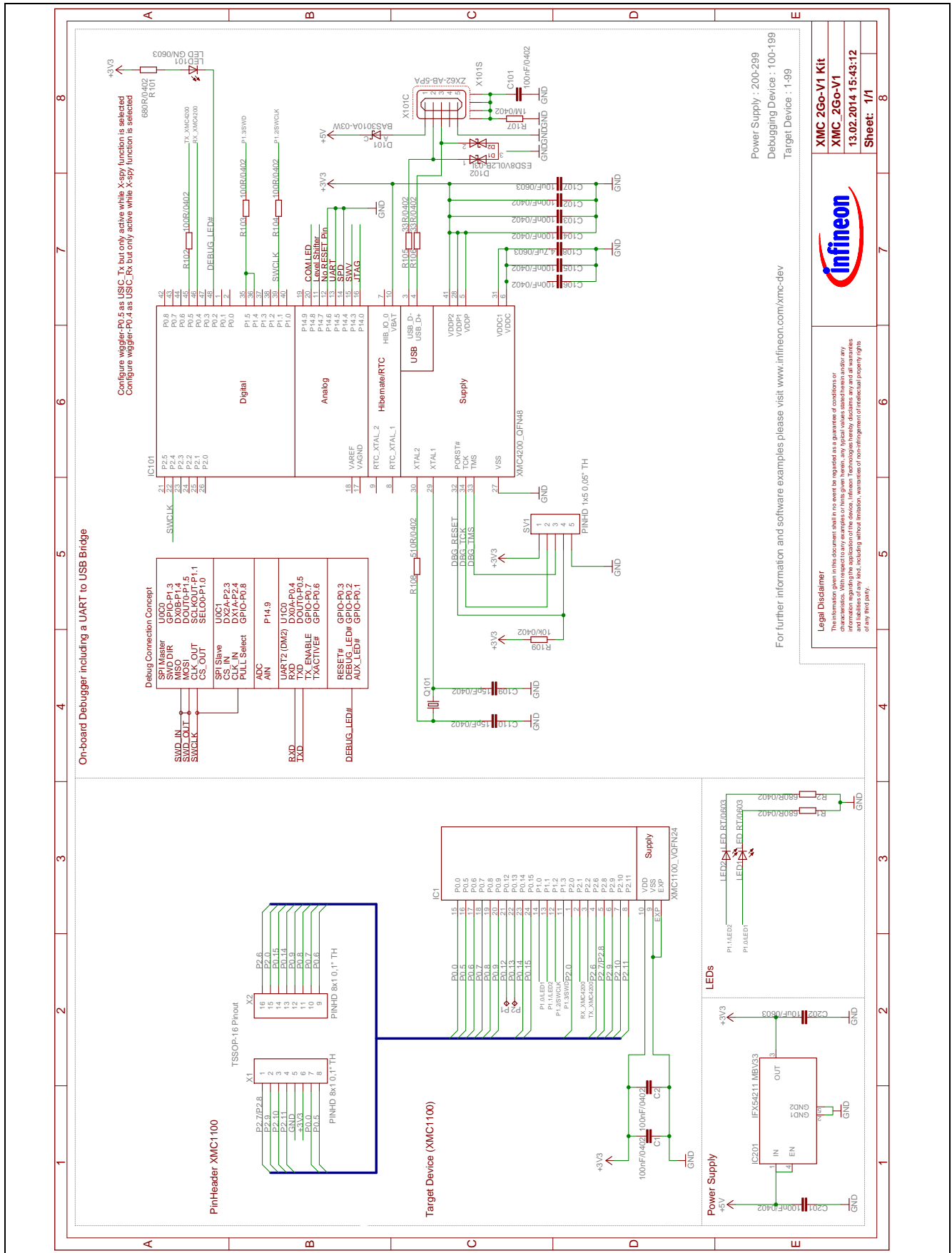
**Table 3 XMC1100 Pins used for Debugging and UART Communication**

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.



### 3.2 Components Placement and Geometry

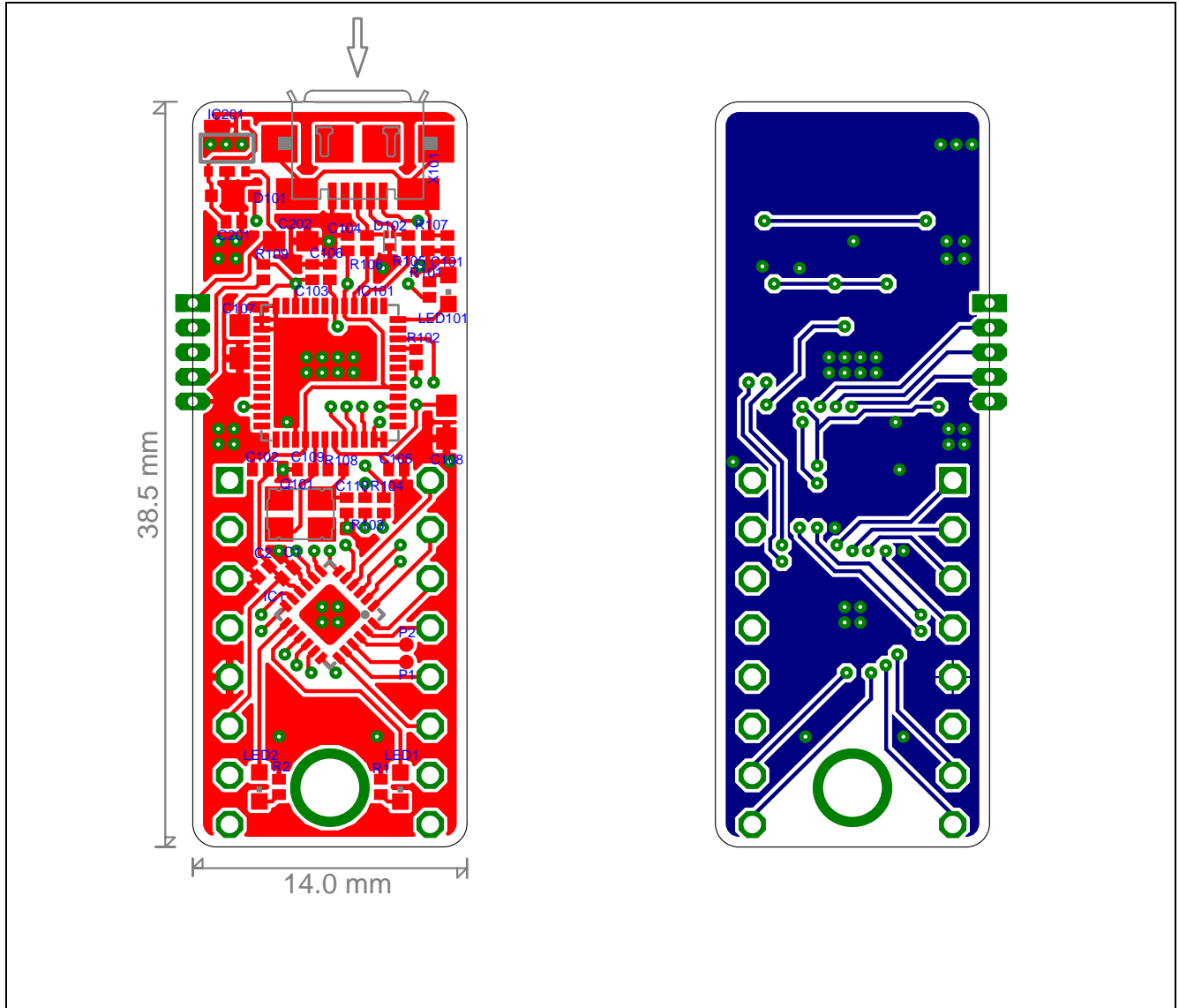


Figure 6 Components Placement and Geometry

### 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
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_VQFN24	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

[www.infineon.com](http://www.infineon.com)

Published by Infineon Technologies AG

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Infineon:](#)

[KIT\\_XMC\\_2GO\\_XMC1100\\_V1](#)