Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.

- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.

- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip’s Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.

- Microchip is willing to work with the customer who is concerned about the integrity of their code.

- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as “unbreakable.”

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip’s code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

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Microchip received ISO/TS-16949:2009 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company’s quality system processes and procedures are for its PIC® MCUs and dsPIC® DSCs, Keeloo® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip’s quality system for the design and manufacture of development systems is ISO 9001:2000 certified.

QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV

ISO/TS 16949
EU Declaration of Conformity

This declaration of conformity is issued by the manufacturer. The development/evaluation tool is designed to be used for research and development in a laboratory environment. This development/evaluation tool is not a Finished Appliance, nor is it intended for incorporation into Finished Appliances that are made commercially available as single functional units to end users under EU EMC Directive 2004/108/EC and as supported by the European Commission's Guide for the EMC Directive 2004/108/EC (8th February 2010). This development/evaluation tool complies with EU RoHS2 Directive 2011/65/EU. This development/evaluation tool, when incorporating wireless and radio-telecom functionality, is in compliance with the essential requirement and other relevant provisions of the R&TTE Directive 1999/5/EC and the FCC rules as stated in the declaration of conformity provided in the module datasheet and the module product page available at www.microchip.com. For information regarding the exclusive, limited warranties applicable to Microchip products, please see Microchip’s standard terms and conditions of sale, which are printed on our sales documentation and available at www.microchip.com. Signed for and on behalf of Microchip Technology Inc. at Chandler, Arizona, USA.

Rodger Richey  
Director of Development Tools  

Date  
4/4/17
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Preface

NOTICE TO CUSTOMERS

All documentation becomes dated, and this manual is no exception. Microchip tools and
documentation are constantly evolving to meet customer needs, so some actual dialogs
and/or tool descriptions may differ from those in this document. Please refer to our web site
(www.microchip.com) to obtain the latest documentation available.

Documents are identified with a “DS” number. This number is located on the bottom of each
page, in front of the page number. The numbering convention for the DS number is
“DSXXXXXXXXX”, where “XXXXXXXX” is the document number and “A” is the revision level
of the document.

For the most up-to-date information on development tools, see the MPLAB® IDE online help.
Select the Help menu, and then Topics to open a list of available online help files.

INTRODUCTION

This chapter contains general information that will be useful to know before using the
PIC32MK General Purpose (GP) Development Board. Items discussed in this chapter include:

- Document Layout
- Conventions Used in this Guide
- Recommended Reading
- The Microchip Web Site
- Development Systems Customer Change Notification Service
- Customer Support
- Document Revision History

DOCUMENT LAYOUT

This document describes how to use the PIC32MK General Purpose (GP) Development
Board as a development tool to emulate and debug firmware on a target board. This user’s guide is composed of the following chapters:

- Chapter 1. “Introduction” provides a brief overview of the starter kit, highlighting
  its features and functionality.
- Chapter 2. “Hardware” provides the hardware descriptions of the starter kit.
- Appendix A. “Schematics” provides a block diagram, board layouts, and
detailed schematics of the starter kit.
- Appendix B. “Bill of Materials” provides the bill of materials for the components
  used in the design and manufacture of the starter kit.
CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

<table>
<thead>
<tr>
<th><strong>DOCUMENTATION CONVENTIONS</strong></th>
<th><strong>Description</strong></th>
<th><strong>Represents</strong></th>
<th><strong>Examples</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Italic characters</strong></td>
<td>Referenced books</td>
<td><em>MPLAB IDE User’s Guide</em></td>
<td><em>...is the only compiler...</em></td>
</tr>
<tr>
<td><strong>Initial caps</strong></td>
<td>A window</td>
<td>Output window</td>
<td><em>select Enable Programmer</em></td>
</tr>
<tr>
<td></td>
<td>A dialog</td>
<td>Settings dialog</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A menu selection</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quotes</strong></td>
<td>A field name in a window or dialog</td>
<td><em>“Save project before build”</em></td>
<td></td>
</tr>
<tr>
<td><strong>Underlined, italic text with right angle bracket</strong></td>
<td>A menu path</td>
<td><em>File&gt;Save</em></td>
<td></td>
</tr>
<tr>
<td><strong>Bold characters</strong></td>
<td>A dialog button</td>
<td>Click OK</td>
<td></td>
</tr>
<tr>
<td><strong>Text in angle brackets &lt; &gt;</strong></td>
<td>A key on the keyboard</td>
<td><em>Press &lt;Enter&gt;, &lt;F1&gt;</em></td>
<td></td>
</tr>
<tr>
<td><strong>Plain Courier New</strong></td>
<td>Sample source code</td>
<td><em>#define START</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Filenames</td>
<td><em>autoexec.bat</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>File paths</td>
<td><em>c:\mcc18\h</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Keywords</td>
<td><em>_asm, _endasm, static</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Command-line options</td>
<td><em>-Opa+, -Opa-</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bit values</td>
<td><em>0, 1</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constants</td>
<td><em>0xFFFF, ‘A’</em></td>
<td></td>
</tr>
<tr>
<td><strong>Italic Courier New</strong></td>
<td>A variable argument</td>
<td><em>file.o, where file can be any valid filename</em></td>
<td></td>
</tr>
<tr>
<td><strong>Square brackets []</strong></td>
<td>Optional arguments</td>
<td><em>mcc18 [options] file [options]</em></td>
<td></td>
</tr>
<tr>
<td>**Curly brackets and pipe character: {</td>
<td>Choice of mutually exclusive arguments; an OR selection</td>
<td>*errorlevel {0</td>
<td>1}*</td>
</tr>
<tr>
<td></td>
<td>Ellipses...</td>
<td>Replaces repeated text</td>
<td><em>var_name [, var_name...]</em></td>
</tr>
<tr>
<td></td>
<td>Represents code supplied by user</td>
<td><em>void main (void) { ... }</em></td>
<td></td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>A Note presents information that we want to re-emphasize, either to help you avoid a common pitfall or to make you aware of operating differences between some device family members. A Note can be in a box, or when used in a table or figure, it is located at the bottom of the table or figure.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RECOMMENDED READING

This user’s guide describes how to use the starter kit. The following Microchip documents are available and recommended as supplemental reference resources.

PIC32MK General Purpose Family Data Sheet (DM320106)
Refer to this document for detailed information on PIC32MK GP family devices. Reference information found in this data sheet includes:
• Device memory maps
• Device pinout and packaging details
• Device electrical specifications
• List of peripherals included on the devices

MPLAB® XC32 C/C++ Compiler User’s Guide (DS50001686)
This document details the use of Microchip’s MPLAB XC32 C/C++ Compiler to develop an application.

MPLAB® X IDE User’s Guide (DS50002027)
Refer to this document for more information pertaining to the installation and implementation of the MPLAB X IDE software, as well as the MPLAB SIM Simulator software that is included with it.

Universal Serial Bus Specification and Associated Documents
The Universal Serial Bus is defined by the USB 2.0 specification and its associated supplements and class-specific documents. These documents are available from the USB Implementers Forum. See their web site at: http://www.usb.org

THE MICROCHIP WEB SITE

Microchip provides online support via our web site at http://www.microchip.com. This web site makes files and information easily available to customers. Accessible by most Internet browsers, the web site contains the following information:
• Product Support – Data sheets and errata, application notes and sample programs, design resources, user’s guides and hardware support documents, latest software releases and archived software
• General Technical Support – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip consultant program member listings
• Business of Microchip – Product selector and ordering guides, latest Microchip press releases, listings of seminars and events; and listings of Microchip sales offices, distributors and factory representatives
DEVELOPMENT SYSTEMS CUSTOMER CHANGE NOTIFICATION SERVICE

Microchip’s customer notification service helps keep customers current on Microchip products. Subscribers will receive e-mail notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, access the Microchip web site at www.microchip.com, click on Customer Change Notification and follow the registration instructions.

The Development Systems product group categories are:

• **Compilers** – The latest information on Microchip C compilers and other language tools
• **Emulators** – The latest information on the Microchip in-circuit emulator, MPLAB REAL ICE™
• **In-Circuit Debuggers** – The latest information on the Microchip in-circuit debugger, MPLAB ICD 3
• **MPLAB X IDE** – The latest information on Microchip MPLAB X IDE, the Windows® Integrated Development Environment for development systems tools
• **Programmers** – The latest information on Microchip programmers including the PICkit™ 3 development programmer

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

• Distributor or Representative
• Local Sales Office
• Field Application Engineer (FAE)
• Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at: http://support.microchip.com
DOCUMENT REVISION HISTORY

Revision A (June 2017)

This is the initial released of this document.
Chapter 1. Introduction

Thank you for purchasing a Microchip Technology PIC32MK General Purpose (GP) Development Board. This development board provides a low-cost, modular development system for Microchip’s line of 32-bit microcontrollers.

For a free Microchip demonstration code and additional information, visit the MPLAB Harmony page at: http://www.microchip.com/MPLABHarmony. The MPLAB Harmony Integrated Software Framework includes several demonstrations that have configurations for the PIC32MK GP Development Board.

These demonstrations are available in the <install-dir>/apps folder of the MPLAB Harmony installation, where <install-dir> is either:

C:/microchip/harmony/<version> (for Windows OS) or
~/microchip/harmony/<version> (for MAC or Linux OS).

For additional information on demonstrations and for building/running steps, refer to the documents available in the <install-dir>/doc folder.

This chapter covers the following topics:

• Kit Contents
• Starter Kit Functionality and Features

The preprogrammed example code on the PIC32MK GP family MCU is available for download from the Microchip web site at: http://www.microchip.com/design-centers/32-bit. All project files are included, hence the code may be used to restore the PIC32MK GP family MCU on the starter kit to its original state (i.e., if the sample device has been reprogrammed with another program) or you can use the tutorial code as a platform for further experiment.

1.1 KIT CONTENTS

The PIC32MK General Purpose (GP) Development Board contains the following items:

• PIC32MK GP Development Board
• Micro-B USB cable to full-size Type-A cable, PIC32 USB cable to communicate with the PIC32 USB port

Note: If you are missing any part of a kit, contact a Microchip sales office for assistance. A list of Microchip offices for sales and service is provided on the last page of this document.
1.2 BLOCK DIAGRAM

Figure 1-1 illustrates the high-level block diagram of the PIC32MK GP Development Board.

FIGURE 1-1: PIC32MK GP DEVELOPMENT BOARD BLOCK DIAGRAM

[Diagram of the PIC32MK GP Development Board block diagram showing various components such as Power System, VBUS_DBG, VBUS_TGT, +5V_EXT, +3.3V_PKOB, USB micro-B Target USB, USB micro-B Debug USB, PKOB, MCLR Switch, 3x LED, 3x Switch, PIC32MK1024GPE100, CAN 1, CAN 2, CAN 3, CAN 4, mikroBUS Socket 1, mikroBUS Socket 2, X32 Header, and Serial EEPROM LCD Controller.]
1.3 KIT FUNCTIONALITY AND FEATURES

1.3.1 Development Board

Representations of the layout of the development board included in the PIC32MK General Purpose (GP) Development Board are shown in Figure 1-2 and Figure 1-3. The top assembly of the PIC32MK GP Development Board includes these key features, as indicated in Figure 1-2:

1. PIC32MK1024GPE100
2. Green power indicator LED
3. Power diode shunt
4. Power in
5. In-Circuit Serial Programming™ (ICSP™) connection
6. USB Type-C connection
7. CAN 120 Ohm terminations
8. USB Type-A receptacle connectivity for PIC32 host-based applications
9. X32 header
10. Bus socket
11. Three user-defined switches
12. Three user-defined LEDs
13. DB-9F CAN connectors
14. CAN 3 & 4 header connectors.

For additional information about these features, refer to Chapter 2. “Hardware”.

FIGURE 1-2: PIC32MK GP DEVELOPMENT BOARD LAYOUT (TOP VIEW)
The bottom assembly of the PIC32MK GP Development Board includes these key features, as indicated in Figure 1-3:

1. 50-pin LCD connector
2. SSD1963QL9 display controller
3. PIC24FJ256GB106 debug IC
4. Mini-USB 2.0 connector (debug)
5. USB Host and OTG power supply for powering PIC32 USB applications
6. Mini-USB 2.0 connector (OTG)
Chapter 2. Hardware

This chapter describes the hardware features of the PIC32MK General Purpose (GP) Development Board.

2.1 HARDWARE FEATURES

The following key features of the development board are presented in the order given in Section 1.3 “Kit Functionality and Features”. See Figure 1-2 for their locations on the development board.

2.1.1 Processor Support

The development board kit is designed with a permanently mounted (i.e., soldered) processor, PIC32MK1024GPE100.

2.1.2 Power Supply

Power is supplied to the development board by a USB bus power, which is connected to the USB debug connector J12.

One green LED (D6) is provided to indicate the PIC32 device is powered up.

2.1.3 Debug USB Connectivity

The development board includes a PIC24FJ256GB106 USB microcontroller that provides debugger connectivity over USB. The PIC24FJ256GB106 is hard-wired to the PIC32 device to provide protocol translation through the I/O pins of the PIC24FJ256GB106 to the ICSP pins of the PIC32 device.

If MPLAB REAL ICE or MPLAB ICD 3 is used with the starter kit, disconnect the on-board debugger from the PIC32 device by removing the jumper J11. When the on-board debugger is required, replace the jumper J11. When the jumper JP2 is installed, pin 1 must be connected to pin 3 and pin 2 must be connected to pin 4.

2.1.4 PIC32 USB Connectivity

There are three possible ways to connect to the PIC32 USB microcontroller:

• Host mode – Connect the device to the Type-A connector J14, which is located on the top of the starter kit. If using the Debug USB port to power the Host port, install the jumper JP1 to short the back-power prevention diode. A maximum of ~400 mA can be supplied from the Debug USB port to the Host port using this method. If the full 500 mA supply is needed, an external supply must be connected to the application board, and jumper J28 must be removed to prevent back-powering the Debug USB port.
• Device mode – Connect the debug mini-B USB cable to port J3 and then connect the starter kit to the host by using a cable with a Type-B micro-connector to the starter kit's micro-A/B port J4, which is located on the bottom of the board. The other end of the cable must have a Type-A connector. Connect the Type-A connector to a USB host. Jumper J28 should be removed.

• OTG mode – Connect the starter kit to the OTG device using an OTG micro-A/B cable to the micro-A/B port J13, which is located on the bottom of the board. The starter kit provides an on-board power supply capable of providing 120 mA Maximum. This supply is controlled by the PIC32MK1024GPE100 device. Jumper J28 should be removed.

2.1.5 Switches

Push button switches provide the following functionality:

• S1: Active-low switch connected to RG11
• S2: Active-low switch connected to RF13
• S3: Active-low switch connected to RF12
• /MCLR: Connected to Microcontroller /MCLR

These switches do not have any debounce circuitry and require internal pull-up resistors, this enables the user to investigate software debounce techniques. When Idle, the switches are pulled high (+3.3V), and when pressed, they are grounded.

2.1.6 LEDs

The LEDs, LED1 through LED3, are connected to the PORTG pins (RG12 through RG14) of the processor. The PORTG pins are set high to illuminate the LEDs.

2.1.7 Oscillator Options

A 12 MHz oscillator circuit (Y4) is connected to the on-board microcontroller. This oscillator circuit functions as the controller’s primary oscillator.

Use of an external crystal or external oscillator is required to develop USB applications. The USB specification dictates a frequency tolerance of ±0.05% for high speed. Non-USB applications can use the internal oscillators.

The development board kit also has provisions for an external secondary 32 kHz oscillator (Y4); however, this is not populated. A suitable oscillator, ECS-3X8, can be obtained from Digi-Key: P/N - X801-ND CMR200TB32.768KDZFR.

The PIC24FJ256GB106 is independently clocked and has its own 12 MHz crystal.

2.1.8 mikroBUS™ Sockets

Two mikroBUS sockets, J1 and J8, are available on the development board. These sockets can be used to expand the functionality using the MikroElectronika Click adapter boards. The mikroBUS connector consists of two 1x8 female headers with SPI, I2C, UART, RST, PWM, analog, and interrupt lines as well as 3.3V, 5V, and GND power lines.

The GPIO pins for the mikroBUS sockets are assigned to route, as follows:

• UART1, I2C4, SPI1, and OC1 peripheral instances to mikroBUS socket J1
• UART2, I2C2, SPI2, and OC2 peripheral instances to mikroBUS socket J8

Note: UART2, I2C2, and SPI2 peripherals are also routed to the X32 audio header.
2.1.9 Audio Header

The PIC32MK GP Development Board includes two X32 headers, J5 and J6, to enable a connection to the Microchip Audio Codec Daughter Board. Table 2-2 provides the details of the available Audio Codec Daughter Board, and for additional information, contact your local Microchip sales office.

For a complete list of currently available Audio Codec Daughter Boards, visit the microchipDIRECT web site (www.microchipdirect.com).

<table>
<thead>
<tr>
<th>Daughter Board</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIC32 Audio Coded Daughter Board</td>
<td>AC320100</td>
</tr>
</tbody>
</table>

2.1.10 Peripheral Resource Assignment

The MCU peripheral instances, assigned for different hardware interfaces, are provided in Table 2-2. The correct peripheral instance must be used in the application to use the respective hardware interface.

<table>
<thead>
<tr>
<th>Resource Assignment</th>
<th>Peripheral</th>
<th>Reference Clock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Output Compare</td>
<td>Interrupt</td>
</tr>
<tr>
<td>I2C</td>
<td>SPI</td>
<td>UART</td>
</tr>
<tr>
<td>MikroBus1 (J1)</td>
<td>I2C4</td>
<td>SPI1</td>
</tr>
<tr>
<td>MikroBus2 (J8)</td>
<td>I2C2</td>
<td>SPI2</td>
</tr>
<tr>
<td>X32 (J5, J6)</td>
<td>I2C2</td>
<td>SPI2</td>
</tr>
</tbody>
</table>
FIGURE A-2: PIC32MK GP DEVELOPMENT BOARD SCHEMATICS (2 OF 6)
FIGURE A-3: PIC32MK GP DEVELOPMENT BOARD SCHEMATICS (3 OF 6)

[Diagram of PIC32MK GP Development Board Schematics]

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FIGURE A-4: PIC32MK GP DEVELOPMENT BOARD SCHEMATICS (4 OF 6)

Position Set
Position 3 & 4 → USB Host
Position 1 & 4 → USB Device

USB - Type-C

USB2.0 MICRO-B FEMALE
J2
USBID1/RPB5

FIGURE A-4: PIC32MK GP DEVELOPMENT BOARD SCHEMATICS (4 OF 6)
FIGURE A-5: PIC32MK GP DEVELOPMENT BOARD SCHEMATICS (5 OF 6)
FIGURE A-6: PIC32MK GP DEVELOPMENT BOARD SCHEMATICS (6 OF 6)
Appendix B. Bill of Materials

B.1  PIC32MK GP DEVELOPMENT BOARD BILL OF MATERIALS

<table>
<thead>
<tr>
<th>QTY</th>
<th>DESIGNATOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BT1</td>
<td>BATT HOLDER Retainer SMD CR1216, CR1220, CR1225</td>
</tr>
<tr>
<td>21</td>
<td>C1, C2, C3, C4, C5, C6, C8, C10, C11, C12, C16, C17, C18, C19, C20, C22, C24, C27, C29, C60, C63</td>
<td>CAP CER 0.1uF 16V 10% X7R SMD 0402</td>
</tr>
<tr>
<td>1</td>
<td>C13</td>
<td>CAP CER 10uF 10V 10% X7R SMD 0805</td>
</tr>
<tr>
<td>13</td>
<td>C14, C23, C59, C84, C85, C86, C87, C88, C89, C90, C102, C103, C106</td>
<td>CAP CER 1uF 16V 10% X5R SMD 0402</td>
</tr>
<tr>
<td>2</td>
<td>C25, C28</td>
<td>CAP CER 2.2uF 16V 10% X5R SMD 0603</td>
</tr>
<tr>
<td>1</td>
<td>C26</td>
<td>CAP CER 4.7uF 10V 10% X5R SMD 0603</td>
</tr>
<tr>
<td>1</td>
<td>C30</td>
<td>CAP CER 10uF 25V 10% X5R SMD 0805</td>
</tr>
<tr>
<td>40</td>
<td>C31, C34, C35, C36, C44, C45, C46, C47, C52, C53, C54, C55, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C93, C94, C95, C96, C97, C98, C99, C100, C101</td>
<td>CAP CER 0.1uF 10V 10% X5R SMD 0402</td>
</tr>
<tr>
<td>2</td>
<td>C32, C33</td>
<td>CAP CER 100uF 10V 20% X5R SMD 1206</td>
</tr>
<tr>
<td>2</td>
<td>C38, C39</td>
<td>CAP CER 330pF 50V 5% NP0 SMD 0402</td>
</tr>
<tr>
<td>4</td>
<td>C41, C43, C49, C51</td>
<td>CAP CER 47pF 50V 5% NP0 SMD 0603</td>
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<tr>
<td>1</td>
<td>C83</td>
<td>CAP CER 10uF 6.3V 10% X5R SMD 0805</td>
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<tr>
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<td>DIO SCTKY 385mV 500mA 20V SOD-123</td>
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<td>D5, D6, LED2</td>
<td>LED GREEN 2.2V 25mA 15mod Clear SMD 0603</td>
</tr>
<tr>
<td>1</td>
<td>D7</td>
<td>DIO SCTKYARR 1V 200mA 40V SOT-23-3</td>
</tr>
<tr>
<td>2</td>
<td>D8, LED1</td>
<td>DIO LED RED 1.75V 20mA CLEAR SMD 0603</td>
</tr>
<tr>
<td>4</td>
<td>D15, D16, D19, D20</td>
<td>DIO TVS 22V 40W SOT-23-3</td>
</tr>
<tr>
<td>2</td>
<td>J1, J8</td>
<td>mikroBUS HOST</td>
</tr>
<tr>
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<td>J29, J30, J31</td>
<td>HDR-2.54 Male 1x10 TH 5.84MH TH VERT</td>
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## PIC32MK GP Development Board User’s Guide

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<td>SWITCH TACTILE SPST-NO 0.05A 12V</td>
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<td>SWITCH SLIDE DPDT 6V 300mA SMD</td>
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<td>TEST POINT MULTI PURPOSE MINI BLACK</td>
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<td>TP5, TP6, TP7, TP8, TP10, TP11</td>
<td>CON TP TAB Silver Mini 3.8x2.03 SMD</td>
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<td>U5</td>
<td>IC SWITCH LOAD FULL FUNC SOT23-5</td>
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<td>IC GATE NAND 4CH 2-INP 14-TSSOP</td>
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<td>IC D-TYPE POS TRG DUAL 14TSSOP</td>
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<td>IC SWITCH SPDT SC70-6</td>
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<td>1215K bytes frame buffer. Support up to 864 x 480 at 24bpp display</td>
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<td>CRYSTAL 10MHz 12pF SMD ABM38</td>
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<td>PIC32MK GP with CAN 1024 KB mem 100-pin</td>
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<td>MCHP MCU 16-BIT 32MHz 256kB 16kB PIC24FJ256GB106-I/PT TQFP-64</td>
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<td>MCHP ANALOG LDO 3.3V MCP1727-3302E/FM</td>
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<td>IC SWITCHER MIC2026-1YM Dual-Channel Power Distribution Switch SOIC-8</td>
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<td>U10, U11, U12, U13</td>
<td>MCHP INTERFACE CAN SOIC-8</td>
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<td>MCHP MEMORY SERIAL EEPROM 256k SPI SOIC-8</td>
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## Bill of Materials

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<td>DIODE GEN PURP 75V 150MA 0402</td>
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<td>DNP</td>
<td>J11</td>
<td>Terminal Strip, Dual Row Horizontal, Surface Mount, 0.100” Pitch</td>
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<td>DNP</td>
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<td>CON HDR-2.54 Male 2x20 Gold 5.84MH TH VERT</td>
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<td>DNP</td>
<td>J12, J18</td>
<td>CON HDR-1.27 Female 1x6 Gold TH VERT</td>
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**Legend:** DNP = Do Not Place
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