STM32F4DISCOVERY

Discovery kit with STM32F407VG MCU

Features

- STM32F407VGT6 microcontroller featuring 32-bit Arm® Cortex®-M4 with FPU core, 1-Mbyte Flash memory and 192-Kbyte RAM in an LQFP100 package
- USB OTG FS
- ST MEMS 3-axis accelerometer
- ST-MEMS audio sensor omni-directional digital microphone
- Audio DAC with integrated class D speaker driver
- User and reset push-buttons
- Eight LEDs:
  - LD1 (red/green) for USB communication
  - LD2 (red) for 3.3 V power on
  - Four user LEDs, LD3 (orange), LD4 (green), LD5 (red) and LD6 (blue)
  - Two USB OTG LEDs, LD7 (green) VBUS and LD8 (red) over-current
- Board connectors:
  - USB with Micro-AB
  - Stereo headphone output jack
  - 2.54 mm pitch extension header for all LQFP100 I/Os for quick connection to prototyping board and easy probing
- Flexible power-supply options: ST-LINK, USB VBUS, or external sources
- External application power supply: 3 V and 5 V
- Comprehensive free software including a variety of examples, part of STM32CubeF4 MCU Package, or STSW-STM32068 for using legacy standard libraries
- On-board ST-LINK/V2-A debugger/programmer with USB re-enumeration capability: mass storage, Virtual COM port, and debug port
- Support of a wide choice of Integrated Development Environments (IDEs) including IAR Embedded Workbench®, MDK-ARM, and STM32CubeIDE

Description

The STM32F4DISCOVERY Discovery kit leverages the capabilities of the STM32F407 high-performance microcontrollers, to allow users to develop audio applications easily. It includes an ST-LINK/V2-A embedded debug tool, one ST-MEMS digital accelerometer, one digital microphone, one audio DAC with integrated class D speaker driver, LEDs, push-buttons, and a USB OTG Micro-AB connector. Specialized add-on boards can be connected by means of the extension header connectors.
1 Ordering information

To order the STM32F4DISCOVERY Discovery kit, refer to Table 1. For a detailed description, refer to its user manual on the product web page. Additional information is available from the datasheet and reference manual of the target microcontroller.

<table>
<thead>
<tr>
<th>Order code</th>
<th>Board reference</th>
<th>User manual</th>
<th>Target STM32</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM32F407G-DISC1(1)</td>
<td>MB997</td>
<td>UM1472</td>
<td>STM32F407VGT6</td>
</tr>
</tbody>
</table>

1. STM32F407G-DISC1 with ST-LINK/V2-A replaces the obsolete STM32F4DISCOVERY order code with ST-LINK/V2.

1.1 Product marking

The sticker located on the top or bottom side of the PCB board shows the information about product identification such as board reference, revision, and serial number.

The first identification line has the following format: “MBxxxx-Variant-yzz”, where “MBxxxx” is the board reference, “Variant” (optional) identifies the mounting variant when several exist, “y” is the PCB revision and “zz” is the assembly revision: for example B01.

The second identification line is the board serial number used for traceability.

Evaluation tools marked as “ES” or “E” are not yet qualified and therefore not ready to be used as reference design or in production. Any consequences deriving from such usage will not be at ST charge. In no event, ST will be liable for any customer usage of these engineering sample tools as reference designs or in production.

“E” or “ES” marking examples of location:
• On the targeted STM32 that is soldered on the board (For an illustration of STM32 marking, refer to the STM32 datasheet “Package information” paragraph at the www.st.com website).
• Next to the evaluation tool ordering part number that is stuck or silk-screen printed on the board.

1.2 Codification

The meaning of the codification is explained in Table 2.

<table>
<thead>
<tr>
<th>STM32F4XXX-DISC1</th>
<th>Description</th>
<th>Example: STM32F407G-DISC1</th>
</tr>
</thead>
<tbody>
<tr>
<td>STM32F4</td>
<td>MCU series in STM32 32-bit Arm Cortex MCUs</td>
<td>STM32F4 Series</td>
</tr>
<tr>
<td>XX</td>
<td>MCU product line in the series</td>
<td>STM32F407</td>
</tr>
<tr>
<td>Y</td>
<td>STM32 Flash memory size: G for 1 Mbyte</td>
<td>1 Mbyte</td>
</tr>
<tr>
<td>DISC1</td>
<td>Discovery kit</td>
<td>Discovery kit</td>
</tr>
</tbody>
</table>
2 Development environment

STM32 32-bit microcontrollers are based on the Arm® Cortex®-M processor.

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

2.1 System requirements

- Windows® OS (7, 8, and 10), Linux® 64-bit, or macOS®
- USB Type-A or USB Type-C® to Mini-B cable

Note: macOS® is a trademark of Apple Inc. registered in the U.S. and other countries. All other trademarks are the property of their respective owners.

2.2 Development toolchains

- IAR Systems - IAR Embedded Workbench®
- Keil® - MDK-ARM®
- STMicroelectronics - STM32CubeIDE

1. On Windows® only.

2.3 Demonstration software

The demonstration software, included in the STM32Cube MCU Package corresponding to the on-board microcontroller, is preloaded in the STM32 Flash memory for easy demonstration of the device peripherals in standalone mode. The latest versions of the demonstration source code and associated documentation can be downloaded from www.st.com.
## Revision history

**Table 3. Document revision history**

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Sep-2011</td>
<td>1</td>
<td>Initial version.</td>
</tr>
<tr>
<td>28-Jan-2013</td>
<td>2</td>
<td>Added URL for expanding functionality in Description.</td>
</tr>
<tr>
<td>15-Jul-2013</td>
<td>3</td>
<td>Modified to apply to STM32F407/417. Added LIS3DSH accelerometer.</td>
</tr>
<tr>
<td>29-Sep-2014</td>
<td>4</td>
<td>Updated Section : Features and Section : Description to introduce STM32CubeF4 and STSW-STM32078. Updated Section : System requirements and Section : Development toolchains.</td>
</tr>
<tr>
<td>25-Feb-2016</td>
<td>5</td>
<td>Updated Features, Description and System requirements to introduce STM32F407G-DISC1.</td>
</tr>
<tr>
<td>28-Oct-2016</td>
<td>6</td>
<td>Updated Features and Description to remove reference to Mbed™ and to add information on the new order code.</td>
</tr>
</tbody>
</table>
| 12-Oct-2020  | 7       | Removed all references to the obsolete STM32F4DISCOVERY order code. Updated ST MEMS descriptions in Features. Reorganized the entire document:  
  - Updated Features, Description, Ordering information and Development environment  
  - Added Codification |