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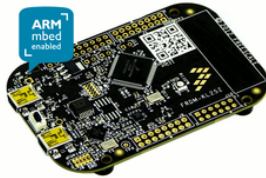
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FRDM-KL25Z

The FRDM-KL25Z is an ultra-low-cost development platform for Kinetis L Series KL1x (KL14/15) and KL2x (KL24/25) MCUs built on ARM® Cortex™-M0+ processor. Features include easy access to MCU I/O, battery-ready, low-power operation, a standard-based form factor with expansion board options and a built-in debug interface for flash programming and run-control. The FRDM-KL25Z is supported by a range of Freescale and third-party development software.



Overview

The FRDM-KL25Z has been designed by Freescale in collaboration with mbed for prototyping all sorts of devices, especially those requiring the size and price point offered by Cortex-M0+ and the power of USB Host and Device. It is packaged as a development board with connectors to break out to strip board and breadboard, and includes a built-in USB FLASH programmer.

Table of Contents

- [1. Overview](#)
- [2. Features](#)
- [3. Firmware](#)
- [4. Getting Started with mbed](#)
- [5. PC Configuration](#)
- [6. Downloading A program](#)
- [7. Hello World!](#)
- [8. Where Next](#)
- [9. Technical Reference](#)

Platform Partner



Freescale (/teams/Freescale/)

Freescale is a leader in embedded processing solutions for the automotive, consumer, industrial and networking markets.

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Example programs

[mbed blinky](#) (/teams/mbed/code/mbed_blinky/platform=KL25Z/)

Featured
10
(/teams/mbed/code/mbed_blinky/shortlog)
322584
(/teams/mbed/code/mbed_blinky/)

The example program for mbed pin-compatible platforms [Blinky](#) (/search/?q=Blinky&type=), [mbed blinky](#) (/search/?q=mbed_blinky&type=), [mbed_blinky](#) (/search/?q=mbed_blinky&type=), [mbed_blinky](#) (/search/?q=mbed_blinky&type=), [mbedblinky](#) (/search/?q=mbedblinky&type=)

Last updated: 29 Oct 2015 (29 Oct 2015)

[frdm_gpio](#) (/teams/Freescale/code/frdm_gpio/platform=KL25Z/)

10
(/teams/Freescale/code/frdm_gpio/shortlog)
18806
(/teams/Freescale/code/frdm_gpio/)

gpio example for the Freescale freedom platform [Freedom](#) (/search/?q=Freedom&type=), [Freescale](#) (/search/?q=Freescale&type=), [GPIO](#) (/search/?q=GPIO&type=)

Last updated: 16 Jul 2014 (16 Jul 2014)

[frdm_rgbled](#) (/teams/Freescale/code/frdm_rgbled/platform=KL25Z/)

8
(/teams/Freescale/code/frdm_rgbled/shortlog)
3043
(/teams/Freescale/code/frdm_rgbled/)

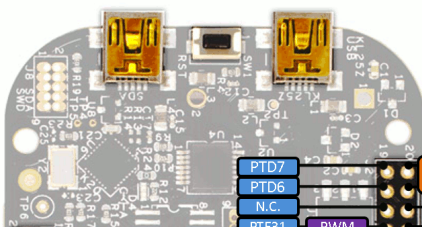
Example PWM control of RGB LEDs [Freedom](#) (/search/?q=Freedom&type=), [Freescale](#) (/search/?q=Freescale&type=), [rgb](#) (/search/?q=rgb&type=)

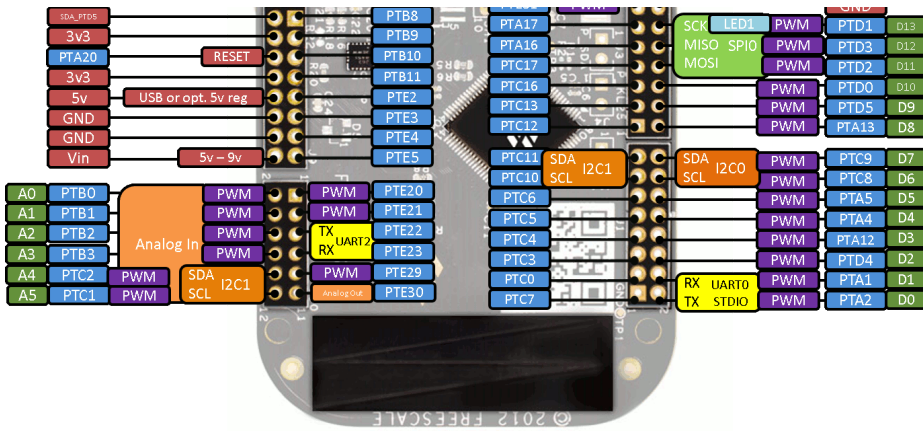
Last updated: 16 Jul 2014 (16 Jul 2014)

[frdm_ticker](#) (/teams/Freescale/code/frdm_ticker/platform=KL25Z/)

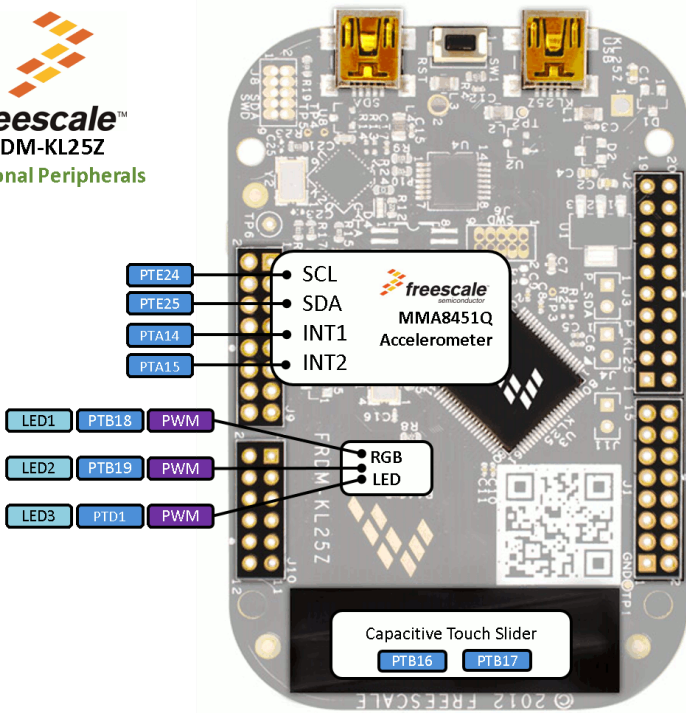
10
(/teams/Freescale/code/frdm_ticker/shortlog)
1095
(/teams/Freescale/code/frdm_ticker/)

frdm ticker example for the Freescale freedom platform [FRDM](#) (/search/?q=FRDM&type=), [Freedom](#) (/search/?q=Freedom&type=), [Freescale](#)





It is based on the Freescale KL25Z, with a 32-bit ARM Cortex-M0+ core running at 48MHz. It includes 128KB FLASH, 16KB RAM and lots of interfaces including USB Host, USB Device, SPI, I2C, ADC, DAC, PWM, Touch Sensor and other I/O interfaces.



The FRDM-KL25Z is fully supported in the mbed platform, so it gets access to the free tools and SDK that provides experienced embedded developers with powerful and productive tools for building proof-of-concepts. The pinout above shows the commonly used interfaces and their locations. Note that all the numbered pins (PT_XX) can also be used as [DigitalIn](#) ([/handbook/DigitalIn](#)) and [DigitalOut](#) ([/handbook/DigitalOut](#)) interfaces.

Pin names

- <http://mbed.org/teams/Freescale/wiki/frdm-kl25z-pinnames> (<http://mbed.org/teams/Freescale/wiki/frdm-kl25z-pinnames>)

Features

- Freescale KL25Z Kinetis KL2x MCU (MKL25Z128VLK4)
 - High performance ARM® Cortex™-M0+ Core
 - 48MHz, 16KB RAM, 128KB FLASH
 - USB (Host/Device)
 - SPI (2)
 - I2C (2)
 - UART (3)
 - PWM (TPM)
 - ADC (16 bit)
 - DAC (1x 12bit)
 - Touch Sensor
 - GPIO (66)

[\(/search/?q=Freescale&type=\)](#), [Ticker](#) ([/search/?q=Ticker&type=](#))

Last updated: 16 Jul 2014 (16 Jul 2014)

frdm_serial
[\(/teams/Freescale/code/frdm_s platform=KL25Z\)](#)

[3](#) ([/teams/Freescale/code/frdm_serial/shortlog](#))

[4281](#) ([/teams/Freescale/code/frdm_serial/](#))
frdm serial example for the Freescale freedom platform FRDM ([/search/?q=FRDM&type=](#)), Freedom ([/search/?q=Freedom&type=](#)), Freescale ([/search/?q=Freescale&type=](#)), Serial ([/search/?q=Serial&type=](#))

Last updated: 16 Jul 2014 (16 Jul 2014)

frdm_timer
[\(/teams/Freescale/code/frdm_ti platform=KL25Z\)](#)

[9](#) ([/teams/Freescale/code/frdm_timer/shortlog](#))

[1507](#) ([/teams/Freescale/code/frdm_timer/](#))
timer example for the Freescale freedom platform FRDM ([/search/?q=FRDM&type=](#)), Freedom ([/search/?q=Freedom&type=](#)), Freescale ([/search/?q=Freescale&type=](#))

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FRDM_MMA8451Q
[\(/teams/Freescale/code/FRDM platform=KL25Z\)](#)

[5](#) ([/Freescale/code/FRDM_MMA8451Q/shortlog](#))

[16](#) ([/Freescale/code/FRDM_MMA8451Q/](#))
Example program for FRDM boards with a Freescale MMA8451Q accelerometer FRDM ([/search/?q=FRDM&type=](#)), KL05 ([/search/?q=KL05&type=](#)), KL25 ([/search/?q=KL25&type=](#)), KL46 ([/search/?q=KL46&type=](#)), MMA8451Q ([/search/?q=MMA8451Q&type=](#))

Last updated: 16 Jul 2014 (16 Jul 2014)

frdm_tsi_slider
[\(/teams/Freescale/code/frdm_t platform=KL25Z\)](#)

[3](#) ([/teams/Freescale/code/frdm_tsi_slider/shortlog](#))

[2342](#) ([/teams/Freescale/code/frdm_tsi_slider/](#))
The TSI Analog slider demo for the freedom platform with Kinetis L MCU, FRDM ([/search/?q=FRDM&type=](#)), Freedom ([/search/?q=Freedom&type=](#)), sensing ([/search/?q=sensing&type=](#)), touch ([/search/?q=touch&type=](#)), TSI ([/search/?q=TSI&type=](#))

Last updated: 23 Feb 2014 (23 Feb 2014)

frdm_interrupt
[\(/teams/Freescale/code/frdm_i platform=KL25Z\)](#)

[3](#) ([/teams/Freescale/code/frdm_interrupt/shortlog](#))

[1587](#) ([/teams/Freescale/code/frdm_interrupt/](#))
Example Interrupt code for FRDM platforms FTF2014 ([/search/?q=FTF2014&type=](#)), hands-on ([/search/?q=hands-on&type=](#)), lab ([/search/?q=lab&type=](#))

Last updated: 07 Apr 2014 (07 Apr 2014)

frdm_rtos
[\(/teams/Freescale/code/frdm_r platform=KL25Z\)](#)

[3](#) ([/teams/Freescale/code/frdm_rtos/shortlog](#))

[2021](#) ([/teams/Freescale/code/frdm_rtos/](#))
Basic example usage of mbed RTOS (complete) Created for FTF2014, FTF2014 ([/search/?q=FTF2014&type=](#)), hands-on ([/search/?q=hands-on&type=](#)), lab ([/search/?q=lab&type=](#))

Last updated: 07 Apr 2014 (07 Apr 2014)

frdm_helloworld
[\(/teams/Freescale/code/frdm_h platform=KL25Z\)](#)

- **FRDM-KL25Z Onboard Sensors**
 - MMA8451Q - 3-axis accelerometer
 - Capacitive touch sensor
- **Evaluation Form factor**
 - 81mm x 53mm
 - 5V USB or 4.5-9V supply
 - Built-in USB drag 'n' drop FLASH programmer
- **mbed HDK & SDK enabled**
 - Drag-n-drop programming
 - USB Serial Port
 - CMSIS-DAP
 - Online development tools
 - Easy to use C/C++ SDK
 - Lots of published libraries and projects
- **Status**
 - Production

Firmware

FirmwareUpdate

A new interface firmware image is necessary to mbed-enable Freescale FRDM boards

- [Step by step firmware upgrade instructions \(http://mbed.org/handbook/Firmware-FRDM-KL25Z\)](http://mbed.org/handbook/Firmware-FRDM-KL25Z)

[3](#)
[ams/Freescale/code/frdm_helloworld/shortlog](https://github.com/Freescale/code/frdm_helloworld/shortlog)
[3539](#)
[ams/Freescale/code/frdm_helloworld/](https://github.com/Freescale/code/frdm_helloworld/)
 Hello world example program. This program exercises many of the peripherals including serial (prints hello world), as well as pushbutton and LED usage. [FTF2014 \(/search?q=FTF2014&type=\)](#), [hands-on \(/search?q=hands-on&type=\)](#), [lab \(/search?q=lab&type=\)](#)
 Last updated: 07 Apr 2014 (07 Apr 2014)

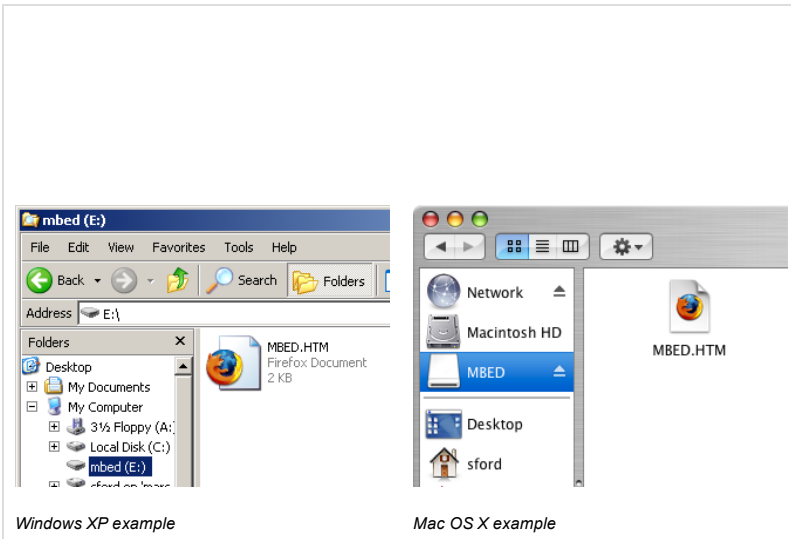
[Brushed DC Motor Control M \(/teams/Freescale/code/Brushedplatform=KL25Z\)](#)

[Motor Control MC34931 MC33931/shortlog](#)
[id DC Motor Control MC34931 MC33931/](#)
 MCU Code for FRDMKL25Z which works with Graphical User Interface available on Freescale website to control a brushed DC motor using FRDM-34931S-EVB / FRDM-34931-EVB / FRDM-33931-EVB. The code enables controlling ... [and \(/search?q=and&type=\)](#), [Brushed \(/search?q=Brushed&type=\)](#), [control \(/search?q=control&type=\)](#), [DC \(/search?q=DC&type=\)](#), [FRDM-KL25Z \(/search?q=FRDM-KL25Z&type=\)](#), [MC34931/MC33931 \(/search?q=MC34931/MC33931&type=\)](#), [motor \(/search?q=motor&type=\)](#), [using \(/search?q=using&type=\)](#)
 Last updated: 12 Jun 2015 (12 Jun 2015)

Getting Started with mbed

1. Connect your microcontroller to a PC

Use the USB lead to connect your mbed to a PC. The status light will come on, indicating it has power. After a few seconds of activity, the PC will recognise the mbed Microcontroller as a standard USB drive.



2. Click the MBED.HTM link to get logged in

Go to the new USB Drive, and click MBED.HTM to open it in a web browser.

If you do not have an mbed account, choose "Signup", and create your mbed Account. Otherwise, log in with your normal username and password.

This will give you access to the website, tools, libraries and documentation.

PC Configuration

Your mbed Microcontroller can appear on your computer as a serial port. On Mac and Linux, this will happen by default. For Windows, you need to install a driver.

Windows, you need to install a driver.

Windows

See [Windows-serial-configuration \(/handbook/Windows-serial-configuration\)](#) for full details about setting up Windows for *serial communication* with your mbed Microcontroller

From a host PC to communicate with mbed you will need a **terminal application**. This allows the mbed Microcontroller to print to your PC screen, and for you to send characters back to your mbed.

- [Terminals \(/handbook/Terminals\)](#) - Using Terminal applications to communicate between the Host PC and the mbed Microcontroller

Some terminal programs (e.g. TeraTerm) list the available serial ports by name. However, if you do need to know the identity of the serial port so that you can attach a terminal or an application to it:

Windows	Mac	Linux
Find the identity of the COM port by opening "Device Manager". To do this navigate "Start -> Control Panel -> System -> Hardware -> Device Manager".	To find the device name under Mac OS X, use the command "ls /dev/tty.usbmodem**"	To find the device name under Linux, use the command "ls /dev/ttyACM**"
 (/media/uploads/sam_grove/windows_device_manager.jpg)	 (/media/uploads/sam_grove/mac_tty.png)	 (/media/uploads/sam_grove/linux_acm.jpg)

Downloading A program

1. Save a program binary (.bin) to the FRDM Platform

Download the appropriate "Hello World!" binary:

- Freescale FRDM-KL25Z: [HelloWorld_KL25Z.bin \(/media/uploads/sam_grove/mbed_blinky2_kl25z.bin\)](#)

Note: the source code for this program will be seen in the next section.

Save the program binary file to your mbed Microcontroller Disk, just like you would with a normal USB disk. The **Status LED** will flash as the PC writes the file to the Microcontroller disk.

2. Press the Reset Button

When the Reset Button is pressed, the newest program on the mbed Microcontroller Disk will be loaded into the Microcontroller FLASH memory. The **Status LED** will flash as this happens.

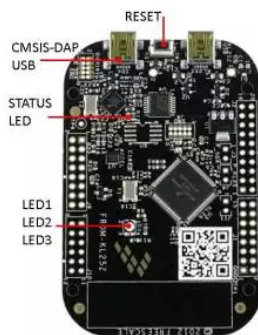
When the program has been loaded onto the microcontroller, it will then start it running.

3. Hello World!

The Microcontroller is now running the program; flashing LED1 forever! If you reset the Microcontroller, or disconnect and reconnect the power, the program will simply restart.

4. To download a different program

It is the newest program on the mbed Microcontroller that is run after reset. We can therefore download a new program or overwrite an existing one to update the program that will run.



Hello World!

mbed blinky

most recent (/media/uploads/sam_grove/mbed_blinky2_kl25z.bin)

[//teams/mbed/code/mbed_blinky/](#)

import program (https://developer.mbed.org/compiler/#import:teams/mbed/code/mbed_blinky/)

The example program for mbed pin-compatible platforms

Last commit 29 Oct 2015 (29 Oct 2015) by [./teams/mbed/](#) [mbed](#) ([./teams/mbed/](#))

Where Next

Follow the guide to creating your own programs using the online compiler

- [Create your own program \(/handbook/Creating-a-program\)](#)

Technical Reference

Power

- USB powered or 4.5v - 9v on Vin pin
- Current (active): < ___ mA
- Current (sleep): < ___ mA
- 3.3v regulated output on VOUT to power peripherals
- 5.0v from USB available on 5v (only available when USB is connected unless extra regulator is added!)
- Digital IO pins are 3.3v, 4mA each, 400mA max total

Schematics

- [Freescale FRDM-KL25Z Schematic \(http://cache.freescale.com/files/soft_dev_tools/hardware_tools/schematics/FRDM-KL25Z_SCH.pdf\)](http://cache.freescale.com/files/soft_dev_tools/hardware_tools/schematics/FRDM-KL25Z_SCH.pdf)
- [Freescale FRDM-KL25Z User's Manual \(http://cache.freescale.com/files/32bit/doc/user_guide/FRDMKL25ZUM.zip\)](http://cache.freescale.com/files/32bit/doc/user_guide/FRDMKL25ZUM.zip)

Data Sheets

- [Freescale KL2x Data Sheet \(http://cache.freescale.com/files/32bit/doc/data_sheet/KL25P80M48SF0.pdf\)](http://cache.freescale.com/files/32bit/doc/data_sheet/KL25P80M48SF0.pdf)
- [Freescale KL2x Reference Manual \(http://cache.freescale.com/files/32bit/doc/ref_manual/KL25P80M48SF0RM.pdf\)](http://cache.freescale.com/files/32bit/doc/ref_manual/KL25P80M48SF0RM.pdf)
- [Freescale KL2x Errata Sheet \(http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=KL2x&fosp=1&tab=Documentation_Tab\)](http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=KL2x&fosp=1&tab=Documentation_Tab)
- [MMA8451Q Data Sheet \(http://cache.freescale.com/files/sensors/doc/data_sheet/MMA8451Q.pdf\)](http://cache.freescale.com/files/sensors/doc/data_sheet/MMA8451Q.pdf)

Interface Firmware

- [CMSIS-DAP Interface Firmware \(http://mbed.org/handbook/Firmware-FRDM-KL25Z\)](http://mbed.org/handbook/Firmware-FRDM-KL25Z)

 [Buy Now \(http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=FRDM-KL25Z&tab=Buy_Parametric_Tab&nodeId=015210045A&pspl=1&fromSearch=false\)](http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=FRDM-KL25Z&tab=Buy_Parametric_Tab&nodeId=015210045A&pspl=1&fromSearch=false)

Discussion topics

Topic	Replies	Last post
problem with my KL25Z (/forum/platform-16-KL25Z-community/topic/17171/)	6	18 Nov 2015 (18 Nov 2015) (/forum/platform-16-KL25Z-community/post/40271/) by Chris Heald (/users/atevercheese/)
Need firmware that does NOT put clock on A5 (PTC1) (/forum/platform-16-KL25Z-A1 (/search?q=A1&type=Forum), FRDM-KL25Z (/search?q=FRDM-KL25Z&type=Forum), PTC1 (/search?q=PTC1&type=Forum) community/topic/5493/)	0	15 Feb 2015 (15 Feb 2015) (/forum/platform-16-KL25Z-community/post/27252/) by Modtronix Com (/users/modtronix/)
KL25Z and KL25z (/search?q=KL25z&type=Forum), SD Card (/search?q=SD Card&type=Forum) seeed SD card (/forum/platform-16-KL25Z-community/topic/5232/)	2	24 Oct 2014 (24 Oct 2014) (/forum/platform-16-KL25Z-community/post/25668/) by Keith 55 (/users/Keith55/)
KL-25Z (/search?q=KL-25Z&type=Forum), USB connector (/search?q=USB connector&type=Forum) USB connector came out easily (/forum/platform-16-KL25Z-community/topic/4902/)	0	08 May 2014 (08 May 2014) (/forum/platform-16-KL25Z-community/post/24356/) by HM Yoong (/users/yoonghm/)

Questions

1 [\(/questions/61475/Disaster/\)](/questions/61475/Disaster/) [Disaster?? \(/questions/61475/Disaster/\)](/questions/61475/Disaster/)
answers [FRDM-KL25Z \(/questions/tag/FRDM-KL25Z/\)](/questions/tag/FRDM-KL25Z/), [\(/users/michastro/\)](/users/michastro/) [michel Meunier \(/users/michastro/\)](/users/michastro/)
2 months ago (Mon 09 Nov 2015 16:43)

2 [\(/questions/60885/Port-Application-to-a-KL25Z64-MCU/\)](/questions/60885/Port-Application-to-a-KL25Z64-MCU/) [Port Application to a KL25Z64 MCU \(/questions/60885/Port-Application-to-a-KL25Z64-MCU/\)](/questions/60885/Port-Application-to-a-KL25Z64-MCU/)
answers [FRDM-KL25Z \(/questions/tag/FRDM-KL25Z/\)](/questions/tag/FRDM-KL25Z/), [\(/users/alex323qp/\)](/users/alex323qp/) [Alexander Agudelo \(/users/alex323qp/\)](/users/alex323qp/)
KL25Z64 (/questions/tag/KL25Z64) 4 months ago (Sat 12 Sep 2015 15:10)

2 [\(/questions/54520/Bootloaderdebug-files-required-for-FRDM-/\)](/questions/54520/Bootloaderdebug-files-required-for-FRDM-/)) [Bootloader/debug files required for FRDM-KL25Z variant \(/questions/54520/Bootloaderdebug-files-required-for-FRDM-/\)](/questions/54520/Bootloaderdebug-files-required-for-FRDM-/))
answers [FRDM-KL25Z \(/questions/tag/FRDM-KL25Z/\)](/questions/tag/FRDM-KL25Z/), [\(/users/ddoumenis/\)](/users/ddoumenis/) [Demos DOUMENIS \(/users/ddoumenis/\)](/users/ddoumenis/)
OpenSDAv2 (/questions/tag/OpenSDAv2) 5 months, 2 weeks ago (Fri 24 Jul 2015 17:50)

1 [\(/questions/54097/Pin-mapping-and-peripheral-usage/\)](/questions/54097/Pin-mapping-and-peripheral-usage/) [Pin mapping and peripheral usage \(/questions/54097/Pin-mapping-and-peripheral-usage/\)](/questions/54097/Pin-mapping-and-peripheral-usage/)
answers [FRDM-KL25Z \(/questions/tag/FRDM-KL25Z/\)](/questions/tag/FRDM-KL25Z/), [\(/users/Kas_Lewis/\)](/users/Kas_Lewis/) [Kasriel Lewis \(/users/Kas_Lewis/\)](/users/Kas_Lewis/)
6 months, 3 weeks ago (Fri 19 Jun 2015 07:37)

1 [\(/questions/53946/Why-are-there-different-pins-for-the-KL2/\)](/questions/53946/Why-are-there-different-pins-for-the-KL2/)) [Why are there different pins for the KL25Z serial ports on 'old' pinouts and new pinouts ? \(/questions/53946/Why-are-there-different-pins-for-the-KL2/\)](/questions/53946/Why-are-there-different-pins-for-the-KL2/))
answers [\(/users/cstevens/\)](/users/cstevens/) [chris stevens \(/users/cstevens/\)](/users/cstevens/)
FRDM-KL25Z (/questions/tag/FRDM-KL25Z) 7 months ago (Tue 09 Jun 2015 15:32)

[See more related questions \(/questions/related/72/16/KL25Z/\)](/questions/related/72/16/KL25Z/)