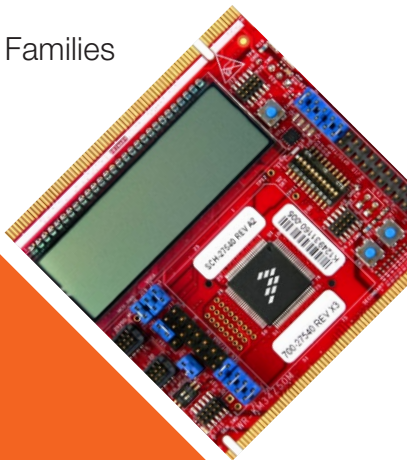




# TWR-KM34Z50M Quick Start Guide

Development Kit for Kinetis  
KM38/34/33/32/14/13 MCU Families

Tower System  
Development Board  
Platform



## Get to know the TWR-KM34Z50M Board

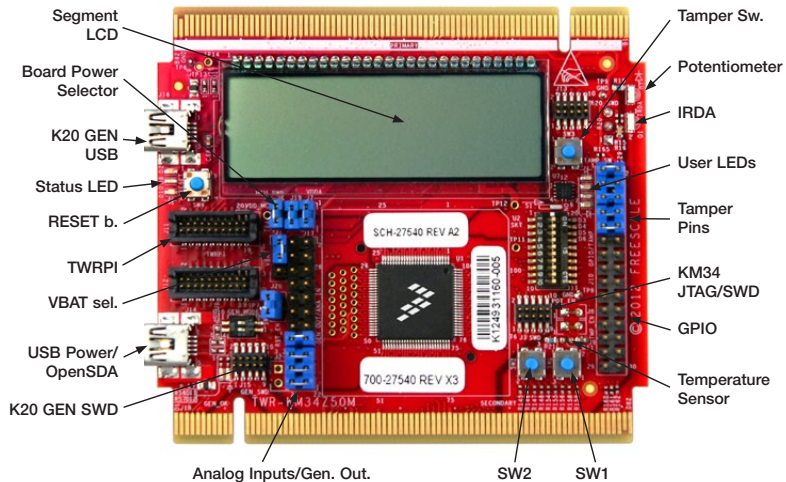


Figure 1: Front side of TWR-KM34Z50M board (TWRPI devices not shown)

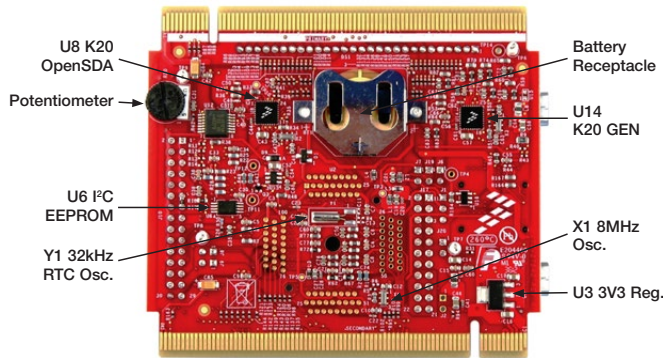


Figure 2: Back side of TWR-KM34Z50M board



### TWR-KM34Z50M Freescale Tower System Development Board Platform

The TWR-KM34Z50M board is designed to work either in standalone mode or as part of the Freescale Tower System, a modular development board platform that enables rapid prototyping and tool re-use through reconfigurable hardware. Take your design to the next level and begin constructing your Tower System rapid prototyping platform today by visiting [freescale.com/Tower](http://freescale.com/Tower) for additional Tower System boards and compatible peripherals.

## Features

- MKM34Z5128CLL5 MCU (50 MHz, 128 KB Flash, 16 KB RAM, low power, LQFP 100 package)
- USB interface with mini-AB USB connector
- Large 160-segment glass LCD
- Onboard debug circuit: open source JTAG/SWD (OpenSDA) with virtual serial port
- Three-axis accelerometer/anti-tamper tilt sensor (MMA8491Q)
- Four user-controllable LEDs
- Two user pushbutton switches for GPIO interrupts
- One user pushbutton switch for tamper detection
- One user pushbutton switch for MCU reset
- Potentiometer
- Headers for direct GPIO and ADC access
- External tamper pins
- Independent, battery-operated power supply for real-time clock (RTC) and tamper detection modules
- Onboard 7-channel sinus signal generator with USB interface for emulating the AC net waveforms
- IRDA support
- NTC temperature sensor
- General-purpose Tower plug-in (TWRPI) socket

## Tools

- Freescale CodeWarrior Development Studio for Microcontrollers V10.5 (CW-MCU10)
- IAR EWARM V6.50 or higher
- Processor Expert software configuration tool with MQX™ Lite RTOS integration available for CodeWarrior IDE or a standalone for integrating generated code into other IDEs

## Step-by-Step Installation Instructions

In this Quick Start Guide, you will learn how to set up the TWR-KM34Z50M board and run the included demonstrated software. For more detailed information, review the user manual at [freescale.com/TWR-KM34Z50M](http://freescale.com/TWR-KM34Z50M).

### 1 Download Software and Tools

Download installation software and documentation under **“Jump Start Your Design”** at [freescale.com/TWR-KM34Z50M](http://freescale.com/TWR-KM34Z50M).



### 4 Segment LCD

All segments are turned on for three seconds, then potentiometer readings are displayed. The LEDs should be blinking.

### 5 Move the Potentiometer

The onboard LCD shows the SAR-ADC reading.

### 6 Explore Further

Explore the Kinetis KM “metering” MCU family, Sigma-Delta ADC performance and low power modes, 1-ph electro meter demo in connection with the onboard AC waveform generator, software peripheral drivers and more labs at [freescale.com/TWR-KM34Z50M](http://freescale.com/TWR-KM34Z50M).

### 2 Install Software and Tools

Install the OpenSDA Tower Toolkit to install the OpenSDA and USB-to-Serial drivers.

### 3 Configure the Hardware

Connect one end of the USB cable to the PC and the other end to the Power/OpenSDA mini-B connector (J14) on the TWR-KM34Z50M board. Allow the PC to automatically configure the USB drivers if needed.

... following is a list of all the jumper options. The default installed jumper settings are indicated in the shaded boxes.

Option	Jumper	Setting	Description
MCU Power Connection	J1	1-2	Connect VBAT to onboard 3.3 V supply
		2-3	Connect VBAT to the higher voltage between MCU supply (MCU_PWR) or VBATD
VREF Out Selection	J2	ON	VREF connected to ELEVATOR edge
		OFF	VREF available on pins
MCU_PWR Selection	J6	ON	MCU powered from V_BRD 3.3 V on board reg.
		OFF	MCU can be supplied by ext. Voltage connected to J6-pin 1
Analog Power Enable	J7	ON	Connect analog voltages to MCU_PWR
		OFF	Connect analog voltages to MCU_PWR. external VDDA can be applied
Pot. Enable (might be hardwired)	J8	ON	Connect PTG1/AD10 to pot. R20
		OFF	Disconnect PTG1/AD10 from pot. R20
Temp. Sensor Enable (might be hardwired)	J9	ON	Connect PTF0/AD7 to temperature sensor
		OFF	Disconnect PTF0/AD7 to temperature sensor
Low-Power Current Measurement	J19	ON	Low-power current measurement bypassed
		OFF	Low-power current measurement enabled
OpenSDA Reset Enabled	J20	ON	KM34 reset input driven by K20 OpenSDA
		OFF	KM34 reset input isolated from OpenSDA
DIP Switch S1 Connections	S1	ON	Connect PTE5 to green LED (D3)
		ON	Connect PTF1 to red LED (D4)
		ON	Connect PTD1 to orange LED (D5)
		ON	Connect PTC1 to yellow LED (D6)
		ON	Connect IRDA Tx LED (D7) to PTC2
		ON	Connect IRDA Rx transistor (Q1) to PTC3
		ON	Connect Serial EEPROM data to I2C0 Data
		ON	Connect Serial EEPROM clock to I2C0 Clock
		ON	Connect TILT_ENABLE (MMA8491Q) signal to PTF7
		ON	Connect VBAT voltage measurement signal to PTF2/AD9

## GPIO Header (J10) Signal Connections

MCU Signal	J10 Pin		MCU Signal
SW3 (Tamper switch)	1	2	SW3 to TAMPER1 (when closed)
SW3 (Tamper switch)	3	4	SW3 to TAMPER2 (when closed)
TILT_XOUT	5	6	TILT_XOUT to TAMPER0
TILT_YOUT	7	8	TILT_YOUT to TAMPER1
TILT_ZOUT	9	10	TILT_ZOUT to TAMPER2
V_BRD	11	12	PTI0/SCI1_RXD
PTI1/SCI1_TXD	13	14	GND
PTE0/I2C0_SDA	15	16	PTD7/I2C0_SCL
PTF6/SPI1_MOSI	17	18	PTF5/SPI1_MISO
PTF4/SPI1_SCK	19	20	PTF3/SPI1_SS
PTA6/AFE_EXT_MOD_IN1	21	22	PTF7/CLKOUT
PTC0/AFE_EXT_MOD_IN2	23	24	PTG0
PTB7/AFE_EXT_CLK_IN	25	26	PTC5/AD0
PTA7/AFE_EXT_CLK_OUT	27	28	PTC6/AD1
VSSA_SAR	29	30	GND

## Analog Inputs/Generator Out (J17)

MCU Signal	J17 Pin		MCU Signal
GEN_OUT0	1	2	EXT_SD_ADP0
GEN_OUT1	3	4	EXT_SD_ADP1
GEN_OUT2	5	6	EXT_SD_ADP2
GEN_OUT3	7	8	EXT_SD_ADP3
GEN_OUT4	9	10	EXT_SAR_AD0
GEN_OUT5	11	12	EXT_SAR_AD1
GEN_OUT6	13	14	EXT_SAR_AD2
VSSA	15	16	EXT_SD_ADM0 (can short to VSSA)
VSSA	17	18	EXT_SD_ADM1
VSSA	19	20	EXT_SD_ADM2
VSSA	21	22	EXT_SD_ADM3

## K20 Generator Default Operation (SW5 Settings)

Option	Position	Setting	MCU Signal
DIP SW5 Settings	1	OFF	K20 USB communication disabled, K20 in Very Low-Power Stop (VLPS) mode
	2	OFF	Generator output disabled
	1	ON	USB communication and KM34 current sensing enabled, green LED ON
	2	ON	Generator output enabled, amber LED ON



## et Started



Download installation software and documentation under  
“**Jump Start Your Design**” at [freescale.com/TWR-KM34Z50M](http://freescale.com/TWR-KM34Z50M).

## Support

Visit [freescale.com/support](http://freescale.com/support) for a list of phone numbers within your region.

## Warranty

Visit [freescale.com/warranty](http://freescale.com/warranty) for complete warranty information.

For more information, visit [freescale.com/Tower](http://freescale.com/Tower)

Join the online Tower community at [towergeeks.org](http://towergeeks.org)

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