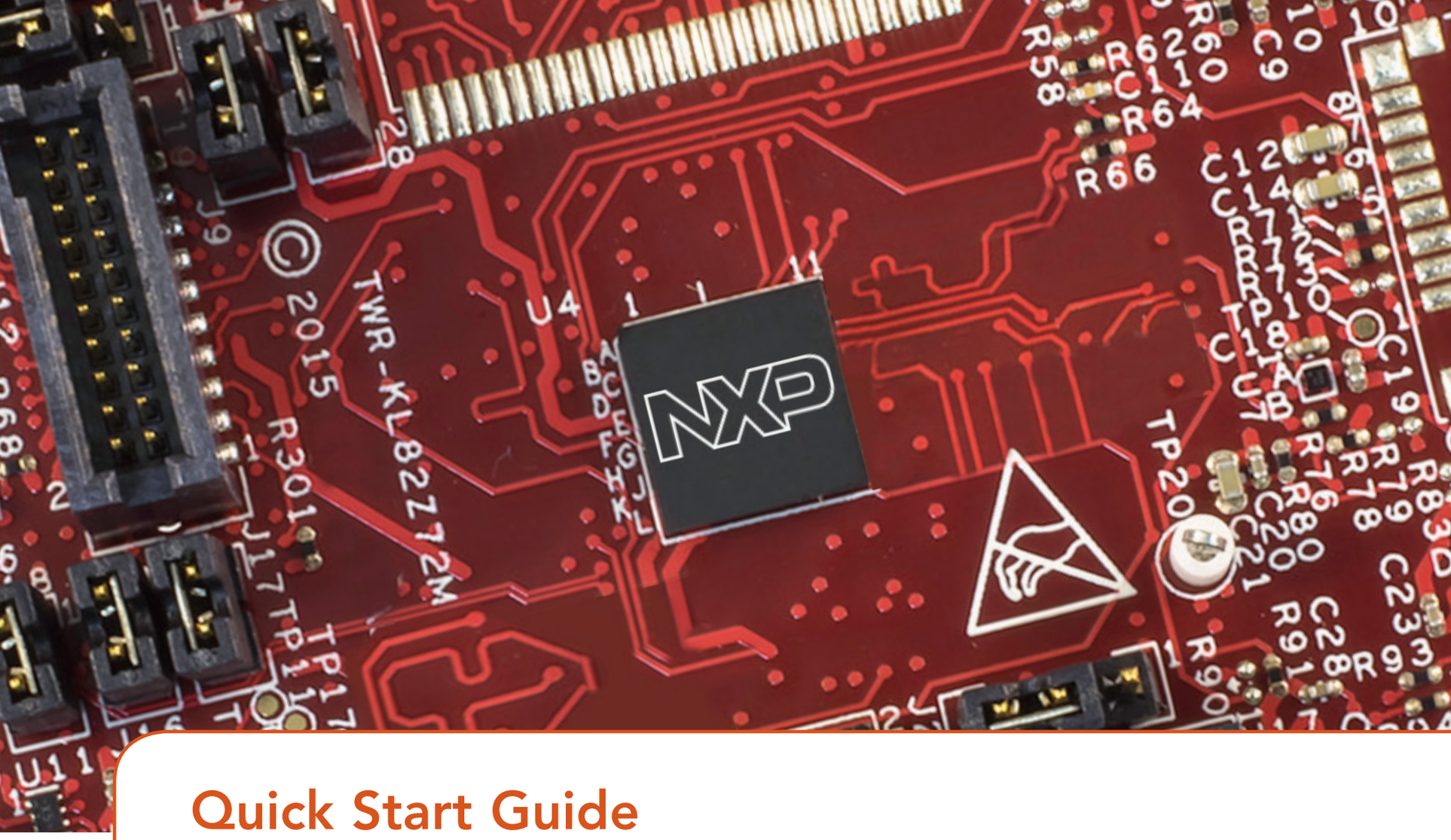


Quick Start Guide

TWR-KL82Z72M

Power-Efficient, 72 MHz ARM® Cortex®-M0+ based MCUs with 128 KB Flash and 96 KB SRAM

TOWER® SYSTEM DEVELOPMENT PLATFORM

GET TO KNOW THE TWR-KL82Z72M

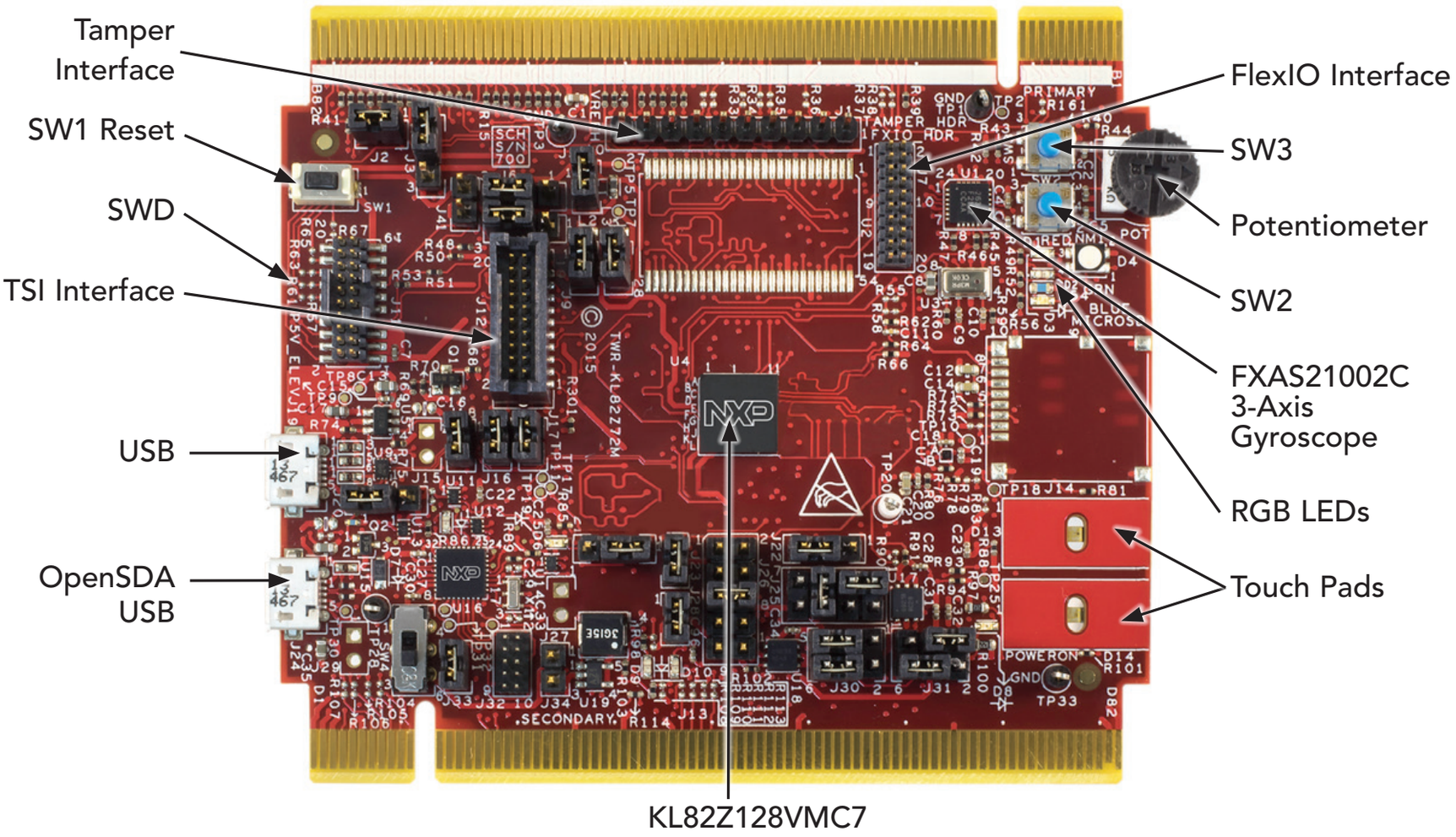


Figure 1: Front side of TWR-KL82Z72M

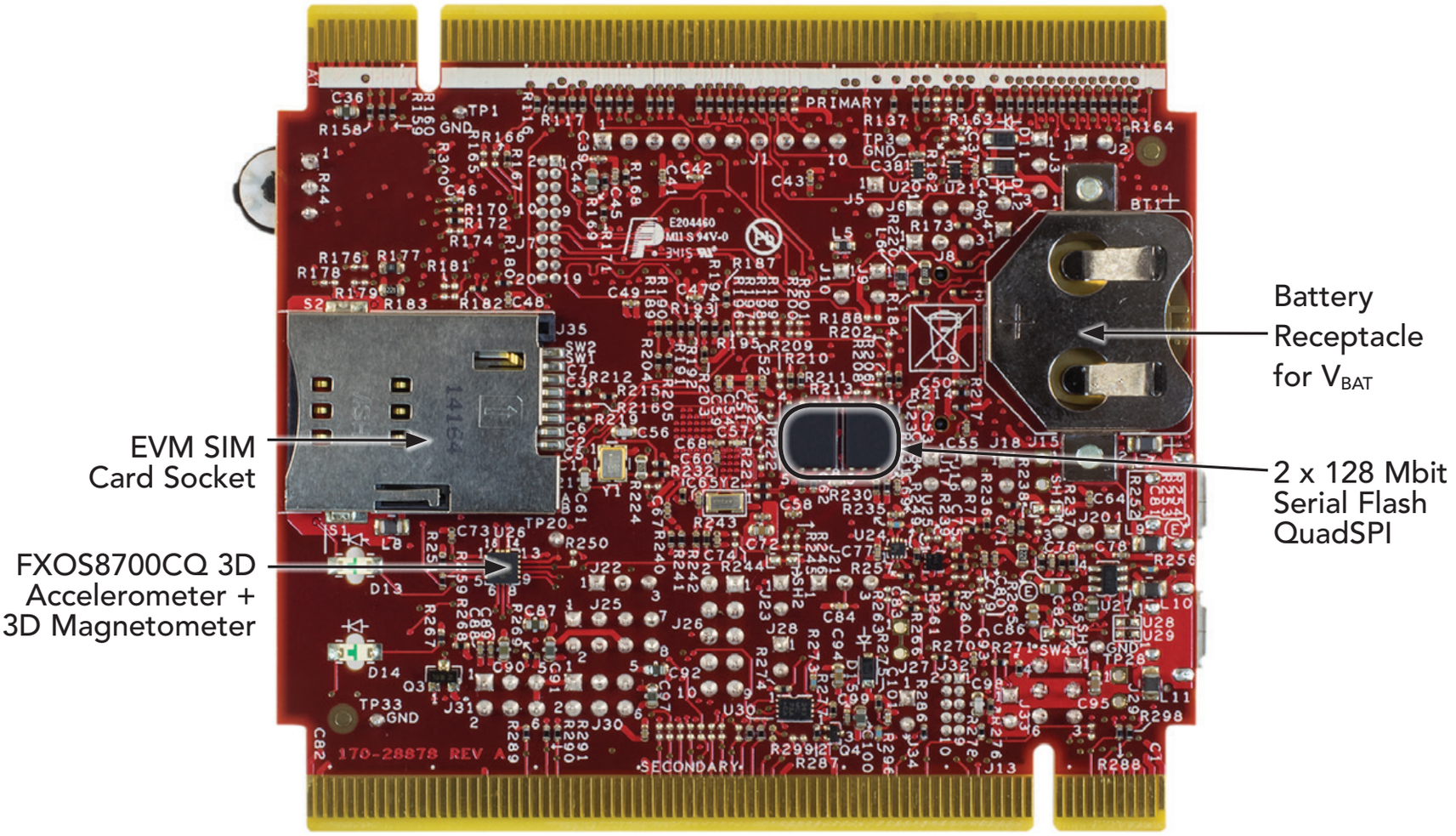


Figure 2: Back side of TWR-KL82Z72M

TWR-KL82Z72M
NXP TOWER SYSTEM DEVELOPMENT PLATFORM

The TWR-KL82Z72M board is designed to work either in standalone mode or as part of the NXP Tower System, a modular development platform that enables rapid prototyping and tool re-use through reconfigurable hardware. Begin constructing your Tower System development platform today by visiting **www.nxp.com/Tower** for additional Tower System boards and compatible peripherals.

FEATURES

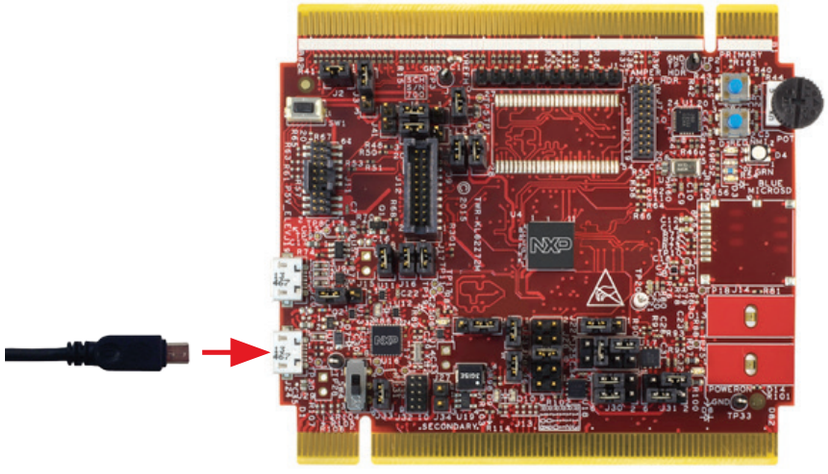
- MKL82Z128VMC7 MCU
  - 72 MHz ARM® Cortex®-M0+ core, 128 KB Flash, 96 KB SRAM, 121 MAPBGA, and USB
- Tower-compatible processor board
- Onboard debug circuit: K20DX128VFM5 OpenSDA with virtual serial port
- 2 x 128 Mbit (16 MB) Dual on-board QuadSPI memory @ 3.3 V
- Five (5) user-controlled status LEDs
- Two (2) capacitive touch pads
- Two (2) mechanical push buttons
- Stand-alone full-speed USB host and device function
- Potentiometer
- EMVSIM card interface
- Ten-(10) axis sensor system
  - FXOS8700CQ 3D accelerometer + 3D magnetometer
  - MPL3115A2 digital pressure sensor
  - FXAS21002C three-axis gyroscope
- Socket for touch keypad plug-in (TWRPI-TOUCH-STR)
- Board power select with 3.3 V or 1.8 V MCU operation
- Independent, battery-operated power supply for real-time clock (RTC) module
- Battery holder for 20 mm lithium battery (e.g., 2032, 2025)

STEP-BY-STEP INSTRUCTIONS

In this Quick Start Guide, you will learn how to set up the TWR-KL82Z72M board and run the included demonstrated software. For more detailed information, review the user manual at **www.nxp.com/TWR-KL82Z72M**.

1 Configure the Hardware

Connect one end of the USB cable to the PC and the other end to the Power/OpenSDA micro-AB connector on the TWR-KL82Z72M board. Allow the PC to automatically configure the USB drivers if needed.



2 Run the Quick Start Demo

The LEDs on the board, D2 and D3, will gradually illuminate as the board is tilted. When rotated around the accelerometer's x-axis the yellow LED (D2) will illuminate. Similarly, the blue LED (D3) will gradually illuminate as rotated around the y-axis.

The LEDs under the TSI pad, D13 and D14, respond to touch events. When the TSI pad on the board is touched, it will toggle between the LEDs under the pad.

3 Download Software

Download installation software and documentation under **"Jump Start Your Design"** at **www.nxp.com/TWR-KL82Z72M**.

EXPANDED SOFTWARE AND TOOLS NOW AVAILABLE FOR KINETIS MCUS

Additional details regarding the Quick Start Demo are included as part of the Kinetis software development kit (SDK).

To take your design to the next level, leverage the Kinetis SDK and other online enablement software and tools for Kinetis MCUs, available for download at the relevant links listed here.

- Kinetis software development kit at **www.nxp.com/ksdk**
- Kinetis Design Studio IDE at **www.nxp.com/kds**
- Bootloader for Kinetis MCUs at **www.nxp.com/kboot**

TWR-KL82Z72M JUMPER OPTIONS

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

JUMPER	OPTION	SETTING	DESCRIPTION
J2	MCU Reset Connection on JTAG Connector	ON	Connect MCU reset on pin10 of JTAG connector J11
		OFF	Disconnect MCU reset on pin10 of JTAG connector J11
J3	V_{BAT} Power Selection	1–2	Connect V_{BAT} to on-board MCU supply from MCU_PWR
		2–3	Connect V_{BAT} to the higher voltage between on-board MCU_PWR supply or coin cell supply
J4	JTAG Power Connection	ON	Connect on-board 5 V supply to JTAG port (supports powering board from external JTAG probe)
		OFF	Disconnect on-board 5 V supply from JTAG port
J5	QuadSPI Power Enable	ON	Connect VDDIO_E domain to power QuadSPI flash
		OFF	Disconnect VDDIO_E domain from QuadSPI flash
J6	UART RX Connection	1–2	Connect UART1_RX to elevator
		2–3	Connect UART1_RX to OpenSDA UART RX
J8	UART TX Connection	1–2	Connect UART1_TX to elevator
		2–3	Connect UART1_TX to OpenSDA UART TX
J9	MCU Power Connection	ON	Connect V_BRD and MCU_PWR to MCU_VDD
		OFF	Disconnect V_BRD and MCU_PWR from MCU_VDD
J10	VDD and VDDA Connection	ON	Connect VDD and VDDA
		OFF	Disconnect VDD and VDDA

TWR-KL82Z72M JUMPER OPTIONS (CONT.)

JUMPER	OPTION	SETTING	DESCRIPTION
J15	USB ID Connection	ON	Connect PTD7 to USB ID pin on micro-USB connector J19
		OFF	Disconnect PTD7 from USB ID pin on micro-USB connector J19
J16	SWD DIO OpenSDA Connection	**ON**	Connect SWD_DIO from OPENSDA circuit to KL82 MCU to allow debugging using OPENSDA
		OFF	Disconnect SWD_CLK from OPENSDA circuit to KL82 MCU to allow J-Link or U-Link debug
J17	SWD Clock OpenSDA Connection	**ON**	Connect SWD_CLK from OPENSDA circuit to KL82 MCU to allow debugging using OPENSDA
		OFF	Disconnect SWD_CLK from OPENSDA circuit to KL82 MCU to allow J-Link or U-Link debug
J18	USB Over-current Flag Connection	**ON**	Connect PTC18 to USB over-current flag for MIC2005
		OFF	Disconnect PTC18 to USB over-current flag for MIC2005
J20	USB Switch Selection	**1–2**	Use the on-board micro-USB connector J19
		2–3	USB signals come from elevator
J21	Reset Button Connection	**1–2**	When powering the OPENSDA MCU, bootloader mode can be selected
		2–3	When OPENSDA MCU is not powered, RESET button can be used
J22	USB_VDD Selection	**2-3**	USB_VDD comes from 3V3_BRD
		1-2	USB_VDD comes from MCU_VDD
J23	5 V Connection	**ON**	Connect 5 V IN to the 3.3 V regulator
		OFF	Disconnect 5 V IN from the 3.3 V regulator

TWR-KL82Z72M JUMPER OPTIONS (CONT.)

JUMPER	OPTION	SETTING	DESCRIPTION
J25	Board Power and Regulator Selection	**1–3**	3V3_BRD connected to output of 3.3 V regualtor
		2–4	Invalid configuration. Do not use.
		3–4	Invalid configuration. Do not use.
		4–6	1.8 V regulator uses output of Li-Ion battery domain
		5–6	1.8 V regulator uses output of 3.3 V regulator
		6–8	1.8 V regulator uses 5 V IN directory.
J26	5 V Input Power Selection	3–4	Raw 5 V input from KL82 USB
		5–6	Regulated 5 V output from OpenSDA 5 V input
		7–8	Power from P5V_ELEV input
		9–10	Raw 5 V input from OpenSDA USB port J24
J27	OpenSDA Reset	ON	Connect OpenSDA reset signal to board reset. There is a board trace that makes this connection even if jumper is not populated.
		OFF*	Disconnect OpenSDA reset signal to board reset. *By default there is a board trace connecting this signal even though jumper is off.
J28	USB Power Enable Connection	**ON**	Connect PTC19 to USB power enable for MIC2005
		OFF	Disconnect PTC19 to USB power enable for MIC2005

TWR-KL82Z72M JUMPER OPTIONS (CONT.)

JUMPER	OPTION	SETTING	DESCRIPTION
J30	3.3 V and 1.8 V Sequencing	1–2	Invalid configuration. Do not use.
		1–3	Option 2: 1.8 V comes up before 3.3 V. 3.3 V regulator enabled by output of 1.8 V regulator. Only used if VDD=1.8 V and VDDIO_E=3.3 V.
		2–4	Option 2: 1.8 V comes up before 3.3 V. 1.8 V regulator enabled by input to regulator. Only used if VDD=1.8 V and VDDIO_E=3.3 V.
		3–5	Option 1: 3.3 V comes up before 1.8 V. 3.3 V regulator enabled by input to regulator.
		4–6	Option 1: 3.3 V comes up before 1.8 V. 1.8 V regulator enabled by 3.3 V board supply.
		5–6	Invalid configuration. Do not use.
J31	VDDIO_E and VDD Selection	**1–3**	V_BRD/MCU_VDD is 3.3 V
		2-4	VDDIO_E is 3.3 V
		3–5	V_BRD/MCU_VDD is 1.8 V
		4–6	VDDIO_E is 1.8 V
J33	Battery Voltage Monitoring	ON	Connect ADC0_SE6B to battery voltage
		OFF	Enable 5 V boost
J34	Battery Boost Regulator Input	ON	Enable 5 V boost
		OFF	Disconnect boost enable

SUPPORT

Visit **www.nxp.com/support** for a list of phone numbers within your region.

WARRANTY

Visit **www.nxp.com/warranty** for complete warranty information.

Get Started

Download installation software and documentation under **"Jump Start Your Design"** at **www.nxp.com/TWR-KL82Z72M**.

www.nxp.com/TWR-KL82Z72M,
www.nxp.com/Kinetis and **www.nxp.com/Tower**

Document Number: TWRKL82Z72MQSG REV 1

Agile Number: 926-28878 REV B