Ultra-low-power, smart-metering MCUs with precision analog, security and HMI peripherals

Kinetis M Series MCUs

Kinetis M series MCUs are based on the 32-bit ARM® Cortex®-M0+ core and provide a low-cost, highly integrated solution for one-, two- and three-phase electricity meters that require powerful 32-bit processing capability, precision analog, security, and HMI functionality.

TARGET APPLICATIONS

- Electricity meters
- Flow meters (e.g., heat, water, gas)
- Industrial measurement and sensing

Each MCU includes a powerful analog front end that is configurable for different regions, enabling power calculations with 0.1 percent accuracy. A high-accuracy, real-time clock delivers less than 5 PPM drift over temperature. Metrology firmware for calculating active, reactive and apparent power using a variety of algorithms is provided free of charge. Pre-certified reference designs for Europe, China, India, the U.S. and Japan are available for customer evaluation.

The Kinetis M series is supported by the Tower System hardware development platform.

SPECIFICATIONS

Kinetis M series MCUs

- High-performance ARM Cortex-M0+ core, up to 75 MHz of core clock frequency
- 256/128/64 KB single array flash
- Supports v6-M instruction set architecture including all 16-bit v7-M instructions plus a number of 32-bit Thumb®-2 instructions
- Phase-locked loop to generate clocks for analog front end
  - Input range: 31.25–39.0625 kHz
  - Output range: 11.72–14.65 MHz
- Frequency-locked loop to generate core, system and flash clocks
  - Input range: 31.25–39.0625 kHz
  - Output range: 20–50 MHz
- Flexible modes of operation
- Two internal trimmable clock references
  - 32 kHz
  - 4 MHz

Analog front end

- 24-bit sigma-delta ADC with 94 dB SNR
- Programmable gain amplifier with gains from 1 to 32 with low temperature drift
- High precision internal voltage reference with low temperature drift
- Up to 16-channel, 16-bit SAR ADC

Security

- Memory mapped cryptographic acceleration unit (MMCAU) for AES encryption
- Memory protection unit, AIPS (peripheral protection), random number generator, CRC

Interface

- LCD segment driver up to 448 (56 x 8) segments
- High accuracy RTC +-5 PPM over temperature range
- Up to five UART, two SPI, two I²C

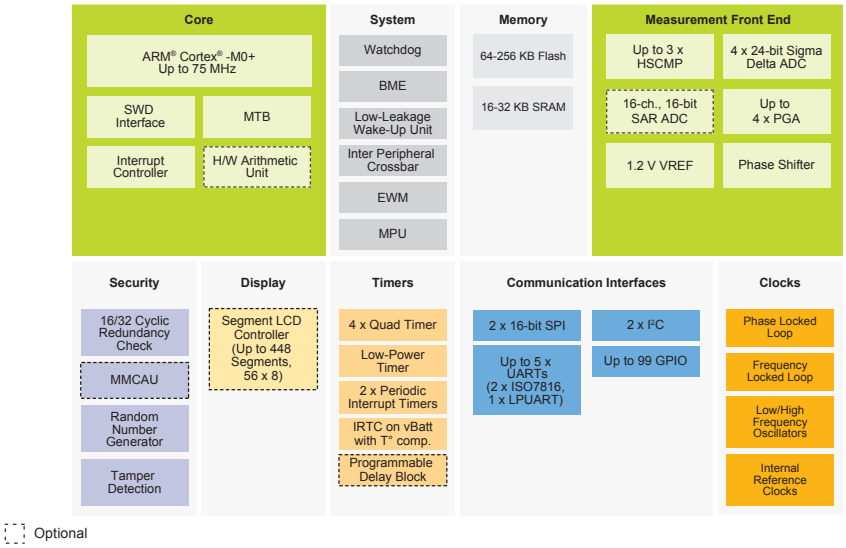
Other specifications

- Voltage range: 1.71–3.6 V (without AFE)
- Voltage range: 2.7–3.6 V (with AFE)
- Temperature range: –40 °C to +105 °C

KEY FEATURES

- High-performance ultra-low-power ARM Cortex-M0+ core
- 24-bit sigma-delta ADC and PGA achieving 94 dB SNR
- High accuracy RTC with +5 PPM over temperature
- Rich set of security: MPU, active tamper, RNG for Welmec compliant meters
- Pre-certified metrology software

KINETIS M SERIES METERING MCUs



ENABLEMENT

- TWR-KM34Z75M/TWR-KM34Z50M Tower® System development module
- Reference designs (available for loan)
  - Low-cost three-phase/single-phase power meters for markets in Asia
  - Three-phase/single-phase power meters for markets in EMEA
  - Two-phase power meter for markets in AMR/JPN
- Kinetis Design Studio integrated development environment (IDE), a free and unlimited IDE that includes Processor Expert software configuration tool with Kinetis SDK integration
- IAR Embedded Workbench®, ARM Keil® MDK IDEs and others from the ARM technology ecosystem
- Proprietary MQX™ Lite RTOS
- Application notes
- Tower System development platform

KINETIS M SERIES SELECTOR GUIDE

Sub-Family	Part Number	CPU Frequency (MHz)	Flash (KB)	SRAM (KB)	UART (ISO 7816/LPUART)	I²C	SPI	ADC (24-bit (∑Δ))	Total I/Os	Package				Development Hardware
										HH	LH	LL	LQ	
										44 LGA (5 x 5, 0.65 mm)	64 LQFP (10 x 10, 0.5 mm)	100 LQFP (14 x 14, 0.5 mm)	144 LQFP (20 x 20, 0.5 mm)	
KM14	MKM14Z128(A)xxx5	50	128	16	2 (2 / -)	1	2	4	20	Y				TWR-KM34Z50M(V3)
	MKM14Z64(A)xxx5	50	64	16	2 (2 / -)	1	2	4	20	Y				TWR-KM34Z50M(V3)
KM33	MKM33Z128(A)xxx5	50	128	16	4 (2 / -)	2	2	3	38–68		Y	Y		TWR-KM34Z50M(V3)
	MKM33Z64(A)xxx5	50	64	16	4 (2 / -)	2	2	3	38–68		Y	Y		TWR-KM34Z50M(V3)
KM34	MKM34Z128(A)xxx5	50	128	16	4 (2 / -)	2	2	4	68			Y		TWR-KM34Z50M(V3)
	MKM34Z256xxx7	75	256	32	5 (2 / 1)	2	2	4	72–99			Y	Y	TWR-KM34Z75M

www.nxp.com/Kinetis/Mseries

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