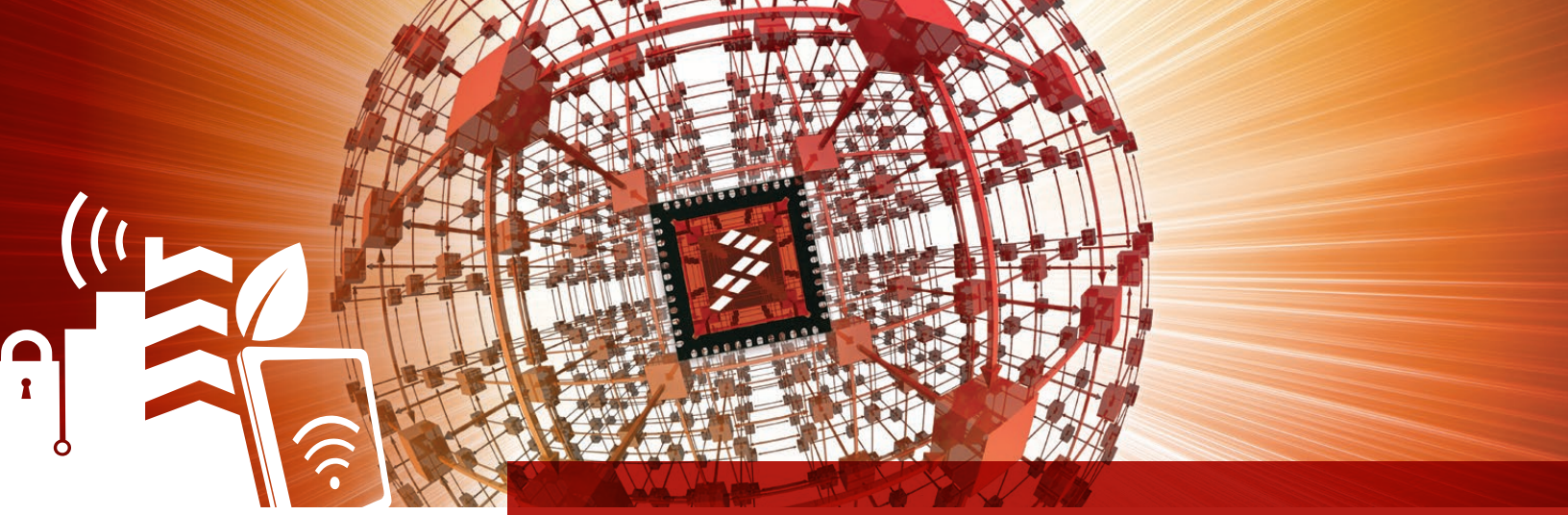


32-bit E Series MCUs

Kinetis KE02 Family

Robust 5-Volt MCU with 8-bit S08 Compatibility

Target Applications

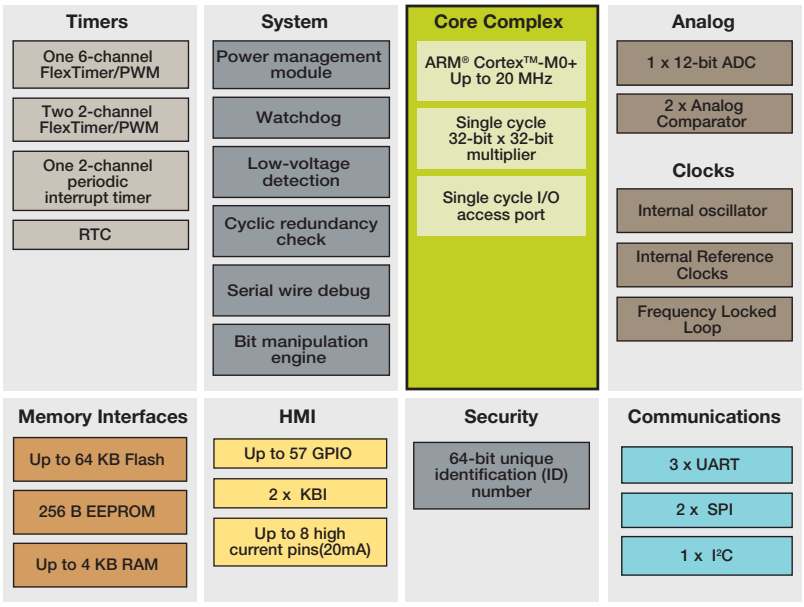
- Appliances
- DC fans
- Metering/PLC
- Offline UPS
- Analog Power
- DC/DC

Overview

The Kinetis KE02 sub-family is the entry-point into the Kinetis E series and is pin-compatible across the E series and with the 8-bit S08P family.

This sub-family includes a powerful array of analog, communication, timing and control peripherals with varying flash memory size and pin count. This family offers a series of highly robust, cost-effective and energy-efficient MCUs that provide the appropriate entry-level solution. This family is the next-generation MCU solution offering enhanced ESD/EMC performance for cost-sensitive, high-reliability device applications used in high electrical noise environments.

Kinetis KE02 Family Block Diagram



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Features

Operating Characteristics

- Voltage range: 2.7 to 5.5 V
- Flash write voltage range: 2.7 to 5.5 V
- Temperature range (ambient): –40 °C to +105 °C

Performance

- Up to 20 MHz ARM® Cortex™-M0+ core
- Single cycle 32-bit x 32-bit multiplier
- Single cycle I/O access port

Memories and Memory Interfaces

- Up to 64 KB flash
- Up to 256 B EEPROM
- Up to 4 KB RAM

Clocks

- Oscillator (XOSC): Loop-controlled Pierce oscillator, crystal or ceramic resonator range of 31.25 to 39.0625 kHz or 4 to 20 MHz
- Internal clock source (ICS): Internal FLL with internal or external reference, precision trimming of internal reference allowing 1 percent deviation across temperature range of 0 °C to 70 °C and 1.5 percent deviation across temperature range of –40 °C to +105 °C, up to 20 MHz
- Internal 1 kHz low-power oscillator (LPO)

System Peripherals

- Power management module (PMC) with three power modes: run, wait, stop
- Low-voltage detection (LVD) with reset or interrupt, selectable trip points
- Watchdog with independent clock source (WDOG)
- Programmable cyclic redundancy check module (CRC)
- Serial wire debug interface (SWD)
- Bit manipulation engine (BME)

Security and Integrity Modules

- 64-bit unique identification (ID) number per chip

Human-Machine Interface

- Up to 57 general-purpose input/output (GPIO)
- Two 8-bit keyboard interrupt modules (KBI)
- Up to 8 ultra high current sink pins supporting 20 mA source/sink current

Analog Modules

- One 16-channel 12-bit SAR ADC with internal band gap reference channel, operation in stop mode, optional hardware trigger (ADC)
- Two analog comparators containing a 6-bit DAC and programmable reference input (ACMP)

Timers

- One 6-channel FlexTimer/PWM (FTM)
- Two 2-channel FlexTimer/PWM (FTM)
- One 2-channel periodic interrupt timer (PIT)
- One real-time clock (RTC)

Tools

Freescale Freedom Development Platform: FRDM-KE02Z

Features:

- MKE02Z64VQH2 MCU – 20 MHz, 64 KB Flash, 4 KB SRAM, 64 QFP
- Capacitive touch slider, MMA8451Q accelerometer, Tri-color LED
- Flexible power supply options – USB and external source
- Easy access to MCU I/O
- IrDA transmitter and receiver
- Thermistor sensor to measuring temperature
- Form factor compatible with Arduino ™ R3 pin layout
- New, OpenSDA debug interface
  - Mass storage device flash programming interface (default)
  - Tool installation not required to evaluate demo apps
  - P&E Debug interface provides run-control debugging and compatibility with IDE tools
  - CMSIS-DAP interface: new ARM standard for embedded

Learn more at: **freescale.com/freedom**

Documentation:

- FRDM-KE02Z User's Manual and OpenSDA User's Guide

Kinetis KE02 Family Options

MC Part Number	CPU	Pin	Package	Flash	SRAM	EEPROM	Debug SWD	Watchdog	PMC/BME	ICS	OSC	IRC/CRC	iLPO	Real-Time Counter	ADC	DAC	Analog Comparator	Bandgap Vref	Flex Timer (6-ch.)	Flex Timer (2-ch.)	PIT	UART (LIN slave)	SPI (8-bit)	I²C	GPIOs	20 mA High Drive GPIO	True Open Drain
MKE02Z16VLC2(R)	20 MHz	32	LQFP	16 KB	2 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 11-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	28	4	2
MKE02Z32VLC2(R)	20 MHz	32	LQFP	32 KB	4 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 11-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	28	4	2
MKE02Z64VLC2(R)	20 MHz	32	LQFP	64 KB	4 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 11-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	28	4	2
MKE02Z16VLD2(R)	20 MHz	44	LQFP	16 KB	2 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 11-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	37	6	2
MKE02Z32VLD2(R)	20 MHz	44	LQFP	32 KB	4 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 11-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	37	6	2
MKE02Z64VLD2(R)	20 MHz	44	LQFP	64 KB	4 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 11-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	37	6	2
MKE02Z32VLH2(R)	20 MHz	64	LQFP	32 KB	4 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 16-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	57	8	2
MKE02Z64VLH2(R)	20 MHz	64	LQFP	64 KB	4 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 16-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	57	8	2
MKE02Z32VQH2(R)	20 MHz	64	QFP	32 KB	4 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 16-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	57	8	2
MKE02Z64VQH2(R)	20 MHz	64	QFP	64 KB	4 KB	256 B	Yes	Yes	Yes	FLL	Yes	Yes	Yes	1	12-bit, 1 x 16-ch.	2	2	1	1	2	1 x 2-ch.	3	2	1	57	8	2

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For current information about Kinetis products and documentation, please visit freescale.com/Kinetis/Eseries

Doc Number: KINETISKE02FS REV 0