Freescale's ZigBee® Technology Products Summary

Freescale Semiconductor draws on extensive radio frequency (RF) and wireless experience accumulated from more than 50 years of developing semiconductor products. To help determine the best fit of transceiver and MCU, the products summary offers a matrix of ZigBee technology solution transceivers which may be paired with the Freescale 8-bit MCU's for system solutions. The System in a Package (SiP) alternatives offer the MCU and the transceiver in one package for reduced cost and board space requirements.

Software

SMAC (up to 4 KB MCU memory)

- Proprietary SMAC (simple MAC) software
- Cost-efficient solution
- Library of transceiver-related primitives
- Small size memory alternatives
- ANSI C source code provided
- Provides serial peripheral interface (SPI) and control interface to the transceiver from the MCU
- Ultra-low-power requirements
- Ultra-low-memory requirements
- Target applications
  - Point-to-point and star networks
- Repeater functionality
- Over-the-air programming

IEEE® 802.15.4-Compliant MAC (approximately 17–35 KB MCU memory required)

- IEEE 802.15.4—compliant physical layer (PHY) and MAC software
- Compliant to all IEEE 802.15.4 specifications
- Supports beaconed and non-beaconed networks
- Guaranteed Time Slots (GTS)
- Advanced Encryption Standard (AES) encryption
- Target applications
  - Mesh and cluster tree networks
  - Robust communication and timing critical networks

ZigBee-Compliant Platforms (approximately 32–56 KB MCU memory required)

- Complete wireless networking standard—from antenna to application program interface (API)
- Provides interoperability among different vendor platforms
- Established routing algorithm
- Network recovery and healing
- Wireless embedded or dongle options
- Target applications
  - Mesh and cluster tree networks
  - Robust communication and timing critical networks

Transceivers

Product	Supply Voltage V	Supply Current @ 1% Duty Cycle (Typ) mA	Standyby Curent (Typ) uA	Frequency Band GHz	Sensitivity @ 1% PER (Typ) dBm	Control Interface	Data Rate (Spec) kbps	TX/RX Switch	MAC Options	Packages	MSRP (USD)
MC13191FC	2.0–3.4	30 TX, 37 RX	500	2.4–2.5	-91	SPI	250	No	SMAC	1311 (32 QFN)	$1.95
MC13192FC	2.0–3.4	30 TX, 37 RX	500	2.4–2.5	-92	SPI	250	No	SMAC, IEEE®, 802.15.4, ZigBee® BeeStack™	1311 (32 QFN)	$2.35
MC13201FC	2.0–3.4	30 TX, 37 RX	500	2.4–2.5	-91	SPI	250	Yes	SMAC	1311 (32 QFN)	$2.13
MC13202FC	2.0–3.4	30 TX, 37 RX	500	2.4–2.5	-92	SPI	250	Yes	SMAC, IEEE, 802.15.4, ZigBee® BeeStack™	1311 (32 QFN)	$2.51

System in a Package

Product	Supply Voltage V	Supply Current @ 1% Duty Cycle, CPU @ 2MHz (Typ) mA	Standyby Curent (Typ) mA	Frequency Band GHz	Sensitivity @ 1% PER (Typ) dBm	Data Rate (Spec) kbps	TX/RX Switch	MAC Options	Packages	Flash	RAM	Core	Interfaces and Peripherals	MSRP (USD)
MC13211 NEW!	2.0–3.4	31.1 TX, 38.1 RX	0.2–0.675	2.4–2.5	-92	250	Yes	SMAC	1664 (71-LGA)	16 KB	1 KB	HCS08	I2C, SCI (2), Timer/PWM(2), KBI, 8-ch., 10-bit ADC, Up to 32 GPIO	$3.33
MC13212 NEW!	2.0–3.4	31.1 TX, 38.1 RX	0.2–0.675	2.4–2.5	-92	250	Yes	SMAC, IEEE®, 802.15.4	1664 (71-LGA)	32 KB	2 KB	HCS08	I2C, SCI (2), Timer/PWM(2), KBI, 8-ch., 10-bit ADC, Up to 32 GPIO	$3.64
MC13213 NEW!	2.0–3.4	31.1 TX, 38.1 RX	0.2–0.675	2.4–2.5	-92	250	Yes	SMAC, IEEE, 802.15.4, ZigBee® BeeStack™	1664 (71-LGA)	60 KB	4 KB	HCS08	I2C, SCI (2), Timer/PWM(2), KBI, 8-ch., 10-bit ADC, Up to 32 GPIO	$3.98

8-bit Microcontrollers

Product	Supply Voltage V	Flash	RAM	10-bit ADC	Timer/ PWM	Clock Type	Package	Low Cost Demo	EVB or FSICE	Control Interface	Applications/Additional Features	MSRP (USD) Device and Package Dependent
MC9S08GB60A	1.8–3.6	60 KB	4 KB	8-ch.	3+5-ch.	ICG	64 LQFP	√	√	I2C, SCI, SPI	Flash programmable down to 1.8	$3.52
MC9S08GT60A	1.8–3.6	60 KB	4 KB	8-ch.	2+2-ch.	ICG	44 LQFP, 48 LQFP	√	√	I2C, SCI, SPI	Flash programmable down to 1.8	$3.26
MC9S08GB32A	1.8–3.6	32 KB	2 KB	8-ch.	3+5-ch.	ICG	64 LQFP	√	√	I2C, SCI, SPI	Flash programmable down to 1.8	$2.63
MC9S08GT32A	1.8–3.6	32 KB	2 KB	8-ch.	2+2-ch.	ICG	44 LQFP, 48 LQFP	√	√	I2C, SCI, SPI	Flash programmable down to 1.8	$2.37
MC9S08GT16	1.8–3.6	16 KB	1 KB	8-ch.	2+2-ch.	ICG	42 PDIP, 44 LQFP, 48 LQFP	√	√	I2C, SCI, SPI	Flash programmable down to 1.8	$1.65

Development Tools

Features	13192DSK-A0E 13192DSK-BDM-A0E	13192EVB-A0E 13192EVB-BDM-A0E	13192EVK-A0E 13192EVK-SFTE
13192SARD (boards per kit)	2	0	2
13192EVB (boards per kit)	0	2	3
Freescale BeeKit	Yes	Yes	Yes
CodeWarrior® IDE Version	Special Edition	Special Edition	Special Edition, Standard Edition (13192EVK-SFTE only)
ZigBee® BeeStack™ Development License	90-day Evaluation	90-day Evaluation	90-day Evaluation, Full Version (13192EVK-SFTE only)
ZigBee Packet Analyzer Hardware	No	No	Yes
Daintree Standard Edition Protocol Analyzer	No	No	Yes
Out-of-Box Application	Accelerometer Application Demo	Range Test Demo	ZigBee Environment Demo (ZED) Application

Features	1321XDSK 1321XDSK-BDM	1321XNSK 1321XNSK-BDM	1321XEVK 1321XEVK-SFTW
13213-SRB (boards per kit)	2	2	4
13213-NCB (boards per kit)	0	1	3
Freescale BeeKit	Yes	Yes	Yes
CodeWarrior® IDE Version	Special Edition	Special Edition	Special Edition, Standard Edition (1321X EVK-SFTW only)
ZigBee® BeeStack™ Development License	90-day Evaluation	90-day Evaluation	90-day Evaluation, Full Version (1321X EVK-SFTW only)
ZigBee Packet Analyzer Hardware	No	No	Yes
Daintree Standard Edition Protocol Analyzer	No	No	Yes
Out-of-Box Application	Accelerometer Application Demo	IEEE® 802.15.4 Star Network Demo	ZigBee Environment Demo (ZED) Application

All MSRP shown are 10 Ku price point unless otherwise specified.
MSRP are subject to change.

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BeeKit™

BeeKit™ Software Development Tool Complimentary to Freescale customers*, included in hardware development kits or downloadable from www.freescale.com/zigbee.
BeeKit is Freescale's simplified integrated development environment (IDE) for ZigBee technology solutions and includes development capability for Simple MAC (SMAC), IEEE® 802.15.4 MAC and full-function 90-day evaluation copy of ZigBee BeeStack. BeeStack license is available for purchase upon expiration of evaluation copy (see BeeStack™ below). The IDE includes a GUI (graphical users interface) for creating, modifying and updating wireless networking designs. The BeeKit offers a comprehensive code base of wireless networking libraries, application templates and sample applications. Easily scalable to support new code bases and functionality, the BeeKit is a complementary tool to the CodeWarrior® IDE for MCU development.

BeeStack™

BeeStack™ ZigBee Stack Software Development Tool (BEESTK-S08-STD, BEESTK-S08-FLT)
MSRP $995 and $1495 respectively*
The BeeStack is a licensable ZigBee stack object code software for developing fully compliant, interoperable ZigBee network applications. The BeeKit and BeeStack work seamlessly to provide fast time-to-market when implementing ZigBee-compliant networks.



1319X Developer's Starter Kit (13192DSK-A0E and 13192DSK-BDM-A0E)
MSRP starting at $199
The 1319X Developer's Starter Kit is a cost-effective, reusable development kit used to implement wireless network designs compatible with simple MAC (SMAC), IEEE 802.15.4 standard or ZigBee. The kit contains all the hardware, software and documentation necessary to create proprietary and standards based peer-to-peer, star and mesh networks. The development boards in these kits include Freescale X, Y and Z accelerometers.



1319X Evaluation Boards (13192EVB-A0E and 13192EVB-BDM-A0E)
MSRP starting at $399
The Evaluation Board Kit contains all the hardware, software and documentation necessary to create proprietary and standards-based, peer-to-peer and star networks. The 13192 Evaluation Boards are designed to provide the maximum performance in range with the F-antenna implementation. The boards include an optional LNA, that when enabled, can increase the line-of-sight transmission distance by up to 600m.



1319X Evaluation Kit (13192EVK-A0E and 13192EVK-SFTE)
MSRP starting at $1,499
The Evaluation Kit is a comprehensive kit that provides capabilities for demonstration and development of complete ZigBee protocol-based mesh networks. It includes five hardware nodes, an 802.15.4 packet analyzer and Daintree protocol analyzing software, ZigBee protocol stack, cables and power adapters, providing the ideal platform for point-to-point, star and mesh networks. The 13192EVK-SFTE contains a developer license for Freescale's CodeWarrior IDE and ZigBee stack. The development kit comes preloaded with Freescale's ZigBee Environment Demo (ZED) featuring a complete ZigBee network based on the ZigBee Alliance Home Automation Profile.



1320XRFC
MSRP starting at $79
The RF daughter card is a cost-effective development board that provides a simple interface to Freescale's MC13202 transceiver, providing a direct connection to Freescale's 8-bit and ColdFire microcontroller EVBs. The board has a printed PCB F-antenna and SMA connector for connecting RF test equipment.



1321X Developer's Starter Kit (1321XDSK and 1321XDSK-BDM)
MSRP starting at $249
Freescale's second-generation Developer's Starter Kit is an ideal cost-effective development and demonstration kit used to implement wireless network designs compatible with simple MAC (SMAC), IEEE 802.15.4 standard or ZigBee solutions. The kit comes with everything you need to get started, including MC13213-based hardware boards, cables, batteries, power adapters, software and sample applications to create proprietary and standards-based peer-to-peer, star or mesh networks. The boards also contain Freescale's advanced MMA7260 X, Y, Z, low-power, low-voltage accelerometer as well as a temperature sensor.



Network Starter's Kit (1321XNSK and 1321XNSK-BDM)
MSRP starting at $499
The Network Starter's Kit provides a solid basis for demonstrating and developing more complex networks, including star and mesh networks. The development kit comes with three hardware boards that are pre-programmed with a demonstration written on top of Freescale's IEEE 802.15.4 MAC.



ZigBee Evaluation Kit (1321XEVK and 1321XEVK-SFTW)
MSRP starting at $1749
Freescale Semiconductor's second-generation ZigBee Evaluation Kit provides one of the most comprehensive kits for demonstration and development of complete ZigBee mesh networks. The platform includes seven hardware nodes, an 802.15.4 packet analyzer and Daintree protocol analyzing software, ZigBee protocol stack, cables and power adapters which provide the ideal platform for point-to-point, star, and mesh networks. The 1321XEVK-SFTW contains a developer license for Freescale's CodeWarrior IDE and the BeeStack ZigBee stack. The development kit comes preloaded with Freescale's ZigBee Environment Demo (ZED) featuring a complete ZigBee network based on the ZigBee Alliance Home Automation Profile.

*Subject to license agreement and registration.

Acronyms:

BDM: Background debug module
DSK: Developer's starter kit
EVB: Evaluation board
NSK: Network starter's kit
PCB: Printed Circuit Board
RFC: RF daughter card
SRB: Sensor reference board

Learn More: For more information about ColdFire family products, please visit **www.freescale.com/zigbee.**

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Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

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