Wireless

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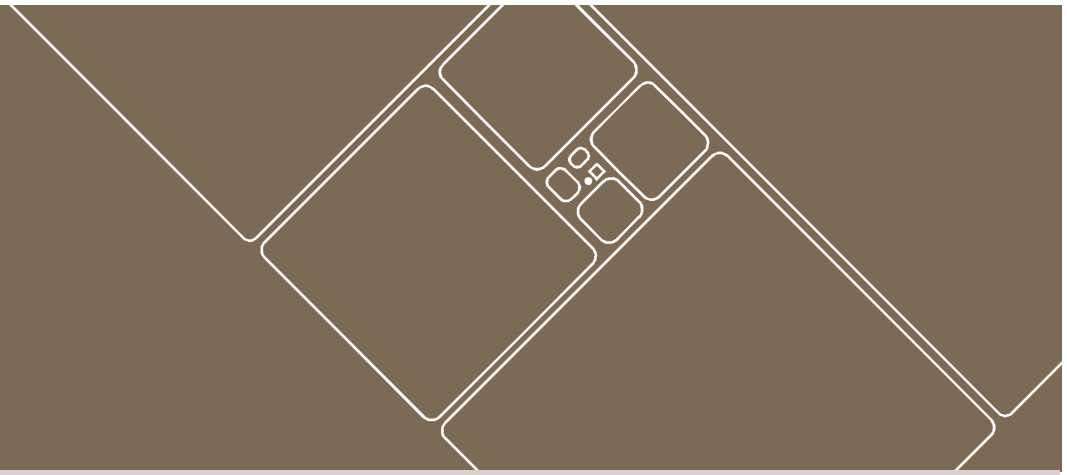

freescale semiconductor

WIRELESS PLATFORMS

Cellular Platforms

Freescale delivers a full range of UMTS/WCDMA, EDGE and GSM/GPRS cellular platforms that speed time-to-market by simplifying development for manufacturers. As total system solutions, Freescale's cellular platforms provide the industry's most integrated solutions — silicon, software, and support — to deliver a wide variety of mobile data applications and services.

Based on the revolutionary Mobile eXtreme Convergence (MXC) architecture, Freescale's MXC300-30 cellular platform is an advanced solution that meets the technical challenges of 3G. MXC300-30 supports multi-call, High-Speed Downlink Packet Access (HSDPA) and High-Speed Uplink Packet Access (HSUPA). HSDPA/HSUPA enables streaming audio, video, interactive downloads and uploads, faster Internet access and emerging services such as push-to-share and multiplayer mobile gaming.

Freescale's MXC275-30 cellular platform is a comprehensive cellular platform for EDGE-based handsets. By reducing component count and cost, the MXC 275-30 platform enables consumers to have handsets that are slim, sleek and stylish. Integrated world-class power amplifier and power management technology helps reduce dropped calls and extend battery life.

For low-tier handsets, the i.250-22 platform for 2.5G and the i.200-22 platform for 2.G are best-in-class system solutions that help you get to market quickly with scalable, cost-effective wireless products.

Cellular Platforms Product Table

Product	Description	Documentation
MXC300-30	Comprehensive cellular platform solution integrating silicon, software and support for mid-to high-tier 3G wireless handsets.	BR1904, MXC30030FS, BRMXCARCHITECT
MXC275-30	Comprehensive cellular platform solution integrating silicon, software and support for 2.75G wireless handsets.	BR1904, MXC27530FS, BRMXCARCHITECT
i.250-22	Comprehensive cellular platform solution integrating silicon, software and support for 2.5G wireless handsets.	BR1904, I25022FS
i.200-22	Comprehensive cellular platform solution integrating silicon, software and support for low-tier 2G wireless handsets.	BR1904, I20022FS

ZigBee®-Compliant Platform

The Freescale Semiconductor ZigBee-compliant platform is a comprehensive, scalable platform designed for a variety of monitoring, automation, and control applications in the home, commercial, industrial, and medical environments. The platform enables cost-effective, low-power applications ranging from simple point-to-point proprietary networks through fully compliant ZigBee technology networks. Freescale is a complete one-stop-shop for your needs, including the MC1319x and MC1320x family of transceivers, MC1321x SiP containing both the RF transceiver and MCU, software and development tools.

The RF transceivers in this family can be used in a variety of networks including proprietary networks, IEEE 802.15.4 networks and ZigBee mesh networks. They are designed to connect to a variety of microcontrollers via a 4-wire SPI interface. This provides for maximum flexibility by allowing designers to pick a MCU that best fits their application needs.

See www.freescale.com/zigbee for ordering and complete documentation.

ZigBee-Compliant and Proprietary RF Transceivers

Product	Supply Voltage (V)	Supply Current @ 1% Duty Cycle (Typ) mA	Standby Current (Typ) µA	Frequency Band GHz	Sensitivity @ 1% PER (Typ) dBm	Serial Interface	Data Rate (Spec) kbps	Tx/RX Switch	Communication Protocol	Packaging
MC13193FC (18B)	2.0 to 3.4	30, TX 37, RX	500	2.4-2.5	-92	SPI	250	No	Figure 8 Wireless ZigBee®	1311 (32 QFN)
MC13192FC (18B)	2.0 to 3.4	30, TX 37, RX	500	2.4-2.5	-92	SPI	250	No	ZigBee®/IEEE® 802.15.4	1311 (32 QFN)
MC13191FC (18B)	2.0 to 3.4	30, TX 37, RX	500	2.4-2.5	-91	SPI	250	No	Proprietary	1311 (32 QFN)
MC13201FC (18B)	2.0 to 3.4	30, TX 37, RX	500	2.4-2.5	-92	SPI	250	Yes	Figure 8 Wireless ZigBee®	1311 (32 QFN)
MC13202FC (18B)	2.0 to 3.4	30, TX 37, RX	500	2.4-2.5	-92	SPI	250	Yes	ZigBee®/IEEE® 802.15.4	1311 (32 QFN)
MC13203FC (18B)	2.0 to 3.4	30, TX 37, RX	500	2.4-2.5	-91	SPI	250	Yes	Proprietary	1311 (32 QFN)

WIRELESS PLATFORMS (continued)

ZigBee-Compliant SiP (System in Package)

The 1321x SiP includes the RF transceivers and an HCS08 in a single package, providing the most cost effective solution. Like the 1320x family, the SiP supports a variety of networks including proprietary networks, IEEE802.15.4 networks and ZigBee networks. The MC13211 is ideal for proprietary networks that have little memory requirements. The MC13212 supports proprietary and IEEE 802.15.4 networks that have larger memory requirements. Finally the MC1313 and MC13214 supports ZigBee networks or applications where a large amount of memory is required.

ZigBee-Compliant SiP Product Table

Product	CPU	Memory	Peripherals	Supply Voltage (V)	Supply Current @ 1% Duty Cycle, CPU @ 2MHz (Typ) mA	Standby Current (Tpy) µA	Frequency Band (GHz)	Sensitivity @ 1% PER (Tpy) dBm	Data Rate (Spec) kbps	Tx/RX Switch	Communication Protocol	Packaging
MC13214 (18m)	HCS08	60KB Flash 4KB RAM	IIC, SCI (2), Timer/PWM(2), KBI, 8ch. 10-bit ADC, Up to 32 GPIO	2.0 to 3.4	31.1, TX 38.1, RX	0.675	2.4-2.5	-92	250	Yes	Figure 8 Wireless ZigBee®	1664 (71-LGA)
MC13213 (18m)	HCS08	60KB Flash 4KB RAM	IIC, SCI (2), Timer/PWM(2), KBI, 8ch. 10-bit ADC, Up to 32 GPIO	2.0 to 3.4	31.1, TX 38.1, RX	0.675	2.4-2.5	-92	250	Yes	ZigBee®/IEEE® 802.15.4	1664 (71-LGA)
MC13212 (18m)	HCS08	32KB Flash 2KB RAM	IIC, SCI (2), Timer/PWM(2), KBI, 8ch. 10-bit ADC, Up to 32 GPIO	2.0 to 3.4	31.1, TX 38.1, RX	0.675	2.4-2.5	-92	250	Yes	Proprietary	1664 (71-LGA)
MC13211 (18m)	HCS08	16KB Flash 1KB RAM	IIC, SCI (2), Timer/PWM(2), KBI, 8ch. 10-bit ADC, Up to 32 GPIO	2.0 to 3.4	31.1, TX 38.1, RX	0.675	2.4-2.5	-92	250	Yes	Figure 8 Wireless ZigBee®	1664 (71-LGA)

ZigBee®-Compliant Platform Development Tools

1320xRFC

The MC13202 RF daughter card is a low-cost development board that provides a simple interface to Freescale's MC13202 transceiver.

- Headers for direct connections to various HCS08 and Coldfire Development boards
- Compliant with the IEEE 802.15.4 and ZigBee standards
- Low power consumption
- Power supply range: 2.0V to 3.4V operating voltage with on-chip regulator
- Data and control interface via standard serial peripheral interface (SPI)

1321xDSK and 1321xDSK-BDM

Freescale Semiconductor's 1321xDSK (Developer's Starter Kit) is based on Freescale's 2nd generation of ZigBee Compliant platforms. The kit contains all the hardware, software and documentation necessary to create proprietary and standards-based peer-to-peer and star networks.

- Two 1321x-SRB (Sensor Reference Board) boards
- Boards have 3-axis acceleration sensor and temperature sensor for easy demonstration of wireless data collection.
- Hardware supports Freescale's IEEE 802.15.4 MAC and example SMAC software
- Preprogrammed accelerometer demonstration and additional downloadable sample applications
- Power Adapters, Batteries and Cables
- DevTech's CodeWarrior™ Development Studio for HCS08 special edition
- Includes USB HCS08 BDM Multilink Programmer (1321xDSK only)

1321xNSK and 1321xNSK-BDM

Freescale Semiconductor's 1321xNSK (Network Starter Kit) provides a solid basis for demonstrating and developing more complex networks, including star and mesh networks.

- Two 1321x-SRB (Sensor Reference Board) and one 1321x-NCB (Network Coordinator Board).
- The 1321x-NCB includes a programmable 2-line LCD for displaying messages
- Supports SMAC, IEEE 802.15.4 network development and ZigBee Z-Stack
- Power Adapters, Batteries and Cables
- Includes DevTech's CodeWarrior™ Development Studio for HCS08 Special Edition
- USB Multilink BDM Programmer/Debugger (1321xNSK-BDM only)

1321xEVK and 1321xEVK-SFTW

The 1321xEVK provides one of the most comprehensive kits for demonstration and development of a complete ZigBee mesh network.

- Four 1321x-SRB (Sensor Reference Board) and three 1321x-NCB (Network Coordinator Board).
- 802.15.4 packet analyzer
- SMAC, 802.15.4 and ZigBee compatible
- Includes Freescale's ZigBee Application Network Demo (ZAND) for easy demonstration of a ZigBee mesh network
- Includes a 90 day evaluation of the ZigBee protocol stack, sample applications and utilities
- Includes DevTech's CodeWarrier Development Studio Special Edition for HCS08

1321xEVK-SFTW adds the following software

- Single user version of the Z-Stack
- DevTech's CodeWarrier Development Studio 60K Standard Edition for the HCS08

RF Low Power Components

Product	Freq. Range MHz	Supply Volt. Range Vdc	Supply Current mA (Typ)	Standby Current uA (Typ)	Small Signal Gain dB (Typ)	Output IP3 dBm (Typ)	NF dB (Typ)	Packaging	System Applicability
MBC13720NT1(18c)	400 to 2500	2.5 to 3.0	9	<20	14.5 @ 1900 MHz	24.5 @ 1900 MHz	1.38 @ 1900 MHz	419B/SOT-363	ISM900, 2400, PCS, CDMA
MBC13916NT1(18c)	100 to 2500	2.7 to 5.0	4.7	—	16.5 @ 900 MHz	16.5 @ 900 MHz	0.9 @ 900 MHz	1404/SOT-343R	General purpose cascode amp for VCOs, buffers, & LNAs
MC13821(18b)	800 to 2500	2.7 to 3.0	2.8	10	18 @ 1575 MHz	18.5 @ 1575 MHz	1.2 @ 1575 MHz	1345/QFN-12	ISM900, ISM2400, GPS, Cellular, PCS, WCDMA

RF Low Power Transistors

Product	Gain-Bandwidth		Nfmin @ f		Gain @ f		Maximum Ratings		Packaging/Style
	fT Typ GHz	Ic mA	(Typ) dB	GHz	(Typ) dB	GHz	V(BR) CEO Volts	Ic mA	
MBC13900NT1(18c)	15	20	1.0 1.3	1.0 2.0	17 14	1.0 2.0	7	20	318M/SOT-343

Low Noise Amplifiers/Mixers

Product	Input Freq. MHz	LO Freq. Vdc	IF Freq. MHz	Gain dB	NF dB	IIP3 dBm	Supply Current	Packaging	System Applicability
MC13770(42) (LNA/Mixer)	2100 to 2170	n/a	n/a	15 -5.0	1.5 5.0	0 20	3.0 mA 10 uA	1345/QFN-12	WCDMA, PCS, PDC

POWER MANAGEMENT

Power Management & User Interface Solutions

Freescale Semiconductor powers the cellular and portable handheld industry with highly integrated, feature rich power management products. Our power management devices provide the fundamentals of battery charging and power distribution complemented with user interface features. This functional convergence is referred to as PMUI (Power Management & User Interface). Freescale's PMUI ICs help reduce overall system cost, component count and board area.

Our mid-to high-tier PMUI ICs include integrated audio amplifiers for microphones, speakers and headsets. The audio subsystem features a voice CODEC for phone calls and 16-bit Stereo DAC for music playback. Other enhanced features include white LED backlighting and tri-color fun lighting support, USB OTG transceiver, and CEA-936-A carkit capability. Freescale's PMUI highly integrated drop-in solutions can help power your smartphones, PMPs, and other portable handheld devices.

Learn More: For more information about Freescale products, please visit www.freescale.com/pmui.

Power Management, Audio & User Interface ICs

Part Number/Description	LDOs	DC-DC Converter	Audio Amps	CODEC	Battery System	Iterface	Lighting	Other	System Applications	Pkg/Pin Count/ Case Outline
MC13783 Highly Integrated, High-Tier PMUI	18	▪ Four bucks 500 mA each ▪ DVS and Parallel capable ▪ One boost	▪ Handset speaker, ▪ Speaker-phone ▪ Stereo ▪ Aux driver ▪ 3-mic amps ▪ Headset detectors ▪ Phantom ground	▪ 13-bit Voice (2-ch ADC) ▪ 16-bit Stereo DAC	▪ Li-Ion main battery charger with 10-bit GPADC and scaling circuitry ▪ Carkit capable ▪ Coin cell charger and system backup	▪ Dual SPI ▪ Dual SSI ▪ Touchscreen interface	▪ 3 zone WLED backlight ▪ 3 bank RGB drivers	▪ RTC ▪ USB OTG transceiver ▪ CEA-936-A Carkit interface ▪ Power gating ▪ User off power cut support	▪ Smartphones and UMTS handsets ▪ PMP (MP3, DVD) ▪ Other portable handheld devices	BGA-247 10x10mm 1605-01
MC13890 Highly Integrated, Mid-Tier PMUI	15	▪ Buck, 350mA ▪ Boost, 5V (adaptive)	▪ Handset speaker ▪ Speaker-phone ▪ Stereo ▪ Aux driver ▪ 2-mic amps ▪ Headset detectors	▪ 13-bit Voice ▪ 16-bit Stereo DAC	▪ Li-Ion main battery charger with 10-bit GPADC and scaling circuitry ▪ Carkit capable ▪ Coin cell charger and system backup	▪ SPI ▪ SSI	▪ 3 zone WLED backlight ▪ 3 bank RGB drivers	▪ RTC ▪ USB OTG transceiver ▪ CEA-936-A Carkit interface	▪ 2.xG cellular handsets ▪ PMP (MP3, DVD) ▪ Other portable handheld devices	BGA-185 10x10mm 1605-01
MC13883 Integrated Charger, USB OTG Transceiver & Carkit Interface	2	No	▪ Carkit switches	No	▪ Li-Ion battery ▪ Carkit capable	SPI or I^2C	▪ Charge indicator only	▪ USB OTG transceiver ▪ CEA-936-A carkit interface ▪ UART ▪ OVP	▪ Cellular handsets ▪ 2-way radios ▪ PMP (MP3, DVD) ▪ Other portable handheld devices	QFN-40 6x6mm 1624-01

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CELLULAR RF SUBSYSTEMS

Cellular RF Subsystems

Freescale is one of the world's largest suppliers of RF transceivers for GSM/EDGE handsets and has been providing WCDMA RF solutions since the standard's creation. As multiband, multimode functions are required for cell phone design, small and easy-to-use RF solutions are mandatory. Freescale has addressed these issues with a portfolio of RF subsystems that are optimized for performance, size, ease of use and cost. Such subsystems leverage Freescale's radio expertise in RF technologies.

The RF piece of the subsystem provides an antenna-to-bits functionality by including not only the traditional transceiver function, but also the analog baseband block as well. In addition to small size and a low number of connections that offer a high level of reliability, low part counts and small inventory for the radio manufacturer, the product designs have been optimized for high performance, best possible integration and cost efficiency. Freescale's innovative layer-one programming function, which debuted in the RFX275-20 RF subsystem, uses single-command programming that reduces calibration steps and speeds time to first call. An engineer enters a single command stating the desired channel and power level. This command sets the parameters and times the events practically guaranteeing compliance.

Learn More: For more information about Freescale products, please visit www.freescale.com/cellularRF.

Cellular RF Subsystems

Subsystem	Number of ICs	Devices	Function	Protocol	Interface	Package	System Applicability
RFX250-20	2	MMM6000 MMM6015	Transceiver Front-End Power Amplifier	GSM/GPRS	DigRF	1584/9x11 mm 1648/6x8 mm	GSM/GPRS Cellular Handsets with Easy Upgrade to EDGE
RFX275-20	2	MMM6000 MMM6027	Transceiver Power Amplifier Switch Module	GSM/GPRS EDGE	DigRF	1584/9x11 mm 1597/8x8 mm	GSM/GPRS/EDGE Cellular Handsets
RFX275-30	2	MMM7010 MMM6028	Transceiver Front-End Power Amplifier	GSM/GPRS EDGE	DigRF	6422/5.2 x 6.8 x 1.1 mm 6426/7.5 x 7.5 x 1.1 mm	GSM/GPRS/EDGE Cellular Handsets
RFX300-20	4	MMM6007 MMM6000 MMM6029 MMM6032	Transceiver Transceiver Power Amplifier Module Power Amplifier Module	WCDMA/EDGE (3G)	Digital and DigRF	1610/11x15 mm 1548/9x11 mm 1597/8x8 mm 1643/4x4 mm	GSM/GPRS/EDGE/WCDMA Cellular Handsets
RFX300-30	2	MMM7020 MMM6038	Transceiver Front-End Power Amplifier	WCDMA/EDGE (3G)	DigRF (3G)	6430/9.25 x 7.65 x 1.1 mm 6432/7.5 x 7.5 x 1.1 mm	GSM/GPRS/EDGE/WCDMA Cellular Handsets

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APPLICATIONS PROCESSORS

i.MX FAMILY

The i.MX family of applications processors is designed for use in multimedia smartphones, portable media players, portable navigation devices, video surveillance systems, point-of-sale systems, bar code scanners, and many other consumer, industrial, medical and general purpose embedded applications. Based on ARM® core technology, the i.MX family is engineered with Freescale's Smart Speed™ technology to deliver power performance while minimizing power consumption. Extensive integration helps to reduce your design time significantly.

i.MX ARM® Core Product Table

Product	RAM (KB)	Product Integration	Timer	Serial	A/D	Operating Voltage	Operating Frequency (MHz)	Temp	Packaging	Status	Additional Information	Documentation
MCIMX31	6 SRAM	ARM1136JF-S™ core processor, 2D/3D Graphics Processing Unit, LCDC, Smart LCDC, CMOS Sensor Interface, Fast IR, Image Processing Unit, L2 Cache, Security, USBOTG, 5xUARTs, 3xCSPIs, I^2C, 2xSSI, Digital Aud MUX, 1-Wire Controller, Keypad IF, 2xMMC/SD, EIM, SDRAM controller, NAND-Flash controller, PCMCIA, DMAC, GPIO, ATA HDD IF	(3) 32-bit	SSI, CSPI, UART, USB, I^2C, I^2S	n/a	1.2 V to 1.6 V Internal; 1.8 V to 3.0 V I/O	532	0°C to 70°C	457-ball MAPBGA	Available		MCIMX31RM
MCIMX31L	6 SRAM	ARM1136JF-S™ core processor, LCDC, Smart LCDC, CMOS Sensor Interface, Fast IR, Image Processing Unit, L2 Cache, Security, USBOTG, 5xUARTs, 3xCSPIs, I^2C, 2xSSI, Digital Aud MUX, 1-Wire Controller, Keypad IF, 2xMMC/SD, EIM, SDRAM controller, NAND-Flash controller, PCMCIA, DMAC, GPIO, ATA HDD IF	(3) 32-bit	SSI, CSPI, UART, USB, I^2C, I^2S	n/a	1.2 V to 1.6 V Internal; 1.8 V to 3.0 V I/O	532	0°C to 70°C	457-ball MAPBGA	Available		MCIMX31RM
MCIMX27	45 SRAM	ARM926EJ-S™ core processor, Smart Speed switch, H.264 D1, MPEG-4, H.263 HW encoder and decoder, 10/100 Ethernet MAC, LCDC, Smart LCDC, CMOS Sensor Interface, Security, USB OTG, Fast IR, ATA, 1-Wire Controller, SDRAM controller, NAND Flash controller, PCMCIA, various connectivity	(6) 32-bit	SSI, CSPI, UART, USB, I^2C, ATA	n/a	1.15 V to 1.65 V Internal, 1.75 V - 3.3 V I/O	400	-20°C to 85°C	404-ball MAPBGA	Available		MCIMX27RM
MC9328MX21	6 SRAM	ARM926EJ-S™ core processor, eMMA, LCDC, Smart LCDC, CMOS Sensor Interface, Fast IR, USBOTG, 4xUARTs, 3xCSPIs, I^2C, 2xSSI, Digital Aud MUX, 1-Wire Controller, Keypad IF, 2xMMC/SD, EIM, SDRAM controller, NAND-Flash controller, PCMCIA, DMAC, GPIO	(3) 32-bit	SSI, CSPI, UART, USB, I^2C, I^2S	n/a	1.45 V to 1.65 V Internal 1.7 V to 2.0 V, or 2.7 V to 3.3 V I/O	266	0°C to 70°C -40°C to 85°C	289-ball MAPBGA	Available		MC9328MX21RM
MC9328MX21S	6 SRAM	ARM926EJ-S™ core processor, LCDC, Smart LCDC, CMOS Sensor Interface, Fast IR, Image Processing Unit, L2 Cache, USBOTG, 3xUARTs, 2xCSPIs, I^2C, 2xSSI, Digital Aud MUX, 1-Wire Controller, Keypad IF, 2xMMC/SD, EIM, SDRAM controller, NAND-Flash controller, PCMCIA, DMAC, GPIO, ATA HDD IF	(3) 32-bit	SPI, CSPI, UART, USB, I^2C, I^2S	n/a	1.45 V to 1.65 V Internal 1.7 V to 2.0 V, or 2.7 V to 3.3 V I/O	266	0°C to 70°C; -40°C to 85°C	289-ball MAPBGA	Available		MC9328MX21S
MC9328MX1	128 SRAM	ARM920T™ core processor, color LCD controller, ASP, DMAC, MMC/SD HC, MSHC, MMA, Video port, 110 GPIO ports, BTA	(2) 32-bit	SPI, UART, USB, I^2C, I^2S	4-CH	1.7 V to 2.0 V Internal, 1.7 V to 2.0 V, 2.7 V to 3.3 V I/O	150, 200	0°C to 70°C -40°C to 85°C	256-ball MAPBGA	No longer recommended for new designs	No longer recommended for new designs	MC9328MX1RM
MC9328MXL	n/a	ARM920T™ core processor, color LCD controller, DMAC, MMC/SD HC, MSHC, MMA, Video port, 110 GPIO ports	(2) 32-bit	SPI, UART, USB, I^2C, I^2S	n/a	1.8, 1.9 Internal 1.8, 1.9/3.0 I/O	150, 200	0°C to 70°C -40°C to 85°C	225-ball MAPBGA 256-ball MAPBGA	Available		MC9328MXLRM
MC9328MXS	n/a	ARM920T™ core processor, color LCD controller, DMAC	(2) 32-bit	SPI, UART, USB, I^2C, I^2S	n/a	1.8, 1.9 Internal, 1.8, 1.9/3.0 I/O	100	0°C to 70°C -40°C to 85°C	225-ball MAPBGA	Available		MC9328MXSRM

DragonBall™ Family

DragonBall 68K Core Product Table

DragonBall processors are no longer recommended for new designs.

Product	RAM (KB)	Product Integration	Timer	Serial	A/D	Operating Voltage +/- 10% (V)	Operating Frequency (MHz)	Temp	Packaging	Status	Additional Information	Documentation
MC68SZ328	100 SRAM	FLX68000 core processor, color LCD controller, ASP, DMAC, MMC/SD HC, MSHC, 93 GPIO ports	(2) 16-bit	SPI, UART, USB, I²C	4-CH	1.8 Internal 3.0 I/O	66	0°C to 70°C -40°C to 85°C	196-ball MAPBGA	No longer recommended for new designs	No longer recommended for new designs.	MC68SZ328RM
MC68VZ328	n/a	FLX68000 core processor, LCD controller, 76 GPIO ports	(2) 16-bit	SPI, UART	n/a	3.0	33, 45	0°C to 70°C -40°C to 85°C	144-pin LQFP 144-ball MAPBGA	No longer recommended for new designs	No longer recommended for new designs.	MC68VZ328UM

ACCESS AND REMOTE CONTROL

Transmitters and Receivers

Product	Description	Packaging	Band (MHz)	Data Rate (kbps)	MCU Interface	Operating Voltage (V)	Status
Transmitter (TANGO3)							
MC33493	PLL Tuned UHF Transmitter, OOK/FSK Modulation, -40°C to +125°C	14-pin TSSOP	315, 434, 868	1 to 11	2 Logic Lines	1.8 to 3.6	Available
Receiver (ROMEO2)							
MC33591	PLL Tuned UHF Receiver, OOK/FSK Modulation, IF BW = 500 kHz, -40°C to +85°C	24-pin LQFP	315, 434	1 to 11	SPI	5	Available
MC33592	PLL Tuned UHF Receiver, OOK Modulation, IF BW = 300 kHz, -40°C to +85°C	24-pin LQFP	315, 434	1 to 11	SPI	5	Available
MC33593	PLL Tuned UHF Receiver, OOK/FSK Modulation, IF BW = 500 kHz, -40°C to +85°C	24-pin LQFP	868	1 to 11	SPI	5	Available
MC33594	PLL Tuned UHF Receiver, OOK/FSK Modulation (Data Manager in FSK only), IF BW = 500 kHz, -40°C to +105°C Extended Temperature	24-pin LQFP	315, 434	1 to 11	SPI	5	Available
TAG Reader (STARC) for Immobilizer Applications							
MC33690	Stand-alone TAG reader with Voltage Regulator	20-pin SOIC	125 (kHz)	0.5 to 8	K line ISO-9141	12	Available

68HC08 Family

Product	ROM (Bytes)	RAM (Bytes)	Flash or OTP (KB)	EEPROM (Bytes)	Timer	I/O	Serial	A/D	PWM	COP	Packaging	OperVoltage (V)	Max Bus Freq (MHz)	Temp	Flash or OTP	Status	Additional Information	Documentation
MC68HC908RF2	n/a	128	2 Flash	n/a	1-CH, 16-bit	12	n/a	n/a	See Timer	Y	32-pin LQFP (FA)	1.8 to 3.6	4.0	C, M	Flash	Available	Two-chip hybrid MCU with an on-board TANGO3 RF Transmitter	MC68HC908RF2

DEVELOPMENT TOOLS

MCU Wireless Development Tools

Product	Description	Status
13192DSK-A00	MC13191/92 Developer's Starter Kit used to implement wireless network designs compatible with the IEEE® 802.15.4 standard.	Available
13192RFC-A00	A low-cost development board that provides a simple interface to Freescale's MC13192 transceiver.	Available
13193EVK-00A	MC13193 Evaluation Kit used to implement wireless designs compatible with the ZigBee® and the IEEE 802.15.4 standard	Available

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