

# ember ZigBee™ ICs and Development Kits



The **EM250** is a single-chip solution that integrates a 2.4GHz, ZigBee/802.15.4-compliant transceiver with a 16-bit XAP2b microprocessor. It contains integrated Flash and RAM memory and peripherals of use to designers of ZigBee-based applications.

The **EM260** integrates a 2.4GHz, IEEE 802.15.4-compliant transceiver with a 16-bit XAP2b processor to run EmberNet, the Ember ZigBee-compliant network stack. The XAP2b microprocessor is a power-optimized core integrated in the EM260. It contains integrated Flash and RAM memory along with an optimized peripheral set to enhance the operation of the network stack.

The **EM2420** is a true single-chip 2.4GHz IEEE 802.15.4 compliant RF transceiver. It includes a digital direct sequence spread spectrum baseband modem and an effective datarate of 250kbps.

## Features:

- RF transceiver with baseband modem, MAC support and networking stack • DSSS baseband modem • RFD and FFD operation • Low current (RX: 19.7mA, TX: 17.4mA)
- 2.1 ~ 3.6V with integrated voltage regulator, 1.6 ~ 2.0V with external voltage regulator.

The **JumpStart™ Developer Kit** contains both hardware and software, enabling customers to quickly launch development projects for embedding low-power low-data rate wireless application into their products.

The **Full Development Kit** includes hardware, networking stack and development and debugging software for building embedded applications. The software package includes a service-aware API that simplifies code development and lets you focus on your embedded applications.

Description	Digi-Key Part No.	Price Each			Ember Part No.
		1	10	100	
<b>IEEE 802.15.4/ZigBee ICs — RoHS Compliant</b>					
ZigBee Single Chip IC, 48-OFN	636-1000-1-ND\$	10.00	9.00	7.98	EM250-RTR
ZigBee Single Chip IC, 48-OFN	636-1000-2-ND\$	14820.00/2,000			EM250-RTR
ZigBee Single Chip IC, 40-OFN	636-1003-ND	9.82	7.86	6.63	EM260-RTY
ZigBee Single Chip IC, 40-OFN	636-1007-1-ND\$	9.40	7.52	6.35	EM260-RTR
ZigBee Single Chip IC, 40-OFN	636-1007-2-ND\$	20398.00/3,500			EM260-RTR
ZigBee Single Chip IC, 48-QLP	636-1006-1-ND\$	8.00	6.40	5.40	EM2420-RTR
ZigBee Single Chip IC, 48-QLP	636-1006-2-ND\$	19840.00/4,000			EM2420-RT
<b>Development Kits</b>					
JumpStart Kit for EM250	636-1001-ND	2500.00	—	—	EM250-JMP-R
JumpStart Kit for EM260	636-1004-ND	2500.00	—	—	EM260-USART-JMP-R
Full Development Kit for EM250	636-1002-ND	10000.00	—	—	EM250-DEV
Full Development Kit for EM260	636-1005-ND	10000.00	—	—	EM260-DEV
RF Evaluation Kit for EM250	636-1008-ND\$	500.00	—	—	EM250-EK-R
<b>Tool — RoHS Compliant</b>					
USB FLASH Programming for EM250/EM260	636-1009-ND	72.00	—	—	EM2XX-USB-PROG-R

§ Cut Tape    † Tape and Reel    ◆ RoHS Compliant



## NEW! LTCC WLAN Frontend Modules for 802.11



**Features:** • Miniature fully-integrated WLAN/ Bluetooth frontend module for mobile phone applications • Covering IEEE 802.11b/g (WLAN) and Bluetooth frequency band at 2.4GHz • Integrated fully-matched power amplifier with power detector • Integrated high-rejection filter for co-existence of cellular and WLAN radios • Integrated high-isolation SPDT antenna switch • Simple application circuit with minimum external component count • Power supply from unregulated battery voltage

**Specifications:** • Operation Temperature Range: -30°C ~ 85°C • Maximum Input Power on Tx Port: 50Bm • Maximum Input Power on RF Ports (except Tx): 300Bm • Maximum Supply Voltage: 5.4V • Maximum Supply Current: 400mA • Maximum Reference Voltage: 3.0V

Digi-Key Part No.	Cut Tape Price Each			Digi-Key Part No.	Tape and Reel Pricing 3,000	Epcos Part No.
	1	10	100			
495-3922-1-ND	5.70	5.13	4.28	495-3922-2-ND	2850.00/M	B30810D6101Q819

## OBID i-scan FEIG Readers

### ID CPR.02.VP/AB-ATS

ID CPR.02.VP/AB-ATS is not only able to identify ISO 14443, but also type ISO 15693 transponders. It is a multi-tag reader, which means that it is able to identify and to write on transponders of different manufacturers and ISO-types. The reader supports the safety functions of various known 13.56MHz transponders, such as MIFARE or my-d, due to a SAM-card interface for Security Access Modules. So the reader is even suitable for problematic applications such as ticketing and accounting systems. The use of an ISO-host record guarantees a problem free creation of user software as well as the module's unlimited compatibility with all readers of the OBID i-scan family.

**Specifications:** • Dimensions (W x H x D): 114mm x 83mm x 48mm • Housing: Plastic ASA, desk top reader • Protection Class: IP 22 • Operating Frequency: 13.56MHz • Power Supply: 12 ~ 24VDC • Power Consumption: Maximum 2.6W • Processable Transponders: ISO 14443-A (e.g. MIFARE, MIFARE Ultra Light, my-proximity) ISO 14443-B; ISO 15693 (e.g. I-CODE SLI, my-d vicinity, STM LRI512, Tag-it HF-I)

• Processable Safety Features: Integrated SAM-card interface for SAM (e.g. my-d vicinity and my-d proximity) • Antenna: Integrated • Reading Distance: 7cm with ISO 15693-tags, 6cm with ISO 14443-A-tags. Reading distances depend on the used labels; here made statements relate to an inlet size of 76mm x 45mm. In addition, tuning and quality of the antennas have to be taken into consideration. • Interfaces: 1x RS232 with 2.5m connecting cable • Signal Generator: 1 LED (bi-color), 1 Buzzer • Temperature Range: Operating: -20°C ~ 60°C; Storage: -40°C ~ 85°C • EEPROM: 1kB (10,000 writing cycles) • FLASH: Software-Update over interface possible

629-1001-ND (FEIG ELECTRONICS # 0913.017.00) ..... \$831.13

### ID ISC.MR101-A, ID ISC.MR101-USB and ID ISC.MR101.M-A

Multi-tag mid range reader for identification of Smart Labels in the fields of application retail, rental services and industry. The mid-range reader ID ISC.MR101-A/-USB/-M-A works with Smart Labels which are based on transponders with an operating frequency of 13.56MHz. Depending on the antenna used, the reader has a maximum reading distance of up to 40cm.

**Specifications:** • Anticollision Function • OBID i-scan SMP (Standard Multi-tag Protocol) • Multi-tag Reader (I-CODE, Tag-it, ISO 15693) • Housing: Plastic • Color: Light Grey • Dimensions (L x W x H): 145mm x 85mm x 31mm • Protection Class: IP 30 • Weight: 170g • Power Supply: Variant A: 12 ~ 24VDC +/-15% via external power supply; Variant USB: 12V via external power supply • Power Consumption: Approximately 6VA • Operating Frequency: 13.56MHz • Transmitting Power: Approximately 0.8 up to 1W • Modulation Factor: 10% and 100% (via software adjustable) • Antenna connection: 1 x SMA female plug (50Ω) • Reading Distance: Maximum 40cm • Interfaces: RS232/RS485 (switchable) or USB • Signal Generator: 1 LED (multicolored red/green) • Processable Transponders: I-CODE, Tag-it and ISO 15693 • Temperature Range: Operating: -25°C ~ 60°C; Storage: -25°C ~ 85°C • FLASH: 64kByte (software may be updated via interface)

629-1015-ND (FEIG ELECTRONICS # 1638.000.01) RS-232/485 ..... \$571.49

629-1016-ND (FEIG ELECTRONICS # 1638.001.02) USB ..... \$611.86

629-1019-ND (FEIG ELECTRONICS # 1638.005.01) Module, RS232/485 ..... \$540.43

### ID ISC.LRMU1000-A-FCC, ID ISC.LRU1000-AO-FCC and ID ISC.LRU1000-A-FCC

The UHF-Long Range Reader Module ID ISC.LRMU1000 identifies UHF transponders within a frequency range from 865MHz to 928MHz and so can be used in Europe and in North America. Licensed according to EN and FCC, in each area maximum allowed transmitting power can be realized. Due to the high maximum reading range of up to 5m with a single antenna and up to 10m with a multi-antenna application, the reader is suitable especially for Asset Management and logistical applications especially there, simultaneous identification of several transponders and very high reading ranges are necessary! Connection of up to 4 external antennas enables realization of multi-antenna-applications (integrated Multiplexer), two different interfaces (RS232, RS485) guarantee high flexibility to connect the reader with your individual backup-system.

#### Specifications:

• Dimensions (W x L x H): 170mm x 320mm x 48mm • Power Supply: 12 ~ 24VDC • Power Consumption: Maximum 29VA • Operating Frequency: 869, 525MHz; 865, 6-867, 6MHz (200kHz steps); 902 ~ 928MHz (500kHz steps) • Transmitting Power: 100mW ~ 4W (100mW steps); 4W EIRP; 2W ERP (0.5W ERP) • Modulation: 20%, 40% and 100% (scalable via software) • Receiver: Data rates 40 ~ 320kbps • Antenna Connectors: 4 x SMA connector (50Ω) • Outputs: 1 Optocoupler: 24VDC/30mA, 1 Relay (1x NO/NC); 24VDC/2A • Inputs: 1 Optocoupler: Maximum 24VDC/20mA • Interfaces: RS232 and RS485 • Temperature Range: Operating: -25°C ~ 55°C (-25°C ~ 70°C); Storage: -25°C ~ 85°C

629-1049-ND (FEIG ELECTRONICS # 2481.001.11) FCC Module ..... \$3636.74

• Housing: Plastic with heatsink • Dimensions (W x L x H): 180mm x 320mm x 110mm • Protection Class: IP 54

629-1045-ND (FEIG ELECTRONICS # 2241.002.12) Housed ..... \$4305.56

629-1046-ND (FEIG ELECTRONICS # 2241.002.11) Housed, Supports EPC Class 0/0+ Protocols ..... \$4044.18

### ID ISC.M02-B

The ID ISC.M02-B works with Smart Labels with an operating frequency of 13.56MHz. The Read/Write PCB has a maximum reading distance of up to 10cm by using the integrated antenna. By using the external antennas, distances of 7cm (antenna size 30mm x 40mm) respectively 14cm (antenna size 100mm x 100mm) will be reached. The reader is above all suitable for supply chain applications in the fields of retail, industry, logistics etc. It is even suitable for problematic applications such as ticketing and accounting systems due to an attachable security access module. Apart from this, the data/clock interface enables the reader to be used in access control systems.

#### Specifications:

• Dimensions (L x W x H): 50mm x 50mm x 15mm • Connector Plug: 10-pole pin terminal (spacing = 2.54mm) • Operating Frequency: 13.56MHz • Power Supply: 5VDC +/-5% • RF Transmitting Power: 90mW +/-2dB • Power Consumption: Maximum 1W • Processable Transponders: ISO 15693 transponders such as I-CODE SLI, my-d vicinity, STM LRI512, Tag-it HF-I etc. • Processable Safety Features: Refitting of SAM (Security Access Module) is possible for my-d vicinity • Antenna: Integrated, 48mm x 48mm, external 50Ω antennas optional • Reading Distance: 10cm with integrated antenna up to 14cm with external antennas • Interfaces: 1x RS232-TTL, 1x Data/clock interface, (magnet card emulation and Wiegand emulation) • Signal Generator: 2 LED • Temperature Range: Operating: -20°C ~ 70°C; Storage: -40°C ~ 85°C • EEPROM: 1kB (10,000 writing cycles) • FLASH: 64kB (Software update over interface possible)

629-1032-ND (FEIG ELECTRONICS # 1834.000.00) ..... \$217.41

### ID ISC.PRH101-B, ID ISC.PRH101-USB and ID ISC.PRH101-A

As every device of the OBID i-scan HF product family, the hand-held reader ID ISC.PRH101-B identifies transponders with an operating frequency of 13.56MHz. The reader has a maximum reading/writing distance of up to 18cm and is suitable especially for mobile use in connection with a PDA or laptop. PDA or laptop can be used as a mobile host e.g. as data collector. The reader's own power supply allows RF transmitting power, that enables identification of transponders which are very close together.

#### Specifications:

• Bluetooth interface (class I-B) • Anti-collision function • OBID i-scan ISO Host Mode • 2 Operation Modes: Scan-Mode/ Polling-Mode • Housing: Plastic ABS (closed) • Color: RAL 9002/RAL 7044 • Dimensions (L x W x H): 230mm x 100mm x 80mm • Weight: 320g (without batteries) • Protection Class: IP 30 • Power Consumption: Maximum 2.5W • Operating Frequency: 13.56MHz • Transmitting Power 0.5W +/-2dB • Antenna: Integrated • Interface: Bluetooth (class I)/USB/RS232 • Supported Transponders: ISO 15693 tags, ISO 18000-3 tags, optional: further tag types • Signal Generator: Optical: 1 LED (red/green/blue); Acoustic: Buzzer • Temperature Range: Operating: 0°C ~ 50°C; Storage: -20°C ~ 70°C • Relative Humidity: 95% (non-condensing)

629-1010-ND (FEIG ELECTRONICS # 1524.000.01) RS-232 ..... \$512.47

629-1011-ND (FEIG ELECTRONICS # 1524.001.01) USB ..... \$549.74

629-1013-ND (FEIG ELECTRONICS # 1524.004.00) Bluetooth ..... \$838.59

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Digi-Reel® Most SMT cutdown parts are available on a Digi-Reel®. For Digi-Reel part number, change 1-ND to 6-ND or CT-ND to DKR-ND. See Digi-Key® Services on page 2 for additional information.

More Product Available Online: [www.digikey.com](http://www.digikey.com)