CEL

Empowering Wireless Connectivity



Embed +60 Years of Wireless Expertise & Performance Into Your Connected Solution

THE CEL ADVANTAGE

Performance
- Best in class wireless connectivity
- Lowest system power consumption
- Product testing & verification

AcCELerate TTM
- 2-day in-person training
- Quick start guides/resources
- Fast prototyping

Commercial Grade Quality & Reliability
- 100% RF tested w/traceability
- Extensive JESD22 qualifications
- No field failures, RMAs, truck rolls…

Technical Support & Expertise
- HW, FW, Antenna design guides
- Comprehensive design reviews
- Certification/compliance



- Home Automation
- Building Automation
- Connected Lighting
- Industrial
- Smart Energy

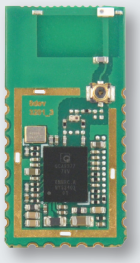
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High-performance & Ultra Low-power Wi-Fi & BT for Hosted Applications

- Based on Qualcomm's QCA9377-x
- Dual-band 1x1 802.11 b/g/n/a/ac Wave2 & BT5.0
- SDIO and USB interface options
- +20dBm
- On-board and external antenna options
- Miniature form factor
- Industrial Temp.
- Drivers: Linux, Windows 10, and Android



COMING SOON — Low-Power IoT Module

- Based on Realtek 8710
- 1T1R 802.11 b/g/n
- ARM Cortex M4F
- FreeRTOS, Arm Mbed
- On-board and external antenna options



COMING SOON — Multi-Protocol IoT Connectivity Solution

- Based on Qualcomm's QCA4020 chip set
- Wi-Fi, BLE, ZigBee, Thread
  - Dual-band 1x1 802.11 a/b/g/n
  - BLE5.0
  - ZB 3.0
  - Thread v1.1
- Implementation options:
  - Hostless…Integrated Cortex-M4F, SRAM, Flash & peripherals for application, ThreadX and FreeRTOS
  - Hosted…SDIO/SPI/UART interfaces for external host MCU, driver source code and APIs
- Dedicated CPUs for Wi-Fi and 802.15.4 stacks
- Concurrent Wi-Fi and 802.15.4 operation
- Coexistence manager
- Low power Wi-Fi and 802.15.4 operation modes
- Pre-integrated s/w for HomeKit and OCF, AWS IoT SDK, and Microsoft Azure IoT Device SDK



PRODUCT OFFERINGS & TECHNICAL INFORMATION



Based on EM3588 SoC



Based on EM357 SoC



Based on EFR32MG12 SoC



MeshConnect Products		EM358x Mini Modules		EM357 Mini Modules		ZB3212F6R Multi-Mode	EM35x USB Sticks	
		Standard	Extended Range	Standard	Extended Range	Standard	Standard	Extended Range
MCU	**Radio Parameters**	2405 to 2480 MHz / DSSS / IEEE 802.15.4		2405 to 2480 MHz / DSSS / IEEE 802.15.4		2405 to 2480 MHz / DSSS / IEEE 802.15.4	2405 to 2480 MHz / DSSS / IEEE 802.15.4	
	Transceiver Chipset	**Silicon Labs™ EM3588** 32 bit, ARM® Cortex™ - M3		**Silicon Labs™ EM357** 32 bit, ARM® Cortex™ - M3		**Silicon Labs™ EFR32MG12** 32 bit, ARM® Cortex™ - M4	**Silicon Labs™ EM35x** 32 bit, ARM® Cortex™ - M3	
	Memory on Chip	512 kB Flash, 64 kB RAM		192 kB Flash, 12 kB RAM		1MB Flash, 256kB RAM	192 kB Flash, 12 kB RAM	
	Supplemental Memory	–		–		–	1 MB Flash	
	Inputs / Outputs	Up to 23		Up to 22		Up to 24	N/A	
	USB	USB 2.0 (full speed)		–		–	USB 2.0 (full speed)	
NETWORK	**Protocal**	Zigbee, Thread		Zigbee		Zigbee, Thread, BTLE	USB, Zigbee, Thread	
	Mesh Networks	✓		✓		✓	✓	
	Over-the-Air Data Rate	250 kbps		250 kbps		250kbps	250 kbps	
	Over-the-Air Security	128-bit AES Encryption		128-bit AES Encryption		128/256-bit AES Encryption	128-bit AES Encryption	
	Software / ZigBee Stack	EmberZNet PRO™ (ZigBee PRO)		EmberZNet PRO™ (ZigBee PRO)		EmberZNet PRO™	EmberZNet PRO™ (ZigBee PRO)	
PERFORMANCE	**Tx Output Power**	+ 8 dBm	+ 20 dBm	+ 8 dBm	+ 20 dBm	+20dBm	+ 8 dBm	+ 20 dBm
	Rx Sensitivity	- 100 dBm	- 103 dBm	- 100 dBm	- 103 dBm	-101dBm	- 100 dBm	- 103 dBm
	RF Link Budget	+108 dB	+123 dB	+108 dB	+123 dB	+121dBm	+108 dB	+123 dB
	Power Supply Voltage	2.1 to 3.6 V		2.1 to 3.6 V		2.4-3.8V	4.0 to 5.25 V	
	Rx Current	30 mA	34 mA	30 mA	34 mA	12mA	51 mA	55 mA
	Tx Current @ Max Power	44 mA	150 mA	44 mA	150 mA	120mA	65 mA	165 mA
	Sleep / Suspend Current	2.4 µA		1.0 µA		.43uA	0.24 µA	
	Dimensions	23.9 x 16.6 x 3.9 mm (0.94 x 0.655 x 0.152 in)		23.9 x 16.6 x 3.9 mm (0.94 x 0.655 x 0.152 in)		23.9x16.6.x3.9mm	52.7 x 24.9 x 9.98 mm (2.075 x 0.984 x 0.393 in)	
	Footprint Compatible	✓		✓		✓	–	
	Integrated Antenna	✓		✓		✓	✓	
	RF Port for External Antenna	✓		✓		✓	–	
	Temperature Range	-40 °C to 85 °C		-40 °C to 85 °C	-40 °C to 85	-40 °C to +85°C	-30 °C to 70°C	
CERTIFICATIONS	**FCC**	✓	✓	✓	✓	✓	✓	✓
	IC	✓	✓	✓	✓	✓	✓	✓
	CE	✓	–	✓	–	–	✓	–
	RoHS	✓	✓	✓	✓	✓	✓	✓
	Part Numbers	ZICM3588SP0-1 ZICM3588SP0-1C*	ZICM3588SP2-2 ZICM3588SP2-2C*	ZICM357SP0-1 ZICM357SP0-1C*	ZICM357SP2-2 ZICM357SP2-2C*	ZB3212F6R4SP2-1,-1C	ZM357S-USB	ZM357S-USB-LR

* Part numbers ending in ***SP0-1C*** have an RF port for external antennas and are not FCC, IC or CE certified.
Part numbers ending in ***SP2-2C*** have an RF port for external antennas and are FCC and IC certified for a Nearson S181AH-2450S antenna.