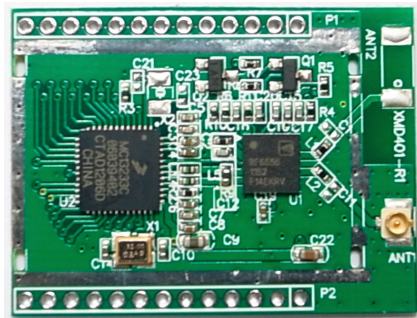# XMD410

ZigBee Compliant Platform 2.4GHz High Power Transceiver Module for IEEE 802.15.4 Standard

DATA SHEET Version A

Quan International Co., Ltd.,

XMD410 Features

- Fully compliant 802.15.4 Standard and can support fully Zigbee features
  — 2.4GHz, 16 selectable channels in the 2.4 GHz ISM band
  — Programmable output power, +17dBm maximum
  — Receive sensitivity of -90 dBm
  — Supports up to 250 kbps O-QPSK data and full spread-spectrum encode and decode
- Hardware acceleration for IEEE® 802.15.4 applications
  — DMA interface
  — AES-128 Security module
  — 16-Bit random number generator
  — 802.15.4 Auto-sequence support
  — 802.15.4 Receiver Frame filtering
- Multiple power saving modes provide super low power consumption benefits;
- 82 KB Flash and 5KB RAM for application programming and no additional MCU cost;
- Keyboard interrupt (KBI) modules
  —10 KBI pins with selectable polarity
- Up to 22 I/O pins provide flexible interfaces;
- 1 UART port, 1 SPI port and 1 I2C port
- Compact size with iPex RF connector or embedded antenna on board;
- 2X13 through hole for 2.0mm pitch header

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- "Ready to go" modules speeding up products development;

Applications

- Home Automation : Security control , HVAC/Lighting control, access control, lawn & garden irrigation, energy management, smart home network;

- Building Automation : security, HVAC, ARM, lighting control, access control;

- Industry Automation : Asset management, process control, environmental monitoring, energy management ;

- Cable replacement

Specifications:

- 82KB flash memory with block protection and security and up to 5KB RAM , allows for application programming space and save the cost for additional MCU.;
- Input voltage: 1.8V ~ 3.6V
- RF Data rate: 250kbps
- Low power modes (Wait plus Stop2 and Stop3 modes, less than 3 µA in STOP3)
- Fully compliant 802.15.4 Standard transceiver supports 250 kbps O-QPSK data in 5.0 MHz channels and full spread-spectrum encode and decode
- Programmable output power with 0 dBm nominal output power, programmable from -20 dBm to +17dBm typical

- Receive sensitivity of -90 dBm (typical) at 1% PER, 20-byte packet, much better than the IEEE 802.15.4 Standard of -85 dBm

- Operates on one of 16 selectable channels in the 2.4 GHz ISM band
- Keyboard interrupt (KBI) modules
  — Two Keyboard control modules capable of supporting up to a 12x12 keyboard matrix
  — 10 Dedicated KBI pins with selectable polarity
- Serial communication interface (SCI)
  — Full duplex non-return to zero (NRZ)
  — Baud rates as high as 1 Mbps can be supported
  — LIN master extended break generation
  — LIN slave extended break detection
  — Wake-up on active edge
- Serial peripheral interface (SPI)
  — Full-duplex or single-wire bidirectional
  — Double-buffered transmit and receive
  — Master or Slave mode; MSB-first or LSB-first shifting
- Inter-integrated circuit (IIC) interface -— Up to 100 kbps baud rate with maximum bus loading
  — Baud rates as high as 800 kbps can be programmed
  — Multi-master operation
  — Programmable slave address
  — Interrupt driven byte-by-byte data transfer;
  — Supports broadcast mode and 10-bit addressing
- Four 16-bit timer/pulse width modulators (TPM[4:1]) - each TPM module has an assigned GPIO pin and provides
  — Single channel capability
  — Input capture
  — Output compare
  — Buffered edge-aligned or center-aligned PWM10 Bit A/D converters
- Real-time counter (RTC)
  — 16-bit modulus counter with binary or decimal based pre-scaler;
  — External clock source for precise time base, time-of-day, calendar or task scheduling functions(optional)
 — Capable of greater than one day interrupt.

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- System protection features
    - Programmable low voltage interrupt (LVI)
    - Optional watchdog timer (COP)
    - Illegal opcode detection
- Up to 22 I/O pins, include GPIOs, UART, IIC, Counters, Keyboard Interrupts,etc., and provide flexible interfaces for product development and integration.
- Minimal external components are required such as antenna, matching circuit and power, provides simple and flexible options for applications development.
- Operating Temperature: -40 to +85°C
- Additional RF switch to minimize the noise caused by internal RF switch. And this greatly enhances the communication distance.
- Power Consumption:
    - Hibernate: 8μA
    - Transmit Mode : 130 mA(output power=17dbm)
    - Receive Mode : 45 mA(typical)

- Small module footprint: 27mmX36mm

Device Diagram
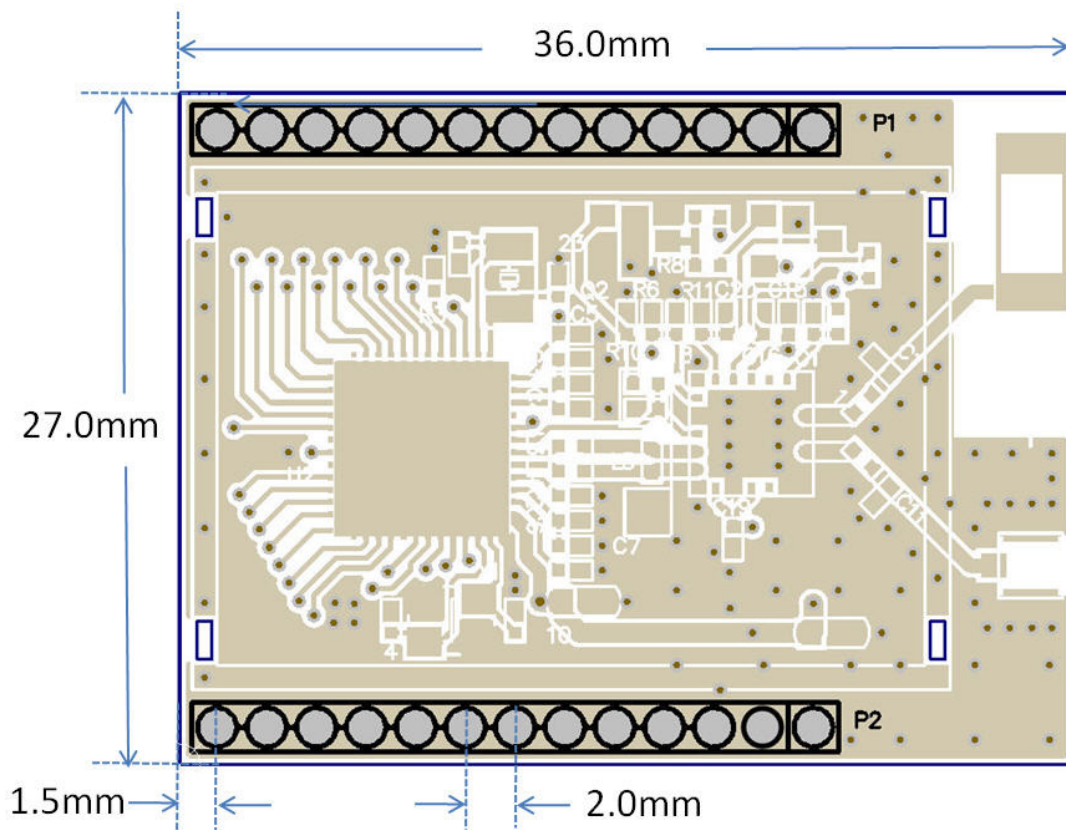
Dimensions :　length 27 mm X width 36mm X height 3mm

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Device Pinouts
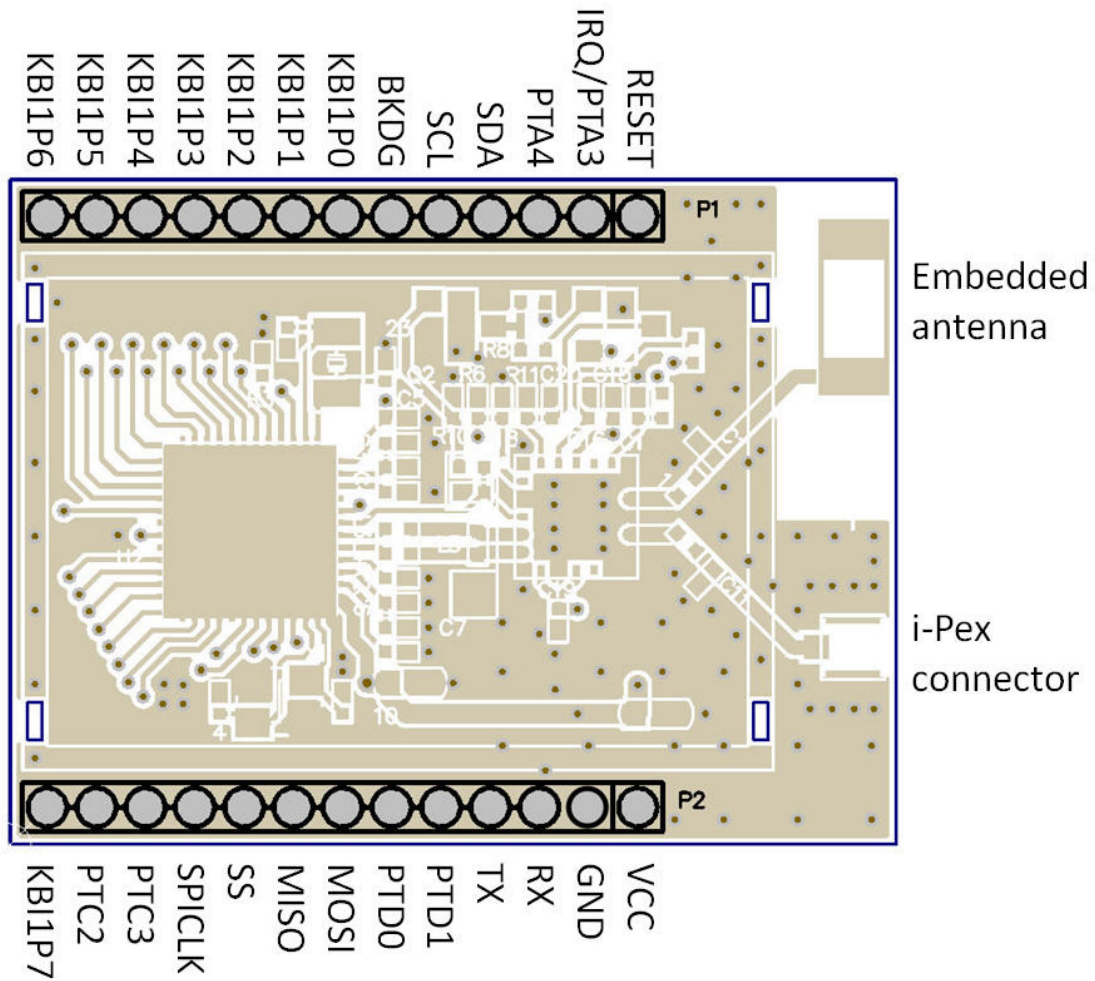
Electrical Specifications

Item		Min	Typical	Max	Unit
Frequency		2.405		2.480	GHz
Supply voltage		1.8	2.7	3.6	V
MCU current consumption	Run mode		4.7		mA
	Wait mode		0.56		mA
	Stop2 mode		0.40		uA
	Stop3 mode		0.45		uA
RF current consumption	TX		130		mA
	RX		45		mA
TX output power		-20	0	17	dBm

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Item	Min	Typical	Max	Unit
TX EVM		<16	20	%
RX sensitivity(250Kbps)		-90		dBm
Maximum input level			10	dBm
Frequency error tolerance			200	kHz
Operation temperature	-40	25	85	℃