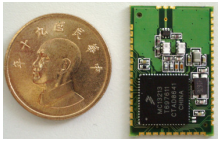
ZMD100-A01

ZigBee Compliant Platform
2.4G RF Low Power Transceiver
Module for IEEE 802.15.4 Standard

DATA SHEET
Revision F



Quan International Co., Ltd.,

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
  - — Supports up to 250 kbps O-QPSK data and full spread-spectrum encode and decode
- Multiple power saving modes provide super low power consumption benefit ;
- 60 KB Flash and 4KB RAM for application programming and no additional MCU cost;
- Up to 32 pins provide flexible interfaces;
- “Ready to go” modules to speed up products development;
- With additional RF switch to decrease the noise and support for long distance communication.

Applications

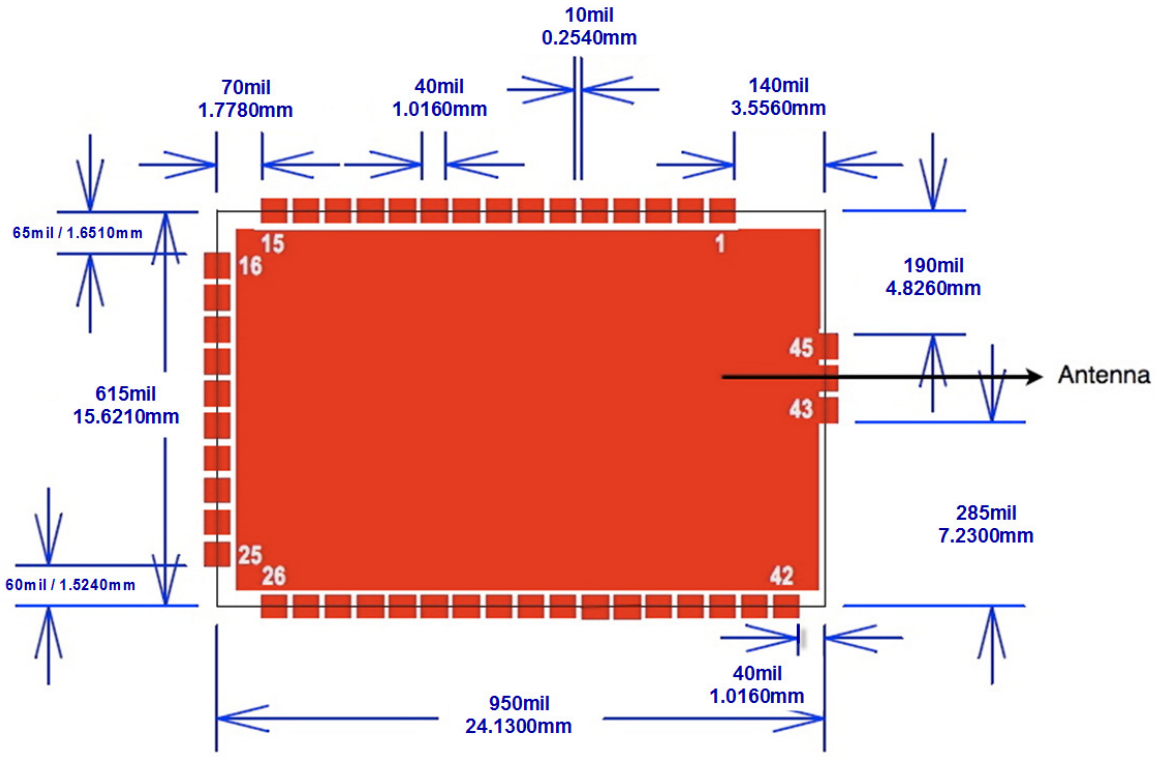
- Home Automation : Security control , HVAC/Lighting control, access control, lawn & garden irrigation, energy management, smart home network;
- Building Automation : security, HVAC, ARM, lighting control, access control;
- Industry Automation : Asset management, process control, environmental monitoring, energy management ;
- Health Care : patient monitoring, fitness monitoring ;

Specifications:

- 60KB flash memory with block protection and security and up to 4KB RAM , allows for application programming space and save the cost for additional MCU.;
- Input voltage: 2.4V ~ 3.6V
- RF Data rate: 250kbps
- Low power modes (Wait plus Stop2 and Stop3 modes)
- 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
- -1 dBm to 0 dBm nominal output power, programmable from -27 dBm to +3 dBm typical
- Operates on one of 16 selectable channels in the 2.4 GHz ISM band
- Receive sensitivity of < -92 dBm (typical) at 1% PER, 20-byte packet, much better than the 802.15.4 Standard of -85 dBm
- Onboard trim capability for 16 MHz crystal reference oscillator eliminates need for external variable capacitors and allows for automated production frequency calibration
- 10 Bit A/D converters
- System protection features
  - Programmable low voltage interrupt (LVI)
  - Optional watchdog timer (COP)
  - Illegal opcode detection
- Up to 32 I/O pins, include GPIOs, UART, IIC, Counters, Keyboard Interrupts, A/D converters etc., 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: -20 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 : 41.5 mA
  - Receive Mode : 43.5 mA

Device Diagram



Dimensions : length 24.13 mm X width 15.62mm X height 2mm

Device Pinouts

Pin #	Pin Name	Description
1	GPIO4	General Purpose Input/Output 4.
2	GPIO3	Modem General Purpose Input/Output 3
3	GPIO2	MCU Port E Bit 6 / Modem General Purpose Input/Output 2
4	PTD2/TPM1CH2	MCU Port D Bit 2 / TPM1 Channel 2
5	PTD4/TPM2CH1	MCU Port D Bit 4 / TPM2 Channel 1
6	PTD5/TPM2CH2	MCU Port D Bit 5 / TPM2 Channel 2
7	PTD6/TPM2CH3	MCU Port D Bit 6 / TPM2 Channel 3
8	PTD7/TPM2CH4	MCU Port D Bit 7 / TPM2 Channel 4
9	PTB0/AD1P0	MCU Port B Bit 0 / ATD analog Channel 0
10	PTB1/AD1P1	MCU Port B Bit 1 / ATD analog Channel 1
11	PTB2/AD1P2	MCU Port B Bit 2 / ATD analog Channel 2
12	PTB3/AD1P3	MCU Port B Bit 3 / ATD analog Channel 3
13	PTA3/KBI1P3	MCU Port A Bit 3 / Keyboard Interrupt Bit 3
14	PTA4/KBI1P4	MCU Port A Bit 4 / Keyboard Interrupt Bit 4
15	PTA5/KBI1P5	MCU Port A Bit 5 / Keyboard Interrupt Bit 5
16	PTA6/KBI1P6	MCU Port A Bit 6 / Keyboard Interrupt Bit 6
17	PTA7/KBI1P7	MCU Port A Bit 7 / Keyboard Interrupt Bit 7
18	V_BB	MCU Main Power Supply
19	Ground	
20	PTG0/BKGD/MS	MCU Port G Bit 0 / Background / Mode Select
21	PTG1/XTAL	MCU Port G Bit 1 / Crystal Oscillator Output
22	RESET	MCU Reset. Active Low
23	PTC0/TXD2	MCU Port C Bit 0 / SCI2 TX Data Out
24	PTC1/RXD2	MCU Port C Bit 1/ SCI2 RX Data In
25	PTC2/SDA1	MCU Port C Bit 1/ IIC Bus Data
26	PTC3/SCL1	MCU Port C Bit 1/ IIC bus data

Pin #	Pin Name	Description
27	PTC4	MCU Port C Bit 4
28	GPIO5	General Purpose Input/Output 5. (See Footnote 1)
29	GPIO6	Modem General Purpose Input/Output 6
30	GPIO7	Modem General Purpose Input/Output 7
31	V_RF	Modem Voltage Regulators' input / ModemDigital Interface Supply
32	Ground	
33	PTA2/KBIP2	MCU Port A Bit 2 / Keyboard Interrupt 2
34	PTA1/KBIP1	MCU Port A Bit 1 / Keyboard Interrupt 1
35	PTA0/KBIP0	MCU Port A Bit 0 / Keyboard Interrupt 0
36	VREFL	MCU Low Reference Voltage for ATD
37	VREFH	MCU High Reference Voltage for ATD
38	Ground	
39	PTB7/AD1P7	MCU Port B Bit 7 / ATD Analog Channel 7
40	PTB6/AD1P6	MCU Port B Bit 6 / ATD Analog Channel 6
41	PTB5/AD1P5	MCU Port B Bit 5 / ATD Analog Channel 5
42	PTB4/AD1P4	MCU Port B Bit 4 / ATD Analog Channel 4
43	Ground	
44	RF Port	
45	Ground	

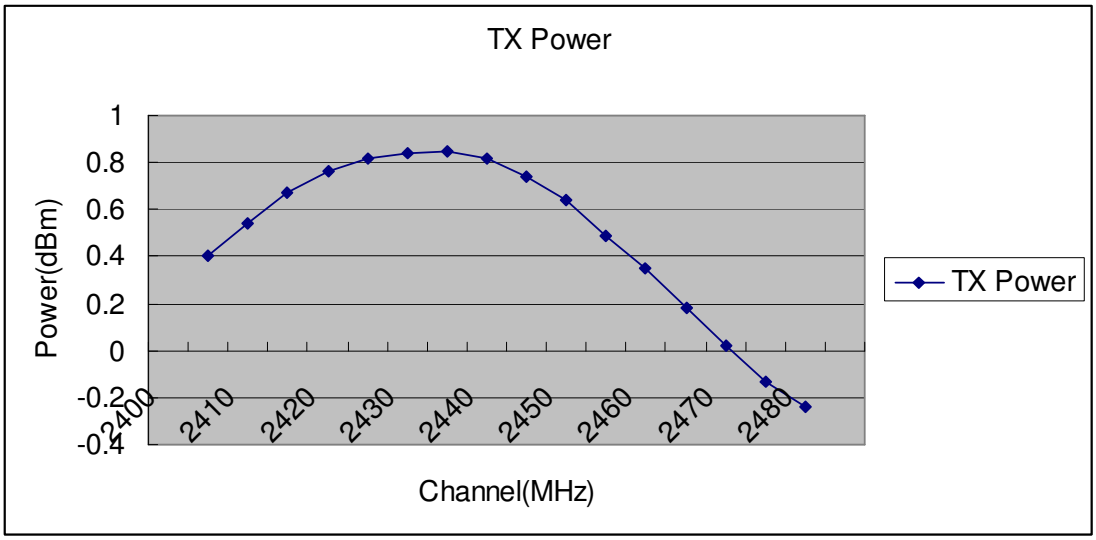
Note :

1. The transceiver GPIO pins default to inputs at reset. There are no programmable pullups on these pins. Unused GPIO pins should be tied to ground if left as inputs, or if left unconnected, they should be programmed as outputs set to the low state.
2. Please refer to Freescale MC1321X for detailed information

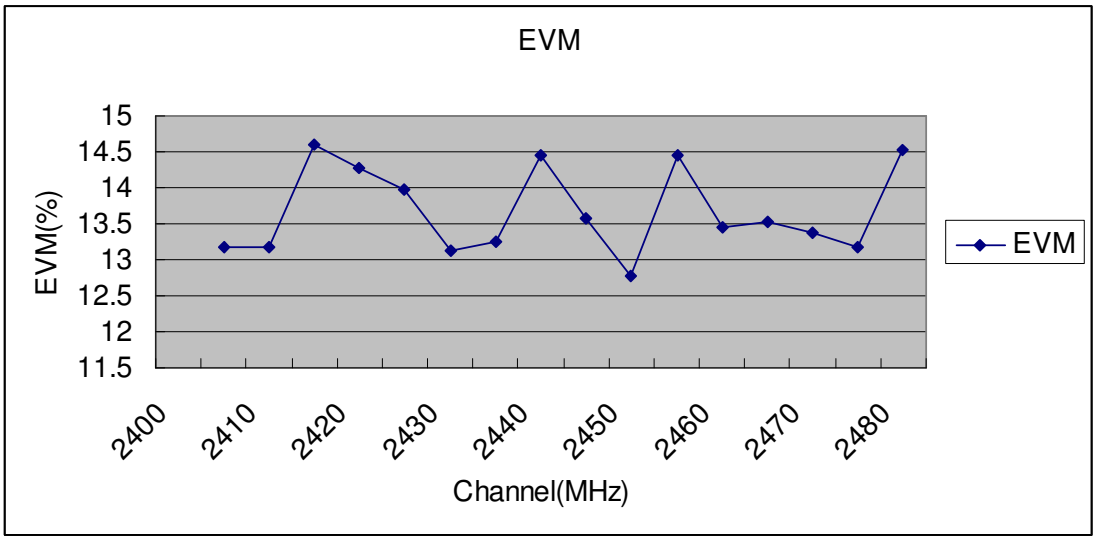
Electrical Specification

Item		Min	Typical	Max	Unit
Frequency		2.405		2.480	GHz
Supply voltage		2.0	2.7	3.4	V
Current consumption	Sleep mode		35		uA
	TX		30	35	mA
	RX		37	42	mA
TX output power			0		dBm
TX EVM			18	35	%
RX sensitivity(250Kbps)			-92	-87	dBm
Maximum input level				10	dBm
Frequency error tolerance				200	kHz
Operation temperature		-40	25	85	℃

TX Power



TX EVM


EVM
15
14.5
14
13.5
13
12.5
12
11.5
EVM(%)
2400
2410
2420
2430
2440
2450
2460
2470
2480
Channel(MHz)
EVM

Document History

Date	Version	Status	Author	Change
2011/08/02	Rev D	proposal	H.Y	Document update
2011/08/23	Rev E	proposal	H.Y	Document update
2011/09/27	Rev F	proposal	K.H	Document update