Document Title :

GEM0357 PRODUCT SPECIFICATION

APPROVAL	NAME	SIGNATURE	DATE
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Revision History

Rev. No.	Comments	Author	Revision Date
A0	Initial release	Miner Kuang	24-July-2010

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1.Introduction

The GEM0357 Zigbee module offers a complete Zigbee wireless solution for development and deployment of a low-data-rate, low-power Zigbee application. The four layer, ROHS-Compliant module based on Ember EM357 which is a 2.4GHz, IEEE 802.15.4-2003 SOC running with Ember Zigbee-compliant EmberZNetStack.The host interface to the module is UART.

The GEM0357 Zigbee module connects to the GE host systems through a 24-pin connector. It also contains a external RF connector, a ceramic SMT internal antenna, a side switch for external antenna and internal antenna transition. external 1K(128x8) SPI Bus Serial EEPROM for Manufacturing Configuration Prom

2. GEM0357 Features

- Selectable RF interface (RF connector or ceramic antenna)
- RX sensitivity of -100dBm typ. at 1% packet error rate
- Maximum Conducted output power is +18.27dBm
- 16 RF channels spaced 5 MHz apart (2.405, 2.410, … 2.480 GHz)
- Wide range of supply voltage (2.1V to 3.6V)
- Minimal current draw (36mA in RX, 36mA in TX; VBRD at 3.0V)
- external 1K(128x8) SPI Bus Serial EEPROM
- Access to the InSight Desktop packet trace interface
- FCC and CE (EMC and RTT&E) compliant (pre-scan certification was completed)
- IEEE 802.15.4-2003 PHY and MAC Level 1 compliant platform
- Open Air, Line of Sight Range (Normal Mode, Ceramic Antenna) is 230m

3. GEM0357 Pin I/O

3.1 Module Interface Connector

GEM0357 has a 24-pins, 2mm pitch, dual row connector. Figure 1 shows the pinout of the module interface connector, and Table 1 describes the pin out and signal names.

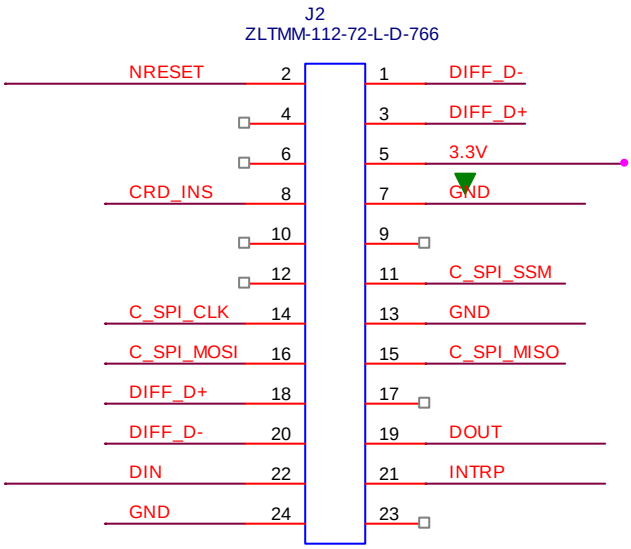


Figure 1 Module Interface Connector

Table 1 Module Interface Pins description

Pin #	Pin name	Function	Direction *
1	DIFF_D~	USB480~ routed to Gen2 South connector	BI-DIR
2	nRESET~	Reset from Host, active low. Requires a pull-up (3.3K) on the external daughter card	Open Drain Output
3	DIFF_D+	USB480+ routed to Gen2 South connector	BI-DIR
4	NG	NG	NG
5	3.3	3.3V power supply	PWR
6	NG	NG	NG
7	GND	Ground	GND
8	CRD_INS~	Card Installed Signal output	OUTPUT
9	NC	NC	NC
10	NC	NC	NC
11	C_SPI_SMM	SPI Slave Select for Manuf. configuration EEPOM, active low, ref. to 3.3V	INPUT
12	NC	NC	NC
13	GND	GROUND	GND
14	C_SPI_CLK	SPI Clock (output from master), ref. to 3.3V	INPUT
15	C_SPI_MISO	SPI Master Input, Slave Output,	Input
16	C_SPI_MOSI	SPI Master Output, Slave Input,	OUPUT
17	NC	NC	NC
18	DIFF_D+	USB data+	BI-DIR
19	DOUT	UART TXD	OUTPUT
20	DIFF_D~	USB data+	BI-DIR
21	INTRP	Interrupt to Host, active high, ref. to 3.3V	INPUT
22	DIN	UART RXD	INPUT
23	NC	NC	NC
24	GND	Ground	GND

* USB480 interface, pin #18 & 20 not used, the Module will route these pins to respected DIFF pins #3 & 1.

3.2 Insight Port Connector

GEM0357 has a 10-pins, 0.05" pitch, dual row connector. Figure 2 shows the pinout of the Insight Port connector, and Table 2 describes the pinout and signal names.

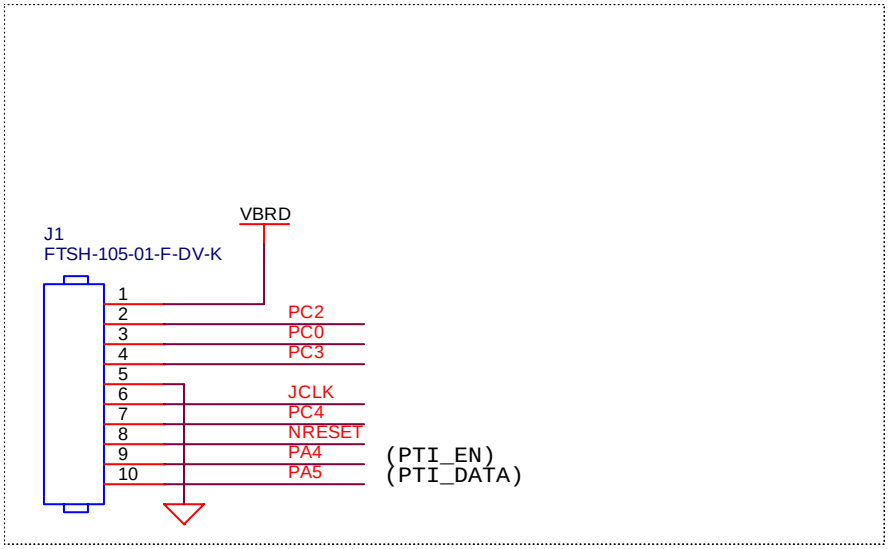


Figure 2 Insight Port Connector

Table 2 Insight Port Pins description

Pin #	Pin name	Function	Direction *
1	VBRD	2.1 to 3.6V VDC net on the module	Power
2	PC2/SIF_MISO	Serial interface, master in/slave out	Output
3	PC0/SDBG	Debug signal to be used on further Pin-compatible products	Output
4	PC3/SIF_MOSI	Serial interce, master out/slave in	Input
5	GND	Gound	Power
6	JCLK	Jtag clock from debugeer	Input
7	PC4/nSIF_LOAD	Serial interface, load strobe (open collector with internal pull-up)	I/O
8	nRESET	Active low, EM357 reset (Internal pull-up)	Input
9	PA4/PTI_EN	Packet trace frame signal	Output
10	PA5/PTI_DATA	Packet trace data signal, 500kbps	Output

(* with respect to the module)

4. GEM0357 Module Specifications

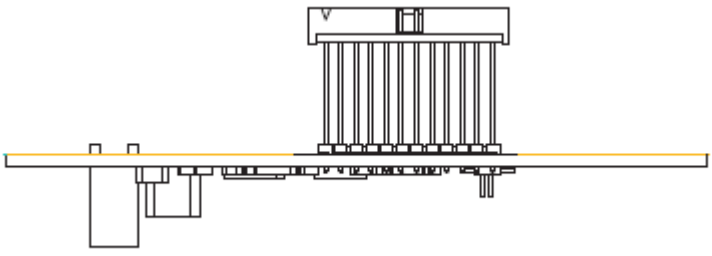
4.1 Electrical specifications

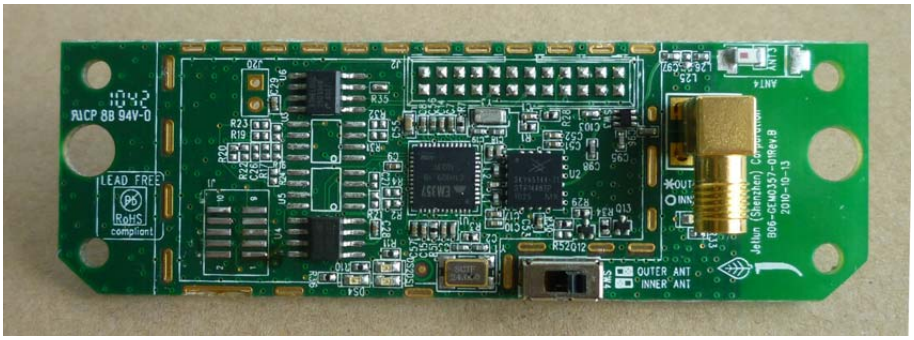
Electrical specifications for the GEM0357 module are presented in Table 3.

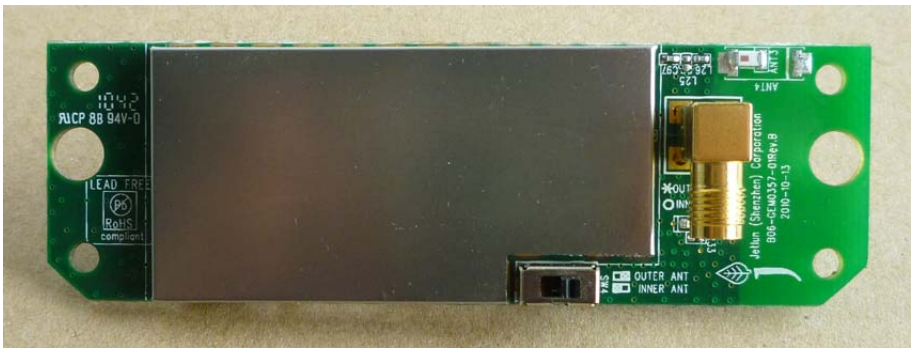
Table 3 DC Electrical Characters

Parameter	Min	Typ.	Max	Unit
VDD Supply (VBRD)	2.1		3.6	V
RX mode current (VBRD=3.0V) –Normal Mode		36.0		mA
RX mode current (VBRD=3.0V) –Boost Mode		41.0		mA
TX active current (VBRD=3.0V) –Normal Mode		36.0		mA
TX mode current (VBRD=3.0V) –Boost Mode		41.0		mA
Sleep mode current – 32.y68kHz Osc,25C			1.3	mA
Operating temperature range	-40		80	℃

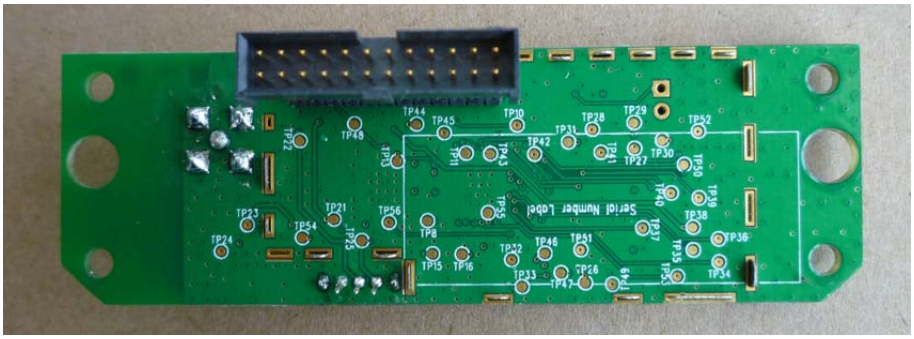
4.2 Mechanical specifications



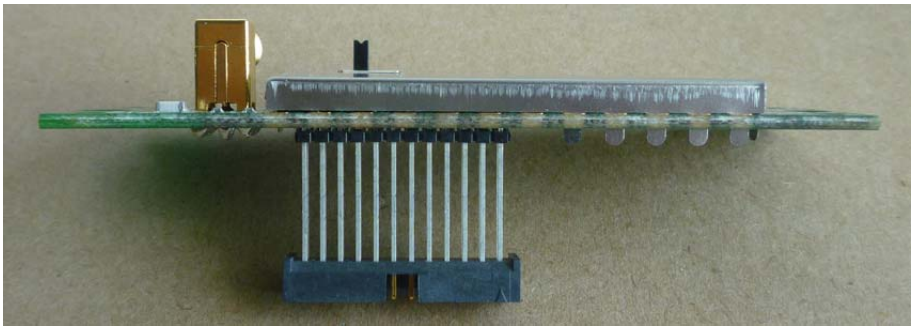




GEM0357E Top

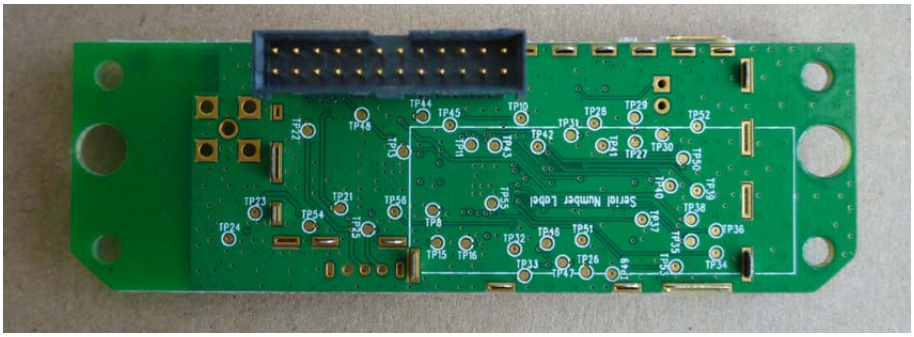


GEM0357E Bottom

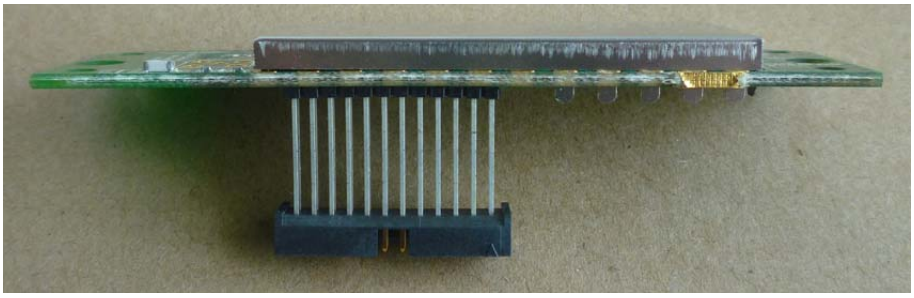


GEM0357E Side

GEM0357F Top



GEM0357F Bottom



GEM0357F Side

5. Ordering Information

Part Number	Description
GEM0357E-310	contain internal antenna and external connector and switch for antenna transiton
GEM0357F-310	Only have the internal ceramic antenna

6. Product Approvals

6.1 FCC Approvals

The GEM0357 has been designed to meet all national regulations for World-wide use. Using the integrated antenna it conforms to FCC CFR 47 Part 15 (USA).

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The device GEM0357 carries FCC authorization and is marked with the FCC ID Number. Whilst any device into which this authorized module is installed will not normally be required to obtain FCC authorization, this does not preclude the possibility that some other form of authorization or testing may be required for the finished device.

When the GEM0357 module is integrated inside another device/product, then the outside surface of that device/product must display a label referring to the enclosed module. This exterior label can use wording such as **"Contains Transmitter Module FCC ID:** X5QGEM0357**"**

To meet the Section 15.209 emission requirements in the restricted frequency bands of Section 15.205, the transceiver transmitter power for the GEM0357 module needs to be reduced from the typical maximum setting on the channel 2480 MHz. Maximum value of 2480MHz is 0.71dBm (Configured the output power of EM357).

FCC statement:

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

6.2 CE Certificate

With the integrated antenna the GEM0357 has been tested and conforms to the following standards:

- Radio: ETSI EN300 328 V1.6.
- EMC: ETSI EN301 489-17 V1.2.1
- EMC: ETSI EN301 489-1 V1.6.1

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