Technical Description

The Equipment Under Test (EUT) is a 2.4GHz BT 4.0 BLE transceiver for a Baby bottle Warmer that operating from 2402MHz to 2480MHz with 2MHz channel spacing. The EUT is powered by AC120V/60Hz. After paired with smart device, the user can set the command from the smart device to control the EUT.

The brief circuit description is listed as below:

1) IC2 act as a MCU (SH79F084A).
2) IC1 acts as a LCD Display Controller (CMS69F116B).
3) MD8105-A06 acts as a Bluetooth Module.
4) U5 acts as a Voltage Regulator (LM1117).
5) BUZ 1 acts as a Buzzer.
5) Y1 and Y3 act as Crystal for Bluetooth Module (MD8105-A06).

Antenna Type: Internal antenna
Antenna Gain: 0dBi
Nominal rated field strength: 93.3 dBμV/m at 3m
Maximum allowed field strength of production tolerance: +/- 3dB

MD8105-A06

Bluetooth Low Energy Module

Revision History

Rev.	History	Issue Date	Remark
0.1	Initial issue.	Feb. 25, 2014	Preliminary
0.2	Add module photo	Mar. 04, 2014	
0.3	Add 32K module part no.	Apr. 28, 2014	
0.4	Change Operation Temp	Sep. 27, 2014	
0.5	Add **industrial version** module	Oct. 7, 2014	
0.6	Add Application note	Nov. 7, 2014	

1. General Description

Hiswill Bluetooth module, MD8105-A06 is designed for a Bluetooth bw energy (BLE) single mode with 6dBm (MAX) output power wireless applications. Using AMIC A8105 FSK/GFSK system-on-chip (SOC) wireless transceiver IC. MD8105-A06 integrates high speed pipeline 8051 MCU, 16KBytes In-system programmable flash memory, 2KB SRAM, various powerful functions and excellent performance of a leading BLE FSK/GFSK RF transceiver. It can be operated with wide voltage from 2.0V ~ 3.6V. MD8105-A06 has various operating modes, making it highly suited for systems where ultra-low power
consumption is required. MD8105-A06 need to connect with external antenna.

2. General specification

Number	Item	Description
1	Chipset	A8105
2	Dimension	15.5*13.5*2.5mm
3	Frequency	2.40GHz~2.48GHz unlicensed ISM Band
4	Bluetooth Standard	V4.0
5	Voltage	2.0~3.6V
6	Temperature	**Commercial Version:** -20 ℃ ~ 70 ℃ **Industrial Version:** -40 ℃ ~ 85 ℃
7	Storage Temperature	**Commercial Version:** -40 ℃ ~ 85 ℃ **Industrial Version:** -55 ℃ ~ 125 ℃
8	Frequency Range	2402~2480MHz
9	RF Transmission Power	+6dBm to -10dBm
10	Receive Sensitivity	-92dBm at 1Mbps(data rate)

3. Electrical specification

Item	Specification	Remark
Supply voltage	2.0V-3.6V	Unit : Volt
Current consumption	0.8uA @Deep Sleep mode 3mA @ Stand-by mode 9.5mA @ PLL mode 18mA @ RX mode 21mA@TX mode (Pout=6 dBm)	Typical
Frequency	2402 – 2480 MHz	ISM band

Transmit output power	6 dBm @ room temperature	Typical **Annotation1**
Rx sensitivity	-92 dBm @ 1Mbps mode	BER≦1E-3
Modulation	GFSK	
Interface	19 pin PCB connector	
PCB Dimension	15. 5(L) x 13.5(W) x 0.8(H)	Unit : mm
Operating temperature	**Commercial Version:** -20 ℃ ~ 70 ℃ **Industrial version:** -40 ℃ ~ 85 ℃	

Annotation1:

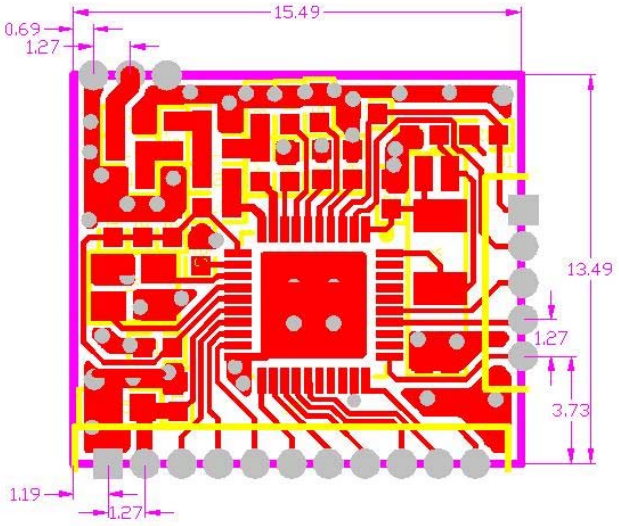
1. Tx output power = 6dBm,

Register: [082C] Tx test(TBG: 6, PAC: 3, TXCS: Low Current) value:0X5E.

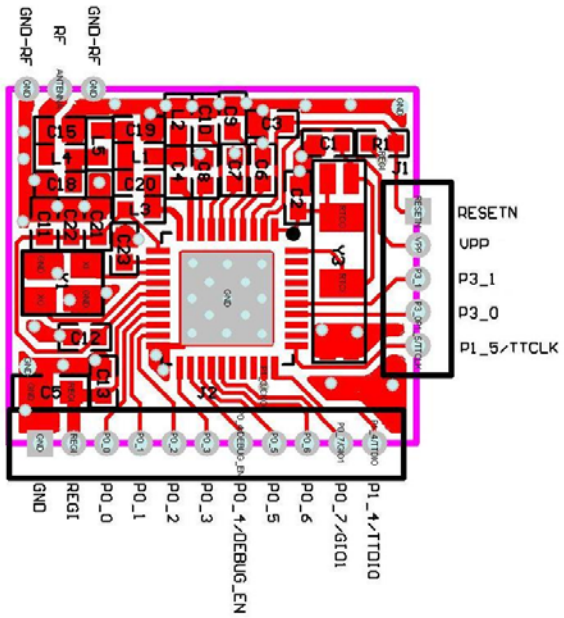
2. TX output power can be set by Register: [082C] Tx test.

4. Dimension and Interface Pinout.

Dimension:



PCB Size (Unit: mm)



PCB Pin Out

Interface J1:

Pin No.	Pin name	Description	Type
1	RESETN	RESETN	I
2	VPP	NC	NC
3	P3_1	DIO/UART0_TX/ADC7	I/O
4	P3_0	DIO/UART0_RX/ADC6	I/O
5	P1_5	DIO/TTCK (Program PIN)	O

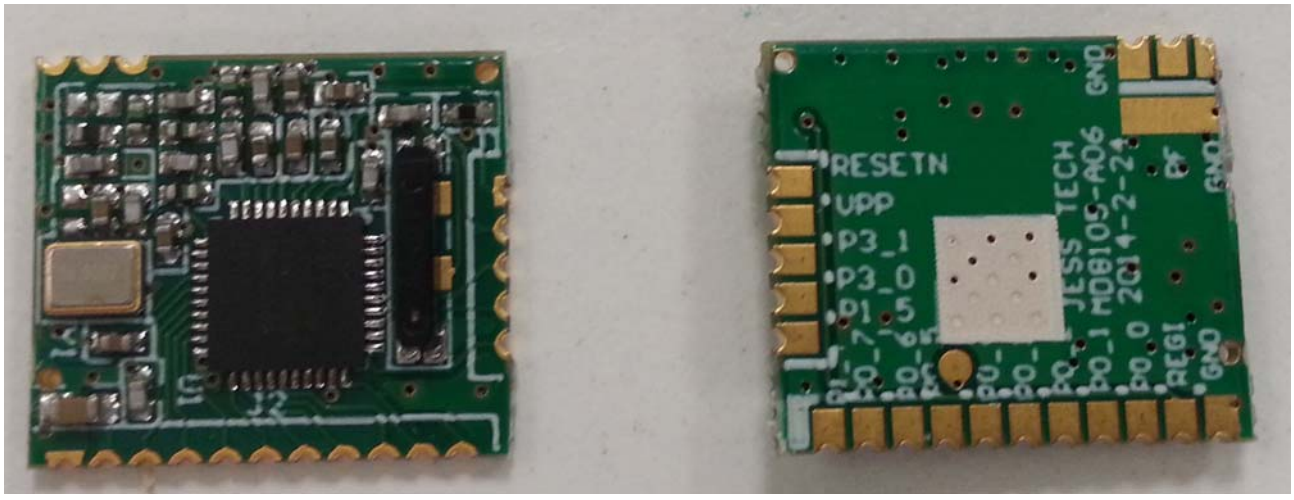
Interface J2:

Pin No.	Pin name	Description	Type
1	GND	Ground	PWR
2	REGI	RF module supply voltage input	PWR
3	P0_0	DIO/SPI_SCLK	I/O
4	P0_1	DIO/SPI_MOSI	I/O
5	P0_2	DIO/SPI_MISO	I/O
6	P0_3	DIO/SPI_SSEL	I/O
7	P0_4	GPIO/ICE mode (Program PIN)	I
8	P0_5	DIO/I2C_SCL	I/O
9	P0_6	DIO/I2C_SDA	I/O
10	P0_7	GIO1/INT2	I
11	P1_4	DIO/TTDIO (Program PIN)	I/O

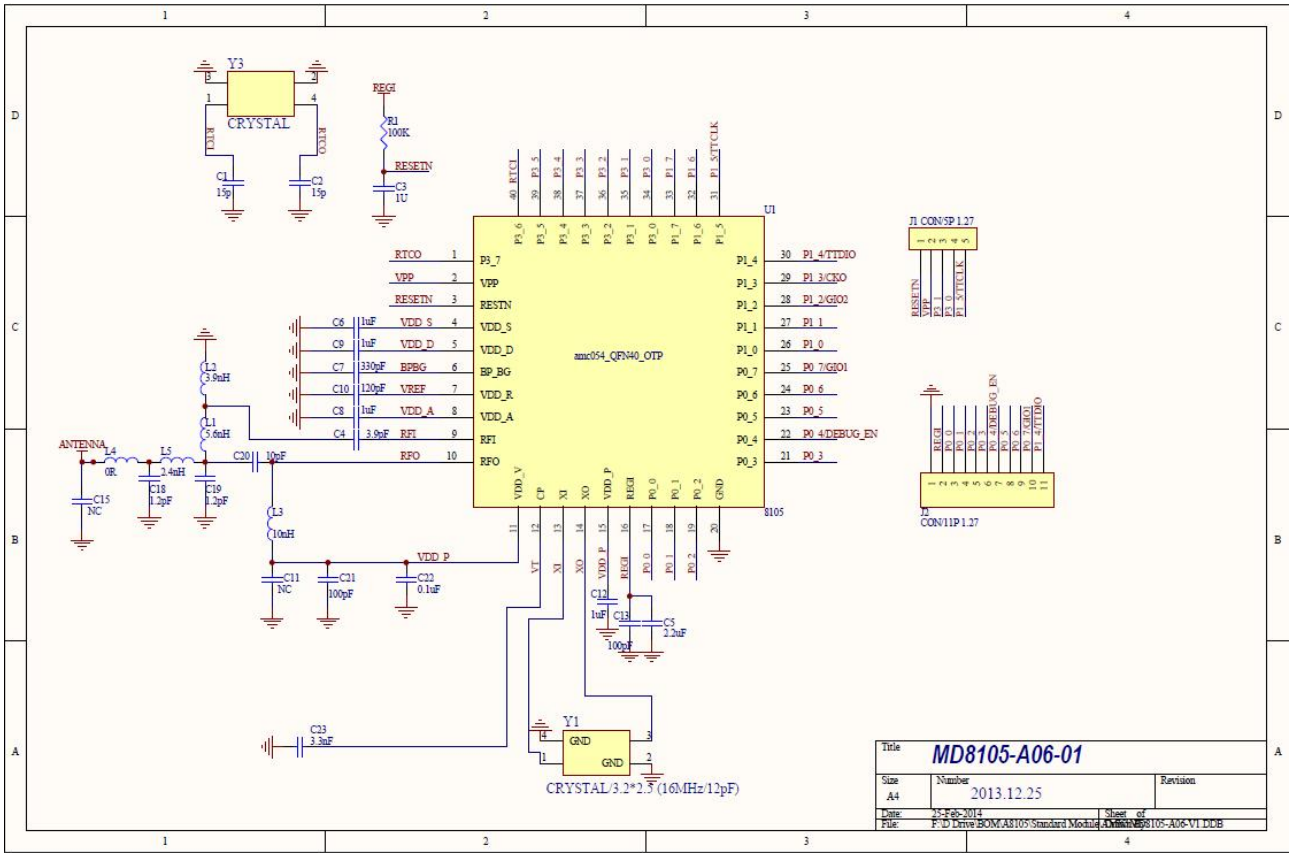
Interface J3:

Pin No.	Pin name	Description	Type
1	GND-RF	RF Ground	RF GND
2	RF	RF input/output	RF
3	GND-RF	RF Ground	RF GND

5. Module photograph



6. Application Circuit



Application Circuit

7. Ordering Information.

Part Number	Size(W*L*H)	Description	Marking
MD8105F4-A06	15.5*13.5*2.5mm	A8105 16K flash commercial version Module	F4
MD8105F5-A06	15.5*13.5*2.5mm	A8105 32K flash commercial version Module	F5
MD8105F4I-A06	15.5*13.5*2.5mm	A8105 16K flash industrial version Module	F4I
MD8105F5I-A06	15.5*13.5*2.5mm	A8105 32K flash industrial version Module	F5I

8. QDID and BQB Information.

QDID: B022182

BQB search:

Open web site and search: AMIC:

https://www.bluetooth.org/tpg/listings.cfm

9. Application Note.

MD8105-A06 Module has no any antenna. Please add “F” type PCB or chip antenna when using it. Doing Demo, it can solder one wire (about 30mm, solder on Module’s RF Pin) to replace the external antenna.