1 Features

- 2.4G wireless data transmission module
- Full duplex transparent serial port
- Configurable baud rate, range: 2400bps to 57600bps
- Add wireless communication without any RF knowledge requirement
- Frequency range: 2400-2483.5 MHz ISM
- 4 bytes RF TX/RX configurable address
- Maximum duplex RF air data rate reaches 38.4kbps
- Transmission distance more than 60 meters
- Connection type: Connector or SMD, suitable for DIY or mass production
- Suitable for high-speed data transmission with low power consumption
- Featured PSM (Power Saving Mode) Mode, can balance high-speed data transmission and power consumption
- Configurable sleep time in PSM Mode: 20ms to 65000ms
- Operating voltage: DC 2.7V to 3.6V, rated voltage 3.3V
- Pin level Compatible both 3.3 V and 5 V TTL level
- Average working current (@DC 3.3V):

  NML Mode: 26mA

  PSM Mode: 1.6mA

2 Typical Application

- Wireless audio transmission
- Handheld device
- Wireless monitoring and control System
- Remote controlled toys
- Short distance wireless data transmission
- 1 to N wireless data acquisition

3 Pin Definitions

3.1 Product Structure Diagram

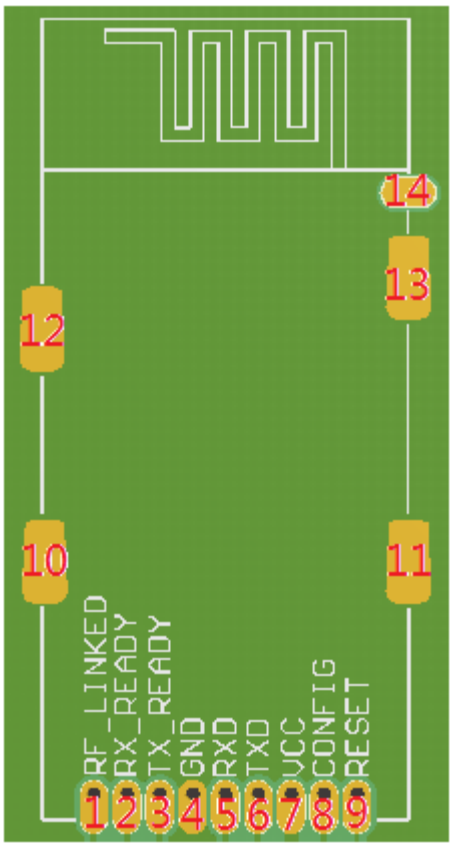


Figure 2: PIN Configuration Sketch Map

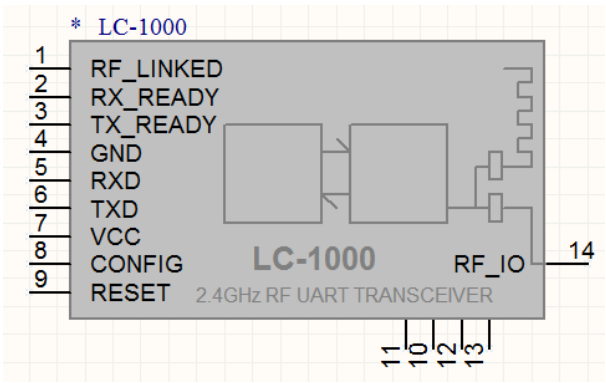


Figure 1 : LC-1000 Schematic Component symbol

LC-1000 supports two kinds of antenna connection mode: On-board antenna mode and an external antenna mode.

The on-board antenna is a Wiggle antenna which is specially validation tested, the rated gain is 1.5dBi. It can get a better communication performance directly using the on-board antenna when user doesn't have special requirements.

A rated impedance of 50 ohm's external antenna can connect to LC-1000's RF_IO pin, when user needs an external antenna.

This two antenna connection mode can be configured by onboard SEL1 and SEL2. By default the on-board antenna mode is selected. If need external antenna mode, you can inform INHAOS to change the configuration after place an order.

3.2 Pin Description

Number	Name	Direction	Description
1	RF_LINKED	OUT	Indicating the RF connection status Linked Un-Linked
2	RX _READY	OUT	Indication valid data received Data valid, and will send via TXD after 1ms No data received
3	TX_READY	OUT	Indication LC-1000 is ready for data input via RXD ready for data input not ready, data can't input
4，10，11，12，13	GND	GND	All ground pins must be connect to the reference GND
5	RXD	IN	UART data input
6	TXD	OUT	UART data output
7	VCC	VDD	3.3V power supply
8	CONFIG	IN	Configuration Pin for configuring the LC-1000 switch to configuration mode switch out configuration mode (Need to use cooperatively with TX READY pin)
9	RESET	IN	Reset pin LC-1000 into reset mode LC-1000 into running mode
14	RF_IO	RF Signal IN/OUT	Pin for connect external antenna, selecting antenna mode through the SEL1 combined with SEL2.

			SEL1：NC SEL2：100pF ：external antenna SEL1：100pF SEL2：NC ：on-board antenna

4 Functional Description

4.1 System State Diagram

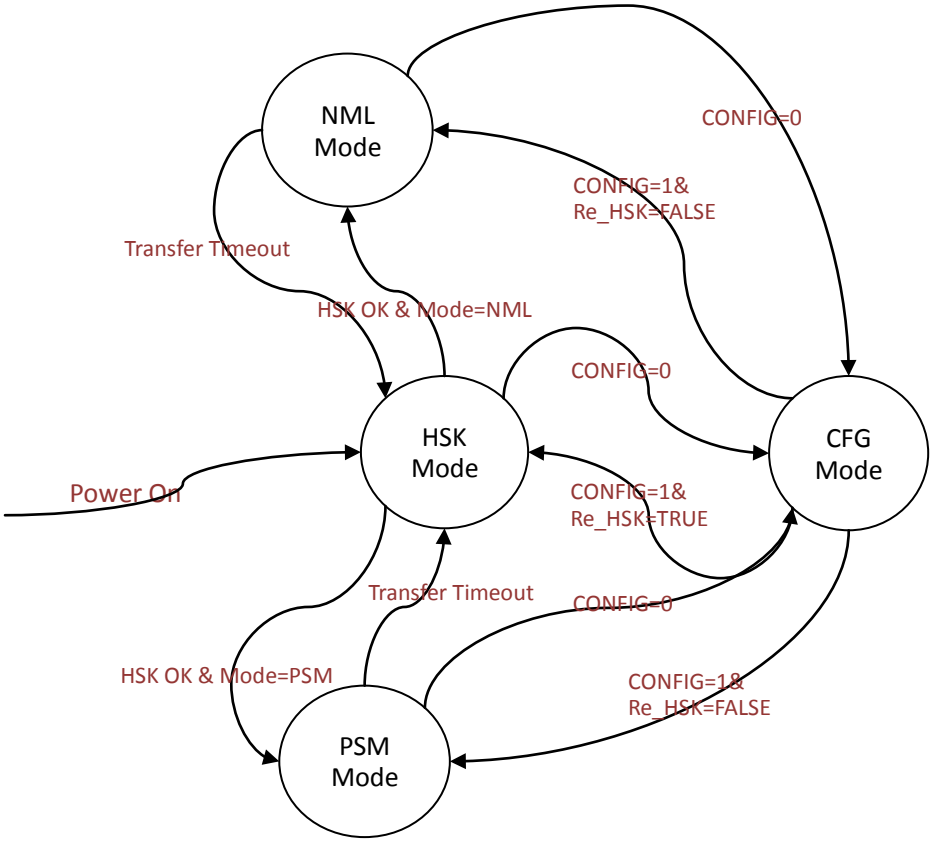


Figure 3 System State Diagram

4.2 Pin Indication

4.2.1 RF_LINKED Pin Indication

Once LC-1000 linked successfully, RF_LINKED pin will be pulled down at once.

And RF_LINKED pin will be set to HIGH when link state is disconnected.

4.2.2 RX_READY Pin Indication

When RX FIFO has valid data, the RX _READY pin will set to LOW immediately, and data will be sent through TXD after 1ms's delay time;

After all data sent, RX_READY will become HIGH after 2ms's delay time. Because of

this feature, RX_READY can serve as a wake-up pin of MCU.

The follow diagram shows the detail timing of RX_READY & TXD.

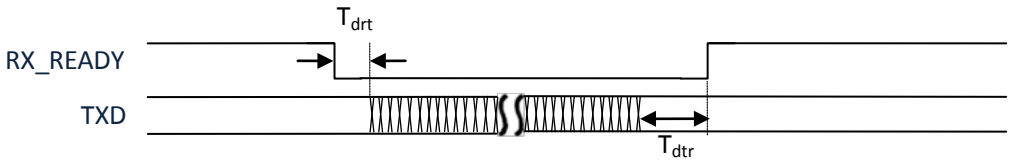


Figure 4 RX_READY & TXD

Symbol	Parameter	Min	Typ	Max	Unit
T_{drt}	RX_READY becomes LOW to TXD data valid	---	1	--	ms
T_{dtr}	Data FIFO empty to RX_READY becomes HIGH	---	2	--	ms

Table 1 RX_READY & TXD Timing Parameters

4.2.3 TX_READY Pin Indication

TX_READY pin indicates whether LC-1000 is ready for data input via RXD or not. TX_READY's state must be check before writing data or configuration. Any data writing operation (including data and configuration) must under the condition of TX_READY = LOW, otherwise writing operation is not permitted.

The follow diagram shows the detail timing of TX_READY & RXD.

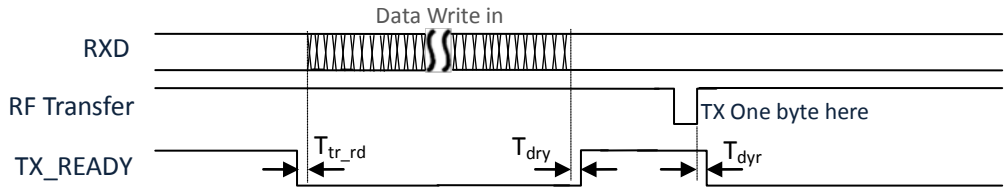


Figure 5 TX_READY & RXD

Symbol	Parameter	Min	Typ	Max	Unit
T_{tr_rd}	TX_READY to RXD Data transfer start	5	--	--	us
T_{dry}	RX FIFO full to TX_READY becomes HIGH	--	--	20	us
T_{dyr}	RX FIFO not full to TX_READY becomes LOW	--	--	20	us

Table 2 TX_READY & RXD Timing Parameters

4.3 Reset Baud rate

A baud rate resetting condition will be detected in the progress of initialization after LC-1000 powered on. The baud rate resetting condition is: CONFIG pin state is LOW and last at least 200ms. If this condition is established, then the baud rate of LC-1000 will reset to 9600bps.

User can reset the baud rate of LC-1000 whenever the baud rate state becomes fuzzy just following the steps:

1) Set RESET pin to LOW
2) Set CONFIG pin to LOW
3) Delay 100ms
4) Set RESET pin to HIGH
5) Delay at least 200ms
6) Set CONFIG pin to HIGH
7) LC-1000's baud rate is 9600bps in the later

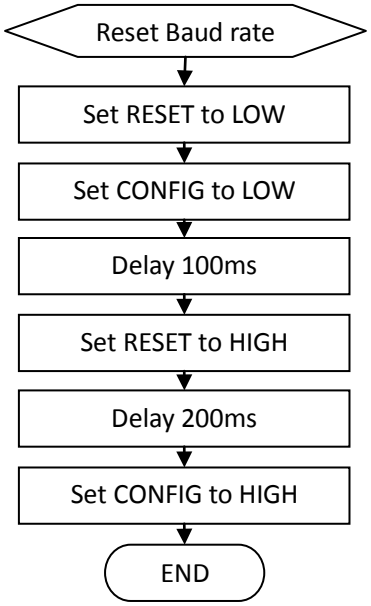


Figure 6 Reset baud rate flow chat

4.4 HSK Mode

The main task of HSK mode is searching for the other side of LC-1000, then handshaking with each other till a stable connection established.

The following conditions lead LC-1000 to HSK mode:

1) After initialization when power on
2) Connection is interrupted when in NML/PSM mode
3) After configuration to LC-1000 (only write not including read operation)

Setting name	LC-1000 parameter
TX address	TX_ADDR
RX address	LOCAL_ADDR
Power level	RF_POWER_LEVEL
Channel	Assigned by LC-1000

Table 3 Settings of RF in HSK Mode

Table 3 Settings of RF in HSK Mode shows the settings of RF chip when in HSK mode.

For connection successfully, user mush ensure the parameters TX_ADDR and LOCAL_ADDR in LC-1000 meet the conditions as Table 4 TX ADDR configuration for connect

Parameter	Value
TX_ADDR of A	LOCAL_ADDR of B
TX_ADDR of B	LOCAL_ADDR of A

Table 4 TX_ADDR configuration for connect A and B

Following Figure 7 Example for TX_ADDR configuration is an example for TX_ADDR configuration.

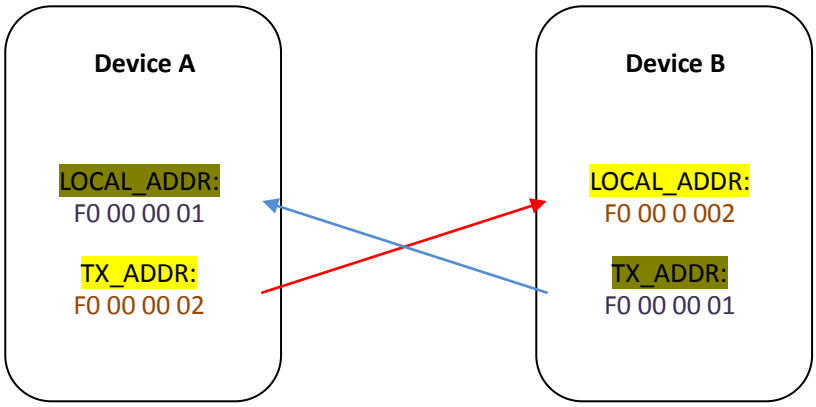


Figure 7 Example for TX_ADDR configuration

After connect established, LC-1000 will switch into the corresponding work mode according to the setting of WORK_MODE, if WORK_MODE=0, LC-1000 will into NML mode, otherwise PSM mode instead.

4.5 NML Mode

The NML mode is full duplex real-time data transfer mode, LC-1000 has the highest efficiency of data transmission in this mode. And the data rate of NML mode can up to 38.4kbps.

There are two application modes according to usage occasions: Simple 3 lines Mode (“S3M” for short) and Hardware flow control Mode (“HFCM” for short).

4.5.1 Simple 3 lines Mode (“S3M”)

The hardware connection is the simplest connection for LC-1000 application. Only 3

line need in this mode: TXD/RXD/GND. Figure 8 Hardware connection of S3M sketch shows the connection of this mode. But the baud rate of LC-1000 in this mode must not more than 19200 bps, otherwise the correctness of data transmission cannot be guaranteed.

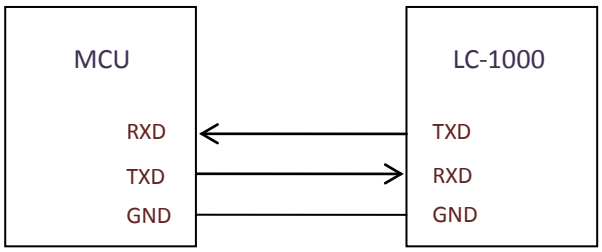


Figure 8 Hardware connection of S3M sketch

For data transferring, MCU must prepare for reading from the UART's RXD anytime if data is received by LC-1000 from other side of communication. This reading operation usually handled by MCU's hardware UART RX interrupt service function. Then MCU can write data to LC-1000 through UART's TXD pin anytime regardless of any pin state. Figure 9 Data transfer flow chart in S3M shows a demo flow chart for S3M data transmit of LC-1000.

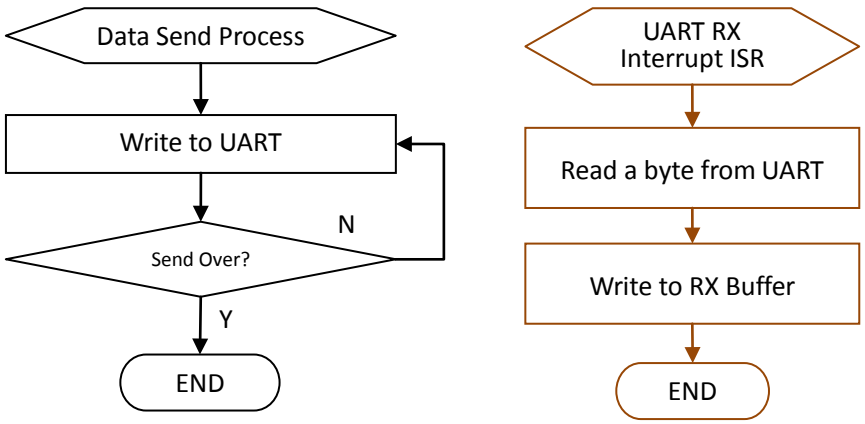


Figure 9 Data transfer flow chart in S3M

The feature of S3M is: Easy to use, Low data rate and transmission error permitted.

Figure 10 Typical application example of S3M based on PCshows a typical application example for S3M of LC-1000. In this application PC A and B can transmit data each other.

For example, A transmits data to B, its data flow as follows:

a) APP(A) write a packet to UC-3000(A) by COMx in PC

b) UC-3000(A) sends data to LC-1000(A) through UART

c) LC-1000(A) transmit it to LC-1000(B) by RF

d) LC-1000(B) sends data to UC-3000(B) through UART

e) APP(B) will read a packet from COMx in PC

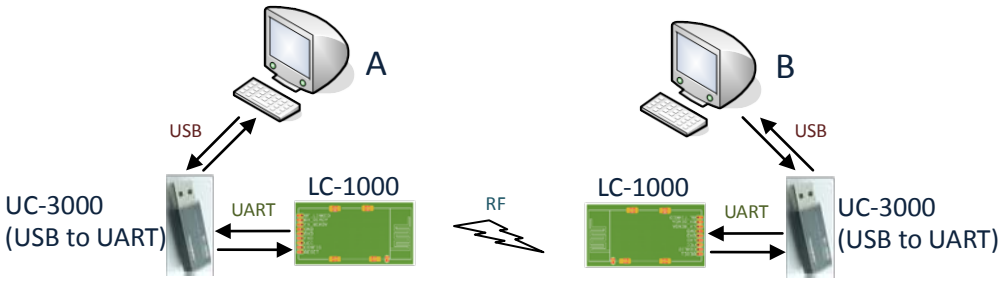


Figure 10 Typical application example of S3M based on PC

4.5.2 Hardware flow control Mode("HFCM")

Unlike S3M, the hardware connection is much more complicated in the HFCM. All pins of LC-1000 are needed for this mode.

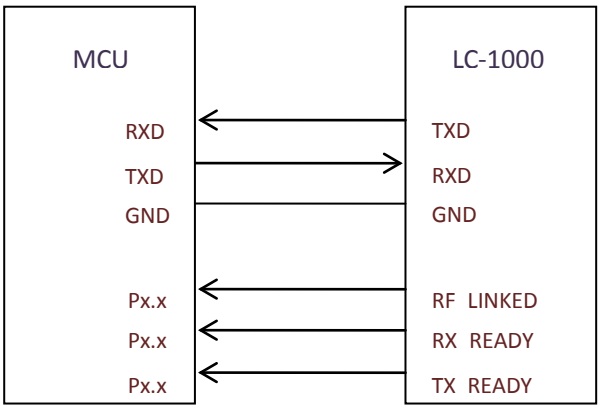


Figure 11 Hardware connect of HFCM sketch

The baud rate range is 2400bps to 57600bps, and what's more the correctness of data transmission can be guaranteed in HFCM.

For data receiving in HFCM, MCU must prepare for reading from the UART's RXD within 1ms after RX_READY becomes LOW, otherwise the received data will be lost. This reading operation usually handled by MCU's hardware UART RX interrupt service function.

Before data sending in HFCM, MCU must check that CONFIG pin is set to HIGH, otherwise the data wrote in LC-1000 may be treated as configuration data.

When sending data in HFCM, MCU must check the state of TX_READY pin before write each byte of data. Only when TX_READY = LOW a new byte can be wrote in to LC-1000, otherwise the TX FIFO in LC-1000 will overflow, and the oldest data will be overwrote. The detail TX_READY timing please reference Figure 5 TX_READY & RXD

Figure 12 Data transfer flow chart in HFCMshows a demo flow chart of data transferring process in HFCM.

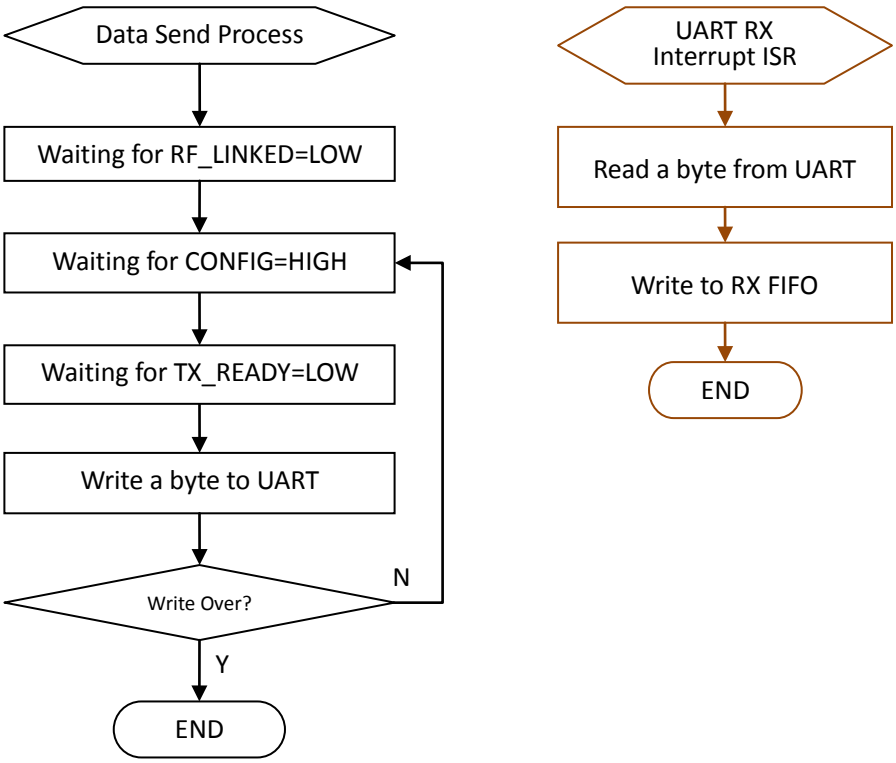


Figure 12 Data transfer flow chart in HFCM

The feature of HFCM is: High speed data rate, High reliability, but more complex of Control, and Suitable for bulk data transfer.

Figure 13 Typical application example of HFCMshows a typical application example of HFCM. In this application MCU A and B can transmit data each other.

For example, A transmits data to B, its data flow as follows:

a) MCU(A) write a packet to LC-1000(A) through UART

b) LC-1000(A) transmit it to LC-1000(B) by RF

c) MCU(B) will read a packet from LC-1000(B)

Figure 13 Typical application example of HFCM

4.5.3 Communication failure and recovery

When data is not sent successfully within 400ms, the LC-1000 will switch to HSK mode.

4.6 PSM Mode

In PSM mode, the LC - 1000 will normally keep in sleep status and wake-up every SLEEP_TIME (ms) to check data receive as Figure 14 Sleep & wake-up period in PSM modeshows. When data received, it keeps wake-up and transfers data, and after all data transmit finished, LC-1000 will back to sleep status once again.

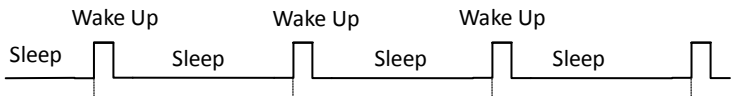


Figure 14 Sleep & wake-up period in PSM mode

Compared with NML mode, the power consumption in PSM mode greatly reduced. As Figure 15 LC-1000 Power Consumption in NML mode shows the average current in NML mode is 31mA, but no more than 2mA in PSM mode when SLEEP_TIME=1000 as Figure 16 shows.

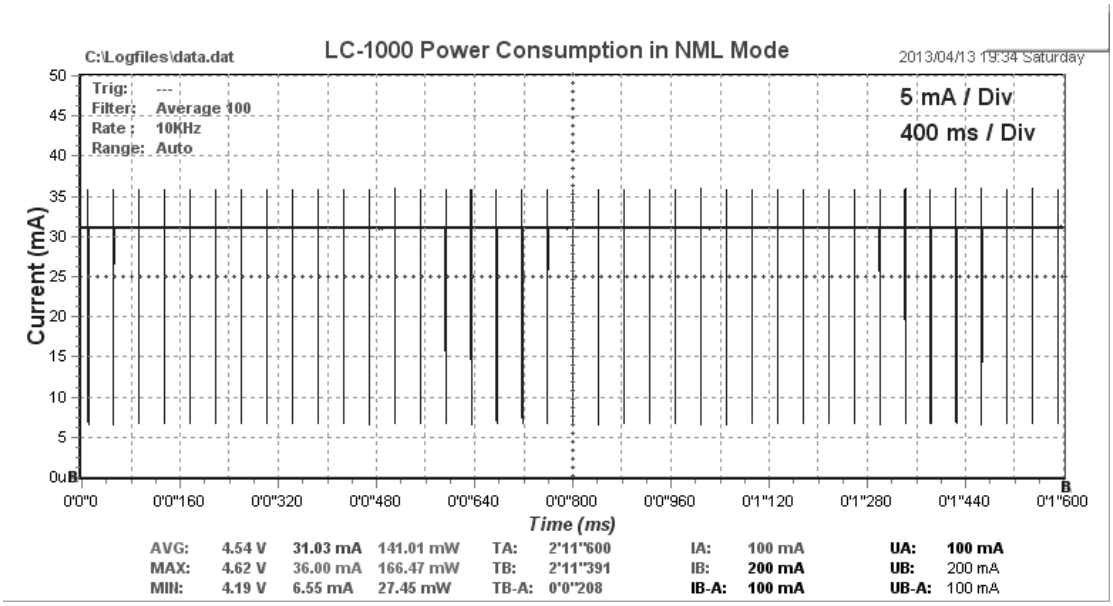


Figure 15 LC-1000 Power Consumption in NML mode

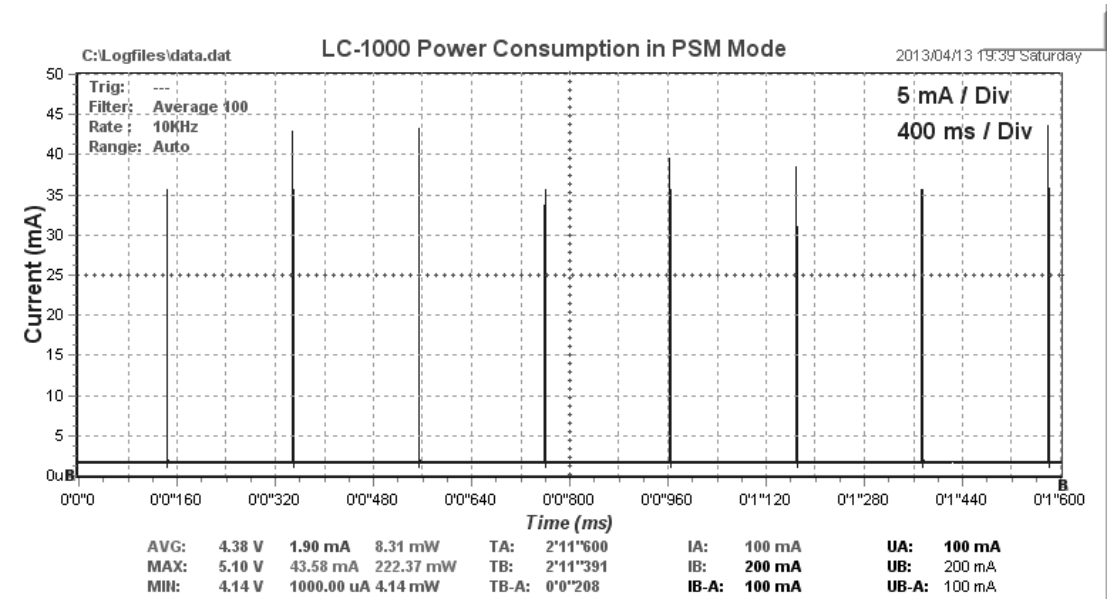


Figure 16 LC-1000 Power Consumption in PSM mode (SLEEP_TIME=1000)

Unlike NML mode, the PSM mode has only one Hardware flow control Mode (“HFCM” for short).

And the HFCM mode process is the same with NML mode, please reference 4.5.2.

After wake-up if data is not sent successfully within 400ms, the LC-1000 will switch to HSK mode.

4.7 CFG Mode

User application can read or write the configurations of LC-1000 when in CFG mode.

The CONFIG pin is used for CFG mode selection. When CONFIG becomes LOW, LC-1000 start

switch to CFG mode, and when it becomes HIGH, LC-1000 start switch out CFG mode. For LC-1000's internal mode switch need some times, so it's can't be guaranteed that the mode switch finished immediately after CONFIG pin changed. User app often needs to check the TX_READY state for the progress of the mode switch.

Figure 17 shows the detail timing of switch IN/OUT CFG mode.

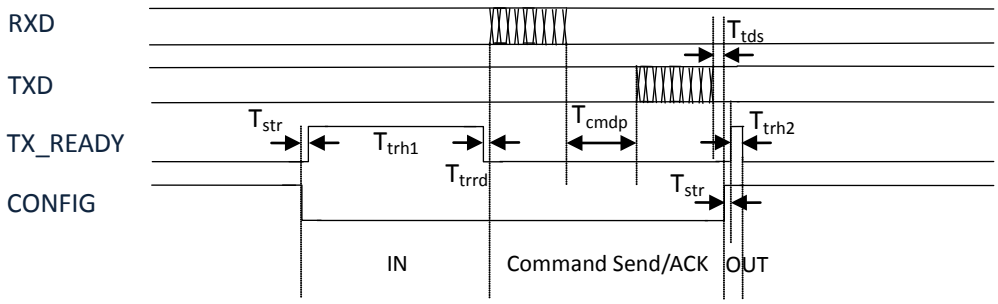


Figure 17 Timing Diagram of switch IN/OUT CFG mode

Symbol	Parameter	Min	Typ	Max	Unit
T_{str}	CONFIG=LOW to TX_READY=HIGH	--	--	5	us
T_{trh1}	TX_READY keep HIGH level after CONFIG=LOW	4	--	--	ms
T_{trrd}	TX_READY=LOW to RXD data valid	50	--	--	us
T_{cmdp}	RXD data finished to TXD data start	--	3	10	ms
T_{tds}	TXD data finished to CONFIG=HIGH	60	--	--	us
T_{trh2}	TX_READY keep HIGH level after CONFIG=HIGH	60	--	--	us

Table 5 Timing Parameters of switch IN/OUT CFG mode

4.7.1 Switch in CFG mode

According to the timing diagram as Figure 17 shows, the steps for switch in CFG mode as follows:

Set CONFIG pin to LOW

Waiting for TX_READY to HIGH

Waiting for TX_READY to LOW again

Now LC-1000 stay in CFG mode

Note, the control MCU must ready for UART data receiving any time before step 3), Otherwise the coming date will be lost.

4.7.2 Write and read configuration

After switched in CFG mode, user's APP can send configuration packet to LC-1000 and then waiting for the ACK packet. LC-1000 will send back an ACK packet after each configuration packet received. The detail configuration command list please reference Configuration Command.

4.7.3 Switch out CFG mode

According to the timing diagram as Figure 17 shows, the steps for switch out CFG mode as follows:

Set CONFIG pin to HIGH

Waiting for TX_READY become HIGH

Now LC-1000 switch out CFG mode finished

Note, LC-1000 will switch to HSK mode after switch out CFG mode, when a write configuration command is received. Otherwise it switches back to previous mode.

Figure 18 Flow chart of Configure LC-1000 shows a demo flow chart of configure the LC-1000.

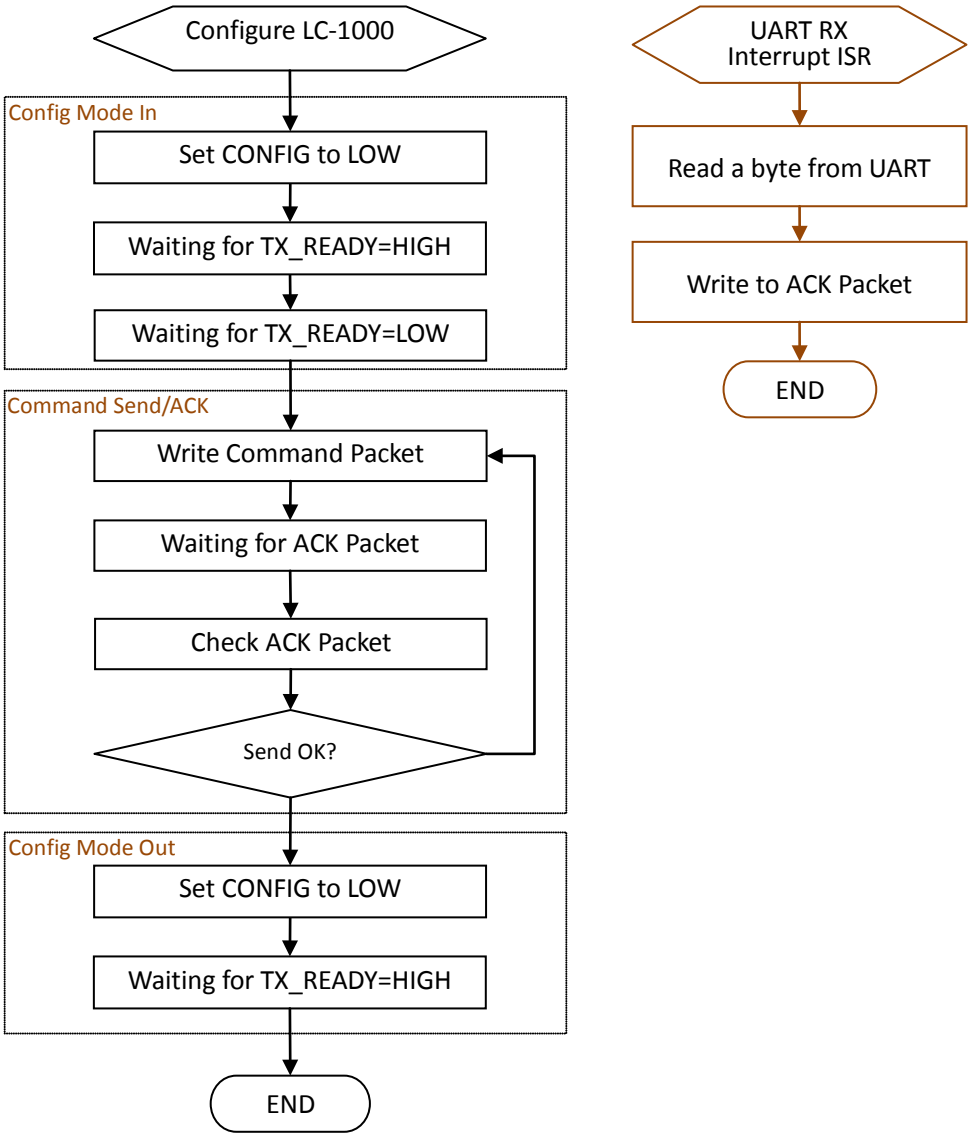


Figure 18 Flow chart of Configure LC-1000

5 Configuration Command

5.1 LC-1000's Configurable system parameters

LC-1000's configurable system parameters can be write or read by sending the configuration commands to it.

There are serial configurable system parameters as follows:

LOCAL_ADDR ---- Local address

The default LOCAL_ADDR is the UID of LC-1000 (the UID is Unique for each devices).

TX_ADDR ---- Link address of other side of communication

BAUD_RATE ---- baud rate configure value

This is not the direct UART's baud rate value, but the setting value for UART's baud rate, this value can be calculated by the formula as below:

BAUD_RATE = (1500000/ baud_rate) – 1

(The baud_rate is the real baud rate of LC-1000's UART, it's value range is 2400bps~57600bps, And the corresponding BAUD_RATE range is 0x0270~0x0019).

SLEEP_TIME ---- wake-up period of PSM mode

WORK_MODE ---- work mode

When WORK_MODE = 0, system work mode is NML mode

When WORK_MODE=1, system work mode is PSM mode

RF_POWER_LEVEL ---- RF power level

The RF_POWER_LEVEL's value range is 0~15 (0 is the highest power level).

The default value of these system parameters is as follows:

LOCAL_ADDR ---- UID

TX_ADDR ---- Not So Sure

BAUD_RATE ---- 0x9B, (baud rate is 9600bps)

SLEEP_TIME ---- 1000, (=1000ms)

WORK_MODE ---- 0x00, (NML mode)

RF_POWER_LEVEL ---- 0x00, (the highest power level)

5.2 Configuration command packet format

Name	Checksum	Save	CMD/MSG	Length	Parameter	END
Bytes	1	1	1	1	7	2
Values	0X00~0Xff	0/1	Command List	0X00~0X07	0X00~0XFF	0X0D, 0X0A

Figure 19 Configuration command packet format

- Checksum

Can be calculated by the formula:

Checksum = NOT (Checksum+Save+CMD+Length+Parameter+END)

Please set Checksum byte to 0, before make this calculation.

- Save

  Save flag

  =1, indicates this parameter value need to be saved to EEPROM

  =0, indicates this parameter value no need to save

- Command/MSG

  Command of this packets, please reference to "Configuration command list"

- Length

  The valid data length of parameter

  Note the Length field must be set to the correct length of parameter field's length in both the read and write command packet.

- Parameter

- END

  End symbol, it takes a fixed value = 0x0D0A

5.3 Configuration command list

Function	Dir	Configuration packet	Description
Set RF carrier out (CMD=0xEF)	TX	0xXX,Save,0XEF,0x02,Chn,Power,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Chn** RF channel，0~83； **Power** RF Power level: 0x00~0x0F (0x00–highest power 0x0F–lowest power)
	RX	None	
Set local address (CMD=0XF0)	TX	0xXX,Save,0xF0,0x04,Addr0(LSB),Addr1, Addr2,Addr3,0x00,0x00,0x00,0x0D,0x0A	**Addr** Local address: 0x000001~0xfffffe
	RX	0xXX,Save,0xF0,0x04,Addr0(LSB),Addr1, Addr2,Addr3,0x00,0x00,0x00,0x0D,0x0A	
Set Link address (CMD=0XF1)	TX	0xXX,Save,0xF1,0x04,Addr0(LSB),Addr1, Addr2,Addr3,0x00,0x00,0x00,0x0D,0x0A	**Addr** Link address: 0x000001~0xfffffe
	RX	0xXX,Save,0xF1,0x04,Addr0(LSB),Addr1, Addr2,Addr3,0x00,0x00,0x00,0x0D,0x0A	

Set UART rate (CMD=0XF2)	TX	0xXX,Save,0xF2,0x02,Rate0(LSB),Rate1, 0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Rate** UART rate value Rate = (1500000/ baudrate) – 1, baudrate is the actual value of UART baud rate. Its value range: 2400bps~57600bps, And the value range of Rate is: 0x0270 ~ 0x19
	RX	0xXX,Save,0xF2,0x02,Rate0(LSB),Rate1, 0x00,0x00,0x00,0x00,0x00,0x0D,0x0A	
Set sleep time (CMD=0XF3)	TX	0xXX,Save,0xF3,0x02,Time0(LSB),Time1, 0x00,0x00,0x00,0x00,0x00,0x0D,0x0A	**Time** Sleep time: 0x0000~0xffff
	RX	0xXX,Save,0xF3,0x02,Time0(LSB),Time1, 0x00,0x00,0x00,0x00,0x00,0x0D,0x0A	
Set work mode (CMD=0XF4)	TX	0xXX,Save,0xF4,0x01,Mode,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Mode** Work mode: 0x00 --NML Mode 0x01 --PSM Mode
	RX	0xXX,Save,0xF4,0x01,Mode,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	
Set RF power level (CMD=0XF5)	TX	0xXX,Save,0XF5,0x01,Power,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Power** RF power level: 0x00~0x0F 0x00-highest power 0x0F-lowest power
	RX	0xXX,Save,0XF5,0x01,Power,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	
Read local address (CMD=0XD0)	TX	0xXX,Save,0XD0,0x04,0x00,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Addr** Local address
	RX	0xXX,Save,0xD0,0x04,Addr0(LSB),Addr1, Addr2,Addr3,0x00,0x00,0x00,0x0D,0x0A	
Read link address (CMD=0XD1)	TX	0xXX,Save,0XD1,0x04,0x00,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Addr** Link address
	RX	0xXX,Save,0xD1,0x04,Addr0(LSB),Addr1, Addr2,Addr3,0x00,0x00,0x00,0x0D,0x0A	
Read UART rate (CMD=0XD2)	TX	0xXX,Save,0XD2,0x02,0x00,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Rate** UART Rate
	RX	0xXX,Save,0xD2,0x02,Rate0(LSB),Rate1, 0x00,0x00,0x00,0x00,0x00,0x0D,0x0A	
Read sleep time (CMD=0XD3)	TX	0xXX,Save,0XD3,0x02,0x00,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Time** Sleep time
	RX	0xXX,Save,0xD3,0x02,Time0(LSB),Time1, 0x00,0x00,0x00,0x00,0x00,0x0D,0x0A	
Read work mode (CMD=0XD4)	TX	0xXX,Save,0XD4,0x01,0x00,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Mode** Work mode
	RX	0xXX,Save,0xD4,0x01,Mode,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	
Read RF power level (CMD=0XD5)	TX	0xXX,Save,0XD5,0x01,0x00,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Power** RF power level
	RX	0xXX,Save,0xD5,0x01,Power,0x00,0x00,	

		0x00,0x00,0x00,0x00,0x0D,0x0A	
Read device type name (CMD=0XCE)	TX	0xXX,Save,0XCE,0x07,0x00,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**IDN** Device type, fixed value "LC-1000"
	RX	0xXX,Save,0xCE,0x07,IDN0(LSB),IDN1, IDN2,IDN3,IDN4,IDN5,IDN6,0x0D,0x0A	
Read FW version (CMD=0XCF)	TX	0xXX,Save,0XCF,0x02,0x00,0x00,0x00, 0x00,0x00,0x00,0x00,0x0D,0x0A	**Ver** Version Ver0--major; Ver1--minor
	RX	0xXX,Save,0xCF,0x02,Ver0(LSB),Ver1, 0x00,0x00,0x00,0x00,0x00,0x0D,0x0A	

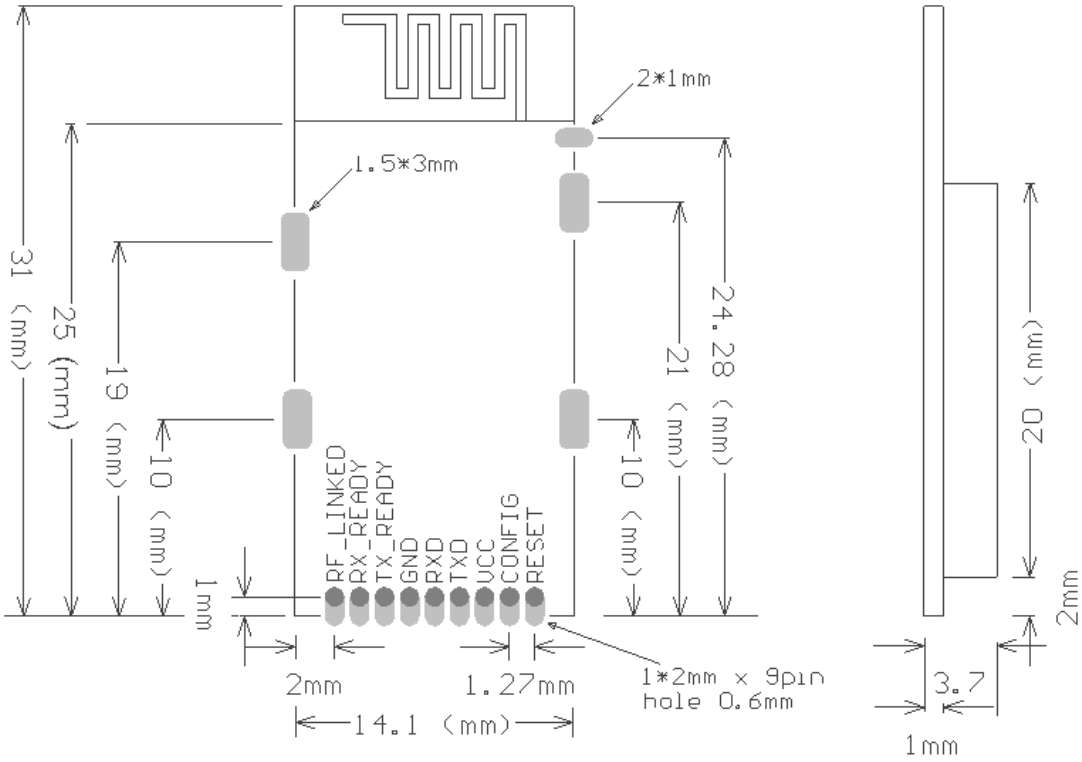
5.4 Error MSG list for configuration packet

LC-1000 will send back an ACK packet which MSG field is the same value with the received packet's CMD field, when the received configuration packet was processed correctly. Otherwise the MSG field's value is as follows:

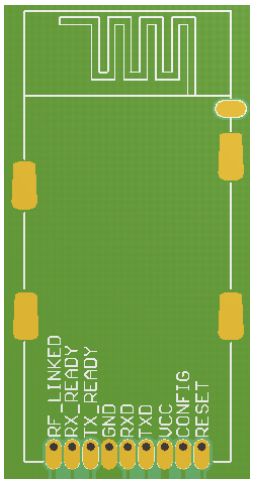
1) Parameter has error, MSG = 0XE1
2) Checksum error, MSG = 0XE2
3) Command error, MSG = 0XE3

6 Dimensional Drawings

6.1 Machine Dimensions (Unit: mm)



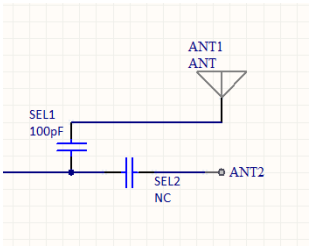
6.2 PCB design reference

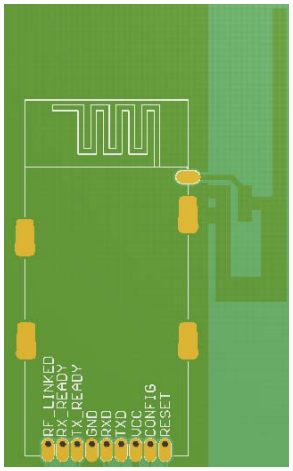


PCB designed sample 1：Using on-board Wiggle antenna

When using on-board Wiggle antenna, the SEL1 must placed with a 100pF 0402 NP0 ceramic capacitor. Meanwhile the PCB of the antenna part cannot place any Component or circuit, especially the large areas of GND paving.

(Note：the designator of the on-board antenna in the right schematic diagram is ANT1)

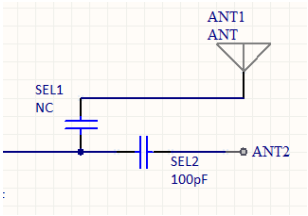




PCB designed sample 2：Using an External antenna

It is allowed to using the extennal antenna for LC-1000, and in this mode, the SEL2 must placed with a a 100pF 0402 NPO ceramic capacitor, and the PCB of the on-board antenna must place with a large areas of GND paving.

(Note：the designator of the on-board antenna in the right schematic diagram is ANT2)



7 Characteristic parameter

7.1 Electric parameter

Name	Parameter	Min	Typ	Max	Unit
	Operation Condition				
VDD	Supply Voltage	3.0	3.3	3.6	V
VSS	Supply GND	0	0	0	V
TEMP	Temperature	-40	+25	+86	℃
	Digital Signal Level				
V_{Low}	Signal Low level	0.3	0.3	0.8	V
V_{Hi}	Signal High Level	2.0	VDD-0.3	VDD-0.3	V
	Current consumption				
I_{hsk}	Current of HSK Mode (VDD=3.3V,TEMP=25℃)	25	31	35	mA
I_{nml}	Current of NML Mode, when idle (VDD=3.3V,TEMP=25℃)	28	31	35	mA
	Current of NML Mode, when transfer data	25	26	35	mA

	(VDD=3.3V,TEMP=25℃)				
I_{psm}	Current of PSM Mode, When SleepTime=500ms (VDD=3.3V,TEMP=25℃)	1.90	1.95	2.0	mA
	Current of PSM Mode, When SleepTime=1000ms (VDD=3.3V,TEMP=25℃)	1.89	1.93	1.98	mA
	Current of PSM Mode, When SleepTime=5000ms (VDD=3.3V,TEMP=25℃)	1.60	1.66	1.75	mA
	Current of PSM Mode, When SleepTime=10000ms (VDD=3.3V,TEMP=25℃)	1.58	1.64	1.70	mA
	Current of PSM Mode, When SleepTime=65000ms (VDD=3.3V,TEMP=25℃)	1.55	1.60	1.65	mA

7.2 Other Timing parameter

Symbol	Parameter	Min	Typ	Max	Unit
$T_{poweron}$	Power on delay time for system initialize (CONFIG = 1)	--	35	--	ms
	Power on delay time for system initialize (CONFIG = 0)	--	245	--	ms
T_{hsk}	The time stay @HSK Mode	6.5	100	--	ms
$T_{nml\_tx\_to}$	Transfer time out @NML Mode	--	400	--	ms
$T_{psm\_tx\_to}$	Transfer time out after wake up @PSM Mode	--	400	--	ms
T_{psm_wk}	Wake-up keep time @ PSM Mode, when	5	--	--	ms

	RXD received data				
	Wake-up keep time @ PSM Mode, when wake up time out	13	--	--	ms

8 Revision History

Version	Date	Author	Description
V10	2013-5-3	Momo Wen	First released

Declare

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