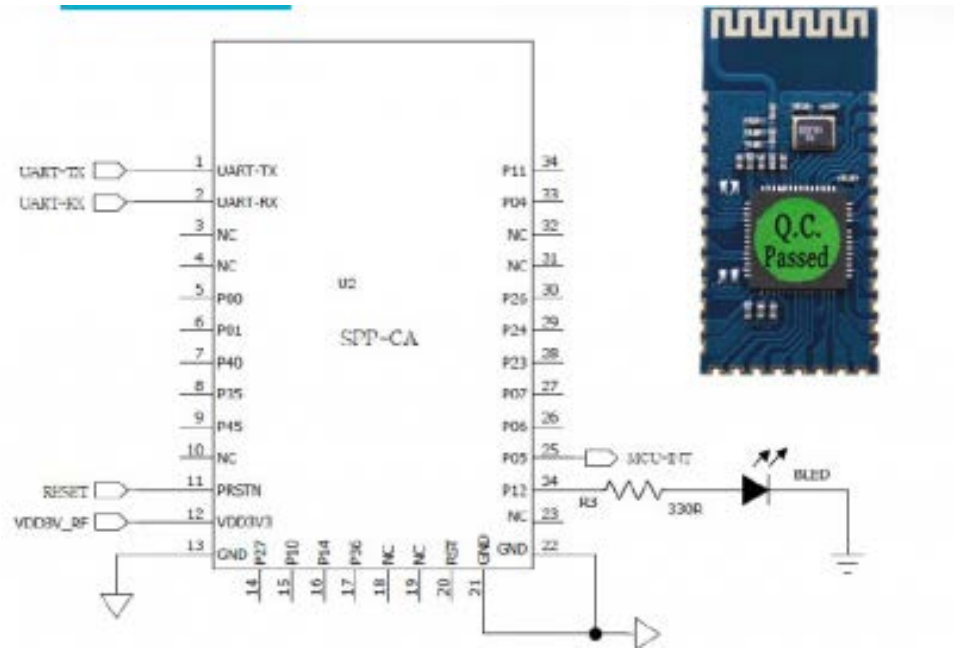


Based on Beken 3231Q chip, follow V2.1 + EDR Bluetooth specification. The module supports UART interface, and support for the SPP Bluetooth serial protocol, small size, low power consumption, send and receive sensitivity

advantages, just with a few external components will be able to achieve its powerful.

Features

- Bluetooth V2.1 + EDR
- Bluetooth Class 2
- Built-in PCB RF antenna
- Built-in 8Mbit Flash
- Support for SPI programming interface
- Support UART,
- 3.3V power supply
- REACH, ROHS certification

Application

The module is mainly used for short-range wireless data transmission field. Convenient and connected to the PC, Bluetooth devices can also data exchange between the two modules. Avoid cumbersome cable connections, direct replacement for the serial line.

- Bluetooth wireless data transmission;
- industrial remote control, telemetry;
- POS system, wireless keyboard, mouse;
- traffic, underground positioning, alarm;
- automated data acquisition system;
- wireless data transmission; banking system;
- wireless data acquisition;
- building automation, security, wireless monitoring room equipment, access control systems;
- smart home, industrial control;
- automotive testing equipment;
- television the interactive program vote Equipment;
- government street light energy saving equipment
- wireless LED display system
- Bluetooth joystick, Bluetooth gamepad
- Bluetooth printer
- Bluetooth remote control toy

Mechanical Features

- Operating Frequency Band 2.4GHz -2.48GHz unlicensed ISM band

- Bluetooth Specification V2.1+EDR
- Output Power Class Class 2
- Operating Voltage 3.3V
- Host Interface USB 1.1/2.0 or UART
- Audio Interface PCM interface
- Flash Memory Size 8Mbit
- Dimension 27mm (L) x 13 (W) mm x 2mm (H)

Electric Features

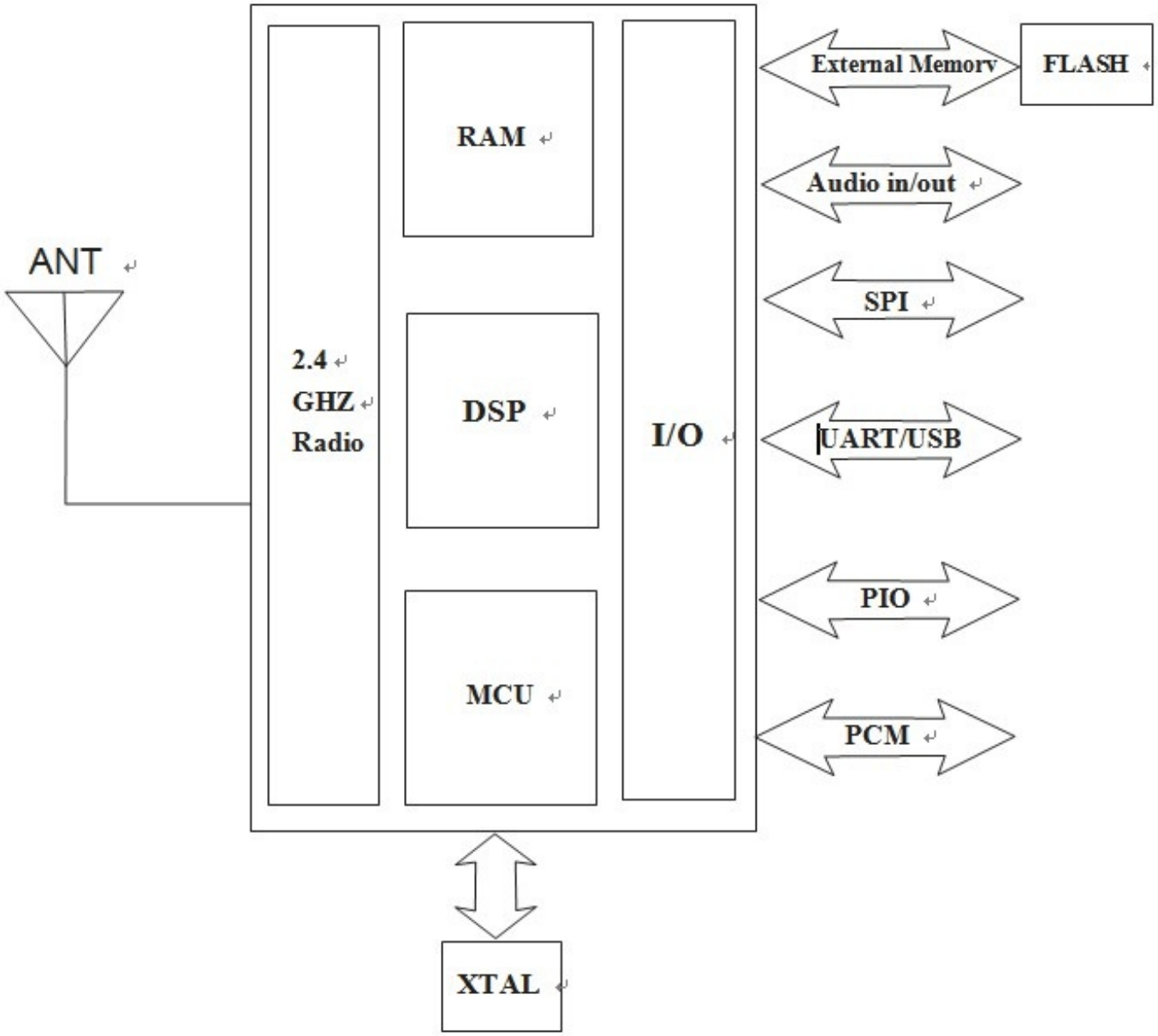
- Absolute Maximum Ratings
- Rating Min Max
- Storage temperature -40℃ +150℃
- Supply voltage: VBAT -0.4V 5.6V
- Other terminal voltages VSS-0.4V VDD+0.4V

- Recommended Operating Conditions
- Operating Condition Min Max
- Operating temperature range -40℃ +150℃
- Guaranteed RF performance range(a) -40℃ +150℃
- Supply voltage: VBAT 2.2V 4.2V(b)

Power Consumption

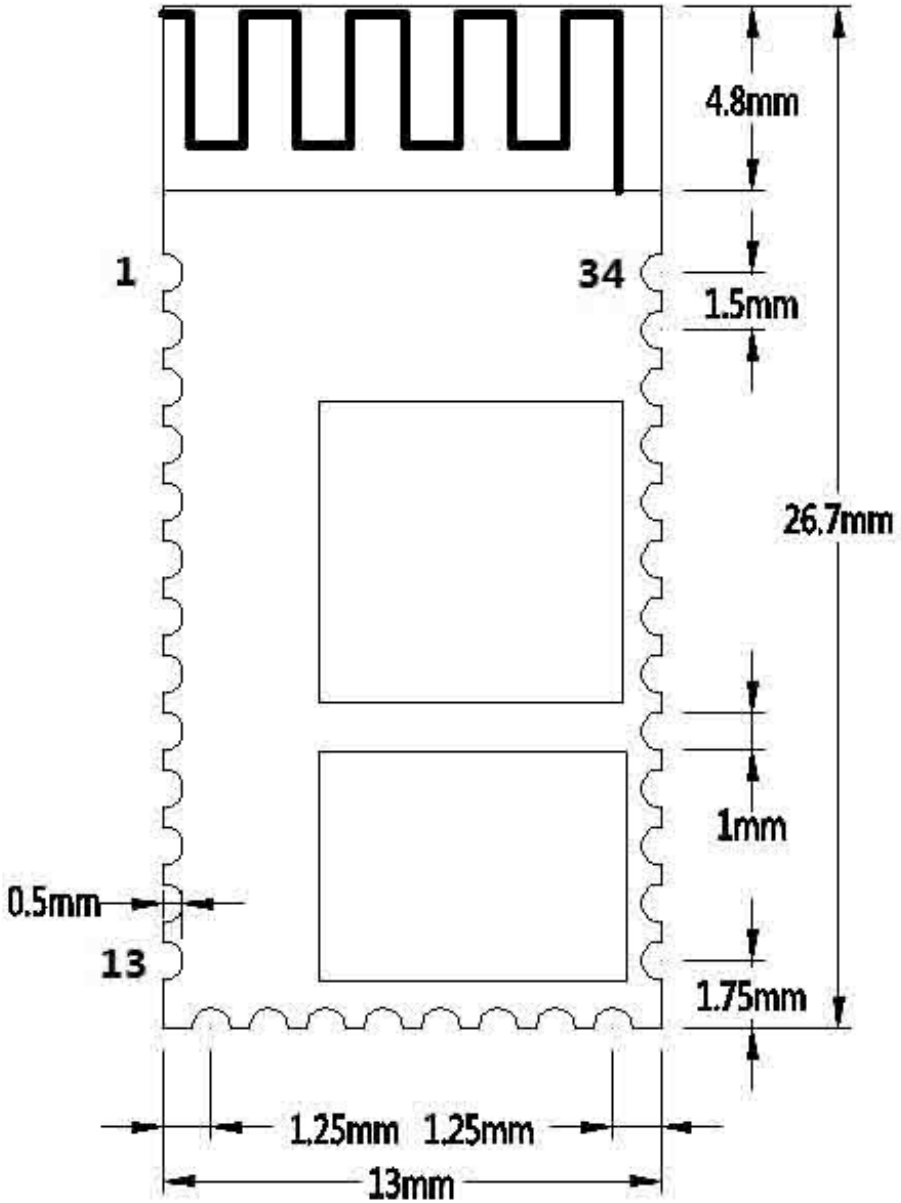
- Operation Mode Connection Type UART Rate(kbps) Average Unit
- Page scan - 115.2 0.42 mA
- ACL No traffic Master 115.2 4.60 mA
- ACL With file transfer Master 115.2 10.3 mA
- ACL 1.28s sniff Master 38.4 0.37 mA
- ACL 1.28s sniff Slave 38.4 0.42 mA
- SCO HV3 30ms sniff Master 38.4 19.8 mA
- SCO HV3 30ms sniff Slave 38.4 19.0 mA
- Standby Host connection - 38.4 40 μA

Function Diagram


ANT
2.4
GHZ
Radio
RAM
DSP
MCU
I/O
External Memory
FLASH
Audio in/out
SPI
UART/USB
PIO
PCM
XTAL

Schematic

Dimension



Basic Connection

To computer

1. Convert TTL level RS232
2. Module power supply 3.3 V
3. TX and RX connected to RX and TX

To other devices

1. TX and RX connected to RX and TX
2. Module supply 3.3V

Module into the AT test methods

1. Module power supply 3.3
2. Open HyperTerminal or other serial debugging tools
3. Open HyperTerminal or other serial debugging tools to set the baud rate (default 9600), 8 data bits, 1 stop bit, no parity, no flow control
4. Convert TTL level RS232 computer serial port connection
5. Send commands AT carriage return line returns OK

Pin Number	Name	Type	Decription	
1	UART-TX	CMOS output	UART data output	-
2	UART-RX	CMOS input	UART data input	-
3	UART-CTS	CMOS input	UART cancel send	-
4	UART-RTS	CMOS output	UART request send	-
5	PCM-CLK	Double way	PCM clock	-
6	PCM-OUT	CMOS output	PCM data output	-
7	PCM-IN	CMOS input	PCM data input	-
8	PCM-SYNC	double way	Sync PCM data	-
9	AIO(0)	double way	Programmable Analog I/O	-
10	AIO(1)	double way	Programmable Analog I/O	-
11	RESETB	CMOS input	Low TTL to reset	-
12	3.3V	Power Input	Power 3.3V	-
13	GND	Power Output	GND	-
14	NC	output	Please NC it	-
15	USB-DN	double way	USB data negative	-
16	SPI-CSB	CMOS input	SPI chip selection	-
17	SPI-MOSI	CMOS input	SPI data input	-
18	SPI-MISO	CMOS output	SPI data output	-
19	SPI-CLK	CMOS input	SPI clock	-
20	USB-DP	double way	USB data positive	-
21	GND	GND	GND	-
22	GND	GND	GND	-
23	PIO(0)	double way	Programmerable I/O (0)	-
24	PIO(1)	output	Status indicating LED	Status indicating LED
25	PIO(2)	double way	Programmerable I/O (2)	interrupts indication port
26	PIO(3)	double way	Programmerable I/O (3)	Memory clear key (short press) Restore Defaults button (long press 3s)
				Software / hardware main from settings mouth;

27	PIO(4)	double way	Programmerable I/O (4)	set low (or vacant) hardware setup master-slave mode, set high 3.3V for the software to set master-slave mode
28	PIO(5)	double way	Programmerable I/O (5)	Hardware master-slave mode settings mouth; set low (or vacant) mainly from the mode, set high 3.3V mode
29	PIO(6)	double way	Programmerable I/O (6)	-
30	PIO(7)	double way	Programmerable I/O (7)	-
31	PIO(8)	double way	Programmerable I/O (8)	-
32	PIO(9)	double way	Programmerable I/O (9)	-
33	PIO(10)	double way	Programmerable I/O (10)	-
34	PIO(11)	double way	Programmerable I/O (11)	-

ATcommands

Users can use UART port to communicate with IC, UART port use Tx and Rx this two signal lines, baud rate supports 1200,2400,4800,9600,14400,19200,38400,57600,115200,230400,460800 and 921600bps。Default Baud rate is 9600bps.

Detailed command lists

BluetoothModule use AT commands list（PS: AT must be capitor, and AT commands can only write when the module is not connected, once the module connected the devices enter into data communication mode)

Command 1 : Testing connection

Downward Command	Response	Parameters
AT	OK	None

Command 2 : set name

Downward Command	Response	Parameters
AT+NAME< Para1>	1.OKsetname——success	<Para1>：device name (Default：BOLUTEK)

command 3：Set - Match code

Downward Command	Response	Parameters
AT+PIN< Para1>	1.OKsetPIN—— success	<Para1>：match code; default：1234

e.g.：send AT+PIN8888 return: OKsetPIN Now the module match code is 8888, and the module default match code is 1234

command 4：set - baud rate

Downward Command	Response	Parameters
AT+BAUD< Para1>	1.OK< Para1>——success	<Para1>：baud rate 1---1200 2---2400 3---4800 4---9600 5---19200 6---38400 7---57600 8---115200 9---230400 A---460800 B---921600 C---1382400 default：4---9600

e.g.：send：AT+BAUD8 return：OK115200

P.S: when the baud rate changed, if it's not default 9600, you need to set correct baud rate for further settings or data communication.
It's It is NOT recommended to use a Baudrate higher than 115200 as th system will be not stable due to the interference.

Master/Slave Settings and other settings

Status indicating LED：PIO(1) Use to indicating the status of the Bluetooth module, LED light flashes with the Bluetooth module state

corresponding to the following table:

Mode	Header text	Header text
Slave	Even Speed rapid flashing (200ms-on,200ms-off)	waiting for matching
Slave	always on	waiting for connection

Command list

Bluetooth serial module instruction is divided into Command (downlink command) and Indication (reporting instructions). (NOTE: AT commands are not case-sensitive, are carriage return, newline character at the end: \ r \ n AT instruction only in the state of the module is not connected to take effect once the Bluetooth module connected to the device, the Bluetooth module that entering data pass-through mode)

Command Name	Command	Response	Parameter
testing connection	AT	OK	Null
Check version	AT+VERSION	+VERSION=<Para1>	<Para1>: Firmware version number, the Bluetooth version number, the local HCI version, HCI amendments, LMP version number, LMP sub-version number
check help	AT+HELP	...	
check/set name	AT+NAME AT+NAME< Para1>	OK or error	<Para1>：device name
Reset to default	AT+DEFAULT	OK	null
reset	AT+ RESET	OK	null
check/set pins	AT+PIN AT+PIN< Para1>	OK or error	<Para1>: pins
check/set baud rate	AT+BAUD AT+BAUD< Para1>	OK or error	1---1200 2---2400 3---4800 4---9600 5---19200 6---38400 7---57600 8---115200 9---230400 A---460800 B---921600 C---1382400 Default ：4---9600
check/set device type	AT+COD AT+COD< Para1>,<Para2>	OK or error	<Para1>: Local device type (length must be 6 bytes) from the mode is in effect, the end retrieval <Para2>: Filtration equipment type effect in the main mode for filtering search to equipment (if you set

			000,000 returns all search equipment) default: 001f00, 000000
check/set module SPP master/slave mode	AT+ROLE AT+ROLE< Para1>	OK or error	<Para1>: 0 --- from the device; 1 --- master; Default: 0 from equipment
check/set GIAC	AT+IAC< Para1>	OK or Error	<Para1>: The query access code, default value: 9e8b33 specific settings, see Appendix 2: query access code Description
check/set remote bluetooth device name	AT+RNAME< Para1>	OK or Error	<Para1>: remote Bluetooth device address
check/set inquiry mode	AT+INQM<Para1>,<Para2>,<Para3>	OK or Error	<Para1>: Query mode: 0: inquiry_mode_standard,1: inquiry_mode_rssi, 2: inquiry_mode_eir, Length: 1 byte, <Para2>: Up Bluetooth Device response, Length: 2 bytes, <Para3>: Query timeout, Timeout range :1-30(Converted into time :1.28-61.44 seconds), Length: 2 bytes, Default: 1,9,30 (16 hex)
check/set connection mode	AT+CMODE< Para1>	OK or Error	<Para1>: 0: specified Bluetooth address connected mode (specified Bluetooth address set by the BIND command) 1: Any Bluetooth address connection mode (not the BIND command set address the constraints), the default value:
check/set bluetooth			<Para1>: Set binding Bluetooth address format: 11,22,33,44,55,66

check/set bluetooth address	AT+BIND<Para1>	OK or Error	format: 11,22,33,44,55,66 Reply the Bluetooth address format: 11:22:33:44:55:66 Default: 00:00:00:00:00:00
clear memory address	AT+CLEAR	OK	Null
check/set UART MODE	AT+ UARTMODE<Para1>,<Para2>	OK or Error	<Para1>: Stop bit: 0:1 stop bit, 1:2 stop bit <Para2>: Parity: 0: no parity, 1: Odd, 2: Even parity, default value: 0,0
check local BT address	AT+LADDR	+LADDR=<Para1>	<Para1>: Local Bluetooth address, for example: 11:22:33:44:55:66
checkt BT module working status	AT+STATE	+STATE=<Para1>	Example
check/set Remote Bluetooth device automatically search	AT+ AUTOINQ<Para1>	Ok or Error	0=no, 1=yes
check remote bluetooth device	AT+INQ	Ok	null
cancel check remote bluetooth device	AT+INQC	Ok	null
check/set Whether to automatically connect to a remote Bluetooth device	AT+ AUTOCONN<Para1>	OK or Error	0=Not Auto, 1= Auto
Connect to remote bluetooth device	AT+CONNECT<Para1>	OK or Error	<Para1>: Set the remote bluetooth address format: 11,22,33,44,55,66 Reply Bluetooth address format: 11:22:33:44:55:66

check/set Page scan and inquiry scan parameters	AT+IPSCAN<Para1>,<Para2>,<Para3>,<Para4>	OK or Error	<Para1>: Query interval <Para2>: Query duration <Para3>: Paging time intervals <Para4>: Paging duration The above parameters are hexadecimal numbers. Default: 800,12,800,12
check/set Encrypt mode	AT+SENM<Para1>,<Para2>	OK or Error	<Para1>: Safe mode, the following values (1 byte): 0 - sec_mode0_off 1 - sec_mode1_non_secure 2 - sec_mode2_service 3 - sec_mode3_link 4 - sec_mode4_ssp <Para2>: Encryption mode, the following values (1 byte): 0 - hci_enc_mode_off 1 - hci_enc_mode_pt_to_pt 2 - hci_enc_mode_pt_to_pt_and_bcast Default: 0,0
Check/set low power Mode	AT+ LOWPOWER<Para1>	ok or error	0=not support, 1=support, default =1
check/set sniff energy save mode	AT+SNIFF<Para1>,<Para2>,<Para3>,<Para4>	ok or error	<Para1> - max time, <Para2> - min time, <Para3> - trial time, <Para4> - timeout time
check/set indication upward command	AT+ENABLEIND<Para1>	ok or error	0= close, 1= open, default 1
check Bluetooth pairing list	AT+LSP	LSP=<Para1>,<Para2>,<Para3> …… LSP=F	<Para1>：number（0-7） <Para2>：bluetooth address code <Para3>：name

		LSP=E	default feedback：LSP=E
Clear all bluetooth pairing list	AT+RESETPDL	Ok	-
clear selected bluetooth pairing record	AT+REMOVEPDL<Para1>	OK	<Para1>：number（0-7）
check/set linkloss checking time	AT+SUPERVISION<Para1>	Ok or error	<Para1> response time, unit in second (Hex), default 5

Uplink Command list

Command Name	Command	Response	Parameter
ready	+READY	-	-
inquiry status	+INQUIRING	-	-
inquiry pairing status	+PAIRABLE	-	-
connecting	+CONNECTING<Para1>	-	-
connected	+CONNECTED	-	-
connection fail	+CONNECTION FAILED	-	-
report remote bluettoth device name	+RNAME=<Para1>	<Para1>： report remote bluetooth name	
report inquiry result	+INQS start inquiry +INQ=<Para1>,<Para2>,<Para3> …… device information +INQE inquiry completed	<Para1>：bluetooth address format：11:22:33:44:55:66 <Para2>：device type <Para3>：RSSI signal strength (normal is decimal) signal strengthness (default in decimal return 7fff when is not available)	