Bluetooth module without antenna BK8002 manual

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http://shop110280715.taobao.com

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1. BK8002

BK8002 link: https://item.taobao.com/item.htm?id=520172931863

Adapter board link: https://item.taobao.com/item.htm?id=531428017858

Figure 1.1 BK8002 Promotional image

Figure 1.2 BK8002 Adapter board (2.4x3.1cm)

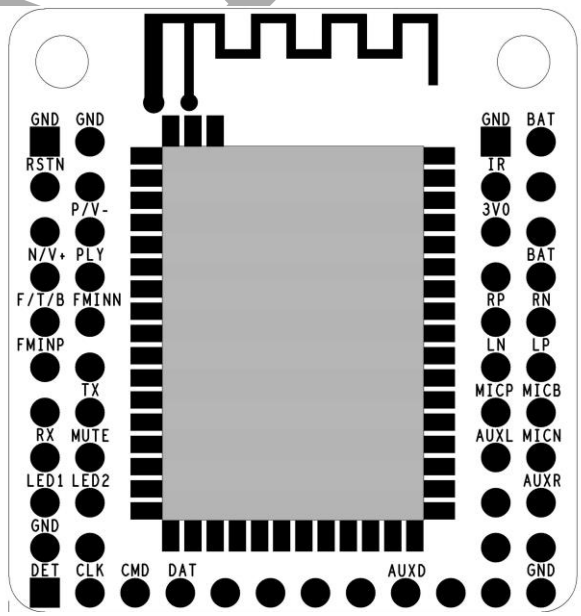

Figure 1.3 BK8002 Adapter board IO definition

1.1 Module introduction

This module master uses Beken (Broadcom) BK8002 The chip provides high-quality sound quality and compatibility for the module, The overall performance is better. The Bluetooth module adopts a driver-free mode, and customers only need to connect the module to the application product, and they can quickly Realize the wireless transmission of music, enjoy the fun of wireless music, stand by SPP Digital transmission, support buttons and AT Serial port Let control, SPP Can be done simultaneously with audio. Support intelligence **Chinese Voice** Prompt, reporting function (the reporting function will be upgraded later to support Support); integrated SD/TF Card playback function; support MP3/WMA/WAV Music format, support internal LINE-IN , Support internal FM Radio. Can be stored 6 When the module is powered on, it will automatically connect back to the last paired device. in case 6 When two paired devices are turned on at the same time, the last paired device is automatically connected .

1.2 Application field

This module is mainly used for short-distance music transmission, which can be conveniently used with laptops, mobile phones, PDA Other digital products The Bluetooth device of the product is connected to realize the wireless transmission of music.

1) Stereo Bluetooth speakers;
2) Stereo Bluetooth headset;
3) Bluetooth call;
4) Bluetooth control and multimedia equipment;
5) Bluetooth SPP Serial data transmission.

1.3 Basic characteristics

1) Bluetooth v2.1 + EDR ;
2) A2DP v1.2 ;
3) AVRCP v1.0 ;
4) HFP v1.5 ;
5) GAVDP1.2 ;
6) HSP1.2 ;
7) IOP .

1.4 Performance parameter

model	BK8002
Bluetooth specifications	Bluetooth V2.1
Supply voltage	DC2.8-4.2V , ≤ 2.9V Automatic shutdown, ≤ 3.1V Call the police
Support Bluetooth protocol	HFPV1.5 , A2DPV1.2 , AVRCPV1.4 , HSP1.2 , GAVDP1.2 , IOP
Working current	≤ 60mA
stand-by current	<500uA
temperature range	-40ºC ~ +85ºC
Wireless transmission range	≤ 10 Meter
Transmission power	Class2 4dbm
Sensitivity	-80dBm<0.1%BER
Frequency Range	2.4GHz~2.480GHz
External Interface	Serial port (TTL Level), and PC Connection requires level conversion, such as CH340G , USB turn TTL
Audio performance	SBC decoding
Module size	22.8x16.5x1.8mm
Adapter board size	

1.5 **Module size**

Pad size: 1.6x0.8mm

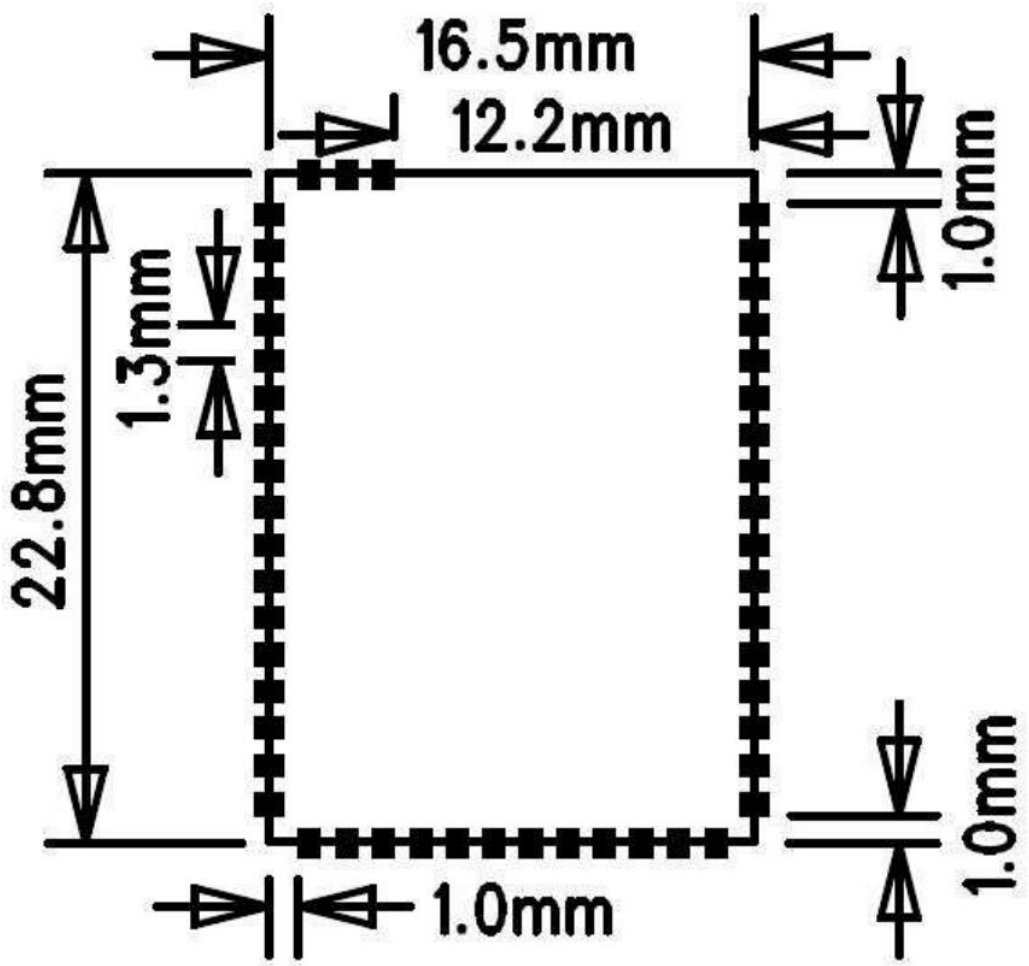

Figure 1.4 BK8002 Dimensions

1.6 **IO definition**

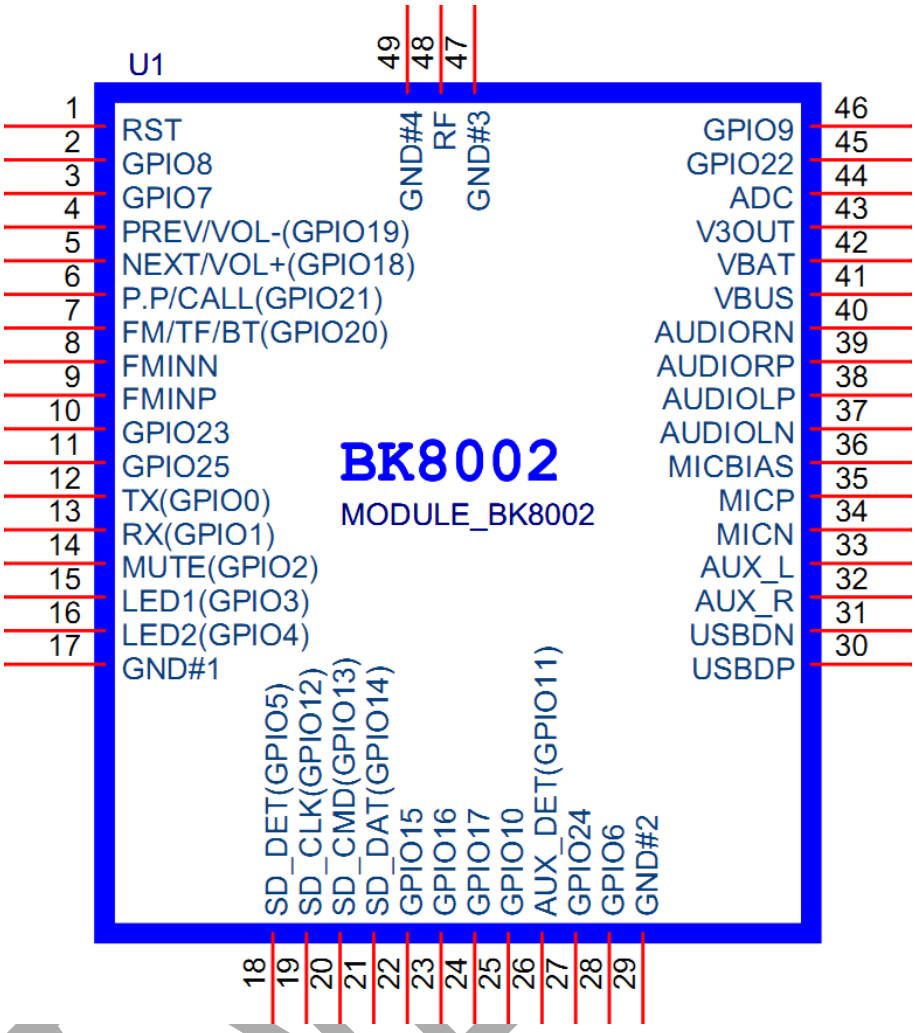

Figure 1.5 BK8002 Pin definition

IO Numbering	IO name	IO description
1	RST	Reset (active low). Hang in the air when not in use
2	VOL-(GPIO8)	Click volume down
3	VOL+(GPIO7)	Click volume down
4	PREV/VOL-(TMS)GPIO19	Previous song/Volume down
5	NEXT/VOL+(TCK)GPIO18	Next song/volume increase
6	PP/CALL(TDO)GPIO21	Play/pause/hang up/call back/re-pair
7	CHG_MODE(TDI)GPIO20	BT/FM/MP3/AUX Mode switch
8	FMINN	FM Antenna negative terminal
9	FMINP	FM Antenna positive end
10	GPIO23	Unused
11	GPIO25	Unused
12	TX(GPIO0)	Serial port TX (TTL Level 3.3V)
13	RX(GPIO1)	Serial port RX (TTL Level 3.3V)
14	MUTE(GPIO2)	Mute control (output low level when mute), control the power amplifier
15	LED1(GPIO3)	Status Indicator

16	LED2(GPIO4)	Status Indicator
17	GND	Power ground
18	SD/TF_DET(GPIO5)	SD/TF Insertion detection (active low)
19	SPI_CLK(GPIO12)	SD/TF of SPI Interface clock line
20	SPI_MOSI(GPIO13)	SD/TF of SPI interface
twenty one	SPI_MISO(GPIO14)	SD/TF of SPI interface
twenty two	GPIO15	Unused
twenty three	GPIO16	Unused
twenty four	GPIO17	Unused
25	GPIO10	Unused
26	AUX_DET(GPIO11)	AUX Insertion detection (active low)
27	GPIO24	Unused
28	GPIO6	Unused
29	GND	Power ground
30	USBDN	Unused
31	USBDP	Unused
32	AUX_R	AUX Right channel input
33	AUX_L	AUX Left channel input
34	MICIN	MIC Input negative
35	MICIP	MIC Input positive
36	VMIC	MIC Bias voltage
37	AUDIOLN	Audio left channel differential output negative terminal
38	AUDIOLP	Audio left channel differential output positive terminal
39	AUDIORP	Audio right channel differential output positive terminal
40	AUDIORN	Audio right channel differential output negative terminal
41	VBUS	Charging port 5V Input (charging is not enabled)
42	VBAT	power input(3.3V~4.2V)
43	3VOUT	3V Output, SD/TF power supply
44	ADC	ADC Input (not enabled)
45	GPIO22	Unused
46	FM_DISABLE(GPIO9)	FM Close foot (High level: FM Effective; low level: FM Invalid) Default high level Note: The control is valid before power-on, and the control is invalid after power-on
47	GND	Antenna_Ground
48	RF	antenna
49	GND	Antenna_Ground

1.7 **Precautions**

1. During the application of the module, please pay attention to avoid the influence of interference sources such as power amplifier and booster line on the module, and avoid The electric circuit forms a series circuit with the high-power circuit unit to improve the whole machine SNR .
2. Regarding the use environment of wireless Bluetooth, wireless signals including Bluetooth applications are greatly affected by the surrounding environment, such as trees. Obstacles such as wood and metal will absorb the wireless signal to a certain extent, so in practical applications, the distance of data transmission Li is affected to a certain extent.
3. Because the Bluetooth module must be matched with the existing system, it is placed in the shell. Because the metal shell is There is a shielding effect. Therefore, it is not recommended to install in a metal enclosure.
4. PCB Layout: The antenna part of the Bluetooth module is PCB Antenna, because metal will weaken the function of the antenna, in When arranging the module, it is strictly forbidden to lay the ground and wire under the module antenna. It is better to hollow out.

1.8 AT instruction

1.8.1 Serial port configuration

1. Baud rate 9600 ;
2. 8 Bit data bit
3. No parity bit;
4. One stop bit.

1.8.2 Instruction format

Control instruction format: AT+<CMD>[<param>]\r\n

Data feedback format: < IND>[<param>]\r\n

Description: The control command is the control command given to the Bluetooth by the control host, with " AT+ "Start immediately followed by < CMD> control Instruction, if the instruction has parameters, continue to transmit immediately after the instruction< param> Parameters, and end with "\ r\n "End.

Data feedback is the Bluetooth feedback of various status and data information to the host, IND> Is a feedback command, if you need to take parameters Number, then follow < IND> Continue transmission afterwards< param> parameter.

note:

- \r\n : The character type is **Line feed (keyboard "Enter" key)** , The hexadecimal is **0x0D , 0x0A** .

1.8.3 **Control instruction**

Serial command	parameter	description	For example
CA		Enter pairing	AT+CA\r\n
CB		Exit pairing	AT+CB\r\n
CC		Connect the last paired device	AT+CC\r\n
CD		Disconnect	AT+CD\r\n
CE		Answer the call	AT+CE\r\n
CF		Reject call	AT+CF\r\n
CG		Hang up the phone	AT+CG\r\n
CH		Redial	AT+CH\r\n
CK		Volume up	AT+CK\r\n
CL		Volume down	AT+CL\r\n
VOL	x :(0-15)	Set the volume level	AT+VOL9\r\n
CO		Channel switch	AT+CO\r\n
CW	Keep		
CX	Keep		
CZ		Clear memory	AT+CZ\r\n
CP		Shutdown	AT+CP\r\n
CV		Turn on the phone VOICE	AT+CV\r\n
CM		Multi-language switching	AT+CM\r\n
CMM	<number> :(0-4)	Set the number of multiple languages	AT+CMM4\r\n
CT		Enter test mode	AT+CT\r\n
MNBT		Bluetooth mode	AT+MNBT\r\n
MNMP3		TF mode	AT+MNMP3\r\n
MNAUX		AUX mode	AT+MNAUX\r\n
MNFM		FM mode	AT+MNFM\r\n
MPM0		Loop all (TF Mode)	AT+MPM0\r\n
MPM1		Single loop playback (TF Mode)	AT+MPM1\r\n
SMPxxxx	xxxx :(0000-9999) (" 0000 "On behalf of the 1 first)	Play selection (TF Mode)	AT+SMP0040\r\n
MA		Music play/pause	AT+MA\r\n
MC		Music stopped	AT+MC\r\n
MD		next track	AT+MD\r\n
ME		previous piece	AT+ME\r\n
MF		Fast forward	AT+MF\r\n
MH		Rewind	AT+MH\r\n

1.8.4 **Query/feedback instructions**

Serial command	description	For example	Bluetooth return information
MR	Query Bluetooth address	AT+MR\r\n	AD:191919191919\r\n
MP	PIN Code query	AT+MP\r\n	PN:0000\r\n
MN	Bluetooth name query	AT+MN\r\n	NA:BK8002\r\n
MRFM	Inquire FM Channel number (FM Mode)	AT+MRFM\r\n	FM99.8\r\n
MRMP3	Inquire MP3 Song number (TF Mode)	AT+MRMP3\r\n	MP3x\r\n (x Represents the song number)
MMMP3	Inquire MP3 Number of songs (TF Mode)	COM+MMMP3\r\n	MMP4\r\n (A total of 4 First song)
MPMC	Inquire MP3 Play mode (TF Mode)	AT+MPMC\r\n	All cycles: PLAY_ALL\r\n Single cycle: PLAY_ONE\r\n
MVOL	Query current volume	AT+MVOL\r\n	VOLx\r\n (x : Represents the volume level)
MO	Query Bluetooth connection status	AT+MO\r\n	connection succeeded: C1\r\n no connection: C0\r\n
MV	Query Bluetooth playback status	AT+MV\r\n	Play: MB\r\n time out: MA\r\n disconnect: M0\r\n
MY	Query Bluetooth HFP status	AT+MY\r\n	disconnect: M0\r\n connection: M1\r\n Incoming call: M2\r\n To call: M3\r\n calling: M4\r\n
MM	Query current mode	AT+MM\r\n	Bluetooth: BT_MODE\r\n TF : MP3_MODE\r\n FM : FM_MODE\r\n AUX : AUX_MODE\r\n
The following is the status sent by Bluetooth actively			
Serial command	description	description	Bluetooth return information
ERR	error		ERR\r\n
OK	Control command recognition completed		OK\r\n
PLAY_ALL	Loop all (TF Mode)		PLAY_ALL\r\n
PLAY_ONE	Single loop playback (TF Mode)		PLAY_ONE\r\n
VOLx	Current volume x level		VOLx\r\n (x : Represents the volume level)
BT_MODE	Bluetooth mode		BT_MODE\r\n
MP3_MODE	TF mode		MP3_MODE\r\n
FM_MODE	FM mode		FM_MODE\r\n
AUX_MODE	AUX mode		AUX_MODE\r\n
II		connection succeeded	II\r\n
IA		disconnect	IA\r\n
FM	FM Channel number	Switch every time FM Channel Automatically return to the channel number	FM99.8\r\n
MP3	MP3 Song number	Switch every time MP3 song Automatically return the song number	MP3x\r\n (x Represents the song number)

MA			time out: MA\r\n
MB			Play: MB\r\n
IR-	<Number>	Caller number	IR-136XXXXXXX
PR-	<Number>	Outgoing number	PR-136XXXXXXX
ON		Bluetooth is on	ON\r\n

1.8.5 **SPP Introduction**

Bluetooth active status			
SPP Data Format	description	For example	Bluetooth return information
APT+SPPxxxx	Four-digit password (8888) Open by password SPP	APT+SPP8888\r\n	Just send it once, The password is correct: OK \r\n wrong password: ERR \r\n
APT+xxxxxxx	The total data length each time, It is recommended not to exceed 64bye	APT+xxxxxxx\r\n Data sent to mobile	success: OK \r\n error: ERR \r\n
APR+xxxxxxx	The total data length each time, It is recommended not to exceed 64bye	APR+xxxxxxx\r\n Data received from the mobile phone	Data sent from mobile phone APR+xxxxxxx\r\n

1.8.6 **Serial port demo**

When the serial port connection is successful, the module will return " ON\r\n ", return to "after connecting to the main device II\r\n " ,Such as Figure 1.6 Shown:

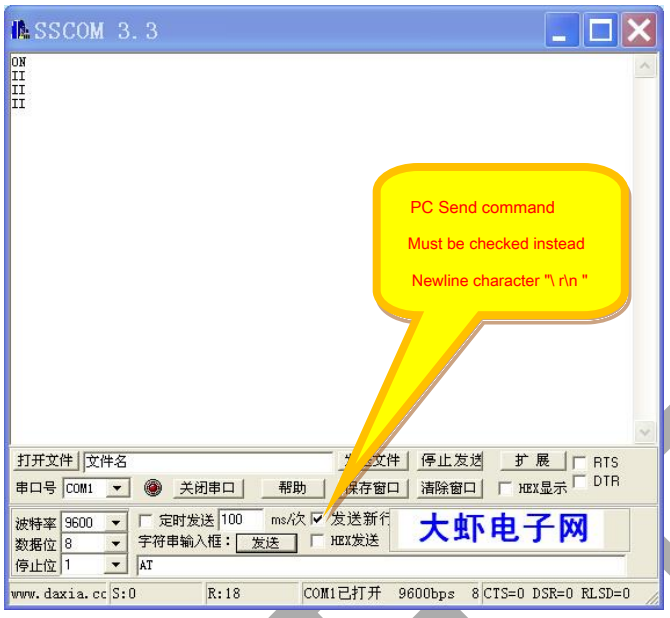

Figure 1.6 Serial port open

Send open SPP Password, the module returns " OK\r\n ", as shown 1.7 Shown:

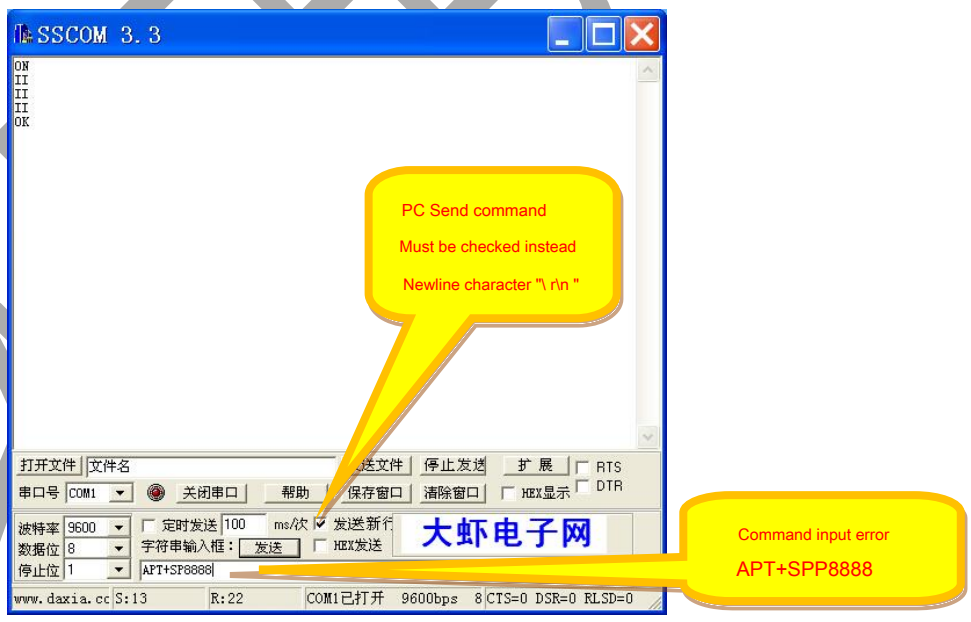

Figure 1.7 send SPP Open password

Install the software on the Android phone, and run the software, click connect, connect appears BK8002 As shown 1.8 Shown:

Figure 1.8 Cell phone APP

in SSCOM Send according to the instruction format SPP Data, as shown 1.9 Shown. On the phone APP The corresponding data is received in 1.9 Shown.

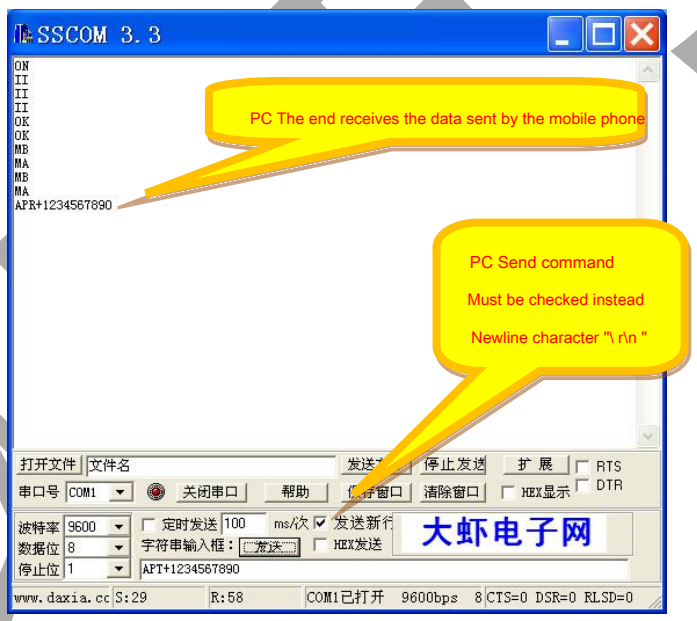

Figure 1.9 Serial port to send and receive data

On the phone APP Send according to the instruction format SPP Data, as shown 1.10 Shown. in SSCOM The corresponding data is received in the 1.9 Shown.

Figure 1.10 Cell phone APP Send and receive data