

# User Manual

FCC ID: 2AKS8DX-BT18

Model Name: DX-BT18

Shenzhen DX-SMART Technology Co Ltd.

DX-BT18 Dual Bluetooth Module

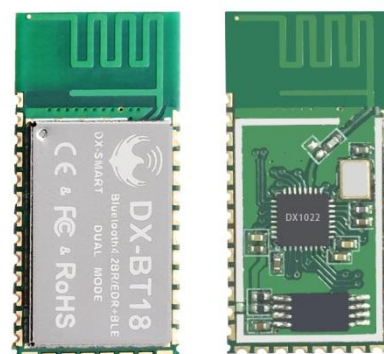
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## 1. Overview:

DX-BT18 dual-mode Bluetooth module is a dual-mode Bluetooth module (Dual-Mode) that is specially designed for smart wireless data transmission by Shenzhen DX-SMART Technology Co., Ltd. and follows the Bluetooth 4.2 standard protocol.

DX-BT18 module applies to wireless data transmission field, uses BT4.2 Bluetooth chip + PCB printed antenna design, SOC chip embedded BT4.2 Dual-Mode protocol stack, supports data transmission of Windows, Linux, Android, iOS and other systems And applications, with industrial design, transmission distance, data stability, simple operation, high cost performance and technology leading edge.



## 2. Module default parameters:

<b>Bluetooth Protocol</b>	Bluetooth 4.2 BR/EDR+BLE	-
<b>Working Frequency</b>	2402-248MHz	
<b>Communication Interface</b>	UART	
<b>Power Supply</b>	3.3V	
<b>Communication distance</b>	30-40M (Open and unobstructed environment)	
<b>Physical Dimension</b>	27mm x 13mm x 2.35 mm	
<b>Bluetooth Authentication</b>	ROHS REACH FCC	
<b>Bluetooth Name</b>	DX-BT18	
<b>Pairing Code</b>	1234 (The SPP agreement is valid)	
<b>Serial Port Parameters</b>	9600、8 data bits、1 stop bit、No check、No flow control	
<b>Service UUID</b>	FFE0	
<b>Notify\Write UUID</b>	FFE1	
<b>Write UUID</b>	FFE2	
<b>Storage temperature</b>	MIN:-40℃ - MAX:+140℃	
<b>Work temperature</b>	MIN:-20℃ - MAX:+85℃	
<b>Custom requirements</b>	If you have other special function requirements, you can contact us to customize the module.	

### 3. Application area:

DX-BT18 module supports BT4.2 SPP standard protocol, which can be paired with all Bluetooth-enabled desktop computers, notebooks, Android mobile phones and Bluetooth main module to achieve bidirectional data transmission and receiving; DX-BT18 module supports BT4.2 BLE protocol at the same time, Can connect directly with iOS device with BLE Bluetooth function, support background program resident operation.

Successful application of BT18 module:

- ※ Bluetooth wireless data transmission;
- ※ mobile phones, computer peripherals;
- ※ hand-held POS devices;
- ※ Medical equipment wireless data transmission;
- ※ smart home control;
- ※ car detection OBD equipment;
- ※ Bluetooth printer
- ※ Bluetooth Remote Control Toy
- ※ Anti-lost device, LED light control

### 4. Power consumption parameters:

DC-DC	Average Current	Unit
Discoverable	4.4	mA
Connected (BLE)	3.8	mA
Connected (SPP)	12	mA

### 5. Transparent transmission parameters

#### SPP data throughput:

Android ->BT18 -> UART	UART ->BT18 -> Android	BAUD
14400 bytes/s	7500 bytes/s	115200

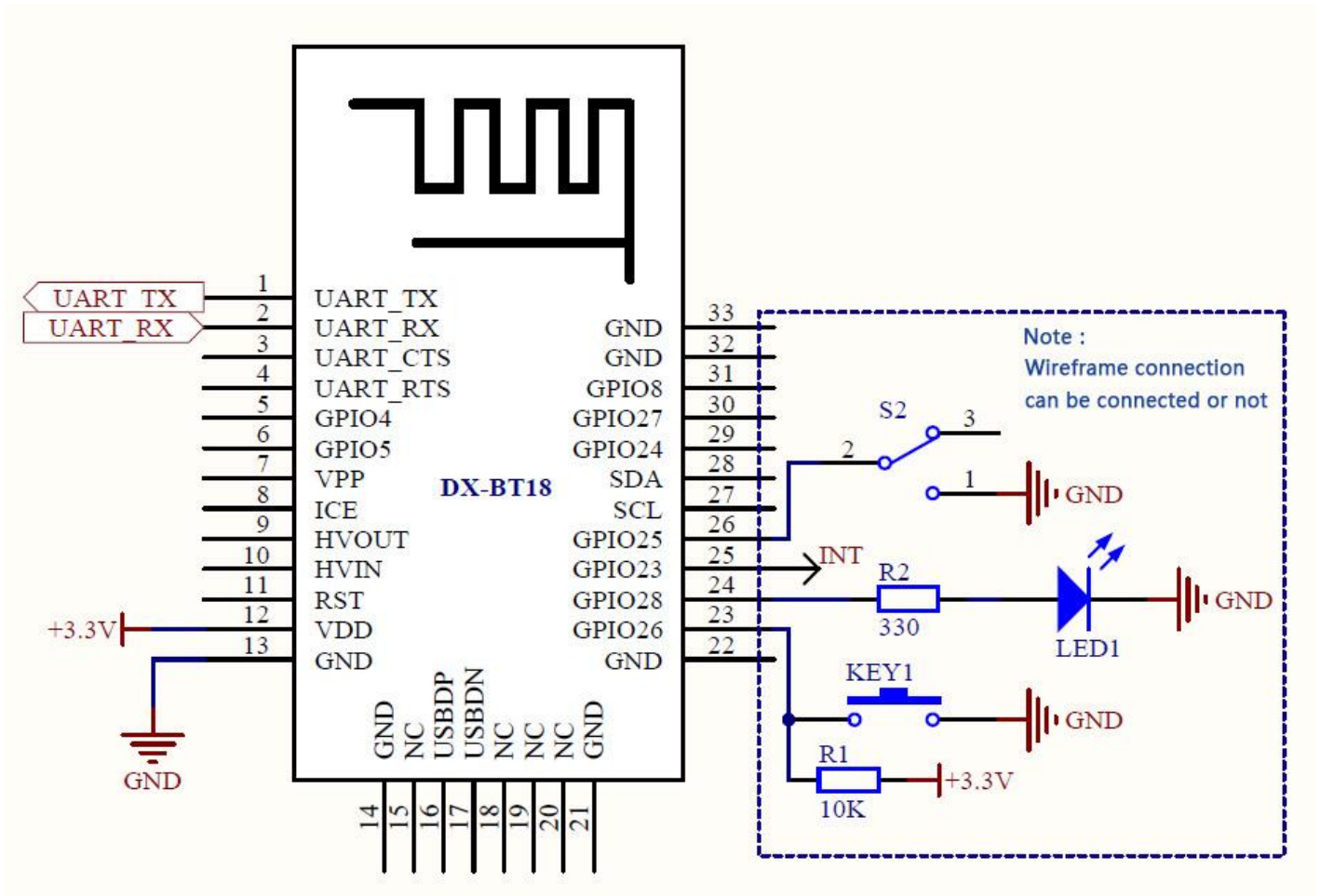
#### BLE data throughput:

iPhone 6 ->BT18 -> UART		UART ->BT18 -> iPhone 6	
Baud rate	115200	Baud rate	115200
Connection interval (ms)	15	Connection interval (ms)	15
APP Serial packet size (bytes)	300	Serial packet size (bytes)	300
Transmission interval (ms)	20	Transmission interval (ms)	50
Throughput (bytes/s)	5000	Throughput (bytes/s)	5040

<b>Characteristic Write method</b>	Write without Response		
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Note: This table parameter is for reference only and does not represent the maximum data throughput that the module can support.

## 6. Module pin description and minimum circuit diagram:



## 7. Pin function description:

Pin number	Pin name	Pin description
1	UART_TX	Serial data output
2	UART_RX	Serial data input
3	UART_CTS	Vacant
4	UART_RTS	Vacant
5	GPIO4	Programmable input and output port
6	GPIO5	Programmable input and output port
7	VPP	VPP
8	ICE	Firmware upgrade port

9	HVOUT	Programmable input and output port
10	HVIN	Vacant
11	RESETB	Low level reset, at least 5ms
12	VCC	Power supply V3.3
13	GND	GND
14	GND	GND
15	NC	NC
16	USBDP	NC
17	USBDN	NC
18	NC	Vacant
19	NC	Vacant
20	NC	NC
21	GND	GND
22	GND	GND
23	GPIO26	Disconnect pin (200ms low electrical pulse off)
24	GPIO28	LED light pin (unconnected flashing, connection is always on)
25	GPIO23	Bluetooth connection indicator (not connected low, connection high)
26	GPIO25	AT command switch pin (low AT command mode)
27	SCL	NC
28	SDA	NC
29	GPIO24	Programmable input and output port
30	GPIO27	Programmable input and output port
31	GPIO28	Programmable input and output port
32	GND	GND
33	GND	GND

## 8. Detailed description of function pins:

### 1. P24 pin (GPIO28): LED indicator pin

- Used to indicate the status of the Bluetooth module. Correspondence between the LED flashing mode and the Bluetooth module status is shown in the following table:

LED display	Module status
Uniformly slow flashing (800ms-on, 800ms-off)	standby mode
always bright	Connection Status

### 2. P26 pin (GPIO25): AT command switching pin

Pin status	Module status
Connect to GND	Enter AT command mode

NC	Module enters transparent mode
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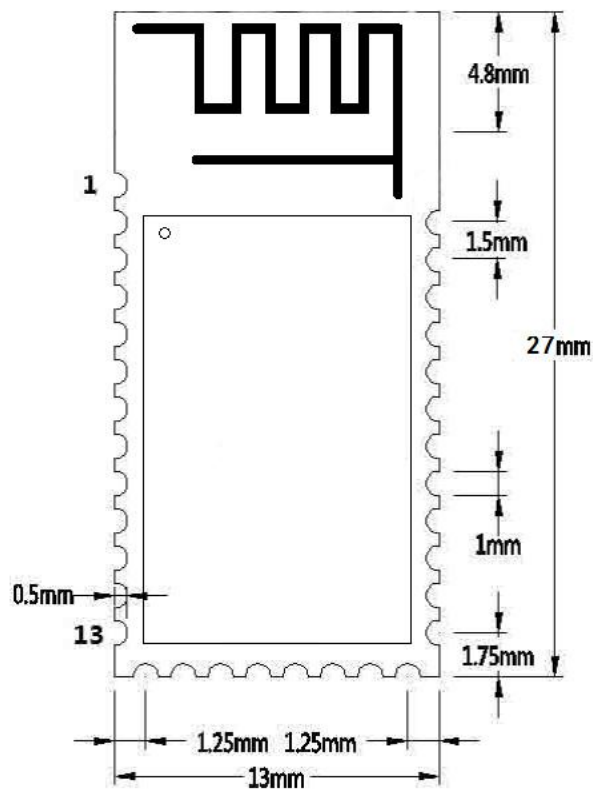
### 3. P25 pin (GPIO23): Connection status indicator

Pin status	Module status
Low output	standby mode
Output high	Connection Status

### 4. P23 pin (GPIO26): Connect interrupt pin (module is in valid connection state)

Pin status	Module status
No action	Connection Status
Input 200ms low level pulse	Interrupt connection, module enters standby

## 9. Dimensions:



## 10. LAYOUT

### Precautions:

The DX-BT18 dual-mode Bluetooth module works in the 2.4G wireless band. It should try to avoid the influence of various factors on the wireless transceiver. Pay attention to the following points:

1. The product shell surrounding the Bluetooth module to avoid the use of metal, when using part of the metal shell, should try to make the module antenna part away from the metal part.
2. The internal metal connecting wires or metal screws of the product should be far away from the antenna part of the module.
3. The antenna part of the module should be placed around the PCB of the carrier board. It is not allowed to be placed in the board and the carrier board under the antenna is to be milled empty.

The direction parallel to the antenna does not allow copper to be laid or routed. It is also a good choice to directly expose the antenna part out of the carrier board.

4. It is recommended to use insulating material for isolation at the module mounting position on the substrate. For example, put a block of screen printing (TopOver Lay) at this position.

## 11. AT COMMAND

1. When sending AT commands, you need to pull module P26 low to enter the AT command mode. At other times, the commands do not respond.

2. AT command, which belongs to the character line instruction, is parsed according to the line (AT command must be returned by carriage return or `\r\n`, hexadecimal number is 0D0A)

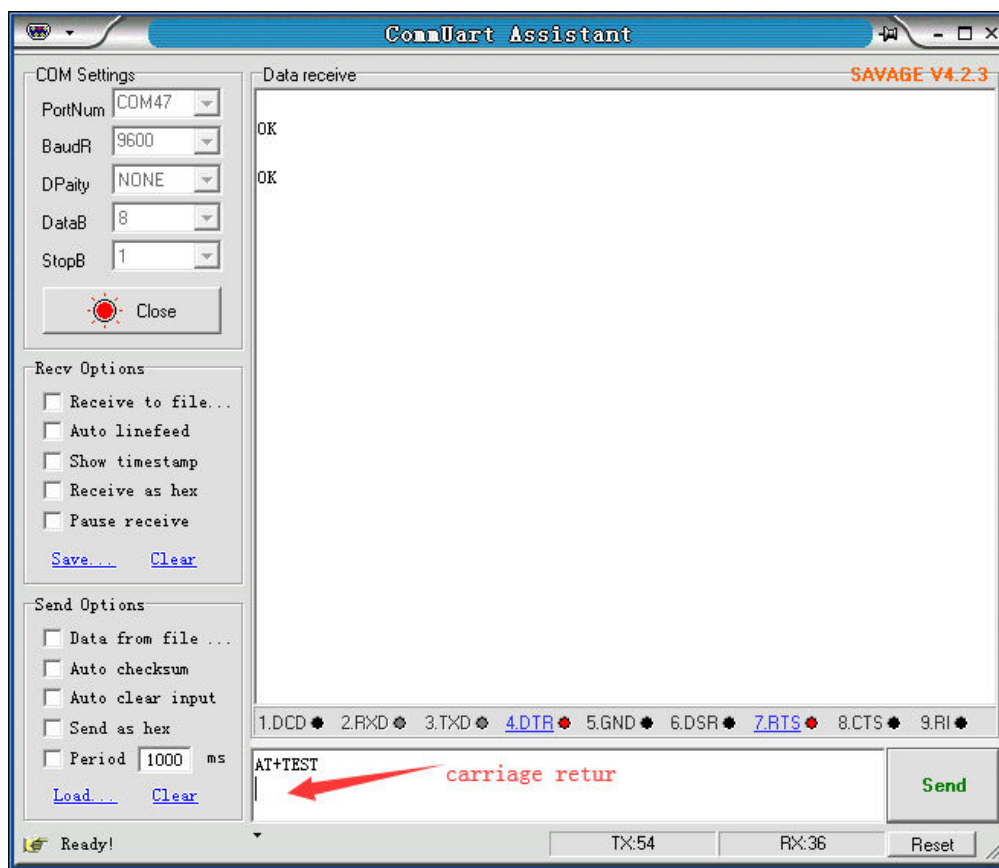
3. The AT command only supports uppercase. The instruction prefix is AT+ and can be divided into parameter setting instructions and read instructions.

4. Set the instruction format: AT+<CMD>=<PARAM> The operation succeeds.  
Return: +<CMD>=<PARAM>\r\n OK\r\n Fail Back:ERR\r\n

5. Read instruction format:

AT+<CMD>? Operation succeeds: +<CMD>=<PARAM>\r\nFailed to return ERR\r\n

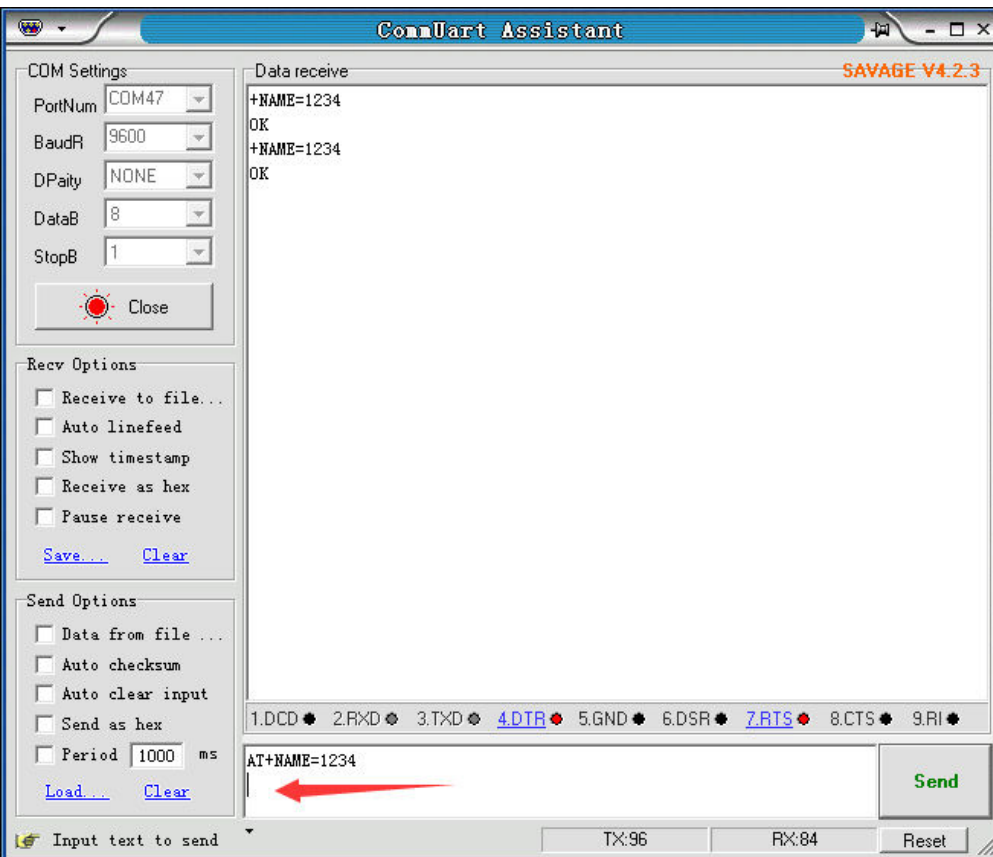
6. instruction error or not support, return ERR\r\n



AT  
com  
mand  
form  
at  
exam  
ple  
(fig  
ure 1  
is AT  
test  
com  
mand



d, Figure 2 is to change the Bluetooth name to 1234):



1、 Test instructions:

Function	Command	Response	Description
Test instructions	AT+TEST\r\n	\r\n OK\r\n	

## 2、 Get The Software Version:

Function	Command	Response	Description
Query version number	AT+VERS?\r\n	+VERS=<version>\r\n OK\r\n	<version > Software version number

Note: The version will be different depending on different modules and customization requirements.

## 3、 Set/Query Module Bluetooth MAC:

Function	Command	Response	Description
Query module MAC address	AT+ADSS?\r\n	+ADSS=<addr>\r\n	<addr> 12-bit MAC address code
Set the module MAC address	AT+ADSS=<LA DDR>\r\n	+ADSS=<addr>\r\n OK\r\n	

Note: The SPP and BLE Bluetooth address codes of the module are the same address code.

## 4、 Set/Query Device Name:

Function	Command	Response	Description
Query Module device Name	AT+NAME?\r\n	+NAME=<name>\r\n	<name> device Name, Up to 19 bytes Default NAME:BT18
Set the module device name	AT+NAME=<na me>\r\n	+NAME=<name>\r\n OK\r\n	

**Note:** The Bluetooth names of the module's SPP and BLE are the same. Each time the name is changed, the names of the SPP and BLE are the same.

### Example:

#### 1. Send Settings:

AT+NAME=DX-BT18\r\n ——Set module device name: “DX-BT18”

return:

+NAME=DX-BT18\r\n ——Set module device name: “DX-BT18” succeeded

OK\r\n

2. Send inquiry:

AT+NAME?\r\n

——Query module device name

return:

+NAME=BT18\r\n

——Return module device name: “ BT18”

### 5、 Set/Query - Serial Port Baud Rate:

Function	Command	Response	Description
Query module baud	AT+BAUD?\r\n	+BAUD=<baud>\r\n	<baud> Baud rate
Set the module baud	AT+BAUD=<baud>\r\n	+BAUD=<baud>\r\n OK\r\n	corresponding serial number 1:9600 2:19200 3:38400 4:115200 Default BAUD:1(9600)

**Note:** The module must be re-powered after setting the baud rate, enabling the new baud rate for data communication and AT command resolution.

**Example:** Setting the Serial Port Baud Rate: 38400

1. Send Settings:

AT+BAUD=3\r\n

return:

+BAUD=3\r\n

OK\r\n

2. Send inquiry:

AT+BAUD?\r\n

return:

+BAUD=3\r\n

OK\r\n

### 6、 Set/Query Pairing PIN:

Function	Command	Response	Description
Query module SPP pairing code	AT+PIN?\r\n	+PIN=<pin>\r\n	<pin> pairing PIN Default PIN:1234

Set module SPP pairing code	AT+PIN=<pin>\r\n	+PIN=<pin>\r\n OK\r\n	
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### 7、Query—UUID:

Function	Command	Response	Description
Query module UUID	AT+UUID?\r\n	+UUID=<service>,<notify>,<write>\r\n	<service> service UUID <notify> notify UUID <write> write UUID

**NOTE:** Module default UUID: SERVICE UUID FFE0, NOTIFY UUID FFE1, WRITE UUID FFE2 (When setting UUID, the last two bits need to be swapped with the first two bits)

#### Example:

1. Send Settings:

`AT+UUID?\r\n`                      ——Query module UUID

return:

+UUID= e0ff,e1ff,e2ff\r\n  
OK\r\n

### 8、Set—Service UUID:

Function	Command	Response	Description
Query service UUID	AT+SERV=<service>\r\n	+SERV=<service>\r\n	<service> service UUID

**Example:** Set the service UUID to: FE01 (When setting, the last two bits need to be swapped with the first two bits)

1. Send Settings:

`AT+SERV =01FE \r\n`

return:

+SERV=01fe r\n  
OK\r\n

### 9、Set—NOTIFY UUID\ WRITE UUID:

Function	Command	Response	Description
SET NOTIFY UUID	AT+NOTIFY=<	+SERV=<notify>\r\n	<notify> notify UUID

	notify >\r\n	OK\r\n	
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**Note: This channel is NOTIFY and WRITE (It can be read or written)**

**Example:** Set the NOTIFY UUID to: FE02(When setting, the last two bits need to be swapped with the first two bits)

1. Send Settings:

`AT+NOTIFY=02FE \r\n`

return:

`+NOTIFY=02fe \r\n`

`OK\r\n`

#### 10、Set—WRITE UUID:

Function	Command	Response	Description
Set WRITE UUID	<code>AT+WRITE?=&lt;n otify &gt;\r\n</code>	<code>+WRITE?=&lt;write&gt;\r\n OK\r\n</code>	<write> write UUID

#### 11、Disconnect The Link:

Function	Command	Response	Description
Disconnect the link	<code>AT+DIS?\r\n</code>	<code>\r\n OK\r\n</code>	You can disconnect the module when the module is connected

## 12. Contact us

### Shen Zhen DX-SMART Technology Co., Ltd.

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## Single Module

### FCC Statement

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.

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

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2AKS8DX-BT18 Or Contains FCC ID: 2AKS8DX-BT18"

When the module is installed inside another device, the user manual of the host must contain below warning statements;

1. 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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

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

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Any company of the host device which install this modular with Single modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C : 15.247 and 15.209 requirement, Only if the test result comply with FCC part 15C : 15.247 and 15.209 requirement, then the host can be sold legally.