

# Instructions for Low Power Bluetooth Motor Drive Modules

Model:Carbon Flyer

Serial number	Modify logs	File version	modification date
1	first draft	V1.0	2018-10-26
2			
3			

## 1: Summary

**CARBON FLYER BT PCB V3** Low power Bluetooth module is a high performance Bluetooth module based on embedded SOC chip. It integrates Bluetooth BLE control protocol and motor drive function. It is compact and delicate, the control port is drawn out, easy to use, and helps users bypass the tedious design, development and production of radio frequency hardware. On this basis, users can easily realize the development of Bluetooth motor control application.

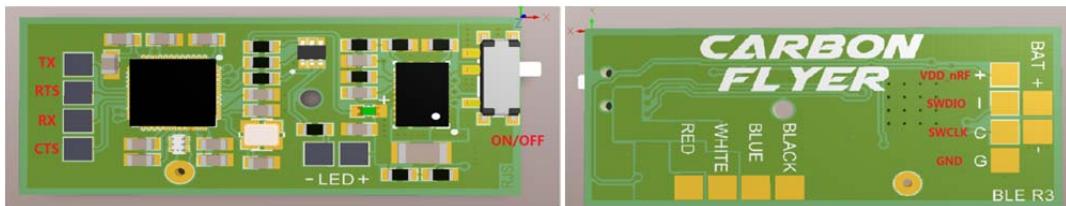
## 2: KEY FEATURES

- Multiprotocol 2.4GHz radio
- 32-bit ARM Cortex M0 processor
- 256kB/128kB flash and 32kB/16kB RAM
- Software stacks available as downloads
- Application development independent from protocol stack
- Fully on-air compatible with nRF24L Series
- Programmable output power from +4dBm to -20dBm
- RSSI
- RAM mapped FIFOs using EasyDMA
- Dynamic on air payload length up to 256 Bytes
- Programmable Peripheral Interface – PPI
- Simple ON/OFF global power modes
- Full set of digital interfaces including: SPI/2-wire/UART
- Quadrature demodulator
- It can directly drive the MOTOR, H-bridge continuous output current up to 5A, voltage 2.0-5.5V

## 3: Main application areas

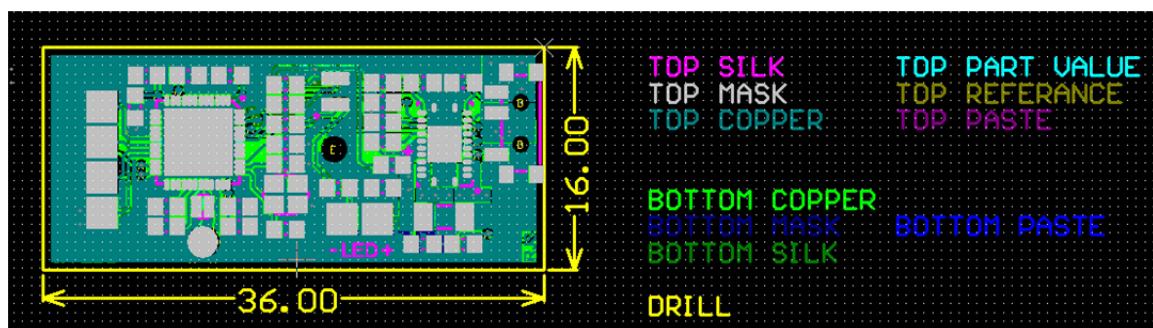
Intelligent Bluetooth control of motor toys or other product applications.

## 4: Pin Configuration and Functions



PIN	Name	DESCRIPTION	EXTERNAL COMPONENTS OR CONNECTIONS
1	TX	UART_TX	Serial Communication for Bluetooth Fixed Frequency Test
2	RX	UART_RX	Serial Communication for Bluetooth Fixed Frequency Test
3	RTS	UART_RTS	
4	CTS	UART_CTS	
5	ON/OFF	POWER SWITCH	It will switch the POWER ON/OFF
6	VDD_nRF	BLE CHIP POWER	DC +3.3V
7	SWDIO		
8	SWCLK		
9	BAT+	BATTERY INPUT	3.7V Lithium Battery Input
10	BAT-	GND	Connect TO GND
11	GND	DEVICE GROUND	Connect to GND
12	BLACK	GND	Connect to GND
13	BLUE	GND	Connect to GND
14	WHITE	Moto output1	Connect to motor winding, UP to 5A current driver
15	RED	Moto output2	Connect to motor winding, UP to 5A current driver

## 5: PCB specification



.062 FR4, 2 LAYER, 1 Oz, EING, 2 WHITE SILK, GREEN LPI  
NO additional text. NO symbols, NO date codes permitted

Symbol	Count	Hole Size	Plated
A	85	8.00mil (0.203mm)	PTH
B	16	12.99mil (0.330mm)	PTH
C	1	30.00mil (0.762mm)	PTH
D	2	35.43mil (0.900mm)	NPTH
E	1	62.99mil (1.600mm)	NPTH
105 Total			

Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Overlay				
2	Top Solder	Solder Resist	0.40mil	3.5	
3	Top Layer	Copper	1.40mil		
4	Dielectric 1	FR-4	58.00mil	4.8	
5	Bottom Layer	Copper	1.40mil		
6	Bottom Solder	Solder Resist	0.40mil	3.5	
7	Bottom Overlay				

**Integration instructions for host product manufacturers according to KDB 996369 D03  
OEM Manual v01**

## 2.2 List of applicable FCC rules

FCC Part 15 Subpart C 15.247 & 15.207 & 15.209

## 2.3 Specific operational use conditions

Not applicable. The module is a normal 2.4G module, which has its own antenna connector and specific antenna, and it's not a point-to-point device, not 5G WIFI device;

## 2.4 Limited module procedures

The module does not have a shield. It must be connected to the host for use. The distance between the antenna and end user must be min 5cm. It can guarantee the RF Exp requirements. For additional

hosts other than the specific host originally granted with a limited module, a Class II Permissive change is required on the module grant to register the additional host as a specific host also approved with the module.

## 2.5 Trace antenna designs

Not applicable. The module has its own antenna, and doesn't need a host's printed board microstrip trace antenna etc.

## 2.6 RF exposure considerations

The module must be installed in the host equipment such that at least 5mm is maintained between the antenna and users' body; and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module

through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

## **2.7 Antennas**

Type: Wire Antenna; Gain: 1 dBi;

This device is intended only for host manufacturers under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna;

The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a 'unique' antenna coupler. As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

## **2.8 Label and compliance information**

Host product manufacturers need to provide a physical or e-label stating "Contains FCC ID:2AUD4-V3 with their finished product.

## **2.9 Information on test modes and additional testing requirements**

Operation Frequency: 2402-2480MHz Number of Channel: 40 Modulation: GFSK

Host manufacturer must perform test of radiated & conducted emission and spurious emission, etc

according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

## **2.10 Additional testing, Part 15 Subpart B disclaimer**

The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 & 15.207 & 15.209 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Federal Communication Commission Statement (FCC, U.S.)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or

television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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.

FCC Caution:

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

#### IMPORTANT NOTES

Co-location warning:

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

OEM integration instructions:

This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module.

As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End product labeling:

The final end product must be labeled in a visible area with the following: "Contains Transmitter Module [FCC ID: 2AUD4-V3](#)

Information that must be placed in the end user manual:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.