



1.1 Blue tooth Low Energy States

There are three basic operating modes among 17H26 MCU:

1) working mode : at this time the MCU execute program normally, the hardware digital module work normally, according to the program the corresponding analog module and BLE RF transceiver module needs to be open. The working current is between the 10-30mA.

2) Suspend mode: Low power mode 1, at this time the program is similar to a pause function. Most of the hardware modules on the IC hardware are powered off only the PM module is working properly. Digital and analog registers, memory, all the data and state are hold live, 17H26 will not lose any data, at this time the pure IC current is about 10uA or so. When the suspend is awakened, the program continues to execute.

3) Deep sleep mode: Low power mode 2, at this time the program stopped running, the majority of the IC hardware are powered off, PM hardware module maintenance work. Digital registers and memory power off, all data is no longer saved, only a few analog registers do not lose power, you can save some necessary information like True/False in them. When the Deep Sleep is awakened, the MCU will start working again, with the same effect as the power on, the program restarts initialize and execute, you can deposit some information in the DEEP_ANA_REG0-DEEP_ANA_REG7 register before Deep Sleep ,Then read the registers in the initialization to determine whether the program is a pure reconnect or deep sleep wake up. The Pure IC current under DeepSleep is about 0.5 ua.

Method for BLE SDK to achieve Low-power : In the BLE work sequence, among the program when it does not need to deal with BLE timing and any UI, the system can enter the suspend state, the MCU in working mode of the time accounted for a very small proportion, after processing the corresponding tasks, MCU will enter the suspend state, because the suspend of the current is very low and suspend accounted for a large proportion of time, the entire Main_loop average current is very low.

When we do not need 17h26 MCU to work, we can set the MCU into the DeepSleep mode, so that the power consumption is very low, we can set up a number of special operations to wake up the chip and restart the program .

1.2 Comparison of Suspend mode and Deep sleep mode

Based on the 1.1 3rd reason, it takes less time for suspend to wake up than Deep Sleep mode.

In each mode, program performs different processes:

A. In suspend mode, RAM and all registers are maintained, so the program exits from the Suspend function when suspend mode wakes up, as follows:

```
{  
//State 1  
//suspend state  
//State 2  
}
```

So ,the basic flow among suspend state is : state 1 -> suspend state -> wake up suspend -> state 2.

B. In Deep Sleep mode, when the RAM and part of the module's data is reset and the program wakes from Deep Sleep mode, the program Restart from the main function as follows:

```
Main(){  
//State 1  
//deep sleep state  
}
```



So ,the basic flow among deep sleep state is : state 1 -> deep sleep state -> wake up deep sleep -> state 1.