HBK-001 Bluetooth CAR KIT

Purpose explanation & Working principle

A. *Purpose explanation:*

HBK-001 CAR KIT design is compliant with Bluetooth specification V 1.1,

Which works in ISM band 2.402GHZ to 2.480GHZ. This adapter is Embedded with Audio Gateway profile. It supports pair input in order to pair with various Bluetooth headsets. It can plug in existing mobile phone via 2.5 ϕ phone jack for hand free application.

B. *Working principle:*

This CAR KIT is consist of Bluetooth module & codec IC, function & working principle are described as below:

a. CSR Bluetooth module

The module comprises radio, baseband & PCM interface:

1. Radio:
   (1) TX: BC02 (U1of Module) pin TX_A & TX_B feed output power 0 dbm balance ISM band signal, Balun (T1 of Module) transfers it to unbalance signal (loss 1 db), and then it is connecting with antenna to radiate ISM band signal via band pass filter (F1 of Module).
   (2) RX: Antenna decouples signal from Bluetooth headset, then feeds this signal to filter (F1), We use the differential RF input, the input signal will from TX_A & TX_B pass to the internal LNA of BC02.
   (3) VCO: VCO comprises 16MHZ crystal circuit & loop filter , Provides signal to TX & RX.

2. Baseband:
   (1) External Memory port: They are also include address lines (A0~A18)and data bus(D0~D15). They are all connected to flash memory. Flash memory functions to provide residence to download Bluestack firmware, audio gateway profile & AP (MMI) via Serial peripheral interface.

   (2) Serial peripheral interface:

Serial peripheral interface comprises SPI_CLK, SPI_CSB, SPI_MOSI, SPI_MISO. Audio gateway firmware or test program can be downloaded into flash memory via Serial peripheral interface connecting to desktop (laptop) printer port.

(3) UART interface:

UART interface comprises UART_TX, UART_RX, UART_CTS & UART_RTS. When the adapter would like to be entered test or debugging mode, headset must use UART interface to connect to desktop (laptop) COM port.

(4) PIO port:

PIO port comprises PIO (0)-PIO (9) and AIO(0)-AIO(1).

PIO port output controls adapter status when key is pressed. AIO(0) is as battery voltage detection port. AIO(1) is detecting the signal from the audio jack in order to let the adapter as the master role.

3. PCM interface:

PCM interface comprises PCM_CLK, PCM_SYNC, PCM_IN & PCM_OUT. Audio signal can be processing PCM encoding & decoding via PCM interface connecting to codec IC.

b. Codec IC

1. Codec IC (U1) pin TI+, TI-, TIG amplifies the signal from audio jack. The amplified signal will connect to U1 pin DT, encoding it to be PCM signal, and then send the PCM signal to BC02′s PCM_IN.

2. Codec IC (U1) pin DR decodes PCM signal from BC02′s PCM_OUT. The decoded audio signal connects to RO-, then the audio will send to audio jack.