## **BTSP200 Bluetooth schematic diagram description**

## 1. Summary

The BTSP200 Bluetooth speaker, based on CSR BlueCore 05-MM, the single chip Bluetooth system, It provides the high quality wireless stereo audio solution. It is compliant to Bluetooth v2.1 + EDR specification. Also, the BTSP200 Bluetooth speaker supported 3.5mm audio line in interface.

The BTSP200 Bluetooth speaker is power by external DC 6V/1A adapter, or power by 4 AA alkaline batteries.

## 2. Schematic diagram description

The schematic diagram description references to the document <BTSP200 Bluetooth speaker block diagram> and <BTSP200 Bluetooth Speaker schematic diagram>.

BT1 (YG-209M) is a Bluetooth Module, it provides Bluetooth RF, baseband and some power regulator functions. It uses inverted-F PCB antenna, and integrated DC +1.5V, DC +1.8V power supply. +1.5V uses for the chipset core running, +1.8V uses for the PIO pull up such as the buttons.

BT1 uses with an external flash memory, U16 is external DC-DC voltage converter that provides the +3.3V power supply for the flash memory.

U10 is LDO, it converts the VCC1 (from DC +6V or Batteries power) to a fixed voltage VBAT for Bluetooth module BT1. +1.8V and +1.5V are converted from VBAT.

U8 is the power voltage detector, if the VCC1 is lower than +3.3V, it will output low level. While the BT1 detects the level turn to low, it will indicate by RED led.

The PIO 10, 11, 13, 14, 15, and P38 of BT1 are buttons input for Bluetooth operation, like POWER ON/OFF, VOLUME UP/DOWN, FORWADD/BACKWARD call control and etc. thev connects to SW8,9,10,11,12,13. Also, the SW13 is the power control button for BT1.

Bluetooth system and 3.5mm LINE IN use respective power supply. Q19 and Q20 are MOS-FET for power control. Q19 is drove by BT11 when the Bluetooth is power on. Q20 is drove by 3.5mm LINE IN, when 3.5mm plug is plug in, the BT1 will be reset, and the Q20 will be breakover, the VCC3 is activated.

U7 is a Class-D type stereo audio power amplifier with differential input; it connects to BT1's audio output and LINE IN audio from the preamplifier U6. Also U6 is the volume controller for LINE IN audio signal.

U1, U2, U3, U4 are low noise operational amplifier, they buildup the

Active-filter for Line In audio signal.

U9 and the circumjacent components buildup the Clock Generator for volume controller U6.

## 3. The Signal Path description

When the Bluetooth system is working, BT1 connects to mobile phone or PC as an AV end device, the audio signal, play control command are communicated between master device and BT1 module, via wireless. The differential stereo audio signal from Pin44-47 will be amplified by U7 to drive the speaker.

When uses BTSP200 as a speakerphone, the voice can receive by microphone MIC1.

When 3.5mm plug is plug in, the Bluetooth system will be reset, the external single end stereo audio signal passes through low pass Active-filter, Volume Controller (U6) then translate to differential signal by U4, and then input to amplifier U7 to drive the speaker.

End.