Description of Intended Function

1.Operational Description

- XBM-100P is a MP3 player with the Bluetooth Device Functions (Handsfree/File Transfer).

Functions of XBM-100P series

- When Bluetooth cellular phone makes sound, XBM-100P stops music with the feature of Bluetooth Headset / Handsfree. Then user can respond to the call.
- When phone rings, Bluetooth button emits light and makes it easy to seek Bluetooth button.
- When PC with our provided software has Bluetooth, it can easily send or receive files to and from XBM-100P.
- If your wireline phone has Bluetooth adapter, you can receive a call in an area near to the phone.
- It supports hearing high quality of music with 3D effect that is provided by SRS Lab.
- It enables MP3 Direct Encoding and makes it easy to record files.
- It supports the formats of MP3 and WMA as Multi Codec player.
- User can easily enjoy to FM stations and set user's favorite stations by using auto frequency preset and memory functions.
- It can easily record specific parts of radio program or telephone communications.
- It supports the feature of equalizer for some types of music(Normal, SRS, Rock, Jazz,Classic, Pop, Vocal, User) and the feature of automatic equalizing.
- It provides wide Graphic LCD display, multi languages of song name and Firmware Upgrade
- It can connect PC as the feature of USB Mass Storage through USB cable to transfer files to and from PC easily.
- User can charge the built-in rechargeable Li-Polymer battery of XBM-100P through PC and other digital devices using provided USB cable and AC adapter.

2.Specification

2.1 Standard Specification

- Audio : 20Hz~20kHz
- FM Tuner : 76~108MHz frequency range
- Bluetooth : 2.4GHz ISM Band

2.2 General Specification

Description	Value	Unit	Remark
Frequency range	2,402 ~ 2,480	MHz	
Antenna impedance	50	ohm	Refer to the specification of antenna.
Modulation Type	GFSK		
Transceiver Type	FHSS		

- Antenna Specification

Electrical Specification

Frequency Range	2402 ~ 2480 MHz
V.S.W.R	1.9: 1 (max)
Gain(Max)	0 dBi
Nominal Impedance	50 ohm
Polarization	Linear

Mechanical Specification

Dimensions	11x5x1.6
Weight	0.2g
Radiator	Copper
Operating Temp	-30 ~ 90 ℃
Operating Humidity	10 ~ 90 %

2.3 Electrical Specification

Description	Value	Unit	Remark
Communication rate	1	Mbps	
Output power	0.25~2.5	mW/1MHz	Class II
Out-of-Band Spurious	-36	dBm	30MHz~1GHz
	-30	dBm	1 to 12.75MHz
	-47	dBm	1.8 to 1.9GHz
	-47	dBm	5.15 to 5.3GHz
Modulation			GFSK
Sensitivity	<-70	dBm	0.1% BER
Maximum input level	>-20	dBm	0.1% BER

2.4 Environmental Specification

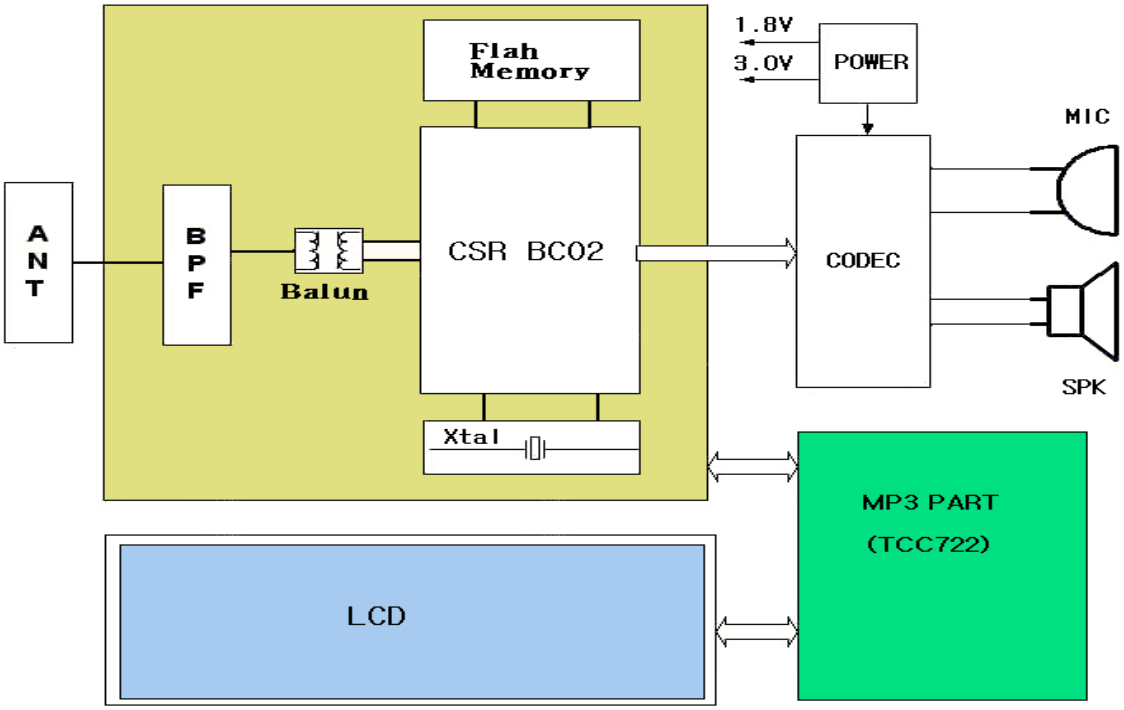
Description	Value	Unit	Remark
Operating temperature	-10 ~ +50	°C	
Storage temperature	-20 ~+80	°C	
Operation Voltage	4.0 (nominal)	V	Li-Polymer Battery
Humidity (Non-condensing)	10 ~ 90	%	

2.5 Mechanical Specification

Description	Value	Unit	Remark
Dimensions	85 x 30 x 18	mm	
Weight	42	g	

3. Block Diagram

3.1 RF(Bluetooth/LCD) Block



The Bluetooth functions of XBM-100P are controlled by TCC722 chip (MP3 core chip).

1.8V and 3.0V power through regulators are supplied to the devices for bluetooth communication and the program stored Flash Memory is booted to CSR BC02(Bluetooth core chip). The reference clock is 16MHz (16MHz crystal).

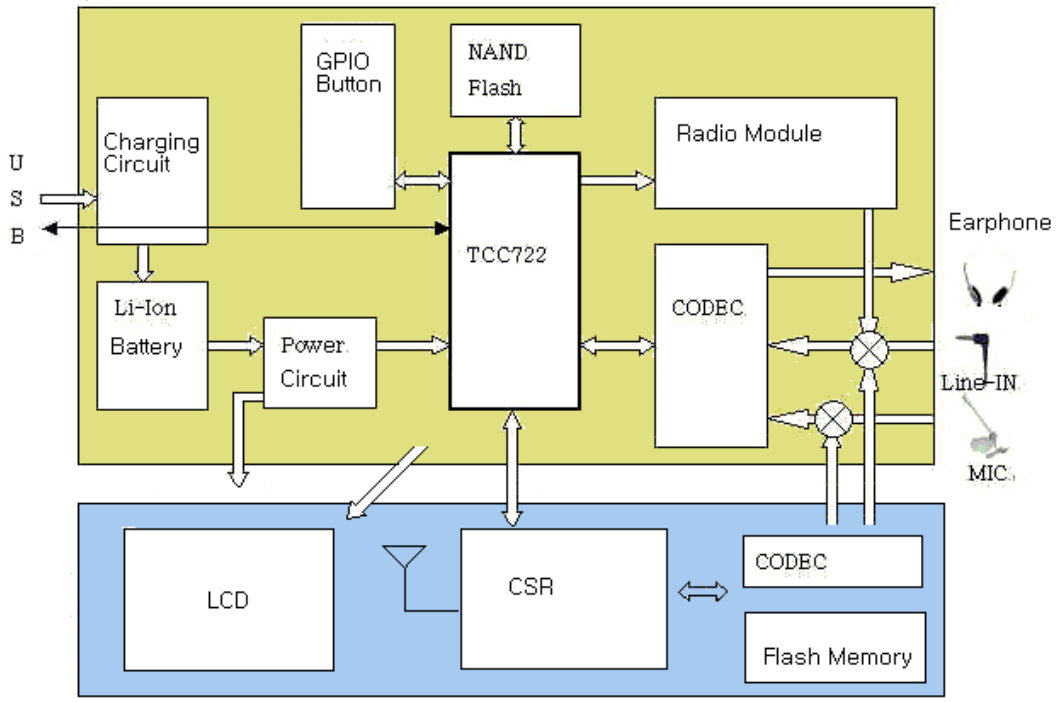
The signal path of Receiver/Transmitter is same and is controlled by TDD(Time Division Duplex). CSR BC02 uses FHSS(Frequency Hopping Spread Spectrum) with hopping rate 1600 hop/set .

The procedure of Transmitting : The Balanced singnal from CSR BC02 is converted to a 1-port(unbalanced) signal through Balun ,and then the unwanted spurious noises are filtered by BPF(Band Pass Filter) filter. The filtered signal is transmitted to Air through Chip Antenna.

The procedure of Receiving : The adverse procedure of transmitting signal.

The voice data from Mic or to Speaker is converted to PCM data or voice data through CODEC.

3.2 MP3 Block



Lithium-polymer battery is built-in for power source. To charge, USB cable is used to connect on USB port of PC or another adaptor. On power circuit, 1.8V, 2.5V and 3.5V are created.

TCC722 chip(Telechips-MP3 chip) includes Flash ROM 512 kbyte, SRAM 64 kbyte. Therefore, it does not need external memory. In addition, it decodes MP3 and WMA files which are saved at NAND Flash, because ARM9 core is implemented. It directly encodes audio data(come through Line-in), FM Radio broadcasting and phone conversation(through bluetooth) into MP3 file and saves it. If it is connected on USB port of PC, it is automatically recognized as USB MASS Storge without additional program. Therefore, Uploading/Downloading file is available by using explorer on PC.

Power block controls the power of bluetooth part and TCC722 supports Handsfree/Headset profiles by connecting bluetooth part with UART & I2C