![Namtai logo] Namtai	Wireless SingStar Microphone technical spec	Doc No. SCWM-ET-XXX
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Checked by:	Approved by:	Version: **R0.1**	Date: **02-Sep-08**

1. Instruction

Wireless SingStar Microphone composes of 2 Microphones and a Receiver. Receiver of the basic station communicates with 2 Microphones by 2.4GHz ISM band RF wireless technology. It is compatible with PS3 or PS2 console for home entertainment area. Receiver contains 2 RF Channels, every channel can only communicate with one Microphone.

2. RF frequency

Wireless SingStar Microphone use the 2.4GHz hopping technical, hopping table sees Table 1:

Table1 Unit: MHz

2405	2407	2409	2411	2413	2415	2417	2419	2421	2423	2425	2427	
2429	2431	2433	2435	2437	2439	2441	2443	2447	2449	2451	2453	
2455	2457	2459	2461	2463	2465	2467	2469	2471	2473	2475	2477	

Every Microphone can only use half of frequency points in same time. Bandwidth is about 4MHz.The same is for one Receiver Chanel. If one Microphone and Receiver Channel uses following frequency point of Table2, then the other uses Table3.

Output power is about 0dBm.

Table2 Unit: MHz

2405	2409	2413	2417	2421	2425	2429	2433	2437
2441	2447	2451	2455	2459	2463	2467	2471	2475

Table3 Unit: MHz

2407	2411	2415	2419	2423	2427	2431	2435	2439
2443	2449	2453	2457	2461	2465	2469	2473	2477

Frequency hopping information:

For MIC1 Channel		For MIC2 Channel	
2405	MHz	2431	MHz
2425	MHz	2453	MHz
2421	MHz	2415	MHz
2467	MHz	2443	MHz
2441	MHz	2461	MHz
2471	MHz	2407	MHz
2413	MHz	2469	MHz
2455	MHz	2439	MHz
2409	MHz	2423	MHz
2459	MHz	2477	MHz
2417	MHz	2465	MHz
2433	MHz	2411	MHz
2447	MHz	2473	MHz
2475	MHz	2435	MHz
2463	MHz	2419	MHz
2437	MHz	2457	MHz
2451	MHz	2427	MHz
2429	MHz	2449	MHz

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2.4GHz wireless communication technology

PS3

or

PS2

Two Microphones

One Receiver
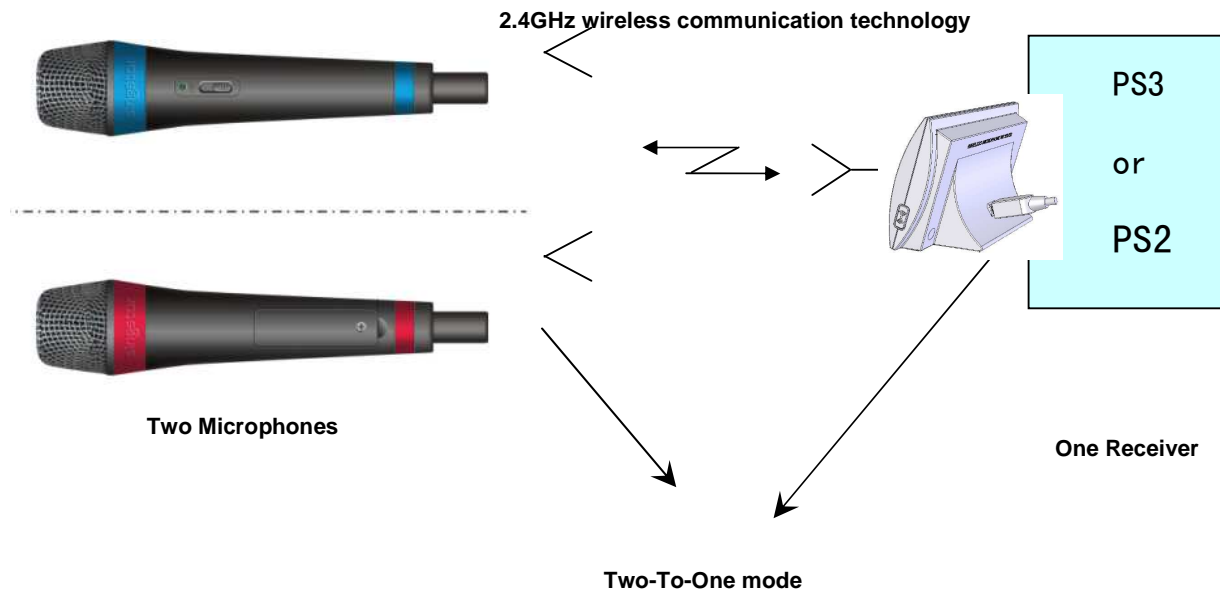
Two-To-One mode

Figure 1: Wireless SingStar System

3. Circuit design spec

MIC block see future 2

Power source: 2 pcs AA battery

Switch: Control the MCU PIC505(actualize pairing function) and Switching Circuits

Switching Circuits: Power on/off the source, can provide the Vbat to A/D, RF Transceiver, and Gate and MCU.

MCU Circuit: Control the LED, A/D Circuit, RF Transceiver and Switching Circuit.

Mic sensor: convert the voice to analog signals

A/D: convert the analog signals to digital signals. It will send the information to Nand Gate if voice is very low.

RF Transceiver: Transmit audio signals to RF Matching nets; Transmit control signals, pairing signal etc to RF Matching;

Receive RX signal via RF Matching nets, communicate with MCU use SPI signal.

Crystal (16MHz): Use for RF Transceiver (nRF24Z1)

RF Matching: Process the RF signal.
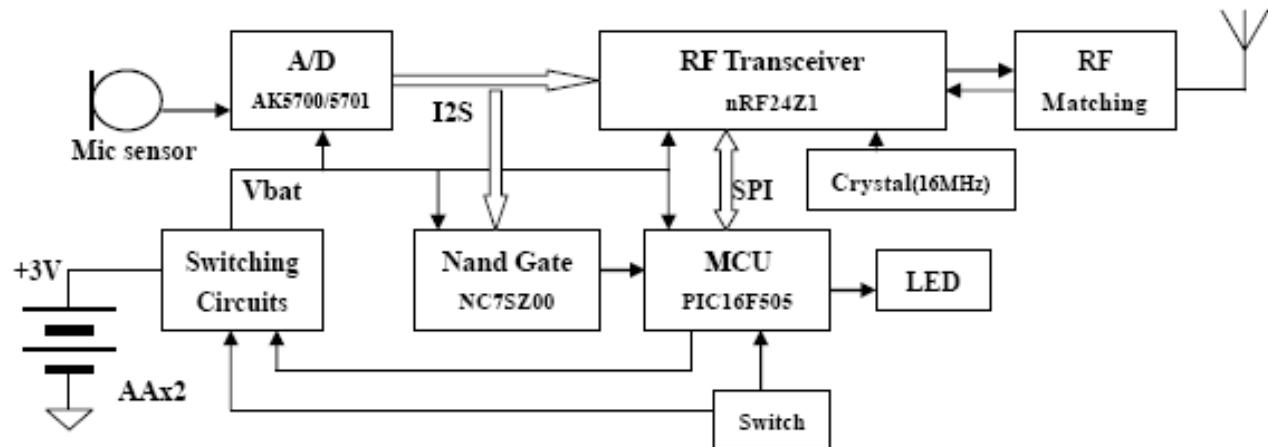
LED: denote MIC status

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Figure 2: MIC block diagram

Receiver block see future 3

USB Port: Provide 5V power; Transmit USB signal between Receiver and host

LDO: convert 5V power to 3.3V; it provide the power to MCU, A/D & USB circuit;

Switching Circuits: Control the 3.3V power and provide it RF Transceiver 1, RF Transceiver 2, A/D1, and A/D2;

A/D & USB: Convert analog signals to USB signals; Transmit the USB signal to host and receive it from host via USB port; transmit one control signal to MCU, and command MCU working.

EEPROM (1K): Store USB information, example PID etc.

Crystal (11.2896M): Use for A/D & USB circuit.

MCU: Control RF Transceiver 1, RF Transceiver 2, A/D1, A/D2 and LED; Transmit MIC address and channel information to EEPROM (I2C, 4K).

EEPEOM (I2C, 4K): Record and store the MIC address and channel information.

Switch: Control MCU, use for pairing.

LED: denote Receiver status

RF Transceiver1, RF Transceiver2: Receive the RF signal, and convert to I2S signals, then transmit to A/D; Transceiver pairing, control signal to MCU.

Crystal(16MHz):use for RF Transceiver1,RF Transceiver2.

A/D1, A/D2: Convert the I2S signal to analog signals.
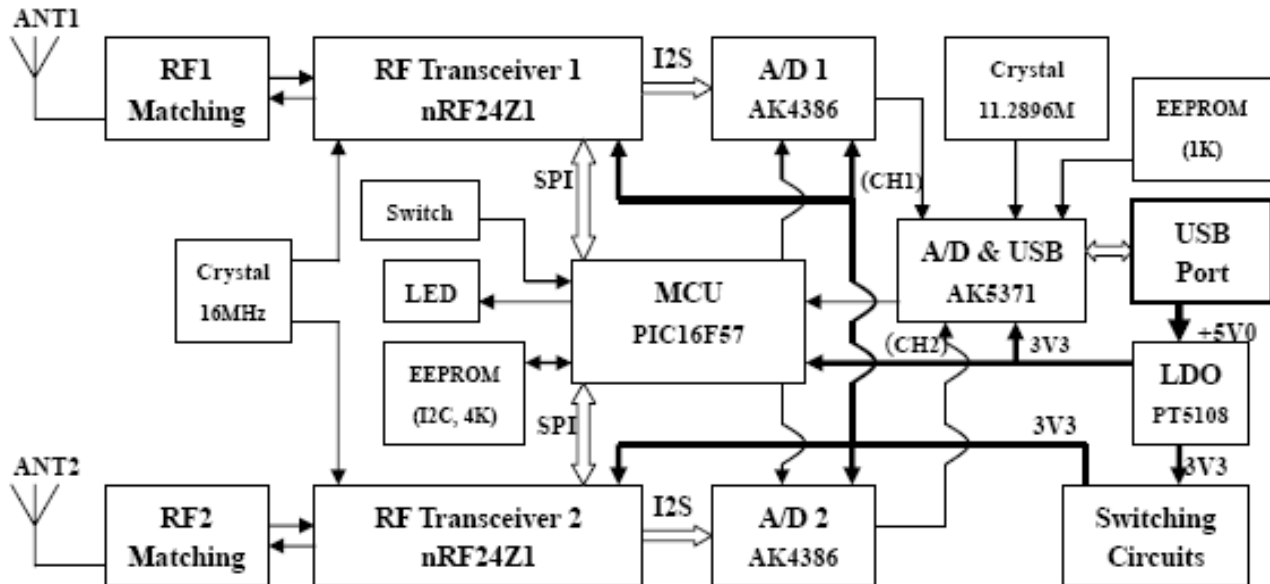
RF1 Matching, RF2 Matching: Process RF signal.

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Figure 3: Receiver block diagram

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