

## Operation theory of FM-03(US)

FM-03(US) is a low power stereo FM (frequency modulator) transmitter for iPod with 30pin iPod dock connector, that works across the FM broadcast band, allow iPod users to broadcast audio wirelessly from their iPod to FM radio. The transmission frequency is set from 88.1 to 107.9MHz. Modulation type: FM

This product mainly consists by 8 portions :

- 1) The whole operation is controlled by the MCU TM87P08.
- 2) Stereo multiplexer and 19KHz pilot generator-- The stereo audio signal from iPod is multiplexed by NJM2035M, and mixed with a 19KHz pilot.
- 3) RF oscillator and amplifier circuit is formed by Q1 and Q2, this RF carrier will be modulated by the MPX signal from NJM2035M, after amplified by Q2, the modulated radio signal will be sent to space by the antenna.
- 4) TR3001 is a PLL IC, it cooperates with MCU, Q1 and Q2 to form a complete PLL circuit, and MCU to control the RF radiated frequency
- 5) AME8800 IC is a low dropout voltage regulator, it draws voltage supply 3.3V directly from iPod and provides a regulated voltage output to MCU, U4 NJM2903 IC and U5 HC9L3C46.
- 6) U4 NJM2903 is an auto power OFF control circuit, when it detects an audio signal input from iPod, it will send a high level output to MCU (pin61), which will trigger MCU to create a high level output to turn on the voltage supply switch formed by Q3 and Q4, and supply voltage to U2 2035 MPX IC, TR3001 PLL IC and RF oscillator (Q1, Q2) simultaneously.  
When there is no audio signal input from iPod for about 2 minutes, the output of NJM2903 will turn low and shut off the supply to MPX, PLL IC and RF oscillator.  
This will save the power from iPod
- 7) Frequency is displayed by the LCD which is controlled and driven by the MCU.
- 8) HT93LC46 IC is a CMOS RAM, it is controlled by the MCU and keep the last tuned frequency in memory.`