Model:	FM-228/IPS-APL-00
Description:	FM Transmitter
Date:	8.April.2005

Introduction

FM-228/IPS-APL-00 is a stereo audio signal transmitter over FM band. It works as a slave device of **iPod Shuffle** and controlled by the signal command from **iPod Shuffle** through UART interface. It operates in either one of the two frequency bands. The two bands are hardware programmable by factory jumper setting of open and short. One is 88.1 to 107.9 MHz for U.S. The other one is 76.1 to 89.9MHz for Japan. Both are in the step of 100 kHz.

Features

a. A LCD displays 4 digits in 7-segment format with one decimal place. Digits show the transmission frequency in the unit of MHz.

b. Two buttons to adjust the transmission frequency.

c. Three buttons to memory transmission channel.

d. An automobile power rates 12-24 Volts and 500mA whose is from the external device.（Sealed lead-acid batteries.

e. Stereo analog audio input is from external device.

f. The operation mode of FM-228/IPS-APL-00 is controlled by external device.

Appearance

Figure 1

Figure 2

Operation

The default frequencies are 88.1 to 107.9 MHz for US .

The front of FM-228/IPS-APL-00 has the said LCD and five control buttons. The LCD shows the transmission frequency in MHz with one decimal place and the display will switch off automatically for power saving purpose after no further key operation in 1sec. One of the control button symbolic "—" has the function of tuning the transmission frequency downward in 200KHz step. Another control button marked "＋" tunes the frequency upward in 200KHz. Another control button marked "1" "2" or "3" preset memory control button.

Preset the memory buttons "1" "2" or "3". will pressing the two buttons "＋" or "—" step the transmission frequency any channel purpose after Holding "1" or "2" or "3" for 2sec the LCD show one flash read-in memory channel complete .

Should FM-228/IPS-APL-00 unit plug-in **iPod shuffle** pressing the play button the volume should be set up to 50% after 2sec pressing the "1" or "2" or "3" button read the memory frequency channel.

Pressing the two buttons "＋" or "—" step the transmission frequency up or down respectively. Holding down the two buttons "＋" or "—" for 1.5sec will accelerate the stepping frequency. For accelerate activation in 30sec.

FM-228/IPS-APL-00 will turn on and start transmission for receiving the "Begin Transmission" command through UART interface or receiving audio signal through the audio plug for 1sec.

System will turn off automatically for receiving the "End Transmission" command though UART interface or not receiving audio signal for 60sec.

LCD of FM-228/IPS-APL-00 will only be activated and turn on either system is plugged into car's power 12Vdc or one of the control buttons is pressed. LCD will turn off automatically for no further activation in 8sec.

INSTRUCTION TO THE USER

This equipment has been tested and found to comply with the limits for a digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

* Reorient or relocate the receiving antenna.

* Increase the separation between the equipment and receiver.

* Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

* Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.