YMU757

MA-1

Outline

The YMU757 is a high quality melody LSI for cellular phone handsets, supporting the data format for various applications including ringing and holding melody sounds. The built-in Yamaha's original FM synthesizer can create various timbres, and its built-in sequencer can produce up to 4 different sounds with 4 different timbres simultaneously without placing a load to the controller.

The serial port controller interface enables real time reproduction of the melody data via FIFO, without the limitation of the data capacity.

With a built-in amplifier to drive the dynamic type speaker, it is possible to connect the speaker directly.

This LSI also has an analog-output terminal for the phone jack. In the stand-by mode, the power consumption can be reduced to 1 µA or less while waiting.

A portable terminal machine.

Features

- YAMAHA's original FM sound generator function
- Built-in sequencer
- Capable of producing up to 4 different sounds simultaneously (4 independent timbres available)
- Built-in output 400mW speaker amplifier
- Built-in circuit for sound quality correcting equalizer
- Built-in serial interface
- 2.688, 8.4, 12.6, 14.4, 19.2, 19.68, 19.8 and 27.82 MHz serial clock inputs support
- Analog output for earphone.
- Power down mode (Typ 1µA or less)
- Power supply voltage (Digital and Analog) : 3.0V ±10 %
- 20-pin TSSOP

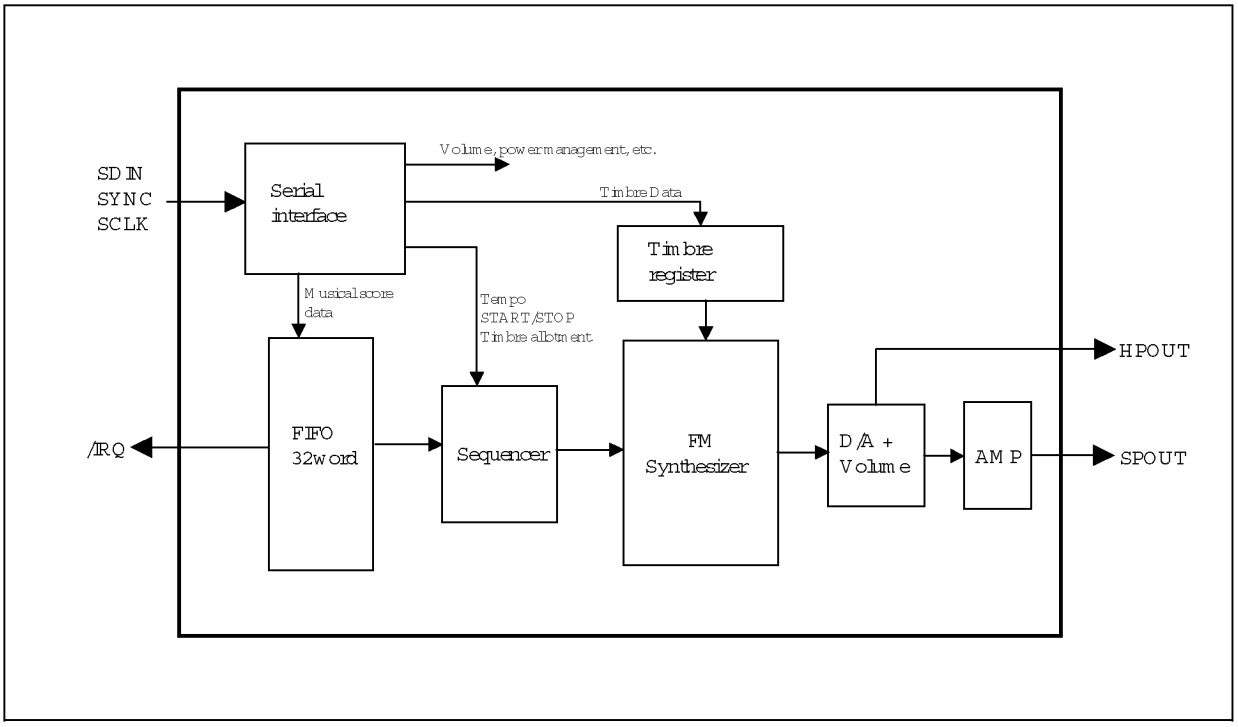
YAMAHA CORPORATION

Contents

■ General description of YMU757

The YMU757 is controlled by way of the serial interface.

Shown below is its internal configuration.



When the data is inputted into the serial interface, it is converted into the parallel data and transmitted to each function block according to the index address.

The musical score data is stored in the 32-word FIFO first and then transmitted to the sequencer where it is interpreted and signals to control sound generation of the FM synthesizer is output.

The timbre register is where up to 8 timber data can be stored.

Also, as the sequencer controlling parameters, the start/stop and tempo signals are provided.

In order to have sound generated, the following processes must be performed for this LSI.

1) Initial status setting (cancellation of power-down function, clock selection, etc.)
2) Timbre data setting
3) Writing the musical score data in FIFO before starting the sequence
4) Writing the next musical score data before FIFO becomes empty upon receipt of the interrupt signal from FIFO during reproduction.

(For the details, refer to "Settings & procedure required to generate melody".)

■ Block description

1) Serial interface

When the serial interface receives the serial data, it identifies the index data and transmits the control data to each function block.

2) FIFO

The musical score data are stored temporarily in FIFO which can contain up to 32 musical score data. The musical score data are processed are processed in the sequencer when they are generated as sounds and those that have been processed are deleted one after another. When the remaining data amount in FIFO reaches the register setting (IRQ point) or less, it outputs an interrupt signal to ask for the continuing musical score data to be fed.

3) Sequencer

When the sequencer receives the START command, it starts to read the musical score data which have been stored in FIFO. The processed musical score data are deleted.

4) Timbre register

The timbre data are stored in this register which can contain up to 8 timbres. Settings for this register must be made before sound generation. It is initialized when the hardware or the software is reset but the values are retained while in the power-down mode and also after it is cancelled.

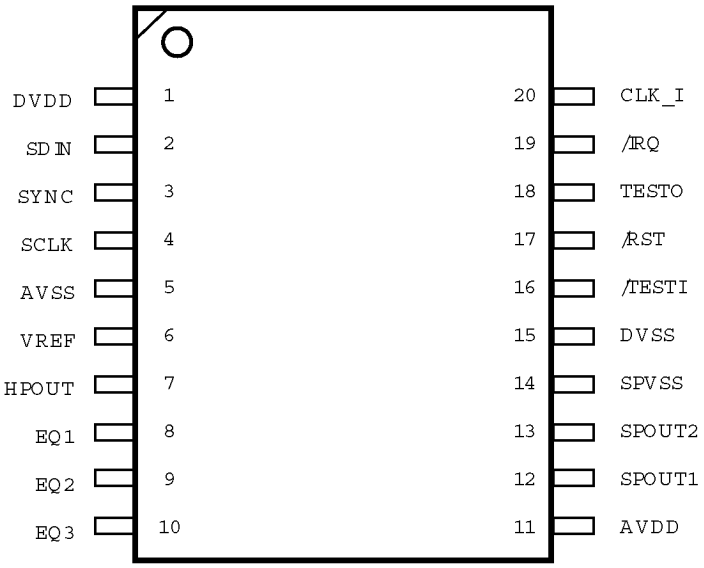
5) FM synthesizer

The timbres are synthesized and generated according to settings. Four sounds can be generated at the same time.

6) D/A, volume and amplifier

The outputs from the synthesizer are D/A converted and volume processed. After that, they are output from the speaker or the earphone out terminal.

■ Pin configuration



20 Pin TSSOP Top View

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