



SANYO Semiconductors DATA SHEET

GGB LV25300M — Bi-CMOS IC 1-chip Tuner IC

Overview

The LV25300M integrates all six blocks (FM FE, FM IF, double conversion AM, AM-NC, and PLL diversity) required in car radio tuner on a single ship.

Features

The LV25300M is a tuner system that supports the SDRS300 (SANYO car audio DSP) that allows the creation of standard tuner modules. Various setting changes can be performed with the software of the control microcontroller according to the intended application. Small tuner modules can be developed with a smaller number of parts compared to conventional tuners and at a lower total cost.

Moreover, the LV25300M comes with an antenna switching diversity function that switches two antennas in response to various electric field changes while the vehicle is running, a malfunction prevention circuit that operates through antenna switching frequency detection, and a weak electric field detection, and antenna fixing circuit that uses S meter voltage, making stable reception possible.

Functions

FM F.E.

- Balanced input type double balanced mixer (FM mixer 1)
- Dedicated RF tuner DAC (8 bits × 2)
- Pin diode drive AGC output (antenna damping)
- MOSFET second gate drive AGC output
- Keyed AGC adjustment pin (3D-AGC)
- Differential IF amplifier (first IF amplifier)
- Wide band AGC sensitivity setting pin, and narrow band AGC sensitivity setting pin
- Local oscillator circuit (oscillator 1)
- AM/FM second mixing oscillator (oscillator 2)
- FM second mixing (FM mixer 2)

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- Supports both FM Japan band and US band.
- AM first oscillator coil for AM LW, MW, and SW frequency divider circuit, internal frequency divider with reduced number of varactor diode
- Weather band

FM IF

- IF limiter amplifier (IFAMP: Also runs in AM mode.)
- S-meter output (shared pin for AM), 6-stage pickup (VSM: for DSP)
- Dedicated FM S-meter (for DSP and diversity circuit)
- Coilless detector circuit
- Digital detection buffer output
- IF counter buffer output (also used for AM)
- SD (IF counter buffer ON level) adjustment
- SD output (active high) (also used for AM)

AM

- Double balance mixer (first and second)
- Eliminated IF amplification (AM 450kHz) AM IFT
- Digital detection IF buffer output (also used for FM)
- IF AGC (controlled by narrow band S-meter output)
- RF AGC (Wide)
- Pin diode drive pin (antenna damping)
- Wide band S-meter output (shared pin for FM IF)
- Narrow band S-meter output (detected by AM IF second amplifier)
- IF counter buffer output function (shared pin for FM IF), directly connected to PLL counter
- SD (IF counter buffer ON Level) adjustment
- SD output (active high) (also used for FM)
- AM noise canceller trigger output pin

PLL

- Charge pump for high-speed locking
- Internal FET for active LPF
- Low radiation noise due to 3V operation
- 4-wire serial bus control circuit (SANYO's original CCB bus format)
- Reference divider
- Programmable divider (pulse swallow type)
- Crystal oscillator circuit
 - FM band selection signal detection and control circuits
 - AM, SW1, and SW2 reception
 - Weather band
 - AM/FM RF AGC voltage
 - FM/AM RF DAC (9 bits × 2)
- ADC (6/8bits × 2, selectable)

Bus control circuit

- Switching control
- AM/FM reception switching
 - AM/FM RF AGC sensitivity setting: 4 bits
 - FM keyed AGC control: 4 bits
 - AM/FM RF tuning DAC (9 bits × 2)
 - AM/FM SD control ON/OFF
 - AM/FM IF counter output control ON/OFF
 - AM oscillator 1 divider setting
 - SEEK/receive mode switching

Automatic adjustment

- FM ANT tuning circuit fc control
- FM RF tuning circuit fc control
- AM/FM IF gain adjustment
- FM/AM W-AGC sensitivity adjustment
- FM/AM N-AGC sensitivity adjustment
- FM S-meter shift
- AM/FM SD sensitivity setting
- NULL adjustment
- AFC band width

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Connection to CDSP300 (interface)

- AM/FM IF output (450kHz)
- AM/FM S-meter output, AC/DC 2 systems
- AM-NC gate trigger output

Diversity

- Noise amplifier, noise, and AGC circuits
- Noise density coefficient circuit
- Antenna selection output
- Generating a signal for the antenna switching frequency and positioning antenna
- Weak electric field detection and antenna positioning

Block Diagram



