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FM STEREO RADIO SIGNAL PROCESSOR WITH RDS

TEA5991 - best performance to lowest cost

The TEA5991 uses a full-CMOS design to deliver top performance, along with the industry's best sensitivity, at the lowest overall cost. It uses a new command interface that simplifies software development and system integration, and requires only 15 mm² of PCB space. New improved search algorithms decrease the scan search time and enable robust channel identification.



KEY FEATURES

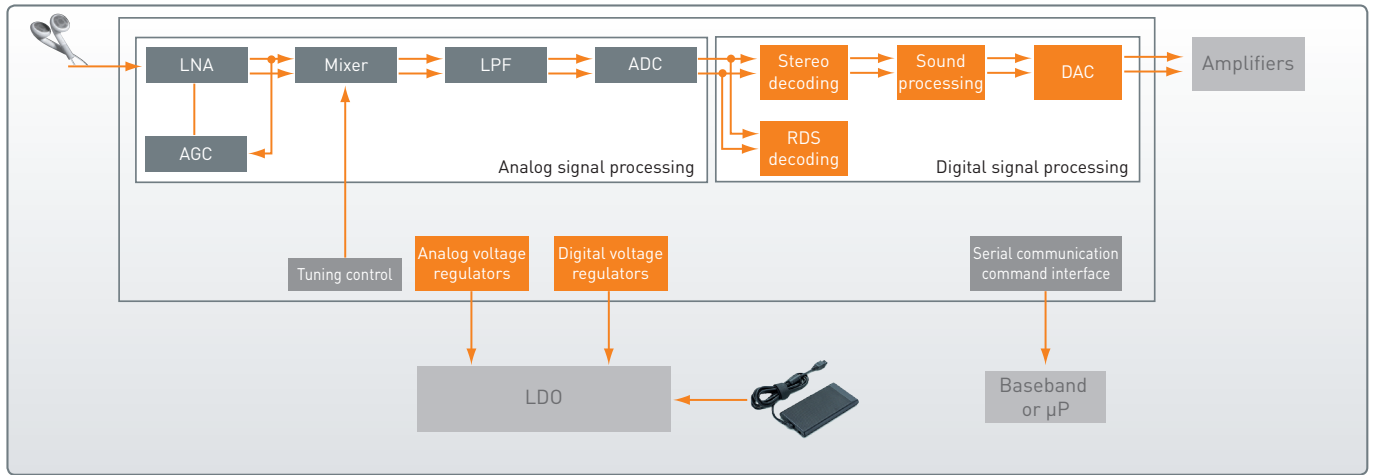
- Industry-leading FM and RDS sensitivity
- New algorithm improves search time (< 8 seconds)
- Single-ended antenna input optimized for headphone wire
- Pilotless RDS feature enables RDS reception from FM mono broadcasts
- Power-saving modes
- Command-based interface for simpler software design and system integration
- Wide tuning range: 70 to 108 MHz, including 70-MHz China band
- Digital volume and balance control
- Internal auto store of up to 32 channels
- Low supply voltage: 2.4 to 3.6 V
- Flexible interfaces: I²C bus, SPI bus
- Small size: 4 x 4 mm HVQFN, 2.56 x 2.56 mm WL-CSP

KEY BENEFITS

- FM best-in-class: channel separation, sensitivity, selectivity, and sound
- Can be implemented with no external components
- Easy hardware and software integration
- Demo board with reference design available to enable smooth integration in customer platforms
- Complete design in less than 15 mm²
- Faster search time
- Excellent reception in urban areas due to improved multipath performance

TARGETED APPLICATIONS

- Mobile and portable devices



TEA5991 block diagram

The FM + RDS stereo radio IC, TEA5991, is the follow-on to the popular TEA5760, and TEA5766. This full-CMOS radio IC sets a new standard in radio performance, with better channel separation, industry-leading sensitivity, very high selectivity and superb sound. In addition, a new command-based interface simplifies software development and makes system integration easier.

The IC is available in a WL-CSP package.

A complete radio can be implemented without external components. Adding two small decoupling capacitors to the design improves reception and sound quality. Even with the 2 extra capacitors, the design is very small, requiring less than 15 mm² of PCB space. Adding a pre-select filter in the FM antenna path can enhance reception quality even further.

The TEA5991 requires no alignment and uses a low supply voltage (2.4 to 3.6 V). The single-ended antenna input is optimized for a headphone wire. The radio offers a wide tuning range (70 to 108 MHz, including the 70 MHz China band) and uses a tuning grid of 50, 100 and 200 kHz. It has a very reliable and fast auto search with an internal auto store of up to 32 channels, and it supports dynamic adjacent channel suppression for better reception quality.

To make design-in more flexible, the TEA5991 supports the I²C and SPI buses (3- or 4-wire format). A digitally controlled algorithm supports seamless co-existence with GSM, Bluetooth, Wi-Fi and WiMAX. To save power, there is a standby mode for fast restart and a power-down mode for very low-power mode.

| | |
|--|---------------------------------|
| Package size | WL-CSP/UK: 2.56 x 2.56 x 0.6 mm |
| Required number of external components | None |
| Required PCB area | < 15 mm ² for WL-CSP |
| Current consumption (typical) | 22 mA |
| Channel separation | 48 dB |
| Ultimate S/N (mono typical) | 60 dB |
| FM sensitivity (at 26 dB S/N) | 1.2 μV _{EMF} |
| RDS sensitivity (≥ 95 %, 2000 blocks) | 12 μV _{EMF} |
| Audio THD (mono) | 0.2 % |
| Typical supply voltage | 2.7 V |
| Reference clock frequency | 32.768 kHz ± 1024 Hz |
| Interface bus | I ² C-bus, SPI |

LET'S CREATE IT

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