

Broadcast FM Radio Tuner for Portable Applications

Description

The Si4700 is the industry's first FM radio tuner IC to leverage digital integration and 100% CMOS process technology, resulting in a completely integrated solution that requires only one external supply bypass capacitor and less than 20 mm² of board space. Offering unmatched integration, the Si4700 allows FM radio reception to be added to a variety of portable devices where board space, performance, low power consumption, and ease of use are essential.

Leveraging Silicon Laboratories' proven Aero® digital low intermediate frequency (low-IF) receiver architecture and frequency synthesizer technology, the Si4700 delivers superior RF performance and interference rejection. Digital signal processing is utilized to provide optimum sound quality with varying reception conditions.

The high integration and complete system production test simplifies design-in, increases quality, and improves manufacturing. The Si4700 also uses a streamlined programming model, which further reduces product development time. Power management is also simplified with an integrated regulator allowing direct connection to a 2.7 to 5.5 V battery.

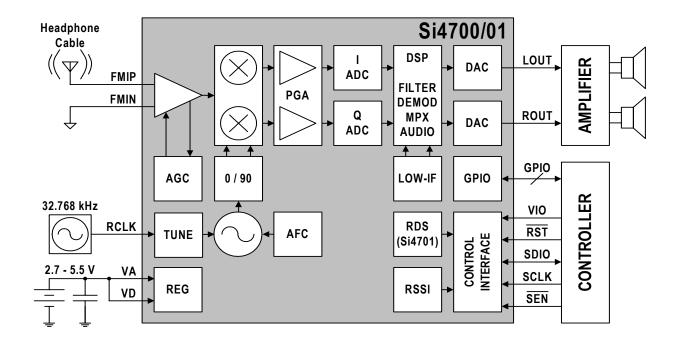
The Si4701 incorporates a digital processor for the European Radio Data System (RDS) and the US Radio Broadcast Data System (RBDS) including all required symbol decoding, block synchronization, error detection, and error correction functions. Using this feature, the Si4701 enables data such as station identification and song name to be displayed to the user.

Features

- Worldwide FM band support (76–108 MHz)
- Digital low-IF receiver
- Frequency synthesizer with integrated VCO
- Seek tuning
- Automatic frequency control (AFC)
- Automatic gain control (AGC)
- Excellent overload immunity
- Signal strength measurement
- Programmable de-emphasis (50/75 μs)
- Adaptive noise suppression
- Volume control
- Line-level analog output
- 32.768 kHz reference clock
- RDS/RBDS processor (Si4701 only)
- 2-wire and 3-wire control interface
- 2.7 to 5.5 V supply voltage
- Integrated LDO regulator allows direct connection to battery
- 4x4 mm 24-pin QFN package
 - Lead-free/RoHS compliant

Applications

- Cellular handsets
- MP3 players
- PDAs. Notebook PCs
- Portable radios
- USB FM radio



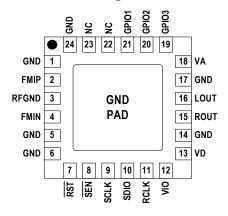


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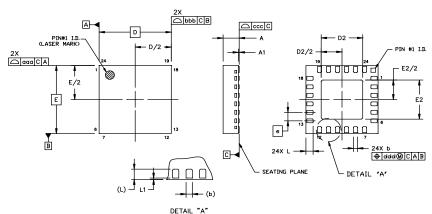
Selected Electrical Specifications

| Parameter | Symbol | Test Condition | Min | Тур | Max | Unit |
|-------------------------------|------------------|---|------|--------|-----|------------|
| Input Frequency | f _{RF} | | 76 | _ | 108 | MHz |
| Sensitivity | | (S+N)/N = 26 dB | _ | 2.5 | 3.5 | μV EMF |
| RDS Sensitivity | | $\Delta f = 2 \text{ kHz}, \text{ RDS BLER} = 5\%$ | _ | 15 | _ | μV EMF |
| Input IP3 | | $ f_2 - f_1 > 1 \text{ MHz}; f_0 = 2 \text{ x } f_1 - f_2$ AGC disabled | _ | 108 | _ | dΒμV |
| Adjacent Channel Selectivity | | ±200 kHz | 35 | 50 | _ | dB |
| Alternate Channel Selectivity | | ±400 kHz | 60 | 70 | _ | dB |
| RCLK Frequency | | | _ | 32.768 | _ | kHz |
| RCLK Frequency Tolerance | | | -200 | _ | 200 | ppm |
| Audio Output Voltage | | | 72 | 80 | 90 | mVrms |
| Audio Band Limits | | 0 to -3 dB | 30 | _ | 15k | Hz |
| Audio S/N | | | | 63 | | dB |
| Audio THD | | | _ | 0.1 | 0.5 | % |
| Supply Voltage | V_D, V_A | | 2.7 | _ | 5.5 | V |
| Interface Supply Voltage | V _{IO} | | 1.5 | _ | 3.6 | V |
| Ambient Temperature | T _A | | -20 | 25 | 85 | °C |
| Supply Current | I _{AD} | | _ | 17.6 | _ | mA |
| Powerdown Current | I _{PD} | | _ | 4 | 20 | μΑ |
| Seek Time | | | _ | _ | 40 | ms/channel |
| SCLK Frequency | f _{CLK} | 3-wire operation | 0 | _ | 2.5 | MHz |
| | f _{SCL} | 2-wire operation | 0 | _ | 400 | kHz |
| Powerup Time | | From powerdown | _ | _ | 50 | ms |

Pin Assignments



Package Information



| Symbol | Millimeters | | | | | |
|--------|-------------|------|------|--|--|--|
| | Min | Nom | Max | | | |
| Α | 0.80 | 0.85 | 0.90 | | | |
| A1 | 0.00 | 0.02 | 0.05 | | | |
| b | 0.18 | 0.25 | 0.30 | | | |
| D, E | 4.00 BSC | | | | | |
| D2, E2 | 2.20 | 2.30 | 2.40 | | | |
| е | 0.50 BSC | | | | | |

| Symbol | Millimeters | | | | |
|--------|-------------|------|------|--|--|
| | Min | Nom | Max | | |
| L | 0.30 | 0.40 | 0.50 | | |
| L1 | 0.03 | 0.05 | 0.08 | | |
| aaa | _ | _ | 0.10 | | |
| bbb | _ | _ | 0.10 | | |
| CCC | _ | _ | 0.08 | | |
| ddd | _ | _ | 0.10 | | |