

High-Performance FM RDS/RBDS Data Receiver/ Alternate Frequency Scanner

Description

The Si4749 is a 100% CMOS receiver integrated circuit (IC), offering the full receive functionality from antenna to RDS/RBDS* data for use in the automotive and personal navigation markets. It is an ideal companion RDS background data receiver for Traffic Message Channel (TMC) and Open Data Applications (ODA) applications frequently used in conjunction with GPS functionality or as an alternate frequency (AF) scanner in automotive radios. It offers a fully-integrated advanced decoder for the European RDS* and the North American RBDS. It includes demodulation, symbol decoding, advanced error correction, detailed visibility to block-error rates (BLER), and decoder reliability, synchronization status, and times. The Si4749 provides complete, decoded, and error-corrected RDS groups, up to 25 groups at a time with associated BLER.

The Si4749 incorporates a high performance RDS decoder based on patented methodologies, and delivers excellent RDS sensitivity performance, synchronization to RDS at high BLER levels, and RDS data decoding with superior decoder reliability. The Si4749 draws on Silicon Laboratories' broadcast audio and corresponding patent portfolio using a digital low intermediate frequency (low-IF) receiver architecture proven by hundreds of millions broadcast audio receivers shipped worldwide. The low-IF architecture allows the Si4749 to deliver superior performance while integrating the great majority of external components required by competing solutions.

The Si4749 is feature-rich, providing both highly automated performance, according to Silicon Laboratories' recommended settings, or extensive programmability and flexibility for customized system performance. The part accepts programmable reference clock values. The Si4749 offers several modes of operation for various applications which

provide more or less visibility to the RDS status and group data. The Si4749 is offered in a compact 4 x 4 x 0.85 mm 24-pin Quad Flat No-Lead (QFN) package.

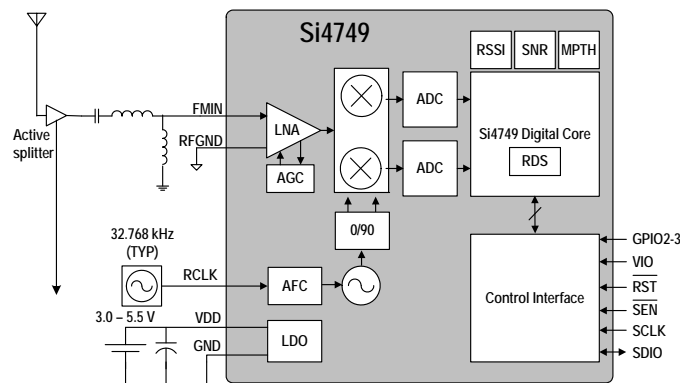
***Note:** The term "RDS" will be used to mean "RDS/RBDS" throughout this document.

Features

- Worldwide FM band support (76–108 MHz)
- Advanced patented RDS/RBDS Forward Error Correction (FEC) engine
 - Highest RDS Decoder Reliability
 - Robust synchronization at high BLER
- RDS reception with FM mono broadcast
- Fully configurable RDS data quality visibility and associated interrupts
- On-chip memory for up to 25 RDS groups
- Multi-path interference detection
- Received signal quality indicators (RSSI, SNR, wideband AM)
- Automatic frequency control (AFC)
- Automatic gain control (AGC)
- Image-rejection mixer
- Frequency synthesizer with integrated VCO
- Low-IF direct conversion; no external ceramic filters
- 3.0 to 5.5 V supply voltage
- Programmable reference clock
- AECQ-100 qualified
 - -40 to 85 °C operation
- 24-pin 4 x 4 mm QFN package
 - Pb-free/RoHS compliant

Application

- OEM car audio systems
- After-market car audio systems
- Telematics
- Personal navigation system (PND)
- GPS-enabled devices

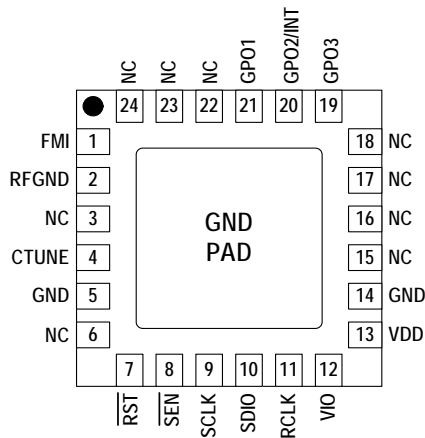


Alternate Frequency Scanner

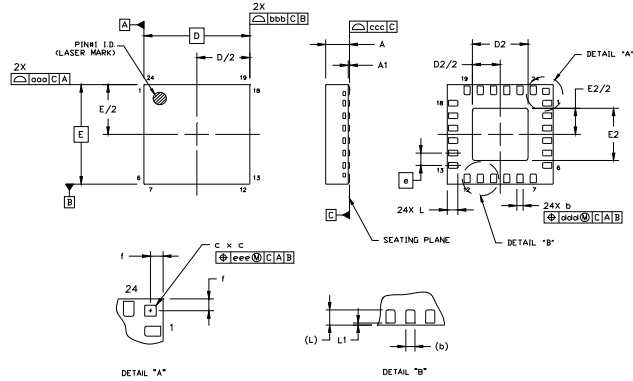
Selected Electrical Specifications

| Parameter | Test Conditions | Min | Typ | Max | Units |
|-------------------------------|-----------------------------------|-------|--------|--------|----------------|
| Input Frequency | | 76 | — | 108 | MHz |
| Frequency Steps | | 10 | — | 200 | kHz |
| RDS Sensitivity | $\Delta f = 2$ kHz, RDS BLER < 5% | — | 8 | — | μ V emf |
| Input IP3 | 400 and 800 kHz blockers | — | 105 | — | dB μ V emf |
| Image Rejection | | — | 55 | — | dB |
| Adjacent Channel Selectivity | ± 200 kHz | — | 50 | — | dB |
| Alternate Channel Selectivity | ± 400 kHz | — | 70 | — | dB |
| RCLK Frequency | | 31.13 | 32.768 | 40,000 | kHz |
| RCLK Tolerance | | -100 | — | 100 | ppm |
| Supply Voltage | | 3 | — | 5.5 | V |
| Interface Supply Voltage | | 1.5 | — | 3.6 | V |
| Supply Current | | — | 24 | — | mA |
| Ambient Temperature | | -40 | — | 85 | C |
| Seek/Tune Time | RCLK tolerance = 100 ppm | — | 40 | 60 | ms/channel |
| Powerup Time | From powerdown | — | — | 110 | ms |

Pin Assignments



Package Information



| Symbol | Millimeters | | |
|--------|-------------|------|------|
| | Min | Nom | Max |
| A | 0.80 | 0.85 | 0.90 |
| A1 | 0.00 | 0.02 | 0.05 |
| b | 0.18 | 0.25 | 0.30 |
| c | 0.19 | 0.24 | 0.29 |
| D | 4.00 BSC | | |
| D2 | 2.00 | 2.10 | 2.20 |
| e | 0.50 BSC | | |
| f | 0.27 BSC | | |
| E | 4.00 BSC | | |

| Symbol | Millimeters | | |
|--------|-------------|------|------|
| | Min | Nom | Max |
| E2 | 2.00 | 2.10 | 2.20 |
| 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 |
| eee | — | — | 0.10 |

Notes:

- All dimensions are shown in millimeters unless otherwise noted.
- Dimensioning and tolerancing per ANSI Y14.5M-1994.
- This drawing conforms to the JEDEC Solid State Outline MO-220, Variation VGGD-8.
- Recommended card reflow profile is per the JEDEC/IPC J-STD-020C specification for Small Body Components.
- Lead-free/RoHS compliant.



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- Оценку стоимости проекта по компонентам.
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