# Si4710/11

## FM Radio Transmitter for Portable Applications

## Description

The Si4710/11 is the industry's first 100% CMOS FM transmitter single chip IC. The device leverages Silicon Labs' highly successful and proven Si4700/01 FM receiver, and offers unmatched integration and performance allowing FM transmit to be added to any portable device by using a single chip. As with the Si4700/01, the Si4710/11 offers industry leading size, performance, low power consumption, and ease of use.

The Si4710/11's digital integration reduces the required external components of traditional offerings, resulting in a solution requiring only an external inductor and bypass capacitor, and PCB space of approximately 15 $mm^2$. High reliability in device manufacturing, improved quality, easy design-in, and software programmability are key advantages of the Si4710/11.

The Si4711 supports the European Radio Data System (RDS) and the US Radio Broadcast Data System (RBDS) including all the symbol encoding, block synchronization, and error correction functions. Using this feature, the Si4711 enables data such as artist name and song title to be transmitted to an RDS/RBDS receiver.

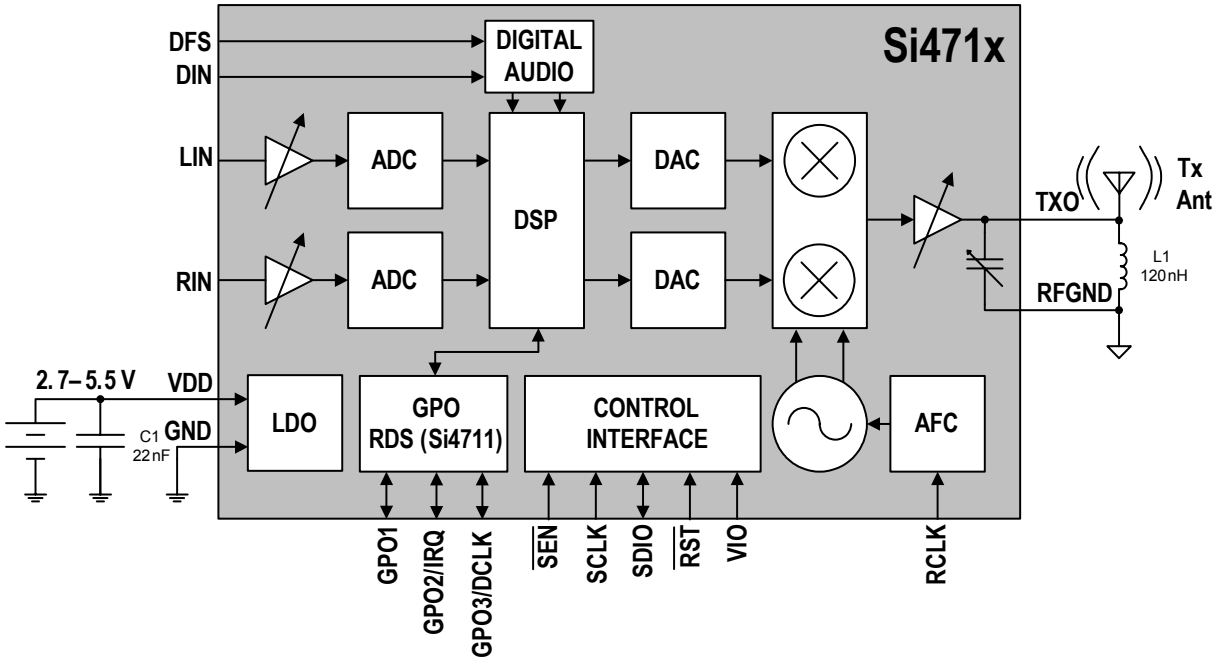
Users are responsible to adjust their system's radiated power levels to comply with local regulations on RF transmission (FCC, ETSI, ARIB, etc.).

## Features

- Worldwide FM band support (76–108 MHz) for transmit
- Requires only two external components
- Frequency synthesizer with integrated VCO
- Digital stereo modulator
- Programmable pre-emphasis (50/75 µs)
- Analog/digital audio interface
- Programmable reference clock
- RDS/RBDS transmit encoder (Si4711 only)
- PCB loop antenna support with self calibrated capacitor tuning
- Programmable transmit level
- Programmable modulation
- 2.7 to 5.5 V supply voltage
- Digital gain compression
- Integrated LDO regulator
- 3 x 3 x 0.55 mm 20-pin QFN
  - Pb-free and RoHS Compliant

## Applications

- Cellular handsets/hands-free
- MP3 players
- Portable audio/video players
- Wireless speakers/microphone
- Satellite digital audio radios
- Personal computers/notebooks



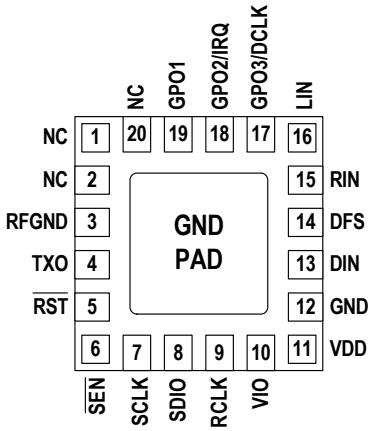


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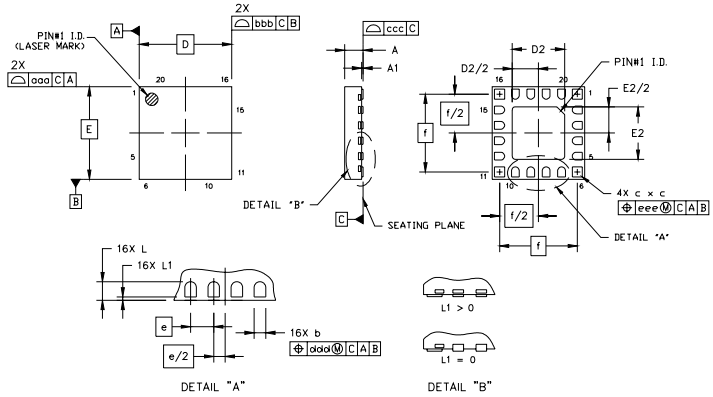
## Selected Electrical Specifications

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Transmit Frequency Range | $f_{RF}$ | | 76 | — | 108 | MHz |
| Programmable Transmit Output Voltage, TXO (Maximum Voltage) | | | — | 115 | — | dBµV |
| Programmable Transmit Output Voltage, TXO (Minimum Voltage) | | | — | 83 | — | dBµV |
| Transmit Voltage Stability | | | –1 | — | 1 | dB |
| Transmit Voltage Step | | | — | 1 | 2 | dB |
| Transmit Channel Edge Power | | | — | — | –20 | dBC |
| Transmit Adjacent Channel Power | | | — | –30 | –26 | dBC |
| Pre-emphasis Time Constant | | FMPE[1:0] = 00 | 70 | 75 | 80 | us |
| | | FMPE[1:0] = 01 | 45 | 50 | 54 | us |
| Audio SNR | | | — | 63 | — | dB |
| Audio THD | | | — | 0.1 | 0.5 | % |
| Audio Stereo Separation | | | 30 | 35 | — | dB |
| Sub Carrier Rejection Ratio | SCR | | — | –50 | –40 | dB |
| Input Signal Level (0 dB) | $V_{AI}$ | 0.6 $V_{RMS}$ input, $V_{IO}$ = 1.8 V | — | — | 0.636 | $V_{pk}$ |
| Audio Bandwidth (3 dB) | | | 20 | — | 15 K | Hz |
| Audio Imbalance | | | –1 | — | 1 | dB |
| Powerup Settling Time | | From powerdown | — | 110 | — | ms |

## Pin Assignments




## Package Information




| Symbol | Millimeters | | |
|---|---|---|---|
| | Min | Nom | Max |
| A | 0.50 | 0.55 | 0.60 |
| A1 | 0.00 | 0.02 | 0.05 |
| b | 0.20 | 0.25 | 0.30 |
| c | 0.27 | 0.32 | 0.37 |
| D | | 3.00 BSC | |
| D2 | 1.65 | 1.70 | 1.75 |
| e | | 0.50 BSC | |
| E | | 3.00 BSC | |
| E2 | 1.65 | 1.70 | 1.75 |

| Symbol | Millimeters | | |
|---|---|---|---|
| | Min | Nom | Max |
| f | | 2.53 BSC | |
| L | 0.35 | 0.40 | 0.45 |
| L1 | 0.00 | — | 0.10 |
| aaa | — | — | 0.05 |
| bbb | — | — | 0.05 |
| ccc | — | — | 0.08 |
| ddd | — | — | 0.10 |
| eee | — | — | 0.10 |


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