

### Description

The Si4730/31 is the industry's first fully integrated, 100% CMOS AM/FM radio receiver IC. Offering unmatched integration and PCB space savings, the Si4730/31 only requires two external components and less than 15 mm<sup>2</sup> of board area excluding the antenna inputs. The Si4730/31 AM/FM radio provides the space savings and low power consumption necessary for portable devices while delivering high performance and design simplicity desired for all AM/FM solutions.

Leveraging Silicon Laboratories' proven and patented Si4700/01 FM tuner's digital low intermediate frequency (low-IF) receiver architecture, the Si4730/31 delivers superior RF performance and interference rejection in both AM and FM bands. Digital signal processing is utilized to provide optimum sound quality signal under varying reception conditions, and the high integration and complete system production test simplifies design-in, increases system quality, and improves manufacturability.

The Si4730/31 is a feature-rich solution including advanced seek algorithms, soft mute, auto-calibrated digital tuning, and FM stereo processing. In addition, the Si4730/31 provides analog or digital audio output and a programmable reference clock. The device supports I2C-compatible 2-wire control interface, and a Si4700/01 backwards-compatible 3-wire control interface.

The Si4730/31 utilizes digital processing to achieve high fidelity, optimal performance, and design flexibility. The on-chip DSP provides excellent pilot rejection, selectivity, and unmatched audio performance. The on-chip micro-controller offers both the manufacturer and the end-user extensive programmability and flexibility in listening experience.

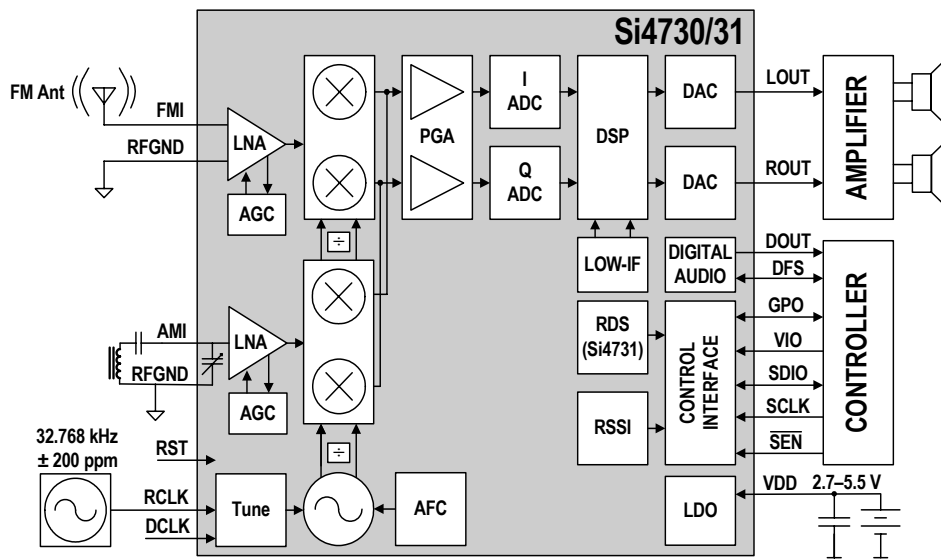
The Si4731 incorporates a digital processor for the European Radio Data System (RDS) and the North American Radio Broadcast Data System (RBDS) including all required symbol decoding, block synchronization, error detection, and error correction functions. Using this feature, the Si4731 enables broadcast data such as station identification and song name to be displayed to the user.

### Features

- Worldwide FM band support (76–108 MHz)
- Worldwide AM band support (520–1720 kHz)
- Excellent real-world performance
- Frequency synthesizer with integrated VCO
- Advanced AM/FM seek tuning
- Automatic frequency control (AFC)
- Automatic gain control (AGC)
- Automatic AM/FM digital tuning
- Digital FM stereo decoder
- Programmable de-emphasis
- Adaptive noise suppression
- Integrated LDO regulator
- Programmable reference clock
- Volume control
- Soft mute control
- Only 2 external components
- RDS/RBDS processor (Si4731 only)
- 2-wire and 3-wire control interface
- 2.7 to 5.5 V supply voltage
- Firmware upgradeable
- Ferrite loopstick and air loop antenna support
- 3 x 3 x 0.55 mm 20-pin QFN package
  - Pb-free/RoHS compliant

### Applications

- Table radios
- Stereos
- Portable CD players
- Portable media players
- Boomboxes
- Cellular handsets
- Mini/micro-systems
- Modules



### Selected FM Electrical Specifications

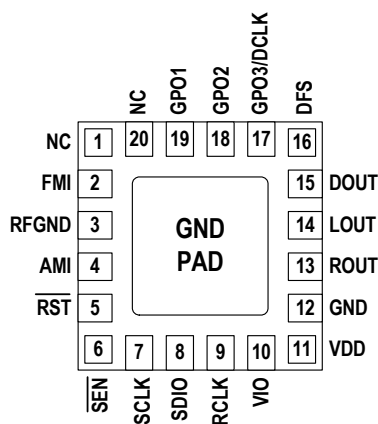
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input Frequency	$f_{RF}$		76	—	108	MHz
Sensitivity		(S+N)/N = 26 dB	—	2.2	—	$\mu$ V EMF
Input IP3		$ f_2 - f_1  > 1$ MHz; $f_0 = 2 \times f_1 - f_2$ AGC disabled	—	108	—	dB $\mu$ V EMF
Adjacent Channel Selectivity		$\pm 200$ kHz	—	50	—	dB
Alternate Channel Selectivity		$\pm 400$ kHz	—	70	—	dB
Audio Output Voltage*			72	80	90	mVrms
Audio Band Limits		$\pm 1.5$ dB	30	—	15k	Hz
Audio S/N			—	63	—	dB
Audio THD			—	0.1	—	%
Supply Voltage*	$V_D, V_A$		2.7	—	5.5	V
Interface Supply Voltage*	$V_{IO}$		1.5	—	3.6	V
Supply Current*	$I_{AD}$		—	16	—	mA
Powerdown Current*	$I_{PD}$		—	5	—	$\mu$ A

\*Note: Applies to both FM and AM modes.

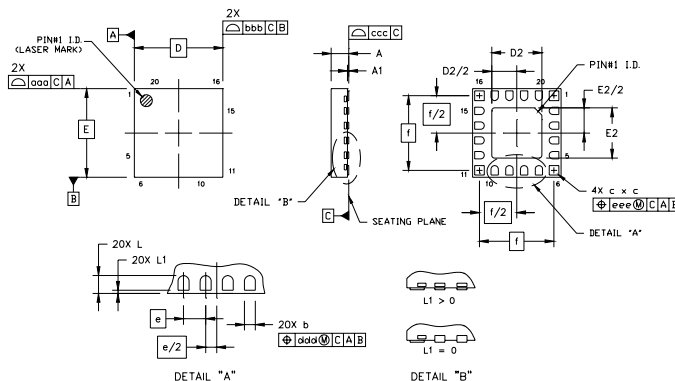
### Selected AM Electrical Specifications

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input Frequency	$f_{RF}$		520	—	1720	kHz
Sensitivity		(S+N)/N = 26 dB	—	30	—	$\mu$ V EMF
Audio S/N			—	48	—	dB
Audio THD			—	1	—	%
Antenna Inductance			180	—	600	$\mu$ H

### Pin Assignments



### Package Information



Symbol	Millimeters		
	Min	Nom	Max
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
b	0.18	0.25	0.30
c	0.27	0.32	0.37
D	3.00 BSC		
D2	1.60	1.70	1.80
e	0.50 BSC		
E	3.00 BSC		
E2	1.60	1.70	1.80

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