

Description

The Si4730/31 is the industry's first fully integrated, 100% CMOS AM/FM radio receiver IC. The Si4730/31 AM/FM radio provides the space savings and low power consumption necessary for portable devices while delivering the high performance and design simplicity desired for all AM/FM solutions. Offering unmatched integration and PCB space savings, the Si4730/31 requires only two external components and less than 15 mm² of board area.

Leveraging Silicon Laboratories' proven and patented Si4700/01 FM digital receiver architecture, the Si4730/31 delivers superior RF performance and interference rejection in both AM and FM bands. The high integration and complete system production test simplifies design-in, increases system quality, and improves manufacturability. The Si4730/31 solution includes advanced seek algorithms, adjustable soft mute, auto-calibrated digital tuning, and FM stereo processing. In addition, the Si4730/31 provides a programmable reference clock, 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 chip provides excellent pilot rejection, selectivity, and unmatched audio performance, and offers both the manufacturer and the end-user extensive programmability and flexibility in listening experience.

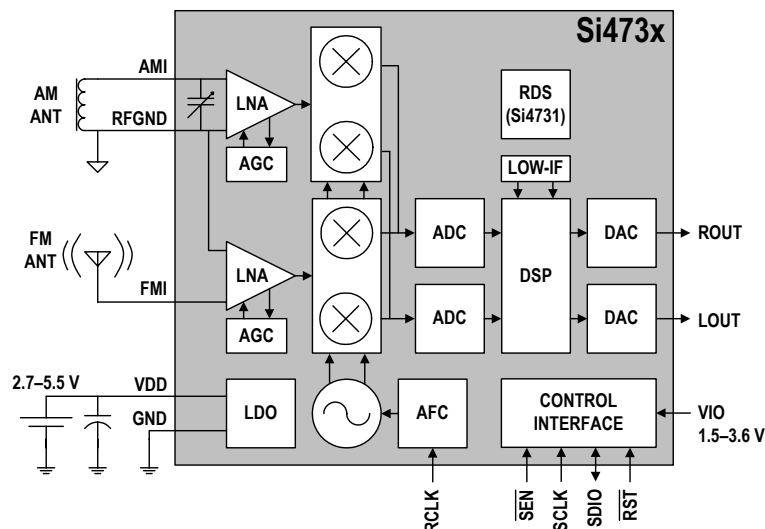
The Si4731 incorporates a digital processor for the European Radio Data System (RDS) and the North American Radio Broadcast Data System (RBDS) including all required symbol decoding, block synchronization, error detection, and error correction functions. Using this feature, the Si4731 enables broadcast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

Features

- Worldwide FM band support (76–108 MHz)
- Worldwide AM band support (520–1710 kHz)
- AM/FM digital tuning
- Excellent real-world performance
- Only 2 external components
- No manual alignment required
- Adjustable AM channel filters
- Advanced AM/FM seek tuning
- Digital volume control
- Adjustable soft mute control
- Frequency synthesizer with integrated VCO
- Automatic frequency control (AFC)
- Automatic gain control (AGC)
- Programmable AM/FM de-emphasis
- Adaptive noise suppression
- Integrated LDO regulator
- Programmable reference clock
- FM RDS/RBDS processor (Si4731 only)
- 2-wire and 3-wire control interface
- 2.7 to 5.5 V supply voltage
 - AM ferrite loopstick and air loop antenna support
 - 3 x 3 x 0.55 mm 20-pin QFN package
 - Pb-free/RoHS compliant

Applications

- Table and portable radios
- Stereos
- Mini/micro systems
- Portable media players
- Boomboxes
- Cellular handsets
- Clock radios
- Modules
- Entertainment systems



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Selected FM Electrical Specifications

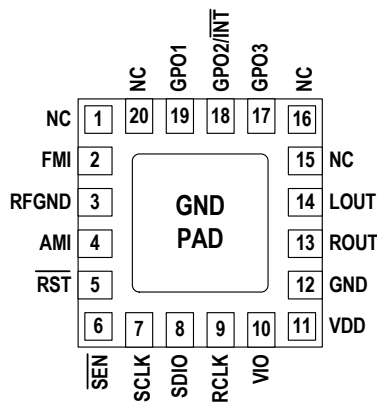
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input Frequency	f_{RF}		76	—	108	MHz
Sensitivity headphone matching		(S+N)/N = 26 dB	—	2.2	—	μ V EMF
Sensitivity 50 Ω matching		(S+N)/N = 26 dB	—	1.1	—	μ V EMF
Input IP3		$ f_2 - f_1 > 1 \text{ MHz}; f_0 = 2 \times f_1 - f_2$	—	105	—	dB μ V EMF
Adjacent Channel Selectivity		$\pm 200 \text{ kHz}$	—	50	—	dB
Alternate Channel Selectivity		$\pm 400 \text{ kHz}$	—	70	—	dB
Audio Band Limits		$\pm 1.5 \text{ dB}$	30	—	15k	Hz
Audio S/N			—	63	—	dB
Audio THD			—	0.1	—	%
Audio Output Voltage			72	80	90	mVrms
Supply Voltage*	V_D, V_A		2.7	—	5.5	V
Interface Supply Voltage*	V_{IO}		1.5	—	3.6	V
Powerdown Current*	I_{PD}		—	10	—	μ A

*Note: Applies to both FM and AM modes.

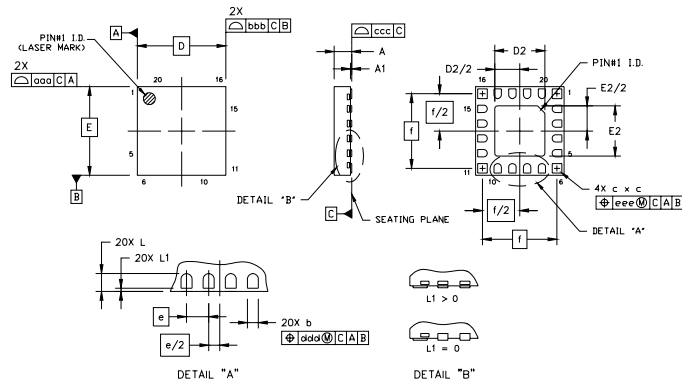
Selected AM Electrical Specifications

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input Frequency	f_{RF}		520	—	1710	kHz
Sensitivity		(S+N)/N = 26 dB	—	38	—	μ V EMF
Audio S/N			—	58	—	dB
Audio THD			—	0.1	—	%
Audio Output Voltage			54	60	66	mVrms
Antenna Inductance			180	—	600	μ H

Pin Assignments



3 x 3 x 0.55 mm, 20-pin QFN 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