Si4704/05

Enhanced Broadcast FM Radio Receiver for Portable Applications

Description

The Si4704/05 enhanced FM receiver is the most advanced portable solution available today offering embedded antenna support, digital audio out, worldwide FM band support, and highly flexible, mature, and proven FM functionality in a simple API. The Si4704/05 incorporates Skyworks' tuned-resonance antenna technology for crystal clear FM reception in wire-free device enclosures. Skyworks' internationally patented tuned-resonance technology allows embedded FM antennas such as PCB traces, loops, stubs, or other devices to perform exceptionally well, enabling devices with integrated Bluetooth to receive FM transmissions without an external FM antenna, and transmit the FM content to Bluetooth-enabled headsets. This is the best, most cost-effective solution to enable wire-free FM reception.

The Si4705 also offers digital audio out for FM recording. Content recorded over the Si4705 can be shared with friends or played at a later time in MP3 format. The content can also be tagged with RDS information, allowing song name and artist labels to be displayed as is done with MP3 meta data. Using the digital audio out, the Si4705 can also reduce total system power consumption by avoiding unnecessary ADC/DAC conversions between the FM receiver and the host processor.

The Si4704/05 truly supports worldwide FM bands, starting at 64 MHz for Eastern European countries and extending all the way to 108 MHz for the rest of the world. The device supports channel spacing down to 10 kHz, and includes advanced, proven seek functionality. All the Skyworks proven FM receiver expertise is incorporated in the Si4704/05, gained through thousands of designs with almost every OEM and ODM in the world and over 100 million devices shipped.

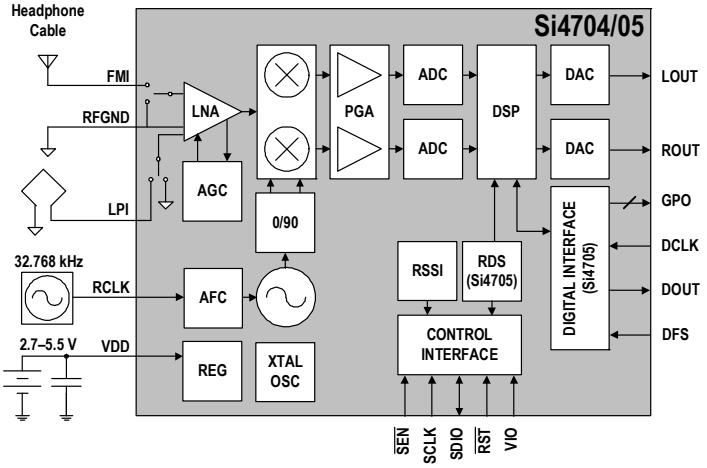
The Si4704/05 leverage Skyworks' internationally patented and proven digital low-IF architecture, offering proven functionality in a simple and mature API. The device is offered in a highly reliable, ultra-small 3 x 3 x 0.55 mm 20-pin QFN and is layout compatible with the full suite of Skyworks broadcast offerings including FM transmit, AM/FM/SW receive, weather band receive and SAME decode, and unparalleled RDS data receivers. The complete solution, including a minimal BOM, requires less than 15 mm^2 board area, or less than half that of other competing solutions. The Si4705 incorporates Skyworks' proven and widely adopted RDS processor, including worldwide compliance, all symbol decoding, error detection, error correction, and other RDS functions. The Si4705 RDS functionality is unmatched in the industry for performance, on-chip processing, and worldwide adoption.

Features

- Worldwide FM band support (64~108 MHz)
- Supports integrated antenna
- Digital low-IF receiver
- Excellent real-world performance
- Frequency synthesizer with integrated VCO
- Seek tuning
- Automatic frequency control (AFC)
- Automatic gain control (AGC)
- Integrated LDO regulator
- Minimal BOM
- Adjustable seek parameters
- Adjustable mono/stereo blend
- Adjustable soft mute
- RDS/RBDS decoder(Si4705 only)
- Optional digital audio output (Si4705 only)
- Programmable de-emphasis(50/75us)
- Programmable reference clock input
- Signal quality measurement
- 3 x 3 x 0.55 mm 20-pin Pb-free QFN package

Applications

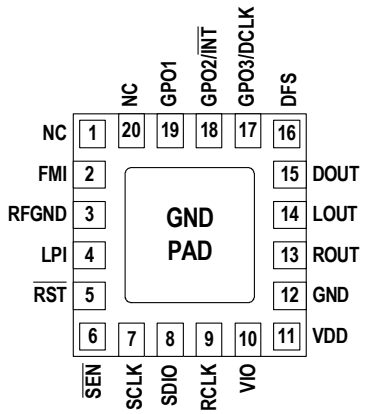
- Cellular handsets
- MP3 players
- Portable media players
- Personal computers
- Portable navigation devices
- Consumer electronics



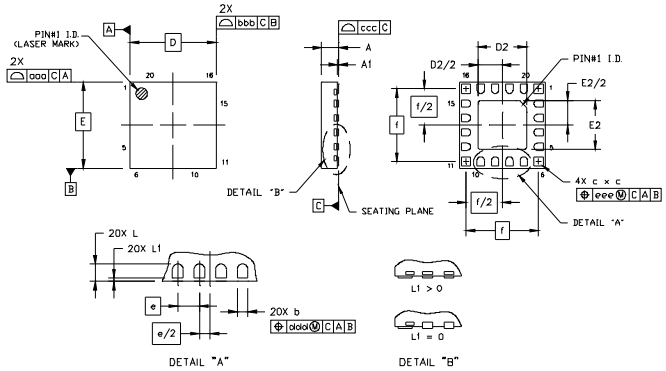
Selected Electrical Specifications

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input Frequency	f_{RF}		64	—	108	MHz
Sensitivity (76–108 MHz)		(S+N)/N = 26 dB	—	1.1	—	µV EMF
Input IP3		$\|f_2 - f_1\| > 1$ MHz; $f_0 = 2 \times f_1 - f_2$ AGC disabled	—	105	—	dBµV EMF
Adjacent Channel Selectivity		±200 kHz	—	50	—	dB
Alternate Channel Selectivity		±400 kHz	—	70	—	dB
RCLK Frequency			—	32.768	—	kHz
RCLK Frequency Tolerance			–100	—	100	ppm
Audio Output Voltage			72	80	90	mVrms
Audio Mono S/N			55	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}		—	19.2	—	mA
Powerdown Current	I_{PD}		—	10	12	µA
Seek/Tune Time			—	—	80	ms/channel
SCLK Frequency	f_{CLK}	3-wire operation	—	—	2.5	MHz
	f_{SCL}	2-wire operation	—	—	400	kHz
Powerup 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	0.18	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

Notes:
1. All dimensions are shown in millimeters unless otherwise noted.
2. Dimensioning and tolerancing per ANSI Y14.5M-1994.

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