



HIGH-PERFORMANCE AUTOMOTIVE AM/FM RADIO RECEIVER AND HD RADIO[™]/DAB/DAB+/DMB/DRM TUNER

Description

The Si47901/02 analog AM/FM receiver and digital radio tuner sets a new standard for automotive broadcast reception.

Si47902 supports all radio bands (AM/FM/DAB/Shortwave/ Longwave/Weatherband). The Si47901/02 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.

Si47901/02 supports AM/FM HD Radio channel reception with digital (I^2S) baseband I/Q outputs for interface to a HD Radio processor. Si47902 supports Band-III and L-band channel reception with digital (I^2S) baseband I/Q outputs for interface to a DAB processor. Si47901/02 support dual antenna FM phase diversity reception.

Si47901/02 leverages Silicon Laboratories' patented digital architecture, delivering superior RF performance and interference rejection. The proven digital techniques provide excellent sensitivity in weak signal environments and superb selectivity and inter-modulation immunity in strong signal environments. Si47901/02 comes with comprehensive AM/FM signal processing firmware.

The Si47901/02 is the highest integrated monolithic IC in the industry with the lowest external bill of materials. Si47901/02 based systems can scale from low-cost single tuner AM/FM radio to highest performance systems with multiple tuners and multiple antennas, enabling the radio suppliers to reuse their R&D across multiple product lines, all with a common software API.

Features

- Worldwide FM band support (64–108 MHz)
- Worldwide AM band support (520-1710 kHz)
- LW band support (144-288 kHz)
- SW band support (2.3-30 MHz)
- DAB/DAB+/DMB support (170–240 MHz, 1452–1492 MHz) (Si47902 only)
- NOAA Weather Band support
- On-chip soft-decision RDS/RDBS demodulator/decoder
- Low-IF architecture eliminates expensive 10.7 MHz IF ceramic filter
- AM/FM:
 - Comprehensive AM/FM signal processing fimware
 - Integrated active AM/FM buffers for background/data tunes
 - Analog FM phase diversity
 - Fully integrated AGC for AM and FM inputs
- HD Radio:
 - Digital I/Q interface to HD Radio Processor
 - AM/FM HD Radio IBOC blend
- DAB/DAB+/DMB (Si47902 only);
 - Digital I/Q Interface to DAB/DAB+/DMB processor
 - Integrated active Band III/L-band buffers for background/data tuners
 - Fully integrated AGC for Band III and L-Band inputs
- Analog and digital (I²S) audio outputs
- Frequency synthesizer with fully integrated PLL-VCO
- Integrated clock oscillator
- 1.8 V and 3.3 V power supplies
- QFN 84-pin, 12x12x0.85 mm
- Pb-free/ROHS compliant
- AEC-Q100 gualified

Applications

- Automotive OEM infotainment systems
- Aftermarket car radio systems



Automotive AM/FM Tuner



Selected Electrical Specifications

Parameter	Symbol	Test Condition	Min	Тур	Max	Unit
Analog Supply Voltage	V _A		3.15	3.3	3.63	V
Digital Supply Voltage	VD		1.71	1.8	2.0	V
Interface Supply Voltage			1.71	1.8	2.0	V
	V _{IO1}		3.0	3.3	3.63	V
	V _{IO2}		1.71	1.8	2.0	V
			3.0	3.3	3.63	V
FM				1		I
Input Frequency			64	—	108	MHz
Input Resistance			—	50	—	Ω
АМ		·				
Input Frequency			520	—	1710	kHz
Input Capacitance		Varies with RF AGC state	20	—	128	pF
Band III (Si47902 only)		·	•	•		•
Input Frequency			168	—	240	MHz
Input Resistance			—	50	—	Ω
L-Band (Si47902 only)			•		•	
Input Frequency			1452	—	1492	MHz
Input Resistance			—	50	_	Ω

Pin Assignment



Package Information



Min

0.35

0.075

_

_

Dimension	Min	Nom	Max	Dimension		
А	0.80	0.85	0.90		L	
A1	0.00	0.03	0.05		R	
b	0.20	0.25	0.30		S	
D		7.00 BSC			aaa	
D2	5.20	5.30	5.40		bbb	
е		0.50 BSC			CCC	
E		7.00 BSC			ddd	
E2	5.20	5.30	5.40			
Notes: 1. Al	l dimensi	ons sho	wn are in i Tolerancin	millime	ters (mm) unle	

All dimensions shown are in millimeters (mm) unless otherwise noted.
Dimensioning and Tolerancing per ANSI Y14.5M-1994.

This drawing conforms to JEDEC Outline MO-220, Variation VJJD-2. 3.

Automotive AM/FM Tuner

Copyright © 2014 by Silicon Laboratories

Silicon Laboratories and Silicon Labs are trademarks of Silicon Laboratories Inc.

Max

0.45

0.075

0.10

0.10

0.08

0.10

Nom

0.40

_

_

_

Other products or brandnames mentioned herein are trademarks or registered trademarks of their respective holders

Recommended card reflow profile is per the JEDEC/IPC J-STD-020 specification for Small Body Components. 4.



Disclaimer

Silicon Laboratories intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Laboratories products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications. Application examples described herein are for illustrative purposes only. Silicon Laboratories reserves the right to make changes without further notice and limitation to product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Silicon Laboratories shall have no liability for the consequences of use of the information supplied herein. This document does not imply or express copyright licenses granted hereunder to design or fabricate any integrated circuits. The products must not be used within any Life Support System without the specific to result in significant personal injury or death. Silicon Laboratories products are generally not intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Laboratories products are generally not intended for military applications. Silicon Laboratories products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons.

Trademark Information

Silicon Laboratories Inc., Silicon Laboratories, Silicon Labs, SiLabs and the Silicon Labs logo, CMEMS®, EFM, EFM32, EFR, Energy Micro, Energy Micro logo and combinations thereof, "the world's most energy friendly microcontrollers", Ember®, EZLink®, EZMac®, EZRadio®, EZRadioPRO®, DSPLL®, ISOmodem ®, Precision32®, ProSLIC®, SiPHY®, USBXpress® and others are trademarks or registered trademarks of Silicon Laboratories Inc. ARM, CORTEX, Cortex-M3 and THUMB are trademarks or registered trademarks of ARM Holdings. Keil is a registered trademark of ARM Limited. All other products or brand names mentioned herein are trademarks of their respective holders.



Silicon Laboratories Inc. 400 West Cesar Chavez Austin, TX 78701 USA

http://www.silabs.com