Si4790x

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.

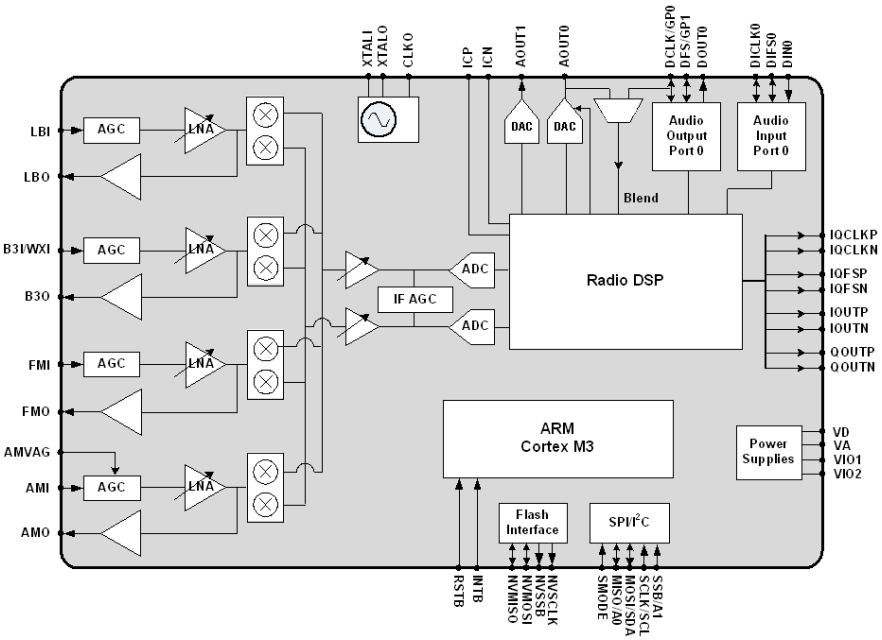
The Si47901/02 is the highest integrated monolithic IC in the industry with the lowest external bill of materials. Si47901/02 based systems can scale from low-cost single tuner AM/FM radio to highest performance systems with multiple tuners and multiple antennas, enabling the radio suppliers to reuse 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 (I^2S) 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 qualified

Applications

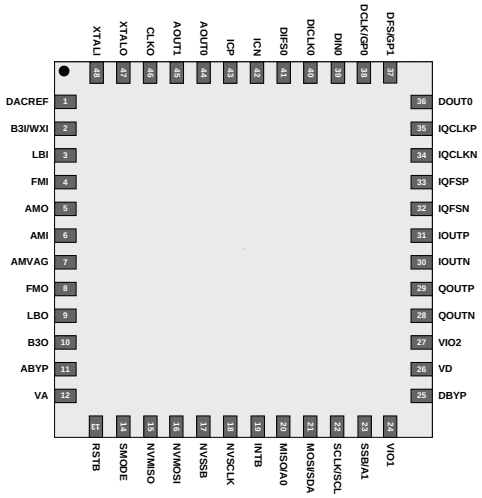
- Automotive OEM infotainment systems
- Aftermarket car radio systems



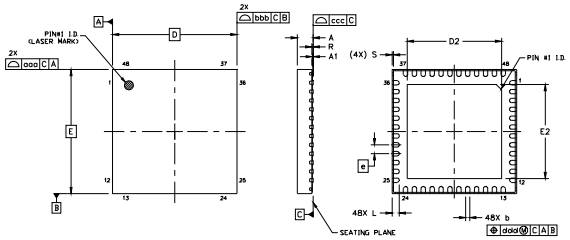
Selected Electrical Specifications

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Analog Supply Voltage	V_A		3.15	3.3	3.63	V
Digital Supply Voltage	V_D		1.71	1.8	2.0	V
Interface Supply Voltage	V_{IO1}		1.71	1.8	2.0	V
			3.0	3.3	3.63	V
	V_{IO2}		1.71	1.8	2.0	V
			3.0	3.3	3.63	V
FM						
Input Frequency			64	—	108	MHz
Input Resistance			—	50	—	Ω
AM						
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

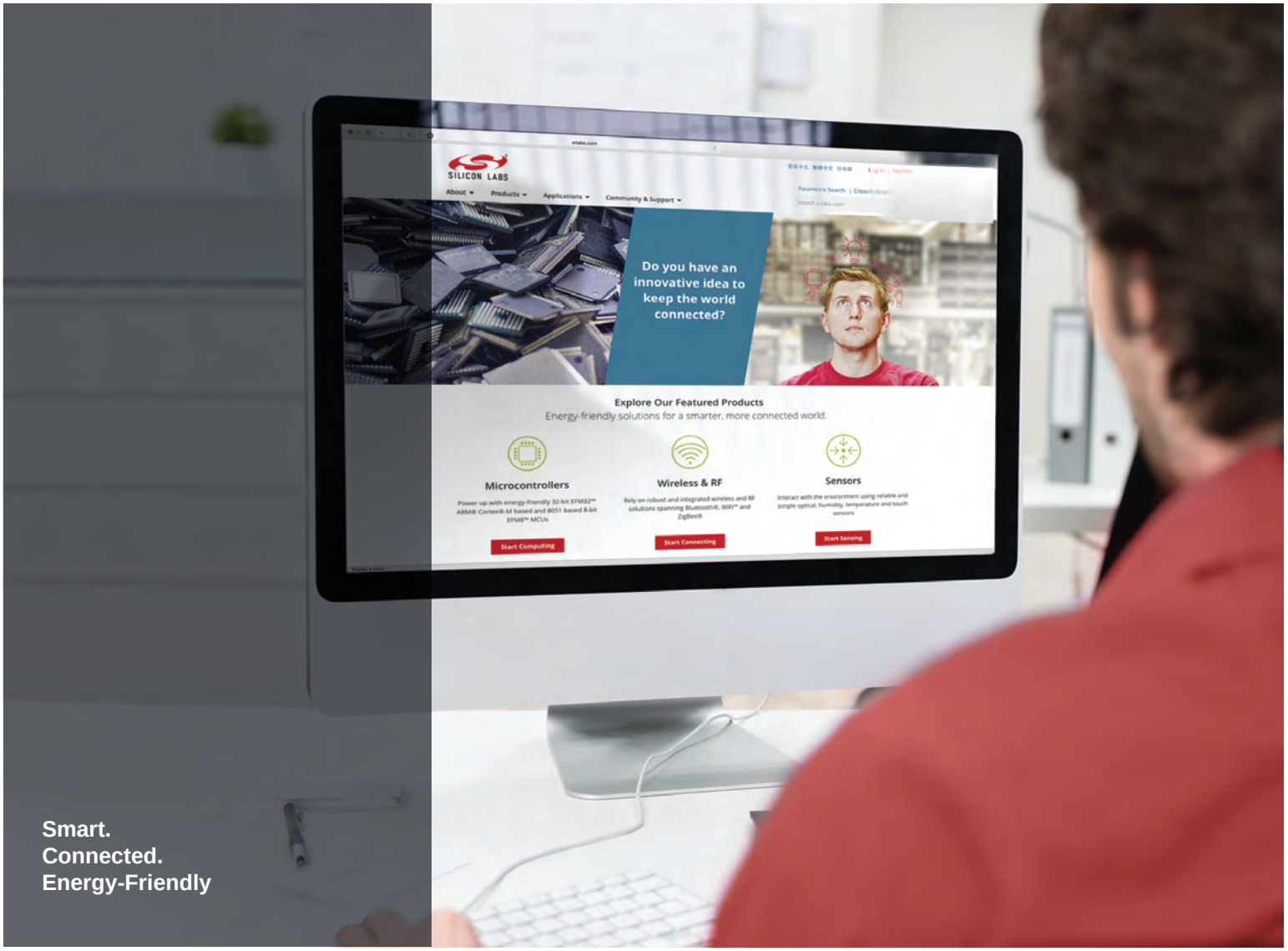


Dimension	Min	Nom	Max
A	0.80	0.85	0.90
A1	0.00	0.03	0.05
b	0.20	0.25	0.30
D		7.00 BSC	
D2	5.20	5.30	5.40
e		0.50 BSC	
E		7.00 BSC	
E2	5.20	5.30	5.40

Dimension	Min	Nom	Max
L	0.35	0.40	0.45
R	0.075	—	—
S	—	—	0.075
aaa	—	—	0.10
bbb	—	—	0.10
ccc	—	—	0.08
ddd	—	—	0.10

Notes:

1. All dimensions shown are in millimeters (mm) unless otherwise noted.
2. Dimensioning and Tolerancing per ANSI Y14.5M-1994.
3. This drawing conforms to JEDEC Outline MO-220, Variation VJJD-2.
4. Recommended card reflow profile is per the JEDEC/IPC J-STD-020 specification for Small Body Components.



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