

Description

The Silicon Labs Si4770/77-A20 represents the world's first high performance single-chip mixed signal CMOS receiver targeting high-end consumer electronics. The device is a true all-in-one chip, receiving RF with zero-BOM implementation, and performing all required demodulation and signal conditioning to provide digital I²S audio and / or left and right analog audio out. The Si4777 also supports AM/FM HD radio channel reception with digital (I²S) zero-IF (ZIF) I/Q outputs for interface to an HD radio processor.

The Si4770/77-A20 leverages Silicon Labs' long and proven history of delivering mixed signal low-intermediate-frequency (low-IF) ICs. The low-IF digital architecture and leading mixed signal design provide superior RF performance and interference rejection in a highly integrated, single chip device. As the leader in mixed signal CMOS, Silicon Labs has now shipped over 2 billion such devices.

The fully integrated analog chain receives analog broadcast bands including AM and FM. The solution offers superior on-chip filtering and signal conditioning, and incorporates automatic channel bandwidth adjustment, sub-2 msec tune time and corresponding very fast seek time, highly effective seek algorithms, and advanced audio conditioning including programmable soft mute, multi-path mitigation / cancellation, stereo-mono blend and hi-cut / lo-cut.

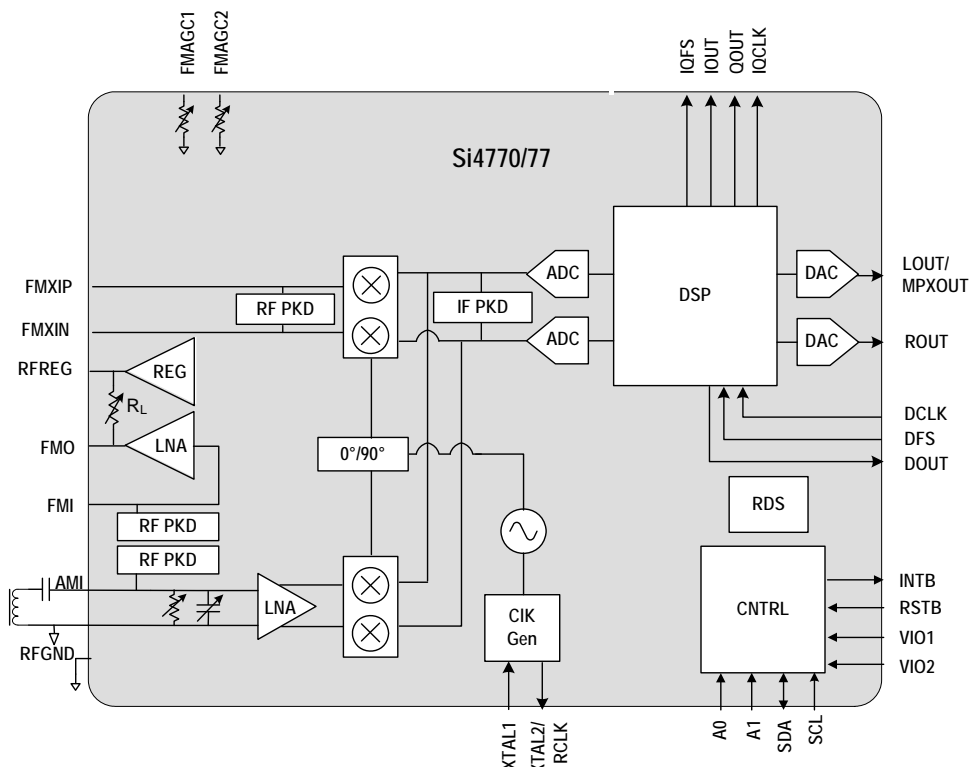
The Si4770/77-A20 also incorporates the world's leading FM R(B)DS decoder, including all required symbol decoding, block synchronization, error detection, and error correction functions.

Features

- Worldwide FM band support (64–108 MHz)
- Worldwide AM band support (520–1710 kHz)
- Comprehensive signal quality metrics: RSSI, SNR, multipath interference, frequency offset, adjacent channel RSSI, frequency deviation, and image RSSI
- Advanced patented RDS soft-decision decoder
- Advanced, patented FM channel equalizer for multipath interference
- Dynamic AM/FM channel bandwidth control
- Programmable AM/FM soft mute
- FM stereo-mono blend
- FM hi-blend control
- AM/FM hi-cut control
- AM lo-cut filter
- L/R analog and digital (I²S) audio outputs
- Digital (I²S) zero-IF AM/FM I/Q outputs (Si4777 only)
- Digital Low-IF architecture
- Frequency synthesizer with fully integrated PLL-VCO
- Fully integrated AM/FM front-end including high performance LNA, AGC with integrated resistor and capacitor banks, and RF and IF peak detectors
- Integrated crystal oscillator
- 1.2 to 5 V power supplies
- QFN 40-pin, 6x6x0.85 mm
 - Pb-free/RoHS compliant

Applications

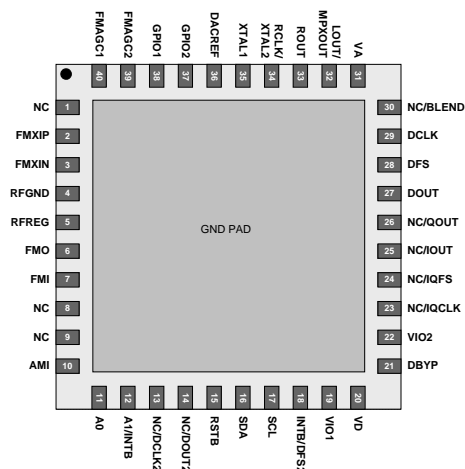
- Audio/video receivers
- Consumer electronics
- Boom boxes
- Home theater systems



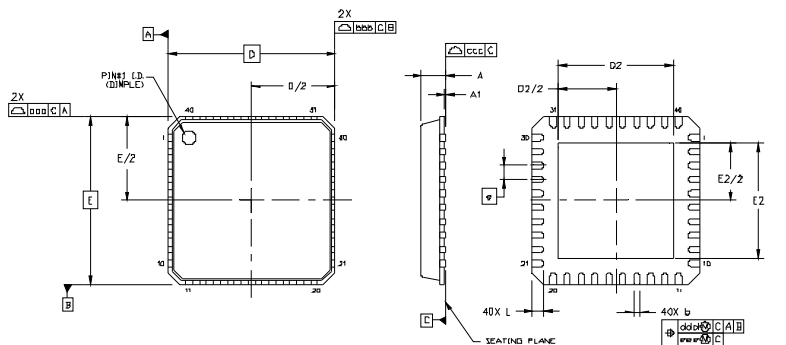
Selected Electrical Specifications

Parameter	Test Conditions	Min	Typ	Max	Units
Ambient temperature		-40	25	85	°C
Analog supply voltage 5 V (VA)		4.5	5	5.5	V
Digital supply voltage 3.3 V (VD)		2.7	3.3	3.6	V
Interface supply voltage (VIO1)		1.7	3.3	3.6	V
Interface supply voltage (VIO2)		1.2	3.3	3.6	V
Analog supply current (FM mode)		121	130	139	mA
Analog supply current (AM mode)		129	140	147	mA
Digital supply current		47	60	81	mA
Interface supply current (VIO1)		0.1	0.5	0.82	mA
Interface supply current (VIO2)		0.1	0.2	0.5	mA
FM					
Input frequency		64	—	108	MHz
Tune time		—	1.5	—	msec
Seek time/channel		—	20	—	msec
IP3	Blockers at 400/800 kHz offset	115	117	—	dBμV
Sensitivity	SINAD = 26 dB	—	-3.5	-2	dBμV
AM					
Input frequency		520	—	1710	kHz
Seek time/channel		—	55	—	msec
IP2	Desired = 700 kHz Undesired = 1000, 1700 kHz AGC Disabled (Max Gain)	142	146	—	dBμV
IP3	Blockers at 40/80 kHz offset AGC Disabled (Max Gain)	110	120	—	dBμV
Sensitivity	SINAD = 26 dB	—	14	17	dBμV EMF

Pin Assignment



Package Information



Symbol	Millimeters		
	Min	Nom	Max
A	0.80	0.85	0.90
A1	0.00	0.02	0.05
b	0.18	0.25	0.30
D	6.00 BSC		
D2	3.95	4.10	4.25
e	0.50 BSC		
E	6.00 BSC		

Symbol	Millimeters		
	Min	Nom	Max
E2	3.95	4.10	4.25
L	0.30	0.40	0.50
aaa	0.10		
bbb	0.10		
ccc	0.08		
ddd	0.10		
eee	0.05		



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