skyworks®

Description

The Si4613 HD Radio™ radio processor provides significant advances in size, power consumption, and performance to enable HD Radio reception in automotive infotainment systems and car radios as well as in high-end audio/video receivers and pro-audio systems. It is designed to work with the high-performance automotive Si476x and Si479x families of AM/FM radio tuners.

The Si4613 HD Radio processor supports the iBiquity and NRSC-5 standards for FM In-Band-On-Channel (IBOC) and AM IBOC digital radio broadcasting. The processors support Station Information Service (SIS), Service Information Guide (SIG), Program Service Data (PSD), IBOC multicasting, and HD Radio digital audio.

The Si4613 implements a version of iBiquity's Cayenne HD Radio core, optimized for low power, cost, and footprint. It features an extremely efficient Viterbi decoder, thereby eliminating the need for an external SRAM memory module. The Si4613 HD Radio core utilizes iBiquity's proprietary HDC codec to decode the HD radio signal and directs the HD radio audio output to other system ICs through an I2S digital audio interface. The Si4613 enables many additional features, such as real-time traffic, iTunes Tagging and Artist Experience by providing the Advanced Application Services (AAS) payload to the external application processor.

The Si4613 HD Radio core was co-developed by Skyworks and iBiquity and is the most advanced power-efficient HD Radio processing core available today.

Features

- AM/FM HD Radio channel decoder (Si4613)
- Complete on-chip HDC audio source decoder
- FM HD1, HD2, HD3 multicast support
- Station Information Service (SIS) support
- Program Service Data (PSD)
- Advanced Application Services (AAS) Payload for data applications
- No external RAM required for channel decoding
- Flash memory interface for application program load
- On-chip crystal oscillator
- Reference clock input
- SPI, I^{2}C control interfaces
- QFN 48-pin, 7x7x0.85 mm
- Pb-free/RoHS compliant
- AEC-Q100 qualified

Applications

- Aftermarket car radio systems
- OEM automotive infotainment systems
- OEM automotive PND docking systems
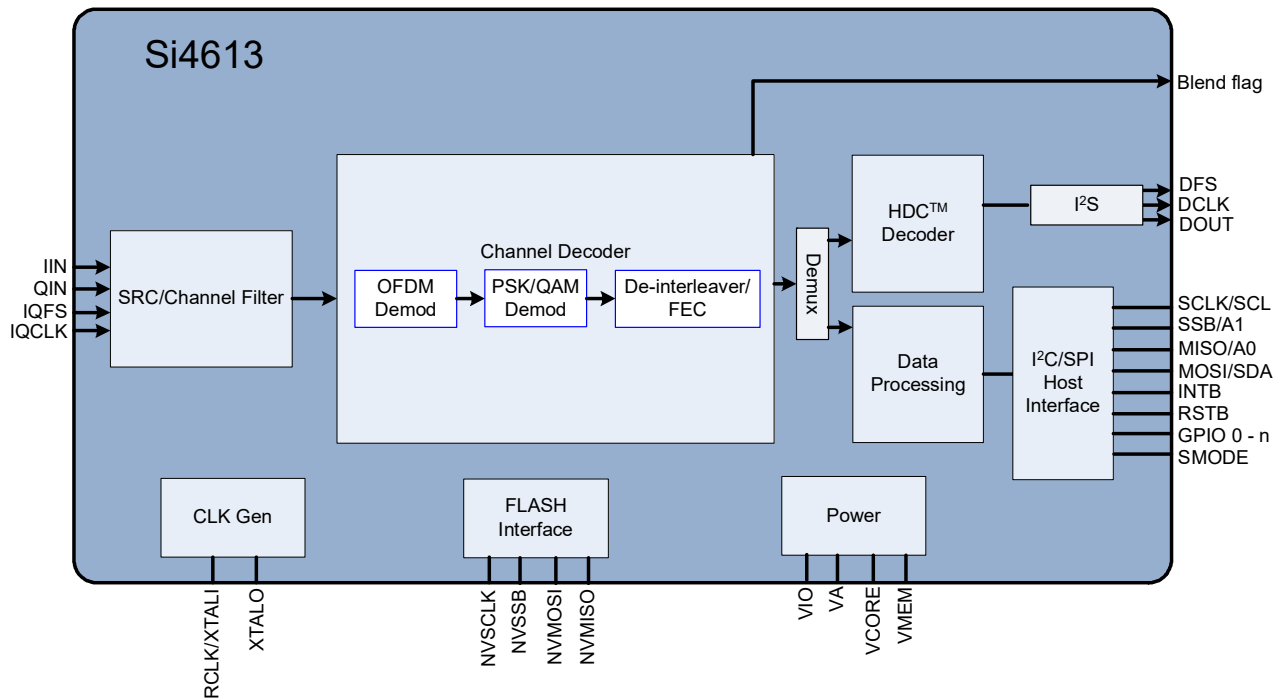
Selected Electrical Specifications

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Analog Supply Voltage	V_A		1.71	1.8	2.0	V
Interface Supply Voltage	V_{IO}		1.62	1.8	3.6	V
Core Digital Supply Voltage	V_{CORE}		1.71	1.8	2.0	V
Memory Supply Voltage	V_{MEM}		1.71	1.8	2.0	V
Reference Clock						
Reference Clock Frequency	RCLK		—	37.209	—	MHz
Reference Clock Accuracy			−100	—	100	ppm
Reference Clock Duty Cycle			45	—	55	%
Crystal Oscillator						
Crystal Oscillator Frequency			—	37.209	—	MHz
Crystal Frequency Tolerance		37.209 MHz	−100	—	100	ppm
Load Capacitance		37.209 MHz	—	—	10	pF
ESR		37.209 MHz	—	—	50	Ω
Ambient Temperature	T_A		−40	25	85	°C

Si4613-A10
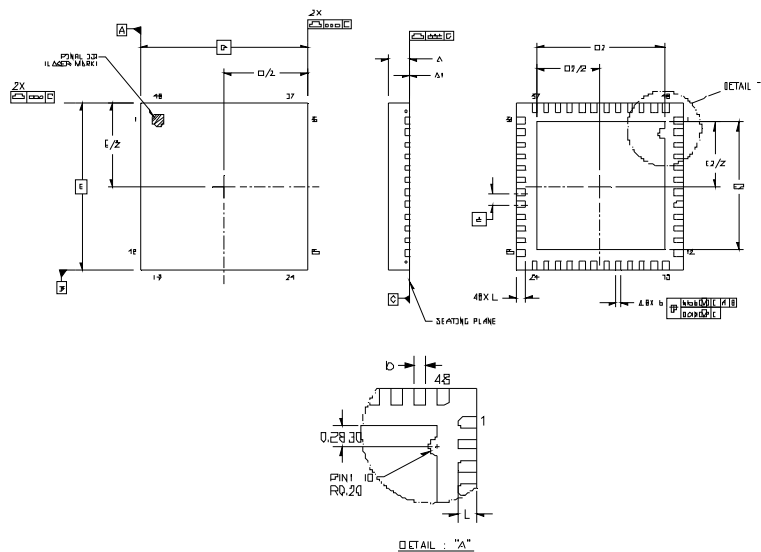
Dimension	Min	Nom	Max
A	0.80	0.85	0.90
A1	0.00	0.02	0.05
b	0.18	0.25	0.30
D		7.00 BSC	
D2	5.20	5.30	5.40
e		0.50 BSC	
E		7.00 BSC	
E2	5.20	5.30	5.40
L	0.30	0.40	0.50
aaa		0.15	
bbb		0.10	
ddd		0.05	
eee		0.08	

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

SKYWORKS®

Connecting Everyone
and Everything,
All the Time

Portfolio
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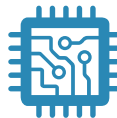
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