

FC8300

Terrestrial Digital Multimedia Broadcast
RF tuner & Demodulator SoC
(ISDB-T 1-Segment/13-Segment/Tmm Receiver)

Data sheet

Preliminary

Ver.0.3



Confidential

Contents

1. Introduction	6
1.1. General Description	6
1.2. Block Diagram	6
1.3. Feature	7
1.4. Supported Transmission Parameters	8
2. Package Information	9
2.1. WLCSP Package – Top view	9
2.2. WLCSP Package – Bottom view	10
2.3. BGA Package – Top view(TBD)	11
2.4. BGA Package – Bottom view(TBD).....	12
2.5. Pin Description	13
2.6. WLCSP1 Dimension	16
2.7. WLCSP 2 Dimension	18
2.8. BGA Dimension	20
3. Electrical Characteristics	21
3.1. Absolute Maximum Rating	21
3.2. Recommended Operating Condition	21
3.3. DC Characteristics	22
3.4. Clocks Electrical Characteristics	23
3.5. Electrical Performance.....	24
3.6. Power Current	26
4. Power Management	27
4.1. Power On Sequence.....	27
4.2. Power Off Sequence.....	29
5. Host Interface	30
5.1. SPI Interface.....	30
5.2. I2C Interface	37
5.3. TSIF	45
5.4. EB12-LCD Interface.....	52
6. Diversity Application.....	57
6.1. Connection for Diversity.....	57
7. Application Schematic.....	62



7.1.	Single Application Schematic (WLCSP)	62
7.2.	2-Diversity Application Schematic (WLCSP)	64

Figures

Figure 1 WLCSP assignment (Top view)	9
Figure 2 WLCSP assignment (Bottom view)	10
Figure 3. Top View	16
Figure 4. Bottom View	16
Figure 6. Detail 1.....	16
Figure 7. Detail 2.....	16
Figure 5. Side View	16
Figure 8. Top View	18
Figure 9. Bottom View	18
Figure 11. Detail 1	18
Figure 12. Detail 2.....	18
Figure 10. Side View	18
Figure 13. Top View	20
Figure 14. Bottom View	20
Figure 15. Side View	20
Figure 16 TS_CLK_DIV = 0 and clock phase = 0	49
Figure 17 TS_CLK_DIV = 6 and clock phase = 0	50
Figure 18 TS_CLK_DIV = 0 and clock phase = 0	51
Figure 19 Single Application Schematic (WLCSP Top View)	62

Revision History

Version	Date	Description
Ver. 0.1	2013. 05.14	Initial release.
Ver. 0.2	2013. 06.04	A3,A4,B5 pin name Updated. 1.2.Block Diagram Serial Interface ID0, ID1 Pin I/O Description Updated. Electrical Performance 'Minimum input Level', 'C/N' Updated.
Ver. 0.3	2013. 06.12	WLCSP 2, BGA Information Updated.

1. Introduction

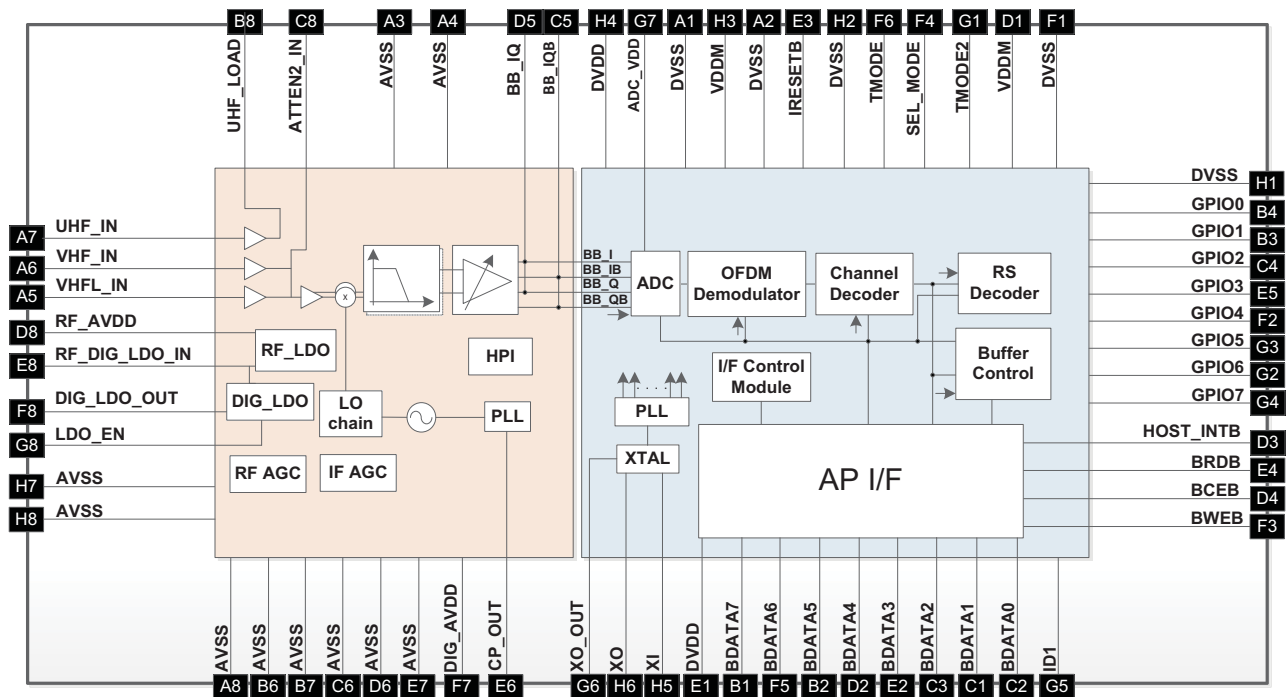
1.1. General Description

FC8300 is a highly integrated RF and Demodulator chip for receiving digital broadcasts such as ISDB-T 1-Seg, 3-Seg, ISDB-Tmm, ISDB-T Full Seg, and ISDB-Tsb.

FC8300 is a single-die implementation of FCI's proprietary RF and demodulator with outstanding in-door and mobility performances. It provides good sensitivity and immunity to interference with low power consumption mostly suitable for mobile phone and many other portable devices.

1.2. Block Diagram

WLCSP Block Diagram



1.3. Feature

Item	Content
Supported Broadcast System	1/13 segment reception of ISDB-T(B31) 1/13 segment reception of ISDB-Tmm(B46) 1/3 segment reception of Tsb(B29) Supported Channel Bandwidth 6,7 and 8[MHz]
Reception frequency	VHF-L 90~108MHz VHF-H 170~240MHz UHF 470~806MHz
Features	Built-in Inter Carrier Interference Canceller (ICIC). Built-in continues controllable FFT window position control circuit. Built-in co - channel interference suppressing circuit for Analog TV. Built-in Status monitor: C/N, error rate, constellation. Embedded MULTI-2 Descrambler for B-CAS(ARIB-B25) Supports Diversity Functions(Up to 4 diversity) Supports AC carrier Demodulation for Emergency Broadcasting Supports 8 GPIO ports(*1) Interrupt signal output High-speed channel switching and High-speed channel search available.
Ext Input Clock	Supported External Crystal/Osc Clock(MHz) : 16.0 ~ 38.4MHz Recommended Clock(MHz) : 19.2, 24.0, 26.0, 32.0
Interface	Control Path : SPI, I2C, EBI2-LCD Data Path : SPI, TSIF(Serial/Parallel), EBI2-LCD
Power supply	Recommended Supply Voltage : Core : 1.1V / I/O : 1.8V, 2.5V, 3.3V / RF & LDO : 1.5V ~ 1.8V
Size	62-balls WLCSP 1 : 3.4mm × 3.3mm × 0.63(max) 62-balls WLCSP 2 : 3.4mm × 3.3mm × 0.38(max) 62-balls BGA : 5.0mm × 5.0mm × 0.90(max)

(*1) FC8300 has 8pins which can be used for GPIO function in a particular case
The available number of GPIO interface depends on system construction

1.4. Supported Transmission Parameters

Item	Parameter	Content					
ISDB-T (B31)	Segment	1			13		
	Band width[MHz]	6/7/8			6/7/8		
	Transmission mode	Mode1	Mode2	Mode3	Mode1	Mode2	Mode3
	Guard interval	1/4, 1/8, 1/16, 1/32			1/4, 1/8, 1/16, 1/32		
	Modulation method	QPSK, 16QAM			QPSK, 16QAM,64QAM		
	Code rate	1/2, 2/3, 3/4, 5/6, 7/8			1/2, 2/3, 3/4, 5/6, 7/8		
	Time interleave	4,8,16	2,4,8	1,2,4	4,8,16	2,4,8	1,2,4
ISDB-Tmm (B46)	Segment	1			13		
	Band width[MHz]	6/7/8			6/7/8		
	Transmission mode	Mode1	Mode2	Mode3	Mode1	Mode2	Mode3
	Guard interval	1/4, 1/8, 1/16, 1/32			1/4, 1/8, 1/16, 1/32		
	Modulation method	QPSK, 16QAM			QPSK, 16QAM,64QAM		
	Code rate	1/2, 2/3, 3/4, 5/6, 7/8			1/2, 2/3, 3/4, 5/6, 7/8		
	Time interleave	4,8,16	2,4,8	1,2,4	4,8,16	2,4,8	1,2,4
ISDB-Tsb (B29)	Segment	1			3		
	Band width[MHz]	6/7/8			6/7/8		
	Transmission mode	Mode1	Mode2	Mode3	Mode1	Mode2	Mode3
	Guard interval	1/4, 1/8, 1/16, 1/32			1/4, 1/8, 1/16, 1/32		
	Modulation method	QPSK, 16QAM,64QAM			QPSK, 16QAM,64QAM		
	Code rate	1/2, 2/3, 3/4, 5/6, 7/8			1/2, 2/3, 3/4, 5/6, 7/8		
	Time interleave	4,8,16	2,4,8	1,2,4	4,8,16	2,4,8	1,2,4