LG-KS.WT0601

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Wireless Digital Audio TX Module User Manual

KWANG SUNG ELECTRONICS

LG-KS.WT0601

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1. Introduction

The series of modules from LG are designed for the wireless audio transmission and reception with providing a high-end quality of DVD receiving speaker system audio. The transmission technique used in the module is DSSS (Direct Sequence Spread Spectrum) that is also adopted in the IEEE 802.11b specification, and the data rate can be up to 2Mbps with constant and continuous transmission.
The antenna has the 1dBi (Peak) gain.
The Oscillator frequency is operated as 44MHz and provide RF channel scanning function, then the transmitter can choose a clear channel and coexist with the WLAN system in the same environment.
The channel use the 1~12Ch and also automatically scan the best optimized channel without noise.
When inputting the initial power, this Channel will be shifted to the best optimized
condition to receive and transmit the high qualified sound between the transmitting module and receiving module.
In this user manual, it will describe specifications and operating steps for these wireless system board..

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1. System Descriptions

The LG-KS.WT0601 module high-end digital wireless audio solution is a concept combination with system module, and main board.
The system module is a complete design, which includes all parts of RFIC, IA8 IC, optional audio I/O c hip and connector in the single board.

(1) Clock generation

1 . Use a 44MHz clock signal as reference clock of internal **programmable PLL** circuit to generate the audio sys tem clock to the external ADC. Audio clock: SYS_CLK: 12.288MHz (512Fs), BCK: 3.072MHz, LRCK: 48 KHz

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2. LG-KS.WT0601 have the internal PLL is configured as output frequency being 24/25 of reference clock (44MHz). Then, the output clock frequency is 44MHz*24/25=42.24MHz. This clock is used as Base Band chip IA8's operating clock signal for audio sampling clock being 48KHz

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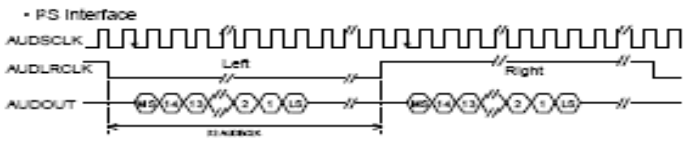
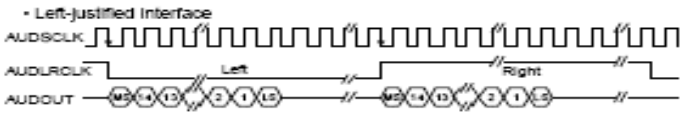
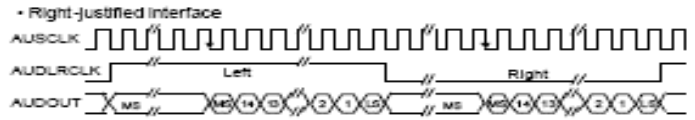
(2) External Audio ADC and Internal DAC Clock generation

Audio ADC/DAC interface provides a high quality multi resolution(16/18/20/24-bit) digital audio connection to external audio devices. ADI interface supports I2S audio format as well as optional left-justified or right-justified audio format. ADI interface produces one 64-bit frame at the audio sample frequency using a bit clock and frame sync signal. ADI interface supports 32KHz, 44.1KHz or 48KHz audio sampling frequency, of which 256 or 384 times main clock can be generated from on-chip audio clock oscillator or external clock signal by interface mode programming.

Pin Name	I/O	Type	Description
AUD_MCLK	programmable	clock	audio oversampled clock This clock can be programmed 256 or 384 times AUDLRCLK
AUD_SCLK	programmable	clock	audio serial data bit clock This clock is fixed at 64 times AUDLRCLK
AUD_LRCLK	programmable	clock	audio frame synchronization clock This clock can be programmed 32KHz, 44.1KHz or 48KHz
AUD_DATA	programmable	serial data	audio serial data used for sending playback data to DAC and receiving data from ADC 16-bit data format with I2C, left-justified or right-justified interface







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(3) Pin con figuration

Pin No.	Pin definition	Pin No.	Pin definition
1	VCCIO	2	MIC_IN
3	NCS_CPU	4	AIR
5	SYS_CLK	6	UGND
7	PGND	8	AIL
9	RED LED	10	DGND
11	Blue LED	12	CH_ID
13	SCLK_CPU	14	SDA_CPU
15	REQ_CPU	16	SDI_ADC
17	LRCK_IN	18	SDI_I2S
19	SPDIF	20	BCK_IN
21	TEST1	22	TEST2
23	BCK_OUT	24	LRCK_OUT

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2. Software Parameter Settings

To help the customers can well evaluate and learn the rich functions and features about the LG-KS.WT0601 module LG provides a Windows based software parameter setting tool delive red with the Jig. Customers can learn the TX & RX module's parameters setting by way of the test Jig and this software.

About how to operate test Jig with this software parameter setting tool, please refer to the attached file, "**Software Parameter Setting Tool Operation Guide**".

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3. Product Specification

Occupied Channel	11MHz
Spread Spectrum Technology	DSSS
Modulation Scheme	π /4 DQPSK
Link Distance (free space)	200m
Sensitivity @ BER=0	-83dBm
Data Rate	2Mbps
Max. coexist RX	Unlimited
Coexist with WLAN	Yes
Latency	<2ms
Audio Compression	No
Support I2S, SPDIF	+/-0.13dB
Frequency Response @20-20KHz	96dB
SNR	0.003%
THD+N	93dB
Dynamic Range	No cross talk
Cross Talk	2 concrete walls
Through wall transmission	2 concrete walls
ID authentication	Yes

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4. LABEL

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5. Channel

Channel No.	Center Frequency
1	2412 MHz
2	2417 MHz
3	2422 MHz
4	2427 MHz
5	2432 MHz
6	2437 MHz
7	2442 MHz
8	2447MHz
9	2452MHz
10	2457 MHz
11	2462 MHz
12	2467 MHz

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 2 0 cm from all persons and must not be colocated or operating in conjunction with any antenna or tran smitter other than those contained in this device.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operatio n of the device.