INTEGRATOR GUIDE FOR THE WMDA-119AN

Gemtek

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#1440

1 Specification

Product Name	Wireless Full HD Video/Audio Sender
Model Number	WMDA-119AN
Host Interface	60 pin LVDS
Chipset solution	MCU STM32F105 MAC/BBP Amimon AMN2120 RF Amimon AMN3110
Memory	4Mbit Flash
Switch	Reset Button x 1
Dimensions	PCB 140 x 70 (mm)
LED	Power (Yellow)
Operating Voltage	5V +/- 5%
Current consumption	10W maximum
Antenna	PIFA Type antenna; Peak Gain: 3.5 dBi Four antenna for Transmitter One antenna for Receiver
Frequency Band	5.15~5.35, 5.47~5.725, 5.725~5.825 (GHz) Depends on the country region
Channel Bandwidth	40MHz
Modulation	Orthogonal Frequency Division Multiplexing (OFDM)
Network mode	Uni-cast
Transmit Power	10dBm @ each antenna, tolerance +/-1.5 dB
SNR	> 22 dB @ Pin~ -50 dBm
PSNR	> 37 dB @ Pin~ -50 dBm
Message Error	< 10 packet @ Pin~ -50 dBm
Video block error	< 10 @ Pin~ -50 dBm
Operating Range	10 ~15 meter Indoor. The transmission quality varies in the system board and surrounding environment.
Temperature Range	0 ~ 40°C (Operating), -20~80°C (Storage)

2 Hardware involved

2.1 WMDA-119AN Module

The following figure shows the TX board, which has 4 transmitting antennas. Each antenna has a matching push connector (marked SW-1 to Sw-4) for conducted measurements.

The board has a UART port located on the top of the board (marked J2) for communication of the Baseband chipset (marked U1). The board has a UART port located on the Top of the board (marked J501) for communication of the MCU chipset (marked U501).

The board has a Power connector located on the top of the board (marked J702) for the 5V power supply.
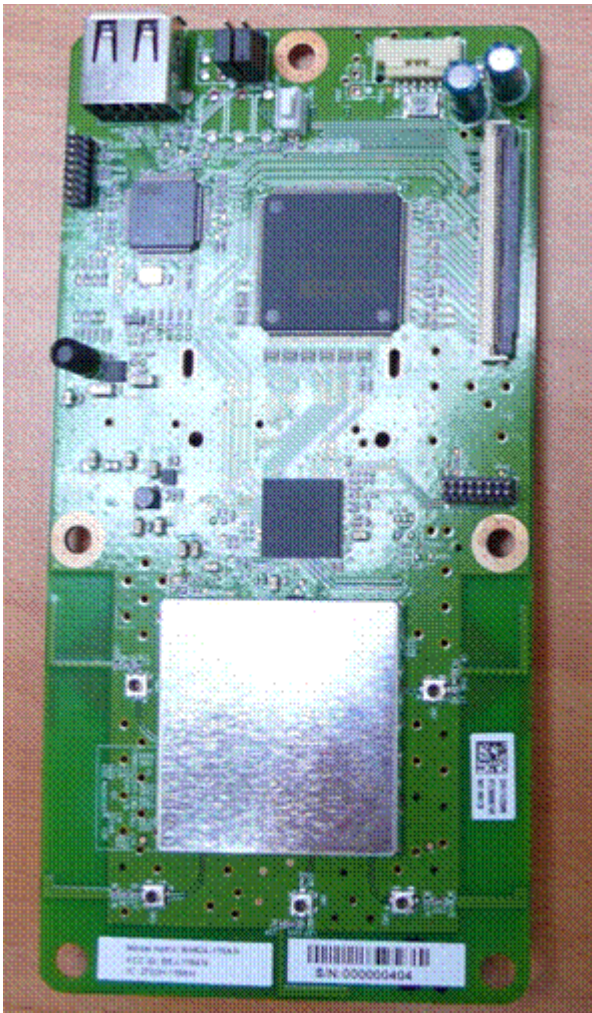

Figure 1: WMDA-119AN board

2.2 Product Main Features

- WMDA-119AN Module :
  - A/V signals input through 60 pin LVDS cable
  - Power and control input/output through 8pin cable assembly
  - Supports 30bit YCbCr (4:4:4) TTL signals include HSYNC, VSYNC, DE and DCLK.
  - Supports 1080p/60 video resolution output.
  - Supports standard I2S.
  - HDMI v1.3 supports.
  - Application micro-controller's image update via USB memory disk.
  - Amimon's 2ND generation 1080P chipsets. (AMN2120, AMN3110)
  - RF Antenna use printed pattern.
  - Supports 5GHz MIMO compatibility (World band 4.9 GHz – 5.9 GHz)
  - Supports 20MHz channel bandwidth for wireless link setup
  - Supports 40MHz channel bandwidth for AV data transmit
  - Supports downlink stream video and audio through up to four RF output channels
  - Supports four downlink direct-conversion transmitters.
  - Supports four digital to analog converters (ADC)
  - Supports downlink channel with up to 1Mbps for data and control
  - Supports uplink stream data and control from one RF channel.
  - Supports one uplink direct-conversion receiver.
  - Supports one analog to digital converter (DAC)
  - Supports uplink channel with up to 100Kbps for data and control
  - Multi Layer PCB (6-Layer)
  - 140 x 70 x 13.5 mm.

2.3 Major Components

- ☒ AMN3110 RF IC Transmitter. (U16)
- ☒ 40MHz 3225 SMD crystal. (Y2)
- ☒ AMN2120 Base Band IC transmitter. (U1)
- ☒ M25P40 4Mbit Flash memory. (U2)
- ☒ STM32F105RB-T6 Application microcontroller. (U501)
- ☒ 25MHz 3225 SMD crystal. (Y501)
- ☒ USB connector (J502)
- ☒ Control and A/V data connector (J701)
- ☒ Power connector (J702)
- ☒ Microwave Coaxial Connector without Switch SWD Type (SW1, SW2, SW3, SW4)
- ☒ RTC6670 2.4/5 GHz 802.11a/b/g WLAN Power Amplifier (U5, U7, U9, U11)
- ☒ 5V Power supply voltage

2.4 *Interfaces*

Video   2 channel LVDS
Audio   2 channel I2S
                     I^2C - Application microcontroller
Control I/F   SPI – Amimon baseband
                     UART – IR Transmitter microcontroller
Debug   UART
External Power   5V
Maintenance   For development phase - Firmware Update Header connector
Maintenance   For development phase - JTAG debugging Header connector
Maintenance   For development phase - USB connector

Figure 2: WMD-119AN Interface

2.5 Connector Pin-out (J701)

#	Signal	In/Out	#	Signal	In/Out
1	GND		31	GND	
2	LVDS_RA1-	LVDS output	32	GND	
3	LVDS_RA1+	LVDS output	33	MCLK	Audio master clock
4	LVDS_RB1-	LVDS output	34	SCLK	Audio serial clock
5	LVDS_RB1+	LVDS output	35	I2S0	Audio data
6	LVDS_RC1-	LVDS output	36	LRCLK	Audio LR clock
7	LVDS_RC1+	LVDS output	37	GND	
8	GND		38	SPDIF	Audio SPDIF data
9	LVDS_RCLK1-	LVDS clock output	39	GND	
10	LVDS_RCLK1+	LVDS clock output	40	TP	Test Point
11	GND		41	TP	Test Point
12	LVDS_RD1-	LVDS output	42	IR_RESETB	IR Blaster reset
13	LVDS_RD1+	LVDS output	43	RESET_OUT	RESET output
14	LVDS_RE1-	LVDS output	44	RESET_IN	RESET in
15	LVDS_RE1+	LVDS output	45	GND	
16	GND		46	APP_TXD	UART_TXD (Debug)
17	LVDS_RA2-	LVDS output	47	APP_RXD	UART_RXD (Debug)
18	LVDS_RA2+	LVDS output	48	GND	
19	LVDS_RB2-	LVDS output	49	I2C_SCL1	I2C1_SCL
20	LVDS_RB2+	LVDS output	50	I2C_SDA1	I2C1_SDA
21	LVDS_RC2-	LVDS output	51	WIRELESS_INT	Interrupt out
22	LVDS_RC2+	LVDS output	52	GND	
23	GND		53	IR_BLASTER	IR PWM data output
24	LVDS_RCLK2-	LVDS clock output	54	GND	
25	LVDS_RCLK2+	LVDS clock output	55	IR_TXD	UART_TXD (IR)
26	GND		56	IR_RXD	UART_RXD (IR)
27	LVDS_RD2-	LVDS output	57	GND	
28	LVDS_RD2+	LVDS output	58	I2C_SCL0	I2C0_SCL
29	LVDS_RE2-	LVDS output	59	I2C_SDA0	I2C0_SDA
30	LVDS_RE2+	LVDS output	60	GND	GND

2.6 A/V and Control signal
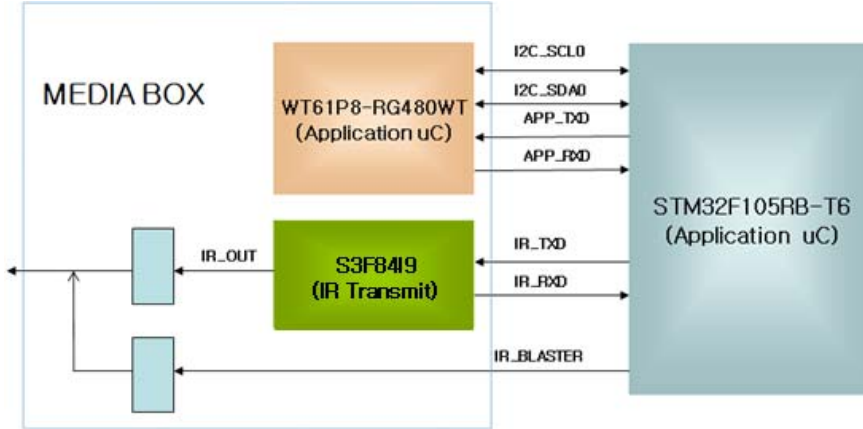
J701 Connector

Figure 3: A/V and Control Cable connection Method

2.7 Power Supply

Input: 5V for TX

J702: Power connector

Figure 4: Power Cable connection Method

2.8 Reset Switch

The WMDA-119AN module is operating reset function.

SW501: Reset

Figure 5: Reset switch location

2.9 PC computer with a USB port

The PC should be installed with:

1. Java UART application
2. Scripts that activate Gemtek TX /Gemtek RX for a transmitting mode via UART communication (supplied by Amimon).

2.10 Firmware Update Header (J501)

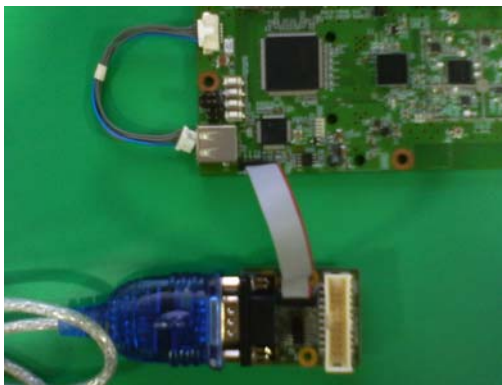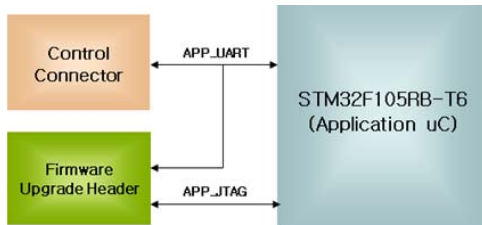| #	Signal	Direction
1	VCC	3.3v, From Amimon
2	VCC	3.3v, From Amimon
3	GND	Ground
4	APP_RST	Reset
5	APP_TRST	JTAG functionality to Microcontroller
6	GND	Ground
7	TDI	JTAG functionality to Microcontroller
8	APP_TXD	Connect to Microcontroller
9	GND	Ground
10	APP_RXD	Connect to Microcontroller
11	APP_TMS	JTAG functionality to Microcontroller
12	APP_RTCK	
13	APP_TCK	JTAG functionality to Microcontroller
14	APP_TDO	JTAG functionality from Microcontroller
15	GND	Ground
16	GND	Ground

Figure 6: UART Cable connection Method

2.11 JTAG Debug Header (J2)

| #	Signal	Direction
1	VCC	3.3v, From Amimon
2	VCC	3.3v, From Amimon
3	GND	Ground
4	N.C.	
5	TRST	JTAG functionality to Amimon
6	GND	Ground
7	TDI	JTAG functionality to Amimon
8	UART_TX	Connect to MAC uC (communications)
9	GND	Ground
10	UART_RX	Connect to MAC uC (communications)
11	TMS	JTAG functionality to Amimon
12	N.C.	
13	TCK	JTAG functionality to Amimon
14	TDO	JTAG functionality from Amimon
15	GND	Ground
16	GND	Ground
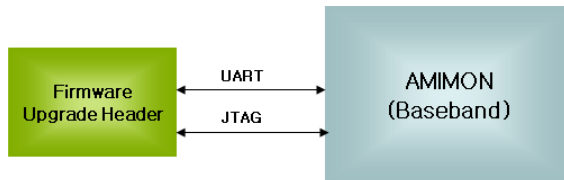
Figure 7: UART Cable connection Method

Confidential

2.12 Application Microcontroller

 The application micro-controller is used for communication channel from wireless module to the Media box or TV, communication channel from wireless module to Amimon base band chipset, communication channel from wireless module to IR Blaster micro-controller, application debugging message send and receiver.
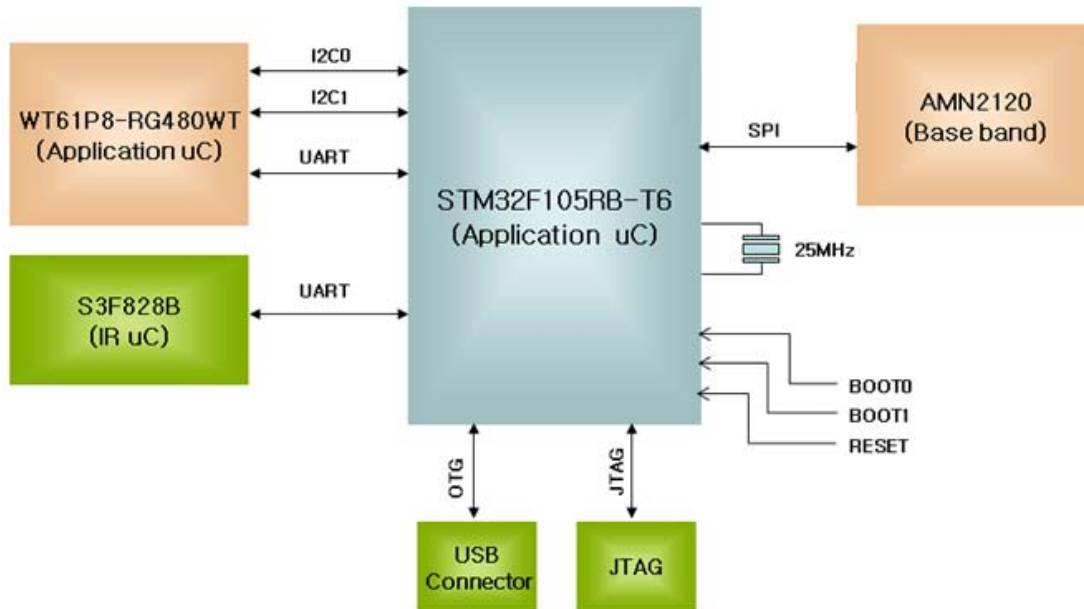
 The I2C0 interface use to communicate between the media box and microcontroller. The I2C1 interface is optional for factory mode. The purpose is registration between TX and RX module.
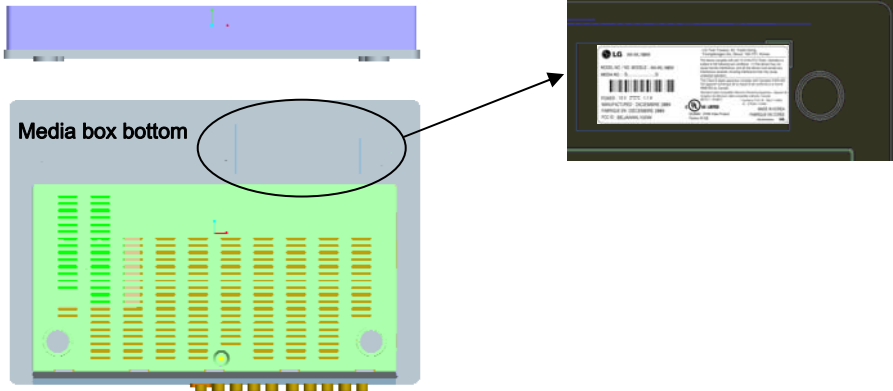
3 FCC Label

1) Label on the module

Model name: WMDA-119AN
FCC ID: BEJ-119AN
IC: 2703H-119AN

2) Label on the Media box

Media box bottom

LG AN-WL100W

MODEL NO. / NO. MODELE : AN-WL100W
MEDIA NO. : S....................S

POWER : 12 V ⎓ 1.1 A
MANUFACTURED : DICIEMBRE 2009
FABRIQUE EN : DÉCEMBRE 2009
FCC ID : BEJANWL100W

LG Twin Towers, 20, Yoido-Dong,
Youngdungpo-Gu, Seoul, 150-721, Korea.

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.

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Standard Cable Compatible Television Receiving Apparatus - Appareil de réception de télévision câblo-compatible ordinaire, Canada
BETS-7 / NTMR-7

c (UL) US LISTED

E239584 3YW0 Video Product
Factory ID:SE

* Contains FCC ID : BEJ-119AN,
  IC : 2703H-119AN

MADE IN KOREA
FABRIQUE EN COREE
MEZ620366xx **HS**

4 FCC statement

Federal Communications Commission (FCC) Statement

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

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.

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 of the device of the device.

FCC Caution: for indoor use only, use outdoors or in other modes not covered by this manual may violate the FCC regulation and violate the user authority to use the product.

Specially, within the 5.15-5.25 GHz band, U-NII device is restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations.

FCC RF Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. End users must follow the specific operating

instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.