HD-SDI TX

WIRELESS MODULE –

FALCON TX
AMN35254

USER GUIDE 1.0

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Revision History

Version	Date	Description
1.0	17 Feb 2013	Initial Release

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Chapter 1

Introduction

The **AMN35254 / AMN36254** are respectively wireless A/V transmitter /receiver boards, which works at the 5GHz unlicensed band.

They are based on AMIMON's WHDI Professional chipset that consist of the AMN2220_A4W / AMN2120_A4W baseband receiver/transmitter and the MAXIM 2851/2850 ICs, presents the ultimate solution for HD-SDI system into a wireless one. The perfect HD/SD video, audio quality, the high robustness and the invisible latency of the wireless system are unmatched by any other wireless technology and presents a true alternative to cable. The WHDI system transmits **uncompressed** video and audio streams wirelessly and thus simplifies and eliminates system issues, such as: lip-sync, large buffers and other burdens like retransmissions or error propagation.

System Technical Specifications:

Video Resolution:	1080p/50, 1080p/60, 1080/59.94i, 1080/50i, 1080/29.97p, 1080/23.98p, , 720/59.94p, 720/50p, 525i/59.94, 625i/50, 1080/24p, 1080/24PsF, 1080/23.98PsF,1080/25PsF
Frequencies:	Non-DFS Frequencies: 5.15 ~ 5.25 GHz 5.725~5.825 GHz DFS Frequencies: 5.25 ~ 5.35 GHz 5.47 ~ 5.725 GHz
Video Interface:	SDI with automatic detection (SD,HD and 3G) over 75 Ohm BNC.
Environment:	Operational - 0:40° C, 10%~90% humidity Storage - 0:55° C, 10%~90% humidity
Range:	Up to 50m line of sight.
Audio:	Over SDI

Table 1: ***Technical Specifications***

Transmitter Specifications:

Transmitter AMN35254	
Video Interface:	SDI pass through (Option to connect external connector board)
Frequency Control:	Analog knob with 4 manual fix (non DFS) frequencies and one for automatic frequency selection mode (included DFS).
Antenna:	3 transmitting+ 1 transmitting /Receiving
Voltage:	7-17 V
Size:	(L)130mm x (W)106mm x (H) 16mm
User Control:	3 LEDs indicating Power, Video lock and Network lock USB connector for software update Hidden button for registration Reset button

Table 2: ***Transmitter Specifications***

Chapter 2

Overview

2.1 AMN35254 WHDI Source (TX):

The **AMN35254** WHDI Source is designed to modulate and transmit downstream video and audio content over the wireless medium and receive a control channel over the wireless upstream. The modulation uses a 40 MHz bandwidth and is carried over the 5GHz unlicensed band. Fig 2 shows a block diagram of the **AMN35254**. The HD-SDI input is connected to the Gennum SDI 2971A which converts the SDI signal to A/V digital bus that is connected to the AMN2120 baseband transmitter. It has a MIMO design of four wireless output channels and one input channel. The internal microcontroller (STM32103) is responsible for control and management.

The ST STM32F103 application microcontroller controls the SDI chip and the baseband AMN2120 chip using SPI standard bus. The application microcontroller provides USB device interface through a mini USB connector.

2.1.1 AMN35254 - General Guidelines (Tx)

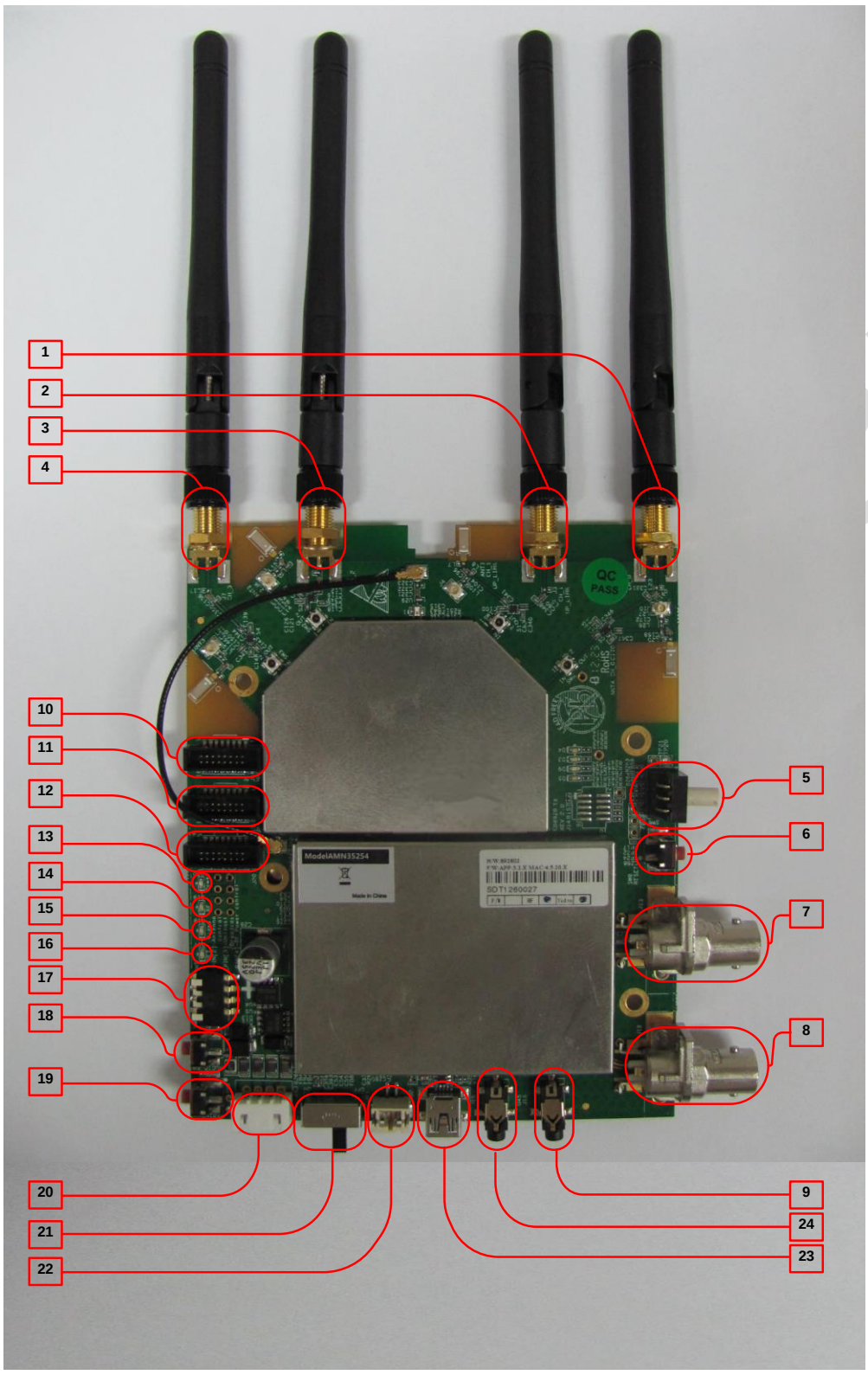


Figure 1 - Tx AMN35254

Description of all connectors and their functionality including USB, Pass through, power conn pin out debug connectors,

2.1.1.1

01- Down link antenna CH#0	16- LED #1
02- Down link /UP link antenna CH#1	17- DIP Switch
03- Down link antenna CH#2	18- TBD
04- Down link antenna CH#3	19- Boot button & Registration
05- KNOB Switch	20- Input Voltage connector 7-17v
06- Reset Button	21- ON/OFF Switch
07- HD-SDI Output	22- External On/Off switch connector
08- HD-SDI Input	23- USB connector
09- External Audio	24- IR output connector
10- MAC DEBUG Port	
11- APP DEBUG Port	
12- Interface connector	
13- LED #4	
14- LED #3	
15- LED #2	

2.1.1.2 Knob Switch Frequency selection

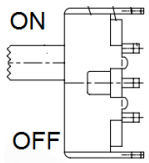
0- Auto
1- 5190 MHz
2- 5230 MHz
3- 5755 MHz
4- 5795 MHz
5- 5755 MHz
6- 5795 MHz
7- Auto
8- Auto
9- Auto

2.1.2 LEDs

1- D20 - Power - on/off
2- D19 - Video Lock (SDI locked) - on/off
3- D18 - Network (link to Rx) - on/off
4- D17 - (TBD)

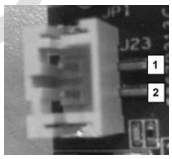
2.1.3 On/Off switch

System has a main switch that turns on and off.
The system is active when the switch is near J1(voltage input connector)



2.1.4 External On/Off switch connector

This connector is used for external On/Off switch. Pin 1 is VDD, Pin 2 is Power Enable.



2.1.5 Boot button

Boot mode is a technical mode. In order to operate this mode you should hold "Boot button" for 5 seconds, when the system wakes up (press on the "Boot button" and then press on the "Reset button").

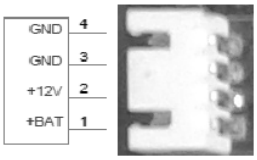
2.1.6 Reset button

The "Reset button" clears the dynamic memory and reboots the system.

2.1.7 Input Voltage connector

Input voltage connector contains 4 pins,

1- +BAT.
2- Power supply.
3- GND.
4- GND.



2.1.8 Knob - Frequency selection commands

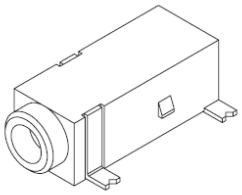
The user will be able to select between fixed, non-DFS, frequencies, and automatic mode that will include all frequencies as specified in the table below. Using knob the user will determine on which fixed frequency system will work 1-4, or alternatively system in automatic mode – 5-9, system will hop between different available frequencies. (DFS channels cannot be used as fixed frequencies since system must hop automatically if radar is detected).

Table 3 - Frequency selection commands

40MHz Bandwidth Frequency [MHz]	US	Europe
	SW Command	SW Command
5190	1	1
5230	2	2
5270	Only in Auto mode	Only in Auto mode
5310	Only in Auto mode	Only in Auto mode
5510	Only in Auto mode	Only in Auto mode
5550	Only in Auto mode	Only in Auto mode
5590	X	Only in Auto mode
5630	X	Only in Auto mode
5670	Only in Auto mode	Only in Auto mode
5755	3	X
5795	4	X
Automatic	5-9	5-9

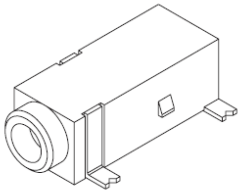
2.1.9 IR blaster

AMN35254 support PWM interface to IR blaster via audio 2.5mm jack, for mechanical dimensions of the audio jack follow the datasheet http://www.cui.com/pdffiles/SJ-2523-SMT.pdf , Silk number: J15.



2.1.10 Audio AUX

The External audio connected via 2.5mm jack, for mechanical dimensions of the audio jack follow the datasheet http://www.cui.com/pdffiles/SJ-2523-SMT.pdf , Silk number: J16.

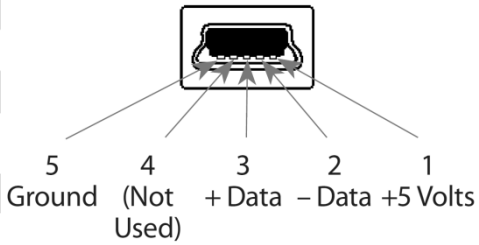


2.1.11 USB

There is a USB connector on board that is connected to the application uC.

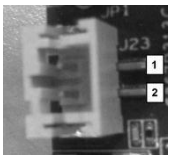
This will be used for software upgrade through WHDI monitor.

USB type: USB mini-B connector, Silk number J18.



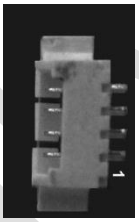
2.1.12 External On/Off switch connector

This connector is used for external On/Off switch, Pin 1 is VDD, Pin 2 is Power Enable.



2.1.13 I2C connector

I2C Host interface connector is used for transferring I2C protocol message between the host chip (Micro Controller STM32F103) and the slave component.
Pin-1: 3.3v, Pin–2: SCL Pin–3: SDA Pin-4: GND



2.2 Antennas

This module is authorized to use only with the RP-SMA external antennas with 5dBi gain or less.

2.3 Block diagram of the TX AMN35254

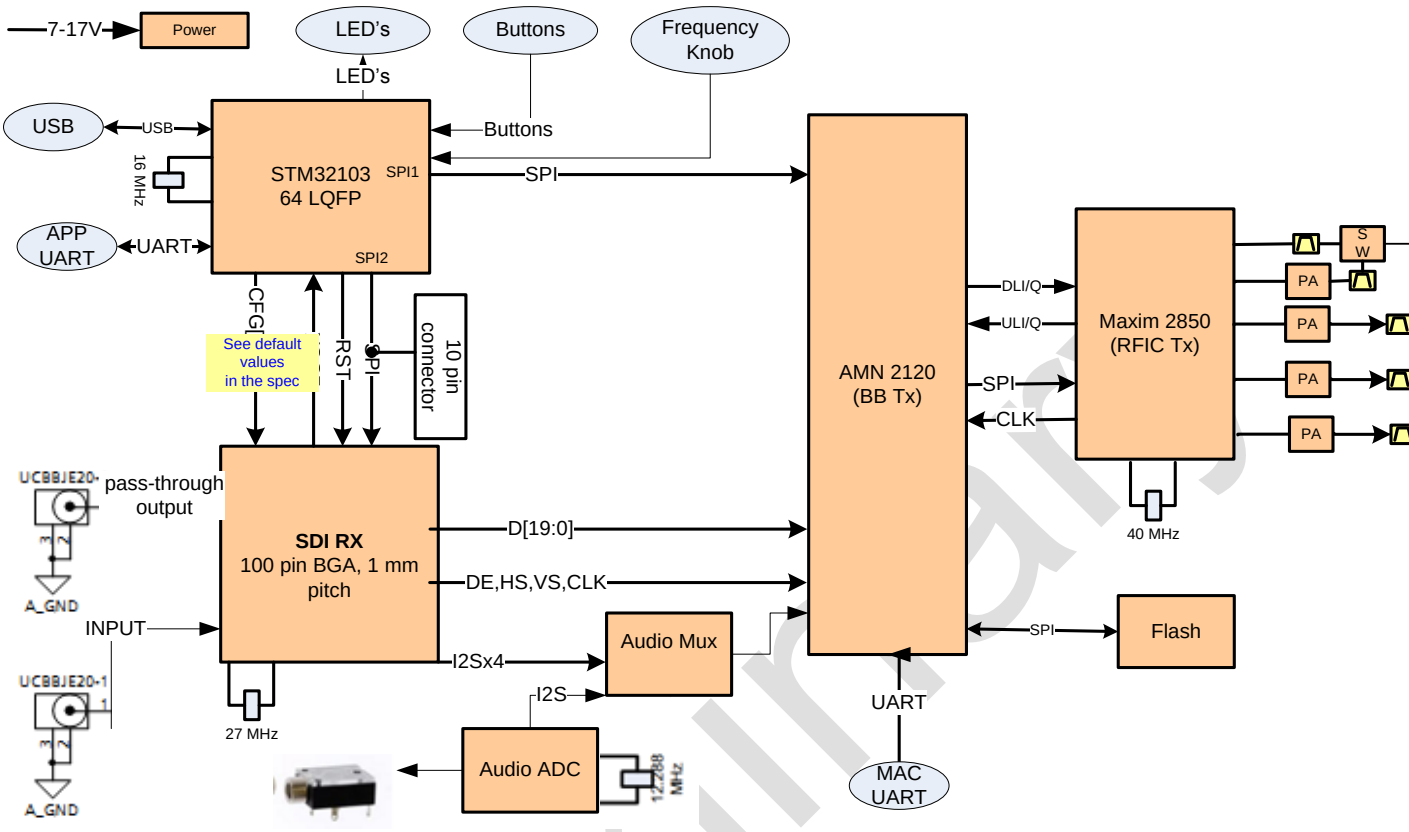


Figure 2: TX - AMN35254 BLOCK DIAGRAM

Chapter 3

FCC Caution

Any changes or modifications not expressly approved by the responsible party could void the user's authority to operate this equipment.

***Notice**: This module in its final integration requires the end-product to continue to comply with DFS requirements. A class II permissive change may be required for operation not already described in the FCC Grant filing.*

OEM Labeling Requirements
Notice: The OEM of final integrator must ensure that FCC labeling requirements are met.
For a host using this module, if (1) the module's FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straightforward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module should be used, with the following contents: Contains FCC ID:VQSAMN35254.
The host OEM user manual must also contain clear instructions on how end users can find and/or access the module and the FCC ID.

The applicable usage is to be used as a wireless device, connected to the back of a professional camera and transmitting live video, coming from BNC connectors

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 radi-ate radio frequency energy and, if not in-stalled 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.

FCC Radiation Exposure Statement
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
This equipment 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.

The antenna used for transmission must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Channel loading
This device is a frame based system with variable talk/listen ratio.
The maximum supported talk/listen ration is 96%/4%.
This device in his max talk/listen ratio complies with FCC 06-96 DFS radar testing.