

# 5GHz 2.1CH Module (SW-S)

## Data Sheet

# DENON Wireless Module 5G

## EW21DM

*Version: 1.4*

2020/01/07

## 1. Features

The SW-S is a module based on Everestek ETK52, providing 3 channels audio for 2.1 channel (L+R+subwoofer) application. Operating in both 5.2G and 5.8GHz RF bands.

This module support 3 channels compressed audio stream and comes with additional features such as data encryption, pairing functionality, bi-directional data messages, enhanced RF interference detection, and automatic frequency allocation.

Brief features include:

- Radio Frequency: 5.8G and 5.2G unlicensed bands**
- Delay Time Variation + audio jitter is only +/- 6.5  $\mu$  sec.**  
(Total delay time variation is less than +/-2.5 degree @ 1K sine tone.)
- Long Link Distance**
- Advanced RF Selection Algorithm**
- Small RF Foot Print**
- Best Coexistence with Wi-Fi/Bluetooth**
- Highly Integrated SoC: RF/PA/CPU/Flash Embedded**
- Wide-Band Antenna on Module**
- Short RBOM List**
- RF Modulation: FSK**
- Digital I2S (master or slave) Audio Interface, 24bit , 32/44.1/48KHz Sampling Rate**
- Low Power Consumption**
- Supply Voltage: 2.7~3.6V**
- Support I2C master/slave mode and UART**
- Compliant with EMC Regulations (FCC/CE)**

## 2. Application

- Wireless 2.1 channels audio**
- Dolby ATMOS 5.1.2 / 5.1.4**
- Dolby Digital 5.1**

### 3. Electrical Specifications

#### RF Specification

Item	Min	Typ	Max	Unit	Note
RF Carrier Frequency	5725	—	5845	MHz	For 5.8GHz
	5135	—	5255	MHz	For 5.2GHz
-20dB bandwidth	—	2	—	MHz	
Output Power		7		dBm	
RF Sensitivity	—	-85		dBm	

#### Operation Condition

Item	Min	Typ	Max	Unit	Note
VDD	2.7	3.3	3.6	V	Power Supply Voltage

#### Digital interface

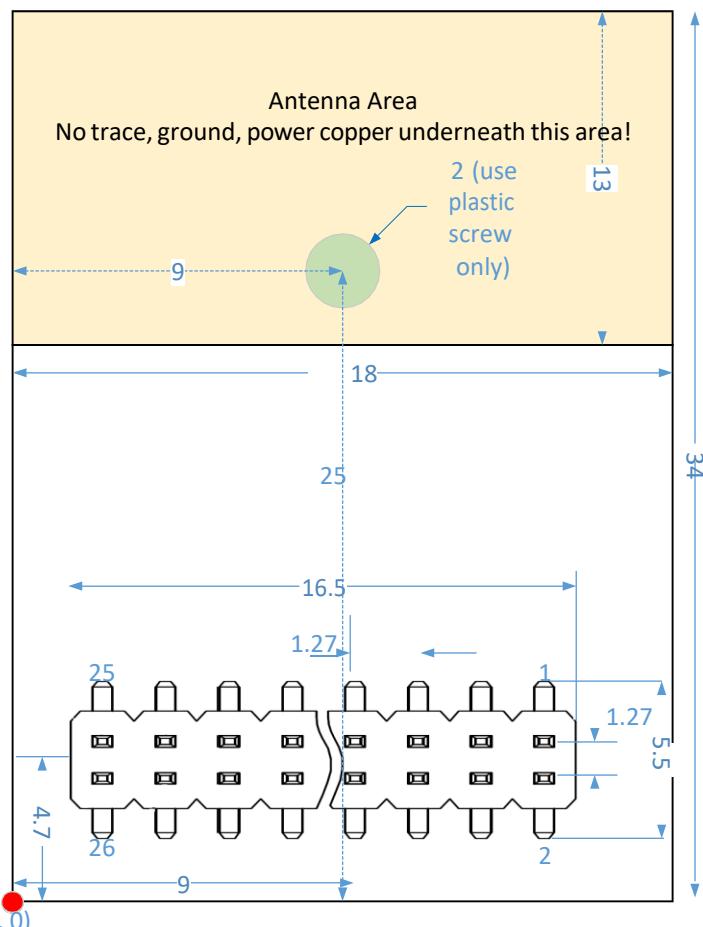
Item	Min	Typ	Max	Unit	Note
VIH	0.7VDD		VDD+0.2	V	Input High Threshold
VIL	VSS		0.3VDD	V	Input Low Threshold
VOH	VDD-0.3		VDD	V	Output High Threshold
VOL	0		0.3	V	Output Low Threshold

## 4. Mechanical Specification

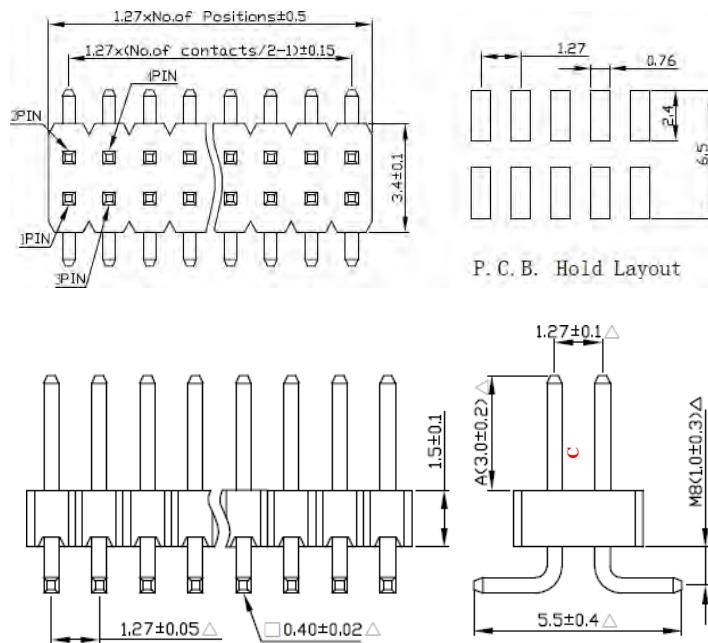


Different labels and part numbers are used to distinguish between Tx and Rx.

- Dimension : 34 mm x 18 mm, thickness 2.5mm (PCB with shielding case, connector is not included)
- PCB 4 Layers
- Mechanical Drawing:  
Bottom view



- Connector Drawing:



## 2.1 Channel I2S pins connections

Note: Subwoofer I2S output, L-channel data will be the original data from Tx, R-channel will be the inverse data of L-channel

### Federal Communication Commission Interference Statement

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 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.

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

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 device is restricted for indoor use.

### FCC 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.

**IMPORTANT NOTE:**

This module is intended for OEM integrator. This module is only FCC authorized for the specific rule parts listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Additional testing and certification may be necessary when multiple modules are used.

**USERS MANUAL OF THE END PRODUCT:**

In the users manual of the end product, the end user has to be informed to keep at least **20cm** separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

This device complies with Part 15 of 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.

**LABEL OF THE END PRODUCT:**

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: BV2-EW21DM ".

This device complies with Part 15 of 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 device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

*Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes au (x) RSS (s) exemptés de licence d'Innovation, Sciences et Développement économique Canada. L'opération est soumise aux deux conditions suivantes:*

*(1) Cet appareil ne doit pas provoquer d'interférences.*

*(2) Cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable de l'appareil.*

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures.

Referring to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without reassessment permissive change.

*Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.*

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

*les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.*

#### **IMPORTANT NOTE:**

##### **IC Radiation Exposure Statement:**

This equipment complies with IC RSS-102 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.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de **20 cm** de distance entre la source de rayonnement et votre corps.

#### **IMPORTANT NOTE:**

This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.

Additional testing and certification may be necessary when multiple modules are used.

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

#### **USERS MANUAL OF THE END PRODUCT:**

In the users manual of the end product, the end user has to be informed to keep at least **20cm** separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. Operation is subject to the following two conditions: (1) this device may not cause harmful interference (2) this device must accept any interference received, including interference that may cause undesired operation.

#### **LABEL OF THE END PRODUCT:**

The final end product must be labeled in a visible area with the following " Contains IC: 10369A-EW21DM ". The Host Model Number (HMN) must be indicated at any location on the exterior of the end product or product packaging or product literature which shall be available with the end product or online.

Oerational modes

RF General Information			
Frequency Range (MHz)	Channel Spacing (MHz)	Ch. Frequency (MHz)	Channel Number
5725 – 5875 MHz	2	5732-5848	1-59 [59]

The frequency and the maximum transmitted power in EU are listed below:

5732 MHz: 11.16 dBm

5790 MHz: 11.38 dBm

5848 MHz: 11.25 dBm

## ANT LIST

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
1	N/A	N/A	Printed Antenna	N/A	2	TX
2	N/A	N/A	Printed Antenna	N/A	2	RX