LIBRE WIRELESS TECHNOLOGIES

LIBRE SYNC

LS8
High Performance Wireless Media Module Certification

Data Sheet

Revision: 1.8

Libre Wireless Technologies Private Limited

librewireless.com

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1. Document Information

1.1. Document Revision History

Revision	Date	Description of change	Author
1.8	Oct 13, 2024	Added Antenna Switching and updated Module Ordering Information	Chandravel
1.7	Sept 12, 2024	Updated the Manufacturer of Antenna	Chandravel
1.6	Aug 26, 2024	Updated Module Images	Chandravel and Shahim Ahmed
1.5	July 17, 2024	Updated Ordering Information and Pin Descriptions - Certification	Chandravel and Shahim Ahmed
1.4	July 09, 2024	Updated Ordering Information	Anoop Rajan
1.3	May 16, 2024	Updated section 7.3. Pin Descriptions	Chandravel and Shahim Ahmed
1.2	April 04, 2024	Updated Block Diagram	Chandravel and Shahim Ahmed
1.1	Mar 14, 2024	Updated section 7.3. Pin Descriptions	Chandravel and Shahim Ahmed
1.0	Jan 30, 2024	Updated sections 7.4. GPIO and 7.5. Power Consumption	Chandravel and Shahim Ahmed
0.1	Oct 18, 2023	Initial Draft	Chandravel and Thousif Khan

2. Introduction

Libre Wireless - LS8 is an advanced high-performance media/audio streaming module for smart audio and smart home appliances. This document defines the hardware interfaces which are connected with your application.

This document provides a quick insight into module interface specification, electrical and mechanical specifications.

2.1. LS8 Module Ordering Information

Product Number	Wi-Fi Tx/Rx	Antenna Switching	Bluetooth	Memory
LS8-NFK-11G-R	802.11 b/g/n/ac 2.4 / 5.0 GHz	No	5.0 BT + BLE	128 MB DDR3 128 MB NAND
LS8-NFK-12G-R	802.11 b/g/n/ac 2.4 / 5.0 GHz	No	5.0 BT + BLE	128 MB DDR3 256 MB NAND
LS8-NFK-21G-R	802.11 b/g/n/ac 2.4 / 5.0 GHz	No	5.0 BT + BLE	256 MB DDR3 128 MB NAND
LS8-NFK-22G-R	802.11 b/g/n/ac 2.4 / 5.0 GHz	No	5.0 BT + BLE	256 MB DDR3 256 MB NAND
LS8-NFK-24G-R	802.11 b/g/n/ac 2.4 / 5.0 GHz	No	5.0 BT + BLE	256 MB DDR3 512 MB NAND
LS8-NFK-42G-R	802.11 b/g/n/ac 2.4 / 5.0 GHz	No	5.0 BT + BLE	512 MB DDR3 256 MB NAND
LS8-NFK-44G-R	802.11 b/g/n/ac 2.4 / 5.0 GHz	No	5.0 BT + BLE	512 MB DDR3 512 MB NAND
LS8-NFK-22G-S	802.11 b/g/n/ac 2.4 / 5.0 GHz	Yes	5.0 BT + BLE	256 MB DDR3 256 MB NAND
LS8-NFK-24G-S	802.11 b/g/n/ac 2.4 / 5.0 GHz	Yes	5.0 BT + BLE	256 MB DDR3 512 MB NAND
LS8-NFK-44G-S	802.11 b/g/n/ac 2.4 / 5.0 GHz	Yes	5.0 BT + BLE	512 MB DDR3 512 MB NAND

2.2. LS8 Variant Selection Guide

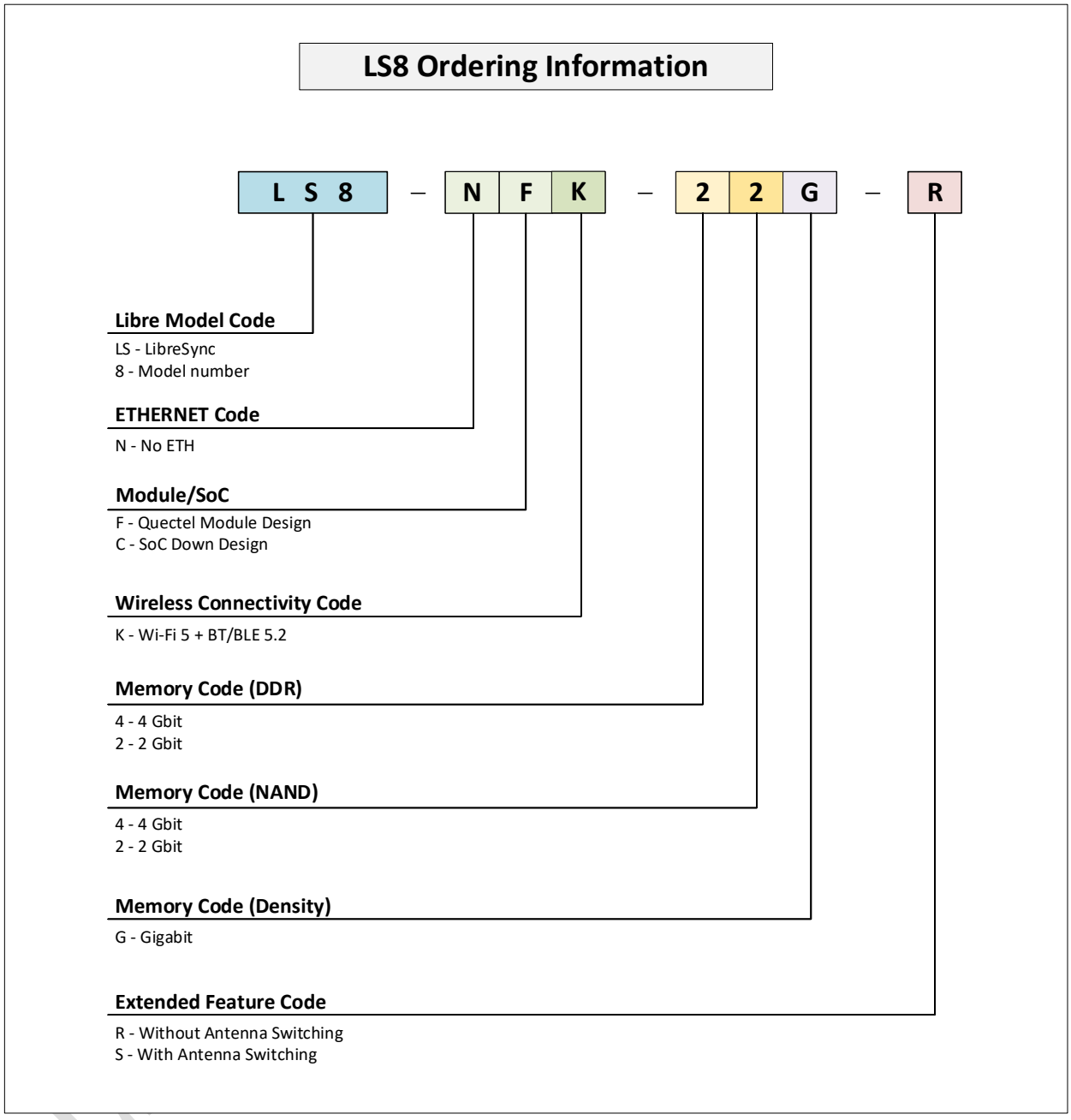


Figure 2.2-1: LS8 Variant Guide

3. Module Feature Summary

Key Features

- Dual Core ARM Cortex-A35 CPU @1.2 GHz, Dual HiFi DSP core
- Supports MP3, AAC, WMA, RM, FLAC, Ogg, Dolby Audio, DTS and programmable with 7.2/5.1 down mixing.
- 2 built-in TDM/I2S ports with TDM mode up to 384 kHz x 32 bits
- 4 high dynamic range PDM input with programmable CIC, LPF and HPF
- Built-in Stereo audio DAC
- High performance audio sampling rate converter (ASRC)
- Internal HiFi PLL for audio
- 1x USB 2.0
- 4x PWM, 2x UART, 1x I2C master, 1x I2C slave and 1x High speed SPI host interface
- Built-in 10-bit SAR ADC with 2 input channels
- Internal Boot ROM and eFuse as root of trust
- Integrated general purpose timers, counters and DMA controllers
- AES block cipher with 128/256 bits keys, standard 16 bytes block size and streaming ECB, CBC and CTR modes.
- Supports DDR3 SRAM size 256MB/512MB
- Supports NAND size 128MB/256MB/512MB
- Internal 2MB RAM for DSP direct access
- Dual band antenna for WLAN, single Band antenna for Bluetooth

4. LibreSync Features

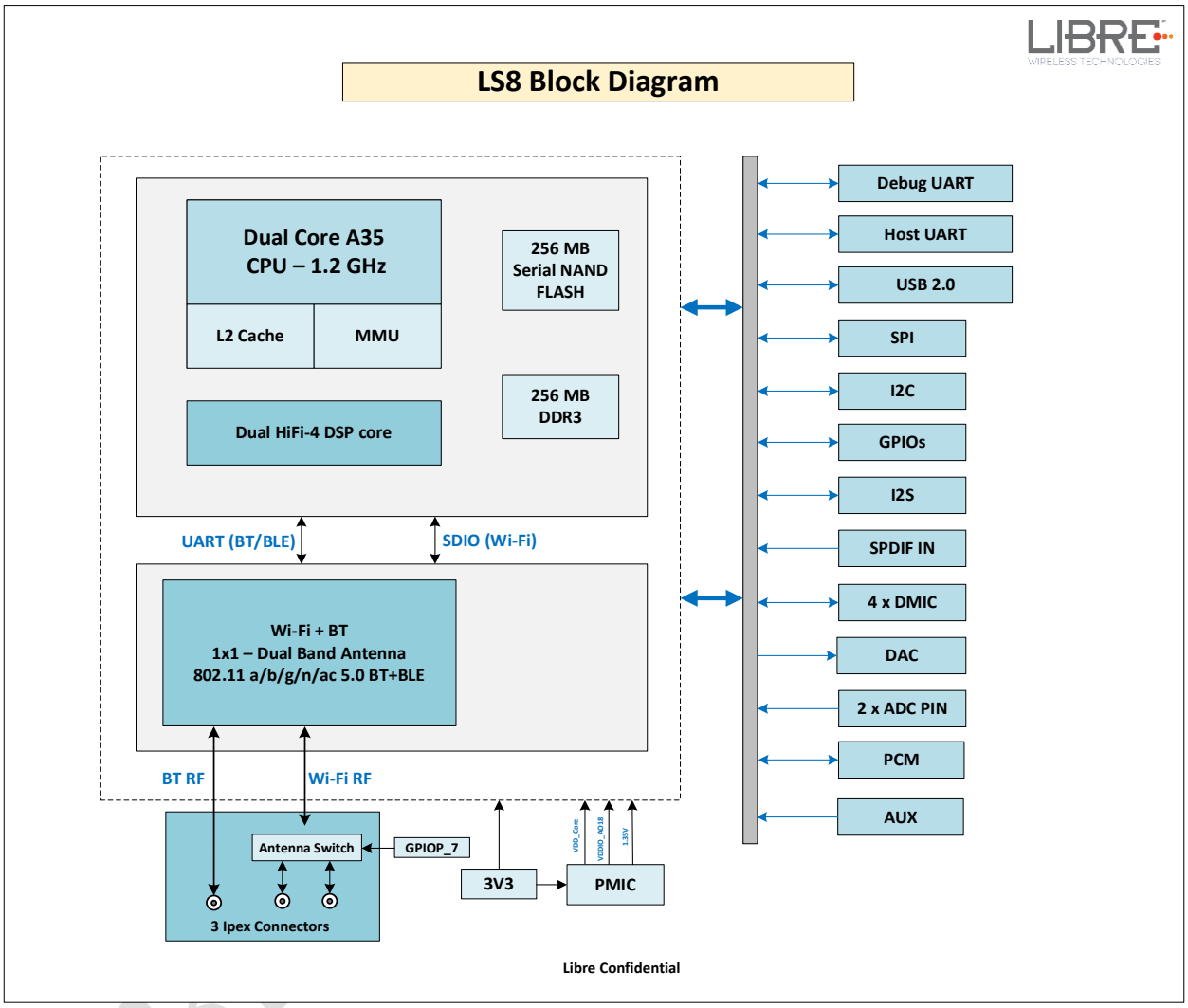
LibreSync modules have extensive software features for connected media streaming and control applications. These include system level control and interface features as well as networking features.

Refer to the "Master Feature List" for details of supported features.

Platform features can vary based on module configuration/derivatives and commercial engagement details.

5. Block Diagram

LS8 block diagram is as shown below:



6. Specifications

6.1. General Specifications

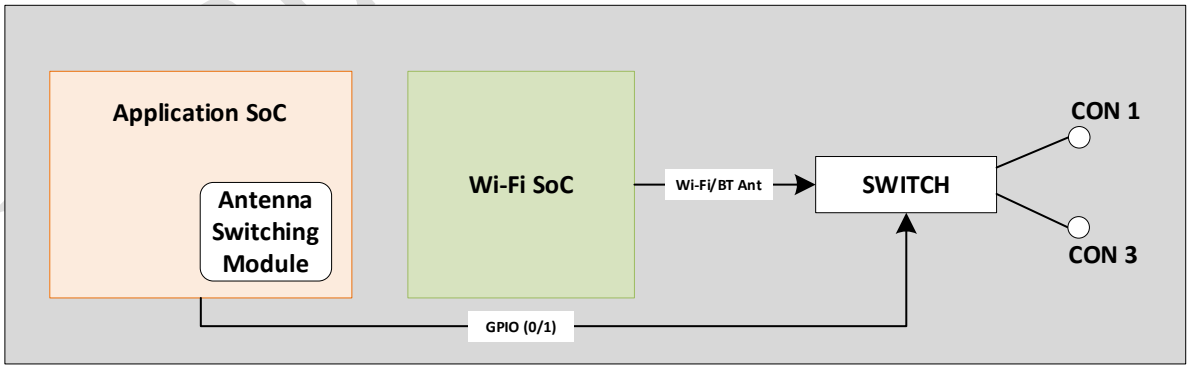
Parameter	Description/Values
Model	LS8 Module
Product Name	Network Media Module
Standard	Wi-Fi – IEEE802.11a, IEEE802.11b, IEEE802.11g, IEEE802.11n, IEEE802.11ac standards V5.0 BT/BLE
Frequency Band	2.4/5.0 GHz
Input Voltage 3.3V	3.3 V ± 5 %, 20-30 mVpk-pk
Input Voltage 5V	4.8-5.2V, 50 mVpk-pk
Operating Temperature	0˚C to +70˚C
Dimensions	55 mm x 40 mm x 7 mm (L x W x H) ± 0.2mm
Version	Wi-Fi 5

6.2. Wi-Fi Specifications

Parameter	Description/Values
Standard	IEEE 802.11 a/b/g/n/ac
Operating Band Support	Dual Band 2.4 GHz: 2.412 ~ 2.483 GHz 5.0 GHz: 5.180GHz ~ 5.825GHz
Wi-Fi Operating mode	STA
Security	WPA, WPA2, WPA3

6.3. Antenna Switching

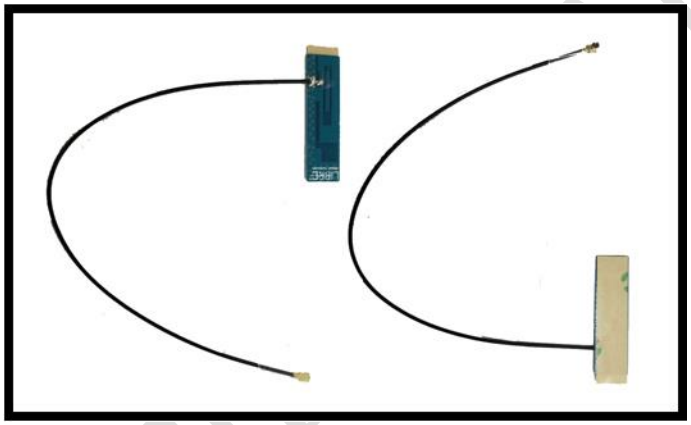
"Antenna Switching" entails dynamically selecting the most suitable antenna from a set of options based on specific criteria or conditions. Libre has introduced this feature specifically for certain LSx modules, where the Wi-Fi System-on-Chip (SoC) supports only a 1x1 antenna without inherent Antenna Diversity support. For such modules LSx module mounts two antenna connectors and incorporates a switch, controlled by a GPIO, to connect the single antenna line from the Wi-Fi SoC to the best-performing antenna.



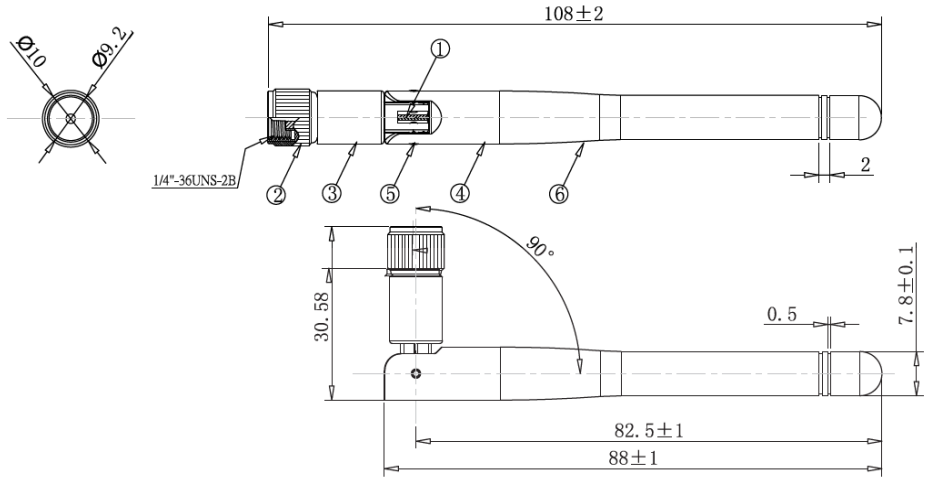
6.4. Bluetooth Specifications

Parameter	Description/Values
Standard	V5.0 BT/BLE
Audio CODEC Support	SBC, AAC
Profile Support	A2DP 1.2 and AVRCP 1.3
Sampling Rates	44.1 kHz/48 kHz
Coexistence Support	Intelligent AFH (Advanced Frequency Hopping) - Channel Assessment WLAN/Bluetooth Coexistence (BCA) Protocol Support
Data Rate	GFSK: 1 Mbps π/4 DQPSK: 2 Mbps 8DPSK: 3 Mbps
Operation Channel	0 to 78 for BDR/EDR 0 to 39 for BLE
Frequency Range	2.4 GHz (2402 -2480 MHz)
Security	AES Encryption

6.5. Antenna Specification

Antenna Module	LSANT-1C-180
Antenna Gain	≤ 3.5 dBi
Manufacturer of Antenna	Auden Communications & Multimedia Techno (Kunshan) Co.,Ltd
Antenna Images	

6.6. Rubber Antenna Specification

Antenna Model	RC1WFI0886A
Antenna Gain	≤ 2.0 dBi
Manufacturer of Antenna	Suzhou Point Positive Electronic Technology Co., Ltd
Antenna Image	

SPECIFICATION
1.Frequency Range: 2.4--5.8Ghz
2.Impendance:50Ω
3.VSWR：≤2.0
4.Polanization:Vertical
5.Radlation:Omni
6.Gain: 2dBi

NO	PARTNAME	DESCRIPTION	Q'TY	Part P/NO
⑥	Connettor	SM3033 Reverse	1PCS	
⑤	Antenna Cover	L153mm*□13.0mm TPEE Black	1PCS	
④	Rivet	L5.1mm*□2.4mm POM Black	2PCS	
③	Antenna Base	L28.2*□13.0mm PBT Black	1PCS	
②	Antenna Base	L29.4*□13.0mm PC Black	1PCS	
①	Cable	RG-178 Cable 50Ω	1PCS	

7. Mechanical Connectors and Interfaces

7.1. Physical Module

Physical module dimensions are 55mm x 40mm x 7mm (L x W x H) ± 0.2mm (LS8).

Figure 7.1-1: LS8 Module Top view

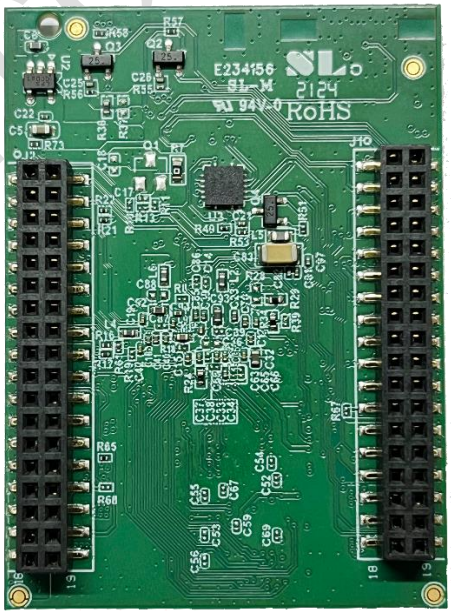


Figure 7.1-2: LS8 Module Top view

> **Note:** The module dimension is measured in millimeters (mm).

7.1.1. Module Manufacturer

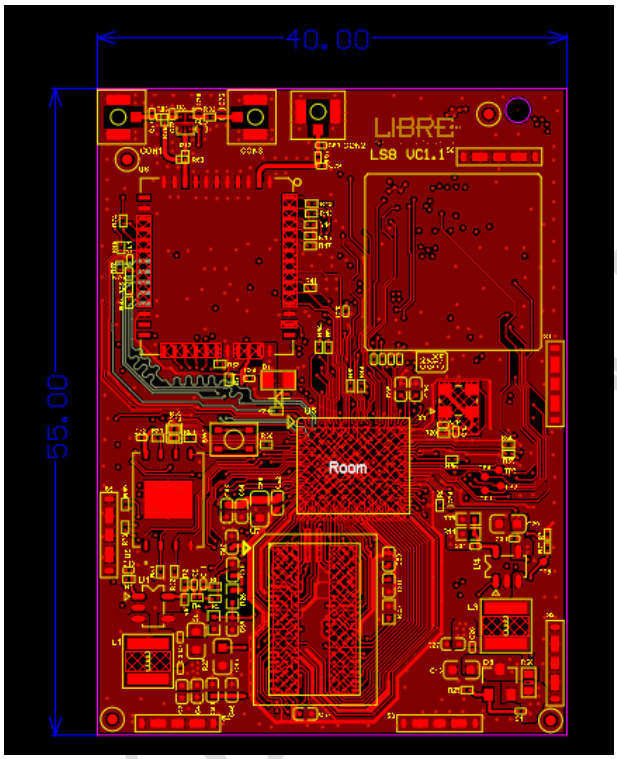


Figure 7.1.1-1: Dimension 1

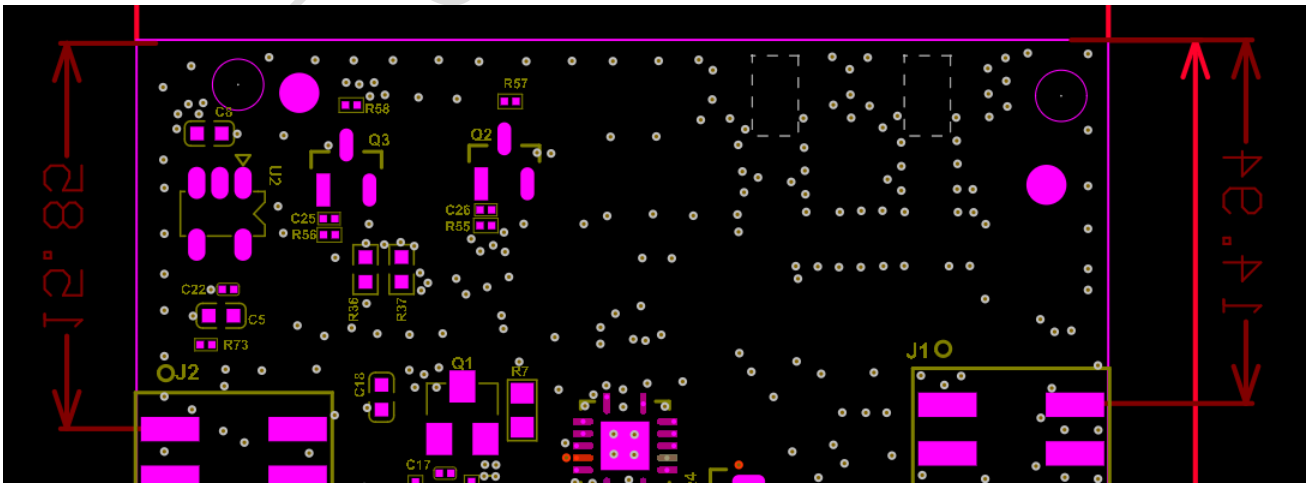


Figure 7.1.1-1: Dimension 1

7.2. Media Connector Specification

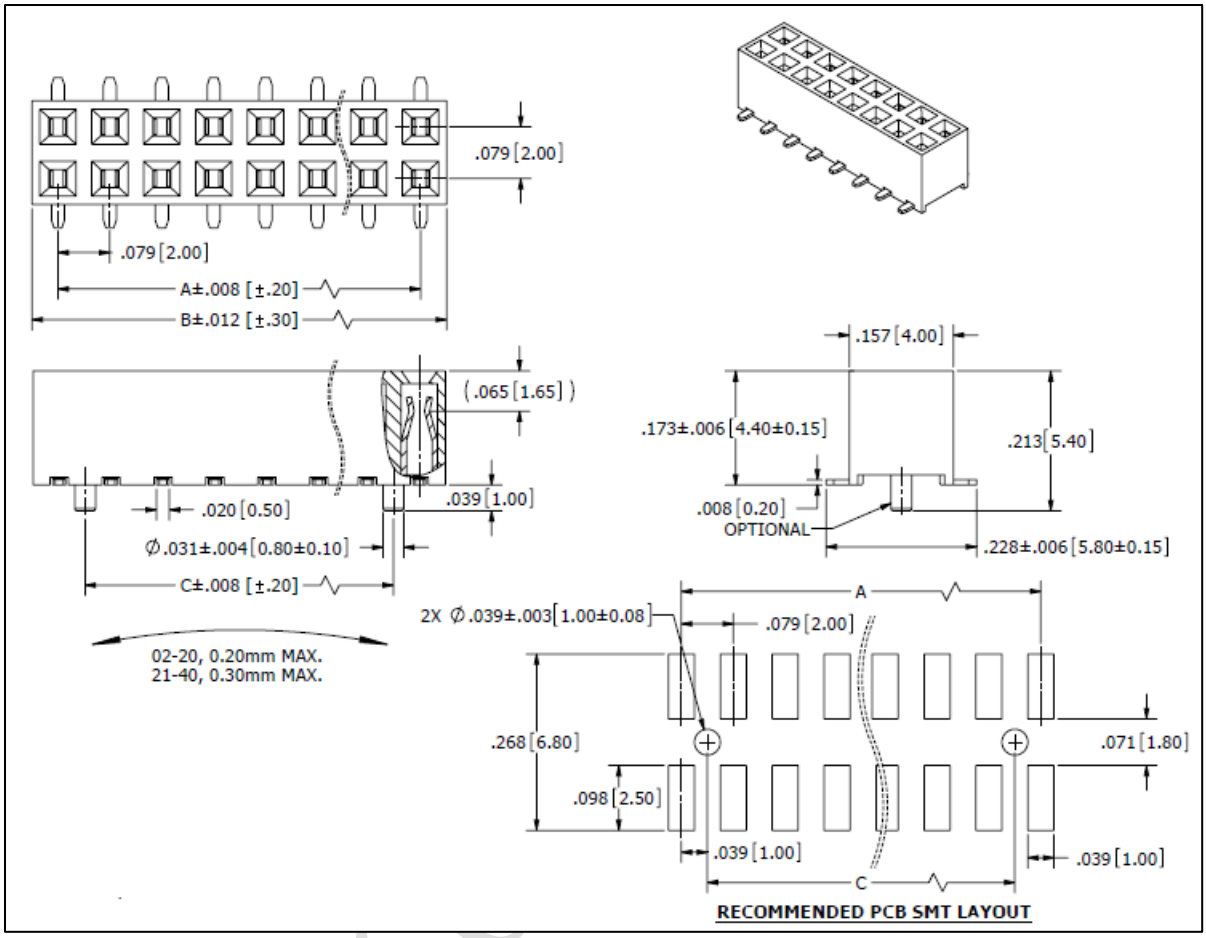


Figure 7.2-1: Media Connector

7.3. Pin Descriptions

Connector J1		
Pin No.	**Signal Name**	**Functionality**
1	I2S_DATA2	I2S DATA
2	I2S_DATA3	I2S DATA
3	GPIOP_12	GPIO
4	GPIOP_10	GPIO
5	GND	GROUND
6	BTPCM_CLK	BT PCM BIT CLOCK
7	BTPCM_IN	BT PCM RXD
8	BTPCM_OUT	BT PCM TXD
9	BTPCM_SYNC	BT PCM LRCLK
10	GND	GROUND
11	GPIOB_6	GPIO
12	GPIOF_9	GPI
13	GND	GROUND
14	GPIOP_11	GPIO
15	GPIOP_9	GPIO
16	AUDIO_LOL	ANALOG AUDIO LEFT OUT
17	AUDIO_LOR	ANALOG AUDIO RIGHT OUT
18	GND	GROUND

Connector J1		
Pin No.	**Signal Name**	**Functionality**
19	GND	GROUND
20	SPI_A_SS0	SPI CHIP SELECT
21	SPI_A_MISO	SPI MISO
22	SPI_A_MOSI	SPI MOSI
23	SPI_A_CLK	SPI CLOCK
24	GND	GROUND
25	I2CM_B_SDA	I2C_M_ DATA
26	I2CM_B__SCL	I2C_M_CLOCK
27	GND	GROUND
28	MCLKB	AUDIO O/P MASTER CLOCK
29	I2S_BCLK	AUDIO O/P BIT CLOCK
30	I2S_LRCLK	AUDIO O/P LR CLOCK
31	I2S_RXD	I2S_ RXD
32	I2S_TXD	I2S_ TXD
33	CPU_RESET	RESET PIN
34	HOST_UART_RX	HOST UART Communication
35	HOST_UART_TX	HOST UART Communication
36	GND	GROUND

Connector J2		
Pin No.	**Signal Name**	**Functionality**
1	GND	GROUND
2	GPIOP_2	GPIOP_2
3	LEDB	GPIOF_8
4	LEDG	GPIOF_7
5	LEDR	GPIOF_6
6	GPIOF_4	GPIO
7	GND	GROUND
8	LINUX_UARTB_TX	DEBUG UARTB_TX
9	LINUX_UARTB_RX	DEBUG UARTB_RX
10	GND	GROUND
11	USB_DP	USB DATA PLUS
12	USB_DM	USB DATA MINUS
13	GND	GROUND
14	USB_VBUS	USB POWER. (5V should come from external if it is in device mode).
15	GND	GROUND
16	GND	GROUND
17	3.3V_IN	POWER RAIL (support 1A)
18	3.3V _IN	POWER RAIL

Connector J2		
Pin No.	**Signal Name**	**Functionality**
19	GND	GROUND
20	SARADC_CH0	ANALOG ADC INPUT CHANNEL 0
21	GND	GROUND
22	GPIOF_2	GPI
23	PDM_D1	MIC DATA 1
24	PDM_D0	MIC DATA 0
25	PDM_CLK	MIC CLOCK
26	GND	GROUND
27	CLK12_24	INTERNAL CLOCK 12_24MHz
28	SPDIF_IN	SPDIF INPUT
29	GND	GROUND
30	MIC2_P	ANALOG MIC2_P IN
31	MIC2_N	ANALOG MIC2_N IN
32	MIC1_P	ANALOG MIC1_P IN
33	MIC1_N	ANALOG MIC1_N IN
34	GPIOF_5	GPIO
35	SARADC_CH1	ANALOG ADC INPUT CHANNEL 1
36	GPIOP_8	GPIO

7.4. GPIO

Interface	Signal Name	Availability/Usage
TDM	TDM_A_D1	Other channels of I2S including data and clock
	TDM_A_D0	
	TDM_A_FS	
	TDM_A_SCLK	
	TDM_B_SCLK	
	TDM_B_FS	
	TDM_B_D0	
	TDM_B_D1	
	TDM_B_D2/TDM_B_SLV_SCLK	
	TDM_B_D3/TDM_B_SLV_FS	
	TDM_B_D4	
	TDM_B_D5	
	GPIOA_9	
	TDM_B_DIN0	
	TDM_B_DIN1	
	TDM_B_DIN2	
UART	UART_B_TX	Debug UART

Interface	Signal Name	Availability/Usage
	UART_B_RX	
	UART_C_TX	Host UART
	UART_C_RX	
I2C B	I2CM_B_SCL	Master I2C
	I2CM_B_SDA	
PWM	PWM_A	General purpose PWM
	PWM_B	
	PWM_C	
	PWM_E	
	PWM_F	
	PWM_A_HiZ	
	PWM_B_HiZ	
SPI	SPI_A_SS0	Master SPI
	SPI_A_MOSI	
	SPI_A_MISO	
	SPI_A_CLK	

7.5. Power Consumption

Parameter	Active Mode	Network Standby Mode
I (mA)	150	TBD
V (V)	3.3	3.3
P (mW)	495	TBD

Power numbers may vary based on features.

8. Environmental

8.1. Storage Conditions

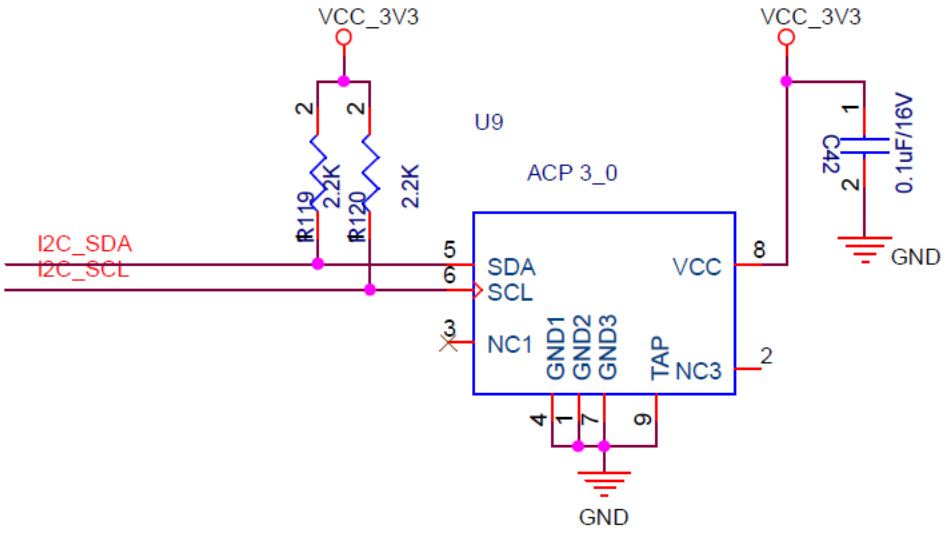
The calculated shelf life in a sealed bag is 12 months if stored between 0°C and 70˚C at less than 90% relative humidity (RH).

After the bag is opened, devices that are subjected to solder reflow or other high temperature processes must be handled in the following manner:

- Mounted within 168 hours in factory conditions, i.e., <30°C at 60% RH.
- Storage humidity needs to be maintained at <10%RH.

9. Reference Schematics

9.1. MFI 3.0C Authentication Circuit



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FCC regulatory conformance

FCC ID: 2ADBM-LS8

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

NOTE: Unauthorized changes will result in loss of device operating privileges.

RF Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IC regulatory conformance

IC: 20276-LS8

This device complies with CAN ICES-003 (B)/NMB-003(B).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 est conforme à la norme CAN ICES-003 (B)/NMB-003 (B).
Cet appareil contient des émetteurs / récepteurs exempt (s) de licence qui sont conformes aux RSS exemptes de licence d'Innovation, Sciences et Développement économique Canada. Son fonctionnement est soumis 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.

RF Exposure
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
Cet équipement est conforme aux limites d'exposition aux rayonnements de la IC établies pour unenvironnement non contrôé. Cet équipement doit être installé et fonctionner à au moins 20cm de distance d'un radiateur ou de votre corps.

ORIGINAL EQUIPMENT MANUFACTURER (OEM) NOTES

OEM must certify the final end product to comply with unintentional radiators (FCC Sections 07 and 15.109) before declaring compliance of the final product to Part 15 of the FCC rules and regulations. Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change.

The OEM must comply with the FCC labeling requirements. If the module's label is not visible when installed, then an additional permanent label must be applied on the outside of the finished product which states: "Contains transmitter module FCC ID: 2ADBM-LS8". Additionally, the following statement should be included on the label and in the final product's user manual: "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 interferences, and

(2) this device must accept any interference received, including interference that may cause undesired operation."

The module is limited to installation in mobile or fixed applications. Separate approval is required for all other operating configurations, including portable configuration with respect to Part 2.1093 and different antenna configurations.

A module or modules can only be used without additional authorizations if they have been tested and granted under the same intended end-use operational conditions, including simultaneous transmission operations. When they have not been tested and granted in this manner, additional testing and/or FCC application filing may be required. The most straightforward approach to address additional testing conditions is to have the grantee responsible for the certification of at least one of the modules submit a permissive change application. When having a module grantee file a permissive change is not practical or feasible, the following guidance provides some additional options for host manufacturers. Integrations using modules where additional testing and/or FCC application filing(s) may be required are: (A) a module used in devices requiring additional RF exposure compliance information (e.g., MPE evaluation or SAR testing); (B) limited and/or split modules not meeting all of the module requirements; and (C) simultaneous transmissions for independent collocated transmitters not previously granted together.

This Module is full modular approval, it is limited to OEM installation ONLY.

Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change. (OEM) Integrator has to assure compliance of the entire end product include the integrated Module. Additional measurements (15B) and/or equipment authorizations (e.g. Verification) may need to be addressed depending on co-location or simultaneous transmission issues if applicable. (OEM) Integrator is reminded to assure that these installation instructions will not be made available to the end user

IC labeling requirement for the final end product:

The final end product must be labeled in a visible area with the following “Contains IC: 20276-LS8”

The Host Marketing Name (HMN) must be indicated at any location on the exterior of the host product or product packaging or product literature, which shall be available with the host product or online.

Unauthorized modifications could void the user's authority to operate the equipment.

This radio transmitter [lC: 20276-LS8] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Frequency range	Manufacturer	Peak gain	Impedance	Antenna type
2400-2483.5MHz	AUDEN COMMUNICATIONS & MULTIMEDIA TECHNO (KUNSHAN) CO., LTD	3.5dBi	50Ω	PCB Antenna
2400-2483.5MHz	Suzhou Point Positive Electronic Technology Co., Ltd	2.6651 dBi	50Ω	Rod Antenna
2400-2483.5MHz	AUDEN COMMUNICATIONS & MULTIMEDIA TECHNO (KUNSHAN) CO., LTD	3.0dBi	50Ω	FPC Antenna
5150 to 5250 MHz 5250 to 5350 MHz 5470 to 5725 MHz 5725 to 5850 MHz	AUDEN COMMUNICATIONS & MULTIMEDIA TECHNO (KUNSHAN) CO., LTD	5.9 dBi	50Ω	PCB Antenna
5150 to 5250 MHz 5250 to 5350 MHz 5470 to 5725 MHz 5725 to 5850 MHz	Suzhou Point Positive Electronic Technology Co., Ltd	2.73919 dBi	50Ω	Rod Antenna
5150 to 5250 MHz 5250 to 5350 MHz 5470 to 5725 MHz 5725 to 5850 MHz	AUDEN COMMUNICATIONS & MULTIMEDIA TECHNO (KUNSHAN) CO., LTD	2.13 dBi	50Ω	FPC Antenna

Requirement per KDB996369 D03

2.2 List of applicable FCC rules

List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies. DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required.3
Explanation: This module meets the requirements of FCC part 15C(15.247). part 15E(15.407)

2.3 Summarize the specific operational use conditions

Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.
Explanation: The module has the trace antenna designs, and the antenna use a permanently attached antenna which is unique, The designed antenna meets the hardware module's requirements via the connection between Reverse polarity SMA connector and module.

2.4 Limited module procedures

If a modular transmitter is approved as a "limited module," then the module manufacturer is responsible for approving the host environment that the limited module is used with. The manufacturer of a limited module must describe, both in the filing and in the installation instructions, the alternative means that the limited module manufacturer uses to verify that the host meets the necessary requirements to satisfy the module limiting conditions. A limited module manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation. The alternative method could include that the limited module manufacturer reviews detailed test data or host designs prior to giving the host manufacturer approval.
This limited module procedure is also applicable for RF exposure evaluation when it is necessary to demonstrate compliance in a specific host. The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained such that full compliance of the product is always ensured. For additional hosts other than the specific host originally granted with a limited module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approved with the module.
Explanation: The module is not a limited module.

2.5 Trace antenna designs

For a modular transmitter with trace antenna designs, see the guidance in Question 11 of KDB Publication 996369 D02 FAQ – Modules for Micro-Strip Antennas and traces. The integration information shall include for the TCB review the integration instructions for the following aspects:
layout of trace design, parts list (BOM), antenna, connectors, and isolation requirements.
a) Information that includes permitted variances (e.g., trace boundary limits, thickness, length, width, shape(s), dielectric constant, and impedance as applicable for each type of antenna);
b) Each design shall be considered a different type (e.g., antenna length in multiple(s) of frequency,

the wavelength, and antenna shape (traces in phase) can affect antenna gain and must be considered);
c) The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (PC) board layout;
d) Appropriate parts by manufacturer and specifications;
e) Test procedures for design verification; and
f) Production test procedures for ensuring compliance.
The module grantee shall provide a notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.
Explanation: Yes, The module with trace antenna designs, and this manual has been shown the layout of trace design, antenna, connectors, and isolation requirements.

2.6 RF exposure considerations

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).
Explanation: This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment, This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body." This module is designed to comply with the FCC statement, FCC ID is: 2ADBM-LS8.

2.7 Antennas

A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an "omni-directional antenna" is not considered to be a specific "antenna type")).
For situations where the host product manufacturer is responsible for an external connector, for example with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique antenna connector must be used on the Part 15 authorized transmitters used in the host product. The module manufacturers shall provide a list of acceptable unique connectors.
Explanation: The module has the trace antenna designs, and the antenna use a permanently attached antenna which is unique, The designed antenna meets the hardware module's requirements via the connection between Reverse polarity SMA connector and module.

2.8 Label and compliance information

Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating "Contains FCC ID" with their finished product. See Guidelines for Labeling and User Information for RF Devices – KDB Publication 784748.
Explanation: The host system using this module, should have label in a visible area indicated the following texts: "Contains FCC ID: 2ADBM-LS8"

2.9 Information on test modes and additional testing requirements5

Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.
The grantee should provide information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host.
Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer's determination that a module as installed in a host complies with FCC requirements.
Explanation: Top band can increase the utility of our modular transmitters by providing instructions that simulates or characterizes a connection by enabling a transmitter.

2.10 Additional testing, Part 15 Subpart B disclaimer

The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) 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. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuity), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.
Explanation: The module without unintentional-radiator digital circuity, so the module does not require an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B.