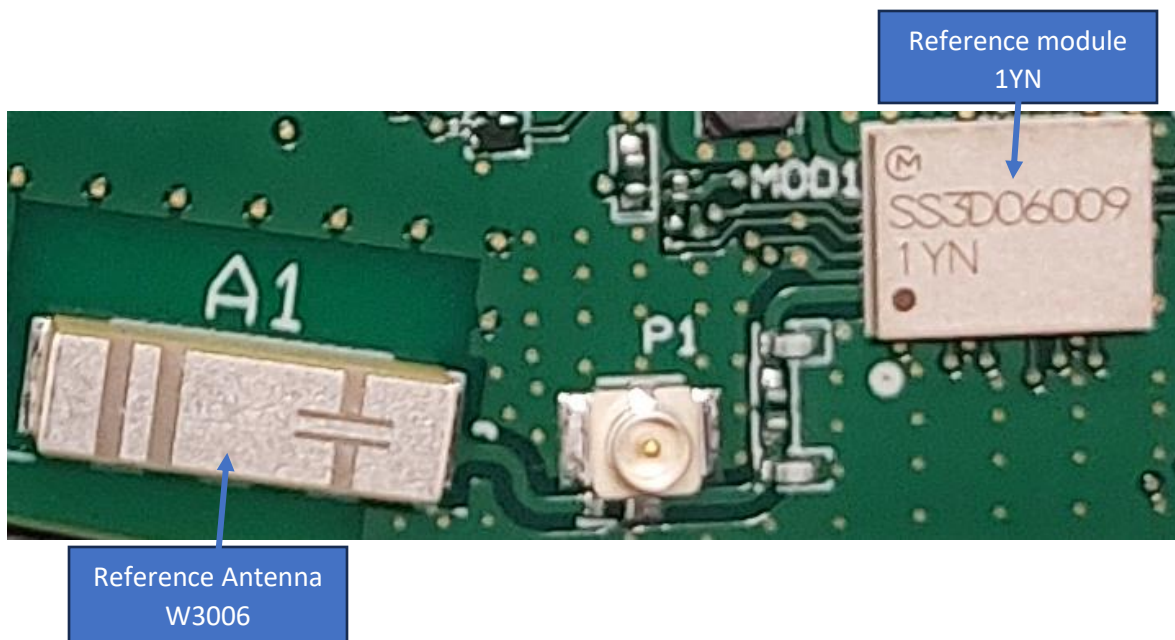


WLAN and Bluetooth Modules

Model number (1YN)



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Units of Measurement

Units of measurement in this publication conform to SI standards and practices.

Patents

The exhaustive list of patents is available at [EXFO.com/patent](https://www.exfo.com/patent).

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1 SCOPE

FCC ID and ISED Certification number:

- ❖ FCC ID: 2AYQH-LB1DX
- ❖ IC: 26882-LB1DX
- ❖ Model number (HVIN): 1YN

For OEM integration only – device cannot be sold to general public.

Therefore we will ask OEM to include the following statements required by FCC and ISED on the product and in the Installation manual Notice.

2 Voltage

Supply Voltage

		min.	typ.	max.	unit
Specification Temperature Range		-10	+25	+55	Deg. C°
Specification Voltage	VBAT	3.2	3.6	4.2	V
	VDDIO	1.71	1.8 or 3.3	3.63	V

3 Antenna

- Please perform the antenna design that followed the specifications of the antenna.

The concrete contents of a check are the following three points.

1. It is the same type as the antenna type of antenna specifications. Confirm the same size as the Gerber file.
2. An antenna gain is lower than a gain given in antenna specifications. Measure the gain, and confirm the peak gain is less than the application value (1.4dBi @ 2.4-2.5GHz).
3. The emission level is not getting worse. Measure the spurious and confirm degradation of less than 3dB than spurious value of worst of report used for the application.

4 Notice

For OEM integration only – device cannot be sold to general public.

Therefore we will ask OEM to include the following statements required by FCC/IC on the product and in the Installation manual Notice.

Please describe the following warning on the final product which contains this module.

Contains Transmitter Module	
FCC ID:	2AYQH-LB1DX
IC:	26882-LB1DX

Please describe the following warning to the 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 interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
FCC CAUTION Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

*When the product is small, as for these words mentioned above, the posting to a manual is possible.

ISED non-interference disclaimer

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.

This device complies with the Canadian ICES-003 Class B specifications. CAN ICES-003(B) / NMB-003 (B).

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempt de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

When installing it in a mobile equipment. Please describe the following warning to the manual.

This equipment complies with FCC and ISED RSS-102 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. In order to avoid the possibility of exceeding the FCC and ISED RSS-102 radio frequency exposure limits, this equipment should be installed and operated with minimum distance 20 cm (7.9 inches) between the antenna and your body during normal operation. Users must follow the specific operating instructions for satisfying RF exposure compliance.

Cet équipement est conforme aux limites d'exposition aux rayonnements FCC et ISED CNR-102 établies pour un environnement non contrôlé. Cet émetteur ne doit pas être installé ou utilisé en conjonction avec une autre antenne ou un autre émetteur. Afin d'éviter la possibilité de dépasser les limites d'exposition aux radiofréquences FCC et ISED, cet équipement doit être installé et utilisé avec une distance minimale de 20 cm (7.9 pouces) entre l'antenne et votre corps pendant le fonctionnement normal. Les utilisateurs doivent suivre les instructions spécifiques d'utilisation pour respecter la conformité à l'exposition aux RF.

When installing it in a portable equipment.

It is necessary to take a SAR test with your set mounting this module.
Class II permissive change application is necessary using the SAR report.

Note:

- ❖ Portable equipment : Equipment for which the spaces between human body and antenna are used within 20cm.
- ❖ Mobile equipment : Equipment used at position in which the spaces between human body and antenna exceeded 20cm.

This device is intended only for OEM integrators under the following conditions:

The antenna must be installed such that 20 cm is maintained between the antenna and users, and
The transmitter module may not be co-located with any other transmitter or antenna.
The use of an antenna with gain less than 1.4 dBi.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or colocation with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following:

“Contains FCC ID: XXXXXXXXXX” and IC: XXXXXXXXXX. The grantee's FCC ID and IC certification number can be used only when all FCC & ISED compliance requirements are met.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

5 Modular Integration Requirements

This module is not sold separately and is not installed in any hosts except for EXFO Inc. hosts. The module was approved under a Limited Modular Approval and tested to FCC requirements whilst being installed on a test jig board simulating the board of the installed end product and, therefore, has not been tested in a standalone configuration. The end installer shall need to ensure that the module and antenna are mounted on a board similar to that shown in the photographs and the board is then installed in the end product. In case where the module will be integrated in other non-identical hosts in the future, we will expand the LMA to include the new hosts after an appropriate assessment to the FCC rules through a C2PC process.

FCC Part 15 Subpart C 15.247 rules apply for 2.4 GHz operation of this product, in particular:

- FCC Part 15 Subpart C 15.247(a)(2)
- FCC Part 15 Subpart C 15.247(b)(3)
- FCC Part 15 Subpart C 15.247(d)
- FCC Part 15 Subpart C 15.247(e)

ISED RSS-247 Issue 3 Part 5 rules apply for 2.4 GHz operation of this product, in particular:

- ISED RSS-247 Issue 3 Part 5.2(a)
- ISED RSS-247 Issue 3 Part 5.2(b)
- ISED RSS-247 Issue 3 Part 5.4(d)
- ISED RSS-247 Issue 3 Part 5.4(e)
- ISED RSS-247 Issue 3 Part 5.5

The end installer product needs to be tested in accordance to FCC Part 15 Subpart B technical requirements and also comply with the regulatory notice requirements outlined in Part 15 Subpart B such as 15.105.

Article 1. Test Plan (according to KDB 996369 D04)

1. Test Objective: Verify the electromagnetic emissions of the Product.

2. Specifications:

- Transmit output power for 2.4 GHz operation according to FCC Part 15 Subpart C, paragraph 15.247(b)(3) – with limits: 30 dBm at antenna port, 36 dBm EIRP.
- Spurious unwanted emissions for 2.4 GHz operation according to FCC Part 15 Subpart C, paragraph 15.247(d) – with limits according to FCC 15.209 within bands listed in FCC 15.205.
- Test methods are according to ANSI C6310 (2020):
 - i. Section 6.5, 11.11, and 11.12 for emissions below 1 GHz for 2.4 GHz operation.
 - ii. Section 6.6, 11.11, and 11.12 for emissions above 1 GHz for 2.4 GHz operation.
 - iii. Section 11.9 for output power for 2.4 GHz operation
 - iv. It's important to note that there are restricted frequency bands both below and above 1 GHz. Within these bands, Section 11.11 applies; outside them, Section 11.12 is relevant.

3. Setup:

- Place the Product on the turn platform within the anechoic chamber.
- Position the measurement antenna on the antenna mast at a distance of 3 meters from the Product.
- For fundamental power set transmitter to operate in continuous mode on the highest aggregate power, and highest power spectral density to confirm continued compliance.
- For band edge compliance, set the transmitter to operate in continuous mode on the widest and the narrowest bandwidths per modulation type.
- For radiated spurious emissions up to 10th harmonic the following three parameters should be tested:
 - 1) widest bandwidth
 - 2) highest aggregate power
 - 3) highest power spectral density
- If according to the radio module's initial test report these conditions do not all combine in the same mode, then multiple modes should be tested: set transmitter to operate in continuous mode at low, mid and top channels with all the supported modulations, data rates and channel bandwidths until the modes with these three parameters have been tested and confirmed.

4. Spectrum Scan Range:

- When scanning the spectrum, we consider 10 harmonics of the fundamental frequency.
- For 2.4 GHz operation, the top frequency for the scan is 24.835 GHz. We usually round this up to 25 GHz.

5. Rotation and Elevation:

- Rotate the turn platform 360 degrees.
- Gradually raise the antenna from 1 to 4 meters.
- Purpose: Maximize emissions and verify compliance with Quasi-peak limits below 1 GHz and Peak/Average limits above 1 GHz; and compare with the appropriate limits as outlined in ANSI C63.10 and appropriate FCC Part 15 Subpart C and Subpart E rule parts.

6. Frequency Scans:

- Initial scan: Cover frequency ranges from 30 MHz to 1 GHz.
- Subsequent scan: Change measurement setup for above 1 GHz measurements.

7. Verification:

- Verify fundamental emission levels, according to FCC 15.247(b)(3) within the pass band 2400–2483.5 MHz.
- Check band edges within restricted bands at 2390 MHz and 2483.5 MHz, and check for Harmonics above 4.8 GHz - according to 15.247(d).

8. Extended Scans:

- Continue scanning for frequency ranges:
- 1–18 GHz
- 18–25 GHz (10th harmonic of 2.4 GHz fundamental)

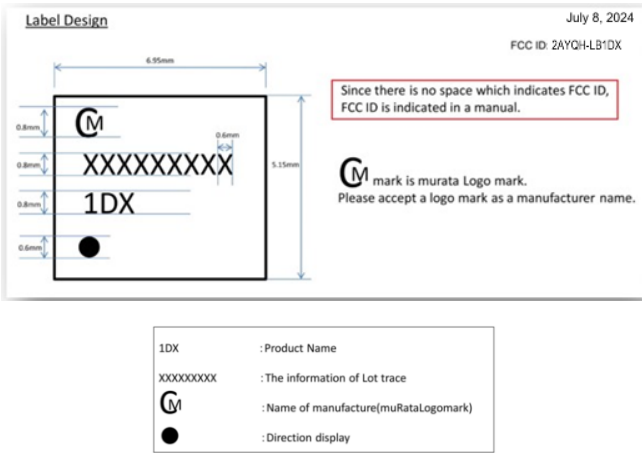
9. Spurious Emissions:

- Verify against quasi-peak, peak and average limits.

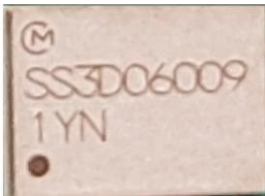
This comprehensive test plan ensures thorough assessment of the product's electromagnetic behavior across various frequency ranges connected to spectrum analyzer via appropriate attenuators, notch filters and LNA where applicable.

6 Label

For your information, the product (module) is too small to fit the label on, therefore all the mandatory certification details for the label are in the User Manual.



Mark on the module used:



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