FCC PART 15, CLASS II PERMISSIVE CHANGE TEST REPORT

for the

Stanley Black & Decker, Inc.

Limited Single Module, NA230951

FCC ID: YJ7-NA230951

WLL REPORT# 18855-01 REV 1

Prepared for:

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Testing Certificate AT-1448

Class II Permissive Change Test Report

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Limited Single Module, NA230951
FCC ID: YJ7-NA230951

September 30, 2024

WLL Report# 18855-01 Rev 1

Prepared by:

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Reviewed by:

Samuel Violette
Vice President

Abstract

This report has been prepared on behalf of Stanley Black & Decker, Inc. to support the attached permissive change application for equipment authorization. The test report and application are submitted for incorporating this LMA module into a host device, in this case the DCHE310 and DCHE320. The embedded module is currently certified under FCC ID: YJ7-NA230951 and IC ID: 9082A-NA230951.

This test report documents the test configuration and Class II Permissive Change (CIIPC) test results for the Stanley Black & Decker, Inc., Single Limited Module, NA230591. The information provided in this report is only applicable to device herein documented as the EUT.

Radiated testing below 1GHz was performed on an Open Area Test Site (OATS). Radiated testing above 1GHz was performed in a Free-space Anechoic Chamber Test-site (FACT) 3m chamber. Both sites are located at 4840 Winchester Boulevard, Suite #5. Frederick, MD 21703. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by ANAB under Certificate AT-1448 as an independent FCC test laboratory. The ISED Canada number for Washington Laboratories is 3035A.

The Stanley Black & Decker, Inc., NA230591, BLE Module [FCC ID: YJ7-NA230951] complies with the requirements for a Digital Transmission System (DTS) transmitter device under FCC Part 15.247.

Revision History	Description of Change	Issue Date
Rev 0	Initial Release	September 30, 2024
Rev 1	ACB comments, dated: 10/22/24	October 23, 2024

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1 Introduction

1.1 Compliance Statement

The Stanley Black & Decker, Inc., NA230591, BLE Module [FCC ID: YJ7-NA230951] complies with the requirements for a Digital Transmission System (DTS) transmitter device under FCC Part 15.247 and.

1.2 Test Scope

Tests for radiated emissions were performed. All measurements were performed in accordance with ANSI C63.10-2020 “ANSI Procedures for Compliance Testing of Unlicensed Wireless Devices”. The measurement equipment conforms to ANSI C63.2 “Specifications for Electromagnetic Noise and Field Strength Instrumentation”. The modules were tested “stand alone” as required for modular testing and approval.

1.3 Contract Information

Customer:	Stanley Black & Decker, Inc.
Purchase Order Number:	E131124A
Quotation Number:	74842

1.4 Test and Support Personnel

Washington Laboratories, LTD	Richard Quarcoo and Randon McIlwain
Customer Representative	Kirwan Magdamo

1.5 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Frederick, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. The ISED Canada number for Washington Laboratories, Ltd. is 3035A. Washington Laboratories, Ltd. has been accepted by the FCC and approved by ANAB under Testing Certificate AT-1448 as an independent FCC test laboratory.

2 Equipment Under Test

2.1 EUT Identification

Table 1: EUT Device Summary

Manufacturer:	Stanley Black & Decker, Inc.
Embedded Module:	FCC ID: YJ7-NA230951
Power Source & Voltage:	3.3VDC from host battery
	3VDC from coin battery (secondary)
Host Model Number:	DCHE310 and DCHE320
Host Product Name:	PowerPack Vibrator
Software/Firmware Version:	not declared by applicant
CIIPC Testing Date:	9/25/2024 and 9/26/2024

2.2 EUT Description

The NA230591 is DeWalt's Gen2 Bluetooth Low Energy Module (BLEM). The BLE transmitter module is designed for tracking, locating, enabling/disabling, and customizing DeWalt professional power tools via the DeWalt Site Manger App., and via DeWalt Asset Gateway. The device can operate off the internal CR2450 coin cell battery or alternately the DeWalt battery pack, when present. The EUT was tested while embedded in a host device. The host was a concrete tool; DeWalt PowerPack Vibrator, powered by the 60V Proteus battery pack. The 60V battery (Model: DCBPS0554) contains FCC ID: YJ7-NA382408. The NA382408 single limited module can transmit simultaneously along with the NA230591 module. Co-location for transmitter harmonics and products of intermodulation, are addressed in the radiated emissions test section of this report (see Section 3.5). Co-location for RF Exposure is addressed in WL Test Report No. 18856.

2.3 Test Configuration and Algorithm

The EUT was provided in a variety of engineering samples that were configured for testing. The EUT samples were loaded with test-mode software/firmware to allow individual samples to dwell, hop, sweep, and/or receive only as needed for required testing. The EUT was tested in a powered on, steady state. Please note that the EUT was investigated in accordance with the module's approved test plan, which is provided in Annex A of this report. The embedded transmitter investigation complimented the original filing test data. That is, the low channel of 2402 MHz was the worst-case channel. For the host tool, both the DCHE310 and DCHE320 models were investigated for radiated emissions. The difference between the units is negligible. The DCHE310 was elected for the final testing due to having the tethered hand-controller (worst-case).

2.4 Deviations to the Test Standard

There were no deviations to the requirements of the standard(s).

2.5 EUT Configuration Details

The EUT was comprised of the following equipment, provided on the following page. All Modules, PCBs, etc. listed were considered as part of the EUT, as tested.

Table 2: EUT System Configuration List

Name / Description	Model Number	Part Number	Serial Number	Rev. #
Host	DCHE310 DCHE320	--	--	--
Limited Single Module	NA230951	NA230951	Prod.	rF1

Table 3: Support Equipment

Name / Description	Manufacturer	Model Number	Calibration Data
60V battery	DeWalt	--	N/A
Battery charger	DeWalt	--	N/A

Table 4: Cable Configuration

Ref. ID	EUT Port Name	Cable Description	Qty.	Length (m)	Shielded	Termination Port ID
--	None	--	--	--	--	--

Figure 1: EUT Module Image (Example Only)

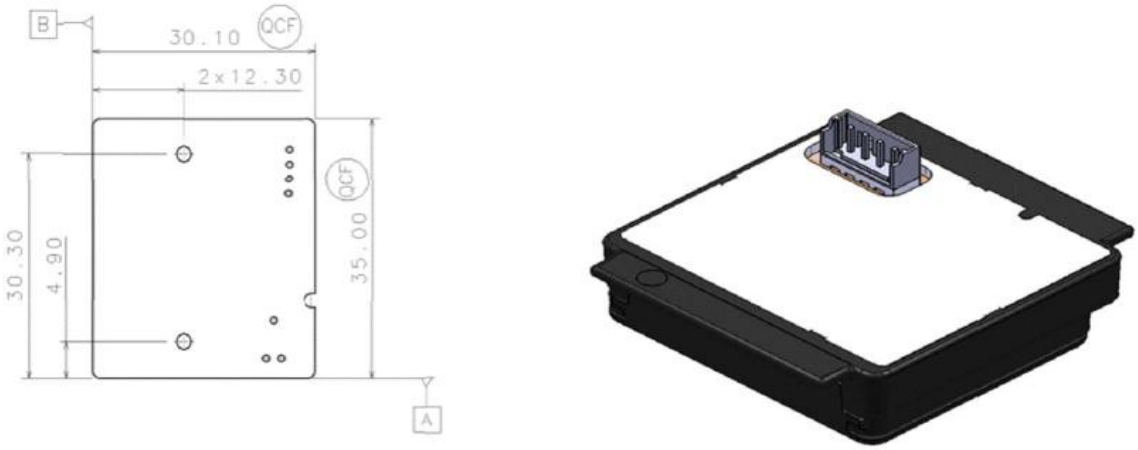
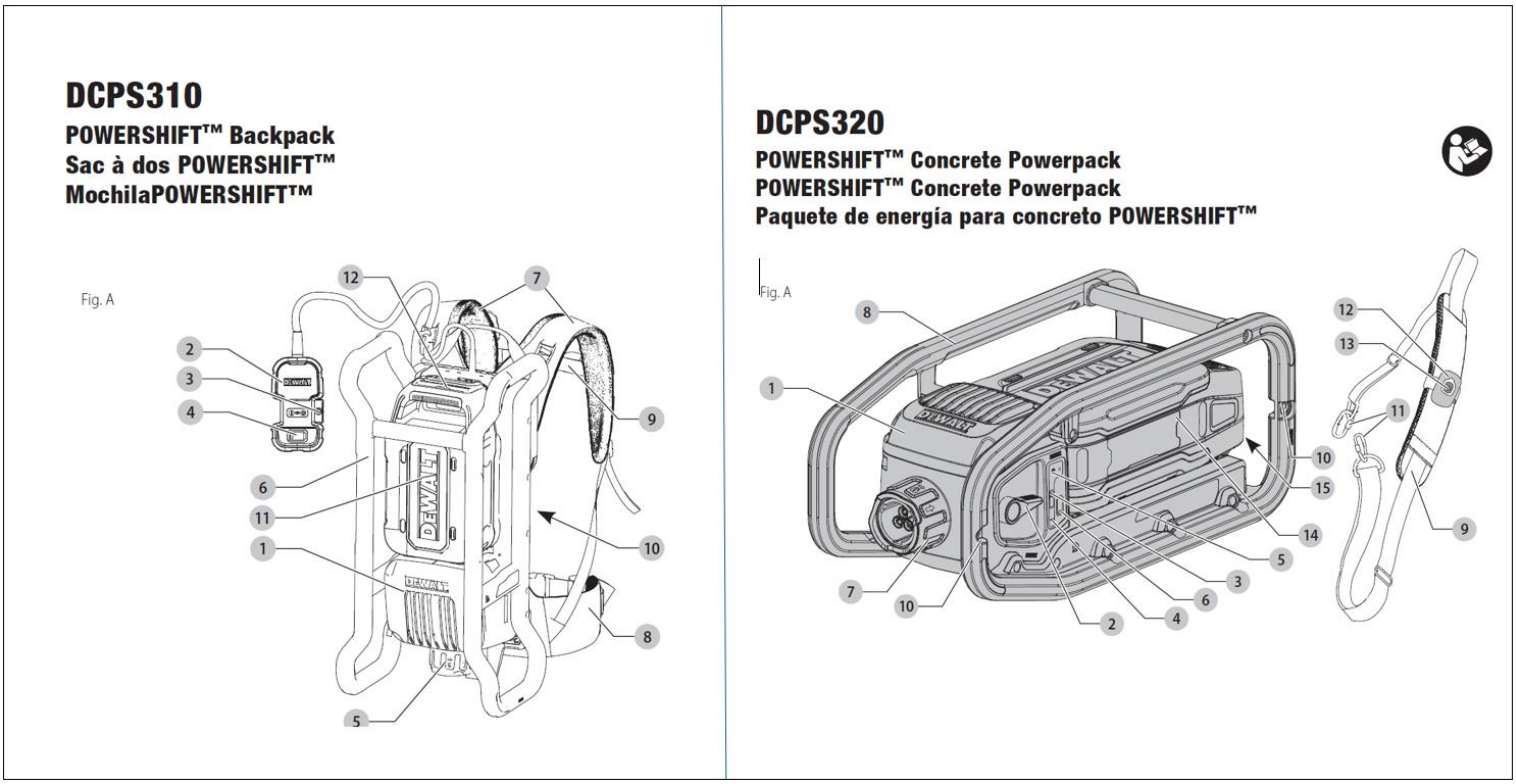


Figure 2: Host Configuration Diagram



3 Test Results

The table below shows the results of testing for compliance with a Digital Transmission System in accordance with FCC Part 15.247 and RSS-247 Issue 3. Full test results are shown in subsequent sub-sections.

Table 5: Testing and Results Summary

FCC Rule Part	IC Rule Part	Description	Result
15.247(a)(2)	RSS-247 [5.2 (a)]	Occupied Channel Bandwidth	Pass
15.247 (b)(3)	RSS-247 [5.4 (d)]	Transmit Output Power	Pass
15.247 (e)	RSS-247 [5.2 (b)]	Power Spectral Density	Pass
15.247 (d)	RSS-247 [5.5]	Out-of-Band Emissions (Band Edge @ 20dB below)	Pass
15.205 15.209	RSS-Gen [8.9/8.10]	General Field Strength Limits (Restricted Bands & RE Limits)	Pass
15.207	RSS-Gen [8.8]	AC Conducted Emissions	N/A *

* the EUT is not subject to the provisions of 15.207 for powerline emissions.

3.1 Occupied (DTS) Bandwidth

For a DTS operating in the 2.4GHz band, FCC Rule Part 15.247(a)(2) and RSS-247, 5.2(a) require the minimum 6dB bandwidth be at least 500 kHz. The 99% BW shall also be recorded.

The transmitter OBW of the EUT shall also closely resemble the original filing test data for the embedded module. In this case, the reported OBW data from the LMA filing is as follows:

Limited Module Data:

Modulation	Data Rate	TX Frequency	6dB Bandwidth	99% Bandwidth
GFSK	1 Mbps	2402 MHz	714.1 MHz	1.07 MHz

3.1.1 Measurement Method

This test was performed in accordance with Clause 11.8.2, Option 2, of ANSI C63.10-2020.

This test was performed as a 3-meter radiated emissions measurement. The transmit signal was maximized by rotating the turntable and varying the height of the test antenna.

3.1.2 Test Data

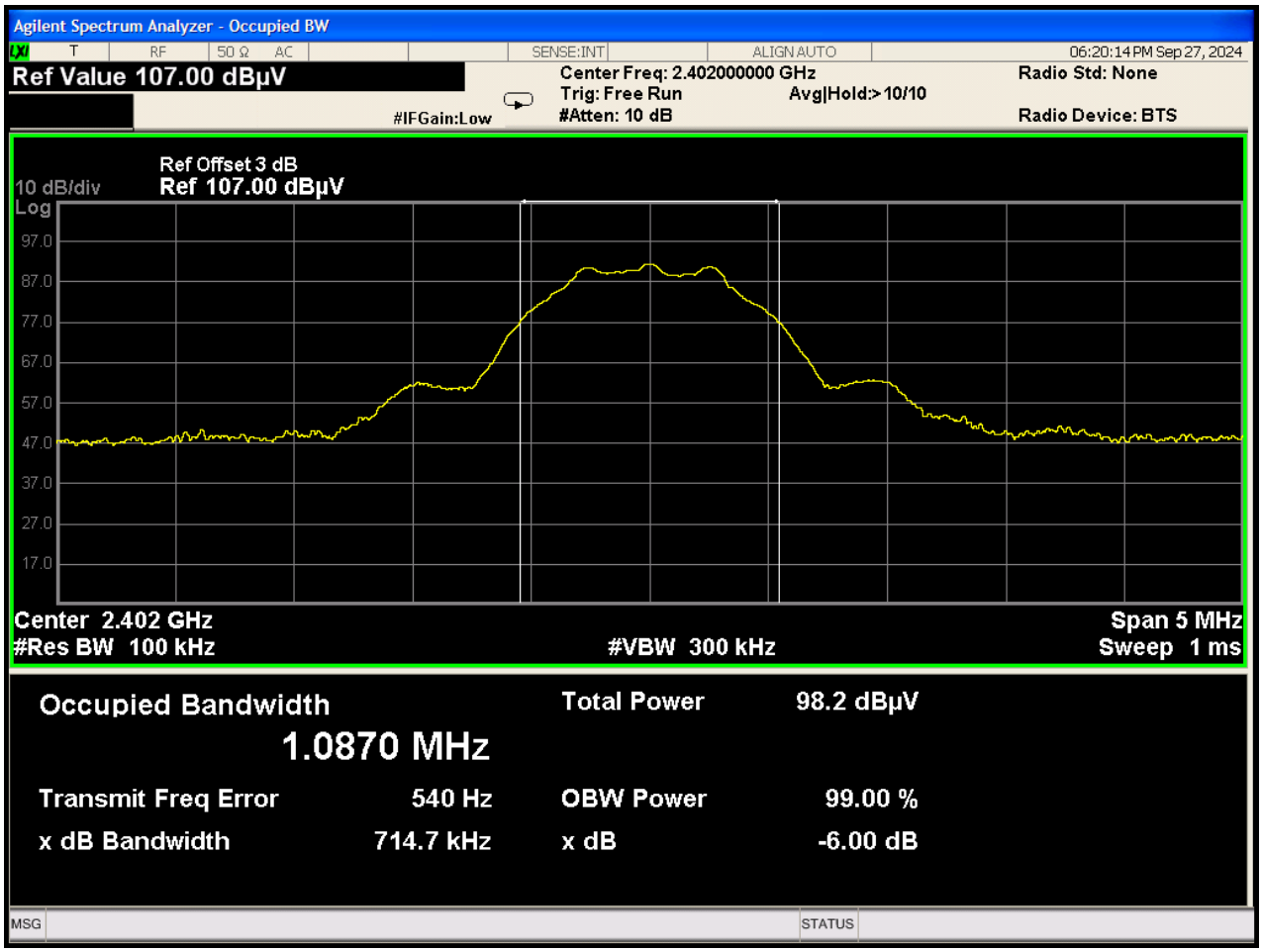
The EUT was investigated for worst-case emissions, across various channels and data rates.

The EUT was configured to transmit a modulated signal, with channel hopping disabled.

The EUT is compliant with the requirements of this test.

The final CIIPC test data is provided below.

Figure 3: CIIPC Occupied Bandwidth, Low Channel, 1Mbps (DH5)



3.2 Peak Transmit Power

For a DTS operating in the 2.4GHz band, FCC Rule Part 15.247(b)(3) and RSS-247, 5.4(d) require that the maximum peak conducted output power shall not exceed 30 dBm, or 1W. Additionally, the EIRP shall not exceed 36 dBm, or 4W.

The transmitter power of the EUT shall also closely resemble the original filing test data for the embedded module. In this case, the reported output power data from the LMA filing is as follows:

Limited Module Data:

Modulation	Data Rate	TX Frequency	Peak Power (dBm)	EIRP (dBm)
GFSK	1 Mbps	2402 MHz	0.89	-5.59

3.2.1 Measurement Method

This test was performed as a 3-meter radiated field strength measurement. The EUT was investigated in three orthogonal axes (x, y, z). The EUT position that produced the highest fundamental field strength was maintained during the final measurement. The transmit signal was maximized by rotating the turntable and varying the height of the test antenna. Testing and compliance calculations are performed based on the informative guidance provided in Annex G of ANSI C63.10-2020.

3.2.2 Test Data

The EUT was investigated for worst-case emissions, across various channels and data rates.

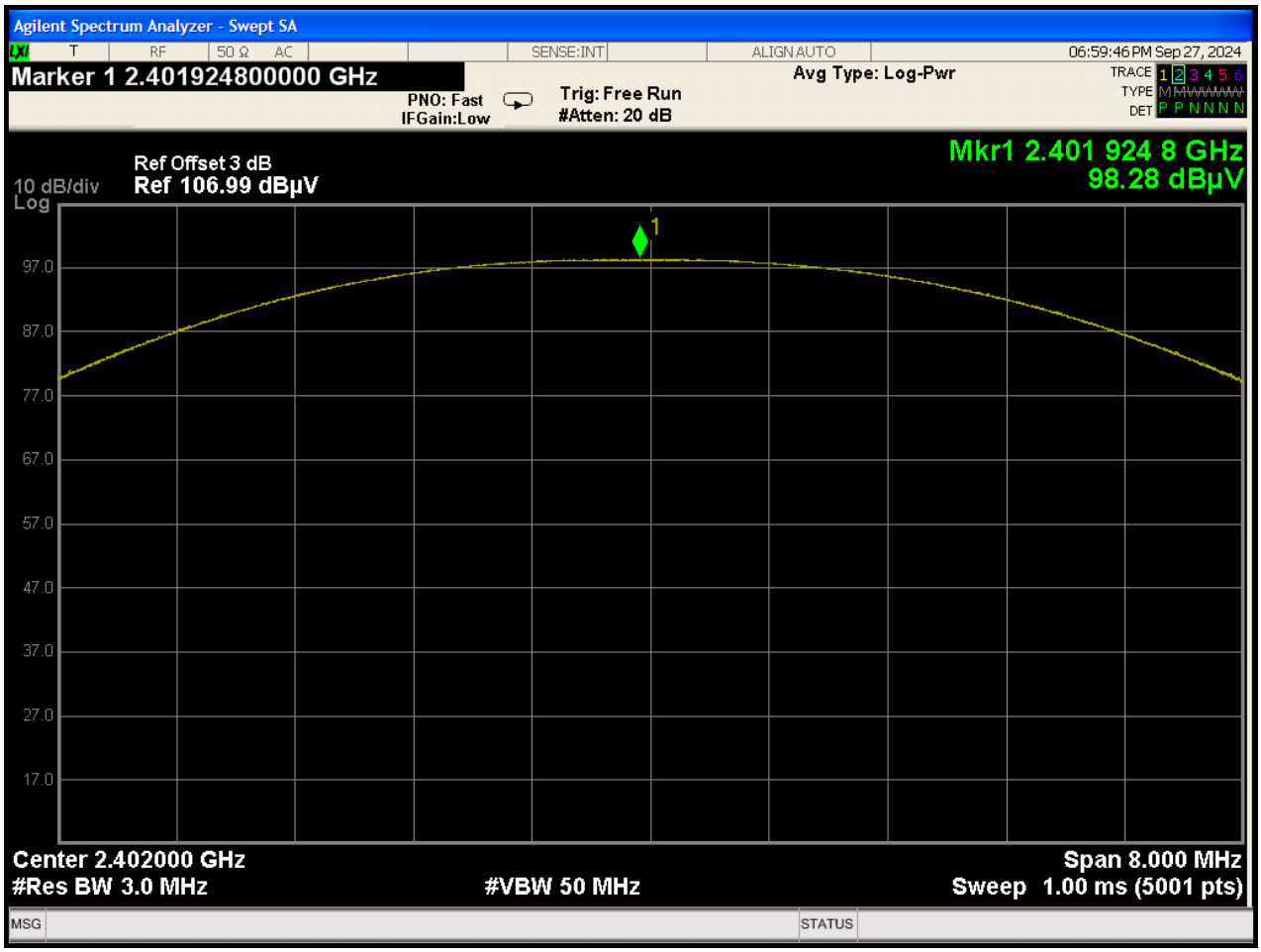
The EUT was configured to transmit a modulated signal, with channel hopping disabled.

The EUT is compliant with the requirements of this test.

The EUT employs a PCB trace antenna with a peak gain of -6.48 dBi.

The final CIIPC test data is provided below.

Figure 4: CIIPC, Uncorrected Field Strength, Low Channel, 1Mbps (DH5)



Modulation	Data Rate	TX Frequency	SA Level (dBuV)	Corr. Factors (dB/m)	Corr. Level (dBuV/m)	EIRP (dBm)
GFSK	1 Mbps	2402 MHz	98.28	-14.7	83.58	-11.68

EIRP = dBuV/m + 20LOG(D_m) – 104.8

where, D_m is the measurement distance in meters

EIRP = 83.58 + 20LOG(3) – 104.8 = -11.68

The result of -11.68 dBm EIRP is 6.09 dB lower than the granted power of the LMA.

The host tool does provide some attention of the fundamental. This result is acceptable.

3.3 Power Spectral Density

For a DTS operating in the 2.4GHz band, FCC Rule Part 15.247(e) and RSS-247, 5.2(b) require that the maximum peak power spectral density shall not exceed 8 dBm in any 3 kHz band.

The transmitter PSD of the EUT shall also closely resemble the original filing test data for the embedded module. In this case, the reported PSD data from the LMA filing is as follows:

Limited Module Data:

Modulation	Data Rate	TX Frequency	Measured PSD (dBm)
GFSK	1 Mbps	2402 MHz	0.70

3.3.1 Measurement Method

This test was performed in accordance with Clause 11.10.2 of ANSI C63.10-2020.

This test was performed as a 3-meter radiated field strength measurement. The EUT was investigated in three orthogonal axes (x, y, z). The EUT position that produced the highest fundamental field strength was maintained during the final measurement. The transmit signal was maximized by rotating the turntable and varying the height of the test antenna.

3.3.2 Test Data

The EUT was investigated for worst-case emissions, across various channels and data rates.

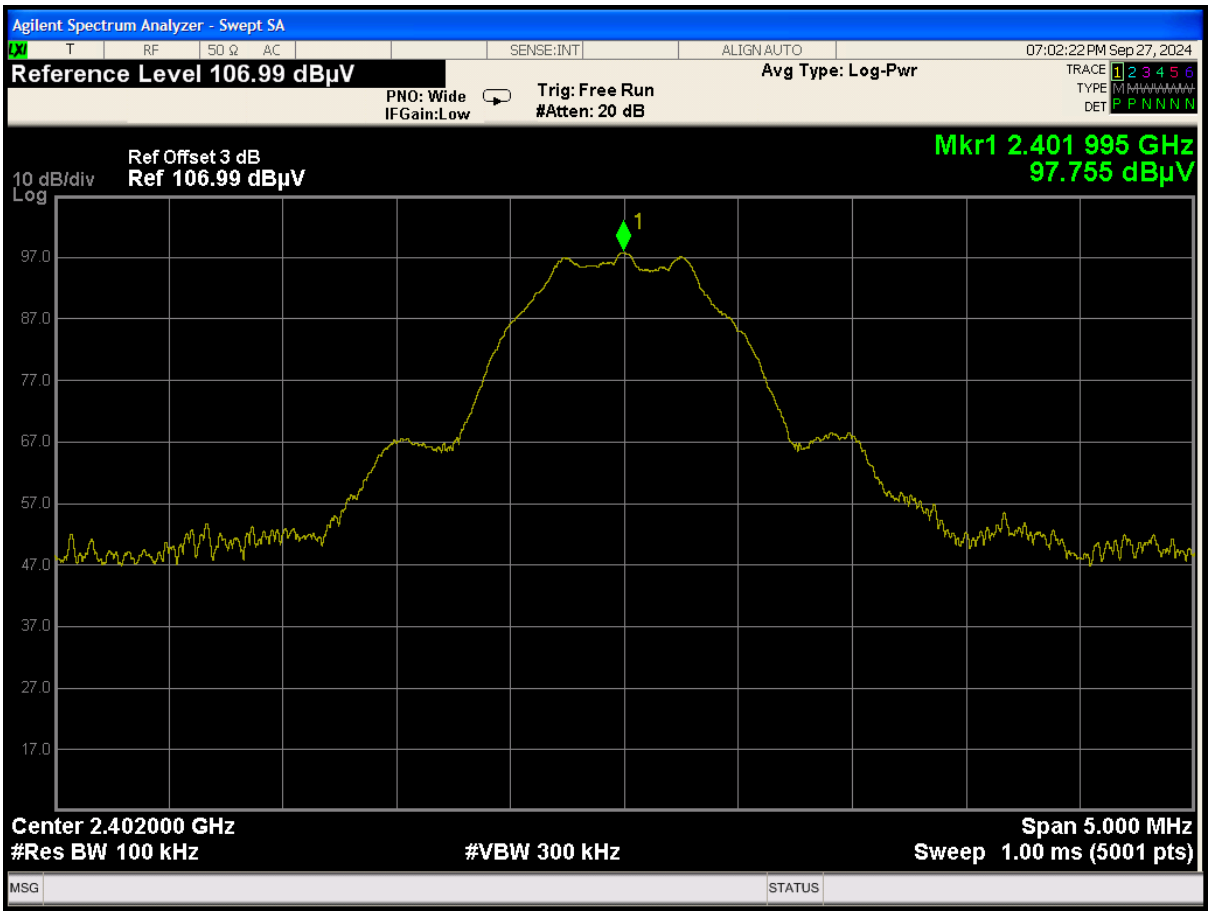
The EUT was configured to transmit a modulated signal, with channel hopping disabled.

The EUT is compliant with the requirements of this test.

The EUT employs a PCB trace antenna with a peak gain of -6.48 dBi.

The final CIIPC test data is provided below.

Figure 5: CIIPC Power Spectral Density, Low Channel, 1Mbps (DH5)



Modulation	Data Rate	TX Frequency	SA Level (dBuV)	Corr. Factors (dB/m)	Corr. Level (dBuV/m)	Corr. PSD (dBm)
GFSK	1 Mbps	2402 MHz	97.76	-14.7	83.06	-5.72

EIRP = dBuV/m + 20LOG(D_m) – 104.8

PSD = EIRP – G_{dBi}

where, D_m is the measurement distance in meters

G_{dBi} transmitting antenna gain of the EUT in dBi

PSD = -12.2 – (-6.48) = -5.72

The result of -5.72 dBm/100kHz PSD is within ± 5.02 dB of the granted PSD of the LMA.

3.4 Band-edge

This section provides close-up band-edge plots of the low and high channel, with respect to the nearest authorized band-edge.

For a DTS operating in the 2.4GHz band, FCC Rule Part 15.247(d) and RSS-247, 5.5 require that in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the unwanted radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

3.4.1 Measurement Method

This test was performed in accordance with Clause 6.10 through Clause 6.10.4 of ANSI C63.10-2020.

This test was performed as a 3-meter radiated emissions measurement. The transmit signal was maximized by rotating the turntable and varying the height of the test antenna.

3.4.2 Test Data

The EUT was investigated for worst-case emissions, across various channels and data rates.

The EUT was configured to transmit a modulated signal. The EUT was evaluated in two modes, channel hopping enabled and channel hopping disabled. The hopping/sweeping function had no impact on the results of this test. The worst-case band-edge is reported below.

The EUT is compliant with the requirements of this test.

The final CIIPC test data is provided below.

Figure 6: CIIPC, Worst-Case Band-Edge, Low Channel

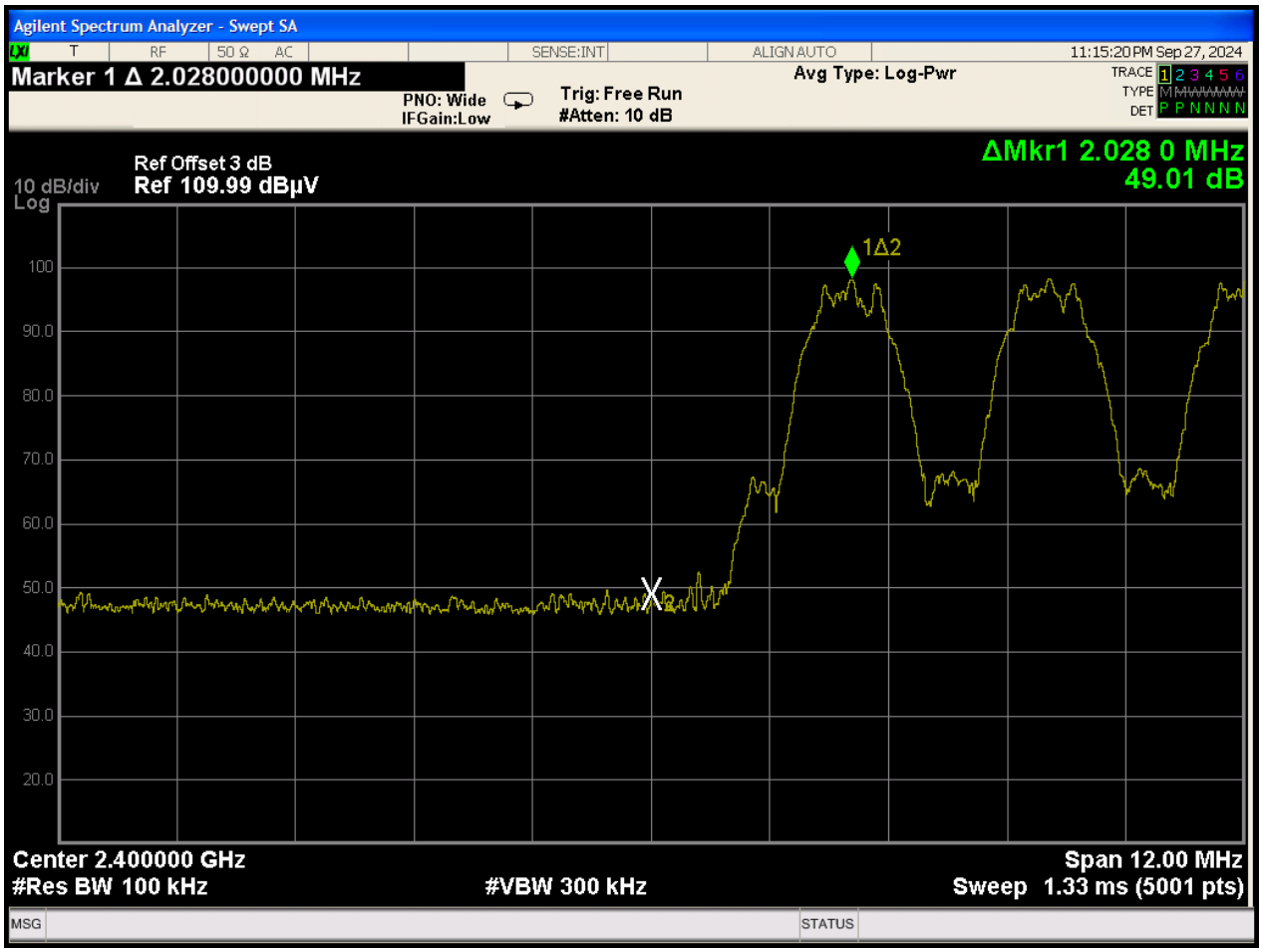
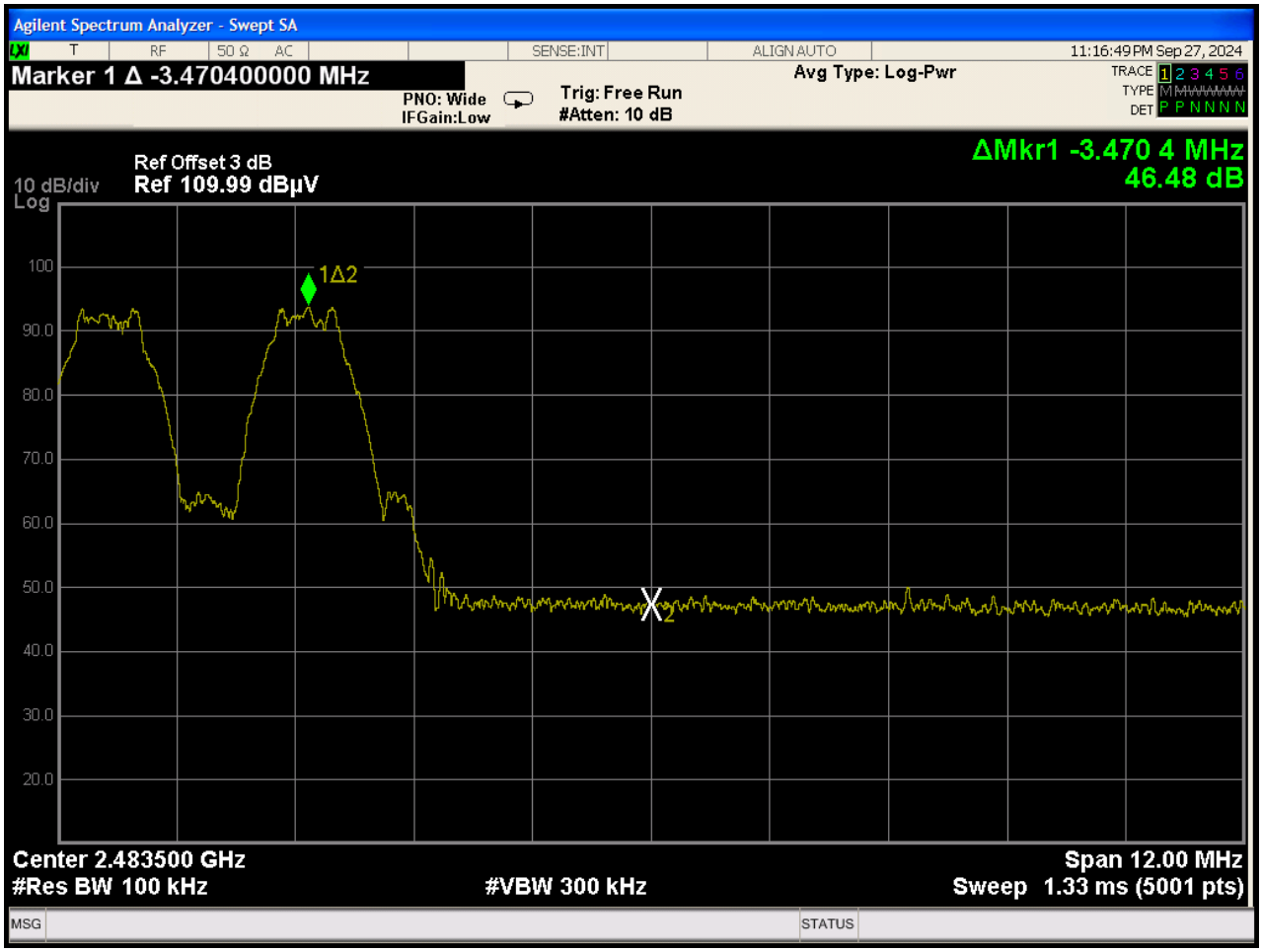


Figure 7: CIIPC, Worst-Case Band-Edge, High Channel



3.5 Radiated Emissions

3.5.1 Requirements

Compliance Standard: FCC Part 15.247, 15.209, 15.205

Radiated Emissions, Compliance Limits	
Frequency Range	Class B Equivalent (3-meters)
30 – 88 MHz	100 µV/m
88 – 216 MHz	150 µV/m
216 – 960 MHz	200 µV/m
> 960 MHz	500 µV/m

3.5.2 Test Procedure

The requirements of FCC Part 15 and ICES-003 call for the EUT to be placed on a 1 X 1.5 meters non-conductive motorized turntable for radiated testing on a 3-meter open air test site. The height of the table is 80cm for testing below 1GHz. The height of the table is 150cm for testing above 1GHz.

The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Bi-conical and log periodic broadband antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The output of the antenna was connected to the input of the spectrum analyzer and the emissions in the frequency range of 30 MHz to 25 GHz were measured. Both the horizontal and vertical field components were measured.

The output from the antenna was connected, via a preamplifier, to the input of the spectrum analyzer. The detector function was set to quasi-peak or peak, as appropriate. Above 1GHz average measurement are recorded. The measurement bandwidth of the spectrum analyzer system was set to at least 120 kHz, with all post-detector filtering no less than 10 times the measurement bandwidth. Frequencies above 1GHz were performed using a measurement bandwidth of 1 MHz with a video bandwidth setting of 10 Hz for the average measurement.

3.5.3 Test Results Summary

The EUT complies with the radiated emissions requirements of this section.

3.5.4 Radiated Data Reduction and Reporting

To convert the raw spectrum analyzer radiated data into a form that can be compared with the FCC limits, it is necessary to account for various calibration factors that are supplied with the antennas and other measurement accessories. These factors are included into the antenna factor (AF) column of the table and in the cable factor (CF) column of the table. The AF (in dB/m) and the CF (in dB) is algebraically added to the raw Spectrum Analyzer Voltage in dBµV to obtain the Radiated Electric Field in dBµV/m. This logarithm amplitude is converted to a linear amplitude, then compared to the FCC limit.

Example:

Spectrum Analyzer Voltage:	VdBµV
Antenna Correction Factor:	AFdB/m
Cable Correction Factor:	CFdB
Pre-Amplifier Gain:	GdB
Electric Field:	EdBµV/m = V dBµV + AFdB/m + CFdB - GdB
Convert to linear unit:	EdBµV/m/20 Inv log

3.5.5 Test Data

The EUT was investigated for worst-case emissions. This included evaluating the unit with two different lengths of vibrating hose, which showed no significant difference. Additionally, both the DCHE310 and DCHE320 models were investigated to determine worst-case emissions. There is no significant difference between the models.

The EUT was scanned for co-location unwanted emissions and products of intermodulation.

There were no EUT emissions detected in the frequency range of 3 GHz to 25 GHz.

A complete investigation of the radiated fundamental field strength was performed

The EUT was configured to transmit a modulated signal as follows:

a) for testing of 30 MHz to 1 GHz, the EUT was set to a transmitter enabled mode, the BLE transceiver was set to sweep the 2.4GHz ISM band, in an active hopping.

b) for testing of 1 GHz to 25 GHz, the EUT was set to a transmitter enabled mode, the BLE transceiver was set to dwell on the low channel.

c) The module in the Proteus battery pack was set to dwell on 2404 MHz.

Please accept the 30MHz to 1GHz data to cover the digital portion under the provisions of 15.109(a).

Table 6: Radiated Emissions Test Data, 30MHz 1GHz (OATS)

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr. Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Detector
40.62	V	0	1.2	37.9	-7.7	32.0	100.0	-9.9	QP
41.10	H	180	1.4	44.9	-8.0	69.9	100.0	-3.1	QP
57.17	V	0	1.2	36.5	-11.4	17.8	100.0	-15.0	QP
57.35	H	180	1.3	44.9	-11.4	47.0	100.0	-6.6	QP
172.95	V	0	1.2	25.2	-6.4	8.7	150.0	-24.7	QP
183.69	H	180	1.4	36.7	-6.9	30.6	150.0	-13.8	QP
249.97	H	180	1.2	41.5	-6.1	59.2	200.0	-10.6	QP

Table 7: Radiated Emissions Test Data, 1GHz to 25GHz (FACT3)

Frequency (GHz)	Detector	Meas (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Turn Table (deg)	Antenna (cm)
2.390	Peak	43.954	74	-30.046	180	Vert, 185
	Avg	29.587	54	-24.413	180	Vert, 185
2.402	Peak	82.818	--	--	20	Horiz, 150
2.404	Peak	80.642	--	--	180	Vert, 185
11.811 *	Peak	60.57	54	-13.43	20	Horiz, 150
	Avg	46.418	74	-7.582	20	Horiz, 150

* ambient after 3GHz

4 Test Equipment

The table below provides a list of the test equipment used for measurements along with the calibration information.

Table 8: Test Equipment List

Test Name:	**Radiated Emissions**	Testing Date: 9/25/2024 and 9/26/2024	
Asset #	**Manufacturer/Model**	**Description**	**Cal. Due**
00644	SUNOL SCIENCES CORP.	BICONALOG ANTENNA	11/7/2024
00425	ARA, DRG-118/A	ANTENNA DRG 1-18GHZ	11/7/2024
00955	JUNKOSHA USA MWX32	18M HF COAXIAL CABLE	7/1/2025
00865	STORM 874-0101-036	HF COAXIAL CABLE	6/25/2025
00276	ELECTRO-METRICS	RF PRE-AMPLIFIER	6/25/2025
00522	HP, 8449B	HF PRE-AMPLIFIER	3/29/2025
00823	AGILENT N9010A	EXA SPECTRUM ANALYZER	6/21/2026

5 Measurements

5.1.1 References

ANSI C63.2 (1/2016) Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 (1/2014) American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

ANSI C63.10 (9/2020) American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Office of Engineering and Technology (OET), Exhibits List for FCC ID: YJ7-NA230951, "NA230951 LMA BT Module Integration Manual Rev 1 (8/7/2024); retrieved from: https://apps.fcc.gov/oetcf/eas/reports/ViewExhibitReport.cfm?mode=Exhibits&RequestTimeout=500&calledFromFrame=Y&application_id=93q9gtVuYkOkz%2BWeJ40NcQ%3D%3D&fcc_id=YJ7-NA230951

5.2 Measurement Uncertainty

All results reported herein relate only to the equipment tested. The basis for uncertainty calculation uses ANSI/NCSL Z540-2-1997 (R2002) with a type B evaluation of the standard uncertainty. Elements contributing to the standard uncertainty are combined using the method described in Equation 1. to arrive at the total standard uncertainty. The standard uncertainty is multiplied by the coverage factor to determine the expanded uncertainty which is generally accepted for use in commercial, industrial, and regulatory applications and when health and safety are concerned (see Equation 2). A coverage factor was selected to yield a 95% confidence in the uncertainty estimation.

Equation 1: Standard Uncertainty

$$u_c = \pm\sqrt{\frac{a^2}{div_a{}^2} + \frac{b^2}{div_b{}^2} + \frac{c^2}{div_c{}^2} + ...}$$

where,

uc	= standard uncertainty
a, b, c,..	= individual uncertainty elements
Diva, b, c	= the individual uncertainty element divisor based on the probability distribution
Divisor	= 1.732 for rectangular distribution
Divisor	= 2 for normal distribution
Divisor	= 1.414 for trapezoid distribution

Equation 2: Expanded Uncertainty

$$U = ku_c$$

where,

U = expanded uncertainty
k = coverage factor
k ≤ 2 for 95% coverage (ANSI/NCSL Z540-2 Annex G)
uc = standard uncertainty

The measurement uncertainty complies with the maximum allowed uncertainty from CISPR 16-4-2. Measurement uncertainty is not used to adjust the measurements to determine compliance. The expanded uncertainty values for the various scopes in the WLL accreditation are provided in the table below.

Table 9: Expanded Uncertainty List

Scope	Standard(s)	Expanded Uncertainty
Conducted Emissions	CISPR11, CISPR32, CISPR14, FCC Part 15	± 2.63 dB
Radiated Emissions	CISPR11, CISPR32, CISPR14, FCC Part 15	± 4.55 dB

5.3 Environmental Conditions

Environmental Conditions During All Measurements

Ambient Temperature:	Between 19.9 and 23.9 °C
Relative Humidity:	Between 45 and 60 %

Annex A

This Annex provides the module's integration guide and permissive change test plan. The information provided in this section was retrieved from the EUT original filing exhibits.

NA230951 LMA BT Module Integration Manual Rev 1

August 6, 2024

The NA230951 BT module is intended only for use in proprietary Stanley Black and Decker power tools and lighting products. It is not intended for sale to third parties and these integration instructions are internal, manufacturing documents.

FCC Part 15.212(a)(1) Modular Transmitter Requirements:

(i) The module does not have its own shielding. The end-product host must be additionally tested to ensure continued RF compliance when this module is implemented. This testing must include spurious radiated emissions testing. See the host testing guidance in this integration manual.

(ii) The module's data inputs are buffered internal to the Bluetooth IC on the module.

(iii) The module contains its own power supply regulation, separate from the host.

(iv) The antenna for the module is permanent and etched into the module PCB. The antenna design cannot be changed without a Class II permissive change application for this module.

(v) The module has been tested in a stand-alone configuration, independent of any host device.

(vi) The module is labeled with its FCC ID and IC number granted by the FCC and ISED after authorization. These identification numbers must appear on a permanent label on the host device. See the labeling instructions in this integration manual.

(vii) The module complies with FCC Part 15C, Intentional Radiator requirements. § 15.247
describes operation requirements for the module transmit frequency range of 2400-2483.5 MHz.

(viii) The module meets Portable exclusion levels.

Module Integration Instructions:

The NA230951 module is an intentional radiator and is therefore governed by the FCC rules 47 CFR Part 15, Subpart C. As a Bluetooth radio transmitting in the frequency range 2400-2483.5 MHz, § 15.247 applies. The module is not for sale and only to be used by the Grantee in their proprietary power tools without any modifications to the radio circuitry or PCB antenna.

The NA230951 Grant of Authorization is issued as a Limited Modular Approval because the module does not have its own RF shield. As such, deployment of the module in a host device requires a Class II Permissive Change filing for the module. The host product must also be evaluated for RF exposure.

A fixed PCB trace antenna is integral to this radio module. This antenna cannot be modified in any way without a Class II Permissive Change filing for the module.

Changes or modifications to the module not expressly approved by Stanley Black & Decker could void the user's authority to operate the device.

Host Device Testing Guidance:

Because of the Limited Modular Approval of the NA230951 due to the lack of a shield, extra care must be exercised when evaluating all end-product hosts incorporating this module. In particular, the host device must be evaluated using the following test plan to demonstrate compliance with the following:

FCC Rule Part: 15.247
Approval FCC ID: YJ7-NA230951
Modulation Modes: 1 Mb/s and 2 Mb/s
Maximum power: Low Channel, 1.23 mW (1 Mb/s)
Highest Spectral Density: Low Channel (1 Mb/s)
Highest Occupied Bandwidth: Low Channel (2 Mb/s)

Based on this test data from the module filing, confirm and then select the worst-case channel in the host for each band under each specific rule part and verify that each specific fundamental frequency remains in full compliance with the respective rule part (i.e. 15.247 for Bluetooth LE).

The host device must be investigated with the NA230951 module in each modulation mode (1 Mb/s and 2 Mb/s) to demonstrate full compliance with the specific rule part. The permissive change test data shall compliment the test data from the original module filing with regard to the worst-case modulation.

With the NA230951 module set to hop between low-, mid-, and high-channels, record the radiated emissions band edge measurements for both the widest and narrowest BW available to ensure the host device is compliant.

Per Part 15.31(m), one frequency near the low-end, one frequency near the middle, and one frequency near the high-end of the frequency range of the module must be evaluated in the host device. The worst- case channel may be confirmed through an approved investigation. The widest BW, highest aggregate power, and highest power spectral density conditions shall be investigated. If these conditions do not occur within the same operating mode of the module, then multiple modes require testing. Only the data for worst-case condition among the modes needs to be included in the permissive change report if the overall testing strategy is explained and justified. For the LMA NA230951, since it has no shield, testing of radiated spurious emissions shall cover the 10th harmonic of the fundamental, per the requirements in Part 15.247, to confirm no additional parasitic non-compliant emissions exist. In all cases, a test of each worst-case modulation is required for channels over the frequency range defined in Part 15.33(a).

Lastly, confirm and demonstrate with the host radiated testing that no additional parasitic, non-compliant emissions exist due to ingress (parasitic oscillations, radiation of stray signals within a host, etc.). This can be based on ANSI C63.10 and C63.26. Complete FCC Part 15, Subpart B testing as necessary.

If the host device contains additional intentional radiator devices, modular or otherwise, all transmitter devices must be operated simultaneous to ensure that the transmitters can be co-located. The host device is otherwise operated in a typical user mode. The antenna used for this transmitter must not transmit simultaneously with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures.

This modular transmitter is ONLY authorized for the specific FCC and ISED intentional radiator rules listed in the grants of authorization. The host device must be evaluated for RF compliance to any other FCC and ISED rules that apply to the host device and not covered by the modular transmitter grant. At a minimum, the host device must be evaluated for compliance to 47 CFR Part 15, Subpart B with the module installed.

All new host configurations require a Class II Permissive Change filing to the LMA authorization of this module.

Refer to the FCC KDB 996369 D04 Module Integration Guide for additional guidance.

Host Device Labeling Instructions:

The host device employing the NA230951 module shall be permanently marked with a label stating, “Contains FCC ID: YJ7-NA230951” and “Contains IC: 9082A-NA230951”. If the host device employs additional certified modules, the FCC ID and IC number for each additional module can be appended to each statement. The two statements can be combined so that only one “Contains” is used, but the other text is required. E-labeling of the host device is also allowed. Check current agency regulations for e- labeling.

Host devices that comply with the RF requirements must follow the Labeling requirements in §15.19 of 47 CFR Part 15 and bear the following compliance statement in a conspicuous location on the device if space allows. If there isn’t enough space to accommodate this compliance statement in at least 4 point size, the statement must be included in the user manual and on the packaging of the host device.

“This device complies with part 15 of the FCC Rules and Industry Canada License-exempt RSS standard(s). 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.”