



# RADIO TEST REPORT FCC ID: 2A74I-TLL161191

Product: Bluetooth Speaker Trade Mark: Tellur Model No.: TLL161191 Family Model: N/A Report No.: S23031501201001 Issue Date: Mar 28. 2023

## Prepared for

ABN SYSTEMS INTERNATIONAL S.A.

Str. Marinarilor, nr. 31, Sector 1, Bucuresti, Romania

## Prepared by

Shenzhen NTEK Testing Technology Co., Ltd. 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street Bao'an District, Shenzhen 518126 P.R. China Tel. 400-800-6106, 0755-2320 0050, 0755-2320 0090 Website: http://www.ntek.org.cn





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## **1 TEST RESULT CERTIFICATION**

Applicant's name:	ABN SYSTEMS INTERNATIONAL S.A.
Address:	Str. Marinarilor, nr. 31, Sector 1, Bucuresti, Romania
Manufacturer's Name:	ABN SYSTEMS INTERNATIONAL S.A.
Address:	Str. Marinarilor, nr. 31, Sector 1, Bucuresti, Romania
Product description	
Product name:	Bluetooth Speaker
Model and/or type reference:	TLL161191
Family Model:	N/A
Sample number	S230315012002

#### Measurement Procedure Used:

### APPLICABLE STANDARDS

STANDARD/ TEST PROCEDURE	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C ANSI C63.10-2013	Complied

This device described above has been tested by Shenzhen NTEK Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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The test results of this report relate only to the tested sample identified in this report.

Date of Test	:	Mar 15, 2023 ~ Mar 27, 2023
Testing Engineer	:	Allen Liu)
		(Allen Liu)
Authorized Signatory		Aless
rationzoa orginatory	•	(Alex Li)





	FCC Part15 (15.247), Subpart	С	
Standard Section	Test Item	Verdict	Remark
15.207	Conducted Emission	PASS	
15.209 (a) 15.205 (a)	Radiated Spurious Emission	PASS	
15.247(a)(1)	Hopping Channel Separation	PASS	
15.247(b)(1)	Peak Output Power	PASS	
15.247(a)(iii)	Number of Hopping Frequency	PASS	
15.247(a)(iii)	Dwell Time	PASS	
15.247(a)(1)	Bandwidth	PASS	
15.247 (d)	Band Edge Emission	PASS	
15.247 (d)	Spurious RF Conducted Emission	PASS	
15.203	Antenna Requirement	PASS	

Remark:

 "N/A" denotes test is not applicable in this Test Report.
 All test items were verified and recorded according to the standards and without any deviation during the test.





## **3 FACILITIES AND ACCREDITATIONS**

#### 3.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R. China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

#### 3.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description	
CNAS-Lab.	: The Certificate Registration Number is L5516.
IC-Registration	The Certificate Registration Number is 9270A.
	CAB identifier:CN0074
FCC- Accredited	Test Firm Registration Number: 463705.
	Designation Number: CN1184
A2LA-Lab.	The Certificate Registration Number is 4298.01
	This laboratory is accredited in accordance with the recognized
	International Standard ISO/IEC 17025:2005 General requirements for
	the competence of testing and calibration laboratories.
	This accreditation demonstrates technical competence for a defined
	scope and the operation of a laboratory quality management system
	(refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).
Name of Firm	: Shenzhen NTEK Testing Technology Co., Ltd.
Site Location	: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang
	Street, Bao'an District, Shenzhen 518126 P.R. China.

#### 3.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y\pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	±2.80dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(30MHz~1GHz)	±2.64dB
5	All emissions, radiated(1GHz~6GHz)	±2.40dB
6	All emissions, radiated(>6GHz)	±2.52dB
7	Temperature	±0.5°C
8	Humidity	±2%
9	All emissions, radiated(9KHz~30MHz)	±6dB





## 4 GENERAL DESCRIPTION OF EUT

Product Feature and Specification		
Equipment	Bluetooth Speaker	
Trade Mark	Tellur	
FCC ID	2A74I-TLL161191	
Model No.	TLL161191	
Family Model	N/A	
Model Difference	N/A	
Operating Frequency	2402MHz~2480MHz	
Modulation	GFSK, π/4-DQPSK	
Number of Channels	79 Channels	
Antenna Type	PCB Antenna	
Antenna Gain	-0.58 dBi	
Adapter	N/A	
Battery	DC 3.7V, 3000mAh	
Power supply	DC 3.7V from battery or DC 5V from USB Port.	
HW Version	N/A	
SW Version	N/A	

Note 1: Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.

Note 2: The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.





Certificate #4298.01			
Revision History			
Report No.	Version	Description	Issued Date
S23031501201001	Rev.01	Initial issue of report	Mar 28. 2023
			<u> </u>





## 5 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (1Mbps for GFSK modulation; 2Mbps for  $\pi/4$ -DQPSK modulation;) were used for all test. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

Carrier Frequency and Channel list:

Channel	Frequency(MHz)
0	2402
1	2403
39	2441
40	2442
77	2479
78	2480

Note: fc=2402MHz+k×1MHz k=0 to 78

The following summary table is showing all test modes to demonstrate in compliance with the standard.

For AC Conducted Emission	
Final Test Mode	Description
Mode 1	normal link mode

Note: AC power line Conducted Emission was tested under maximum output power.

For Radiated Test Cases		
Final Test Mode	Description	
Mode 1	normal link mode	
Mode 2	CH00(2402MHz)	
Mode 3	CH39(2441MHz)	
Mode 4	CH78(2480MHz)	

Note: For radiated test cases, the worst mode data rate 2Mbps was reported only, because this data rate has the highest RF output power at preliminary tests, and no other significantly frequencies found in conducted spurious emission.

For Conducted Test Cases				
Final Test Mode	Description			
Mode 2	CH00(2402MHz)			
Mode 3	CH39(2441MHz)			
Mode 4	CH78(2480MHz)			
Mode 5	Hopping mode			

Note: The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.





6 SETUP OF EQUIPMENT UNDER TEST	
6.1 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM	
For AC Conducted Emission Mode AC PLUG C-1 AE-1 Adapter Adapter	
For Radiated Test Cases	
For Conducted Test Cases	
Measurement C-2 EUT	
<ul> <li>Note: 1. The temporary antenna connector is soldered on the PCB board in order to prand this temporary antenna connector is listed in the equipment list.</li> <li>2. EUT built-in battery-powered, the battery is fully-charged.</li> </ul>	erform conducted test





#### 6.2 SUPPORT EQUIPMENT

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Model/Type No.	Series No.	Note
AE-1	Adapter	N/A	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	USB Cable	NO	NO	1.0m
C-2	RF Cable	YES	NO	0.1m

#### Notes:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in [Length] column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".





#### 6.3 EQUIPMENTS LIST FOR ALL TEST ITEMS

#### Radiation& Conducted Test equipment

uuluu		corequipment					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibrati on period
1	Spectrum Analyzer	Aglient	E4407B	MY45108040	2022.04.06	2023.04.05	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2022.04.06	2023.04.05	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2022.04.06	2023.04.05	1 year
4	Test Receiver	R&S	ESPI7	101318	2022.04.06	2023.04.05	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2022.03.30	2023.03.29	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
7	Horn Antenna	EM	EM-AH-1018 0	2011071402	2022.03.31	2023.03.30	1 year
8	Broadband Horn Antenna	SCHWARZBE CK	BBHA 9170	803	2022.11.08	2023.11.07	1 year
9	Amplifier	EMC	EMC051835 SE	980246	2022.06.17	2023.06.16	1 year
10	Active Loop Antenna	SCHWARZBE CK	FMZB 1519 B	055	2022.11.08	2023.11.07	1 year
11	Power Meter	DARE	RPR3006W	15I00041SN 084	2022.11.08	2023.11.07	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2020.05.11	2023.05.10	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2020.05.11	2023.05.10	3 year
14	High Test Cable(1G-40G Hz)	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
15	Filter	TRILTHIC	2400MHz	29	2022.11.08	2023.11.07	1 year
16	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

Note:

We will use the temporary antenna connector (soldered on the PCB board) When conducted test And this temporary antenna connector is listed within the instrument list





AC Co	AC Conduction Test equipment						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2022.04.06	2023.04.05	1 year
2	LISN	R&S	ENV216	101313	2022.04.06	2023.04.05	1 year
3	LISN	SCHWARZBE CK	NNLK 8129	8129245	2022.04.06	2023.04.05	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2020.05.11	2023.05.10	3 year
5	Test Cable (9KHz-30MH z)	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
6	Test Cable (9KHz-30MH z)	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
7	Test Cable (9KHz-30MH z)	N/A	C03	N/A	2020.05.11	2023.05.10	3 year

Note: Each piece of equipment is scheduled for calibration once a year except the Aux Equipment & Test Cable which is scheduled for calibration every 2 or 3 years.





#### 7 TEST REQUIREMENTS

#### 7.1 CONDUCTED EMISSIONS TEST

#### 7.1.1 Applicable Standard

According to FCC Part 15.207(a)

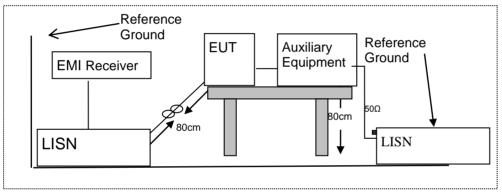
#### 7.1.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit		
Frequency(MHz)	Quasi-peak	Average	
0.15-0.5	66-56*	56-46*	
0.5-5.0	56	46	
5.0-30.0	60	50	

Note: 1. \*Decreases with the logarithm of the frequency

- 2. The lower limit shall apply at the transition frequencies
  - 3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

#### 7.1.3 Test Configuration



#### 7.1.4 Test Procedure

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
- 2. The EUT was placed on a table which is 0.8m above ground plane.
- Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable
  may be terminated, if required, using the correct terminating impedance. The overall length shall not
  exceed 1 m.
- 6. LISN at least 80 cm from nearest part of EUT chassis.
- 7. The frequency range from 150KHz to 30MHz was searched.
- 8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
- 9. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 7.1.5 Test Results

Pass





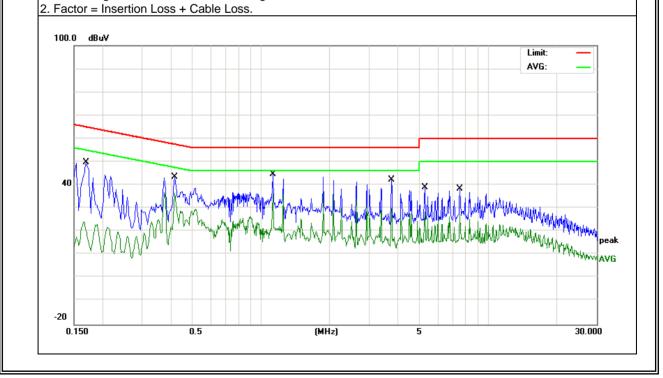
### 7.1.6 Test Results

EUT:	Bluetooth Speaker	Model Name :	TLL161191
Temperature:	<b>22</b> ℃	Relative Humidity:	57%
Pressure:	1010hPa	Phase :	L
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode:	Mode 1

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Domork
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	- Remark
0.1700	40.19	9.61	49.80	64.96	-15.16	QP
0.1700	10.57	9.61	20.18	54.96	-34.78	AVG
0.4180	33.80	9.66	43.46	57.49	-14.03	QP
0.4180	26.76	9.66	36.42	47.49	-11.07	AVG
1.1260	35.12	9.68	44.80	56.00	-11.20	QP
1.1260	26.69	9.68	36.37	46.00	-9.63	AVG
3.7540	32.51	9.75	42.26	56.00	-13.74	QP
3.7540	20.19	9.75	29.94	46.00	-16.06	AVG
5.2580	29.28	9.78	39.06	60.00	-20.94	QP
5.2580	18.56	9.78	28.34	50.00	-21.66	AVG
7.5060	28.43	9.85	38.28	60.00	-21.72	QP
7.5060	17.44	9.85	27.29	50.00	-22.71	AVG

Remark:

1. All readings are Quasi-Peak and Average values.







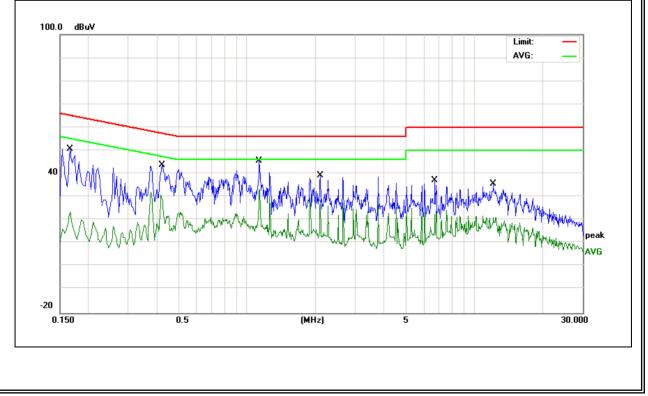
EUT:	Bluetooth Speaker	Model Name :	TLL161191
Temperature:	<b>25</b> ℃	Relative Humidity:	62%
Pressure:	1010hPa	Phase :	N
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode:	Mode 1

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Remark
0.1660	41.03	9.65	50.68	65.15	-14.47	QP
0.1660	14.13	9.65	23.78	55.15	-31.37	AVG
0.4220	33.96	9.67	43.63	57.41	-13.78	QP
0.4220	19.51	9.67	29.18	47.41	-18.23	AVG
1.1300	35.90	9.68	45.58	56.00	-10.42	QP
1.1300	23.22	9.68	32.90	46.00	-13.10	AVG
2.1020	29.48	9.67	39.15	56.00	-16.85	QP
2.1020	18.70	9.67	28.37	46.00	-17.63	AVG
6.7100	27.32	9.81	37.13	60.00	-22.87	QP
6.7100	12.52	9.81	22.33	50.00	-27.67	AVG
12.1420	25.71	9.97	35.68	60.00	-24.32	QP
12.1420	11.38	9.97	21.35	50.00	-28.65	AVG

#### Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.







#### 7.2 RADIATED SPURIOUS EMISSION

#### 7.2.1 Applicable Standard

#### According to FCC Part 15.247(d) and 15.209 and ANSI C63.10-2013

#### 7.2.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)). According to FCC Part15.205, Restricted bands

7.0001 all g to 1 00 1 alt 10.20			
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Restricted Frequency(MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)	Measurement Distance	
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300	
0.490~1.705	24000/F(KHz)	20 log (uV/m)	30	
1.705~30.0	30	29.5	30	
30-88	100	40	3	
88-216	150	43.5	3	
216-960	200	46	3	
Above 960	500	54	3	

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)					
Frequency(iviriz)	PEAK	AVERAGE				
Above 1000	74	54				

Remark :1. Emission level in dBuV/m=20 log (uV/m)

Measurement was performed at an antenna to the closed point of EUT distance of meters.
 For Frequency 9kHz~30MHz:

Distance extrapolation factor =40log(Specific distance/ test distance)(dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.

For Frequency above 30MHz:

Distance extrapolation factor =20log(Specific distance/ test distance)(dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.



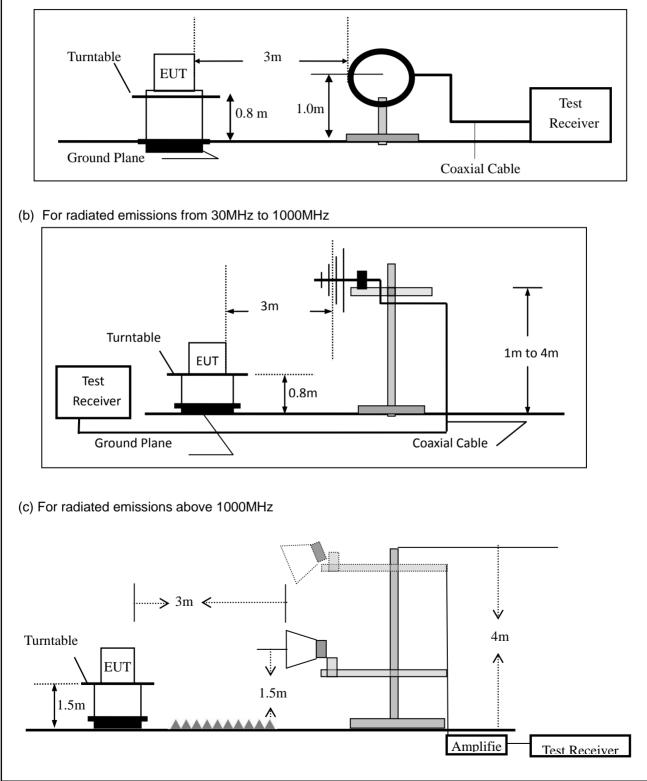


#### 7.2.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.2.4 Test Configuration

#### (a) For radiated emissions below 30MHz







#### 7.2.5 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

	-
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 1 MHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- e. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- f. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- g. For the actual test configuration, please refer to the related Item –EUT Test Photos.
  - Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported





During the radiated emission test, the Spectrum Analyzer was set with the following configurations:										
Frequency Band (MHz)	Function	Video Bandwidth								
30 to 1000	QP	120 kHz	300 kHz							
Ah awa 4000	Peak	1 MHz	1 MHz							
Above 1000	Average	1 MHz	1 MHz							

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10\*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

#### 7.2.6 Test Results

	Spurious Emission	below 30MHz	(9KHz to 30MHz)
--	-------------------	-------------	-----------------

EUT:	Bluetooth Speaker	Model No.:	TLL161191
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Allen Liu

Freq.	Freq. Ant.Pol.		.evel(dBuV/m)	Limit 3	m(dBuV/m)	Over(dB) PK AV		
(MHz)	H/V	PK	AV	PK	AV	PK	AV	

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.





Spurious Emission below 1GHz (30MHz to 1GHz) All the modulation modes have been tested, and the worst result was report as below: EUT: Bluetooth Speaker TLL161191 Model Name : Temperature: **25°**℃ 55% **Relative Humidity:** 1010hPa Test Mode: Mode 3 GFSK Pressure: DC 3.7V Test Voltage : Emission Meter Frequency Factor Limits Margin Polar Reading Level Remark (H/V) (MHz) (dBuV) (dB) (dBuV/m) (dBuV/m) (dB) V 33.4449 9.88 18.08 27.96 40.00 -12.04 QP 20.62 28.97 QP V 45.6948 8.35 40.00 -11.03 V 167.8241 14.07 15.76 29.83 43.50 -13.67 QP V 191.7450 19.09 17.58 36.67 43.50 -6.83 QP V 383.9318 12.27 21.67 33.94 46.00 -12.06 QP V 480.5276 16.80 23.15 39.95 46.00 -6.05 QP Remark: Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit 72.0 dBuV/m Limit: Margin: 6 A 5 x 32 3 2 1 , Î -8 30.000 40 50 60 70 80 (MHz) 300 400 500 600 700 1000.000

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Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Н	47.1599	6.09	20.78	26.87	40.00	-13.13	QP
Н	105.2718	5.60	18.80	24.40	43.50	-19.10	QP
Н	146.3735	9.98	15.02	25.00	43.50	-18.50	QP
Н	191.7450	13.15	17.58	30.73	43.50	-12.77	QP
Н	480.5276	8.35	23.15	31.50	46.00	-14.50	QP
Н	766.0570	7.34	27.51	34.85	46.00	-11.15	QP
						Limit: Margin:	
-						6	
32	used on an other standard and and an other standard and an other	Normal manager approved	2 3 ************************************	4 And And And And And And And And And And	5 X WWWWWWWWWW		North Contract of the Contract
_				Hz)	300 400 50	0 600 700	1000.000





Spurious E	Spurious Emission Above 1GHz (1GHz to 2 JT: Bluetooth Speaker				,	ТІ	L161191				
emperature:						48%					
•											
est Mode:				Test By			en Liu				
Il the modulat	ion modes	nave bee	en testea,	and the w	orst result	t was re	port as belo	W:			
Frequency	Read Level	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Remark	Comment		
(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBµV/n	n) (dB)				
Low Channel (2402 MHz)( π/4-DQPSK)Above 1G											
4804.214	64.26	5.21	35.59	44.30	60.76	74.00	-13.24	Pk	Vertical		
4804.214	41.90	5.21	35.59	44.30	38.40	54.00	-15.60	AV	Vertical		
7206.265	61.58	6.48	36.27	44.60	59.73	74.00	-14.27	Pk	Vertical		
7206.265	45.22	6.48	36.27	44.60	43.37	54.00	-10.63	AV	Vertical		
4804.109	61.78	5.21	35.55	44.30	58.24	74.00	-15.76	Pk	Horizontal		
4804.109	43.13	5.21	35.55	44.30	39.59	54.00	-14.41	AV	Horizontal		
7206.224	62.78	6.48	36.27	44.52	61.01	74.00	-12.99	Pk	Horizontal		
7206.224	48.05	6.48	36.27	44.52	46.28	54.00	-7.72	AV	Horizontal		
		N	lid Channel	(2441 MHz)	441 MHz)( π/4-DQPSK)Above 1G						
4882.396	62.35	5.21	35.66	44.20	59.02	74.00	-14.98	Pk	Vertical		
4882.396	43.92	5.21	35.66	44.20	40.59	54.00	-13.41	AV	Vertical		
7323.241	60.23	7.10	36.50	44.43	59.40	74.00	-14.60	Pk	Vertical		
7323.241	48.38	7.10	36.50	44.43	47.55	54.00	-6.45	AV	Vertical		
4882.108	61.21	5.21	35.66	44.20	57.88	74.00	-16.12	Pk	Horizontal		
4882.108	48.72	5.21	35.66	44.20	45.39	54.00	-8.61	AV	Horizontal		
7323.132	61.56	7.10	36.50	44.43	60.73	74.00	-13.27	Pk	Horizontal		
7323.132	42.82	7.10	36.50	44.43	41.99	54.00	-12.01	AV	Horizontal		
		Hi	gh Channel	(2480 MHz) I	( π/4-DQPSh	<) Above	1G	1	1		
4960.397	67.33	5.21	35.52	44.21	63.85	74.00	-10.15	Pk	Vertical		
4960.397	42.79	5.21	35.52	44.21	39.31	54.00	-14.69	AV	Vertical		
7440.201	62.21	7.10	36.53	44.60	61.24	74.00	-12.76	Pk	Vertical		
7440.201	44.70	7.10	36.53	44.60	43.73	54.00	-10.27	AV	Vertical		
4960.225	67.90	5.21	35.52	44.21	64.42	74.00	-9.58	Pk	Horizontal		
4960.225	46.96	5.21	35.52	44.21	43.48	54.00	-10.52	AV	Horizontal		
7440.298	61.07	7.10	36.53	44.60	60.10	74.00	-13.90	Pk	Horizontal		
7440.298	46.00	7.10	36.53	44.60	45.03	54.00	-8.97	AV	Horizontal		

Note:

(1) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor (2)All other emissions more than 20dB below the limit.





	Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz										
ΕL	IT:	Bluetooth S	Speaker		Model I	No.:	TL	TLL161191			
Те	emperature: 20 °C			Relative	e Humidity	: 48	%				
Те	st Mode:	Mode2/ Mo	ode4		Test By	/:	All	en Liu			
A	I the modul	ation mode	s have be	en tested	, and the	worst resu	It was re	eport as belo	ow:		
	Frequency	Meter Reading	Cable Loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector	Comment	
	(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBµV/n	n) (dB)	Туре		
				2Mbp	s(π/4-DQPS	SK)-Non-hop	ping				
	2310.00	59.20	2.97	27.80	43.80	46.17	74	-27.83	Pk	Horizontal	
	2310.00	44.93	2.97	27.80	43.80	31.90	54	-22.10	AV	Horizontal	
	2310.00	58.20	2.97	27.80	43.80	45.17	74	-28.83	Pk	Vertical	
	2310.00	43.34	2.97	27.80	43.80	30.31	54	-23.69	AV	Vertical	
	2390.00	59.39	3.14	27.21	43.80	45.94	74	-28.06	Pk	Vertical	
	2390.00	42.67	3.14	27.21	43.80	29.22	54	-24.78	AV	Vertical	
	2390.00	57.92	3.14	27.21	43.80	44.47	74	-29.53	Pk	Horizontal	
	2390.00	42.78	3.14	27.21	43.80	29.33	54	-24.67	AV	Horizontal	
	2483.50	58.33	3.58	27.70	44.00	45.61	74	-28.39	Pk	Vertical	
	2483.50	43.14	3.58	27.70	44.00	30.42	54	-23.58	AV	Vertical	
	2483.50	59.14	3.58	27.70	44.00	46.42	74	-27.58	Pk	Horizontal	
	2483.50	42.82	3.58	27.70	44.00	30.10	54	-23.90	AV	Horizontal	
				2M	bps(π/4-DQ	PSK)-hoppir	ıg				
	2310.00	50.31	2.97	27.80	43.80	37.28	74.00	-36.72	Pk	Vertical	
	2310.00	42.55	2.97	27.80	43.80	29.52	54.00	-24.48	AV	Vertical	
	2310.00	50.52	2.97	27.80	43.80	37.49	74.00	-36.51	Pk	Horizontal	
	2310.00	41.71	2.97	27.80	43.80	28.68	54.00	-25.32	AV	Horizontal	
	2390.00	53.46	3.14	27.21	43.80	40.01	74.00	-33.99	Pk	Vertical	
	2390.00	40.60	3.14	27.21	43.80	27.15	54.00	-26.85	AV	Vertical	
	2390.00	54.03	3.14	27.21	43.80	40.58	74.00	-33.42	Pk	Horizontal	
	2390.00	40.71	3.14	27.21	43.80	27.26	54.00	-26.74	AV	Horizontal	
	2483.50	50.12	3.58	27.70	44.00	37.40	74.00	-36.60	Pk	Vertical	
	2483.50	41.03	3.58	27.70	44.00	28.31	54.00	-25.69	AV	Vertical	
	2483.50	50.66	3.58	27.70	44.00	37.94	74.00	-36.06	Pk	Horizontal	
	2483.50	40.18	3.58	27.70	44.00	27.46	54.00	-26.54	AV	Horizontal	

Note: (1) All other emissions more than 20dB below the limit.





	Spurious E	Emission in	Restricte	ed Band 32	260MHz-1	8000MHz					
EUT: Bluetooth Speaker				Model I	No.:		TLL1	61191			
Ter	mperature:	<b>20</b> ℃			Relativ	e Humidity	<i>'</i> :	48%			
Tes	Test Mode: Mode2/ Mode4 1			Test By	/:		Allen	Liu			
All	All the modulation modes have been tested, an			, and the	worst resu	lt wa	as repo	ort as belo	ow:		
	Frequency Readin Level		Cable Loss	Antenna Factor	Preamp Factor	Emission Level	Li	mits	Margin	Detector	Comment
	(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBj	µV/m)	(dB)	Туре	
	3260 61.91		4.04	29.57	44.70	50.82	-	74	-23.18	Pk	Vertical
	3260 57.46		4.04	29.57	44.70	46.37		54	-7.63	AV	Vertical
	3260	62.10	4.04	29.57	44.70	51.01	-	74	-22.99	Pk	Horizontal
	3260	56.55	4.04	29.57	44.70	45.46		54	-8.54	AV	Horizontal
	3332	64.19	4.26	29.87	44.40	53.92	-	74	-20.08	Pk	Vertical
	3332	53.97	4.26	29.87	44.40	43.70		54	-10.30	AV	Vertical
	3332	62.20	4.26	29.87	44.40	51.93	-	74	-22.07	Pk	Horizontal
	3332	53.60	4.26	29.87	44.40	43.33	:	54	-10.67	AV	Horizontal
	17797	43.84	10.99	43.95	43.50	55.28	-	74	-18.72	Pk	Vertical
	17797	33.74	10.99	43.95	43.50	45.18	:	54	-8.82	AV	Vertical
	17788	44.12	11.81	43.69	44.60	55.02	-	74	-18.98	Pk	Horizontal
	17788	32.64	11.81	43.69	44.60	43.54		54	-10.46	AV	Horizontal

Note: (1) All other emissions more than 20dB below the limit.





#### 7.3 NUMBER OF HOPPING CHANNEL

#### 7.3.1 Applicable Standard

According to FCC Part 15.247(a)(1) (iii)and ANSI C63.10-2013

#### 7.3.2 Conformance Limit

Frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

#### 7.3.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.3.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.3.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.3 The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = the frequency band of operation RBW : To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller. VBW  $\geq$  RBW Sweep = auto Detector function = peak Trace = max hold

#### 7.3.6 Test Results

EUT:	Bluetooth Speaker	Model No.:	TLL161191
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode 5(1Mbps)	Test By:	Allen Liu





#### 7.4 HOPPING CHANNEL SEPARATION MEASUREMENT

#### 7.4.1 Applicable Standard

According to FCC Part 15.247(a)(1) and ANSI C63.10-2013

#### 7.4.2 Conformance Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band shall have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

#### 7.4.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.4.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.4.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.2

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = Measurement Bandwidth or Channel Separation

RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.

VBW ≥ RBW Sweep = auto

Detector function = peak Trace = max hold

#### 7.4.6 Test Results

EUT:	Bluetooth Speaker	Model No.:	TLL161191
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Allen Liu





#### 7.5 AVERAGE TIME OF OCCUPANCY (DWELL TIME)

#### 7.5.1 Applicable Standard

According to FCC Part 15.247(a)(1)(iii) and ANSI C63.10-2013

#### 7.5.2 Conformance Limit

The average time of occupancy on any channel shall not be greater than 0.4s within a period of 0.4s multiplied by the number of hopping channels employed.

#### 7.5.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.5.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.5.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.4 The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel RBW  $\geq$  1MHz VBW  $\geq$  RBW Sweep = as necessary to capture the entire dwell time per hopping channel Detector function = peak Trace = max hold Measure the maximum time duration of one single pulse. Set the EUT for DH5, DH3 and DH1 packet transmitting. Measure the maximum time duration of one single pulse.





#### 7.5.6 **Test Results**

EUT:	Bluetooth Speaker	Model No.:	TLL161191
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Allen Liu

Test data reference attachment.

Note:

A Period Time = (channel number)\*0.4

DH1 Dwell time: Reading \* (1600/2)\*31.6/(channel number) DH3 Dwell time: Reading \* (1600/4)\*31.6/(channel number) DH5 Dwell time: Reading \* (1600/6)\*31.6/(channel number)

For Example:

- 1. In normal mode, hopping rate is 1600 hops/s with 6 slots in 79 hopping channels. With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4 x 79) (s), Hops Over Occupancy Time comes to  $(1600 / 6 / 79) \times (0.4 \times 79) = 106.67$  hops.
- 2. In AFH mode, hopping rate is 800 hops/s with 6 slots in 20 hopping channels. With channel hopping rate (800 / 6 / 20) in Occupancy Time Limit (0.4 x 20) (s), Hops Over Occupancy Time comes to  $(800 / 6 / 20) \times (0.4 \times 20) = 53.33$  hops.
- 3. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time





#### 7.6 20DB BANDWIDTH TEST

#### 7.6.1 Applicable Standard

According to FCC Part 15.247(a)(1) and ANSI C63.10-2013

#### 7.6.2 Conformance Limit

No limit requirement.

#### 7.6.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.6.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.6.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 6.9.2 The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. The EUT was operating in controlled its channel. Use the following spectrum analyzer settings: Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel RBW  $\geq$  1% of the 20 dB bandwidth VBW  $\geq$  RBW Sweep = auto Detector function = peak Trace = max hold

#### 7.6.6 Test Results

EUT:	Bluetooth Speaker	Model No.:	TLL161191
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Allen Liu





#### 7.7 PEAK OUTPUT POWER

#### 7.7.1 Applicable Standard

According to FCC Part 15.247(b)(1) and ANSI C63.10-2013

#### 7.7.2 Conformance Limit

The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts.

#### 7.7.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.7.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.7.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.5.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

 $RBW \ge the 20 dB$  bandwidth of the emission being measured

 $VBW \ge RBW$ 

Sweep = auto

Detector function = peak Trace = max hold

#### 7.7.6 Test Results

EUT:	Bluetooth Speaker	Model No.:	TLL161191	
Temperature:	<b>20</b> ℃	Relative Humidity:	48%	
Test Mode:	Mode2/Mode3/Mode4	Test By:	Allen Liu	





#### 7.8 CONDUCTED BAND EDGE MEASUREMENT

#### 7.8.1 Applicable Standard

According to FCC Part 15.247(d) and ANSI C63.10-2013

#### 7.8.2 Conformance Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.205(c)).

#### 7.8.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.8.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.8.5 Test Procedure

The testing follows ANSI C63.10-2013 clause 7.8.6.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT must have its hopping function enabled.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

RBW = 100KHz

VBW = 300KHz

Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.

Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

Repeat above procedures until all measured frequencies were complete.

#### 7.8.6 Test Results

EUT:	Bluetooth Speaker	Model No.:	TLL161191
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	Mode2 /Mode4/ Mode 5	Test By:	Allen Liu





#### 7.9 SPURIOUS RF CONDUCTED EMISSION

#### 7.9.1 Applicable Standard

According to FCC Part 15.247(d) and ANSI C63.10-2013.

#### 7.9.2 Conformance Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

#### 7.9.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.9.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.9.5 Test Procedure

Establish an emission level by using the following procedure:

a) Set the center frequency and span to encompass frequency range to be measured.

- b) Set the RBW = 100 kHz.
- c) Set the VBW  $\geq$  [3 × RBW].
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level.

Then the limit shall be attenuated by at least 20 dB relative to the maximum amplitude level in 100 kHz.

#### 7.9.6 Test Results

Remark: The measurement frequency range is from 30MHzHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.





#### 7.10 ANTENNA APPLICATION

#### 7.10.1 Antenna Requirement

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

#### 7.10.2 Result

The EUT antenna is permanent attached PCB antenna (Gain: -0.58dBi). It comply with the standard requirement.





#### 7.11 FREQUENCY HOPPING SYSTEM (FHSS) EQUIPMENT REQUIREMENTS 7.11.1 Standard Applicable

According to FCC Part 15.247(a)(1), The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals. (g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section. (h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

#### 7.11.2 Frequency Hopping System

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule. This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each: centred from 2402 to 2480 MHz) in the range 2,400-2,483.5 MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock. Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

This device was tested with an bluetooth system receiver to check that the device maintained hopping synchronization, and the device complied with these requirements for FCC Part 15.247 rule.

#### 7.11.3 EUT Pseudorandom Frequency Hopping Sequence

Pseudorandom Frequency Hopping Sequence Table as below: Channel: 08, 24, 40, 56, 40, 56, 72, 09, 01, 09, 33, 41, 33, 41, 65, 73, 53, 69, 06, 22, 04, 20, 36, 52, 38, 46, 70, 78, 68, 76, 21, 29, 10, 26, 42, 58, 44, 60, 76, 13, 03, 11, 35, 43, 37, 45, 69, 77, 55, 71, 08, 24, 08, 24, 40, 56, 40, 48, 72, 01, 72, 01, 25, 33, 12, 28, 44, 60, 42, 58, 74, 11, 05, 13, 37, 45 etc.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.





## 8 TEST RESULTS

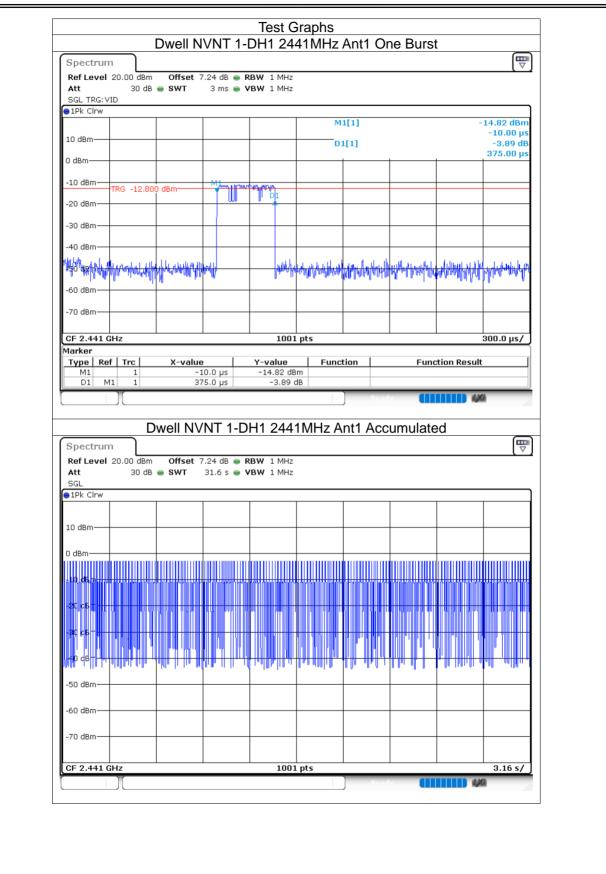
## 8.1 **DWELL TIME**

Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	Ant1	0.375	81.375	217	31600	400	Pass
NVNT	1-DH3	2441	Ant1	1.63	130.4	80	31600	400	Pass
NVNT	1-DH5	2441	Ant1	2.888	193.496	67	31600	400	Pass
NVNT	2-DH1	2441	Ant1	0.384	81.792	213	31600	400	Pass
NVNT	2-DH3	2441	Ant1	1.635	145.515	89	31600	400	Pass
NVNT	2-DH5	2441	Ant1	2.888	190.608	66	31600	400	Pass





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●1Pk Clrw	/ID								
					М	1[1]		-	-14.39 dBm -5.00 μs
10 dBm					D	1[1]			3.49 dB 1.63000 ms
0 dBm									1.03000 ms
-10 dBm—	TRG -12.90	dBm <sup>*******</sup>		AND CHANNEL THE COMPANY					
-20 dBm—									
-30 dBm—									
-40 dBm—									
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-60 dBm							e e i i		1
-70 dBm—									
CF 2.441 ( Marker	GHz			1001	pts				500.0 μs/
Type Re			-5.0 µs 63 ms	<b>Y-value</b> -14.39 dB 3.49 c		Read	· (11	tion Result	
	_								
	U		'NT 1-D	H3 244 <sup>,</sup>	I WHZ A	Int'i Acc	umulate	a	
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•	n 20.00 dBm		7.24 dB 👄 🛛 31.6 s 👄 V						
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Ref Level Att SGL	n 20.00 dBm								
Ref Level Att SGL 1Pk Clrw	n 20.00 dBm								
Ref Level Att SGL 1Pk Clrw	n 20.00 dBm								
Ref Level Att SGL IPk Clrw 10 dBm 0 dBm	n 20.00 dBm								
Ref Level Att SGL 1Pk Clrw 10 dBm -10 dBm -10 dBm -20 dBm	n 20.00 dBm 30 dB	• SWT		<b>/BW</b> 1 MHz					
Ref Level Att SGL 1Pk Clrw 10 dBm	n 20.00 dBm	• SWT							
Ref Level Att SGL ● 1Pk Clrw 10 dBm - 10 dBm - 20 dBm - 20 dBm - 20 dBm	n 20.00 dBm 30 dB	• SWT	31.6 5	28W 1 MHz					
Ref Level Att SGL ● 1Pk Clrw 10 dBm -10 dBm -10 dBm -20 dBm -20 dBm -20 dBm -20 dBm -10	n 20.00 dBm 30 dB	• SWT	31.6 5	28W 1 MHz					
Ref Level Att SGL ● 1Pk Clrw 10 dBm - 10 dBm - 10 dBm - 20 dBm - 20 dBm - 50 dBm	n 20.00 dBm 30 dB	• SWT	31.6 5	28W 1 MHz					
Ref Level Att SGL ● 1Pk Clrw 10 dBm -10 dBm -10 dBm -20 dBm -20 dBm -20 dBm -20 dBm -10 dB	n 20.00 dBm 30 dB	• SWT	31.6 5	28W 1 MHz					
Ref Level Att SGL ● 1Pk Clrw 10 dBm - 10 dBm - 10 dBm - 20 dBm - 20 dBm - 50 dBm	n 20.00 dBm 30 dB	• SWT	31.6 5	28W 1 MHz					
Ref Level Att SGL ● 1Pk Clrw 10 dBm -10 dBm -20 dBm -20 dBm -50 dBm -60 dBm -70 dBm	n 20.00 dBm 30 dB	• SWT	31.6 5	<pre>//BW 1 MHz</pre>					
Ref Level Att SGL • 1Pk Clrw 10 dBm -10 dBm -10 dBm -20 dBm -20 dBm -50 dBm -60 dBm	n 20.00 dBm 30 dB	• SWT	31.6 5	28W 1 MHz					3.16 s/





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10 dBm						1[1]		0.0	-4.25 dBm
0 dBmM1					D	1[1]		2	1.07 dB 2.88800 ms
-10 dBm									
TRG	-12.900 d	lBm							
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-30 dBm									
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-60 dBm									
-70 dBm									
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						) Read	v <b>O</b>		1
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	30 dB 😑	SWT	31.6 s 👄 🎙	/BW 1 MHz					
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				1					
SGL 9 1Pk Cirw									
SGL 91Pk Clrw 10 dBm									
SGL 9 1Pk Cirw									
SGL 91Pk Clrw 10 dBm									
SGL									
SGL 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 cBm -10									
SGL 10 dBm 0 dBm -10 dBm									
SGL 1Pk Clrw 10 dBm 0 dBm -10 dBm -20 cBm -10									
SGL ●1Pk Clrw 10 dBm 0 dBm -10 dBr -20 cBr -30 cBr -30 cBr									
SGL ●1Pk Clrw 10 dBm 0 dBm -10 dBm -20 cBm -30 cBm -30 cBm -40 cBm -40 cBm									
SGL ●1Pk Clrw 10 dBm 0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -50 dBm -60 dBm									
SGL									
SGL									3.16 5/
SGL ●1Pk Clrw 10 dBm 0 dBm 10 dBm 20 dBm -20 dBm -50 dBm -60 dBm -70 dBm									





	/ID	1		1		1[1]			14.92 dBm
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0 dBm					U	1[1]			1.60 dB 384.00 μs
-10 dBm—			1011						
-20 dBm-	-TRG -12.70	0 dBm							
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-70 dBm—									
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SGL 91Pk Clrw 10 dBm									
SGL									
SGL 1Pk Clrw 10 dBm	1								
SGL ●1Pk Clrw 10 dBm 0 dBm 0 dBm									
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SGL 1Pk Clrw 10 dBm 0 dBm 11 56 12 56 12 56 14 7 14 7 15 7 15 15 7 15 15 15 7 15 15 15 1	GHz								3.16 s/





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0 dBm							1	63500 ms
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haandahaan ahaan ahaa	44MA			- The Martine	had have been allowed a	Prallel result of the	MMMAN MARCEN	while while water
-60 dBm								
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CF 2.441 GHz			1001	pts				500.0 µs/
Marker	: X-value	、 I	Y-value	Funct	tion	<b>F</b>	tion Result	
	1 -1	15.0 µs	-14.78 dBr	n		Func	tion Result	
D1 M1	1 1.0	635 ms	2.15 d		Read			2
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-50 dBm								
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Att SGL TRG: VI		● SWT	8 ms 🔲 🖣	BW 1 MHz					
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10 dBm					D	1[1]		0.0	00000000 s -1.38 dB
0 dBm	<u>M1</u>			. D1		1	1	:	2.88800 ms
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-20 dBm	RG -12.600	) dBm							
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-40 dBm	h				Mundanasarbatta	later and calified	Hel man an a su		u
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CF 2.441 G	Ηz			100:	L pts				800.0 µs/
Marker _Type   Ref	Trc	X-valu	e	Y-value	Func	tion	Fund	ction Result	
M1 D1 M1	1	2.	0.0 s 888 ms	-2.86 dE -1.38					
	27					Read	iy 🚺		0
Spectrum Ref Level 2	20.00 dBm	Offset	/NT 2-D	RBW 1 MHz	1MHz A	nt1 Acc	cumulate	ed	₽
-	20.00 dBm			RBW 1 MHz	1MHz A	nt1 Acc		ed	
Ref Level 2 Att SGL	20.00 dBm	Offset	7.24 dB 😑 R	RBW 1 MHz	1MHz A	nt1 Acc		ed	
Ref Level 2 Att SGL 1Pk Clrw 10 dBm	20.00 dBm	Offset	7.24 dB 😑 R	RBW 1 MHz	1MHz A	nt1 Acc		ed	
Ref Level 2 Att SGL 1Pk Cirw	20.00 dBm	Offset	7.24 dB 😑 R	RBW 1 MHz	1MHz A	nt1 Acc		ed	
Ref Level 2 Att SGL 1Pk Clrw 10 dBm	20.00 dBm	Offset	7.24 dB 😑 R	RBW 1 MHz	1MHz A	nt1 Acc			
Ref Level 2 Att SGL 1Pk Clrw 10 dBm 0 dBm	20.00 dBm	Offset	7.24 dB 😑 R	RBW 1 MHz	1MHz A				
Ref Level 2 Att SGL 1Pk Clrw 10 dBm UCldBm 2CldBm 2CldBm	20.00 dBm 30 dB	Offset	7.24 dB • R 31.6 s • V	BW 1 MHz BW 1 MHz					
Ref Level 2 Att SGL ● 1Pk Clrw 10 dBm 0 dBm +LC dBm +LC dBm +LC dBm +LC dBm +LC dBm	20.00 dBm 30 dB	Offset	7.24 dB • R 31.6 s • V	BW 1 MHz BW 1 MHz		nt1 Acc			
Ref Level 2 Att SGL 1Pk Clrw 10 dBm UCldBm 2CldBm 2CldBm	20.00 dBm 30 dB	Offset	7.24 dB • R 31.6 s • V	BW 1 MHz BW 1 MHz					
Ref Level 2 Att SGL ● 1Pk Clrw 10 dBm 0 dBm +LC dBm +LC dBm +LC dBm +LC dBm +LC dBm	20.00 dBm 30 dB	Offset	7.24 dB • R 31.6 s • V	BW 1 MHz BW 1 MHz					
Ref Level 2 Att SGL 10 dBm 10 dBm 10 dBm 20 dBm 22C	20.00 dBm 30 dB	Offset	7.24 dB • R 31.6 s • V	BW 1 MHz BW 1 MHz					
Ref Level 2 Att SGL 10 dBm 10 dBm 20 dBm 2	20.00 dBm 30 dB	Offset	7.24 dB • R 31.6 s • V	BW 1 MHz BW 1 MHz					
Ref Level 2 Att SGL 10 dBm 10 dBm 10 dBm 20 dBm 20 dBm 20 dBm 20 dBm -50 dBm -60 dBm	20.00 dBm 30 dB	Offset	7.24 dB • R 31.6 s • V	BW 1 MHz BW 1 MHz					
Ref Level 2 Att SGL 10 dBm 10 dBm 10 dBm 20 dBm 20 dBm 20 dBm 20 dBm -50 dBm -60 dBm	20.00 dBm 30 dB	Offset	7.24 dB • R 31.6 s • V	RBW 1 MHz /BW 1 MHz					3.16 s/
Ref Level 2 Att SGL ● 1Pk Clrw 10 dBm 0 dBm +LC dBm +LC dBm +BC cBm -50 dBm -60 dBm -70 dBm	20.00 dBm 30 dB	Offset	7.24 dB • R 31.6 s • V	RBW 1 MHz /BW 1 MHz					3.16 s/





#### 8.2 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	-2.85	21	Pass
NVNT	1-DH5	2441	Ant1	-2.61	21	Pass
NVNT	1-DH5	2480	Ant1	-2.34	21	Pass
NVNT	2-DH5	2402	Ant1	-2.16	21	Pass
NVNT	2-DH5	2441	Ant1	-1.92	21	Pass
NVNT	2-DH5	2480	Ant1	-1.7	21	Pass





	n 20.00 dBm 30 dB		.07 dB 👄 RE			- 0			
Att SGL Count		SWT	1 ms 👄 VE	BW 2 MHz	Mode Aut	o Sweep			
●1Pk Max			1	1	м	1[1]			-2.85 dBm
10 dBm							1	2.40	184020 GHz
10 00.00									
0 dBm				M1					
-10 dBm									
-20 dBm—									
-30 dBm									
-40 dBm									
-50 dBm									<u> </u>
-60 dBm									<b> </b>
-70 dBm									
				1	1				
Spectrun	][					) Prov IMHz A	nt1	Sp.	an 5.0 MHz 2 2 2 2 2 2 2 2 2 2 2 2 2
Spectrun Ref Level Att SGL Count	n 20.00 dBm 30 dB		.24 dB 🖷 RE	NT 1-D	H5 2441		nt1	Sp.	
Spectrun Ref Level Att SGL Count	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut		nt1		₩ (₩)
Spectrum Ref Level Att SGL Count 9 1Pk Max	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut	o Sweep	nt1		
Spectrum Ref Level Att SGL Count 1Pk Max 10 dBm-	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut	o Sweep	nt1		₩ (₩)
Spectrum Ref Level Att SGL Count 1Pk Max 10 dBm	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D BW 2 MH2 BW 2 MH2	H5 2441 Mode Aut	o Sweep	nt1		₩ (₩)
Spectrum Ref Level Att SGL Count 1Pk Max 10 dBm-	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut	o Sweep	nt1		₩ (₩)
Spectrum Ref Level Att SGL Count 1Pk Max 10 dBm	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut	o Sweep	nt1		₩ (₩)
Att SGL Count 1Pk Max 10 dBm	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut	o Sweep	nt1		₩ (₩)
Spectrum Ref Level Att SGL Count 10 dBm	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut	o Sweep	nt1		₩ (₩)
Spectrum Ref Level Att SGL Count ID dBm	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut	o Sweep	nt1		₩ (₩)
Spectrum Ref Level Att SGL Count SGL Count 10 dBm	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut	o Sweep	nt1		₩ (₩)
Spectrum Ref Level Att SGL Count SGL Count 10 dBm	n 20.00 dBm 30 dB	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441 Mode Aut	o Sweep	nt1		₩ (₩)
Spectrum Ref Level Att SGL Count SGL Count ID dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm	20.00 dBm 30 dB 100/100	Offset 7.	.24 dB 🖷 RE	NT 1-D	H5 2441	o Sweep	nt1	2.44	₩ (₩)





Spectrum Ref Level 20.00 dBm Att 30 dB SGL Count 100/100		RBW 2 MHz VBW 2 MHz	Mode Auto	Sweep			
1Pk Max			M1[	[1]			-2.34 dBm
10 dBm				[1]	1	2.479	78520 GHz
10 dbiii							
0 dBm		M1					
-10 dBm							
-20 dBm							
-20 0811							
-30 dBm							
-40 dBm							
-50 dBm							
-50 0811							
-60 dBm							
-70 dBm							
CF 2.48 GHz		1001	L pts			Spa	n 5.0 MHz
Ref Level 20.00 dBm	Offset 7.07 dB 👄				nt1		
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100	Offset 7.07 dB 👄		H5 24021		nt1		
Ref Level 20.00 dBm Att 30 dB SGL Count 100/100 1Pk Max	Offset 7.07 dB 👄	RBW 2 MHz		Sweep	nt1	2.401	-2.16 dBm 90260 GHz
	Offset 7.07 dB 👄	RBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm
Ref Level 20.00 dBm Att 30 dB SGL Count 100/100 1Pk Max	Offset 7.07 dB 👄	RBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100           1Pk Max         10 dBm           10 dBm         0 dBm	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm
Ref Level         20.00 dBm           Att         30 dB           SGL         Count         100/100           IPk         Max           10 dBm         0           -10 dBm         0	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm
Ref Level         20.00 dBm           Att         30 dB           SGL         Count         100/100           IPk         Max           10 dBm         0           -10 dBm         0	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm 90260 GHz
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100           1Pk Max         10 dBm	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100           1Pk Max         10 dBm           10 dBm	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm 90260 GHz
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100           IPk Max         10 dBm           10 dBm	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm 90260 GHz
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100           IPk Max         10 dBm           0 dBm	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm 90260 GHz
Ref Level         20.00 dBm           Att         30 dB           SGL         Count         100/100           IPk Max         10 dBm	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm 90260 GHz
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100           1Pk Max         10           10 dBm	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm 90260 GHz
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100           1Pk Max         10           10 dBm	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep	nt1	2.401	-2.16 dBm 90260 GHz
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100           IPk Max         10 dBm           10 dBm	Offset 7.07 dB 👄	NBW 2 MHz VBW 2 MHz	Mode Auto	Sweep		Spe	-2.16 dBm 90260 GHz
Ref Level         20.00 dBm           Att         30 dB           SGL Count         100/100           IPk Max         10 dBm           10 dBm	Offset 7.07 dB 👄	RBw         2 MHz           VBw         2 MHz	Mode Auto	Sweep			-2.16 dBm 90260 GHz









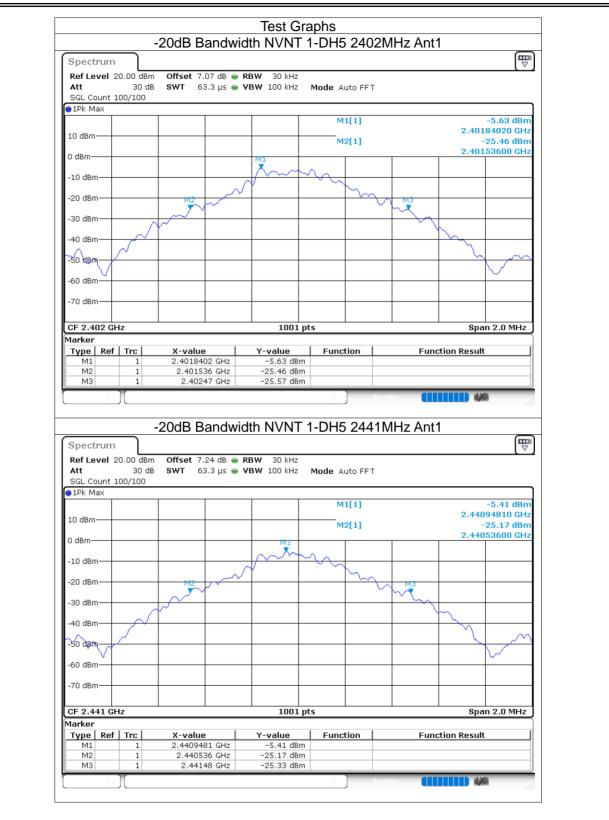


### 8.3 -20DB BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant1	0.934	Pass
NVNT	1-DH5	2441	Ant1	0.944	Pass
NVNT	1-DH5	2480	Ant1	0.866	Pass
NVNT	2-DH5	2402	Ant1	1.316	Pass
NVNT	2-DH5	2441	Ant1	1.284	Pass
NVNT	2-DH5	2480	Ant1	1.316	Pass





















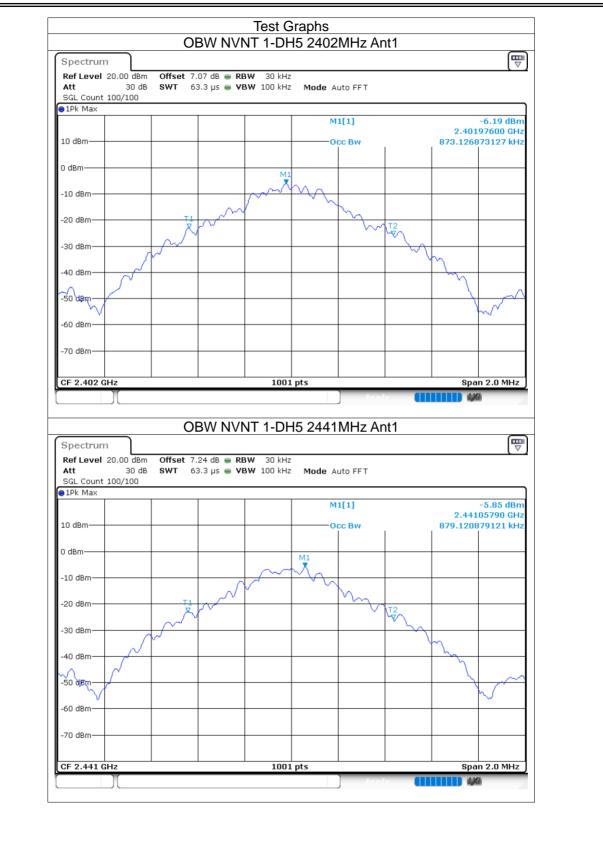


## 8.4 OCCUPIED CHANNEL BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	1-DH5	2402	Ant1	0.873
NVNT	1-DH5	2441	Ant1	0.879
NVNT	1-DH5	2480	Ant1	0.861
NVNT	2-DH5	2402	Ant1	1.165
NVNT	2-DH5	2441	Ant1	1.187
NVNT	2-DH5	2480	Ant1	1.197

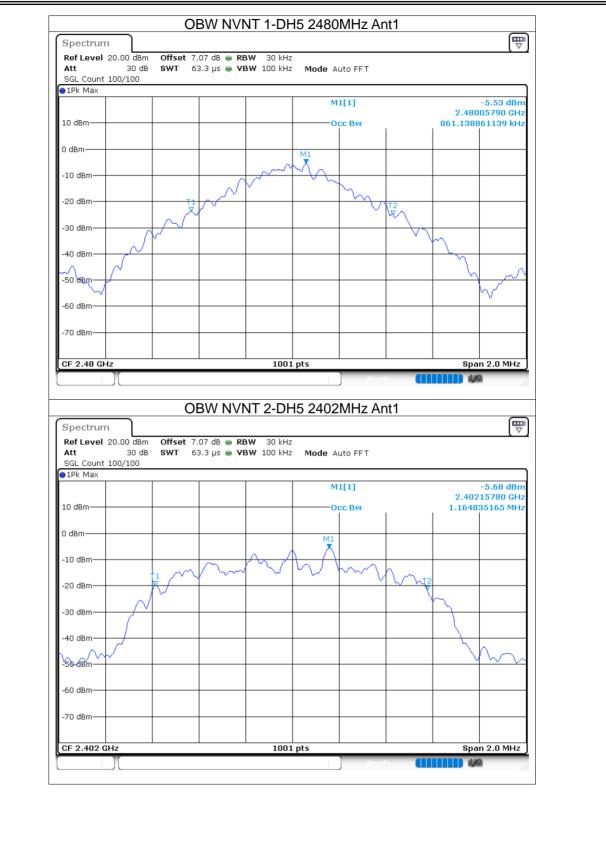




















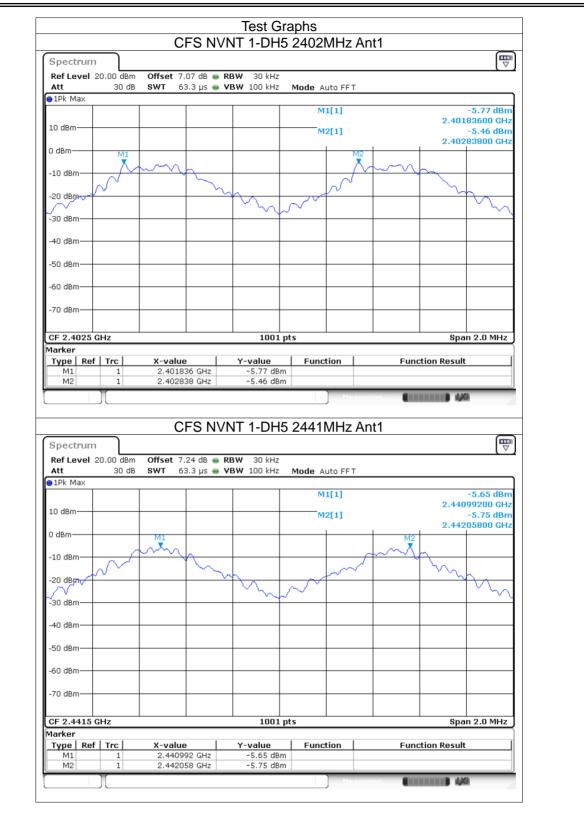


#### 8.5 CARRIER FREQUENCIES SEPARATION

		LCOLINO					
Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2401.836	2402.838	1.002	0.623	Pass
NVNT	1-DH5	Ant1	2440.992	2442.058	1.066	0.629	Pass
NVNT	1-DH5	Ant1	2479.058	2480.058	1	0.577	Pass
NVNT	2-DH5	Ant1	2401.996	2403.002	1.006	0.877	Pass
NVNT	2-DH5	Ant1	2441.082	2442.1	1.018	0.856	Pass
NVNT	2-DH5	Ant1	2479.03	2480.035	1.005	0.877	Pass

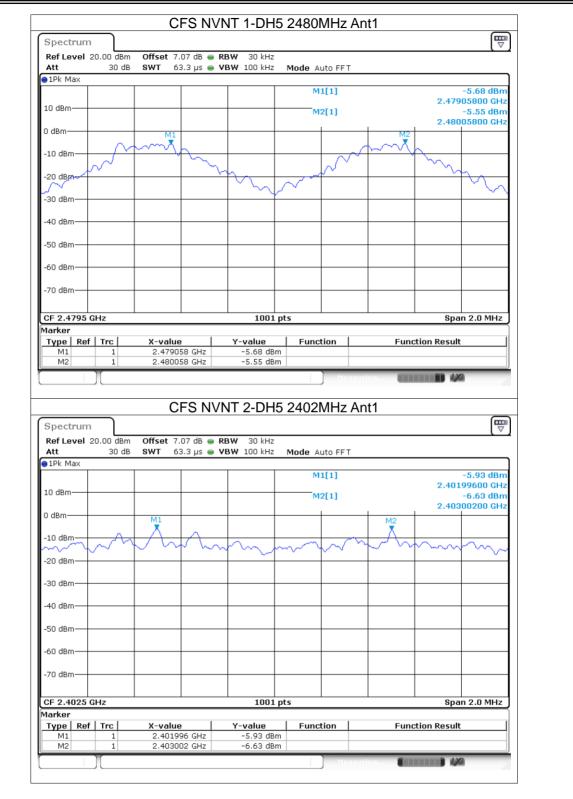






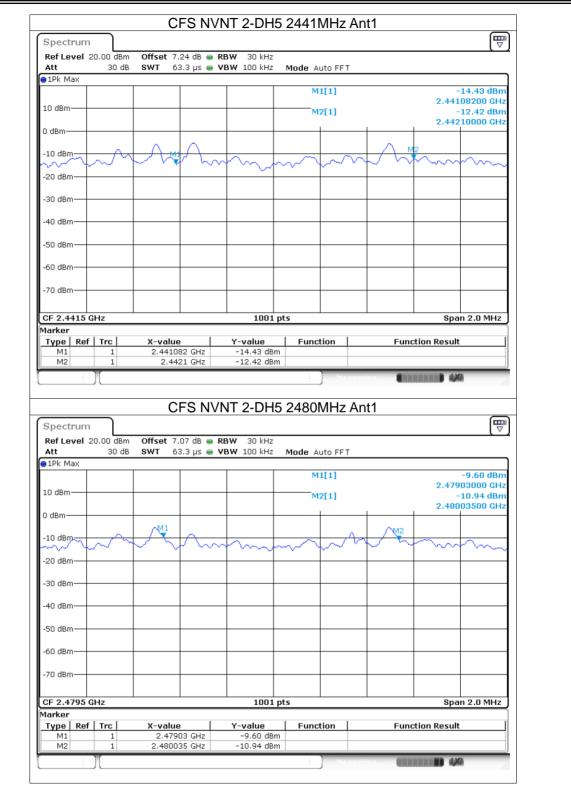
















## 8.6 NUMBER OF HOPPING CHANNEL

Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant1	79	15	Pass
NVNT	2-DH5	Ant1	79	15	Pass





		Норрі	ng No.	NVNT 1	-DH5 24	402MH	z Ant1		
Spectrum Ref Level 2		Offect 7		3W 100 kHz					
Att	20.00 dBm 30 dB	SWT	_	3W 300 kHz		uto Sweep			
∋1Pk Max					MI	1[1]			-3.37 dBm
10 dBm								2.40	18370 GHz
					M	2[1]		2.48	-3.41 dBm 02435 GHz
		NAANDANAI		Ballbash		00000000000	0.0.0.0.0.0.0.0		
-10 cBm	ЩАЦЦА		ALINUUU		uppspagn/	HADAAAA	AHAHAHAK	11862280	
-20 dBm	VAAAAAAA	1111111111	A KA KA KA KA KA	LOA NA NA NA NA	AAAAAAA	NA N	NYNYYY	INANANANA	144411
-20 UBIII									
30 dBm									
40 dBm									
-50 dBm									կել
									6
-60 dBm									
-70 dBm									
Start 2.4 GH Iarker	1Z			1001	pts			stop 2.	4835 GHz
	11		35 GHz		m				2
	)[					Measuri		44	
	)[	Норрі		NVNT 2	-DH5 24	) Measuri 402MHz	z Ant1	44	
-			ng No.		-DH5 24	) 402MH:	z Ant1		
Ref Level 2	20.00 dBm 30 dB		ng No.	NVNT 2	-DH5 24	402MH2	z Ant1		, (\vec{V})
Ref Level 2 Att		Offset 7.	ng No.	<b>3W</b> 100 kHz	-DH5 24 Mode Au	uto Sweep	z Ant1		
Ref Level 2 Att 1Pk Max		Offset 7.	ng No.	<b>3W</b> 100 kHz	-DH5 24 Mode At	uto Sweep	z Ant1	2.40	-3.40 dBm 18370 GHz
Ref Level 2 Att 1Pk Max		Offset 7.	ng No.	<b>3W</b> 100 kHz	-DH5 24 Mode At	uto Sweep	z Ant1		-3.40 dBm 18370 GHz -2.80 dBm
Ref Level 2 Att 1Pk Max 10 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Ref Level 2 Att ) 1Pk Max 10 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Ref Level 2 Att 1Pk Max 10 dBm 40 dBm 10 dBm 10 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Ref Level 2 Att 1Pk Max 10 dBm 40 40 40 40 40 40 40 40 40 40 40 40 40	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Spectrum Ref Level 2 Att 1Pk Max 10 dBm 10 dBm 20 dBm 20 dBm 80 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Ref Level 2 Att 1Pk Max 10 dBm 10 dBm 20 dBm 20 dBm 30 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Ref Level 2           Att           1Pk Max           10 dBm           10 dBm           20 dBm           20 dBm           20 dBm           40 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Ref Level 2           Att           1Pk Max           10 dBm           10 dBm           10 dBm           20 dBm           20 dBm           40 dBm           50 dBm           50 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Ref Level 2           Att           IPk Max           10 dBm           10 dBm           10 dBm           20 dBm           20 dBm           40 dBm           -50 dBm           -60 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Ref Level 2           Att           1Pk Max           10 dBm           10 dBm           10 dBm           20 dBm           20 dBm           40 dBm           50 dBm           50 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE	3W 100 kHz 3W 300 kHz	-DH5 24 Mode At	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz M2
Ref Level 2           Att           IPk Max           10 dBm           10 dBm           10 dBm           20 dBm           20 dBm           40 dBm           50 dBm           -50 dBm           -60 dBm	30 dB	Offset 7. SWT	ng No. □7 dB ● RE 1 ms ● VE		-DH5 24	uto Sweep L[1] 2[1]		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz WWW
Ref Level 2           Att           1Pk Max           10 dBm           10 dBm           20 dBm           20 dBm           40 dBm           40 dBm           50 dBm           40 dBm           40 dBm           50 dBm           40 dBm           50 dBm           50 dBm           60 dBm           50 dBm	30 dB	Offset 7. SWT	ng No.   1 ms ● ve	3W 100 kHz 3W 300 kHz ////////////////////////////////////	-DH5 24	uto Sweep		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz WWW
Ref Level 2           Att           1Pk Max           10 dBm           10 dBm           20 dBm           20 dBm           40 dBm           50 dBm           60 dBm           50 dBm           60 dBm           50 dBm           60 dBm           50 dBm           50 dBm           60 dBm           50 dBm           50 dBm           50 dBm	30 dB	Offset 7. SWT	ng No.		P-DH5 24	uto Sweep		2.48	-3.40 dBm 18370 GHz -2.80 dBm 02435 GHz WWW





# 8.7 BAND EDGE

0								
	Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
	NVNT	1-DH5	2402	Ant1	No-Hopping	-48.75	-20	Pass
	NVNT	1-DH5	2480	Ant1	No-Hopping	-50.07	-20	Pass
	NVNT	2-DH5	2402	Ant1	No-Hopping	-44.13	-20	Pass
	NVNT	2-DH5	2480	Ant1	No-Hopping	-50.17	-20	Pass





Spectrum									
Ref Level 20 Att SGL Count 10	30 dB			3W 100 kHz 3W 300 kHz	Mode Au	uto FFT			
1Pk Max	00/100								
					Mi	1[1]		2 403	-1.38 dBm 215980 GHz
10 dBm								2.402	
0 dBm					M1				
o ubili				C	$\mathcal{A}$				
-10 dBm									
-20 dBm									
		$-\Lambda$							
-30 dBm				1					
-40 dBm		$\rightarrow$				~			
-50 dBm							m	<u>h</u>	
The	~~~~	$\sim \gamma$	m			~~~		how	m
-60 dBm									
-70 dBm									
CF 2.402 GH	17			1001	pts			Spa	n 8.0 MHz
Ba	)[	ge NVN	T 1-DH	5 2402N	ЛНz Ant	) Read 1 No-H	opping	Emissic	
Ba Spectrum Ref Level 20		Offset 9	9.07 dB 🥌 R	BW 100 kH	z		opping	Emissio	on I
Ba		Offset 9	9.07 dB 🥌 R	BW 100 kH			opping	Emissic	
Ba Spectrum Ref Level 21 Att SGL Count 11		Offset 9	9.07 dB 🥌 R	<b>BW</b> 100 kH	z z <b>Mode</b> A	Auto FFT	opping	Emissic	
Ba Spectrum Ref Level 20 Att SGL Count 11 SGL Count 11		Offset 9	9.07 dB 🥌 R	<b>BW</b> 100 kH	z z Mode A M:	Auto FFT	opping	2.402	-1.74 dBm 205000 GHz
Ba Spectrum Ref Level 20 Att SGL Count 10 1Pk Max 10 dBm		Offset 9	9.07 dB 🥌 R	<b>BW</b> 100 kH	z z Mode A M:	Auto FFT	opping	2.402	-1.74 dBm
Ba Spectrum Ref Level 20 Att SGL Count 10 IPk Max 10 dBm 0 dBm		Offset 9	9.07 dB 🥌 R	<b>BW</b> 100 kH	z z Mode A M:	Auto FFT	opping	2.402	-1.74 dBm 205000 GHz 23.02 dBm
Ba Spectrum Ref Level 24 Att SGL Count 10 PIPk Max 10 dBm 0 dBm -10 dBm	nd Edg 0.00 dBm 30 dB 00/100	Offset 9 SWT 22	9.07 dB 🥌 R	<b>BW</b> 100 kH	z z Mode A M:	Auto FFT	opping	2.402	-1.74 dBm 205000 GHz 23.02 dBm
Ba Spectrum Ref Level 20 Att SGL Count 11 9 IPk Max 10 dBm -10 dBm -20 dBm D		Offset 9 SWT 22	9.07 dB 🥌 R	<b>BW</b> 100 kH	z z Mode A M:	Auto FFT	opping	2.402	-1.74 dBm 205000 GHz 23.02 dBm 00000 GHz
Ba Spectrum Ref Level 24 Att SGL Count 11 1Pk Max 10 dBm -10 dBm -20 dBm -30 dBm	nd Edg 0.00 dBm 30 dB 00/100	Offset 9 SWT 22	9.07 dB 🥌 R	BW 100 kH	z z Mode A M:	Auto FFT	opping	2.402	-1.74 dBm 205000 GHz 23.02 dBm 00000 GHz
Ba Spectrum Ref Level 24 Att SGL Count 11 9 IPk Max 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	nd Edg 0.00 dBm 30 dB 00/100	Offset 9 SWT 22	0.07 dB <b>• R</b> 27.5 μs <b>• V</b>	28W 100 kH 78W 300 kH	z Mode A	Auto FFT	opping	2.402	-1.74 dBm 205000 GHz 23.02 dBm 00000 GHz
Ba Spectrum Ref Level 20 Att SGL Count 10 IPk Max 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	nd Edg 0.00 dBm 30 dB 00/100	Offset 9 SWT 22	0.07 dB <b>• R</b> 27.5 μs <b>• V</b>	BW 100 kH	z Mode A	Auto FFT 1[1] 2[1]		2.402 2.400	-1.74 dBm 205000 GHz 23.02 dBm 00000 GHz
Ba Spectrum Ref Level 24 Att SGL Count 11 9 IPk Max 10 dBm -10 dBm -20 dBm -20 dBm -40 dBm -50 dBm -50 dBm	nd Edg 0.00 dBm 30 dB 00/100	Offset 9 SWT 22	0.07 dB <b>• R</b> 27.5 μs <b>• V</b>	28W 100 kH 78W 300 kH	z Mode A	Auto FFT 1[1] 2[1]		2.402	-1.74 dBm 205000 GHz 23.02 dBm 00000 GHz
Ba Spectrum Ref Level 24 Att SGL Count 11 9 IPk Max 10 dBm -10 dBm -20 dBm -20 dBm -40 dBm -50 dBm -50 dBm	nd Edg 0.00 dBm 30 dB 00/100	Offset 9 SWT 22	0.07 dB <b>• R</b> 27.5 μs <b>• V</b>	28W 100 kH 78W 300 kH	z Mode A	Auto FFT 1[1] 2[1]		2.402	-1.74 dBm 205000 GHz 23.02 dBm 00000 GHz
Ba Spectrum Ref Level 24 Att SGL Count 11 9 1Pk Max 10 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -50 dBm -70 dBm -70 dBm -70 dBm	1 -21.377	Offset 9 SWT 22	0.07 dB <b>• R</b> 27.5 μs <b>• V</b>	28W 100 kH 78W 300 kH	2 Z Mode A M: M: M: M: M: M: M: M: M: M: M: M: M:	Auto FFT 1[1] 2[1]		2.402 2.400	-1.74 dBm 205000 GHz 23.02 dBm 00000 GHz
Ba Spectrum Ref Level 21 Att SGL Count 11 SGL Count 11 ID dBm -10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -70 dBm -70 dBm Start 2.306 d Marker Type Ref	1 -21.377	Offset 9 SWT 22 dBm ประคาญในแทรสะคัญ X-value	9.07 dB <b>• R</b> 27.5 μs <b>• V</b> M4 M4	BW 100 kH BW 300 kH	Z Mode A	Auto FFT 1[1] 2[1] դիսկվուտորանն	hand frequently a	2.402 2.400	-1.74 dBm 205000 GHz -23.02 dBm 000000 GHz M2 M2 00000 GHz 00000 GHz
Ba Spectrum Ref Level 24 Att SGL Count 11 PIPk Max 10 dBm -10 dBm -20 dBm -20 dBm -20 dBm -40 dBm -50 dBm -50 dBm -50 dBm -70 dBm -70 dBm Type Ref M1	1 -21.377	Offset 9 SWT 22 dBm الس <sup>مر</sup> اليسعارالي X-value 2.4020	0.07 dB <b>P R</b> 27.5 μs <b>V</b> <b>V</b> <b>V</b> <b>V</b> <b>V</b> <b>V</b> <b>V</b> <b>V</b> <b>V</b> <b>V</b>	שע 100 kH ישע 300 kH	2 Z Mode A M M M M M M M M M M M M M M M M M M M	Auto FFT 1[1] 2[1] դիսկվուտորանն	hand frequently a	2.402 2.400	-1.74 dBm 205000 GHz -23.02 dBm 000000 GHz M2 M2 00000 GHz 00000 GHz
Ba Spectrum Ref Level 20 Att SGL Count 11 SGL Count 11 IPK Max 10 dBm -10 dBm -20 dBm -20 dBm -20 dBm -30 dBm -30 dBm -30 dBm -70 dBm -70 dBm Start 2.306 d Marker Type Ref	nd Edg 0.00 dBm 30 dB 00/100 1 -21.377 1 -21.377 GHz GHz	Offset 9 SWT 22 dBm ریستمراب ریستمراب کردی X-value 2.402( 2 2.2)	9.07 dB <b>• R</b> 27.5 μs <b>• V</b> M4 M4	BW 100 kH BW 300 kH	2 2 Mode A M3 M3 M3 M3 M3 M3 M3 M3 M3 M3 M3 M3 M3	Auto FFT 1[1] 2[1] դիսկվուտորանն	hand frequently a	2.402 2.400	-1.74 dBm 205000 GHz -23.02 dBm 000000 GHz M2 M2 00000 GHz 00000 GHz





Spectrum									
Ref Level 2 Att				<b>BW</b> 100 kHz <b>BW</b> 300 kHz					
SGL Count 1		awr 18	כי בי א פיי	อาท อบป KHZ	Mode A	ulu FF í			
⊖1Pk Max									
					M	1[1]		0.45	-1.28 dBn
10 dBm						1	ļ	2.480	05590 GH:
0 dBm				1	41 				
					ٽ				
-10 dBm				+	+				
				6	1				
-20 dBm		Λ		+/-	$\vdash$				
				17					
-30 dBm				1/					
-40 dBm									
			$\neg$	Ú T		A.	m		
-50\dBm		2 h	/			ř 🔪 🖊		<u>\</u>	-
$\sim$	$\sim\sim\sim\sim$	r h	$\sim$			$  \sim$		$\sim$	$h^{n}$
-60 dBm									
-70 dBm									
CF 2.48 GHz	2			1001	l pts	1		Spa	n 8.0 MHz
	)(					\			F4.
Spectrum				15 24801		Read t1 No-H	opping I	Emissic	on
	0.00 dBm	Offset 9	.07 dB 😑	15 24801 RBW 100 kH VBW 300 kH	z		opping I		
Spectrum Ref Level 2 Att SGL Count 1	0.00 dBm 30 dB	Offset 9	.07 dB 😑	<b>RBW</b> 100 kH	z		opping I		on
Spectrum Ref Level 2 Att	0.00 dBm 30 dB	Offset 9	.07 dB 😑	<b>RBW</b> 100 kH	z Iz <b>Mode</b>	Auto FFT	opping I		on (₩
Spectrum Ref Level 2 Att SGL Count 1 91Pk Max	0.00 dBm 30 dB	Offset 9	.07 dB 😑	<b>RBW</b> 100 kH	z Iz <b>Mode</b>		opping I	Emissic	on
Spectrum Ref Level 2 Att SGL Count 1 • 1Pk Max 10 dBm M1	0.00 dBm 30 dB	Offset 9	.07 dB 😑	<b>RBW</b> 100 kH	z Z Mode	Auto FFT	opping I	Emissic	-0.58 dBn 985000 GH: 51.72 dBn
Spectrum Ref Level 2 Att SGL Count 1 1Pk Max	0.00 dBm 30 dB	Offset 9	.07 dB 😑	<b>RBW</b> 100 kH	z Z Mode	Auto FF T	opping I	Emissic	0N (₩ -0.58 dBn 985000 GH;
Spectrum Ref Level 2 Att SGL Count 1 1Pk Max 10 dBm M1	0.00 dBm 30 dB	Offset 9	.07 dB 😑	<b>RBW</b> 100 kH	z Z Mode	Auto FF T	opping I	Emissic	-0.58 dBn 985000 GH: 51.72 dBn
Spectrum Ref Level 2 Att SGL Count 1 ● 1Pk Max 10 dBm -10 dBm	0.00 dBm 30 dB 00/100	Offset 9 SWT 22	.07 dB 😑	<b>RBW</b> 100 kH	z Z Mode	Auto FF T	opping I	Emissic	-0.58 dBn 985000 GH: 51.72 dBn
Spectrum Ref Level 2 Att SGL Count 1 1Pk Max 10 dBm M1 0 dBm	0.00 dBm 30 dB 00/100	Offset 9 SWT 22	.07 dB 😑	<b>RBW</b> 100 kH	z Z Mode	Auto FF T	opping I	Emissic	-0.58 dBn 985000 GH: 51.72 dBn
Spectrum Ref Level 2 Att SGL Count 1 ● 1Pk Max 10 dBm -10 dBm	0.00 dBm 30 dB 00/100	Offset 9 SWT 22	.07 dB 😑	<b>RBW</b> 100 kH	z Z Mode	Auto FF T	opping I	Emissic	-0.58 dBn 985000 GH: 51.72 dBn
Spectrum Ref Level 2 Att SGL Count 1 @ 1Pk Max 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm	0.00 dBm 30 dB 00/100	Offset 9 SWT 22	.07 dB 😑	<b>RBW</b> 100 kH	z Z Mode	Auto FF T	opping I	Emissic	-0.58 dBn 985000 GH: 51.72 dBn
Spectrum Ref Level 2 Att SGL Count 1 P1Pk Max 10 dBm M1 0 dBm -10 dBm -20 dBm D	0.00 dBm 30 dB 00/100	Offset 9 SWT 22	.07 dB 😑	<b>RBW</b> 100 kH	z Z Mode	Auto FF T	opping I	Emissic	-0.58 dBn 985000 GH: 51.72 dBn
Spectrum Ref Level 2 Att SGL Count 1 @ 1Pk Max 10 dBm -10 dBm -20 dBm -30 cBm	0.00 dBm 30 dB 00/100 1 -21.279 M4	Offset 9 SWT 22	.07 dB 😑	RBW 100 kH	z Mode Mode	Auto FFT		2.479 2.483	-0.58 dBn 85000 GH: 51.72 dBn 50000 GH:
Spectrum Ref Level 2 Att SGL Count 1 P1Pk Max 10 dBm M1 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm -40 dBm	0.00 dBm 30 dB 00/100	Offset 9 SWT 22	.07 dB 🖷 7.5 µs 🖷	RBW 100 kH	z Mode Mode	Auto FF T		2.479 2.483	-0.58 dBn 85000 GH: 51.72 dBn 55.000 GH:
Spectrum Ref Level 2 Att SGL Count 1 ● 1Pk Max 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm -60 dBm	0.00 dBm 30 dB 00/100 1 -21.279 M4	Offset 9 SWT 22	.07 dB 🖷 7.5 µs 🖷	RBW 100 kH	z Mode Mode	Auto FFT		2.479 2.483	-0.58 dBn 85000 GH: 51.72 dBn 50000 GH:
Spectrum Ref Level 2 Att SGL Count 1 © 1Pk Max 10 dBm -10 dBm -10 dBm -30 cBm -30 cBm -30 cBm -50 dBm -10 dBm	0.00 dBm 30 dB 00/100 1 -21.279 M4	Offset 9 SWT 22	.07 dB 🖷 7.5 µs 🖷	RBW 100 kH	z Mode Mode	Auto FFT		2.479 2.483	-0.58 dBn 85000 GH: 51.72 dBn 50000 GH:
Spectrum Ref Level 2 Att SGL Count 1 ● 1Pk Max 10 dBm -10 dBm -10 dBm -30 dBm -30 dBm -60 dBm -70 dBm -70 dBm	0.00 dBm 30 dB 00/100 1 -21.279 M4 Mounty, M	Offset 9 SWT 22	.07 dB 🖷 7.5 µs 🖷	RBW 100 kH	z Mode	Auto FFT		2.479 2.483	-0.58 dBn 985000 GH: 51.72 dBn 850000 GH:
Spectrum Ref Level 2 Att SGL Count 1 © 1Pk Max 10 dBm -10 dBm -10 dBm -30 dBm -30 dBm -30 dBm -60 dBm	0.00 dBm 30 dB 00/100	Offset 9 SWT 22	.07 dB 🖷 7.5 µs 🖷	RBW 100 kH	z Mode	Auto FFT		2.479 2.483	-0.58 dBn 85000 GH: 51.72 dBn 50000 GH:
Spectrum Ref Level 2 Att SGL Count 1 9 1Pk Max 10 dBm -10 dBm -10 dBm -10 dBm -30 dBm -30 dBm -30 dBm -70 dB	0.00 dBm 30 dB 00/100 1 -21.279 M4 Mountow GHz	Offset 9 SWT 22	.07 dB ● 7.5 μs ●	RBW 100 kH VBW 300 kH	Z Mode	Auto FFT		2.479 2.483	-0.58 dBn -0.58 dBn 85000 GH: 51.72 dBn 50000 GH: 
Spectrum Ref Level 2 Att SGL Count 1 ● 1Pk Max 10 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -30 dBm -70 dB	0.00 dBm 30 dB 00/100 1 -21.279 M4 Mum(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Offset 9 SWT 22 dBm dBm	.07 dB 7.5 μs 	RBW 100 kH VBW 300 kH	Z Mode	Auto FFT		2.479 2.483	-0.58 dBn -0.58 dBn 85000 GH: 51.72 dBn 50000 GH: 
Spectrum Ref Level 2 Att SGL Count 1 9 1Pk Max 10 dBm -10 dBm -10 dBm -10 dBm -30 dBm -30 dBm -30 dBm -70 dB	0.00 dBm 30 dB 00/100 1 -21.279 M4 Mountow GHz	Offset 9 SWT 22 dBm dBm <u>M3</u> www.mu.y.wo a S.4796 2.483	.07 dB ● 7.5 μs ●	RBW 100 kH VBW 300 kH	z Mode	Auto FFT		2.479 2.483	-0.58 dBn -0.58 dBn 85000 GH: 51.72 dBn 50000 GH: 
Spectrum           Ref Level 2           Att           SGL Count 1           ● 1Pk Max           10 dBm           -10 dBm           -20 dBm           -30 dBm           -60 dBm           -70 dBm           -70 dBm           Start 2.476           Marker           Type Ref           M1	0.00 dBm 30 dB 00/100 1 -21.279 M4 Mww.(ty,M GHz I Trc 1 1	Offset 9 SWT 22	.07 dB 7.5 μs 	RBW 100 kH VBW 300 kH 	z Mode	Auto FFT		2.479 2.483	-0.58 dBn -0.58 dBn 85000 GH: 51.72 dBn 50000 GH: 





Spectrum Ref Level : Att SGL Count :	20.00 dBm 30 dB		dB 👄 RBW 1 µs 👄 VBW 3		1ode Auto	FFT			⊽
⊖1Pk Max									
					M1[1	]		2,401	-4.86 dBm 184820 GHz
10 dBm									
0 dBm				M1					
-10 dBm				mym	$\sim$				
-20 dBm		Δ							
-30 dBm									
00 00.00									
-40 dBm			~~~{			m			
~ <del>5</del> 0~dBm	~ ~						him		
~50-GBM	J~~~							m V.	mm
-60 dBm									
-70 dBm									
Spectrum	and Ed	lge NVNT				Read No-Ho	Copping I		in 8.0 MHz 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Ba Spectrum Ref Level 3 Att	and Ed	Offset 9.07	2-DH5 2 <sup>7</sup> dв ● <b>кв</b> w 5 µs ● <b>vвw</b>	402MH	z Ant1		opping l		on
Ba Spectrum Ref Level :	and Ed	Offset 9.07	' dB 🖷 RBW	402MH	z Ant1 Mode Auto	D FFT	opping l		a on Ţ
Ba Spectrum Ref Level 3 Att SGL Count 1 ● 1Pk Max	and Ed	Offset 9.07	' dB 🖷 RBW	402MH	z Ant1	D FFT	opping l	Emissic	2000 -1.74 dBm
Ba Spectrum Ref Level 3 Att SGL Count 3	and Ed	Offset 9.07	' dB 🖷 RBW	402MH	z Ant1 Mode Auto	D FFT	opping I	Emissic	-1.74 dBm 205000 GHz 25.07 dBm
Ba Spectrum Ref Level 3 Att SGL Count 1 ● 1Pk Max	and Ed	Offset 9.07	' dB 🖷 RBW	402MH	Z Ant1 Mode Auto M1[1	D FFT	opping l	Emissic	0000000000000000000000000000000000000
Ba Spectrum Ref Level 3 Att SGL Count 3 @ 1Pk Max 10 dBm	and Ed	Offset 9.07	' dB 🖷 RBW	402MH	Z Ant1 Mode Auto M1[1	D FFT	opping l	Emissic	-1.74 dBm 205000 GHz 25.07 dBm
Backson Backso	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	' dB 🖷 RBW	402MH	Z Ant1 Mode Auto M1[1	D FFT	opping I	Emissic	-1.74 dBm 205000 GHz 25.07 dBm
Baccount : Spectrum Ref Level : SGL Count : ID dBm 0 dBm -10 dBm -20 dBm	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	' dB 🖷 RBW	402MH	Z Ant1 Mode Auto M1[1	D FFT	opping I	Emissic	-1.74 dBm 205000 GH2 25.07 dBm 000000 GH2
Backson Backso	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	' dB 🖷 RBW	402MH	Z Ant1 Mode Auto M1[1	D FFT	opping I	Emissic	-1.74 dBm 205000 GH2 25.07 dBm 000000 GH2
Bac Spectrum Ref Level 3 SGL Count 1 9 IPk Max 10 dBm -10 dBm -20 dBm	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	dB  RBW  by  by  c  c  c  c  c  c  c  c  c  c  c  c  c	402MH	Z Ant1 Mode Auto M1[1 M2[1	D FFT	opping I	Emissic	-1.74 dBm 205000 GH2 25.07 dBm 000000 GH2
Ba Spectrum Ref Level 3 Att SGL Count 3 PIPK Max 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	dB  RBW  by  by  c  c  c  c  c  c  c  c  c  c  c  c  c	402MH	Z Ant1 Mode Auto M1[1 M2[1	0 FFT		2.400	-1.74 dBm 205000 GH2 25.07 dBm 000000 GH2
Back Spectrum Ref Level : Att SGL Count : PIPk Max 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	dB ● RBW 5 μs ● VBW	402MH	Z Ant1 Mode Auto M1[1 M2[1	D FFT	Dopping I	2.400	-1.74 dBm 205000 GH2 25.07 dBm 000000 GH2
Ba Spectrum Ref Level 3 Att SGL Count 1 It Max 10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	dB  RBW  by  by  c  c  c  c  c  c  c  c  c  c  c  c  c	402MH	Z Ant1 Mode Auto M1[1 M2[1	0 FFT		2.400	-1.74 dBm 205000 GH2 25.07 dBm 000000 GH2
Ba Spectrum Ref Level 3 Att SGL Count 3 ● 1Pk Max 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50 dBm -70 dBm -70 dBm	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	dB  RBW  by  by  c  c  c  c  c  c  c  c  c  c  c  c  c	402MH: 100 kHz 300 kHz 402MH: 100 kHz 400 kHz	Z Ant1 Mode Auto M1[1 M2[1	0 FFT		2.402 2.400	-1.74 dBm 205000 GHz 25.07 dBm 000000 GHz
Ba Spectrum Ref Level 2 Att SGL Count 2 PIPK Max 10 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -40 dBm -50 dBm -70 dBm -70 dBm -70 dBm	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	dB  RBW  by  by  c  c  c  c  c  c  c  c  c  c  c  c  c	402MH	Z Ant1 Mode Auto M1[1 M2[1	0 FFT		2.402 2.400	-1.74 dBm 205000 GH2 25.07 dBm 000000 GH2
Ba Spectrum Ref Level 3 Att SGL Count 3 ● 1Pk Max 10 dBm -10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -70 dBm -70 dBm	20.00 dBm 30 dB 100/100	Offset 9.07 SWT 227.5	M4	402MH: 100 kHz 300 kHz 402MH: 100 kHz 400 kHz	Z Ant1 Mode Auto M1[1 M2[1	o FFT ] ]	host fragment fragment	2.402 2.400	2.406 GHz
Backson Spectrum Ref Level : Att SGL Count : 9 IPk Max 10 dBm -10 dBm -20 dBm -20 dBm -40 dBm -40 dBm -50 dBm -50 dBm -70 dBm -70 dBm Start 2.306 Marker Type Ref M1	and Ed 20.00 dBm 30 dB 100/100 01 -21.377 01 -21.377 01 -21.377 01 -21.377 01 -21.377	Offset 9.07 SWT 227.5	<sup>2</sup> dB ● RBW 5 µs ● VBW М4 м <sup>4</sup> и <sup>4</sup> сема (1), рума SH2 ~-2	402MH: 100 kHz 300 kHz 1 	Z Ant1 Mode Auto M1[1 M2[1	o FFT ] ]	host fragment fragment	Emissic 2.402 2.400	2.406 GHz
Ba Spectrum Ref Level 3 SGL Count 1 SGL Count 1 SGL Count 1 I 0 dBm 0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -50 dBm -70 dBm -70 dBm Start 2.3006 Marker Type Ref	and Ed 20.00 dBm 30 dB 100/100 01 -21.377	Offset 9.07 SWT 227.5	2 dB	402MH	Z Ant1 Mode Auto M1[1 M2[1	o FFT ] ]	host fragment fragment	Emissic 2.402 2.400	2.406 GHz





Ref Level 2 Att SGL Count 1	30 dB			<b>(BW</b> 100 kHz <b>/BW</b> 300 kHz		uto FFT			
					M	1[1]			-0.81 dBm
10 dBm								2.479	99200 GHz
				м	1				
0 dBm				000	5				
-10 dBm					~~ <u>}</u>				
-20 dBm									
-30 dBm				1					
40 dBm	Λ	$\square$	port.	4		L-M			
-50 dBm	M	$\int V$					24	m	
								- WV	how
-60 dBm									
-70 dBm									
								- Pro-	- 0 0 MU-
CF 2.48 GH2	)[	ge NVN	IT 2-DF	1001 15 2480N		) Pear 1 No-H	opping		n 8.0 MHz 0 0 0 0 0 0 0 0 0 0 0 0 0
Ba	0.00 dBm 30 dB	Offset 9	9.07 dB 👄		/Hz Ant		opping		n
Ba Spectrum Ref Level 2 Att	0.00 dBm 30 dB	Offset 9	9.07 dB 👄	15 2480N RBW 100 kH	/Hz Ant <sup>z</sup> Mode 4	auto FFT	opping		n T
Ba Spectrum Ref Level 2 Att SGL Count 1	0.00 dBm 30 dB	Offset 9	9.07 dB 👄	15 2480N RBW 100 kH	/Hz Ant <sup>z</sup> Mode 4	uto FFT	opping	Emissic	000 (₩ -0.70 dBm 015000 GHz
Ba Spectrum Ref Level 2 Att SGL Count 1 ● 1Pk Max	0.00 dBm 30 dB	Offset 9	9.07 dB 👄	15 2480N RBW 100 kH	/Hz Ant <sup>z</sup> Mode 4	auto FFT	opping	Emissic	0000000000000000000000000000000000000
Ba Spectrum Ref Level 2 Att SGL Count 1 @1Pk Max 10 dBm M1	0.00 dBm 30 dB	Offset 9	9.07 dB 👄	15 2480N RBW 100 kH	/Hz Ant <sup>z</sup> Mode 4	uto FFT	opping	Emissic	-0.70 dBm 115000 GHz 52.34 dBm
Ba Spectrum Ref Level 2 Att SGL Count 1 IPk Max 10 dBm 0 dBm -10 dBm	0.00 dBm 30 dB	Offset 9 SWT 22	9.07 dB 👄	15 2480N RBW 100 kH	/Hz Ant <sup>z</sup> Mode 4	uto FFT	opping	Emissic	-0.70 dBm 115000 GHz 52.34 dBm
Ba Spectrum Ref Level 2 Att SGL Count 1 IPk Max 10 dBm 0 dBm -10 dBm	Ind Ed	Offset 9 SWT 22	9.07 dB 👄	15 2480N RBW 100 kH	/Hz Ant <sup>z</sup> Mode 4	uto FFT	opping	Emissic	-0.70 dBm 115000 GHz 52.34 dBm
Ba Spectrum Ref Level 2 Att SGL Count 1 • IPk Max 10 dBm -10 dBm -20 cBm -20 cBm -30 dBm -40 dBm	Ind Ed	Offset 9 SWT 22	9.07 dB 👄	15 2480N RBW 100 kH	/Hz Ant <sup>z</sup> Mode 4	uto FFT	opping	Emissic	-0.70 dBm 115000 GHz 52.34 dBm
Ba Spectrum Ref Level 2 Att SGL Count 1 • IPk Max 10 dBm -10 dBm -20 cBm -20 cBm -30 dBm -40 dBm	1 -20.810	Offset 9 SWT 22	9.07 dB 27.5 μs 	15 2480N RBW 100 kH увw 300 kH	/Hz Ant	L[1] 2[1]		2.480	000 (₩ -0.70 dBm 15000 GHz -52.34 dBm 55000 GHz
Ba Spectrum Ref Level 2 Att SGL Count 1 IPk Max 10 dBm -10 dBm -20 cBm -30 dBm -30 dBm -50 dBm -50 dBm	Ind Ed	Offset 9 SWT 22	9.07 dB 27.5 μs 	15 2480N RBW 100 kH	/Hz Ant	L[1] 2[1]	opping	2.480	000 (₩ -0.70 dBm 15000 GHz -52.34 dBm 55000 GHz
Ba Spectrum Ref Level 2 Att SGL Count 1 I O dBm 10 dBm -10 dBm -20 cBm -30 dBm -30 dBm -30 dBm -30 dBm	1 -20.810	Offset 9 SWT 22	9.07 dB 27.5 μs 	15 2480N RBW 100 kH увw 300 kH	/Hz Ant	L[1] 2[1]		2.480	000 (₩ -0.70 dBm 15000 GHz -52.34 dBm 55000 GHz
Ba Spectrum Ref Level 2 Att SGL Count 1 1Pk Max 10 dBm -10 dBm -10 dBm -20 cBm -30 dBm -30 dBm -50 dBm -60 dBm -70 dBm	1 -20.810	Offset 9 SWT 22	9.07 dB 27.5 μs 	15 2480N	AHz Ant	L[1] 2[1]		2.480 2.480	-0.70 dBm 015000 GHz 52.34 dBm 050000 GHz
Ba Spectrum Ref Level 2 Att SGL Count 1 I D dBm 10 dBm -10 dBm -20 cBm -20 cBm -30 dBm -50 dBm -50 dBm -70 dBm -70 dBm -70 dBm	Ind Ed 0.00 dBm 30 dB 00/100 1 -20.810	Offset 9 SWT 22	9.07 dB 27.5 μs 	15 2480N RBW 100 kH увw 300 kH	MHz Ant	uto FFT [[1] 2[1] [און איניטאילאיניישל		Emissic	-0.70 dBm 15000 GHz 52.34 dBm 55000 GHz 2.576 GHz
Ba Spectrum Ref Level 2 Att SGL Count 1 I D dBm 10 dBm -10 dBm -20 cBm -20 cBm -30 dBm -50 dBm -50 dBm -70 dBm -70 dBm -70 dBm	1 -20.810	Offset 9 SWT 22 dBm dBm	9.07 dB 27.5 μs 	15 2480N	AHz Ant	uto FFT [[1] 2[1] [און איניטאילאיניישל		2.480 2.480	-0.70 dBm 15000 GHz 52.34 dBm 55000 GHz 2.576 GHz
Ba Spectrum Ref Level 2 Att SGL Count 1 PIPk Max 10 dBm -10 dBm -20 cBm -30 dBm -30 dBm -50 dBm -70	1 -20.810 MARCAL	Offset 9 SWT 22 dBm dBm M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M4 M2 M1 M2 M1 M1 M2 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1	9.07 dB 27.5 μs 	15 2480N	MHz Ant	uto FFT [[1] 2[1] [און איניטאילאיניישל		Emissic	-0.70 dBm 15000 GHz 52.34 dBm 55000 GHz 2.576 GHz



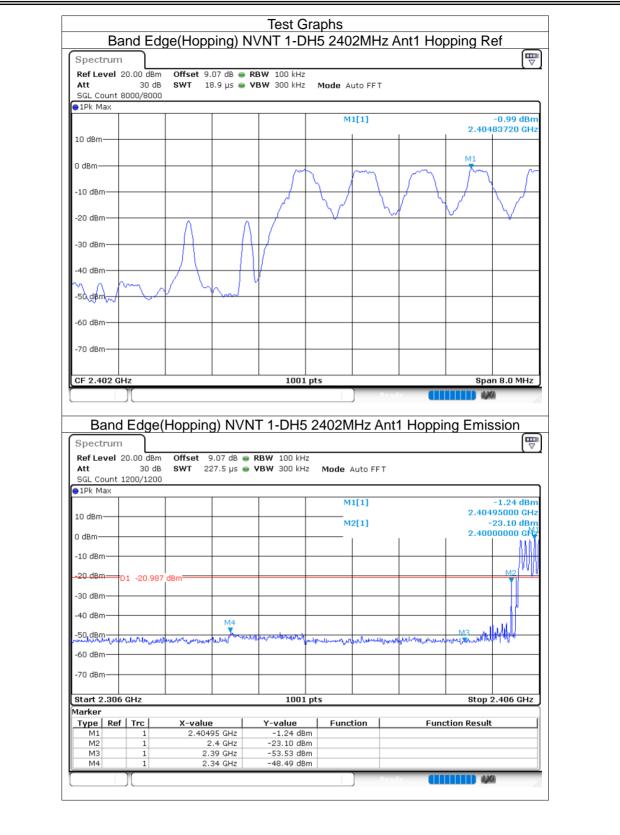


## 8.8 BAND EDGE(HOPPING)

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	Hopping	-47.49	-20	Pass
NVNT	1-DH5	2480	Ant1	Hopping	-50.1	-20	Pass
NVNT	2-DH5	2402	Ant1	Hopping	-47.71	-20	Pass
NVNT	2-DH5	2480	Ant1	Hopping	-50.07	-20	Pass

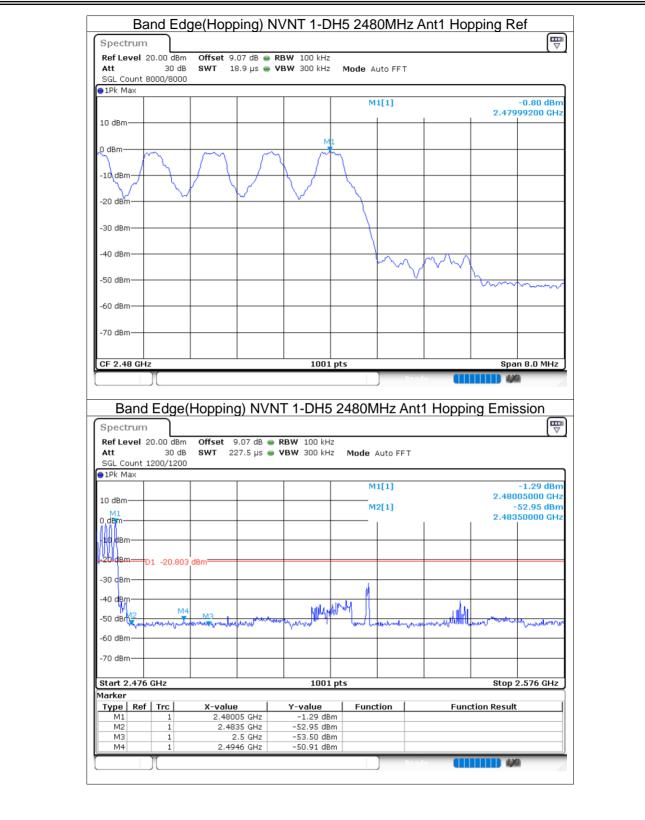
















Spectru	1 20.00 dBm	Offect 01		<b>BW</b> 100 kHz					
Att	30 dB			BW 300 kHz	Mode A	uto FFT			
	nt 8000/8000								
●1Pk Max					M	1[1]			-1.08 dBr
						1[1]		2.405	584420 GH
10 dBm—									
0 dBm									M
U dBm—						m	Δ	(	
-10 dBm—				m	m	, wh	June me	m	m
-20 dBm—		0							
			$- \Lambda$						
-30 dBm—			-1						
-40 dBm—			~1						
, e abiii	~~		r						
∽ടാഷഹ	4 m	pr V							
-60 dBm—	+			+ +			+		
70 45									
-70 dBm—									
L									L
CF 2.402	GHz			1001	pts	<u> </u>		Spa	n 8.0 MHz
Spectru	m			T 2-DH5		1Hz Ant	t1 Hoppi	ng Emis	ssion
Spectru Ref Leve Att	m 1 20.00 dBm 30 dB	Offset 9	.07 dB 👄 F	T 2-DH5 RBW 100 kHz VBW 300 kHz	2		t1 Hoppi	ng Emis	
Spectru Ref Leve Att SGL Cour	m 1 20.00 dBm	Offset 9	.07 dB 👄 F	<b>RBW</b> 100 kHz	2		t1 Hoppi	ng Emis	
Spectru Ref Leve Att	m 1 20.00 dBm 30 dB	Offset 9	.07 dB 👄 F	<b>RBW</b> 100 kHz	: Mode /		t1 Hoppi		-2.24 dBr
Spectru Ref Leve Att SGL Cour	m 1 20.00 dBm 30 dB	Offset 9	.07 dB 👄 F	<b>RBW</b> 100 kHz	: Mode / M	Auto FFT 1[1]	t1 Hoppi	2.403	-2.24 dBr 395000 GH
Spectru Ref Leve Att SGL Cour 1Pk Max	m 1 20.00 dBm 30 dB	Offset 9	.07 dB 👄 F	<b>RBW</b> 100 kHz	: Mode / M	Auto FFT	t1 Hoppi	2.403	-2.24 dBr
Spectru Ref Leve Att SGL Cour 1Pk Max 10 dBm-	m 1 20.00 dBm 30 dB	Offset 9	.07 dB 👄 F	<b>RBW</b> 100 kHz	: Mode / M	Auto FFT 1[1]	t1 Hoppi	2.403	-2.24 dBr 95000 GH -21.24 dBr
Spectru Ref Lever SGL Cour 1Pk Max 10 dBm- 0 dBm- -10 dBm-	m 30 dB 30 dB 1200/1200	Offset 9 SWT 22	.07 dB 👄 F	<b>RBW</b> 100 kHz	: Mode / M	Auto FFT 1[1]	t1 Hoppi	2.403	-2.24 dBr 895000 GH 21.24 dBr 000000 GH
Spectru Ref Lever SGL Cour 1Pk Max 10 dBm- 0 dBm- -10 dBm-	m 1 20.00 dBm 30 dB	Offset 9 SWT 22	.07 dB 👄 F	<b>RBW</b> 100 kHz	: Mode / M	Auto FFT 1[1]	t1 Hoppi	2.403	-2.24 dBr 895000 GH -21.24 dBr 000000 GH
Spectru Ref Lever SGL Cour 1Pk Max 10 dBm- 0 dBm- -10 dBm-	m 30 dB 30 dB 1200/1200	Offset 9 SWT 22	.07 dB 👄 F	<b>RBW</b> 100 kHz	: Mode / M	Auto FFT 1[1]	t1 Hoppi	2.403	-2.24 dBr 895000 GH 21.24 dBr 000000 GH
Spectru Ref Leve Att SGL Cour 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm-	m 30 dB 30 dB 1200/1200	Offset 9 SWT 22	.07 dB 👄 F	<b>RBW</b> 100 kHz	: Mode / M	Auto FFT 1[1]		2.403	-2.24 dBr 895000 GH 21.24 dBr 000000 GH
Spectru Ref Leve Att SGL Cour 1Pk Max 10 dBm- -0 dBm- -20 dBm- -30 dBm- -40 dBm-	m 30 dB30 dB	Offset 9 SWT 22	.07 dB 👄 F	<b>RBW</b> 100 kHz	: Mode / M	Auto FFT 1[1]		2.403 - 2.400	-2.24 dBr -21.24 dBr -21.24 dBr 000000 eH
Spectru Ref Leve Att SGL Cour 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm-	m 30 dB30 dB	Offset 9 SWT 22	.07 dB 👄 F 7.5 μs 👄 Ν	RBW 100 kHz YBW 300 kHz	: Mode / M	Auto FFT  1[1] 2[1]		2.403	-2.24 dBr -21.24 dBr -21.24 dBr 000000 eH
Spectru Ref Leve Att SGL Cour 1Pk Max 10 dBm- -0 dBm- -20 dBm- -30 dBm- -40 dBm-	D1 -21.076	Offset 9 SWT 22	.07 dB 👄 F 7.5 μs 👄 Ν	RBW 100 kHz YBW 300 kHz	: Mode / M	Auto FFT  1[1] 2[1]		2.403 - 2.400	-2.24 dBr -21.24 dBr -21.24 dBr 000000 eH
Spectru Ref Leve Att SGL Cour 9 1Pk Max 10 dBm- -10 dBm- -20 dBm- -30 dBm- -40 dBm- -50 dBm-	D1 -21.076	Offset 9 SWT 22	.07 dB 👄 F 7.5 μs 👄 Ν	RBW 100 kHz YBW 300 kHz	: Mode / M	Auto FFT  1[1] 2[1]		2.403 - 2.400	-2.24 dBr -21.24 dBr -21.24 dBr 000000 eH
Spectru Ref Leve Att SGL Cour • 1Pk Max 10 dBm	D1 -21.076	Offset 9 SWT 22	.07 dB 👄 F 7.5 μs 👄 Ν	RBW 100 kHz YBW 300 kHz	: Mode / M	Auto FFT  1[1]  2[1]		2.403 - 2.400	-2.24 dBr -21.24 dBr -21.24 dBr 000000 eH
Spectru Ref Leve Att SGL Cour 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm- -30 dBm- -40 dBm- -50 dBm- -70 dBm- -70 dBm-	D1 -21.076	Offset 9 SWT 22	.07 dB 👄 F 7.5 μs 👄 Ν	RBW 100 kHz YBW 300 kHz	Mode /	Auto FFT  1[1]  2[1]		2.403 - 2.400 	-2.24 dBr -21.24 dBr -21.24 dBr 000000 eH
Spectru Ref Leve Att SGL Cour 9 1Pk Max 10 dBm- -0 dBm- -10 dBm- -20 dBm- -30 dBm- -30 dBm- -50 dBm- -70 dBm- Start 2.3 Marker	D1 -21.076	Offset 9 SWT 22	.07 dB 7.5 μs	RBW 100 kHz VBW 300 kHz	2 Mode /    	Auto FFT  1[1]  2[1]		2.403 2.400 	-2.24 dBr 395000 GH 21.24 dBr 000000 GH M2 M2 M2 2.406 GHz
Spectru Ref Leve Att SGL Cour 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm- -30 dBm- -40 dBm- -50 dBm- -70 dBm- -70 dBm-	D1 -21.076	Offset 9 SWT 22	.07 dB • Γ 7.5 μs • Υ	RBW 100 kHz VBW 300 kHz	mode / Mode / M M m m m m m m m m m m m m m m m m m	Auto FFT  1[1]  2[1]		2.403 - 2.400 	-2.24 dBr 395000 GH 21.24 dBr 000000 GH M2 M2 M2 2.406 GHz
Spectru Ref Leve Att SGL Cour ● 1Pk Max 10 dBm	D1 -21.076	Offset 9 SWT 22	.07 dB 7.5 μs N4 M4 M4 M4 M4 M4 M4 M4 M4 M4 M	RBW 100 kHz VBW 300 kHz VBW 3	2 Mode / M M M M M M M M M M M M M	Auto FFT  1[1]  2[1]		2.403 2.400 	-2.24 dBr 395000 GH 21.24 dBr 000000 GH M2 M2 M2 2.406 GHz
Spectru Ref Leve Att SGL Cour • 1Pk Max 10 dBm	D1 -21.076	Offset 9 SWT 22	.07 dB • Γ 7.5 μs • Υ	RBW         100         kHz           VBW         300         kHz           VBW         1001         1001           Y-value         -2.24         dBr	2 Mode / Mode / M M M M M M M M M M M M M	Auto FFT  1[1]  2[1]		2.403 2.400 	-2.24 dBr 395000 GH 21.24 dBr 000000 GH M2 M2 M2 2.406 GHz





Spectrum Ref Level 20.00 dBm		DW 100 kus				
Att 30 dB			Node Auto FFT			
SGL Count 8000/8000		-				
●1Pk Max	1	1	M1[1]			-0.75 dBm
			MILI		2.479	-0.75 uBrr 16080 GHz
10 dBm						
0.40		<u>1</u>				
0 dBm	m m					
-10 dBm			h			
-20 dBm						
20 d0m						
-30 dBm						
-40 dBm				<u> </u>		
				Mar		
-50 dBm	+	+			t~ ∽∽	h
-60 dBm						
-70 dBm						
CF 2.48 GHz						n 8.0 MHz
		1001 pt:		Ready 🗾		1
Spectrum	(Hopping) NVN		480MHz A	nt1 Hopp	ing Emis	
Spectrum Ref Level 20.00 dBm Att 30 dB	n Offset 9.07 dB ● 3 SWT 227.5 µs ●	RBW 100 kHz			ing Emis	ssion (The second secon
Spectrum Ref Level 20.00 dBm	n Offset 9.07 dB ● 3 SWT 227.5 µs ●	RBW 100 kHz			ing Emis	
Spectrum           Ref Level 20.00 dBm           Att         30 dE           SGL Count 1200/1200	n Offset 9.07 dB ● 3 SWT 227.5 µs ●	RBW 100 kHz				-1.64 dBm
Spectrum Ref Level 20.00 dBm Att 30 df SGL Count 1200/1200 PIPk Max 10 dBm	n Offset 9.07 dB ● 3 SWT 227.5 µs ●	RBW 100 kHz	Mode Auto FF		2.480	-1.64 dBm 15000 GH2
Spectrum Ref Level 20.00 dBm Att 30 df SGL Count 1200/1200 PIPk Max	n Offset 9.07 dB ● 3 SWT 227.5 µs ●	RBW 100 kHz	Mode Auto FF1		2.480	-1.64 dBm
Spectrum           Ref Level         20.00 dBn           Att         30 dE           SGL         Count         1200/1200           ● 1Pk Max         10 dBm         10 dBm           10 dBm         0 dBm         10 dBm	n Offset 9.07 dB ● 3 SWT 227.5 µs ●	RBW 100 kHz	Mode Auto FF		2.480	-1.64 dBm 15000 GHz 52.24 dBm
Spectrum Ref Level 20.00 dBn Att 30 db SGL Count 1200/1200 P1Pk Max 10 dBm 0 dBm 10 dBm 10 dBm	Offset 9.07 dB ● 3 SWT 227.5 μs ● 3	RBW 100 kHz	Mode Auto FF		2.480	-1.64 dBm 15000 GHz 52.24 dBm
Spectrum           Ref Level         20.00 dBn           Att         30 dE           SGL         Count         1200/1200           ● 1Pk Max         10 dBm         10 dBm           10 dBm         0 dBm         10 dBm	Offset 9.07 dB ● 3 SWT 227.5 μs ● 3	RBW 100 kHz	Mode Auto FF		2.480	-1.64 dBm 15000 GHz 52.24 dBm
Spectrum Ref Level 20.00 dBn Att 30 db SGL Count 1200/1200 P1Pk Max 10 dBm 0 dBm 10 dBm 10 dBm	Offset 9.07 dB ● 3 SWT 227.5 μs ● 3	RBW 100 kHz	Mode Auto FF		2.480	-1.64 dBm 15000 GHz 52.24 dBm
Spectrum           Ref Level 20.00 dBm           Att 30 df           SGL Count 1200/1200           IN dBm           0 dBm           0 dBm           -20 cBm           D1 -20.74	Offset 9.07 dB ● 3 SWT 227.5 μs ● 3	RBW 100 kHz	Mode Auto FF		2.480	-1.64 dBm 15000 GHz 52.24 dBm
Spectrum Ref Level 20.00 dBn Att 30 df SGL Count 1200/1200 1Pk Max 10 dBm 0 dBm -0 dBm -10 dBm -20 cBm -10 cBm -30 dBm -40 dBm -50 dBm	6 dBm	RBW 100 kHz	Mode Auto FF <sup>*</sup> M1[1] M2[1]	T	2.480	-1.64 dBm 115000 GH2 52.24 dBm 50000 GH2
Spectrum           Ref Level 20.00 dBn           Att 30 dE           SGL Count 1200/1200           ● 1Pk Max           10 dBm           0 dBm           0 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           20 dBm	6 dBm	RBW 100 kHz	Mode Auto FF		2.480	-1.64 dBm 15000 GHz 52.24 dBm
Spectrum Ref Level 20.00 dBn Att 30 df SGL Count 1200/1200 1Pk Max 10 dBm 0 dBm -0 dBm -10 dBm -20 cBm -10 cBm -30 dBm -40 dBm -50 dBm	6 dBm	RBW 100 kHz	Mode Auto FF <sup>*</sup> M1[1] M2[1]	T	2.480	-1.64 dBm 115000 GH2 52.24 dBm 50000 GH2
Spectrum           Ref Level 20.00 dBn           Att 30 dE           SGL Count 1200/1200           ● 1Pk Max           10 dBm           0 dBm           0 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           20 dBm	6 dBm	RBW 100 kHz	Mode Auto FF <sup>*</sup> M1[1] M2[1]	T	2.480	-1.64 dBm 115000 GH2 52.24 dBm 50000 GH2
Spectrum           Ref Level 20.00 dBn           Att 30 dE           SGL Count 1200/1200           ● 1Pk Max           10 dBm           0 dBm           0 dBm           -20 cBm           -10 dBm           -30 dBm           -40 dBm           -50 dBm           -60 dBm           -70 dBm	6 dBm	RBW         100 kHz           VBW         300 kHz	Mode Auto FF <sup>*</sup>	T	2.480 - 2.483	-1.64 dBm 15000 GH2 52.24 dBm 50000 GH2
Spectrum           Ref Level 20.00 dBn           Att 30 dE           SGL Count 1200/1200           ● 1Pk Max           10 dBm           0 dBm           20 dBm           -20 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           -70 dBm           -70 dBm           Start 2.476 GHz	6 dBm	RBW 100 kHz	Mode Auto FF <sup>*</sup>	T	2.480 - 2.483	-1.64 dBn 115000 GH: 52.24 dBn 50000 GH:
Spectrum           Ref Level 20.00 dBn           Att 30 dE           SGL Count 1200/1200           ● 1Pk Max           10 dBm           0 dBm           0 dBm           -20 cBm           -10 dBm           -30 dBm           -40 dBm           -50 dBm           -60 dBm           -70 dBm	6 dBm	RBW         100 kHz           VBW         300 kHz	Mode Auto FF <sup>*</sup>	T 	2.480 - 2.483	-1.64 dBr 115000 GH2 52.24 dBr 50000 GH2
Spectrum           Ref Level 20.00 dBn           Att 30 dE           SGL Count 1200/1200           ● 1Pk Max           10 dBm           0 dBm           -20 cBm           -20 cBm           -20 cBm           -30 dBm           -40 dBm           -50 dBm           -70 dBm           Start 2.476 GHz           Marker           Type         Ref           M1         1	6 dBm M3 M3 M3 M3 M3 M3 M3 M3 M3 M3	RBW 100 kHz VBW 300 kHz 	Mode Auto FF <sup>*</sup> M1[1] M2[1] M2[1]	T 	2.480 2.483	-1.64 dBr 115000 GH2 52.24 dBr 50000 GH2
Spectrum           Ref Level 20.00 dBn           Att 30 df           SGL Count 1200/1200           ● 1Pk Max           10 dBm           0 dBm           0 dBm           -20 dBm           -10 dBm           -30 dBm           -40 dBm           -50 dBm           -70 dBm           -70 dBm           Start 2.476 GHz           Marker           Type         Ref           M1         1           M2         1           M3         1	6 dBm X-value 2.48015 GHz 2.5 GHz 2.5 GHz	RBW         100 kHz           VBW         300 kHz             Image: state	Mode Auto FF <sup>*</sup> M1[1] M2[1] M2[1]	T 	2.480 2.483	-1.64 dBr 115000 GH2 52.24 dBr 50000 GH2
Spectrum           Ref Level 20.00 dBn           Att 30 dE           SGL Count 1200/1200           ● 1Pk Max           10 dBm           0 dBm           0 dBm           20 dBm           20 dBm           -30 dBm           -40 dBm           -50 dBm           -60 dBm           -70 dBm           Start 2.476 GHz           Marker           Type         Ref           M1         1           M2         1	6 dBm 3 SWT 227.5 µs ● 6 dBm 6 dBm 7 SWT 8 SWT 8 SWT 9.07 dB ● 9.07	RBW 100 kHz VBW 300 kHz 	Mode Auto FF <sup>*</sup> M1[1] M2[1] M2[1]	T 	2.480 2.483	-1.64 dBr 115000 GH2 52.24 dBr 50000 GH2





## 8.9 CONDUCTED RF SPURIOUS EMISSION

Cond	lition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NV	NT	1-DH5	2402	Ant1	-42.42	-20	Pass
NV	NT	1-DH5	2441	Ant1	-41.7	-20	Pass
NV	NT	1-DH5	2480	Ant1	-43.52	-20	Pass
NV	NT	2-DH5	2402	Ant1	-43.01	-20	Pass
NV	NT	2-DH5	2441	Ant1	-43.51	-20	Pass
NV	NT	2-DH5	2480	Ant1	-40.82	-20	Pass





	Tx. Spu	irious N∖	/NT 1-DH	5 2402MHz	Ant1 Ref	:	
Spectrum	)						
Ref Level 20.0		9.07 dB 👄 RI					
Att SGL Count 100/1		18.9 µs 👄 <b>V</b>	<b>BW</b> 300 kHz	Mode Auto FFT			
1Pk Max	.00						
				M1[1]			-1.83 dBm
10 dBm					1	2.40197	58010 GHz
0 dBm			М1				
-10 dBm							
-20 dBm							
-30 dBm							
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
		1 1					
CF 2.402 GHz	Tx Spurio		30001 p	Re	it1 Emiss		n 1.5 MHz
	Tx. Spurio	us NVN		ts 2402MHz Ar	it1 Emiss		n 1.5 MHz
Spectrum Ref Level 20.0	0 dBm Offset	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar	it1 Emiss		
Spectrum Ref Level 20.0	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar			
Spectrum Ref Level 20.0 Att SGL Count 10/10	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar			
Spectrum Ref Level 20.0 Att SGL Count 10/10	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar		ion	(₩) -1.49 dBm
Spectrum Ref Level 20.0 Att SGL Count 10/10 1Pk Max	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.44	-1.49 dBm 02070 GHz
Spectrum Ref Level 20.0 Att SGL Count 10/10 1Pk Max 10 dBm M1	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar		ion 2.4	(₩) -1.49 dBm
Spectrum Ref Level 20.0 att SGL Count 10/10 pipk Max 10 dBm M1 0 dBm	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.4	-1.49 dBm 02070 GHz 44.25 dBm
Spectrum Ref Level 20.0 Att SGL Count 10/10 1Pk Max 10 dBm -10 dBm	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.4	-1.49 dBm 02070 GHz 44.25 dBm
Spectrum Ref Level 20.0 Att SGL Count 10/10 1Pk Max 10 dBm -10 dBm	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.4	-1.49 dBm 02070 GHz 44.25 dBm
Spectrum Ref Level 20.0 Att SGL Count 10/10 1Pk Max 10 dBm -10 dBm -20 dBm -20 dBm -21 -2	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.4	-1.49 dBm 02070 GHz 44.25 dBm
Spectrum Ref Level 20.0 att SGL Count 10/10 PIPK Max 10 dBm -10 dBm -20 dBm -20 dBm -20 dBm -30 dBm	0 dBm Offset 30 dB SWT	9.07 dB <b>R</b> 265 ms <b>V</b>	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.4	-1.49 dBm 02070 GHz 44.25 dBm
Spectrum Ref Level 20.0 Att SGL Count 10/10 1Pk Max 10 dBm -10 dBm -10 dBm -20 dBm -20 dBm -40 dBm	0 dBm Offset 30 dB SWT	9.07 dB 👄 RI	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.4	-1.49 dBm 02070 GHz 44.25 dBm
Spectrum Ref Level 20.0 Att SGL Count 10/10 1Pk Max 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50,dBm	0 dBm Offset 30 dB SWT	9.07 dB      R	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.4	-1.49 dBm 02070 GHz 44.25 dBm
Spectrum Ref Level 20.0 Att SGL Count 10/10 1Pk Max 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -50,dBm	0 dBm Offset 30 dB SWT	9.07 dB      R	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.4	-1.49 dBm 02070 GHz 44.25 dBm
Att SGL Count 10/10 PIPk Max 10 dBm -10 dBm -10 dBm -20 dBm -20 dBm -30 dBm	0 dBm Offset 30 dB SWT	9.07 dB      R	T 1-DH5 2	2402MHz Ar Mode Auto Swee M1[1]		ion 2.4	-1.49 dBm 02070 GHz 44.25 dBm
Spectrum Ref Level 20.0 Att SGL Count 10/10 IPk Max 10 dBm 0 dBm -10 dBm -20 dBm 01 -2 -30 dBm -50 dBm -50 dBm -70 dBm	0 dBm Offset 30 dB SWT	9.07 dB      R	Г 1-DH5 2 вж 100 kHz вж 300 kHz	Mode Auto Swee		2.44 	-1.49 dBm 02070 GHz 44.25 dBm 98475 GHz
Spectrum Ref Level 20.0 Att SGL Count 10/10 IPk Max 10 dBm 0 dBm -10 dBm -20 dBm 01 -2 -30 dBm -50 dBm -70 dBm -70 dBm Start 30.0 MHz	0 dBm Offset 30 dB SWT	9.07 dB      R	T 1-DH5 2	Mode Auto Swee		2.44 	-1.49 dBm 02070 GHz 44.25 dBm
Spectrum           Ref Level         20.0           Att         SGL Count         10/10           IPK Max         10 dBm         10 dBm           10 dBm         -0         -0         -0           -10 dBm         -0         -0         -0           -20 dBm         -0         -2         -0           -30 dBm         -0         -2         -0           -40 dBm         -7         -2         -2           -60 dBm         -7         -2         -2           -70 dBm         -2         -2         -2           -70 dBm         -2         -2         -2           -70 dBm         -2         -2         -2	M3 M4	9.07 dB R R 265 ms V	Г 1-DH5 2 вw 100 kHz вw 300 kHz	2402MHz Ar		ion 2.4 15.6	-1.49 dBm 02070 GHz 44.25 dBm 98475 GHz
Spectrum           Ref Level 20.0           Att           SGL Count 10/10           IPk Max           10 dBm           0 dBm           -10 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           -70 dBm           -70 dBm           Start 30.0 MHz           Jarker           Type         Ref	M3 M4 M3 M4 M3 M4 M4 M3 M4 M4 M4 M4 M4 M4 M4 M4 M4 M4	9.07 dB R R 265 ms V	T 1-DH5 2 BW 100 kHz BW 300 kHz B	Mode Auto Swee		2.44 	-1.49 dBm 02070 GHz 44.25 dBm 98475 GHz
Spectrum           Ref Level         20.0           Att         SGL Count         10/10           IPk Max         ID         ID         IPk Max           10 dBm	M3 M4 2 X-valu 1.826 dBm	9.07 dB R 265 ms V 10.07 GHz 10.07 GHz 175 GHz	Г 1-DH5 2 вж 100 kHz вж 300 kHz и и и и и и и и и и и и и	2402MHz Ar		ion 2.4 15.6	-1.49 dBm 02070 GHz 44.25 dBm 98475 GHz
Spectrum           Ref Level         20.0           Att         SGL Count         10/10           IPK Max         10         10           10 dBm	M3 M4 1.826 dBm M3 M4 1.826 dBm 2 X-valu 1 2.402 1 15.6984 1 4.6340	9,07 dB R 265 ms V 1000 100	T 1-DH5 2 BW 100 kHz BW 300 kHz B	2402MHz Ar		ion 2.4 15.6	-1.49 dBm 02070 GHz 44.25 dBm 98475 GHz
Spectrum           Ref Level 20.0           Att           SGL Count 10/10           IPk Max           10 dBm           0 dBm           -10 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           -70 dBm           -70 dBm           Start 30.0 MHz           Marker           Type         Ref           M1           M2           M3           M4	M3 M4 1.826 dBm M3 M4 1.826 dBm M3 M4 1.826 dBm M3 A4 1.826 dBm M4 1.826 dBm M3 A4 1.826 dBm M4 1.826 dBm 1.826 dBm 1	9.07 dB R 265 ms V V V V V V V V V V V V V V	T 1-DH5 2 BW 100 kHz BW 300 kHz B	2402MHz Ar		ion 2.4 15.6	-1.49 dBm 02070 GHz 44.25 dBm 98475 GHz





