

# FCC TEST REPORT

# Test report On Behalf of DongGuan Kemi Electronic Technology Co., Ltd For Bone Conduction Headphone Model No: X14, X14 Pro Max, X7, X9, X8 FCC ID: 2AXV7-X14

Prepared for :	DongGuan Kemi Electronic Technology Co., Ltd
	Room 301, building 4, No. 55, Dongshen South Road, Tangxia Town, Dongguan City, China

Prepared By : Shenzhen Tongzhou Testing Co.,Ltd 1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China

 Date of Test:
 2022/3/10 - 2022/3/21

 Date of Report:
 2022/3/22

Report Number: TZ220303008-E

The test report apply only to the specific sample(s) tested under stated test conditions It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



# **TEST RESULT CERTIFICATION**

Applicant's name	DongGuan Kemi Electronic Technology Co., Ltd
Address:	Room 301, building 4, No. 55, Dongshen South Road, Tangxia Town, Dongguan City, China
	DongGuan Kemi Electronic Technology Co., Ltd
Address:	Room 301, building 4, No. 55, Dongshen South Road, Tangxia Town, Dongguan City, China
Product description	

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Trade Mark:	N/A
Product name:	Bone Conduction Headphone
Model No:	X14, X14 Pro Max, X7, X9, X8
Standards:	FCC Rules and Regulations Part 15 Subpart C Section 15.247 ANSI C63.10: 2013

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Test Result	PASS
Date of Issue	2022/3/22
Date (s) of performance of tests:	2022/3/10- 2022/3/21
Date of Test	

**Testing Engineer** 

Nançu Li

(Nancy Li)

Technical Manager

hen ugo

(Hugo Chen)

Authorized Signatory:

Andy

(Andy Zhang)



# **Revision History**

Revision	Issue Date	Revisions	Revised By
00	2022/3/22	Initial Issue	Andy Zhang



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# **1. GENERAL INFORMATION**

<b>1.1. Description of Device (EUT)</b> EUT : Bone Conduction Headphone				
Model Number	: X14, X14 Pro Max, X7, X9, X8			
Model Difference Declaration	: All the same except for the model name			
Test Model	: X14			
Power Supply	DC 3.7V by battery USB Input:DC5V			
Hardware version	: SST459M_AP_V04			
Software version	: SST459_AB5335B_X14_(00001B55_E694F949)_20211214			
Sample ID	: TZ220303008–1# / TZ220303008–2#			
Bluetooth				
Bluetooth Version	: V5.0			
Frequency Range	: 2402-2480MHz			
Channel Number	: 79 Channels			
Modulation Technology	: GFSK, π/4-DQPSK, 8DPSK			
Data Rates	: 1~3Mbps			
Antenna Type And Gain	: PCB Antenna -0.58dBi(supplied by applicant)			
Note: Antenna postion refer to EUT Photos.				

# 1.2 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate

# 1.3 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- $\, \odot \,$  supplied by the lab

# 1.4 External I/O Cable

I/O Port Description	Quantity	Cable



# 1.5 Description of Test Facility

#### FCC

Designation Number: CN1275 Test Firm Registration Number: 167722 Shenzhen Tongzhou Testing Co.,Ltd has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

# A2LA

Certificate Number: 5463.01

Shenzhen Tongzhou Testing Co.,Ltd has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

# IC

ISED#: 22033 CAB identifier: CN0099 Shenzhen Tongzhou Testing Co.,Ltd has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010



# 1.6 Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen Tongzhou Testing Co.,Ltd quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

# 1.7 Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
		9KHz~30MHz	±3.08dB	(1)
Radiation Uncertainty	:	30MHz~1000MHz	±3.92dB	(1)
		1GHz~40GHz	±4.28dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±2.71dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

#### 1.8 Description of Test Modes

Bluetooth operates in the unlicensed ISM Band at 2.4GHz. The EUT works in the X-axis, Y-axis, Z-axis. The following operating modes were applied for the related test items. All test modes were tested, only the result of the worst case was recorded in the report.

Mode of Operations	Frequency Range (MHz)	Data Rate (Mbps)		
	2402	1/2/3		
Bluetooth	2441	1/2/3		
	2480	1/2/3		
For Conducted Emission				
Test Mode	-	TX Mode		
	For Radiated Emission			
Test Mode		TX Mode		

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be TX(3Mbps-Low Channel).



# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR PART 15C 15.207, 15.209, 15.247 and DA 00-705.

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### 2.2 EUT Exercise

The EUT was operated in the normal operating mode for Hopping Numbers and Dwell Time test and a continuous transmits mode for other tests.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209, 15.247 under the FCC Rules Part 15 Subpart C.

#### 2.3 General Test Procedures

#### 2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

#### 2.3.2 Radiated Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013

#### 2.4. Test Sample

The application provides 2 samples to meet requirement;

Sample ID	Description
TZ220303008–1#	Engineer sample – continuous transmit
TZ220303008–2#	Normal sample – Intermittent transmit



# **3. SYSTEM TEST CONFIGURATION**

# 3.1 Justification

The system was configured for testing in a continuous transmits condition.

# 3.2 EUT Exercise Software

The system was configured for testing in a continuous transmits condition and change test channels by software (bt\_tool v1.0.9) provided by application.

#### 3.3 Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
1	PC	ASUS	X454L	15105-0038A1 00	/	1	/

### 3.4 Block Diagram/Schematics

Please refer to the related document.

### 3.5 Equipment Modifications

Shenzhen Tongzhou Testing Co.,Ltd has not done any modification on the EUT.

# 3.6 Test Setup

Please refer to the test setup photo.

# 4. SUMMARY OF TEST RESULTS

	Applied Standard: FCC Part 15 S	Subpart C	
FCC Rules	Description of Test	Test Sample	Result
§15.247(b)(1)	47(b)(1) Maximum Peak Conducted Output Power T		Compliant
§15.247(a)	Frequency Separation And 20 dB Bandwidth	TZ220303008–1#	Compliant
§15.247(a)(1)(iii) Number Of Hopping Frequency		TZ220303008-1#	Compliant
§15.247(a)(1)(iii)	Time Of Occupancy (Dwell Time)	TZ220303008-1#	Compliant
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	TZ220303008–1# TZ220303008–2#	Compliant
§15.205	Emissions at Restricted Band	TZ220303008-1#	Compliant
§15.207(a)	§15.207(a) Conducted Emissions		Compliant
§15.203 Antenna Requirements		TZ220303008-1#	Compliant
§15.247(i)§2.1093	RF Exposure	N/A	Compliant

Remark: The measurement uncertainty is not included in the test result.



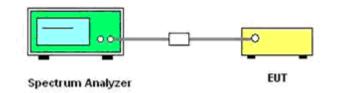
# 5. SUMMARY OF TEST EQUIPMENT

Item	Test Equipment	Manufacturer	Manufacturer Model No. Serial No.		Calibration Date	Calibration Due Date
1	MXA Signal Analyzer	Keysight	N9020A	MY52091623	2022/1/13	2023/1/12
2	Power Sensor	Agilent	U2021XA	MY5365004	2022/1/13	2023/1/12
3	Power Meter	Agilent	U2531A	TW53323507	2022/1/13	2023/1/12
4	Loop Antenna	schwarzbeck	FMZB1519B	00023	2019/11/16	2022/11/15
5	Wideband Antenna	schwarzbeck	VULB 9163	958	2019/11/16	2022/11/15
6	Horn Antenna	schwarzbeck	9120D-1141	1574	2019/11/16	2022/11/15
7	EMI Test Receiver	R&S	ESCI	100849/003	2022/1/12	2023/1/11
8	Controller	MF	MF7802	N/A	N/A	N/A
9	Amplifier	schwarzbeck	BBV 9743	209	2022/1/12	2023/1/11
10	Amplifier	Tonscend	TSAMP-051 8SE		2022/1/12	2023/1/11
11	RF Cable(below 1GHz)	HUBER+SUHNE R	RG214	N/A	2022/1/12	2023/1/11
12	RF Cable(above 1GHz)	HUBER+SUHNE R	RG214	N/A	2022/1/14	2023/1/13
12	Artificial Mains	ROHDE & SCHWARZ	ENV 216	101333-IP	2022/1/13	2023/1/12
14	EMI Test Software	ROHDE & SCHWARZ	ESK1	V1.71	N/A	N/A
15	RE test software	Tonscend	JS32-RE	V2.0.2.0	N/A	N/A
16	Test Software	Tonscend	JS1120-3	V2.5.77.0418	N/A	N/A
17	Horn Antenna	A-INFO	LB-180400-K F	J211020657	2020/10/12	2022/10/11
18	Amplifier	CDSA	PAP-1840	17021	2021/10/10	2022/10/09
19	Spectrum Analyzer	R&S	FSP40	100550	2022/1/10	2023/1/9



# 6. MEASUREMENT RESULTS

- 6.1 Peak Power
- 6.1.1 Block Diagram of Test Setup



#### 6.1.2 Limit

According to §15.247(b)(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.

#### 6.1.3 Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

#### 6.1.4 Test Results

Pass

#### Remark:

- 1. Test results including cable loss;
- 2. please refer to following plots;
- 3. Measured output power at difference Packet Type for each mode and recorded worst case for each mode.
- 4. Plesase See appendix for Peak Output Power test data

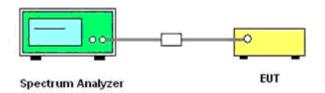


# 6.2 Frequency Separation and 20 dB Bandwidth

#### 6.2.1 Limit

According to §15.247(a) (1), 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 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

6.2.2 Block Diagram of Test Setup



#### 6.2.3 Test Procedure

Frequency separation test procedure:

1). Place the EUT on the table and set it in transmitting mode.

2). Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set center frequency of Spectrum Analyzer = middle of hopping channel.

4). Set the Spectrum Analyzer as RBW = 100 kHz, VBW = 300 kHz, Span = wide enough to capture the peaks of two adjacent channels, Sweep = auto.

5). Max hold, mark 2 peaks of hopping channel and record the 2 peaks frequency.

20dB bandwidth test procedure:

1). Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel.

2). RBW  $\geq$ 1% of the 20 dB bandwidth, VBW  $\geq$ RBW.

- 3). Detector function = peak.
- 4). Trace = max hold.

6.2.4 Test Results Pass



Remark:

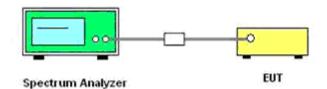
- 1. Test results including cable loss;
- 2. please refer to following plots;
- 3. Measured at difference Packet Type for each mode and recorded worst case for each mode.
- 4. Plesase See appendix for 20dB Bandwidth test data
- 5. Plesase See appendix for Carrier Frequency Separation test data

# 6.3 Number of Hopping Frequency

### 6.3.1 Limit

According to §15.247(a)(1)(iii) or A8.1 (d), Frequency hopping systems operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels.

6.3.2 Block Diagram of Test Setup



#### 6.3.3 Test Procedure

1). Place the EUT on the table and set it in transmitting mode.

2). Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set Spectrum Analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.

- 4). Set the Spectrum Analyzer as RBW, VBW=1MHz.
- 5). Max hold, view and count how many channel in the band.

6.3.4 Test Results

Pass

#### Plesase See appendix for Hopping Channel Number test data

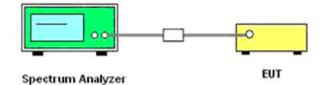


# 6.4 Time of Occupancy (Dwell Time)

#### 6.4.1 Limit

According to §15.247(a)(1)(iii) or A8.1 (d), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

#### 6.4.2 Block Diagram of Test Setup



#### 6.4.3 Test Procedure

1). Place the EUT on the table and set it in transmitting mode.

2). Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

- 3). Set center frequency of Spectrum Analyzer = operating frequency.
- 4). Set the Spectrum Analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.
- 5). Repeat above procedures until all frequency measured was complete.

#### 6.4.4 Test Results

Pass

#### Option 1

The Dwell Time=Burst Width\*Total Hops. The detailed calculations are showed as follows:

The duration for dwell time calculation: 0.4[s]\*hopping number=0.4[s]\*79[ch]=31.6[s\*ch];

The burst width [ms/hop/ch], which is directly measured, refers to the duration on one channel hop.

The hops per second for all channels: The selected EUT Conf uses a slot type of 5-Tx&1-Rx and a hopping rate of 1600 [ch\*hop/s] for all channels. So the final hopping rate for all channels is 1600/6=266.67 [ch\*hop/s] The hops per second on one channel: 266.67 [ch\*hop/s]/79 [ch]=3.38 [hop/s];

The total hops for all channels within the dwell time calculation duration: 3.38 [hop/s]\*31.6[s\*ch]=106.67 [hop\*ch];

The dwell time for all channels hopping: 106.67 [hop\*ch]\*Burst Width [ms/hop/ch].

#### Option 2

The Dwell Time=Burst Width\*Total Hops. The detailed calculations are showed as follows:

The duration for dwell time calculation: 0.4[s]\*hopping number=0.4[s]\*79[ch]=31.6[s\*ch];

The burst width [ms/hop/ch], which is directly measured, refers to the duration on one channel hop.

The dwell time for all channels hopping: [hops/3.16s]\*10\*Burst Width [ms/hop/ch].



Remark:

- 1. Test results including cable loss;
- 2. please refer to following plots;
- Measured at difference Packet Type for each mode and recorded woest case for each mode.
   Measured at low, middle and high channel, recorded worst at middle channel;
- 5. Plesase See appendix for Dwell Time test data

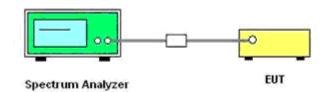


# 6.5 Conducted Spurious Emissions and Band Edges Test

#### 6.5.1 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. Attenuation below the general limits specified in Section 15.209(a) is not required.

#### 6.5.2 Block Diagram of Test Setup



#### 6.5.3 Test Procedure

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 300 KHz.

Measurements are made over the 9 kHz to 26.5GHz range with the transmitter set to the lowest, middle, and highest channels

6.5.4 Test Results of Conducted Spurious Emissions

Pass



Test Mode	Channel	Frequency (MHz)	Measured Frequency Range	Spurious RF Conducted Emission (dBc)	Limits (dBc)	Verdict
	0	2402	9 KHz – 26.5 GHz	<-20		
GFSK	39	2441	9 KHz – 26.5 GHz	<-20	-20	PASS
	78	2480	9 KHz – 26.5 GHz	<-20		
	0	2402	9 KHz – 26.5 GHz	<-20		
π/4-DQPSK	39	2441	9 KHz – 26.5 GHz	<-20	-20	PASS
	78	2480	9 KHz – 26.5 GHz	<-20		
	0	2402	9 KHz – 26.5 GHz	<-20		
8DPSK	39	2441	9 KHz – 26.5 GHz	<-20	-20	PASS
	78	2480	9 KHz – 26.5 GHz	<-20		

### Remark:

- 1. Test results including cable loss;
- 2. please refer to following plots;
- Measured at difference Packet Type for each mode and recorded worst case for each mode.
   Plesase See appendix for Band-edge Emissions test data
   Plesase See appendix for Conducted Spurious Emissions test data



# 6.6 Restricted Band Emission Limit

# 6.6.1. Standard Applicable

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz		MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15	
\1\ 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	108-121.94	1718.8-1722.2	13.25-13.4	
6.31175-6.31225	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				

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

#### \2\ Above 38.6

According to §15.247 (d): 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.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

# 6.6.2. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10 <sup>th</sup> carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average



Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

6.6.3. Test Procedures

### 1) Sequence of testing 9 kHz to 30 MHz

#### Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

#### Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna height is 0.8 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

#### Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

#### 2) Sequence of testing 30 MHz to 1 GHz

#### Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

#### **Premeasurement:**

--- The turntable rotates from 0° to 315° using 45° steps.

- --- The antenna is polarized vertical and horizontal.
- --- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

#### **Final measurement:**

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ( $\pm$  45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.



#### 3) Sequence of testing 1 GHz to 18 GHz

#### Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

- --- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

#### **Premeasurement:**

- --- The turntable rotates from 0° to 315° using 45° steps.
- --- The antenna is polarized vertical and horizontal.
- --- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

#### **Final measurement:**

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ( $\pm 45^{\circ}$ ) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.



#### 4) Sequence of testing above 18 GHz

#### Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

- --- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 1 meter.
- --- The EUT was set into operation.

#### **Premeasurement:**

--- The antenna is moved spherical over the EUT in different polarizations of the antenna.

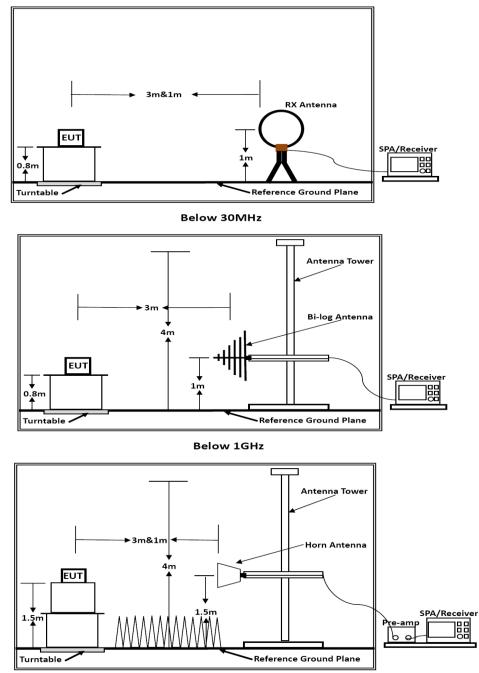
#### **Final measurement:**

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.



# 6.6.4. Test Setup Layout



Above 1GHz

Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distanc [3m] / test distance [1.5m]) (dB); Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].



# 6.6.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

#### 6.6.6. Radiated Emissions

Temperature	22.8°C	Humidity	56%
Test Engineer	Nancy Li	Configurations	BT

(i) Results of Radiated Emissions (9 kHz~30MHz)

Freq.	Level	Over Limit	Over Limit	Remark
(MHz)	(dBuV)	(dB)	(dBuV)	
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB); Limit line = specific limits (dBuV) + distance extrapolation factor.

#### PASS.

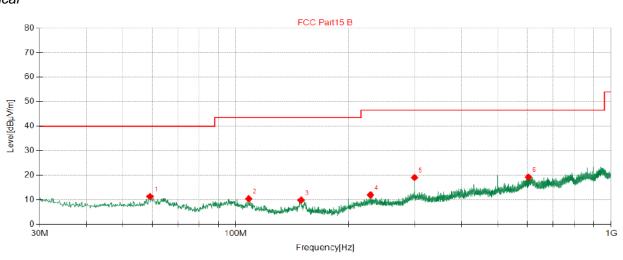
Only record the worst test result in this report.

The test data please refer to following page.



(ii) Results of Radiated Emissions (30MHz ~1GHz)

Below 1GHz (Worst case: 3Mbps, Low Channel)



#### Vertical

QP Detector

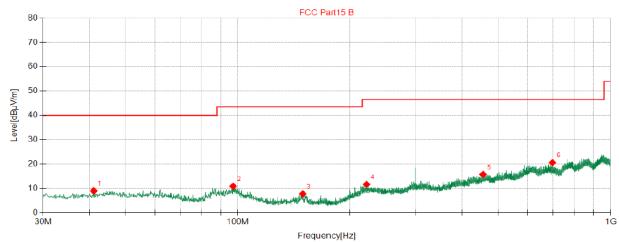
Susp	Suspected Data List								
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/ m]	Limit [dBµV/ m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	59.10	26.28	-14.94	11.34	40.00	28.66	100	119	Vertical
2	108.3	25.98	-15.57	10.41	43.50	33.09	100	208	Vertical
3	149.5	27.54	-17.67	9.87	43.50	33.63	100	217	Vertical
4	228.9	26.53	-14.56	11.97	46.50	34.53	200	176	Vertical
5	300.0	31.17	-12.11	19.06	46.50	27.44	200	176	Vertical
6	603.5	25.08	-5.88	19.20	46.50	27.30	200	356	Vertical

\*\*\*Note:

1. Level [dBµV/m] = Reading [dBµV] + Factor [dB/m]

2. Margin  $[dB] = Limit [dB\mu V/m] - Level [dB\mu V/m]$ 





	QP D	etector							
Susp	ected Da	ata List							
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/ m]	Limit [dBµV/ m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	41.03	23.46	-14.50	8.96	40.00	31.04	300	180	Horizontal
2	97.17	27.32	-16.46	10.86	43.50	32.64	300	10	Horizontal
3	149.5	26.85	-19.11	7.74	43.50	35.76	100	190	Horizontal
4	221.8	26.40	-14.75	11.65	46.50	34.85	300	233	Horizontal
5	455.7	24.65	-8.94	15.71	46.50	30.79	300	313	Horizontal
6	700.0	24.94	-4.35	20.59	46.50	25.91	100	109	Horizontal

\*\*\*Note:

1. Level [dBµV/m] = Reading [dBµV] + Factor [dB/m]

2. Margin [dB] = Limit [dBµV/m] - Level [dBµV/m]



### (iii) Results of Radiated Emissions (1GHz ~26.5GHz)

# Above 1GHz

The worst test result for GFSK, Channel 0 / 2402 MHz

Freq. MHz	Reading dBuv	Ant. Fac dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4804.00	58.78	33.06	35.04	3.94	60.74	74.00	13.26	Peak	Horizontal
4804.00	43.43	33.06	35.04	3.94	45.39	54.00	8.61	Average	Horizontal
4804.00	52.59	33.06	35.04	3.94	54.55	74.00	19.45	Peak	Vertical
4804.00	43.66	33.06	35.04	3.94	45.62	54.00	8.38	Average	Vertical

The worst test result for  $\pi$ /4-DQPSK, Channel 0 / 2402 MHz

Freq. MHz	Reading dBuv	Ant. Fac dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4804.00	58.50	33.06	35.04	3.94	60.46	74.00	13.54	Peak	Horizontal
4804.00	43.24	33.06	35.04	3.94	45.20	54.00	8.80	Average	Horizontal
4804.00	53.11	33.06	35.04	3.94	55.07	74.00	18.93	Peak	Vertical
4804.00	39.65	33.06	35.04	3.94	41.61	54.00	12.39	Average	Vertical

The worst test result for 8DPSK, Channel 0 / 2402 MHz

Freq. MHz	Reading dBuv	Ant. Fac dB/m	Pre. Fac.	Cab. Loss	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
			dB	dB					
4804.00	53.74	33.06	35.04	3.94	55.70	74.00	18.30	Peak	Horizontal
4804.00	42.73	33.06	35.04	3.94	44.69	54.00	9.31	Average	Horizontal
4804.00	57.12	33.06	35.04	3.94	59.08	74.00	14.92	Peak	Vertical
4804.00	43.89	33.06	35.04	3.94	45.85	54.00	8.15	Average	Vertical

The worst test result for GFSK, Channel 39 / 2441 MHz

Freq.	Reading	Ant. Fac	Pre.	Cab.	Measured	Limit	Margin	_	
MHz	dBuv	dB/m	Fac.	Loss	dBuv/m	dBuv/m	dB	Remark	Pol.
			dB	dB					
4882.00	59.23	33.16	35.15	3.96	61.20	74.00	12.80	Peak	Horizontal
4882.00	40.00	33.16	35.15	3.96	41.97	54.00	12.03	Average	Horizontal
4882.00	55.88	33.16	35.15	3.96	57.85	74.00	16.15	Peak	Vertical
4882.00	43.58	33.16	35.15	3.96	45.55	54.00	8.45	Average	Vertical

The worst test result for  $\pi/4$ -DQPSK, Channel 39 / 2441 MHz

Freq.	Reading	Ant. Fac	Pre.	Cab.	Measured	Limit	Margin	_	
MHz	dBuv	dB/m	Fac.	Loss	dBuv/m	dBuv/m	dB	Remark	Pol.
			dB	dB					
4882.00	56.48	33.16	35.15	3.96	58.45	74.00	15.55	Peak	Horizontal
4882.00	42.64	33.16	35.15	3.96	44.61	54.00	9.39	Average	Horizontal
4882.00	58.49	33.16	35.15	3.96	60.46	74.00	13.54	Peak	Vertical
4882.00	40.35	33.16	35.15	3.96	42.32	54.00	11.68	Average	Vertical



# The worst test result for 8DPSK, Channel 39 / 2441 MHz

Freq. MHz	Reading dBuv	Ant. Fac dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4882.00	52.15	33.16	35.15	3.96	54.12	74.00	19.88	Peak	Horizontal
4882.00	41.91	33.16	35.15	3.96	43.88	54.00	10.12	Average	Horizontal
4882.00	58.61	33.16	35.15	3.96	60.58	74.00	13.42	Peak	Vertical
4882.00	42.95	33.16	35.15	3.96	44.92	54.00	9.08	Average	Vertical

The worst test result for GFSK, Channel 78 / 2480 MHz

Freq.	Reading	Ant. Fac	Pre.	Cab.	Measured	Limit	Margin		
MHz	dBuv	dB/m	Fac.	Loss	dBuv/m	dBuv/m	dB	Remark	Pol.
			dB	dB					
4960.00	54.68	33.26	35.14	3.98	56.78	74.00	17.22	Peak	Horizontal
4960.00	40.36	33.26	35.14	3.98	42.46	54.00	11.54	Average	Horizontal
4960.00	59.56	33.26	35.14	3.98	61.66	74.00	12.34	Peak	Vertical
4960.00	42.99	33.26	35.14	3.98	45.09	54.00	8.91	Average	Vertical

The worst test result for  $\pi/4$ -DQPSK, Channel 78 / 2480 MHz

Freq.	Reading	Ant. Fac	Pre.	Cab.	Measured	Limit	Margin	Remark	Pol.
MHz	dBuv	dB/m	Fac. dB	Loss dB	dBuv/m	dBuv/m	dB		
4960.00	59.15	33.26	35.14	3.98	61.25	74.00	12.75	Peak	Horizontal
4960.00	40.59	33.26	35.14	3.98	42.69	54.00	11.31	Average	Horizontal
4960.00	55.34	33.26	35.14	3.98	57.44	74.00	16.56	Peak	Vertical
4960.00	42.14	33.26	35.14	3.98	44.24	54.00	9.76	Average	Vertical

The worst test result for 8DPSK, Channel 78 / 2480 MHz

Freq. MHz	Reading dBuv	Ant. Fac dB/m	Pre. Fac.	Cab. Loss	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
			dB	dB					
4960.00	54.20	33.26	35.14	3.98	56.30	74.00	17.70	Peak	Horizontal
4960.00	39.19	33.26	35.14	3.98	41.29	54.00	12.71	Average	Horizontal
4960.00	57.96	33.26	35.14	3.98	60.06	74.00	13.94	Peak	Vertical
4960.00	39.72	33.26	35.14	3.98	41.82	54.00	12.18	Average	Vertical

#### Notes:

1). Measuring frequencies from 9k~10th harmonic (ex. 26GHz), No emission found between lowest internal used/generated frequency to 30 MHz.

2). Radiated emissions measured in frequency range from 9k~10th harmonic (ex. 26GHz) were made with an instrument using Peak detector mode.

3). 18~25GHz at least have 20dB margin. No recording in the test report.

4).Measured = Reading + Ant. Fac - Pre. Fac. + Cab. Loss; Margin = Limit - Measured



#### 6.7. AC Power line conducted emissions

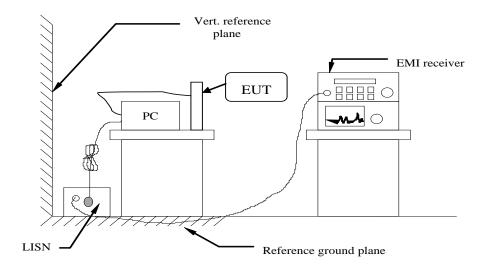
#### 6.7.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range	Limits (	dBµV)
(MHz)	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

\* Decreasing linearly with the logarithm of the frequency

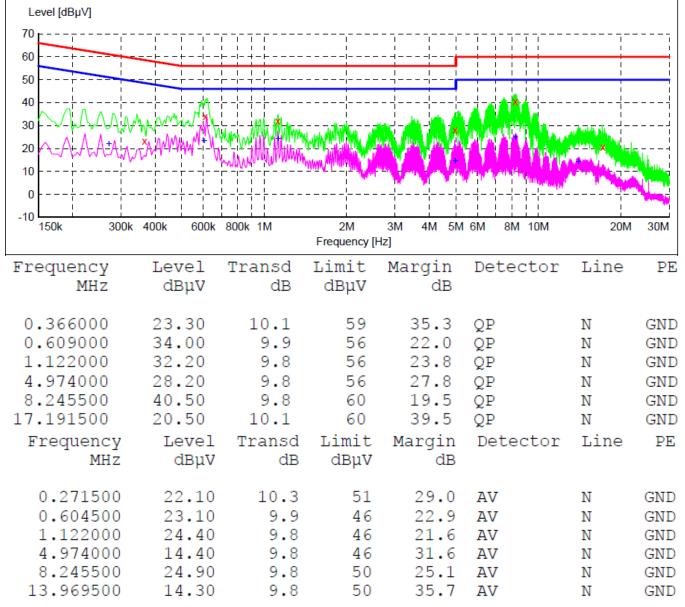
#### 6.7.2 Block Diagram of Test Setup



#### 6.7.3 Test Results

Temperature	22.8°C	Humidity	56%
Test Engineer	Nancy Li	Configurations	BT





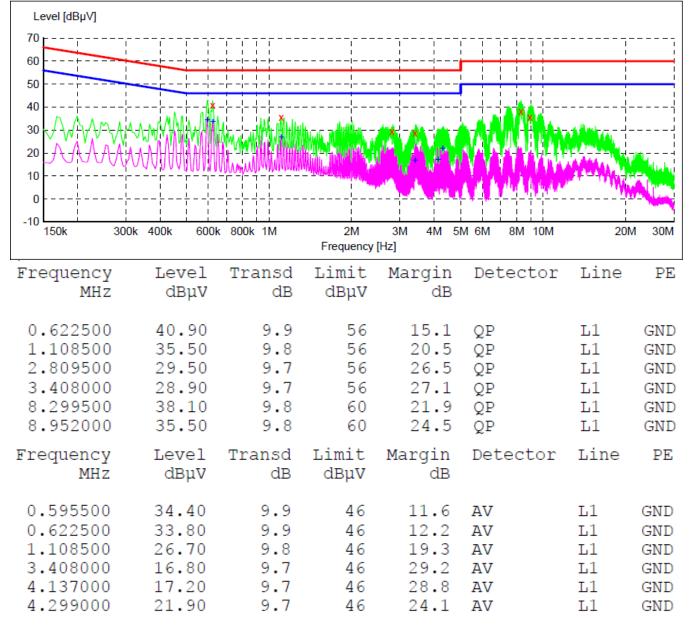
#### Note:

1). Pre-scan all modes and recorded the worst case results in this report

2). Emission level (dBuV) = 20 log Emission level (uV).

3). Margin=Limit-Level





#### Note:

1). Pre-scan all modes and recorded the worst case results in this report

2). Emission level (dBuV) = 20 log Emission level (uV).

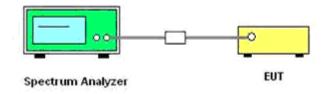
3). Margin=Limit-Level

# 6.8. Band-edge measurements for radiated emissions

### 6.8.1 Standard Applicable

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)).

# 6.8.2. Test Setup Layout



# 6.8.3. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of Spectrum Analyzer.

### 6.8.4. Test Procedures

According to KDB 412172 section 1.1 Field Strength Approach (linear terms):

 $eirp = p_t x g_t = (E x d)^2/30$ 

Where:

pt = transmitter output power in watts,

gt = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m,

d = measurement distance in meters (m).

 $erp = eirp/1.64 = (E \times d)^2/(30 \times 1.64)$ 

Where all terms are as previously defined.

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
- 3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=1/B for Peak detector.
- 4. 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.
- 5. Repeat above procedures until all measured frequencies were complete.
- 6. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
- 7. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)



- 8. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
- For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
- 10. Compare the resultant electric field strength level to the applicable regulatory limit.
- 11. Perform radiated spurious emission test duress until all measured frequencies were complete.

6.8.5. Test Results

Pass

Remark:

- 1. Measured at difference Packet Type for each mode and recorded worst case for each mode.
- 2. Worst case data at DH5 for GFSK, 2DH5 for  $\pi$ /4DQPSK, 3DH5 for 8DPSK modulation type;
- 3. Measured at Hopping and Non-Hopping mode, recorded worst at Non-Hopping mode.
- 4. The other emission levels were very low against the limit.
- 5. The average measurement was not performed when the peak measured data under the limit of average detection.
- 6. Detector AV is setting spectrum/receiver. RBW=1MHz/VBW=10Hz/Sweep time=Auto/Detector=Peak;
- 7. Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.
- 8. Plesase See appendix for Band-edge measurements for radiated emissions.



# 6.9. Pseudorandom frequency hopping sequence

### 6.9.1 Standard Applicable

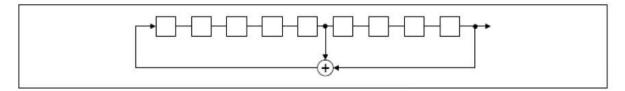
For 47 CFR Part 15C sections 15.247 (a) (1) requirement:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hop-ping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. 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 hop-ping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

# 6.9.2 EUT Pseudorandom Frequency Hopping Sequence Requirement

The pseudorandom frequency hopping sequence may be generated in a nice-stage shift register whose 5th first stage. The sequence begins with the first one of 9 consecutive ones, for example: the shift register is initialized with nine ones.

- Number of shift register stages:9
- Length of pseudo-random sequence:29-1=511 bits
- Longest sequence of zeros:8(non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of pseudorandom frequency hopping sequence as follows:

0	2	4	6	62	64	78	1	73	75	77
			Π-	 F	$\square$			 	Γ	Г
				1		1				
						1				L
			LL	 <u>l</u>				 		L

Each frequency used equally one the average by each transmitter.

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



#### 6.10. Antenna requirement

#### 6.10.1 Standard Applicable

#### According to antenna requirement of §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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

#### 6.10.2 Antenna Connected Construction

#### 6.10.2.1. Standard Applicable

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.

#### 6.10.2.2. Antenna Connector Construction

The directional gains of antenna used for transmitting is refer to section 1.1 of this report, and the antenna is an internal antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

6.10.2.3. Results: Compliance.



# 7. TEST SETUP PHOTOGRAPHS

Please refer to separated files for Test Setup Photos of the EUT.

# **8.EXTERNAL PHOTOS OF THE EUT**

Please refer to separated files for External Photos of the EUT.

# 9.INTERIOR PHOTOS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF REPORT----- -----

# Appendix A RF Test Data for BT(BDR/EDR) (Conducted Measurement) Product Name: Bone Conduction Headphone Trade Mark: N/A

## Test Model: X14 FCC ID: 2AXV7-X14

# **Environmental Conditions**

Temperature:	22.8° C
Relative Humidity:	56%
ATM Pressure:	100.0 kPa
Test Engineer:	Nancy Li
Supervised by:	Hugo Chen

#### A.1 20 dB Bandwidth

	Danamat						
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2402	0.936	2401.559	2402.495		
DH5	Ant1	2441	0.864	2440.556	2441.420		
		2480	0.891	2479.559	2480.450		
		2402	1.329	2401.352	2402.681		
2DH5	Ant1	2441	1.287	2440.382	2441.669		
		2480	1.329	2479.352	2480.681		
		2402	1.281	2401.376	2402.657		
3DH5	Ant1	2441	1.281	2440.370	2441.651		
		2480	1.332	2479.349	2480.681		

### **Test Graph**

DH5_Ant1_2402         Added Spectrum Analyzer - Swept SM         RL       EX       EX       EX       All State       All State       Frequency         PR0: Wide       Trig: Free Run #Ref 0f5st9.4 dB       All State       All State       Frequency       Auto Tune         I of State       Add State       Add State       All State       Center Freq (cell property)       Auto Tune         I of State       Ref 0ffsst9.4 dB       0.00 dBm       1.066 dB       1.066 dB       2.40200000 GHz         1 of State       Ref 0ffsst9.4 dB       0.00 dBm       0.066 dB       1.066 dB       2.40200000 GHz         1 of State       0.00 dBm       0.00 dBm       0.00 dBm       0.066 dB       2.40200000 GHz         1 of 0       0.00 dBm       0.00 dBm       0.00 dBm       0.066 dB       2.40200000 GHz         1 of 0       0.00 dBm       0.00 dBm       0.00 dBm       0.00 dBm       0.00 dBm       0.00 dBm         1 of 0       0.00 dBm         1 of 0       0.00 dBm       0	
Image: Product Produ	
Center Freq 2:40200000 FR0; Write         Trig: Free Run         Avgifield: 100/100         Trig: Free Run         Avgifield: 100/100         Trig: Free Run         Autor Ture           Ref Offset 9:4 00         B         ΔMkr3 936 kHz         Autor Ture         Autor Ture         Autor Ture           10 dB/div         Ref Offset 9:4 00         B         ΔMkr3 936 kHz         Autor Ture           10 dB/div         Ref Offset 9:4 00         Center Freq         2.40200000 GHz           100	
Ref Offset 9 & dB     Δ1WIK 5 350 KHZ       10 dB/div     Ref 30.00 dBm       10 dB/div     Ref 30.00 dBm       200     1.066 dB       200     2       300     2       400     2       400     3Δ1       200     2       300     3Δ1       200     2       300     3Δ1       400     3Δ1       200     3Δ1       300     3Δ1       300     3Δ1       300     3Δ1       300     3Δ1       300     3Δ1	
200     Center Freq       000     2       000     2       000     3Δ1       000     Start Freq       2.4000000 GHz	
0.00         2         301         301         301         301         240500000 GHz           0.00         0.00         0.00         0.00         0.00         555 dbs         555 dbs           0.00         0.00         0.00         0.00         555 dbs         555 dbs         555 dbs           0.00         0.00         0.00         0.00         0.00         555 dbs         555 dbs         555 dbs           0.00         0.00         0.00         0.00         0.00         555 dbs         555 dbs         555 dbs           0.00         0.00         0.00         0.00         0.00         555 dbs         555 dbs         555 dbs	
300     1     33Δ1     33Δ1     3235.66     Start Freq       400     1     1     1     1     1     1     1       400     1     1     1     1     1     1     1       400     1     1     1     1     1     1     1       400     1     1     1     1     1     1     1       400     1     1     1     1     1     1     1	
500 Stop Freq	
80.0 2.403500000 GHz	
Center 2.402000 GHz         Span 3.000 MHz         CF Step           #Res BW 20 kHz         #VBW 62 kHz         Sweep 7.200 ms (1001 pts)         300.000 kHz	
Image index i	
Image: Second	
MSG Contraction of the second	
DH5_Ant1_2441	
Agilent Spectrum Analyzer - Swept SA         Automation         Opt.42:12 PM Mir 12: 2022.         Frequency           If RL         8F         50:0; AC         59:NE: 59:U.95         AUtoMatrix 0; 01:42:12 PM Mir 12: 2022.         Frequency           Center Freq 2.4410000000 GHz         #Xeg Type: RMS         TPACE [12:3:43:6         Frequency	
Certiter Pred 2:44 100000 GPI2 Trig: Free Run Avg Fold: 100/100 trig: PPPPP P FGaint.ew #Atter: 40 dB Avg Fold: 100/100 trig: PPPPP P Auto Tune	
Ref Offset 9.56 dB         ΔMkr3 864 kHz         Auto Tune           10 dB/div         Ref 30.00 dBm         0.564 dB	
200 Center Freq 100 2.44100000 GHz	
-20.0	
400 400 Stop Freq	
-00 0 2.442500000 GHz	
Center 2.441000 GHz Span 3.000 MHz CF Step #Res BW 20 kHz #VBW 62 kHz Sweep 7.200 ms (1001 pts) 300.000 kHz	
IMBE         IN         1         K         Y         FUNCTION         FUNCTION         FUNCTION         FUNCTION         Man           1         N         1         f         2.440.0556         GHz         -29.952         dBm	
3         Δ1         1         f         (Δ)         864 kHz         (Δ)         0.564 dB         Freq Offset           4         6         0 Hz         0 Hz </td <td></td>	
MSG Libertarus	
DH5_Ant1_2480	
Agliers Spectrum Analyzer         Server 54.56         ALIONAUTO         (0144603081Mar12,2022)           R R         Store 54.456         Alionautro         (0144603081Mar12,2022)         Frequency           Center Freq 2.480000000 GHz         Store 54.456         Store 54.565         Frequency	
PNO: Wide → 10g: Free Run Avginoid: 1001100 1001100 IFGainLow #Atten: 40 dB 1011100 1001100 1001100 1001100	
Ref Offset 9 56 dB         Zimin 3 69 i kn2           10 dB/div         Ref 30.00 dBm         0.785 dB           Log	
200 Center Freq 100 248000000 GHz	
100 22 Start Freq	
-200 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
500 Stop Freq	
-60.0	
Center 2.480000 GHz Span 3.000 MHz CF Step #Res BW 20 kHz #VBW 62 kHz Sweep 7.200 ms (1001 pts) 000.000 kHz Ann	
1 N 1 f 2.479 559 GHz -31,833 dBm	
MSG 65TATUS	
2DH5_Ant1_2402	

Page 2 of 36



	Agilent Spectrum Analyzer - Swept SA 20 R.L. RF 30.0 AC SENSE PULSE ALIGNAUTO 01.59:11 PM Mar12, 2022
	Center Freq 2.40200000 GHz #Avg Type: RMS TRACE [12:3:4:5.6]
	Auto Tuno
	Ref Offset 9.4 dB         ΔMkr3 1.281 MHz         Add 0 fulle           10 dB/div         Ref 30.00 dBm         0.641 dB
	200 Center Freq 100 2.40200000 GHz
	100 Start Freq
	2.400500000 GHz
	300 proving months Stop Freq
	-50.0 2.403500000 GHz
	Center 2.402000 GHz CF Step
	#Res BW 20 kHz #VBW 62 kHz Sweep 7.200 ms (1001 pts) 300.000 kHz 300.000 kHz
	1 N I f 2.401376 GHz 32.023 dBm
	4 0Hz
	6
	9
	MSG 🕼 STATUS
	3DH5_Ant1_2441
	Agilent Spectrum Analyzer - Swept SA.
	Center Freq 2.441000000 GHz #Avg Type: RMS TRACE [12:34:56]
	AMER'S 1 201 MUR
	10 dB/div Ref 30.00 dBm -0.543 dB
	200 Center Freq
	100 2.44100000 GHz
	Start Freq
	-2.0.0 -30.0 30.1 32.07 dBr (γ - 1 - 1 - 2 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 3 - 2 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4
	500 transformation to the state of the state
	Center 2.441000 GHz Span 3.000 MHz CF Step #Res BW 20 kHz #VBW 62 kHz Sweep 7.200 ms (1001 pts) 300.000 kHz
	1 N 1 f 2440 370 GHz 32 198 dBm 2 1 2074 dBm 2 1 f 2441 180 GHz 12074 dBm 2 1 1 f 2441 180 GHz 12074 dBm 2 1 1 2074 dBm 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	4 0 Hz
	8
	9 10 11
	MSG GSTATUS
	3DH5_Ant1_2480
	Agilent Spectrum Analyzer - Swept SA
	14 RL № 50.0 AC SINSEAUSE 4U34MUTO 0203520MUT2 2020 Center Frequency 8A000000 GHz 84051996; BMS TRACE[12.34:56]
	IFGainLuw #Atten: 40 dB DEFIP PP PP
	Ref Offset 9.56 dB ΔMkr3 1.332 MHz Auto Tune
	10 dB/div Ref 30.00 dBm -0.164 dB
	20.0 Center Freq
	100 2.48000000 GHz
	20.0 Start Fred
	30.0
	500 Stop Freq
	-50.0
	Center 2.480000 GHz Span 3.000 MHz CF Step #Res BW 20 kHz #VBW 62 kHz Sweep 7.200 ms (1001 pts) 300.000 kHz
	1         N         1         f         2479349 GHz         34879 dBm           2         N         1         f         2460 030 GHz         -14.680 dBm           3         A 1         1         f         (Δ)         -0.164 dB
	8
1	9

## A.2 Dwell Time

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Нор	2.902	110	0.319	<=0.4	PASS
2DH5	Ant1	Нор	2.912	110	0.32	<=0.4	PASS
3DH5	Ant1	Нор	2.912	110	0.32	<=0.4	PASS

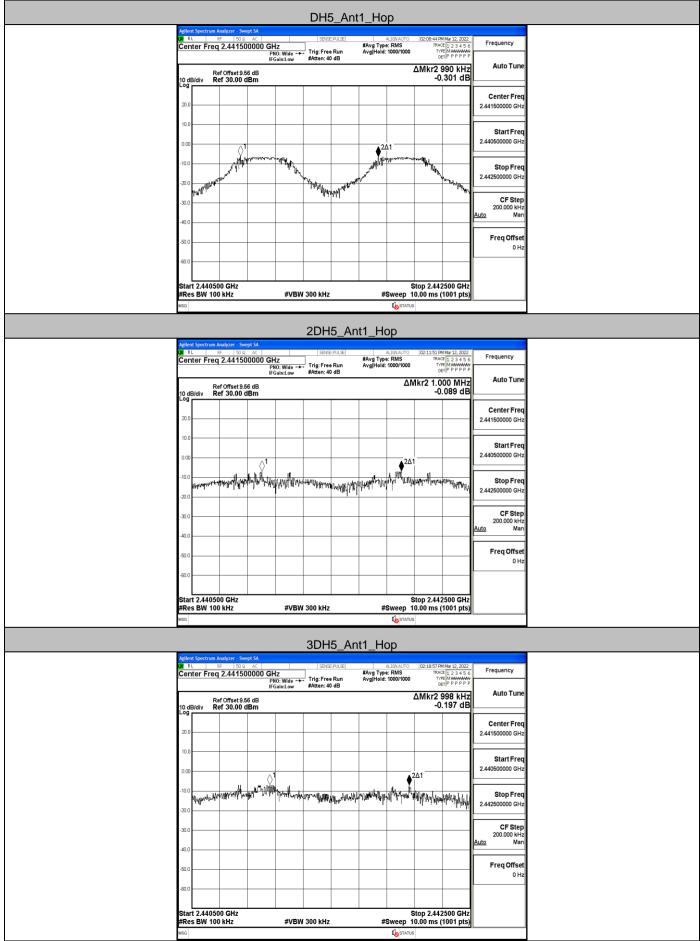
•						DH	5_Ant	:1_Hc	р			
2 C 1	enter	Ref O Ref O Ref O	50 Ω	AC DOOO GI P IF	Hz 'NO: Fast ↔ Gain:Low	SENS Trig Del Trig: Vid #Atten: 2	EPULSE ay-200.0 μs eo t0 dB	#Avg Typ		TRAC TYP DE Mkr2 2	Mar 12, 2022 E 1 2 3 4 5 6 E WWWWWWW TP P P P P P 898 ms 0.64 dB	Frequency Auto Tune
					_2∆1 —							Center Freq 2.441000000 GHz
	20.0										TRIG LVL	Start Freq 2.441000000 GHz
	30.0 40.0											Stop Freq 2.441000000 GHz
	50.0 60.0				niqtilliger Altelaturd	(de) (de la compañía de la compañía A de la compañía de la	tabildagali Kabildan ka	ekti kiiseen jä dadaksi tääkseen jä	yliryitytaydys salaat san s	kalduluk ka	(kodi, liki) n 1. in livit -	CF Step 1.000000 MHz <u>Auto</u> Man
	70.0				hiiik.	un ha addu	րես, տել	na hUnun h	ու են կերել	L. D. M. H.	ladia k. b	Freq Offset 0 Hz
C	enter 2 tes BW	2.44100 1.0 MH	0000 GI	Ηz	#VBI	N 3.0 MH2			Sweep 1	S 0.13 ms (	pan 0 Hz 8000 pts)	
A.	sg gilent Spe	ctrum Anal	yzer - Swej	ot SA					<b>K</b> STATUS	1		
r		Ref C	.441000 .9000000000000000000000000000000000	P IF	Hz PNO: Fast ↔ Gain:Low	Trig Del	æpulse ay0.000 s eo t0 dB	#Avg Typ	ERMS	U2:U9:36 PM TRAC TYP DE	Mar 12, 2022 E 1 2 3 4 5 6 E WWWWWW T P P P P P P	Frequency Auto Tune
(	0 dB/div 0 g		10.00 0	5						1		Center Freq 2.441000000 GHz
	20.0										TRIG LVL	Start Freq 2.441000000 GHz
	40.0											Stop Freq 2.441000000 GHz
	50.0 4.44	ر بنا این اختر در با این اختر			رور الأدر والدور ور و مراجع معرود ور			المالية بريانية المالية بريانية		dhaan Qiyaaa		CF Step 510.000 kHz <u>Auto</u> Man
												Freq Offset 0 Hz
	70.0											
4	80.0	2.44100 510 kH	0000 GI	Hz	#)(P)	AY 3.0 MH;			Sweep 3	S 162 c /2	pan 0 Hz	

					2DH	5 An	t1_Ho	ac			
	RL	rum Analyzer - S RF 50 req 2.4410	Ω AC 000000	GHz PNO: Fast ↔ IFGain:Low	SENSE Trig Dela	epulse  y-200.0 µs		LIGNAUTO E RMS		E 1 2 3 4 5 6 E WWWWWW T P P P P P P	Frequency Auto Tune
10 La	dB/div	Ref Offset 9 Ref 10.00	dBm					Δ	MKr2 2. 20	906 ms 0.91 dB	
٥			100000	▲2∆1							Center Freq 2.441000000 GHz
-1										TRIG LVL	Start Freq 2.441000000 GHz
з	1.0 <b>-</b>	_				7					<b>Stop Freq</b> 2.441000000 GHz
-				la "Unikaikaikaikaikaikai	inter adultat	Jastan	e la alticul lube		ta da la facina na	الاردين الي	CF Step 1.000000 MHz Auto Man
-6					-n#lik		p kon la pon	ni ni hi	hikuph		Freq Offset
9		_									
C Ri MS	es BW 1	441000000 I.0 MHz	GHz	#VBW	3.0 MHz		1	Sweep 1	0.13 ms (	pan 0 Hz 8000 pts)	
	RL		Ω AC		SENS	PULSE		ALIGNAUTO	02:13:08 PM	1 Mar 12, 2022	Frequency
<u>c</u>	enter F	Ref Offset 9	56 dB	GHZ PNO: Fast ↔ IFGain:Low	Trig Dela Trig: Vide #Atten: 20	0	#Avg Type	: RMS	TYP	E 1 2 3 4 5 6 E WWWWWW T P P P P P P	Auto Tune
10 Lo	dB/div	Ref 10.00	dBm								Center Freq
	00			1						1	2.441000000 GHz
-1	1.0		-							TRIG LVL	Start Freq 2.441000000 GHz
.3											<b>Stop Freq</b> 2.441000000 GHz
-5		ر. ال بهدية الإنقس	يو غذ الله		L L L L	lakenta.eri	ر مارو ال معرف المعال مارو	La para de China	وتديتما أربان		CF Step 510.000 kHz <u>Auto</u> Man
-6 .7		and the second second second	1 - Andread and An	o to an		da constant o	an Bogo Loca	a sin one frances			Freq Offset 0 Hz
8	1.0										
C	enter 2. es BW 5	441000000 510 kHz	GHz	#VBW	3.0 MHz				3.162 s (3	pan 0 Hz 0000 pts)	
MS	G							<b>K</b> STATUS			

					3DF	l5_An	t1 H	n			
CALL F	RL		02 AC	GHz PNO: Fast + IFGain:Low	SEN Trig Del	ay-200.0 µs		ALIGNAUTO e: RMS		E 1 2 3 4 5 6 E WWWWWW T P P P P P P	Frequency Auto Tune
10 c Log	IB/div	Ref Offset Ref 10.0	9.56 dB 0 dBm					Δ	Mkr2 2.9 19	908 ms 9.69 dB	Auto Tulle
0.00		aliter bei finnske	fitzeni fizza el	2∆1							Center Freq 2.441000000 GHz
-10.0										TRIG LVL	Start Freq 2.441000000 GHz
-300	) 							hitit	Little a didda		Stop Freq 2.441000000 GHz
-50.0				(ht.)://www.iv	hana	والمتعام والمتعادية	المرابط المرابع				CF Step 1.000000 MHz <u>Auto</u> Man
-80.0				inda purka		, NA IN AN AN	n n n n n n n n n n n n n n n n n n n	l den			Freq Offset 0 Hz
-80.0 Cet	ter 24	4100000							S	pan 0 Hz	
		.0 MHz		#VB	W 3.0 MH:	2		Sweep 10	0.13 ms (8	8000 pts)	
<b>U0</b> F	RL	um Analyzer - RF S	Swept SA	SH7	Tria De	E:PULSE ay0.000 s	#Avg Typ	ALIGNAUTO e: RMS	02:16:12 PM TRACE	1 Mar 12, 2022 E 1 2 3 4 5 6	Frequency
		Ref Offset Ref 10.0	9.56 dB	PNO: Fast + IFGain:Low		eo			TYPE DET	E 1 2 3 4 5 6 WWWWWW TPPPPPP	Auto Tune
	B/div										Center Freq 2.441000000 GHz
-10.0										TRIG LVL	Start Freq 2.441000000 GHz
-20.0 -30.0											Stop Freq
-40.0			i i		11	1 1			a 1	1 1	2.441000000 GHz
-50.0			dalapi seja se				dayye lawara 2014 Ministra			e.e., finder å sår Reges provider	510.000 kHz Auto Man
-60.0											Freq Offset
-70 0											0 Hz
-30.0 -80.0	ter 2.4	14100000	) GHz						S	pan 0 Hz	0 Hz

# A.3 Carrier Frequency Separation

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Нор	0.99	≥0.936	PASS
2DH5	Ant1	Нор	1	≥0.886	PASS
3DH5	Ant1	Нор	0.998	≥0.888	PASS



# A.4 Hopping Channel Number

TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Нор	79	>=15	PASS
2DH5	Ant1	Нор	79	>=15	PASS
3DH5	Ant1	Нор	79	>=15	PASS

## **Test Graph**

				DH	5_Ant	1_Ho	р			
Ant Ce	Ref Of	50 Q AC 441750000 Gi F IF	Hz NO: Fast ↔ Gain:Low			#Avg Type Avg Hold:	RMS	02:09:06 PM TRAC TYP DE	1Mar 12, 2022 E 1 2 3 4 5 6 E M WWWWW T P P P P P P	Frequency Auto Tune
20		:0.00 dBm								Center Freq 2.441750000 GHz
10 0.0 -10.	0	LANALANAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	) A A A A A A A A A A A A A A A A A A A	Vin da	100000	10 D.A.a.b.a.d	43640461	1680680	bànáb	Start Freq 2.400000000 GHz
-20										Stop Freq 2.483500000 GHz CF Step
-40.	ĩ								Mu	8.350000 MHz Auto Man Freq Offset 0 Hz
	art 2.40000 GF		#VBM	( 300 kHz				Stop 2.48 .000 ms (	350 GHz	
NSG					5_An		STATUS			
	nter Freq 2.4	50 2 AC 441750000 Gi F IF	Hz PNO: Fast ↔ Gain:Low	SENSI Trig: Free #Atten: 44	Run	#Avg Type Avg Hold:	RMS	02:12:31 PM TRAC TYP DE	1 Mar 12, 2022 E 1 2 3 4 5 6 E MWWWWW T P P P P P P	Frequency Auto Tune
10, 20	3	ffset 9.4 dB 10.00 dBm								Center Freq 2.441750000 GHz
01 0.0	0									Start Freq 2.40000000 GHz
-10.		www.medully.pr	www.	iliyiwaand	444686774	wnthwi	n Uhimiliyahinah	Viti matin	λγµA	<b>Stop Freq</b> 2.483500000 GHz
-30 -40	0 <b>n</b>								N.Y	CF Step 8.350000 MHz <u>Auto</u> Man Freq Offset
-50	0									0 Hz
Sta	art 2.40000 GI	Hz Iz	#VBW					Stop 2.48	350 GHz 1001 pts)	

	3DH5_Ant1_Hop
	Senter Freq 2.441750000 GHz FRL SF 100 0 AC Senter Freq 2.441750000 GHz FNO: Sat →→ Trig: Free Run FNO: Sat →→ Trig: Free Run Attan: 40 40 Attan: 40
	IFGaint.ow #Atten: 40 dB CETPPPPP Auto Tune
	000 Center Freq 2.441750000 GHz
	10.0 Start Freq 1.00 2.40000000 GHz
-1/	00 Withdry Withdright And Withdry Withdry Withdry Withdry Stop Freq 2,48350000 GHz
	0.0 CF Step 8.350000 MHz
-4	Auto Man
	200 Freq Offset
	tart 2.40000 GHz Stop 2.48350 GHz
## MS	Res BW 100 kHz         #VBW 300 kHz         Sweep 8.000 ms (1001 pts)           ssi         Image: Status         Image: Status

### A.5 Conducted Peak Output Power

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
		2402	-4.3	≤30	PASS
DH5	Ant1	2441	-5.33	≤30	PASS
		2480	-6.38	≤30	PASS
		2402	-3.56	≤20.97	PASS
2DH5	Ant1	2441	-4.75	≤20.97	PASS
		2480	-5.84	≤20.97	PASS
		2402	-2.9	≤20.97	PASS
3DH5	Ant1	2441	-4.12	≤20.97	PASS
		2480	-5.28	≤20.97	PASS

		DH5_An	1 2402			
0	I	SENSE:PULSE	ALIGNAUTO #Avg Type: RMS Avg Hold: 100/100	01:41:47 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWW OET P P P P P	Frequency Auto Tune	
L	Ref Offset 9.4 dB 10 dB/div Ref 30.00 dBm		Mkr1	2.401 856 GHz -4.301 dBm	Center Freq	
	10.0				2.402000000 GHz Start Freq	
	-10.0				2.398000000 GHz Stop Freq 2.406000000 GHz	
	30.0				CF Step 800.000 kHz Auto Man	
	-40.0				Freq Offset 0 Hz	
4	-60.0			Span 8.000 MHz		
	Center 2.402000 GHz #Res BW 3.0 MHz	#VBW 8.0 MHz		.000 ms (1001 pts)		
#	#Res BW 3.0 MHz Asg	#VBW 8.0 MHz DH5_An	<b>K</b> STATUS	.000 ms (1001 pts)		
1 	#Res BW 3.0 MHz           ssc           Aglient Spectrum Analyzer - Swept SA           RL         RF           SSC         SSC           Center Freq 2.441000000 G	DH5_An	LICALIONAUTO #Avg Type: RMS Avg[Heid: 100/100	000 ms (1001 pts)	Frequency	
±	#Res BW 3.0 MHz           ssc           Aglient Spectrum Analyzer - Swept SA           RL         RF           SSC         SSC           Center Freq 2.441000000 G	DH5_An	LICALIONAUTO #Avg Type: RMS Avg[Heid: 100/100	.000 ms (1001 pts)	Frequency Auto Tune	
а       	#Res BW 3.0 MHz asc Addition Spectrum Analyzer - Swept SA Addition Spectrum Analyzer - Swept SA RL №  50 a AC  Center Freq 2.441000000 G 10 dB/div Ref 0ffset 9.56 dB 20 0 20 0	DH5_An	LICALIONAUTO #Avg Type: RMS Avg[Heid: 100/100	01-43-22 PM Nar 12, 2022 TRACE [1 2 3 4 5 6 TYPE [MWWWWW CEIP PP PP P 2.440 840 GH2		
	#Res BW 3.0 MHz  Adjient Spectrum Analyzer - Swept SA  Adjient Spectrum Analyzer - Swept SA  RL №  50 a Ac   Center Freq 2.441000000 G  10  10  0  0  0  0  0  0  0  0  0  0	DH5_An	LICALIONAUTO #Avg Type: RMS Avg[Heid: 100/100	01-43-22 PM Nar 12, 2022 TRACE [1 2 3 4 5 6 TYPE [MWWWWW CEIP PP PP P 2.440 840 GH2	Auto Tune Center Freq	
<u>н</u>     	#Res BW 3.0 MHz           Maint Spectrum Analyzer - Swept SA           RL         BP           RC         SO 2           Ref Offset 9.56 dB           10 dB/div         Ref 30.00 dBm           20.0         0.0	DH5_An	LICALIONAUTO #Avg Type: RMS Avg[Heid: 100/100	01-43-22 PM Nar 12, 2022 TRACE [1 2 3 4 5 6 TYPE [MWWWWW CEIP PP PP P 2.440 840 GH2	Auto Tune           Center Freq           2.441000000 GHz           Start Freq           2.43700000 GHz           Stop Freq           2.44500000 GHz	
	#Res BW 3.0 MHz asc Addref Syectrum Analyzer - Swept SA ■ RL BF  S0 = AC Center Freq 2.441000000 G 10 dB/div Ref 016:00 dBm 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DH5_An	LICALIONAUTO #Avg Type: RMS Avg[Heid: 100/100	0.000 ms (1001 pts)	Auto Tune           Center Freq           2.441000000 GHz           Start Freq           2.437000000 GHz           Stop Freq           2.445000000 GHz           CF Step           800.000 kHz           Auto	
	#Res BW 3.0 MHz           Asso           Addreft Spectrum Analyzer - Swept SA           RL         86           SF         30 a           Center Freq 2.441000000 G           10 dB/div         Ref Offset 9.56 dB           00         00           100         00           100         00           100         00           100         00           100         00           100         00	DH5_An	LICALIONAUTO #Avg Type: RMS Avg[Heid: 100/100	0.000 ms (1001 pts)	Auto Tune           Center Freq           2.441000000 GHz           Start Freq           2.437000000 GHz           Stop Freq           2.445000000 GHz           CF Step           800.000 KHz	
	Res BW 3.0 MHz           Addrest Spectrum Analyzer - Swept SA           RL         86           Rt         86           10 dB/div         Ref Offset 9.56 dB           100         000           100         000           100         000           100         000           100         000           100         000           100         000           100         000	DH5_An	Contraction	0000 ms (1001 pts)	Auto Tune           Center Freq           2.441000000 GHz           Start Freq           2.437000000 GHz           Stop Freq           2.445000000 GHz           CF Step           800.000 kHz           Auto           Man           Freq Offset	

	DH5_Ant	1_2480			
Agilent Spectrum Analyzer - Swept SA           04         RL         RF         50 Ω         AC           Center Freq 2.480000000	DNO, Foot Irid: Free Run	ALIGNAUTO #Avg Type: RMS Avg Hold: 100/100	01:46:35 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P	Frequency	
Ref Offset 9.56 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 40 dB		2.480 072 GHz	Auto Tune	
10 dB/div Ref 30.00 dBm			-6.378 dBm	Conto-E	
20.0				Center Freq 2.480000000 GHz	
10.0				Start Freq 2.476000000 GHz	
0.00	↓ <sup>1</sup>			2.47600000 GHz	
-10.0 -20.0			and a start of the	Stop Freq 2.484000000 GHz	
-30.0			Nik.	CF Step	
-40.0				800.000 kHz <u>Auto</u> Man	
-50.0				Freq Offset 0 Hz	
-60.0				3112	
Center 2.480000 GHz	#)/D)// 0.0 MIL-		Span 8.000 MHz		
#Res BW 3.0 MHz	#VBW 8.0 MHz	Sweep 1	.000 ms (1001 pts)		
	2DH5_An	t1_2402			
Agilent Spectrum Analyzer - Swept SA	SENSE:PULSE		01:53:11 PM Mar 12, 2022	Frequency	
	GHZ PNO: Fast Trig: Free Run IFGain:Low #Atten: 40 dB	Avg Hold: 100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P	Auto Tune	
Ref Offset 9.4 dB 10 dB/div Ref 30.00 dBm		Mkr1	2.401 688 GHz -3.563 dBm		
20.0				Center Freq 2.402000000 GHz	
10.0					
0.00	1			Start Freq 2.398000000 GHz	
-10.0			Marine and Marine	Stop Freq	
-20.0			and a second sec	2.406000000 GHz	
-30.0				CF Step 800.000 kHz <u>Auto</u> Man	
-40.0				Freq Offset	
-60.0				0 Hz	
-60.0					
Center 2.402000 GHz #Res BW 3.0 MHz	#VBW 8.0 MHz	· · ·	Span 8.000 MHz .000 ms (1001 pts)		
MSG		Ko status	·		
Agilent Spectrum Analyzer - Swept SA	2DH5_An	t1_2441			
04 RL RF 50Ω AC Center Freq 2.441000000	SENSEPULSE GHz PNO: Fast →→ Trig: Free Run IFGain:Low #Atten: 40 dB	ALIGNAUTO #Avg Type: RMS Avg[Hold: 100/100	01:55:03 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P	Frequency	
Ref Offset 9.56 dB	IFGain:Low #Atten: 40 dB		2.440 976 GHz -4.749 dBm	Auto Tune	
Log				Center Freq	
20.0				2.441000000 GHz	
0.00	1			Start Freq 2.437000000 GHz	
-10.0					
-20.0 Albertankermanner			The second second	Stop Freq 2.445000000 GHz	
-30.0				CF Step 800.000 kHz	
-40.0				Auto Man	
-60.0				Freq Offset 0 Hz	
-60.0					
Center 2.441000 GHz #Res BW 3.0 MHz	#VBW 8.0 MHz	Sween 1	Span 8.000 MHz .000 ms (1001 pts)		
MSG	#¥D¥¥ 0.U I¥IПZ	Sweep 1			

Agilent Spectrum Analyzer - Swept SA	2DH5_An	t1_2480			_
Center Freg 2.480000000 GHz	SENSE:PULSE	ALIGNAUTO #Avg Type: RMS Avg Hold: 100/100	01:58:11 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWWW DET P P P P P P	Frequency	
PNO: Fast → IFGain:Low Ref Offset 9.56 dB	#Atten: 40 dB		2.480 056 GHz	Auto Tune	
10 dB/div Ref 30.00 dBm			-5.836 dBm	Center Freq	
20.0				2.480000000 GHz	
10.0				Start Freq	
0.00	1			2.476000000 GHz	
-10.0			and a start of the	Stop Freq 2.484000000 GHz	
-20.0				CF Step	
-40.0				800.000 kHz <u>Auto</u> Man	
-60.0				Freq Offset	
-60.0				0 Hz	
Center 2.480000 GHz			Span 8.000 MHz		
Center 2.480000 GHz #Res BW 3.0 MHz #VBW	/ 8.0 MHz	Sweep 1	.000 ms (1001 pts)		
Agilent Spectrum Analyzer - Swept SA	3DH5_An		02:01:41 PM Mar 12, 2022		_
ON RL RF 50.2 AC Center Freq 2.402000000 GHz PN0: Fast → IFGainLow	→ Trig: Free Run #Atten: 40 dB	#Avg Type: RMS Avg Hold: 100/100	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P	Frequency	
Ref Offset 9.4 dB 10 dB/div Ref 30.00 dBm		Mkr1	2.402 176 GHz -2.898 dBm	Auto Tune	
Log				Center Freq	
20.0				2.402000000 GHz	
0.00	<b>▲</b> 1			Start Freq 2.398000000 GHz	
-10.0	anserver	and and a stand			
-20.0 100 miles - 20.0			and a second sec	Stop Freq 2.406000000 GHz	
-30.0			ور در	CF Step	
-40.0				800.000 kHz <u>Auto</u> Man	
-50.0				Freq Offset 0 Hz	
-60.0					
Center 2.402000 GHz #Res BW 3.0 MHz #VBW			Span 8.000 MHz		
#Res BW 3.0 MHz #VBW	/ 8.0 MHz	Sweep 1	.000 ms (1001 pts)		
	3DH5_An	t1 2441			
Agilent Spectrum Analyzer - Swept SA	SENSE/PULSE	ALIGNAUTO	02:03:19 PM Mar 12, 2022		
Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low	Trig: Free Run #Atten: 40 dB	#Avg Type: RMS Avg Hold: 100/100	12.03.19 PMMai 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P	Frequency	
Ref Offset 9.56 dB 10 dB/div Ref 30.00 dBm		Mkr1	2.441 048 GHz -4.123 dBm	Auto Tune	
20.0				Center Freq	
10.0				2.441000000 GHz	
0.00	11			Start Freq 2.437000000 GHz	
-10.0		- Andrew Contraction of the second		Stop Freq	
-20.0			- and - charter and a faith	2.445000000 GHz	
-30.0				CF Step 800.000 kHz	
-40.0				<u>Auto</u> Man	
-50.0				Freq Offset 0 Hz	
-60.0					
Center 2.441000 GHz	( 9 0 M <sup>12</sup> -		Span 8.000 MHz		
#Res BW 3.0 MHz #VBW	/ 8.0 MHz	Sweep 1	.000 ms (1001 pts)		

		:	3DH5_Ar	nt1_2480			
(XI RL	rum Analyzer - Swept SA RF 50.0 AC req 2.480000000	PNO: Fast +++	SENSE:PULSE	ALIGNA #Avg Type: RM: Avg[Hold: 100/1	NUTO 02:06:24 F S TRA 00 TV	M Mar 12, 2022 CE 1 2 3 4 5 6 CPE M WWWWW CET P P P P P P	Frequency
10 dB/div Log	Ref Offset 9.56 dB Ref 30.00 dBm	IFGain:Low	#Atten: 40 dB	N	1kr1 2.480 (		Auto Tune
20.0							Center Freq 2.480000000 GHz
0.00			1				Start Freq 2.476000000 GHz
-10.0			****	mensemble	and a second and a s		Stop Freq 2.484000000 GHz
-20.0						And the second second	CF Step 800.000 kHz
-40.0							Auto Man Freq Offset
-60.0							0 Hz
#Res BW	480000 GHz 3.0 MHz	#VBW	8.0 MHz		ep 1.000 ms	3.000 MHz (1001 pts)	
MSG				<mark>0</mark> ا	STATUS		

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
		Low	2402	-5.00	-50.01	≤-25	PASS
		High	2480	-7.15	-48.6	≤-27.15	PASS
DH5	Ant1	Low	Hop_2402	-5.58	-49.27	≤-25.58	PASS
		High	Hop_2480	-7.13	-49.3	≤-27.13	PASS
		Low	2402	-5.00	-48.24	≤-25	PASS
		High	2480	-8.08	-48.14	≤-28.08	PASS
2DH5	Ant1	Low	Hop_2402	-6.64	-49.85	≤-26.64	PASS
		High	Hop_2480	-10.70	-48.62	≤-30.7	PASS
		Low	2402	-5.06	-50.11	≤-25.06	PASS
		High	2480	-7.22	-48.33	≤-27.22	PASS
3DH5	Ant1	Low	Hop_2402	-10.08	-50.46	≤-30.08	PASS
		High	Hop_2480	-8.77	-49.31	≤-28.77	PASS

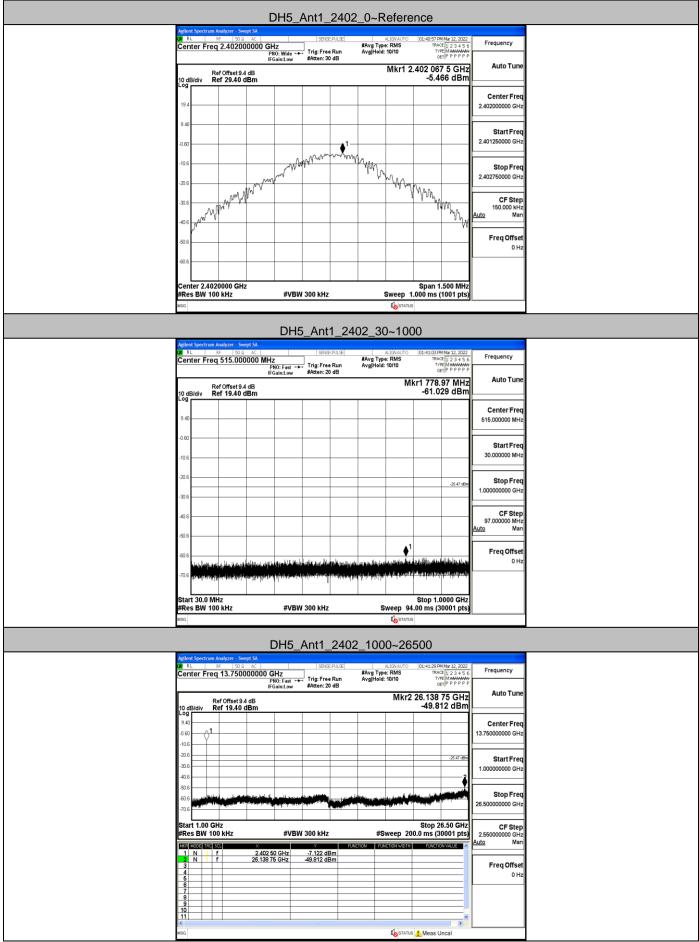
DH	5_Ant1_Lo	w_2402			
Agilent Spectrum Analyzer - Swept SA V RL RF SD Ω AC	SENSE:PULSE	ALIGNAUTO	01:39:30 PM Mar 12, 2022	Frequency	
Center Freq 2.352500000 GHz	#A rig: Free Run Av Atten: 30 dB	vg Type: RMS g Hold: 300/300	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P	Frequency	
Ref Offset 9.4 dB		Mkr5	2.304 830 GHz -50.007 dBm	Auto Tune	
10 dB/div Ref 20.00 dBm			-50.007 UBII	Contor From	
0.00			^1	Center Freq 2.352500000 GHz	
-10.0			-25.00 dBm		
-30.0			-23.00 000	Start Freq 2.30000000 GHz	
-40.0 5 - 4 -50.0 Berlin Handle baralating war in the interview	ما <i>ن مواند ارسی می مورد می موسط می</i>	باليدين مريد مير الأربي الأربي ال	3 2		
-60.0				Stop Freq 2.40500000 GHz	
Start 2.30000 GHz			Stop 2.40500 GHz	CF Step	
#Res BW 100 kHz #VBW 30		Sweep 10	).07 ms (1001 pts)	10.500000 MHz Auto Man	
NKE         NODE         TAC         SCL         X           1         N         1         f         2.401         850         GHz         -5           2         N         1         f         2.400         000         GHz         -51	Y FUNCTION .000 dBm .113 dBm	FUNCTION WIDTH	FUNCTION VALUE		
1         N         1         F         2401 850 GHz         5           2         N         1         f         2400 000 GHz         51           3         N         1         f         2300 000 GHz         52           4         N         1         f         2310 000 GHz         52           5         N         1         f         2304 830 GHz         50	.000 dBm .113 dBm .772 dBm .414 dBm .007 dBm			Freq Offset 0 Hz	
7					
8 9 10					
11 S	Ш		× ×		
 MSG		<b>K</b> STATUS			
	5_Ant1_Hig	gh_2480			
Agilent Spectrum Analyzer - Swept SA           M         RL         RF         SO Q         AC           Center Freq 2.510000000 GHz	SENSE:PULSE	ALIGNAUTO vg Type: RMS	01:44:25 PM Mar 12, 2022 TRACE 1 2 3 4 5 6	Frequency	
PNO: Fast +++ T	rig: Free Run Av Atten: 30 dB	g Hold: 300/300	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P		
Ref Offset 9.56 dB 10 dB/div Ref 20.00 dBm		Mkr4	2.526 56 GHz -48.598 dBm	Auto Tune	
			40.000 40.00	Center Freq	
0.00				2.510000000 GHz	
-10.0			-27.15 dBm	Start Freq	
-30.0		.4	-27.15 dbm	2.470000000 GHz	
-40.0 2 3	of international production of the	weiserer gewannight	ป <sub>อ</sub> าวระณ <sub>์ที่</sub> งหาราวิทธรรษประ	Ctop Frog	
-60.0				Stop Freq 2.55000000 GHz	
Start 2.47000 GHz			Stop 2.55000 GHz	CF Step	
#Res BW 100 kHz #VBW 30		Sweep 7.	667 ms (1001 pts)	CF Step 8.000000 MHz Auto Man	
#Res BW 100 kHz         #VBW 30           Image Model Hate         X           1         N         1         f         2.479 84 GHz         -7           2         N         1         f         2.479 84 GHz         -7	Y FUNCTION .154 dBm .108 dBm		667 ms (1001 pts)	8.000000 MHz <u>Auto</u> Man	
#Res BW 100 kHz         #VBW 30           U026 U026 BE9 E53         X           1         N         1         F         2.479 84 GHz         -7           2         N         1         F         2.439 84 GHz         -7           3         N         1         F         2.433 50 GHz         -53           3         N         1         f         2.5000 00 GHz         -52           4         N         1         f         2.500 00 GHz         -43           5           2.526 56 GHz         -48	Y FUNCTION	Sweep 7.	667 ms (1001 pts)	8.000000 MHz	
#Res BW 100 kHz         #VBW 30           USE REGE 153         2           1         N           1         F           2.N         1           7         2.000 kHz           3         N           1         F           2.000 kHz         52           3         N           1         F           2.5000 c0 kHz         53           6         -48           7         -49	Y FUNCTION .154 dBm .108 dBm .042 dBm	Sweep 7.	667 ms (1001 pts)	8.000000 MHz <u>Auto</u> Man Freq Offset	
#Res BW 100 kHz         #VBW 30           Image faces         Science         Science           1         N         1         F         2.479 84 GHz         -7           2         N         1         F         2.479 84 GHz         -7           3         N         1         F         2.439 50 GHz         -53           3         N         1         F         2.5000 00 GHz         -53           4         N         1         F         2.502 56 GHz         -48           6	Y FUNCTION .154 dBm .108 dBm .042 dBm	Sweep 7.	6667 ms (1001 pts)	8.000000 MHz <u>Auto</u> Man Freq Offset	
#Res BW 100 kHz         #VBW 30           USE REGE 153         2           1         N           1         F           2.N         1           7         2.000 kHz           3         N           1         F           2.000 kHz         52           3         N           1         F           2.5000 c0 kHz         53           6         -48           7         -49	Y FUNCTION .154 dBm .108 dBm .042 dBm	Sweep 7.	667 ms (1001 pts)	8.000000 MHz <u>Auto</u> Man Freq Offset	
#Res BW 100 kHz         #VBW 30           Image toxics         Isia         Image toxics         Imag	Y Runction 154 dBm 109 dBm 0.42 dBm 5390 dBm	Sweep 7.	667 ms (1001 pts)	8.000000 MHz <u>Auto</u> Man Freq Offset	
#Res BW 100 kHz         #VBW 30           Image Excess field Science         X           1         1         1           2         N         1         1           2         N         1         1         2.479 84 GHz           2         N         1         1         2.479 84 GHz         -7           2         N         1         1         2.600 00 GHz         52           N         1         1         2.500 00 GHz         48           6	Y FUNCTION 154 dBm 164 dBm 042 dBm 044 dBm	Sweep 7.	667 ms (1001 pts)	8.000000 MHz <u>Auto</u> Man Freq Offset	
#Res BW 100 kHz         #VBW 30           Image: Section 2005 KHz         53           1         1         1         2.479 84 GHz         7           2         N         1         1         2.479 84 GHz         7           3         N         1         1         2.479 84 GHz         7           3         N         1         2.479 84 GHz         48           6         1         2.600 00 GHz         48           6         1         1         1         1           10         1         1         1         1         1           10         1         1         1         1         1         1           10         1	Y EURCTION 154 dBm 194 dBm 942 dBm 944 dBm	Sweep 7.	6667 ms (1001 pts)	8.000000 MHz <u>Auto</u> Man Freq Offset	
#Res BW 100 kHz         #VBW 30           Image: Section 2000 kHz         X	Y FUNCTION 154.08 m 164.08 dBm 0.422.08 m 588.08 m Ant1_Low_ SPREPLIE 568.00 m 19902 PLIE 56.00 m 19902 PLIE 19902 PLIE	Sweep 7.	AUGETION VALUE AUGETION VALUE AUGETION VALUE (2006-36 DBM May 12, 2022 TRACE [1, 2, 3, 4, 5, 6 TRACE [1, 2, 3, 4, 5, 6 TRACE [1, 2, 3, 4, 5, 6 CEL (P) P P P P P	8.00000 MHz Auto Man Freq Offset 0 Hz	
#Res BW 100 kHz         #VBW 30           Image: Section of the sect	Y EURCTION 154 dBm 194 dBm 942 dBm 944 dBm	Sweep 7.	6667 ms (1001 pts)	8.00000 MHz Auto Man Freq Offset 0 Hz	
#Res BW 100 kHz         #VBW 30           Image Excess field Scale         X           1         1         1           2         N         1         1           2         N         1         1         2.479 84 GHz           3         N         1         1         2.479 84 GHz           3         N         1         1         2.439 84 GHz           4         N         1         2.500 00 GHz         458           6	Y EURCTION 154 dBm 194 dBm 942 dBm 944 dBm	Sweep 7.	022 122 122 122 122 122 122 122	8.00000 MHz Auto Man Freq Offset 0 Hz Hz Frequency Auto Tune Center Freq	
#Res BW 100 kHz         #VBW 30           Image: Section 2000 kHz         2479 84 GHz         -7           2         N         1         1         2479 84 GHz         -7           2         N         1         1         2479 84 GHz         -7           3         N         1         2479 84 GHz         -7         -           3         N         1         2479 84 GHz         -7         -           3         N         1         2479 84 GHz         -7         -	Y EURCTION 154 dBm 194 dBm 942 dBm 944 dBm	Sweep 7.	022 12206-36 PM Mr 12, 2022 TRACE 11 2 3 4 5 6 TYPE IN WARK 12, 2022 TRACE 11 2 3 4 5 6 TYPE IN WARK 12, 2022 TYPE IN WARK 12, 2022	B.00000 MHz Auto Man Freq Offset 0 Hz Frequency Auto Tune	
#Res BW 100 kHz     #VBW 30       Image: Sector of the sector of	Y EURCTION 154 dBm 194 dBm 942 dBm 944 dBm	Sweep 7.	022 12206-36 PM Mr 12, 2022 TRACE 11 2 3 4 5 6 TYPE IN WARK 12, 2022 TRACE 11 2 3 4 5 6 TYPE IN WARK 12, 2022 TYPE IN WARK 12, 2022	8.00000 MHz Auto Man Freq Offset 0 Hz Hz Frequency Auto Tune Center Freq 2.35250000 GHz Start Freq	
#Res BW 100 kHz         #VBW 30           Image Excess for Section 2         X           1         1         1           2         N         1         1           3         N         1         1         2.479 84 GHz           3         N         1         1         2.479 84 GHz         -7           3         N         1         1         2.400 00 Hz         52           6         1         -         -         48         -           7         -         -         -         -         48         - <td>Y EURCTION 154 dBm 194 dBm 942 dBm 944 dBm</td> <td>Sweep 7.</td> <td>02 12:235 00 May 12, 2122 12:235 00 May 12, 2125 12:235 00 May 12, 2125 12:255 00 May 12, 2125 12</td> <td>8.00000 MHz Auto Man Freq Offset 0 Hz Hz Frequency Auto Tune Center Freq 2.352500000 GHz</td> <td></td>	Y EURCTION 154 dBm 194 dBm 942 dBm 944 dBm	Sweep 7.	02 12:235 00 May 12, 2122 12:235 00 May 12, 2125 12:235 00 May 12, 2125 12:255 00 May 12, 2125 12	8.00000 MHz Auto Man Freq Offset 0 Hz Hz Frequency Auto Tune Center Freq 2.352500000 GHz	
#Res BW 100 kHz         #VBW 30           Image Excess field Solar         X           1         f         2.479 84 GHz         -7           1         N         f         2.439 80 GHz         -5           3         N         f         2.600 00 GHz         -52           6         1         -7         -7         -7           8         -7         -7         -7         -7           9         -1         -7         -7         -7           9         -1         -7         -7         -7         -7           8         -1         -7         -7         -7         -7         -7           9         -1         -1         -7 <t< td=""><td>Y FUNCTION 154 dBm 164 dBm</td><td>Sweep 7.</td><td>022 12206-36 PM Mr 12, 2022 TRACE 12 2 3 4 5 6 TOPE PP PP P 2.312 390 GHz -49.265 dBm</td><td>8.00000 MHz Auto Man Freq Offset 0 Hz Hz Center Freq 2.35250000 GHz 2.30000000 GHz Start Freq 2.30000000 GHz</td><td></td></t<>	Y FUNCTION 154 dBm 164 dBm	Sweep 7.	022 12206-36 PM Mr 12, 2022 TRACE 12 2 3 4 5 6 TOPE PP PP P 2.312 390 GHz -49.265 dBm	8.00000 MHz Auto Man Freq Offset 0 Hz Hz Center Freq 2.35250000 GHz 2.30000000 GHz Start Freq 2.30000000 GHz	
#Res BW 100 kHz         #VBW 30           Image: Second	Y FUNCTION 154 dBm 164 dBm	Sweep 7.	02 12.312 390 GHz 49.265 dBm 49.265 dBm 49.265 dBm 11 11 11 25.65 dBm 21 21 22 23 23 24 25 25 25 25 25 25 25 25 25 25	B.00000 MHz Auto Man  FreqOffset 0 Hz  Frequency  Auto Tune  Center Freq 2.36250000 GHz  Start Freq 2.30000000 GHz	
#Res BW 100 kHz     #VBW 30       Image Except for a first sector of the first	Y FUNCTION 154 dBm 164 dBm 164 dBm 164 dBm 164 dBm 164 dBm 169 dBm	Sweep 7.	2 2 2 2 2 2 2 2 2 2 2 2 2 2	8.00000 MHz Auto Man Freq Offset 0 Hz 0 Hz 0 Hz 2.0000000 Hz 2.352500000 Hz 2.352500000 Hz 2.30000000 Hz 2.405000000 Hz 2.405000000 Hz	
#Res BW 100 kHz         #VBW 30           Image: Book End State	Y         EUNCTION           1.54 dBm	Sweep 7.	02 12 12 12 12 12 12 12 12 12 1	B.00000 MHz Auto Man FreqOffset 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 2 35250000 GHz 2 35250000 GHz 2 35250000 GHz 2 35250000 GHz 2 35250 Freq 2 40550000 GHz	
#Res BW 100 kHz         #VBW 30           Image: Book End State	Y         FUNCTION           154 dBm         154 dBm           154 dBm         158 dBm           154 dBm         158 dBm           159 dBm         159 dBm	Sweep 1.	02 12 12 12 12 12 12 12 12 12 1	8.00000 MHz Auto Man FreqOffset 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz	
#Res BW 100 kHz     #VBW 30       Image Busice Biology     Image Busice Biology       1     1       2     N       1     1       2     N       1     1       2     N       1     1       2     1       1     1       2     1       1     1       2     1       1     1       2     1       1     1       2     1       1     1	Y         EUNCTION           1.54 dBm	Sweep 1.	02 12 12 12 12 12 12 12 12 12 1	8.00000 MHz Auto Man Freq Offset 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz	
#Res BW 100 kHz     #VBW 30       #Res BW 100 kHz     2479 84 GHz       2     N     f       2.479 84 GHz     -7       2.N     f       2.479 84 GHz     -7       3     N     f       2.600 00 GHz     -5       6     -       7     -       8     -       9     -       10     -       10     -       11     -       12     -       13     N       14     -       15     -       16     -       17     -       18     -       19     -       10     -       10     -       11     -       12     -       13     -       14     -       15     -       16     -       17     -       18     -       19     -       10     -       10     -       10     -       10     -       10     -       10     -       10     -       10     -       <	Y         EDUCTION           1.54 dBm	Sweep 1.	02 12 12 12 12 12 12 12 12 12 1	8.00000 MHz Auto Man Freq Offset 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 2.35250000 GHz 2.35250000 GHz 2.35250000 GHz 0 Start Freq 2.40500000 GHz 0 Start Step 10.50000 MHz Auto Man Freq Offset	
#Res BW 100 kHz         #VBW 30           Image Excess for the second	Y         EDUCTION           1.54 dBm	Sweep 1.	02 12 12 12 12 12 12 12 12 12 1	8.00000 MHz Auto Man Freq Offset 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 0 Hz 2.35250000 GHz 2.35250000 GHz 2.35250000 GHz 0 Start Freq 2.40500000 GHz 0 Start Step 10.50000 MHz Auto Man Freq Offset	

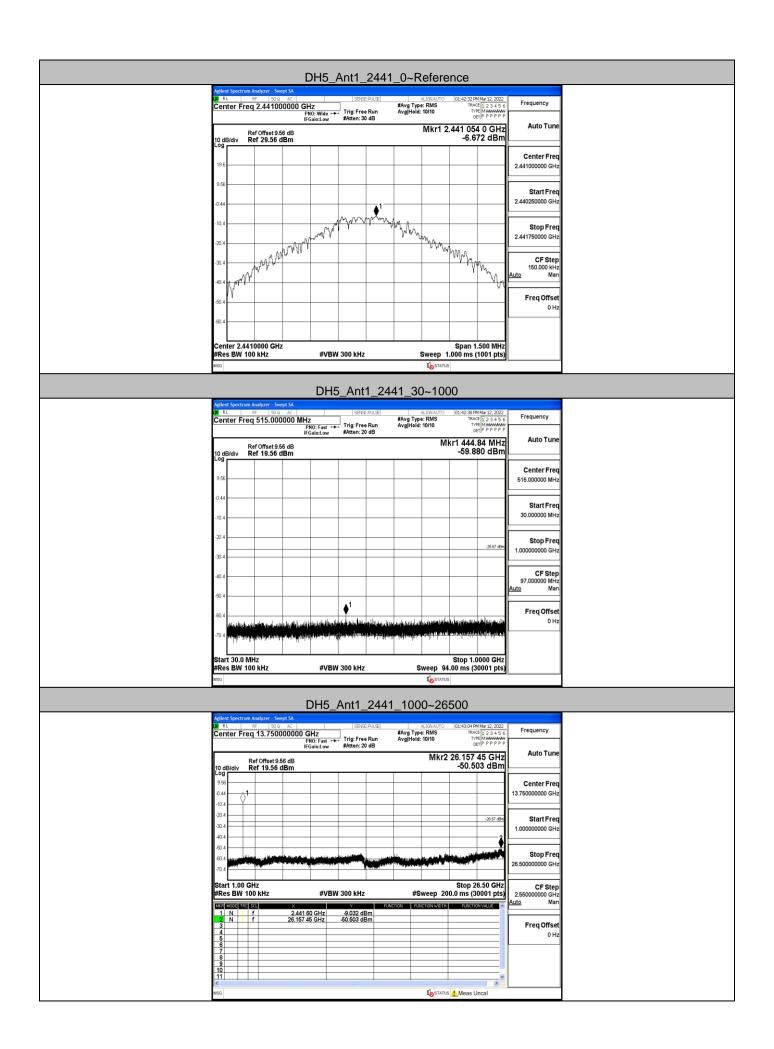
DH5 Ant1 F	ligh_Hop_2480	
Agilent Spectrum Analyzer - Sweyt SA A RL FF S0.0 AC SPECTURE Center Freq 2.510000000 GHz	ALTEN AUTO 02:09:54 PM Mar 12, 2022	Frequency
Center Freq 2.510000000 GHz PM:Fast IFGainLow #Atten: 30 dB	#Avg Type: RMS Avg Hold: 300/300 Det  P P P P F	
Ref Offset 9.56 dB 10 dB/d/v Ref 20.00 dBm Log	Mkr4 2.539 44 GHz -49.297 dBm	
		Center Freq 2.51000000 GHz
-30.0	27.13 dBm	Start Freq 2.47000000 GHz
	whether we have a state of the	Stop Freq
-70.0		2.55000000 GHz
Start 2.47000 GHz #Res BW 100 kHz #VBW 300 kHz 100명 비대의 Scul × 또 또	Stop 2.55000 GHz Sweep 7.667 ms (1001 pts)	
1 N 1 f 2.475 04 GHz -7.133 dBm 2 N 1 f 2.483 50 GHz -52.379 dBm		Freq Offset
3 N 1 f 2.500.00 GHz 52.270 dBm A N 1 f 2.539.44 GHz 49.297 dBm 5 6 6	E E E E E E E E E E E E E E E E E E E	0 Hz
/		
11 · · · · · · · · · · · · · · · · · ·		
Agilent Spectrum Analyzer - Swept SA           M           M           RL         85           M         RL	1_Low_2402 ALISNAUTO 01:50:54 PM Mar 12, 2022	
Center Freq 2.352500000 GHz Freq 2.352500000 GHz PR0:Fast — Trig:Free Run If Gaint.cow #Atten: 30 dB	ALIGNAUTO ULISUSA HAM Mar 12, 2022 #Avg Type: RMS TRACE 12 3 4 5 6 Avg Hold: 300/300 TYPE MWWWWW DET P P P P P	Frequency
Ref Offset 9.4 dB 10 dB/div Ref 20.00 dBm	Mkr5 2.399 645 GHz -48.239 dBm	Auto Tune
100		Center Freq
-10.0		2.352500000 GHz
-20.0	-25.00 dBm	Start Freq 2.30000000 GHz
40.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	anium freshered interesting industry and the service	Stop Freq
-60.0 -70.0		2.405000000 GHz
Start 2.30000 GHz #Res BW 100 kHz #VBW 300 kHz	Stop 2.40500 GHz Sweep 10.07 ms (1001 pts)	10.500000 MHz
M22         H22         K1         X </td <td>FUNCTION FUNCTION WIDTH FUNCTION VALUE</td> <td>Auto Man</td>	FUNCTION FUNCTION WIDTH FUNCTION VALUE	Auto Man
3 N 1 f 2,30000 GHz 52,595 dBm 4 N 1 f 2,310,000 GHz 52,954 dBm 5 N 1 f 2,339 645 GHz 48,239 dBm		Freq Offset 0 Hz
6 7 8 9		
456	<b>I</b> STATUS	
Agilent Spectrum Analyzer - Swept SA	1_High_2480	
BR RL RF 150.0 AC SERVERUSE Center Freq 2.510000000 GHz → Trig:FreeRun	ALIGNAUTO 01:56:01 PM Mar 12, 2022 #Avg Type: RMS TRACE [12 3 4 5 Avg[Hold: 300/300 Type MixeMAMA DCT  P P P F	Frequency
IFGain:Low #Atten: 30 dB Ref Offset 9.56 dB	Mkr4 2.524 96 GHz	Auto Tuno
10 dB/div Ref 20.00 dBm	-48.140 dBm	Center Freq
1000 A		2.510000000 GHz
-20.0	-28.08 dBm	Start Freq 2.47000000 GHz
40.0	4-	
e0 0 -70 0		Stop Freq 2.55000000 GHz
Start 2.47000 GHz #Res BW 100 kHz #VBW 300 kHz	Stop 2.55000 GHz Sweep 7.667 ms (1001 pts)	
MKRI MODEL TRCI SCL X Y	FUNCTION FUNCTION WIDTH FUNCTION VALUE	Auto Man
1         N         1         F         2.480.16 GHz         3.073 dBm           2         N         1         f         2.483.56 GHz         51.545 dBm           3         N         1         f         2.243.56 GHz         51.545 dBm           3         N         1         f         2.200 GHz         52.319 dBm           4         N         1         f         2.524.96 GHz         48.140 dBm           5           2.524.96 GHz         48.140 dBm		Freq Offset 0 Hz
6 7 8		
9 10 11		
KSG L	► Lostatus	

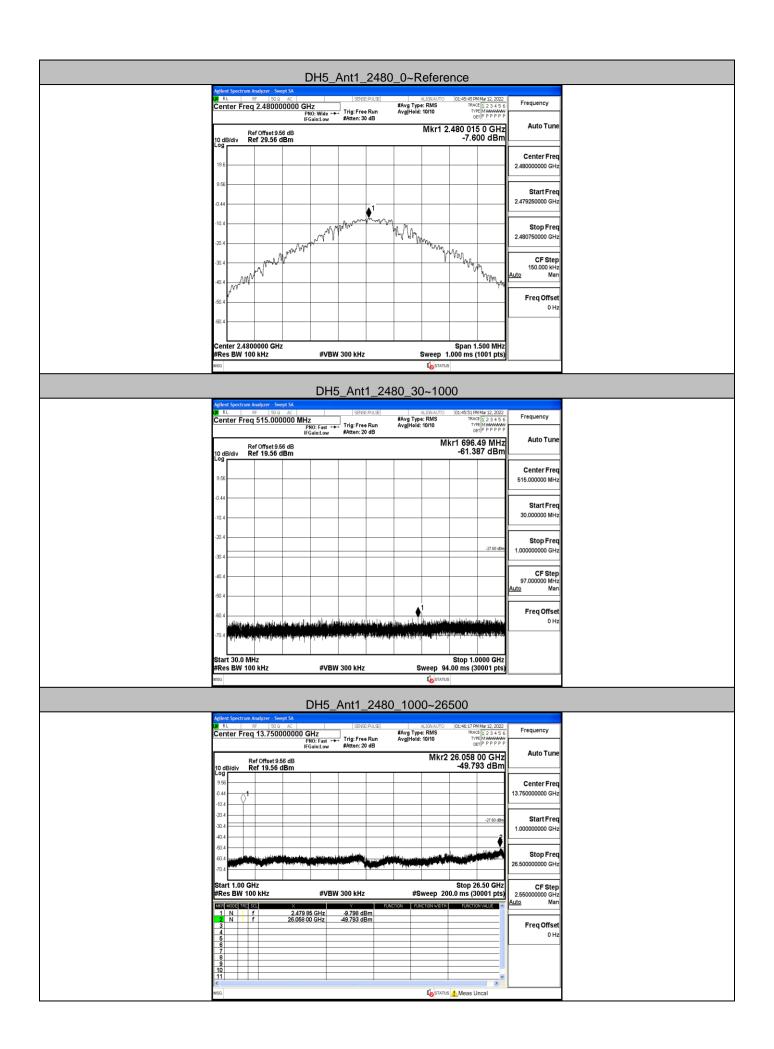
2DH5_Ant1_Low_Hop_2402	
Agilent Spectrum Analyzer - Swept SA R R 87 50 0 AC SPACESULSE ALIGNAUTO (22:10:16 PM Mg 12, 2022 Center Free 2, 3525 00000 GHz RAVg Type: RMS TRACE[2:2:3:4:5:	Frequency
PRO First → Ing. ree kun Avginei: 300.000 (ref PPPP) IFG inclow #Atten: 30 dB Mkr5 2.371 295 GHz	Auto Tune
10 dB/div Ref 20.00 dBm - 49.854 dBm - 49.854 dBm - 10 dB/div Ref 20.00 dBm - 49.854 dBm - 49.856 dBm - 49.85	Center Freq
10.0	2.352500000 GHz
-20.0 // // // // // // // // // // // // //	Start Freq 2.30000000 GHz
	Stop Freq
-70.0 Start 2.30000 GHz Stop 2.40500 GHz	2.40500000 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 10.07 ms (1001 pts)	
1         N         1         f         2403 005 GHz         -6643 dBm           2         N         I         f         2400 000 GHz         -52 102 dBm           3         N         I         f         2400 000 GHz         -52 102 dBm           4         N         I         f         230 000 GHz         -53 1972 dBm           4         N         I         f         2310 000 GHz         -53 503 dBm	Freq Offset
6         N         1         f         2.371 295 GHz         49.854 dBm           7	
2DH5_Ant1_High_Hop_2480	
Image: Name         RL         RF         50.9         AC         SENSE PULSE         ALIGNATIO         02*1328PMEF12,2022           Center Freq 2.510000000 GHz         Trig: Free Run         Avg[Hold: 300/300         TRAFE[12:34:5]         Trig: Free Run         Avg[Hold: 300/300         Trig: PP P P           IFGGinLow         #Atten: 30 dB         Aug[Hold: 300/300         Trig: PP P P         Trig: PP P	P
Ref Offset 9.56 dB Mkr4 2.513 68 GHz 10 dB/div Ref 20.00 dBm -48.622 dBm -48.622 dBm	
	Center Freq 2.51000000 GHz
10.0 20.0 PMu/*m//	Start Freq
300	2.470000000 GHz
200 1425	<b>Stop Freq</b> 2.550000000 GHz
Start 2.47000 GHz         Stop 2.55000 GHz           #Res BW 100 kHz         #VBW 300 kHz         Sweep 7.667 ms (1001 pts	CF Step 8.00000 MHz
MXR         V         FUNCTION         PARCTION VALUE           1         N         1         F         2.479.04.GHz         -10.703.dBm         PARCTION VALUE           2         N         -1         F         2.4825.50.GHz         -51.775.6Bm         PARCTION VALUE	Auto Man
3 N 1 f 250000 GHz 50066 dBm N 1 f 2513 68 GHz 48.622 dBm 6 6	Freq Offset
9 9 10	
3DH5_Ant1_Low_2402	
Agilent Spectrum Analyzer - Swept SA         [SENSE PULSE]         ALIGNAUTO         [01:59:34 PM Mar 12, 2022           10         R.L         RF         50:0.8         [ALIGNAUTO         [01:59:34 PM Mar 12, 2022           Constant From 2, 32525 DOIDON CHuz         #Ave True: RMS         TMARET[1:0:34:51         [Mar 21]	6 Frequency
PRO: Fast     Trig: Free Run IFGaincLow     Avg Hold: 300/300     Type huwww. cc  P.P.P.P.P       Ref Offset 9.4 dB     Mkr5 2.364 155 GHz	P Auto Tuno
10 dB/div Ref 20.00 dBm -50.110 dBm	Center Freq
	2.352500000 GHz
200	Start Freq 2.30000000 GHz
100 4 5 7 7 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	Stop Freq
	2.405000000 GHz
Start 2.30000 GHz         Stop 2.40500 GHz           #Res BW 100 kHz         #VBW 300 kHz         Sweep         10.07 ms (1001 pts)           track block in a start	
1         N         1         f         2.402.060 GHz         5.059.dBm           2         N         1         f         2.400.000 GHz         5.1979 dBm           3         N         1         f         2.209.000 GHz         5.1979 dBm	Freq Offset
4         N         1         2.310.900 strz         -53,109.00 str           6         N         1         2.364.155 GHz         -50,110 dBm           6         -         -         -         -           7         -         -         -         -	0 Hz
8	
MSG GSTATUS	·

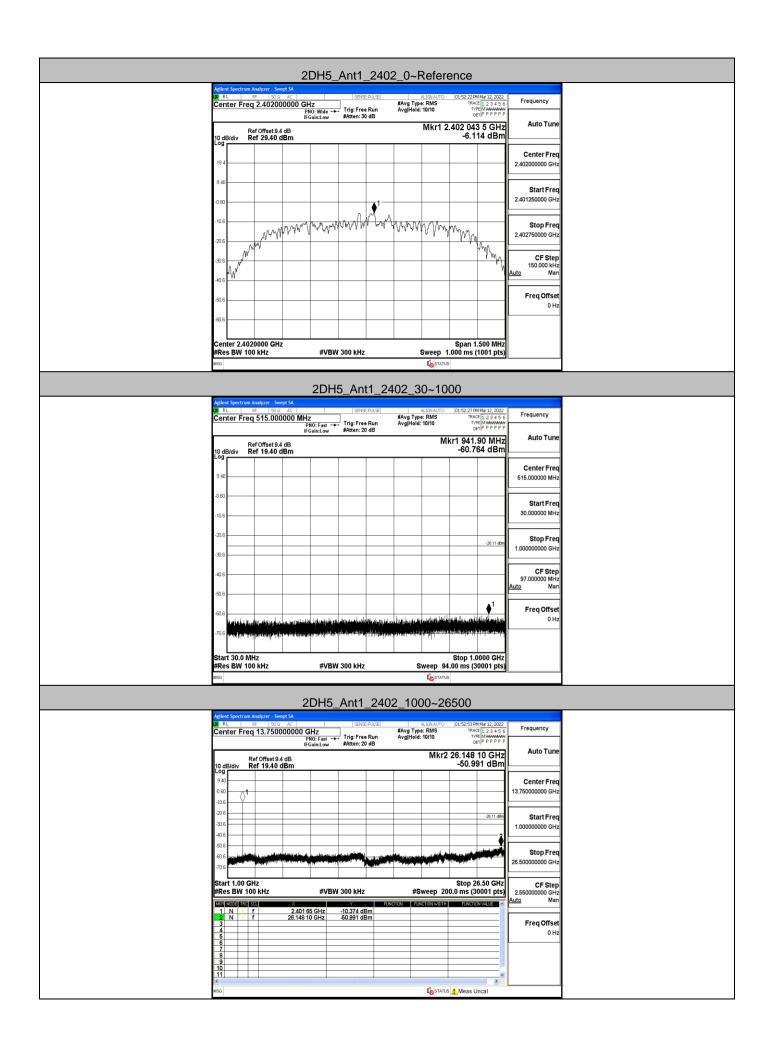
	3DH5 Apt1	_High_2480	
AP	ilent Spectrum Analyzer - Swept SA		
au	RL RF 50 Q AC SENSE.PULSE enter Freq 2.510000000 GHz PN0: Fast → Trig: Free Run ⊮Gaint.tow #Atten: 30 dB	ALIGNAUTO 02:04:14 PM Mar 12, 2022 #Avg Type: RMS TRACE [1 2 3 4 5 6 Avg[Hold: 300/300 TVPE MV444444 DET P.P.P.P.P.P.	Frequency
1	Ref Offset 9.56 dB 0 dB/div Ref 20.00 dBm	Mkr4 2.527 28 GHz -48.330 dBm	Auto Tune
1	0.0 00 01		Center Freq 2.51000000 GHz
-2		-27.22.48e	Start Freq 2.47000000 GHz
-5		4	Stop Freq
-7	tart 2.47000 GHz	Stop 2.55000 GHz	2.55000000 GHz
#	Res BW 100 kHz #VBW 300 kHz	Sweep 7.667 ms (1001 pts)	8.000000 MHz Auto Man
	2 N 1 f 2.483 50 GHz 52.777 dBm 3 N 1 f 2.500 00 GHz 51.208 dBm 4 N 1 f 2.527 28 GHz 48.330 dBm 5 -		Freq Offset 0 Hz
-	6 7 7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9		
1 je us		▼ ↓	
	3DH5_Ant1_L	.ow_Hop_2402	
	Ilent Spectrum Analyzer - Swept SA         SENSE PULSE           RL         RF         90.0         AC         SENSE PULSE           enter Freq 2.352500000 GHz         Trig: Free Run           PN0: Fast →         Trig: Free Run	ALIGNAUTO 02:14:44 PM Mar 12, 2022 #Avg Type: RMS TRACE 12:34 5 6 Avg Hold: 300/300 TVPE MUMANNAY	- Frequency
[	PN0: Fast → The reaction PN0: Fast → The reaction #Atten: 30 dB Ref Offset 9.19 dB 0 dB/div Ref 20.00 dBm	AvgiHold: 300/300 TYPE MUMANAN DETIPPPPP Mkr5 2.363 420 GHz -50.462 dBm	Auto Tune
1			Center Freq 2.352500000 GHz
-2		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Start Freq
4	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	5 	2.30000000 GHz
			Stop Freq 2.405000000 GHz
#	tart 2.30000 GHz Res BW 100 kHz #VBW 300 kHz B Made Infe State X	Stop 2.40500 GHz Sweep 10.07 ms (1001 pts)	CF Step 10.500000 MHz <u>Auto</u> Man
	1 N 1 f 2.404.055 GHz -10.081 dBm 2 N 1 f 2.400.000 GHz -52.982 dBm 3 N 1 f 2.390.000 GHz -52.458 dBm 4 N 1 f 2.310.000 GHz -52.276 dBm		Freq Offset
-	5 N 1 f 2.363 420 GHz 50.462 dBm 6 7 8		
		STATUS	
		ligh_Hop_2480	
	Itent Spectrum Analyzer - Swept SA           RL         RF         SO & AC         SENSE PULSE           enter Freq 2.510000000 GHz	ALTEN AUTO 02:19:10 PM Mar 12, 2022	Frequency
Г	PN0: Fast Ing: Free Run IFGain:Low #Atten: 30 dB Ref Offset 9.56 dB	Avg Hold: 300/300 TYPE MWWWWW Det PPPPPP Mkr4 2.548 80 GHz	0.4.5 Tune
1	0 dB/div Ref 20.00 dBm 99 0.0	-49.307 dBm	Center Freq
-1			2.51000000 GHz
-3		-28.77 dBn	Start Freq 2.470000000 GHz
-8	00 hale assessment and a second assessment ass assessment assessment assessment assessment assessment assessment assessment assessment assessment assessment a	~~ <u>~</u> ~ <u>~</u> <u>~</u>	<b>Stop Freq</b> 2.55000000 GHz
	tart 2.47000 GHz Res BW 100 kHz #VBW 300 kHz	Stop 2.55000 GHz Sweep 7.667 ms (1001 pts)	
-	1 N 1 f 2.477 04 GHz -8.771 dBm 2 N 1 f 2.483 50 GHz -51 742 dBm	FUNCTION FUNCTION WIDTH FUNCTION VALUE	Auto Man Freq Offset
	4 N 1 f 2.548 80 GHz 49.307 dBm 5 6 6 7		0 Hz
1	8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9		
I Constanting of the second se	G	STATUS	L

# A.7 RF Conducted Spurious Emissions

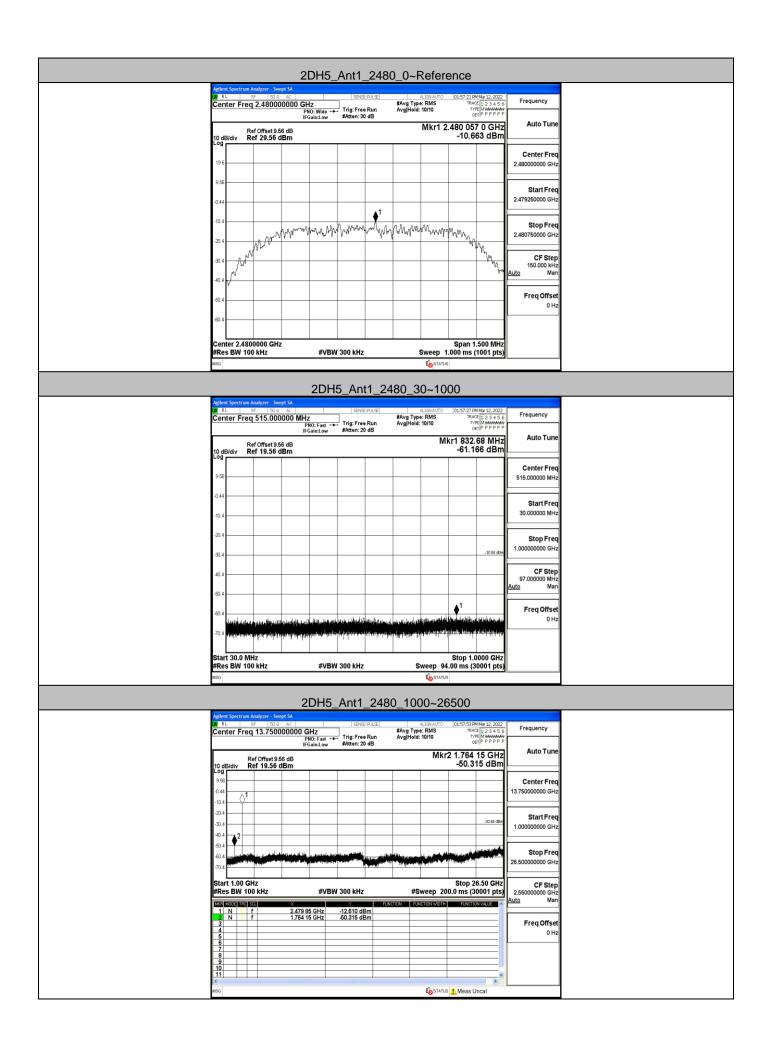






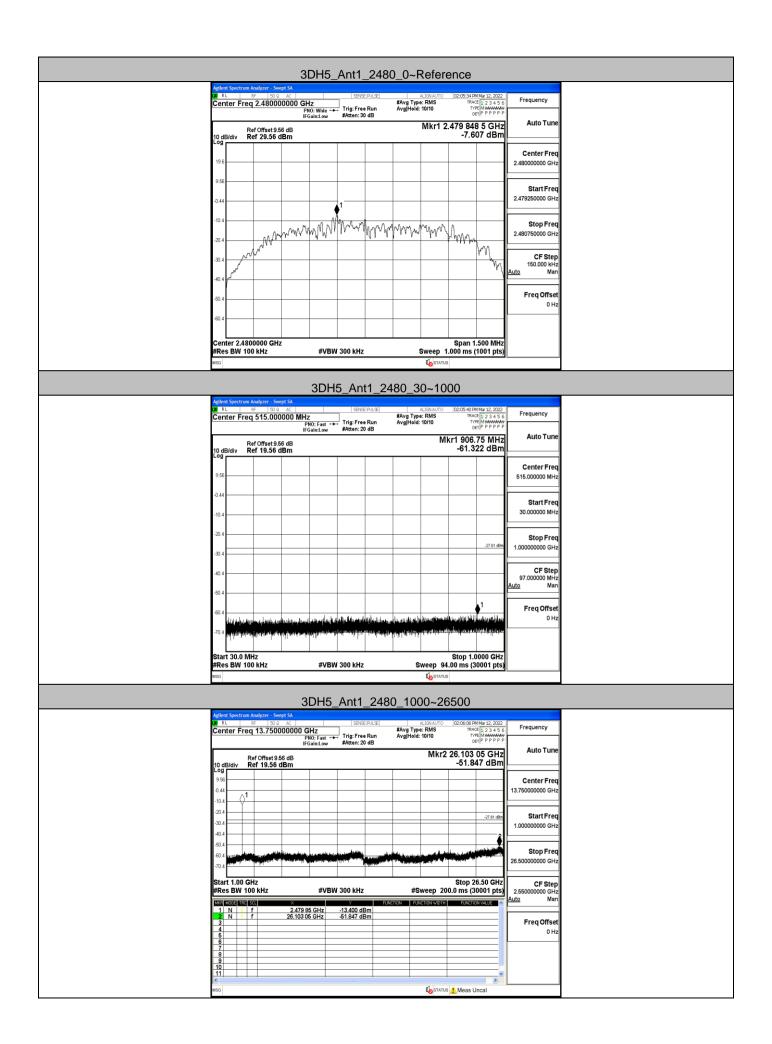


Agilent Spectrum Analyzer - Swept SA	2DH5_Ant1_244				
RL RF 500 AC Center Freq 2.441000000 (	PNO: Wide +++ Irig: Free Run	ALIGNAUTO #Avg Type: RMS Avg Hold: 10/10	01:54:13 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P	Frequency	
Ref Offset 9.56 dB	IFGain:Low #Atten: 30 dB	Mkr1 2.4	440 863 5 GHz -10.507 dBm	Auto Tune	
10 dB/div Ref 29.56 dBm				Center Freq	
19.6				2.441000000 GHz	
9.56				Start Freq 2.440250000 GHz	
-0.44	1			2.440250000 GHz	
-10.4	and my my have	n waldman have	ILM.	Stop Freq 2.441750000 GHz	
-20.4 MAN	๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛		he all have	CF Step	
-40.4			v.	150.000 kHz <u>Auto</u> Man	
-50.4				Freq Offset	
-60.4				0 Hz	
Center 2.4410000 GHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 1.0	Span 1.500 MHz )00 ms (1001 pts)		
MSG		<b>K</b> STATUS			
Agilent Spectrum Analyzer - Swept SA	2DH5_Ant1_24	441_30~100	00		
RL RF 50Ω AC Center Freq 515.000000 M		ALIGNAUTO #Avg Type: RMS Avg Hold: 10/10	01:54:19 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWWW DET P P P P P P	Frequency	
Ref Offset 9.56 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 20 dB		т1 780.10 MHz	Auto Tune	
10 dB/div Ref 19.56 dBm			-60.104 dBm		
9.56				Center Freq 515.000000 MHz	
-0.44				Start Freq	
-10.4				30.000000 MHz	
-20.4				Stop Freq	
-30.4			-30.51 dBm	1.00000000 GHz	
-40.4				CF Step 97.000000 MHz Auto Man	
-50.4		1			
-60.4		فالطبوغ يتعلوك بالتلوم وتلقه	an a	Freq Offset 0 Hz	
-20.4 אאריינטיאייערייערייערייערייערייעריי	<sup>13</sup> Ale ga and a start and a start and a start of the st	and on the first sector of the	a historitati a hala sa ang ang ang ang ang ang ang ang ang an		
Start 30.0 MHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 94.0	Stop 1.0000 GHz 00 ms (30001 pts)		
MSG		<b>K</b> STATUS	( p,		
	2DH5_Ant1_244	1_1000~26	500		
Agilent Spectrum Analyzer - Swept SA X RL RF 50 Q AC Center Freq 13.750000000				Frequency	
	PNO: Fast ↔ IFGain:Low #Atten: 20 dB	#Avg Type: RMS Avg Hold: 10/10	01:54:45 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWWW DET P P P P P		
Ref Offset 9.56 dB 10 dB/div Ref 19.56 dBm Log		Mkr2 2	26.164 25 GHz -50.413 dBm	Auto Tune	
9.56				Center Freq	
-0.44				13.750000000 GHz	
-20.4			-30.51 dBm	Start Freq 1.00000000 GHz	
-40.4			2		
-60.4				Stop Freq 26.50000000 GHz	
Start 1.00 GHz #Res BW 100 kHz	#VBW 300 kHz	#Sween 200	Stop 26.50 GHz	CF Step	
MKRI MODEL TACI SCLI X	Y FU	#Sweep 200.	.0 ms (30001 pts)	2.550000000 GHz <u>Auto</u> Man	
1 N 1 f 2.44 2 N 1 f 26.16 3 4	1 60 GHz -12.331 dBm 4 25 GHz -50.413 dBm			Freq Offset	
4 5 6 7			E	0 Hz	
9 10					
11 K MSG	ш	#1-	Maga Ungal		
~~~		STATUS 4	L Meas Uncal		



Agilent Spectrum Analyzer - Swept SA	3DH5_Ant1_2402	2_0~Refere	nce		
M         RL         RF         50 Ω         AC           Center Freq 2.402000000	GHz	#Avg Type: RMS	02:01:01 PM Mar 12, 2022 TRACE 1 2 3 4 5 6	Frequency	
	PNO: Wide +++ Trig: Free Run IFGain:Low #Atten: 30 dB	Avg Hold: 10/10	TYPE MWWWWW DET PPPPP	Auto Tumo	
Ref Offset 9.4 dB 10 dB/div Ref 29.40 dBm		Mkr1 2.	401 853 0 GHz -9.479 dBm	Auto Tune	
				Center Freq	
19.4				2.402000000 GHz	
9.40					
-0.60				Start Freq 2.401250000 GHz	
	↓1				
-10.6	www.www.www.www.www.www.www.www.www.ww	month	h	Stop Freq	
-20.6	р:	- 11	NA 1	2.402750000 GHz	
-30.6			Υ.	CF Step	
-40.6			Y,	150.000 kHz <u>Auto</u> Man	
-40.6					
-60.6				Freq Offset 0 Hz	
-60.6					
Center 2.4020000 GHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 1.0	Span 1.500 MHz 000 ms (1001 pts)		
 MSG		<b>K</b> STATUS			
	3DH5_Ant1_24	02 30, 100	0		
Agilent Spectrum Analyzer - Swept SA	<u>30113_AIIL1_</u> 24				
Center Freq 515.000000 N	IHZ J. C. D.	#Avg Type: RMS	02:01:06 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P	Frequency	
	PNO: Fast ++- Trig: Free Run IFGain:Low #Atten: 20 dB	Avg Hold: 10/10		Auto Tuno	
Ref Offset 9.4 dB 10 dB/div Ref 19.40 dBm		Mk	r1 974.13 MHz -60.580 dBm	Auto Tune	
				Center Freq	
9.40				515.000000 MHz	
-0.60					
-10.6				Start Freq 30.000000 MHz	
-10.0					
-20.6				Stop Freq	
-30.6			-29.48 dBm	1.00000000 GHz	
-40.6				CF Step 97.000000 MHz	
-50.6				Auto Man	
			▲1	Freq Offset	
-60.6	والمتعاقبة أفتاره الافتقاق ومستاريا والم	haddelesia einidereinigen	بالأفد بالقراط فأفأ فبالرفة أساده	0 Hz	
-70.6 and a particular second and the	andresi ang pang pang pang pang	hu dhu an	an ingener ang kanalang pangkan pangka Pangkan pangkan		
			Oton 1 0000 Olla		
Start 30.0 MHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 94.	Stop 1.0000 GHz 00 ms (30001 pts)		
MSG		<b>K</b> STATUS			
	3DH5_Ant1_2402	2 1000~26	500		
Agilent Spectrum Analyzer - Swept SA					
Center Freq 13.75000000	SENSE:PULSE D GHz PNQ: East →→ Trig: Free Run	ALIGNAUTO #Avg Type: RMS Avg Hold: 10/10	02:01:33 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P P	Frequency	
	PNO: Fast ++ Trig: Free Run IFGain:Low #Atten: 20 dB			Auto Tune	
Ref Offset 9.4 dB 10 dB/div Ref 19.40 dBm		Mkr2 2	26.092 00 GHz -49.694 dBm		
9.40				Center Freq	
-0.60				13.750000000 GHz	
-10.6					
-30.6			-29.48 dBm	Start Freq 1.00000000 GHz	
-40.6					
-50.6	and the second	والمراقة ويراجع		Stop Freq	
-70.6	A loss of the second seco	। १९४०काम <b>स्व वर्ष्</b> स्वत्या पर		26.50000000 GHz	
Start 1.00 GHz #Res BW 100 kHz	#VBW 300 kHz	#Sween 200	Stop 26.50 GHz .0 ms (30001 pts)	CF Step 2.55000000 GHz	
MKR MODE TRC SCL ×	Y FUN	#Sweep 200	· · · ·	2.550000000 GHz <u>Auto</u> Man	
1 N 1 f 2.40 2 N 1 f 26.09	1 65 GHz -10.909 dBm 2 00 GHz -49.694 dBm			Eron Offert	
3 4 5				Freq Offset 0 Hz	
6 7			2		
8 9 10					
	<u> </u>		×		
MSG		<b>K</b> STATUS	! Meas Uncal		

	,					
	gilent Spectrum Analyzer - Swept SA	3DH5_Ant1_244				
u C	RL RF 50Ω AC enter Freq 2.441000000 C	SENSE:PULSE CHZ PNO: Wide →→ Trig: Free Run	ALIGNAUTO #Avg Type: RMS Avg[Hold: 10/10	02:02:37 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P	Frequency	
r		PNO: Wide ↔ This, Free Kun IFGain:Low #Atten: 30 dB		440 955 0 GHz	Auto Tune	
1	Ref Offset 9.56 dB 0 dB/div Ref 29.56 dBm			-10.063 dBm		
	19.6				Center Freq 2.44100000 GHz	
	3.56					
	1.44				Start Freq 2.440250000 GHz	
		↓ <sup>1</sup>				
	10.4 1	And Man Man Marker M	Manyman	M.	Stop Freq 2.441750000 GHz	
-	hall	Ary My Market Market		M.	05.01.0	
-					CF Step 150.000 kHz Auto Man	
-	10.4					
د د	50.4				Freq Offset 0 Hz	
4	60.4					
ç	enter 2.4410000 GHz			Span 1.500 MHz		
#	Res BW 100 kHz	#VBW 300 kHz	Sweep 1.	000 ms (1001 pts)		
			_			
		3DH5_Ant1_24	441_30~10	00		
<u> </u>	gilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Senter Freq 515.000000 Mi	SENSE:PULSE	ALIGNAUTO #Avg Type: RMS	02:02:42 PM Mar 12, 2022 TRACE 1 2 3 4 5 6	Frequency	
		HZ PNO: Fast ↔→ Trig: Free Run IFGain:Low #Atten: 20 dB	Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE MWWWWWW DET P P P P P P	Auto Turro	
ſ	Ref Offset 9.56 dB 0 dB/div Ref 19.56 dBm		M	r1 775.32 MHz -60.967 dBm	Auto Tune	
	og				Center Freq	
	9.56				515.000000 MHz	
4	1.44				Start Freq	
-	10.4				30.000000 MHz	
-	20.4				Stop Freq	
-	10.4			-30.06 dBm	1.00000000 GHz	
	10.4				CF Step 97.00000 MHz	
	50.4				Auto Man	
	50.4				Freq Offset	
		ga ha ang a bai gini in tin bai ang ilikini sina a		n televen de proposition de la construction de la construction de la construction de la construction de la cons La construction de la construction d	0 Hz	
	<sup>70.4</sup> an every serie produce on a light series of	and a start of a local strategy of the start	ومحدانا يغريهما بالما المانية المرابع			
s #	tart 30.0 MHz Res BW 100 kHz	#VBW 300 kHz	Sweep 94	Stop 1.0000 GHz .00 ms (30001 pts)		
	3G		<b>K</b> STATUS			
		3DH5_Ant1_244	1 1000~26	500		
	gilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC		ALISNAUTO			
Ē	enter Freq 13.75000000	GHZ PNO: Fast ++ Trig: Free Run	#Avg Type: RMS Avg Hold: 10/10	02:03:09 PM Mar 12, 2022 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P	Frequency	
r	Ref Offset 9.56 dB	#Atten: 20 dB	Mkr2	26.131 95 GHz	Auto Tune	
L	odBidiv Ref 19.56 dBm			-50.600 dBm		
	9.56				Center Freq 13.75000000 GHz	
	10.4					
	30.4			-30.06 dBm	Start Freq 1.00000000 GHz	
	40.4			2		
	60.4				Stop Freq 26.50000000 GHz	
	start 1.00 GHz			Stop 26.50 GHz	CF Step	
#	Res BW 100 kHz	#VBW 300 kHz		0.0 ms (30001 pts)	2.550000000 GHz Auto Man	
	KE MODE         TRC         SCL         X           1         N         1         f         2.440           2         N         1         f         26.131	95 GHz -50.600 dBm	FUNCTION WIDTH	TORETIONWOLDE		
	3 4 5			=	Freq Offset 0 Hz	
-	6 7 8					
-	9					
	11					



# A.8 Restrict-band band-edge measurements

TestMode	Antenna	ChName	Channel	Detector	Freq(MHz)	Result(dBm)	Limit(dBm)	Verdict
				AV	2310.000	-49.04	≤-41.20	PASS
				AV	2387.045	-48.57	≤-41.20	PASS
			- /	AV	2390.000	-48.73	≤-41.20	PASS
		Low	2402	Peak	2310.000	-41.75	≤-21.20	PASS
				Peak	2358.065	-38.07	≤-21.20	PASS
DUE				Peak	2390.000	-40.61	≤-21.20	PASS
DH5	Ant1			AV	2483.500	-48.28	≤-41.20	PASS
				AV	2497.920	-47.95	≤-41.20	PASS
		L L'arte	0.400	AV	2500.000	-47.94	≤-41.20	PASS
		High	2480	Peak	2483.500	-41.7	≤-21.20	PASS
				Peak	2486.400	-38.51	≤-21.20	PASS
				Peak	2500.000	-40.97	≤-21.20	PASS
				AV	2310.000	-49.02	≤-41.20	PASS
				AV	2386.520	-48.58	≤-41.20	PASS
		Law	2402	AV	2390.000	-48.71	≤-41.20	PASS
		Low	2402	Peak	2310.000	-43.28	≤-21.20	PASS
				Peak	2374.550	-38.69	≤-21.20	PASS
	A pt1			Peak	2390.000	-41.15	≤-21.20	PASS
2DH5	Ant1			AV	2483.500	-48.29	≤-41.20	PASS
				AV	2499.760	-47.95	≤-41.20	PASS
		High	2480	AV	2500.000	-48.04	≤-41.20	PASS
		High	2400	Peak	2483.500	-41.52	≤-21.20	PASS
				Peak	2491.680	-38.36	≤-21.20	PASS
				Peak	2500.000	-39.77	≤-21.20	PASS
				AV	2310.000	-49.08	≤-41.20	PASS
				AV	2387.780	-48.63	≤-41.20	PASS
		Low	2402	AV	2390.000	-48.77	≤-41.20	PASS
		LOW	2402	Peak	2310.000	-42.15	≤-21.20	PASS
				Peak	2311.550	-38.98	≤-21.20	PASS
3DH5	Ant1			Peak	2390.000	-41.84	≤-21.20	PASS
0110				AV	2483.500	-48.17	≤-41.20	PASS
				AV	2499.120	-48	≤-41.20	PASS
		High	2480	AV	2500.000	-48.06	≤-41.20	PASS
		High	∠40U	Peak	2483.500	-42.52	≤-21.20	PASS
				Peak	2491.040	-38.16	≤-21.20	PASS
				Peak	2500.000	-40.61	≤-21.20	PASS

1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.

2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs					
	DH5_Ant1_Low_2402_AV				
	Center Freq 2.352500000 GHz #Avg Type: RMS	0140-49 PM Mar 12, 2022 TRACE [1 2 3 4 5 6 Frequency			
	PN0: Fast →→ Trig: Free Run Avg Hold: 100/100 IFGain:Low #Atten: 30 dB	TRACE [123456 TREMWWWW OUP PPPPP Auto Tune			
	Ref Offset 11.4 dB Mkr4 10 dB/div Ref 20.00 dBm Log	48.573 dBm			
		Center Freq 2.352500000 GHz			
	-10.0				
		Start Freq 2.30000000 GHz			
		↓4 2			
	-70.0	2.405000000 GHz			
	#Res BW 1.0 MHz #VBW 390 Hz Sweep 2	Stop 2.40500 GHz 209.9 ms (1001 pts) Auto Man			
	Image         Model         Here         Sector         Y         Runction         Runction				
	2         N         f         2.380 000 GHz         48.730 dBm           3         N         f         2.380 000 GHz         49.036 dBm           4         N         i         f         2.387 045 GHz         48.673 dBm           5         -         -         -         48.673 dBm         -           6         -         -         -         -         -	Freq Offset			
	6				
		*			
	DH5_Ant1_Low_2402_Pe	eak			
	Agilent Spectrum Analyzer - Swept SA ■ RL RF 1908 AC SPRE-PULSE ALIGNAUTO Center Freq 2.352500000 GHz FAvg Type: RMS	01-00-115PM Mar 12, 2022 TRACE 12 2 3 4 5 6 Frequency			
	PNO: Fast Trg: Free Run Avg Hold: 100/100 IFGain:Low #Atten: 30 dB				
	Ref Offset 11.4 dB Mkr4 10 dB/div Ref 20.00 dBm	-38.068 dBm			
	0.00	Center Freq 2.352500000 GHz			
	20.0				
	-30.0	Start Freq 2.30000000 GHz			
	-50.0	Stop Freq			
	60.0	2.40500000 GHz			
		Stop 2.40500 GHz CF Step 1.000 ms (1001 pts) 10.500000 MHz			
	XX8         X         Y         Function         Function violet           1         N         1         f         2.402.060 GHz         -2.787 dBm         Function violet           2         N         1         f         2.399.000 GHz         -4.0.613 dBm         Function violet	PUNCTION VALUE A Auto Man			
	2 N 1 f 2390000 GHz 40.613 dBm 3 N 1 f 2310000 GHz 41.745 dBm 4 N 1 f 2358 065 GHz 38.068 dBm 5	Freq Offset			
	5 6 7 8				
	9 10 11				
		s s			
	DH5_Ant1_High_2480_A	AV			
	Agilent Spectrum Analyzer - Swept SA	01:45:36 PM Mar 12, 2022			
	Center Freq 2.510000000 GHz PR0:Fast → Trig: Free Run IFGaint.ow #AvgrHold: 100/100 #Kter: 30 dB	TRACE [12 3 4 5 6] TYPE MWWWWW oET [P P P P P			
	Ref Offset 11.56 dB Mkr 10 dB/div Ref 20.00 dBm	r4 2.497 92 GHz Auto Tune -47.950 dBm			
	10.0 . 1	Center Freq			
	-10.0	2.51000000 GHz			
	30.0	Start Freq 2.47000000 GHz			
	600	Stop Freq           2.55000000 GHz			
		Stop 2.55000 GHz CF Step 160.0 ms (1001 pts) 8.000000 MHz			
	MKBLMODELTBELSEL X Y FUNCTION FUNCTION VIDTH				
	1         N         f         2480 00 GHz         5.133 dBm           2         N         f         2483 50 GHz         48275 dBm           3         N         f         2480 00 GHz         47.940 dBm           4         N         f         2.497 92 GHz         47.940 dBm	Freq Offset			
	5 6 7				
	8				
	11	s			
L					

DH5_Ant1_High_2480_Peak			
Agilent Spectrum Analyzer - Swept SA			
RL RF 50 Ω AC SENSERUSE Center Freq 2.510000000 GHz PN0:Fast → Trig:Free Run IFGainLow #Atten: 30 dB	ALIONAUTO 01:45:11 PM Mar 12, 2022 #Avg Type: RMS TRACE 12:34 5 6 Avg Hold: 100/100 TYPE MWAWAWA DET  P P P P P P	requency	
Ref Offset 11.56 dB 10 dB/div Ref 20.00 dBm	Mkr4 2.486 40 GHz -38.510 dBm	Auto Tune	
		Center Freq 2.51000000 GHz	
200 200 200 200 200 200 200 200 200 200	21.20 dBm สิมพิษาร์กระบาท แต่ไป หรุ่มประเทศ เร็า หลุ่มหูสามาร์การเกาะระบาท หัวกระกำรับการเปล่า	Start Freq 2.47000000 GHz	
-50.0		Stop Freq 2.55000000 GHz	
Start 2.47000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz	Stop 2.55000 GHz Sweep 1.000 ms (1001 pts)	8.000000 MHz	
U28         U29         U29 <thu29< th=""> <thu29< th=""> <thu29< th=""></thu29<></thu29<></thu29<>	FUNCTION FUNCTION WIDTH FUNCTION VALUE	Auto Man Freq Offset 0 Hz	
6 7 8 9			
10	To STATUS		
	Low_2402_AV		
Aglient Spectrum Analyzer - Swept SA ■ RL RF 50.0 AC SPINE-PULSE Center Freq 2.352500000 GHz PNO: Fast → Trig: Free Run	ALIGNAUTO 01:52:12 PM Mar 12, 2022 #Avg Type: RMS TRACE 12 3 4 5 6 Avg Hold: 100/100 DF P P P P P DF P P P P P	Frequency	
PMC: Fast → mg. reservan IFGain:Low #Atten: 30 dB Ref Offset 11.4 dB 10 dB/div Ref 20.00 dBm	Mkr4 2.386 520 GHz -48.576 dBm	Auto Tune	
Log		Center Freq 2.352500000 GHz	
-10.0		Start Freq 2.30000000 GHz	
40.0 3 -0.0	↓4 <u>2</u>	Stop Freq	
-70.0	Stop 2.40500 GHz	2.405000000 GHz	
#Res BW 1.0 MHz #VBW 390 Hz	Sweep 209.9 ms (1001 pts)		
1         N         1         f         2.402.050 GHz         5.573.dBm           2         N         i         f         2.390.000 GHz         48.714.dBm           3         N         f         2.310.000 GHz         48.214.dBm           4         N         i         f         2.386.520 GHz         48.576.dBm           6		Freq Offset 0 Hz	
8 9 10			
11	The STATUS		
 2DH5_Ant1_L Agilent Spectrum Analyzer - Swept SA	.ow_2402_Peak		
RL R F 500 AC SUBJECTION SUBJECT SUBJECTION SUBJECT SUBJECTION SUBJECT SUBJECTIONS AC SUBJECT	ALIGNAUTO 01:51:40 PM Mar 12, 2022 #Avg Type: RMS TRACE [123456 Avg]Hold: 100/100 TYPE MWWWWWW bet P P P P P	Frequency	
Ref Offset 11.4 dB 10 dB/div Ref 20.00 dBm	Mkr4 2.374 550 GHz -38.693 dBm	Auto Tune	
100		Center Freq 2.352500000 GHz	
-20.0		Start Freq 2.30000000 GHz	
400 <b></b>	- the second	Stop Freq	
-70.0	Stop 2.40500 GHz	2.40500000 GHz	
#Res BW 1.0 MHz         #VBW 3.0 MHz           1028 M003 M09	Sweep 1.000 ms (1001 pts) FUNCTION FUNCTION VALUE	10.50000 MHz <u>Auto</u> Man	
1         N         1         f         2.401 850 GHz         -2.304 dBm           2         N         f         2.300 000 GHz         4.1153 dBm           3         N         f         2.300 000 GHz         4.1153 dBm           4         N         f         2.374 550 GHz         -38.693 dBm           5         5         5         5         5		Freq Offset 0 Hz	
7			
All and a second s	To STATUS	L	

	2DH5_Ant1_H	iah 2480 AV		
	gilent Spectrum Analyzer - Swept SA			
	RL RF [50 Q AC   SENSEPULSE Enter Freq 2.510000000 GHz PN0: Fast → Trig: Free Run IFGain:Low #Atten: 30 dB	ALIGNAUTO 01:57:12 PM Mar 12, 2022 #Avg Type: RMS TRACE[1 2 3 4 5 6 Avg[Hold: 100/100 TYPE]MWAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	Frequency	
	Ref Offset 11.56 dB 0 dB/div Ref 20.00 dBm	Mkr4 2.499 76 GHz -47.953 dBm		
	10.0 0.00 10.0		Center Freq 2.510000000 GHz	
-	200 // // // // // // // // // // // // /	.41.20 dBn	Start Freq 2.470000000 GHz	
	50.0		Stop Freq 2.55000000 GHz	
5	Res BW 1.0 MHz #VBW 390 Hz	Stop 2.55000 GHz Sweep 160.0 ms (1001 pts)	8.000000 MHz	
	1 N 1 f 2,480 00 GHz -7.587 dBm 2 N 1 f 2,483 50 GHz -48.292 dBm 2 N 1 f 2,600 00 GHz -48.292 dBm	NCTION FUNCTION WIDTH FUNCTION VALUE	Auto Man Freq Offset	
-	A N 1 f 2.499 76 GHz -47.953 dBm 5		0 Hz	
	8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10	×		
а м	sc 	<b>K</b> STATUS		
	2DH5_Ant1_Hig glent Spectrum Analyzer - Swept SA RL RF SD AC SDEEPUSE	ALIGNALITO 01:56:47 PM Mar 12, 2022		
C	RL BF 900 AC SERVERUSE Center Freq 2.510000000 GHz PN0: Fast ↔ IFGaincLow #Atten: 30 dB	#Avg Type: RMS TRACE 1 2 3 4 5 6 Avg Hold: 100/100 TYPE MWWWWW DET P P P P P	Auto Tuno	
L	Ref Offset 11.56 dB 0 dB/div Ref 20.00 dBm 0 0	Mkr4 2.491 68 GHz -38.361 dBm		
			Center Freq 2.510000000 GHz	
-	20 0 30.0 40.0 yest traces and the state of		Start Freq 2.470000000 GHz	
			Stop Freq 2.55000000 GHz	
s	Start 2.47000 GHz           Res BW 1.0 MHz           #VBW 3.0 MHz	Stop 2.55000 GHz Sweep 1.000 ms (1001 pts)	CF Step 8.00000 MHz	
	Image         Image         X         Y         AU           1         N         f         2.479         92         GHz         4.539         dBm           2         N         f         2.435         95         GHz         4.521         dBm           3         N         f         2.835         GHz         3.83.66         GHz         3.93.66         GHz           4         N         f         2.451         GB         3.83.61         GHm	NCTION FUNCTION WIDTH FUNCTION VALUE	Auto Man Freq Offset	
	5 6 6 7 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9		0 Hz	
-	8 9 9 00 00 00 00 00 00 00 00 00 00 00 00	v		
2 M	sc	<b>Lo</b> STATUS		
	3DH5_Ant1_Lu sitent Spectrum Analyzer - Swept SA RL RF 50.0 AC SEVEREFULSE	ALIGNAUTO 02:00:52 PM Mar 12, 2022		
	enter Freq 2.352500000 GHz PN0: Fast	#Avg Type: RMS TRACE 1 2 3 4 5 6 Avg Hold: 100/100 TYPE MWWWWW DET P P P P P P	Frequency	
L	Ref Offset 11.4 dB 0 dB/div Ref 20.00 dBm -99	Mkr4 2.387 780 GHz -48.630 dBm		
	0.00		Center Freq 2.352500000 GHz	
-	20.0	- 4 2 -41204Ba	Start Freq 2.300000000 GHz	
	50.0	4 2	Stop Freq 2.40500000 GHz	
s	Start 2.30000 GHz           Res BW 1.0 MHz         #VBW 390 Hz	Stop 2.40500 GHz Sweep 209.9 ms (1001 pts)	CF Step	
-	MODE         THE         SCI.         X         Y         FUI           1         N         1         f         2.402.060 GHz         5.594 dBm           2         N         1         f         2.390.000 GHz         -48.770 dBm	Sweep 209.9 ms (1001 pts)	10.500000 MHz <u>Auto</u> Man	
	2 N 1 f 2.390 OHz 48.70 dBm 4 N 1 f 2.391000 GHz 49.076 dBm 5 6 6		Freq Offset 0 Hz	
	7 8 9 9 9 10 11 11			
	se the second se	Co STATUS		

	3DH5_Ant1_Low_2402_Peak	
Ad	lent Spectrum Analyzer - Swept SA	
<u> </u>	RL         PE         S0.2         AC         SENSE-PLLSE         ALIGNAUTO         02:00:19 MWs/12, 2022.           enter Freq 2.352500000 GHz         Trig: Free Run         Avg Type: RMS         Trace [12:3:4:5:6         Avg Type: RMS	Frequency
10	Ref Offset 11.4 dB         Mkr4 2.311 550 GHz           dB/div         Ref 20.00 dBm	Auto Tune
1		Center Freq 2.352500000 GHz
-11		Start Freq
.3	10 contraction and a construction of the second providence on the second providence of the second seco	2.30000000 GHz
-9 -8 -7		Stop Freq 2.405000000 GHz
s	art 2.30000 GHz Sweep 1.000 ms (100 pt) Exe BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (100 pts)	CF Step 10.500000 MHz
	PENDER         Y         PUNCTION         PUNCTION walls           1         N         1         f         2.401 955 GHz         2.093 dBm           2         N         1         f         2.300 00 GHz         4.11844 dBm	<u>Auto</u> Man
	3 N 1 f 2.310 000 GHz 42.19 dBm N 1 f 2.311 550 GHz 38.979 dBm 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Freq Offset 0 Hz
	3DH5_Ant1_High_2480_AV	
<u> </u>	Ref: Spectrum Analyzer - Swept SA           RL         SF         50.0         AC           SPIEE Fred: S: 510000000 GHz         FAvg Type: RMS         IRXXE[12.34.5.6	Frequency
	IFGain:Low #Atten: 30 dB Det 2 400 12 CH	Auto Tune
Lo	Ref Offset 11.56 dB 101.14 2.439 12 GHz dRidiv Ref 20.00 dBm	Center Freq
٥		2.51000000 GHz
-2 -3		Start Freq 2.470000000 GHz
-4 -5 -6		Stop Freq
-71		2.55000000 GHz
#1	ant 2.47000 GHz Stop 2.55000 GHz kes BW 1.0 MHz #VBW 390 Hz Sweep 160.0 ms (100 pts) floog ling Stol x y Runction Runctionwater Resolution Runctionwater Resolution Resolution Runctionwater Resolution Resolution Runctionwater Resolution Runctionwater Resolution Runctionwater Resolution Runctionwater Runctionwater Resolution Runctionwater Runcti Runctionwater Runcti	CF Step 8.000000 MHz <u>Auto</u> Man
-	1 N 1 f 2.480.08 GHz -7.609 dBm 2 N 1 f 2.483.50 GHz 48.171 dBm 3 N 1 f 2.500.00 GHz 48.06 dBm	Freq Offset
		0 Hz
1		
<u>∢</u> MS		
	3DH5_Ant1_High_2480_Peak	
20	RL         85         50.0         AC         SBNSEPULE         ALIGNAUTO         02:05:00 MWs/12, 2022           enter Freq 2.510000000 GHz         Trig: Free Run         Avg Type: RMS         maxe[][2:3:4:5         Trig: Free Run	Frequency
	Ref Offset 11.56 dB Mkr4 2.491 04 GHz	Auto Tune
	dB/div Ref 20.00 dBm	Center Freq
		2.510000000 GHz
	10 10 10	
-2		Start Freq 2.47000000 GHz
	20 20 Aparticity of Aparticity of the standard and the standa	
-51 -61 -77	10	<b>Stop Freq</b> 2.550000000 GHz
s	art 2.47000 GHz Sweep 1.000 ms (100 pt) Exe BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (100 pts)	CF Step 8.000000 MHz
132	PI MODE         THE         State         Y         PUNCTION         RUNCTION WOTH         RUNCTION WALKE           1         N         1         f         2.480 16 GHz         4.202 dBm         Fill Comparison         Fill Compar	<u>Auto</u> Man
	N         1         2450 00 0Ftz         42210 00 0Ft           N         1         f         2500 00 0Ftz         40007 dBm           N         1         f         2491 04 0Ftz         38.156 dBm           S         5         5         5         5	Freq Offset 0 Hz
-		
1		
MS		

FCC ID: 2AXV7-X14

## **EXTERIOR PHOTOGRAPHS OF EUT**



Fig.1



Fig.2



Fig.3



Fig.4



Fig.6



Fig.7

# **INTERIOR PHOTOGRAPHS OF EUT**

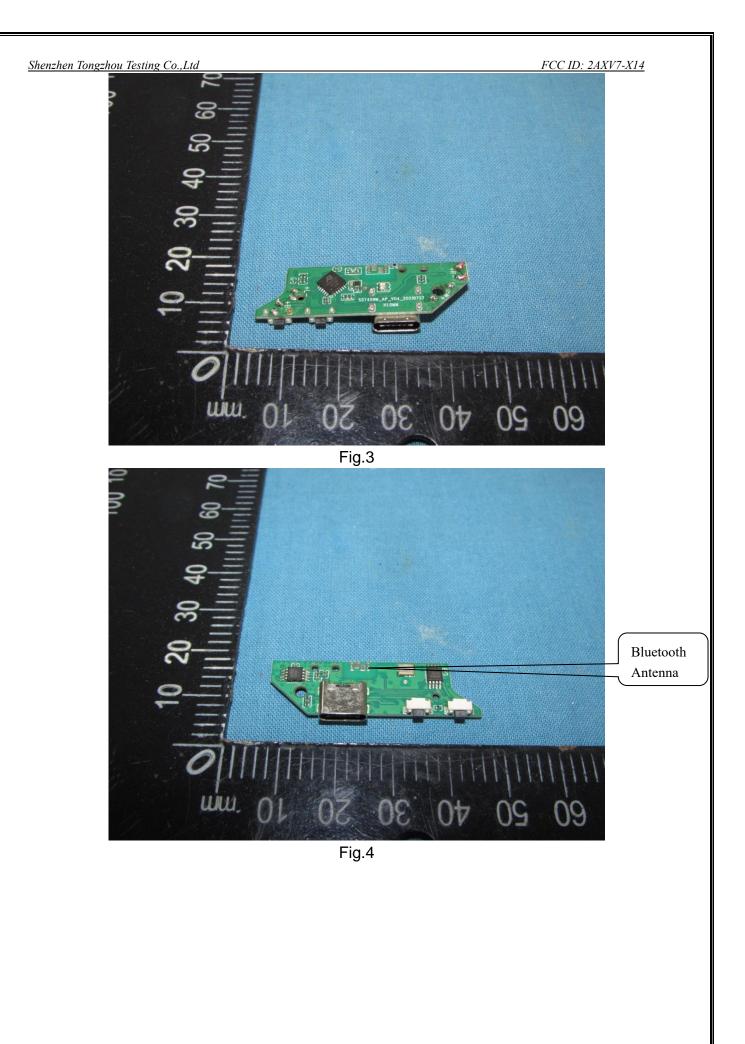


Fig.1



Fig.2

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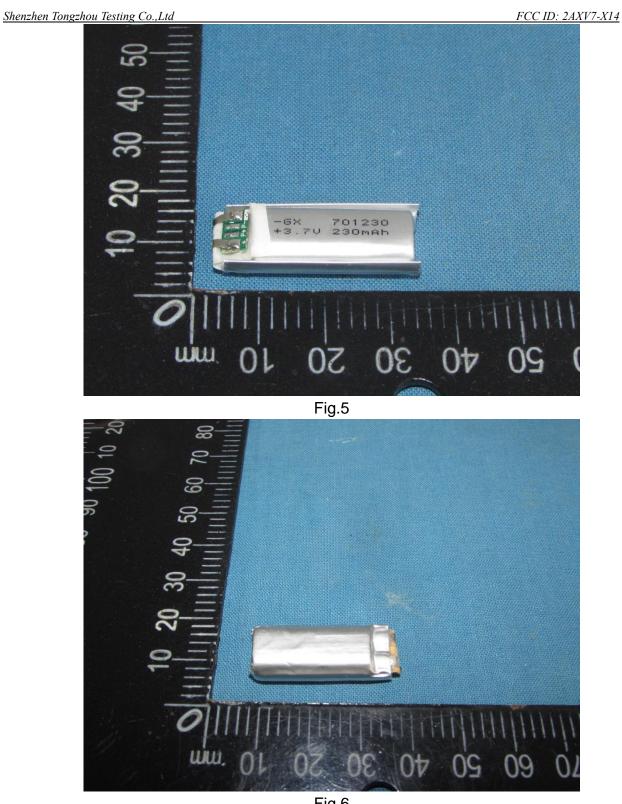


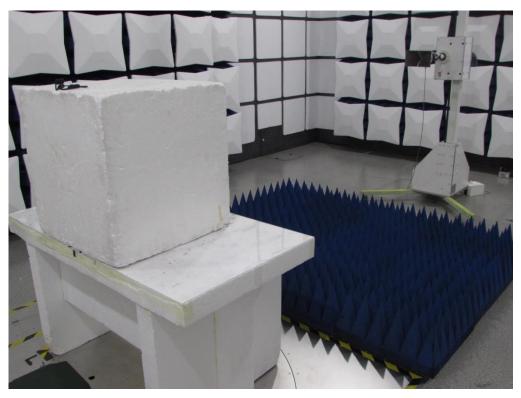
Fig.6

# TEST SETUP PHOTOS OF THE EUT



Radiated Emission Below 1GHz

Radiated Emission Above 1GHz



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#### **Conducted Emission**

