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FCC BT REPORT Certification

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Date of Issue: April 09, 2021

Test Site/Location: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2104-FC005

FCC ID:

A3LNP340XLA

 APPLICANT:
 SAMSUNG Electronics Co., Ltd.

 According to the Evaluation report, all of the data contained herein is reused from the reference FCC ID : A3LNP345XLA report.

Model:	NP340XLA
EUT Type:	Notebook Computer
Max. RF Output Power:	11.213 dBm (13.22 mW)
Frequency Range:	2 402 MHz – 2 480 MHz (Bluetooth)
Modulation type	GFSK(Normal), π /4DQPSK and 8DPSK(EDR)
FCC Classification:	FCC Part 15 Spread Spectrum Transmitter (DSS)
FCC Rule Part(s):	Part 15 subpart C 15.247

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.



REVIEWED BY

Report prepared by : Chang Hee Hwang Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee Manager of Telecommunication Testing Center

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *. The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

* The report shall not be reproduced except in full(only partly) without approval of the laboratory.



<u>Version</u>

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2104-FC005	April 09, 2021	- First Approval Report



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1. EUT DESCRIPTION

Model	NP340XLA	
Additional Model	_	
ЕИТ Туре	Notebook Computer	
Power Supply	DC 7.72 V	
Frequency Range	2 402 MHz ~ 2 480 MHz	
Max. RF Output Power	11.213 dBm (13.22 mW)	
BT Operating Mode	Normal, EDR, AFH	
Modulation Type	GFSK(Normal), π /4DQPSK and 8DPSK(EDR)	
Modulation Technique	FHSS	
Number of Channels	79 Channels, Minimum 20 Channels(AFH)	
Date(s) of Tests	March 9, 2021~ March 25, 2021	
Serial number	Radiated: FGCD930R301073T Conducted: FGCD01R2N00050	

ANTENNA CONFIGURATIONS for Bluetooth

1. This device supports simultaneous transmission operation, which allows for two channels to operate independent of one another in the Bluetooth and 5GHz bands simultaneously on each antenna.

DBS	5GHz WiFi Ant.1	5GHz WiFi Ant.2	Bluetooth
5GHz WiFi MIMO + Bluetooth	On	On	On



2. Requirements for Bluetooth transmitter(15.247)

This Bluetooth module has been tested by a Bluetooth Qualification Lab, and we confirm the following:

- 1) This system is hopping pseudo-randomly.
- 2) Each frequency is used equally on the average by each transmitter.
- 3) The receiver input bandwidths that match the hopping channel bandwidths of their corresponding transmitters
- 4) The receiver shifts frequencies in synchronization with the transmitted signals.

• 15.247(g): The system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this Section 15.247 should the transmitter be presented with a continuous data (or information) stream.

• 15.247(h): The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

3. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Device (ANSI C63.10-2013, KDB 558074) is used in the measurement of the test device.

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.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.



GENERAL TEST PROCEDURES

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 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m 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 max emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013). To record the final measurements, the analyzer detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 120 kHz for frequencies below 1 GHz or 1 MHz for frequencies above 1 GHz. For average measurements above 1 GHz, the analyzer was set to peak detector with a reduced VBW setting(RBW = 1 MHz, VBW = 1/T Hz, where T = Pulse width).

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.



4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

Espectially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil,

Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.

The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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."

- (1) The antennas of this E.U.T are permanently attached.
- (2) The E.U.T Complies with the requirement of §15.203

7. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05



8. DESCRIPTION OF TESTS

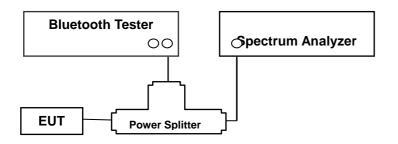
8.1. Conducted Maximum Peak Output Power

<u>Limit</u>

The maximum peak output power of the intentional radiator shall not exceed the following:

- 1. For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 nonoverlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 W. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 W.
- 2. The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer. The Spectrum Analyzer is set to the peak detector mode. This test is performed with hopping off.

The Spectrum Analyzer is set to (7.8.5 in ANSI 63.10-2013 & Procedure 10(b)(6)(i) in KDB 558074 v05r02)

- 1) Span: approximately 5 times the 20 dB bandwidth, centered on a hopping channel
- 2) RBW > the 20 dB bandwidth of the emission being measured
- 3) VBW ≥ RBW
- 4) Sweep = Auto
- 5) Detector = Peak
- 6) Trace = Max hold

Sample Calculation

Output Power = Spectrum Reading Power + Power Splitter loss + Cable loss(2 ea)

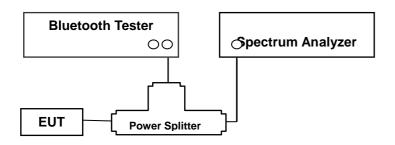
= 10 dBm + 6 dB + 1.5 dB = 17.5 dBm

8.2. Conducted Band Edge(Out of Band Emissions)

<u>Limit</u>

According to §15.247(d), 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.

Test Configuration



Test Procedure

This test is performed with hopping off and hopping on.

The Spectrum Analyzer is set to (6.10.4 in ANSI 63.10-2013 & Procedure 8.5 and 8.6 in KDB 558074 v05r02)

- 1) Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation
- Reference level: As required to keep the signal from exceeding the maximum instrument input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level.
- 3) Attenuation: Auto (at least 10 dB preferred).
- 4) Sweep time: Coupled.
- 5) RBW: 100 kHz
- 6) VBW: 300 kHz
- 7) Detector: Peak
- 8) Trace: Max hold

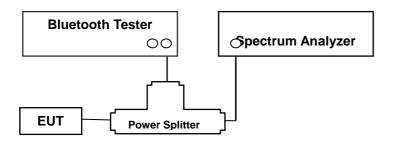


8.3. Frequency Separation & 20 dB Bandwidth

<u>Limit</u>

According to §15.247(a)(1), 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.

Test Configuration



Test Procedure(Frequency Separation)

The Channel Separation test is performed with hopping on. And the 20 dB Bandwidth test is performed with hopping off.

The Spectrum Analyzer is set to (7.8.2 in ANSI 63.10-2013 & Procedure 10(b)(6)(iii) in KDB 558074 v05r02)

- 1) Span: Wide enough to capture the peaks of two adjacent channels
- 2) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- 3) VBW ≥ RBW
- 4) Sweep: Auto
- 5) Detector: Peak
- 6) Trace: Max hold
- 7) All the trace to stabilize.
- 8) Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Compliance of an EUT with the appropriate regulatory limit shall be determined. A plot of the data shall be included in the test report.



Test Procedure (20 dB Bandwidth)

And the 20 dB Bandwidth test is performed with hopping off.

The Spectrum Analyzer is set to (6.9.2 in ANSI 63.10-2013)

- 1) Span: Set between two times and five times the OBW
- 2) RBW: 1% to 5% of the OBW.
- 3) VBW \ge 3 x RBW
- 4) Sweep: Auto
- 5) Detector: Peak
- 6) Trace: Max hold
- 7) All the trace to stabilize.

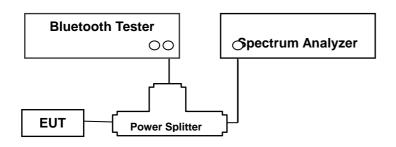


8.4. Number of Hopping Frequencies

<u>Limit</u>

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5 MHz bands shall use at least 15 hopping frequencies.

Test Configuration



Test Procedure

The Bluetooth frequency hopping function of the EUT was enabled.

The Spectrum Analyzer is set to (7.8.3 in ANSI 63.10-2013 & Procedure 10(b)(4) in KDB 558074 v05r02)

- 1) Span: the frequency band of operation
- 2) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- 3) VBW ≥ RBW
- 4) Sweep: Auto
- 5) Detector: Peak
- 6) Trace: Max hold
- 7) Allow the trace to stabilize.

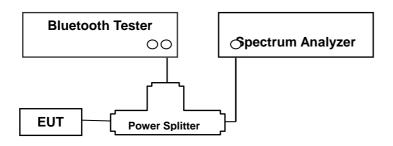


8.5. Time of Occupancy

<u>Limit</u>

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5MHz 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.

Test Configuration



Test Procedure

This test is performed with hopping off.

The Spectrum Analyzer is set to (7.8.4 in ANSI 63.10-2013 & Procedure 10(b)(6)(iv) in KDB 558074 v05r02)

- 1) Span: Zero span, centered on a hopping channel
- RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
- 3) Sweep = as necessary to capture the entire dwell time per hopping channel
- 4) Detector: Peak
- 5) Trace: Max hold

The marker-delta function was used to determine the dwell time.



Sample Calculation

The following calculation process is not relevant to our measurement results. It is just an example.

- (1) Non-AFH Mode
- DH 5 (GFSK) : 2.890 x (1600/6)/79 x 31.6 = 308.27 (ms)
- 2-DH 5 (π/4DQPSK) : 2.890 x (1600/6)/79 x 31.6 = 308.27 (ms)
- 3-DH 5 (8DPSK) : 2.890 x (1600/6)/79 x 31.6 = 308.27 (ms)
- (2) AFH Mode
- DH 5 (GFSK) : 2.890 x (800/6)/20 x 8.0 = 154.13 (ms)
- 2-DH 5 (π/4DQPSK) : 2.890 x (800/6)/20 x 8.0 = 154.13 (ms)
- 3-DH 5 (8DPSK) : 2.890 x (800/6)/20 x 8.0 = 154.13 (ms)

Note :

DH5 Packet need 5 time slot for transmitting and 1 time slot for receiving.

Then the system makes worst case 1600/6 hops per second with 79 channels. So the system have each channel 3.3755 times per second and so for 31.6 seconds the system have 106.667 times of appearance. Each tx-time per appearance of DH5 is 2.890 ms.

Dwell time = Tx-time x 106.667 = 308.27 (ms)

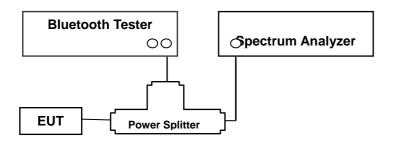


8.6. Conducted Spurious Emissions

<u>Limit</u>

Conducted > 20 dBc

Test Configuration



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 Spectrum Analyzer is set to (7.8.8 in ANSI 63.10-2013 & Procedure 8.5 and 8.6 in KDB 558074 v05r02)

- 1) Span: 30 MHz to 10 times the operating frequency in GHz.
- 2) RBW: 100 kHz
- 3) VBW: 300 kHz
- 4) Sweep: Coupled
- 5) Detector: Peak

Measurements are made over the 30 MHz to 25 GHz range with the transmitter set to the lowest, middle, and highest channels.

This test is performed with hopping off.



Factors for frequency

Freq(MHz)	Factor(dB)
30	6.14
100	6.22
200	6.30
300	6.40
400	6.46
500	6.49
600	6.49
700	6.53
800	6.55
900	6.59
1000	6.61
2000	6.88
2400	6.97
2500	6.99
3000	7.09
4000	7.25
5000	7.44
6000	7.51
7000	7.66
8000	7.78
9000	7.90
10000	8.04
11000	8.12
12000	8.28
13000	8.47
14000	8.41
15000	8.51
16000	8.56
17000	8.63
18000	8.75
19000	8.81
20000	8.89
21000	9.18
22000	9.24
23000	9.27
24000	9.35
25000	9.48
26000	9.58

Note : 1. 2400 ~ 2500 MHz is fundamental frequency range.

- 2. Factor = Cable loss(2 EA) + Splitter loss(6 dB)
- 3. EUT Cable loss = 0.35dB



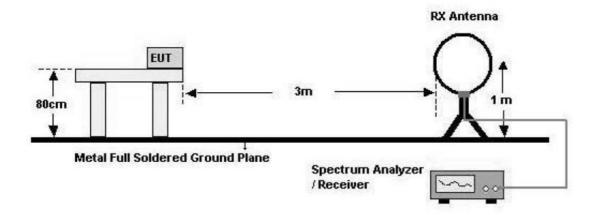
8.7. Radiated Test

<u>Limit</u>

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

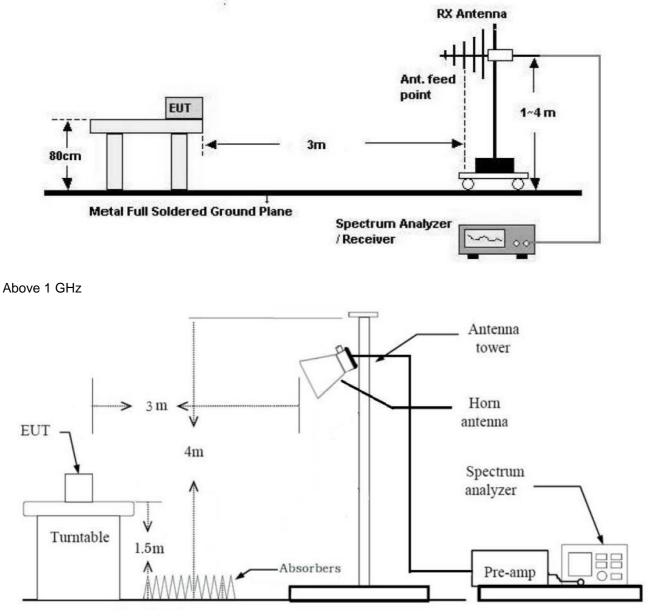
Below 30 MHz





FCC ID: A3LNP340XLA

30 MHz - 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

- 1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
- 2. The loop antenna was placed at a location 3m from the EUT
- 3. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
- 5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- Distance Correction Factor(0.009 MHz 0.490 MHz) = 40log(3 m/300 m) = 80 dB Measurement Distance : 3 m
- 7. Distance Correction Factor(0.490 MHz 30 MHz) = $40\log(3 \text{ m}/30 \text{ m})$ = 40 dB

Measurement Distance : 3 m



- 8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 9 kHz
 - VBW \ge 3 x RBW

9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions(Below 1GHz)

- 1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
- 2. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 6. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \ge 3 x RBW
 - (2) Measurement Type(Quasi-peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Quasi-Peak
 - RBW = 120 kHz
 - * In general, (1) is used mainly
- 7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
- 8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions



from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

- 1. Radiated test is performed with hopping off.
- 2. The EUT is placed on a turntable, which is 1.5 m above ground plane.
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 5. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 6. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 7. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 8. The unit was tested with its standard battery.
- 9. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW ≥ 3 x RBW
 - (2) Measurement Type(Average):
 - We performed using a reduced video BW method was done with the analyzer in linear mode
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \ge 1/T Hz, where T = pulse width in seconds
 - The actual setting value of VBW = 1 kHz
- 10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 11. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
- 12. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) Amp Gain(A.G) + Distance Factor(D.F)



Test Procedure of Radiated Restricted Band Edge

- 1. Radiated test is performed with hopping off.
- 2. The EUT is placed on a turntable, which is 1.5 m above ground plane.
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 5. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. The unit was tested with its standard battery.
- 8. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \ge 3 x RBW
 - (2) Measurement Type(Average):
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \ge 1/T Hz, where T = pulse width in seconds

The actual setting value of VBW = 1 kHz

- 9. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
- 10. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
- 11. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.



8.8. AC Power line Conducted Emissions

<u>Limit</u>

For an intentional radiator that 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 the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).

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

^(a)Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

- 1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
- 2. The EUT is connected via LISN to a test power supply.
- 3. The measurement results are obtained as described below:
- 4. Detectors : Quasi Peak and Average Detector.
- 5. The EUT is the device operating below 30 MHz.
 - For unterminated the Antenna, the AC line conducted tests are performed with the antenna connected
 - For terminated the Antenna, the AC line conducted tests are performed with a dummy load connected to the EUT antenna output terminal.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor



8.9 Worst case configuration and mode

Radiated test

- 1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories (Earphone, etc)
 - Worstcase : Stand alone
- 2. EUT Axis
 - Radiated Spurious Emissions : Z(0 degree)
 - Radiated Restricted Band Edge : X(90 degree), X(180 degree)

3. All data rate of operation were investigated and the test results are worst case in highest datarate of each mode.

- GFSK : DH5
- π/4DQPSK : 2-DH5
- 8DPSK : 3-DH5
- 4. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
 - Position : Horizontal, Vertical, Parallel to the ground plane
- 5. We were performed the RSE test in condition of co-location. There has no significant emission raised.
 - WWAN+WLAN 5GHz+BT

Radiated test(DBS)

- 1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
 - Worstcase : Stand alone
- 2. EUT Axis
 - Radiated Spurious Emissions : Z(0 degree)
- 3. The following tables show the worst case configurations determined during testing.
 - Worstcase : The lowest margin condition the channels and modes were selected for test.

Description	Bluetooth Emission	5 GHz Emission
Antenna	Ant 1	Ant All
Channel	0	144
Data Rate	1 Mbps	6 Mbps
Mode	GFSK : DH5	802.11a

AC Power line Conducted Emissions

- 1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone + External accessories(Earphone, etc)+Travel Adapter, Stand alone+Travel Adapter
 - Worstcase : Stand alone + Travel Adapter



Conducted test

- 1. The EUT was configured with data rate of highest power.
 - GFSK : DH5
 - π/4DQPSK : 2-DH5
 - 8DPSK : 3-DH5
- 2. AFH & Non-AFH were tested and the worst case results are reported.
 - Worst case : Non-AFH



9. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
20 dB Bandwidth	§15.247(a)(1)	N/A		PASS
Occupied Bandwidth	N/A	N/A		N/A
Conducted Maximum Peak Output Power	§15.247(b)(1)	< 0.125 W	-	PASS
Carrier Frequency Separation	§15.247(a)(1)	> 25 kHz or >2/3 of the 20dB BW	-	PASS
Number of Hopping Frequencies	§15.247(a)(1)(iii) ≥ 15		Conducted	PASS
Time of Occupancy				PASS
Conducted Spurious Emissions	§15.247(d)	47(d) > 20 dB for all out-of band emissions		PASS
Band Edge (Out of Band Emissions)	§15.247(d)	> 20 dB for all out-of band emissions		PASS
AC Power line Conducted Emissions	§15.207(a)	cf. Section 8.8		PASS
Radiated Spurious Emissions	§15.247(d), 15.205, 15.209	cf. Section 8.7		PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 8.7	Radiated	PASS

Note: Average Power data refer to SAR report



10. TEST RESULT

10.1 PEAK POWER

Channel	Frequency (MHz)	· · · · ·	t Power FSK)	Limit
		(dBm)	(mW)	(mW)
Low	2402	11.196	13.17	
Mid	2441	10.871	12.22	125
High	2480	10.391	10.94	

Channel	Frequency	•	Output Power (8DPSK)	
	(MHz)	(dBm)	(mW)	(mW)
Low	2402	11.213	13.22	
Mid	2441	10.909	12.33	125
High	2480	10.449	11.09	

Channel	Frequency (MHz)	Outpu (π/4D	Limit	
	(MITZ)	(dBm)	(mW)	(mW)
Low	2402	10.904	12.31	
Mid	2441	10.598	11.48	125
High	2480	10.197	10.46	

Note:

1. Spectrum reading values are not plot data.

The power results in plot is already including the actual values of loss for the splitter and cable combination.

2. Actual value of loss for the splitter and cable combination is 7.32 dB at 2400 MHz and is 7.34 dB at 2500 MHz. So, 7.34 dB is offset. And the offset gap in the 2.4 GHz range do not affect the conducted peak power final result.



Test Plots (GFSK)

Peak Power (CH.0)

	ım Analyzer - Swept SA					
Center Fr	RF 50Ω AC eq 2.402000000	GHz PNO: Fast ↔	SENSE:INT Trig: Free Run Atten: 24 dB	ALIGNAUTO #Avg Type: RMS Avg Hold: 1/1	12:10:16 PM Mar 10, 2021 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P	Frequency
10 dB/div	Ref Offset 7.34 dB Ref 20.00 dBm	II Gaineow		Mkr1	2.402 052 GHz 11.196 dBm	Auto Tune
10.0			∳ ¹			Center Free 2.402000000 GH:
-10.0						Start Fre 2.399642121 GH
-20.0						Stop Fre 2.404357879 GH
-40.0						CF Ste 471.576 kH <u>Auto</u> Ma
-60.0						Freq Offso 0 ⊦
-70.0	02000 GHz				Span 4.716 MHz	
#Res BW 3		#VBW	50 MHz	Sweep 1	.000 ms (1001 pts)	
MSG				STATUS	3	

Test Plots (GFSK) Peak Power (CH.39)





Test Plots (GFSK)

Peak Power (CH.78)

	um Analyzer - Swept SA					
Center Fr	req 2.480000000	GHz PNO: Fast ↔	Trig: Free Run Atten: 24 dB	ALIGNAUTO #Avg Type: RMS Avg Hold: 1/1	12:10:39 PM Mar 10, 2021 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P P P P P P	Frequency
10 dB/div	Ref Offset 7.34 dB Ref 20.00 dBm	IF Gam. LUW		Mkr1	2.479 986 GHz 10.391 dBm	Auto Tune
10.0			1			Center Free 2.480000000 GH
-10.0						Start Fre 2.477643306 GH
-20.0						Stop Fre 2.482356694 GH
-40.0						CF Ste 471.339 k⊦ <u>Auto</u> Ma
60.0						Freq Offso 0 ⊦
-70.0						
Center 2.4 #Res BW ∶	80000 GHz 3.0 MHz	#VBW	(50 MHz	Sweep 1	Span 4.713 MHz .000 ms (1001 pts)	
WSG				STATU		

Test Plots (8DPSK) Peak Power (CH.0)





Test Plots (8DPSK)

Peak Power (CH.39)

MSG					STATUS		
Center 2. #Res BW	441000 GHz 3.0 MHz	#VBW	50 MHz	Sv	Span veep 1.000 ms	6.505 MHz (1001 pts)	
-70.0							
+60.0							Freq Offset 0 Hz
-50.0							<u>Auto</u> Mar
-40.0							CF Step 650.500 kH
-30.0							2.444252500 GH:
-20.0							Stop Fred
-10.0							2.437747500 GH:
0.00							Start Free
10.0					and the second s		2.441000000 GHz
			↓ 1				Center Fred
10 dB/div	Ref Offset 7.34 dB Ref 20.00 dBm				Mkr1 2.441 10.9	020 GHz 909 dBm	Auto Tune
Center F	req 2.441000000	GHz PNO: Fast ↔ IFGain:Low	Trig: Free Run Atten: 24 dB	#Avg Type: F Avg Hold: 1/′	1 T	ACE 123456 YPE M WWWWWWW DET P P P P P P	
LXI RL	rum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT			PM Mar 10, 2021	Frequency

Test Plots (8DPSK) Peak Power (CH.78)





Test Plots (π/4DQPSK)

Peak Power (CH.0)

	rum Analyzer - Swept SA					
Center F	RF 50 Ω AC req 2.402000000	GHz PNO: Fast Trig: Fi	ee Run	ALIGNAU #Avg Type: RMS Avg Hold: 1/1	TO 12:10:52 PM Mar 10, 2021 TRACE 2 3 4 5 6 TYPE M	
10 dB/div	Ref Offset 7.34 dB Ref 20.00 dBm	IFGain:Low Atten:	24 dB	MI	kr1 2.402 197 GHz 10.904 dBm	Auto Tune
10.0			♦ ¹			Center Fred 2.402000000 GH;
-10.0						Start Fre 2.398712500 GH
-20.0						Stop Fre 2.405287500 GH
-40.0						CF Ste 657.500 kH <u>Auto</u> Ma
-60.0						Freq Offse 0 H
	402000 GHz				Span 6.575 MHz	
#Res BW	5.0 MHZ	#VBW 50 MH	2		p 1.000 ms (1001 pts) ratus	

Test Plots (π/4DQPSK) Peak Power (CH.39)





Test Plots (π /4DQPSK)

Peak Power (CH.78)

Agilent Spectr	rum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGNAUTO	12:11:15 PM Mar 10, 2021	
	req 2.480000000	GHz PNO: Fast ↔→	Trig: Free Run Atten: 24 dB	#Avg Type: RMS Avg Hold: 1/1	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P	Frequency
10 dB/div	Ref Offset 7.34 dB Ref 20.00 dBm	IFGain:Low	Atten: 24 db	Mkr1	2.479 929 GHz 10.197 dBm	Auto Tune
10.0			∮ 1			Center Fre 2.480000000 GH
10.00						Start Fre 2.476777500 G⊦
20.0 30.0 						Stop Fre 2.483222500 GH
40.0						CF Ste 644.500 kl <u>Auto</u> M
60.0						Freq Offs
20.0 Center 2.4 Res BW	480000 GHz	#VBW :	50 MHz	Swaan	Span 6.445 MHz 1.000 ms (1001 pts)	
SG SG	5.0 14112	#VD9V	70 WH12	SWEEP		



10.2 BAND EDGES

Without hopping

Outside Frequency Band	GFSK	8DPSK	π/4DQPSK	Limit
Outside Frequency Band	(dB)	(dB)	(dB)	(dBc)
Lower	56.924	57.631	56.903	00
Upper	66.207	65.577	64.974	20

With hopping

Outoido Eroqueneu Pend	GFSK	8DPSK	π/4DQPSK	Limit
Outside Frequency Band	(dB)	(dB)	(dB)	(dBc)
Lower	63.907	55.902	63.038	00
Upper	66.694	64.580	61.745	20

Note :

1. Spectrum reading values are not plot data.

The power results in plot is already including the actual values of loss for the splitter and cable combination.

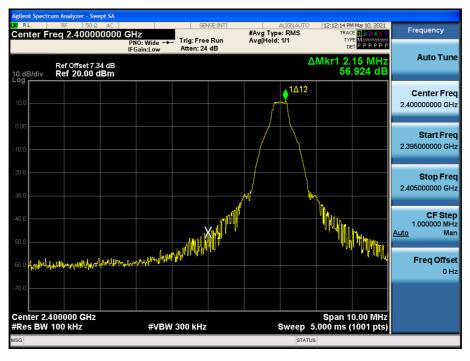
2. Actual value of loss for the splitter and cable combination is 7.32 dB at 2400 MHz

and is 7.34 dB at 2500 MHz. So, 7.34 dB is offset. And the offset gap in the 2.4 GHz range do not affect the conducted peak power final result.

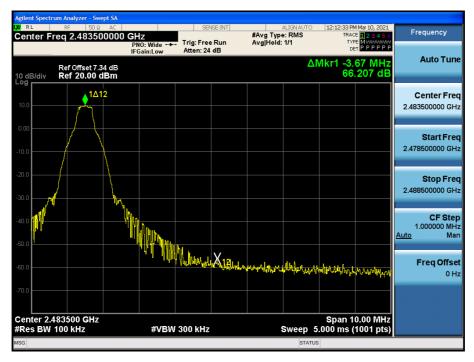


Test Plots without hopping (GFSK)

Band Edges (CH.0)



Test Plots without hopping (GFSK) Band Edges (CH.78)



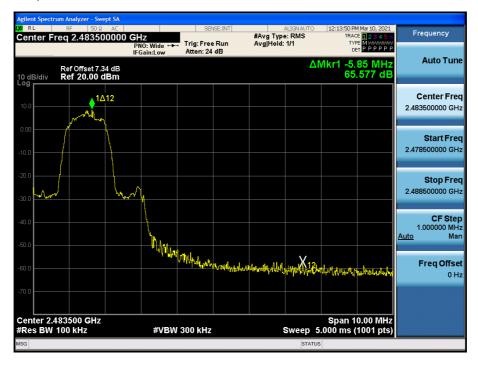


Test Plots without hopping (8DPSK)

Band Edges (CH.0)



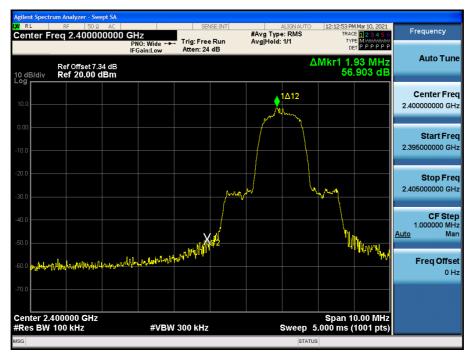
Test Plots without hopping (8DPSK) Band Edges (CH.78)



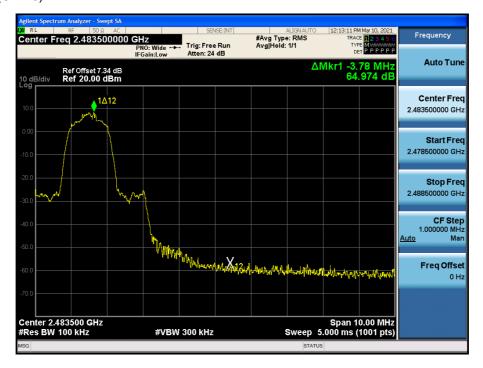


Test Plots without hopping (π /4DQPSK)

Band Edges (CH.0)



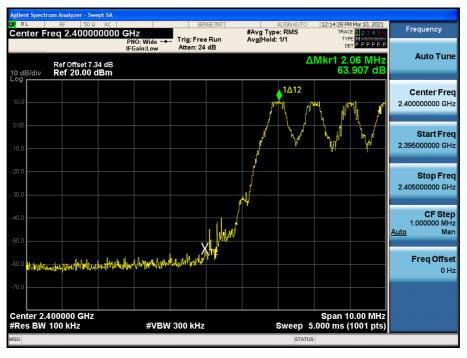
Test Plots without hopping (π /4DQPSK) Band Edges (CH.78)



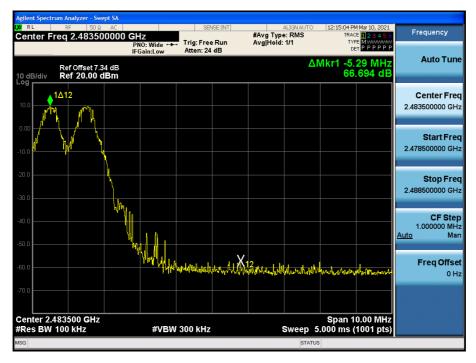


Test Plots with hopping (GFSK)

Band Edges (CH.0)



Test Plots with hopping (GFSK) Band Edges (CH.78)





Test Plots with hopping (8DPSK)

Band Edges (CH.0)



Test Plots with hopping (8DPSK) Band Edges (CH.78)





Test Plots with hopping (π /4DQPSK)

Band Edges (CH.0)



Test Plots with hopping (π/4DQPSK) Band Edges (CH.78)





10.3 FREQUENCY SEPARATION / OCCUPIED BANDWIDTH (99% BW)

99% BW (kHz)									
Channel	Channel GFSK 8DPSK π/4DQPSK								
CH.0	840.49	1185.2	1178.9						
CH.39	828.71	1178.0	1170.6						
CH.78	828.70	1189.1	1179.6						

20dB BW (kHz)									
Channel GFSK 8DPSK π/4DQPSK									
CH.0	943.2	1302	1315						
CH.39	943.9	1301	1292						
CH.78	942.7	1305	1289						

	Channel Separation(kHz)							
GFSK	8DPSK	(kHz)						
			>25 kHz					
958	1004	971	or					
			>2/3 of the 20dB BW					

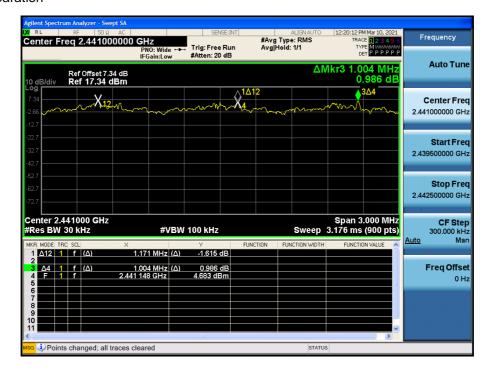


Test Plots (GFSK)

Channel Separation



Test Plots (8DPSK) Channel Separation





Test Plots (π/4DQPSK)

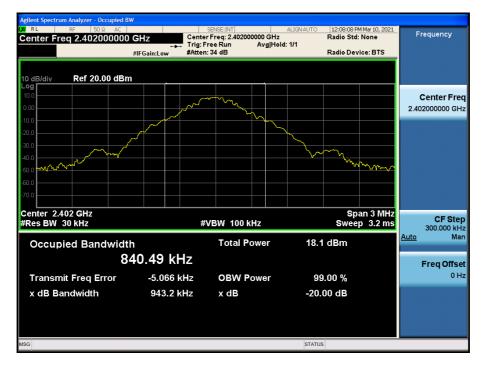
Channel Separation

Agilent Spectrum	n Analyzer - Swept SA RF 50 Ω AC		SENSE:INT		LIGNAUTO	10-10-56 DA	1 Mar 10, 2021	
	q 2.44100000	D GHz PNO: Wide		#Avg Type Avg Hold:	RMS	TRAC		Frequency
		IFGain:Low	#Atten: 20 dB			DE	тРРРРР	Auto Tune
10 dB/div	Ref Offset 7.34 dB Ref 17.34 dBm				Ĺ	2 Mkr3 1.	971 kHz 146 dB	Auto Tulle
-12.7	~~~X12~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	A		$\sim \sim \sim$	<u>3</u> ∆4 ∕^~~~.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Center Freq 2.441000000 GHz
-22.7 -32.7 -42.7								Start Freq 2.439500000 GHz
-52.7 -62.7 -72.7								Stop Freq 2.442500000 GHz
Center 2.44 #Res BW 3		#VBW	100 kHz		Sweep 3		.000 MHz (900 pts)	CF Step 300.000 kHz
MKR MODE TRC		998 kHz (Δ)	⊻ 0.744 dB	FUNCTION FUNC	CTION WIDTH	FUNCTIO	N VALUE	<u>Auto</u> Man
2 3 △4 1 4 F 1 5	f (Δ) f 2.44	971 kHz (∆) 40 998 GHz	1.146 dB 4.957 dBm					Freq Offset 0 Hz
6 7 8 9 10								
11							>	
мsg 🗼 Points	changed; all traces	cleared			STATUS			



Test Plots (GFSK)

20 dB Bandwidth & Occupied Bandwidth (CH.0)



Test Plots (GFSK)

20 dB Bandwidth & Occupied Bandwidth (CH.39)





Test Plots (GFSK)

20 dB Bandwidth & Occupied Bandwidth (CH.78)



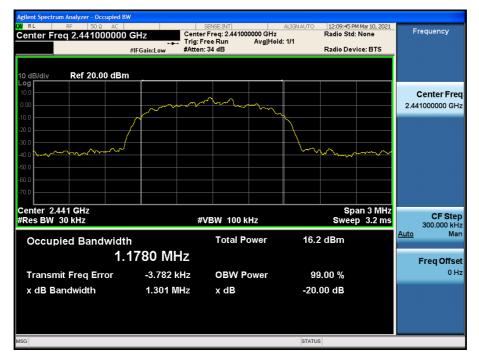
Test Plots (8DPSK) 20 dB Bandwidth & Occupied Bandwidth (CH.0)



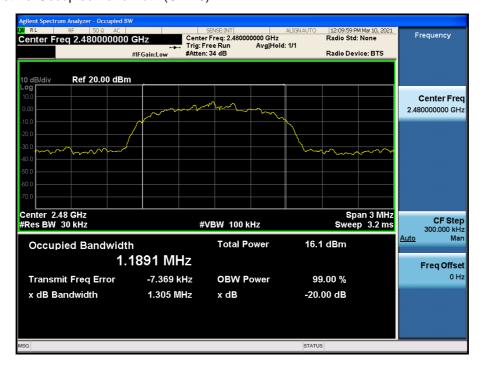


Test Plots (8DPSK)

20 dB Bandwidth & Occupied Bandwidth (CH.39)



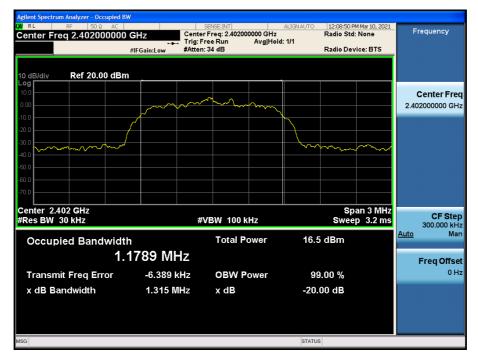
Test Plots (8DPSK) 20 dB Bandwidth & Occupied Bandwidth (CH.78)





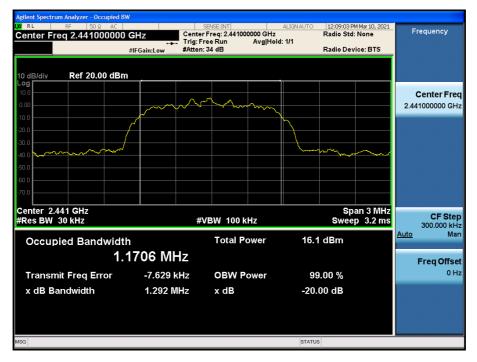
Test Plots (π/4DQPSK)

20 dB Bandwidth & Occupied Bandwidth (CH.0)



Test Plots (π/4DQPSK)

20 dB Bandwidth & Occupied Bandwidth (CH.39)





Test Plots (π/4DQPSK)

20 dB Bandwidth & Occupied Bandwidth (CH.78)





10.4 NUMBER OF HOPPING FREQUENCY

	Limit						
GFSK	GFSK 8DPSK π/4DQPSK						
79	79	79	>15				

Note :

In case of AFH mode, minimum number of hopping channels is 20.



Test Plots (GFSK)

Number of Channels (2.4 GHz - 2.441 GHz)



Test Plots (GFSK)

Number of Channels (2.441 GHz - 2.483.5 GHz)





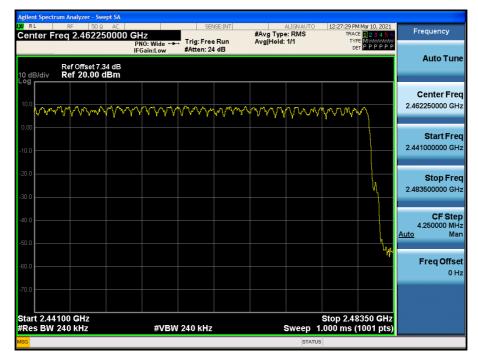
Test Plots (8DPSK)

Number of Channels (2.4 GHz - 2.441 GHz)

Agilent Spectrum Analyzer - Swept S		SENSE:INT	ALIGN AUTO	12:26:54 PM Mar 10, 2021	
Center Freq 2.4205000	PNO: Wide 🔸	Trig: Free Run	#Avg Type: RMS Avg Hold: 1/1	TRACE 123456 TYPE MWWWWW DET PPPPP	Frequency
Ref Offset 7.34 dl 10 dB/div Ref 20.00 dBn		#Atten: 24 dB			Auto Tune
10.0	~~~~~~~	γ	~~~~~	᠇᠋ᠬᡃᠬᠬ᠋᠋ᡎ	Center Freq 2.420500000 GHz
-10.0					Start Freq 2.400000000 GHz
-20.0					Stop Freq 2.441000000 GHz
-40.0					CF Step 4.100000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0 Start 2.400000 GHz				Stop 2.44100 GHz	
#Res BW 240 kHz	#VBW :	240 kHz	Sweep 1	.000 ms (1001 pts)	

Test Plots (8DPSK)

Number of Channels (2.441 GHz - 2.483.5 GHz)



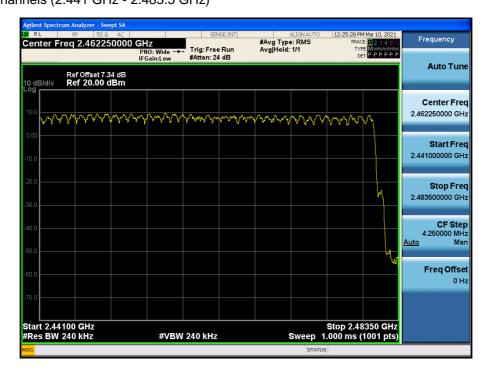


Test Plots (π/4DQPSK)

Number of Channels (2.4 GHz - 2.441 GHz)



Test Plots (π/4DQPSK) Number of Channels (2.441 GHz - 2.483.5 GHz)





10.5 TIME OF OCCUPANCY (DWELL TIME)

	Channel	GFSK	8DPSK	π/4DQPSK	
Pulse Time	Low	2.880	2.885	2.885	
(ms)	Mid	2.885	2.885	2.885	
	High	2.885	2.885	2.885	

Non-AFH Mode

	Channel	GFSK	8DPSK	π/4DQPSK	Period Time (s)	Limit (ms)
Total of Dwell	Low	307.20	307.73	307.73	31.6	
(ms)	Mid	307.73	307.73	307.73	31.6	400
	High	307.73	307.73	307.73	31.6	

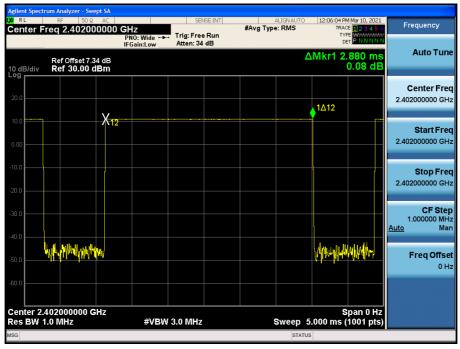
AFH Mode

	Channel	GFSK	8DPSK	π/4DQPSK	Period Time (s)	Limit (ms)
Total of Dwell	Low	153.60	153.87	153.87	8.0	
(ms)	Mid	153.87	153.87	153.87	8.0	400
	High	153.87	153.87	153.87	8.0	

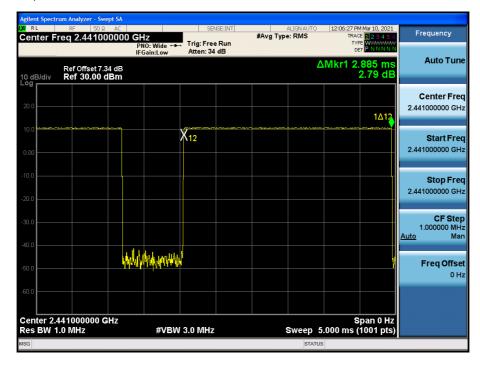


Test Plots (GFSK)

Dwell Time (CH.0)



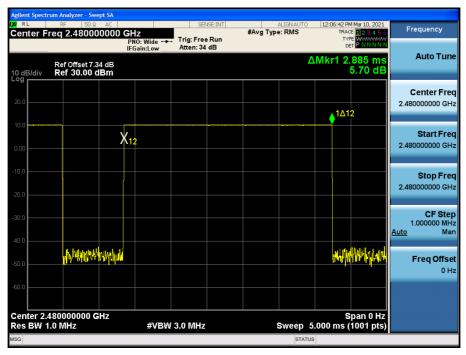
Test Plots (GFSK) Dwell Time (CH.39)





Test Plots (GFSK)

Dwell Time (CH.78)



Test Plots (8DPSK) Dwell Time (CH.0)



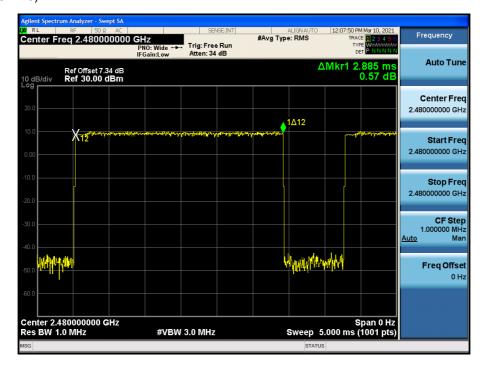


Test Plots (8DPSK)

Dwell Time (CH.39)



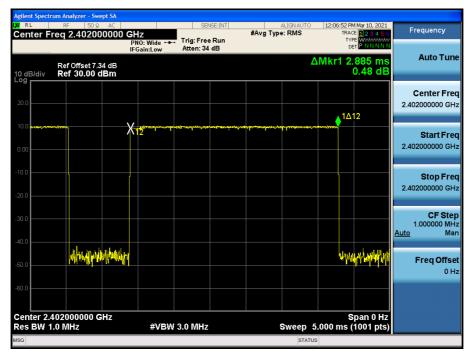
Test Plots (8DPSK) Dwell Time (CH.78)



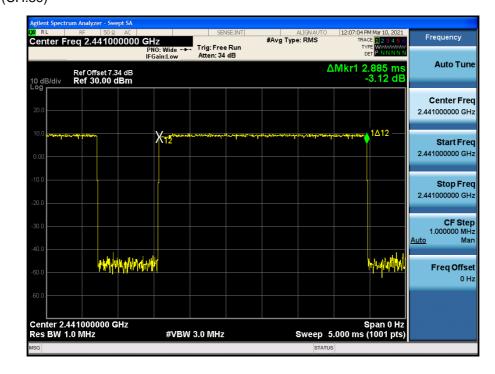


Test Plots (π/4DQPSK)

Dwell Time (CH.0)



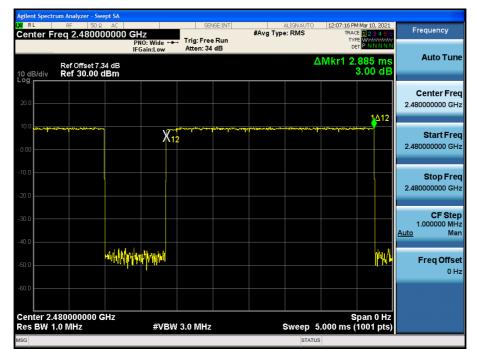
Test Plots (π/4DQPSK) Dwell Time (CH.39)





Test Plots (π /4DQPSK)

Dwell Time (CH.78)





10.6 SPURIOUS EMISSIONS 10.6.1 CONDUCTED SPURIOUS EMISSIONS

Test Result : please refer to the plot below.

In order to simplify the report, attached plots were only the worst case channel and data rate.

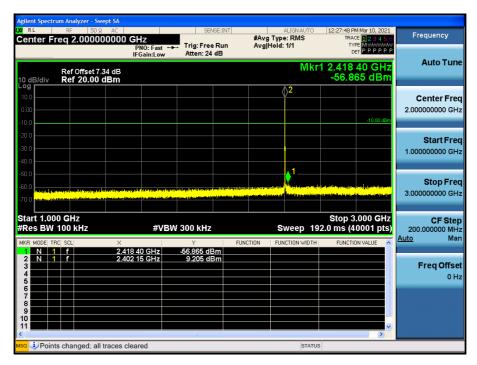


Test Plots (8DPSK)- 30 MHz - 1 GHz

Spurious Emission (CH.0)

Agilent Spec	trum Analyzer - Swo	ept SA		075	VSE:INT		ALIGN AUTO	10/07/50 54	4 Mar 10, 2021	
	req 515.000	0000 MH				#Avg Type Avg Hold:	e: RMS	TRAC	2021 XE 1 2 3 4 5 6 XE M Manadada	Frequency
			NO: Fast 🔸 Gain:Low	Atten: 24		Arginola.		DE	T P P P P P P	Auto Tune
10 dB/div Log	Ref Offset 7.3 Ref 20.00 (IV	1kr1 53. -60.2	72 MHz 85 dBm	Auto Tune
									2	Center Freq
10.0									→	515.000000 MHz
0.00										
-10.0									-10.80 dBm	Start Freq 30.000000 MHz
-10.0										
-20.0										Stop Freq
-30.0										1.000000000 GHz
(0.0										CF Step
-40.0										97.000000 MHz Auto Man
-50.0										
-60.0										Freq Offset
de <mark>de </mark> au	ad the table of the state	powerland	og with the old	han da anda	elitere to a se	Latata and states	e a dispetial de la de Recentación de la del	nd Angerther (NA <mark>a sangert Dia angert</mark> i	and a state of the second state of the	0 Hz
-70.0	an in an an Indiana an	مهار فعالات الأربعي الم	والتماعا لمطاولتها والمراجعة والعما							
Start 30.	0 MHz							Stop 1 (0000 GHz	
	100 kHz		#VBW	300 kHz		S	weep 93		0000 pts)	
<mark>мsg</mark> 🗼 Poii	nts changed; all	traces clear	ed				STATUS			

Test Plots (8DPSK)- 1 GHz – 3 GHz



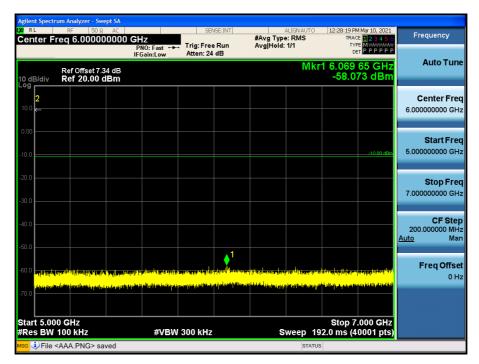


Test Plots(8DPSK)- 3 GHz - 5 GHz

Spurious Emission (CH.0)

Agilent Spectr	um Analyzer - Swep RF 50 Q		SE	VSE:INT		ALIGN AUTO	12:28:09 PM	4 Mar 10, 2021	
Center Fi	eq 4.000000	0000 GHz PNO: Fast		e Run	#Avg Type Avg Hold:	e: RMS	TRAC	^ж 123456 е М илилин т Р Р Р Р Р Р	Frequency
10 dB/div	Ref Offset 7.34 Ref 20.00 dE		Atten: 24	a B		Mkr	3.602	50 GHz 52 dBm	Auto Tune
10.0 C									Center Fred 4.000000000 GH2
10.0								-10.80.dBm	Start Free 3.000000000 GH:
30.0									Stop Fred 5.000000000 GH
40.0		1							CF Stej 200.000000 MH <u>Auto</u> Ma
60.0 <mark>210,000,000,000,000,000,000,000,000,000,</mark>	under an en	namela tarihadari ta	ⁿⁱⁿ a ^k élasin appartite. ^{Dahi} si Dapatén ak	a and the state of the	Marialia posta		i Managaran Managaran	ana talingga ay partan ana ana ata ana talar	Freq Offse 0 H
70.0	0 GHz						Stop 5	.000 GHz	
Res BW	100 kHz s changed; all tra		3W 300 kHz		S	weep 19: STATUS	2.0 ms (4	0001 pts)	

Test Plots (8DPSK)- 5 GHz - 7 GHz



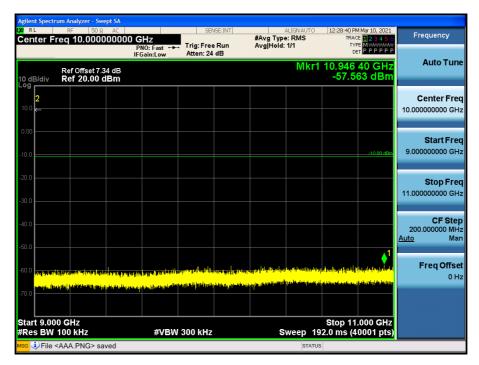


Test Plots(8DPSK)- 7 GHz - 9 GHz

Spurious Emission (CH.0)

Agilent Spectr	um Analyzer - Swep RF 50 Q			CE	VSE:INT		ALIGN AUTO	12/20/20 0	1 Mar 10, 2021	
	req 8.000000	000 GH	Z I0: Fast ↔			#Avg Type Avg Hold:	: RMS	TRAC	E 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offset 7.34 Ref 20.00 dE	dB	ain:Low	Atten: 24				DE 1 7.144	45 GHz 18 dBm	Auto Tune
Log 2 10.0										Center Freq 8.00000000 GHz
0.00 -10.0									-10.80.dBm	Start Freq 7.000000000 GHz
-20.0 -30.0										Stop Freq 9.000000000 GHz
-40.0	.1									CF Step 200.000000 MHz <u>Auto</u> Man
-60.0 andudat	(nasilaari taany di tatata Ang ang ang ang ang ang ang ang ang ang a	ligigth ochdist <mark>Tygele powystet</mark>		a matility and the state		a construction of the state of the			erilyiyeneriyye	Freq Offset 0 Hz
-70.0										
Start 7.00 #Res BW			#VBW	300 kHz		s	weep 19		.000 GHz 0001 pts)	
<mark>мsg</mark> 🗘 File <	<aaa.png> save</aaa.png>	ed					STATUS			

Test Plots(8DPSK)- 9 GHz - 11 GHz



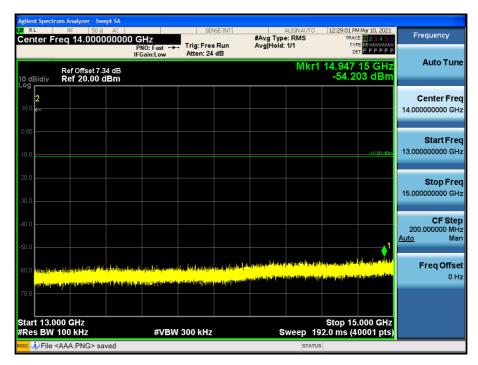


Test Plots(8DPSK) 11 GHz - 13 GHz

Spurious Emission (CH.0)

	rum Analyzer - Swep									
Center F	RF 50 Ω req 12.00000		Hz		JSE:INT	#Avg Type		TRAC	4 Mar 10, 2021 E <mark>1 2 3 4 5 6</mark>	Frequency
		P	IO: Fast ↔ ain:Low	. Trig: Free Atten: 24		Avg Hold:	1/1	TYF	EMW/////// TPPPPPP	
10 dB/div Log	Ref Offset 7.34 Ref 20.00 dl						Mkr1	12.474 -57.4	10 GHz 55 dBm	Auto Tune
2 10.0										Center Freq 12.00000000 GHz
0.00										Start Freq
-10.0									-10.80.dBm	11.000000000 GHz
-20.0										Stop Freq 13.00000000 GHz
-30.0										CF Step
-40.0										200.000000 MHz <u>Auto</u> Man
	yra er te derblikke terre skaret	ater data per se	tin getter beskett	hadimor ⁱ n pail _{led}	lawan katilaka na	un an	1 Darihariliha	eghadd ta dae stêr <mark>b</mark>	data ang ang ang ang ang ang ang ang ang an	Freq Offset
	alayan tanki na asin t	, identifiction in the second	altinoant fait	white and the state of the	<mark>itan sanan sanah sina</mark>	رايدىنغى الكندية بالعراقي المراجعة المراجعة الم	antenan state	<mark>ntellingi di netta anchi di</mark>	apprender of the	0 H2
-70.0										
Start 11.0 #Res BW			#VBW	300 kHz		s	weep 19	Stop 13 2.0 ms (4	.000 GHz 0001 pts)	
MSG 😲 File 🕯	<aaa.png> sav</aaa.png>	ed					STATUS			

Test Plots (8DPSK)- 13 GHz – 15 GHz



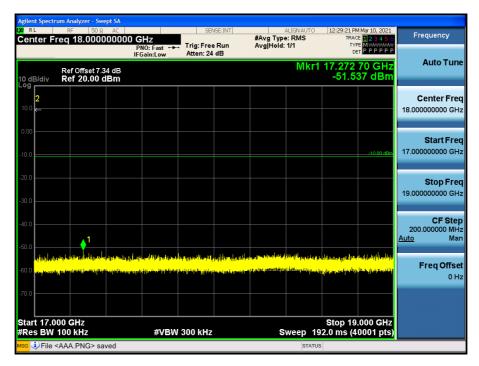


Test Plots(8DPSK)- 15 GHz - 17 GHz

Spurious Emission (CH.0)

	um Analyzer - Swep									
Center F	⊮ୋ 50 ହ req 16.00000		Hz		JSE:INT	#Avg Type		TRAC	4 Mar 10, 2021 E <mark>1 2 3 4 5 6</mark>	Frequency
		PN	IO: Fast ↔ ain:Low	Trig: Free Atten: 24		Avg Hold:	1/1	TYF	E MWWWWWW T P P P P P P	
10 dB/div Log	Ref Offset 7.34 Ref 20.00 dl						Mkr1		25 GHz 92 dBm	Auto Tune
2 10.0 ←										Center Freq 16.00000000 GHz
0.00 -10.0									-10.80.dBm	Start Freq 15.000000000 GHz
-20.0										Stop Freq 17.000000000 GHz
-40.0	1									CF Step 200.000000 MHz <u>Auto</u> Man
	alet for an and a state of the					dlatinaana www.caraa			aret, de Alfond et paratien (gebet)	Freq Offset 0 Hz
-70.0 Start 15.0									.000 GHz	
#Res BW	400 kHz	ad	#VBW	300 kHz		S	weep 19	· · ·	0001 pts)	
mag 🧇 File ·	AAA.PNG> sav	eu					STATUS			

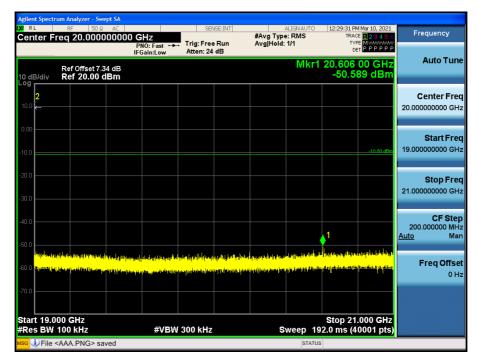
Test Plots(8DPSK)- 17 GHz - 19 GHz



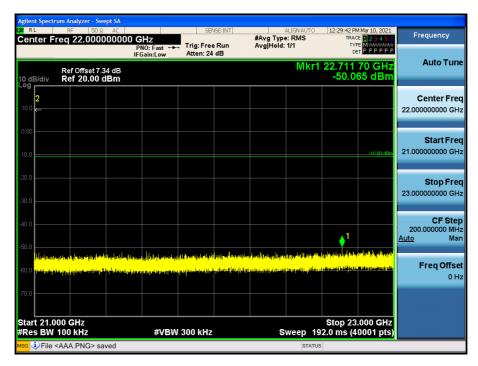


Test Plots (8DPSK)- 19 GHz - 21 GHz

Spurious Emission (CH.0)



Test Plots (8DPSK)- 21 GHz - 23 GHz





Test Plots (8DPSK)- 23 GHz - 25 GHz

Agilent Spectr	rum Analyzer - Swept SA RF 50 Q AC		SEN	SE:INT		ALIGN AUTO	12:29:52 PM	4 Mar 10, 2021	_
Center F	req 24.00000000	0 GHz PNO: Fast ↔	. Trig: Free		#Avg Type Avg[Hold:		TYP	E 1 2 3 4 5 6 E M WWWWWW T P P P P P P	Frequency
10 dB/div	Ref Offset 7.34 dB Ref 20.00 dBm	IFGain:Low	Atten: 24	dB		Mkr	1 24.870		Auto Tune
10.0 2									Center Fred 24.000000000 GHz
-10.0								-10.80.dBm	Start Fred 23.000000000 GH;
-20.0									Stop Fred 25.000000000 GH:
-40.0	calization (frames of contracts and the states)	No Nijelen (na se		yh ditter dirion yn d	ing the state of the state	t på ling betæger ga	hann ganghad Millin	1 Indelleptontpo	CF Step 200.000000 MH <u>Auto</u> Mar
-60.0 <mark>11211 (111</mark>	en de la companya de la contra d La contra presenta de la contra d La contra presenta de la contra d	ter langt pilo ser par provinsi	a yana ada di da	<mark>na da kana kana kana kana kana kana kana</mark>	k Lohaning yan deced	ikiri ati _t ayatan i	ille de pla dessionel ande	detrating to part the second	Freq Offse 0 H
-70.0 Start 23.0								.000 GHz	
#Res BW	<pre>400 kHz <aaa.png> saved</aaa.png></pre>	#VBW	/ 300 kHz		S	weep 1	192.0 ms (4	0001 pts)	



10.6.2 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30MHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin		
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB		
No Critical peaks found									

Note:

1. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.

- 2. Distance extrapolation factor = 40log (specific distance / test distance) (dB)
- 3. Limit line = specific Limits (dBuV) + Distance extrapolation factor
- 4. Radiated test is performed with hopping off.

Frequency Range : Below 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin		
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB		
No Critical peaks found									

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made

with an instrument using Quasi peak detector mode.

2. Radiated test is performed with hopping off.



Frequency Range : Above 1 GHz

Operation Mode: CH Low(GFSK)

Frequency [MHz]	Reading [dBuV]	A.F+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	41.38	3.75	V	45.13	73.98	28.85	PK
4804	28.25	3.75	V	32.00	53.98	21.98	AV
7206	37.68	12.70	V	50.38	73.98	23.60	PK
7206	24.24	12.70	V	36.94	53.98	17.04	AV
4804	42.45	3.75	Н	46.20	73.98	27.78	PK
4804	29.76	3.75	Н	33.51	53.98	20.47	AV
7206	38.98	12.70	Н	51.68	73.98	22.30	PK
7206	25.09	12.70	Н	37.79	53.98	16.19	AV
Operation N	lode: CH Mi	d(GFSK)					
Frequency	Reading	A.F+C.L-A.G+D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4882	42.57	3.71	V	46.28	73.98	27.70	PK
4882	30.12	3.71	V	33.83	53.98	20.15	AV
7323	38.12	11.73	V	49.85	73.98	24.13	PK
7323 7323	38.12 25.01	11.73 11.73	V V	49.85 36.74	73.98 53.98	24.13 17.24	PK AV
			-				
7323	25.01	11.73	V	36.74	53.98	17.24	AV

Operation Mode: CH High(GFSK)

25.44

11.73

7323

Frequency [MHz]	Reading [dBuV]	A.F+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	42.89	4.49	V	47.38	73.98	26.60	PK
4960	30.58	4.49	V	35.07	53.98	18.91	AV
7440	38.02	12.08	V	50.10	73.98	23.88	PK
7440	24.85	12.08	V	36.93	53.98	17.05	AV
4960	43.18	4.49	н	47.67	73.98	26.31	PK
4960	31.20	4.49	Н	35.69	53.98	18.29	AV
7440	38.55	12.08	Н	50.63	73.98	23.35	PK
7440	25.01	12.08	Н	37.09	53.98	16.89	AV

Н

37.17

53.98

16.81

AV



Operation Mode: CH Low(π /4DQPSK)

Frequency [MHz]	Reading [dBuV]	A.F+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	41.52	3.75	V	45.27	73.98	28.71	PK
4804	28.97	3.75	V	32.72	53.98	21.26	AV
7206	37.85	12.70	V	50.55	73.98	23.43	PK
7206	24.01	12.70	V	36.71	53.98	17.27	AV
4804	42.25	3.75	н	46.00	73.98	27.98	PK
4804	29.18	3.75	Н	32.93	53.98	21.05	AV
7206	38.34	12.70	Н	51.04	73.98	22.94	PK
7206	24.91	12.70	Н	37.61	53.98	16.37	AV

Operation Mode: CH Mid(π/4DQPSK)

Frequency	Reading	A.F+C.L-A.G+D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4882	42.56	3.71	V	46.27	73.98	27.71	PK
4882	28.79	3.71	V	32.50	53.98	21.48	AV
7323	38.81	11.73	V	50.54	73.98	23.44	PK
7323	24.99	11.73	V	36.72	53.98	17.26	AV
4882	42.45	3.71	н	46.16	73.98	27.82	PK
4882	29.85	3.71	Н	33.56	53.98	20.42	AV
7323	39.45	11.73	Н	51.18	73.98	22.80	PK
7323	25.73	11.73	Н	37.46	53.98	16.52	AV

⊐

Operation Mode: CH High(π /4DQPSK)

Frequency [MHz]	Reading [dBuV]	A.F+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	41.88	4.49	V	46.37	73.98	27.61	PK
4960	29.11	4.49	V	33.60	53.98	20.38	AV
7440	37.55	12.08	V	49.63	73.98	24.35	PK
7440	24.02	12.08	V	36.10	53.98	17.88	AV
4960	42.49	4.49	н	46.98	73.98	27.00	PK
4960	30.01	4.49	Н	34.50	53.98	19.48	AV
7440	38.12	12.08	Н	50.20	73.98	23.78	PK
7440	24.75	12.08	Н	36.83	53.98	17.15	AV



Operation Mode: CH Low(8DPSK)

Frequency [MHz]	Reading [dBuV]	A.F+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	41.68	3.75	V	45.43	73.98	28.55	PK
4804	28.56	3.75	V	32.31	53.98	21.67	AV
7206	37.68	12.70	V	50.38	73.98	23.60	PK
7206	24.12	12.70	V	36.82	53.98	17.16	AV
4804	42.27	3.75	н	46.02	73.98	27.96	PK
4804	29.05	3.75	н	32.80	53.98	21.18	AV
7206	38.22	12.70	Н	50.92	73.98	23.06	PK
7206	24.99	12.70	Н	37.69	53.98	16.29	AV

Operation Mode: CH Mid(8DPSK)

Frequency	Reading	A.F+C.L-A.G+D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4882	41.85	3.71	V	45.56	73.98	28.42	PK
4882	28.99	3.71	V	32.70	53.98	21.28	AV
7323	38.74	11.73	V	50.47	73.98	23.51	PK
7323	24.99	11.73	V	36.72	53.98	17.26	AV
4882	42.56	3.71	Н	46.27	73.98	27.71	PK
4882	29.79	3.71	Н	33.50	53.98	20.48	AV
7323	39.48	11.73	Н	51.21	73.98	22.77	PK
7323	25.74	11.73	Н	37.47	53.98	16.51	AV

Operation Mode: CH High(8DPSK)

Frequency [MHz]	Reading [dBuV]	A.F+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	42.15	4.49	V	46.64	73.98	27.34	PK
4960	29.45	4.49	V	33.94	53.98	20.04	AV
7440	37.46	12.08	V	49.54	73.98	24.44	PK
7440	24.15	12.08	V	36.23	53.98	17.75	AV
4960	42.89	4.49	н	47.38	73.98	26.60	PK
4960	30.04	4.49	Н	34.53	53.98	19.45	AV
7440	38.22	12.08	Н	50.30	73.98	23.68	PK
7440	24.78	12.08	Н	36.86	53.98	17.12	AV



[DBS Mode]

WLAN/BT Ant : 802.11a ch. 144 & Bluetooth Ch. 0 (GFSK)

Operation Mode:	802.11a & GFSK
Transfer Rate (MCS Index):	6 Mbps & 1 Mbps
Operating Frequency	5 720 & 2 402MHz
Channel No.	144 Ch & 0 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L-A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	41.45	3.75	V	45.20	73.98	28.78	PK
4804	28.02	3.75	V	31.77	53.98	22.21	AV
7206	37.75	12.70	V	50.45	73.98	23.53	PK
7206	24.15	12.70	V	36.85	53.98	17.13	AV
4804	42.64	3.75	Н	46.39	73.98	27.59	PK
4804	29.64	3.75	н	33.39	53.98	20.59	AV
7206	38.72	12.70	Н	51.42	73.98	22.56	PK
7206	24.97	12.70	Н	37.67	53.98	16.31	AV

Note : WLAN DBS Data refer to UNII Test Report.



RESULT PLOTS

Radiated Spurious Emissions plot – Average Reading (GFSK, Ch.0 3rd Harmonic, Z-H_0 degree)

Spectrum Spectrum 2 🛞		
Ref Level 77.00 dBµV	Ηz	
Att 0 dB SWT 10 ms 👄 VBW 1 kH	Hz Mode Sweep	
Count 500/500		
●1Pk Max●2Pk Clrw		
70 dBµV	M1[1]	25.09 dBµV 7.2016440 GHz
60 dBµV		
50 dBµV		
40 dBuV		
20 dBµV		
10 dBµV		
0 dBµV		
-10 dBµV		
-20 dBµV		
CF 7.206 GHz	691 pts	Span 10.0 MHz

Radiated Spurious Emissions plot – Peak Reading (GFSK, Ch.0 3rd Harmonic, Z-H_0 degree)

Spectrun	n Sp	ectrum 2	×						
	Ι 77.00 dBμ			1 MHz					
Att	0 di	B SWT 4	ms 👄 VBW	3 MHz M	lode Sweep	0			
Count 500, 1Pk Maxe									
	ZPK CIIW				м	1[1]			38.98 dBµV
70 dBµV									33230 GHz
70 ubµv									
co do al									
60 dBµV									
50 dBµV—									
		M1							
40 dBµV	menter	ableman	a horn markens	Mahunham Mar	Henry Henry	handhala salawaa	and at lake the second	a sharen ha a a	day been adapted
	ածի շորի և		ա հետել	ي بالسلام ال	alah tulat	الب الاسال	1	المتنا برياني	L L L L L L L
nelolderthroop	, պեպվեր	MAAAN	MINNENNE	ԱՈՒ ՆԳՈ1 Խ1	ԻԿՅԳԱԳՆՅԵՆԵՆ	ափինկութի	MAR AND A	HUNDA	Judd had half and have
			•						
20 dBµV—									
10 dBµV—									
0 dBµV									
-10 dBµV—									
-20 dBµV—									
CF 7.206 (Hz			691	nts			Span	10.0 MHz
				271	F				

Note:

Plot of worst case are only reported.



10.6.3 RADIATED RESTRICTED BAND EDGES

Operation Mode	Normal(GFSK)
Operating Frequency	2402 MHz, 2480 MHz
Channel No	CH 0, CH 78

Frequency	Reading	A.F+C.L+D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2390.0	21.368	34.04	Н	55.41	73.98	18.57	PK
2390.0	8.563	34.04	Н	42.60	53.98	11.38	AV
2390.0	21.245	34.04	V	55.29	73.98	18.70	PK
2390.0	8.427	34.04	V	42.47	53.98	11.51	AV
2483.5	25.307	35.00	Н	60.31	73.98	13.67	PK
2483.5	12.443	35.00	Н	47.44	53.98	6.54	AV
2483.5	24.302	35.00	V	59.30	73.98	14.68	PK
2483.5	11.756	35.00	V	46.76	53.98	7.22	AV

Operation Mode

Channel No

EDR(π/4DQPSK)

2402 MHz, 2480 MHz

Operating Frequency

CH 0, CH 78

Frequency	Reading	A.F+C.L+D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2390.0	21.851	34.04	Н	55.89	73.98	18.09	PK
2390.0	8.544	34.04	н	42.58	53.98	11.40	AV
2390.0	21.665	34.04	V	55.71	73.98	18.28	PK
2390.0	8.315	34.04	V	42.36	53.98	11.63	AV
2483.5	24.433	35.00	н	59.43	73.98	14.55	PK
2483.5	9.311	35.00	н	44.31	53.98	9.67	AV
2483.5	24.213	35.00	V	59.21	73.98	14.77	PK
2483.5	9.175	35.00	V	44.18	53.98	9.81	AV

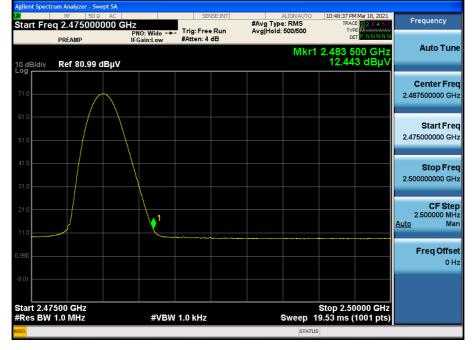


Operation Mode	EDR(8DPSK)
Operating Frequency	2402 MHz, 2480 MHz
Channel No	CH 0, CH 78

Frequency	Reading	A.F+C.L+D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2390.0	21.451	34.04	Н	55.49	73.98	18.49	PK
2390.0	8.636	34.04	Н	42.68	53.98	11.30	AV
2390.0	21.002	34.04	V	55.04	73.98	18.94	PK
2390.0	8.473	34.04	V	42.51	53.98	11.47	AV
2483.5	23.210	35.00	Н	58.21	73.98	15.77	PK
2483.5	9.384	35.00	н	44.38	53.98	9.60	AV
2483.5	22.965	35.00	V	57.97	73.98	16.02	PK
2483.5	9.207	35.00	V	44.21	53.98	9.77	AV



RESULT PLOTS



Radiated Restricted Band Edges plot – Average Reading (GFSK, Ch.78, X-H_180 degree)

Radiated Restricted Band Edges plot - Peak Reading (GFSK, Ch.78, X-H_180 degree)



Note:

Plot of worst case are only reported.



10.7 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

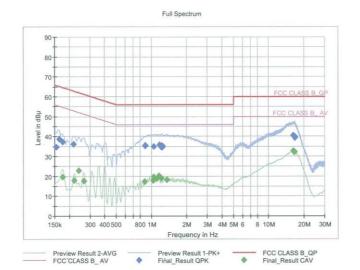
BT L1

1/2

Test Report

Common Information

EUT : Manufacturer : Test Site: Operating Conditions : Operator Name: Comment: NP345XLA SAMSUNG SHIELD ROOM BT L1



Final_Result_QPK

Frequency (MHz)	QuasiPea k	Limit (dBuV	Margi n	Bandwidt h	Line	Filter	Corr. (dB)
0.1545	34.68	65.75	31.08	9.000	L1	OFF	9.6
0.1635	38.64	65.28	26.64	9.000	L1	OFF	9.6
0.1748	37.27	64.73	27.46	9.000	L1	OFF	9.6
0.2175	35.96	62.91	26.95	9.000	L1	OFF	9.6
0.8825	35.16	56.00	20.84	9.000	L1	OFF	9.6
0.8870	35.34	56.00	20.66	9.000	L1	OFF	9.6
1.0490	34.92	56.00	21.08	9.000	L1	OFF	9.6
1.1705	35.84	56.00	20.16	9.000	L1	OFF	9.6
1.2223	34.62	56.00	21.38	9.000	L1	OFF	9.6
1.2268	35.08	56.00	20.92	9.000	L1	OFF	9.6
1.2425	34.52	56.00	21.48	9.000	L1	OFF	9.6
1.2470	35.24	56.00	20.76	9.000	L1	OFF	9.6
16.2050	40.37	60.00	19.63	9.000	L1	OFF	9.9
16.2388	40.47	60.00	19.53	9.000	L1	OFF	9.9
16.4368	40.12	60.00	19.88	9.000	L1	OFF	9.9
16.5020	40.15	60.00	19.85	9.000	L1	OFF	9.9
16.6865	39.80	60.00	20.20	9.000	L1	OFF	9.9
16.7315	39.31	60.00	20.69	9.000	L1	OFF	9.9

Final_Result_CAV

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BT L1

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1748	19.58	54.73	35.16	9.000	L1	OFF	9.6
0.2198	17.76	52.83	35.07	9.000	L1	OFF	9.6
0.2400	22.71	52.10	29.39	9.000	L1	OFF	9.6
0.2648	17.65	51.28	33.63	9.000	L1	OFF	9.6
0.8803	17.39	46.00	28.61	9.000	L1	OFF	9.6
1.0378	17.96	46.00	28.04	9.000	L1	OFF	9.6
1.0513	19.52	46.00	26.48	9.000	L1	OFF	9.6
1.1233	19.14	46.00	26.86	9.000	L1	OFF	9.6
1.1683	20.21	46.00	25.79	9.000	L1	OFF	9.6
1.2110	19.03	46.00	26.97	9.000	L1	OFF	9.6
1.3618	18.08	46.00	27.92	9.000	L1	OFF	9.6
16.0993	32.69	50.00	17.31	9.000	L1	OFF	9.9
16.2028	32.47	50.00	17.53	9.000	L1	OFF	9.9
16.2388	32.63	50.00	17.37	9.000	L1	OFF	9.9
16.4143	32.41	50.00	17.59	9.000	L1	OFF	9.9
16.4773	32.25	50.00	17.75	9.000	L1	OFF	9.9
16.5020	32.37	50.00	17.63	9.000	L1	OFF	9.9
16.5920	32.14	50.00	17.86	9.000	L1	OFF	9.9

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FCC ID: A3LNP340XLA

Conducted Emissions (Line 2)

BT N

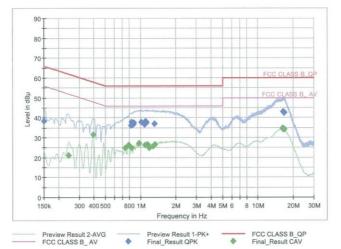
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Test Report

Common Information

EUT : Manufacturer : Test Site: Operating Conditions : Operator Name: Comment: NP345XLA SAMSUNG SHIELD ROOM BT N





Final_Result_QPK

Frequency (MHz)	QuasiPea k	Limit (dBuV	Margi n	Bandwidt h	Line	Filter	Corr. (dB)
0.1500	38.46	66.00	27.54	9.000	N	OFF	9.6
0.8263	35.96	56.00	20.04	9.000	N	OFF	9.6
0.8420	37.89	56.00	18.11	9.000	N	OFF	9.6
0.8578	36.56	56.00	19.44	9.000	N	OFF	9.6
0.8645	36.72	56.00	19.28	9.000	N	OFF	9.6
0.8758	37.50	56.00	18.50	9.000	N	OFF	9.6
1.0198	37.80	56.00	18.20	9.000	N	OFF	9.6
1.0895	36.53	56.00	19.47	9.000	N	OFF	9.6
1.0963	37.98	56.00	18.02	9.000	N	OFF	9.6
1.1075	38.14	56.00	17.86	9.000	N	OFF	9.6
1.1188	37.57	56.00	18.43	9.000	N	OFF	9.6
1.3145	36.86	56.00	19.14	9.000	N	OFF	9.6
16.3085	43.02	60.00	16.98	9.000	N	OFF	9.9
16.4030	42.97	60.00	17.03	9.000	N	OFF	9.9
16.5875	42.65	60.00	17.35	9.000	N	OFF	9.9
16.6348	42.61	60.00	17.39	9.000	N	OFF	9.9
16.6820	42.51	60.00	17.49	9.000	N	OFF	9.9
16.7293	42.46	60.00	17.54	9.000	N	OFF	9.9

Final_Result_CAV

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BT N

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.2445	21.17	51.94	30.77	9.000	N	OFF	9.6
0.3930	31.52	48.00	16.48	9.000	N	OFF	9.6
0.7430	24.69	46.00	21.31	9.000	N	OFF	9.6
0.7903	26.15	46.00	19.85	9.000	N	OFF	9.6
0.8353	24.73	46.00	21.27	9.000	N	OFF	9.6
0.9703	27.03	46.00	18.97	9.000	N	OFF	9.6
1.0985	26.24	46.00	19.76	9.000	N	OFF	9.6
1.1435	26.40	46.00	19.60	9.000	N	OFF	9.6
1.1908	24.95	46.00	21.05	9.000	N	OFF	9.6
1.2808	25.80	46.00	20.20	9.000	N	OFF	9.6
1.3235	26.60	46.00	19.40	9.000	N	OFF	9.6
16.2343	34.52	50.00	15.48	9.000	N	OFF	9.9
16.3805	34.47	50.00	15.53	9.000	N	OFF	9.9
16.4008	34.48	50.00	15.52	9.000	N	OFF	9.9
16.5020	34.42	50.00	15.58	9.000	N	OFF	9.9
16.6100	34.29	50.00	15.71	9.000	N	OFF	9.9
16.6348	34.29	50.00	15.71	9.000	N	OFF	9.9
16.7180	34.10	50.00	15.90	9.000	N	OFF	9.9

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11. LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration	Calibration	Serial No.	
Manufacturer	Model / Equipment	Date	Interval	Senai No.	
Rohde & Schwarz	ENV216 / LISN	09/04/2020	Annual	102245	
Rohde & Schwarz	ESR / EMI Test Receiver	09/16/2020	Annual	101910	
ESPAC	SU-642 /Temperature Chamber	03/15/2021	Annual	0093008124	
Agilent	N9030A / Signal Analyzer	01/11/2021	Annual	MY49431210	
Rohde & Schwarz	OSP 120 / Power Measurement Set	07/02/2020	Annual	101231	
Agilent	N1911A / Power Meter	04/07/2020	Annual	MY45100523	
Keysight	N1921A / Power Sensor	06/08/2020	Annual	MY57820067	
Agilent	87300B / Directional Coupler	11/10/2020	Annual	3116A03621	
Hewlett Packard	11667B / Power Splitter	05/25/2020	Annual	05001	
Hewlett Packard	E3632A / DC Power Supply	06/12/2020	Annual	KR75303960	
Agilent	8493C / Attenuator(10 dB)	06/26/2020	Annual	07560	
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A	
	FCC WLAN&BT&BLE Conducted Test Software	N1/A	N1/A	N//A	
HCT CO., LTD.	v3.0	N/A	N/A	N/A	
Rohde & Schwarz	CBT / Bluetooth Tester	05/12/2020	Annual	100422	

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.

2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.



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Radiated Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.	
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p	
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A	
Audix	EM1000 / Controller	N/A	N/A	060520	
Audix	Turn Table	N/A	N/A	N/A	
Rohde & Schwarz	Loop Antenna	05/18/2020	Biennial	1513-175	
Schwarzbeck	VULB 9168 / Hybrid Antenna	02/22/2021	Biennial	760	
Schwarzbeck	BBHA 9120D / Horn Antenna	02/17/2021	Biennial	9120D-937	
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	11/29/2019	Biennial	BBHA9170541	
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	07/28/2020	Annual	102168	
Agilent	N9030A / Signal Analyzer	01/11/2021	Annual	MY49431210	
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/06/2021	Annual	2	
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	02/08/2021	Annual	1	
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	02/03/2021	Annual	8	
Wainwright Instruments	WHKX8-6090-7000-18000-40SS/ High Pass Filter	02/03/2021	Annual	25	
Api tech.	18B-03 / Attenuator (3 dB)	02/03/2021	Annual	1	
Agilent	8493C-10 / Attenuator(10 dB)	02/03/2021	Annual	08285	
CERNEX	CBLU1183540 / Power Amplifier	02/03/2021	Annual	22964	
CERNEX	CBL06185030 / Power Amplifier	02/03/2021	Annual	22965	
CERNEX	CBL18265035 / Power Amplifier	12/04/2020	Annual	22966	
CERNEX	CBL26405040 / Power Amplifier	03/23/2021	Annual	25956	
TESCOM	TC-3000C / Bluetooth Tester	03/09/2021	Annual	3000C000276	

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.

2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

3. Espectially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).



12. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2104-FC005-P