



# FCC RADIO TEST REPORT

FCC ID	: PY7-26726G
Equipment	: GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPC and NFC
Brand Name	: Sony
Applicant	: Sony Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Manufacturer	: Sony Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Standard	: FCC Part 15 Subpart C §15.247

The product was received on Dec. 22, 2020 and testing was started from Dec. 30, 2020 and completed on Mar. 03, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Win

Approved by: Louis Wu Sporton International Inc. EMC & Wireless Communications Laboratory No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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## History of this test report

Report No.	Version	Description	Issued Date
FR0D2215B	01	Initial issue of report	Mar. 26, 2021



## Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)(3)	Output Power	Pass	-
3.3	15.247(e)	Power Spectral Density	ectral Density Pass	
3.4	15.247(d)	Conducted Band Edges and Spurious Emission Pass		-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission Pa		Under limit 3.99 dB at 17985.000 MHz
3.6	15.207	AC Conducted Emission	AC Conducted Emission Pass	
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

#### Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

### Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang Report Producer: Tina Chuang



## **1** General Description

## **1.1 Product Feature of Equipment Under Test**

GSM/WCDMA/LTE, Bluetooth, DTS/UNII a/b/g/n/ac/ax, NFC, FM Receiver, WPC/WPT, and GNSS.

Standards-related Product Specification		
Antenna Type / Gain	<ant. 0="">: Loop Type Antenna with gain -5.3 dBi</ant.>	
	<ant. 1="">: Loop Type Antenna with gain -4.9 dBi</ant.>	

**Remark:** The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

EUT Information List				
HW Version SW Version		S/N	Performed Test Item	
A	0.325	QV72002N5Z	RF conducted measurement	
	0.325	QV72000U6F	Radiated Spurious Emission	
	1.48	QV7200LU6F	AC Conducted Emission	

Accessory List		
	Model Name : XQZ-UC1	
AC Adapter	S/N:	
	0020W51300039 (for Radiated Spurious Emission)	
	0020W51300024 (for Conducted Emission)	
Farabana	Model Name : STH40D	
Earphone	S/N : N/A	
Blueteeth Fornhane	Model Name : SBH82D	
Bluetooth Earphone	S/N : N/A	
	Model Name : XQZ-UB1	
USB Cable	S/N : N/A	
Window Charger	Model Name : F7U050	
Wireless Charger	S/N : 26S10EHC828473	

#### Note:

1. Above EUT list used are electrically identical per declared by manufacturer.

- 2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report.
- 3. For other wireless features of this EUT, test report will be issued separately.

## **1.2 Modification of EUT**

No modifications are made to the EUT during all test items.



## **1.3 Testing Location**

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No. TH05-HY, CO05-HY	

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	Sporton International Inc. Wensan Laboratory	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No.	
Test Sile NO.	03CH15-HY (TAF Code: 3786)	
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory	

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190 and TW0007

## **1.4 Applicable Standards**

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01
- ANSI C63.10-2013

#### Remark:

- 1. All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. The TAF code is not including all the FCC KDB listed without accreditation.
- 3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 2 Test Configuration of Equipment Under Test

## 2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	0	2402	21	2444
	1	2404	22	2446
	2	2406	23	2448
	3	2408	24	2450
	4	2410	25	2452
	5	2412	26	2454
	6	2414	27	2456
	7	2416	28	2458
	8	2418	29	2460
	9	2420	30	2462
2400-2483.5 MHz	10	2422	31	2464
	11	2424	32	2466
	12	2426	33	2468
	13	2428	34	2470
	14	2430	35	2472
	15	2432	36	2474
	16	2434	37	2476
	17	2436	38	2478
	18	2438	39	2480
	19	2440	-	-
	20	2442	-	-

## 2.2 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels X, Y, Z. The worst cases (X plane and WPC Charging Mode) were recorded in this report
- b. AC power line Conducted Emission was tested under maximum output power.

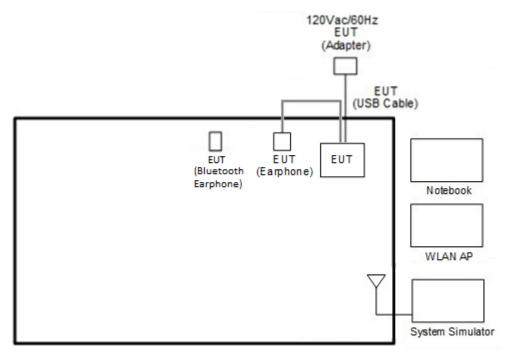
The following summary table is showing all test modes to demonstrate in compliance with the standard.

Summary table of Test Cases			
Test Item	Data Rate / Modulation		
	Bluetooth – LE / GFSK		
	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps		
Conducted	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps		
Test Cases	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps		
Test Cases	Mode 4: Bluetooth Tx CH00_2402 MHz_2Mbps		
	Mode 5: Bluetooth Tx CH19_2440 MHz_2Mbps		
	Mode 6: Bluetooth Tx CH39_2480 MHz_2Mbps		
	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps		
	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps		
Radiated	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps		
Test Cases	Mode 4: Bluetooth Tx CH00_2402 MHz_2Mbps		
	Mode 5: Bluetooth Tx CH19_2440 MHz_2Mbps		
	Mode 6: Bluetooth Tx CH39_2480 MHz_2Mbps		
AC Conducted	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN (2.4GHz) Link + MPEG4 +		
Emission	Earphone + USB Cable (Charging from AC Adapter) + Battery		

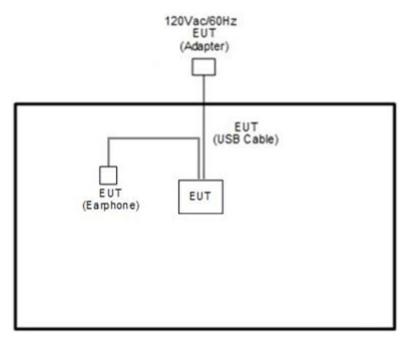


## 2.3 Connection Diagram of Test System

<AC Conducted Emission>



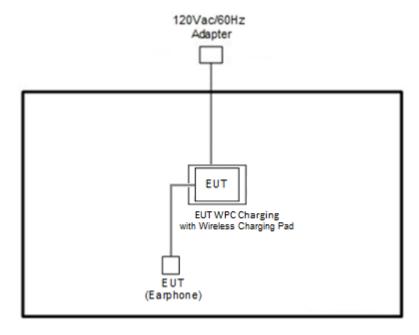
#### <Bluetooth-LE Tx Mode>



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Report Template No.: BU5-FR15CBT4.0 Version 2.4	Report Version	: 01



## <WPC Charging Mode>



## 2.4 Support Unit used in test configuration and system

ltem	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	Latitude 3400	FCC DOC	N/A	AC I/P: Unshielded, 1.2m DC O/P: Shielded, 1.8m
4.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A



## 2.5 EUT Operation Test Setup

The RF test items, utility "FTMC\_bridge V\_0.39" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

## 2.6 Measurement Results Explanation Example

### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)



## 3 Test Result

## 3.1 6dB and 99% Bandwidth Measurement

## 3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

## 3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

## 3.1.3 Test Procedures

- 1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.
- 5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW)  $\ge$  3 \* RBW.
- 6. Measure and record the results in the test report.

## 3.1.4 Test Setup



EUT

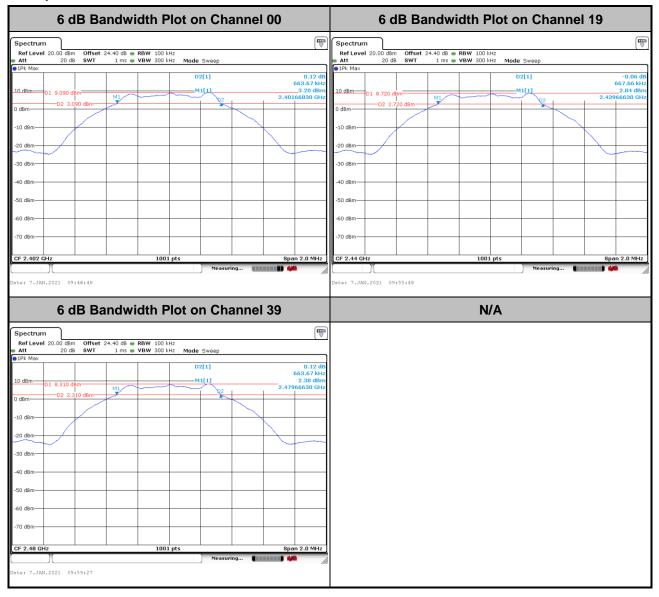
Spectrum Analyzer



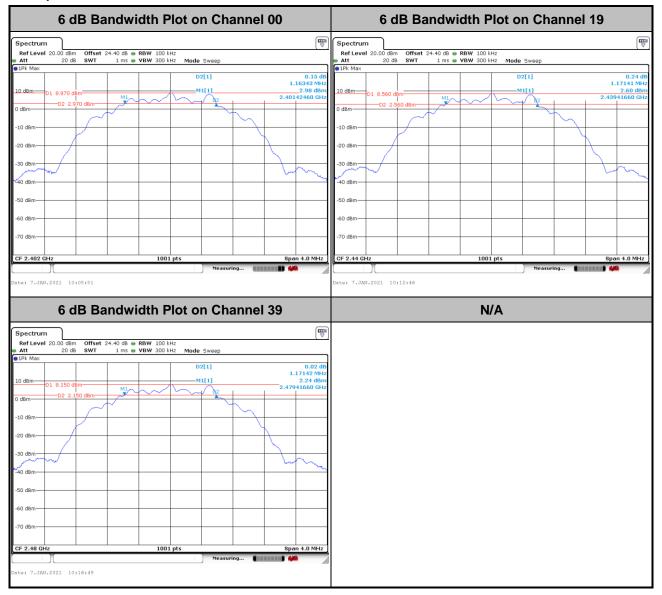
## 3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

#### <Ant. 0>

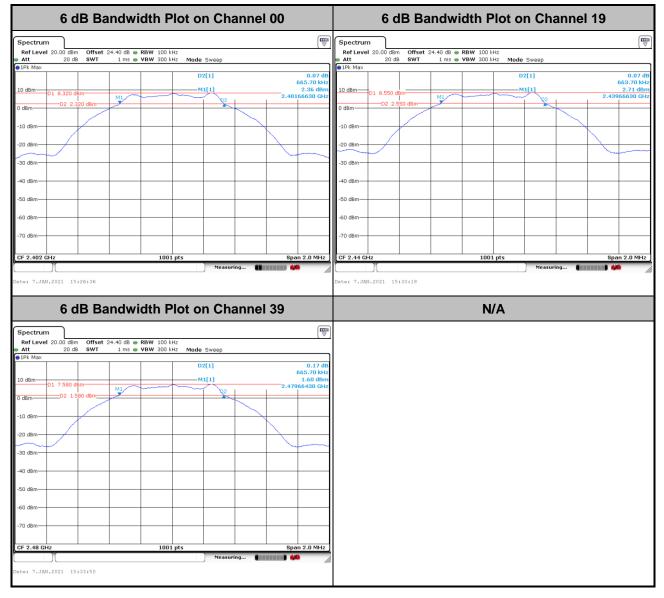




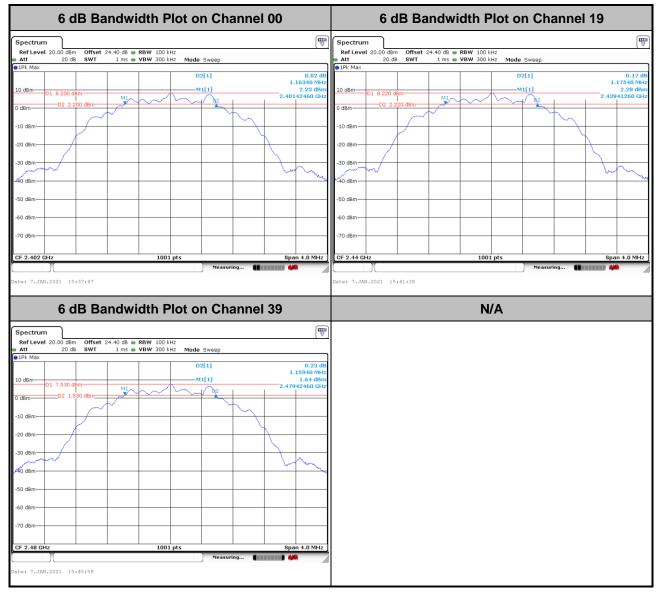




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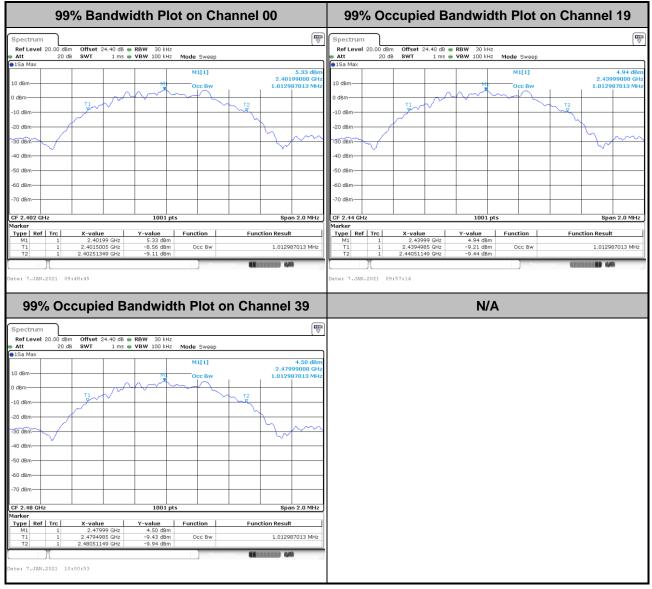




## 3.1.6 Test Result of 99% Occupied Bandwidth

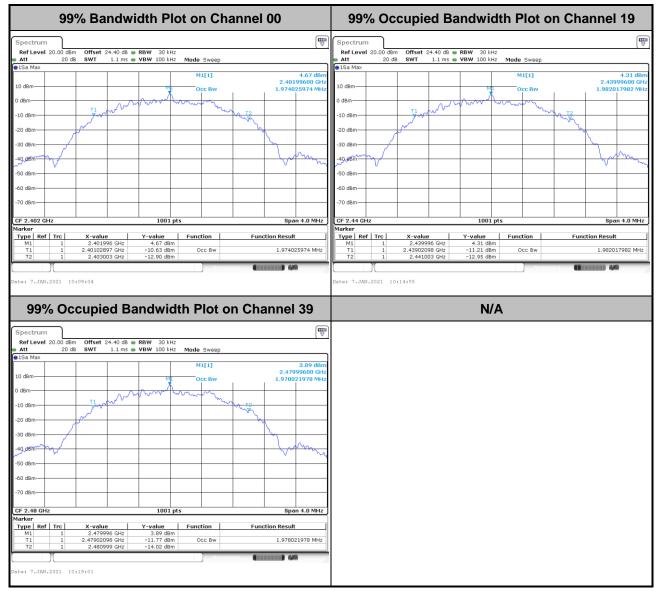
Please refer to Appendix A.

#### <Ant. 0>



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

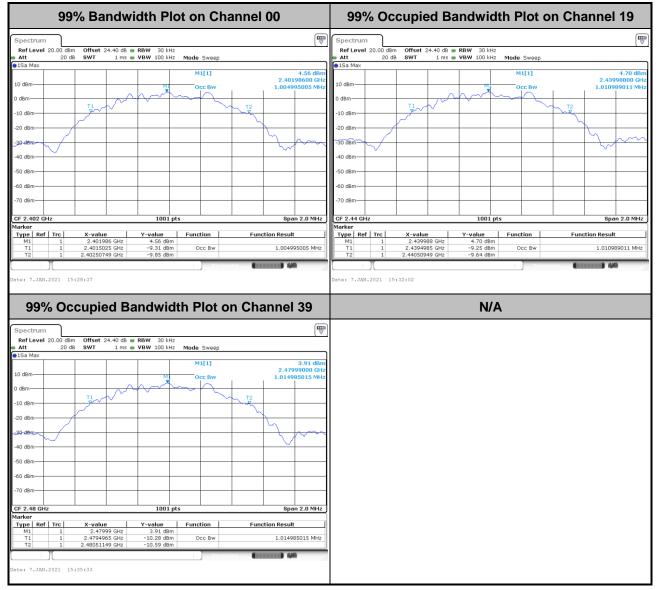




Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

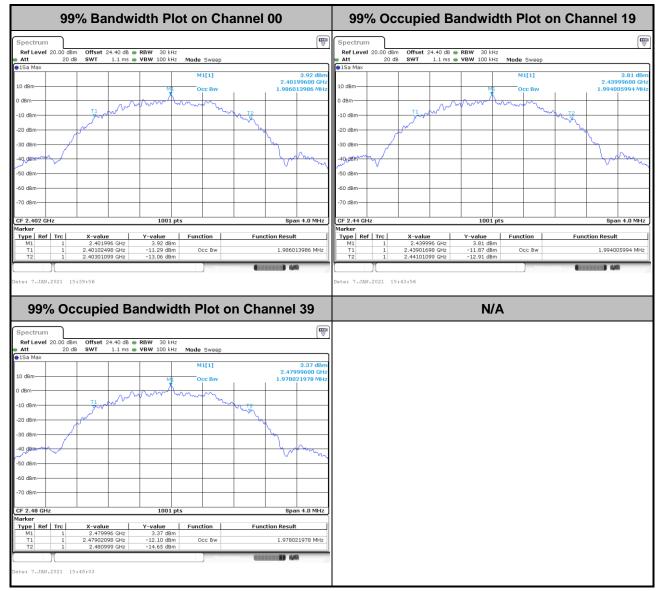


#### <Ant. 1>



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.





Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



## 3.2 Output Power Measurement

## 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5 MHz, the limit for output power is 30 dBm. If transmitting antenna of directional gain greater than 6 dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

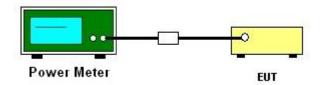
## 3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

### 3.2.3 Test Procedures

- 1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
- 2. The RF output of EUT was connected to the power meter by RF cable and attenuator.
- 3. The path loss was compensated to the results for each measurement.
- 4. Set the maximum power setting and enable the EUT to transmit continuously.
- 5. Measure the conducted output power and record the results in the test report.

## 3.2.4 Test Setup



## 3.2.5 Test Result of Average Output Power

Please refer to Appendix A.



## 3.3 Power Spectral Density Measurement

## 3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band at any time interval of continuous transmission.

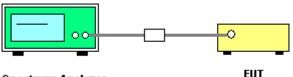
## 3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

## 3.3.3 Test Procedures

- 1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz.
   Video bandwidth VBW = 10 kHz. In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
- 5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
- 6. Measure and record the results in the test report.
- The Measured power density (dBm)/ 100 kHz is a reference level and is used as 20 dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

## 3.3.4 Test Setup



Spectrum Analyzer

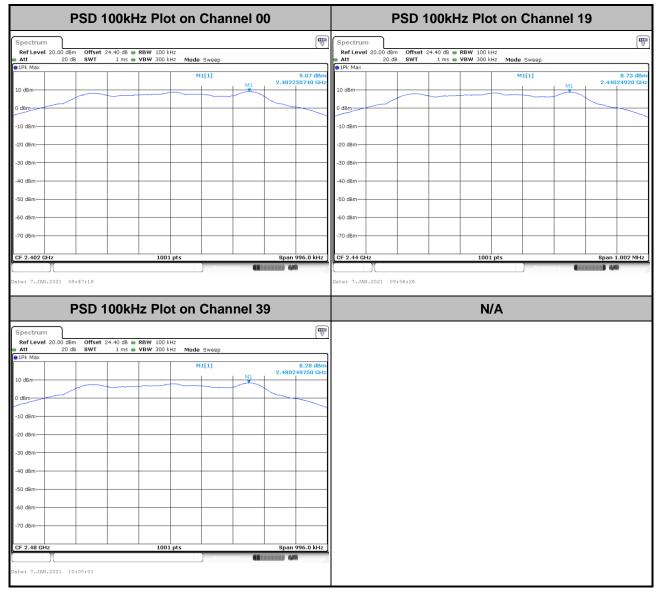
## 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

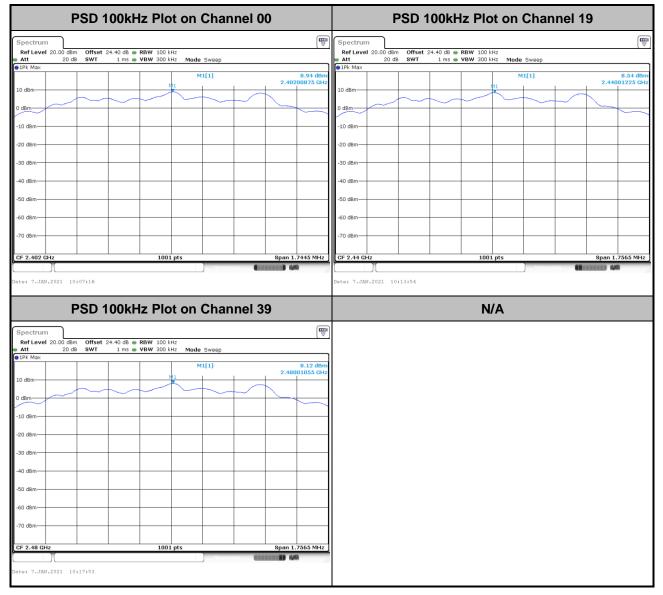


## 3.3.6 Test Result of Power Spectral Density Plots (100kHz)

#### <Ant. 0>

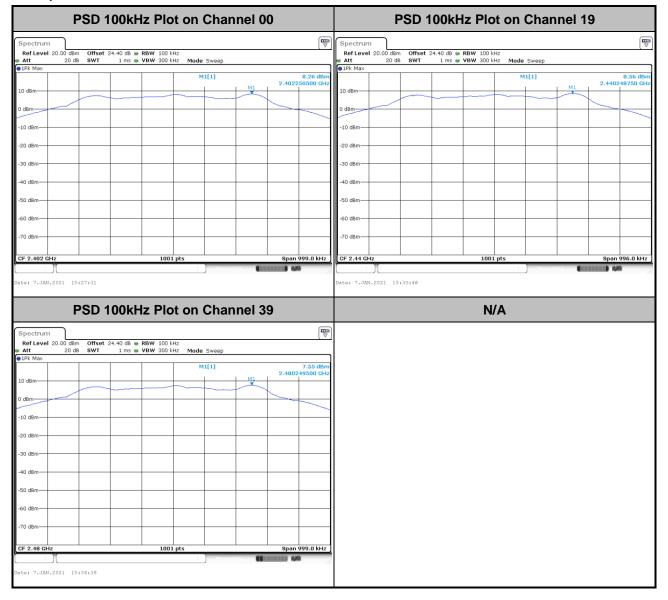




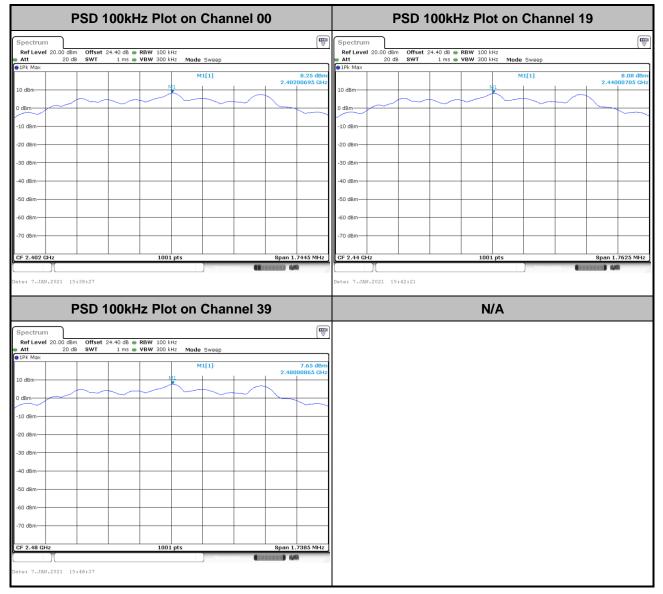




### <Ant. 1>









## 3.3.7 Test Result of Power Spectral Density Plots (3kHz)

#### <Ant. 0>

PSD 3kHz Plot	on Channel 00	PSD 3kHz Plot on Channel 19						
Spectrum Ref Level 20.00 dBm Offset 24.40 dB • RBW 3 kHz	z Z	Spectrum         Image: Construction of the sector of						
Att 20 dB SWT 11.1 ms • VBW 10 kHz 1Pk Max		Att 20 dB SWT 11.2 ms • VBW 10 kHz Mode Sweep     IPk Max						
	M1[1] -7.34 dBm 2.402022890 GHz	M1[1] -7.69 dBm 2.44002200 GHz						
10 dBm		10 dBm						
0 dBm	M1	0 dBm						
-10 dBm	M2 Manufarmative way my man	-10 dBm						
SB-46Mm hyperter	Manufal and the second and the secon	32.46Km WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW						
-30 dBm		-30 dBm-						
-40 dBm		-40 dBm						
-50 dBm		-50 dBm-						
-60 dBm		-60 d8m-						
-70 dBm		-70 dBm						
*/0 dbii/-								
CF 2.402 GHz 1001	pts Span 996.0 kHz	CF 2.44 GHz 1001 pts Span 1.002 MHz						
Date: 7.JAN.2021 09:47:07		Date: 7.JAN.2021 09:56:04						
PSD 3kHz Plot	on Channel 39	N/A						
Spectrum								
Ref Level         20.00 dBm         Offset         24.40 dB         RBW         3 kHz           Att         20 dB         SWT         11.1 ms         VBW         10 kHz								
IPk Max	M1[1] -8.18 dBm 2.480021890 GHz							
10 dBm	2.480021890 GH2							
0 dBm								
-10 dBm	M1							
-10 dBm	and the second sec							
-30 dBm								
-40 dBm								
-50 dBm								
-60 dBm-								
-70 dBm								
CF 2.48 GHz 1001	pts Span 996.0 kHz							
Date: 7.JAN.2021 09:59:47								



Ref Level 20.00 mm         Offset 24.40 mm         Start         Start <th< th=""><th>PSD 3kHz Plot on Channel 00</th><th colspan="8">PSD 3kHz Plot on Channel 19</th></th<>	PSD 3kHz Plot on Channel 00	PSD 3kHz Plot on Channel 19							
Att         20 db         SVT         13.4 mg         VEW 10 Hz         Mode Sweep           01PM Max         9.4 mg         9.4 mg         9.4 mg         9.4 mg         10.1 mg									
10 dm       N1[1]       -0.64 dm         0 dm       2.4092435 Hz       10 dm       2.4099445 Cm         10 dm       10 dm       10 dm       10 dm       10 dm         10 dm       10 dm       10 dm       10 dm       10 dm         20 dm       10 dm       10 dm       10 dm       10 dm         30 dm       10 dm       10 dm       10 dm       10 dm         40 dm       10 dm       10 dm       10 dm       10 dm         50 dm       10 dm       10 dm       10 dm       10 dm         40 dm       10 dm       10 dm       10 dm       10 dm         50 dm       10 dm       10 dm       10 dm       10 dm         40 dm       10 dm       10 dm       10 dm       10 dm         50 dm       10 dm       10 dm       10 dm       10 dm         60 dm       10 dm       10 dm       10 dm       10 dm         70 dm       10 dm       10 dm       10 dm       10 dm         60 dm       10 dm       10 dm       10 dm       10 dm         70 dm       10 dm       10 dm       10 dm       10 dm         10 dm       10 dm       10 dm       10 dm	Att 20 dB SWT 19.4 ms  VBW 10 kHz Mode Sweep	Att 20 dB SWT 19.6 ms VBW 10 kHz Mode Sweep							
10 dem	M1[1] -9.64 d	3m M1[1] -10.11 dBm							
10 dBm       10 dBm       11 dBm	10 dBm	10 dBm							
10 dm	0 dBm								
30 dem 40	-10 dBm	-10 dBm							
40 dbm       40 dbm       40 dbm       40 dbm       40 dbm       40 dbm       50 dbm       60 dbm       50 dbm       60 dbm       70 dbm		ton water water and the second and							
-50 dBm -00 dBm -00 dBm -70	-30 dBm								
-60 dBm       -70 dBm       -       <	-40 dBm								
-70 dBm	-50 dBm								
CF 2.402 CHz       1001 pts       Span 1.7445 MHz         Date:       Transmission       CF 2.44 CHz       1001 pts       Span 1.7565 MHz         Date:       T.JJAN.2021       10:06:59       Date:       Transmission       Max         PSD 3kHz Plot on Channel 39       N/A         Spectrum       V       N/A         Ref Level 20:00 dism       Offset 24.40 d8 @ RBW 3 HH; att       20 d8 @ SWT       19.6 ms @ VBW 10 HH; Mode Sweep       MI[1]       -10.41 dBm         0 dBm       Max       MI[1]       2.448002455 CH;       MI       MI       1.2448002455 CH;         10 dBm       MI       MI       MI       MI       MI       MI       MI	-60 d8m								
Date:         7.JAN.2021         10:06:59           Date:         7.JAN.2021         10:13:12	-70 dBm								
Date:         7.JAN.2021         10:06:59           Date:         7.JAN.2021         10:13:12	CF 2.402 GHz 1001 pts Span 1.7445 M	IZ CF 2.44 GHz 1001 pts Span 1.7565 MHz							
PSD 3kHz Plot on Channel 39         N/A           Spectrum         Image: Comparison of the top of top of top of the top of top									
Spectrum         Image: Constraint of the system of th	ate: 7.JAN.2021 10:06:59	Date: 7.JAN.2021 10:13:12							
Ref Level 20.00 dBm         Offset 24.40 dB         8 BW         3 Ht           Att         20 dB         SWT         19.6 ms         VBW 10 kHz           Make         Mode Sweep         -10.41 dBm           10 dBm         2.48002455 GHz         -10.41 dBm           0 dBm	PSD 3kHz Plot on Channel 39	N/A							
Att 20 dB SWT 19.6 ms VBW 10 kHz Mode Sweep      PIPk Max      ID dBm	Spectrum								
10 dBm     M1[1]     -10.41 dBm       2.48002455 GHz     2.48002455 GHz       0 dBm     M1       -10 dBm     M1	Att 20 dB SWT 19.6 ms 🖝 VBW 10 kHz Mode Sweep								
10 dBm	M1[1] -10.41 d								
-10 dBm									
	0 dBm-	-							
		-							
29 Brown allow when the second state of the se	1. Wellenter and the second	~0.							
-30 dBm-	-30 dBm	-							
-40 dBm	-40 dBm	-							
-50 dBm	-50 dBm	-							
-60 dBm	-60 d8m	-1							
-70 dBm	-70 d8m								
CF 2.48 GHz         1001 pts         Span 1.7565 MHz									
Measuring.	CF 2.48 GHz 1001 pts Span 1.7565 M	12							
Date: 7.JAN.2021 10:17:39	CF 2.48 GHz 1001 pts Span 1.7565 M								



### <Ant. 1>

PSD 3kHz Plot on Channel 00	PSD 3kHz Plot on Channel 19
Spectrum 🕎	Spectrum
RefLevel 20.00 dBm Offset 24.40 dB RBW 3 kHz Att 20 dB SWT 11.1 ms VBW 10 kHz Mode Sweep	Ref Level         20.00         dBm         Offset         24.40         dB         RBW         3 kHz           Att         20 dB         SWT         11.1 ms         WBW         10 kHz         Mode         Sweep
PIPk Max     M1[1] -8.05 dBm     2.401998000 GHz	1Pk Max     10
10 dBm	10 dBm
0 dBm	0 dBm
-10 dBm	-10 d8m
Real and a second s	280,48M/ With the second s
-30 d8m-	-30 dBm
-40 dBm-	-40 dBm-
-50 dBm-	-50 dBm-
-60 dBm-	-60 dBm-
-70 dBm	-70 dBm
CF 2.402 GHz 1001 pts Span 999.0 kHz	CF 2.44 GHz 1001 pts Span 996.0 kHz
Date: 7.JNN.2021 15:27:14	Date: 7. JAN. 2021 15:30:35
Date: /.UAN.2021 1512/114	Nate: /.JWH.2021 15:30:33
PSD 3kHz Plot on Channel 39	N/A
Spectrum 🕎	
Reflevel 20.00 dBm         Offset 24.40 dB ● RBW         3 kHz           ● Att         20 dB         SWT         11.1 ms ● VBW 10 kHz         Mode Sweep           ● DFR Max         ●         ■         ■         ■         ■	
M1[1] -8.73 dBm 2.480020960 GHz	
10 dBm	
0 dBm	
-10 dam -10 dam -28 fear for the for t	
-20 Memory	
-30 dBm-	
-40 d8m-	
-50 d8m-	
-60 dBm	
-70 dBm	
CF 2.48 GHz 1001 pts Span 999.0 kHz	
Measuring 44 2	

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PSD 3kHz Plot on Channel 00	PSD 3kHz Plot on Channel 19						
Spectrum 🕎	Spectrum 🕎						
Reflevel         20.00         dBm         Offset         24.40         db         RBW         3 kHz           Att         20.dB         SWT         19.4 ms         VBW         10 kHz         Mode         Sweep           G1PK         Max	Ref Level         20.00 dBm         Offset         24.40 dB         ■ RBW         3 kHz           ■ Att         20 dB         SWT         19.6 ms         ● VBW 10 kHz         Mode         Sweep           ● IPK Max         ■         ■         IA         IA </th						
M1[1] -10.40 dBm 2.40202435 GHz	M1[1] -10.43 dBm 2.44002285 GHz						
10 dBm-	10 d8m						
0 dBm	0 dBm						
-10 dam-	-10 dBm-						
-29 Bern alle My min all and an and a second a	2908 min Multi and						
-30 d8m	-30 d8m-						
-40 dBm-	-40 dBm						
-50 dBm-	-50 dBm-						
-60 dBm-	-60 dBm-						
-70 dBm-	-70 dBm-						
CF 2.402 GHz         1001 pts         Span 1.7445 MHz	CF 2.44 GHz         1001 pts         Span 1.7625 MHz						
Measuring.	Massing and Market and M						
Date: 7.JAN.2021 15:38:08	Date: 7.JAN.2021 15:42:09						
PSD 3kHz Plot on Channel 39	N/A						
Spectrum (₩							
Reflevel 20.00 dBm         Offset 24.40 dB ● RBW         3 kHz           ● Att         20 dB         SWT         19.4 ms ● VBW 10 kHz         Mode Sweep           ● DFR Max         ●         ■         ■         ■         ■							
M1[1] -11.01 dBm 2.48002435 GHz							
10 dBm							
0 dBm							
-10 dBm - M1							
29 Bon Manual Manual Contraction of the second seco							
-30 d8m							
-40 dBm-							
-50 dBm							
-60 dBm-							
-70 dBm-							
CF 2.48 GHz         1001 pts         Span 1.7385 MHz							
Measuring.							
Date: 7.JAN.2021 15:46:21							



## 3.4 Conducted Band Edges and Spurious Emission Measurement

## 3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

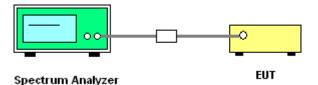
## 3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

## 3.4.3 Test Procedure

- 1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- 4. Set RBW = 100 kHz, VBW = 300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
- 5. Measure and record the results in the test report.
- 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

## 3.4.4 Test Setup

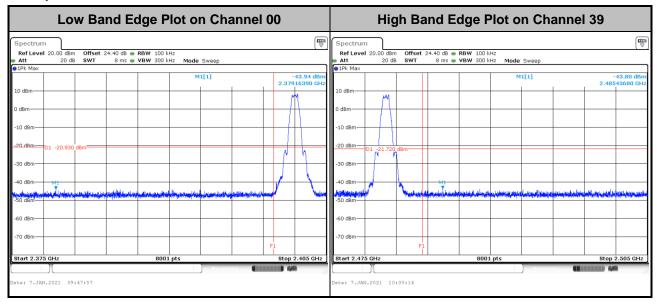




## 3.4.5 Test Result of Conducted Band Edges Plots

#### <Ant. 0>

#### <1Mbps>

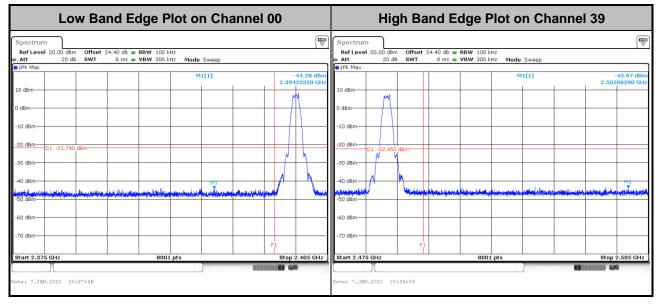


Low Band E	Edge Plot on Chani	High Band Edge Plot on Channel 39					
Spectrum           Ref Level 20.00 dBm         Offset 24.40 dB           Att         20 dB         SWT         8 ms           IPk Max         SWT         8 ms         9 ms	● RBW 100 kHz ● VBW 300 kHz Mode Sweep		Spectrum Ref Level 20.00 dBn Att 20 da		B <b>● RBW</b> 100 kHz s <b>● VBW</b> 300 kHz <b>M</b>	ode Sweep	\ ▽
10 dBm 0 dBm -10 dBm -20 dBm -20 dBm -20 dBm -30 dBm -40 dBm -40 dBm -40 dBm -70 dB	MI[1]	F1 Stop 2.405 GHz	10 d8m 0 d8m -10 d8m -20 d8m -20 d8m -30 d8m -40 d8m -40 d8m -50 d8m -60 d8m -70 d8m -70 d8m -70 d8m -70 d8m -20 d8	P3	8001 pts		



### <Ant. 1>

#### <1Mbps>



Low Band Edg	High Band Edge Plot on Channel 39							
Spectrum           Ref Level 20.00 dBm         Offset 24.40 dB         RBi           Att         20 dB         SWT         8 ms         VB'           IPk Max         IPk Max         IPk Max         IPk Max         IPk Max	W 300 kHz Mode Sweep		Spectrum Ref Level 20.00 dBm Att 20 dB		VBW 300 kHz Mod			₹
10 d8m		-41.48 dBm 2.39999630 GHz	10 dBm 0 dBm -10 dBm -20 dBm 01 -22.350 -30 dBm -40 dBm -60 dBm					
-70 dBm	8001 pts	F1 Stop 2.405 GHz	-70 dBm	F1	8001 pts	Measuring	Stop 2.505	IS GHZ

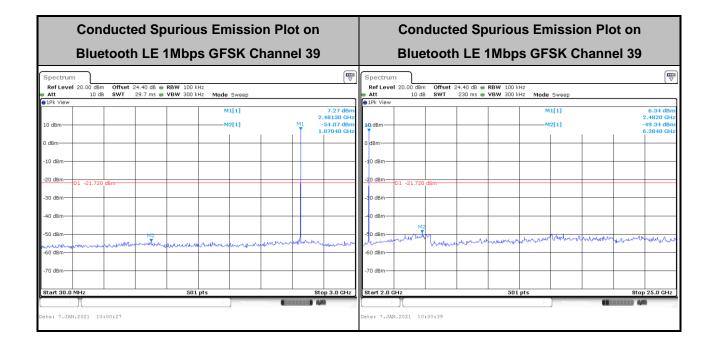


## 3.4.6 Test Result of Conducted Spurious Emission Plots

#### <Ant. 0>

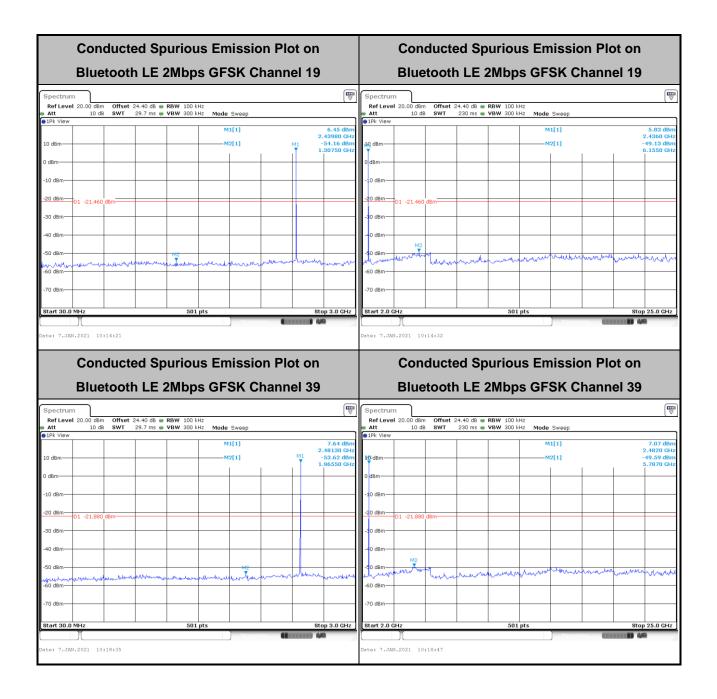
Conducted	Spurious Emission	Plot on	Conducted Spurious Emission Plot on						
Bluetooth L	E 1Mbps GFSK Cha	innel 00	Bluetooth LE 1Mbps GFSK Channel 00						
	dB <b>e RBW</b> 100 kHz ms <b>e VBW</b> 300 kHz <b>Mode</b> Sweep			4.40 dB • RBW 100 kHz 230 ms • VBW 300 kHz Mode Sw	2000				
10 UB SW1 29.7 m		O 1Pk							
10 dBm	M1[1] M2[1]	7.58 dBm 2.40420 GHz M1 -52.82 dBm 2.16710 GHz	m	M1[1] M2[1]		7.75 dBm 2.3900 GHz -48.86 dBm 6.9810 GHz			
0 dBm		O dBr	n						
-10 dBm		-10 d							
-20.dBm D1 -20.930 dBm		-21.0 -30 d	D1 -20.930 UBIN						
-40 dBm		-+0 d	Bm						
-50 dBm	M2	man moundant when		month markener have a	-augustation with more	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
-60 dBm		-60 d	Bm						
-70 dBm		-70 d							
Start 30.0 MHz	501 pts	Stop 3.0 GHz Start	2.0 GHz	501 pts		Stop 25.0 GHz			
conducted	Spurious Emission		7.JAN.2021 09:48:22	ed Spurious Emis	ssion Plot	on			
Conducted	Spurious Emission E 1Mbps GFSK Cha	Plot on Innel 19	Conducte	ed Spurious Emis		19			
Conducted Sector	E 1Mbps GFSK Cha	Plot on Innel 19	Conducte Bluetooth	LE 1Mbps GFSI		19			
Conducted Bluetooth L		Plot on innel 19	Conducte Bluetooth	-	K Channel	19			
Conducted Bluetooth L	E 1Mbps GFSK Cha	Plot on innel 19	Conducte Bluetooth		K Channel	<b>19</b>			
Conducted S Bluetooth L	E 1Mbps GFSK Cha	Plot on Innel 19	Conducte Bluetooth Level 20.00 dBm Offset 2 10 dB SWT 2	4.40 dB • RBW 100 kHz 230 ms • VBW 300 kHz Mode Sw	K Channel	7.00 dBr 2.4360 GH -49.47 dBr			
Conducted S Bluetooth L	B TMbps GFSK Cha dB • RBW 100 kHz rs • VBW 300 kHz Made Sweep M1[1]	Plot on innel 19	Conducte Bluetooth	4.40 dB @ RBW 100 kHz 230 ms @ VBW 300 kHz Mode Sw M1(1)	K Channel	7.00 dBr 2.4360 GH -49.47 dBr			
Conducted 3 Bluetooth Ll	B TMbps GFSK Cha dB • RBW 100 kHz rs • VBW 300 kHz Made Sweep M1[1]	Plot on innel 19	Conducte Bluetooth Level 20.00 dem Offset 2 10 de Swr	4.40 dB @ RBW 100 kHz 230 ms @ VBW 300 kHz Mode Sw M1(1)	K Channel	7.00 dBr 2.4360 GH -49.47 dBr			
Conducted S Bluetooth L	B TMbps GFSK Cha dB • RBW 100 kHz rs • VBW 300 kHz Made Sweep M1[1]	Plot on innel 19 © Spe 2.43980 GHz 2.40980 GHz 2.40980 GHz 2.40981 GHz 0 dBn -33.13 dBn 0 dBn -10 d	Conducte Bluetooth	4.40 dB @ RBW 100 kHz 230 ms @ VBW 300 kHz Mode Sw M1(1)	K Channel	<b>19</b> 7.00 dB 2.4360 GF -49.47 dB			
Conducted 3 Bluetooth L Spectrum Ref Level 20.00 dBm Offset 24.40 tu dBm Offset 24.40 tu dBm Of dBm Of -21.270 dBm O1 -21.270 dBm	B TMbps GFSK Cha dB • RBW 100 kHz rs • VBW 300 kHz Made Sweep M1[1]	Plot on innel 19	Conducte Bluetooth	4.40 dB @ RBW 100 kHz 230 ms @ VBW 300 kHz Mode Sw M1(1)	K Channel	7.00 dBr 2.4360 GH -49.47 dBr			
Conducted 3 Bluetooth L Spectrum Ref Level 20.00 dBm Offset 24.40 th PIPk View 10 dBm OdBm OdBm OdBm OdBm OdBm OdBm OdBm O	B TMbps GFSK Cha dB • RBW 100 kHz rs • VBW 300 kHz Made Sweep M1[1]	Plot on innel 19 © Spe 2.43980 GHz 2.40980 GHz 2.40980 GHz 2.40981 GHz 0 dBn -33.13 dBn 0 dBn -10 d	Conducte Bluetooth	4.40 dB @ RBW 100 kHz 230 ms @ VBW 300 kHz Mode Sw M1(1)	K Channel	7.00 dBr 2.4360 GH -49.47 dBr			
Conducted 3 Bluetooth L Spectrum Ref Level 20.00 dBm Offset 24.40 tu dBm Offset 24.40 tu dBm Of dBm Of -21.270 dBm O1 -21.270 dBm	B TMbps GFSK Cha dB • RBW 100 kHz rs • VBW 300 kHz Made Sweep M1[1]	Plot on innel 19	Conducte Bluetooth Level 20.00 dBm Offset 2 10 dB SWT	4.40 dB @ RBW 100 kHz 230 ms @ VBW 300 kHz Mode Sw M1(1)	K Channel	7.00 dBr 2.4360 GH -49.47 dBr			
Conducted 3 Bluetooth Ll Spectrum Ref Level 20.00 dBm Offset 24.40 o 10 dB WT 29.7 n 10 dB WT 29.7 n 10 dBm 01 -21.270 dBm	E 1Mbps GFSK Cha	Plot on innel 19	Conducte Bluetooth	A 40 dB @ RBW 100 kHz 230 ms @ VBW 300 kHz Mode Sw M1[1] 	K Channel	7.00 dBr 2.4360 GH -49.47 dBr			
Conducted 3 Bluetooth Ll Spectrum Ref Level 20.00 dBm Offset 24.40 o Att 10 dB SWT 29.7 n D dBm 10 dBm -10 dBm	E 1Mbps GFSK Cha	Plot on innel 19	Conducte Bluetooth	A.40 dB @ RBW 100 kH2 230 ms @ VBW 300 kH2 Mode Sw M1[1] 	K Channel	7.00 dBr 2.4360 GH -49,47 dBr 6.7510 GH			
Conducted         Conducted <thconducted< th="">         Conducted         <thconducted< th="">         Conducted         <thcond< th="">         Conducted         Conduc</thcond<></thconducted<></thconducted<>	E 1Mbps GFSK Cha	Plot on innel 19	Conducte Bluetooth	A 40 dB @ RBW 100 kHz 230 ms @ VBW 300 kHz Mode Sw M1[1] 	K Channel	7.00 dBr 2.4360 GH -49,47 dBr 6.7510 GH			
Conducted         Sector           Bluetooth L         Spectrum           Ref Level 20.00 dBm         Offset 24.40 c           10 dB w         01 swr           1Pk View         00 dBm           10 dBm         01 swr           10 dBm         01 str           10 dBm         01 swr           10 dBm         10 swr           10 swr         10 swr	B 1Mbps GFSK Cha	Plot on innel 19	Conducte Bluetooth	A 40 dB @ RBW 100 kH2 230 ms @ VBW 300 kH2 Mode Sw M1[1] 	K Channel	19 7.00 dBm 2.4360 GH -49.47 dBm 6.7510 GH			
Conducted 3 Bluetooth Ll Spectrum Ref Level 20.00 dBm Offset 24.40 o to dB WY 29.7 n PTPL View 10 dBm 01 -21.270 dBm	E 1Mbps GFSK Cha	Plot on innel 19	Conducte Bluetooth	A 40 dB @ RBW 100 kHz 230 ms @ VBW 300 kHz Mode Sw M1[1] 	K Channel	7.00 dBr 2.4300 dFr -49.47 dBr 6.7510 GH			





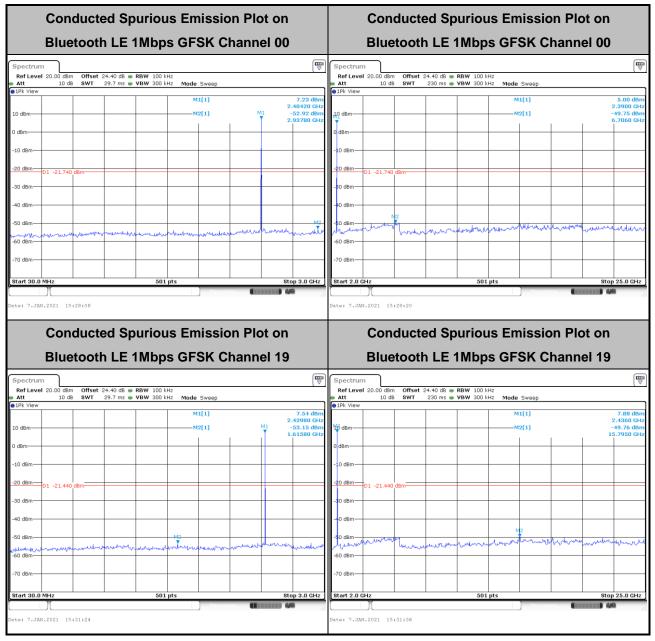
Conducted Spuriou	us Emission Plo	ot on	Con	ducted S	puriou	s Emissio	on Plot o	n
Bluetooth LE 2Mbp	s GFSK Chann	Bluetooth LE 2Mbps GFSK Channel 00						
Spectrum           Ref Level 20.00 dBm         Offset 24.40 dB @ RBW 100 i           Att         10 dB @ SWT         29.7 ms @ VBW 300 i           ID I blw         0 dBm         0 dBm         0 dBm           -20 dBm         D1 -21.060 dBm         -20 dBm         0 -21.060 dBm           -30 dBm         -10 dBm         -10 dBm         -10 dBm         -10 dBm		5.42 dBm 2.40420 GHz 11 -53.17 dBm 904.40 MHz	Spectrum           Ref Level 20.00 dBs           Att           10 d           IPk View           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -50 dBm	B SWT 230 ms	• VBW 300 kHz	Mode Sweep		5.17 dBm 2.3900 GH2 -49.75 dBm 6.9350 GH2
-60 dBm -70 dBm Start 30.0 MHz 501 Date: 7.JNN.2021 10:09:12	Lpts		-70 dBm -70 dBm Start 2.0 GHz		501 p	ts		top 25.0 GHz



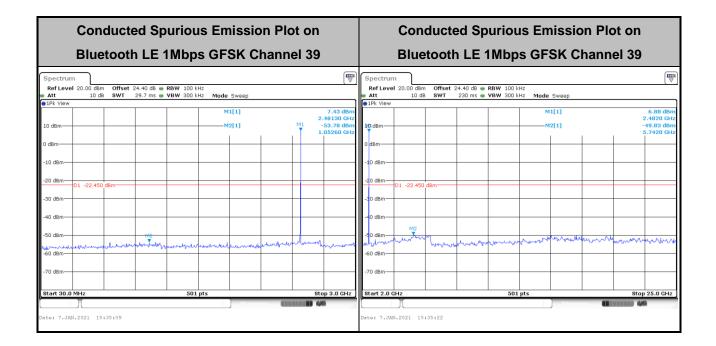




#### <Ant. 1>

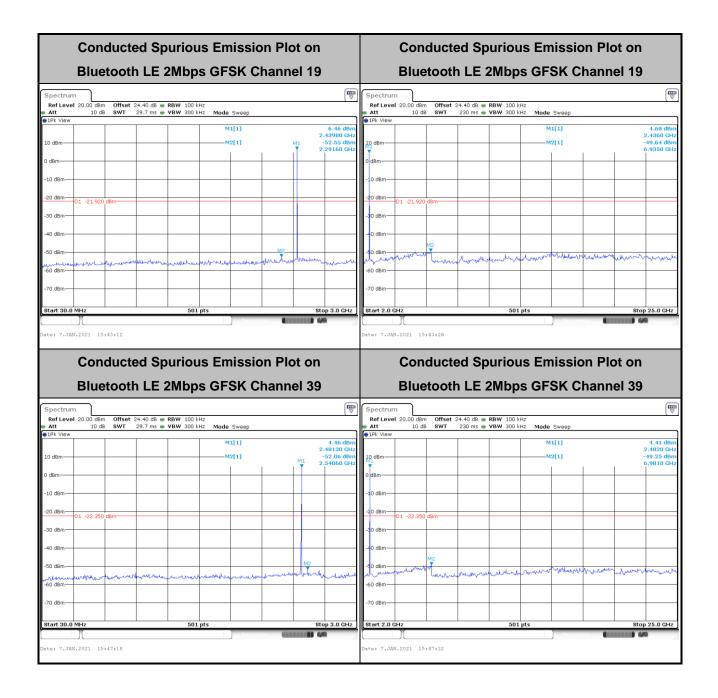






Conducted Spur	ious Emission I	Plot on	Conducted Spurious Emission Plot on				
Bluetooth LE 2M	lbps GFSK Char	nnel 00	Blueto	oth LE 2Mbp	s GFSK C	hannel 00	
Spectrum         Offset 24.40 d8 = RBW           Ref Level 20.00 d8m         0 d8 SWT         29.7 ms           10 d8         SWT         29.7 ms         VBW           10 d8m         0         0         0           10 d8m         0         0         0           -10 d8m         -10 d8m         -10         -10 d8m           -20 d8m         01 -21.750 d8m         -40 d8m         -40 d8m		5.43 dBm           2.40420 GHz           M1         -53.76 dBm           Y         1.08220 GHz	Spectrum           Ref Level 20.00 dBm         Of           Att         10 dB         SV           #1Pk View         0         dBm           0 dBm         -0         dBm           -10 dBm         01 -21.750 dBm           =80 dBm         -01 -21.750 dBm	Set 24.40 d8 RBW 100 h 7T 230 ms VBW 300 h		4.76 dBm 2.3900 GHz -48.82 dBm 6.9810 GHz	
-50 dBm	501 pts	Stop 3.0 GHz	-50 dBm -60 dBm -70 dBm -70 dBm Date: 7.JAN.2021 15:39:2	501	pts	Stop 25.0 GHz	





# 3.5 Radiated Band Edges and Spurious Emission Measurement

# 3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency	Field Strength	Measurement Distance	
(MHz)	(microvolts/meter)	(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	

### 3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

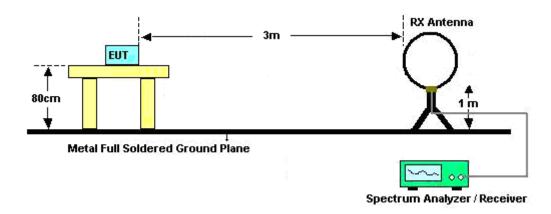
## 3.5.3 Test Procedures

- 1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
- 2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
- 3. The EUT was placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
- 4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 5. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level
- 6. For testing below 1 GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and be reported.
- 7. For testing above 1 GHz, the emission level of the EUT in peak mode was 20 dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and be reported.
- 8. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW = 100 kHz for f < 1 GHz; VBW  $\ge$  RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW = 3 MHz for  $f \ge 1$  GHz for peak measurement. For average measurement:
    - VBW = 10 Hz, when duty cycle is no less than 98 percent.
    - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

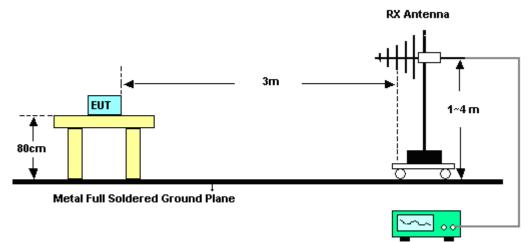


# 3.5.4 Test Setup

For radiated emissions below 30MHz



#### For radiated emissions from 30MHz to 1GHz

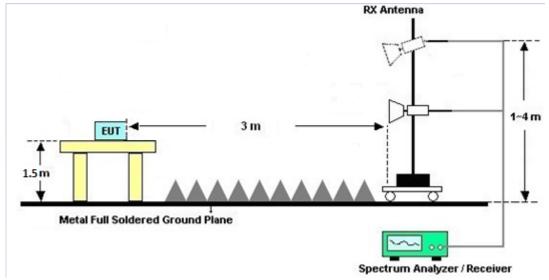


Spectrum Analyzer / Receiver

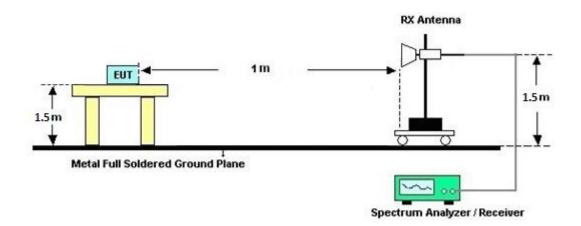
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#### For radiated test from 1GHz to 18GHz



#### For radiated test above 18GHz



## 3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

## 3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

### 3.5.7 Duty Cycle

Please refer to Appendix E.

# 3.5.8 Test Result of Radiated Spurious Emission (30 MHz ~ 10th Harmonic)

Please refer to Appendix C and D.



# 3.6 AC Conducted Emission Measurement

# 3.6.1 Limit of AC Conducted Emission

For equipment 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.

Eroquency of omission (MHz)	Conducted limit (dBµV)			
Frequency of emission (MHz)	Quasi-peak	Average		
0.15-0.5	66 to 56*	56 to 46*		
0.5-5	56	46		
5-30	60	50		

\*Decreases with the logarithm of the frequency.

### 3.6.2 Measuring Instruments

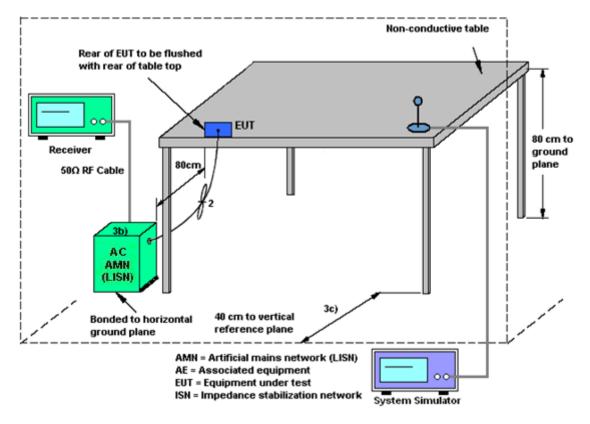
See list of measuring equipment of this test report.

#### 3.6.3 Test Procedures

- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to the other LISN.
- 4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- 5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
- 6. Both sides of AC line were checked for maximum conducted interference.
- 7. The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.



# 3.6.4 Test Setup



# 3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



# 3.7 Antenna Requirements

# 3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. 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 rule.

# 3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

# 3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



#### List of Measuring Equipment 4

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jul. 14, 2020	Feb. 26, 2021~ Mar. 03, 2021	Jul. 13, 2021	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01 N-06	41912 & 05	30MHz~1GHz	Feb. 08, 2021	Feb. 26, 2021~ Mar. 03, 2021	Feb. 07, 2022	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 28, 2020	Feb. 26, 2021~ Mar. 03, 2021	Dec. 27, 2021	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-016 20	1GHz~18GHz	Nov. 03, 2020	Feb. 26, 2021~ Mar. 03, 2021	Nov. 02, 2021	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 251	18GHz~40GHz	Dec. 02, 2020	Feb. 26, 2021~ Mar. 03, 2021	Dec. 01, 2021	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	171000180 0055006	1GHz~18GHz	May 07, 2020	Feb. 26, 2021~ Mar. 03, 2021	May 06, 2021	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY532701 95	1GHz~26.5GHz	Aug. 21, 2020	Feb. 26, 2021~ Mar. 03, 2021	Aug. 20, 2021	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Oct. 27, 2020	Feb. 26, 2021~ Mar. 03, 2021	Oct. 26, 2021	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE )	MY541300 85	20MHz~8.4GHz	Nov. 02, 2020	Feb. 26, 2021~ Mar. 03, 2021	Nov. 01, 2021	Radiation (03CH15-HY
Spectrum Analyzer	Agilent	E4446A	MY501801 36	3Hz~44GHz	May 04, 2020	Feb. 26, 2021~ Mar. 03, 2021	May 03, 2021	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Feb. 26, 2021~ Mar. 03, 2021	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Feb. 26, 2021~ Mar. 03, 2021	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k 5)	RK-00045 1	N/A	N/A	Feb. 26, 2021~ Mar. 03, 2021	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY36980/ 4, MY9838/4 PE,508405 /2E	30MHz~18G	Nov. 16, 2020	Feb. 26, 2021~ Mar. 03, 2021	Nov. 15, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 22, 2021	Feb. 26, 2021~ Mar. 03, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 22, 2021	Feb. 26, 2021~ Mar. 03, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	9kHz~30MHz	Mar. 12, 2020	Feb. 26, 2021~ Mar. 03, 2021	Mar. 11, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WLJ4-1000-1 530-6000-40S T	SN4	1.53GHz Low Pass Filter	Jul. 03, 2020	Feb. 26, 2021~ Mar. 03, 2021	Jul. 02, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60ST	SN4	3GHz High Pass Filter	Sep. 16, 2020	Feb. 26, 2021~ Mar. 03, 2021	Sep. 15, 2021	Radiation (03CH15-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 02, 2020	Dec. 30, 2020 Jan. 07, 2021	Mar. 01, 2021	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054S NO12	10MHz~6GHz	Dec. 16, 2020	Dec. 30, 2020 Jan. 07, 2021	Dec. 15, 2021	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz ~ 40GHz	Jul. 22, 2020	Dec. 30, 2020 Jan. 07, 2021	Jul. 21, 2021	Conducted (TH05-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2020	Dec. 30, 2020 Jan. 07, 2021	Mar. 16, 2021	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Mar. 01, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 30, 2020	Mar. 01, 2021	Nov. 29, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 18, 2020	Mar. 01, 2021	Nov. 17, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	Mar. 01, 2021	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Mar. 01, 2021	N/A	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	Mar. 01, 2021	Dec. 30, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Feb. 25, 2021	Mar. 01, 2021	Feb. 24, 2022	Conduction (CO05-HY)



# 5 Uncertainty of Evaluation

#### Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence	2.2
of 95% (U = 2Uc(y))	2.3

#### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence	4.7
of 95% (U = 2Uc(y))	

#### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence	5.2
of 95% (U = 2Uc(y))	5.5

#### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence	4.0
of 95% (U = 2Uc(y))	4.9

Report Number : FR0D2215B

# Appendix A. Test Result of Conducted Test Items

Test Engineer:	Eason Huang	Temperature:	21~25	°C
Test Date:	2020/12/30~2021/01/07	Relative Humidity:	51~54	%

<Ant. 0>

Mod.Data RateNTXCH.Freq. (MHz)99% Occupied BW (MHz)6dB BW (MHz)6dB BW Limit (MHz)Pass/FailBLE1Mbps1024021.0130.6640.50PassBLE1Mbps11924401.0130.6680.50Pass		<u>TEST RESULTS DATA</u> 6dB and 99% Occupied Bandwidth								
Mod.RateNTXCH.(MHz)BW (MHz)(MHz)Limit (MHz)Pass/FailBLE1Mbps1024021.0130.6640.50Pass		Data			<b>F</b> ace			6dB BW		
	Mod.		Ντx	CH.		ВŴ			Pass/Fail	
BLE 1Mbps 1 19 2440 1.013 0.668 0.50 Pass	BLE	1Mbps	1	0	2402	1.013	0.664	0.50	Pass	
	BLE	1Mbps	1	19	2440	1.013	0.668	0.50	Pass	
BLE 1Mbps 1 39 2480 1.013 0.664 0.50 Pass	BLE	1Mbps	1	39	2480	1.013	0.664	0.50	Pass	

#### TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	9.00	30.00	-5.30	3.70	36.00	Pass
BLE	1Mbps	1	19	2440	8.80	30.00	-5.30	3.50	36.00	Pass
BLE	1Mbps	1	39	2480	8.30	30.00	-5.30	3.00	36.00	Pass

#### TEST RESULTS DATA Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	1Mbps	1	0	2402	9.07	-7.34	-5.30	8.00	Pass
BLE	1Mbps	1	19	2440	8.73	-7.69	-5.30	8.00	Pass
BLE	1Mbps	1	39	2480	8.28	-8.18	-5.30	8.00	Pass

Report Number : FR0D2215B

<u>TEST RESULTS DATA</u> 6dB and 99% Occupied Bandwidth												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail				
BLE	2Mbps	1	0	2402	1.974	1.163	0.50	Pass				
BLE	2Mbps	1	19	2440	1.982	1.171	0.50	Pass				
BLE	2Mbps	1	39	2480	1.978	1.171	0.50	Pass				

#### TEST RESULTS DATA Average Power Table

Mod.	Data Rate	Ντx	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	2Mbps	1	0	2402	9.00	30.00	-5.30	3.70	36.00	Pass
BLE	2Mbps	1	19	2440	9.00	30.00	-5.30	3.70	36.00	Pass
BLE	2Mbps	1	39	2480	8.50	30.00	-5.30	3.20	36.00	Pass

#### TEST RESULTS DATA Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	2Mbps	1	0	2402	8.94	-9.64	-5.30	8.00	Pass
BLE	2Mbps	1	19	2440	8.54	-10.11	-5.30	8.00	Pass
BLE	2Mbps	1	39	2480	8.12	-10.41	-5.30	8.00	Pass

<Ant. 1>

Report Number : FR0D2215B

					<u>6dE</u>	<u>TEST  </u> 3 and 99%	RESULTS 6 Occupie	
Mod.	Data Rate	Ntx	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	1Mbps	1	0	2402	1.004	0.666	0.50	Pass
BLE	1Mbps	1	19	2440	1.010	0.664	0.50	Pass
BLE	1Mbps	1	39	2480	1.014	0.666	0.50	Pass

#### TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	8.40	30.00	-4.90	3.50	36.00	Pass
BLE	1Mbps	1	19	2440	8.60	30.00	-4.90	3.70	36.00	Pass
BLE	1Mbps	1	39	2480	7.60	30.00	-4.90	2.70	36.00	Pass

<u>TEST RESULTS DATA</u> <u>Peak Power Density</u>												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail			
BLE	1Mbps	1	0	2402	8.26	-8.05	-4.90	8.00	Pass			
BLE	1Mbps	1	19	2440	8.56	-7.74	-4.90	8.00	Pass			
BLE	1Mbps	1	39	2480	7.55	-8.73	-4.90	8.00	Pass			

Report Number : FR0D2215B

#### TEST RESULTS DATA Average Power Table

Mod.	Data Rate	Ntx	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	2Mbps	1	0	2402	8.50	30.00	-4.90	3.60	36.00	Pass
BLE	2Mbps	1	19	2440	8.70	30.00	-4.90	3.80	36.00	Pass
BLE	2Mbps	1	39	2480	7.80	30.00	-4.90	2.90	36.00	Pass

							RESULTS Power De		
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	2Mbps	1	0	2402	8.25	-10.40	-4.90	8.00	Pass
BLE	2Mbps	1	19	2440	8.08	-10.43	-4.90	8.00	Pass
BLE	2Mbps	1	39	2480	7.65	-11.01	-4.90	8.00	Pass

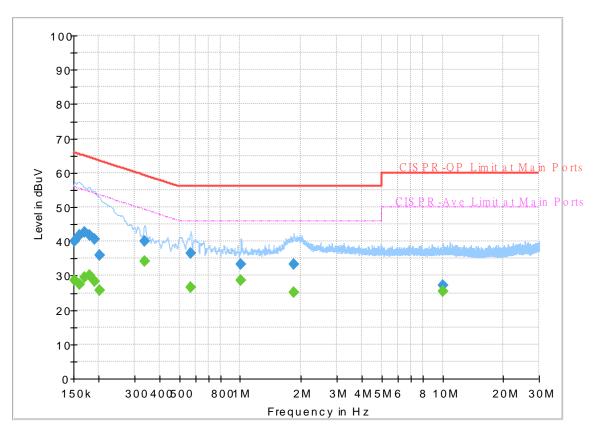


# Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Loo	Temperature :	<b>23~26</b> ℃
Test Engineer :	Tom Lee	Relative Humidity :	40~50%

# **EUT Information**

Report NO : Test Mode : Test Voltage : Phase : 0D2215 Mode 1 120Vac/60Hz Line



#### FullSpectrum

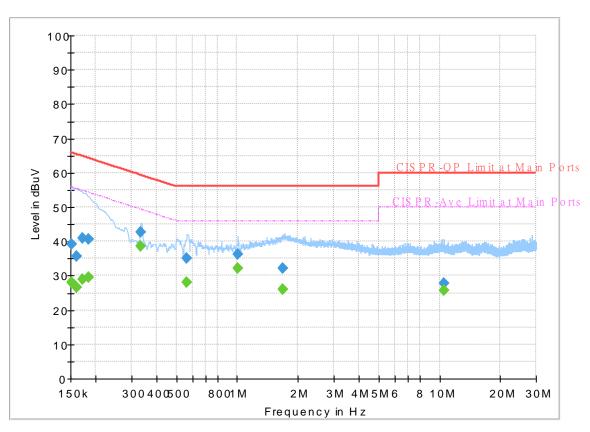
# Final\_Result

Frequency	QuasiPeak	CAverage	Limit	Margin	Line	Filter	Corr.
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dB)			(dB)
0.152250		28.72	55.88	27.16	L1	OFF	19.5
0.152250	40.17		65.88	25.71	L1	OFF	19.5
0.161250		27.39	55.40	28.01	L1	OFF	19.5
0.161250	41.93		65.40	23.47	L1	OFF	19.5
0.170250		29.57	54.95	25.38	L1	OFF	19.5
0.170250	42.74		64.95	22.21	L1	OFF	19.5
0.179250		30.24	54.52	24.28	L1	OFF	19.5
0.179250	41.81		64.52	22.71	L1	OFF	19.5
0.190500		28.36	54.02	25.66	L1	OFF	19.5
0.190500	40.74		64.02	23.28	L1	OFF	19.5
0.201750		25.72	53.54	27.82	L1	OFF	19.5
0.201750	35.99		63.54	27.55	L1	OFF	19.5
0.336750		34.33	49.28	14.95	L1	OFF	19.5
0.336750	39.94		59.28	19.34	L1	OFF	19.5
0.568500		26.70	46.00	19.30	L1	OFF	19.7
0.568500	36.50		56.00	19.50	L1	OFF	19.7
1.009500		28.78	46.00	17.22	L1	OFF	20.0
1.009500	33.43		56.00	22.57	L1	OFF	20.0
1.842000		25.16	46.00	20.84	L1	OFF	20.0
1.842000	33.37		56.00	22.63	L1	OFF	20.0
10.005000		25.44	50.00	24.56	L1	OFF	20.0

10.005000 27.12 60.00 32.88 L1 OFF
------------------------------------

# **EUT Information**

Report NO : Test Mode : Test Voltage : Phase : 0D2215 Mode 1 120Vac/60Hz Neutral



#### FullSpectrum

# Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250		28.20	55.88	27.68	N	OFF	19.5
0.152250	39.29		65.88	26.59	Ν	OFF	19.5
0.161250		26.62	55.40	28.78	Ν	OFF	19.5
0.161250	35.77		65.40	29.63	Ν	OFF	19.5
0.172500		28.88	54.84	25.96	Ν	OFF	19.5
0.172500	40.84		64.84	24.00	Ν	OFF	19.5
0.183750		29.57	54.31	24.74	Ν	OFF	19.5
0.183750	40.71		64.31	23.60	Ν	OFF	19.5
0.334500		38.48	49.34	10.86	Ν	OFF	19.6
0.334500	42.81		59.34	16.53	Ν	OFF	19.6
0.564000		28.15	46.00	17.85	Ν	OFF	19.8
0.564000	35.05		56.00	20.95	Ν	OFF	19.8
1.007250		32.11	46.00	13.89	Ν	OFF	20.1
1.007250	36.18		56.00	19.82	Ν	OFF	20.1
1.682250		26.03	46.00	19.97	Ν	OFF	20.0
1.682250	32.30		56.00	23.70	Ν	OFF	20.0
10.493250		25.79	50.00	24.21	Ν	OFF	20.1
10.493250	27.63	-	60.00	32.37	Ν	OFF	20.1



# Appendix C. Radiated Spurious Emission

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.1~23.1°C
Test Engineer .		Relative Humidity :	55~60%

<1Mbps>

#### 2.4GHz 2400~2483.5MHz

# BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0		(MHz)	(dBµV/m)	( dB )	( dBµV/m )	(dBµV)	( dB/m )	( dB )	(dB)	( cm )	(deg)	(P/A)	(H/V)
		2313.675	55.03	-18.97	74	41.77	27.77	16.44	30.95	146	266	Ρ	Н
		2358.405	44.55	-9.45	54	31.3	27.67	16.51	30.93	146	266	А	Н
	*	2402	97.64	-	-	84.47	27.5	16.58	30.91	146	266	Ρ	Н
	*	2402	97.08	-	-	83.91	27.5	16.58	30.91	146	266	А	Н
BLE													
CH 00 2402MHz		2323.65	54.54	-19.46	74	41.28	27.75	16.45	30.94	344	272	Ρ	V
240211112		2387.49	44.46	-9.54	54	31.27	27.55	16.56	30.92	344	272	А	V
	*	2402	91.07	-	-	77.9	27.5	16.58	30.91	344	272	Ρ	V
	*	2402	90.55	-	-	77.38	27.5	16.58	30.91	344	272	A	V
		2333.68	54.61	-19.39	74	41.35	27.73	16.47	30.94	145	256	Р	н
		2310.96	44.66	-9.34	54	31.4	27.78	16.43	30.95	145	256	А	Н
	*	2440	99.19	-	-	85.95	27.5	16.64	30.9	145	256	Р	н
	*	2440	98.52	-	-	85.28	27.5	16.64	30.9	145	256	А	Н
		2490.64	54.62	-19.38	74	41.35	27.42	16.72	30.87	145	256	Ρ	Н
BLE CH 19		2498.47	44.55	-9.45	54	31.29	27.4	16.73	30.87	145	256	А	Н
Сп 19 2440MHz		2350.32	54.23	-19.77	74	40.96	27.7	16.5	30.93	384	312	Ρ	V
244010112		2318.64	44.5	-9.5	54	31.24	27.76	16.45	30.95	384	312	А	V
	*	2440	93.95	-	-	80.71	27.5	16.64	30.9	384	312	Ρ	V
	*	2440	93.19	-	-	79.95	27.5	16.64	30.9	384	312	А	V
		2497.75	53.98	-20.02	74	40.72	27.4	16.73	30.87	384	312	Ρ	V
		2496.67	44.52	-9.48	54	31.25	27.41	16.73	30.87	384	312	А	V



	*	2480	98.33	-	-	85.07	27.44	16.7	30.88	144	257	Р	Н
	*	2480	96.71	-	-	83.45	27.44	16.7	30.88	144	257	А	Н
		2488.04	54.25	-19.75	74	40.99	27.42	16.72	30.88	144	257	Ρ	Н
		2498.68	44.52	-9.48	54	31.26	27.4	16.73	30.87	144	257	А	Н
													Н
BLE CH 39													Н
2480MHz	*	2480	95.51	-	-	82.25	27.44	16.7	30.88	361	309	Р	V
24001112	*	2480	94.25	-	-	80.99	27.44	16.7	30.88	361	309	А	V
		2498.44	54.39	-19.61	74	41.13	27.4	16.73	30.87	361	309	Р	V
		2494.56	44.49	-9.51	54	31.22	27.41	16.73	30.87	361	309	А	V
													V
													V
Remark		o other spurious I results are PA		Peak and	Average lim	iit line.							



					DLE (Harrin		-		ſ				1
BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant		Peak	Pol.
Ant 0		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)		Factor (dB/m)		Factor	Pos	Pos	Avg. (P/A)	
0		4804	<u>(авруля)</u> 38.94	-35.06	<u>(аврула)</u> 74	(dBµV) 56.87	( <b>db/iii</b> ) 31.1	( dB ) 10.05	(dB) 59.08	( cm ) 100	( deg ) 0	P	(п/v) Н
		18000	58.95	-15.05	74	48.96	49	18.89	57.9	100	25	Р	н
BLE		18000	49.95	-4.05	54	39.96	49	18.89	57.9	100	25	A	H
CH 00													Н
2402MHz		4804	39.3	-34.7	74	57.23	31.1	10.05	59.08	100	0	Р	V
		17985	58.62	-15.38	74	48.93	48.73	18.88	57.92	100	126	Р	V
		17985	49.72	-4.28	54	40.03	48.73	18.88	57.92	100	126	A	V
													V
		4880	39.1	-34.9	74	57.08	31.04	10.11	59.13	100	0	Р	Н
		7320	45.62	-28.38	74	55.55	36.3	12.32	58.55	100	0	Р	Н
		18000	58.88	-15.12	74	48.89	49	18.89	57.9	100	38	Р	Н
BLE		18000	49.86	-4.14	54	39.87	49	18.89	57.9	100	38	А	Н
CH 19 2440MHz		4880	38.91	-35.09	74	56.89	31.04	10.11	59.13	100	0	Р	V
244010112		7320	45.4	-28.6	74	55.33	36.3	12.32	58.55	100	0	Р	V
		17970	59.05	-14.95	74	49.66	48.46	18.87	57.94	100	127	Р	V
		17970	49.46	-4.54	54	40.07	48.46	18.87	57.94	100	127	Α	V
		4960	39.92	-34.08	74	57.71	31.22	10.17	59.18	100	0	Р	Н
		7440	45.93	-28.07	74	55.62	36.3	12.39	58.38	100	0	Р	н
		18000	59.77	-14.23	74	49.78	49	18.89	57.9	100	29	Р	Н
BLE		18000	49.98	-4.02	54	39.99	49	18.89	57.9	100	29	А	Н
CH 39 2480MHz		4960	40.04	-33.96	74	57.83	31.22	10.17	59.18	100	0	Р	V
24001112		7440	46.41	-27.59	74	56.1	36.3	12.39	58.38	100	0	Р	V
		17985	59.13	-14.87	74	49.44	48.73	18.88	57.92	100	138	Р	V
		17985	49.88	-4.12	54	40.19	48.73	18.88	57.92	100	138	Α	V
Remark		o other spurious results are PA		Peak and	l Average lim	it line.							

### BLE (Harmonic @ 3m)



# BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	( dBµV/m )	( dB )	(dBµV/m)	(dBµV)	( dB/m )	( dB )	( dB )	( cm )	(deg)	(P/A)	(H/V)
		2369.115	54.49	-19.51	74	41.26	27.62	16.53	30.92	174	203	Ρ	Н
		2310	44.62	-9.38	54	31.36	27.78	16.43	30.95	174	203	А	Н
	*	2402	99.45	-	-	86.28	27.5	16.58	30.91	174	203	Р	н
	*	2402	98.7	-	-	85.53	27.5	16.58	30.91	174	203	А	Н
BLE													Н
CH 00													Н
2402MHz		2366.49	55.48	-18.52	74	42.26	27.63	16.52	30.93	332	266	Р	V
240211112		2323.02	44.8	-9.2	54	31.54	27.75	16.45	30.94	332	266	А	V
	*	2402	92.14	-	-	78.97	27.5	16.58	30.91	332	266	Ρ	V
	*	2402	91.38	-	-	78.21	27.5	16.58	30.91	332	266	А	V
													V
													V
		2354.96	55.5	-18.5	74	42.24	27.68	16.51	30.93	192	208	Ρ	Н
		2316.24	44.72	-9.28	54	31.46	27.77	16.44	30.95	192	208	А	н
	*	2440	99.86	-	-	86.62	27.5	16.64	30.9	192	208	Р	н
	*	2440	99.28	-	-	86.04	27.5	16.64	30.9	192	208	А	Н
BLE		2499.82	54.44	-19.56	74	41.18	27.4	16.73	30.87	192	208	Р	Н
CH 19		2487.04	44.69	-9.31	54	31.43	27.43	16.71	30.88	192	208	А	Н
2440MHz		2353.2	54.64	-19.36	74	41.38	27.69	16.5	30.93	359	268	Р	V
244010112		2360.08	44.77	-9.23	54	31.53	27.66	16.51	30.93	359	268	А	V
	*	2440	93.18	-	-	79.94	27.5	16.64	30.9	359	268	Р	V
	*	2440	92.58	-	-	79.34	27.5	16.64	30.9	359	268	А	V
		2488.39	54.12	-19.88	74	40.85	27.42	16.72	30.87	359	268	Ρ	V
		2492.44	44.61	-9.39	54	31.34	27.42	16.72	30.87	359	268	А	V



	*	2480	97.41	-	-	84.15	27.44	16.7	30.88	164	216	Р	Н
	*	2480	96.79	-	-	83.53	27.44	16.7	30.88	164	216	А	Н
		2486.48	54.82	-19.18	74	41.56	27.43	16.71	30.88	164	216	Р	н
		2486.64	44.78	-9.22	54	31.52	27.43	16.71	30.88	164	216	А	Н
													Н
BLE CH 39													Н
СП 39 2480MHz	*	2480	93.86	-	-	80.6	27.44	16.7	30.88	399	268	Р	V
240010112	*	2480	93.3	-	-	80.04	27.44	16.7	30.88	399	268	А	V
		2497.2	54.94	-19.06	74	41.67	27.41	16.73	30.87	399	268	Р	V
		2488.84	44.8	-9.2	54	31.53	27.42	16.72	30.87	399	268	А	V
													V
													V
Remark		o other spurious I results are PA		Peak and	Average lim	iit line.							



					ELE (Harm		,			[		[	[
BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant		Peak	Pol.
Ant 1		(MHz)	(dBµV/m)	Limit (dB)	Line ( dBµV/m )	Level (dBµV)	Factor ( dB/m )	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
		4804	39.13	-34.87	74	57.06	31.1	10.05	59.08	100	0	P	H
		18000	58.37	-15.63	74	48.38	49	18.89	57.9	100	25	Р	Н
		18000	49.5	-4.5	54	39.51	49	18.89	57.9	100	25	А	Н
BLE													н
CH 00		4804	39.47	-34.53	74	57.4	31.1	10.05	59.08	100	0	Р	V
2402MHz		17970	58.82	-15.18	74	49.43	48.46	18.87	57.94	100	124	Р	V
		17970	49.75	-4.25	54	40.36	48.46	18.87	57.94	100	124	А	V
													V
		4880	38.31	-35.69	74	56.29	31.04	10.11	59.13	100	0	Ρ	Н
		7320	44.36	-29.64	74	54.29	36.3	12.32	58.55	100	0	Р	Н
		17970	58.11	-15.89	74	48.72	48.46	18.87	57.94	100	37	Р	Н
BLE CH 19		17970	49.88	-4.12	54	40.49	48.46	18.87	57.94	100	37	А	Н
2440MHz		4880	39.21	-34.79	74	57.19	31.04	10.11	59.13	100	0	Р	V
244010112		7320	44	-30	74	53.93	36.3	12.32	58.55	100	0	Р	V
		17985	58.93	-15.07	74	49.24	48.73	18.88	57.92	100	141	Р	V
		17985	49.9	-4.1	54	40.21	48.73	18.88	57.92	100	141	Α	V
		4960	39.38	-34.62	74	57.17	31.22	10.17	59.18	100	0	Р	Н
		7440	45.55	-28.45	74	55.24	36.3	12.39	58.38	100	0	Р	Н
BLE		17985	58.06	-15.94	74	48.37	48.73	18.88	57.92	100	127	Р	Н
CH 39		17985	49.82	-4.18	54	40.13	48.73	18.88	57.92	100	127	А	Н
2480MHz		4960	39.02	-34.98	74	56.81	31.22	10.17	59.18	100	0	Р	V
		7440	44.83	-29.17	74	54.52	36.3	12.39	58.38	100	0	Р	V
		18000	58.32	-15.68	74	48.33	49	18.89	57.9	100	25	Р	V
		18000	49.85	-4.15	54	39.86	49	18.89	57.9	100	25	А	V
Remark		o other spurious		eak and	Average lim	it line.							

# BLE (Harmonic @ 3m)



### Emission above 18GHz

# 2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	( dB )	(dBµV/m)	(dBµV)	( dB/m )	( dB )	( dB )	( cm )	(deg)	(P/A)	(H/V)
		21200	38.21	-35.79	74	43.26	38.24	11.41	54.7	150	0	Р	Н
													н
													Н
													Н
													Н
2.4GHz													Н
BLE SHF		23696	40.5	-33.5	74	43.16	38.62	12.6	53.88	150	0	Р	V
SHE													V
													V
													V
													V
													V
	1. No	o other spuriou	s found.										
Remark		results are PA		mit line.									
			÷										



## Emission below 1GHz

Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol
			Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
					(dBµV)		( dB )	(dB)	( cm )	(deg)		1
		22.65		40					-	-		Н
	109.54	28.92	-14.58	43.5	43.2	16.75	1.49	32.52	-	-	Р	Н
	151.25	28.23	-15.27	43.5	41.99	16.98	1.76	32.5	-	-	Р	Н
	216.24	26.55	-19.45	46	41.86	15	2.12	32.43	-	-	Р	Н
	717.73	31.21	-14.79	46	33.27	26.76	3.63	32.45	-	-	Р	Н
	891.36	34.12	-11.88	46	32.81	28.84	4.14	31.67	100	0	Ρ	Н
												Н
												н
												н
												Н
												Н
												Н
	39.7	33.22	-6.78	40	45.38	19.59	0.81	32.56	100	0	Р	V
	107.6	28	-15.5	43.5	42.29	16.75	1.48	32.52	-	-	Ρ	V
	144.46	29.59	-13.91	43.5	43.17	17.21	1.71	32.5	-	-	Р	V
	326.82	23.38	-22.62	46	33.73	19.68	2.49	32.52	-	-	Р	V
	713.85	31.1	-14.9	46	33.33	26.6	3.62	32.45	-	-	Р	V
	942.77	33.37	-12.63	46	30.15	30.26	4.31	31.35	-	-	Р	V
												V
												V
												V
												V
												V
												V
		216.24 717.73 891.36 39.7 39.7 107.6 144.46 326.82 713.85	86.26       22.65         109.54       28.92         151.25       28.23         216.24       26.55         717.73       31.21         891.36       34.12         91.36       34.12         39.7       33.22         107.6       28         144.46       29.59         326.82       23.38         713.85       31.1	(MHz)         (dBμV/m)         (dB)           86.26         22.65         -17.35           109.54         28.92         -14.58           151.25         28.23         -15.27           216.24         26.55         -19.45           717.73         31.21         -14.79           891.36         34.12         -11.88           109.54         28.92         -14.58           216.24         26.55         -19.45           717.73         31.21         -14.79           891.36         34.12         -11.88           107.6         28         -15.5           107.6         28         -15.5           144.46         29.59         -13.91           326.82         23.38         -22.62           713.85         31.1         -14.9	(MHz)         (dBμV/m)         (dB)         (dBμV/m)           86.26         22.65         -17.35         40           109.54         28.92         -14.58         43.5           151.25         28.23         -15.27         43.5           216.24         26.55         -19.45         46           717.73         31.21         -14.79         46           891.36         34.12         -11.88         46           891.36         34.12         -11.88         46           891.36         34.12         -11.88         46           39.7         33.22         -6.78         40           107.6         28         -15.5         43.5           107.6         28         -15.5         43.5           3326.82         23.38         -22.62         46           713.85         31.1         -14.9         46	(MHz)         (dBµV/m)         (dB)         (dBµV/m)         (dBµV/m)           86.26         22.65         -17.35         40         39.77           109.54         28.92         -14.58         43.5         43.2           151.25         28.23         -15.27         43.5         41.99           216.24         26.55         -19.45         46         41.86           717.73         31.21         -14.79         46         33.27           891.36         34.12         -11.88         46         32.81           1         1         -14.79         46         32.81           891.36         34.12         -11.88         46         32.81           1         1         1         1         1         1           1         1         1         1         1         1           1         1         1         1         1         1           1         1         1         1         1         1           1         1         1         1         1         1           1         1         1         1         1         1           1         1	(MHz)         (dBµV/m)         (dB)         (dBµV/m)         (dBµV)         (dBµv)           86.26         22.65         -17.35         40         39.77         14.05           109.54         28.92         -14.58         43.5         43.2         16.75           151.25         28.23         -15.27         43.5         41.99         16.98           216.24         26.55         -19.45         46         41.86         15           717.73         31.21         -14.79         46         33.27         26.76           891.36         34.12         -11.88         46         32.81         28.84           1         1         1         1         1         1         1           891.36         34.12         -11.88         46         32.81         28.84           1         1         1         1         1         1         1           1         1         1         1         1         1         1           1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1	(MHz)         (dBμV/m)         (dB μV/m)         (dBμV/m)         (dBμV/m)         (dBμV/m)         (dB/m)         (dB/m)         (dB/m)           86.26         22.65         -17.35         40         39.77         14.05         1.32           109.54         28.92         -14.58         43.5         43.2         16.75         1.49           151.25         28.23         -15.27         43.5         41.99         16.98         1.76           216.24         26.55         -19.45         46         41.86         15         2.12           717.73         31.21         -14.79         46         33.27         26.76         3.63           891.36         34.12         -11.88         46         32.81         28.84         4.14           1	(MHz)         (dBµV/m)         (dB         (dBµV/m)         (dB/m)         (dB/m)         (dB/m)         (dB)           86.26         22.65         -17.35         40         39.77         14.05         1.32         32.49           109.54         28.92         -14.58         43.5         43.2         16.75         1.49         32.52           151.25         28.23         -15.27         43.5         41.99         16.98         1.76         32.53           216.24         26.55         -19.45         46         41.86         15         2.12         32.43           717.73         31.21         -14.79         46         33.27         26.76         3.63         32.45           891.36         34.12         -11.88         46         32.81         28.84         4.14         31.67           1         1         -11.88         46         32.81         28.84         4.14         31.67           1         1         1         1         1         1         1         1         1           1         1         1         1         1         1         1         1         1         1         1         1 <td< td=""><td>(MHz)         (dBµV/m)         (dBµV/m)         (dBµV/m)         (dB/m)         (dB)         (dB)         (cm)           86.26         22.65         -17.35         40         39.77         14.05         1.32         32.49         -           109.54         28.92         -14.58         43.5         43.2         16.75         1.49         32.52         -           151.25         28.23         -15.27         43.5         41.99         16.98         1.76         32.52         -           216.24         26.55         -19.45         46         41.86         15         2.12         32.43         -           717.73         31.21         -14.79         46         33.27         26.76         3.63         32.45         -           891.36         34.12         -11.88         46         32.81         28.84         4.14         31.67         100           1         1.1</td><td>(MHz)(dBµ/m)(dBµ/m)(dBµ/m)(dB/m)(dB/m)(dB)(dB)(dB)(dB)(dB)86.2622.6517.354039.7714.051.3232.49109.5428.92-14.5843.543.216.751.4932.52151.2528.23-15.2743.541.9916.981.7632.54216.2426.55-19.454641.86152.1232.43717.7331.21-14.794633.2726.763.6332.45891.3634.12-11.884632.8128.844.1431.67100011&lt;</td><td>(MHz)(dBµ/m)(dB)(dBµ/m)(dBµ/m)(dB)(dB)(dm)&lt;</td></td<>	(MHz)         (dBµV/m)         (dBµV/m)         (dBµV/m)         (dB/m)         (dB)         (dB)         (cm)           86.26         22.65         -17.35         40         39.77         14.05         1.32         32.49         -           109.54         28.92         -14.58         43.5         43.2         16.75         1.49         32.52         -           151.25         28.23         -15.27         43.5         41.99         16.98         1.76         32.52         -           216.24         26.55         -19.45         46         41.86         15         2.12         32.43         -           717.73         31.21         -14.79         46         33.27         26.76         3.63         32.45         -           891.36         34.12         -11.88         46         32.81         28.84         4.14         31.67         100           1         1.1	(MHz)(dBµ/m)(dBµ/m)(dBµ/m)(dB/m)(dB/m)(dB)(dB)(dB)(dB)(dB)86.2622.6517.354039.7714.051.3232.49109.5428.92-14.5843.543.216.751.4932.52151.2528.23-15.2743.541.9916.981.7632.54216.2426.55-19.454641.86152.1232.43717.7331.21-14.794633.2726.763.6332.45891.3634.12-11.884632.8128.844.1431.67100011<	(MHz)(dBµ/m)(dB)(dBµ/m)(dBµ/m)(dB)(dB)(dm)<

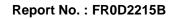


# <2Mbps>

## 2.4GHz 2400~2483.5MHz

BLE (Band	Edge	@ 3m)
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BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0		(MHz)	( dBµV/m )	( dB )	( dBµV/m )	(dBµV)	( dB/m )	( dB )	(dB)	( cm )	(deg)	(P/A)	(H/V)
		2357.565	55.33	-18.67	74	42.08	27.67	16.51	30.93	176	266	Р	Н
		2378.355	44.47	-9.53	54	31.26	27.59	16.54	30.92	176	266	Α	Н
	*	2402	97.59	-	-	84.42	27.5	16.58	30.91	176	266	Р	н
	*	2402	96.03	-	-	82.86	27.5	16.58	30.91	176	266	А	Н
BLE													Н
CH 00													Н
2402MHz		2326.17	54.74	-19.26	74	41.47	27.75	16.46	30.94	400	307	Р	V
240211112		2315.67	44.64	-9.36	54	31.38	27.77	16.44	30.95	400	307	А	V
	*	2402	93.94	-	-	80.77	27.5	16.58	30.91	400	307	Р	V
	*	2402	92.39	-	-	79.22	27.5	16.58	30.91	400	307	А	V
													V
													V
		2331.44	54.4	-19.6	74	41.13	27.74	16.47	30.94	143	260	Р	Н
		2333.68	44.48	-9.52	54	31.22	27.73	16.47	30.94	143	260	А	Н
	*	2440	99	-	-	85.76	27.5	16.64	30.9	143	260	Ρ	Н
	*	2440	96.78	-	-	83.54	27.5	16.64	30.9	143	260	А	Н
515		2493.79	54.88	-19.12	74	41.61	27.41	16.73	30.87	143	260	Р	Н
BLE		2487.58	44.72	-9.28	54	31.46	27.42	16.72	30.88	143	260	А	Н
CH 19 2440MHz		2327.28	54.52	-19.48	74	41.25	27.75	16.46	30.94	376	301	Р	V
2440101112		2343.44	44.48	-9.52	54	31.22	27.71	16.49	30.94	376	301	А	V
	*	2440	95.8	-	-	82.56	27.5	16.64	30.9	376	301	Р	V
	*	2440	94.17	-	-	80.93	27.5	16.64	30.9	376	301	Α	V
		2487.94	54.15	-19.85	74	40.89	27.42	16.72	30.88	376	301	Р	V
		2483.53	44.38	-9.62	54	31.12	27.43	16.71	30.88	376	301	Α	V





	*	2480	97.78	-	-	84.52	27.44	16.7	30.88	100	250	Ρ	Н
	*	2480	96.09	-	-	82.83	27.44	16.7	30.88	100	250	А	н
		2499.16	54.31	-19.69	74	41.05	27.4	16.73	30.87	100	250	Ρ	Н
		2485.76	44.47	-9.53	54	31.21	27.43	16.71	30.88	100	250	А	Н
													н
BLE													Н
CH 39 2480MHz	*	2480	95.76	-	-	82.5	27.44	16.7	30.88	399	303	Р	V
240010112	*	2480	94.16	-	-	80.9	27.44	16.7	30.88	399	303	А	V
		2490.56	54.87	-19.13	74	41.6	27.42	16.72	30.87	399	303	Р	V
		2499.84	44.48	-9.52	54	31.22	27.4	16.73	30.87	399	303	А	V
													V
													V
Remark		o other spurious		Peak and	Average lir	nit line.							



			[		SLE (Harm		<b>,</b>						
BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant		Peak	Pol.
Ant 0		(MHz)	(dBµV/m)	Limit (dB)	Line ( dBµV/m )	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
		4804	39.21	-34.79	74	57.14	31.1	10.05	59.08	100	0	P	H H
		18000	59.29	-14.71	74	49.3	49	18.89	57.9	100	36	Р	Н
		18000	49.89	-4.11	54	39.9	49	18.89	57.9	100	36	А	Н
BLE													Н
CH 00 2402MHz		4804	39.59	-34.41	74	57.52	31.1	10.05	59.08	100	0	Р	V
240210112		18000	59.56	-14.44	74	49.57	49	18.89	57.9	100	128	Р	V
		18000	49.87	-4.13	54	39.88	49	18.89	57.9	100	128	А	V
													V
		4880	39.25	-34.75	74	57.23	31.04	10.11	59.13	100	0	Р	Н
		7320	45.7	-28.3	74	55.63	36.3	12.32	58.55	100	0	Р	Н
		18000	59.18	-14.82	74	49.19	49	18.89	57.9	100	28	Р	Н
BLE CH 19 2440MHz		18000	49.81	-4.19	54	39.82	49	18.89	57.9	100	28	А	Н
		4880	39.38	-34.62	74	57.36	31.04	10.11	59.13	100	0	Р	V
		7320	44.92	-29.08	74	54.85	36.3	12.32	58.55	100	0	Р	V
		18000	59.52	-14.48	74	49.53	49	18.89	57.9	100	139	Р	V
		18000	49.96	-4.04	54	39.97	49	18.89	57.9	100	139	А	V
		4960	39.95	-34.05	74	57.74	31.22	10.17	59.18	100	0	Р	н
		7440	45.19	-28.81	74	54.88	36.3	12.39	58.38	100	0	Р	Н
BLE		18000	58.92	-15.08	74	48.93	49	18.89	57.9	100	38	Р	Н
CH 39		18000	49.77	-4.23	54	39.78	49	18.89	57.9	100	38	А	Н
2480MHz		4960	39.87	-34.13	74	57.66	31.22	10.17	59.18	100	0	Р	V
		7440	45.31	-28.69	74	55	36.3	12.39	58.38	100	0	Р	V
		18000	59.02	-14.98	74	49.03	49	18.89	57.9	100	117	Р	V
		18000	49.47	-4.53	54	39.48	49	18.89	57.9	100	117	А	V
Remark		o other spurious results are PA		Peak and	Average lim	it line.							

# BLE (Harmonic @ 3m)



### Emission above 18GHz

# 2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0		(MHz)	(dBµV/m)	( dB )	(dBµV/m)	(dBµV)	( dB/m )	( dB )	( dB )	( cm )	(deg)	(P/A)	
		21856	39.48	-34.52	74	43.79	38.37	12.02	54.7	150	0	Р	Н
													н
													Н
													Н
													Н
2.4GHz													Н
BLE		20624	38.07	-35.93	74	42.97	38.73	11.22	54.85	150	0	Ρ	V
SHF													V
													V
													V
													V
													V
													V
Remark		o other spurious results are PA		mit line.						<u>.</u>	·		



## Emission below 1GHz

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0		(MHz)	(dBµV/m)		( dBµV/m )	(dBµV)	( dB/m )	( dB )	(dB)	( cm )	(deg)		
		30.97	22.05	-17.95	40	29.66	24.21	0.68	32.5	-	-	Р	Н
		105.66	28.08	-15.42	43.5	42.64	16.48	1.47	32.51	-	-	Р	Н
		164.83	27.96	-15.54	43.5	42.6	16.02	1.84	32.5	-	-	Р	Н
		248.25	28.12	-17.88	46	40.11	18.14	2.27	32.4	-	-	Р	Н
		718.7	32.73	-13.27	46	34.74	26.81	3.63	32.45	-	-	Р	Н
		903.97	33.43	-12.57	46	31.84	29.01	4.18	31.6	100	0	Р	Н
													н
													Н
													н
													н
													н
2.4GHz BLE													н
BLE LF		39.7	32.65	-7.35	40	44.81	19.59	0.81	32.56	100	0	Р	V
LF		104.69	27.28	-16.22	43.5	41.93	16.39	1.47	32.51	-	-	Р	V
		145.43	22.69	-20.81	43.5	36.31	17.16	1.72	32.5	-	-	Р	V
		217.21	21.81	-24.19	46	37.07	15.04	2.13	32.43	-	-	Р	V
		733.25	30.74	-15.26	46	32.01	27.5	3.68	32.45	-	-	Р	V
		911.73	33.23	-12.77	46	31.44	29.13	4.21	31.55	-	-	Р	V
													V
													V
													V
													V
													V
													V

#### 2.4GHz BLE (LF)



# BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	( dBµV/m )	( dB )	(dBµV/m)	(dBµV)	( dB/m )	( dB )	( dB )	( cm )	(deg)	(P/A)	(H/V)
		2371.95	55.08	-18.92	74	41.86	27.61	16.53	30.92	165	215	Р	Н
		2360.295	44.74	-9.26	54	31.5	27.66	16.51	30.93	165	215	А	Н
	*	2402	99.4	-	-	86.23	27.5	16.58	30.91	165	215	Р	Н
	*	2402	97.78	-	-	84.61	27.5	16.58	30.91	165	215	А	н
BLE													Н
CH 00													Н
2402MHz		2371.74	54.91	-19.09	74	41.69	27.61	16.53	30.92	378	269	Р	V
240211112		2334.255	44.75	-9.25	54	31.49	27.73	16.47	30.94	378	269	А	V
	*	2402	91.83	-	-	78.66	27.5	16.58	30.91	378	269	Р	V
	*	2402	89.13	-	-	75.96	27.5	16.58	30.91	378	269	А	V
													V
													V
		2337.84	54.95	-19.05	74	41.69	27.72	16.48	30.94	186	215	Ρ	Н
		2345.2	44.77	-9.23	54	31.51	27.71	16.49	30.94	186	215	А	Н
	*	2440	100.21	-	-	86.97	27.5	16.64	30.9	186	215	Ρ	Н
	*	2440	97.42	-	-	84.18	27.5	16.64	30.9	186	215	А	Н
		2488.75	53.8	-20.2	74	40.53	27.42	16.72	30.87	186	215	Ρ	Н
BLE CH 19		2499.19	44.6	-9.4	54	31.34	27.4	16.73	30.87	186	215	А	Н
2440MHz		2340.56	54.67	-19.33	74	41.41	27.72	16.48	30.94	399	234	Р	V
		2320.24	44.64	-9.36	54	31.38	27.76	16.45	30.95	399	234	А	V
	*	2440	93.11	-	-	79.87	27.5	16.64	30.9	399	234	Ρ	V
	*	2440	91.32	-	-	78.08	27.5	16.64	30.9	399	234	А	V
		2495.86	54.65	-19.35	74	41.38	27.41	16.73	30.87	399	234	Р	V
		2495.95	44.59	-9.41	54	31.32	27.41	16.73	30.87	399	234	А	V





	A P A	217 217 217	146 146	30.88 30.87	16.7	27.44	83.28			98.17	2480	
				30.87			00.20	-	-	96.54	2480	*
	A	217			16.73	27.41	41.72	74	-19.01	54.99	2496.72	
			146	30.88	16.71	27.43	31.47	54	-9.27	44.73	2484.16	
-												
	Ρ	267	398	30.88	16.7	27.44	80.67	-	-	93.93	2480	*
× '	А	267	398	30.88	16.7	27.44	79.1	-	-	92.36	2480	*
, v	Ρ	267	398	30.87	16.72	27.42	40.91	74	-19.82	54.18	2490.64	
× ,	А	267	398	30.87	16.73	27.41	31.34	54	-9.39	44.61	2495.84	
,												
,												
										s found.	o other spurious	



									_				
BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant		Peak	Pol.
Ant 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor ( dB/m )	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
		4804	38.82	-35.18	74	56.75	31.1	10.05	59.08	100	0	P	H
		18000	58.66	-15.34	74	48.67	49	18.89	57.9	100	41	Р	н
		18000	49.87	-4.13	54	39.88	49	18.89	57.9	100	41	А	Н
BLE													Н
CH 00 2402MHz		4804	38.09	-35.91	74	56.02	31.1	10.05	59.08	100	0	Р	V
240210112		17985	58.48	-15.52	74	48.79	48.73	18.88	57.92	100	134	Р	V
		17985	49.98	-4.02	54	40.29	48.73	18.88	57.92	100	134	А	V
													V
		4880	39.61	-34.39	74	57.59	31.04	10.11	59.13	100	0	Р	Н
		7320	44.36	-29.64	74	54.29	36.3	12.32	58.55	100	0	Р	Н
DIE		18000	58.55	-15.45	74	48.56	49	18.89	57.9	100	28	Р	Н
BLE CH 19 2440MHz		18000	49.87	-4.13	54	39.88	49	18.89	57.9	100	28	Α	Н
		4880	38.38	-35.62	74	56.36	31.04	10.11	59.13	100	0	Р	V
24401112		7320	44.39	-29.61	74	54.32	36.3	12.32	58.55	100	0	Р	V
		17985	59.34	-14.66	74	49.65	48.73	18.88	57.92	100	135	Р	V
		17985	50.01	-3.99	54	40.32	48.73	18.88	57.92	100	135	А	V
		4960	39.15	-34.85	74	56.94	31.22	10.17	59.18	100	0	Р	Н
		7440	46.53	-27.47	74	56.22	36.3	12.39	58.38	100	0	Р	Н
BLE		18000	59.46	-14.54	74	49.47	49	18.89	57.9	100	21	Р	Н
CH 39		18000	49.91	-4.09	54	39.92	49	18.89	57.9	100	21	А	Н
2480MHz		4960	40.02	-33.98	74	57.81	31.22	10.17	59.18	100	0	Р	V
		7440	45.81	-28.19	74	55.5	36.3	12.39	58.38	100	0	Р	V
		18000	59.12	-14.88	74	49.13	49	18.89	57.9	100	138	Р	V
		18000	49.77	-4.23	54	39.78	49	18.89	57.9	100	138	А	V
Remark		o other spurious results are PA		eak and	Average lim	it line.							

## BLE (Harmonic @ 3m)





# <WPC Charging Mode>

<1Mbps>

#### 2.4GHz 2400~2483.5MHz

# BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	( dB )	(dBµV/m)	(dBµV)	( dB/m )	( dB )	(dB)	( cm )	(deg)	(P/A)	(H/V)
	*	2480	97.87	-	-	84.61	27.44	16.7	30.88	342	213	Р	н
	*	2480	97.27	-	-	84.01	27.44	16.7	30.88	342	213	А	н
		2490.48	54.5	-19.5	74	41.23	27.42	16.72	30.87	342	213	Р	Н
		2494.68	44.64	-9.36	54	31.37	27.41	16.73	30.87	342	213	А	Н
													Н
BLE													н
CH 39 2480MHz	*	2480	95.46	-	-	82.2	27.44	16.7	30.88	391	302	Р	V
240010112	*	2480	94.83	-	-	81.57	27.44	16.7	30.88	391	302	А	V
		2492.56	54.76	-19.24	74	41.5	27.41	16.72	30.87	391	302	Ρ	V
		2498	44.79	-9.21	54	31.53	27.4	16.73	30.87	391	302	А	V
													V
													V
	1. No	o other spurious	s found.										
Remark		results are PA		eak and	Average lim	it line.							

#### TEL : 886-3-327-3456 FAX : 886-3-328-4978



				В	LE (Harm	onic @	3m)						
BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant		Peak	
Ant 1		(MHz)	(dBµV/m)	Limit (dB)	Line ( dBµV/m )	Level (dBµV)	Factor ( dB/m )	Loss (dB)	Factor (dB)	Pos (cm)		Avg. (P/A)	
		4960	40.98	-33.02	74	58.77	31.22	10.17	59.18	100	0	Р	н
		7440	46.57	-27.43	74	56.26	36.3	12.39	58.38	100	0	Ρ	Н
		18000	61.95	-12.05	74	51.96	49	18.89	57.9	100	31	Ρ	Н
BLE		18000	50.86	-3.14	54	40.87	49	18.89	57.9	100	31	А	Н
CH 39 2480MHz		4960	40.86	-33.14	74	58.65	31.22	10.17	59.18	100	0	Ρ	V
240010172		7440	46.88	-27.12	74	56.57	36.3	12.39	58.38	100	0	Ρ	V
		17985	60.15	-13.85	74	50.46	48.73	18.88	57.92	100	22	Ρ	V
		17985	49.92	-4.08	54	40.23	48.73	18.88	57.92	100	22	А	V
Remark		o other spurious I results are PA		Peak and	Average lim	it line.							



### Emission above 18GHz

# 2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	( dB )	(dBµV/m)	(dBµV)	( dB/m )	( dB )	( dB )	( cm )	(deg)	(P/A)	(H/V)
		21640	38.63	-35.37	74	43.18	38.33	11.82	54.7	150	0	Р	Н
													Н
													н
													Н
2.4GHz													Н
2.4GHZ BLE													н
SHF		20528	37.09	-36.91	74	41.9	38.86	11.22	54.89	150	0	Ρ	V
SHF													V
													V
													V
													V
													V
	1. No	o other spurious	s found.										
Remark		results are PA		mit line.									



## Emission below 1GHz

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)		(dBµV/m)	(dBµV)	( dB/m )	( dB )	(dB)	( cm )	(deg)	(P/A)	
		87.23	22.73	-17.27	40	39.71	14.19	1.32	32.49	-	-	Р	Н
		108.57	29.79	-13.71	43.5	44.04	16.78	1.49	32.52	-	-	Р	Н
		148.34	29.4	-14.1	43.5	43.04	17.12	1.74	32.5	-	-	Р	Н
		217.21	26.2	-19.8	46	41.46	15.04	2.13	32.43	-	-	Р	Н
		242.43	25.22	-20.78	46	37.97	17.41	2.25	32.41	-	-	Ρ	Н
		890.39	33.83	-12.17	46	32.54	28.83	4.14	31.68	100	0	Ρ	н
													н
													Н
													Н
													Н
													н
2.4GHz													н
BLE		39.7	32.94	-7.06	40	45.1	19.59	0.81	32.56	100	0	Р	V
LF		107.6	28.02	-15.48	43.5	42.31	16.75	1.48	32.52	-	-	Р	V
		140.58	32.33	-11.17	43.5	45.7	17.44	1.69	32.5	-	-	Р	V
		218.18	22.07	-23.93	46	37.28	15.09	2.13	32.43	-	-	Р	V
		321	24.06	-21.94	46	34.61	19.49	2.47	32.51	-	-	Р	V
		931.13	33.41	-12.59	46	30.88	29.68	4.27	31.42	-	-	Р	V
													V
													V
													V
													V
													V
													V
					1								•
Remark	1. No other spurious found.												
	2. All results are PASS against limit line.												

# 2.4GHz BLE (LF)



# Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any							
	unwanted emissions shall not exceed the level of the fundamental frequency.							
!	Test result is <b>over limit</b> line.							
P/A	Peak or Average							
H/V	Horizontal or Vertical							



# A calculation example for radiated spurious emission is shown as below:

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBµV/m)	( dB )	(dBµV/m)	(dBµV)	( dB/m )	( dB )	(dB)	( cm )	(deg)	(P/A)	(H/V)
BLE		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	Р	н
CH 00													
2402MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	А	Н

- 1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
- 2. Level( $dB\mu V/m$ ) =

Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

3. Over Limit(dB) = Level(dB $\mu$ V/m) – Limit Line(dB $\mu$ V/m)

#### For Peak Limit @ 2390MHz:

- 1. Level(dBµV/m)
- = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBµV) Preamp Factor(dB)
- $= 32.22(dB/m) + 4.58(dB) + 54.51(dB\mu V) 35.86 (dB)$
- = 55.45 (dBµV/m)
- 2. Over Limit(dB)
- = Level(dBµV/m) Limit Line(dBµV/m)
- $= 55.45(dB\mu V/m) 74(dB\mu V/m)$
- = -18.55(dB)

### For Average Limit @ 2390MHz:

- 1. Level(dBµV/m)
- = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBµV) Preamp Factor(dB)
- $= 32.22(dB/m) + 4.58(dB) + 42.6(dB\mu V) 35.86 (dB)$
- = 43.54 (dBµV/m)
- 2. Over Limit(dB)
- = Level(dB $\mu$ V/m) Limit Line(dB $\mu$ V/m)
- $= 43.54(dB\mu V/m) 54(dB\mu V/m)$
- = -10.46(dB)

#### Both peak and average measured complies with the limit line, so test result is "PASS".