



Report No.: FR450907B

# FCC RADIO TEST REPORT

**FCC ID** : HLZA24004 **Equipment** : Tablet PC

**Brand Name** : acer **Model Name** : A24004

Marketing Name: Acer Iconia Tab P10, P10-21

**Applicant** : Acer Incorporated

8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City

22181, Taiwan (R.O.C)

Manufacturer : Acer Incorporated

8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City

22181, Taiwan (R.O.C)

Standard : FCC Part 15 Subpart C §15.247

The product was received on May 21, 2024 and testing was performed from May 29, 2024 to Jun. 17, 2024. We, Sporton International Inc. Wensan 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 from Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.

Approved by: Louis Wu

Louis Wu

Sporton International Inc. Wensan Laboratory

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)

TEL: 886-3-327-0868 Page Number : 1 of 23 FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024 : 01

## **Table of Contents**

Report No.: FR450907B

His	tory c	of this test report	3
Su	mmar	y of Test Result	4
1	Gene	eral Description	5
	1.1	Product Feature of Equipment Under Test	5
	1.2	Modification of EUT	6
	1.3	Testing Location	6
	1.4	Applicable Standards	6
2	Test	Configuration of Equipment Under Test	7
	2.1	Carrier Frequency Channel	7
	2.2	Test Mode	8
	2.3	Connection Diagram of Test System	9
	2.4	Support Unit used in test configuration and system	9
	2.5	EUT Operation Test Setup	10
	2.6	Measurement Results Explanation Example	10
3	Test	Result	11
	3.1	6dB and 99% Bandwidth Measurement	11
	3.2	Output Power Measurement	12
	3.3	Power Spectral Density Measurement	13
	3.4	Conducted Band Edges and Spurious Emission Measurement	14
	3.5	Radiated Band Edges and Spurious Emission Measurement	15
	3.6	AC Conducted Emission Measurement	19
	3.7	Antenna Requirements	21
4	List	of Measuring Equipment	22
5	Meas	surement Uncertainty	23
Ар	pendi	x A. Conducted Test Results	
Ар	pendi	x B. AC Conducted Emission Test Result	
Ар	pendi	x C. Radiated Spurious Emission Test Data	
Ар	pendi	x D. Duty Cycle Plots	
Аp	pendi	x E. Setup Photographs	

TEL: 886-3-327-0868 Page Number : 2 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

# History of this test report

Report No.: FR450907B

Report No.	Version	Description	Issue Date
FR450907B	01	Initial issue of report	Jun. 25, 2024

TEL: 886-3-327-0868 Page Number : 3 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

# **Summary of Test Result**

Report No.: FR450907B

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) 15.247(b)(4)	Output Power	Pass	-
3.3	15.247(e)	Power Spectral 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	Pass	6.04 dB under the limit at 30.97 MHz and 347.19 MHz
3.6	15.207	AC Conducted Emission	Pass	12.39 dB under the limit at 2.00 MHz
3.7	15.203	Antenna Requirement	Pass	-

#### **Conformity Assessment Condition:**

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the
  regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who
  shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken
  into account.
- 2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty".

#### Disclaimer

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Keven Cheng Report Producer: Rebecca Wu

TEL: 886-3-327-0868 Page Number : 4 of 23 FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

# 1 General Description

## 1.1 Product Feature of Equipment Under Test

#### **Product Feature**

Report No.: FR450907B

#### **General Specs**

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, and GNSS.

#### **Antenna Type**

WLAN: PIFA Antenna Bluetooth: PIFA Antenna

GPS / Glonass / BDS: FPC Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	-2.34

	SKU List						
	SKU1_4G+64G	SKU2_4G+64G	SKU3_6G+128G				
	GuangDong Kingshine	GuangDong Kingshine	GuangDong Kingshine				
PCB	Electronic Technology Co., Ltd.	Electronic Technology Co., Ltd.	Electronic Technology Co.ltd				
	M100TCR110	M100TCR110	M100TCR110				
Front	Shenzhen GALAXYCORE	Shenzhen GALAXYCORE	Shenzhen GALAXYCORE				
Camera	Electronic Co., Ltd.	Electronic Co., Ltd.	Electronic Co., Ltd.				
Camera	GC05A2	GC05A2	GC05A2				
Rear	HIVAC Technology Group	HIVAC Technology Group	HIVAC Technology Group				
Camera	OV13850R2A	OV13850R2A	OV13850R2A				
	Shenzhen Longsys Electronics	ChangXin Memory Electronics,	Shenzhen Longsys Electronics				
DDR	Co., Ltd.	INC.	Co., Ltd.				
	MLXC4004G-W6	KL4X321CQ-C7A	FLXC4006G-63				
	Shenzhen Longsys Electronics	Shenzhen Longsys Electronics	Shenzhen Longsys Electronics				
UFS	Co., Ltd.	Co., Ltd.	Co., Ltd.				
	FEUDNN64G-C2G07	FEUDNN64G-C2G07	FEUDNN128G-C2G07				

	SKU List						
	SKU4_6G+128G	SKU5_6G+256G	SKU6_6G+256G				
	GuangDong Kingshine	GuangDong Kingshine	GuangDong Kingshine				
PCB	Electronic Technology Co., Ltd.	Electronic Technology Co.ltd	Electronic Technology Co., Ltd.				
	M100TCR110	M100TCR110	M100TCR110				
Front	Shenzhen GALAXYCORE	Shenzhen GALAXYCORE	Shenzhen GALAXYCORE				
Camera	Electronic Co., Ltd.	Electronic Co., Ltd.	Electronic Co., Ltd.				
Camera	GC05A2	GC05A2	GC05A2				
Rear	HIVAC Technology Group	HIVAC Technology Group	HIVAC Technology Group				
Camera	OV13850R2A	OV13850R2A	OV13850R2A				
	ChangXin Memory Electronics,	Shenzhen Longsys Electronics	ChangXin Memory Electronics,				
DDR	INC.	Co., Ltd.	INC.				
	KL4X480CO-D2M	FLXC4006G-63	KL4X480CO-D2M				
	SHENZHEN SHICHUANGYI	Shenzhen Longsys Electronics	SHENZHEN SHICHUANGYI				
UFS	ELECTRONICS Co., Ltd.	Co., Ltd.	ELECTRONICS Co., Ltd.				
	U128EYNW2AFE00	FEUDNN256G-C2G07	U256EYNW4AFE00				

**Remark:** The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

TEL: 886-3-327-0868 Page Number : 5 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

## 1.2 Modification of EUT

No modifications made to the EUT during the testing.

## 1.3 Testing Location

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.	
lest one 140.	TH05-HY, CO07-HY, 03CH23-HY	

Report No.: FR450907B

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

FCC designation No.: TW3786

## 1.4 Applicable Standards

According to the specifications declared by 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 15.247 Meas Guidance v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01
- ANSI C63.10-2013

#### Remark:

- 1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
- 2. The TAF code is not including all the FCC KDB listed without accreditation.

TEL: 886-3-327-0868 Page Number : 6 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

# 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	-	-

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : 7 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

#### 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, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported in this report.

Report No.: FR450907B

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.

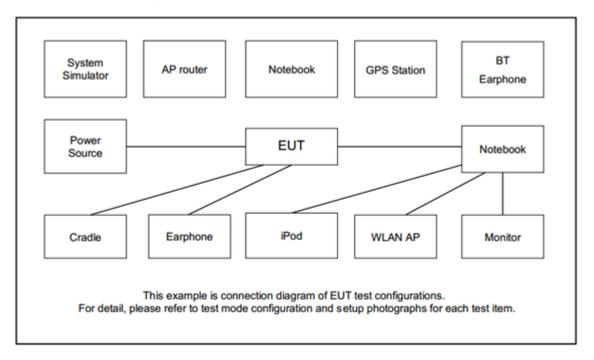
	Summary table of Test Cases				
Test Item	Data Rate / Modulation				
	Bluetooth – LE / GFSK				
Conducted	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps				
Test Cases	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps				
	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps				
Radiated	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps				
Test Cases	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps				
rest cases	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps				
AC Conducted	Mode 1: Bluetooth Link + WLAN (2.4GHz) Link + Battery + USB Cable (Charging				
Emission	form AC Adapter) for SKU5				

#### Remark:

- 1. For Radiated Test Cases, the tests were performed with SKU5 and SKU6.
- 2. For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.

TEL: 886-3-327-0868 Page Number : 8 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

# 2.3 Connection Diagram of Test System



Report No.: FR450907B

## 2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC52	MSQ-RTAC4A00	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

TEL: 886-3-327-0868 Page Number : 9 of 23 FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

## 2.5 EUT Operation Test Setup

The RF test items, make the EUT (SW: Acer\_AV0U0\_P10-21\_1.001.00\_PAPAP\_GEN1) get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

Report No.: FR450907B

## 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)

TEL: 886-3-327-0868 Page Number : 10 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

## 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

Please refer to the measuring equipment list in this test report.

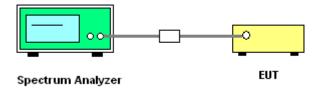
#### 3.1.3 Test Procedures

- 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 is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.

Report No.: FR450907B

- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- 4. 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.
- 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) ≥ 3 \* RBW.
- 6. Measure and record the results in the test report.

#### 3.1.4 Test Setup



#### 3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

#### 3.1.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

TEL: 886-3-327-0868 Page Number : 11 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

## 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.

Report No.: FR450907B

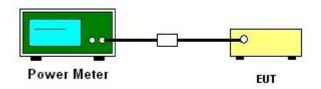
### 3.2.2 Measuring Instruments

Please refer to the measuring equipment list in 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 is connected to the power meter by RF cable and attenuator.
- 3. The path loss is 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.

TEL: 886-3-327-0868 Page Number : 12 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

## 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.

Report No.: FR450907B

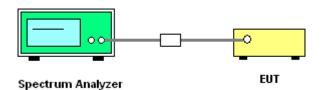
### 3.3.2 Measuring Instruments

Please refer to the measuring equipment list in 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 is connected to the spectrum analyzer by RF cable and attenuator. The path loss is 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. (6 dB 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.
- 7. 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



### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

TEL: 886-3-327-0868 Page Number : 13 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

## 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 30 dB down from the highest emission level within the authorized band.

Report No.: FR450907B

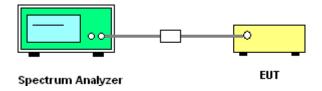
## 3.4.2 Measuring Instruments

Please refer to the measuring equipment list in 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 is connected to the spectrum analyzer by RF cable and attenuator. The path loss is 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

Please refer to Appendix A.

### 3.4.6 Test Result of Conducted Spurious Emission Plots

Please refer to Appendix A.

TEL: 886-3-327-0868 Page Number : 14 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

# 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 transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required 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.

Report No.: FR450907B

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

Please refer to the measuring equipment list in this test report.

TEL: 886-3-327-0868 Page Number : 15 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

### 3.5.3 Test Procedures

- 1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
- 2. The EUT is 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.

Report No.: FR450907B

- 3. The EUT is 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 is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
- 5. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level
- 6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as "-".
- 7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as "-".
- 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 ≥ 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.

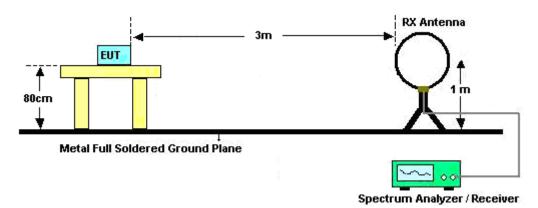
For average measurement:

- 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.

TEL: 886-3-327-0868 Page Number : 16 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

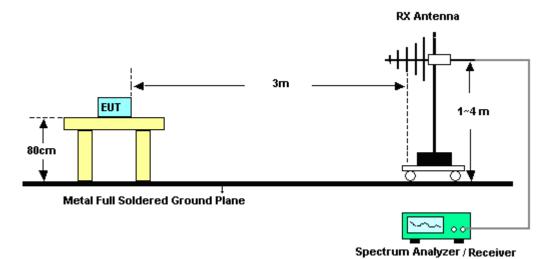
## 3.5.4 Test Setup

#### For radiated test below 30MHz

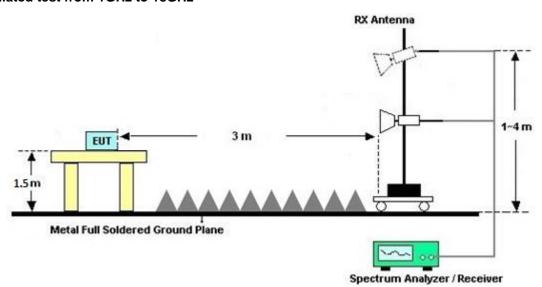


Report No.: FR450907B

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

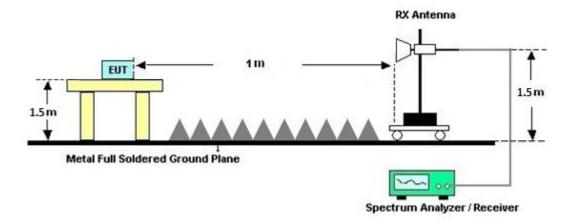


For radiated test from 1GHz to 18GHz



TEL: 886-3-327-0868 Page Number : 17 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

#### For radiated test above 18GHz



Report No.: FR450907B

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

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

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

### 3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

## 3.5.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix C.

TEL: 886-3-327-0868 Page Number : 18 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

### 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.

Report No.: FR450907B

Eroquonov of omission (MHz)	Conducted	limit (dΒμV)
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

<sup>\*</sup>Decreases with the logarithm of the frequency.

### 3.6.2 Measuring Instruments

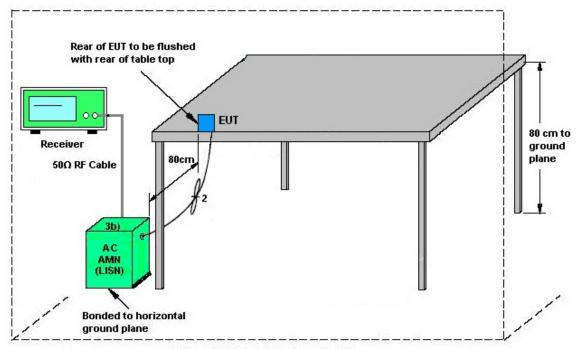
Please refer to the measuring equipment list in this test report.

#### 3.6.3 Test Procedures

- 1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is 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 Line and Neutral shall be tested in order to find out the maximum conducted emission.
- 7. The frequency range from 150 kHz to 30 MHz is scanned.
- Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9 kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

TEL: 886-3-327-0868 Page Number : 19 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

## 3.6.4 Test Setup



Report No.: FR450907B

AMN = Artificial mains network (LISN)

AE = Associated equipment

EUT = Equipment under test

ISN = Impedance stabilization network

## 3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

TEL: 886-3-327-0868 Page Number : 20 of 23 FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

# 3.7 Antenna Requirements

## 3.7.1 Standard Applicable

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.

Report No.: FR450907B

## 3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

TEL: 886-3-327-0868 Page Number : 21 of 23
FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

# 4 List of Measuring Equipment

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	Sep. 12, 2023	Jun. 04, 2024~ Jun. 17, 2024	Sep. 11, 2024	Radiation (03CH23-HY)
Bilog Antenna with 6dB pad	TESEQ & WOKEN	CBL 6111D & 00802N1D-06	62028 & 003	N/A	Oct. 15, 2023	Jun. 04, 2024~ Jun. 17, 2024	Oct. 14, 2024	Radiation (03CH23-HY)
Amplifier	SONOMA	310N	421582	N/A	Jul. 15, 2023	Jun. 04, 2024~ Jun. 17, 2024	Jul. 14, 2024	Radiation (03CH23-HY)
Double Ridged Guide Horn Antenna	RFSPIN	DRH18-E	LE2C05A18E N	1GHz~18GHz	Jul. 12, 2023	Jun. 04, 2024~ Jun. 17, 2024	Jul. 11, 2024	Radiation (03CH23-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA9170	1223	18GHz-40GHz	Jul. 10, 2023	Jun. 04, 2024~ Jun. 17, 2024	Jul. 09, 2024	Radiation (03CH23-HY)
Amplifier	EMEC	EM01G18GA	060878	N/A	Sep. 28, 2023	Jun. 04, 2024~ Jun. 17, 2024	Sep. 27, 2024	Radiation (03CH23-HY)
Preamplifier	EMEC	EM18G40G	060871	18-40GHz	Sep. 06, 2023	Jun. 04, 2024~ Jun. 17, 2024	Sep. 05, 2024	Radiation (03CH23-HY)
Signal Analyzer	Keysight	N9010B	MY62170337	N/A	Aug. 17, 2023	Jun. 04, 2024~ Jun. 17, 2024	Aug. 16, 2024	Radiation (03CH23-HY)
Hygrometer	TECPEL	DTM-303B	TP211542	N/A	Oct. 30, 2023	Jun. 04, 2024~ Jun. 17, 2024	Oct. 29, 2024	Radiation (03CH23-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jun. 04, 2024~ Jun. 17, 2024	N/A	Radiation (03CH23-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Jun. 04, 2024~ Jun. 17, 2024	N/A	Radiation (03CH23-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Jun. 04, 2024~ Jun. 17, 2024	N/A	Radiation (03CH23-HY)
Software	Audix	E3 6.09824_2019 122	RK-002348	N/A	N/A	Jun. 04, 2024~ Jun. 17, 2024	N/A	Radiation (03CH23-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9kHz~30MHz	Mar. 06, 2024	Jun. 04, 2024~ Jun. 17, 2024	Mar. 05, 2025	Radiation (03CH23-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804395/2	N/A	Nov. 27, 2023	Jun. 04, 2024~ Jun. 17, 2024	Nov. 26, 2024	Radiation (03CH23-HY)
RF Cable	EMC	EMC101Y	231115/23111 9/231122	N/A	Nov. 27, 2023	Jun. 04, 2024~ Jun. 17, 2024	Nov. 26, 2024	Radiation (03CH23-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 07, 2023	May 31, 2024~ Jun. 14, 2024	Nov. 06, 2024	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	17I00015SNO 36 (NO:35)	10MHz~6GHz	Aug. 23, 2023	May 31, 2024~ Jun. 14, 2024	Aug. 22, 2024	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101564	10Hz ~ 40GHz	Sep. 12, 2023	May 31, 2024~ Jun. 14, 2024	Sep. 11, 2024	Conducted (TH05-HY)
Switch Box & RF Cable	E-Instument	ETF-1405-0	EC1900067	N/A	Jul. 10, 2023	May 31, 2024~ Jun. 14, 2024	Jul. 09, 2024	Conducted (TH05-HY)
Software	Sporton	BTWIFI_Final_ version1.0	N/A	N/A	N/A	May 31, 2024~ Jun. 14, 2024	N/A	Conducted (TH05-HY)
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	May 29, 2024	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	May 29, 2024	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBE CK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Oct. 20, 2023	May 29, 2024	Oct. 19, 2024	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	Mar. 14, 2024	May 29, 2024	Mar. 13, 2025	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Mar. 10, 2024	May 29, 2024	Mar. 09, 2025	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 20, 2023	May 29, 2024	Sep. 19, 2024	Conduction (CO07-HY)

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : 22 of 23 FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

# **5** Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence	3.44 dB
of 95% (U = 2Uc(y))	

Report No.: FR450907B

#### <u>Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)</u>

Measuring Uncertainty for a Level of Confidence	6 50 dB
of 95% (U = 2Uc(y))	6.50 dB

## Uncertainty of Radiated Emission Measurement (1000 MHz ~ 6000 MHz)

of 95% (U = 2Uc(y))	Measuring Uncertainty for a Level of Confidence	4.60 dB
---------------------	---	---------

#### Uncertainty of Radiated Emission Measurement (6000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence	4.60 dB
of 95% $(U = 2Uc(y))$	4.00 db

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

Measuring Uncertainty for a Level of Confidence	5.30 dB
of 95% (U = 2Uc(y))	5.30 dB

TEL: 886-3-327-0868 Page Number : 23 of 23 FAX: 886-3-327-0855 Issue Date : Jun. 25, 2024

Report Number: FR450907B

## Appendix A. Test Result of Conducted Test Items

Test Engineer:	Hank Hsu	Temperature:	21~25	°C
Test Date:	2024/05/31 ~ 2024/06/14	Relative Humidity:	51~54	%

## TEST RESULTS DATA 6dB and 99% Occupied Bandwidth

Мо	od.	Data Rate	N⊤x	(MHz)		99% Occupied BW (MHz)	ccupied 6dB BW BW (MHz)		Pass/Fail
BL	E	1Mbps	1	0	2402	1.033	0.691	0.50	Pass
BL	E	1Mbps	1	19	2440	1.037	0.693	0.50	Pass
Bl	E	1Mbps	1	39	2480	1.035	0.696	0.50	Pass

# TEST RESULTS DATA Average Power Table

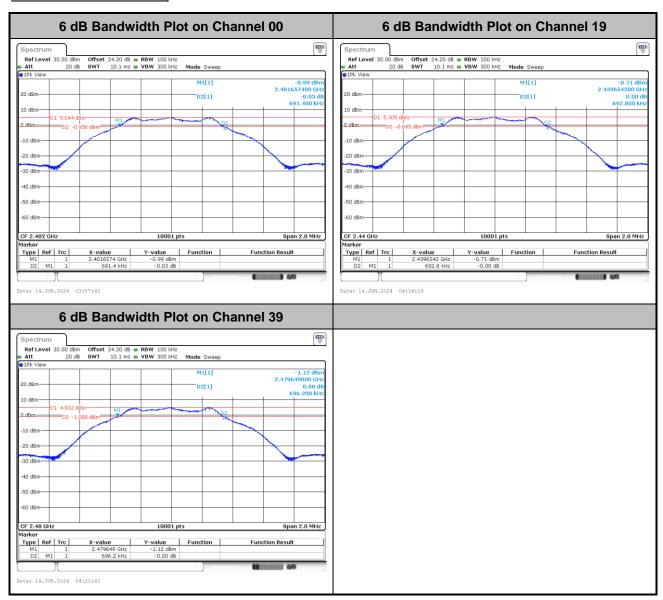
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	5.50	30.00	-2.34	3.16	36.00	Pass
BLE	1Mbps	1	19	2440	5.80	30.00	-2.34	3.46	36.00	Pass
BLE	1Mbps	1	39	2480	5.40	30.00	-2.34	3.06	36.00	Pass

# TEST RESULTS DATA Peak Power Density

Mod.	Data Rate	N⊤x	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	5.02	-9.45	-2.34	8.00	Pass
BLE	1Mbps	1	19	2440	5.30	-9.13	-2.34	8.00	Pass
BLE	1Mbps	1	39	2480	4.92	-9.47	-2.34	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

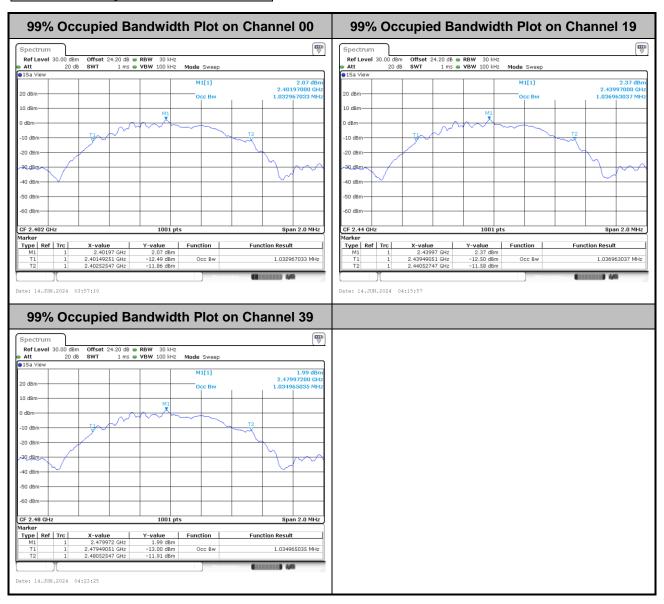
# 6dB Bandwidth



Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : A2-1 of 6

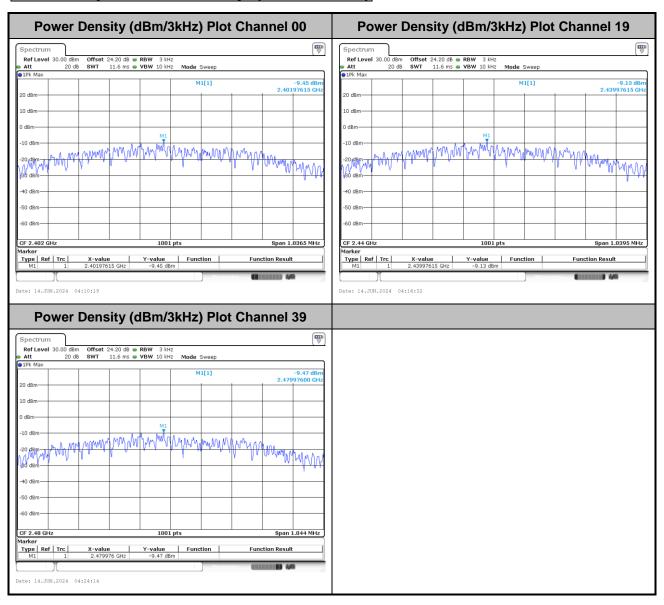
# 99% Occupied Bandwidth



Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : A2-2 of 6

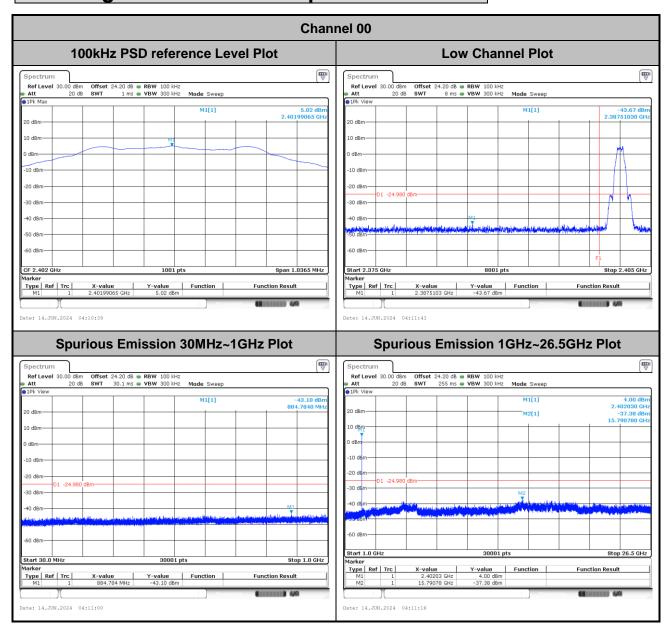
# Power Spectral Density (dBm/3kHz)



Report No.: FR450907B

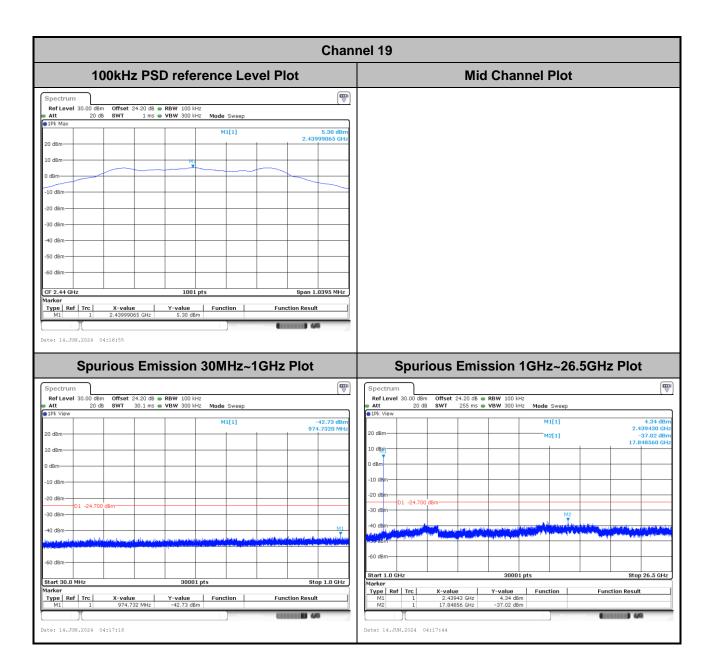
TEL: 886-3-327-0868 Page Number : A2-3 of 6

# **Band Edge and Conducted Spurious Emission**



Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : A2-4 of 6



Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : A2-5 of 6

**Channel 39** 100kHz PSD reference Level Plot **High Channel Plot** Ref Level 30.00 4.92 dBm 2.47999370 GHz -10 dBm-30 dBn 40 dBm Start 2.475 GHz CF 2.48 GHz Span 1.044 MHz Stop 2.505 GHz Type Ref Trc Type Ref Trc Function Function Result Function Function Result Spurious Emission 30MHz~1GHz Plot Spurious Emission 1GHz~26.5GHz Plot Ref Level 30.00 Att Offset 24.20 dB • RBW 100 kHz SWT 30.1 ms • VBW 300 kHz Mode Sweep -37.65 dBn 18.511540 GH 10 dBm 10 dBm -10 dB -20 dBn D1 -25.08 30 dBm 60 dBm Start 1.0 GHz Stop 1.0 GHz X-value 2.48023 GHz 18.51154 GHz Y-value 5.09 dBm -37.65 dBm Function **Function Result** Y-value Function -42.55 dBm Type Ref Trc Function Result Date: 14.JUN.2024 04:25:04 Date: 14.JUN.2024 04:25:22

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : A2-6 of 6

# **Appendix B. AC Conducted Emission Test Results**

Tool Engineer	Lauia Chung	Temperature :	20.4~25.6°C
Test Engineer :	Louis Chung	Relative Humidity :	46.7~58.3%

Report No.: FR450907B

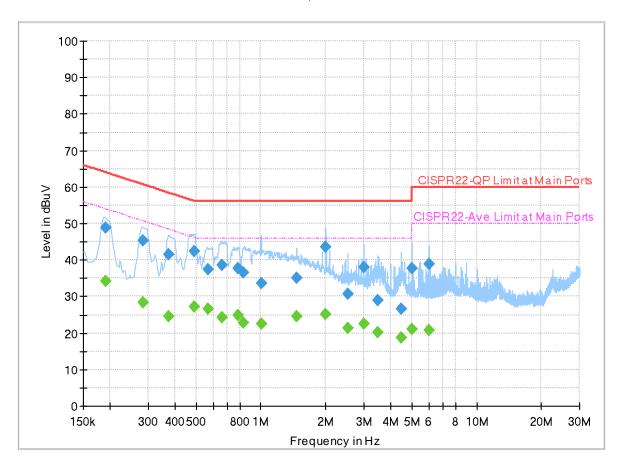
TEL: 886-3-327-0868 Page Number : B1 of B

## **EUT Information**

Report NO: 450907
Test Mode: Mode 1
Test Voltage: 120Vac/60Hz

Phase: Line

### Full Spectrum



# Final\_Result

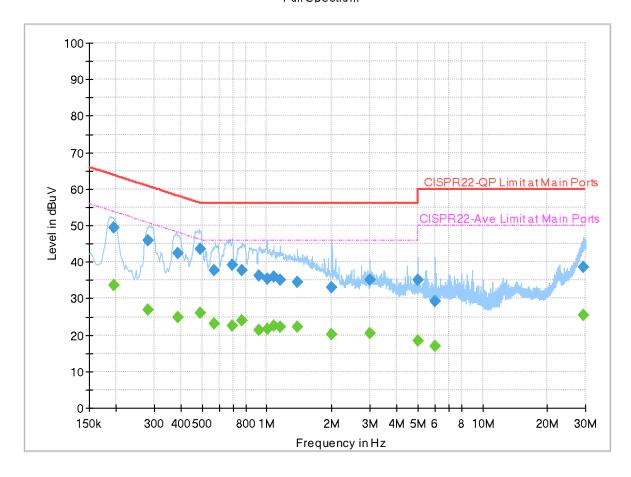
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.190320		34.30	54.02	19.72	L1	OFF	19.9
0.190320	48.77		64.02	15.25	L1	OFF	19.9
0.282750		28.47	50.74	22.27	L1	OFF	19.9
0.282750	45.40		60.74	15.34	L1	OFF	19.9
0.372750		24.46	48.44	23.98	L1	OFF	19.9
0.372750	41.60		58.44	16.84	L1	OFF	19.9
0.492090		27.16	46.13	18.97	L1	OFF	19.9
0.492090	42.49		56.13	13.64	L1	OFF	19.9
0.567960		26.63	46.00	19.37	L1	OFF	19.9
0.567960	37.41		56.00	18.59	L1	OFF	19.9
0.656340		24.22	46.00	21.78	L1	OFF	19.9
0.656340	38.68		56.00	17.32	L1	OFF	19.9
0.784500		24.74	46.00	21.26	L1	OFF	19.9
0.784500	37.59		56.00	18.41	L1	OFF	19.9
0.829500		22.78	46.00	23.22	L1	OFF	19.9
0.829500	36.56	-	56.00	19.44	L1	OFF	19.9
1.007250		22.40	46.00	23.60	L1	OFF	19.9
1.007250	33.68		56.00	22.32	L1	OFF	19.9
1.463730		24.50	46.00	21.50	L1	OFF	19.9

1.463730	35.21		56.00	20.79	L1	OFF	19.9
1.999050		25.11	46.00	20.89	L1	OFF	19.9
1.999050	43.61		56.00	12.39	L1	OFF	19.9
2.538510		21.38	46.00	24.62	L1	OFF	20.0
2.538510	30.66		56.00	25.34	L1	OFF	20.0
2.999760		22.62	46.00	23.38	L1	OFF	20.0
2.999760	38.00		56.00	18.00	L1	OFF	20.0
3.499800		20.24	46.00	25.76	L1	OFF	20.0
3.499800	28.90		56.00	27.10	L1	OFF	20.0
4.456860		18.79	46.00	27.21	L1	OFF	20.0
4.456860	26.57		56.00	29.43	L1	OFF	20.0
5.001270		20.98	50.00	29.02	L1	OFF	20.0
5.001270	37.76		60.00	22.24	L1	OFF	20.0
6.000450		20.70	50.00	29.30	L1	OFF	20.0
6.000450	38.76		60.00	21.24	L1	OFF	20.0

## **EUT Information**

Report NO: 450907
Test Mode: Mode 1
Test Voltage: 120Vac/60Hz
Phase: Neutral

Full Spectrum



# Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.195000		33.60	53.82	20.22	N	OFF	19.9
0.195000	49.27		63.82	14.55	N	OFF	19.9
0.281760		26.76	50.76	24.00	N	OFF	19.9
0.281760	45.78		60.76	14.98	N	OFF	19.9
0.386250		25.00	48.14	23.14	N	OFF	19.9
0.386250	42.40		58.14	15.74	N	OFF	19.9
0.492000		26.04	46.13	20.09	N	OFF	19.9
0.492000	43.52		56.13	12.61	N	OFF	19.9
0.571920		23.12	46.00	22.88	N	OFF	19.9
0.571920	37.59		56.00	18.41	N	OFF	19.9
0.688740		22.60	46.00	23.40	N	OFF	19.9
0.688740	39.11		56.00	16.89	N	OFF	19.9
0.768300		23.89	46.00	22.11	N	OFF	19.9
0.768300	37.82		56.00	18.18	N	OFF	19.9
0.921750		21.32	46.00	24.68	N	OFF	19.9
0.921750	36.39		56.00	19.61	N	OFF	19.9
1.003650		21.66	46.00	24.34	N	OFF	19.9
1.003650	35.31		56.00	20.69	N	OFF	19.9
1.077450		22.51	46.00	23.49	N	OFF	19.9

1.077450	35.91		56.00	20.09	Ν	OFF	19.9
1.149000	-	22.31	46.00	23.69	Ν	OFF	19.9
1.149000	35.19		56.00	20.81	Ν	OFF	19.9
1.383630	-	22.21	46.00	23.79	Ν	OFF	19.9
1.383630	34.44		56.00	21.56	N	OFF	19.9
1.995000		20.05	46.00	25.95	N	OFF	19.9
1.995000	33.16		56.00	22.84	N	OFF	19.9
3.001110		20.61	46.00	25.39	N	OFF	20.0
3.001110	35.02		56.00	20.98	N	OFF	20.0
5.001270		18.44	50.00	31.56	N	OFF	20.0
5.001270	35.08		60.00	24.92	N	OFF	20.0
6.004500		16.92	50.00	33.08	N	OFF	20.0
6.004500	29.15		60.00	30.85	N	OFF	20.0
29.290650		25.45	50.00	24.55	N	OFF	20.2
29.290650	38.49	-	60.00	21.51	N	OFF	20.2

# **Appendix C. Radiated Spurious Emission Test Data**

Test Engineer : Leo L	Loo Li and Lucifor liana	Relative Humidity :	21.7~22.5℃	
	eo Li and Lucifer Jiang	Temperature :	51~57%	

Report No. : FR450907B

## C1. Radiated Spurious Emission Test Modes

## <SKU5>

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 5	2400-2483.5	1	Bluetooth-LE_GFSK	00	2402	1Mbps	-	-
Mode 6	2400-2483.5	1	Bluetooth-LE_GFSK	19	2440	1Mbps	-	-
Mode 7	2400-2483.5	1	Bluetooth-LE_GFSK	39	2480	1Mbps	-	-
Mode 8	2400-2483.5	1	Bluetooth-LE_GFSK	39	2480	1Mbps	-	LF

### <SKU6>

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 20	2400-2483.5	1	Bluetooth-LE_GFSK	39	2480	1Mbps	-	-
Mode 20	2400-2483.5	1	Bluetooth-LE_GFSK	39	2480	1Mbps	-	LF

TEL: 886-3-327-0868 Page Number : C1 of C18

# C2. Summary of each worse mode

## <SKU5>

Mode	Modulation	Ch.	Freq.	Level	Limit	Margin	Pol.	Peak	Beault	sult RU	Remark
			(MHz)	(dBuV/m)	(dBuV/m)	(dB)		Avg.	Result		
5	Bluetooth-LE_GFSK	00	2364.92	41.84	54.00	-12.16	Н	Avg.	Pass	-	Band Edge
	Bluetooth-LE_GFSK	00	4804.00	45.15	74.00	-28.85	V	Peak	Pass	-	Harmonic
6	Bluetooth-LE_GFSK	19	2374.87	41.86	54.00	-12.14	V	Avg.	Pass	-	Band Edge
	Bluetooth-LE_GFSK	19	7320.00	40.45	54.00	-13.55	V	Avg.	Pass	-	Harmonic
7	Bluetooth-LE_GFSK	39	2491.42	42.02	54.00	-11.98	V	Avg.	Pass	-	Band Edge
	Bluetooth-LE_GFSK	39	7440.00	40.26	54.00	-13.74	V	Avg.	Pass	-	Harmonic
8	LF	39	30.97	33.96	40.00	-6.04	V	Peak	Pass	-	LF

Report No. : FR450907B

## <SKU6>

Mode	Modulation	Ch.	Freq.	Level	Limit	Margin	Pol.	Peak	Result RU	DII	Remark
			(MHz)	(dBuV/m)	(dBuV/m)	(dB)		Avg.		Remark	
	Bluetooth-LE_GFSK	39	2485.04	41.80	54.00	-12.20	Н	Avg.	Pass	-	Band Edge
20	Bluetooth-LE_GFSK	39	7440.00	40.55	54.00	-13.45	Н	Avg.	Pass	-	Harmonic
	BLE Tx LF	39	347.19	39.96	46.00	-6.04	Н	Peak	Pass	-	LF

TEL: 886-3-327-0868 Page Number : C2 of C18



# <SKU5>

	5									
Mode	Band Edge  2400-2483.5_Bluetooth-LE_GFSK _CH00_2402MHz									
ANT	1									
Pol.	Horizontal	Fundamental								
	140 Level (dBuVim)	140 Level (dBuV/m)								
	122.5	122.5								
	105.0	105.0								
	87.5	87.5 PEAK_74								
	70.0	70.0								
	52.5 service contravers and in the contravers and a service of the contravers and the con	52.5								
Peak	35.0 17.5	35.0 17.5								
	2310 2328.4 2346.8 2365.2 2383.6 2402 Frequency (MHz)	1000 1400. 1800. 2200. 2600. 3000 Frequency (MHz)								
	: RBN:1000.000kHz VBN:3000.000kHz SNT:Auto  Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark  MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2340.18 51.69 74.00 -22.31 38.61 27.10 7.25 31.70 10.43 300 183 PEAK	: RBM:1000.000kHz VBM:3000.000kHz SMT:Auto  Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor  MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB dB cm deg 1 2402.00 96.99								
	140_Level (dBuVim)	140 evel (dBuVim)								
	122.5	122.5								
	105.0	105.0								
	87.5	87.5								
	70.0	70.0								
	52.5	52.5 AVG_54								
Avg	35.0	35.0								
	17.5	17.5								
	2310 2328.4 2346.8 2365.2 2383.6 2402 Frequency (MHz)	1000 1400. 1800. 2200. 2600. 3000 Frequency (MHz)								
	Site : 03CH23-HY Condition: AVG BE 54 3m DRH18-E_LE2C05A18EN_230712 HORIZONTAL : RBN:1000.000kHz VBN:2.700kHz SNT:Auto	Site : 03CH23-HY Condition: AVG_54 3m DRH18-E_LE2C05A18EN_230712 HORIZONTAL : RBN:1000.000kHz VBN:2.700kHz SNT:Auto								
	Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark	Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark								
	MHz dBUV/m dBUV/m dB dBUV dB/m dB dB dB cm deg   1 2364.92 41.84 54.00 -12.16 28.73 27.10 7.30 31.72 10.43 300 183 AVERAGE	MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2402.00 96.37 83.23 27.08 7.36 31.74 10.44 300 183 AVERAGE								

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C3 of C18

5 Mode **Band Edge** 2400-2483.5\_Bluetooth-LE\_GFSK \_CH00\_2402MHz **ANT** Pol. Vertical **Fundamental** 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK\_74 70.0 70.0 52.5 52.5 35.0 35.0 **Peak** 17.5 17.5 2310 1000 2328.4 2346.8 2 Frequency (MHz) 2383.6 1400. 2402 3000 Frequency (MHz) : 03CH23-HY : 03CH23-HV Condition: PEAK\_BE\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor | MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB dB cm deg | 1 2362.44 | 51.26 | 74.00 -22.74 | 38.15 | 27.10 | 7.29 | 31.71 | 10.43 | 300 | 197 PEAK | MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB dB cm deg | 1 2492.00 80.88 ----- 67.74 27.08 7.36 31.74 10.44 300 197 PEAK 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 70.0 70.0 52.5 52.5 35.0 35.0 Avg 17.5 17.5 2310 1000 2346.8 2365.2 Frequency (MHz) 2383.6 1800. 2200. Frequency (MHz) 2328.4 2402 1400. 3000 : 03CH23-HY : 03CH23-HY Condition: AVG\_BE\_54 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Condition: AVG\_54 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:2.700kHz SWT:Auto : RBW:1000.000kHz VBW:2.700kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2383.78 41.62 54.00 -12.38 28.58 27.00 7.33 31.73 10.44 300 197 AVERAGE | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2402.00 80.07 ----- 66.93 27.08 7.36 31.74 10.44 300 197 AVERAGE

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C4 of C18

5 Mode Harmonic 2400-2483.5\_Bluetooth-LE\_GFSK \_CH00\_2402MHz **ANT** Pol. Horizontal Vertical 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 PEAK\_74 PEAK\_74 70.0 70.0 AVG\_54 52.5 52.5 Peak 35.0 35.0 Avg 17.5 17.5 1000 10600. Frequency (MHz) 1000 00. 15400. Frequency (MHz) 20200. 5800. 20200. 25000 5800. 15400. 25000 Site : 03CH23-HY Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Site : 03CH23-HY Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL Limit Read Ant Cable Preamp Aux APos TPos
Freq Level Line Margin Level Factor Loss Factor Factor Remark Limit Read Ant Cable Preamp Aux APos TPos
Freq Level Line Margin Level Factor Loss Factor Factor Remark | MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB dB cm deg | 1 4804.00 44.83 74.00 -29.17 33.13 32.30 10.56 32.98 1.82 --- -- Peak | MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg | 1 4804.00 45.15 74.00 -28.85 33.45 32.30 10.56 32.98 1.82 -- -- Peak

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C5 of C18

6 Mode Band Edge - L 2400-2483.5\_Bluetooth-LE\_GFSK \_CH19\_2440MHz **ANT** Pol. Horizontal **Fundamental** 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK\_74 70.0 70.0 52.5 35.0 35.0 **Peak** 17.5 17.5 2310 2362. Frequency (MHz) 1000 1400. 2440 3000 Frequency (MHz) : 03CH23-HY : 03CH23-HV Condition: PEAK\_BE\_74 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | dB | dB | dB | cm | | 1 | 2338.73 | 51.06 | 74.00 | -22.94 | 37.98 | 27.11 | 7.25 | 31.70 | 10.42 | 200 | deg 181 PEAK 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 70.0 52.5 52.5 35.0 35.0 Avg 17.5 17.5 2310 1000 2362. 2388. Frequency (MHz) 2336. 2440 1400. 1800. 2200. Frequency (MHz) 3000 : 03CH23-HY : 03CH23-HY Condition: AVG\_BE\_54 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL Condition: AVG\_54 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL : RBW:1000.000kHz VBW:2.700kHz SWT:Auto : RBW:1000.000kHz VBW:2.700kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2354.33 41.71 54.00 -12.29 28.61 27.10 7.28 31.71 10.43 200 181 AVERAGE MHz dBuV/m dBuV/m dB dB dB dB cm deg 1 2440.00 98.07 ----- 85.06 26.90 7.41 31.76 10.46 200 181 AVERAGE

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C6 of C18

6 Mode Band Edge - R 2400-2483.5\_Bluetooth-LE\_GFSK \_CH19\_2440MHz **ANT** Pol. Horizontal **Fundamental** 140 Level (dBuV/m) 122.5 105.0 87.5 PEAK\_BE\_74 70.0 52.5 35.0 **Peak Blank** 17.5 2464. 2476. Frequency (MHz) 2452. 2488. 2500 Site : 03CH23-HY
Condition: PEAK\_BE\_74 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Line Margin Level Factor Loss Factor Factor 140 Level (dBuV/m) 122.5 105.0 87.5 70.0 52.5 35.0 **Blank** Avg 17.5 2440 2452. 2464. 2476. Frequency (MHz) 2488. 2500 : 03CH23-HY Condition: AVG\_BE\_54 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL : RBW:1000.000kHz VBW:2.700kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2487.34 41.82 54.00 -12.18 28.78 26.87 7.48 31.79 10.48 200 181 AVERAGE

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C7 of C18

6 Mode Band Edge - L 2400-2483.5\_Bluetooth-LE\_GFSK \_CH19\_2440MHz **ANT** Pol. Vertical **Fundamental** 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK\_74 70.0 70.0 52.5 35.0 35.0 **Peak** 17.5 17.5 2310 1000 2336. 1400. 2440 3000 Frequency (MHz) Frequency (MHz) : 03CH23-HY : 03CH23-HV Condition: PEAK\_BE\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | dB | dB | dB | cm | | 2374.87 | 51.40 | 74.00 | -22.60 | 38.33 | 27.05 | 7.31 | 31.72 | 10.43 | 300 | deg 305 PEAK 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 70.0 70.0 52.5 52.5 35.0 35.0 Avg 17.5 17.5 2310 1000 2362. 2388. Frequency (MHz) 1800. 2200. Frequency (MHz) 2336. 2440 1400. 3000 : 03CH23-HY : 03CH23-HY Condition: AVG\_BE\_54 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Condition: AVG\_54 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:2.700kHz SWT:Auto : RBW:1000.000kHz VBW:2.700kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2374.87 41.86 54.00 -12.14 28.79 27.05 7.31 31.72 10.43 300 305 AVERAGE MHz dBuV/m dBuV/m dB dB dB dB cm deg 1 2440.00 93.48 ----- 80.47 26.90 7.41 31.76 10.46 300 305 AVERAGE

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C8 of C18

6 Mode Band Edge - R 2400-2483.5\_Bluetooth-LE\_GFSK \_CH19\_2440MHz **ANT** Pol. Vertical **Fundamental** 140 Level (dBuV/m) 122.5 105.0 87.5 PEAK\_BE\_74 70.0 52.5 35.0 **Peak Blank** 17.5 2440 2464. 2476. Frequency (MHz) 2452. 2488. 2500 Site : 03CH23-HY
Condition: PEAK\_BE\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Line Margin Level Factor Loss Factor Factor | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | dB | dB | dB | cm | | 1 | 2491.48 | 51.58 | 74.00 -22.42 | 38.51 | 26.90 | 7.48 | 31.79 | 10.48 | 300 | deg 305 PEAK 140 Level (dBuV/m) 122.5 105.0 87.5 70.0 52.5 35.0 **Blank** Avg 17.5 2440 2452. 2464. 2476. Frequency (MHz) 2488. 2500 : 03CH23-HY Condition: AVG\_BE\_54 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:2.700kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Remark | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2496.94 41.69 54.00 -12.31 28.62 26.90 7.49 31.80 10.48 300 305 AVERAGE

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C9 of C18

6 Mode **Harmonic** 2400-2483.5\_Bluetooth-LE\_GFSK \_CH19\_2440MHz **ANT** Pol. Horizontal Vertical 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK\_74 PEAK\_74 70.0 70.0 AVG\_54 AVG\_54 52.5 52.5 35.0 35.0 **Peak** 17.5 17.5 Avg 1000 1000 5800. 10600. 15400. Frequency (MHz) 20200. 25000 5800. 10600. 15400. Frequency (MHz) 20200. 25000 : 03CH23-HY Site : 03CH23-HY Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Limit Read Ant Cable Preamp Aux Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Limit Read Ant Cable Preamp Aux APos TPos Read Ant Cable Preamp Aux APos TPos Remark Remark -- Average

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C10 of C18

7 Mode **Band Edge** 2400-2483.5\_Bluetooth-LE\_GFSK \_CH39\_2480MHz **ANT** Pol. Horizontal **Fundamental** 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK\_74 PEAK\_BE\_74 70.0 70.0 52.5 52.5 35.0 35.0 **Peak** 17.5 17.5 2480 1000 1400. 2500 3000 Frequency (MHz) Frequency (MHz) : 03CH23-HY : 03CH23-HV Condition: PEAK\_BE\_74 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor | MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB dB cm deg | 1 2492.30 | 52.17 | 74.00 -21.83 | 39.11 | 26.90 | 7.48 | 31.80 | 10.48 | 217 | 151 | PEAK MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB dB cm deg 1 2488.00 180.56 ····· 87.60 26.80 7.47 31.79 10.48 217 151 PEAK 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 70.0 52.5 52.5 35.0 35.0 Avg 17.5 17.5 2480 1000 2488. 2492. Frequency (MHz) 2484. 2500 1400. 1800. 2200. Frequency (MHz) 3000 : 03CH23-HY : 03CH23-HY Condition: AVG\_BE\_54 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL Condition: AVG\_54 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL : RBW:1000.000kHz VBW:2.700kHz SWT:Auto : RBW:1000.000kHz VBW:2.700kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2483.54 41.88 54.00 -12.12 28.88 26.84 7.47 31.79 10.48 217 151 AVERAGE MHz dBuV/m dBuV/m dB dB dB dB cm deg 1 2480.00 100.00 ----- 87.04 26.80 7.47 31.79 10.48 217 151 AVERAGE

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C11 of C18

7 Mode **Band Edge** 2400-2483.5\_Bluetooth-LE\_GFSK \_CH39\_2480MHz **ANT** Pol. Vertical **Fundamental** 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK\_74 PEAK\_BE\_74 70.0 70.0 52.5 35.0 35.0 **Peak** 17.5 17.5 2480 1000 1400. 2500 3000 Frequency (MHz) Frequency (MHz) : 03CH23-HY : 03CH23-HV Condition: PEAK\_BE\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor | MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB dB cm deg | 1 2487.06 | 51.66 | 74.00 | -22.34 | 38.62 | 26.87 | 7.48 | 31.79 | 19.48 | 373 | 260 PEAK 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 70.0 52.5 52.5 35.0 35.0 Avg 17.5 17.5 2480 1000 2488. 2492. Frequency (MHz) 2484. 2500 1400. 1800. 2200. Frequency (MHz) 3000 : 03CH23-HY : 03CH23-HY Condition: AVG\_BE\_54 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Condition: AVG\_54 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:2.700kHz SWT:Auto : RBW:1000.000kHz VBW:2.700kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2491.42 42.02 54.00 -11.98 28.95 26.90 7.48 31.79 10.48 373 260 AVERAGE MHz dBuV/m dBuV/m dB dB vdV dB/m dB dB dB cm deg 1 2480.00 95.55 ----- 82.59 26.80 7.47 31.79 10.48 373 260 AVERAGE

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C12 of C18

7 Mode **Harmonic** 2400-2483.5\_Bluetooth-LE\_GFSK \_CH39\_2480MHz **ANT** Pol. Horizontal Vertical 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK\_74 PEAK\_74 70.0 70.0 AVG\_54 AVG\_54 52.5 52.5 35.0 35.0 **Peak** 17.5 17.5 Avg 1000 1000 5800. 10600. 15400. Frequency (MHz) 20200. 25000 5800. 10600. 15400. Frequency (MHz) 20200. 25000 : 03CH23-HY Site : 03CH23-HY Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Limit Read Ant Cable Preamp Aux Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Limit Read Ant Cable Preamp Aux APos TPos Read Ant Cable Preamp Aux APos TPos Remark Remark deg -- Peak -- Peak -- Average -- Average

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C13 of C18

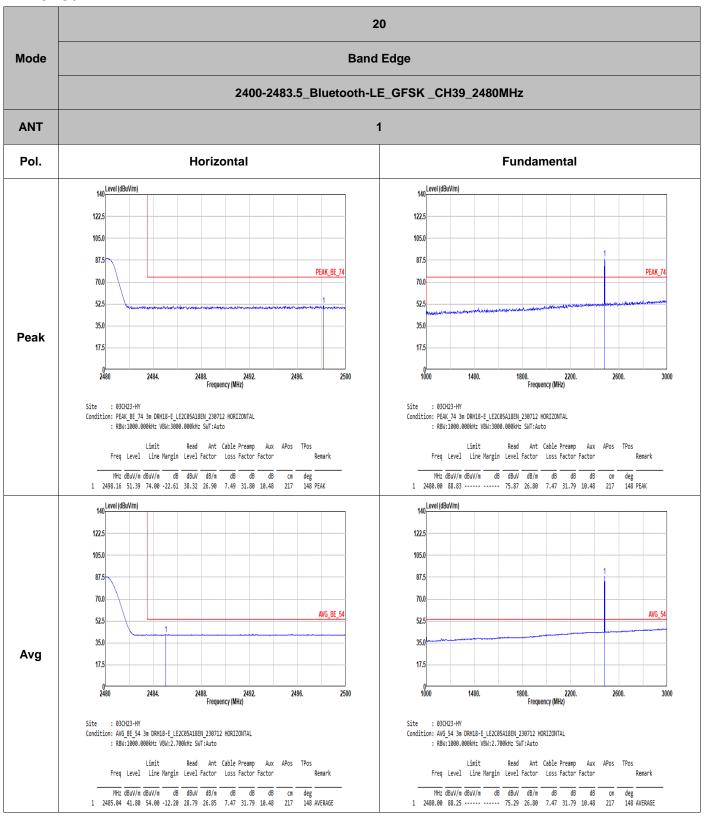
8 LF Mode 2400-2483.5\_Bluetooth-LE\_GFSK \_CH39\_2480MHz **ANT** Pol. Horizontal Vertical 80 Level (dBuV/m) 80 Level (dBuV/m) 70.0 50.0 50.0 20.0 QP/ 10.0 10.0 Peak 418. Frequency (MHz) 224. 418. 612. Frequency (MHz) 806. 1000 224. 612. 806. 1000 Site : 03CH23-HY Condition: QP 3m LF\_63303&001\_231015 HORIZONTAL Site : 03CH23-HY Condition: QP 3m LF\_63303&001\_231015 VERTICAL APos TPos Remark Limit Read Ant Cable Preamp Aux Freq Level Line Margin Level Factor Loss Factor Factor Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor deg
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-- Peak
-- Peak deg
-- Peak
-- Peak
-- Peak
-- Peak
-- Peak

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C14 of C18



### <SKU6>



Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C15 of C18

20 Mode **Band Edge** 2400-2483.5\_Bluetooth-LE\_GFSK \_CH39\_2480MHz **ANT** Pol. Vertical **Fundamental** 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK\_74 PEAK\_BE\_74 70.0 70.0 52.5 52.5 35.0 35.0 **Peak** 17.5 17.5 2480 1000 1400. 2488. 2500 3000 Frequency (MHz) Frequency (MHz) : 03CH23-HY : 03CH23-HY Condition: PEAK\_BE\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor | MHz | dBuV/m | dBuV/m | dB | dBuV | dB/m | dB | dB | dB | cm | 1 | 2484.26 | 51.84 | 74.00 | -22.16 | 38.84 | 26.84 | 7.47 | 31.79 | 10.48 | 178 | deg 0 PEAK 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 52.5 52.5 35.0 35.0 Avg 17.5 17.5 2480 1000 2488. 2492. Frequency (MHz) 2484. 2500 1400. 1800. 2200. Frequency (MHz) 3000 : 03CH23-HY : 03CH23-HY Condition: AVG\_BE\_54 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Condition: AVG\_54 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL : RBW:1000.000kHz VBW:2.700kHz SWT:Auto : RBW:1000.000kHz VBW:2.700kHz SWT:Auto Limit Read Ant Cable Preamp Aux APos TPos Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor Freq Level Line Margin Level Factor Loss Factor Factor Remark Remark | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2485.36 41.78 54.00 -12.22 28.76 26.85 7.48 31.79 10.48 178 0 AVERAGE | MHz dBuV/m dBuV/m dB dB dB dB cm deg | 1 2480.00 85.03 ----- 72.07 26.80 7.47 31.79 10.48 178 0 AVERAGE

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C16 of C18

20 Mode **Harmonic** 2400-2483.5\_Bluetooth-LE\_GFSK \_CH39\_2480MHz **ANT** Pol. Horizontal Vertical 140 Level (dBuV/m) 140 Level (dBuV/m) 122.5 122.5 105.0 105.0 87.5 87.5 PEAK\_74 PEAK\_74 70.0 70.0 AVG\_54 AVG\_54 52.5 52.5 35.0 35.0 **Peak** 17.5 17.5 Avg 1000 1000 5800. 10600. 15400. Frequency (MHz) 20200. 25000 5800. 10600. 15400. Frequency (MHz) 20200. 25000 : 03CH23-HY Site : 03CH23-HY Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 HORIZONTAL Condition: PEAK\_74 3m DRH18-E\_LE2C05A18EN\_230712 VERTICAL Freq Level Limit Read Ant Cable Preamp Aux APos TPos Limit Read Ant Cable Preamp Aux Freq Level Line Margin Level Factor Loss Factor Factor Read Ant Cable Preamp Aux APos TPos Remark Remark deg -- Peak -- Peak -- Average -- Average

Report No.: FR450907B

TEL: 886-3-327-0868 Page Number : C17 of C18

20 LF Mode 2400-2483.5\_Bluetooth-LE\_GFSK \_CH39\_2480MHz **ANT** Pol. Horizontal Vertical 80 Level (dBuV/m) 80 Level (dBuV/m) 70.0 50.0 20.0 QP/ 10.0 10.0 Peak 418. Frequency (MHz) 418. Frequency (MHz) 224. 612. 806. 1000 224. 612. 806. 1000 Site : 03CH23-HY Condition: QP 3m LF\_63303&001\_231015 HORIZONTAL Site : 03CH23-HY Condition: QP 3m LF\_63303&001\_231015 VERTICAL APos TPos Remark Limit Read Ant Cable Preamp Aux Freq Level Line Margin Level Factor Loss Factor Factor Limit Read Ant Cable Preamp Aux APos TPos Freq Level Line Margin Level Factor Loss Factor Factor MHz dbuV/m dbuV/m db db db db db db db db 31,94 33,79 40,00 -6.21 41,47 24,01 1.06 32.75 0.00 136,70 36.28 43,50 -7.22 49,33 17.69 1.62 32.70 0.14 259.89 28.28 46.00 -17.72 38,54 19.92 2.42 32.75 0.15 37.19 33,13 46.00 -12.69 42.97 28.29 2.76 32.81 0.10 737,13 31,28 46.00 -14.72 31,95 28.19 3.87 32.87 0.14 26.01 27.87 28.19 28.19 3.87 32.87 0.14 deg
-- Peak
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-- Peak deg
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-- Peak
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-- Peak

Report No.: FR450907B

952.47 33.48 46.00 -12.52 29.41 31.12 4.30 31.61

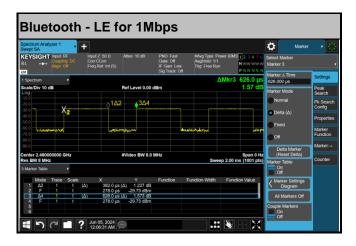
TEL: 886-3-327-0868 Page Number : C18 of C18

# Appendix D. Duty Cycle Plots

## <SKU5>

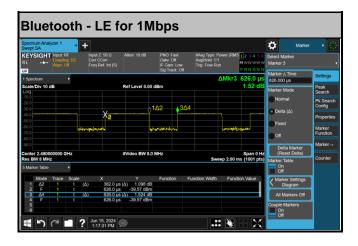
Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
Bluetooth - LE for 1Mbps	61.02	382	2.62	2.7kHz

Report No. : FR450907B



## <SKU6>

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	
Bluetooth - LE for 1Mbps	61.02	382	2.62	2.7kHz	



TEL: 886-3-327-0868 Page Number : D1 of D1