

NCC

低功率射頻器材型式試驗報告

產品名稱 : Portable Wireless Receiver
型號 : ADX5D A
廠牌 : SHURE
商標 : 
申請者 : Shure Incorporated
申請者地址 : 5800 West Touhy Avenue, Niles, IL 60714-4608, USA
測試標準 : LP0002 (109 年版)
參考法規 : ANSI C63.10-2013
測試結果 : 符合
接收日期 : 2021/3/5
測試日期 : 2021/3/18~2021/4/8

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修訂紀錄

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1. 一般資訊

申請者	Shure Incorporated
申請者地址	5800 West Touhy Avenue, Niles, IL 60714-4608, USA
製造商	Shure Incorporated
製造商地址	5800 West Touhy Avenue, Niles, IL 60714-4608, USA
實驗室	台灣曼瑞檢測科技有限公司
實驗室地址	33377 台灣桃園市龜山區復興二路 38 號
實驗室資訊	1. MRT facility is a FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm. 2. MRT facility is an IC registered (MRT Reg. No. 21723) test laboratory with the site description on file at Industry Canada. 3. MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Taiwan, EU and TELEC Rules.
實驗室測試環境條件	溫度 (°C) : 20-35 / 濕度 (%RH) : 30-65

2. 產品描述

2.1 產品資訊

產品名稱	Portable Wireless Receiver
產品型號	ADX5D A
廠牌	SHURE
商標	
頻率範圍	2405~2480MHz
規格	IEEE 802.15.4 / ZigBee; RX: 510~530MHz
調變模式	OQPSK for Zibee; 16QAM for RX
最大峰值輸出功率	External Antenna Port: 1.35 dBm Internal Antenna Port: -5.21 dBm
配件(僅搭配測試用)	
電源供應器	Brand: Shure Incorporated Model No: PS43US Input: AC 100-240V~50-60Hz 250mA Max Output: DC 15V, 600mA

2.2 產品規格

ZigBee :

Channel	Frequency	Channel	Frequency
11	2405 MHz	19	2445 MHz
12	2410 MHz	20	2450 MHz
13	2415 MHz	21	2455 MHz
14	2420 MHz	22	2460 MHz
15	2425 MHz	23	2465 MHz
16	2430 MHz	24	2470 MHz
17	2435 MHz	25	2475 MHz
18	2440 MHz	26	2480 MHz

RX:

Channel	Frequency	Channel	Frequency
01	510.1MHz	02	510.125MHz
...	...	...	...
792	529.875 MHz	793	529.9 MHz

2.3 測試模式

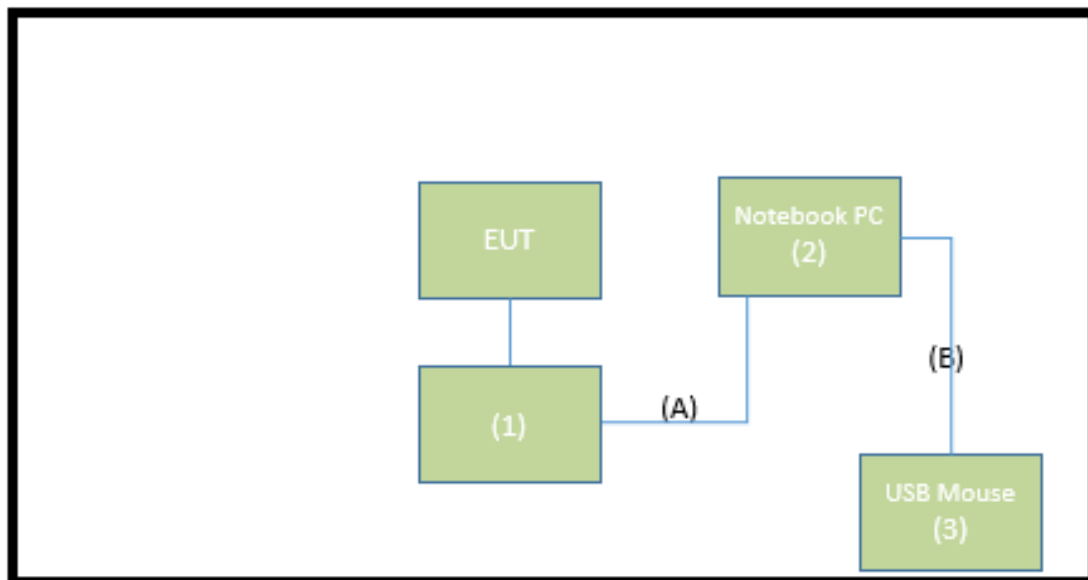
Test Mode	Mode 1: TX – ZigBee with External Antenna
	Mode 2: TX – ZigBee with Internal Antenna
	Mode 3: RX – ZigBee with External Antenna
	Mode 4: RX – ZigBee with Internal Antenna
	Mode 5: Normal Operation with Receive by 510MHz~530MHz

Note:

1. 傳導功率皆有針對內建/外置天線評估，並針對傳導功率較大者(外置天線) 執行其它傳導測試項目評估。
2. 輻射部份皆有針對內建/外置天線評估。

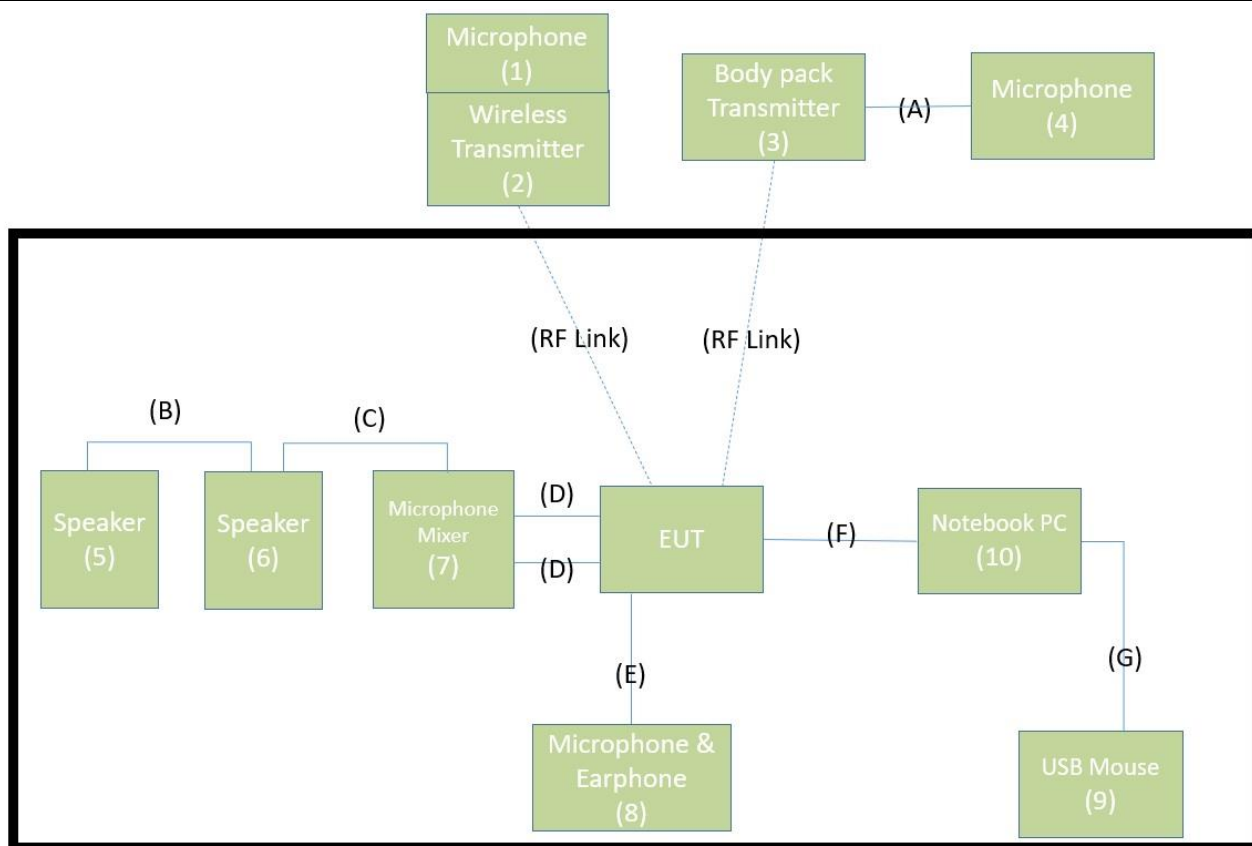
2.4 測試配置

待測物測試配置圖 (Mode1~Mode4)



Signal Cable Type		Signal Cable Description
A	USB Cable	Shielded, 1.8m (Brand: HUNG HOW; M/N:USB A MALE to USB B MALE CABLE)
B	USB Mouse Cable	Shielded, 1.6m

待測物測試配置圖 (Mode5)



Signal Cable Type		Signal Cable Description
A	Microphone Cable	Non-Shielded, 1.5m (Brand: Shure ;M/N:PGA98H)
B	3.5mm to 2RCA	Shielded, 1.5m (Brand: PHILIPS, M/N: SWA2527W/10)
C	XLR to Audio Cable	Shielded, 1.0m (Brand: YONGWEI,M/N: 11021632836)
D	XLR to Signal Cable	Shielded, 0.6m (Brand: Sound Devices, M/N: XL-2)
E	Microphone & Earphone Cable	Non-Shielded, 1.5m
F	USB Cable	Shielded, 1.5m (Brand: meitu;M/N: SMT-A007A)
G	USB Mouse Cable	Shielded, 1.6m

2.5 測試周邊

待測裝置測試時，其搭配系統測試時之週邊裝置包括如下：

Mode1~Mode4

No.	周邊名稱	廠牌	型號	序號	電源線
1	nfared Box	SHURE	Shure Jig 1#	N/A	N/A
2	Notebook PC	Lenovo	X240S	N/A	Non-shielded, 0.8m
3	USB Mouse	Lenovo	M110	N/A	N/A

Mode5

No.	周邊名稱	廠牌	型號	序號	電源線
1	Microphone	SHURE	PGA58	N/A	N/A
2	Wireless Transmitter	SHURE	AD3	N/A	N/A
3	Bodypack Transmitter	SHURE	ADX1	N/A	N/A
4	Microphone	SHURE	PGA98H	N/A	N/A
5	Speaker	Pioneer	DM-40	N/A	Non-shielded, 1.8m
6	Speaker	Pioneer	DM-40	N/A	Non-shielded, 1.8m
7	Microphone Mixer	SHURE	SCM268	N/A	Non-shielded, 1.8m
8	Microphone & Earphone	Nokia	WH-201	N/A	N/A
9	USB Mouse	Lenovo	M110	N/A	N/A
10	Notebook PC	Lenovo	X240S	N/A	Non-shielded, 0.8m

2.6 操作程序

1.	Turn on the power of all equipment.
2.	Execute “Tera Term” program
3.	Configure the test channel and the data rate.
4.	Start test.

3. 測試設備明細

電源傳導 – SR2

儀器名稱	廠牌	型號	財產編號	校正年限	校正有效日期
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2022/3/23
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2021/4/24
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2021/5/26

輻射干擾 – AC1

儀器名稱	廠牌	型號	財產編號	校正年限	校正有效日期
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00001	1 year	2021/10/5
Broadband Horn antenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2021/4/24
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2021/4/24
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2022/3/23
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2022/3/24

傳導量測設備 –SR2

儀器名稱	廠牌	型號	財產編號	校正年限	校正有效日期
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2021/10/14
EXA Signal Analyzer	KEYSIGHT	N9010B	MRTTWA00074	1 year	2021/7/14
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00015	1 year	2022/3/24

EMI 測試軟體

軟體名稱	廠牌	版本
e3	Audix	9.160520a
EMI	Quietek	V3

4. 量測不確定度

電源傳導量測-電源線 (Conducted Emission- Power Line)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.15MHz~30MHz: $\pm 2.53\text{dB}$
輻射干擾量測 (Radiated Spurious Emission)
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz~30MHz: $\pm 3.92\text{dB}$ 30MHz~1GHz: $\pm 4.25\text{dB}$ 1GHz~18GHz: $\pm 4.40\text{dB}$ 18GHz~40GHz: $\pm 4.45\text{dB}$

5. 測試結果

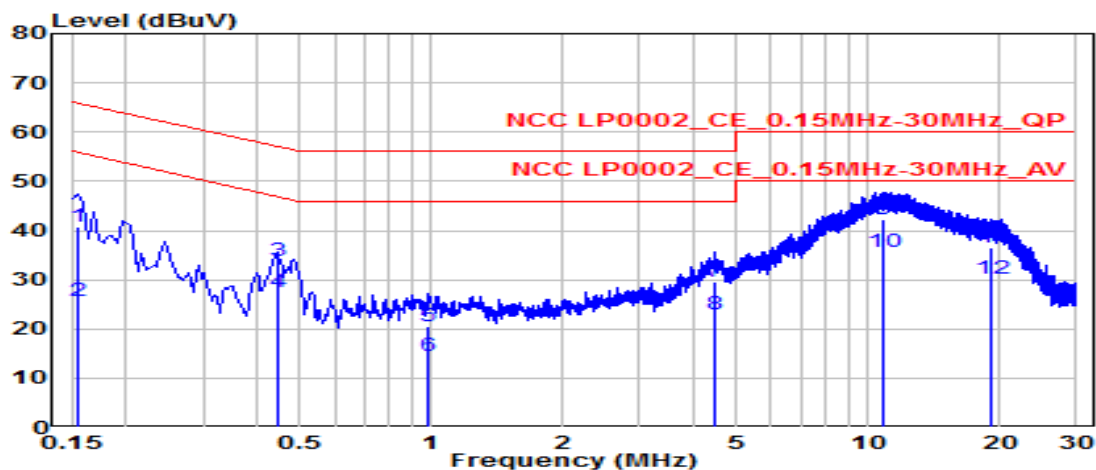
產品名稱 **Portable Wireless Receiver**
 型號 **ADX5D A**

法規章節	量測項目	限制值	測試結果	測試數據
3.3	電源傳導	低功率射頻器材技術規範 3.3 節	符合	第 5.1 章節
4.10.1.2	峰值傳導輸出功率	$\leq 30.00\text{dBm}$	符合	第 5.2 章節
4.10.1.3	天線之要求	低功率射頻器材技術規範 4.10.1.3 節	符合	第 5.3 章節
4.10.1.5	帶外發射限制	$\leq 20\text{dBc(Peak)}$	符合	第 5.4 章節
3.6	輻射電場強度	低功率射頻器材技術規範 3.6 節	符合	第 5.5 章節
3.5	頻帶邊緣	$\leq 74\text{dBuV/m(Peak)}$ $\leq 54\text{dBuV/m(Average)}$	符合	第 5.6 章節
4.10.1.6(2)(A)	占用頻寬	$\geq 500\text{KHz}$	符合	第 5.7 章節
4.10.1.6(2)(B)	功率頻譜密度	$\leq 8\text{dBm}$	符合	第 5.8 章節
N/A	工作週期	N/A	符合	第 5.9 章節

備註：符合性的判定是基於測試結果符合規範的限制值或客戶的宣告要求，測試結果的判定是不考慮測量不確定度的值。

5.1.4 電源傳導測試結果

EUT	Portable Wireless Receiver	Date of Test	2021-03-24
Factor	CE_ENV216-L1 (Filter ON)	Temp. / Humidity	22.4°C / 55%
Polarity	Line1	Site / Test Engineer	SR2 / Eric
Test Mode	Zigbee TX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

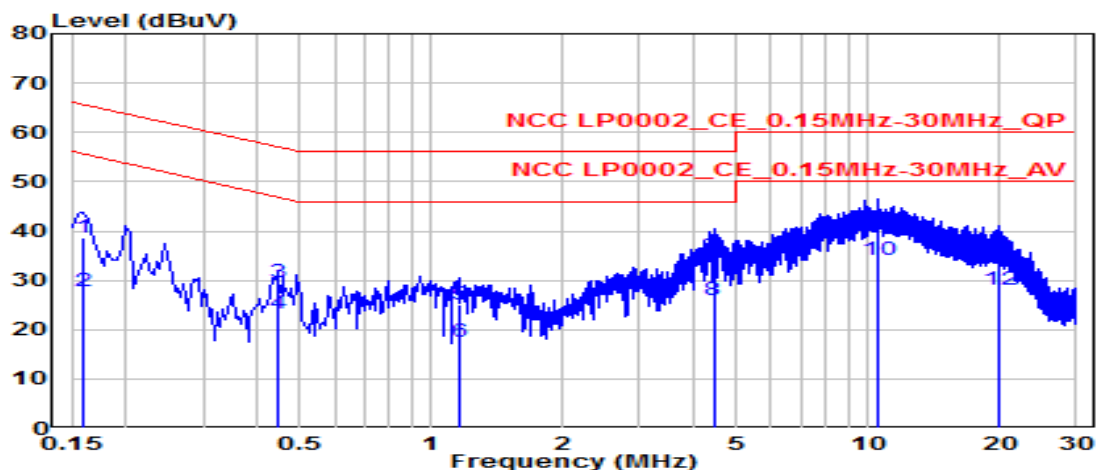


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Remark (QP/PK/AV)
1	0.154	31.29	9.61	40.90	-24.86	65.75	QP
2	0.154	16.15	9.61	25.76	-30.00	55.75	Average
3	0.442	24.05	9.63	33.68	-23.33	57.02	QP
4	0.442	17.81	9.63	27.43	-19.58	47.02	Average
5	0.987	10.97	9.66	20.63	-35.37	56.00	QP
6	0.987	4.74	9.66	14.40	-31.60	46.00	Average
7	4.488	19.84	9.73	29.57	-26.43	56.00	QP
8	4.488	13.15	9.73	22.88	-23.12	46.00	Average
9	*	10.778	9.89	42.29	-17.71	60.00	QP
10	*	10.778	9.89	35.56	-14.44	50.00	Average
11	19.237	26.61	9.98	36.60	-23.40	60.00	QP
12	19.237	20.18	9.98	30.16	-19.84	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).

EUT	Portable Wireless Receiver	Date of Test	2021-03-24
Factor	CE_ENV216-N (Filter ON)	Temp. / Humidity	22.4°C / 55%
Polarity	Neutral	Site / Test Engineer	SR2 / Eric
Test Mode	Zigbee TX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

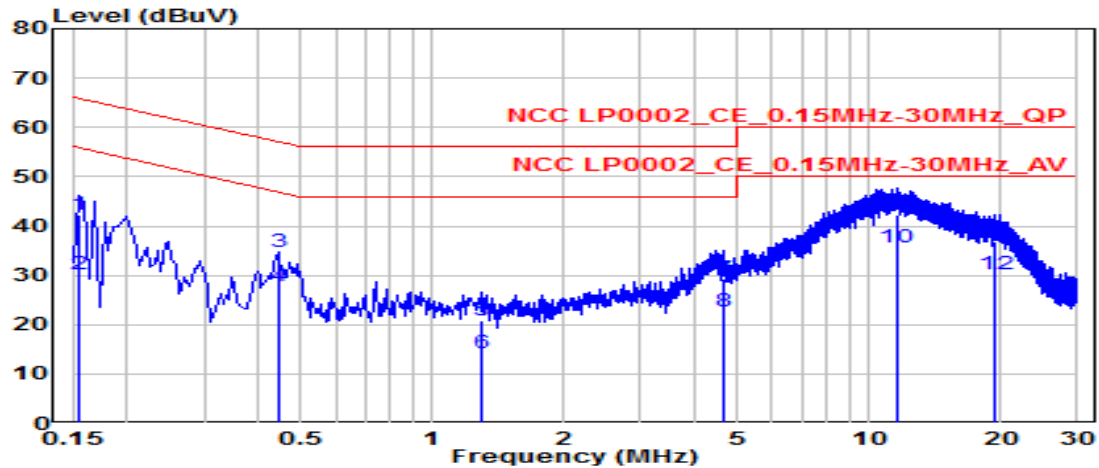


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Remark (QP/PK/AV)
1	0.159	28.89	9.62	38.51	-27.00	65.52	QP
2	0.159	18.29	9.62	27.91	-27.60	55.52	Average
3	0.442	19.93	9.64	29.57	-27.45	57.02	QP
4	0.442	13.55	9.64	23.18	-23.83	47.02	Average
5	1.153	15.32	9.67	25.00	-31.00	56.00	QP
6	1.153	7.78	9.67	17.45	-28.55	46.00	Average
7	4.429	24.94	9.74	34.67	-21.33	56.00	QP
8	4.429	16.30	9.74	26.04	-19.96	46.00	Average
9	* 10.584	30.18	9.90	40.08	-19.92	60.00	QP
10	* 10.584	24.30	9.90	34.20	-15.80	50.00	Average
11	19.989	24.42	10.07	34.49	-25.51	60.00	QP
12	19.989	18.01	10.07	28.08	-21.92	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).

EUT	Portable Wireless Receiver	Date of Test	2021-03-24
Factor	CE_ENV216-L1 (Filter ON)	Temp. / Humidity	22.4°C / 55%
Polarity	Line1	Site / Test Engineer	SR2 / Eric
Test Mode	Zigbee TX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

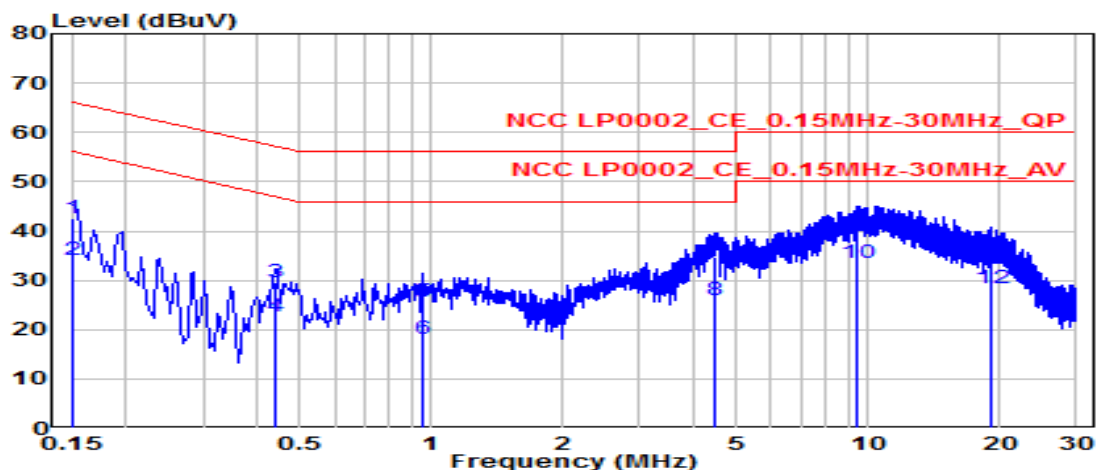


No	Frequency (MHz)	Reading (dBUV)	C.F (dB)	Measurement (dBUV/m)	Margin (dB)	Limit (dBUV/m)	Remark (QP/PK/AV)
1	0.154	32.76	9.61	42.37	-23.38	65.75	QP
2	0.154	20.65	9.61	30.26	-25.49	55.75	Average
3	0.442	24.97	9.63	34.59	-22.42	57.02	QP
4	0.442	18.15	9.63	27.78	-19.24	47.02	Average
5	1.288	11.21	9.67	20.88	-35.12	56.00	QP
6	1.288	4.62	9.67	14.29	-31.71	46.00	Average
7	4.618	19.40	9.73	29.14	-26.86	56.00	QP
8	4.618	12.85	9.73	22.58	-23.42	46.00	Average
9	*	11.547	9.90	42.23	-17.77	60.00	QP
10	*	11.547	9.90	35.62	-14.38	50.00	Average
11	19.431	26.77	9.98	36.75	-23.25	60.00	QP
12	19.431	20.19	9.98	30.17	-19.83	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBUV/m) = Reading(dBUV) + C.F (Correction Factor).

EUT	Portable Wireless Receiver	Date of Test	2021-03-24
Factor	CE_ENV216-N (Filter ON)	Temp. / Humidity	22.4°C / 55%
Polarity	Neutral	Site / Test Engineer	SR2 / Eric
Test Mode	Zigbee TX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

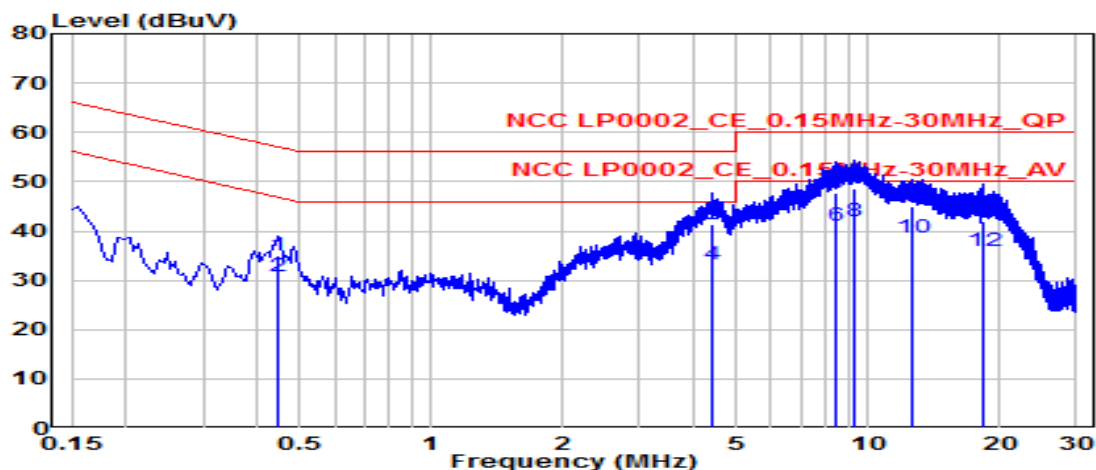


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Remark (QP/PK/AV)
1	0.150	33.03	9.62	42.65	-23.35	66.00	QP
2	0.150	24.53	9.62	34.15	-21.85	56.00	Average
3	0.438	19.94	9.64	29.58	-27.52	57.10	QP
4	0.438	13.05	9.64	22.69	-24.41	47.10	Average
5	0.960	16.02	9.67	25.68	-30.32	56.00	QP
6	0.960	8.35	9.67	18.02	-27.98	46.00	Average
7	4.488	24.93	9.74	34.67	-21.33	56.00	QP
8	4.488	16.24	9.74	25.98	-20.02	46.00	Average
9	* 9.397	29.69	9.87	39.56	-20.44	60.00	QP
10	* 9.397	23.52	9.87	33.39	-16.61	50.00	Average
11	19.161	23.98	10.05	34.04	-25.96	60.00	QP
12	19.161	18.23	10.05	28.28	-21.72	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).

EUT	Portable Wireless Receiver	Date of Test	2021-04-07
Factor	CE_ENV216-L1 (Filter ON)	Temp. / Humidity	23.2°C /56%
Polarity	Line1	Site / Test Engineer	SR2 / Tim
Test Mode	Mode5	Test Voltage	AC 110V/60Hz

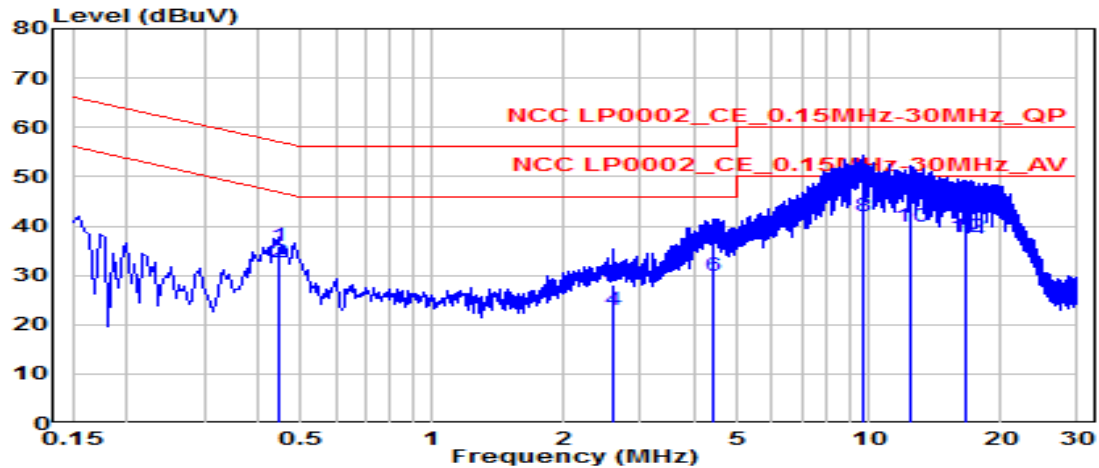


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Remark (QP/PK/AV)
1	0.447	25.54	9.63	35.17	-21.76	56.93	QP
2	0.447	21.13	9.63	30.76	-16.17	46.93	Average
3	4.420	31.73	9.73	41.46	-14.54	56.00	QP
4	4.420	23.61	9.73	33.33	-12.67	46.00	Average
5	8.461	37.79	9.84	47.63	-12.37	60.00	QP
6	8.461	31.08	9.84	40.91	-9.09	50.00	Average
7	* 9.325	38.75	9.86	48.61	-11.39	60.00	QP
8	* 9.325	32.19	9.86	42.06	-7.94	50.00	Average
9	12.560	34.93	9.91	44.84	-15.16	60.00	QP
10	12.560	28.87	9.91	38.78	-11.22	50.00	Average
11	18.396	32.11	9.97	42.08	-17.92	60.00	QP
12	18.396	25.99	9.97	35.96	-14.04	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).

EUT	Portable Wireless Receiver	Date of Test	2021-04-07
Factor	CE_ENV216-N (Filter ON)	Temp. / Humidity	23.2°C /56%
Polarity	Neutral	Site / Test Engineer	SR2 / Tim
Test Mode	Mode5	Test Voltage	AC 110V/60Hz



No	Frequency (MHz)	Reading (dBUV)	C.F (dB)	Measurement (dBUV/m)	Margin (dB)	Limit (dBUV/m)	Remark (QP/PK/AV)
1	0.442	26.43	9.64	36.07	-20.95	57.02	QP
2	0.442	22.83	9.64	32.47	-14.55	47.02	Average
3	2.611	18.46	9.70	28.16	-27.84	56.00	QP
4	2.611	13.11	9.70	22.81	-23.19	46.00	Average
5	4.425	26.52	9.74	36.26	-19.74	56.00	QP
6	4.425	20.19	9.74	29.93	-16.07	46.00	Average
7	* 9.662	38.75	9.88	48.63	-11.37	60.00	QP
8	* 9.662	32.23	9.88	42.11	-7.89	50.00	Average
9	12.465	36.82	9.93	46.75	-13.25	60.00	QP
10	12.465	30.03	9.93	39.97	-10.03	50.00	Average
11	16.650	34.25	10.01	44.26	-15.74	60.00	QP
12	16.650	27.67	10.01	37.68	-12.32	50.00	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBUV/m) = Reading(dBUV) + C.F (Correction Factor).

5.2 峰值傳導輸出功率

5.2.1 量測方法

待測物之天線埠經由適當之衰減直接連至頻譜分析儀RF輸入端，設定頻譜分析儀之解析度頻寬大於6dB發射頻寬或使用峰值功率表。除使用上述測量方式外，並得使用以最大傳導輸出功率作為測量方式。

備註: DH1,DH3,DH5僅為封包傳輸率的差異,其針對此章節無顯著之影響，因此僅檢附DH5為測試數據。

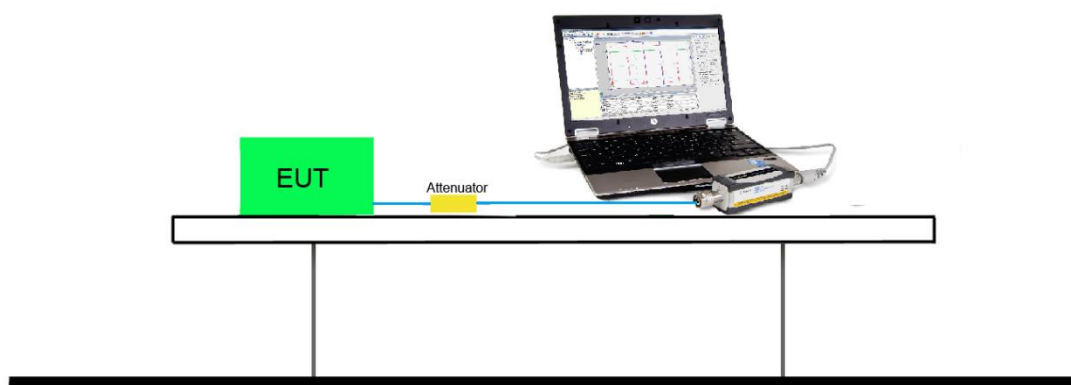
5.2.2 限制要求

操作於2400-2483.5 MHz之跳頻或數位調變的發射器材與5725-5850 MHz之跳頻發射器材：1W(含)以下，當跳頻系統符合國家通訊傳播委員會低功率射頻器材技術規範之第4.10.1.6(1)(A)(a)節,其限制值為0.125 W(含)以下。

若用於非固定式點對點操作時，若其發射天線之方向性增益超過6dBi，應依所超過之dB數等量降低峰值輸出功率。如用於固定式點對點(註)操作時，應符合下列情形之一：

- (1)操作於2400-2483.5兆赫(MHz)者，其發射天線之方向性增益超過6dBi，應於每超過3dB降低1dB之峰值輸出功率。
- (2) 操作於5725-5850兆赫(MHz)者，其發射天線之方向性增益超過6dBi，不需降低峰值輸出功率。

5.2.3 測試架構圖



5.2.4 峰值傳導輸出功率測試結果

待測物名稱	Portable Wireless Receiver	測試日期	2021/4/7
待測物型號	ADX5D A	溫度 / 濕度	23°C / 55%
測試場地 / 測試工程師	SR2 / Eric		

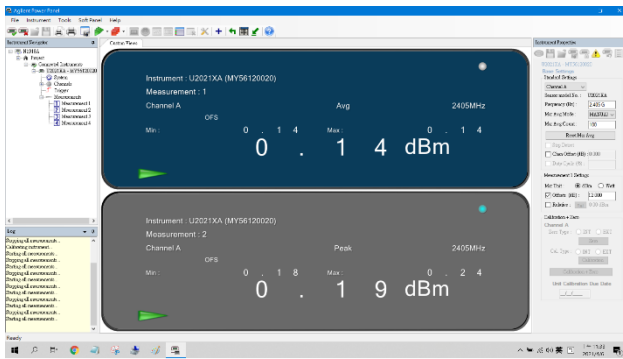
Test Mode	Channel No.	Frequency (MHz)	Peak Power (dBm)	Average Power (dBm)	Limit (dBm)
ZigBee with External Antenna	11	2405	0.19	0.14	< 30
	18	2440	0.38	0.33	< 30
	26	2480	1.35	1.29	< 30

Test Mode	Channel No.	Frequency (MHz)	Peak Power (dBm)	Average Power (dBm)	Limit (dBm)
ZigBee with Internal Antenna	11	2405	-5.36	-5.41	< 30
	18	2440	-5.62	-5.67	< 30
	26	2480	-5.21	-5.16	< 30

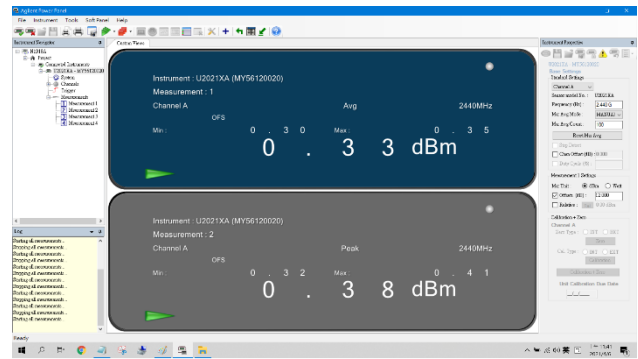
備 註： 此量測值已含線材損耗(Cable Loss=1dB)。

ZigBee with External Antenna

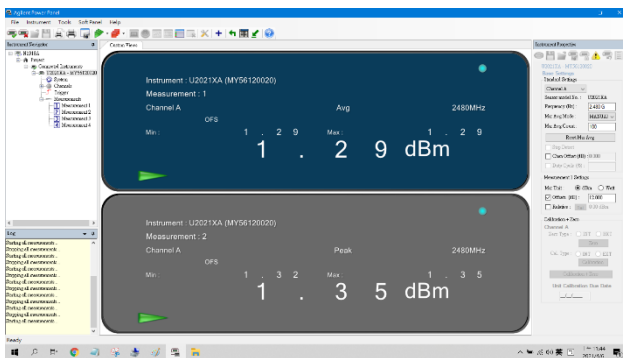
CH11 (2405MHz) ZigBee



CH18 (2440MHz) ZigBee

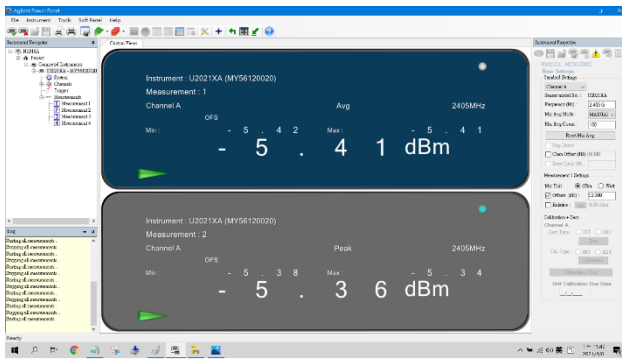


CH26 (2480MHz) ZigBee

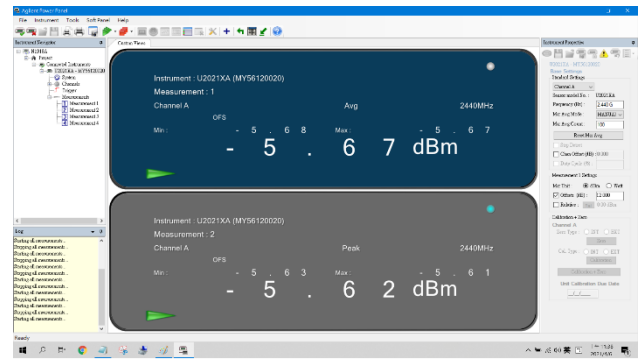


ZigBee with Internal Antenna

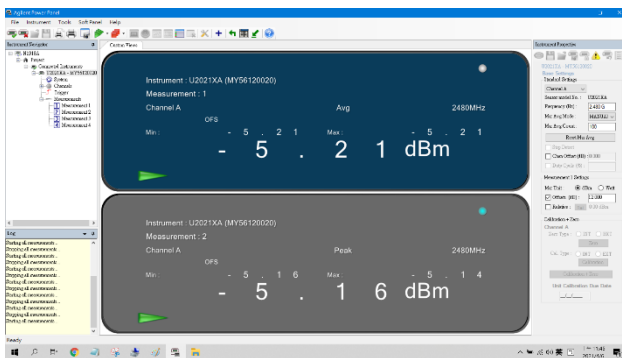
CH11 (2405MHz) ZigBee



CH18 (2440MHz) ZigBee



CH26 (2480MHz) ZigBee



5.3 天線之要求

5.3.1 限制要求

依據國家通訊傳播委員會低功率射頻器材技術規範之第4.10.1.4節規定，天線之規格可不受下述規定之限制。

低功率射頻器材之發射機或收發信機所使用之天線，應為全固定、半固定式或以獨特之耦合(unique coupling)方式連接機體。製造者可設計供使用者因損壞而替換之天線，但不得設計或使用原認證以外之天線或可供引接各類電纜之標準天線插座或電氣連接頭，如：BNC、F type、N type、M type、UG type、RCA、SMA、SMB...等及其他各類工業或通訊標準接頭。

5.3.2 天線樣式

Antenna List

External Antenna:

No.	Brand	Part No.	Antenna Type	Peak Gain
1	RF Solutions	ANT-24G-S18-SMAM	Monopole	0.0dBi

Internal Antenna:

No.	Brand	Part No.	Antenna Type	Peak Gain
1	Johanson Technology	2450AT42E010B	Chip	-2.0dBi

檢附天線規格書

5.4 帶外發射限制

5.4.1 量測方法

待測物之天線埠經由適當之衰減直接連至頻譜分析儀 RF 輸入端：

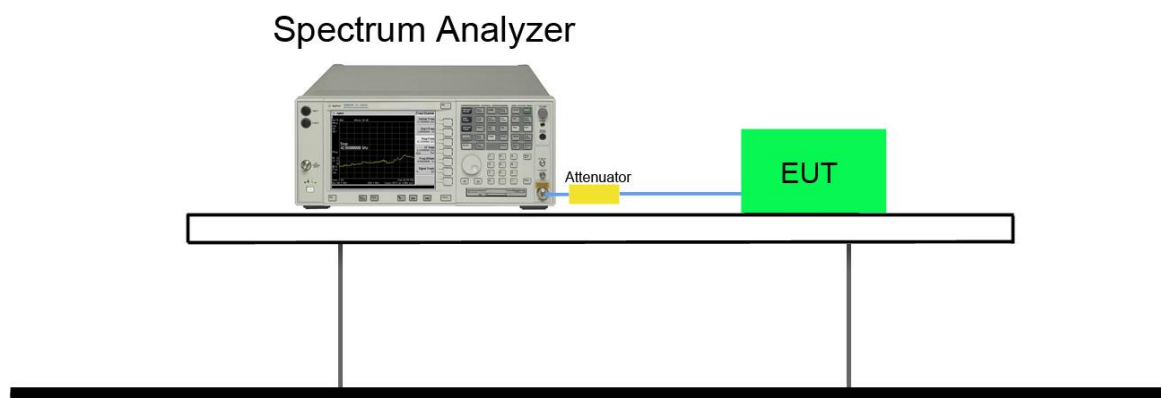
- (1) 頻率掃描範圍足以檢測頻帶內的發射波峰位準以及由受測物產生之最低頻率到第 10 次諧波的所有混附發射，通常需要分幾段以涵蓋全部頻率範圍。
- (2) 解析頻寬為 100 kHz，視訊頻寬不小於解析頻寬。
- (3) 掃描時間為自動，檢波功能為峰值，訊號軌跡為最大保留(Max Hold)。
- (4) 將標記設定於任何欲紀錄之波峰上，所顯示之位準值必須符合指定之限制值。

5.4.2 限制要求

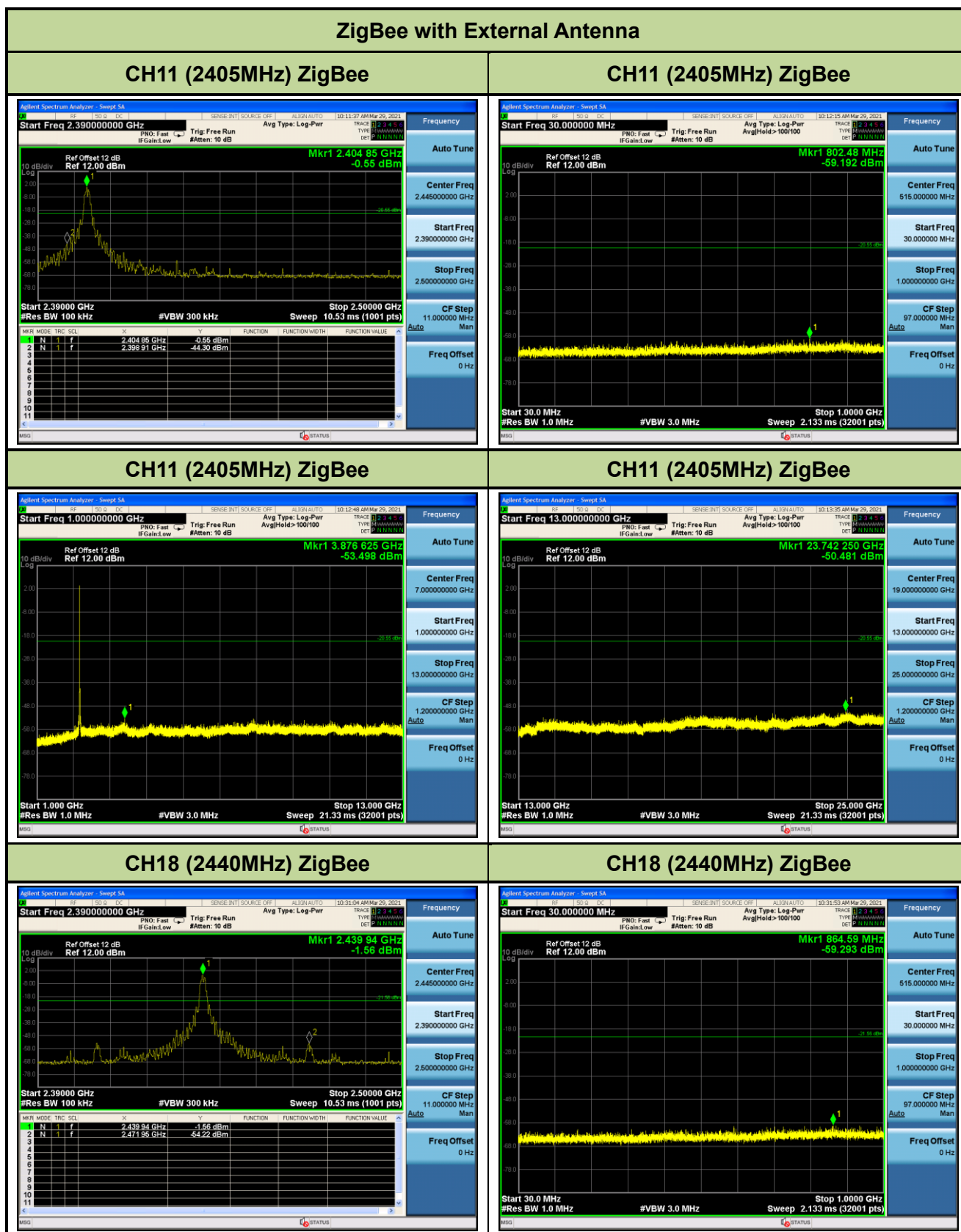
使用頻帶範圍外之任意 100 千赫 (kHz)內，發射器所產生的射頻功率相較於使用頻帶範圍中包含最高所需功率之 100 千赫 (kHz)內的射頻功率，衰減值限制如下：

- (1) 輸出功率以低功率射頻器材技術規範附件二之峰值輸出功率方式量測者，至少須衰減 20 dB，可使用射頻傳導或輻射方式測量。
- (2) 輸出功率以數位調變技術系統之最大傳導輸出功率量測方式者，至少須衰減 30 dB。
- (3) 若落於禁用頻段之輻射發射，應符合低功率射頻器材技術規範第 3.6 節之規定。

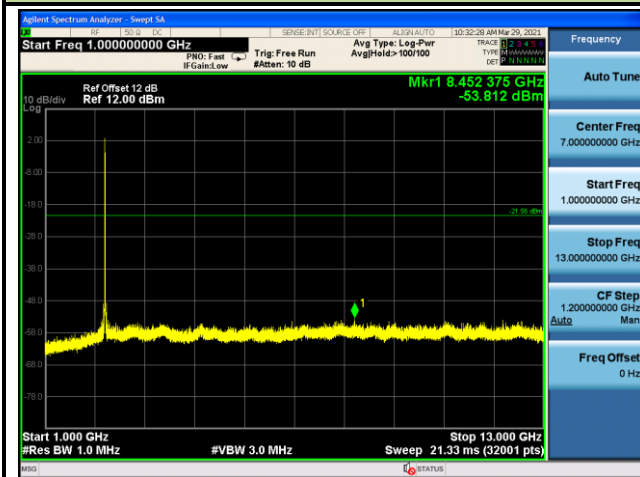
5.4.3 測試架構圖



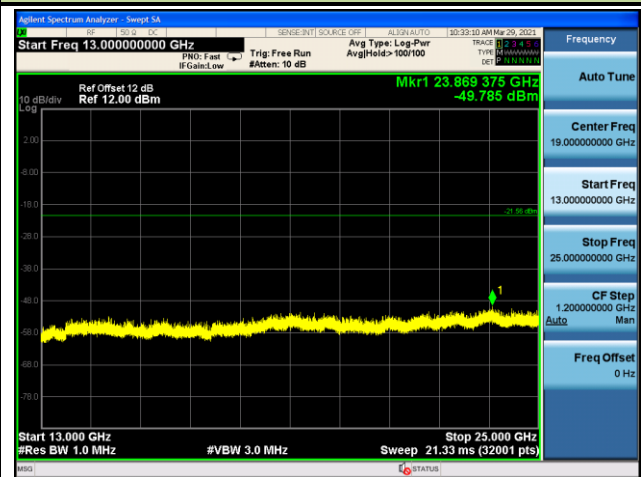
5.4.4 帶外輻射測試結果



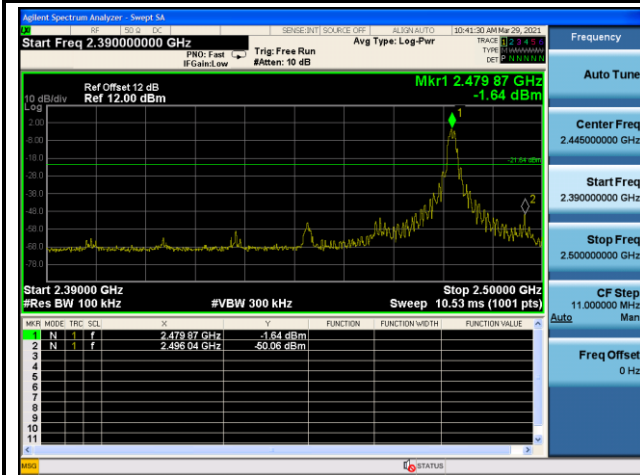
CH18 (2440MHz) ZigBee



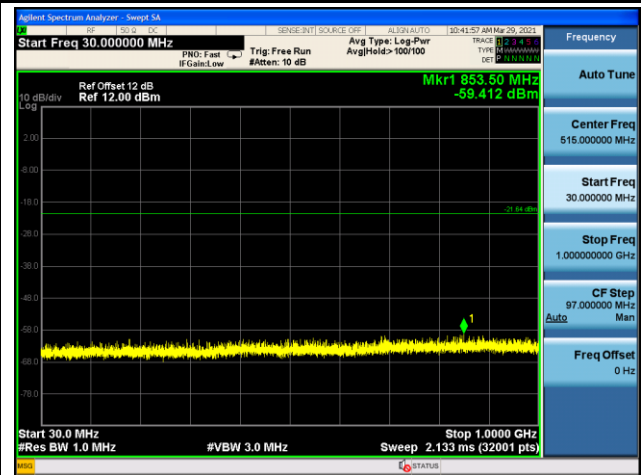
CH18 (2440MHz) ZigBee



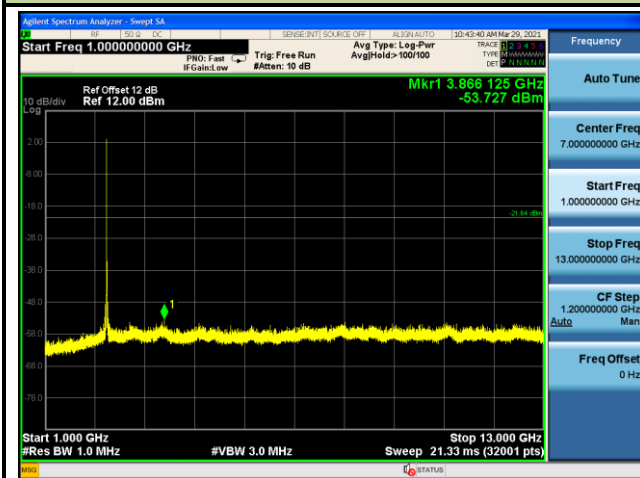
CH26 (2480MHz) ZigBee



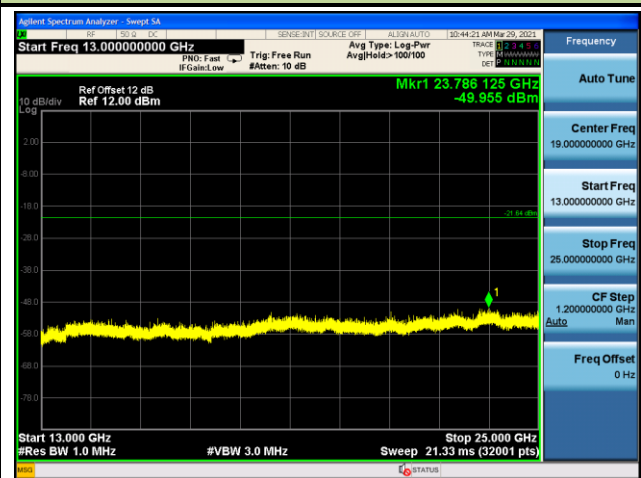
CH26 (2480MHz) ZigBee



CH26 (2480MHz) ZigBee



CH26 (2480MHz) ZigBee



5.5 輻射電場強度

5.5.1 量測方法

待測物置於非導體桌面（落地型產品置於地上），受測物使用交流電源時，將其與任何配件設備之電源線連接至位於旋轉桌的交流電源。受測物使用電池時，測試時應裝置新電池或充電完全的電池。受測物與配件設備之電源線無須束綁，桌面上受測設備的所有電源線由桌子的後緣垂下沿旋轉桌表面接至交流插座。落地型設備的交流電源線可以方便的型態走線。桌面可 360 度旋轉，接收天線置於距待測物 3m 距離，高度可在 1 至 4 公尺間變動，以量測待測物之最大輻射電場強度，接收天線並應於水平及垂直極化方向各量測一次。（待測物擺設方式根據 ANSI C63.10-2013 版本，待測物放置桌中心，1G 以下擺設高度為 80cm/1G 以上擺設高度為 150cm）

- (1) 任一頻率小於或等於 1000 MHz 之訊號,使用 CISPR 準峰值檢波器
- (2) 任一頻率大於 1000 MHz 之訊號，使用平均值檢波器測量，當規定之發射限制值為平均值時(含 1000 MHz 以下)，受測訊號藉由峰值檢波器(RBW:1MHz,VBW:3MHz)所測量之峰值，亦須符合峰值發射限制值，其峰值發射限制值為最大容許平均值加 20 dB。

備註：若為手持式或穿戴式之裝置，需對其三個正交軸的方位評估測試，並記錄最差的數值。

5.5.2 限制要求

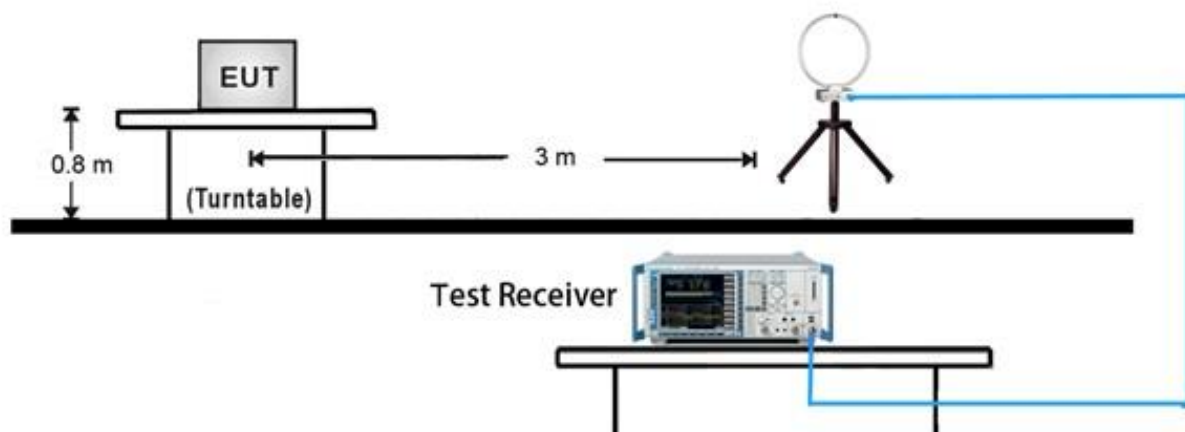
其電場強度不得超過下表之限值，且其不必要之發射皆不得大於主波發射強度。各頻段重疊處，以較嚴格之限制值為準。

頻率(f) (MHz)	電場強度 (微伏特/公尺， $\mu\text{V}/\text{m}$)	測距 (公尺)
$0.009 \leq f \leq 0.490$	$2400/f(\text{kHz})$	300
$0.490 < f \leq 1.705$	$24000/f(\text{kHz})$	30
$1.705 < f < 30$	30	30
$30 \leq f \leq 88$	100	3
$88 < f \leq 216$	150	3
$216 < f \leq 960$	200	3
$960 < f$	500	3

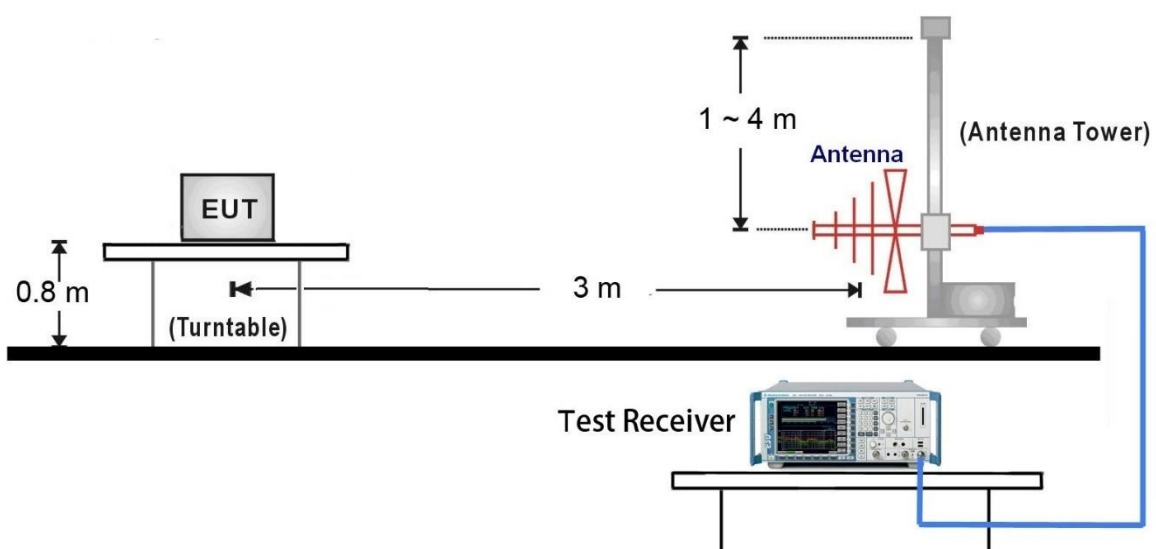
上表規定之電場強度，發射頻率在 9 kHz~90 kHz、110 kHz~490 kHz 及 1000MHz 以上者，其量測應以平均值檢波器為基準，且須符合低功率射頻器材技術規範第 6.14.節之規定；其他發射頻率，應以 CISPR 準峰值(quasi-peak) 檢波器測量；非以上表所指定之距離測量時，應符合第 6.5 節之規定，而輻射發射之量測頻率範圍須符合低功率射頻器材技術規範第 6.12 節之規定。

5.5.3 測試架構圖

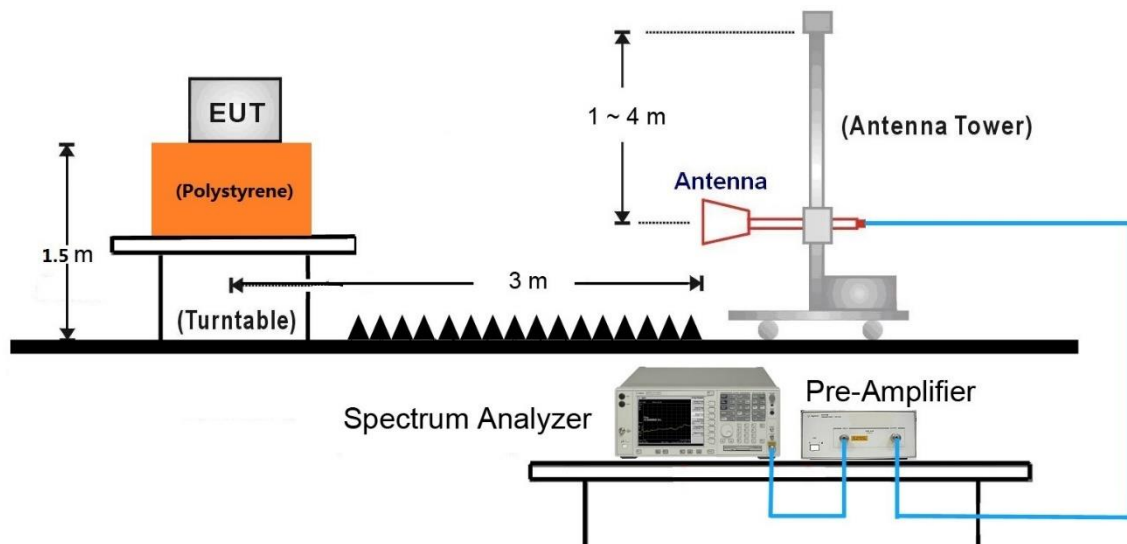
Under 30MHz Test Setup



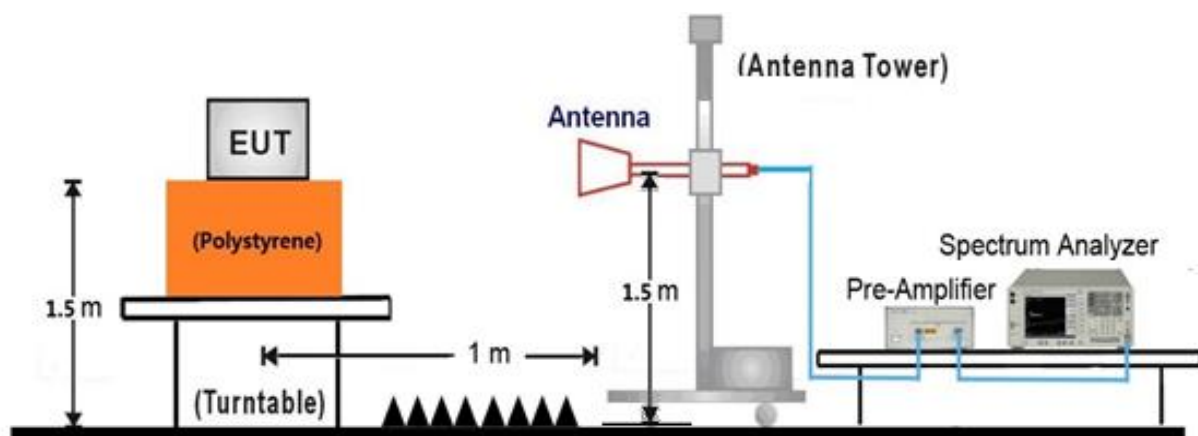
Under 1GHz Test Setup



1GHz ~ 18GHz Test Setup:

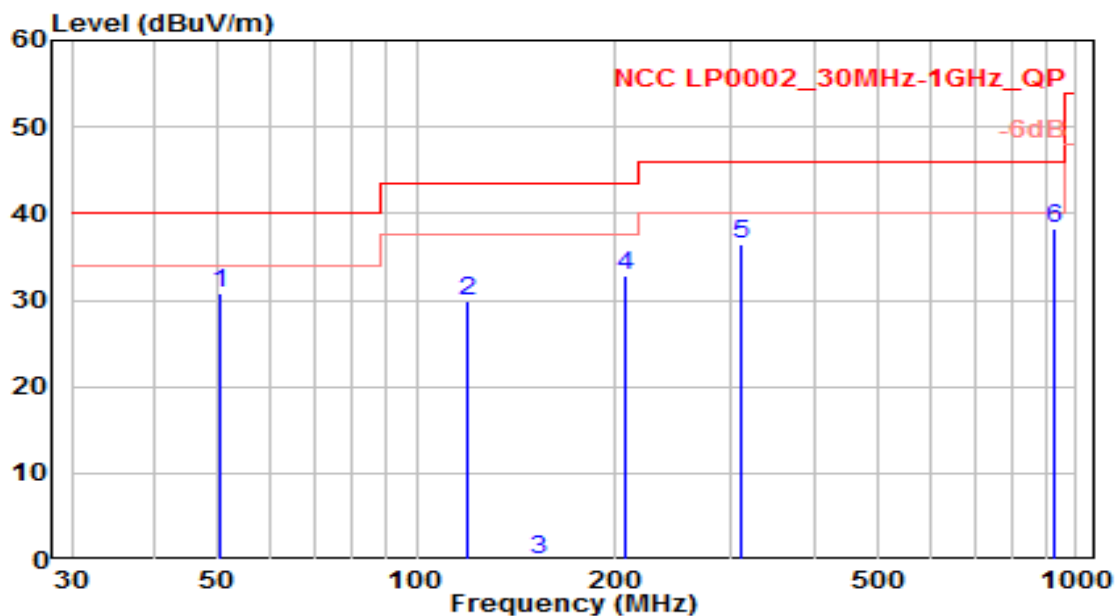


18GHz ~25GHz Test Setup:



5.5.4 輻射電場強度測試結果

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	VULB 9162	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

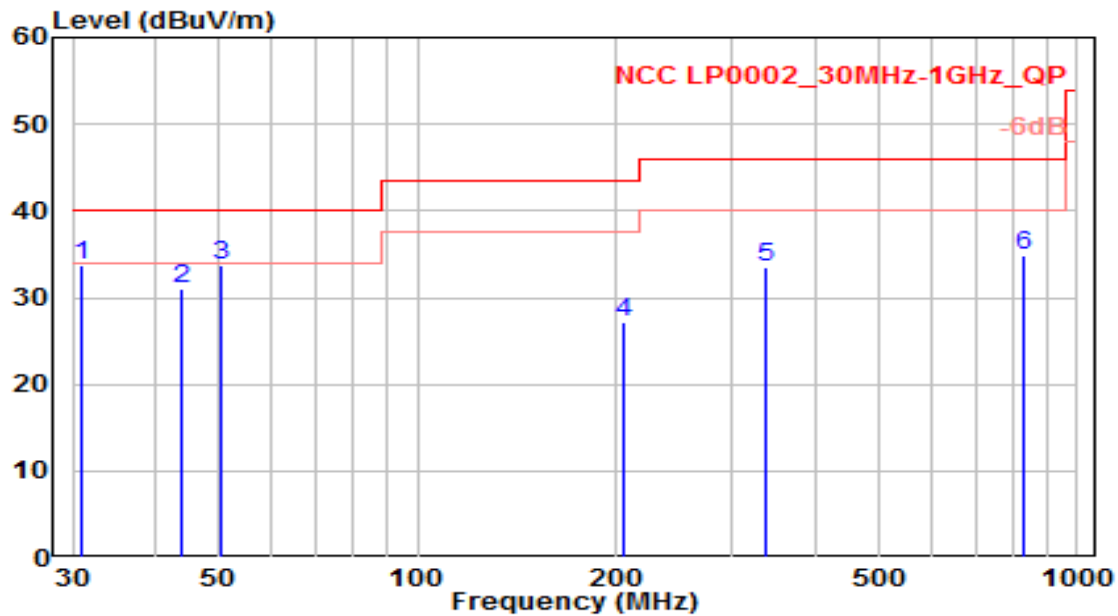


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	50.230	8.89	22.01	30.89	-9.11	40.00	100	225	QP
2	119.880	12.74	17.26	30.00	-13.50	43.50	100	360	QP
3	152.740	-16.07	16.07	0.00	-43.50	43.50	100	40	QP
4	207.260	13.95	18.91	32.86	-10.64	43.50	100	285	QP
5	311.530	14.48	21.90	36.38	-9.62	46.00	100	115	QP
6	* 924.940	6.27	31.96	38.24	-7.76	46.00	100	170	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	VULB 9162	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

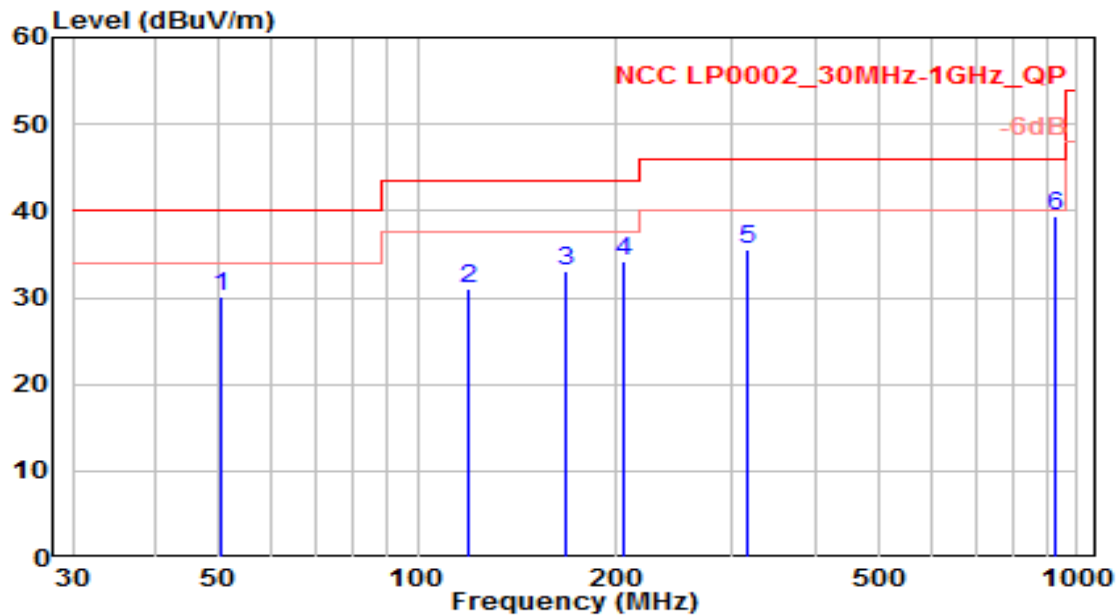


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	30.970	15.25	18.58	33.83	-6.17	40.00	100	245	QP
2		43.840	9.29	21.63	30.92	-9.08	40.00	100	55	QP
3		50.290	11.65	22.00	33.65	-6.35	40.00	100	165	QP
4		206.150	8.22	18.97	27.19	-16.31	43.50	100	335	QP
5		338.350	10.73	22.83	33.56	-12.44	46.00	100	140	QP
6		826.440	3.77	31.02	34.79	-11.21	46.00	100	75	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	VULB 9162	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee RX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

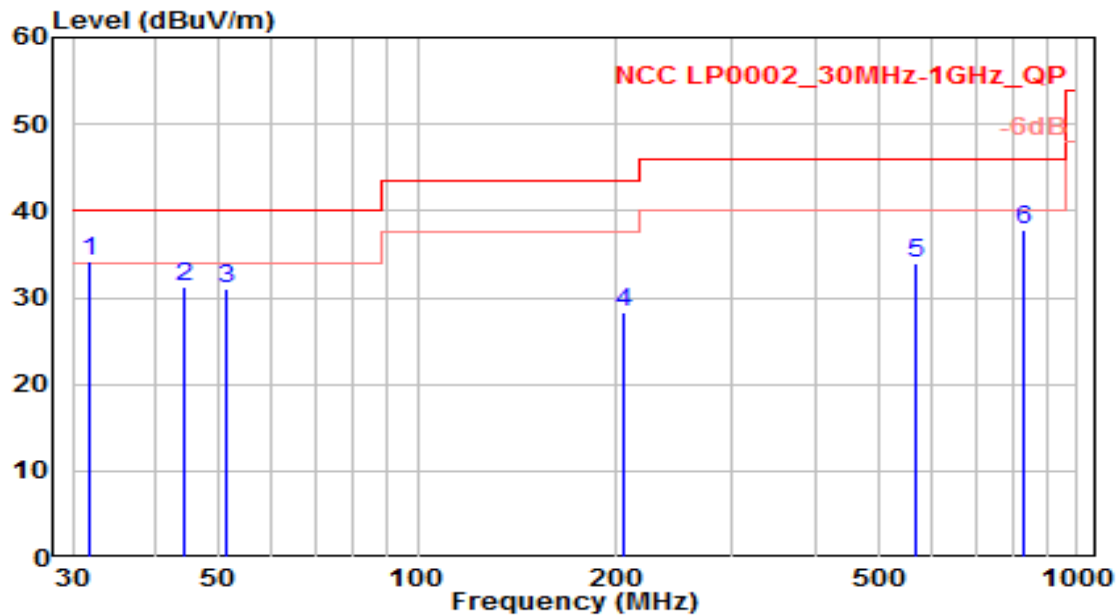


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	50.250	8.16	22.00	30.17	-9.83	40.00	100	145	QP
2	119.130	13.58	17.37	30.95	-12.55	43.50	100	200	QP
3	167.260	16.49	16.56	33.05	-10.45	43.50	100	55	QP
4	205.390	15.26	19.00	34.26	-9.24	43.50	100	165	QP
5	316.400	13.37	22.07	35.44	-10.56	46.00	100	320	QP
6	* 925.520	7.49	31.97	39.46	-6.54	46.00	100	170	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	VULB 9162	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee RX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

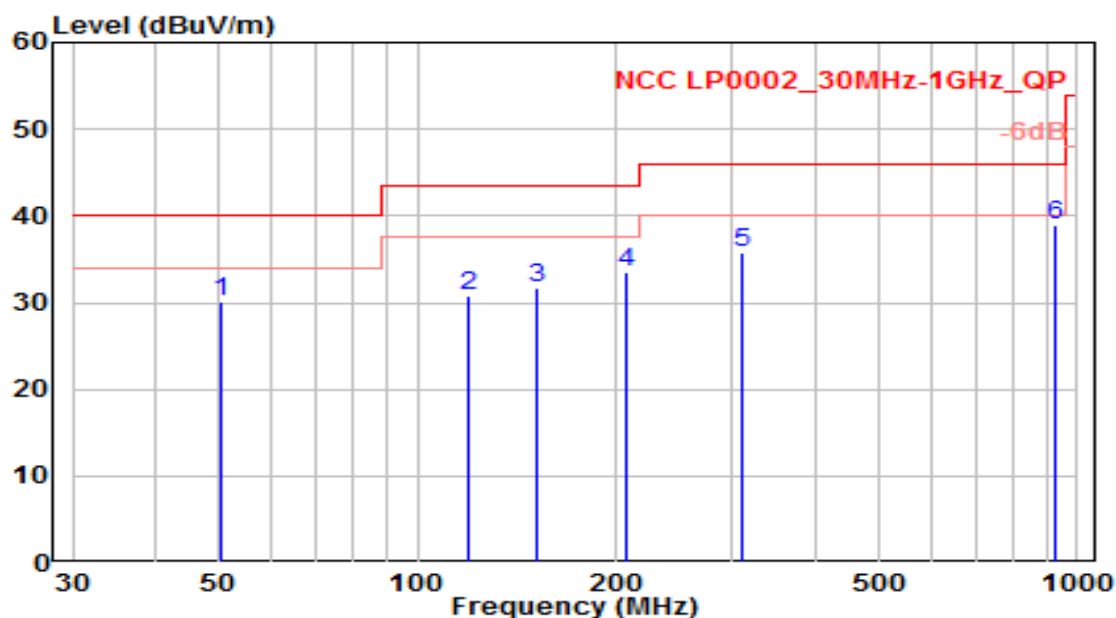


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	31.850	15.47	18.74	34.21	-5.79	40.00	100	245	QP
2		44.430	9.57	21.72	31.29	-8.71	40.00	100	30	QP
3		51.260	9.17	21.82	30.99	-9.01	40.00	100	185	QP
4		204.970	9.29	19.02	28.31	-15.19	43.50	100	360	QP
5		567.240	6.92	27.15	34.07	-11.93	46.00	100	115	QP
6		827.630	6.75	31.04	37.79	-8.21	46.00	100	250	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	VULB 9162	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

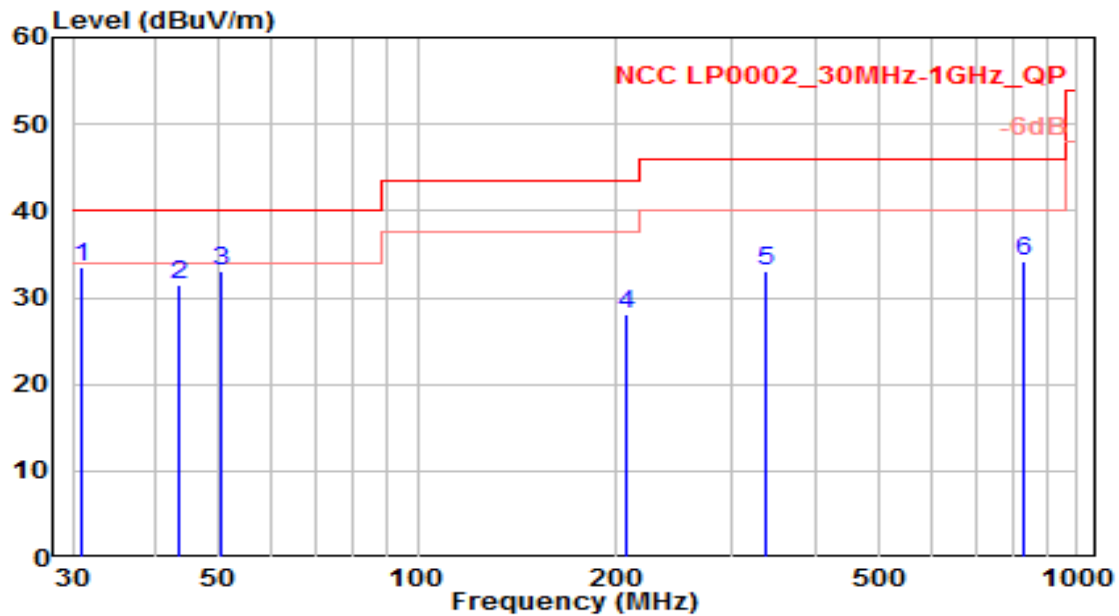


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	50.370	8.23	21.98	30.21	-9.79	40.00	100	225	QP
2	119.240	13.33	17.35	30.68	-12.82	43.50	100	360	QP
3	152.220	15.66	16.05	31.71	-11.79	43.50	100	40	QP
4	207.510	14.62	18.90	33.52	-9.98	43.50	100	285	QP
5	311.300	13.92	21.89	35.81	-10.19	46.00	100	115	QP
6	* 924.340	6.93	31.96	38.89	-7.11	46.00	100	170	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	VULB 9162	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

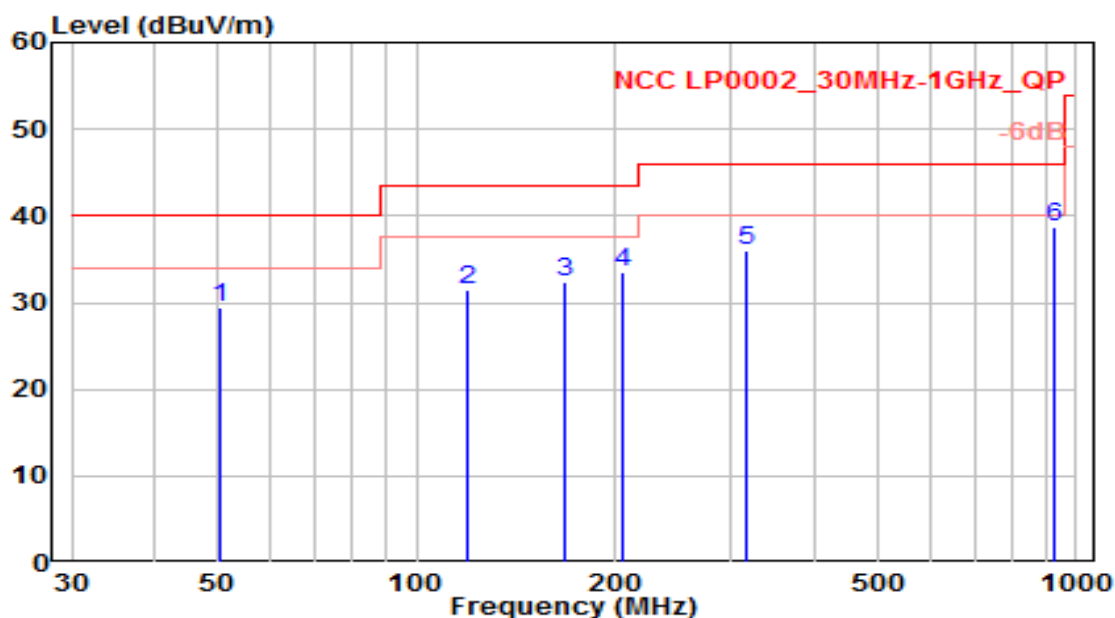


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	30.970	14.90	18.58	33.48	-6.52	40.00	100	245	QP
2		43.580	9.98	21.59	31.57	-8.43	40.00	100	55	QP
3		50.370	11.01	21.98	32.99	-7.01	40.00	100	165	QP
4		206.540	9.11	18.95	28.05	-15.45	43.50	100	335	QP
5		338.460	10.16	22.83	32.99	-13.01	46.00	100	140	QP
6		826.370	3.12	31.02	34.14	-11.86	46.00	100	75	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	VULB 9162	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee RX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

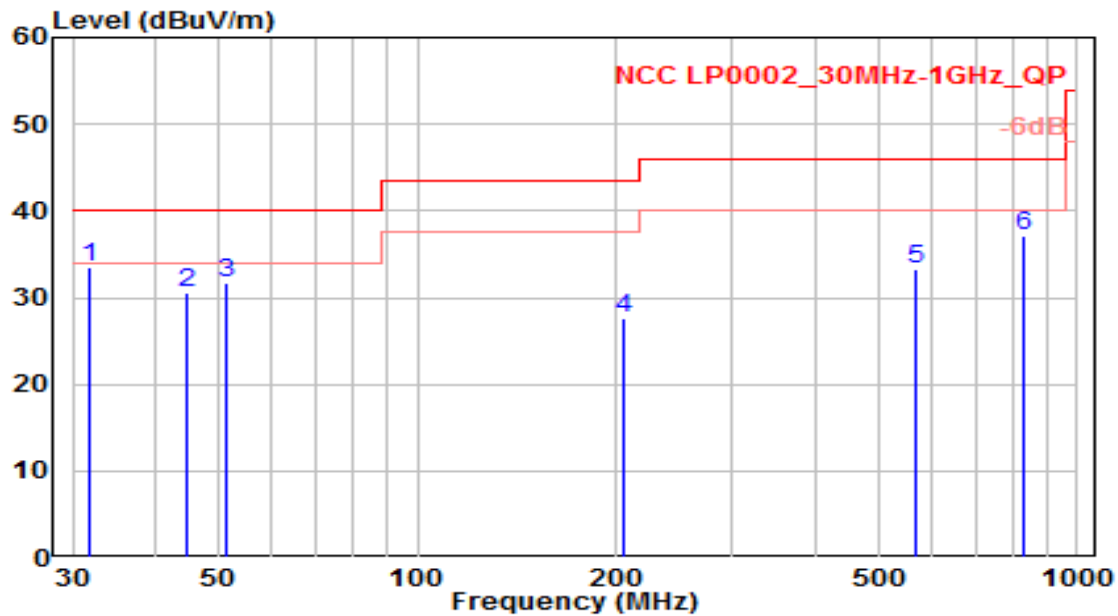


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	50.370	7.53	21.98	29.51	-10.49	40.00	100	145	QP
2	119.240	14.16	17.35	31.52	-11.98	43.50	100	200	QP
3	167.740	15.82	16.58	32.39	-11.11	43.50	100	55	QP
4	205.570	14.61	18.99	33.61	-9.89	43.50	100	165	QP
5	316.150	13.94	22.06	36.00	-10.00	46.00	100	320	QP
6	* 925.310	6.84	31.97	38.80	-7.20	46.00	100	170	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	VULB 9162	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee RX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

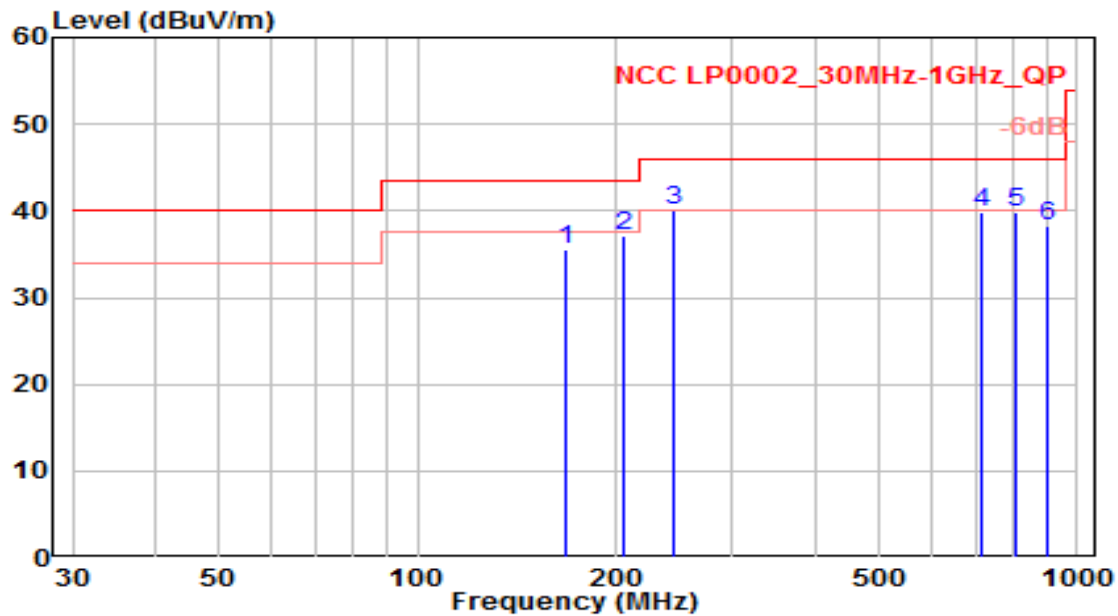


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	31.940	14.80	18.76	33.56	-6.44	40.00	100	245	QP
2		44.550	8.90	21.74	30.63	-9.37	40.00	100	30	QP
3		51.340	9.84	21.80	31.65	-8.35	40.00	100	185	QP
4		204.600	8.62	19.04	27.66	-15.84	43.50	100	360	QP
5		567.380	6.23	27.15	33.39	-12.61	46.00	100	115	QP
6		827.340	6.07	31.04	37.11	-8.89	46.00	100	250	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-04-07
Factor	VULB 9162	Temp. / Humidity	23°C /57%
Polarity	Horizontal	Site / Test Engineer	AC1 / Howard
Test Mode	Mode5	Test Voltage	AC 110V/60Hz

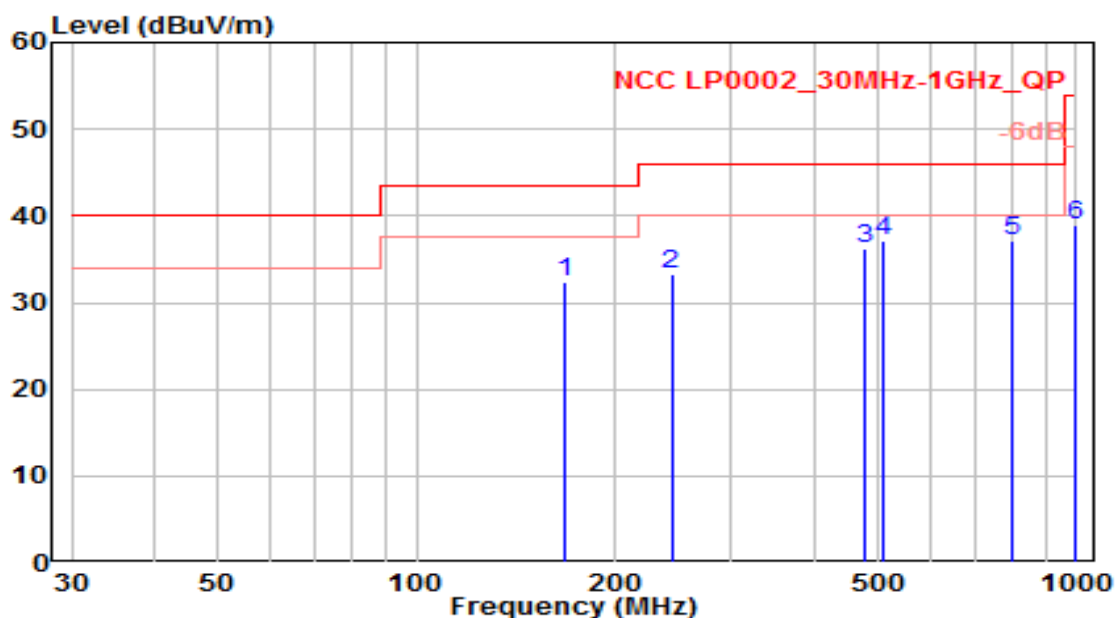


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	167.740	18.96	16.58	35.54	-7.96	43.50	100	245	QP
2	204.600	18.00	19.04	37.04	-6.46	43.50	155	260	QP
3	* 244.370	19.72	20.35	40.07	-5.93	46.00	100	320	QP
4	715.790	10.30	29.57	39.87	-6.13	46.00	100	360	QP
5	806.000	9.17	30.62	39.79	-6.21	46.00	100	125	QP
6	901.060	6.60	31.78	38.37	-7.63	46.00	100	70	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-04-07
Factor	VULB 9162	Temp. / Humidity	23°C /57%
Polarity	Vertical	Site / Test Engineer	AC1 / Howard
Test Mode	Mode5	Test Voltage	AC 110V/60Hz

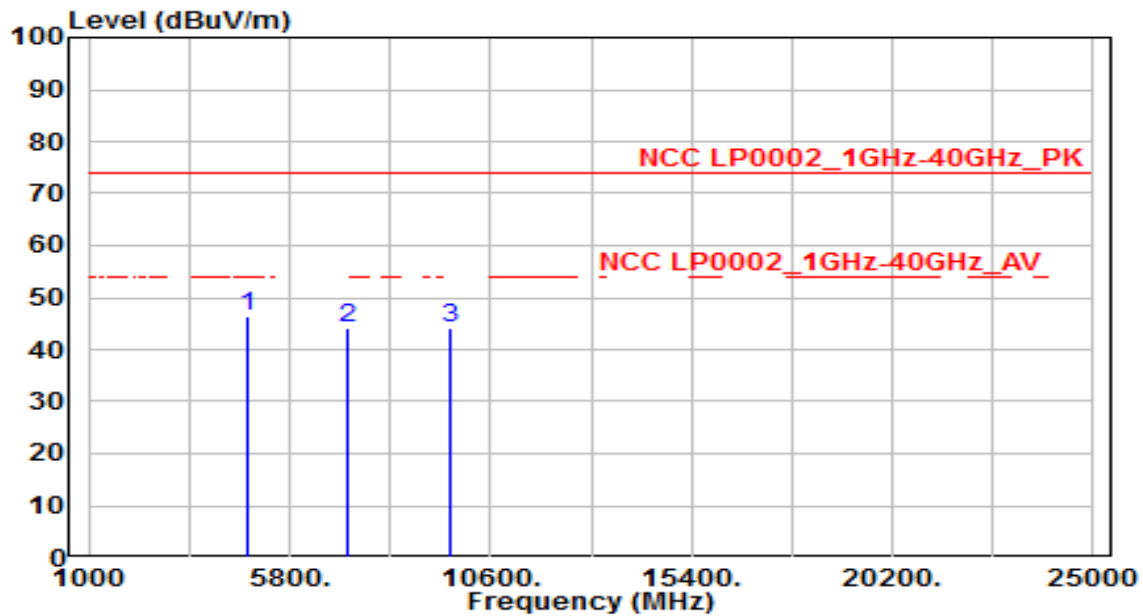


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	167.740	15.83	16.58	32.41	-11.09	43.50	100	125	QP
2	243.400	12.91	20.32	33.23	-12.77	46.00	100	220	QP
3	480.080	10.57	25.69	36.26	-9.74	46.00	100	320	QP
4	* 510.150	10.77	26.34	37.11	-8.89	46.00	100	75	QP
5	799.210	6.58	30.49	37.08	-8.92	46.00	100	350	QP
6	996.120	6.12	32.89	39.01	-14.99	54.00	100	250	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2405MHz with External Antenna	Test Voltage	AC 110V/60Hz

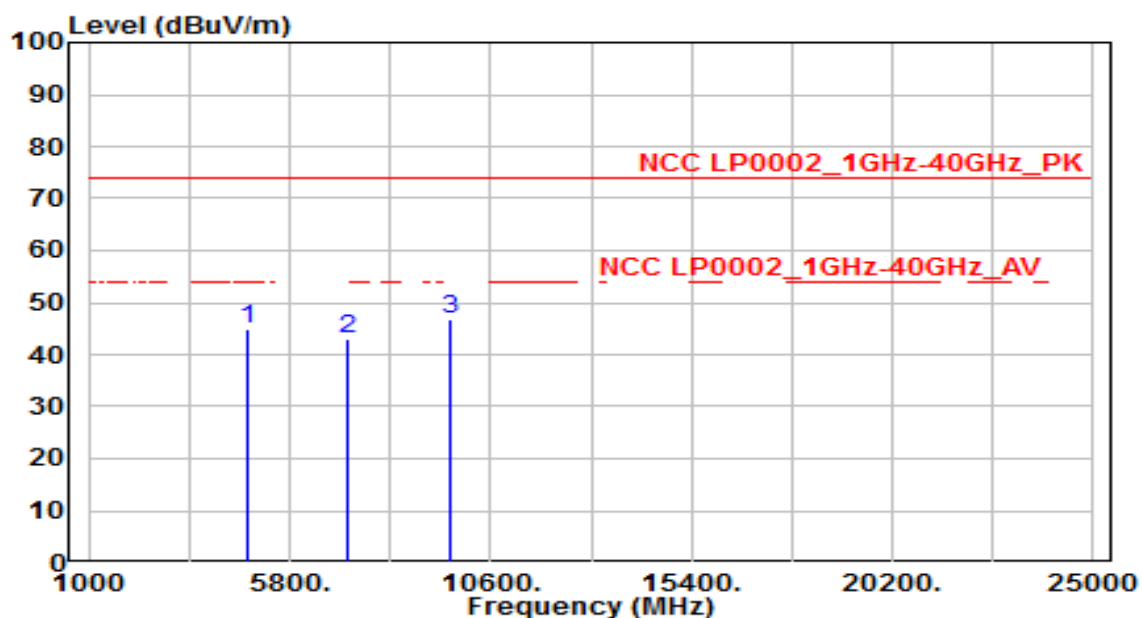


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	* 4810.000	42.98	3.29	46.27	-27.73	74.00	100	360	Peak
2	7215.000	33.21	10.91	44.12	-29.88	74.00	100	360	Peak
3	9620.000	29.37	14.65	44.02	-29.98	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2405MHz with External Antenna	Test Voltage	AC 110V/60Hz

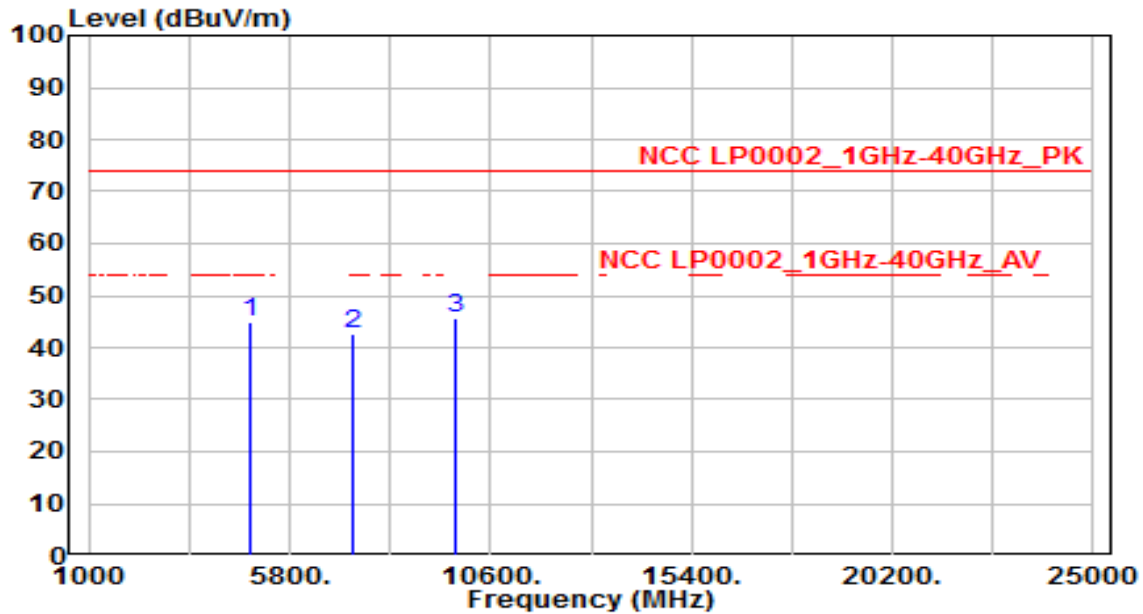


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4810.000	41.72	3.29	45.01	-28.99	74.00	100	360	Peak
2	7215.000	31.98	10.91	42.88	-31.12	74.00	100	360	Peak
3	* 9620.000	32.01	14.65	46.66	-27.34	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

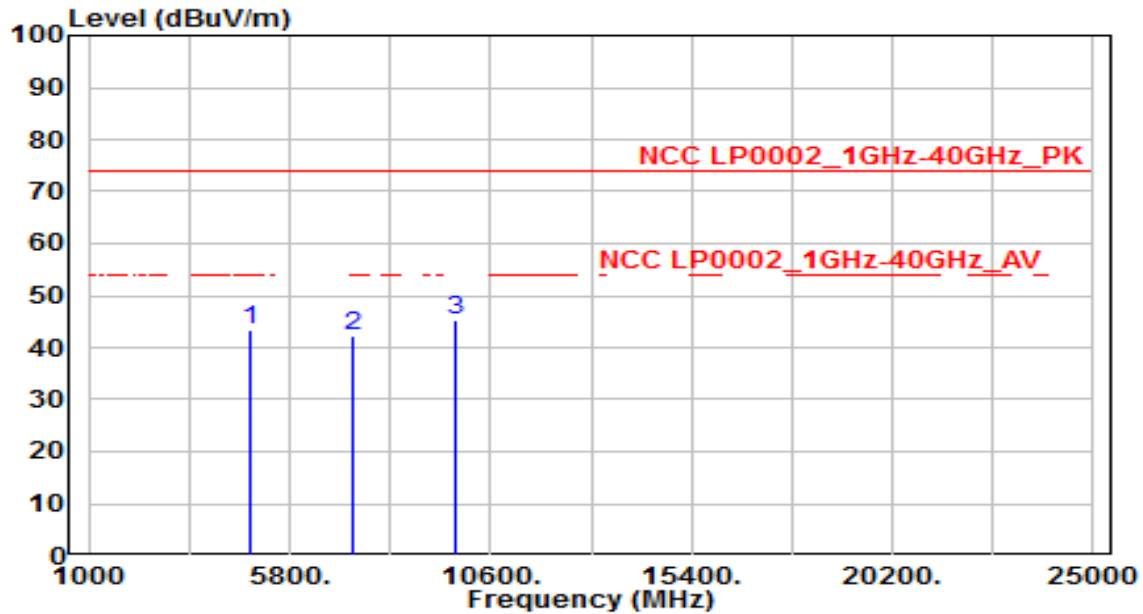


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4880.000	41.58	3.46	45.04	-28.96	74.00	100	360	Peak
2	7320.000	31.58	11.21	42.79	-31.21	74.00	100	360	Peak
3	* 9760.000	30.75	14.91	45.66	-28.34	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

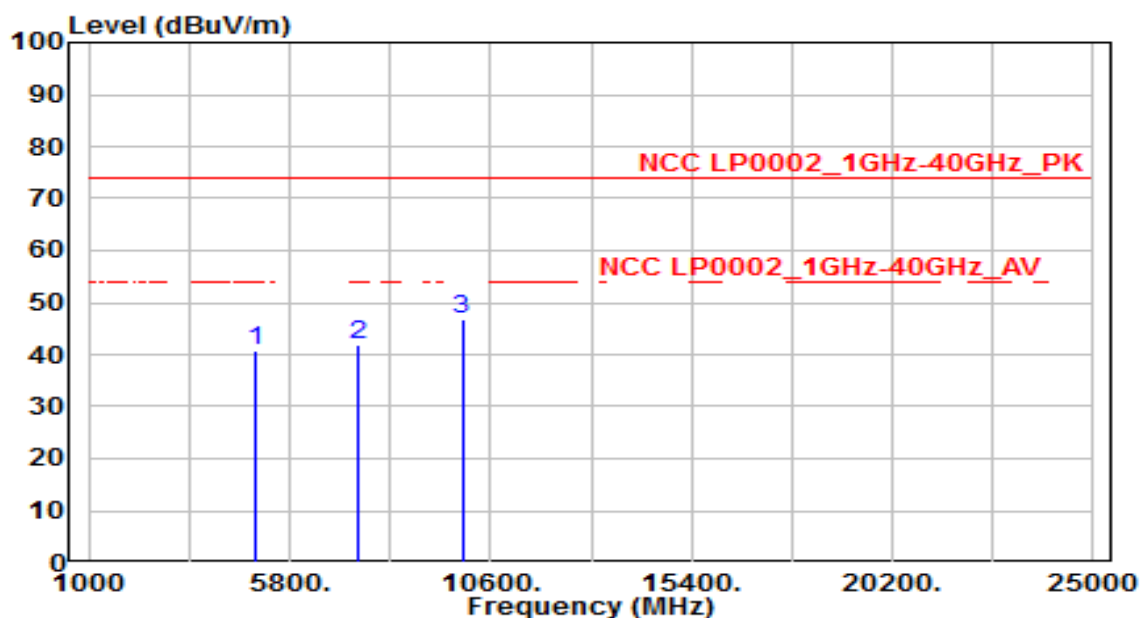


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4880.000	39.94	3.46	43.40	-30.60	74.00	100	360	Peak
2	7320.000	31.15	11.21	42.36	-31.64	74.00	100	360	Peak
3	* 9760.000	30.39	14.91	45.30	-28.70	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2480MHz with External Antenna	Test Voltage	AC 110V/60Hz

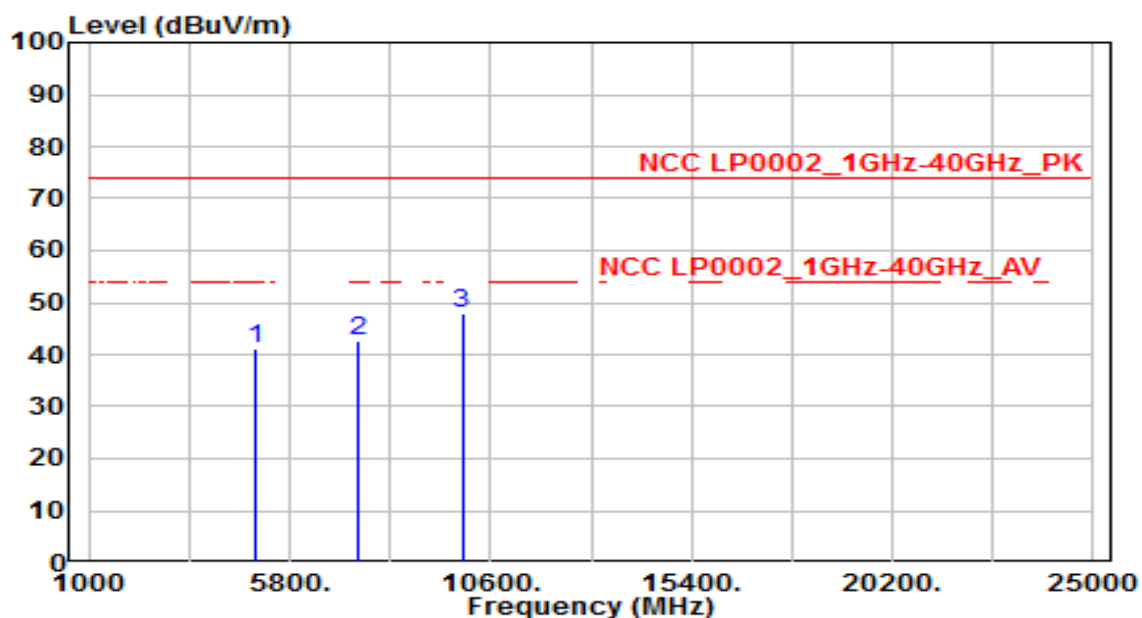


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4960.000	37.17	3.65	40.83	-33.17	74.00	100	360	Peak
2	7440.000	30.51	11.55	42.06	-31.94	74.00	100	360	Peak
3	* 9920.000	31.69	15.21	46.90	-27.10	74.00	100	360	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2480MHz with External Antenna	Test Voltage	AC 110V/60Hz

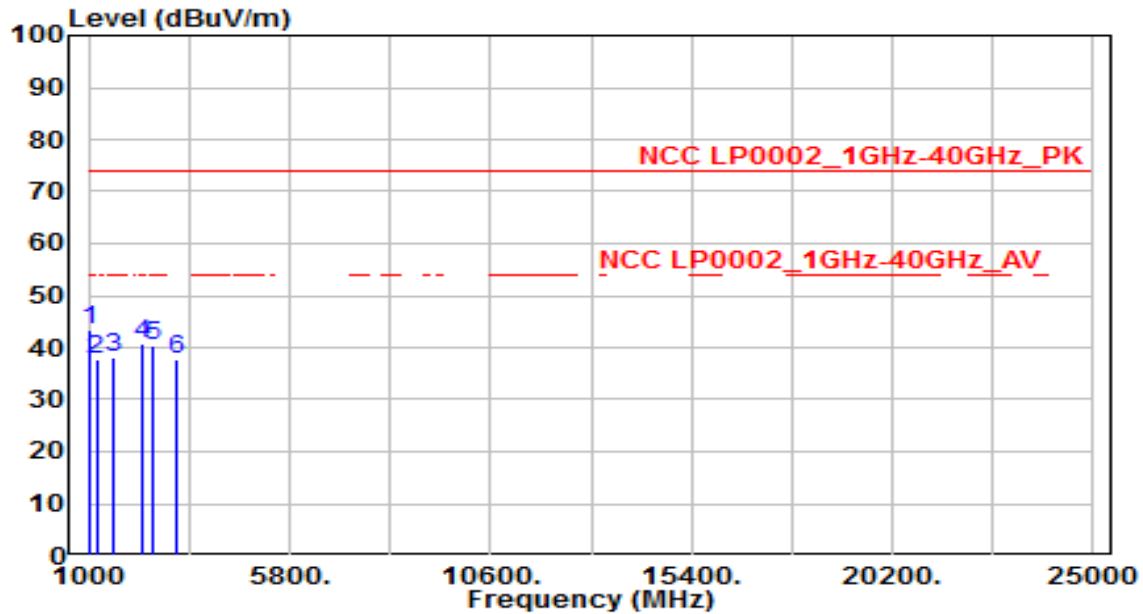


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4960.000	37.33	3.65	40.98	-33.02	74.00	100	360	Peak
2	7440.000	31.02	11.55	42.56	-31.44	74.00	100	360	Peak
3	* 9920.000	32.55	15.21	47.76	-26.24	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee RX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

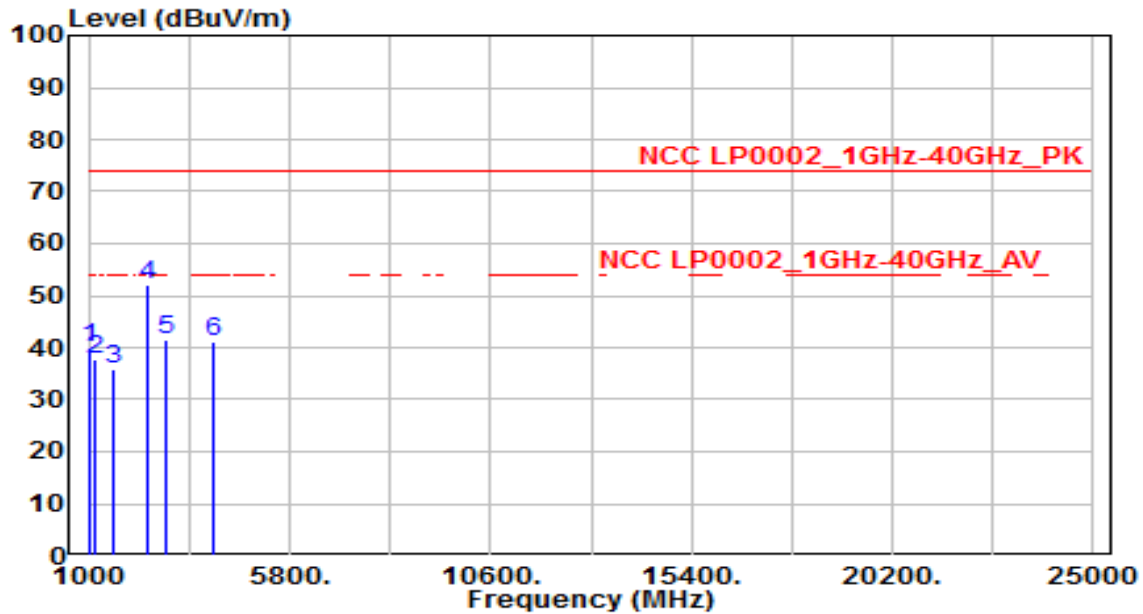


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	1019.335	51.34	-7.86	43.48	-30.52	74.00	100	360	Peak
2		1180.412	44.94	-7.15	37.79	-36.21	74.00	100	360	Peak
3		1598.193	43.51	-5.47	38.03	-35.97	74.00	100	360	Peak
4		2252.562	43.90	-3.31	40.60	-33.40	74.00	100	360	Peak
5		2539.475	42.75	-2.24	40.50	-33.50	74.00	100	360	Peak
6		3079.339	40.00	-2.26	37.74	-36.26	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee RX_2440MHz with External Antenna	Test Voltage	AC 110V/60Hz

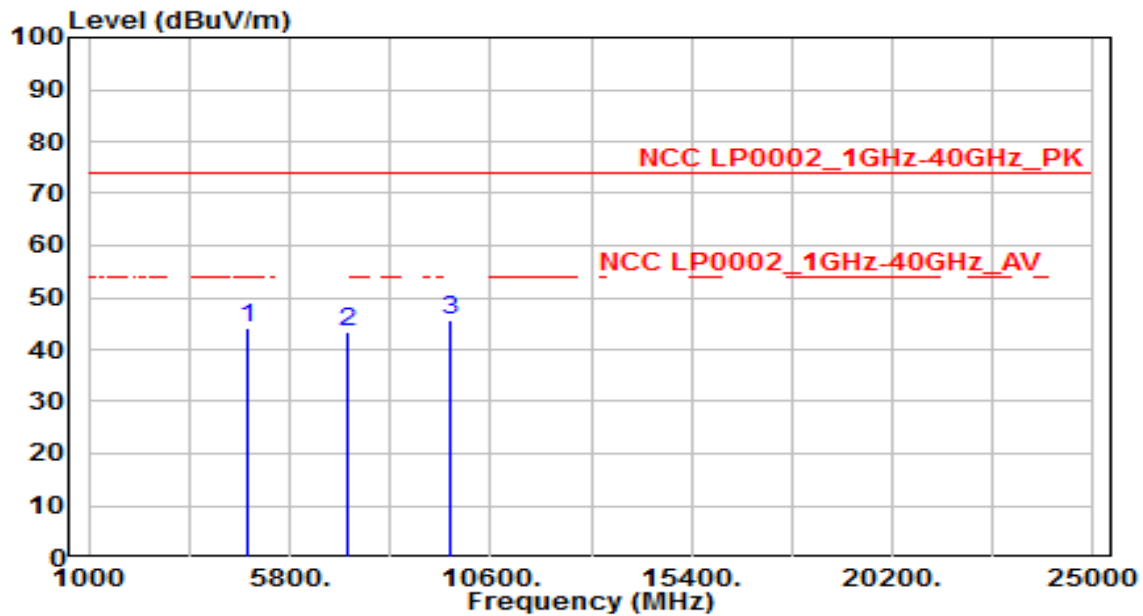


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1012.152	48.05	-7.90	40.15	-33.85	74.00	100	360	Peak
2	1176.745	44.92	-7.17	37.75	-36.25	74.00	100	360	Peak
3	1596.321	41.41	-5.48	35.93	-38.07	74.00	100	360	Peak
4	* 2392.529	54.96	-2.69	52.26	-21.74	74.00	100	360	Peak
5	2849.908	43.77	-2.44	41.33	-32.67	74.00	100	360	Peak
6	3989.143	40.27	0.84	41.11	-32.89	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2405MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

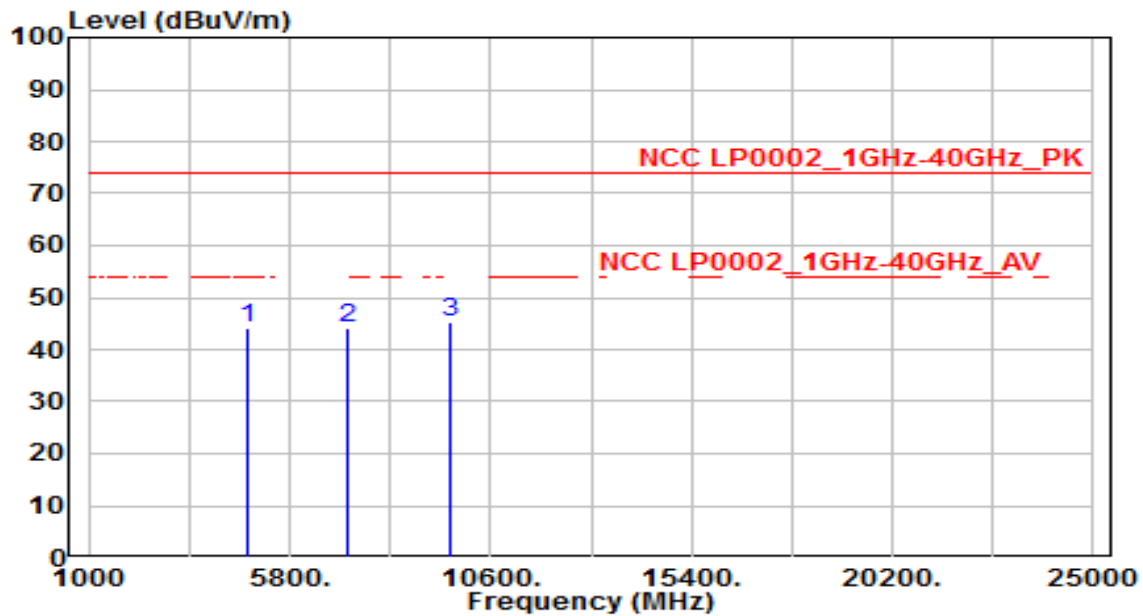


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4810.000	40.68	3.29	43.98	-30.02	74.00	100	360	Peak
2	7215.000	32.54	10.91	43.44	-30.56	74.00	100	360	Peak
3	* 9620.000	31.14	14.65	45.78	-28.22	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2405MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

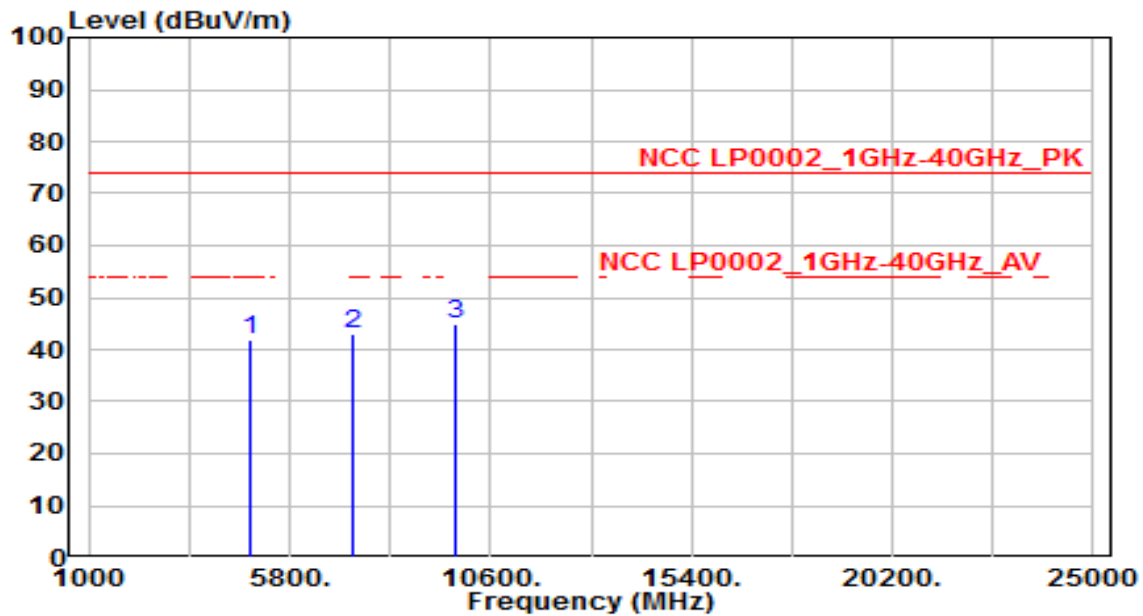


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4810.000	40.73	3.29	44.03	-29.97	74.00	100	360	Peak
2	7215.000	33.31	10.91	44.22	-29.78	74.00	100	360	Peak
3	* 9620.000	30.54	14.65	45.19	-28.81	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

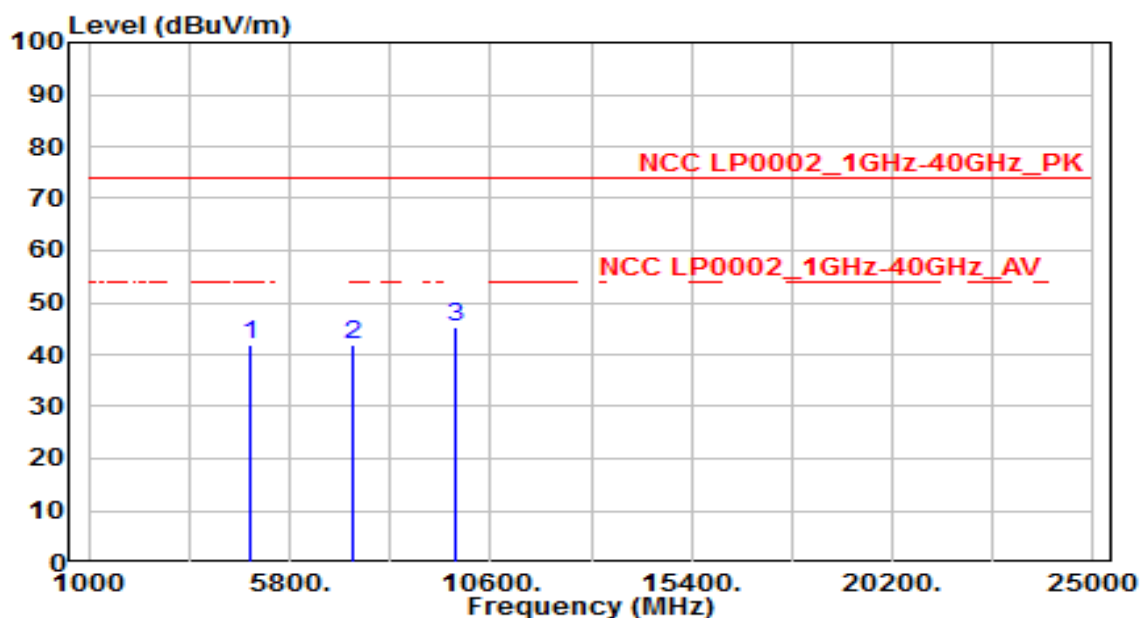


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4880.000	38.24	3.46	41.70	-32.30	74.00	100	360	Peak
2	7320.000	31.68	11.21	42.89	-31.11	74.00	100	360	Peak
3	* 9760.000	30.18	14.91	45.09	-28.91	74.00	100	360	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

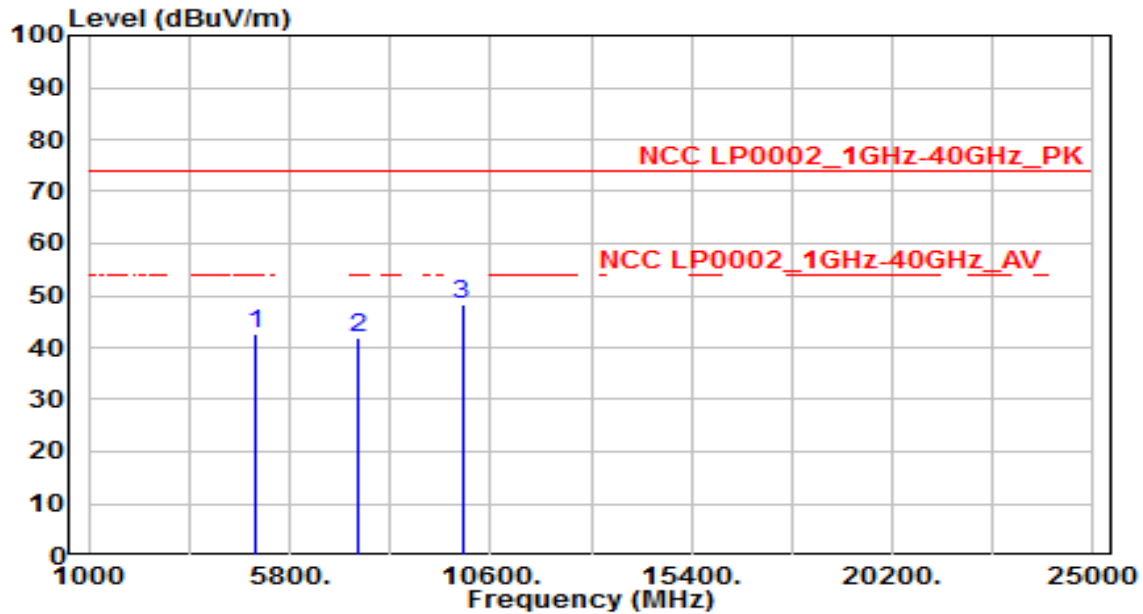


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4880.000	38.41	3.46	41.87	-32.13	74.00	100	360	Peak
2	7320.000	30.81	11.21	42.01	-31.99	74.00	100	360	Peak
3	* 9760.000	30.51	14.91	45.42	-28.58	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2480MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

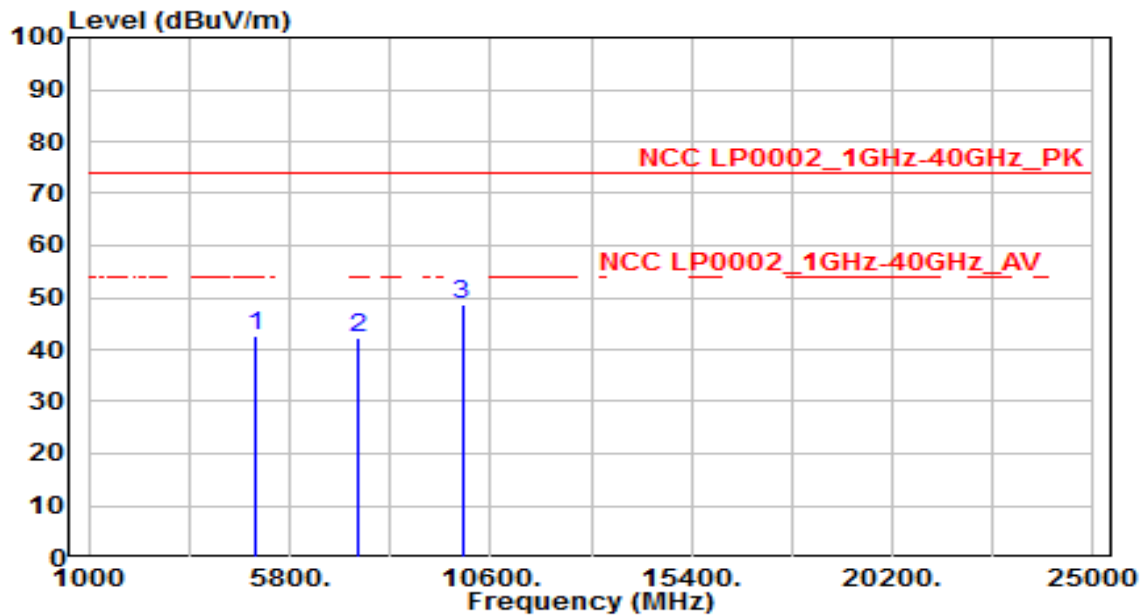


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4960.000	38.91	3.65	42.56	-31.44	74.00	100	360	Peak
2	7440.000	30.22	11.55	41.77	-32.23	74.00	100	360	Peak
3	* 9920.000	33.07	15.21	48.28	-25.72	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2480MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

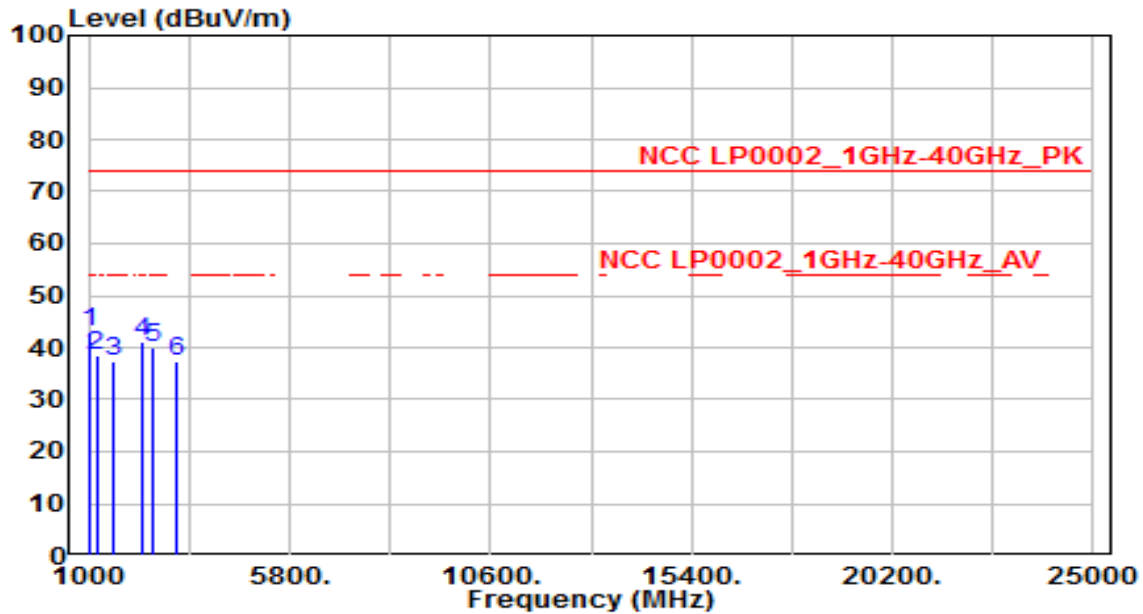


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4960.000	38.92	3.65	42.57	-31.43	74.00	100	360	Peak
2	7440.000	30.54	11.55	42.09	-31.91	74.00	100	360	Peak
3	* 9920.000	33.36	15.21	48.57	-25.43	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee RX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

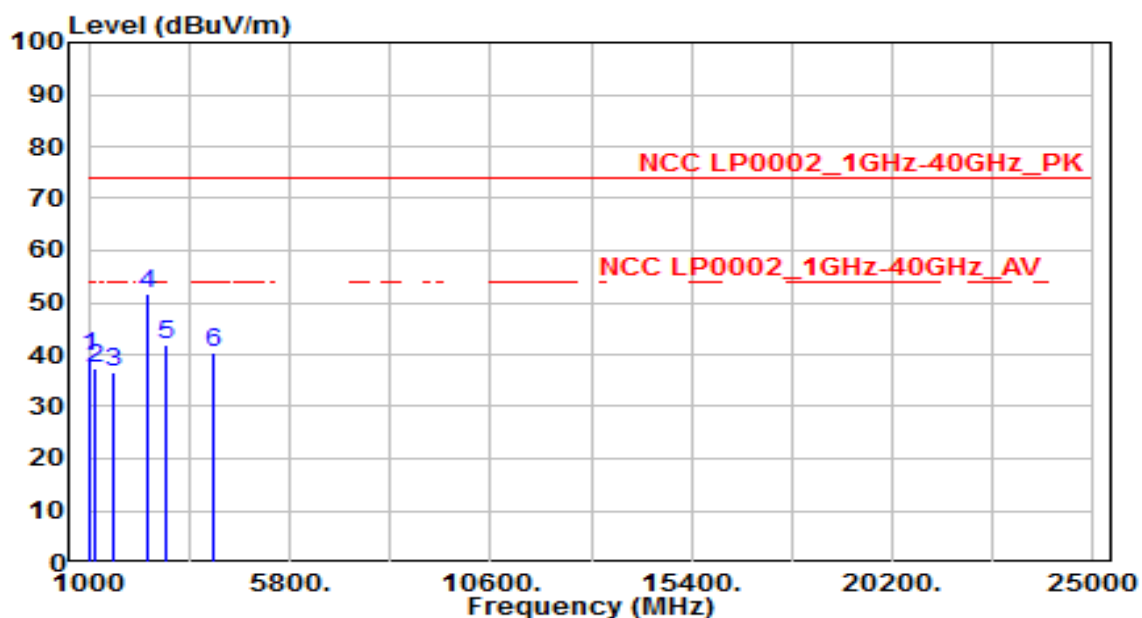


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	1019.656	50.77	-7.86	42.91	-31.09	74.00	100	360	Peak
2		1180.625	45.60	-7.15	38.45	-35.55	74.00	100	360	Peak
3		1598.188	42.85	-5.47	37.38	-36.62	74.00	100	360	Peak
4		2252.688	44.56	-3.31	41.25	-32.75	74.00	100	360	Peak
5		2539.031	42.09	-2.24	39.85	-34.15	74.00	100	360	Peak
6		3079.313	39.44	-2.26	37.18	-36.82	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee RX_2440MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

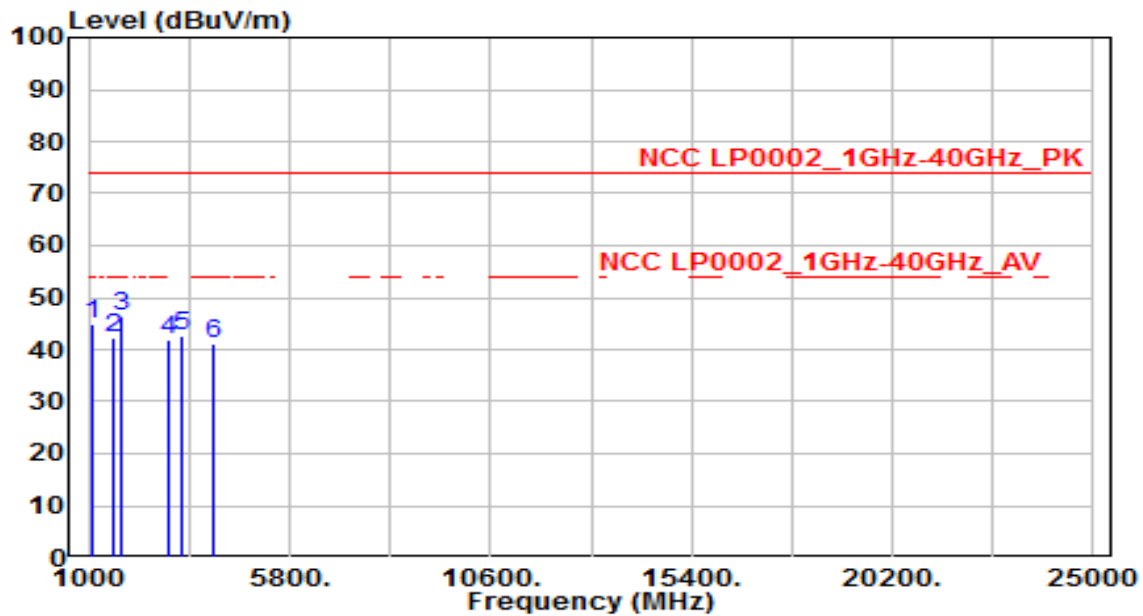


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1012.219	47.48	-7.90	39.59	-34.41	74.00	100	360	Peak
2	1176.375	44.35	-7.17	37.19	-36.81	74.00	100	360	Peak
3	1596.594	42.06	-5.48	36.58	-37.42	74.00	100	360	Peak
4	* 2392.406	54.39	-2.69	51.70	-22.30	74.00	100	360	Peak
5	2849.281	44.43	-2.44	41.99	-32.01	74.00	100	360	Peak
6	3989.875	39.70	0.85	40.55	-33.45	74.00	100	360	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-04-07
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /57%
Polarity	Horizontal	Site / Test Engineer	AC1 / Howard
Test Mode	Mode5	Test Voltage	AC 110V/60Hz

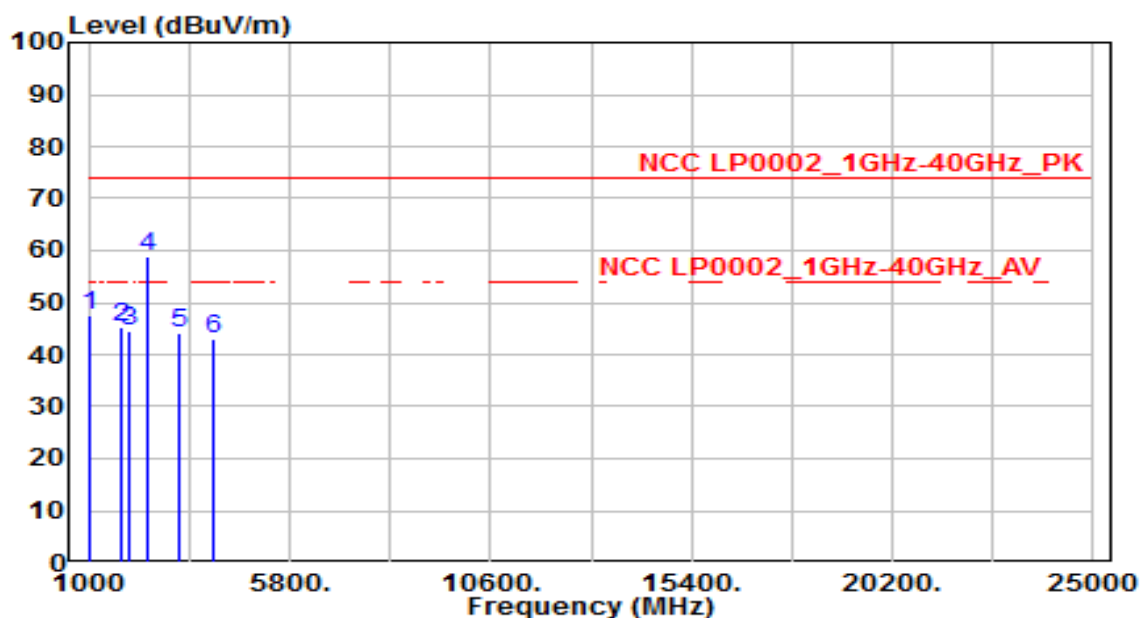


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1057.906	52.65	-7.69	44.96	-29.04	74.00	150	360	Peak
2	1609.875	47.55	-5.44	42.11	-31.89	74.00	150	360	Peak
3	* 1791.031	51.46	-4.97	46.50	-27.50	74.00	150	360	Peak
4	2892.313	44.52	-2.46	42.06	-31.94	74.00	150	360	Peak
5	3215.844	44.57	-1.80	42.77	-31.23	74.00	150	360	Peak
6	3991.469	40.30	0.85	41.15	-32.85	74.00	150	360	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-04-07
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /57%
Polarity	Vertical	Site / Test Engineer	AC1 / Howard
Test Mode	Mode5	Test Voltage	AC 110V/60Hz



No	Frequency (MHz)	Reading (dBUV)	C.F (dB)	Measurement (dBUV/m)	Margin (dB)	Limit (dBUV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1045.688	55.45	-7.75	47.70	-26.30	74.00	150	360	Peak
2	1761.281	50.18	-5.05	45.14	-28.86	74.00	150	360	Peak
3	1994.500	49.00	-4.43	44.56	-29.44	74.00	150	360	Peak
4	* 2396.125	61.46	-2.68	58.79	-15.21	74.00	150	360	Peak
5	3187.156	46.10	-1.90	44.20	-29.80	74.00	150	360	Peak
6	3996.781	42.28	0.87	43.15	-30.85	74.00	150	360	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBUV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

5.6 頻帶邊緣

5.6.1 量測方法

待測物置於非導體桌面（落地型產品置於地上），受測物使用交流電源時，將其與任何配件設備之電源線連接至位於旋轉桌的交流電源。受測物使用電池時，測試時應裝置新電池或充電完全的電池。受測物與配件設備之電源線無須束綁，桌面上受測設備的所有電源線由桌子的後緣垂下沿旋轉桌表面接至交流插座。落地型設備的交流電源線可以方便的型態走線。桌面可360度旋轉，接收天線置於距待測物3m距離，高度可在1至4公尺間變動，以量測待測物之最大輻射電場強度，接收天線並應於水平及垂直極化方向各量測一次。（待測物擺設方式根據 ANSI C63.10-2013版，待測物放置桌中心，1G以下擺設高度為80cm/1G以上擺設高度為150cm）

- (1) 任一頻率小於或等於1000 MHz 之訊號,使用CISPR準峰值檢波器
- (2) 任一頻率大於1000 MHz 之訊號，使用平均值檢波器測量，當規定之發射限制值為平均值時(含1000 MHz 以下)，受測訊號藉由峰值檢波器(RBW:1MHz,VBW:3MHz)所測量之峰值，亦須符合峰值發射限制值，其峰值發射限制值為最大容許平均值加20 dB。

備註：若為手持式或穿戴式之裝置，需對其三個正交軸的方位評估測試，並記錄最差的數值。

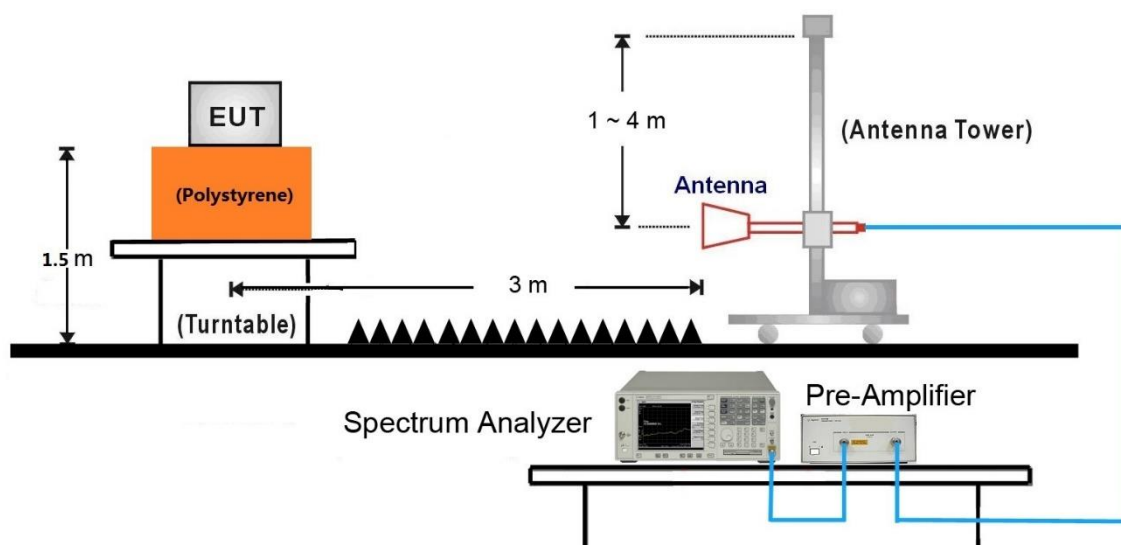
5.6.2 限制要求

除低功率射頻器材技術規範另有規定外，任何低功率射頻器材之主波皆不得使用下表所列各頻段之頻率低功率射頻器材落於下表所列頻帶內之混附發射，其電場強度必須符合低功率射頻器材技術規範之第3.6節限制規定

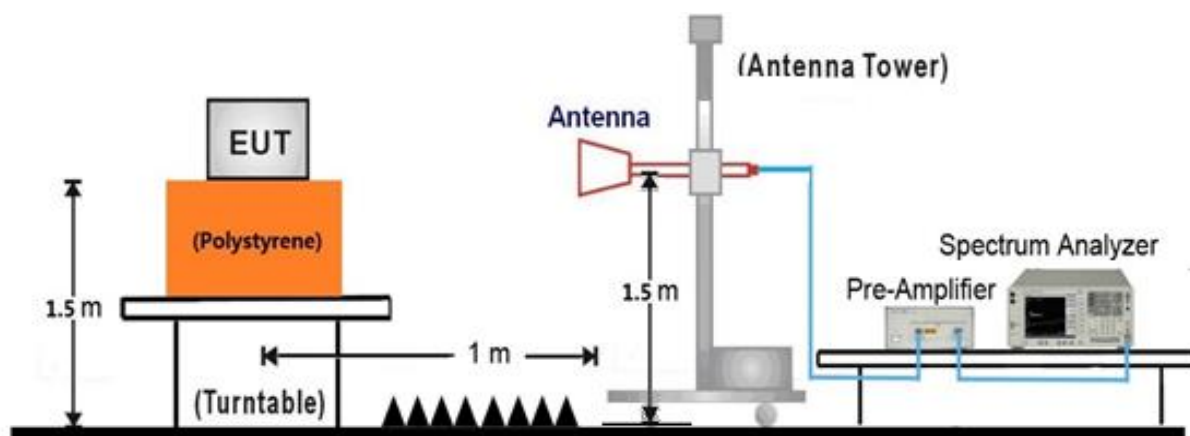
頻 率 (MHz)	頻 率 (MHz)	頻 率 (MHz)	頻 率 (MHz)	頻 率 (MHz)
0.090~0.110	25.500~25.700	703.00~748.00	2310.0~2390.0	13250~13400
0.490~0.510	37.475~38.275	758.00~803.00	2483.5~2900.0	14470~14500
2.172~2.198	73.500~75.400	825.00~915.00	3260.0~3267.0	15350~16200
3.013~3.033	108.00~138.00	930.00~1240.0	3332.0~3339.0	17700~21400
4.115~4.198	149.90~150.05	1300.0~1427.0	3345.8~3358.0	22010~23120
5.670~5.690	156.70~156.90	1435.0~1626.5	3500.0~4400.0	23600~24000
6.200~6.300	162.01~167.17	1660.0~1785.0	4500.0~5250.0	31200~31800
8.230~8.400	167.72~173.20	1805.0~1880.0	5350.0~5460.0	36430~36500
12.265~12.600	240.00~285.00	1885.0~1900.0	7250.0~7750.0	38600 以上
13.340~13.430	322.00~335.40	1905.0~1985.0	8025.0~8500.0	
14.965~15.020	399.90~410.00	2010.0~2025.0	9000.0~9200.0	
16.700~16.755	485.00~510.00	2110.0~2170.0	9300.0~9500.0	
19.965~20.020	608.00~614.00	2200.0~2300.0	10600~12700	

5.6.3 測試架構圖

1GHz ~ 18GHz Test Setup:

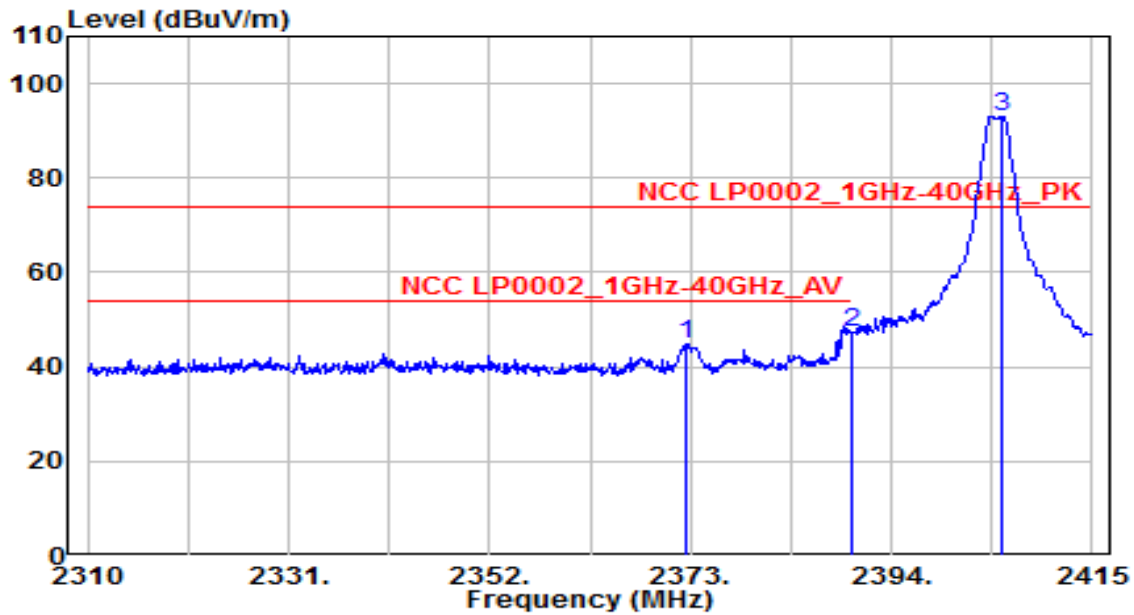


18GHz ~25GHz Test Setup:



5.6.4 頻帶邊緣測試結果

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2405MHz with External Antenna	Test Voltage	AC 110V/60Hz

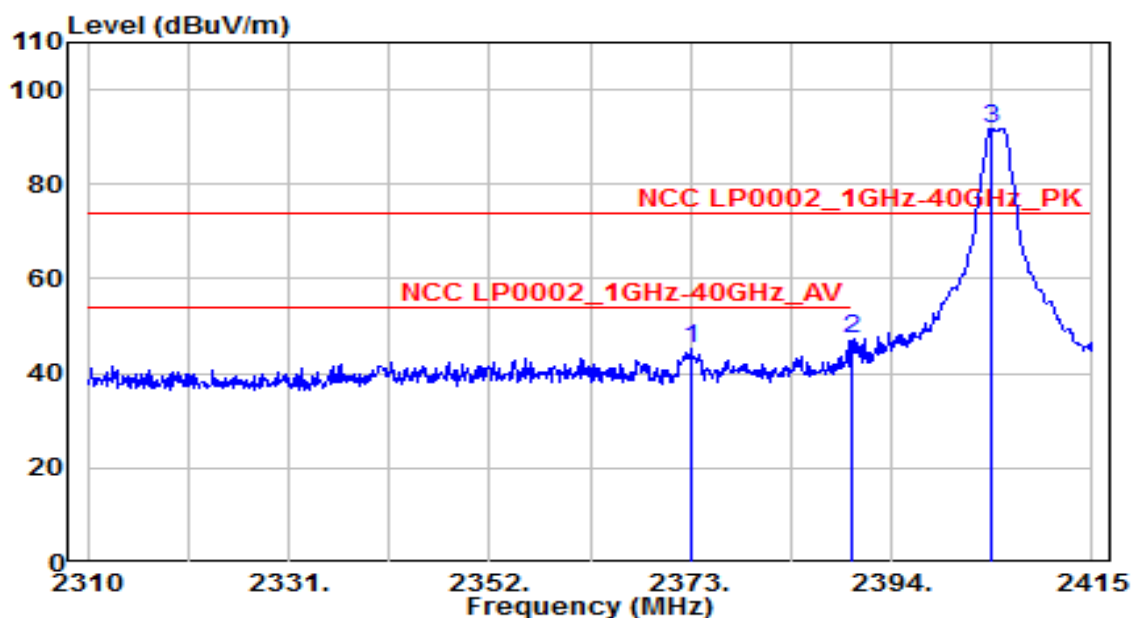


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2372.475	47.53	-2.78	44.75	-29.25	74.00	145	240	Peak
2	* 2390.000	50.15	-2.70	47.45	-26.55	74.00	145	240	Peak
3	2405.550	95.76	-2.64	93.12	N/A	N/A	145	240	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2405MHz with External Antenna	Test Voltage	AC 110V/60Hz

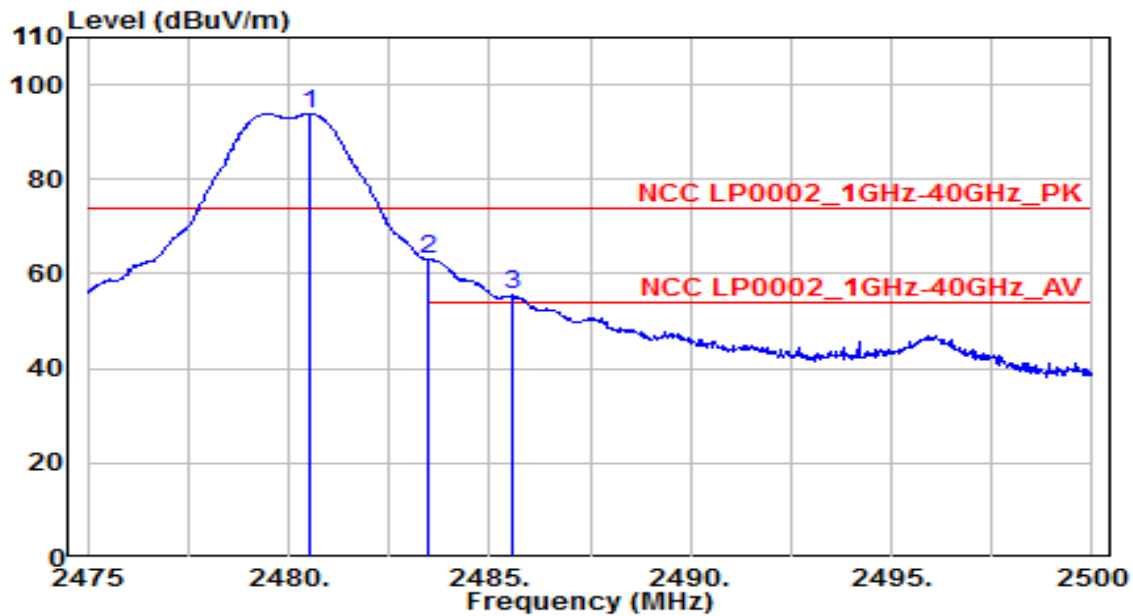


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2373.000	47.99	-2.78	45.21	-28.79	74.00	100	50	Peak
2	* 2390.000	49.83	-2.70	47.12	-26.88	74.00	100	50	Peak
3	2404.500	94.57	-2.64	91.93	N/A	N/A	100	50	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2480MHz with External Antenna	Test Voltage	AC 110V/60Hz

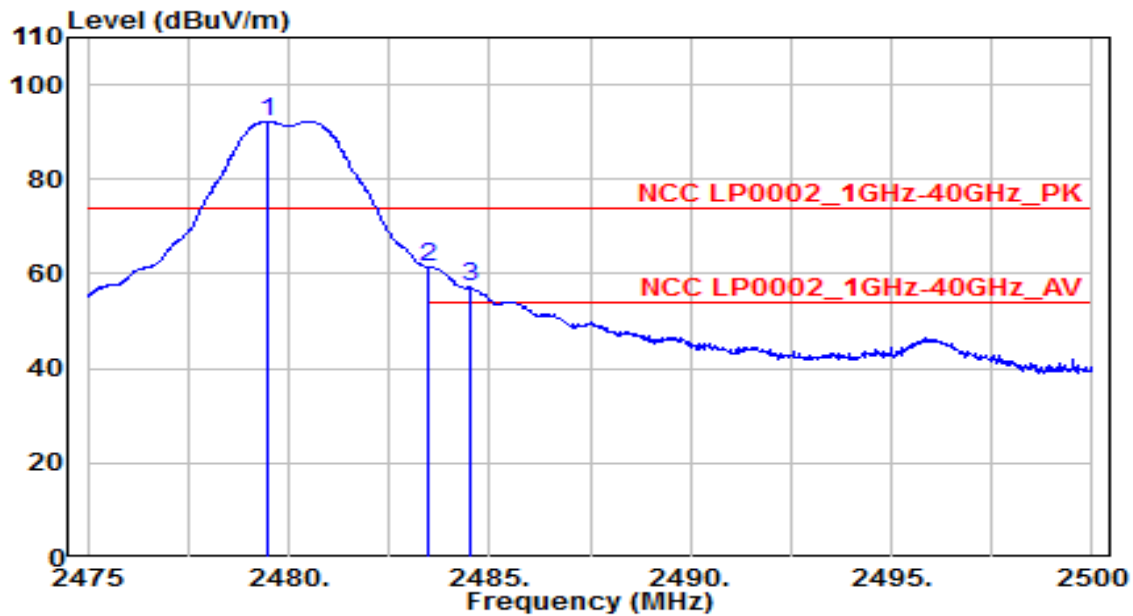


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2480.500	96.05	-2.31	93.75	N/A	N/A	155	240	Peak
2	* 2483.500	65.32	-2.29	63.03	-10.97	74.00	155	240	Peak
3	2483.500	65.32	20	45.32	-8.68	54.00	155	240	Average ^{*5}
4	2485.550	57.82	-2.28	55.54	-18.46	74.00	155	240	Peak
5	2485.550	57.82	20	37.82	-16.18	54.00	155	240	Average ^{*5}

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. The average for restricted bands is converted by Average Factor, In non-restricted bands, the limit is 20dBc of the fundamental emission level.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2480MHz with External Antenna	Test Voltage	AC 110V/60Hz

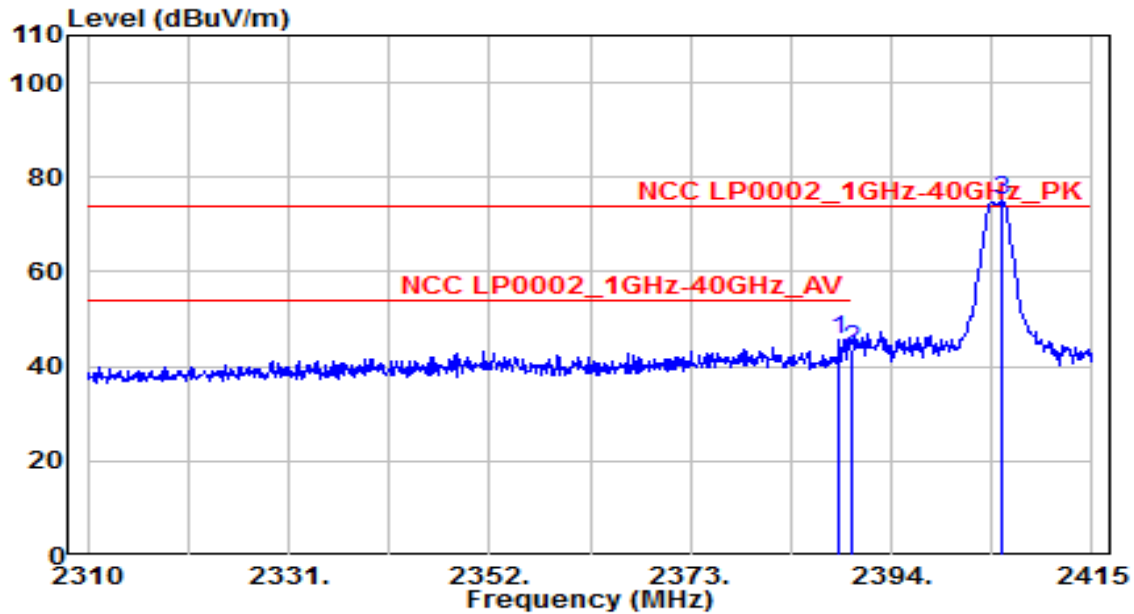


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2479.450	94.48	-2.31	92.17	N/A	N/A	145	270	Peak
2	* 2483.500	63.83	-2.29	61.54	-12.46	74.00	145	270	Peak
3	2483.500	63.83	20	43.83	-10.17	54.00	145	270	Average ^{*5}
4	2484.500	59.51	-2.29	57.22	-16.78	74.00	145	270	Peak
5	2484.500	59.51	20	39.51	-14.49	54.00	145	270	Average ^{*5}

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. The average for restricted bands is converted by Average Factor, In non-restricted bands, the limit is 30dBc of the fundamental emission level.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2405MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

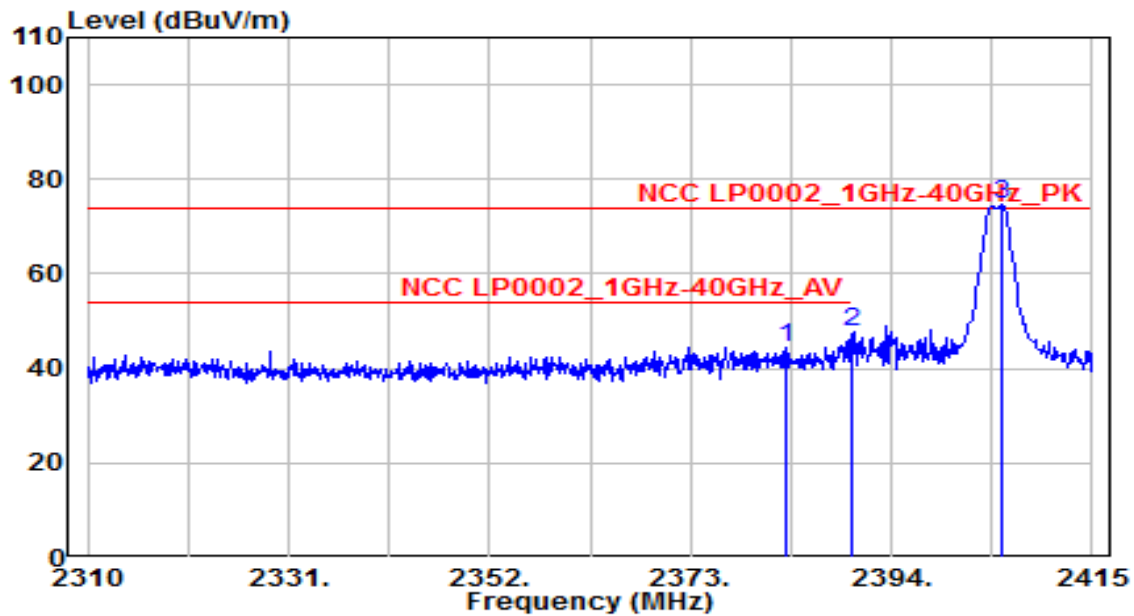


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	* 2388.540	48.30	-2.71	45.59	-28.41	74.00	135	230	Peak
2	2390.000	46.23	-2.70	43.52	-30.48	74.00	135	230	Peak
3	2405.445	77.59	-2.64	74.95	N/A	N/A	135	230	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2405MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

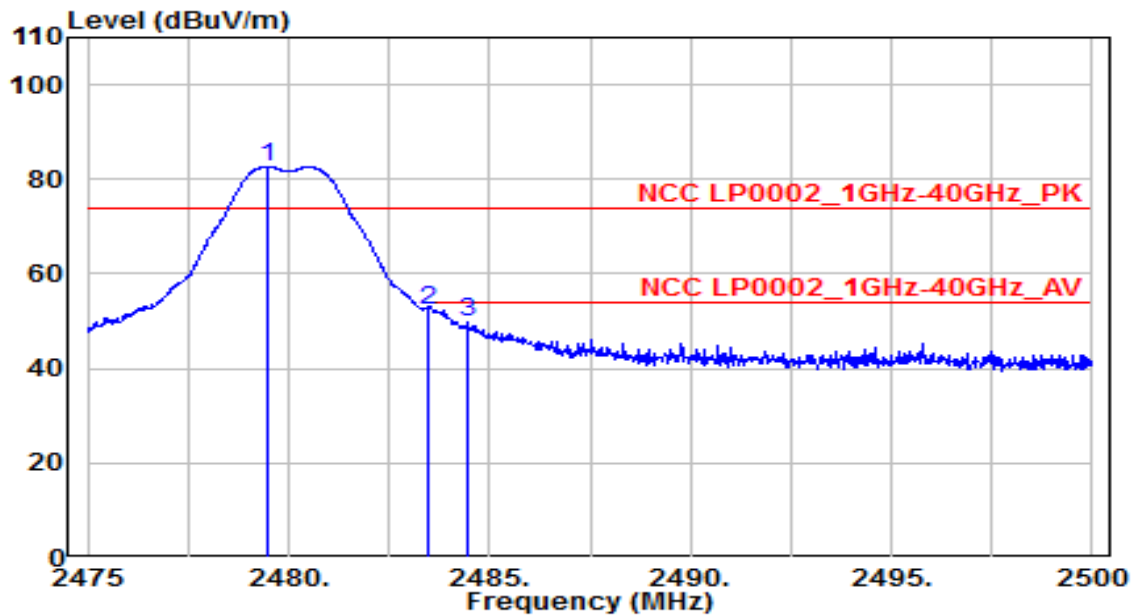


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2383.080	47.29	-2.73	44.56	-29.44	74.00	180	170	Peak
2	* 2390.000	50.47	-2.70	47.77	-26.23	74.00	180	170	Peak
3	2405.550	77.16	-2.64	74.53	N/A	N/A	180	170	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2480MHz with Internal Antenna	Test Voltage	AC 110V/60Hz

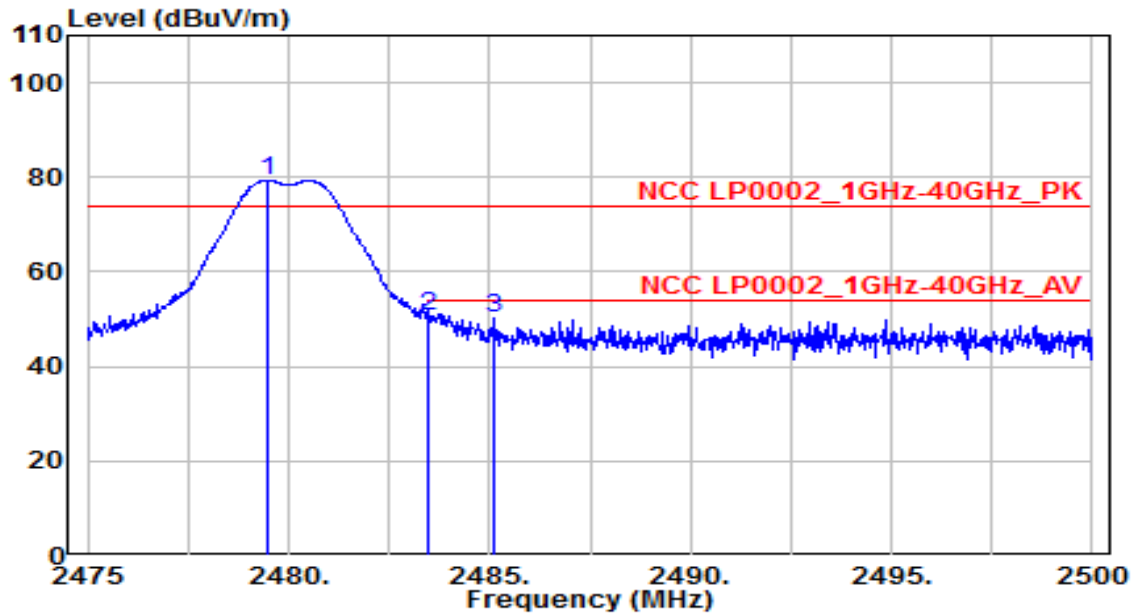


No	Frequency (MHz)	Reading (dBUV)	C.F (dB)	Measurement (dBUV/m)	Margin (dB)	Limit (dBUV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2479.475	84.92	-2.31	82.61	N/A	N/A	135	235	Peak
2	* 2483.500	54.76	-2.29	52.47	-21.53	74.00	135	235	Peak
3	2484.425	51.93	-2.29	49.64	-24.36	74.00	135	235	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBUV/m) = Reading(dBUV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	Portable Wireless Receiver	Date of Test	2021-03-18
Factor	BBHA 9120D	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	Zigbee TX_2480MHz with Internal Antenna	Test Voltage	AC 110V/60Hz



No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2479.475	81.68	-2.31	79.37	N/A	N/A	190	180	Peak
2	* 2483.500	52.94	-2.29	50.65	-23.35	74.00	190	180	Peak
3	2485.125	52.55	-2.29	50.26	-23.74	74.00	190	180	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

5.7. 占用頻寬

5.7.1 量測方法

待測物之天線埠經由適當之衰減直接連至頻譜分析儀RF輸入端，頻譜分析儀之設定,參考如下:

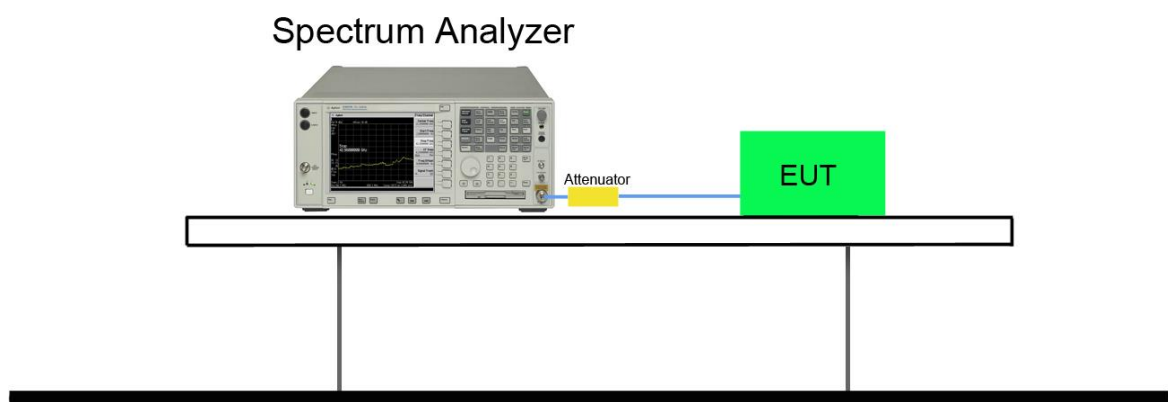
- (1) Set RBW = 100 kHz
- (2) VBW $\geq 3 \times$ RBW
- (3) Detector = Peak
- (4) Trace mode = max hold
- (5) Sweep = auto couple

備 註: DH1,DH3,DH5僅為封包傳輸率的差異,其針對此章節無顯著之影響，因此僅檢附DH5為測試數據。

5.7.2 限制要求

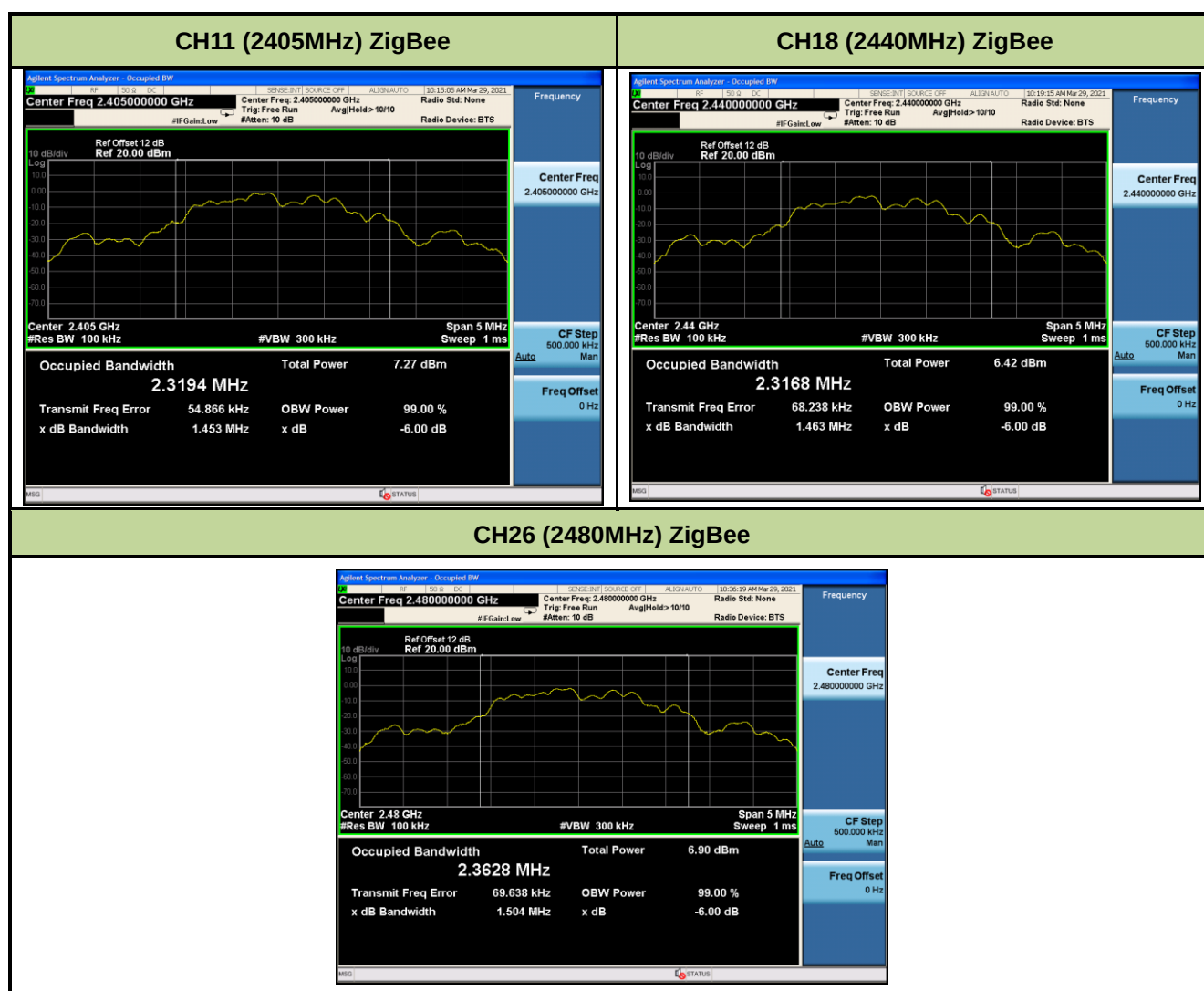
6dB頻寬至少應有500kHz。

5.7.3 測試架構圖



5.7.4 占用頻寬測試結果

Test Mode	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
ZigBee with External Antenna	11	2405	1.453	≥ 0.5	Pass
	18	2440	1.463	≥ 0.5	Pass
	26	2480	1.504	≥ 0.5	Pass



5.8. 功率頻譜密度

5.8.1 量測方法

將發射機之天線埠經由適當之衰減直接連至測試儀器。找出發射峰值並擴展於通帶內，設定解析頻寬為3 kHz，視訊頻寬大於解析頻寬，掃描時間為頻率掃描範圍除以3 kHz。所測得之峰值位準必須應小於或等於8 dBm。

若受測裝置之頻譜線間隔小於3 kHz，測量時應將解析頻寬降低以使頻譜線間隔大於3kHz，所測得之數據再藉加總3 kHz 頻帶內所有個別頻譜線之功率(即標準化至3 kHz)以決定是否符合規定。

5.8.2 限制要求

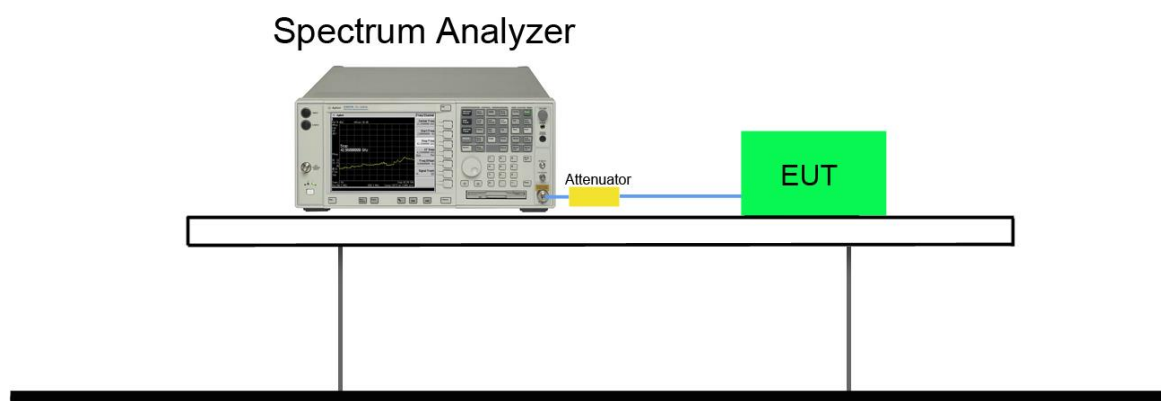
在使用頻率範圍之任意3千赫(kHz)頻寬內，由發射機傳導至天線之峰值發射電功率密度在任意期間內，皆不得大於8dBm。

若用於非固定式點對點操作時，若其發射天線之方向性增益超過6dBi，應依所超過之dB數等量降低峰值輸出功率。如用於固定式點對點(註)操作時，應符合下列情形之一：

(1)操作於2400-2483.5兆赫(MHz)者，其發射天線之方向性增益超過6dBi，應於每超過3dB降低1dB之峰值輸出功率。

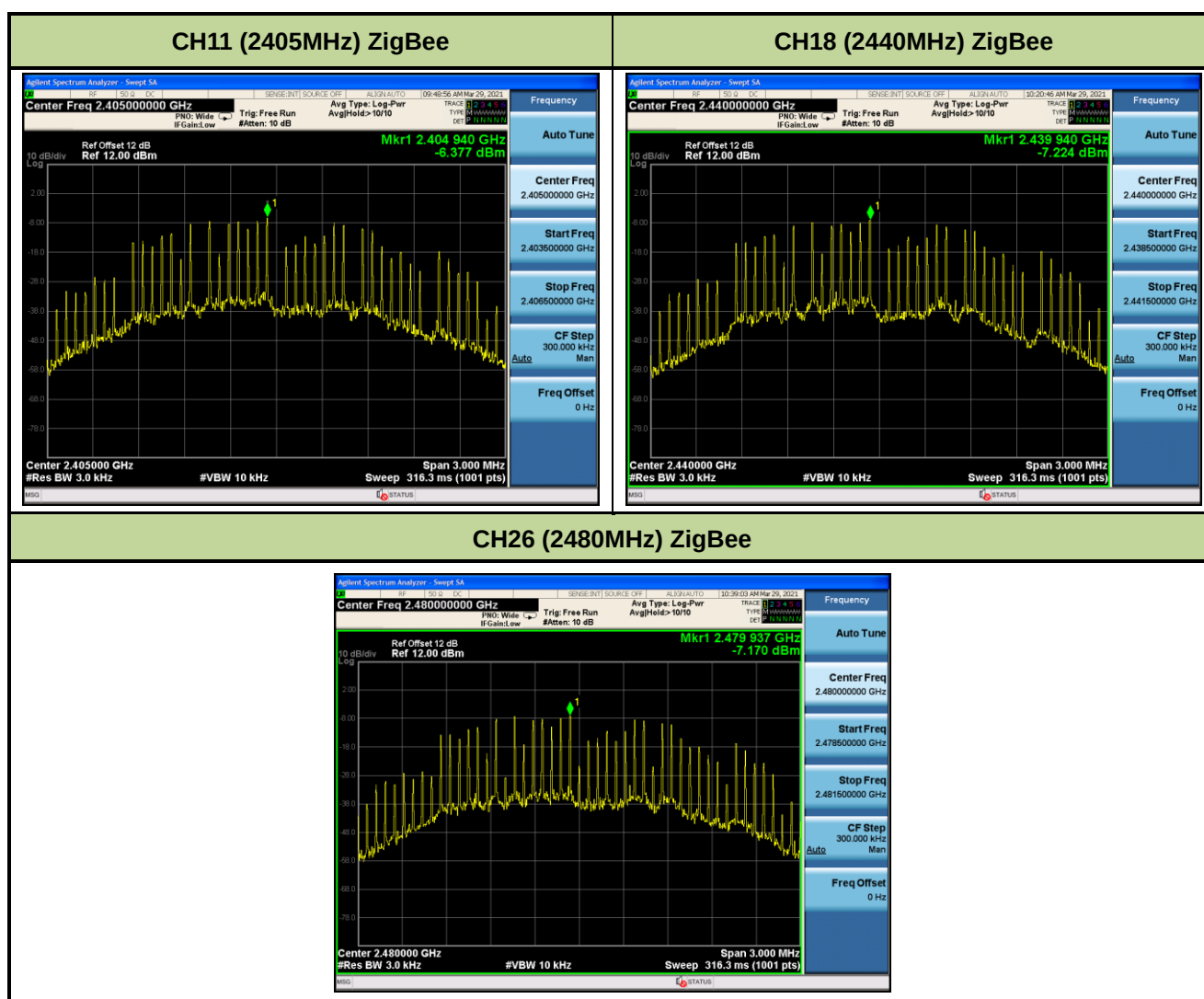
(2) 操作於5725-5850兆赫(MHz)者，其發射天線之方向性增益超過6dBi，不需降低峰值輸出功率。

5.8.3 測試架構圖



5.8.4 功率頻譜密度測試結果

Test Mode	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
ZigBee with External Antenna	11	2405	-6.377	≤ 8	Pass
	18	2440	-7.224	≤ 8	Pass
	26	2480	-7.17	≤ 8	Pass



5.9. 工作週期

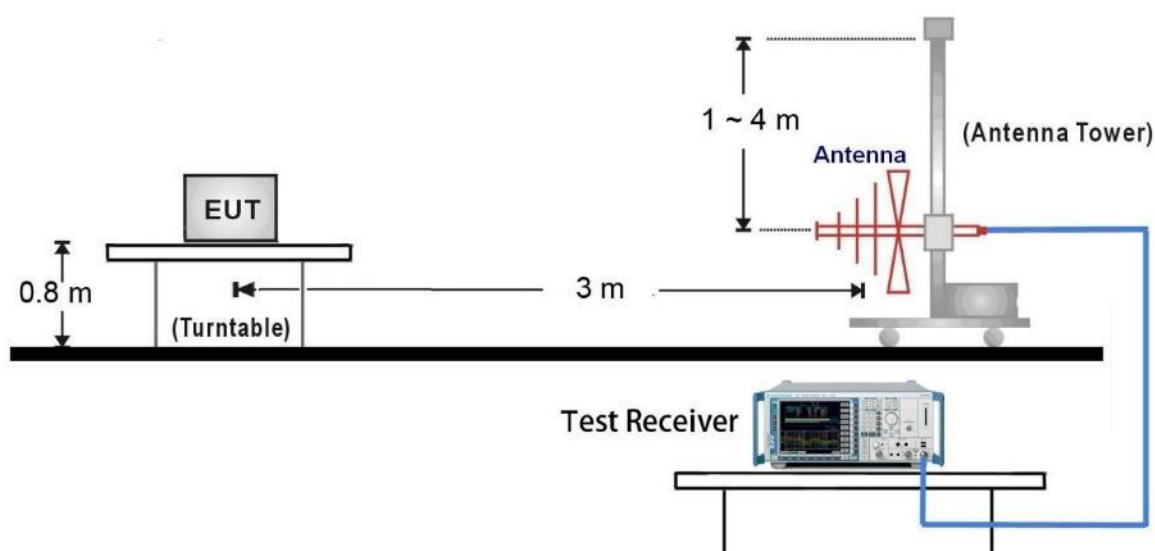
5.9.1 量測方法

待測物之天線埠經由適當之衰減直接連至頻譜分析儀RF輸入端，設定頻譜分析儀之解析度頻寬為1MHz，視訊頻寬不小於解析度頻寬，頻率掃瞄範圍設定為Zero Span。

5.9.2 限制要求

當脈衝序列之週期(包括無發射期間)不大於 100 毫秒時，以平均一完整脈衝序列之脈衝寬度總合計算工作週期；或者，當脈衝序列不具週期性或週期超過 100 毫秒時，則取脈衝序列中任一 100 毫秒區間，其總合脈衝寬度最長者計算之，即工作週期為該總合脈衝寬度除以 100 毫秒。

5.9.3 測試架構圖

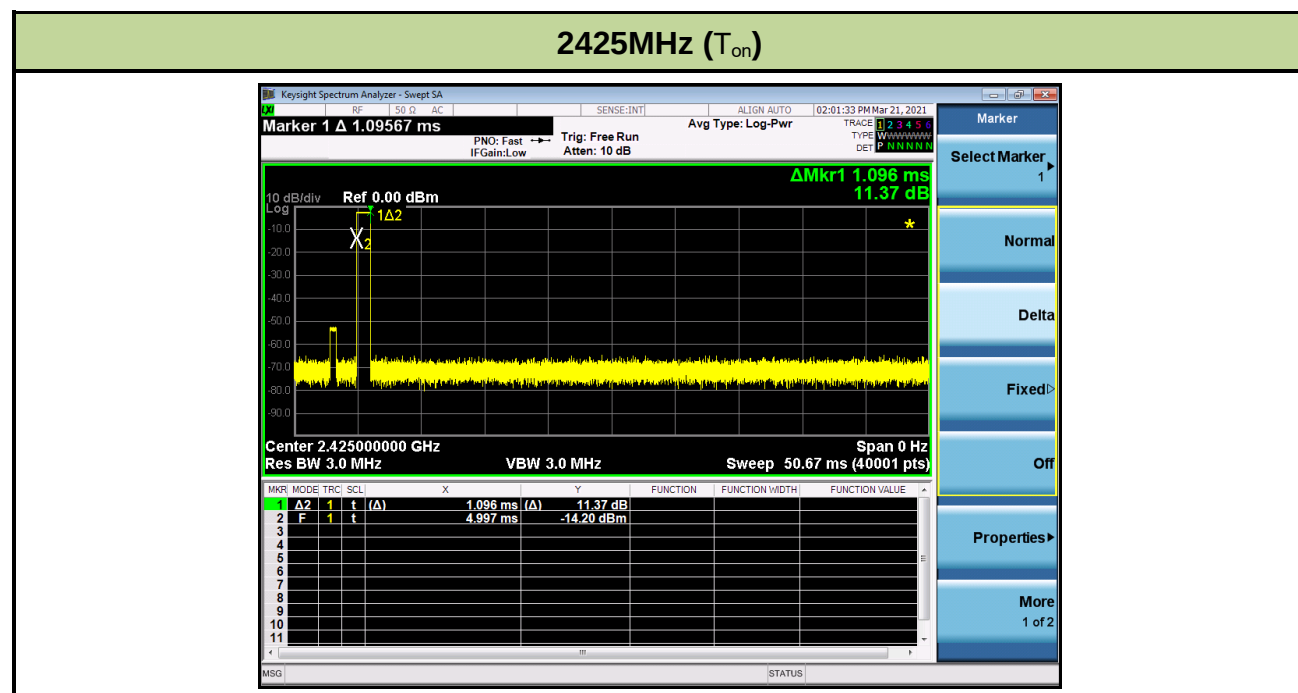


5.9.4 工作週期測試結果

Frequency (MHz)	Total Time (T _{on}) (ms)	The duration time (ms)	Duty Cycle	Duty Cycle Factor (dB)
2425	1.096	100	0.1	20

Note 1: Duty Cycle = Total Time (T_{on}) / The duration time(ms).

Note 2: Duty Cycle Factor = 20*Log*(1/Duty Cycle).



The End