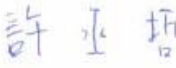


NCC

低功率射頻電機型式試驗報告

產品名稱 : 電視喇叭
型號 : Cinema 600 SOUND BAR
系列型號 : Cinema 400 SOUND BAR
Cinema 800 SOUND BAR
Cinema 1200 SOUND BAR
廠牌 : Klipsch
商標 : 
申請者 : 鈺環數位音響有限公司
申請者地址 : 臺中市霧峰區五福里中投西路二段 442 號
測試標準 : LP0002 (107 年版)
參考法規 : ANSI C63.10-2013
測試結果 : 符合
接收日期 : 2020/8/26
測試日期 : 2020/9/3~2020/9/10

測試工程師 : 
(許丞哲)

報告審核人 : 
(陳柏均)

報告簽屬人 : 
(柯承志)



修訂紀錄

報告編號	版本	描述	發行日期
2008TW3703-T2	1.0	Original Report	2020-09-23

CONTENTS

Description	Page
1. 一般資訊.....	4
2. 產品描述.....	5
2.1 產品資訊.....	5
2.2 產品規格.....	6
2.3 測試模式.....	6
2.4 測試配置.....	7
2.5 測試周邊.....	8
2.6 操作程序.....	8
3. 測試設備明細.....	9
4. 量測不確定度.....	10
5. 測試結果.....	11
5.1 電源傳導測試.....	12
5.1.1 量測方法.....	12
5.1.2 限制要求.....	12
5.1.3 測試架構圖.....	12
5.1.4 電源傳導測試結果.....	13
5.2 天線之要求.....	15
5.2.1 限制要求.....	15
5.2.2 天線樣式.....	15
5.3 主波電場強度.....	16
5.3.1 量測方法.....	16
5.3.2 限制要求.....	16
5.3.3 測試架構圖.....	17
5.3.4 主波電場強度測試結果.....	18
5.4 輻射電場強度.....	24
5.4.1 量測方法.....	24
5.4.2 限制要求.....	24
5.4.3 測試架構圖.....	25
5.4.4 輻射電場強度測試結果.....	27
5.5 頻帶邊緣.....	39
5.5.1 量測方法.....	39
5.5.2 限制要求.....	39
5.5.3 測試架構圖.....	40
5.5.4 頻帶邊緣測試結果.....	41

1. 一般資訊

申請者	鈺環數位音響有限公司
申請者地址	臺中市霧峰區五福里中投西路二段 442 號
製造商	Zhao Yang Electronic (ShenZhen) Co., Ltd.
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	電視喇叭
產品型號	Cinema 600 SOUND BAR
系列型號	Cinema 400 SOUND BAR Cinema 800 SOUND BAR Cinema 1200 SOUND BAR
廠牌	Klipsch
商標	
頻率範圍	2402~2480MHz
規格	Bluetooth Dual Mode: V4.2
調變模式	GFSK
待測物電壓	AC 110V/60Hz
最大輸出功率	96.06dBuV/m
配件	
電源線	Brand: 和可 M/N: HSC-701+HSC-405 Length: 2.0m
HDMI cable	Brand: ZONG M/N: ZG-1001 Length: 1.5m
遙控器	Brand: Klipsch M/N: SOUNDBAR

Note:

1. 型號差異為因市場銷售需求，變更產品外觀、軟體，其餘電路設計、印刷電路板等等並無變更(廠商宣告)。
2. 僅針對型號: Cinema 600 SOUND BAR 評估測試。

2.2 產品規格

Type of modulation	GFSK
Data Rate	1Mbps(GFSK)

V4.2+LE

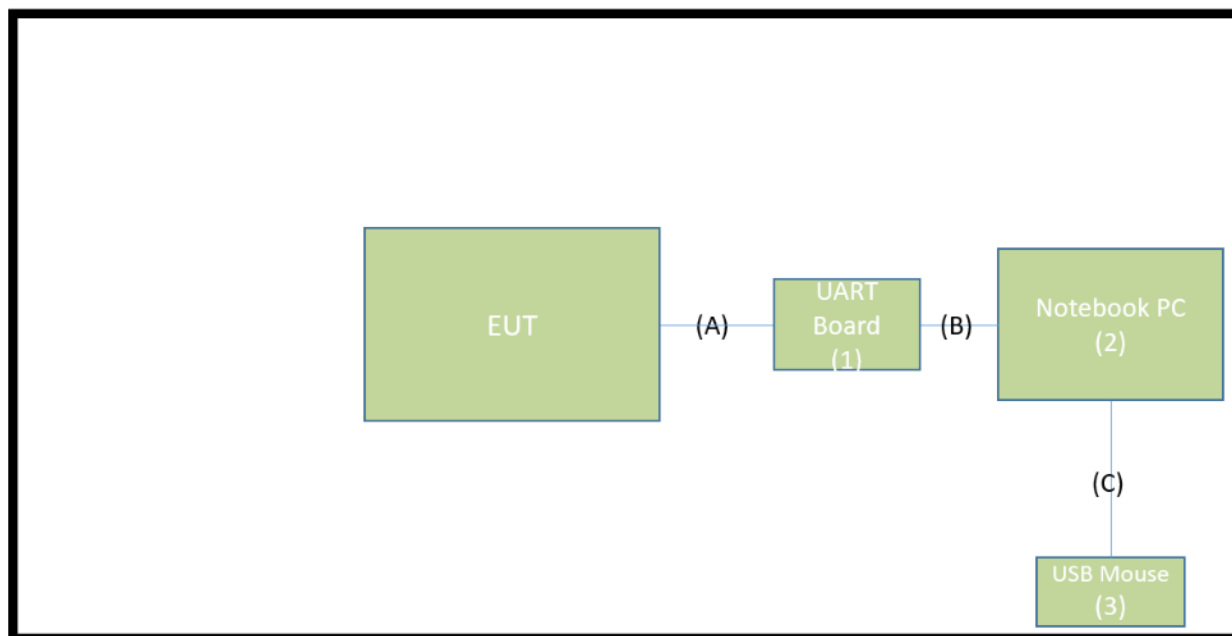
Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 MHz
21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz
27	2456 MHz	28	2458 MHz	29	2460 MHz
30	2462 MHz	31	2464 MHz	32	2466 MHz
33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz
39	2480 MHz	N/A	N/A	N/A	N/A

2.3 測試模式

Test Mode	Mode 1: 發射器- 1Mbps(LE)
	Mode 2: 接收機- 1Mbps(LE)

2.4 測試配置

待測物測試配置圖 Mode1~Mode2



Signal Cable Type		Signal Cable Description
A	Signal Cable(Dupont Line)	Non-shielded, 0.1m
B	USB Cable	Shielded, 1.0m (MFR:BENEVO Technology Co., Ltd, M/N: BUSB3300AMFB)
C	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~Mode2

No.	周邊名稱	廠牌	型號	序號	電源線
1	UART Board	N/A	CP2102	N/A	N/A
2	Notebook PC	Lenovo	ThinkPad T450	PC0BH4FR	Non-shielded, 0.8m
3	USB Mouse	Lenovo	M-U0025-O	HS427HA10UV	N/A

2.6 操作程序

1.	Turn on the power of all equipment.
2.	Execute "FCC_Test_Tools_V2.20" 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	製造商	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	2021/3/26
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	製造商	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	2021/9/3
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	2021/3/24
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2021/3/25

EMI 測試軟體

軟體名稱	製造商	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 電視喇叭

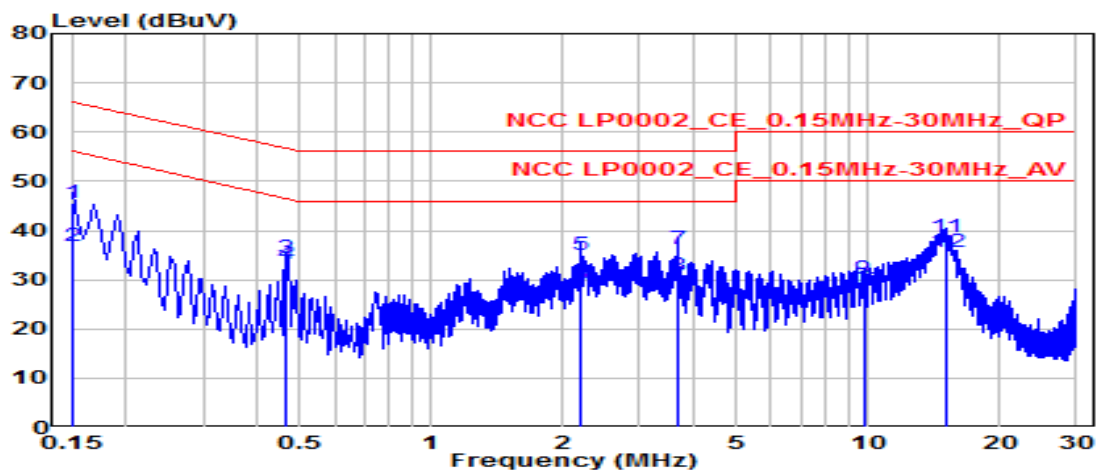
型號 Cinema 600 SOUND BAR

法規章節	量測項目	限制值	測試結果	測試數據
2.3	電源傳導	低功率射頻電機技術規範 2.3 節	符合	第 5.1 章節
3.10.1.3	天線之要求	低功率射頻電機技術規範 3.10.1.3 節	符合	第 5.2 章節
3.10.2	主波電場強度	低功率射頻電機技術規範 3.10.2 節	符合	第 5.3 章節
2.8	輻射電場強度	低功率射頻電機技術規範 2.8 節	符合	第 5.4 章節
2.7	頻帶邊緣	$\leq 74\text{dBuV/m(Peak)}$ $\leq 54\text{dBuV/m(Average)}$	符合	第 5.5 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	電視喇叭	Date of Test	2020-09-03
Factor	CE_ENV216-L1 (Filter ON)	Temp. / Humidity	25.4°C / 57%
Polarity	Line1	Site / Test Engineer	SR2 / Eric
Test Mode	BLE_TX_1Mbps_CH19	Test Voltage	AC 110V/60Hz

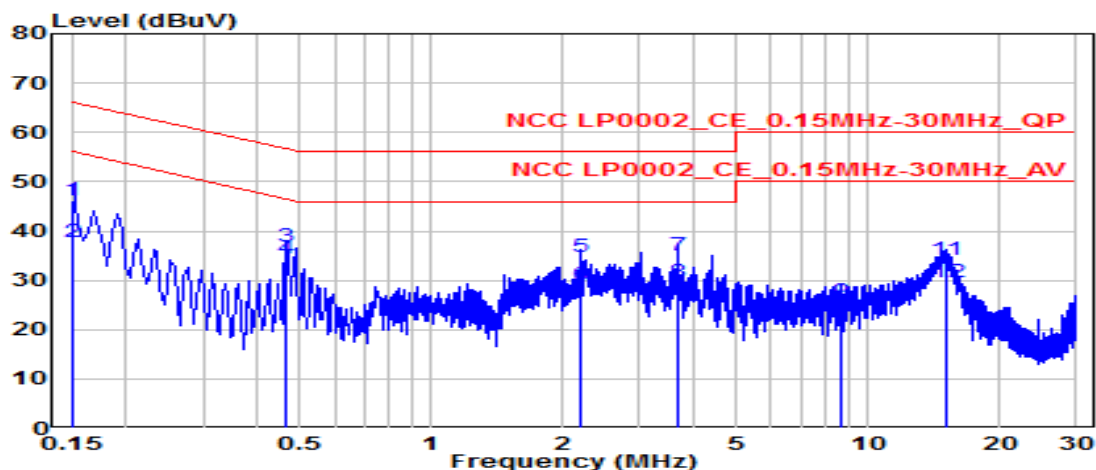


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Remark (QP/PK/AV)
1	0.150	36.11	9.61	45.72	-20.28	66.00	QP
2	0.150	27.11	9.61	36.72	-19.28	56.00	Average
3	* 0.465	24.91	9.63	34.54	-22.07	56.60	QP
4	* 0.465	23.59	9.63	33.22	-13.39	46.60	Average
5	2.202	25.18	9.69	34.87	-21.13	56.00	QP
6	2.202	19.26	9.69	28.95	-17.05	46.00	Average
7	3.669	26.52	9.72	36.23	-19.77	56.00	QP
8	3.669	21.01	9.72	30.73	-15.27	46.00	Average
9	9.770	20.19	9.87	30.06	-29.94	60.00	QP
10	9.770	18.03	9.87	27.91	-22.09	50.00	Average
11	15.111	28.61	9.93	38.54	-21.46	60.00	QP
12	15.111	25.58	9.93	35.51	-14.49	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	電視喇叭	Date of Test	2020-09-03
Factor	CE_ENV216-N (Filter ON)	Temp. / Humidity	25.4°C / 57%
Polarity	Neutral	Site / Test Engineer	SR2 / Eric
Test Mode	BLE_TX_1Mbps_CH19	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	36.58	9.62	46.20	-19.80	66.00	QP
2	0.150	27.98	9.62	37.60	-18.40	56.00	Average
3	* 0.465	27.27	9.64	36.91	-19.70	56.60	QP
4	* 0.465	24.76	9.64	34.40	-12.21	46.60	Average
5	2.202	25.03	9.69	34.73	-21.27	56.00	QP
6	2.202	19.20	9.69	28.90	-17.10	46.00	Average
7	3.669	25.34	9.72	35.07	-20.93	56.00	QP
8	3.669	19.87	9.72	29.60	-16.40	46.00	Average
9	8.708	15.91	9.85	25.77	-34.23	60.00	QP
10	8.708	13.29	9.85	23.15	-26.85	50.00	Average
11	15.107	24.05	9.98	34.03	-25.97	60.00	QP
12	15.107	19.65	9.98	29.62	-20.38	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 天線之要求

5.2.1 限制要求

依據國家通訊傳播委員會低功率射頻電機技術規範之第3.10.1.4節規定，天線之規格可不受下述規定之限制。

低功率射頻電機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。

5.2.2 天線樣式

此電視喇叭其天線為 PCB Antenna，(檢附天線規格書)

Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	N/A	N/A	0dBi

5.3 主波電場強度

5.3.1 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:

1. 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。
2. 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。

5.3.2 限制要求

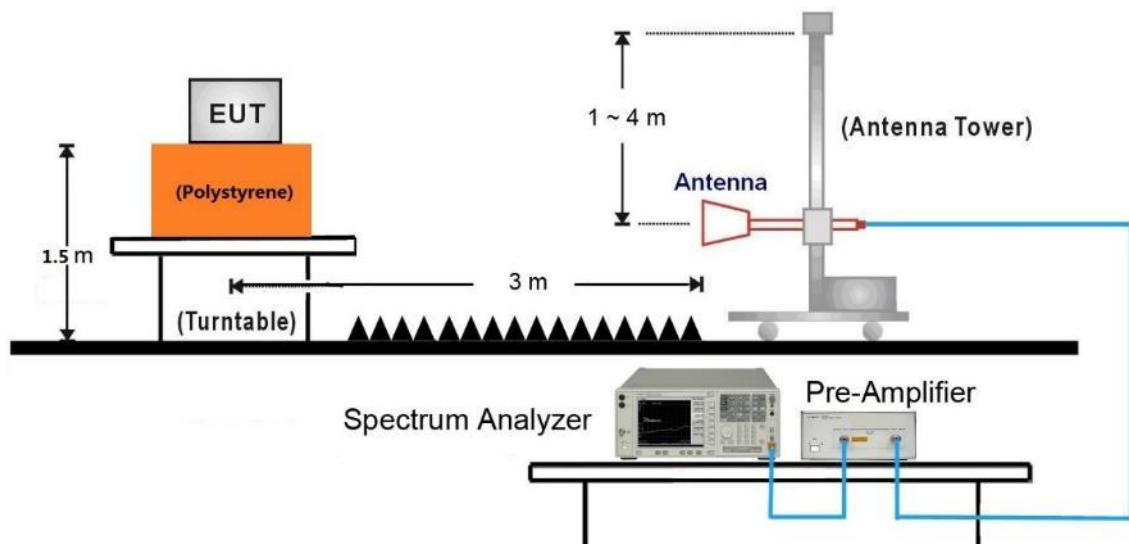
主波與諧波發射：除 3.10.2.3 外，發射之電場強度應小於或等於下表限制值。

主波頻率 (MHz)	主波電場強度 (mV/m)	諧波電場強度 (uV/m)
2400~2483.5	50	500
5725~5875	50	500
24000~24250	250	2500

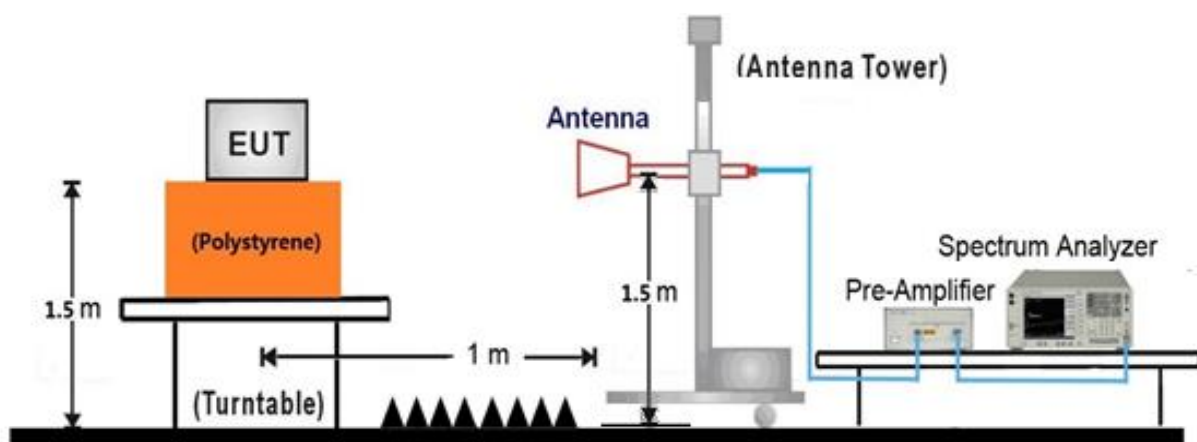
除諧波外，指定頻帶外之發射應比主波低 50 dB 以上或依 2.8 之發射限制，兩者取其較鬆者。

5.3.3 測試架構圖

1GHz ~ 18GHz Test Setup:

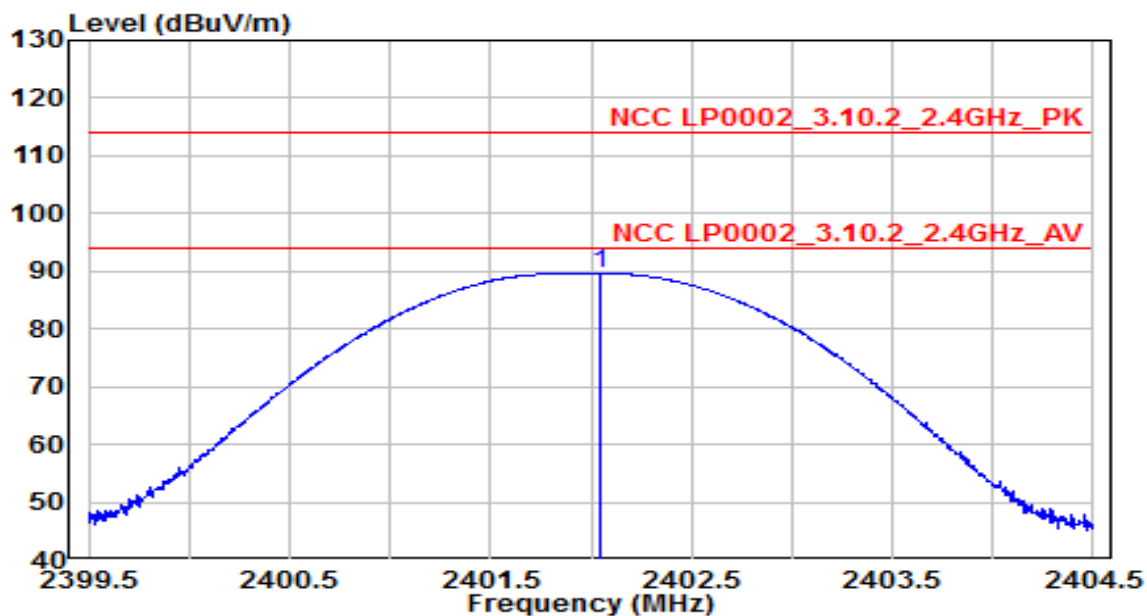


18GHz ~25GHz Test Setup:



5.3.4 主波電場強度測試結果

EUT	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C / 56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 0	Test Voltage	AC 110V/60Hz

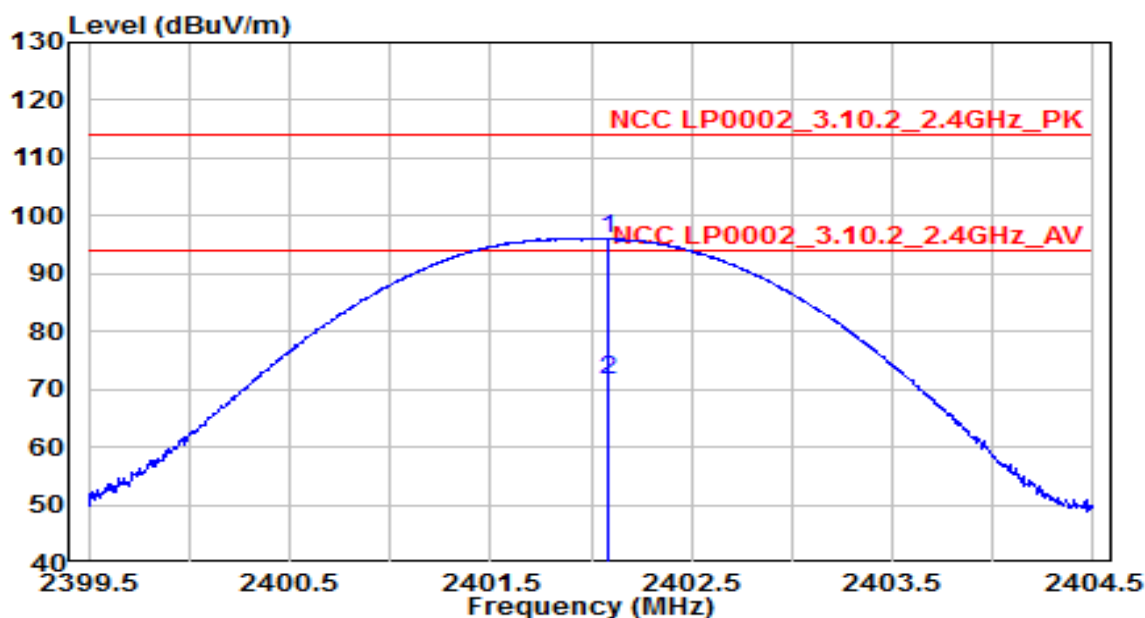


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2402.040	92.24	-2.65	89.59	-24.41	114.00	120	245	Peak

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 0	Test Voltage	AC 110V/60Hz

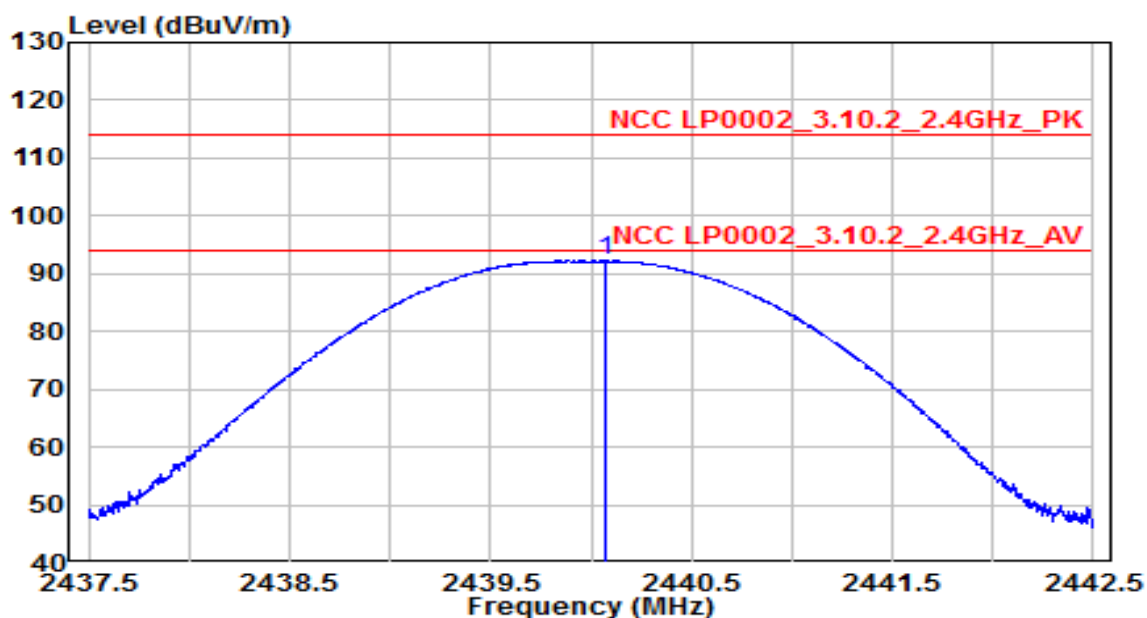


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2402.085	98.71	-2.65	96.06	-17.94	114.00	170	235	Peak
2	*	2402.085	74.40	-2.65	71.75	-22.25	94.00	170	235	Average

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 19	Test Voltage	AC 110V/60Hz

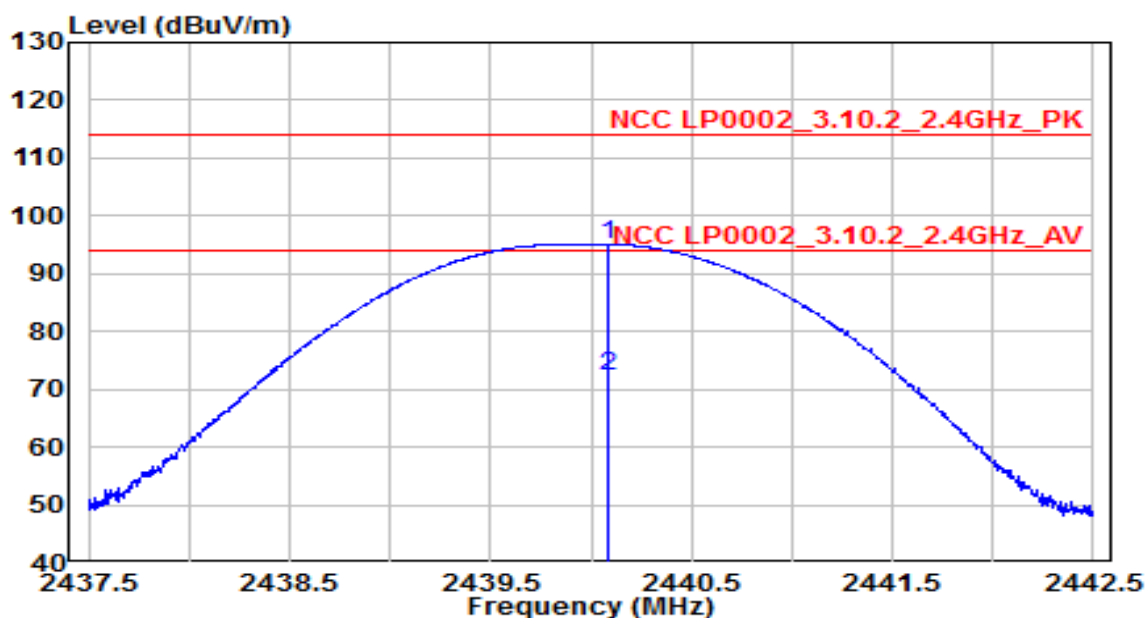


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2440.075	94.69	-2.48	92.20	-21.80	114.00	150	250	Peak

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 19	Test Voltage	AC 110V/60Hz

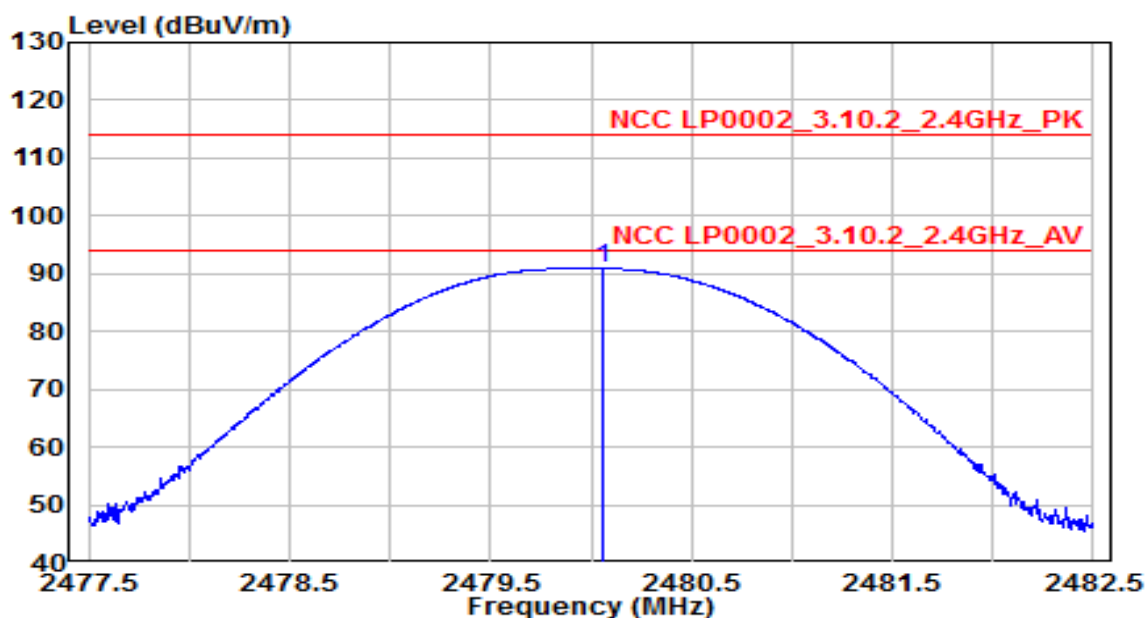


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2440.090	97.52	-2.48	95.04	-18.96	114.00	160	235	Peak
2	*	2440.090	74.66	-2.48	72.18	-21.82	94.00	160	235	Average

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 39	Test Voltage	AC 110V/60Hz

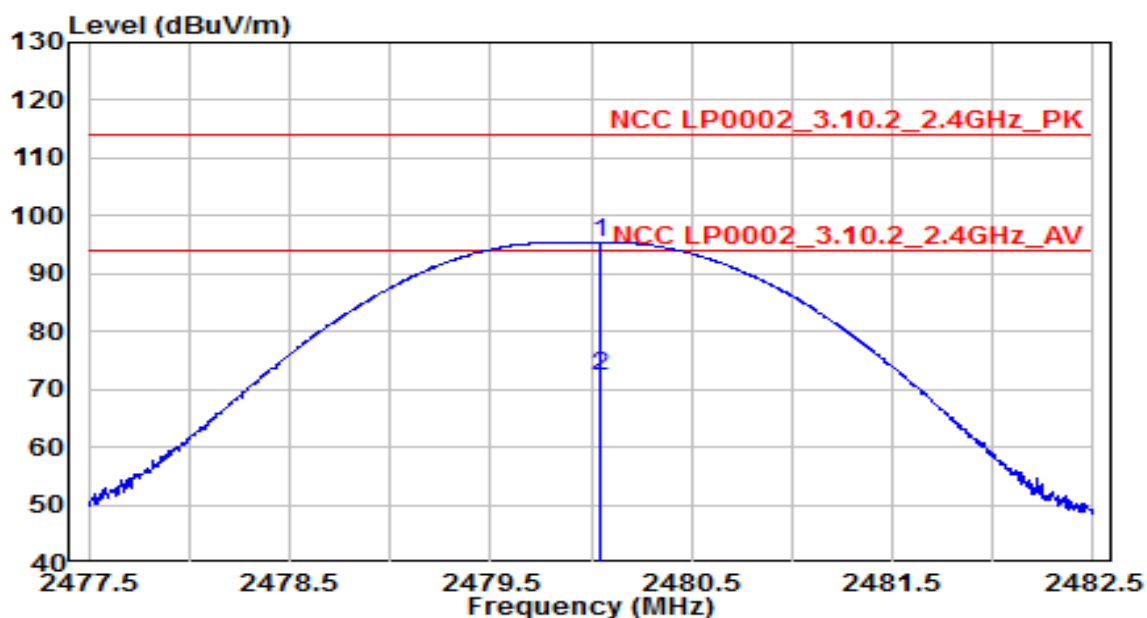


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2480.065	93.16	-2.31	90.85	-23.15	114.00	170	180	Peak

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.

EUT	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 39	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	*	2480.045	97.77	-2.31	95.46	-18.54	114.00	160	230	Peak
2	*	2480.045	74.42	-2.31	72.11	-21.89	94.00	160	230	Average

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.

5.4 輻射電場強度

5.4.1 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：

1. 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。
2. 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。

5.4.2 限制要求

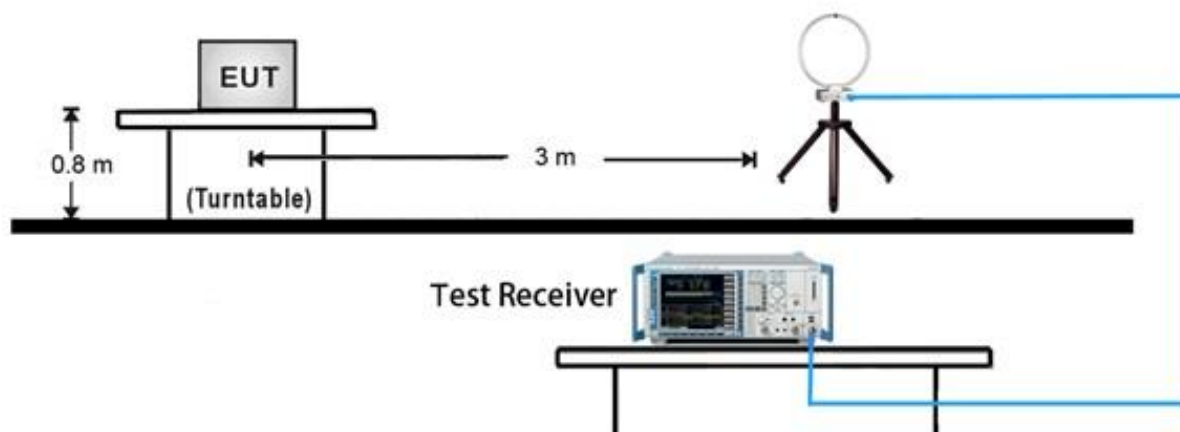
其電場強度不得超過下表之限值，且其不必要之發射皆不得大於主波發射強度。各頻段重疊處，以較嚴格之限制值為準。

頻 率 (MHz)	電場強度(uV/m)	測距(m)
0.009 - 0.490(含)	2,400/f(KHz)	300
0.490 (不含) – 1.705 (含)	24,000/f(KHz)	30
1.705(不含) – 30 (不含)	30	30
30 (含) – 88 (含)	100	3
88 (不含)- 216 (含)	150	3
216 (不含)- 960 (含)	200	3
960 (不含)以上	500	3

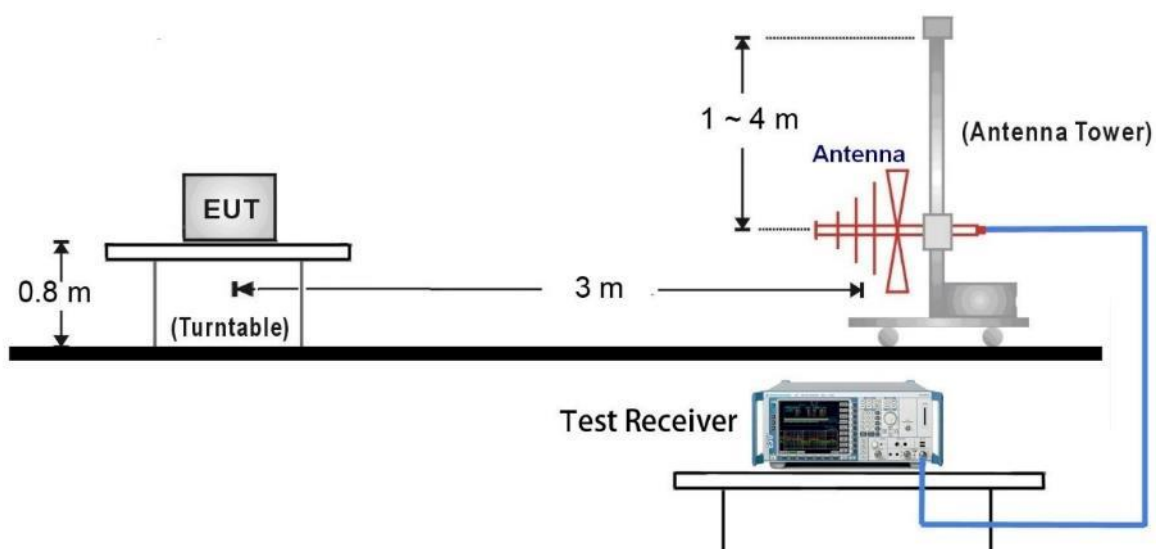
上表規定之電場強度，頻率在 9-90kHz 千赫(kHz)、110-490 千赫(kHz)以及 1000 兆赫(MHz)以上之發射，其量測以平均值檢波器為基準，且須符合低功率射頻電機技術規範第 5.14 節之規定；其他頻率之發射，應以 CISPR 準峰值(quasi-peak) 檢波器測量；非以上表所指定之距離測量時須符合低功率射頻電機技術規範第 5.5 節之規定，而輻射發射之量測頻率範圍須符合低功率射頻電機技術規範第 5.12 節之規定。

5.4.3 測試架構圖

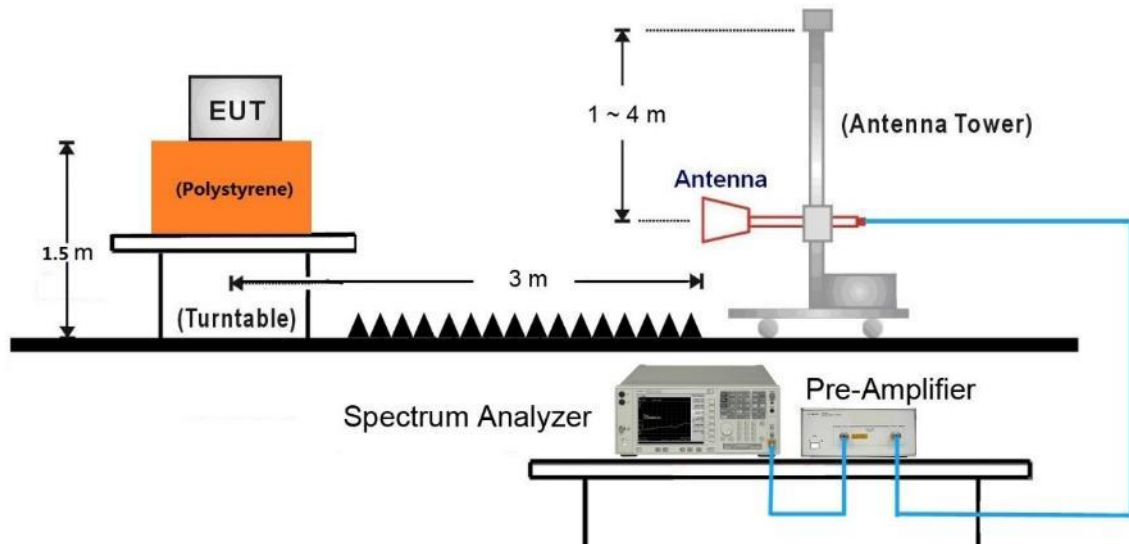
Under 30MHz Test Setup



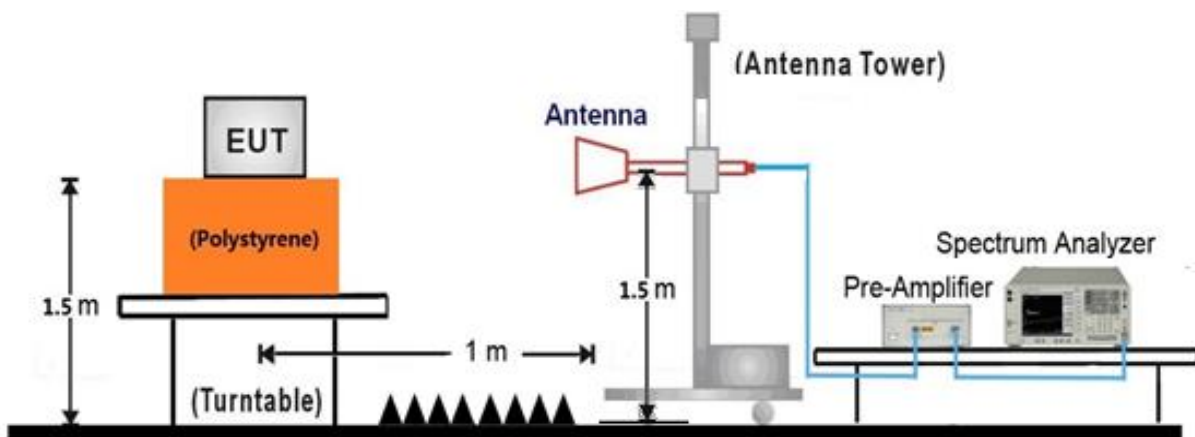
Under 1GHz Test Setup



1GHz ~ 18GHz Test Setup:

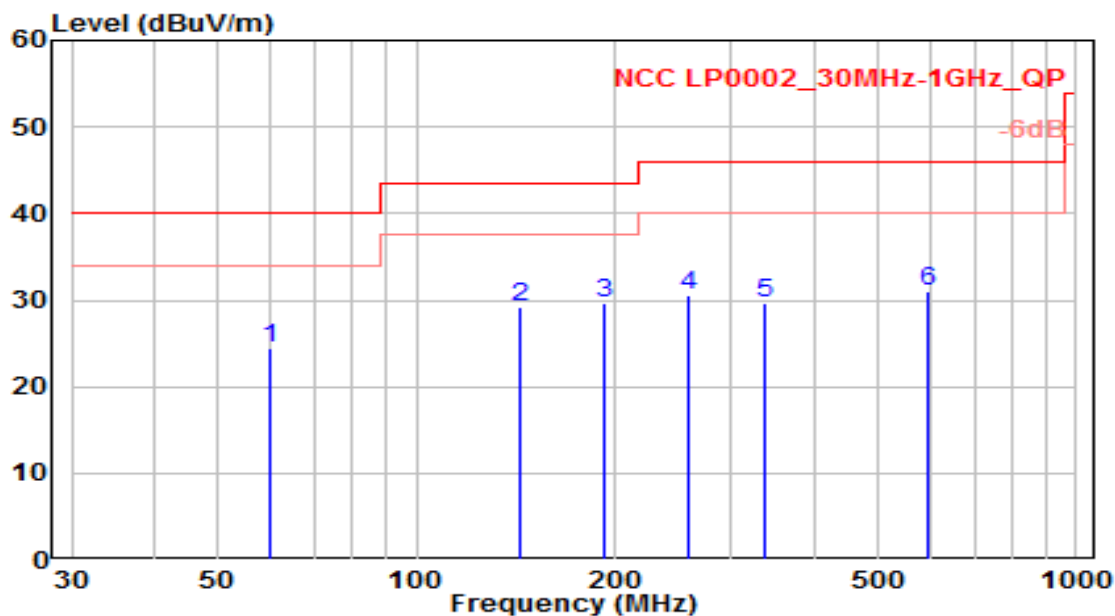


18GHz ~25GHz Test Setup:



5.4.4 輻射電場強度測試結果

EUT	電視喇叭	Date of Test	2020-09-04
Factor	VULB 9162	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 19	Test Voltage	AC 110V/60Hz

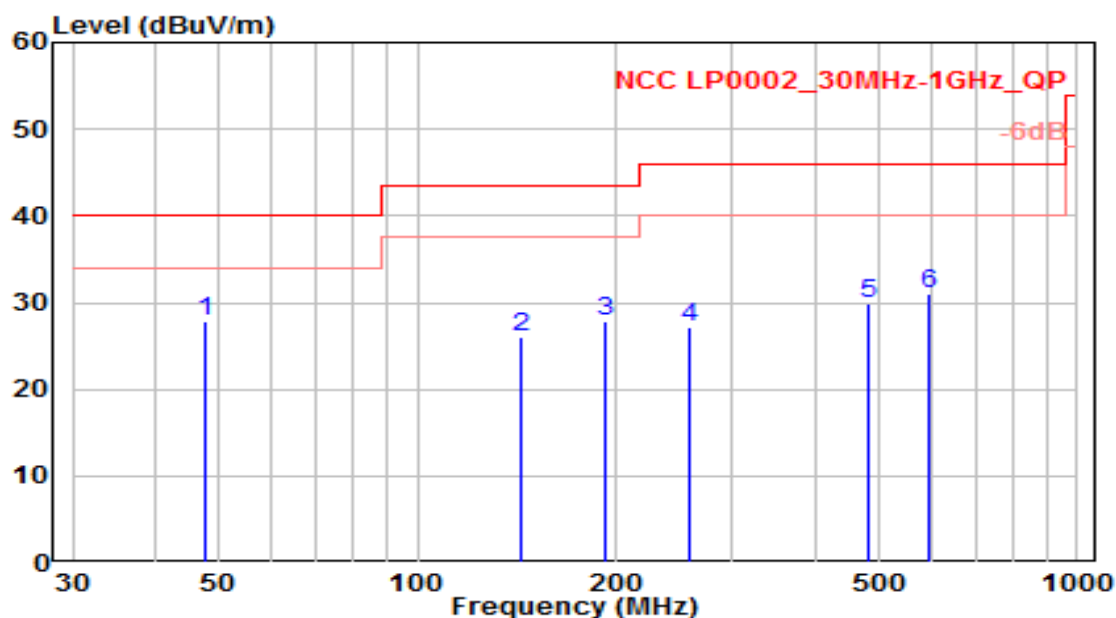


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	60.070	4.30	20.08	24.38	-15.62	40.00	100	100	QP
2	143.490	13.67	15.55	29.22	-14.28	43.50	100	0	QP
3	* 191.990	10.94	18.76	29.70	-13.80	43.50	100	120	QP
4	258.920	10.07	20.57	30.64	-15.36	46.00	100	230	QP
5	336.520	6.79	22.88	29.68	-16.32	46.00	100	330	QP
6	596.480	3.69	27.44	31.12	-14.88	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	電視喇叭	Date of Test	2020-09-04
Factor	VULB 9162	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 19	Test Voltage	AC 110V/60Hz

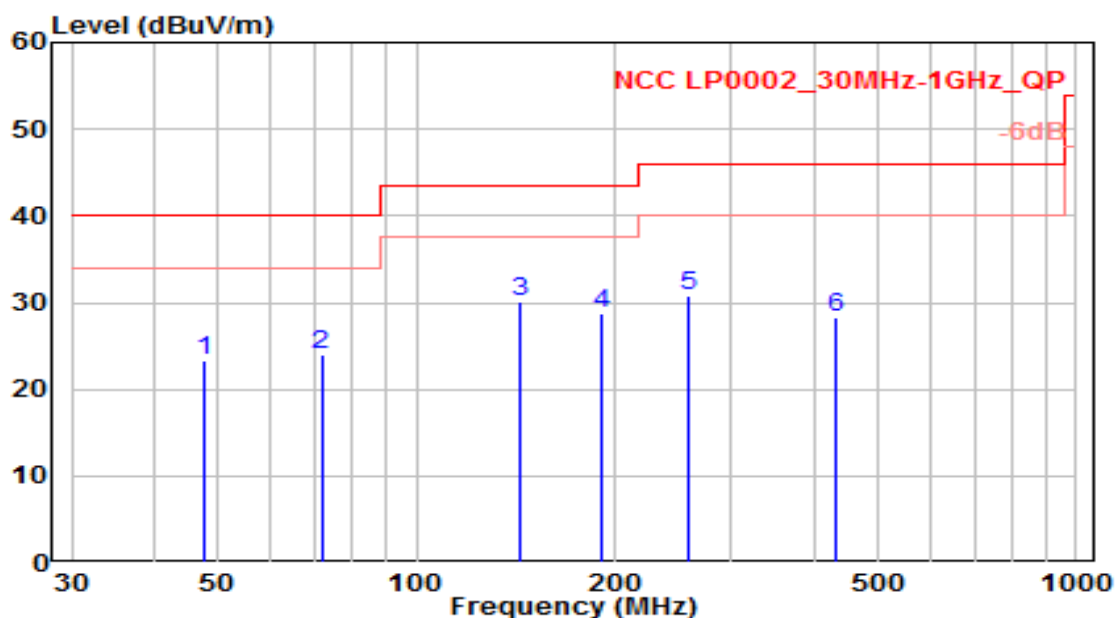


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	47.460	6.38	21.53	27.91	-12.09	40.00	100	100	QP
2		143.490	10.55	15.55	26.10	-17.40	43.50	100	30	QP
3		191.990	9.17	18.76	27.93	-15.57	43.50	100	250	QP
4		258.920	6.54	20.57	27.11	-18.89	46.00	100	150	QP
5		481.050	4.37	25.47	29.84	-16.16	46.00	100	180	QP
6		598.420	3.64	27.47	31.11	-14.89	46.00	100	310	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	電視喇叭	Date of Test	2020-09-04
Factor	VULB 9162	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_RX_1Mbps_CH 19	Test Voltage	AC 110V/60Hz

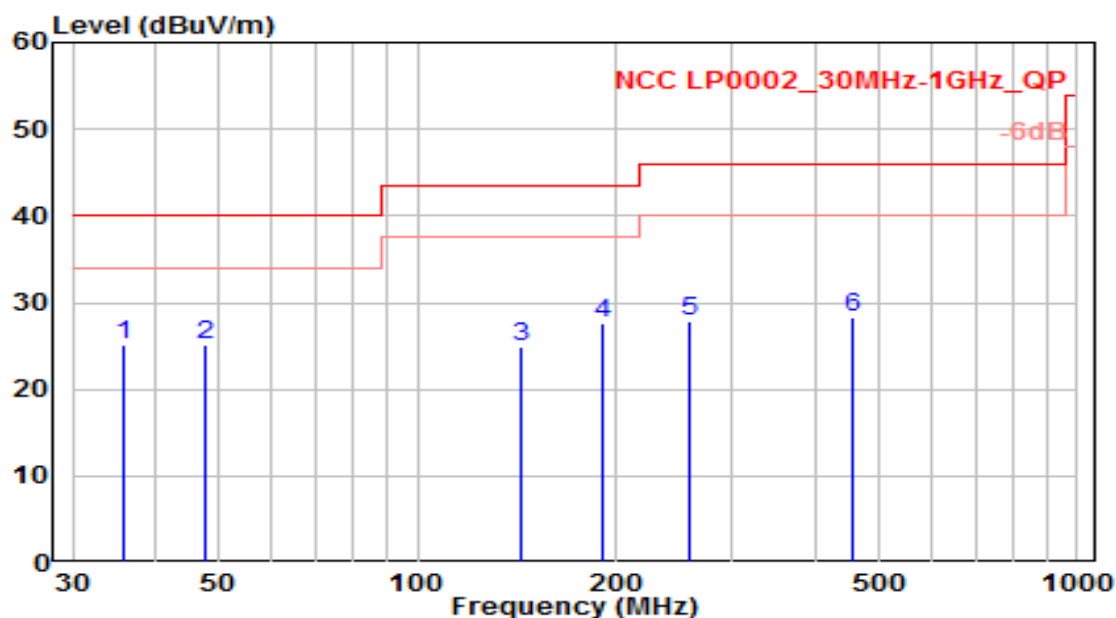


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	47.460	1.74	21.53	23.27	-16.73	40.00	100	0	QP
2	71.710	8.01	16.06	24.07	-15.93	40.00	100	120	QP
3	* 143.490	14.51	15.55	30.06	-13.44	43.50	100	330	QP
4	191.020	10.09	18.74	28.83	-14.67	43.50	100	245	QP
5	258.920	10.24	20.57	30.81	-15.19	46.00	100	65	QP
6	432.550	3.74	24.64	28.38	-17.62	46.00	100	80	QP

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB)+ Cable Loss (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	電視喇叭	Date of Test	2020-09-04
Factor	VULB 9162	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_RX_1Mbps_CH 19	Test Voltage	AC 110V/60Hz

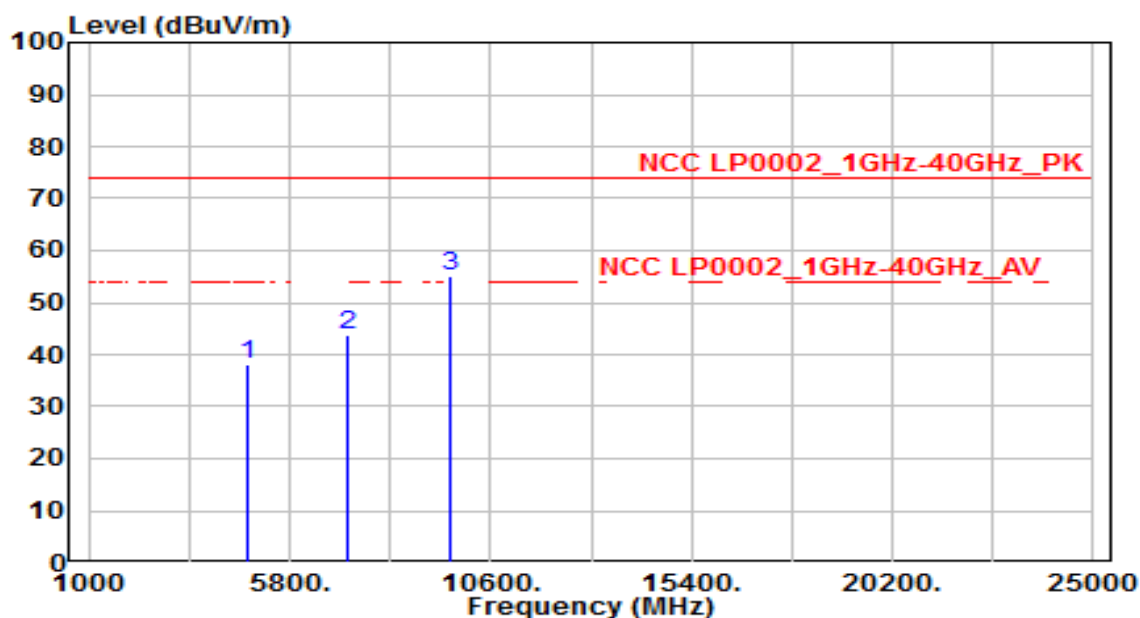


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	35.820	5.87	19.29	25.16	-14.84	40.00	100	150	QP
2		47.460	3.53	21.53	25.06	-14.94	40.00	100	200	QP
3		143.490	9.45	15.55	25.00	-18.50	43.50	100	320	QP
4		191.020	8.92	18.74	27.66	-15.84	43.50	100	150	QP
5		258.920	7.30	20.57	27.87	-18.13	46.00	100	200	QP
6		457.770	3.19	25.03	28.22	-17.78	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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 0	Test Voltage	AC 110V/60Hz

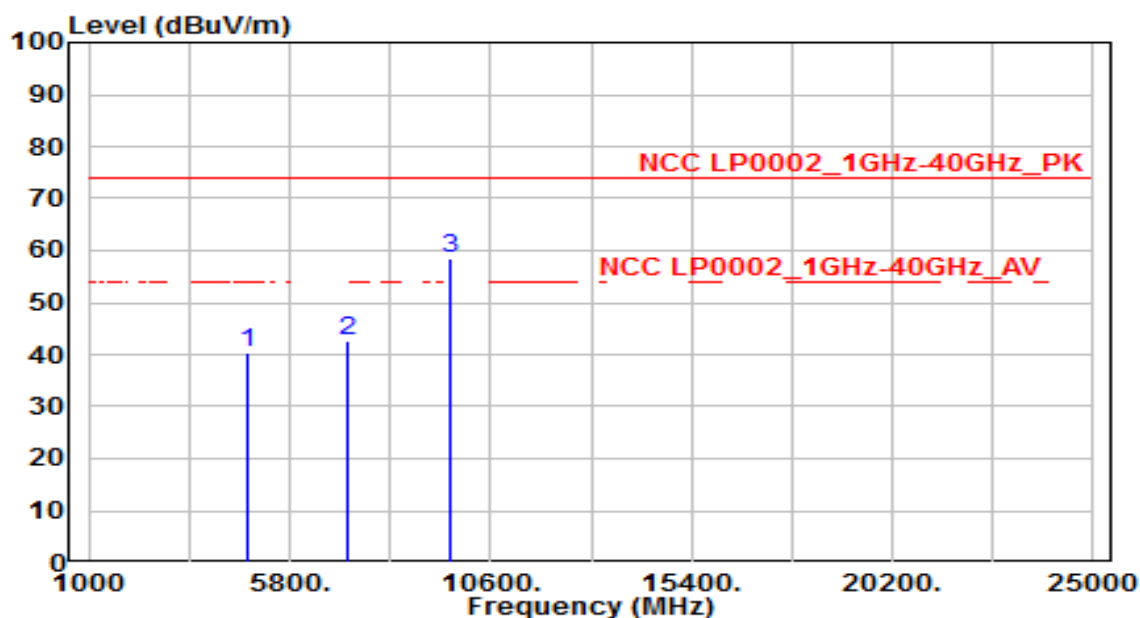


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4804.000	34.76	3.28	38.04	-35.96	74.00	150	400	Peak
2	7206.000	32.72	10.88	43.60	-30.40	74.00	150	400	Peak
3	* 9608.000	40.60	14.62	55.23	-18.77	74.00	150	400	Peak

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).
- No3 is not in restricted band, its limit is 20dBc/30dBc of the fundamental emission level(already evaluated in Section 5.4) or LP0002 Section 2.8 which is higher.(Here, we are using stringent limits:74dBuV/m.)
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 0	Test Voltage	AC 110V/60Hz

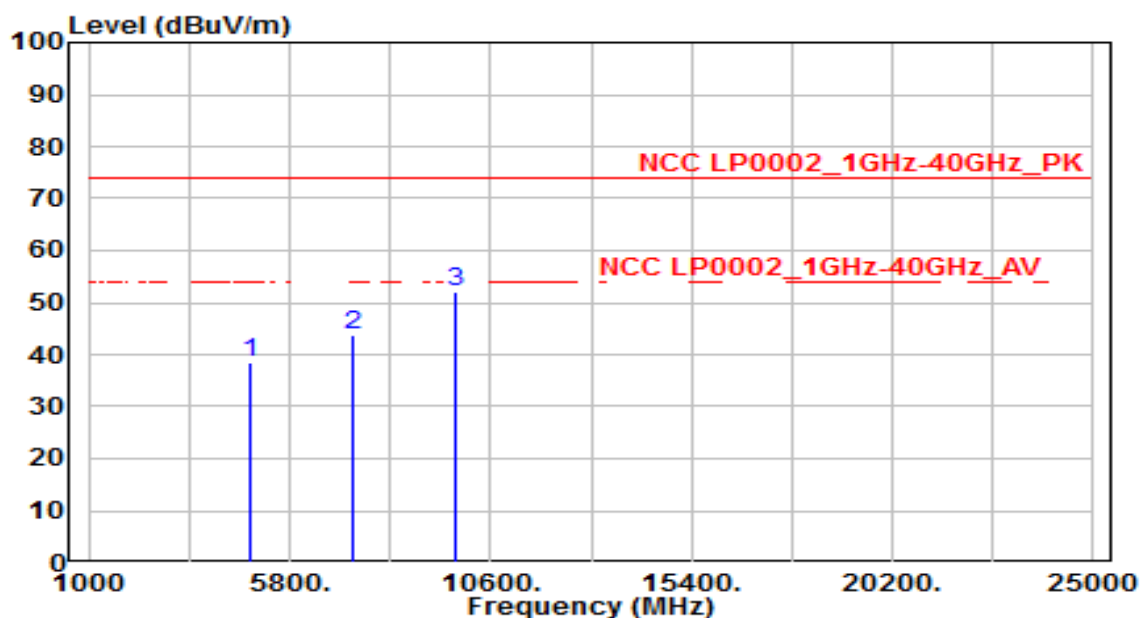


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4804.000	37.06	3.28	40.34	-33.66	74.00	150	400	Peak
2	7206.000	31.74	10.88	42.62	-31.38	74.00	150	400	Peak
3	* 9608.000	43.69	14.62	58.31	-15.69	74.00	150	400	Peak

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).
- No3 is not in restricted band, its limit is 20dBc/30dBc of the fundamental emission level(already evaluated in Section 5.4) or LP0002 Section 2.8 which is higher.(Here, we are using stringent limits:74dBuV/m.)
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 19	Test Voltage	AC 110V/60Hz

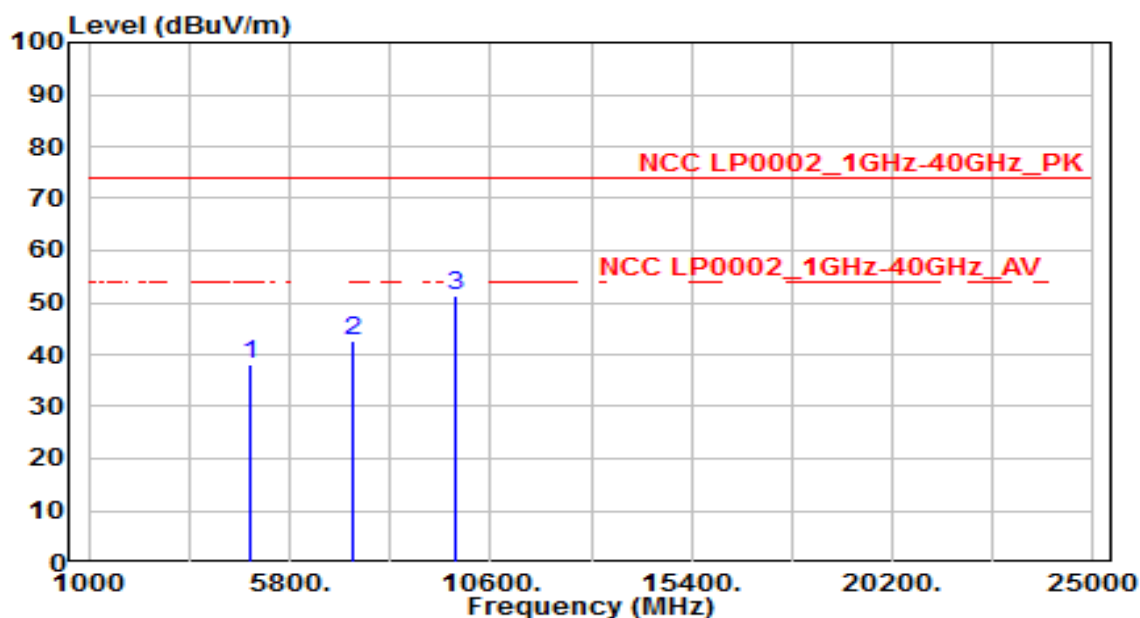


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4880.000	35.08	3.46	38.54	-35.46	74.00	150	400	Peak
2	7320.000	32.68	11.21	43.89	-30.11	74.00	150	400	Peak
3	* 9760.000	37.34	14.91	52.25	-21.75	74.00	150	400	Peak

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 19	Test Voltage	AC 110V/60Hz

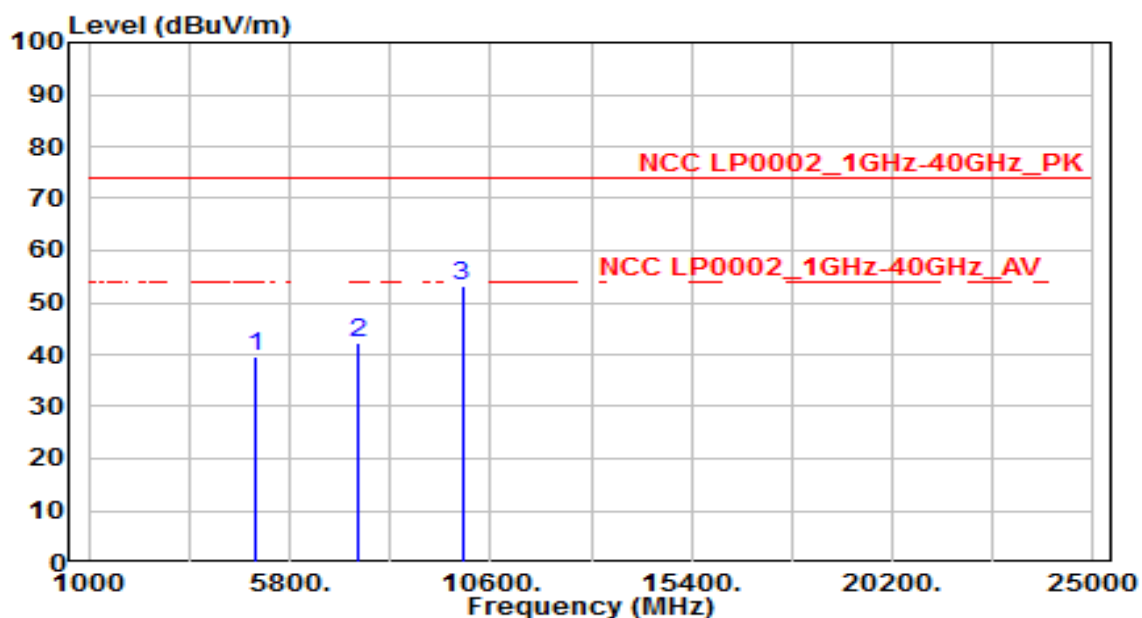


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4880.000	34.53	3.46	38.00	-36.00	74.00	150	400	Peak
2	7320.000	31.58	11.21	42.78	-31.22	74.00	150	400	Peak
3	* 9760.000	36.31	14.91	51.22	-22.78	74.00	150	400	Peak

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 39	Test Voltage	AC 110V/60Hz

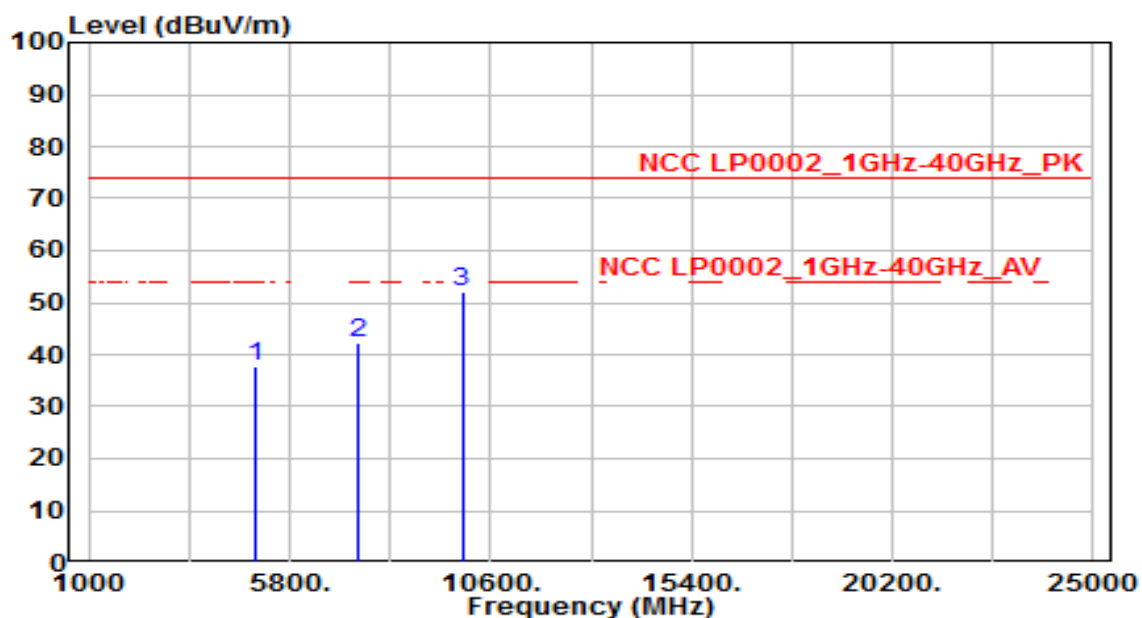


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4960.000	36.13	3.65	39.78	-34.22	74.00	150	400	Peak
2	7440.000	30.83	11.55	42.37	-31.63	74.00	150	400	Peak
3	* 9920.000	37.89	15.21	53.10	-20.90	74.00	150	400	Peak

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 39	Test Voltage	AC 110V/60Hz

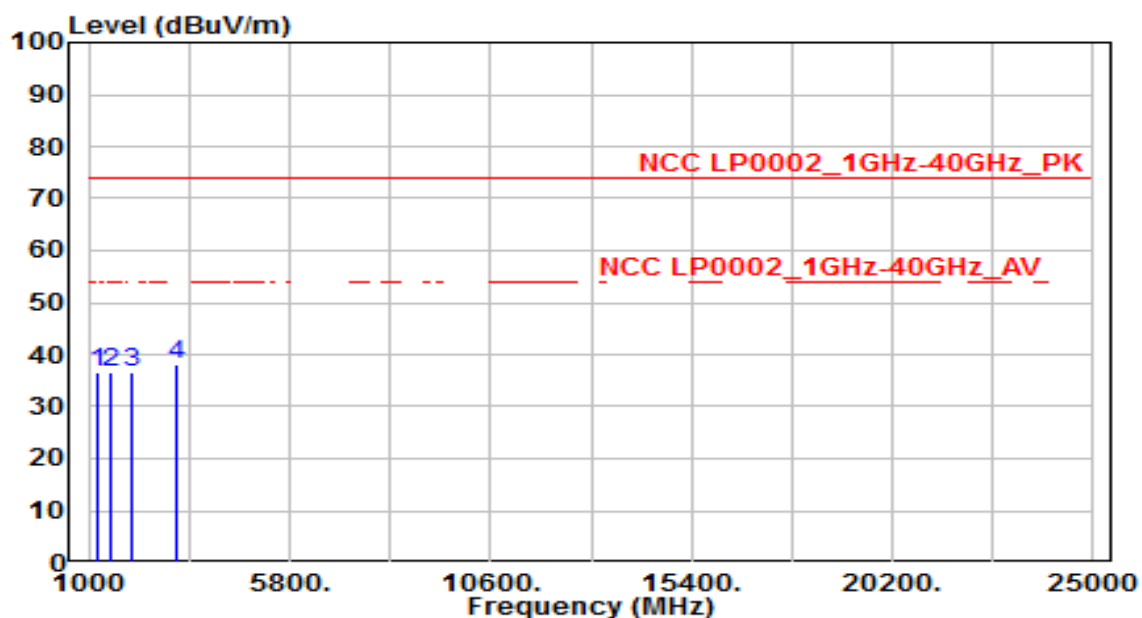


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4960.000	34.20	3.65	37.85	-36.15	74.00	150	400	Peak
2	7440.000	30.64	11.55	42.18	-31.82	74.00	150	400	Peak
3	* 9920.000	36.98	15.21	52.19	-21.81	74.00	150	400	Peak

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_RX_1Mbps_CH 0	Test Voltage	AC 110V/60Hz

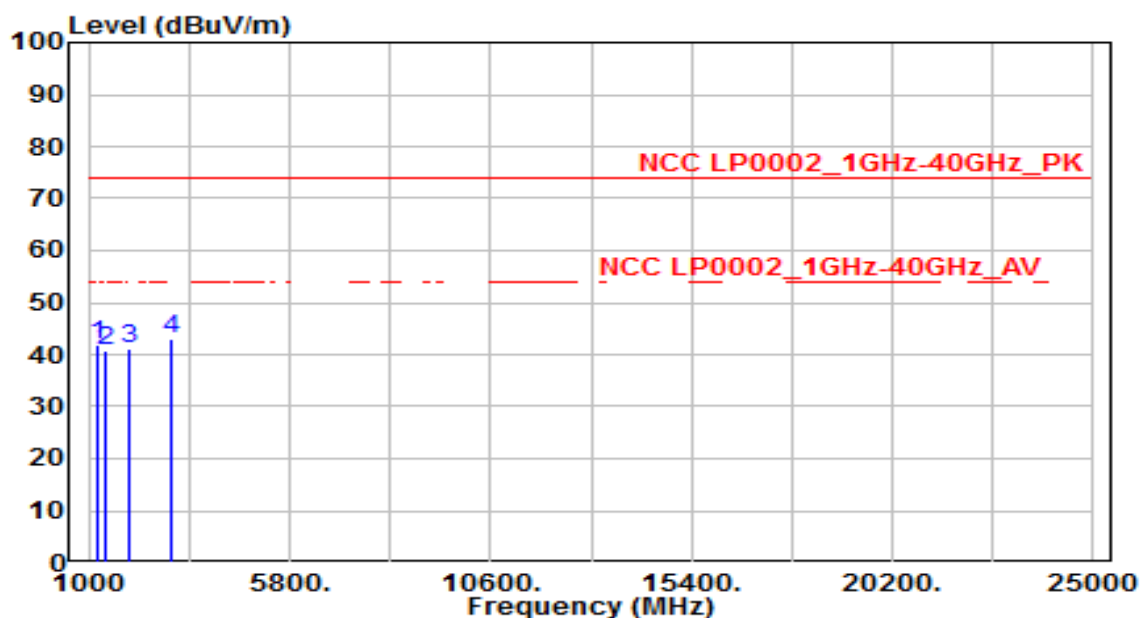


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1196.031	43.84	-7.08	36.76	-37.24	74.00	150	400	Peak
2	1508.406	42.28	-5.71	36.57	-37.43	74.00	150	400	Peak
3	2004.594	40.99	-4.40	36.59	-37.41	74.00	150	400	Peak
4	* 3086.750	40.32	-2.24	38.08	-35.92	74.00	150	400	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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_RX_1Mbps_CH 0	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	1194.438	49.01	-7.09	41.92	-32.08	74.00	150	400	Peak
2	1395.781	46.81	-6.19	40.62	-33.38	74.00	150	400	Peak
3	1994.500	45.46	-4.43	41.03	-32.97	74.00	150	400	Peak
4	* 2994.313	45.66	-2.53	43.14	-30.86	74.00	150	400	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.

5.5 頻帶邊緣

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，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: 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。

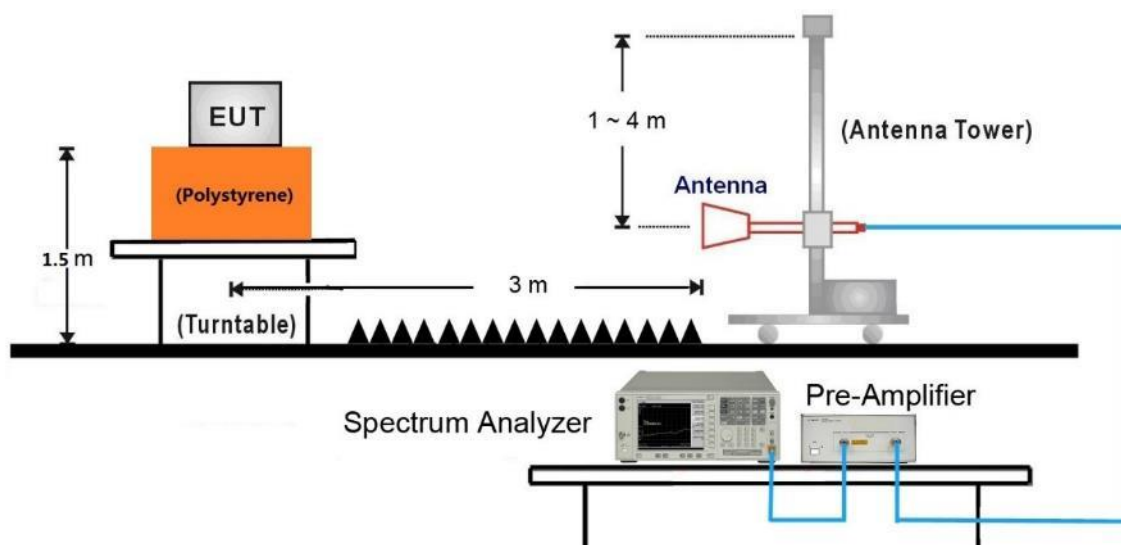
5.5.2 限制要求

除低功率射頻電機技術規範另有規定外，任何低功率射頻電機之主波皆不得使用下表所列各頻段之頻率低功率射頻電機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電機技術規範之第2.8節限制規定

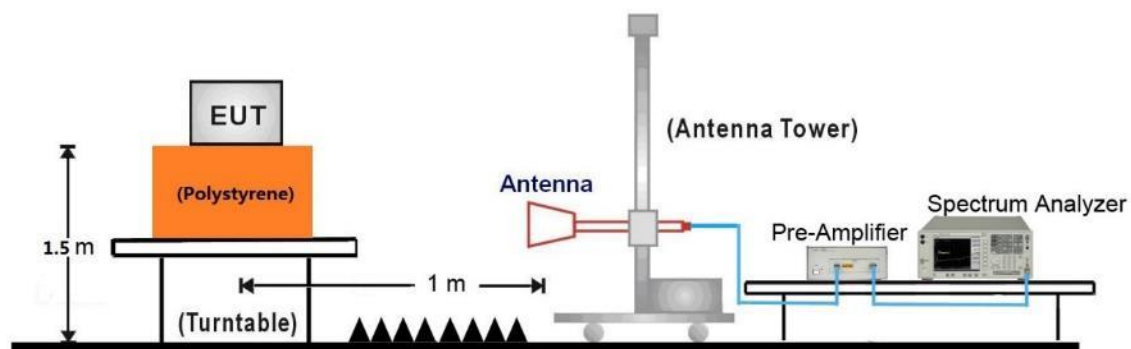
頻 率 (MHz)	頻 率 (MHz)	頻 率 (MHz)	頻 率 (MHz)	頻 率 (MHz)
0.090~0.110	25.500~25.700	703.00~748.00	2310.0~2390.0	13250~13400
0.490~0.510	37.475~38.275	758.00~803.00	2483.5~2900.0	14470~14500
2.172~2.198	73.500~75.400	825.00~915.00	3260.0~3267.0	15350~16200
3.013~3.033	108.00~138.00	930.00~1240.0	3332.0~3339.0	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	

5.5.3 測試架構圖

1GHz ~ 18GHz Test Setup:

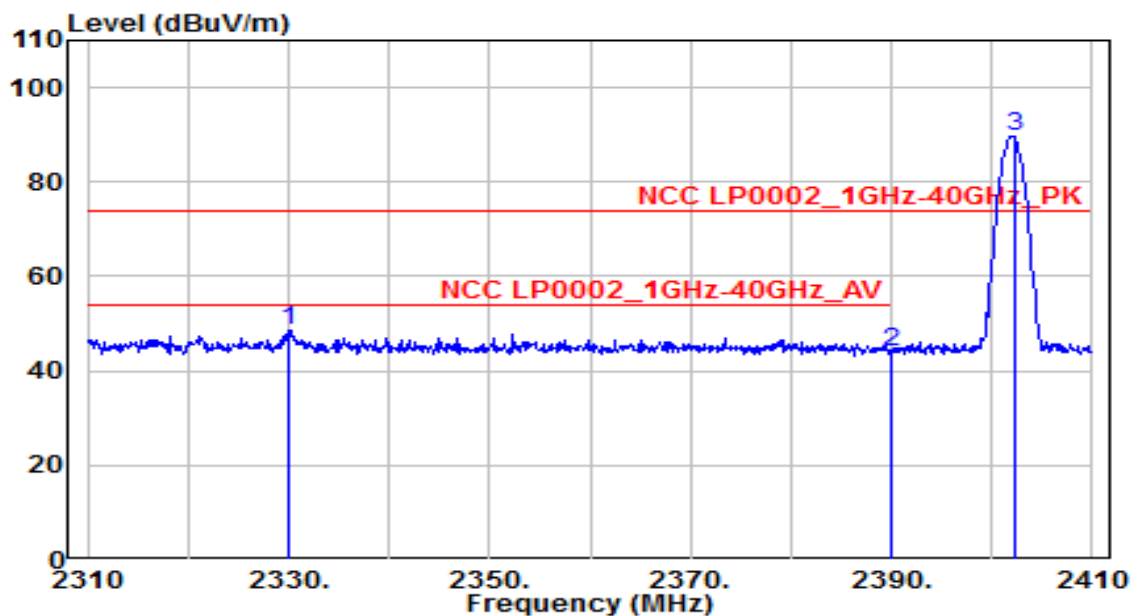


18GHz ~25GHz Test Setup:



5.5.4 頻帶邊緣測試結果

EUT	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 0	Test Voltage	AC 110V/60Hz

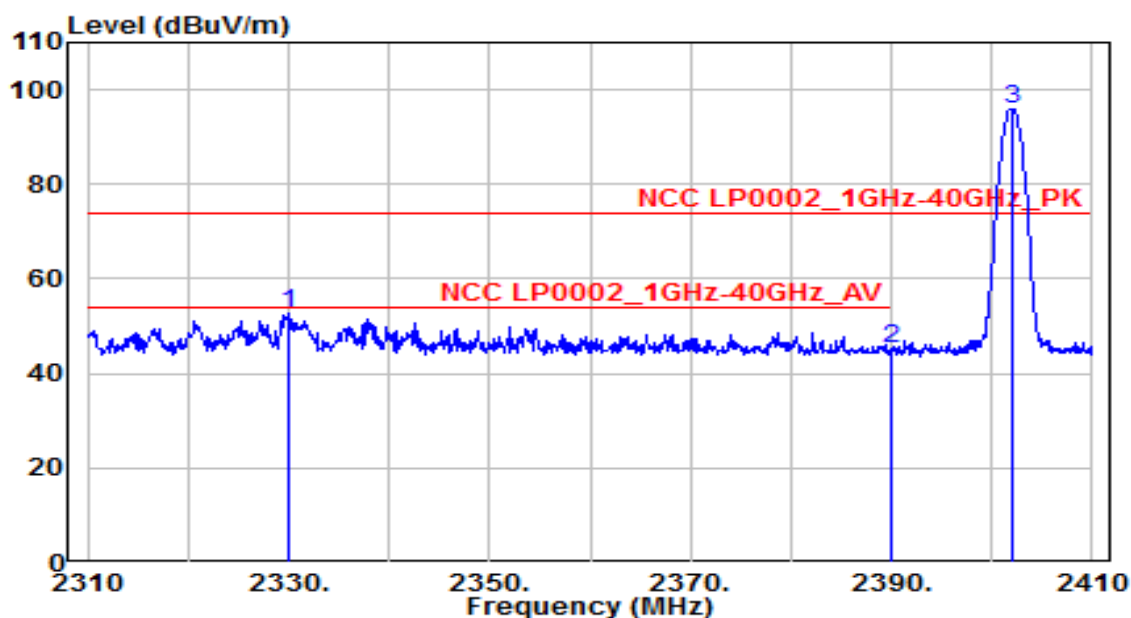


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2329.900	51.59	-2.97	48.63	-25.37	74.00	120	245	Peak
2	* 2390.000	46.90	-2.70	44.20	-29.80	74.00	120	245	Peak
3	2402.200	92.21	-2.65	89.56	N/A	N/A	120	245	Peak

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 0	Test Voltage	AC 110V/60Hz

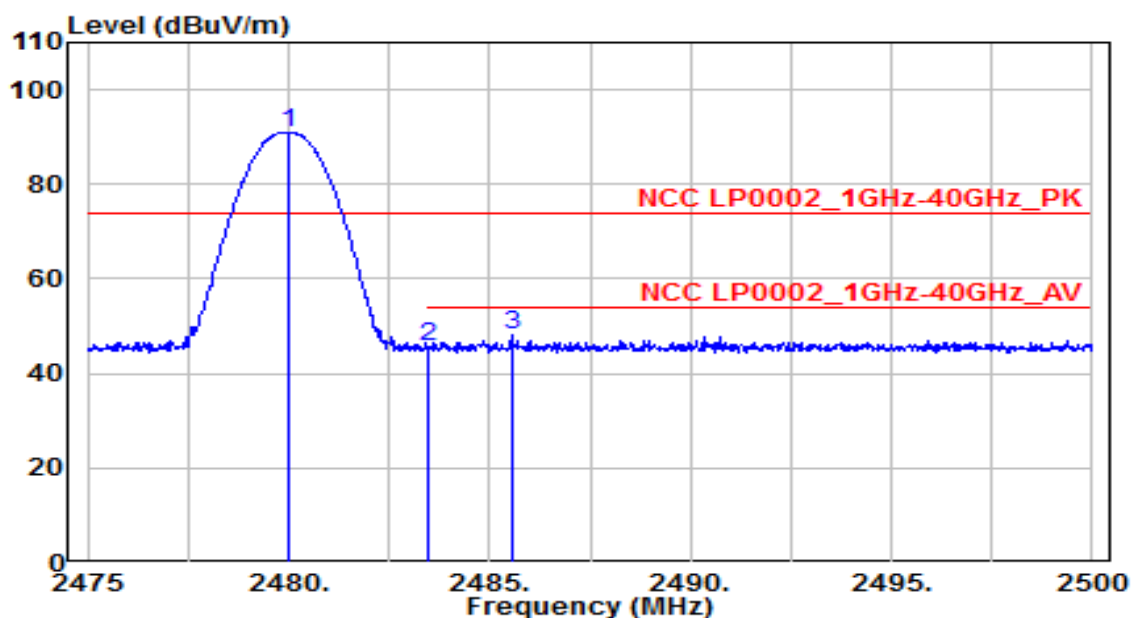


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2330.000	55.62	-2.97	52.65	-21.35	74.00	170	235	Peak
2		2390.000	48.14	-2.70	45.43	-28.57	74.00	170	235	Peak
3		2402.100	98.71	-2.65	96.06	N/A	N/A	170	235	Peak

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	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C /56%
Polarity	Horizontal	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 39	Test Voltage	AC 110V/60Hz

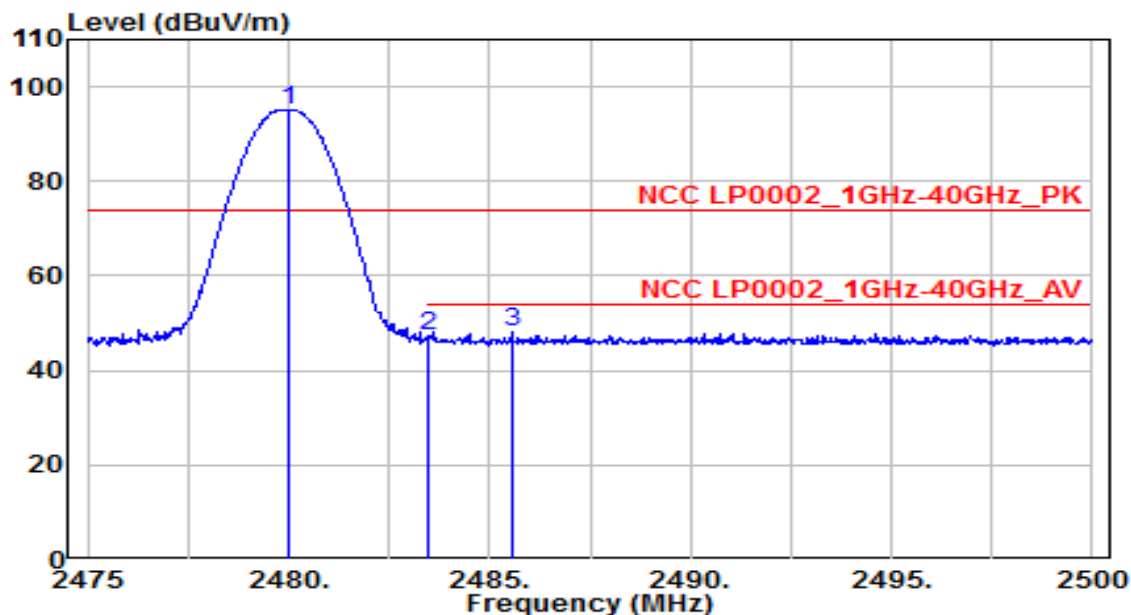


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2480.025	93.19	-2.31	90.88	N/A	N/A	170	180	Peak
2	2483.500	47.99	-2.29	45.70	-28.30	74.00	170	180	Peak
3	* 2485.550	50.38	-2.28	48.10	-25.90	74.00	170	180	Peak

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.

EUT	電視喇叭	Date of Test	2020-09-10
Factor	BBHA 9120D	Temp. / Humidity	25°C /56%
Polarity	Vertical	Site / Test Engineer	AC1 / Jay
Test Mode	BLE_TX_1Mbps_CH 39	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	2480.025	97.44	-2.31	95.14	N/A	N/A	160	230	Peak
2	2483.500	49.56	-2.29	47.27	-26.73	74.00	160	230	Peak
3	* 2485.550	50.38	-2.28	48.10	-25.90	74.00	160	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.

The End