



低功率射頻器材測試報告

申請廠商 : 台灣飛利浦股份有限公司
地址 : 台北市南港區園區街3-1號14樓
器材名稱 : 飛利浦電鬚刀
廠牌 : PHILIPS
型號 : S9986



財團法人台灣商品檢測驗證中心電磁相容試驗二部

新北市林口區頂福里5鄰34號

電話 : (02)26023052

傳真 : (02)26010910

報告號碼: 21-06-RBF-006-01

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低功率射頻器材測試報告



受理日期 : 110 年 6 月 3 日
 完成日期 : 110 年 7 月 15 日
 報告號碼 : 21-06-RBF-006-01
 實驗室名稱 : 林口實驗室
 實驗室地址 : 新北市林口區頂福里 5 鄰 34 號
 實驗室電話 : 02-26023052
 TAF 認可編號及範圍 : 2628 (9KHz- 40GHz)
 TAF 證書有效期限 : 110 年 10 月 08 日
 申請廠商 : 台灣飛利浦股份有限公司
 申請廠商地址 : 台北市南港區園區街 3-1 號 14 樓
 製造廠商 : Philips Consumer Lifestyle B.V.
 器材名稱 : 飛利浦電鬚刀
 廠牌 : PHILIPS
 型號 : S9986
 發射功率(電場強度) : 90.62 dB μ V/m @3m Peak(電場強度)
 工作頻率及調變方式 : 2402 - 2480 MHz ; 40CH ; GFSK
 天線規格 : 製造商 : Shenzhen Sunlord Electronics Co., Ltd./型號 : SLDA31-2R400G-S2TF/Gain: 2.5 dBi

- 備註
1. 本測試報告僅對受測之樣品負責。
 2. 非經本中心同意，測試報告不得摘錄複印使用。(全部複製除外)
 3. 本產品所適用之規範修訂日期 109 年 07 月 01 日。

項次	測試項目	適用規範	測試結果	量測設備	備註
1	場強輻射	低功率射頻器材技術規範 4.10.2.2節、3.6節	請參閱4.5節	請參閱4.3節	合格
2	電源線傳導干擾	低功率射頻器材技術規範3.3 節	請參閱5.4節	請參閱5.3節	無需實施 此項檢測
3	天線之要求	低功率射頻器材技術規範3.2 節	請參閱6.2節	----	合格
4	開放頻帶邊緣之發 射	低功率射頻器材技術規範 4.10.2.4、3.6節	請參閱7.4節	請參閱7.3節	合格
	以下空白				

報告簽署人：

量測員：



1 一般資料

1.1 產品描述

- a) 產品型態 : 飛利浦電鬚刀
 b) 廠 牌 : PHILIPS
 c) 產品型號 : S9986
 d) 供應電源 : 1. Battery : 3.8Vdc , 900 mAh , 3.42Wh
 2. 電源供應器如下 :

廠牌	型號	規格
和泰電機	SSW-2600US-2(HQ8505)	Input:100-240V,50/60Hz , 0.2A Output:15Vdc , 5.4W
柏怡電子	AD21163HF(HQ8505)	Input:100-240V,50/60Hz , 150mA , 9W Output:15Vdc , 5.4W
PI Electronics (H.K.) Ltd.	AD20163HF (HQ8505)	Input:100-240V,50/60Hz , 150mA , 9W Output:15Vdc , 5.4W

1.2 產品特性

此裝置Bluetooth Low Energy Module，藍牙BLE部份，使用頻率範圍為2402 – 2480 MHz共分40個頻道，採用GFSK調變技術。

Wireless Technology :				Bluetooth BLE 4.0	
Band :				2402-2480 MHz	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	19	2440	38	2478
1	2404	20	2442	39	2480
2	2406	21	2444		
3	2408	22	2446		
4	2410	23	2448		
5	2412	24	2450		
6	2414	25	2452		
7	2416	26	2454		
8	2418	27	2456		
9	2420	28	2458		
10	2422	29	2460		
11	2424	30	2462		
12	2426	31	2464		
13	2428	32	2466		
14	2430	33	2468		
15	2432	34	2470		
16	2434	35	2472		
17	2436	36	2474		
18	2438	37	2476		

1.3 測試方法之依據

本測試報告之所有項目皆依據低功率射頻器材技術規範以及參考EIA 603、ANSI、FCC/47 CFR/2.1046、2.1047、2.1049、2.1051、2.1053及2.1055之檢驗法。

1.4 系列機種差異說明及測試判定

本案無系列

2 適用規範

2.1 規範要求

(1) 傳導之規定

依據國家通訊傳播委員會低功率射頻器材技術規範3.3節之規定，以市電為電源之低功率射頻器材，其傳導回電源線上頻率自150 kHz~30百萬赫(MHz)之射頻電壓(在電源端子每一電源線對接地點)應小於或等於下表所列之限制值。測量時應經過50微亨利(uH)及50歐姆(Ω)之電源線阻抗穩定網路(Line Impedance Stabilization Network；LISN)。頻率重疊處，以較低限制值為準。電源傳導干擾之限制要求如下：

頻率(MHz)	傳導限制值(dB μ V)	
	準峰值(Quasi-peak)	平均值(Average)
0.15-0.5	66 – 56 _(註)	56 – 46 _(註)
0.5-5	56	46
5-30	60	50

註：隨頻率之對數遞減。

(2) 輻射之規定

依據低功率射頻器材技術規範4.10.2.2節之要求，主波與諧波發射：除4.10.2.3 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 (μ V/m)
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

4.10.2.4 除諧波外，指定頻帶外之發射應比主波低50 dB以上或依3.6之發射限制，兩者取其較鬆者。

接收機依據低功率射頻器材技術規範之要求，其任何輻射場強需符合3.6節之一般限制要求：

頻率 MHz	測試距離 m	限制值 dB μ V/m	限制值 μ V/m
0.009 - 0.490	300	48.5 ~ 13.8	2400/kHz
0.490 - 1.705	30	33.8 ~ 22.97	24000/kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88 - 216	3	43.5	150
216 - 960	3	46.0	200
960以上	3	54.0	500

(3) 天線之要求

依據低功率射頻器材技術規範3.2節之規定，低功率射頻器材之發射機或收發信機所使用之天線，除本規範章節中另有規定外，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。

2.2 限制使用之頻帶

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

2.3 量測不確定度資訊

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz ~ 30MHz	$\pm 3.34\text{dB}$ (Mains)(LISN)
Radiated emissions	9kHz ~ 30MHz	$\pm 4.22\text{dB}$
Radiated emissions	30MHz ~ 1GHz	$\pm 4.2\text{dB}$ ($30\text{MHz} \leq f \leq 300\text{MHz}$)
		$\pm 4.44\text{dB}$ ($300\text{MHz} < f \leq 1\text{GHz}$)
	Above 1GHz	$\pm 4.44\text{dB}$ ($1\text{GHz} \leq f \leq 18\text{GHz}$)
		$\pm 3.02\text{dB}$ ($18\text{GHz} \leq f \leq 40\text{GHz}$)

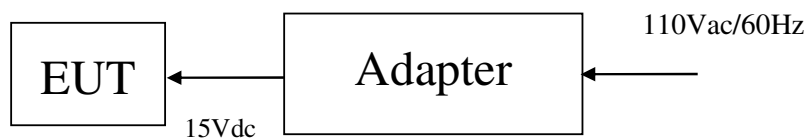
此量測不確定數值係以 95%區間,k=2 之擴充不確定度表示

本實驗室依據之測試方法或標準若已有限制值或判斷基準，測試結果將依據測試方法或標準作為符合性判定，量測不確定度將依據測試標準之方法或規範執行。

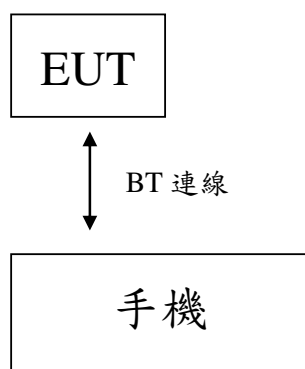
3 受測裝置之系統說明

3.1 測試接續圖(一般正常使用)

Line Charge Mode



BT Mode



3.1.1 待測物之主要配備

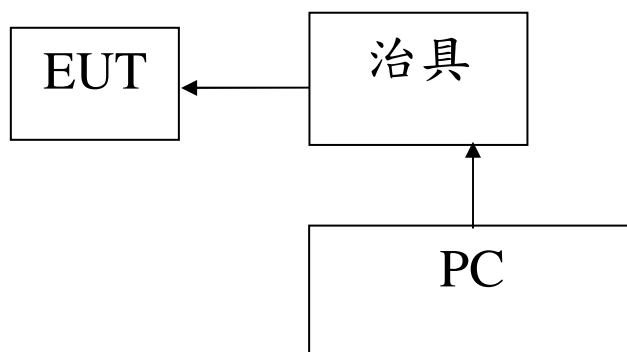
裝置名稱	廠牌/製造者	型號/料號	纜線說明/規格
飛利浦電鬚刀*	PHILIPS(廠牌)	S9986	---
電源供應器*	和泰電機	SSW-2600US-2(HQ8505)	1.5 非屏蔽線
電源供應器*	柏怡電子	AD21163HF(HQ8505)	1.5 非屏蔽線
電源供應器*	PI Electronics (H.K.) Ltd.	AD20163HF(HQ8505)	1.5 非屏蔽線

*表示待測物

3.1.2. 外接週邊設備

裝置名稱	廠牌/製造者	型號/料號	纜線說明/規格
手機	紅米(廠牌)	Note 4X(型號)	-

3.2測試接續圖(測試模式使用)



3.2.1.測試治具、測試軟體名稱、測試軟體版本

裝置名稱	廠牌	型號	纜線說明/規格
測試治具	Philips	D1	1.3m 非屏蔽線材

測試軟體名稱	RealTerm
測試軟體版本	-

3.2.2.測試模式之最大發射功率、頻率、頻寬、調變技術等設定值

模式	頻率	設定值
Bluetooth 4.0 BLE : 1Mbps	2402MHz~2480MHz	0x00 Send numbers For 2402Mhz, enter 0x80 0x94 + click ' send numbers ' For 2440Mhz, enter 0x93 0x94 + click ' send numbers ' For 2480Mhz, enter 0xA7 0x94 + click ' send numbers '

3.2.3 測試治具應具 4x6 吋以上具尺規之彩色照片。



4 場強輻射之量測

4.1 適用標準

依據低功率射頻器材技術規範4.10.2.2節之要求，主波與諧波發射：除4.10.2.3 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

4.10.2.4 除諧波外，指定頻帶外之發射應比主波低50 dB以上或依3.6之發射限制，兩者取其較鬆者。

4.2 量測方法

30MHz ~ 1GHz：將待測物置於0.8米高的非金屬桌面，使其在工作狀態，接收天線置於3米外1米高相同的高度。待測物分別要垂直或水平放置，而且桌面要360度旋轉，另外接收天線也要從1米至4米升降變化，以找出最大的輻射電場強度，接收天線置於水平、垂直極向各執行測試一次。

1GHz以上：將待測物置於1.5米或0.8米高(依待測物為發射機或接收機)的非金屬桌面，使其在工作狀態，接收指向性天線置於3米外相同高度或1米高(依待測物為發射機或接收機)。待測物分別要垂直或水平放置，而且桌面要360度旋轉，另外接收指向性天線也要從1米至4米升降變化，以找出最大的輻射電場強度，接收指向性天線置於水平、垂直極向各執行測試一次。

4.3 量測場強輻射之儀器

儀器名稱	製造者	型號	本次校驗日期	下次校驗日期
EMI Test Receiver	Rohde & Schwarz	ESU40 (13054416-001)	2021/03/25	2022/03/24
Bi-Log Antenna	ETC & JYE BAO	MCTD 2786 & FAT-NM5NF5T3G2W6(13057618-002 & RF-002)	2020/07/31	2021/07/30
Amplifier	HP	8447D (13040711-001)	2020/10/6	2021/10/5
Horn Antenna	EMCO	3116 (13058801-001)	2020/08/19	2021/08/18
Horn Antenna	ETS-Lindgren	3117 (13059211-002)	2021/03/16	2022/03/15
Amplifier	Keysight	83051A (13052926-001 & 13032683-001)	2020/08/27	2021/08/26

4.4 場強度之計算

場強之計算公式如下

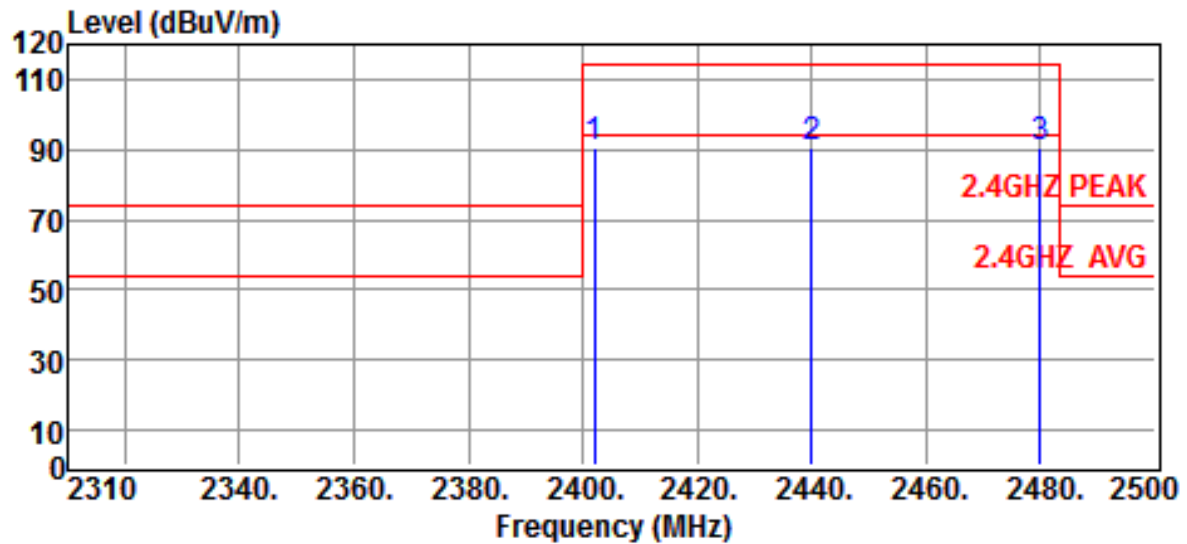
$$\text{結果值} = \text{讀值} + \text{校正因子} + \text{週期因子}$$

其中校正因子為：

$$\text{天線因子} + \text{饋線損失} + \text{濾波器損失 (若有使用)} - \text{放大器增益 (若有使用)}$$

4.5 場強輻射之量測結果

4.5.1 發射主波



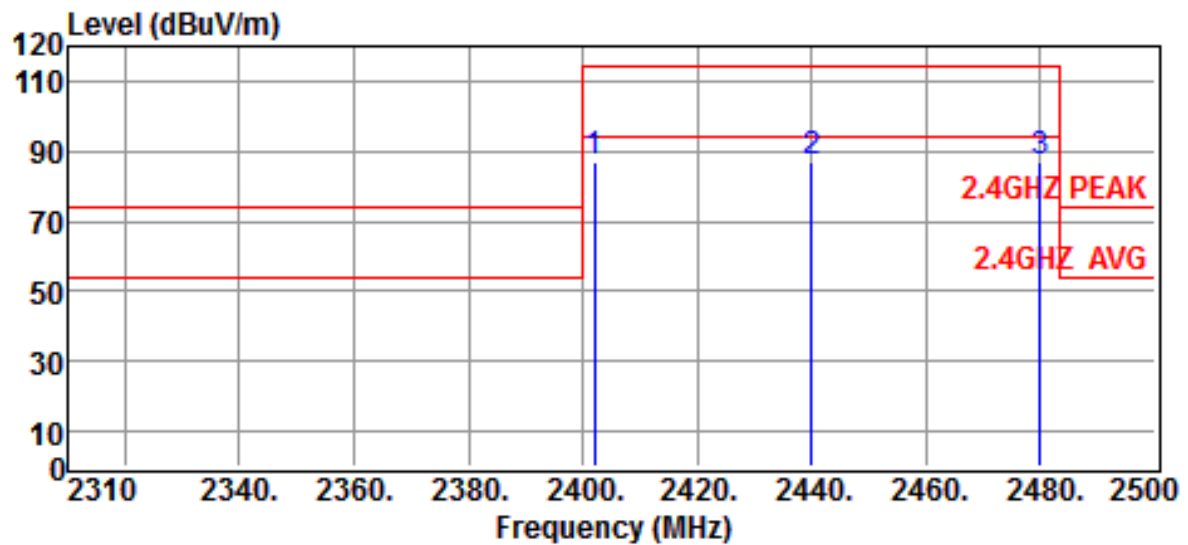
Site :CHAMBER#2
 Limit :2.4GHZ PEAK
 EUT :飛利浦電鬚刀
 Power Rating :Battery
 Engineer :Brian Huang
 Test Mode :BLE Mode

Date :2021-06-19
 Ant. Pol. :HORIZONTAL
 Model :S9986
 Temp. :24 °C
 Humi. :65 %

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	2402.0000	90.45	-0.17	90.28	114.00	-23.72	Peak
	2440.0000	90.62	-0.19	90.43	114.00	-23.57	Peak
*	2480.0000	90.71	-0.09	90.62	114.00	-23.38	Peak

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.



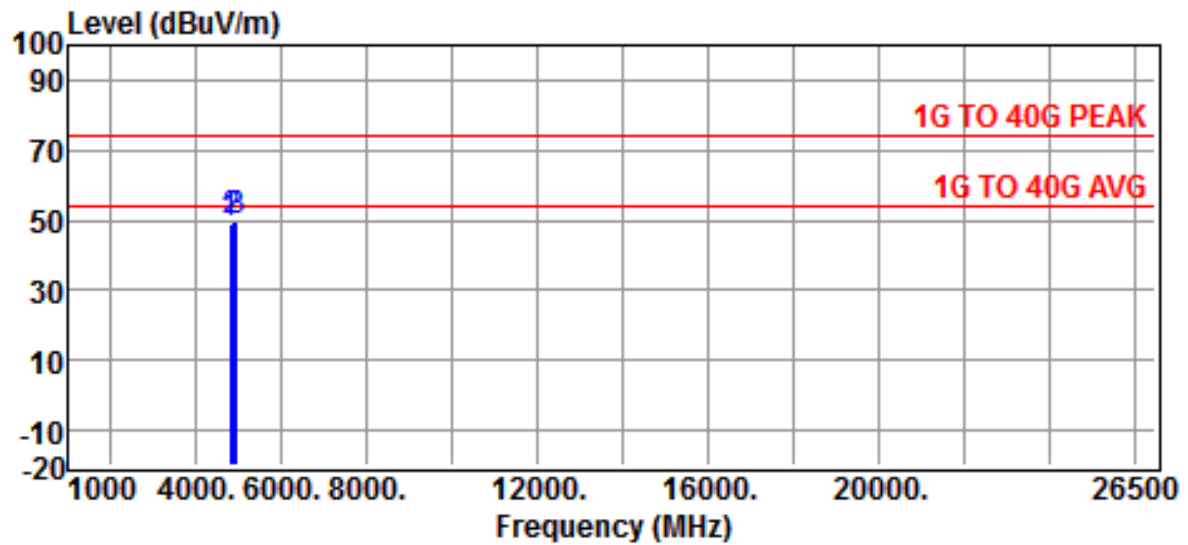
Site	:CHAMBER#2	Date	:2021-06-19
Limit	:2.4GHZ PEAK	Ant. Pol.	:VERTICAL
EUT	:飛利浦電鬚刀	Model	:S9986
Power Rating	:Battery	Temp.	:24 °C
Engineer	:Brian Huang	Humi.	:65 %
Test Mode	:BLE Mode		

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	2402.0000	86.93	-0.17	86.76	114.00	-27.24	Peak
	2440.0000	87.25	-0.19	87.06	114.00	-26.94	Peak
*	2480.0000	87.33	-0.09	87.24	114.00	-26.76	Peak

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.

4.5.2 諧波及本地震盪

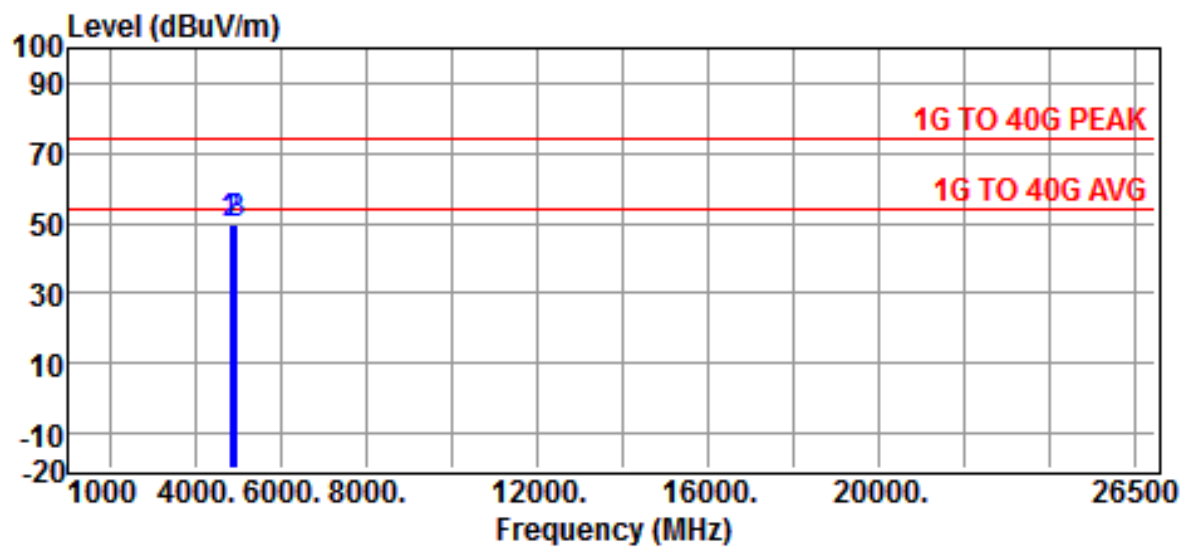


Site	:CHAMBER#2	Date	:2021-06-19
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:飛利浦電鬚刀	Model	:S9986
Power Rating	:Battery	Temp.	:24 °C
Engineer	:Brian Huang	Humi.	:65 %
Test Mode	:BLE Mode		

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	4804.0000	44.63	4.68	49.31	74.00	-24.69	Peak
	4880.0000	44.81	4.80	49.61	74.00	-24.39	Peak
*	4960.0000	44.92	4.90	49.82	74.00	-24.18	Peak

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.



Site	:CHAMBER#2	Date	:2021-06-19
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:飛利浦電鬚刀	Model	:S9986
Power Rating	:Battery	Temp.	:24 °C
Engineer	:Brian Huang	Humi.	:65 %
Test Mode	:BLE Mode		

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	4804.0000	44.70	4.68	49.38	74.00	-24.62	Peak
	4880.0000	44.82	4.80	49.62	74.00	-24.38	Peak
*	4960.0000	44.93	4.90	49.83	74.00	-24.17	Peak

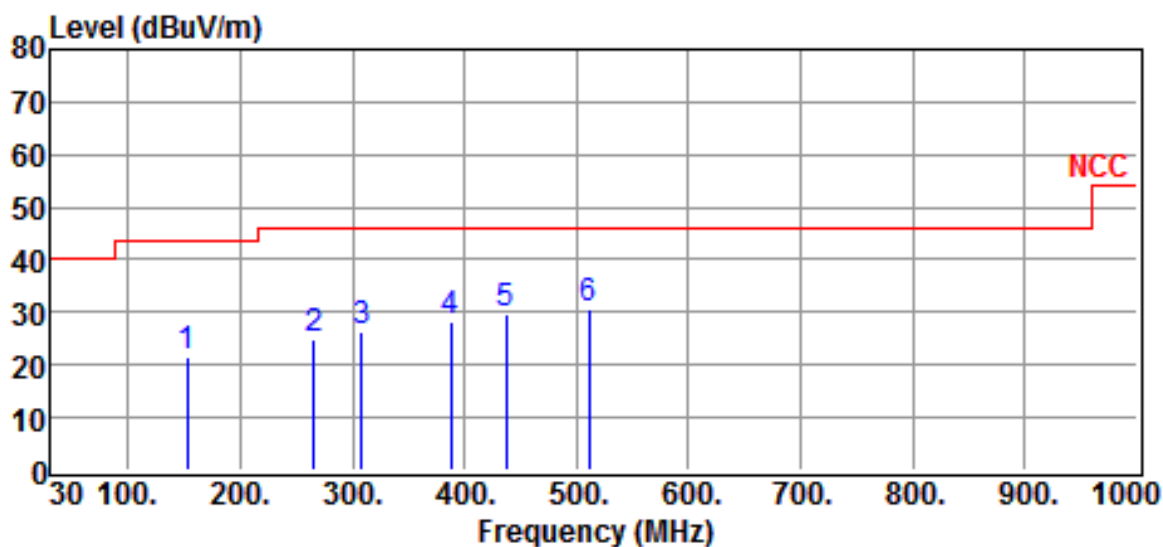
Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.

4.5.3 其它不必要之訊號

A. 1GHz以下(Line Charge)

1) 和泰電機



Site :CHAMBER#2

Date :2021-06-19

Limit :NCC

Ant. Pol. :HORIZONTAL

EUT :飛利浦電鬚刀

Model :S9986

Power Rating :DC 15V From Adapter 110Vac60Hz

Temp. :24 °C

Engineer :Brian Huang

Humi. :65 %

Test Mode :Line Charge Mode

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	153.1900	29.12	-7.56	21.56	43.50	-21.94	QP
	265.7100	29.33	-4.64	24.69	46.00	-21.31	QP
	308.3900	29.30	-3.00	26.30	46.00	-19.70	QP
	387.9300	29.86	-1.45	28.41	46.00	-17.59	QP
	437.4000	30.15	-0.46	29.69	46.00	-16.31	QP
*	511.1200	30.53	0.26	30.79	46.00	-15.21	QP

Note :

1. Result = Reading + Correction Factor

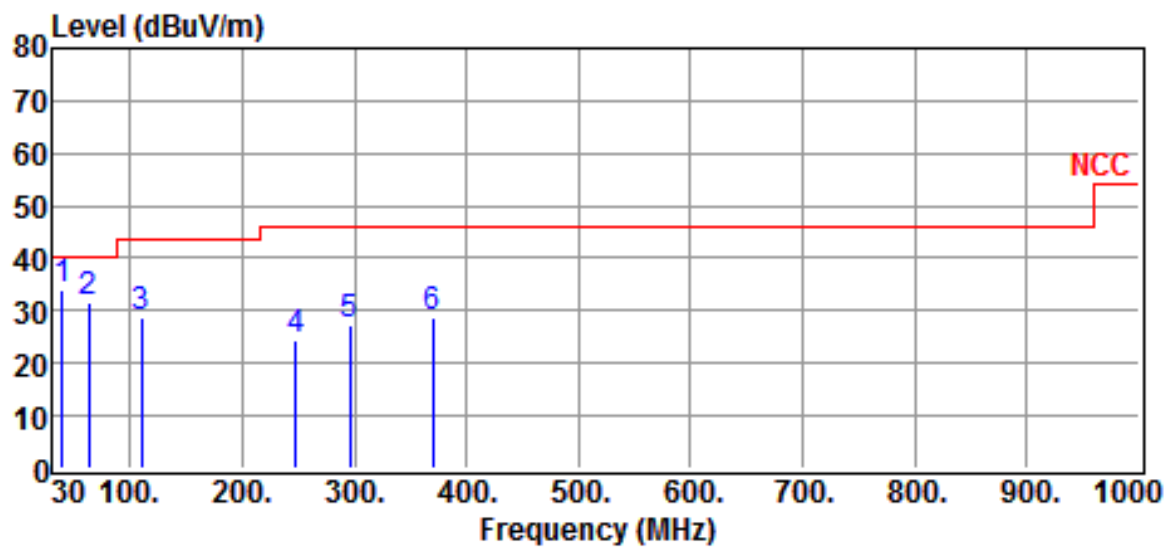
2. Average Result = Peak Result + Duty Factor ()

3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)

4. The margin value=Limit - Result

5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

6. " * " mean this data is the worst emission level.



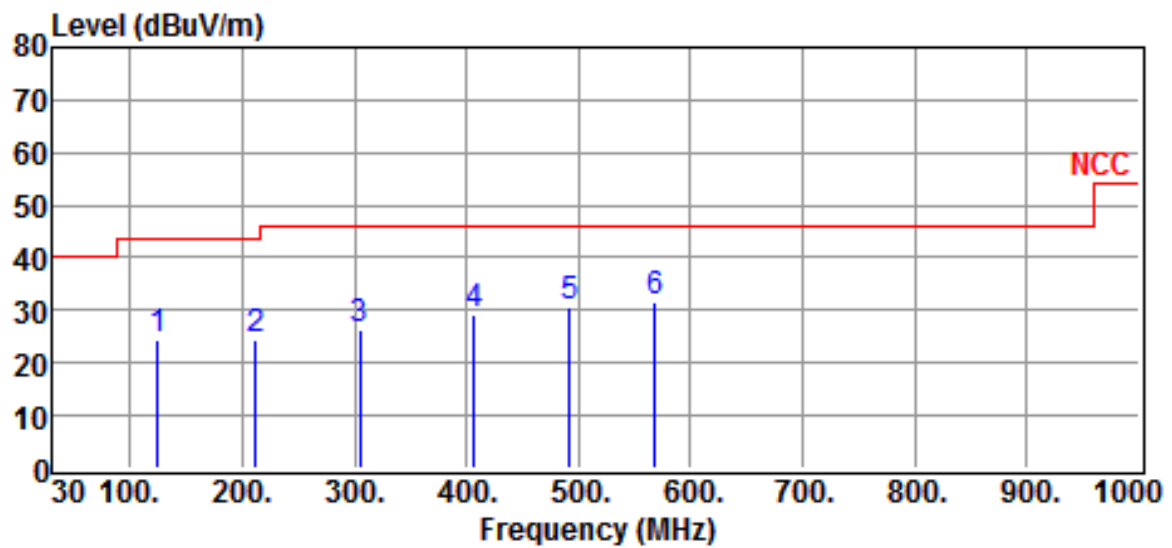
Site	:CHAMBER#2	Date	:2021-06-19
Limit	:NCC	Ant. Pol.	:VERTICAL
EUT	:飛利浦電鬚刀	Model	:S9986
Power Rating	:DC 15V From Adapter 110Vac60Hz	Temp.	:24 °C
Engineer	:Brian Huang	Humi.	:65 %
Test Mode	:Line Charge Mode		

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
*	39.7000	39.78	-5.98	33.80	40.00	-6.20	QP
	62.9800	46.35	-14.95	31.40	40.00	-8.60	QP
	109.5400	37.77	-8.85	28.92	43.50	-14.58	QP
	248.2500	29.64	-5.16	24.48	46.00	-21.52	QP
	295.7800	30.71	-3.20	27.51	46.00	-18.49	QP
	369.5000	30.54	-1.59	28.95	46.00	-17.05	QP

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. ” * ” mean this data is the worst emission level.

2) 柏怡電子



Site :CHAMBER#2

Date :2021-06-19

Limit :NCC

Ant. Pol. :HORIZONTAL

EUT :飛利浦電鬚刀

Model :S9986

Power Rating :DC 15V From Adapter 110Vac60Hz

Temp. :24 °C

Engineer :Brian Huang

Humi. :65 %

Test Mode :Line Charge Mode

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	125.0600	32.00	-7.71	24.29	43.50	-19.21	QP
	212.3600	30.61	-6.16	24.45	43.50	-19.05	QP
	305.4800	29.17	-3.00	26.17	46.00	-19.83	QP
	406.3600	30.11	-1.02	29.09	46.00	-16.91	QP
	491.7200	30.16	0.29	30.45	46.00	-15.55	QP
*	568.3500	30.18	1.28	31.46	46.00	-14.54	QP

Note :

1. Result = Reading + Correction Factor

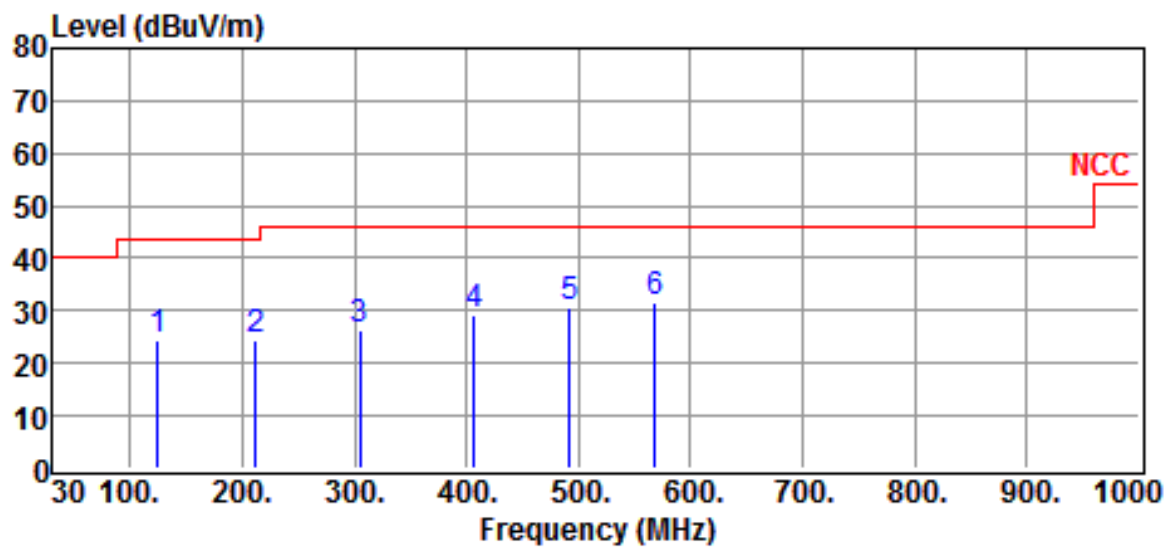
2. Average Result = Peak Result + Duty Factor ()

3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)

4. The margin value=Limit - Result

5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

6. " * " mean this data is the worst emission level.



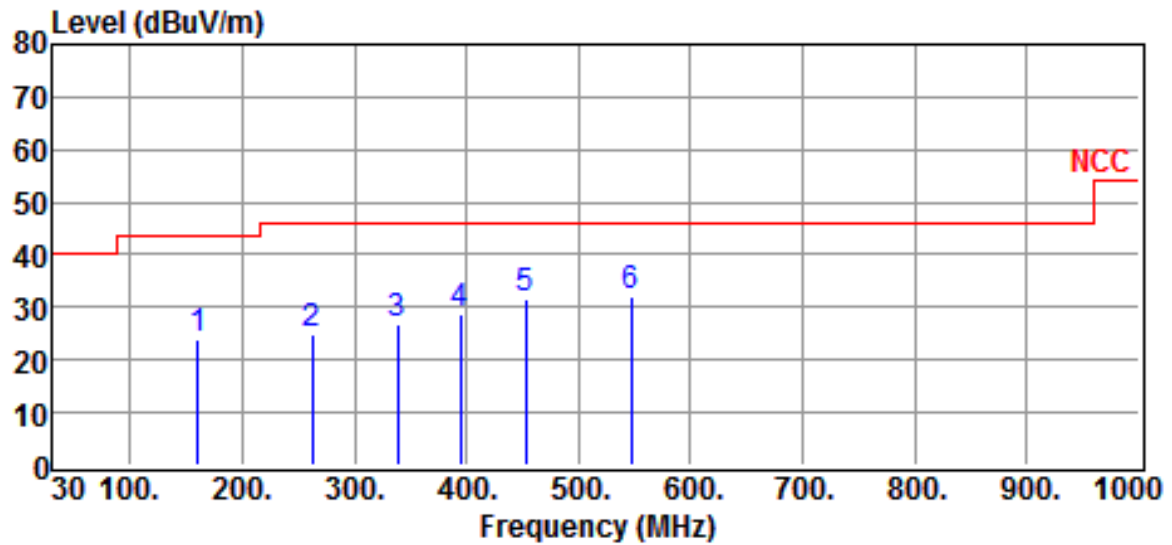
Site	:CHAMBER#2	Date	:2021-06-19
Limit	:NCC	Ant. Pol.	:HORIZONTAL
EUT	:飛利浦電鬚刀	Model	:S9986
Power Rating	:DC 15V From Adapter 110Vac60Hz	Temp.	:24 °C
Engineer	:Brian Huang	Humi.	:65 %
Test Mode	:Line Charge Mode		

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	125.0600	32.00	-7.71	24.29	43.50	-19.21	QP
	212.3600	30.61	-6.16	24.45	43.50	-19.05	QP
	305.4800	29.17	-3.00	26.17	46.00	-19.83	QP
	406.3600	30.11	-1.02	29.09	46.00	-16.91	QP
	491.7200	30.16	0.29	30.45	46.00	-15.55	QP
*	568.3500	30.18	1.28	31.46	46.00	-14.54	QP

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.

3) PI Electronics (H.K.) Ltd.



Site :CHAMBER#2

Date :2021-06-19

Limit :NCC

Ant. Pol. :HORIZONTAL

EUT :飛利浦電鬚刀

Model :S9986

Power Rating :DC 15V From Adapter 110Vac60Hz

Temp. :24 °C

Engineer :Brian Huang

Humi. :65 %

Test Mode :Line Charge Mode

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	159.9800	31.55	-7.75	23.80	43.50	-19.70	QP
	262.8000	29.66	-4.66	25.00	46.00	-21.00	QP
	338.4600	29.58	-2.70	26.88	46.00	-19.12	QP
	394.7200	30.17	-1.22	28.95	46.00	-17.05	QP
	452.9200	31.88	-0.50	31.38	46.00	-14.62	QP
*	547.0100	30.73	1.24	31.97	46.00	-14.03	QP

Note :

1. Result = Reading + Correction Factor

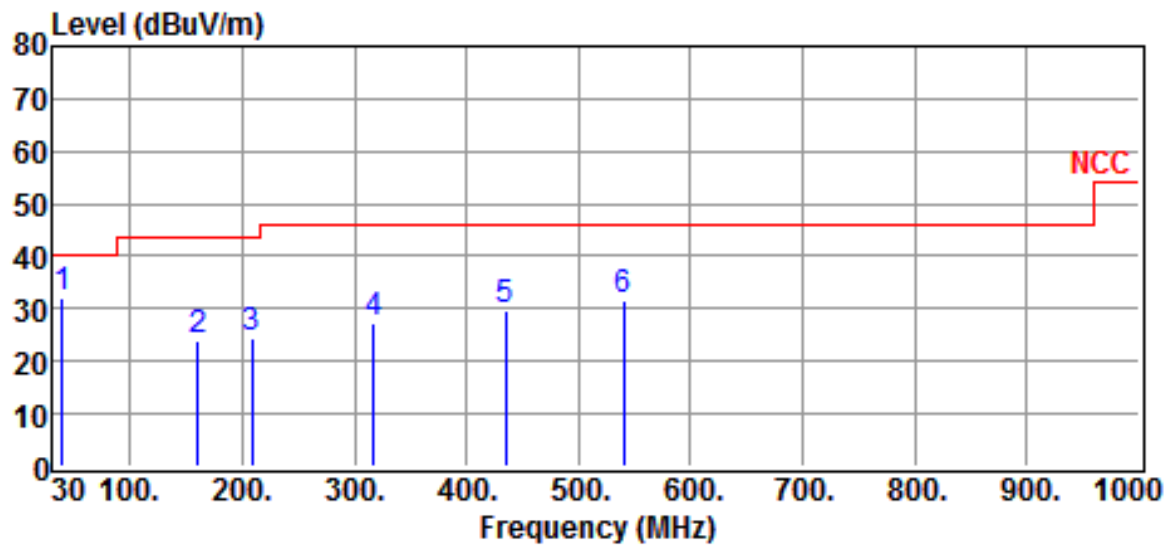
2. Average Result = Peak Result + Duty Factor ()

3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)

4. The margin value=Limit - Result

5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.

6. " * " mean this data is the worst emission level.

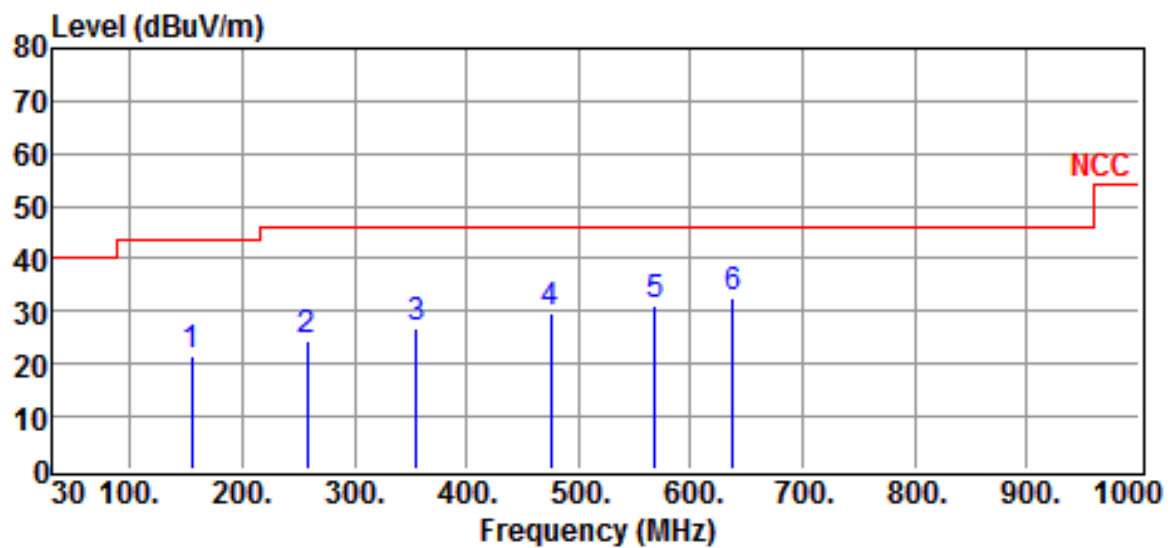


Site	:CHAMBER#2	Date	:2021-06-19
Limit	:NCC	Ant. Pol.	:VERTICAL
EUT	:飛利浦電鬚刀	Model	:S9986
Power Rating	:DC 15V From Adapter 110Vac60Hz	Temp.	:24 °C
Engineer	:Brian Huang	Humi.	:65 %
Test Mode	:Line Charge Mode		

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
*	39.7000	38.05	-5.98	32.07	40.00	-7.93	QP
	159.9800	31.70	-7.75	23.95	43.50	-19.55	QP
	208.4800	30.29	-5.94	24.35	43.50	-19.15	QP
	317.1200	30.24	-3.01	27.23	46.00	-18.77	QP
	435.4600	30.50	-0.57	29.93	46.00	-16.07	QP
	540.2200	30.56	0.99	31.55	46.00	-14.45	QP

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. ” * ” mean this data is the worst emission level.

B. 1GHz以下(單機BT)

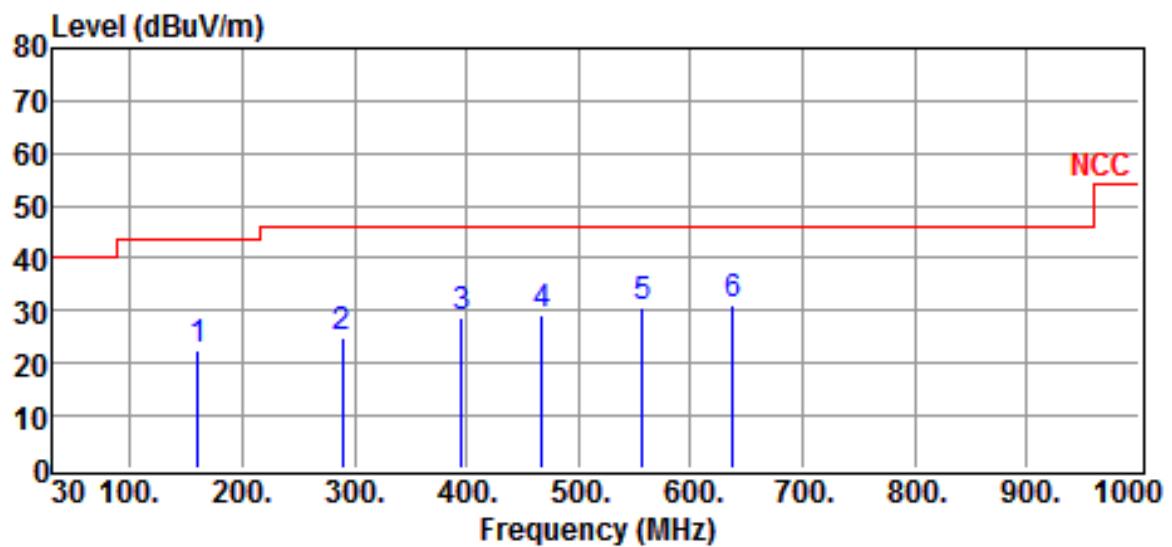
Site :CHAMBER#2
 Limit :NCC
 EUT :飛利浦電鬚刀
 Power Rating :Battery
 Engineer :Brian Huang
 Test Mode :BT Mode

Date :2021-06-19
 Ant. Pol. :HORIZONTAL
 Model :S9986
 Temp. :24 °C
 Humi. :65 %

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	155.1300	29.26	-7.62	21.64	43.50	-21.86	QP
	257.9500	28.89	-4.62	24.27	46.00	-21.73	QP
	354.9500	29.11	-2.06	27.05	46.00	-18.95	QP
	475.2300	29.88	-0.08	29.80	46.00	-16.20	QP
	568.3500	29.77	1.28	31.05	46.00	-14.95	QP
*	637.2200	29.80	2.62	32.42	46.00	-13.58	QP

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.



Site :CHAMBER#2
 Limit :NCC
 EUT :飛利浦電鬚刀
 Power Rating :Battery
 Engineer :Brian Huang
 Test Mode :BT Mode

Date :2021-06-19
 Ant. Pol. :VERTICAL
 Model :S9986
 Temp. :24 °C
 Humi. :65 %

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	160.9500	30.28	-7.83	22.45	43.50	-21.05	QP
	288.9900	28.32	-3.53	24.79	46.00	-21.21	QP
	395.6900	29.80	-1.20	28.60	46.00	-17.40	QP
	467.4700	29.65	-0.29	29.36	46.00	-16.64	QP
	556.7100	29.16	1.44	30.60	46.00	-15.40	QP
*	637.2200	28.28	2.62	30.90	46.00	-15.10	QP

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. ” * ” mean this data is the worst emission level.

c. 1GHz以上

操作模式 : 請參閱第三章節受測裝置之系統說明

測試日期 : 2021-06-19 環境溫度 : 24 °C

環境溼度 : 65 %

測試結果 : 合格

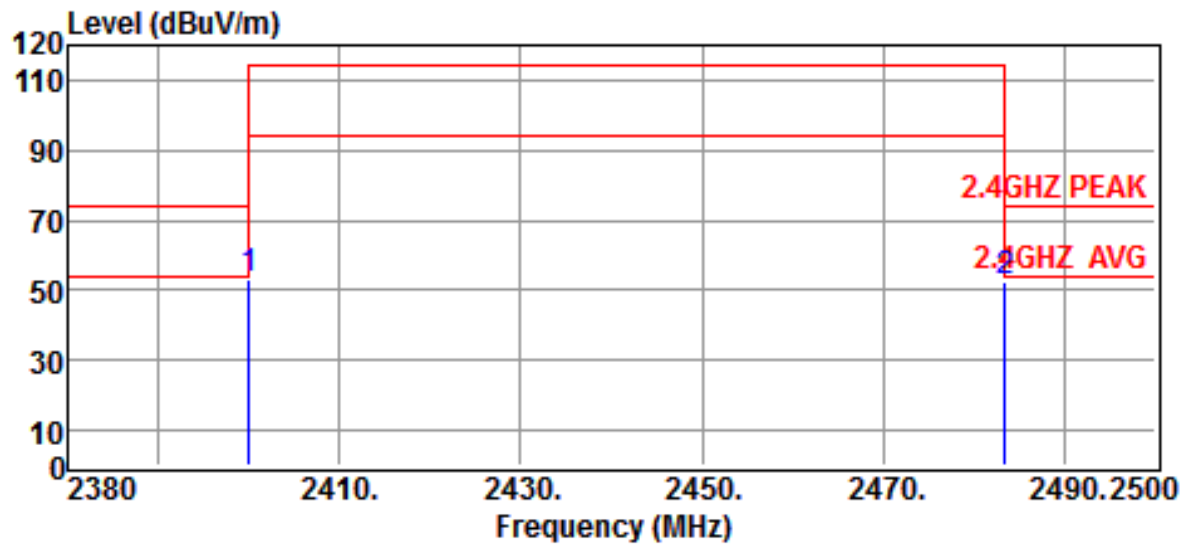
測試者 : 黃義傑

註：

1.1GHz 以上之不必要發射之訊號太弱而儀器無法量測。

2.掃描圖請參考 4.5.2 發射諧波及本地震盪。

4.5.4 限制頻帶之場強輻射測量

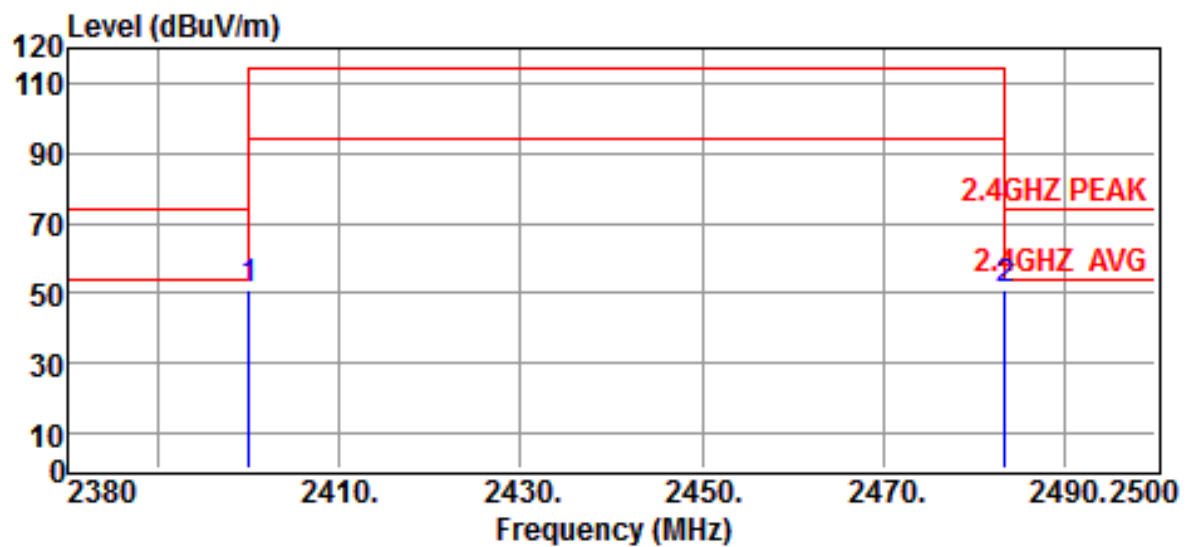


Site	:CHAMBER#2	Date	:2021-06-19
Limit	:2.4GHZ PEAK	Ant. Pol.	:HORIZONTAL
EUT	:飛利浦電鬚刀	Model	:S9986
Power Rating	:Battery	Temp.	:24 °C
Engineer	:Brian Huang	Humi.	:65 %
Test Mode	:BLE Mode		

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
*	2400.0000	53.07	-0.17	52.90	74.00	-21.10	Peak
	2483.5000	52.49	-0.08	52.41	74.00	-21.59	Peak

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.



Site :CHAMBER#2
 Limit :2.4GHZ PEAK
 EUT :飛利浦電鬚刀
 Power Rating :Battery
 Engineer :Brian Huang
 Test Mode :BLE Mode

Date :2021-06-19
 Ant. Pol. :VERTICAL
 Model :S9986
 Temp. :24 °C
 Humi. :65 %

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	2400.0000	51.19	-0.17	51.02	74.00	-22.98	Peak
*	2483.5000	51.29	-0.08	51.21	74.00	-22.79	Peak

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.

4.6 輻射之測試配置

圖 1：量測頻率低於1GHz之測試配置

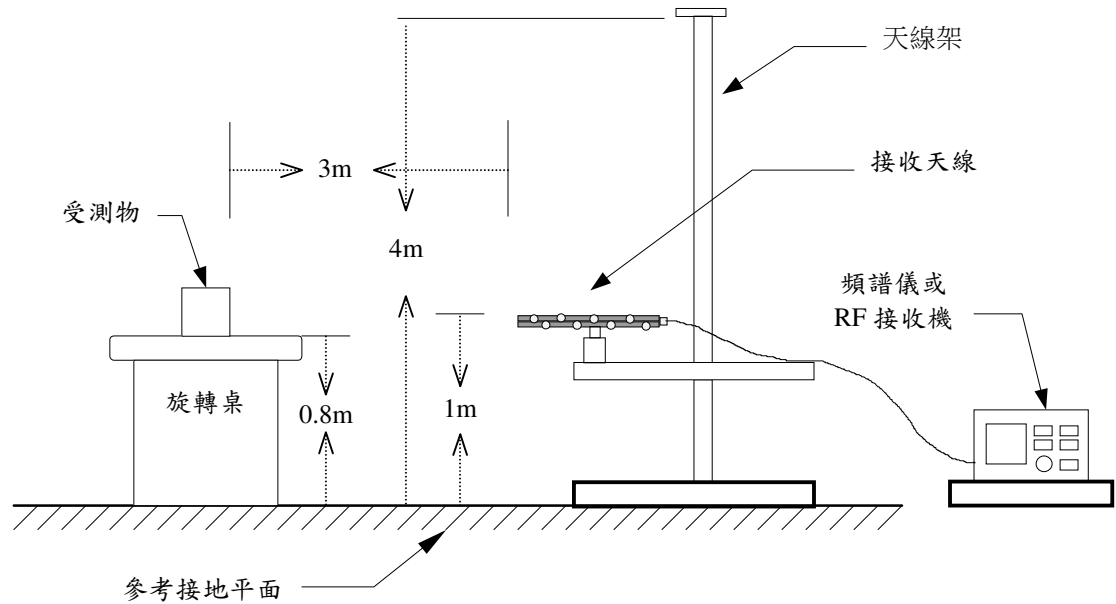
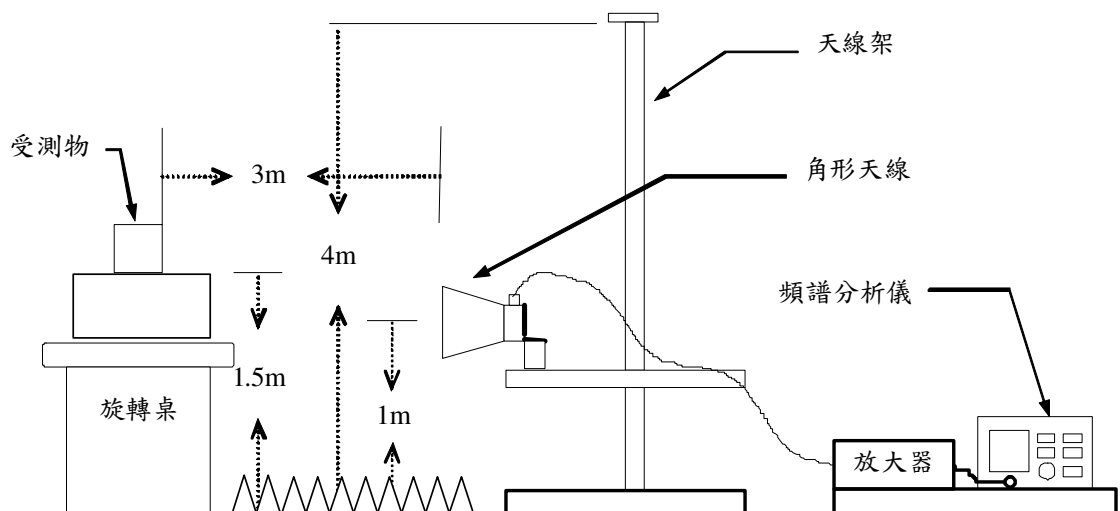


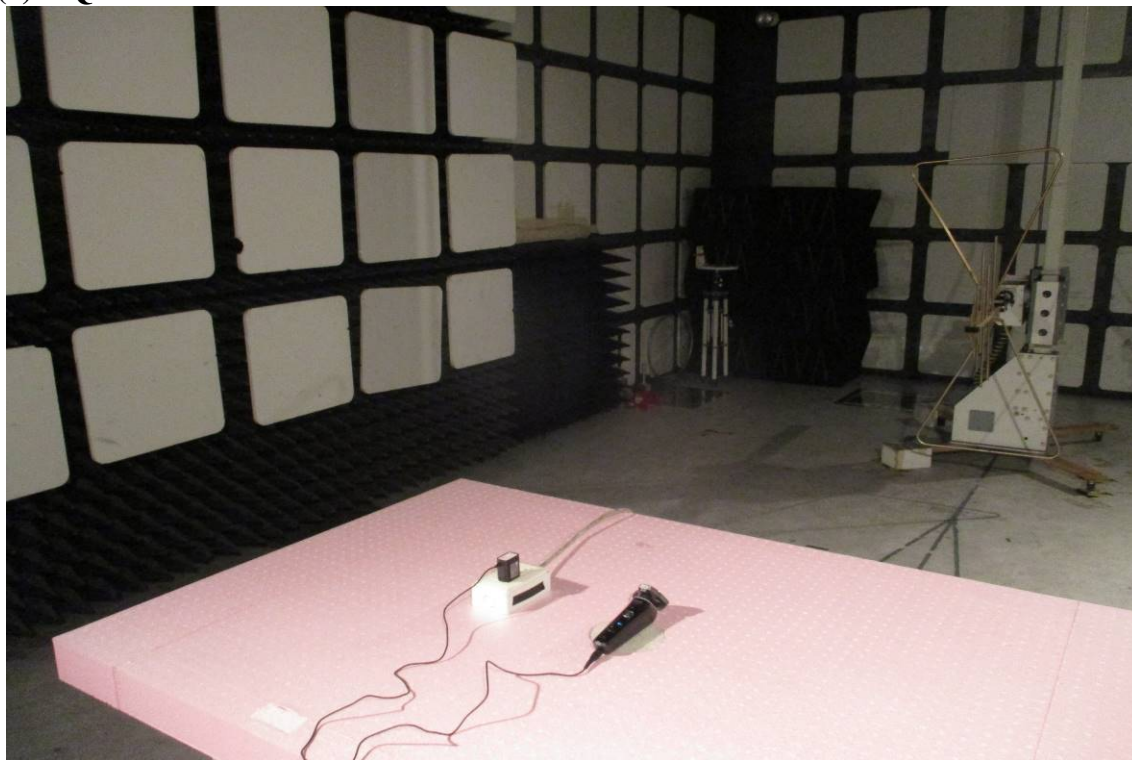
圖 2：量測頻率高於1GHz之測試配置



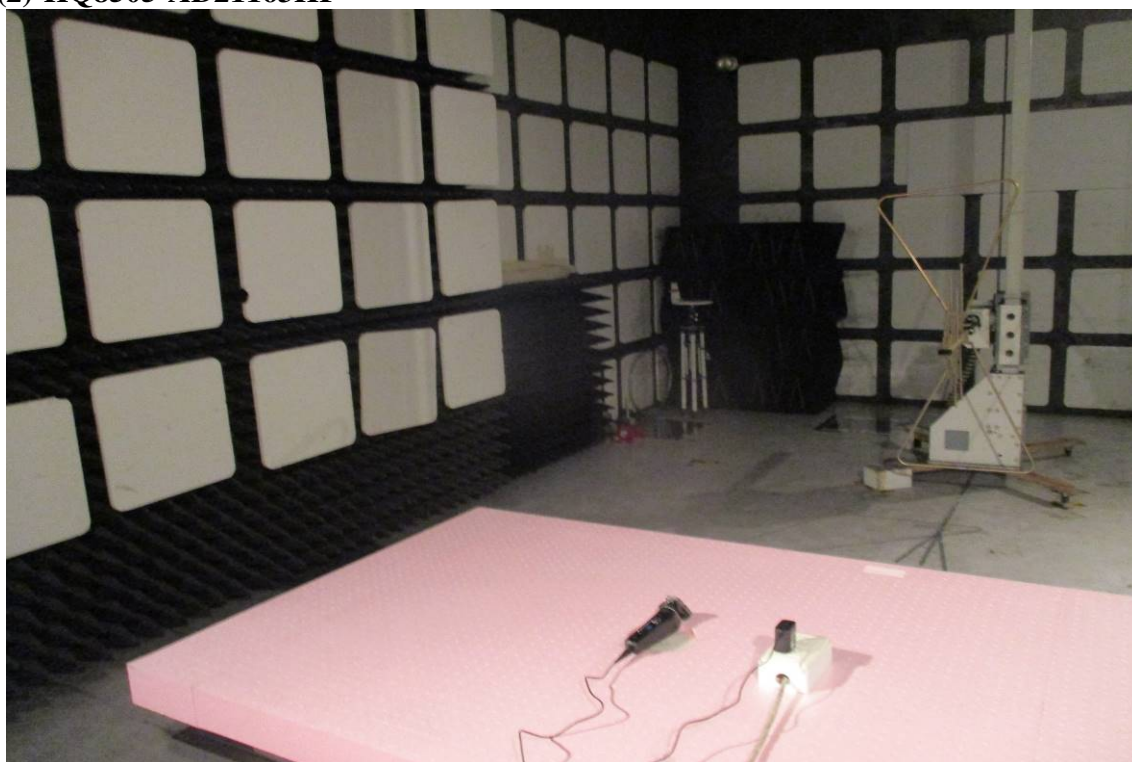
4.7 輻射量測之配置照片

(30MHz~1000MHz)

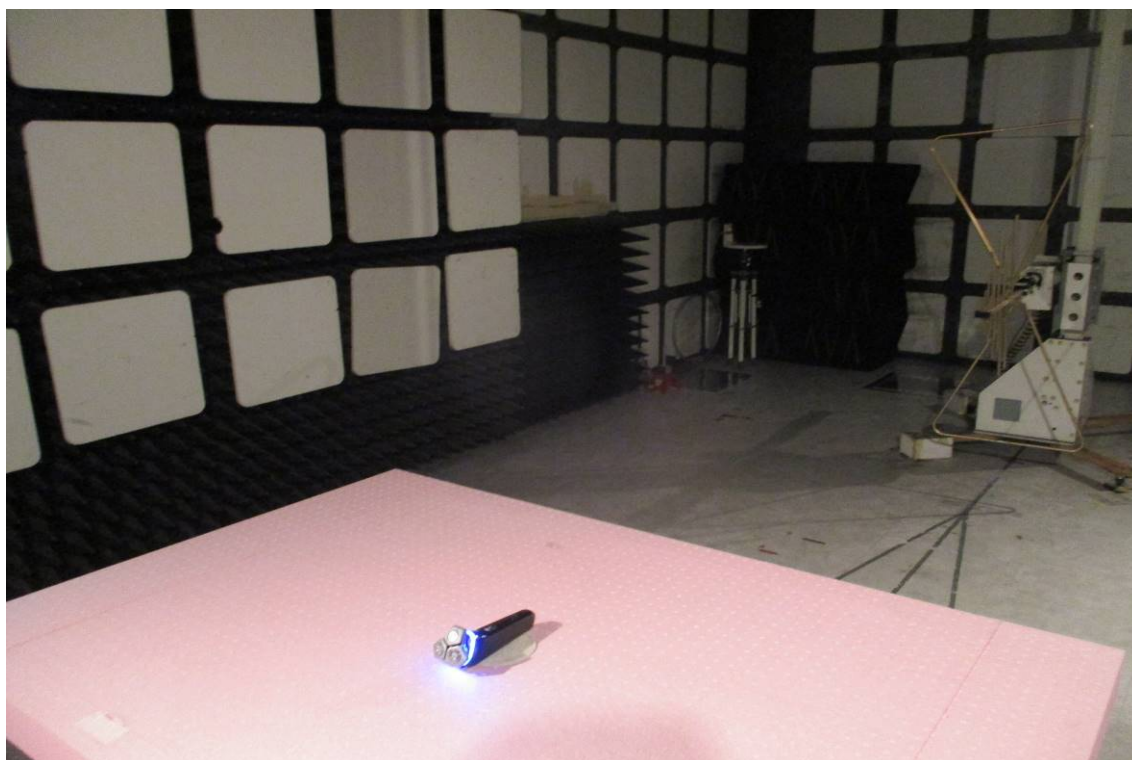
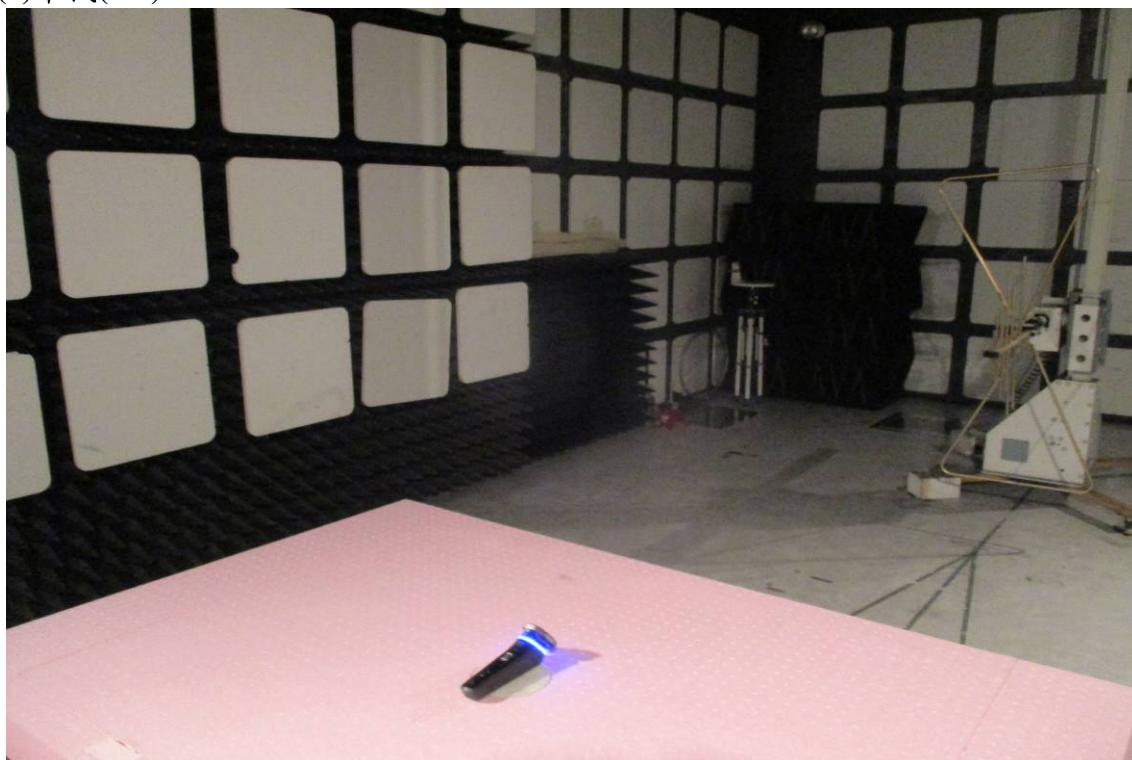
(1)-HQ8S05SSW-2600US-2



(2)-HQ8505-AD21163HF

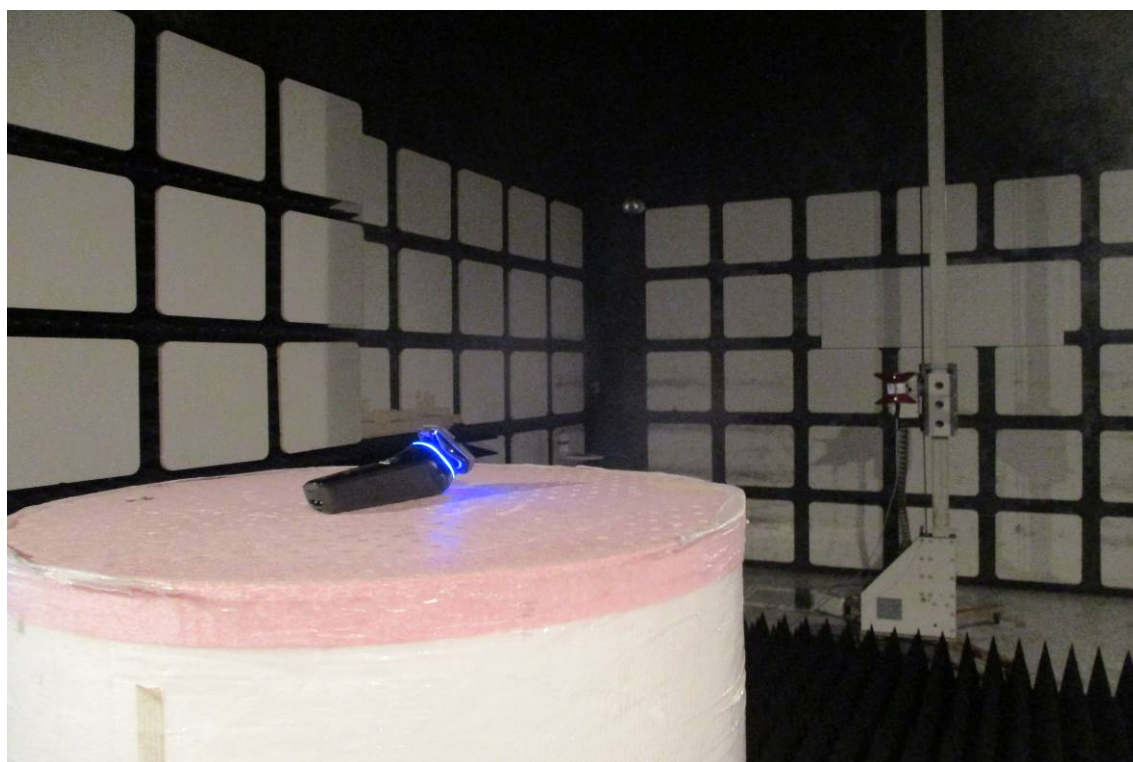
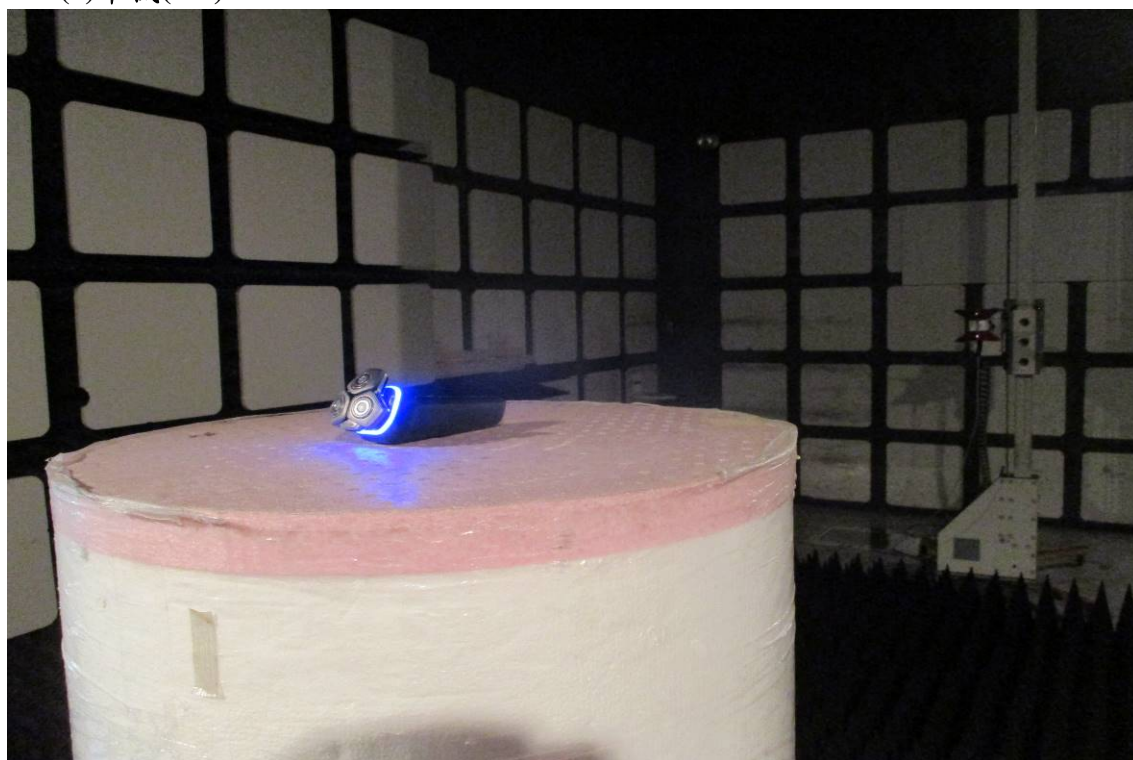


(4)單機(BT)



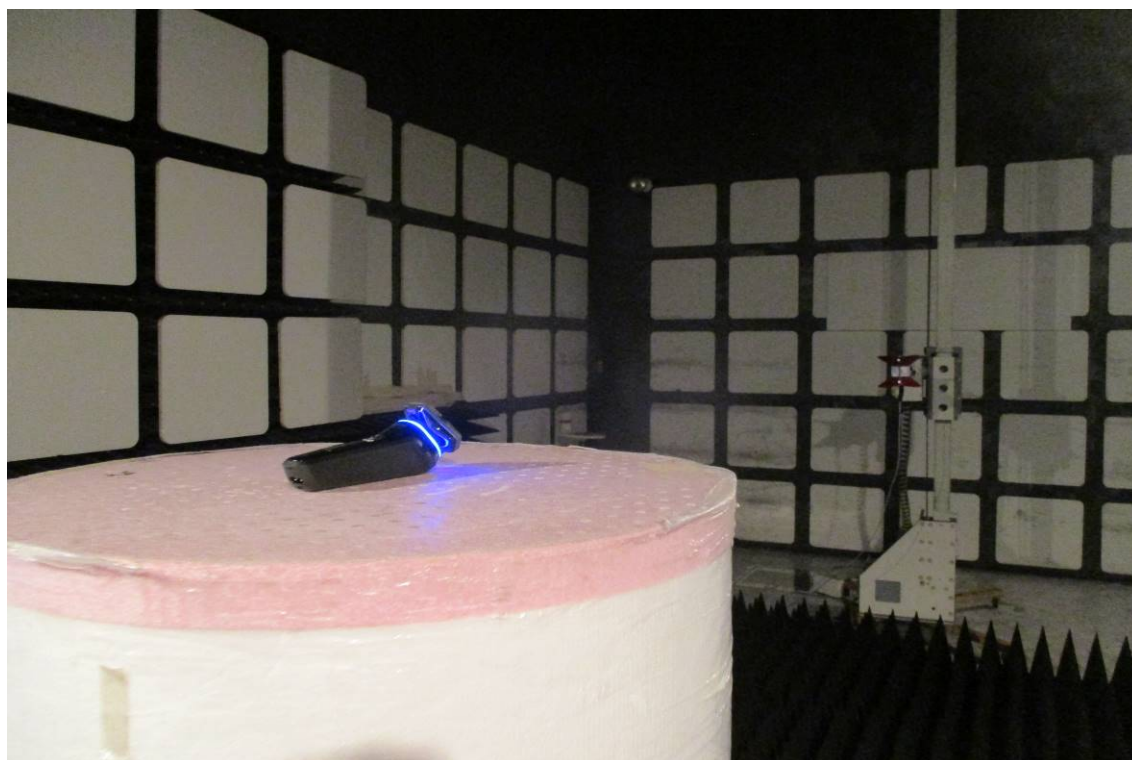
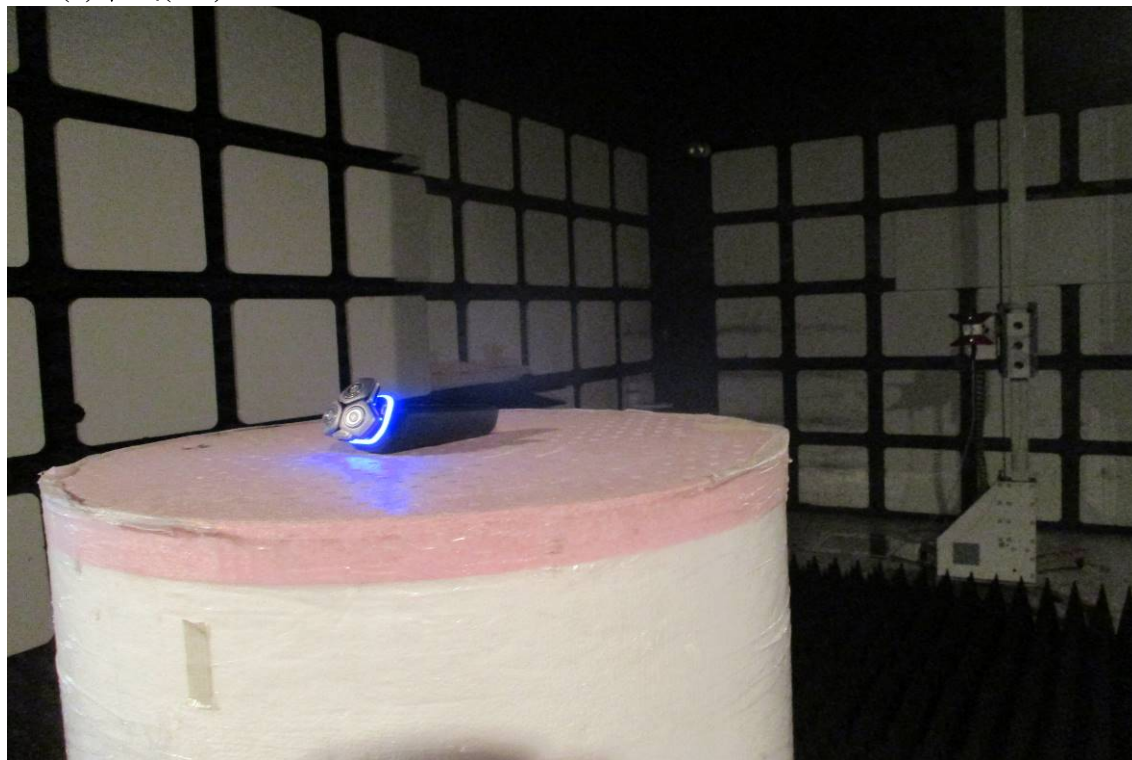
(1-6GHz)

(4)單機(BT)



(6~26.5GHz)

(4)單機(BT)



5 電源線傳導干擾之量測

5.1 適用標準

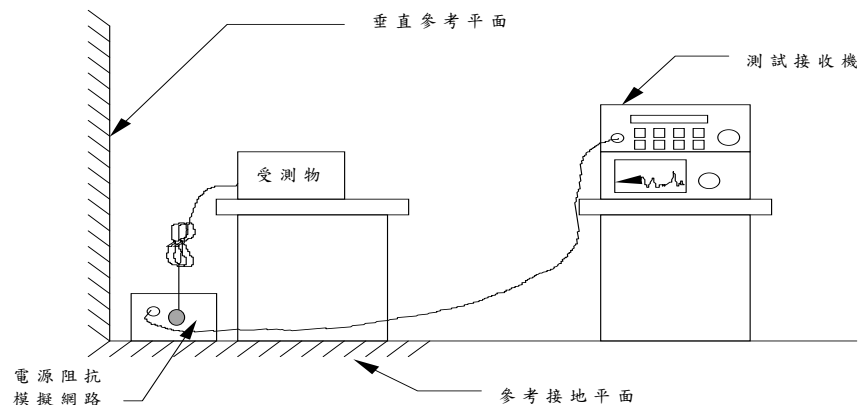
依據低功率射頻器材技術規範3.3節之要求。

5.2 測試方法

將待測物置於0.8米高的非金屬桌面，使其在工作狀態，待測物電源線接至電源線阻抗穩定網路上，從測試接收機記錄頻率由 0.15MHz 至 30MHz 之間之電源線傳導放射強度。

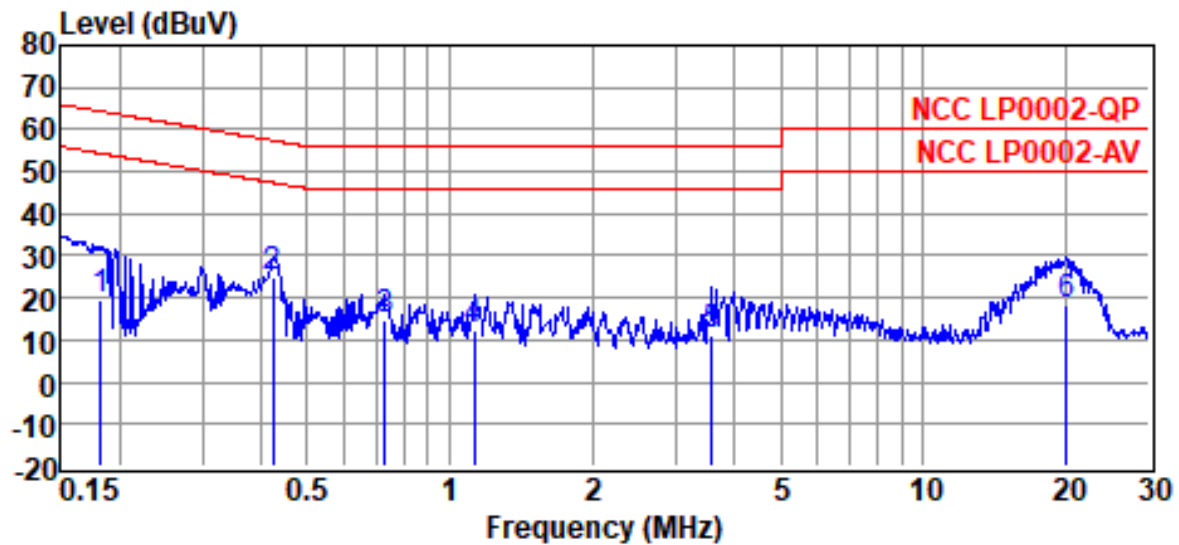
5.3 測試配置

圖 3：傳導干擾之量測配置



5.4 傳導干擾之量測結果

1) 和泰電機

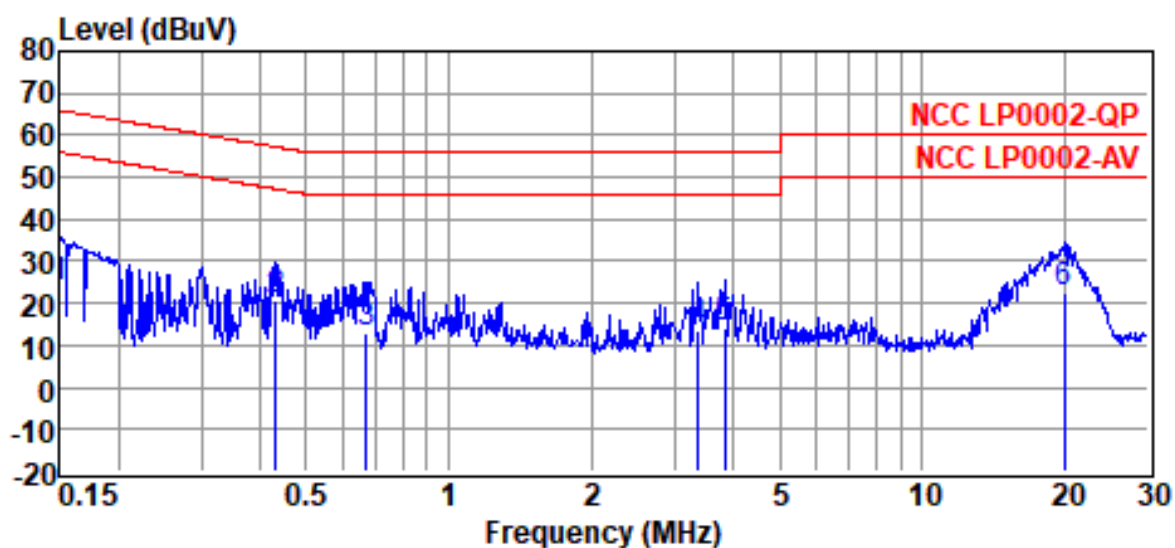


Site : conducted #1 Date : 2021-06-15
 Condition : NCC LP0002-QP LISN : NEUTRAL
 Tem / Hum : 22 °C / 60%
 Test Mode : Line Charge Mode
 EUT : 飛利浦電鬚刀
 Power Rating : DC 15V From Adapter 110Vac60Hz
 Engineer : Brian Huang Model : S9986

	Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
	0.1835	9.42	10.07	19.49	64.33	-44.84	QP
*	0.4237	14.82	10.06	24.88	57.37	-32.49	QP
	0.7274	4.94	10.07	15.01	56.00	-40.99	QP
	1.1230	2.53	10.09	12.62	56.00	-43.38	QP
	3.5840	1.24	10.19	11.43	56.00	-44.57	QP
	20.0560	8.21	10.41	18.62	60.00	-41.38	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss+ Pulse Limiter Factor
3. " * " mean this data is the worst emission level



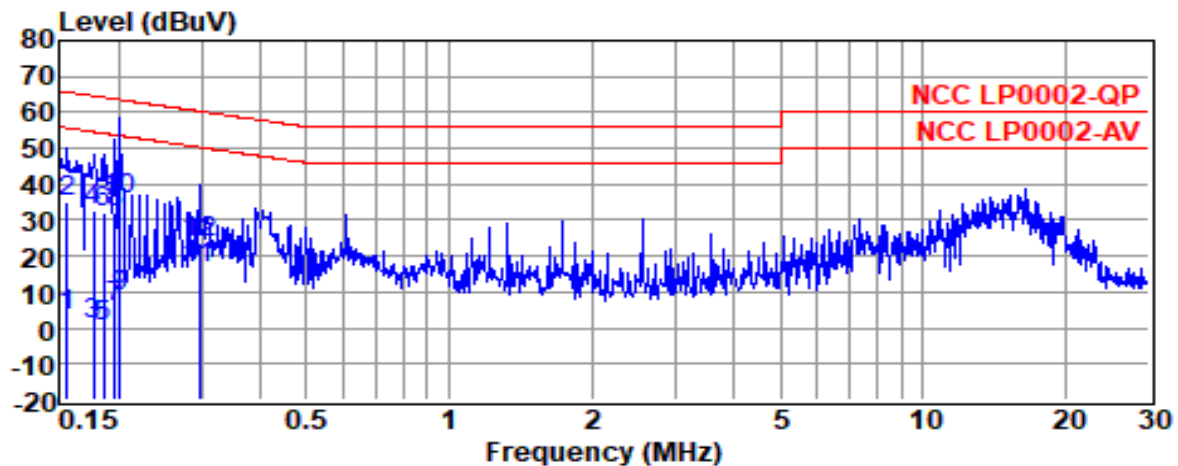
Site : conducted #1 Date : 2021-06-15
 Condition : NCC LP0002-QP LISN : LINE
 Tem / Hum : 22 °C / 60%
 Test Mode : Line Charge Mode
 EUT : 飛利浦電鬚刀
 Power Rating : DC 15V From Adapter 110Vac60Hz
 Engineer : Brian Huang Model : S9986

	Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
	0.1508	13.68	10.07	23.75	65.96	-42.21	QP
*	0.4305	10.69	10.05	20.74	57.24	-36.50	QP
	0.6683	2.60	10.06	12.66	56.00	-43.34	QP
	3.3640	3.64	10.18	13.82	56.00	-42.18	QP
	3.8200	3.80	10.19	13.99	56.00	-42.01	QP
	19.9500	11.97	10.40	22.37	60.00	-37.63	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss+ Pulse Limiter Factor
3. " * " mean this data is the worst emission level

2) 柏怡電子

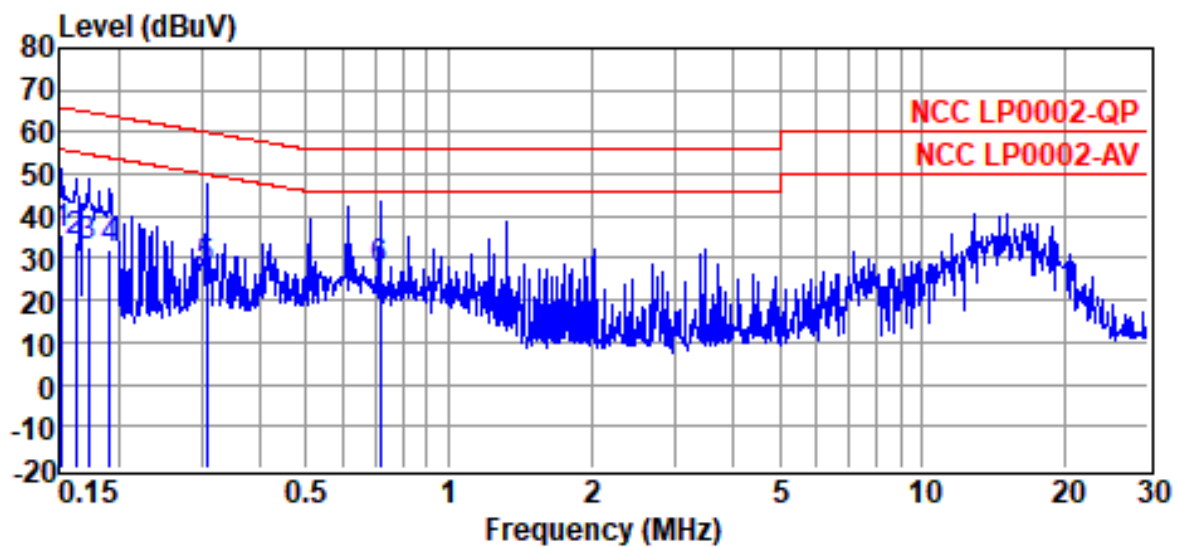


Site : conducted #1 Date : 2021-06-15
 Condition : NCC LP0002-QP LISN : NEUTRAL
 Tem / Hum : 22 °C / 60%
 Test Mode : Line Charge Mode
 EUT : 飛利浦電鬚刀
 Power Rating : DC 15V From Adapter 110Vac60Hz
 Engineer : Brian Huang Model : S9986

	Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
	0.1557	-6.84	10.08	3.24	55.69	-52.45	Average
	0.1557	25.03	10.08	35.11	65.69	-30.58	QP
	0.1777	-9.19	10.07	0.88	54.59	-53.71	Average
	0.1777	22.47	10.07	32.54	64.59	-32.05	QP
	0.1864	-9.69	10.07	0.38	54.20	-53.82	Average
	0.1864	21.87	10.07	31.94	64.20	-32.26	QP
	0.1965	-4.03	10.06	6.03	53.76	-47.73	Average
	0.1965	21.91	10.06	31.97	63.76	-31.79	QP
	0.2018	-1.58	10.06	8.48	53.54	-45.06	Average
*	0.2018	25.78	10.06	35.84	63.54	-27.70	QP
	0.2971	6.62	10.06	16.68	50.32	-33.64	Average
	0.2971	13.76	10.06	23.82	60.32	-36.50	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss+ Pulse Limiter Factor
3. " * " mean this data is the worst emission level



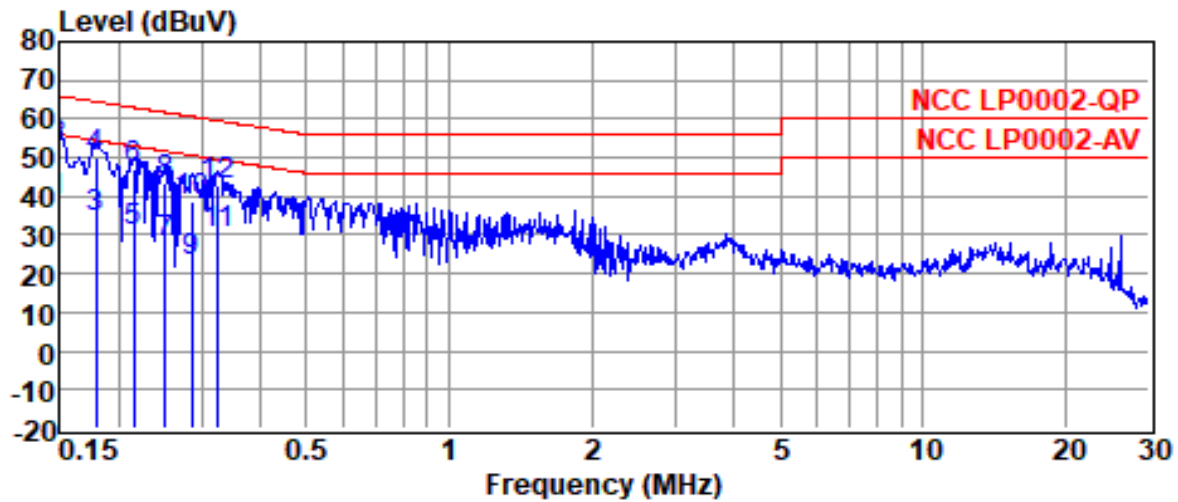
Site : conducted #1 Date : 2021-06-15
 Condition : NCC LP0002-QP LISN : LINE
 Tem / Hum : 22 °C / 60%
 Test Mode : Line Charge Mode
 EUT : 飛利浦電鬚刀
 Power Rating : DC 15V From Adapter 110Vac60Hz
 Engineer : Brian Huang Model : S9986

	Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
	0.1524	25.47	10.07	35.54	65.87	-30.33	QP
	0.1633	23.94	10.07	34.01	65.30	-31.29	QP
	0.1731	22.59	10.07	32.66	64.81	-32.15	QP
	0.1924	22.11	10.06	32.17	63.93	-31.76	QP
	0.3083	17.15	10.05	27.20	60.02	-32.82	QP
*	0.7160	17.18	10.06	27.24	56.00	-28.76	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss+ Pulse Limiter Factor
3. " * " mean this data is the worst emission level

3) PI Electronics (H.K.) Ltd.

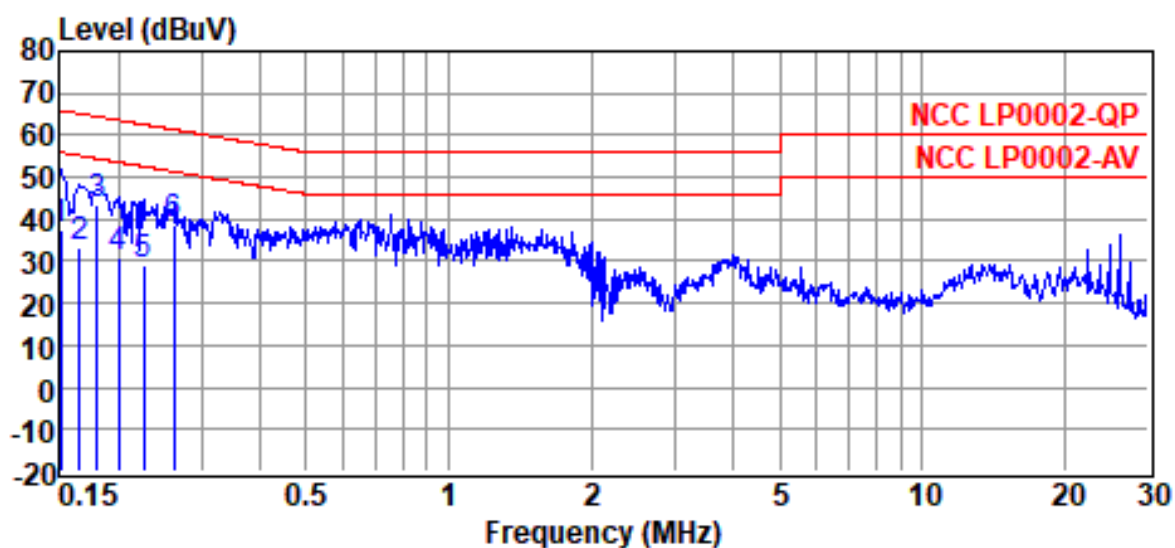


Site : conducted #1 Date : 2021-06-15
 Condition : NCC LP0002-QP LISN : NEUTRAL
 Tem / Hum : 22 °C / 60%
 Test Mode : Line Charge Mode
 EUT : 飛利浦電鬚刀
 Power Rating : DC 15V From Adapter 110Vac60Hz
 Engineer : Brian Huang Model : S9986

	Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
	0.1500	28.61	10.08	38.69	56.00	-17.31	Average
*	0.1500	42.51	10.08	52.59	66.00	-13.41	QP
	0.1796	24.55	10.07	34.62	54.50	-19.88	Average
	0.1796	40.07	10.07	50.14	64.50	-14.36	QP
	0.2162	21.06	10.06	31.12	52.96	-21.84	Average
	0.2162	36.77	10.06	46.83	62.96	-16.13	QP
	0.2521	17.91	10.06	27.97	51.69	-23.72	Average
	0.2521	33.50	10.06	43.56	61.69	-18.13	QP
	0.2863	13.11	10.06	23.17	50.63	-27.46	Average
	0.2863	28.92	10.06	38.98	60.63	-21.65	QP
	0.3251	20.22	10.06	30.28	49.57	-19.29	Average
	0.3251	32.70	10.06	42.76	59.57	-16.81	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss+ Pulse Limiter Factor
3. " * " mean this data is the worst emission level



Site : conducted #1 Date : 2021-06-15
 Condition : NCC LP0002-QP LISN : LINE
 Tem / Hum : 22 °C / 60%
 Test Mode : Line Charge Mode
 EUT : 飛利浦電鬚刀
 Power Rating : DC 15V From Adapter 110Vac60Hz
 Engineer : Brian Huang Model : S9986

	Freq (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Remark
	0.1516	27.50	10.07	37.57	65.91	-28.34	QP
	0.1659	23.45	10.07	33.52	65.16	-31.64	QP
*	0.1806	33.40	10.06	43.46	64.46	-21.00	QP
	0.2008	20.83	10.06	30.89	63.58	-32.69	QP
	0.2268	18.93	10.06	28.99	62.57	-33.58	QP
	0.2630	28.66	10.06	38.72	61.34	-22.62	QP

Note :

1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss+ Pulse Limiter Factor
3. " * " mean this data is the worst emission level

5.5 干擾值之計算

電源傳導干擾電壓之計算公式如下

$$\text{結果值} = \text{儀器讀值} + \text{校正因子}$$

其中校正因子為：

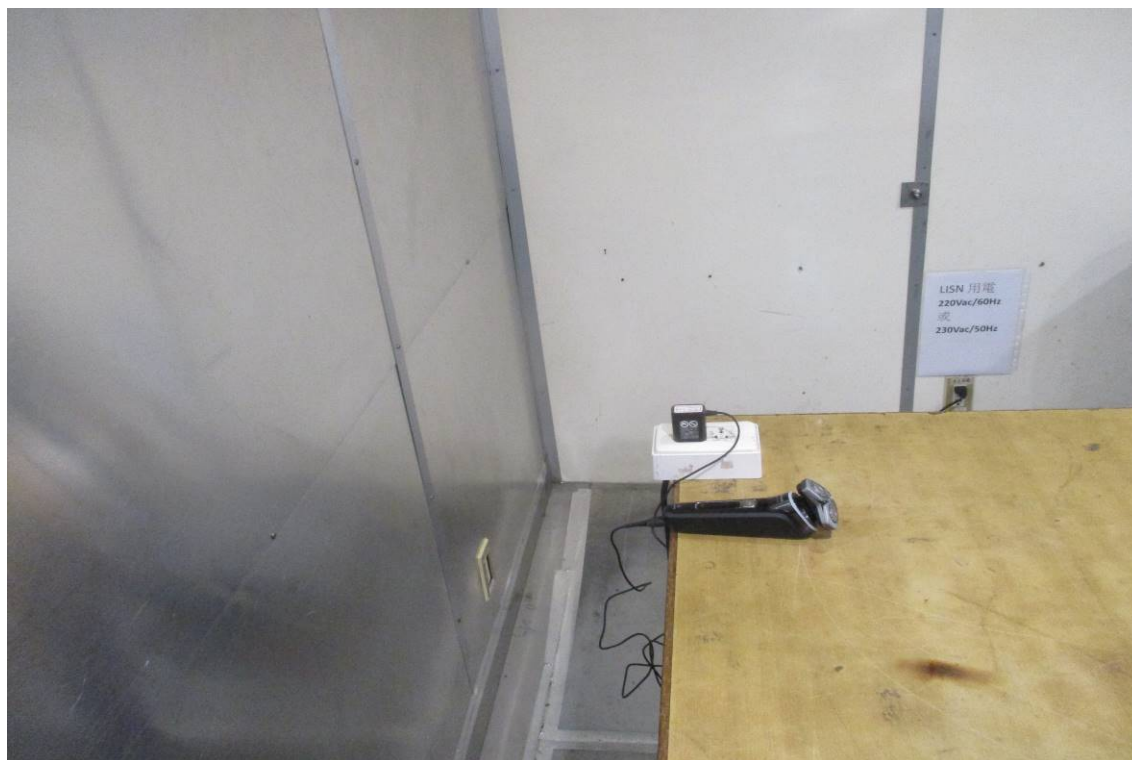
饋線損失 + 電源阻抗模擬網路損失

5.6 傳導干擾之量測儀器

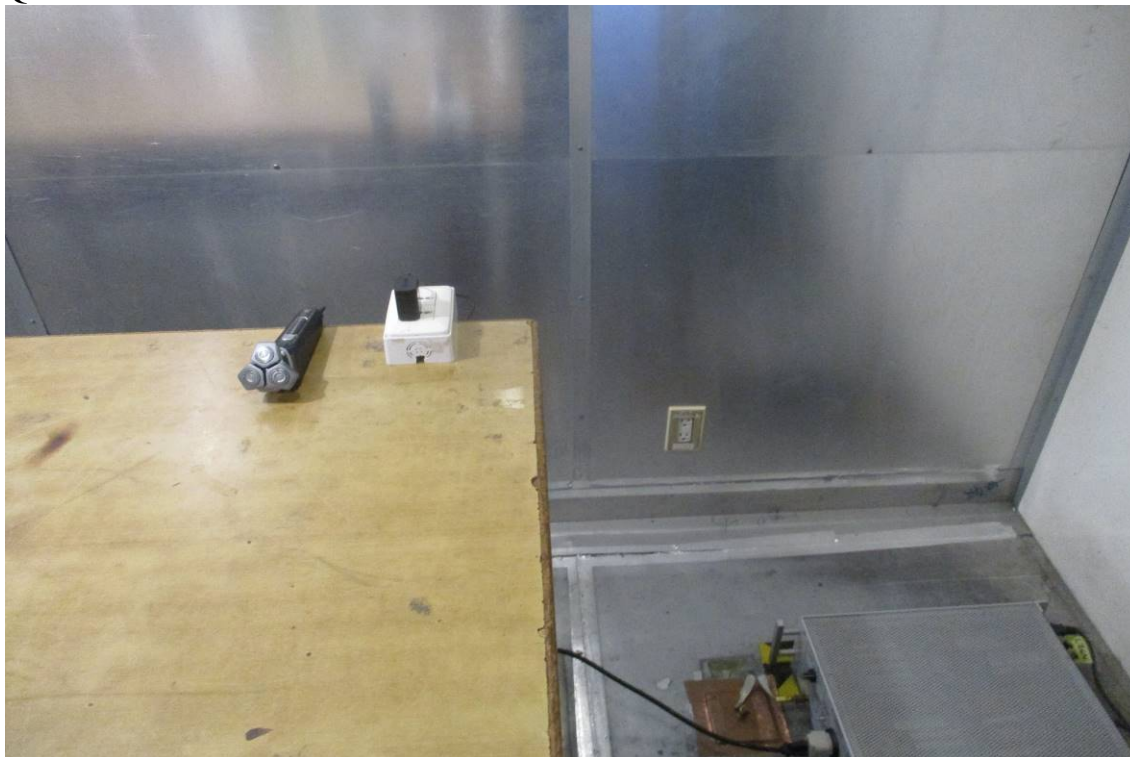
儀器名稱	製造者	型號	本次校驗日期	下次校驗日期
EMI Test Receiver	Rohde & Schwarz	ESCI (13054412-003)	2020/10/14	2021/10/13
LISN	Schwarzbeck	NSLK 8127 PLC (13057743-001)	2020/12/22	2021/12/21
LISN	Shibasoku	563(13044902-001)	2020/11/10	2021/11/09
PLUSE LIMITER (10dB)	Schwarzbeck	VTSD 9561 F-N (13056701-003)	2021/04/29	2022/04/28

5.7 傳導量測之配置照片

(1)-HQ8S05SSW-2600US-2



(2)-HQ8505-AD21163HF



6 天線之要求

6.1 適用標準

依據低功率射頻器材技術規範3.2節之規定，低功率射頻器材之發射機或收發信機所使用之天線，除本規範章節中另有規定外，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。

6.2 天線增益

此裝置使用固定式Chip Antenna，其天線增益未超過6dBi之規定值，不需降低峰值發射功率以及峰值功率頻譜密度。

(製造商：Shenzhen Sunlord Electronics Co., Ltd./型號：SLDA31-2R400G-S2TF/Gain: 2.5 dBi)

7 開放頻帶邊緣之量測

7.1 適用標準

4.10.2.4 除諧波外，指定頻帶外之發射應比主波低50 dB以上或依3.6之發射限制，兩者取其較鬆者。

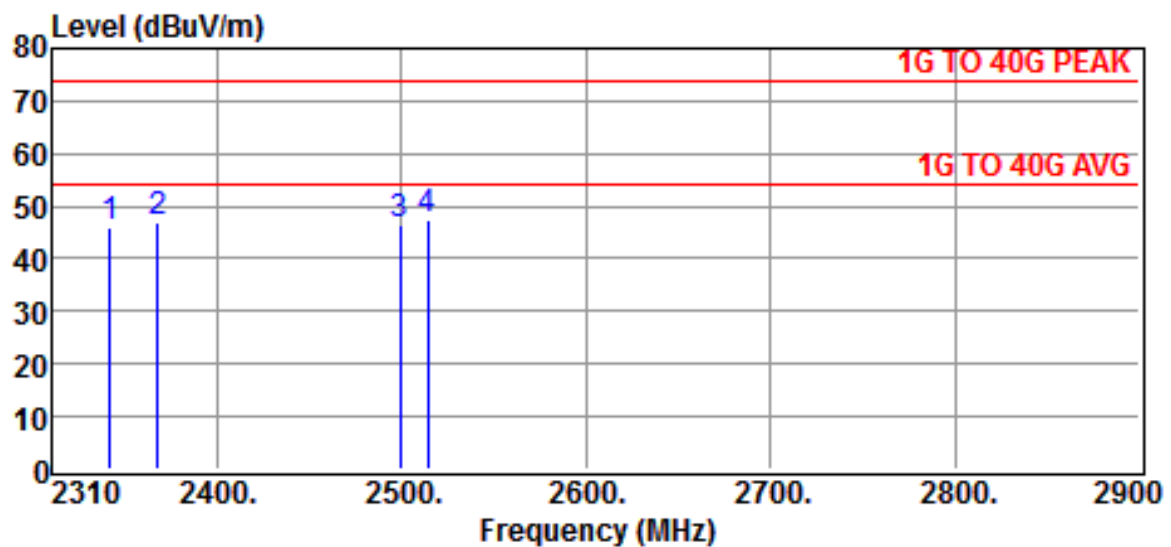
7.2 開放頻帶邊緣之測試配置

如圖2所示。

7.3 量測開放頻帶邊緣之儀器

儀器名稱	製造者	型號	本次校驗日期	下次校驗日期
EMI Test Receiver	Rohde & Schwarz	ESU40 (13054416-001)	2021/03/25	2022/03/24
Horn Antenna	ETS-Lindgren	3117 (13059211-002)	2021/03/16	2022/03/15
Amplifier	Keysight	83051A (13052926-001 & 13032683-001)	2020/08/27	2021/08/26

7.4 開放頻帶邊緣之量測結果

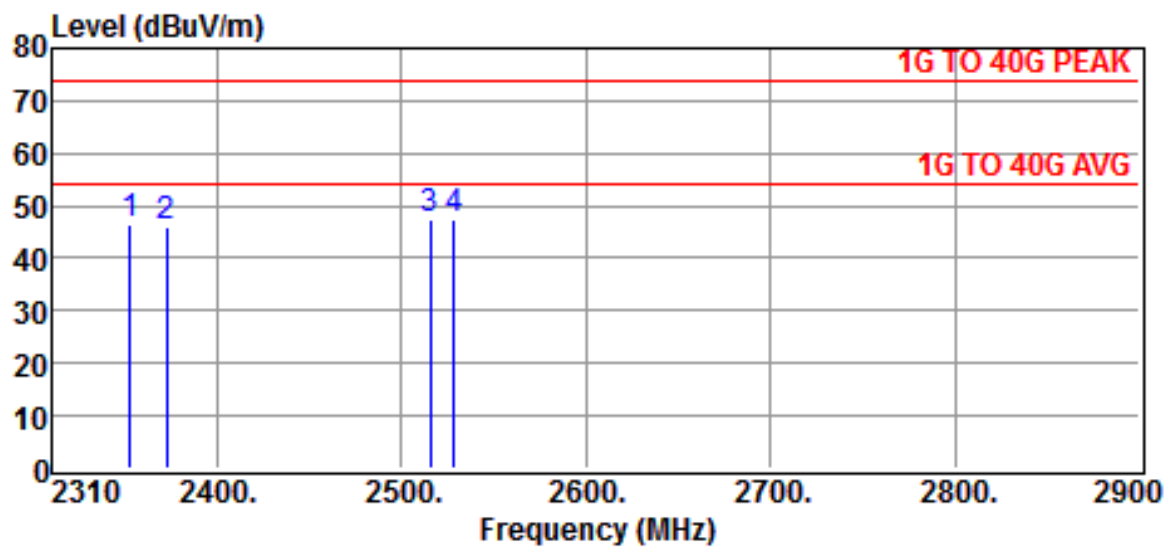


Site	:CHAMBER#2	Date	:2021-06-19
Limit	:1G TO 40G PEAK	Ant. Pol.	:HORIZONTAL
EUT	:飛利浦電鬚刀	Model	:S9986
Power Rating	:Battery	Temp.	:24 °C
Engineer	:Brian Huang	Humi.	:65 %
Test Mode	:BLE Mode		

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	2341.8600	46.13	-0.21	45.92	74.00	-28.08	Peak
	2367.8200	47.00	-0.16	46.84	74.00	-27.16	Peak
	2498.8000	46.45	-0.02	46.43	74.00	-27.57	Peak
*	2514.1400	47.41	0.00	47.41	74.00	-26.59	Peak

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.



Site	:CHAMBER#2	Date	:2021-06-19
Limit	:1G TO 40G PEAK	Ant. Pol.	:VERTICAL
EUT	:飛利浦電鬚刀	Model	:S9986
Power Rating	:Battery	Temp.	:24 °C
Engineer	:Brian Huang	Humi.	:65 %
Test Mode	:BLE Mode		

	Freq MHz	Reading dBuV	Correction Factor dB/m	Result dBuV/m	Limits dBuV/m	Over limit dB	Detector
	2352.4800	46.53	-0.15	46.38	74.00	-27.62	Peak
	2372.5400	46.21	-0.17	46.04	74.00	-27.96	Peak
	2515.3200	47.44	0.00	47.44	74.00	-26.56	Peak
*	2528.3000	47.50	0.02	47.52	74.00	-26.48	Peak

Note :

1. Result = Reading + Correction Factor
2. Average Result = Peak Result + Duty Factor ()
3. Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain (if any)
4. The margin value=Limit - Result
5. Above 1Ghz : Peak measurements are compared to the average limit - as peak measurements are below the average limit, they also comply with the peak limit.
6. " * " mean this data is the worst emission level.