

低功率射頻電機試驗報告

申請廠商 漢威聯合股份有限公司
新北市板橋區遠東路3號5樓
製造廠商 Honeywell International Inc.
產品名稱 資料收集電腦
廠牌 Honeywell
型號 VM1A-L0N
電場強度 74.50dBuV/m (Peak)
工作頻率 13.56MHz
調變方式 ASK
法規 LP0002: 3.2.1 節

實驗室資訊

程智科技股份有限公司 五股實驗室

新北市五股區五工六路11號

認證有效期間：105年10月18日起至108年10月17日止

受理日期 民國108年04月30日

完成日期 民國108年07月12日



報告簽署人
蔡永譚 簽章

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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
T190430W01-RD5	Rev.00	Initial creation of document	All	May 17, 2019	Elle Chang
T190430W01-RD5	Rev.01	Update information Add cradle information and fully system data	Page 3, 7, 9, 13, 16, 28~29, 40~41	Jul. 12, 2019	Elle Chang

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測試標準

國家通訊傳播委員會低功率射頻電機技術規範

民國 107 年 1 月 10 日版本

待測裝置已於程智科技股份有限公司 五股實驗室，依據國家通訊傳播委員會於中華民國一百零七年一月頒佈之低功率射頻電機技術規範測試。

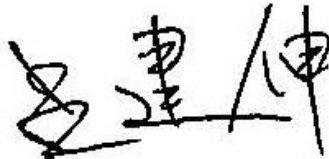
程智科技股份有限公司根據此條文規範項目測試，測試各項數據皆能符合此規範規定之限度值。

程智科技股份有限公司依低功率射頻電機技術規範審驗要點規範製作測試結果報告，測試結果評判為合格。

備註：

1. 報告中所描述之測試結果和待測設備的架構組合，均根據實際量測情況作詳實的記錄，且本測試報告僅對上述待測設備樣品負責。
2. 此份報告未經本公司同意，不得部份摘錄複製使用。
3. 基座系列申請，主型號: VM3D 與系列型號: VM1D，主要差異在於(1)設備外觀 (2)電路設計 (3)使用元件、線材、模組、材料 (4)使用元件位置、走線、結構不同，該產品確認符合系列產品，技術規格及射頻性能相同，詳見系列差異說明書。

測試人員：

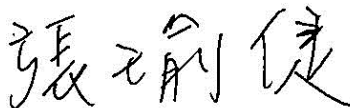


日期：

07/12/2019

呂建伸 / 工程師

報告製作：



日期：

07/12/2019

張瑜健 / 行政

報告審核：



日期：

07/12/2019

蔡永譚 / 副理

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測試實驗室資料:

實驗室認可登錄 : 中華民國實驗室認證體系

認可編號 : TAF 1309, 認可頻率範圍9kHz ~ 40GHz

認證有效期間 : 105年10月18日起至108年10月17日止

測試場地 : 新北市五股區五工六路11號

實驗室名稱 : 程智科技股份有限公司
五股實驗室

實驗室地址 : 新北市五股區五工六路11號

電話 : 886-2-22999720

傳真 : 886-2-22981882

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實驗室之量測不確定度

測試項目	測試場地 / 測試頻率	不確定度(dB)
傳導干擾電壓量測	Powerline Conducted Emission	+/-1.2575
輻射干擾場強量測 (測試距離: 3m)	3M Semi Anechoic Chamber / 30MHz ~ 200MHz	+/- 4.12
	3M Semi Anechoic Chamber / 200MHz ~ 1GHz	+/- 4.68
	3M Semi Anechoic Chamber / 1GHz ~ 8GHz	+/- 5.18
	3M Semi Anechoic Chamber / 8GHz ~ 18GHz	+/- 5.47
	3M Semi Anechoic Chamber / 18GHz ~ 26GHz	+/- 3.81
	3M Semi Anechoic Chamber / 26GHz ~ 40GHz	+/- 3.87

附註: K=2 即代表測試結果具有95%的量測可信度。

符合性判定僅依據試驗結果，不考慮其試驗結果的量測不確定度

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1 一般資料

1.1 產品描述

產品名稱	資料收集電腦	
產品型號	VM1A-L0N	
產品商標	Honeywell	
基座(標準型)	Brand Name: Honeywell / Model No.: VM1D	
基座(增強型)	Brand Name: Honeywell / Model No.: VM3D	
Product HW/SW Version:	VM1AL0N / 85.00.00-0322	
Radio HW/SW Version:	V1.0 / V5.1.1.28U	
使用電源	10.8Vdc from Rechargeable Li-ion Battery or 15Vdc from AC/DC Adapter	
	Battery:	Model No.: 163176-0001 Rev C / OVT310L1R00 C Supplier: TOTEX
	Adapter:	Model: GT-46600-6015-T3 Supplier: GlobTek, Inc.

1.2 產品特性

此裝置為資料收集電腦，發射頻率為13.56MHz，調變方式為ASK。

1.3 測試方法之依據

本測試報告之所有項目皆依據國家通訊傳播委員會低功率射頻電機技術規範(107.1.10版本)如無國家標準可適用者，得依美國EIA、IEEE ANSI檢驗法檢驗，及美國FCC 47 CFR Part 2 有關檢驗之規定及參考ANSI 63.10:2013、FCC CFR 47 15.225之檢驗法。

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一般規定項目

項次	測試項目	適用規範	測試結果	量測設備	備註
1	待測試產品確認	低功率射頻電機技術規範2.1節	N/A	N/A	符合
2	天線之要求	低功率射頻電機技術規範2.2節	N/A	N/A	符合，此天線並非標準接頭
3	電源線傳導干擾	低功率射頻電機技術規範2.3節	合格	合格	符合
4	接收機禁用頻帶	低功率射頻電機技術規範2.11節	N/A	N/A	符合，該接收頻率13.56, 並非落於禁用頻帶
5	不得發射減幅波	低功率射頻電機技術規範2.8節	合格	合格	符合
6	輻射電場強度	低功率射頻電機技術規範2.8節	合格	合格	符合
7	手冊內容確認	低功率射頻電機技術規範2.10節	N/A	N/A	是
8	是否成套銷售	低功率射頻電機技術規範2.11節	N/A	N/A	否
	以下空白				

特別規定：任何發射型式之器材

項次	測試項目	適用規範	測試結果	量測設備	備註
1	主波發射	低功率射頻電機技術規範3.2.1節(1)	請參閱5.5節	請參閱3.2節	合格
2	不必要發射	低功率射頻電機技術規範3.2.1節(2)	請參閱5.5節	請參閱3.2節	合格
3	電源線傳導干擾	低功率射頻電機技術規範2.3節	請參閱4.5節	請參閱3.1節	合格
4	頻率穩定度	低功率射頻電機技術規範3.2.1節(3)	請參閱6.3節	請參閱3.2節	合格
	以下空白				

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AC POWER LINE CONDUCTED EMISSION TEST:

Test Condition	AC Power line conducted emission for line and neutral
Worst Case	Operation in fully system mode

RADIATED EMISSION TEST

Test Condition	Operation Mode
Fully System	Fully System

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2 適用規範

(1) 輻射之規定

依據NCC低功率射頻電機技術規範之3.2節(1)，發射機電場強度之限制要求如下(測試距離 30 米)：特別規定

主波頻率 (MHz)	主波電場強度		不必要之發射	
	uv/m	dBuv/m	uv/m	dBuv/m
13.553～ 13.567	15848	84.0	如下表	
備註：*為線性內差法				

$$3\text{m主波電場強度} = 84 + 40\log(30/3) = 124\text{dBuV/m}$$

依據NCC低功率射頻電機技術規範2.11節，收信機之輻射電場強度不得超過2.8節之規定，即如上表之『其他發射之限制值』，其限制值如下：(一般規定)

頻率 MHz	測試距離 m	其他發射之限制值	
		dBμV/m	μV/m
0.009 – 0.490 (含)	300		2,400 / 頻率 (千赫)
0.490 (不含) – 1.705 (含)	30		24,000 / 頻率 (千赫)
1.705 (不含) – 30 (含)	30		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

依據NCC低功率射頻電機技術規範之3.2節(3)，頻率容許差度應維持在主波頻率之±0.01%以內。在正常供應電壓下，溫度在攝氏零下二十度至攝氏五十度間變化；及在攝氏二十度下，供應電壓在額定值之±15%內變化時。以電池作業，應以新電池測試，須符合第5.18節之規定。

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(2) 傳導之規定

依據NCC低功率射頻電機技術規範之2.3節，電源傳導干擾之限制要求如下：

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

(3) 發射天線之要求

低功率發射機，依據NCC低功率射頻電機技術規範2.2節之規定，其發射天線應為全固定式或半固定式，不得使用可供引接之天線接頭。

(4) 依據NCC低功率射頻電機技術規範2.11節之要求，收、發信機為成套銷售者，收、發信機應一併送審或提供經型式認證合格之對應收、發信機之送審資料；送信機之輻射電場強度不得超過第2.8節之發射規定，且不得接收、解調第2.7節所列之頻率。

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(5) 限制使用之頻帶

依據NCC低功率射頻電機技術規範2.7節之要求，任何低功率射頻電機之主波皆不得使用下表所列各頻帶內之頻率；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第2.8節的限制規定。

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

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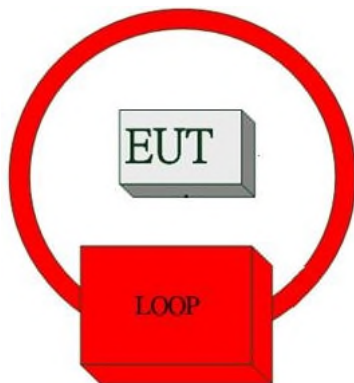
3 受測裝置之系統說明

裝置名稱	製造者/申請者	型號	纜線說明
*資料收集電腦	Honeywell International Inc./ 漢威聯合股份有限公司	VM1A-L0N	無纜線

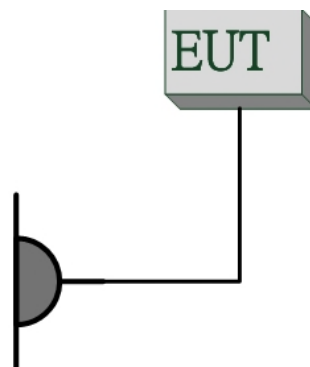
3.1 待測物與測試設備系統圖

3.1.1 量測配置圖

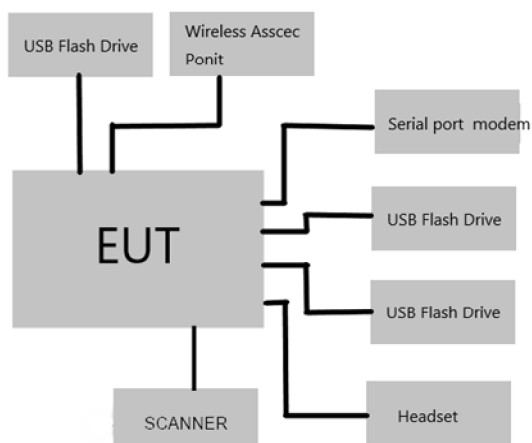
Conducted (Antenna Port)



Radiated Emission & Conduction



Fully System



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3.2 輔助測試週邊設備名稱描述

編號	產品別	商標	型號	序號
1.	N/A	N/A	N/A	N/A

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4 量測儀器設備

4.1 AC 電源端傳導干擾之量測儀器

Conduction (RF)					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
CABLE	EMCI	CFD300-NL	CERF	06/29/2018	06/28/2019
EMI Test Receiver	R&S	ESCI	100064	07/24/2018	07/23/2019
LISN	SCHWARZBECK	NSLK 8127	8127-541	01/31/2019	01/30/2020
LISN	SCHAFFNER	NNB 41	03/10013	02/13/2019	02/12/2020
Software	EZ-EMC(CCS-3A1-CE)				

4.2 量測場強輻射之量測儀器

966A Chamber					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Bilog Antenna	Sunol Sciences	JB3	A030105	07/13/2018	07/12/2019
Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/26/2019	02/25/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020
Loop Ant	COM-POWER	AL-130	121051	03/22/2019	03/21/2020
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/31/2018	05/30/2019
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	e3 V6.11-20180413				

註: 以上部份設備跟量測值沒有影響, 且沒有直接關聯, 因此不需要進行校正。

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4.3 天線端傳導測試之量測儀器

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Loop Antenna	COM-POWER	AL-130	121051	03/22/2019	03/21/2020
DC Power Supply	Agilent	E3640A	KR93300208	08/15/2018	08/14/2019
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY57120290	02/13/2019	02/12/2020

4.4 Fully System 測試之量測儀器

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Modem	LEMEL	MD-56KVC	N/A	N/A	N/A
EARPHONE	VOXWare	N/A	N/A	N/A	N/A
SCANNER	Honeywell	1900	18197B4BF9	N/A	N/A
FLASE DRIVER	Verbatim	32G	N/A	N/A	N/A
FLASE DRIVER	Verbatim	32G	N/A	N/A	N/A
FLASE DRIVER	SEAGATE	1TB	WL1M9FE3	N/A	N/A
Accece Ponit	LINKSYS	WRT3200ACM	1981060B614986	N/A	N/A

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5 電源線傳導干擾之量測

5.1 適用標準

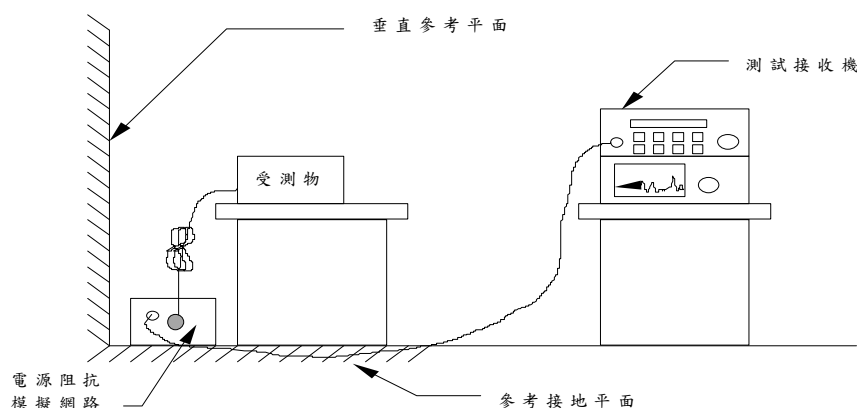
依據NCC低功率射頻電機技術規範2.3節之要求。

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

傳導干擾之量測配置圖



5.4 干擾值之計算

電源傳導干擾電壓之計算公式如下

$$\text{結果值} = \text{儀器讀值}(QP/AV) + \text{校正因數}$$

其中校正因數為：

$$\text{饋線損失} + \text{電源阻抗模擬網路損失}$$

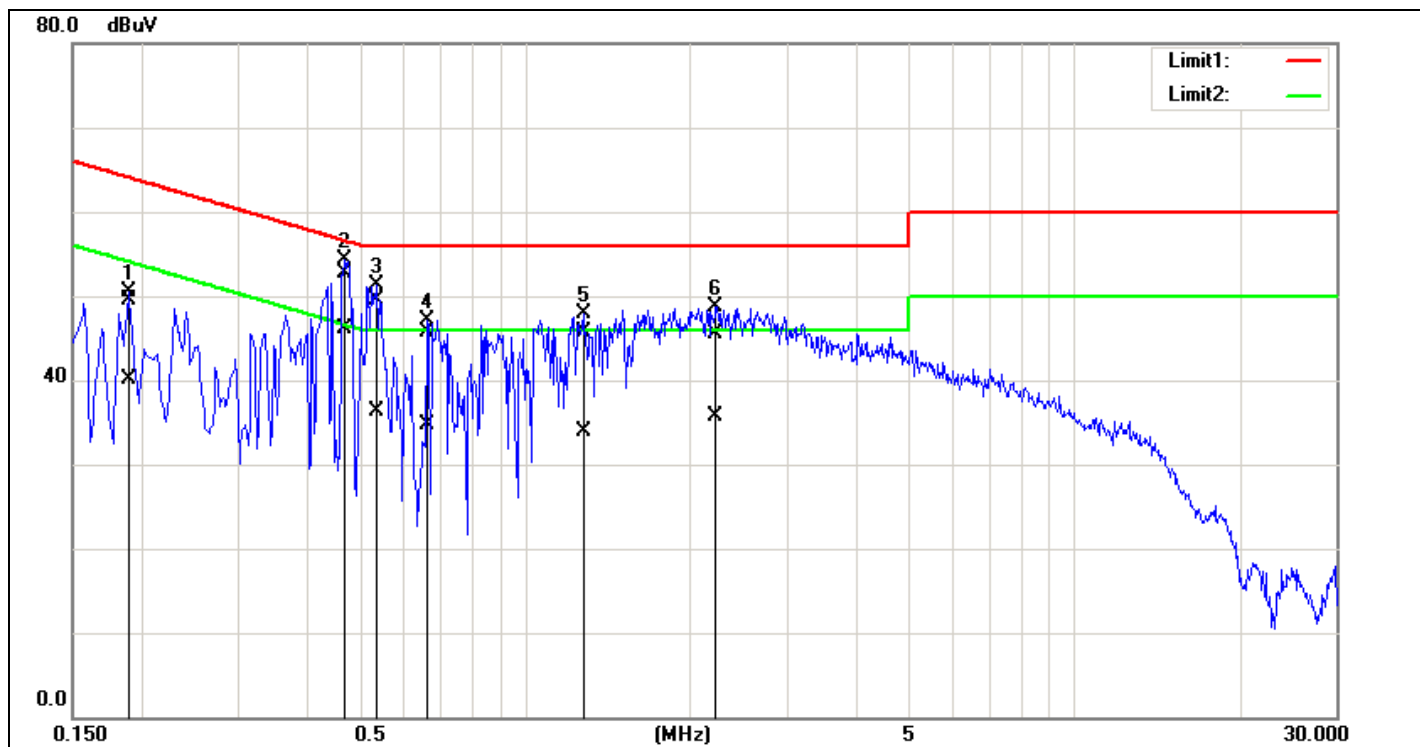
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5.5 傳導干擾之量測結果

Description:	Operation	Date:	2019/5/13
Line:	L1	Temp.(°C)/Hum.(%):	24(°C)/50%
Test Voltage:	AC 110V/60Hz	Test By:	Gary



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1900	49.39	39.88	0.15	49.54	40.03	64.03	54.04	-14.49	-14.01	Pass
2*	0.4700	52.49	45.97	0.16	52.65	46.13	56.51	46.51	-3.86	-0.38	Pass
3	0.5380	49.25	36.08	0.16	49.41	36.24	56.00	46.00	-6.59	-9.76	Pass
4	0.6660	45.49	34.58	0.16	45.65	34.74	56.00	46.00	-10.35	-11.26	Pass
5	1.2820	45.53	33.74	0.19	45.72	33.93	56.00	46.00	-10.28	-12.07	Pass
6	2.2340	45.19	35.48	0.22	45.41	35.70	56.00	46.00	-10.59	-10.30	Pass

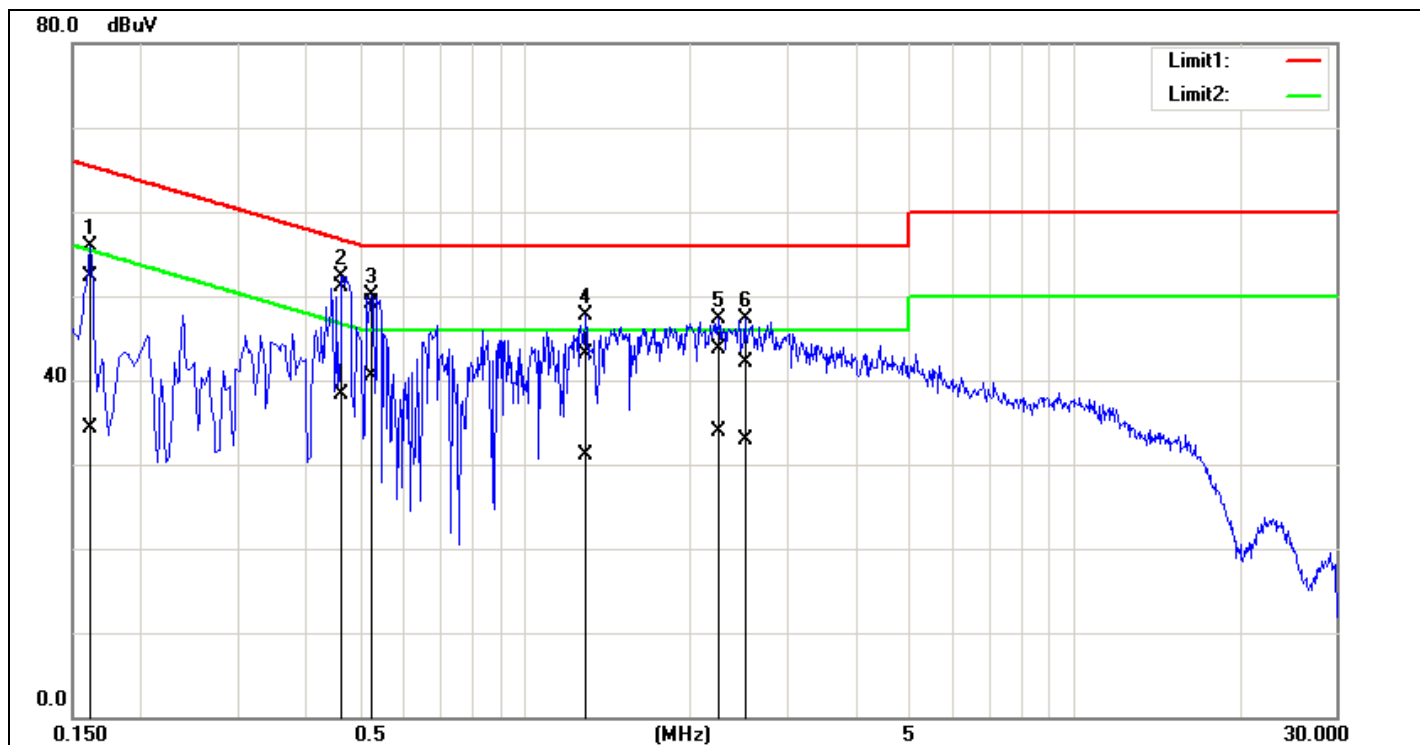
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Description: Operation
Line: N
Test Voltage: AC 110V/60Hz

Date: 2019/5/13
Temp.(°C)/Hum.(%): 24(°C)/50%
Test By: Gary



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1620	52.14	34.29	0.10	52.24	34.39	65.36	55.36	-13.12	-20.97	Pass
2*	0.4660	51.07	38.29	0.11	51.18	38.40	56.58	46.58	-5.40	-8.18	Pass
3	0.5260	49.03	40.36	0.11	49.14	40.47	56.00	46.00	-6.86	-5.53	Pass
4	1.2940	42.98	31.02	0.14	43.12	31.16	56.00	46.00	-12.88	-14.84	Pass
5	2.2500	43.53	33.67	0.16	43.69	33.83	56.00	46.00	-12.31	-12.17	Pass
6	2.5220	42.00	32.65	0.18	42.18	32.83	56.00	46.00	-13.82	-13.17	Pass

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6 場強輻射之量測

6.1 適用標準

依據NCC低功率射頻電機技術規範3.2節(2)之要求，其他開放頻帶外不必要之輻射干擾需符合2.8節之一般限制要求。

6.2 量測方法

將待測物置於 0.8 米高的非金屬桌面，使其在工作狀態，接收天線置於 3 米外相同的高度。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 1.0 米至 4.0 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。

9kHz~150kHz 測試

解析頻寬:	300Hz	視訊頻寬:	300Hz
量測天線:	AL-130	檢測器:	Quasi-Peak

150kHz~30MHz 測試

解析頻寬:	10kHz	視訊頻寬:	10kHz
量測天線:	AL-130	檢測器:	Quasi-Peak

1GHz 以下測試

解析頻寬:	100kHz	視訊頻寬:	100kHz
量測天線:	JB3	檢測器:	Quasi-Peak

註: 經評估後，比較 H PLAN、E1 PLAN 和 E2 PLAN 測試值後發現 E2 PLAN 為最差模式，故附上最差模式 E2 PLAN 數據。

6.3 場強度之計算

A. 場強之計算公式如下

$$\text{結果值} = \text{讀值} + \text{校正因數}$$

其中校正因數為：

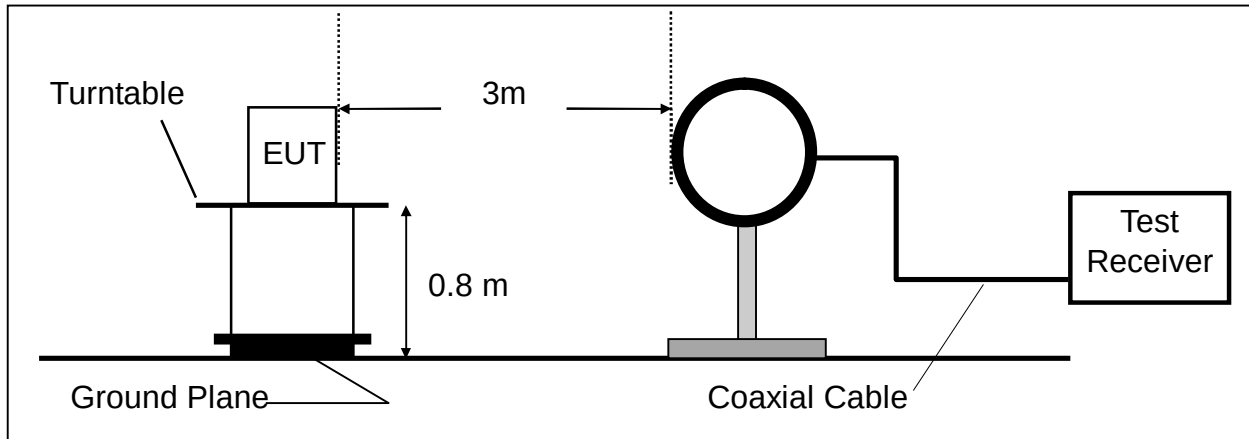
天線因數+ 饋線損失+ 濾波器損失（若有使用）- 放大器增益（若有使用）
量測結果請見下頁。

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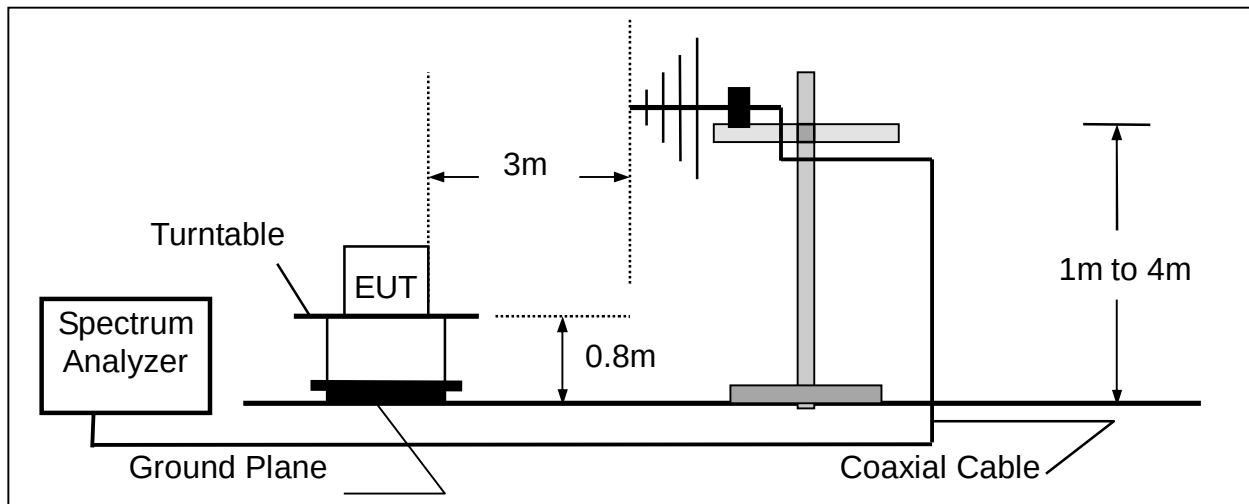
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6.4 輻射之測試配置

(A) 量測頻率低於 30MHz 以下之測試配置



(B) 量測頻率 30MHz 至 1000MHz 之測試配置



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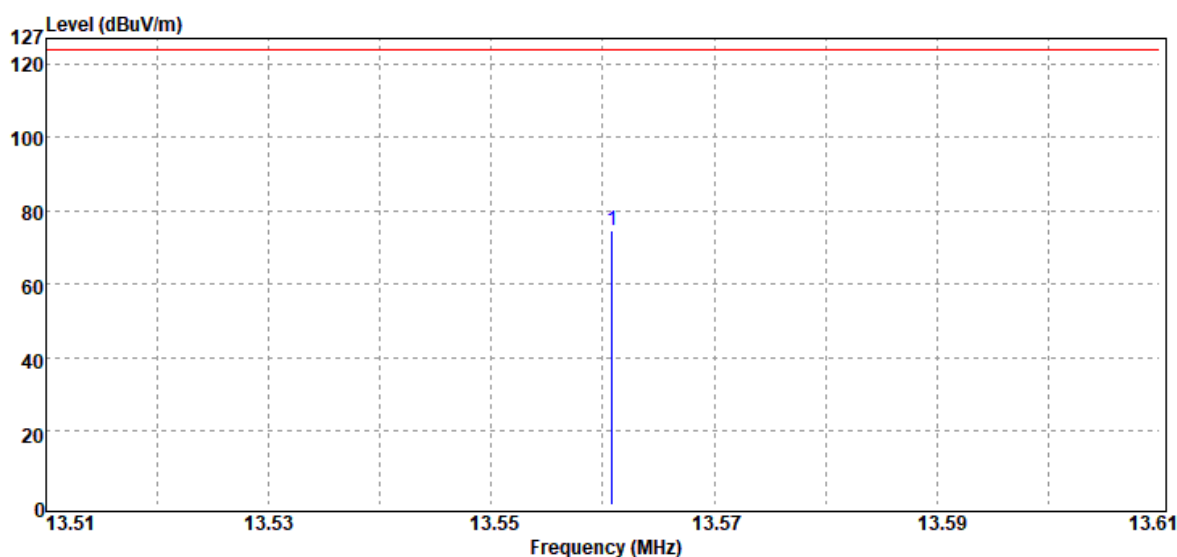
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6.5 主波場強輻射之量測結果

6.5.1 發射機

A. RF Portion (特別規定之 3.2.1(1) 節) – 主波：13.56 MHz

Project Number	: T190430W01	Test Date	:2019-05-10
Operation Band	:NFC	Temp./Humi.	:21/55
Fundamental Frequency	:13.56 MHz	Engineer	:Jerry
Operation Mode	:Main CH Mid	Measurement Antenna Pol.	:VERTICAL
EUT Pol.	:E2 Plan		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
13.56	Peak	58.59	15.91	74.50	124.00	-49.50

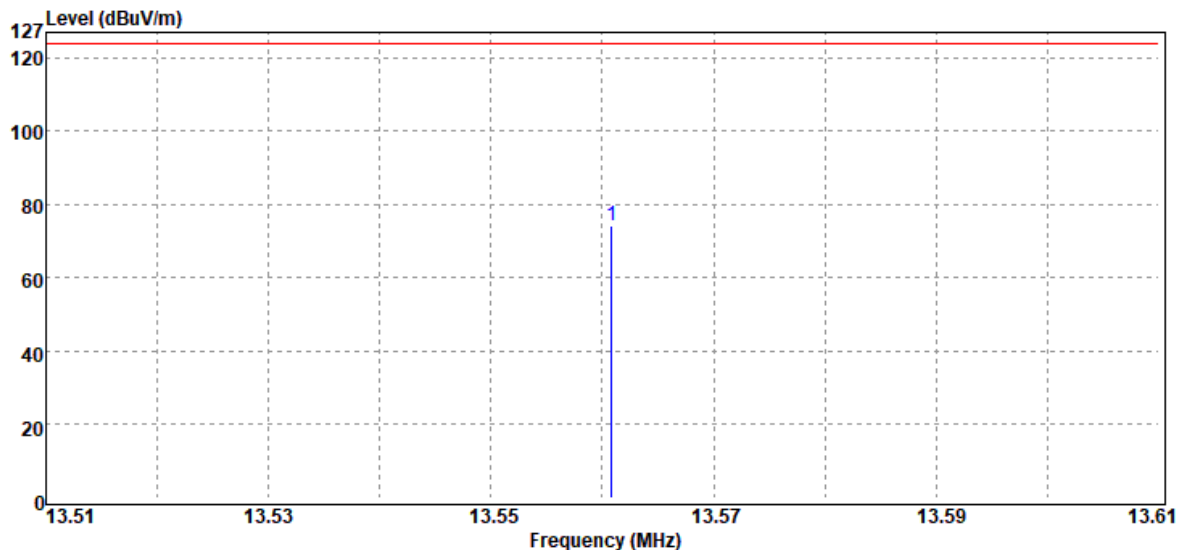
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Project Number : T190430W01
Operation Band :NFC
Fundamental Frequency :13.56 MHz
Operation Mode :Main CH Mid
EUT Pol. :E2 Plan

Test Date :2019-05-10
Temp./Humi. :21/55
Engineer :Jerry
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
13.56	Peak	58.54	15.91	74.45	124.00	-49.55

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

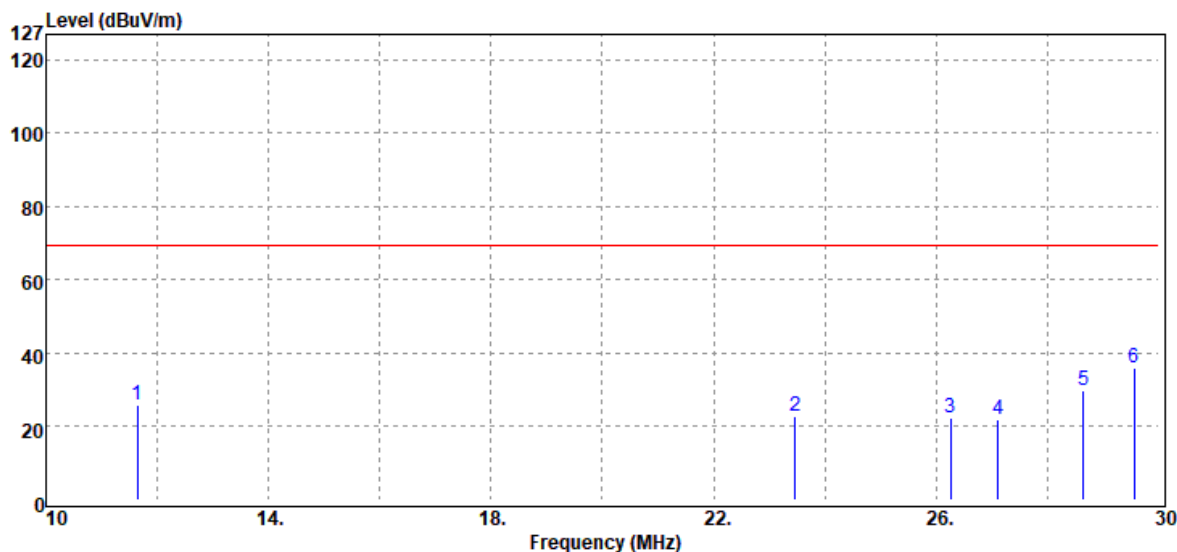
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B. 其他不必要之訊號 (一般規定之 2.8 節)

Project Number : T190430W01
Operation Band :NFC
Fundamental Frequency :13.56 MHz
Operation Mode :Tx CH Mid
EUT Pol. :E2 Plan

Test Date :2019-05-10
Temp./Humi. :21/55
Engineer :Jerry
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11.64	Peak	9.98	16.04	26.02	69.54	-43.52
23.46	Peak	7.89	14.83	22.72	69.54	-46.82
26.26	Peak	8.20	14.31	22.51	69.54	-47.03
27.12	Peak	7.92	14.16	22.08	69.54	-47.46
28.64	Peak	16.01	13.91	29.92	69.54	-39.62
29.56	Peak	22.50	13.75	36.25	69.54	-33.29

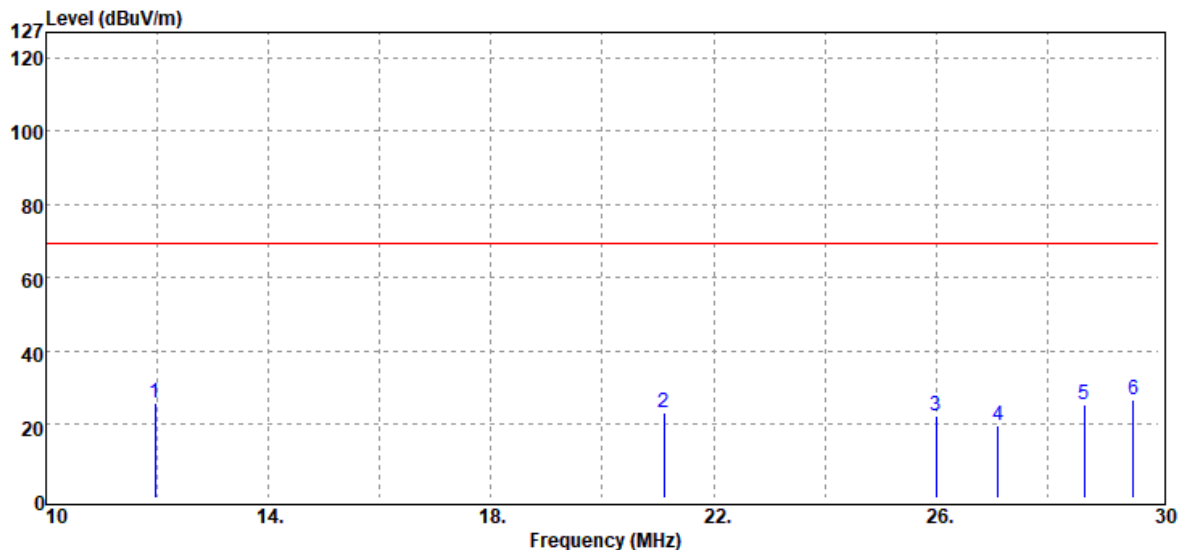
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Project Number : T190430W01
 Operation Band :NFC
 Fundamental Frequency :13.56 MHz
 Operation Mode :Tx CH Mid
 EUT Pol. :E2 Plan

Test Date :2019-05-10
 Temp./Humi. :21/55
 Engineer :Jerry
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11.96	Peak	10.12	16.02	26.14	69.54	-43.40
21.10	Peak	7.80	15.33	23.13	69.54	-46.41
26.00	Peak	8.07	14.36	22.43	69.54	-47.11
27.12	Peak	5.79	14.16	19.95	69.54	-49.59
28.66	Peak	11.75	13.91	25.66	69.54	-43.88
29.54	Peak	13.23	13.76	26.99	69.54	-42.55

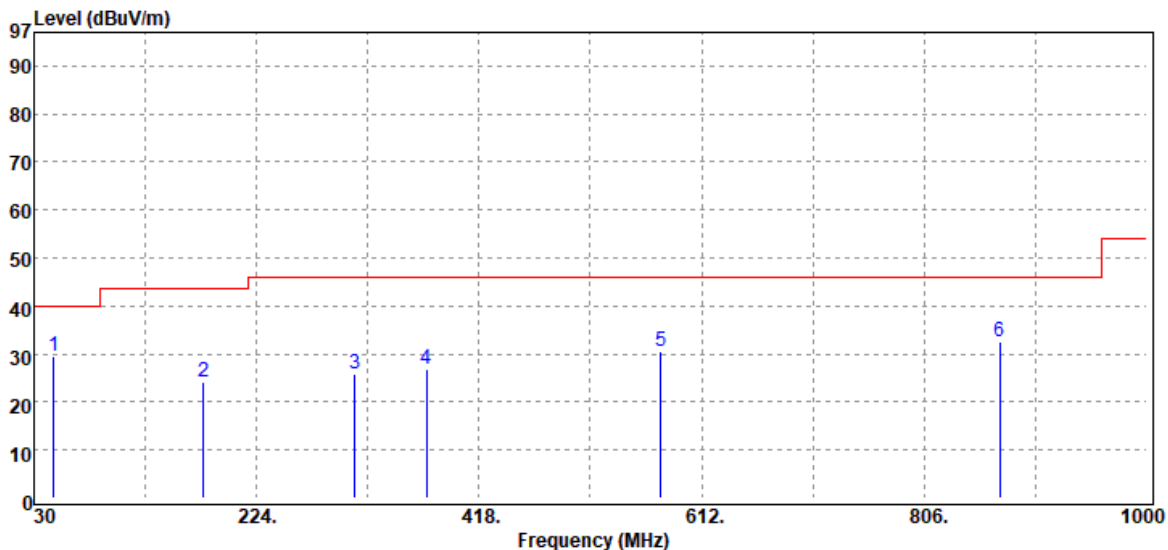
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Project Number : T190430W01
 Operation Band :NFC
 Fundamental Frequency :13.56 MHz
 Operation Mode :Tx CH Mid
 EUT Pol. :E2 Plan

Test Date :2019-05-10
 Temp./Humi. :21/55
 Engineer :Jerry
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
47.46	Peak	43.83	-14.26	29.57	40.00	-10.43
177.44	Peak	35.46	-11.13	24.33	43.50	-19.17
309.36	Peak	33.69	-7.91	25.78	46.00	-20.22
372.41	Peak	33.25	-6.40	26.85	46.00	-19.15
576.11	Peak	32.41	-1.82	30.59	46.00	-15.41
871.96	Peak	29.37	3.10	32.47	46.00	-13.53

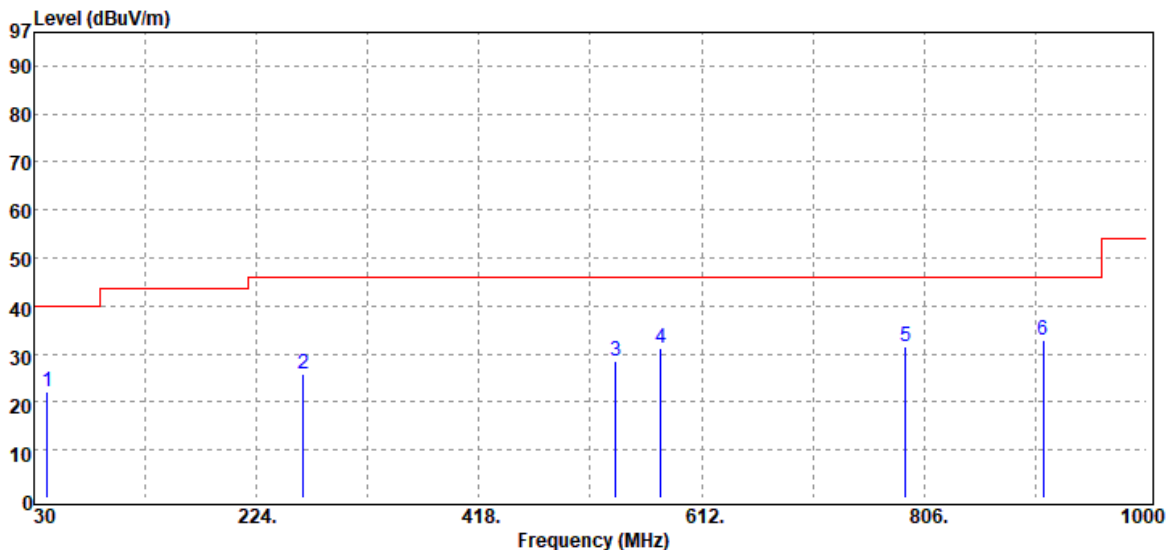
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Project Number : T190430W01
 Operation Band :NFC
 Fundamental Frequency :13.56 MHz
 Operation Mode :Tx CH Mid
 EUT Pol. :E2 Plan

Test Date :2019-05-10
 Temp./Humi. :21/55
 Engineer :Jerry
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
41.64	Peak	32.85	-10.69	22.16	40.00	-17.84
264.74	Peak	34.77	-8.95	25.82	46.00	-20.18
537.31	Peak	30.70	-2.16	28.54	46.00	-17.46
576.11	Peak	33.16	-1.82	31.34	46.00	-14.66
789.51	Peak	30.48	1.09	31.57	46.00	-14.43
909.79	Peak	29.02	3.91	32.93	46.00	-13.07

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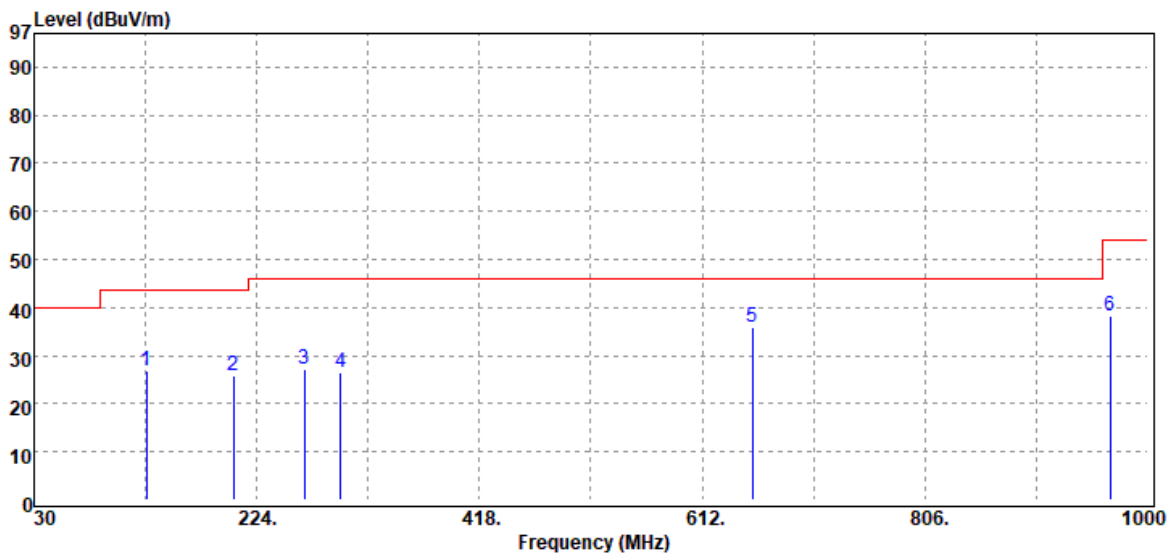
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Fully System

Project Number :T190430W01
Operation Band :Fully System
Frequency :Fully System
Operation Mode : Fully System
EUT Pol. :E2 Plan

Test Date :2019-06-04
Temp./Humi. :21/55
Antenna Pol. :VERTICAL
Engineer :Jerry



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	PK/QP/AV	Reading Level	dB	FS	@3m	dB
127.97	Peak	35.82	-8.98	26.84	43.50	-16.66
203.63	Peak	36.69	-10.80	25.89	43.50	-17.61
265.71	Peak	36.14	-8.88	27.26	46.00	-18.74
296.75	Peak	34.77	-8.29	26.48	46.00	-19.52
655.65	Peak	35.99	0.00	35.99	46.00	-10.01
967.02	Peak	33.22	5.15	38.37	54.00	-15.63

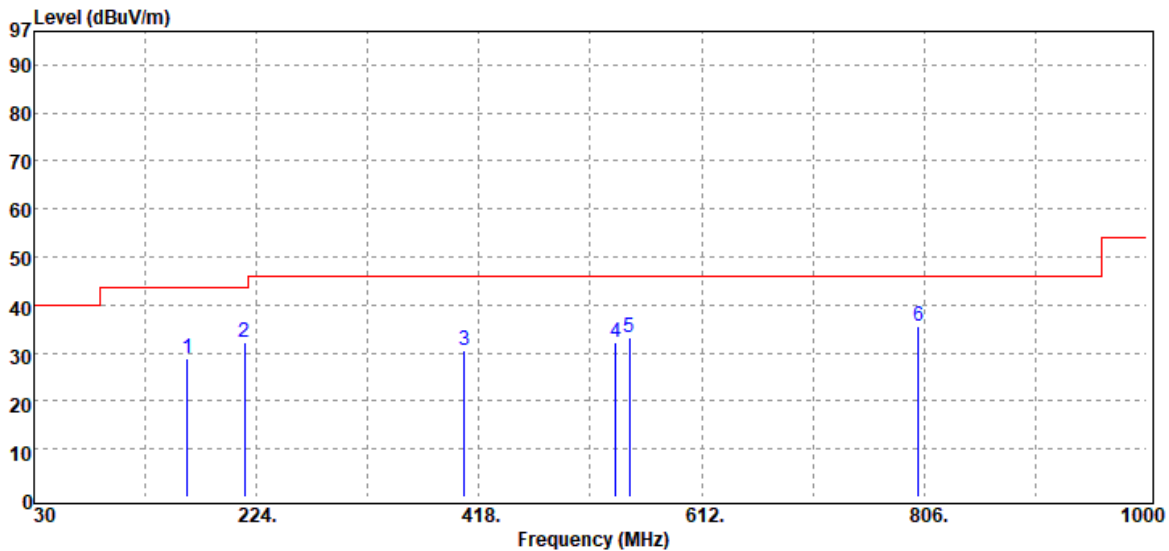
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Project Number :T190430W01
 Operation Band :Fully System
 Frequency :Fully System
 Operation Mode :Fully System
 EUT Pol. :E2 Plan

Test Date :2019-06-04
 Temp./Humi. :21/55
 Antenna Pol. :HORIZONTAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
163.86	Peak	39.25	-10.24	29.01	43.50	-14.49
213.33	Peak	43.62	-11.51	32.11	43.50	-11.39
405.39	Peak	35.76	-5.34	30.42	46.00	-15.58
537.31	Peak	34.24	-2.16	32.08	46.00	-13.92
548.95	Peak	35.59	-2.33	33.26	46.00	-12.74
801.15	Peak	33.89	1.72	35.61	46.00	-10.39

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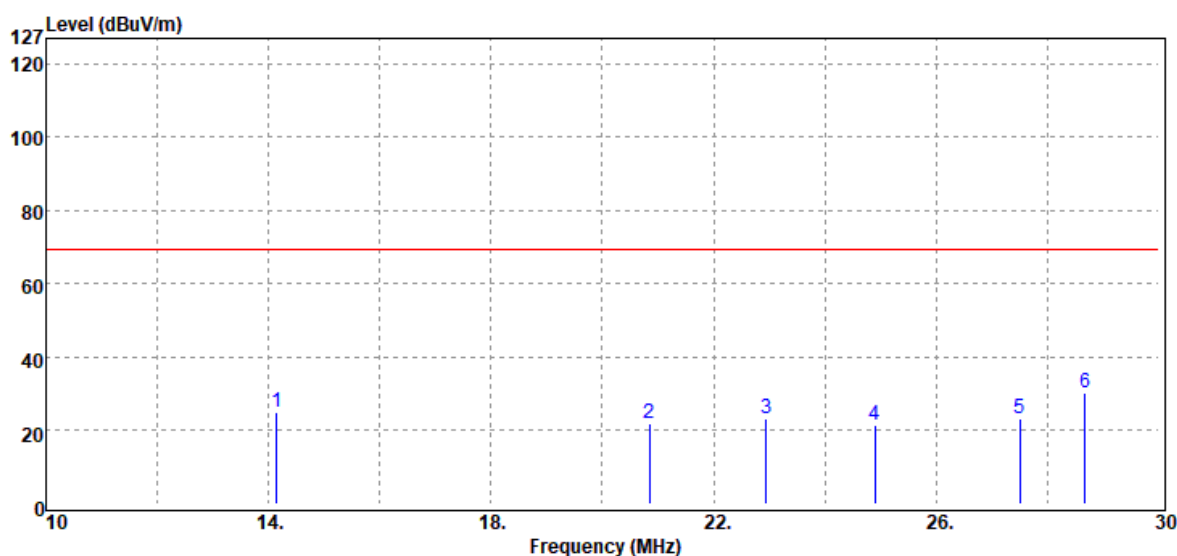
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6.5.2 接收機

A. 其他不必要之訊號 (一般規定之 2.8 節)

Project Number : T190430W01
 Operation Band : NFC
 Fundamental Frequency : 13.56 MHz
 Operation Mode : Rx CH Mid
 EUT Pol. : E2 Plan

Test Date : 2019-05-10
 Temp./Humi. : 21/55
 Engineer : Jerry
 Measurement Antenna Pol. : VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
14.14	Peak	8.99	15.87	24.86	69.54	-44.68
20.84	Peak	6.68	15.39	22.07	69.54	-47.47
22.94	Peak	8.19	14.94	23.13	69.54	-46.41
24.90	Peak	7.02	14.56	21.58	69.54	-47.96
27.50	Peak	8.98	14.09	23.07	69.54	-46.47
28.68	Peak	16.21	13.90	30.11	69.54	-39.43

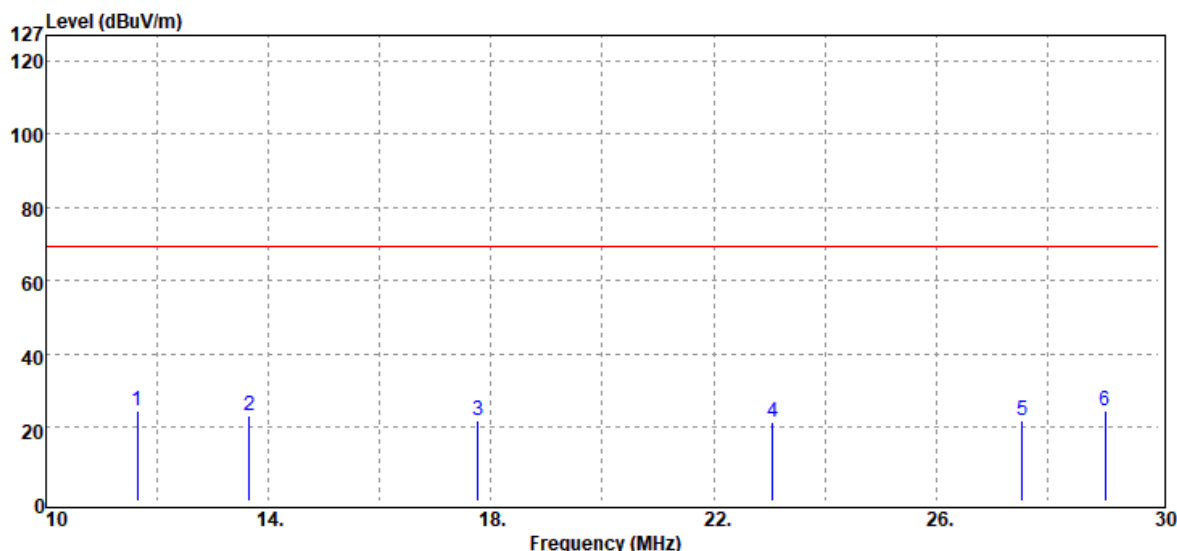
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Project Number : T190430W01
 Operation Band :NFC
 Fundamental Frequency :13.56 MHz
 Operation Mode :Rx CH Mid
 EUT Pol. :E2 Plan

Test Date :2019-05-10
 Temp./Humi. :21/55
 Engineer :Jerry
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11.64	Peak	8.48	16.04	24.52	69.54	-45.02
13.66	Peak	7.31	15.91	23.22	69.54	-46.32
17.76	Peak	6.36	15.68	22.04	69.54	-47.50
23.06	Peak	6.59	14.92	21.51	69.54	-48.03
27.54	Peak	7.88	14.09	21.97	69.54	-47.57
29.04	Peak	10.97	13.84	24.81	69.54	-44.73

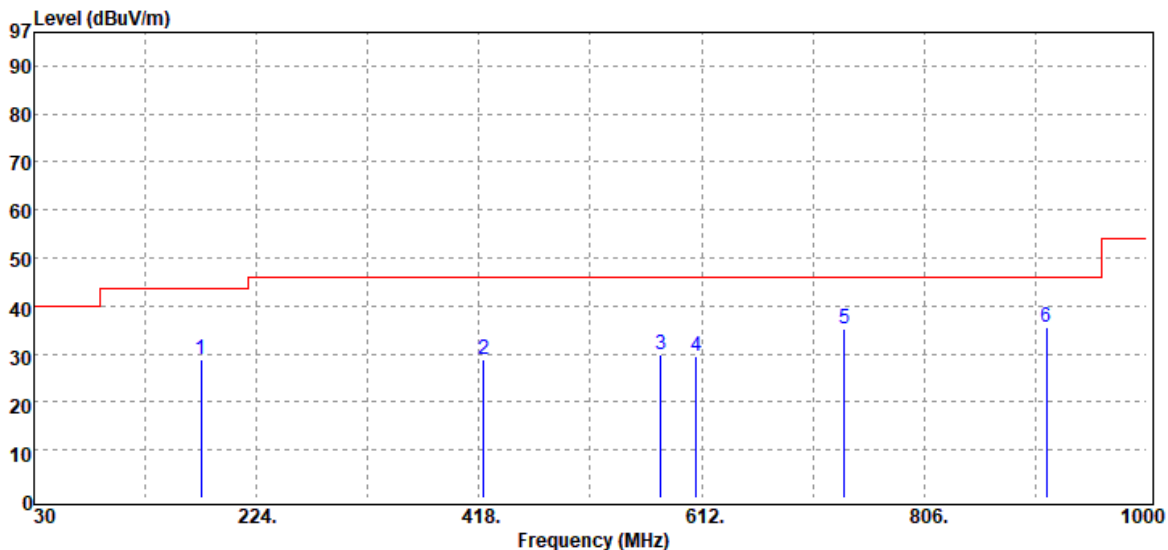
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Project Number : T190430W01
 Operation Band :NFC
 Fundamental Frequency :13.56 MHz
 Operation Mode :Rx CH Mid
 EUT Pol. :E2 Plan

Test Date :2019-05-10
 Temp./Humi. :21/55
 Engineer :Jerry
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
175.50	Peak	39.84	-11.11	28.73	43.50	-14.77
421.88	Peak	33.59	-4.70	28.89	46.00	-17.11
576.11	Peak	31.74	-1.82	29.92	46.00	-16.08
607.15	Peak	31.11	-1.41	29.70	46.00	-16.30
736.16	Peak	33.66	1.49	35.15	46.00	-10.85
912.70	Peak	31.55	3.89	35.44	46.00	-10.56

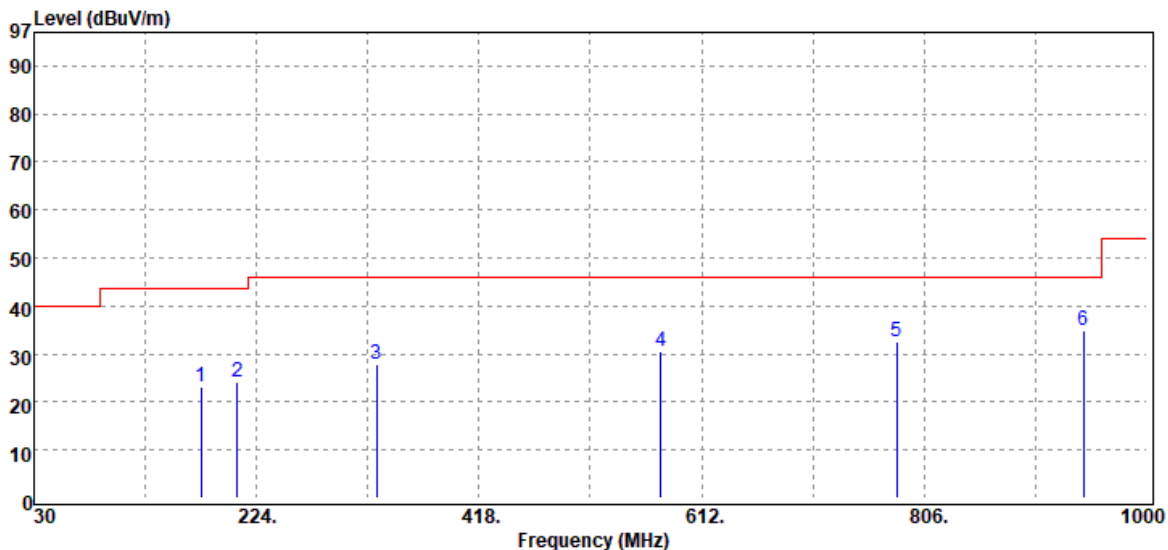
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Project Number : T190430W01
 Operation Band :NFC
 Fundamental Frequency :13.56 MHz
 Operation Mode :Rx CH Mid
 EUT Pol. :E2 Plan

Test Date :2019-05-10
 Temp./Humi. :21/55
 Engineer :Jerry
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
175.50	Peak	34.22	-11.11	23.11	43.50	-20.39
207.51	Peak	35.50	-11.47	24.03	43.50	-19.47
328.76	Peak	35.06	-7.18	27.88	46.00	-18.12
576.11	Peak	32.45	-1.82	30.63	46.00	-15.37
781.75	Peak	31.40	1.21	32.61	46.00	-13.39
944.71	Peak	30.88	4.06	34.94	46.00	-11.06

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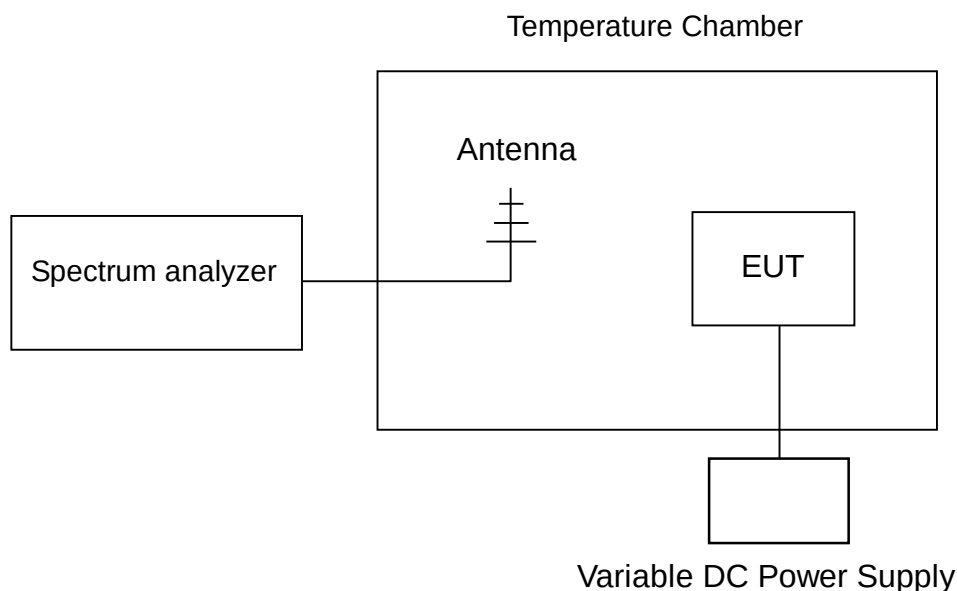
7 頻率容許差度之量測

7.1 適用標準

依據NCC低功率射頻電機技術規範3.2節(3)之要求，應維持在主波頻率之 $\pm 0.01\%$ 以內。在正常供應電壓下，溫度在攝氏零下二十度至攝氏五十度間變化；及在攝氏二十度下，供應電壓在額定值之 $\pm 15\%$ 內變化時。以電池作業者，應以新電池測試。並須符合第5.17節之要求。

NCC低功率射頻電機技術規範5.17節要求，除另有規定外，測試環境溫度應於攝氏 10°C 到 40°C 之範圍內，相對環境濕度應於 10% 到 90% 之範圍內。

7.2 頻率容許差度之測試配置



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7.3 頻率容許差度之量測結果

A. 溫度變化

Power Supply	Environment	Frequency	Delta (Hz)	Limit (KHz)
Vdc	Temperature (°C)	(MHz)		
15	-20	13.559926	140.00	+/- 1.356
15	-10	13.559926	140.00	+/- 1.356
15	0	13.559969	97.00	+/- 1.356
15	10	13.559975	91.00	+/- 1.356
15	20	13.560066	0.00	+/- 1.356
15	30	13.560084	-18.00	+/- 1.356
15	40	13.560096	-30.00	+/- 1.356
15	50	13.559966	100.00	+/- 1.356

B. 電壓變化

Power Supply	Environment	Frequency	Delta (Hz)	Limit (KHz)
Vdc	Temperature (°C)	(MHz)		
16.5	20	13.559946	120.00	+/- 1.356
15	20	13.560066	0.00	+/- 1.356
13.5	20	13.559902	164.00	+/- 1.356

~ End of Report ~

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