



報告編號 : 4790036263-TW-R0-V0

頁碼 : 1 of 46

報告發行日期 : 2021/12/13

低功率射頻器材試驗報告

產品名稱 : Server

型號 : A5TS

申請廠商 : 廣達電腦股份有限公司

申請者地址 : 桃園市龜山區文化里文化二路 188 號

製造廠商 : Quanta Computer Inc.

製造商地址 : 桃園市龜山區文化里文化二路 188 號

實驗室名稱 : 優力國際安全認證有限公司

實驗室地址 : 新竹縣竹東鎮中興路四段 372-7 號 B 戶、E 戶

試驗受理日期 : 2021/7/7

試驗完成日期 : 2021/7/7 ~ 2021/7/16

待測物接收日期 : 2021/7/7

依據標準 : 低功率射頻器材技術規範 (LP0002) 109 年 7 月版



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認可報告之試驗機構

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認證編號：3398

認證有效期間：2020.08.29 ~ 2023.08.28

認可能量範圍：低功率射頻器材技術規範(LP0002)

報告製作者：

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，日期：

2021/12/13

審核者：

蔡顯佳

，日期：

2021/12/13

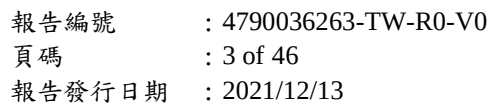
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測試項目與結果判定總表

項次	測試項目	適用規範	結果判定
1	場強輻射	低功率射頻器材技術規範 3.6、4.2 節	符合
2	電源線傳導干擾	低功率射頻器材技術規範 3.3 節	符合
3	頻率容許差度	低功率射頻電機技術規範 4.2.1.3 節	符合

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1. 一般資料

1.1 產品描述

產 品 名 稱	Server
廠 牌	Quanta Computer Inc.
型 號	A5TS
額 定 電 壓	220Vac
頻 率 使 用 範 圍	13.56 MHz
最 大 電 場 強 度	51.8 dBuV/m (Peak) @ 3m
Sample ID	4106585
天 線 型 態	見註 1

註:

1. 此待測設備搭配測試的天線，其資料如下：

Ant. No.	天線型式	天線型號	商標	接頭型式	增益 (dBi)
1	FR4 Loop Coil	SM-MFAD4-C02	Smart Approach	N/A	-
Note : 1. 適用規範請見本報告 3.1 節第 (2) 的規定。 2. 依據測試數據結果，符合低功率射頻器材技術規範之要求。 3. 此天線資訊由客戶提供，詳請參閱製造商的產品規格或使用手冊。					

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2. 配件清單如下：

配件	廠牌	型號	規格
K2 card	Annapurna	K2T-QB	-
K2 card	Annapurna	K2X-N	-

3. 此報告中待測物測試模式評估如下表：

模式	測試狀態
模式 1	NFC TX
模式 2	NFC RX

當待測物在發射模式1，場強輻射之1 GHz以下其他不必要之訊號量測與電源線傳導干擾量測以此模式進行最終量測。

4. 此待測設備，供電模式 為 220Vac進行量測，並將測試結果記錄於報告中。

5. 此待測設備，以平躺擺放方式進行最終量測，並將測試結果紀錄。

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1.2 輔助測試之週邊設備

待測設備於受測時均接上其所屬的配件或一般用途之相關設備；下列輔助設備或配件測試中所使用的配備，以形成一個代表待測物實際運作的受測系統。

Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Monitor	LG	22MP58VQ	710NTVS2L751	Provided by Lab
B	Keyboard	Microsoft	1576	NA	Provided by Lab
C	HUB	D-Link	DES-1005A	QS2E1J3001782	Provided by Lab
D	HUB	D-Link	DES-1005A	QS2E1J3001782	Provided by Lab
E	Power Source	AcBel	FSE023	NA	Supplied by client

I/O Cables

ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	VGA Cable	HOTRON	E246588	1.46	Provided by Lab
2	Keyboard with USB Cable	Microsoft	1576	1.95	Provided by Lab
3	RJ45	Fastlink	FL-61STU-04	10	Number x 4 Provided by Lab
4	RJ45	Fastlink	FL-61STU-04	10	Number x 2 Provided by Lab
5	Type C Cable	UGREEN	US287	0.74	Provided by Lab
6	AC Power Cable	PowerSync	TPCPHN0006	1.7	Number x 4 Provided by Lab

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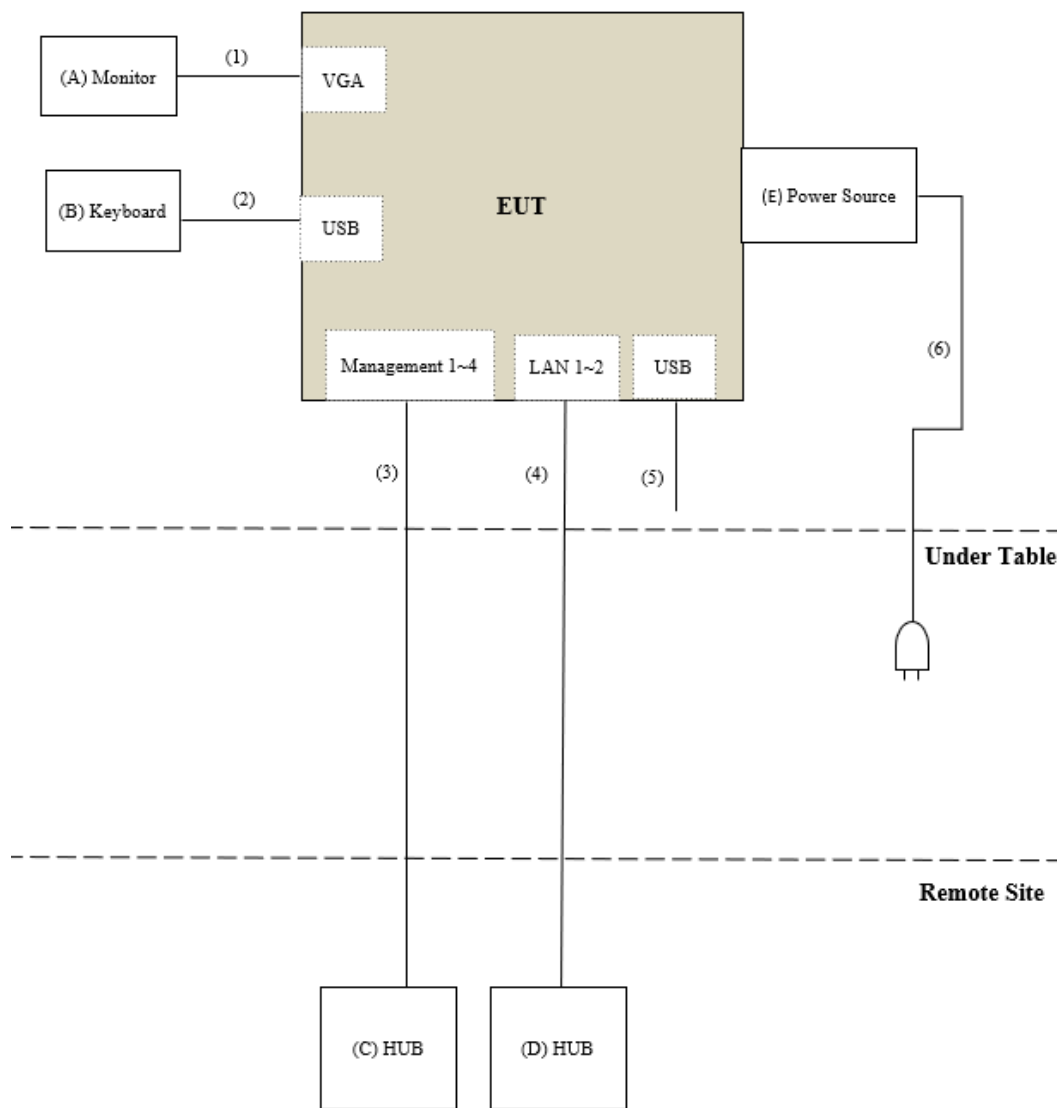
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1.3 測試架構圖

在待測物上開啟測試軟體（Linux）進行控制。該測試軟體用於啟用連續傳輸或接收模式，並根據需要選擇測試通道，數據速率，調變方式和功率設置。



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2. 量測儀器及測試配置說明

2.1 量測設備

Test Equipment List					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired date
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070827	2020/11/11	2021/11/10
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2020/12/11	2021/12/10
Loop Antenna	ETS lindgren	6502	00213440	2020/12/25	2021/12/24
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2021/1/13	2022/1/12
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2021/6/8	2022/6/7
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2021/1/22	2022/1/21
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2020/11/17	2021/11/16
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2020/8/19	2021/8/18
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2020/8/12	2021/8/11
Cables	TITAN	CFD200	T0732ACFD200 20A300-1	2021/3/2	2022/3/1

UL Software

Software	Test Item	Version
e3	Radiated measurement	6.191211 (V6)
EZ EMC	AC power Line Conducted Emission	UL-3A1.2

2.2 測試應用參考標準

本報告中記錄的測試程序參照如下：

ANSI C63.10-2013

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2.3 量測不確定度

此報告中關於量測之符合性聲明，採用 ISO Guide 98-4 的 8.2.4 與 8.2.5 章節中描述的準確度方法為判定規則。

下列量測不確定水準是參照量測儀器 CISPR 16-4-2 所規定之不確定度。

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	±3.1 dB
RF Conducted	9 kHz - 40GHz	±1.9 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	±1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	±5.4 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	±4.7 dB

2.4 試驗環境

產品測試時之實驗室環境條件如下：

測試項目	環境條件	輸入電壓	測試日期	測試人員
場強輻射	25~27°C/ 53~57%RH	220Vac/ 60Hz	2021/07/07~ 2021/07/16	官聲宇
電源線傳導干擾	25~27°C/ 54~58%RH	220Vac/ 60Hz	2021/07/07~ 2021/07/16	官聲宇
頻率容許差度	25~27°C/ 54~58%RH	220Vac/ 60Hz	2021/07/07~ 2021/07/16	官聲宇

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3. 適用規範

3.1 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之 3.3 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 (註)	56-46 (註)
0.5-5	56	46
5-30	60	50

(註)：隨頻率之對數遞減。

(2) 天線之規定

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。

**(3) 輻射之要求**

(a)依據 NCC 低功率射頻器材技術規範第 4.2 節之規定，距器材 30 公尺處之主波場強度應小於 15848 uV/m。

(b)依據 NCC 低功率射頻器材技術規範第 3.6 節之規定,除本規範各章節另有放寬規定者外，其電場強度不得超過下表之限值，且其不必要之發射皆不得大於主波發射強度。各頻段重疊處，以較嚴格之限制值為準。

頻率(f) (MHz)	電場強度 (微伏特/公尺，uV/m)	測距(公尺)
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

(4) 頻率容許差度之要求

(a) 依據 NCC 低功率射頻電機技術規範第 4.2.1.3 節之規定，應維持在主波頻率之±0.01%以內。



(5) 限制使用之頻帶

除本規範另有規定外，任何低功率射頻器材之主波皆不得使用下表所列各頻段之頻率；低功率射頻器材落於下表所列頻段之混附發射，其電場強度必須符合 3.6 之限制規定。

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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4. 測試項目

4.1 場強輻射

4.1.1 適用標準

請見本報告 3.1 節第 (3)、(4) 的規定。

4.1.2 測試方法

For 9kHz ~ 30MHz:

在半電波暗室，將待測物置於 0.8 米高的非金屬桌面，使其操作在工作狀態。接收天線置於 3 米距離，桌面要 360 度旋轉，接收天線設置離地於 1 米，分別置於 Parallel、Perpendicular 極化各執行測試一次。

For 30MHz ~ 1GHz:

在半電波暗室，將待測物置於 0.8 米高的非金屬桌面，使其操作在工作狀態。接收天線置於 3 米距離，桌面要 360 度旋轉，接收天線從離地 1 米至 4 米升降變化，以找出最大的輻射電場強度，接收天線分別置於水平、垂直極化各執行測試一次。

頻譜設定如下:

Peak

頻率範圍	RBW	VBW
9 kHz~150 kHz	200 Hz	600 Hz
150 kHz~30 MHz	10 kHz	30 kHz
30 MHz~1 GHz	120 kHz	360 kHz

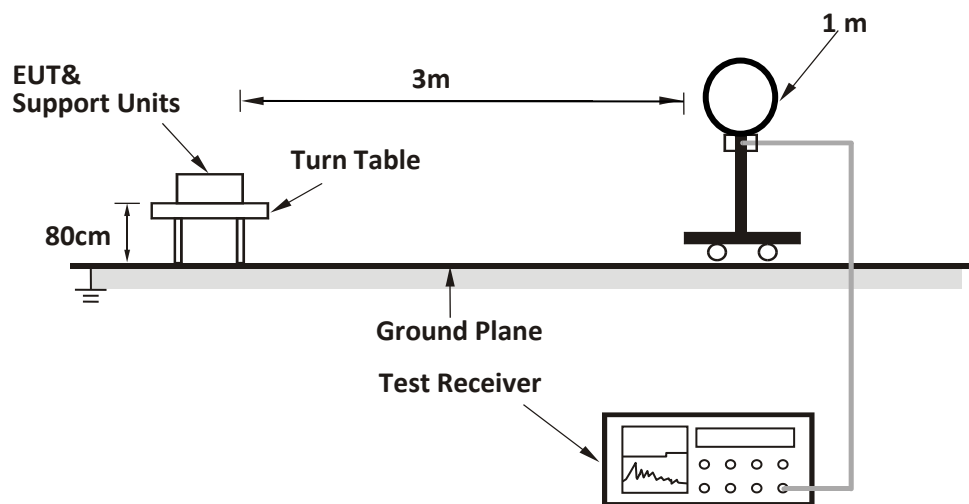
Note: Quasi-Peak RBW = 120 kHz

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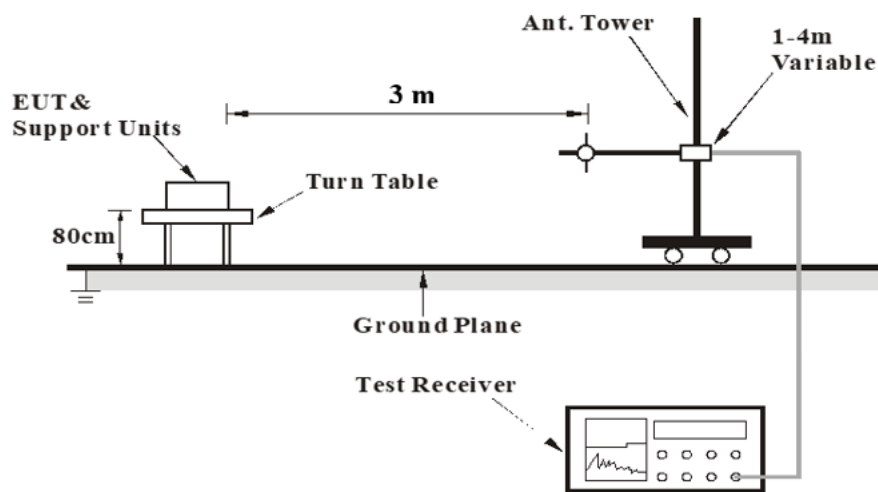
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4.1.3 測試配置圖

<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >



For the actual test configuration, please refer to the Appendix I.

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4.1.4 場強之計算公式

結果值 Result value (dBuV/m) = 機器讀值 Reading value (dBuV/m) + 校正因子
Correction Factor (dB/m)

餘裕度 Margin(dB) = 結果值 Result value (dBuV/m) - 限制值 Limit value (dBuV/m)

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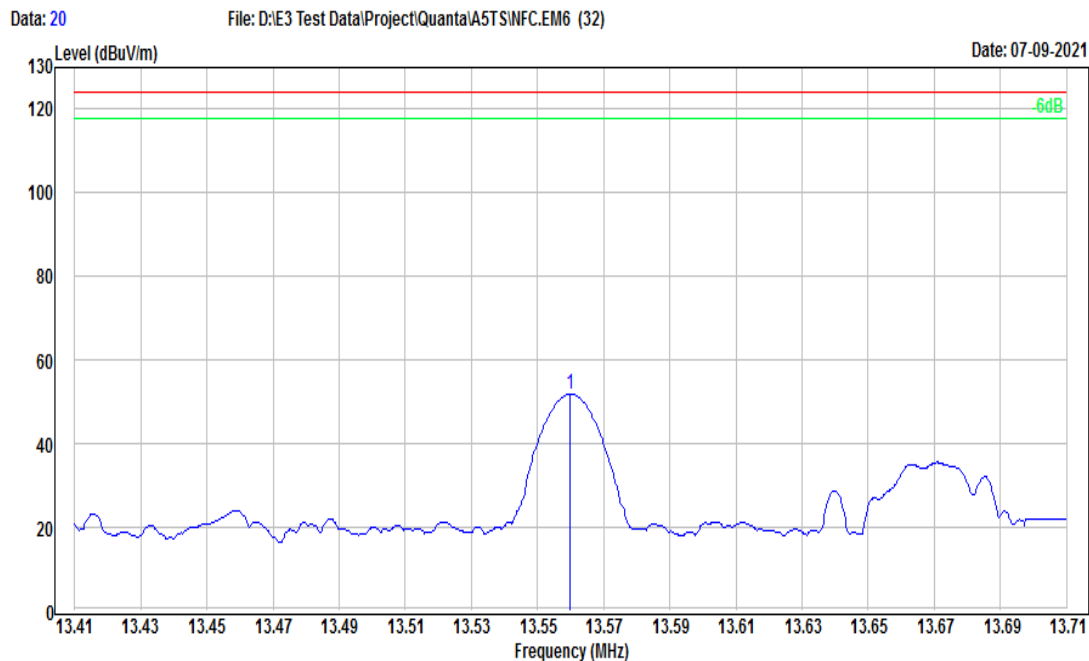


4.1.5 測試結果

發射模式

EUT Test Condition		Measurement Detail	
Mode 1	13.56MHz TX	Frequency Range	13.41 ~ 13.71MHz

Parallel



Notation	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	13.56	39.05	12.75	51.8	124	-72.2	Peak

Note :

- Result (dBuV/m) = Reading (dBuV/m) + Correct (dB/m)
- Margin (dB) = Result (dBuV/m) - Limit (dBuV/m)
- Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
- Above limits have been translated by the formula.
- The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} & 30\text{m} \\
 &= 84\text{dBuV/m} & 30\text{m} \\
 &= 84+20\log(30/3)^2 & 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$

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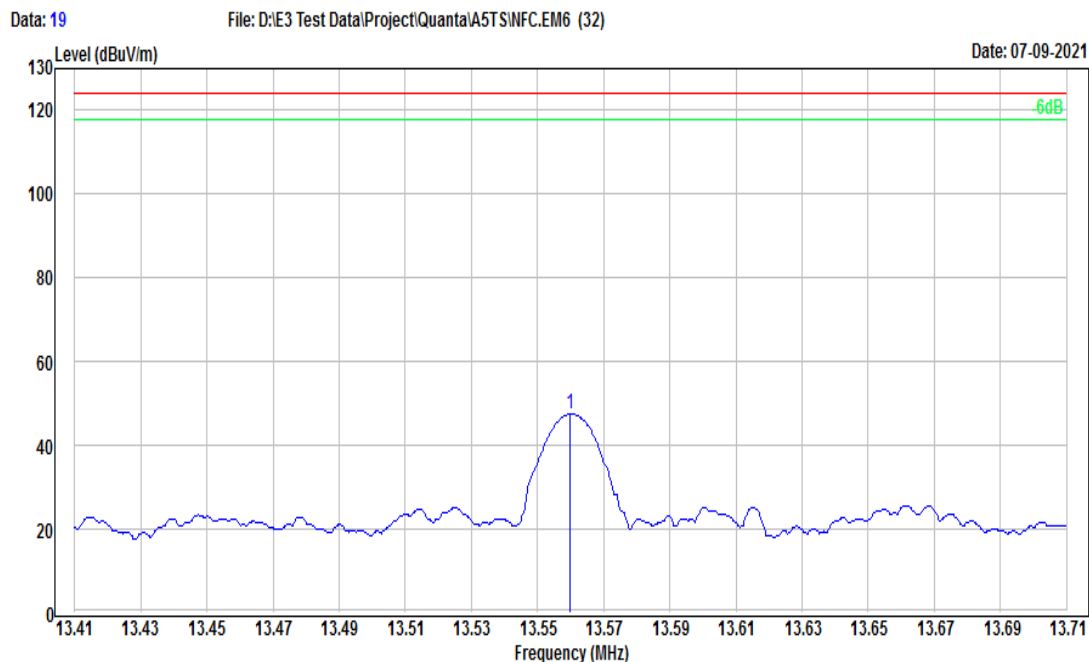


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Perpendicular



Notation	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	13.56	34.7	12.75	47.45	124	-76.55	Peak

Note :

- Result (dBuV/m) = Reading (dBuV/m) + Correct (dB/m)
- Margin (dB) = Result (dBuV/m) - Limit (dBuV/m)
- Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
- Above limits have been translated by the formula.
- The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

Example:

$$\begin{aligned} 13.56\text{MHz} &= 15848\text{uV/m} & 30\text{m} \\ &= 84\text{dBuV/m} & 30\text{m} \\ &= 84+20\log(30/3)^2 & 3\text{m} \\ &= 124\text{dBuV/m} \end{aligned}$$

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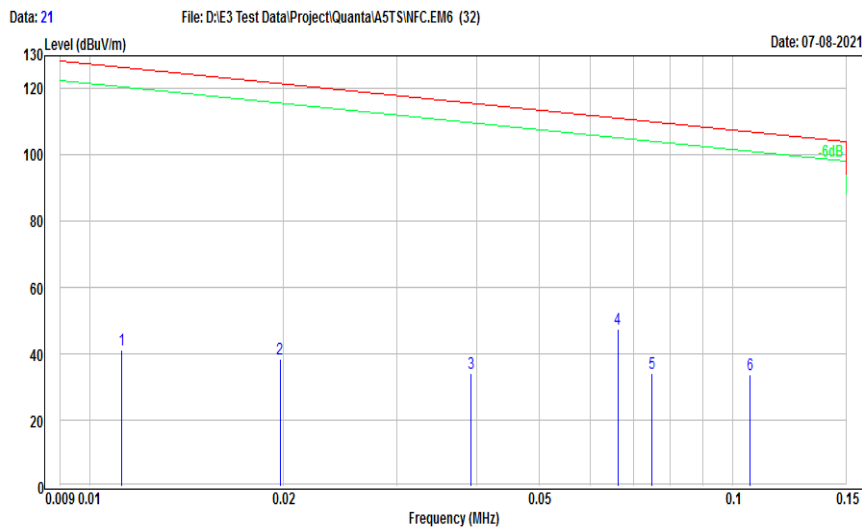
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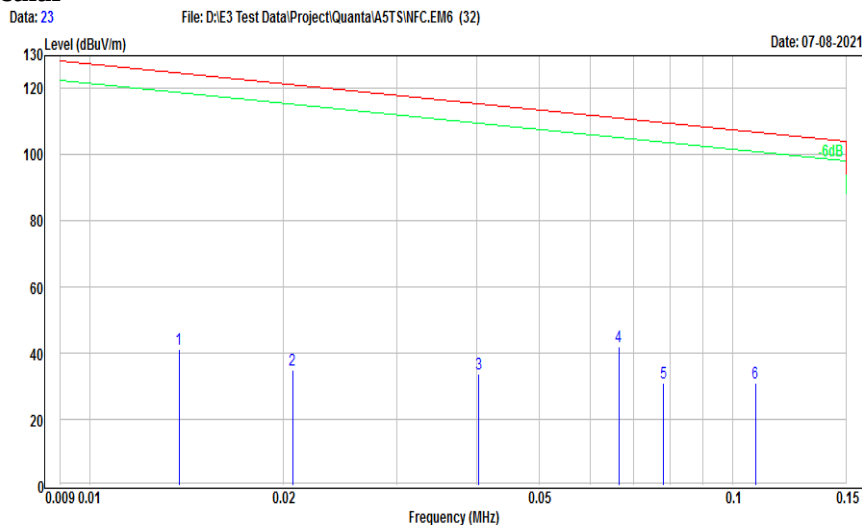


EUT Test Condition		Measurement Detail	
Mode 1	13.56MHz TX	Frequency Range	9kHz ~ 0.15 MHz

Parallel



Perpendicular



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Antenna Polarity & Test Distance: Parallel at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	0.01121	23.96	17.31	41.27	126.61	-85.34	Peak
2	0.01979	22.89	15.55	38.44	121.68	-83.24	Peak
3	0.0392	20.63	13.73	34.36	115.74	-81.38	Peak
4	0.06634	34.67	12.66	47.33	111.17	-63.84	Peak
5	0.07487	21.67	12.4	34.07	110.12	-76.05	Peak
6	0.10642	22.1	11.82	33.92	107.06	-73.14	Peak
Antenna Polarity & Test Distance: Perpendicular at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	0.01376	24.67	16.67	41.34	124.83	-83.49	Peak
2	0.0207	19.72	15.41	35.13	121.29	-86.16	Peak
3	0.04032	20.03	13.67	33.7	115.49	-81.79	Peak
4	0.06652	29.27	12.65	41.92	111.14	-69.22	Peak
5	0.07809	18.65	12.31	30.96	109.75	-78.79	Peak
6	0.10854	19.23	11.83	31.06	106.89	-75.83	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The other emission levels were very low against the limit.

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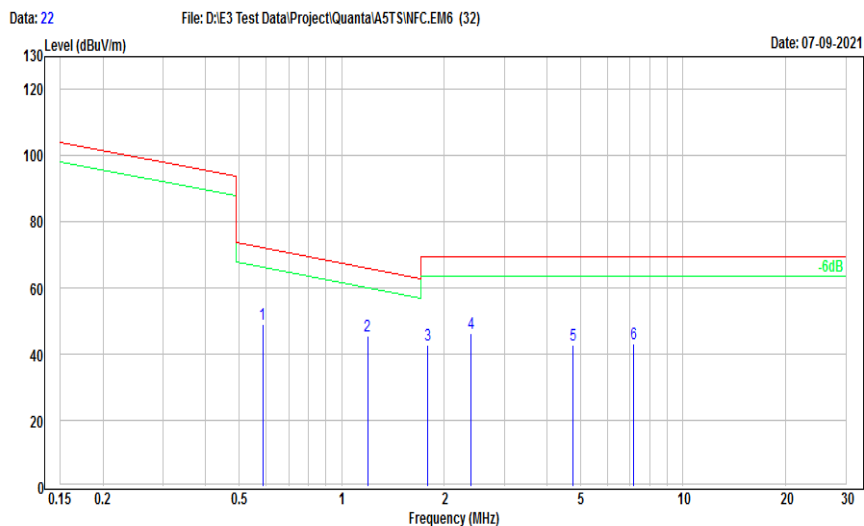
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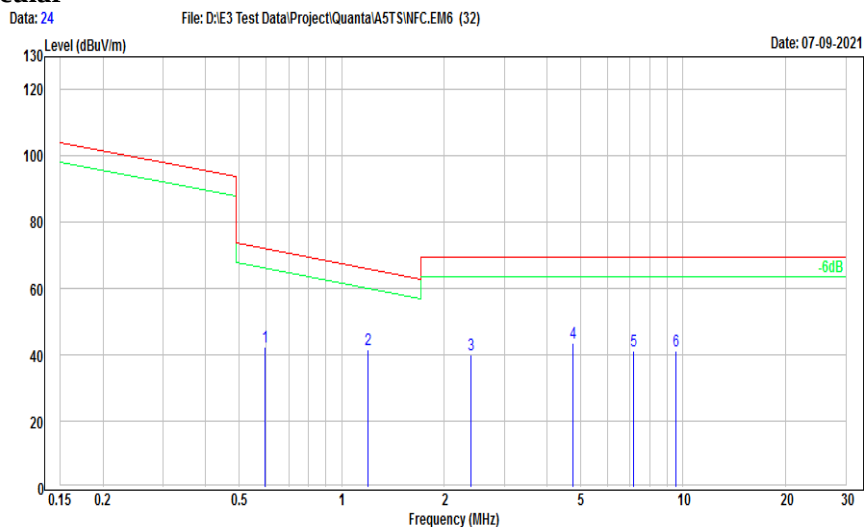
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EUT Test Condition		Measurement Detail	
Mode 1	13.56kHz TX	Frequency Range	0.15MHz ~ 30 MHz

Parallel



Perpendicular



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Antenna Polarity & Test Distance: Parallel at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	0.58851	36.53	12.46	48.99	72.21	-23.22	QP
2	1.191	32.98	12.49	45.47	66.09	-20.62	QP
3	1.79	30.53	12.3	42.83	69.54	-26.71	QP
4	2.396	34	12.17	46.17	69.54	-23.37	QP
5	4.772	30.84	12.15	42.99	69.54	-26.55	QP
6	7.175	30.54	12.6	43.14	69.54	-26.4	QP
Antenna Polarity & Test Distance: Perpendicular at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	0.59794	29.82	12.47	42.29	72.07	-29.78	QP
2	1.197	29.29	12.49	41.78	66.04	-24.26	QP
3	2.396	27.8	12.17	39.97	69.54	-29.57	QP
4	4.772	31.3	12.15	43.45	69.54	-26.09	QP
5	7.175	28.61	12.6	41.21	69.54	-28.33	QP
6	9.552	28.47	12.96	41.43	69.54	-28.11	QP

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The other emission levels were very low against the limit.

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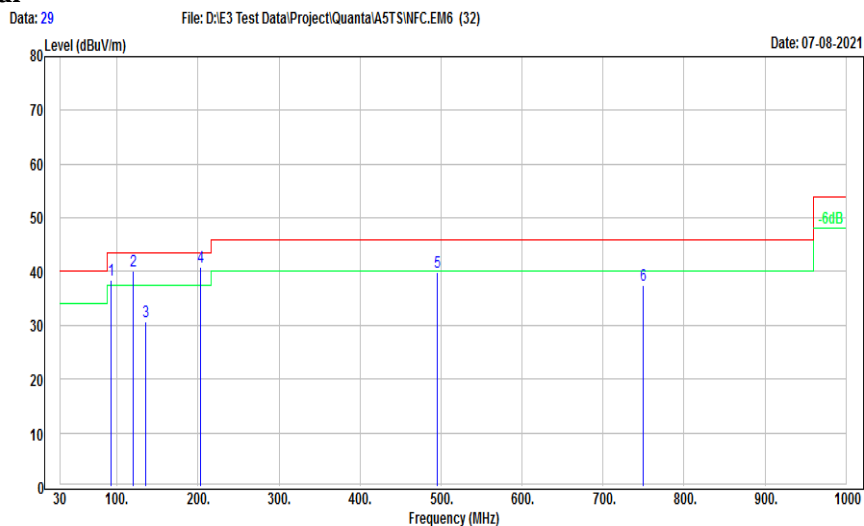
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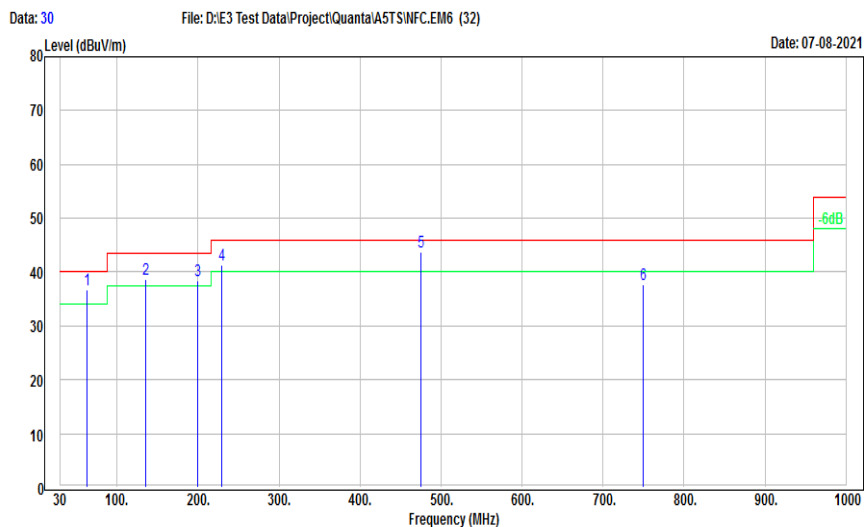
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EUT Test Condition		Measurement Detail	
Mode 1	13.56MHz TX	Frequency Range	30MHz ~ 1 GHz

Horizontal



Vertical



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Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	93.05	55.83	-17.45	38.38	43.5	-5.12	Peak
2	120.21	54.41	-14.28	40.13	43.5	-3.37	Peak
3	135.73	43.19	-12.56	30.63	43.5	-12.87	QP
4	203.63	54.91	-13.96	40.95	43.5	-2.55	Peak
5	495.6	44.73	-4.79	39.94	46	-6.06	Peak
6	749.74	36.99	0.57	37.56	46	-8.44	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	62.98	49.12	-12.44	36.68	40	-3.32	Peak
2	135.73	51.32	-12.56	38.76	43.5	-4.74	Peak
3	199.75	52.32	-13.93	38.39	43.5	-5.11	Peak
4	229.82	53.87	-12.62	41.25	46	-4.75	Peak
5	475.23	48.75	-5.11	43.64	46	-2.36	Peak
6	749.74	37.05	0.57	37.62	46	-8.38	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The peak result complies with QP limit, QP result is deemed to comply with QP limit.
5. The other emission levels were very low against the limit.

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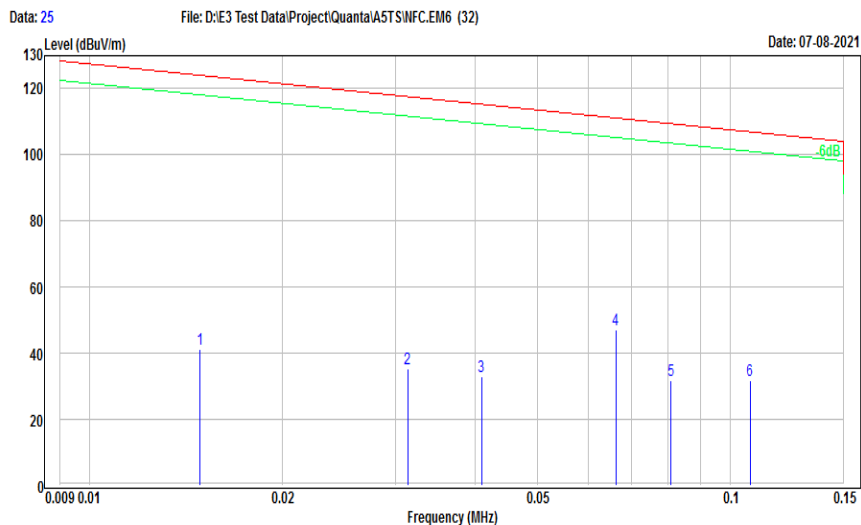
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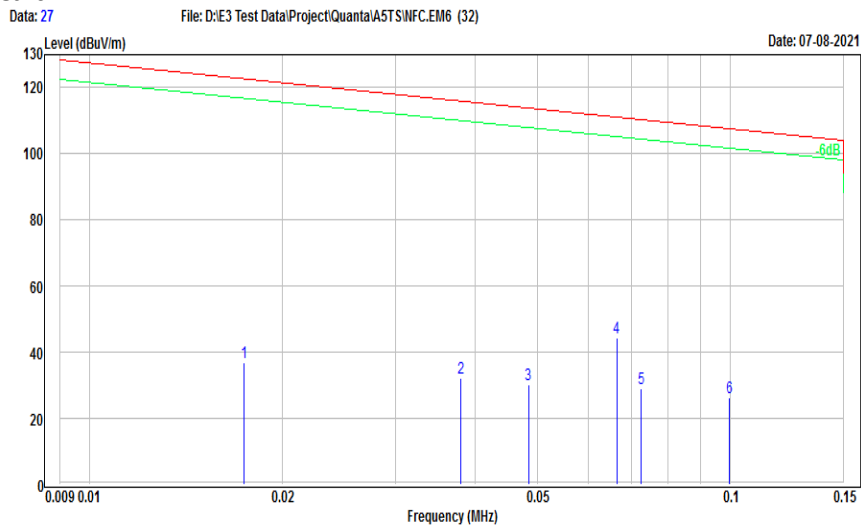
接收模式

EUT Test Condition		Measurement Detail	
Mode 2	13.56kHz RX	Frequency Range	9kHz ~ 0.15 MHz

Parallel



Perpendicular



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Antenna Polarity & Test Distance: Parallel at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	0.01489	24.9	16.43	41.33	124.15	-82.82	Peak
2	0.03139	21.15	14.17	35.32	117.67	-82.35	Peak
3	0.04089	19.24	13.64	32.88	115.37	-82.49	Peak
4	0.06634	34.62	12.66	47.28	111.17	-63.89	Peak
5	0.08078	19.52	12.23	31.75	109.46	-77.71	Peak
6	0.10732	19.8	11.83	31.63	106.99	-75.36	Peak
Antenna Polarity & Test Distance: Perpendicular at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	0.01743	20.99	15.94	36.93	122.78	-85.85	Peak
2	0.038	18.61	13.79	32.4	116.01	-83.61	Peak
3	0.04841	17.06	13.32	30.38	113.9	-83.52	Peak
4	0.06652	31.76	12.65	44.41	111.14	-66.73	Peak
5	0.07259	16.75	12.46	29.21	110.39	-81.18	Peak
6	0.09975	14.66	11.78	26.44	107.62	-81.18	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

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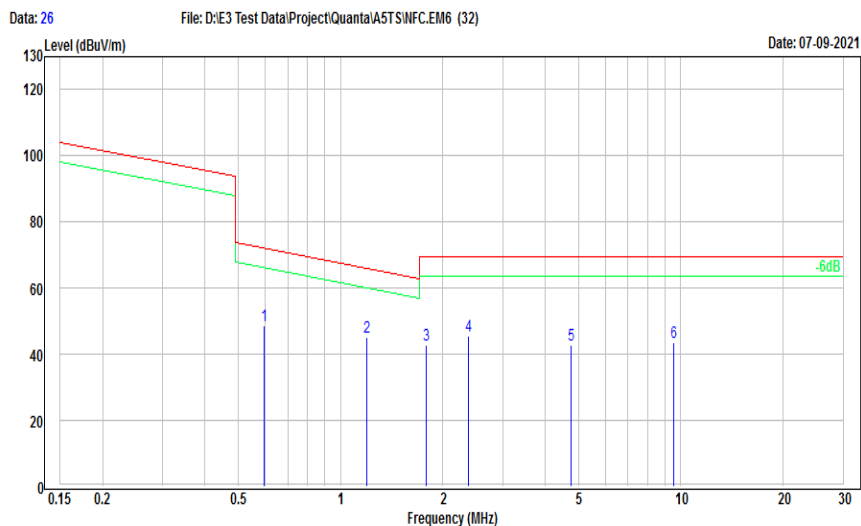
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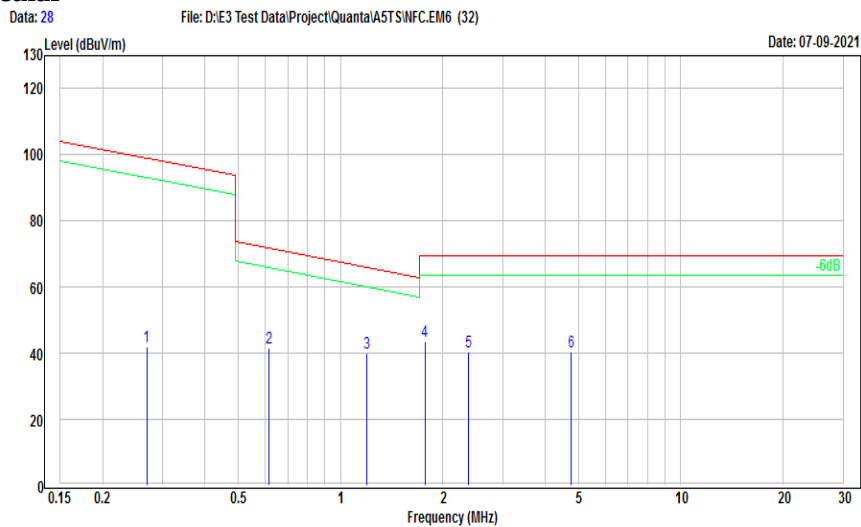
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EUT Test Condition		Measurement Detail	
Mode 2	13.56MHz RX	Frequency Range	0.15MHz ~ 30 MHz

Parallel



Perpendicular



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Antenna Polarity & Test Distance: Parallel at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	0.59794	36.26	12.47	48.73	72.07	-23.34	QP
2	1.197	32.75	12.49	45.24	66.04	-20.8	QP
3	1.79	30.41	12.3	42.71	69.54	-26.83	QP
4	2.384	33.29	12.18	45.47	69.54	-24.07	QP
5	4.772	30.65	12.15	42.8	69.54	-26.74	QP
6	9.552	30.49	12.96	43.45	69.54	-26.09	QP
Antenna Polarity & Test Distance: Perpendicular at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	0.27009	29.78	12.43	42.21	98.97	-56.76	QP
2	0.61726	29.15	12.47	41.62	71.79	-30.17	QP
3	1.197	27.63	12.49	40.12	66.04	-25.92	QP
4	1.772	31.15	12.31	43.46	69.54	-26.08	QP
5	2.384	28.47	12.18	40.65	69.54	-28.89	QP
6	4.772	28.34	12.15	40.49	69.54	-29.05	QP

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The other emission levels were very low against the limit.

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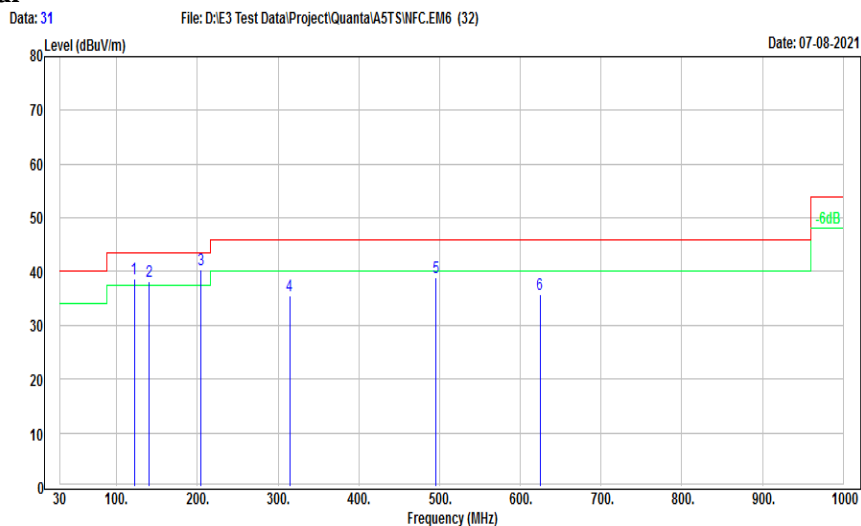
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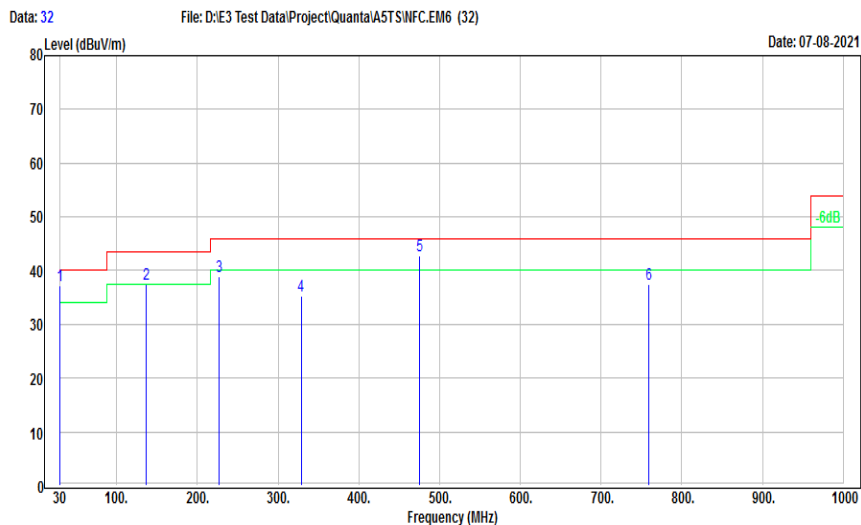
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EUT Test Condition		Measurement Detail	
Mode 2	13.56MHz RX	Frequency Range	30MHz ~ 1 GHz

Horizontal



Vertical



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Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	122.15	52.93	-14.17	38.76	43.5	-4.74	Peak
2	140.58	50.2	-12.07	38.13	43.5	-5.37	QP
3	204.6	54.44	-13.98	40.46	43.5	-3.04	Peak
4	314.21	45.17	-9.55	35.62	46	-10.38	Peak
5	495.6	43.73	-4.79	38.94	46	-7.06	Peak
6	624.61	37.5	-1.78	35.72	46	-10.28	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	30	49.66	-12.55	37.11	40	-2.89	Peak
2	136.7	50.03	-12.49	37.54	43.5	-5.96	Peak
3	226.91	51.97	-13.04	38.93	46	-7.07	Peak
4	328.76	44.42	-9.04	35.38	46	-10.62	Peak
5	475.23	47.83	-5.11	42.72	46	-3.28	Peak
6	759.44	36.83	0.71	37.54	46	-8.46	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The peak result complies with QP limit, QP result is deemed to comply with QP limit.
5. The other emission levels were very low against the limit.

4.1.6 測試結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

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4.2 電源線傳導干擾

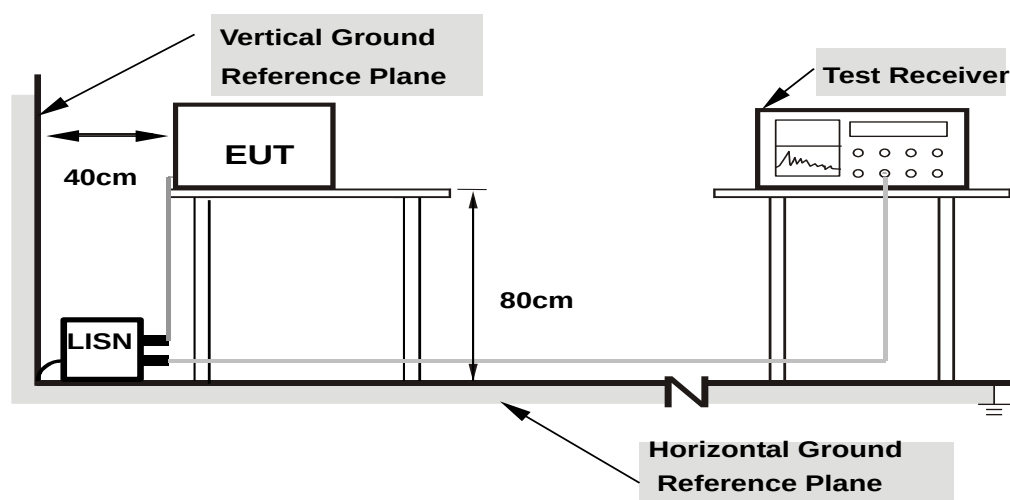
4.2.1 適用標準

請見本報告 3.1 節第 (1) 的規定。

4.2.2 測試方法

將待測物置於 0.8 米高的非金屬桌面，使其操作在工作狀態，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 0.15 MHz 至 30 MHz 之間之電源線傳導放射強度。

4.2.3 測試配置圖



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the Appendix II.



4.2.4 電源傳導干擾電壓值之計算

結果值 Result value (dBuV) = 機器讀值 Reading value (dBuV) + 校正因子 Correction Factor (dB)

餘裕度 Margin(dB) = 結果值 Result value (dBuV) - 限制值 Limit value (dBuV)

其中校正因子 Correction Factor (dB)為：

饋線損失+電源阻抗模擬網路損失

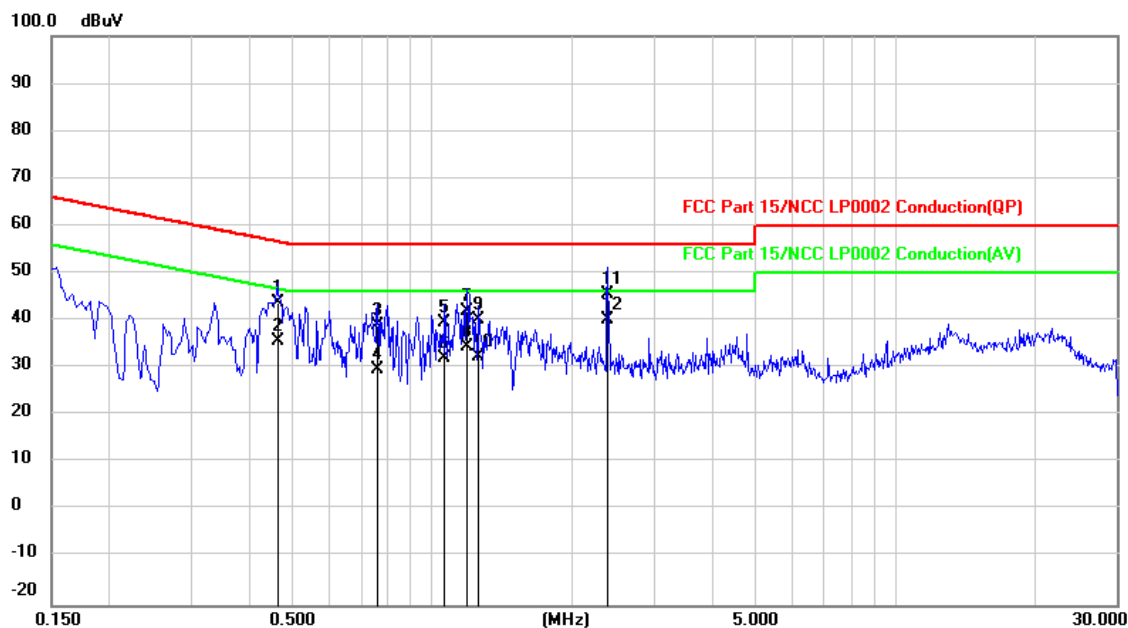


4.2.5 測試結果

發射模式

EUT Test Condition		Measurement Detail	
Mode 1	13.56MHz TX	Frequency Range	150 kHz ~ 30 MHz

Phase of Power : Line (L)



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No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	
1	0.4620	24.28	19.48	43.76	56.66	-12.90	QP
2	0.4620	16.29	19.48	35.77	46.66	-10.89	AVG
3	0.7620	19.34	19.51	38.85	56.00	-17.15	QP
4	0.7620	10.06	19.51	29.57	46.00	-16.43	AVG
5	1.0620	19.90	19.51	39.41	56.00	-16.59	QP
6	1.0620	12.64	19.51	32.15	46.00	-13.85	AVG
7	1.1900	22.49	19.51	42.00	56.00	-14.00	QP
8	1.1900	15.00	19.51	34.51	46.00	-11.49	AVG
9	1.2620	20.65	19.51	40.16	56.00	-15.84	QP
10	1.2620	12.95	19.51	32.46	46.00	-13.54	AVG
11	2.3900	26.11	19.54	45.65	56.00	-10.35	QP
12	2.3900	20.60	19.54	40.14	46.00	-5.86	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

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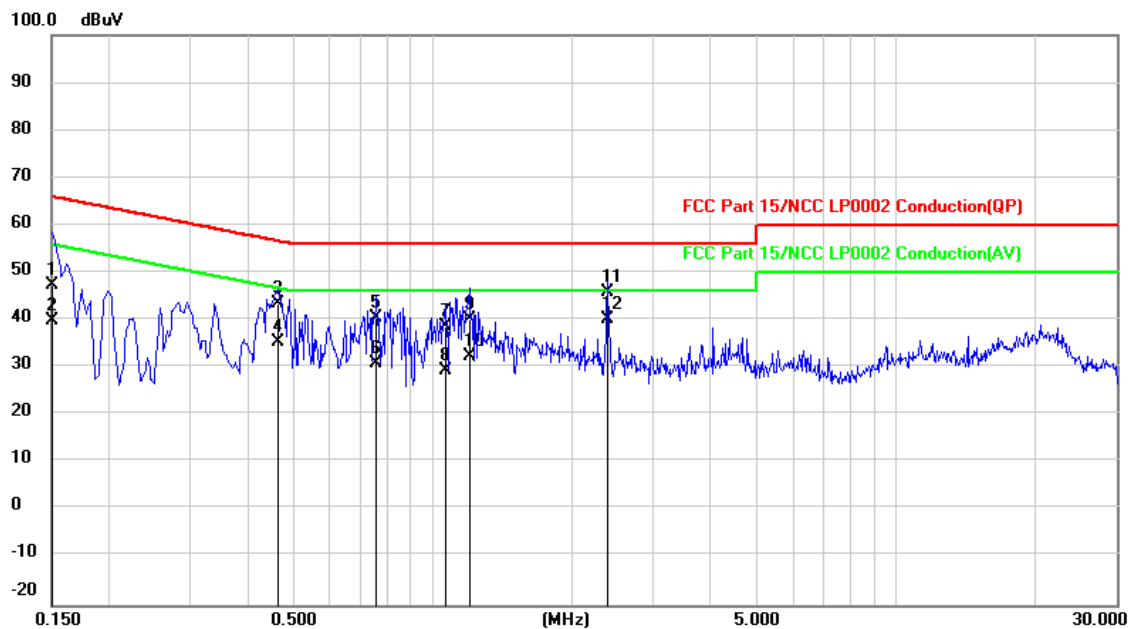


報告編號 : 4790036263-TW-R0-V0

頁碼 : 36 of 46

報告發行日期 : 2021/12/13

Phase of Power : Neutral (N)



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報告編號 : 4790036263-TW-R0-V0

頁碼 : 37 of 46

報告發行日期 : 2021/12/13

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	
1	0.1500	28.00	19.50	47.50	66.00	-18.50	QP
2	0.1500	20.49	19.50	39.99	56.00	-16.01	AVG
3	0.4620	24.07	19.48	43.55	56.66	-13.11	QP
4	0.4620	15.98	19.48	35.46	46.66	-11.20	AVG
5	0.7580	20.90	19.50	40.40	56.00	-15.60	QP
6	0.7580	11.24	19.50	30.74	46.00	-15.26	AVG
7	1.0700	19.08	19.50	38.58	56.00	-17.42	QP
8	1.0700	9.77	19.50	29.27	46.00	-16.73	AVG
9	1.2020	20.52	19.50	40.02	56.00	-15.98	QP
10	1.2020	12.83	19.50	32.33	46.00	-13.67	AVG
11	2.3900	26.25	19.53	45.78	56.00	-10.22	QP
12	2.3900	20.73	19.53	40.26	46.00	-5.74	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

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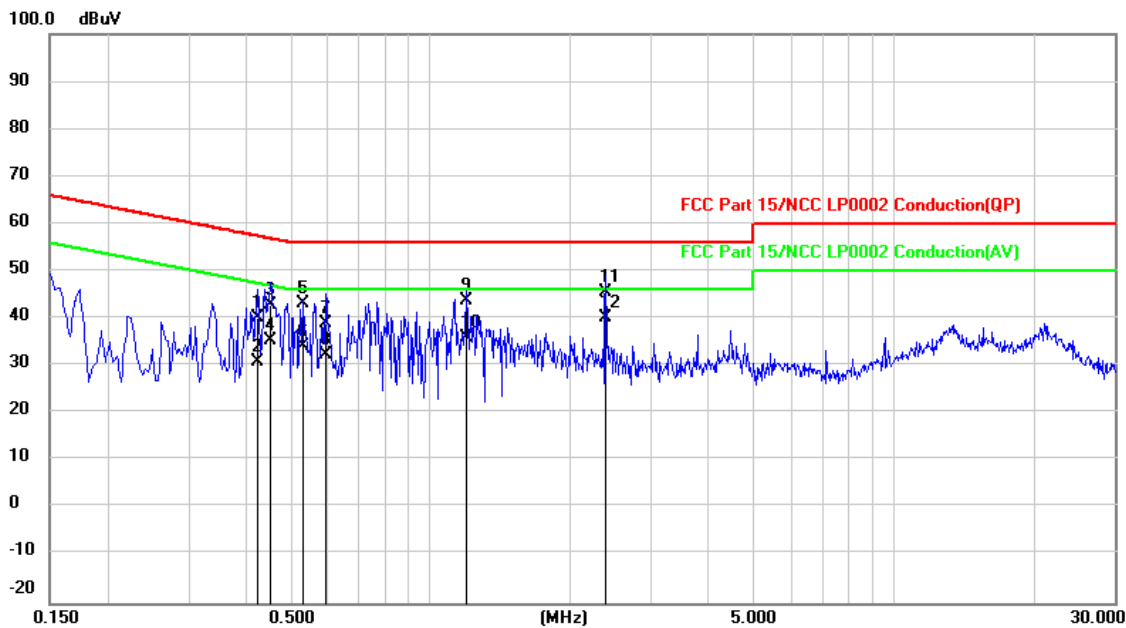
Doc No: 17-EM-F0880 / 6.0



接收模式

EUT Test Condition		Measurement Detail	
Mode 2	13.56MHz RX	Frequency Range	150 kHz ~ 30 MHz

Phase of Power : Line (L)



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報告發行日期 : 2021/12/13

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	
1	0.4220	20.81	19.48	40.29	57.41	-17.12	QP
2	0.4220	11.32	19.48	30.80	47.41	-16.61	AVG
3	0.4500	23.29	19.48	42.77	56.88	-14.11	QP
4	0.4500	15.82	19.48	35.30	46.88	-11.58	AVG
5	0.5299	23.71	19.49	43.20	56.00	-12.80	QP
6	0.5299	14.58	19.49	34.07	46.00	-11.93	AVG
7	0.5940	19.42	19.49	38.91	56.00	-17.09	QP
8	0.5940	12.99	19.49	32.48	46.00	-13.52	AVG
9	1.1940	24.25	19.51	43.76	56.00	-12.24	QP
10	1.1940	16.58	19.51	36.09	46.00	-9.91	AVG
11	2.3900	26.12	19.54	45.66	56.00	-10.34	QP
12	2.3900	20.69	19.54	40.23	46.00	-5.77	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

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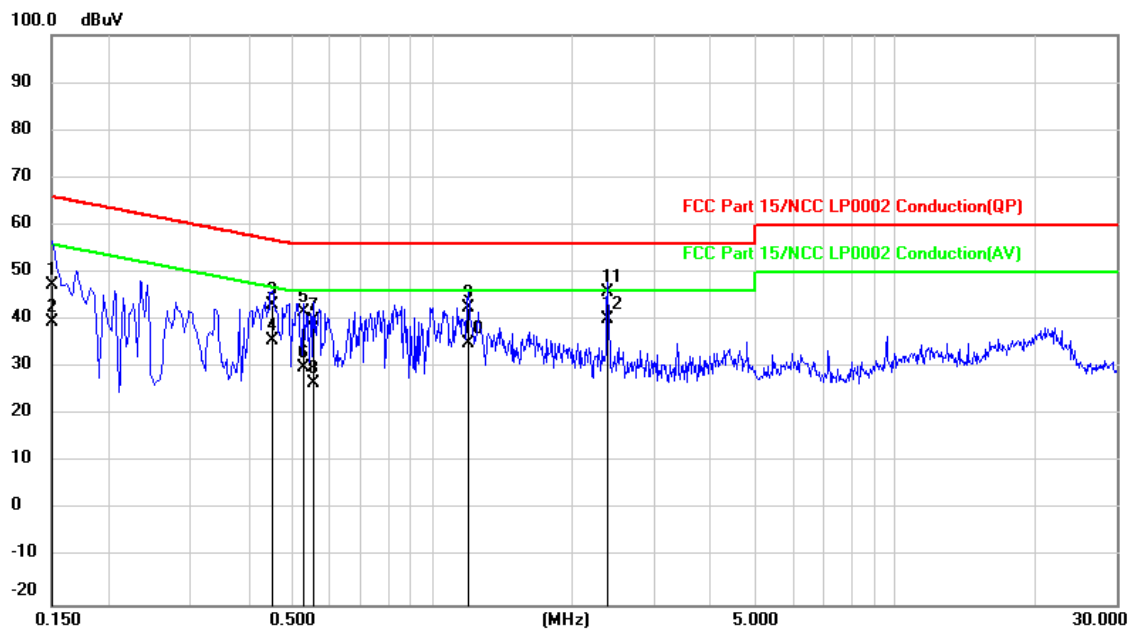


報告編號 : 4790036263-TW-R0-V0

頁碼 : 40 of 46

報告發行日期 : 2021/12/13

Phase of Power : Neutral (N)



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報告發行日期 : 2021/12/13

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	
1	0.1500	27.95	19.50	47.45	66.00	-18.55	QP
2	0.1500	20.11	19.50	39.61	56.00	-16.39	AVG
3	0.4500	23.65	19.48	43.13	56.88	-13.75	QP
4	0.4500	16.30	19.48	35.78	46.88	-11.10	AVG
5	0.5260	22.30	19.49	41.79	56.00	-14.21	QP
6	0.5260	10.37	19.49	29.86	46.00	-16.14	AVG
7	0.5540	20.36	19.49	39.85	56.00	-16.15	QP
8	0.5540	7.14	19.49	26.63	46.00	-19.37	AVG
9	1.1940	23.16	19.50	42.66	56.00	-13.34	QP
10	1.1940	15.59	19.50	35.09	46.00	-10.91	AVG
11	2.3900	26.32	19.53	45.85	56.00	-10.15	QP
12	2.3900	20.77	19.53	40.30	46.00	-5.70	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

4.2.6 測試結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

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4.3 頻率容許差度

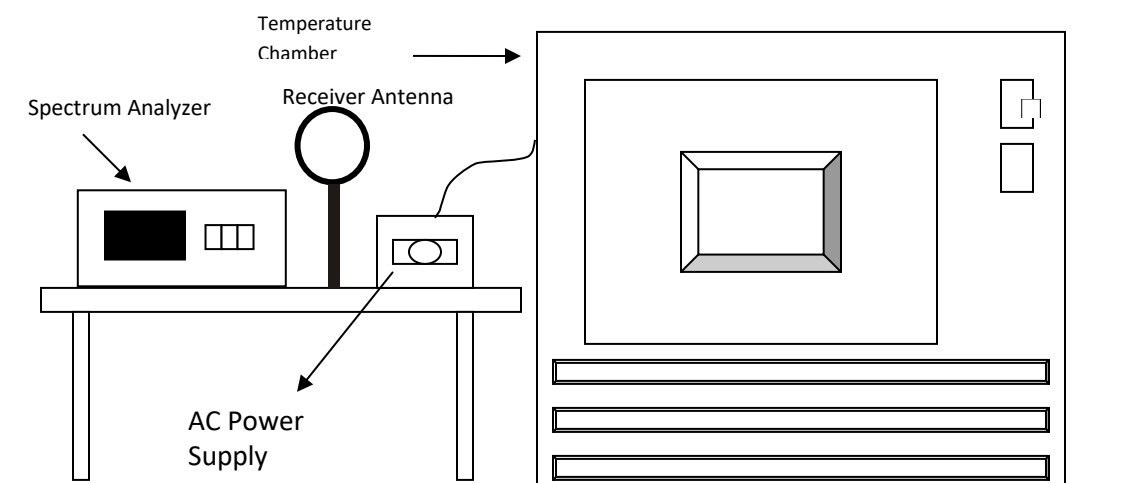
4.2.1 適用標準

請見本報告 3.1 節第 (4) 點的規定。

4.2.2 測試方法

- a. 將待測物之無線電部分(含天線)放置在環境溫度攝氏 20 度的測試箱內，並由 AC Power supply 供電。
- b. 打開待測物電源並透過接收天線接收訊號耦合到頻譜分析儀，測量記錄工作頻率。
- c. 關閉待測物電源，並將溫度測試箱設置為指定的最高溫度。
- d. 等待足夠的時間(約 30 分鐘)直到溫度測試箱內溫度穩定，然後打開 EUT 並在 2、5 和 10 分鐘後測量工作頻率。
- e. 將溫度測試箱的溫度設置為指定的最低溫度，關閉待測物的電源並重複步驟 d。
- f. 將溫度測試箱的溫度設置為攝氏 20 度下穩定最少 30 分鐘。然後將 EUT 上的電源電壓調整為 85%以及 115%並各自紀錄頻率。

4.2.3 測試配置圖





4.3.4 測試結果

Frequency Stability Versus Temp.									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Freq. Drift (%)	Measured Frequency (MHz)	Freq. Drift (%)	Measured Frequency (MHz)	Freq. Drift (%)	Measured Frequency (MHz)	Freq. Drift (%)
50	220	13.56004	0.00029	13.56004	0.00029	13.56003	0.00022	13.56004	0.00029
40	220	13.56005	0.00037	13.56005	0.00037	13.56004	0.00029	13.56005	0.00037
30	220	13.56	0.00000	13.56	0.00000	13.56	0.00000	13.56	0.00000
20	220	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029
10	220	13.55998	-0.00015	13.55998	-0.00015	13.55997	-0.00022	13.55997	-0.00022
0	220	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029	13.56005	0.00037
-10	220	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007	13.56001	0.00007
-20	220	13.56005	0.00037	13.56005	0.00037	13.56004	0.00029	13.56005	0.00037
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Freq. Drift (%)	Measured Frequency (MHz)	Freq. Drift (%)	Measured Frequency (MHz)	Freq. Drift (%)	Measured Frequency (MHz)	Freq. Drift (%)
20	253	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029
20	220	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029
20	187	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029	13.56004	0.00029

4.3.5 測試結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

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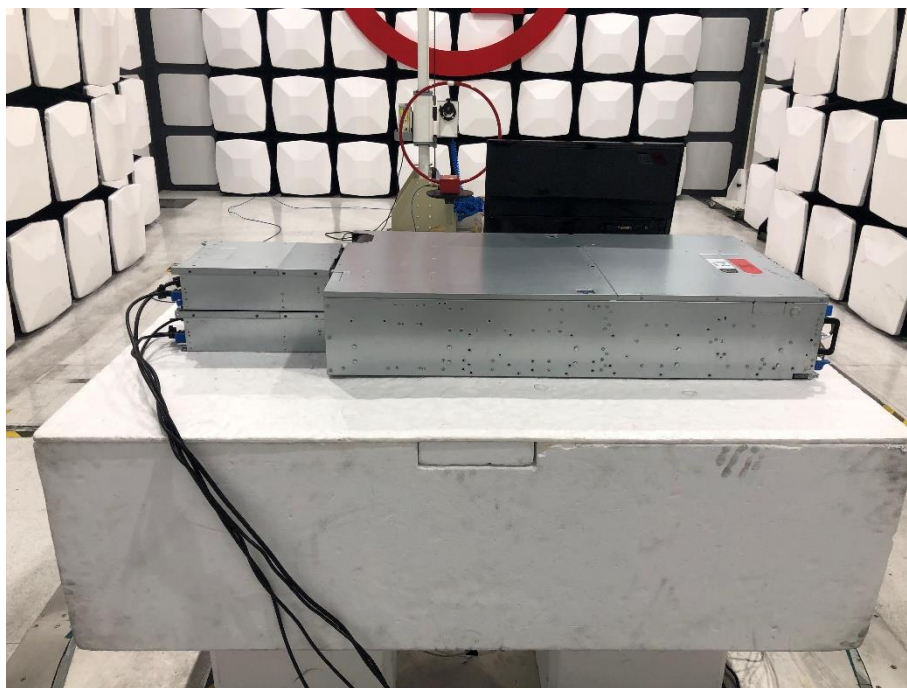
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附錄 1 場強輻射測試照

9 kHz ~ 30 MHz



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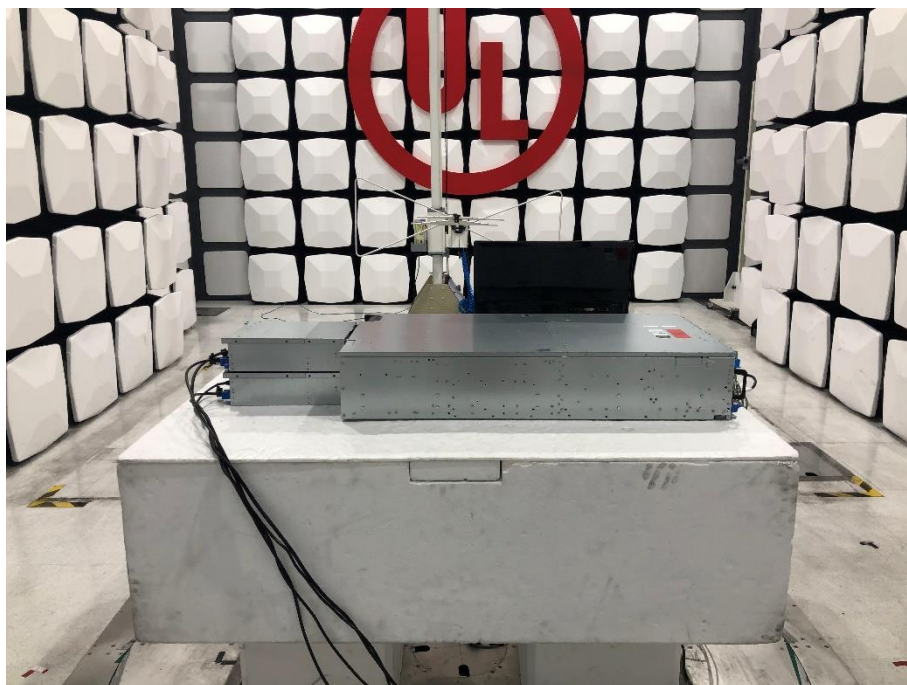
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30 MHz ~ 1 GHz



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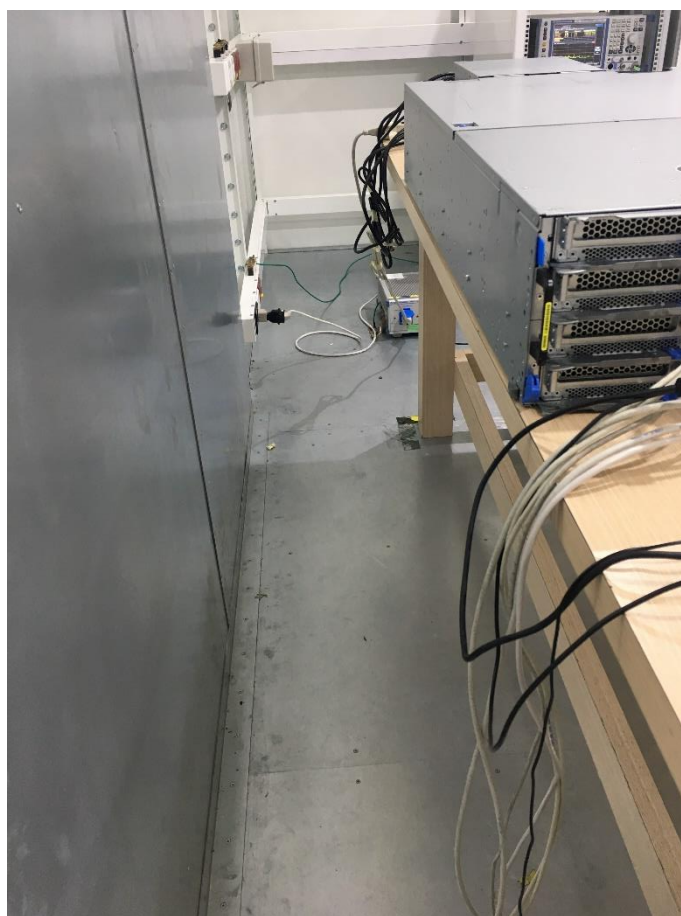
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附錄 2 電源線傳導干擾測試照



END OF REPORT

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