

低功率射頻器材技術規範測試報告

報告編號:

RT201030E01

申請者

ADC Automotive Distance Control Systems GmbH

產品名稱

SRD for Road Transport and Traffic Telematics

型號

SRR5-B

製造廠商

ADC Automotive Distance Control Systems GmbH

商標或廠牌

Continental

該產品樣品試驗

國家通訊傳播委員會低功率射頻器材技術規範

依據之試驗標準

109 年 7 月 1 日訂定

試驗結果

合格

香港商立德國際商品試驗有限公司桃園分公司新竹實驗室

日期 109 年 12 月 23 日

報告簽署人簽章:

陳 瓊 美



目 錄

報告發行紀錄	4
1 低功率射頻器材量測記錄表	6
2 一般敘述	7
2.1 待測設備	7
2.2 輔助測試之週邊設備描述	8
2.3 測試架構圖	9
3 適用規範	10
3.1 規範要求	10
3.2 限制使用之頻帶	12
4 混附波之量測	13
4.1 適用標準	13
4.2 量測方法	13
4.3 量測儀器	14
4.4 測試配置	17
4.5 量測結果 (模式 1)	19
4.5.1 混附發射	19
4.5.2 混附接收	27
4.6 量測結果 (模式 2)	29
4.6.1 混附發射	29
4.6.2 混附接收	37
4.7 量測結果 (模式 3)	39
4.7.1 混附發射	39
4.7.2 混附接收	47
4.8 量測結果判定	48
4.9 配置照片	48
5 發射功率密度之量測	49
5.1 適用標準	49
5.2 量測方法	49
5.3 量測儀器	49
5.4 測試配置	49
5.5 量測結果 (模式 1)	50
5.6 量測結果 (模式 2)	51
5.7 量測結果 (模式 3)	52
5.8 量測結果判定	52
6 頻率穩定度之量測	53
6.1 適用標準	53
6.2 量測方法	53
6.3 量測儀器	53
6.4 測試配置	54
6.5 量測結果	55
6.6 量測結果判定	55
7 天線之要求	56
7.1 適用標準	56
7.2 天線之規定	56
7.3 結果判定	56

8	電波暴露量之評估	57
8.1	適用標準	57
8.2	評估方法	57
8.3	評估結果	57
9	檢測實驗室基本資料	58

報告發行紀錄

Issue No.	Description	Date Issued
RT201030E01	Original release.	109 年 12 月 23 日

證 明 書

產 品 名 稱：SRD for Road Transport and Traffic Telematics

商 標：Continental

型 號：SRR5-B

申 請 者：ADC Automotive Distance Control Systems GmbH

量 測 規 範：低功率射頻器材技術規範 LP0002 (訂定日期：109 年 7 月 1 日)
ANSI C63.10-2013

香港商立德國際商品試驗有限公司桃園分公司在此證明上述待測設備樣品 (型號：SRR5-B)，收件日期 109 年 10 月 30 日，於 109 年 12 月 01 日至 3 日，已在本公司的標準測試場地完成量測。報告中所描述之測試結果和待測設備的架構組合，均根據樣品實際的量測情況作詳實的記錄。

立德桃園分公司依“低功率射頻器材技術規範”及“電信管制射頻器材審驗管理辦法”製作測試結果報告。

特 此 證 明 ！

報告製作者：

黃健琳

黃健琳 / 專員

， 日 期：109 年 12 月 23 日

審 核 者：

陳瓊美

陳瓊美 / 經理

， 日 期：109 年 12 月 23 日

香港商立德國際商品試驗有限公司桃園分公司

實驗室地址：300 新竹市科學工業園區力行一路 1 號 E-2

此份報告不得摘錄複製，除全份複製外，需經實驗室書面同意。



1 低功率射頻器材量測記錄表

申請廠商： ADC Automotive Distance Control Systems GmbH

製造廠商： ADC Automotive Distance Control Systems GmbH

申請廠商地址： Peter Dornier Strasse 10, 88131, Lindau (Bodensee), Germany

廠牌： Continental

產品名稱： SRD for Road Transport and Traffic Telematics

型號： SRR5-B

量測單位名稱： 香港商立德國際商品試驗有限公司桃園分公司 新竹實驗室

量測單位地址： 300 新竹市科學工業園區力行一路 1 號 E-2

量測單位認可編號： TAF 2022

量測規範： 低功率射頻器材技術規範 LP0002 (訂定日期： 109 年 7 月 1 日)
ANSI C63.10-2013

項次	量測項目	規 範	量測結果判定
1	發射功率密度	低功率射頻器材技術規範 4.14.1.2 節	合格
2	混附發射	低功率射頻器材技術規範 4.14.1.3 節及 3.6 節	合格
3	頻率穩定度	低功率射頻器材技術規範 4.14.1.4 節	合格
4	電源線傳導干擾	低功率射頻器材技術規範 3.3 節	註
5	天線之要求	低功率射頻器材技術規範 3.2 節	合格

註：此待測設備為車用設備，且無與個人電腦做任何連接，故免測傳導干擾測試。

最大暴露允許值(Maximum Permissible Exposure, MPE)

項次	量測項目	規 範	量測結果判定
1	電波暴露量	低功率射頻器材技術規範 6.20.2 節	合格

備註：量測結果之判定不考慮量測不確定度的貢獻。

2 一般敘述

2.1 待測設備

產品名稱：	SRD for Road Transport and Traffic Telematics
型號：	SRR5-B
額定電源：	8.65 - 16.4 Vdc, 600 mA
調變方式：	FMCW
工作頻率：	76 ~ 77 GHz
峰值功率密度：	35.51 dBm/MHz
天線種類：	見註
電源線類別：	NA
信號線類別：	NA
配件：	NA

註：

1. 此裝置為 SRD for Road Transport and Traffic Telematics，其發射頻率落於 76 至 77 GHz，本測報測試頻道的中心頻率如下：

模式	Operating Mode	f center FRS [GHz]	f center NRS [GHz]	FRS Bandwidth [MHz]	NRS Bandwidth [MHz]
1	49	76.800	76.395	214.6	947.2
2	50	76.547	76.395	214.6	947.2
3	164	76.538	NA	665.4	NA

2. 此待測設備天線規格,詳列如下:

Brand	Model	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
Elekonta	SRR520 C3	15.3052	76~77	Micro-strip line Antenna	None

3. 上述天線的規格資訊由申請者聲明，實驗室不承擔任何責任。

詳細之規格請參考使用說明書，產品的照片請參照 BV 編號: 201030E01-1。

2.2 輔助測試之週邊設備描述

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。

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	DC Power Supply	Topward	6603D	795551	NA	Provided by Lab
B	Vehicle Gateway VG-4	Continental	SW 1.0.1 SRR520TA12	NA	NA	Supplied by client
C	Radar Detector	Continental	ARS5-SRR5	NA	NA	Supplied by client

NOTE:

1. All power cords of the above support units are non-shielded (1.8 m).

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	Signal Cable	1	2	No	0	Supplied by client (Brand: Continental ; Model: N/A)
2	DC Cable	2	0.5	No	0	Supplied by client (Brand: Continental ; Model: N/A)
3	VG4 Cable	1	0.6	No	0	Supplied by client (Brand: Continental ; Model: N/A)
4	Sub D 15 Cable	1	0.6	No	0	Supplied by client (Brand: Continental ; Model: N/A)

註：本案經申請者切結器材不提供隨貨配件，測試時依申請者(或實驗室)提供的非隨貨配件併同檢驗。

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) 混附發射之規定

依據國家通訊傳播委員會低功率射頻器材技術規範 4.14.1.2 節(1)之要求，低於 40GHz 的輻射發射應符合 3.6 節之一般限制要求：

頻率(MHz)	電場強度(微伏特/公尺, uV/m)	測距(公尺)
$0.009 \leq f \leq 0.490$	$2,400/f(\text{kHz})$	300
$0.490 < f \leq 1.705$	$24,000/f(\text{kHz})$	30
$1.705 < f < 30$	30	30
$30 \leq f \leq 88$	100	3
$88 < f \leq 216$	150	3
$216 < f \leq 960$	200	3
$960 < f$	500	3

(3) 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。

(4) 發射功率密度之要求

依據國家通訊傳播委員會低功率射頻器材技術規範之 4.14 節，工作頻率為 76 GHz~77 GHz。

低功率發射機，需符合規範 4.14.1.2 之規定如下：

發射限制值：距發射器表面 3 公尺處測量之任何發射，其平均功率密度 (power density) 應小於或等於 88 微瓦特/平方公分(uW/cm^2)(EIRP 50 dBm)；峰值功率密度應小於或等於 $279 \text{ uW}/\text{cm}^2$ (EIRP 55 dBm)。

(5) 混附發射之要求

依據國家通訊傳播委員會低功率射頻器材技術規範之 4.14.1.3 節之規定如下：

頻段外之任何頻率應僅有混附發射，其功率密度 (power density) 發射限制值如下：

- (1) 低於 40 GHz 以下之任何發射，應符合 3.6 之規定。
- (2) 介於 40 GHz~200 GHz 間任何發射，距發射器表面 3 公尺處測量，應小於或等於 $600 \text{ pW}/\text{cm}^2$ 。
- (3) 高於 200 GHz 之發射，距發射器表面 3 公尺處測量，任何發射之功率密度 (power density) 應小於或等於 $1000 \text{ pW}/\text{cm}^2$ 。
- (4) 頻譜之測量頻率應達 231 GHz。

(6) 頻率穩定度之要求

依據國家通訊傳播委員會低功率射頻器材技術規範 4.14.1.4 節之規定如下：

主要發射須包括此頻段之所有操作狀態。操作溫度範圍自-20℃~50℃間變化，供應電壓在額定值之±15%內變化。

(7) 電波暴露量之評估

依據國家通訊傳播委員會低功率射頻器材技術規範 6.20.2 節之規定，若受測物於正常操作模式下，其發射機距離人體 20 公分以上者，可測試最大暴露允許值(Maximum Permissible Exposure, MPE)以證明其符合電波暴露量之要求。

限制值如下：

(1) 職業性/可控制之暴露

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (minutes)
0.3 - 3.0	614	1.63	*100	6
3 - 30	1842/f	4.89/f	*900/f ²	6
30 - 300	61.4	0.163	1.0	6
300 - 1,500	---	---	f/300	6
1,500 - 100,000	---	---	5.0	6

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：MHz。

(2) 一般人/不可控制之暴露

頻率範圍 (MHz)	電場強度 (V/m)	磁場強度 (A/m)	功率密度 (mW/cm ²)	平均時間 (minutes)
0.3 - 1.34	614	1.63	*100	30
1.34 - 30	824/f	2.19/f	*180/f ²	30
30 - 300	27.5	0.073	0.2	30
300 - 1,500	---	---	f/1500	30
1,500 - 100,000	---	---	1.0	30

註 1：標記*表平面波等效功率密度。

註 2：f 表測試頻率，單位：MHz。

3.2 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(兆赫)	頻率(兆赫)	頻率(兆赫)
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	

4 混附波之量測

4.1 適用標準

請見本報告 3.1 節第(5)項的規定。

4.2 量測方法

<Frequency Range below 1GHz>

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，另外接收天線從離地 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。

<Frequency Range 1GHz ~ 40GHz>

將待測物置於 1.5 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，另外接收天線從離地 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。

<Frequency Range 40GHz ~ 231GHz>

將待測物置於 1.5 米高的非金屬桌面，使其操作在工作狀態。接收天線置於適當量測距離。桌面要 360 度旋轉，另外接收天線從離地 1 米至 4 米升降變化，以找出最大的輻射強度，接收天線分別置於水平、垂直極化各執行測試一次。

4.3 量測儀器

For below 40GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 05, 2020	Nov. 04, 2021
RF Cable	8D	966-3-1	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 24, 2020	Sep. 23, 2021
Horn Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-1500	180504	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-2000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6000	180602	June 09, 2020	June 08, 2021
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Frequency	Uncertainty
Radiated emissions	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

For above 40GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Keysight	N9030A	MY55330160	Feb. 07, 2020	Feb. 06, 2021
*OXE89 Horn Antenna (33~55GHz) QuinStar	QWH-UCRR00	924200002	Jan. 20, 2020	Jan. 19, 2022
*Conical Horn Antenna (50~75GHz) Keysight	WR15CH-Conical	WR15CH_001	Jan. 20, 2020	Jan. 19, 2022
*Conical Horn Antenna (75~110GHz) Keysight	WR10CH-Conical	WR10CH_001	Jan. 20, 2020	Jan. 19, 2022
*Conical Horn Antenna (110~170GHz) Keysight	WR6.5CH-Conical	WR6.5CH_001	Jan. 20, 2020	Jan. 19, 2022
*Conical Horn Antenna (140~220GHz) Keysight	WR5.1CH-Conical	WR5.1CH_001	Dec. 09, 2019	Dec. 08, 2021
*Conical Horn Antenna (220~330GHz) Keysight	WR3.4DH-Diagonal	WR3.4DH_001	Dec. 09, 2019	Dec. 08, 2021
N9029AV15-DC9 - 50-75 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension WR15	SAX 381	CoC	CoC
N9029AV10-DC9 - 75-110 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension WR10	SAX 378	CoC	CoC
N9029AV06-DC9 - 110-170 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension WR6.5	SAX 377	CoC	CoC
*N9029AV05-DC9 - 140-220 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension WR5.1	SAX 375	Dec. 09, 2019	Dec. 08, 2021
*N9029AV03-DC9 - 220-330 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension	SAX 376	Dec. 09, 2019	Dec. 08, 2021
Millimeter-Wave Signal Generator Frequency Extension Module (50~75 GHz) Keysight	E8257DV15	SGX 050	CoC	CoC
Millimeter-Wave Signal Generator Frequency Extension Module (75~110 GHz) Keysight	E8257DV10	SGX 069	CoC	CoC
Millimeter-Wave Signal Generator Frequency Extension Module (110~170 GHz)	E8257DV06-DC9	SGX 223	CoC	CoC

Keysight				
PSG analog signal generator Keysight	E8257D	MY53401987	June 17, 2020	June 16, 2021
*Power Meter VDI	PM5	431V	Dec. 09, 2019	Dec. 08, 2021
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA

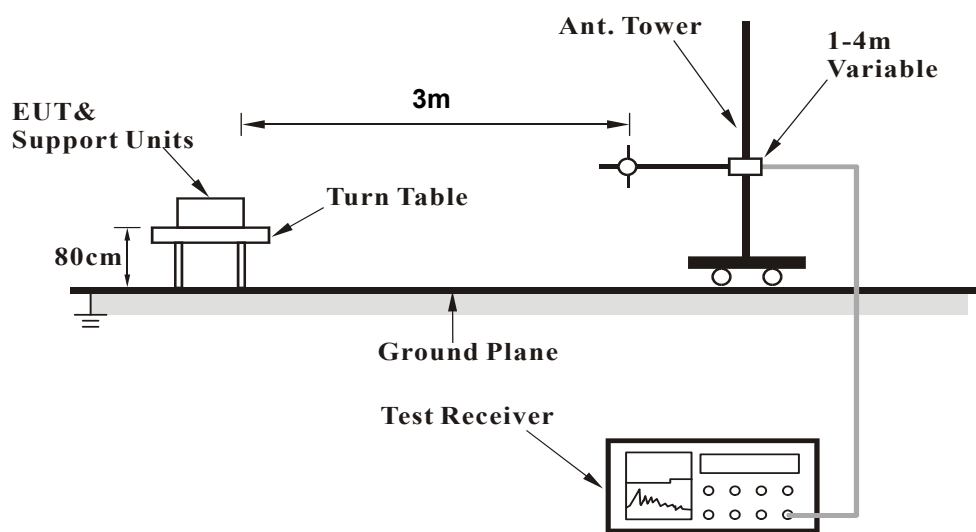
Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Certificate of Conformance (CoC) which is issued by manufacturer states that the product meets the specification.
4. The test was performed in 966 Chamber No. 6
5. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

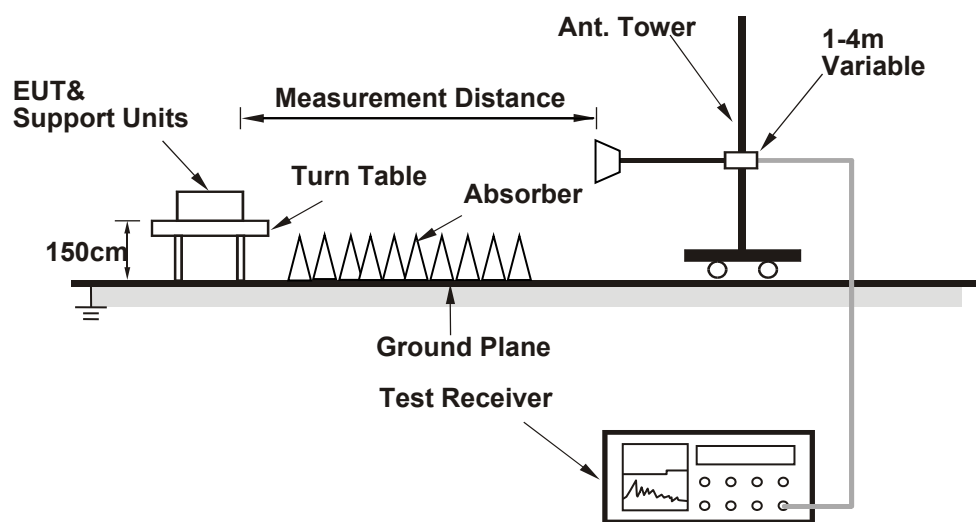
Measurement	Frequency	Uncertainty
Radiated emissions	40GHz ~ 231GHz	5.4 dB

4.4 測試配置

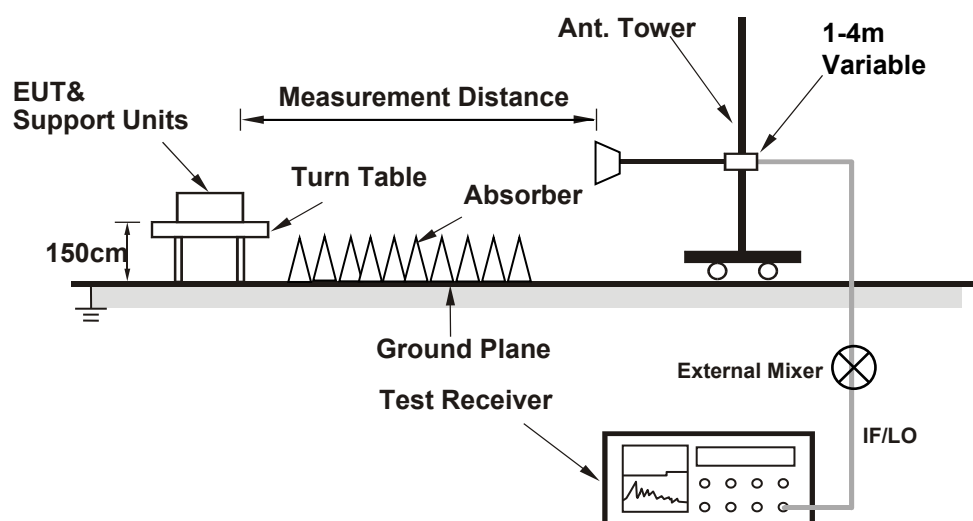
<Frequency Range below 1GHz>



<Frequency Range above 1GHz ~ 50GHz>



<Frequency Range above 50GHz>



4.5 量測結果 (模式 1)

4.5.1 混附發射

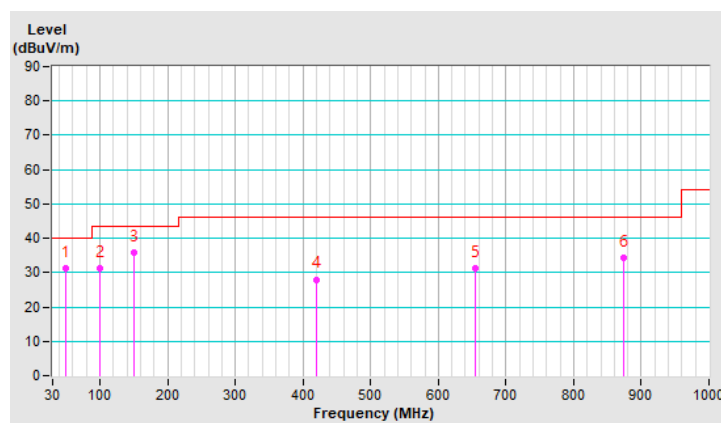
Below 1GHz Data

操作模式：	發射接收	頻率範圍：	Below 1GHz
基本波頻率 FRS / NRS：	76.800GHz / 76.395GHz	檢測器與頻寬：	(QP) RB=120kHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109 年 12 月 3 日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	49.46	31.3 QP	40.0	-8.7	1.50 H	33	38.8	-7.5
2	100.65	31.3 QP	43.5	-12.2	1.50 H	89	42.9	-11.6
3	150.60	35.7 QP	43.5	-7.8	2.00 H	36	42.7	-7.0
4	420.40	28.0 QP	46.0	-18.0	2.00 H	29	30.3	-2.3
5	655.45	31.2 QP	46.0	-14.8	1.50 H	49	28.0	3.2
6	873.05	34.2 QP	46.0	-11.8	3.00 H	96	27.3	6.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

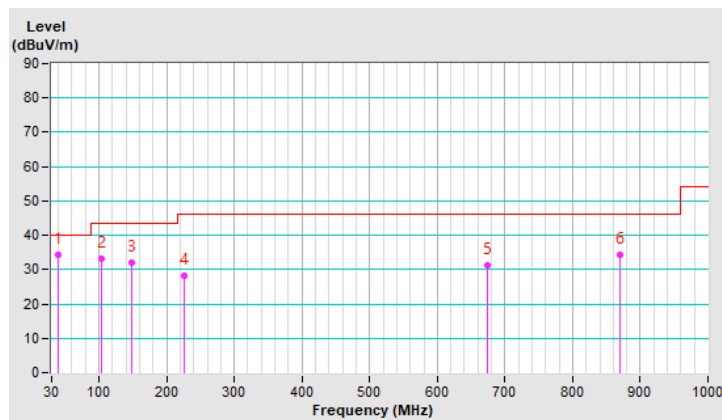


操作模式：	發射接收	頻率範圍：	Below 1GHz
基本波頻率 FRS / NRS：	76.800GHz / 76.395GHz	檢測器與頻寬：	(QP) RB=120kHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.13	34.4 QP	40.0	-5.6	1.00 V	128	42.6	-8.2
2	103.37	33.3 QP	43.5	-10.2	1.50 V	351	44.3	-11.0
3	148.47	32.1 QP	43.5	-11.4	1.50 V	287	39.2	-7.1
4	226.64	28.3 QP	46.0	-17.7	1.00 V	18	38.0	-9.7
5	673.31	31.2 QP	46.0	-14.8	2.00 V	267	27.7	3.5
6	869.95	34.2 QP	46.0	-11.8	1.00 V	334	27.2	7.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



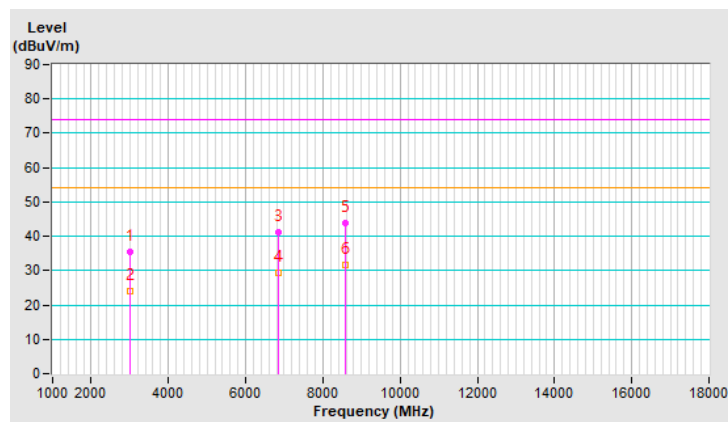
Above 1GHz Data

操作模式：	發射	頻率範圍：	1GHz ~ 18GHz
基本波頻率 FRS / NRS：	76.800GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2993.42	35.3 PK	74.0	-38.7	1.83 H	244	35.7	-0.4
2	2993.42	24.0 AV	54.0	-30.0	1.83 H	244	24.4	-0.4
3	6835.27	41.2 PK	74.0	-32.8	2.11 H	342	33.4	7.8
4	6835.27	29.2 AV	54.0	-24.8	2.11 H	342	21.4	7.8
5	8589.63	44.0 PK	74.0	-30.0	2.41 H	205	33.3	10.7
6	8589.63	31.5 AV	54.0	-22.5	2.41 H	205	20.8	10.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

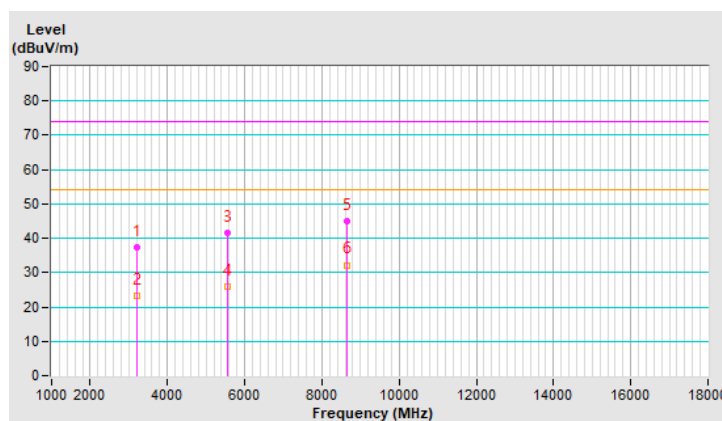


操作模式：	發射	頻率範圍：	1GHz ~ 18GHz
基本波頻率 FRS / NRS：	76.800GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109 年 12 月 3 日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3197.54	37.3 PK	74.0	-36.7	1.87 V	224	37.3	0.0
2	3197.54	23.3 AV	54.0	-30.7	1.87 V	224	23.3	0.0
3	5571.24	41.5 PK	74.0	-32.5	1.63 V	187	36.8	4.7
4	5571.24	25.9 AV	54.0	-28.1	1.63 V	187	21.2	4.7
5	8643.29	44.9 PK	74.0	-29.1	1.52 V	287	33.8	11.1
6	8643.29	32.2 AV	54.0	-21.8	1.52 V	287	21.1	11.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

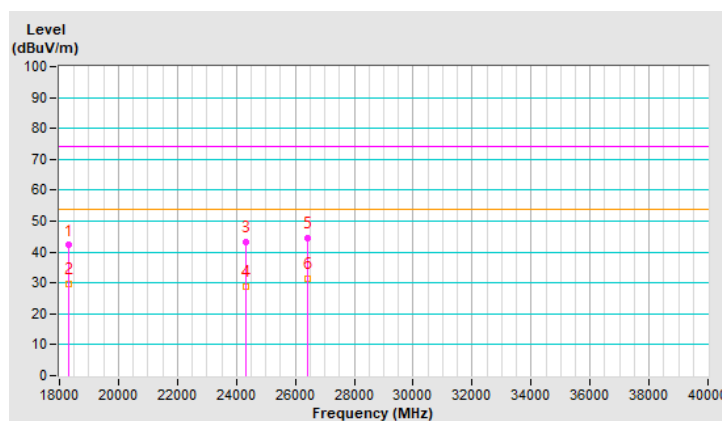


操作模式：	發射	頻率範圍：	18GHz ~ 40GHz
基本波頻率 FRS / NRS：	76.800GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	18328.47	42.2 PK	74.0	-31.8	1.56 H	241	49.1	-6.9
2	18328.47	29.6 AV	54.0	-24.4	1.56 H	241	36.5	-6.9
3	24328.72	43.1 PK	74.0	-30.9	1.83 H	214	45.9	-2.8
4	24328.72	29.0 AV	54.0	-25.0	1.83 H	214	31.8	-2.8
5	26412.66	44.4 PK	74.0	-29.6	1.66 H	134	45.8	-1.4
6	26412.66	31.4 AV	54.0	-22.6	1.66 H	134	32.8	-1.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

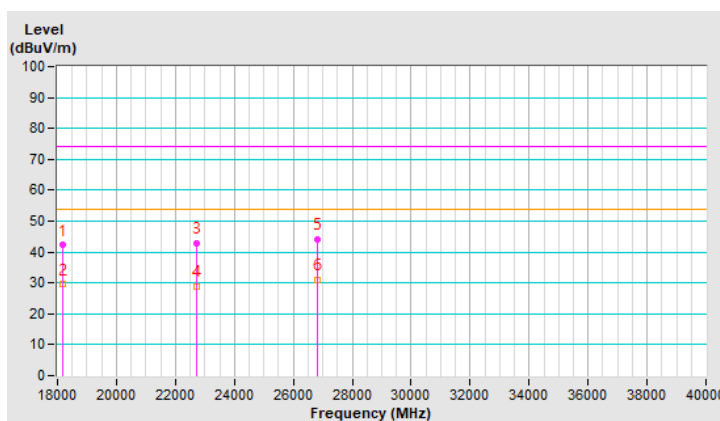


操作模式：	發射	頻率範圍：	18GHz ~ 40GHz
基本波頻率 FRS / NRS：	76.800GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109 年 12 月 3 日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	18172.41	42.2 PK	74.0	-31.8	1.64 V	127	49.0	-6.8
2	18172.41	29.5 AV	54.0	-24.5	1.64 V	127	36.3	-6.8
3	22725.21	42.8 PK	74.0	-31.2	1.82 V	223	46.5	-3.7
4	22725.21	28.9 AV	54.0	-25.1	1.82 V	223	32.6	-3.7
5	26832.16	44.2 PK	74.0	-29.8	1.43 V	258	45.2	-1.0
6	26832.16	31.1 AV	54.0	-22.9	1.43 V	258	32.1	-1.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



操作模式：	發射接收	頻率範圍：	40GHz ~ 231GHz
基本波頻率 FRS / NRS：	76.800GHz / 76.395GHz	測試儀器：	(AV) RB=1MHz, VB=3MHz
量測場地溫度：	25°C	量測場地濕度：	66%RH
測試日期：	109 年 12 月 01 日	測試者：	廖偉鈞

Antenna Polarity : Horizontal										
No.	Frequency (GHz)	SA Value (dBm)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm/MHz)	Power Density (pW/cm ²)	Power Density Limit (pW/cm ²)	Margin (pW/cm ²)	Pass/Fail
1	42.38	-73.25	-70.77	20.30	78.73	-16.43	20.13	600.00	-579.87	Pass
2	73.66	-72.08	-67.00	19.90	87.70	-7.46	158.86	600.00	-441.14	Pass
3	75.69	-71.88	-66.68	20.00	88.16	-7.00	176.46	600.00	-423.54	Pass
4	99.60	-92.19	-81.71	20.00	75.51	-19.64	9.60	600.00	-590.40	Pass
5	164.53	-91.73	-81.70	20.50	79.38	-15.78	23.39	600.00	-576.61	Pass
6	194.07	-95.89	-71.79	21.32	89.91	-5.25	263.92	600.00	-336.08	Pass
7	228.50	-96.20	-81.53	21.52	81.39	-13.77	37.10	1000.00	-962.90	Pass
Antenna Polarity : Vertical										
No.	Frequency (GHz)	SA Value (dBm)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm/MHz)	Power Density (pW/cm ²)	Power Density Limit (pW/cm ²)	Margin (pW/cm ²)	Pass/Fail
1	41.92	-73.36	-70.73	20.30	78.68	-16.48	19.88	600.00	-580.12	Pass
2	73.44	-71.93	-66.80	19.90	87.88	-7.28	165.36	600.00	-434.64	Pass
3	75.71	-71.61	-67.15	20.00	87.69	-7.47	158.44	600.00	-441.56	Pass
4	102.30	-92.66	-81.73	20.00	75.73	-19.43	10.08	600.00	-589.92	Pass
5	168.92	-91.56	-81.64	20.50	79.67	-15.49	25.00	600.00	-575.00	Pass
6	192.31	-96.36	-71.65	21.32	89.97	-5.19	267.65	600.00	-332.35	Pass
7	227.85	-96.01	-82.13	21.52	80.76	-14.40	32.13	1000.00	-967.87	Pass

Remarks:

1. The measured power level is converted to EIRP using the equation:

Follow ANSI 63.10 section 9.4 Equations to calculate and extrapolate field strength

$$E_{Meas} \text{ (dB}\mu\text{V/m)} = 126.8 - 20\log(\lambda) + P - G$$

where:

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

Follow ANSI 63.10 section 9.5 Equations to calculate EIRP

$$\text{EIRP Level (dBm/MHz)} = E_{Meas} \text{ (dB}\mu\text{V/m)} + 20 \cdot \log(d_{Meas}) - 104.7$$

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

Measurements made at 3 meter distance.

2. Power density formula as follows

Follow ANSI 63.10 section 9.6 Equations to calculate power density

$$PD = EIRP_{Linear} / 4\pi d^2$$

PD is the power density at the distance specified by the limit, in W/m²

EIRP_{Linear} is the equivalent isotropically radiated power, in watts

d is the 3m distance.

3. The far-field boundary is given in ANSI 63.10 as:

$$R \text{ far field} = (2 * L^2) / \lambda$$

L is the Largest Antenna Dimension of measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
40	0.03	0.0075	0.240
50	0.03	0.0060	0.300

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
50	0.025	0.0060	0.208
75	0.025	0.0040	0.313

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
75	0.018	0.0040	0.162
110	0.018	0.0027	0.238

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
110	0.012	0.0027	0.106
170	0.012	0.0018	0.163

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
170	0.008	0.0018	0.073
260	0.008	0.0012	0.111

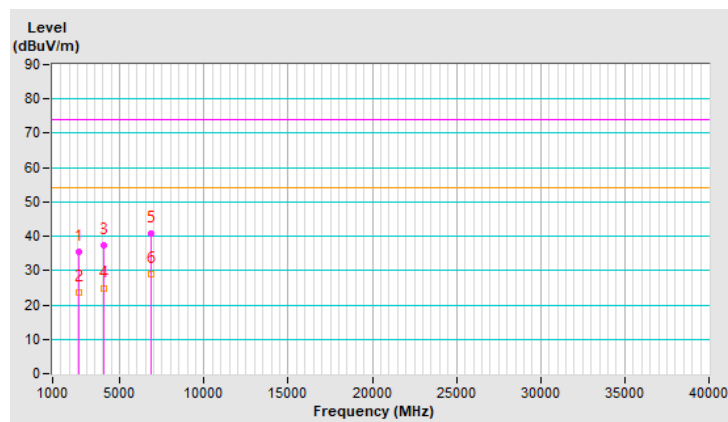
4.5.2 混附接收

操作模式：	接收		
基本波頻率 FRS / NRS：	76.800GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2544.13	35.4 PK	74.0	-38.6	1.50 H	222	36.7	-1.3
2	2544.13	23.6 AV	54.0	-30.4	1.50 H	222	24.9	-1.3
3	4023.68	37.5 PK	74.0	-36.5	2.50 H	82	35.7	1.8
4	4023.68	24.8 AV	54.0	-29.2	2.50 H	82	23.0	1.8
5	6822.81	40.9 PK	74.0	-33.1	2.00 H	271	33.1	7.8
6	6822.81	28.8 AV	54.0	-25.2	2.00 H	271	21.0	7.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

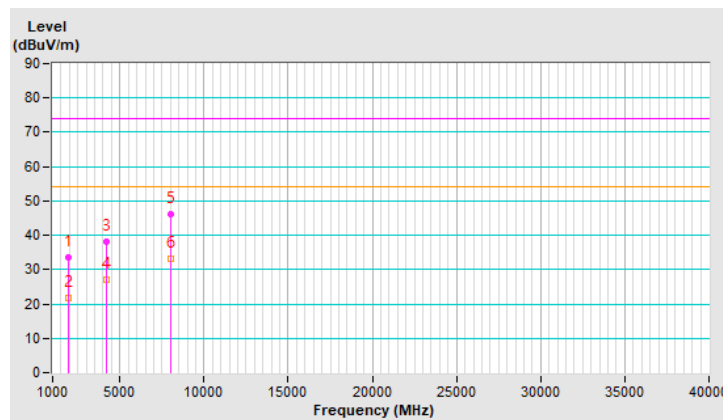


操作模式：	接收		
基本波頻率 FRS / NRS：	76.800GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1922.42	33.4 PK	74.0	-40.6	1.50 V	347	36.9	-3.5
2	1922.42	21.8 AV	54.0	-32.2	1.50 V	347	25.3	-3.5
3	4211.29	38.0 PK	74.0	-36.0	1.50 V	235	35.9	2.1
4	4211.29	26.9 AV	54.0	-27.1	1.50 V	235	24.8	2.1
5	8037.45	46.0 PK	74.0	-28.0	1.50 V	354	35.4	10.6
6	8037.45	33.2 AV	54.0	-20.8	1.50 V	354	22.6	10.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



4.6 量測結果 (模式 2)

4.6.1 混附發射

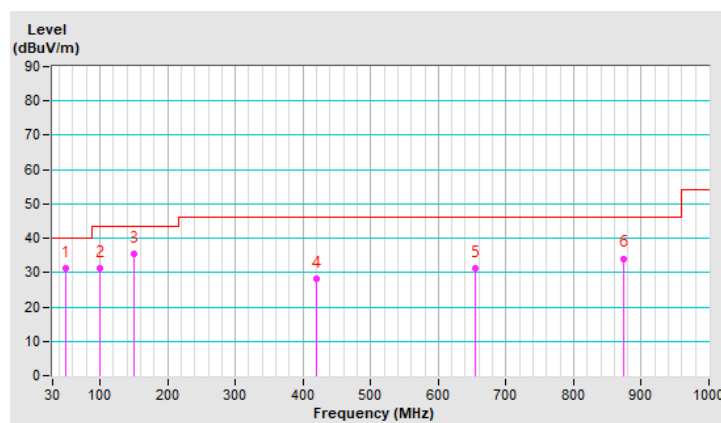
Below 1GHz Data

操作模式：	發射接收	頻率範圍：	Below 1GHz
基本波頻率 FRS / NRS：	76.547GHz / 76.395GHz	檢測器與頻寬：	(QP) RB=120kHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109 年 12 月 3 日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	49.40	31.2 QP	40.0	-8.8	1.50 H	48	38.7	-7.5
2	100.61	31.4 QP	43.5	-12.1	1.50 H	72	43.0	-11.6
3	150.56	35.5 QP	43.5	-8.0	2.00 H	71	42.5	-7.0
4	420.37	28.2 QP	46.0	-17.8	2.00 H	45	30.5	-2.3
5	655.39	31.4 QP	46.0	-14.6	1.50 H	85	28.2	3.2
6	873.02	34.1 QP	46.0	-11.9	3.00 H	112	27.2	6.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

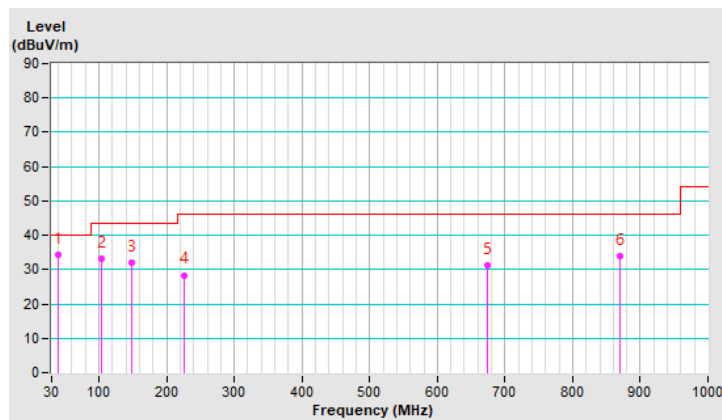


操作模式：	發射接收	頻率範圍：	Below 1GHz
基本波頻率 FRS / NRS：	76.547GHz / 76.395GHz	檢測器與頻寬：	(QP) RB=120kHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109 年 12 月 3 日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.05	34.2 QP	40.0	-5.8	1.00 V	148	42.4	-8.2
2	103.33	33.2 QP	43.5	-10.3	1.50 V	341	44.2	-11.0
3	148.41	32.0 QP	43.5	-11.5	1.50 V	274	39.1	-7.1
4	226.59	28.4 QP	46.0	-17.6	1.00 V	32	38.1	-9.7
5	673.36	31.1 QP	46.0	-14.9	2.00 V	251	27.6	3.5
6	869.91	34.0 QP	46.0	-12.0	1.00 V	347	27.0	7.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



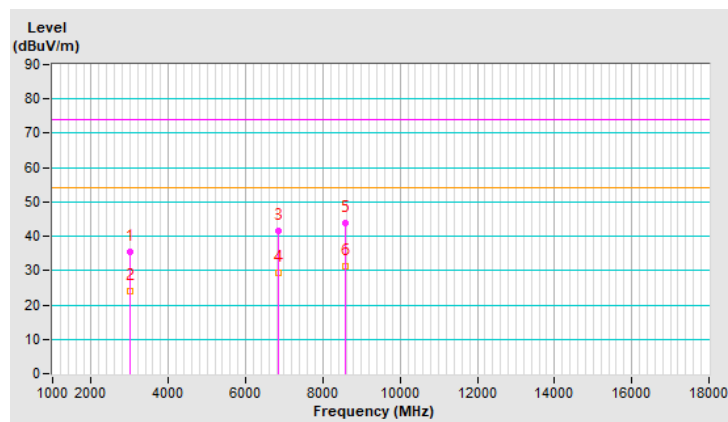
Above 1GHz Data

操作模式：	發射	頻率範圍：	1GHz ~ 18GHz
基本波頻率 FRS / NRS：	76.547GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2995.27	35.4 PK	74.0	-38.6	1.72 H	268	35.8	-0.4
2	2995.27	24.0 AV	54.0	-30.0	1.72 H	268	24.4	-0.4
3	6837.71	41.4 PK	74.0	-32.6	2.24 H	319	33.6	7.8
4	6837.71	29.3 AV	54.0	-24.7	2.24 H	319	21.5	7.8
5	8592.21	44.0 PK	74.0	-30.0	2.53 H	176	33.3	10.7
6	8592.21	31.4 AV	54.0	-22.6	2.53 H	176	20.7	10.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

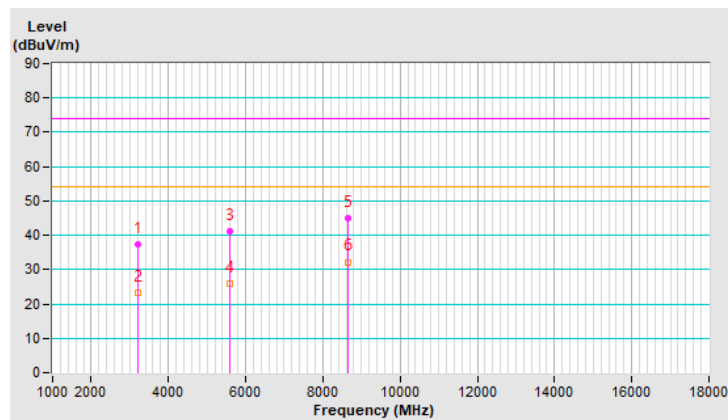


操作模式：	發射	頻率範圍：	1GHz ~ 18GHz
基本波頻率 FRS / NRS：	76.547GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109 年 12 月 3 日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3194.26	37.5 PK	74.0	-36.5	1.76 V	234	37.5	0.0
2	3194.26	23.4 AV	54.0	-30.6	1.76 V	234	23.4	0.0
3	5573.51	41.2 PK	74.0	-32.8	1.75 V	143	36.5	4.7
4	5573.51	25.8 AV	54.0	-28.2	1.75 V	143	21.1	4.7
5	8647.82	45.0 PK	74.0	-29.0	1.47 V	294	33.9	11.1
6	8647.82	32.2 AV	54.0	-21.8	1.47 V	294	21.1	11.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

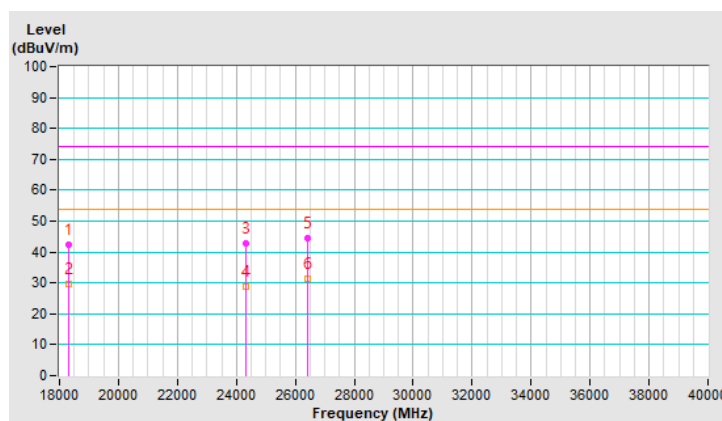


操作模式：	發射	頻率範圍：	18GHz ~ 40GHz
基本波頻率 FRS / NRS：	76.547GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	18329.52	42.3 PK	74.0	-31.7	1.67 H	205	49.2	-6.9
2	18329.52	29.6 AV	54.0	-24.4	1.67 H	205	36.5	-6.9
3	24325.47	43.0 PK	74.0	-31.0	1.71 H	189	45.8	-2.8
4	24325.47	29.0 AV	54.0	-25.0	1.71 H	189	31.8	-2.8
5	26416.23	44.6 PK	74.0	-29.4	1.55 H	176	46.0	-1.4
6	26416.23	31.5 AV	54.0	-22.5	1.55 H	176	32.9	-1.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

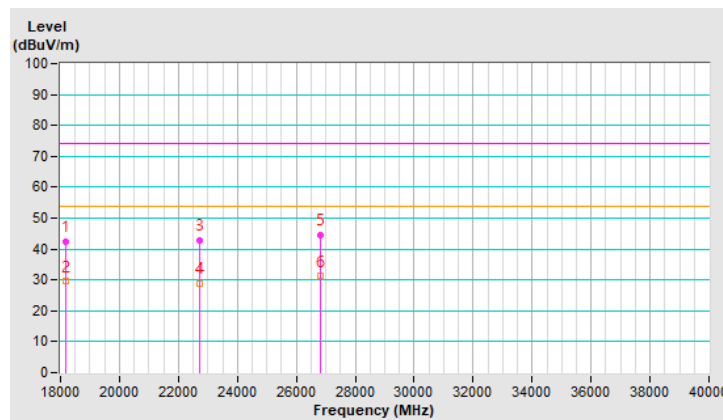


操作模式：	發射	頻率範圍：	18GHz ~ 40GHz
基本波頻率 FRS / NRS：	76.547GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	18178.28	42.3 PK	74.0	-31.7	1.72 V	143	49.1	-6.8
2	18178.28	29.5 AV	54.0	-24.5	1.72 V	143	36.3	-6.8
3	22721.78	42.9 PK	74.0	-31.1	1.69 V	214	46.6	-3.7
4	22721.78	29.0 AV	54.0	-25.0	1.69 V	214	32.7	-3.7
5	26836.25	44.4 PK	74.0	-29.6	1.49 V	243	45.4	-1.0
6	26836.25	31.2 AV	54.0	-22.8	1.49 V	243	32.2	-1.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



操作模式：	發射接收	頻率範圍：	40GHz ~ 231GHz
基本波頻率 FRS / NRS：	76.547GHz / 76.395GHz	測試儀器：	(AV) RB=1MHz, VB=3MHz
量測場地溫度：	25°C	量測場地濕度：	66%RH
測試日期：	109 年 12 月 01 日	測試者：	廖偉鈞

Antenna Polarity : Horizontal										
No.	Frequency (GHz)	SA Value (dBm)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm/MHz)	Power Density (pW/cm ²)	Power Density Limit (pW/cm ²)	Margin (pW/cm ²)	Pass/Fail
1	41.95	-73.17	-70.65	20.30	78.34	-16.81	18.42	600.00	-581.58	Pass
2	73.23	-72.16	-66.85	19.90	87.82	-7.34	163.11	600.00	-436.89	Pass
3	75.66	-71.52	-66.49	20.00	88.45	-6.70	188.86	600.00	-411.14	Pass
4	102.23	-92.18	-81.43	20.00	76.09	-19.06	10.97	600.00	-589.03	Pass
5	169.63	-91.42	-81.85	20.50	79.41	-15.75	23.55	600.00	-576.45	Pass
6	192.40	-95.91	-71.80	21.32	90.10	-5.05	276.18	600.00	-323.82	Pass
7	228.44	-96.13	-81.38	21.52	81.16	-14.00	35.22	1000.00	-964.78	Pass
Antenna Polarity : Vertical										
No.	Frequency (GHz)	SA Value (dBm)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm/MHz)	Power Density (pW/cm ²)	Power Density Limit (pW/cm ²)	Margin (pW/cm ²)	Pass/Fail
1	41.90	-73.70	-70.60	20.30	78.80	-16.36	20.46	600.00	-579.54	Pass
2	73.73	-72.30	-66.83	19.90	87.88	-7.28	165.52	600.00	-434.48	Pass
3	75.23	-71.83	-66.82	20.00	87.97	-7.19	168.79	600.00	-431.21	Pass
4	102.55	-92.72	-81.99	20.00	75.49	-19.67	9.54	600.00	-590.46	Pass
5	169.12	-91.71	-81.72	20.50	79.60	-15.56	24.60	600.00	-575.40	Pass
6	192.56	-96.58	-72.03	21.32	89.60	-5.56	245.86	600.00	-354.14	Pass
7	228.03	-96.05	-81.96	21.52	80.94	-14.22	33.46	1000.00	-966.54	Pass

Remarks:

1. The measured power level is converted to EIRP using the equation:

Follow ANSI 63.10 section 9.4 Equations to calculate and extrapolate field strength

$$E_{Meas} \text{ (dB}\mu\text{V/m)} = 126.8 - 20\log(\lambda) + P - G$$

where:

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

Follow ANSI 63.10 section 9.5 Equations to calculate EIRP

$$\text{EIRP Level (dBm/MHz)} = E_{Meas} \text{ (dB}\mu\text{V/m)} + 20 \cdot \log(d_{Meas}) - 104.7$$

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

Measurements made at 3 meter distance.

2. Power density formula as follows

Follow ANSI 63.10 section 9.6 Equations to calculate power density

$$PD = EIRP_{Linear} / 4\pi d^2$$

PD is the power density at the distance specified by the limit, in W/m²

EIRP_{Linear} is the equivalent isotropically radiated power, in watts

d is the 3m distance.

3. The far-field boundary is given in ANSI 63.10 as:

$$R \text{ far field} = (2 * L^2) / \lambda$$

L is the Largest Antenna Dimension of measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
40	0.03	0.0075	0.240
50	0.03	0.0060	0.300

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
50	0.025	0.0060	0.208
75	0.025	0.0040	0.313

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
75	0.018	0.0040	0.162
110	0.018	0.0027	0.238

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
110	0.012	0.0027	0.106
170	0.012	0.0018	0.163

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
170	0.008	0.0018	0.073
260	0.008	0.0012	0.111

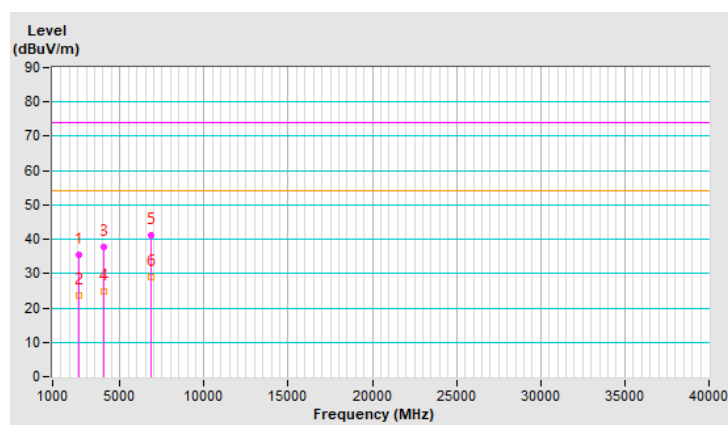
4.6.2 混附接收

操作模式：	接收		
基本波頻率 FRS / NRS：	76.547GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2547.49	35.5 PK	74.0	-38.5	1.50 H	189	36.8	-1.3
2	2547.49	23.7 AV	54.0	-30.3	1.50 H	189	25.0	-1.3
3	4027.38	37.6 PK	74.0	-36.4	2.50 H	63	35.9	1.7
4	4027.38	24.8 AV	54.0	-29.2	2.50 H	63	23.1	1.7
5	6824.76	41.0 PK	74.0	-33.0	2.00 H	257	33.2	7.8
6	6824.76	28.9 AV	54.0	-25.1	2.00 H	257	21.1	7.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

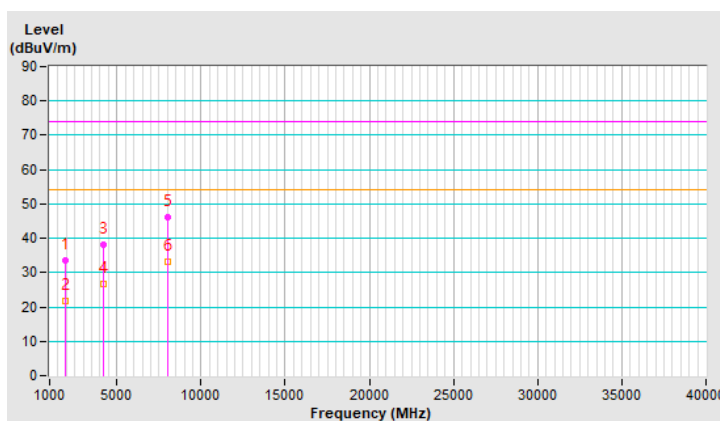


操作模式：	接收		
基本波頻率 FRS / NRS：	76.547GHz / 76.395GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1926.29	33.5 PK	74.0	-40.5	1.50 V	325	37.0	-3.5
2	1926.29	21.8 AV	54.0	-32.2	1.50 V	325	25.3	-3.5
3	4214.66	38.0 PK	74.0	-36.0	1.50 V	212	35.9	2.1
4	4214.66	26.8 AV	54.0	-27.2	1.50 V	212	24.7	2.1
5	8042.27	46.1 PK	74.0	-27.9	1.50 V	358	35.4	10.7
6	8042.27	33.2 AV	54.0	-20.8	1.50 V	358	22.5	10.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



4.7 量測結果 (模式 3)

4.7.1 混附發射

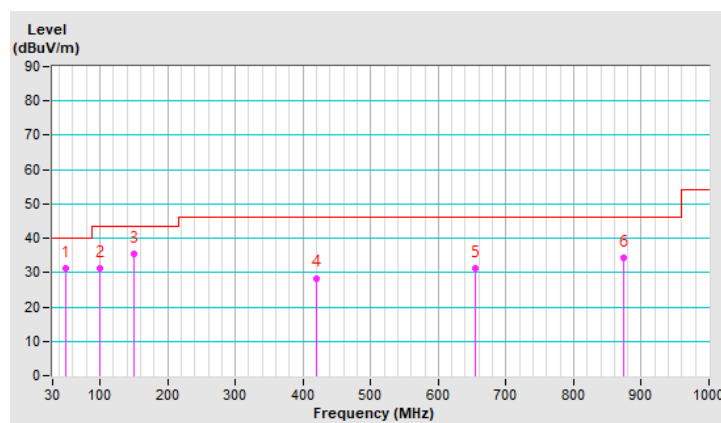
Below 1GHz Data

操作模式：	發射接收	頻率範圍：	Below 1GHz
基本波頻率 F R S：	76.538GHz	檢測器與頻寬：	(QP) RB=120kHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109 年 12 月 3 日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	49.37	31.1 QP	40.0	-8.9	1.50 H	57	38.6	-7.5
2	100.57	31.2 QP	43.5	-12.3	1.50 H	86	42.8	-11.6
3	150.49	35.3 QP	43.5	-8.2	2.00 H	86	42.3	-7.0
4	420.32	28.4 QP	46.0	-17.6	2.00 H	63	30.7	-2.3
5	655.34	31.2 QP	46.0	-14.8	1.50 H	97	28.0	3.2
6	872.97	34.2 QP	46.0	-11.8	3.00 H	134	27.3	6.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

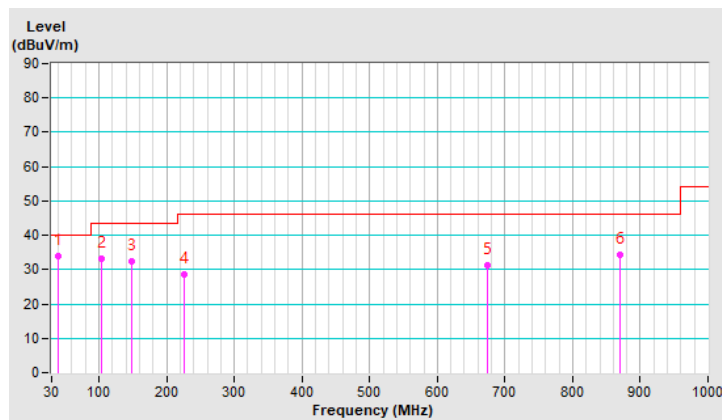


操作模式：	發射接收	頻率範圍：	Below 1GHz
基本波頻率 F R S：	76.538GHz	檢測器與頻寬：	(QP) RB=120kHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109 年 12 月 3 日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.02	34.0 QP	40.0	-6.0	1.00 V	128	42.2	-8.2
2	103.29	33.3 QP	43.5	-10.2	1.50 V	352	44.3	-11.0
3	148.36	32.3 QP	43.5	-11.2	1.50 V	248	39.4	-7.1
4	226.56	28.6 QP	46.0	-17.4	1.00 V	75	38.3	-9.7
5	673.30	31.3 QP	46.0	-14.7	2.00 V	227	27.8	3.5
6	869.86	34.2 QP	46.0	-11.8	1.00 V	332	27.2	7.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



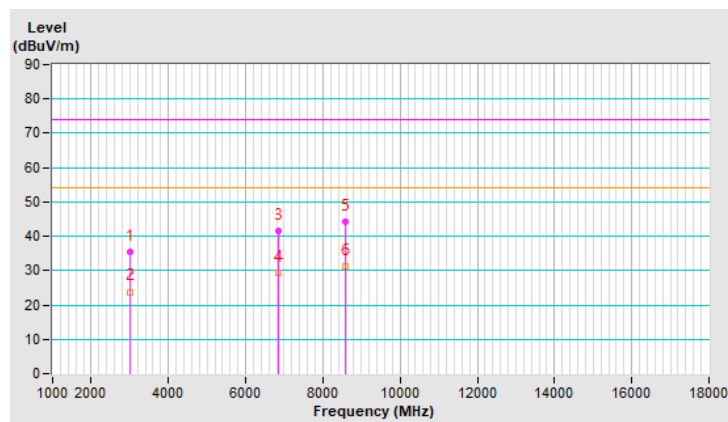
Above 1GHz Data

操作模式：	發射	頻率範圍：	1GHz ~ 18GHz
基本波頻率 F R S：	76.538GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2991.82	35.3 PK	74.0	-38.7	1.64 H	293	35.7	-0.4
2	2991.82	23.8 AV	54.0	-30.2	1.64 H	293	24.2	-0.4
3	6834.65	41.5 PK	74.0	-32.5	2.07 H	326	33.7	7.8
4	6834.65	29.3 AV	54.0	-24.7	2.07 H	326	21.5	7.8
5	8594.63	44.1 PK	74.0	-29.9	2.49 H	193	33.3	10.8
6	8594.63	31.3 AV	54.0	-22.7	2.49 H	193	20.5	10.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

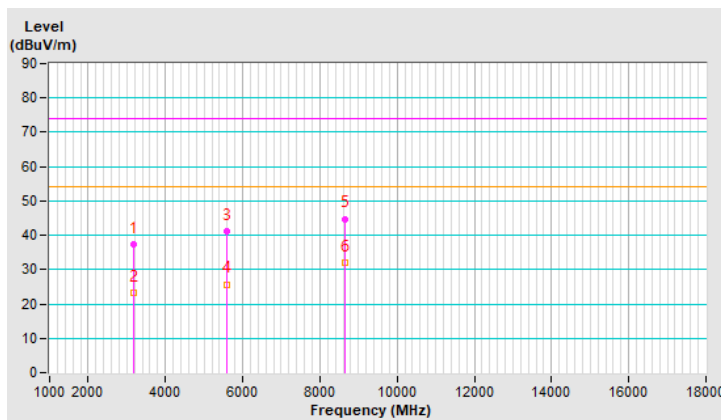


操作模式：	發射	頻率範圍：	1GHz ~ 18GHz
基本波頻率 F R S：	76.538GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3191.82	37.4 PK	74.0	-36.6	1.89 V	263	37.4	0.0
2	3191.82	23.3 AV	54.0	-30.7	1.89 V	263	23.3	0.0
3	5577.48	41.3 PK	74.0	-32.7	1.64 V	173	36.7	4.6
4	5577.48	25.7 AV	54.0	-28.3	1.64 V	173	21.1	4.6
5	8644.97	44.8 PK	74.0	-29.2	1.42 V	306	33.7	11.1
6	8644.97	32.0 AV	54.0	-22.0	1.42 V	306	20.9	11.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

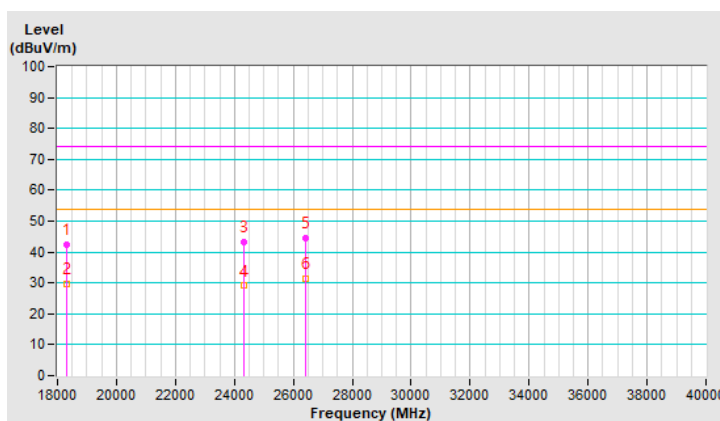


操作模式：	發射	頻率範圍：	18GHz ~ 40GHz
基本波頻率 F R S：	76.538GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	18324.15	42.5 PK	74.0	-31.5	1.74 H	243	49.4	-6.9
2	18324.15	29.8 AV	54.0	-24.2	1.74 H	243	36.7	-6.9
3	24321.29	43.2 PK	74.0	-30.8	1.63 H	158	46.0	-2.8
4	24321.29	29.1 AV	54.0	-24.9	1.63 H	158	31.9	-2.8
5	26409.85	44.5 PK	74.0	-29.5	1.38 H	204	45.9	-1.4
6	26409.85	31.4 AV	54.0	-22.6	1.38 H	204	32.8	-1.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

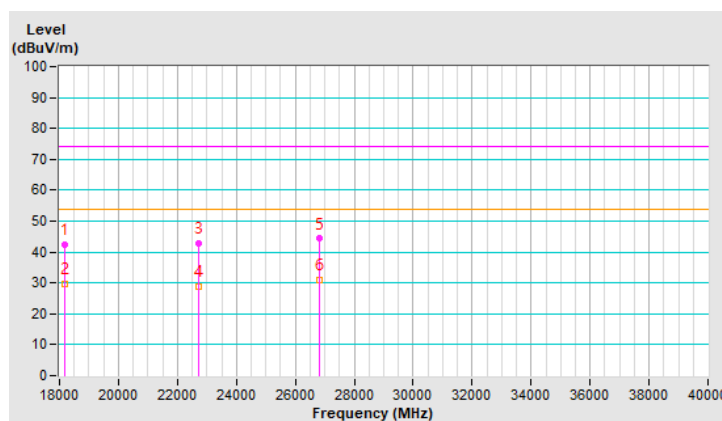


操作模式：	發射	頻率範圍：	18GHz ~ 40GHz
基本波頻率 F R S：	76.538GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	18183.24	42.5 PK	74.0	-31.5	1.89 V	163	49.3	-6.8
2	18183.24	29.7 AV	54.0	-24.3	1.89 V	163	36.5	-6.8
3	22724.63	43.0 PK	74.0	-31.0	1.73 V	199	46.7	-3.7
4	22724.63	29.0 AV	54.0	-25.0	1.73 V	199	32.7	-3.7
5	26835.19	44.3 PK	74.0	-29.7	1.58 V	218	45.3	-1.0
6	26835.19	31.1 AV	54.0	-22.9	1.58 V	218	32.1	-1.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



操作模式：	發射接收	頻率範圍：	40GHz ~ 231GHz
基本波頻率 F R S：	76.538GHz	測試儀器：	(AV) RB=1MHz, VB=3MHz
量測場地溫度：	25°C	量測場地濕度：	66%RH
測試日期：	109 年 12 月 01 日	測試者：	廖偉鈞

Antenna Polarity : Horizontal										
No.	Frequency (GHz)	SA Value (dBm)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm/MHz)	Power Density (pW/cm ²)	Power Density Limit (pW/cm ²)	Margin (pW/cm ²)	Pass/Fail
1	42.30	-73.47	-71.14	20.30	78.34	-16.81	18.42	600.00	-581.58	Pass
2	73.53	-72.15	-66.87	19.90	87.82	-7.34	163.11	600.00	-436.89	Pass
3	75.30	-71.56	-66.34	20.00	88.45	-6.70	188.86	600.00	-411.14	Pass
4	102.29	-92.36	-81.36	20.00	76.09	-19.06	10.97	600.00	-589.03	Pass
5	169.71	-91.78	-81.94	20.50	79.41	-15.75	23.55	600.00	-576.45	Pass
6	192.67	-95.73	-71.53	21.32	90.10	-5.05	276.18	600.00	-323.82	Pass
7	228.09	-96.08	-81.74	21.52	81.16	-14.00	35.22	1000.00	-964.78	Pass
Antenna Polarity : Vertical										
No.	Frequency (GHz)	SA Value (dBm)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm/MHz)	Power Density (pW/cm ²)	Power Density Limit (pW/cm ²)	Margin (pW/cm ²)	Pass/Fail
1	41.99	-73.55	-71.01	20.30	78.41	-16.75	18.70	600.00	-581.30	Pass
2	73.86	-72.25	-67.10	19.90	87.63	-7.53	156.09	600.00	-443.91	Pass
3	75.28	-71.81	-66.97	20.00	87.82	-7.34	163.27	600.00	-436.73	Pass
4	102.25	-92.75	-81.97	20.00	75.48	-19.68	9.53	600.00	-590.47	Pass
5	169.06	-91.92	-81.85	20.50	79.47	-15.69	23.86	600.00	-576.14	Pass
6	192.30	-96.17	-72.05	21.32	89.57	-5.59	244.07	600.00	-355.93	Pass
7	227.89	-96.17	-81.93	21.52	80.96	-14.20	33.65	1000.00	-966.35	Pass

Remarks:

1. The measured power level is converted to EIRP using the equation:

Follow ANSI 63.10 section 9.4 Equations to calculate and extrapolate field strength

$$E_{Meas} \text{ (dB}\mu\text{V/m)} = 126.8 - 20\log(\lambda) + P - G$$

where:

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

Follow ANSI 63.10 section 9.5 Equations to calculate EIRP

$$\text{EIRP Level (dBm/MHz)} = E_{Meas} \text{ (dB}\mu\text{V/m)} + 20 \cdot \log(d_{Meas}) - 104.7$$

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

Measurements made at 3 meter distance.

2. Power density formula as follows

Follow ANSI 63.10 section 9.6 Equations to calculate power density

$$PD = EIRP_{Linear} / 4\pi d^2$$

PD is the power density at the distance specified by the limit, in W/m²

EIRP_{Linear} is the equivalent isotropically radiated power, in watts

d is the 3m distance.

3. The far-field boundary is given in ANSI 63.10 as:

$$R \text{ far field} = (2 * L^2) / \lambda$$

L is the Largest Antenna Dimension of measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
40	0.03	0.0075	0.240
50	0.03	0.0060	0.300

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
50	0.025	0.0060	0.208
75	0.025	0.0040	0.313

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
75	0.018	0.0040	0.162
110	0.018	0.0027	0.238

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
110	0.012	0.0027	0.106
170	0.012	0.0018	0.163

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
170	0.008	0.0018	0.073
260	0.008	0.0012	0.111

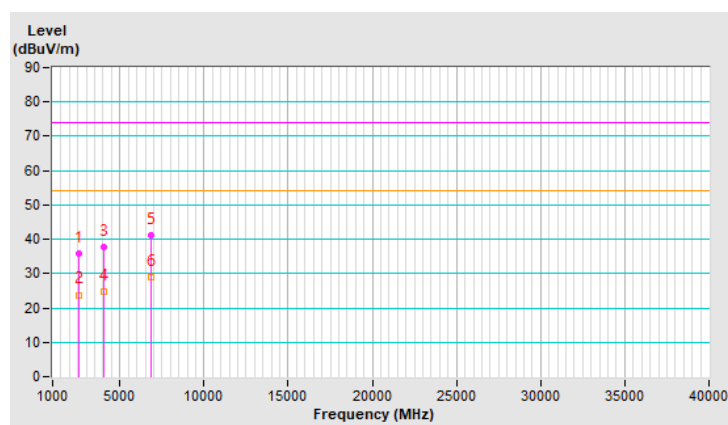
4.7.2 混附接收

操作模式：	接收		
基本波頻率 F R S：	76.538GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0°C	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2549.27	35.7 PK	74.0	-38.3	1.50 H	193	37.0	-1.3
2	2549.27	23.8 AV	54.0	-30.2	1.50 H	193	25.1	-1.3
3	4028.44	37.7 PK	74.0	-36.3	2.50 H	56	36.0	1.7
4	4028.44	24.9 AV	54.0	-29.1	2.50 H	56	23.2	1.7
5	6827.51	41.2 PK	74.0	-32.8	2.00 H	273	33.4	7.8
6	6827.51	29.0 AV	54.0	-25.0	2.00 H	273	21.2	7.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

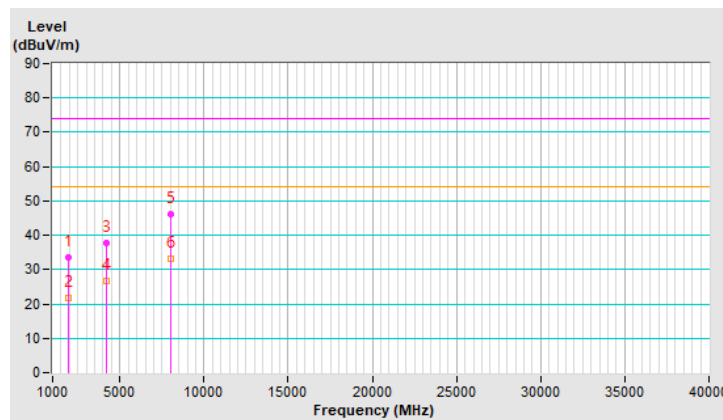


操作模式：	接收		
基本波頻率 F R S：	76.538GHz	檢測器與頻寬：	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度：	22.0℃	量測場地濕度：	70.0%RH
測試日期：	109年12月3日	測試者：	杜維倫

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1924.51	33.5 PK	74.0	-40.5	1.50 V	319	36.9	-3.4
2	1924.51	21.7 AV	54.0	-32.3	1.50 V	319	25.1	-3.4
3	4212.93	37.9 PK	74.0	-36.1	1.50 V	198	35.9	2.0
4	4212.93	26.6 AV	54.0	-27.4	1.50 V	198	24.6	2.0
5	8043.66	46.0 PK	74.0	-28.0	1.50 V	342	35.3	10.7
6	8043.66	33.1 AV	54.0	-20.9	1.50 V	342	22.4	10.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



4.8 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

4.9 配置照片

請參照 Test Setup Photos (BV 編號: 201030E01)

5 發射功率密度之量測

5.1 適用標準

請見本報告 3.1 節第(4)項的規定。

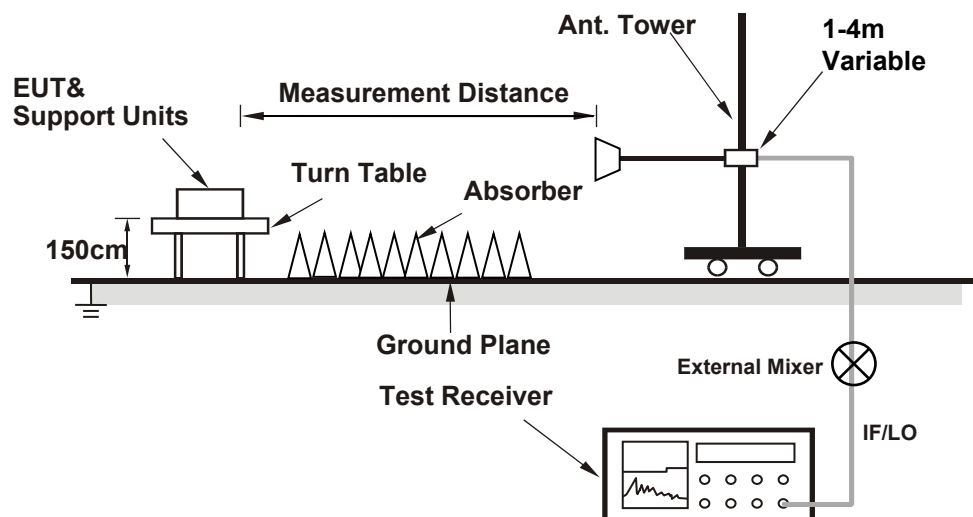
5.2 量測方法

將待測物置於 1.5 米高的非金屬桌面，使其操作在工作狀態。接收天線置於適當量測距離。桌面要 360 度旋轉，另外接收天線從離地 1 米至 4 米升降變化，以找出最大的發射功率密度強度，接收天線分別置於水平、垂直極化各執行測試一次。

5.3 量測儀器

同 4.3 節

5.4 測試配置



5.5 量測結果 (模式 1)

操作模式	發射	測試日期	109 年 12 月 01 日
基本波頻率 FRS / NRS :	76.800GHz / 76.395GHz	測試儀器	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度	25°C	量測場地濕度	66%RH
測試者	廖偉鈞		

Antenna Polarity : Horizontal								
No.	Frequency (GHz)	SA Value (mV)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm)	EIRP Limit (dBm)	Pass/Fail
1	76.50	-57.17	-20.29	20.00	125.10	20.4 PK	55.00	Pass
2	76.50	-58.04	-22.71	20.00	122.68	17.98 AV	50.00	Pass
Antenna Polarity : Vertical								
No.	Frequency (GHz)	SA Value (mV)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm)	EIRP Limit (dBm)	Pass/Fail
1	76.50	-32.36	-5.41	20.00	139.98	35.28 PK	55.00	Pass
2	76.50	-34.16	-9.13	20.00	136.26	31.56 AV	50.00	Pass

Remarks:

1. The measured power level is converted to EIRP using the equation:

Follow ANSI 63.10 section 9.4 Equations to calculate and extrapolate field strength

$$E_{\text{Meas}} (\text{dB}\mu\text{V/m}) = 126.8 - 20\log(\lambda) + P - G$$

where:

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

Follow ANSI 63.10 section 9.5 Equations to calculate EIRP

$$\text{EIRP Level (dBm/MHz)} = E_{\text{Meas}} (\text{dB}\mu\text{V/m}) + 20 \cdot \log(d_{\text{Meas}}) - 104.7$$

where:

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

Measurements made at 1 meter distance.

2. The far-field boundary is given in ANSI 63.10 as:

$$R_{\text{far field}} = (2 \cdot L^2) / \lambda$$

L is the Largest Antenna Dimension of either the EUT antenna or measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
76.5	0.01	0.00392	0.051

5.6 量測結果 (模式 2)

操作模式	發射	測試日期	109 年 12 月 01 日
基本波頻率 FRS / NRS :	76.547GHz / 76.395GHz	測試儀器	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度	25°C	量測場地濕度	66%RH
測試者	廖偉鈺		

Antenna Polarity : Horizontal								
No.	Frequency (GHz)	SA Value (mV)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm)	EIRP Limit (dBm)	Pass/Fail
1	76.50	-57.46	-20.08	20.00	125.31	20.61 PK	55.00	Pass
2	76.50	-58.95	-22.47	20.00	122.92	18.22 AV	50.00	Pass
Antenna Polarity : Vertical								
No.	Frequency (GHz)	SA Value (mV)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm)	EIRP Limit (dBm)	Pass/Fail
1	76.50	-32.31	-5.18	20.00	140.21	35.51 PK	55.00	Pass
2	76.50	-33.70	-8.87	20.00	136.52	31.82 AV	50.00	Pass

Remarks:

1. The measured power level is converted to EIRP using the equation:

Follow ANSI 63.10 section 9.4 Equations to calculate and extrapolate field strength

$$E_{Meas} \text{ (dB}\mu\text{V/m)} = 126.8 - 20\log(\lambda) + P - G$$

where:

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

Follow ANSI 63.10 section 9.5 Equations to calculate EIRP

$$\text{EIRP Level (dBm/MHz)} = E_{Meas} \text{ (dB}\mu\text{V/m)} + 20 \cdot \log(d_{Meas}) - 104.7$$

where:

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

Measurements made at 1 meter distance.

2. The far-field boundary is given in ANSI 63.10 as:

$$R \text{ far field} = (2 \cdot L^2) / \lambda$$

L is the Largest Antenna Dimension of either the EUT antenna or measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
76.5	0.01	0.00392	0.051

5.7 量測結果 (模式 3)

操作模式	發射	測試日期	109 年 12 月 01 日
基本波頻率 FRS:	76.538GHz	測試儀器	(PK) RB=1MHz, VB=3MHz (AV) RB=1MHz, VB=3MHz
量測場地溫度	25°C	量測場地濕度	66%RH
測試者	廖偉鈺		

Antenna Polarity : Horizontal								
No.	Frequency (GHz)	SA Value (mV)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm)	EIRP Limit (dBm)	Pass/Fail
1	76.538	-57.78	-20.43	20.00	124.97	20.27 PK	55.00	Pass
2	76.538	-58.03	-22.92	20.00	122.48	17.78 AV	50.00	Pass
Antenna Polarity : Vertical								
No.	Frequency (GHz)	SA Value (mV)	Power (dBm)	Gain of test Antenna (dBi)	E _{Meas} (dBμV/m)	EIRP Level (dBm)	EIRP Limit (dBm)	Pass/Fail
1	76.538	-32.74	-5.52	20.00	139.88	35.18 PK	55.00	Pass
2	76.538	-33.97	-9.27	20.00	136.13	31.43 AV	50.00	Pass

Remarks:

1. The measured power level is converted to EIRP using the equation:

Follow ANSI 63.10 section 9.4 Equations to calculate and extrapolate field strength

$$E_{\text{Meas}} (\text{dB}\mu\text{V/m}) = 126.8 - 20\log(\lambda) + P - G$$

where:

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

Follow ANSI 63.10 section 9.5 Equations to calculate EIRP

$$\text{EIRP Level (dBm/MHz)} = E_{\text{Meas}} (\text{dB}\mu\text{V/m}) + 20 \cdot \log(d_{\text{Meas}}) - 104.7$$

where:

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

Measurements made at 1 meter distance.

2. The far-field boundary is given in ANSI 63.10 as:

$$R_{\text{far field}} = (2 \cdot L^2) / \lambda$$

L is the Largest Antenna Dimension of either the EUT antenna or measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
76.538	0.01	0.00392	0.051

5.8 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

6 頻率穩定度之量測

6.1 適用標準

請見本報告 3.1 節第(6)項的規定。

6.2 量測方法

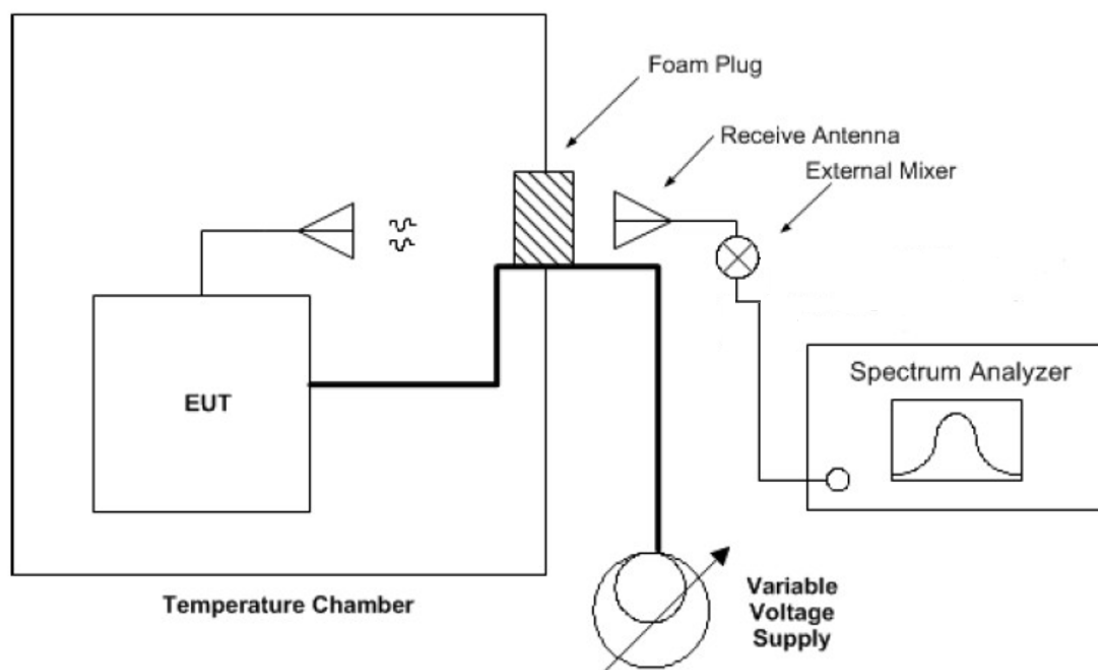
- 將待測物之天線對準接收天線並連至測試儀器。
- 設定待測物為無調變狀況,設定解析頻寬為 10 kHz,視訊頻寬大於解析頻寬。
- 觀察其頻率飄移的狀況。
- 依不同溫度和電壓變化狀況,依上面步驟重覆測試。
- 將所測的頻率飄移狀況記錄於報告內。

6.3 量測儀器

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Keysight	N9030A	MY55330160	Feb. 07, 2020	Feb. 06, 2021
*Conical Horn Antenna (75~110GHz) Keysight	WR10CH-Conical	WR10CH_001	Jan. 20, 2020	Jan. 19, 2022
N9029AV10-DC9 - 75-110 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension WR10	SAX 378	CoC	CoC
DC Power Supply Topward	6603D	795558	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP -AR	MAA0812-008	Jan. 16, 2020	Jan. 15, 2021
True RMS Clamp Meter FLUKE	325	31130711WS	June 06, 2020	June 05, 2021

- NOTE:**
- The test was performed in Oven room 2.
 - The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 - *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 - Certificate of Conformance (CoC) which is issued by manufacturer states that the product meets the specification.

6.4 測試配置



6.5 量測結果

操作模式：	發射	測試日期：	109年12月01日
量測場地溫度：	22°C	量測場地濕度：	62%RH
測試者：	廖偉鈞		

Frequency Stability Versus Voltage													
Test Frequency :		76500 MHz		Frequency Range (MHz) :		76000 ~ 77000		Pass / Fail		Pass			
Temperature (°C)	Power Supply (Vdc)	Frequency Over Time Of Reading Tolerance											
		0 minutes			2 minutes			5 minutes			10 minutes		
		FL(MHz)	FH(MHz)	Pass/Fail	FL(MHz)	FH(MHz)	Pass/Fail	FL(MHz)	FH(MHz)	Pass/Fail	FL(MHz)	FH(MHz)	Pass/Fail
85	12	76023.26	76970.20	Pass	76023.24	76970.20	Pass	76023.24	76970.23	Pass	76023.27	76970.25	Pass
80	12	76023.21	76970.37	Pass	76023.15	76970.35	Pass	76023.16	76970.32	Pass	76023.21	76970.35	Pass
70	12	76023.32	76970.09	Pass	76023.36	76970.09	Pass	76023.31	76970.10	Pass	76023.33	76970.09	Pass
60	12	76022.75	76970.63	Pass	76022.73	76970.60	Pass	76022.71	76970.63	Pass	76022.72	76970.58	Pass
50	12	76022.71	76970.51	Pass	76022.69	76970.48	Pass	76022.71	76970.49	Pass	76022.72	76970.54	Pass
40	12	76023.09	76970.17	Pass	76023.11	76970.16	Pass	76023.07	76970.21	Pass	76023.06	76970.14	Pass
30	12	76023.09	76970.02	Pass	76023.07	76970.03	Pass	76023.09	76970.07	Pass	76023.10	76970.01	Pass
20	12	76023.18	76970.54	Pass	76023.18	76970.56	Pass	76023.20	76970.56	Pass	76023.16	76970.53	Pass
10	12	76023.12	76970.09	Pass	76023.08	76970.06	Pass	76023.07	76970.07	Pass	76023.12	76970.09	Pass
0	12	76023.04	76970.55	Pass	76023.01	76970.56	Pass	76023.01	76970.52	Pass	76023.03	76970.51	Pass
-10	12	76022.81	76970.69	Pass	76022.76	76970.74	Pass	76022.74	76970.70	Pass	76022.79	76970.73	Pass
-20	12	76023.19	76970.43	Pass	76023.23	76970.39	Pass	76023.22	76970.40	Pass	76023.24	76970.46	Pass
-30	12	76022.72	76970.13	Pass	76022.71	76970.14	Pass	76022.77	76970.12	Pass	76022.75	76970.14	Pass
-40	12	76023.11	76970.62	Pass	76023.11	76970.59	Pass	76023.09	76970.60	Pass	76023.10	76970.62	Pass

Frequency Stability Versus Voltage													
Test Frequency :		76500 MHz		Frequency Range (MHz) :		76000 ~ 77000		Pass / Fail		Pass			
Temperature (°C)	Power Supply (Vdc)	Frequency over time of reading tolerance											
		0 minutes			2 minutes			5 minutes			10 minutes		
		FL(MHz)	FH(MHz)	Pass/Fail	FL(MHz)	FH(MHz)	Pass/Fail	FL(MHz)	FH(MHz)	Pass/Fail	FL(MHz)	FH(MHz)	Pass/Fail
20	13.8	76023.19	76970.35	Pass	76023.18	76970.27	Pass	76023.19	76970.34	Pass	76023.15	76970.31	Pass
	12	76023.18	76970.34	Pass	76023.18	76970.27	Pass	76023.20	76970.33	Pass	76023.16	76970.29	Pass
	10.2	76023.19	76970.33	Pass	76023.16	76970.26	Pass	76023.19	76970.33	Pass	76023.18	76970.30	Pass

6.6 量測結果判定

依據測試數據結果，符合低功率射頻器材技術規範之要求。

7 天線之要求

7.1 適用標準

請見本報告 3.1 節第(3)項的規定。

7.2 天線之規定

此待測物搭配 Micro-trip line Antenna，無使用天線接頭。

7.3 結果判定

符合低功率射頻器材技術規範之要求。

8 電波暴露量之評估

8.1 適用標準

請見本報告 3.1 節第(7)項的規定。

8.2 評估方法

a) 以 5.5 至 5.7 節所測得的最大平均輸出功率值帶入下面公式換算出待測物所輻射的功率密度。

b) $P_d = (P_{out} * G) / (4 * \pi * r^2)$

where

P_d = power density in mW/cm^2

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

8.3 評估結果

Frequency (GHz)	Max. Avg. EIRP (dBm)	Max. Avg. EIRP (mW)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Pass/ Fail
76~77	31.82	1520.548	20	0.30250	1	Pass

9 檢測實驗室基本資料

立德國際商品試驗有限公司桃園分公司提供產業界最佳的檢測以及諮詢服務。
本公司為 ISO/IEC 17025 認可實驗室。

如您有任何問題或建議，請與下列實驗室聯絡：

林口 EMC / RF 實驗室：

Tel: 886-2-26052180

Fax: 886-2-26051924

新竹 EMC / RF 及通訊實驗室：

Tel: 886-3-6668565

Fax: 886-3-6668323

華亞 EMC / RF / Safety 實驗室：

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

您也可以在我們的網站內找到各實驗室的地圖。

---END---