

低功率射頻電機技術規範測試報告

報告編號	RT141210C03B
申請者	金鈴汽車股份有限公司
產品名稱	Car Audio
型號	FT0086A
製造廠商	DENSO TEN Limited / Japan
商標或廠牌	SUZUKI
該產品樣品試驗 依據之試驗標準	國家通訊傳播委員會低功率射頻電機技術規範 107 年 1 月修訂
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 林口實驗室

日期 107 年 04 月 10 日

報告簽署人簽章:

陳志偉



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報告發行紀錄

Issue No.	Description	Date Issued
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證 明 書

發行日期：107 年 04 月 10 日

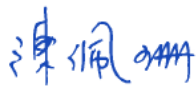
產 品 名 稱：Car Audio
商 標：SUZUKI
型 號：FT0086A
申 請 者：金鈴汽車股份有限公司
量 測 規 範：低功率射頻電機技術規範 LP0002
ANSI C63.10-2013

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一組(型號：FT0086A)，此份測試報告為原始報告 Report No.: RT141210C03A (原證書號碼為 CCAB15LP0540T0) 之系列報告。原收件日期 103 年 12 月 10 日，於 103 年 12 月 11 日至 103 年 12 月 13 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。此次變更商標及製造商，依據 LP0002 標準執行免測判定並確認可不需重作測試。

立德桃園分公司依“低功率射頻電機技術規範”、“低功率電波輻射性電機管理辦法”及“電信管制射頻器材審驗辦法”製作測試結果報告。

特 此 證 明 ！

報告製作者：



陳佩珊/高級專員

， 日 期： 107 年 04 月 10 日

審 核 者：



陳志偉/專案工程師

， 日 期： 107 年 04 月 10 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：新北市林口區嘉寶里 14 鄰 47-2 號

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 低功率射頻電機量測記錄表

申請廠商: 金鈴汽車股份有限公司

製造廠商: DENSO TEN Limited / Japan

申請廠商地址: 新北市板橋區中山路 1 段 156 號 5 樓

廠牌: SUZUKI

產品名稱: Car Audio

型號: FT0086A

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

林口實驗室華亞檢測部

量測單位地址: 桃園市龜山區文化里華亞二路 19 號

量測單位認可編號: TAF 2021 (9kHz~40GHz)

量測規範: 低功率射頻電機技術規範 LP0002

ANSI C63.10-2013

Bluetooth 頻段概要

項次	量測項目	規 範	量測結果判定
1	帶外發射	低功率射頻電機技術規範 3.10.1.5	合格
2	電源線傳導干擾	低功率射頻電機技術規範 2.3 節	Note 1
3	20 dB 頻寬	低功率射頻電機技術規範 3.10.1.6 節	Note 2
4	峰值傳導輸出功率	低功率射頻電機技術規範 3.10.1.2 節	合格
5	跳頻頻道數之量測	低功率射頻電機技術規範 3.10.1.6 節	合格
6	跳頻頻道間隔之量測	低功率射頻電機技術規範 3.10.1.6 節	合格
7	每一頻道停留時間之量測	低功率射頻電機技術規範 3.10.1.6 節	合格

Note:

1. 此待測設備使用 DC 電源，故無需執行傳導干擾電壓量測。
2. 此頻寬測試值為跳頻頻道間隔之量測參考值

2 一般敘述

2.1 待測設備

產品名稱：	Car Audio
型號：	FT0086A
額定電源：	14Vdc, 1.2A
調變方式：	GFSK, $\pi/4$ -DQPSK, 8DPSK
傳輸速率：	1/ 2/ 3Mbps
載波頻率：	2402 ~ 2480MHz
頻道數：	79
發射功率(電場強度)：	1.14dBm
天線種類：	見註 1
電源線類別：	NA
信號線類別：	NA
配件：	NA

註 1: 此待測設備搭配測試的天線，其資料如下：

天線型式	製造廠商	型號	接頭型式	增益(dBi)
Inverted-F PCB Antenna	CHANGZHOU Impel Technology Co., Ltd	NF2301	N/A	-9.1 dBi

註 2: 此報告中，場強輻射量經過評估後以下列測試模式進行最終量測。

量測項目	發射	接收
1GHz 以上量測	GFSK: Ch 0, 39, 78 8DPSK: Ch 0, 39, 78	GFSK: Ch 0, 39, 78
其它不必要之訊號	GFSK: Ch 0	

註 3: Bluetooth EDR 傳輸模式 DH1、DH3 及 DH5 皆經過預測試，其中以 DH5 的傳輸模式具有較大干擾雜訊，因此僅以此傳輸模式進行最終量測。

註 4: 此待測設備使用DC電源，故無需執行傳導干擾電壓量測。

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此裝置各頻道的中心頻率如下：

Bluetooth EDR 頻段：

頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)	頻道	對應頻率 (MHz)
0	2402	14	2416	28	2430	42	2444	56	2458	70	2472
1	2403	15	2417	29	2431	43	2445	57	2459	71	2473
2	2404	16	2418	30	2432	44	2446	58	2460	72	2474
3	2405	17	2419	31	2433	45	2447	59	2461	73	2475
4	2406	18	2420	32	2434	46	2448	60	2462	74	2476
5	2407	19	2421	33	2435	47	2449	61	2463	75	2477
6	2408	20	2422	34	2436	48	2450	62	2464	76	2478
7	2409	21	2423	35	2437	49	2451	63	2465	77	2479
8	2410	22	2424	36	2438	50	2452	64	2466	78	2480
9	2411	23	2425	37	2439	51	2453	65	2467		
10	2412	24	2426	38	2440	52	2454	66	2468		
11	2413	25	2427	39	2441	53	2455	67	2469		
12	2414	26	2428	40	2442	54	2456	68	2470		
13	2415	27	2429	41	2443	55	2457	69	2471		

詳細之規格請參考使用說明書，產品的照片請參照BV報告編號: 141210C03B。

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。

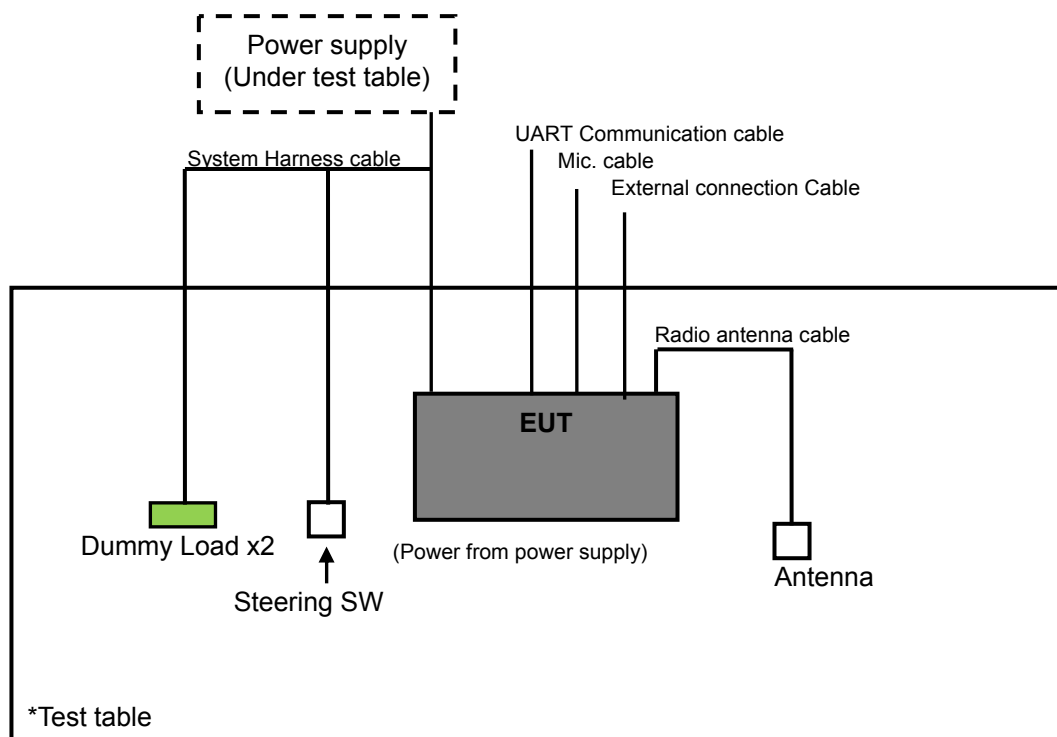
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Power Supply	TOP WARD	6603A	725906	NA	-
B.	Dummy Load	NA	NA	NA	NA	
C.	Steering SW	NA	NA	NA	NA	

No.	Signal Cable Description of the above Support Units
1	4.05m USB non-shielded cable without core
2	1.8m System Harness non-shielded cable without core
3	0.4m USB adaptor shielded cable without core
4	0.31m UART Communication non-shielded cable without core
5	1.0m Mic. non-shielded cable without core
6	1.0m External connection non-shielded cable without core

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Item 3 is provided by the client.

2.3 測試架構圖



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電機技術規範之 2.3 節，電源傳導干擾之限制要求如下：

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

(註)：隨頻率之對數遞減。

(2) 帶外發射之規定

依據國家通訊傳播委員會低功率射頻電機技術規範 3.10.1.5 節之要求，操作頻帶範圍外之任意 100 kHz 內，發射機所產生的射頻功率相較於使用頻帶範圍中包含最高所需功率之 100 kHz 內的射頻功率，其衰減值限制如下：(1) 輸出功率以附件二之峰值輸出功率方式測量者，至少須衰減 20 dB，可使用射頻傳導或輻射方式測量。(2) 輸出功率以 3.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少須衰減 30 dB。此外，落於 2.7 禁用頻段之輻射發射，應符合 2.8 之規定。

頻率(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

3.2 限制使用之頻帶

除本規範另有規定外，任何低功率射頻電機之主波皆不得使用下表所列各頻段之頻率；低功率射頻電機落於下表所列頻段之混附發射，其電場強度必須符合 2.8 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 帶外發射之量測

4.1 適用標準

請見本報告3.1節第2項的規定。

4.2 量測方法

在電波暗室，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，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。

備註：對於 1GHz 以上場強輻射的測試，待測物則置於1.5米高的非金屬桌面。

4.3 量測儀器

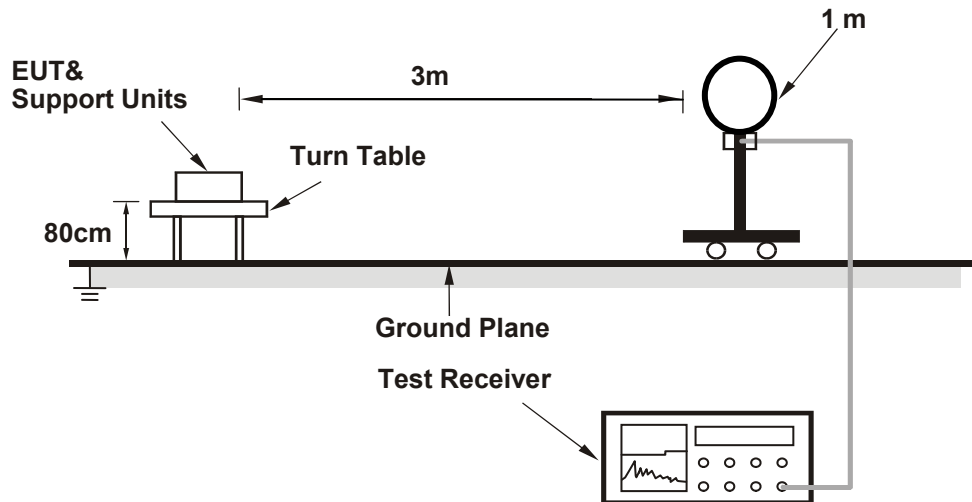
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Jan. 02, 2014	Jan. 01, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Mar. 03, 2014	Mar. 02, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	9120D	209	Aug. 25, 2014	Aug. 24, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 17, 2014	Feb. 16, 2015
Preamplifier Agilent	8447D	2944A10738	Oct.18, 2014	Oct. 17, 2015
Preamplifier Agilent	8449B	3008A01964	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 22, 2014	Aug. 21, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	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 HwaYa Chamber 3.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 988962.
5. The IC Site Registration No. is IC 7450F-3.
6. 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.

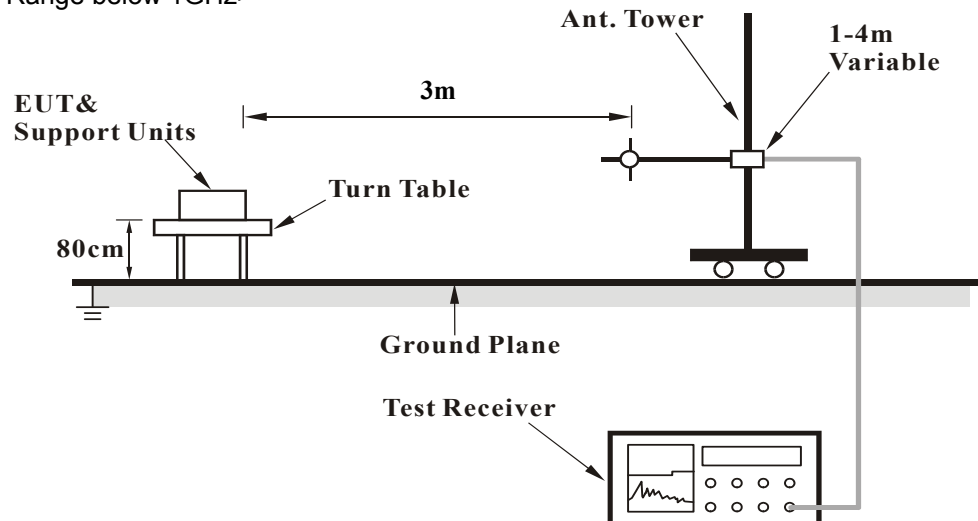
Measurement	Frequency	Uncertainty
Radiated emissions	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

4.4 測試配置

<Frequency Range below 30MHz>



<Frequency Range below 1GHz>



4.5 場強度之計算

場強之計算公式如下：

結果值Emission level (dBuV/m)=機器讀值 Raw Value (dBuV) +校正因子Correction Factor (dB/m)

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

量測結果請見下頁。

4.6 量測結果

4.6.1 發射諧波

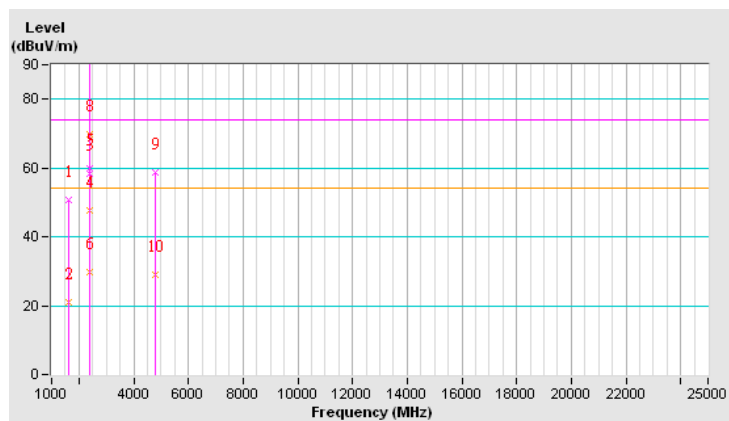
GFSK

操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1602.00	50.90 PK	74.00	-23.10	1.53 H	21	54.30	-3.40
2	1602.00	20.80 AV	54.00	-33.20	1.53 H	21	24.20	-3.40
3	2390.00	58.20 PK	74.00	-15.80	1.32 H	33	25.00	33.20
4	2390.00	47.80 AV	54.00	-6.20	1.32 H	33	14.60	33.20
5	#2400.00	59.90 PK	80.00	-20.10	1.32 H	32	60.80	-0.90
6	#2400.00	29.80 AV	49.90	-20.10	1.32 H	32	30.70	-0.90
7	*2402.00	100.00 PK			1.32 H	32	66.70	33.30
8	*2402.00	69.90 AV			1.32 H	32	36.60	33.30
9	4804.00	58.90 PK	74.00	-15.10	1.58 H	53	52.90	6.00
10	4804.00	28.80 AV	54.00	-25.20	1.58 H	53	22.80	6.00
	7206.00	-	-	-	-	-	-	-
	9608.00	-	-	-	-	-	-	-
	12010.00	-	-	-	-	-	-	-
	14412.00	-	-	-	-	-	-	-
	16814.00	-	-	-	-	-	-	-
	19216.00	-	-	-	-	-	-	-
	21618.00	-	-	-	-	-	-	-
	24020.00	-	-	-	-	-	-	-

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. “*” : Fundamental Frequency (主頻)
5. “-” : The emission levels were too low to be detected.
6. The other emission levels were very low against the limit.
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
8. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1$ dB
9. Average value = peak reading + $20\log(\text{duty cycle})$
10. “#”: The radiated frequency is out the restricted band.

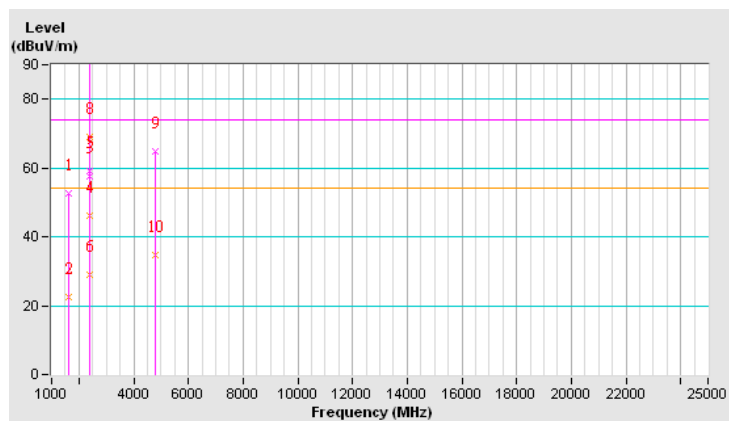


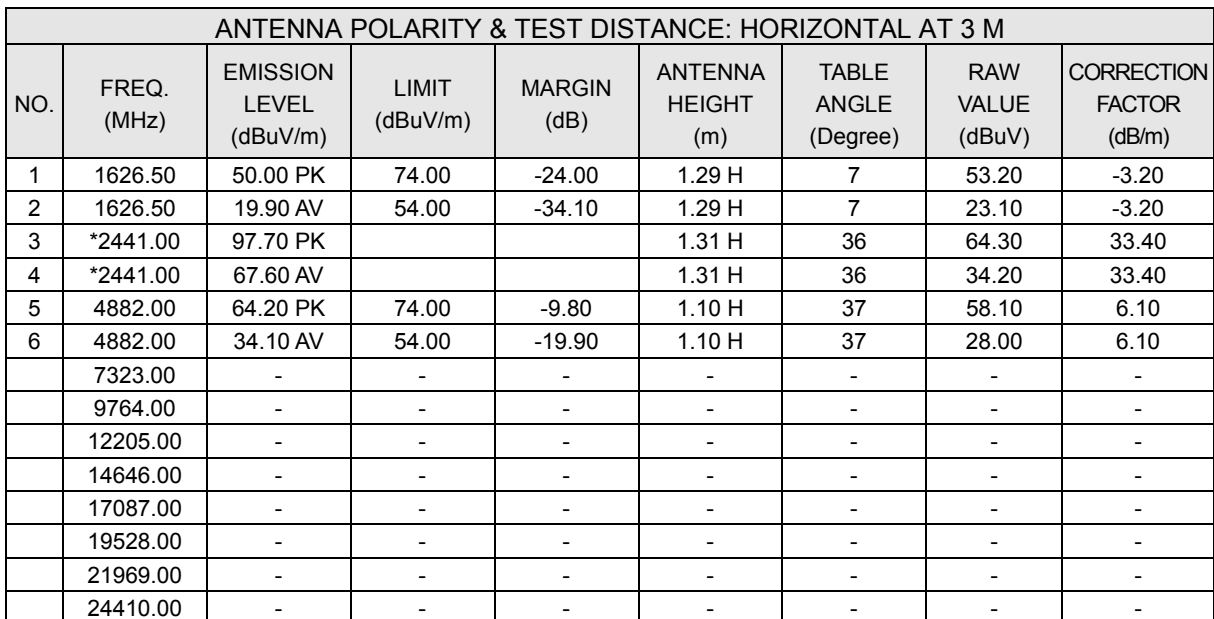
操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1602.00	52.70 PK	74.00	-21.30	1.00 V	39	56.10	-3.40
2	1602.00	22.60 AV	54.00	-31.40	1.00 V	39	26.00	-3.40
3	2390.00	57.50 PK	74.00	-16.50	1.15 V	29	24.30	33.20
4	2390.00	46.20 AV	54.00	-7.80	1.15 V	29	13.00	33.20
5	#2400.00	59.00 PK	79.10	-20.10	1.15 V	29	59.90	-0.90
6	#2400.00	28.90 AV	49.00	-20.10	1.15 V	29	29.80	-0.90
7	*2402.00	99.10 PK			1.15 V	29	65.80	33.30
8	*2402.00	69.00 AV			1.15 V	29	35.70	33.30
9	4804.00	64.70 PK	74.00	-9.30	1.42 V	4	58.70	6.00
10	4804.00	34.60 AV	54.00	-19.40	1.42 V	4	28.60	6.00
	7206.00	-	-	-	-	-	-	-
	9608.00	-	-	-	-	-	-	-
	12010.00	-	-	-	-	-	-	-
	14412.00	-	-	-	-	-	-	-
	16814.00	-	-	-	-	-	-	-
	19216.00	-	-	-	-	-	-	-
	21618.00	-	-	-	-	-	-	-
	24020.00	-	-	-	-	-	-	-

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. “*”: Fundamental Frequency (主頻)
5. “-”: The emission levels were too low to be detected.
6. The other emission levels were very low against the limit.
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
8. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1$ dB
9. Average value = peak reading + $20\log(\text{duty cycle})$
10. “#”: The radiated frequency is out the restricted band.



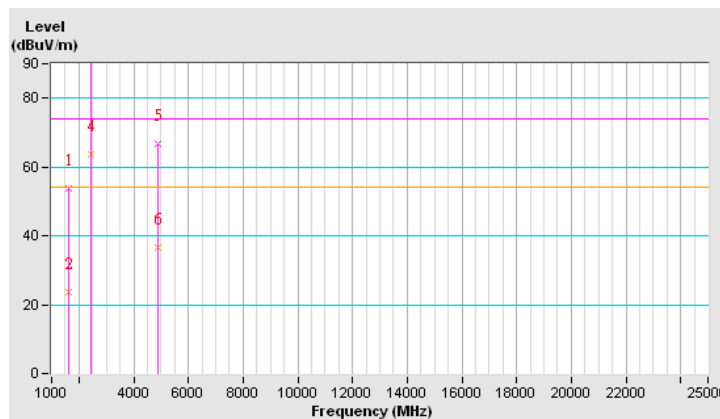


操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 39：2441 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1626.50	53.90 PK	74.00	-20.10	1.00 V	12	57.10	-3.20
2	1626.50	23.80 AV	54.00	-30.20	1.00 V	12	27.00	-3.20
3	*2441.00	93.60 PK			1.23 V	120	60.20	33.40
4	*2441.00	63.50 AV			1.23 V	120	30.10	33.40
5	4882.00	66.80 PK	74.00	-7.20	1.34 V	357	60.70	6.10
6	4882.00	36.70 AV	54.00	-17.30	1.34 V	357	30.60	6.10
	7323.00	-	-	-	-	-	-	-
	9764.00	-	-	-	-	-	-	-
	12205.00	-	-	-	-	-	-	-
	14646.00	-	-	-	-	-	-	-
	17087.00	-	-	-	-	-	-	-
	19528.00	-	-	-	-	-	-	-
	21969.00	-	-	-	-	-	-	-
	24410.00	-	-	-	-	-	-	-

Remarks:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor(dB)
- Margin value = Emission level – Limit value
- “ * ” : Fundamental Frequency (主頻)
- ” – “: The emission levels were too low to be detected.
- The other emission levels were very low against the limit.
- The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
- The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1 \text{ dB}$
- Average value = peak reading + $20\log(\text{duty cycle})$

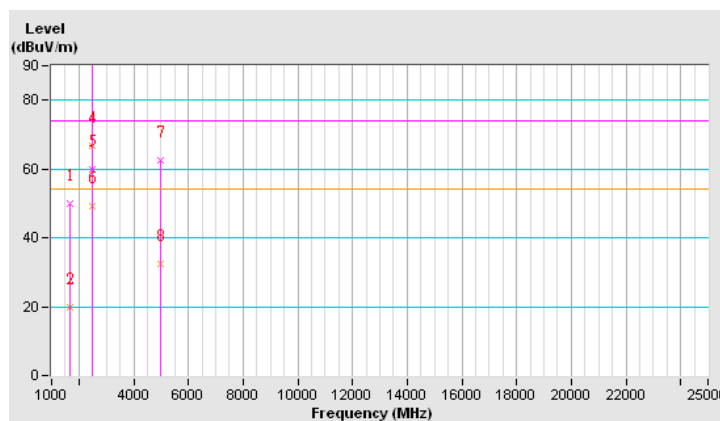


操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 78：2480 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1650.00	50.00 PK	76.70	-26.70	1.74 H	5	53.20	-3.20
2	#1650.00	19.90 AV	46.60	-26.70	1.74 H	5	23.10	-3.20
3	*2480.00	96.70 PK			1.94 H	14	63.30	33.40
4	*2480.00	66.60 AV			1.94 H	14	33.20	33.40
5	2483.50	59.70 PK	74.00	-14.30	1.96 H	15	26.30	33.40
6	2483.50	49.30 AV	54.00	-4.70	1.96 H	15	15.90	33.40
7	4960.00	62.60 PK	74.00	-11.40	1.00 H	33	56.20	6.40
8	4960.00	32.50 AV	54.00	-21.50	1.00 H	33	26.10	6.40
	7440.00	-	-	-	-	-	-	-
	9920.00	-	-	-	-	-	-	-
	12400.00	-	-	-	-	-	-	-
	14880.00	-	-	-	-	-	-	-
	17360.00	-	-	-	-	-	-	-
	19840.00	-	-	-	-	-	-	-
	22320.00	-	-	-	-	-	-	-
	24800.00	-	-	-	-	-	-	-

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. “*”: Fundamental Frequency (主頻)
5. ” – “: The emission levels were too low to be detected.
6. The other emission levels were very low against the limit.
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
8. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1 \text{ dB}$
9. Average value = peak reading + $20\log(\text{duty cycle})$

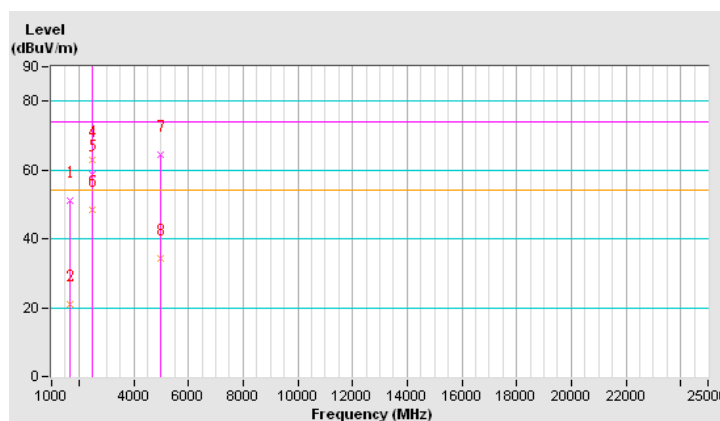


操作模式：	發射	調變技術：	GFSK
基本波頻率：	CH 78：2480 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1650.00	51.20 PK	72.90	-21.70	1.00 V	13	54.40	-3.20
2	#1650.00	21.10 AV	42.80	-21.70	1.00 V	13	24.30	-3.20
3	*2480.00	92.90 PK			1.03 V	48	59.50	33.40
4	*2480.00	62.80 AV			1.03 V	48	29.40	33.40
5	2483.50	58.70 PK	74.00	-15.30	1.03 V	48	25.30	33.40
6	2483.50	48.50 AV	54.00	-5.50	1.03 V	48	15.10	33.40
7	4960.00	64.50 PK	74.00	-9.50	1.00 V	23	58.10	6.40
8	4960.00	34.40 AV	54.00	-19.60	1.00 V	23	28.00	6.40
	7440.00	-	-	-	-	-	-	-
	9920.00	-	-	-	-	-	-	-
	12400.00	-	-	-	-	-	-	-
	14880.00	-	-	-	-	-	-	-
	17360.00	-	-	-	-	-	-	-
	19840.00	-	-	-	-	-	-	-
	22320.00	-	-	-	-	-	-	-
	24800.00	-	-	-	-	-	-	-

Remarks:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor(dB)
- Margin value = Emission level – Limit value
- “ * ”: Fundamental Frequency (主頻)
- “ - ”: The emission levels were too low to be detected.
- The other emission levels were very low against the limit.
- The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
- The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1 \text{ dB}$
- Average value = peak reading + $20\log(\text{duty cycle})$



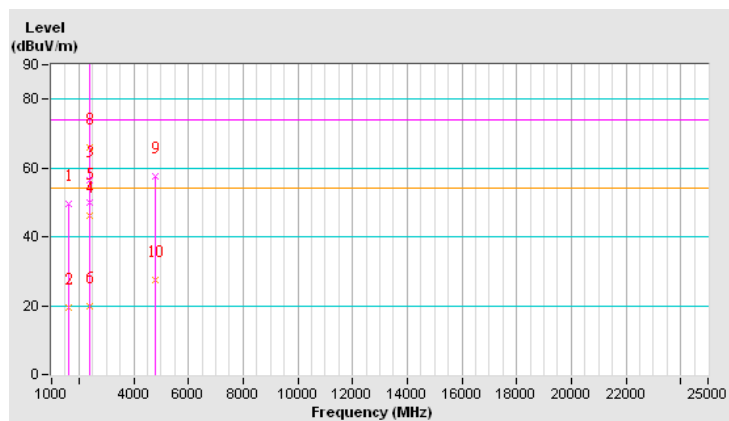
8DPSK

操作模式：	發射	調變技術：	8DPSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1602.00	49.70 PK	74.00	-24.30	1.54 H	31	53.10	-3.40
2	1602.00	19.60 AV	54.00	-34.40	1.54 H	31	23.00	-3.40
3	2390.00	56.50 PK	74.00	-17.50	1.30 H	30	23.30	33.20
4	2390.00	46.10 AV	54.00	-7.90	1.30 H	30	12.90	33.20
5	#2400.00	50.00 PK	76.10	-26.10	1.30 H	31	50.90	-0.90
6	#2400.00	19.90 AV	46.00	-26.10	1.30 H	31	20.80	-0.90
7	*2402.00	96.10 PK			1.30 H	31	62.80	33.30
8	*2402.00	66.00 AV			1.30 H	31	32.70	33.30
9	4804.00	57.40 PK	74.00	-16.60	1.54 H	58	51.40	6.00
10	4804.00	27.30 AV	54.00	-26.70	1.54 H	58	21.30	6.00
	7206.00	-	-	-	-	-	-	-
	9608.00	-	-	-	-	-	-	-
	12010.00	-	-	-	-	-	-	-
	14412.00	-	-	-	-	-	-	-
	16814.00	-	-	-	-	-	-	-
	19216.00	-	-	-	-	-	-	-
	21618.00	-	-	-	-	-	-	-
	24020.00	-	-	-	-	-	-	-

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. “*” : Fundamental Frequency (主頻)
5. “-” : The emission levels were too low to be detected.
6. The other emission levels were very low against the limit.
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
8. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1$ dB
9. Average value = peak reading + $20\log(\text{duty cycle})$
10. “#”:The radiated frequency is out the restricted band.

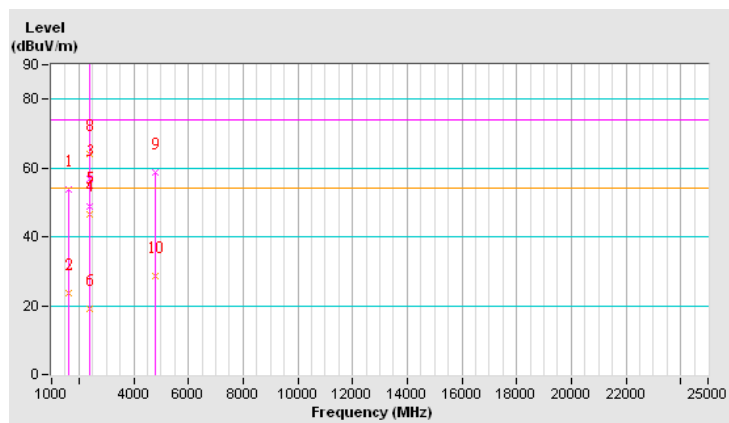


操作模式：	發射	調變技術：	8DPSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1602.00	53.70 PK	74.00	-20.30	1.00 V	25	57.10	-3.40
2	1602.00	23.60 AV	54.00	-30.40	1.00 V	25	27.00	-3.40
3	2390.00	57.00 PK	74.00	-17.00	1.12 V	29	23.80	33.20
4	2390.00	46.70 AV	54.00	-7.30	1.12 V	29	13.50	33.20
5	#2400.00	49.00 PK	75.10	-26.10	1.12 V	29	49.90	-0.90
6	#2400.00	18.90 AV	44.00	-25.10	1.12 V	29	19.80	-0.90
7	*2402.00	95.10 PK			1.12 V	29	61.80	33.30
8	*2402.00	64.00 AV			1.12 V	29	30.70	33.30
9	4804.00	58.70 PK	74.00	-15.30	1.40 V	4	52.70	6.00
10	4804.00	28.60 AV	54.00	-25.40	1.40 V	4	22.60	6.00
	7206.00	-	-	-	-	-	-	-
	9608.00	-	-	-	-	-	-	-
	12010.00	-	-	-	-	-	-	-
	14412.00	-	-	-	-	-	-	-
	16814.00	-	-	-	-	-	-	-
	19216.00	-	-	-	-	-	-	-
	21618.00	-	-	-	-	-	-	-
	24020.00	-	-	-	-	-	-	-

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. “ * ”: Fundamental Frequency (主頻)
5. ” – “: The emission levels were too low to be detected.
6. The other emission levels were very low against the limit.
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
8. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1$ dB
9. Average value = peak reading + $20\log(\text{duty cycle})$
10. “#”: The radiated frequency is out the restricted band.

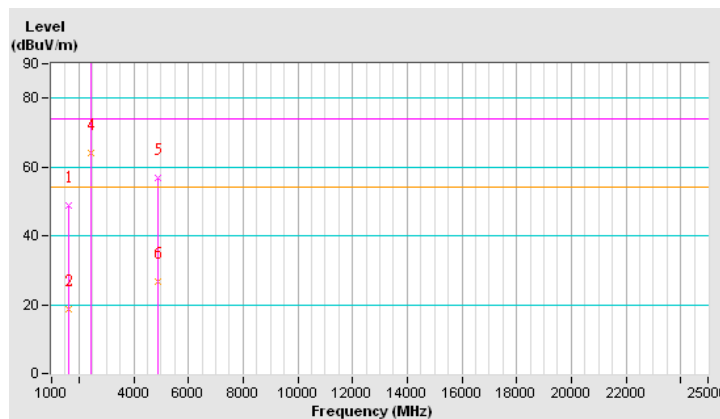


操作模式：	發射	調變技術：	8DPSK
基本波頻率：	CH 39：2441 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1626.50	48.70 PK	74.00	-25.30	1.29 H	11	51.90	-3.20
2	1626.50	18.60 AV	54.00	-35.40	1.29 H	11	21.80	-3.20
3	*2441.00	94.30 PK			1.30 H	37	60.90	33.40
4	*2441.00	64.20 AV			1.30 H	37	30.80	33.40
5	4882.00	56.70 PK	74.00	-17.30	1.09 H	38	50.60	6.10
6	4882.00	26.60 AV	54.00	-27.40	1.09 H	38	20.50	6.10
	7323.00	-	-	-	-	-	-	-
	9764.00	-	-	-	-	-	-	-
	12205.00	-	-	-	-	-	-	-
	14646.00	-	-	-	-	-	-	-
	17087.00	-	-	-	-	-	-	-
	19528.00	-	-	-	-	-	-	-
	21969.00	-	-	-	-	-	-	-
	24410.00	-	-	-	-	-	-	-

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. “ * ” : Fundamental Frequency (主頻)
5. ” – “: The emission levels were too low to be detected.
6. The other emission levels were very low against the limit.
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
8. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1$ dB
9. Average value = peak reading + $20\log(\text{duty cycle})$

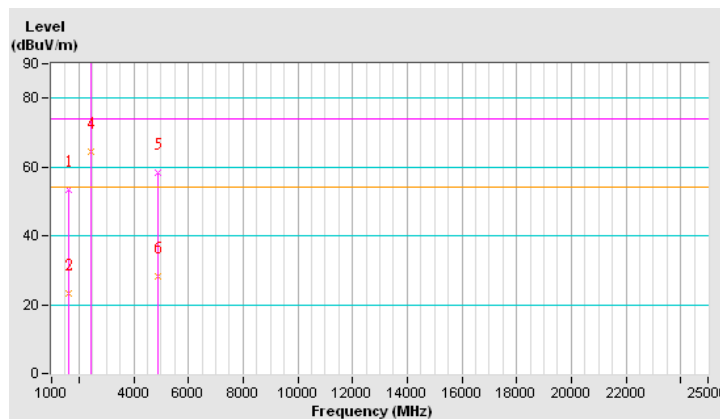


操作模式：	發射	調變技術：	8DPSK
基本波頻率：	CH 39：2441 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1626.50	53.50 PK	74.00	-20.50	1.00 V	13	56.70	-3.20
2	1626.50	23.40 AV	54.00	-30.60	1.00 V	13	26.60	-3.20
3	*2441.00	94.70 PK			1.14 V	30	61.30	33.40
4	*2441.00	64.60 AV			1.14 V	30	31.20	33.40
5	4882.00	58.40 PK	74.00	-15.60	1.02 V	24	52.30	6.10
6	4882.00	28.30 AV	54.00	-25.70	1.02 V	24	22.20	6.10
	7323.00	-	-	-	-	-	-	-
	9764.00	-	-	-	-	-	-	-
	12205.00	-	-	-	-	-	-	-
	14646.00	-	-	-	-	-	-	-
	17087.00	-	-	-	-	-	-	-
	19528.00	-	-	-	-	-	-	-
	21969.00	-	-	-	-	-	-	-
	24410.00	-	-	-	-	-	-	-

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. “ * ” : Fundamental Frequency (主頻)
5. ” – “: The emission levels were too low to be detected.
6. The other emission levels were very low against the limit.
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
8. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1 \text{ dB}$
9. Average value = peak reading + $20\log(\text{duty cycle})$

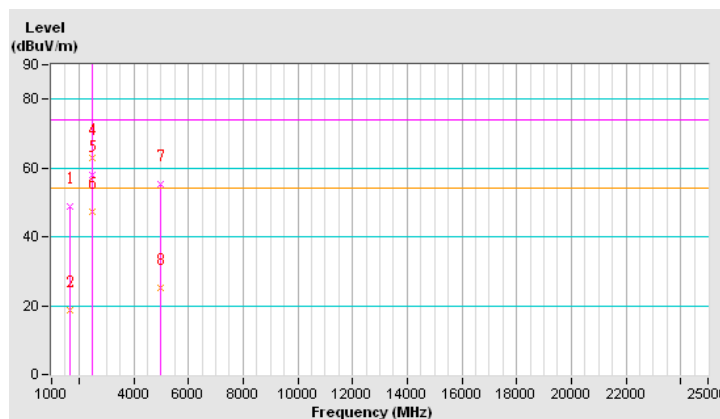


操作模式：	發射	調變技術：	8DPSK
基本波頻率：	CH 78：2480 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1650.00	48.70 PK	72.90	-24.20	1.00 H	46	51.90	-3.20
2	#1650.00	18.60 AV	42.80	-24.20	1.00 H	46	21.80	-3.20
3	*2480.00	92.90 PK			1.08 H	25	59.50	33.40
4	*2480.00	62.80 AV			1.08 H	25	29.40	33.40
5	2483.50	57.90 PK	74.00	-16.10	1.02 H	25	24.50	33.40
6	2483.50	47.40 AV	54.00	-6.60	1.02 H	25	14.00	33.40
7	4960.00	55.30 PK	74.00	-18.70	1.00 H	33	48.90	6.40
8	4960.00	25.20 AV	54.00	-28.80	1.00 H	33	18.80	6.40
	7440.00	-	-	-	-	-	-	-
	9920.00	-	-	-	-	-	-	-
	12400.00	-	-	-	-	-	-	-
	14880.00	-	-	-	-	-	-	-
	17360.00	-	-	-	-	-	-	-
	19840.00	-	-	-	-	-	-	-
	22320.00	-	-	-	-	-	-	-
	24800.00	-	-	-	-	-	-	-

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. “*”: Fundamental Frequency (主頻)
5. ” – “: The emission levels were too low to be detected.
6. The other emission levels were very low against the limit.
7. The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
8. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1 \text{ dB}$
9. Average value = peak reading + $20\log(\text{duty cycle})$

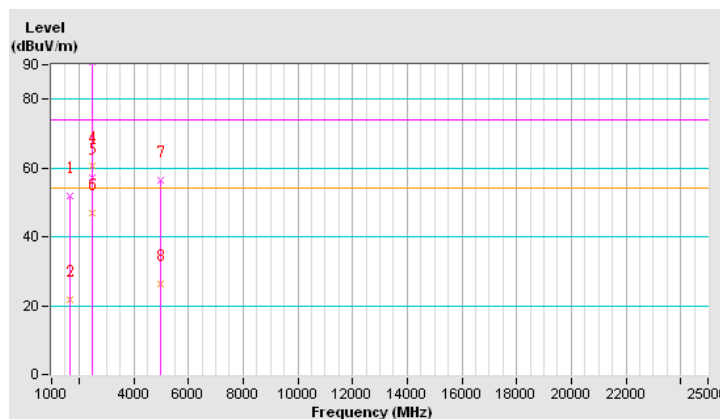


操作模式：	發射	調變技術：	8DPSK
基本波頻率：	CH 78：2480 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1650.00	51.70 PK	70.60	-18.90	1.00 V	18	54.90	-3.20
2	#1650.00	21.60 AV	40.50	-18.90	1.00 V	18	24.80	-3.20
3	*2480.00	90.60 PK			1.04 V	50	57.20	33.40
4	*2480.00	60.50 AV			1.04 V	50	27.10	33.40
5	2483.50	57.20 PK	74.00	-16.80	1.04 V	50	23.80	33.40
6	2483.50	46.80 AV	54.00	-7.20	1.04 V	50	13.40	33.40
7	4960.00	56.50 PK	74.00	-17.50	1.00 V	14	50.10	6.40
8	4960.00	26.40 AV	54.00	-27.60	1.00 V	14	20.00	6.40
	7440.00	-	-	-	-	-	-	-
	9920.00	-	-	-	-	-	-	-
	12400.00	-	-	-	-	-	-	-
	14880.00	-	-	-	-	-	-	-
	17360.00	-	-	-	-	-	-	-
	19840.00	-	-	-	-	-	-	-
	22320.00	-	-	-	-	-	-	-
	24800.00	-	-	-	-	-	-	-

Remarks:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor(dB)
- Margin value = Emission level – Limit value
- “ * ”: Fundamental Frequency (主頻)
- “ - ”: The emission levels were too low to be detected.
- The other emission levels were very low against the limit.
- The blank is not available, the limit of fundamental frequency was restricted at the peak output power (see LP0002 3.10.1.2)
- The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 296.25 ms per channel. Therefore, the duty cycle correction factor be equal to: $20\log(3.125/100) = -30.1 \text{ dB}$
- Average value = peak reading + $20\log(\text{duty cycle})$



4.6.2 接收諧波

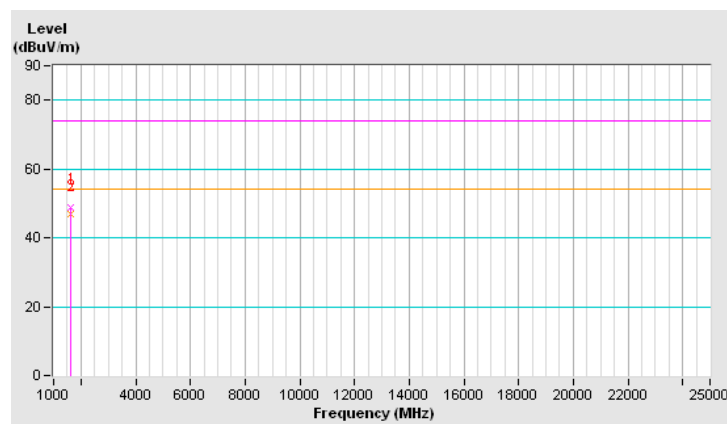
GFSK

操作模式：	接收	調變技術：	GFSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 12 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1602.00	48.80 PK	74.00	-25.20	1.00 H	109	52.90	-4.10
2	1602.00	47.00 AV	54.00	-7.00	1.00 H	109	51.10	-4.10

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

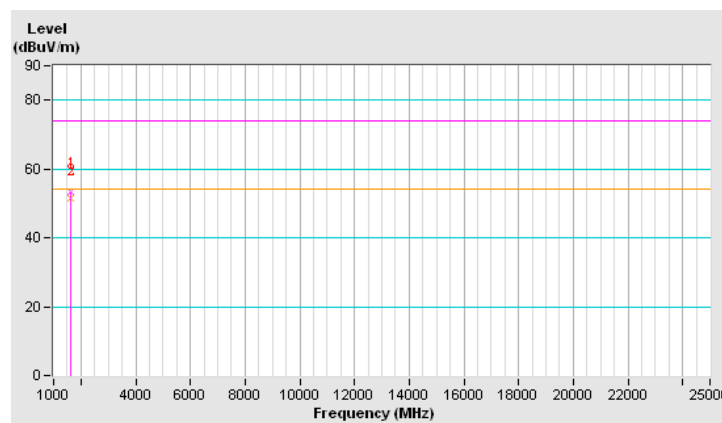


操作模式：	接收	調變技術：	GFSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 12 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1602.00	53.20 PK	74.00	-20.80	1.00 V	14	57.30	-4.10
2	1602.00	51.40 AV	54.00	-2.60	1.00 V	14	55.50	-4.10

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

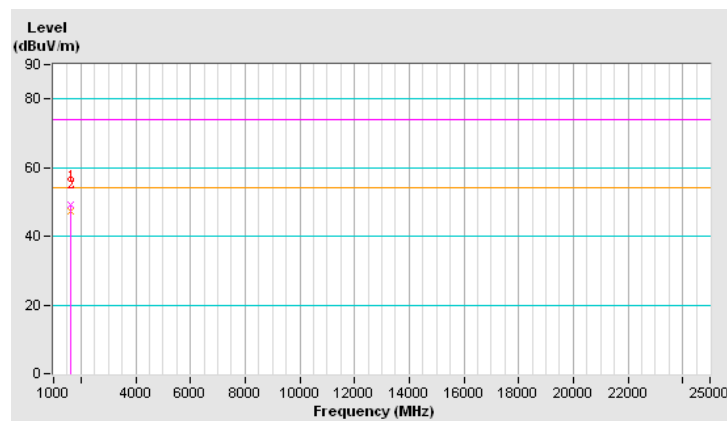


操作模式：	接收	調變技術：	GFSK
基本波頻率：	CH 39: 2441MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1628.00	49.30 PK	74.00	-24.70	1.02 H	15	53.20	-3.90
2	1628.00	47.20 AV	54.00	-6.80	1.02 H	15	51.10	-3.90

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

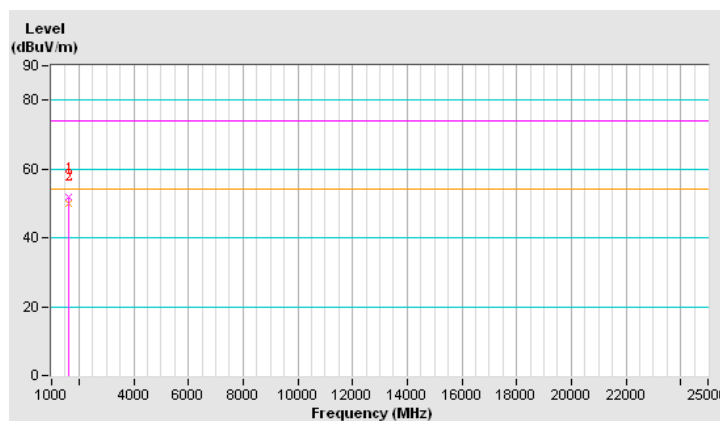


操作模式：	接收	調變技術：	GFSK
基本波頻率：	CH 39: 2441MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 11 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1628.00	52.00 PK	74.00	-22.00	1.00 V	18	55.90	-3.90
2	1628.00	50.00 AV	54.00	-4.00	1.00 V	18	53.90	-3.90

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

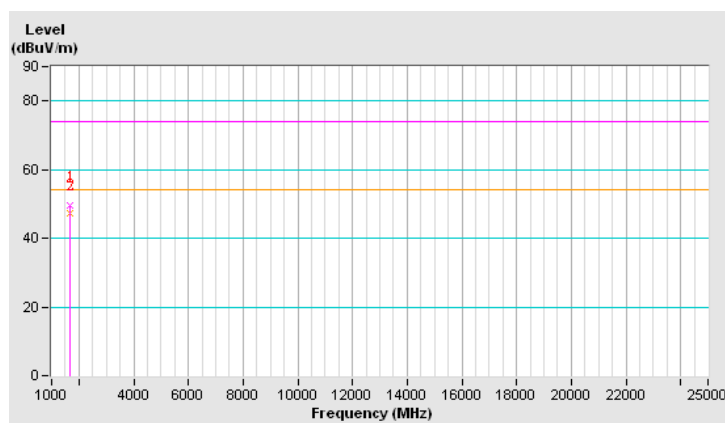


操作模式：	接收	調變技術：	GFSK
基本波頻率：	CH 78 : 2480 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 12 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1654.00	49.50 PK	74.00	-24.50	1.05 H	45	53.40	-3.90
2	1654.00	47.40 AV	54.00	-6.60	1.05 H	45	51.30	-3.90

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



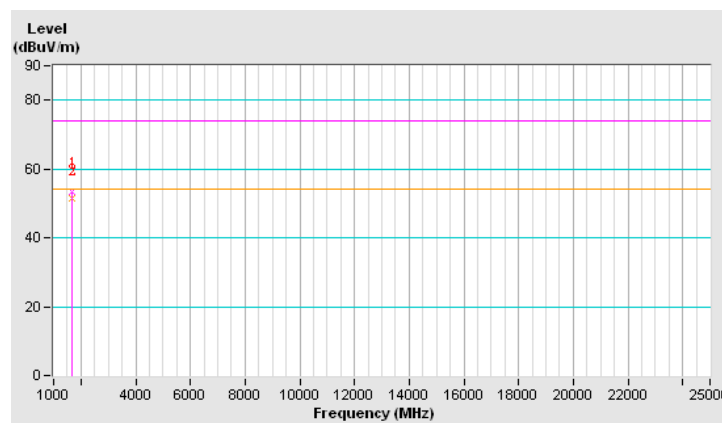
操作模式：	接收	調變技術：	GFSK
基本波頻率：	CH 78 : 2480 MHz	測試儀器：	(PK) RB=VB=1MHz (AV) RB=1MHz, VB=10Hz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 12 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1654.00	53.20 PK	74.00	-20.80	1.00 V	16	57.10	-3.90
2	1654.00	51.50 AV	54.00	-2.50	1.00 V	16	55.40	-3.90

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



4.6.3 其它不必要之訊號

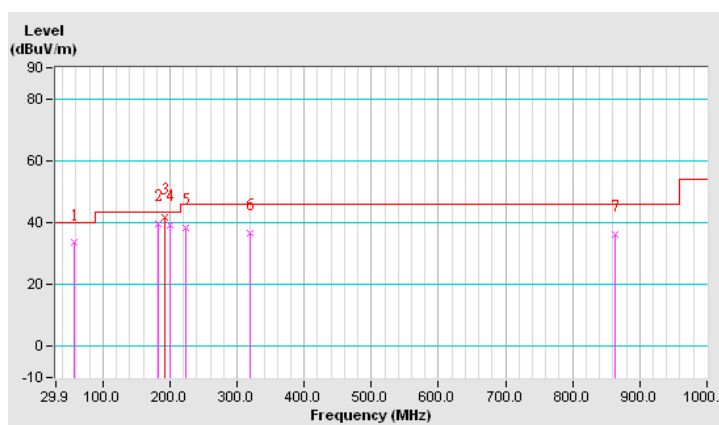
GFSK

操作模式：	發射/接收	調變技術：	GFSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(QP) RB=VB=120kHz
量測場地溫度：	19℃	量測場地濕度：	67%RH
測試日期：	103 年 12 月 12 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	33.40 QP	40.00	-6.60	2.01 H	6	48.10	-14.70
2	181.55	39.40 QP	43.50	-4.10	1.51 H	16	54.90	-15.50
3	192.01	41.60 QP	43.50	-1.90	1.23 H	287	58.20	-16.60
4	201.00	39.40 QP	43.50	-4.10	2.01 H	191	56.10	-16.70
5	224.33	38.20 QP	46.00	-7.80	1.51 H	16	54.60	-16.40
6	319.60	36.50 QP	46.00	-9.50	1.00 H	73	48.30	-11.80
7	864.00	36.30 QP	46.00	-9.70	1.00 H	161	37.70	-1.40

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. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz.

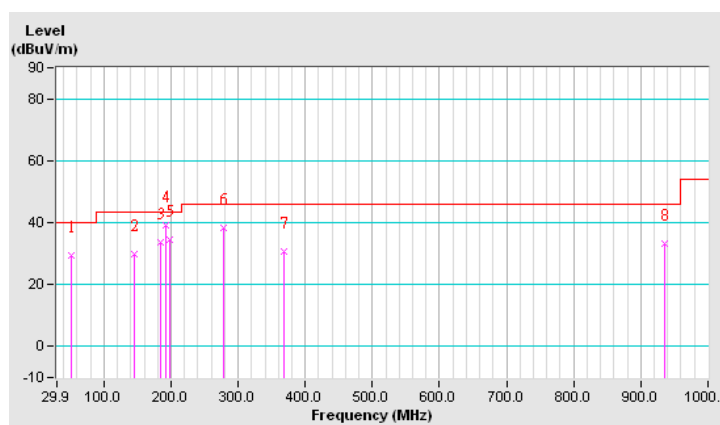


操作模式：	發射/接收	調變技術：	GFSK
基本波頻率：	CH 0：2402 MHz	測試儀器：	(QP) RB=VB=120kHz
量測場地溫度：	19°C	量測場地濕度：	67%RH
測試日期：	103 年 12 月 12 日	測試者：	張仲志

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	51.29	29.60 QP	40.00	-10.40	2.00 V	133	44.20	-14.60
2	144.61	29.70 QP	43.50	-13.80	1.49 V	222	43.90	-14.20
3	183.50	33.80 QP	43.50	-9.70	1.49 V	123	49.50	-15.70
4	191.28	39.20 QP	43.50	-4.30	1.49 V	9	55.70	-16.50
5	199.05	34.40 QP	43.50	-9.10	1.00 V	255	51.20	-16.80
6	278.77	38.10 QP	46.00	-7.90	1.00 V	11	51.00	-12.90
7	368.21	30.80 QP	46.00	-15.20	1.00 V	71	41.80	-11.00
8	935.94	33.30 QP	46.00	-12.70	1.49 V	139	33.20	0.10

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. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz.



4.7 配置照片

請參閱附件（測試設置照片）。

5 20 dB 頻寬之量測

5.1 適用標準

請見本報告3.1節第7項的規定。

5.2 量測方法

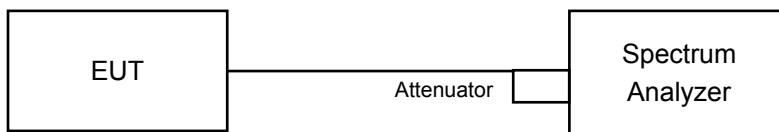
- 將待測物輸出經由衰減器接到頻譜分析儀上。
- 設定待測物處於連續發射狀態。
- 計算由最大輸出功率峰值減20dB的最大頻率範圍。

5.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
SPECTRUM ANALYZER R&S	FSP40	100269	Feb. 11, 2014	Feb. 10, 2015

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 measurement uncertainty is 207Hz, which is calculated as per the document ETSI TR 100 028. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5.4 測試配置



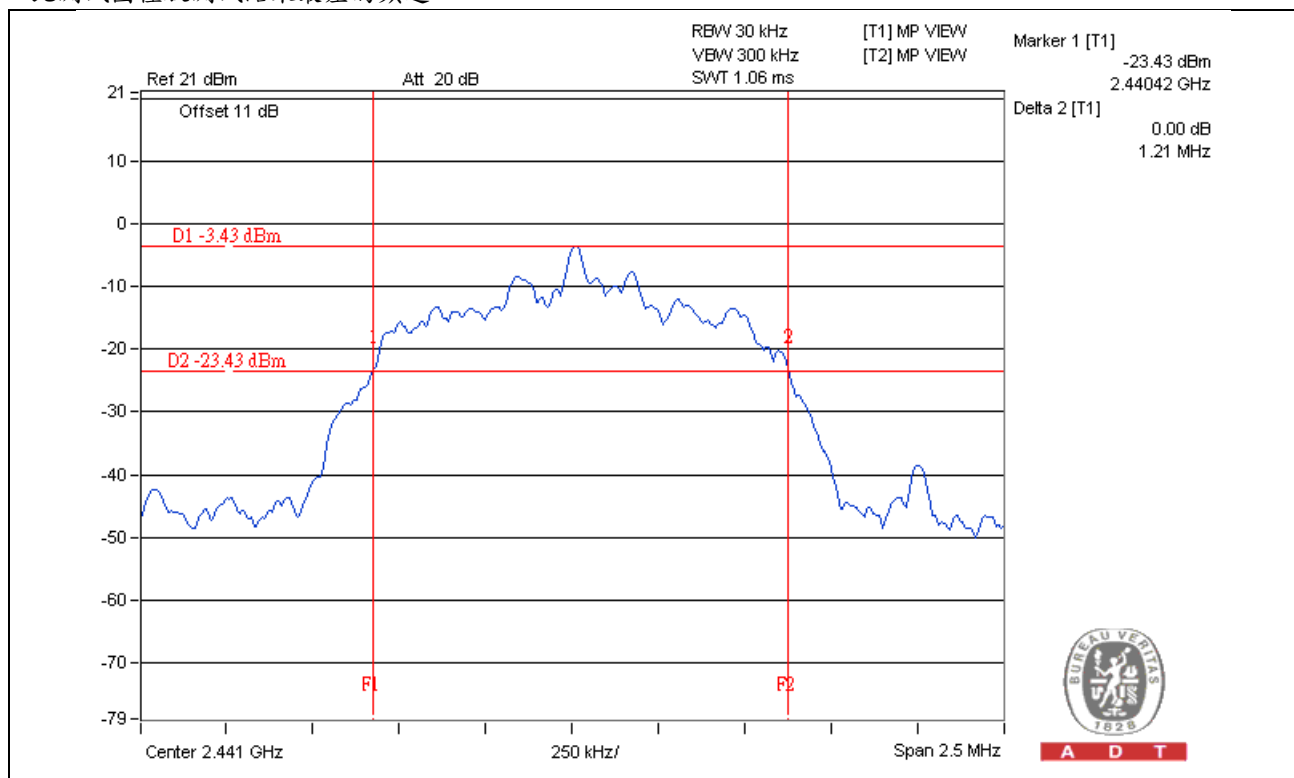
5.5 量測結果

操作模式	發射	測試日期	103 年 12 月 13 日
量測場地溫度	24°C	量測場地濕度	64%RH
測試者	崔祐寧		

Channel	Channel Frequency (MHz)	20dB Bandwidth (MHz)		>= 25kHz
		GFSK	8DPSK	
0	2402	0.82	1.20	Yes
39	2441	0.83	1.21	Yes
78	2480	0.82	1.21	Yes

註：依據國家通訊傳播委員會低功率射頻電機技術規範3.10.1.6節之規定，跳頻系統之載波頻率頻道間隔應大於或等於25 kHz 或跳頻頻道之20 dB頻寬，兩者取較寬者。但操作頻率為2400 MHz~2483.5 MHz 頻段且輸出功率應小於或等於125 mW 跳頻系統，其載波頻率頻道間隔不得小於25 kHz 或跳頻頻道20 dB頻寬之三分之二，兩者取較寬者。

**此測試圖僅放測試結果最差的頻道。



5.6 量測結果判定

依據測試數據結果，三分之二20dB頻寬值乃為此產品之載波頻率頻道間隔的判定限制值。

6 峰值傳導輸出功率之量測

6.1 適用標準

請見本報告3.1節第5項的規定。

6.2 量測方法

- 將待測物輸出經由衰減器接到頻譜分析儀上。
- 設定待測物處於連續發射狀態。
- 計算其峰值傳導輸出功率。

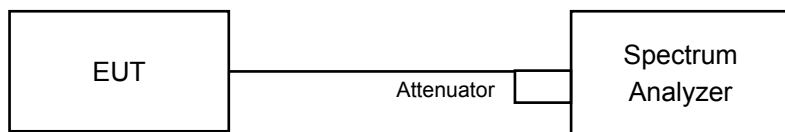
6.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
SPECTRUM ANALYZER R&S	FSP40	100269	Feb. 11, 2014	Feb. 10, 2015

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

- The measurement uncertainty is 207Hz, which is calculated as per the document ETSI TR 100 028. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

6.4 測試配置

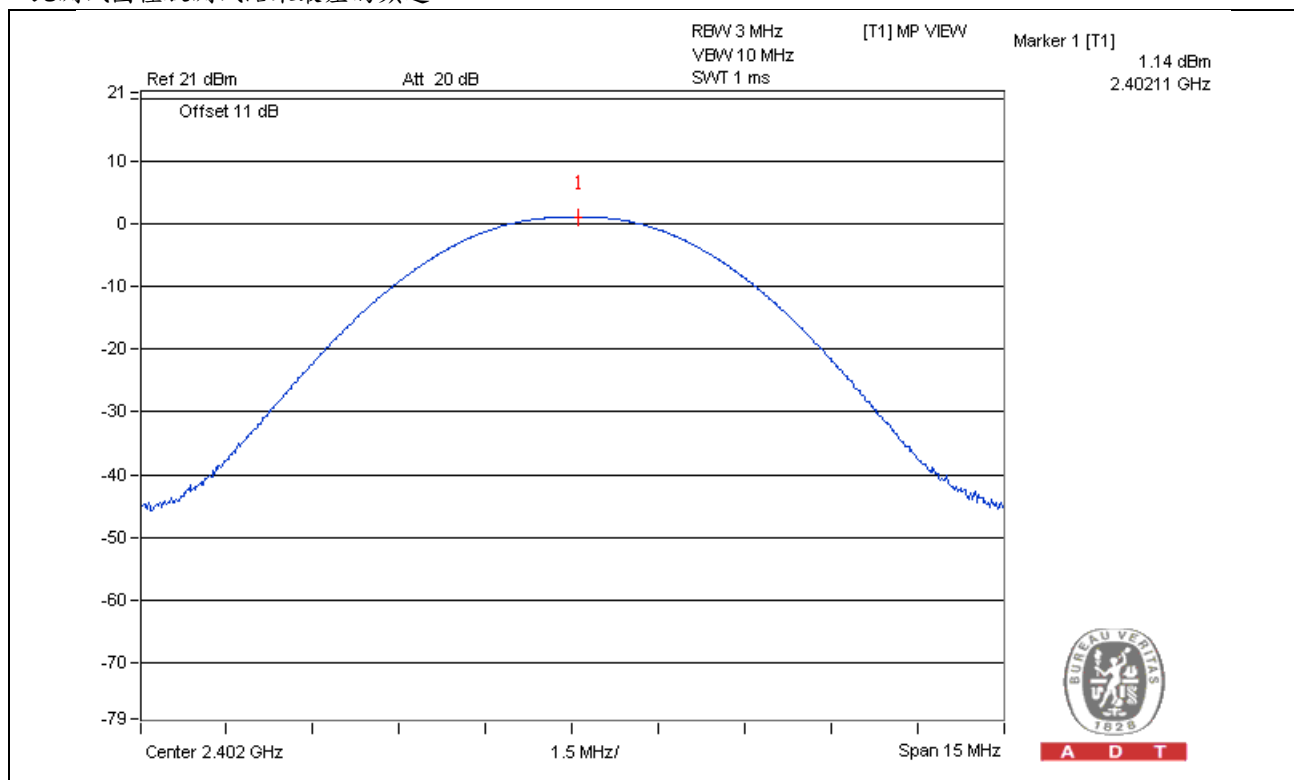


6.5 量測結果

操作模式	發射	測試日期	103 年 12 月 13 日
量測場地溫度	24°C	量測場地濕度	64%RH
測試者	崔祐寧		

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)		Peak Power Limit (dBm)	Pass / Fail
		GFSK	8DPSK		
0	2402	1.14	-0.19	21	Pass
39	2441	-0.33	-1.95	21	Pass
78	2480	-1.33	-3.32	21	Pass

**此測試圖僅放測試結果最差的頻道。



6.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

7 跳頻頻道數之量測

7.1 適用標準

請見本報告3.1節第6項的規定。

7.2 量測方法

- a) 將待測物輸出接到頻譜分析儀上。
- b) 設定待測物處於正常傳輸跳頻模式下。
- c) 設定 RBW= 100kHz, VBW=300kHz, 量測跳頻頻道數。

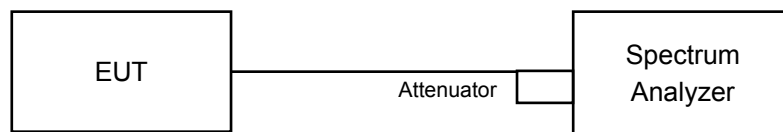
7.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
SPECTRUM ANALYZER R&S	FSP40	100269	Feb. 11, 2014	Feb. 10, 2015

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

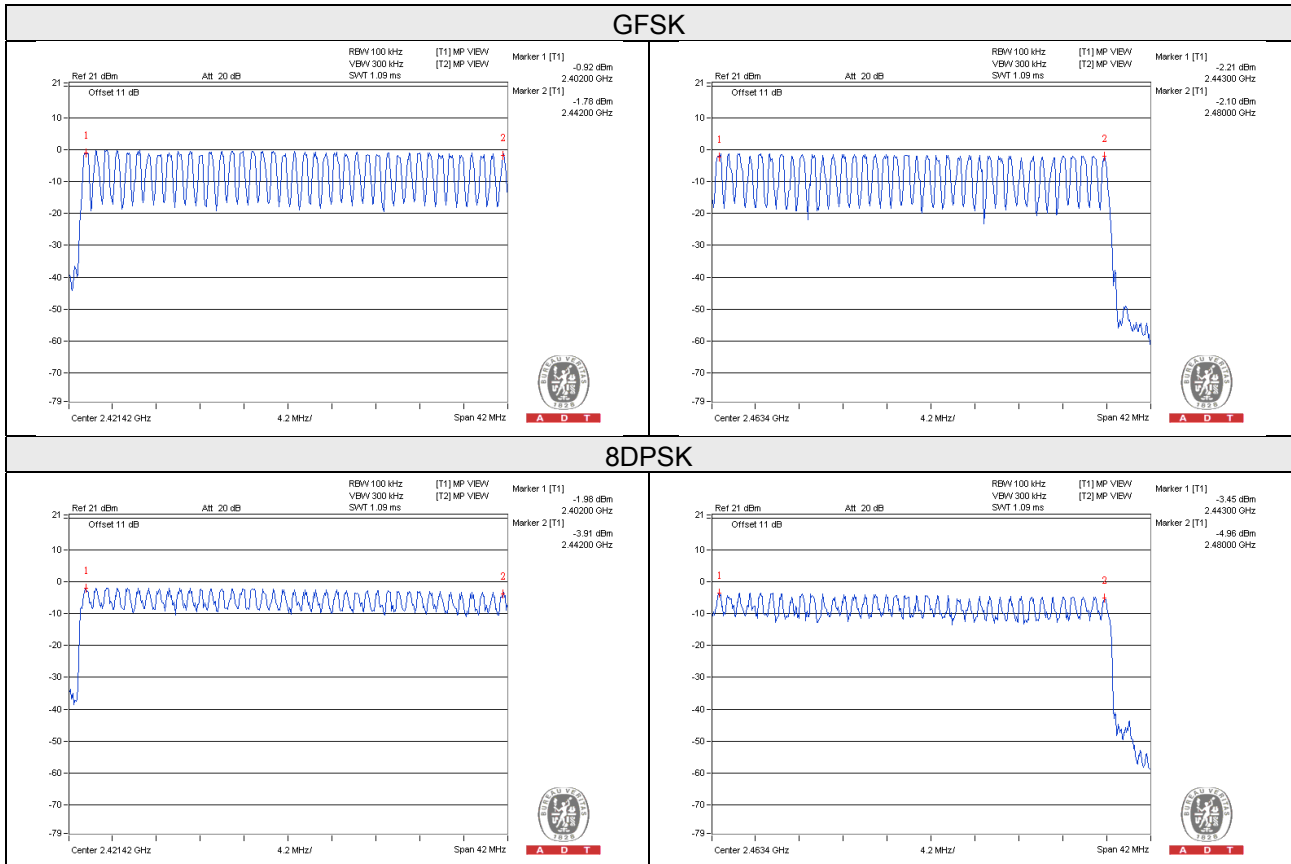
- 2. The measurement uncertainty is 207Hz, which is calculated as per the document ETSI TR 100 028. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

7.4 測試配置



7.5 量測結果

其掃描圖請參閱下圖。跳頻頻道數共有79個，符合至少15個的規定。



7.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

8 跳頻頻道間隔之量測

8.1 適用標準

請見本報告3.1節第7項規定。

8.2 量測方法

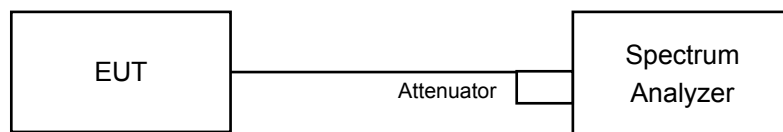
- 將待測物輸出接到頻譜分析儀上。
- 設定待測物處於連續發射狀態。
- 設定 RBW= 30kHz, VBW=300kHz，量測相鄰兩個頻道間的間隔。

8.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
SPECTRUM ANALYZER R&S	FSP40	100269	Feb. 11, 2014	Feb. 10, 2015

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 measurement uncertainty is 207Hz, which is calculated as per the document ETSI TR 100 028. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

8.4 測試配置



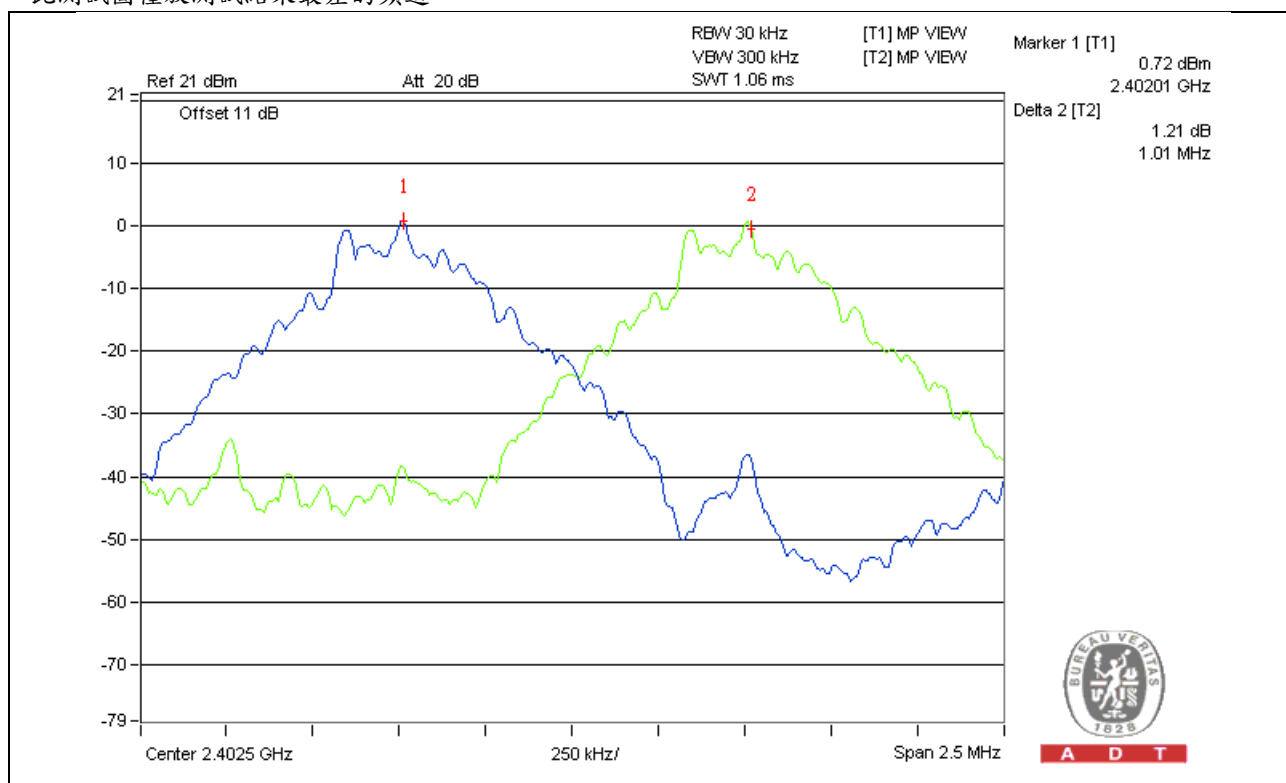
8.5 量測結果

操作模式	發射	測試日期	103 年 12 月 13 日
量測場地溫度	24°C	量測場地濕度	64%RH
測試者	崔祐寧		

Channel	Frequency (MHz)	Adjacent Channel Separation (MHz)		20dB Bandwidth (MHz)		Minimum Limit (MHz)		Pass / Fail
		GFSK	8DPSK	GFSK	8DPSK	GFSK	8DPSK	
0	2402	1.01	1.00	0.82	1.20	0.55	0.80	Pass
39	2441	1.00	1.00	0.83	1.21	0.56	0.81	Pass
78	2480	1.00	1.00	0.82	1.21	0.55	0.81	Pass

Note: 本項測試的limit為至少為三分之二20dB頻寬。

**此測試圖僅放測試結果最差的頻道。



8.6 量測結果判定

依據測試數據結果，符合低功率射頻電機技術規範之要求。

9 每一頻道停留時間之量測

9.1 適用標準

請見本報告3.1節第8項的規定。

9.2 量測方法

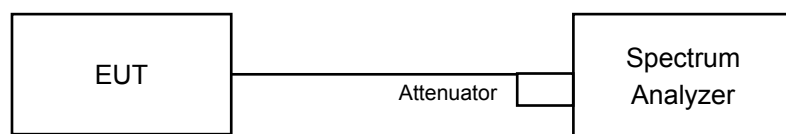
- 將待測物輸出接到頻譜分析儀上。
- 設定待測物處於正常傳輸跳頻模式下。
- 設定 RBW= 100kHz, VBW=300kHz，量測在不同傳輸模式下的頻道停留時間。

9.3 量測儀器

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
SPECTRUM ANALYZER R&S	FSP40	100269	Feb. 11, 2014	Feb. 10, 2015

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 measurement uncertainty is 207Hz, which is calculated as per the document ETSI TR 100 028. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

9.4 測試配置



9.5 量測結果

GFSK

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	50 (times / 5 sec) * 6.32 = 316.00 times	0.444	140.304	400
DH3	25 (times / 5 sec) * 6.32 = 158.00 times	1.710	270.180	400
DH5	16 (times / 5 sec) * 6.32 = 101.10 times	2.990	302.349	400

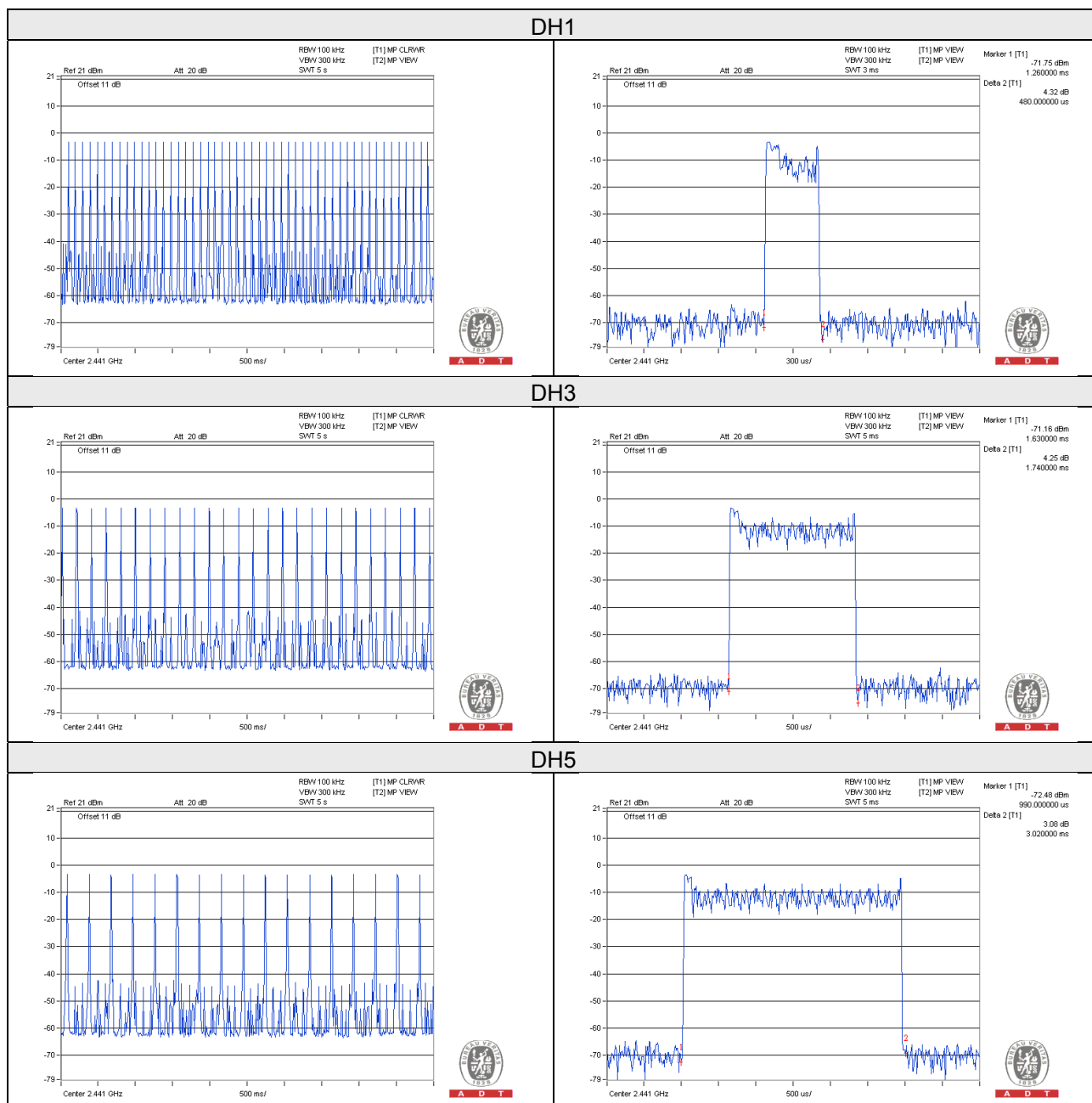
註：因為 Bluetooth 每秒跳 1600 次，會平均落在每個頻道，所以僅測試 Ch39 作為代表。其掃描圖如下所示。



8DPSK

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	50 (times / 5 sec) * 6.32 = 322.32 times	0.480	151.680	400
DH3	26 (times / 5 sec) * 6.32 = 164.32 times	1.740	285.917	400
DH5	17 (times / 5 sec) * 6.32 = 107.44 times	3.020	324.469	400

註：因為 Bluetooth 每秒跳 1600 次，會平均落在每個頻道，所以僅測試 Ch39 作為代表。其掃描圖如下所示。



10 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

您也可以我們的網站內找到各實驗室的地圖。

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