



低功率射頻器材測試報告

申請廠商：惠州高盛達科技有限公司

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工廠：惠州高盛達科技有限公司

地址：惠州市惠澳大道惠南高新科技產業園金達路2號

產品名稱：WIFI+BT Module

產品型號：DCT12R2511

廠牌：GSD

受理日期：110年09月29日

完成日期：110年11月01日

實驗室名稱：世騰電子科技股份有限公司測試實驗室

實驗室地址：桃園市蘆竹區聯福街2巷10號

實驗室認可證書有效期限：112年07月08日

實驗室認可編號及範圍：1439 (9 kHz to 40 GHz)

實驗室認證資格





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修訂記錄

報告號碼.	發行日期	描述
21090245-TRNCC04	Nov. 01, 2021	Original



證 明 書

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工廠	: 惠州高盛達科技有限公司
地址	: 惠州市惠澳大道惠南高新科技產業園金達路 2 號
產品名稱	: WIFI+BT Module
產品型號	: DCT12R2511
廠牌	: GSD
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器材技術規範(LP0002)。 規範修訂日期 109 年 07 月 01 日。
發射功率 (電場強度)	: 8.34dBm

茲在此鄭重聲明：

本試驗報告所列之待測設備樣品已於民國 110 年 10 月 27 日在本公司的標準測試場地完成詳細及完整之量測。本試驗報告所列之量測皆依據低功率射頻器材技術規範之規定來執行。並判斷此待測設備樣品確實符合低功率射頻器材技術規範規定。

備註：本測試報告僅對受測之樣品負責。非經本公司同意，測試報告不得摘錄複印使用。(全部複製除外)。

項次	測試項目	低功率射頻器材技術 規範	量測設備	測試結果	結果判定
1	天線增益之要求	4.10.1.3 節	---	請參閱 3.2 節	---
2	電源線傳導干擾之要求	3.3 節	請參閱 2 章	請參閱 4.4 節	合格
3	場強輻射之要求	4.10.1.5 節	請參閱 2 章	請參閱 5.4 節, 5.5 節及 5.6 節	合格
4	發射頻寬之要求	4.10.1.6 節(1)(A)	請參閱 2 章	請參閱 6.4 節	合格
5	頻道間隔之要求	4.10.1.6 節(1)(A)	請參閱 2 章	請參閱 7.4 節	合格
6	頻道佔用時間之要求	4.10.1.6 節(1)(A)(a)	請參閱 2 章	請參閱 8.4 節	合格
7	跳頻頻道使用數量之要求	4.10.1.6 節(1)(A)(a)	請參閱 2 章	請參閱 9.4 節	合格
8	峰值輸出功率之要求	4.10.1.2 節	請參閱 2 章	請參閱 10.4 節	合格
9	混附波發射限制之要求	4.10.1.5 節	請參閱 2 章	請參閱 11.4 節	合格

本實驗室已依據合約內的標準，降低儀器、環境、人員等不確定因素。因此測試結果將直接依照標準要求判定之。

報告簽署人：



1. 一般描述

1.1. 產品規格

Main Chip	8822CU
IEEE Standards	IEEE 802.11a/b/g/n/ac+ BT
Operating Frequencies	2.4GHz~2.4835GHz /5.150~5.250GHz, 5.725~5.825GHz
Modulation	BT: GFSK, $\pi/4$ -DQPSK, 8DPSK BLE: GFSK 802.11b: CCK, DQPSK, DBPSK 802.11a/g: 64-QAM, 16-QAM, QPSK, BPSK 802.11n: 64-QAM, 16-QAM, QPSK, BPSK 802.11ac: 256-QAM, 64-QAM, 16-QAM, QPSK, BPSK (註：802.11b,a,g,n,ac 可以支持 2TX 模式)
Wireless Data Rate	BT: GFSK:1Mbps, $\pi/4$ -DQPSK: 2Mbps, 8DPSK:3Mbps BLE: GFSK: 1Mbps, 2Mbps WIFI 2.4G: 802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: HT20 reach up to 144.4Mbps, HT40 reach up to 300Mbps WIFI 5G: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: HT20 reach up to 144.4Mbps, HT40 reach up to 300Mbps 802.11ac: VHT20 reach up to 173.3Mbps, VHT40 reach up to 400Mbps, VHT80 reach up to 866.7Mbps
Working Temperature	0°C to +70°C
Storage Temperature	-40°C to +80°C
Power Supply	3.3V +/-10%

Note: For more details, please refer to the User's manual of the EUT.

1.2. 差異說明

無。



1.3. 無線界面規格及頻道對應頻率

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
*00	2402	20	2422	40	2442	60	2462
01	2403	21	2423	41	2443	61	2463
02	2404	22	2424	42	2444	62	2464
03	2405	23	2425	43	2445	63	2465
04	2406	24	2426	44	2446	64	2466
05	2407	25	2427	45	2447	65	2467
06	2408	26	2428	46	2448	66	2468
07	2409	27	2429	47	2449	67	2469
08	2410	28	2430	48	2450	68	2470
09	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	*78	2480
19	2421	*39	2441	59	2461	---	---

*為量測之頻率



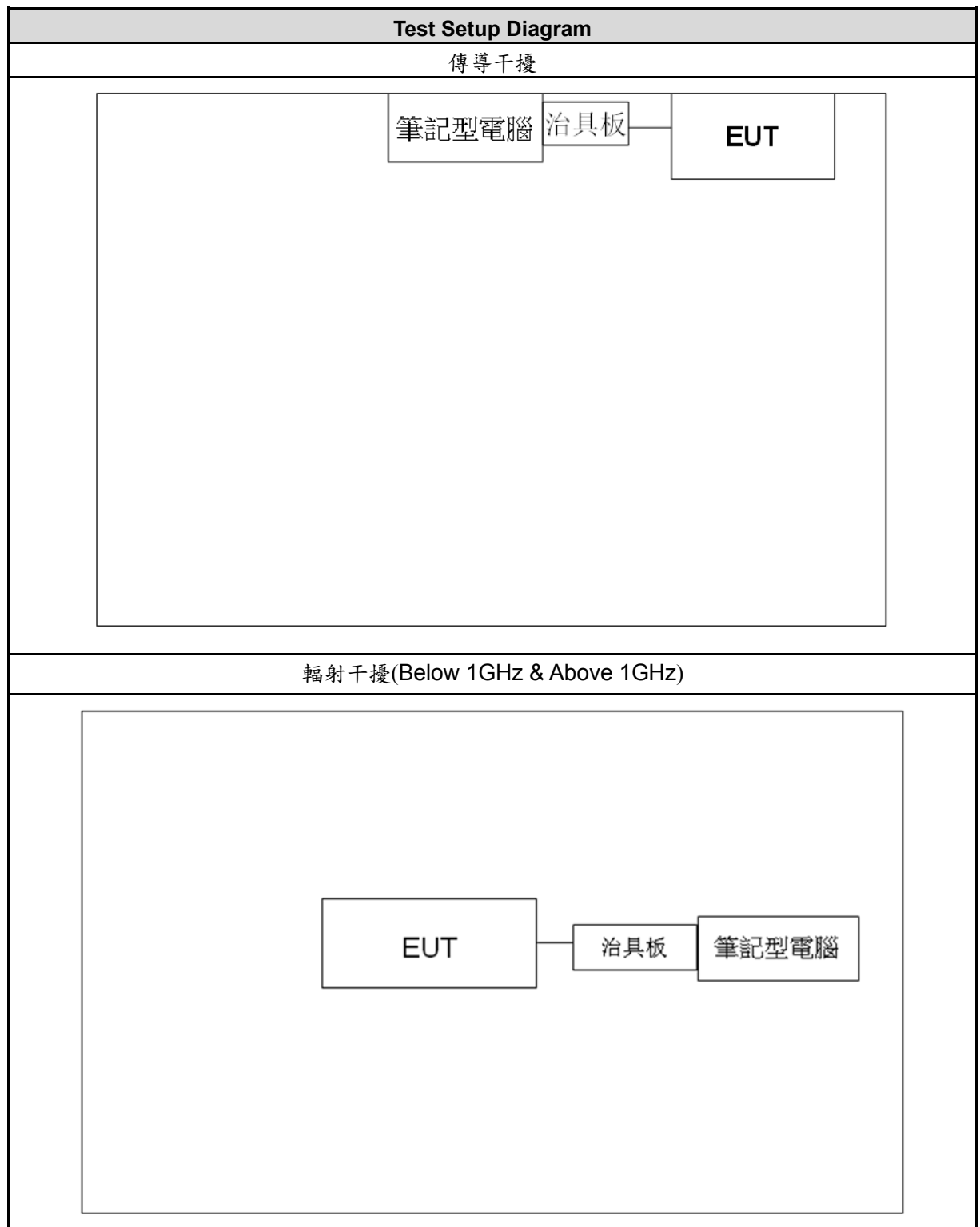
1.4. 測試模式之描述

- 電源傳導及輻射測試之測試軟體如下:
 1. 將量測系統之全部電源打開。
- 2. EUT 連接治具,治具再連接電腦,電腦於 Win 7 作業系統下,EUT 進入 “RTLBTAPP.exe” 來發射與接收訊號。(軟體版本號: 5.2.2.75)
- 執行以下測試模式如下:

Conducted Emissions from the AC mains power ports	
Test Mode	Operating Description
1	GFSK (1Mbps),Transmitter Mode
2	$\pi/4$ -DQPSK (2Mbps) ,Transmitter Mode
3	8DPSK (3Mbps) ,Transmitter Mode
4	GFSK (1Mbps),Receiver Mode
5	$\pi/4$ -DQPSK (2Mbps) , Receiver Mode
6	8DPSK (3Mbps) , Receiver Mode
caused “Test Mode 1,4” generated the worst case, it was reported as the final data.	
Radiation Emissions (30MHz ~ 1GHz)	
Test Mode	Operating Description
1	GFSK (1Mbps),Transmitter Mode
2	$\pi/4$ -DQPSK (2Mbps) ,Transmitter Mode
3	8DPSK (3Mbps) ,Transmitter Mode
4	GFSK (1Mbps),Receiver Mode
5	$\pi/4$ -DQPSK (2Mbps) , Receiver Mode
6	8DPSK (3Mbps) , Receiver Mode
caused “Test Mode 1,4” generated the worst case, it was reported as the final data.	
Radiation Emissions (1GHz ~ 25GHz)	
Test Mode	Operating Description
1	GFSK (1Mbps),Transmitter Mode
2	$\pi/4$ -DQPSK (2Mbps) ,Transmitter Mode
3	8DPSK (3Mbps) ,Transmitter Mode
4	GFSK (1Mbps),Receiver Mode
5	$\pi/4$ -DQPSK (2Mbps) , Receiver Mode
6	8DPSK (3Mbps) , Receiver Mode
caused “Test Mode 1, 3, 4” generated the worst case, it was reported as the final data.	



1.5. 受測裝置之系統說明



[本案經申請者切結器材不提供隨貨配件，配件由實驗室提供併同檢驗]，及其廠牌型號資訊如下：

AC Power Line Conducted Emission & Radiated Emissions & RF Conducted				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
筆記型電腦	Sony	PCG-71811P	N/A	非隔離/1.8m
治具板	GSD	N/A	非隔離/0.5m	N/A



1.6. 測試場地

測試場地：	世騰電子科技股份有限公司測試實驗室 338 桃園市蘆竹區聯福街 2 巷 10 號
測試電壓：	AC 110V/60Hz
適用規範：	本測試報告之所有項目皆依據國家通訊傳播委員會低功率射頻器材技術規範以及參考 ANSI、FCC/47CFR/2.1046、2.1047、2.1049、2.1051、2.1053 及 2.1055 之檢驗法。
測試頻率：	電源傳導：從 150 kHz 到 30 MHz。 場強輻射：從 30 MHz 到 25000 MHz。
測試天線的距離：	場強輻射之測試距離為 3 M。

Test Item	Test Site	Finish Date	Environmental Conditions	Tested By
RF Conducted	RFCON01-NK	2021/10/07~2021/10/27	22~25℃ / 50~60%	Nick Guan
Radiated Emissions (LF, TX)	3M01-NK	2021/10/07~2021/10/27	22~25℃ / 50~60%	Nick Guan
Radiated Emissions (LF, RX)	3M01-NK	2021/10/07~2021/10/27	22~25℃ / 50~60%	Nick Guan
Radiated Emissions (HF, TX)	3M01-NK	2021/10/07~2021/10/27	22~25℃ / 50~60%	Nick Guan
Radiated Emissions (HF, RX)	3M01-NK	2021/10/07~2021/10/27	22~25℃ / 50~60%	Nick Guan
AC Power Line Conducted Emission	CON02-NK	2021/10/07~2021/10/27	22~25℃ / 50~60%	Nick Guan

1.7. 量測不確定度

量測項目	不確定度
AC Power Line Conduction(150K~30MHz)	±1.90dB
Radiated Spurious Emission(9KHz~30MHz)	±3.405dB
Radiated Spurious Emission(30MHz~1GHz)	±5.636dB
Radiated Spurious Emission(1GHz~25GHz)	±6.621dB
Conducted Spurious Emission	±1.8dB
6dB Bandwidth	±4.4%
20dB Bandwidth	±4.4%
Occupied Bandwidth	±4.4%
Peak Output Power(Conducted Power Meter)	±1.1dB
Dwell Time	±1.2%
Power Spectral Density	±1.8dB
Duty Cycle	±1.2%



2. 測試儀器

Test Item	Radiated Emissions				
Test Site	Semi Anechoic Room(3M01-NK)				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Active Loop Antenna	EMCO	6507	40855	2021/06/10	2022/06/09
Bilog Antenna	Sunol	JB1	A051717	2021/06/03	2022/06/02
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-02203	2021/03/16	2022/03/15
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-02203	2021/03/16	2022/03/15
EMI Receiver	ROHDE & SCHWARZ	ESR 7	101906	2021/05/20	2022/05/19
Spectrum Analyzer	ROHDE & SCHWARZ	FSV 40-N	102151	2021/07/14	2022/07/13
Preamplifier	EM Electronics corp.	EM330	60611	2021/03/26	2022/03/25
Preamplifier	EM Electronics corp.	EM01G18G	60700	2021/5/20	2022/05/19
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2020/11/06	2021/11/05
Cable-1m(1G-40G)	HUBER SUHNER	EM104-SMSM	MY4569/2	2021/06/29	2022/06/28
Cable-6m(9k~300M)	NA	EMC5D-BM-BM-6	130606	2021/03/15	2022/03/14
Cable-9m(1G-40G)	HUBER SUHNER	EM104-SMSM	MY5740/2	2021/06/29	2022/06/28
Cable-0.5m(30M-1G)	HUBER SUHNER	RG-214	Cable-08	2021/03/15	2022/03/14
Cable-1m(30M-1G)	HUBER SUHNER	RG-214	Cable-09	2021/03/15	2022/03/14
Cable-6m(30M-1G)	HUBER SUHNER	RG-214	Cable-10	2021/03/15	2022/03/14
Cable-1.5m(1G-40G)	HUBER SUHNER	EM104-SMSM	MY5739/2	2021/06/29	2022/06/28
Cable-3m(30M-40G)	HUBER SUHNER	SUCOFLEX 102	MY2608/2	2021/04/09	2022/04/08
Cable-0.5m(30M-40G)	HUBER SUHNER	SUCOFLEX 102	28420/2	2021/04/03	2022/04/02
E3	AUDIX	v8.2014-8-6	RK-000533	NA	NA

Test Item	RF Conducted				
Test Site	RFCON01-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Spectrum Analyzer	KEYSIGHT	N9010A	MY54200207	2021/04/21	2022/04/20
CAX Signal Analyzer	KEYSIGHT	N9000B	MY57100339	2020/11/10	2021/11/09
Attenuator	KEYSIGHT	8491B	MY39250703	2021/04/09	2022/04/08
Power Meter	Anritsu	ML2495A	1224005	2021/04/14	2022/04/13
Power Sensor	Anritsu	MA2411B	1207295	2021/04/14	2022/04/13

Test Item	AC Power Line Conducted Emission				
Test Site	CON02-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
EMI Receiver	ROHDE & SCHWARZ	ESCI	100443	2021/05/20	2022/05/19
Line Impedance Stabilization Network	Schwarzbeck	NSLK 8127	8127-568	2021/06/02	2022/06/01
TWO-LINE V-NETWORK	ROHDE & SCHWARZ	ENV216	102185	2021/08/18	2022/08/17
Cable-6m(9k~300M)	NA	EMC5D-BM-BM-6	130606	2021/03/15	2022/03/14
E3	AUDIX	v8.2014-8-6	RK-000536	NA	NA



3. 天線增益之要求

天線規格不受國家通訊傳播委員會低功率射頻器材技術規範(3.2)節規定之限制，其發射天線之方向性增益超過 6dBi 時，應依其所超過之 dB 數等量降低峰值輸出功率。如用於固定式點對點操作時，應符合下列情形之一：

操作於 2400-2483.5 兆赫(MHz)者，其發射天線之方向性增益超過 6dBi，應於每超過 3dB 降低 1dB 之峰值輸出功率。

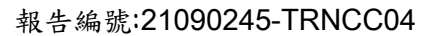
操作於 5725-5850 兆赫(MHz)者，其發射天線之方向性增益超過 6dBi，不需降低峰值輸出功率。

3.1. 天線型式及其增益

- | | |
|----------------------|--------------|
| 1.1 Brand : | 中天迅 |
| 1.2 Model : | DCT12 |
| 1.3 Antenna type : | PCB Antenna |
| 1.4 Frequency Rang : | 2402-2480MHz |
| 1.5 Gain(peak) : | 3dBi |
- (參照天線規格資料)

3.2. 結果判定

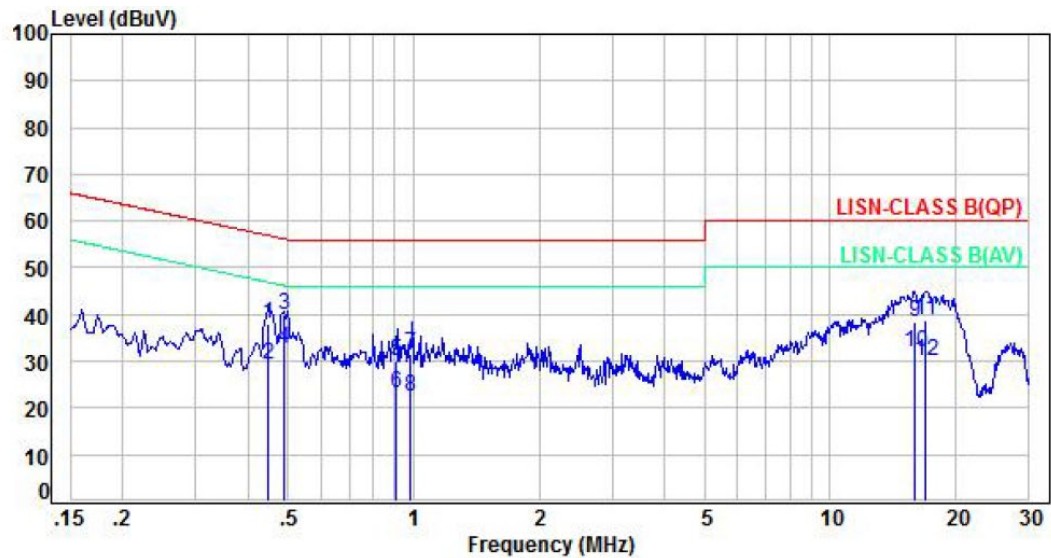
其發射天線之方向性增益低於 6dBi，因此無需降低峰值輸出功率。





4.4. 傳導干擾之測試結果及數據

Power	: AC 110V/60Hz	Pol/Phase	: LINE
Test Mode	: Mode 1		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	P/F
1	0.45	9.84	28.16	38.00	56.95	-18.95	QP	P
2	0.45	9.84	19.49	29.33	46.95	-17.62	Average	P
3	0.49	9.83	30.27	40.10	56.18	-16.08	QP	P
4	0.49	9.83	22.71	32.54	46.18	-13.64	Average	P
5	0.91	9.82	20.31	30.13	56.00	-25.87	QP	P
6	0.91	9.82	13.33	23.15	46.00	-22.85	Average	P
7	0.98	9.82	21.59	31.41	56.00	-24.59	QP	P
8	0.98	9.82	12.68	22.50	46.00	-23.50	Average	P
9	16.03	10.09	28.43	38.52	60.00	-21.48	QP	P
10	16.03	10.09	21.96	32.05	50.00	-17.95	Average	P
11	16.90	10.11	28.72	38.83	60.00	-21.17	QP	P
12	16.90	10.11	19.99	30.10	50.00	-19.90	Average	P

Site: COND-02-NK

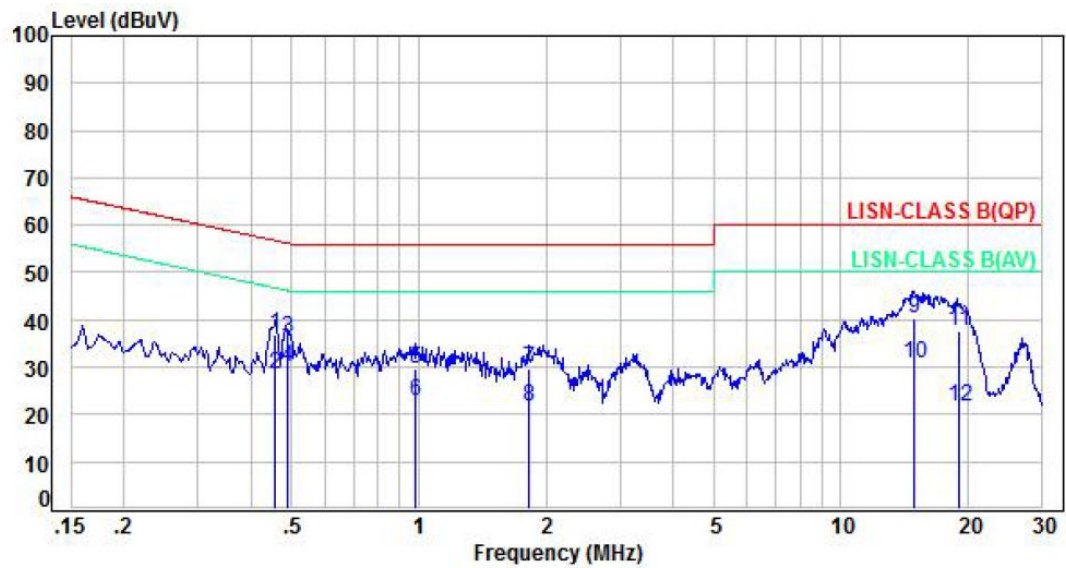
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Power	: AC 110V/60Hz	Pol/Phase	: NEUTRAL
Test Mode	: Mode 1		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.46	9.76	27.06	36.82	56.74	-19.92	QP	P
2	0.46	9.76	18.85	28.61	46.74	-18.13	Average	P
3	0.49	9.75	26.51	36.26	56.23	-19.97	QP	P
4	0.49	9.75	20.38	30.13	46.23	-16.10	Average	P
5	0.98	9.76	19.86	29.62	56.00	-26.38	QP	P
6	0.98	9.76	12.97	22.73	46.00	-23.27	Average	P
7	1.83	9.81	19.68	29.49	56.00	-26.51	QP	P
8	1.83	9.81	11.85	21.66	46.00	-24.34	Average	P
9	14.92	10.07	30.35	40.42	60.00	-19.58	QP	P
10	14.92	10.07	20.65	30.72	50.00	-19.28	Average	P
11	19.05	10.16	27.50	37.66	60.00	-22.34	QP	P
12	19.05	10.16	11.34	21.50	50.00	-28.50	Average	P

Site: COND-02-NK

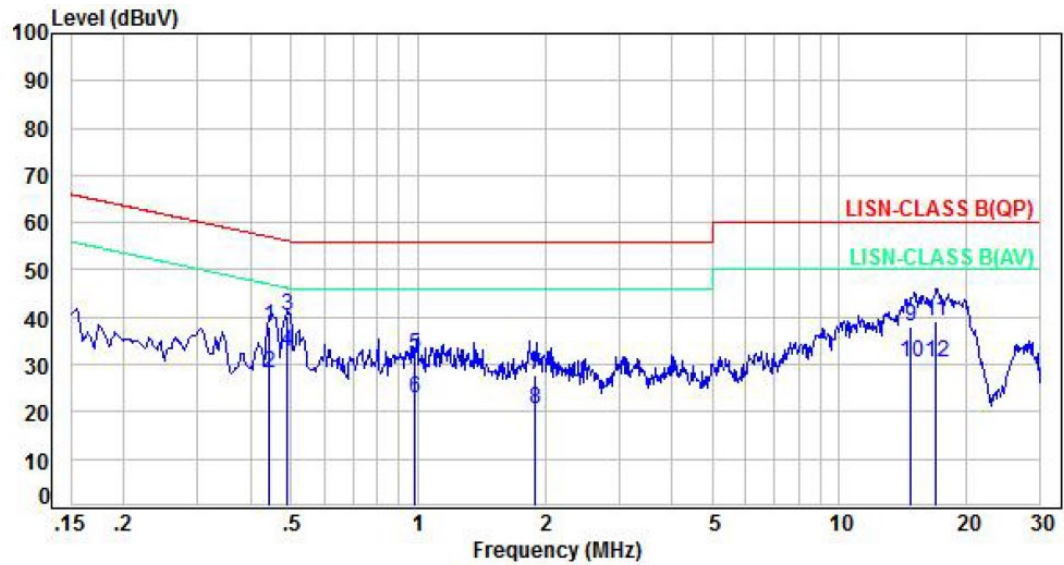
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Power	: AC 110V/60Hz	Pol/Phase	: LINE
Test Mode	: Mode 4		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	P/F
1	0.44	9.84	28.30	38.14	56.98	-18.84	QP	P
2	0.44	9.84	18.45	28.29	46.98	-18.69	Average	P
3	0.49	9.83	30.44	40.27	56.16	-15.89	QP	P
4	0.49	9.83	22.97	32.80	46.16	-13.36	Average	P
5	0.98	9.82	21.95	31.77	56.00	-24.23	QP	P
6	0.98	9.82	12.97	22.79	46.00	-23.21	Average	P
7	1.89	9.88	18.02	27.90	56.00	-28.10	QP	P
8	1.89	9.88	10.77	20.65	46.00	-25.35	Average	P
9	14.81	10.09	28.00	38.09	60.00	-21.91	QP	P
10	14.81	10.09	20.18	30.27	50.00	-19.73	Average	P
11	16.92	10.11	29.22	39.33	60.00	-20.67	QP	P
12	16.92	10.11	20.22	30.33	50.00	-19.67	Average	P

Site: COND-02-NK

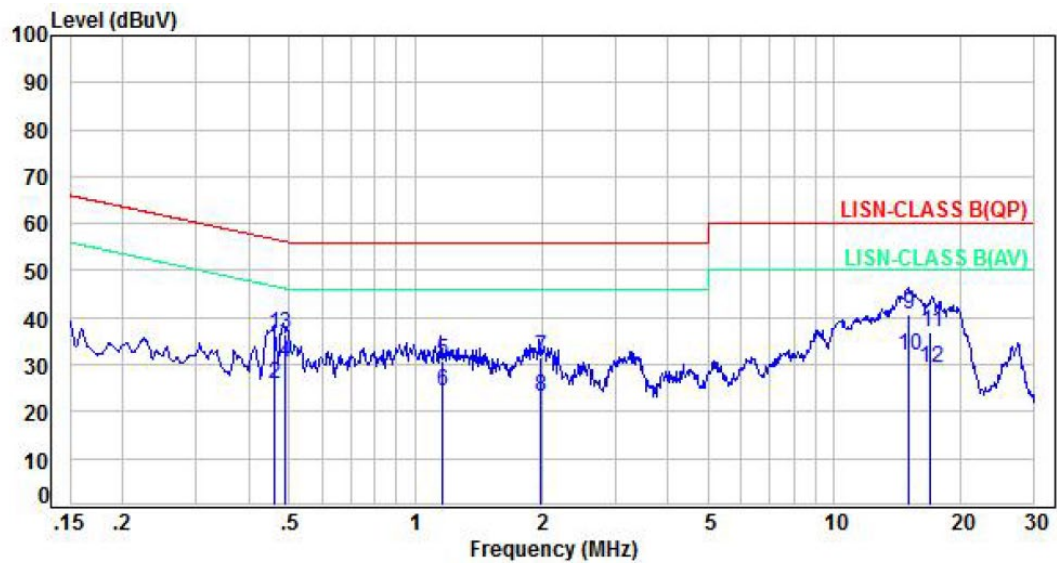
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Power	: AC 110V/60Hz	Pol/Phase	: NEUTRAL
Test Mode	: Mode 4		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.46	9.75	26.58	36.33	56.69	-20.36	QP	P
2	0.46	9.75	15.96	25.71	46.69	-20.98	Average	P
3	0.49	9.75	26.72	36.47	56.22	-19.75	QP	P
4	0.49	9.75	20.58	30.33	46.22	-15.89	Average	P
5	1.15	9.77	21.19	30.96	56.00	-25.04	QP	P
6	1.15	9.77	14.52	24.29	46.00	-21.71	Average	P
7	1.98	9.82	21.82	31.64	56.00	-24.36	QP	P
8	1.98	9.82	13.43	23.25	46.00	-22.75	Average	P
9	15.00	10.07	30.77	40.84	60.00	-19.16	QP	P
10	15.00	10.07	21.71	31.78	50.00	-18.22	Average	P
11	16.98	10.12	26.92	37.04	60.00	-22.96	QP	P
12	16.98	10.12	19.01	29.13	50.00	-20.87	Average	P

Site: COND-02-NK

Note: Level=Reading+Factor

Margin=Level-Limit

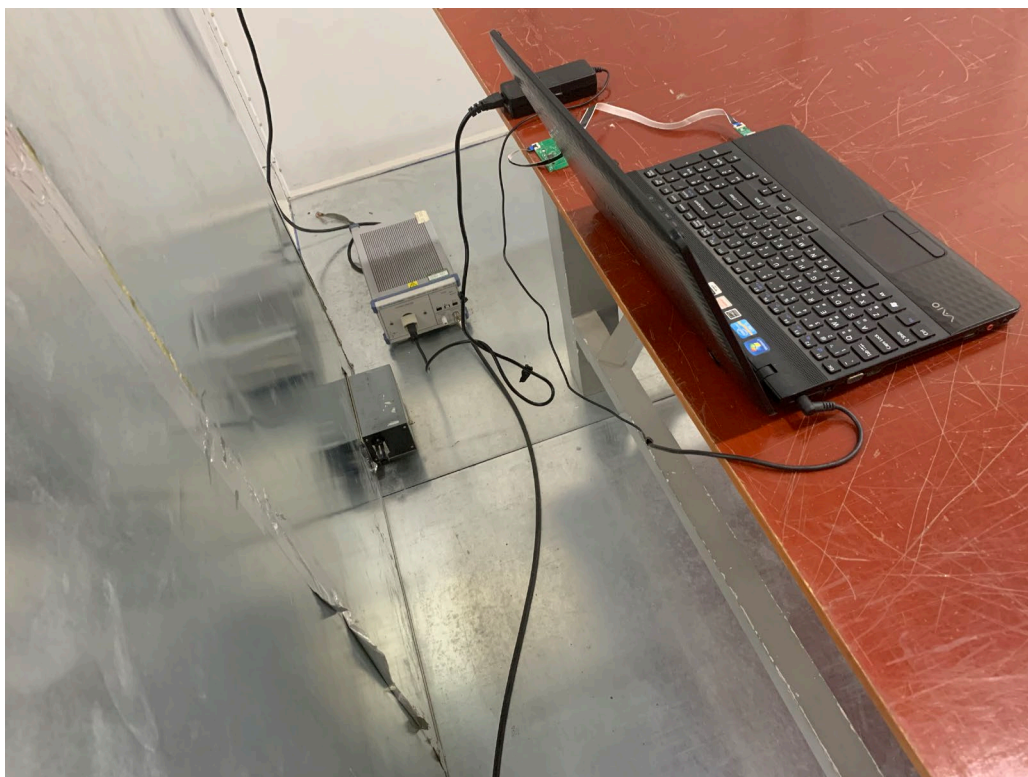
Factor=(LISN or ISN or Current Probe)Factor + Cable Loss

4.5. 傳導量測之配置照片

正面照



側面照





5. 輻射之量測規定

5.1. 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.5 之要求，落於 3.5 節禁用頻段之輻射干擾需符合 3.6 節之一般限制要求：

頻率(MHz)	測試距離(m)	限制值(dB μ V)	限制值(μ V/m)
0.009 – 0.490 (含)	300	67.6 / f(kHz)	2400 / f(kHz)
0.490 (不含) – 1.705 (含)	30	87.6 / f(kHz)	24000 / f(kHz)
1.705(不含) – 30(不含)	30	29.5	30
30 (含) – 88 (含)	3	40.0	100
88(不含) – 216 (含)	3	43.5	150
216(不含) – 960 (含)	3	46.0	200
960(不含)以上	3	54.0	500

5.2. 測試方法

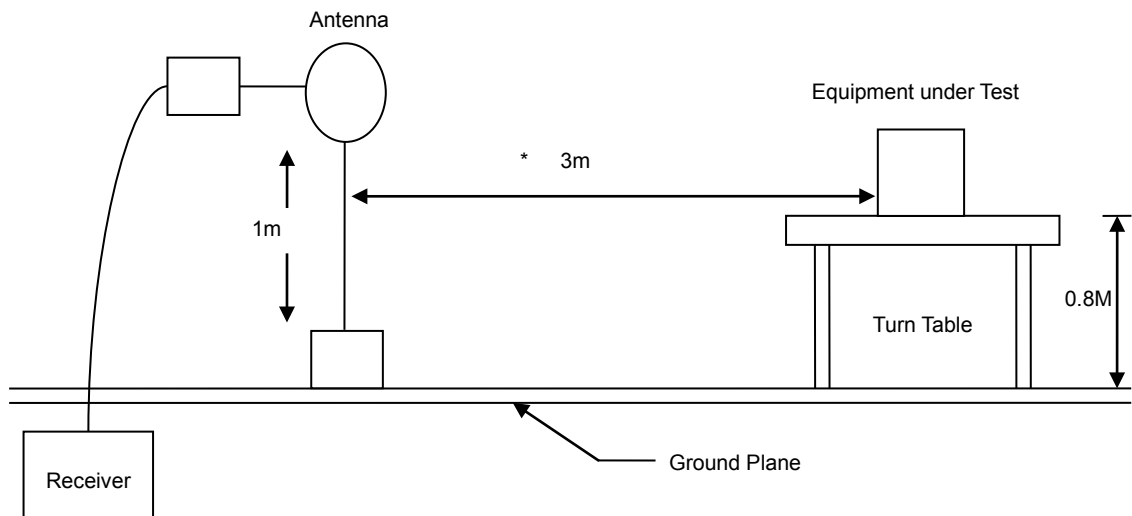
將待測物置於 0.8 米(Below 1G) & 1.5 米(Above 1G)高的非金屬桌面，使其在測試模式狀態，且設定為高、中、低各頻道產生最高峰值輸出功率的傳輸速率，接收天線置於 3 米外，且桌面要 360 度旋轉，另外接收天線也要從 1 米至 4 米升降變化，接收天線置於水平、垂直極向各執行測試一次。如待測物可以三軸相放置，並分別測試以找出最大輻射電場強度(最差的結果為 X 軸)。

備註：

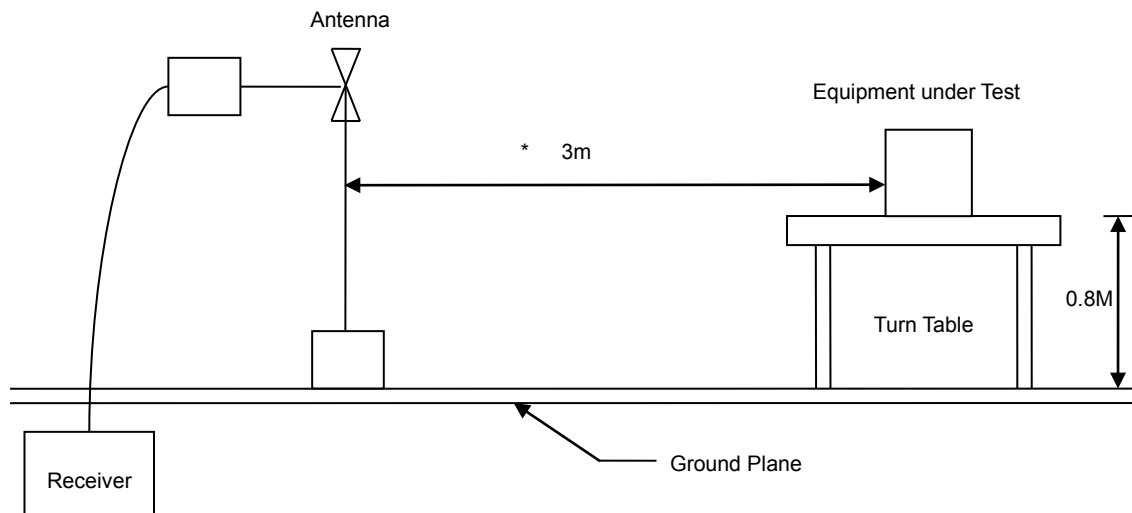
For Below 1G 若待測物之輻射峰值低於限制值 3dB 以上，則將終止測試，並以峰值之讀值作為報告之記錄;反之，若無 3dB 餘裕範圍之輻射，則每一訊號皆以準峰值之測試方法量測，並記錄於報告之中

5.3. 輻射場地之擺設

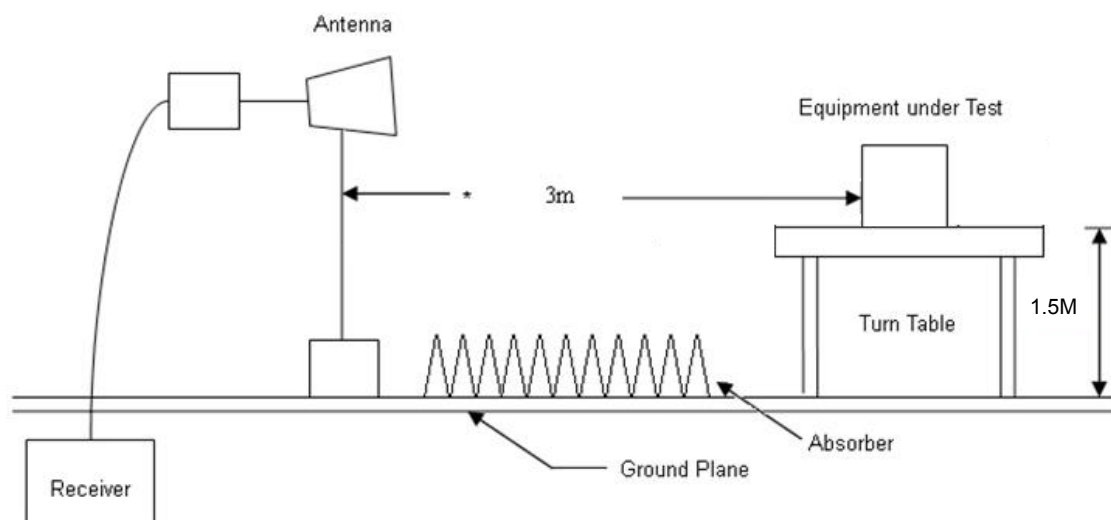
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



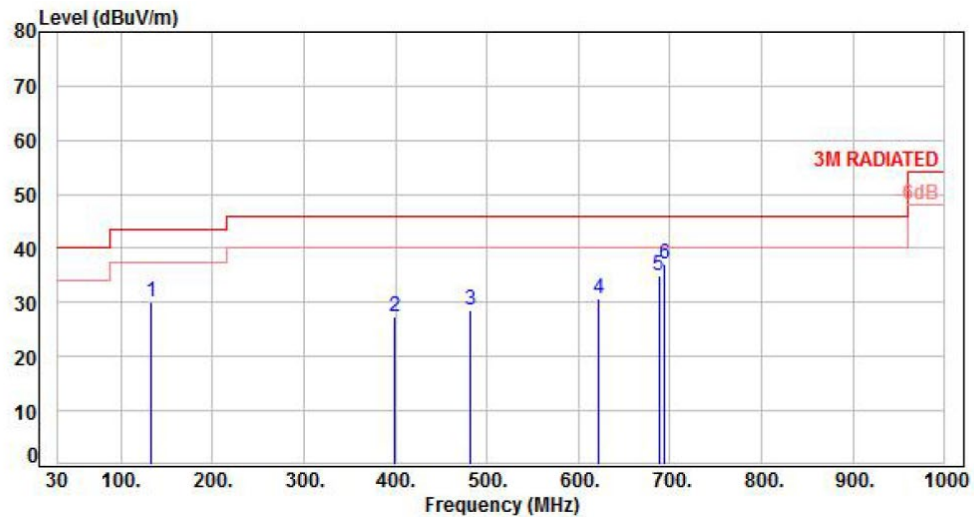


5.4. 輻射之測試結果及數據 (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

5.5. 輻射之測試結果及數據 (30MHz ~ 1GHz)

Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 1		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	132.82	-10.15	40.16	30.01	43.50	-13.49	Peak	100	207	P
2	399.57	-7.18	34.46	27.28	46.00	-18.72	Peak	100	167	P
3	482.02	-4.95	33.54	28.59	46.00	-17.41	Peak	200	306	P
4	622.67	-2.82	33.55	30.73	46.00	-15.27	Peak	100	129	P
5	687.66	-2.00	37.12	35.12	46.00	-10.88	Peak	200	212	P
6	693.48	-1.94	39.01	37.07	46.00	-8.93	Peak	100	358	P

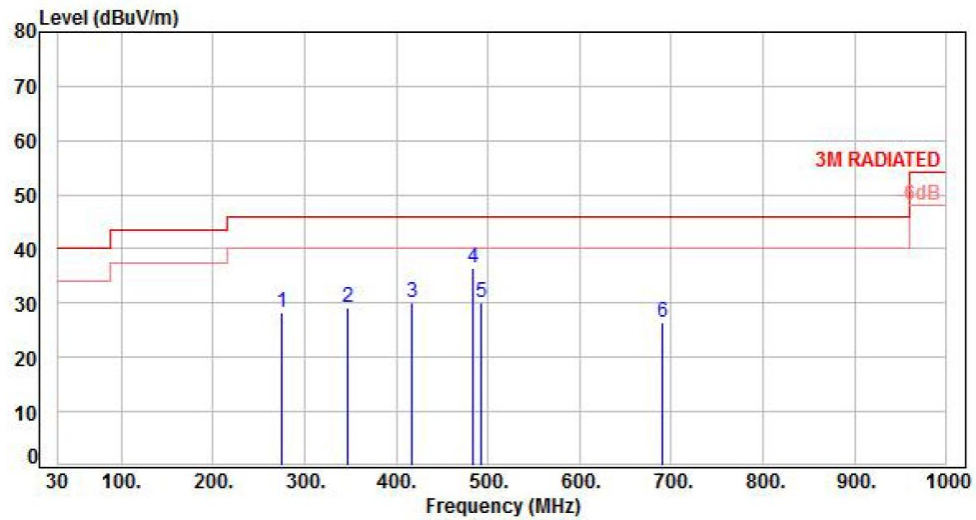
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1		:



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	275.41	-9.78	37.94	28.16	46.00	-17.84	Peak	200	287	P
2	346.22	-8.50	37.63	29.13	46.00	-16.87	Peak	100	162	P
3	417.03	-6.49	36.72	30.23	46.00	-15.77	Peak	100	133	P
4	482.99	-4.91	41.33	36.42	46.00	-9.58	Peak	200	320	P
5	491.72	-4.81	35.07	30.26	46.00	-15.74	Peak	200	205	P
6	689.60	-1.95	28.55	26.60	46.00	-19.40	Peak	200	354	P

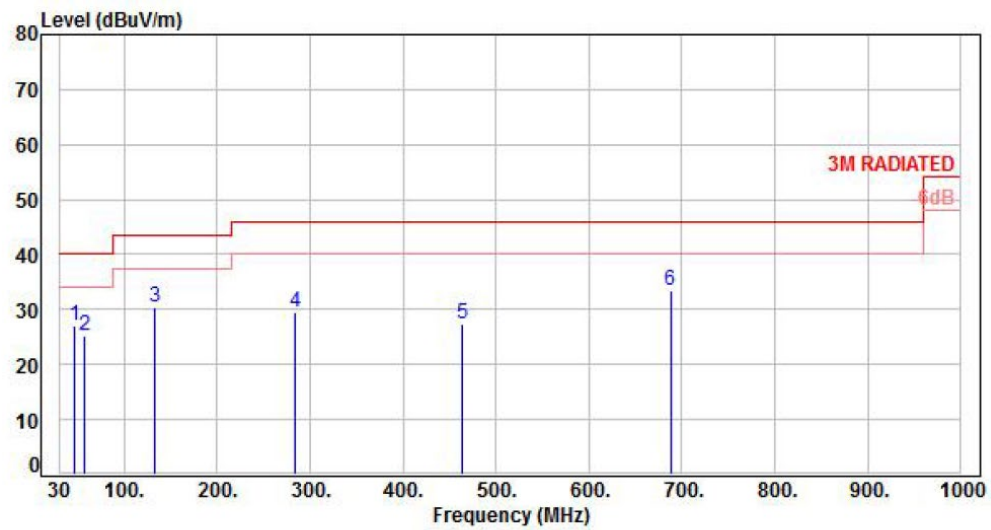
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 4		:

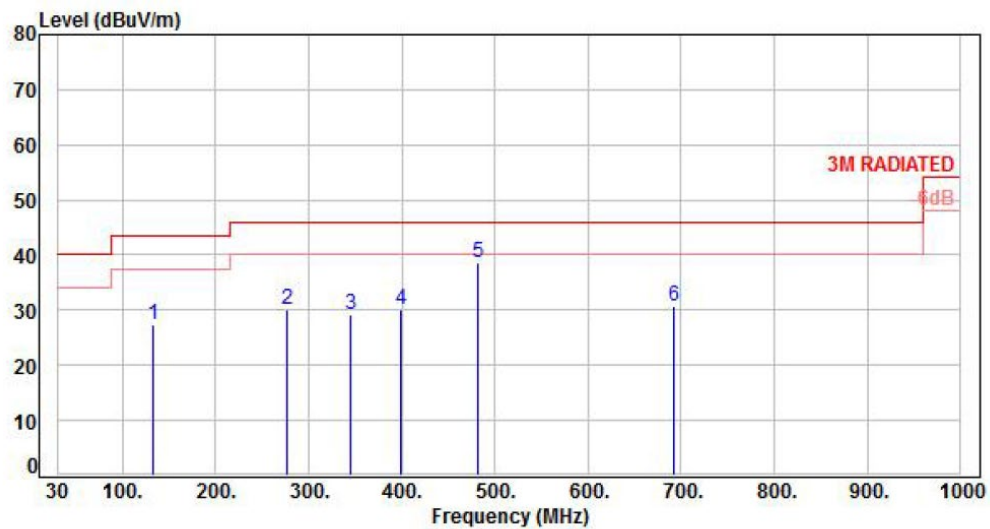


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	46.49	-14.40	41.43	27.03	40.00	-12.97	Peak	100	328	P
2	57.16	-17.01	42.24	25.23	40.00	-14.77	Peak	200	205	P
3	132.82	-10.15	40.59	30.44	43.50	-13.06	Peak	100	164	P
4	283.17	-9.81	39.41	29.60	46.00	-16.40	Peak	100	325	P
5	464.56	-5.58	32.91	27.33	46.00	-18.67	Peak	200	261	P
6	687.66	-2.00	35.34	33.34	46.00	-12.66	Peak	100	332	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4		



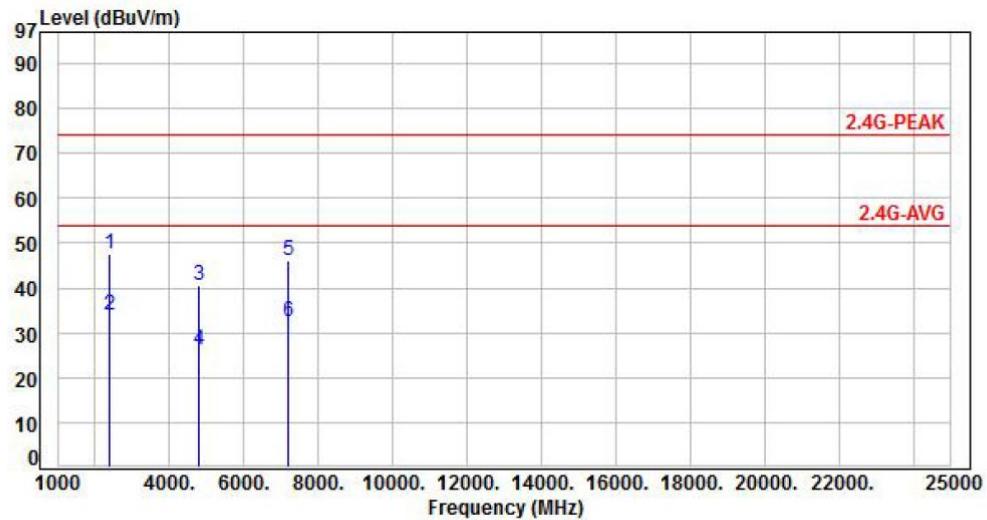
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	132.82	-10.15	37.68	27.53	43.50	-15.97	Peak	100	167	P
2	277.35	-9.77	39.73	29.96	46.00	-16.04	Peak	200	248	P
3	345.25	-8.53	37.69	29.16	46.00	-16.84	Peak	200	312	P
4	399.57	-7.18	37.27	30.09	46.00	-15.91	Peak	200	349	P
5	482.02	-4.95	43.47	38.52	46.00	-7.48	Peak	100	105	P
6	692.51	-1.94	32.65	30.71	46.00	-15.29	Peak	200	83	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



5.6. 輻射之測試結果及數據 (1GHz ~ 25GHz)

Power	:	AC 110V/60Hz	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1, CH00		:	



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-30.60	78.22	47.62	74.00	-26.38	Peak	100	205	P
2	2390.00	-30.60	64.35	33.75	54.00	-20.25	Average	100	205	P
3	4804.00	-25.35	66.09	40.74	74.00	-33.26	Peak	100	328	P
4	4804.00	-25.35	51.67	26.32	54.00	-27.68	Average	100	328	P
5	7206.00	-19.76	65.83	46.07	74.00	-27.93	Peak	100	124	P
6	7206.00	-19.76	52.22	32.46	54.00	-21.54	Average	100	124	P

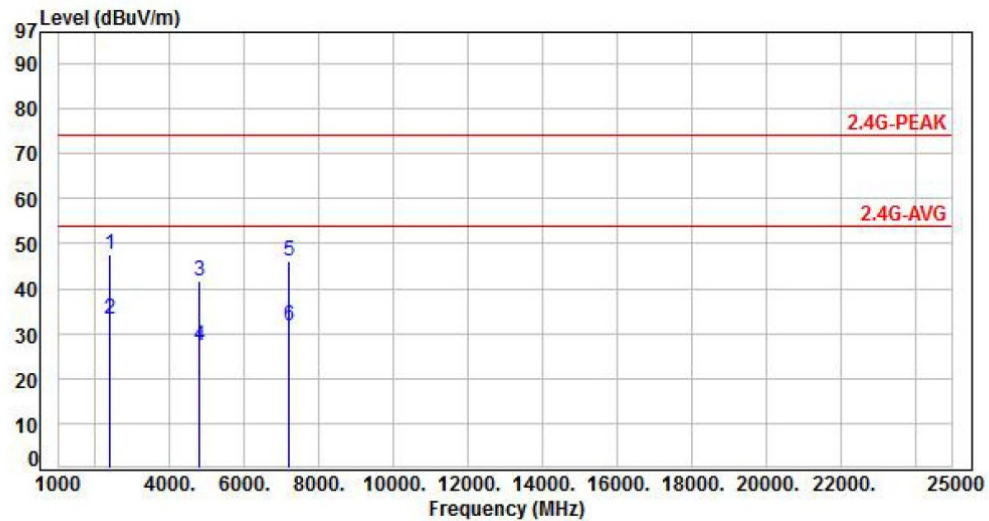
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH00		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-30.60	78.36	47.76	74.00	-26.24	Peak	100	210	P
2	2390.00	-30.60	63.89	33.29	54.00	-20.71	Average	100	210	P
3	4804.00	-25.35	67.02	41.67	74.00	-32.33	Peak	100	356	P
4	4804.00	-25.35	52.78	27.43	54.00	-26.57	Average	100	356	P
5	7206.00	-19.76	65.74	45.98	74.00	-28.02	Peak	100	253	P
6	7206.00	-19.76	51.40	31.64	54.00	-22.36	Average	100	253	P

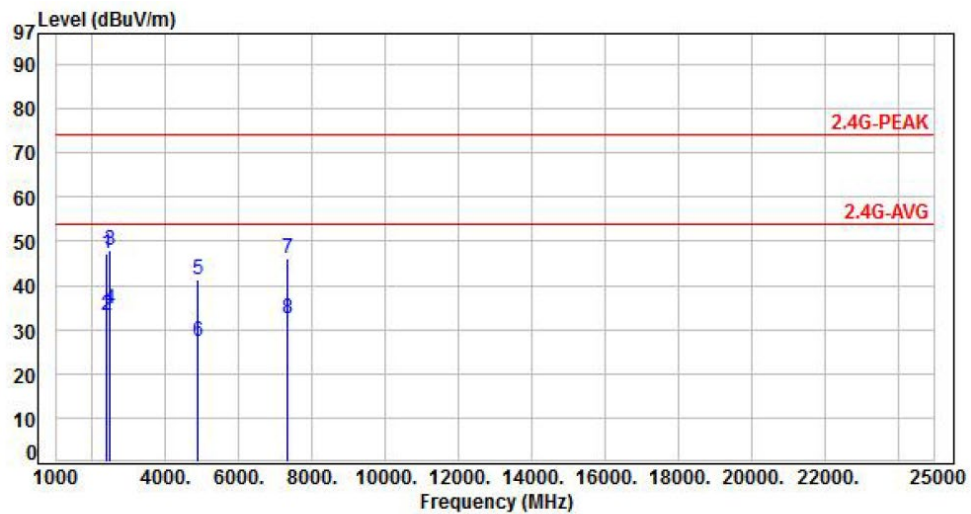
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH39		:



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-30.60	77.98	47.38	74.00	-26.62	Peak	100	169	P
2	2390.00	-30.60	63.95	33.35	54.00	-20.65	Average	100	169	P
3	2483.50	-30.72	78.80	48.08	74.00	-25.92	Peak	100	223	P
4	2483.50	-30.72	65.34	34.62	54.00	-19.38	Average	100	223	P
5	4882.00	-25.29	66.78	41.49	74.00	-32.51	Peak	100	284	P
6	4882.00	-25.29	52.60	27.31	54.00	-26.69	Average	100	284	P
7	7323.00	-19.59	65.73	46.14	74.00	-27.86	Peak	100	348	P
8	7323.00	-19.59	52.22	32.63	54.00	-21.37	Average	100	348	P

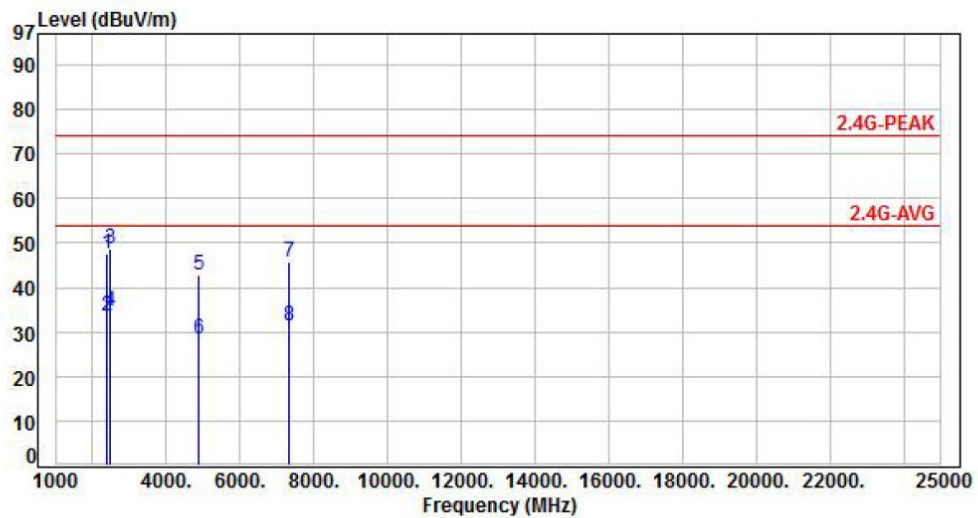
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH39		:

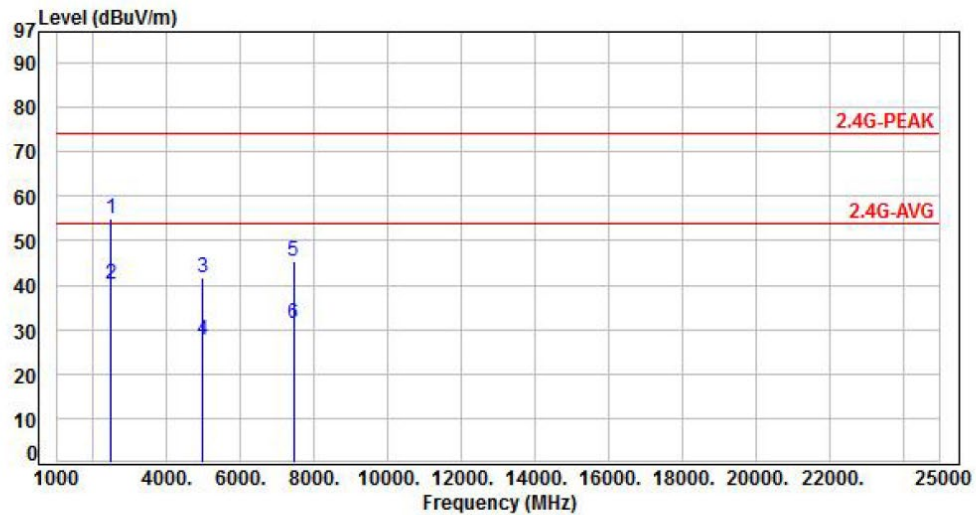


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-30.60	78.20	47.60	74.00	-26.40	Peak	100	73	P
2	2390.00	-30.60	64.11	33.51	54.00	-20.49	Average	100	73	P
3	2483.50	-30.72	79.54	48.82	74.00	-25.18	Peak	100	351	P
4	2483.50	-30.72	65.30	34.58	54.00	-19.42	Average	100	351	P
5	4882.00	-25.29	68.24	42.95	74.00	-31.05	Peak	100	194	P
6	4882.00	-25.29	53.68	28.39	54.00	-25.61	Average	100	194	P
7	7323.00	-19.59	65.24	45.65	74.00	-28.35	Peak	100	317	P
8	7323.00	-19.59	50.82	31.23	54.00	-22.77	Average	100	317	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH78		:



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-30.72	85.63	54.91	74.00	-19.09	Peak	100	262	P
2	2483.50	-30.72	71.07	40.35	54.00	-13.65	Average	100	262	P
3	4960.00	-25.09	66.83	41.74	74.00	-32.26	Peak	100	138	P
4	4960.00	-25.09	52.66	27.57	54.00	-26.43	Average	100	138	P
5	7440.00	-19.68	65.12	45.44	74.00	-28.56	Peak	100	318	P
6	7440.00	-19.68	51.00	31.32	54.00	-22.68	Average	100	318	P

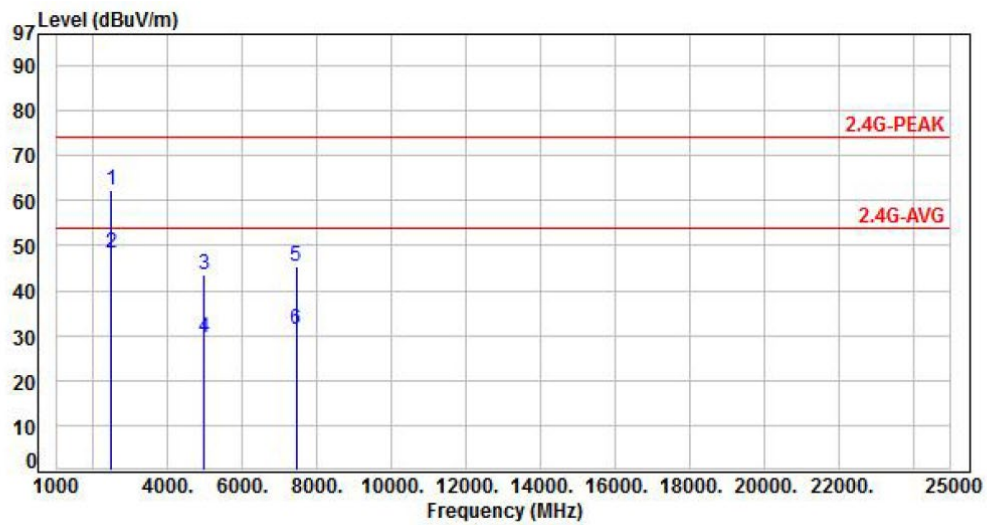
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH78		:

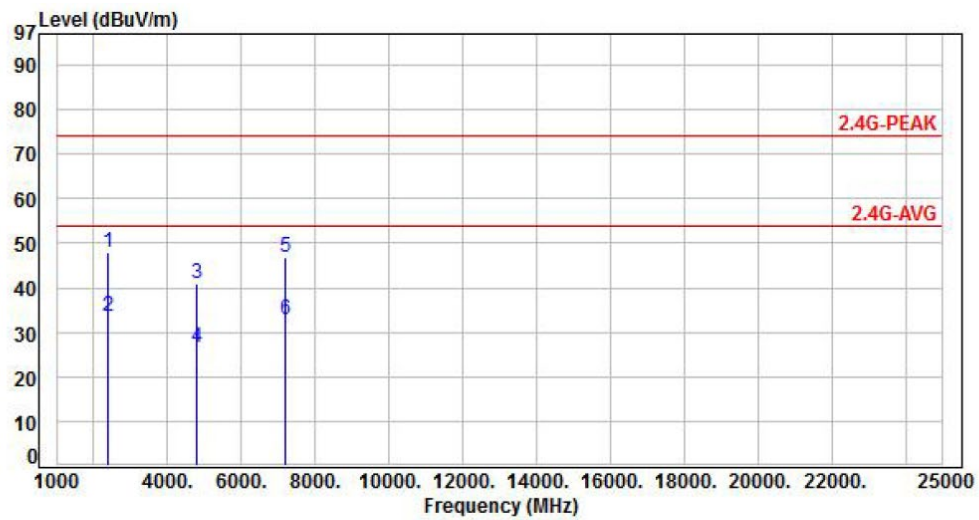


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-30.72	93.10	62.38	74.00	-11.62	Peak	100	305	P
2	2483.50	-30.72	78.89	48.17	54.00	-5.83	Average	100	305	P
3	4960.00	-25.09	68.66	43.57	74.00	-30.43	Peak	100	327	P
4	4960.00	-25.09	54.72	29.63	54.00	-24.37	Average	100	327	P
5	7440.00	-19.68	65.14	45.46	74.00	-28.54	Peak	100	325	P
6	7440.00	-19.68	51.05	31.37	54.00	-22.63	Average	100	325	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH00		:

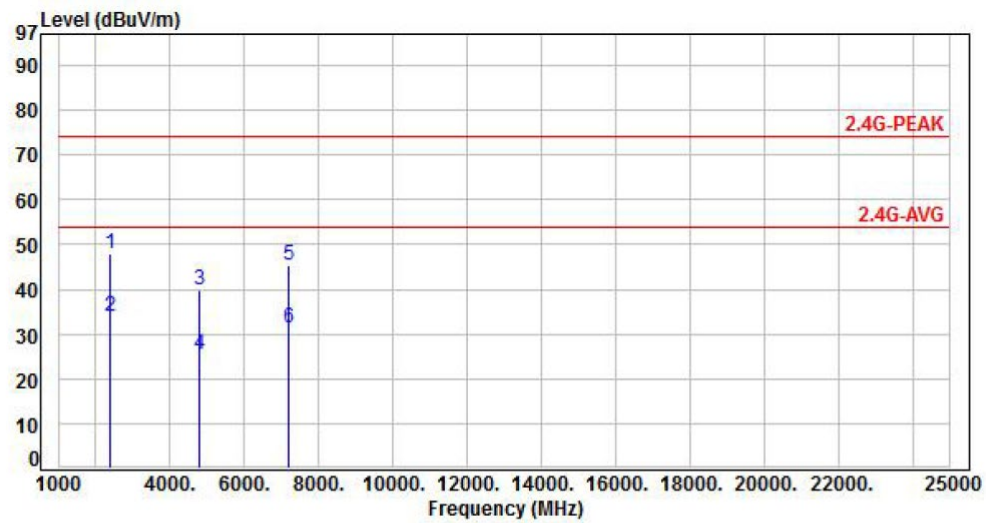


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-30.60	78.71	48.11	74.00	-25.89	Peak	100	285	P
2	2390.00	-30.60	64.33	33.73	54.00	-20.27	Average	100	285	P
3	4804.00	-25.35	66.14	40.79	74.00	-33.21	Peak	100	127	P
4	4804.00	-25.35	52.00	26.65	54.00	-27.35	Average	100	127	P
5	7206.00	-19.76	66.60	46.84	74.00	-27.16	Peak	100	342	P
6	7206.00	-19.76	52.47	32.71	54.00	-21.29	Average	100	342	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH00		:

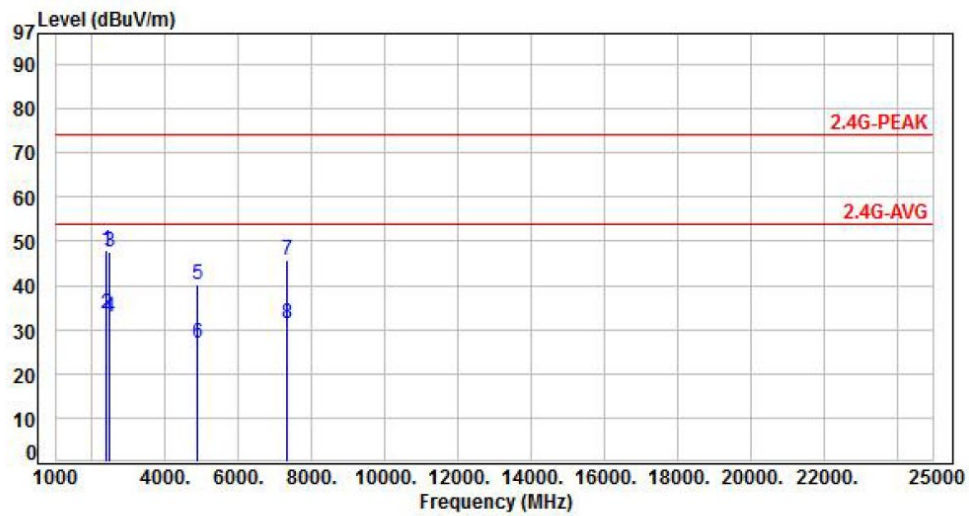


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-30.60	78.61	48.01	74.00	-25.99	Peak	100	276	P
2	2390.00	-30.60	64.42	33.82	54.00	-20.18	Average	100	276	P
3	4804.00	-25.35	65.16	39.81	74.00	-34.19	Peak	100	314	P
4	4804.00	-25.35	50.69	25.34	54.00	-28.66	Average	100	314	P
5	7206.00	-19.76	65.03	45.27	74.00	-28.73	Peak	100	175	P
6	7206.00	-19.76	51.19	31.43	54.00	-22.57	Average	100	175	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH39		:



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-30.60	78.70	48.10	74.00	-25.90	Peak	100	257	P
2	2390.00	-30.60	64.22	33.62	54.00	-20.38	Average	100	257	P
3	2483.50	-30.72	78.35	47.63	74.00	-26.37	Peak	100	324	P
4	2483.50	-30.72	63.47	32.75	54.00	-21.25	Average	100	324	P
5	4882.00	-25.29	65.67	40.38	74.00	-33.62	Peak	100	297	P
6	4882.00	-25.29	52.12	26.83	54.00	-27.17	Average	100	297	P
7	7323.00	-19.59	65.20	45.61	74.00	-28.39	Peak	100	138	P
8	7323.00	-19.59	51.08	31.49	54.00	-22.51	Average	100	138	P

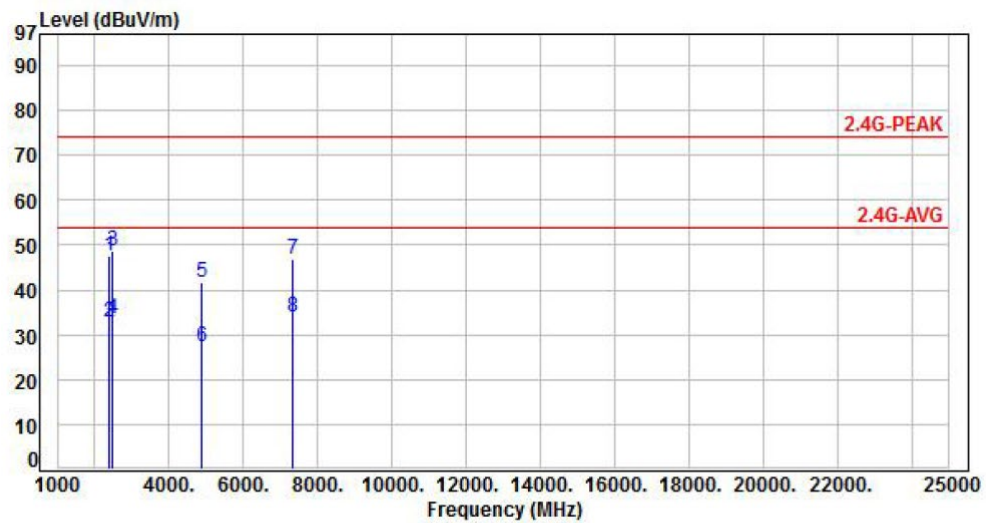
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH39		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-30.60	78.12	47.52	74.00	-26.48	Peak	100	327	P
2	2390.00	-30.60	63.25	32.65	54.00	-21.35	Average	100	327	P
3	2483.50	-30.72	79.25	48.53	74.00	-25.47	Peak	100	153	P
4	2483.50	-30.72	64.39	33.67	54.00	-20.33	Average	100	153	P
5	4882.00	-25.29	66.80	41.51	74.00	-32.49	Peak	100	174	P
6	4882.00	-25.29	52.43	27.14	54.00	-26.86	Average	100	174	P
7	7323.00	-19.59	66.60	47.01	74.00	-26.99	Peak	100	352	P
8	7323.00	-19.59	53.54	33.95	54.00	-20.05	Average	100	352	P

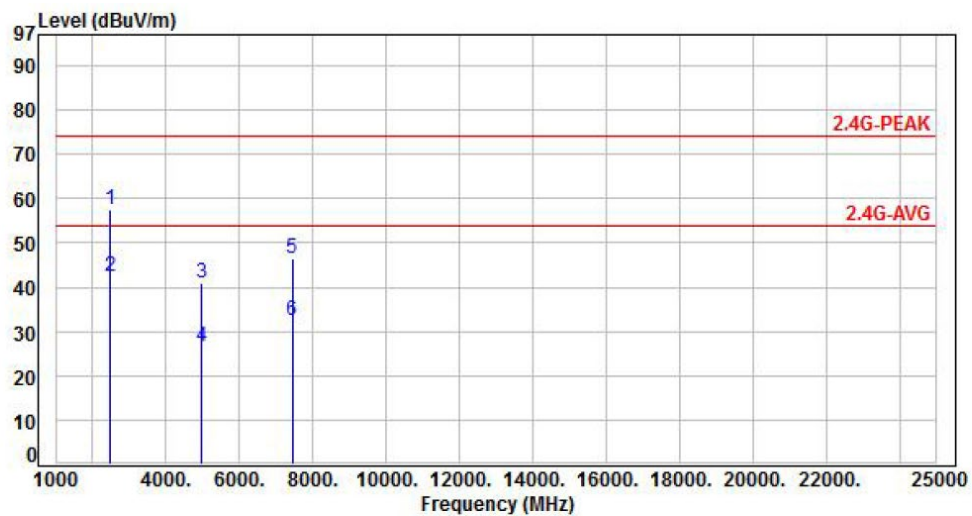
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH78		:

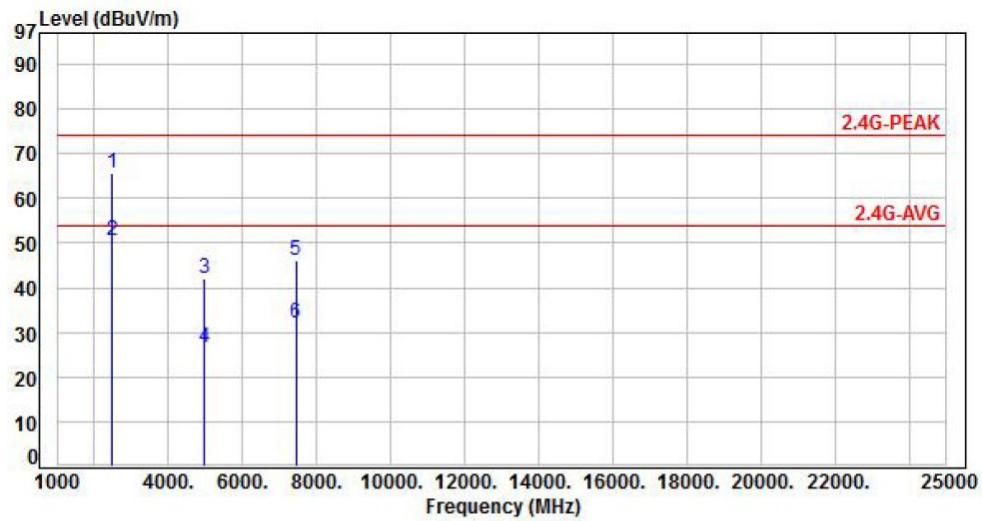


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-30.72	88.08	57.36	74.00	-16.64	Peak	100	349	P
2	2483.50	-30.72	73.09	42.37	54.00	-11.63	Average	100	349	P
3	4960.00	-25.09	66.15	41.06	74.00	-32.94	Peak	100	245	P
4	4960.00	-25.09	51.82	26.73	54.00	-27.27	Average	100	245	P
5	7440.00	-19.68	66.09	46.41	74.00	-27.59	Peak	100	172	P
6	7440.00	-19.68	52.20	32.52	54.00	-21.48	Average	100	172	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH78		:



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-30.72	96.55	65.83	74.00	-8.17	Peak	100	266	P
2	2483.50	-30.72	81.08	50.36	54.00	-3.64	Average	100	266	P
3	4960.00	-25.09	67.02	41.93	74.00	-32.07	Peak	100	327	P
4	4960.00	-25.09	51.60	26.51	54.00	-27.49	Average	100	327	P
5	7440.00	-19.68	65.71	46.03	74.00	-27.97	Peak	100	104	P
6	7440.00	-19.68	51.86	32.18	54.00	-21.82	Average	100	104	P

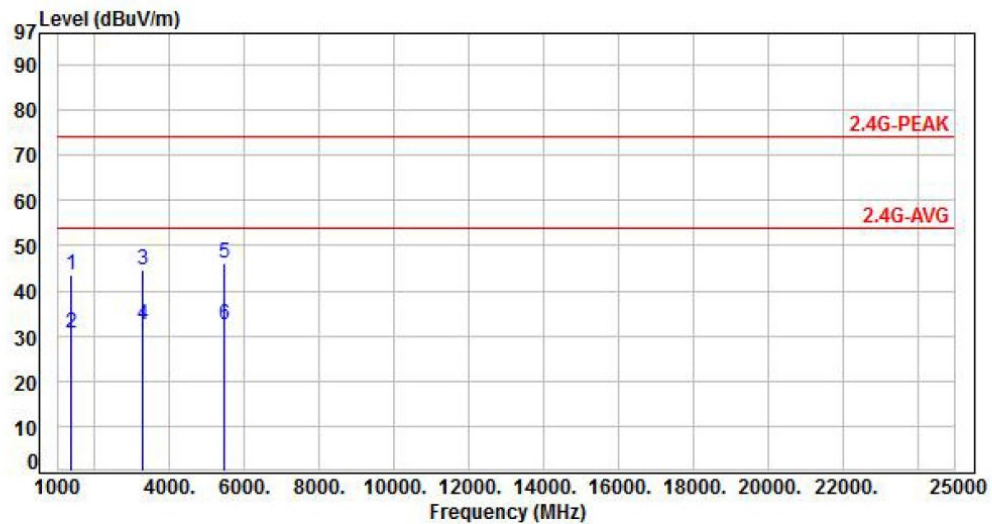
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH00		:



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	1375.00	-33.27	76.69	43.42	74.00	-30.58	Peak	100	107	P
2	1375.00	-33.27	63.90	30.63	54.00	-23.37	Average	100	107	P
3	3287.00	-29.11	73.92	44.81	74.00	-29.19	Peak	100	234	P
4	3287.00	-29.11	61.39	32.28	54.00	-21.72	Average	100	234	P
5	5472.00	-24.48	70.55	46.07	74.00	-27.93	Peak	100	329	P
6	5472.00	-24.48	56.78	32.30	54.00	-21.70	Average	100	329	P

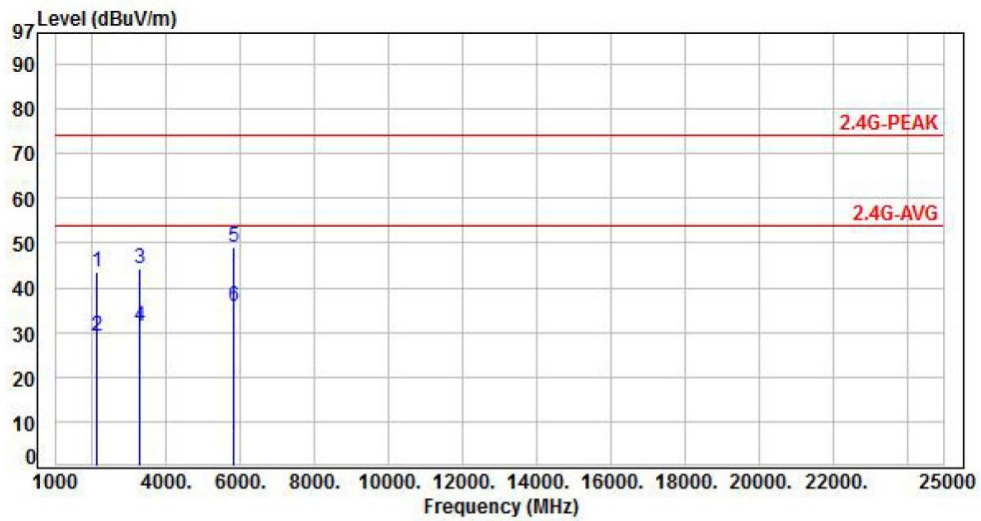
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH00		

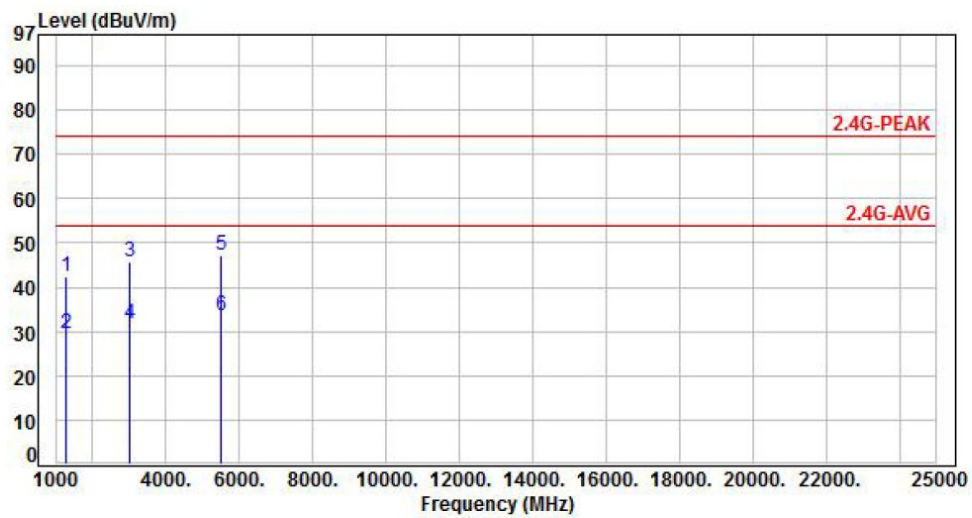


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2114.00	-31.41	74.98	43.57	74.00	-30.43	Peak	100	129	P
2	2114.00	-31.41	60.67	29.26	54.00	-24.74	Average	100	129	P
3	3286.00	-29.11	73.47	44.36	74.00	-29.64	Peak	100	283	P
4	3286.00	-29.11	60.49	31.38	54.00	-22.62	Average	100	283	P
5	5807.00	-23.92	72.87	48.95	74.00	-25.05	Peak	100	301	P
6	5807.00	-23.92	59.74	35.82	54.00	-18.18	Average	100	301	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH39		:

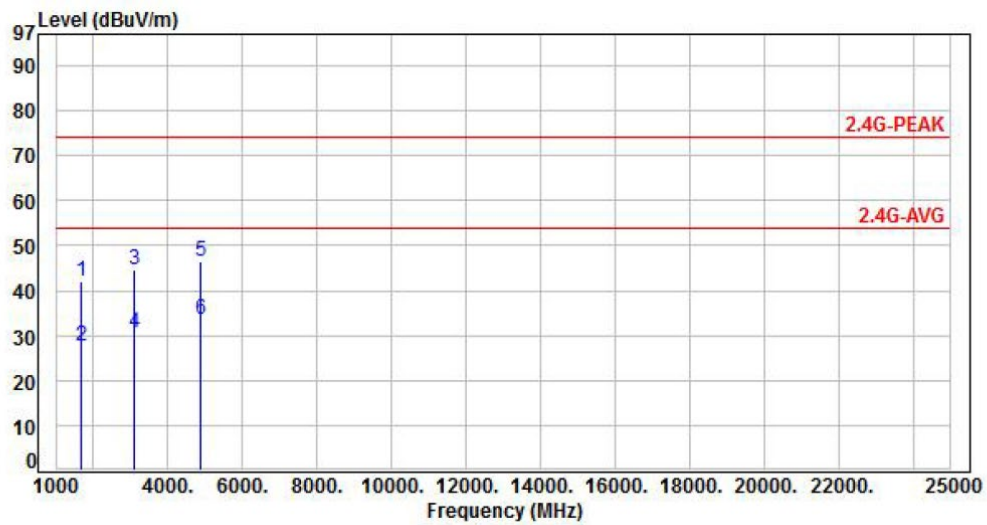


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	1261.00	-33.60	75.93	42.33	74.00	-31.67	Peak	100	241	P
2	1261.00	-33.60	63.23	29.63	54.00	-24.37	Average	100	241	P
3	3012.00	-29.30	74.97	45.67	74.00	-28.33	Peak	100	144	P
4	3012.00	-29.30	61.17	31.87	54.00	-22.13	Average	100	144	P
5	5503.00	-24.37	71.68	47.31	74.00	-26.69	Peak	100	318	P
6	5503.00	-24.37	57.79	33.42	54.00	-20.58	Average	100	318	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH39		:

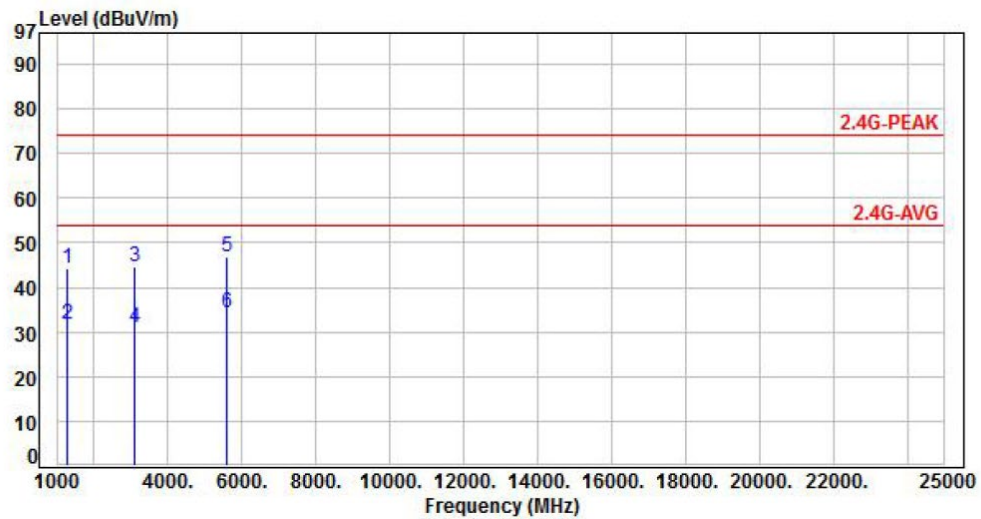


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	1667.00	-33.90	75.87	41.97	74.00	-32.03	Peak	100	183	P
2	1667.00	-33.90	61.73	27.83	54.00	-26.17	Average	100	183	P
3	3107.00	-29.01	73.68	44.67	74.00	-29.33	Peak	100	322	P
4	3107.00	-29.01	59.54	30.53	54.00	-23.47	Average	100	322	P
5	4901.00	-25.28	71.66	46.38	74.00	-27.62	Peak	100	214	P
6	4901.00	-25.28	58.89	33.61	54.00	-20.39	Average	100	214	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 110V/60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH78		:



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	1281.00	-33.49	77.61	44.12	74.00	-29.88	Peak	100	132	P
2	1281.00	-33.49	65.16	31.67	54.00	-22.33	Average	100	132	P
3	3107.00	-29.01	73.66	44.65	74.00	-29.35	Peak	100	246	P
4	3107.00	-29.01	60.16	31.15	54.00	-22.85	Average	100	246	P
5	5597.00	-24.32	71.34	47.02	74.00	-26.98	Peak	100	314	P
6	5597.00	-24.32	58.58	34.26	54.00	-19.74	Average	100	314	P

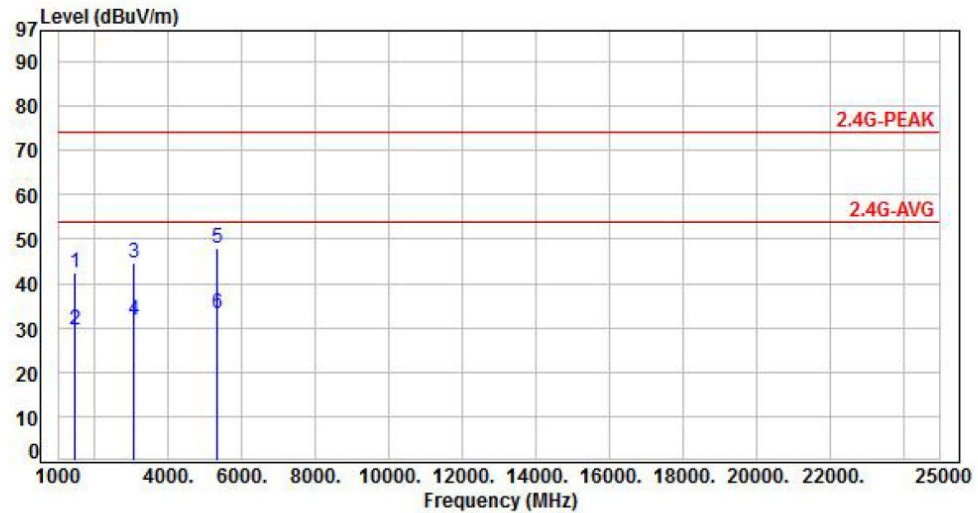
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	AC 110V/60Hz	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 4, CH78		:	

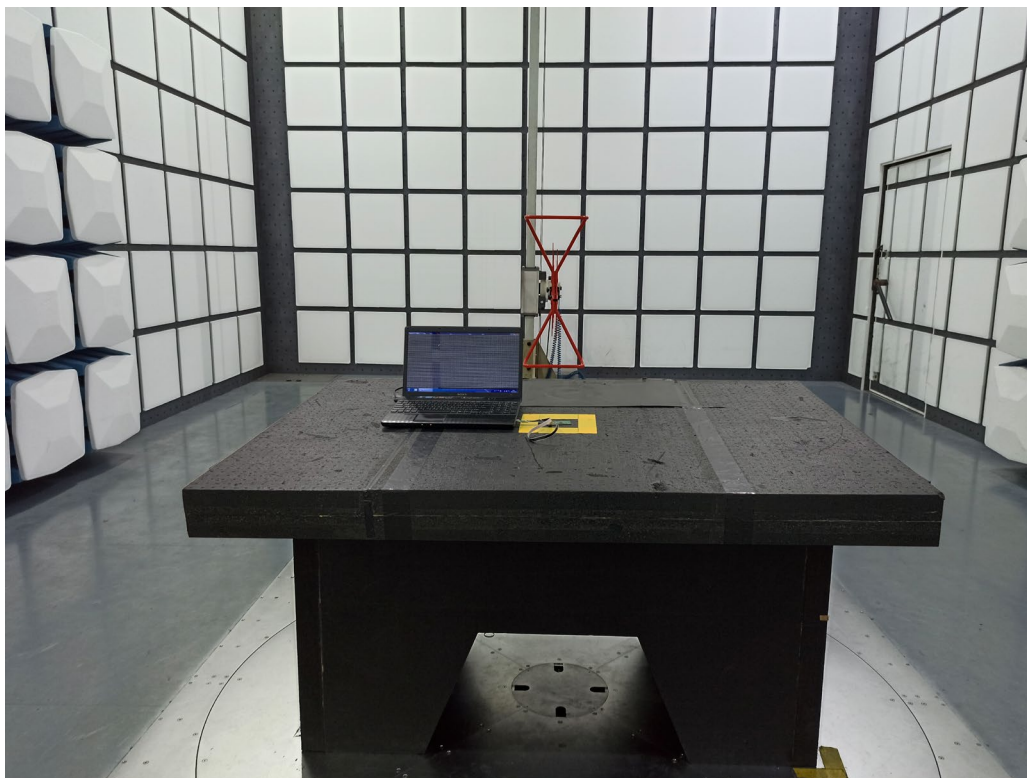


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	1448.00	-33.29	75.65	42.36	74.00	-31.64	Peak	100	187	P
2	1448.00	-33.29	62.96	29.67	54.00	-24.33	Average	100	187	P
3	3062.00	-29.27	73.92	44.65	74.00	-29.35	Peak	100	304	P
4	3062.00	-29.27	61.04	31.77	54.00	-22.23	Average	100	304	P
5	5317.00	-24.95	72.82	47.87	74.00	-26.13	Peak	100	280	P
6	5317.00	-24.95	58.31	33.36	54.00	-20.64	Average	100	280	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor

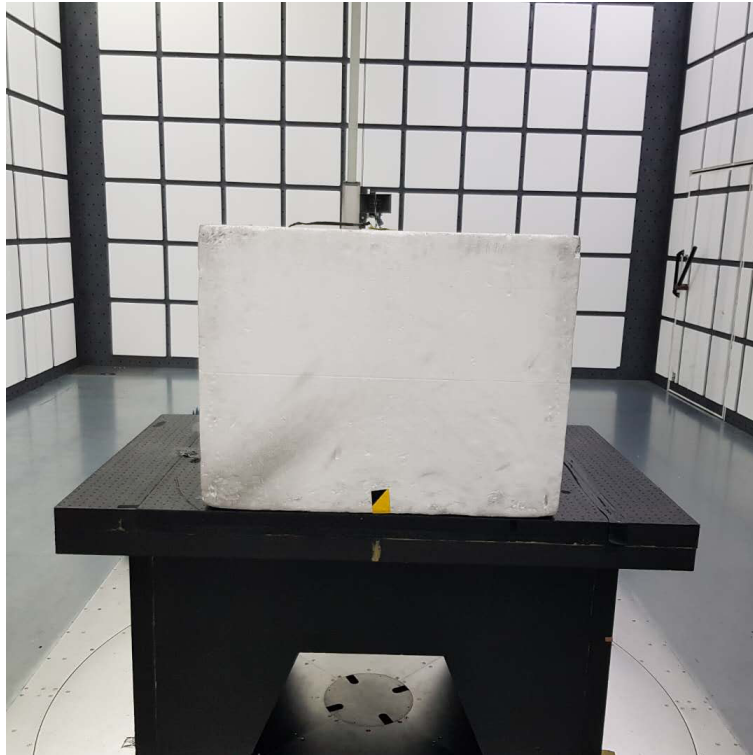


5.7. 輻射量測之配置照片 (30MHz ~ 1GHz)





5.8. 輻射量測之配置照片 (1GHz ~ 25GHz)





6. 20dB 頻寬之規定

6.1. 適用標準

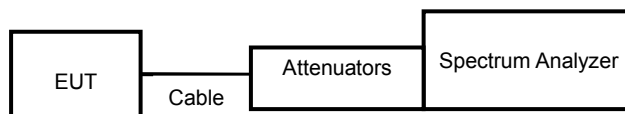
對使用跳頻系統之低功率發射機，依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.6 節之(1)(A)規定，載波頻率頻道間隔不得低於 25 千赫 (kHz)或跳頻頻道之 20dB 頻寬，兩者取較寬者。

但操作頻率為 2400-2483.5 兆赫(MHz)頻帶且輸出功率不大於 125 毫瓦(mW)跳頻系統，其載波頻率頻道間隔不得小於 25 千赫 (kHz)或跳頻頻道 20dB 頻寬之三分之二，兩者取較寬者。系統之跳頻頻道應依虛擬亂數排列，在各頻率之跳頻頻道上跳躍。每一發射機必須均等的使用每一頻率。系統接收機應具有與發射機跳躍頻道頻寬相匹配之輸入頻寬，且應隨所發射之信號同步偏移接收頻率。

6.2. 測試方法

- 將待測物和儀器相連接。
- 設定儀器解析頻寬 30KHz 和視訊頻寬為 100 KHz。
- 量測峰值減去 20 dB 之頻寬並記錄於報告中。

6.3. 測試配置





6.4. 20dB 頻寬之測試結果及數據

Modulation Type	Channel	Frequency (MHz)	20dB Bandwidth (MHz)	2/3 20dB Bandwidth (MHz)
GFSK	00	2402	0.963	0.642
	39	2441	0.958	0.638
	78	2480	0.956	0.637
$\pi/4$ -DQPSK	00	2402	1.283	0.855
	39	2441	1.284	0.856
	78	2480	1.278	0.852
8DPSK	00	2402	1.299	0.866
	39	2441	1.304	0.869
	78	2480	1.297	0.865

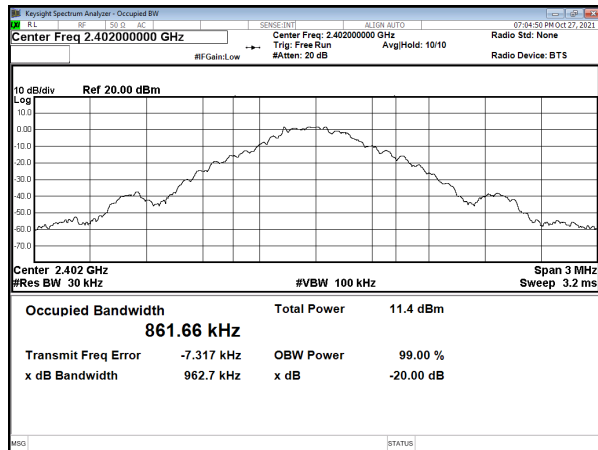
備註：繪圖資料請參考下頁。

6.5. 結果判定

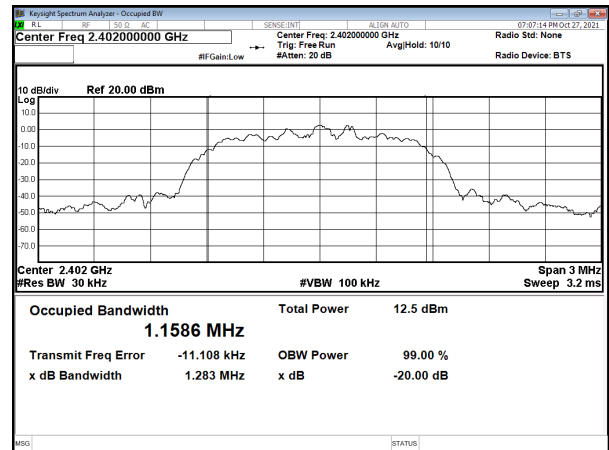
高、中、低頻段的 20dB 頻寬皆大於 25 KHz，合乎標準規定。



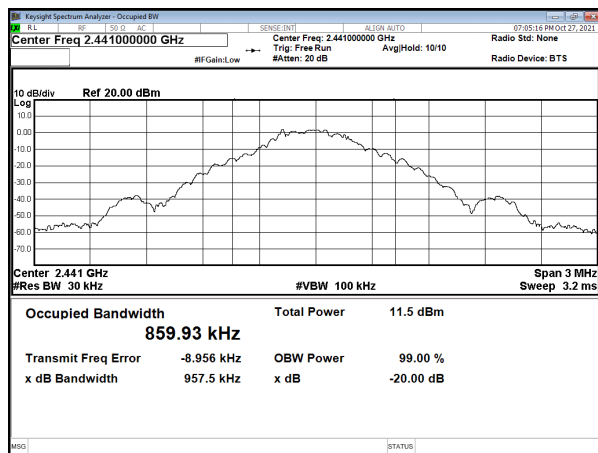
Modulation Type: GFSK (1Mbps)
Channel: 00



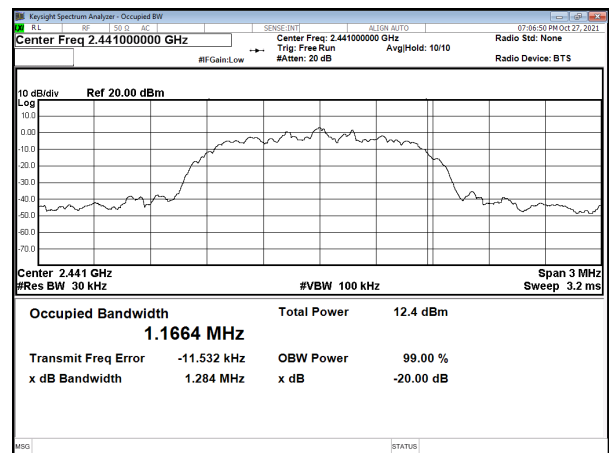
Modulation Type: $\pi/4$ -DQPSK (2Mbps)
Channel: 00



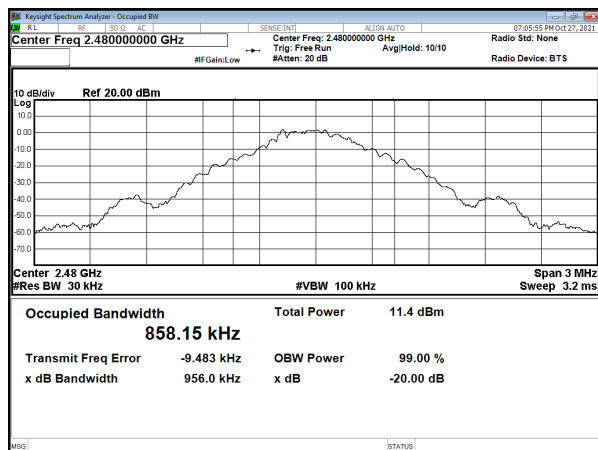
CH39



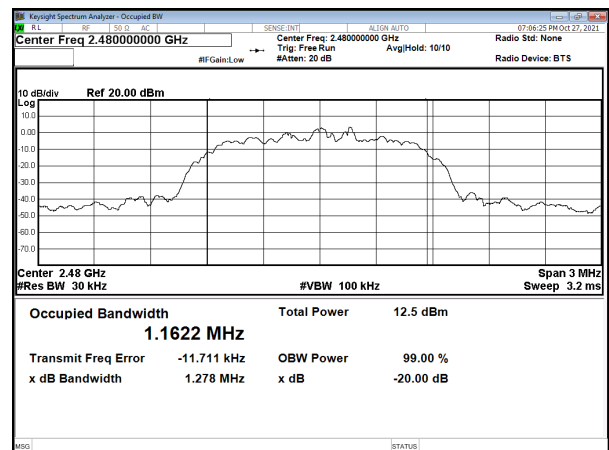
CH39



CH78

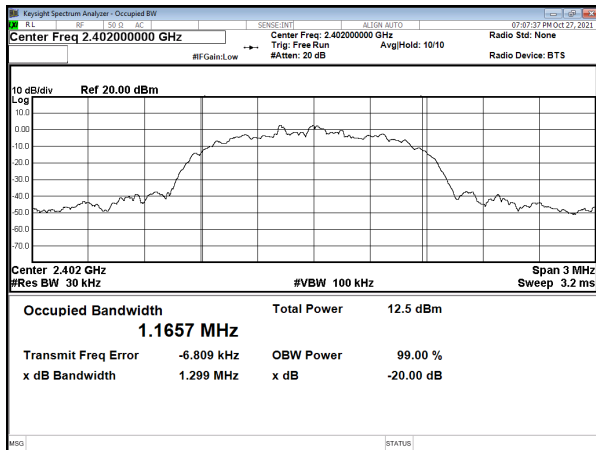


CH78

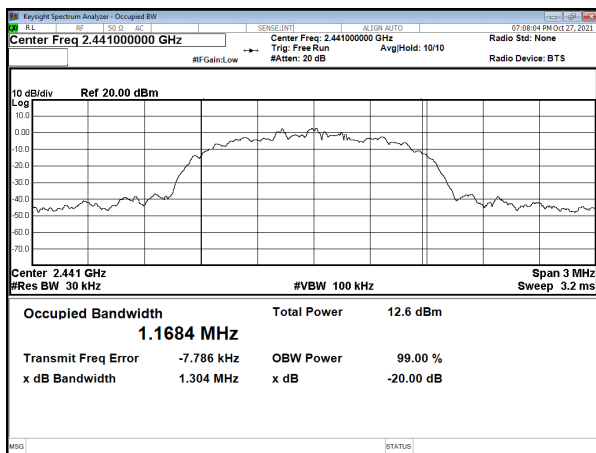




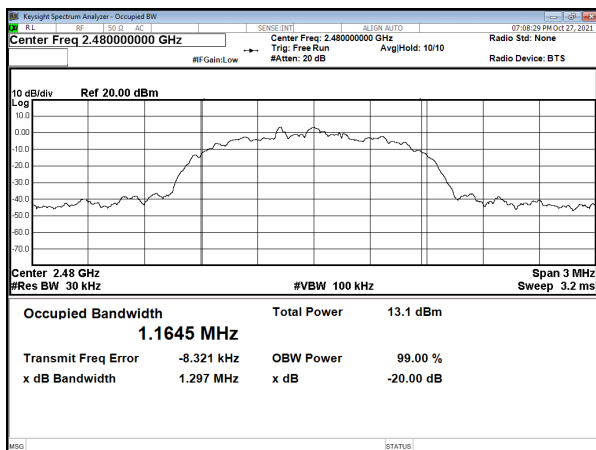
Modulation Type: 8DPSK (3Mbps)
Channel: 00



CH39



CH78





7. 頻道間隔之規定

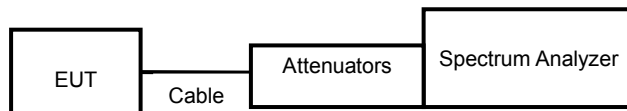
7.1. 適用標準

對使用跳頻系統之低功率發射機，依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.6 節之(1)(A)規定，跳頻系統之載波頻率頻道間隔應大於或等於 25 千赫 (kHz)或跳頻頻道之 20 分貝(dB) 頻寬，兩者取較寬者。但操作頻率為 2400MHz~2483.5MHz 頻段且輸出功率小於或等於 125 毫瓦(mW)跳頻系統，其載波頻率頻道間隔不得小於 25 千赫 (kHz)或跳頻頻道 20 分貝(dB)頻寬之三分之二，兩者取較寬者。

7.2. 測試方法

- 將待測物和儀器相連接。
- 設定儀器解析頻寬 30KHz 和視訊頻寬為 100 KHz。
- 量測頻率間隔並記錄於報告中。

7.3. 測試配置



7.4. 頻道間隔之測試結果及數據

Modulation Type	Channel	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
GFSK	00	2402	1.000	0.642
	39	2441	1.000	0.638
	78	2480	1.000	0.637
$\pi/4$ -DQPSK	00	2402	1.000	0.855
	39	2441	1.000	0.856
	78	2480	1.000	0.852
8DPSK	00	2402	1.000	0.866
	39	2441	1.000	0.869
	78	2480	1.000	0.865

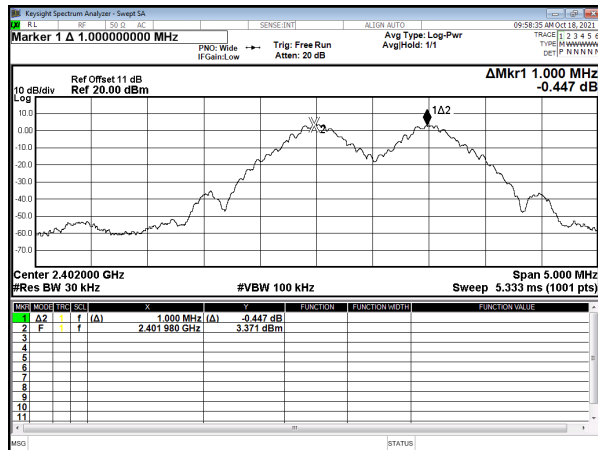
備註：繪圖資料請參考下頁。

7.5. 結果判定

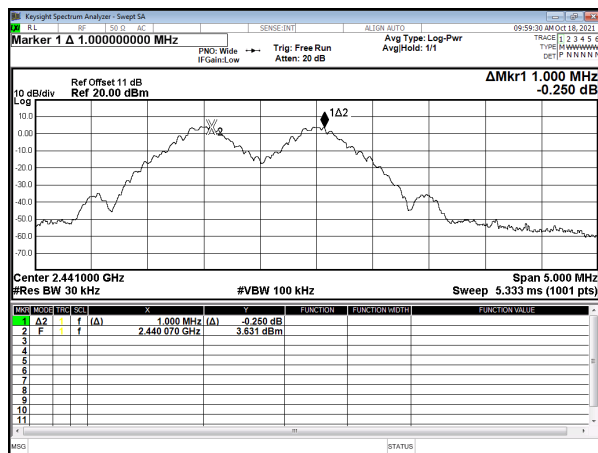
高、中、低頻段的頻道間隔皆大於 25 KHz，合乎標準規定。



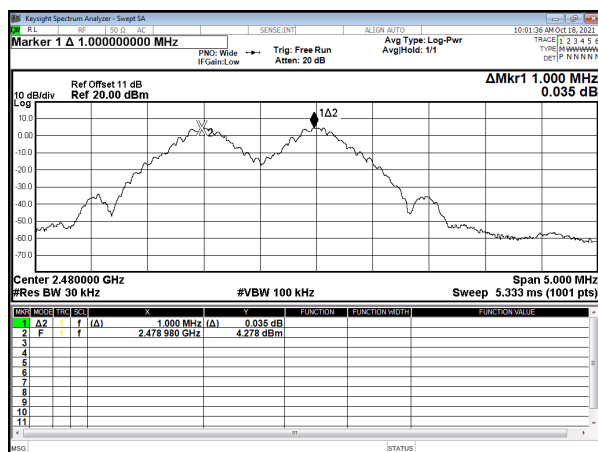
Modulation Type: GFSK (1Mbps)
Channel: 00



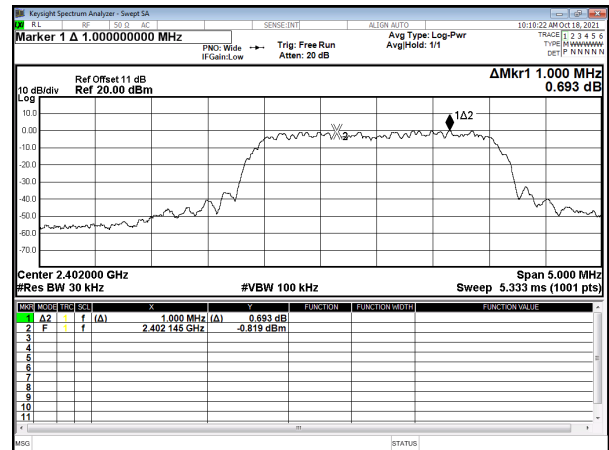
CH39



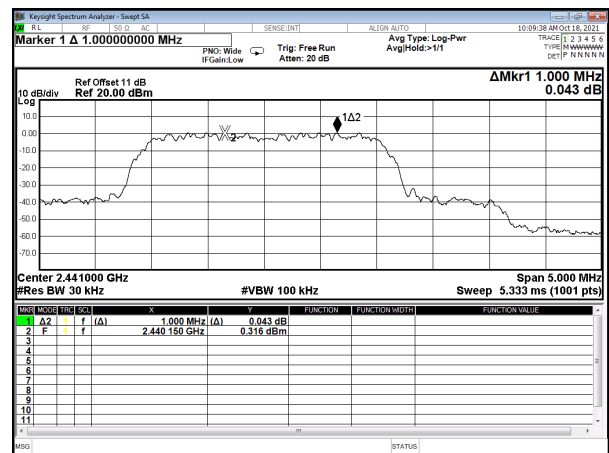
CH78



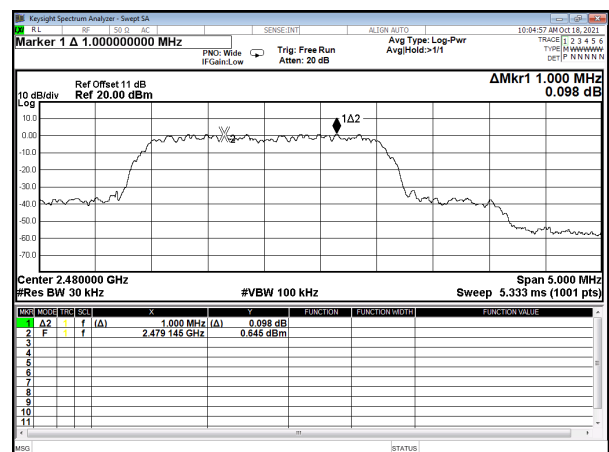
Modulation Type: $\pi/4$ -DQPSK (2Mbps)
Channel: 00



CH39

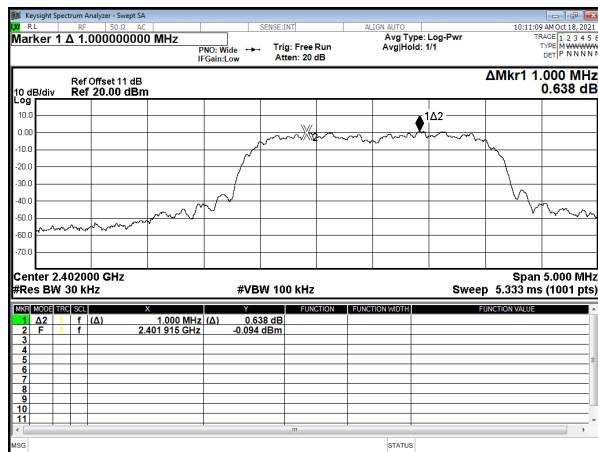


CH78

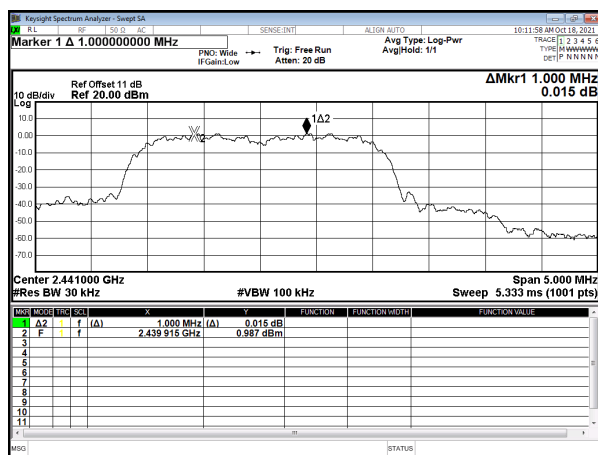




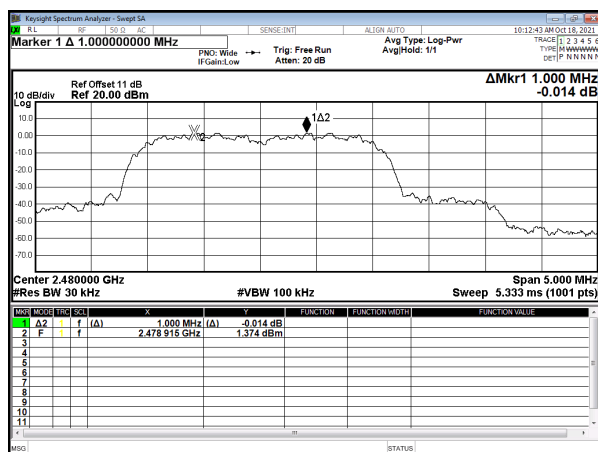
Modulation Type: 8DPSK (3Mbps)
Channel: 00



CH39



CH78





8. 頻率佔用時間之規定

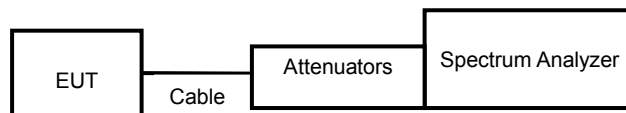
8.1. 適用標準

對使用跳頻系統之低功率發射機，依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.6 節之(1)(A)(a)規定，操作於 2400MHz~2483.5MHz 之展頻跳頻系統，須使用至少 15 個無重疊的頻道，在 0.4 秒乘以跳頻頻道數之週期內，任一頻率佔用之平均時間應小於或等於 0.4 秒。應使用智慧型跳頻技術，以避免占用於特定跳頻頻道。

8.2. 測試方法

- 將待測物和儀器相連接。
- 設定儀器解析頻寬和視訊頻寬為 1MHz。
- 量測頻率佔用時間並記錄於報告中。

8.3. 測試配置





8.4. 頻率佔用時間之測試結果及數據

Test Period = 0.4 (second/ channel) x 79 Channel = 31.6 sec

Modulation Type	Frequency (MHz)	Length of transmission time (ms)	Number of transmission in a 31.6 (79 Hopping*0.4)	Dwell Time (ms)	Limit (ms)
GFSK (DH1)	2402	0.384	320.00	122.88	400
GFSK (DH3)	2402	1.653	160.00	264.48	400
GFSK (DH5)	2402	2.905	106.67	309.87	400
$\pi/4$ -DQPSK (DH1)	2402	0.393	320.00	125.76	400
$\pi/4$ -DQPSK (DH3)	2402	1.653	160.00	264.48	400
$\pi/4$ -DQPSK (DH5)	2402	2.905	106.67	309.87	400
8DPSK (DH1)	2402	0.393	320.00	125.76	400
8DPSK (DH3)	2402	1.653	160.00	264.48	400
8DPSK (DH5)	2402	2.910	106.67	310.40	400

備註：繪圖資料請參考下頁。

DH1 模式:

本系統每秒跳頻 1600 次，故每次跳頻時間 $1/1600=0.625\text{ms}$ 。而每個 package 需要 1 次發射及 1 次接收，故每秒於 79 個頻道中只發射 800 次，平均每秒每個頻道之發射次數為 $800/79=10.12$ 次。故於週期(31.6 秒)內每個頻道發射次數為 $10.12 \times 31.6 = 320$ 次。

DH3 模式:

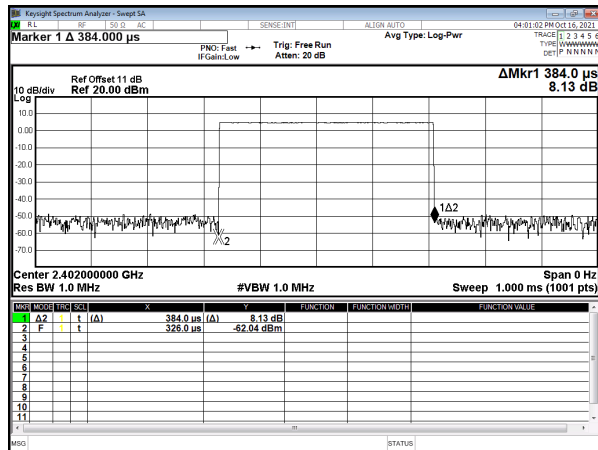
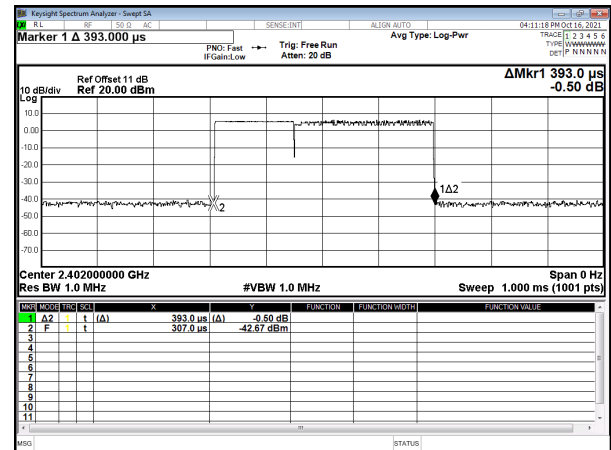
本系統每秒跳頻 1600 次，故每次跳頻時間 $3/1600=1.875\text{ms}$ 。而每個 package 需要 3 次發射及 1 次接收，故每秒於 79 個頻道中只發射 400 次，平均每秒每個頻道之發射次數為 $400/79=5.06$ 次。故於週期(31.6 秒)內每個頻道發射次數為 $5.06 \times 31.6 = 160$ 次。

DH5 模式:

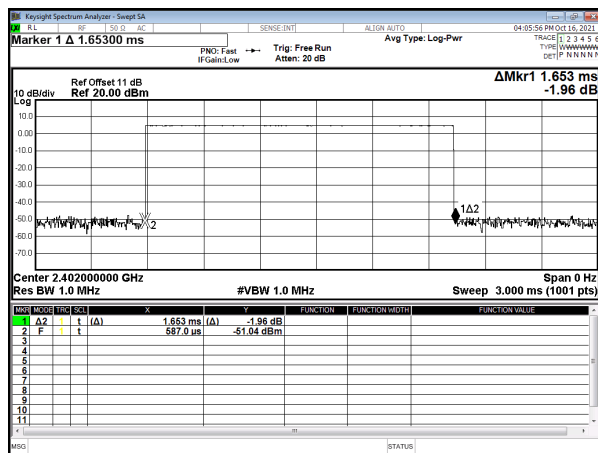
本系統每秒跳頻 1600 次，故每次跳頻時間 $5/1600=3.125\text{ms}$ 。而每個 package 需要 5 次發射及 1 次接收，故每秒於 79 個頻道中只發射 266.67 次，平均每秒每個頻道之發射次數為 $266.67/79=3.37$ 次。故於週期(31.6 秒)內每個頻道發射次數為 $3.37 \times 31.6 = 106.67$ 次。

8.5. 結果判定

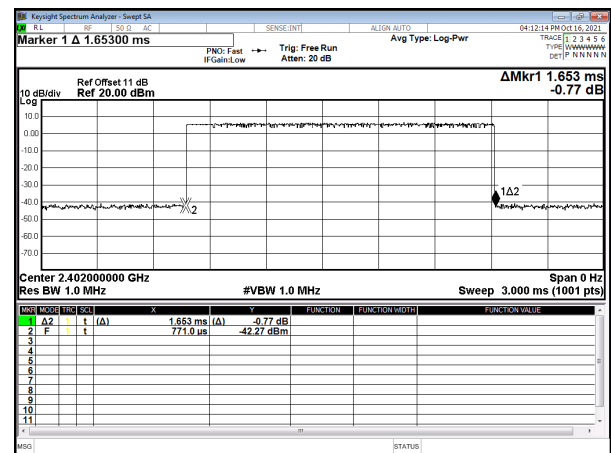
高、中、低頻段的頻率佔用時間皆小於 0.4 秒，合乎標準規定。

Modulation Type: GFSK (1Mbps)
DH1Modulation Type: $\pi/4$ -DQPSK (2Mbps)
DH1

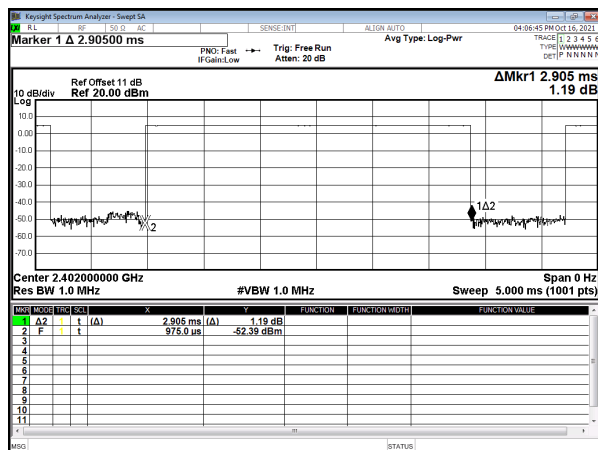
DH3



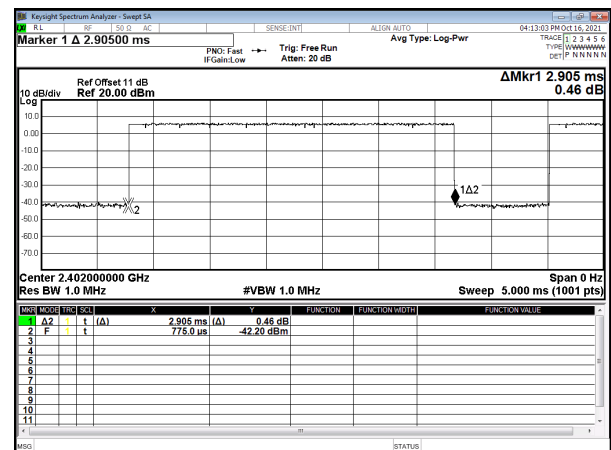
DH3



DH5

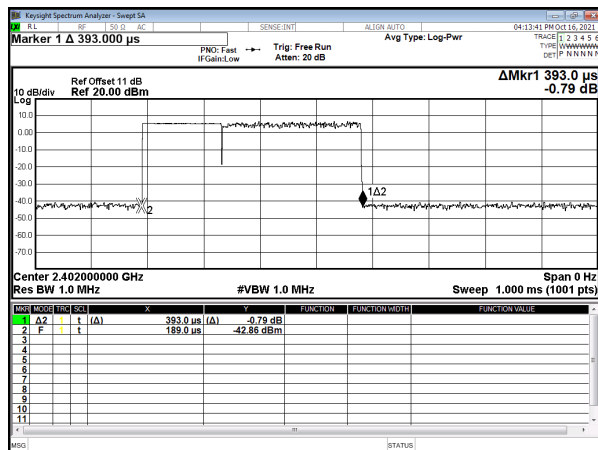


DH5

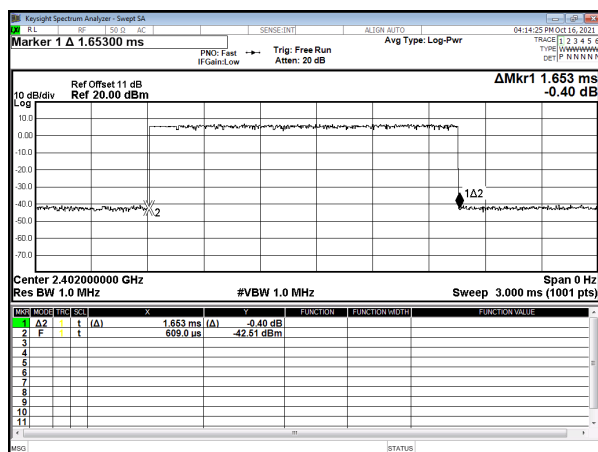




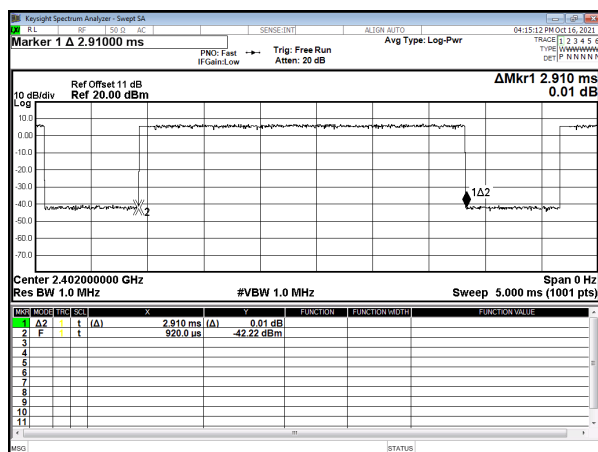
Modulation Type: 8DPSK (3Mbps) DH1



DH3



DH5



9. 跳頻頻道使用數量之規定

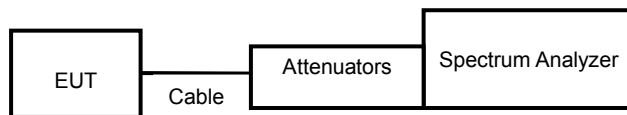
9.1. 適用標準

對使用跳頻系統之低功率發射機，依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.6 節之(1)(A)(a)規定，須使用至少 15 個無重疊的頻道。

9.2. 測試方法

- 將待測物和儀器相連接。
- 設定儀器解析頻寬 300KHz 和視訊頻寬為 300 KHz。
- 將待測物設定於跳頻模式，並記錄每個頻道之所有訊號。

9.3. 測試配置



9.4. 跳頻頻道使用數量之測試結果及數據

Modulation Type	Number of hopping channels
GFSK	79
$\pi/4$ -DQPSK	79
8DPSK	79

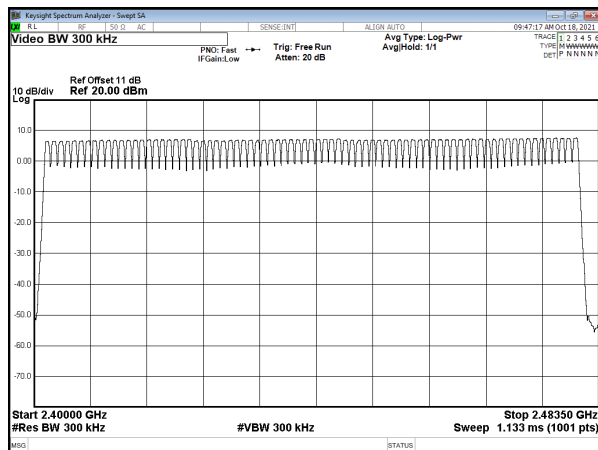
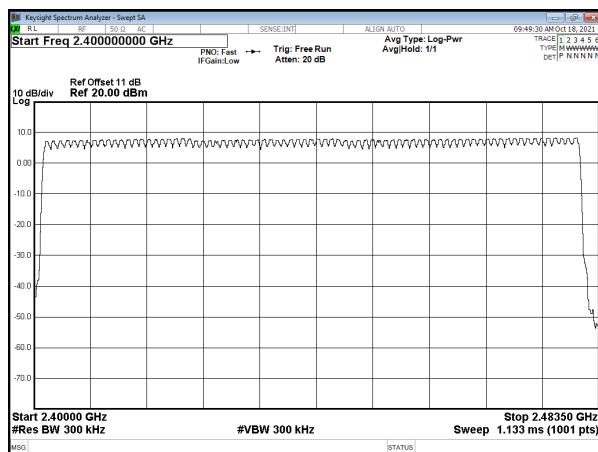
備註：繪圖資料請參考下頁。

9.5. 結果判定

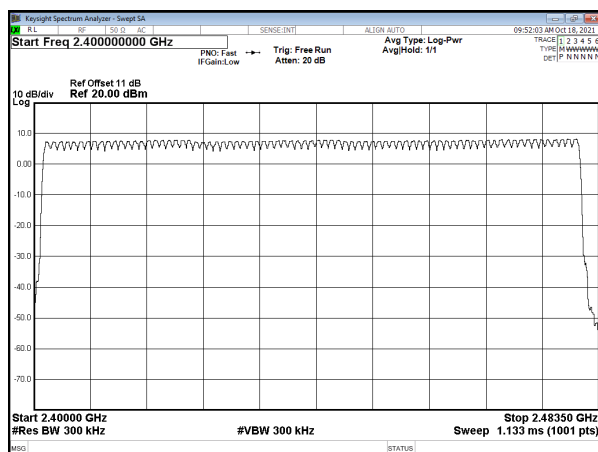
高、中、低頻段的跳頻頻道使用數量皆多於 15 個無重疊的頻道，合乎標準規定。



Modulation Standard: GFSK (1Mbps)

Modulation Standard: $\pi/4$ -DQPSK (2Mbps)

Modulation Standard: 8DPSK (3Mbps)





10. 峰值輸出功率之規定

10.1. 適用標準

對使用跳頻系統之低功率發射機，依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.2 節之(1)規定，操作於 2400MHz~2483.5MHz 者，

(A)：至少使用 75 個跳頻頻道之跳頻系統：1W(含)以下。

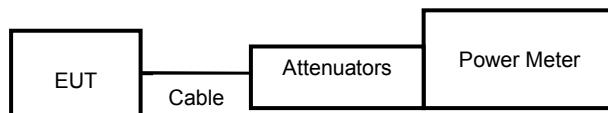
(B)：除(A)外，依 3.10.1.6(A)(a)之跳頻系統：0.125 瓦(W)(含)以下。

(C)：數位調變技術系統：1W(含)以下。

10.2. 測試方法

- 將待測物和儀器相連接。
- 量測輸出功率並記錄於報告中。

10.3. 測試配置



10.4. 峰值輸出功率之測試結果及數據

Modulation Type	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
GFSK (1Mbps)	00	2402	4.79	3.014
	39	2441	5.26	3.360
	78	2480	5.64	3.666
$\pi/4$ -DQPSK (2Mbps)	00	2402	6.90	4.892
	39	2441	7.48	5.603
	78	2480	7.79	6.013
8DPSK (3Mbps)	00	2402	7.39	5.487
	39	2441	7.96	6.252
	78	2480	8.34	6.827

備註：繪圖資料請參考下頁。

10.5. 結果判定

高、中、低頻段的峰值輸出功率皆低於 21 dBm，合乎標準規定。



11. 混附波發射限制之規定

11.1. 適用方法

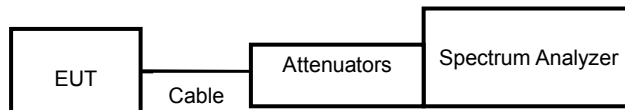
對使用跳頻系統之低功率發射機，依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.5 節之規定，操作頻帶範圍外之任意 100 千赫(kHz)內，發射機所產生的射頻功率相較於使用頻帶範圍中包含最高所需功率之 100 千赫(kHz)內的射頻功率，其衰減值限制如下：

- (1) 輸出功率以附件二峰值輸出功率方式測量者，至少須衰減 20 分貝(dB)，可使用射頻傳導或輻射方式測量。
 - (2) 輸出功率以 4.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少須衰減 30 分貝(dB)。
- 此外，落於第 3.5 節禁用頻段之輻射發射，應符合第 3.6 節之規定。

11.2. 測試方法

1. 將待測物和儀器相連接。
2. 設定儀器解析頻寬 100KHz 和視訊頻寬為 300 KHz。
3. 將頻寬展開至 100 MHz。
4. 量測並記錄於報告中。

11.3. 測試配置



11.4. 結果判定

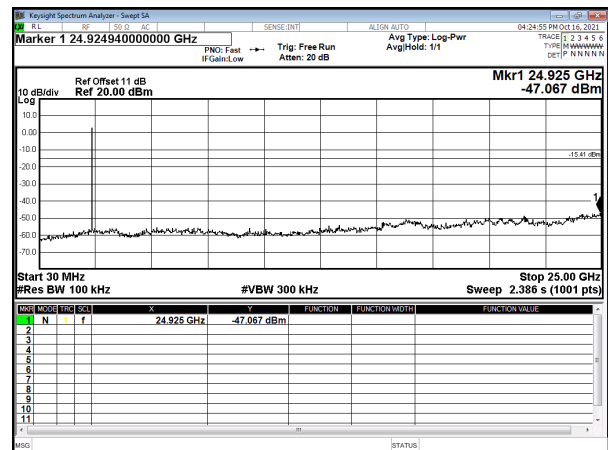
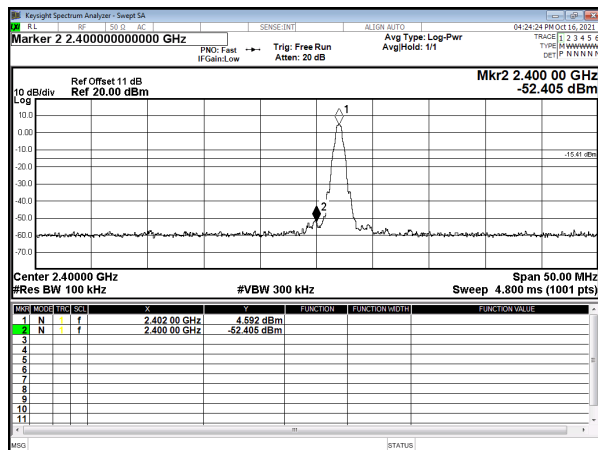
下邊緣頻帶：距下頻帶邊緣 40MHz 內最大混附波比主波低 20dB 以上，合乎標準規定。
上邊緣頻帶：距上頻帶邊緣 40MHz 內最大混附波比主波低 20dB 以上，合乎標準規定。



11.5. 混附波發射限制之測試結果及數據

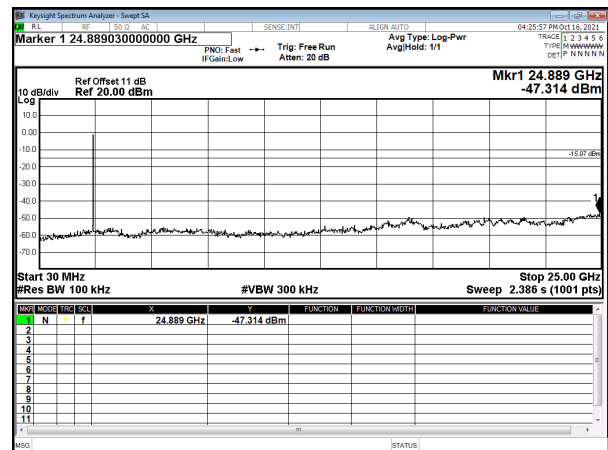
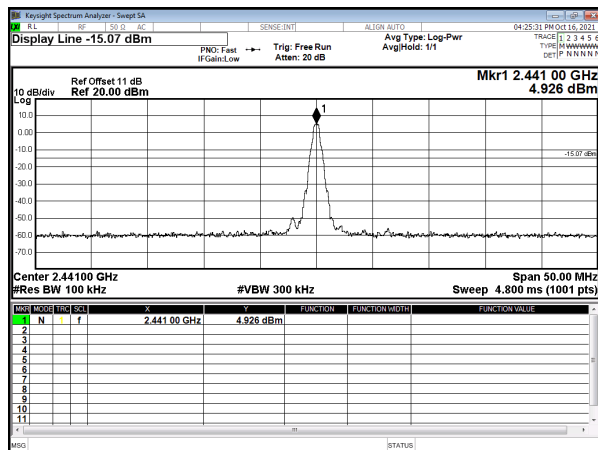
Modulation Type: GFSK (1Mbps)

Channel: 00



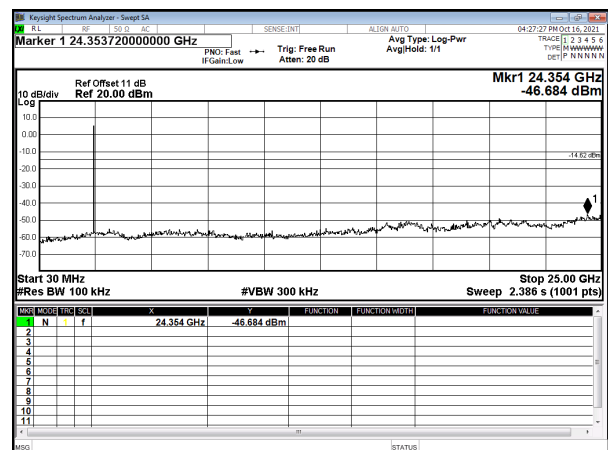
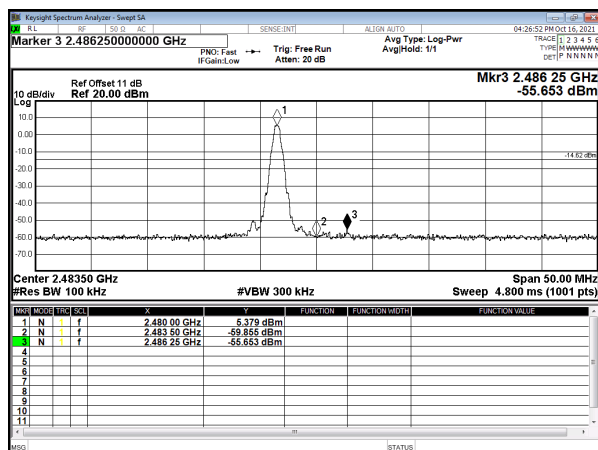
Modulation Type: GFSK (1Mbps)

Channel: 39



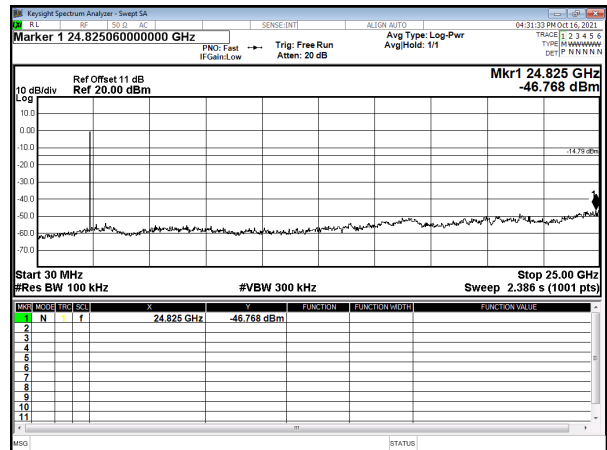
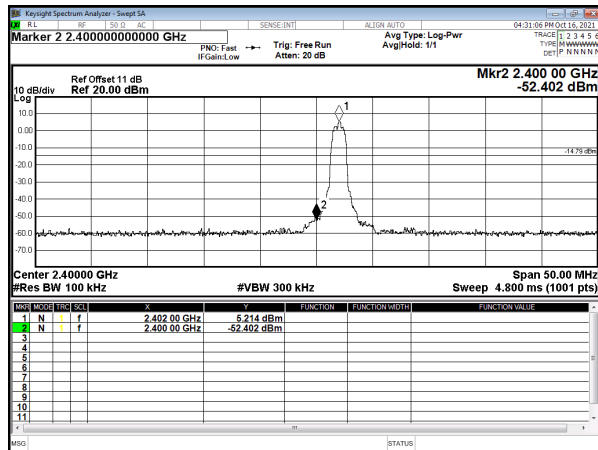
Modulation Type: GFSK (1Mbps)

Channel: 78

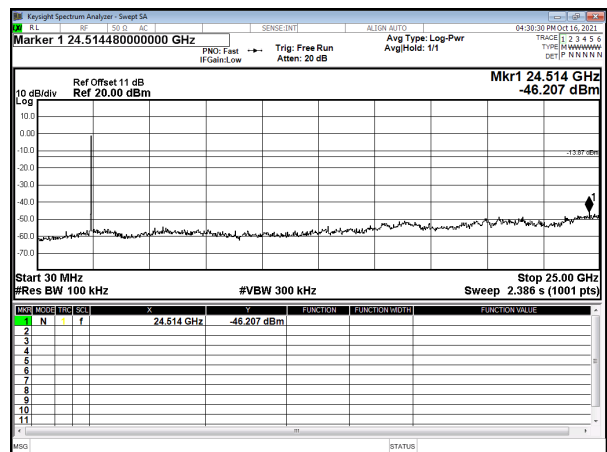
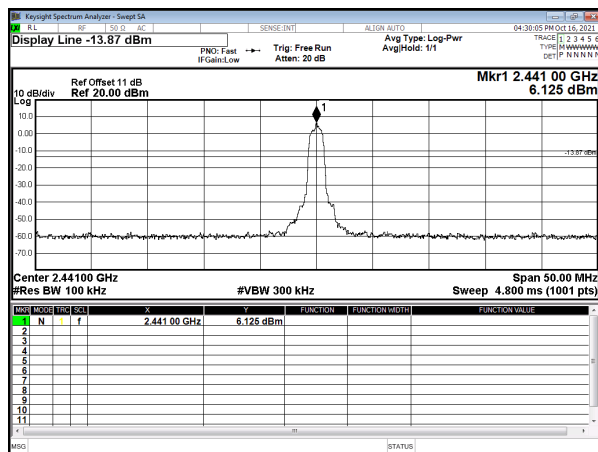




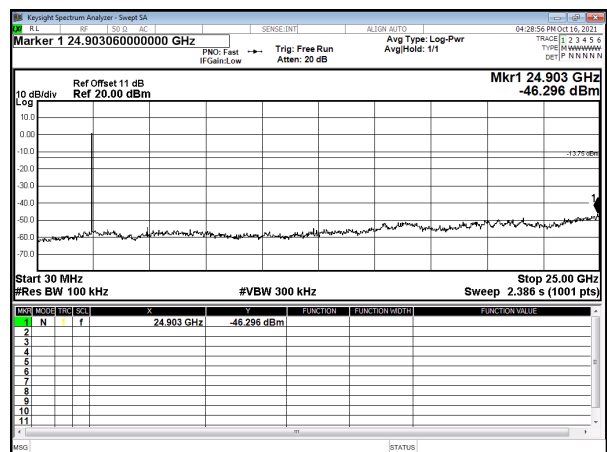
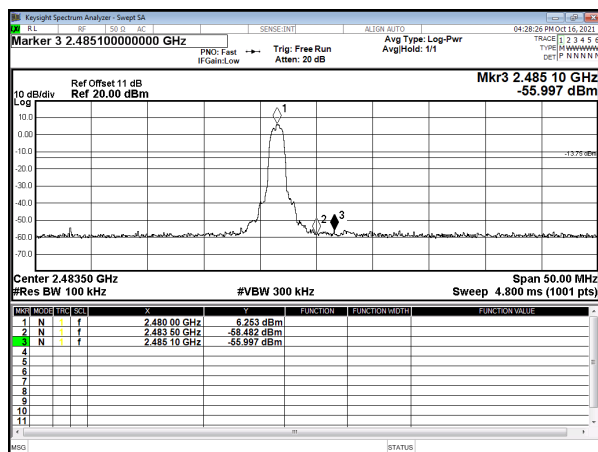
Modulation Type: $\pi/4$ -DQPSK (2Mbps)
Channel: 00



Modulation Type: $\pi/4$ -DQPSK (2Mbps)
Channel: 39

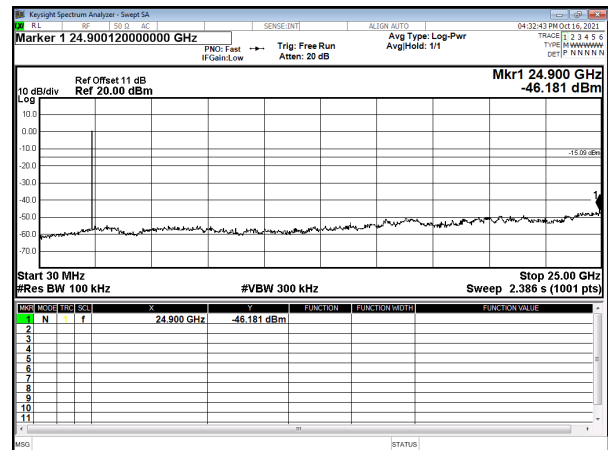
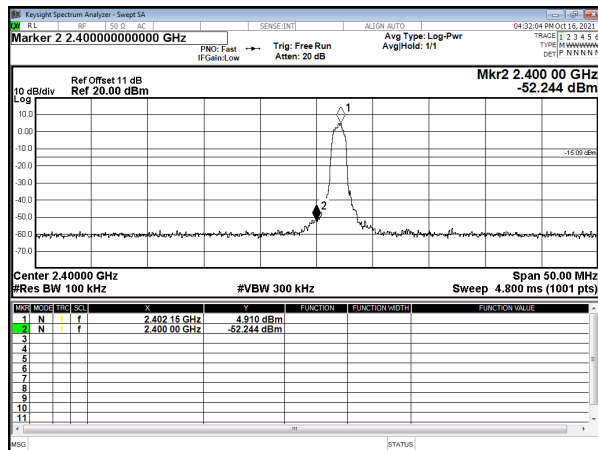


Modulation Type: $\pi/4$ -DQPSK (2Mbps)
Channel: 78

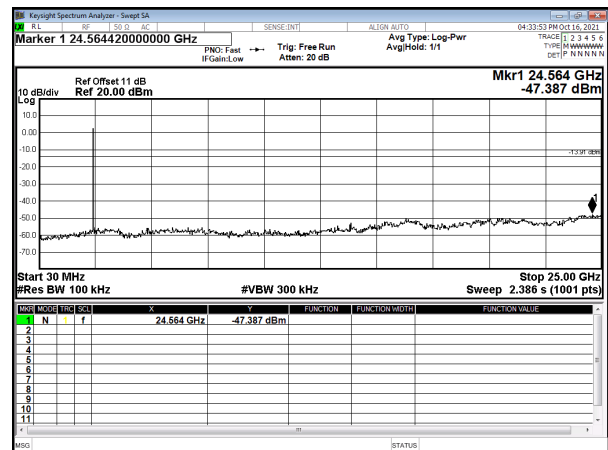
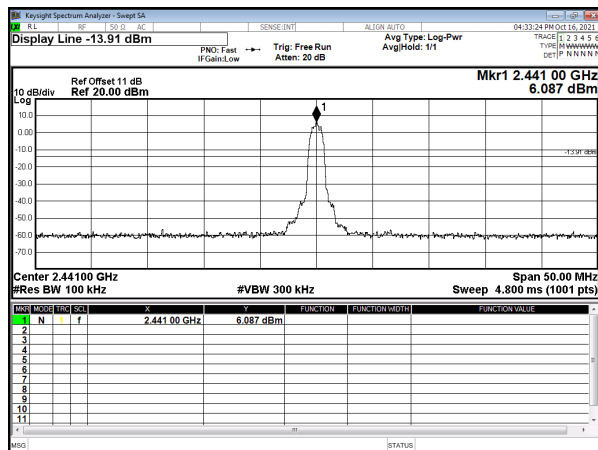




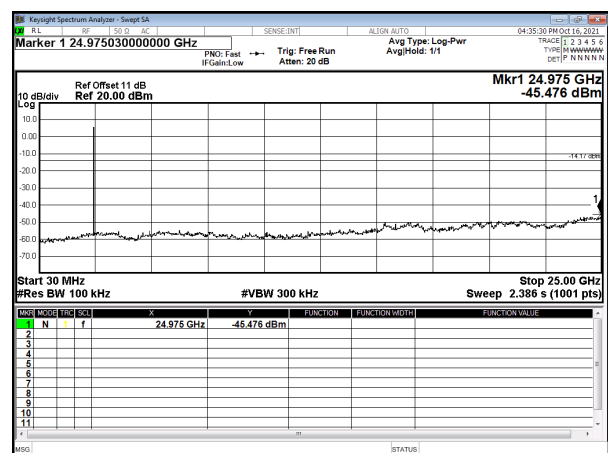
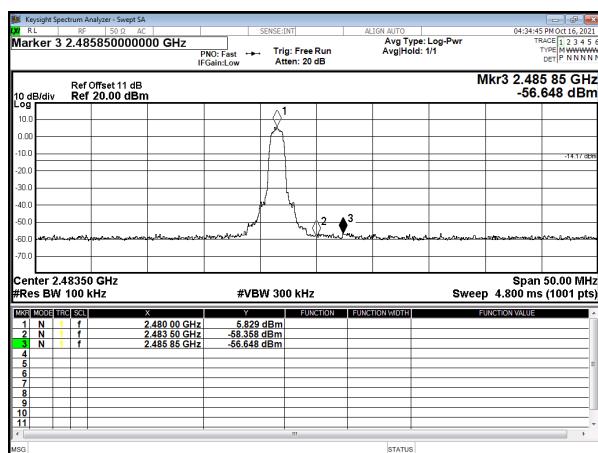
Modulation Type: 8DPSK (3Mbps)
Channel: 00



Modulation Type: 8DPSK (3Mbps)
Channel: 39

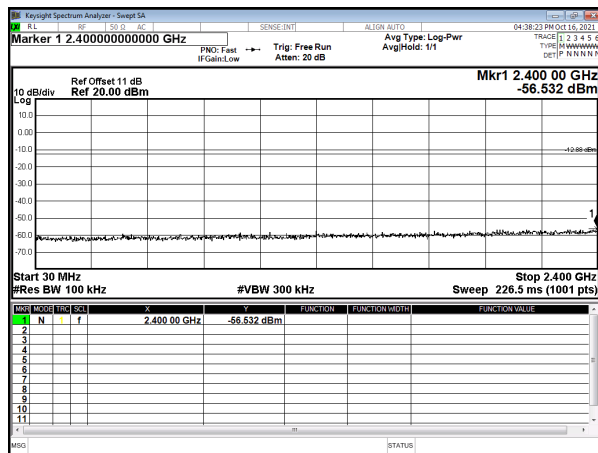


Modulation Type: 8DPSK (3Mbps)
Channel: 78

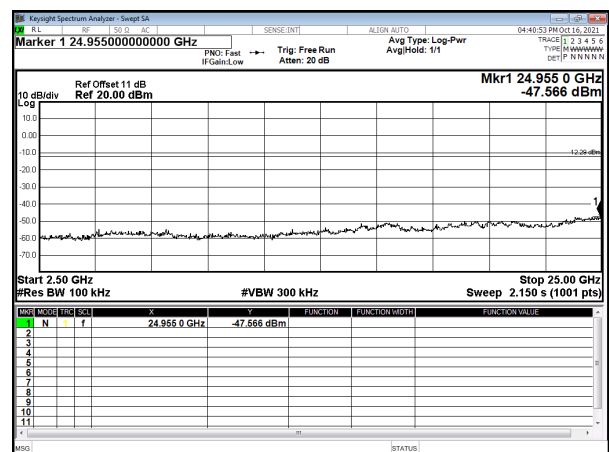
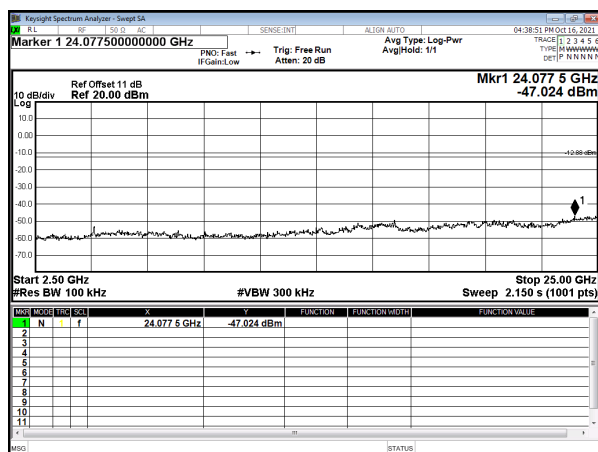
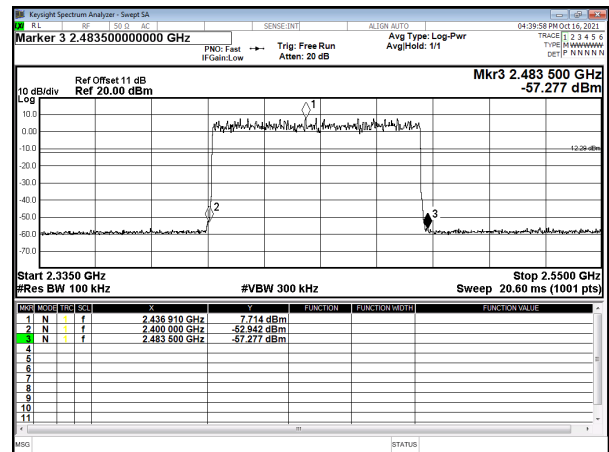
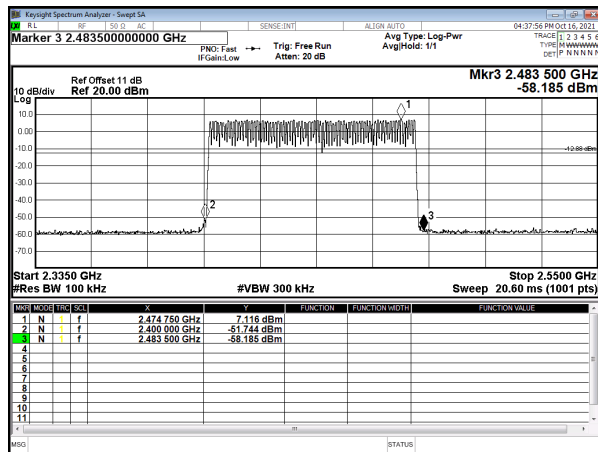
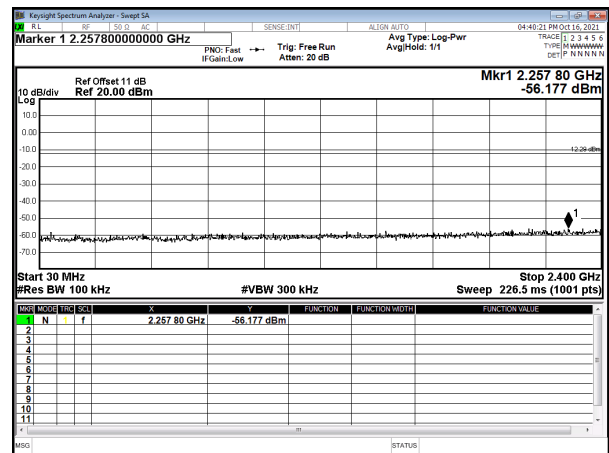




Hopping Mode: Modulation Type: GFSK

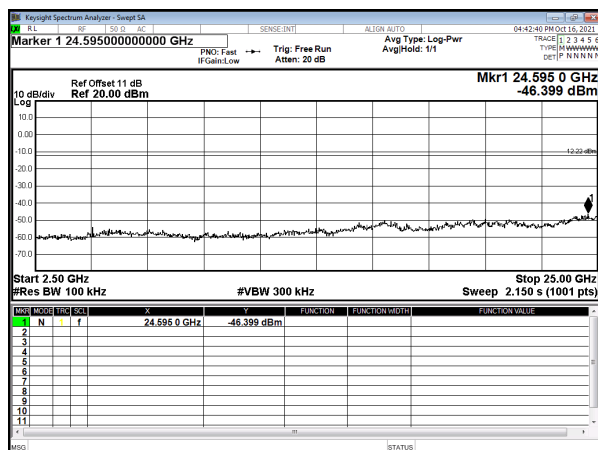
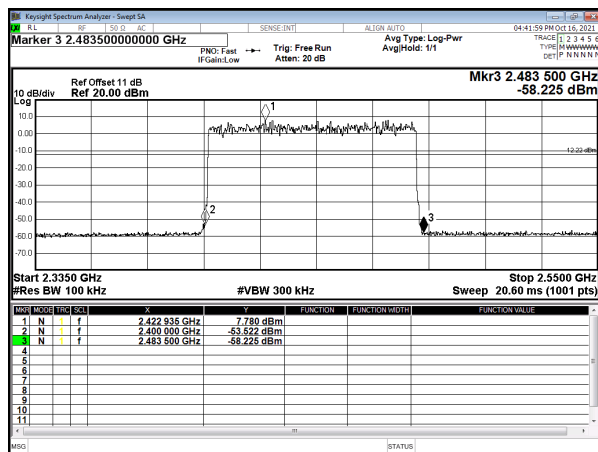
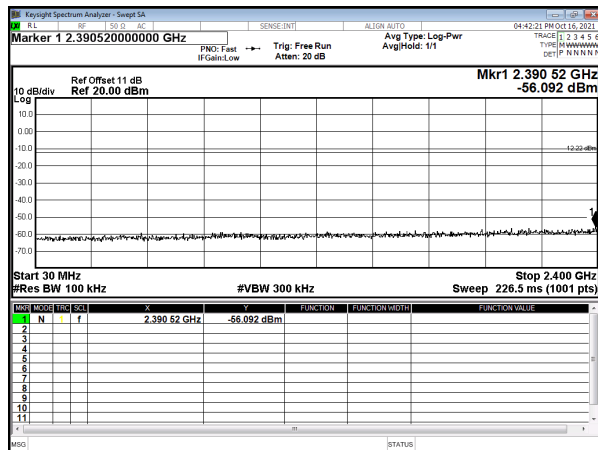


Modulation Type: $\pi/4$ -DQPSK





Modulation Type: 8DPSK





12. 電波暴露量之評估

12.1. 適用標準

依據國家通訊傳播委員會低功率射頻器材技術規範 6.20 節之(6.20.2)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：百萬赫(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)
0.3-3.0	614	1.63	*100	30
3-30	1842/f	4.89/f	*180/f ²	30
30-300	27.5	0.073	1.0	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：百萬赫(MHz)。



12.2. 電波暴露量之評估結果及數據

Modulation Mode	Channel Frequency (MHz)	Max. Conducted output power (dBm)	Max. Tune up power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
GFSK	2402-2480	5.64	7.64	3	20	0.002	1
$\pi/4$ -DQPSK	2402-2480	7.79	9.79	3	20	0.004	1
8DPSK	2402-2480	8.34	10.34	3	20	0.004	1

12.3. 結果判定

高、中、低頻段的電波暴露量皆低於限制值，合乎標準規定。



13. 限制使用之頻帶

Only spurious emissions are permitted in any of the frequency bands listed below:

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	

-----THE END OF REPORT-----