低功率射頻電機測試報告

申請廠商	：	智選科技有限公司
地址	：	新北市中和區橋安街 6 號 4 樓
製造廠商	：	深圳市玖木通科技有限公司
地址	：	深圳市寶安區航城街道鶴州社區鶴州金佛工業區 1 號廠房 303
產品名稱	：	Monster Clarity 102 AirLinks
型 號	：	MH21901
廠牌	：	**MONSTER**
受理日期	：	109 年 02 月 26 日
完成日期	：	109 年 03 月 10 日

實驗室名稱：世騰電子科技股份有限公司
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：109 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

TAF
Testing Laboratory
1439

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修訂記錄

報告號碼.	發行日期	描述
TENB2002167	Mar. 10, 2020	Original

報告形式		說明
■	Original report	NA
□	Derivative Report	NA

證 明 書

申請廠商	:	智選科技有限公司
地址	:	新北市中和區橋安街 6 號 4 樓
製造廠商	:	深圳市玖木通科技有限公司
地址	:	深圳市寶安區航城街道鶴州社區鶴州金佛工業區 1 號廠房 303
產品名稱	:	Monster Clarity 102 AirLinks
型 號	:	MH21901
廠牌	:	**MONSTER**
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(LP0002)。 規範修訂日期 107 年 01 月 10 日。
發射功率(電場強度)	:	7.023dBm

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 109 年 03 月 06 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電機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電機技術規範規定。

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	低功率射頻電機技術規範	量測設備	測試結果	結果判定
1	天線增益之要求	3.10.1.3 節	---	請參閱 3.2 節	合格
2	電源線傳導干擾之要求	2.3 節	請參閱 2 節	請參閱 4.5 節	合格
3	場強輻射之要求	3.10.1.5 節	請參閱 2 節	請參閱 5.5 節	合格
4	發射頻寬之要求	3.10.1.6 節(1)(A)	請參閱 2 節	請參閱 6.5 節	合格
5	頻道間隔之要求	3.10.1.6 節(1)(A)	請參閱 2 節	請參閱 7.5 節	合格
6	頻道佔用時間之要求	3.10.1.6 節(1)(A)(a)	請參閱 2 節	請參閱 8.5 節	合格
7	跳頻頻道使用數量之要求	3.10.1.6 節(1)(A)(a)	請參閱 2 節	請參閱 9.5 節	合格
8	峰值輸出功率之要求	3.10.1.2 節	請參閱 2 節	請參閱 10.5 節	合格
9	混附波發射限制之要求	3.10.1.5 節	請參閱 2 節	請參閱 11.5 節	合格
10	電波暴露量之評估	5.20 節	請參閱 2 節	請參閱 12.3 節	合格

本實驗室依據 ISO-IEC 17025，已將儀器、環境、人員等不確定影響因素降低，故當量測結果符合標準要求時，即判定合格，不評估與量測結果有相關的不確定度

報告簽署人：

1. 一般描述

1.1. 產品規格

藍牙晶片：QCC3020

防水係數：IPX5

播放時間：大約 5-6 小時，配合充電盒可使用 15 小時

耳機充電時間：約 1.5 小時

Frequency Range	2402-2480MHz
Modulation Type	GFSK, π/4-DQPSK, 8DPSK
Number of Channels	79 Channels
Power Supply	DC 3.7V by battery

Note :左耳藍牙耳機,右耳藍牙耳機之電路設計/佈線相同是，左耳藍牙耳機，右耳藍牙耳機屬同一發射機無需驗證輸出功率+/-2dB,僅以右耳藍牙耳機為測試之判定。

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	---	---

*為量測之頻道及頻率

1.4. 測試模式之描述

●電源傳導及輻射測試之測試模式及測試軟體如下:

1. 將量測系統之全部電源打開。
2. 於 Win 7 作業系統下，EUT 進入 “**Airoha.Tool.Kit.exe**” 來發射與接收訊號。
3. 執行以下測試模式如下：

Conducted Emissions from the AC mains power ports	
Test Mode	Operating Description
1	Charging Mode
caused “Test Mode 1” generated the worst case, it was reported as the final data.	
Radiation Emissions (30MHz ~ 1GHz)	
Test Mode	Operating Description
1	Charging Mode
2	Bluetooth Mode
caused “Test Mode 1” generated the worst case, they were reported as the final data.	
Radiation Emissions-TX (1GHz ~ 18GHz)	
Test Mode	Operating Description
1	GFSK(1Mbps)
2	π/4-DQPSK(2Mbps)
3	8DPSK(3Mbps)
caused “Test Mode 1 and Test Mode 3” generated the worst case, they were reported as the final data.	
Radiation Emissions-RX (1GHz ~ 18GHz)	
Test Mode	Operating Description
1	GFSK(1Mbps)
2	π/4-DQPSK(2Mbps)
3	8DPSK(3Mbps)
caused “Test Mode 1” generated the worst case, they were reported as the final data.	
直量測試	
Test Mode	Operating Description
1	GFSK(1Mbps)
2	π/4-DQPSK(2Mbps)
3	8DPSK(3Mbps)
caused “Test Mode 1 ~Test Mode 3” generated the worst case, they were 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：

傳導干擾/輻射干擾(Below 1GHz)

設備	廠牌	型號	長度/訊號線類別	長度/電源線類別
筆記型電腦	Sony	PCG-71811P	N/A	非隔離/1.8m
充電盒（隨貨付）	東莞市星霖欣電子科技有限公司	NHD-SIG-S-577	N/A	N/A

訊號線

訊號線名稱	數量	隔離類型 / 長度
USB Cable （隨貨附）	1	0.3m Non Shielding
Note: USB Cable 廠牌/型號：深圳市鑫智盈電子有限公司/ Type-C 線		

輻射干擾(above 1GHz) & 直量測試

設備	廠牌	型號	長度/訊號線類別	長度/電源線類別
筆記型電腦	Sony	PCG-71811P	N/A	非隔離/1.8m

1.6. 測試情形之描述

測試場地：	世騰電子科技股份有限公司 338 桃園市蘆竹區聯福街 2 巷 10 號
測試電壓：	AC 110V/60Hz; DC 3.7V
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電機技術規範以及參考 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	2020/03/05	26℃ / 55%	Nick Guan
Radiated Emissions	3M01-NK	2020/03/03	25℃ / 55%	Nick Guan
AC Power Line Conducted Emission	CON01-NK	2020/03/06	25℃ / 55%	Nick Guan

1.7. 量測不確定度

量測項目	不確定度
AC Power Line Conduction(150K~30MHz)	±1.60dB
Radiated Spurious Emission(9KHz~30MHz)	±3.405dB
Radiated Spurious Emission(30MHz~1GHz)	±5.326dB
Radiated Spurious Emission(1GHz~25GHz)	±5.918dB
Conducted Spurious Emission	±2.156dB
6dB Bandwidth	±4.401%
20dB Bandwidth	±4.40%
Occupied Bandwidth	±4.41%
Peak Output Power(Conducted Power Meter)	±1.31dB
Dwell Time	±0.11%
Power Spectral Density	±2.146dB
Duty Cycle	±0.17%

2. 測試儀器

Test Item	Radiated Emissions				
Test Site	Semi Anechoic Room(3M02-NK)				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Bilog Antenna	Schwarzbeck	VULB9168	275	2019/09/24	2020/09/23
Active Loop Antenna	EMCO	6507	40855	2019/05/24	2020/05/23
Horn Antenna	EMCO	3115	31589	2019/04/01	2020/03/31
Horn Anrenna	EMCO	3116	31974	2019/09/17	2020/09/16
EMI Receiver	ROHDE & SCHWARZ	ESCI	101423	2019/05/14	2020/05/13
Spectrum Analyzer	ROHDE & SCHWARZ	FSP 40	100047	2019/03/28	2020/03/27
Preamplifier	EM Electronics corp.	EM330	60660	2019/03/11	2020/03/10
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2019/09/20	2020/09/19
Bluetooth Tester	ROHDE & SCHWARZ	CBT	101133	2019/04/07	2020/04/06
Cable-3in1(30M-1G)	HARBOUR INDUSTRIES	LL142	CCE1316	2019/09/20	2020/09/19
Cable-0.5m(1G-40G)	Rapidtek	40GHZ 50CM	38MS-38MS50314	2019/04/09	2020/04/08
Cable-3m(1G-40G)	Rapidtek	40GHZ 300CM	38MS-38MS300314	2019/04/09	2020/04/08
Cable-8m(1G-40G)	Rapidtek	40GHZ 800CM	38MS-38MS800314	2019/04/10	2020/04/09
E3	AUDIX	v8.2014-8-6	RK-000529	NA	NA

Test Item	RF Conducted				
Test Site	RFCON01-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Spectrum Analyzer	ROHDE & SCHWARZ	FSP 40	100047	2019/03/28	2020/03/27
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200207	2019/04/12	2020/04/11
Bluetooth Tester	ROHDE & SCHWARZ	CBT	101133	2019/04/07	2020/04/06
Attenuator	KEYSIGHT	8491B	MY39250703	2019/09/12	2020/09/11
TEMP & HUMI CHAMBER	T-MACHINE	TMJ-9712	T-12-040111	2019/08/28	2020/08/27
Power Sensor	Anritsu	MA2411B	1207295	2019/04/11	2020/04/10

Test Item	AC Power Line Conducted Emission				
Test Site	CON01-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
EMI Receiver	ROHDE & SCHWARZ	ESCI	100821	2019/09/16	2020/09/15
Line Impedance Stabilization Network	Schwarzbeck	NSLK 8127	8127-740	2019/05/22	2020/05/21
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	101933	2019/09/11	2020/09/10
Cable-6m(9k~300M)	NA	CFD300-NL	NA	2019/03/28	2020/03/27
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電機技術規範(2.2)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 :	Shenzhen Bugani Electronics Co., Ltd.
1.2 Model :	FM-S1117-V10
1.3 Antenna type :	Built-in FPC antenna
1.4 Frequency Rang :	2400MHz~2500MHz
1.5 Gain(peak) :	1.14dBi

(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. 電源線傳導干擾之量測規定

4.1. 適用標準

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:

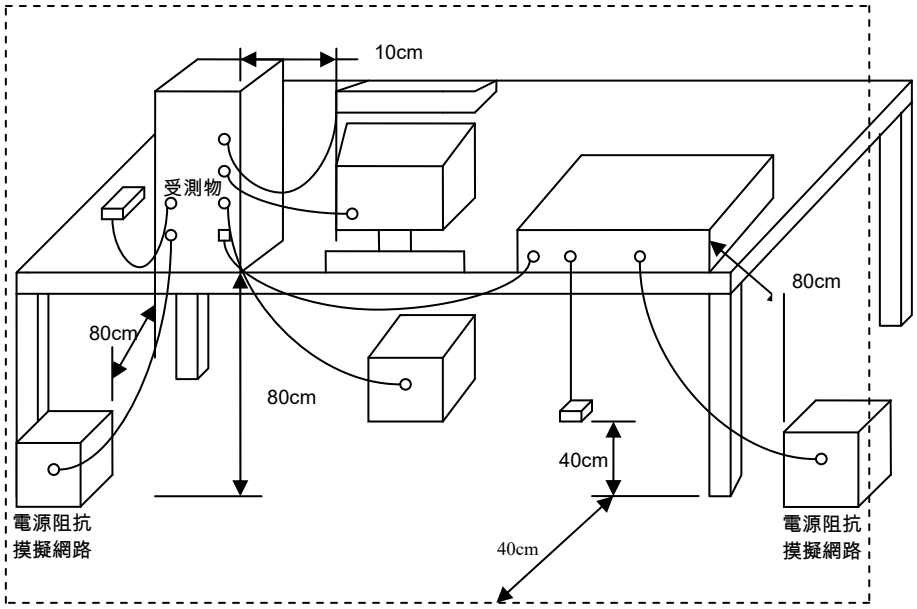
頻率範圍(MHz)	傳導限制值 (dBμV)	
	準峰值(Quasi-peak)	平均值(Average)
0.15 ~ 0.5	66-56 (註)	56-46 (註)
0.5 ~ 5	56	46
5 ~ 30	60	50

註: 隨頻率之對數遞減

4.2. 測試方法

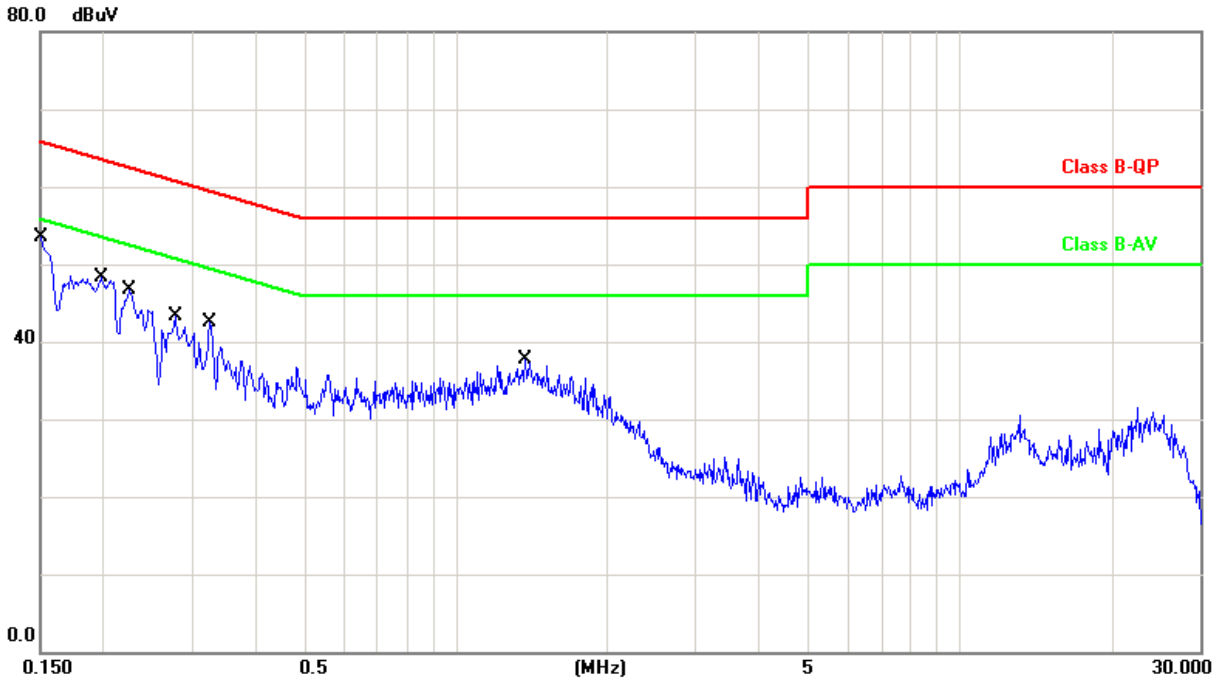
將待測物置於 0.8 米高的非金屬桌面，使其在工作狀態，待測物電源線接至電源線接至電源阻抗穩定網路上，從測試接收機記錄頻率由 0.15MHz 至 30MHz 之間之電源線線導放射強度。

4.3. 傳導干擾之擺設



4.4. 傳導干擾之測試結果及數據

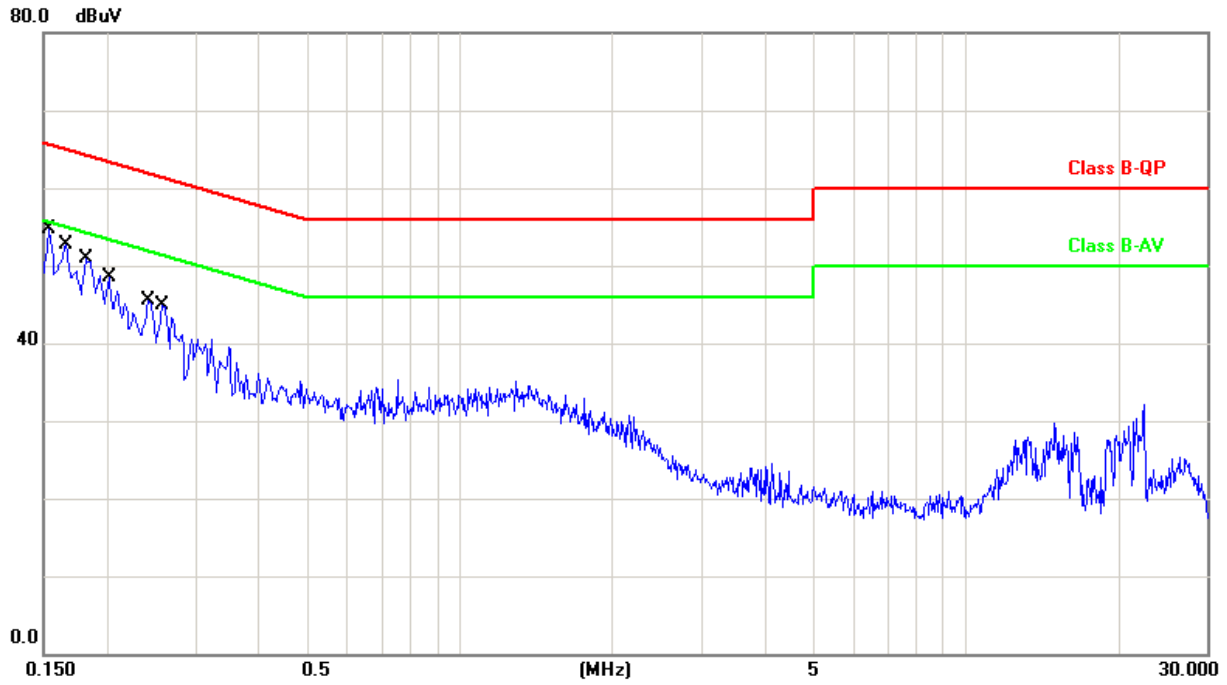
Power:	AC 110V/60Hz	Pol/Phase:	LINE
Test Mode:	Mode 1		



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	10.06	41.35	51.41	65.99	-14.58	QP
2	0.1500	10.06	28.61	38.67	55.99	-17.32	AVG
3	0.1980	10.06	37.31	47.37	63.69	-16.32	QP
4	0.1980	10.06	22.78	32.84	53.69	-20.85	AVG
5	0.2260	10.05	33.66	43.71	62.59	-18.88	QP
6	0.2260	10.05	20.55	30.60	52.59	-21.99	AVG
7	0.2779	10.02	28.71	38.73	60.88	-22.15	QP
8	0.2779	10.02	18.44	28.46	50.88	-22.42	AVG
9	0.3260	9.99	25.42	35.41	59.55	-24.14	QP
10	0.3260	9.99	16.66	26.65	49.55	-22.90	AVG
11	1.3740	10.48	19.22	29.70	56.00	-26.30	QP
12	1.3740	10.48	13.91	24.39	46.00	-21.61	AVG

Note: Level = Reading + Factor
Margin = Level – Limit

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



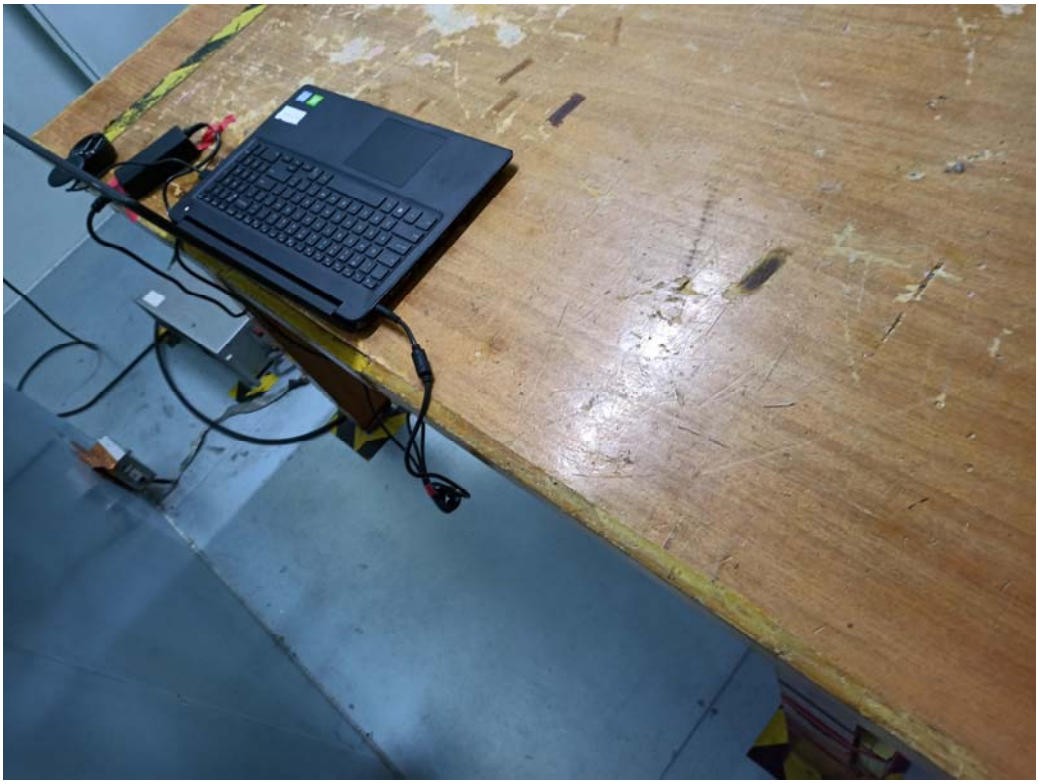
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1539	10.06	39.42	49.48	65.78	-16.30	QP
2	0.1539	10.06	23.97	34.03	55.78	-21.75	AVG
3	0.1660	10.06	38.82	48.88	65.15	-16.27	QP
4	0.1660	10.06	22.97	33.03	55.15	-22.12	AVG
5	0.1825	10.06	37.46	47.52	64.37	-16.85	QP
6	0.1825	10.06	21.67	31.73	54.37	-22.64	AVG
7	0.2020	10.06	31.01	41.07	63.52	-22.45	QP
8	0.2020	10.06	18.89	28.95	53.52	-24.57	AVG
9	0.2420	10.04	25.69	35.73	62.02	-26.29	QP
10	0.2420	10.04	17.32	27.36	52.02	-24.66	AVG
11	0.2580	10.03	24.14	34.17	61.49	-27.32	QP
12	0.2580	10.03	16.80	26.83	51.49	-24.66	AVG

Note: Level = Reading + Factor
Margin = Level – Limit

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電機技術規範 3.10.1 節(5)之要求，落於 2.7 節禁用頻段之輻射干擾需符合 2.8 節之一般限制要求:

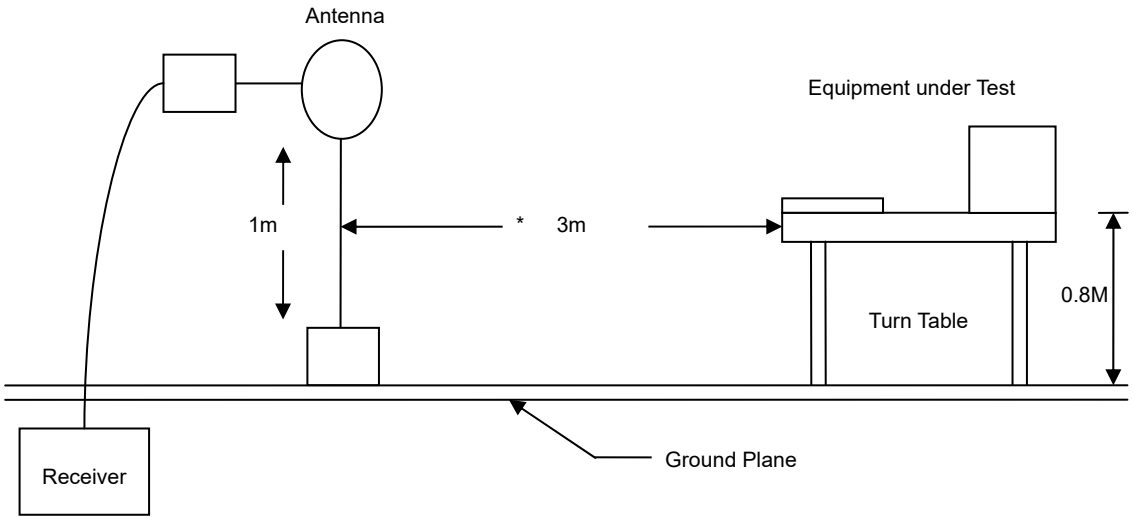
頻率(MHz)	測試距離(m)	限制值(dBμV)	限制值(μV/m)
0.009 – 0.490 (含)	300	67.6 / f(kHz)	2400 / f(kHz)
0.490 (不含) – 1.705 (含)	30	87.6 / f(kHz)	24000 / f(kHz)
1.705(不含) – 30(不含)	30	29.5	30
30 (含) – 88 (含)	3	40.0	100
88(不含) – 216 (含)	3	43.5	150
216(不含) – 960 (含)	3	46.0	200
960(不含)以上	3	54.0	500

5.2. 測試方法

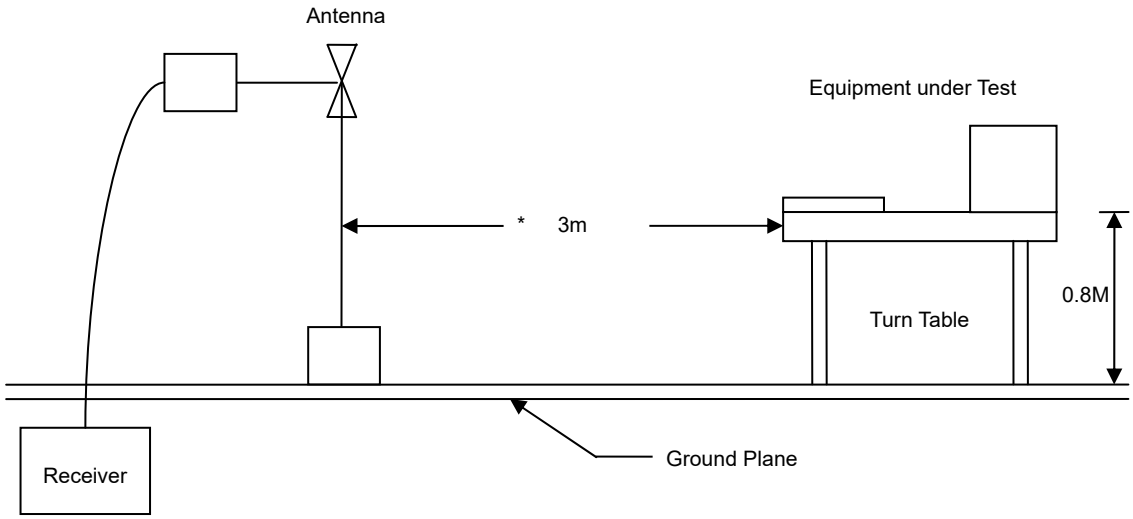
將待測物置於 0.8 米(Below 1G) & 1.5 米(Above 1G)高的非金屬桌面，使其在測試模式狀態，且設定為高、中、低各頻道產生最高峰值輸出功率的傳輸速率，接收天線置於 3 米外，且桌面要 360 度旋轉，另外接收天線也要從 1 米至 4 米升降變化，接收天線置於水平、垂直極向各執行測試一次。待測物若為手持式則分別要以三軸相放置，並分別測試以找出最大輻射電場強度。

5.3. 輻射場地之擺設

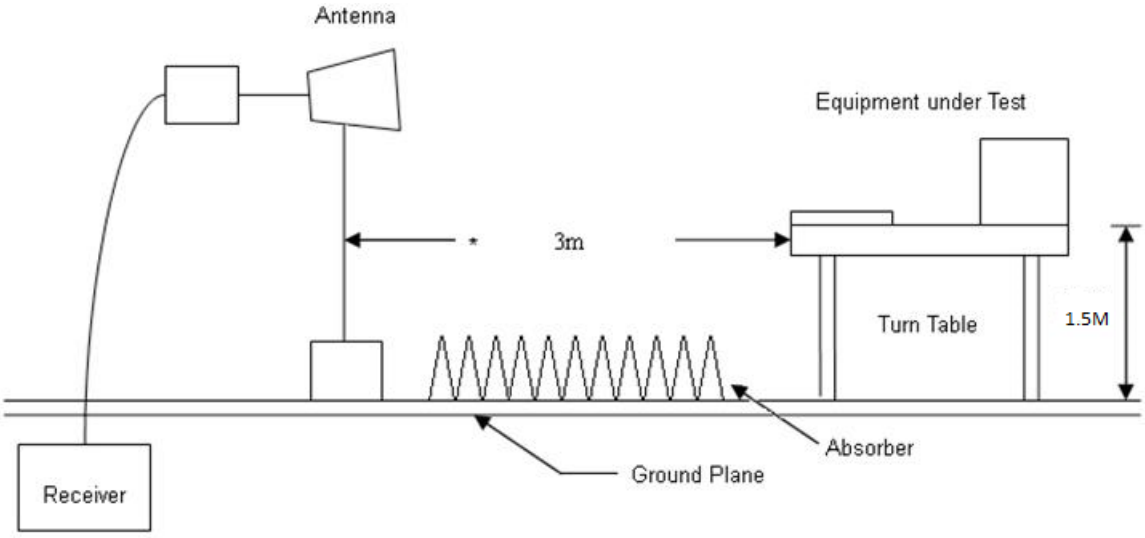
Below 30MHz test setup



30MHz- 1GHz Test Setup



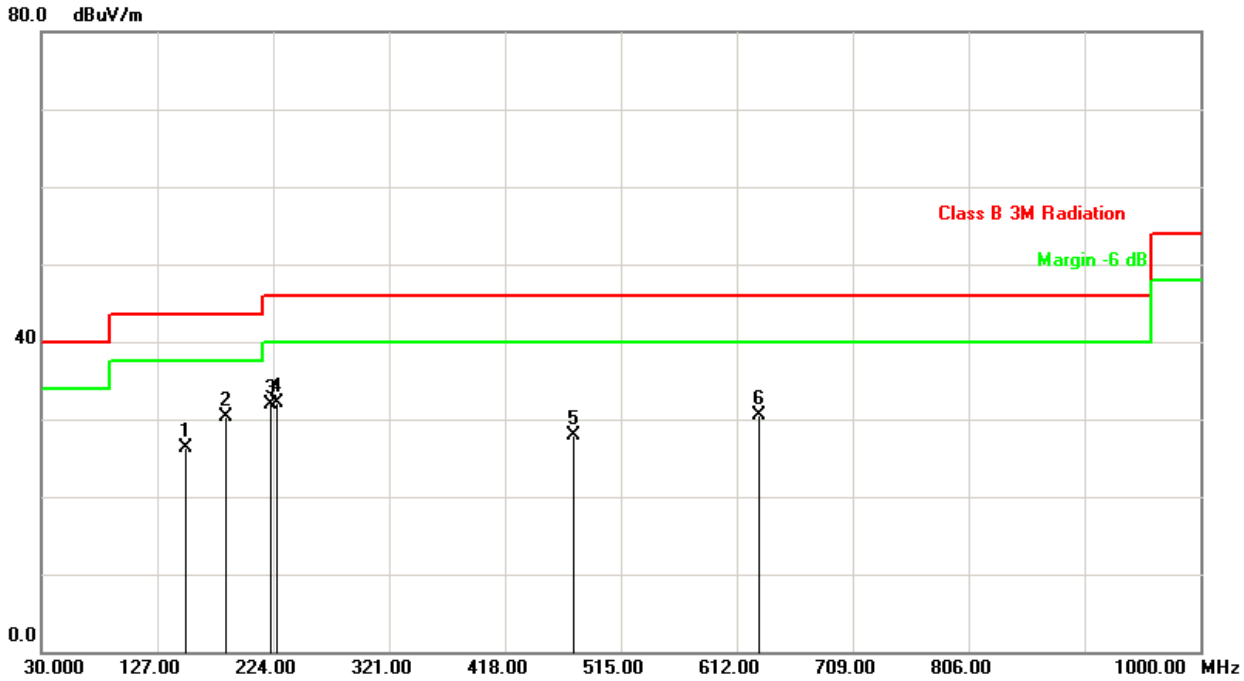
Above 1GHz Test Setup



5.4. 輻射之測試結果及數據 (Below 1GHz)

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

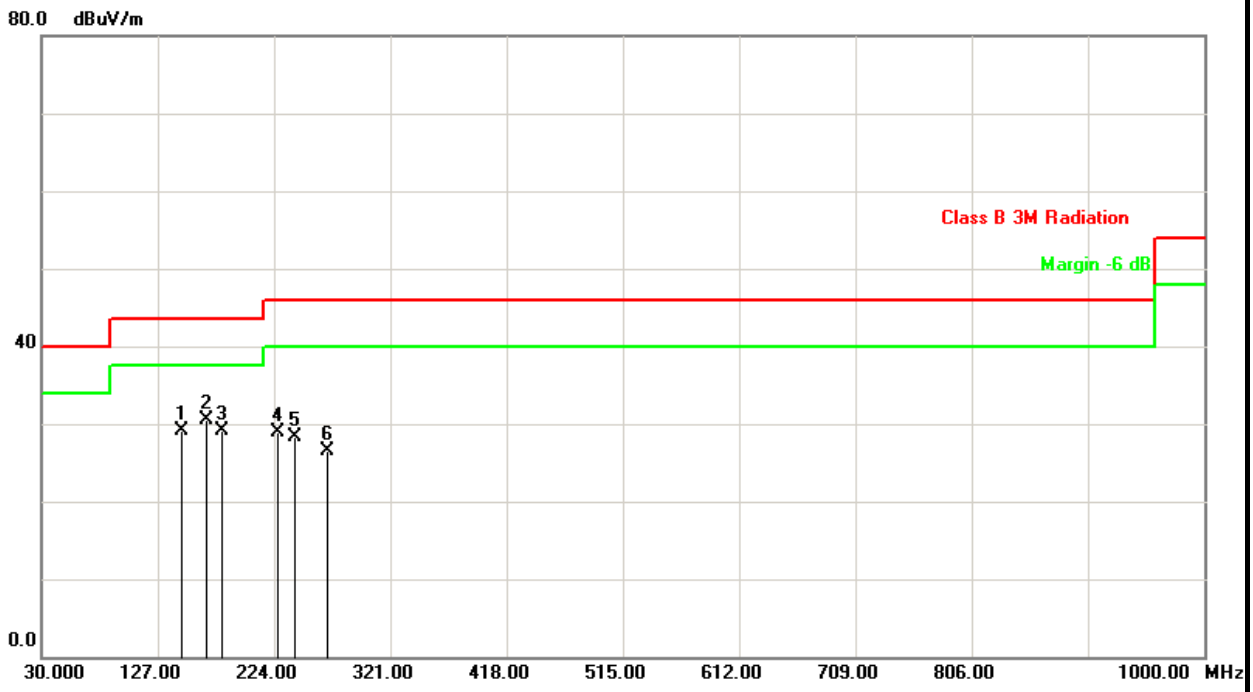
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 9KHz -30MHz spurious emission is under limit 20dB more



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	151.2500	-13.19	39.40	26.21	43.50	-17.29	peak	100	62
2	184.2298	-11.70	42.04	30.34	43.50	-13.16	peak	100	301
3	222.0600	-7.62	39.48	31.86	46.00	-14.14	peak	100	154
4	227.8799	-7.58	39.64	32.06	46.00	-13.94	peak	100	12
5	476.1999	-2.10	30.09	27.99	46.00	-18.01	peak	100	331
6	630.4299	-2.18	32.75	30.57	46.00	-15.43	peak	100	89

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

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 9KHz -30MHz spurious emission is under limit 20dB more

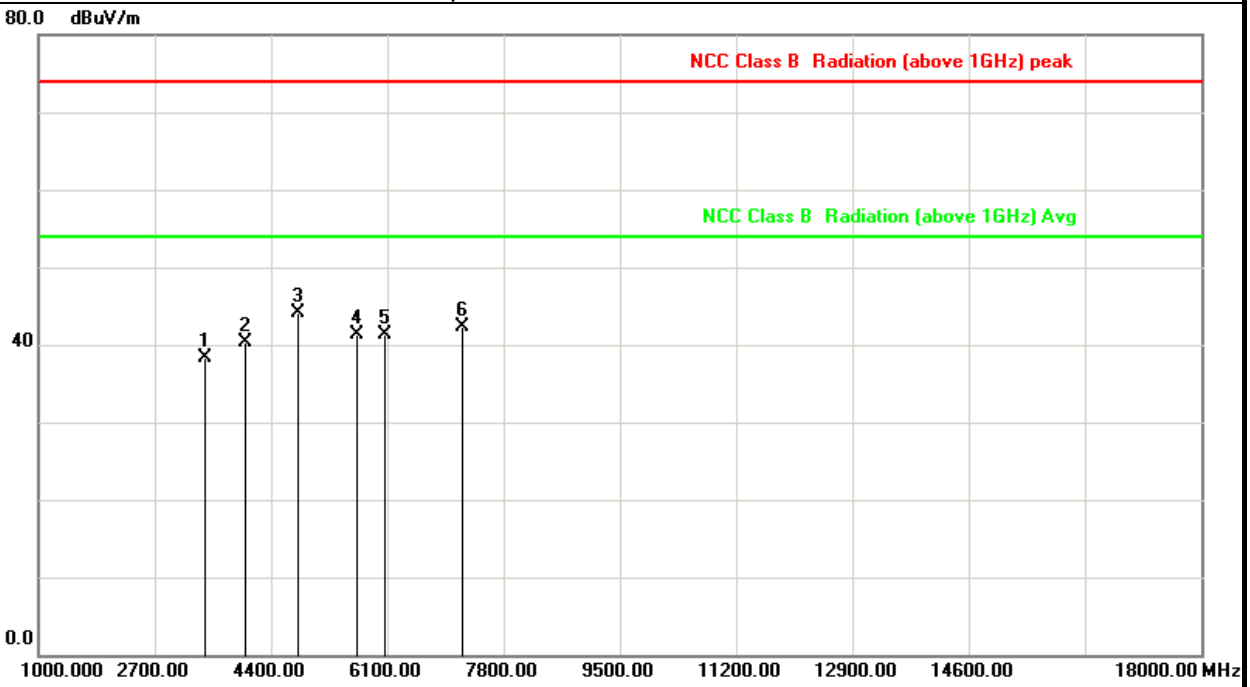


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	147.3700	-13.03	42.23	29.20	43.50	-14.30	peak	100	63
2	167.7400	-11.37	41.97	30.60	43.50	-12.90	peak	200	201
3	180.3499	-9.91	38.93	29.02	43.50	-14.48	peak	100	147
4	227.8799	-7.79	36.70	28.91	46.00	-17.09	peak	100	12
5	241.4600	-6.93	35.22	28.29	46.00	-17.71	peak	200	339
6	268.6200	-6.67	33.23	26.56	46.00	-19.44	peak	100	185

5.5. 輻射之測試結果及數據(Above 1GHz)

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	Mode 1, CH 00	Operation mode	TX

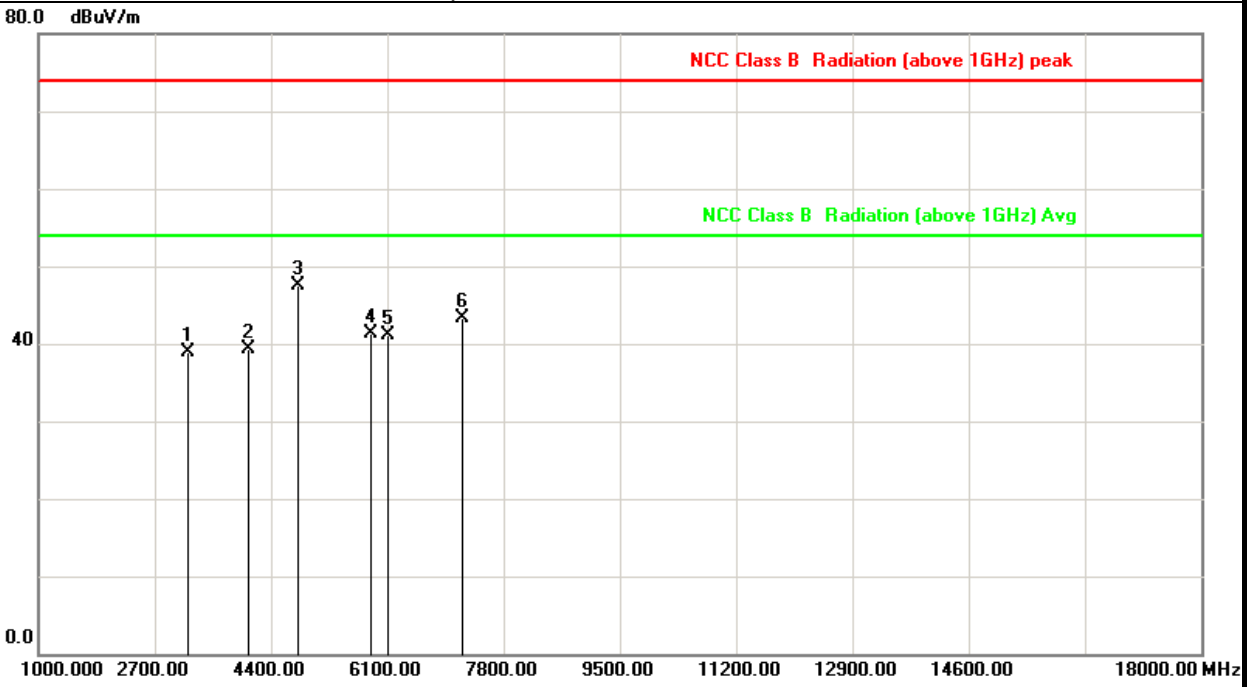
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3436.667	-3.93	42.14	38.21	74.00	-35.79	peak
2	4031.667	-1.73	42.06	40.33	74.00	-33.67	peak
3	4804.000	1.23	42.95	44.18	74.00	-29.82	peak
4	5646.667	2.38	38.96	41.34	74.00	-32.66	peak
5	6071.667	3.29	37.92	41.21	74.00	-32.79	peak
6	7206.000	5.88	36.51	42.39	74.00	-31.61	peak

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	Mode 1, CH 00	Operation mode	TX

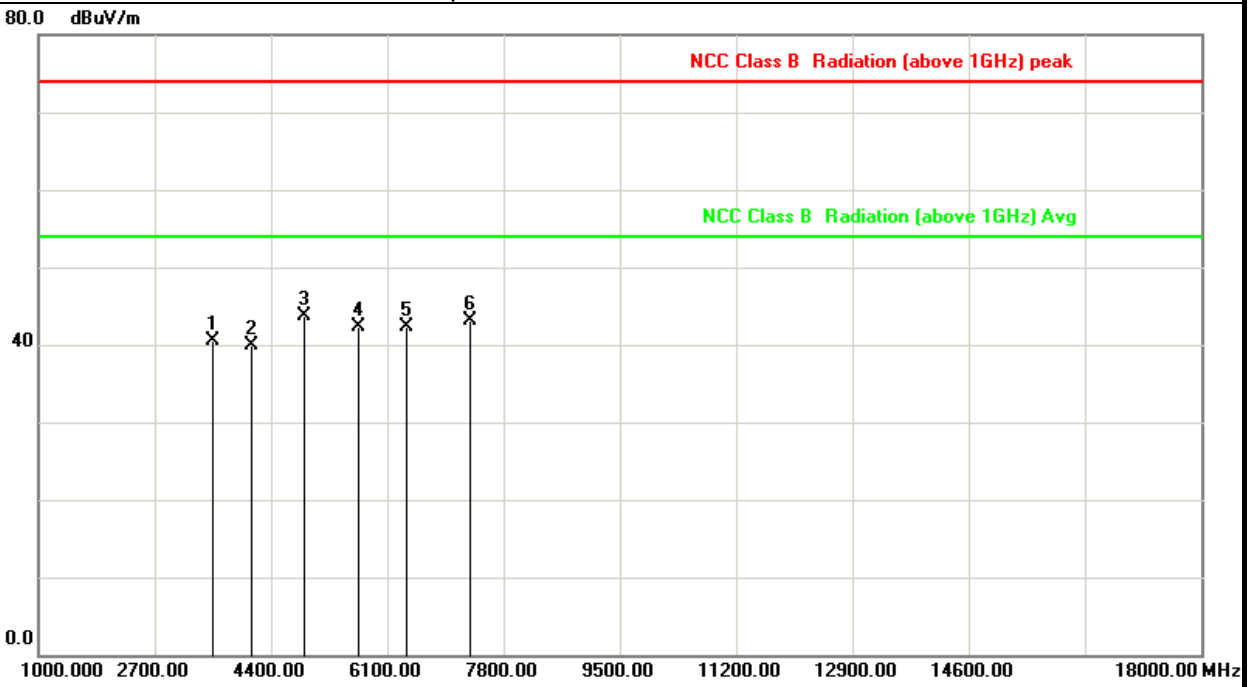
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3181.667	-5.27	44.09	38.82	74.00	-35.18	peak
2	4060.000	-1.58	40.96	39.38	74.00	-34.62	peak
3	4804.000	1.23	46.20	47.43	74.00	-26.57	peak
4	5873.333	2.95	38.40	41.35	74.00	-32.65	peak
5	6100.000	3.30	37.72	41.02	74.00	-32.98	peak
6	7206.000	5.88	37.48	43.36	74.00	-30.64	peak

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	Mode 1, CH 39	Operation mode	TX

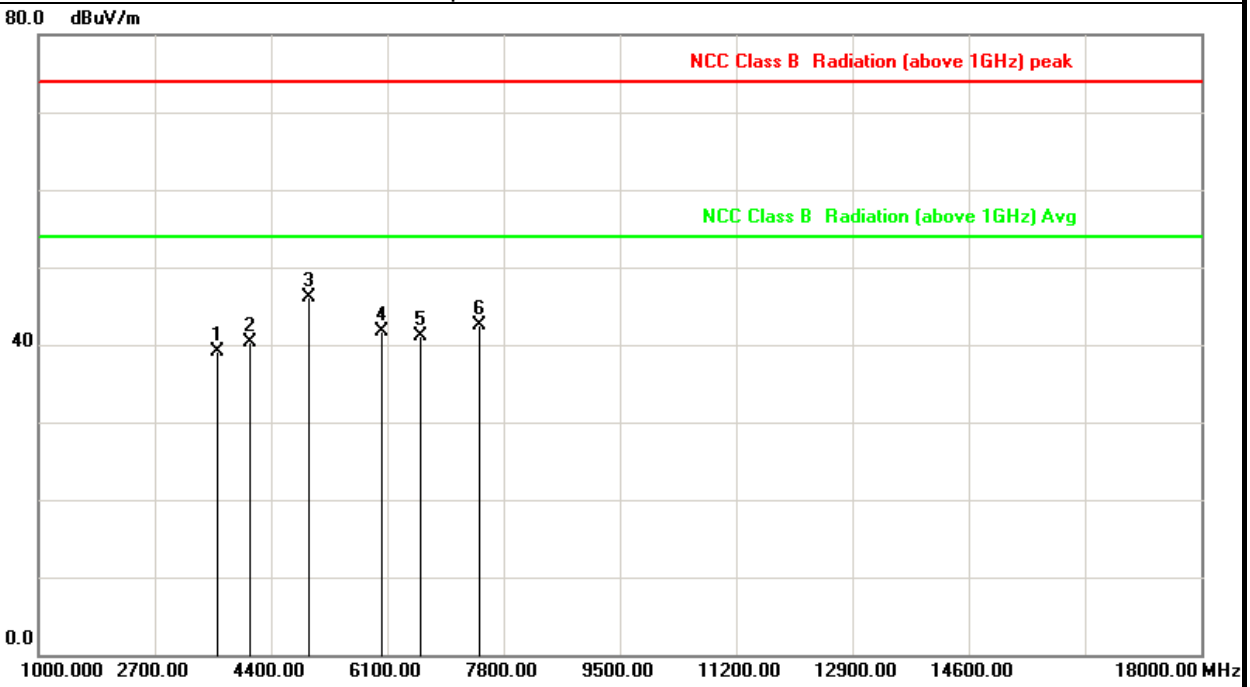
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3550.000	-3.43	43.95	40.52	74.00	-33.48	peak
2	4116.667	-1.29	41.11	39.82	74.00	-34.18	peak
3	4882.000	1.38	42.33	43.71	74.00	-30.29	peak
4	5675.000	2.45	39.79	42.24	74.00	-31.76	peak
5	6383.333	3.41	38.87	42.28	74.00	-31.72	peak
6	7323.000	6.34	36.84	43.18	74.00	-30.82	peak

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	Mode 1, CH 39	Operation mode	TX

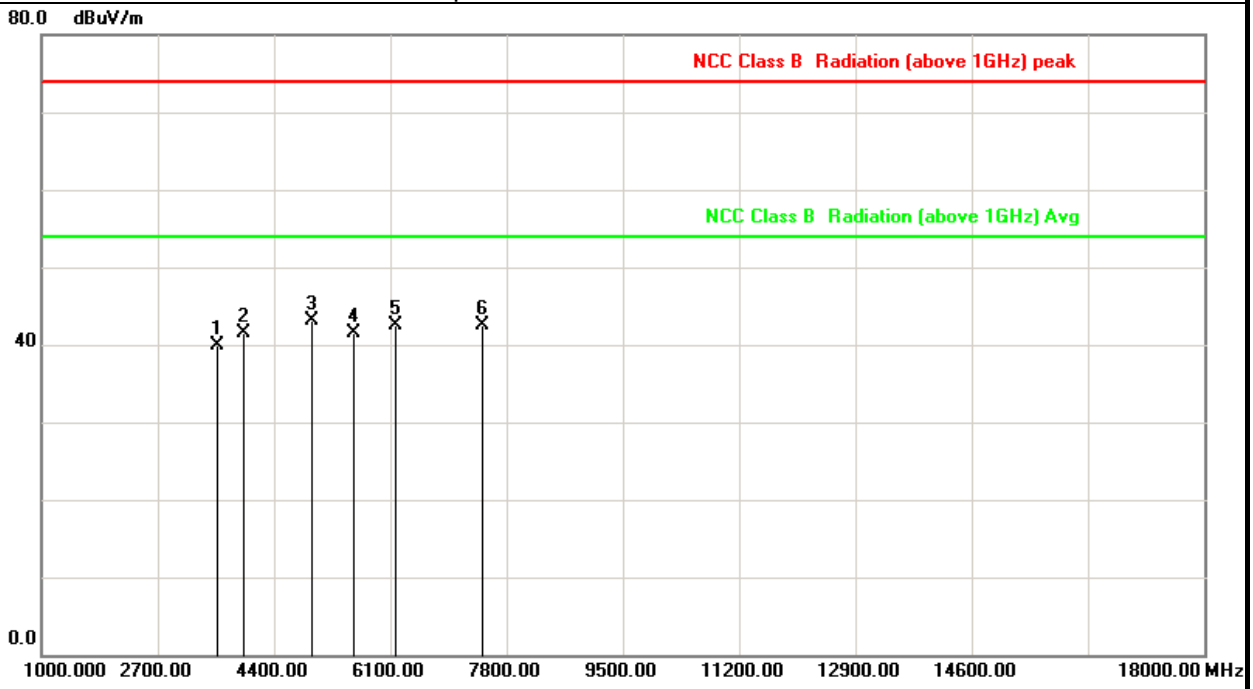
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3550.000	-3.43	43.20	39.77	74.00	-34.23	peak
2	4003.333	-1.87	42.57	40.70	74.00	-33.30	peak
3	4882.000	1.38	46.31	47.69	74.00	-26.31	peak
4	6015.000	3.27	37.81	41.08	74.00	-32.92	peak
5	6638.333	3.91	37.66	41.57	74.00	-32.43	peak
6	7323.000	6.34	35.60	41.94	74.00	-32.06	peak

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	Mode 1, CH 78	Operation mode	TX

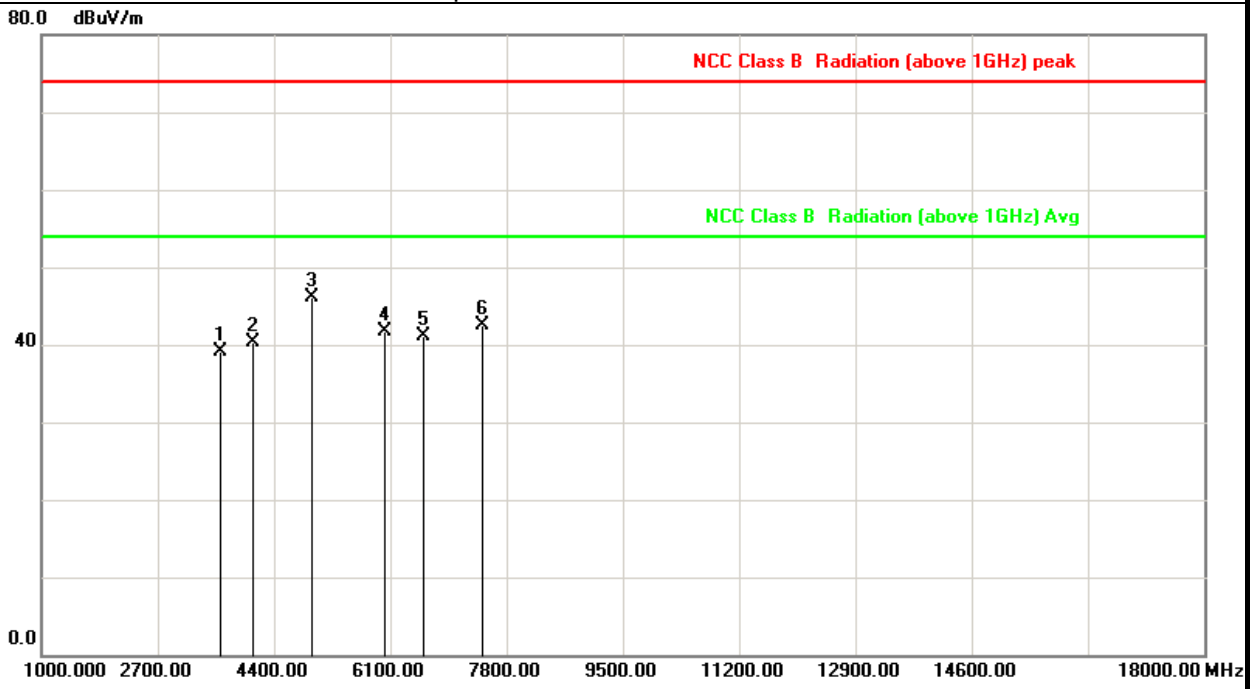
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3578.333	-3.33	43.28	39.95	74.00	-34.05	peak
2	3946.667	-2.07	43.66	41.59	74.00	-32.41	peak
3	4960.000	1.52	41.66	43.18	74.00	-30.82	peak
4	5561.667	2.17	39.34	41.51	74.00	-32.49	peak
5	6185.000	3.33	39.11	42.44	74.00	-31.56	peak
6	7440.000	6.80	35.74	42.54	74.00	-31.46	peak

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	Mode 1, CH 78	Operation mode	TX

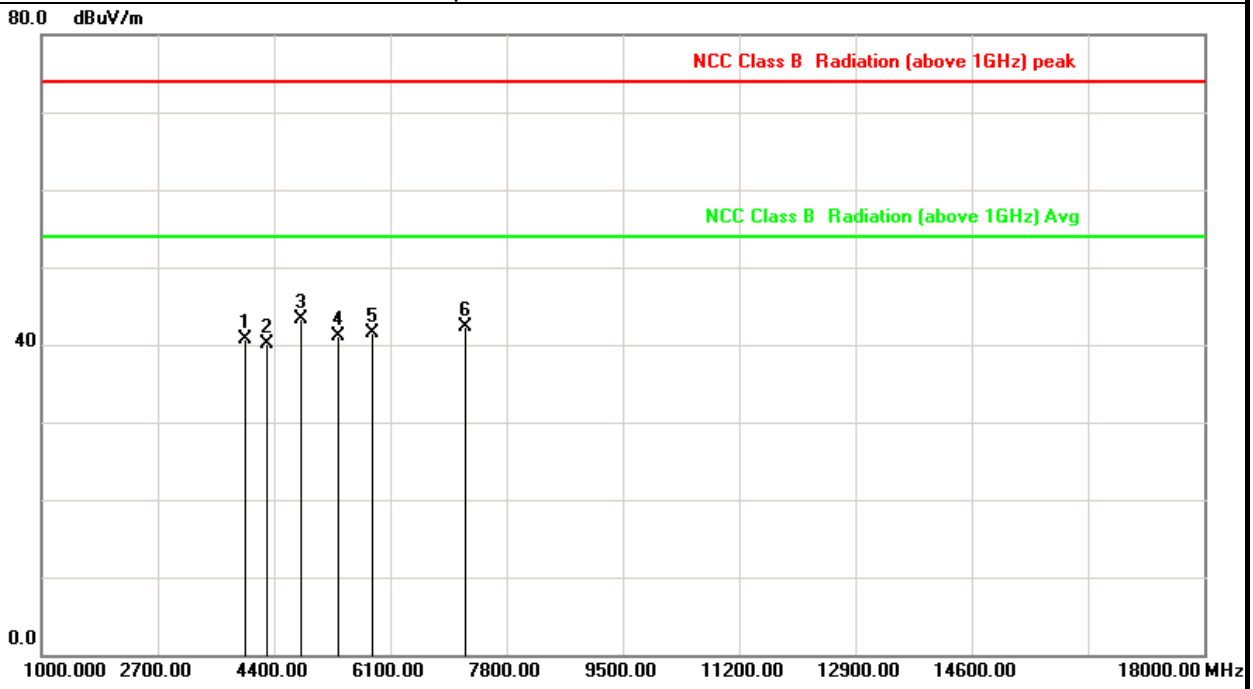
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3606.667	-3.24	42.27	39.03	74.00	-34.97	peak
2	4088.333	-1.44	41.72	40.28	74.00	-33.72	peak
3	4960.000	1.52	44.63	46.15	74.00	-27.85	peak
4	6015.000	3.27	38.39	41.66	74.00	-32.34	peak
5	6581.667	3.72	37.39	41.11	74.00	-32.89	peak
6	7440.000	6.80	35.68	42.48	74.00	-31.52	peak

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	Mode 3, CH 00	Operation mode	TX

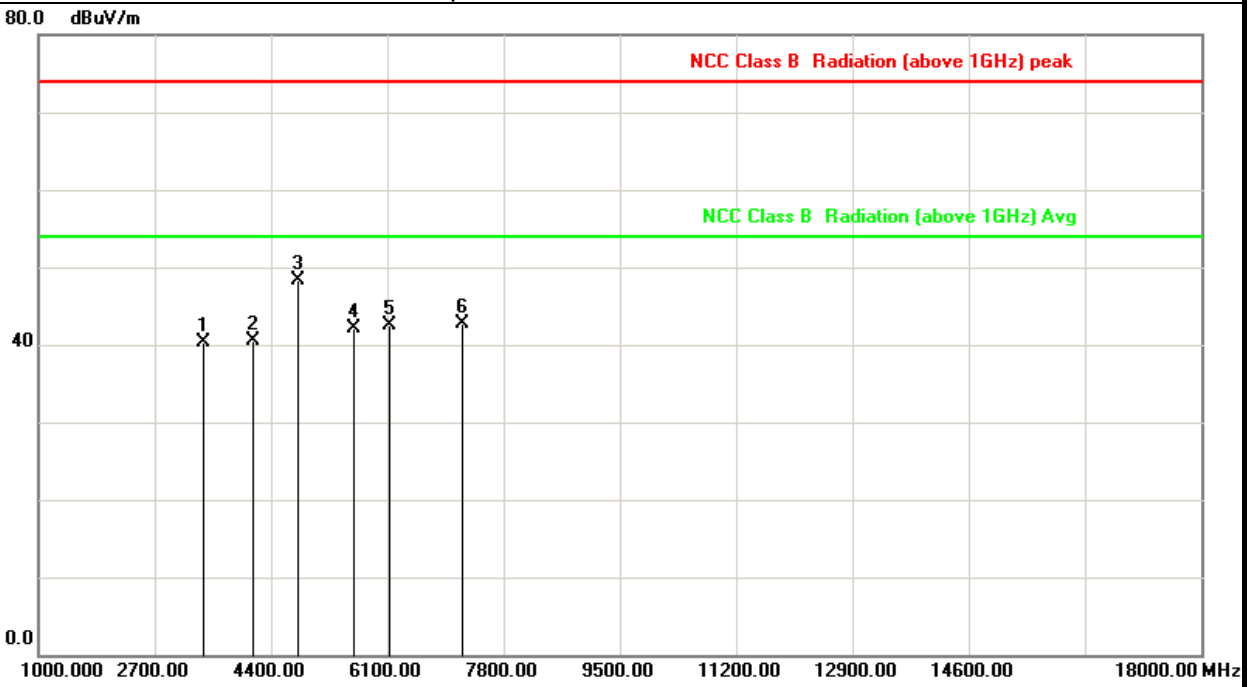
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3975.000	-1.98	42.70	40.72	74.00	-33.28	peak
2	4286.667	-0.43	40.63	40.20	74.00	-33.80	peak
3	4804.000	1.23	42.13	43.36	74.00	-30.64	peak
4	5335.000	1.88	39.17	41.05	74.00	-32.95	peak
5	5845.000	2.88	38.55	41.43	74.00	-32.57	peak
6	7206.000	5.88	36.49	42.37	74.00	-31.63	peak

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	Mode 3, CH 00	Operation mode	TX

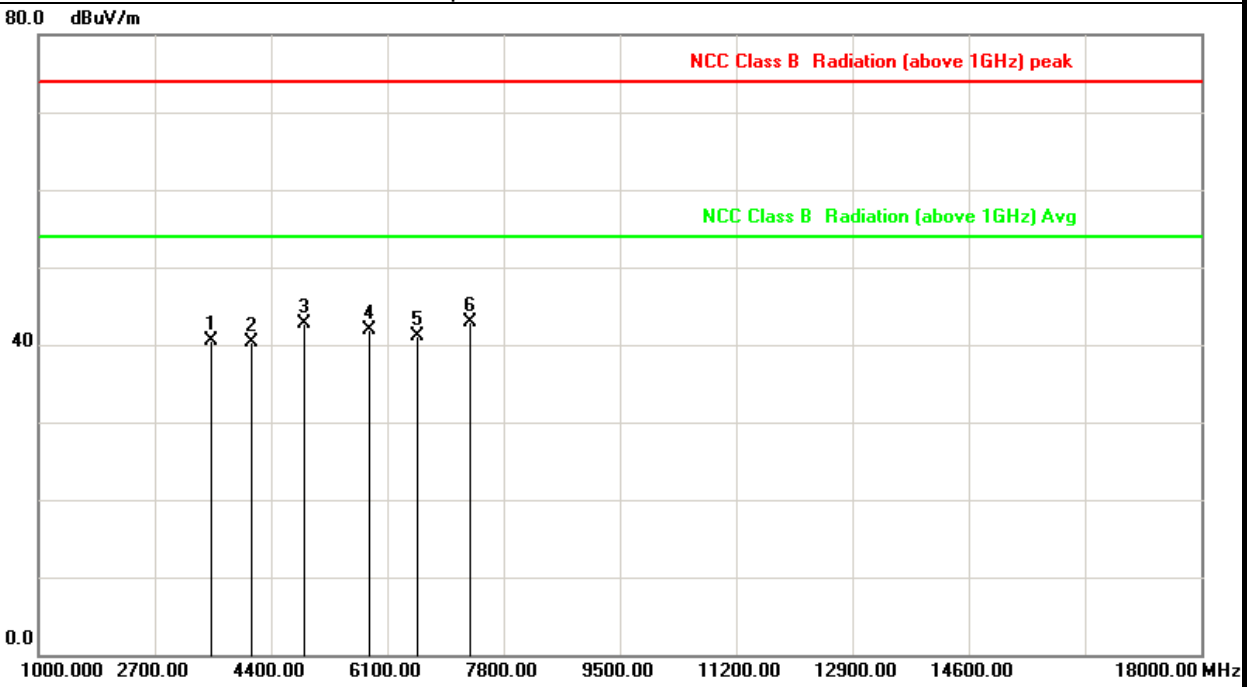
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3408.333	-4.08	44.45	40.37	74.00	-33.63	peak
2	4145.000	-1.15	41.70	40.55	74.00	-33.45	peak
3	4804.000	1.23	47.10	48.33	74.00	-25.67	peak
4	5618.333	2.31	39.85	42.16	74.00	-31.84	peak
5	6128.333	3.31	39.18	42.49	74.00	-31.51	peak
6	7206.000	5.88	36.77	42.65	74.00	-31.35	peak

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	Mode 3, CH 39	Operation mode	TX

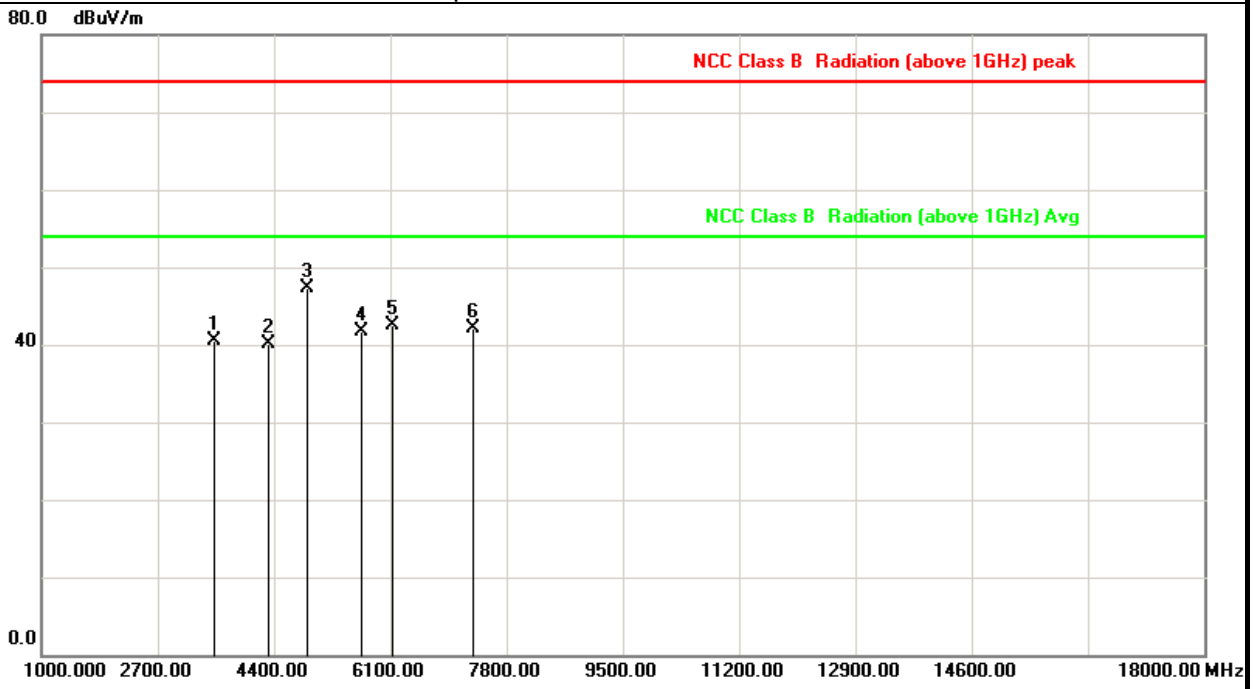
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3521.667	-3.53	44.03	40.50	74.00	-33.50	peak
2	4116.667	-1.29	41.61	40.32	74.00	-33.68	peak
3	4882.000	1.38	41.25	42.63	74.00	-31.37	peak
4	5845.000	2.88	39.09	41.97	74.00	-32.03	peak
5	6553.333	3.63	37.57	41.20	74.00	-32.80	peak
6	7323.000	6.34	36.61	42.95	74.00	-31.05	peak

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	Mode 3, CH 39	Operation mode	TX

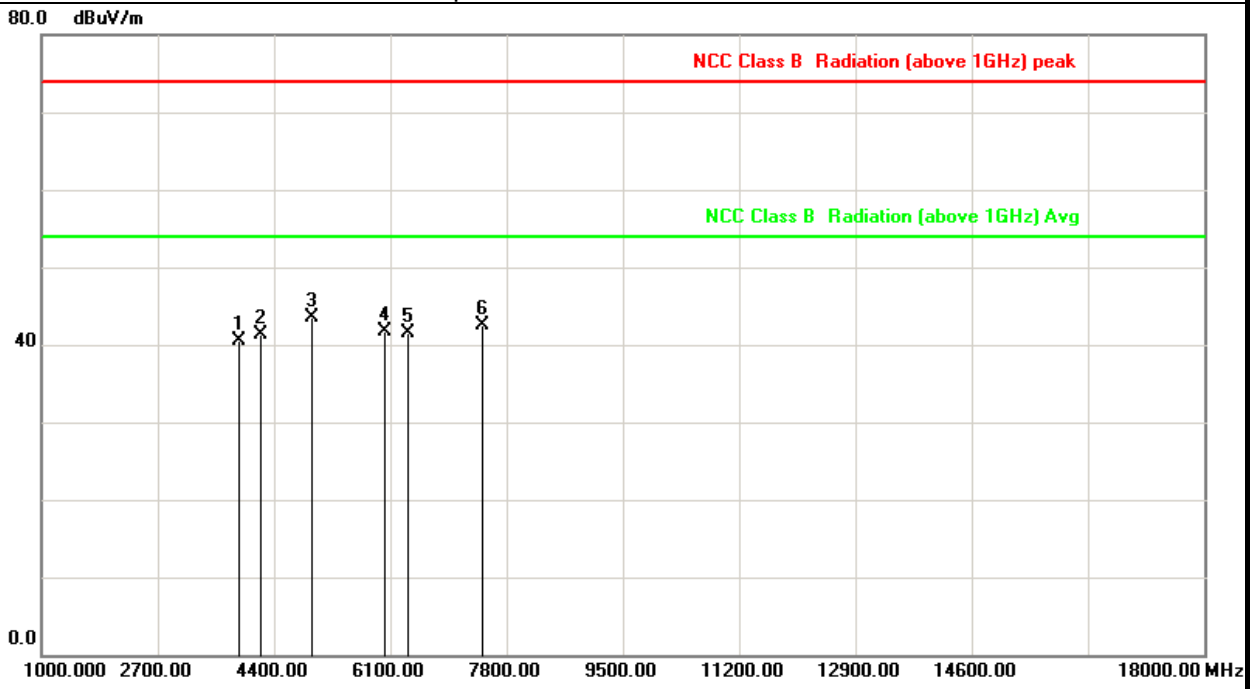
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3521.667	-3.53	44.11	40.58	74.00	-33.42	peak
2	4315.000	-0.28	40.30	40.02	74.00	-33.98	peak
3	4882.000	1.38	45.96	47.34	74.00	-26.66	peak
4	5675.000	2.45	39.24	41.69	74.00	-32.31	peak
5	6128.333	3.31	39.10	42.41	74.00	-31.59	peak
6	7323.000	6.34	35.68	42.02	74.00	-31.98	peak

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	Mode 3, CH 78	Operation mode	TX

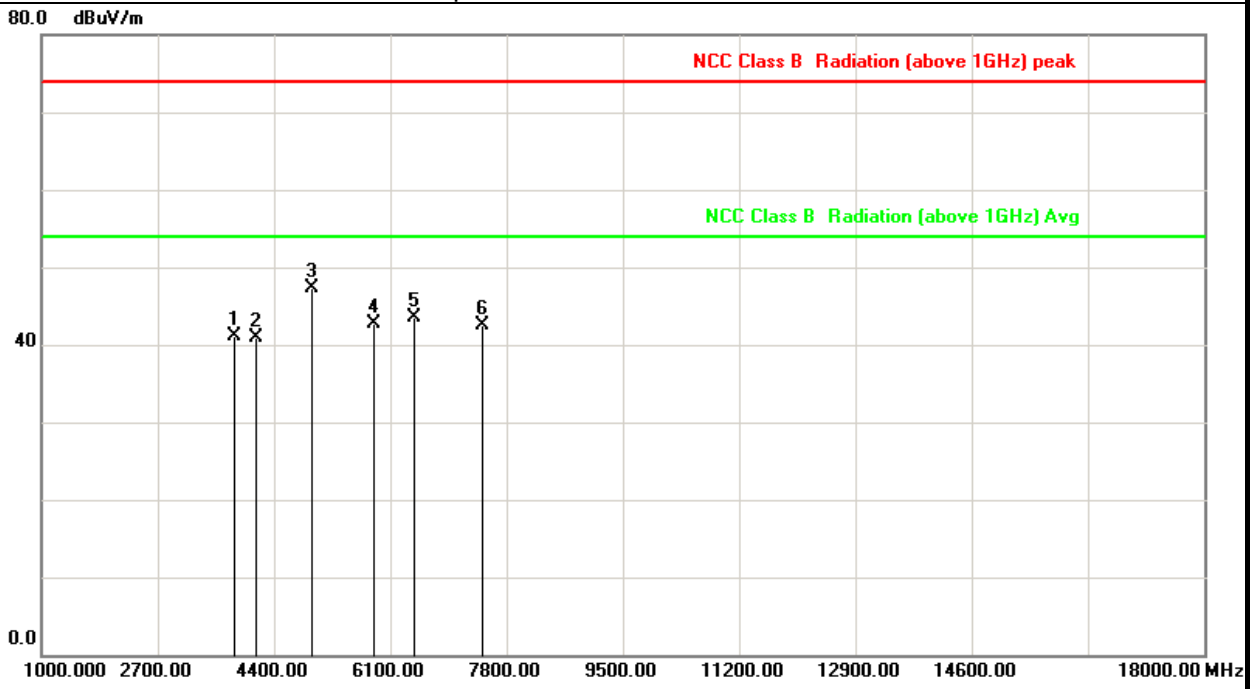
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3890.000	-2.27	42.81	40.54	74.00	-33.46	peak
2	4201.667	-0.86	42.21	41.35	74.00	-32.65	peak
3	4960.000	1.52	41.92	43.44	74.00	-30.56	peak
4	6015.000	3.27	38.43	41.70	74.00	-32.30	peak
5	6355.000	3.40	38.18	41.58	74.00	-32.42	peak
6	7440.000	6.80	35.74	42.54	74.00	-31.46	peak

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	Mode3, CH 78	Operation mode	TX

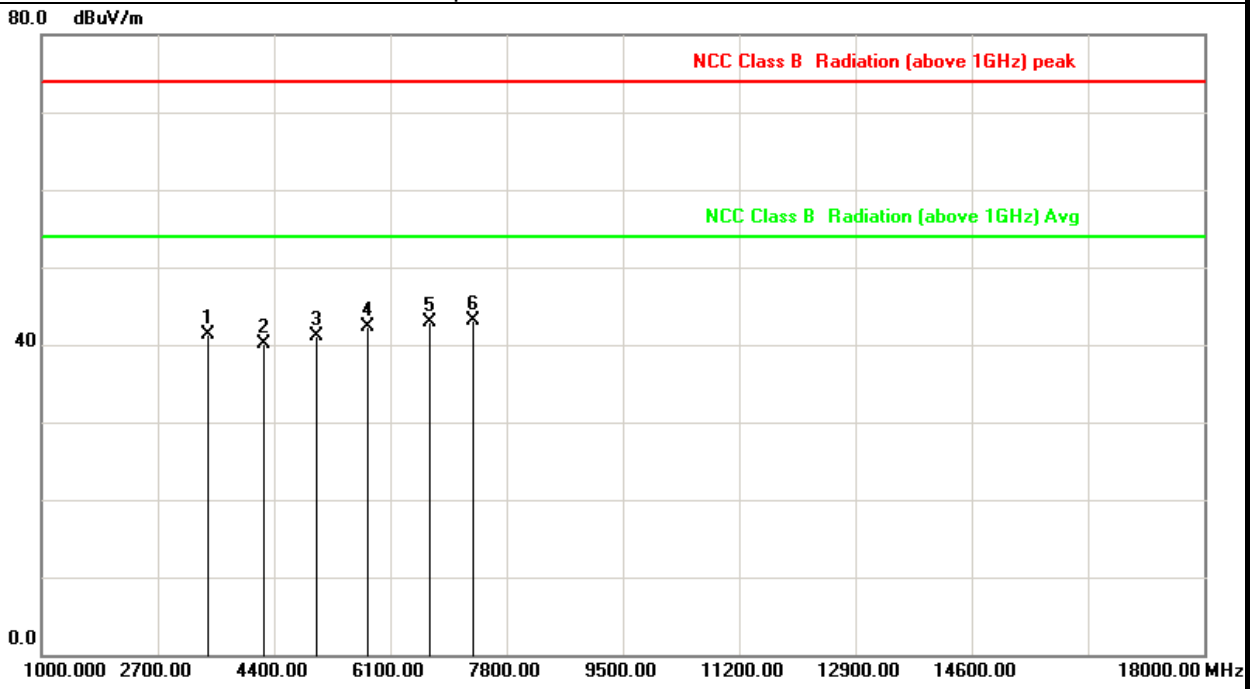
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3833.333	-2.46	43.62	41.16	74.00	-32.84	peak
2	4145.000	-1.15	42.02	40.87	74.00	-33.13	peak
3	4960.000	1.52	45.86	47.38	74.00	-26.62	peak
4	5873.333	2.95	39.66	42.61	74.00	-31.39	peak
5	6440.000	3.44	39.97	43.41	74.00	-30.59	peak
6	7440.000	6.80	35.80	42.60	74.00	-31.40	peak

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	Mode 1, CH 00	Operation mode	RX

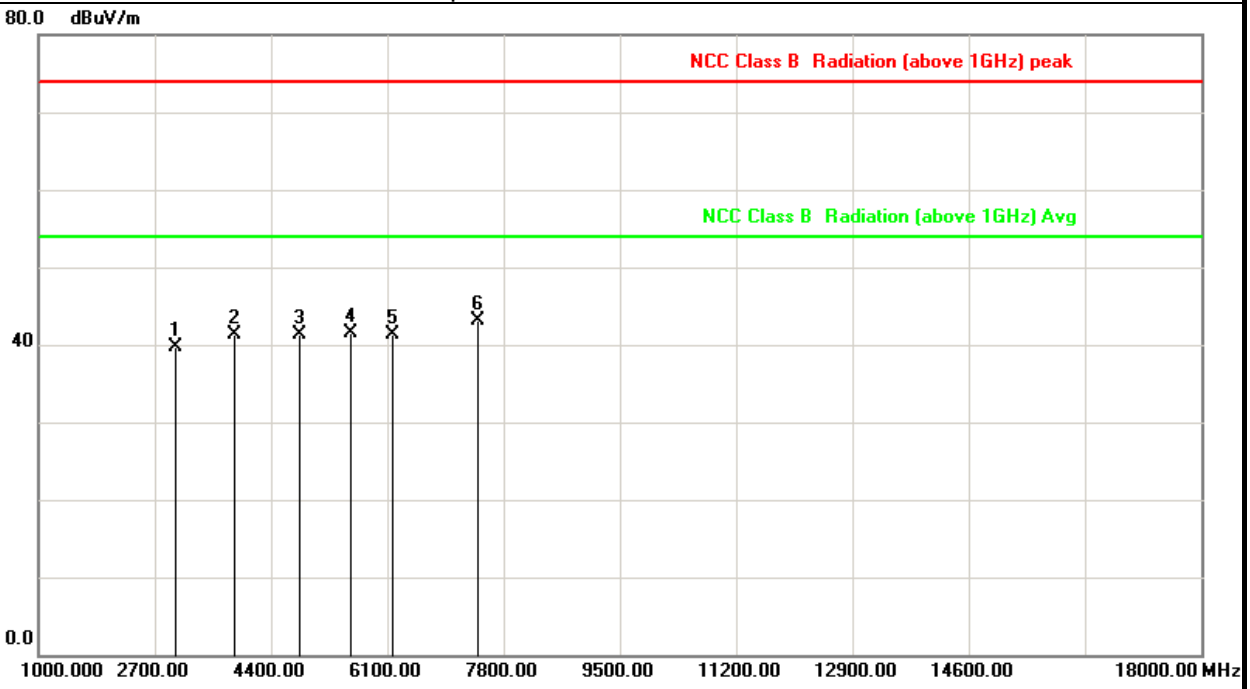
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3436.667	-3.93	45.14	41.21	74.00	-32.79	peak
2	4258.333	-0.57	40.68	40.11	74.00	-33.89	peak
3	5023.333	1.62	39.43	41.05	74.00	-32.95	peak
4	5760.000	2.66	39.65	42.31	74.00	-31.69	peak
5	6666.667	4.00	38.81	42.81	74.00	-31.19	peak
6	7317.333	6.32	36.85	43.17	74.00	-30.83	peak

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	Mode 1, CH 00	Operation mode	RX

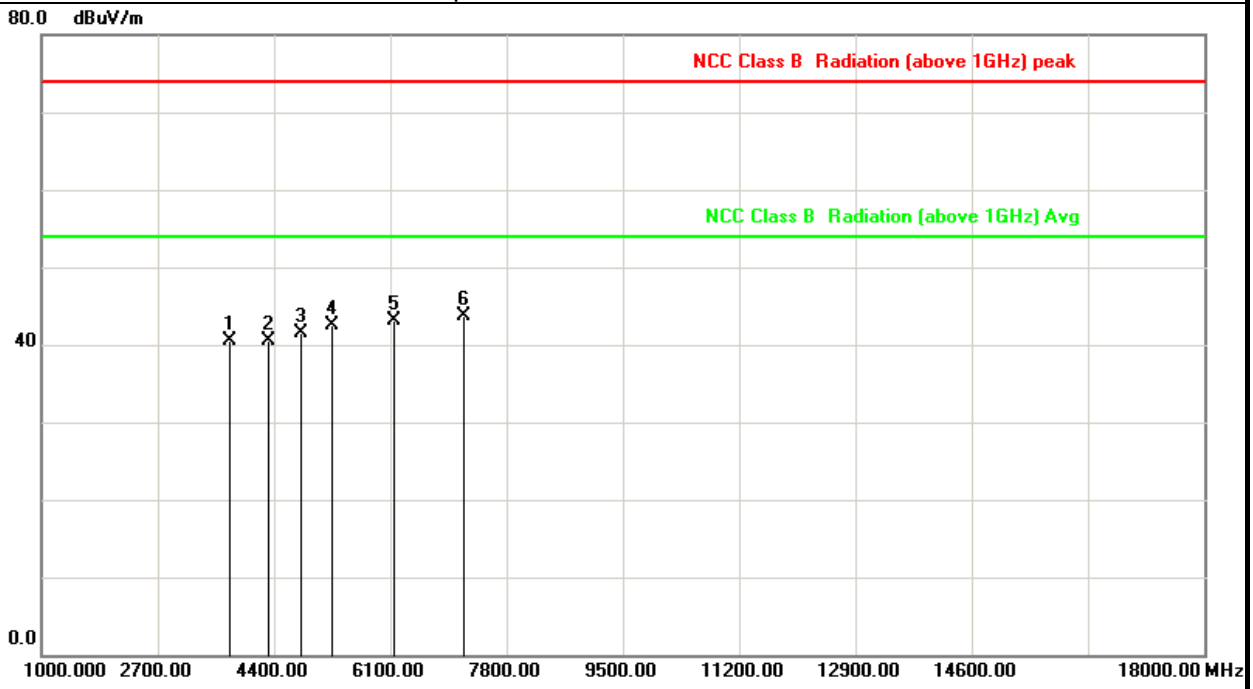
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3011.667	-6.17	45.79	39.62	74.00	-34.38	peak
2	3861.667	-2.36	43.59	41.23	74.00	-32.77	peak
3	4825.000	1.27	40.09	41.36	74.00	-32.64	peak
4	5561.667	2.17	39.34	41.51	74.00	-32.49	peak
5	6185.000	3.33	38.01	41.34	74.00	-32.66	peak
6	7431.667	6.76	36.27	43.03	74.00	-30.97	peak

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	Mode 1, CH 39	Operation mode	RX

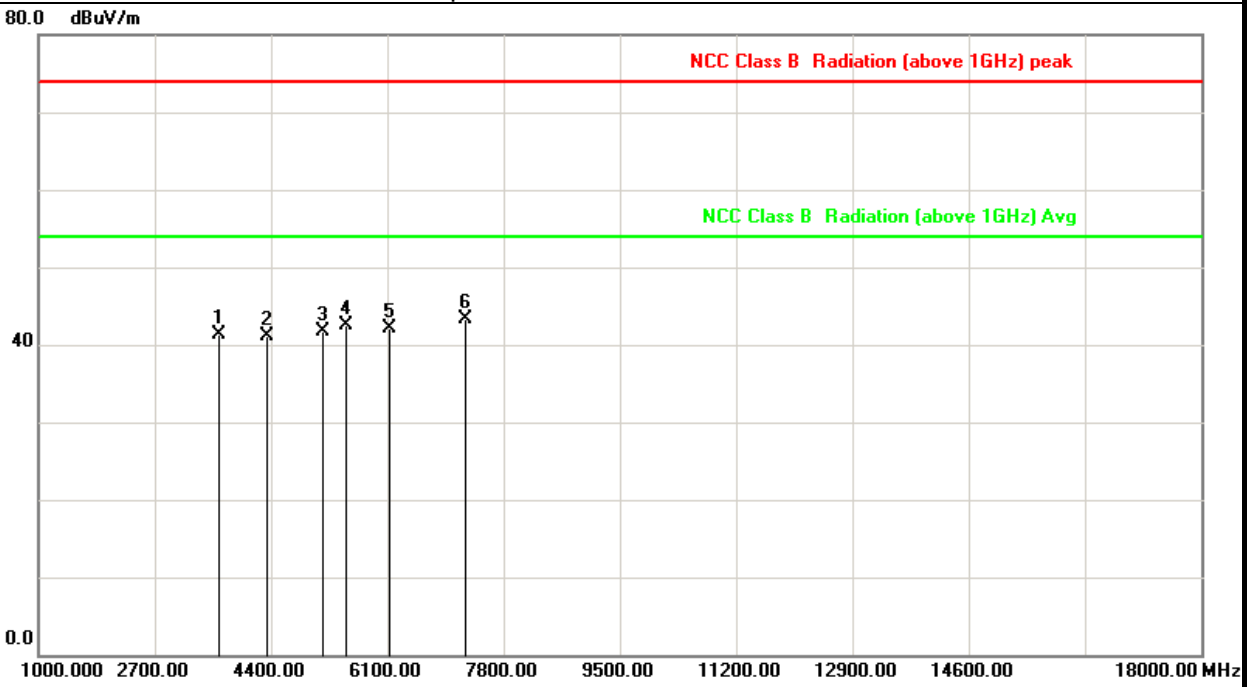
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3748.333	-2.75	43.25	40.50	74.00	-33.50	peak
2	4315.000	-0.28	40.79	40.51	74.00	-33.49	peak
3	4796.667	1.22	40.33	41.55	74.00	-32.45	peak
4	5250.000	1.81	40.71	42.52	74.00	-31.48	peak
5	6156.667	3.32	39.83	43.15	74.00	-30.85	peak
6	7169.333	5.74	37.97	43.71	74.00	-30.29	peak

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	Mode 1, CH 39	Operation mode	RX

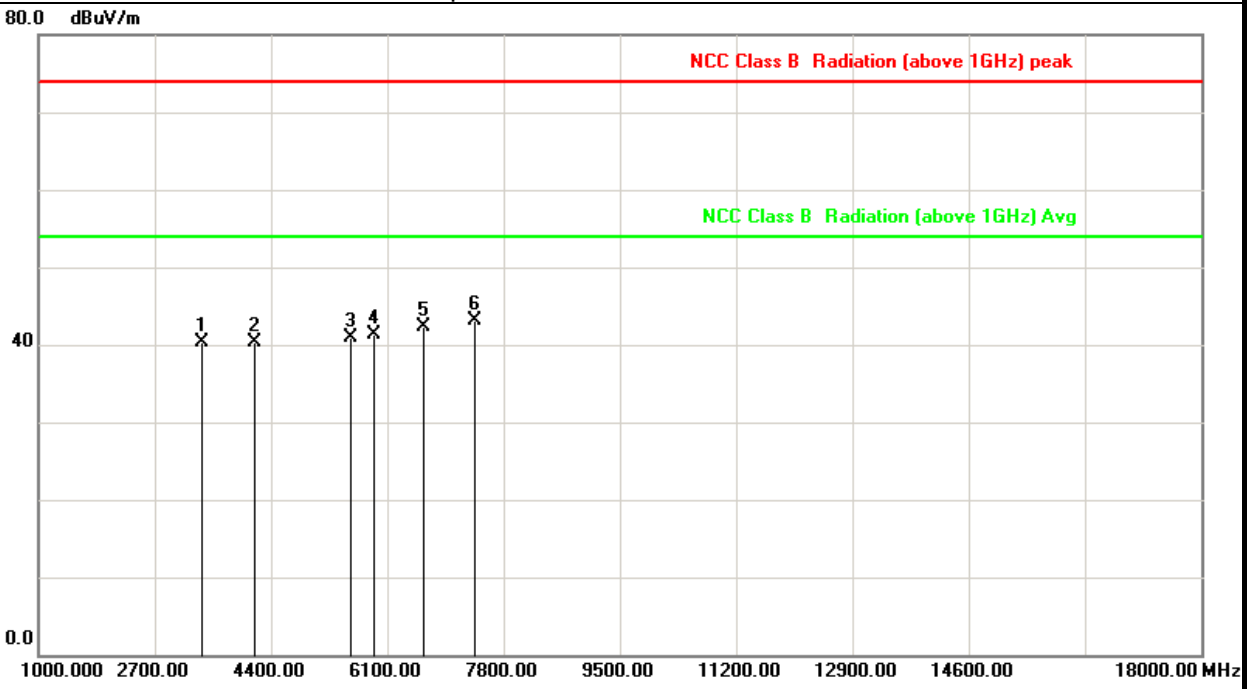
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3635.000	-3.14	44.51	41.37	74.00	-32.63	peak
2	4343.333	-0.14	41.28	41.14	74.00	-32.86	peak
3	5165.000	1.74	39.88	41.62	74.00	-32.38	peak
4	5505.000	2.03	40.38	42.41	74.00	-31.59	peak
5	6128.333	3.31	38.75	42.06	74.00	-31.94	peak
6	7248.667	6.05	37.27	43.32	74.00	-30.68	peak

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	Mode 1, CH 78	Operation mode	RX

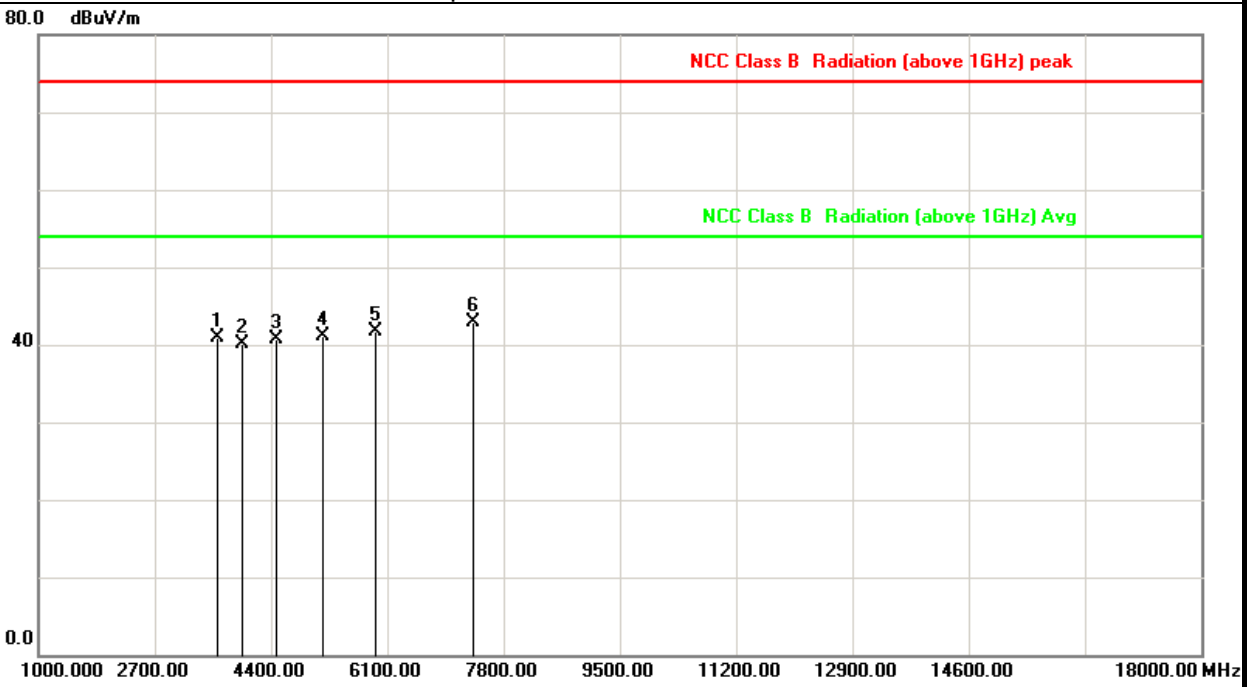
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3380.000	-4.23	44.56	40.33	74.00	-33.67	peak
2	4173.333	-1.01	41.23	40.22	74.00	-33.78	peak
3	5561.667	2.17	38.77	40.94	74.00	-33.06	peak
4	5901.667	3.02	38.29	41.31	74.00	-32.69	peak
5	6638.333	3.91	38.43	42.34	74.00	-31.66	peak
6	7372.333	6.53	36.67	43.20	74.00	-30.80	peak

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	Mode 1, CH 78	Operation mode	RX

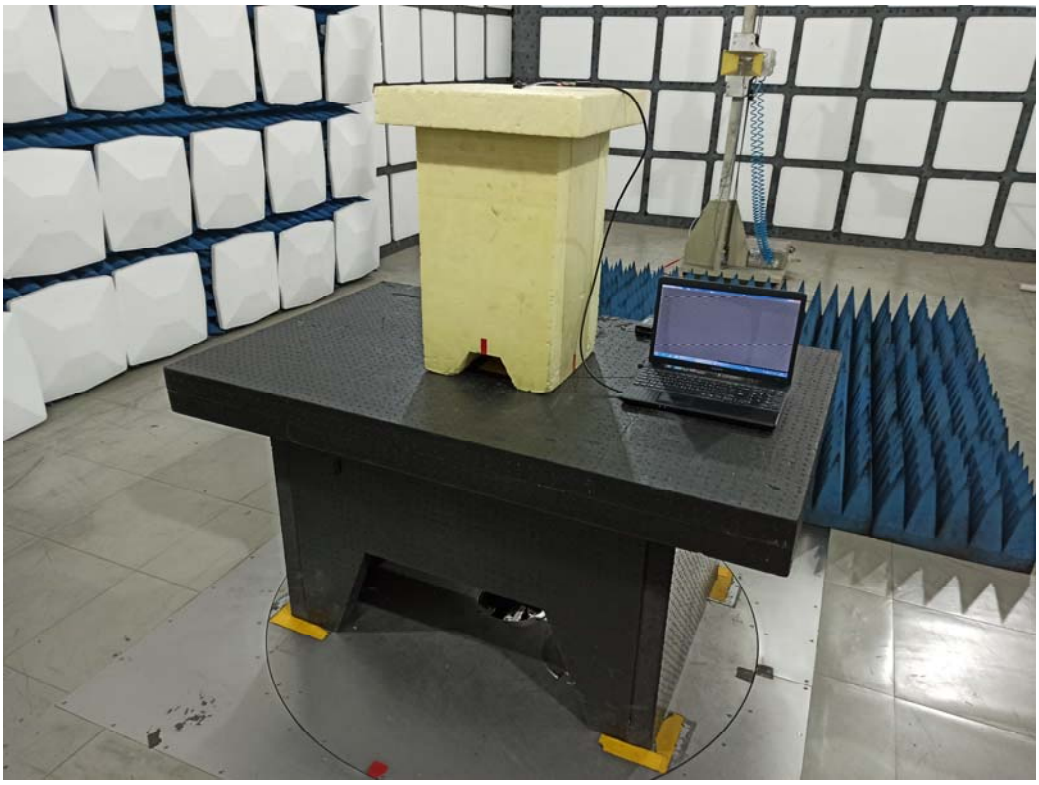
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor
The 18000MHz - 25000MHz spurious emission is under limit 20dB more.



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3606.667	-3.24	44.16	40.92	74.00	-33.08	peak
2	3975.000	-1.98	42.11	40.13	74.00	-33.87	peak
3	4485.000	0.58	40.05	40.63	74.00	-33.37	peak
4	5165.000	1.74	39.38	41.12	74.00	-32.88	peak
5	5930.000	3.09	38.68	41.77	74.00	-32.23	peak
6	7366.667	6.51	36.46	42.97	74.00	-31.03	peak

5.6. 輻射量測之配置照片 (30MHz-1GHz)

5.7. 輻射量測之配置照片 (Above 1GHz)



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電機技術規範 3.10.1.6 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。

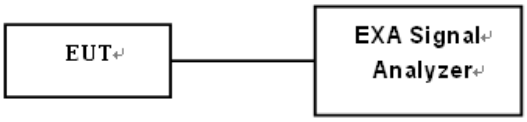
但操作頻率為 2400-2483.5 兆赫(MHz)頻帶且輸出功率不大於 125 毫瓦(mW)跳頻系統，其載波頻率頻道間隔不得小於 25 千赫 (kHz)或跳頻頻道 20dB 頻寬之三分之二，兩者取較寬者。

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

a. 將待測物和儀器相連接。
b. 設定儀器解析頻寬 30KHz 和視訊頻寬為 100 KHz。
c. 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

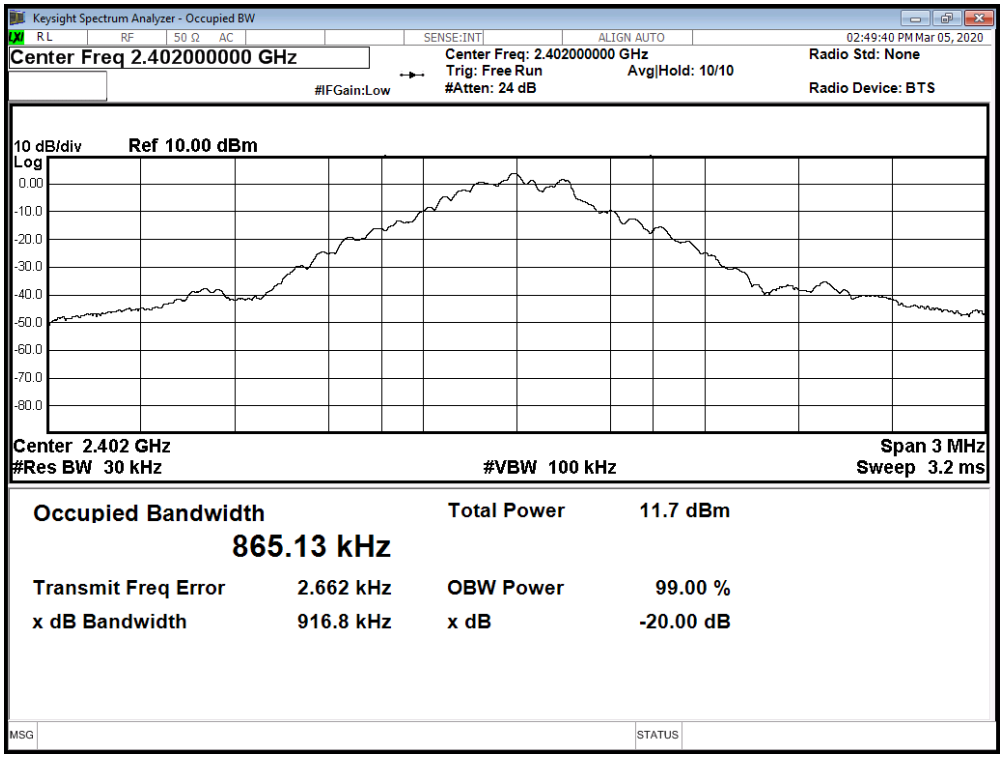
Modulation Type	Channel	Frequency (MHz)	20dB Bandwidth (MHz)	2/3 20dB Bandwidth(KHz)
GFSK (1Mbps)	00	2402	0.917	611
	39	2441	0.867	578
	78	2480	0.867	578
π/4-DQPSK (2Mbps)	00	2402	1.236	824
	39	2441	1.230	820
	78	2480	1.230	820
8DPSK (3Mbps)	00	2402	1.264	843
	39	2441	1.258	839
	78	2480	1.261	841
註	2/3*20dB Bandwidth=20dB Bandwidth x 2/3 例：1054=703x2/3(KHz)			

備註：繪圖資料請參考下頁。

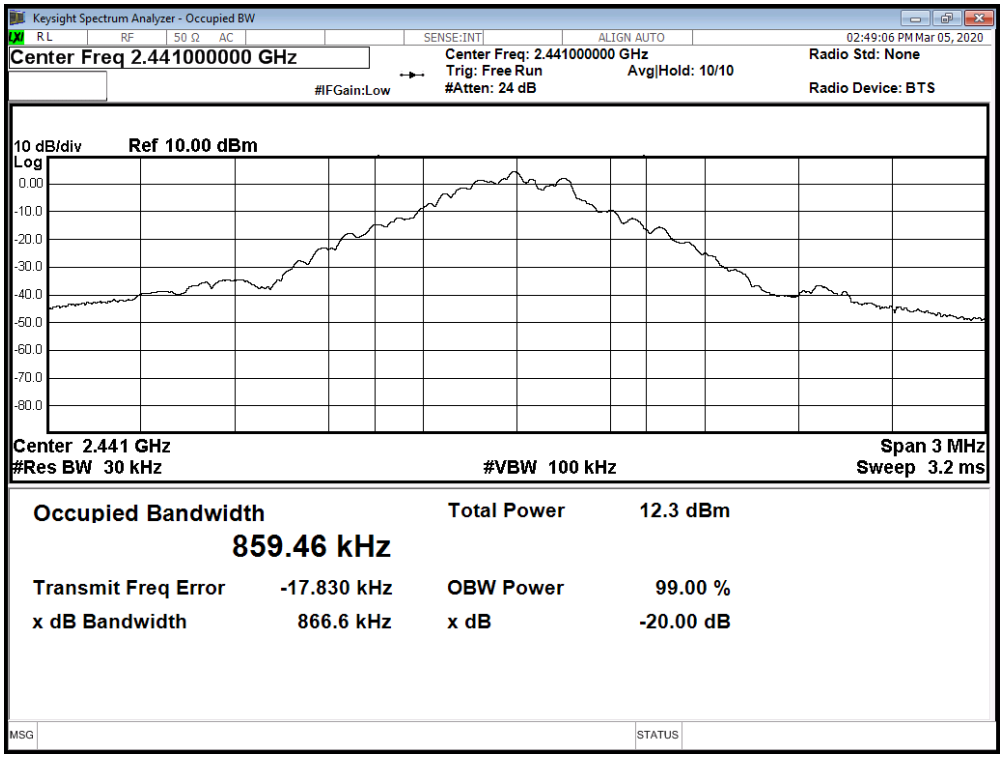
6.5. 結果判定

高、中、低頻段的 20dB 頻寬皆大於 25 KHz，合乎標準規定。

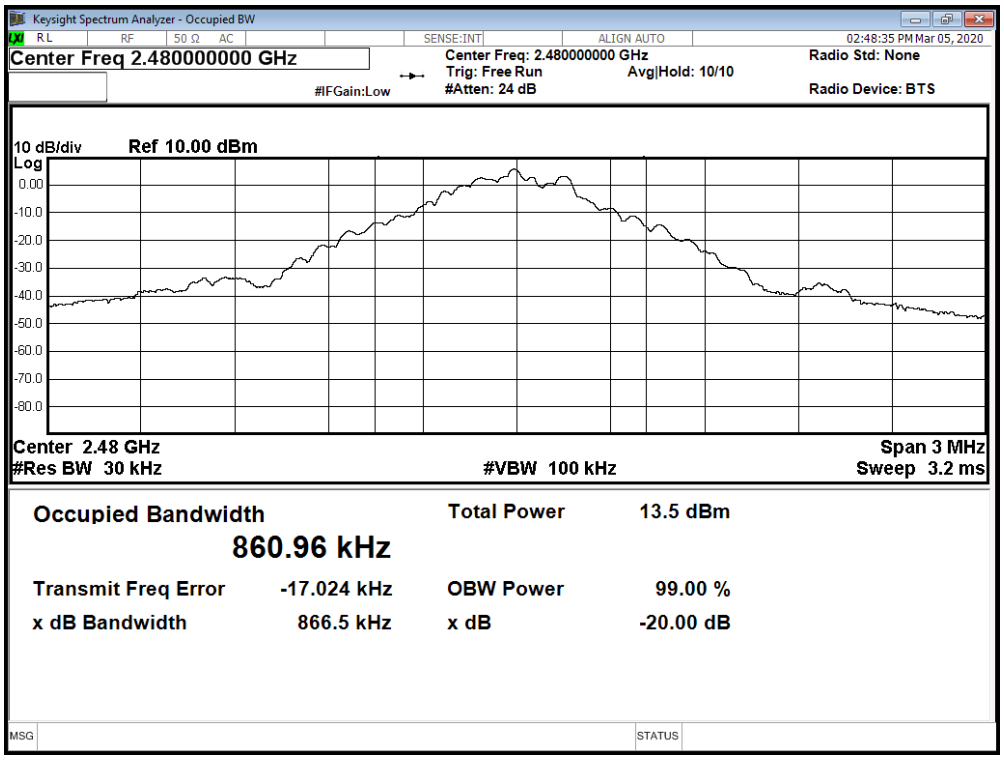
Modulation Standard: GFSK (1Mbps)
Channel: 00



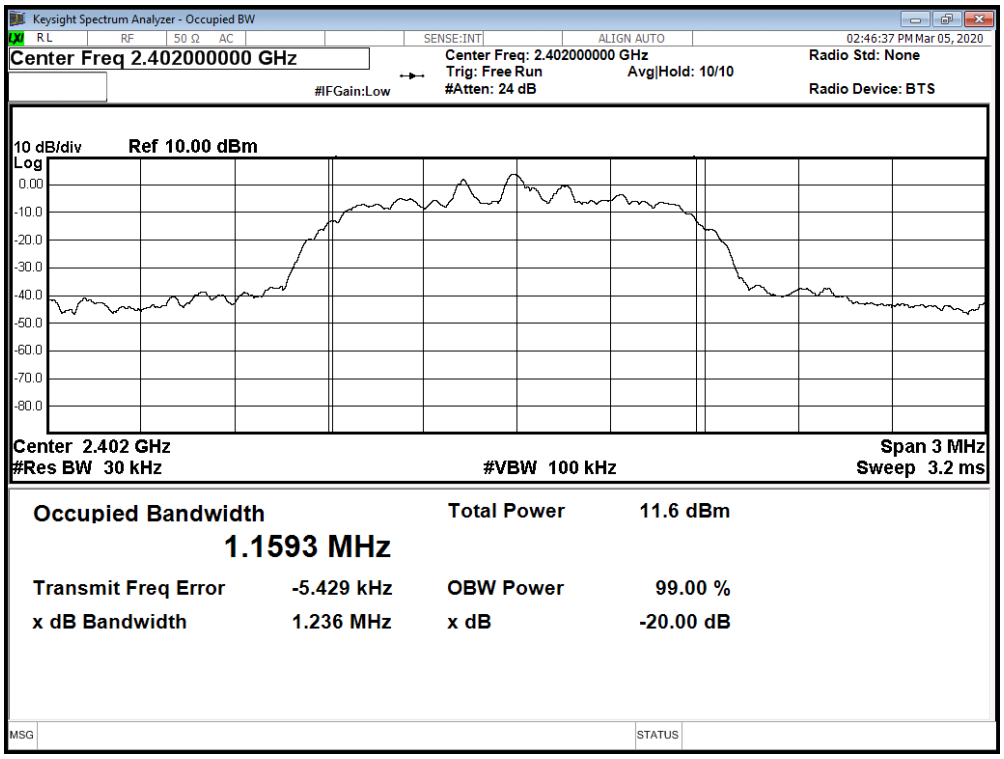
Modulation Standard: GFSK (1Mbps)
Channel: 39



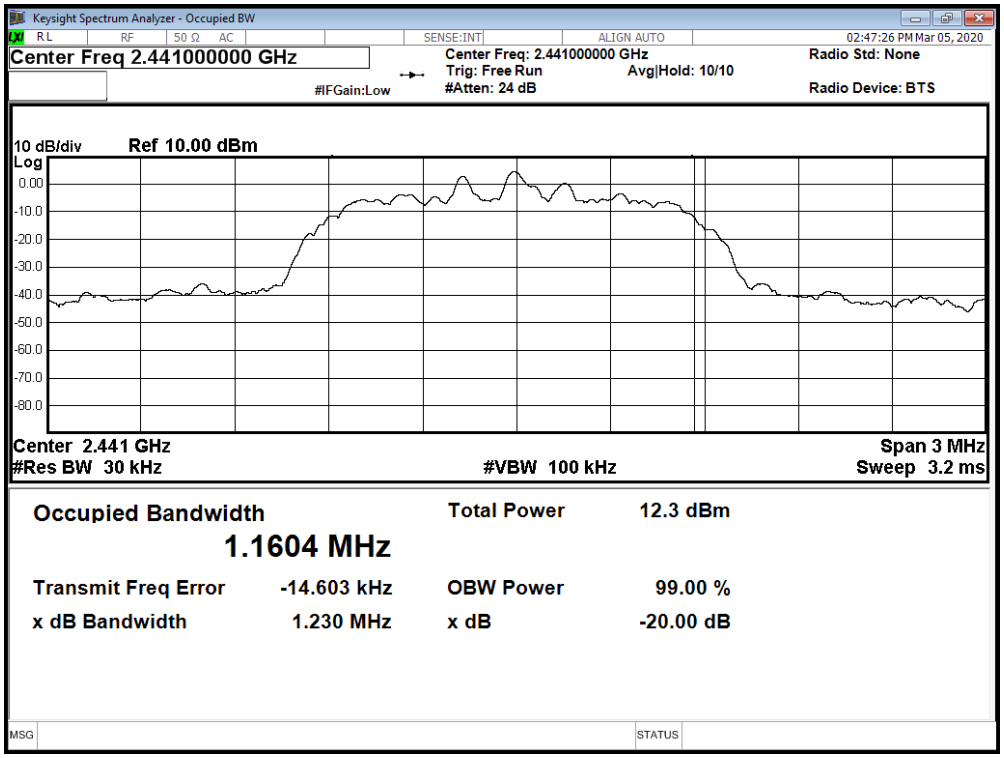
Modulation Standard: GFSK (1Mbps)
Channel: 78



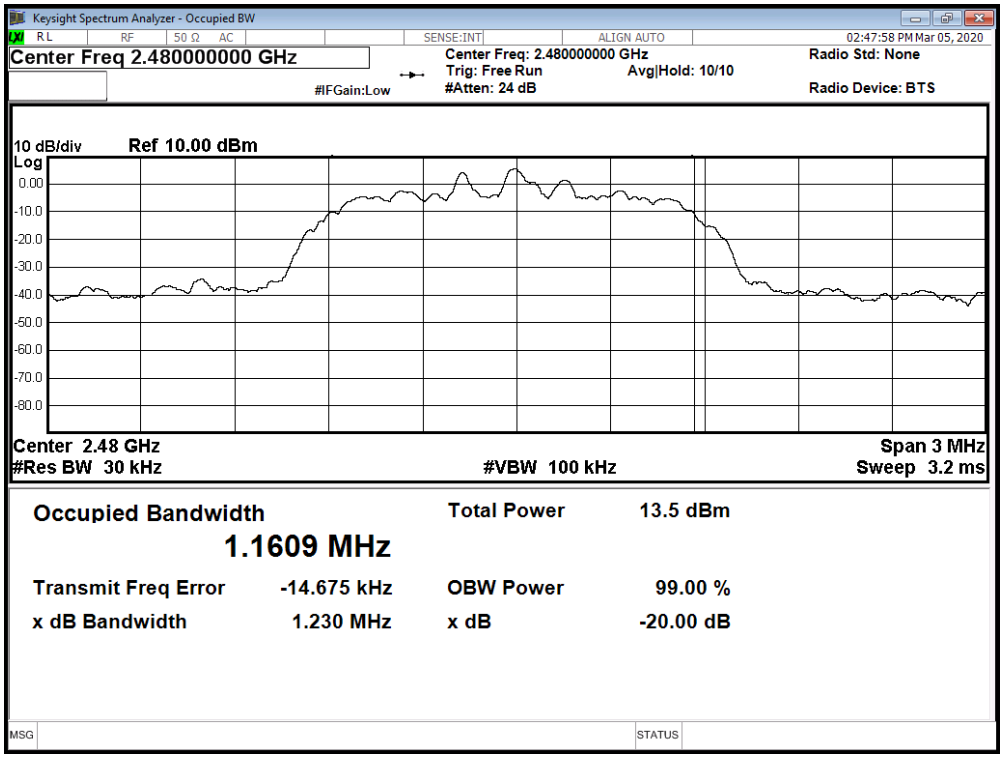
Modulation Standard: π/4-DQPSK(2Mbps)
Channel: 00



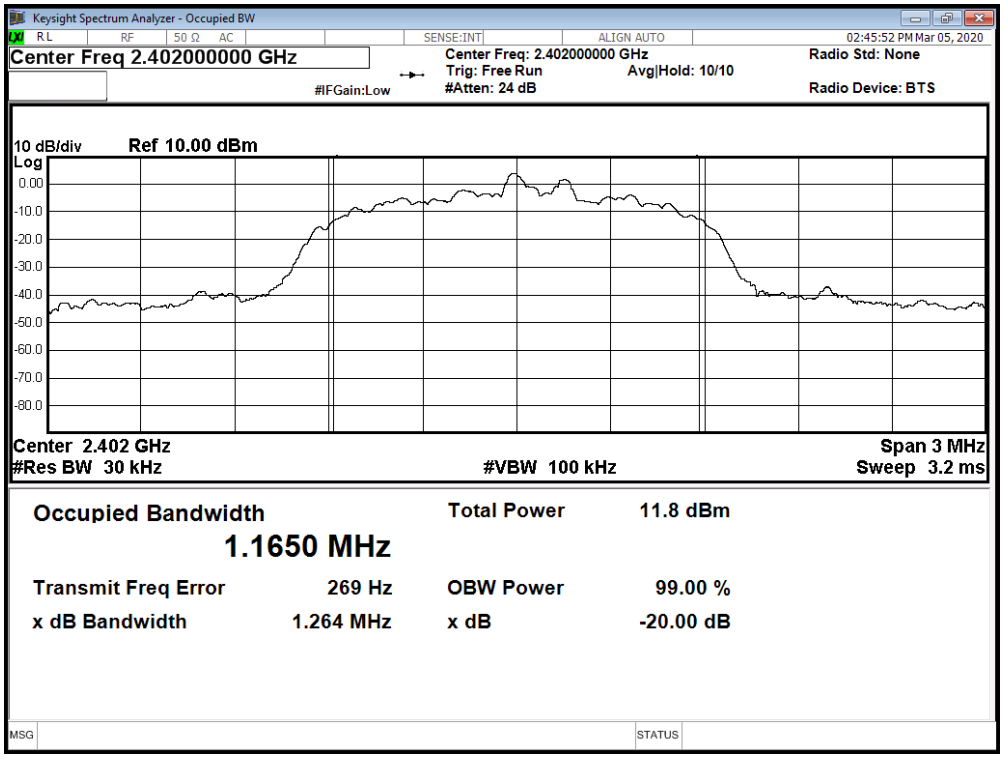
Modulation Standard: π/4-DQPSK(2Mbps)
Channel: 39



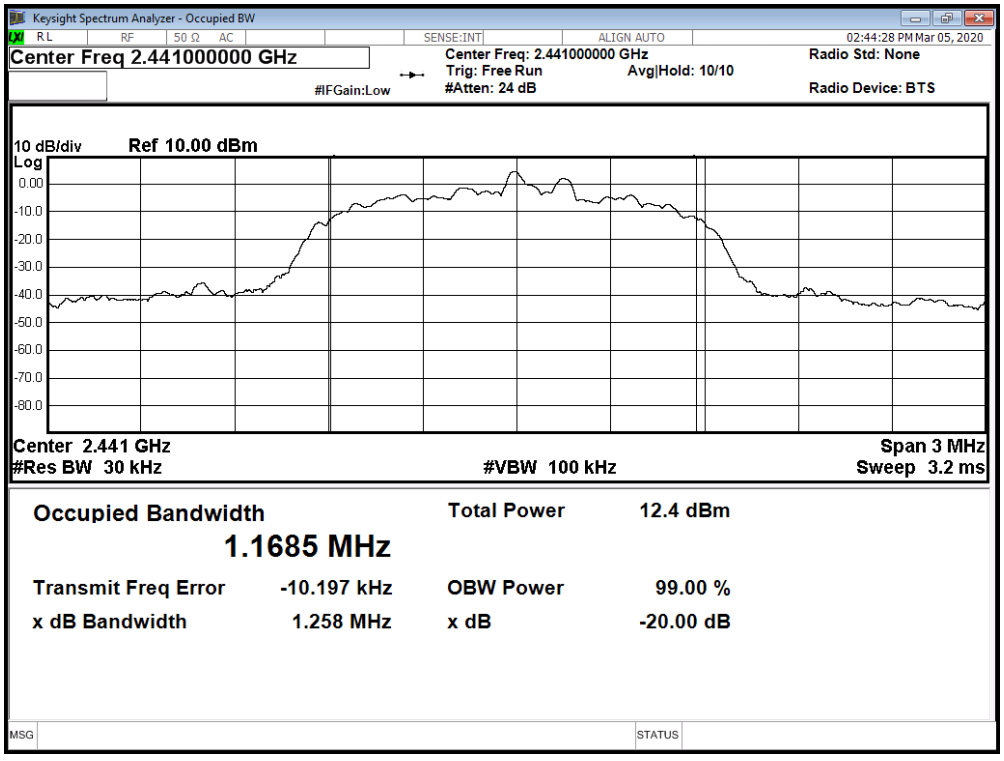
Modulation Standard: π/4-DQPSK(2Mbps)
Channel: 78



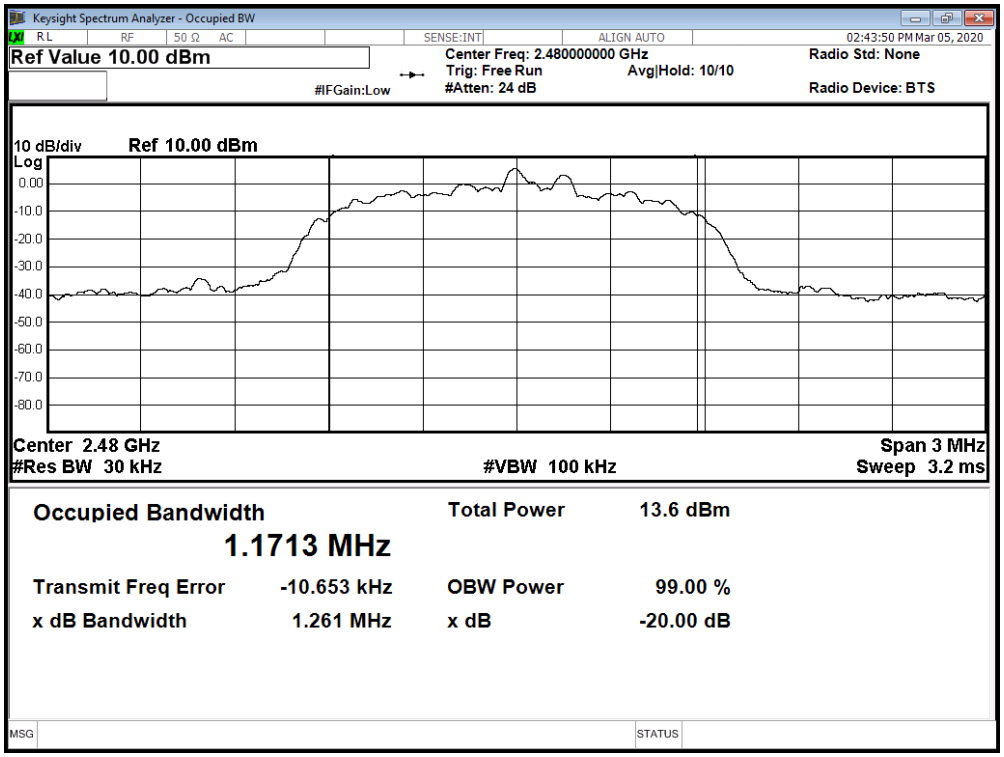
Modulation Standard: 8DPSK(3Mbps)
Channel: 00



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



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



7. 頻道間隔之規定

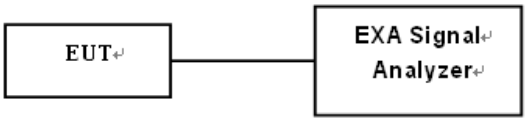
7.1. 適用標準

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電機技術規範 3.10.1.6 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

a. 將待測物和儀器相連接。
b. 設定儀器解析頻寬 30KHz 和視訊頻寬為 100 KHz。
c. 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

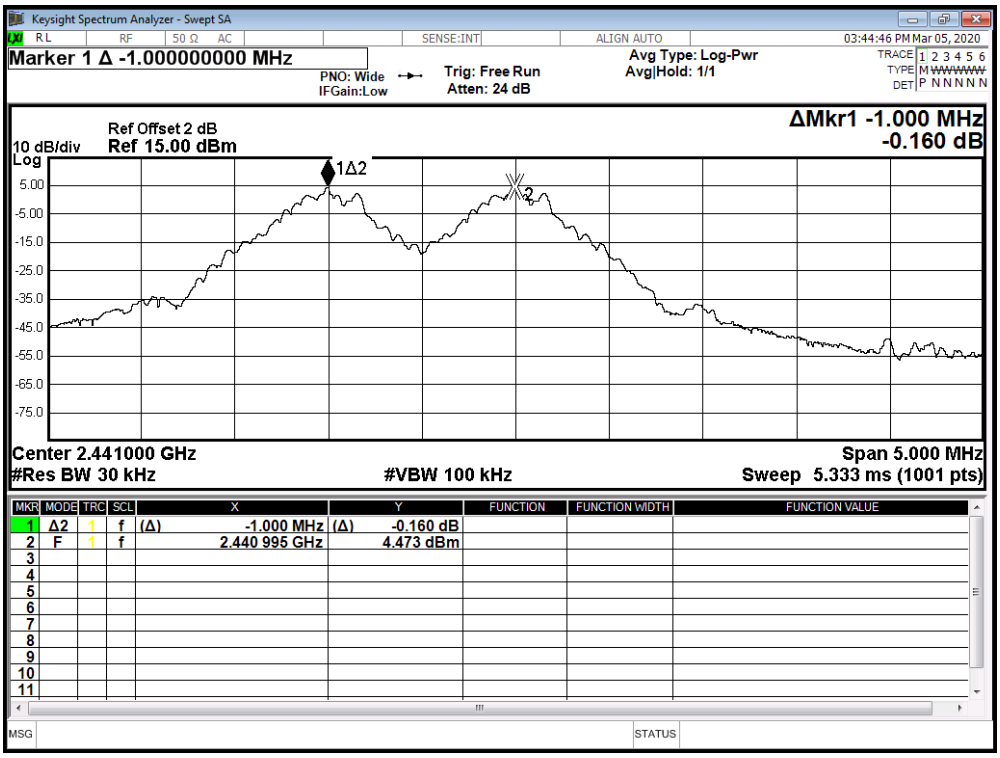
Modulation Type	Channel Separation (MHz)	Limit (MHz)
GFSK (1Mbps)	1.000	0.611
π/4-DQPSK (2Mbps)	1.000	0.824
8DPSK (3Mbps)	1.000	0.843

備註：繪圖資料請參考下頁。

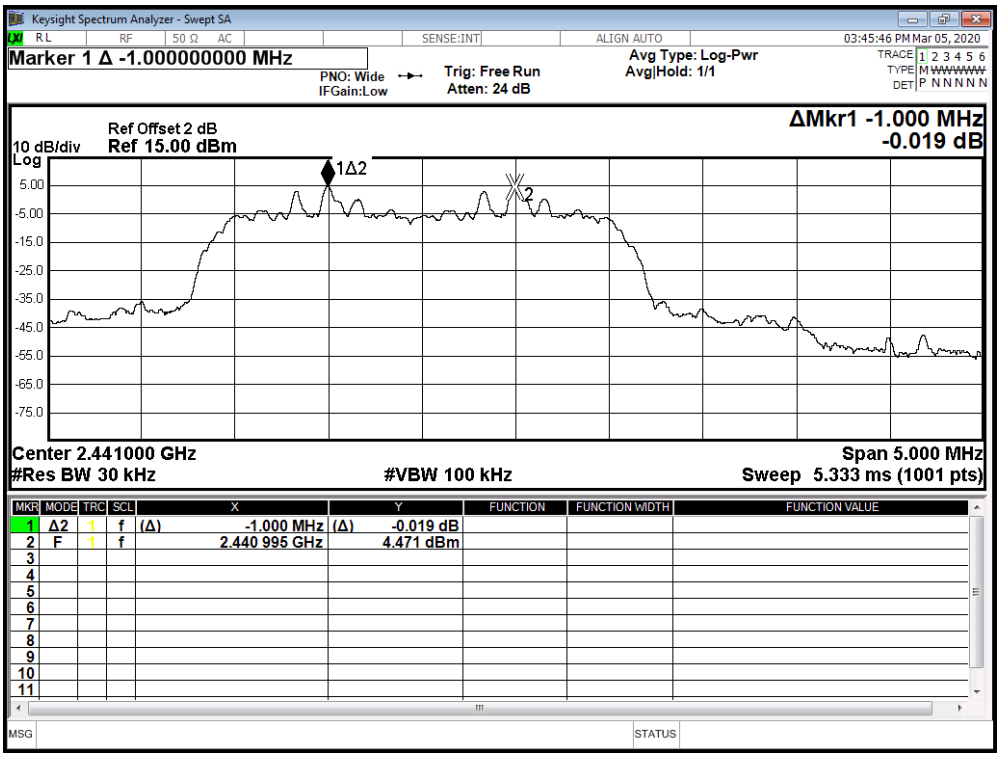
7.5. 結果判定

大於 20 dB 頻寬之三分之二

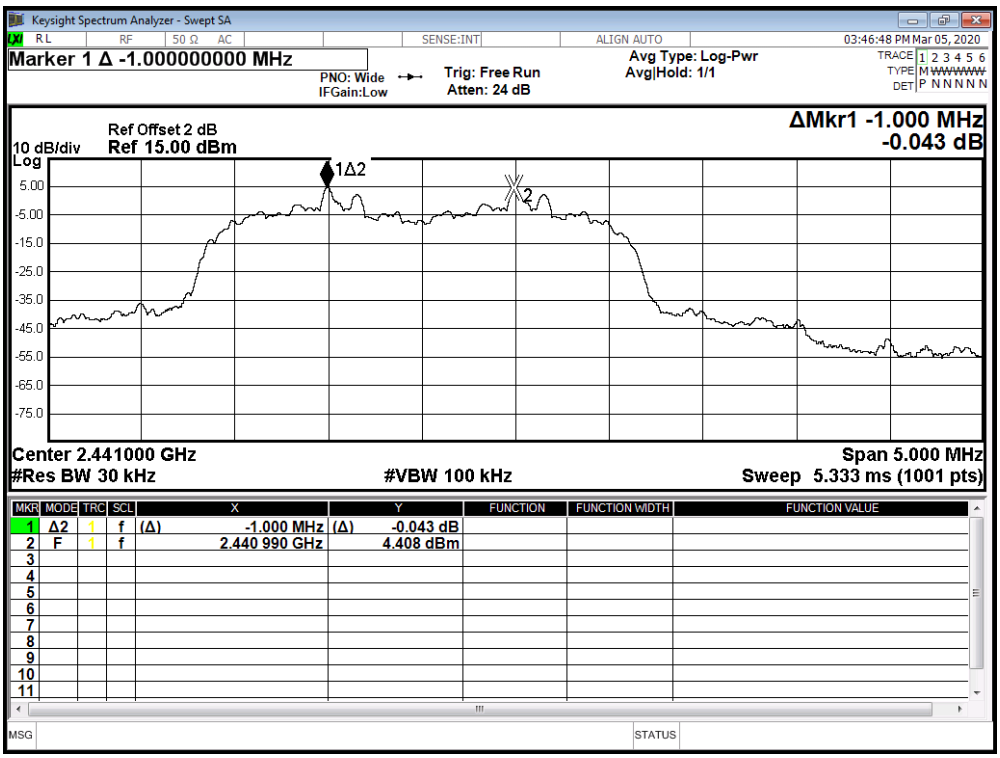
Modulation Standard: GFSK (1Mbps)



Modulation Standard: π/4-DQPSK(2Mbps)



Modulation Standard: 8DPSK (3Mbps)



8. 頻率佔用時間之規定

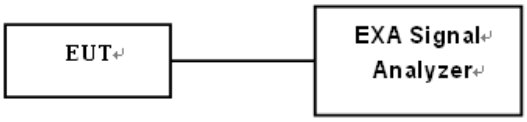
8.1. 適用標準

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電機技術規範 3.10.1.6 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

a. 將待測物和儀器相連接。
b. 設定儀器解析頻寬和視訊頻寬為 1MHz。
c. 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 Standard: GFSK(1Mbps)

DH 1

Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
0.408	130.56	31.6	400	PASS

Remark:Total of Dwell =pulse Time*(1600/2)/79*Period Time

DH 3

Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
1.665	266.40	31.6	400	PASS

Remark:Total of Dwell =pulse Time*(1600/4)/79*Period Time

DH 5

Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2.91	310.40	31.6	400	PASS

Remark:Total of Dwell =pulse Time*(1600/6)/79*Period Time

Modulation Standard: π/4-DQPSK(2Mbps)

DH 1

Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
0.417	133.44	31.6	400	PASS

Remark:Total of Dwell =pulse Time*(1600/2)/79*Period Time

DH 3

Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
1.665	266.40	31.6	400	PASS

Remark:Total of Dwell =pulse Time*(1600/4)/79*Period Time

DH 5

Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2.915	310.93	31.6	400	PASS

Remark:Total of Dwell =pulse Time*(1600/6)/79*Period Time

Modulation Standard: 8DPSK (3Mbps)

DH 1

Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
0.417	133.44	31.6	400	PASS

Remark:Total of Dwell =pulse Time*(1600/2)/79*Period Time

DH 3

Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
1.67	267.20	31.6	400	PASS

Remark:Total of Dwell =pulse Time*(1600/4)/79*Period Time

DH 5

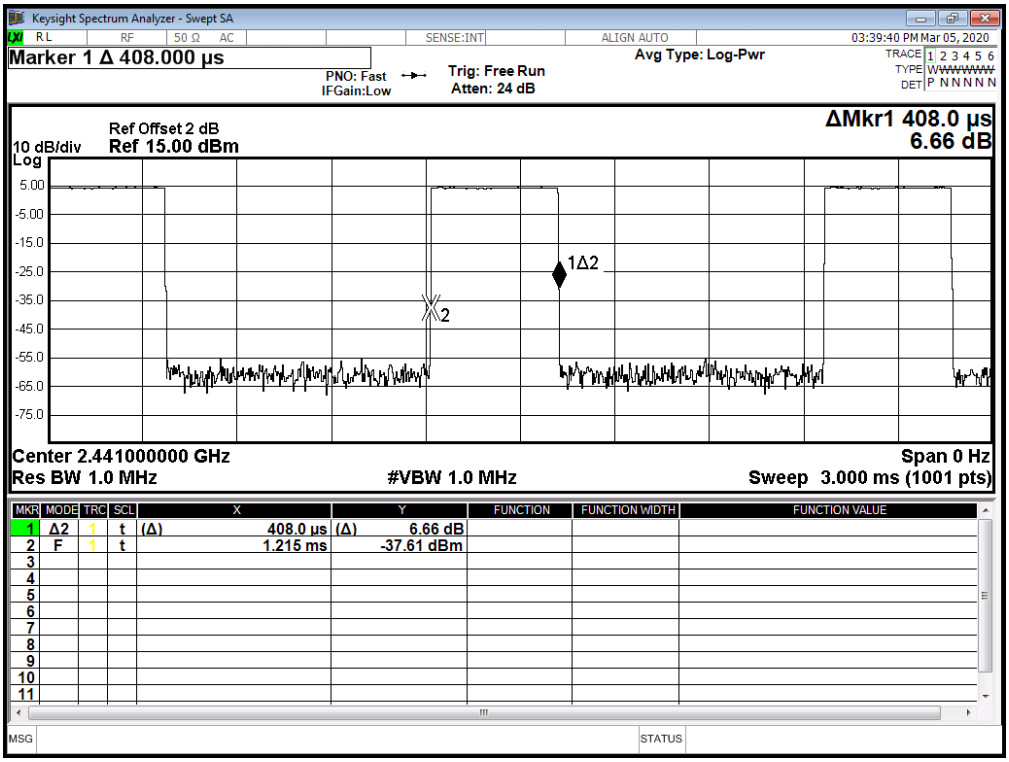
Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
2.92	311.47	31.6	400	PASS

Remark:Total of Dwell =pulse Time*(1600/6)/79*Period Time

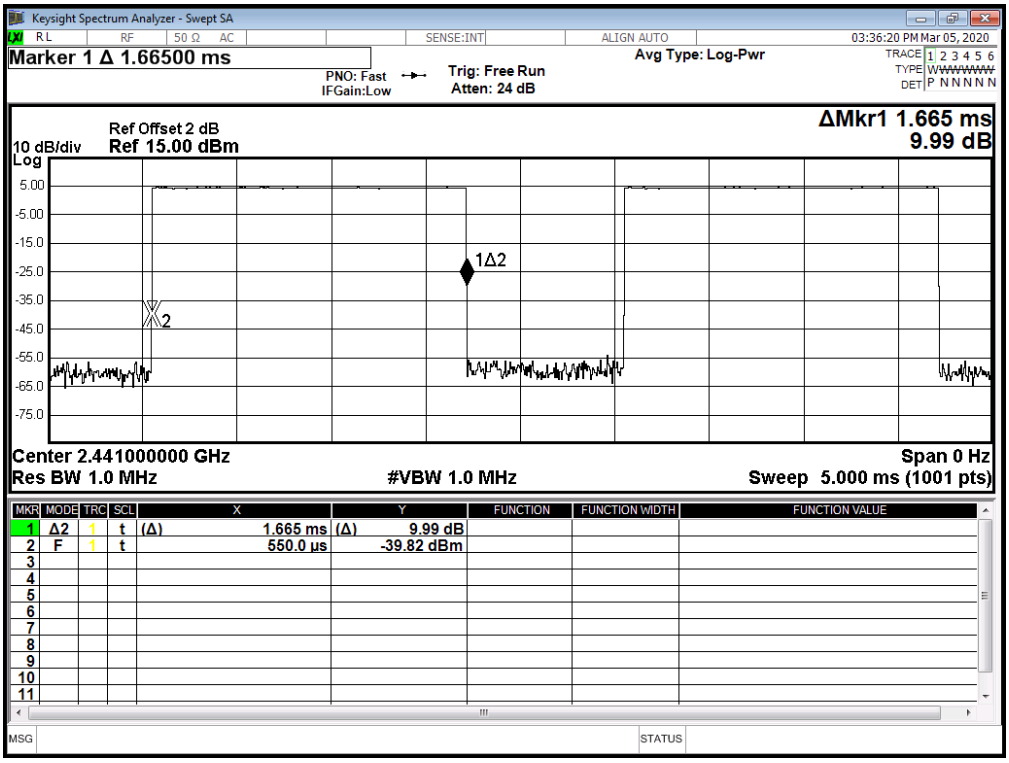
8.5. 結果判定

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 Standard: GFSK (1Mbps)
DH1

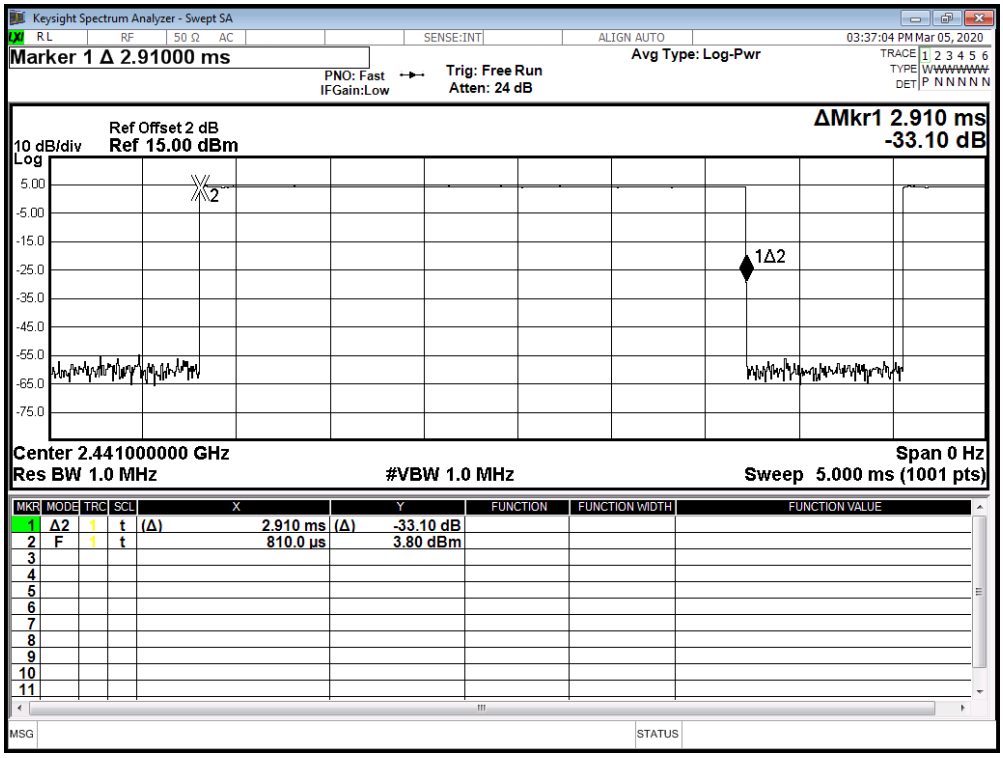


Modulation Standard: GFSK (1Mbps)
DH3



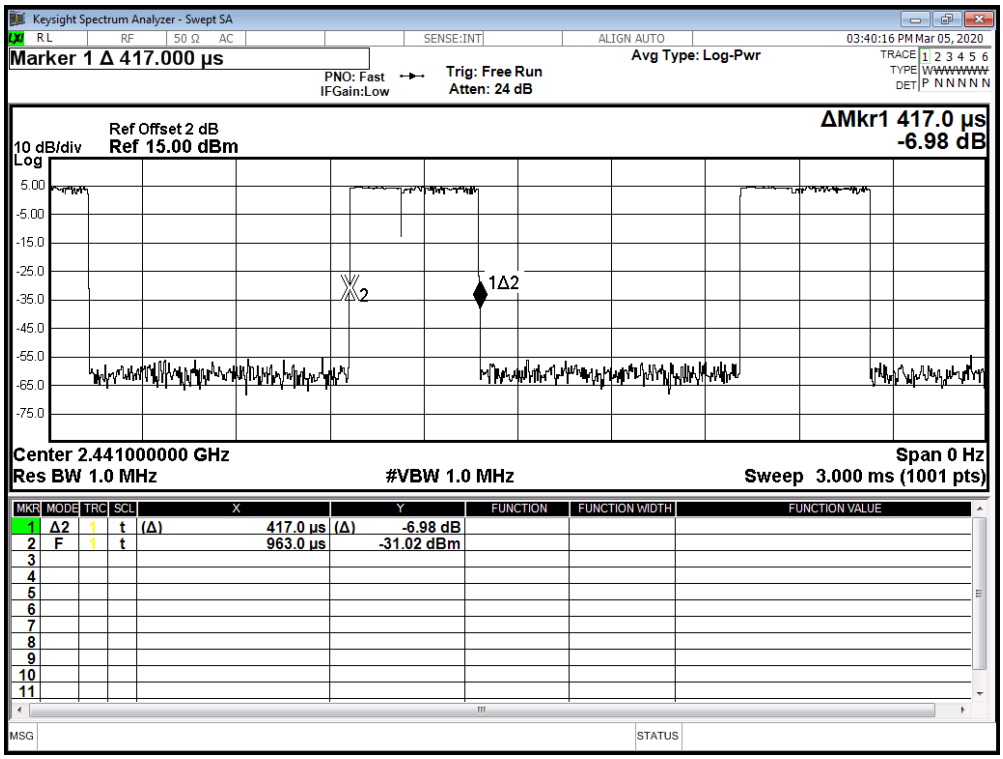
Modulation Standard: GFSK (1Mbps)

DH5

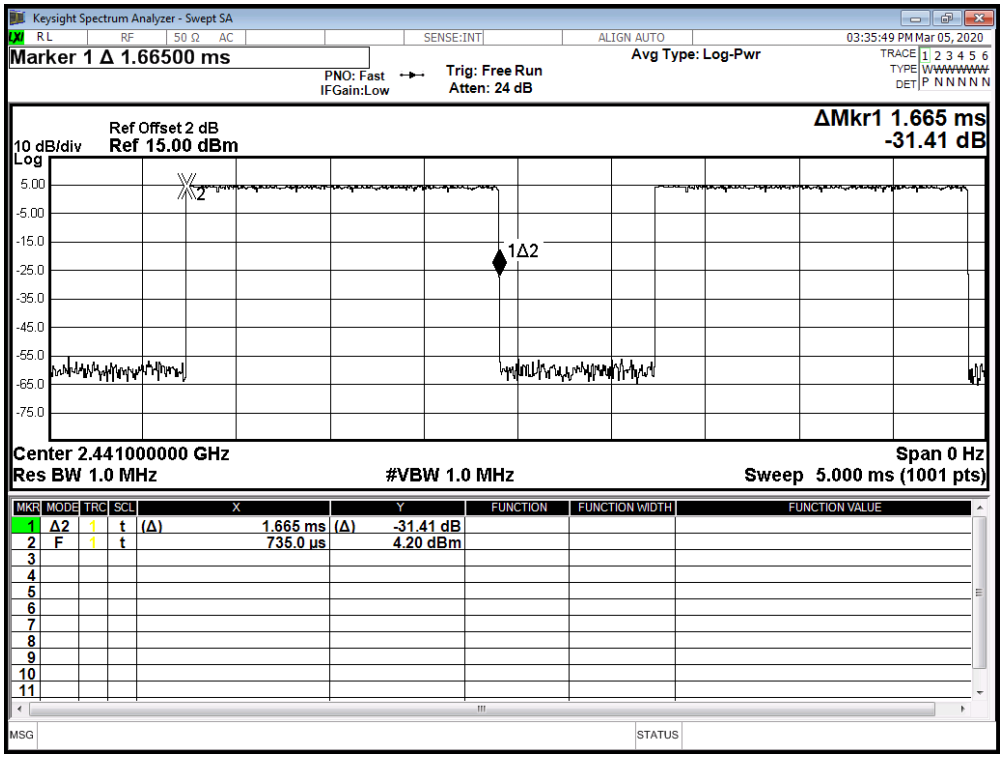


Modulation Standard: π/4-DQPSK(2Mbps)

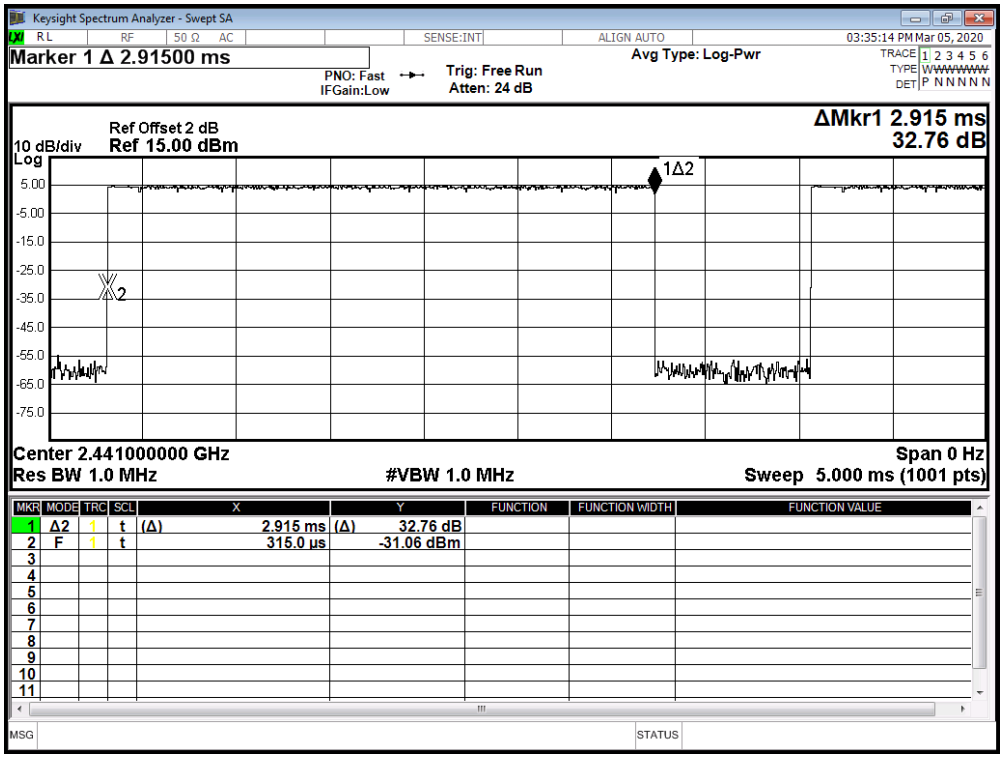
DH1



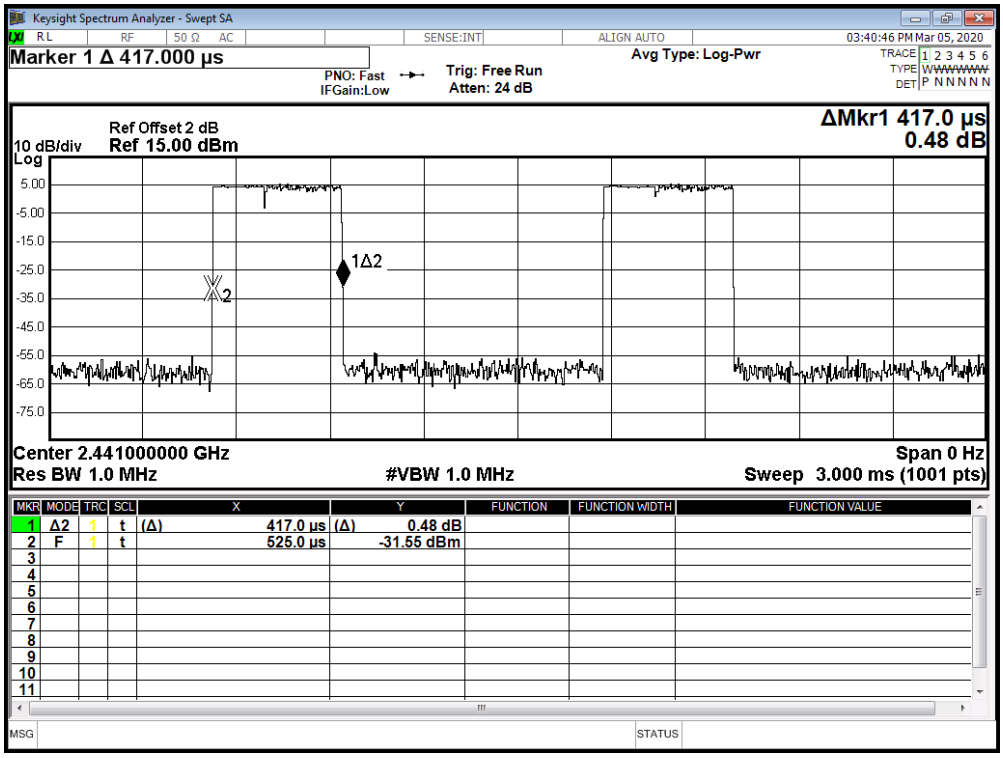
Modulation Standard: π/4-DQPSK(2Mbps)
DH3



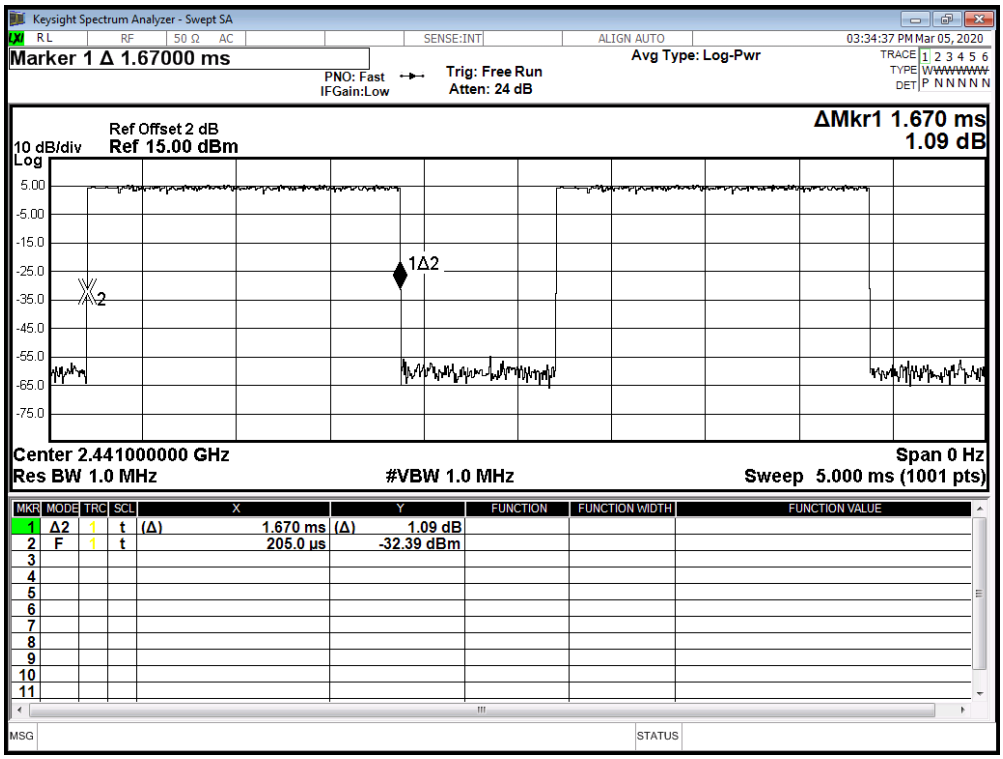
Modulation Standard: π/4-DQPSK(2Mbps)
DH5



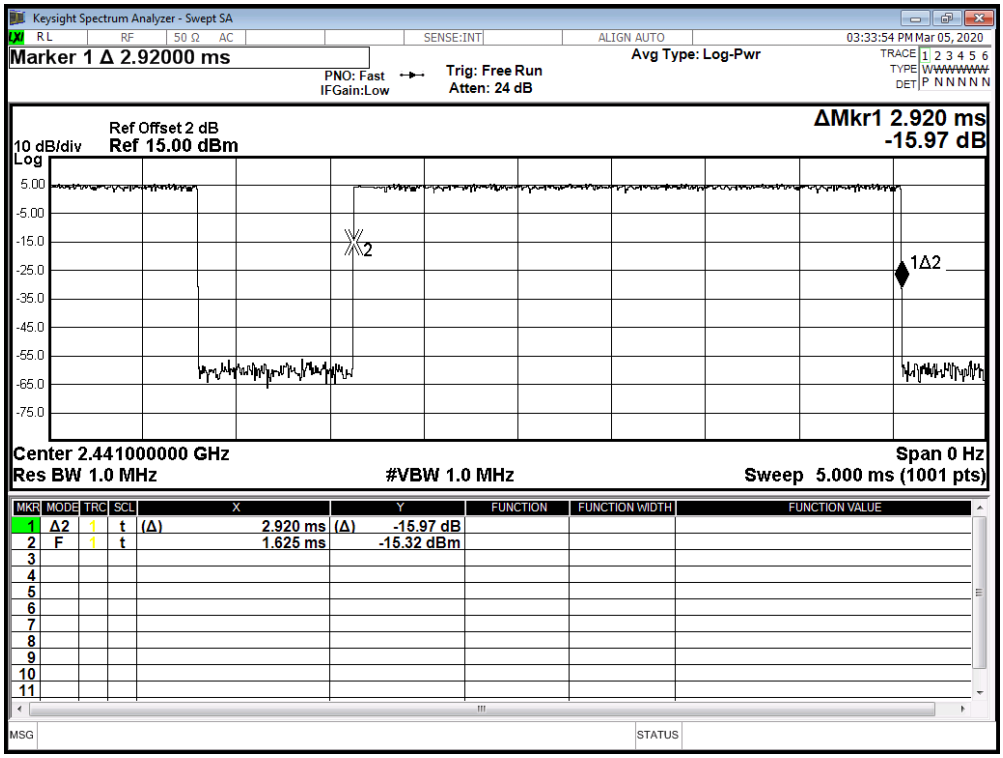
Modulation Standard: 8DPSK(3Mbps)
DH1



Modulation Standard: 8DPSK(3Mbps)
DH3



Modulation Standard: 8DPSK(3Mbps)
DH5



9. 跳頻頻道使用數量之規定

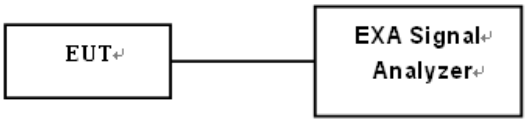
9.1. 適用標準

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電機技術規範 3.10.1.6 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

a. 將待測物和儀器相連接。
b. 設定儀器解析頻寬和視訊頻寬為 300 KHz。
c. 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

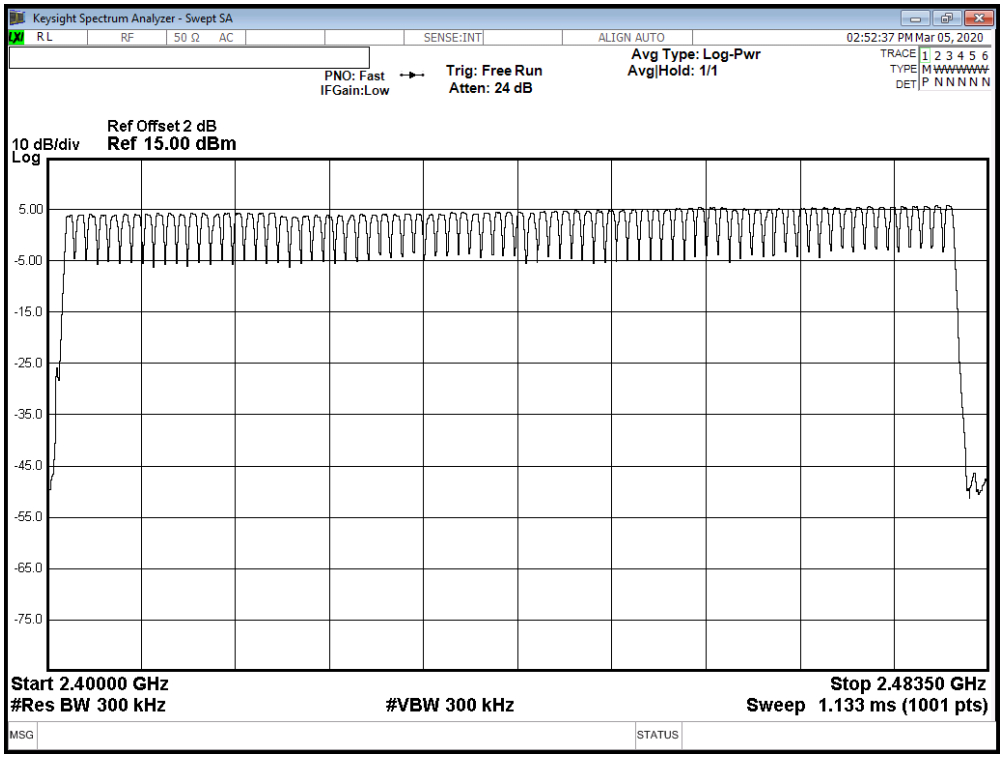
Modulation Type	Number of hopping channels
GFSK (1Mbps)	79
π/4-DQPSK(2Mbps)	79
8DPSK(3Mbps)	79

備註：繪圖資料請參考下頁。

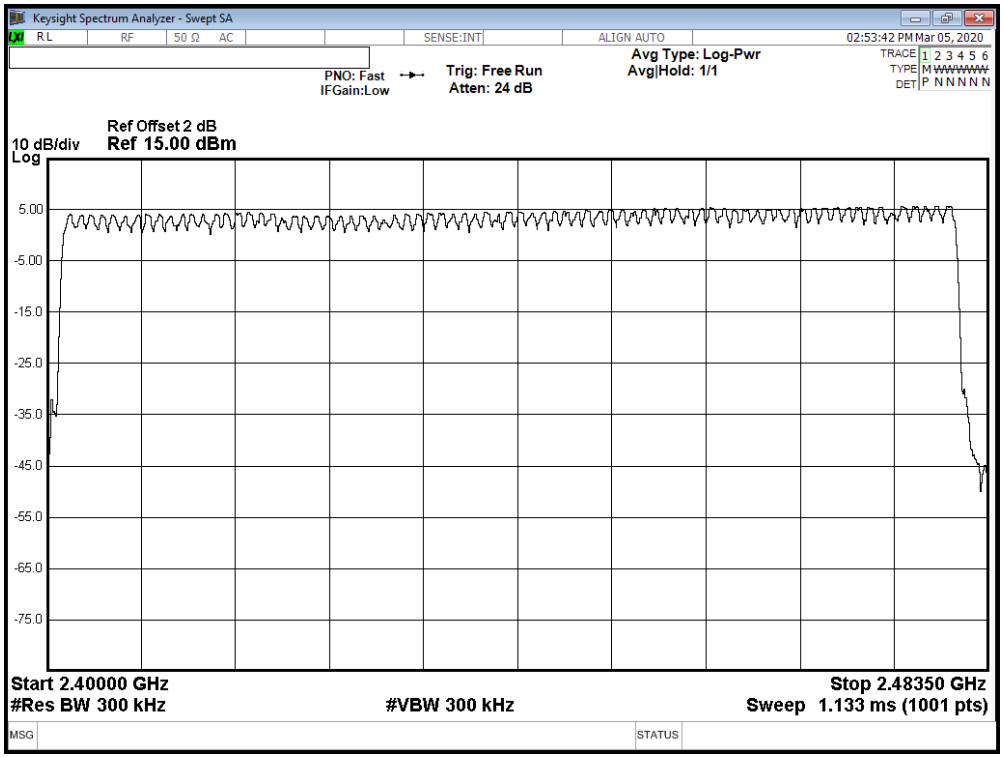
9.5. 結果判定

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。

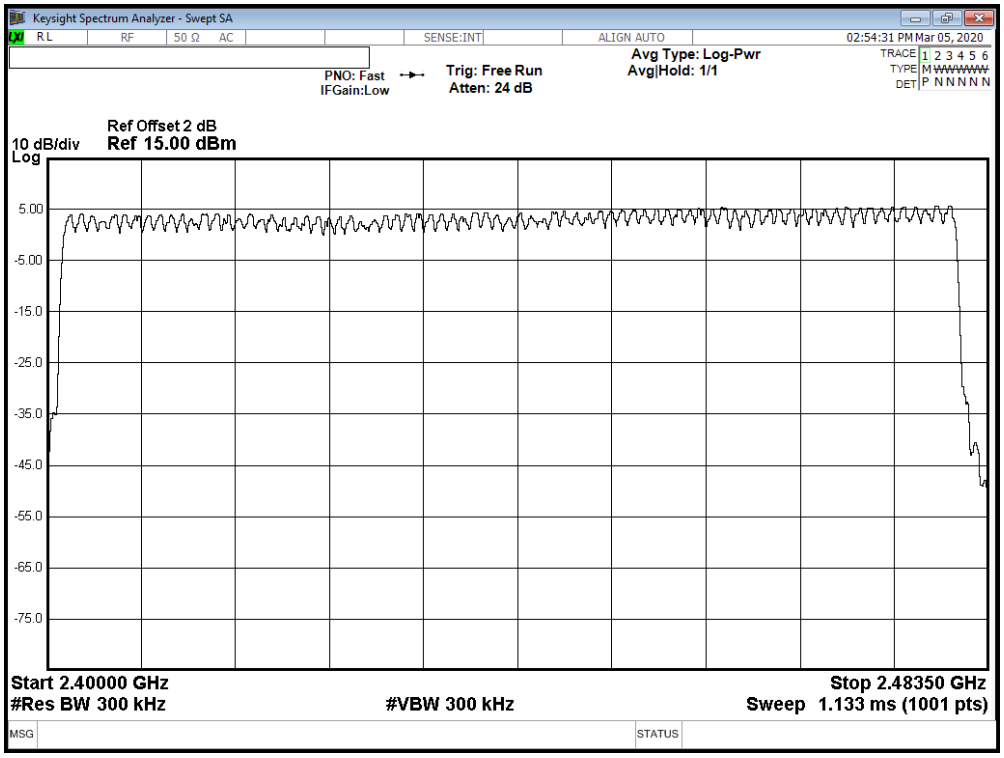
Modulation Standard: GFSK (1Mbps)



Modulation Standard: π/4-DQPSK(2Mbps)



Modulation Standard: 8DPSK(3Mbps)



10. 峰值輸出功率之規定

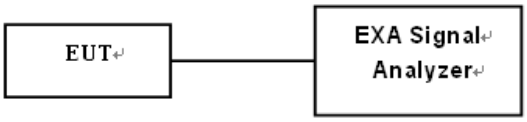
10.1. 適用標準

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電機技術規範 3.10.1.2 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

a. 將待測物和儀器相連接。
b. 量測輸出功率並記錄於報告中。

10.3. 測試配置



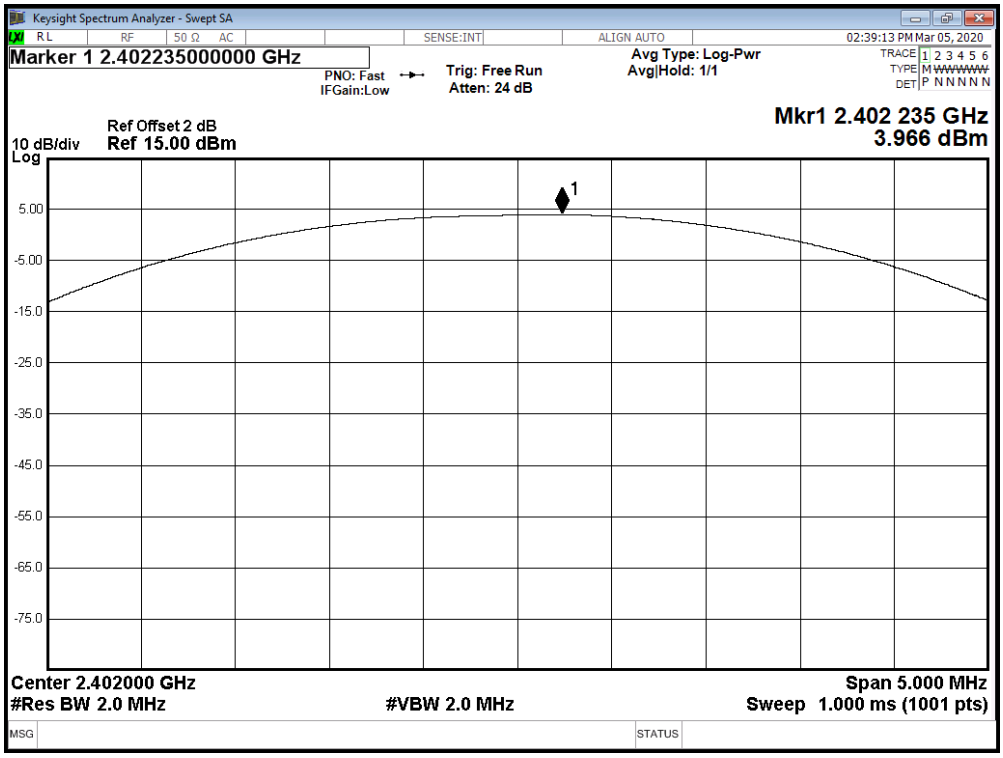
10.4. 峰值輸出功率之測試結果及數據

Modulation Type	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
GFSK (1Mbps)	00	2402	3.966	2.492
	39	2441	4.540	2.844
	78	2480	5.709	3.723
π/4-DQPSK (2Mbps)	00	2402	5.025	3.181
	39	2441	5.518	3.563
	78	2480	6.718	4.697
8DPSK (3Mbps)	00	2402	5.361	3.436
	39	2441	5.902	3.892
	78	2480	7.023	5.038

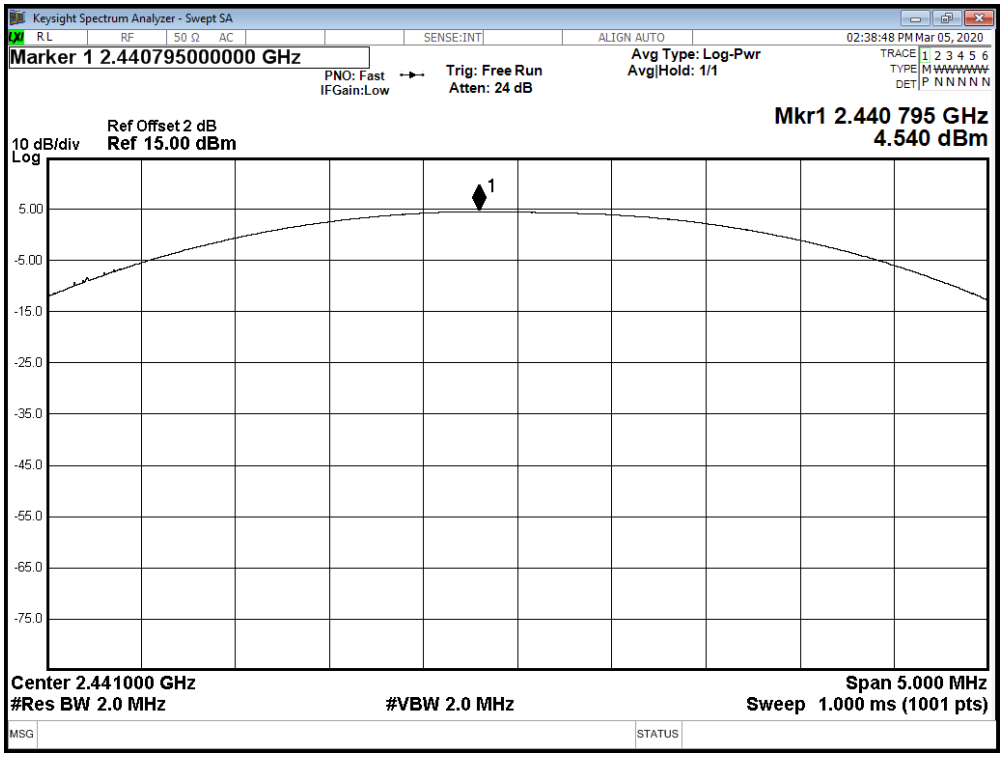
10.5. 結果判定

高、中、低頻段的峰值輸出功率皆低於 21dBm，合乎標準規定。

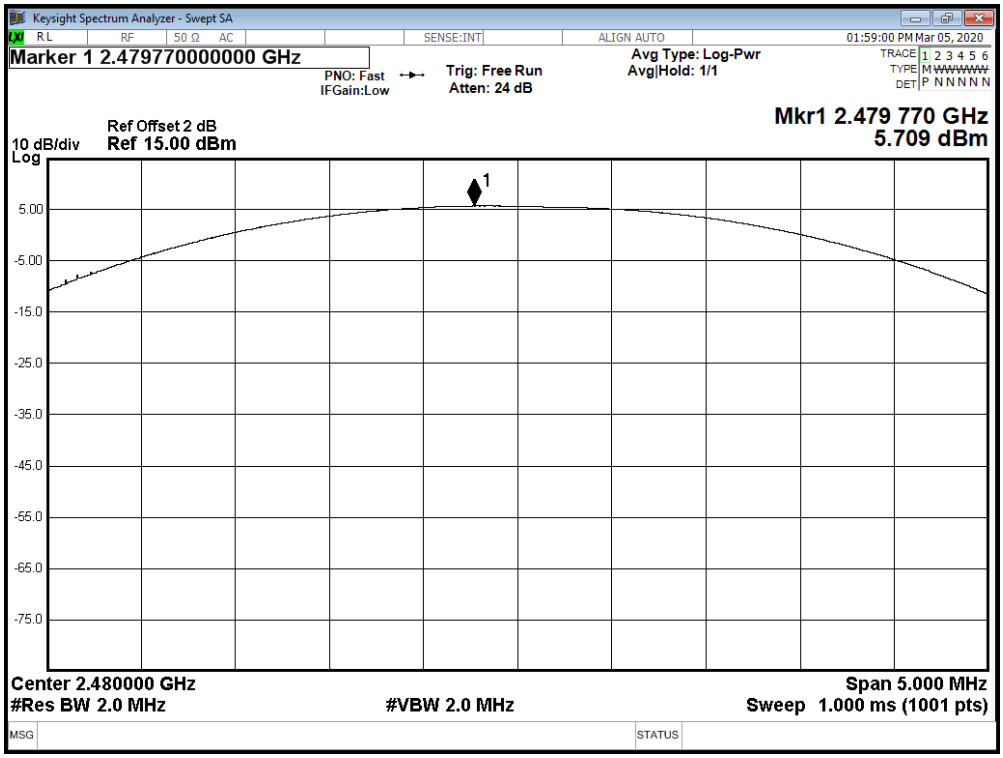
Modulation Standard: GFSK (1Mbps)
Channel: 00



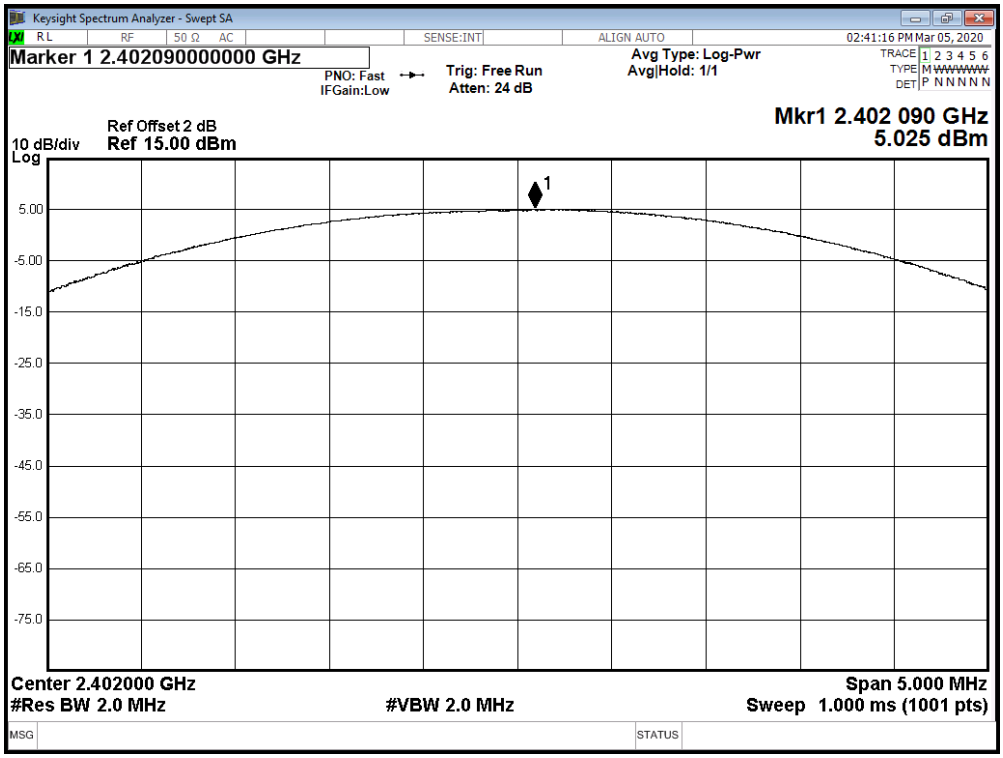
Modulation Standard: GFSK (1Mbps)
Channel: 39



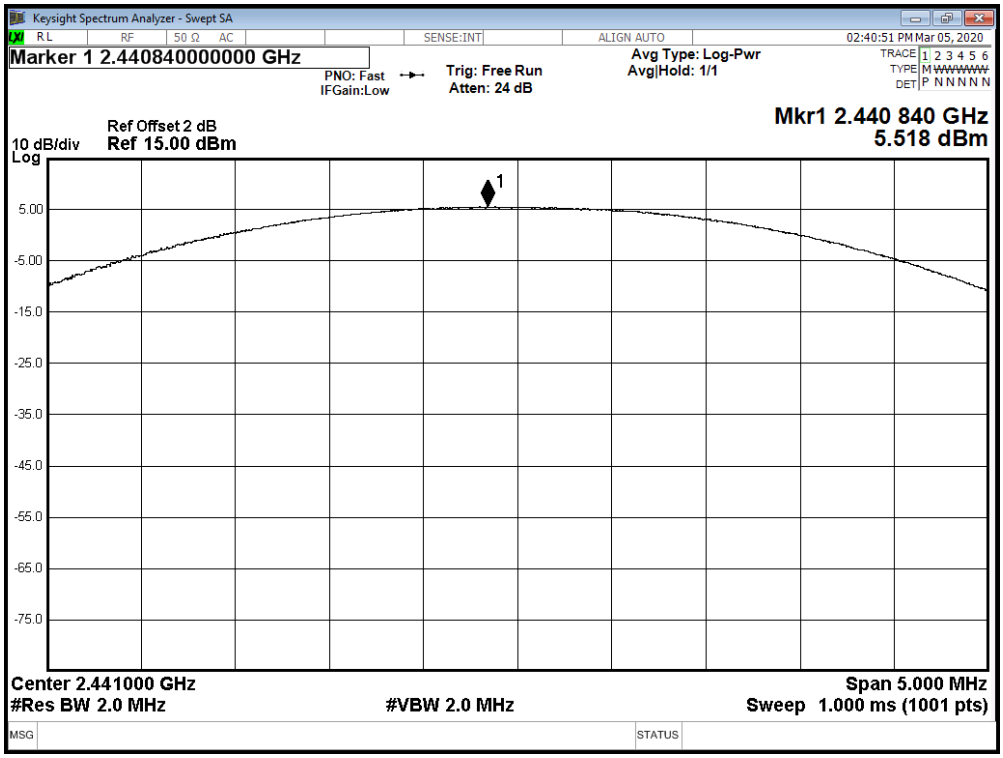
Modulation Standard: GFSK (1Mbps)
Channel: 78



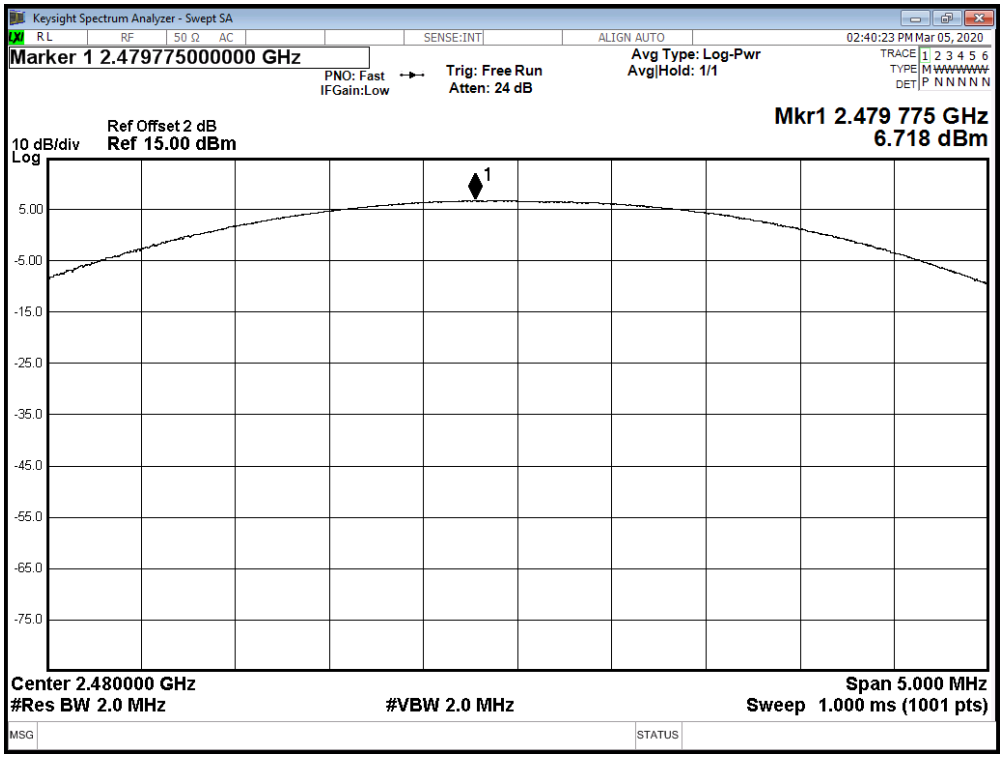
Modulation Standard: π/4-DQPSK (2Mbps)
Channel: 00



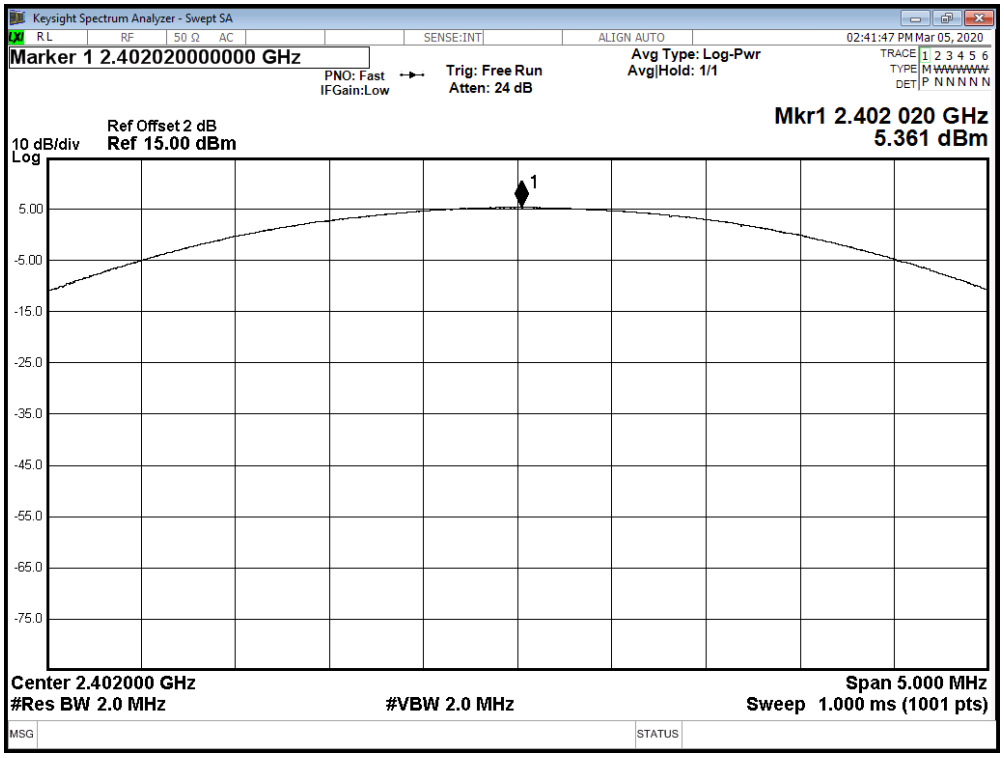
Modulation Standard: π/4-DQPSK (2Mbps)
Channel: 39



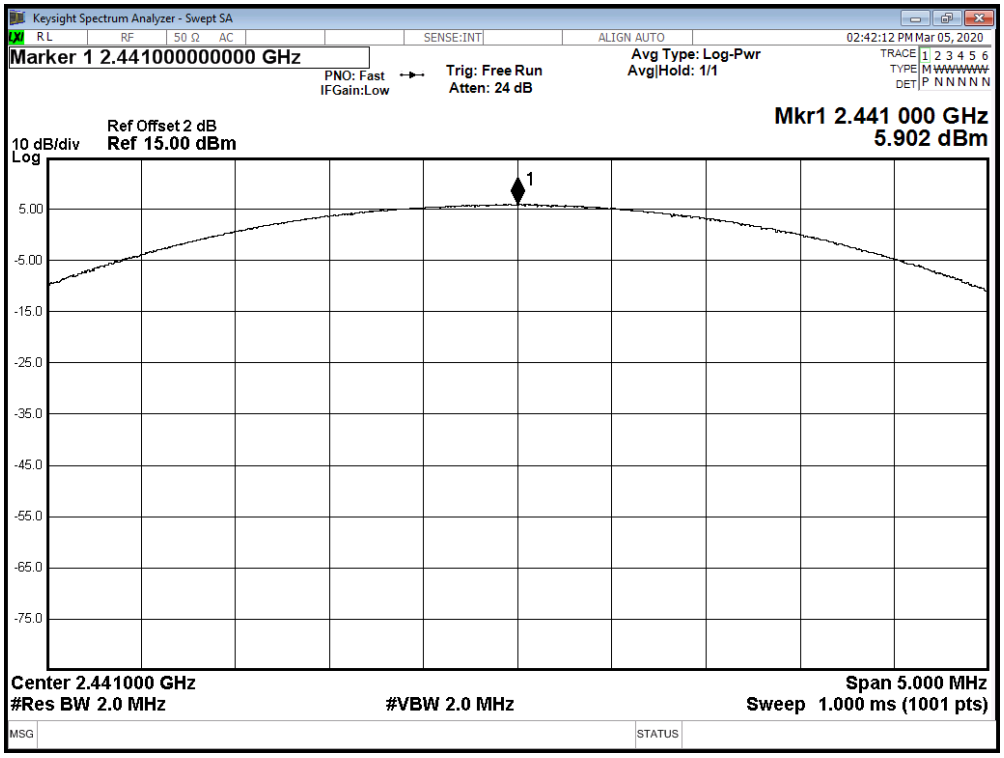
Modulation Standard: π/4-DQPSK (2Mbps)
Channel: 78



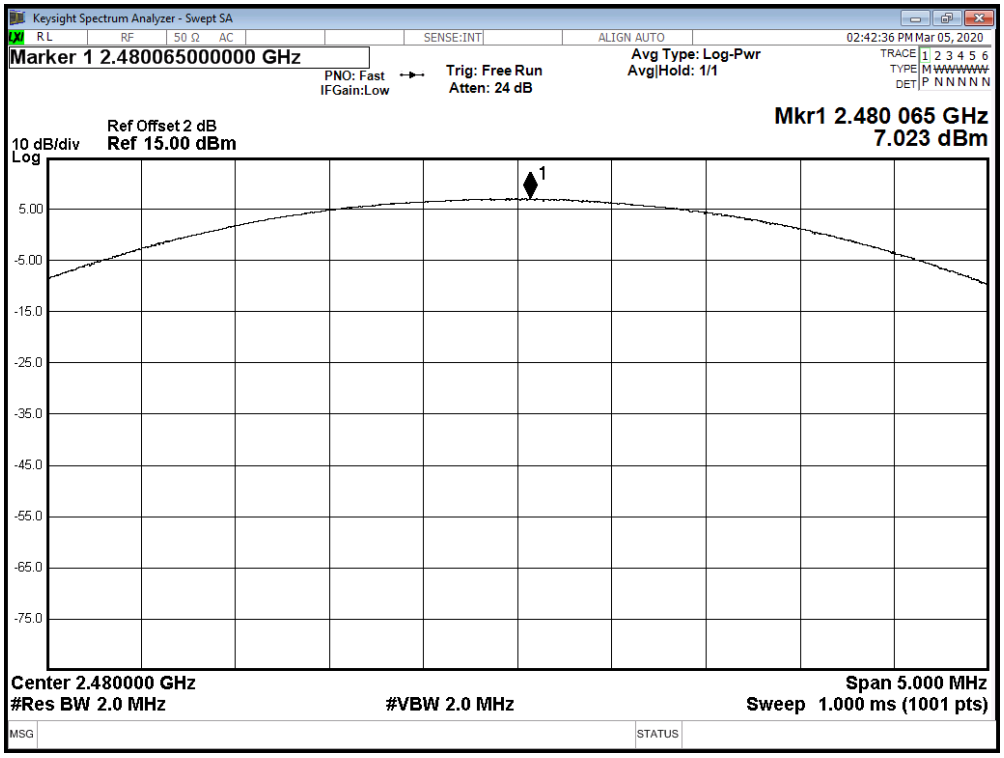
Modulation Standard: 8DPSK(3Mbps)
Channel: 00



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



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



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電機技術規範 3.10.1.5 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。

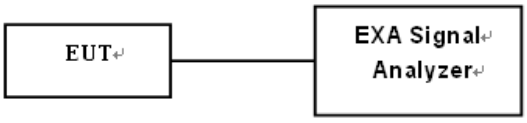
(2) 輸出功率以 3.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少須衰減 30 分貝(dB)。

此外，落於第 2.7 節禁用頻段之輻射發射，應符合第 2.8 節之規定。

11.2. 測試方法

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

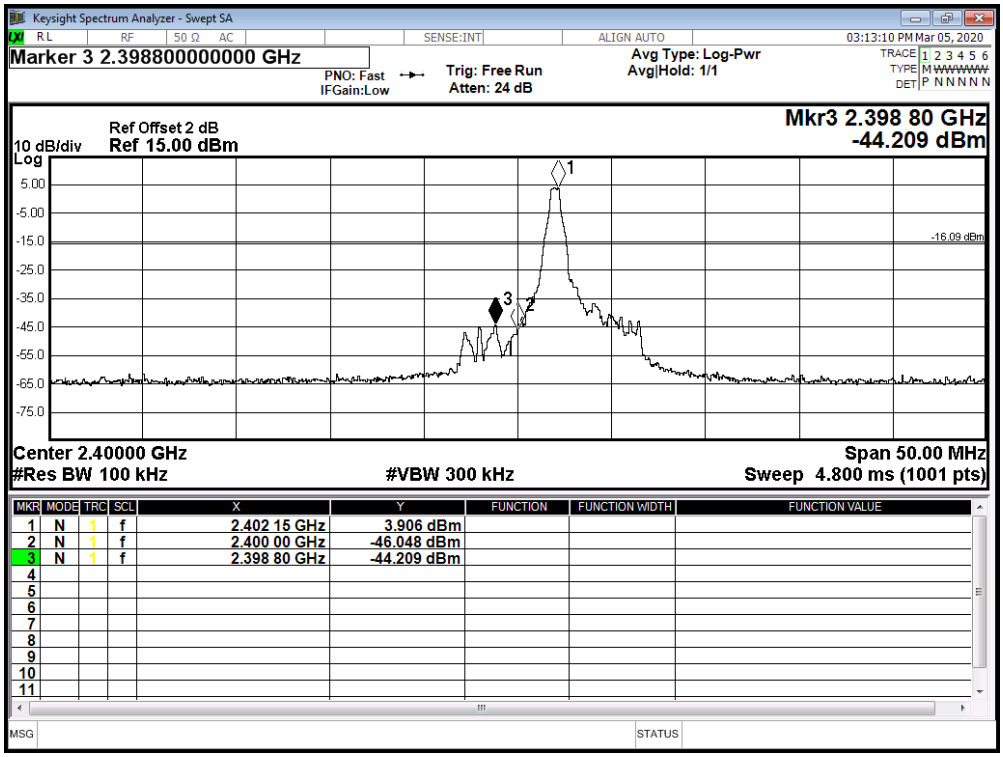
11.3. 測試配置

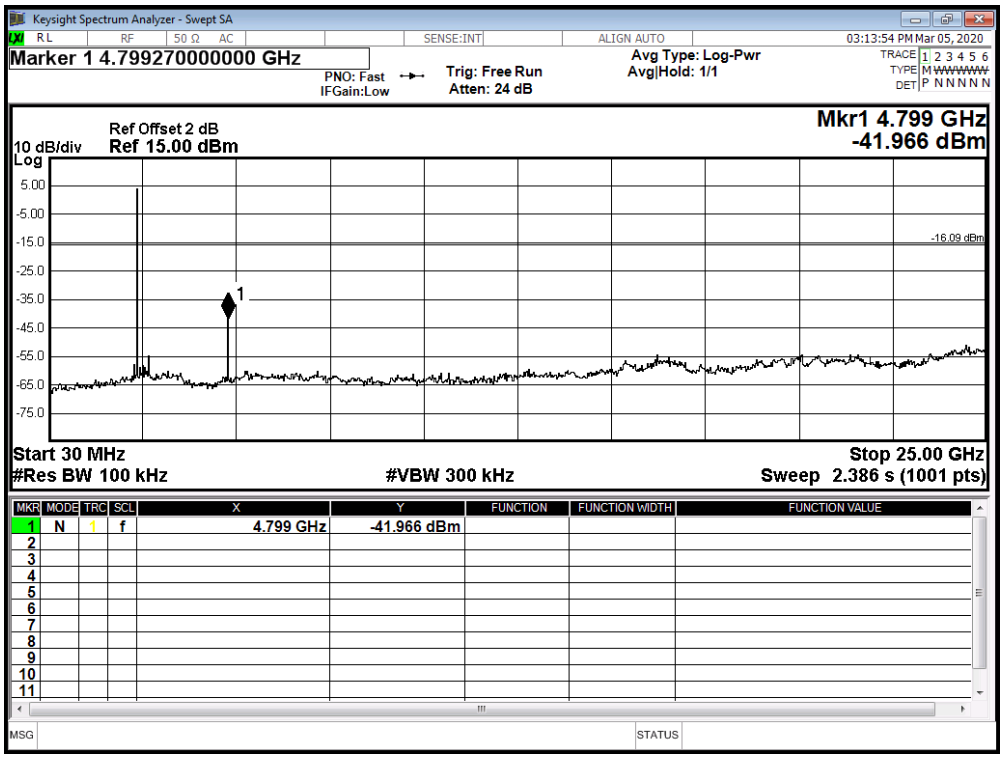


11.4. 結果判定

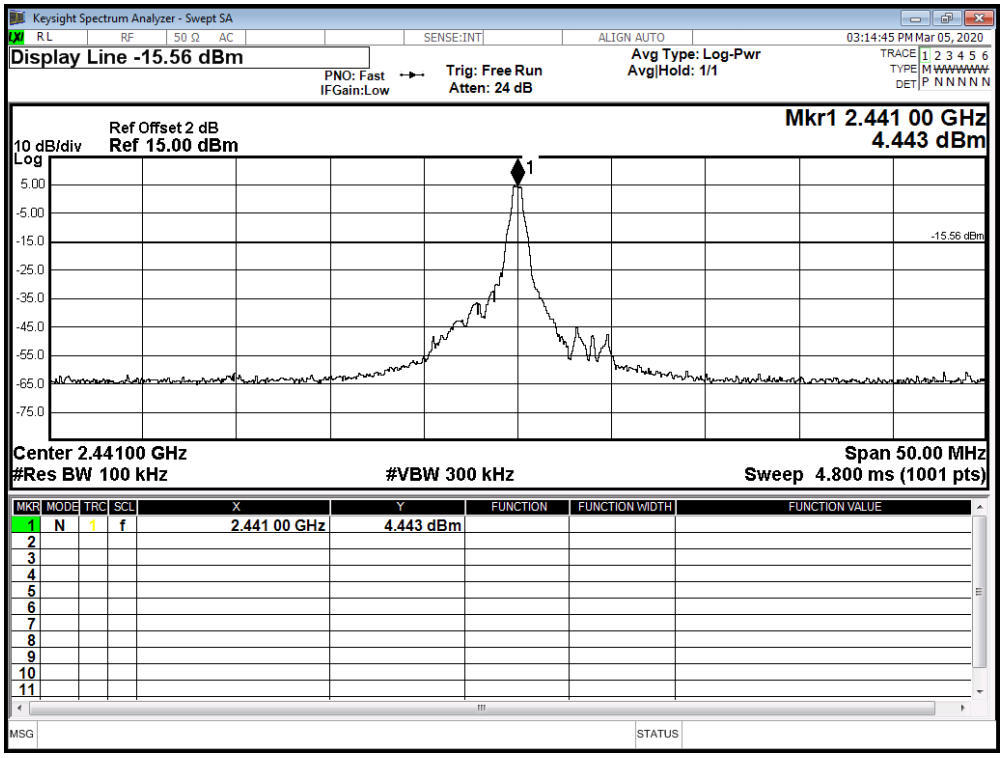
下邊緣頻帶：距下頻帶邊緣 40MHz 內最大混附波比主波低 20dB 以上，合乎標準規定。

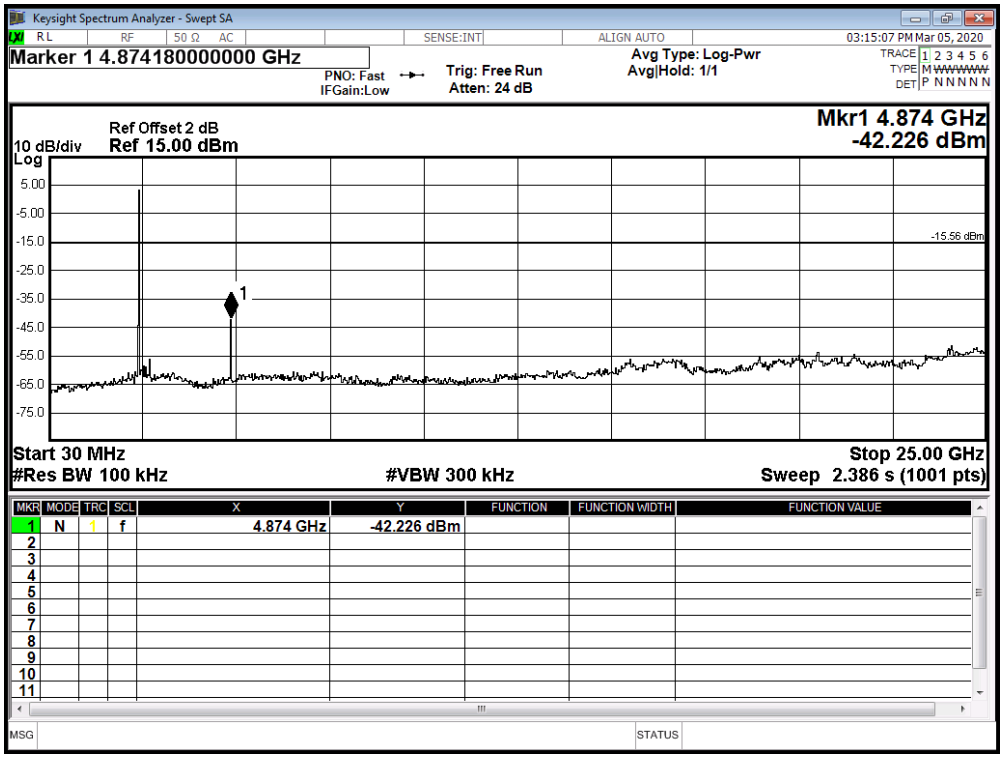
Modulation Standard: GFSK (1Mbps)
Channel: 00



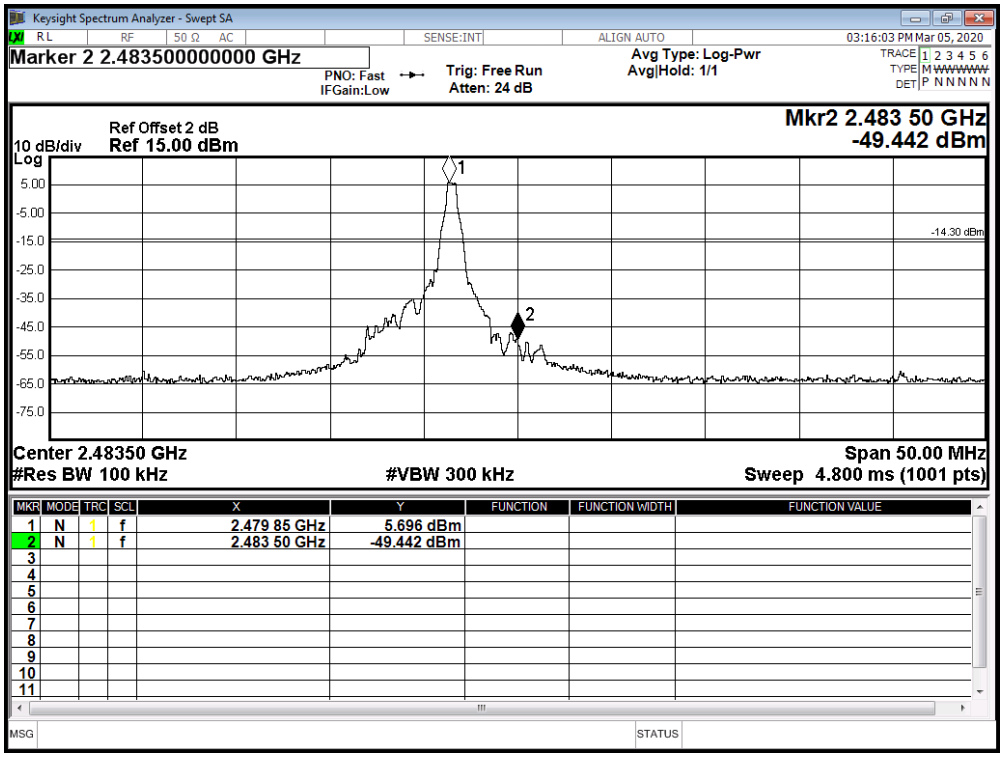


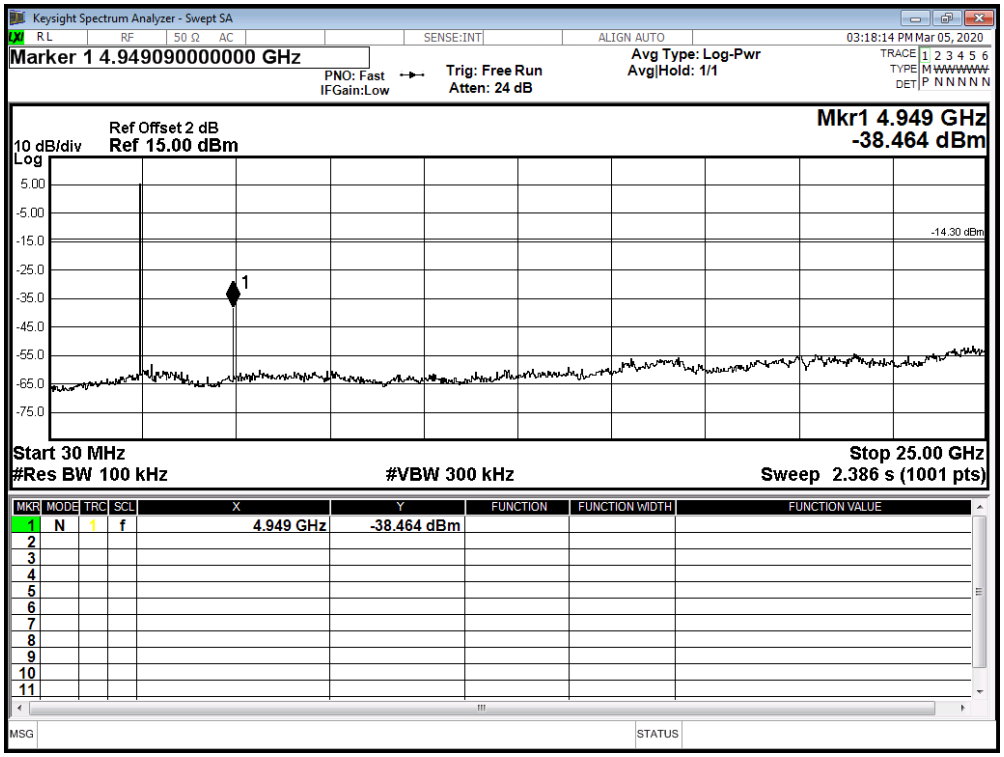
Modulation Standard: GFSK (1Mbps)
Channel: 39



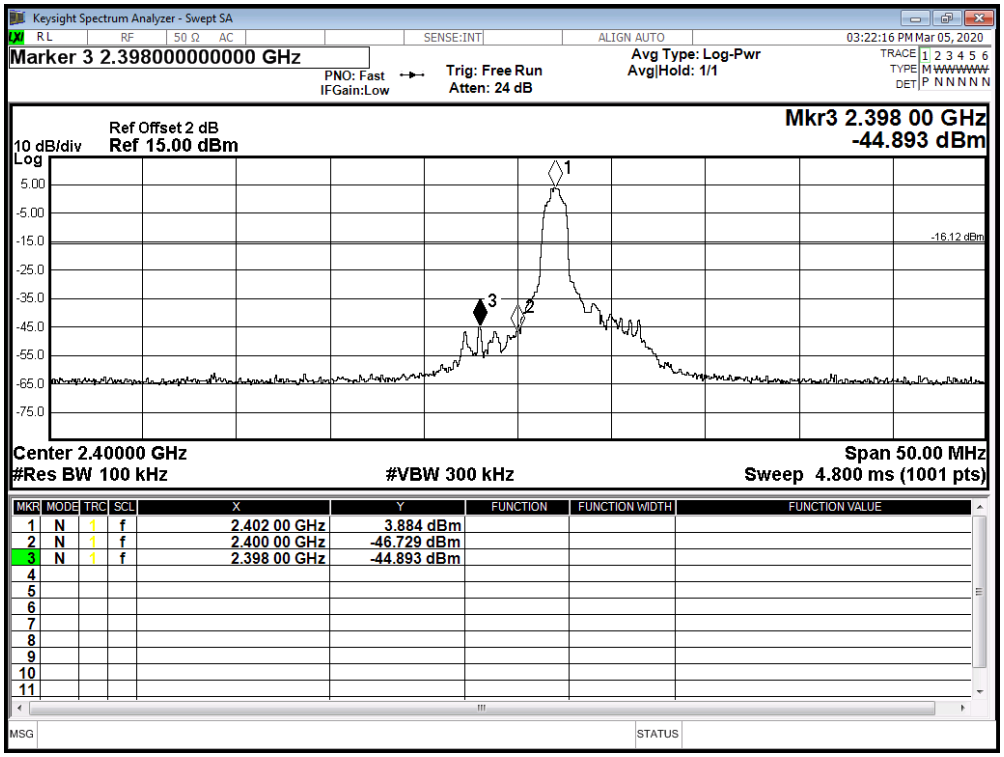


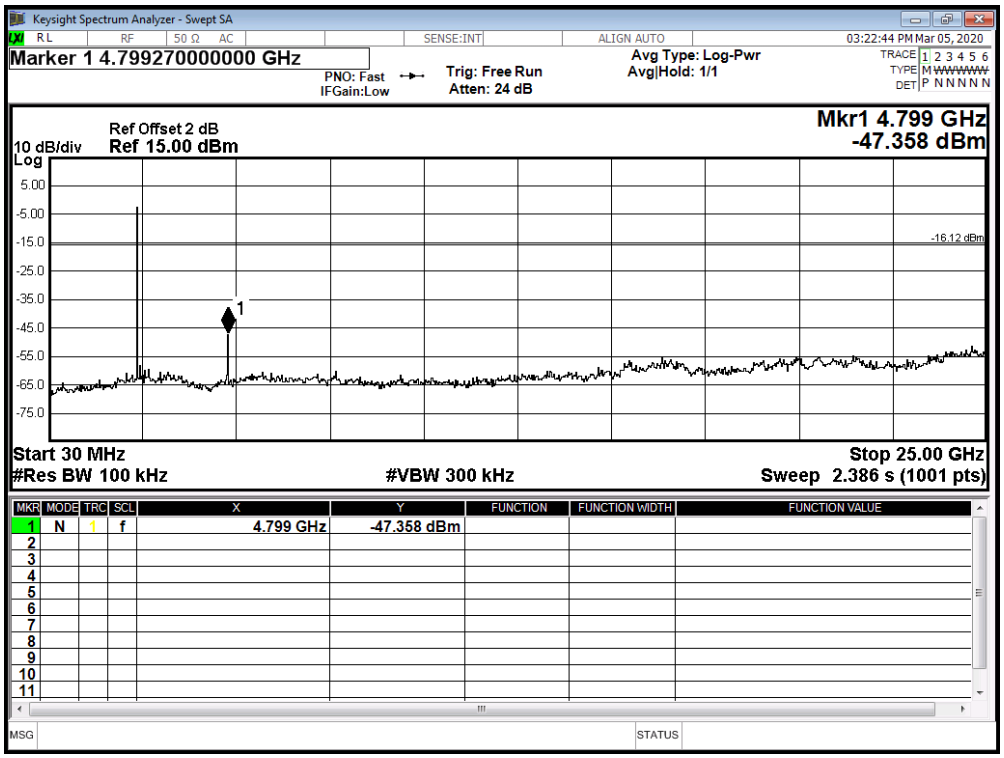
Modulation Standard: GFSK (1Mbps)
Channel: 78



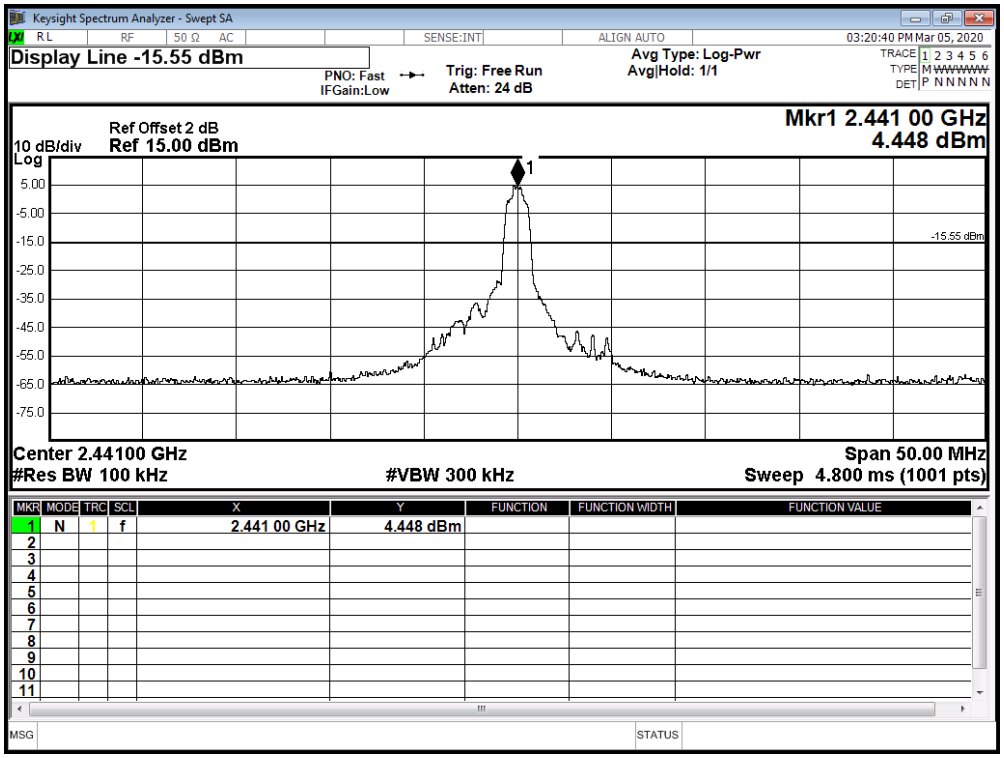


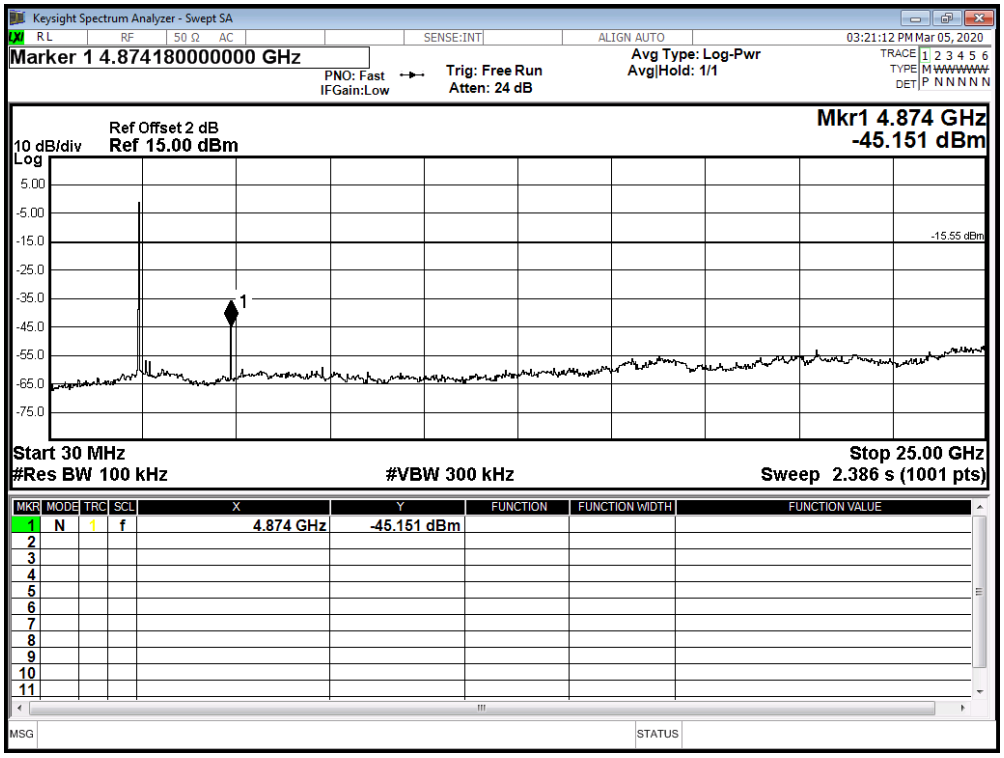
Modulation Standard: π/4-DQPSK(2Mbps)
Channel: 00



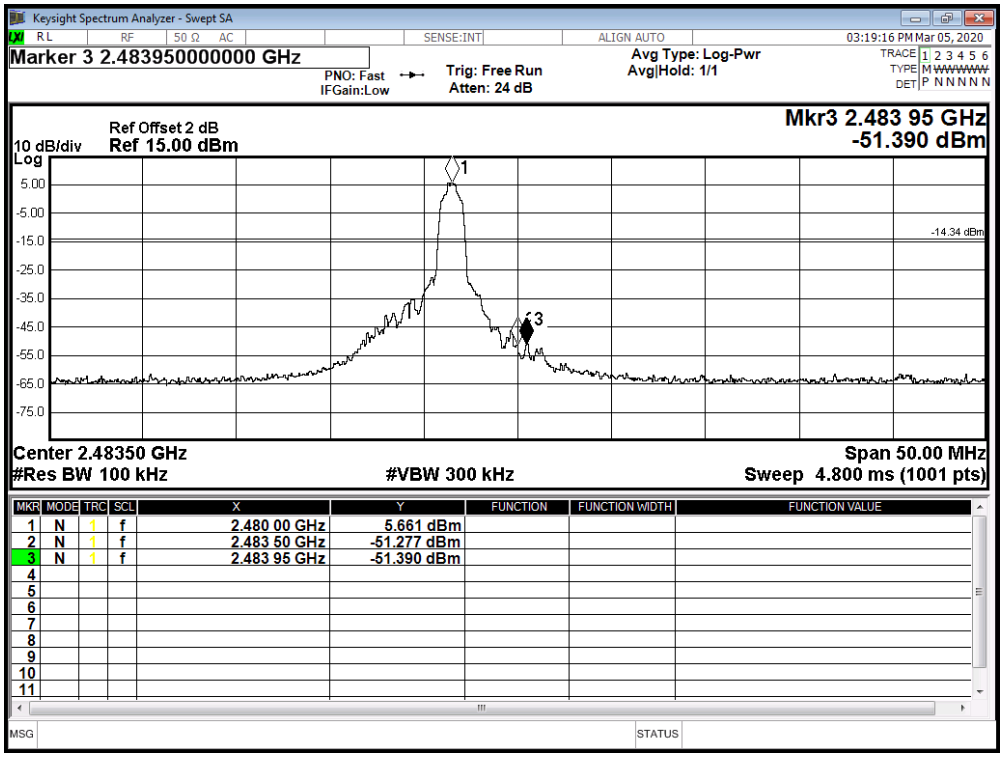


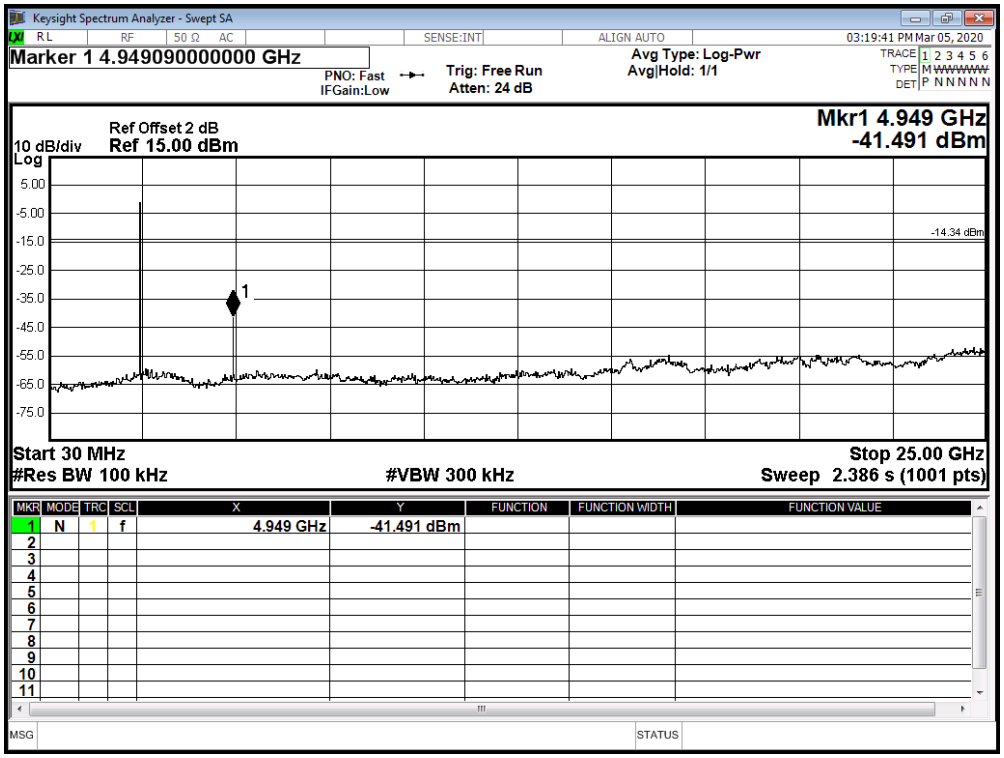
Modulation Standard: π/4-DQPSK(2Mbps)
Channel: 39



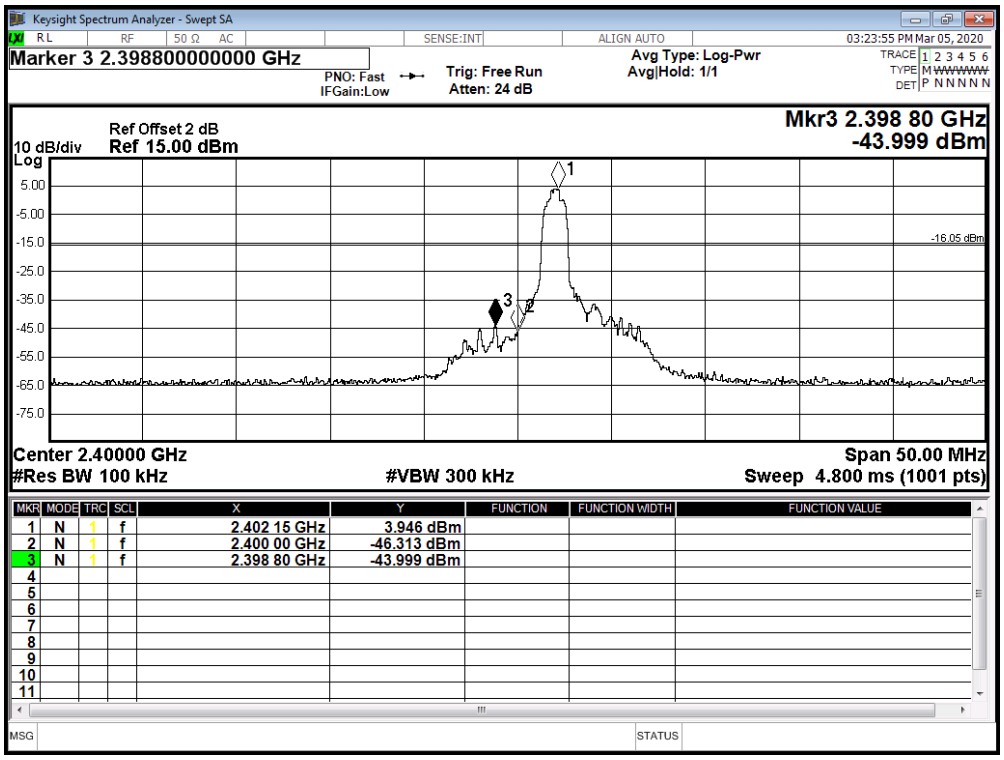


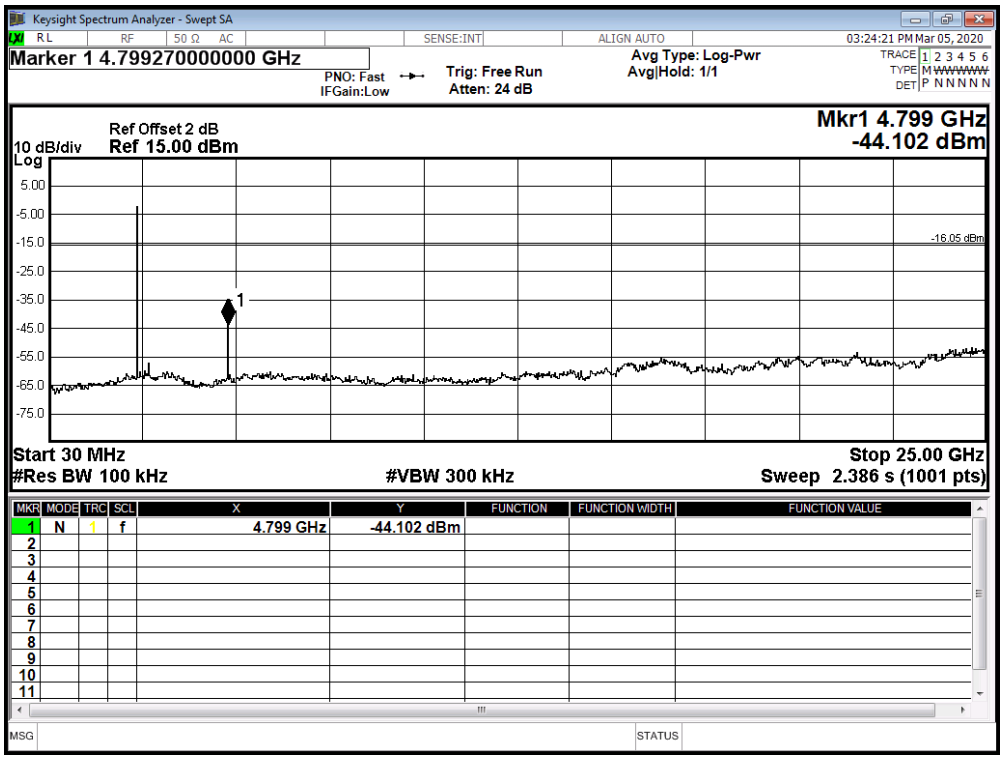
Modulation Standard: π/4-DQPSK(2Mbps)
Channel: 78



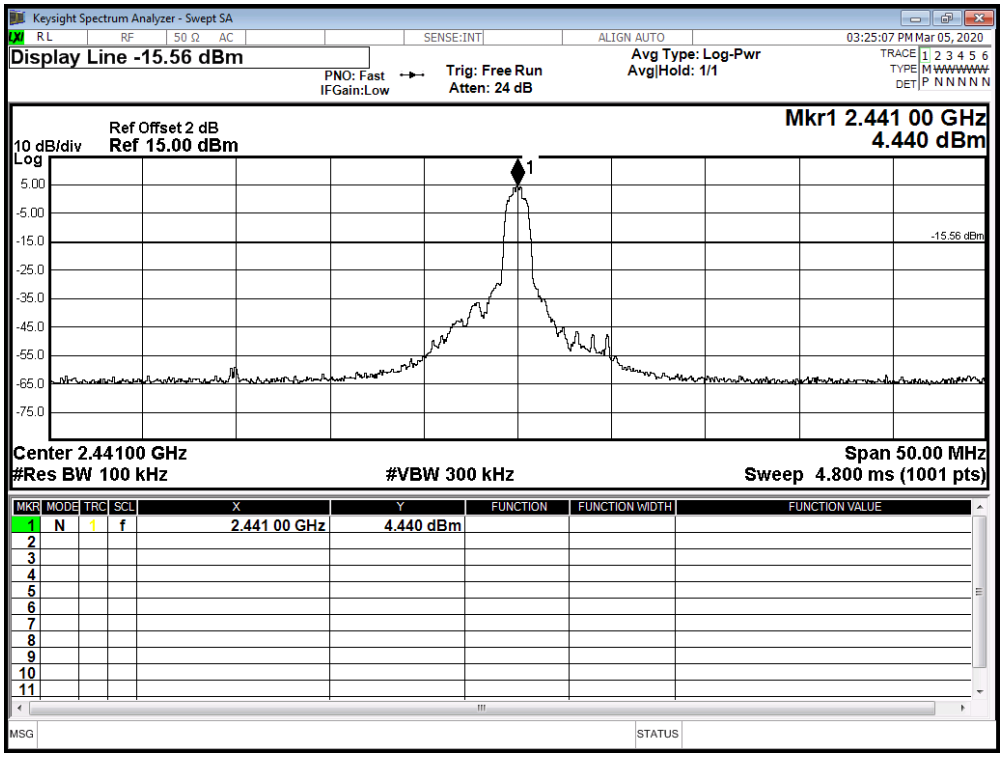


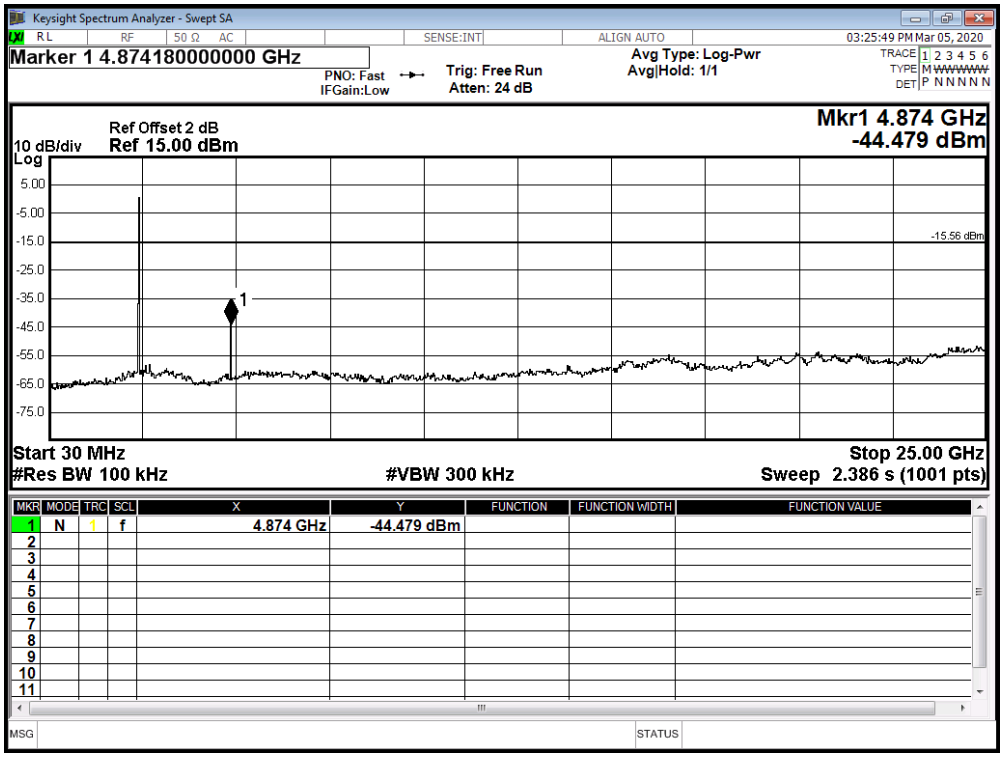
Modulation Standard: 8DPSK(3Mbps)
Channel: 00



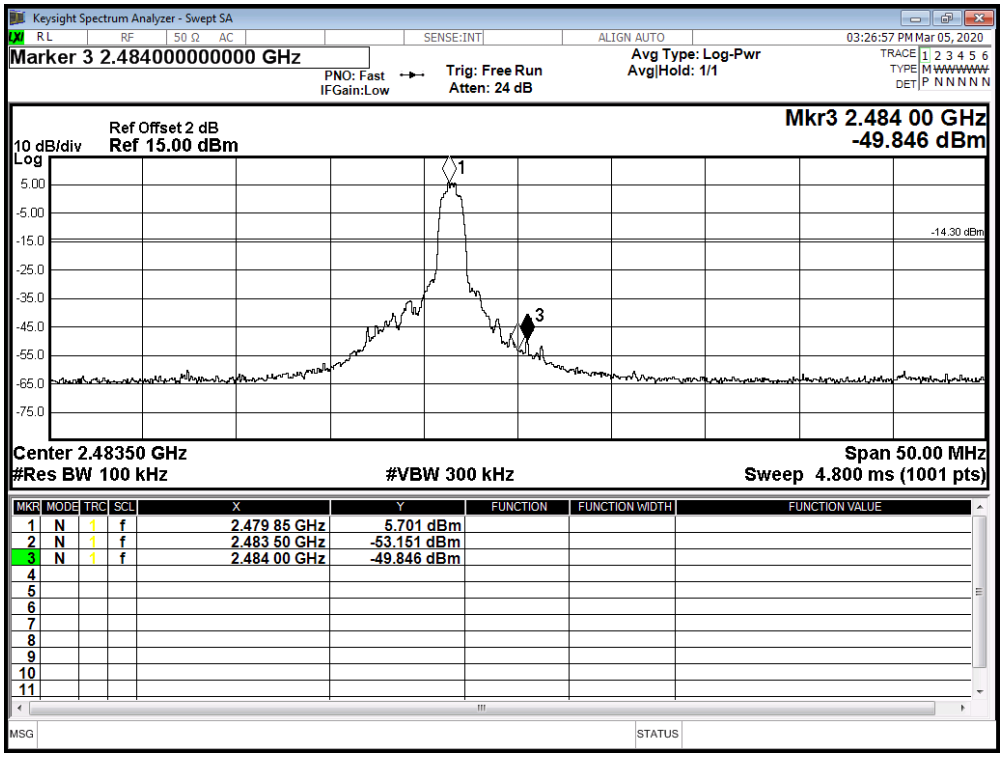


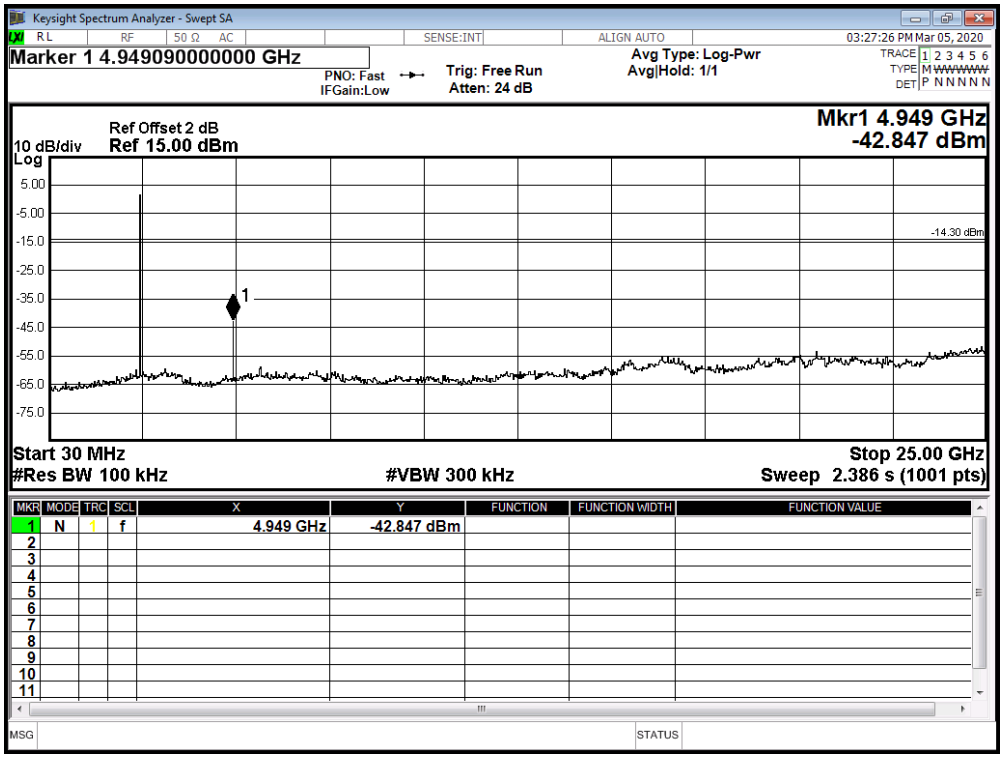
Modulation Standard: 8DPSK(3Mbps)
Channel: 39





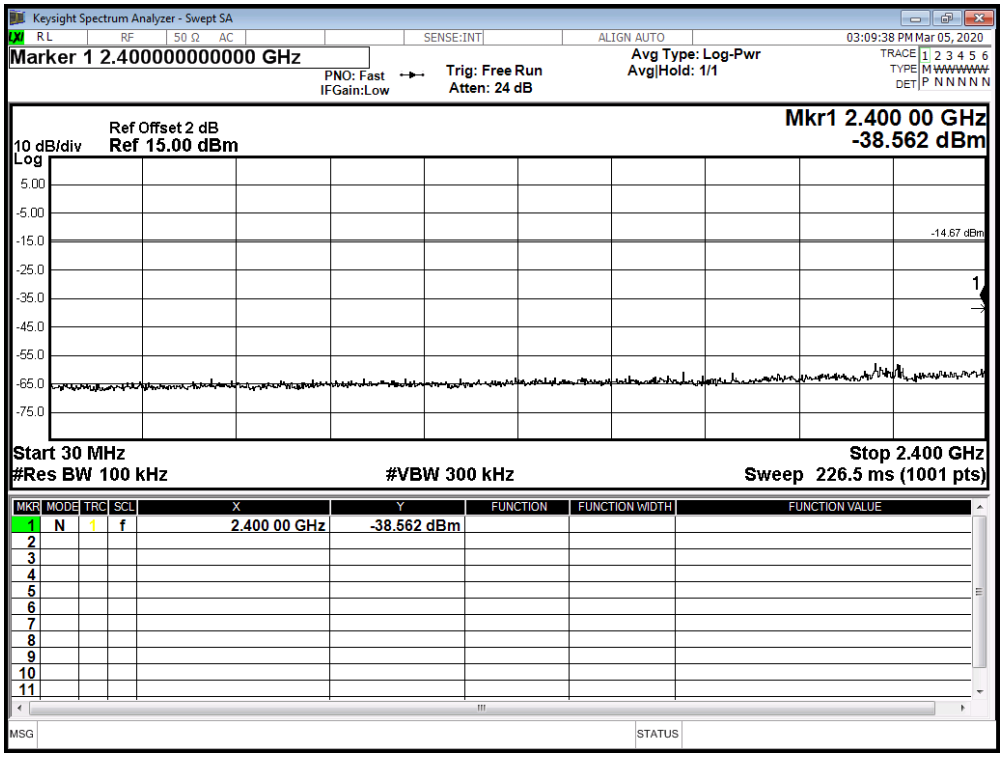
Modulation Standard: 8DPSK(3Mbps)
Channel: 78

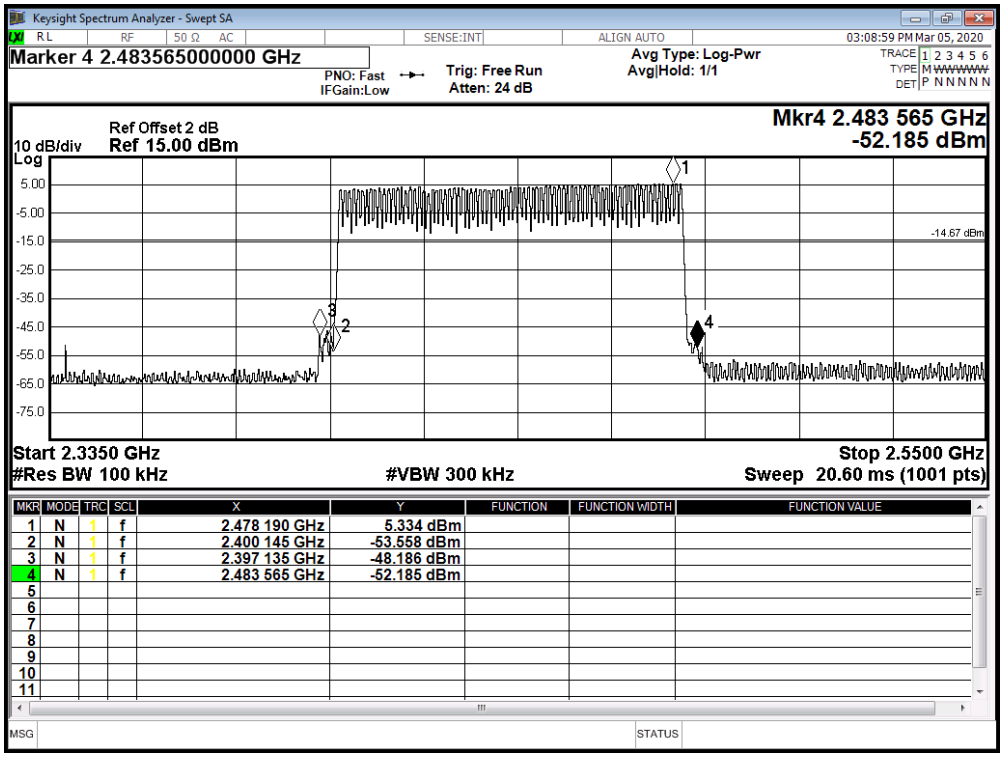


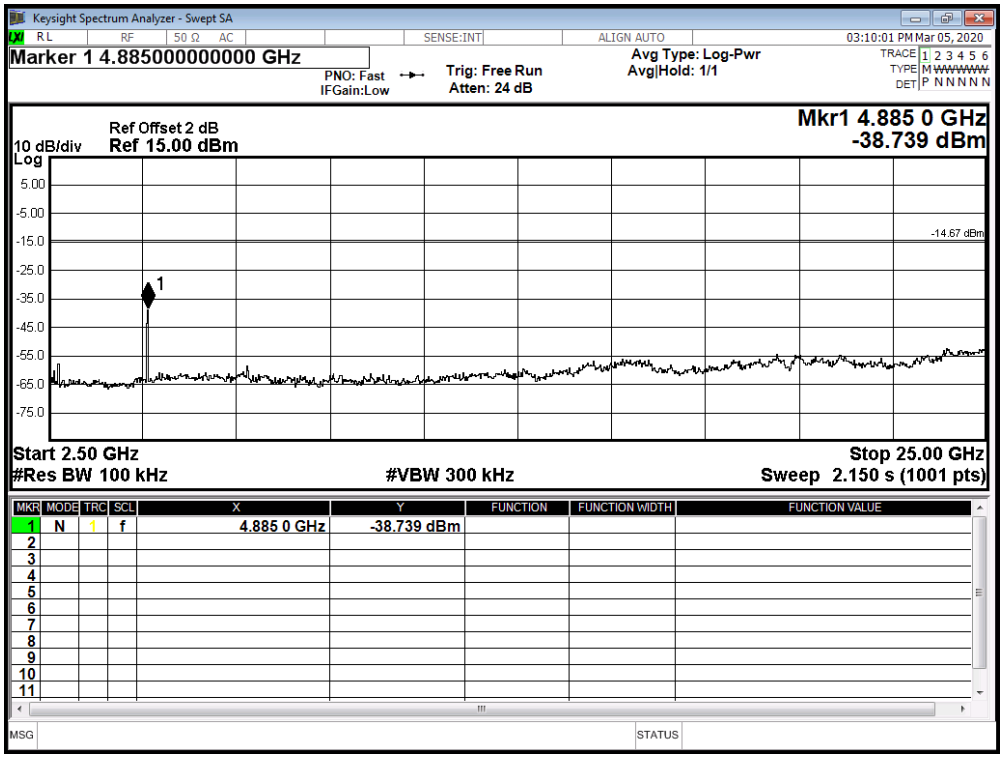


Hopping Mode:

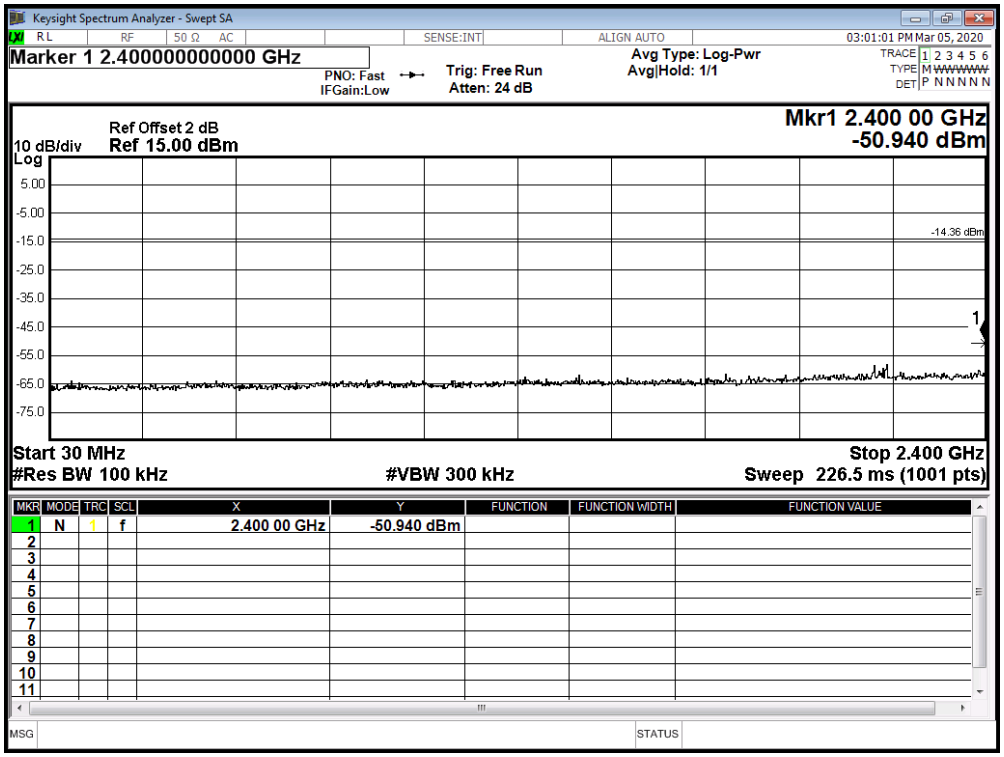
Modulation Standard: GFSK (1Mbps)

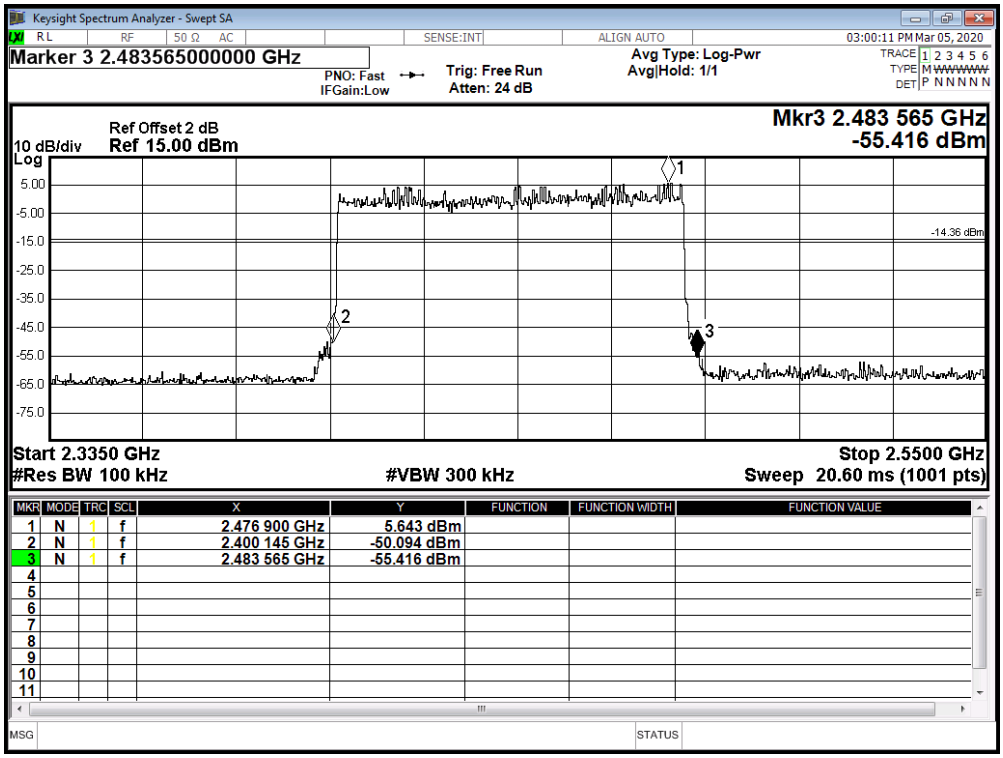


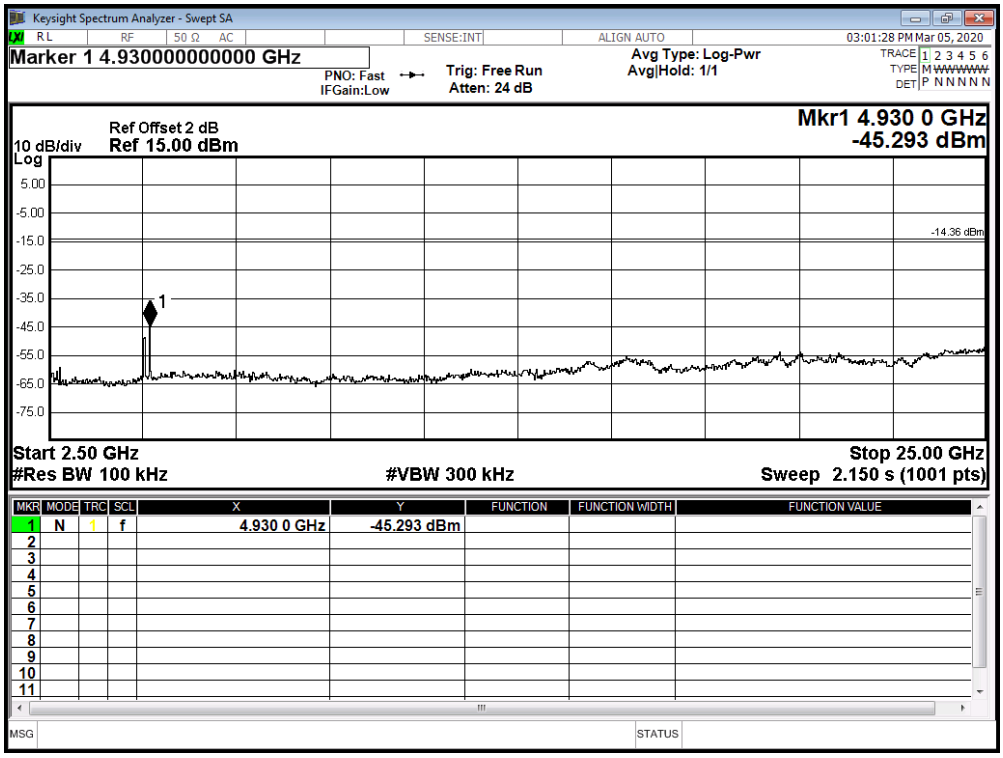




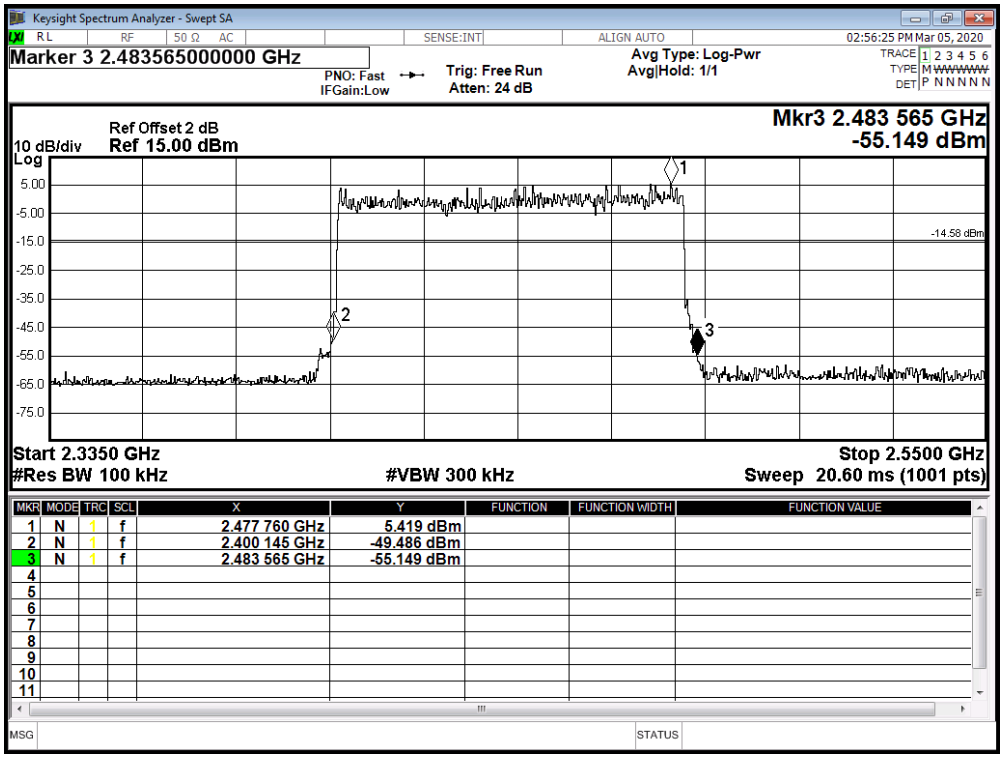
Modulation Standard: π/4-DQPSK(2Mbps)

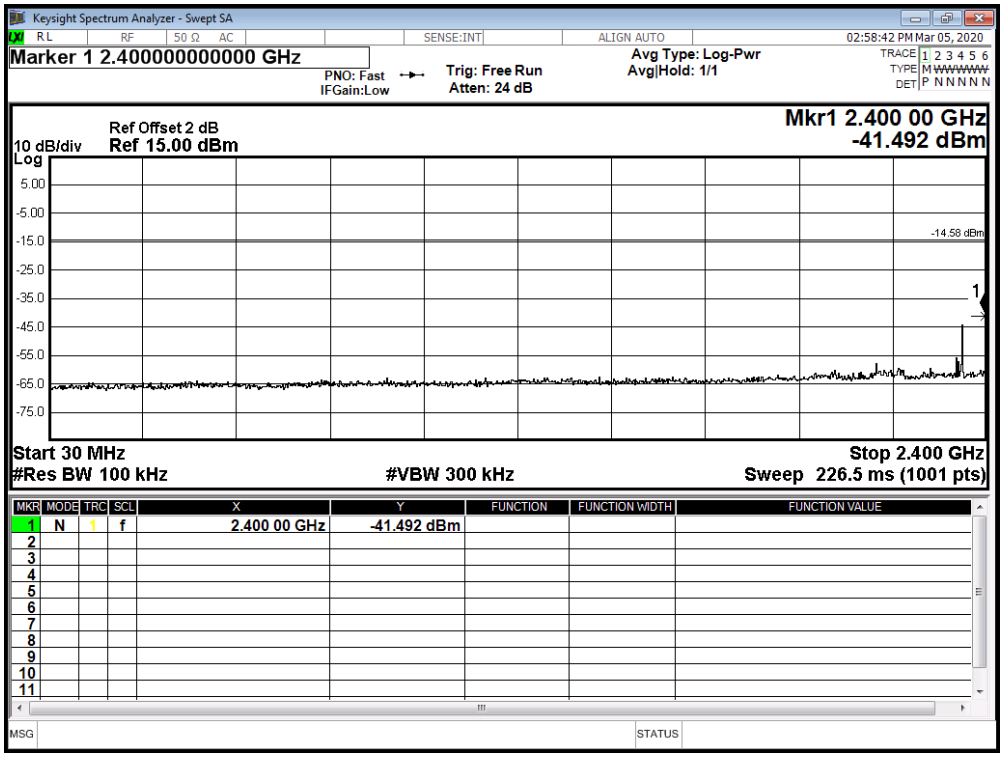


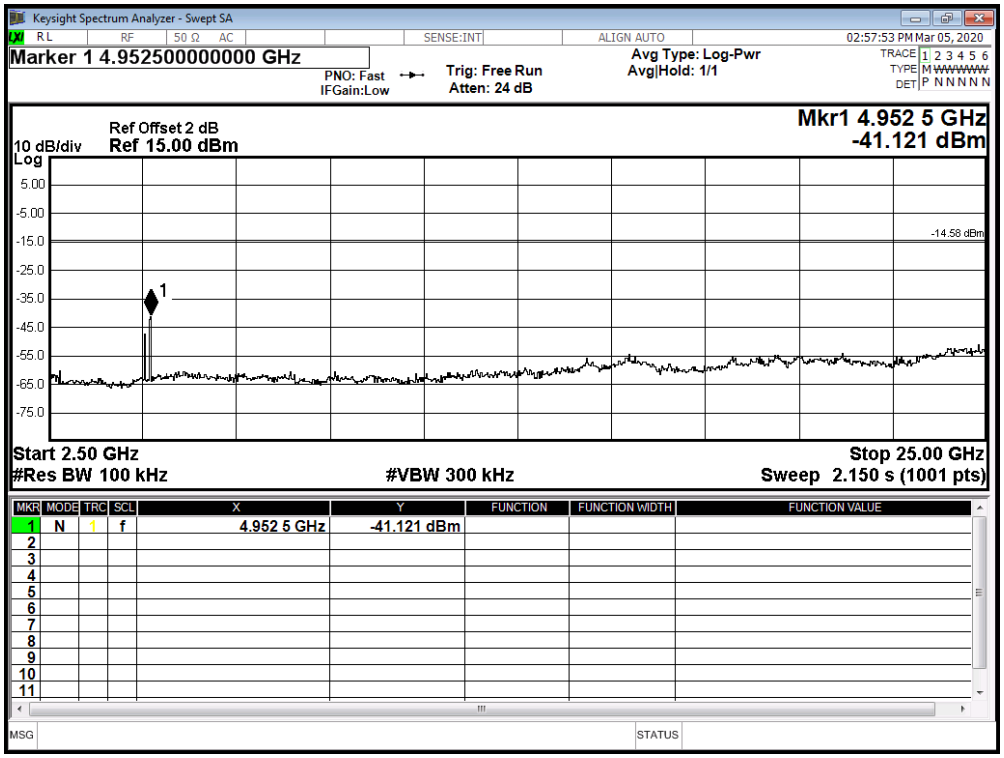

Keysight Spectrum Analyzer - Swept SA
Marker 3 2.483565000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 24 dB
Avg Type: Log-Pwr
Avg|Hold: 1/1
03:00:11 PM Mar 05, 2020
Ref Offset 2 dB
10 dB/div
Ref 15.00 dBm
Log
Mkr3 2.483 565 GHz
-55.416 dBm
-14.36 dBm
Start 2.3350 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.5500 GHz
Sweep 20.60 ms (1001 pts)
1 N 1 f 2.476 900 GHz 5.643 dBm
2 N 1 f 2.400 145 GHz -50.094 dBm
3 N 1 f 2.483 565 GHz -55.416 dBm


Keysight Spectrum Analyzer - Swept SA
Marker 1 4.930000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 24 dB
Avg Type: Log-Pwr
Avg|Hold: 1/1
03:01:28 PM Mar 05, 2020
Ref Offset 2 dB
10 dB/div
Ref 15.00 dBm
Log
Mkr1 4.930 0 GHz
-45.293 dBm
-14.36 dBm
Start 2.50 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.150 s (1001 pts)
1 N 1 f 4.930 0 GHz -45.293 dBm

Modulation Standard: 8DPSK(3Mbps)



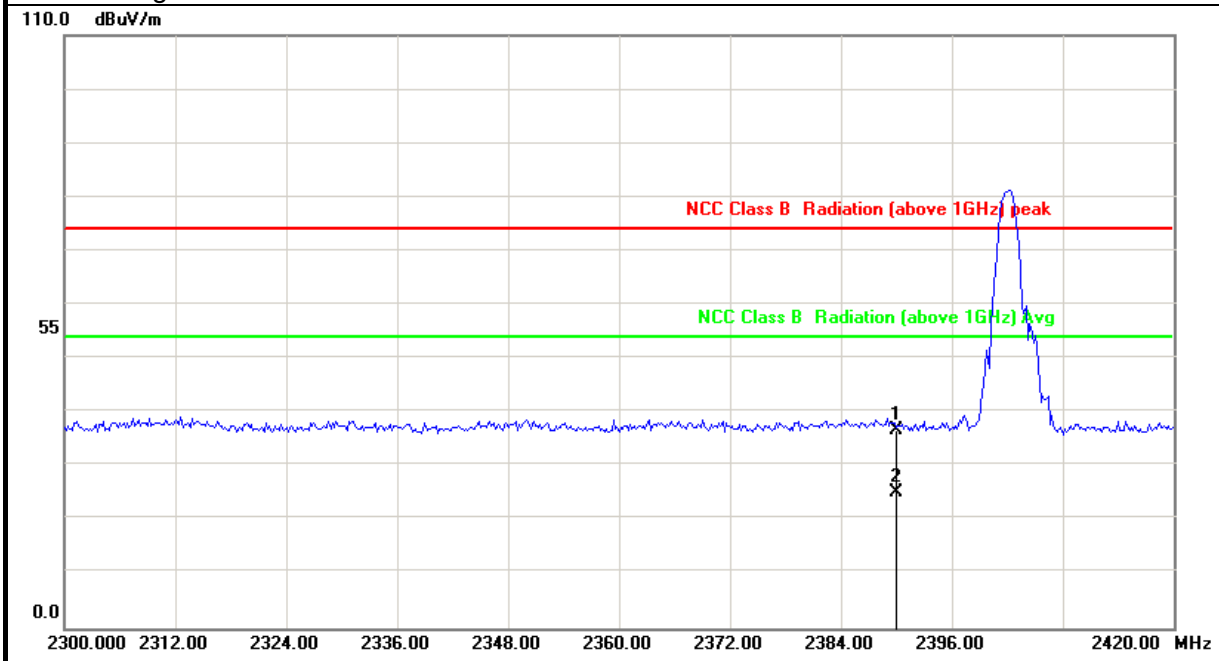



Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:57:53 PM Mar 05, 2020
Marker 1 4.952500000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 24 dB
Avg Type: Log-Pwr
Avg|Hold: 1/1
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 15.00 dBm
Mkr1 4.952 5 GHz
-41.121 dBm
5.00
-5.00
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-14.58 dBm
1
Start 2.50 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.150 s (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 4.952 5 GHz -41.121 dBm
2
3
4
5
6
7
8
9
10
11
MSG
STATUS

11.5. 禁用頻段內幅射場強之量測結果及數據

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	GFSK, CH00		

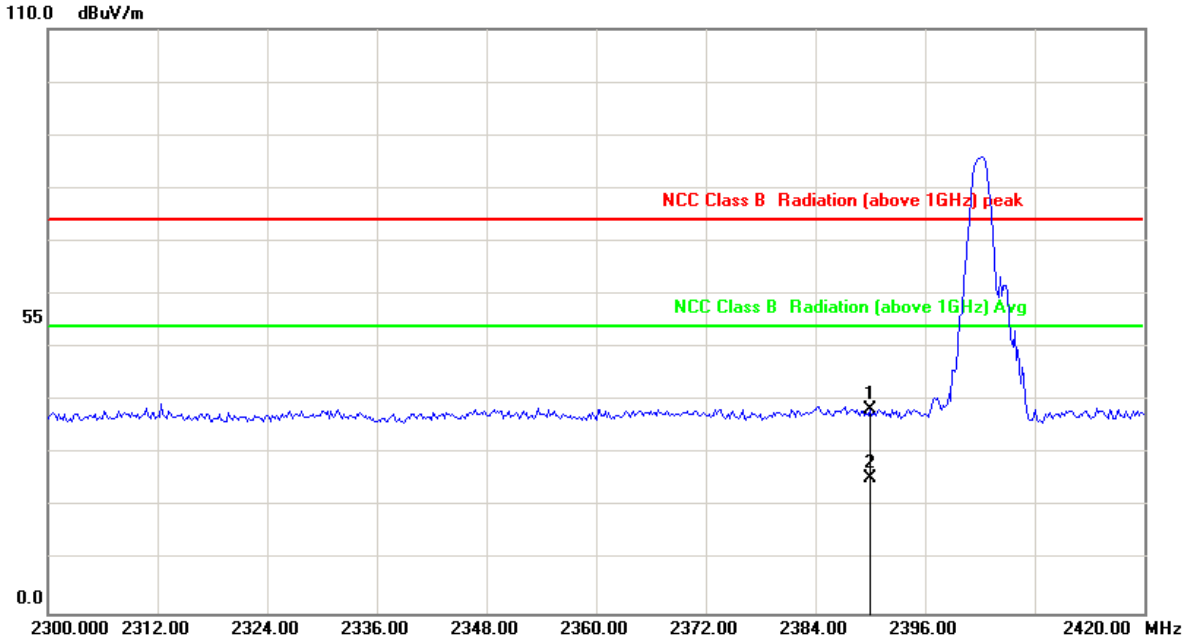
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2390.000	-10.05	46.82	36.77	74.00	-37.23	peak
2	2390.000	-10.05	35.32	25.27	54.00	-28.73	AVG

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	GFSK, CH00		

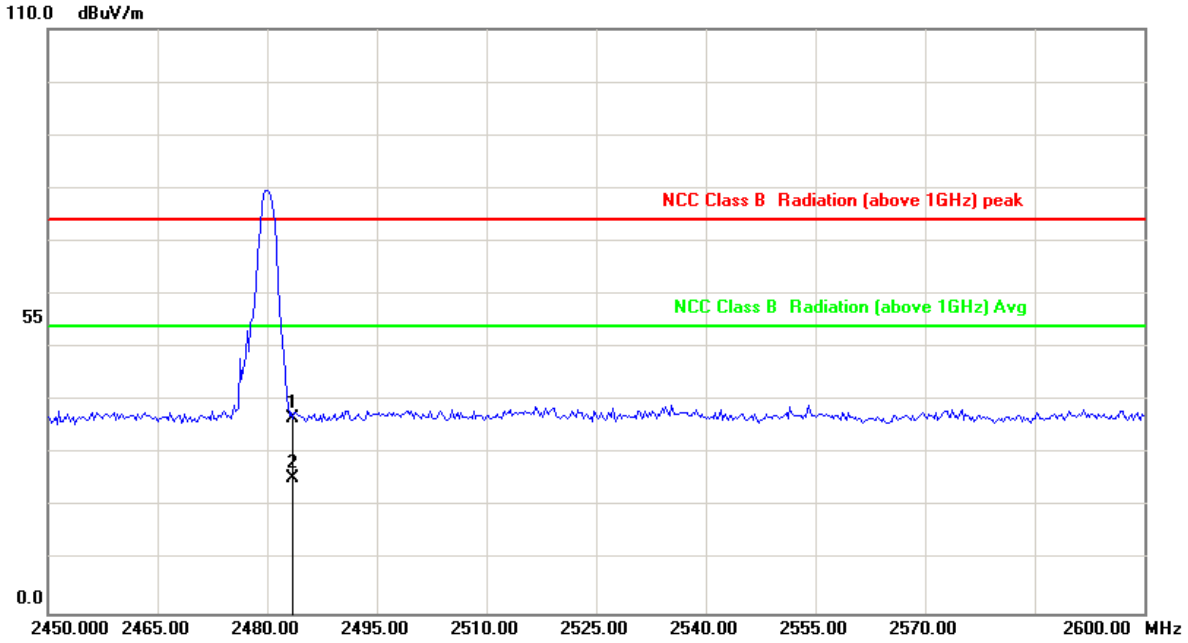
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2390.000	-10.05	48.32	38.27	74.00	-35.73	peak
2	2390.000	-10.05	35.36	25.31	54.00	-28.69	AVG

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	GFSK, CH78		

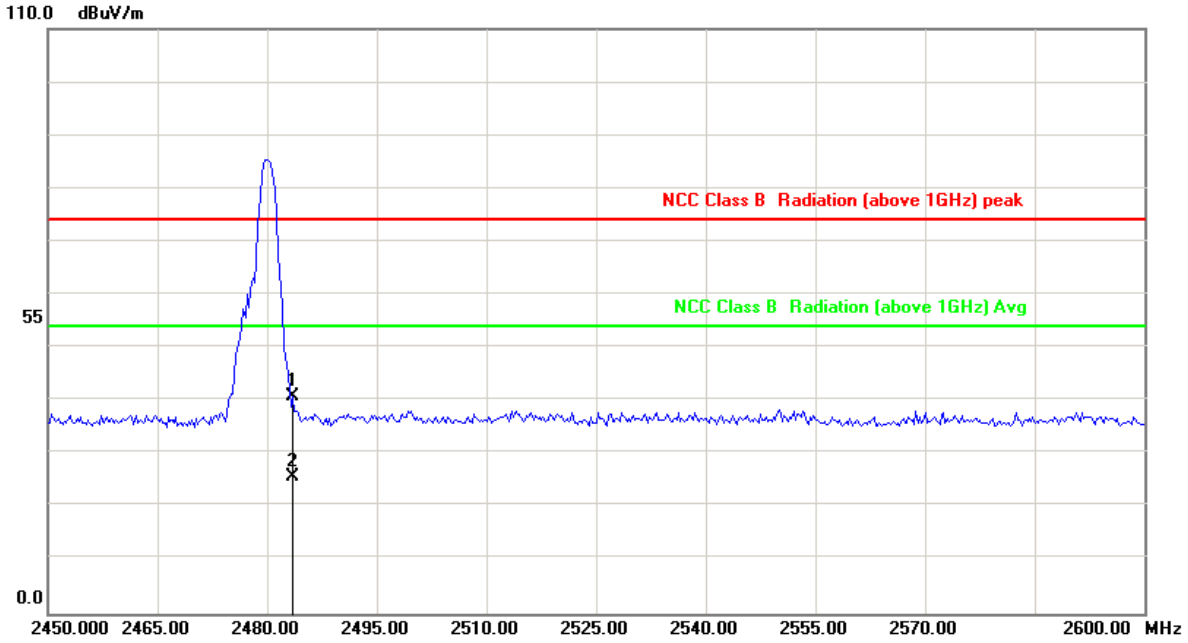
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2483.500	-9.65	46.48	36.83	74.00	-37.17	peak
2	2483.500	-9.65	35.08	25.43	54.00	-28.57	AVG

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	GFSK, CH78		

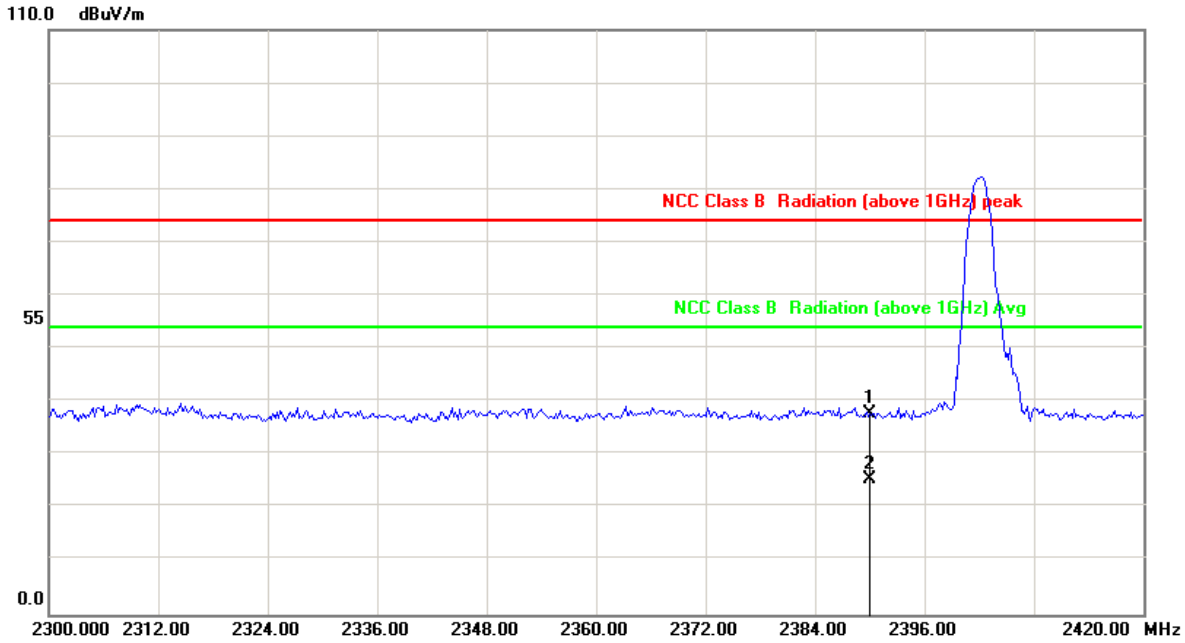
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2483.500	-9.65	50.58	40.93	74.00	-33.07	peak
2	2483.500	-9.65	35.27	25.62	54.00	-28.38	AVG

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	π/4-DQPSK , CH00		

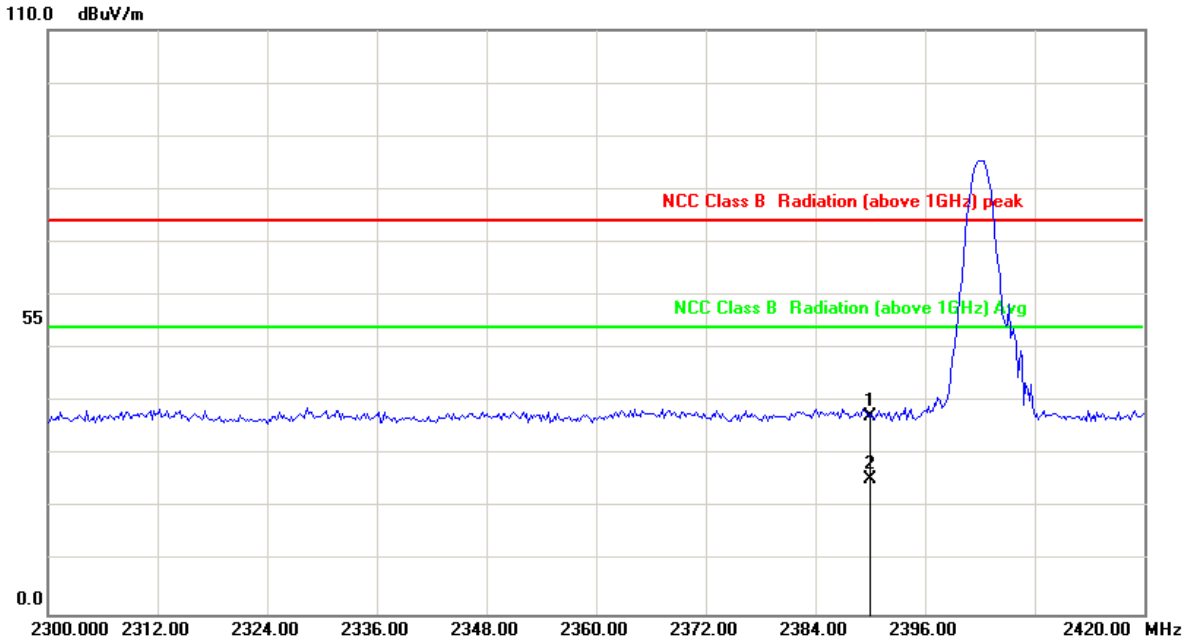
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2390.000	-10.05	47.77	37.72	74.00	-36.28	peak
2	2390.000	-10.05	35.50	25.45	54.00	-28.55	AVG

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	π/4-DQPSK , CH00		

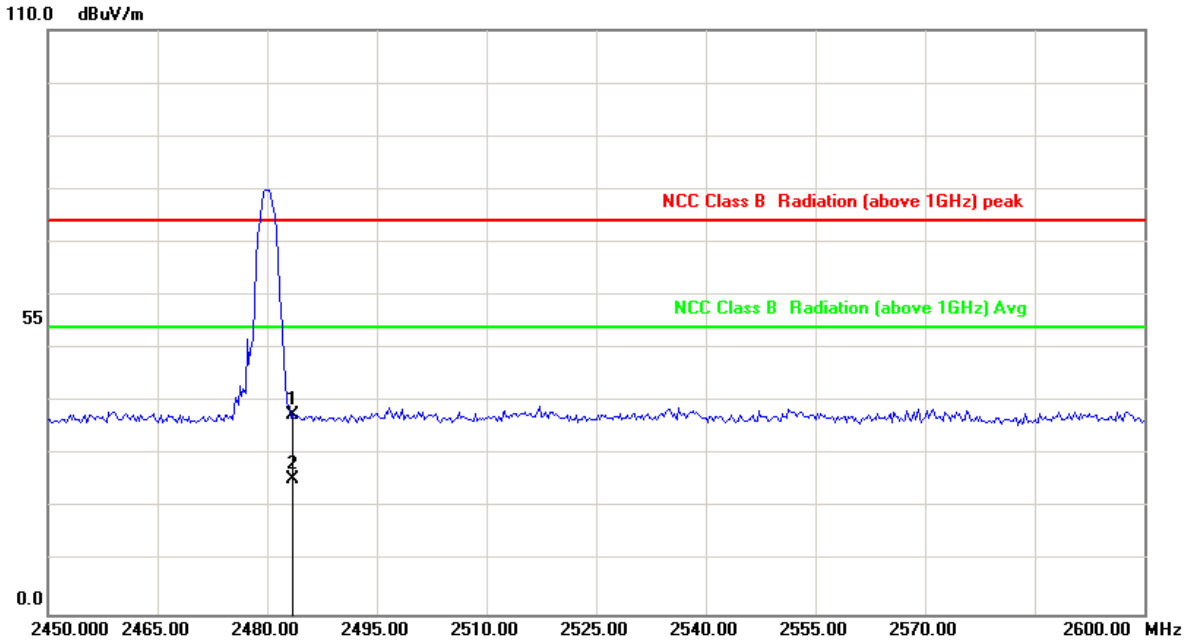
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2390.000	-10.05	47.33	37.28	74.00	-36.72	peak
2	2390.000	-10.05	35.54	25.49	54.00	-28.51	AVG

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	π/4-DQPSK , CH78		

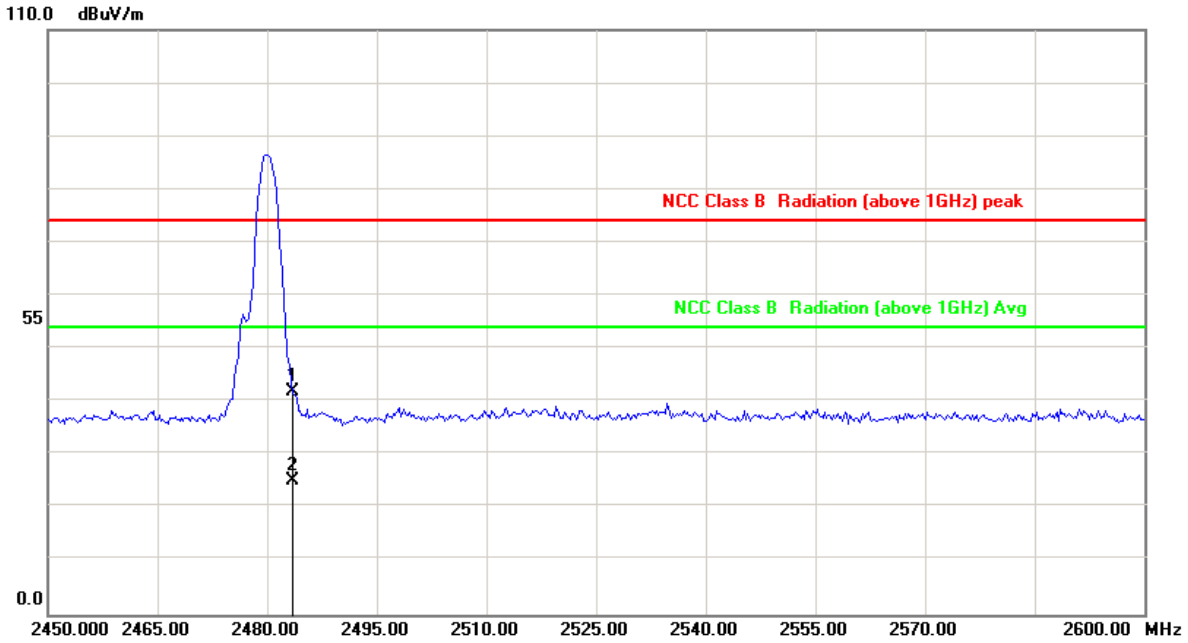
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2483.500	-9.65	47.14	37.49	74.00	-36.51	peak
2	2483.500	-9.65	35.17	25.52	54.00	-28.48	AVG

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	π/4-DQPSK , CH78		

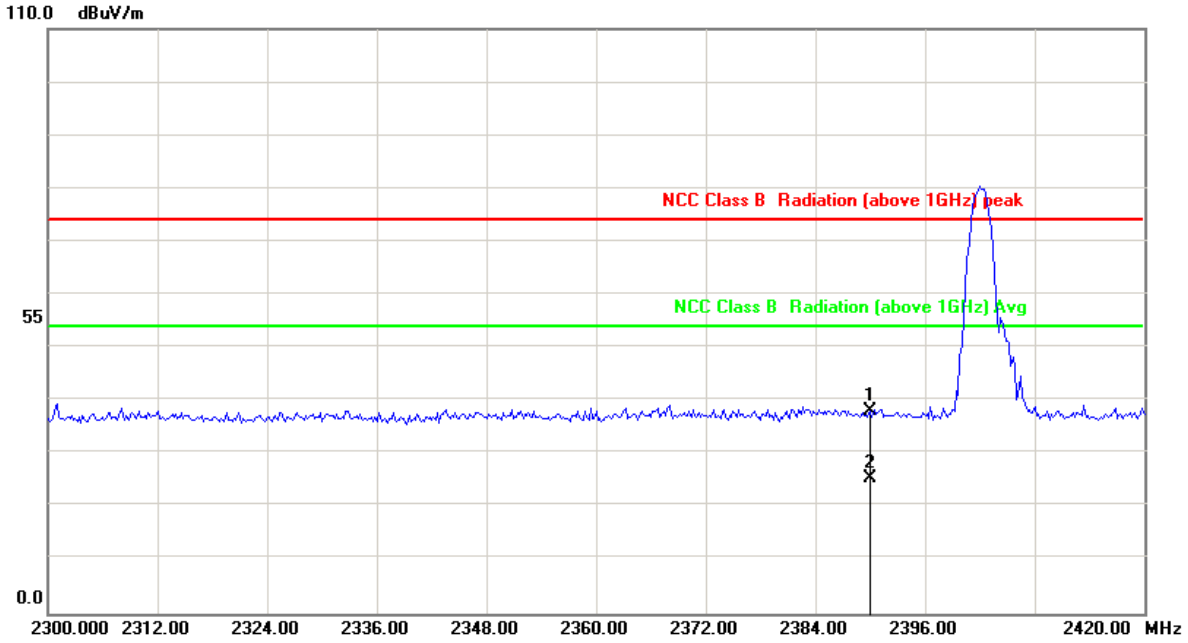
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2483.500	-9.65	51.64	41.99	74.00	-32.01	peak
2	2483.500	-9.65	34.68	25.03	54.00	-28.97	AVG

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	8DPSK , CH00		

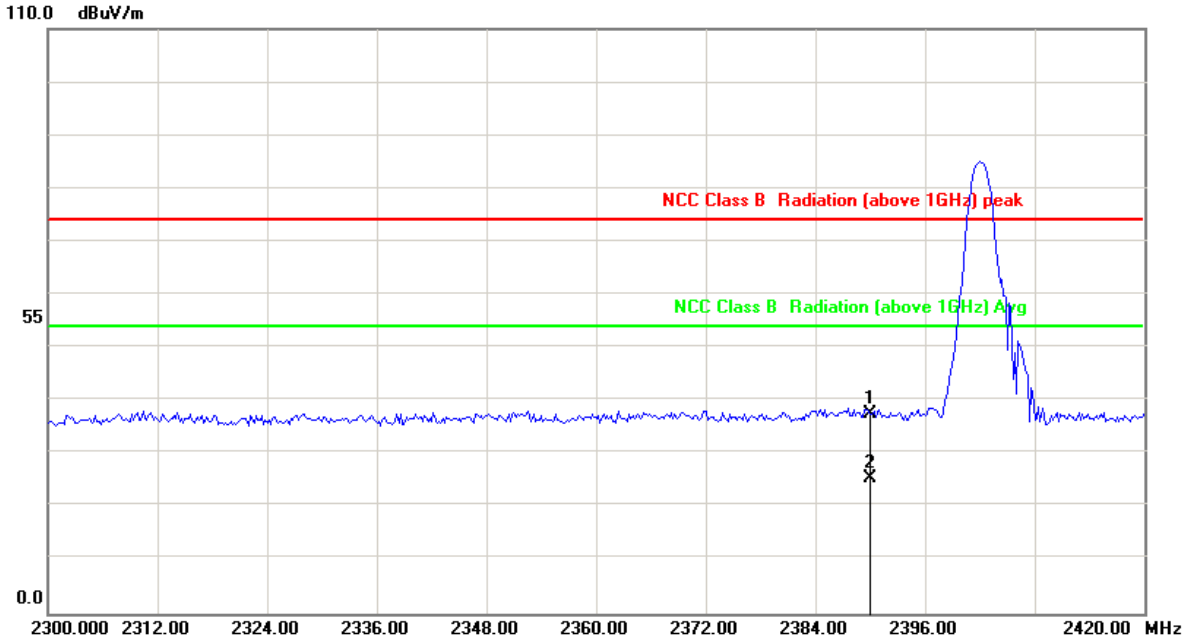
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2390.000	-10.05	48.04	37.99	74.00	-36.01	peak
2	2390.000	-10.05	35.51	25.46	54.00	-28.54	AVG

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	8DPSK , CH00		

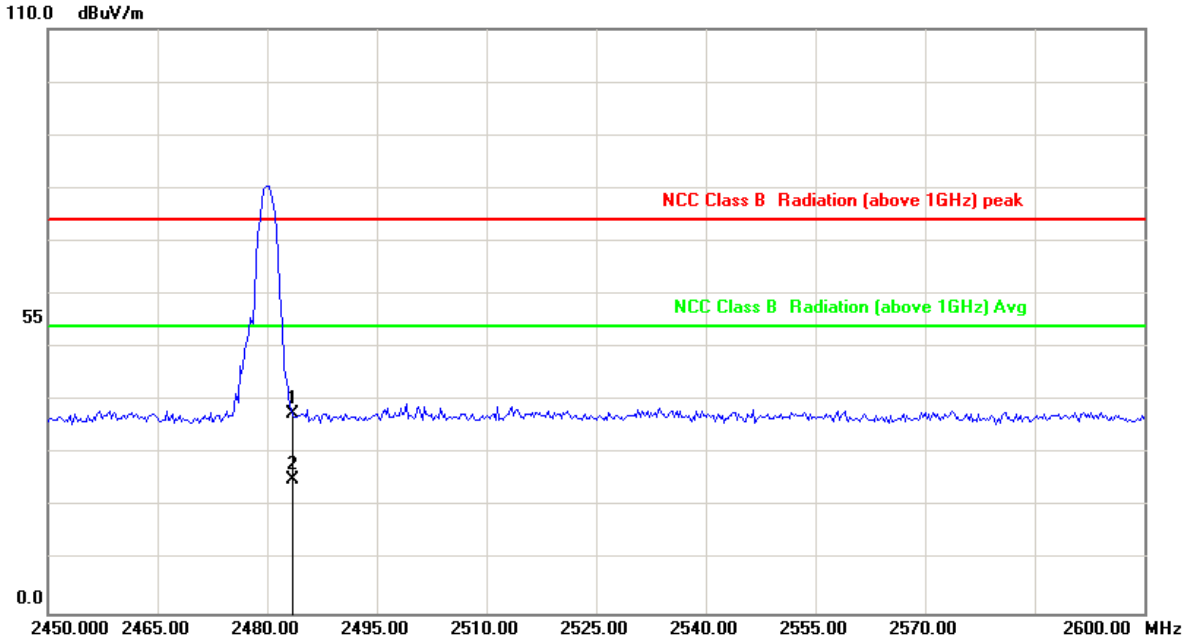
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2390.000	-10.05	47.60	37.55	74.00	-36.45	peak
2	2390.000	-10.05	35.44	25.39	54.00	-28.61	AVG

Power	DC 3.7V	Pol/Phase	VERTICAL
Test Mode	8DPSK , CH78		

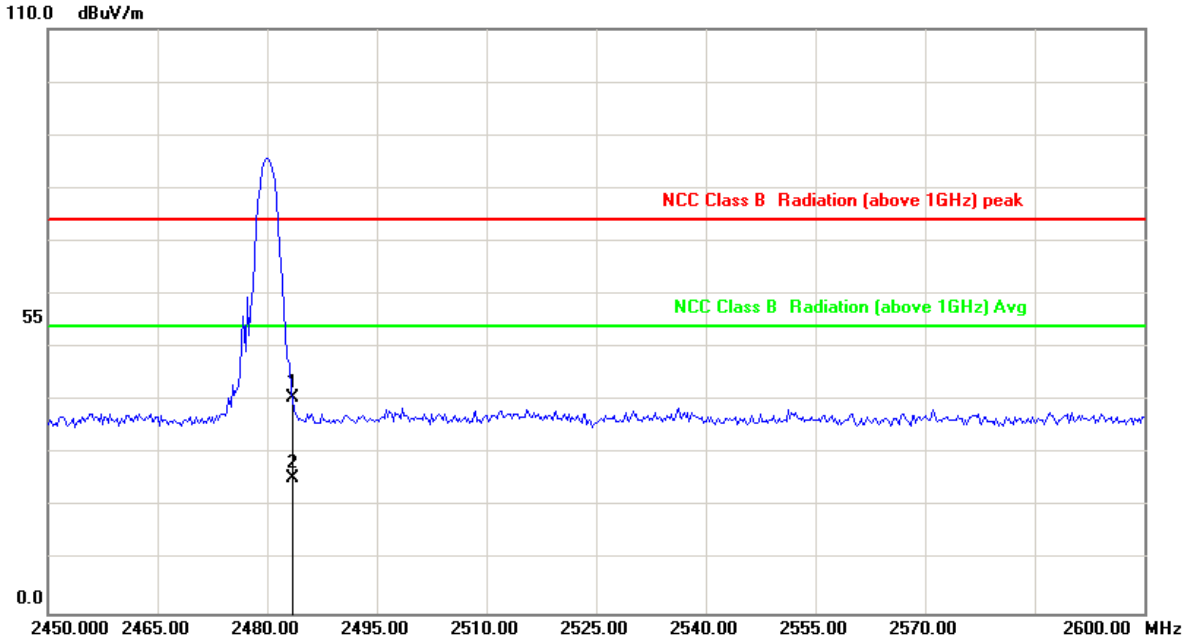
Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2483.500	-9.65	47.07	37.42	74.00	-36.58	peak
2	2483.500	-9.65	34.94	25.29	54.00	-28.71	AVG

Power	DC 3.7V	Pol/Phase	HORIZONTAL
Test Mode	8DPSK , CH78		

Note : Level = Reading + Factor
Margin = Level – Limit



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2483.500	-9.65	50.22	40.57	74.00	-33.43	peak
2	2483.500	-9.65	35.05	25.40	54.00	-28.60	AVG

12. 電波暴露量之評估

12.1. 適用標準

若受測物於正常操作模式下,其發射機距離人體20 公分以內者,須測試電磁波能量比吸收率(Specific Absorption Rate，SAR)以證明其符電波暴露量之要求。限制值如下：

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

f(GHz) is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

12.2. 電波暴露量之評估結果及數據

Test Mode	Frequency band (GHz)	Measured power(dBm)	Tuneuptolerance(dBm)	Max.TuneupPower(dBm)	Peak output power(mW)	Distance (mm)	Result calulation
GFSK	2.48	5.71	5.71±1	6.71	4.687	<5	1.48
π/4-DQPSK	2.48	6.72	6.72±1	7.72	5.913	<5	1.86
8DPSK	2.48	7.02	7.02±1	8.02	6.343	<5	2.00

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	