

附錄 一

受測裝置之測試結果

目錄	頁次
1. 場強輻射之量測.....	2
1.1. 30-1000MHz 頻率範圍，其他不必要發射量測.....	3
1.2. 1000MHz 以上頻率範圍，其他不必要發射量測.....	5
1.4. 禁用頻帶量測結果（其他不必要發射）.....	7
2. 發射頻寬之量測.....	11
2.1. 發射頻寬.....	11
2.2. 發射頻寬之量測圖.....	12
3. 峰值輸出功率之量測.....	13
3.1. 峰值輸出功率.....	13
3.2. 峰值輸出功率之量測圖.....	14
4. 頻帶邊緣之 RF 傳導發射之量測.....	15
5. 混附發射之 RF 傳導發射之量測.....	16
6. 功率密度之量測.....	19
6.1. 功率密度.....	19
6.2. 功率密度之量測圖.....	19

1. 場強輻射之量測

本裝置有兩種電源供應模式分別為電池(DC 7.2V)及 USB (DC 5V)，實驗室以單機(電池供電)分別以三種不同的擺設方式(站立、平放、側立)進行量試評估，最後選取最大場強值的擺設方式(平放)以低、中、高頻率來進行量測，並將下列測試模式之掃頻圖隨案件所附所得讀值資料請見章節 1.1~1.2。

另搭配電源供應器(DC 5V)執行充電模式，經評估充電模式不影響 1GHz 以上訊號結果，此模式僅呈現 30MHz-1GHz 測試結果放置於 EM-NC200031 報告內。

● 發射/接收模式

模式	測試電壓	動作狀態	基本頻率	量測頻率範圍
BLE (2 Mbps)	DC 7.2V (經內建鋰電池供電)	發射	2402MHz (CH37)	1000-25000MHz
		發射	2440MHz (CH17)*	30-1000MHz
		發射	2480MHz (CH39)	1000-25000MHz
BLE		接收	2440MHz (CH17)	30-1000MHz
				1000-25000MHz

註：*：經評估後，以最差頻率進行 30-1000MHz 量測。

對受測物裝置落於技術規範第 2.7 章節的禁用頻率之混附發射以下列測試模式依規定分別進行量測，所得量測資料請見章節 1.3。

模式	測試電壓	動作狀態	基本頻率	量測頻率範圍
BLE (2 Mbps)	DC 7.2V (經內建鋰電池供電)	發射	2402MHz (CH37)	2310-2410MHz
			2480MHz (CH39)	2450-2900MHz

測試日期	2020/01/15~20	環境溫/濕度	17~20°C/59~66%
測試電壓	DC 7.2V (經內建鋰電池供電)	測試人員	Sean Wang

1.1. 30-1000MHz 頻率範圍，其他不必要發射量測

Mode	BLE (2 Mbps)	Frequency	TX 2440MHz
------	--------------	-----------	------------

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
75.590	13.06	1.97	13.90	28.93	40.00	11.07	Peak
120.210	18.63	2.53	19.36	40.52	43.50	2.98	Peak
299.660	19.69	4.43	13.82	37.94	46.00	8.06	Peak
623.640	24.93	7.00	6.49	38.42	46.00	7.58	Peak
672.140	25.27	7.23	7.56	40.06	46.00	5.94	Peak
995.150	28.04	9.01	-0.64	36.41	54.00	17.59	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
33.880	23.04	1.27	-2.85	21.46	40.00	18.54	Peak
120.210	18.63	2.53	8.66	29.82	43.50	13.68	Peak
485.900	23.53	6.64	3.34	33.51	46.00	12.49	Peak
647.890	25.10	7.12	7.30	39.52	46.00	6.48	Peak
915.610	27.44	8.55	-1.82	34.17	46.00	11.83	Peak
979.630	27.92	8.92	-1.85	34.99	54.00	19.01	Peak

Mode	BLE	Frequency	RX 2440MHz
------	-----	-----------	------------

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
71.710	12.67	1.91	18.06	32.64	40.00	7.36	Peak
120.210	18.63	2.53	19.31	40.47	43.50	3.03	Peak
323.910	20.43	4.81	16.02	41.26	46.00	4.74	Peak
673.110	25.27	7.24	7.51	40.02	46.00	5.98	Peak
914.640	27.44	8.54	-0.52	35.46	46.00	10.54	Peak
978.660	27.92	8.92	-1.99	34.85	54.00	19.15	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
33.880	23.04	1.27	-2.85	21.46	40.00	18.54	Peak
120.210	18.63	2.53	8.66	29.82	43.50	13.68	Peak
485.900	23.53	6.64	3.34	33.51	46.00	12.49	Peak
647.890	25.10	7.12	7.30	39.52	46.00	6.48	Peak
915.610	27.44	8.55	-1.82	34.17	46.00	11.83	Peak
979.630	27.92	8.92	-1.85	34.99	54.00	19.01	Peak

1.2. 1000MHz 以上頻率範圍，其他不必要發射量測

頻率範圍量測至主波發射的 10 倍諧波，其他未列在報告上乃因訊號太小無法量測。

Mode	BLE (2 Mbps)	Frequency	TX 2402MHz
------	--------------	-----------	------------

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4804.00	33.92	10.22	-1.54	42.60	54.00	11.40	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4804.00	33.92	10.22	-2.71	41.43	54.00	12.57	Peak

Mode	BLE (2 Mbps)	Frequency	TX 2440MHz
------	--------------	-----------	------------

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4880.00	34.34	10.24	-1.95	42.63	54.00	11.37	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4880.00	34.34	10.24	-3.76	40.82	54.00	13.18	Peak

Mode	BLE (2 Mbps)	Frequency	TX 2480MHz
------	--------------	-----------	------------

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4960.00	34.32	10.27	-1.66	42.93	54.00	11.07	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4960.00	34.32	10.27	-0.88	43.71	54.00	10.29	Peak

Mode	BLE	Frequency	RX 2440MHz
------	-----	-----------	------------

Antenna at Horizontal Polarization

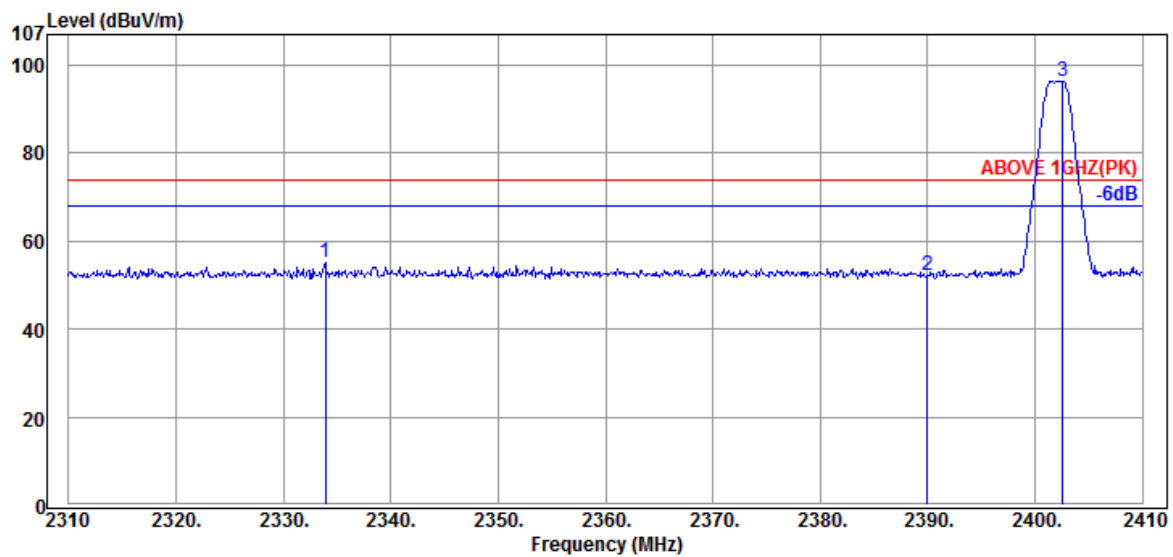
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4880.00	34.34	10.24	-1.48	43.10	54.00	10.90	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
4880.00	34.34	10.24	-2.42	42.16	54.00	11.84	Peak

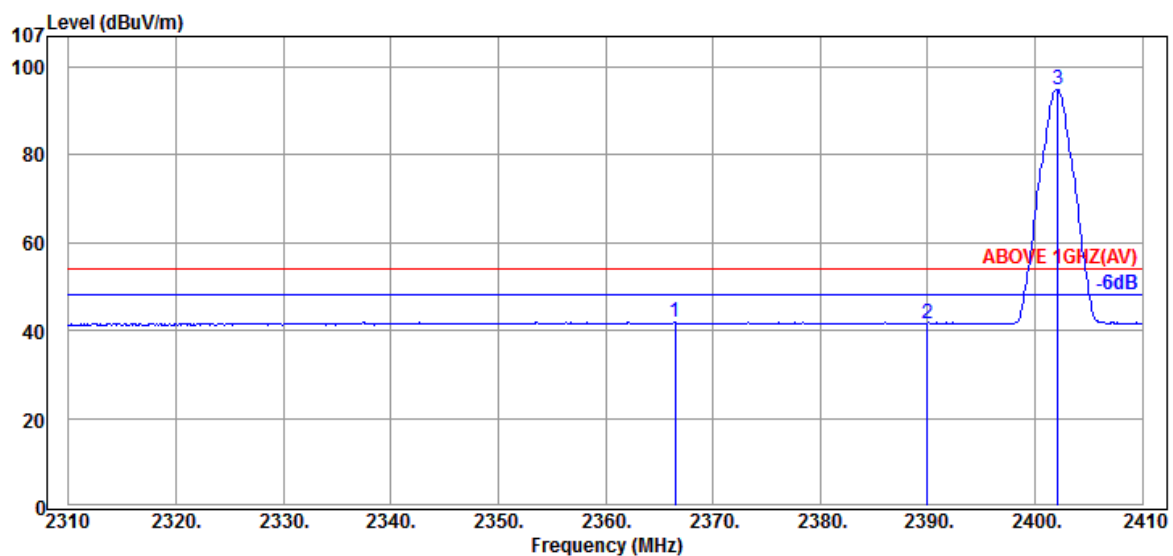
1.4. 禁用頻帶量測結果 (其他不必要發射)

Mode	BLE (2 Mbps)	Frequency	TX 2402MHz
------	--------------	-----------	------------



Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2333.90	32.00	8.47	14.55	55.02	74.00	18.98	Peak
2390.00	32.00	8.52	11.66	52.18	74.00	21.82	Peak
@ 2402.60	32.04	8.53	55.94	96.51	---	---	Peak

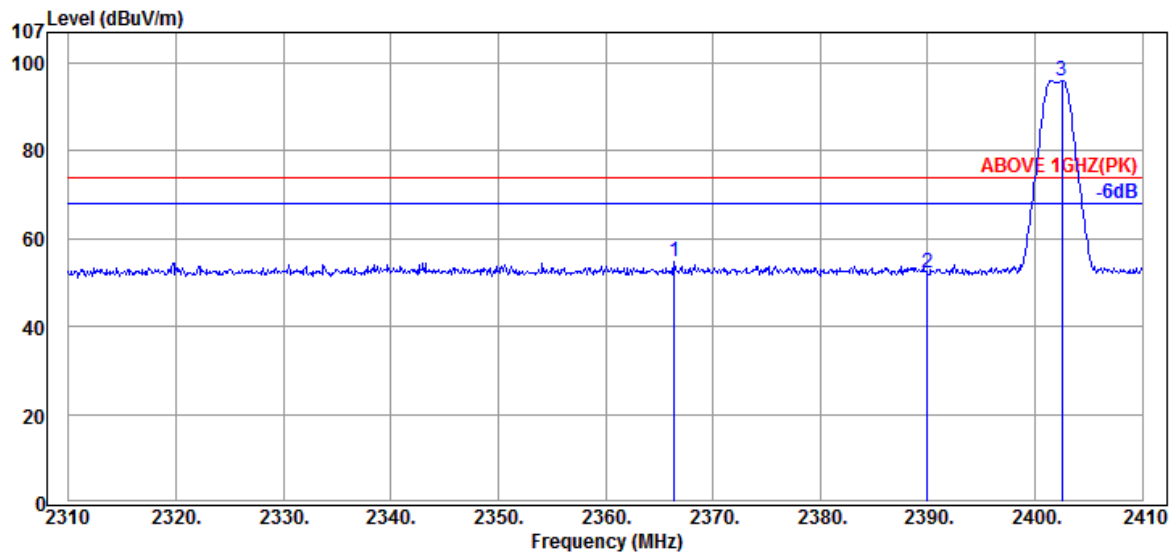


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2366.50	32.00	8.49	1.42	41.91	54.00	12.09	Average
2390.00	32.00	8.52	1.07	41.59	54.00	12.41	Average
@ 2402.10	32.03	8.52	54.27	94.82	---	---	Average

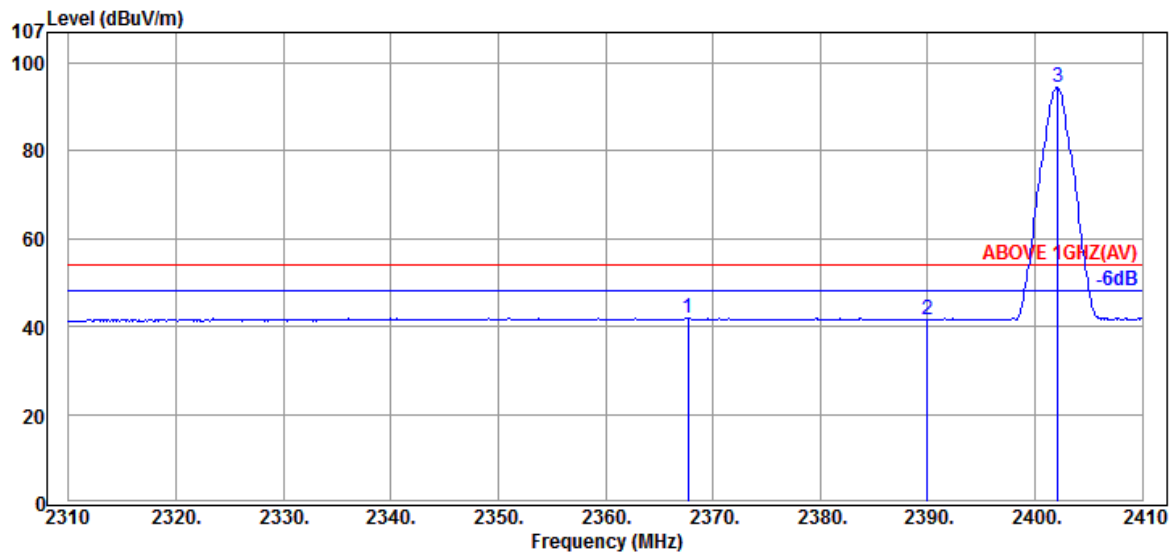
備註：“@”為主波，在此章節是不予以判定。

Mode	BLE (2 Mbps)	Frequency	TX 2402MHz
------	--------------	-----------	------------



Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2366.40	32.00	8.49	14.29	54.78	74.00	19.22	Peak
2390.00	32.00	8.52	11.71	52.23	74.00	21.77	Peak
@ 2402.50	32.03	8.52	55.53	96.08	---	---	Peak

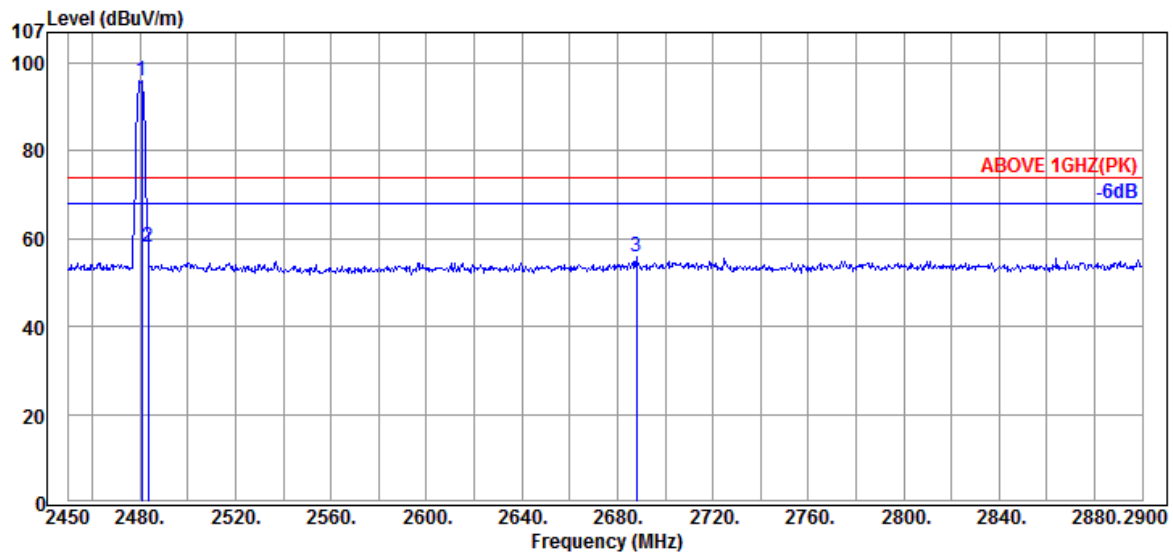


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2367.70	32.00	8.49	1.42	41.91	54.00	12.09	Average
2390.00	32.00	8.52	1.18	41.70	54.00	12.30	Average
@ 2402.10	32.03	8.52	53.86	94.41	---	---	Average

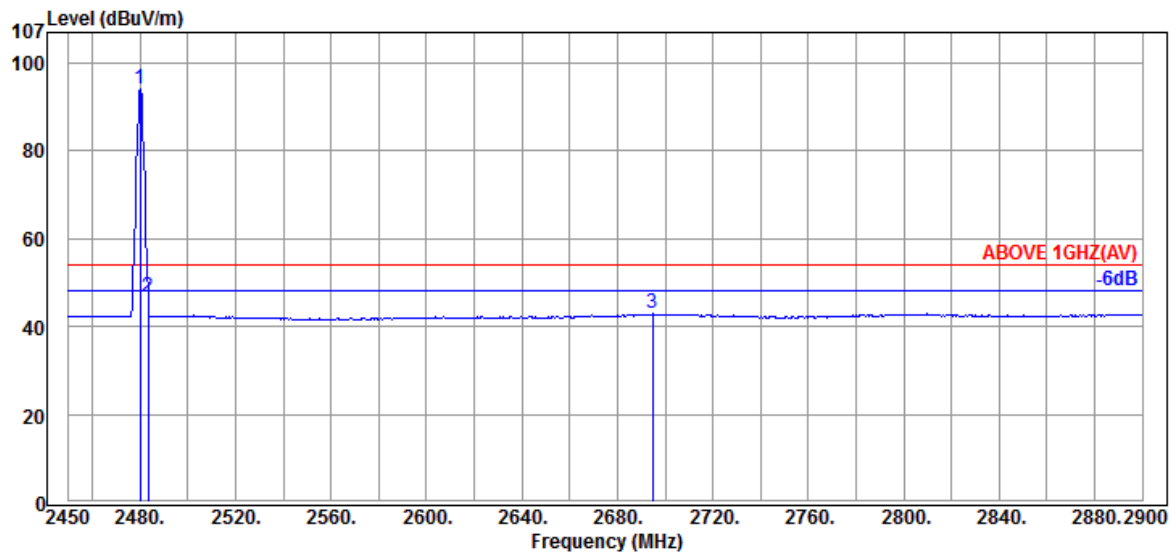
備註：“@”為主波，在此章節是不予以判定。

Mode	BLE (2 Mbps)	Frequency	TX 2480MHz
------	--------------	-----------	------------



Antenna at Horizontal Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2480.60	32.58	8.58	54.78	95.94	---	---	Peak
	2483.30	32.57	8.58	17.09	58.24	74.00	15.76	Peak
	2688.05	32.61	8.63	14.50	55.74	74.00	18.26	Peak

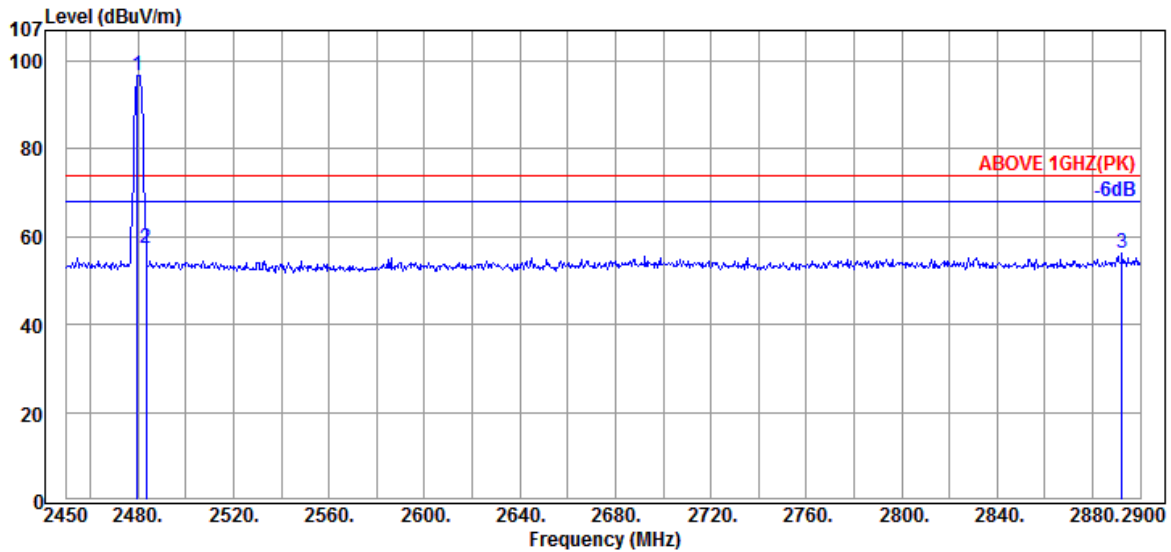


Antenna at Horizontal Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2480.15	32.58	8.58	53.04	94.20	---	---	Average
	2483.30	32.57	8.58	5.46	46.61	54.00	7.39	Average
	2694.80	32.72	8.64	1.49	42.85	54.00	11.15	Average

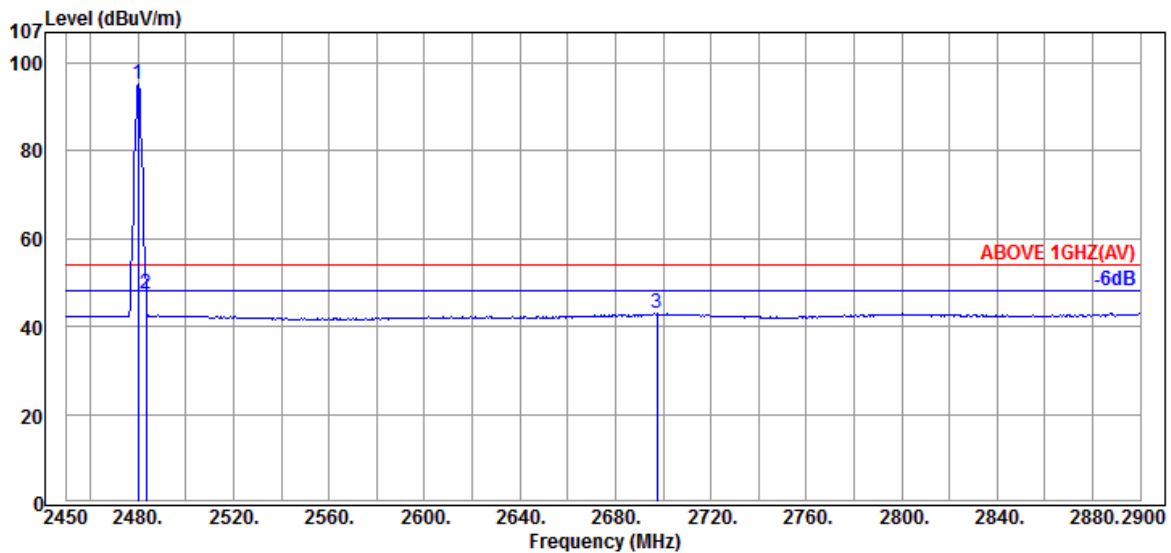
備註：“@”為主波，在此章節是不予以判定。

Mode	BLE (2 Mbps)	Frequency	TX 2480MHz
------	--------------	-----------	------------



Antenna at Vertical Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2479.70	32.58	8.58	55.65	96.81	---	---	Peak
	2483.30	32.57	8.58	16.32	57.47	74.00	16.53	Peak
	2892.35	32.95	8.68	14.46	56.09	74.00	17.91	Peak



Antenna at Vertical Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2480.15	32.58	8.58	53.93	95.09	---	---	Average
	2483.30	32.57	8.58	6.36	47.51	54.00	6.49	Average
	2697.50	32.76	8.64	1.56	42.96	54.00	11.04	Average

備註：“@”為主波，在此章節是不予以判定。

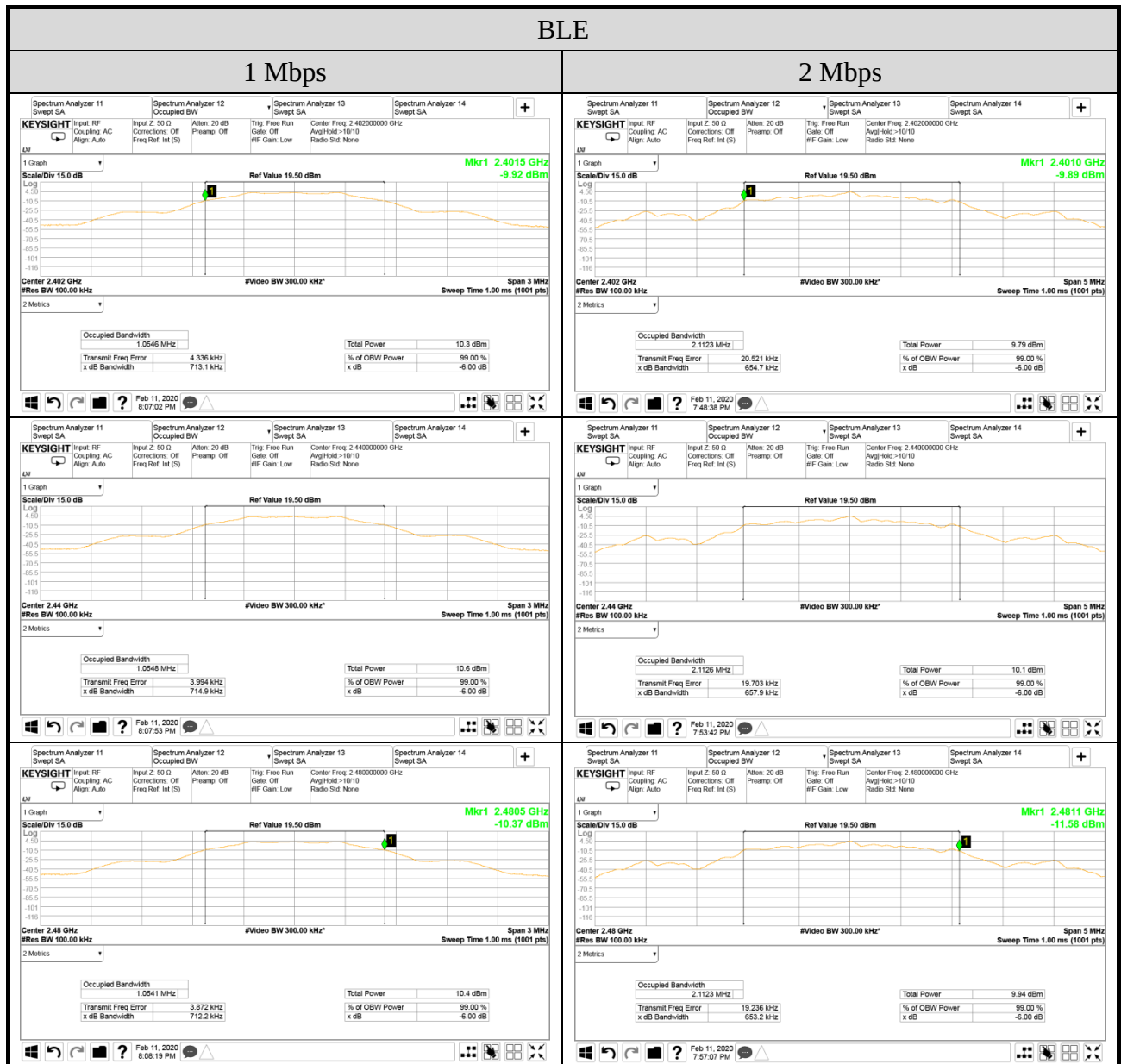
2. 發射頻寬之量測

測試日期	2020/02/11	環境溫/濕度	22°C/56%
電纜損失	1.0dB	測試人員	Sean Wang
測試電壓	DC 7.2V (經內建鋰電池供電)		

2.1. 發射頻寬

模式 (Mode)	測試頻率 (MHz)	6dB 頻寬 (MHz)	限制值 (kHz)
BLE (1Mbps)	2402	0.7131	>500
	2440	0.7149	
	2480	0.7122	
BLE (2 Mbps)	2402	0.6547	
	2440	0.6579	
	2480	0.6532	

2.2. 發射頻寬之量測圖



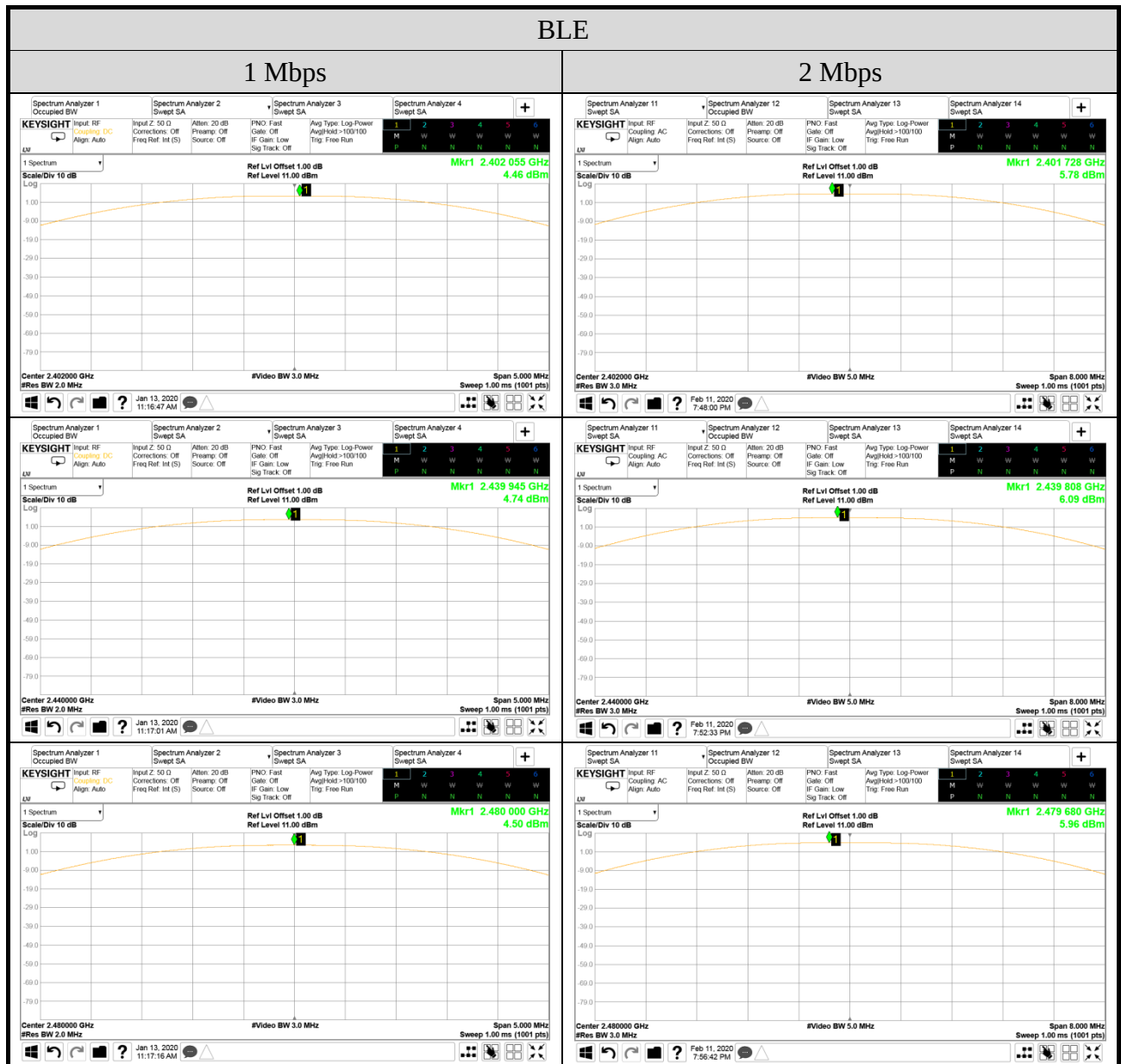
3. 峰值輸出功率之量測

測試日期	2020/02/11	環境溫/濕度	22°C/56%
電纜損失	1.0dB	測試人員	Sean Wang
測試電壓	DC 7.2V (經內建鋰電池供電)		

3.1. 峰值輸出功率

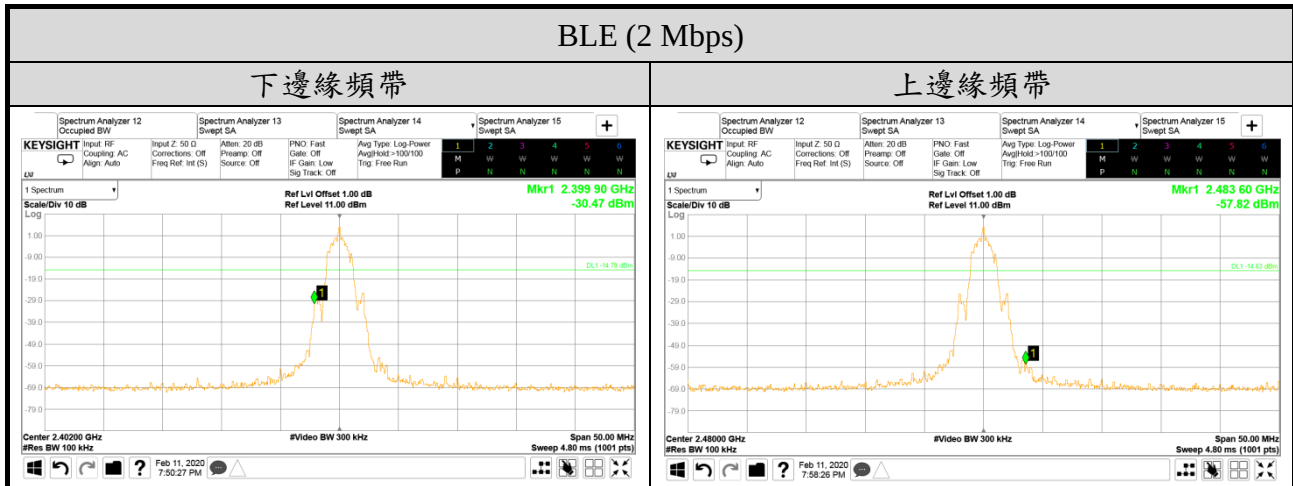
模式 (Mode)	測試頻率 (MHz)	最大輸出功率(dBm)	限制值 (dBm)
BLE (1Mbps)	2402	4.46	30
	2440	4.74	
	2480	4.50	
BLE (2 Mbps)	2402	5.78	
	2440	6.09	
	2480	5.96	

3.2. 峰值輸出功率之量測圖



4. 頻帶邊緣之 RF 傳導發射之量測

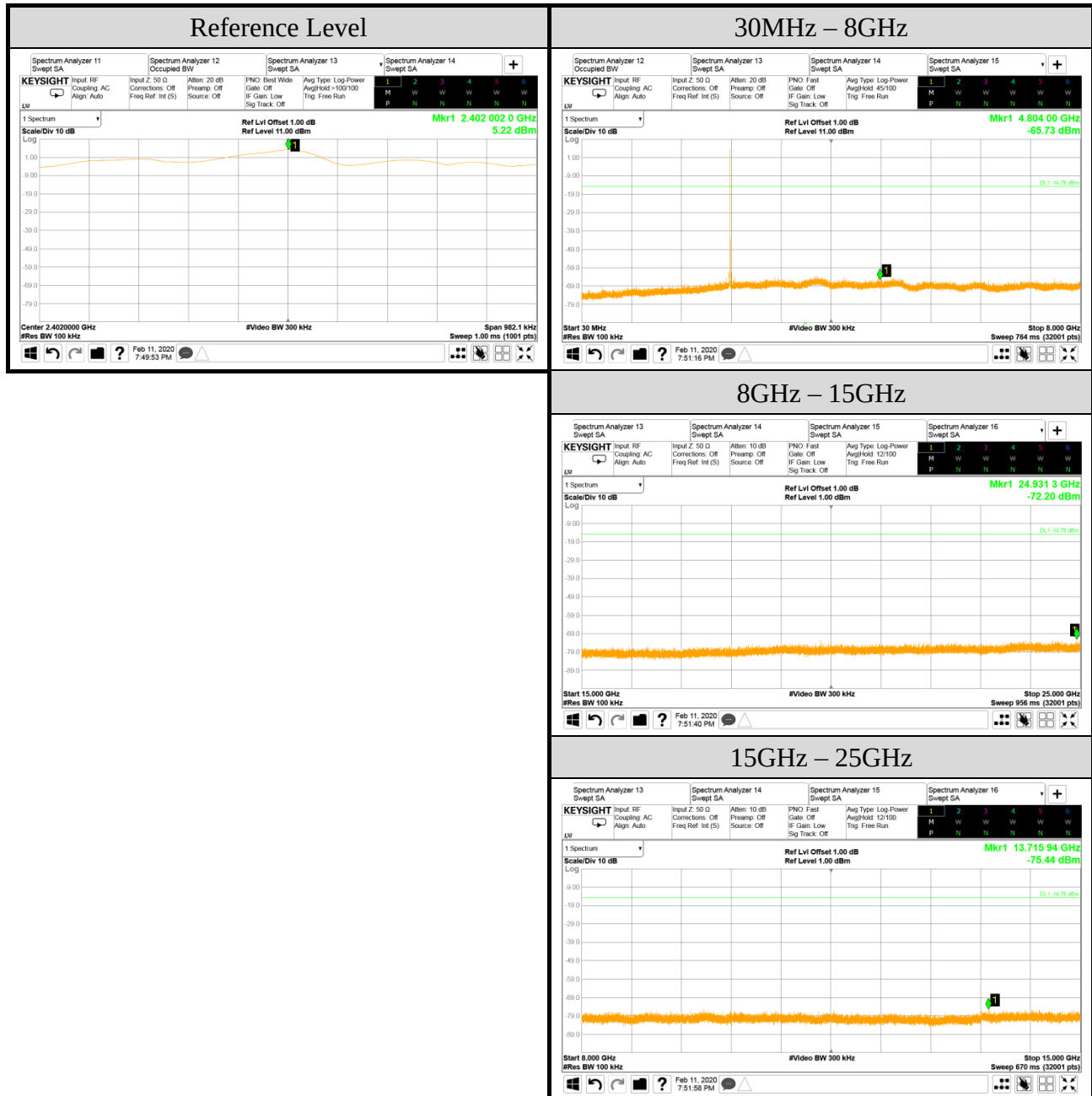
測試日期	2020/02/11	環境溫/濕度	22°C/56%
電纜損失	1.0dB	測試人員	Sean Wang
測試電壓	DC 7.2V (經內建鋰電池供電)		



註：經實驗室評估，擇取較差模式 BLE (2Mbps)進行量測。

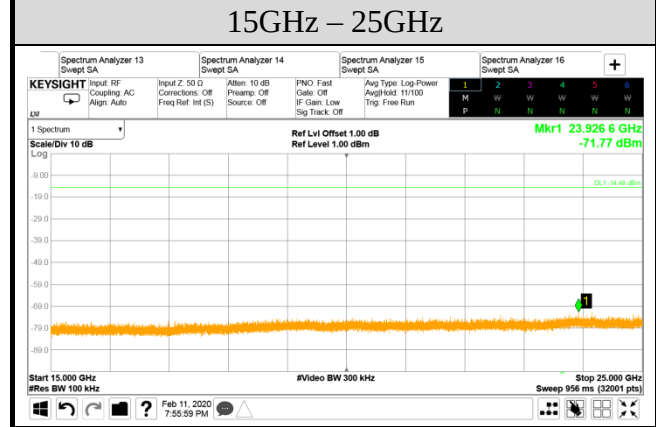
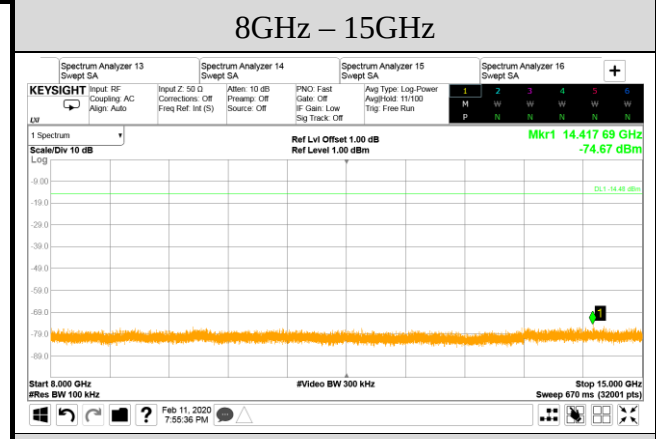
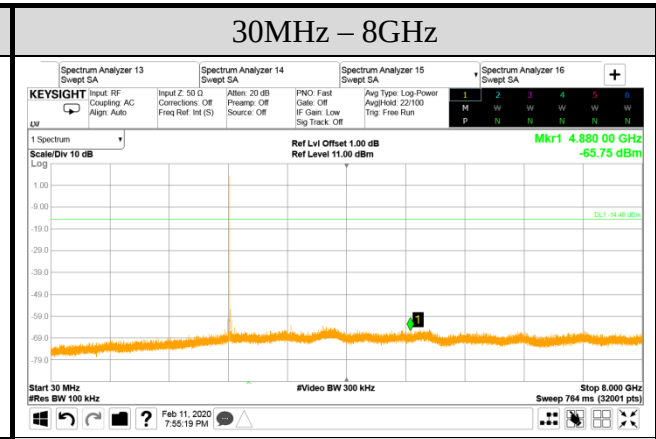
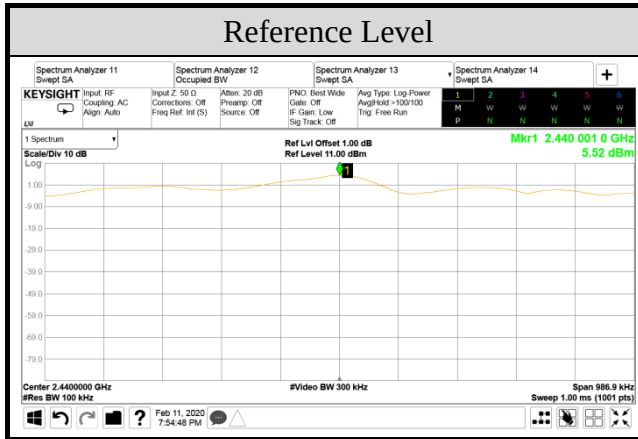
5. 混附發射之 RF 傳導發射之量測

測試日期	2020/02/11	環境溫/濕度	22°C/56%
電纜損失	1.0dB	模式	BLE (2 Mbps)
測試電壓	DC 7.2V (經內建鋰電池供電)	測試頻率	2402MHz
		測試人員	Sean Wang



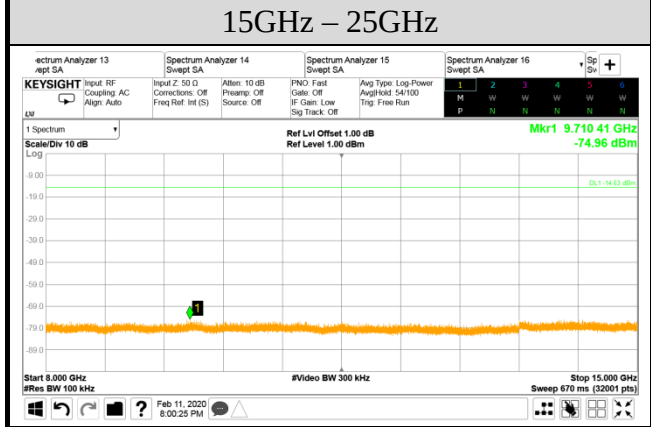
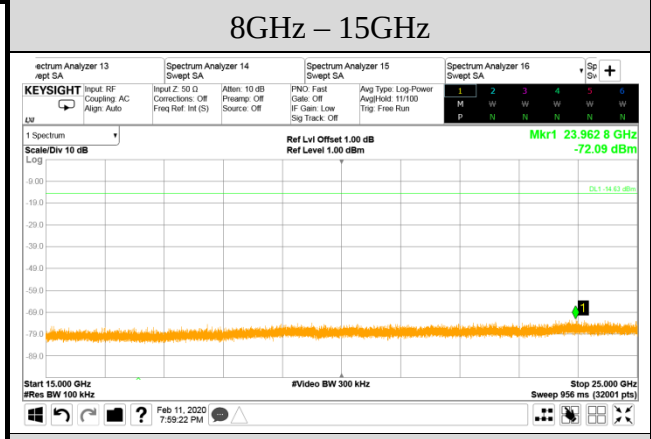
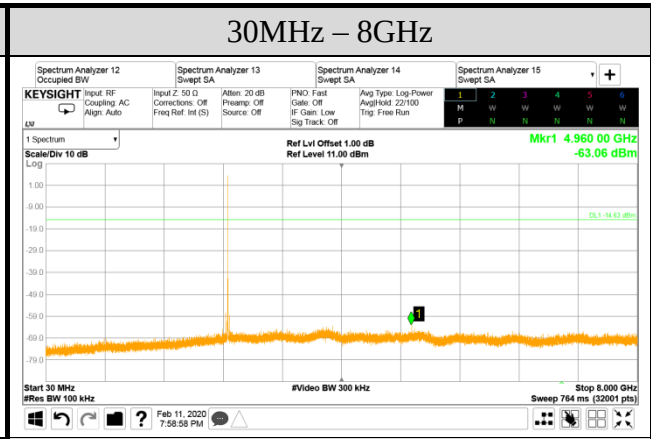
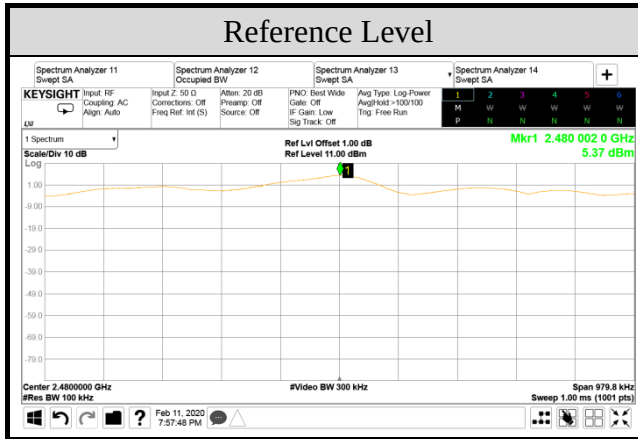
註：經實驗室評估，擇取較差模式 BLE (2Mbps)進行量測。

測試日期	2020/02/11	環境溫/濕度	22°C/56%
電纜損失	1.0dB	模式	BLE (2 Mbps)
測試電壓	DC 7.2V (經內建鋰電池供電)	測試頻率	2440MHz
		測試人員	Sean Wang



註：經實驗室評估，擇取較差模式 BLE (2Mbps)進行量測。

測試日期	2020/02/11	環境溫/濕度	22°C/56%
電纜損失	1.0dB	模式	BLE (2 Mbps)
測試電壓	DC 7.2V (經內建鋰電池供電)	測試頻率	2480MHz
		測試人員	Sean Wang



註：經實驗室評估，擇取較差模式 BLE (2Mbps)進行量測。

6. 功率密度之量測

測試日期	2020/02/11	環境溫/濕度	22°C/56%
電纜損失	1.0dB	測試人員	Sean Wang
測試電壓	DC 7.2V (經內建鋰電池供電)		

6.1. 功率密度

模式 (Mode)	測試頻率 (MHz)	功率密度 (dBm)	限制值 (dBm)
BLE (2 Mbps)	2402	5.22	8
	2440	5.52	
	2480	5.37	

註：1. 測試結果係依照 FCC 公告之 KDB558074 D01V04，且解析頻寬以 100kHz 量測其測試結果較 3kHz 嚴格

2. 經實驗室評估，擇取較差模式 BLE (2Mbps)進行量測。

6.2. 功率密度之量測圖

