

附錄一

受測裝置之測試結果

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1. 場強輻射之量測

對受測物裝置之其他不必要之發射(測至本地振盪頻率之 10 次諧波)依下列測試模式分別於電波暗室內進行量測，實驗室先將發射機分別以三種不同的擺設方式(平放、站立、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測試數據隨案件所附；所得讀值資料請見章節 1.1 ~1.2：

模式	動作狀態	基本頻率	量測頻率範圍
BLE	發射	2402MHz	1000-25000MHz
		2440MHz*	30-1000MHz
			1000-25000MHz
		2480MHz	1000-25000MHz
	接收	2440MHz	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 3.5 章節的禁用頻帶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	動作狀態	基本頻率	量測頻率範圍
BLE	發射	2402MHz	2310-2410MHz
		2480MHz	2430-2930MHz

測試日期	2021/03/09~12	環境溫/濕度	19~22°C/69~71%
測試電壓	DC 3.3V (經 Jig 供電)	測試人員	Kuper Hsu

1.1. 30-1000MHz 頻率範圍，其他不必要發射量測

Mode	BLE	Frequency	TX 2440MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
32.910	23.30	1.24	28.14	34.87	31.27	40.00	8.73	Peak
156.100	16.65	2.92	27.81	44.05	35.81	43.50	7.69	Peak
345.250	20.95	4.91	28.00	37.25	35.11	46.00	10.89	Peak
484.930	23.54	6.32	29.11	41.33	42.08	46.00	3.92	Peak
830.250	26.69	8.01	29.04	37.14	42.80	46.00	3.20	Peak
965.080	27.57	8.79	28.66	31.70	39.40	54.00	14.60	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
35.820	22.12	1.30	28.13	35.31	30.60	40.00	9.40	Peak
207.510	16.21	3.45	27.67	44.87	36.86	43.50	6.64	Peak
482.990	23.49	6.29	29.08	39.65	40.35	46.00	5.65	Peak
666.320	25.37	7.11	29.35	34.34	37.47	46.00	8.53	Peak
830.250	26.69	8.01	29.04	37.44	43.10	46.00	2.90	Peak
967.990	27.60	8.81	28.66	31.20	38.95	54.00	15.05	Peak

Mode	---	Frequency	RX 2440MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
54.250	13.45	1.64	28.12	43.48	30.45	40.00	9.55	Peak
207.510	16.21	3.45	27.67	41.79	33.78	43.50	9.72	Peak
311.300	20.04	4.46	27.68	39.85	36.67	46.00	9.33	Peak
482.990	23.49	6.29	29.08	39.54	40.24	46.00	5.76	Peak
830.250	26.69	8.01	29.04	38.91	44.57	46.00	1.43	Peak
978.660	27.71	8.86	28.64	31.46	39.39	54.00	14.61	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
36.790	21.56	1.32	28.13	35.85	30.60	40.00	9.40	Peak
207.510	16.21	3.45	27.67	46.90	38.89	43.50	4.61	Peak
414.120	22.48	5.68	28.56	35.35	34.95	46.00	11.05	Peak
482.990	23.49	6.29	29.08	38.13	38.83	46.00	7.17	Peak
831.220	26.69	8.01	29.04	38.31	43.97	46.00	2.03	Peak
971.870	27.64	8.83	28.66	31.51	39.32	54.00	14.68	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		Frequency	TX 2402MHz				
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4806.000	33.40	10.49	34.44	39.55	49.00	54.00	5.00	Average
4806.000	33.40	10.49	34.44	44.77	54.22	74.00	19.78	Peak
7206.000	36.40	12.25	34.63	31.97	45.99	54.00	8.01	Peak
9610.000	38.00	14.37	35.17	33.04	50.24	54.00	3.76	Average
9610.000	38.00	14.37	35.17	43.23	60.43	74.00	13.57	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4804.000	33.40	10.49	34.44	36.60	46.05	54.00	7.95	Peak
7206.000	36.40	12.25	34.63	30.90	44.92	54.00	9.08	Peak
9610.000	38.00	14.37	35.17	28.12	45.32	54.00	8.68	Average
9610.000	38.00	14.37	35.17	38.31	55.51	74.00	18.49	Peak

Mode	BLE		Frequency	TX 2440MHz				
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4882.000	33.52	10.54	34.43	39.26	48.89	54.00	5.11	Average
4882.000	33.52	10.54	34.43	44.47	54.10	74.00	19.90	Peak
7319.000	36.70	12.29	34.71	32.82	47.10	54.00	6.90	Peak
9760.000	38.00	14.48	35.16	31.38	48.70	54.00	5.30	Average
9760.000	38.00	14.48	35.16	41.57	58.89	74.00	15.11	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4880.000	33.45	10.54	34.43	36.17	45.73	54.00	8.27	Peak
7319.000	36.70	12.29	34.71	32.03	46.31	54.00	7.69	Peak
9760.000	38.00	14.48	35.16	34.34	51.66	54.00	2.34	Peak

Mode	BLE		Frequency	TX 2480MHz				
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4960.000	33.72	10.60	34.41	43.40	53.31	54.00	0.69	Peak
7439.000	36.77	12.36	34.78	31.21	45.56	54.00	8.44	Peak
9920.000	38.30	14.63	35.15	35.48	53.26	54.00	0.74	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4960.000	33.72	10.60	34.41	35.60	45.51	54.00	8.49	Peak
7439.000	36.77	12.36	34.78	31.09	45.44	54.00	8.56	Peak
9920.000	38.30	14.63	35.15	33.39	51.17	54.00	2.83	Peak

Mode	BLE		Frequency	RX 2440MHz				
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Antenna at Horizontal Polarization

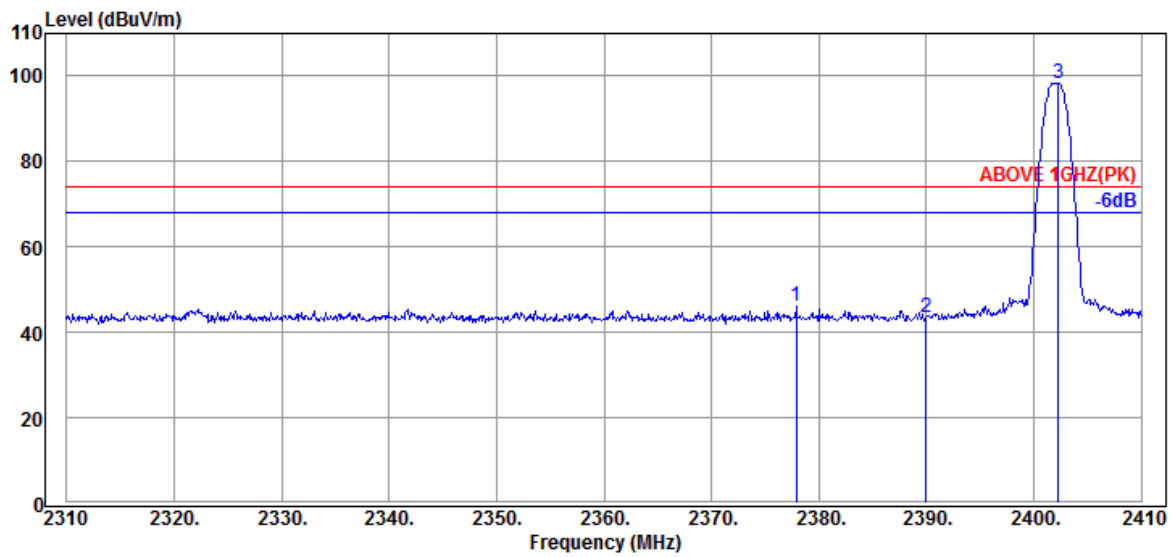
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4880.000	33.45	10.54	34.43	32.25	41.81	54.00	12.19	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
4880.000	33.45	10.54	34.43	32.13	41.69	54.00	12.31	Peak

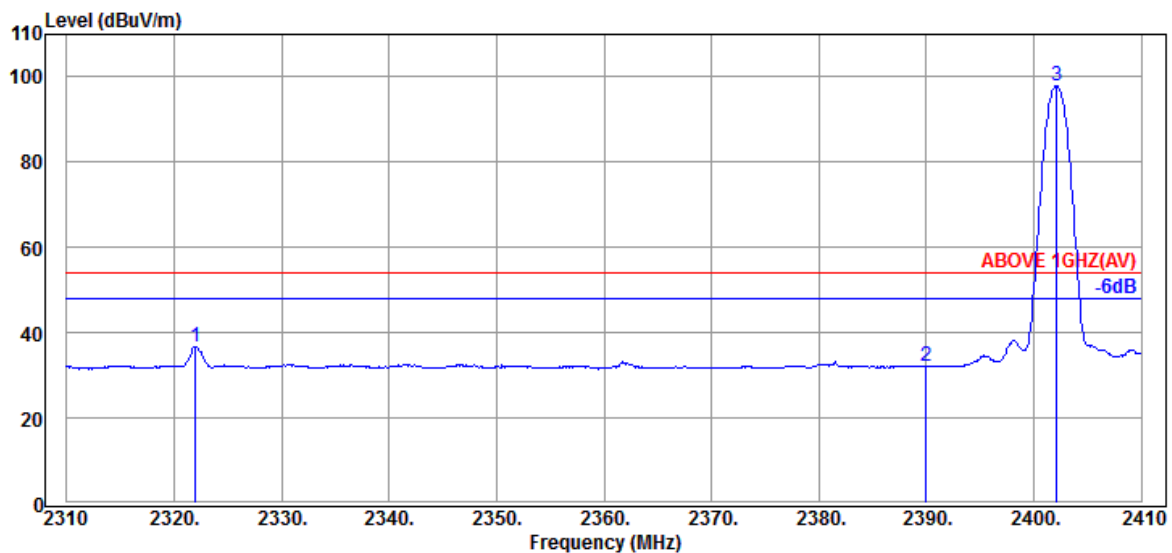
1.3. 禁用頻帶量測結果 (其他不必要發射)

Mode	BLE	Frequency	TX 2402MHz
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Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2377.900	28.26	7.95	34.58	44.33	45.96	74.00	28.04	Peak
2390.000	28.27	7.95	34.58	41.86	43.50	74.00	30.50	Peak
@ 2402.300	28.30	7.95	34.59	96.67	98.33	---	---	Peak

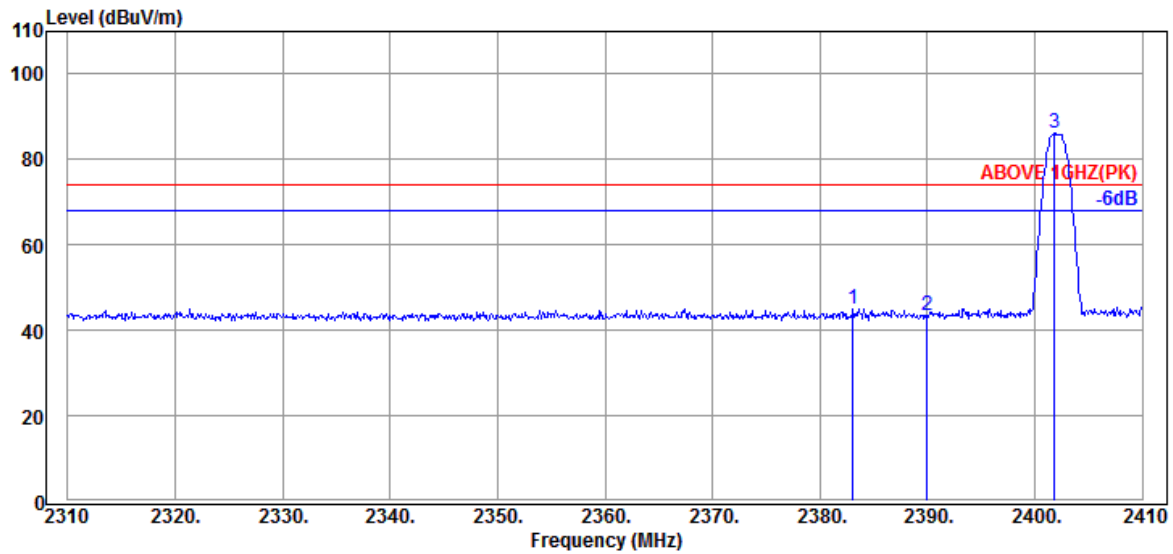


Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2322.000	28.14	7.92	34.57	35.13	36.62	54.00	17.38	Average
2390.000	28.27	7.95	34.58	30.39	32.03	54.00	21.97	Average
@ 2402.100	28.30	7.95	34.59	96.25	97.91	---	---	Average

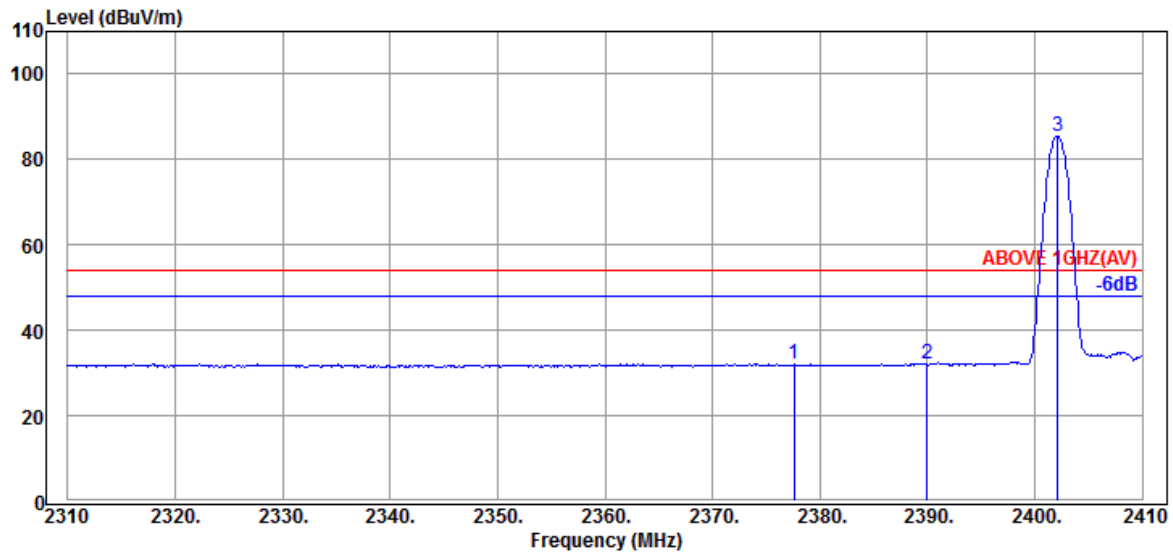
備註：“@”為主波，在此章節是不予以判定。

Mode	BLE	Frequency	TX 2402MHz
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Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2383.100	28.26	7.95	34.58	43.42	45.05	74.00	28.95	Peak
2390.000	28.27	7.95	34.58	41.75	43.39	74.00	30.61	Peak
@ 2401.800	28.30	7.95	34.59	84.37	86.03	---	---	Peak

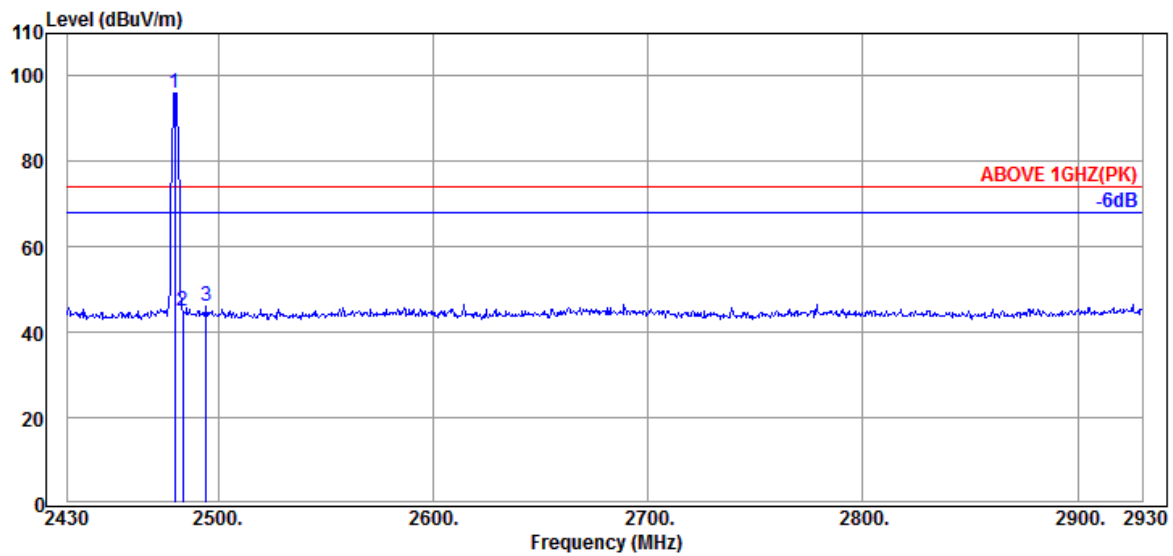


Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
2377.600	28.26	7.95	34.58	30.60	32.23	54.00	21.77	Average
2390.000	28.27	7.95	34.58	30.53	32.17	54.00	21.83	Average
@ 2402.100	28.30	7.95	34.59	83.91	85.57	---	---	Average

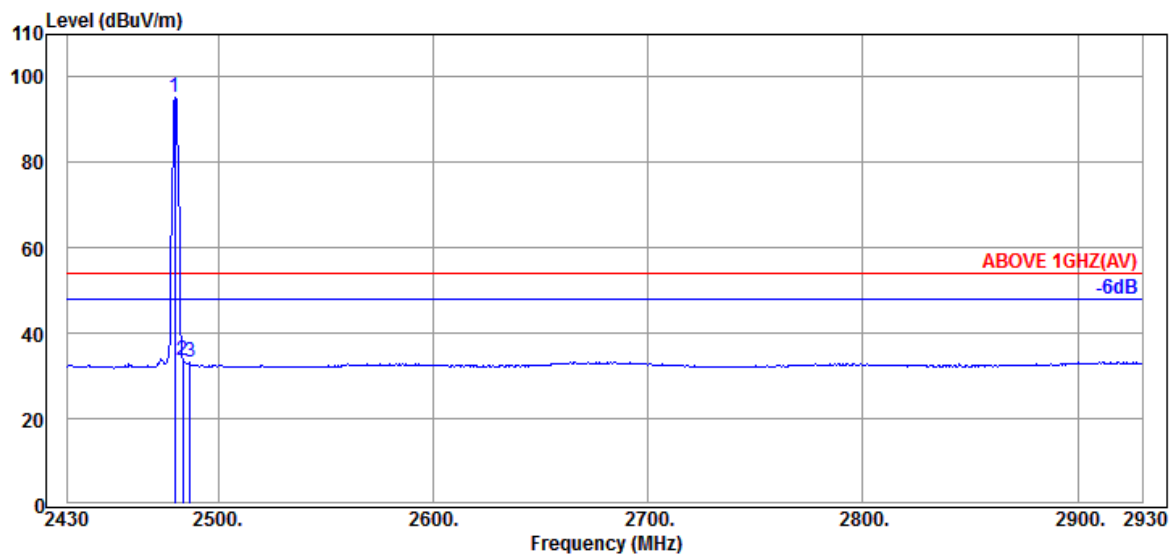
備註：“@”為主波，在此章節是不予以判定。

Mode	BLE	Frequency	TX 2480MHz
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Antenna at Horizontal Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2480.000	28.60	7.99	34.60	93.92	95.91	---	---	Peak
	2483.500	28.60	7.99	34.61	42.92	44.90	74.00	29.10	Peak
	2494.500	28.60	8.00	34.61	44.06	46.05	74.00	27.95	Peak

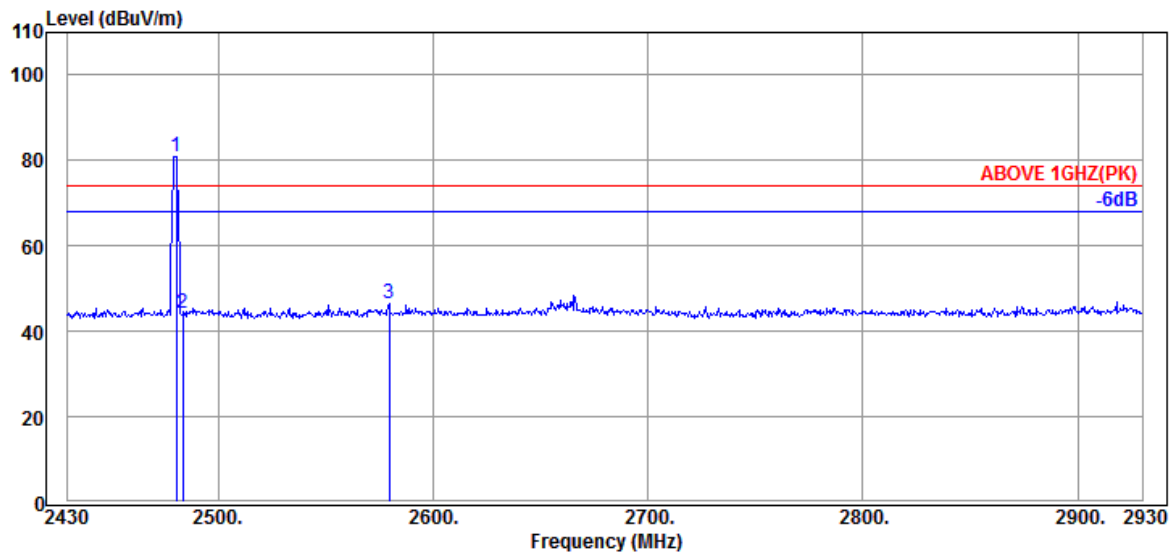


Antenna at Horizontal Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2480.000	28.60	7.99	34.60	93.41	95.40	---	---	Average
	2483.500	28.60	7.99	34.61	31.59	33.57	54.00	20.43	Average
	2487.000	28.60	8.00	34.61	31.23	33.22	54.00	20.78	Average

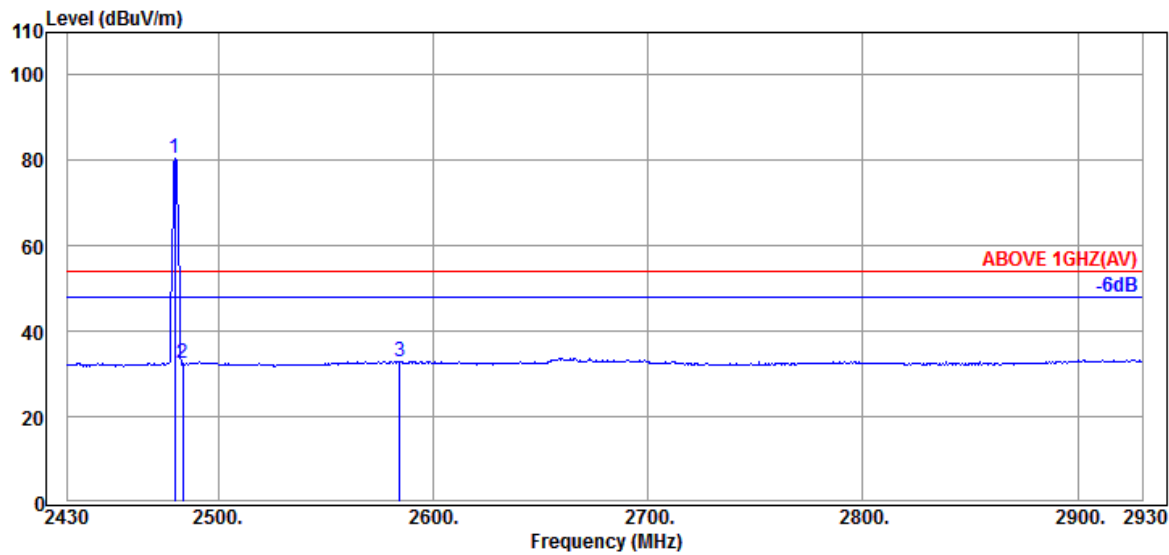
備註：“@”為主波，在此章節是不予以判定。

Mode	BLE	Frequency	TX 2480MHz
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Antenna at Vertical Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2480.500	28.60	7.99	34.60	79.08	81.07	---	---	Peak
	2483.500	28.60	7.99	34.61	42.16	44.14	74.00	29.86	Peak
	2579.500	28.93	8.04	34.62	44.04	46.39	74.00	27.61	Peak



Antenna at Vertical Polarization

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
@	2480.000	28.60	7.99	34.60	78.46	80.45	---	---	Average
	2483.500	28.60	7.99	34.61	30.35	32.33	54.00	21.67	Average
	2584.500	28.99	8.05	34.63	30.58	32.99	54.00	21.01	Average

備註：“@”為主波，在此章節是不予以判定。

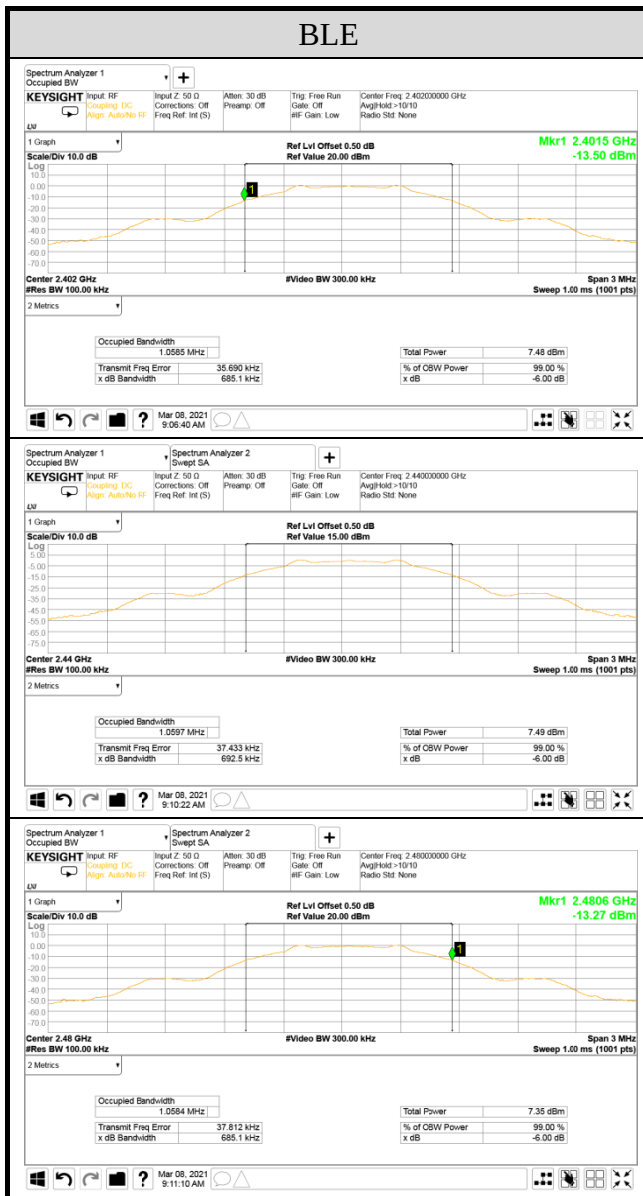
2. 發射頻寬之量測

測試日期	2021/03/08	環境溫/濕度	17°C/75%
測試電壓	DC 3.3V (經 Jig 供電)	電纜損失	0.50dB
		測試人員	Kuper Hsu

2.1. 發射頻寬

模式	測試頻率 (MHz)	6dB 頻寬 (MHz)	限制值 (kHz)
BLE	2402	0.6851	>500
	2440	0.6925	
	2480	0.6851	

2.2. 發射頻寬之量測圖



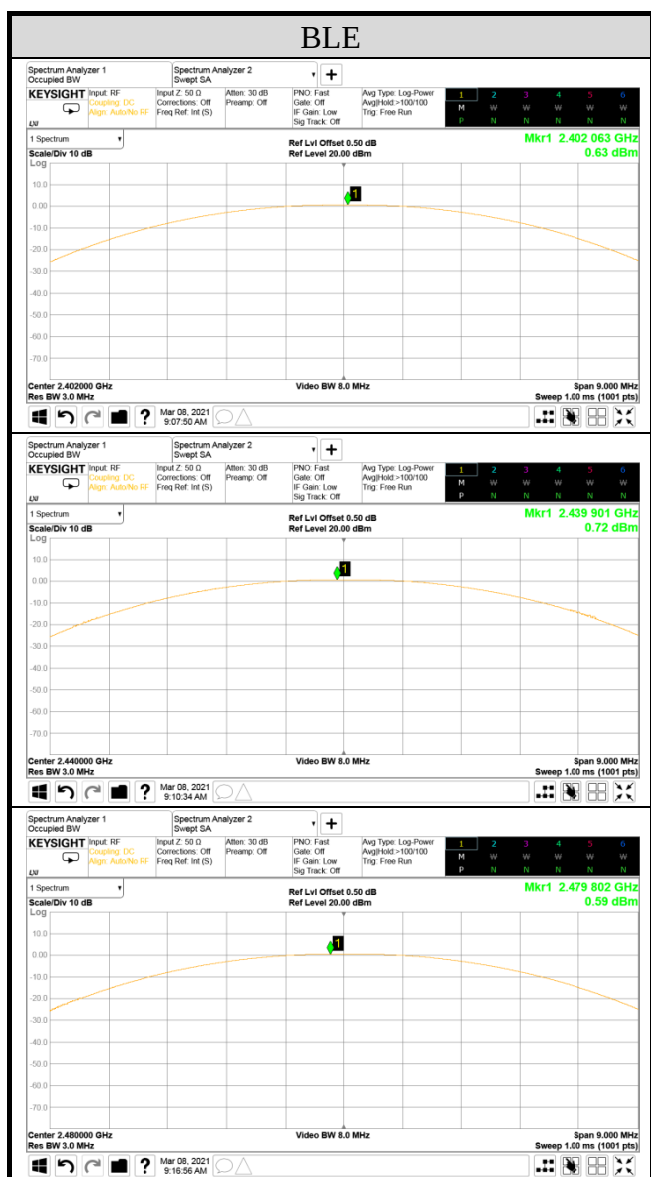
3. 峰值輸出功率之量測

測試日期	2021/03/08	環境溫/濕度	17°C/75%
測試電壓	DC 3.3V (經 Jig 供電)	電纜損失	0.50dB
		測試人員	Kuper Hsu

3.1. 峰值輸出功率

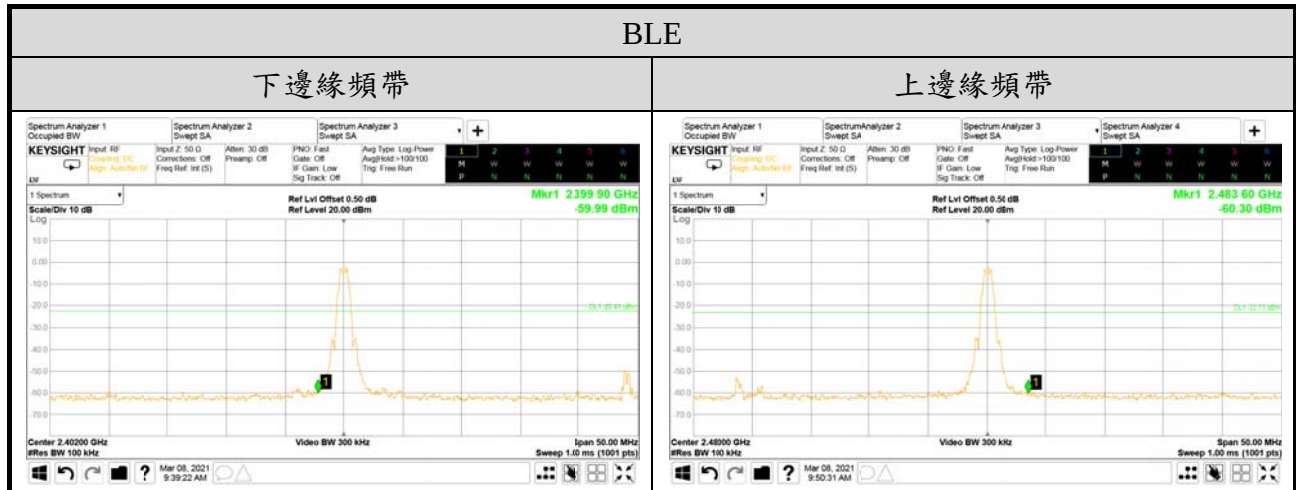
模式	測試頻率(MHz)	輸出功率(dBm)	限制值(dBm)
BLE	2402	0.63	30
	2440	0.72	
	2480	0.59	

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	2021/03/08	環境溫/濕度	17°C/75%
測試電壓	DC 3.3V (經 Jig 供電)	電纜損失	0.50dB
		測試人員	Kuper Hsu



5. 混附發射之 RF 傳導發射之量測

測試日期	2021/03/08	環境溫/濕度	17°C/75%
電纜損失	0.50dB	測試人員	Kuper Hsu
測試電壓	DC 3.3V (經 Jig 供電)	模式	BLE
		測試頻率	2402MHz



測試日期	2021/03/08	環境溫/濕度	17°C/75%
電纜損失	0.50dB	測試人員	Kuper Hsu
測試電壓	DC 3.3V (經 Jig 供電)	模式	BLE
		測試頻率	2440MHz



測試日期	2021/03/08	環境溫/濕度	17°C/75%
電纜損失	0.50dB	測試人員	Kuper Hsu
測試電壓	DC 3.3V (經 Jig 供電)	模式	BLE
		測試頻率	2480MHz



6. 功率密度之量測

測試日期	2021/03/08	環境溫/濕度	17°C/75%
測試電壓	DC 3.3V (經 Jig 供電)	電纜損失	0.50dB
		測試人員	Kuper Hsu

6.1. 功率密度

模式	測試頻率 (MHz)	功率密度 (dBm)	限制值 (dBm)
BLE	2402	-2.41	<8dBm/3kHz
	2440	-2.60	
	2480	-2.73	

BLE 模式測試結果係依照 FCC 公告之 KDB558074 D01 v05r02，且解析頻寬以 100kHz 量測其測試結果較 3kHz 嚴格

6.2. 功率密度之量測圖

