

7. 發射頻寬之要求

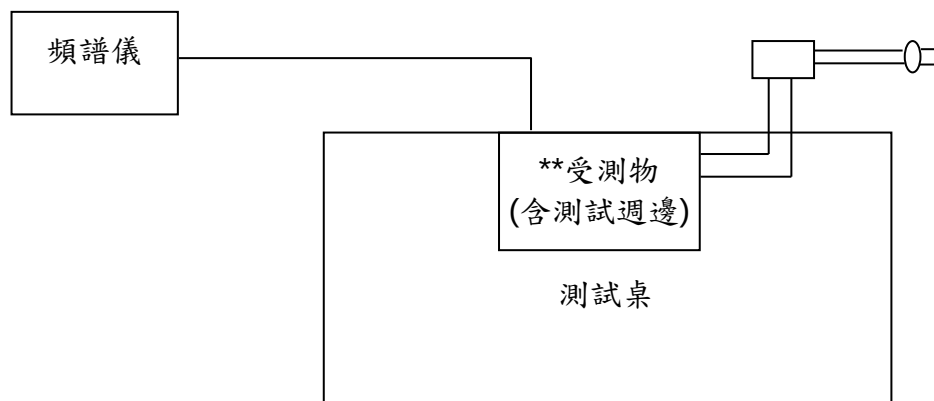
7.1 適用標準

對使用數位調變技術之低功率發射機，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(2)(A)之規定，6dB 之頻寬至少應有 500kHz。

7.2 測試方法

測量時，頻譜分析儀之解析頻寬為 $RBW=100\text{kHz}$ 、 $VBW=300\text{kHz}$ ，視訊頻寬不小於解析頻寬。為求得精確測量，頻率掃描範圍(Span)遠大於解析頻寬。

7.3 測試配置



註: **請參照 3.2 節

7.4 發射頻寬之量測結果

判定結果：合格

Test Mode: IEEE 802.11b Mode

頻道	頻率 (MHz)	頻寬讀值 (MHz)	限制值 (kHz)	測試結果
Low	2412	10.0435	>500	PASS
Mid	2437	10.087		PASS
High	2462	10.087		PASS

Test Mode: IEEE 802.11g Mode

頻道	頻率 (MHz)	頻寬讀值 (MHz)	限制值 (kHz)	測試結果
Low	2412	15.1304	>500	PASS
Mid	2437	15.1304		PASS
High	2462	15.1304		PASS

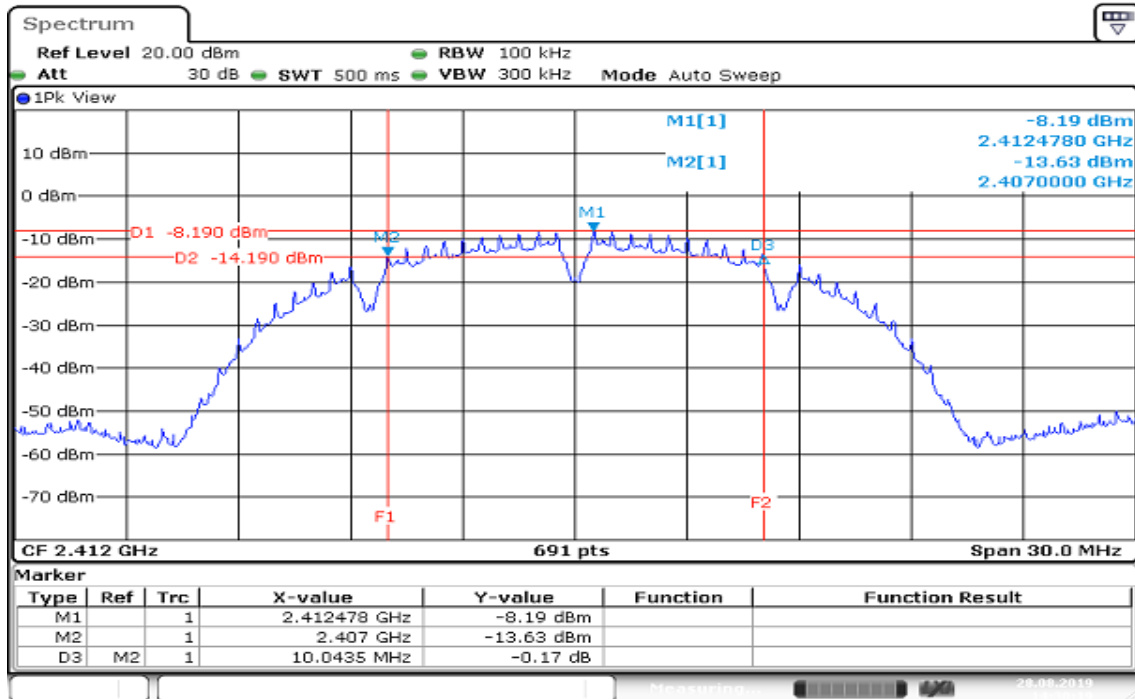
Test Mode: IEEE 802.11n HT 20 Mode

頻道	頻率 (MHz)	頻寬讀值 (MHz)	限制值 (kHz)	測試結果
Low	2412	15.1304	>500	PASS
Mid	2437	15.1304		PASS
High	2462	15.087		PASS

Test Mode: IEEE 802.11n HT 40 Mode

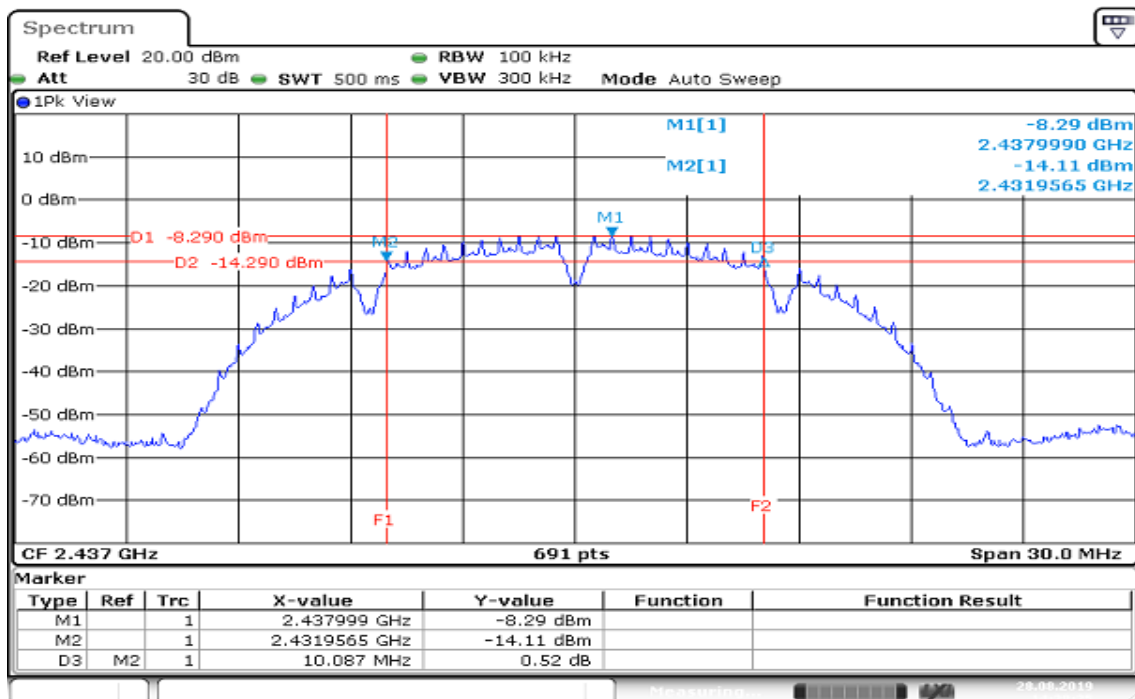
頻道	頻率 (MHz)	頻寬讀值 (MHz)	限制值 (kHz)	測試結果
Low	2422	33.855	>500	PASS
Mid	2437	33.855		PASS
High	2452	33.855		PASS

發射頻寬測試值 IEEE 802.11b Mode / CH Low



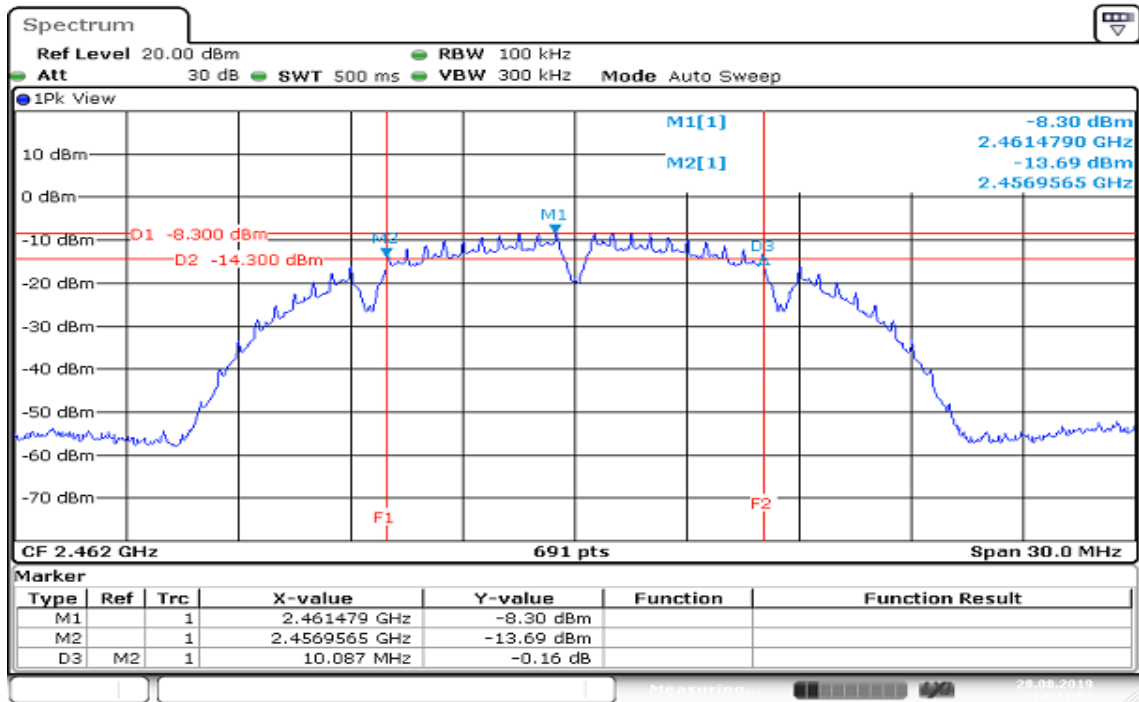
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發射頻寬測試值 IEEE 802.11b Mode / CH Mid



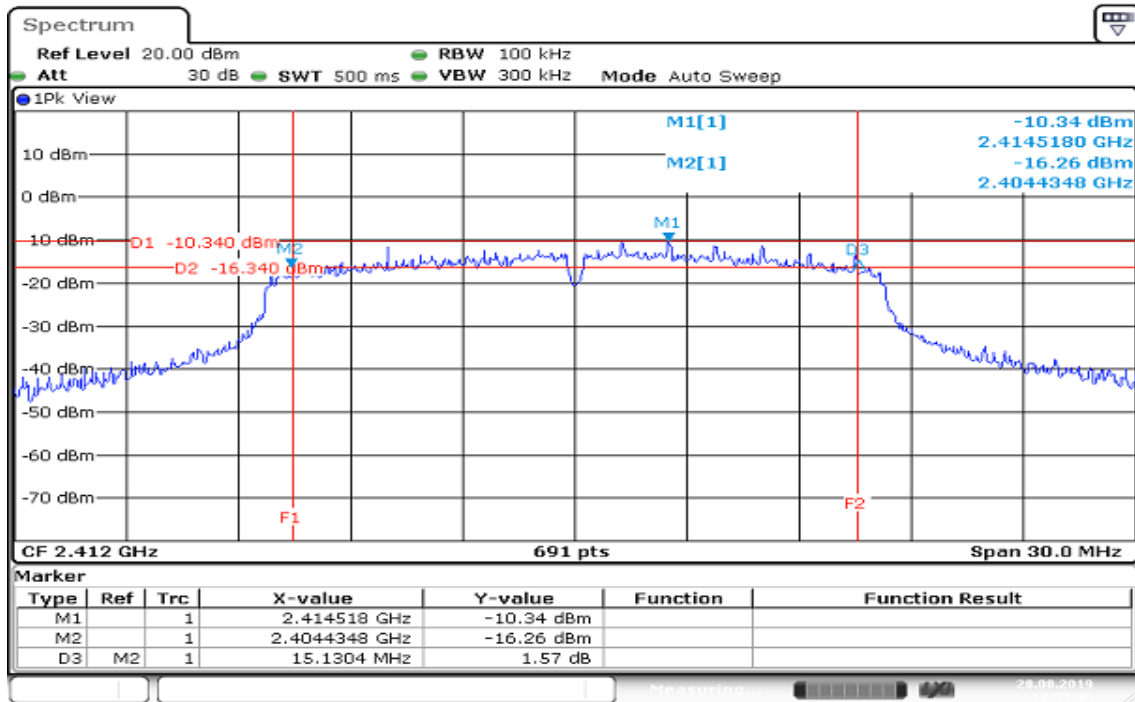
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發射頻寬測試值 IEEE 802.11b Mode / CH High



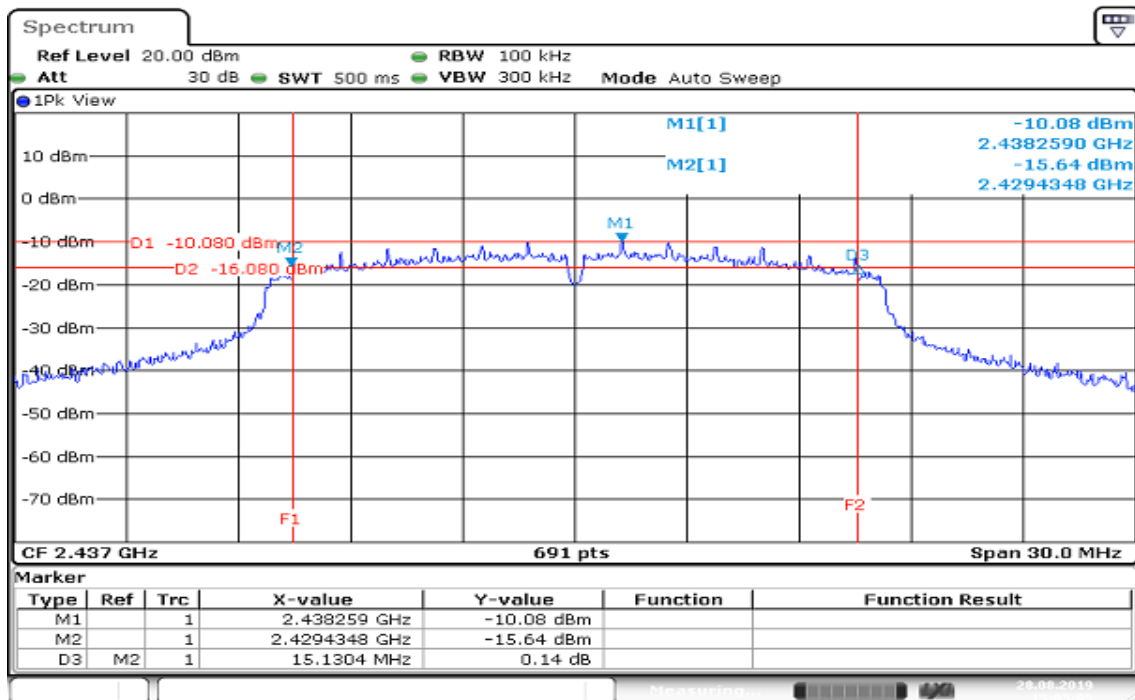
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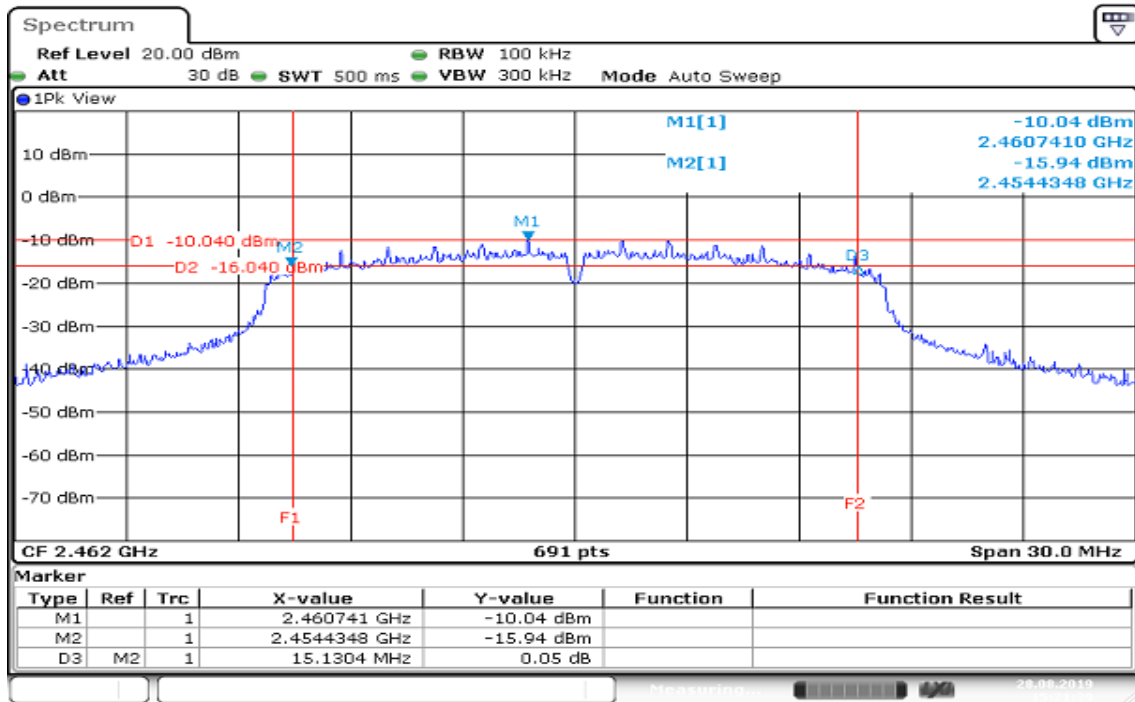
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發射頻寬測試值 IEEE 802.11g Mode / CH Mid



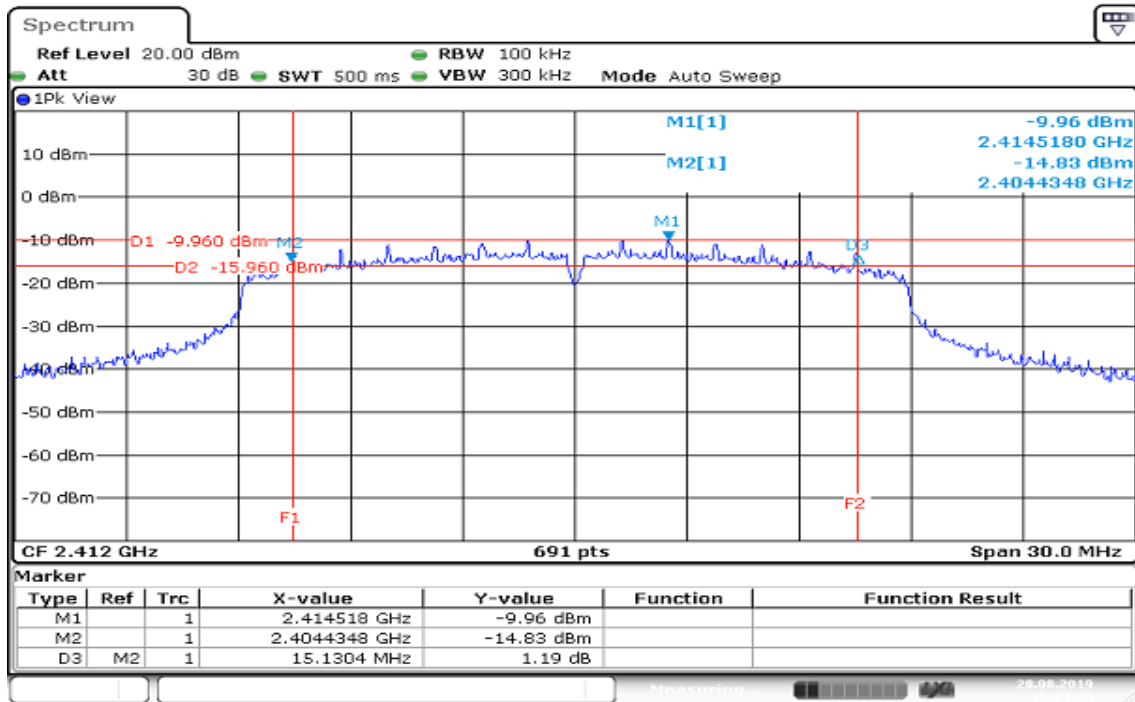
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發射頻寬測試值 IEEE 802.11g Mode / CH High



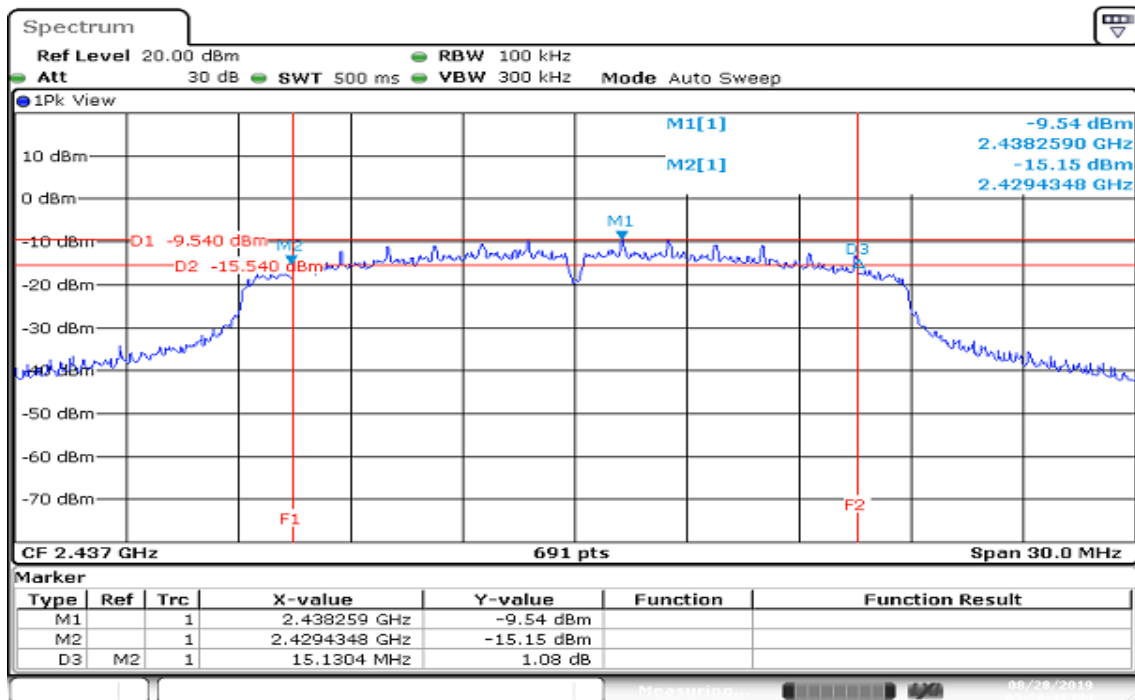
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發射頻寬測試值 IEEE 802.11n HT 20 Mode / CH Low



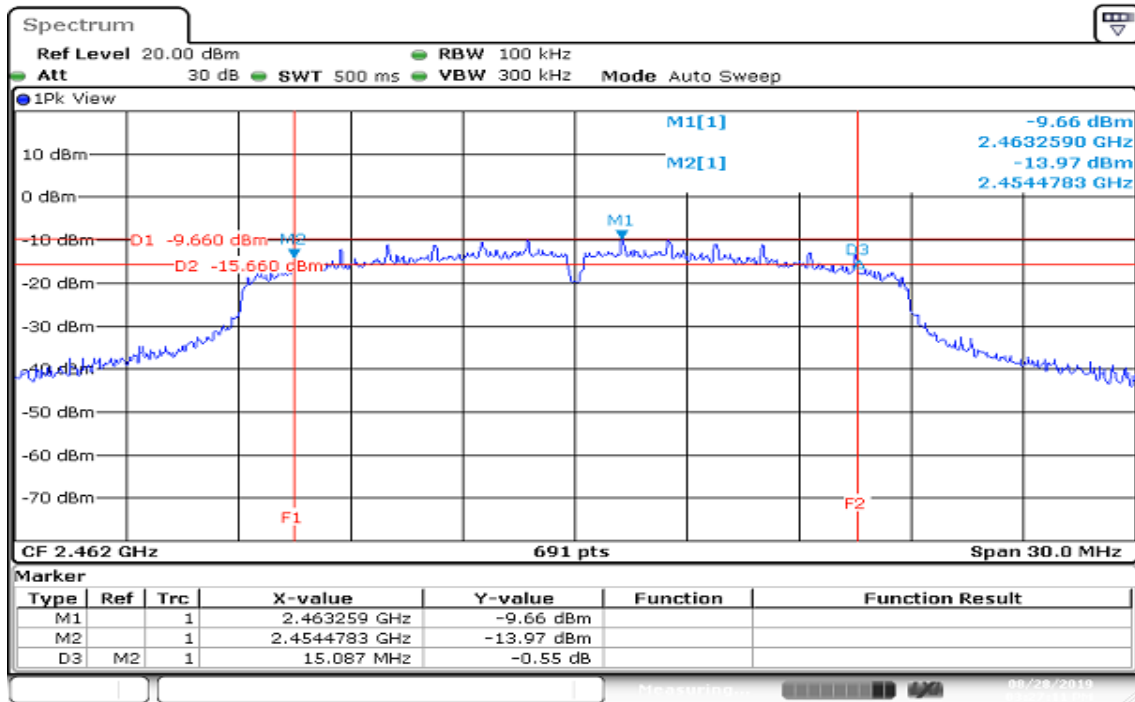
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發射頻寬測試值 IEEE 802.11n HT 20 Mode / CH Mid



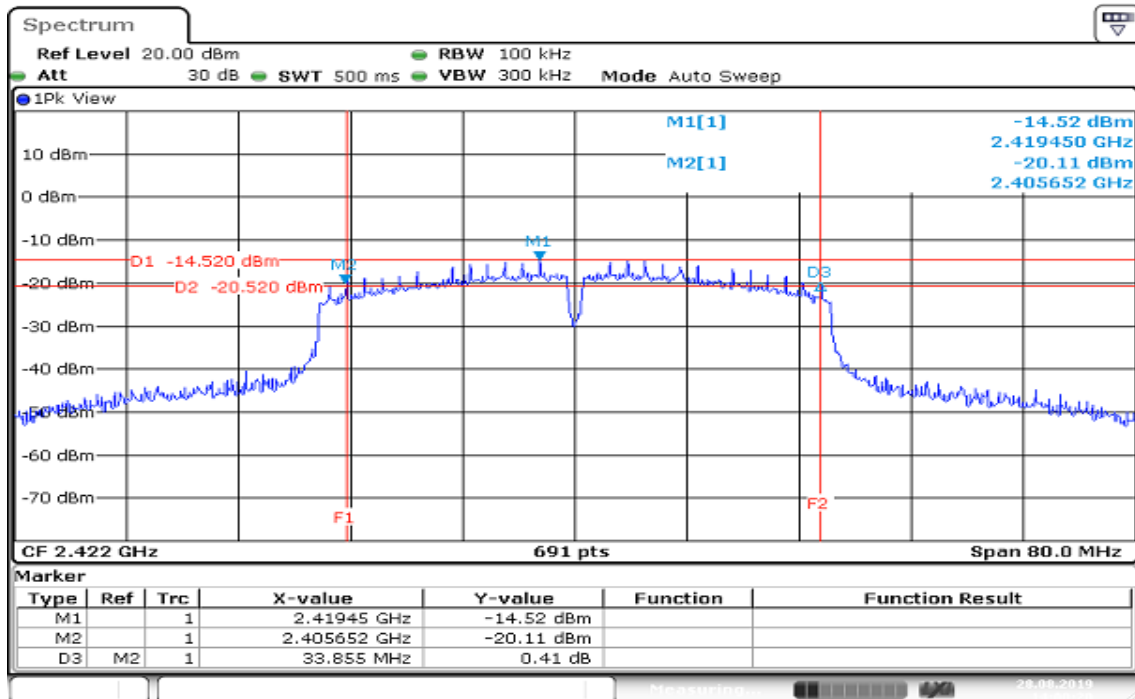
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發射頻寬測試值 IEEE 802.11n HT 20 Mode / CH High



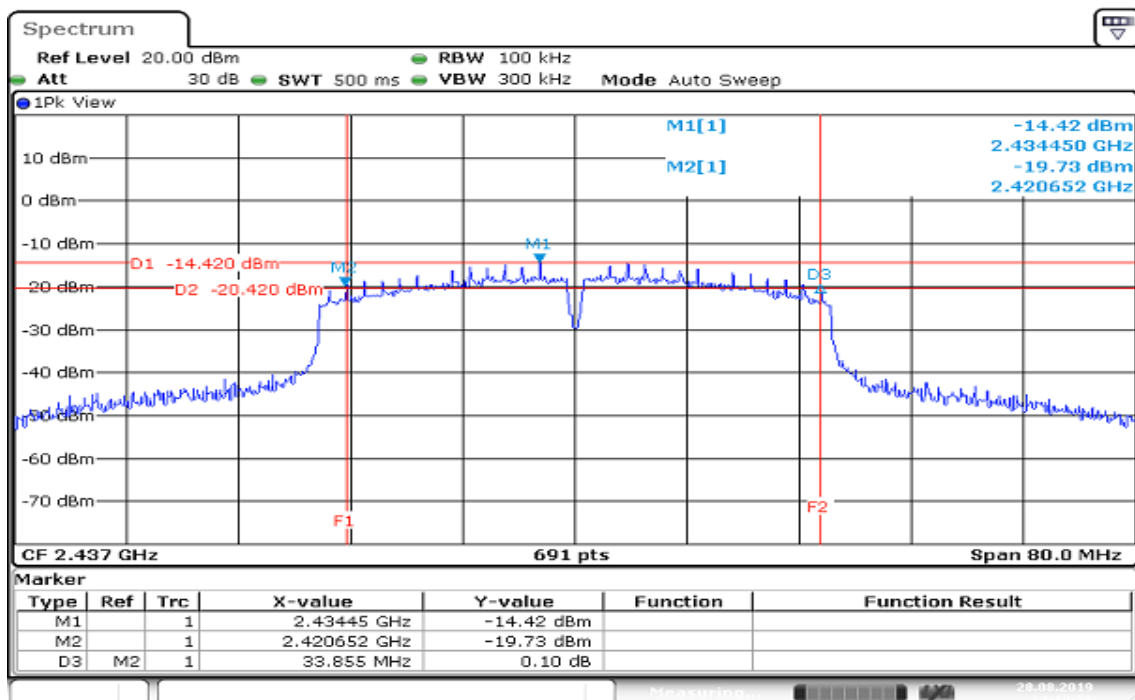
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發射頻寬測試值 IEEE 802.11n HT 40 Mode / CH Low



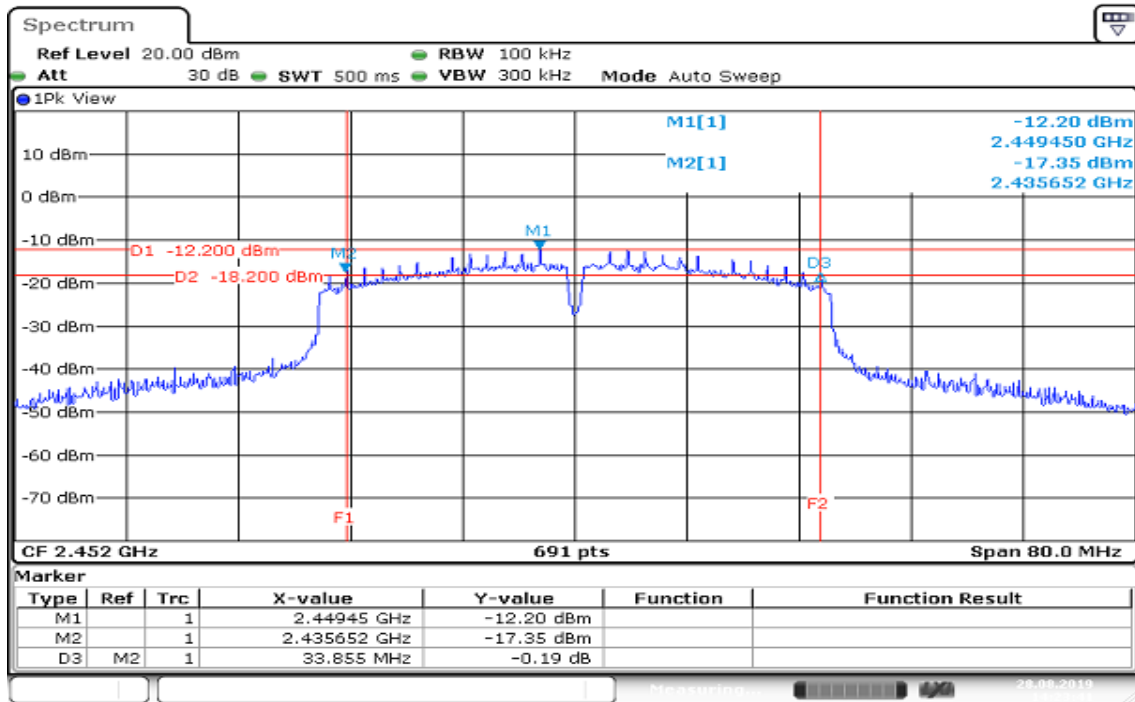
Date: 28.AUG.2019 14:00:21

發射頻寬測試值 IEEE 802.11n HT 40 Mode / CH Mid



Date: 28.AUG.2019 14:10:37

發射頻寬測試值 IEEE 802.11n HT 40 Mode / CH High



Date: 28.AUG.2019 14:23:42

8. 輸出峰值功率之量測

8.1 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 4.10.1.2(1)(C)之規定，對使用展頻技術之低功率發射機，其輸出峰值功率不大於 1 Watt，且其所使用天線之增益不可大於 6dBi；若使用大於 6dBi 增益之天線，則其輸出峰值功率相對需衰減天線增益所增加之量(單位為 dB)。例外放寬之條件如下：

依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.3(1)(C)之規定，2400-2483.5MHz 僅用於固定式點對點操作，每超過 3dB 應降低 1dB 之峰值輸出功率。

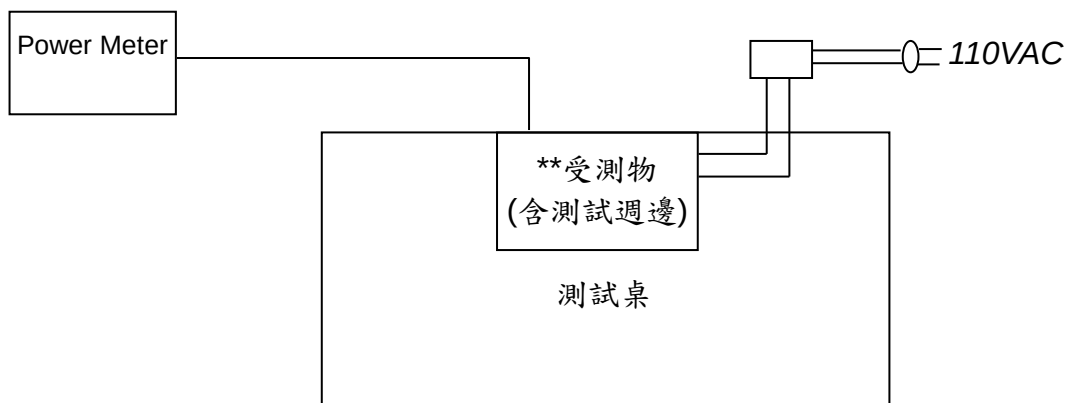
依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.2(2)之規定，5724-5850MHz 僅用於固定式點對點操作，無須降低峰值輸出功率。

8.2 測試方法

此為 RF 傳導測試，將發射機之天線埠經由適當之衰減直接連至測試儀器。設定儀器之解析頻寬大於 6 dB 發射頻寬或使用峰值功率表。

註：測試方法依據 ANSI C63.10: 2013

8.3 測試配置



註：**請參照 3.2 節

8.4 輸出功率之量測結果

Test Mode: IEEE 802.11b Mode

頻道	頻率 (MHz)	Power Setting	輸出峰值 (dBm)	限制值 (dBm)	測試結果
CH Low	2412	20	13.45	30	PASS
CH Mid	2437	20	13.67		PASS
CH High	2462	20	* 13.87		PASS

Test Mode: IEEE 802.11g Mode

頻道	頻率 (MHz)	Power Setting	輸出峰值 (dBm)	限制值 (dBm)	測試結果
CH Low	2412	20	18.86	30	PASS
CH Mid	2437	20	* 19.11		PASS
CH High	2462	20	18.95		PASS

Test Mode: IEEE 802.11n HT 20 Mode

頻道	頻率 (MHz)	Power Setting	輸出峰值 (dBm)	限制值 (dBm)	測試結果
CH Low	2412	20	18.93	30	PASS
CH Mid	2437	20	19.01		PASS
CH High	2462	20	* 19.16		PASS

Test Mode: IEEE 802.11n HT 40 Mode

頻道	頻率 (MHz)	Power Setting	輸出峰值 (dBm)	限制值 (dBm)	測試結果
CH Low	2422	12	18.54	30	PASS
CH Mid	2437	20	18.91		PASS
CH High	2452	20	* 19.02		PASS

9. 開放頻帶邊緣 100kHz 頻寬內之限制

9.1 適用標準

依據國家傳播委員會低功率射頻器材技術規範 4.10.1.5 之規定，

帶外發射限制：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： 4.10.1.5(1) 輸出功率以本規範附件二之峰值輸出功率方式量測者，至少須衰減 20 dB，可使用射頻傳導或輻射方式測量。 4.10.1.5 輸出功率以本節 4.10.1.2(1)(C) 之最大傳導輸出功率方式量測者，至少須衰減 30 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。

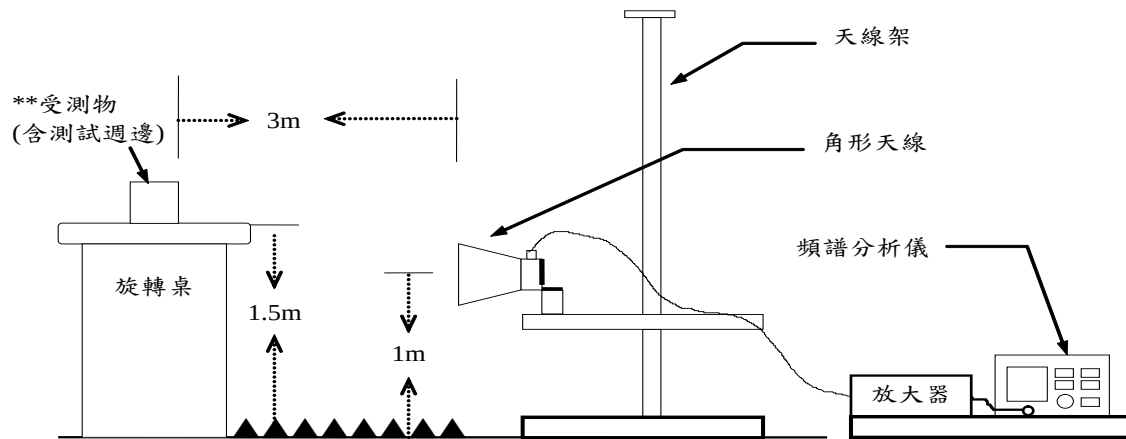
9.2 測試方法

1. 頻率掃描範圍足以涵蓋操作在最靠近頻帶邊緣之頻道的發射波峰位準以及任何落於許可頻帶外之調變產物。
2. 將標記設定於在頻帶邊緣上的發射，或將標記設定於最大之頻帶外調變產物上若其位準大於頻帶邊緣上的發射。啟動標記差值之功能，利用標記至波峰功能 (Marker to Peak) 功能以標記頻帶內發射之波峰，所顯示之標記差值必須符合指定之限制值。

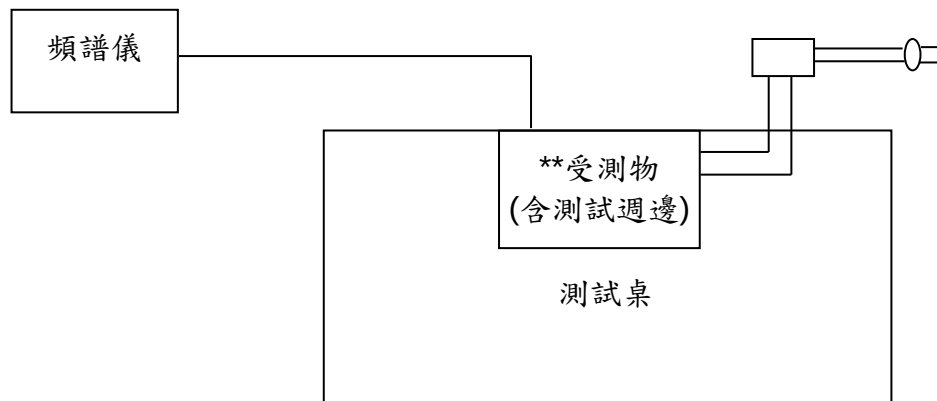
以上述相同的步驟決定由跳頻功能所產生的任何混附波是否亦符合規定之限制值。

註：測試方式引用自 ANSI C63.10: 2013

9.3 測試配置



註: **請參照 3.2 節



註: **請參照 3.2 節

9.4 開放頻帶邊緣之量測結果

請參考附圖

判定結果：合格

發射限制測試值

Test date: April 17, 2020

Test Mode: IEEE 802.11b Mode

發射限制測試值 CH Low(下邊緣頻帶):

在下邊緣頻帶之 100kHz 頻寬內 Peak 為 47.88dBuV/m ; Average 為 35.06dBuV/m 。

發射限制測試值 CH High(上邊緣頻帶):

在上邊緣頻帶之 100kHz 頻寬內 Peak 為 48.29dBuV/m ; Average 為 35.48dBuV/m 。

Test Mode: IEEE 802.11g Mode

發射限制測試值 CH Low(下邊緣頻帶):

在下邊緣頻帶之 100kHz 頻寬內 Peak 為 61.59dBuV/m ; Average 為 40.89dBuV/m 。

發射限制測試值 CH High(上邊緣頻帶):

在上邊緣頻帶之 100kHz 頻寬內 Peak 為 63.10dBuV/m ; Average 為 40.94dBuV/m 。

Test Mode: IEEE 802.11n HT 20 Mode

發射限制測試值 CH Low(下邊緣頻帶):

在下邊緣頻帶之 100kHz 頻寬內 Peak 為 64.10dBuV/m ; Average 為 42.92dBuV/m 。

發射限制測試值 CH High(上邊緣頻帶):

在上邊緣頻帶之 100kHz 頻寬內 Peak 為 63.71dBuV/m ; Average 為 41.67dBuV/m 。

Test Mode: IEEE 802.11n HT 40 Mode

發射限制測試值 CH Low(下邊緣頻帶):

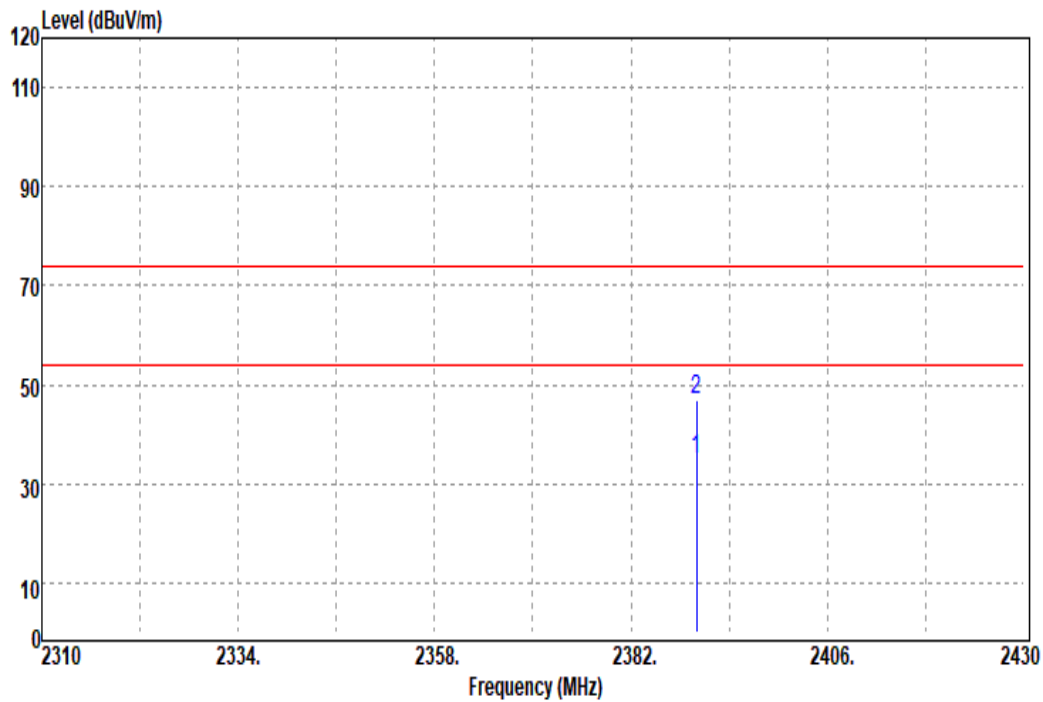
在下邊緣頻帶之 100kHz 頻寬內 Peak 為 72.44dBuV/m ; Average 為 50.05dBuV/m 。

發射限制測試值 CH High(上邊緣頻帶):

在上邊緣頻帶之 100kHz 頻寬內 Peak 為 67.30dBuV/m ; Average 為 48.23dBuV/m 。

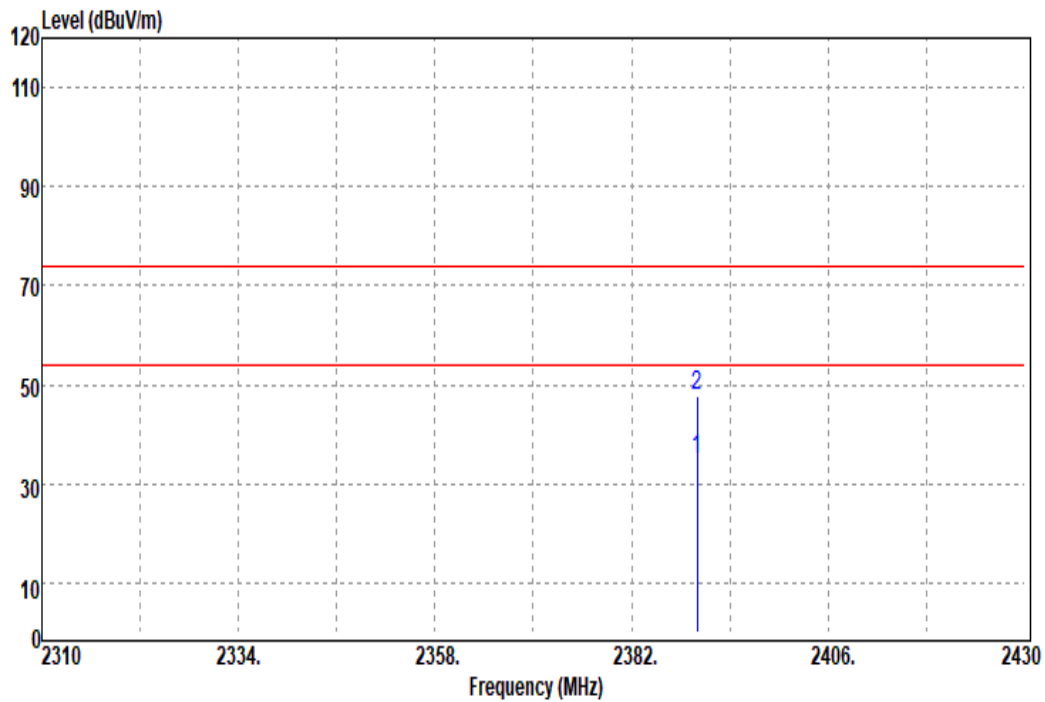
發射限制測試

IEEE 802.11b Mode / CH Low
Detector mode: Peak / Average
Antenna Pol.: Vertical



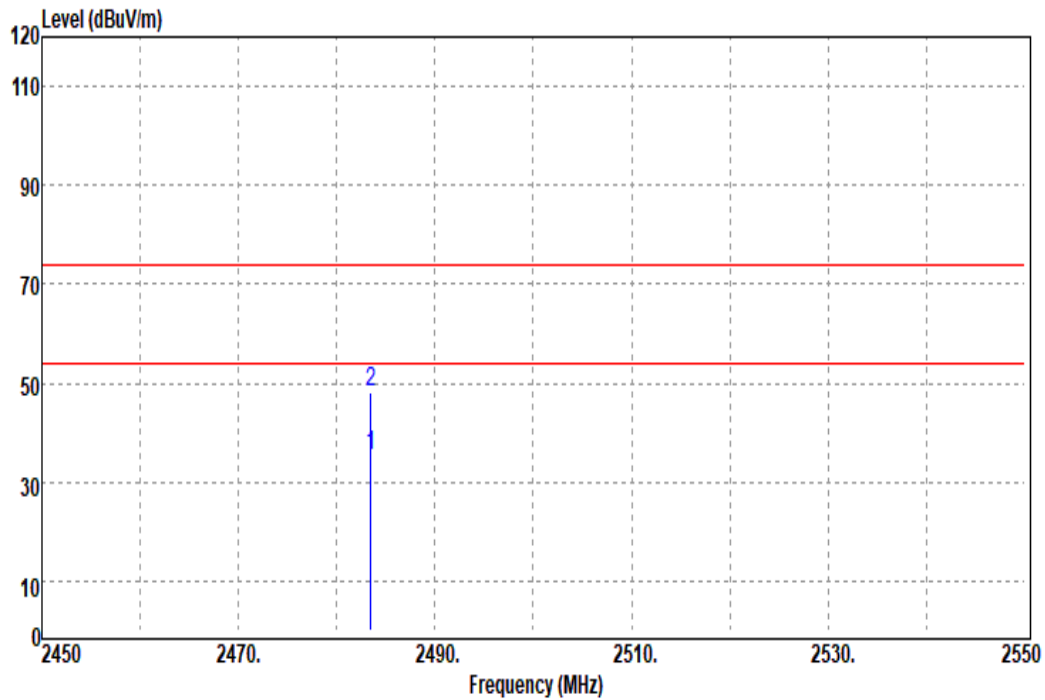
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Average	38.13	-3.17	34.96	54.00	-19.04
2390.00	Peak	50.00	-3.17	46.83	74.00	-27.17

IEEE 802.11b Mode / CH Low
Detector mode: Peak / Average
Antenna Pol.: Horizontal



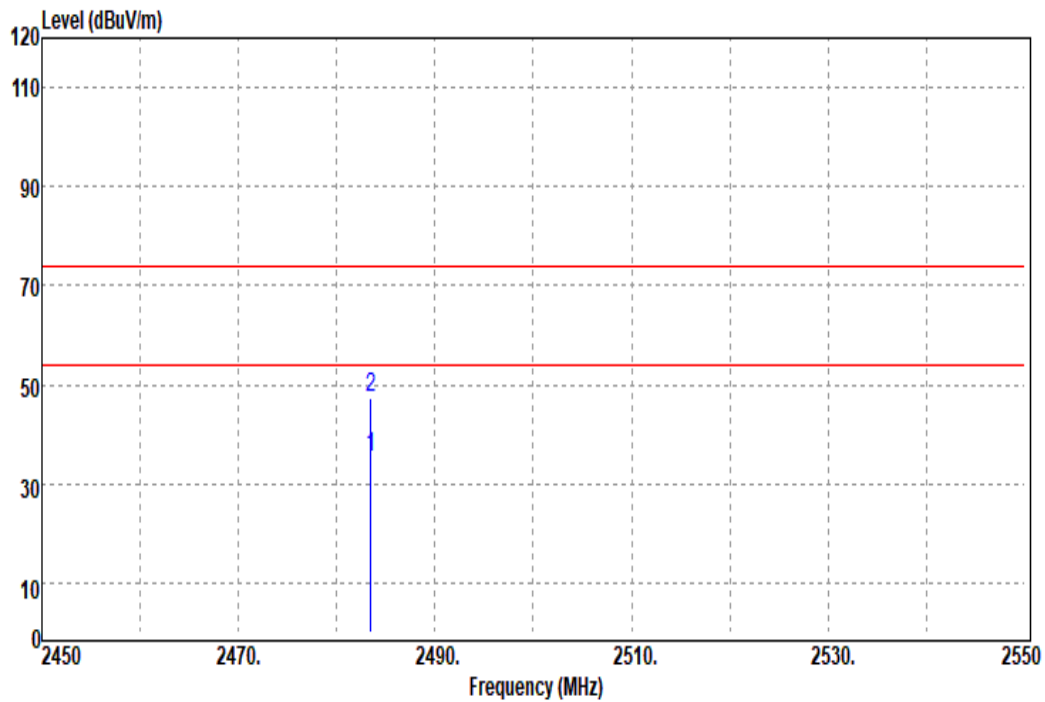
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Average	38.23	-3.17	35.06	54.00	-18.94
2390.00	Peak	51.05	-3.17	47.88	74.00	-26.12

IEEE 802.11b Mode / CH High
Detector mode: Peak / Average
Antenna Pol.: Vertical



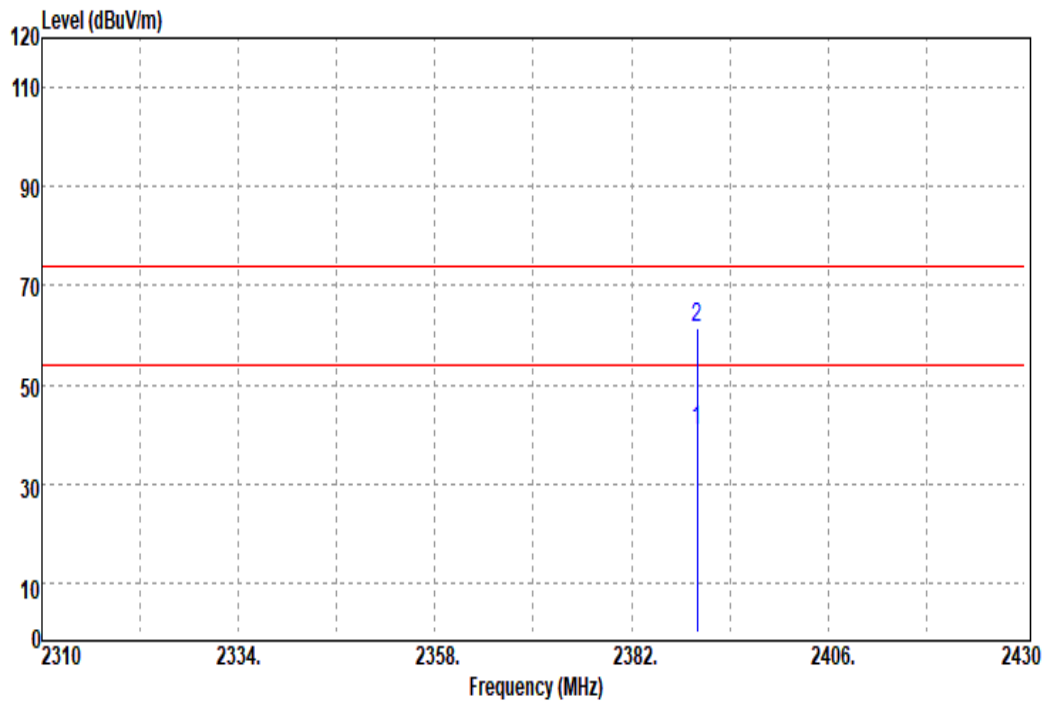
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	38.19	-2.71	35.48	54.00	-18.52
2483.50	Peak	51.00	-2.71	48.29	74.00	-25.71

IEEE 802.11b Mode / CH High
Detector mode: Peak / Average
Antenna Pol.: Horizontal



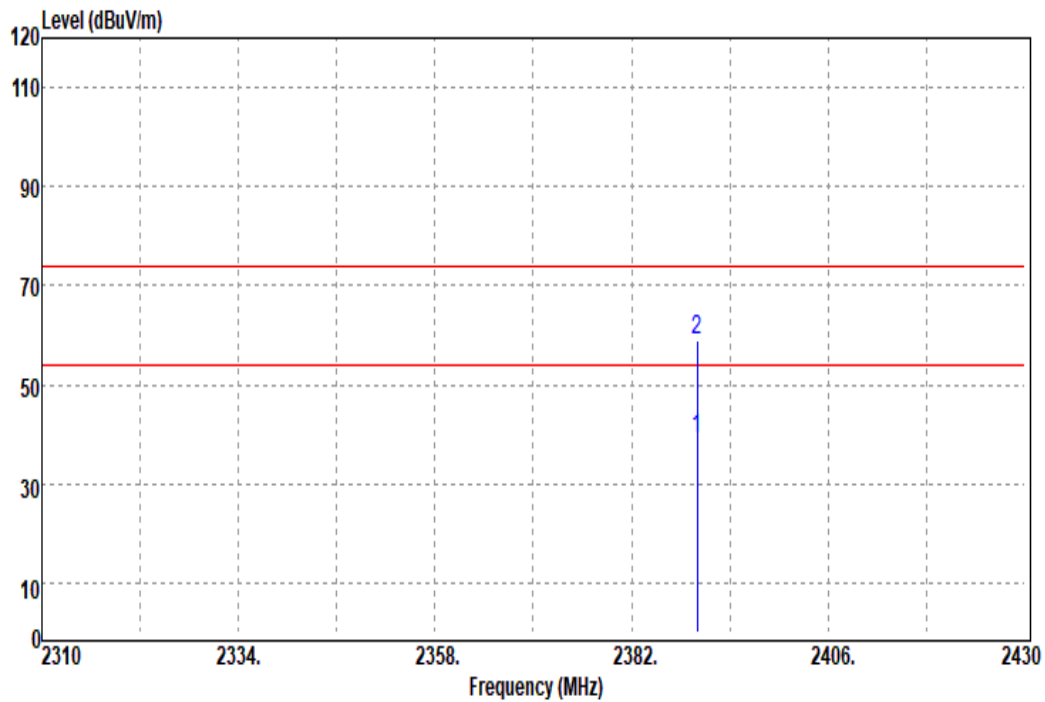
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	38.19	-2.71	35.48	54.00	-18.52
2483.50	Peak	49.90	-2.71	47.19	74.00	-26.81

IEEE 802.11g Mode / CH Low
Detector mode: Peak / Average
Antenna Pol.: Vertical



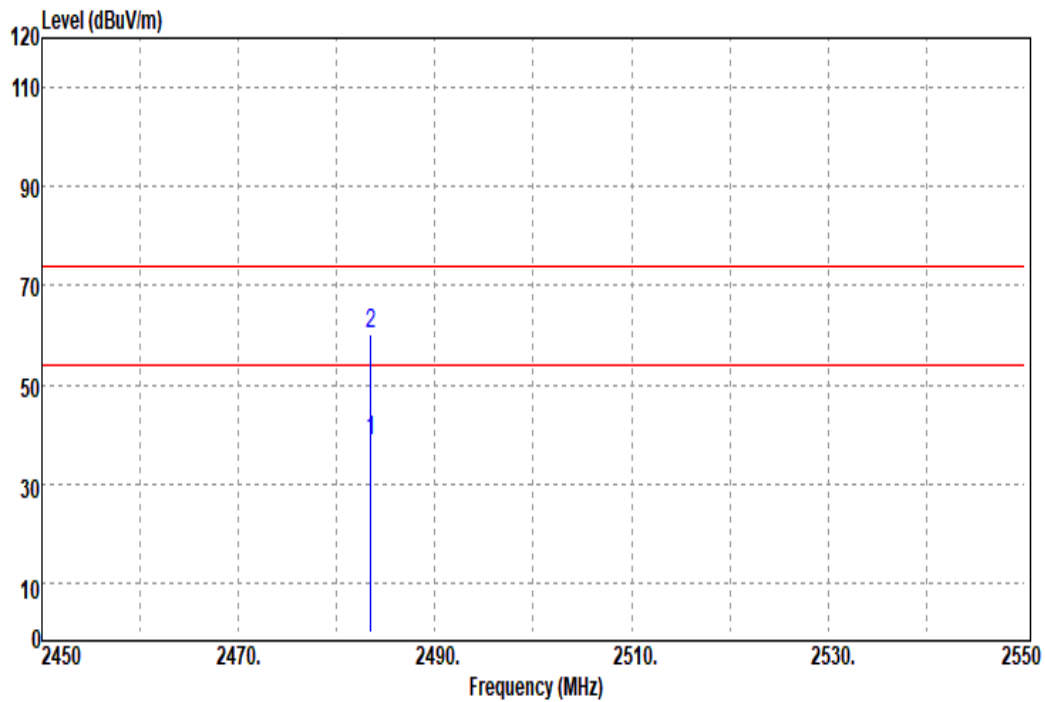
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Average	44.06	-3.17	40.89	54.00	-13.11
2390.00	Peak	64.76	-3.17	61.59	74.00	-12.41

IEEE 802.11g Mode / CH Low
Detector mode: Peak / Average
Antenna Pol.: Horizontal



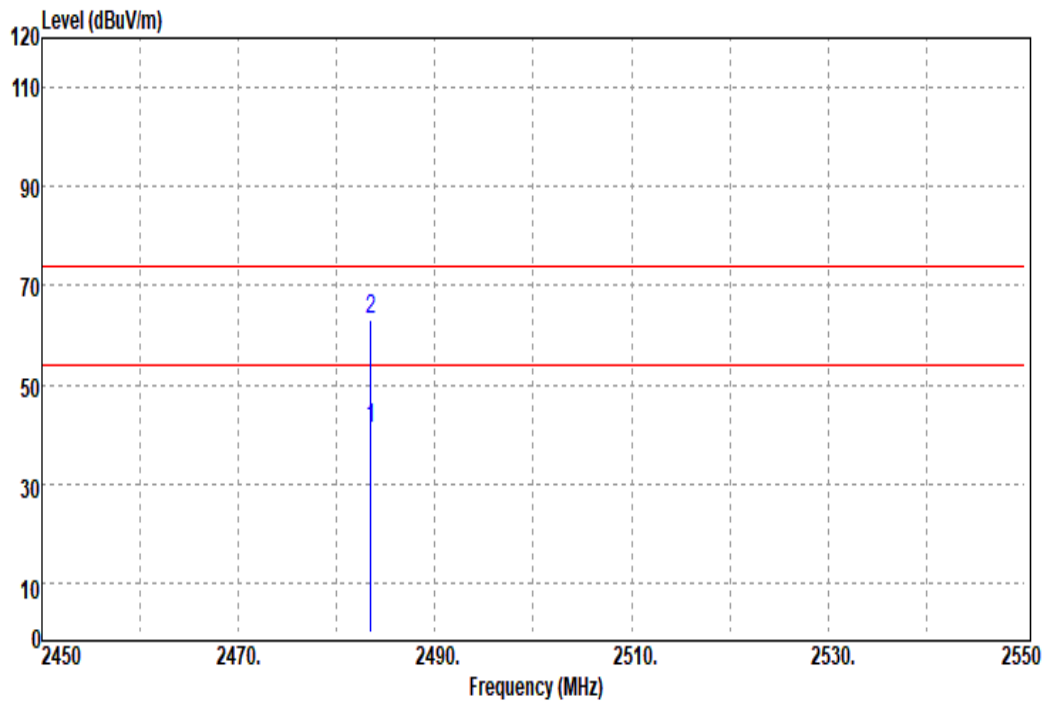
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2390.00	Average	42.29	-3.17	39.12	54.00	-14.88
2390.00	Peak	62.29	-3.17	59.12	74.00	-14.88

IEEE 802.11g Mode / CH High
Detector mode: Peak / Average
Antenna Pol.: Vertical



Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	41.47	-2.71	38.76	54.00	-15.24
2483.50	Peak	63.05	-2.71	60.34	74.00	-13.66

IEEE 802.11g Mode / CH High
 Detector mode: Peak / Average
 Antenna Pol.: Horizontal

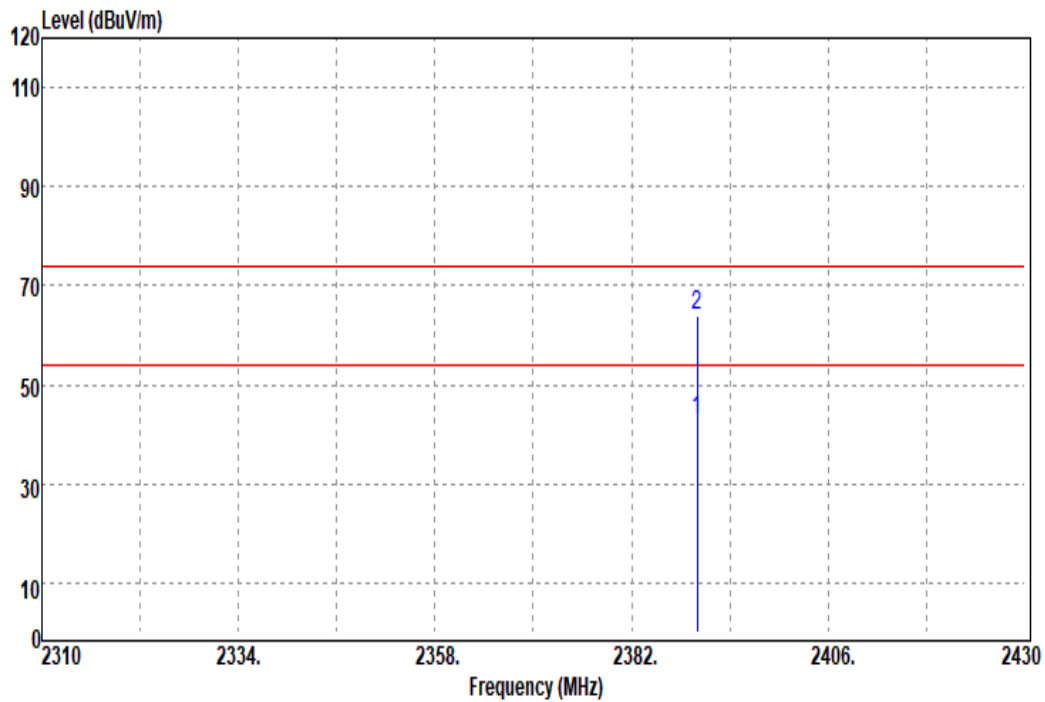


Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	43.65	-2.71	40.94	54.00	-13.06
2483.50	Peak	65.81	-2.71	63.10	74.00	-10.90

IEEE 802.11n HT 20 Mode / CH Low

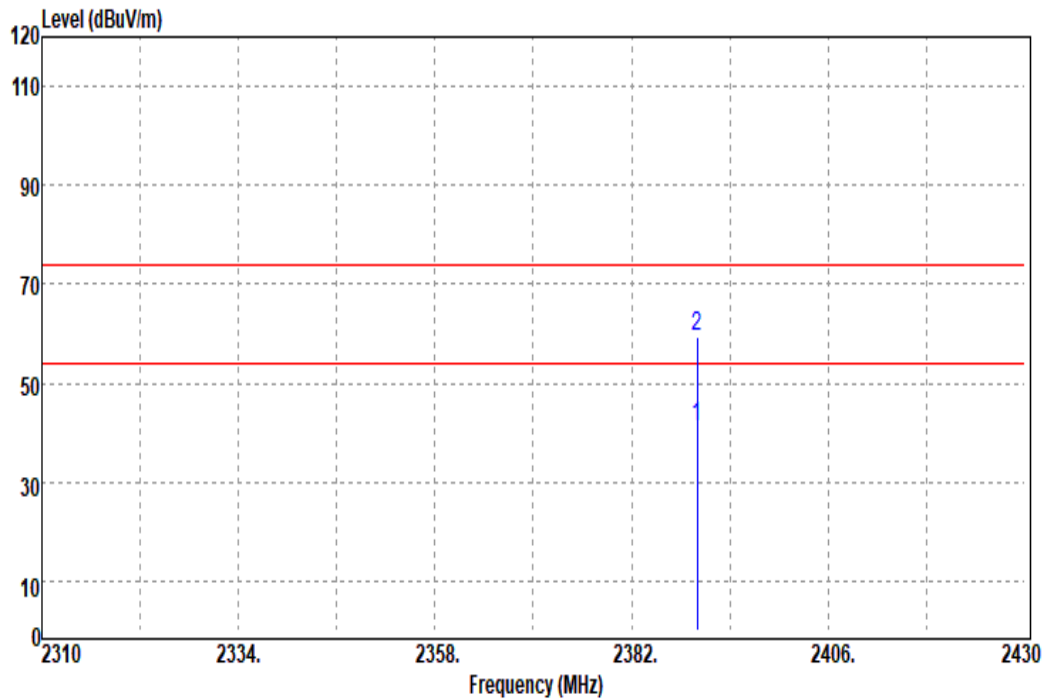
Detector mode: Peak / Average

Antenna Pol.: Vertical



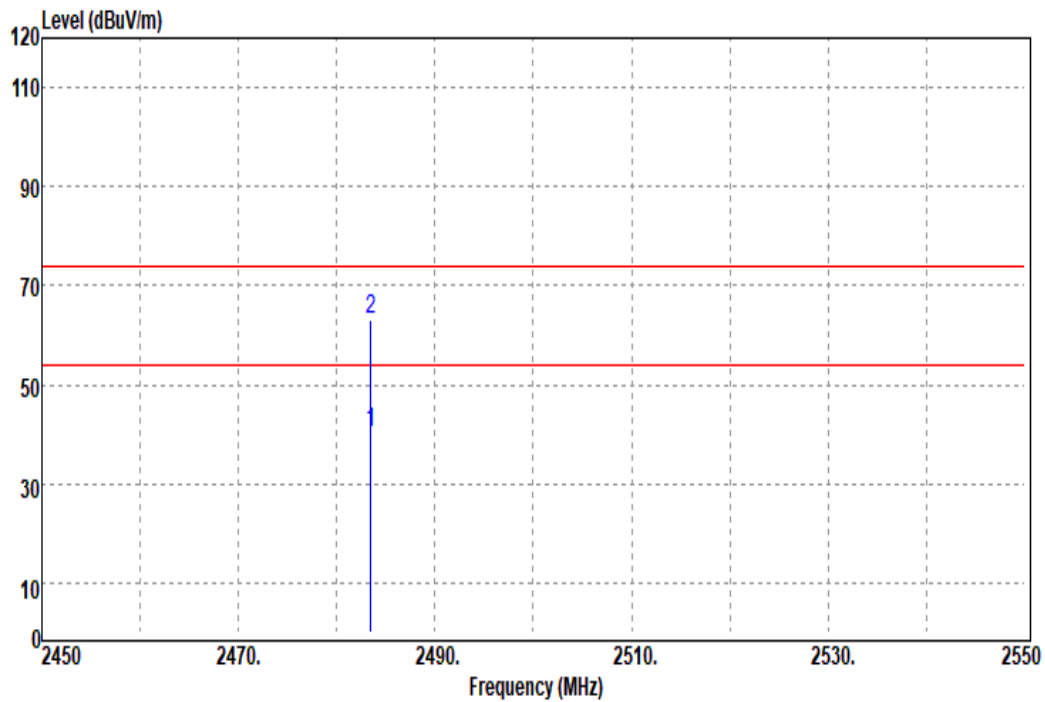
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Average	46.09	-3.17	42.92	54.00	-11.08
2390.00	Peak	67.27	-3.17	64.10	74.00	-9.90

IEEE 802.11n HT 20 Mode / CH Low
Detector mode: Peak / Average
Antenna Pol.: Horizontal



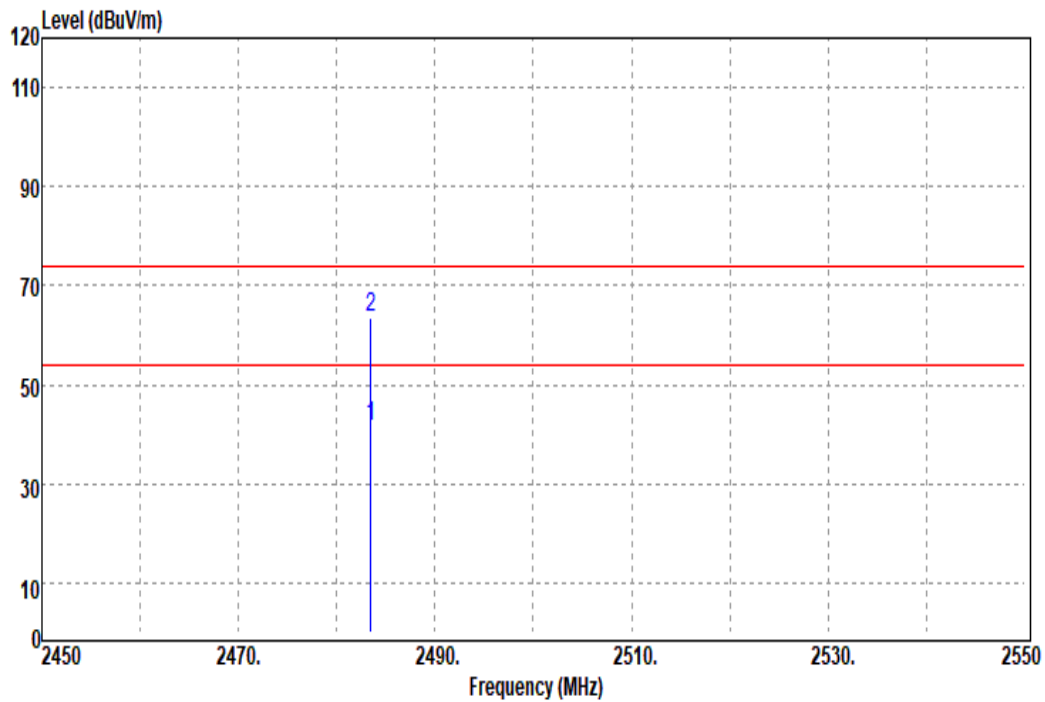
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2390.00	Average	44.10	-3.17	40.93	54.00	-13.07
2390.00	Peak	62.72	-3.17	59.55	74.00	-14.45

IEEE 802.11n HT 20 Mode / CH High
Detector mode: Peak / Average
Antenna Pol.: Vertical



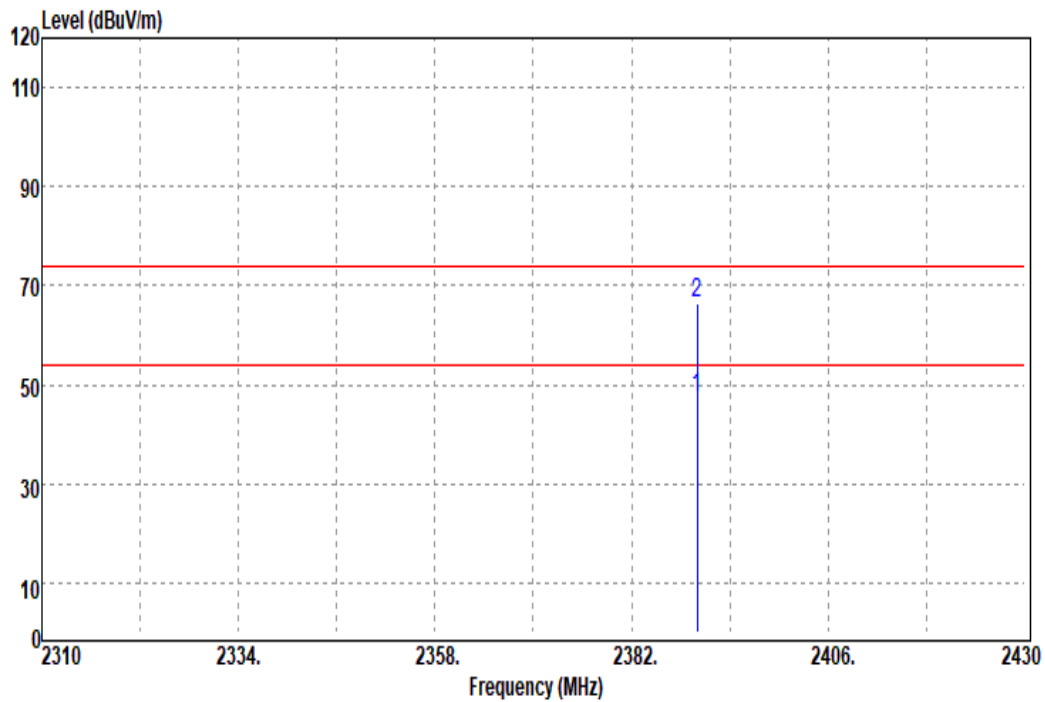
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	42.91	-2.71	40.20	54.00	-13.80
2483.50	Peak	65.83	-2.71	63.12	74.00	-10.88

IEEE 802.11n HT 20 Mode / CH High
Detector mode: Peak / Average
Antenna Pol.: Horizontal



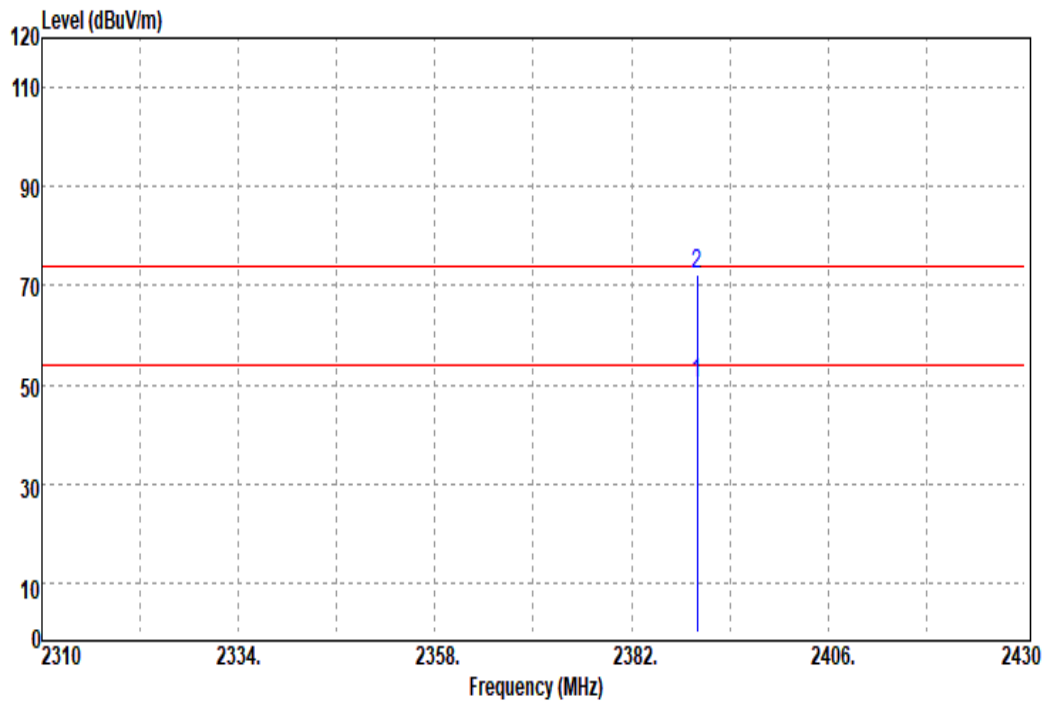
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	44.38	-2.71	41.67	54.00	-12.33
2483.50	Peak	66.42	-2.71	63.71	74.00	-10.29

IEEE 802.11n HT 40 Mode / CH Low
Detector mode: Peak / Average
Antenna Pol.: Vertical



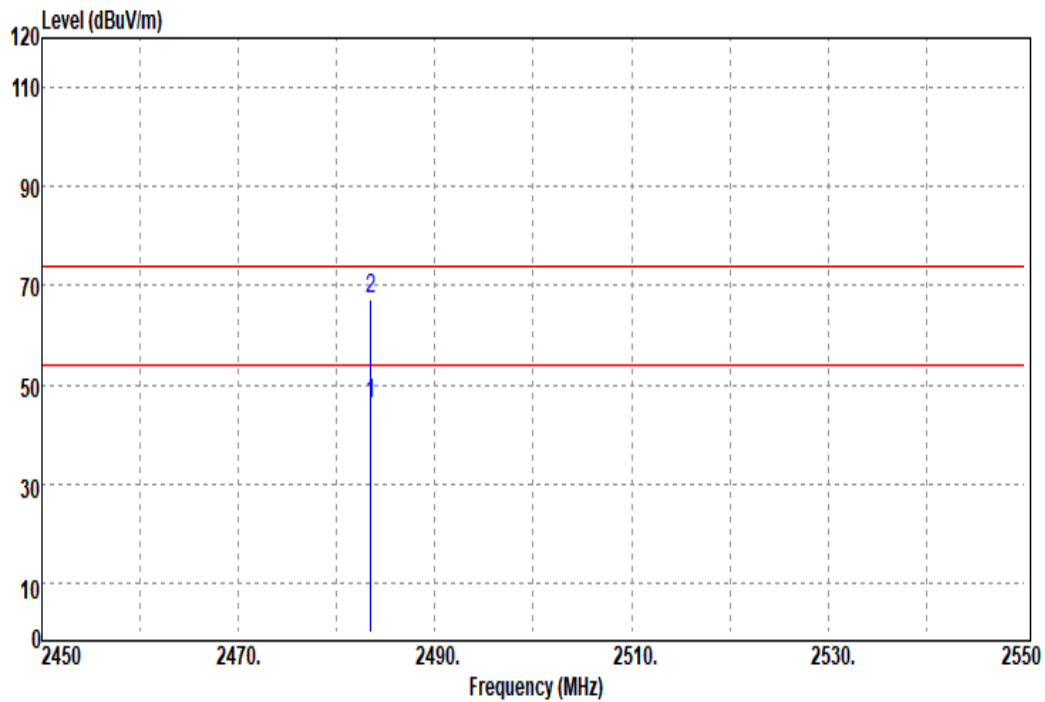
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2390.00	Average	50.66	-3.17	47.49	54.00	-6.51
2390.00	Peak	69.69	-3.17	66.52	74.00	-7.48

IEEE 802.11n HT 40 Mode / CH Low
Detector mode: Peak / Average
Antenna Pol.: Horizontal



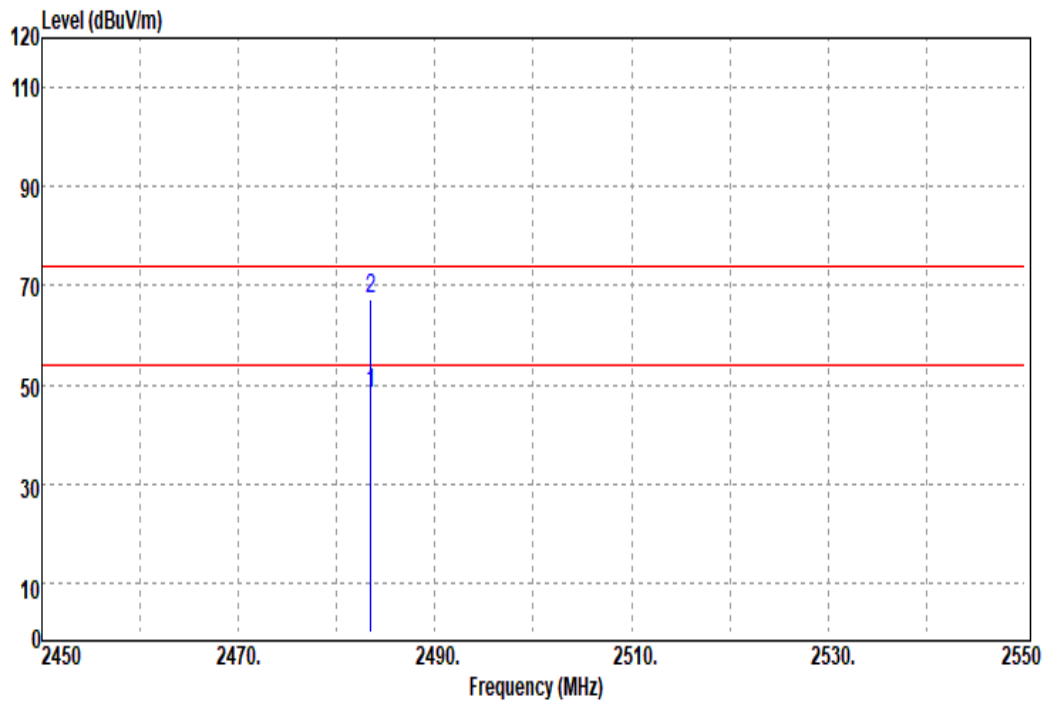
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Average	53.22	-3.17	50.05	54.00	-3.95
2390.00	Peak	75.61	-3.17	72.44	74.00	-1.56

IEEE 802.11n HT 40 Mode / CH High
Detector mode: Peak / Average
Antenna Pol.: Vertical



Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	48.94	-2.71	46.23	54.00	-7.77
2483.50	Peak	69.91	-2.71	67.20	74.00	-6.80

IEEE 802.11n HT 40 Mode / CH High
Detector mode: Peak / Average
Antenna Pol.: Horizontal



Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	50.94	-2.71	48.23	54.00	-5.77
2483.50	Peak	70.01	-2.71	67.30	74.00	-6.70

10. 帶外發射限制

10.1 適用標準

操作頻帶範圍外之任意 100 kHz 內，發射機所產生的射頻功率相較於使用頻帶範圍中包含最高所需功率之 100 kHz 內的射頻功率，其衰減值限制如下：

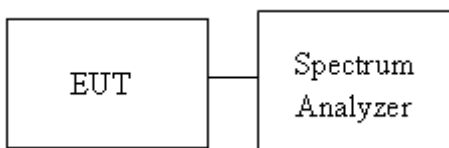
- (1) 輸出功率以附件二之峰值輸出功率方式測量者，至少須衰減 20 dB，可使用射頻傳導或輻射方式測量。
- (2) 輸出功率以 4.10.1.2(1)(C)之最大傳導輸出功率測量方式者，至少須衰減 30 dB。此外，落於 3.5 禁用頻段之輻射發射，應符合 2.8 之規定。

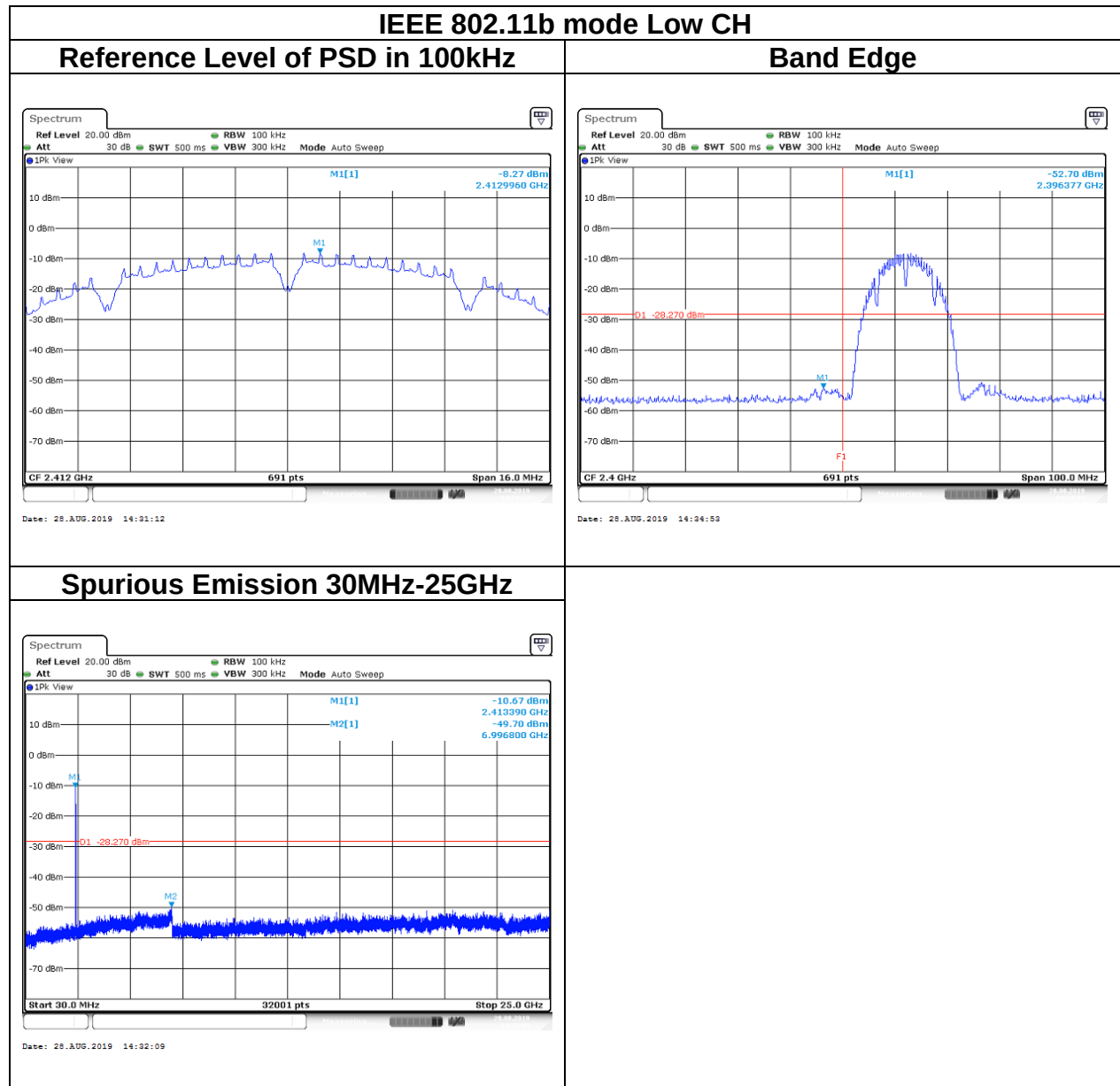
10.2 測試方法

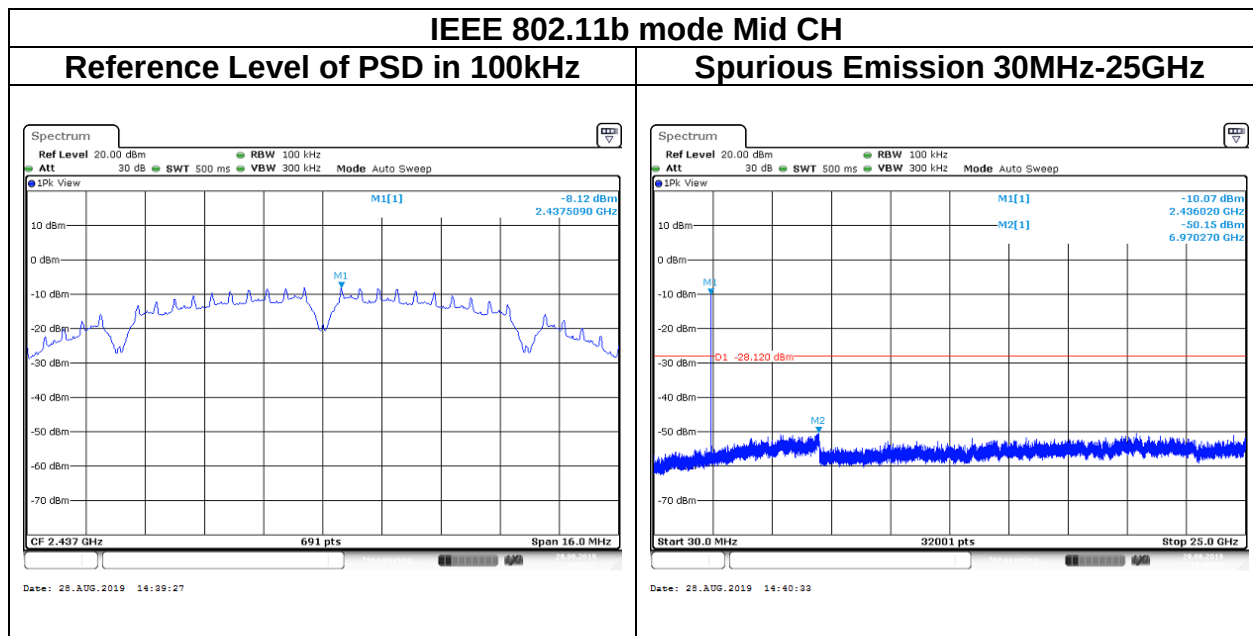
Test method Refer as ANSI C63.10: 2013

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.
2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.
3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

10.3 帶外發射限制之測試配置





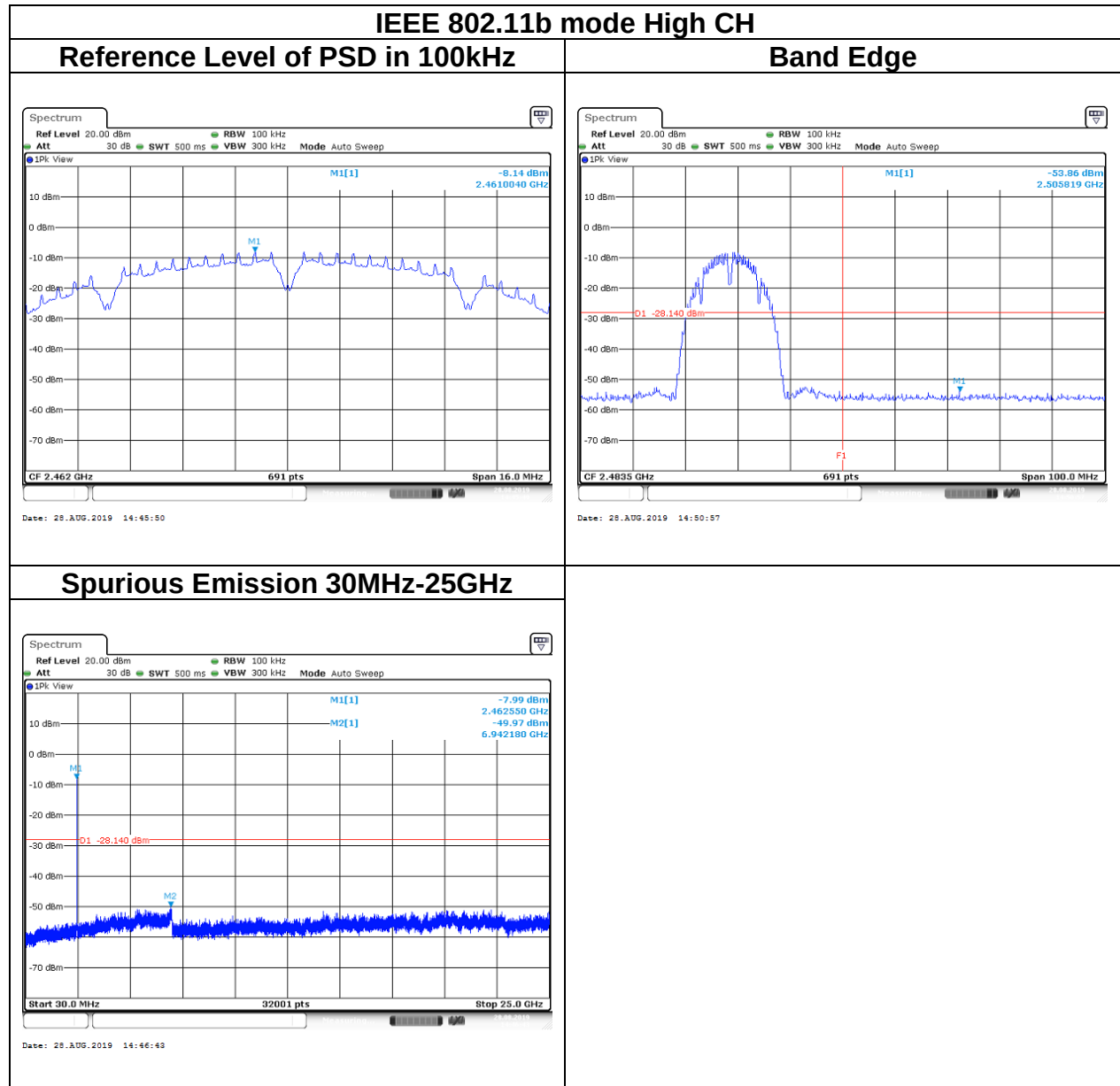




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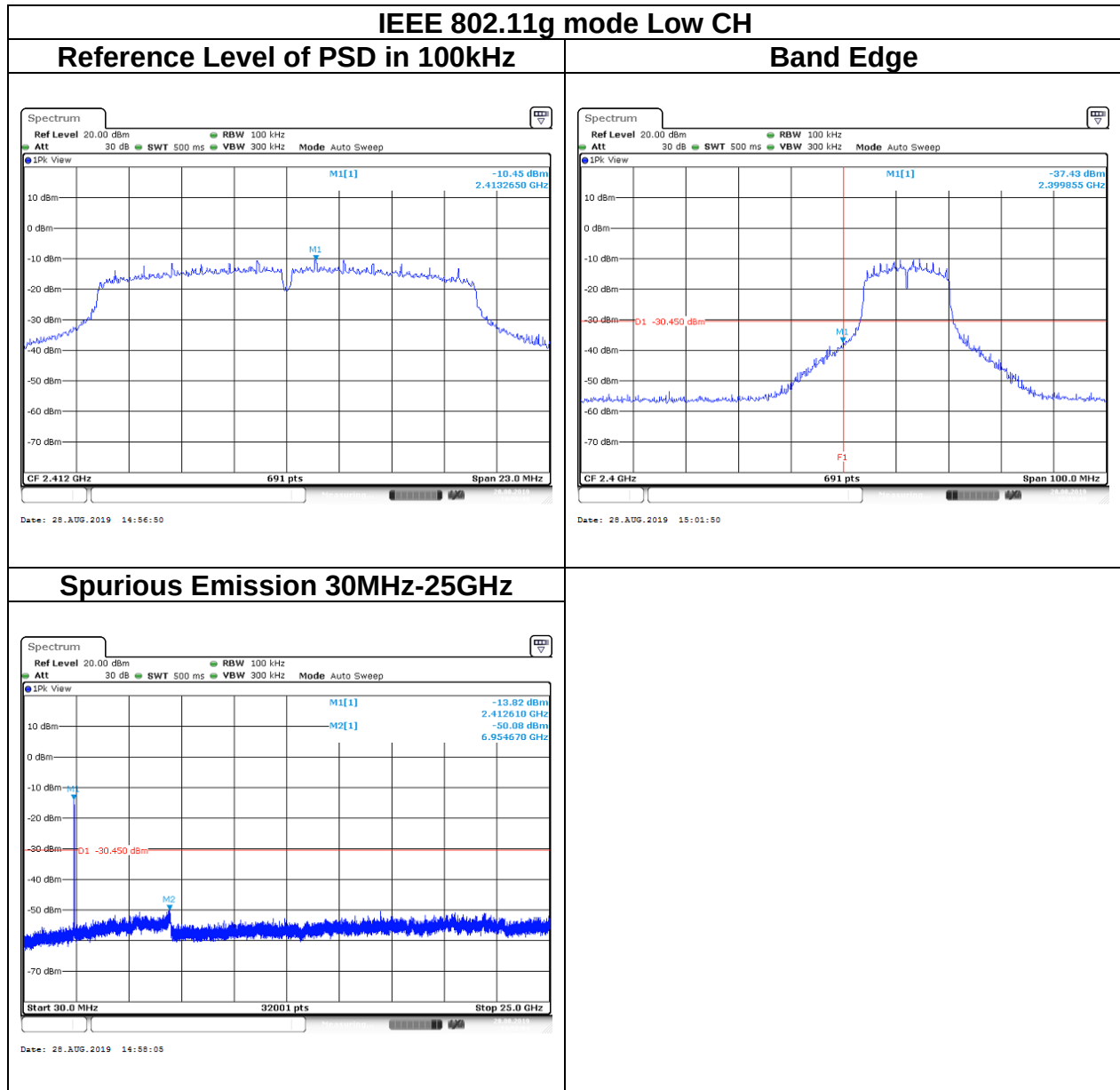
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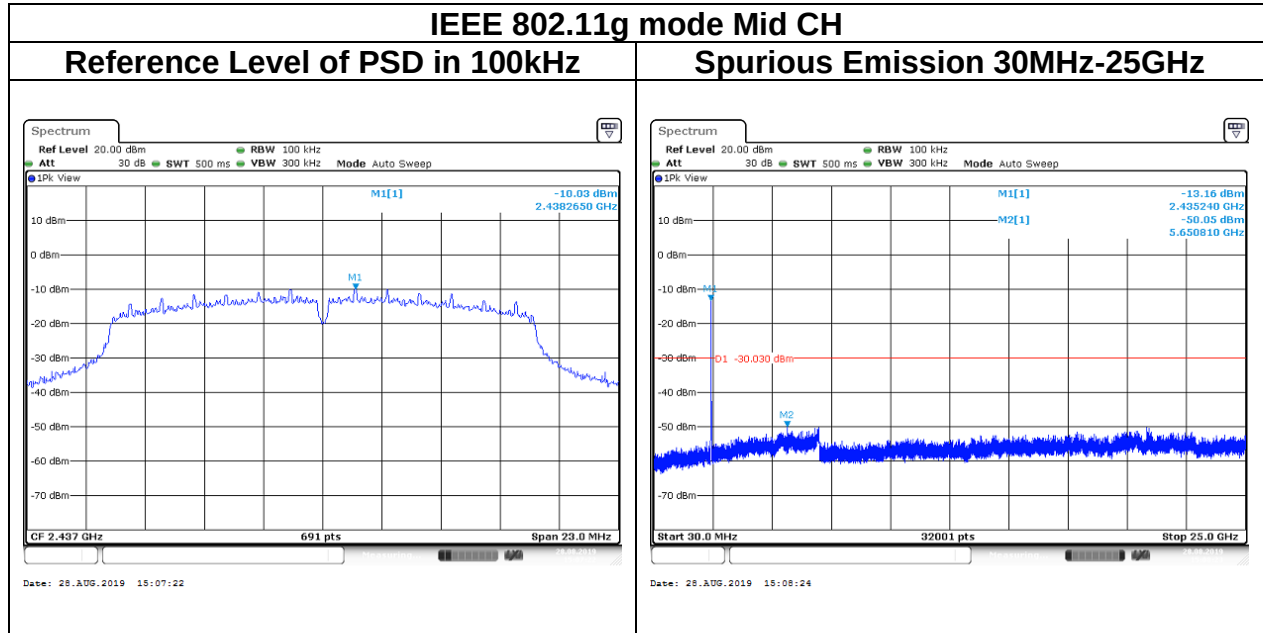


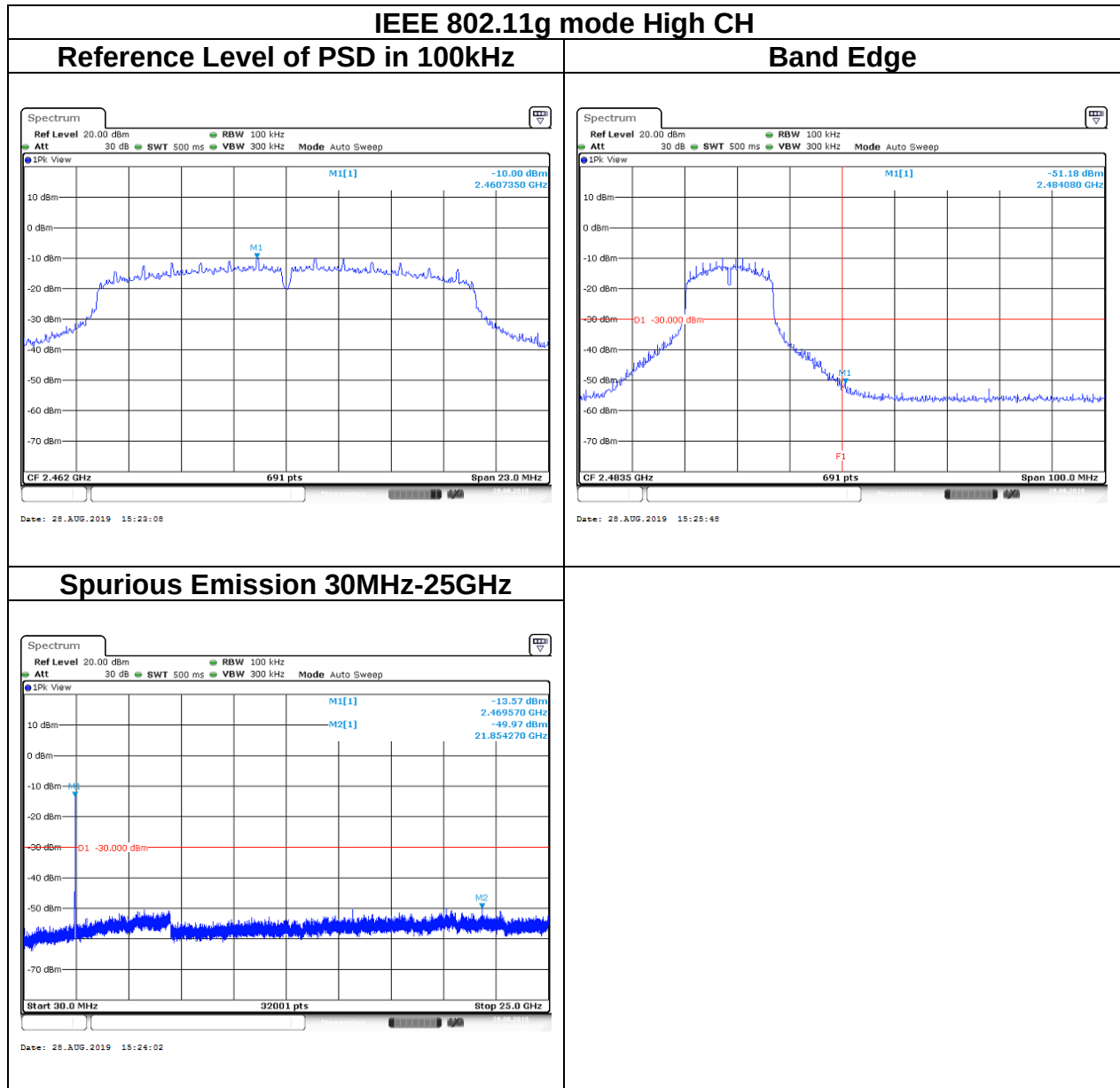


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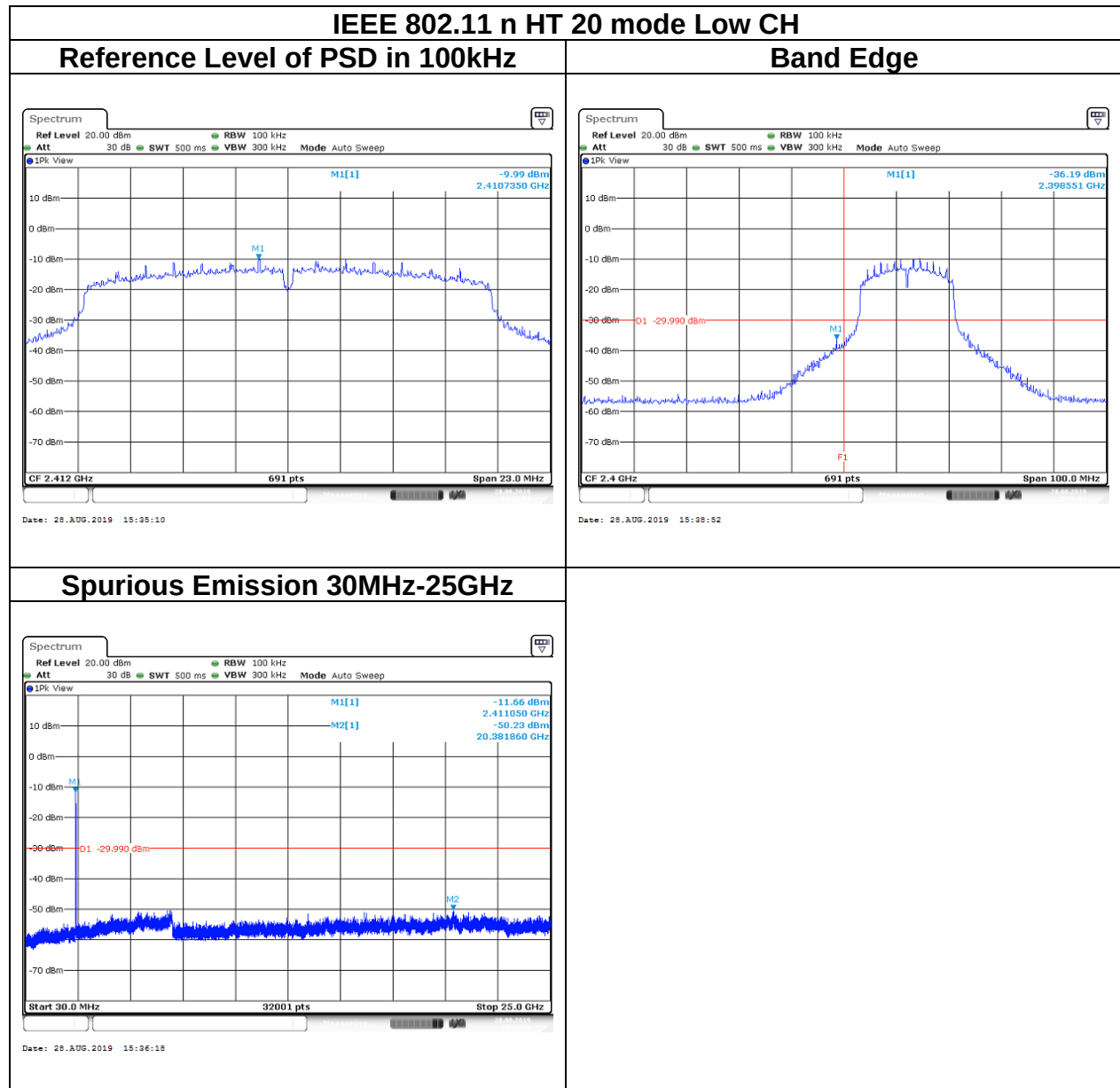




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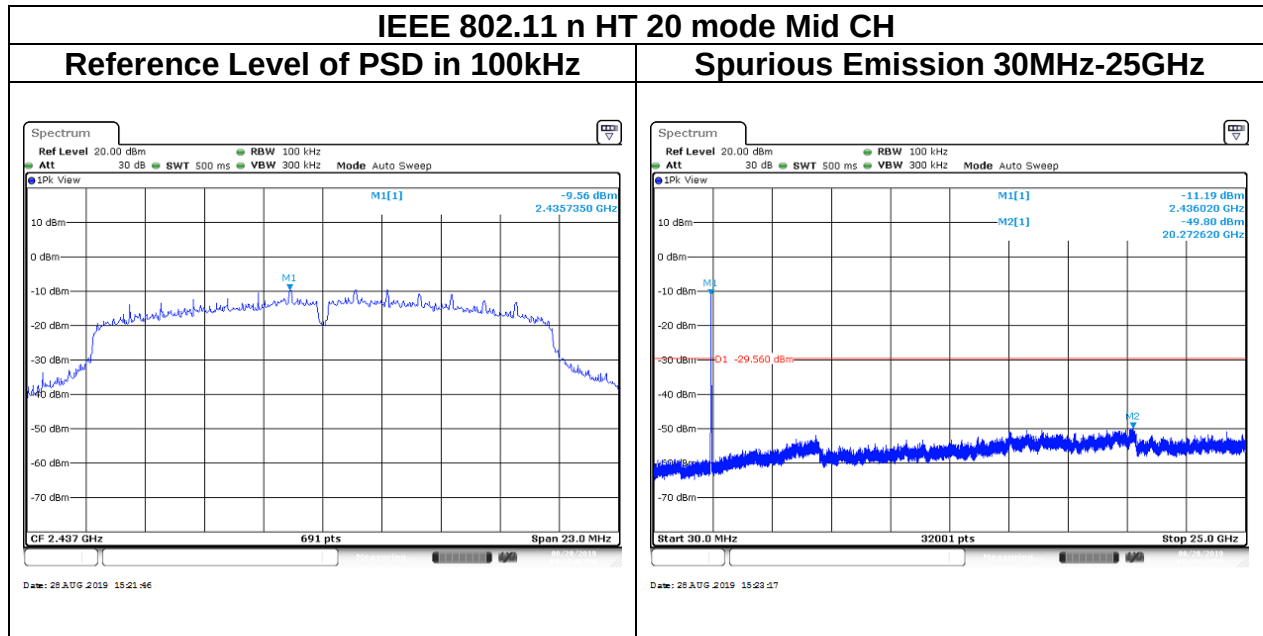


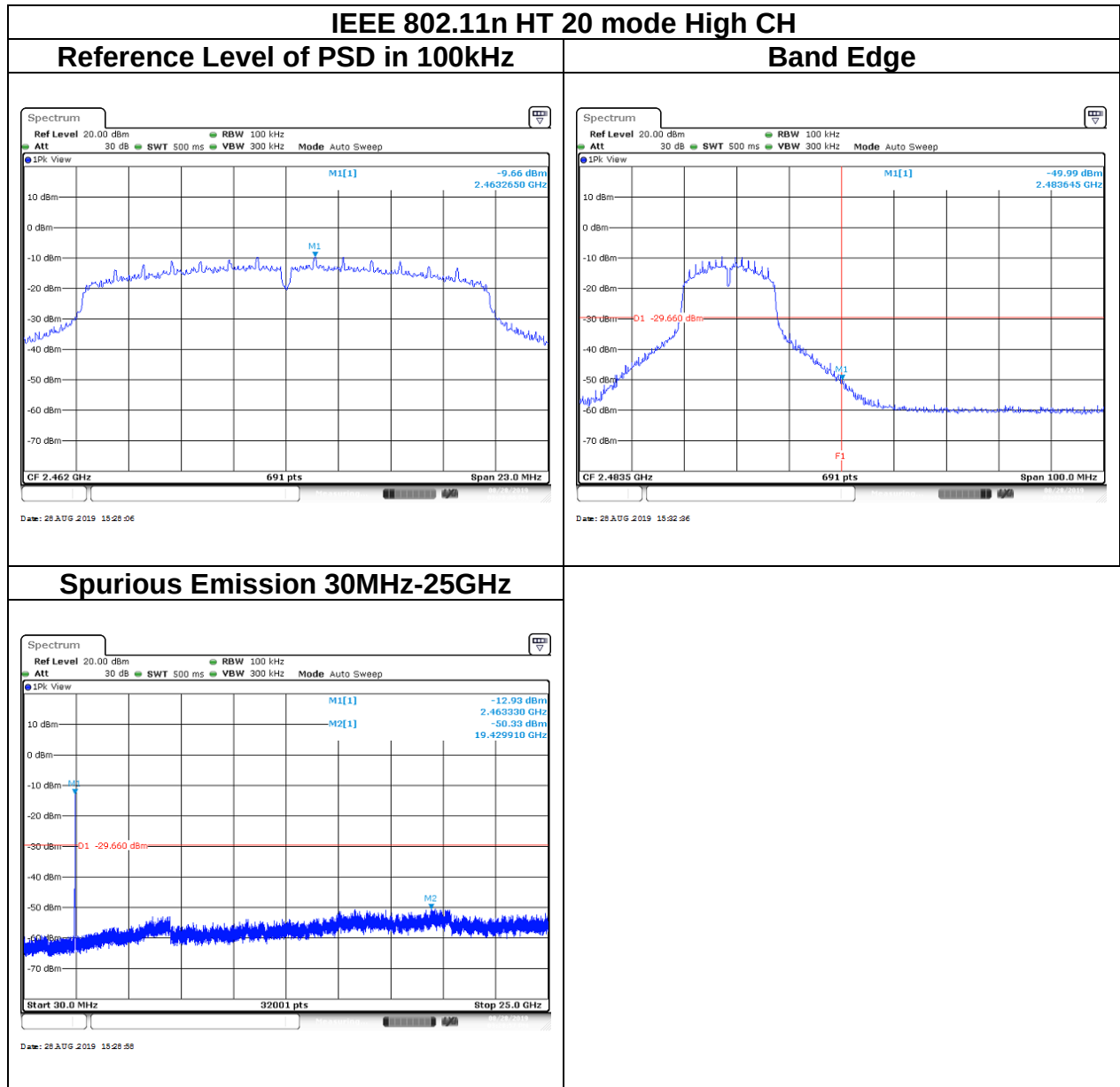


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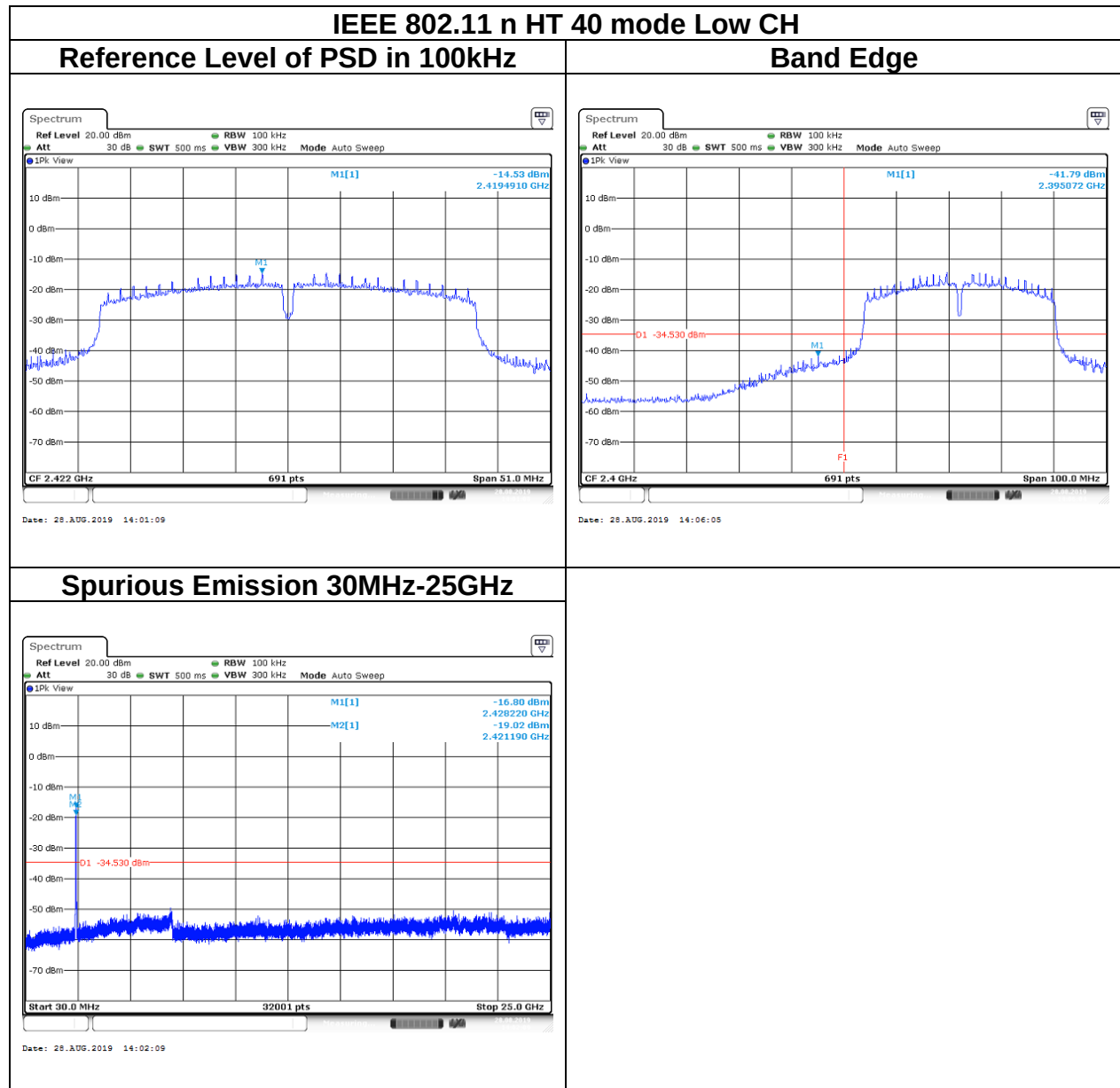


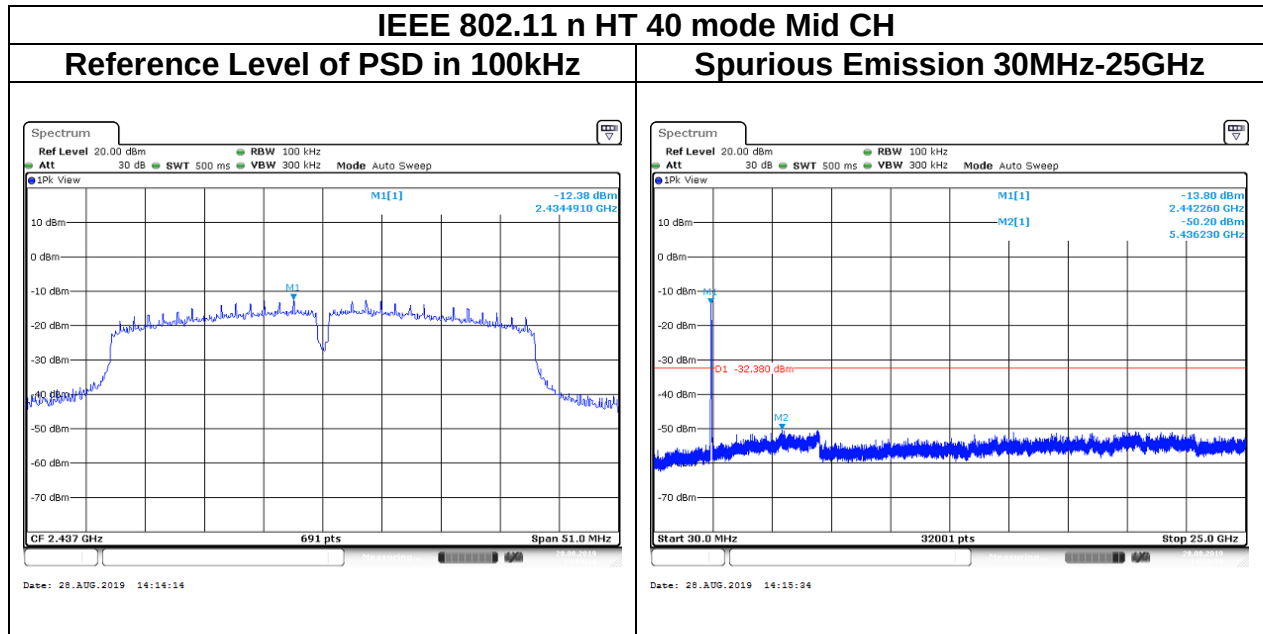


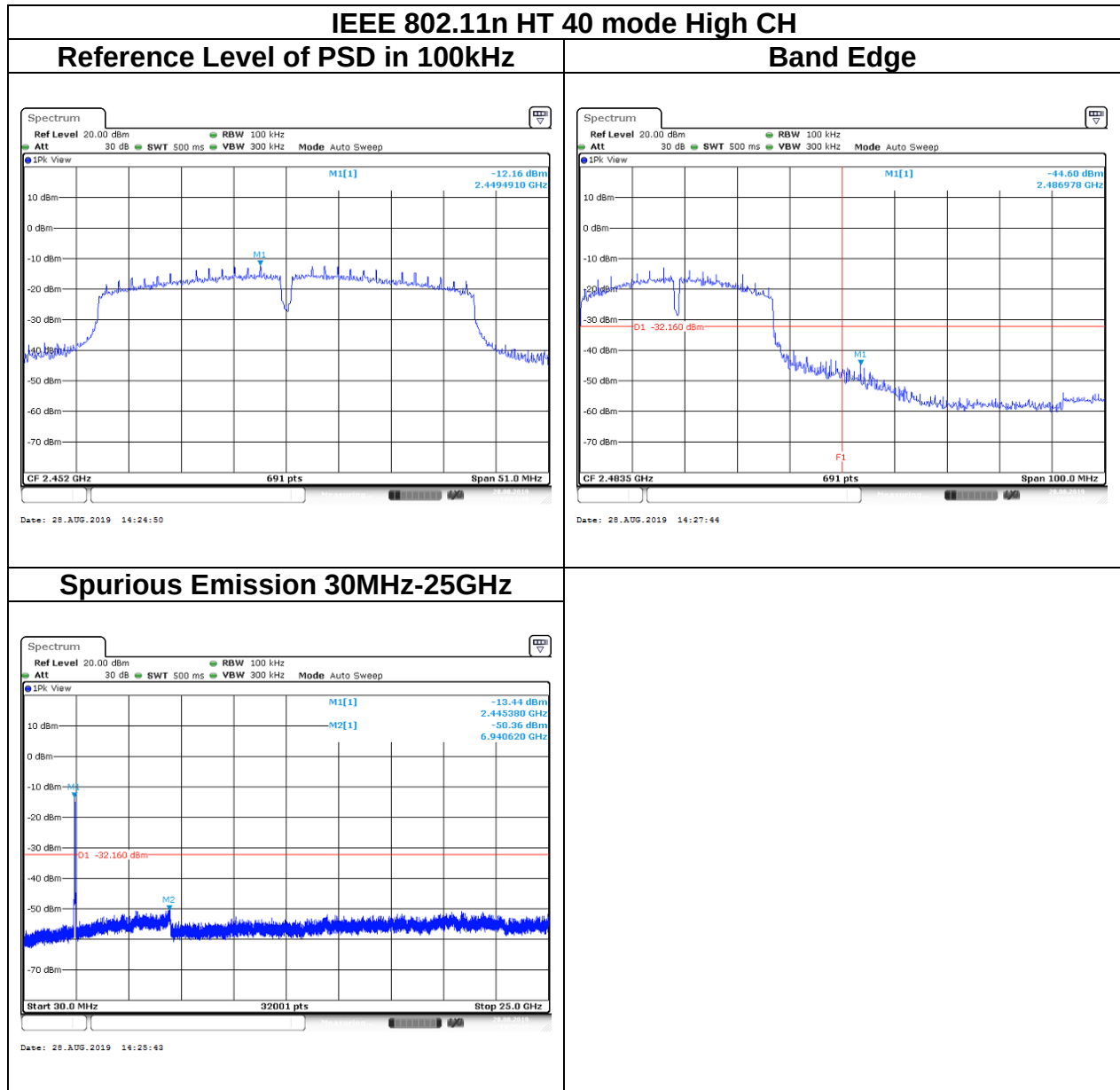
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11. 功率密度之量測

11.1 適用標準

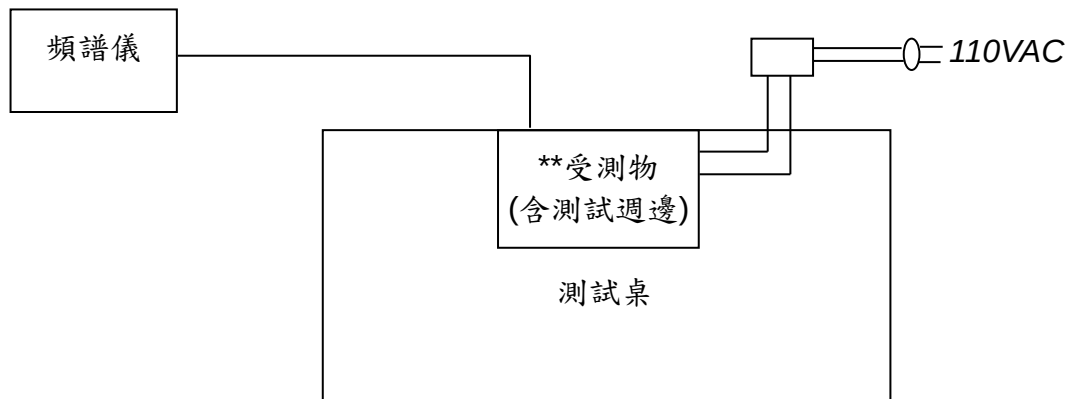
依據國家通訊傳播委員會低功率射頻器材技術規範 4.10.1.6(2)(B)條規定，對數位調變之系統，在使用頻率範圍之任意 3kHz 頻寬內，由發射機傳導至天線之峰值發射電功率密度在任意期間內，皆不得大於 8dBm。

11.2 測試方法

1. 將發射機之天線埠經由適當之衰減直接連至測試儀器。找出發射峰值並擴展於通帶內，設定解析頻寬為 $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$ ，視訊頻寬 $\geq 3 \times \text{RBW}$ ，掃描時間為 auto couple, Span 大於 DTS 頻寬 1.5 倍。所測得之峰值位準必須不大於 +8dBm。
2. 若受測裝置之頻譜線間隔小於 3 kHz，測量時應將解析頻寬降低以使頻譜線間隔大於 3kHz，所測得之數據再藉加總 3 kHz 頻帶內所有個別頻譜線之功率而標準化至 3 kHz 以決定是否符合規定。

註：測試方法依據 ANSI C63.10: 2013

11.3 測試配置



註：**請參照 3.2 節

11.4 功率密度之量測結果

Test Mode: IEEE 802.11b Mode

頻道	頻率 (MHz)	功率密度 (dBm)	限制值 (dBm)	測試結果
CH Low	2412	-11.10	8	PASS
CH Mid	2437	-12.21		PASS
CH High	2462	-10.49		PASS

Test Mode: IEEE 802.11g Mode

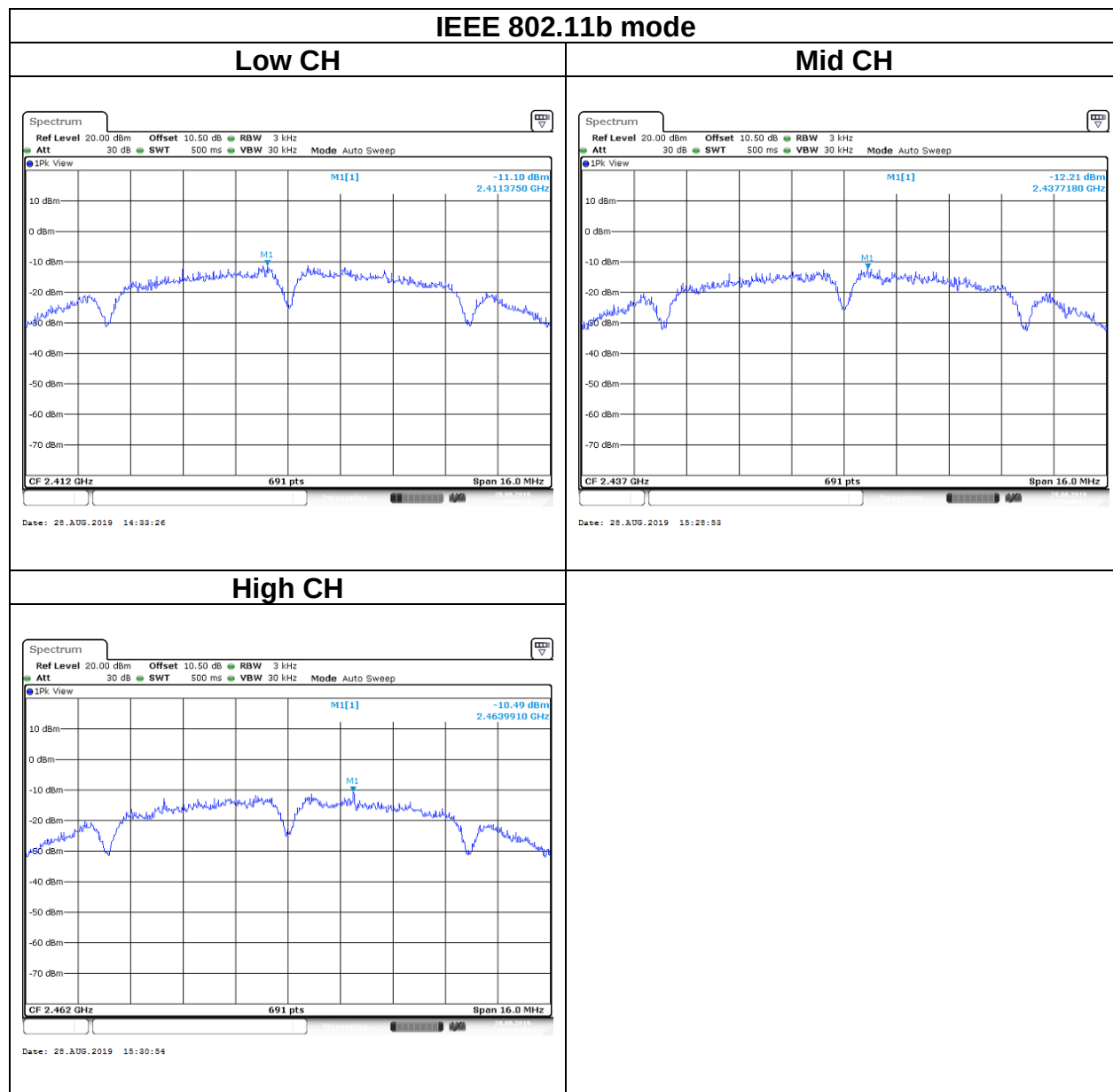
頻道	頻率 (MHz)	功率密度 (dBm)	限制值 (dBm)	測試結果
CH Low	2412	-13.29	8	PASS
CH Mid	2437	-12.88		PASS
CH High	2462	-12.57		PASS

Test Mode: IEEE 802.11n HT 20 Mode

頻道	頻率 (MHz)	功率密度 (dBm)	限制值 (dBm)	測試結果
CH Low	2412	-13.04	8	PASS
CH Mid	2437	-12.76		PASS
CH High	2462	-12.88		PASS

Test mode: IEEE 802.11n HT 40 mode

頻道	頻率 (MHz)	功率密度 (dBm)	限制值 (dBm)	測試結果
CH Low	2422	-15.10	8	PASS
CH Mid	2437	-14.85		PASS
CH High	2452	-14.79		PASS

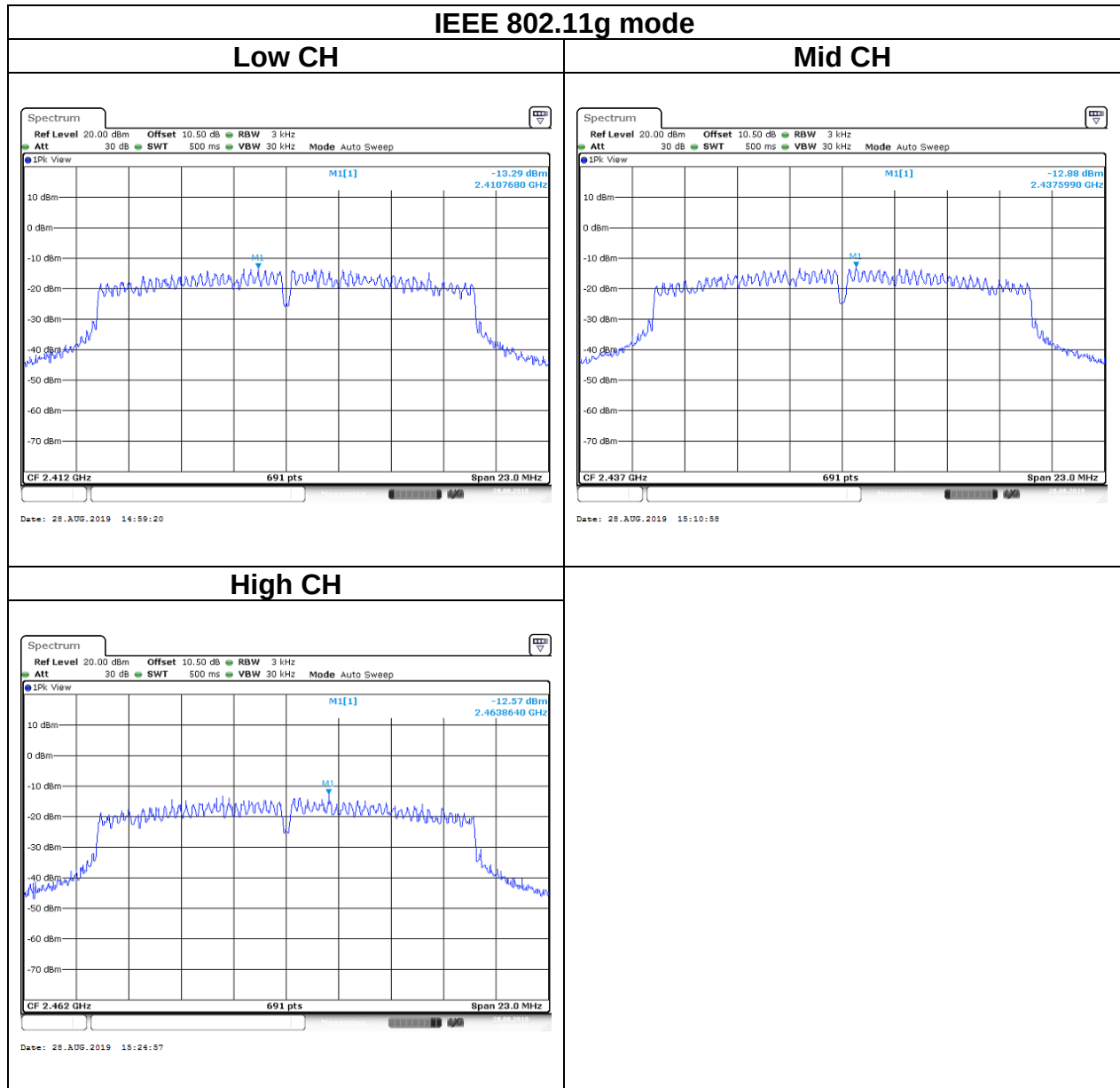




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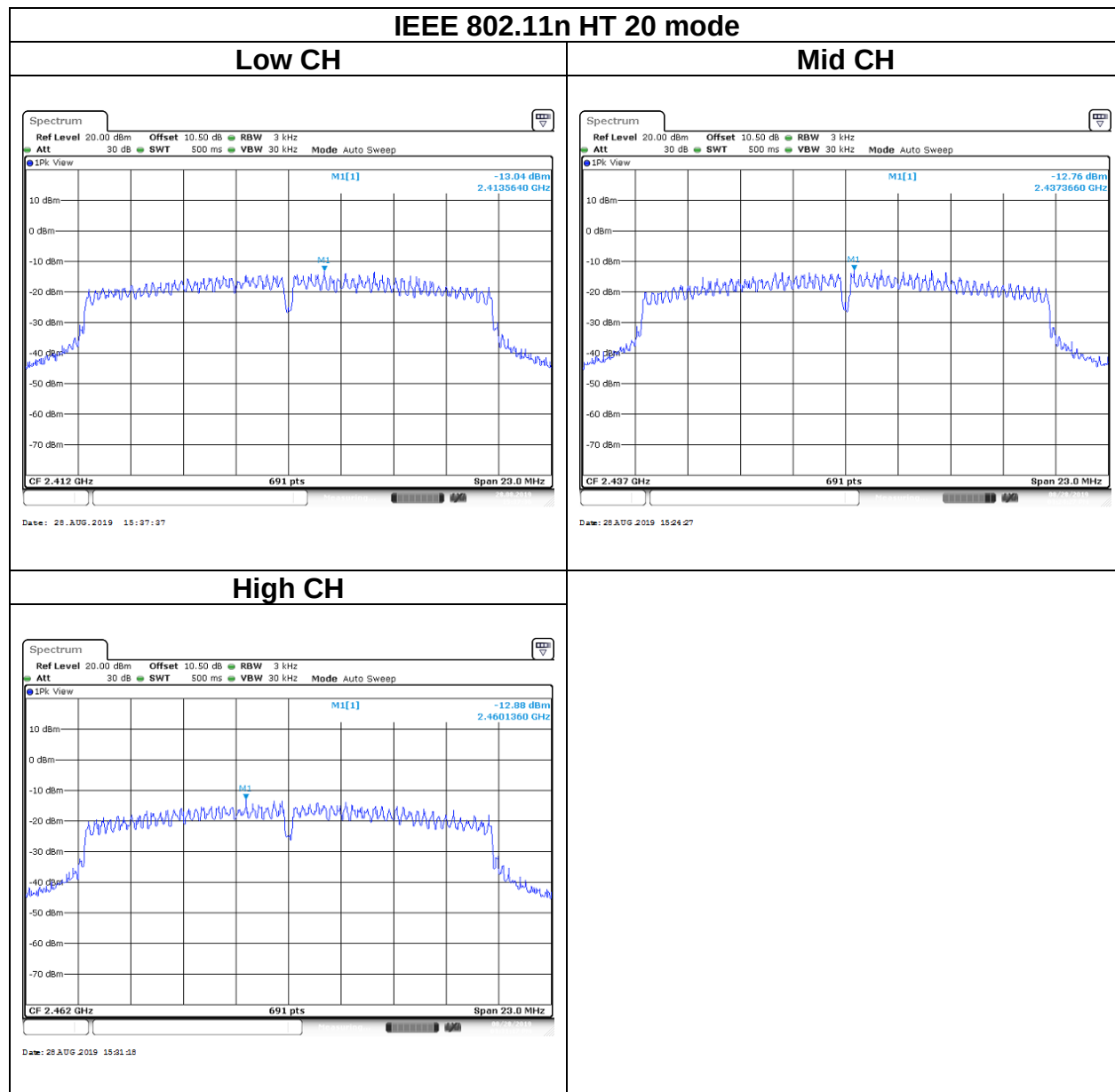


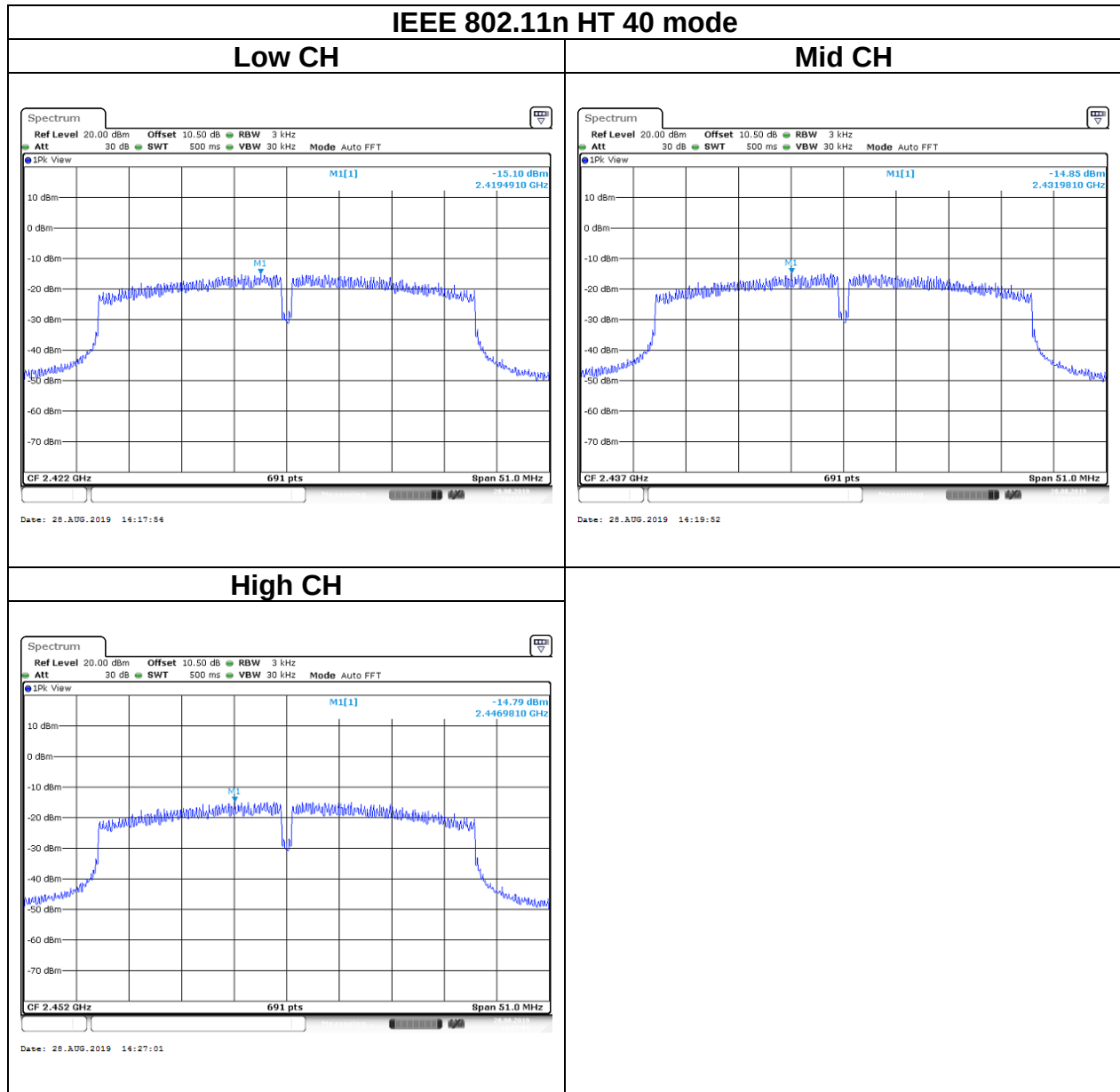


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- End of Test Report -