

Test Report

Product: MLM2XPro

Trade Mark: Rapsodo

Model Number: MLM2.0XP

FCC ID: 2AH3O-MLM2XPRO

Prepared for

Rapsodo Pte Ltd

Blk 20 Ayer Rajah Crescent, #08-05 Singapore 139964

Prepared by

Shenzhen HongBiao Certification& Testing Co., Ltd

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TEST RESULT CERTIFICATION

Applicant's Name..... : Rapsodo Pte Ltd
Address : Blk 20 Ayer Rajah Crescent, #08-05 Singapore 139964
Manufacturer's Name : Rapsodo Pte Ltd
Address : Blk 20 Ayer Rajah Crescent, #08-05 Singapore 139964

Product description

Product name : MLM2XPro
Model Number : MLM2.0XP
Standards : FCC Part 15.247
IEEE/ANSI C63.10-2020 + Cor. 1-2023 + C63.10a-2024 +
Test procedure..... : Errata to C63.10a-2024
KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01

This device described above has been tested by Shenzhen HongBiao Certification& Testing Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.

Date of Test

Date (s) of performance of tests..... : July 13, 2026~July 27, 2026
Test Result..... : **Pass**

Testing Engineer

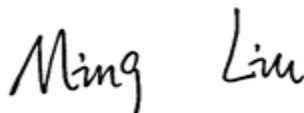
:



(Z o e S u)

Technical Manager

:



(M i n g L i u)

Authorized Signatory :

(L e o S u)

Revision History

[illegible]

1 General Description

1.1 Description of EUT

Product name:	MLM2XPro
Model name:	MLM2.0XP
Series Model:	N/A
Different of series model:	N/A
Operation frequency:	802.11b/g/n/ax20: 2412-2462MHz 802.11n/ax40: 2422-2452MHz
Modulation type:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g/n/ax (HT20/H40): OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bit Rate of transmitter:	IEEE 802.11b: 1/2/5.5/11Mbps IEEE 802.11g: 6/9/12/18/24/36/48/54Mbps IEEE 802.11n(20MHz): MCS0-7, up to 72.2Mbps IEEE 802.11n(40MHz): MCS0-7, up to 150Mbps IEEE 802.11ax(20MHz): MCS0-11, up to 143.4Mbps IEEE 802.11ax(40MHz): MCS0-11, up to 286.8 Mbps
Antenna type:	ANT1: FPC Antenna ANT2: FPC Antenna
Antenna gain:	ANT 1: 5.7dBi ANT 2: 5.7dBi MINO: 8.71dBi
Max. output power:	17.67dBm
Hardware version:	V1.0
Software version:	V1.0
Battery:	DC 7.4V, 3300mAh
Power supply:	Input: 5V=3A
Adapter information:	N/A

1.2 Test Mode

Channel List for 802.11b/g/n/ax(20)

Channel	Channel	Frequency (MHz)
Low	01	2412

Middle	06	2437
High	11	2462

Channel List for 802.11n/ax(40)

Channel	Channel	Frequency (MHz)
Low	03	2422
Middle	06	2437
High	09	2452

Note: 802.11ax mode only support full resource unit size.

1.3 Operation Channel list

Channel List for 802.11b/g/n/ax(20)

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	\	\

Channel List for 802.11n/ax(40)

Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	07	2442
04	2427	08	2447
05	2432	09	2452
06	2437	\	\

1.4 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.5 Power setting configuration parameters

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters.

Test software Version			Tera Term VT	
Mode	802.11b	802.11g	802.11n/ax20	802.11n/ax40
Parameters	default	default	default	default
RF cable				
Description	Connector		Length	Supplied by
Antenna Cable	SMA		10cm	Applicant

Note: Disclaimer: the loss of RF cable is too small and can be ignored. Fixed-frequency software: Tera Term.

1.6 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
Notebook	BDR-WDH	A3RQPM242 0002411	Honor Terminal Co., Ltd.
Adapter	CD289	35810	Ugreen Group Limited

Note: The notebook is used to assist the RF test. In order to prevent the notebook from causing unnecessary impact on the test, the notebook will be removed from the test environment after the EUT successfully transmits at a fixed frequency using the notebook.

2 Summary of Test Result

No.	Standard Section	Test Item	Result	Remark
1	15.203 15.247(b)(4)	Antenna Requirement	Pass	
2	15.247 (b)	Peak Output Power	Pass	
3	15.207	Conducted Emission	Pass	
4	15.247 (d) & 15.209	Radiated Spurious Emission	Pass	
5	15.247 (e)	Power Spectral Density	Pass	
6	15.247 (a)(2)	6dB Bandwidth	Pass	
7	/	Duty Cycle	Pass	
8	15.205	Band Edge Emission	Pass	
9	15.247(d)	Spurious RF Conducted Emissions	Pass	

3 Test Facilities and Accreditations

3.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

3.2 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C~35°C
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

3.3 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

The data and results quoted in this document are true and accurate values, and uncertainties are not involved in the calculations.

In addition, components and mass production processes that are similar to testing equipment may introduce additional deviations, and the manufacturer is solely responsible for the continued compliance of the equipment.

Measurement Frequency Range	U, (dB)	Note
RF frequency	2×10^{-5}	
RF power, conducted	± 0.57 dB	
PSD, conducted	± 1 dB	
Conducted emission(150kHz~30MHz)	± 2.5 dB	
Radiated emission(9kHz-30MHz)	± 2.5 dB	
Radiated emission(30MHz~1GHz)	± 4.2 dB	
Radiated emission (above 1GHz)	± 4.7 dB	
Occupied Bandwidth	$\pm 3\%$	
Temperature	± 1 degree	

Humidity	$\pm 5 \%$	
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3.4 Test Software

Software name	Manufacturer	Model	Version
Conducted Emission test Software	Farad	EZ-EMC	EMC-CON 3A1.1+
Radiated Emission test Software	Farad	EZ-EMC	FA-03A2
RF Test System	MWRF	MTS 8310	2.0.0.0

4 List of Test Equipment

Radiation emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E001	Horn Antenna	Schwarzbeck	BBHA 9120D	02592	2026-04-25	2028-04-24
2	HB-E002	Biconical log-periodic composite antenna	Schwarzbeck	VULB 9168	01340	2026-04-25	2028-04-24
3	HB-E003	SHF-EHF Horn	Schwarzbeck	BBHA 9170	01193	2026-04-25	2028-04-24
4	HB-E005	Preamplifier	Noyetec	LAN-0118	NYCM1420102	2026-04-27	2027-04-26
5	HB-E006	Preamplifier	Noyetec	LAN-1840	NYCM1420103	2026-04-30	2027-04-29
6	HB-E007	EMI TEST RECEIVER	R&S	ESR7	102520	2026-04-28	2027-04-27
7	HB-E009	POSITINAL COTROLLE R	Noyetec	N/A	N/A	/	/
8	HB-E013	RF switch	Noyetec	NY-RF4	NY0CM1420204	/	/
9	HB-E066	Illuminance Tester	TASI	TA8121	N/A	2026-04-30	2027-04-29
10	HB-E075	Active loop antenna	Schwarzbeck	FMZB 1519B	1519B-00245	2026-04-25	2028-04-24
11	HB-E076	Preamplifier	Hewlett Packard	8447D	1937A02278	2026-04-28	2027-04-27
12	HB-E044	Signal& spectrum Analyzer	R&S	FSV3044	101264	2026-04-28	2027-04-27
Conduction emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E014	4 Path V-LISN	Schwarzbeck	NNLK 8121	00770	2026-04-27	2027-04-26
2	HB-E015	Pulse Limiter	Schwarzbeck	VTSD 9561-F	00949	2026-04-27	2027-04-26
3	HB-E016	Absorb clamp	ZHINAN	ZN23201	*21066*	2026-04-29	2027-04-28
4	HB-E059	Attenuator	Xianghua	TS2-6-1	220215166	2026-04-27	2027-04-26
5	HB-E069	EMI TEST RECEIVER	R&S	ESCI	100610	2026-04-27	2027-04-26
RF							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date

1	HB-E041	MXG Anaio Signal Generator	Agilent	N5181A	MY47070421	2026-04-27	2027-04-26
2	HB-E042	WIDEBAND RADIO COMMUNICA TION TESTER	R&S	CMW500	132108	2026-04-27	2027-04-26
3	HB-E043	MXG Anaio Signal Generator	Agilent	N5182A	US46240335	2026-04-28	2027-04-27
4	HB-E044	Signal& spectrum Analyzer	R&S	FSV3044	101264	2026-04-28	2027-04-27
5	HB-E045	RF Control Box	Noyetec	NY100-R FCB	N/A	2026-04-28	2027-04-27
6	HB-E058	Thermometer Clock Humidity Monitor	N/A	HTC-1S	N/A	2026-04-30	2027-04-29

Note: the calibration interval of the above test instruments is 12&24 months and the calibrations are traceable to international system unit (SI).

5 Test Item And Results

5.1 Antenna Requirement

5.1.1 Standard Requirement

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device

5.1.2 Test Result

The EUT antenna is FPC Antenna. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

5.2 Conducted Emission

5.2.1 Limits

Limits – Class B		
Frequency (MHz)	Limit (dBμV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50
Note: 1. the tighter limit applies at the band edges. 2. the limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.		

5.2.2 Test Procedures

a) EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

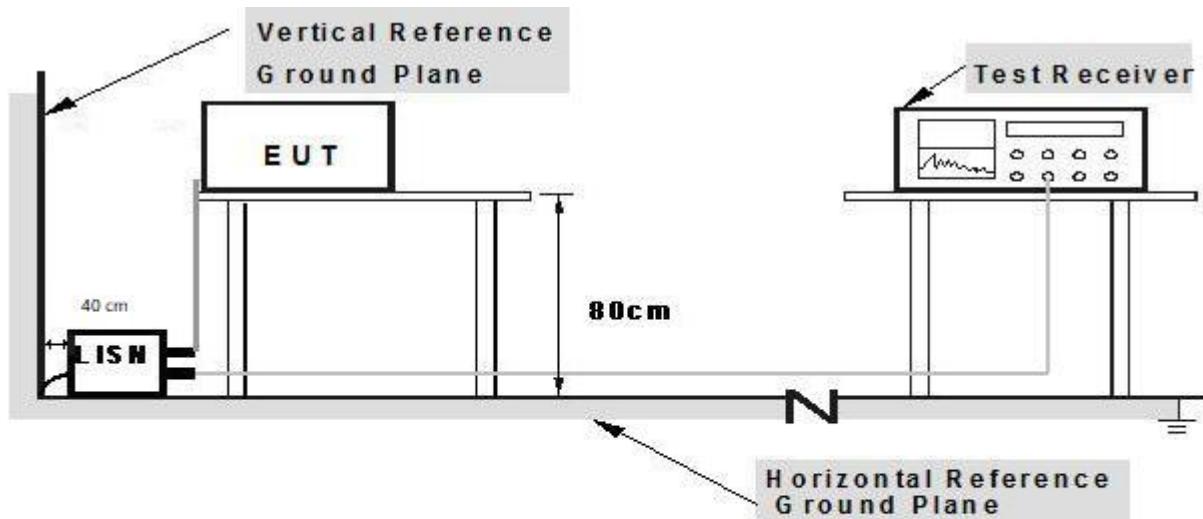
b) The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

- c) The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- d) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- e) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- f) LISN is at least 80 cm from nearest part of EUT chassis.

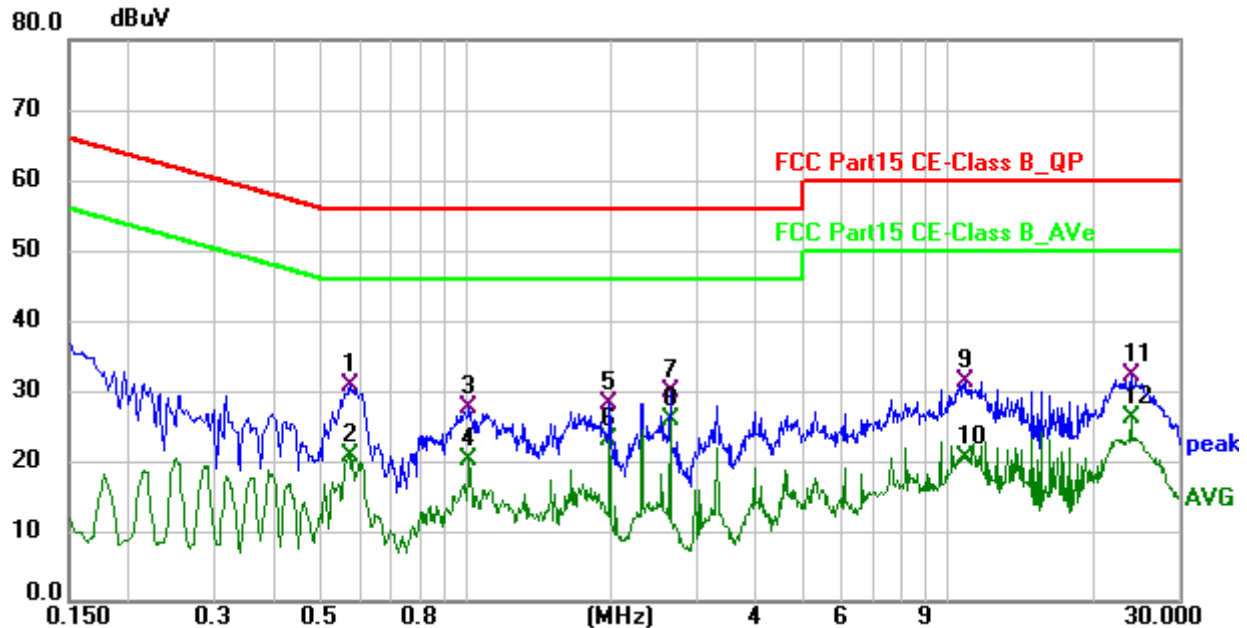
- g) For the actual test configuration, please refer to the related Item – photographs of the test setup.

5.2.3 Test Setup



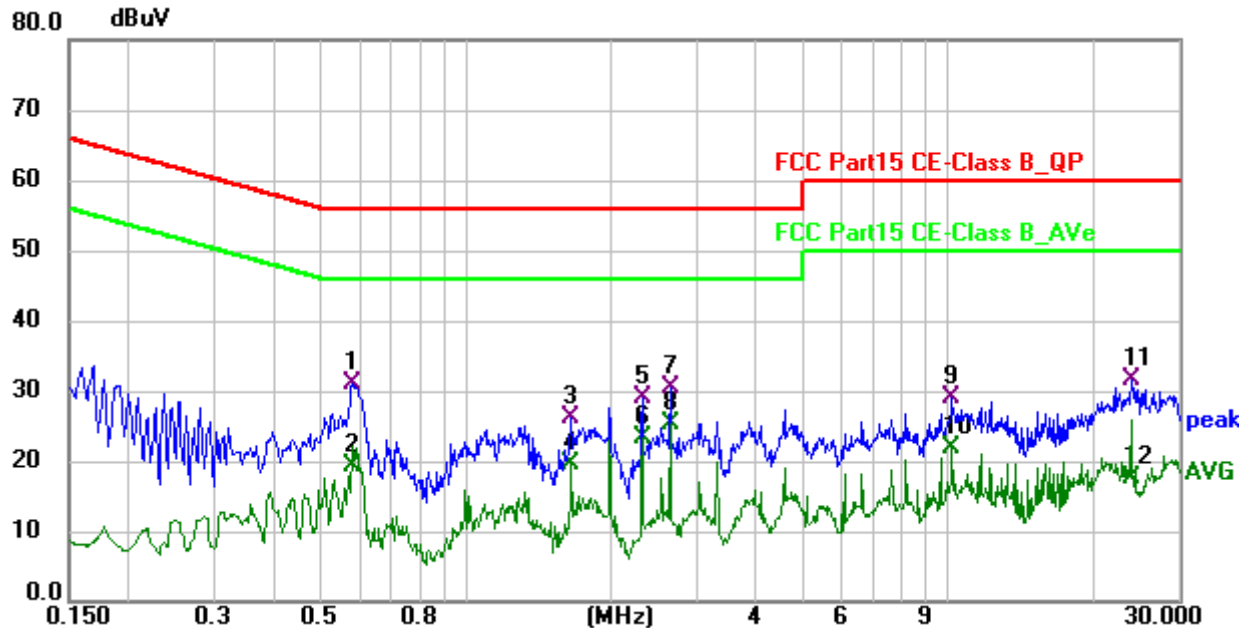
5.2.4 Test Result

EUT:	MLM2XPro	Model Name:	MLM2.0XP
Test Mode:	Charging + TX (802.11n20, 2437, ANT1)	Phase:	L
Test Voltage:	DC 5V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.573	20.52	10.11	30.63	56.00	-25.37	QP
2	0.573	10.68	10.11	20.79	46.00	-25.21	AVG
3	1.018	17.39	10.13	27.52	56.00	-28.48	QP
4	1.018	10.09	10.13	20.22	46.00	-25.78	AVG
5	1.990	17.74	10.35	28.09	56.00	-27.91	QP
6	1.990	12.55	10.35	22.90	46.00	-23.10	AVG
7	2.656	19.32	10.54	29.86	56.00	-26.14	QP
8 *	2.656	15.24	10.54	25.78	46.00	-20.22	AVG
9	10.900	17.66	13.66	31.32	60.00	-28.68	QP
10	10.900	6.76	13.66	20.42	50.00	-29.58	AVG
11	24.000	16.89	15.20	32.09	60.00	-27.91	QP
12	24.000	10.98	15.20	26.18	50.00	-23.82	AVG

EUT:	MLM2XPro	Model Name:	MLM2.0XP
Test Mode:	Charging + TX (802.11n20, 2437, ANT1)	Phase:	N
Test Voltage:	DC 5V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.582	20.78	10.12	30.90	56.00	-25.10	QP
2	0.582	9.23	10.12	19.35	46.00	-26.65	AVG
3	1.657	16.00	10.27	26.27	56.00	-29.73	QP
4	1.657	9.37	10.27	19.64	46.00	-26.36	AVG
5	2.324	18.56	10.45	29.01	56.00	-26.99	QP
6	2.324	12.86	10.45	23.31	46.00	-22.69	AVG
7	2.656	19.79	10.54	30.33	56.00	-25.67	QP
8 *	2.656	14.85	10.54	25.39	46.00	-20.61	AVG
9	10.190	15.22	13.64	28.86	60.00	-31.14	QP
10	10.190	8.35	13.64	21.99	50.00	-28.01	AVG
11	24.049	16.27	15.21	31.48	60.00	-28.52	QP
12	24.049	2.30	15.21	17.51	50.00	-32.49	AVG

5.3 Radiated Emission

5.3.1 Limits

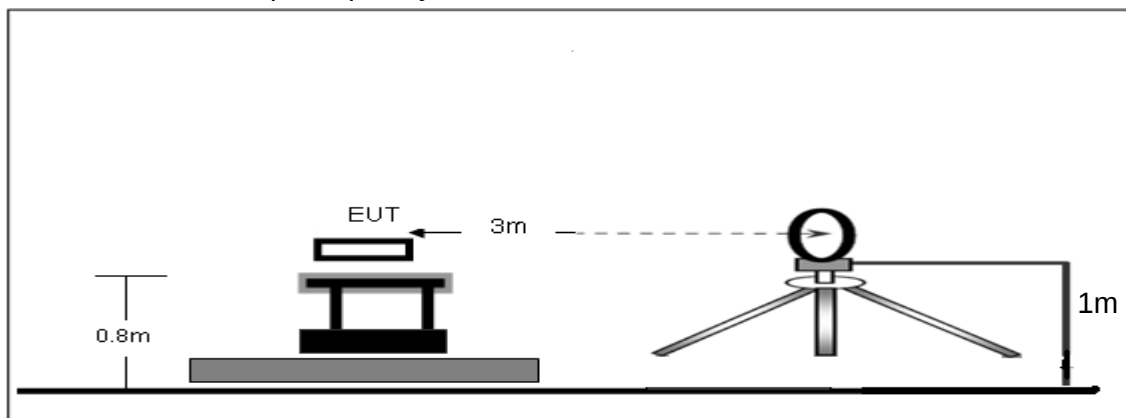
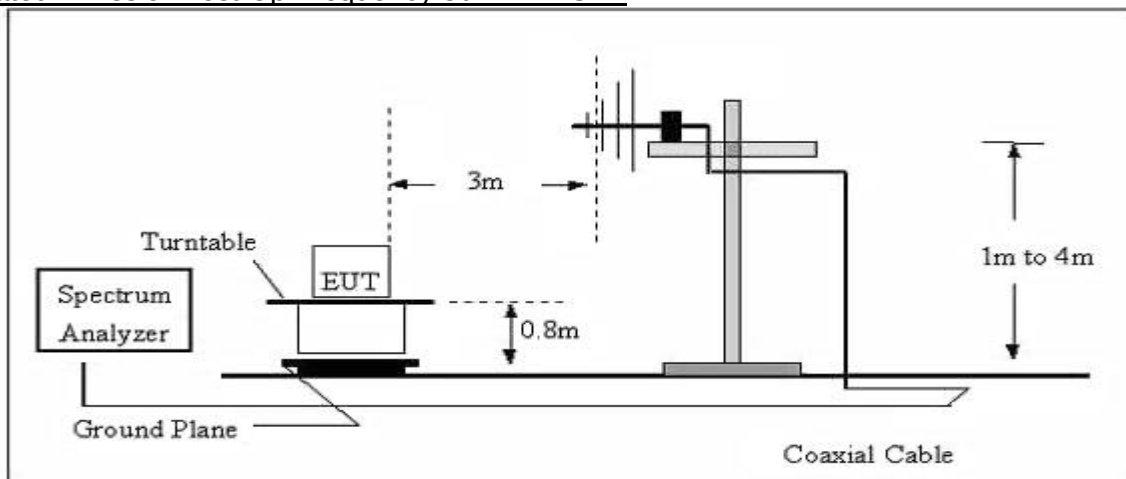
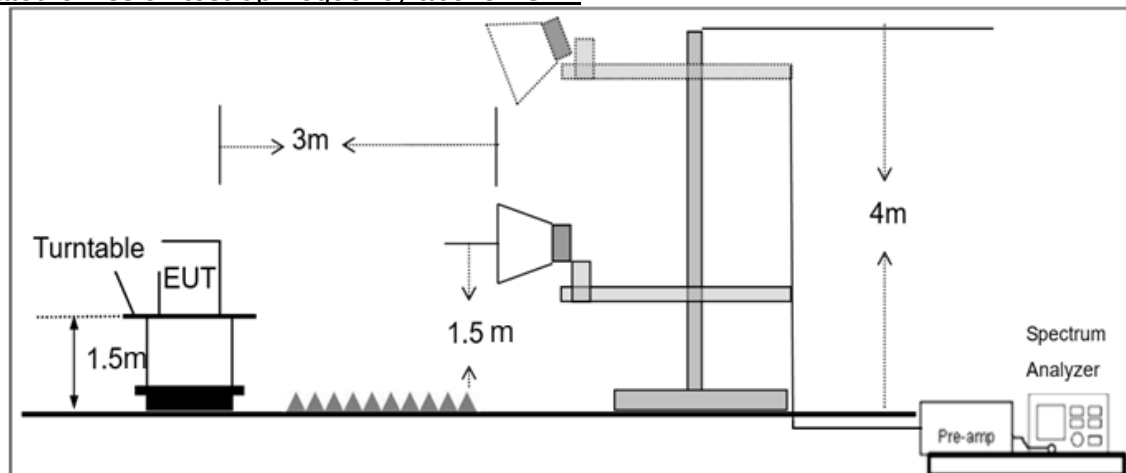
Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.3.2 Test Procedures

- The radiated emission tests were performed in the 3 meters.
- The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- If the peak mode measured value compliance with and lower than quasi peak mode limit, the EUT shall be deemed to meet QP limits and then no additional QP mode measurement performed.
- If the peak mode measured value compliance with and lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.
- For the actual test configuration, please refer to the related item – EUT test photos.

5.3.3 Test Setup

Radiated Emission Test-Up Frequency Below 30MHzRadiated Emission Test-Up Frequency 30MHz~1GHzRadiated emission test-up frequency above 1GHz**5.3.4 Test Result**

Below 30MHz

EUT:	MLM2XPro	Model Name:	MLM2.0XP
Pressure:	1010 hPa	Test Voltage:	DC 7.4V from battery
Test Mode:	TX	Polarization:	--

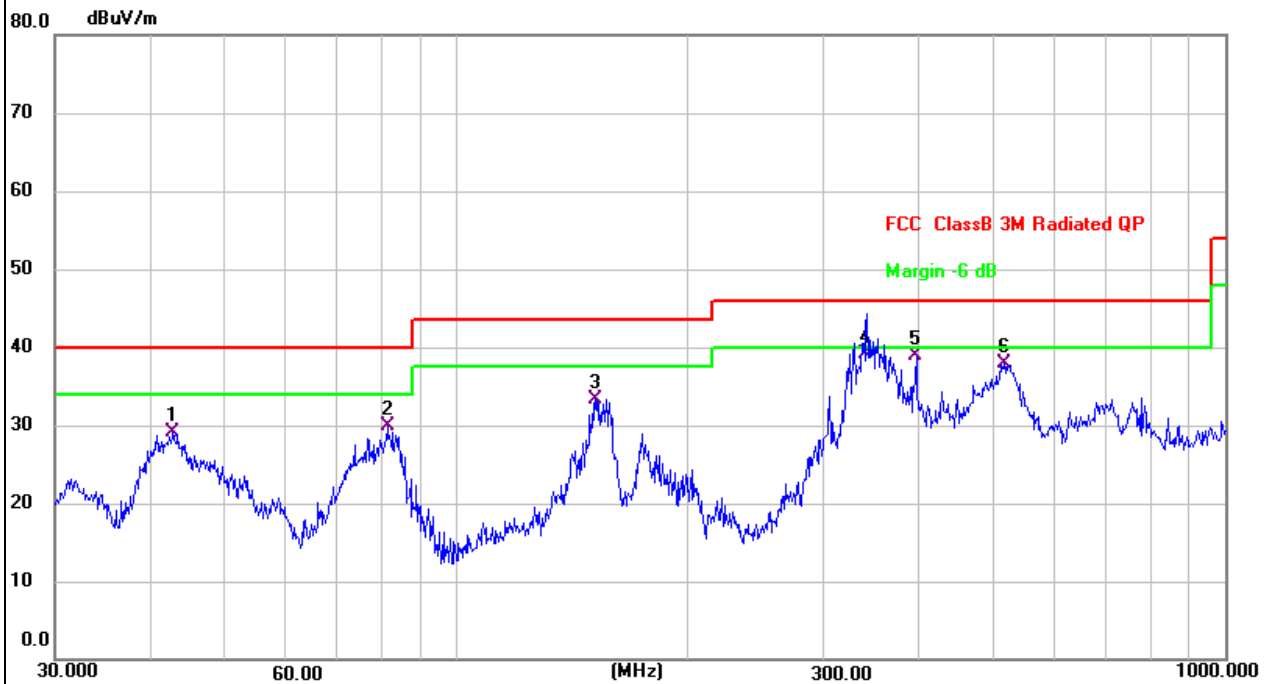
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

Note:

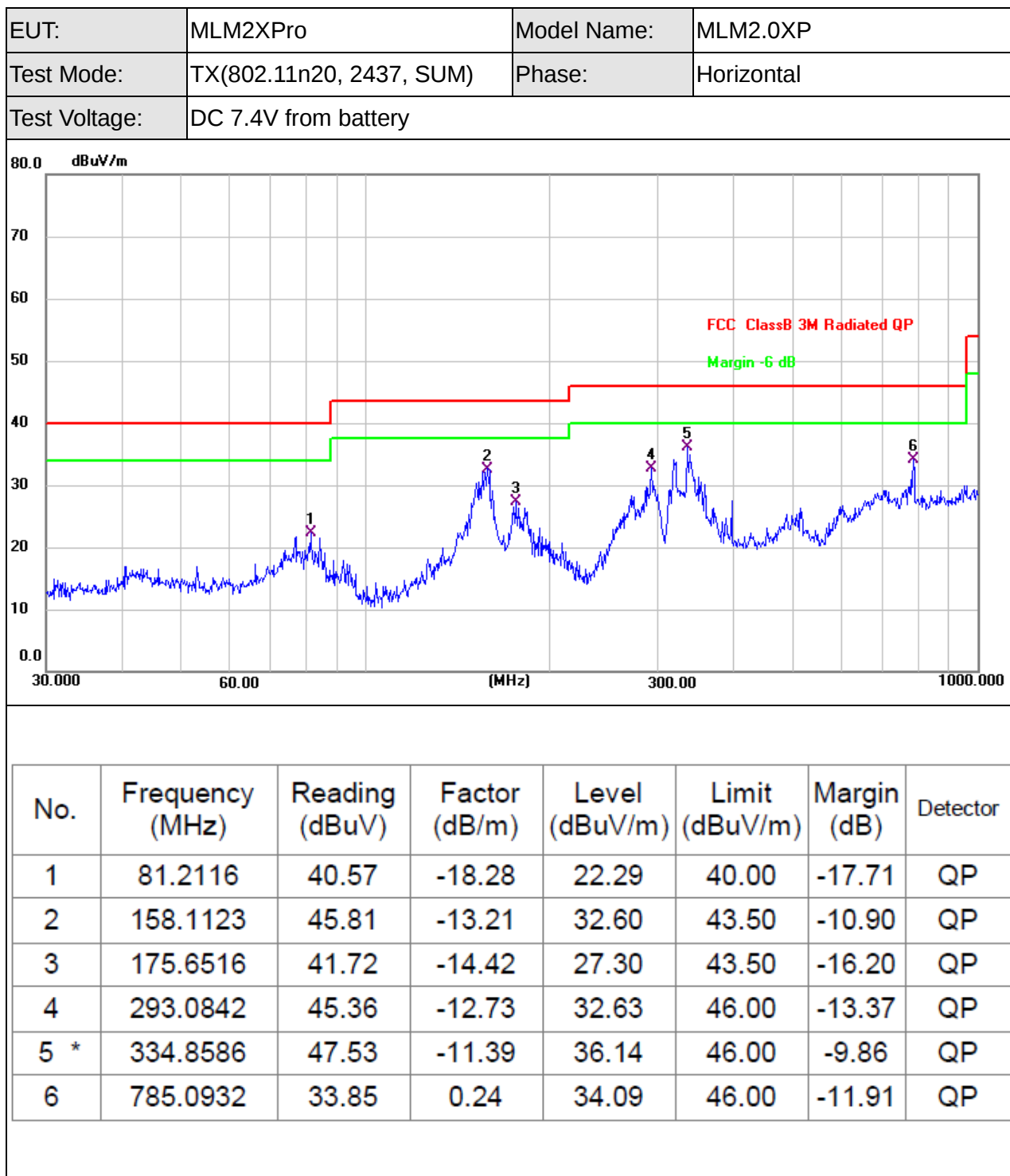
1. For 9kHz-30MHz, the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);
3. Limit line = specific limits (dBuV) + distance extrapolation factor.

Frequency range (30MHz – 1GHz)

EUT:	MLM2XPro	Model Name:	MLM2.0XP
Test Mode:	TX(802.11n20, 2437, SUM)	Phase:	Vertical
Test Voltage:	DC 7.4V from battery		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	42.7494	43.05	-13.93	29.12	40.00	-10.88	QP
2	81.2116	48.25	-18.28	29.97	40.00	-10.03	QP
3	151.5971	46.49	-13.25	33.24	43.50	-10.26	QP
4 *	341.9786	50.41	-11.21	39.20	46.00	-6.80	QP
5	396.2412	48.42	-9.52	38.90	46.00	-7.10	QP
6	515.4373	44.49	-6.65	37.84	46.00	-8.16	QP



Frequency range (1GHz-25GHz)

Frequency (MHz)	Read Level (dBμV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	Comment
Low Channel (2412 MHz)--Above 1G									
4826.252	43.63	4.83	33.6	30.80	51.26	74.00	-22.74	Pk	Vertical
4824.535	31.94	4.83	33.6	30.80	39.57	54.00	-14.43	AV	Vertical
7238.068	42.37	5.85	37.45	31.50	54.17	74.00	-19.83	Pk	Vertical
7236.991	32.20	5.85	37.45	31.50	44.00	54.00	-10.00	AV	Vertical
4825.488	43.18	4.83	33.6	30.80	50.81	74.00	-23.19	Pk	Horizontal
4825.021	31.95	4.83	33.6	30.80	39.58	54.00	-14.42	AV	Horizontal
7236.335	43.60	5.85	37.45	31.50	55.40	74.00	-18.60	Pk	Horizontal
7236.442	32.17	5.85	37.45	31.50	43.97	54.00	-10.03	AV	Horizontal
Middle Channel (2437 MHz)--Above 1G									
4875.632	42.58	4.88	33.75	30.80	50.41	74.00	-23.59	Pk	Vertical
4874.550	31.95	4.88	33.75	30.80	39.78	54.00	-14.22	AV	Vertical
7312.076	44.63	5.90	38.10	31.59	57.04	74.00	-16.96	Pk	Vertical
7311.380	32.81	5.90	38.10	31.59	45.22	54.00	-8.78	AV	Vertical
4876.183	43.93	4.88	33.75	30.80	51.76	74.00	-22.24	Pk	Horizontal
4876.085	32.00	4.88	33.75	30.80	39.83	54.00	-14.17	AV	Horizontal
7312.963	44.14	5.90	38.10	31.59	56.55	74.00	-17.45	Pk	Horizontal
7311.313	32.78	5.90	38.10	31.59	45.19	54.00	-8.81	AV	Horizontal
High Channel (2462 MHz)--Above 1G									
4926.299	43.14	4.93	34.04	30.08	52.03	74.00	-21.97	Pk	Vertical
4926.072	32.09	4.93	34.04	30.08	40.98	54.00	-13.02	AV	Vertical
7386.748	43.54	6.01	37.90	31.74	55.71	74.00	-18.29	Pk	Vertical
7386.297	32.63	6.01	37.90	31.74	44.80	54.00	-9.20	AV	Vertical
4924.090	44.25	4.93	34.04	30.08	53.14	74.00	-20.86	Pk	Horizontal
4925.911	32.03	4.93	34.04	30.08	40.92	54.00	-13.08	AV	Horizontal
7387.847	43.61	6.01	37.90	31.74	55.78	74.00	-18.22	Pk	Horizontal
7387.010	32.55	6.01	37.90	31.74	44.72	54.00	-9.28	AV	Horizontal

Note:

1. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor
2. All other emissions more than 20dB below the limit.
3. All modes have been tested, and only the worst mode 802.11n20 in the report.

5.3.5 Radiated Band Edge

Frequency (MHz)	Meter Reading (dBμV)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11b									
2310.00	45.98	3.40	27.80	32.41	44.77	74	-29.23	Pk	Horizontal
2310.00	33.46	3.40	27.80	32.41	32.25	54	-21.75	AV	Horizontal
2310.00	44.68	3.40	27.80	32.41	43.47	74	-30.53	Pk	Vertical
2310.00	33.72	3.40	27.80	32.41	32.51	54	-21.49	AV	Vertical
2390.00	45.52	3.45	27.70	32.49	44.18	74	-29.82	Pk	Vertical
2390.00	34.38	3.45	27.70	32.49	33.04	54	-20.96	AV	Vertical
2390.00	46.42	3.45	27.70	32.49	45.08	74	-28.92	Pk	Horizontal
2390.00	34.50	3.45	27.70	32.49	33.16	54	-20.84	AV	Horizontal
2400.00	46.63	3.46	27.80	32.54	45.35	74	-28.65	Pk	Vertical
2400.00	34.49	3.46	27.80	32.54	33.21	54	-20.79	AV	Vertical
2400.00	45.94	3.46	27.80	32.54	44.66	74	-29.34	Pk	Horizontal
2400.00	34.42	3.46	27.80	32.54	33.14	54	-20.86	AV	Horizontal
2483.50	47.31	3.48	28.53	32.55	46.77	74	-27.23	Pk	Vertical
2483.50	33.87	3.48	28.53	32.55	33.33	54	-20.67	AV	Vertical
2483.50	46.33	3.48	28.53	32.55	45.79	74	-28.21	Pk	Horizontal
2483.50	33.91	3.48	28.53	32.55	33.37	54	-20.63	AV	Horizontal
2500.00	45.39	3.49	29.20	32.66	45.42	74	-28.58	Pk	Vertical
2500.00	33.77	3.49	29.20	32.66	33.80	54	-20.20	AV	Vertical
2500.00	45.21	3.49	29.20	32.66	45.24	74	-28.76	Pk	Horizontal
2500.00	33.92	3.49	29.20	32.66	33.95	54	-20.05	AV	Horizontal
802.11g									
2310.00	45.97	3.40	27.80	32.41	44.76	74	-29.24	Pk	Horizontal
2310.00	33.36	3.40	27.80	32.41	32.15	54	-21.85	AV	Horizontal
2310.00	44.68	3.40	27.80	32.41	43.47	74	-30.53	Pk	Vertical
2310.00	33.48	3.40	27.80	32.41	32.27	54	-21.73	AV	Vertical
2390.00	45.45	3.45	27.70	32.49	44.11	74	-29.89	Pk	Vertical
2390.00	34.53	3.45	27.70	32.49	33.19	54	-20.81	AV	Vertical
2390.00	46.40	3.45	27.70	32.49	45.06	74	-28.94	Pk	Horizontal
2390.00	34.63	3.45	27.70	32.49	33.29	54	-20.71	AV	Horizontal
2400.00	46.81	3.46	27.80	32.54	45.53	74	-28.47	Pk	Vertical
2400.00	34.47	3.46	27.80	32.54	33.19	54	-20.81	AV	Vertical
2400.00	46.06	3.46	27.80	32.54	44.78	74	-29.22	Pk	Horizontal
2400.00	34.45	3.46	27.80	32.54	33.17	54	-20.83	AV	Horizontal
2483.50	47.21	3.48	28.53	32.55	46.67	74	-27.33	Pk	Vertical
2483.50	34.03	3.48	28.53	32.55	33.49	54	-20.51	AV	Vertical

2483.50	46.32	3.48	28.53	32.55	45.78	74	-28.22	Pk	Horizontal
2483.50	33.84	3.48	28.53	32.55	33.30	54	-20.70	AV	Horizontal
2500.00	45.45	3.49	29.20	32.66	45.48	74	-28.52	Pk	Vertical
2500.00	33.92	3.49	29.20	32.66	33.95	54	-20.05	AV	Vertical
2500.00	45.31	3.49	29.20	32.66	45.34	74	-28.66	Pk	Horizontal
2500.00	33.71	3.49	29.20	32.66	33.74	54	-20.26	AV	Horizontal
802.11n20									
2310.00	46.01	3.40	27.80	32.41	44.80	74	-29.20	Pk	Horizontal
2310.00	33.58	3.40	27.80	32.41	32.37	54	-21.63	AV	Horizontal
2310.00	44.81	3.40	27.80	32.41	43.60	74	-30.40	Pk	Vertical
2310.00	33.45	3.40	27.80	32.41	32.24	54	-21.76	AV	Vertical
2390.00	45.56	3.45	27.70	32.49	44.22	74	-29.78	Pk	Vertical
2390.00	34.50	3.45	27.70	32.49	33.16	54	-20.84	AV	Vertical
2390.00	46.18	3.45	27.70	32.49	44.84	74	-29.16	Pk	Horizontal
2390.00	34.47	3.45	27.70	32.49	33.13	54	-20.87	AV	Horizontal
2400.00	46.74	3.46	27.80	32.54	45.46	74	-28.54	Pk	Vertical
2400.00	34.58	3.46	27.80	32.54	33.30	54	-20.70	AV	Vertical
2400.00	45.98	3.46	27.80	32.54	44.70	74	-29.30	Pk	Horizontal
2400.00	34.34	3.46	27.80	32.54	33.06	54	-20.94	AV	Horizontal
2483.50	47.05	3.48	28.53	32.55	46.51	74	-27.49	Pk	Vertical
2483.50	34.00	3.48	28.53	32.55	33.46	54	-20.54	AV	Vertical
2483.50	46.39	3.48	28.53	32.55	45.85	74	-28.15	Pk	Horizontal
2483.50	33.90	3.48	28.53	32.55	33.36	54	-20.64	AV	Horizontal
2500.00	45.41	3.49	29.20	32.66	45.44	74	-28.56	Pk	Vertical
2500.00	33.91	3.49	29.20	32.66	33.94	54	-20.06	AV	Vertical
2500.00	45.43	3.49	29.20	32.66	45.46	74	-28.54	Pk	Horizontal
2500.00	33.92	3.49	29.20	32.66	33.95	54	-20.05	AV	Horizontal
802.11n40									
2310.00	46.20	3.40	27.80	32.41	44.99	74	-29.01	Pk	Horizontal
2310.00	33.52	3.40	27.80	32.41	32.31	54	-21.69	AV	Horizontal
2310.00	44.71	3.40	27.80	32.41	43.50	74	-30.50	Pk	Vertical
2310.00	33.56	3.40	27.80	32.41	32.35	54	-21.65	AV	Vertical
2390.00	45.57	3.45	27.70	32.49	44.23	74	-29.77	Pk	Vertical
2390.00	34.47	3.45	27.70	32.49	33.13	54	-20.87	AV	Vertical
2390.00	46.24	3.45	27.70	32.49	44.90	74	-29.10	Pk	Horizontal
2390.00	34.38	3.45	27.70	32.49	33.04	54	-20.96	AV	Horizontal
2400.00	46.78	3.46	27.80	32.54	45.50	74	-28.50	Pk	Vertical
2400.00	34.60	3.46	27.80	32.54	33.32	54	-20.68	AV	Vertical
2400.00	46.03	3.46	27.80	32.54	44.75	74	-29.25	Pk	Horizontal
2400.00	34.30	3.46	27.80	32.54	33.02	54	-20.98	AV	Horizontal
2483.50	47.34	3.48	28.53	32.55	46.80	74	-27.20	Pk	Vertical

2483.50	34.09	3.48	28.53	32.55	33.55	54	-20.45	AV	Vertical
2483.50	46.26	3.48	28.53	32.55	45.72	74	-28.28	Pk	Horizontal
2483.50	33.98	3.48	28.53	32.55	33.44	54	-20.56	AV	Horizontal
2500.00	45.34	3.49	29.20	32.66	45.37	74	-28.63	Pk	Vertical
2500.00	33.71	3.49	29.20	32.66	33.74	54	-20.26	AV	Vertical
2500.00	45.20	3.49	29.20	32.66	45.23	74	-28.77	Pk	Horizontal
2500.00	33.78	3.49	29.20	32.66	33.81	54	-20.19	AV	Horizontal
802.11ax20									
2310.00	45.91	3.40	27.80	32.41	44.70	74	-29.30	Pk	Horizontal
2310.00	33.38	3.40	27.80	32.41	32.17	54	-21.83	AV	Horizontal
2310.00	44.74	3.40	27.80	32.41	43.53	74	-30.47	Pk	Vertical
2310.00	33.63	3.40	27.80	32.41	32.42	54	-21.58	AV	Vertical
2390.00	45.71	3.45	27.70	32.49	44.37	74	-29.63	Pk	Vertical
2390.00	34.63	3.45	27.70	32.49	33.29	54	-20.71	AV	Vertical
2390.00	46.18	3.45	27.70	32.49	44.84	74	-29.16	Pk	Horizontal
2390.00	34.38	3.45	27.70	32.49	33.04	54	-20.96	AV	Horizontal
2400.00	46.63	3.46	27.80	32.54	45.35	74	-28.65	Pk	Vertical
2400.00	34.37	3.46	27.80	32.54	33.09	54	-20.91	AV	Vertical
2400.00	45.83	3.46	27.80	32.54	44.55	74	-29.45	Pk	Horizontal
2400.00	34.33	3.46	27.80	32.54	33.05	54	-20.95	AV	Horizontal
2483.50	47.25	3.48	28.53	32.55	46.71	74	-27.29	Pk	Vertical
2483.50	34.05	3.48	28.53	32.55	33.51	54	-20.49	AV	Vertical
2483.50	46.31	3.48	28.53	32.55	45.77	74	-28.23	Pk	Horizontal
2483.50	33.76	3.48	28.53	32.55	33.22	54	-20.78	AV	Horizontal
2500.00	45.47	3.49	29.20	32.66	45.50	74	-28.50	Pk	Vertical
2500.00	33.96	3.49	29.20	32.66	33.99	54	-20.01	AV	Vertical
2500.00	45.22	3.49	29.20	32.66	45.25	74	-28.75	Pk	Horizontal
2500.00	33.77	3.49	29.20	32.66	33.80	54	-20.20	AV	Horizontal
802.11ax40									
2310.00	46.16	3.40	27.80	32.41	44.95	74	-29.05	Pk	Horizontal
2310.00	33.39	3.40	27.80	32.41	32.18	54	-21.82	AV	Horizontal
2310.00	44.80	3.40	27.80	32.41	43.59	74	-30.41	Pk	Vertical
2310.00	33.67	3.40	27.80	32.41	32.46	54	-21.54	AV	Vertical
2390.00	45.60	3.45	27.70	32.49	44.26	74	-29.74	Pk	Vertical
2390.00	34.50	3.45	27.70	32.49	33.16	54	-20.84	AV	Vertical
2390.00	46.20	3.45	27.70	32.49	44.86	74	-29.14	Pk	Horizontal
2390.00	34.57	3.45	27.70	32.49	33.23	54	-20.77	AV	Horizontal
2400.00	46.64	3.46	27.80	32.54	45.36	74	-28.64	Pk	Vertical
2400.00	34.37	3.46	27.80	32.54	33.09	54	-20.91	AV	Vertical
2400.00	45.88	3.46	27.80	32.54	44.60	74	-29.40	Pk	Horizontal
2400.00	34.38	3.46	27.80	32.54	33.10	54	-20.90	AV	Horizontal

2483.50	47.25	3.48	28.53	32.55	46.71	74	-27.29	Pk	Vertical
2483.50	34.04	3.48	28.53	32.55	33.50	54	-20.50	AV	Vertical
2483.50	46.15	3.48	28.53	32.55	45.61	74	-28.39	Pk	Horizontal
2483.50	33.92	3.48	28.53	32.55	33.38	54	-20.62	AV	Horizontal
2500.00	45.47	3.49	29.20	32.66	45.50	74	-28.50	Pk	Vertical
2500.00	33.77	3.49	29.20	32.66	33.80	54	-20.20	AV	Vertical
2500.00	45.40	3.49	29.20	32.66	45.43	74	-28.57	Pk	Horizontal
2500.00	33.66	3.49	29.20	32.66	33.69	54	-20.31	AV	Horizontal

Note:

1. All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
2. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor.

5.3.6 Spurious Emission in Restricted Band 1000MHz-25000MHz

All the modulation modes have been tested, and the worst result was report as below:

Frequency (MHz)	Read Level (dBμV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	Comment
3260	44.29	3.89	30.04	32.85	45.37	74	-28.63	Pk	Vertical
3260	33.47	3.89	30.04	32.85	34.55	54	-19.45	AV	Vertical
3260	44.29	3.89	30.04	32.85	45.37	74	-28.63	Pk	Horizontal
3260	33.26	3.89	30.04	32.85	34.34	54	-19.66	AV	Horizontal
3332	43.32	5.00	34.03	31.00	51.35	74	-22.65	Pk	Vertical
3332	30.28	5.00	34.03	31.00	38.31	54	-15.69	AV	Vertical
3332	43.35	5.00	34.03	31.00	51.38	74	-22.62	Pk	Horizontal
3332	30.36	5.00	34.03	31.00	38.39	54	-15.61	AV	Horizontal
17797	44.62	8.46	39.30	31.30	61.08	74	-12.92	Pk	Vertical
17797	32.37	8.46	39.30	31.30	48.83	54	-5.17	AV	Vertical
17788	44.61	8.46	39.30	31.30	61.07	74	-12.93	Pk	Horizontal
17788	32.60	8.46	39.30	31.30	49.06	54	-4.94	AV	Horizontal

5.4 Peak Output Power

5.4.1 Limit

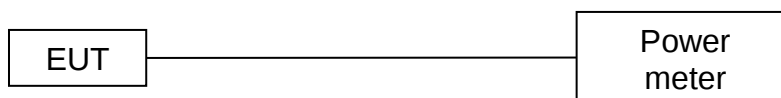
FCC Part15 Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247(b)(3)	Peak output power	1 watt or 30dBm	2400-2483.5

5.4.2 Test Procedure

1. PKPM1 Peak power meter measurement

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

5.4.3 Test Setup



5.4.4 Test Results

EUT:	MLM2XPro	Model Name:	MLM2.0XP
Test Mode:	TX Mode	Test Voltage:	DC 7.4V from battery

802.11b

Test Channel	Frequency (MHz)	ANT1 Maximum Peak Conducted Output Power(dBm)	ANT2 Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH01	2412	16.55	17.01	30
CH06	2437	16.39	16.89	30
CH11	2462	17.04	16.17	30

802.11g

Test Channel	Frequency (MHz)	ANT1 Maximum Peak Conducted Output Power(dBm)	ANT2 Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH01	2412	16.28	16.17	30
CH06	2437	16.56	16.03	30
CH11	2462	16.58	16.76	30

802.11n20

Test Channel	Frequency (MHz)	Output Power (ANT1)		Output Power (ANT2)		Limit	(ANT1+2) Total Power		Total Power Limit (dBm)	
		dBm	mW	dBm	mW		dBm	mW	dBm	mW
CH01	2412	14.93	31.12	12.8	19.05	30	17	50.12	27.29	535.8
CH06	2437	14.74	29.79	14.57	28.64	30	17.67	58.48		
CH11	2462	14.28	26.79	13.76	23.77	30	17.04	50.58		

802.11n40

Test Channel	Frequency (MHz)	Output Power (ANT1)		Output Power (ANT2)		Limit	(ANT1+2) Total Power		Total Power Limit (dBm)	
		dBm	mW	dBm	mW		dBm	mW	dBm	mW
CH01	2422	13.69	23.39	13.22	20.99	30	16.47	44.36	27.29	535.8
CH06	2437	13.87	24.38	13.9	24.55	30	16.9	48.98		
CH11	2452	13.87	24.38	13.7	23.44	30	16.8	47.86		

Note: If transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced. Antenna technology is for MIMO.

The limit should be calculated as below: Total Power Limit =30-(Directional gain-6) =27.29dbm

Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi =5.7+10log(2)=8.71dBi

802.11ax20

Test Channel	Frequency (MHz)	Output Power (ANT1)		Output Power (ANT2)		Limit	(ANT1+2) Total Power		Total Power Limit (dBm)	
		dBm	mW	dBm	mW		dBm	mW	dBm	mW
CH01	2412	14.23	26.49	12.24	16.75	30	16.36	43.25	27.29	535.8
CH06	2437	14.59	28.77	14.35	27.23	30	17.48	55.98		
CH11	2462	12.61	18.24	13.53	22.54	30	16.1	40.74		

802.11ax40

Test Channel	Frequency (MHz)	Output Power (ANT1)		Output Power (ANT2)		Limit	(ANT1+2) Total Power		Total Power Limit (dBm)	
		dBm	mW	dBm	mW		dBm	mW	dBm	mW
CH01	2422	14.35	27.23	13.7	23.44	30	17.05	50.70	27.29	535.8
CH06	2437	12.27	16.87	13.67	23.28	30	16.04	40.18		
CH11	2452	14.51	28.25	14.25	26.61	30	17.39	54.83		

Note: If transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced. Antenna technology is for MIMO.

The limit should be calculated as below: Total Power Limit = 30 - (Directional gain - 6) = 27.29 dBm

Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi = 5.7 + 10log(2) = 8.71 dBi

5.5 Power Spectral Density

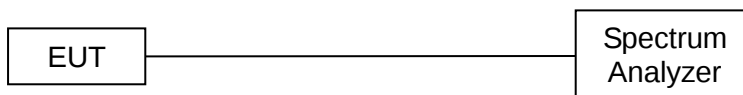
5.5.1 Limit

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247	Power Spectral Density	8 dBm (in any 3kHz)	2400-2483.5

5.5.2 Test Procedure

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ≥ 3 kHz.
4. Set the VBW $\geq 3 \times$ RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

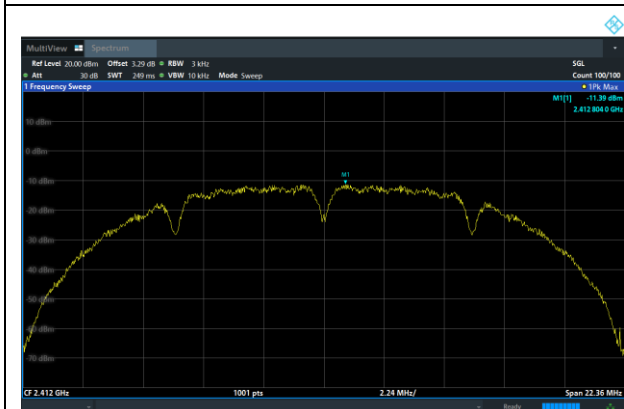
5.5.3 Test Setup



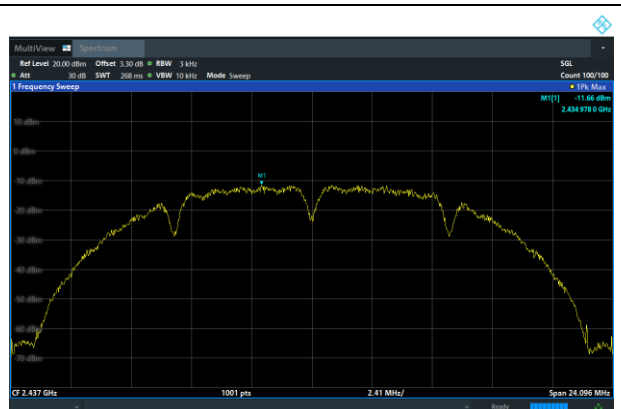
5.5.4 Test Results

802.11b ANT1				
Test Channel	Frequency(MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-11.39	8	Pass
CH06	2437	-11.66	8	Pass
CH11	2462	-10.92	8	Pass

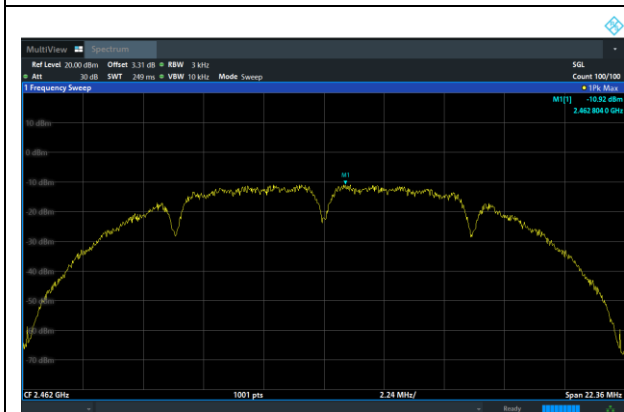
TX CH01



TX CH06

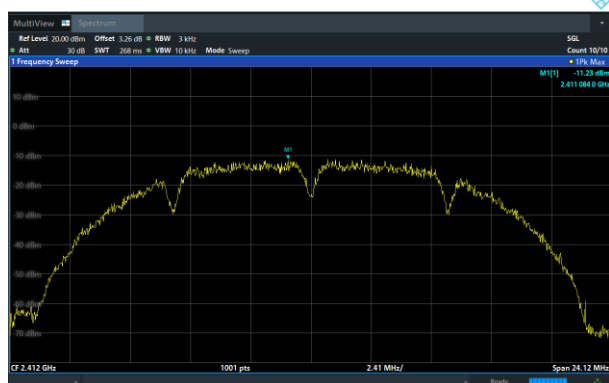


TX CH11

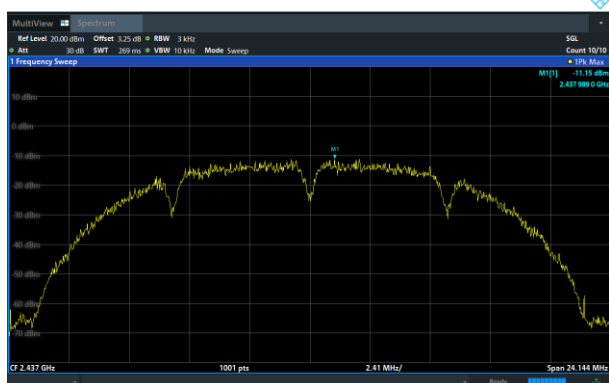


802.11b ANT2				
Test Channel	Frequency(MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-11.23	8	Pass
CH06	2437	-11.15	8	Pass
CH11	2462	-12.07	8	Pass

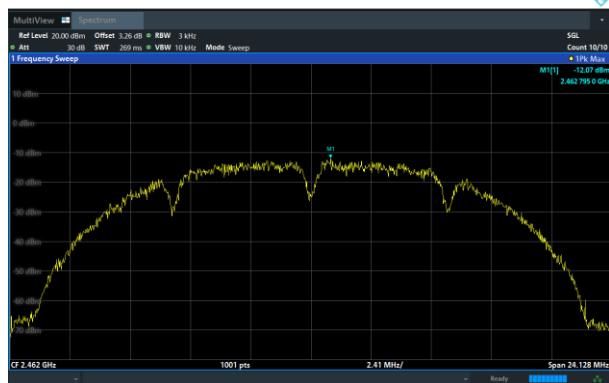
TX CH01



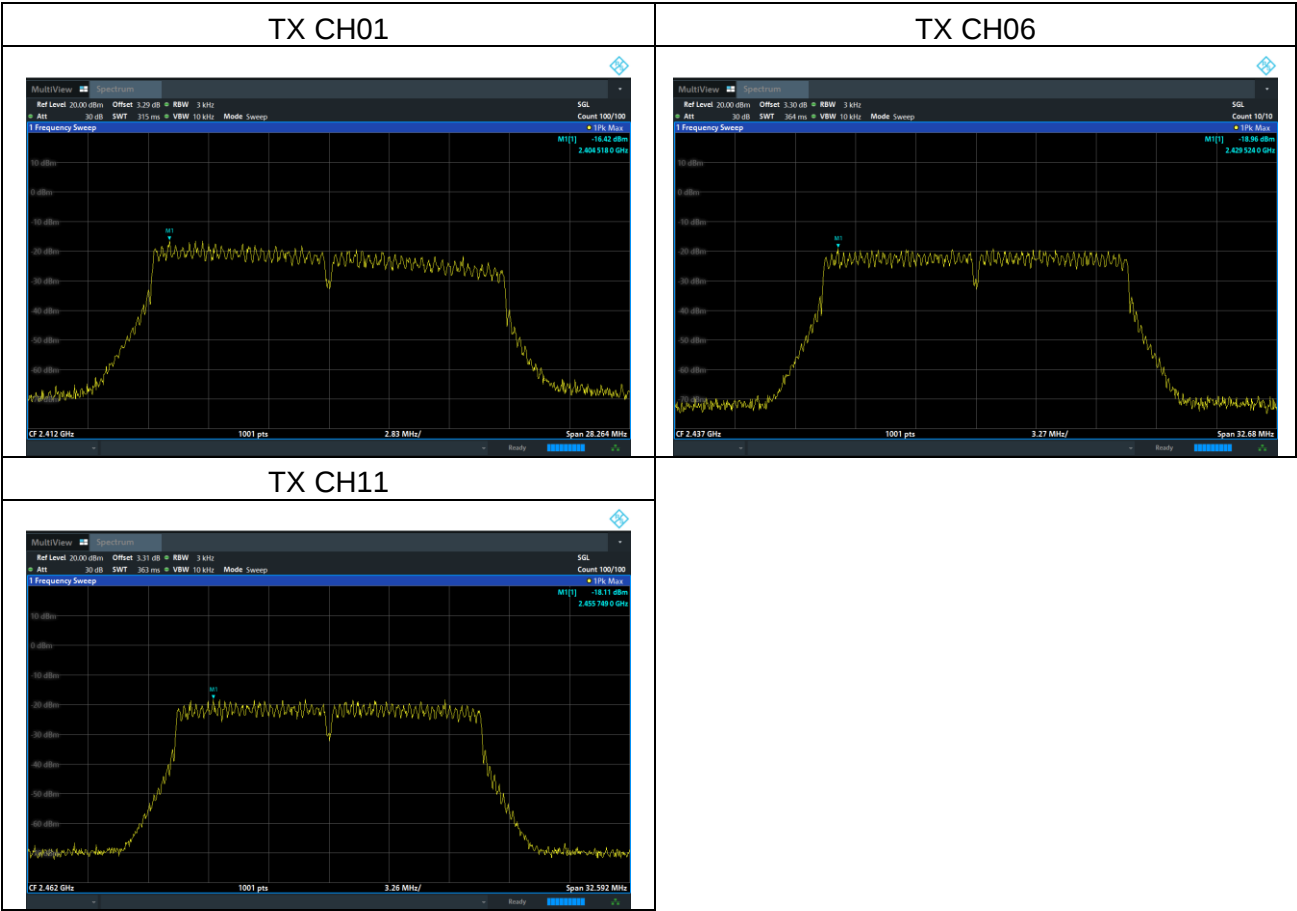
TX CH06



TX CH11

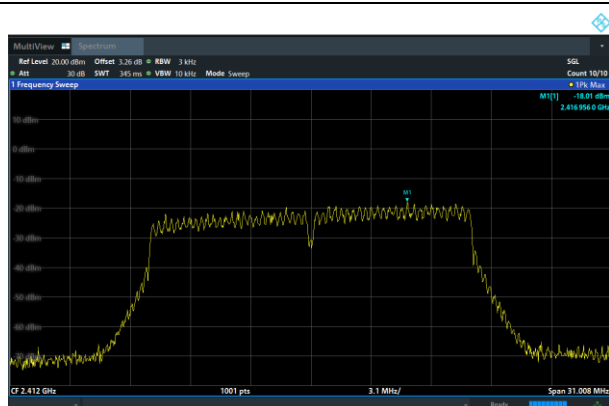


802.11g ANT1				
Test Channel	Frequency(MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-16.42	8	Pass
CH06	2437	-18.96	8	Pass
CH11	2462	-18.11	8	Pass

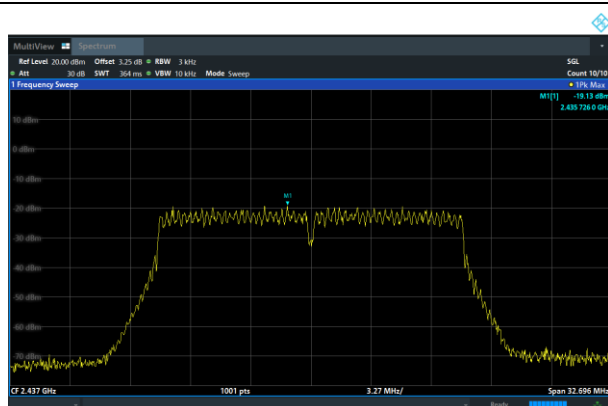


802.11g ANT2				
Test Channel	Frequency(MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-18.01	8	Pass
CH06	2437	-19.13	8	Pass
CH11	2462	-18.43	8	Pass

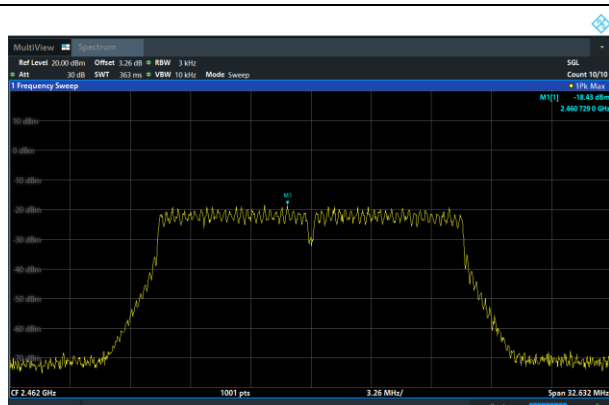
TX CH01



TX CH06



TX CH11

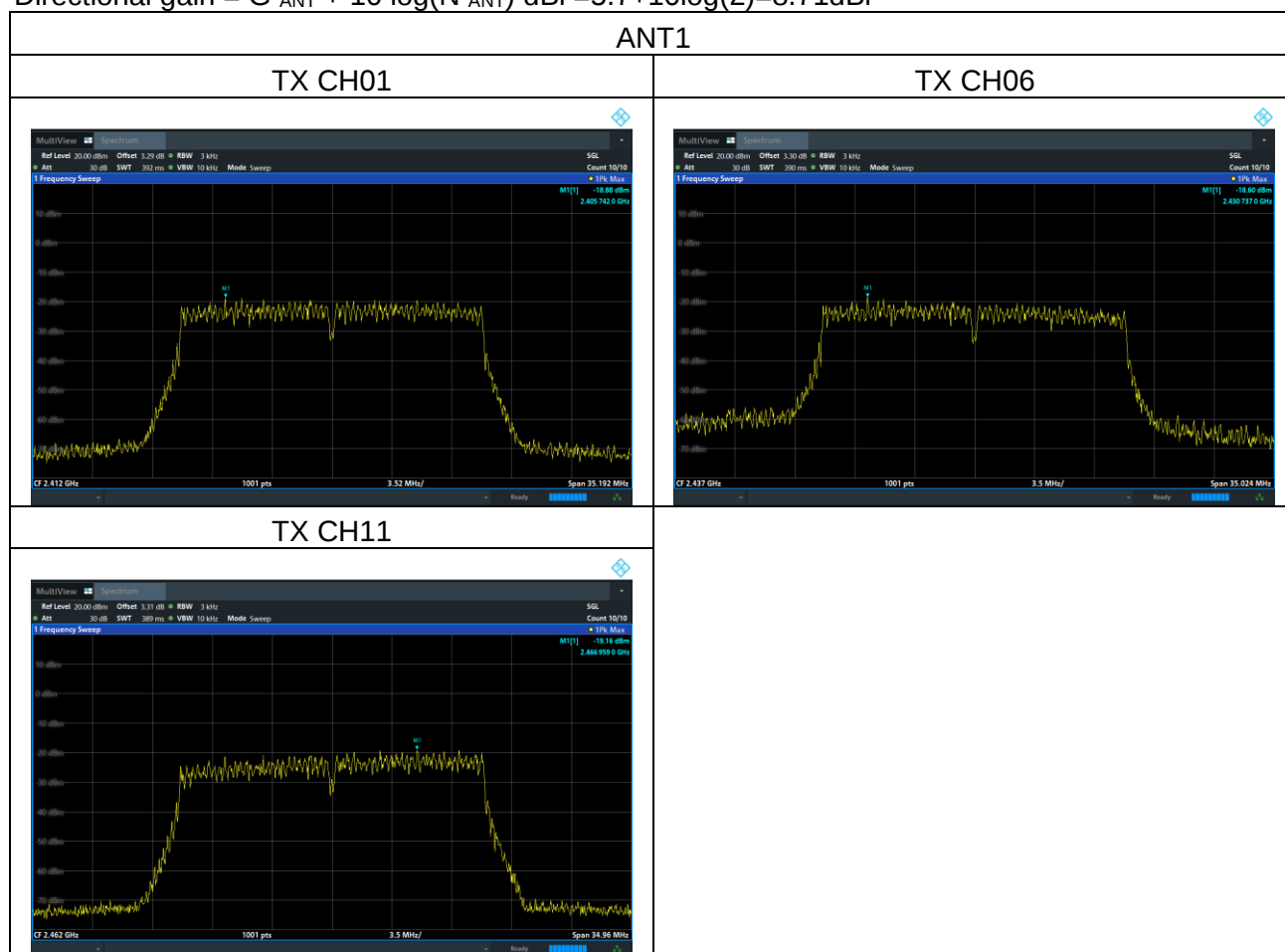


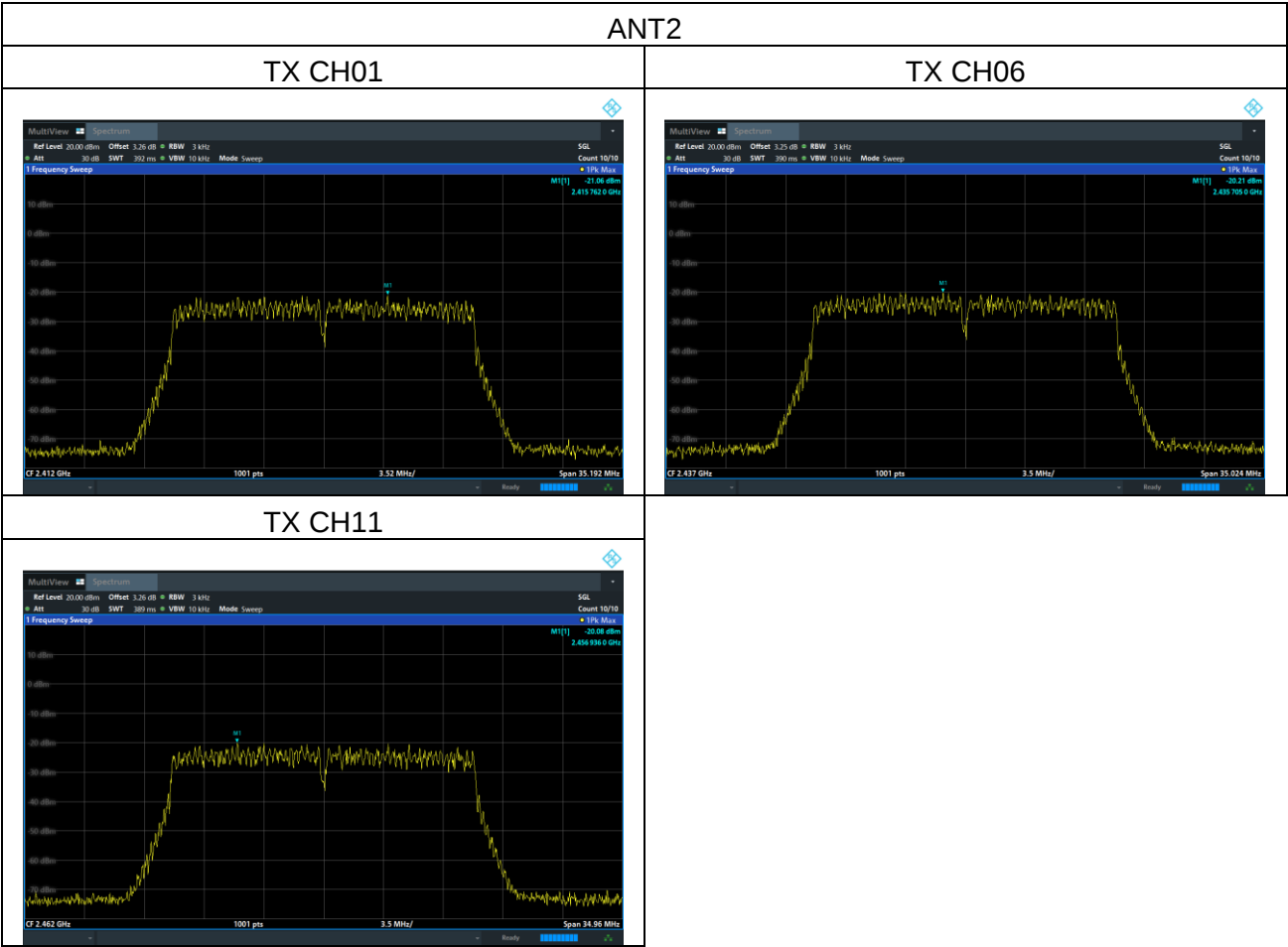
802.11n20						
Test Channel	Frequency (MHz)	Power Density of ANT1 (dBm/3kHz)	Power Density of ANT2 (dBm/3kHz)	Total Power Density of (ANT1 + 2) (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-18.88	-21.06	-16.82	5.29	Pass
CH06	2437	-18.6	-20.21	-16.32	5.29	Pass
CH11	2462	-19.16	-20.08	-16.59	5.29	Pass

Note: If transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced.

The limit should be calculated as below: Total Power Limit = 8-(Directional gain-6) =5.29dbm

Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi =5.7+10log(2)=8.71dBi



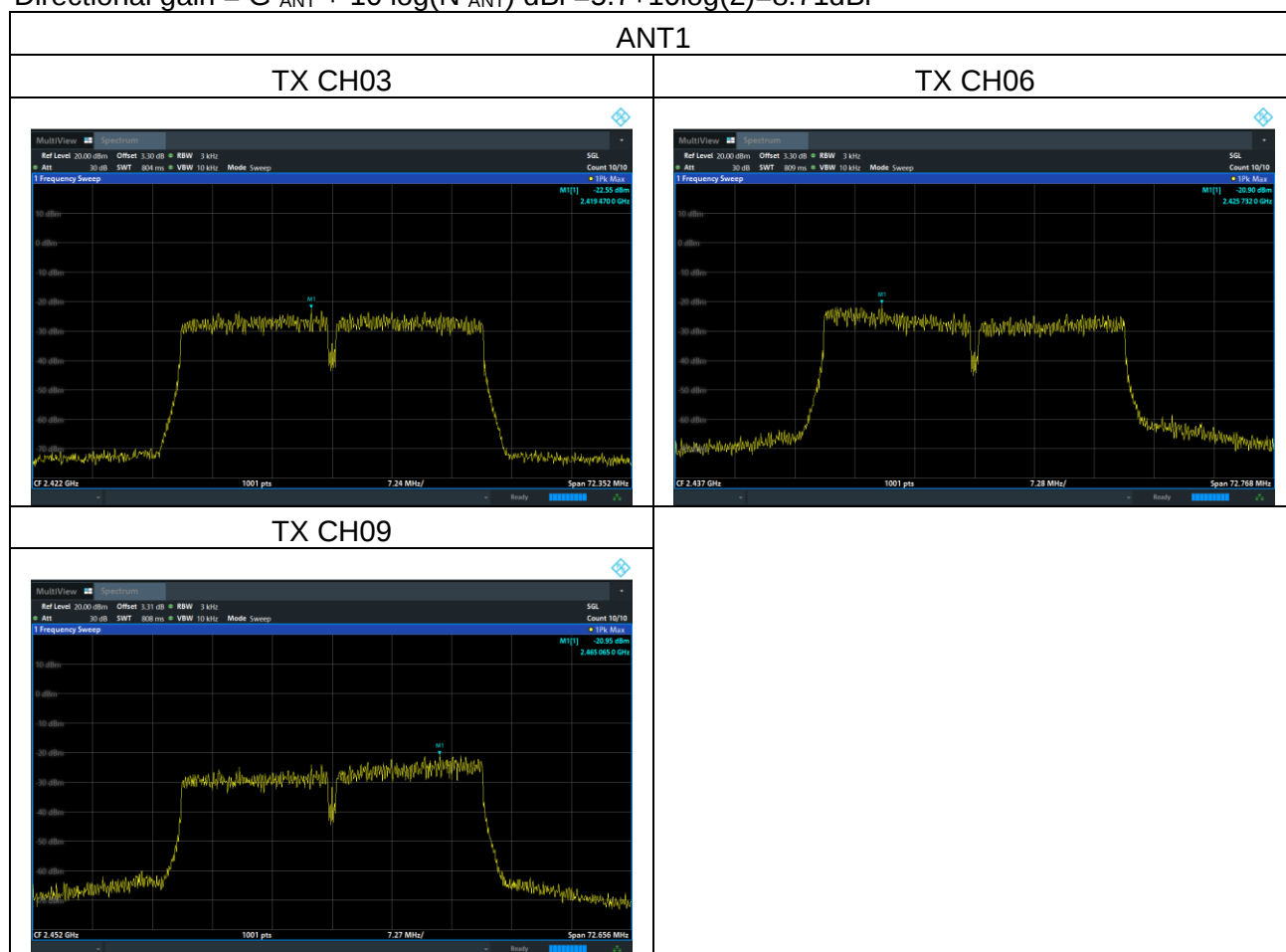


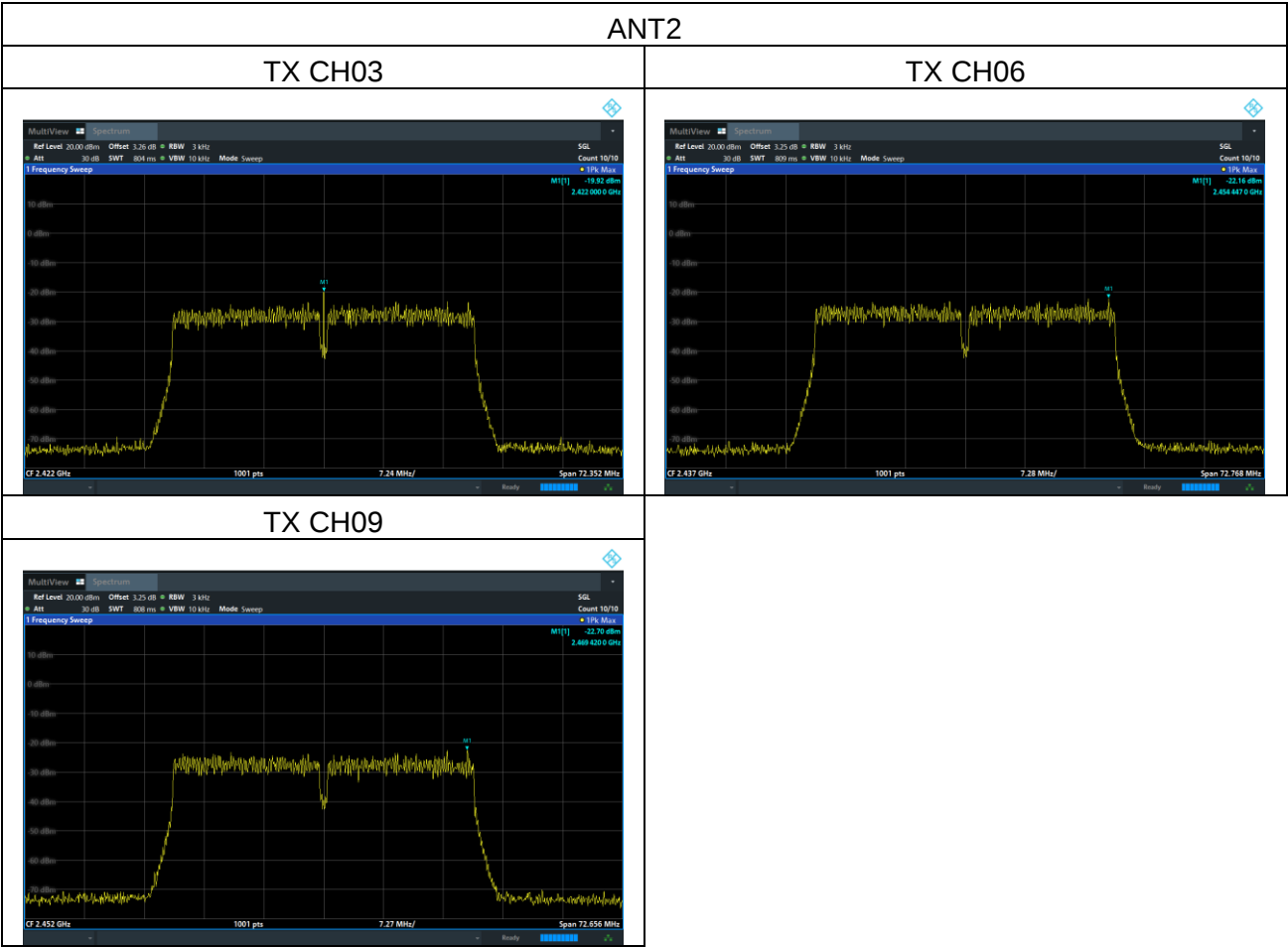
802.11n40						
Test Channel	Frequency (MHz)	Power Density of ANT 1 (dBm/3kHz)	Power Density of ANT 2 (dBm/3kHz)	Total Power Density of (ANT 1 + 2) (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH03	2422	-22.55	-19.92	-18.03	5.29	Pass
CH06	2437	-20.9	-22.16	-18.47	5.29	Pass
CH09	2452	-20.95	-22.7	-18.73	5.29	Pass

Note: If transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced.

The limit should be calculated as below: Total Power Limit = 8-(Directional gain-6) =5.29dbm

Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi =5.7+10log(2)=8.71dBi



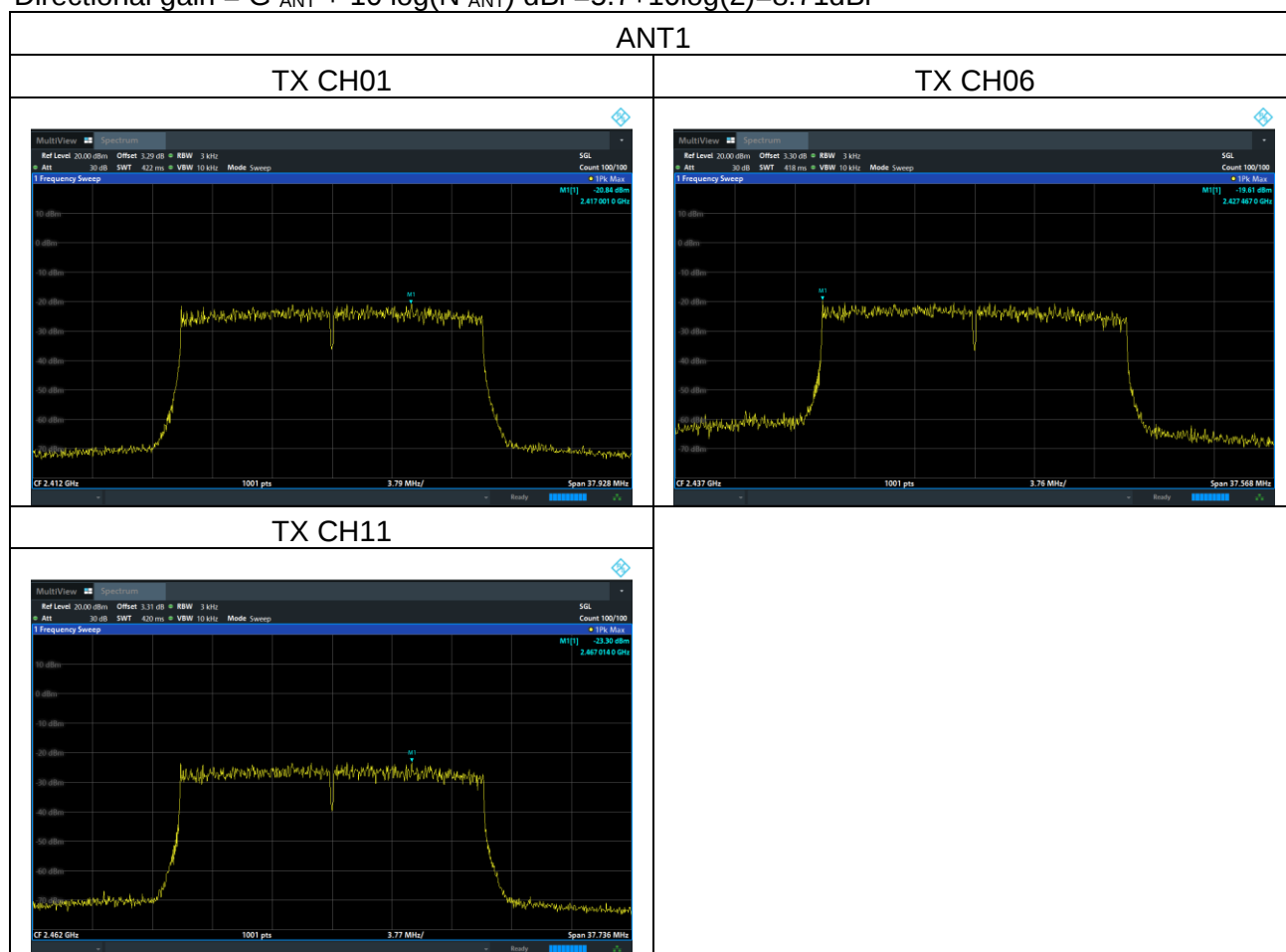


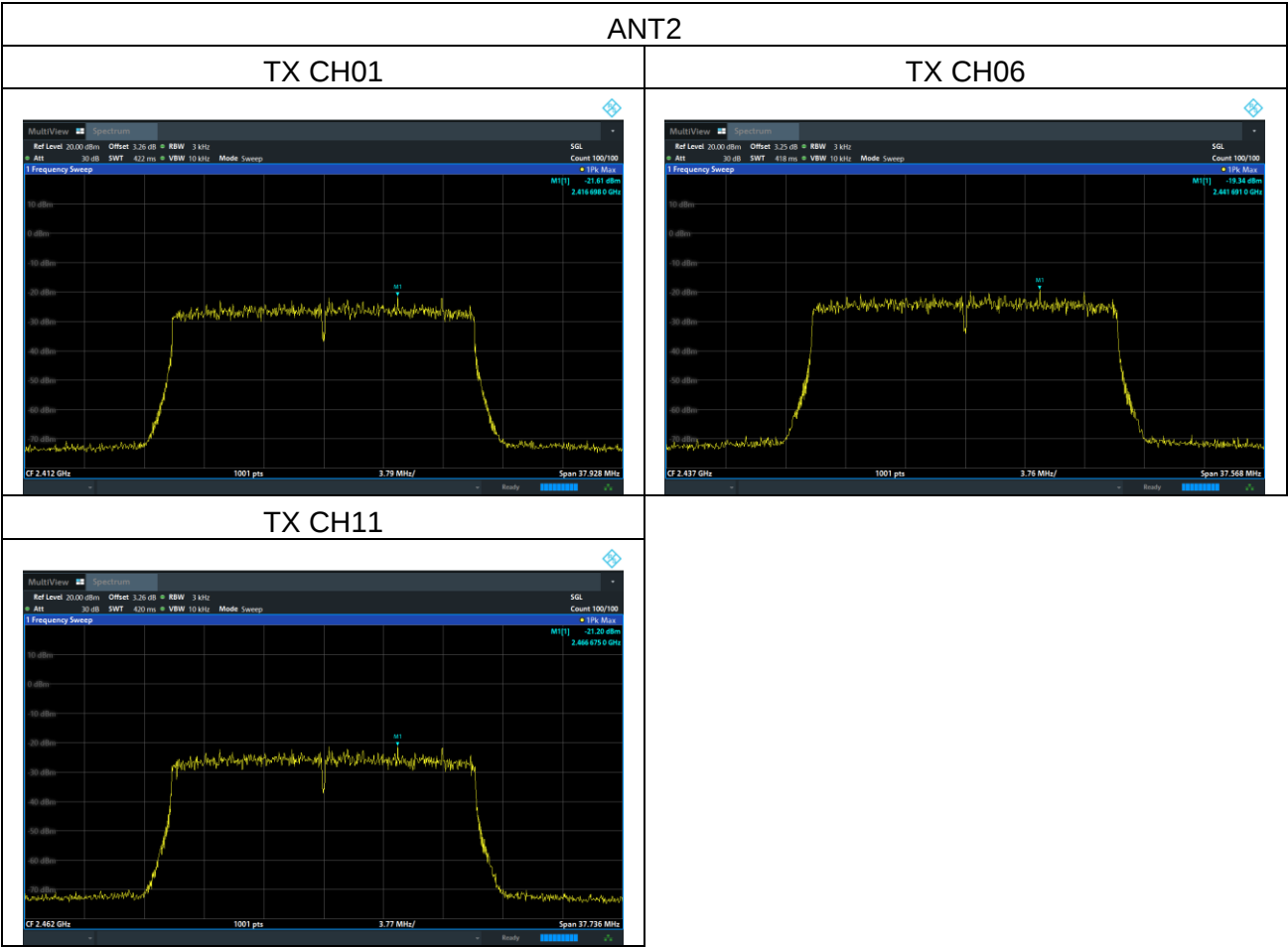
802.11ax20						
Test Channel	Frequency (MHz)	Power Density of ANT1 (dBm/3kHz)	Power Density of ANT2 (dBm/3kHz)	Total Power Density of (ANT1 + 2) (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH01	2412	-20.84	-21.61	-18.2	5.29	Pass
CH06	2437	-19.61	-19.34	-16.46	5.29	Pass
CH11	2462	-23.3	-21.2	-19.11	5.29	Pass

Note: If transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced.

The limit should be calculated as below: Total Power Limit = 8-(Directional gain-6) =5.29dbm

Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi =5.7+10log(2)=8.71dBi



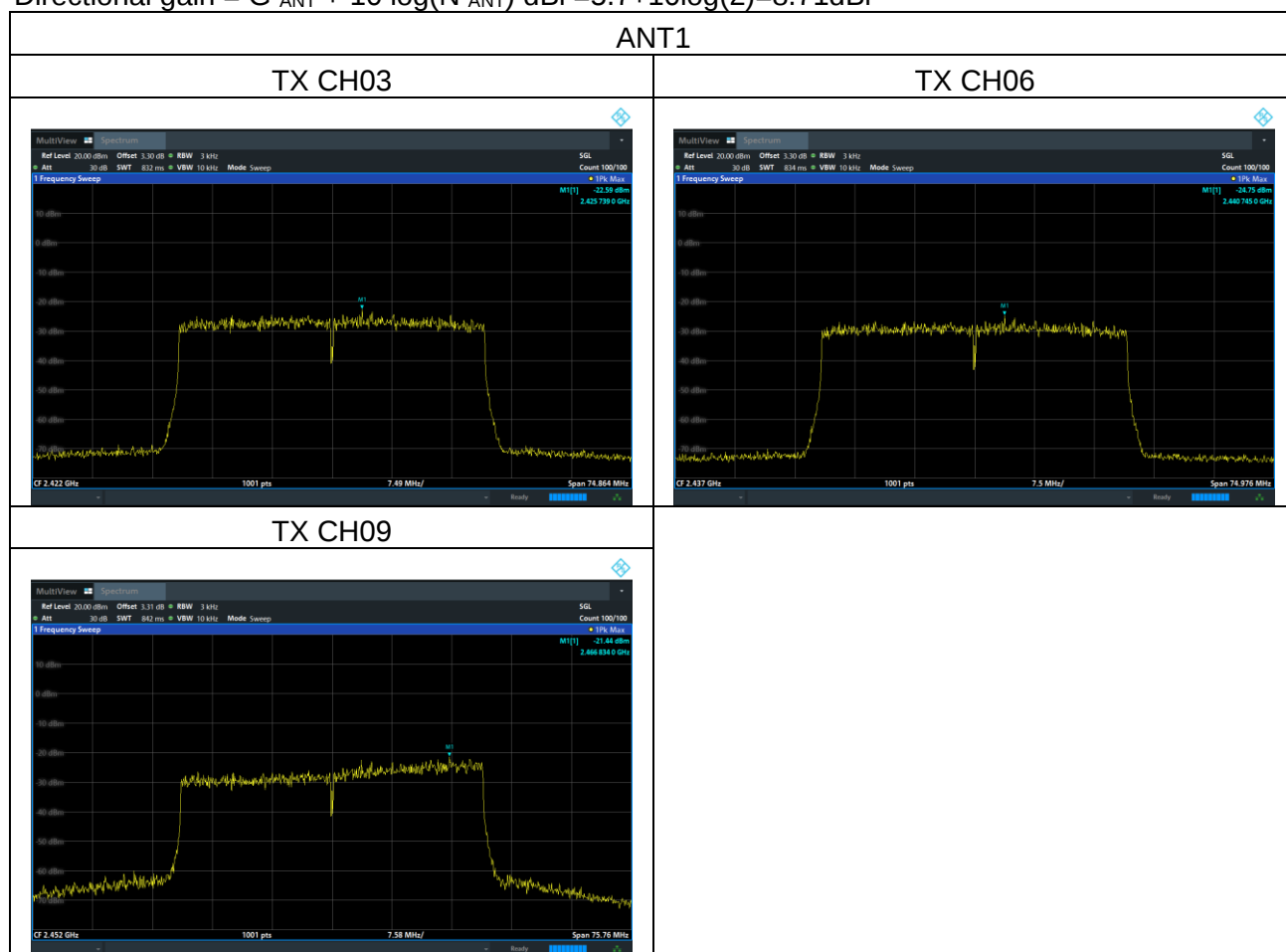


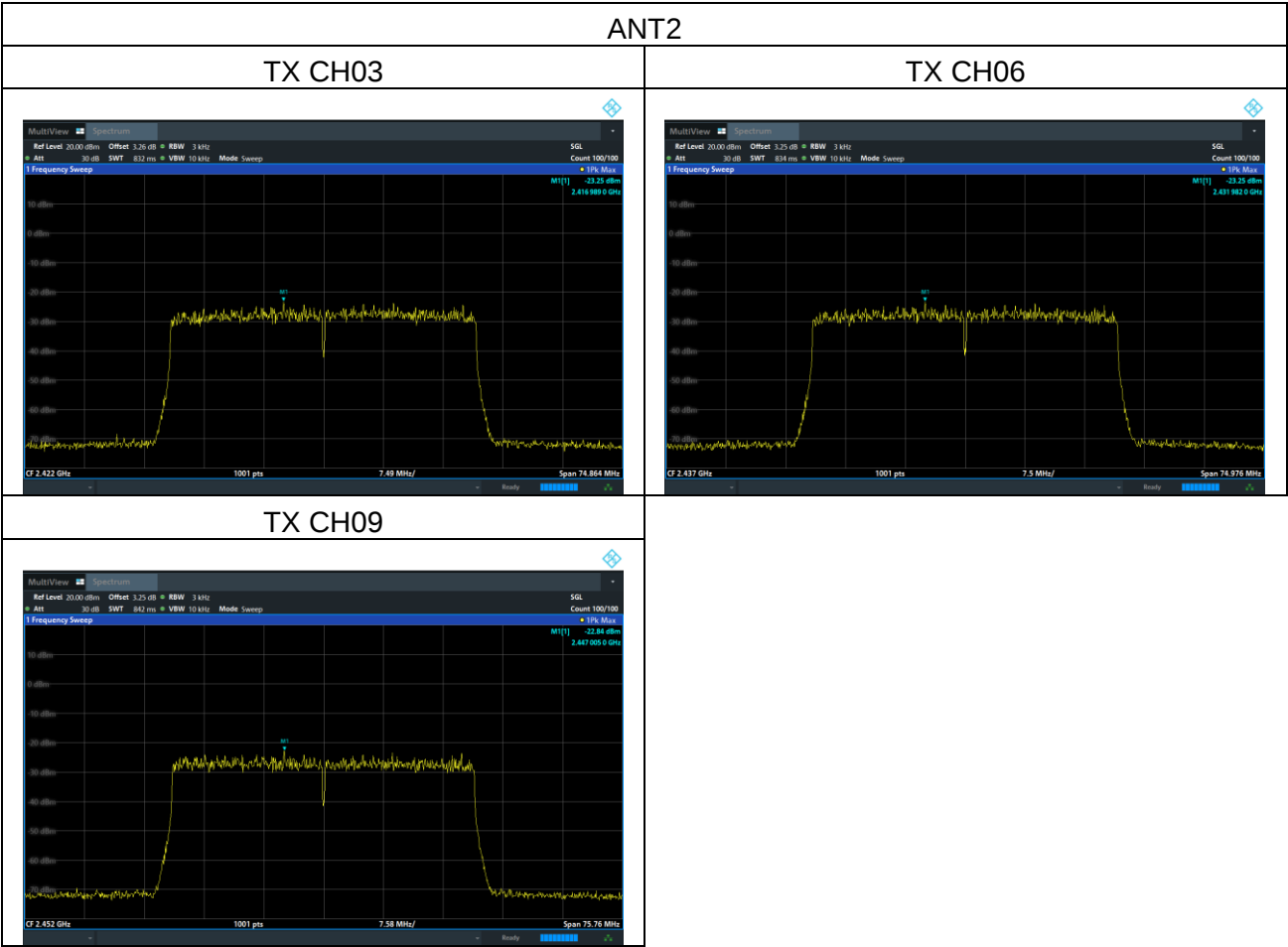
802.11ax40						
Test Channel	Frequency (MHz)	Power Density of ANT 1 (dBm/3kHz)	Power Density of ANT 2 (dBm/3kHz)	Total Power Density of (ANT 1 + 2) (dBm/3kHz)	Limit (dBm/3kHz)	Result
CH03	2422	-22.59	-23.25	-19.9	5.29	Pass
CH06	2437	-24.75	-23.25	-20.93	5.29	Pass
CH09	2452	-21.44	-22.84	-19.07	5.29	Pass

Note: If transmitting antennas of directional gain greater than 6 dBi are used, then the limit should be reduced.

The limit should be calculated as below: Total Power Limit = 8-(Directional gain-6) =5.29dbm

Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi =5.7+10log(2)=8.71dBi





5.6 6dB Bandwidth

5.6.1 Limit

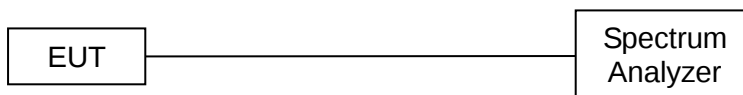
FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247(a)(2)	Bandwidth	$\geq 500\text{kHz}$ (6dB bandwidth)	2400-2483.5

5.6.2 Test Procedure

The steps for the first option are as follows:

- Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
- Set the VBW $\geq [3 \times \text{RBW}]$.
- Detector = peak.
- Trace mode = max-hold.
- Sweep = No faster than coupled (auto) time.
- Allow the trace to stabilize.
- Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-6 dB down amplitude”. If a marker is below this “-6 dB down amplitude” value, then it shall be as close as possible to this value.

5.6.3 Test Setup



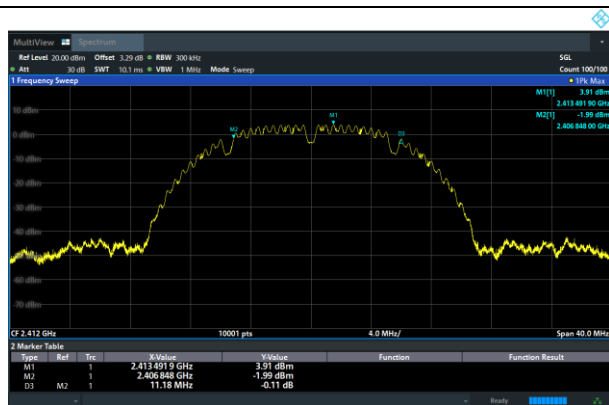
5.6.4 Test Results

EUT:	MLM2XPro	Model Name:	MLM2.0XP
Pressure:	1012 hPa	Test Voltage:	DC 7.4V from battery
Test Mode:	ANT1 TX b Mode /CH01, CH06, CH11		

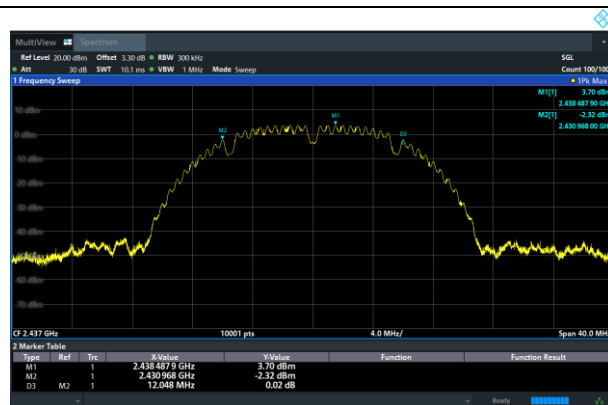
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	11.18	500	Pass
CH06	2437	12.048	500	Pass
CH11	2462	11.18	500	Pass

Test plots

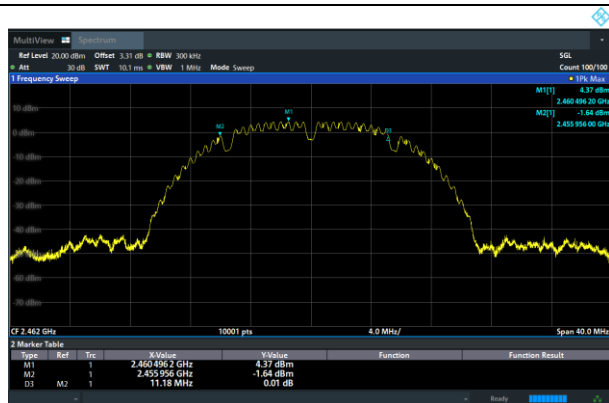
TX CH01



TX CH06



TX CH11



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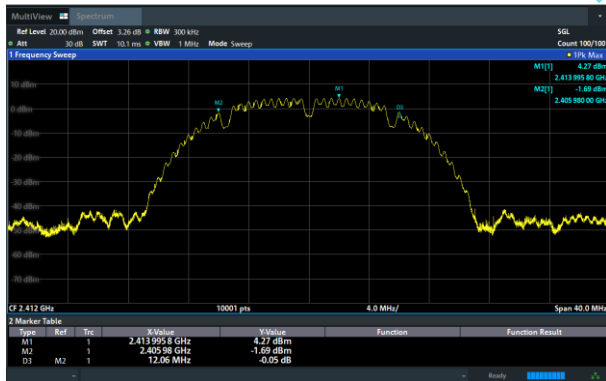
/

EUT:	MLM2XPro	Model Name:	MLM2.0XP
Pressure:	1012 hPa	Test Voltage:	DC 7.4V from battery
Test Mode:	ANT2 TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	12.06	500	Pass
CH06	2437	12.072	500	Pass
CH11	2462	12.064	500	Pass

Test plots

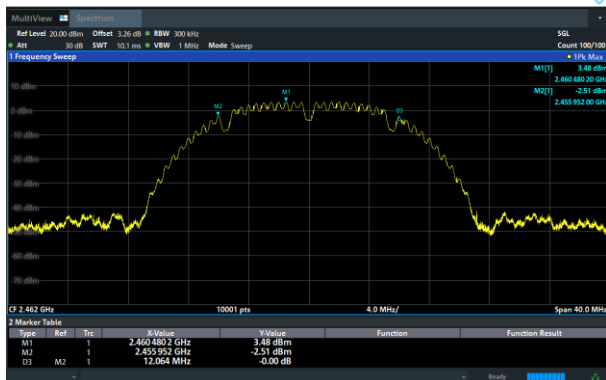
TX CH01



TX CH06



TX CH11



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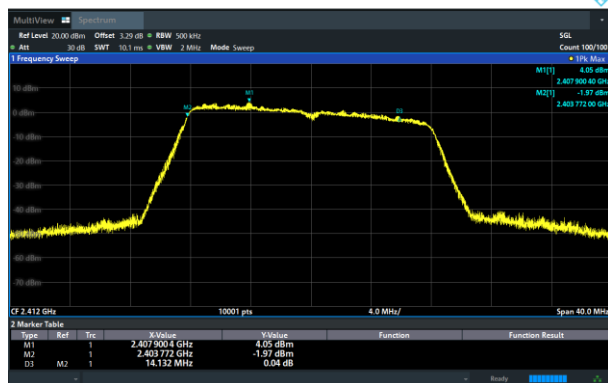
/

EUT:	MLM2XPro	Model Name:	MLM2.0XP
Pressure:	1012 hPa	Test Voltage:	DC 7.4V from battery
Test Mode:	ANT1 TX g Mode /CH01, CH06, CH11		

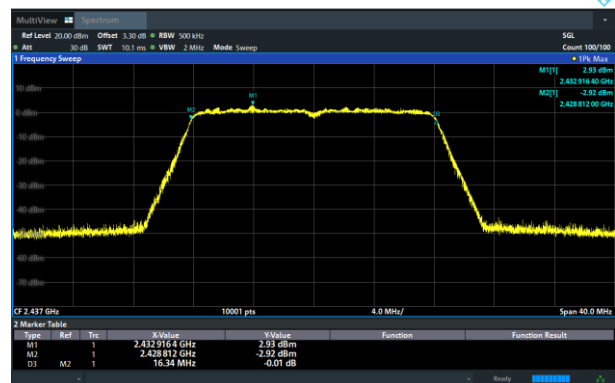
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH01	2412	14.132	500	Pass
CH06	2437	16.34	500	Pass
CH11	2462	16.296	500	Pass

Test plots

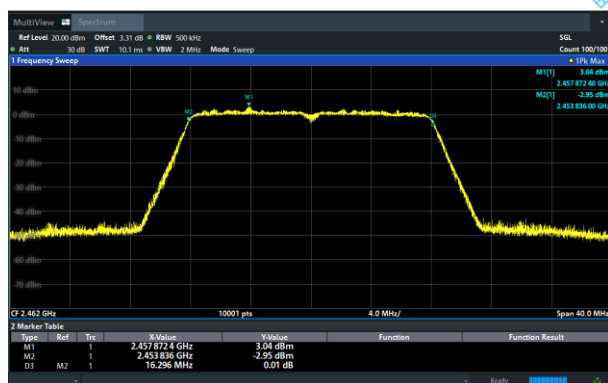
TX CH01



TX CH06



TX CH11



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