



FCC AND ISED CERTIFICATION TEST REPORT

Applicant	:	Harman International Industries, Inc.
Address of Applicant	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Manufacturer	:	Harman International Industries, Inc.
Address of Manufacturer	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	Multi-Channel Soundbar
Model No.	:	BAR 300MK2
FCC ID	:	APIBAR300MK2
IC	:	6132A-BAR300MK2
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart C, RSS-247 Issue 3 August 2023, ANSI C63.10:2013, RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021)
Report No.	:	DDT-RE24111411-1E03
Issue Date	:	2025/02/28
Issue By	:	Guangdong Dongdian Testing Service Co., Ltd. Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

Table of Contents

1.	Summary of Test Results	7
2.	General Test Information	8
2.1.	Description of EUT	8
2.2.	Accessories of EUT	9
2.3.	Block diagram of EUT configuration for test	9
2.4.	Decision of final test mode	9
2.5.	Deviations of test standard	10
2.6.	Test environment conditions	10
2.7.	Test laboratory	10
2.8.	Measurement uncertainty	11
3.	Equipment Used During Conductive Test	12
4.	6dB Bandwidth	13
4.1.	Block diagram of test setup	13
4.2.	Limits	13
4.3.	Test procedure	13
4.4.	Test result	14
4.5.	Test graphs	15
5.	99% Bandwidth	27
5.1.	Block diagram of test setup	27
5.2.	Limits	27
5.3.	Test procedure	27
5.4.	Test result	28
5.5.	Test graphs	29
6.	Conducted Output Power	41
6.1.	Block diagram of test setup	41
6.2.	Limits	41
6.3.	Test procedure	41
6.4.	Test result average	42
7.	Power Spectral Density	45
7.1.	Block diagram of test setup	45
7.2.	Limits	45
7.3.	Test procedure	45
7.4.	Test result	46
7.5.	Test graphs	49
8.	Band Edge Compliance (Conducted Method)	81
8.1.	Block diagram of test setup	81

8.2.	Limits.....	81
8.3.	Test procedure.....	81
8.4.	Test result	82
8.5.	Test graphs.....	83
9.	RF Conducted Spurious Emissions.....	91
9.1.	Block diagram of test setup	91
9.2.	Limits.....	91
9.3.	Test procedure.....	91
9.4.	Test result	92
9.5.	Test graphs.....	93
10.	Duty Cycle.....	129
10.1.	Block diagram of test setup	129
10.2.	Limit.....	129
10.3.	Test procedure.....	129
10.4.	Test result	130
10.5.	Test graphs.....	132
11.	Antenna Requirements	164
11.1.	Limit.....	164
11.2.	Result.....	164
12.	Radiated Emission.....	165
12.1.	Test equipment	165
12.2.	Block diagram of test setup	166
12.3.	Limits.....	167
12.4.	Assistant equipment used for test	169
12.5.	Test procedure.....	169
12.6.	Test result	170
12.7.	Test data	171
13.	Band Edge Compliance	179
13.1.	Test equipment	179
13.2.	Block diagram of test setup	180
13.3.	Limits.....	180
13.4.	Assistant equipment used for test	180
13.5.	Test procedure.....	180
13.6.	Test result	180
13.7.	Test data	181
14.	Power Line Conducted Emissions.....	217
14.1.	Test equipment	217
14.2.	Block diagram of test setup	217

14.3. Limits..... 217

14.4. Assistant equipment used for test 217

14.5. Test procedure..... 218

14.6. Test result 218

14.7. Test data 219

15. Test Setup Photograph..... 221

16. Photos of the EUT 223

Test Report Declare

Applicant	:	Harman International Industries, Inc.
Address of Applicant	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES
Equipment under Test	:	Multi-Channel Soundbar
Model No.	:	BAR 300MK2
Manufacturer	:	Harman International Industries, Inc.
Address of Manufacturer	:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Test Standard Used:
FCC Rules and Regulations Part 15 Subpart C,
RSS-247 Issue 3 August 2023,
ANSI C63.10:2013,
RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021)

We Declare:
The equipment described above is tested by Guangdong Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangdong Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Report No.:	DDT-RE24111411-1E03		
Date of Receipt:	2024/10/16	Date of Test:	2024/10/16 - 2025/02/28

Created: Bobo Chen	Reviewed: Ella Gong	Approved: Damon Hu
		
2025/02/28	2025/02/28	2025/02/28

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	2025/02/28	

1. Summary of Test Results

No.	Test Parameter	Clause No.	Condition	Result
1	6 dB Bandwidth and 99% Bandwidth	FCC Part 15: 15.247(a)(2), RSS-247 Issue 3 clause 5.2(a), RSS-Gen Issue 5 clause 6.7	/	Pass
2	Peak Output Power	FCC Part 15: 15.247(b)(3), RSS-247 Issue 3 clause 5.4(d)	/	Pass
3	Power Spectral Density	FCC Part 15:15.247(e), RSS-247 Issue 3 clause 5.2(b)	/	Pass
4	RF Conducted Spurious Emissions	FCC Part 15: 15.247(d), RSS-247 Issue 3 clause 5.5	/	Pass
5	Radiated Emission	FCC Part 15: 15.205, FCC Part 15: 15.209, FCC Part 15: 15.247(d), RSS-247 Issue 3 clause 5.5, RSS-Gen Issue 5 clause 8.9, RSS-Gen Issue 5 clause 8.10	/	Pass
6	Band Edge Compliance	FCC Part 15: 15.205, FCC Part 15: 15.209, FCC Part 15: 15.247(d), RSS-247 Issue 3 clause 5.5, RSS-Gen Issue 5 clause 8.9, RSS-Gen Issue 5 clause 8.10	/	Pass
7	Antenna Requirement	FCC Part 15: 15.203, RSS-Gen Issue 5 clause 6.8	/	Pass
8	Power Line Conducted Emissions	FCC Part 15: 15.207(a), RSS-Gen Issue 5 clause 8.8	/	Pass
Note: N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device or no need to test according to standard.				

2. General Test Information

2.1. Description of EUT

EUT Name	: Multi-Channel Soundbar
Model Number	: BAR 300MK2
EUT Function Description	: Please reference user manual of this device
Power Supply	: AC 100-240V, 50/60Hz, 70W
Antenna Type	: FPC

Note: This EUT support Bluetooth BR/EDR/LE, 2.4 GHz WLAN, 5 GHz WLAN, this report only for 2.4 GHz WLAN.

Radio Technology	: IEEE 802.11b/g/n/ax
Operation frequency	: IEEE 802.11b: 2412MHz-2462MHz IEEE 802.11g: 2412MHz-2462MHz IEEE 802.11n HT20: 2412MHz-2462MHz IEEE 802.11n HT40: 2422MHz-2452MHz IEEE 802.11ax HE20: 2412MHz-2462MHz IEEE 802.11ax HE40: 2422MHz-2452MHz
Modulation	: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM, OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)

Antenna information			
Antenna Type		FPC	
/		Ant1 gain	Ant2 gain
Max Antenna Gain(dBi)	IEEE 802.11b	1.83	1.64
	IEEE 802.11g	1.83	1.64
	IEEE 802.11n HT20	1.83	1.64
	IEEE 802.11n HT40	1.83	1.64
	IEEE 802.11ax HE20	1.83	1.64
	IEEE 802.11ax HE40	1.83	1.64
Note: This product does not support beamforming.			

Channel information					
CH	Frequency (MHz)	CH	Frequency (MHz)	CH	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447	/	/

Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to

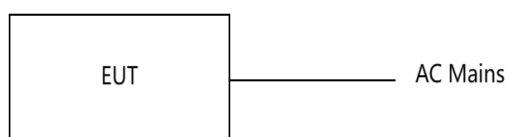
the manufacturer's specifications, the laboratory shall not be held responsible.

“☑” means to be chosen or applicable; “☐” means don't to be chosen or not applicable; This note applies to entire report.

2.2. Accessories of EUT

Accessories	Manufacturer	Model number	Description
AC cable	Harman	N/A	Length: 150cm
HDMI cable	Harman	N/A	Length: 120cm, with two magnetic rings

2.3. Block diagram of EUT configuration for test



2.4. Decision of final test mode

According pre-test, the worst test modes were reported as below:

Test software: adb.exe

The test software was used to control EUT work in Continuous Tx mode and select test channel, wireless mode as below table.

The pathloss of external cable: 0.5dB (According to the manufacturer's claims)

Tested mode, channel, and data rate information					
Mode	Setting Tx Power		Data rate (Mbps) (see Note)	Channel	Frequency (MHz)
	ANT1	ANT2			
IEEE 802.11b	16	16	1	LCH: CH1	2412
	16	16	1	MCH: CH6	2437
	16	16	1	HCH: CH11	2462
IEEE 802.11g	16	16	6	LCH: CH1	2412
	16	16	6	MCH: CH6	2437
	16	16	6	HCH: CH11	2462
IEEE 802.11n HT20	14	14	MCS 8	LCH: CH1	2412
	14	14	MCS 8	MCH: CH6	2437
	14	14	MCS 8	HCH: CH11	2462
IEEE 802.11n HT40	14	14	MCS 8	LCH: CH3	2422
	14	14	MCS 8	MCH: CH6	2437
	14	14	MCS 8	HCH: CH9	2452

IEEE 802.11ax HE20	SU: 12 RU: 12	SU: 12 RU: 12	MCS 0	LCH: CH1	2412
	SU: 12 RU: 12	SU: 12 RU: 12	MCS 0	MCH: CH6	2437
	SU: 12 RU: 12	SU: 12 RU: 12	MCS 0	HCH: CH11	2462
IEEE 802.11ax HE40	SU: 12 RU: 12	SU: 12 RU: 12	MCS 0	LCH: CH3	2422
	SU: 12 RU: 12	SU: 12 RU: 12	MCS 0	MCH: CH6	2437
	SU: 12 RU: 12	SU: 12 RU: 12	MCS 0	HCH: CH9	2452
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.					

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

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

Temperature range:	+15°C to +35 °C
Humidity range:	20% to 75%
Pressure range:	86 kPa to 106 kPa

Note: The specific temperature and humidity information of each test item refers to the temperature and humidity record in the corresponding test data.

2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2.8. Measurement uncertainty

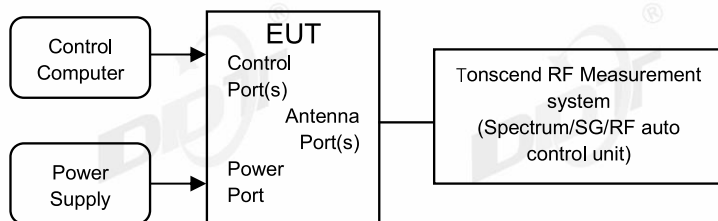
Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.38 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$)
Frequencies Stability	6.7×10^{-8} (Antenna couple method) 5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB ($10 \text{ MHz} \leq f < 3.6 \text{ GHz}$); 1.40 dB ($3.6 \text{ GHz} \leq f < 8 \text{ GHz}$) 1.66 dB ($8 \text{ GHz} \leq f < 26.5 \text{ GHz}$)
Uncertainty for radio frequency (RBW < 20 kHz)	3×10^{-8}
Temperature	0.4 °C
Humidity	2 %
Uncertainty for Radiation Emission test (9 kHz – 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.70 dB (Antenna Polarize: V) 4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz - 40 GHz)	4.10 dB (1 - 6 GHz) 4.40 dB (6 GHz - 18 GHz) 3.54 dB (18 GHz - 26 GHz) 4.30 dB (26 GHz - 40 GHz)
Uncertainty for Power line conduction emission test	3.34dB (150KHz-30MHz) 3.72dB (9KHz-150KHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date
☑RF Connected Test (RF Measurement System 3#)				
SIGNAL ANALYZER	R&S	FSV40	101407	2025/07/08
Wideband Radio Communication Tester	R&S	CMW500	117491	2025/03/31
EXG Analog Signal Generator	KEYSIGHT	N5173B	MY62153058	2025/07/08
MXG Vector Signal Generator	Agilent	N5182A	MY48180912	2025/03/31
RF Control Unit	Tonscend	JS0806-2	20C8060230	2025/03/31
TEMP&HUMI Programmable Chamber	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2025/04/22
Test Software	Tonscend	JS1120-3	Ver.3.2.22	N/A

4. 6dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz

4.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.8.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for 6 dB Bandwidth:

RBW:	100 kHz
VBW:	$\geq [3 \times \text{RBW}]$
Detector Mode:	peak
Sweep time:	auto
Trace mode	max hold

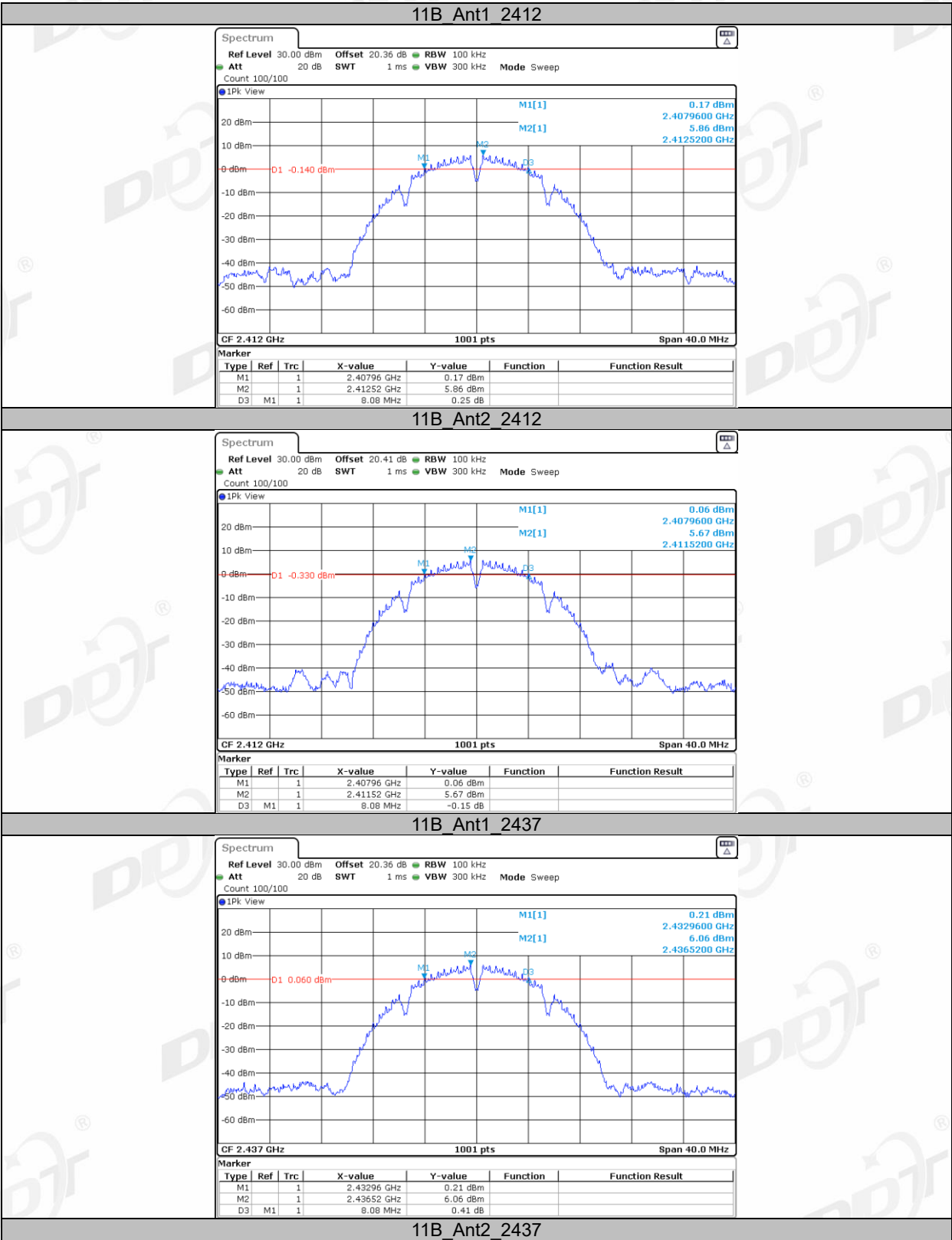
Allow the trace to stabilize, measure the 6 dB bandwidth of signal, and record the results in the report

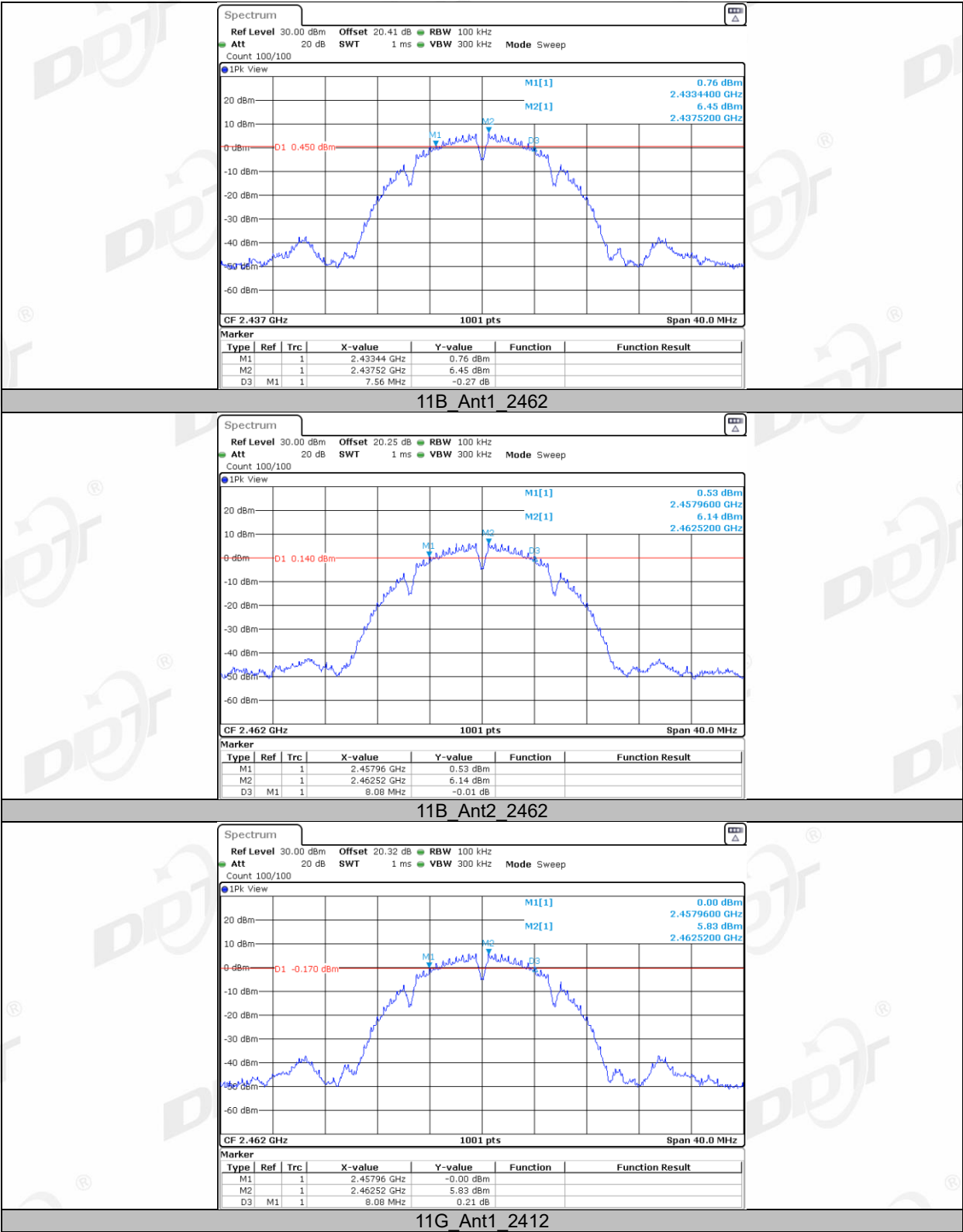
4.4. Test result

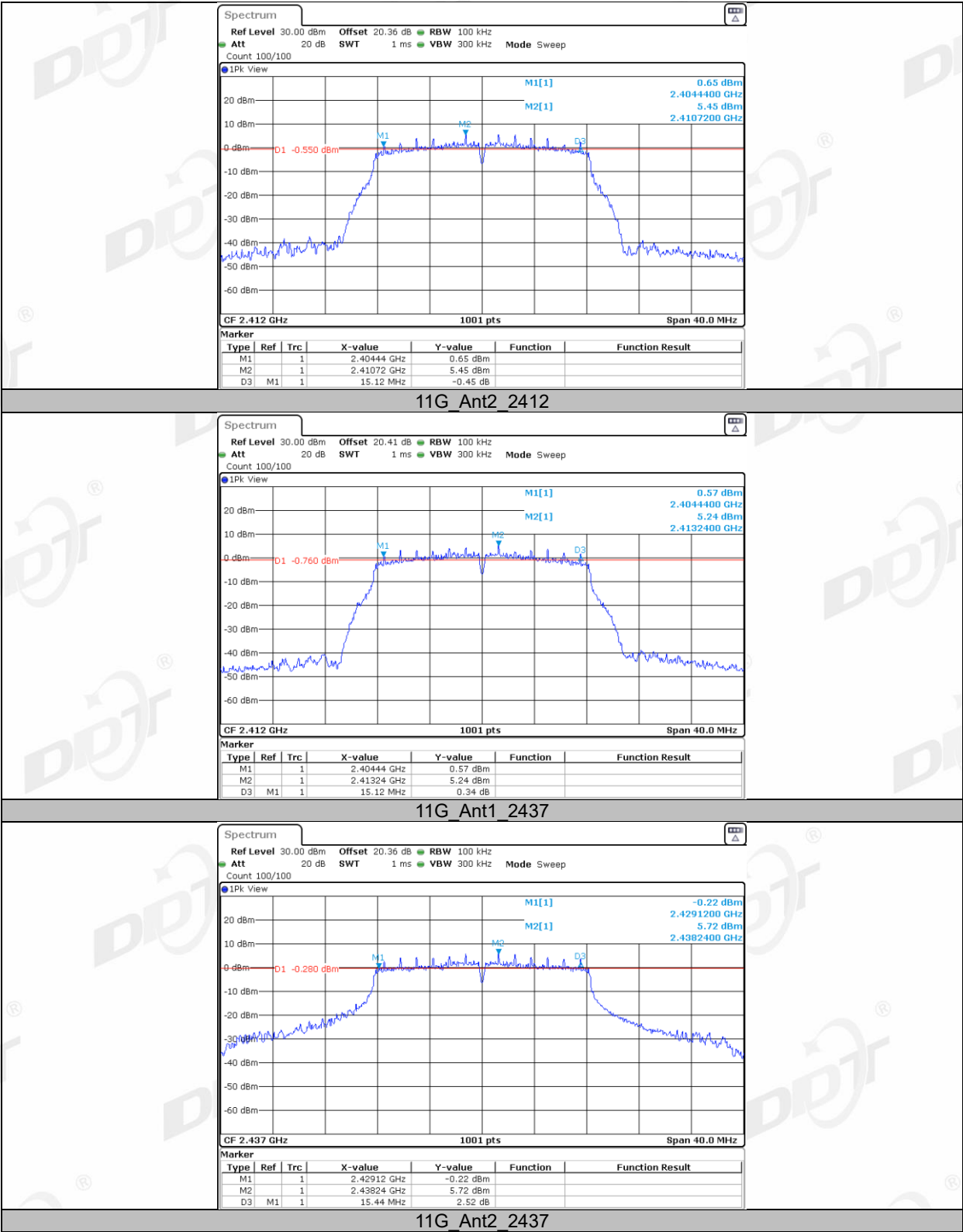
Test Engineer:	Zhongyao	Test Site:	RF Measurement System 3#
Ambient Condition:	23.6-24.3°C,32.7-42.5%RH	Test Date:	2024.11.12-2025.02.06
Test Power Supply:	AC 120V/60Hz	Sample Number:	S24111411-004

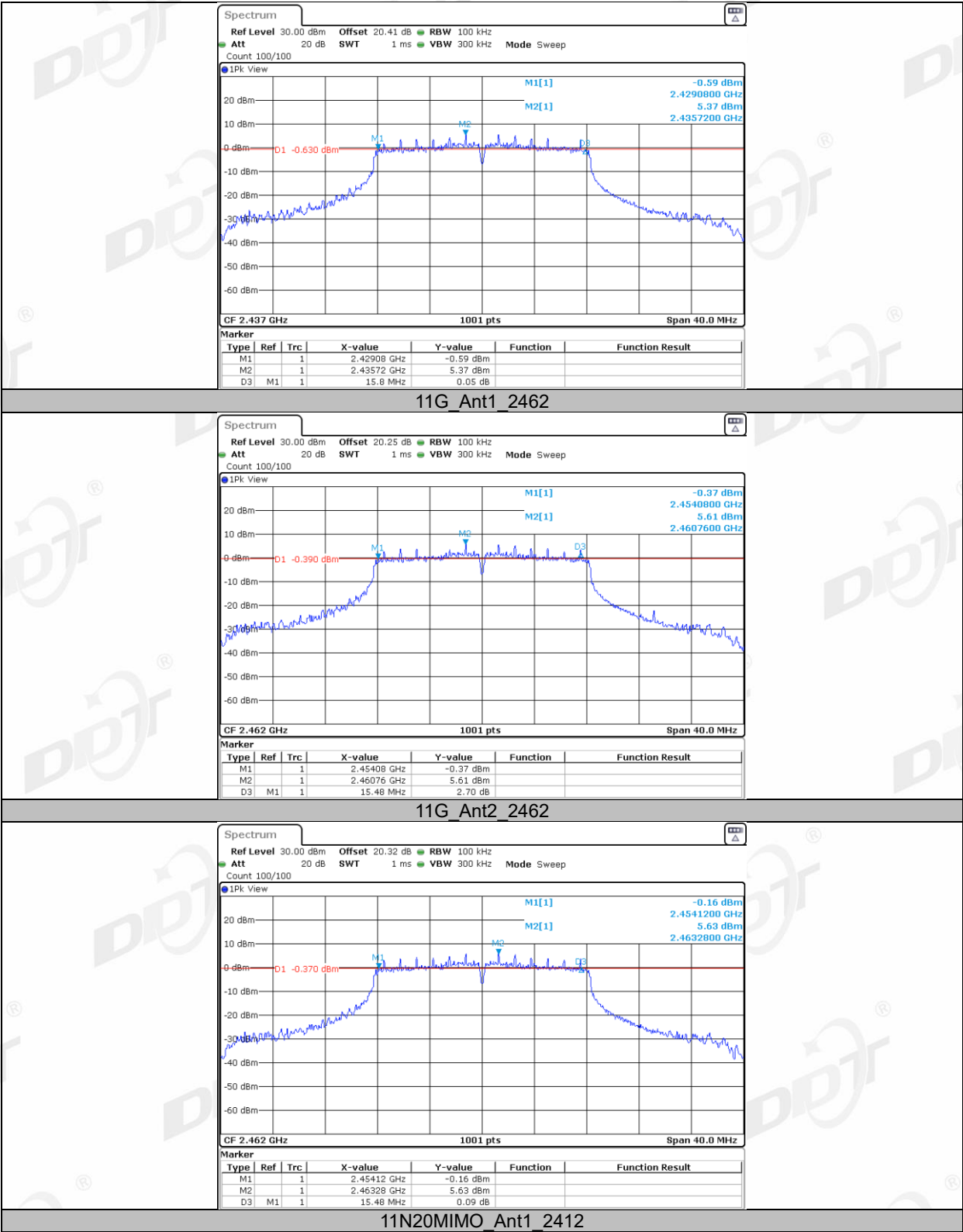
Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	8.08	2407.96	2416.04	0.5	PASS
	Ant2	2412	8.08	2407.96	2416.04	0.5	PASS
	Ant1	2437	8.08	2432.96	2441.04	0.5	PASS
	Ant2	2437	7.56	2433.44	2441.00	0.5	PASS
	Ant1	2462	8.08	2457.96	2466.04	0.5	PASS
	Ant2	2462	8.08	2457.96	2466.04	0.5	PASS
11G	Ant1	2412	15.12	2404.44	2419.56	0.5	PASS
	Ant2	2412	15.12	2404.44	2419.56	0.5	PASS
	Ant1	2437	15.44	2429.12	2444.56	0.5	PASS
	Ant2	2437	15.80	2429.08	2444.88	0.5	PASS
	Ant1	2462	15.48	2454.08	2469.56	0.5	PASS
	Ant2	2462	15.48	2454.12	2469.60	0.5	PASS
11N20MIMO	Ant1	2412	15.12	2404.44	2419.56	0.5	PASS
	Ant2	2412	15.72	2404.44	2420.16	0.5	PASS
	Ant1	2437	15.48	2429.08	2444.56	0.5	PASS
	Ant2	2437	17.52	2428.24	2445.76	0.5	PASS
	Ant1	2462	15.64	2454.24	2469.88	0.5	PASS
	Ant2	2462	16.32	2453.84	2470.16	0.5	PASS
11N40MIMO	Ant1	2422	35.04	2404.48	2439.52	0.5	PASS
	Ant2	2422	35.04	2404.48	2439.52	0.5	PASS
	Ant1	2437	35.12	2419.48	2454.60	0.5	PASS
	Ant2	2437	35.44	2419.16	2454.60	0.5	PASS
	Ant1	2452	35.12	2434.48	2469.60	0.5	PASS
	Ant2	2452	35.12	2434.48	2469.60	0.5	PASS
11AX20MIMO	Ant1	2412	18.20	2402.96	2421.16	0.5	PASS
	Ant2	2412	17.64	2403.00	2420.64	0.5	PASS
	Ant1	2437	18.40	2427.84	2446.24	0.5	PASS
	Ant2	2437	17.84	2428.16	2446.00	0.5	PASS
	Ant1	2462	17.92	2452.92	2470.84	0.5	PASS
	Ant2	2462	17.52	2453.24	2470.76	0.5	PASS
11AX40MIMO	Ant1	2422	36.40	2404.00	2440.40	0.5	PASS
	Ant2	2422	35.76	2403.84	2439.60	0.5	PASS
	Ant1	2437	37.36	2418.36	2455.72	0.5	PASS
	Ant2	2437	35.84	2418.84	2454.68	0.5	PASS
	Ant1	2452	35.84	2434.48	2470.32	0.5	PASS
	Ant2	2452	35.12	2434.48	2469.60	0.5	PASS

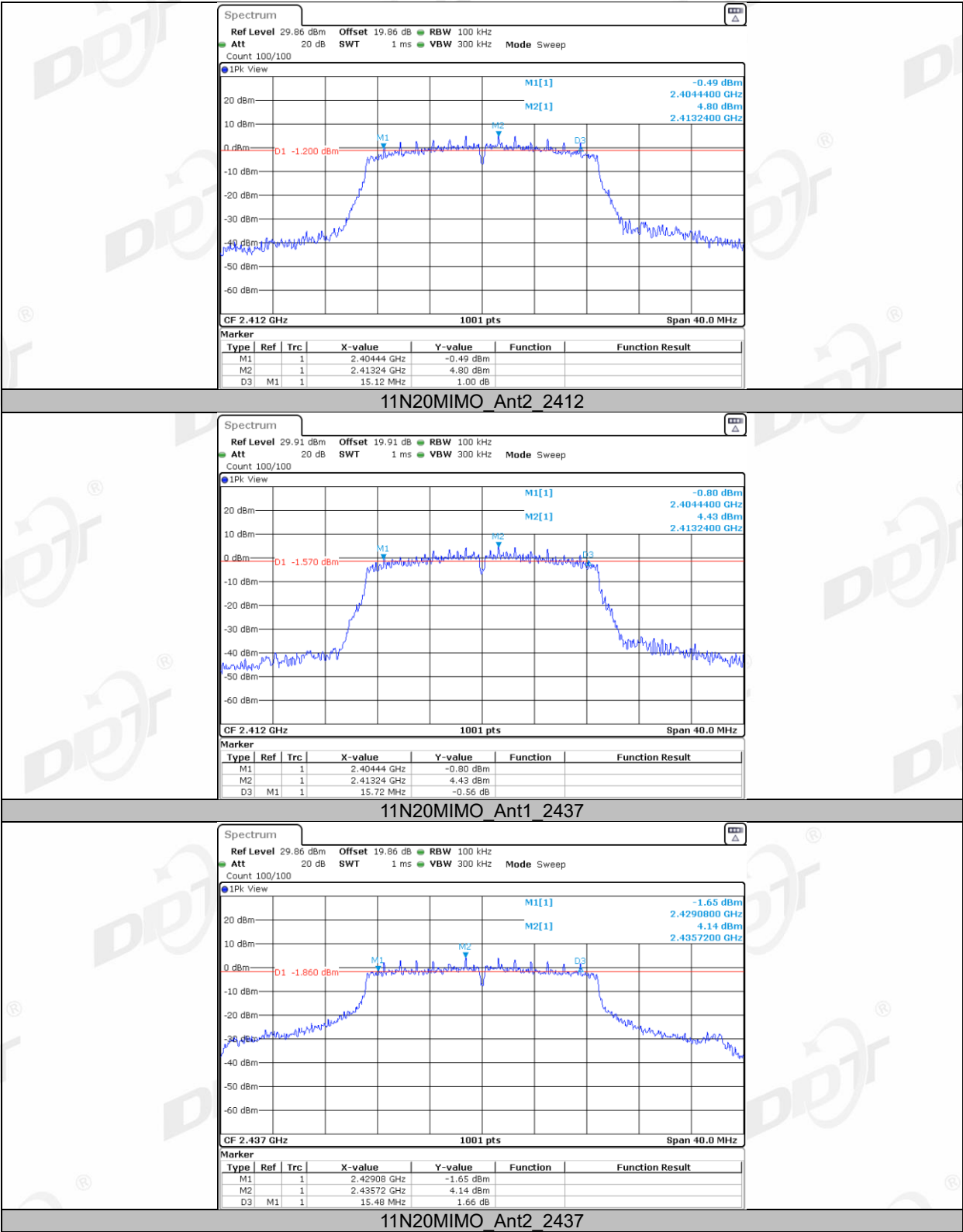
4.5. Test graphs

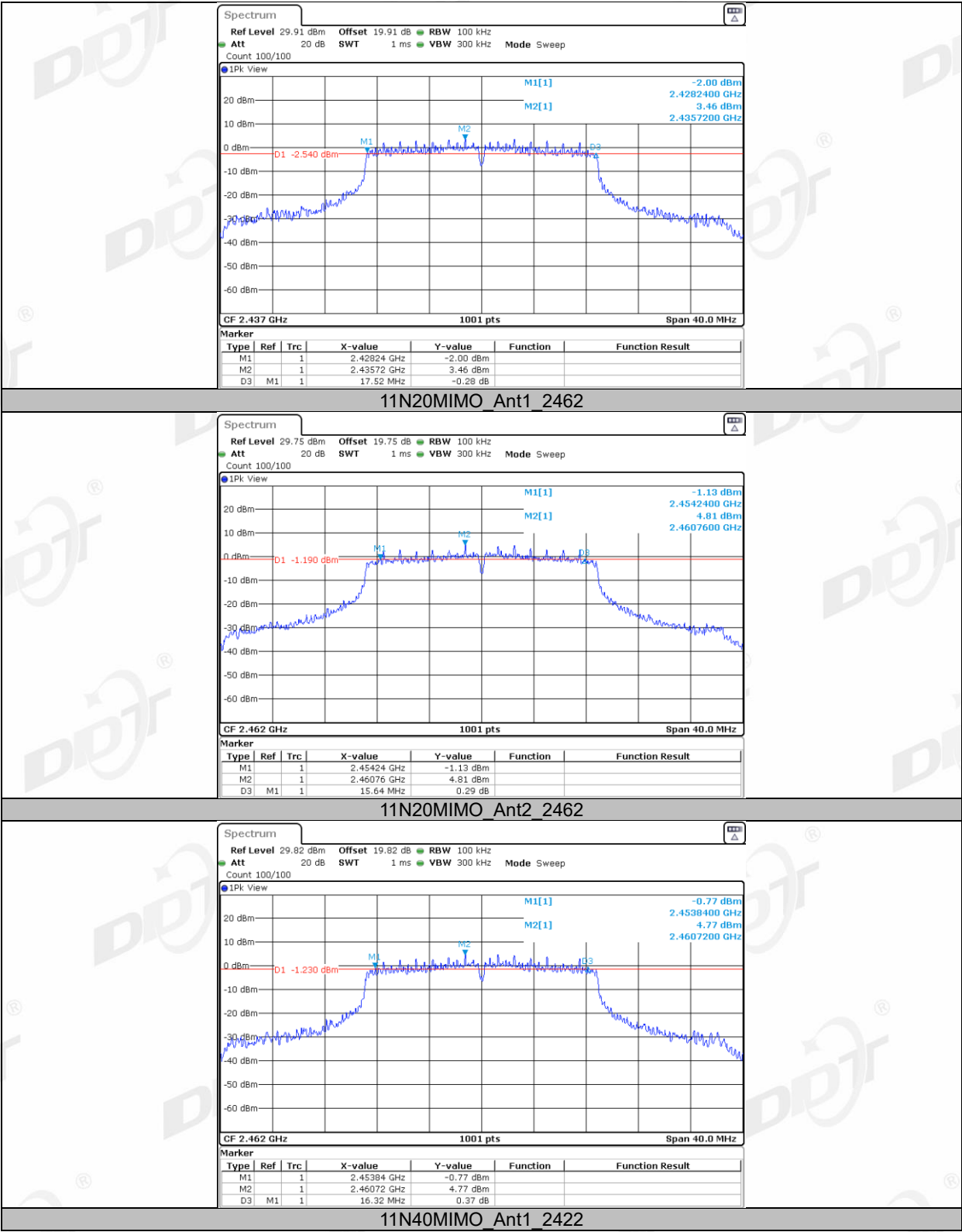


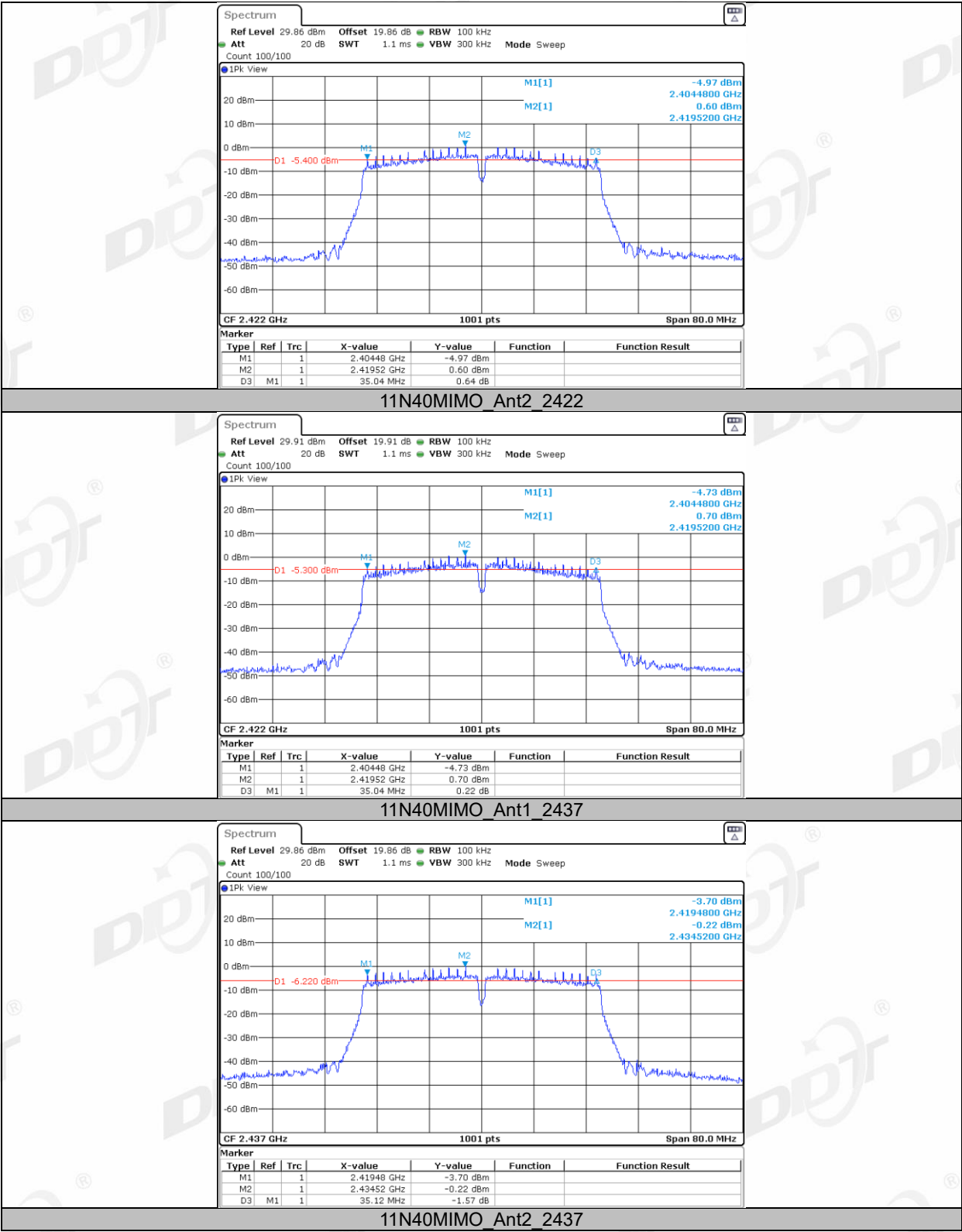


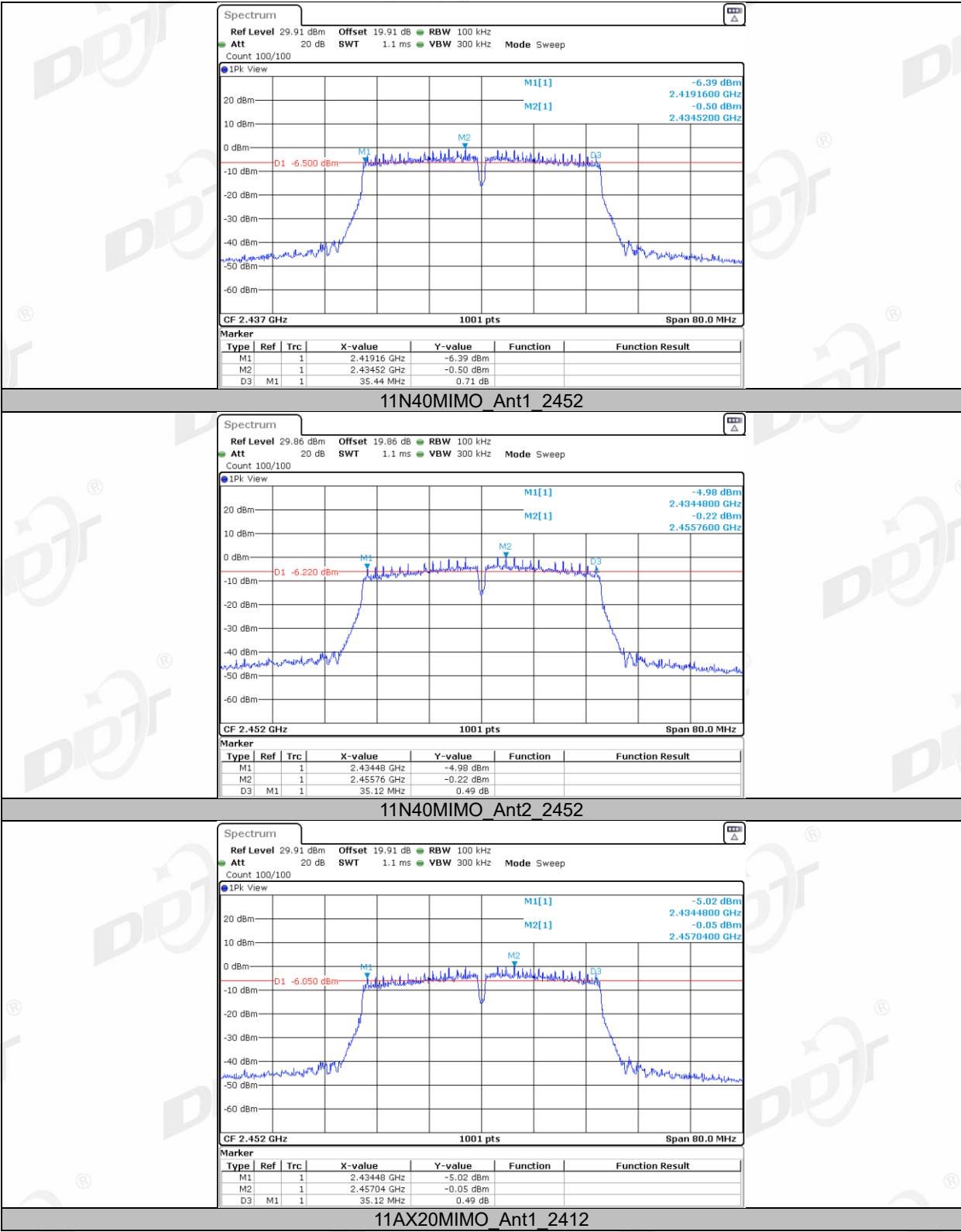


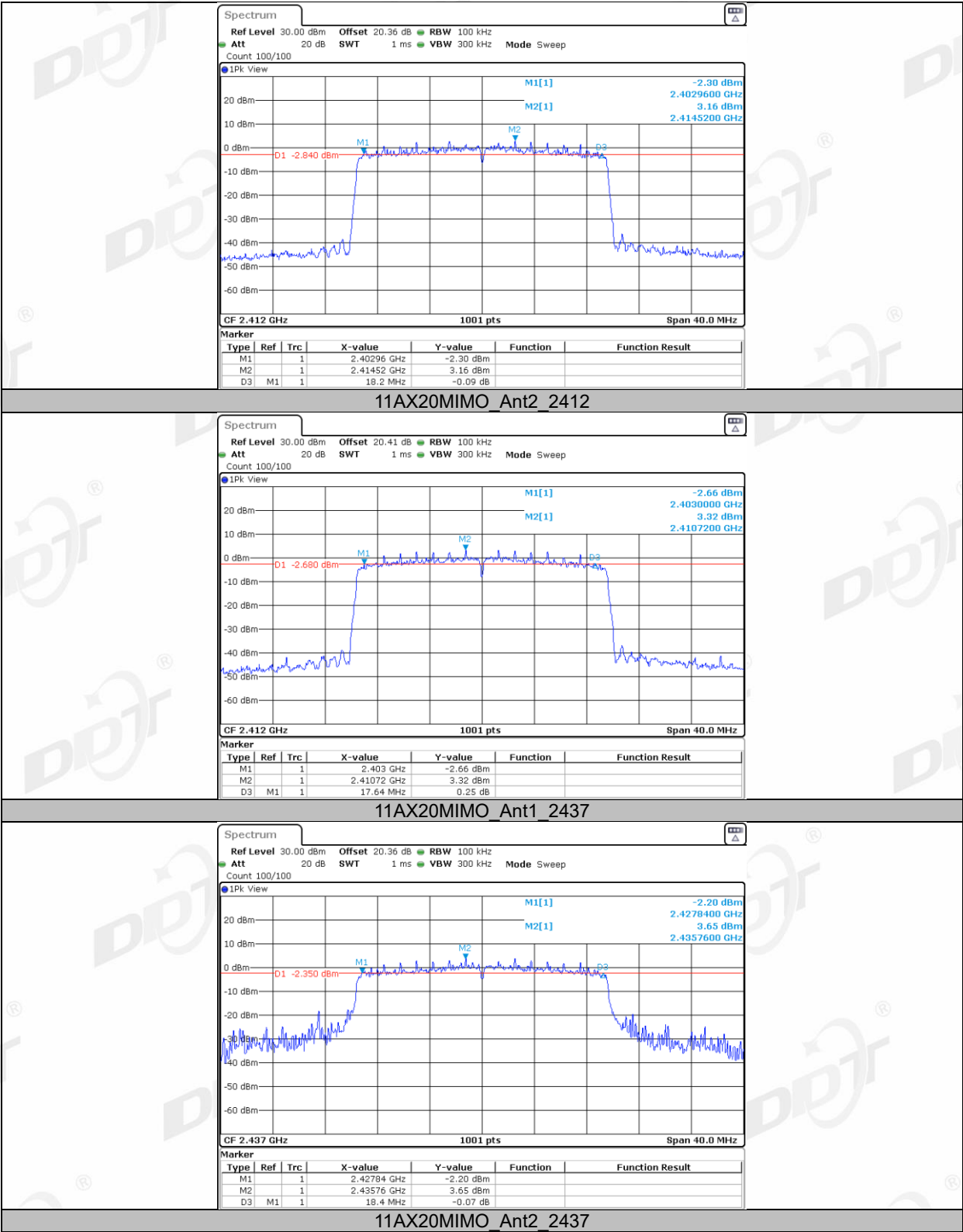


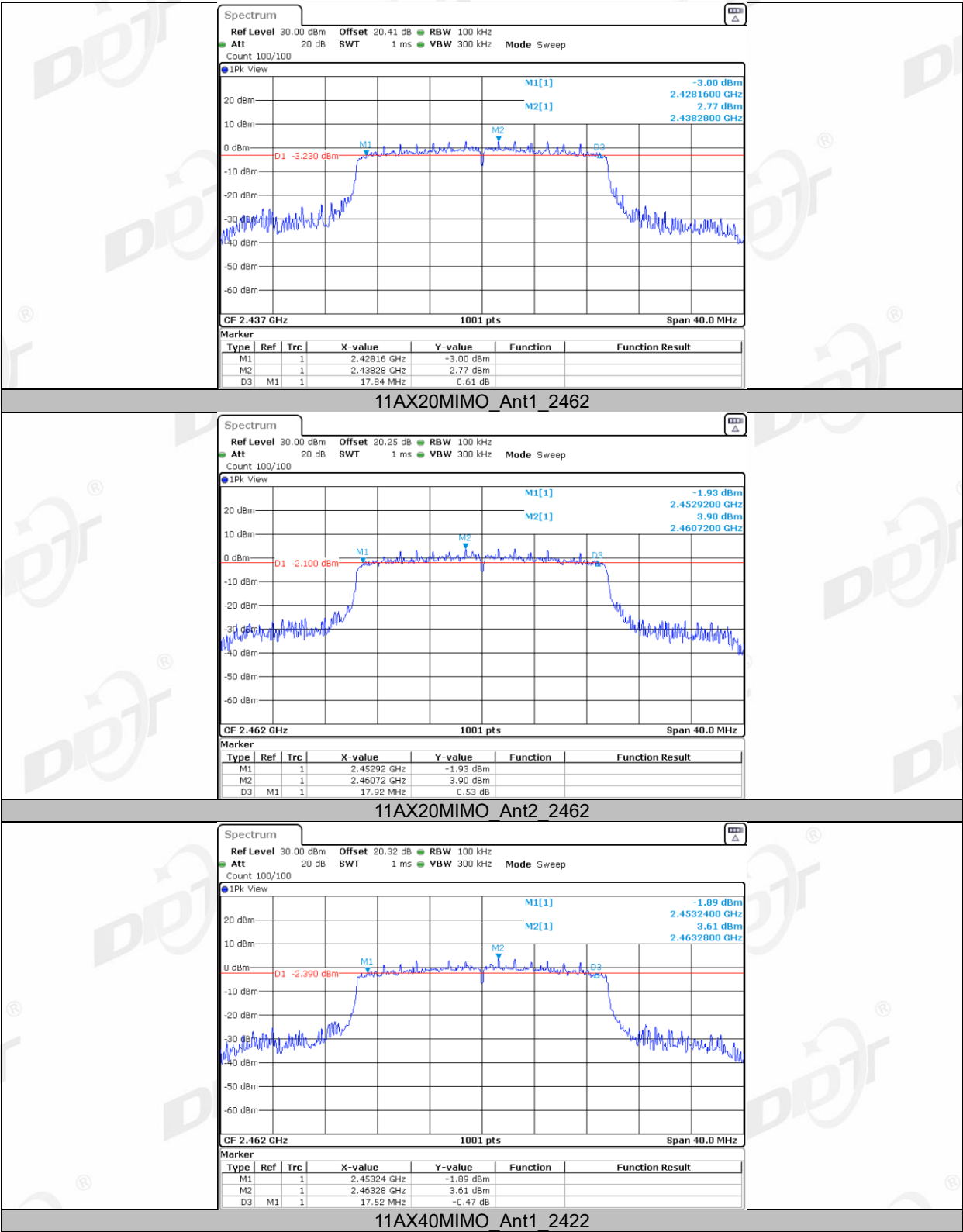


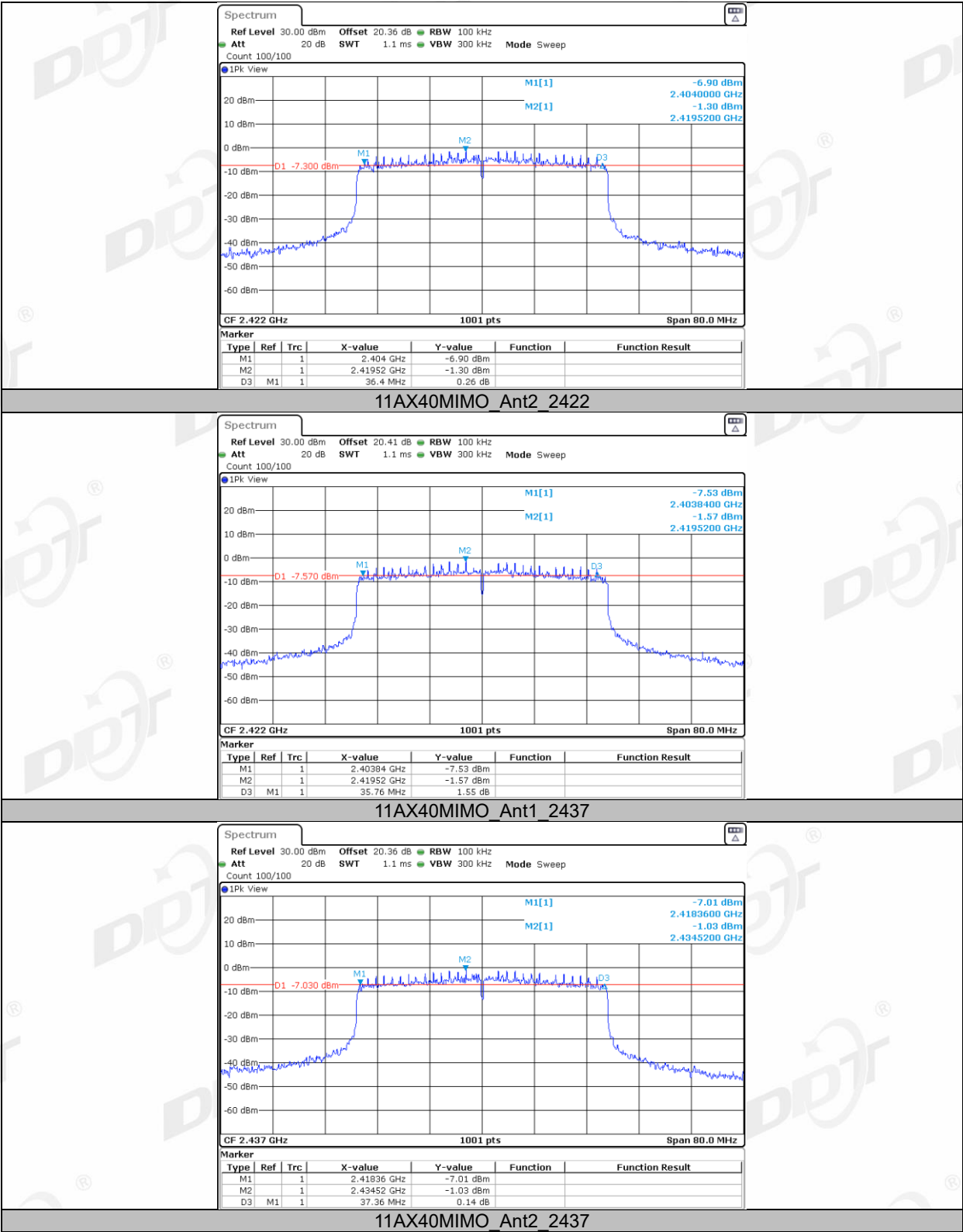


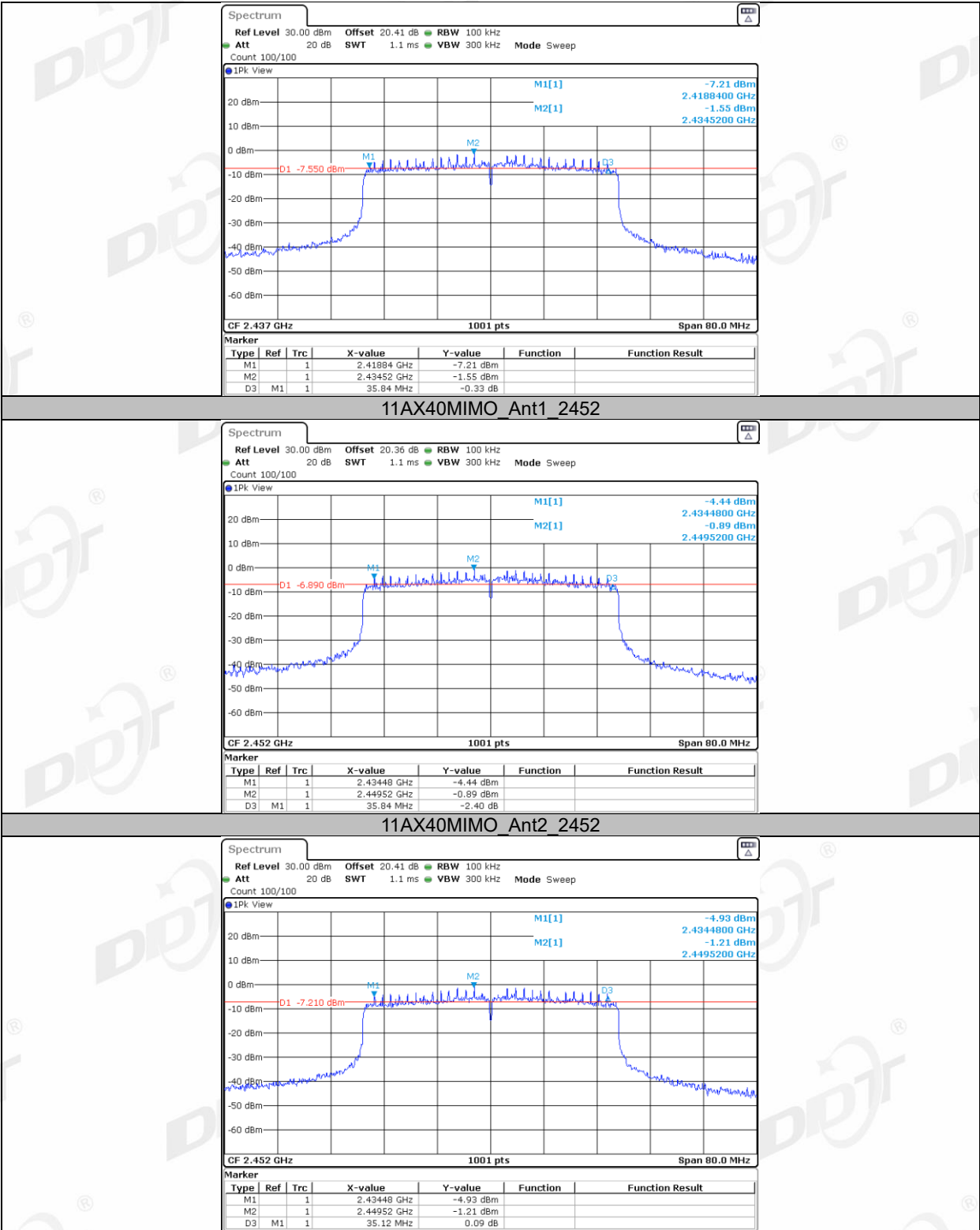






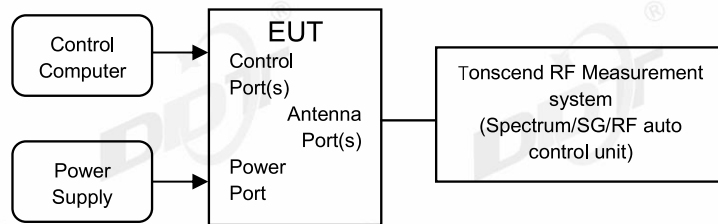






5. 99% Bandwidth

5.1. Block diagram of test setup



5.2. Limits

Just for Report.

5.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 6.9.3.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for the 99% Bandwidth:

RBW:	1% to 5% of the OBW
VBW:	approximately three times RBW
Span:	between 1.5 times and 5.0 times the OBW
Detector Mode:	peak
Sweep time:	auto
Trace mode	max hold

Allow the trace to stabilize, measure the 99% bandwidth of signal, and record the results in the report.

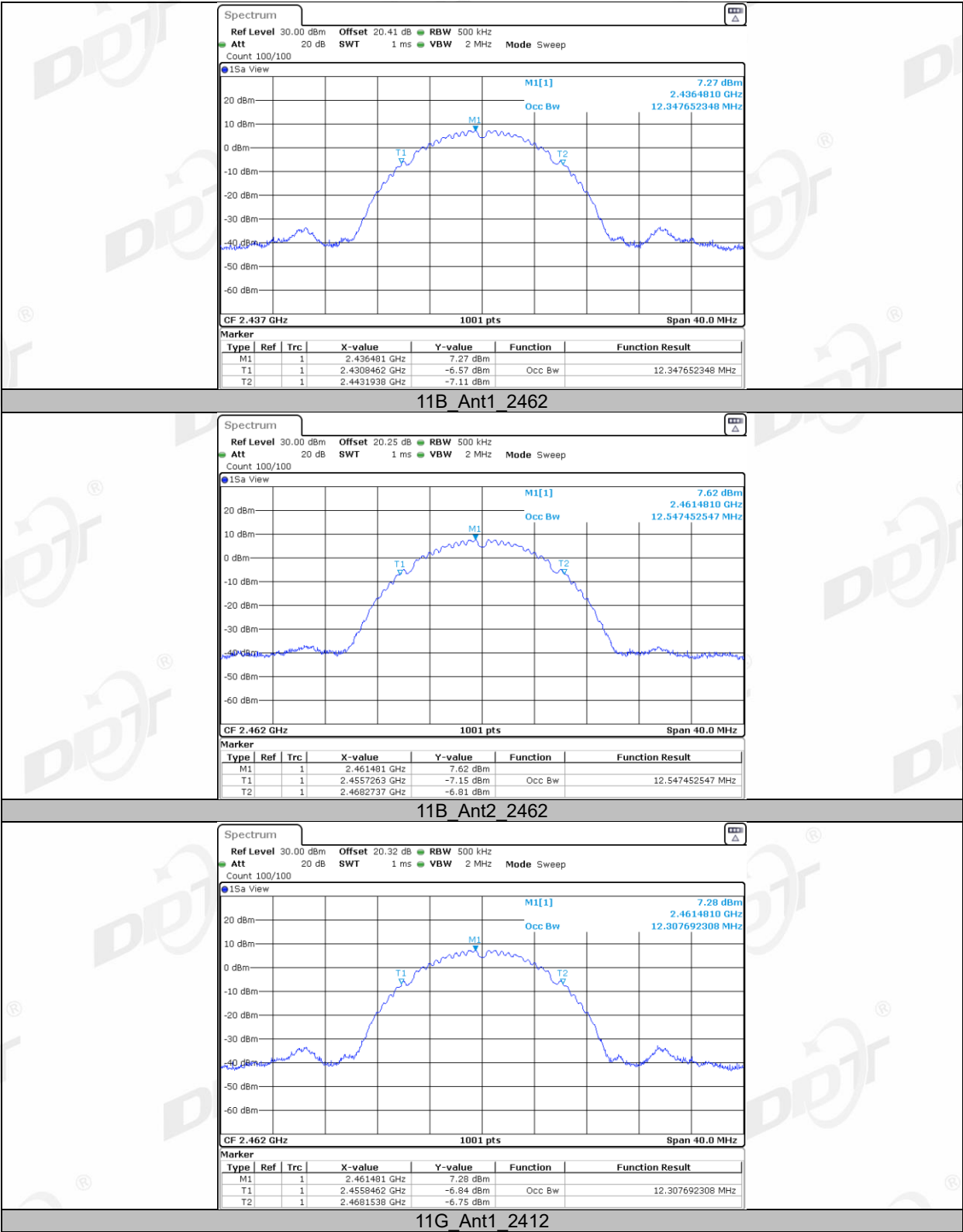
5.4. Test result

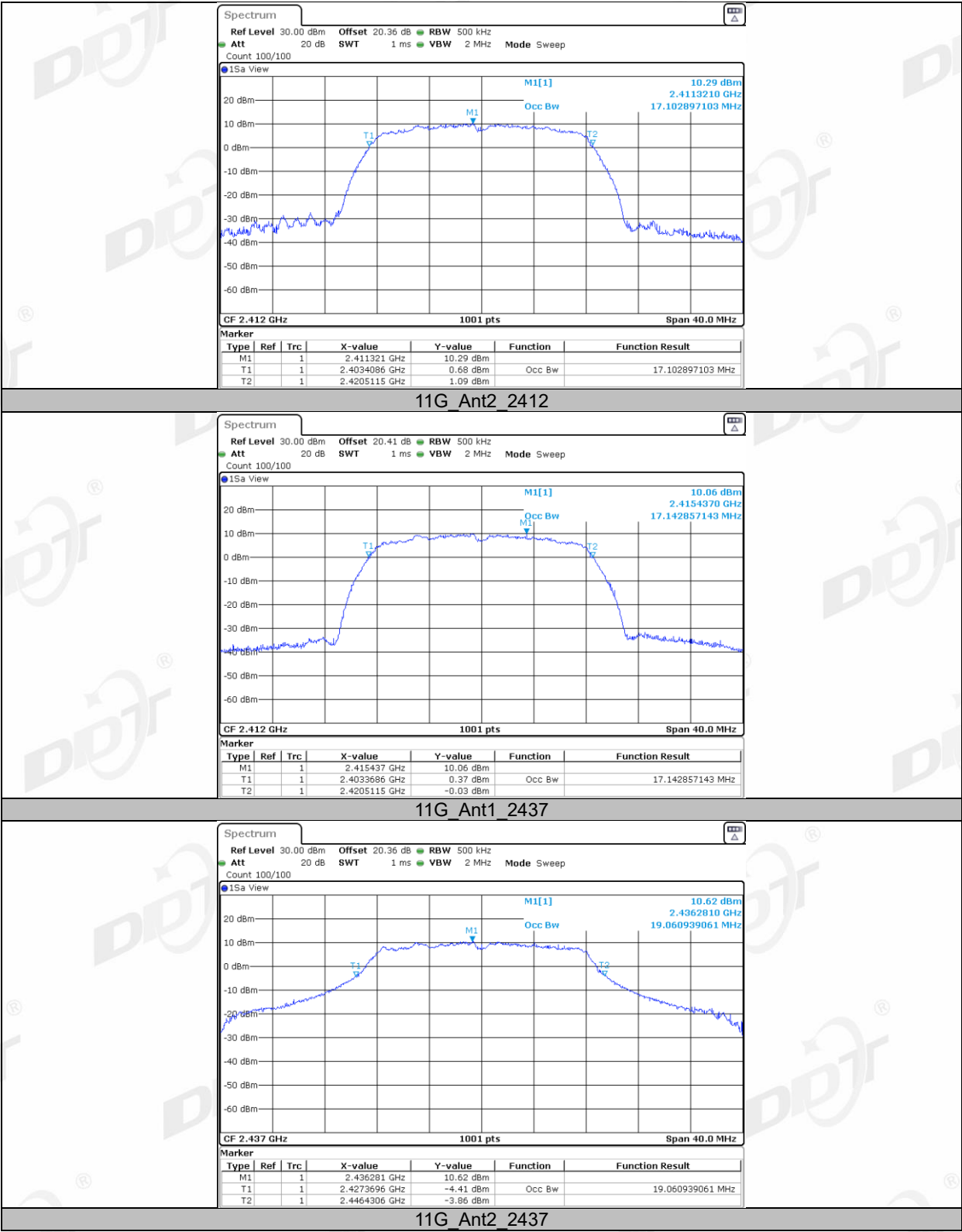
Test Engineer:	Zhongyao	Test Site:	RF Measurement System 3#
Ambient Condition:	23.6-24.3°C,32.7-42.5%RH	Test Date:	2024.11.12-2025.02.06
Test Power Supply:	AC 120V/60Hz	Sample Number:	S24111411-004

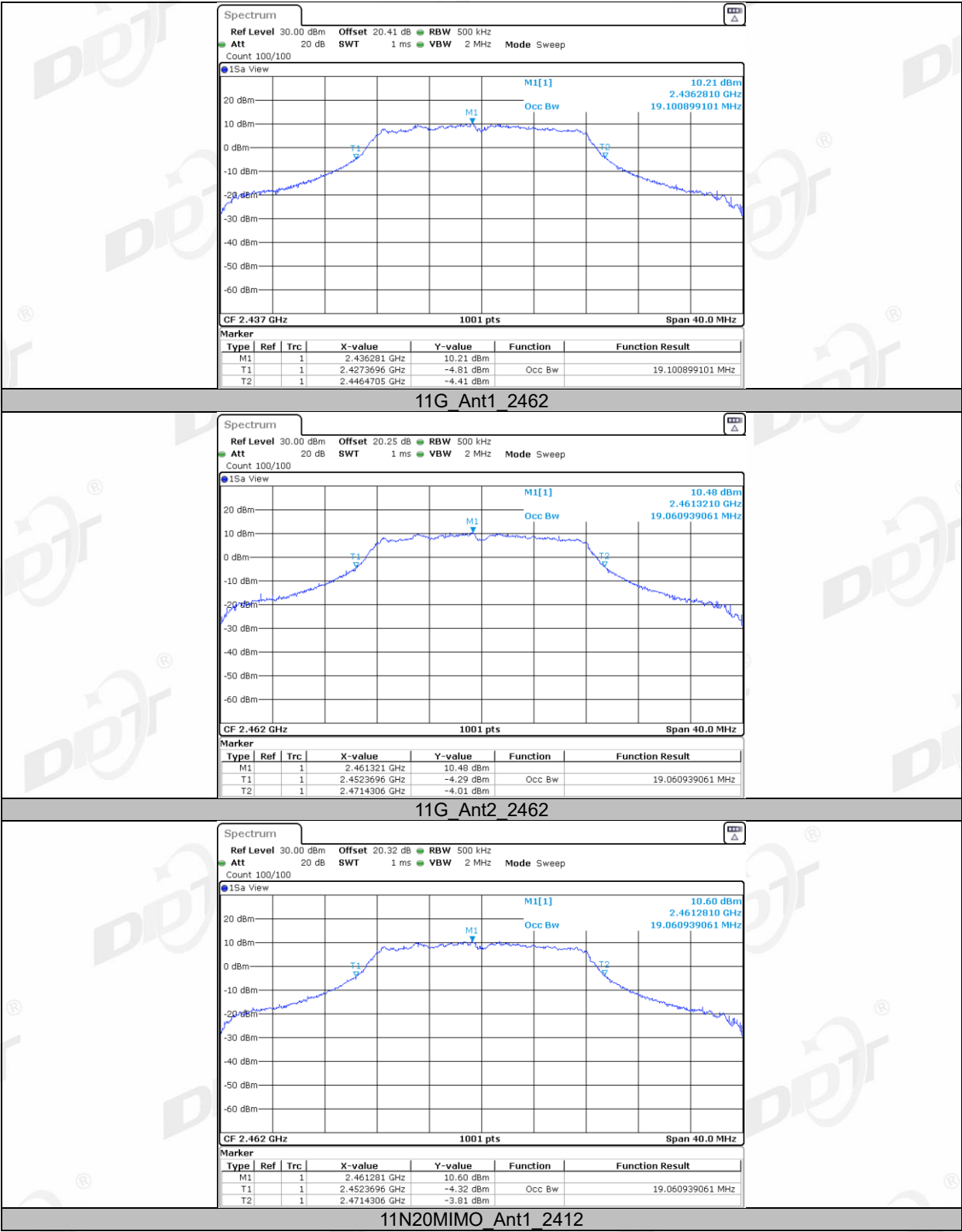
Test Mode	Antenna	Channel Frequency [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	12.587	2405.7263	2418.3137	---	---
	Ant2	2412	12.268	2405.8462	2418.1139	---	---
	Ant1	2437	12.547	2430.7263	2443.2737	---	---
	Ant2	2437	12.348	2430.8462	2443.1938	---	---
	Ant1	2462	12.547	2455.7263	2468.2737	---	---
	Ant2	2462	12.308	2455.8462	2468.1538	---	---
11G	Ant1	2412	17.103	2403.4086	2420.5115	---	---
	Ant2	2412	17.143	2403.3686	2420.5115	---	---
	Ant1	2437	19.061	2427.3696	2446.4306	---	---
	Ant2	2437	19.101	2427.3696	2446.4705	---	---
	Ant1	2462	19.061	2452.3696	2471.4306	---	---
	Ant2	2462	19.061	2452.3696	2471.4306	---	---
11N20MIMO	Ant1	2412	17.902	2403.0889	2420.9910	---	---
	Ant2	2412	17.542	2403.2488	2420.7912	---	---
	Ant1	2437	20.02	2426.8501	2446.8701	---	---
	Ant2	2437	18.382	2427.7692	2446.1508	---	---
	Ant1	2462	19.421	2452.3297	2471.7502	---	---
	Ant2	2462	18.142	2453.0090	2471.1508	---	---
11N40MIMO	Ant1	2422	35.804	2404.0979	2439.9021	---	---
	Ant2	2422	36.124	2403.9381	2440.0619	---	---
	Ant1	2437	36.204	2418.8581	2455.0619	---	---
	Ant2	2437	36.603	2418.6983	2455.3017	---	---
	Ant1	2452	36.124	2434.0180	2470.1419	---	---
	Ant2	2452	36.364	2433.9381	2470.3017	---	---
11AX20MIMO	Ant1	2412	18.821	2402.5694	2421.3906	---	---
	Ant2	2412	18.821	2402.5694	2421.3906	---	---
	Ant1	2437	19.181	2427.4096	2446.5904	---	---
	Ant2	2437	19.221	2427.4096	2446.6304	---	---
	Ant1	2462	19.181	2452.4096	2471.5904	---	---
	Ant2	2462	19.221	2452.4096	2471.6304	---	---
11AX40MIMO	Ant1	2422	37.802	2403.1389	2440.9411	---	---
	Ant2	2422	37.962	2403.0589	2441.0210	---	---
	Ant1	2437	37.882	2418.0589	2455.9411	---	---
	Ant2	2437	37.882	2418.0589	2455.9411	---	---
	Ant1	2452	37.802	2433.0589	2470.8611	---	---
	Ant2	2452	37.802	2433.1389	2470.9411	---	---

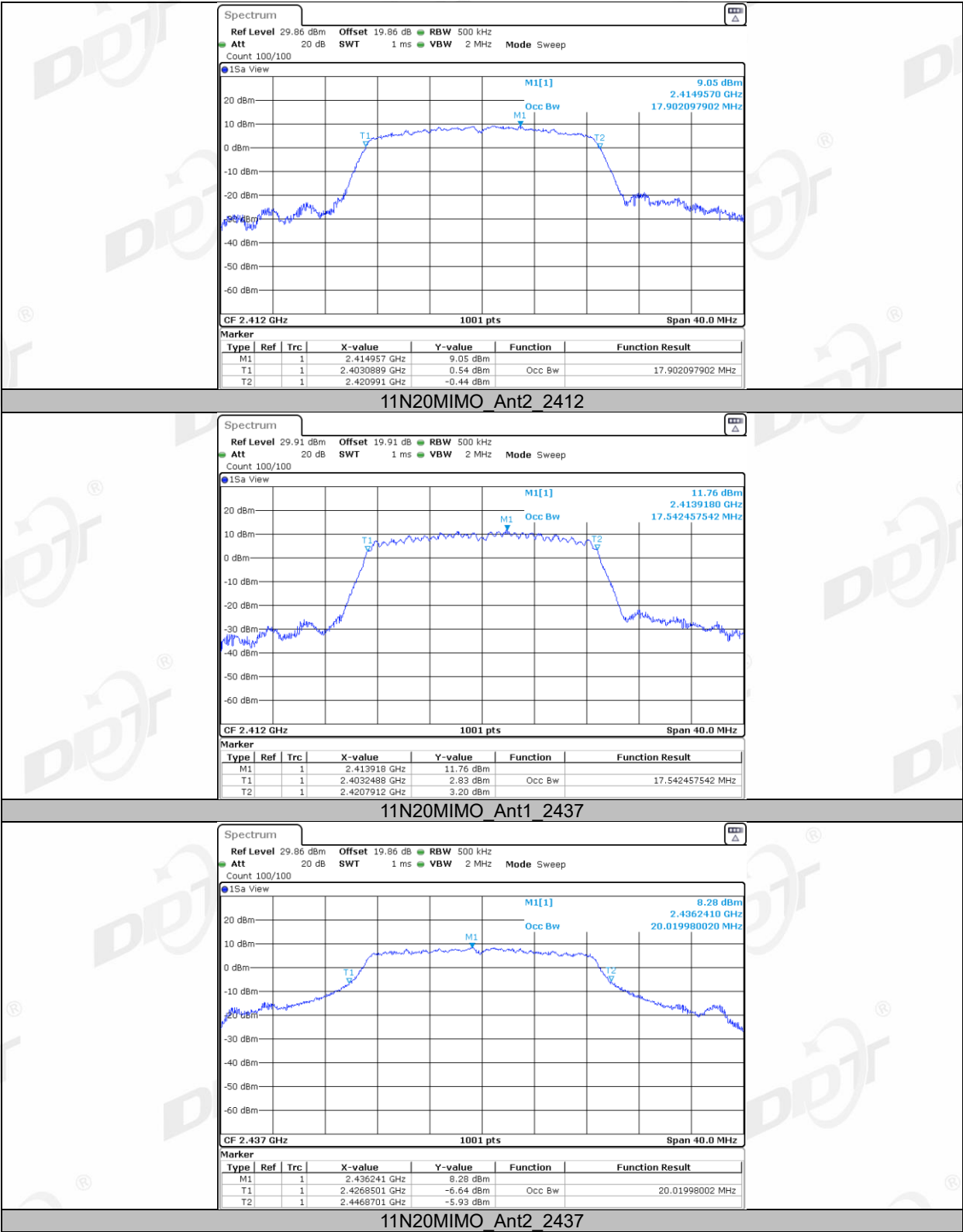
5.5. Test graphs

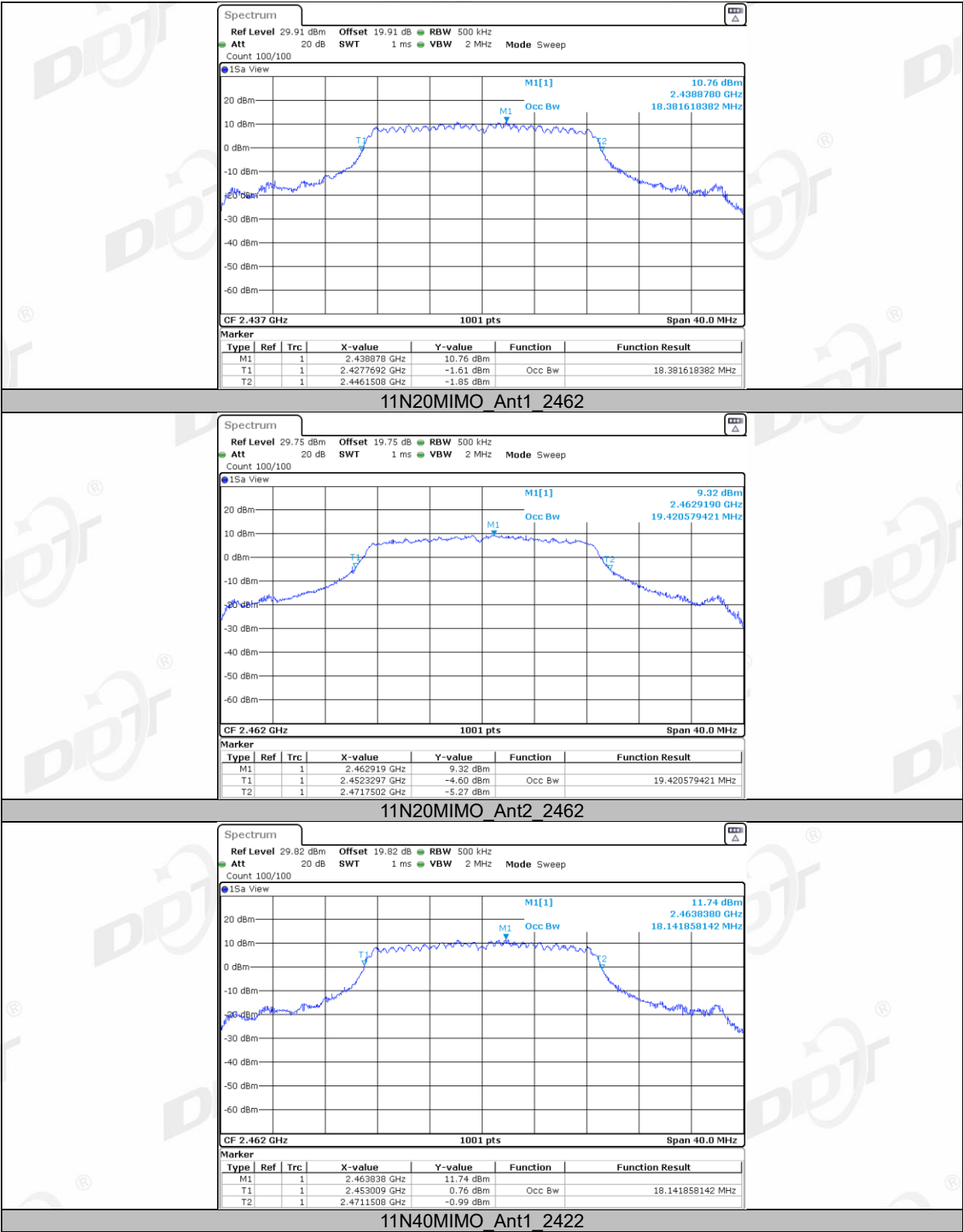


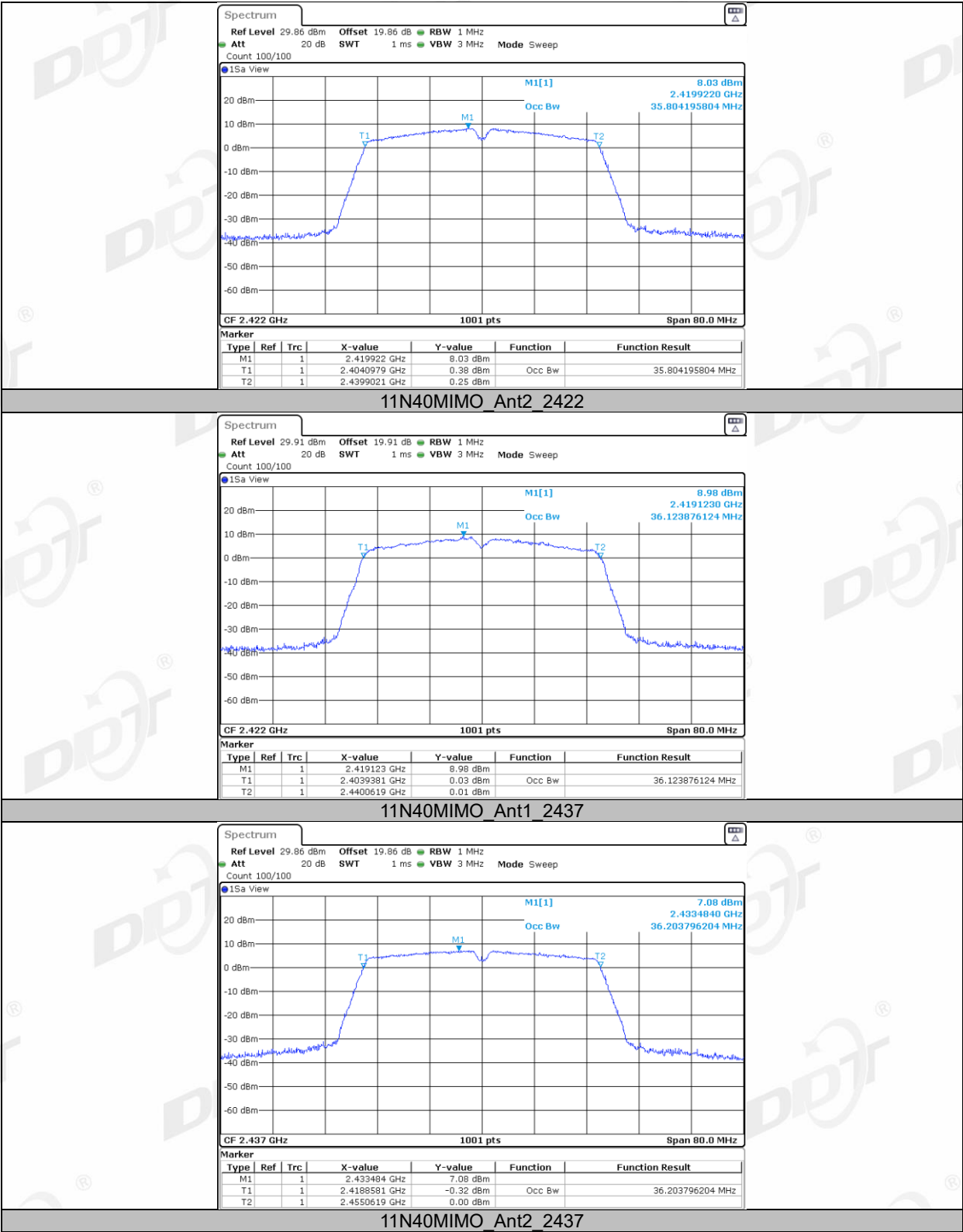


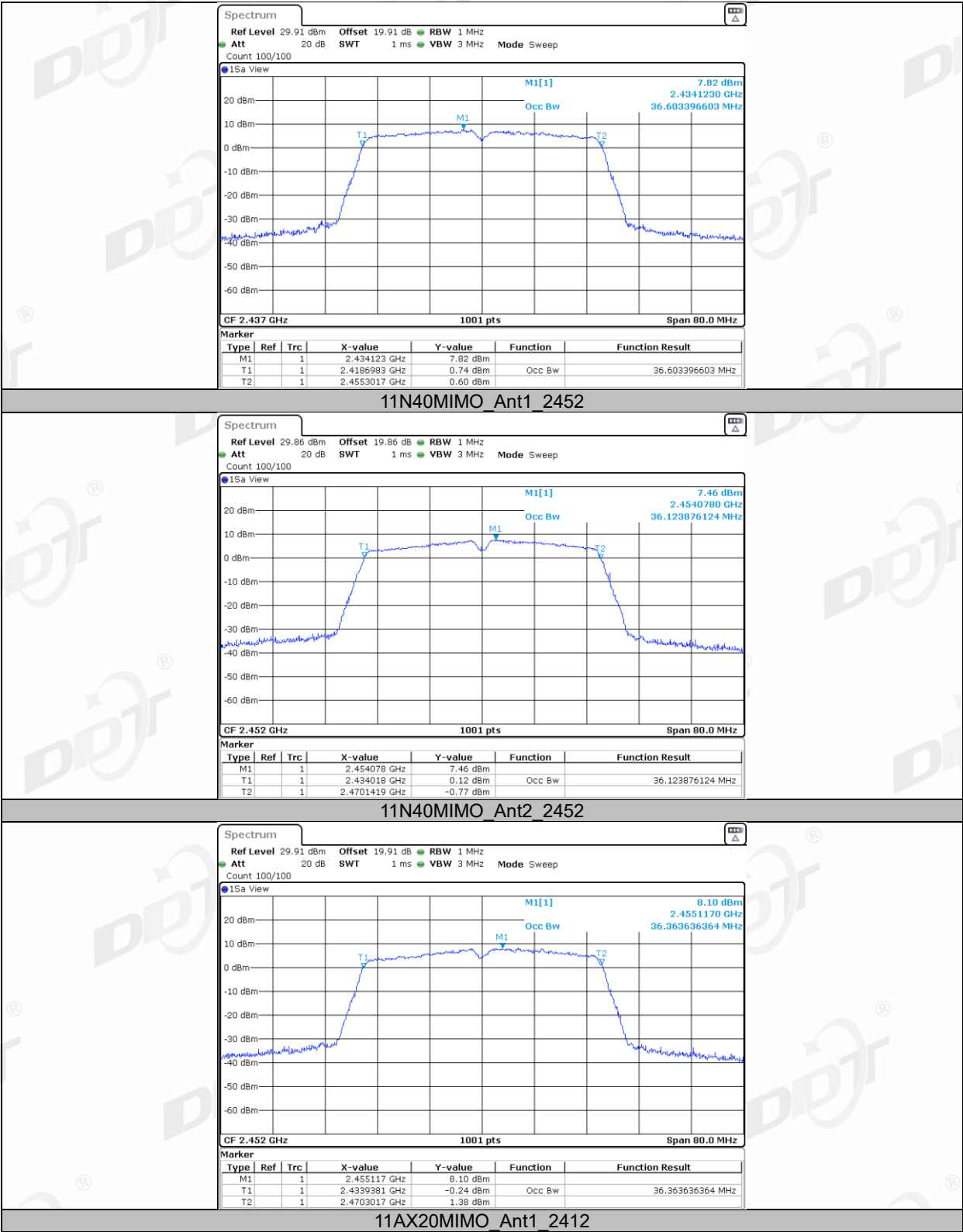


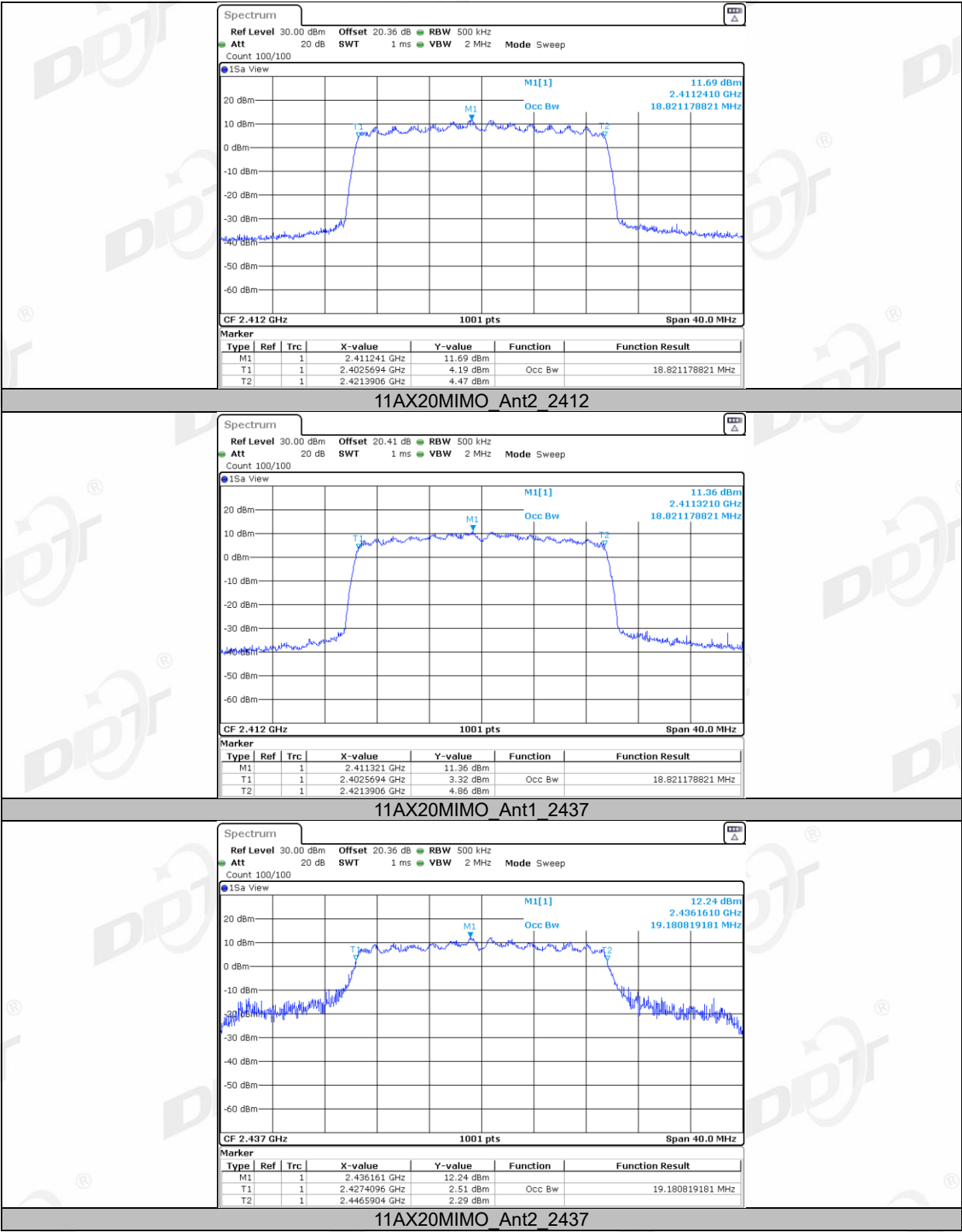


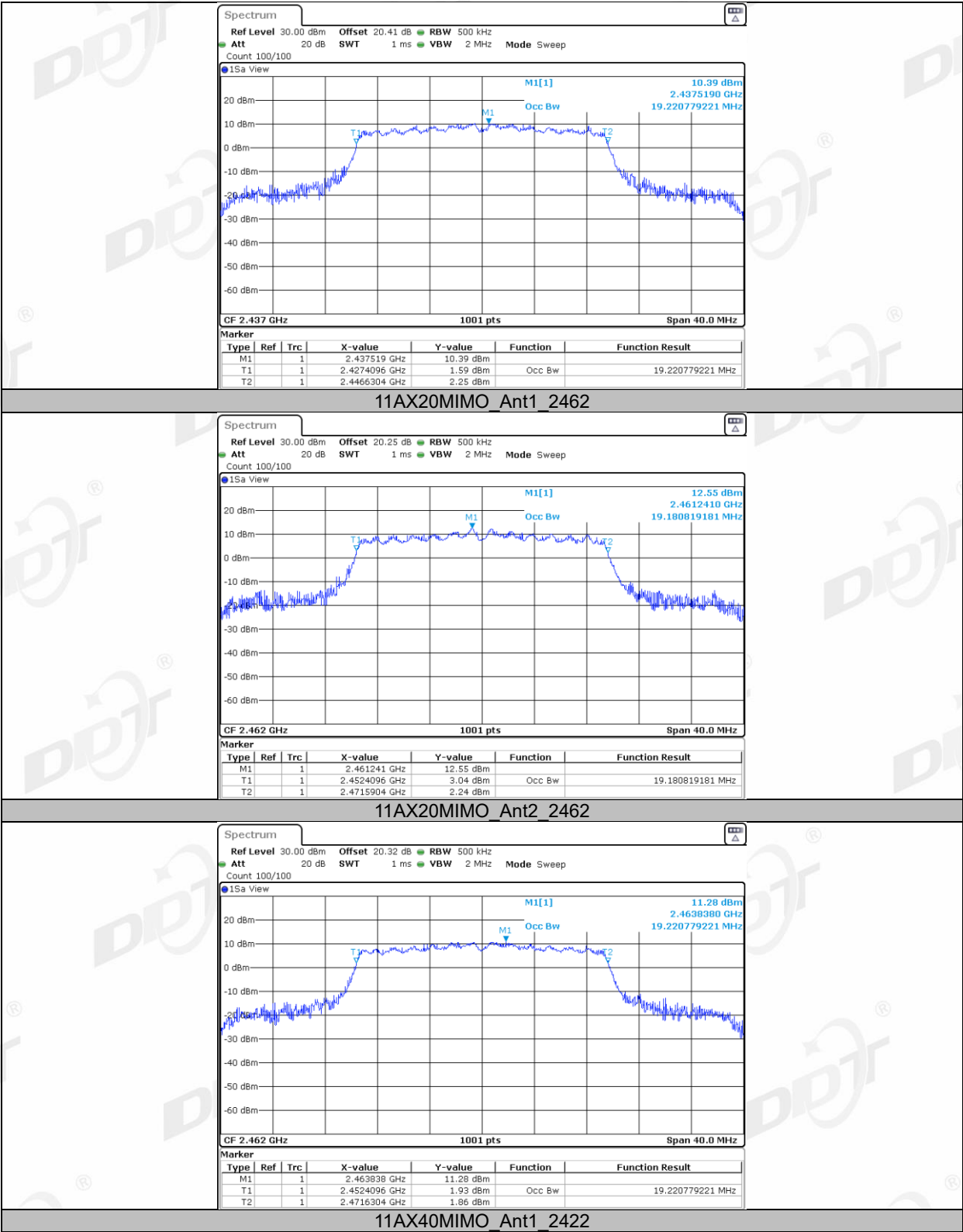


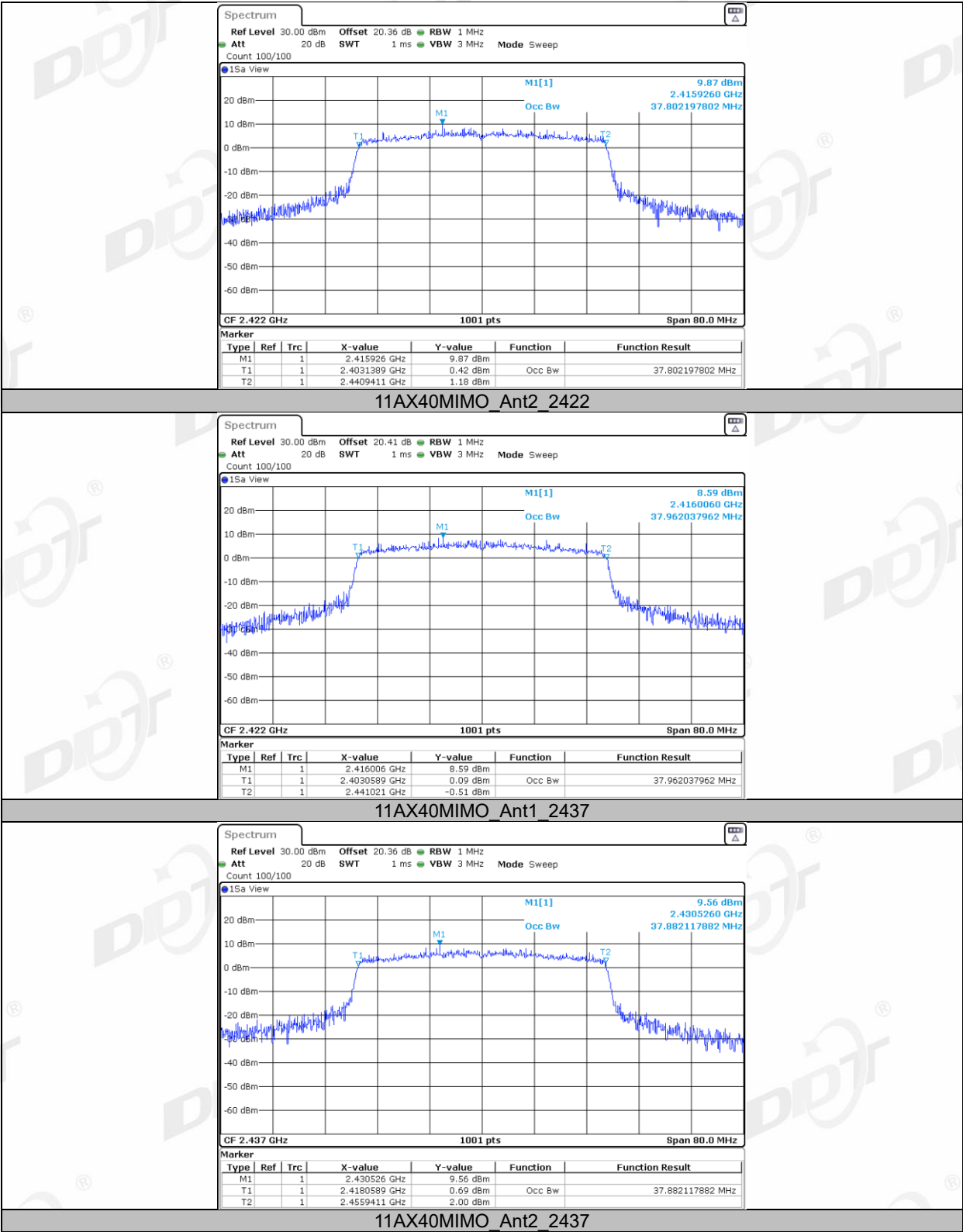


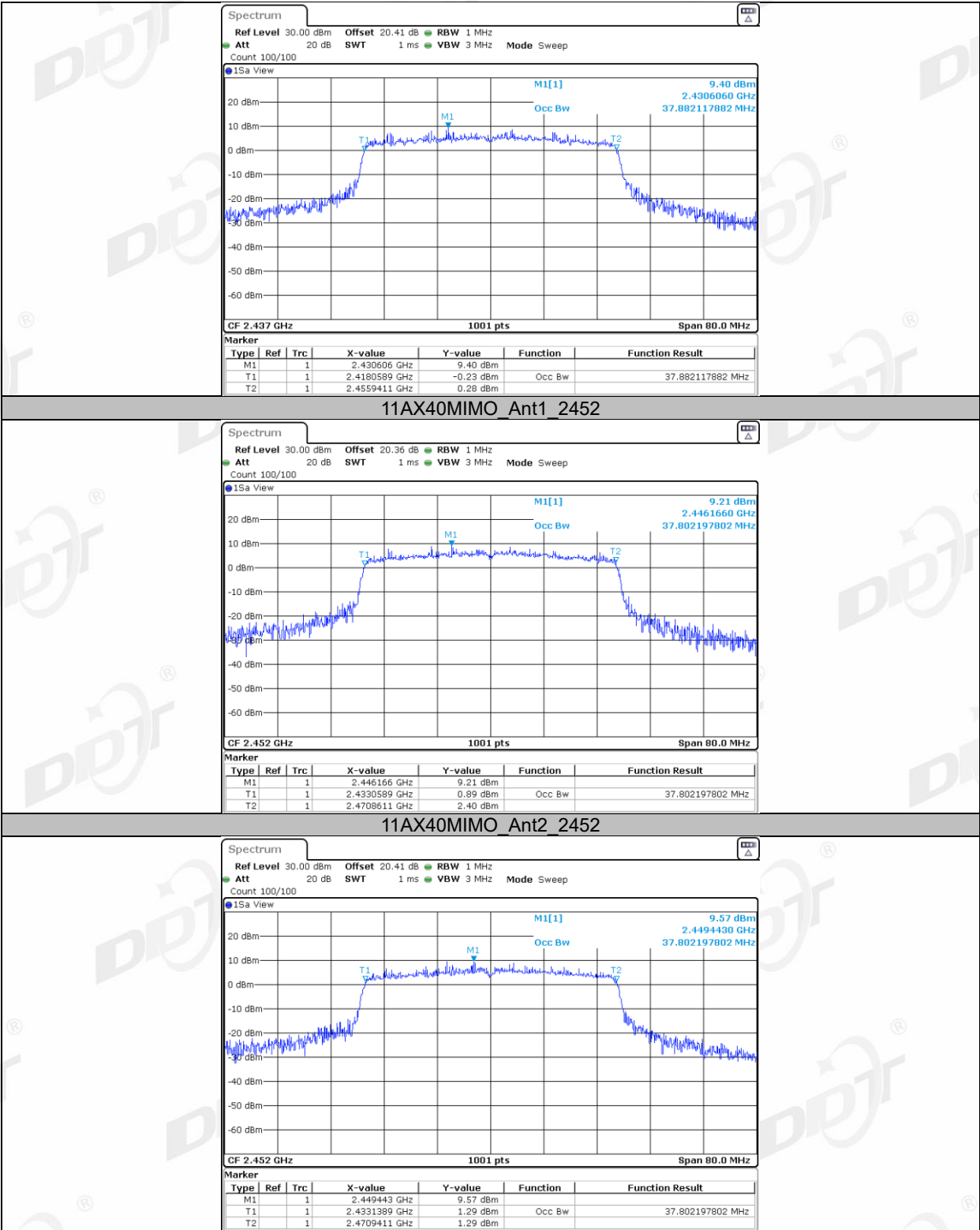






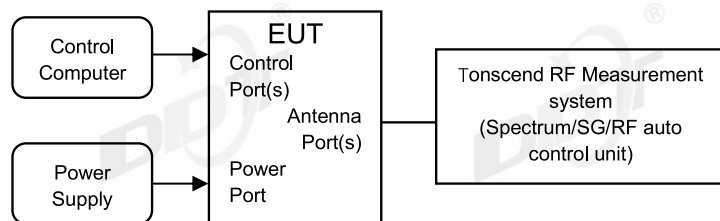






6. Conducted Output Power

6.1. Block diagram of test setup



6.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.9.2.3.
- (2) Connect EUT's antenna output to RF power meter by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously, If the transmitter does not transmit continuously, measure the duty cycle, D, of the transmitter output signal.
- (4) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
- (5) Adjust the measurement in dBm by adding $[10 \log (1 / D)]$, where D is the duty cycle.
- (6) Record the RF average power of each antenna port.

6.4. Test result average

Test Engineer:	Zhongyao	Test Site:	RF Measurement System 3#
Ambient Condition:	23.6-24.3°C,32.7-42.5%RH	Test Date:	2024.11.12-2025.02.06
Test Power Supply:	AC 120V/60Hz	Sample Number:	S24111411-004

Test Mode	Antenna	Frequency [MHz]	Average power [dBm]	Duty Cycle [%]	DC Factor [dB]	Result [dBm]	Limit [dBm]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11B	Ant1	2412	17.88	99.64	0.02	17.90	≤30.00	19.73	≤36.00	PASS
	Ant2	2412	17.53	99.76	0.01	17.54	≤30.00	19.18	≤36.00	PASS
	Ant1	2437	17.90	99.64	0.02	17.92	≤30.00	19.75	≤36.00	PASS
	Ant2	2437	17.54	99.64	0.02	17.56	≤30.00	19.20	≤36.00	PASS
	Ant1	2462	17.91	99.64	0.02	17.93	≤30.00	19.76	≤36.00	PASS
	Ant2	2462	17.65	99.64	0.02	17.67	≤30.00	19.31	≤36.00	PASS
11G	Ant1	2412	16.46	97.22	0.12	16.58	≤30.00	18.41	≤36.00	PASS
	Ant2	2412	16.32	97.20	0.12	16.44	≤30.00	18.08	≤36.00	PASS
	Ant1	2437	16.87	97.20	0.12	16.99	≤30.00	18.82	≤36.00	PASS
	Ant2	2437	16.36	97.90	0.09	16.45	≤30.00	18.09	≤36.00	PASS
	Ant1	2462	16.70	97.90	0.09	16.79	≤30.00	18.62	≤36.00	PASS
	Ant2	2462	15.76	97.20	0.12	15.88	≤30.00	17.52	≤36.00	PASS
11N20MIMO	Ant1	2412	15.49	97.74	0.10	15.59	≤30.00	17.42	≤36.00	PASS
	Ant2	2412	15.19	97.01	0.13	15.32	≤30.00	16.96	≤36.00	PASS
	total	2412	---	---	---	18.47	≤30.00	20.21	≤36.00	PASS
	Ant1	2437	15.83	97.01	0.13	15.96	≤30.00	17.79	≤36.00	PASS
	Ant2	2437	16.02	97.74	0.10	16.12	≤30.00	17.76	≤36.00	PASS
	total	2437	---	---	---	19.05	≤30.00	20.79	≤36.00	PASS
	Ant1	2462	15.97	97.74	0.10	16.07	≤30.00	17.90	≤36.00	PASS
	Ant2	2462	15.82	97.74	0.10	15.92	≤30.00	17.56	≤36.00	PASS
11N40MIMO	total	2462	---	---	---	19.01	≤30.00	20.74	≤36.00	PASS
	Ant1	2422	13.65	94.12	0.26	13.91	≤30.00	15.74	≤36.00	PASS
	Ant2	2422	13.52	94.12	0.26	13.78	≤30.00	15.42	≤36.00	PASS
	total	2422	---	---	---	16.86	≤30.00	18.59	≤36.00	PASS
	Ant1	2437	13.69	94.12	0.26	13.95	≤30.00	15.78	≤36.00	PASS
	Ant2	2437	13.56	94.12	0.26	13.82	≤30.00	15.46	≤36.00	PASS
	total	2437	---	---	---	16.90	≤30.00	18.63	≤36.00	PASS
	Ant1	2452	13.52	95.59	0.20	13.72	≤30.00	15.55	≤36.00	PASS
11AX20MIMO	Ant2	2452	13.57	94.12	0.26	13.83	≤30.00	15.47	≤36.00	PASS
	total	2452	---	---	---	16.79	≤30.00	18.52	≤36.00	PASS
	Ant1	2412	14.01	96.23	0.17	14.18	≤30.00	16.01	≤36.00	PASS
	Ant2	2412	13.67	96.19	0.17	13.84	≤30.00	15.48	≤36.00	PASS
	total	2412	---	---	---	17.02	≤30.00	18.76	≤36.00	PASS
	Ant1	2437	14.35	97.14	0.13	14.48	≤30.00	16.31	≤36.00	PASS
	Ant2	2437	13.73	97.14	0.13	13.86	≤30.00	15.50	≤36.00	PASS
	total	2437	---	---	---	17.19	≤30.00	18.93	≤36.00	PASS
11AX40MIMO	Ant1	2462	14.15	96.19	0.17	14.32	≤30.00	16.15	≤36.00	PASS
	Ant2	2462	14.12	96.19	0.17	14.29	≤30.00	15.93	≤36.00	PASS
	total	2462	---	---	---	17.32	≤30.00	19.05	≤36.00	PASS
	Ant1	2422	12.09	94.74	0.23	12.32	≤30.00	14.15	≤36.00	PASS
	Ant2	2422	11.75	92.98	0.32	12.07	≤30.00	13.71	≤36.00	PASS
	total	2422	---	---	---	15.21	≤30.00	16.95	≤36.00	PASS
	Ant1	2437	12.11	92.98	0.32	12.43	≤30.00	14.26	≤36.00	PASS
	Ant2	2437	11.52	92.98	0.32	11.84	≤30.00	13.48	≤36.00	PASS
11AX40MIMO	total	2437	---	---	---	15.16	≤30.00	16.90	≤36.00	PASS
	Ant1	2452	12.16	94.74	0.23	12.39	≤30.00	14.22	≤36.00	PASS
	Ant2	2452	11.81	92.98	0.32	12.13	≤30.00	13.77	≤36.00	PASS
	total	2452	---	---	---	15.27	≤30.00	17.01	≤36.00	PASS

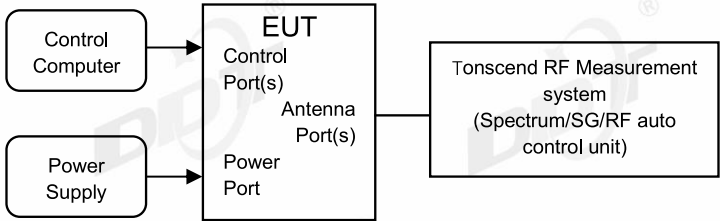
Test Mode	Antenna	Frequency[MHz]	Ru Size	Ru Index	Peak Power[dBm]	Conducted Limit[dBm]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11AX20MIMO	Ant1	2412	26Tone	RU0	11.72	≤30.00	13.55	≤36.00	PASS
				RU4	11.50	≤30.00	13.33	≤36.00	PASS
				RU8	11.07	≤30.00	12.90	≤36.00	PASS
			52Tone	RU37	11.35	≤30.00	13.18	≤36.00	PASS
				RU39	11.81	≤30.00	13.64	≤36.00	PASS
				RU40	11.60	≤30.00	13.43	≤36.00	PASS
			106Tone	RU53	11.71	≤30.00	13.54	≤36.00	PASS
				RU54	11.89	≤30.00	13.72	≤36.00	PASS
				RU0	11.25	≤30.00	12.89	≤36.00	PASS
	Ant2	2412	26Tone	RU4	11.40	≤30.00	13.04	≤36.00	PASS
				RU8	11.35	≤30.00	12.99	≤36.00	PASS
				RU37	11.41	≤30.00	13.05	≤36.00	PASS
			52Tone	RU39	11.25	≤30.00	12.89	≤36.00	PASS
				RU40	11.51	≤30.00	13.15	≤36.00	PASS
				RU53	11.91	≤30.00	13.55	≤36.00	PASS
			106Tone	RU54	11.54	≤30.00	13.18	≤36.00	PASS
				RU0	14.50	≤30.00	16.24	≤36.00	PASS
	total	2412	26Tone	RU4	14.46	≤30.00	16.20	≤36.00	PASS
				RU8	14.22	≤30.00	15.96	≤36.00	PASS
				RU37	14.39	≤30.00	16.13	≤36.00	PASS
			52Tone	RU39	14.55	≤30.00	16.29	≤36.00	PASS
				RU40	14.57	≤30.00	16.30	≤36.00	PASS
				RU53	14.82	≤30.00	16.56	≤36.00	PASS
			106Tone	RU54	14.73	≤30.00	16.47	≤36.00	PASS
				RU0	11.55	≤30.00	13.38	≤36.00	PASS
	Ant1	2437	26Tone	RU4	11.71	≤30.00	13.54	≤36.00	PASS
				RU8	11.58	≤30.00	13.41	≤36.00	PASS
				RU37	11.67	≤30.00	13.50	≤36.00	PASS
			52Tone	RU39	11.73	≤30.00	13.56	≤36.00	PASS
				RU40	11.79	≤30.00	13.62	≤36.00	PASS
				RU53	11.68	≤30.00	13.51	≤36.00	PASS
			106Tone	RU54	11.90	≤30.00	13.73	≤36.00	PASS
				RU0	11.19	≤30.00	12.83	≤36.00	PASS
	Ant2	2437	26Tone	RU4	11.37	≤30.00	13.01	≤36.00	PASS
				RU8	11.35	≤30.00	12.99	≤36.00	PASS
				RU37	11.05	≤30.00	12.69	≤36.00	PASS
			52Tone	RU39	11.41	≤30.00	13.05	≤36.00	PASS
				RU40	11.36	≤30.00	13.00	≤36.00	PASS
				RU53	11.64	≤30.00	13.28	≤36.00	PASS
			106Tone	RU54	10.83	≤30.00	12.47	≤36.00	PASS
				RU0	14.38	≤30.00	16.12	≤36.00	PASS
	total	2437	26Tone	RU4	14.55	≤30.00	16.29	≤36.00	PASS
				RU8	14.48	≤30.00	16.22	≤36.00	PASS
				RU37	14.38	≤30.00	16.12	≤36.00	PASS
			52Tone	RU39	14.58	≤30.00	16.32	≤36.00	PASS
				RU40	14.59	≤30.00	16.33	≤36.00	PASS
				RU53	14.67	≤30.00	16.41	≤36.00	PASS
			106Tone	RU54	14.41	≤30.00	16.16	≤36.00	PASS
				RU0	11.74	≤30.00	13.57	≤36.00	PASS
	Ant1	2462	26Tone	RU4	11.64	≤30.00	13.47	≤36.00	PASS
				RU8	11.58	≤30.00	13.41	≤36.00	PASS
				RU37	11.78	≤30.00	13.61	≤36.00	PASS
			52Tone	RU39	11.97	≤30.00	13.80	≤36.00	PASS
				RU40	11.86	≤30.00	13.69	≤36.00	PASS
				RU53	11.99	≤30.00	13.82	≤36.00	PASS
			106Tone	RU54	12.00	≤30.00	13.83	≤36.00	PASS
				RU0	11.27	≤30.00	12.91	≤36.00	PASS
	Ant2	2462	26Tone	RU4	11.46	≤30.00	13.10	≤36.00	PASS
				RU8	11.56	≤30.00	13.20	≤36.00	PASS
				RU37	11.68	≤30.00	13.32	≤36.00	PASS
			52Tone	RU39	11.75	≤30.00	13.39	≤36.00	PASS
				RU40	11.71	≤30.00	13.35	≤36.00	PASS
				RU53	11.53	≤30.00	13.17	≤36.00	PASS
			106Tone	RU54	11.94	≤30.00	13.58	≤36.00	PASS
				RU0	14.52	≤30.00	16.26	≤36.00	PASS
	total	2462	26Tone	RU4	14.56	≤30.00	16.30	≤36.00	PASS
				RU8	14.58	≤30.00	16.32	≤36.00	PASS
			52Tone	RU37	14.74	≤30.00	16.48	≤36.00	PASS
				RU39	14.87	≤30.00	16.61	≤36.00	PASS

11AX40MIMO			106Tone	RU40	14.80	≤30.00	16.53	≤36.00	PASS
				RU53	14.78	≤30.00	16.52	≤36.00	PASS
	Ant1	2422	242Tone	RU54	14.98	≤30.00	16.72	≤36.00	PASS
				RU61	14.33	≤30.00	16.16	≤36.00	PASS
	Ant2	2422	242Tone	RU62	14.30	≤30.00	16.13	≤36.00	PASS
				RU61	14.30	≤30.00	15.94	≤36.00	PASS
	total	2422	242Tone	RU62	14.15	≤30.00	15.79	≤36.00	PASS
				RU61	17.33	≤30.00	19.06	≤36.00	PASS
	Ant1	2437	242Tone	RU62	17.24	≤30.00	18.97	≤36.00	PASS
				RU61	14.80	≤30.00	16.63	≤36.00	PASS
	Ant2	2437	242Tone	RU62	14.65	≤30.00	16.48	≤36.00	PASS
				RU61	13.95	≤30.00	15.59	≤36.00	PASS
	total	2437	242Tone	RU62	14.23	≤30.00	15.87	≤36.00	PASS
				RU61	17.41	≤30.00	19.15	≤36.00	PASS
	Ant1	2452	242Tone	RU62	17.46	≤30.00	19.20	≤36.00	PASS
				RU61	14.53	≤30.00	16.36	≤36.00	PASS
	Ant2	2452	242Tone	RU62	14.08	≤30.00	15.91	≤36.00	PASS
				RU61	14.03	≤30.00	15.67	≤36.00	PASS
	total	2452	242Tone	RU62	14.06	≤30.00	15.70	≤36.00	PASS
				RU61	17.30	≤30.00	19.04	≤36.00	PASS
				RU62	17.08	≤30.00	18.82	≤36.00	PASS

Note: EIRP (dBm)=Conducted Output Power (dBm)+ Antenna Gain (dBi)

7. Power Spectral Density

7.1. Block diagram of test setup



7.2. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

7.3. Test procedure

- (1) The test according to ANSI C63.10-2013 clause 11.10.5.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for Power Spectral Density measurement:

Center frequency	DTS Channel center frequency
RBW:	$3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$
VBW:	$\geq 3\text{RBW}$
Span	1.5 times the DTS bandwidth
Detector Mode:	RMS
Sweep time:	auto
Trace mode	max hold
	Employ trace averaging (rms)
Trace	mode over a minimum of 100 traces.

- (5) Add $[10 \log (1 / D)]$, where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time.
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

7.4. Test result

Test Engineer:	Zhongyao	Test Site:	RF Measurement System 3#
Ambient Condition:	23.6-24.3°C,32.7-42.5%RH	Test Date:	2024.11.12-2025.02.06
Test Power Supply:	AC 120V/60Hz	Sample Number:	S24111411-004

Test Mode	Antenna	Frequency [MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-10.71	≤8.00	PASS
	Ant2	2412	-13.76	≤8.00	PASS
	Ant1	2437	-10.84	≤8.00	PASS
	Ant2	2437	-10.06	≤8.00	PASS
	Ant1	2462	-9.60	≤8.00	PASS
	Ant2	2462	-11.52	≤8.00	PASS
11G	Ant1	2412	-15.19	≤8.00	PASS
	Ant2	2412	-15.22	≤8.00	PASS
	Ant1	2437	-14.43	≤8.00	PASS
	Ant2	2437	-15.02	≤8.00	PASS
	Ant1	2462	-15.45	≤8.00	PASS
	Ant2	2462	-16.32	≤8.00	PASS
11N20MIMO	Ant1	2412	-16.53	≤8.00	PASS
	Ant2	2412	-16.82	≤8.00	PASS
	total	2412	-13.66	≤8.00	PASS
	Ant1	2437	-17.71	≤8.00	PASS
	Ant2	2437	-17.34	≤8.00	PASS
	total	2437	-14.51	≤8.00	PASS
	Ant1	2462	-16.51	≤8.00	PASS
	Ant2	2462	-16.41	≤8.00	PASS
	total	2462	-13.45	≤8.00	PASS
	total	2412	-13.66	≤8.00	PASS
11N40MIMO	Ant1	2422	-20.84	≤8.00	PASS
	Ant2	2422	-21.05	≤8.00	PASS
	total	2422	-17.93	≤8.00	PASS
	Ant1	2437	-21.89	≤8.00	PASS
	Ant2	2437	-22.39	≤8.00	PASS
	total	2437	-19.12	≤8.00	PASS
	Ant1	2452	-21.29	≤8.00	PASS
	Ant2	2452	-21.40	≤8.00	PASS
	total	2452	-18.33	≤8.00	PASS
	total	2422	-17.93	≤8.00	PASS
11AX20MIMO	Ant1	2412	-19.39	≤8.00	PASS
	Ant2	2412	-19.38	≤8.00	PASS
	total	2412	-16.37	≤8.00	PASS
	Ant1	2437	-18.51	≤8.00	PASS
	Ant2	2437	-19.42	≤8.00	PASS
	total	2437	-15.93	≤8.00	PASS
	Ant1	2462	-19.03	≤8.00	PASS
	Ant2	2462	-19.05	≤8.00	PASS
	total	2462	-16.03	≤8.00	PASS
	total	2412	-16.37	≤8.00	PASS
11AX40MIMO	Ant1	2422	-23.74	≤8.00	PASS
	Ant2	2422	-24.34	≤8.00	PASS
	total	2422	-21.02	≤8.00	PASS
	Ant1	2437	-23.37	≤8.00	PASS
	Ant2	2437	-23.56	≤8.00	PASS
	total	2437	-20.45	≤8.00	PASS
	Ant1	2452	-23.21	≤8.00	PASS
	Ant2	2452	-23.11	≤8.00	PASS
	total	2452	-20.15	≤8.00	PASS
	total	2422	-21.02	≤8.00	PASS

TestMode	Antenna	Frequency[MHz]	RuSize	RuIndex	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11AX20MIMO	Ant1	2412	26Tone	RU0	-11.40	≤8.00	PASS
				RU4	-11.11	≤8.00	PASS
				RU8	-11.60	≤8.00	PASS
			52Tone	RU37	-14.07	≤8.00	PASS
				RU39	-15.34	≤8.00	PASS
				RU40	-13.21	≤8.00	PASS
			106Tone	RU53	-16.28	≤8.00	PASS
				RU54	-16.67	≤8.00	PASS
	Ant2	2412	26Tone	RU0	-11.84	≤8.00	PASS
				RU4	-11.22	≤8.00	PASS
				RU8	-11.28	≤8.00	PASS
			52Tone	RU37	-14.37	≤8.00	PASS
				RU39	-14.70	≤8.00	PASS
				RU40	-13.87	≤8.00	PASS
			106Tone	RU53	-15.99	≤8.00	PASS
				RU54	-15.63	≤8.00	PASS
	total	2412	26Tone	RU0	-8.60	≤8.00	PASS
				RU4	-8.15	≤8.00	PASS
				RU8	-8.43	≤8.00	PASS
			52Tone	RU37	-11.21	≤8.00	PASS
				RU39	-12.00	≤8.00	PASS
				RU40	-10.52	≤8.00	PASS
			106Tone	RU53	-13.12	≤8.00	PASS
				RU54	-13.11	≤8.00	PASS
	Ant1	2437	26Tone	RU0	-11.64	≤8.00	PASS
				RU4	-11.55	≤8.00	PASS
				RU8	-10.23	≤8.00	PASS
			52Tone	RU37	-15.59	≤8.00	PASS
				RU39	-14.77	≤8.00	PASS
				RU40	-12.57	≤8.00	PASS
			106Tone	RU53	-16.57	≤8.00	PASS
				RU54	-16.49	≤8.00	PASS
	Ant2	2437	26Tone	RU0	-12.18	≤8.00	PASS
				RU4	-11.69	≤8.00	PASS
				RU8	-10.74	≤8.00	PASS
			52Tone	RU37	-14.79	≤8.00	PASS
				RU39	-15.17	≤8.00	PASS
				RU40	-13.58	≤8.00	PASS
			106Tone	RU53	-15.51	≤8.00	PASS
				RU54	-15.38	≤8.00	PASS
	total	2437	26Tone	RU0	-8.89	≤8.00	PASS
				RU4	-8.61	≤8.00	PASS
				RU8	-7.47	≤8.00	PASS
			52Tone	RU37	-12.16	≤8.00	PASS
				RU39	-11.96	≤8.00	PASS
				RU40	-10.04	≤8.00	PASS
			106Tone	RU53	-13.00	≤8.00	PASS
				RU54	-12.89	≤8.00	PASS
	Ant1	2462	26Tone	RU0	-10.49	≤8.00	PASS
				RU4	-10.70	≤8.00	PASS
				RU8	-11.42	≤8.00	PASS
			52Tone	RU37	-15.68	≤8.00	PASS
				RU39	-14.92	≤8.00	PASS
				RU40	-13.44	≤8.00	PASS
			106Tone	RU53	-16.57	≤8.00	PASS
				RU54	-16.38	≤8.00	PASS
	Ant2	2462	26Tone	RU0	-11.47	≤8.00	PASS
				RU4	-10.90	≤8.00	PASS
				RU8	-11.01	≤8.00	PASS
			52Tone	RU37	-13.06	≤8.00	PASS
				RU39	-13.96	≤8.00	PASS
			52Tone	RU40	-13.27	≤8.00	PASS

	total	2462	106Tone	RU53	-15.17	≤8.00	PASS
			26Tone	RU54	-15.97	≤8.00	PASS
				RU0	-7.94	≤8.00	PASS
				RU4	-7.79	≤8.00	PASS
				RU8	-8.20	≤8.00	PASS
			52Tone	RU37	-11.17	≤8.00	PASS
				RU39	-11.40	≤8.00	PASS
				RU40	-10.34	≤8.00	PASS
			106Tone	RU53	-12.80	≤8.00	PASS
				RU54	-13.16	≤8.00	PASS
11AX40MIMO	Ant1	2422	242Tone	RU61	-15.43	≤8.00	PASS
	Ant2	2422	242Tone	RU62	-15.75	≤8.00	PASS
				RU61	-15.08	≤8.00	PASS
	total	2422	242Tone	RU62	-14.51	≤8.00	PASS
				RU61	-12.24	≤8.00	PASS
	Ant1	2437	242Tone	RU62	-12.08	≤8.00	PASS
				RU61	-14.94	≤8.00	PASS
	Ant2	2437	242Tone	RU62	-15.61	≤8.00	PASS
				RU61	-16.14	≤8.00	PASS
	total	2437	242Tone	RU62	-14.84	≤8.00	PASS
				RU61	-12.49	≤8.00	PASS
	Ant1	2452	242Tone	RU62	-12.20	≤8.00	PASS
				RU61	-15.15	≤8.00	PASS
	Ant2	2452	242Tone	RU62	-15.58	≤8.00	PASS
				RU61	-15.03	≤8.00	PASS
	total	2452	242Tone	RU62	-14.76	≤8.00	PASS
				RU61	-12.08	≤8.00	PASS
	total	2452	242Tone	RU61	-12.08	≤8.00	PASS
				RU62	-12.14	≤8.00	PASS

Note: The Duty Cycle Factor is compensated in the graph.