

RF TEST REPORT

FCC ID: 2A5DZ-CT-LBWES

Test Report No.....: RF260901001-01-001

Product(s) Name.....: HHOLOVE Automatic Cat Litter Box Ease

Model(s).....: CT-LBWES, CT-LBWES-WB

Trade Mark.....: HHOLOVE, ABRCT

Applicant.....: HHO (Hangzhou) Digital Technology Co., Ltd.

Address.....: Building 9, Haizhi Center, Cangqian Street, Yuhang District, Hangzhou
City, Zhejiang Province, China

Receipt Date.....: 2026.09.03

Test Date.....: 2026.09.04 ~ 2026.09.14

Issued Date.....: 2026.09.14

Standards.....: 47 CFR FCC Part 15, Subpart C(Section 15.247);
ANSI C63.10-2020+Cor. 1-2023

Testing Laboratory.....: Shenzhen Haiyun Standard Technical Co., Ltd.

Prepared By:	Checked By:	Approved By:	
Lemon He	Black Ding	Tim Zhang	
Lemon He	Black Ding	Tim Zhang	

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History of this test report

Original Report Issue Date: 2026.09.14

- ☒ No additional attachment
- ☐ Additional attachments were issued following record

Attachment No.	Issue Date	Description

1. General Information

1.1 Applicant

HHO (Hangzhou) Digital Technology Co., Ltd.

Building 9, Haizhi Center, Cangqian Street, Yuhang District, Hangzhou City, Zhejiang Province, China

1.2 Manufacturer

HHO (Hangzhou) Digital Technology Co., Ltd.

Building 9, Haizhi Center, Cangqian Street, Yuhang District, Hangzhou City, Zhejiang Province, China

1.3 Basic Description of Equipment Under Test

Sample No.	POC260901001-S001	
Product name	HHO LOVE Automatic Cat Litter Box Ease	
Model name	CT-LBWES, CT-LBWES-WB	
Test model	CT-LBWES	
Model difference	Only the model name is different	
Trade Mark	HHO LOVE, ABRCT	
Power supply	DC 12V from adapter	
Adapter information	Model name: JF018WR-1200150UH Input: 100-240V~, 50/60Hz, 0.5A Output: 12.0V===1.5A 18.0W	
Operate temperature	0°C-45°C	
EUT Stage	○ Product Unit	● Final-Sample
Operating Band and Conducted Output Power (Max power)	2400MHz ~ 2483.5MHz	● IEEE 802.11n20: 11.52dBm(0.014W)
Product Type	IEEE 802.11b/g/n: WLAN (SISO)	
Nominal Bandwidth	20MHz	
Antenna gain	2.54dBi	
Antenna type	PCB Antenna	
Modulation	DSSS, OFDM	
Data Rate (Mbps)	IEEE 802.11b mode : 1/2/5.5/11 IEEE 802.11g mode : 6/9/12/18/24/36/48/54 IEEE 802.11n mode : up to 72.2	

Eleven channels are provided for 802.11b, 802.11g, 802.11n20:

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400MHz ~ 2483.5 MHz	01	2412MHz	07	2442MHz
	02	2417MHz	08	2447MHz
	03	2422MHz	09	2452MHz
	04	2427MHz	10	2457MHz
	05	2432MHz	11	2462MHz
	06	2437MHz	/	/

1.4 Transmit Operating Mode

Transmit Operating Mode					Transmit Multiple Antennas					
☒	Operating mode 1 (single antenna)				☒	1TX				
☐	Operating mode 2 (multiple antenna, no beam forming)				☐	2TX	☐	3TX	☐	4TX
☐	Operating mode 3 (multiple antenna, with beam forming)				☐	2TX	☐	3TX	☐	4TX
☒	802.11b	Operating mode	☒	1TX	☐	2TX	☐	3TX	☐	4TX
☒	802.11g	Operating mode	☒	1TX	☐	2TX	☐	3TX	☐	4TX
☒	802.11n20	Operating mode	☒	1TX	☐	2TX	☐	3TX	☐	4TX

2. Summary of Test Results

2.1 Summary of Test Items

47 CFR FCC Part 15, Subpart C (Section 15.247)			
Test item	FCC Clause	Results	Remarks
AC Power Conducted Emission	15.207	Pass	Meet the requirement of the limit
Radiated Emission and Band Edge Measurement	15.205/15.209 /15.247(d)	Pass	Meet the requirement of the limit
Spurious Emission at Antenna Port	15.247(d)	Pass	Meet the requirement of the limit
6dB Bandwidth	15.247(a)(2)	Pass	Meet the requirement of the limit
Maximum Conducted Power	15.247(b)	Pass	Meet the requirement of the limit
Power Spectral Density	15.247(e)	Pass	Meet the requirement of the limit
Antenna Requirements	15.203	Compliance	Note
Note: The EUT has one PCB antennas arrangement which was permanently attached.			

2.2 Application of Standard

47 CFR FCC Part 15, Subpart C (Section 15.247)

KDB 558074 D01 15.247 Meas Guidance v05r02

ANSI C63.10-2020+Cor. 1-2023

2.3 Test Instruments

No.	Name of Equipment	Manufacturer	Model Number	Serial Number	Inventory No.	Last Calibration	Due Calibration
Radiated Emission							
1	Test receiver	Rohde&Schwarz	ESU	100184	JLE011	2026/2/27	2027/2/26
2	Log periodic antenna	Schwarzbeck	VULB 9168	1151	JLE012	2025/4/12	2028/4/11
3	Low frequency amplifier	/	LNA 0920N	2014	JLE023	2026/2/27	2027/2/26
4	High frequency amplifier	Schwarzbeck	BBV 9718	9718-284	JLE024	2026/2/27	2027/2/26
5	Horn Antenna	SCHWARZBECK	BBHA 9120 D	02670	JLE028	2025/4/12	2028/4/11
6	Temp&Humidity Recorder	Meideshi	JR900	/	JLE021	2026/4/8	2027/4/7
7	Horn Antenna	SCHWARZBECK	BBHA 9170	9170#685	JLE029	2024/7/15	2027/7/14
8	Loop Antenna	SCHWARZBECK	FMZB1519B	00029	JLE030	2024/7/15	2027/7/14
9	Broadband preamplifier	Schwarzbeck	BBV9721	9721-019	JLE025	2026/2/27	2027/2/26
10	Filter	dsusoft	ZBSF6-C5170-5330-544	07227557	/	N/A	N/A
11	Filter	dsusoft	ZBSF6-C5495-5705-1309	07227558	/	N/A	N/A
12	Filter	dsusoft	ZBSF6-C5745-5830-1310	07227559	/	N/A	N/A
13	Filter	dsusoft	ZBSF6-C2400-2483.5-543	07227559	/	N/A	N/A
14	10dB attenuator	dsusoft	10dB	/	/	N/A	N/A
15	Filter	dsusoft	ZBSF6-C3000-18000-174	07227597	/	N/A	N/A
16	Filter	dsusoft	ZBSF6-C6500-18000-547	07227595	/	N/A	N/A
17	Test software	Farad Technology Co., Ltd	EZ-EMC Ver.TW-03A2				
Conducted Emission							
1	LISN	Rohde&Schwarz	ENV216	100075	JLE002	2026/2/27	2027/2/26
2	ISN	Schwarzbeck	CATE 5 8158	#171	JLE003	2026/2/27	2027/2/26
3	ISN	Schwarzbeck	CAT 3 8158	00187	JLE032	2026/2/27	2027/2/26
4	Test receiver	Rohde&Schwarz	ESCI	100718	JLE010	2026/2/27	2027/2/26
5	Pulse limiter	Rohde&Schwarz	ESH3-Z2	102299	JLE047	2026/2/27	2027/2/26
6	Temp&Humidity Recorder	Meideshi	JR900	/	JLE020	2026/4/8	2027/4/7
7	Test software	Farad Technology Co., Ltd	EZ-EMC Ver.TW-03A2				
RF Conducted Emissions							
1	MXA Signal Analyzer	Keysight	N9010A	MY51440158	JLE087	2026/9/10	2027/9/9
2	MXA Signal Analyzer	Agilent	N9020A	MY52220022	JLE090	2026/1/19	2027/1/18
3	RF Control Unit	dsusoft	JS0806-2	21G8060449	JLE053	2026/2/27	2027/2/26
4	power supply unit	dsusoft	JS0806-4ADC	N/A	JLE055	2026/2/27	2027/2/26
5	VXG Signal Generator	Keysight	N5182B	MY59100855	JLE068	2026/4/11	2027/4/10
6	EXG Analog Signal Generator	Keysight	N5173B	MY59101282	JLE052	2026/2/27	2027/2/26
7	Wideband Radio Communication Tester	Rohde&Schwarz	CMW500	1201.0002K5 0-116064-Dt	JLE054	2026/2/27	2027/2/26
8	Test software	dsusoft	JS1120-3 Ver.3.2.22.0				

2.4 Test Mode

Test Items	Mode	Data Rate	Channel
AC Power Conducted Emission	802.11n20SISO	MCS0	06
Radiated Emission and Band Edge Measurement	802.11b	1Mbps	01/06/11
	802.11g	6Mbps	01/06/11
	802.11n20SISO	MCS0	01/06/11
Spurious Emission at Antenna Port	802.11b	1Mbps	01/06/11
	802.11g	6Mbps	01/06/11
	802.11n20SISO	MCS0	01/06/11
6dB Bandwidth	802.11b	1Mbps	01/06/11
	802.11g	6Mbps	01/06/11
	802.11n20SISO	MCS0	01/06/11
Maximum Conducted Power	802.11b	1Mbps	01/06/11
	802.11g	6Mbps	01/06/11
	802.11n20SISO	MCS0	01/06/11
Power Spectral Density	802.11b	1Mbps	01/06/11
	802.11g	6Mbps	01/06/11
	802.11n20SISO	MCS0	01/06/11

Note: For AC Power Conducted Emission and Radiated Emission below 1GHz, only worst case was recorded.

2.5 Test Condition

Applicable to	Environmental conditions	Input Power	Tested by
AC Power Conducted Emission	24.6°C, 58% RH	AC 120V/60Hz	Keith Huang
Radiated Emission and Band Edge Measurement	24.8°C, 54% RH	AC 120V/60Hz	Lemon He
Spurious Emission at Antenna Port	23.9°C, 53% RH	DC 12V	Elio Lin
6dB Bandwidth	23.9°C, 53% RH	DC 12V	Elio Lin
Maximum Conducted Power	23.9°C, 53% RH	DC 12V	Elio Lin
Power Spectral Density	23.9°C, 53% RH	DC 12V	Elio Lin

Note: Adapter supply voltage AC 120V/60Hz.

The applicant declare the operating environment of EUT as below:

Normal conditions: DC 12V, 0~45°C

2.6 Duty Cycle of Test Signal

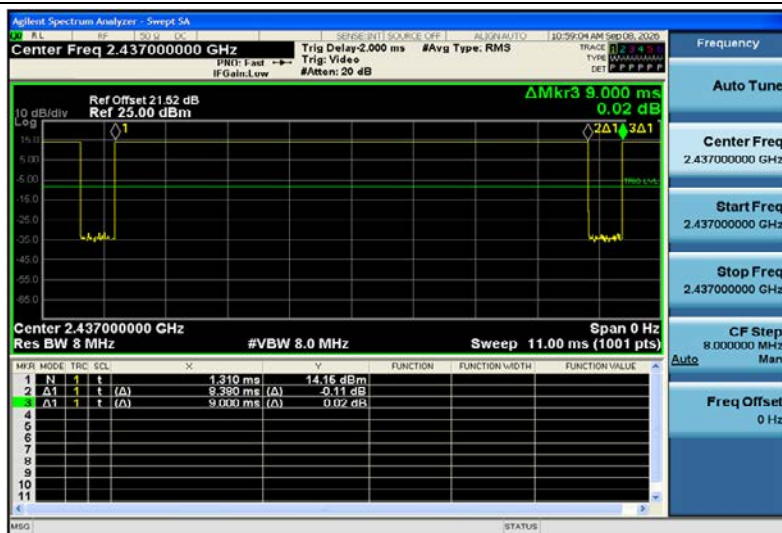
If duty cycle is $\geq 98\%$, duty factor is not required.

If duty cycle is $< 98\%$, duty factor shall be considered.

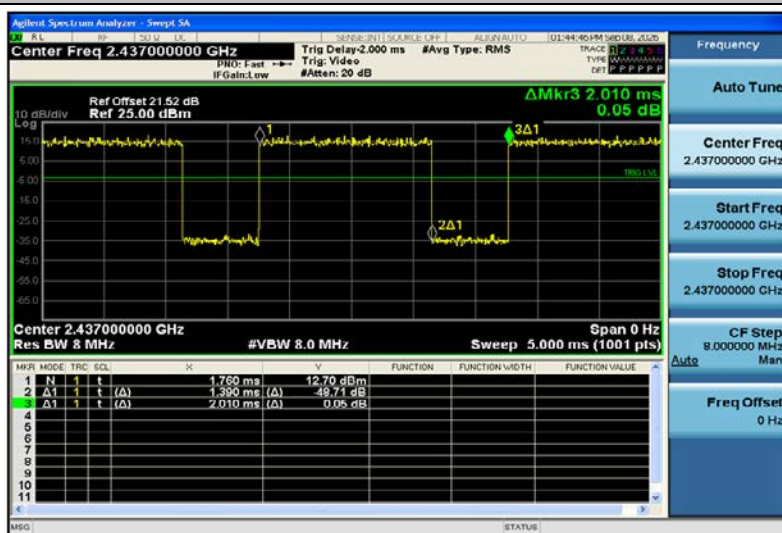
All the duty factor of other test mode have been considered.

Test Mode	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	2437	8.38	9.00	93.11
11G	2437	1.39	2.01	69.15
11N20SISO	2437	1.30	1.92	67.71

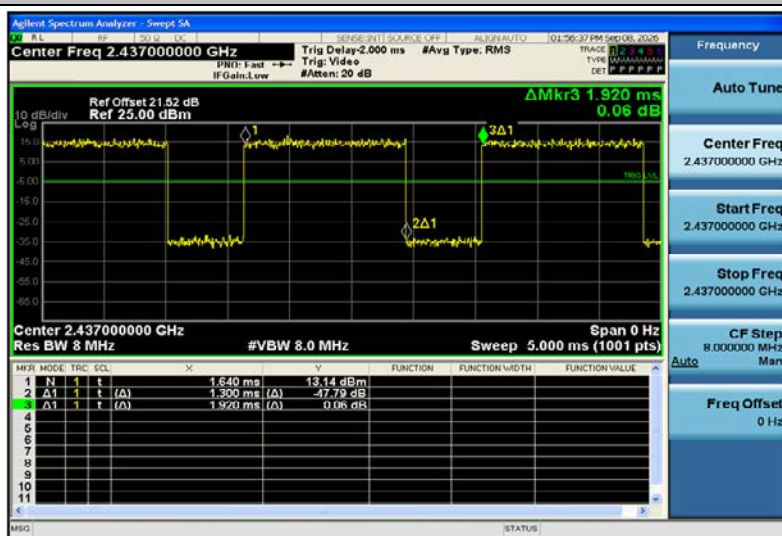
Test Graphs



NTNV-11B-Ant1-2437



NTNV-11G-Ant1-2437



NTNV-11N20SISO-Ant1-2437

2.7 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 102\text{kHz}$
RF power conducted	$\pm 0.243\text{dB}$
Power Spectral Density	$\pm 0.743\text{dB}$
Conducted Spurious Emission	$\pm 1.328\text{dB}$
Conducted emission(9kHz~30MHz) AC main	$\pm 2.68\text{dB}$
Radiated emission(9kHz~30MHz)	$\pm 3.50\text{dB}$
Radiated emission (30MHz~1GHz)	$\pm 4.20\text{dB}$
Radiated emission (1GHz~18GHz)	$\pm 5.10\text{dB}$
Radiated emission (18GHz~40GHz)	$\pm 5.26\text{dB}$

2.8 Test Location

Company:	Shenzhen Haiyun Standard Technical Co., Ltd.
Address:	No. 110-113, 115, 116, Block B, Jinyuan Business Building, Bao'an District, Shenzhen, China
CNAS Registration Number:	CNAS L18252
FCC Designation Number	CN1340
CAB identifier	CN0145
A2LA Certificate Number	6823.01

2.9 Description of Support Units

No.	Equipment	Model	Manufacturer	Series No
/	/	/	/	/

3. Test Procedure And Results

3.1 AC Power Line Conducted Emission

3.1.1 Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

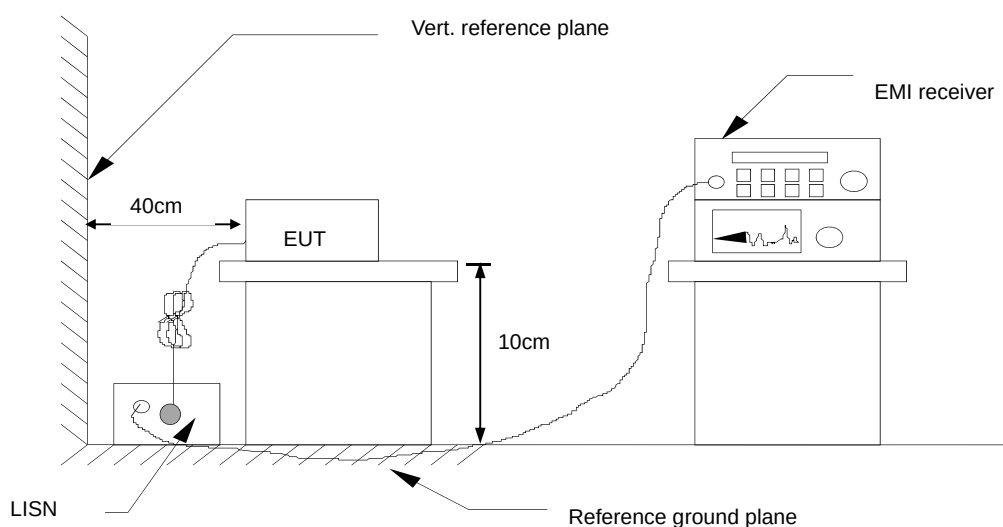
3.1.2 Test Procedure

Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☐ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme

Note: ☒ : Test ☐ : No Test

- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

3.1.3 Test Setup



3.1.4 Test Result

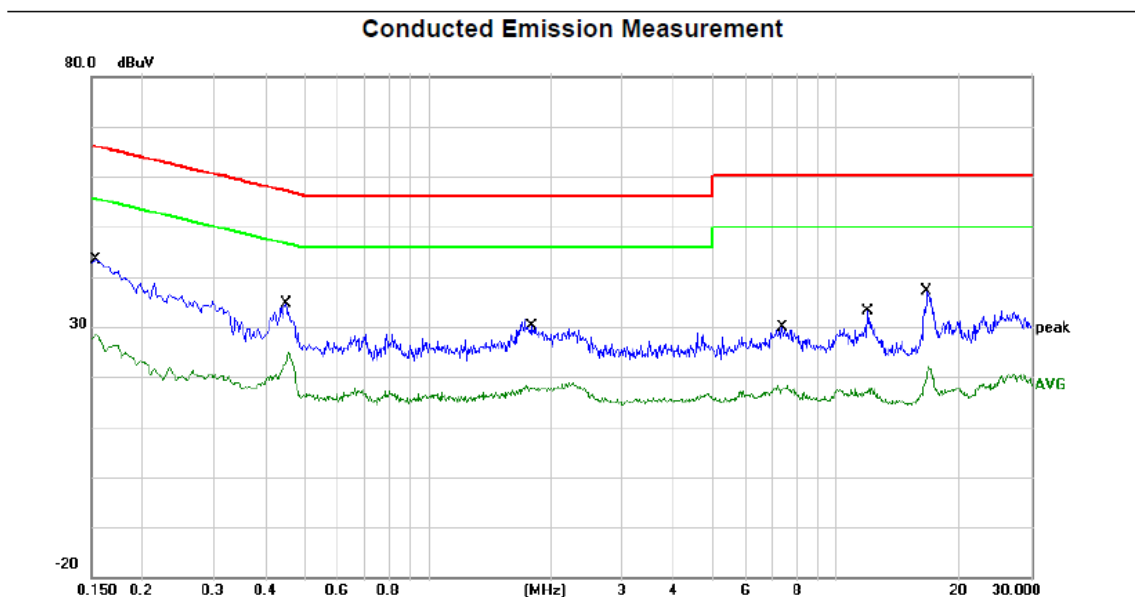
Note:

1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Measurement = Reading + Correct Factor.
3. Over = Measurement – Limit

We only recorded the data of the worst mode. Please see the following:

150kHz~30MHz	Worst Case Operating Mode: 11N20SISO Channel 06
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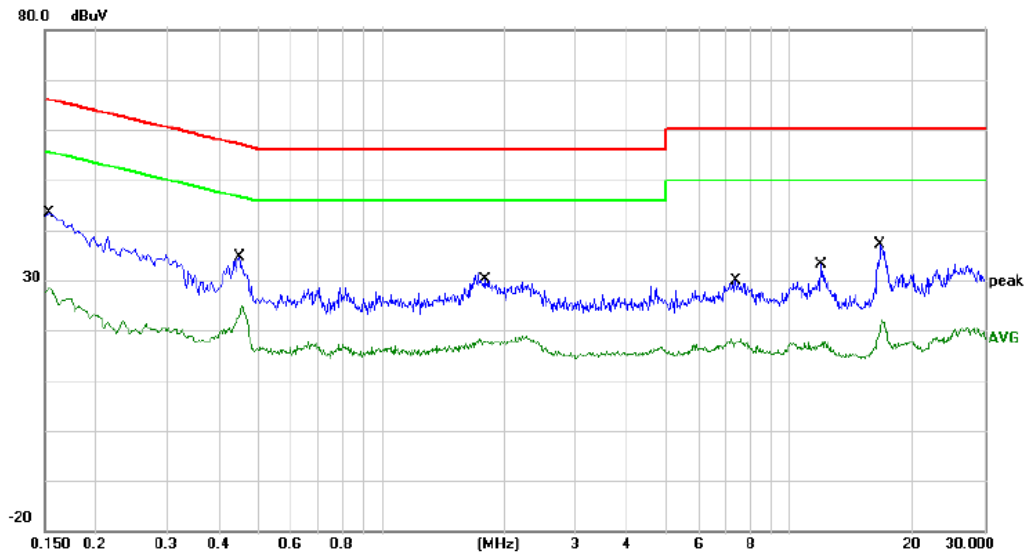
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1547	17.59	19.56	37.15	65.74	-28.59	QP	
2		0.1547	7.11	19.56	26.67	55.74	-29.07	AVG	
3		0.4480	7.06	19.31	26.37	56.91	-30.54	QP	
4	*	0.4480	3.19	19.31	22.50	46.91	-24.41	AVG	
5		1.7762	3.55	19.26	22.81	56.00	-33.19	QP	
6		1.7762	-2.45	19.26	16.81	46.00	-29.19	AVG	
7		7.4335	2.24	19.48	21.72	60.00	-38.28	QP	
8		7.4335	-3.12	19.48	16.36	50.00	-33.64	AVG	
9		11.9541	3.49	19.47	22.96	60.00	-37.04	QP	
10		11.9541	-3.62	19.47	15.85	50.00	-34.15	AVG	
11		16.7474	9.11	19.39	28.50	60.00	-31.50	QP	
12		16.7474	-0.21	19.39	19.18	50.00	-30.82	AVG	

Neutral

Conducted Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1547	17.59	19.56	37.15	65.74	-28.59	QP	
2		0.1547	7.11	19.56	26.67	55.74	-29.07	AVG	
3		0.4480	7.06	19.31	26.37	56.91	-30.54	QP	
4	*	0.4480	3.19	19.31	22.50	46.91	-24.41	AVG	
5		1.7762	3.55	19.26	22.81	56.00	-33.19	QP	
6		1.7762	-2.45	19.26	16.81	46.00	-29.19	AVG	
7		7.4335	2.24	19.48	21.72	60.00	-38.28	QP	
8		7.4335	-3.12	19.48	16.36	50.00	-33.64	AVG	
9		11.9541	3.49	19.47	22.96	60.00	-37.04	QP	
10		11.9541	-3.62	19.47	15.85	50.00	-34.15	AVG	
11		16.7474	9.11	19.39	28.50	60.00	-31.50	QP	
12		16.7474	-0.21	19.39	19.18	50.00	-30.82	AVG	

3.2 Radiated Emission and Band Edge

3.2.1 Limit

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequency (MHz)	Distance Meters(m)	Field Strength Limit	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 – 0.49	300	$2400/\text{F}(\text{kHz})$	-
0.490 – 1.705	30	$24000/\text{F}(\text{kHz})$	-
1.705 – 30	30	30	-
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

Note: (1) Emission level $\text{dB}\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.2.2 Test Procedure

Test Method	
☐ Conducted Measurement	☒ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ☒ : Test ☐ : No Test	

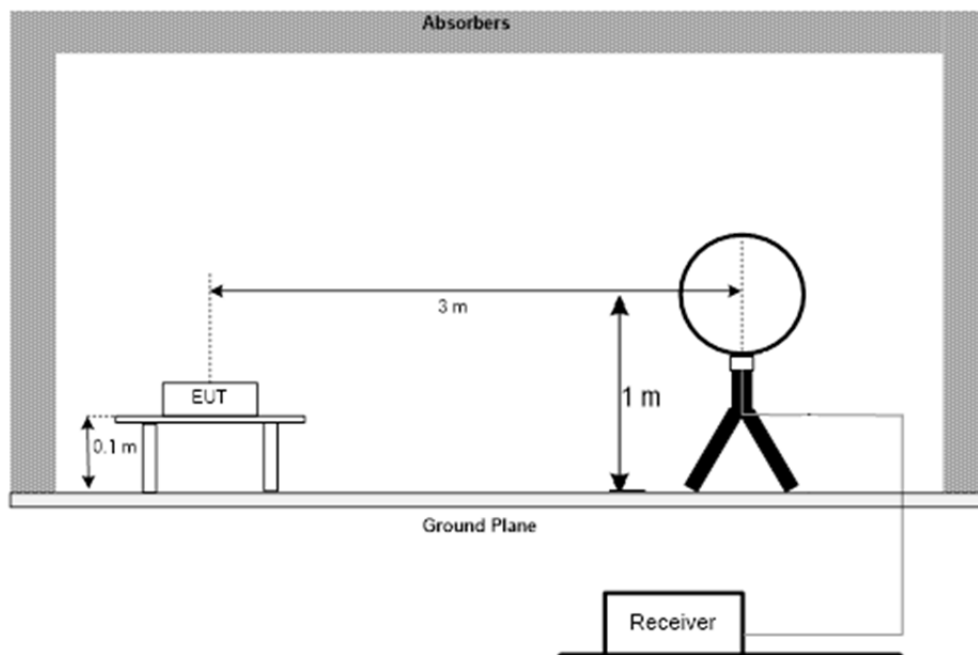
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- The measuring distance of 3 m or 1.5m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna

was tuned to heights find the maximum reading (used Bore sight function).

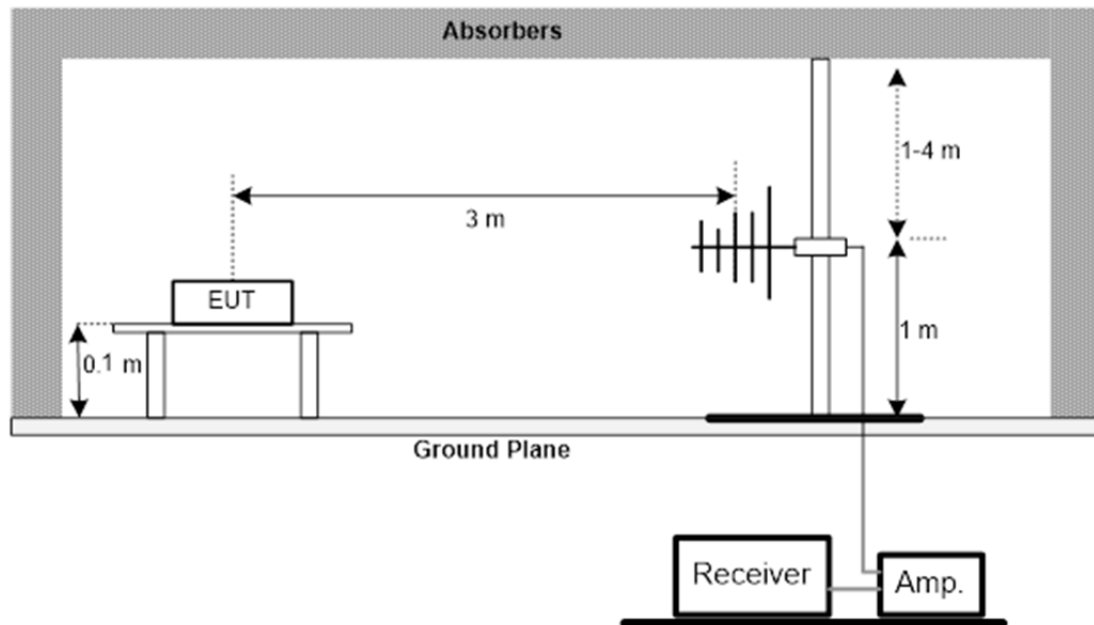
- e) The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- f) The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g) All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1 GHz)
- h) All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1 GHz)
- i) For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.2.3 Test Setup

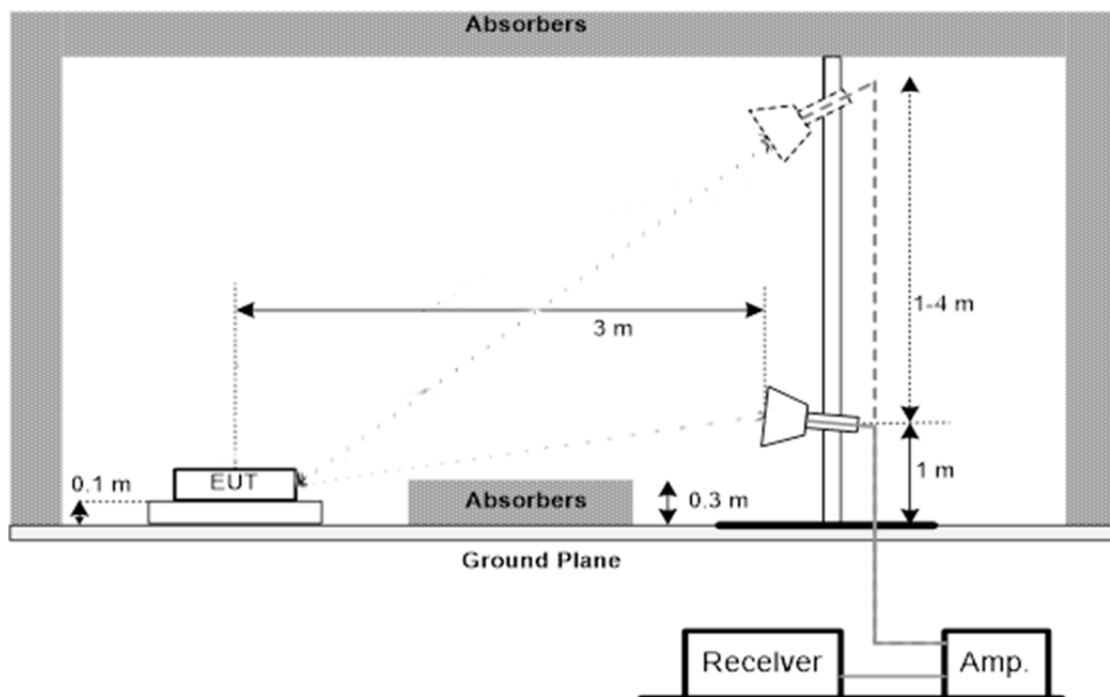
(A) Radiated Emission Test Set-Up Frequency Below 30 MHz



(B) Radiated Emission Test Set-Up Frequency 30 MHz-1000 MHz



(C) Radiated Emission Test Set-Up Frequency Above 1 GHz



3.2.4 Test Result

1) Radiated emission: 9kHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not recorded in this report.

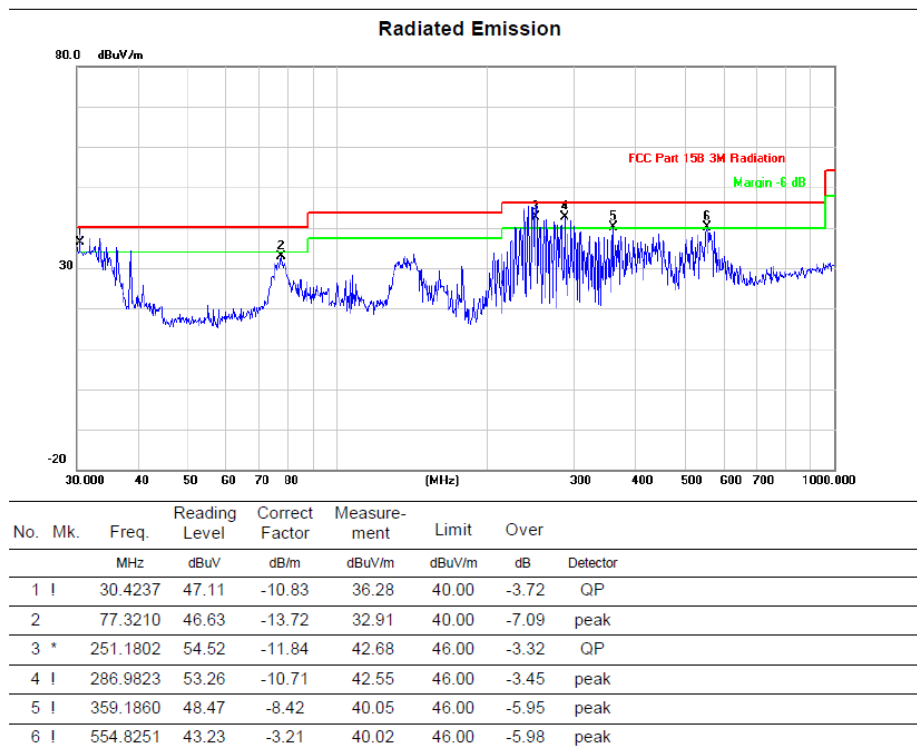
2) Radiated emission: 30MHz-1GHz

Note:

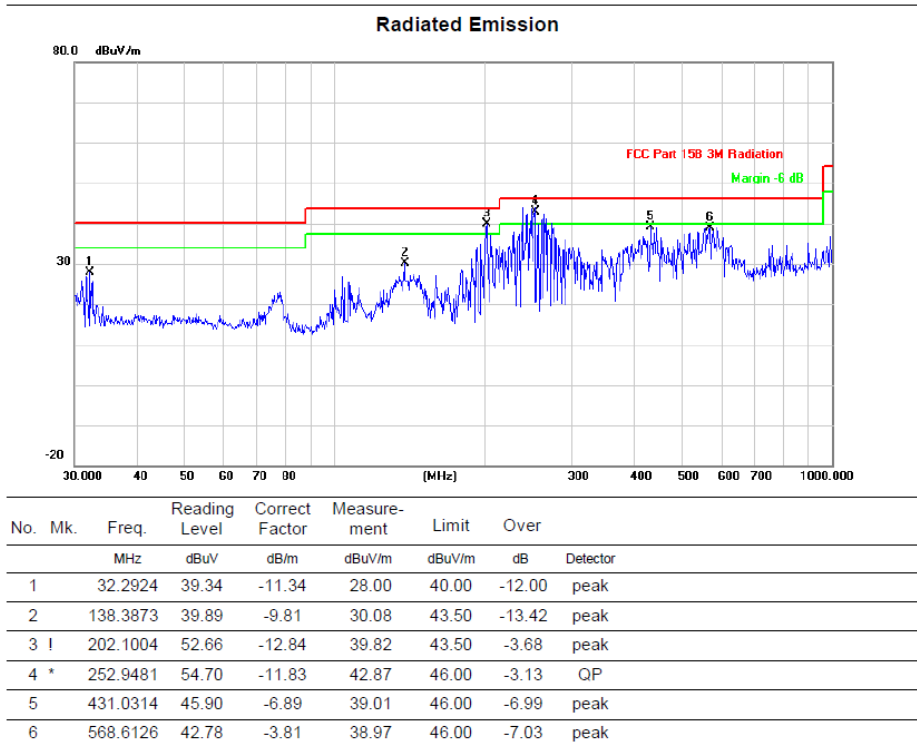
1. Measurement = Reading + Correct Factor.
2. Over = Measurement – Limit

We only recorded the data of the worst mode. Please see the following:

VERTICAL



HORIZONTAL



3) Radiated emission: Above 1GHz

Frequency (MHz)	Read Level (dBμV)	Polarization	Factor (dB/m)	Measurement (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
11B TX CH01							
4824.00	49.97	H	-4.12	45.85	74.00	28.15	peak
2310.00	46.22	H	-1.98	44.24	74.00	29.76	peak
2390.00	46.99	H	-1.58	45.41	74.00	28.59	peak
4824.00	50.69	V	-4.12	46.57	74.00	27.43	peak
2310.00	46.36	V	-1.98	44.38	74.00	29.62	peak
2390.00	47.95	V	-1.58	46.37	74.00	27.63	peak
11B TX CH06							
4874.00	50.35	H	-4.04	46.31	74.00	27.69	peak
4874.00	51.20	V	-4.04	47.16	74.00	26.84	peak
11B TX CH11							
4924.00	49.85	H	-3.82	46.03	74.00	27.97	peak
2483.50	46.84	H	-0.62	46.22	74.00	27.78	peak
2500.00	45.44	H	-0.45	44.99	74.00	29.01	peak
4924.00	50.67	V	-3.82	46.85	74.00	27.15	peak
2483.50	47.70	V	-0.62	47.08	74.00	26.92	peak
2500.00	46.22	V	-0.45	45.77	74.00	28.23	peak
11G TX CH01							
4824.00	49.88	H	-4.12	45.76	74.00	28.24	peak
2310.00	46.26	H	-1.98	44.28	74.00	29.72	peak
2390.00	47.54	H	-1.58	45.96	74.00	28.04	peak
4824.00	50.59	V	-4.12	46.47	74.00	27.53	peak
2310.00	46.42	V	-1.98	44.44	74.00	29.56	peak
2390.00	48.41	V	-1.58	46.83	74.00	27.17	peak
11G TX CH06							
4874.00	50.26	H	-4.04	46.22	74.00	27.78	peak
4874.00	51.14	V	-4.04	47.10	74.00	26.90	peak
11G TX CH11							
4924.00	49.77	H	-3.82	45.95	74.00	28.05	peak
2483.50	47.26	H	-0.62	46.64	74.00	27.36	peak
2500.00	45.58	H	-0.45	45.13	74.00	28.87	peak
4924.00	50.84	V	-3.82	47.02	74.00	26.98	peak
2483.50	47.87	V	-0.62	47.25	74.00	26.75	peak
2500.00	46.51	V	-0.45	46.06	74.00	27.94	peak

11N20SISO TX CH01							
4824.00	49.93	H	-4.12	45.81	74.00	28.19	peak
2310.00	46.22	H	-1.98	44.24	74.00	29.76	peak
2390.00	48.15	H	-1.58	46.57	74.00	27.43	peak
4824.00	50.64	V	-4.12	46.52	74.00	27.48	peak
2310.00	46.37	V	-1.98	44.39	74.00	29.61	peak
2390.00	49.09	V	-1.58	47.51	74.00	26.49	peak
11N20SISO TX CH06							
4874.00	50.50	H	-4.04	46.46	74.00	27.54	peak
4874.00	51.41	V	-4.04	47.37	74.00	26.63	peak
11N20SISO TX CH11							
4924.00	49.82	H	-3.82	46.00	74.00	28.00	peak
2483.50	47.48	H	-0.62	46.86	74.00	27.14	peak
2500.00	45.74	H	-0.45	45.29	74.00	28.71	peak
4924.00	50.90	V	-3.82	47.08	74.00	26.92	peak
2483.50	48.18	V	-0.62	47.56	74.00	26.44	peak
2500.00	46.60	V	-0.45	46.15	74.00	27.85	peak

Note: 1. The other emission levels were very low against the limit.

2. Measurement = Reading Level+ Correct Factor, Margin = Limit- Measurement

3.3 Spurious Emission at Antenna Port

3.3.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

3.3.2 Test Procedure

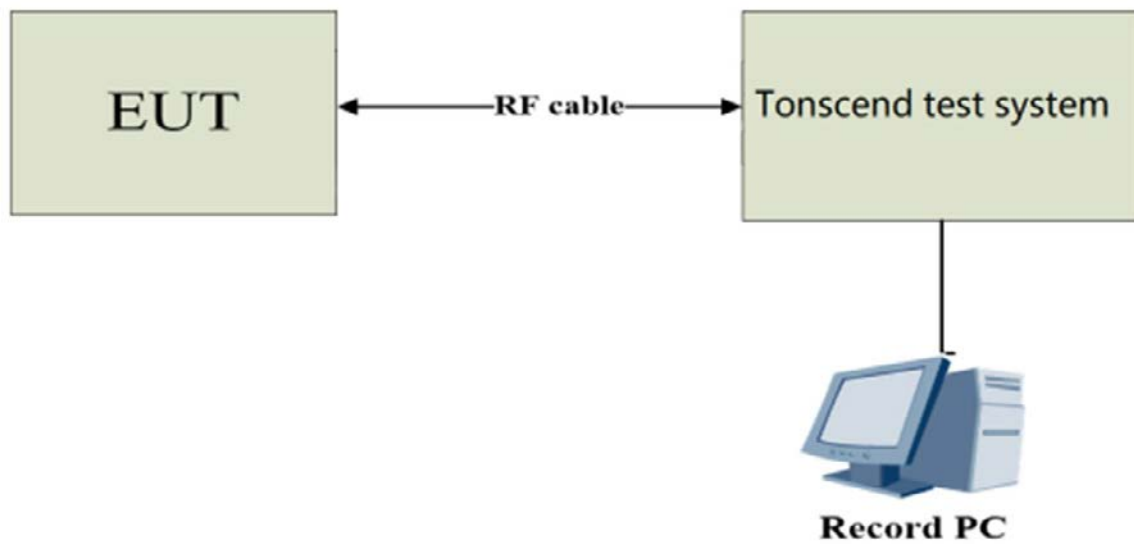
Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ☒ : Test ☐ : No Test	

a) The EUT was directly connected to the tonscond test system and antenna output port as show in the block diagram below.

b) Spectrum Setting as below:

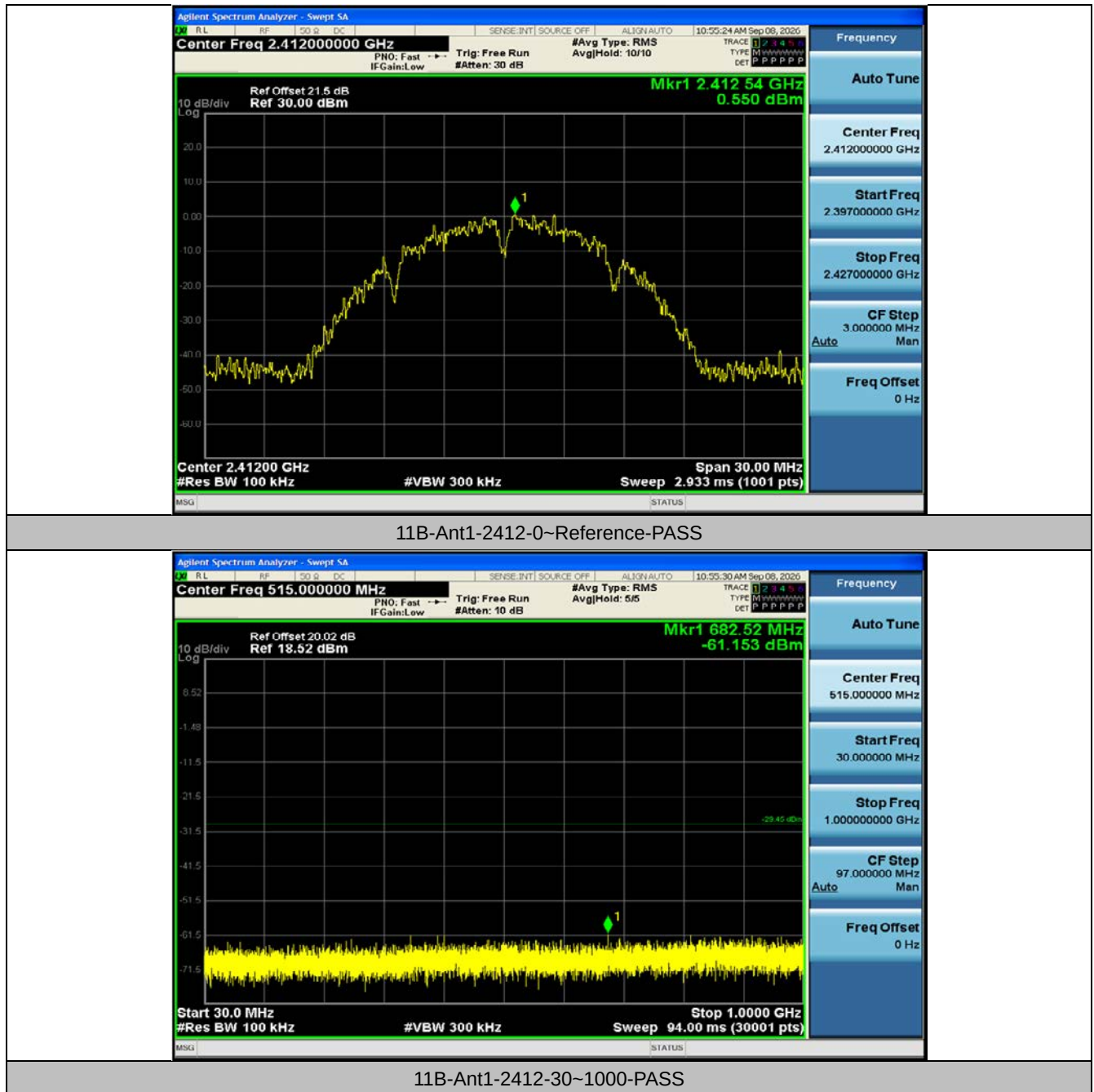
Centre Frequency	The centre frequency of the channel under test
Spectrum Parameters	Setting
Start Frequency	30 MHz
Stop Frequency	26.5 GHz
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

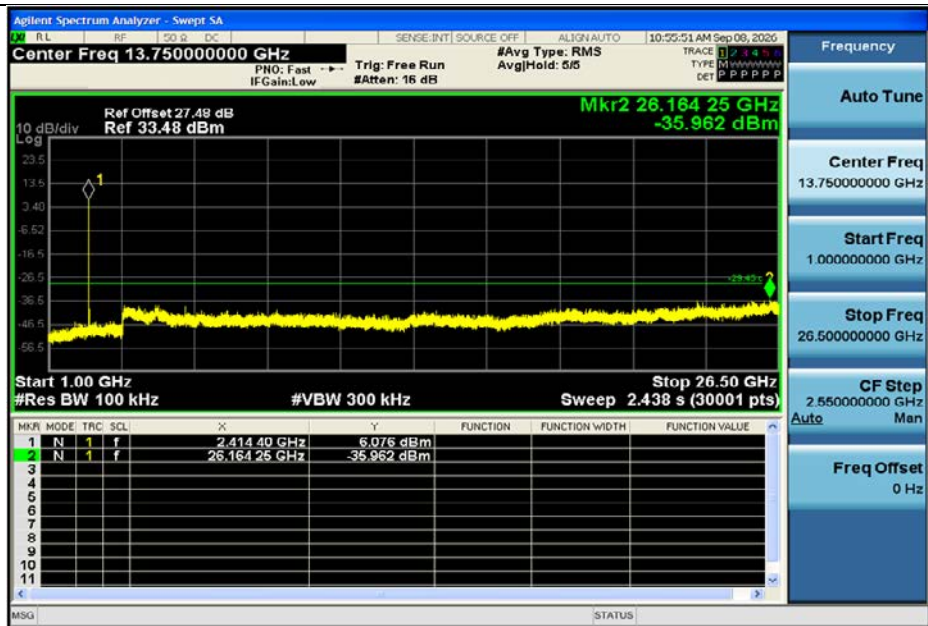
3.3.3 Test Setup



3.3.4 The Result

Conducted Spurious Emission

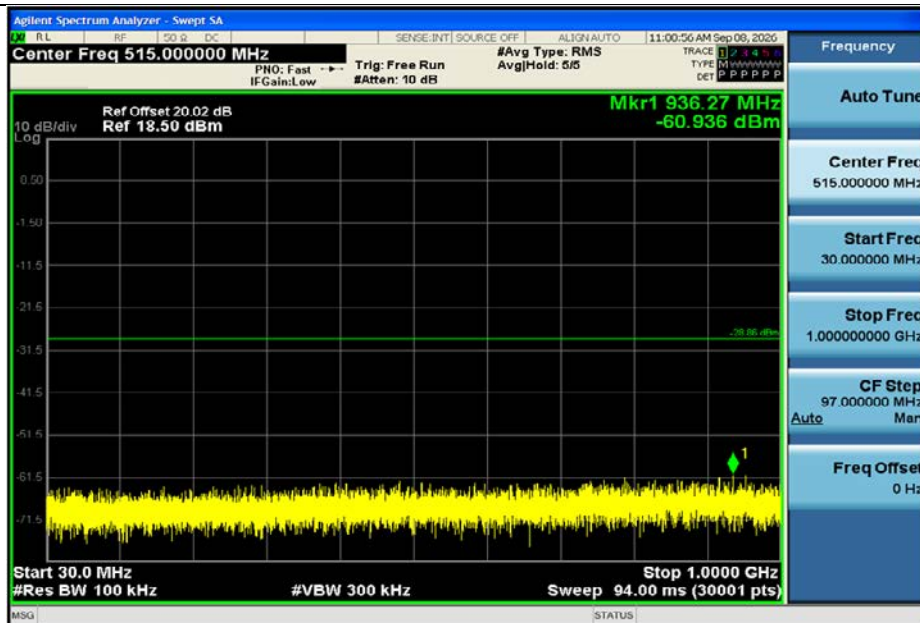




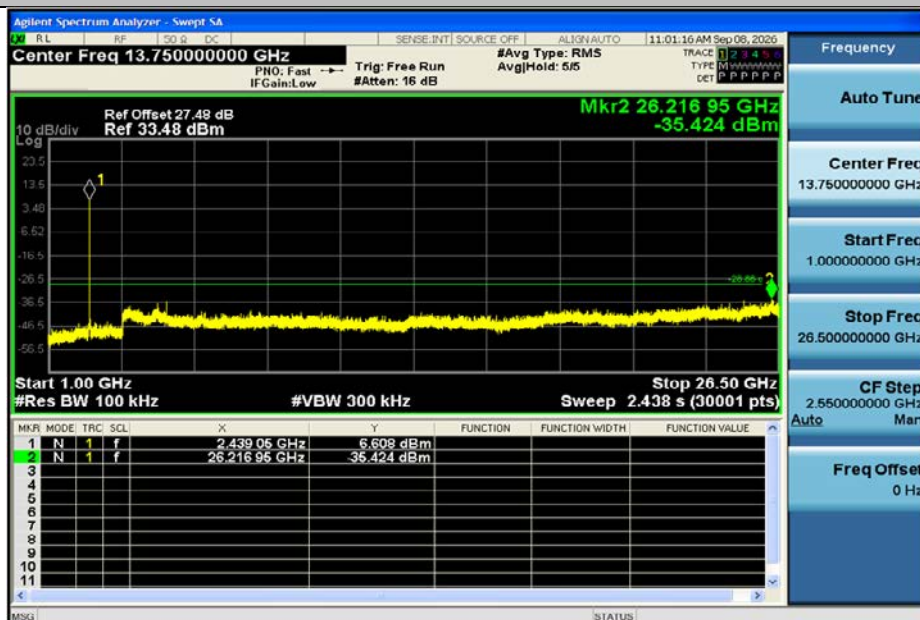
11B-Ant1-2412-1000~26500-PASS



11B-Ant1-2437-0~Reference-PASS



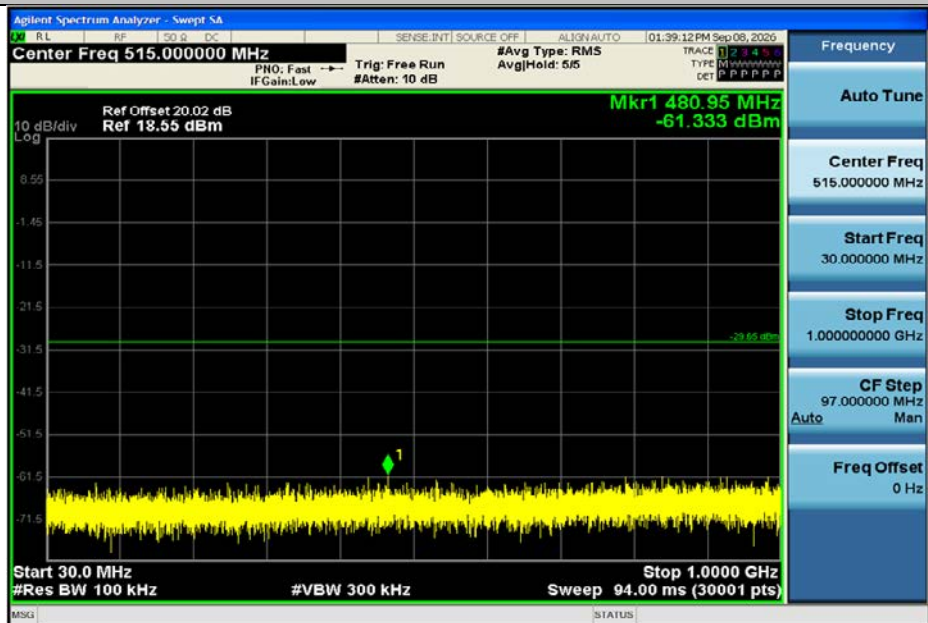
11B-Ant1-2437-30~1000-PASS



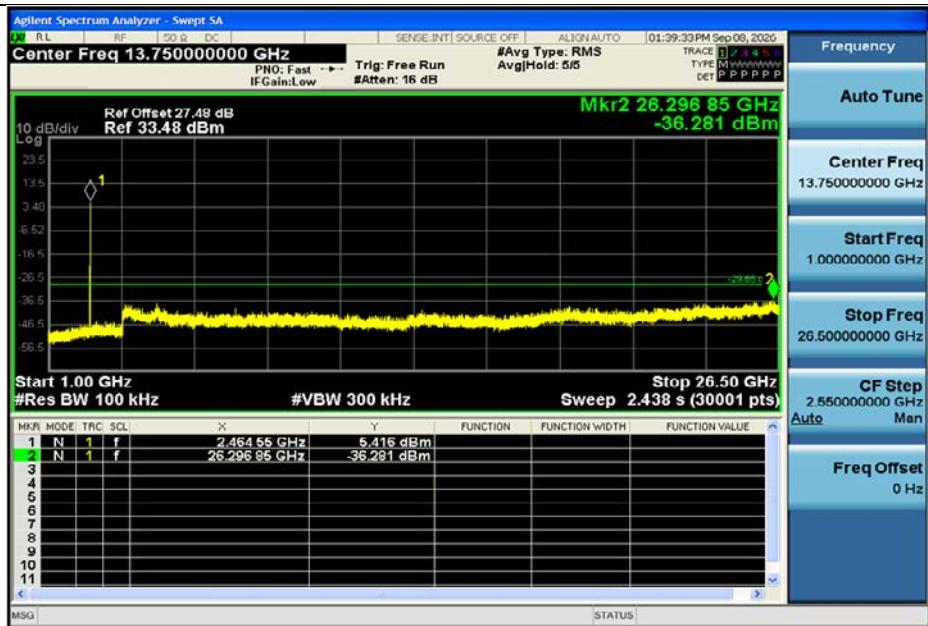
11B-Ant1-2437-1000~26500-PASS



11B-Ant1-2462-0-Reference-PASS



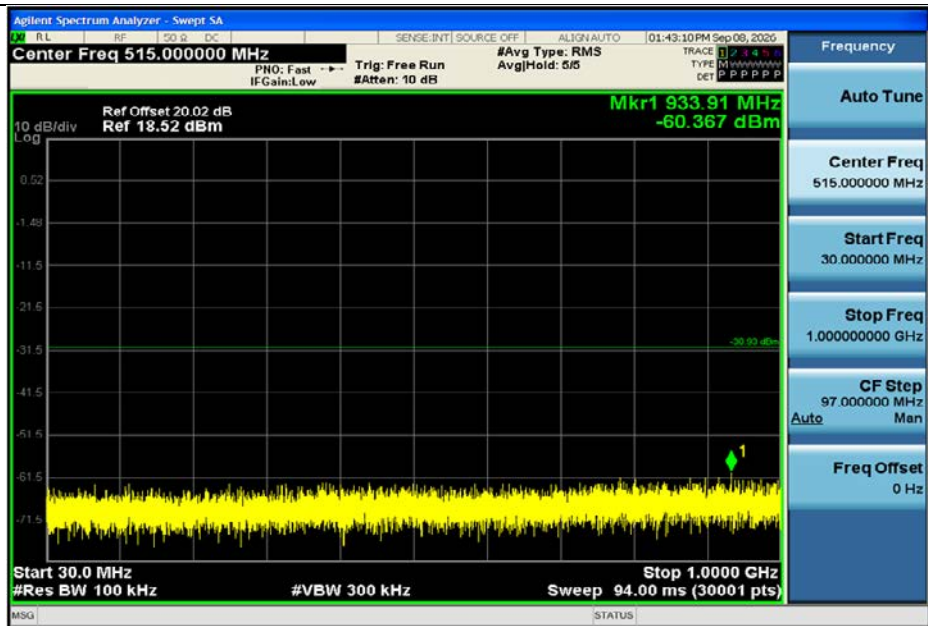
11B-Ant1-2462-30-1000-PASS



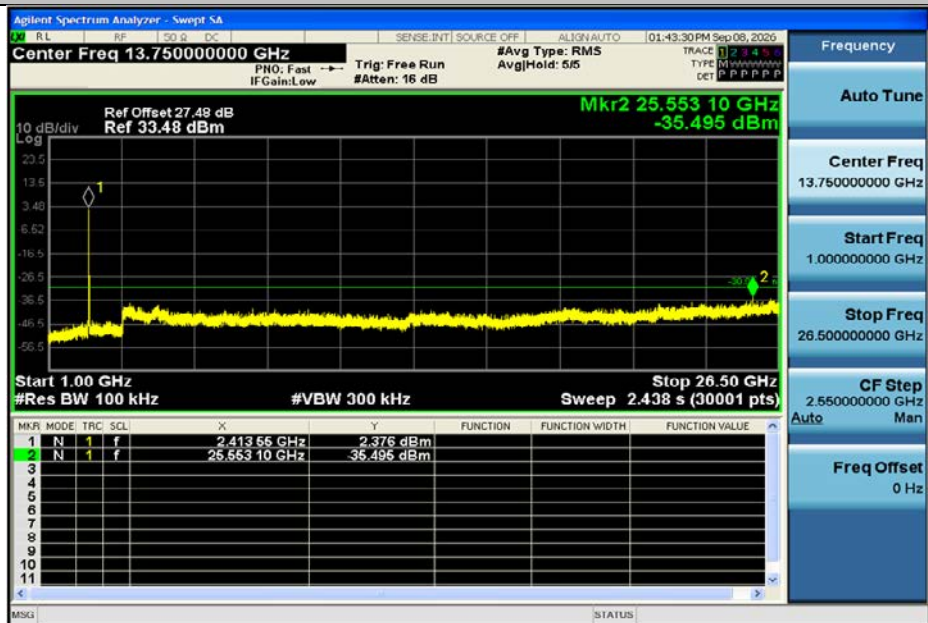
11B-Ant1-2462-1000~26500-PASS



11G-Ant1-2412-0-Reference-PASS



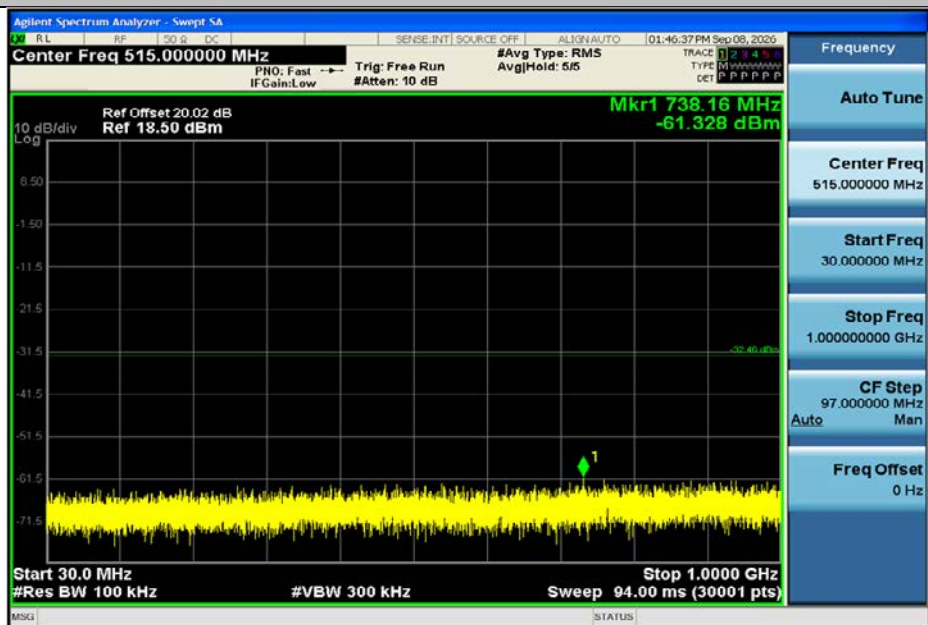
11G-Ant1-2412-30~1000-PASS



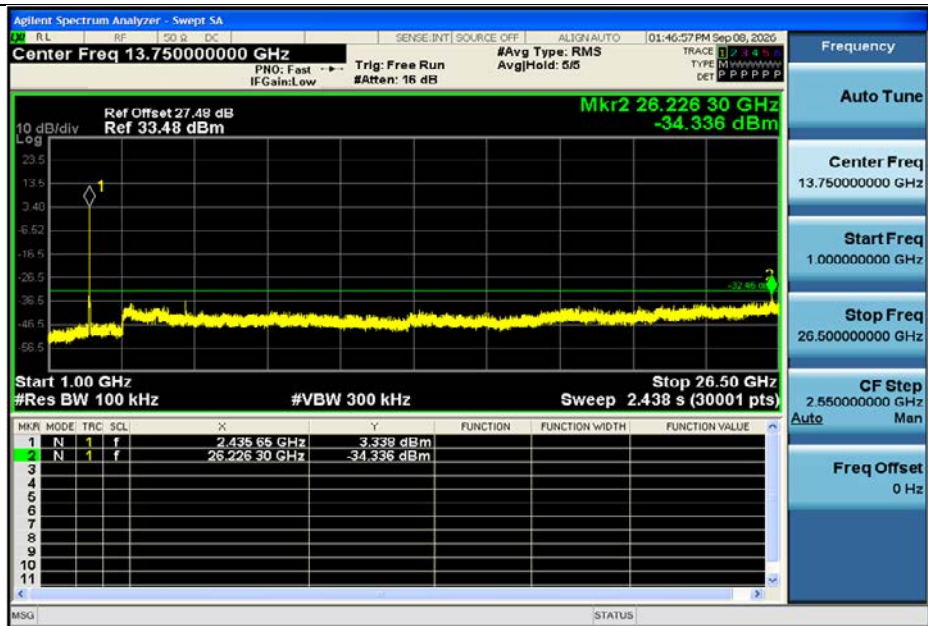
11G-Ant1-2412-1000~26500-PASS



11G-Ant1-2437-0~Reference-PASS



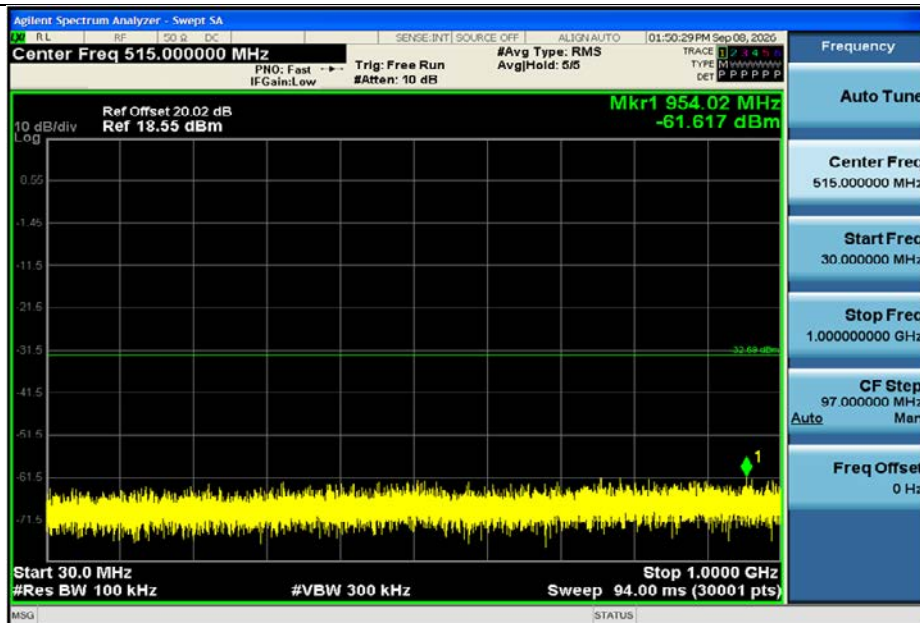
11G-Ant1-2437-30~1000-PASS



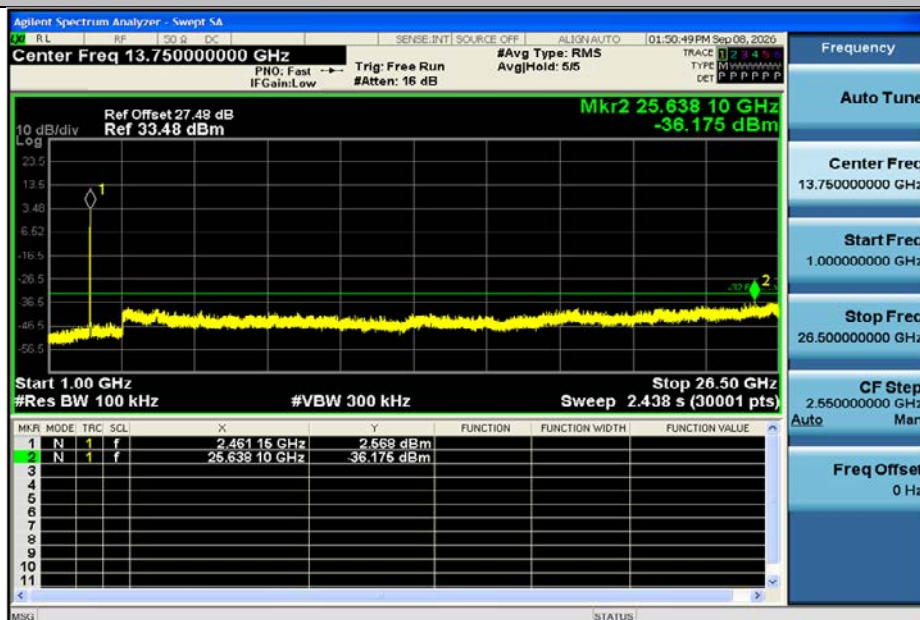
11G-Ant1-2437-1000~26500-PASS



11G-Ant1-2462-0~Reference-PASS



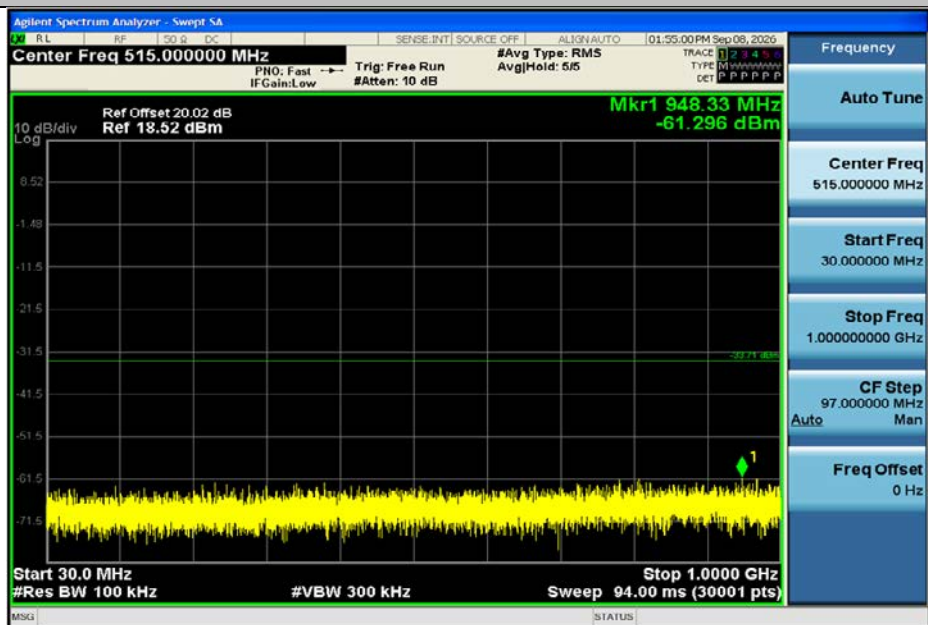
11G-Ant1-2462-30~1000-PASS



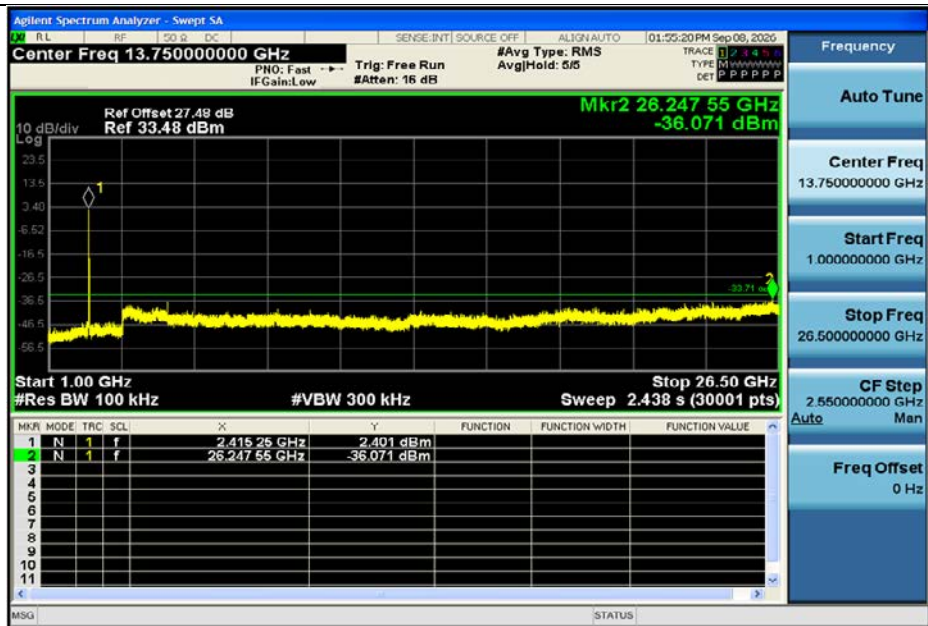
11G-Ant1-2462-1000~26500-PASS



11N20SISO-Ant1-2412-0~Reference-PASS



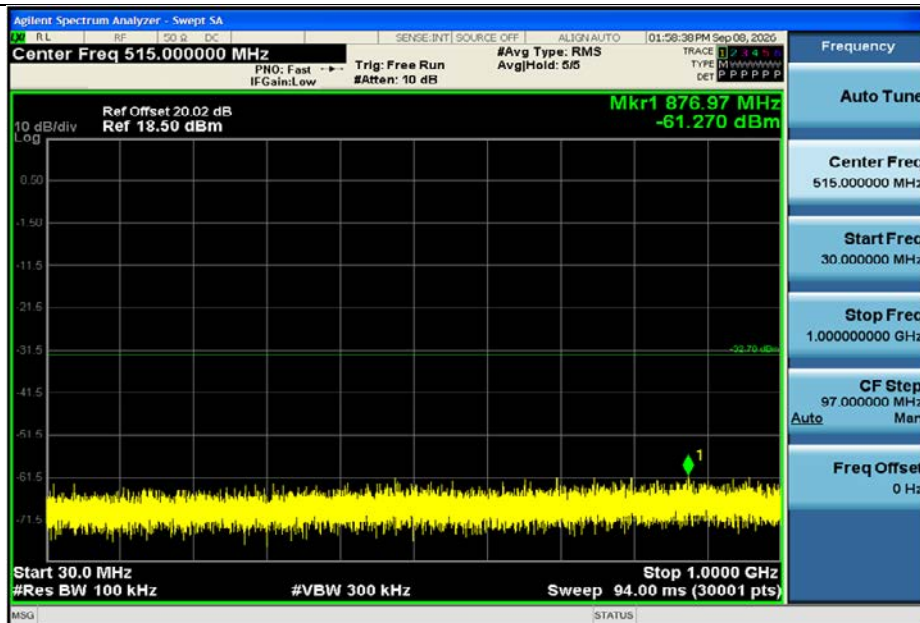
11N20SISO-Ant1-2412-30~1000-PASS



11N20SISO-Ant1-2412-1000~26500-PASS



11N20SISO-Ant1-2437-0~Reference-PASS



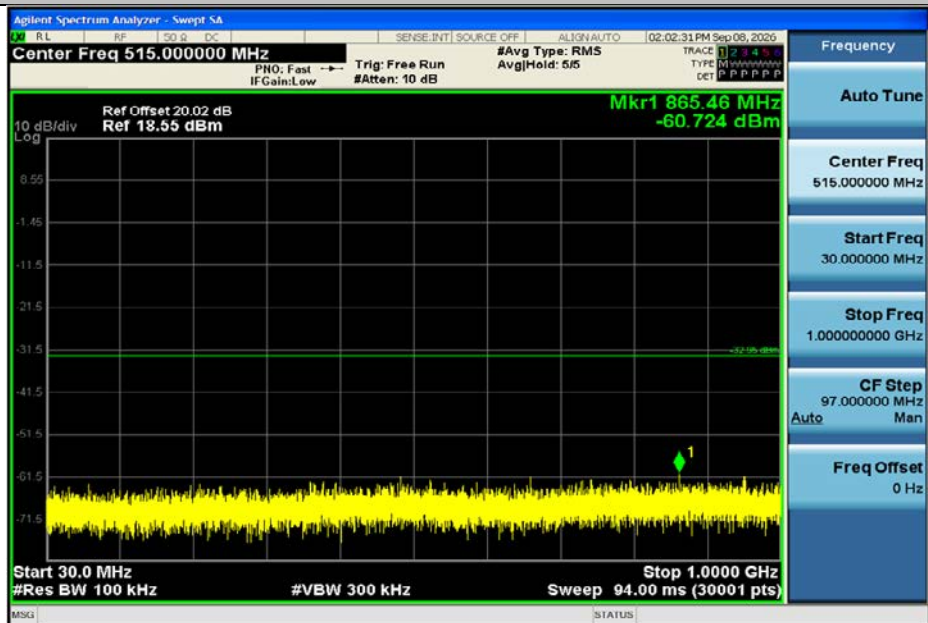
11N20SISO-Ant1-2437-30~1000-PASS



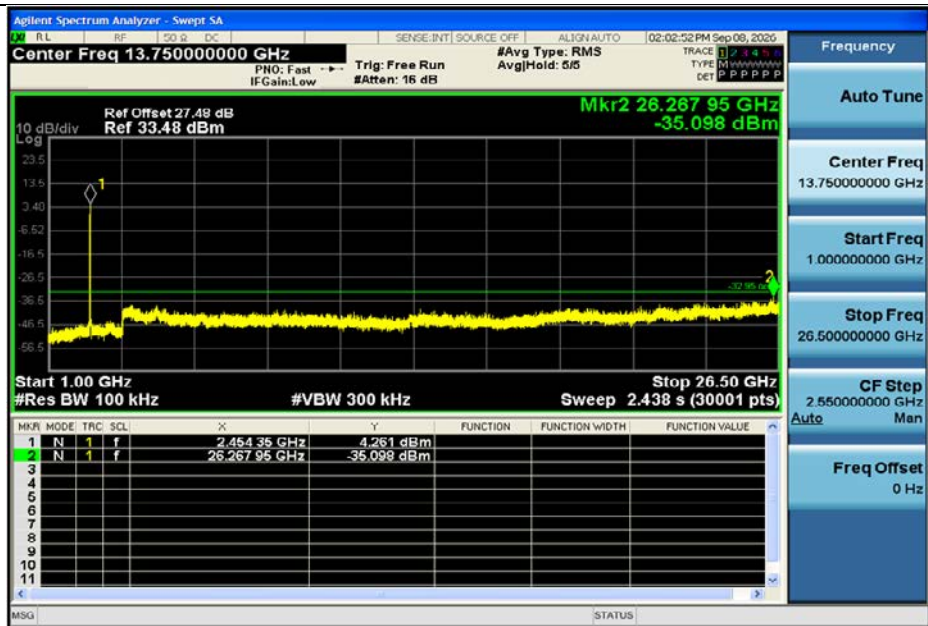
11N20SISO-Ant1-2437-1000~26500-PASS



11N20SISO-Ant1-2462-0~Reference-PASS

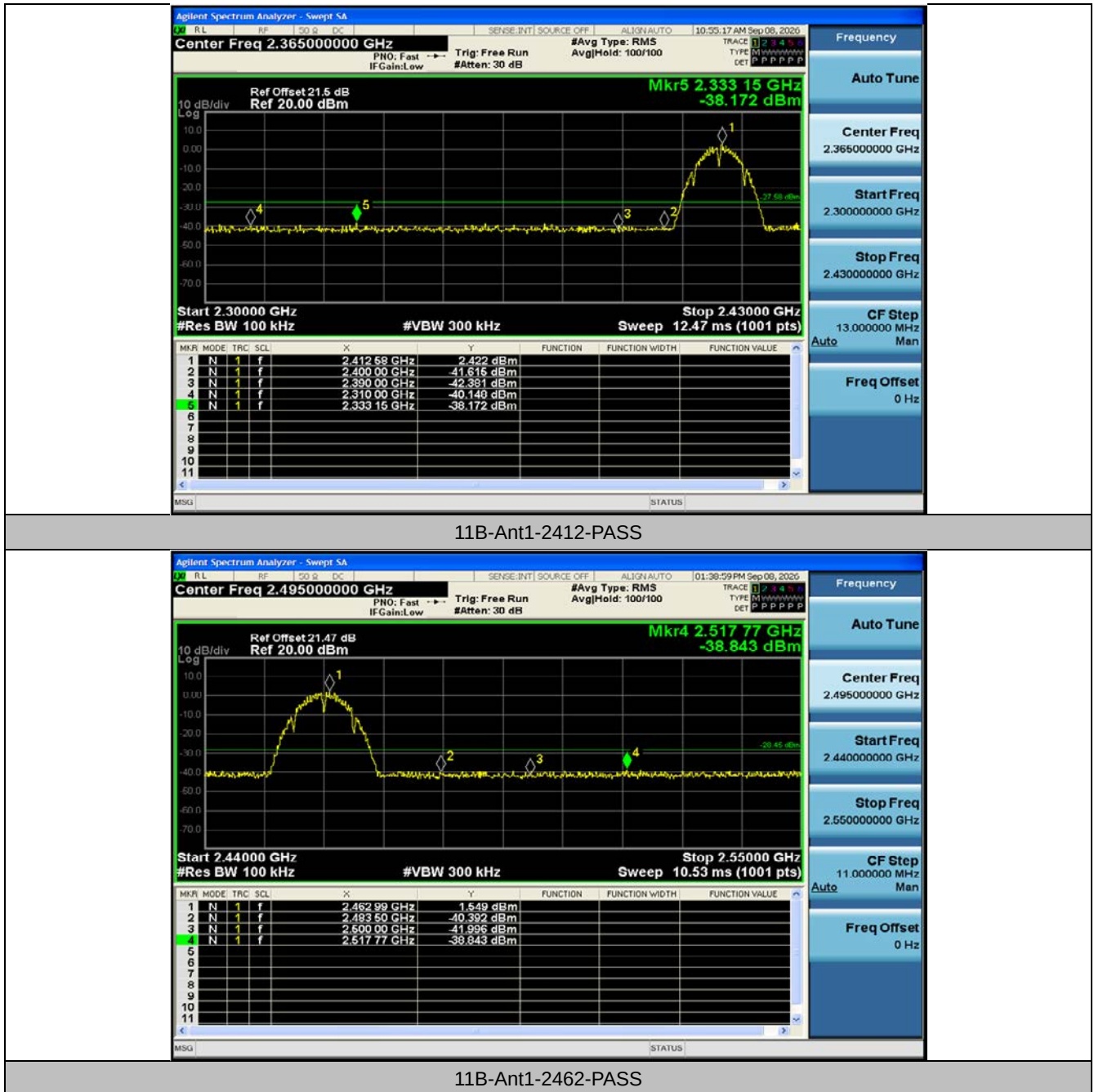


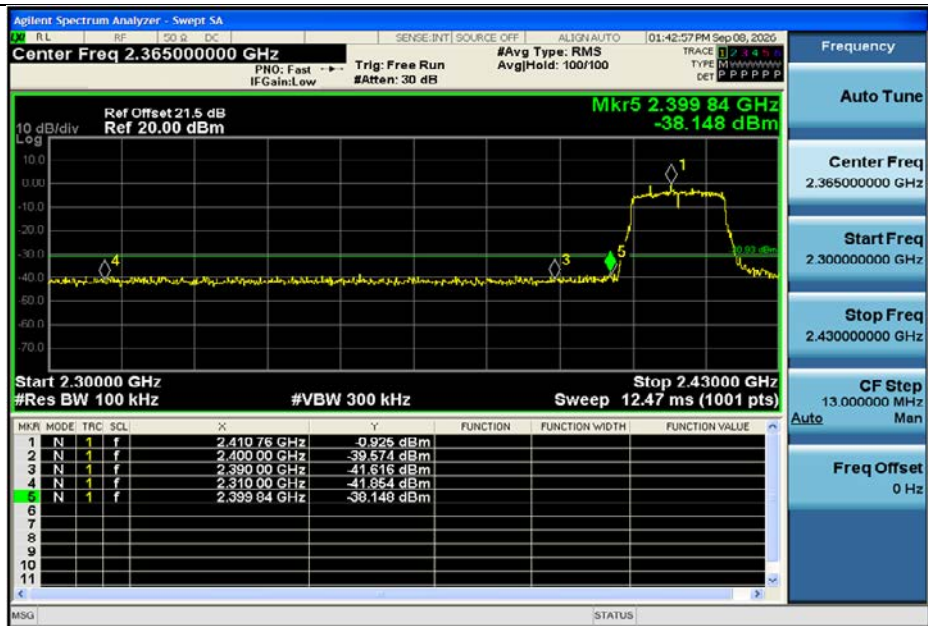
11N20SISO-Ant1-2462-30~1000-PASS



11N20SISO-Ant1-2462-1000~26500-PASS

Band edge

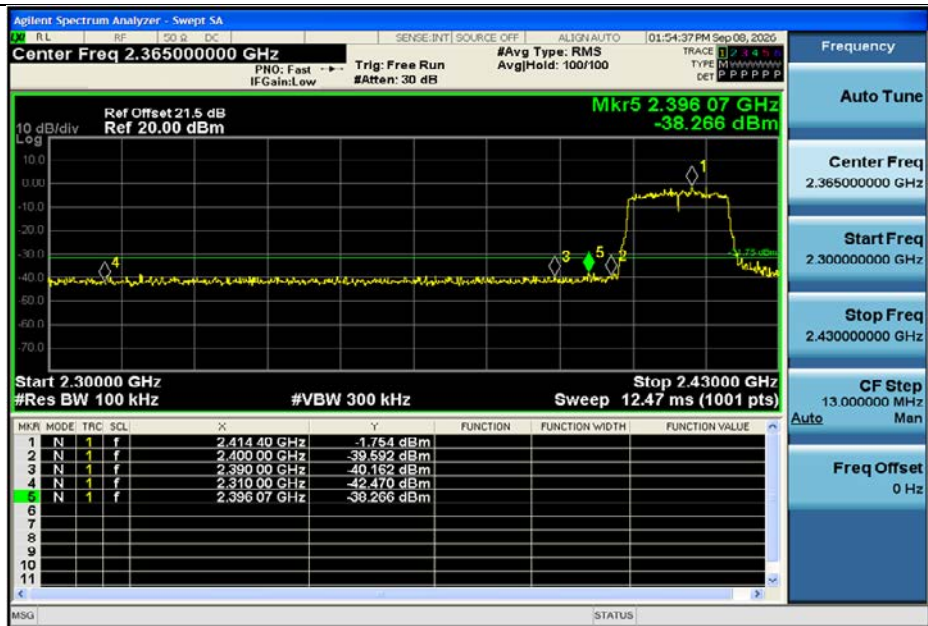




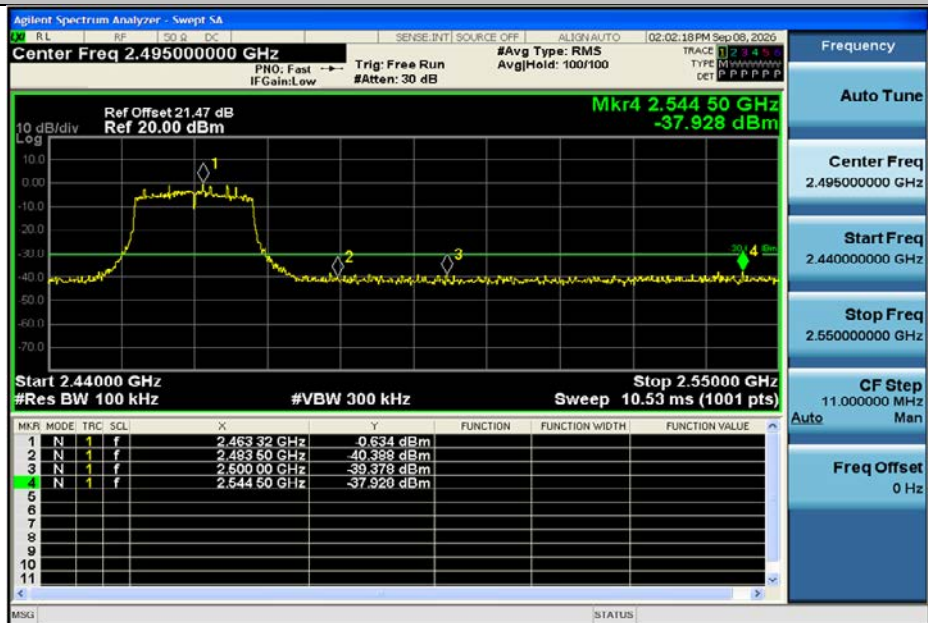
11G-Ant1-2412-PASS



11G-Ant1-2462-PASS



11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2462-PASS

3.4 6dB Bandwidth

3.4.1 Limit

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

3.4.2 Test Procedure

Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ● : Test ○ : No Test	

a) The EUT was connected to the tonscend test system, and the spectrum analyser is set as follow:

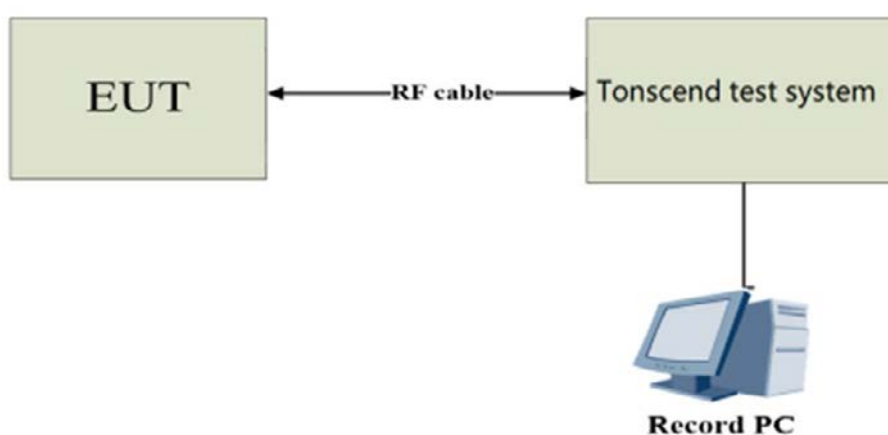
Centre Frequency	The centre frequency of the channel under test
RBW	1%~5% OBW but not less than 100 kHz.
VBW	≥ 3 RBW
Frequency span	2x Nominal Channel Bandwidth
Detector Mode	Peak
Trace Mode	Max Hold
Sweep Time	Auto Couple

b) Wait for the trace to stabilize then find the peak value of the trace and place the analyser marker on this peak.

c) Use the -6dB bandwidth function of the spectrum analyser to measure the 6dB Bandwidth of the EUT. This value shall be recorded.

d) Make sure that the power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals left and right from the power envelope being taken into account by this measurement.

3.4.3 Test Setup

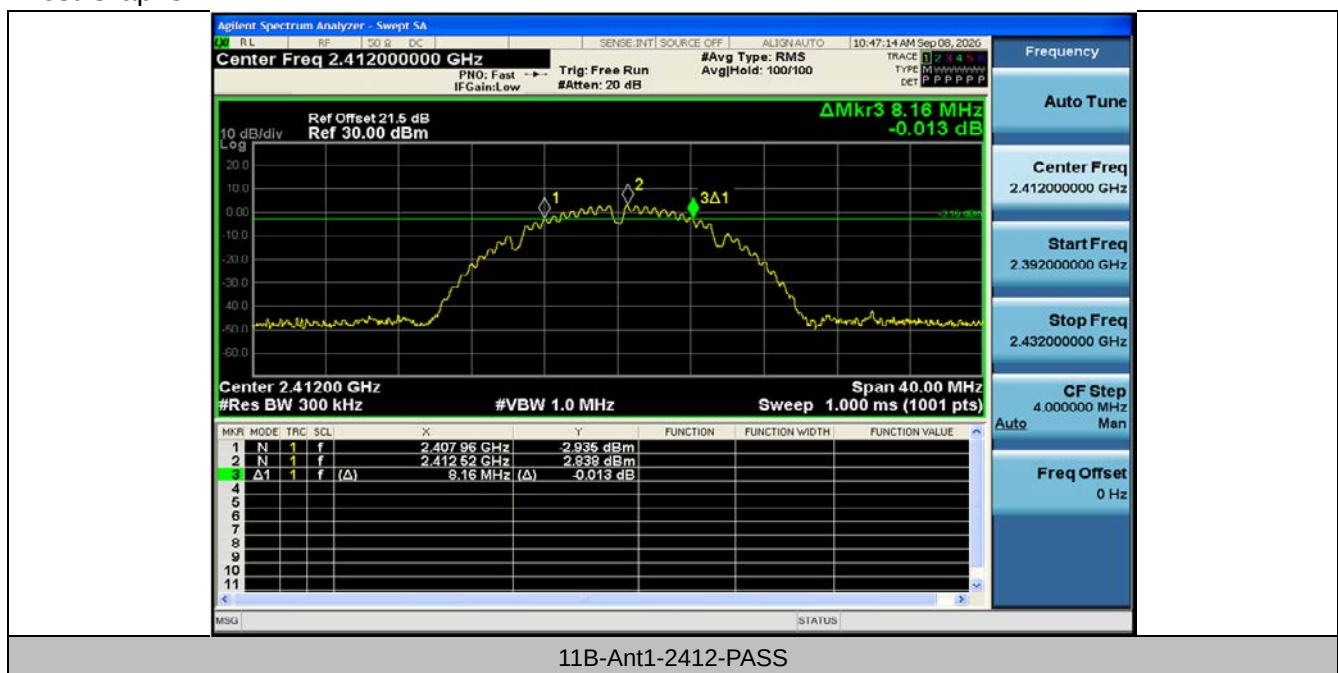


3.4.4 Test Result

DTS Bandwidth

Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.160	2407.960	2416.120	0.5	PASS
11B	Ant1	2437	8.160	2432.920	2441.080	0.5	PASS
11B	Ant1	2462	8.160	2457.920	2466.080	0.5	PASS
11G	Ant1	2412	16.320	2403.920	2420.240	0.5	PASS
11G	Ant1	2437	16.400	2428.840	2445.240	0.5	PASS
11G	Ant1	2462	16.160	2453.920	2470.080	0.5	PASS
11N20SISO	Ant1	2412	17.560	2403.240	2420.800	0.5	PASS
11N20SISO	Ant1	2437	17.480	2428.280	2445.760	0.5	PASS
11N20SISO	Ant1	2462	17.480	2453.280	2470.760	0.5	PASS

Test Graphs





11B-Ant1-2437-PASS



11B-Ant1-2462-PASS



11G-Ant1-2412-PASS



11G-Ant1-2437-PASS



11G-Ant1-2462-PASS



11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2437-PASS

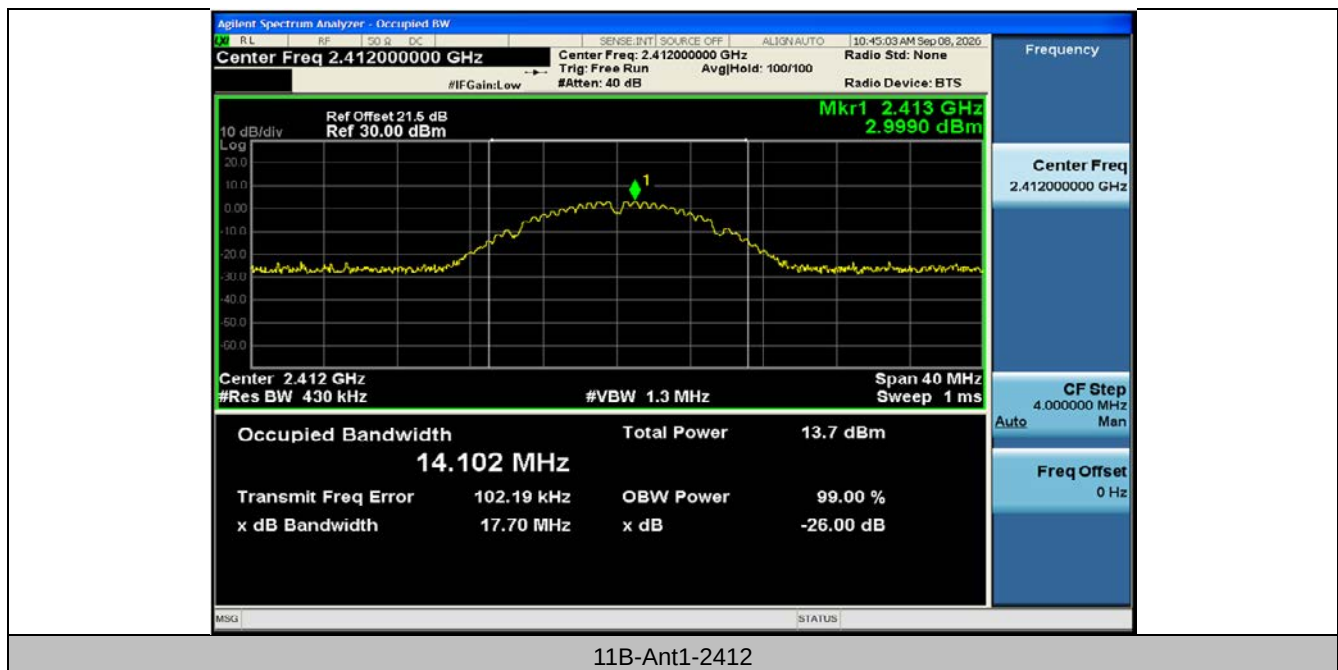


11N20SISO-Ant1-2462-PASS

Occupied Channel Bandwidth

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	14.102	2405.0512	2419.1532	---	---
11B	Ant1	2437	14.153	2429.9045	2444.0575	---	---
11B	Ant1	2462	14.272	2454.8454	2469.1174	---	---
11G	Ant1	2412	17.190	2403.4713	2420.6613	---	---
11G	Ant1	2437	17.063	2428.4462	2445.5092	---	---
11G	Ant1	2462	17.040	2453.4965	2470.5365	---	---
11N20SISO	Ant1	2412	18.146	2402.9838	2421.1298	---	---
11N20SISO	Ant1	2437	18.247	2427.8500	2446.0970	---	---
11N20SISO	Ant1	2462	18.122	2452.9425	2471.0645	---	---

Test Graphs



11B-Ant1-2412



11B-Ant1-2437



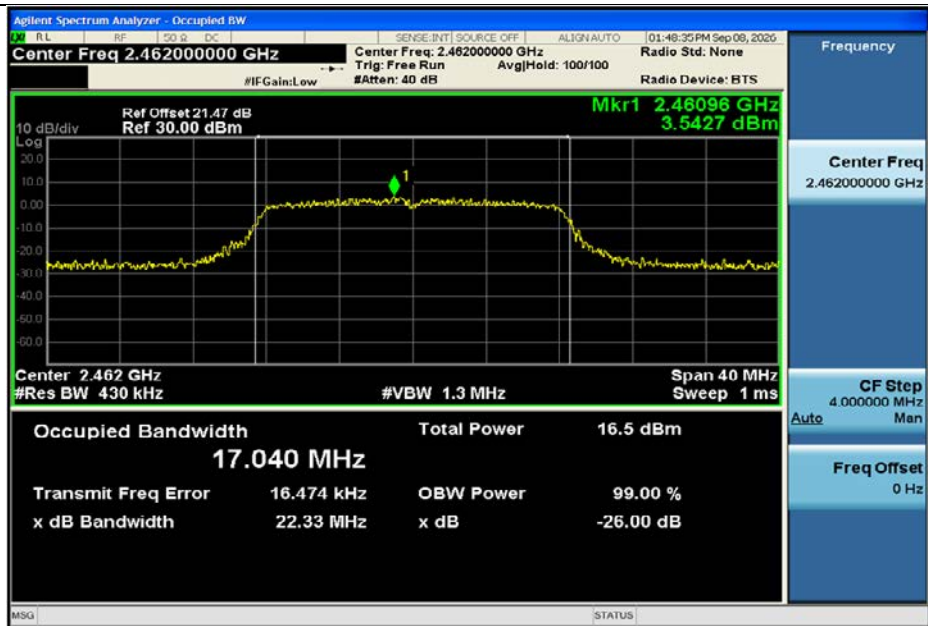
11B-Ant1-2462



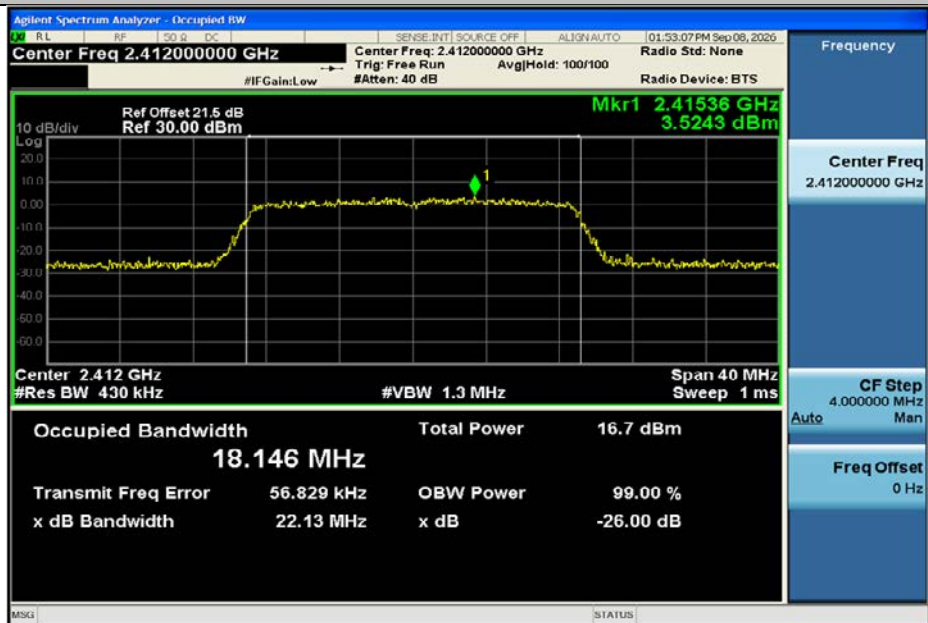
11G-Ant1-2412



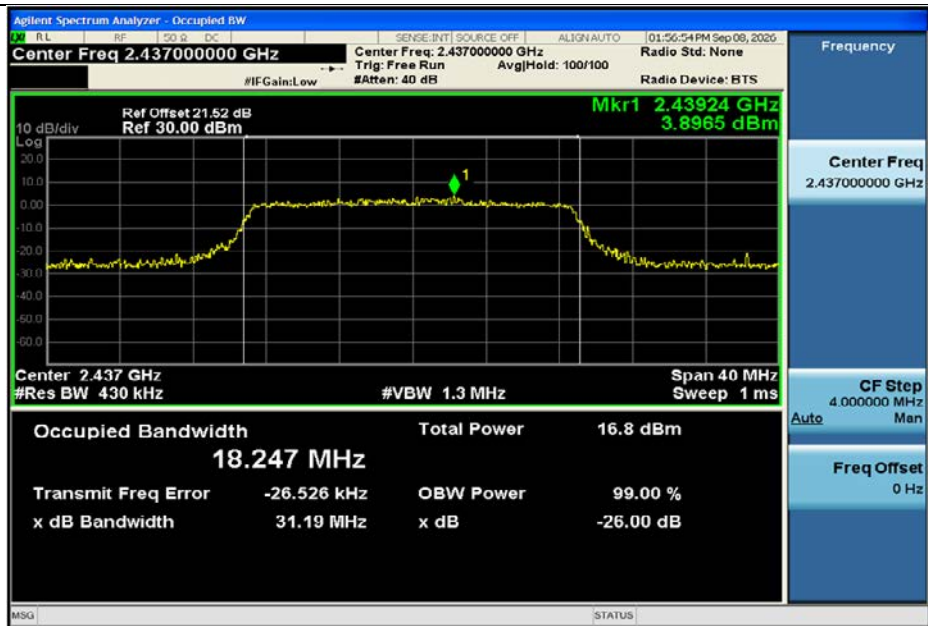
11G-Ant1-2437



11G-Ant1-2462



11N20SISO-Ant1-2412



11N20SISO-Ant1-2437



11N20SISO-Ant1-2462

3.5 Maximum conducted output power

3.5.1 Limit

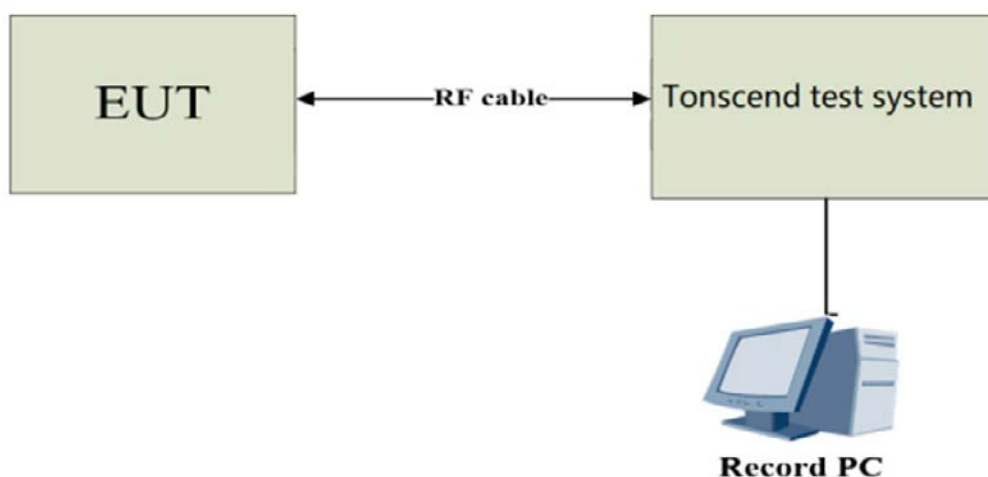
For systems using digital modulation in the 2400~2483.5MHz, The Maximum output Power shall not exceed 1W(30dBm)

3.5.2 Test Procedure

Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ● : Test ○ : No Test	

- The EUT was directly connected to the tonscond test system and antenna output port as show in the block diagram below.
- The maximum conducted output power was performed in accordance with method 11.9.2.3.1 (for average power)of ANSI C63.10-2020.

3.5.3 Test Setup



3.5.4 Table of Parameters of Text Software Setting

Test Mode	Power Level Setting defined by Manufacturer		
Test Software Version	Mptool		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	Default	Default	Default
IEEE 802.11g	Default	Default	Default
IEEE 802.11n20	Default	Default	Default

3.5.5 The Result

Test Mode	Antenna	Frequency[MHz]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	10.57	≤30.00	PASS
11B	Ant1	2437	11.13	≤30.00	PASS
11B	Ant1	2462	10.38	≤30.00	PASS
11G	Ant1	2412	10.92	≤30.00	PASS
11G	Ant1	2437	11.36	≤30.00	PASS
11G	Ant1	2462	10.63	≤30.00	PASS
11N20SISO	Ant1	2412	10.88	≤30.00	PASS
11N20SISO	Ant1	2437	11.52	≤30.00	PASS
11N20SISO	Ant1	2462	10.72	≤30.00	PASS

Note: The duty cycle factor is compensated in the average conducted output power.

3.6 Power Spectral Density

3.6.1 Limit

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

3.6.2 Test Procedure

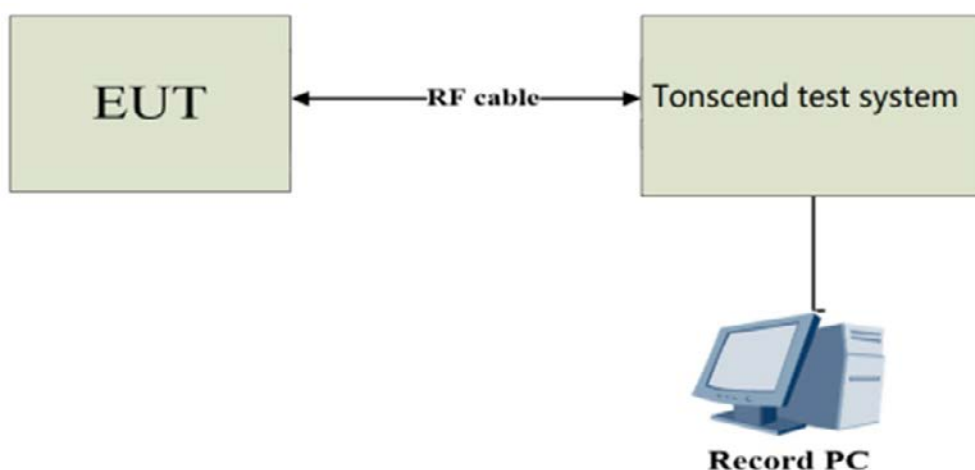
Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ☒ : Test ☐ : No Test	

a) The EUT was directly connected to the tonscond test system and antenna output port as show in the block diagram below.

b) Spectrum analyser settings as following:

Spectrum Parameters	Setting
Span Frequency	>1.5 times the OBW bandwidth
RBW	3 kHz
VBW	10 kHz
Detector	RMS
Trace	RMS
Sweep Time	Auto

3.6.3 Test Setup



3.6.4 The Result

Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-22.07	≤8.00	PASS
11B	Ant1	2437	-20.72	≤8.00	PASS
11B	Ant1	2462	-21.42	≤8.00	PASS
11G	Ant1	2412	-23.42	≤8.00	PASS
11G	Ant1	2437	-22.98	≤8.00	PASS
11G	Ant1	2462	-23.11	≤8.00	PASS
11N20SISO	Ant1	2412	-24.07	≤8.00	PASS
11N20SISO	Ant1	2437	-23.45	≤8.00	PASS
11N20SISO	Ant1	2462	-24.05	≤8.00	PASS

Note: The duty cycle factor has been included in the test diagram.

Test Graphs

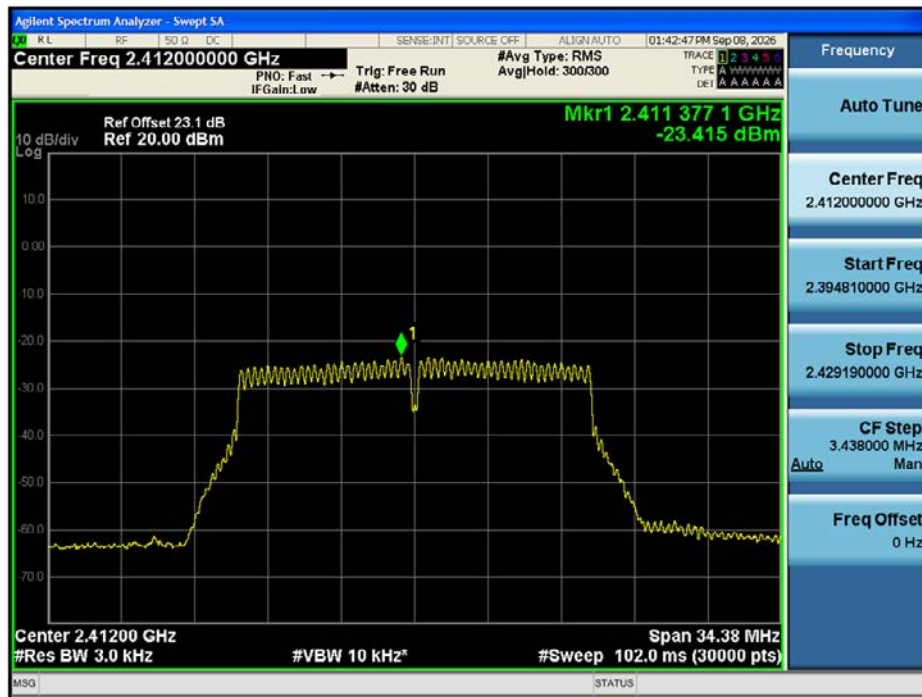




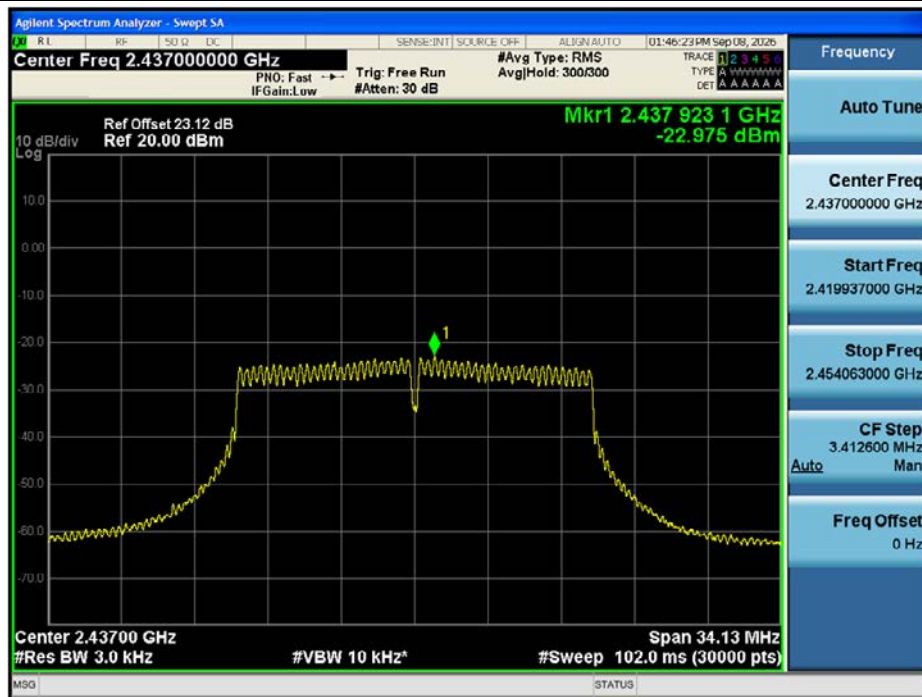
11B-Ant1-2437-PASS



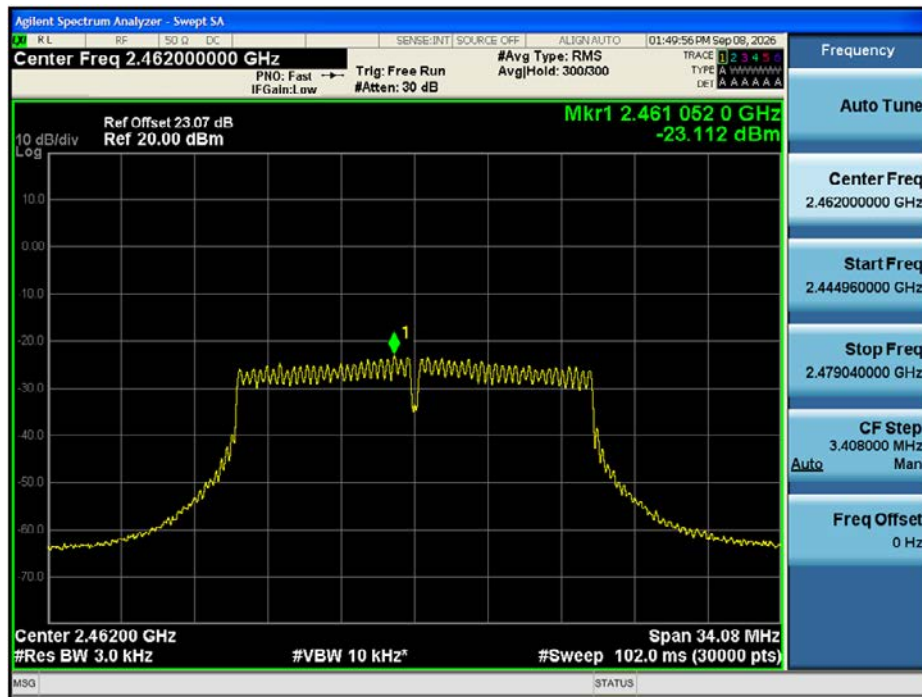
11B-Ant1-2462-PASS



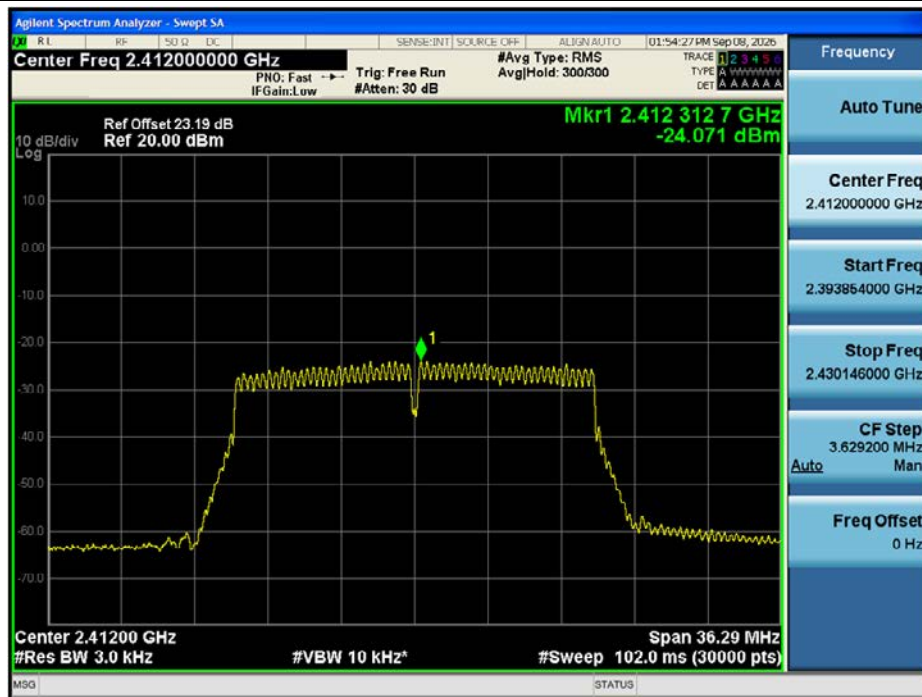
11G-Ant1-2412-PASS



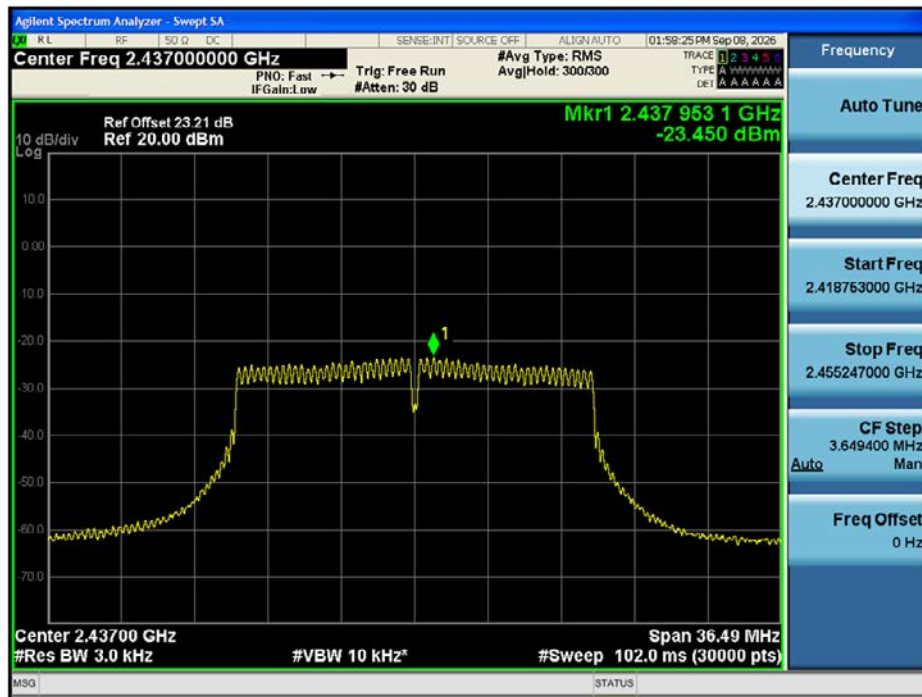
11G-Ant1-2437-PASS



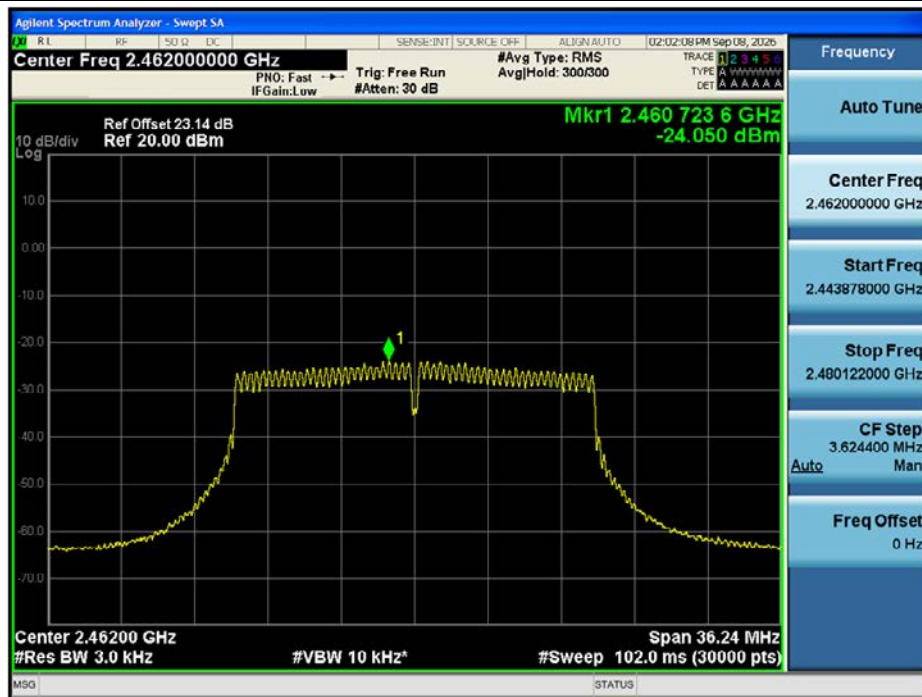
11G-Ant1-2462-PASS



11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2437-PASS



11N20SISO-Ant1-2462-PASS

Statement

1. The report is invalid without the official seal or special seal of Shenzhen Haiyun Standard Technical Co., Ltd. (hereinafter referred to as the unit).
2. The report is invalid without the signature of the approver.
3. The report is invalid if altered arbitrarily.
4. The report shall not be partially copied without the written approval of the unit.
5. The reported test results are only valid for the tested samples.
6. If there is any objection to the test report, it shall be submitted to the test unit within 15 days from the date of receiving the report, and the overdue shall not be accepted.

Shenzhen Haiyun Standard Technical Co., Ltd.

Address: Room 110, 111, 112, 113, 115, 116, Block B, Jinyuan Business Building, No. 302, Xixiang Avenue, Labor Community, Xixiang Street, Baoan District, Shenzhen, China

End of Test Report