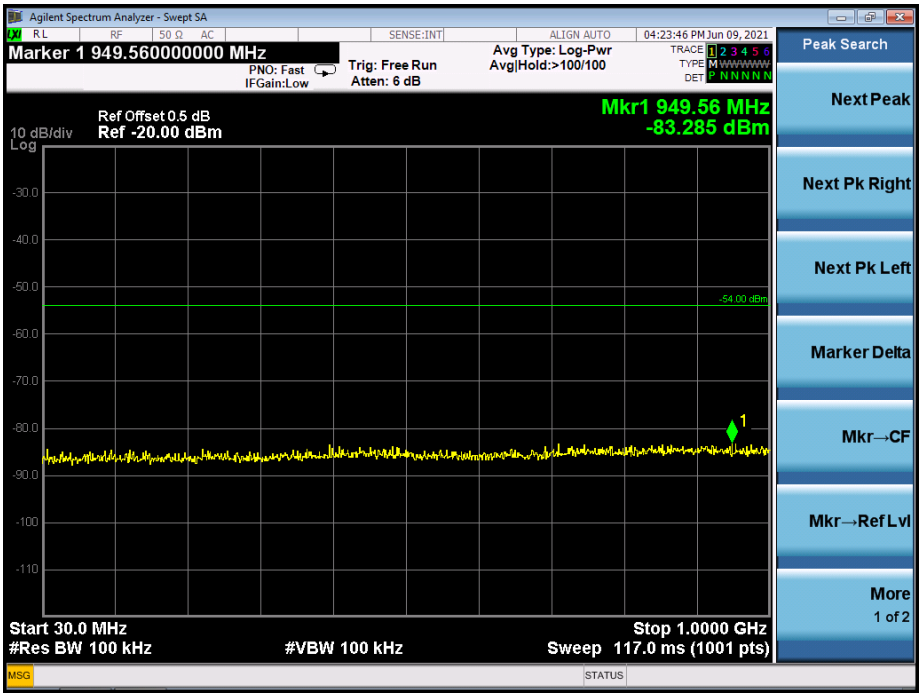
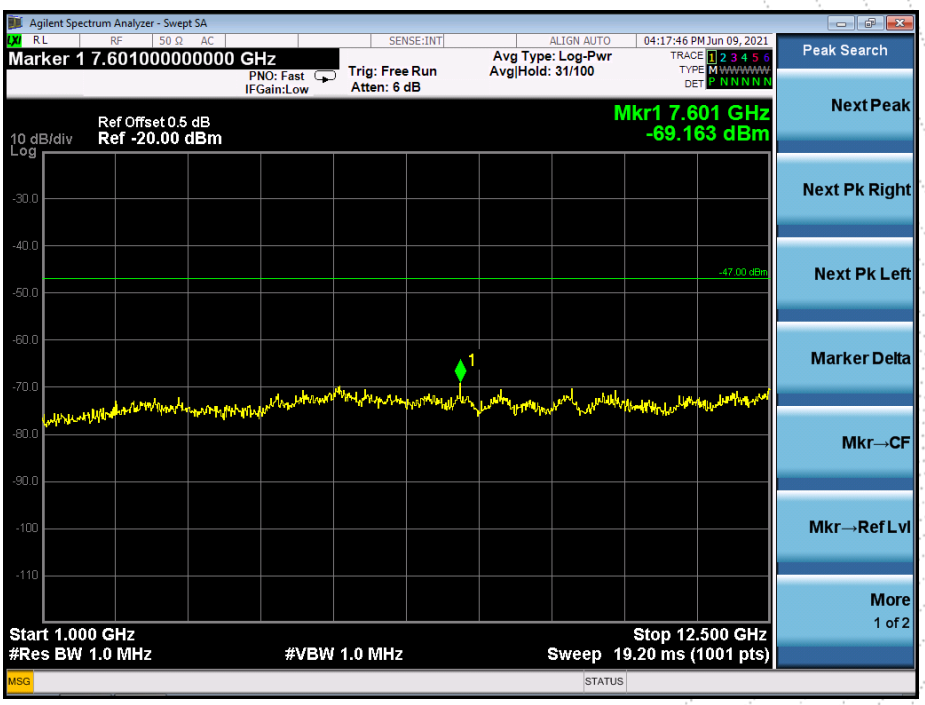
Operation Mode:	Normal Voltage-N40 mode (CH1,CH7,CH13)

RX-Frequency Band 1 (30 MHz ≦ f < 1000 MHz)

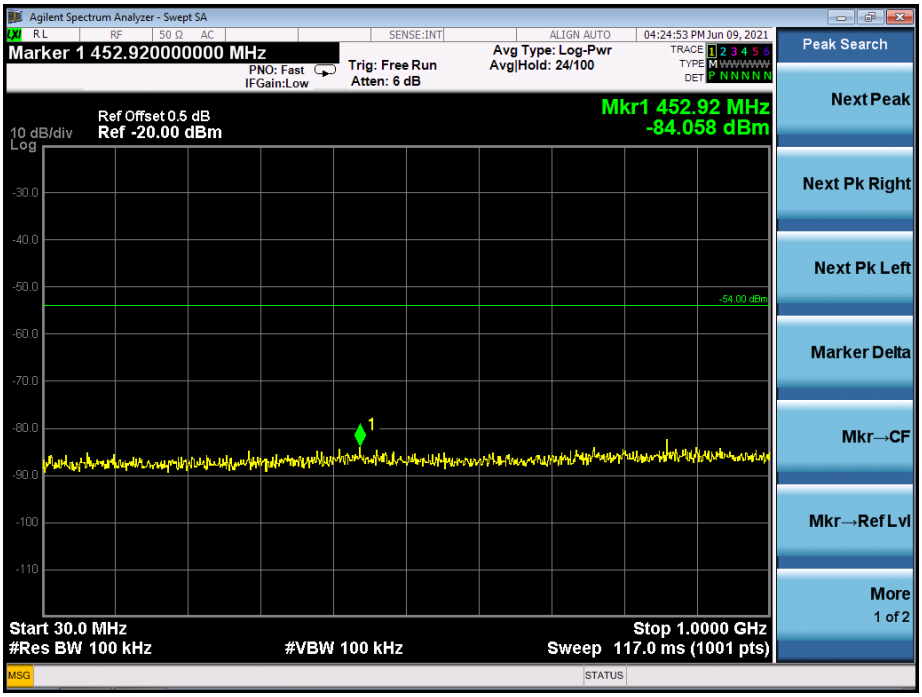


RX-Frequency Band 2 (1000 MHz ≦ f < 12500 MHz)

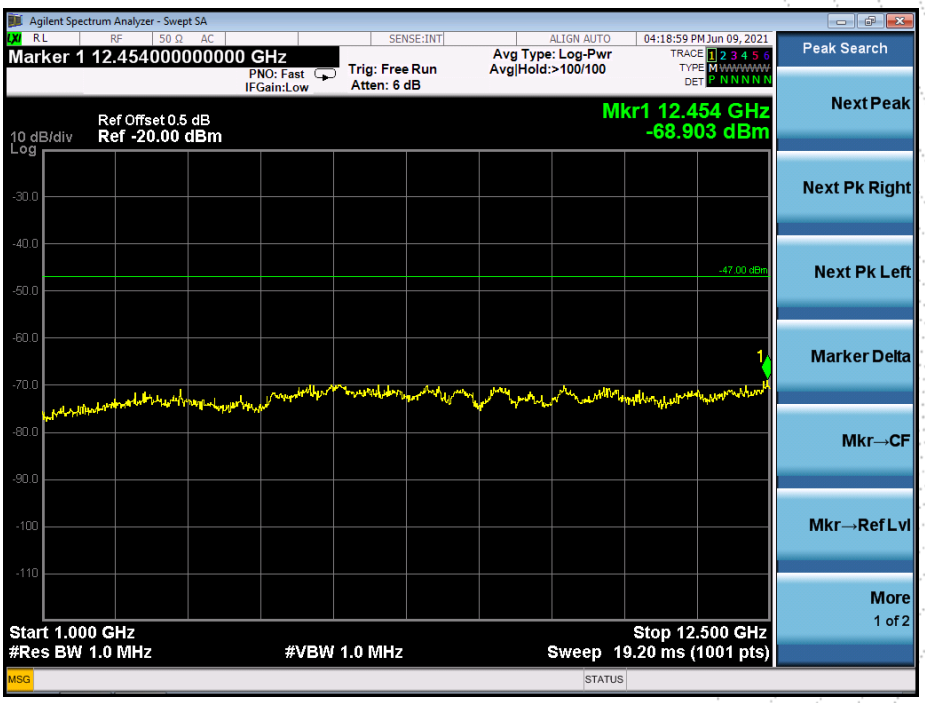


Operation Mode:	Low Voltage-B mode (CH1,CH7,CH13)

RX-Frequency Band 1 (30 MHz ≦ f < 1000 MHz)

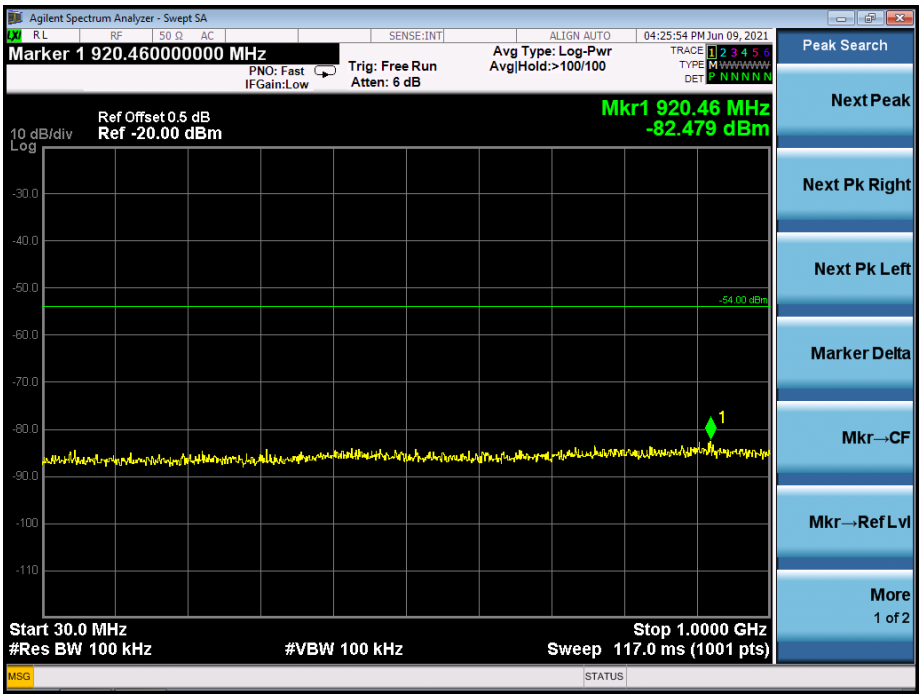


RX-Frequency Band 2 (1000 MHz ≦ f < 12500 MHz)

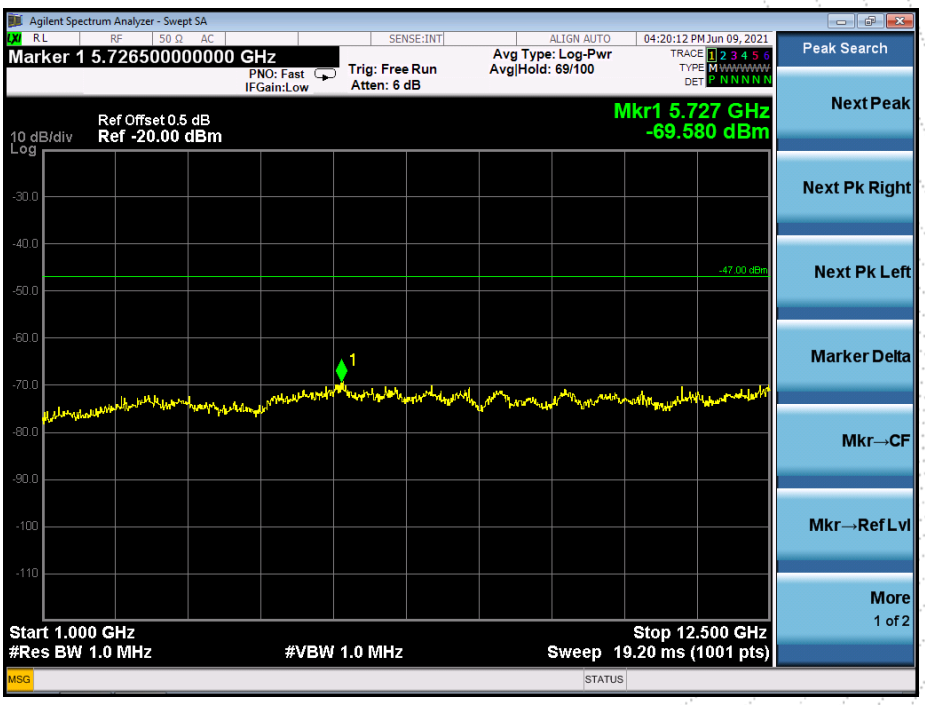


Operation Mode:	Low Voltage -G mode (CH1,CH7,CH13)

RX-Frequency Band 1 (30 MHz ≦ f < 1000 MHz)

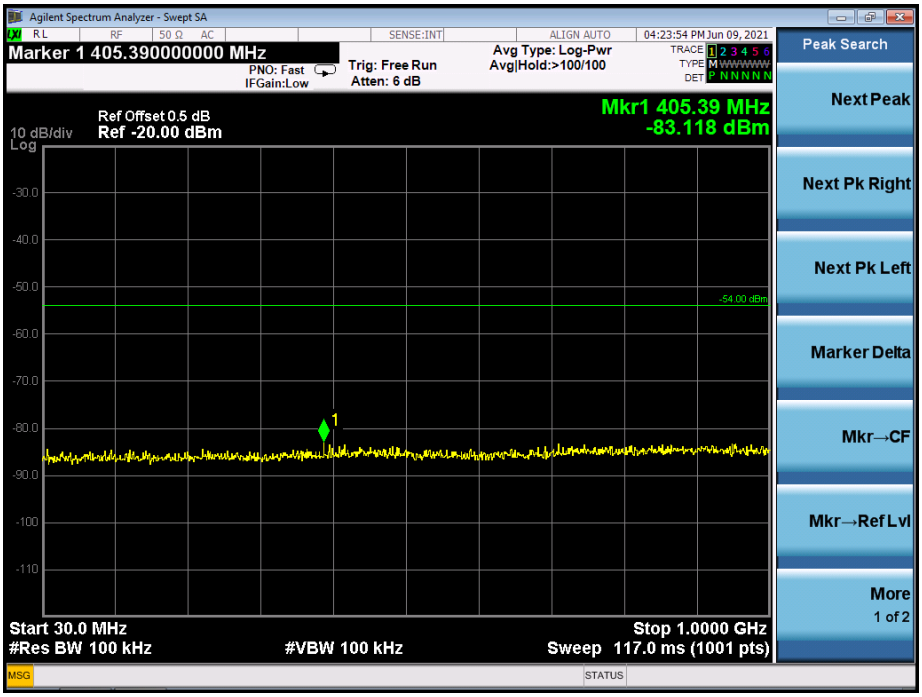


RX-Frequency Band 2 (1000 MHz ≦ f < 12500 MHz)



Operation Mode:	Low Voltage-N20 mode (CH1,CH7,CH13)

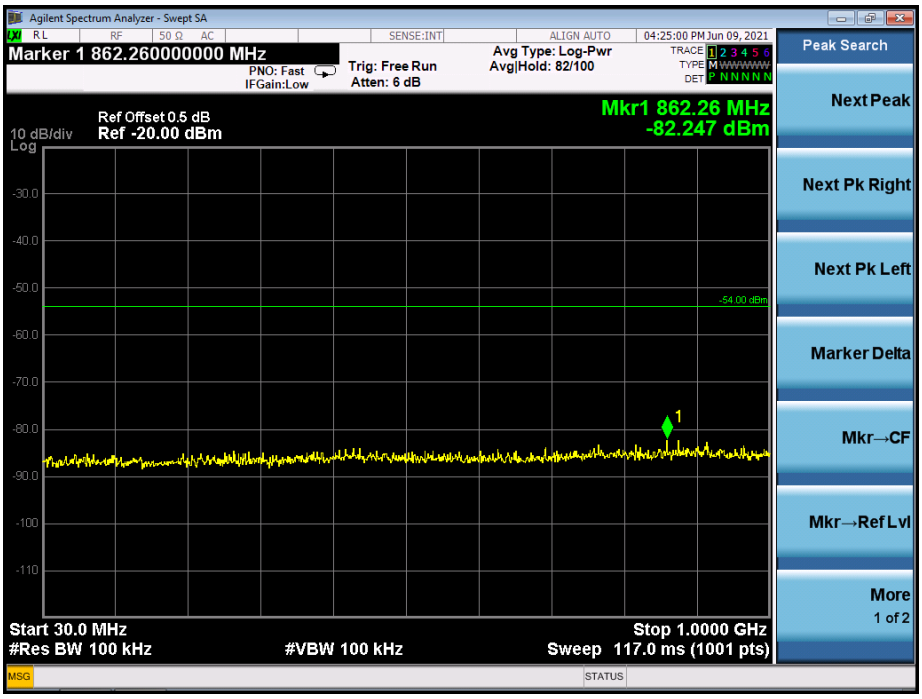
RX-Frequency Band 1 (30 MHz ≦ f < 1000 MHz)



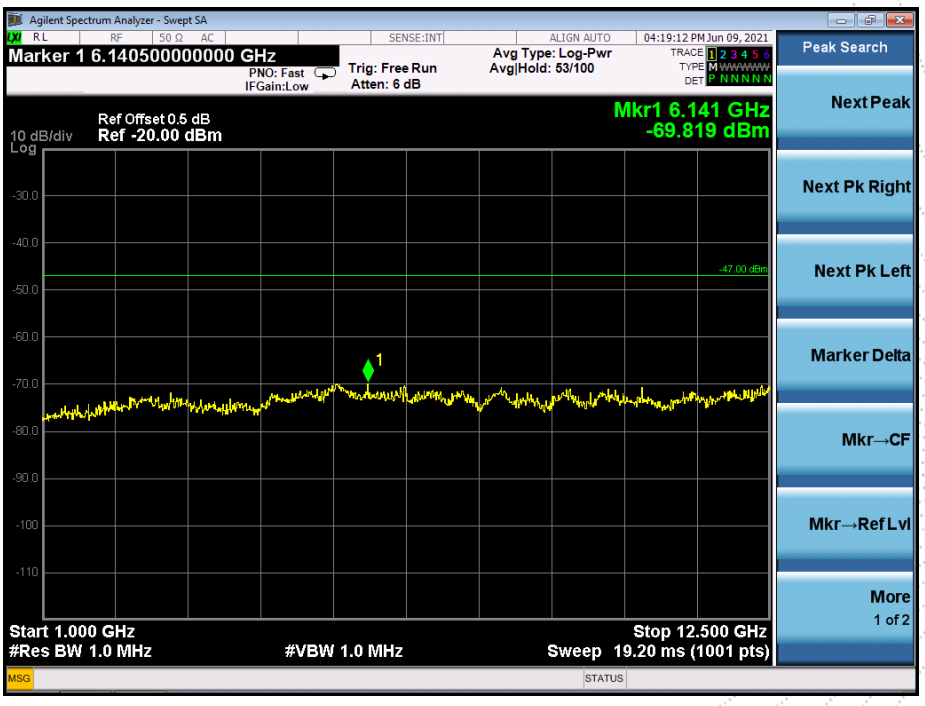
RX-Frequency Band 2 (1000 MHz ≦ f < 12500 MHz)

Operation Mode:	Low Voltage-N40 mode (CH3,CH7,CH11)

RX-Frequency Band 1 (30 MHz ≦ f < 1000 MHz)

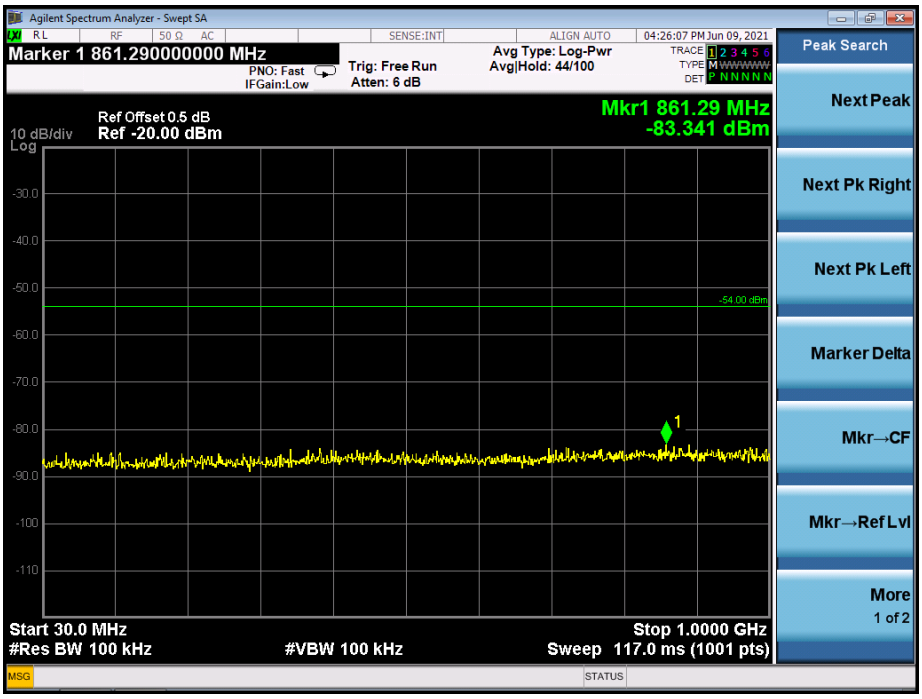


RX-Frequency Band 2 (1000 MHz ≦ f < 12500 MHz)

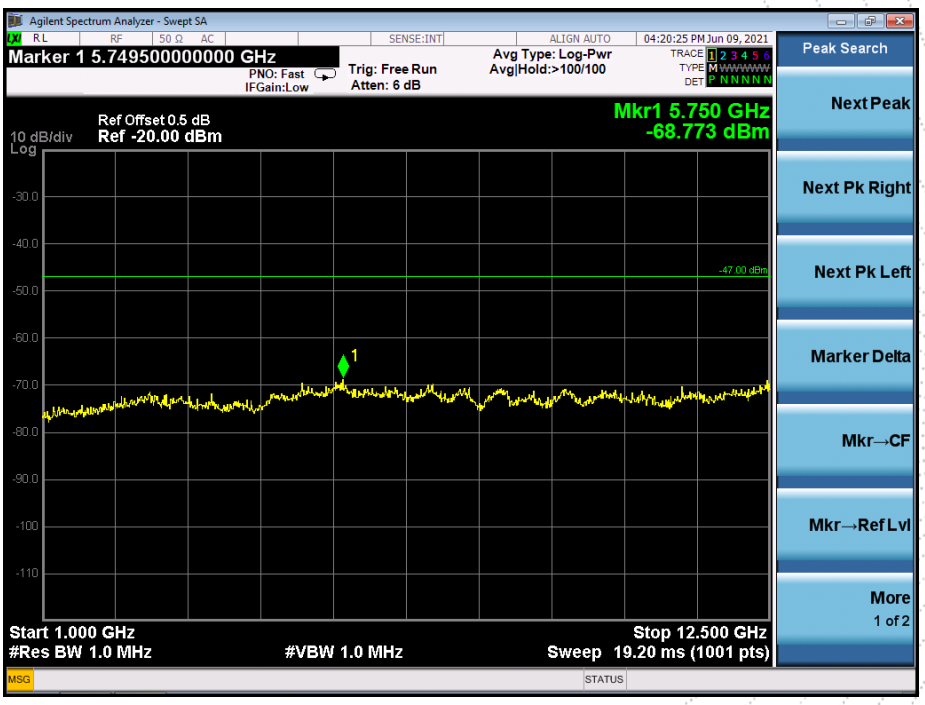


Operation Mode:	High Voltage-B mode (CH1,CH7,CH13)

RX-Frequency Band 1 (30 MHz ≦ f < 1000 MHz)

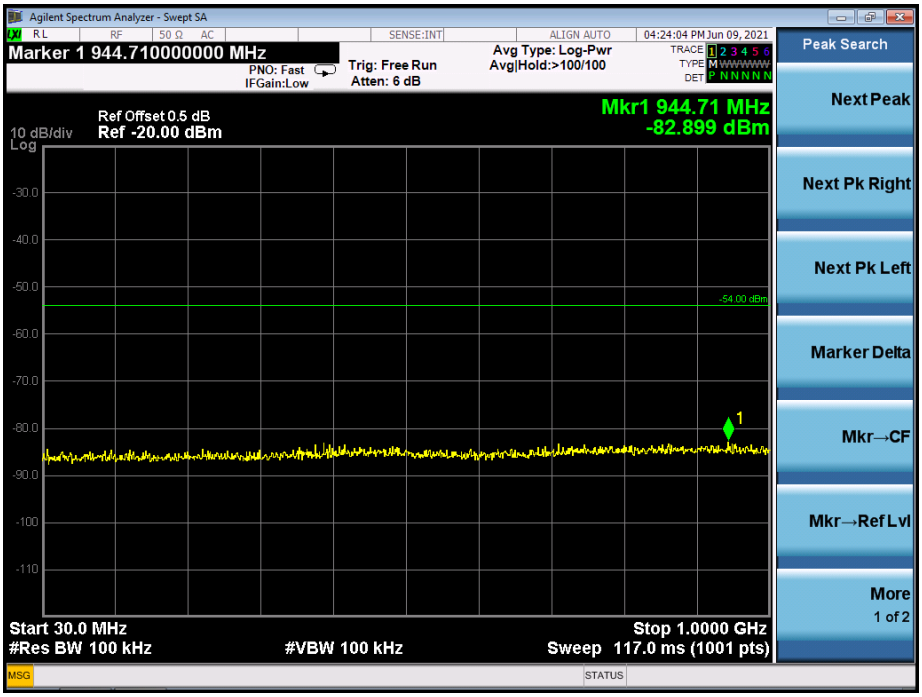


RX-Frequency Band 2 (1000 MHz ≦ f < 12500 MHz)

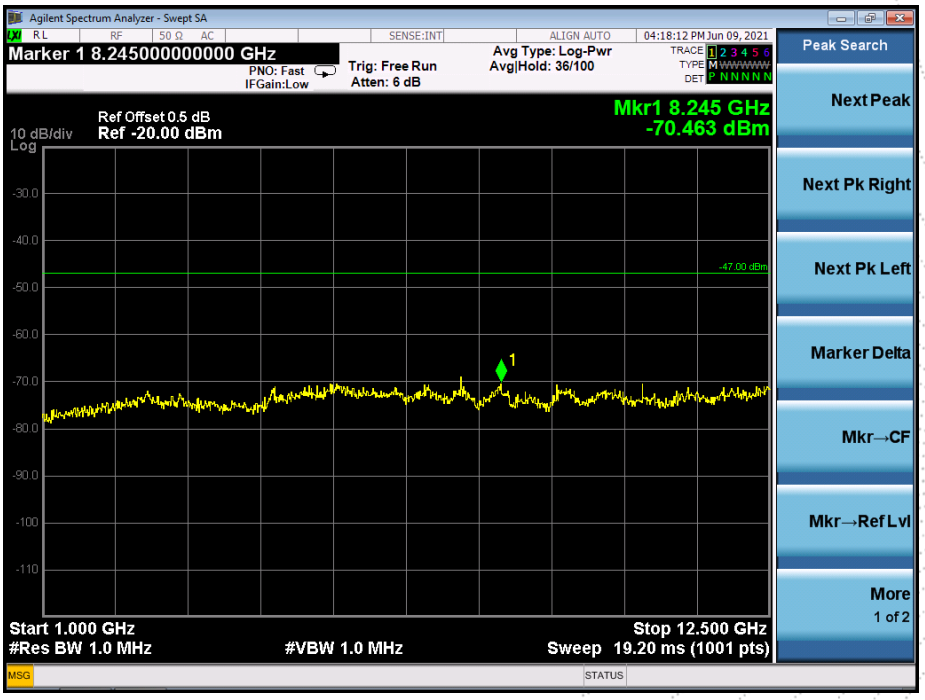


Operation Mode:	High Voltage-G mode (CH1,CH7,CH13)

RX-Frequency Band 1 (30 MHz ≦ f < 1000 MHz)

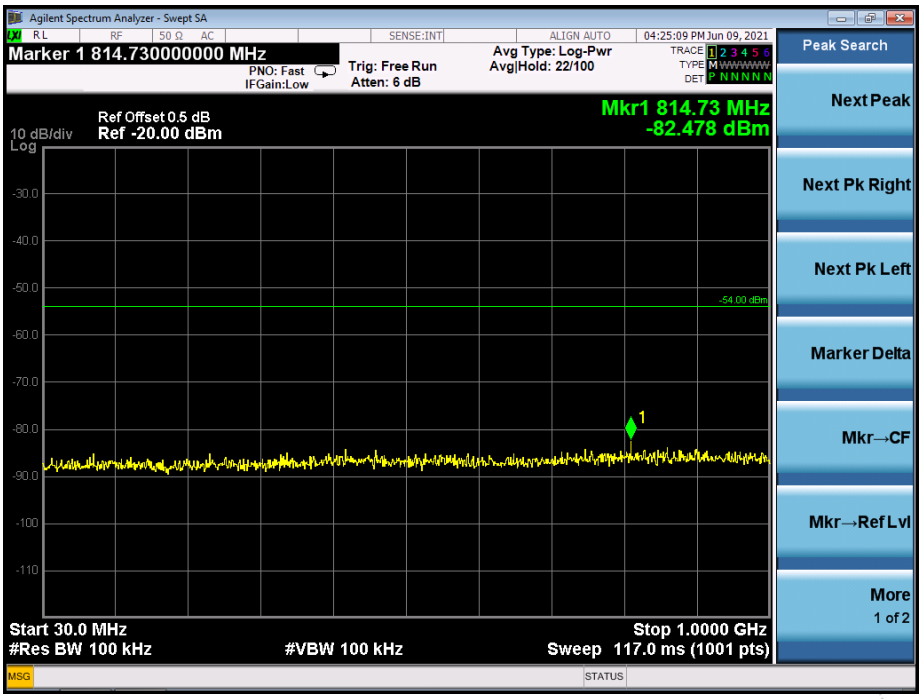


RX-Frequency Band 2 (1000 MHz ≦ f < 12500 MHz)

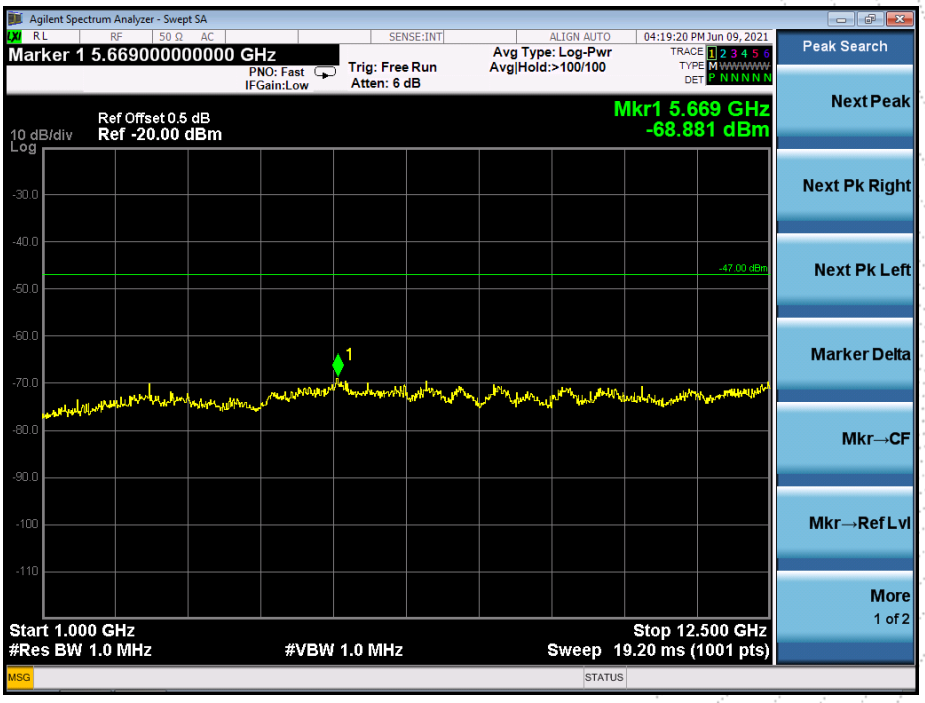


Operation Mode:	High Voltage-N20 mode (CH1,CH7,CH13)

RX-Frequency Band 1 (30 MHz ≦ f < 1000 MHz)

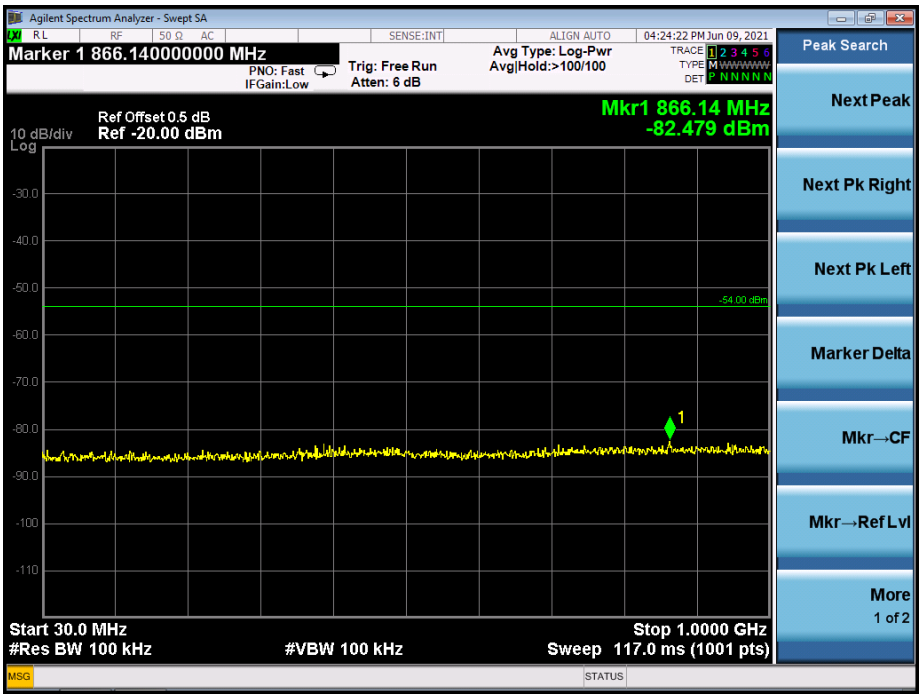


RX-Frequency Band 2 (1000 MHz ≦ f < 12500 MHz)

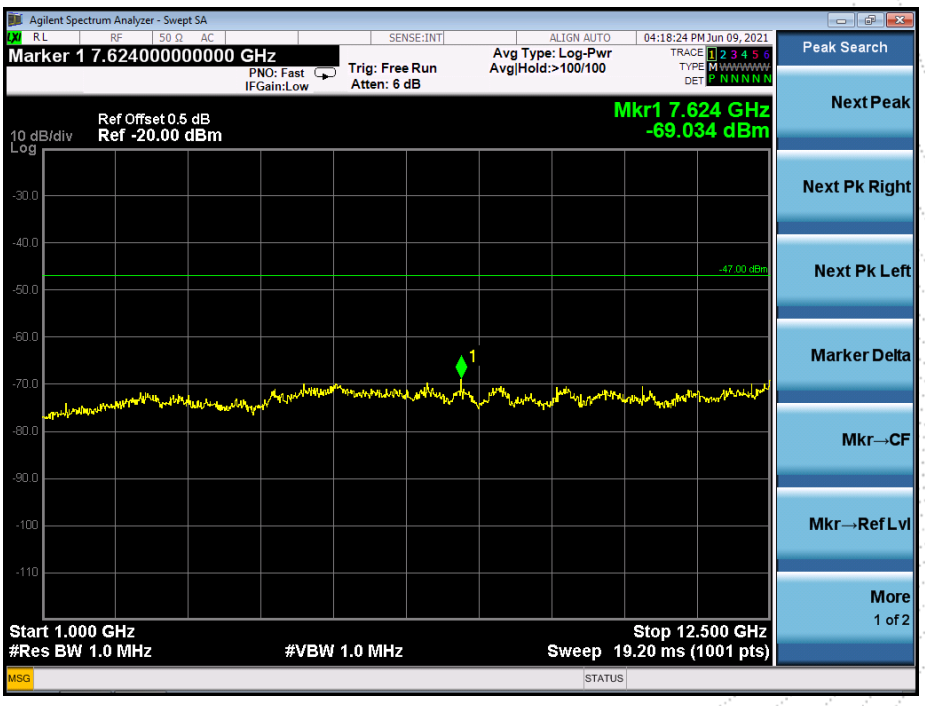


Operation Mode:	High Voltage-N40 mode (CH1,CH7,CH13)

RX-Frequency Band 1 (30 MHz ≦ f < 1000 MHz)



RX-Frequency Band 2 (1000 MHz ≦ f < 12500 MHz)



12. TRANSMISSION ANTENNA GAIN (EIRP ANTENNA POWER) MEASUREMENT

12.1 LIMIT

Modulation	Frequency band	Antenna power	Max EIRP	
			Non-directional	Beam directional[Note1]
DS	2,400-2,483.5MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
OFDM1	2,400-2,483.5MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
OFDM2	2,400-2,483.5MHz	5mW/MHz	9.14dBm/MHz	19.14dBm/MHz
FH,DS-FH, FH-OFDM	2,400-2,483.5MHz	3mW/MHz	6.91dBm/MHz	16.91dBm/MHz
	2,427-2,470.75MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
Other than those above	2,400-2,483.5MHz	10mW	12.14dBm	22.14dBm

Note : OFDM 1 in the modulation method column indicates that the occupied frequency band width is 26 MHz or less, and OFDM 2 indicates the occupied frequency bandwidth exceeding 26 MHz and 38 MHz or less.

12.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB/VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

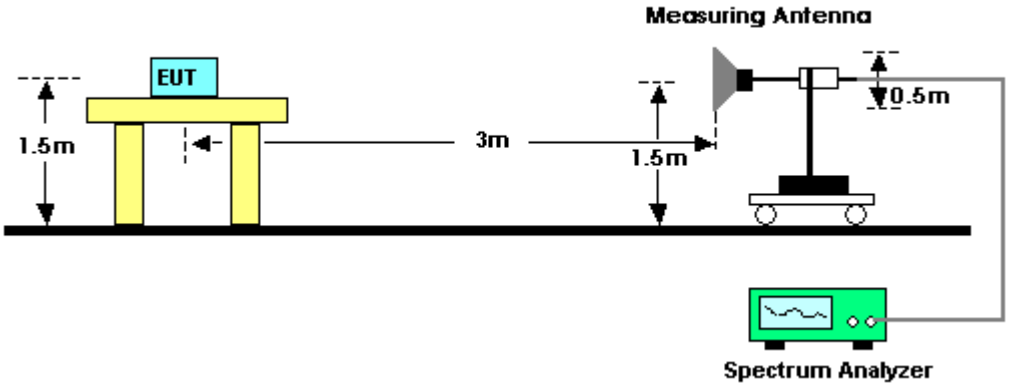
12.3 TEST PROCEDURES

1. Set EUT ad measuring antenna at the same height and roughly facing each other.
2. Move the measuring antenna height up and down within ± 50cm of EUT height and swing it to find the maximum output of the measuring antenna. The output level at the spectrum analyzer is read sa “E“.
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within ± 50cm of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at Pt to give the equivalent output level of “E” or caluate

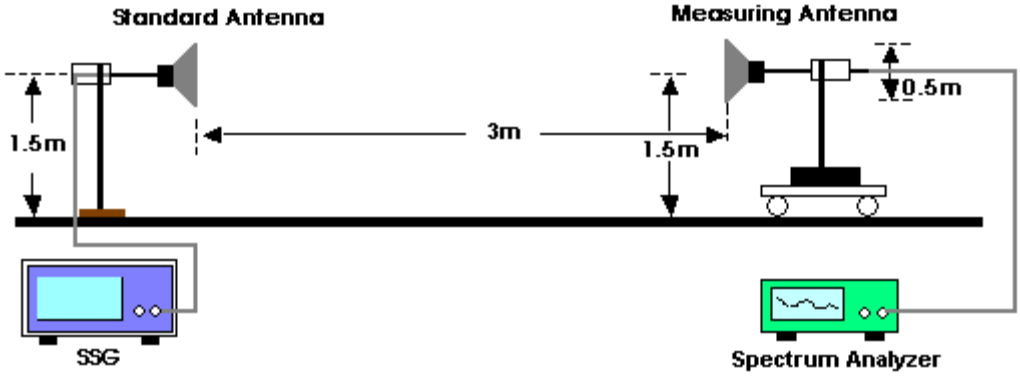
Pt with SSG output which gives the nearest of “E” and difference (± 1dB). Record the Pt.
7. Calculate EIRP by the formula below EIRP = Gt – L + Pt.
Gt: gain of replacing antenna (dBi)
L: feeder loss between SSG and replacing antenna
Pt: Output power of the SSG
8. If the antenna for the EUT has circular polarization, sum of V-field and H-field will be result if measuring antenna is linear polarization.

12.4 TEST SETUP LAYOUT

For EUT radiation measurement



For standard antenna measurement



12.5 TEST DEVIATION

There is no deviation with the original standard.

12.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

12.7 RESULTS OF TRANSMISSION ANTENNA GAIN

Test voltage (V)	Mode	Channel (MHz)	Antenna Power (dBm/MHz)ANT A	Antenna Power (dBm/MHz)ANT B	ANT A (dBi)	ANT B (dBi)	EIRP (dBm/MHz) ANTA	EIRP (dBm/MHz) ANTB	Total EIRP (dBm/MHz)	Limit (dBm/MHz)
DC=3.8V	802.11b	2412	7.26	7.26	-0.48	2.89	6.78	10.15	/	12.14
		2442	7.47	7.30	-0.48	2.89	6.99	10.19	/	
		2472	7.54	7.34	-0.48	2.89	7.06	10.23	/	
	802.11g	2412	6.07	6.28	-0.48	2.89	5.59	9.17	/	
		2442	5.72	5.83	-0.48	2.89	5.24	8.72	/	
		2472	6.24	6.60	-0.48	2.89	5.76	9.49	/	
	802.11n(HT20)	2412	5.07	5.75	-0.48	2.89	4.59	8.64	10.08	
		2442	5.85	5.77	-0.48	2.89	5.37	8.66	10.33	
		2472	5.55	5.43	-0.48	2.89	5.07	8.32	10.00	
	802.11n(HT40)	2422	3.94	3.81	-0.48	2.89	3.46	6.70	8.39	9.14
		2442	4.16	3.98	-0.48	2.89	3.68	6.87	8.57	
		2462	4.27	4.13	-0.48	2.89	3.79	7.02	8.71	
DC=4.18V	802.11b	2412	7.24	7.26	-0.48	2.89	6.76	10.15	\	12.14
		2442	7.45	7.19	-0.48	2.89	6.97	10.08	\	
		2472	7.63	7.43	-0.48	2.89	7.15	10.32	\	
	802.11g	2412	6.09	6.13	-0.48	2.89	5.61	9.02	\	
		2442	5.69	5.75	-0.48	2.89	5.21	8.64	\	
		2472	6.16	6.31	-0.48	2.89	5.68	9.20	\	
	802.11n(HT20)	2412	5.01	5.70	-0.48	2.89	4.53	8.59	10.03	
		2442	5.82	5.77	-0.48	2.89	5.34	8.66	10.32	
		2472	5.45	5.40	-0.48	2.89	4.97	8.29	9.95	
	802.11n(HT40)	2422	3.79	3.83	-0.48	2.89	3.31	6.72	8.35	9.14
		2442	4.08	3.99	-0.48	2.89	3.60	6.88	8.55	
		2462	4.16	4.12	-0.48	2.89	3.68	7.01	8.67	
DC=3.42V	802.11b	2412	7.37	7.38	-0.48	2.89	6.89	10.27	\	12.14
		2442	7.21	7.21	-0.48	2.89	6.73	10.10	\	
		2472	7.49	7.49	-0.48	2.89	7.01	10.38	\	
	802.11g	2412	6.07	6.09	-0.48	2.89	5.59	8.98	\	
		2442	5.65	5.69	-0.48	2.89	5.17	8.58	\	
		2472	6.16	6.25	-0.48	2.89	5.68	9.14	\	
	802.11n(HT20)	2412	5.56	5.67	-0.48	2.89	5.08	8.56	10.17	
		2442	5.78	5.75	-0.48	2.89	5.30	8.64	10.29	
		2472	5.42	5.36	-0.48	2.89	4.94	8.25	9.91	
	802.11n(HT40)	2422	3.81	3.84	-0.48	2.89	3.33	6.73	8.36	9.14
		2442	4.05	3.93	-0.48	2.89	3.57	6.82	8.50	
		2462	4.17	4.10	-0.48	2.89	3.69	6.99	8.66	

13. TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT

13.1 LIMIT

Item	Limits
3dB antenna beam width	360/A (If A<1; then A=1) A = {EIRP Power [mW] / 16.36 for DS, OFDM} or A = {EIRP Power [mW] / 4.9 for FH}
Note1: A = E.I.R.P. / (2.14dBi + "Antenna Power (limit)" of each modulation method (*3mW/MHz, 10mW/MHz, etc.)) Note2: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power(Conducted) limit is 10 mW/MHz (10 dBm/MHz), So the test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less	

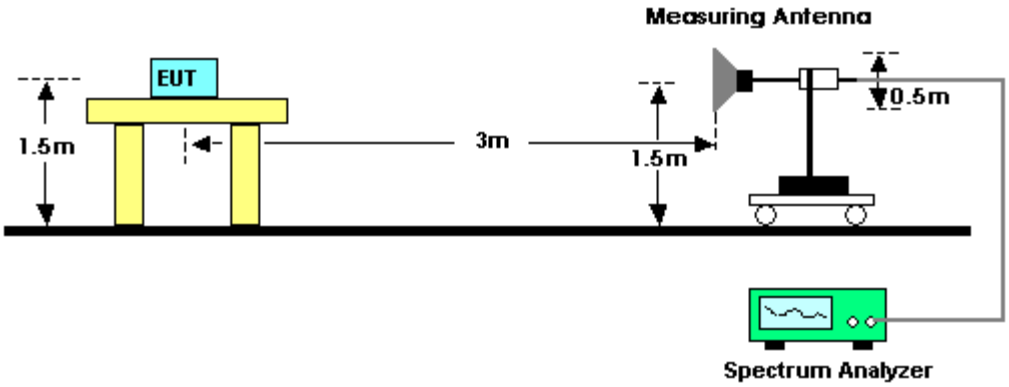
13.2 MEASURING INSTRUMENTS AND SETTING

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

13.3 TEST PROCEDURES

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.7.2 and tune reference level to observe receving signal position.
3. Rotate directions of the EUT horizontally and ertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within ± 50cm of EUT height and swing it to find the maximum output of measuing antenna. The output level at the spectrum analyzer is read as “E”
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below 360/A (If A<1; then A=1).
   A = {EIRP Power [mW] / 16.36 for DS, OFDM} or
   A = {EIRP Power [mW] / 4.9 for FH}

13.4 TEST SETUP LAYOUT



13.5 TEST DEVIATION

There is no deviation with the original standard.

13.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

13.7 TEST RESULT OF TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH)

Antenna B

Polar (H/V)	Frequency(MHz)	EIRP ANTENNA POWER(dBm)	EIRP ANTENNA POWER(mW)	A (See Note1)
H	2412	7.41	5.51	0.45
H	2442	7.16	5.2	0.43
H	2472	6.24	4.21	0.35
V	2412	6.35	4.32	0.36
V	2442	6.83	4.82	0.4
V	2472	6.57	4.54	0.37

3dB BEAMWIDTH test Limit is 360.

Note1: A = {EIRP Power [mW] / 12.14 for DS, OFDM}
Note2: All the modes had been tested, but only the worst data recorded in the report(802.11b).

14. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

14.1 LIMIT

Item	Limits
Identification code	≧ 48 bits

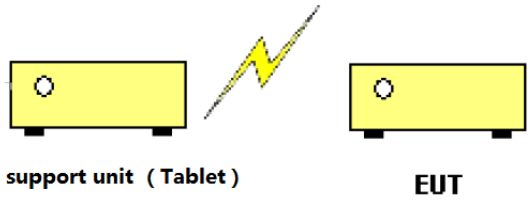
14.2 MEASURING ID CODE SOFTWARE

Item	Limits
MAC IP List	MAC Scan

14.3 TEST PROCEDURES

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes form EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification ocde: a. Transmit the predetermined identification codes form the counterpart. b . Check if communication is normal. c. Transmit the signals other than predetermined ID codes form the counterpart. d. check if the EUT stops the transmission, or if it displays that idnetification codes are different from the predetermined ones.

14.4 TEST SETUP LAYOUT



14.5 TEST DEVIATION

There is no deviation with the original standard.

14.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

14.7 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILIT

Test result:	CONFORM

MAC: 00:0a:f5:f0:11:4e

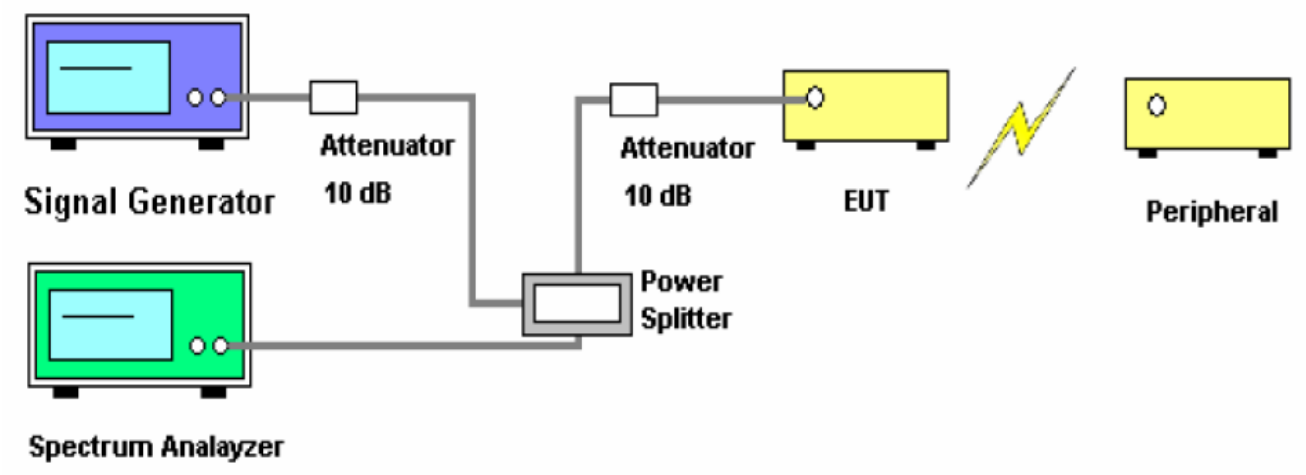
15. CARRIER SENSE CAPABILITY MEASUREMENT

15.1 LIMIT

EUT stop RF transmission signal after carrier inject to EUT

15.2 TEST PROCEDURE

Measurement System Diagram



1. SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of
modulation from SG and power level is (on 22.79+G-20*log(f)dBm)(G is the antenna gain,
f is the test frequency).
2. turn off the RF signal of the SG.
3. EUT have transmitted the maximum modulation signal and fixed channelize.
4. Setting of SA :RBW/VBW=1MHz/1MHz,Span=50MHz,Sweep time=auto,
Sweep mode=continuous, Detect mode=positive peak
5. SG RF signal on.
6. EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous
transmitted signal.

15.3 TEST RESULT

Mode	Channel	Result		
		Normal Voltage	High Voltage	Low Voltage
802.11n40	CH3	Pass	Pass	Pass
	CH7	Pass	Pass	Pass
	CH11	Pass	Pass	Pass

Note: For this test just evaluate the mode which bandwidth≥26MHz.
Pin=22.79+G-20*log(freq_MHz)[dBm]
Limit:100mw/m eirp
Confirmed at -44dBm
Result:OK

16. DUTY CYCLE OF TEST SIGNAL

16.1 STANDARD REQUIREMENT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.
All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage

16.2 FORMULA

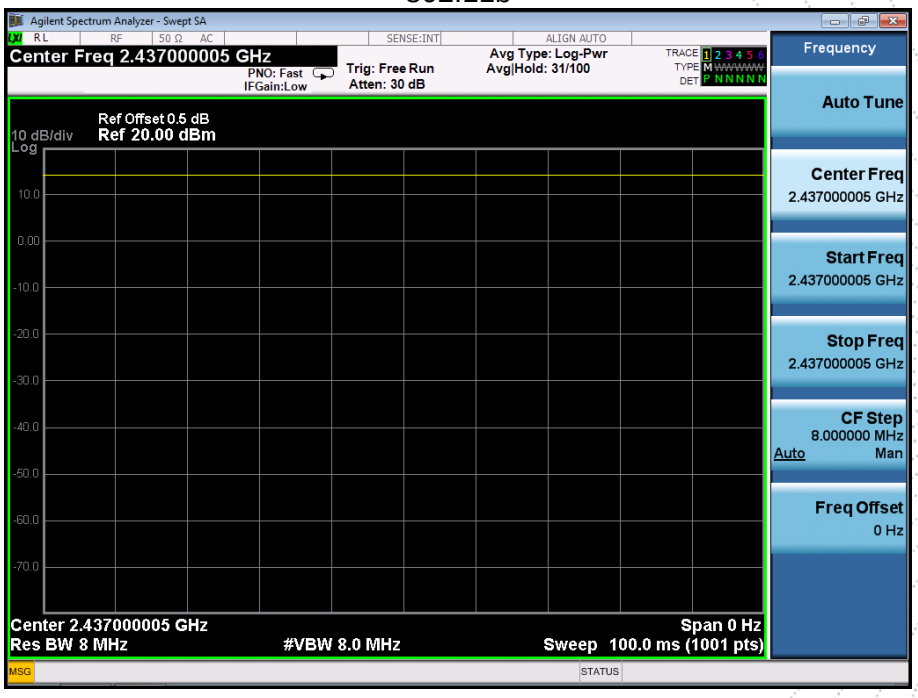
Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

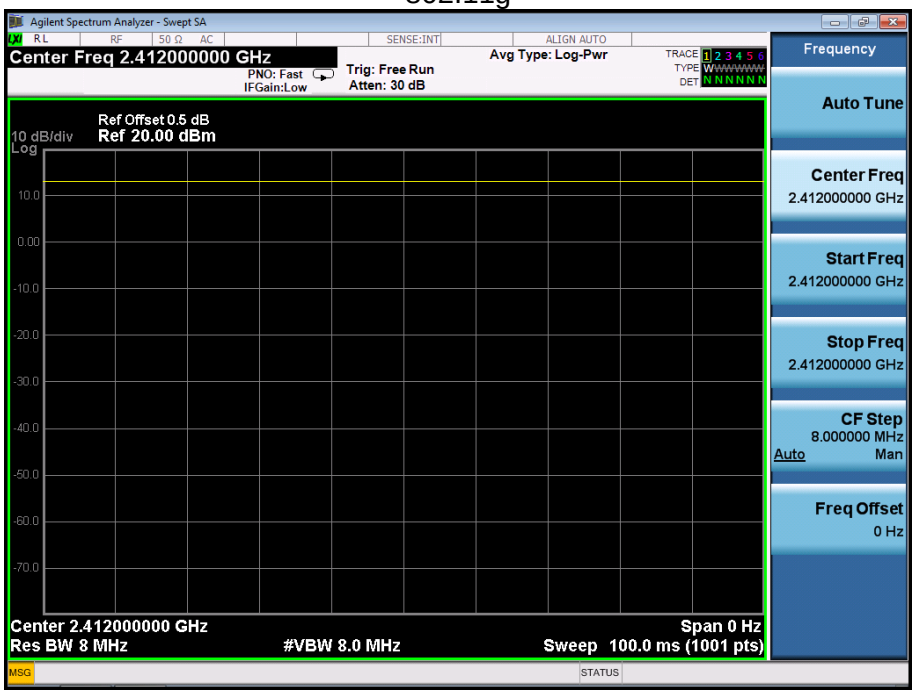
Duty Cycle:

	Duty Cycle	Duty Fator (dB)
802.11b	1	0
802.11g	1	0
802.11n(HT20)	1	0
802.11n(HT40)	1	0

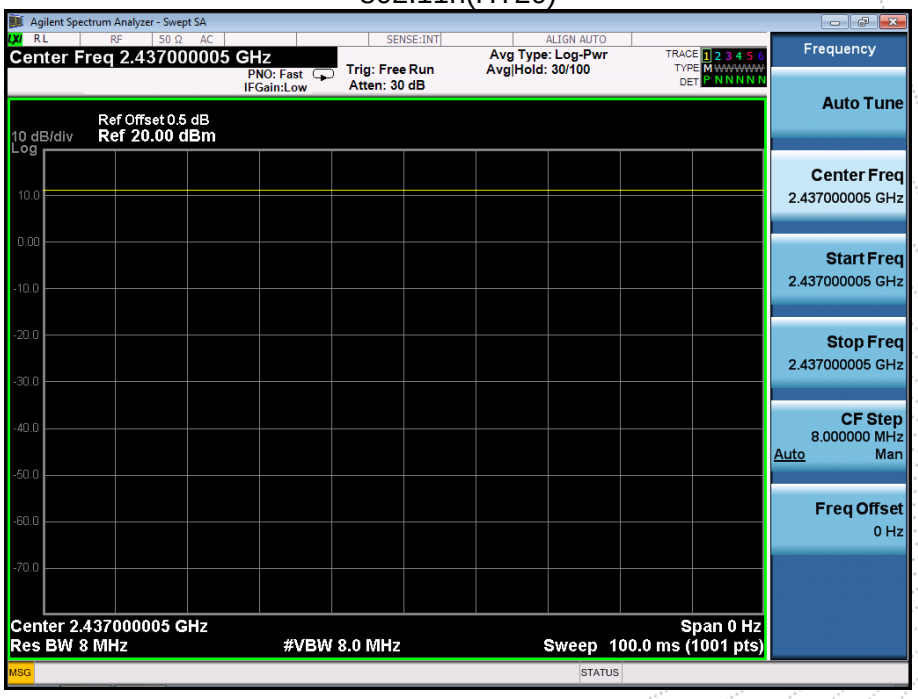
802.11b



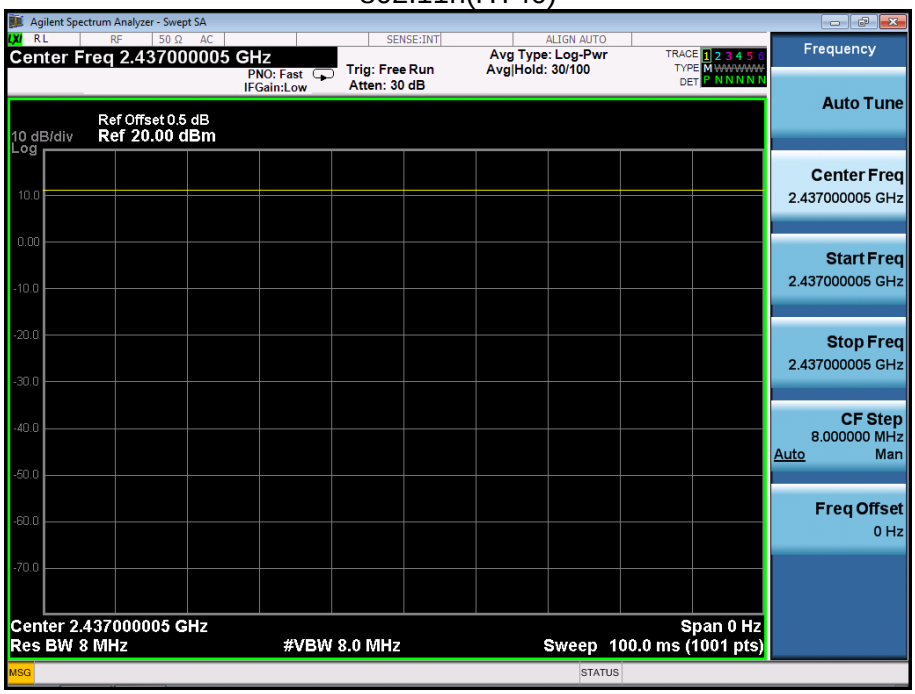
802.11g



802.11n(HT20)

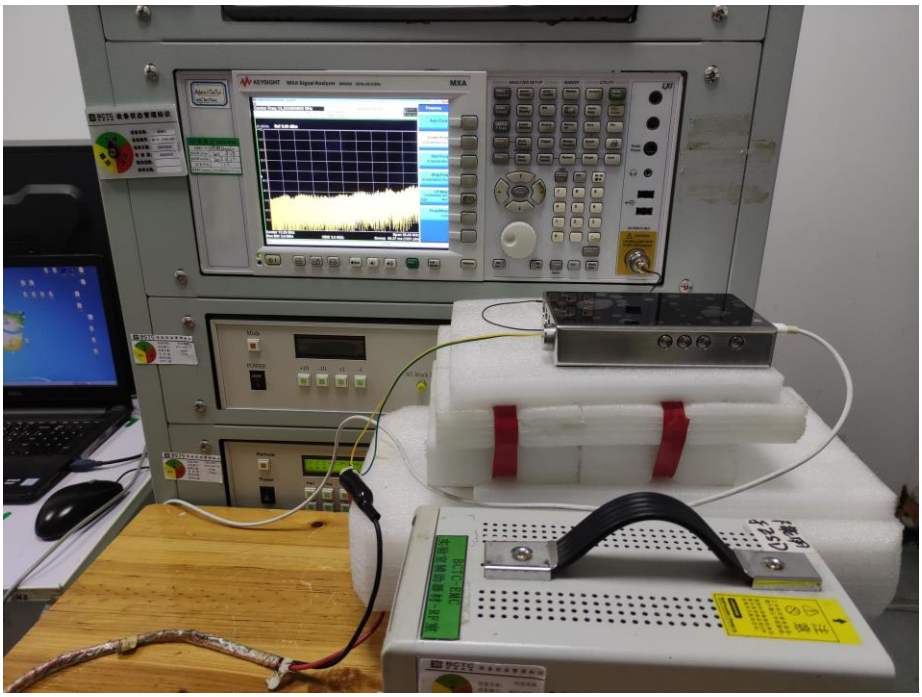


802.11n(HT40)

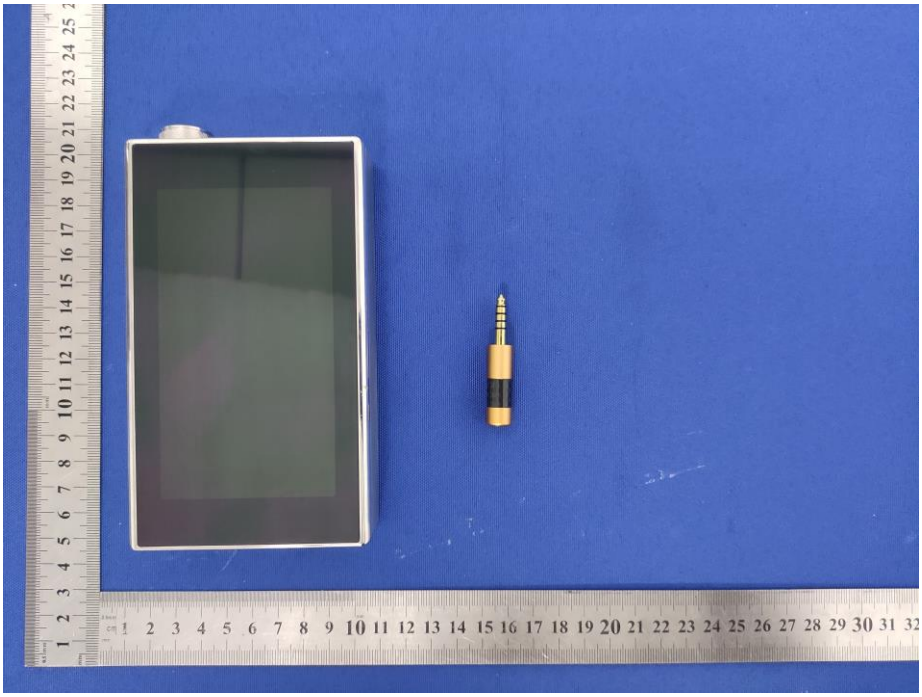

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.437000005 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 30/100
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.437000005 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 100.0 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.437000005 GHz
Start Freq
2.437000005 GHz
Stop Freq
2.437000005 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

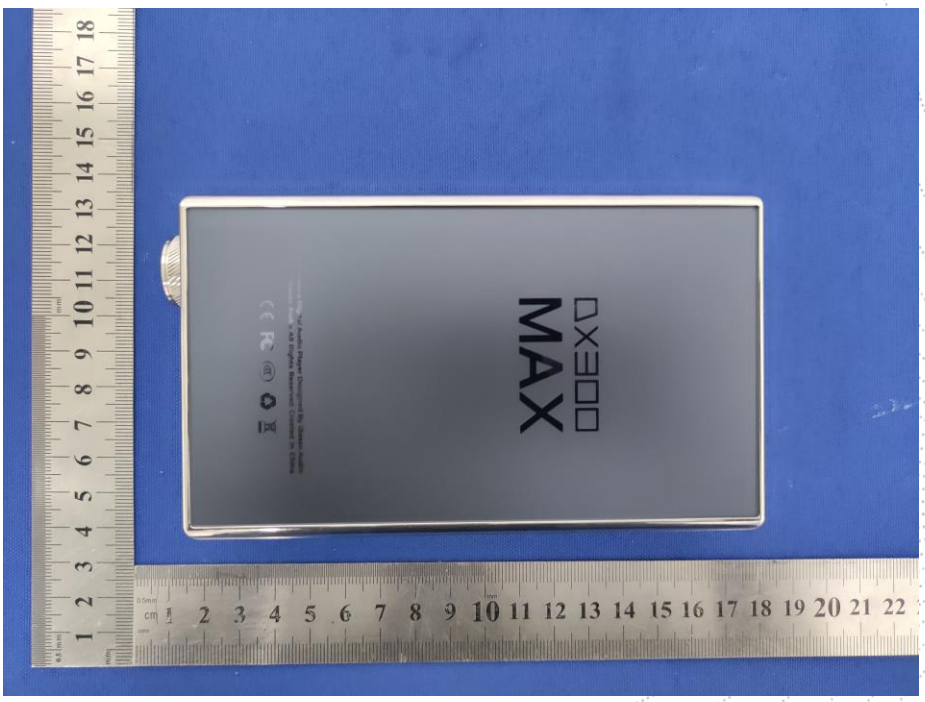
17. EUT TEST PHOTO

Measurement Photos



18. EUT PHOTOS





STATEMENT

1.The equipment lists are traceable to the national reference standards.

2.The test report can not be partially copied unless prior written approval is issued from our lab.

3.The test report is invalid without stamp of laboratory.

4.The test report is invalid without signature of person(s) testing and authorizing.

5.The test process and test result is only related to the Unit Under Test.

6.The quality system of our laboratory is in accordance with ISO/IEC17025.

7.If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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※※※※※ **END** ※※※※※