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Withings

RF TEST REPORT

Report Type:
FCC Part 15.255 RF report

Model:
WPA02

REPORT NUMBER:
2502B1019SHA-001

ISSUE DATE:
February 26, 2025

DOCUMENT CONTROL NUMBER:
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TEST REPORT

Report no.: 2502B1019SHA-001

Applicant:	Withings
	2 Rue Maurice Hartmann Issy-les-Moulineaux 92130 France
Manufacturer:	Withings
	2 Rue Maurice Hartmann Issy-les-Moulineaux 92130 France
Manufacturer Site:	YAHORNG (DONGGUAN) ELECTRONIC CO., LTD
	Room 201, Building #9, No.84 Gaoyu South Road,Tangxia Town, Dong Guan, Guangdong, China
Product Name:	Withings U-Scan Reader
Type/Model:	WPA02
FCC ID:	XNAWPA02

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 15 (2023): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2020): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

PREPARED BY:	**REVIEWED BY:**
Project Engineer Dylan Tang	Reviewer Wakeyou Wang

TEST REPORT

Content

Revision History

Report No.	Version	Description	Issued Date
2502B1019SHA-001	Rev. 01	Initial issue of report	February 26, 2025

Measurement result summary

TEST ITEM	FCC REFERENCE	RESULT
Equivalent Isotropic Radiated Power	15.255(c)	Pass
Peak Conducted Output Power	15.255(c)	Pass
Transmitter Off-times	15.255(c)	Pass
Unwanted Emissions	15.255(d)&15.209	Pass
Power line conducted emission	15.207(a)	NA
Assigned bandwidth (20dB bandwidth)	15.215(c)	Pass
Frequency Stability	15.255(f)	Pass
Antenna requirement	15.203	Pass

Notes: 1: NA =Not Applicable

TEST REPORT

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	Withings U-Scan Reader
Type/Model/PMN/HVIN:	WPA02
Description of EUT:	The EUT is Withings U-Scan Reader,it supports 60G Radar functions, there is only one model. We test them and list the worst results in this report.
Rating:	DC 3.8V
EUT type:	☒ Table top ☐ Floor standing
Software Version:	v3101
Hardware Version:	v10a
Sample Identification No.:	A4:7E:FA:3C:C9:04
Sample received date:	January 24, 2025
Date of test:	February 10, 2025 ~ February 21, 2025

Note：SOP document (RF_EMI_STM32WB_test_procedure_v7) for reference in fixed frequency testing.

1.2 Technical Specification

Frequency Range:	57000MHz ~ 64000MHz
Type of Modulation:	FMCW
Channel Number:	1
Antenna Information:	antenna in package

1.3 Description of Test Facility

Name:	Intertek Testing Services (Shanghai FTZ) Co., Ltd.
Address:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L21189
	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0014
	VCCI Registration Lab Registration No.: R-4243, G-845, C-4723, T-2252
	NVLAP Accreditation Lab NVLAP LAB CODE: 200849-0
	A2LA Accreditation Lab Certificate Number: 3309.02

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2023)
ANSI C63.10 (2020)
KDB 364244 DO1 Meas 15.255 Radars V01

2.2 Mode of operation during the test

The channel was tested as representatives.

Frequency Band (MHz)				57000 ~ 64000			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	**60000**	-	-	-	-	-	-

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Band and Model	Description
-	-	-	-

2.5 Test environment condition:

Test items	Temperature	Humidity
Equivalent Isotropic Radiated Power	22°C	55% RH
Peak Conducted Output Power		
Transmitter Off-times		

TEST REPORT

Emission outside the frequency band		
Occupied bandwidth		
Radiated Emissions in restricted frequency bands		
Power line conducted emission	21°C	52% RH

2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☐	Test Receiver	R&S	ESR7	EC 6194	2025-02-27
☐	A.M.N.	R&S	ESH2-Z5	EC 3119	2025-07-23
☐	A.M.N.	R&S	ENV4200	EC 3558	2025-06-05
☐	Attenuator	Hua Xiang	Ts5-10db-6g	EC 6194-1	2025-12-06
☐	Shielded room	Zhongyu	-	EC 2838	2026-01-09
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESIB 26	EC 3045	2025-08-18
☑	Test Receiver	R&S	ESR	EC6501	2025-09-10
☑	PXA Signal Analyzer	Keysight	N9030B	EC 6078	2025-03-18
☑	Bilog Antenna	TESEQ	CBL 6112B	EC 6411	2025-09-11
☐	Pre-amplifier	R&S	AFS42-00101800-25-S-42	EC 5262	2025-11-06
☑	Pre-amplifier	Tonscend	tap01018050	EC 6432-1	2025-12-03
☑	Horn antenna	Tonscend	bha9120d	EC 6432-2	2025-03-20
☑	Horn antenna	ETS	3116c	EC 5955	2025-08-14
☑	WW wave antenna (40-60G)	HengDa	M19RH	EC 6529-1	2025-03-09
☑	Mixer (40-60G)	VDi		EC 6529-2	2026-03-05
☑	WW wave antenna (60-90G)	HengDa	M12RH	EC 6382-1	2025-03-14
☑	Mixer (60-90G)	VDi		EC 6382-2	2026-03-05
☑	WW wave antenna (90-140G)	HengDa	M15RH	EC 6383-1	2025-03-12
☑	Mixer (90-140G)	VDi		EC 6383-2	2026-03-05
☑	WW wave antenna (140-220G)	HengDa	M5RH	EC 6384	2025-03-27
☑	Mixer (140-220G)	VDi		EC 6384-1	2026-03-05
☑	Semi-anechoic chamber	Albatross project	-	EC 3048	2026-07-11
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Therom-Hygrograph	Testo	175h1	EC 6640	2025-08-29
☑	Pressure meter	YM3	Shanghai Mengde	EC 3320	2025-08-16

2.7 Measurement uncertainty

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

Test item	Measurement uncertainty
Maximum peak output power	± 0.74dB
Radiated Emissions in restricted frequency bands below 1GHz	± 4.90dB
Radiated Emissions in restricted frequency bands above 1GHz	± 5.02dB
Emission outside the frequency band	± 2.89dB

3 Equivalent Isotropic Radiated Power & Peak Conducted Output Power& Transmitter Off-times

Test result: **Pass**

3.1 Limit

Within the 57–71 GHz band, emission levels shall not exceed the following equivalent isotropically radiated power(EIRP):
(1) Products other than fixed field disturbance sensors and short-range devices for interactive motion sensing shall comply with one of the following emission limits, as measured during the transmit interval:
(i) The average power of any emission shall not exceed 40 dBm and the peak power of any emission shall not exceed 43 dBm; or
(ii) For fixed point-to-point transmitters located outdoors, the average power of any emission shall not exceed 82 dBm, and shall be reduced by 2 dB for every dB that the antenna gain is less than 51 dBi. The peak power of any emission shall not exceed 85 dBm, and shall be reduced by 2 dB for every dB that the antenna gain is less than 51dBi.
(A) The provisions in this paragraph (c) for reducing transmit power based on antenna gain shall not require that the power levels be reduced below the limits specified in paragraph (c)(1)(i) of this section.
(B) The provisions of § 15.204(c)(2) and (4) that permit the use of different antennas of the same type and of equal or less directional gain do not apply to intentional radiator systems operating under this provision. In lieu thereof, intentional radiator systems shall be certified using the specific antenna(s) with which the system will be marketed and operated. Compliance testing shall be performed using the highest gain and the lowest gain antennas for which certification is sought and with the intentional radiator operated at its maximum available output power level. The responsible party, as defined in § 2.909 of this chapter, shall supply a list of acceptable antennas with the application for certification.
(2) For fixed field disturbance sensors that occupy 500 MHz or less of bandwidth and that are contained wholly within the frequency band 61.0–61.5 GHz, the average power of any emission, measured during the transmit interval, shall not exceed 40 dBm, and the peak power of any emission shall not exceed 43 dBm. In addition, the average power of any emission outside of the 61.0–61.5 GHz band, measured during the transmit interval, but still within the 57–71GHz band, shall not exceed 10 dBm, and the peak power of any emission shall not exceed 13 dBm.
(3) For fixed field disturbance sensors other than those operating under the provisions of paragraph (c)(2) of this section, and short-range devices for interactive motion sensing, the peak transmitter conducted output power shall not exceed −10 dBm and the peak EIRP level shall not exceed 10 dBm.
(4) The peak power shall be measured with an RF detector that has a detection bandwidth that encompasses the 57–71 GHz band and has a video bandwidth of at least 10 MHz. The average emission levels shall be measured over the actual time period during which transmission occurs.

Field disturbance sensors/radars shall not exceed −10 dBm peak conducted output power and 10 dBm peak EIRP except that field disturbance sensors/radars that limit their operation to all or part of the specified frequency band may operate without being subject to a transmitter conducted output power limit if they operate in compliance with paragraph (b)(3) of this section or with one or more of the provisions below:

57.0-59.4 GHz: the peak EIRP level shall not exceed 20 dBm for indoor operation or 30 dBm for outdoor

operation;
(ii) ***57.0-61.56 GHz:*** the peak EIRP shall not exceed 3 dBm except that the peak EIRP shall not exceed 20 dBm if the sum of continuous transmitter off-times of at least two milliseconds equals at least 16.5 milliseconds within any contiguous interval of 33 milliseconds;
(iii) ***57.0-64.0 GHz:***
(A) The peak EIRP shall not exceed 14 dBm, and the sum of continuous transmitter off-times of at least two milliseconds shall equal at least 25.5 milliseconds within any contiguous interval of 33 milliseconds, except as specific in paragraph (c)(2)(iii)(B) of this section;
(B) The peak EIRP shall not exceed 20 dBm, and the sum of continuous transmitter off-times of at least two milliseconds shall equal at least 16.5 milliseconds within any contiguous interval of 33 milliseconds when operated outdoors:
(*1*) As part of a temporary or permanently fixed application; or
(*2*) When being used in vehicular applications to perform specific tasks of moving something or someone, except for in-cabin applications;
(iv) A field disturbance sensor may operate in any of the modes in the above sub-sections so long as the device operates in only one mode at any time and does so for at least 33 milliseconds before switching to another mode.
(v) ***61.0-61.5 GHz:*** For field disturbance sensors/radars that occupy 500 MHz bandwidth or less that are contained wholly within the frequency band 61.0-61.5 GHz, the average power of any emission, measured during the transmit interval, shall not exceed 40 dBm, and the peak power of any emission shall not exceed 43 dBm. In addition, the average power of any emission outside of the 61.0-61.5 GHz band, measured during the transmit interval, but still within the 57-71 GHz band, shall not exceed 10 dBm, and the peak power of any emission shall not exceed 13 dBm.

For pulsed field disturbance sensors/radars operating in the 57-64 GHz band that have a maximum pulse duration of 6 ns, the average EIRP shall not exceed 13 dBm and the transmit duty cycle shall not exceed 10% during any 0.3 µs time window. In addition, the average integrated EIRP within the frequency band 61.5-64.0 GHz shall not exceed 5 dBm in any 0.3 µs time window. Peak emissions shall not exceed 20 dB above the maximum permitted average emission limit applicable to the equipment under test. The radar bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna.

3.2 Measurement Procedure

For Radiated emission above 1000MHz:

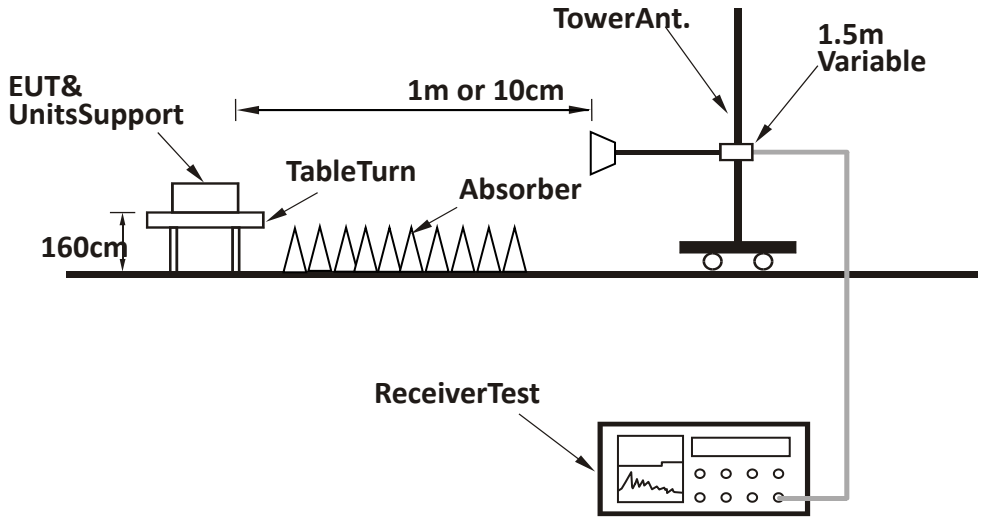
a) The measurements were performed at 3m test site.
b) The EUT is placed on a non-conductive table is 1.6 meter above test site ground plane.
c) The measurement procedure described in ANSI C63.10-2013 Section 9.9 was followed, to find maximum signal.
d) The average and peak voltages was recorded from the DSO.
e) Replace the EUT with mm-wave source to the RF input port of the instrumentation system.
f) The mm-wave source is unmodulated.
g) Adjust the amplitude of the mm-wave source such that the DSO indicates a voltage equal to the peak voltage recorded in step 4).
h) Without changing any settings, replace the DSO with the mm-wave power meter.
i) Measure and note the power.

Note:

1. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 3 x RBW (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
3. All modes of operation were investigated and the worst-case emissions are reported

3.3 Test Configuration

For Radiated emission above 40GHz:



3.4 Test Results of Radiated Emissions

Peak Power(e.i.r.p)

Frequency (GHz)	P (dBm)	G (dBi)	E (dBμV/m)	d-Meas (m)	Desensitization factor (dB)	EIRP (dBm)	Limit (dBm)
58.77	-46.27	23.31	103.061	1.5	5.42	3.78	14.0

Note.

1. Sample calculation.

$E = 126.8 – 20\log(\lambda) + P – G$

where

E is the field strength of the emission at the measurement distance, in dBμV/m

P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.7 + \text{Desensitization factor}$

where

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

FMCW desensitization factor =-20 * Log(α) =5.42dB

$$\alpha = \frac{1}{\sqrt[4]{1+\left(\frac{2\ln(2)}{\pi}\right)^2\left(\frac{F_s}{T_s B^2}\right)^2}}$$

F_s = Sweep width = 5588.2MHz

T_s = Sweep time = 740 μs

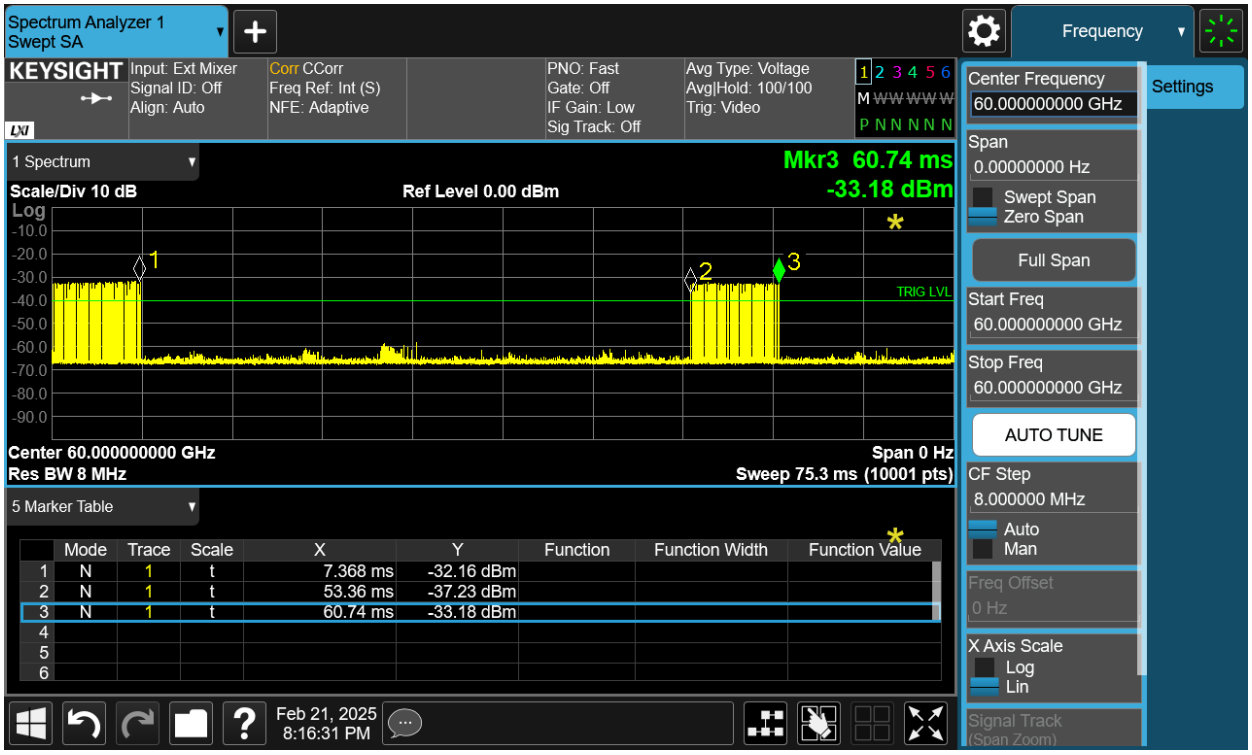
B = 3 dB IF bandwidth =1MHz

Transmitter Off-times

Transmitter off-times (ms)	Observation Time (ms)	Sum of continuous Transmitter off-times (ms)	Limit (ms)
7.37	33	32.99	25.5

TEST REPORT


Spectrum Analyzer 1
Swept SA
KEYSIGHT
Input: Ext Mixer
Signal ID: Off
Align: Auto
Corr CCorr
Freq Ref: Int (S)
NFE: Adaptive
PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off
Avg Type: Voltage
Avg|Hold: 100/100
Trig: Video
Trig Delay: -799.0 µs
1 Spectrum
Scale/Div 10 dB
Ref Level 0.00 dBm
Log
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
TRIG LVL
Center 60.000000000 GHz
Res BW 8 MHz
Span 0 Hz
Sweep 10.0 ms (10001 pts)
5 Marker Table
Mode Trace Scale X Y Function Function Width Function Value
1 N 1 t 798.0 µs -35.72 dBm
2 N 1 t 915.0 µs -35.61 dBm
Feb 21, 2025
8:25:29 PM
Frequency
Center Frequency
60.000000000 GHz
Settings
Span
0.00000000 Hz
Swept Span
Zero Span
Full Span
Start Freq
60.000000000 GHz
Stop Freq
60.000000000 GHz
AUTO TUNE
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
X Axis Scale
Log
Lin
Signal Track
(Span Zoom)


Spectrum Analyzer 1
Swept SA
KEYSIGHT
Input: Ext Mixer
Signal ID: Off
Align: Auto
Corr CCorr
Freq Ref: Int (S)
NFE: Adaptive
PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off
Avg Type: Voltage
Avg|Hold: 100/100
Trig: Video
1 Spectrum
Mkr3 60.74 ms
-33.18 dBm
Scale/Div 10 dB
Ref Level 0.00 dBm
Log
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
TRIG LVL
Center 60.000000000 GHz
Res BW 8 MHz
Span 0 Hz
Sweep 75.3 ms (10001 pts)
5 Marker Table
Mode Trace Scale X Y Function Function Width Function Value
1 N 1 t 7.368 ms -32.16 dBm
2 N 1 t 53.36 ms -37.23 dBm
3 N 1 t 60.74 ms -33.18 dBm
Feb 21, 2025
8:16:31 PM
Frequency
Center Frequency
60.000000000 GHz
Settings
Span
0.00000000 Hz
Swept Span
Zero Span
Full Span
Start Freq
60.000000000 GHz
Stop Freq
60.000000000 GHz
AUTO TUNE
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
X Axis Scale
Log
Lin
Signal Track
(Span Zoom)

4 Unwanted emissions

Test result: **Pass**

4.1 Limit

The radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified showed as below:

Frequencies (MHz)	Field Strength (microvolts/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

4.2 Measurement Procedure

For Radiated emission below 30MHz:

a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c) Both X and Y axes of the antenna are set to make the measurement.
d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz:

j) The EUT was placed on the top of a rotating table 0.01 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360

degrees to determine the position of the highest radiation.

k) The EUT was set 3 or 1 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

l) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

m) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

n) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

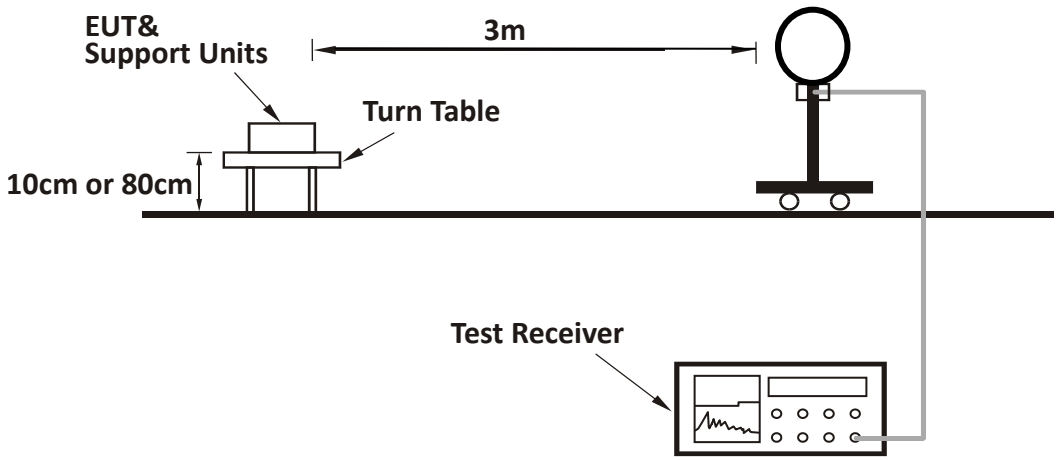
o) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

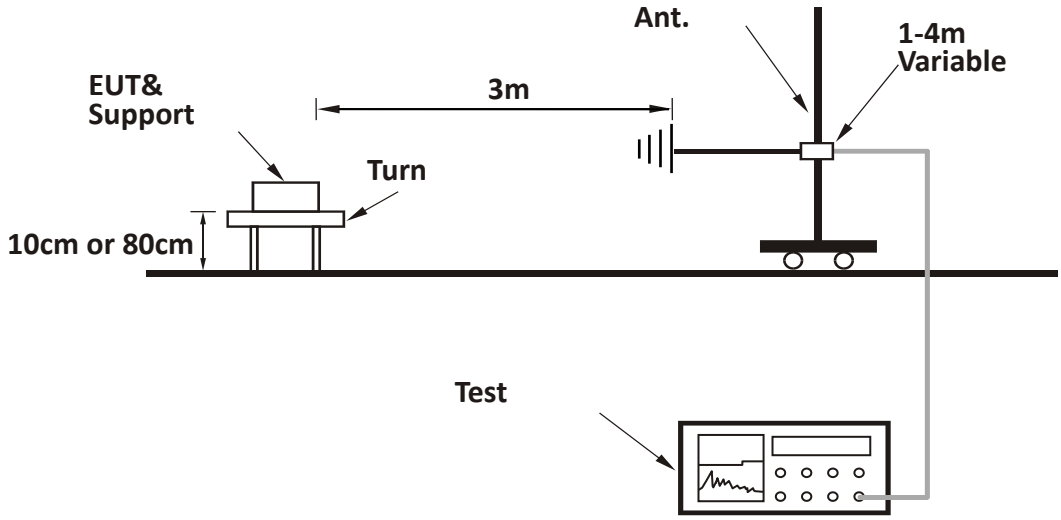
4. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
6. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 3 x RBW (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
7. All modes of operation were investigated and the worst-case emissions are reported

4.3 Test Configuration

For Radiated emission below 30MHz:

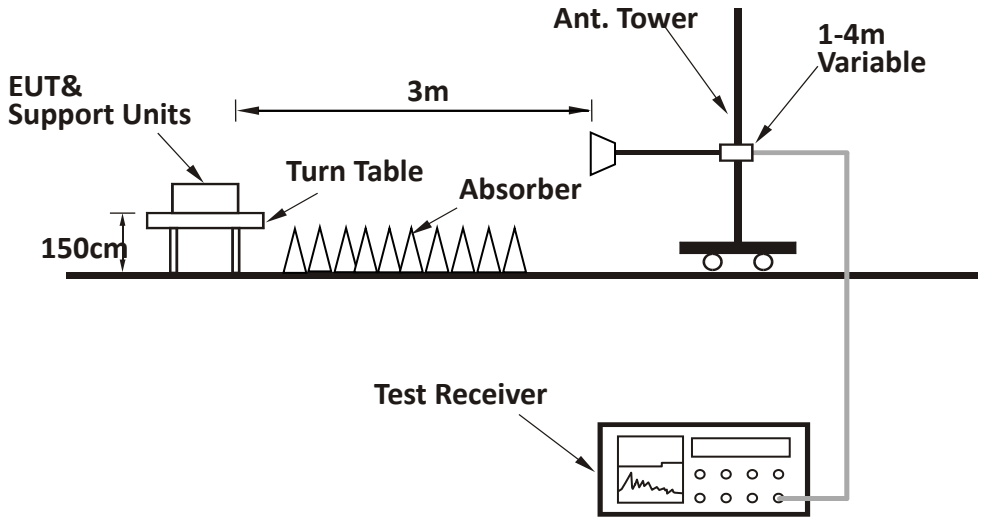


For Radiated emission 30MHz to 1GHz:

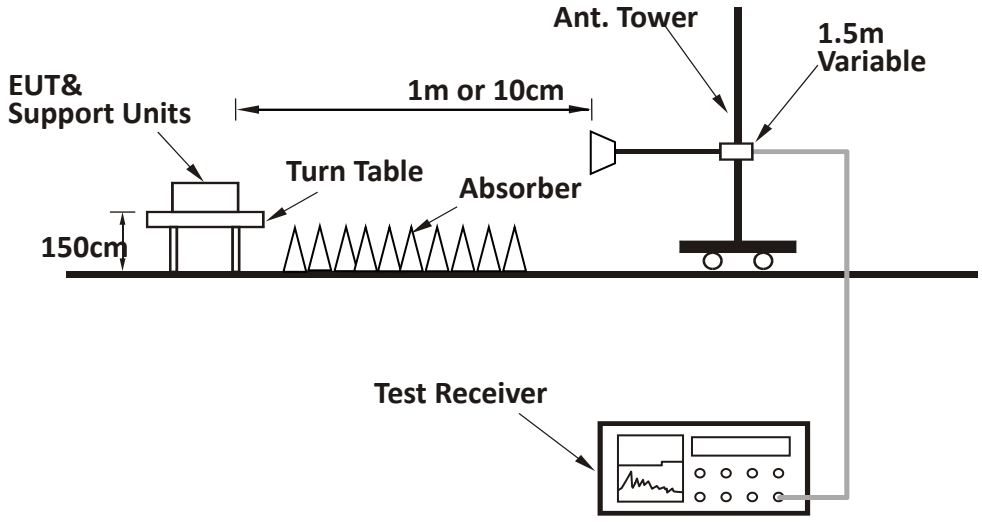


TEST REPORT

For Radiated emission 1GHz to 40GHz:



For Radiated emission above 40GHz:

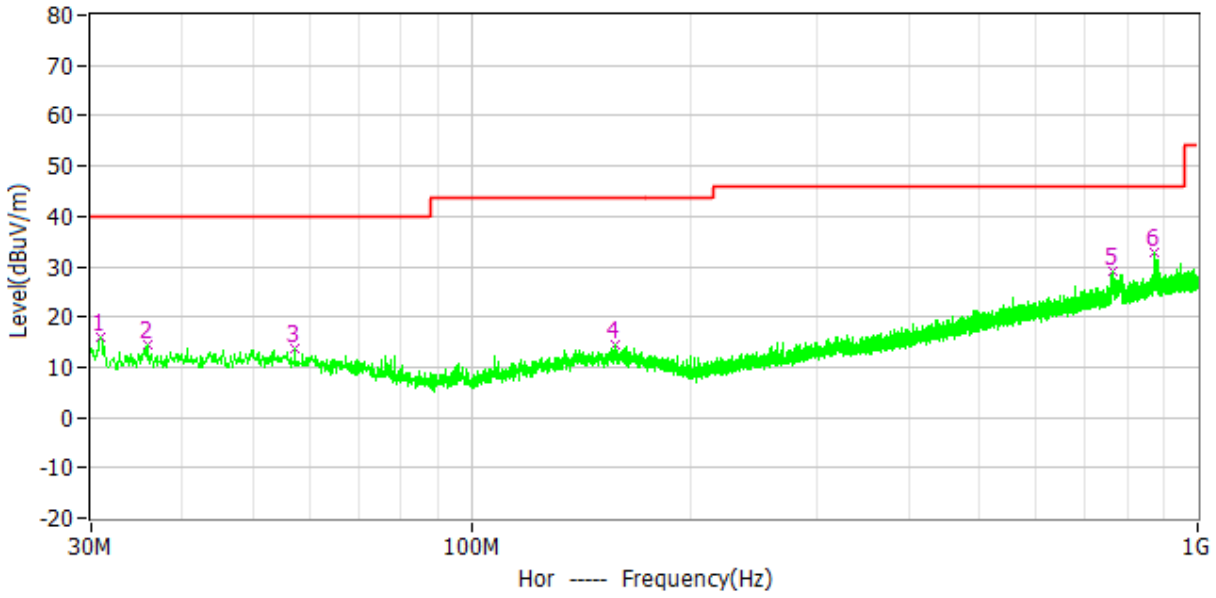


4.4 Test Results of Radiated Emissions

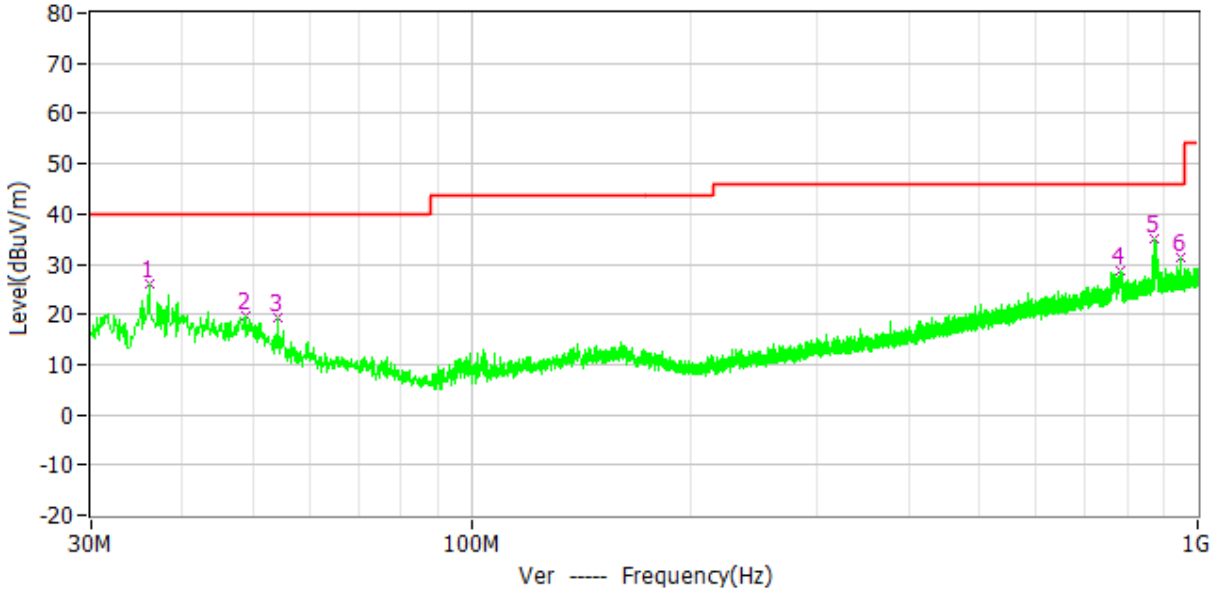
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

The worst waveform from 30MHz to 1000MHz is listed as below:

Horizontal



Vertical



Test data below 1GHz

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	30.970	16.07	12.35	40.00	23.93	QP
H	35.820	14.54	13.22	40.00	25.46	QP
H	57.257	13.75	14.04	40.00	26.25	QP
H	158.137	14.52	14.78	43.50	28.98	QP
H	764.387	29.23	25.17	46.00	16.77	QP
H	869.147	32.72	26.73	46.00	13.28	QP
V	36.014	26.08	13.25	40.00	13.92	QP
V	48.818	19.53	14.49	40.00	20.47	QP
V	54.347	19.40	14.25	40.00	20.60	QP
V	782.041	28.84	25.46	46.00	17.16	QP
V	869.147	34.95	26.73	46.00	11.05	QP
V	948.687	31.20	27.51	46.00	14.80	QP

The emission was conducted from 1GHz to 40GHz

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	6144	37.51	74.00	36.49	PK
H	6758	26.09	54.00	27.91	AV
H	12515	36.62	74.00	37.38	PK
H	12788	23.93	54.00	30.07	AV
H	23339	58.45	74.00	15.55	PK
H	23339	48.93	54.00	5.07	AV
H	40000	55.57	74.00	18.43	PK
H	40000	48.54	54.00	5.46	AV
V	3998	33.27	74.00	40.73	PK
V	4100	21.97	54.00	32.03	AV
V	9074	39.17	74.00	34.83	PK
V	11425	24.22	54.00	29.78	AV
V	23355	58.92	74.00	15.08	PK
V	23355	50.73	54.00	3.27	AV
V	40000	57.10	74.00	16.90	PK
V	40000	49.12	54.00	4.88	AV

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (- Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = Limit - Corrected Reading
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV,
Limit = 40.00dBuV/m.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m;
Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m;
Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.

The emission was conducted from 40GHz to 200GHz

Antenna	Frequency (GHz)	P (dBm)	G (dBi)	E (dBμV/m)	d-Meas (m)	EIRP (dBm)	PD (pW/cm2)	Limit (pW/cm2)
H	40767	-60.49	22.76	86.214	1	-18.486	12.541	90
H	71250	-56.10	23.58	94.633	1	-10.067	87.151	90
H	122600	-65.57	23.63	89.827	1	-14.873	28.819	90
H	153040	-66.39	22.71	91.854	0.5	-18.867	11.488	90
V	40888	-60.08	22.76	86.649	1	-18.051	13.864	90
V	71310	-56.19	23.58	85.008	1	-10.149	85.507	90
V	122400	-65.39	23.63	89.993	1	-14.707	29.941	90
V	193440	-65.88	23.49	93.619	0.5	-17.102	17.248	90

Remark: 1. Correct Factor = Antenna Factor + Cable Loss + Mixer Conversion Loss, the value was added to Original Receiver Reading by the software automatically.
2. Sample calculation.
E = 126.8 – 20log(λ) + P –G
where
E is the field strength of the emission at the measurement distance, in dBμV/m
P is the power measured at the output of the test antenna, in dBm
λ is the wavelength of the emission under investigation [300/fMHz], in m
G is the gain of the test antenna, in dBi
EIRP = EMeas + 20log (dMeas) −104.7
where
EIRP is the equivalent isotropically radiated power, in dBm
E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m
d_{Meas} is the measurement distance, in m
PD=EIRPLinear/4πd2 = 10^(EIRP/10)*10^(9)/(4*3.14*300*300) = 10^(EIRP/10)*885
where
PD is the power density at the distance specified by the limit, in pW/cm2
$EIRP_{Linear}$ is the equivalent isotropically radiated power, in pW
d is the 300cm

5 Frequency stability

Test result: **Pass**

5.1 Limit

Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

5.2 Test Result

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	Tested Frequency: 60 GHz	
			Measured low frequency(FL) (GHz)	Measured High frequency(FH) (GHz)
100%	5	-20	57.601	63.148
100%				
100%		-10	57.558	63.147
100%		0	57.557	63.145
100%		+10	57.600	63.148
100%		+20	57.559	63.149
100%		+30	57.558	63.147
100%		+40	57.555	63.145
100%		+50	57.559	63.148
115%	5.75	+20	57.602	63.150
85%	4.25	+20	57.559	63.150

Note: Fundamental emissions were contained within the frequency bands

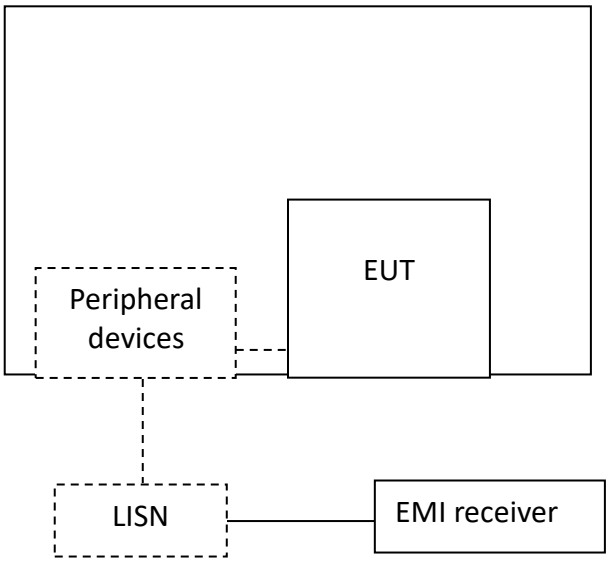
6 Power line conducted emission

Test result: **NA**

6.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

6.2 Test Configuration



6.3 Measurement Procedure

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

6.4 Test Results of Power line conducted emission

Test Data:

No.	Frequency	Limit dBuV	Level dBuV	Margin dB	Reading dBuV	Factor dB	Detector	Phase
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								

Remark: 1. Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.

2. Level = Reading + Factor

3. Margin = Limit - Level

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

7 Assigned bandwidth (20dB bandwidth)

Test result: **Pass**

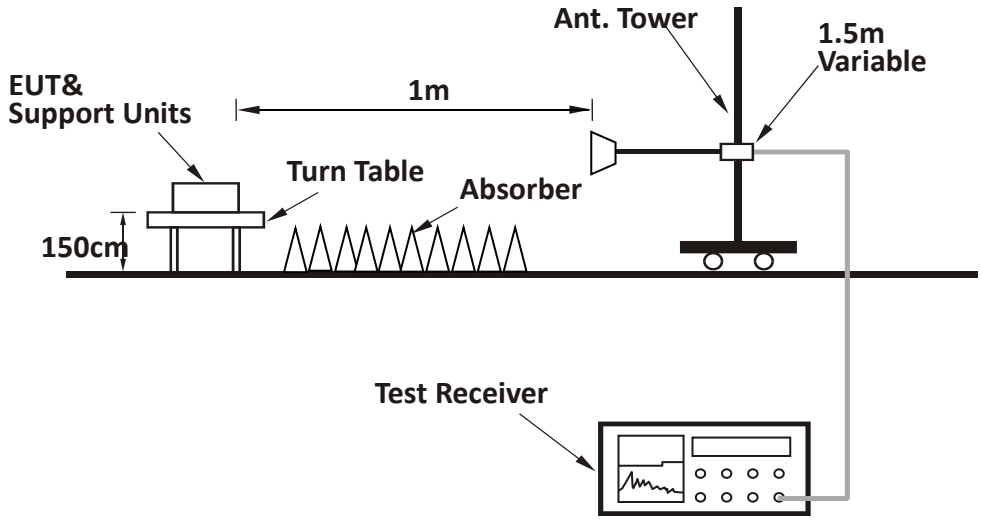
7.1 Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission is contained within the allocated frequency band.

7.2 Measurement Procedure

The 20dB Bandwidth is measured using the Spectrum Analyzer.
Set Span = 2 to 3 times the 20 dB bandwidth, RBW = approximately 1% to 5% of the actual occupied, VBW>3xRBW, Sweep = auto, Detector = peak, Trace = max hold.
The test was performed at one channel.

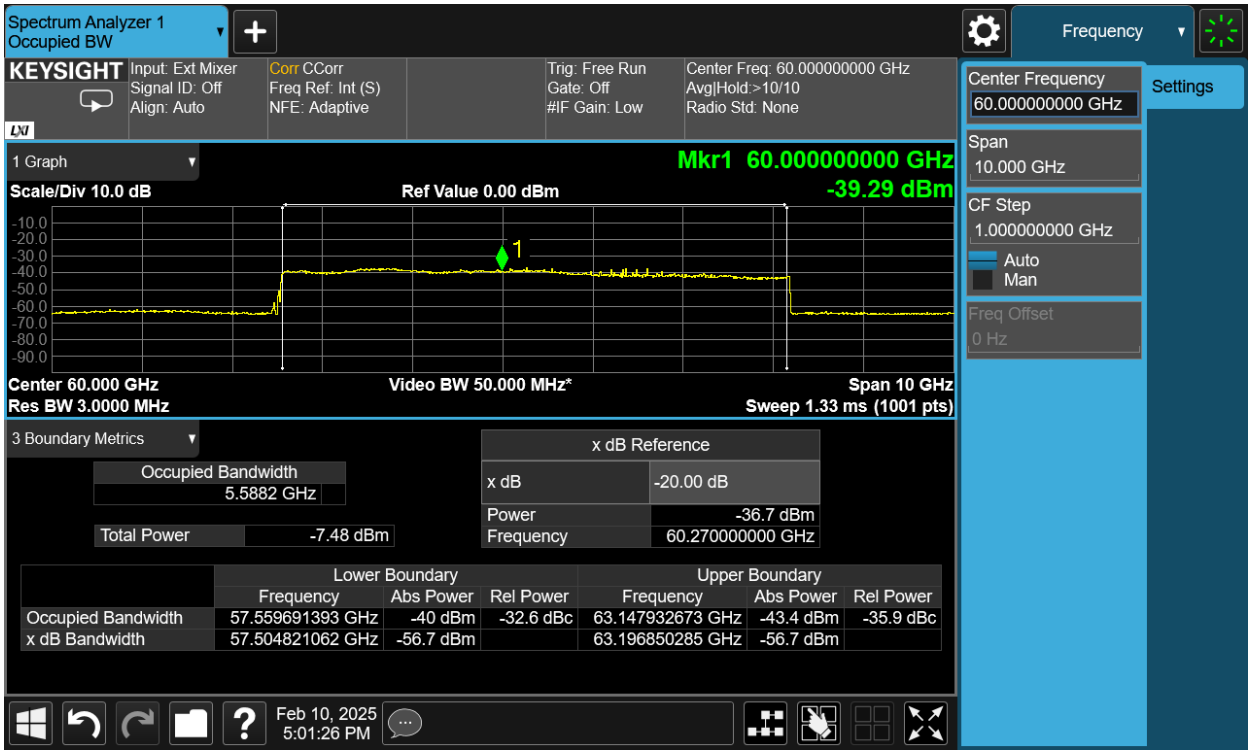
7.3 Test Configuration



TEST REPORT

7.4 The results

Frequency band (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)	F_L at 20dB BW (MHz)	F_H at 20dB BW (MHz)
57000 ~ 71000	57504.82	57559.69	>57000	/
	63196.85	63147.93	/	<71000
Limit	N/A	N/A	F_L >57000	F_H <71000
Result	**Complied**			



8 Antenna requirement

Requirement:
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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Result:
EUT uses permanently attached antenna to the intentional radiator, so it can comply with the provisions of this section.

********** END **********