

Pi Square Technologies India Pvt. Ltd.

RF TEST REPORT

Report Type:

FCC Part 15.256 RF report

Model:

ISP2025

REPORT NUMBER:

2512B1438SHA-001

ISSUE DATE:

May 8, 2026

DOCUMENT CONTROL NUMBER:

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Main Road, Bengaluru, Karnataka, 560045, India

Manufacturer: Pi Square Technologies India Pvt. Ltd.
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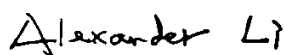
Product Name: Patrol Radar
FCC ID: 2BT32-ISP2025

SUMMARY:

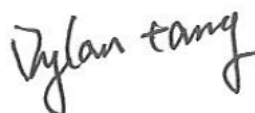
The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 15 (2024): 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
Alexander Li



Reviewer
Dylan Tang

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TEST REPORT

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Revision History

Report No.	Version	Description	Issued Date
2512B1438SHA-001	Rev. 01	Initial issue of report	May 8, 2026

Measurement result summary

TEST ITEM	FCC REFERENCE	RESULT
Fundamental emissions	15.256(g)	Pass
Unwanted Emissions	15.256(h)&15.209	Pass
Antenna beamwidth	15.256(i) (j)	Pass
Fundamental bandwidth	15.256 (f) (1) (2)	Pass
Frequency Stability	15.215 (c)	Pass
Power line conducted emission	15.207(a)	Pass
Antenna requirement	15.203	Pass

Notes: 1: NA =Not Applicable

2: Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

3: Additions, Deviations and Exclusions from Standards: None.

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1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	Patrol Radar
Type/Model/PMN/HVIN:	ISP2025
Description of EUT:	The EUT is a Patrol Radar.
Rating:	DC5V by type C port for charging DC12.8V by battery
Brand Name:	i Safety Patrol
EUT type:	☒ Table top ☐ Floor standing
Software Version:	/
Hardware Version:	/
Sample Identification No.:	A251223-02-001
Sample received date:	December 23, 2025
Date of test:	December 23, 2025 to April 21, 2026

1.2 Technical Specification

Frequency Band:	76000MHz ~ 81000MHz
Type of Modulation:	FMCW
Channel Number:	1
Antenna Information:	PCB antenna
Antenna Gain:	10.5dBi

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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-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02

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2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2024)
ANSI C63.10 (2020)
KDB 890966 D01 v01r01

2.2 Mode of operation during the test

The channel was tested as representatives.
The lowest, middle and highest channel were tested as representatives.

Frequency Band (MHz)	Mode	Channel (MHz)
76000 ~ 81000	FMCW	77000

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	Brand and Model	Description
1	adapter	Honor, Honor, HW-110600C02	--

2.5 Test environment condition:

Test items	Temperature	Humidity
Minimum 6dB Bandwidth	25°C	54%RH
Maximum conducted output power and e.i.r.p.		
Power spectrum density		
Emission outside the frequency band		
Occupied bandwidth		
Radiated Emissions in restricted frequency bands	23°C	52%RH
Power line conducted emission	24°C	53%RH

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2.6 Instrument list

Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESIB 26	EC 3045	2026-08-18
☒	Test Receiver	R&S	ESR	EC 6501	2026-09-10
☒	Bilog Antenna	TESEQ	CBL 6112B	EC 6411	2026-09-11
☒	TRILOG broadband Antenna	Schwarzbeck	VULB9168	EC 6402	2027-03-19
☒	Pre-amplifier	R&S	AFS42-00101800-25-S-42	EC 5262	2026-11-06
☐	Pre-amplifier	Tonscend	tap01018050	EC 6432-1	2026-12-03
☐	Horn antenna	Tonscend	bha9120d	EC 6432-2	2027-03-20
☒	Horn antenna	ETS	3117	EC 4792-1	2026-09-13
☒	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2026-09-12
☐	Active loop antenna	Schwarzbeck	FMZB1519	EC 5345	2026-08-10
☒	Horn antenna	ETS	3116c	EC 5955	2026-08-14
☒	WW wave antenna (60-90G)	HengDa	M12RH	EC 6382-1	2027-03-14
☒	Mixer (60-90G)	VDi		EC 6382	2027-03-24
☒	WW wave antenna (90-140G)	HengDa	M15RH	EC 6381-1	2027-03-12
☒	Mixer (90-140G)	VDi		EC 6381	2027-03-24
☒	WW wave antenna (40-60G)	HengDa	M19RH	EC 6529-1	2027-03-09
☒	Mixer (40-60G)	VDi		EC 6529	2027-03-24
☒	WW wave antenna (140-220G)	HengDa	M5RH	EC 6384-1	2027-03-28
☒	Mixer (140-220G)	VDi		EC 6384	2027-03-24
Tet Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Semi-anechoic chamber	Albatross project	-	EC 3048	2026-07-11
☐	Fully-anechoic chamber	Albatross project	-	EC 3047	2026-07-11
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Thermo-Hygrograph	Testo	175h1	EC 6640	2026-08-29
☐	Pressure meter	YM3	Shanghai Mengde	EC 3320	2026-08-16

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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	$\pm 0.74\text{dB}$
Radiated Emissions in restricted frequency bands below 1GHz	$\pm 4.90\text{dB}$
Radiated Emissions in restricted frequency bands above 1GHz	$\pm 5.02\text{dB}$
Emission outside the frequency band	$\pm 2.89\text{dB}$
Power line conducted emission	$\pm 3.19\text{dB}$

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3 Fundamental Emission

Test result: Pass

3.1 Limit

The EIRP limits for LPR operations in the bands authorized by this rule section are provided below. The emission limits are based on boresight measurements (i.e., measurements performed within the main beam of an LPR antenna).

Frequencies (GHz)	Average emission limit (EIRP in dBm/1 MHz)	Peak emission limit (EIRP in dBm/50 MHz)
5.925 ~ 7.250	-33	7
24.05 ~ 29.00	-14	26
75 ~ 85	-3	34

3.2 Measurement Procedure

For Radiated emission above 1000MHz:

- The measurements were performed at 3m test site.
- The EUT is placed on a non-conductive table is 1.6 meter above test site ground plane.
- The measurement procedure described in ANSI C63.10-2020 Section 9.9 was followed, to find maximum signal.
- The average and peak voltages was recorded from the DSO.
- Replace the EUT with mm-wave source to the RF input port of the instrumentation system.
- The mm-wave source is unmodulated.
- Adjust the amplitude of the mm-wave source such that the DSO indicates a voltage equal to the peak voltage recorded in step 4).
- Without changing any settings, replace the DSO with the mm-wave power meter.
- Measure and note the power.

Analyzer settings (EIRP in 1 MHz):

- Resolution Bandwidth (RBW): 1 MHz
- Video Bandwidth (VBW): 3 MHz
- Span: 8 GHz
- Trace: Maxhold
- Sweeps: allow the trace to stabilize
- Sweep time: $TD = T_s / \Delta F$ (where T_s is the signal sweep frequency time in seconds; ΔF is the signal sweep frequency in MHz)
- Detector: Peak

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Analyzer settings (EIRP in 50 MHz):

- a) Resolution Bandwidth (RBW): 50 MHz
- b) Video Bandwidth (VBW): 50 MHz
- c) Span: 8 GHz
- d) Trace: Maxhold
- e) Sweeps: allow the trace to stabilize
- f) Sweep time: $TD = T_s / \Delta F$ (where T_s is the signal sweep frequency time in seconds; ΔF is the signal sweep frequency in MHz)
- g) Detector: Peak

Fundamental emission for Pulsed Transmitters

1. For radiated emission measurements, locate the receive test antenna at a far field distance Bore sighted on the LPR transmit antenna. Adjust the LPR and the test antenna for maximum main beam coupling.
2. For conducted measurements, connect the output of the LPR transmitter through an appropriate attenuator to the downconverter or external harmonic mixer, if necessary, to the spectrum analyzer.
3. Set the spectrum analyzer for power averaging (RMS) detector and 1 MHz RBW.
4. Record the maximum level and frequency of the signal within the fundamental emission bandwidth, which must be contained entirely within the authorized frequency band.
5. Centered on the frequency of the maximum signal recorded in step 4, select peak detector, 50 MHz RBW and at least 50 MHz VBW. a. If 50 MHz RBW is not available on the spectrum analyzer, determine the maximum of the spectrum trace in a narrower RBW which is greater than or less than the PRF by a factor of 3, but not less than 1 MHz, and calculate the maximum signal level in 50 MHz by adding the appropriate correction factor shown below to the maximum measured signal level. For pulsed LPRs

$20 \text{ Log } (50/\text{RBW}) \text{ dB, if } \text{PRF} < \text{RBW}/3$

$20 \text{ Log } (50/\text{PRF}) \text{ dB, if } \text{PRF} > 3 * \text{RBW}$

where:

RBW is the resolution bandwidth in MHz

PRF is the pulse repetition frequency in MHz

- b. It may be necessary to offset the measurement frequency in order to ensure that the measurement is made within the fundamental emission bandwidth because the 3 dB bandwidth of the RBW is not entirely within the fundamental emission bandwidth. The measurement shall be made at the nearest frequency to the frequency identified in step 4 when the 3 dB point of the RBW closest to the fundamental emission band edge is at the frequency of the band edge.
- c. If the measurement must be performed with a RBW greater than 3 MHz because the PRF is between 1 MHz and 3 MHz or for any other reason, the test report must contain a detailed description of the test procedure, calibration of the test setup, and the instrumentation used.

6. Determine the conducted power output of the EUT or the field strength produced by the EUT at a given distance from the measurements in steps 1 to 5 by calculation taking into account all attenuators, amplifier gains, antenna factor, measurement distance extrapolation, conversion loss, cable losses, etc. as applicable or the signal substitution method.

7. The EIRP is then calculated by applying the appropriate equation as follows: a. For conducted

TEST REPORT

measurements $EIRP \text{ (dBm)} = \text{conducted power (dBm)} + \text{antenna gain (dBi)}$ where the conducted power is the conducted power output of the EUT and antenna gain is the gain of the EUT antenna.

b. For radiated emission measurements $EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} - 104.8 + 20 \text{ Log } D$ where E is the field strength at the far field distance D.

Fundamental Emissions for FMCW transmitters

When making the following measurements, it is important to recognize that there is a sweep frequency time and sweep frequency span for both the LPR signal and the spectrum analyzer which are independent of each other.

1. For radiated emission measurements, locate the receive test antenna at a far field distance bore sighted on the LPR transmit antenna. Adjust the LPR and the test antenna for maximum main beam coupling.
2. For conducted measurements, connect the output of the LPR transmitter through an appropriate attenuator to the downconverter or external harmonic mixer, if necessary, to the spectrum analyzer.
3. Set the spectrum analyzer frequency span to enable viewing the entire sweep frequency span of the LPR signal.
4. Calculate the dwell time, TD, of the sweep frequency signal per MHz of the sweep frequency span $TD = TS/\Delta F$

where:

TS is the signal sweep frequency time in seconds

ΔF is the signal sweep frequency span in MHz

5. Set the detector to peak mode.
6. Set the RBW to 1 MHz.
7. Perform sufficient multiple scans on the spectrum analyzer in maximum hold with a sweep time suitable for displaying the variation in the signal level over the frequency span.
8. Record the maximum signal level. This is the peak value of the LPR signal.
9. Calculate the average factor

Average factor = (TD) / cycle time

where:

Cycle time is the total time for a complete cycle of the signal including retrace and any other latency times.

10. Determine the average by multiplying the maximum signal level obtained in Step 8 by the average factor.

11. Determine the conducted power output of the EUT or the field strength produced by the EUT at a given distance from the measurements in steps 1 to 10 by calculation taking into account all attenuators, amplifier gains, antenna factor, measurement distance extrapolation, conversion loss, cable losses, etc. as applicable or the signal substitution method.

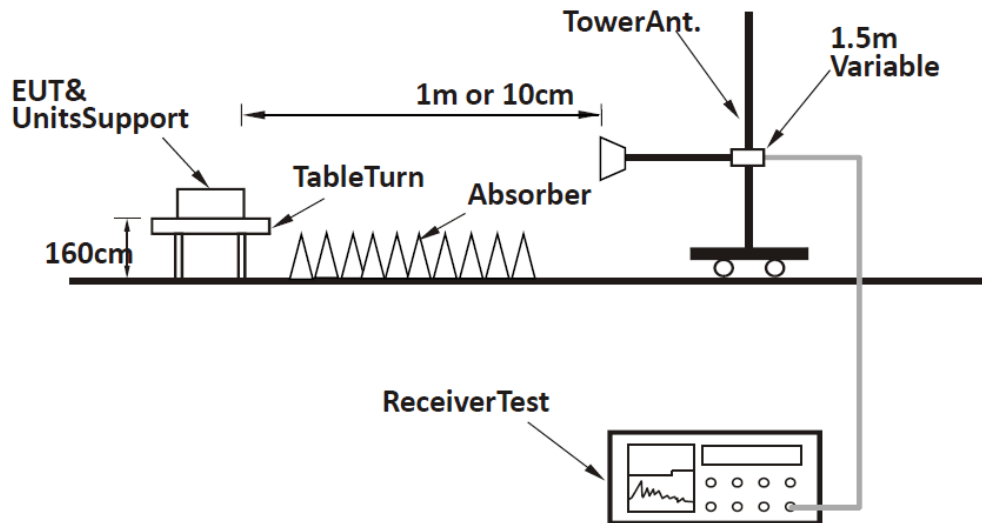
12. The EIRP is then calculated by applying the appropriate equation as follows:

a. For conducted measurements $EIRP \text{ (dBm)} = \text{conducted power (dBm)} + \text{antenna gain (dBi)}$ where the conducted power is the conducted power output of the EUT and antenna gain is the gain of the EUT antenna.

b. For radiated emission measurements $EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} - 104.8 + 20 \text{ Log } D$

where E is the field strength at the far field distance D.

3.3 Test Configuration



3.4 Test Results

According to the manufacturer's declaration, the parameter of the FMCW modulation as below:

Frequency Sweep Time Ts (us)	Signal Sweep Frequency Span ΔF (MHz)	3 dB IF bandwidth (MHz)	Cycle Time (us)
60us	240MHz	2.33Mhz	65us

Peak Power(e.i.r.p)

Frequency (GHz)	P (dBm)	G (dBi)	E (dBμV/m)	d-Meas (m)	desensitization factor	EIRP@8M (dBm)	EIRP@50M (dBm)	Limit (dBm)
77.39	-42.54	23.4	126.09	1	0.22	4.61	20.61	34

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

TEST REPORT

EIRP = EMeas + 20log (dMeas) -104.7+ Desensitization factor
where

EIRP is the equivalent isotropically radiated power, in dBm

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

dMeas is the measurement distance, in m

FMCW desensitization factor = -20 * Log(α) = 0.22dB

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

Average Power(e.i.r.p):

Frequency (GHz)	ERIP (dBm)	Average Factor (dB)	ERIP (dBm)	Limit (dBm)
77.39	20.61	-24.15	-3.54	-3.0

Note:

Average factor= 10log (sweep freq.time/sweep span in MHz)/cycle time.

Average-Factor = -24.15dB.

TEST REPORT

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

The EUT was tested according to Subclause 11.12 of ANSI C63.10-2020.

For Radiated emission below 30MHz:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. For the floor-standing devices, the EUT was placed on the top of a rotating table 0.1 meters above the ground at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Both X and Y axes of the antenna are set to make the measurement.
- 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.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

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

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For Radiated emission above 30MHz:

- a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. For the floor-standing devices, the EUT was placed on the top of a rotating table 0.1 meters above the ground at 3 meters chamber room for test. 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) 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.
- d) 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.
- e) 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.
- f) The test-receiver system was set to peak and average detector 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.

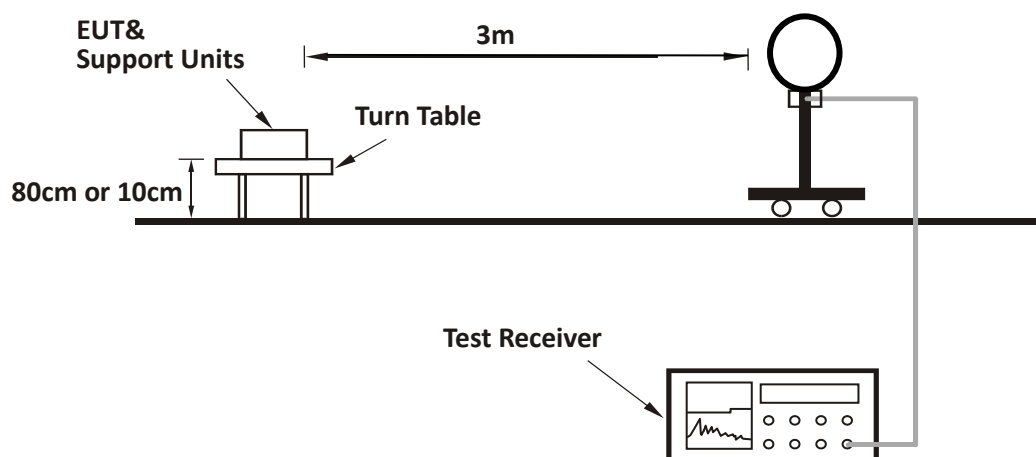
Note:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. 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.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or $3 \times \text{RBW}$ (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions were reported.

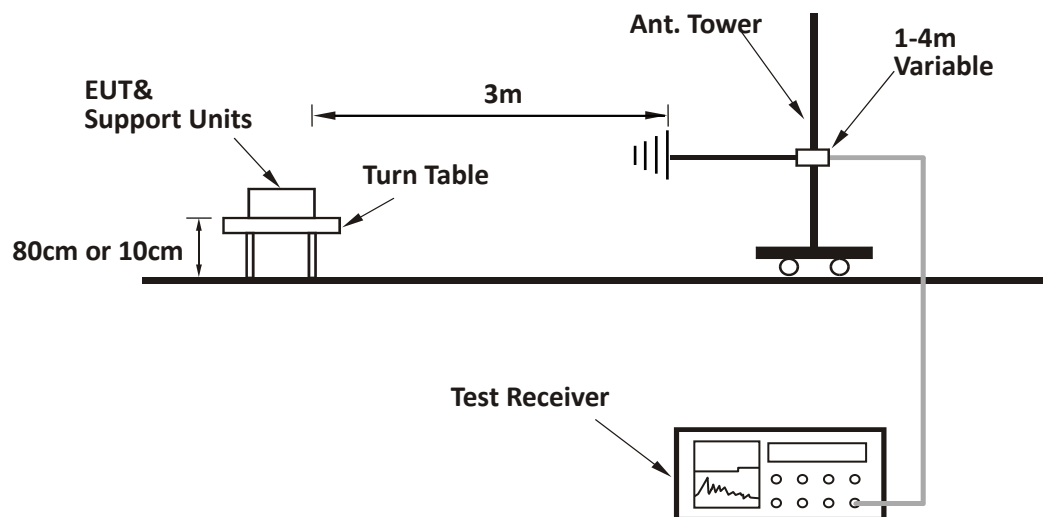
TEST REPORT

4.3 Test Configuration

For Radiated emissions below 30MHz:

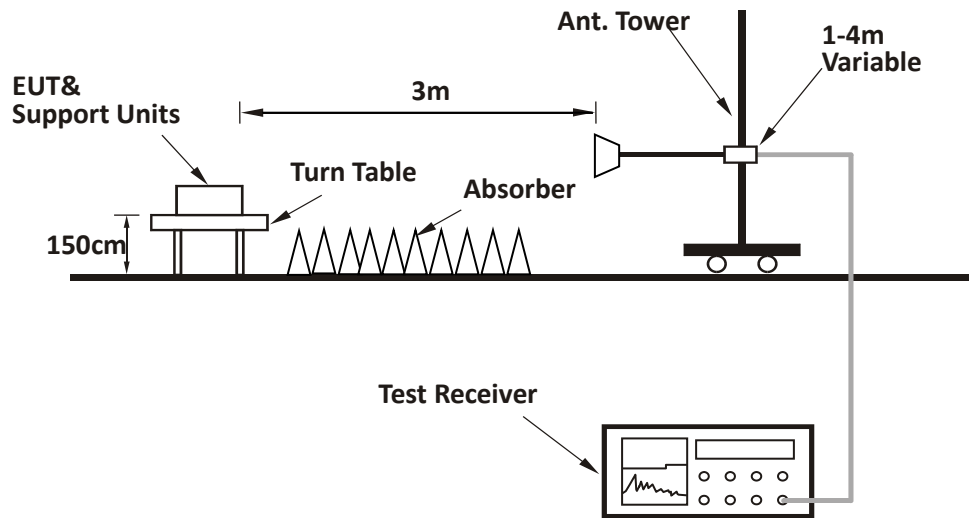


For Radiated emissions 30MHz to 1GHz:

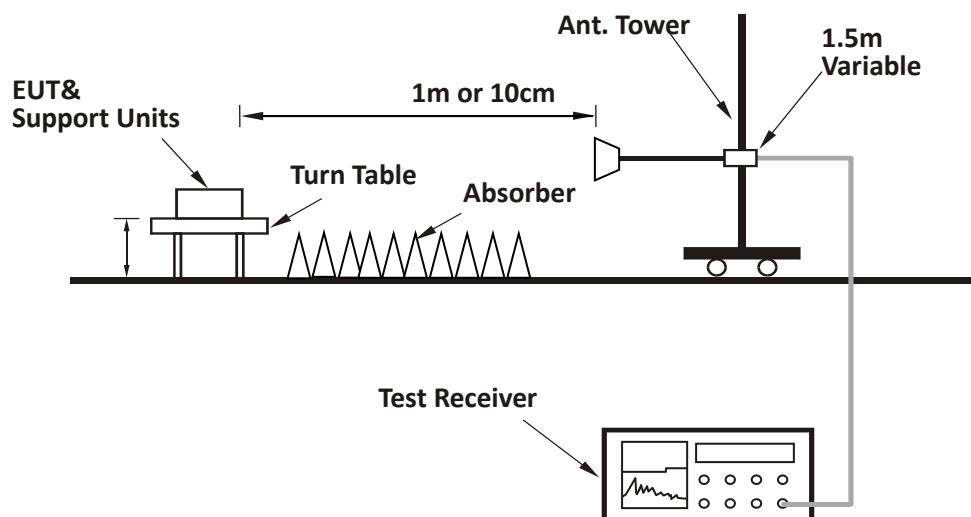


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For Radiated emissions 1GHz-40GHz:



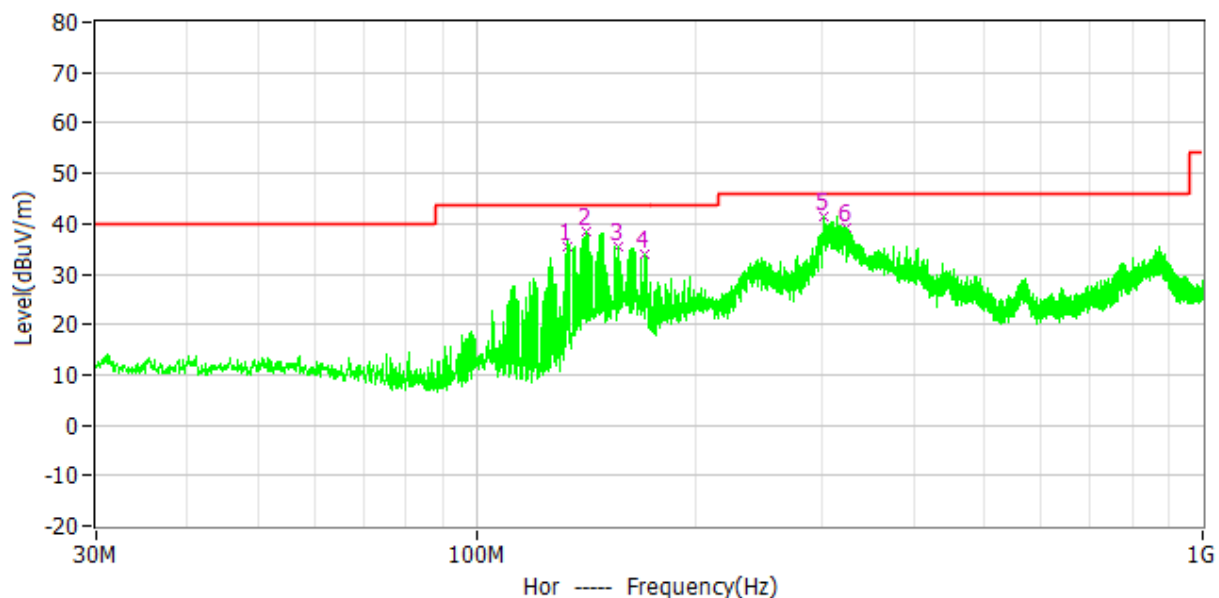
For Radiated emissions above 40GHz:



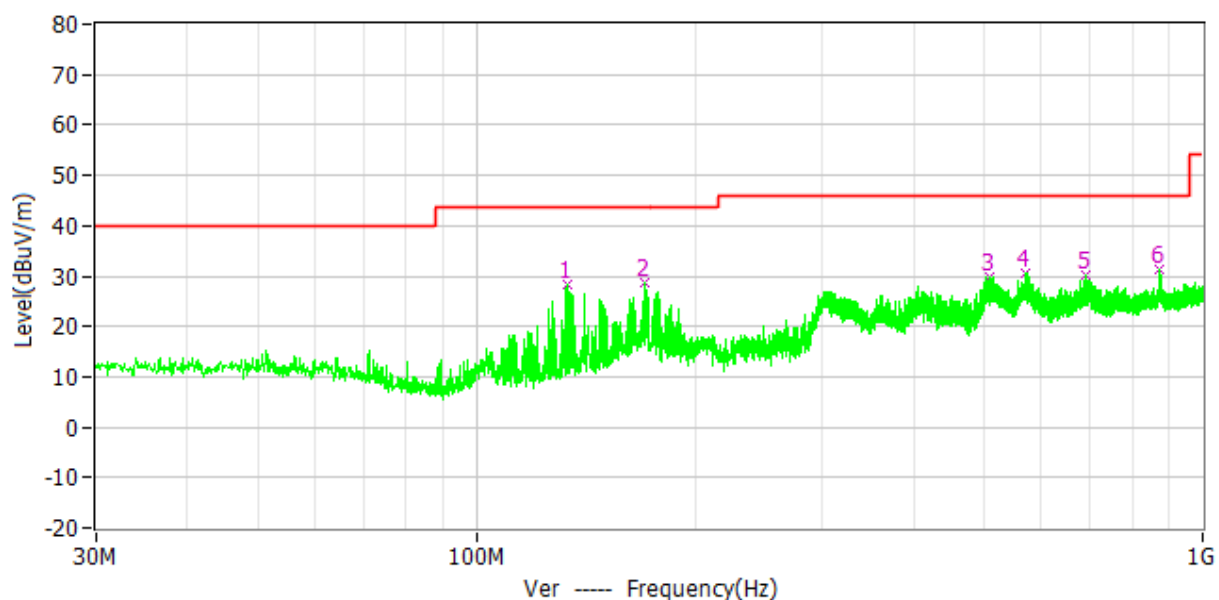
4.4 Test Results of Radiated Emissions

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.

Horizontal



Vertical



TEST REPORT

Test data below 1GHz

Antenna	Frequency	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
Hor	133.208MHz	35.4	13.8	43.5	8.1	QP
Hor	141.550MHz	38.5	14.6	43.5	5.0	QP
Hor	156.585MHz	35.6	15	43.5	7.9	QP
Hor	170.262MHz	33.8	14.2	43.5	9.7	QP
Hor	300.824MHz	41.6	15.5	46	4.4	QP
Hor	323.425MHz	39.2	15.9	46	6.8	QP
Ver	133.499MHz	28.3	13.8	43.5	15.2	QP
Ver	170.844MHz	28.6	14.2	43.5	14.9	QP
Ver	509.762MHz	29.9	20.4	46	16.1	QP
Ver	569.223MHz	30.4	21.7	46	15.6	QP
Ver	691.637MHz	30.1	23.9	46	15.9	QP
Ver	873.027MHz	31.2	26.1	46	14.8	QP

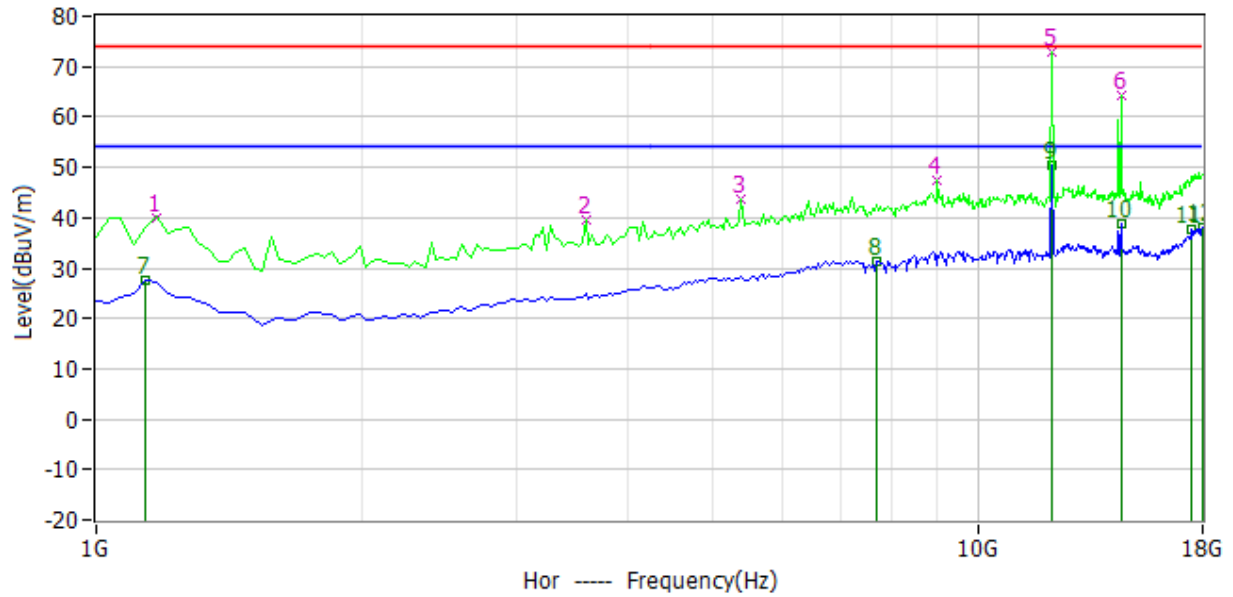
Remark: 1. Correct Factor = Antenna Factor + Cable Loss (- Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.
 2. Corrected Reading = Original Receiver Reading + Correct Factor
 3. Margin = Limit - Corrected Reading
 4. If the PK Corrected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

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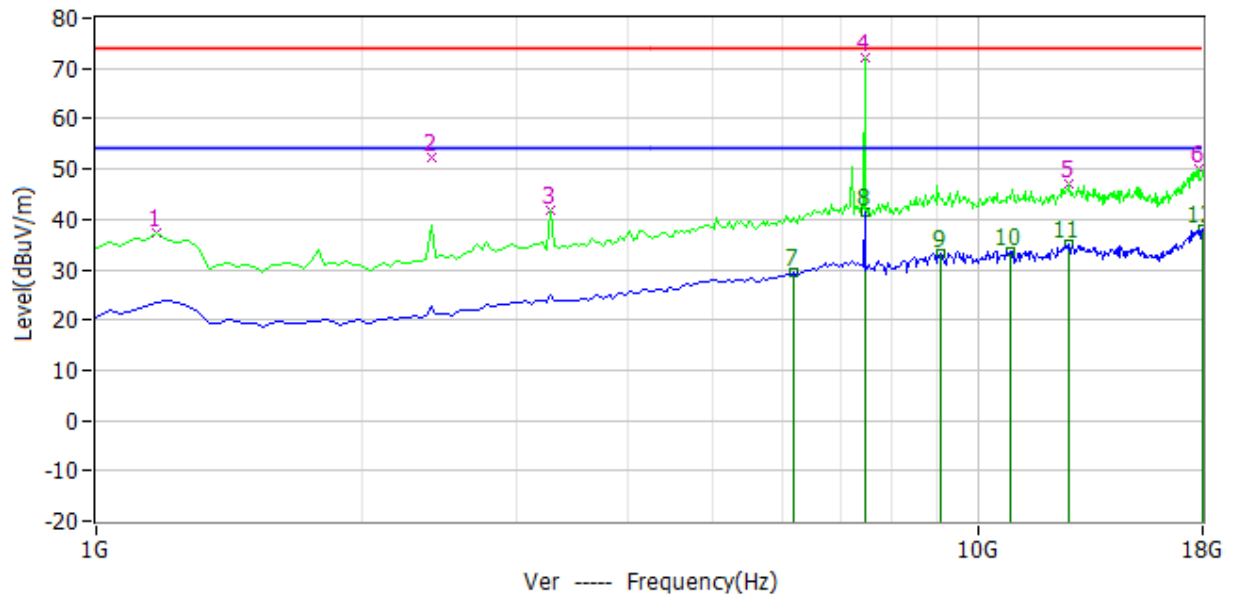
Test result above 1GHz:

The test plots of the worst case were recorded.

Horizontal



Vertical



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The emission was conducted from 1GHz to 40GHz

Antenna	Frequency	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Hor	1.170GHz	40.11	74.00	33.89	PK
Hor	3.589GHz	39.42	74.00	34.58	PK
Hor	5.395GHz	43.76	74.00	30.24	PK
Hor	9.006GHz	47.57	74.00	26.43	PK
Hor	12.140GHz	72.87	74.00	1.13	PK
Hor	14.559GHz	64.27	74.00	9.73	PK
Hor	1.136GHz	27.51	54.00	26.49	AV
Hor	7.677GHz	31.37	54.00	22.63	AV
Hor	12.140GHz	50.45	54.00	3.55	AV
Hor	14.559GHz	38.79	54.00	15.21	AV
Hor	17.489GHz	37.59	54.00	16.41	AV
Hor	17.966GHz	38.08	54.00	15.92	AV
Ver	1.170GHz	37.13	74.00	36.87	PK
Ver	2.397GHz	52.39	74.00	21.61	PK
Ver	3.283GHz	41.74	74.00	32.26	PK
Ver	7.439GHz	72.29	74.00	1.71	PK
Ver	12.719GHz	46.88	74.00	27.12	PK
Ver	17.796GHz	50.02	74.00	23.98	PK
Ver	6.178GHz	29.34	54.00	24.66	AV
Ver	7.439GHz	41.57	54.00	12.43	AV
Ver	9.074GHz	33.35	54.00	20.65	AV
Ver	10.880GHz	33.67	54.00	20.33	AV
Ver	12.685GHz	35.08	54.00	18.92	AV
Ver	17.966GHz	38.05	54.00	15.95	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.

TEST REPORT

The emission was conducted from 40GHz to 220GHz

Antenna	Frequency (GHz)	E (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector
Hor	40.2	61.90	74.00	12.1	PK
Hor	40.2	47.80	54.00	6.2	AV
Hor	58.48	63.94	74.00	10.06	PK
Hor	58.48	48.62	54.00	5.38	AV
Hor	122.6	65.67	74.00	8.33	PK
Hor	122.6	51.46	54.00	2.54	AV
Hor	153.76	69.48	74.00	4.52	PK
Hor	153.76	51.80	54.00	2.20	AV
Ver	53.4	62.10	74.00	11.9	PK
Ver	53.4	48.17	54.00	5.83	AV
Ver	59.8	64.32	74.00	9.68	PK
Ver	59.8	48.57	54.00	5.43	AV
Ver	122.9	69.50	74.00	4.5	PK
Ver	122.9	51.81	54.00	2.19	AV
Ver	164.72	70.12	74.00	3.88	PK
Ver	164.72	51.74	54.00	2.26	AV

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.

$$E = 126.8 - 20\log(\lambda) + P - G$$

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.

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 Results

VOLTAGE (%)	POWER (V DC)	TEMP (°C)	Tested Frequency: 79 GHz	
			Measured low Frequency (FL) (MHz)	Measured High Frequency (FH) (MHz)
100%	12.8	-20	75362.78	79411.01
100%		-10	75364.37	79408.79
100%		0	75366.17	79410.12
100%		+10	75364.35	79409.77
100%		+20	75365.14	79409.20
100%		+30	75364.69	79411.05
100%		+40	75365.27	79409.38
100%		+50	75365.68	79410.25
115%	14.72	+20	75364.93	79408.98
85%	10.88	+20	75365.08	79411.47

Note: Fundamental emissions were contained within the frequency bands

TEST REPORT

6 Antenna Beamwidth and Antenna Side Lobe Gain

Test result: Tested

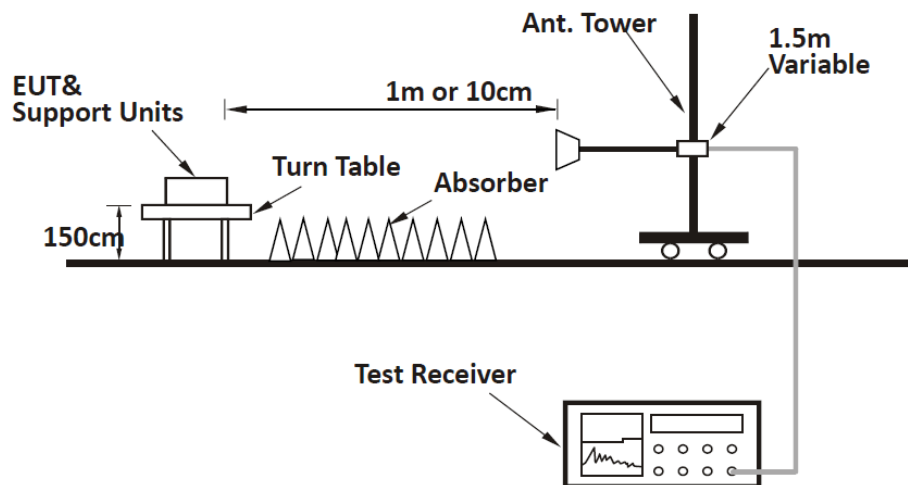
6.1 Limit

LPR devices operating under the provisions of this section within the 5.925-7.250 GHz and 24.05-29.00 GHz bands must use an antenna with a -3 dB beamwidth no greater than 12 degrees.

LPR devices operating under the provisions of this section within the 75-85 GHz band must use an antenna with a -3 dB beamwidth no greater than 8 degrees.

Frequency range (GHz)	Antenna sidelobe gain limit relative to main beam gain (dB)
5.925-7.250	-22
24.05-29.00	-27
75-85	-38

6.2 Test Configuration



6.3 Measurement Procedure

1) 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.

2)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.

3)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.

4)For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1.5 meter and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

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

Note:

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.

6.4 The results

Frequency band (GHz)	Maximum 3 dB beam width (°)	Maximum side lobe level >60°(dB)
75-85	7	-39
Limit	8	-38

7 Fundamental bandwidth

Test result: Pass

7.1 Limit

The minimum fundamental emission bandwidth shall be 50 MHz for LPR operation under the provisions of this section.

Intentional radiators must be designed to ensure that the 10 dB bandwidth of the emission is contained within the allocated frequency band.

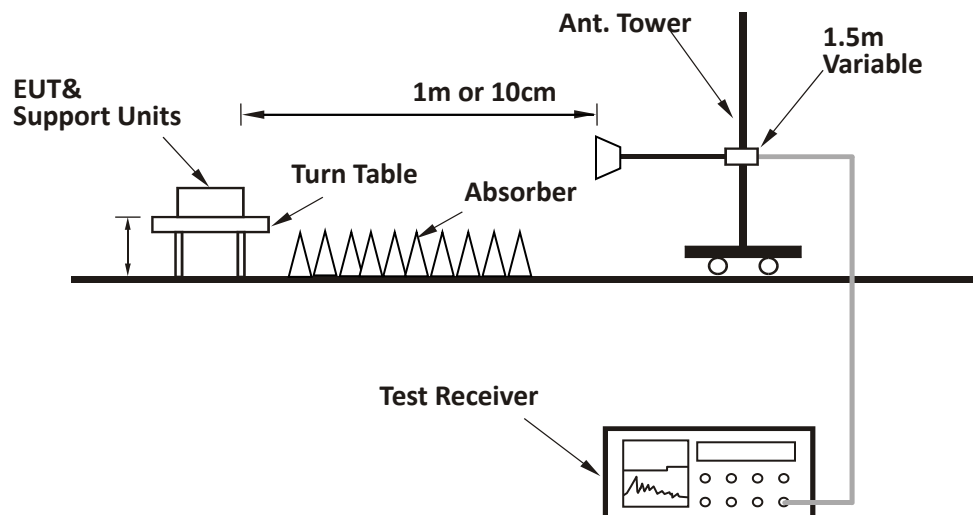
7.2 Measurement Procedure

The 10dB Bandwidth is measured using the Spectrum Analyzer.

Set Span = 2 to 3 times the 10 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.

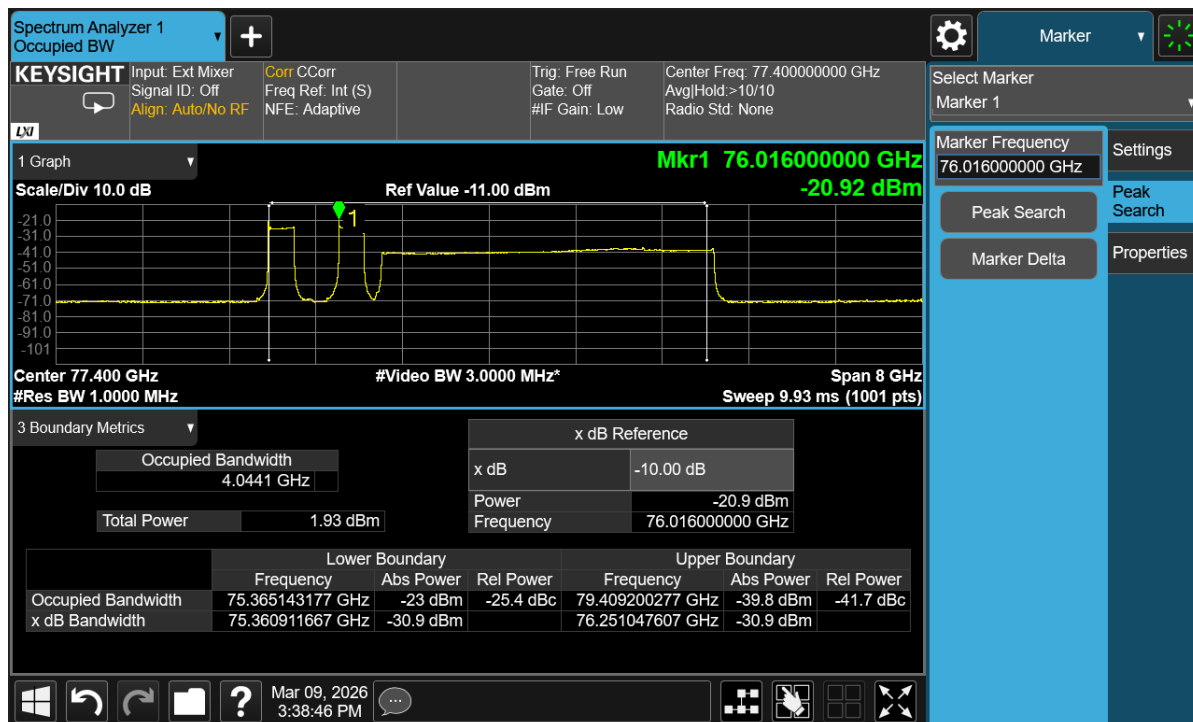
7.3 Test Configuration



TEST REPORT

7.4 The results

Frequency band (MHz)	10dB Bandwidth (MHz)	FL[MHz]	FH[MHz]	Limit for frequency range [MHz]	Limit for Bandwidth [MHz]
75000 ~ 82000	890.14	75360.91	76251.05	75000 to 82000	50
Result	Complied				



TEST REPORT

8 Power line conducted emission

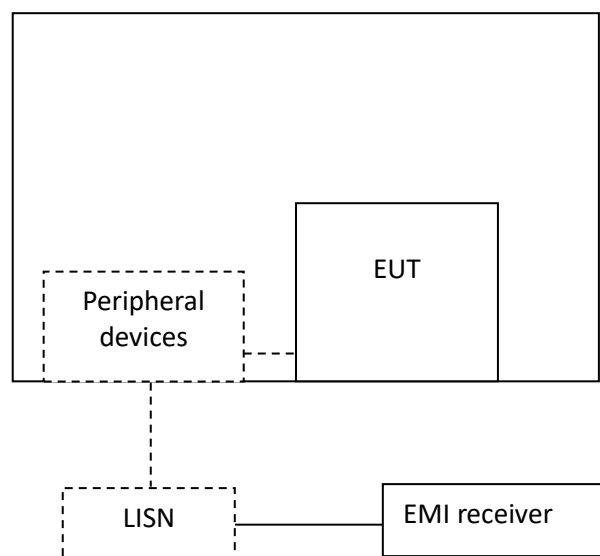
Test result: Pass

8.1 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.

8.2 Test Configuration



TEST REPORT**8.3 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.

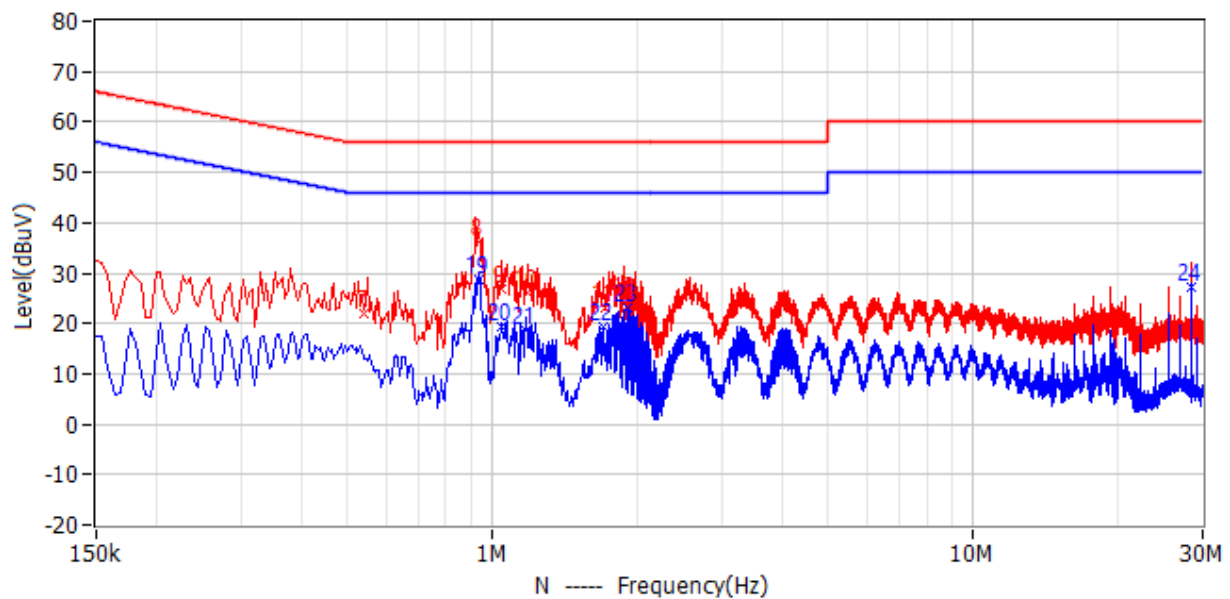
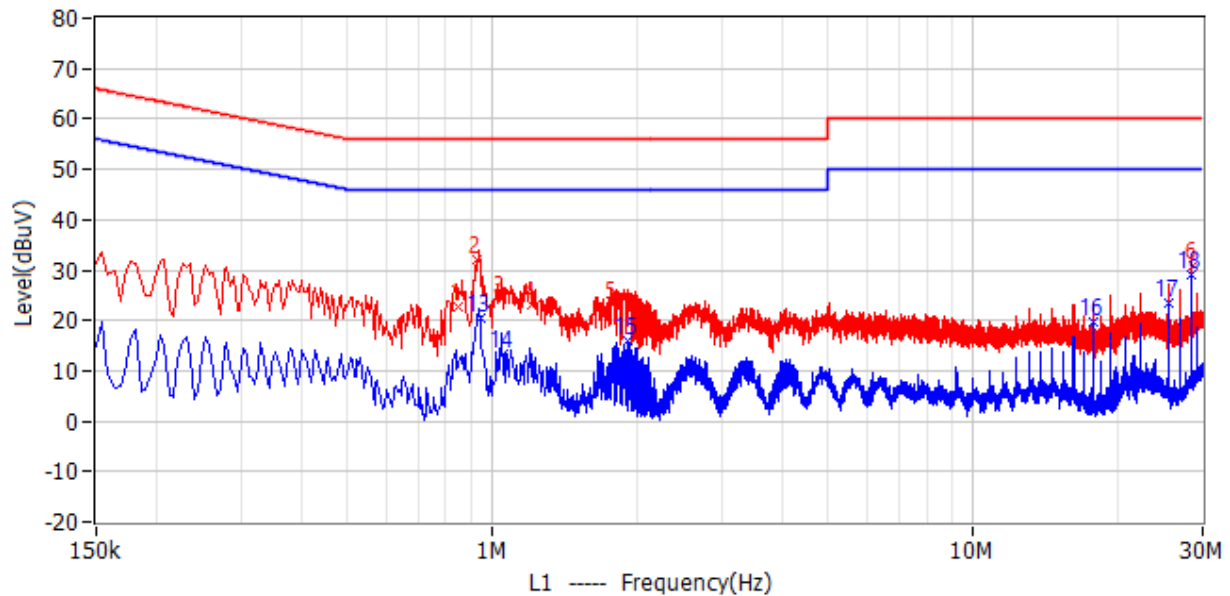
The bandwidth of the test receiver is set at 9 kHz.

TEST REPORT

8.4 Test Results of Power line conducted emission

Test Voltage: AC 120V, 60Hz

Note: the test is performed at the AC port of the peripheral adapter.



TEST REPORT

No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Phase
1	847.500kHz	56.00	22.77	-33.23	12.47	10.30	QP	L1
2	928.500kHz	56.00	32.03	-23.97	21.73	10.30	QP	L1
3	1.046MHz	56.00	24.25	-31.75	13.95	10.30	QP	L1
4	1.203MHz	56.00	23.01	-32.99	12.71	10.30	QP	L1
5	1.775MHz	56.00	23.00	-33.00	12.60	10.40	QP	L1
6	28.550MHz	60.00	30.84	-29.16	18.74	12.10	QP	L1
7	541.500kHz	56.00	22.00	-34.00	11.80	10.20	QP	N
8	937.500kHz	56.00	36.01	-19.99	25.71	10.30	QP	N
9	1.046MHz	56.00	26.86	-29.14	16.56	10.30	QP	N
10	1.185MHz	56.00	26.05	-29.95	15.75	10.30	QP	N
11	1.721MHz	56.00	23.06	-32.94	12.66	10.40	QP	N
12	1.901MHz	56.00	24.65	-31.35	14.15	10.50	QP	N
13	942.000kHz	46.00	20.42	-25.58	10.12	10.30	CAV	L1
14	1.055MHz	46.00	13.28	-32.72	2.98	10.30	CAV	L1
15	1.905MHz	46.00	16.08	-29.92	5.68	10.40	CAV	L1
16	17.750MHz	50.00	19.59	-30.41	8.19	11.40	CAV	L1
17	25.463MHz	50.00	23.46	-26.54	11.66	11.80	CAV	L1
18	28.545MHz	50.00	29.09	-20.91	16.99	12.10	CAV	L1
19	937.500kHz	46.00	28.83	-17.17	18.53	10.30	CAV	N
20	1.046MHz	46.00	19.45	-26.55	9.15	10.30	CAV	N
21	1.172MHz	46.00	18.62	-27.38	8.32	10.30	CAV	N
22	1.698MHz	46.00	19.19	-26.81	8.79	10.40	CAV	N
23	1.905MHz	46.00	22.92	-23.08	12.42	10.50	CAV	N
24	28.518MHz	50.00	27.25	-22.75	15.35	11.90	CAV	N

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

2. Level = Original Receiver Reading + Correct Factor

3. Delta = Level - Limit

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

TEST REPORT

9 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 *****