

**Ecovacs Home Service Robotics Co., Ltd.**

# RF TEST REPORT

**Report Type:**

FCC Part 15.247 & ISSED RSS-247 RF report

**Model:**

DEX54, DDX45

**REPORT NUMBER:**

2411B2087SHA-002

**ISSUE DATE:**

December 18, 2024

**DOCUMENT CONTROL NUMBER:**

TTRF15.247-02\_V1 © 2018 Intertek



**Applicant:** Ecovacs Home Service Robotics Co., Ltd.  
No.518 Songwei Road,Wusongjiang industry Park, Guoxiang Street,  
Wuzhong District, Suzhou, Jiangsu, China.

**Manufacturer:** Ecovacs Home Service Robotics Co., Ltd.  
No.518 Songwei Road,Wusongjiang industry Park, Guoxiang Street,  
Wuzhong District, Suzhou, Jiangsu, China.

**Factory 1:** Ecovacs Robotics Co., Ltd.  
No.518 Songwei Road, Wusongjiang industry Park, Guoxiang  
Street, Wuzhong District, Suzhou, Jiangsu, China

**Factory 2:** Ecovacs Home Service Robotics Co., Ltd.  
No.518 Songwei Road, Wusongjiang industry Park, Guoxiang  
Street, Wuzhong District, Suzhou, Jiangsu, China.

**FCC ID:** 2A64B-DEX54

**IC:** 28593-DEX54

#### 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 (2013):** American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

**RSS-247 Issue 3 (August 2023):** Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

**RSS-Gen Issue 5 (March 2019) Amendment 1:** General Requirements for Compliance of Radio Apparatus

#### PREPARED BY:



Project Engineer  
Eric Li

#### REVIEWED BY:



Reviewer  
Wakeyou Wang

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

## TEST REPORT

### Content

<b>REVISION HISTORY</b>	<b>5</b>
<b>MEASUREMENT RESULT SUMMARY</b>	<b>6</b>
<b>1 GENERAL INFORMATION</b>	<b>7</b>
1.1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	7
1.2 TECHNICAL SPECIFICATION	7
1.3 DESCRIPTION OF TEST FACILITY	8
<b>2 TEST SPECIFICATIONS</b>	<b>9</b>
2.1 STANDARDS OR SPECIFICATION	9
2.2 MODE OF OPERATION DURING THE TEST	9
2.3 TEST SOFTWARE LIST	10
2.4 TEST PERIPHERALS LIST	10
2.5 TEST ENVIRONMENT CONDITION	10
2.6 INSTRUMENT LIST	11
2.7 MEASUREMENT UNCERTAINTY	13
<b>3 MINIMUM 6DB BANDWIDTH</b>	<b>14</b>
3.1 LIMIT	14
3.2 MEASUREMENT PROCEDURE	14
3.3 TEST CONFIGURATION	14
3.4 TEST RESULTS OF MINIMUM 6DB BANDWIDTH	14
<b>4 MAXIMUM CONDUCTED OUTPUT POWER AND E.I.R.P.</b>	<b>15</b>
4.1 LIMIT	15
4.2 MEASUREMENT PROCEDURE	15
4.3 TEST CONFIGURATION	16
4.4 TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	16
<b>5 POWER SPECTRUM DENSITY</b>	<b>17</b>
5.1 LIMIT	17
5.2 MEASUREMENT PROCEDURE	17
5.3 TEST CONFIGURATION	18
5.4 TEST RESULTS OF POWER SPECTRUM DENSITY	18
<b>6 EMISSION OUTSIDE THE FREQUENCY BAND</b>	<b>19</b>
6.1 LIMIT	19
6.2 MEASUREMENT PROCEDURE	19
6.3 TEST CONFIGURATION	20
6.4 THE RESULTS OF EMISSION OUTSIDE THE FREQUENCY BAND	20
<b>7 RADIATED EMISSIONS IN RESTRICTED FREQUENCY BANDS</b>	<b>21</b>
7.1 LIMIT	21
7.2 MEASUREMENT PROCEDURE	21
7.3 TEST CONFIGURATION	23
7.4 TEST RESULTS OF RADIATED EMISSIONS	25
<b>8 POWER LINE CONDUCTED EMISSION</b>	<b>30</b>
8.1 LIMIT	30
8.2 TEST CONFIGURATION	30
8.3 MEASUREMENT PROCEDURE	31
8.4 TEST RESULTS OF POWER LINE CONDUCTED EMISSION	32

**TEST REPORT**

**9    OCCUPIED BANDWIDTH ..... 36**

    9.1    LIMIT ..... 36

    9.2    MEASUREMENT PROCEDURE ..... 36

    9.3    TEST CONFIGURATION ..... 36

    9.4    THE RESULTS OF OCCUPIED BANDWIDTH ..... 36

**10    ANTENNA REQUIREMENT ..... 37**

## Revision History

Report No.	Version	Description	Issued Date
2411B2087SHA-002	Rev. 01	Initial issue of report	December 18, 2024


## Measurement result summary

TEST ITEM	FCC REFERENCE	IC REFERENCE	RESULT
Minimum 6dB Bandwidth	15.247(a)(2)	RSS-247 Issue 3 Clause 5.2	Pass
Maximum conducted output power and e.i.r.p.	15.247(b)(3)	RSS-247 Issue 3 Clause 5.4	Pass
Power spectrum density	15.247(e)	RSS-247 Issue 3 Clause 5.2	Pass
Emission outside the frequency band	15.247(d)	RSS-247 Issue 3 Clause 5.5	Pass
Radiated Emissions in restricted frequency bands	15.247(d), 15.205&15.209	RSS-Gen Issue 5 Clause 8.9&8.10	Pass
Power line conducted emission	15.207(a)	RSS-Gen Issue 5 Clause 8.8	Pass
Occupied bandwidth	-	RSS-Gen Issue 5 Clause 6.6	Tested
Antenna requirement	15.203	-	Pass

Notes: 1: NA =Not Applicable

## 1 GENERAL INFORMATION

### 1.1 Description of Equipment Under Test (EUT)

Product name:	Floor Cleaning Robot
Type/Model/PMN/HVIN:	DEX54, DDX45
Description of EUT:	The EUT is a Floor Cleaning Robot, it supports Bluetooth and WIFI functions, there are two models, they are the same except DDX45 has no AI camera, the PCB board is also changed accordingly. We tested DEX54 and DDX45 and listed the worst results in this report.
Rating:	DC20V, 2A
Brand Name:	
Category of EUT:	Class B
EUT type:	<input type="checkbox"/> Table top <input checked="" type="checkbox"/> Floor standing
Software Version:	/
Hardware Version:	/
Sample Identification No.:	A241128-016-002
Sample received date:	2024.11.28
Date of test:	2024.11.28~2024.12.15

### 1.2 Technical Specification

Frequency Band:	2402MHz to 2480MHz
Support Standards:	Bluetooth Low Energy
Type of Modulation:	GFSK
Channel Number:	40
Data Rate	1Mbps
Channel Separation:	2MHz
Antenna Information:	FPC Antenna, gain is 3.39dBi

### 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 Member No: 3598 (Registration No.: R-14243, G-10845, C-14723, T-12252)
	A2LA Accreditation Lab Certificate Number: 3309.02



## 2 TEST SPECIFICATIONS

### 2.1 Standards or specification

47CFR Part 15 (2023)  
ANSI C63.10 (2013)  
KDB 558074 (v05r02)  
RSS-247 Issue 3 (August 2023)  
RSS-Gen Issue 5 (March 2019) Amendment 1

### 2.2 Mode of operation during the test

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

Frequency Band (MHz)				2402 ~ 2480			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
<b>0</b>	<b>2402</b>	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	<b>19</b>	<b>2440</b>	29	2460	<b>39</b>	<b>2480</b>

#### Data rate VS Power:

Test software and Power Setting parameter			
Test Software	Putty.exe		
Working Mode	BLE		
Test Channel	2402MHz	2440MHz	2480MHz
Power Setting	Default	Default	Default

## 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
1	Laptop computer	DELL 5480	/
2	Docking station	CH2453I	/

## 2.5 Test environment condition:

Test items	Temperature	Humidity
Minimum 6dB Bandwidth	25°C	52% 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	24°C	53% RH
Power line conducted emission	24°C	52% RH

## 2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESR7	EC 6194	2025-02-27
<input checked="" type="checkbox"/>	Attenuator	Hua Xiang	Ts5-10db-6g	EC 6194-1	2025-12-07
<input checked="" type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2025-11-19
<input type="checkbox"/>	A.M.N.	R&S	ENV 216	EC 3393	2025-07-17
<input type="checkbox"/>	A.M.N.	R&S	ENV4200	EC 3558	2025-06-05
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESIB 26	EC 3045	2025-08-22
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESR	EC6501	2025-09-24
<input type="checkbox"/>	Bilog Antenna	TESEQ	CBL 6112B	EC 6411	2025-09-12
<input checked="" type="checkbox"/>	TRILOG broadband Antenna	Schwarzbeck	VULB9168	EC 6402	2025-02-14
<input checked="" type="checkbox"/>	Pre-amplifier	R&S	AFS42-00101800-25-S-42	EC 5262	2025-06-15
<input type="checkbox"/>	Pre-amplifier	Tonscend	tap01018050	EC 6432-1	2025-12-07
<input type="checkbox"/>	Horn antenna	Tonscend	bha9120d	EC 6432-2	2025-02-15
<input checked="" type="checkbox"/>	Horn antenna	ETS	3117	EC 4792-1	2025-09-15
<input checked="" type="checkbox"/>	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2026-09-12
<input type="checkbox"/>	Active loop antenna	Schwarzbeck	FMZB1519	EC 5345	2025-07-16
<input checked="" type="checkbox"/>	Horn antenna	ETS	3116c	EC 5955	2025-07-22
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2025-03-07
<input type="checkbox"/>	Power sensor	Agilent	U2021XA	EC 5338-1	2025-03-07
<input type="checkbox"/>	Vector Signal Generator	Agilent	N5182B	EC 5175	2025-03-07
<input type="checkbox"/>	Universal Radio Communication Tester	R&S	CMW500	EC5944	2025-03-07
<input type="checkbox"/>	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2025-03-07
<input type="checkbox"/>	Mobile Test System	Litepoint	lqxel	EC 5176	2025-01-11
<input type="checkbox"/>	Test Receiver	R&S	ESCI 7	EC 4501	2025-12-09

## TEST REPORT

<input type="checkbox"/>	Climate chamber	GWS	MT3065	EC 6021	2025-03-06
<input type="checkbox"/>	Spectrum Analyzer	Keysight	N9030B	EC 6078	2025-06-08
Tet Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Shielded room	Zhongyu	-	EC 2838	2025-01-11
<input type="checkbox"/>	Shielded room	Zhongyu	-	EC 2839	2025-01-11
<input checked="" type="checkbox"/>	Semi-anechoic chamber	Albatross project	-	EC 3048	2025-07-08
<input type="checkbox"/>	Fully-anechoic chamber	Albatross project	-	EC 3047	2025-07-08
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Thermo-Hygrograph	Testo	175h1	EC 6640	2025-08-28
<input type="checkbox"/>	Thermo-Hygrograph	Testo	175h1	EC 6641	2025-08-28
<input checked="" type="checkbox"/>	Thermo-Hygrograph	Testo	175h1	EC6642	2025-08-28
<input checked="" type="checkbox"/>	Thermo-Hygrograph	Testo	175h1	EC 6643	2025-08-28
<input type="checkbox"/>	Thermo-Hygrograph	Testo	175h1	EC 6644	2025-08-28
<input type="checkbox"/>	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	$\pm 0.74\text{dB}$
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	$\pm 3.19\text{dB}$

### 3 Minimum 6dB bandwidth

**Test result:** Pass

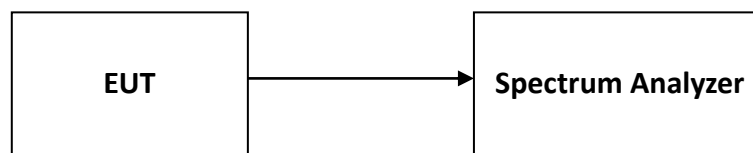
#### 3.1 Limit

For systems using digital modulation techniques that may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz bands, the minimum 6 dB bandwidth shall be at least 500 kHz.

#### 3.2 Measurement Procedure

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### 3.3 Test Configuration



#### 3.4 Test Results of Minimum 6dB bandwidth

Please refer to Appendix B

## 4 Maximum conducted output power and e.i.r.p.

**Test result:** Pass

### 4.1 Limit

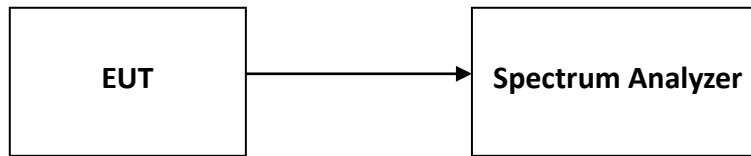
For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 W. (The e.i.r.p. shall not exceed 4 W)

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 30dBm and 30+ (6 –antenna gain-beam forming gain).

### 4.2 Measurement Procedure

- a) Set the RBW  $\geq$  DTS bandwidth.
- b) Set VBW  $\geq 3 \times$  RBW.
- c) Set span  $\geq 3 \times$  RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

### 4.3 Test Configuration



### 4.4 Test Results of Maximum conducted output power

Please refer to Appendix B



**TEST REPORT**

## 5 Power spectrum density

**Test result:** Pass

### 5.1 Limit

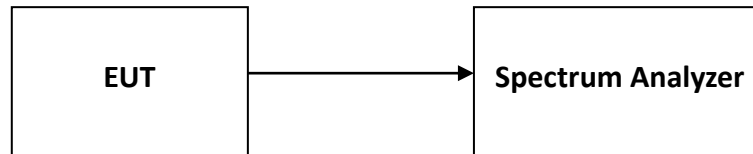
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 8dBm/MHz and  $8 + (6 - \text{antenna gain} - \text{beam forming gain})$ .

### 5.2 Measurement Procedure

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d) Set the VBW  $\geq 3 \times \text{RBW}$ .
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 5.3 Test Configuration



### 5.4 Test Results of Power spectrum density

Please refer to Appendix B

**TEST REPORT**

## 6 Emission outside the frequency band

**Test result:** Pass

### 6.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

### 6.2 Measurement Procedure

#### Reference level measurement

Establish a reference level by using the following procedure:

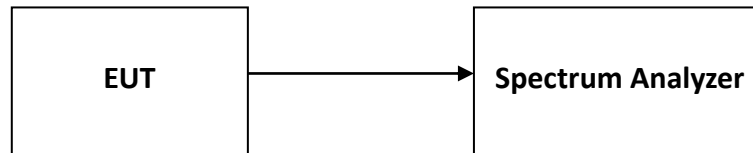
- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to  $\geq 1.5$  times the DTS bandwidth.
- c) Set the RBW = 100 kHz.
- d) Set the VBW  $\geq 3 \times$  RBW.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum PSD level.

#### Emission level measurement

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW  $\geq 3 \times$  RBW.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

### 6.3 Test Configuration



### 6.4 The results of Emission outside the frequency band

Please refer to Appendix B

## 7 Radiated Emissions in restricted frequency bands

Test result: Pass

### 7.1 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

### 7.2 Measurement Procedure

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

#### 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.

## TEST REPORT

### For Radiated emission above 30MHz:

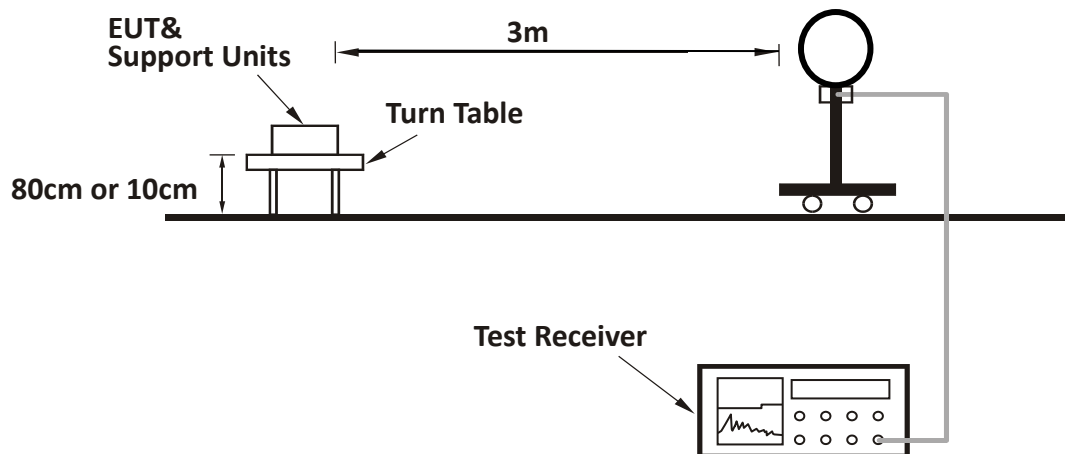
- a) The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meters chamber room for test. For the floor-standing devices, the EUT was placed on the top of a rotating table 0.1 meters above the ground at 3 meters chamber room 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:

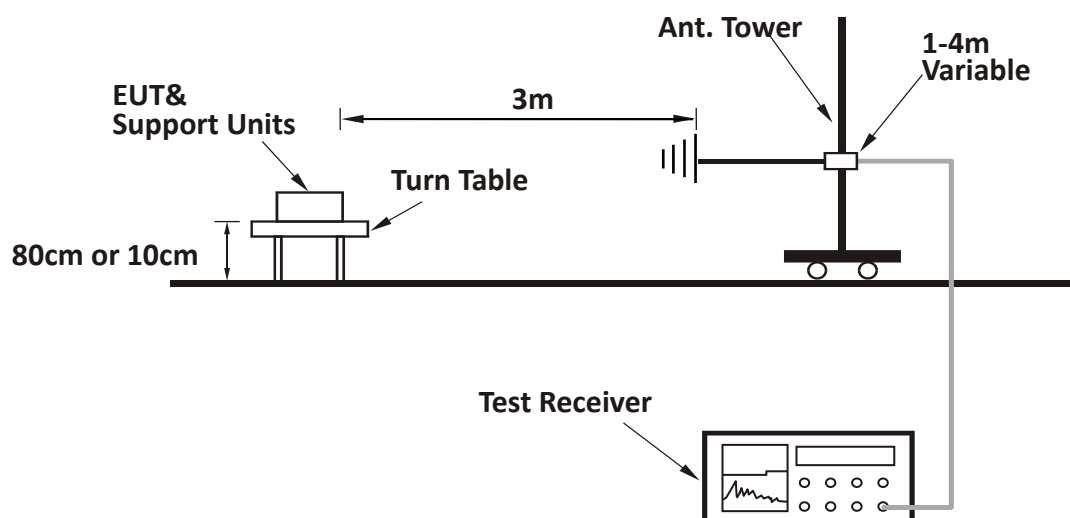
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

### 7.3 Test Configuration

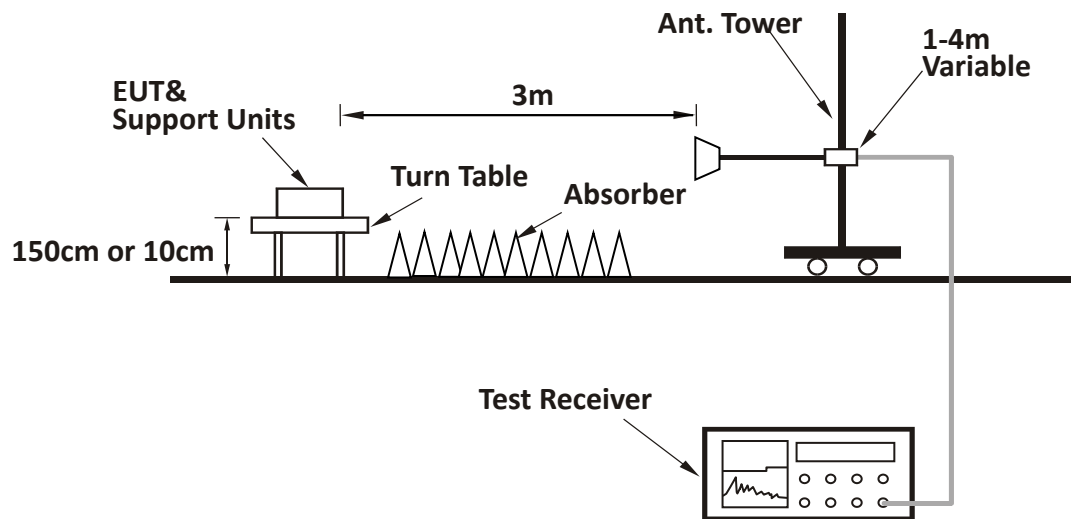
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



**For Radiated emission above 1GHz:**



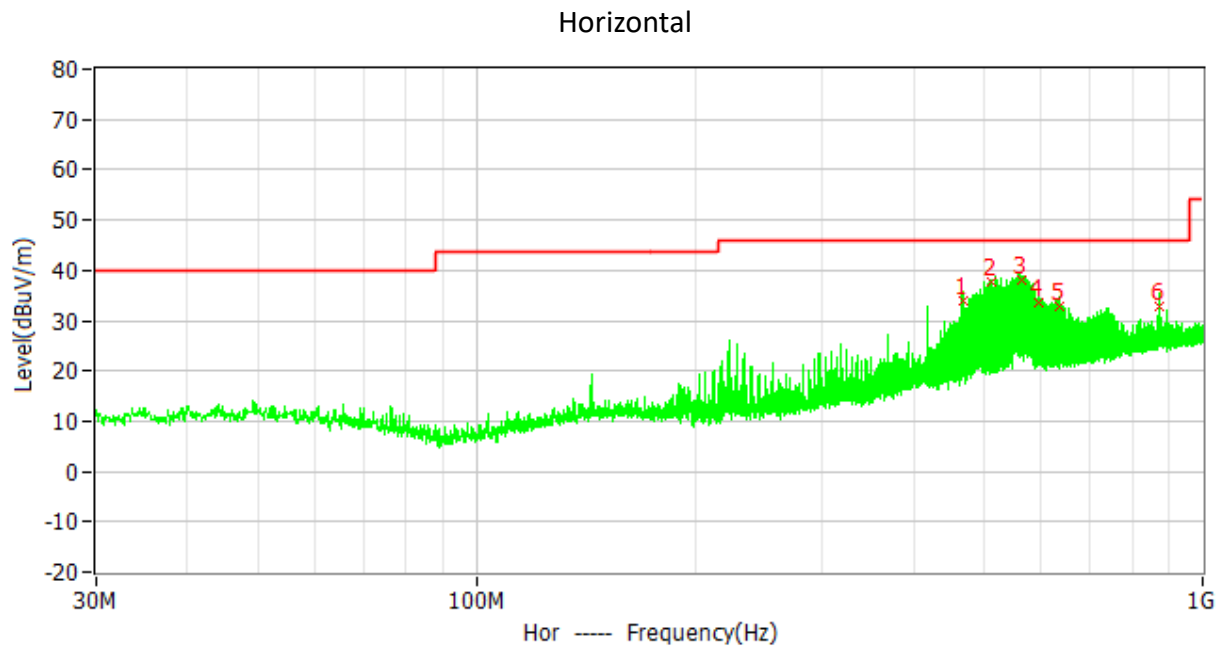


## TEST REPORT

### 7.4 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.

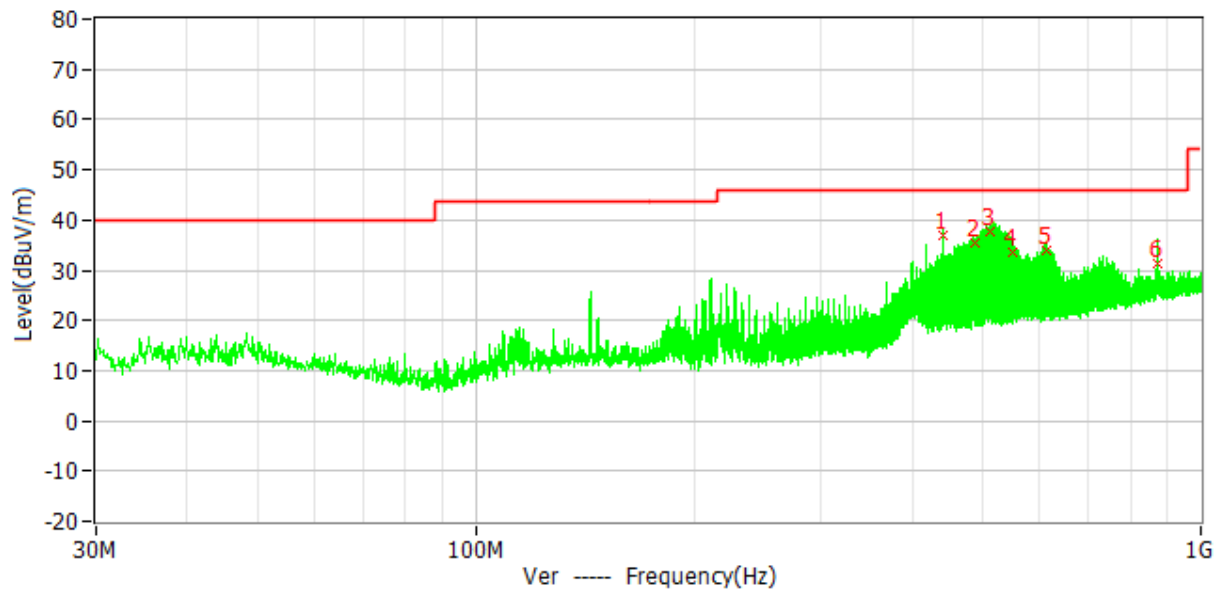
#### Test Curve of model DEX54:



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar
1	466.930MHz	46.00	33.76	-12.24	14.06	19.70	QP	Hor
2	513.158MHz	46.00	37.60	-8.40	16.80	20.80	QP	Hor
3	562.511MHz	46.00	37.89	-8.11	16.09	21.80	QP	Hor
4	594.067MHz	46.00	33.59	-12.41	11.09	22.50	QP	Hor
5	633.544MHz	46.00	32.96	-13.04	9.86	23.10	QP	Hor
6	869.109MHz	46.00	32.77	-13.23	6.07	26.70	QP	Hor

**TEST REPORT**

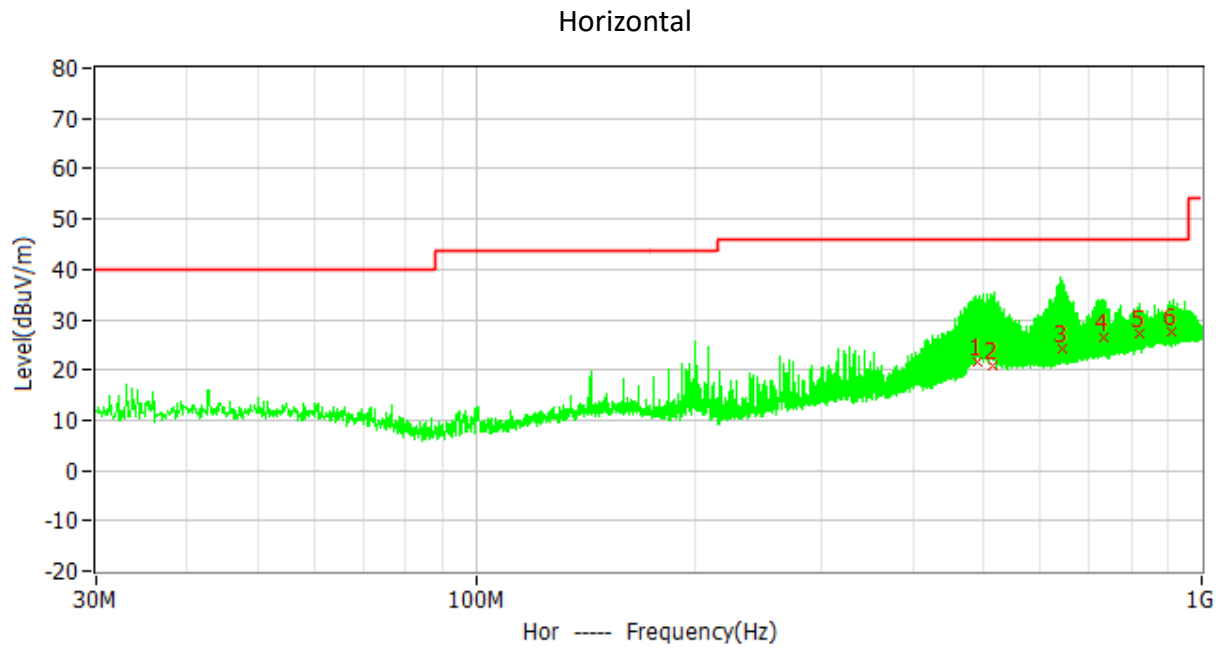
Vertical



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar
1	442.356MHz	46.00	37.07	-8.93	17.97	19.10	QP	Ver
2	487.494MHz	46.00	35.46	-10.54	15.26	20.20	QP	Ver
3	513.137MHz	46.00	37.62	-8.38	16.82	20.80	QP	Ver
4	548.692MHz	46.00	33.68	-12.32	12.08	21.60	QP	Ver
5	611.840MHz	46.00	34.07	-11.93	11.27	22.80	QP	Ver
6	869.074MHz	46.00	31.21	-14.79	4.51	26.70	QP	Ver

## TEST REPORT

### Test Curve of model DDX45:

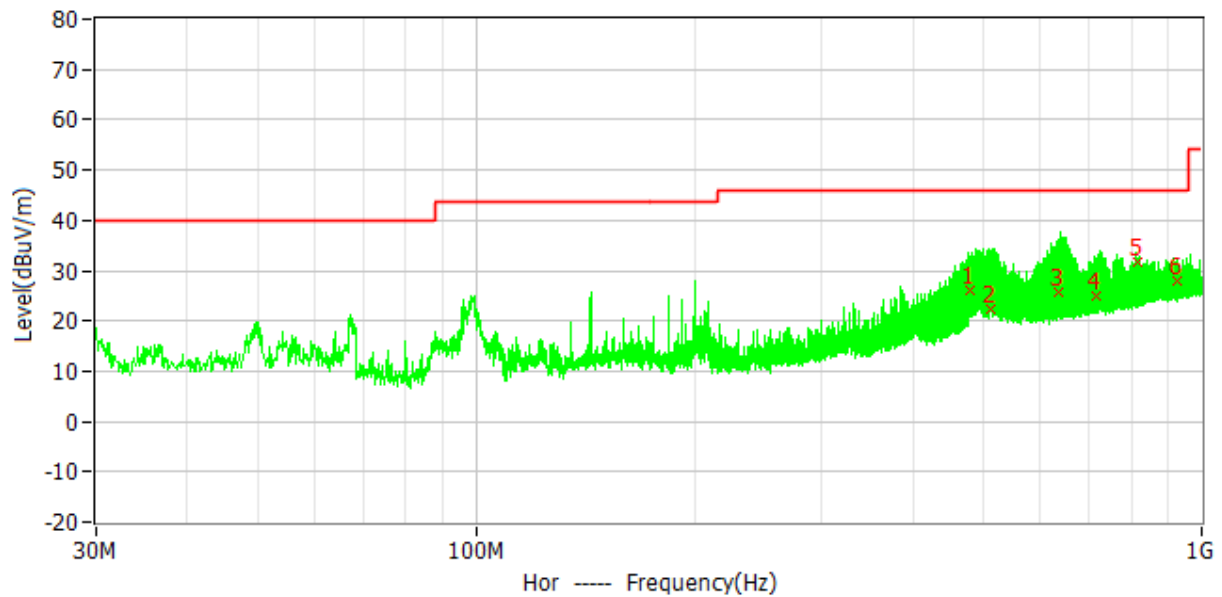


#### Test Data:

No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar
1	492.414MHz	46.00	21.62	-24.38	1.22	20.40	QP	Hor
2	515.555MHz	46.00	20.96	-25.04	0.06	20.90	QP	Hor
3	643.030MHz	46.00	24.03	-21.97	0.73	23.30	QP	Hor
4	733.300MHz	46.00	26.32	-19.68	1.62	24.70	QP	Hor
5	823.386MHz	46.00	27.07	-18.93	0.97	26.10	QP	Hor
6	908.192MHz	46.00	27.64	-18.36	0.44	27.20	QP	Hor

**TEST REPORT**

Vertical



Test Data:

No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar
1	479.198MHz	46.00	25.97	-20.03	5.97	20.00	QP	Hor
2	511.994MHz	46.00	22.30	-23.70	1.50	20.80	QP	Hor
3	634.973MHz	46.00	25.51	-20.49	2.41	23.10	QP	Hor
4	717.148MHz	46.00	24.80	-21.20	0.40	24.40	QP	Hor
5	815.206MHz	46.00	31.76	-14.24	5.76	26.00	QP	Hor
6	924.541MHz	46.00	27.77	-18.23	0.47	27.30	QP	Hor

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. 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

### Test result above 1GHz:

The emission was conducted from 1GHz to 25GHz

CH	Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2390.00	50.70	74.00	23.30	PK
	V	2390.00	51.40	74.00	22.60	PK
	H	4804.00	45.70	74.00	28.30	PK
	V	4804.00	46.40	74.00	27.60	PK
M	H	4880.00	46.10	74.00	27.90	PK
	V	4880.00	46.50	74.00	27.50	PK
H	H	2483.50	51.10	74.00	22.90	PK
	V	2483.50	51.70	74.00	22.30	PK
	H	4960.00	45.30	74.00	28.70	PK
	V	4960.00	46.60	74.00	27.40	PK

- 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.

## 8 Power line conducted emission

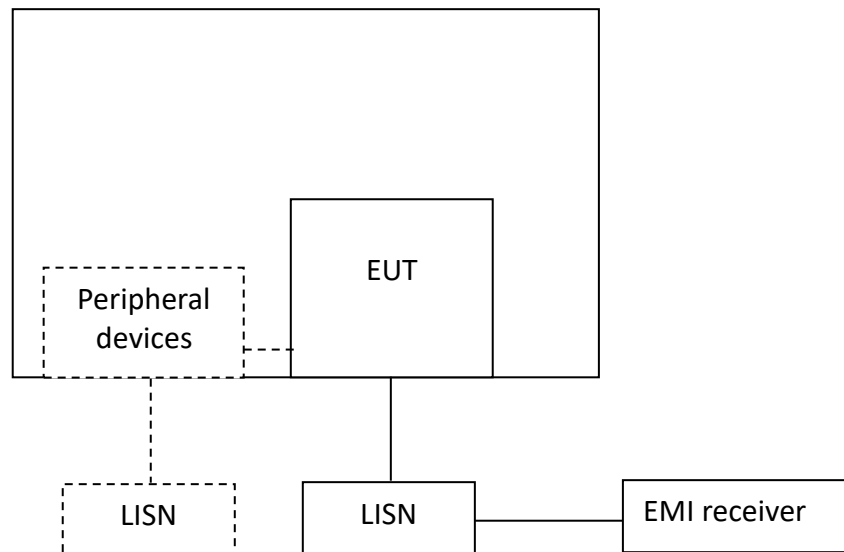
**Test result:** Pass

### 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  $\Omega$  LISN port (to which the EUT is connected), where permitted, terminated into a 50  $\Omega$  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  $\Omega$  measuring port is terminated by a measuring instrument having 50  $\Omega$  input impedance. All other ports are terminated in 50  $\Omega$  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.

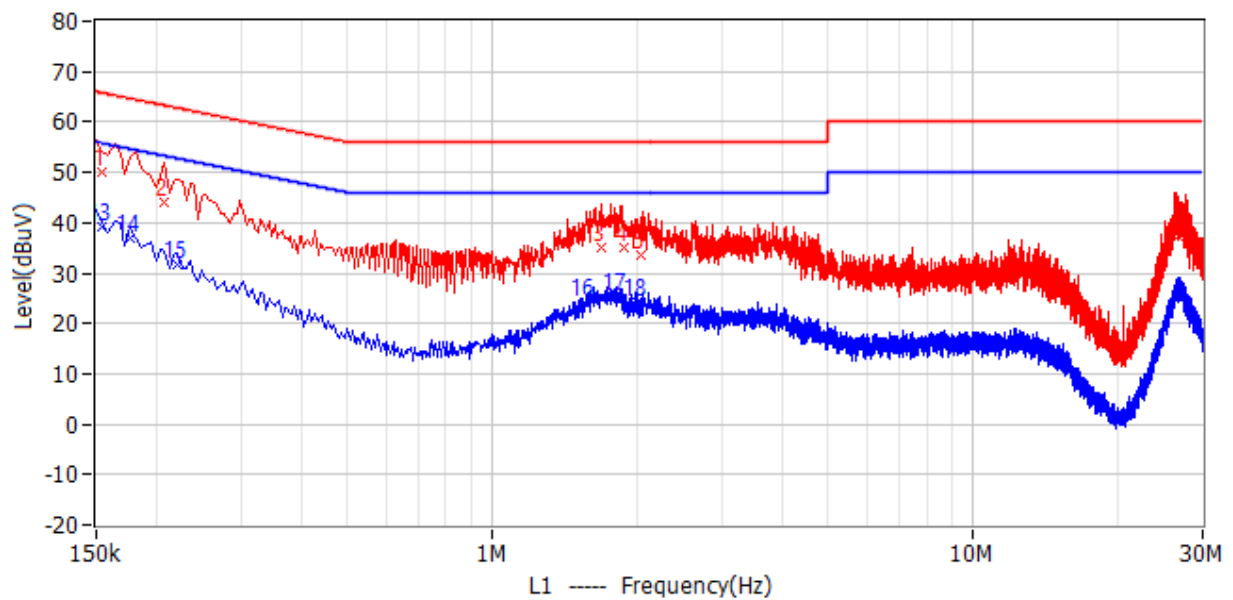
## TEST REPORT

### 8.4 Test Results of Power line conducted emission

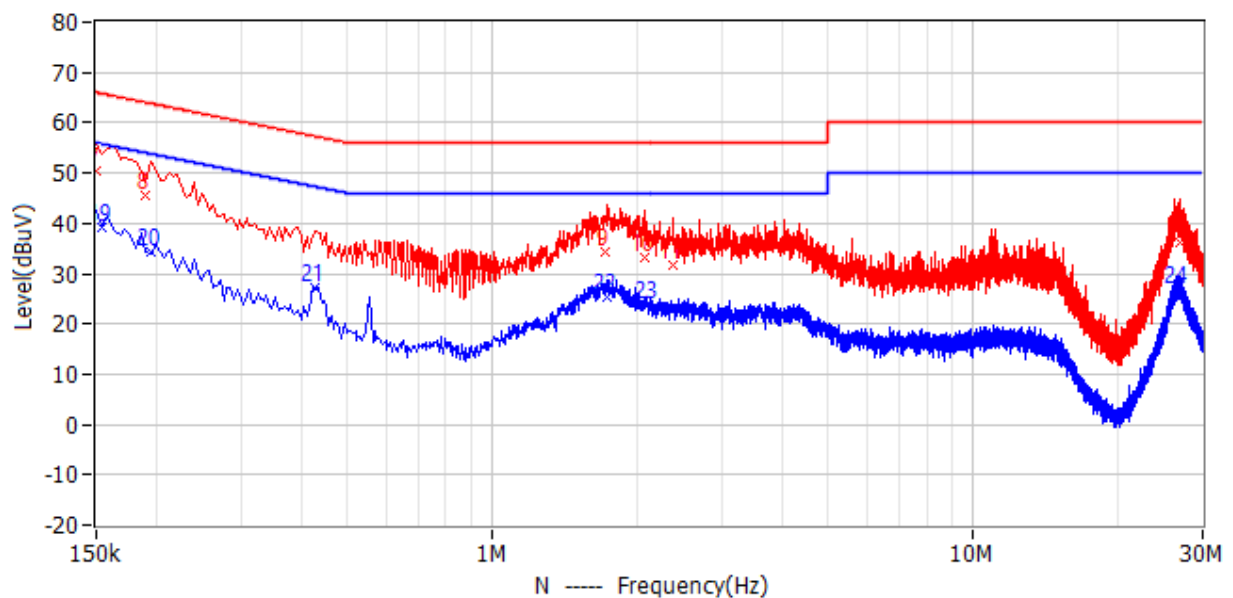
Test Voltage: AC 120V, 60Hz

Test Curve of Model DEX54:

L Line



N Line





## TEST REPORT

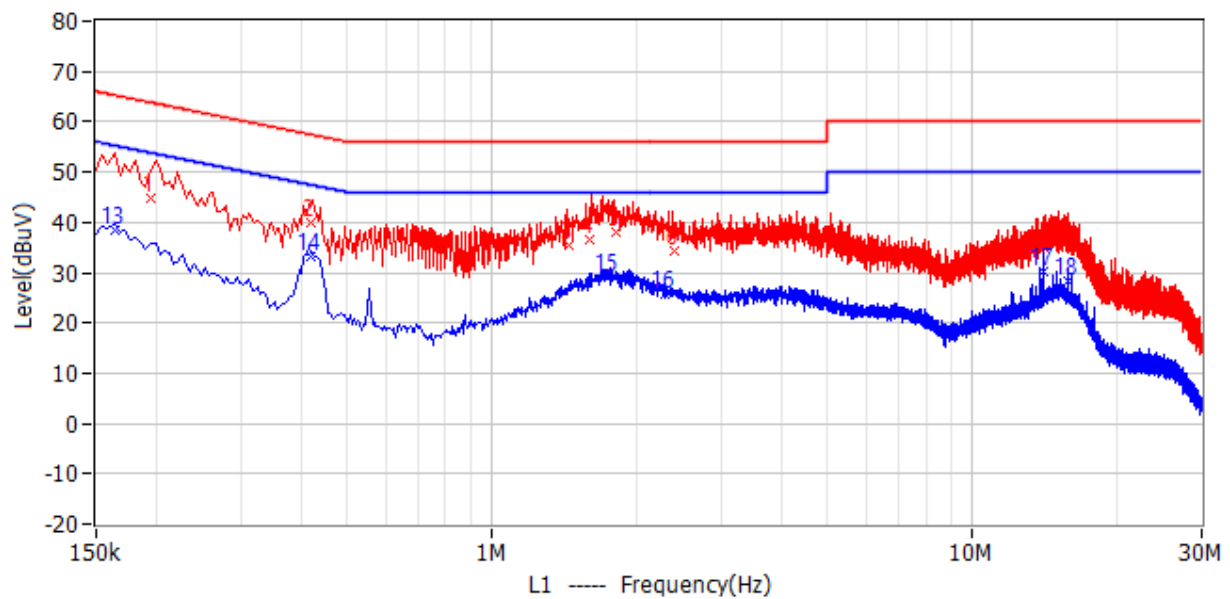
### Test Data:

No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Phase
1	154.500kHz	65.75	50.11	-15.64	43.91	6.20	QP	L1
2	208.500kHz	63.26	43.93	-19.33	37.73	6.20	QP	L1
3	1.689MHz	56.00	34.98	-21.02	28.78	6.20	QP	L1
4	1.878MHz	56.00	34.89	-21.11	28.69	6.20	QP	L1
5	2.045MHz	56.00	33.63	-22.37	27.43	6.20	QP	L1
6	26.606MHz	60.00	37.21	-22.79	29.51	7.70	QP	L1
7	150.000kHz	66.00	50.56	-15.44	44.36	6.20	QP	N
8	190.500kHz	64.01	45.49	-18.52	39.39	6.10	QP	N
9	1.712MHz	56.00	34.30	-21.70	28.10	6.20	QP	N
10	2.072MHz	56.00	33.30	-22.70	27.10	6.20	QP	N
11	2.369MHz	56.00	31.58	-24.42	25.38	6.20	QP	N
12	26.957MHz	60.00	36.23	-23.77	28.63	7.60	QP	N
13	154.500kHz	55.75	39.01	-16.74	32.81	6.20	CAV	L1
14	177.000kHz	54.63	36.78	-17.85	30.68	6.10	CAV	L1
15	222.000kHz	52.74	31.69	-21.05	25.49	6.20	CAV	L1
16	1.550MHz	46.00	24.32	-21.68	18.12	6.20	CAV	L1
17	1.811MHz	46.00	25.30	-20.70	19.10	6.20	CAV	L1
18	2.009MHz	46.00	24.11	-21.89	17.91	6.20	CAV	L1
19	154.500kHz	55.75	39.28	-16.47	33.08	6.20	CAV	N
20	195.000kHz	53.82	34.16	-19.66	27.96	6.20	CAV	N
21	429.000kHz	47.27	27.33	-19.94	21.13	6.20	CAV	N
22	1.734MHz	46.00	25.45	-20.55	19.25	6.20	CAV	N
23	2.108MHz	46.00	23.65	-22.35	17.45	6.20	CAV	N
24	26.741MHz	50.00	26.77	-23.23	19.17	7.60	CAV	N

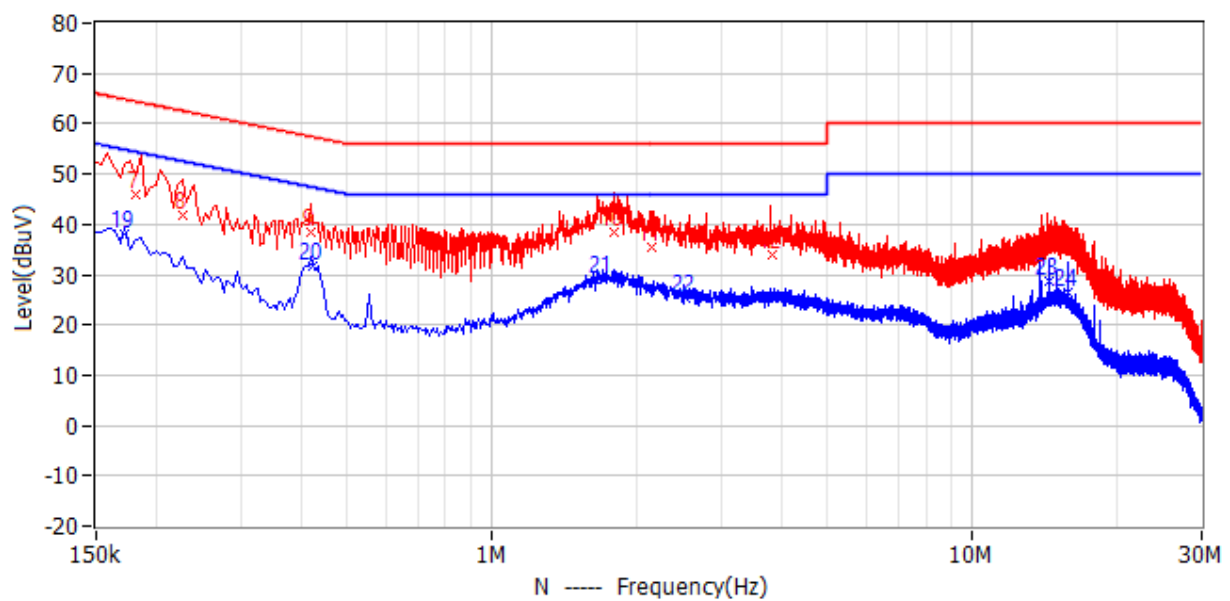
## TEST REPORT

### Test Curve of Model DDX45:

**L Line**



**N Line**



## TEST REPORT

Test Data:

No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Reading dBuV	Factor dB	Detector	Phase
1	195.000kHz	63.82	44.91	-18.91	38.71	6.20	QP	L1
2	420.000kHz	57.45	39.79	-17.66	33.59	6.20	QP	L1
3	1.446MHz	56.00	35.35	-20.65	29.15	6.20	QP	L1
4	1.595MHz	56.00	36.51	-19.49	30.31	6.20	QP	L1
5	1.806MHz	56.00	37.94	-18.06	31.74	6.20	QP	L1
6	2.400MHz	56.00	34.18	-21.82	27.98	6.20	QP	L1
7	181.500kHz	64.42	46.10	-18.32	40.00	6.10	QP	N
8	226.500kHz	62.58	41.92	-20.66	35.72	6.20	QP	N
9	420.000kHz	57.45	38.42	-19.03	32.22	6.20	QP	N
10	1.788MHz	56.00	38.55	-17.45	32.35	6.20	QP	N
11	2.153MHz	56.00	35.46	-20.54	29.26	6.20	QP	N
12	3.831MHz	56.00	33.82	-22.18	27.52	6.30	QP	N
13	163.500kHz	55.28	38.33	-16.95	32.13	6.20	CAV	L1
14	420.000kHz	47.45	33.14	-14.31	26.94	6.20	CAV	L1
15	1.752MHz	46.00	29.21	-16.79	23.01	6.20	CAV	L1
16	2.297MHz	46.00	25.67	-20.33	19.47	6.20	CAV	L1
17	14.096MHz	50.00	30.09	-19.91	23.19	6.90	CAV	L1
18	15.860MHz	50.00	28.46	-21.54	21.46	7.00	CAV	L1
19	172.500kHz	54.84	37.95	-16.89	31.85	6.10	CAV	N
20	424.500kHz	47.36	31.72	-15.64	25.52	6.20	CAV	N
21	1.703MHz	46.00	29.11	-16.89	22.91	6.20	CAV	N
22	2.531MHz	46.00	25.14	-20.86	18.94	6.20	CAV	N
23	14.388MHz	50.00	28.78	-21.22	21.88	6.90	CAV	N
24	15.860MHz	50.00	26.62	-23.38	19.62	7.00	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.

## 9 Occupied Bandwidth

**Test result:**      **Tested**

### 9.1 Limit

None

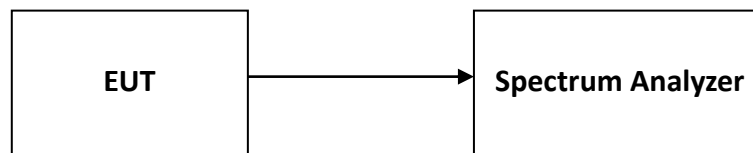
### 9.2 Measurement Procedure

The occupied bandwidth per RSS-Gen was measured using the Spectrum Analyzer.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

### 9.3 Test Configuration



### 9.4 The results of Occupied Bandwidth

Please refer to Appendix B

## 10 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 \*\*\*\*\*