

# RF TEST REPORT

**For CE-RED**

**Report No.** : SSP24070038-2R

**Applicant** : SHENZHEN HANGPIN INDUSTRIAL LIMITED COMPANY

**Product Name** : Mouse

**Model Name** : V16

**Test Standard** : EN 300440 V2.2.1 (2018-07)

**Date of Issue** : 2024-07-08



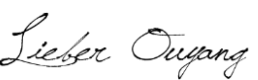



**Shenzhen CCUT Quality Technology Co., Ltd.**

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Guangdong, China; (Tel.:+86-755-23406590 website: [www.ccuttest.com](http://www.ccuttest.com))

This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen CCUT Quality Technology Co., Ltd.

**Test Report Basic Information**

<b>Applicant</b> .....:	SHENZHEN HANGPIN INDUSTRIAL LIMITED COMPANY	
Address of Applicant.....:	Room 303, Ju de Building, No 15, zhengfeng south road, huaide community, fu yong street, BAOAN DISTRICT, SHENZHEN, CHINA	
<b>Manufacturer</b> .....:	SHENZHEN HANGPIN INDUSTRIAL LIMITED COMPANY	
Address of Manufacturer.....:	Room 303, Ju de Building, No 15, zhengfeng south road, huaide community, fu yong street, BAOAN DISTRICT, SHENZHEN, CHINA	
<b>Product Name</b> .....:	Mouse	
<b>Brand Name</b> .....:	-	
<b>Main Model</b> .....:	V16	
<b>Series Models</b> .....:	See section 1.1(page 5)	
<b>Test Standard</b> .....:	EN 300440 V2.2.1 (2018-07)	
<b>Date of Test</b> .....	2023-04-03 to 2023-04-12	
<b>Test Result</b> .....:	PASS	
<b>Tested By</b> .....	 _____ (Walker Wu)	
<b>Reviewed By</b> .....:	 _____ (Lieber Ouyang)	
<b>Authorized Signatory</b> .....:	 _____ (Lahm Peng)	
Note : This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen CCUT Quality Technology Co., Ltd.. All test data presented in this test report is only applicable to presented test sample.		

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Revision History

Revision	Issue Date	Description	Revised By
V1.0	2024-07-08	Initial Release	Lahm Peng

## 1. General Information

### 1.1 Product Information

Product Name:	Mouse
Trade Name:	-
Main Model:	V16
Series Models:	V62, V6, V100, V30, V28, V96, V97, V83, V80, V34, V43, V7, V61, V41, V63, V64, V65, V66, V67, V68, V69, V70, V71, V72, V73, D22, D97, D37, D51, D66, D60, D61, D62, D63, D64, D65, D66, D67, D68
Rated Voltage:	DC 1.5V by "AA" battery
Hardware Version:	V1.2
Software Version:	V1.0
Note 1: The test data is gathered from a production sample, provided by the manufacturer.	
Note 2: The color of appearance and model name of series models listed are different from the main model, but the circuit and the electronic construction are the same, declared by the manufacturer.	

Wireless Specification	
Operating Frequency:	2402-2480MHz
Number of Channel:	40
Modulation:	GFSK
Antenna Gain:	0dBi
Type of Antenna:	PCB Antenna
Type of Device:	<input checked="" type="checkbox"/> Portable Device <input type="checkbox"/> Mobile Device <input type="checkbox"/> Modular Device

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	11	2422	21	2442	31	2462
02	2404	12	2424	22	2444	32	2464
03	2406	13	2426	23	2446	33	2466
04	2408	14	2428	24	2448	34	2468
05	2410	15	2430	25	2450	35	2470
06	2412	16	2432	26	2452	36	2472
07	2414	17	2434	27	2454	37	2474
08	2416	18	2436	28	2456	38	2476
09	2418	19	2438	29	2458	39	2478
10	2420	20	2440	30	2460	40	2480

## 1.2 Test Setup Information

List of Test Modes			
Test Mode	Description	Remark	
TM1	Transmitting	2402/2440/2480MHz	
TM2	Receiving	-	
TM3	Receiving	Receiving Equipment	
List and Details of Auxiliary Cable			
Description	Length (cm)	Shielded/Unshielded	With/Without Ferrite
-	-	-	-
-	-	-	-
List and Details of Auxiliary Equipment			
Description	Manufacturer	Model	Serial Number
-	-	-	-
-	-	-	-
The equipment under test (EUT) was configured to measure its highest possible emission and immunity level. The test modes were adapted according to the operation manual for use.			

Test Conditions					
	NTNV	LTLV	LTHV	HTHV	HTLV
Temperature (°C)	20	-20	-20	55	55
Voltage (V)	1.5	1.35	1.65	1.65	1.35

### 1.3 Compliance Standard

Compliance Standard	
EN 300440 V2.2.1 (2018-07)	Short Range Devices (SRD); Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Harmonised Standard for access to radio spectrum
All measurements contained in this report were conducted with all above standards	
According to standards for test methodology	
EN 300440 V2.2.1 (2018-07)	Short Range Devices (SRD); Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Harmonised Standard for access to radio spectrum
Maintenance of compliance is the responsibility of the manufacturer or applicant. Any modification of the product, which result is lowering the emission, should be checked to ensure compliance has been maintained.	

### 1.4 Test Facilities

Laboratory Name:	<b>Shenzhen CCUT Quality Technology Co., Ltd.</b> 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China
CNAS Laboratory No.:	L18863
A2LA Certificate No.:	6893.01
FCC Registration No:	583813
ISED Registration No.:	CN0164
All measurement facilities used to collect the measurement data are located at 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China.	

## 1.5 List of Measurement Instruments

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
<b>Conducted RF Testing</b>					
RF Test System	MWRFTTest	MW100-RFCB	220418SQS-37	2022-07-09	2023-07-08
Spectrum Analyzer	KEYSIGHT	N9020A	AT0-90521	2022-07-09	2023-07-08
Signal Generator	Agilent	N5182A	MY47071192	2022-07-09	2023-07-08
Radio Tester	ROHDE&SCHWARZ	CMW500	2K50-126968	2022-07-09	2023-07-08
<b>Radiated Spurious Emissions</b>					
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	100154	2022-07-09	2023-07-08
Spectrum Analyzer	KEYSIGHT	N9020A	MY48030972	2022-07-09	2023-07-08
Amplifier	SCHWARZBECK	BBV 9743B	00251	2022-07-09	2023-07-08
Amplifier	HUABO	YXL0518-2.5-45	--	2022-07-09	2023-07-08
Loop Antenna	DAZE	ZN30900C	21104	2022-07-09	2023-07-08
Broadband Antenna	SCHWARZBECK	VULB 9168	01320	2022-07-09	2023-07-08
Horn Antenna	SCHWARZBECK	BBHA 9120D	02553	2022-07-09	2023-07-08

## 1.6 Measurement Uncertainty

Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.50\text{dB}$
Effective Radiated Power	Radiated	$\pm 3.32\text{dB}$
	Conducted	$\pm 1.32\text{dB}$
Occupied Bandwidth	Conducted	$\pm 4.0\%$
Carrier Frequency	Conducted	$\pm 0.16\text{ppm}$
Power Spectral Density	Conducted	$\pm 0.50\text{dB}$
Transmission Time	Conducted	$\pm 1.0\%$
Conducted Spurious Emissions	30MHz~1GHz	$\pm 1.32\text{dB}$
	1GHz~18GHz	$\pm 1.32\text{dB}$
Radiated Spurious Emissions	30MHz~1GHz	$\pm 3.32\text{dB}$
	1GHz~18GHz	$\pm 3.50\text{dB}$
Power Voltage	AC and DC	$\pm 0.2\%$
Temperature	--	$\pm 0.3^{\circ}\text{C}$



## 2. Summary of Test Results

Standards	Reference	Description of Test Items	Result
EN 300440 V2.2.1 (2018-07)	4.2.2	Equivalent Isotropically Radiated Power	Passed
	4.2.3	Permitted Range of Operating Frequencies	Passed
	4.2.3	Occupied Channel Bandwidth	Passed
	4.2.4	Unwanted Emissions in the Spurious Domain	Passed
	4.2.5	Duty Cycle	Passed
	4.3.5	Receiver Spurious Radiations	Passed
	4.3.4	Receiver Blocking	Passed
Passed: The EUT complies with the essential requirements in the standard Failed: The EUT does not comply with the essential requirements in the standard N/A: not applicable			

### 3. Equivalent Isotropically Radiated Power

#### 3.1 Standard and Limit

According to the standard EN 300440 section 4.2.2, The transmitter maximum e.i.r.p. under normal and extreme test conditions is provided in following table.

Entry	Frequency Bands	Power	Application	Notes
1	2 400 MHz to 2 483,5 MHz	10 mW e.i.r.p.	Non-specific short range devices	
2	2 400 MHz to 2 483,5 MHz	25 mW e.i.r.p.	Radiodetermination devices	
3	(a) 2 446 MHz to 2 454 MHz	500 mW e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and Annex G
4	(b) 2 446 MHz to 2 454 MHz	4 W e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and Annex G
5	5 725 MHz to 5 875 MHz	25 mW e.i.r.p.	Non-specific short range devices	
6	9 200 MHz to 9 500 MHz	25 mW e.i.r.p.	Radiodetermination devices	
7	9 500 MHz to 9 975 MHz	25 mW e.i.r.p.	Radiodetermination devices	
8	10,5 GHz to 10,6 GHz	500 mW e.i.r.p.	Radiodetermination devices	
9	13,4 GHz to 14,0 GHz	25 mW e.i.r.p.	Radiodetermination devices	
10	17,1 GHz to 17,3 GHz	400 mW e.i.r.p.	Radiodetermination devices	See Annex H
11	24,00 GHz to 24,25 GHz	100 mW e.i.r.p.	Non-specific short range devices and radiodetermination devices	
NOTE: The spectrum ranges in some entries are not harmonised throughout all EU territory, specifically entries 4, 9, and 11 have been identified as such. Implementers are cautioned to refer to CEPT/ERC Recommendation 70-03 [i.2] as well as current National Radio plans to verify acceptance within intended regions of use.				

#### 3.2 Test Procedure

Test is conducting under the description of EN 300440 section 4.2.2.3.

#### 3.3 Test Data and Results

Test Condition	Channel (MHz)	EIRP (dBm)	EIRP (mW)	Limit (mW)
NTNV	2402	-4.74	0.336	10
	2440	-4.60	0.347	10
	2480	-4.85	0.327	10
LTLV	2402	-4.77	0.333	10
	2440	-4.66	0.342	10
	2480	-4.87	0.326	10
LTHV	2402	-4.75	0.335	10
	2440	-4.63	0.344	10
	2480	-4.86	0.327	10
HTLV	2402	-4.78	0.333	10
	2440	-4.65	0.343	10
	2480	-4.89	0.324	10
HTHV	2402	-4.76	0.334	10
	2440	-4.64	0.344	10
	2480	-4.88	0.325	10

## 4. Permitted Range of Operating Frequencies

### 4.1 Standard and Limit

According to the standard EN 300440 section 4.2.3, The width of the power spectrum envelope is  $f_H - f_L$  for a given operating frequency. In equipment that allows adjustment or selection of different operating frequencies, the power envelope takes up different positions in the allowed band. The frequency range is determined by the lowest value of  $f_L$  and the highest value of  $f_H$  resulting from the adjustment of the equipment to the lowest and highest operating frequencies.

The occupied bandwidth (i.e. the bandwidth in which 99 % of the wanted emission is contained) of the transmitter shall fall within the assigned frequency band.

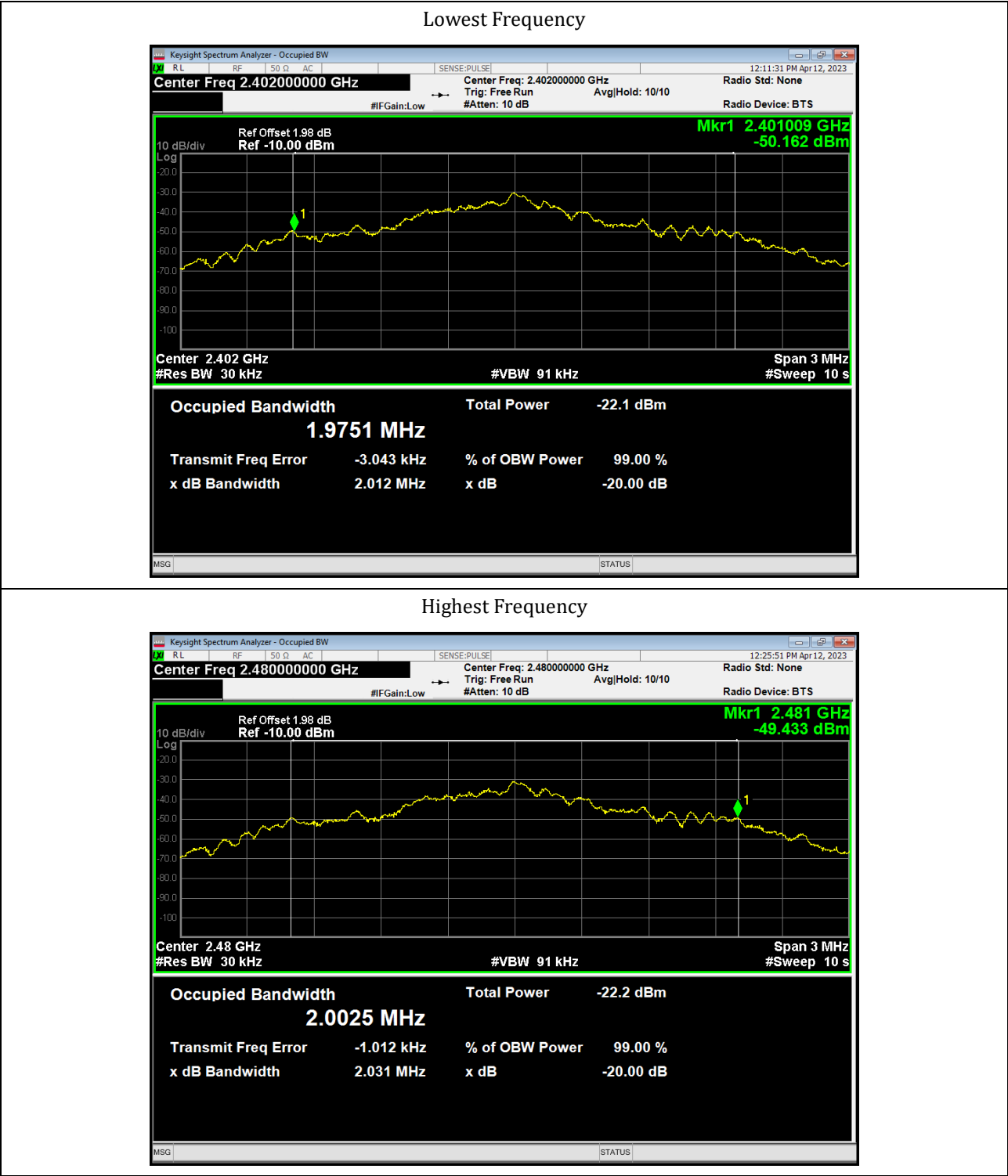
For all equipment the frequency range shall lie within the frequency band given by clause 4.2.2.4, table 2. For non-harmonized frequency bands the available frequency range may differ between national administrations.

### 4.2 Test Procedure

Test is conducting under the description of EN 300440 section 4.2.3.3.

### 4.3 Test Data and Results

Test Conditions	Test Value		Limit	
	fL(Lowest Freq.)	fH (Highest Freq.)	fL(Lowest Freq.)	fH (Highest Freq.)
NTNV	2401.009	2481	>2400MHz	<2483.5MHz
LTLV	2401.014	2480.994	>2400MHz	<2483.5MHz
LTHV	2401.011	2480.998	>2400MHz	<2483.5MHz
HTHV	2401.012	2480.997	>2400MHz	<2483.5MHz
HTLV	2401.016	2480.996	>2400MHz	<2483.5MHz



## 5. Occupied Channel Bandwidth

### 5.1 Standard and Limit

According to the standard EN 300440 section 4.2.3.5, The occupied bandwidth (i.e. the bandwidth in which 99 % of the wanted emission is contained) of the transmitter shall fall within the assigned frequency band.

For all equipment the frequency range shall lie within the frequency band given by clause 4.2.2.4, table 2. For non-harmonized frequency bands the available frequency range may differ between national administrations.

### 5.2 Test Procedure

Test is conducting under the description of EN 300440 section 4.2.3.3.

### 5.3 Test Data and Results

Channel (MHz)	99% OBW (MHz)	Measured Value		Limit	
		fL(Lowest Freq.)	fH (Highest Freq.)	fL	fH
2402	1.975	2401.009	2402.984	>2400MHz	<2483.5MHz
2440	1.988	2439.003	2440.991	>2400MHz	<2483.5MHz
2480	2.002	2478.998	2481	>2400MHz	<2483.5MHz



## 6. Duty Cycle

### 6.1 Standard and Limit

According to the standard EN 300440 section 4.2.5.4, The following table defines the maximum duty cycle within a 1 hour period.

Frequency Band	Duty cycle	Application	Notes
2 400 MHz to 2 483,5 MHz	No Restriction	Generic use	
2 400 MHz to 2 483,5 MHz	No Restriction	Radiodetermination	
(a) 2 446 MHz to 2 454 MHz	No Restriction	RFID	Limits shown in Annex G shall apply
(b) 2 446 MHz to 2 454 MHz	$\leq 15 \%$	RFID	Limits shown in Annex G shall apply
5 725 MHz to 5 875 MHz	No Restriction	Generic use	
9 200 MHz to 9 500 MHz	No Restriction	Radiodetermination	
9 500 MHz to 9 975 MHz	No Restriction	Radiodetermination	
10,5 GHz to 10,6 GHz	No Restriction	Radiodetermination	
13,4 GHz to 14,0 GHz	No Restriction	Radiodetermination	
17,1 GHz to 17,3 GHz	DAA or equivalent techniques	Radiodetermination, limited to GBSAR detecting and movement and alert applications	Limits shown in Annex I shall apply
24,00 GHz to 24,25 GHz	No Restriction	Generic use and for radiodetermination	
NOTE: The spectrum ranges in some entries are not harmonised throughout all EU territory, specifically entries 4, 9, and 11 have been identified as such. Implementers are cautioned to refer to CEPT/ERC Recommendation 70-03 [i.2] as well as current National Radio plans to verify acceptance within intended regions of use.			

### 6.2 Test Procedure

Test is conducting under the description of EN 300440 section 4.2.5.3.

### 6.3 Test Data and Results

For generic use devices operating at frequency range from 2400MHz to 2483.5MHz, according to EN 300440, the duty cycle is no restriction.



## 7. Transmitter Unwanted Emissions in the Spurious Domain

### 7.1 Standard and Limit

According to the standard EN 300440 section 4.2.4.4, The maximum power limits of any unwanted emissions in the spurious domain are given in following table.

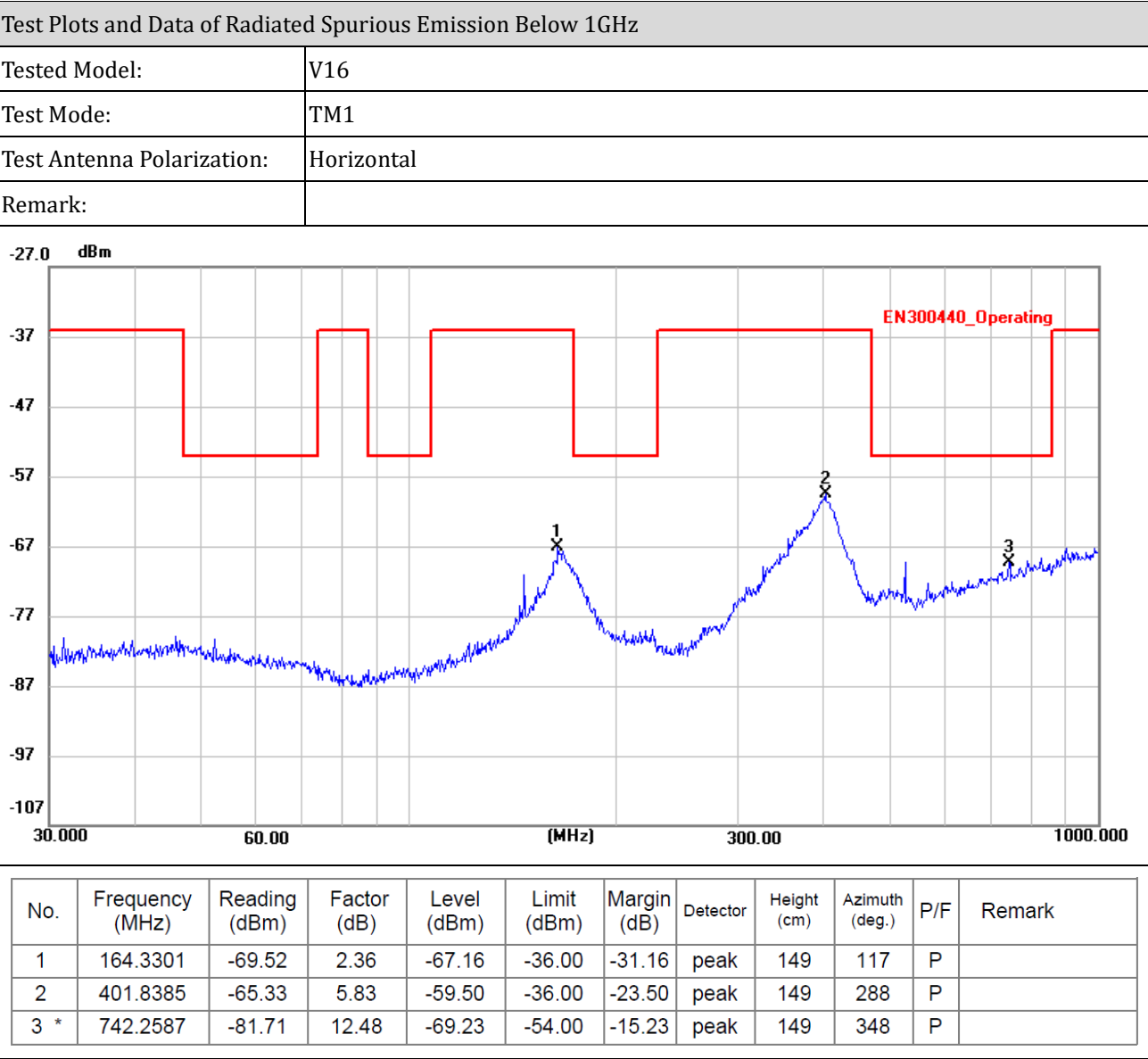
Frequency ranges	47 MHz to 74 MHz 87,5 MHz to 108 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies $\leq 1\,000$ MHz	Frequencies > 1 000 MHz
State			
Operating	4 nW	250 nW	1 $\mu$ W
Standby	2 nW	2 nW	20 nW

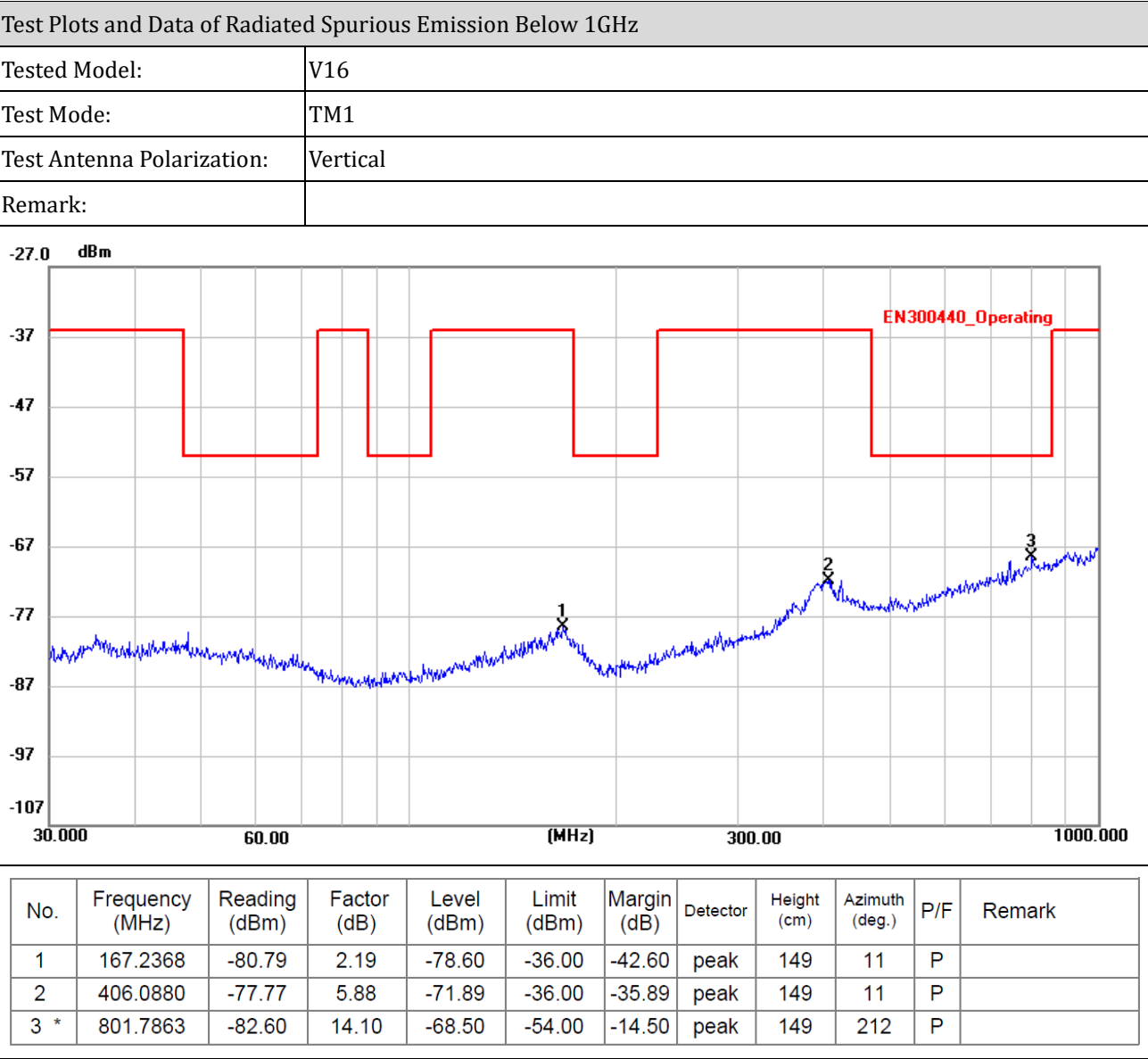
### 7.2 Test Procedure

Test is conducting under the description of EN 300440 section 4.2.4.3 and annex E.

### 7.3 Test Data and Results

According to the data, the EUT complied with the EN 300440 standard, and had the worst cases:





Test Data of Radiated Spurious Emission Above 1GHz						
Frequency	Reading	Correct	Result	Limit	Margin	Polar
(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	H/V
Lowest Channel (2402MHz)						
4804	-64.07	20.09	-43.98	-30.00	-13.98	H
7206	-76.35	27.60	-48.75	-30.00	-18.75	H
4804	-66.69	20.09	-46.60	-30.00	-16.60	V
7206	-75.00	27.60	-47.40	-30.00	-17.40	V
Highest Channel (2480MHz)						
4960	-63.56	20.30	-43.26	-30.00	-13.26	H
7440	-78.77	28.40	-50.37	-30.00	-20.37	H
4960	-65.63	20.30	-45.33	-30.00	-15.33	V
7440	-72.28	28.40	-43.88	-30.00	-13.88	V

*Note 1: Testing is carried out with frequency rang 30MHz to 25GHz, which above 4<sup>th</sup> Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*

*Note 2: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

## 8. Receiver Spurious Emissions

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### 8.1 Standard and Limit

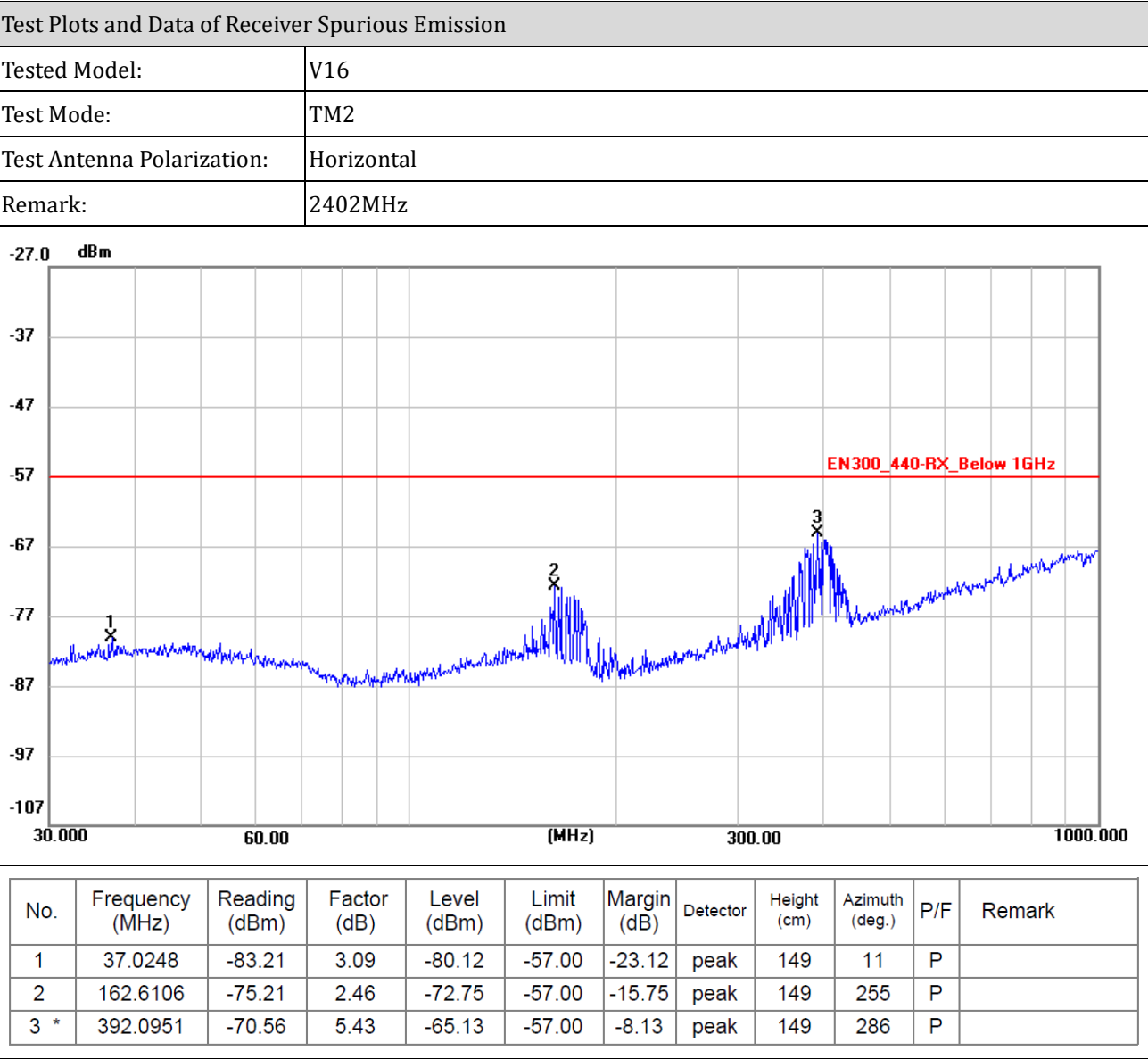
According to the standard EN 300440 section 4.3.5, The power of any spurious emission shall not exceed 2nW in the range 25 MHz to 1 GHz and shall not exceed 20nW on frequencies above 1 GHz.

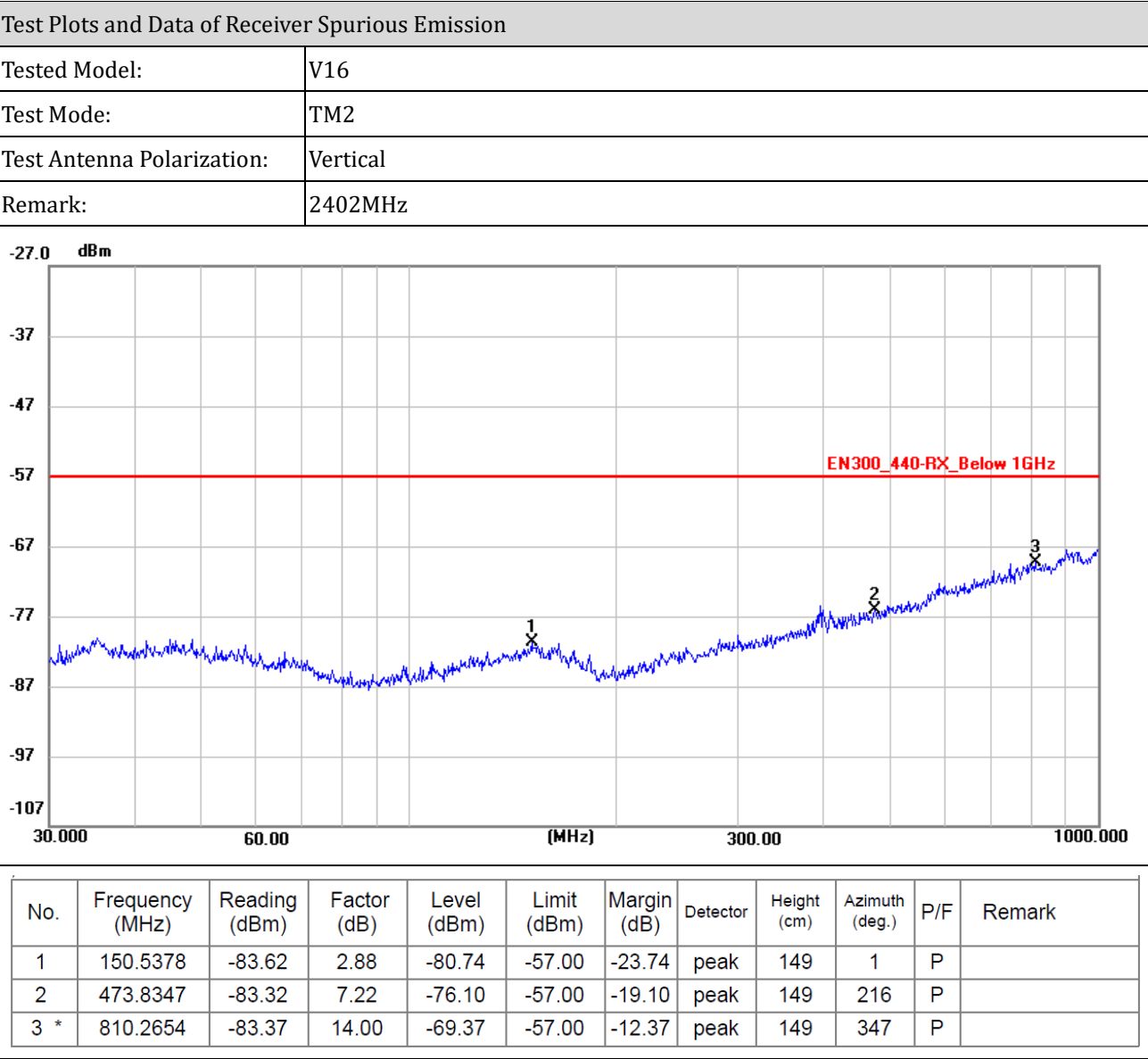
### 8.2 Test Procedure

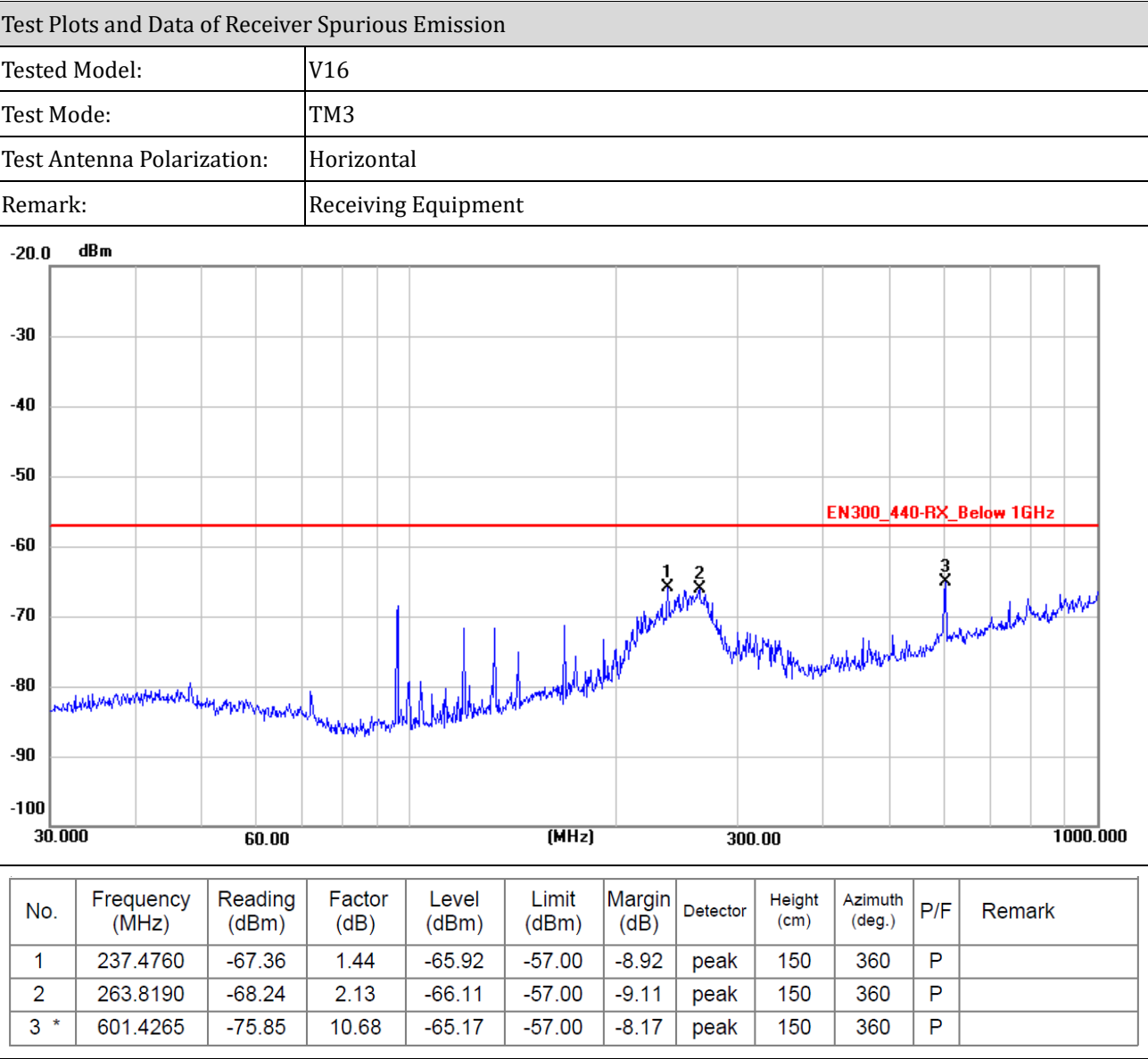
Test is conducting under the description of EN 300440 section 5.3.5.4 and annex E.

### 8.3 Test Data and Results

According to the data, the EUT complied with the EN 300440 standard, and had the worst cases:









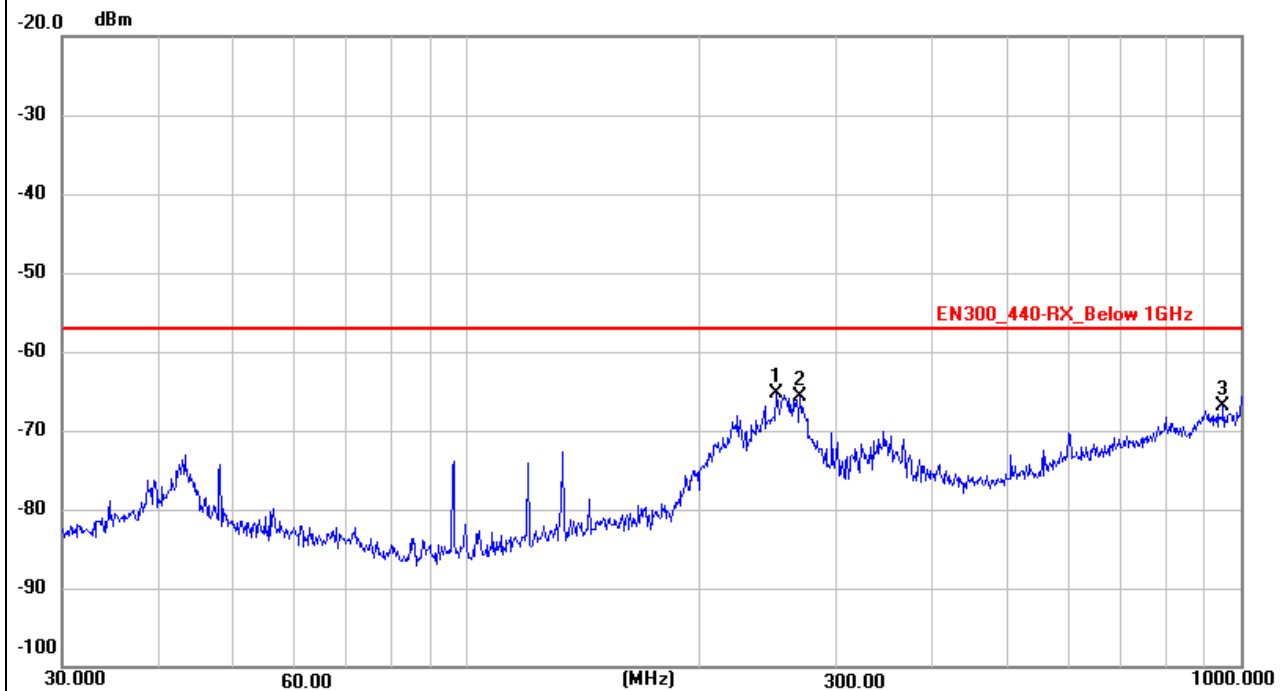
## Test Plots and Data of Receiver Spurious Emission

Tested Model: V16

Test Mode: TM3

Test Antenna Polarization: Vertical

Remark: Receiving Equipment



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	251.1804	-67.18	1.88	-65.30	-57.00	-8.30	peak	150	0	P	
2	269.4284	-67.97	2.30	-65.67	-57.00	-8.67	peak	150	0	P	
3	948.7610	-81.85	14.99	-66.86	-57.00	-9.86	peak	150	0	P	

Note: Testing is carried out with frequency rang 30MHz to 25GHz, which above 1GHz are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

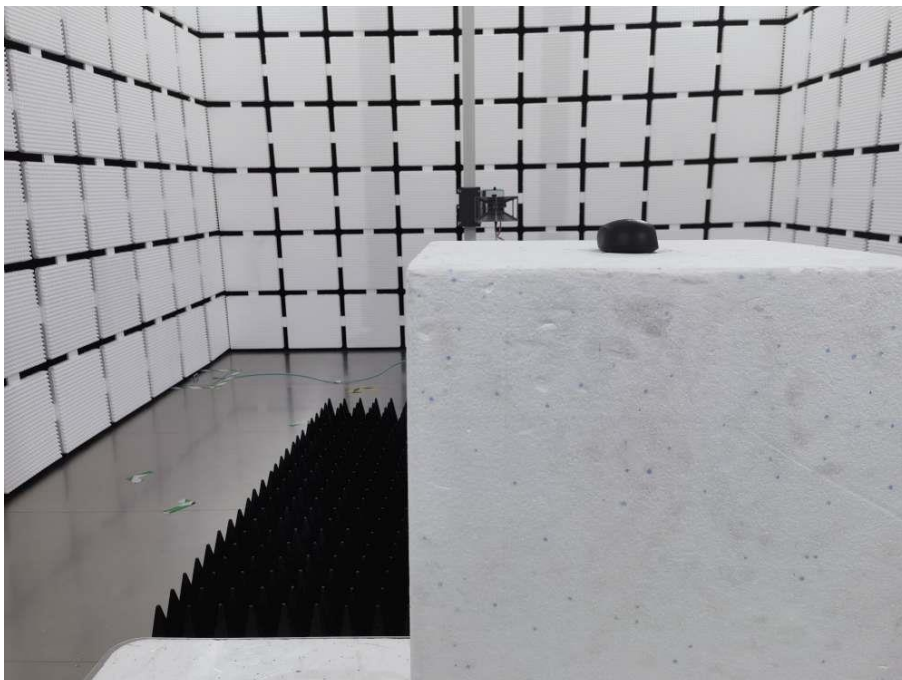
## Annex A. Test Photos

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### Spurious Emission Test View Below 1GHz



### Spurious Emission Test View Above 1GHz



## **Annex B. EUT Photos**

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Please refer to annex B of the test report No: SSP24070038-1E.

**\*\*\*\*\* END OF REPORT \*\*\*\*\***