中国认可
国际互认
检测
TESTING
CNAS L4062

TEST REPORT

Reference No.	:	WTF23X05108883W002
Manufacturer	:	Mid Ocean Brands B.V.
Address	:	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	:	106613
Product Name	:	Optical mouse in RABS bamboo
Model No.	:	MO2085
Standards	:	**EN 50663:2017** **EN 62479:2010**
Date of Receipt sample	:	2023-05-19
Date of Test	:	2023-05-19 to 2023-06-02
Date of Issue	:	2023-06-02
Test Report Form No.	:	WTX_EN 50663_2017W
Test Result	:	**Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road,
Block 70 Bao'an District, Shenzhen, Guangdong, China

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Tested by:

Mike Shi

Approved by:

Silin Chen

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Version No.	Date of issue	Description
Rev.00	2023-06-02	Original
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Optical mouse in RABS bamboo
Trade Name:	/
Model No.:	MO2085
Adding Model(s):	/
Rated Voltage:	Battery:DC1.5V”AA”
Battery Capacity:	/
Software Version:	V05
Hardware Version:	XD_MS_8S_HS06_V05
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
2.4GHz	
Frequency Range:	2402-2480MHz
RF Output Power:	-9.51dBm (EIRP)
Type of Modulation:	GFSK
Type of Antenna:	PCB Antenna
Antenna Gain:	-4.62dBi
Receiver Categories:	/
Note: The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Compliance Standards

The tests were performed according to following standards:

EN 50663:2017: Generic standard for assessment of low power electronic and electrical equipment related to human exposure to electromagnetic fields (10MHz to 300GHz).
EN 62479:2010: Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10MHz to 300GHz).

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with EN 50663,
The equipment under test (EUT) was configured to measure its highest possible emission level. For more detail refer to the Operating Instructions.

1.4 Test Facility

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990
Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

2. RF EXPOSURE BASIC RESTRICTIONS

2.1 Standard Applicable

Equipment complying with the requirements for the general public is deemed to comply with the requirements for workers without further testing.

The conformity assessment to demonstrate equipment compliance shall be made according to EN 62479:2010, 4.1 and Clause 6.

If routes B, C or D of 4.1 of EN 62479:2010 are followed then the values of P_{max}, as described in 4.2 of EN 62479:2010 and given in Annex A of EN 62479:2010, shall be replaced by those in Table 1 below.

Table 1 — Values of Pmax

Exposure tier	Region of body	Pmax(mW)
General public	Head and trunk	20
	Limbs	40
Workers	Head and trunk	100
	Limbs	200

2.2 Evaluation Results

Maximum Average Output Power

Modulation/ Frequency (MHz)	ERP/EIRP dBm	ERP/EIRP mW	Limit mW	Result Pass/Fail
2402	-9.15	0.1216	20	Pass
2440	-9.85	0.1035	20	Pass
2480	-10.09	0.0979	20	Pass

Since average output power at worse case is: 0.1216mW which cannot exceed the exempt condition, 20mW specified in EN 50663. Correspondence between this European standard and Article 3 of Directive 2014/53/EU [2014 OJ L153]

EXHIBIT 1 - EUT PHOTOGRAPHS

Please refer to “ANNEX”.

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

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TEST REPORT

Reference No.	:	WTF23X05108883W001
Manufacturer	:	Mid Ocean Brands B.V.
Address	:	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	:	106613
Product Name	:	Optical mouse in RABS bamboo
Model No.	:	MO2085
Standards	:	**ETSI EN 300 440 V2.2.1 (2018-07)**
Date of Receipt sample	:	2023-05-19
Date of Test	:	2023-05-19 to 2023-06-02
Date of Issue	:	2023-06-02
Test Report Form No.	:	WTX_ETSI EN 300 440_2018W
Test Result	:	**Pass**

Remarks:

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Prepared By:

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1 GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Optical mouse in RABS bamboo
Trade Name:	/
Model No.:	MO2085
Adding Model(s):	/
Rated Voltage:	Battery:DC1.5V”AA”
Battery Capacity:	/
Software Version:	V05
Hardware Version:	XD_MS_8S_HS06_V05
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Frequency Range:	2402-2480MHz
RF Output Power:	-9.51dBm (EIRP)
Type of Modulation:	GFSK
Type of Antenna:	PCB Antenna
Antenna Gain:	-4.62dBi
Note: The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Test Standards

The tests were performed according to following standards:

ETSI EN 300 440 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. Any modification of the product maybe which result in lowering the immunity should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ETSI EN 300 440, the equipment under test (EUT) was configured to measure its highest possible emission level. For more detail refer to the Operating Instructions.
For radiation emission tests above 1GHz, it is referred to section EN 300 440 Annex A, E, F using the substitution measurement.

1.4 Test Facility

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

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Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Test Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, the EUT was operated in the engineering mode to fix the Tx/Rx frequency that was for the purpose of the measurements, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	Low Channel	2402MHz
TM2	Middle Channel	2440MHz
TM3	High Channel	2480MHz

Test Conditions					
	Normal	LTLV	LTHV	HTHV	HTLV
Temperature (°C)	25	-10	-10	+50	+50
Voltage (VDC)	5	4.5	5.5	5.5	4.5
Relative Humidity:	55%.				
ATM Pressure:	1019 mbar				

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Uncertainty	Notes
Conducted EIRP	±0.42dB	(1)
Frequency Range	$\pm 1\times10^{-7}$	(1)
Radiated Spurious Emissions	30-200MHz ±4.52dB	(1)
	0.2-1GHz ±5.56dB	(1)
	1-6GHz ±3.84dB	(1)
	6-18GHz ±3.92dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	N9020A	US47140102	2023-02-25	2024-02-24
Signal Generator	Agilent	83752A	3610A01453	2023-02-25	2024-02-24
Vector Signal Generator	Agilent	N5182A	MY47070202	2023-02-25	2024-02-24
Power Sensor	Agilent	U2021XA	MY54250019	2023-02-25	2024-02-24
Power Sensor	Agilent	U2021XA	MY54250021	2023-02-25	2024-02-24
Simultaneous Sampling	Agilent	U2531A	TW54243509	2023-02-25	2024-02-24
Communication Tester	HP	8921A	/	2023-02-25	2024-02-24
Temperature&Humidity Chamber	/	HTC-1	/	2023-02-25	2024-02-24
Universal Radio Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
☒Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☒Chamber A: Above 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐Chamber B:Below 1GHz					
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
Amplifier	Agilent	8447D	2944A10179	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☐Chamber C:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27

Amplifier	HP	8447F	2944A03869	2023-02-25	2024-02-24
☐Chamber C: Above 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Horn Antenna	POAM	RTF-11A	LP228060221	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP01018050	AP22E806235	2023-02-25	2024-02-24

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

Standards	Reference	Description of Test Item	Result
ETSI EN 300 440	4.2.2	Equivalent Isotropically Radiated Power	Pass
	4.2.3	Permitted Range of Operating Frequencies	Pass
	4.2.4	Unwanted emissions in the spurious domain	Pass
	4.2.5.4	Duty Cycle	Pass
	4.2.6	Additional requirements for FHSS equipment	N/A
	4.3.3	Adjacent channel selectivity	N/A
	4.3.4	Blocking or desensitization	Pass
	4.3.5	Spurious radiation	Pass
	4.4	Spectrum access techniques	N/A
	4.6.4	GBSAR antenna pattern	N/A
	Annex I	Limits for GBSAR	N/A

Pass: The EUT complies with the essential requirements in the standard.
Fail: The EUT does not comply with the essential requirements in the standard.
N/A: not applicable.

3. Equivalent Isotropically Radiated Power

3.1 Standard Applicable

According to ETSI EN 300 440 section 4.2.2, the effective radiated power shall not exceed the power class value given in following table:
Table 2: Maximum radiated peak power (e.i.r.p.)

Frequency Bands	Power	Application	Notes
2 400 MHz to 2 483,5 MHz	10 mW e.i.r.p.	Non-specific short range devices	
2 400 MHz to 2 483,5 MHz	25 mW e.i.r.p.	Radio determination devices	
(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
(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
5 725 MHz to 5 875 MHz	25 mW e.i.r.p.	Non-specific short range devices	
9 200 MHz to 9 500 MHz	25 mW e.i.r.p.	Radio determination devices	
9 500 MHz to 9 975 MHz	25 mW e.i.r.p.	Radio determination devices	
10,5 GHz to 10,6 GHz	500 mW e.i.r.p.	Radio determination devices	
13,4 GHz to 14,0 GHz	25 mW e.i.r.p.	Radio determination devices	
17,1 GHz to 17,3 GHz	400 mW e.i.r.p.	Radio determination devices	See annex F
24,00 GHz to 24,25 GHz	100 mW e.i.r.p.	Non-specific short range devices and Radio determination devices	

3.2 Test Procedure

According to section 4.2.2 of the standard EN 300440, the test procedure shall be as follows:

1. Using a suitable means, the output of the transmitter shall be connected to the spectrum analyzer, the spectrum analyzer shall be capable of faithfully reproducing the envelope peaks and the duty cycle of the transmitter output signal. The observed duty cycle of the transmitter (Tx on/(Tx on + Tx off)) shall be noted as x, (0 < x < 1) and recorded.

2. The average output power of the transmitter shall be determined using the spectrum analyzer. The observed value shall be recorded as "A" (in dBm).

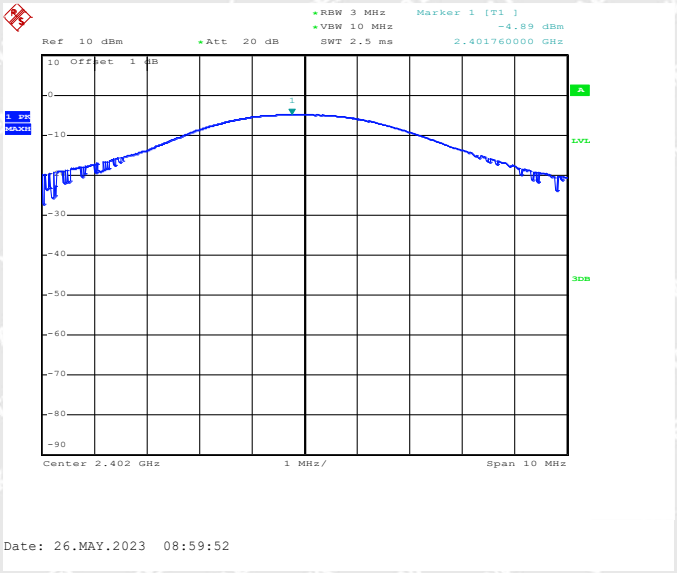
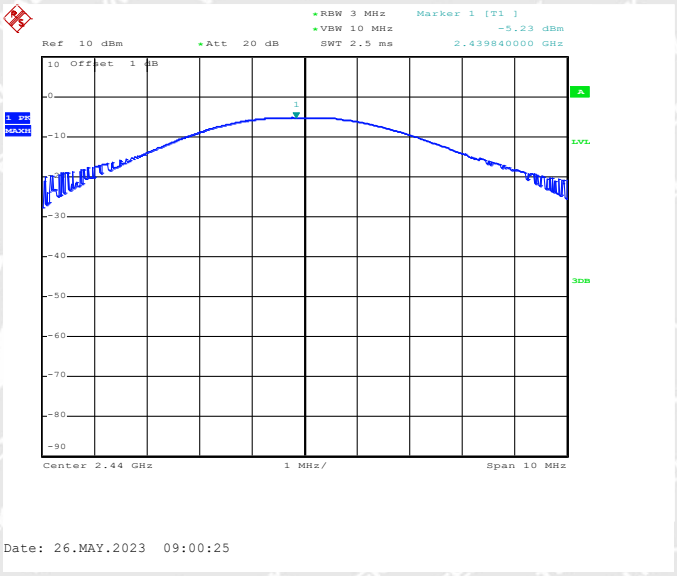
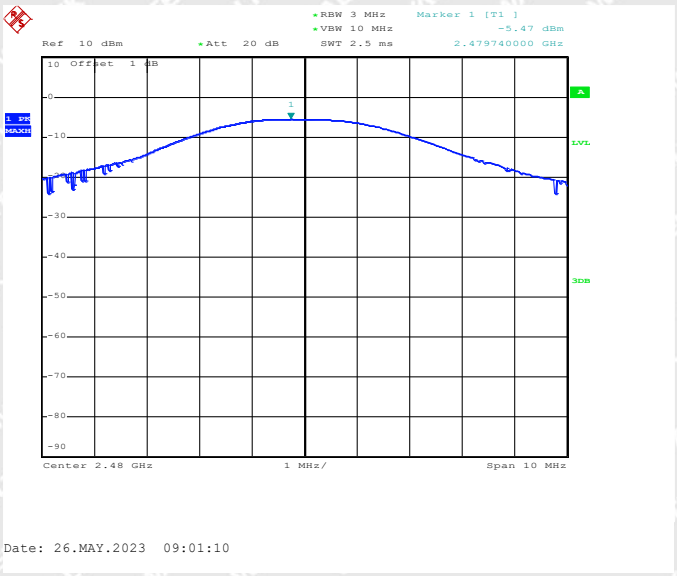
3. The e.i.r.p. shall be calculated from the above measured power output A, the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:
- P = A + G + 10 log (1/x);

4. The measurement shall be repeated at the lowest, the middle, and the highest frequency of the stated frequency range. These frequencies shall be recorded. FHSS equipment shall be made to hop continuously

to each of these three frequencies separately. These measurements shall be performed at normal and extreme test conditions.

3.3 Summary of Test Results

Test Conditions	Measured Value	Antenna Gain	EIRP	Limit
	dBm	dBi	dBm	dBm
Low Channel				
Normal	-4.89	-4.62	-9.51	10
LTLV	-5.11	-4.62	-9.73	10
LTHV	-5.07	-4.62	-9.69	10
HTHV	-5.12	-4.62	-9.74	10
HTLV	-5.02	-4.62	-9.64	10
Middle Channel				
Normal	-5.23	-4.62	-9.85	10
LTLV	-5.37	-4.62	-9.99	10
LTHV	-5.36	-4.62	-9.98	10
HTHV	-5.40	-4.62	-10.02	10
HTLV	-5.45	-4.62	-10.07	10
high Channel				
Normal	-5.47	-4.62	-10.09	10
LTLV	-5.65	-4.62	-10.27	10
LTHV	-5.61	-4.62	-10.23	10
HTHV	-5.66	-4.62	-10.28	10
HTLV	-5.62	-4.62	-10.24	10

Low	
Middle	
High	

4. Permitted Range of Operating Frequencies

4.1 Applicable Standard

According to EN 300 440 section 4.2.3

The frequency range of the equipment is determined by the lowest and highest frequencies occupied by the power envelope in accordance with CEPT/ERC Recommendation 74-01 [2].
f_H is the highest frequency of the power envelope, it is the frequency furthest above the frequency of maximum power where the output power drops below the level of –75dBm/Hz spectral power density (-30 dBm if measured in a 30 kHz reference bandwidth) eirp.
f_L is the lowest frequency of the power envelope; it is the frequency furthest below the frequency of maximum power where the output power drops below the level of –75dBm/Hz spectral power density (-30dBm if measured in a 30 kHz reference bandwidth) eirp.

4.2 Test Procedure

According to section 4.2.3 of the standard EN 300440, the test procedure shall be as follows:

1. Put the spectrum analyzer in video averaging mode with a minimum of 50 sweeps selected.

2. Select the lowest operating frequency of the equipment under test and activate the transmitter with modulation applied. The RF emission of the equipment shall be displayed on the spectrum analyzer.

3. Using the marker of the spectrum analyzer, find lowest frequency below the operating frequency at which spectral power density drops below the required value.

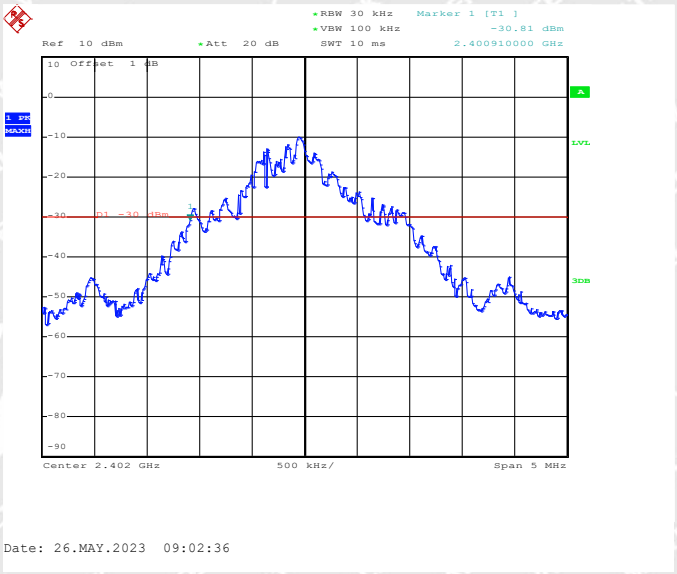
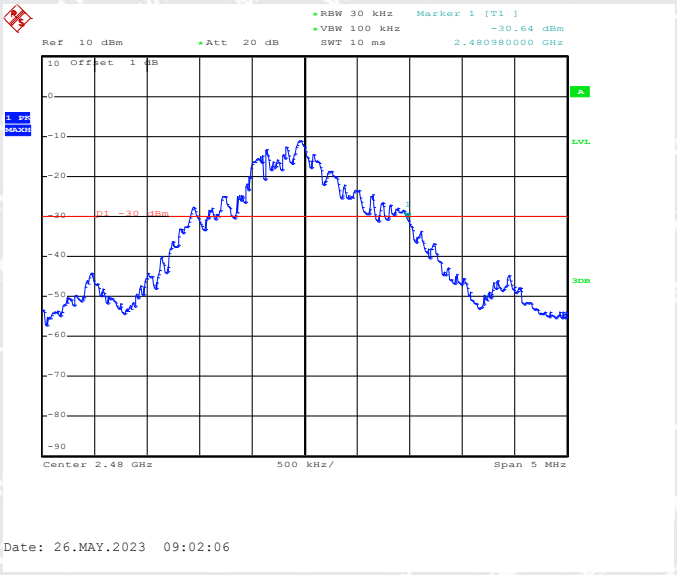
4. Select the highest operating frequency of the equipment under test and find the highest frequency at which the spectral power density drop below the required value.

5. The difference between the frequencies measured in step 3 and step 4 is the operating frequency range.

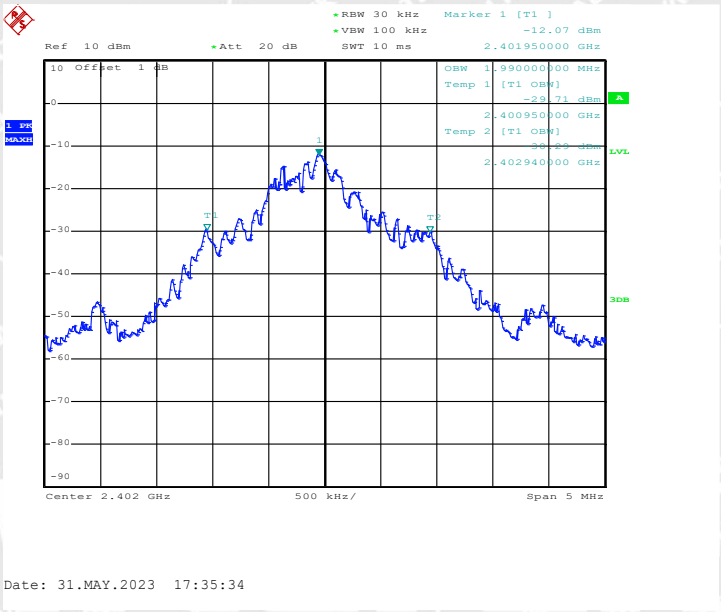
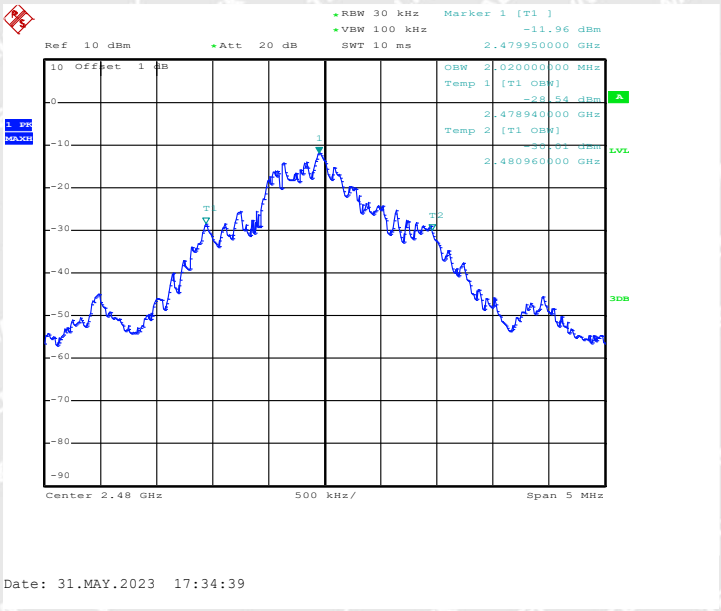
The equivalent isotropically radiated power is then calculated from the measured value, the known antenna gain, relative to an isotropic antenna, and if applicable, any losses due to cables and connectors in the measurement system.

4.3 Test Results/Plots

Frequencies (MHz) at -30dBm/30kHz (EIRP)				
Test conditions	F_L (MHz)	F_H (MHz)	Limit	Result
Normal	2400.91	2480.98	F_L≥2400MHz and F_H≤2483.5MHz	Pass
LTLV	2400.92	2480.98		
LTHV	2400.91	2480.97		
HTHV	2400.90	2480.97		
HTLV	2400.91	2480.99		

Low	
High	

99% OCB				
Test conditions	F_L (MHz)	F_H (MHz)	Limit	Result
Normal	2400.95	2480.96	F_L≥2400MHz and F_H≤2483.5MHz	Pass

Low	
High	

5. Spurious Emissions

5.1 Limit of Spurious Emissions

The power of any spurious emission shall not exceed the following values given in the following table.

Frequency / State	47MHz to 74MHz 87.5MHz to 108MHz 174MHz to 230MHz 470MHz to 862MHz	Other frequencies ≤ 1000MHz	Frequencies > 1000MHz
Operating	4 nW	250 nW	1 μW
Standby	2 nW	2 nW	20 nW

5.2 Test Procedure

The EUT was placed on a nonmetal table which is 1.5 meter above the grounded reference plane and set to work in normal operation mode. Details refer to EN 300 440 subclause 4.2.4.

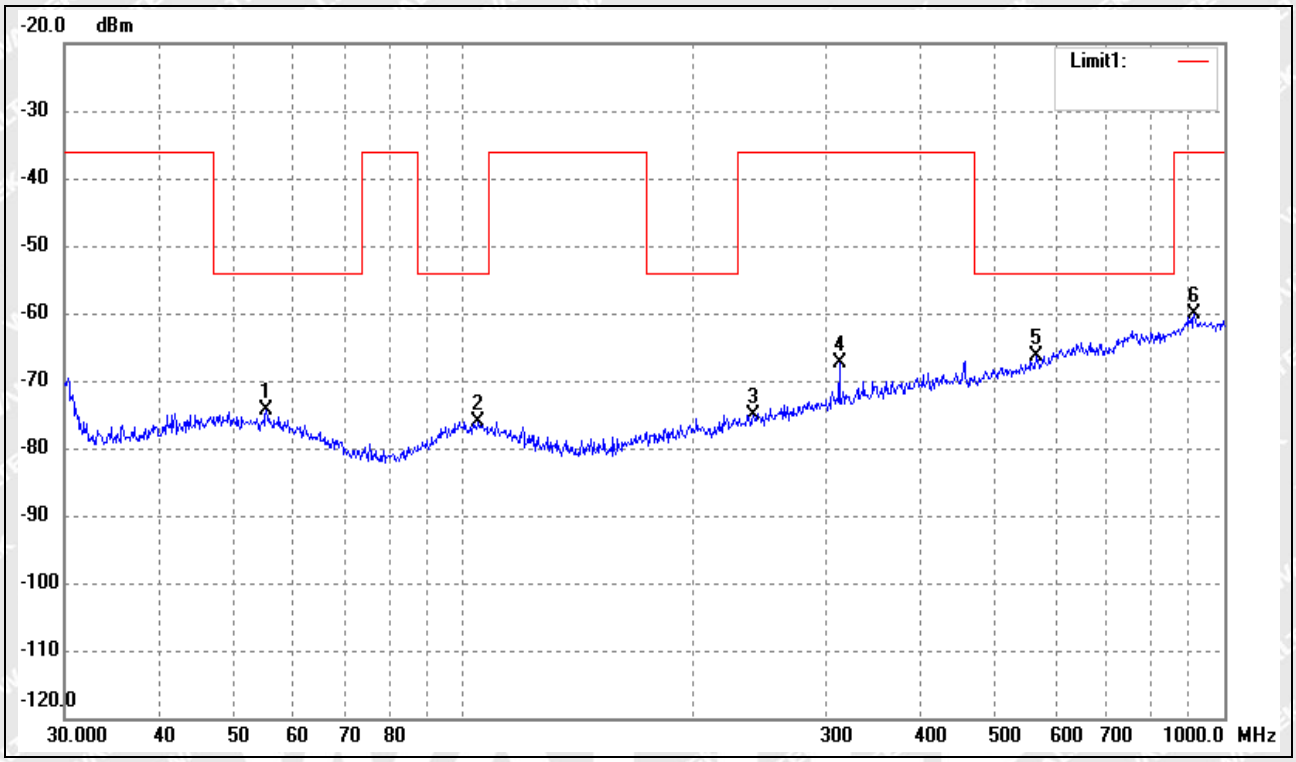
The EUT was operating at transmitting mode to represent worst case during final qualification test.

5.3 Summary of Test Results/Plots

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

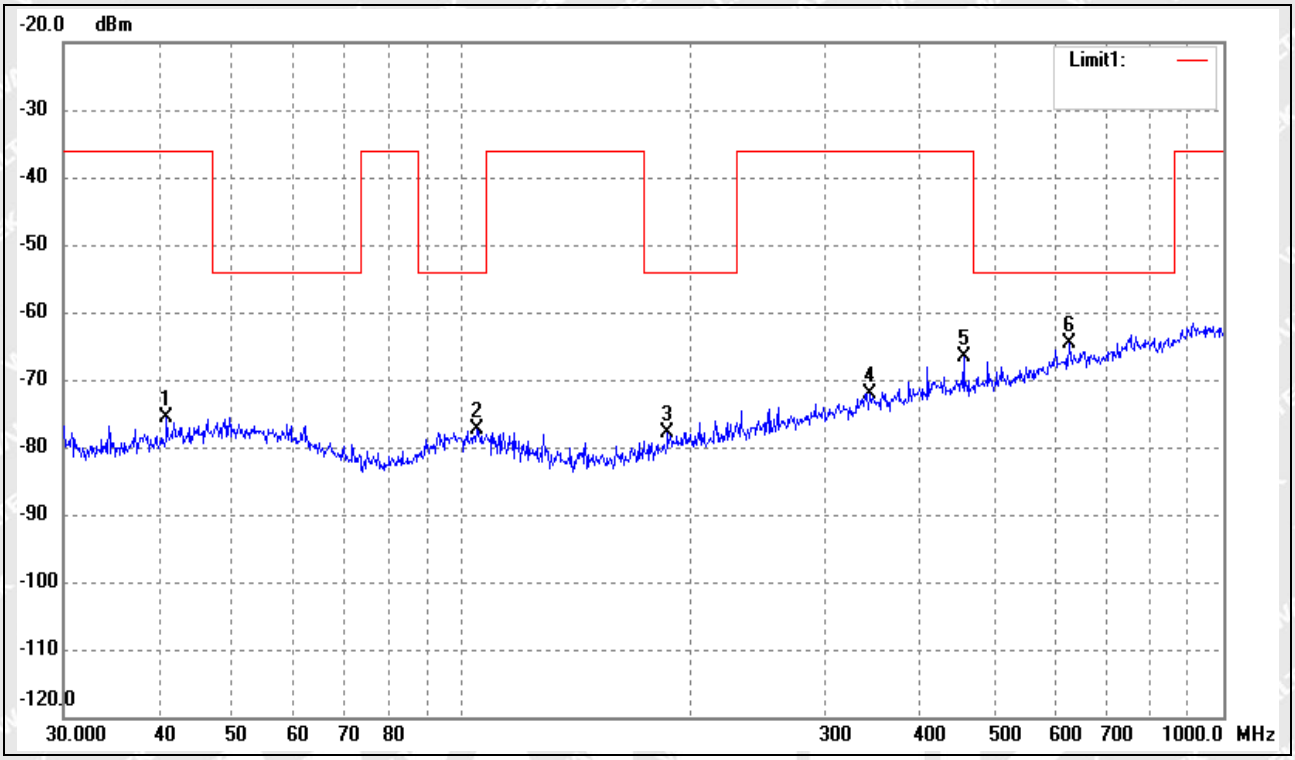
➢ Radiated Spurious Emission From 30MHz To 1GHz

Test Channel:	Low channel	Polarity:	Horizontal



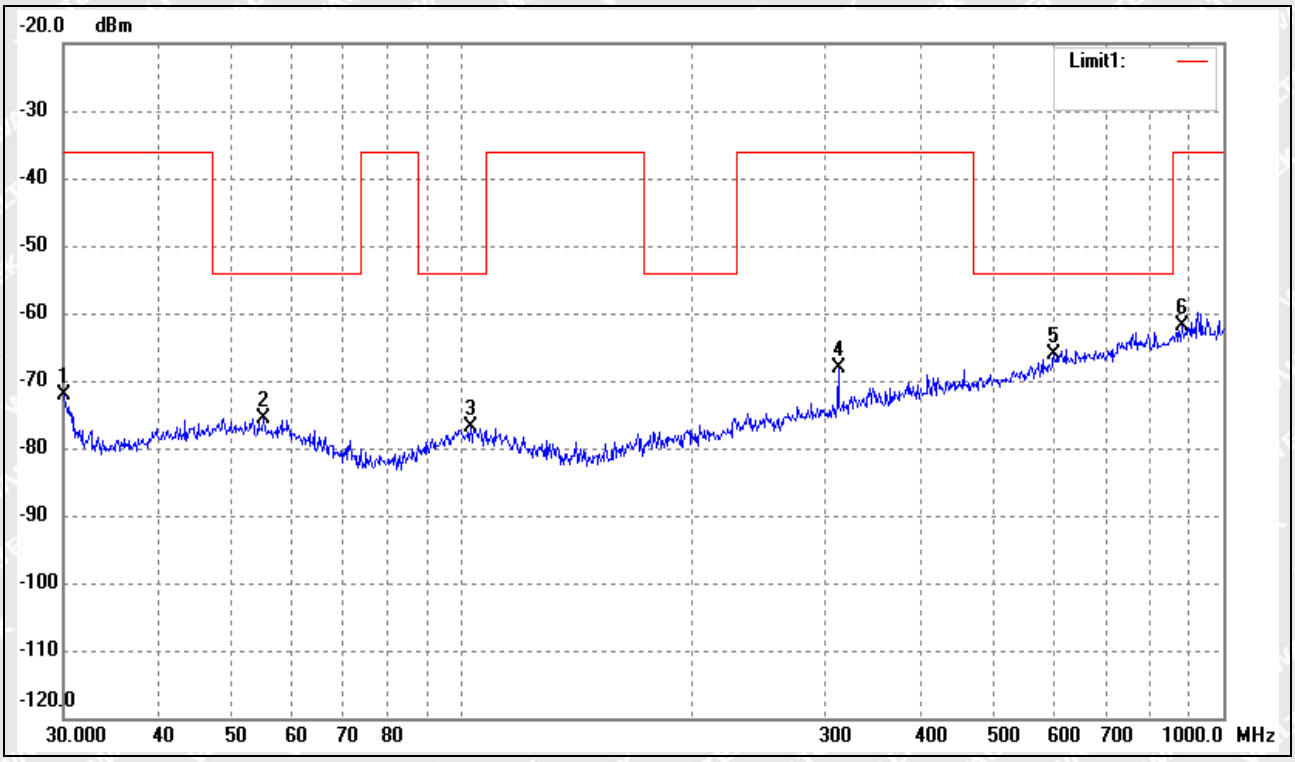
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	55.2207	-78.62	4.15	-74.47	-54.00	-20.47	ERP
2	104.9033	-79.46	3.36	-76.10	-54.00	-22.10	ERP
3	240.8304	-80.18	5.17	-75.01	-36.00	-39.01	ERP
4	312.1794	-74.72	7.27	-67.45	-36.00	-31.45	ERP
5	566.6223	-78.25	11.96	-66.29	-54.00	-12.29	ERP
6	912.8620	-78.19	18.02	-60.17	-36.00	-24.17	ERP

Test Channel:	Low channel	Polarity:	Vertical



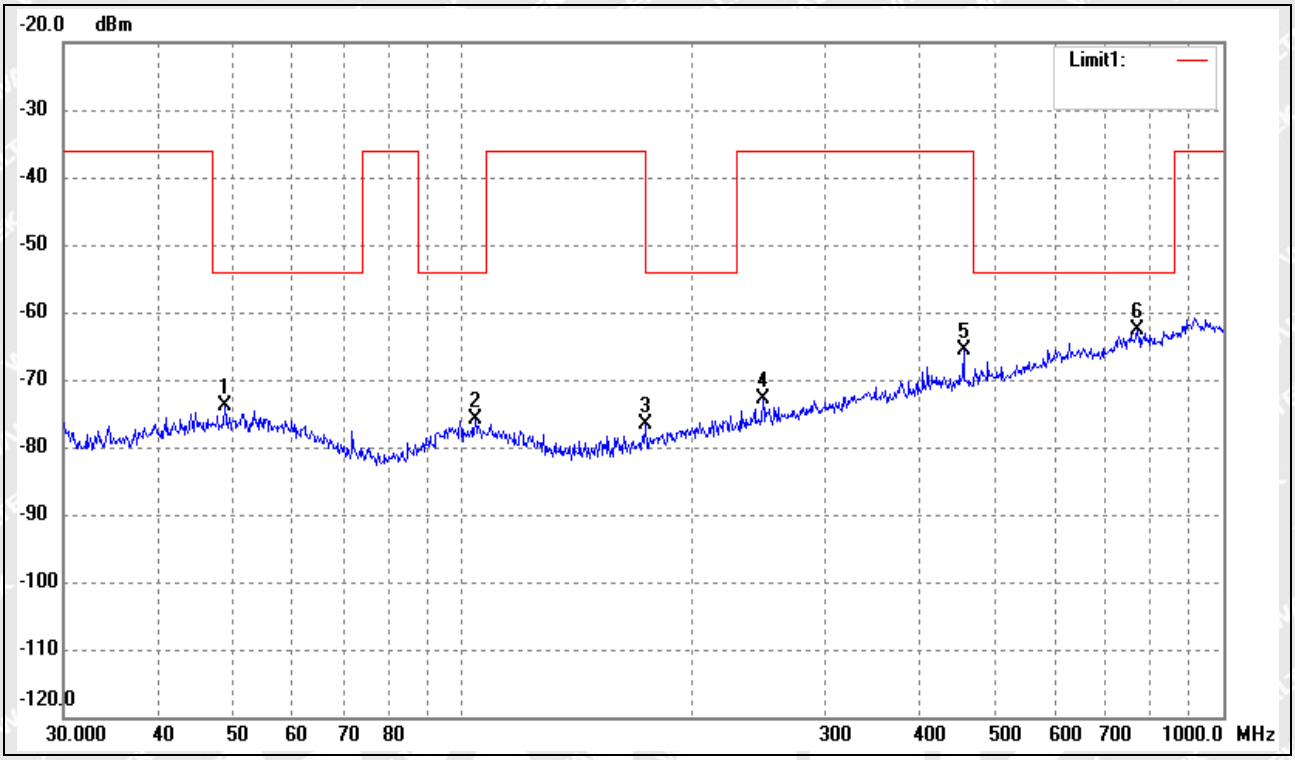
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	40.9881	-79.03	3.40	-75.63	-36.00	-39.63	ERP
2	104.5361	-80.61	3.36	-77.25	-54.00	-23.25	ERP
3	186.4409	-80.54	2.70	-77.84	-54.00	-23.84	ERP
4	343.1800	-80.49	8.49	-72.00	-36.00	-36.00	ERP
5	455.9058	-76.47	9.75	-66.72	-36.00	-30.72	ERP
6	627.2738	-78.00	13.30	-64.70	-54.00	-10.70	ERP

Test Channel:	High channel	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	30.1054	-73.20	1.04	-72.16	-36.00	-36.16	ERP
2	54.8348	-79.69	4.19	-75.50	-54.00	-21.50	ERP
3	102.7192	-80.22	3.33	-76.89	-54.00	-22.89	ERP
4	312.1794	-75.37	7.27	-68.10	-36.00	-32.10	ERP
5	599.3213	-79.32	13.18	-66.14	-54.00	-12.14	ERP
6	881.4067	-79.14	17.25	-61.89	-36.00	-25.89	ERP

Test Channel:	High channel	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	48.8429	-78.24	4.42	-73.82	-54.00	-19.82	ERP
2	104.1701	-79.14	3.37	-75.77	-54.00	-21.77	ERP
3	174.4241	-78.11	1.42	-76.69	-54.00	-22.69	ERP
4	248.5519	-78.26	5.38	-72.88	-36.00	-36.88	ERP
5	455.9058	-75.42	9.75	-65.67	-36.00	-29.67	ERP
6	771.4486	-78.42	15.79	-62.63	-54.00	-8.63	ERP

➢ Radiated Spurious Emission Above 1GHz

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel						
4804	-49.16	7.78	-41.38	-30	-11.38	H
7206	-59.70	12.63	-47.07	-30	-17.07	H
4804	-52.19	7.78	-44.41	-30	-14.41	V
7206	-60.18	12.63	-47.55	-30	-17.55	V
High Channel						
4944	-49.52	8.47	-41.05	-30	-11.05	H
7416	-59.03	13.98	-45.05	-30	-15.05	H
4944	-53.39	8.47	-44.92	-30	-14.92	V
7416	-60.39	13.98	-46.41	-30	-16.41	V

Note: Testing is carried out with frequency rang 30MHz to 10th Harmonics frequency, which above 4th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

6. Duty Cycle

6.1 Applicable Standard

Test is conducting under the description of ETSI EN 300 440 section 4.2.5. Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.

Frequency Band	Duty cycle	Application	Notes
2400MHz to 2 483.5MHz	No Restriction	Generic use	
2400MHz to 2 483.5MHz	No Restriction	Detection, movement and alert applications	
(a) 2446MHz to 2 454MHz	No Restriction	RFID	Limits shown in annex D shall apply
(b) 2446MHz to 2 454MHz	≤15 %	RFID	Limits shown in annex D shall apply
5725MHz to 5 875MHz	No Restriction	Generic use	
9200MHz to 9 500MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
9500MHz to 9975MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
10.5GHz to 10.6GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
13.4GHz to 14.0GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
17.1GHz to 17.3GHz	DAA or equivalent techniques	Radiodetermination: GBSAR detecting and movement and alert applications	Limits shown in annex F shall apply
24.00GHz to 24.25GHz	No Restriction	Generic use and for Radiodetermination: radar, detection, movement and alert applications	

6.2 Test Procedure

Test is conducting under the description of ETSI EN 300 440 section 4.2.5.

6.3 Summary of Test Results/Plots

For generic use devices operating at frequency range 2400-2483.5MHz, according to ETSI EN 300 440, the duty cycle is no restriction.

7. Adjacent channel selectivity

7.1 Standard Applicable

According to EN 300440 section 4.3.3, the adjacent channel selectivity is a measure of the capability of the receiver to operate satisfactorily in the presence of an unwanted signal that differs in frequency from the wanted signal by an amount equal to the adjacent channel separation for which the equipment is intended.

The adjacent channel selectivity of the equipment under specified conditions shall not be less than -30 dBm + k. The correction factor, k, is as follows:

$$k = -20\log f - 10\log BW$$

Where:

- f is the frequency in GHz;
- BW is the channel bandwidth in MHz.

The factor k is limited within the following:

- -40dB < k < 0 dB.

The measured adjacent channel selectivity shall be stated in the test report.

7.2 Test Procedure

This measurement shall be conducted under normal conditions.

Two signal generators A and B shall be connected to the receiver via a combining network to the receiver, either:

a) via a test fixture or a test antenna to the receiver integrated, dedicated or test antenna; or

b) directly to the receiver permanent or temporary antenna connector.

The method of coupling to the receiver shall be stated in the test report.

Signal generator A shall be at the nominal frequency of the receiver, with normal modulation of the wanted signal. Signal generator B shall be unmodulated and shall be adjusted to the adjacent channel centre frequency immediately above that of the wanted signal.

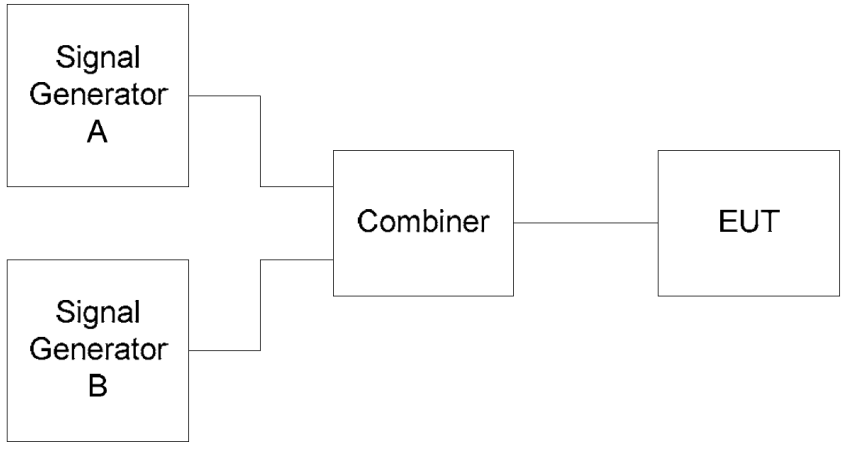
Initially signal generator B shall be switched off and using signal generator A the level that still gives sufficient response shall be established. The output level of generator A shall then be increased by 3 dB.

Signal generator B is then switched on and adjusted until the wanted criteria are met. This level shall be recorded.

The measurements shall be repeated with signal generator B unmodulated and adjusted to the adjacent channel centre immediately below the wanted signal.

The adjacent channel selectivity shall be recorded for the upper and lower adjacent channels as the level in dBm of the unwanted signal.

The following test set-up shall be used for conducted measurements.



Two signal generators A and B shall be connected to the receiver via a combining network to the receiver antenna connector.

7.3 Test Result/Plots

Not applicable

8. Blocking or desensitization

8.1 Standard Applicable

According to EN 300440 section 4.3.4, blocking is a measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given degradation due to the presence of an unwanted input signal at any frequencies other than those of the spurious responses or the occupied bandwidth, see clauses 4.3.3 and 4.3.4.

The blocking level, for any frequency within the specified ranges, shall not be less than the values given in table 6, except at frequencies on which spurious responses are found.

Table 6: Limits for blocking or desensitization

Receiver category	Limit
1	-30 dBm + k
2	-45 dBm + k
3	-60 dBm + k

The correction factor, k, is as follows:

$$k = -20\log f - 10\log BW$$

Where:

- f is the frequency in GHz;
- BW is the channel bandwidth in MHz.

The factor k is limited within the following:

- -40 dB < k < 0 dB.

The measured adjacent channel selectivity shall be stated in the test report.

8.2 Test Procedure

This measurement shall be conducted under normal conditions.

Two signal generators A and B shall be connected to the receiver via a combining network to the receiver, either:

a) via a test fixture or a test antenna to the receiver integrated, dedicated or test antenna; or

b) directly to the receiver permanent or temporary antenna connector.

The method of coupling to the receiver shall be stated in the test report.

Signal generator A shall be at the nominal frequency of the receiver, with normal modulation of the wanted signal. Signal generator B shall be unmodulated and shall be adjusted to a test frequency at approximately 10 times, 20 times and 50 times of the occupied bandwidth above upper band edge of occupied bandwidth.

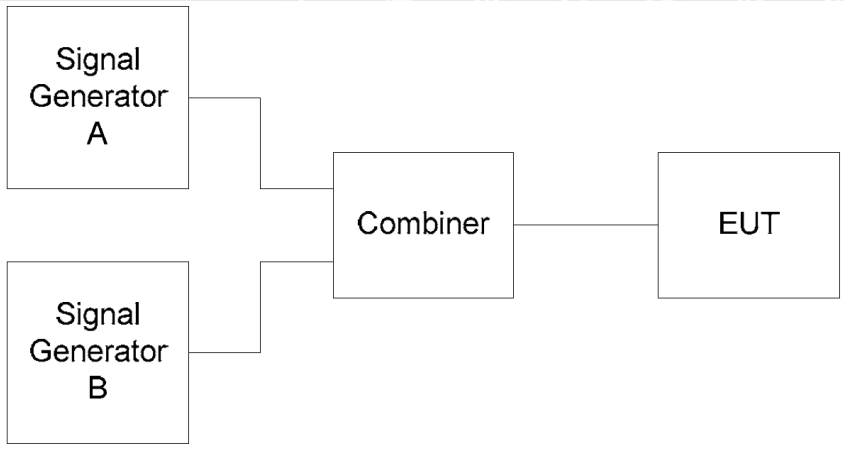
Initially signal generator B shall be switched off and using signal generator A the level that still gives sufficient response shall be established. The output level of generator A shall then be increased by 3 dB.

Signal generator B is then switched on and adjusted until the wanted criteria are met. This level shall be recorded.

The measurement shall be repeated with the test frequency for signal generator B at approximately 10 times,

20 times and 50 times of the occupied bandwidth below the lower band edge of the occupied bandwidth. The blocking or desensitization shall be recorded as the level in dBm of lowest level of the unwanted signal (generator B).

The following test set-up shall be used for conducted measurements.



Two signal generators A and B shall be connected to the receiver via a combining network to the receiver antenna connector.

8.3 Test Result/Plots

Channel Frequency (MHz)	unwanted test signal Frequency (MHz)	SG B dBm	Limit dBm	Result
2440	Centre Frequency – 50*BW	-46.92	-56.11	Pass
	Centre Frequency + 20*BW	-48.23	-55.90	Pass
	Centre Frequency – 10*BW	-49.60	-55.83	Pass
	Centre Frequency + 10*BW	-49.97	-55.69	Pass
	Centre Frequency – 20*BW	-47.03	-55.61	Pass
	Centre Frequency + 50*BW	-44.92	-55.39	Pass

Note: BW=2.0MHz

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9. Receiver Spurious Emissions

9.1 Limit of Spurious Emissions

According to the ETSI EN 300 440 section 4.3.5, the power of any spurious emission shall not exceed 2 nW in the range 25 MHz to 1 GHz and shall not exceed 20 nW on frequencies above 1 GHz.

9.2 Test Procedure

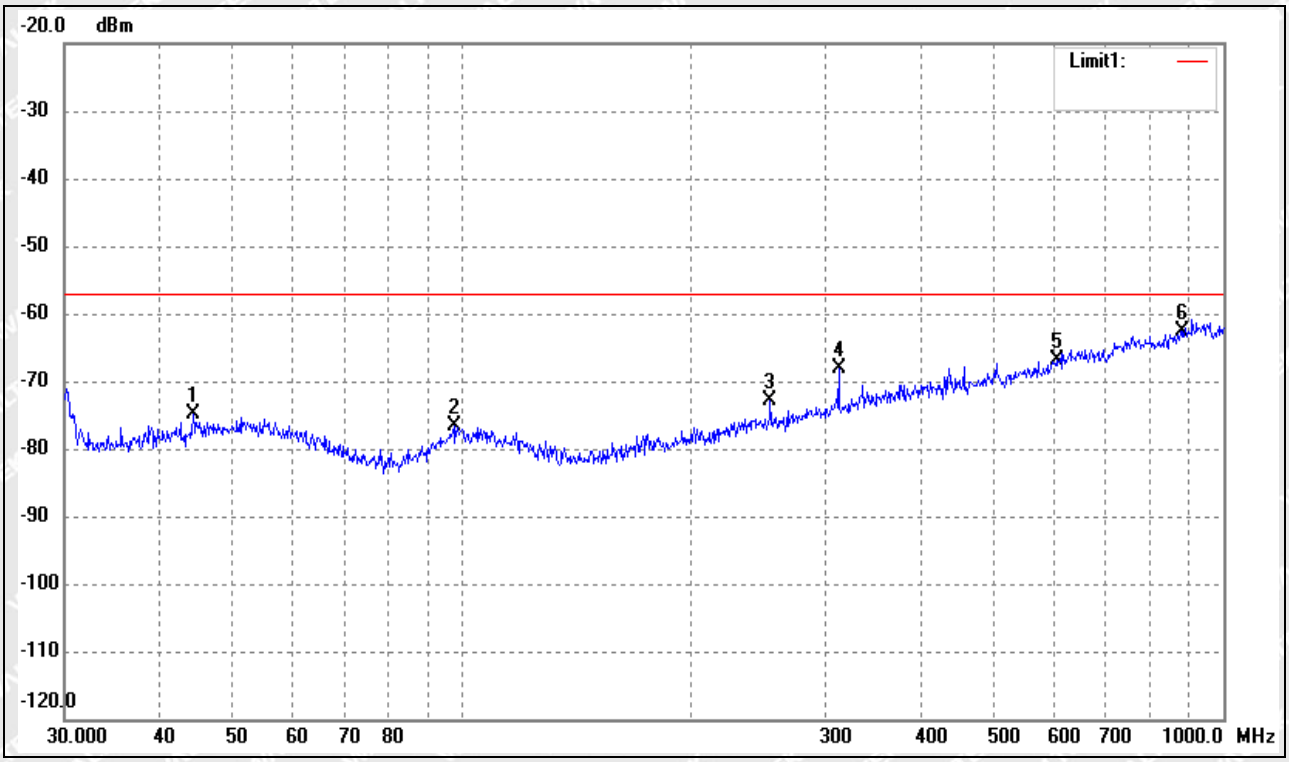
The EUT was placed on a nonmetal table which is 1.5 meter above the grounded reference plane and set to work in receiving operation mode. For more detail please refer to the ETSI EN 300 440 section 4.3.5.
The EUT was operating at normal to represent worst case during final qualification test.

9.3 Summary of Test Results/Plots

According to the data sheet, the EUT complied with the EN 300 440 standards, and had the worst margin of:

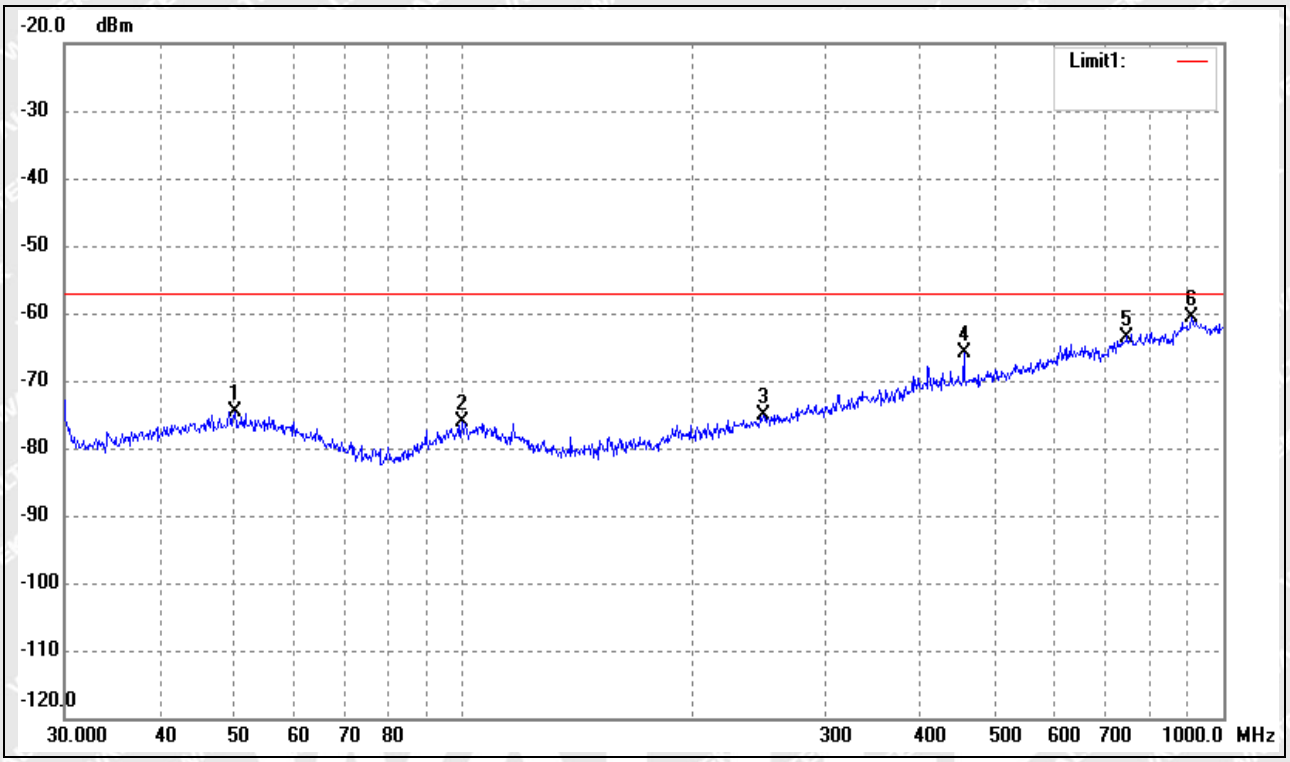
➢ Radiated Receiver Spurious Emission From 30MHz To 1GHz

Test Channel:	Lowest channel (worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	44.2752	-78.94	3.98	-74.96	-57.00	-17.96	ERP
2	97.4560	-79.48	2.83	-76.65	-57.00	-19.65	ERP
3	253.8367	-78.22	5.47	-72.75	-57.00	-15.75	ERP
4	312.1794	-75.48	7.27	-68.21	-57.00	-11.21	ERP
5	603.5392	-79.99	13.24	-66.75	-57.00	-9.75	ERP
6	881.4067	-79.76	17.25	-62.51	-57.00	-5.51	ERP

Test Channel:	Lowest channel (worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	50.2325	-79.00	4.45	-74.55	-57.00	-17.55	ERP
2	99.8777	-79.30	3.17	-76.13	-57.00	-19.13	ERP
3	248.5519	-80.41	5.38	-75.03	-57.00	-18.03	ERP
4	455.9058	-75.71	9.75	-65.96	-57.00	-8.96	ERP
5	747.4826	-79.15	15.65	-63.50	-57.00	-6.50	ERP
6	909.6667	-78.49	17.98	-60.51	-57.00	-3.51	ERP

➢ Radiated Receiver Spurious Emission Above 1GHz

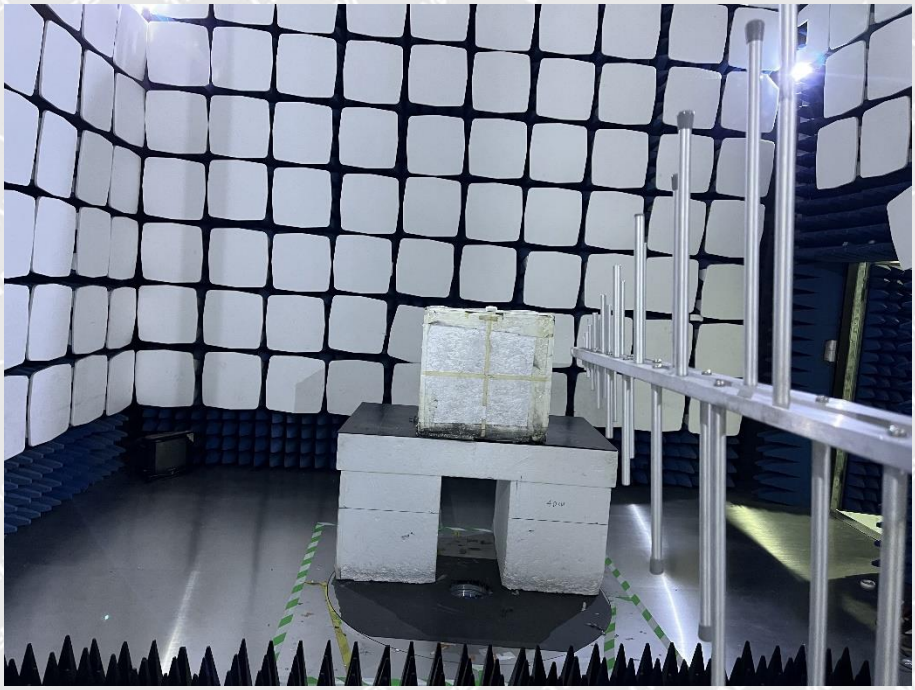
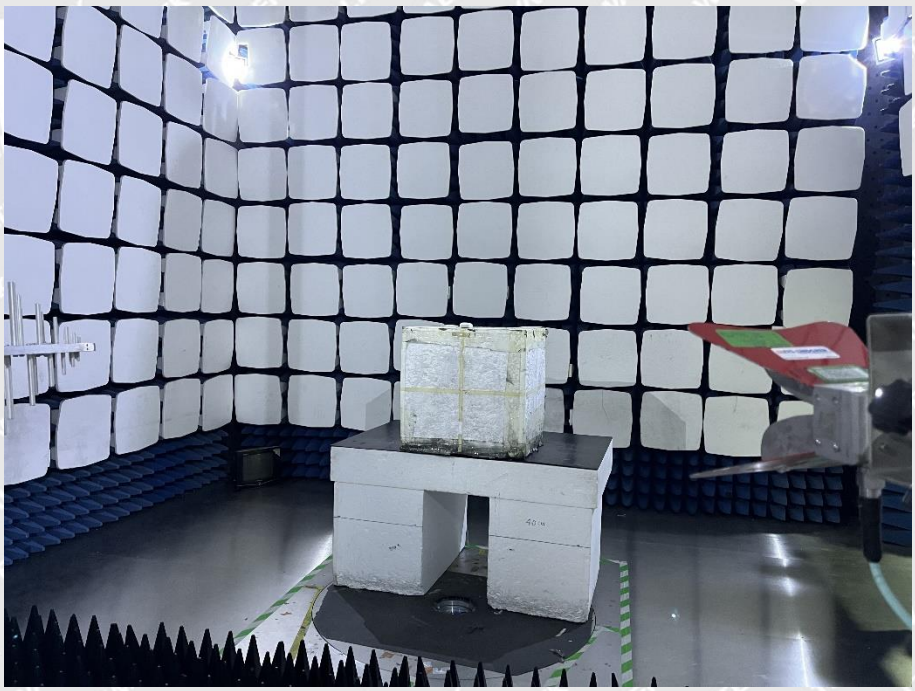
Frequency	Result	Limit	Margin	Polar
(MHz)	(dBm)	(dBm)	(dB)	H/V
1709.50	-62.22	-47.00	-15.22	H
6892.41	-61.65	-47.00	-14.65	H
4322.67	-58.62	-47.00	-11.62	V
7784.27	-61.15	-47.00	-14.15	V

Note: Testing is carried out with frequency rang 30MHz to 10th Harmonics frequency, which above 1GHz are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

EXHIBIT 1 - EUT PHOTOGRAPHS

Please refer to “ANNEX”.

EXHIBIT 2 - TEST SETUP PHOTOGRAPHS

Spurious Emission Test Setup (Below 1GHz)	
Spurious Emission Test Setup (Above 1GHz)	

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

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检测
TESTING
CNAS L4062

TEST REPORT

Reference No.	:	WTF23X05108861W001
Manufacturer	:	Mid Ocean Brands B.V.
Address	:	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	:	106613
Product Name	:	Optical mouse in RABS bamboo
Model No.	:	MO2085
Standards	:	**ETSI EN 300 440 V2.2.1 (2018-07)**
Date of Receipt sample	:	2023-05-19
Date of Test	:	2023-05-19 to 2023-06-02
Date of Issue	:	2023-06-02
Test Report Form No.	:	WTX_ETSI EN 300 440_2018W
Test Result	:	**Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Email: sem@waltek.com.cn

Tested by:

Mike Shi

Approved by:

Silin Chen

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Report version

Version No.	Date of issue	Description
Rev.00	2023-06-02	Original
/	/	/

1 GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Optical mouse in RABS bamboo
Trade Name:	/
Model No.:	MO2085
Adding Model(s):	/
Rated Voltage:	DC5V
Battery Capacity:	/
Software Version:	V05
Hardware Version:	V7.0
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Frequency Range:	2402-2480MHz
RF Output Power:	-7.96dBm (EIRP)
Type of Modulation:	GFSK
Type of Antenna:	PCB Antenna
Antenna Gain:	-5.92dBi
Receiver Categories:	/
Note: The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Test Standards

The tests were performed according to following standards:

ETSI EN 300 440 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. Any modification of the product maybe which result in lowering the immunity should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ETSI EN 300 440, the equipment under test (EUT) was configured to measure its highest possible emission level. For more detail refer to the Operating Instructions.
For radiation emission tests above 1GHz, it is referred to section EN 300 440 Annex A, E, F using the substitution measurement.

1.4 Test Facility

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990
Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Test Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, the EUT was operated in the engineering mode to fix the Tx/Rx frequency that was for the purpose of the measurements, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	Low Channel	2402MHz
TM2	Middle Channel	2440MHz
TM3	High Channel	2480MHz

Test Conditions					
	Normal	LTLV	LTHV	HTHV	HTLV
Temperature (°C)	25	-10	-10	+50	+50
Voltage (VDC)	5	4.5	5.5	5.5	4.5
Relative Humidity:	55%.				
ATM Pressure:	1019 mbar				

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Uncertainty	Notes
Conducted EIRP	±0.42dB	(1)
Frequency Range	$\pm 1\times10^{-7}$	(1)
Radiated Spurious Emissions	30-200MHz ±4.52dB	(1)
	0.2-1GHz ±5.56dB	(1)
	1-6GHz ±3.84dB	(1)
	6-18GHz ±3.92dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	N9020A	US47140102	2023-02-25	2024-02-24
Signal Generator	Agilent	83752A	3610A01453	2023-02-25	2024-02-24
Vector Signal Generator	Agilent	N5182A	MY47070202	2023-02-25	2024-02-24
Power Sensor	Agilent	U2021XA	MY54250019	2023-02-25	2024-02-24
Power Sensor	Agilent	U2021XA	MY54250021	2023-02-25	2024-02-24
Simultaneous Sampling	Agilent	U2531A	TW54243509	2023-02-25	2024-02-24
Communication Tester	HP	8921A	/	2023-02-25	2024-02-24
Temperature&Humidity Chamber	/	HTC-1	/	2023-02-25	2024-02-24
Universal Radio Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
☒Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☒Chamber A: Above 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐Chamber B:Below 1GHz					
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
Amplifier	Agilent	8447D	2944A10179	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☐Chamber C:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27

Amplifier	HP	8447F	2944A03869	2023-02-25	2024-02-24
☐Chamber C: Above 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Horn Antenna	POAM	RTF-11A	LP228060221	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP01018050	AP22E806235	2023-02-25	2024-02-24

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

Standards	Reference	Description of Test Item	Result
ETSI EN 300 440	4.2.2	Equivalent Isotropically Radiated Power	Pass
	4.2.3	Permitted Range of Operating Frequencies	Pass
	4.2.4	Unwanted emissions in the spurious domain	Pass
	4.2.5.4	Duty Cycle	Pass
	4.2.6	Additional requirements for FHSS equipment	N/A
	4.3.3	Adjacent channel selectivity	N/A
	4.3.4	Blocking or desensitization	Pass
	4.3.5	Spurious radiation	Pass
	4.4	Spectrum access techniques	N/A
	4.6.4	GBSAR antenna pattern	N/A
	Annex I	Limits for GBSAR	N/A

Pass: The EUT complies with the essential requirements in the standard.
Fail: The EUT does not comply with the essential requirements in the standard.
N/A: not applicable.

3. Equivalent Isotropically Radiated Power

3.1 Standard Applicable

According to ETSI EN 300 440 section 4.2.2, the effective radiated power shall not exceed the power class value given in following table:
Table 2: Maximum radiated peak power (e.i.r.p.)

Frequency Bands	Power	Application	Notes
2 400 MHz to 2 483,5 MHz	10 mW e.i.r.p.	Non-specific short range devices	
2 400 MHz to 2 483,5 MHz	25 mW e.i.r.p.	Radio determination devices	
(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
(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
5 725 MHz to 5 875 MHz	25 mW e.i.r.p.	Non-specific short range devices	
9 200 MHz to 9 500 MHz	25 mW e.i.r.p.	Radio determination devices	
9 500 MHz to 9 975 MHz	25 mW e.i.r.p.	Radio determination devices	
10,5 GHz to 10,6 GHz	500 mW e.i.r.p.	Radio determination devices	
13,4 GHz to 14,0 GHz	25 mW e.i.r.p.	Radio determination devices	
17,1 GHz to 17,3 GHz	400 mW e.i.r.p.	Radio determination devices	See annex F
24,00 GHz to 24,25 GHz	100 mW e.i.r.p.	Non-specific short range devices and Radio determination devices	

3.2 Test Procedure

According to section 4.2.2 of the standard EN 300440, the test procedure shall be as follows:

1. Using a suitable means, the output of the transmitter shall be connected to the spectrum analyzer, the spectrum analyzer shall be capable of faithfully reproducing the envelope peaks and the duty cycle of the transmitter output signal. The observed duty cycle of the transmitter (Tx on/(Tx on + Tx off)) shall be noted as x, (0 < x < 1) and recorded.

2. The average output power of the transmitter shall be determined using the spectrum analyzer. The observed value shall be recorded as "A" (in dBm).

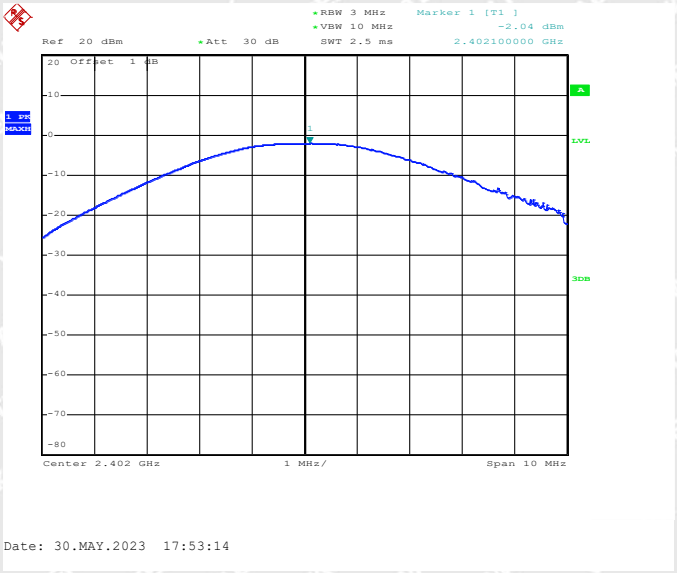
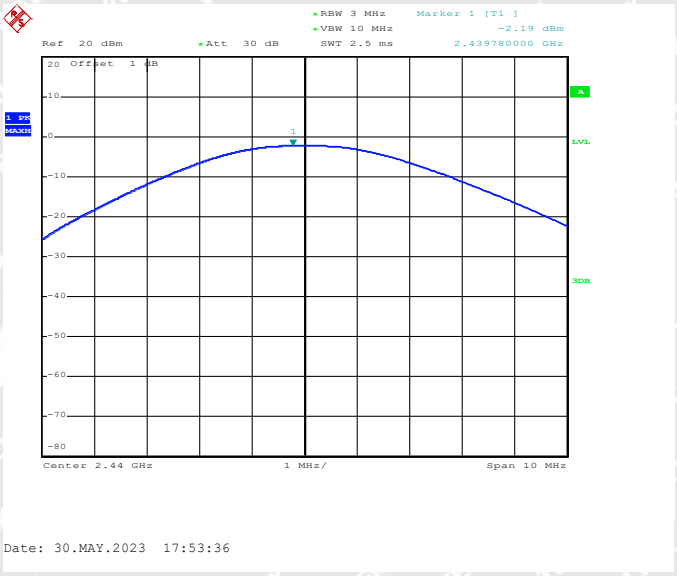
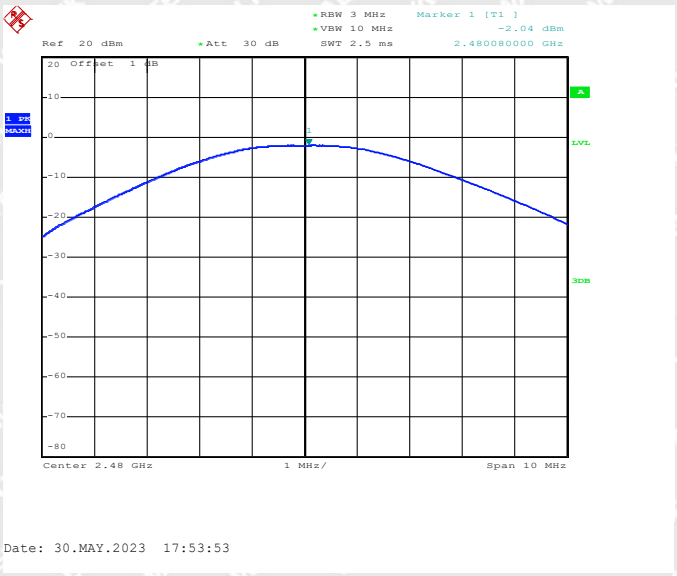
3. The e.i.r.p. shall be calculated from the above measured power output A, the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:
- P = A + G + 10 log (1/x);

4. The measurement shall be repeated at the lowest, the middle, and the highest frequency of the stated frequency range. These frequencies shall be recorded. FHSS equipment shall be made to hop continuously

to each of these three frequencies separately. These measurements shall be performed at normal and extreme test conditions.

3.3 Summary of Test Results

Test Conditions	Measured Value	Antenna Gain	EIRP	Limit
	dBm	dBi	dBm	dBm
Low Channel				
Normal	-2.04	-5.92	-7.96	10
LTLV	-2.24	-5.92	-8.16	10
LTHV	-2.19	-5.92	-8.11	10
HTHV	-2.27	-5.92	-8.19	10
HTLV	-2.28	-5.92	-8.20	10
Middle Channel				
Normal	-2.19	-5.92	-8.11	10
LTLV	-2.33	-5.92	-8.25	10
LTHV	-2.37	-5.92	-8.29	10
HTHV	-2.39	-5.92	-8.31	10
HTLV	-2.31	-5.92	-8.23	10
high Channel				
Normal	-2.04	-5.92	-7.96	10
LTLV	-2.27	-5.92	-8.19	10
LTHV	-2.24	-5.92	-8.16	10
HTHV	-2.21	-5.92	-8.13	10
HTLV	-2.23	-5.92	-8.15	10

Low	
Middle	
High	

4. Permitted Range of Operating Frequencies

4.1 Applicable Standard

According to EN 300 440 section 4.2.3

The frequency range of the equipment is determined by the lowest and highest frequencies occupied by the power envelope in accordance with CEPT/ERC Recommendation 74-01 [2].
f_H is the highest frequency of the power envelope, it is the frequency furthest above the frequency of maximum power where the output power drops below the level of –75dBm/Hz spectral power density (-30 dBm if measured in a 30 kHz reference bandwidth) eirp.
f_L is the lowest frequency of the power envelope; it is the frequency furthest below the frequency of maximum power where the output power drops below the level of –75dBm/Hz spectral power density (-30dBm if measured in a 30 kHz reference bandwidth) eirp.

4.2 Test Procedure

According to section 4.2.3 of the standard EN 300440, the test procedure shall be as follows:

1. Put the spectrum analyzer in video averaging mode with a minimum of 50 sweeps selected.

2. Select the lowest operating frequency of the equipment under test and activate the transmitter with modulation applied. The RF emission of the equipment shall be displayed on the spectrum analyzer.

3. Using the marker of the spectrum analyzer, find lowest frequency below the operating frequency at which spectral power density drops below the required value.

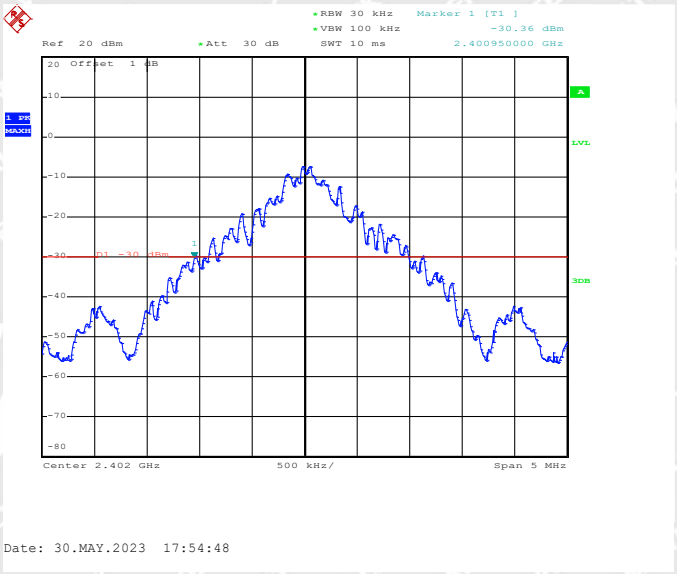
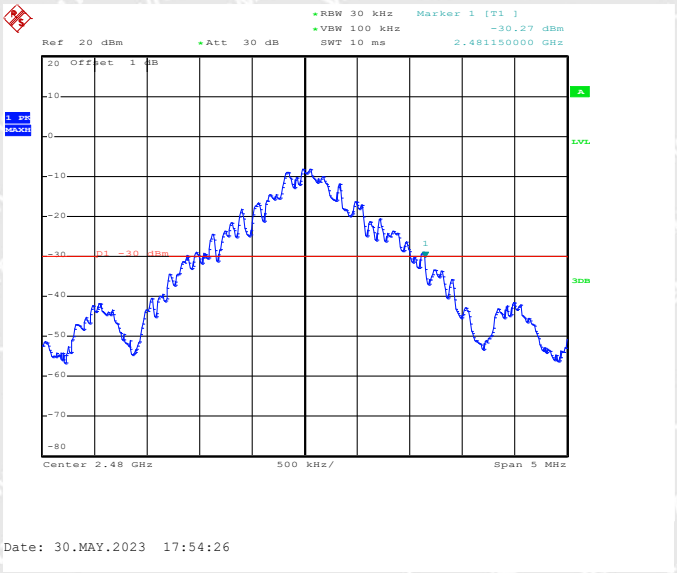
4. Select the highest operating frequency of the equipment under test and find the highest frequency at which the spectral power density drop below the required value.

5. The difference between the frequencies measured in step 3 and step 4 is the operating frequency range.

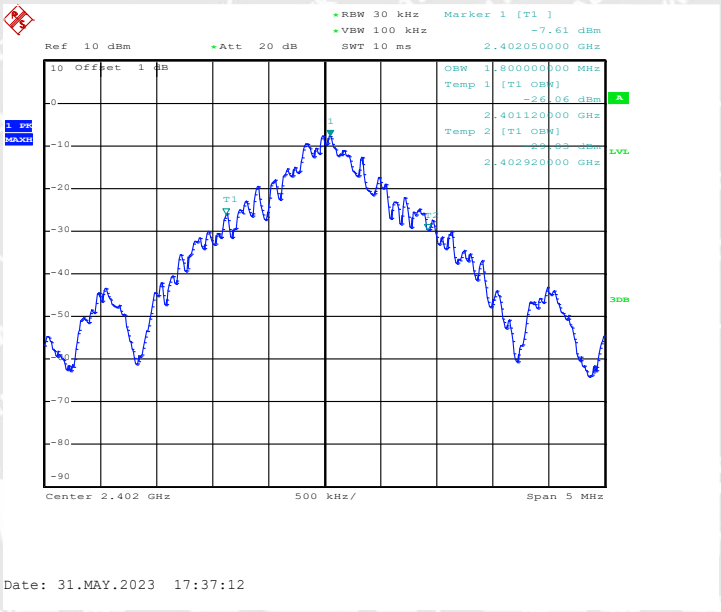
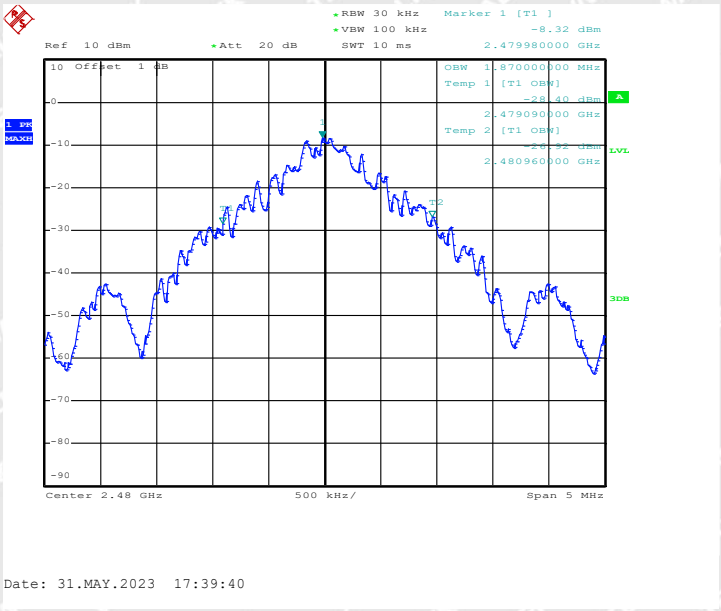
The equivalent isotropically radiated power is then calculated from the measured value, the known antenna gain, relative to an isotropic antenna, and if applicable, any losses due to cables and connectors in the measurement system.

4.3 Test Results/Plots

Frequencies (MHz) at -30dBm/30kHz (EIRP)				
Test conditions	F_L (MHz)	F_H (MHz)	Limit	Result
Normal	2400.95	2481.15	F_L≥2400MHz and F_H≤2483.5MHz	Pass
LTLV	2400.96	2481.16		
LTHV	2400.96	2481.14		
HTHV	2400.94	2481.15		
HTLV	2400.94	2481.16		

Low	
High	

99% OCB				
Test conditions	F_L (MHz)	F_H (MHz)	Limit	Result
Normal	2401.12	2480.96	F_L≥2400MHz and F_H≤2483.5MHz	Pass

Low	
High	

5. Spurious Emissions

5.1 Limit of Spurious Emissions

The power of any spurious emission shall not exceed the following values given in the following table.

Frequency / State	47MHz to 74MHz 87.5MHz to 108MHz 174MHz to 230MHz 470MHz to 862MHz	Other frequencies ≤ 1000MHz	Frequencies > 1000MHz
Operating	4 nW	250 nW	1 μW
Standby	2 nW	2 nW	20 nW

5.2 Test Procedure

The EUT was placed on a nonmetal table which is 1.5 meter above the grounded reference plane and set to work in normal operation mode. Details refer to EN 300 440 subclause 4.2.4.

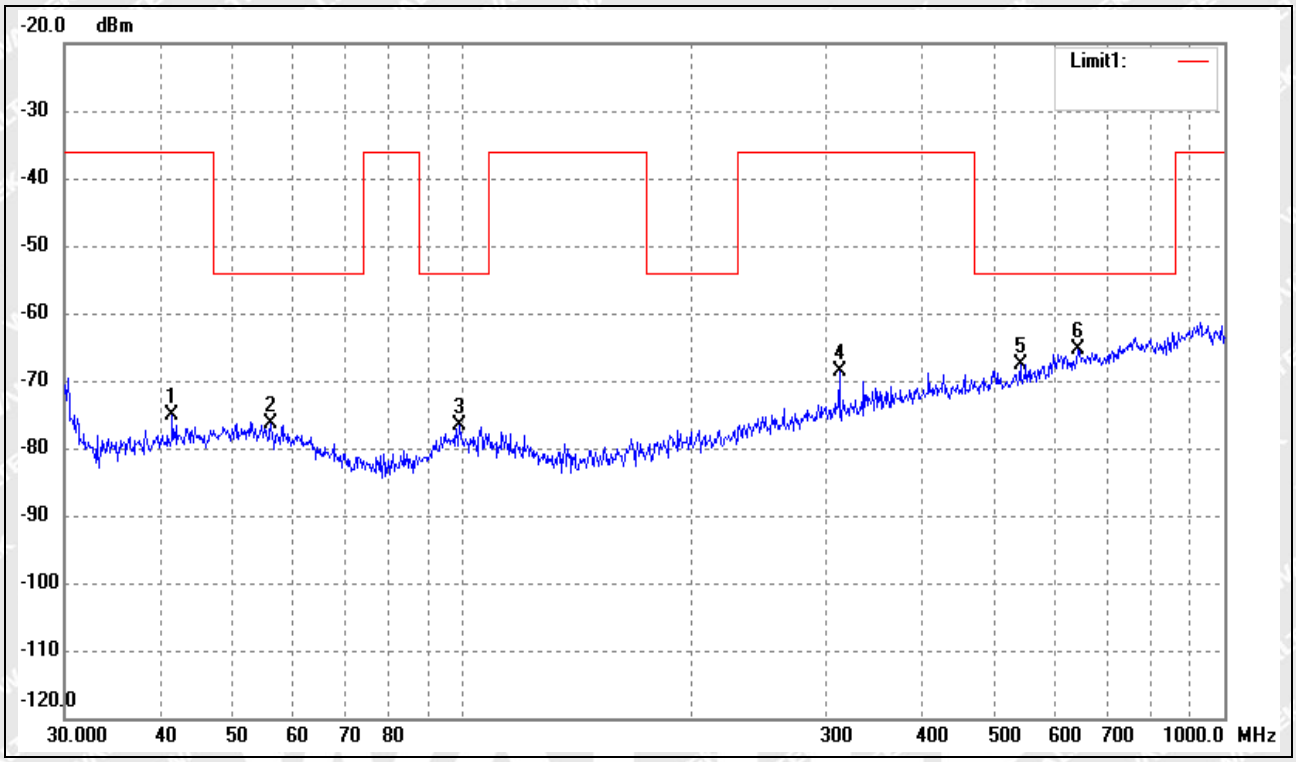
The EUT was operating at transmitting mode to represent worst case during final qualification test.

5.3 Summary of Test Results/Plots

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

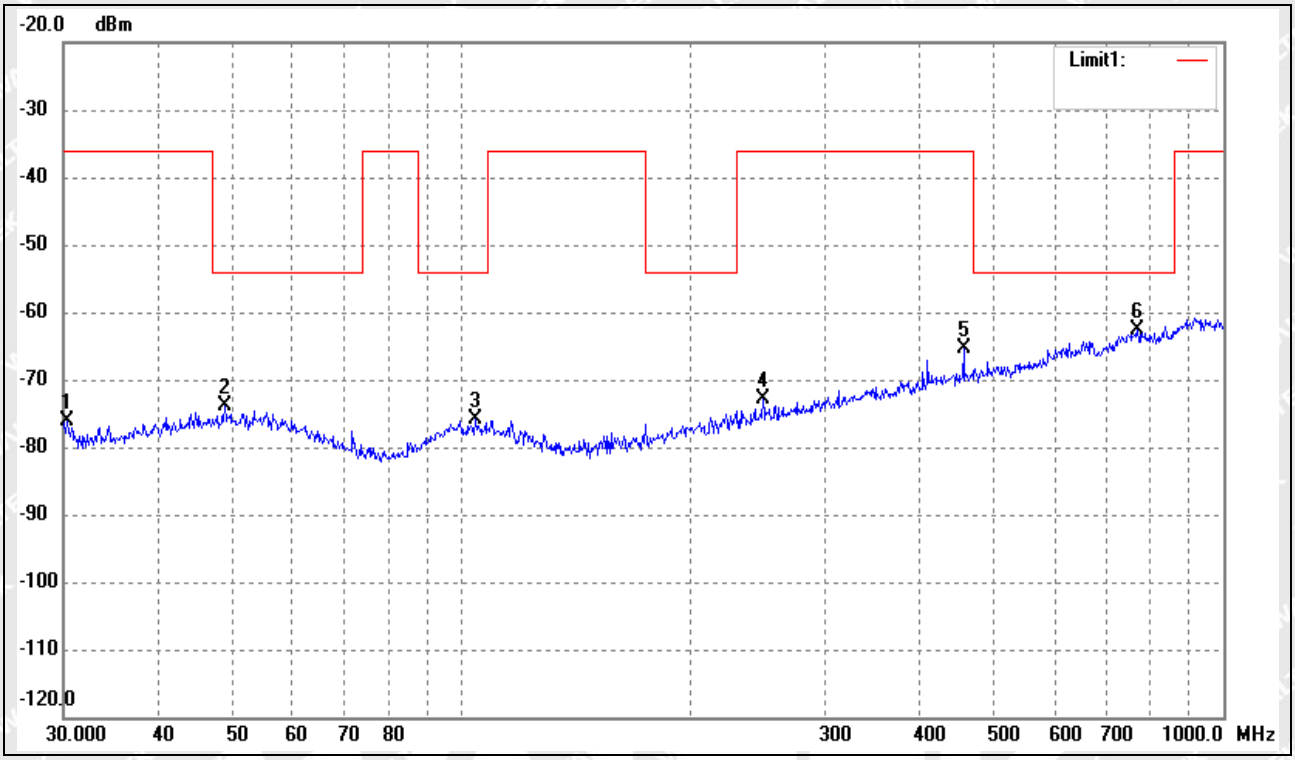
➢ Radiated Spurious Emission From 30MHz To 1GHz

Test Channel:	Low channel	Polarity:	Horizontal



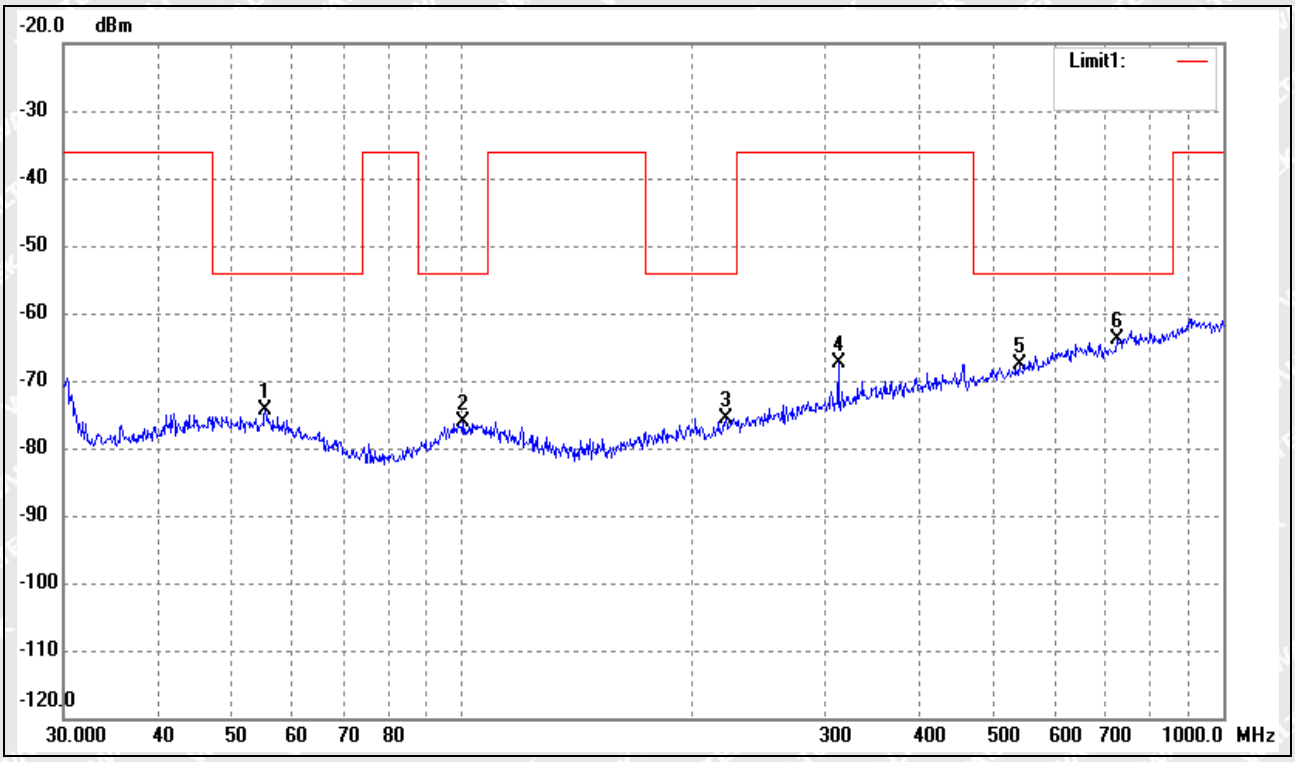
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	41.5670	-78.69	3.51	-75.18	-36.00	-39.18	ERP
2	56.0007	-80.50	4.05	-76.45	-54.00	-22.45	ERP
3	99.1797	-79.64	3.09	-76.55	-54.00	-22.55	ERP
4	312.1794	-75.86	7.27	-68.59	-36.00	-32.59	ERP
5	539.4775	-78.91	11.38	-67.53	-54.00	-13.53	ERP
6	642.8613	-79.12	13.66	-65.46	-54.00	-11.46	ERP

Test Channel:	Low channel	Polarity:	Vertical



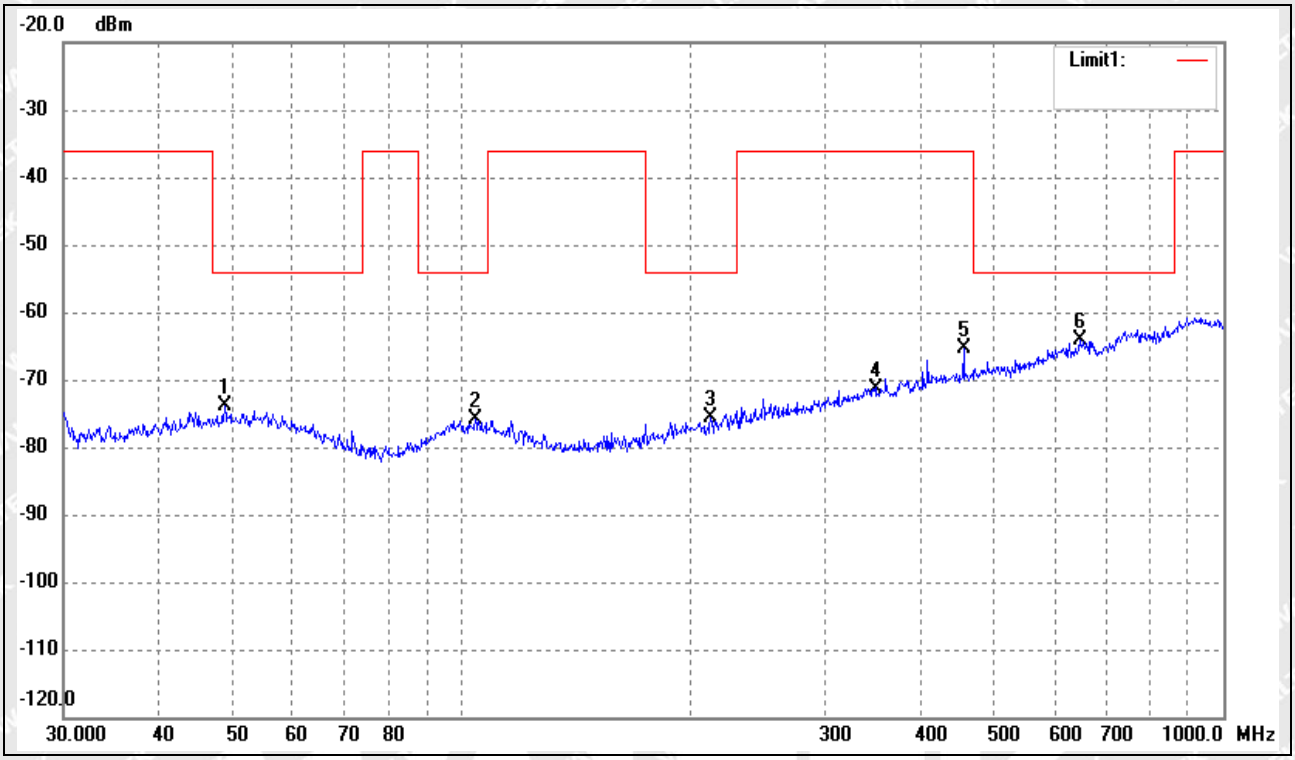
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	30.3173	-77.11	1.04	-76.07	-36.00	-40.07	ERP
2	48.8429	-78.24	4.42	-73.82	-54.00	-19.82	ERP
3	104.1701	-79.14	3.37	-75.77	-54.00	-21.77	ERP
4	248.5519	-78.26	5.38	-72.88	-36.00	-36.88	ERP
5	455.9058	-75.10	9.75	-65.35	-36.00	-29.35	ERP
6	771.4486	-78.42	15.79	-62.63	-54.00	-8.63	ERP

Test Channel:	High channel	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	55.2207	-78.62	4.15	-74.47	-54.00	-20.47	ERP
2	100.5806	-79.45	3.22	-76.23	-54.00	-22.23	ERP
3	222.1698	-79.81	4.27	-75.54	-54.00	-21.54	ERP
4	312.1794	-74.72	7.27	-67.45	-36.00	-31.45	ERP
5	539.4775	-78.91	11.38	-67.53	-54.00	-13.53	ERP
6	724.2611	-78.64	14.75	-63.89	-54.00	-9.89	ERP

Test Channel:	High channel	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	48.8429	-78.24	4.42	-73.82	-54.00	-19.82	ERP
2	104.1701	-79.14	3.37	-75.77	-54.00	-21.77	ERP
3	212.2695	-79.45	3.75	-75.70	-54.00	-21.70	ERP
4	349.2500	-79.69	8.44	-71.25	-36.00	-35.25	ERP
5	455.9058	-75.10	9.75	-65.35	-36.00	-29.35	ERP
6	647.3856	-77.99	13.79	-64.20	-54.00	-10.20	ERP

➢ Radiated Spurious Emission Above 1GHz

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel						
4804	-41.29	7.78	-33.51	-30	-3.51	H
7206	-58.32	12.63	-45.69	-30	-15.69	H
4804	-43.30	7.78	-35.52	-30	-5.52	V
7206	-60.99	12.63	-48.36	-30	-18.36	V
High Channel						
4944	-41.83	8.47	-33.36	-30	-3.36	H
7416	-58.65	13.98	-44.67	-30	-14.67	H
4944	-44.17	8.47	-35.70	-30	-5.70	V
7416	-59.92	13.98	-45.94	-30	-15.94	V

Note: Testing is carried out with frequency rang 30MHz to 10th Harmonics frequency, which above 4th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

6. Duty Cycle

6.1 Applicable Standard

Test is conducting under the description of ETSI EN 300 440 section 4.2.5. Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.

Frequency Band	Duty cycle	Application	Notes
2400MHz to 2 483.5MHz	No Restriction	Generic use	
2400MHz to 2 483.5MHz	No Restriction	Detection, movement and alert applications	
(a) 2446MHz to 2 454MHz	No Restriction	RFID	Limits shown in annex D shall apply
(b) 2446MHz to 2 454MHz	≤15 %	RFID	Limits shown in annex D shall apply
5725MHz to 5 875MHz	No Restriction	Generic use	
9200MHz to 9 500MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
9500MHz to 9975MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
10.5GHz to 10.6GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
13.4GHz to 14.0GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
17.1GHz to 17.3GHz	DAA or equivalent techniques	Radiodetermination: GBSAR detecting and movement and alert applications	Limits shown in annex F shall apply
24.00GHz to 24.25GHz	No Restriction	Generic use and for Radiodetermination: radar, detection, movement and alert applications	

6.2 Test Procedure

Test is conducting under the description of ETSI EN 300 440 section 4.2.5.

6.3 Summary of Test Results/Plots

For generic use devices operating at frequency range 2400-2483.5MHz, according to ETSI EN 300 440, the duty cycle is no restriction.

7. Adjacent channel selectivity

7.1 Standard Applicable

According to EN 300440 section 4.3.3, the adjacent channel selectivity is a measure of the capability of the receiver to operate satisfactorily in the presence of an unwanted signal that differs in frequency from the wanted signal by an amount equal to the adjacent channel separation for which the equipment is intended.

The adjacent channel selectivity of the equipment under specified conditions shall not be less than -30 dBm + k. The correction factor, k, is as follows:

$$k = -20\log f - 10\log BW$$

Where:

- f is the frequency in GHz;
- BW is the channel bandwidth in MHz.

The factor k is limited within the following:

- -40dB < k < 0 dB.

The measured adjacent channel selectivity shall be stated in the test report.

7.2 Test Procedure

This measurement shall be conducted under normal conditions.

Two signal generators A and B shall be connected to the receiver via a combining network to the receiver, either:

a) via a test fixture or a test antenna to the receiver integrated, dedicated or test antenna; or

b) directly to the receiver permanent or temporary antenna connector.

The method of coupling to the receiver shall be stated in the test report.

Signal generator A shall be at the nominal frequency of the receiver, with normal modulation of the wanted signal. Signal generator B shall be unmodulated and shall be adjusted to the adjacent channel centre frequency immediately above that of the wanted signal.

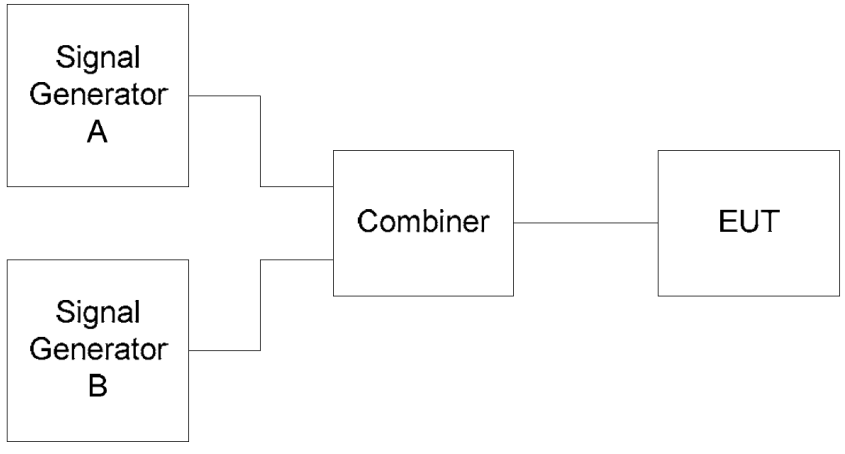
Initially signal generator B shall be switched off and using signal generator A the level that still gives sufficient response shall be established. The output level of generator A shall then be increased by 3 dB.

Signal generator B is then switched on and adjusted until the wanted criteria are met. This level shall be recorded.

The measurements shall be repeated with signal generator B unmodulated and adjusted to the adjacent channel centre immediately below the wanted signal.

The adjacent channel selectivity shall be recorded for the upper and lower adjacent channels as the level in dBm of the unwanted signal.

The following test set-up shall be used for conducted measurements.



Two signal generators A and B shall be connected to the receiver via a combining network to the receiver antenna connector.

7.3 Test Result/Plots

Not applicable

8. Blocking or desensitization

8.1 Standard Applicable

According to EN 300440 section 4.3.4, blocking is a measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given degradation due to the presence of an unwanted input signal at any frequencies other than those of the spurious responses or the occupied bandwidth, see clauses 4.3.3 and 4.3.4.

The blocking level, for any frequency within the specified ranges, shall not be less than the values given in table 6, except at frequencies on which spurious responses are found.

Table 6: Limits for blocking or desensitization

Receiver category	Limit
1	-30 dBm + k
2	-45 dBm + k
3	-60 dBm + k

The correction factor, k, is as follows:

$$k = -20\log f - 10\log BW$$

Where:

- f is the frequency in GHz;
- BW is the channel bandwidth in MHz.

The factor k is limited within the following:

- -40 dB < k < 0 dB.

The measured adjacent channel selectivity shall be stated in the test report.

8.2 Test Procedure

This measurement shall be conducted under normal conditions.

Two signal generators A and B shall be connected to the receiver via a combining network to the receiver, either:

a) via a test fixture or a test antenna to the receiver integrated, dedicated or test antenna; or

b) directly to the receiver permanent or temporary antenna connector.

The method of coupling to the receiver shall be stated in the test report.

Signal generator A shall be at the nominal frequency of the receiver, with normal modulation of the wanted signal. Signal generator B shall be unmodulated and shall be adjusted to a test frequency at approximately 10 times, 20 times and 50 times of the occupied bandwidth above upper band edge of occupied bandwidth.

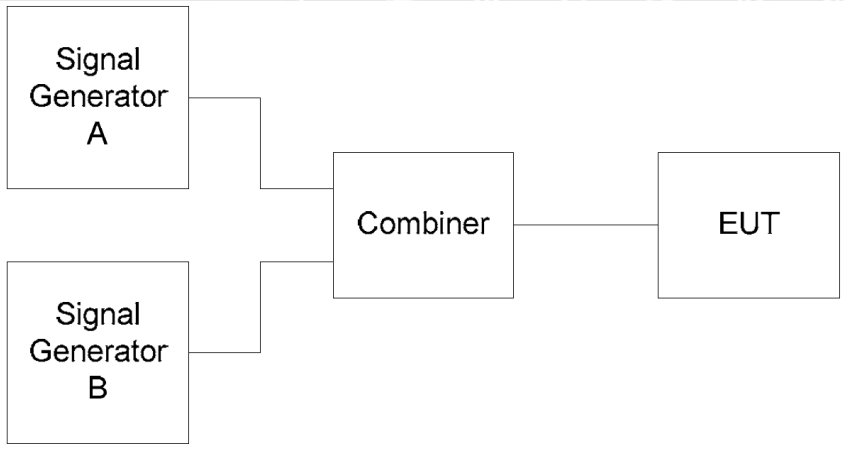
Initially signal generator B shall be switched off and using signal generator A the level that still gives sufficient response shall be established. The output level of generator A shall then be increased by 3 dB.

Signal generator B is then switched on and adjusted until the wanted criteria are met. This level shall be recorded.

The measurement shall be repeated with the test frequency for signal generator B at approximately 10 times,

20 times and 50 times of the occupied bandwidth below the lower band edge of the occupied bandwidth. The blocking or desensitization shall be recorded as the level in dBm of lowest level of the unwanted signal (generator B).

The following test set-up shall be used for conducted measurements.



Two signal generators A and B shall be connected to the receiver via a combining network to the receiver antenna connector.

8.3 Test Result/Plots

Channel Frequency (MHz)	unwanted test signal Frequency (MHz)	SG B dBm	Limit dBm	Result
2440	Centre Frequency – 50*BW	-45.63	-56.11	Pass
	Centre Frequency + 20*BW	-47.11	-55.90	Pass
	Centre Frequency – 10*BW	-49.50	-55.83	Pass
	Centre Frequency + 10*BW	-49.43	-55.69	Pass
	Centre Frequency – 20*BW	-47.06	-55.61	Pass
	Centre Frequency + 50*BW	-46.25	-55.39	Pass

Note: BW=2.0MHz

.

9. Receiver Spurious Emissions

9.1 Limit of Spurious Emissions

According to the ETSI EN 300 440 section 4.3.5, the power of any spurious emission shall not exceed 2 nW in the range 25 MHz to 1 GHz and shall not exceed 20 nW on frequencies above 1 GHz.

9.2 Test Procedure

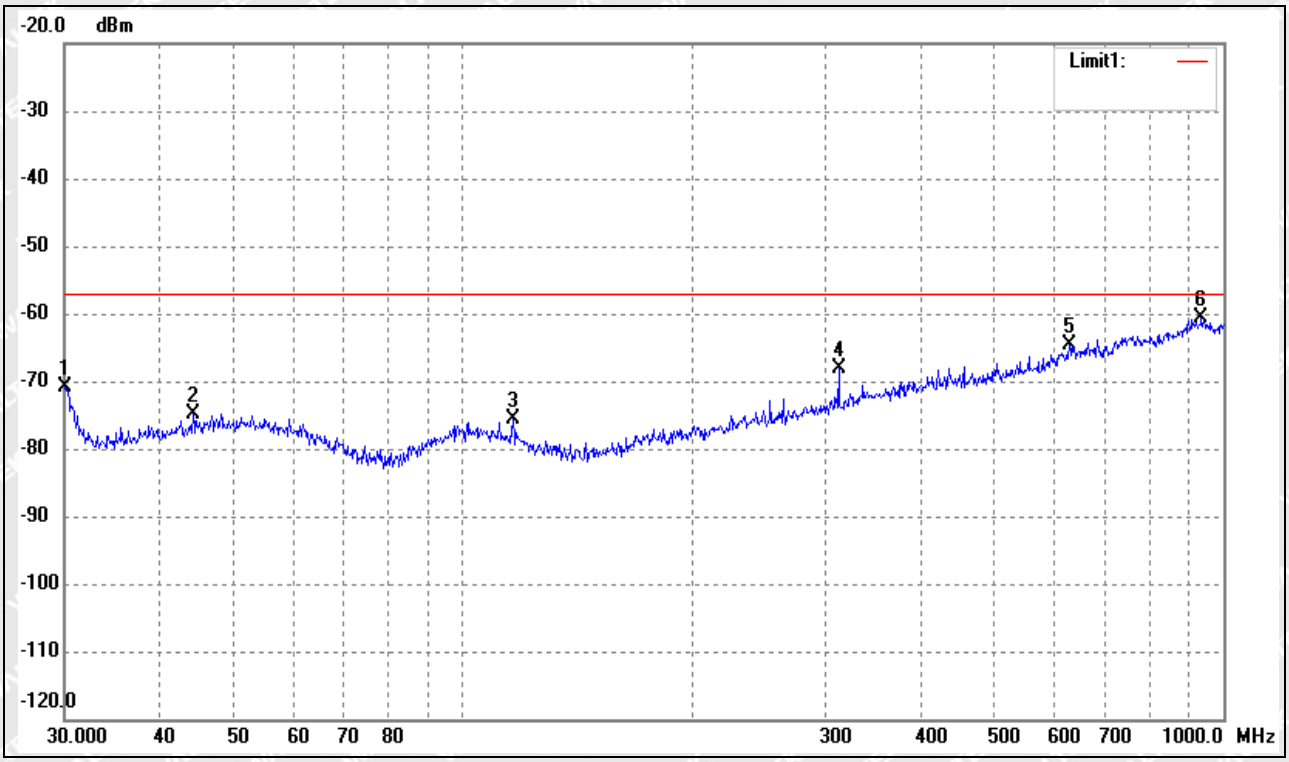
The EUT was placed on a nonmetal table which is 1.5 meter above the grounded reference plane and set to work in receiving operation mode. For more detail please refer to the ETSI EN 300 440 section 4.3.5.
The EUT was operating at normal to represent worst case during final qualification test.

9.3 Summary of Test Results/Plots

According to the data sheet, the EUT complied with the EN 300 440 standards, and had the worst margin of:

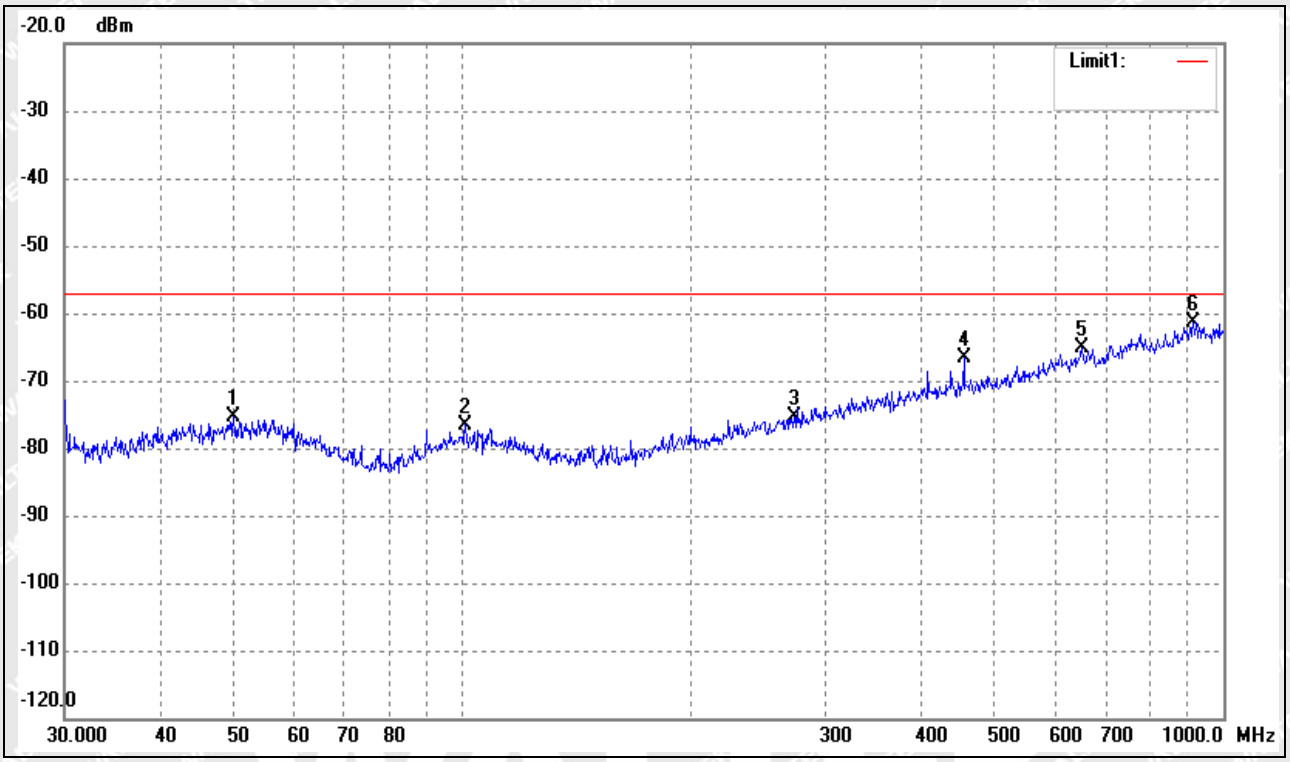
➢ Radiated Receiver Spurious Emission From 30MHz To 1GHz

Test Channel:	Lowest channel (worst case)	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	30.0000	-71.98	1.04	-70.94	-57.00	-13.94	ERP
2	44.2752	-78.94	3.98	-74.96	-57.00	-17.96	ERP
3	116.5401	-77.82	2.18	-75.64	-57.00	-18.64	ERP
4	312.1794	-75.45	7.27	-68.18	-57.00	-11.18	ERP
5	627.2738	-77.80	13.30	-64.50	-57.00	-7.50	ERP
6	935.5463	-78.45	17.90	-60.55	-57.00	-3.55	ERP

Test Channel:	Lowest channel (worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	50.0566	-79.87	4.45	-75.42	-57.00	-18.42	ERP
2	100.9340	-79.74	3.24	-76.50	-57.00	-19.50	ERP
3	273.2341	-81.44	6.06	-75.38	-57.00	-18.38	ERP
4	455.9058	-76.30	9.75	-66.55	-57.00	-9.55	ERP
5	651.9417	-78.86	13.82	-65.04	-57.00	-8.04	ERP
6	912.8620	-79.36	18.02	-61.34	-57.00	-4.34	ERP

➢ Radiated Receiver Spurious Emission Above 1GHz

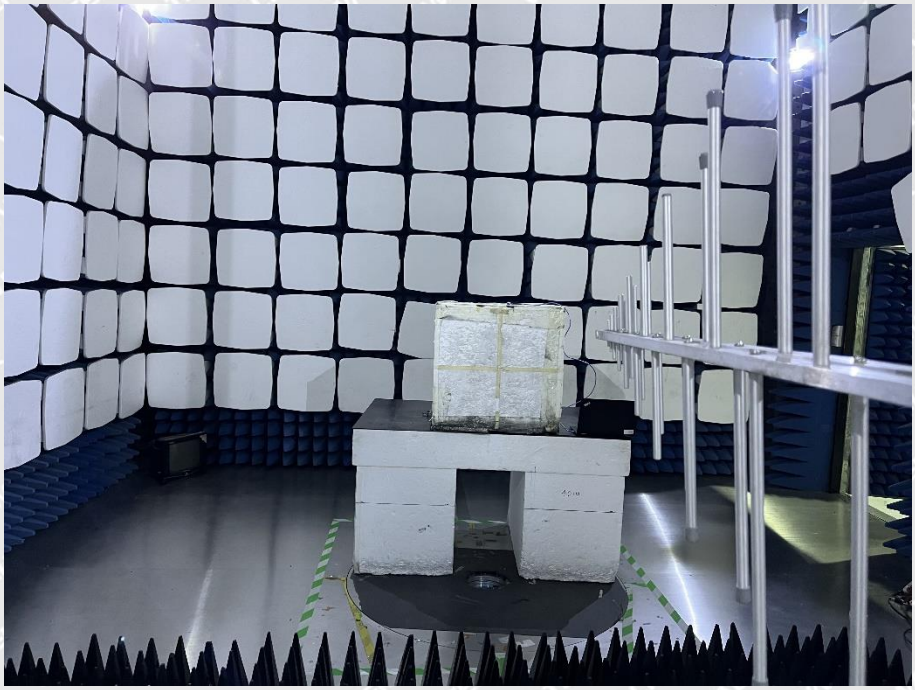
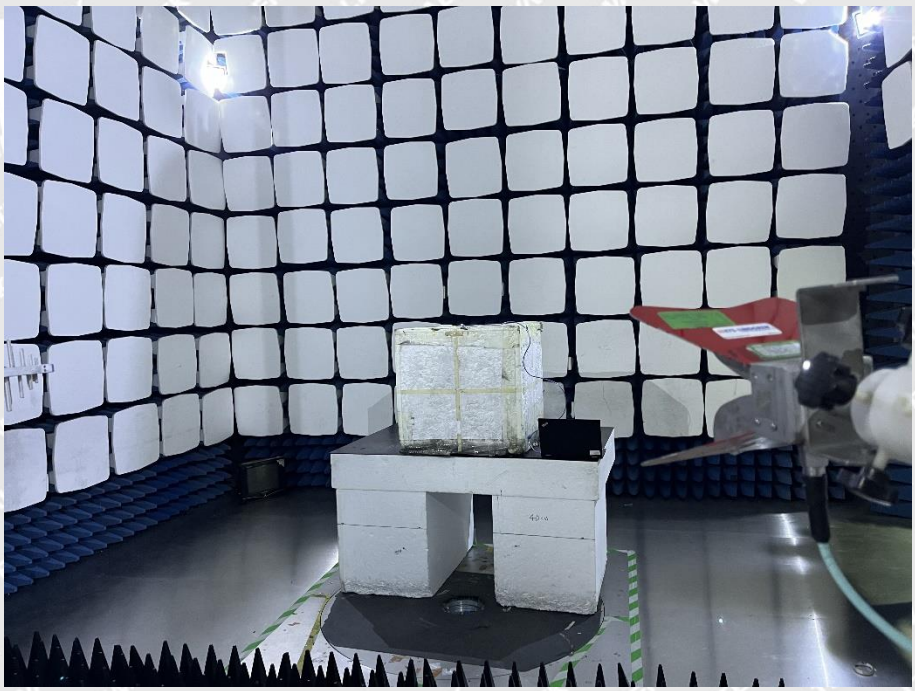
Frequency	Result	Limit	Margin	Polar
(MHz)	(dBm)	(dBm)	(dB)	H/V
1727.83	-63.39	-47.00	-16.39	H
6909.67	-61.52	-47.00	-14.52	H
4324.92	-59.82	-47.00	-12.82	V
7786.74	-61.07	-47.00	-14.07	V

Note: Testing is carried out with frequency rang 30MHz to 10th Harmonics frequency, which above 1GHz are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

EXHIBIT 1 - EUT PHOTOGRAPHS

Please refer to “ANNEX”.

EXHIBIT 2 - TEST SETUP PHOTOGRAPHS

Spurious Emission Test Setup (Below 1GHz)	
Spurious Emission Test Setup (Above 1GHz)	

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

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TESTING
CNAS L4062

TEST REPORT

Reference No.	:	WTF23X05108861W002
Manufacturer	:	Mid Ocean Brands B.V.
Address	:	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	:	106613
Product Name	:	Optical mouse in RABS bamboo
Model No.	:	MO2085
Standards	:	**EN 50663:2017** **EN 62479:2010**
Date of Receipt sample	:	2023-05-19
Date of Test	:	2023-05-19 to 2023-06-02
Date of Issue	:	2023-06-02
Test Report Form No.	:	WTX_EN 50663_2017W
Test Result	:	**Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

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Approved by:

Silin Chen

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Report version

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Optical mouse in RABS bamboo
Trade Name:	/
Model No.:	MO2085
Adding Model(s):	/
Rated Voltage:	DC5V
Battery Capacity:	/
Software Version:	V05
Hardware Version:	V7.0
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
2.4GHz	
Frequency Range:	2402-2480MHz
RF Output Power:	-7.96dBm (EIRP)
Type of Modulation:	GFSK
Type of Antenna:	PCB Antenna
Antenna Gain:	-5.92dBi
Receiver Categories:	/
Note: The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Compliance Standards

The tests were performed according to following standards:

EN 50663:2017: Generic standard for assessment of low power electronic and electrical equipment related to human exposure to electromagnetic fields (10MHz to 300GHz).
EN 62479:2010: Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10MHz to 300GHz).

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with EN 50663,
The equipment under test (EUT) was configured to measure its highest possible emission level. For more detail refer to the Operating Instructions.

1.4 Test Facility

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990
Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

2. RF EXPOSURE BASIC RESTRICTIONS

2.1 Standard Applicable

Equipment complying with the requirements for the general public is deemed to comply with the requirements for workers without further testing.

The conformity assessment to demonstrate equipment compliance shall be made according to EN 62479:2010, 4.1 and Clause 6.

If routes B, C or D of 4.1 of EN 62479:2010 are followed then the values of P_{max}, as described in 4.2 of EN 62479:2010 and given in Annex A of EN 62479:2010, shall be replaced by those in Table 1 below.

Table 1 — Values of Pmax

Exposure tier	Region of body	Pmax(mW)
General public	Head and trunk	20
	Limbs	40
Workers	Head and trunk	100
	Limbs	200

2.2 Evaluation Results

Maximum Average Output Power

Modulation/ Frequency (MHz)	ERP/EIRP dBm	ERP/EIRP mW	Limit mW	Result Pass/Fail
2402	-7.96	0.1600	20	Pass
2440	-8.11	0.1545	20	Pass
2480	-7.96	0.1600	20	Pass

Since average output power at worse case is: 0.1600mW which cannot exceed the exempt condition, 20mW specified in EN 50663. Correspondence between this European standard and Article 3 of Directive 2014/53/EU [2014 OJ L153]

EXHIBIT 1 - EUT PHOTOGRAPHS

Please refer to “ANNEX”.

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