

Test report No: 4395104.58

# **TEST REPORT**Radio Spectrum Matters (RF)

dentification of item tested Vibrating Ring / Vibrating Plug / Wearable Vibrator					
	Refer to model list for details				
Trademark	We-vibe				
Model and /or type reference	6000-01, 6000-02, 6000-03, 6000-04				
FCC ID	ZUE600I				
Features	5 Vdc, 0,5 A				
Applicant's name / address	WOW Tech Canada Ltd.,				
	1545 Carling Avenue, Suite 401. Ottawa, Ontario, K1Z 8P9, Canada				
Test method requested, standard	FCC CFR Title 47 Part15 Subpart C Section 15.247;				
	KDB558074 D01v05r02				
Verdict Summary	COMPLIANCE				
Tested by (name & signature)	Harry Deng  12 Deg				
Approved by (name & signature)	Tim Yan  Tim Yan				
Date of issue	2022-12-20				
Report template No	TRF_EMC 2017-06- FCC_Part15C_247				

Report no.: 4395104.58 Page 1 / 77



# **INDEX**

			page
Gene	eral co	nditions	4
Unce	ertainty	/	4
Envi	ronme	ntal conditions	4
Poss	ible te	st case verdicts	4
Defir	nition c	f symbols used in this test report	5
Abbr	eviatio	ns	5
Docu	ıment	History	5
Rem	arks a	nd Comments	5
1	Gene	ral Information	6
	1.1	General Description of the Item(s)	6
	1.2	Test data	7
	1.3	The environment(s) in which the EUT is intended to be used	8
	1.4	Channel List	8
2	Desc	ription of Test Setup	9
	2.1	Operating mode(s) used for tests	9
	2.2	Support / Auxiliary equipment / unit / software for the EUT	9
	2.3	Test Configuration / Block diagram used for tests	9
3	Verdi	ct summary section	10
	3.1	Standards	10
	3.2	Deviation(s) from the Standard(s) / Test Specification(s)	10
	3.3	Overview of results	10
	3.4	Measurement procedure	11
4	Trans	smitter Test Results	12
	4.1	AC Power Line Conducted Emission	12
	4.2	Emissions in non-restricted frequency bands	15
	4.3	Emissions in restricted frequency bands	38
	4.4	Band Edge	49
	4.5	Duty cycle	58
	4.6	DTS Bandwidth	61
	4.7	Fundamental emission output power	66
	4.8	Power Density	70
5	Ident	fication of the Equipment Under Test	74
Anne	ex 1 –	Measurement Uncertainty	75
Anne	ex 2 - l	Jsed Equipment	76

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Report no.: 4395104.58 Page 3 / 77



### **GENERAL CONDITIONS**

- 1. This report is only referred to the item that has undergone the test.
- 2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
- This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
- 4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.
- 5. This report will not be used for social proof function in China market.

#### UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

#### **ENVIRONMENTAL CONDITIONS**

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

## POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

Report no.: 4395104.58 Page 4 / 77

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#### **DEFINITION OF SYMBOLS USED IN THIS TEST REPORT**

☑ Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.							
☐ Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.							
Decimal separator used in this report   Comma (,)   Point (.)							

#### **ABBREVIATIONS**

For the purposes of the present document, the following abbreviations apply:

EUT : Equipment Under Test

QP : Quasi-Peak
CAV : CISPR Average

AV : Average

CDN : Coupling Decoupling Network SAC : Semi-Anechoic Chamber

OATS : Open Area Test Site

BW: Bandwidth

AM : Amplitude Modulation
PM : Pulse Modulation

HCP : Horizontal Coupling PlaneVCP : Vertical Coupling Plane

U<sub>N</sub> : Nominal voltageTx : Transmitter

Rx : Receiver
N/A : Not Applicable

N/M : Not Measured

#### **DOCUMENT HISTORY**

Report nr.	Date	Description
4395104.58	2022-12-14	First release.

## **REMARKS AND COMMENTS**

The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).

Report no.: 4395104.58 Page 5 / 77

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## 1 **GENERAL INFORMATION**

Description of the item .....

# 1.1 General Description of the Item(s)

	Refer to model list for details					
Trademark:	We-vibe					
Model / Type number:	6000-01, 6000-02, 6000-03, 6000-04					
FCC ID:	ZUE600I					
Ratings:	5 Vdc, 0,5 A					
Manufacturer:	WOW Tech Europe GmbH					
	Hermann-Blankenstein-Str. 5, 10249 Berli	in, Germany				
Factory:	Seaco Technology(Dongguan)Co., Ltd.					
	No.6, the 3rd Jin He Industrial Zone, Zhar	ng Mutou Town, Dongguan City				
	Guangdong, China					
Operating frequency range(s) – Tx.:	2402-2480 MHz					
Operating frequency range(s) – Rx :	2402-2480 MHz					
Maximum RF output power (conducted)	-7,2 dBm					
E.I.R.P:	-2,2 dBm					
Type of Modulation:	GFSK					
PHYs:	LE 1M, LE 2M					
Data Rate	1 Mbit/s, 2 Mbit/s					
Antenna type:	Integral Antenna					
Antenna gain:	5,0 dBi					
Number of channel:	40					
Operating Temperature Range:	-20 − 45 °C					
Rated power supply:	Voltage and Frequency	Reference poles				
	Voltage and Frequency	L1 L2 L3 N PE				
	AC: 220 – 240 V, 50/60 Hz					
	□ DC: 5 V					
	☐ Battery: 3 V					
Mounting position:	Table top equipment					
	Wall/Ceiling mounted equipment					
	Floor standing equipment					
	Hand-held equipment					
	│ □ │ Other·					

Vibrating Ring / Vibrating Plug / Wearable Vibrator

Report no.: 4395104.58 Page 6 / 77

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#### Intended use of the Equipment Under Test (EUT)

The apparatus as supplied for the test is Vibrating Ring / Vibrating Plug / Wearable Vibrator which intended for residential use. The product contains electronic circuitry and charged by external AC/DC adaptor.

According to manufacturer's declaration, all models have same electronic circuit but with different appearance and length of RF antenna.

Product name	PMN	Model number	Antenna Length /	Appearance
			gain	
Vibrating Ring	Verge	6000-01	28 mm / 5 dBi	
Vibrating Ring	Pivot	6000-02	28 mm / 5 dBi	Something the same
Vibrating Plug	Ditto	6000-03	28 mm / 5 dBi	1
Wearable Vibrator	Jive	6000-04	180 mm / 5 dBi	9

Hence, model 6000-04 was chosen for full test, model 6000-03 was chosen to repeat Emissions in non-restricted frequency bands test for compliance verification and the corresponding test data are also representative of the other models as well.

Copy of marking plate:	
No provide.	

#### 1.2 Test data

Test Location	DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China FCC Designation Number: CN1324; ISED CAB identifier: CN0130
Date of receipt of test item	2022-09-29
Date (s) of performance of tests	2022-09-29 to 2022-12-18

Report no.: 4395104.58 Page 7 / 77



# 1.3 The environment(s) in which the EUT is intended to be used

The equipment under test (EUT) is intended to be used in the following environment(s):

$\boxtimes$	Residential (domestic) environment.
$\boxtimes$	Commercial and light-industrial environment.
	Industrial environment.

## 1.4 Channel List

Bluetooth Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
37	2402 MHz	00	2404 MHz	01	2406 MHz	02	2408 MHz
03	2410 MHz	04	2412 MHz	05	2414 MHz	06	2416 MHz
07	2418 MHz	08	2420 MHz	09	2422 MHz	10	2424 MHz
38	2426 MHz	11	2428 MHz	12	2430 MHz	13	2432 MHz
14	2434 MHz	15	2436 MHz	16	2438 MHz	17	2440 MHz
18	2442 MHz	19	2444 MHz	20	2446 MHz	21	2448 MHz
22	2450 MHz	23	2452 MHz	24	2454 MHz	25	2456 MHz
26	2458 MHz	27	2460 MHz	28	2462 MHz	29	2464 MHz
30	2466 MHz	31	2468 MHz	32	2470 MHz	33	2472 MHz
34	2474 MHz	35	2476 MHz	36	2478 MHz	39	2480 MHz

Report no.: 4395104.58 Page 8 / 77



## 2 **DESCRIPTION OF TEST SETUP**

# 2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Used for methos			
mode	Operating mode description	Conducted	Radiated		
1	Transmitting at 1 Mbit/s,	$\boxtimes$	$\boxtimes$		
2	Transmitting at 2 Mbit/s,	$\boxtimes$	$\boxtimes$		
3					
Supplemental information:					

# 2.2 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by		
Supplemental information:					

# 2.3 Test Configuration / Block diagram used for tests

Refer to Annex 3.

Report no.: 4395104.58 Page 9 / 77



## 3 **VERDICT SUMMARY SECTION**

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

#### 3.1 Standards

Standard	Year	Description
FCC CFR Title 47 Part 15	2022	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and
Subpart C Section 15.247		5725–5850 MHz.
KDB 558074 D01 v05r02 2019 Guidance for performing compliance measurements on Di		Guidance for performing compliance measurements on Digital
		Transmission System (DTS) operating under section 15.247
ANSI C63.10 2013		American National Standard of Procedures for Compliance Testing
		of Unlicensed Wireless Devices

# 3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

#### 3.3 Overview of results

Requirement – Test case	Basic standard(s)	Verdict	Remark	
AC Power Line Conducted Emission	FCC 15.207	PASS		
Emissions in non-restricted frequency bands	FCC 15.247(d), FCC 15.209	PASS		
Emissions in restricted frequency bands	FCC 15.247(b)(3)	PASS		
Duty cycle	ANSI C63.10:2013	PASS		
Band Edge	FCC 15.247(d)	PASS		
Fundamental emission output power	FCC 15.247(d), FCC 15.209	PASS		
DTS Bandwidth	FCC 15.247(a)(2)	PASS		
Power Spectral Density	FCC 15.247(e)	PASS		
Antenna Requirement	FCC 15.203	PASS		

The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to calculate the uncertainty associated with the measurement result.

Report no.: 4395104.58 Page 10 / 77



# 3.4 Measurement procedure

The EUT was controlled by a serial PCB which provided by manufacturer which connected to laptop through the com port. After connected, run the software "EMI\_Tool\_V2.0" supplied by manufacturer to control the EUT work in required test mode as below table.

Mode	Frequency	
Wode	(MHz)	
	2402	
BLE	2440	
	2480	

Report no.: 4395104.58 Page 11 / 77



## 4 TRANSMITTER TEST RESULTS

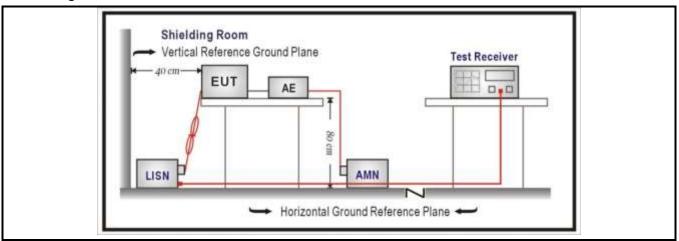
4.1	AC Power Line Conducted Emission	VERDICT: PASS
-----	----------------------------------	---------------

#### Limits

FCC Part 15 Subpart C Paragraph 15.207						
Frequency range [MHz]	Limit: QP [dB(μV) <sup>1)</sup> ]	Limit: AV [dB(μV) 1)]	IF BW	Detector(s)		
0,15 - 0,50	66 – 56 <sup>2)</sup>	56 - 46 <sup>2)</sup>	9 KHz	QP, AV		
0,50 - 5,0	56	46	9 KHz	QP, AV		
5,0 - 30	60	50	9 KHz	QP, AV		

<sup>&</sup>lt;sup>1)</sup> At the transition frequency, the lower limit applies.

## **Test Configuration**



## **Performed measurements**

Port under test			Terminal							
$\boxtimes$	AC mains input power		$\boxtimes$	N	$\boxtimes$	L1	L2		L3	
	DC input power			☐ Positive (+) ☐ Negative (-)						
Test	Test method applied  Artificial mains net  Voltage probe		:twork							
Test	Test setup		Table top	Artificial hand applied						
			Floor standing		Other:					
		Refe	to the Annex 2 for	test se	tup photo	(s).				
Operating mode(s) used		Mode 1, Mode 2								
Envirment condition (temperature; humidiry)		23,0 °C; 45,0 %								
Remark										

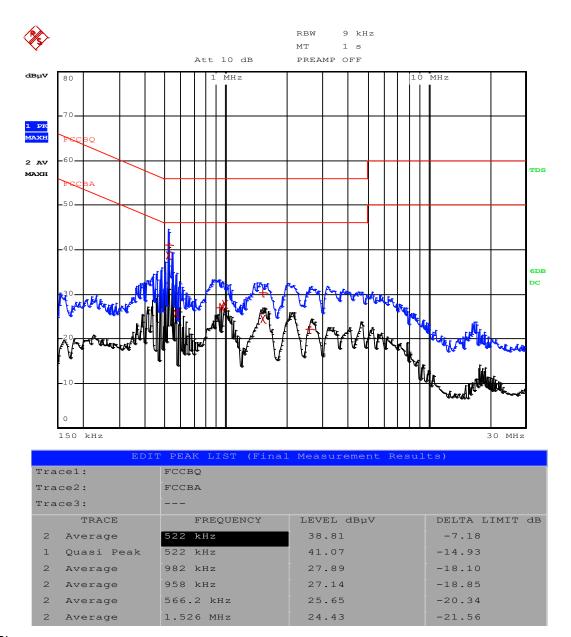
Report no.: 4395104.58 Page 12 / 77

<sup>&</sup>lt;sup>2)</sup> The limit decreases linearly with the logarithm of the frequency.



Model	6000-04
Operation Mode	Mode 1
Test voltage	120 Vac, 60 Hz

## Results Live



#### Remarks:

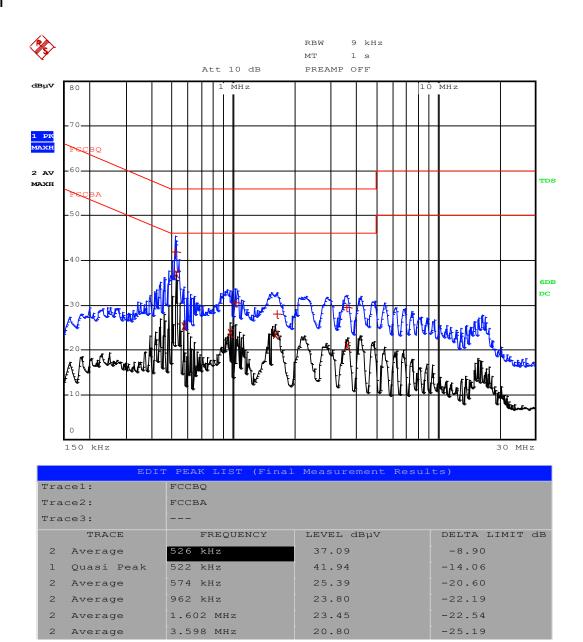
- 1) Level (final measurement) = received value + transducer (Lisn+cable)
- 2) Delta = Level Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Report no.: 4395104.58 Page 13 / 77



#### Neutral



#### Remarks:

- 1) Level (final measurement) = received value + transducer (Lisn+cable)
- 2) Delta = Level Limit

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Report no.: 4395104.58 Page 14 / 77

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# 4.2 Emissions in non-restricted frequency bands VERDICT: PASS

Emissions Limit 15.209(a)						
Frequency (MHz)	Field strength (μV/m)	Field strength (dBµV/m)	Measurement distance (m)			
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 <sub>(Note 1)</sub>			
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 <sub>(Note 1)</sub>			
1.705 - 30	30	29.5	30(Note 1)			
30 - 88	100	40	3(Note 2)			
88 - 216	150	43.5	3 <sub>(Note 2)</sub>			
216 - 960	200	46	3 <sub>(Note 2)</sub>			
Above 960	500	54	<b>3</b> (Note 2)			

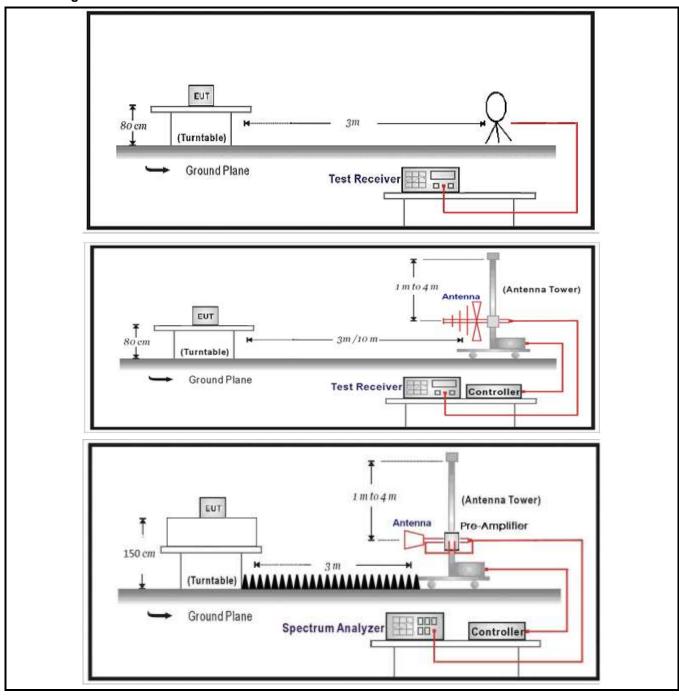
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

Report no.: 4395104.58 Page 15 / 77



## **Test Configuration**



Report no.: 4395104.58 Page 16 / 77

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## **Performed measurements**

Port under test	Enclosure port		
Test method applied	☐ Conducted measurement		
Test setup	Refer to the Annex 3 for test setup photo(s).		
Operating mode(s) used	Mode 1, Mode 2		
Remark	The test frequency range, 9kHz~30MHz, 18GHz~26GHz, both of the worst case are at least 20dB below the limits, therefore no data appear in the report.		

Report no.: 4395104.58 Page 17 / 77

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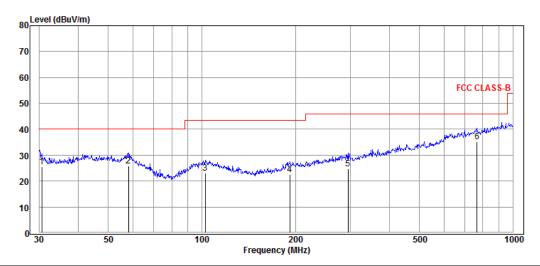
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## Results of 30 - 1000 MHz

Model	6000-04
Operation Mode	Mode 1 @2402MHz (worst case)
Test voltage	

# Results Horizontal



Freq (MHz)	Reading (dBuV)	C.F (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin=limit-result (dB)
30,53	12,40	13,14	25,54	40,00	14,46
58,00	9,59	16,28	25,87	40,00	14,13
102,36	9,02	14,02	23,04	43,50	20,46
191,75	8,94	13,53	22,47	43,50	21,03
295,15	9,03	15,67	24,70	46,00	21,30
766,06	10,66	24,67	35,33	46,00	10,67

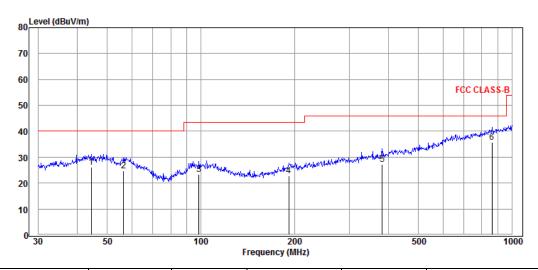
## Remarks:

- 1) C.F (Correction Factor) = Antenna factor + Cable loss Preamp gain
- 2) Result = Reading + C.F (Correction Factor)

No other significant emissions were measured at the frequency range of interest employing the QP detectors.

Report no.: 4395104.58 Page 18 / 77





Freq (MHz)	Reading (dBuV)	C.F (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin=limit-result (dB)
44,43	10,27	15,81	26,08	40,00	13,92
56,40	8,94	15,87	24,81	40,00	15,19
98,49	9,65	13,61	23,26	43,50	20,24
191,75	9,31	13,53	22,84	43,50	20,66
382,59	9,16	17,97	27,13	46,00	18,87
863,06	9,85	25,77	35,62	46,00	10,38

## Remarks:

- 1) C.F (Correction Factor) = Antenna factor + Cable loss Preamp gain
- 2) Result = Reading + C.F (Correction Factor)

No other significant emissions were measured at the frequency range of interest employing the QP detectors.

Report no.: 4395104.58 Page 19 / 77

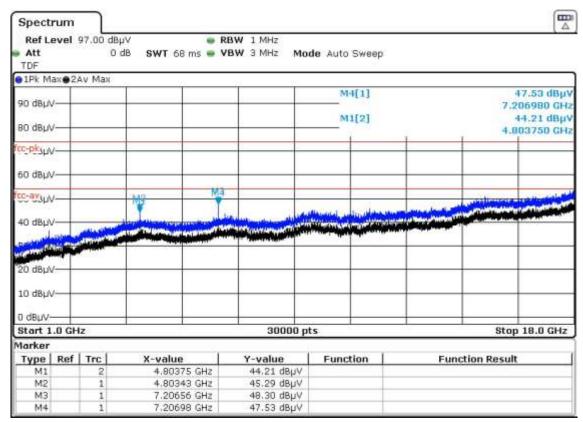
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#### Results of 1 - 18 GHz

Model	6000-04
Operation Mode	Mode 1 @2402 MHz
Test voltage	

# Results Horizontal

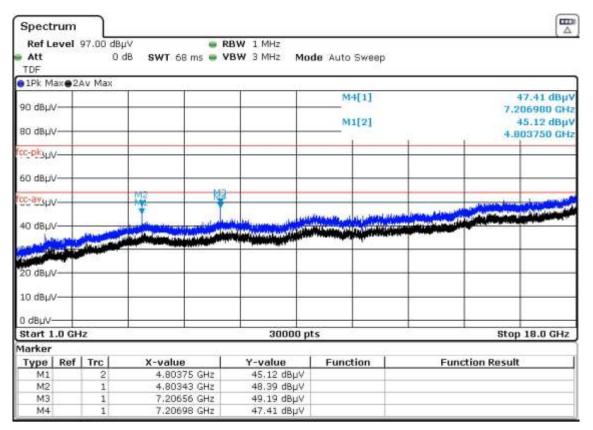


Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 20 / 77





Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

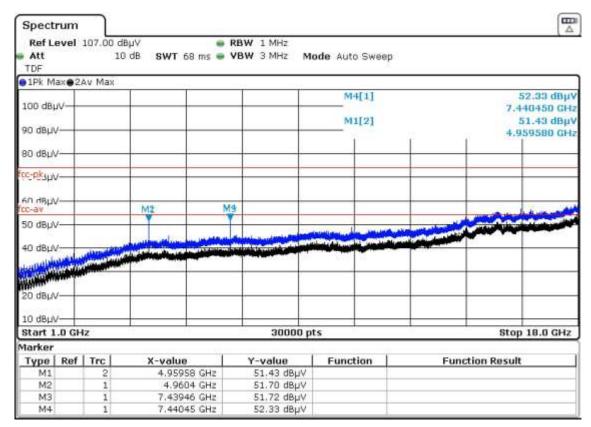
Report no.: 4395104.58 Page 21 / 77

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Model	6000-04
Operation Mode	Mode 1 @2480 MHz
Test voltage	

# Results Horizontal



Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

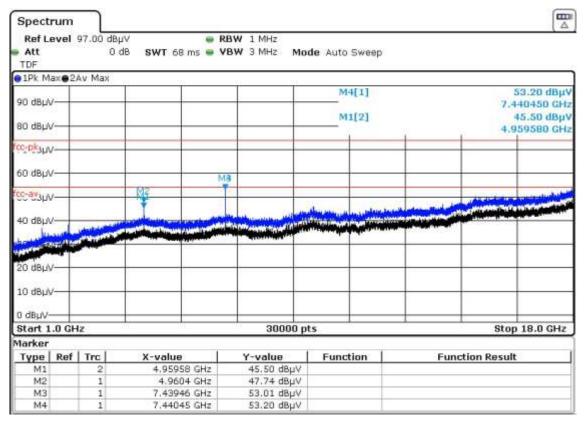
No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 22 / 77

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#### **Vertical**



Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

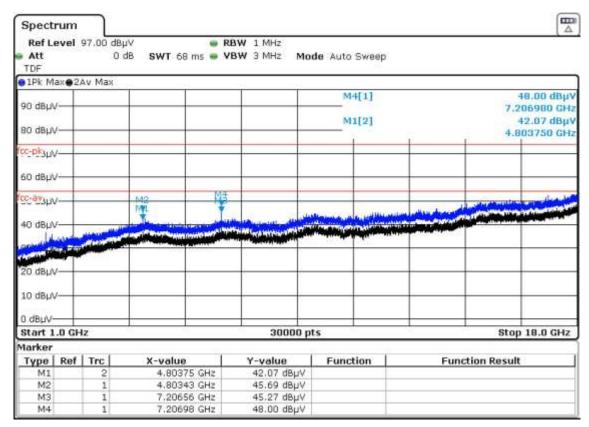
No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 23 / 77



Model	6000-04
Operation Mode	Mode 2 @2402 MHz
Test voltage	

# Results Horizontal

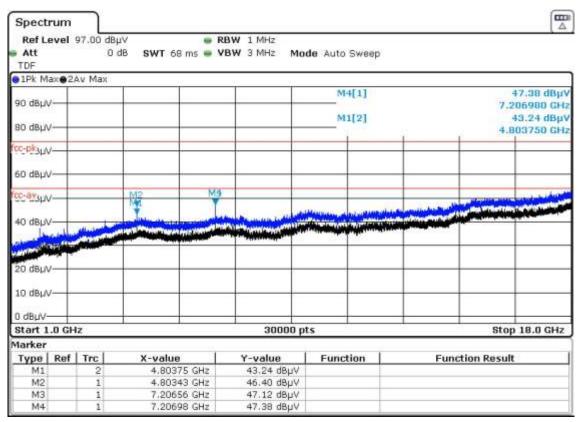


Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 24 / 77





Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

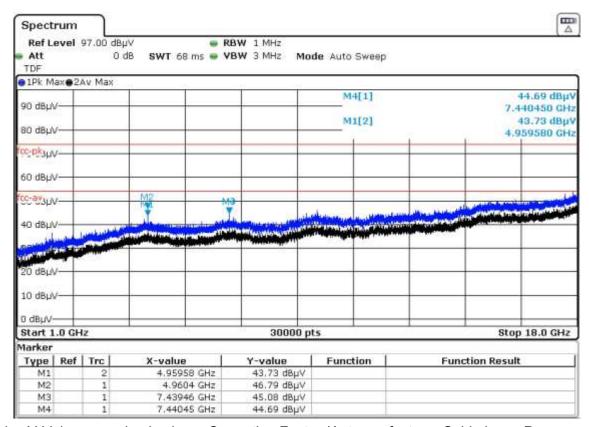
No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 25 / 77



Model	6000-04
Operation Mode	Mode 2 @2480 MHz
Test voltage	

# Results Horizontal

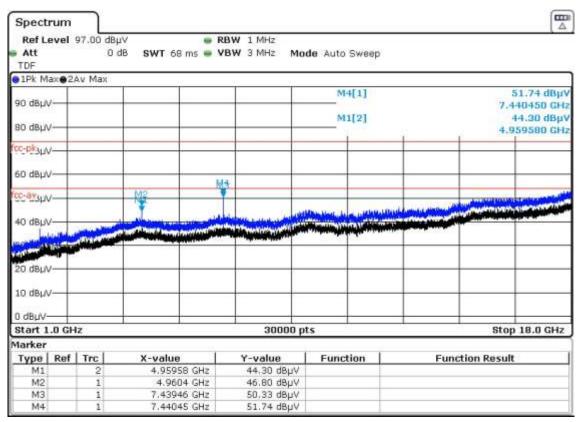


Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 26 / 77





Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 27 / 77

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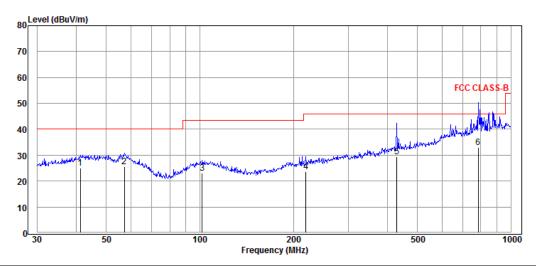
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## Results of 30 - 1000 MHz

Model	6000-03
Operation Mode	Mode 1 @2402MHz (worst case)
Test voltage	

# Results Horizontal



Freq (MHz)	Reading (dBuV)	C.F (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin=limit-result (dB)
41,28	9,02	15,99	25,01	40,00	14,99
57,19	9,59	16,08	25,67	40,00	14,33
101,64	9,06	14,03	23,09	43,50	20,41
219,08	10,02	13,49	23,51	46,00	22,49
429,52	10,17	19,27	29,44	46,00	16,56
785,09	8,31	24,60	32,91	46,00	13,09

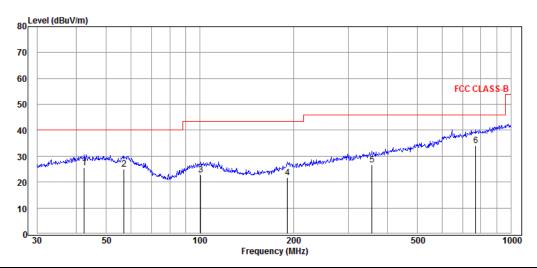
## Remarks:

- 3) C.F (Correction Factor) = Antenna factor + Cable loss Preamp gain
- 4) Result = Reading + C.F (Correction Factor)

No other significant emissions were measured at the frequency range of interest employing the QP detectors.

Report no.: 4395104.58 Page 28 / 77





Freq (MHz)	Reading (dBuV)	C.F (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin=limit-result (dB)
42,45	9,49	16,16	25,65	40,00	14,35
56,99	8,94	16,03	24,97	40,00	15,03
100,58	8,89	13,97	22,86	43,50	20,64
191,07	8,32	13,36	21,68	43,50	21,82
357,93	9,18	17,58	26,76	46,00	19,24
771,45	9,56	24,58	34,14	46,00	11,86

## Remarks:

- 3) C.F (Correction Factor) = Antenna factor + Cable loss Preamp gain
- 4) Result = Reading + C.F (Correction Factor)

No other significant emissions were measured at the frequency range of interest employing the QP detectors.

Report no.: 4395104.58 Page 29 / 77

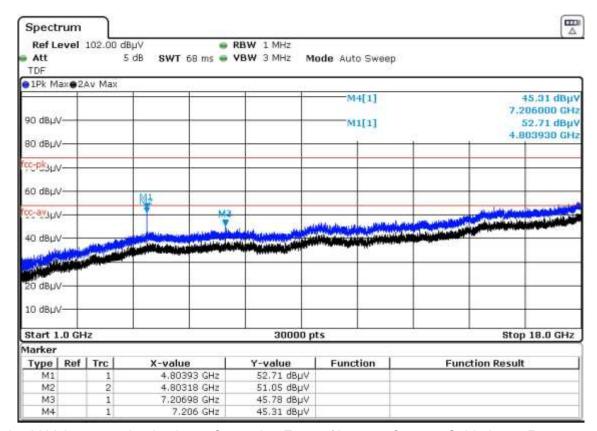
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#### Results of 1 - 18 GHz

Model	6000-03
Operation Mode	Mode 1 @2402 MHz
Test voltage	

# Results Horizontal

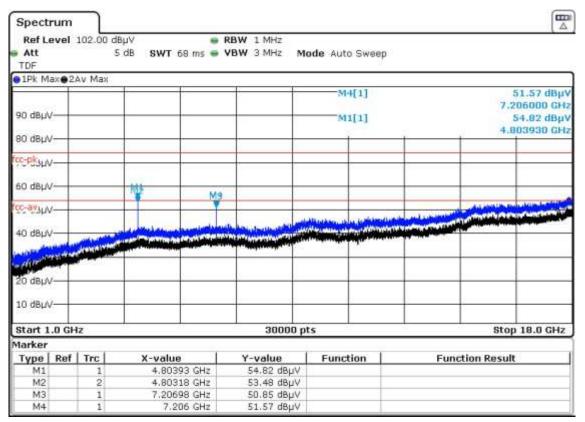


Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 30 / 77





Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

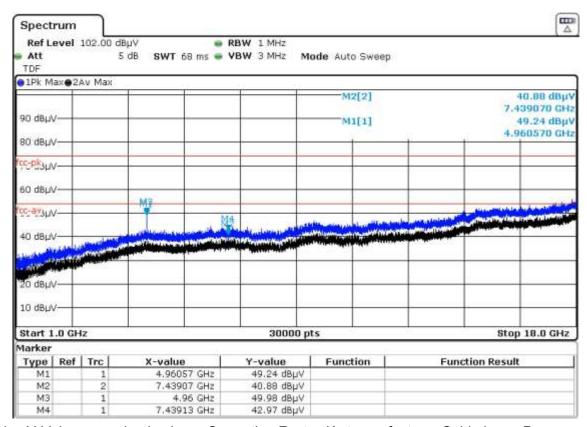
Report no.: 4395104.58 Page 31 / 77





Model	6000-03
Operation Mode	Mode 1 @2480 MHz
Test voltage	

# Results Horizontal

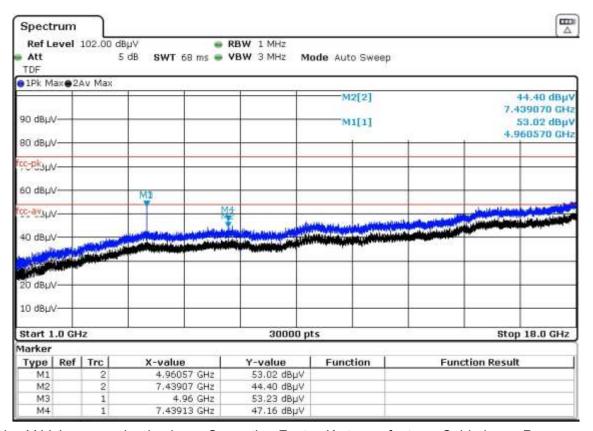


Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 32 / 77





Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

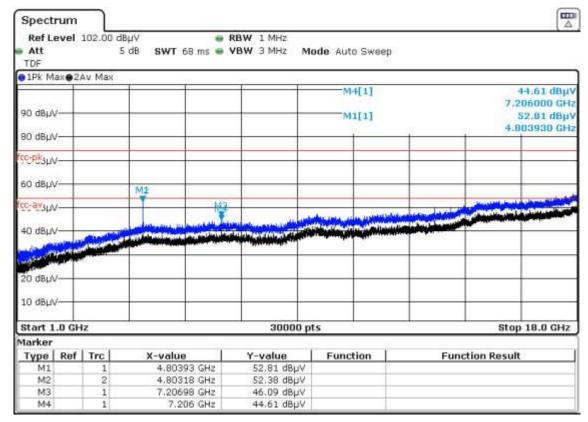
Report no.: 4395104.58 Page 33 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



Model	6000-03
Operation Mode	Mode 2 @2402 MHz
Test voltage	

# Results Horizontal

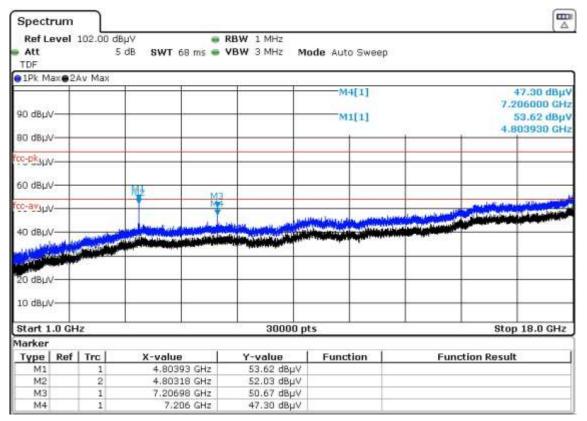


Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 34 / 77





Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

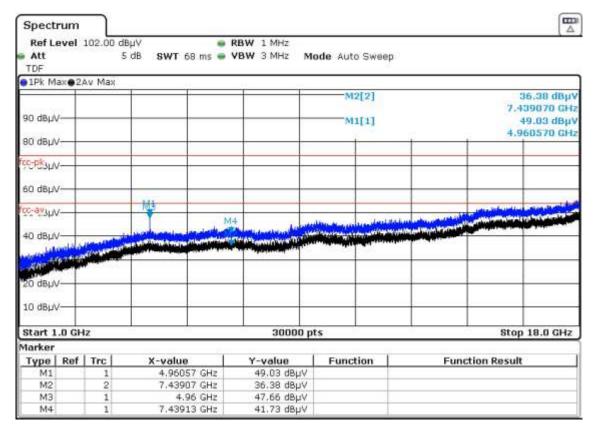
No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 35 / 77



Model	6000-03
Operation Mode	Mode 2 @2480 MHz
Test voltage	

# Results Horizontal



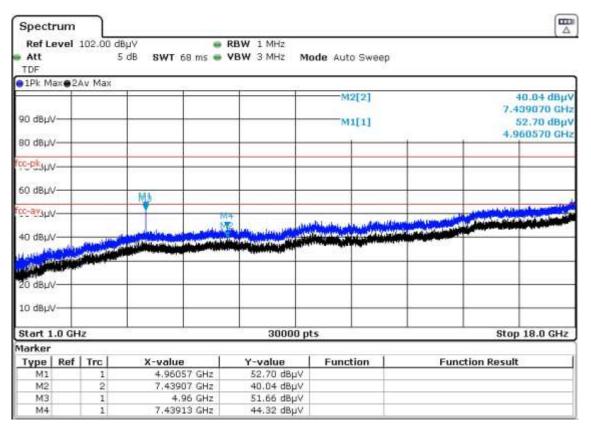
Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 36 / 77



#### **Vertical**



Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 37 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



# 4.3 Emissions in restricted frequency bands VERDICT: PASS

Restricted Bands of oper	ation of FCC		
Frequency	Frequency	Frequency	Frequency
(MHz)	(MHz)	(MHz)	(GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 - 0.505	16.69475 –16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 - 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 - 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 - 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975–12.52025	240 – 285	3345.8 - 3358	36.43 – 36.5
12.57675-12.57725	322 – 335.4	3600 – 4400	
13.36 – 13.41			
Restricted Bands of oper	ation for IC		
0.090 - 0.110	13.36 - 13.41	960 - 1427	9.0 - 9.2
0.495 - 0.505	16.42 - 16.423	1435 - 1626.5	9.3 - 9.5
2.1735 - 2.1905	16.69475 - 16.69525	1645.5 - 1646.5	10.6 - 12.7
3.020 - 3.026	16.80425 - 16.80475	1660 - 1710	13.25 - 13.4
4.125 - 4.128	25.5 - 25.67	1718.8 - 1722.2	14.47 - 14.5
4.17725 - 4.17775	37.5 - 38.25	2200 - 2300	15.35 - 16.2
4.20725 - 4.20775	73 - 74.6	2310 - 2390	17.7 - 21.4
5.677 - 5.683	74.8 - 75.2	2483.5 - 2500	22.01 - 23.12
6.215 - 6.218	108 - 138	2655 - 2900	23.6 - 24.0
6.26775 - 6.26825	149.9 - 150.05	3260 - 3267	31.2 - 31.8
6.31175 - 6.31225	156.52475 - 156.52525	3332 - 3339	36.43 - 36.5
8.291 - 8.294	156.7 - 156.9	3345.8 - 3358	Above 38.6
8.362 - 8.366	162.0125 - 167.17	3500 - 4400	
8.37625 - 8.38675	167.72 - 173.2	4500 - 5150	
8.41425 - 8.41475	240 - 285	5350 - 5460	
12.29 - 12.293	322 - 335.4	7250 - 7750	
12.51975 - 12.52025	399.9 - 410	8025 - 8500	
12.57675 - 12.57725	608 - 614		

Report no.: 4395104.58 Page 38 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com

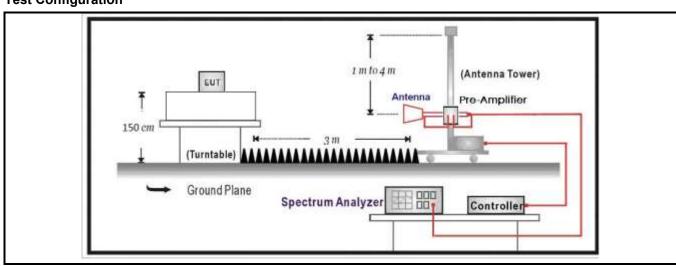


Restricted Band Emissions Limit					
Frequency (MHz)	Field strength (μV/m)	Field strength (dBµV/m)	Measurement distance (m)		
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300(Note 1)		
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 <sub>(Note 1)</sub>		
1.705 - 30	30	29.5	30(Note 1)		
30 - 88	100	40	3 <sub>(Note 2)</sub>		
88 - 216	150	43.5	3(Note 2)		
216 - 960	200	46	<b>3</b> (Note 2)		
Above 960	500	54	<b>3</b> (Note 2)		

Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

#### **Test Configuration**



Report no.: 4395104.58 Page 39 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



## **Performed measurements**

Port under test	Enclosure port	
Test method applied	☐ Conducted measurement	
	$\boxtimes$	Radiated measurement
Test setup	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1, Mode 2	
Remark		

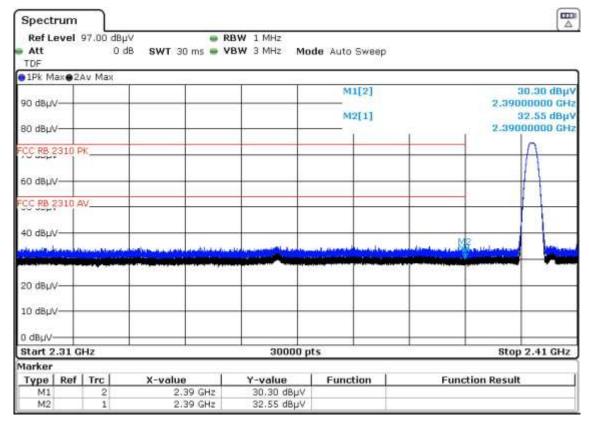
Report no.: 4395104.58 Page 40 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



Model	6000-04
Operation Mode	Mode 1 @2402 MHz
Test voltage	

## Results Horizontal



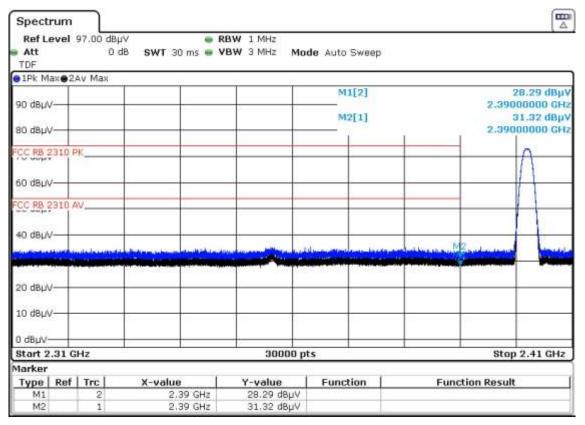
Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 41 / 77



#### **Vertical**



Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

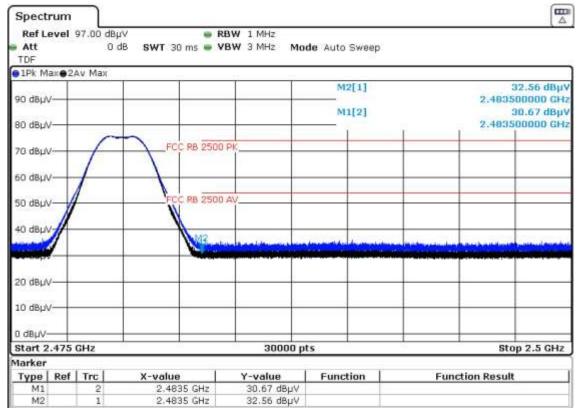
No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 42 / 77



Model	6000-04
Operation Mode	Mode 1 @2480 MHz
Test voltage	

## Results Horizontal



Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

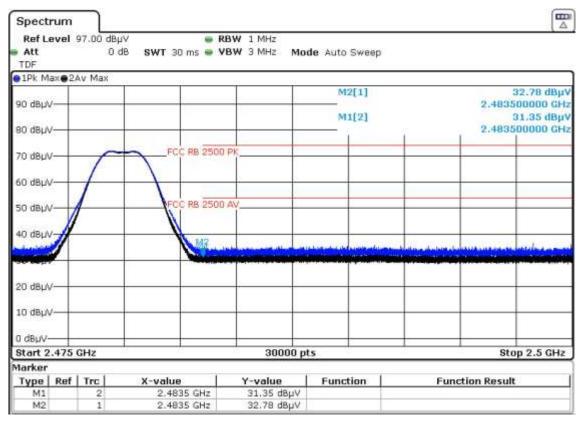
No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 43 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



#### **Vertical**



Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

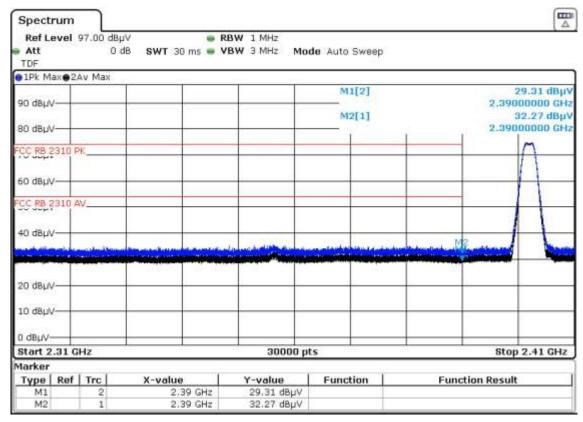
No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 44 / 77



Model	6000-04
Operation Mode	Mode 2 @2402 MHz
Test voltage	

## Results Horizontal



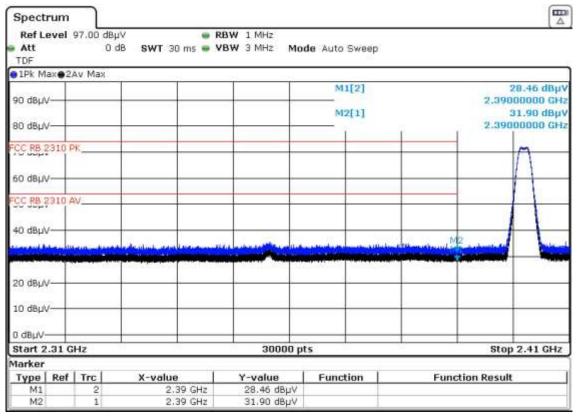
Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 45 / 77



#### **Vertical**



Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

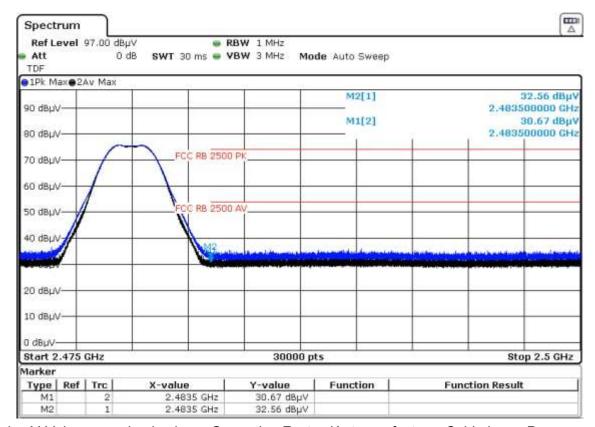
Report no.: 4395104.58 Page 46 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



Model	6000-04
Operation Mode	Mode 2 @2480 MHz
Test voltage	

## Results Horizontal



Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

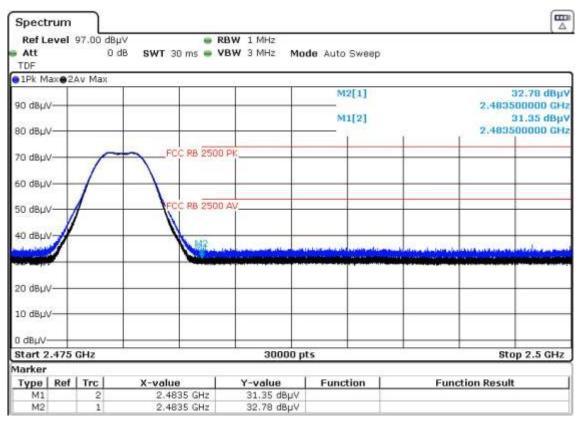
No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 47 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



#### **Vertical**



Remarks: Y-Value = received value + Correction Factor (Antenna factor + Cable loss - Preamp gain)

No other significant emissions were measured at the frequency range of interest employing the PK and AV detectors.

Report no.: 4395104.58 Page 48 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



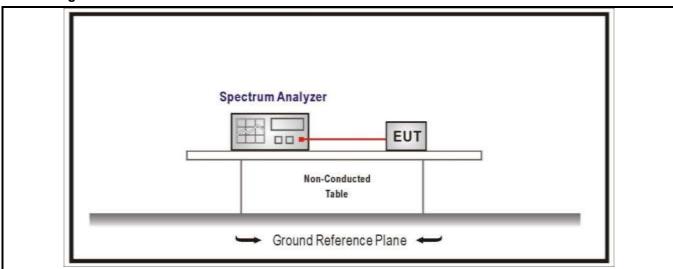
# 4.4 Band Edge VERDICT: PASS

Standard	FCC Part 15 Subpart C Paragraph 15.247(d)		
RF Output power (Detection methods)		Limit(dB)	
RF Output power(Average detector)		30dBc(Note1)	
RF Output power(PK detector)		20dBc(Note2)	

Note 1: If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at by LEast 30 dB relative to the maximum in-band peak PSD by LEvel in 100 kHz (i.e., 30 dBc).

Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at by least 20 dB relative to the maximum in-band peak PSD by level in 100 kHz (i.e., 20 dBc).

#### **Test Configuration**



#### **Performed measurements**

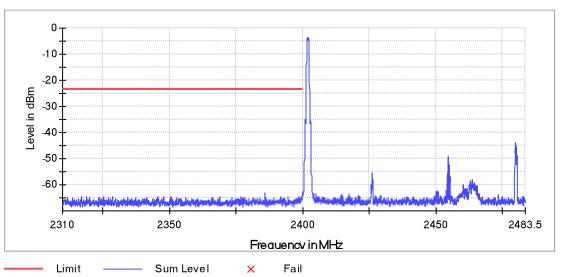
Port under test	Anter	Antenna port	
Test method applied			
		Radiated measurement	
Test setup	Refe	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode	Mode 1, Mode 2	
Remark			

Report no.: 4395104.58 Page 49 / 77



# Results of mode 1 @2402 MHz





#### **Inband Peak**

Frequency	Level
(MHz)	(dBm)
2402.0000	-3,6

#### Measurements

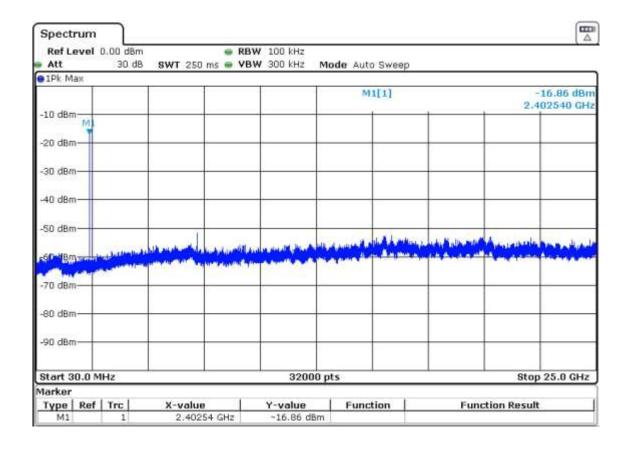
Frequency	Level	Margin	Limit	Result
(MHz)	(dBm)	(dB)	(dBm)	
2399.975000	-62.7	39.1	-23.6	PASS
2385.875000	-63.2	39.6	-23.6	PASS
2385.825000	-63.4	39.7	-23.6	PASS
2385.925000	-64.0	40.4	-23.6	PASS
2368.925000	-64.4	40.8	-23.6	PASS
2368.875000	-64.5	40.8	-23.6	PASS
2391.725000	-64.5	40.8	-23.6	PASS
2317.025000	-64.7	41.1	-23.6	PASS
2398.525000	-64.7	41.1	-23.6	PASS
2398.575000	-64.7	41.1	-23.6	PASS
2345.625000	-64.7	41.1	-23.6	PASS
2317.075000	-64.7	41.1	-23.6	PASS
2399.675000	-64.7	41.1	-23.6	PASS
2399.725000	-64.7	41.1	-23.6	PASS
2347.925000	-64.7	41.1	-23.6	PASS

Report no.: 4395104.58 Page 50 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



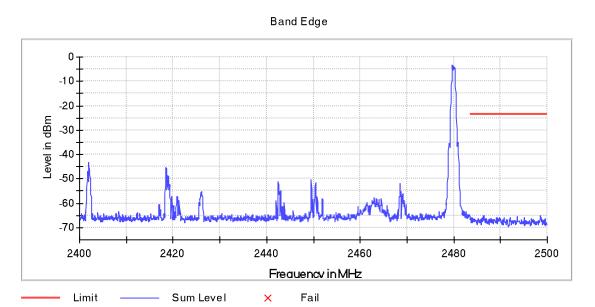
## Additional test figure



Report no.: 4395104.58 Page 51 / 77



# Results of mode 1 @2480 MHz



#### **Inband Peak**

Frequency	Level
(MHz)	(dBm)
2480.0000	-3,4

#### Measurements

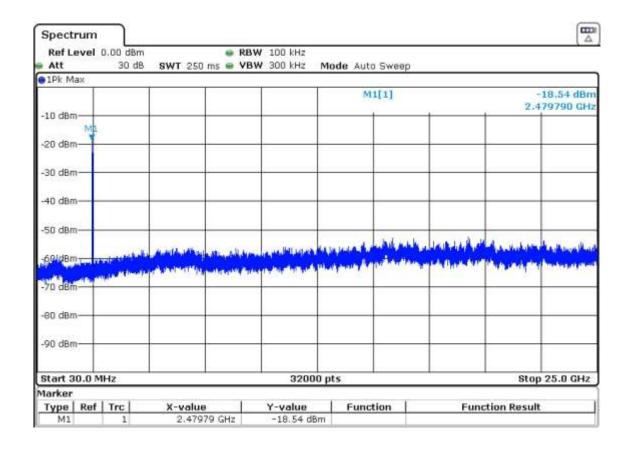
Frague nov	Laval	Morain	1 innit	Dogult
Frequency	Level	Margin	Limit	Result
(MHz)	(dBm)	(dB)	(dBm)	
2498.475000	-65.0	41.6	-23.4	PASS
2486.425000	-65.1	41.7	-23.4	PASS
2486.375000	-65.2	41.8	-23.4	PASS
2498.525000	-65.4	42.0	-23.4	PASS
2498.575000	-65.7	42.3	-23.4	PASS
2493.575000	-65.7	42.3	-23.4	PASS
2483.625000	-65.8	42.4	-23.4	PASS
2489.825000	-65.8	42.4	-23.4	PASS
2489.775000	-65.9	42.5	-23.4	PASS
2489.175000	-65.9	42.6	-23.4	PASS
2493.525000	-66.0	42.6	-23.4	PASS
2490.775000	-66.0	42.6	-23.4	PASS
2498.625000	-66.0	42.6	-23.4	PASS
2492.025000	-66.1	42.7	-23.4	PASS
2495.075000	-66.1	42.7	-23.4	PASS

Report no.: 4395104.58 Page 52 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



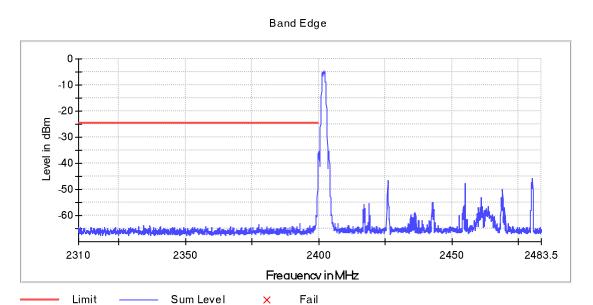
## Additional test figure



Report no.: 4395104.58 Page 53 / 77



# Results of mode 2 @2402 MHz



#### **Inband Peak**

Frequency	Level
(MHz)	(dBm)
2402.0000	-4,5

#### Measurements

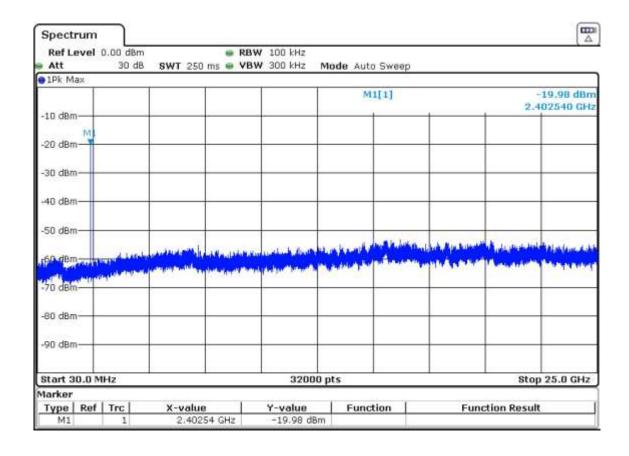
Frequency	Level	Margin	Limit	Result
(MHz)	(dBm)	(dB)	(dBm)	
2399.975000	-35.8	11.3	-24.5	PASS
2399.925000	-36.3	11.8	-24.5	PASS
2399.875000	-37.3	12.8	-24.5	PASS
2399.825000	-39.9	15.4	-24.5	PASS
2399.775000	-40.3	15.8	-24.5	PASS
2399.725000	-43.0	18.5	-24.5	PASS
2399.675000	-45.9	21.3	-24.5	PASS
2399.625000	-48.2	23.7	-24.5	PASS
2399.575000	-49.5	25.0	-24.5	PASS
2399.525000	-53.1	28.6	-24.5	PASS
2399.475000	-53.5	29.0	-24.5	PASS
2399.425000	-53.6	29.0	-24.5	PASS
2399.375000	-56.1	31.6	-24.5	PASS
2399.325000	-58.3	33.8	-24.5	PASS
2399.125000	-60.0	35.5	-24.5	PASS

Report no.: 4395104.58 Page 54 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com



## Additional test figure

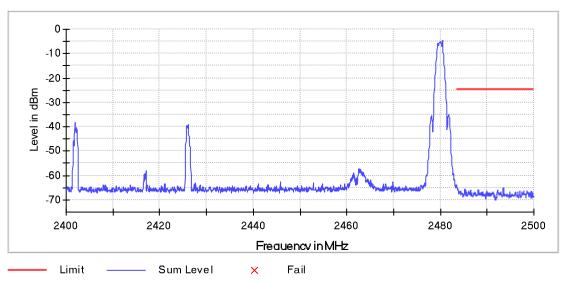


Report no.: 4395104.58 Page 55 / 77



# Results of mode 1 @2480 MHz

#### Band Edge



#### **Inband Peak**

Frequency	Level
(MHz)	(dBm)
2480.0000	-4,7

#### Measurements

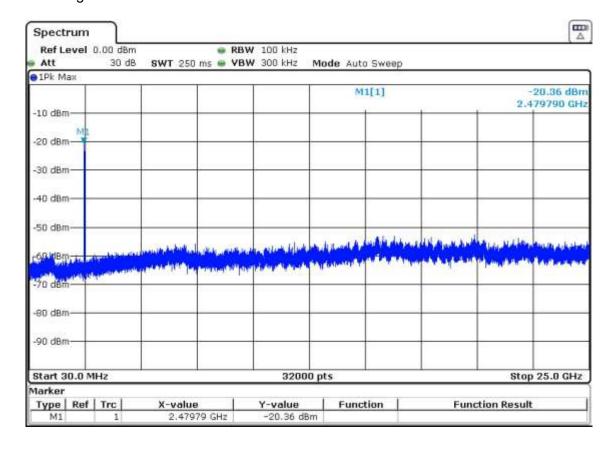
Frequency	Level	Margin	Limit	Result
(MHz)	(dBm)	(dB)	(dBm)	riodan
2483.575000	-64.6	39.9	-24.7	PASS
2483.525000	-64.8	40.1	-24.7	PASS
2493.475000	-65.1	40.4	-24.7	PASS
2493.425000	-65.2	40.5	-24.7	PASS
2483.775000	-65.5	40.8	-24.7	PASS
2483.725000	-65.6	40.9	-24.7	PASS
2483.625000	-65.6	40.9	-24.7	PASS
2485.175000	-65.7	41.0	-24.7	PASS
2488.075000	-65.8	41.1	-24.7	PASS
2485.325000	-65.8	41.1	-24.7	PASS
2483.675000	-65.8	41.1	-24.7	PASS
2488.125000	-65.8	41.1	-24.7	PASS
2485.375000	-65.9	41.2	-24.7	PASS
2492.225000	-66.0	41.3	-24.7	PASS
2486.425000	-66.1	41.4	-24.7	PASS

Report no.: 4395104.58 Page 56 / 77

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# Additional test figure



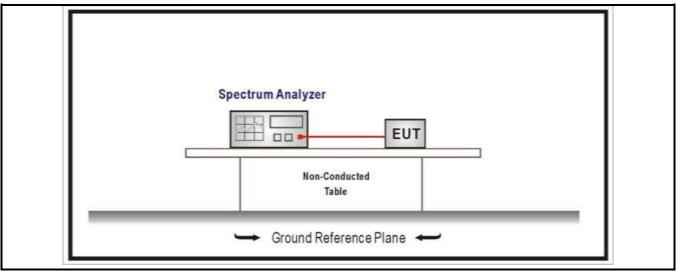
Report no.: 4395104.58 Page 57 / 77

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# 4.5 Duty cycle VERDICT: PASS

## **Test Configuration**



## **Performed measurements**

Port under test	Anter	Antenna port	
Test method applied	$\boxtimes$	Conducted measurement	
		Radiated measurement	
Test setup	Refer to the Annex 3 for test setup photo(s).		
Operating mode(s) used	Mode 1, Mode 2		
Remark			

Report no.: 4395104.58 Page 58 / 77

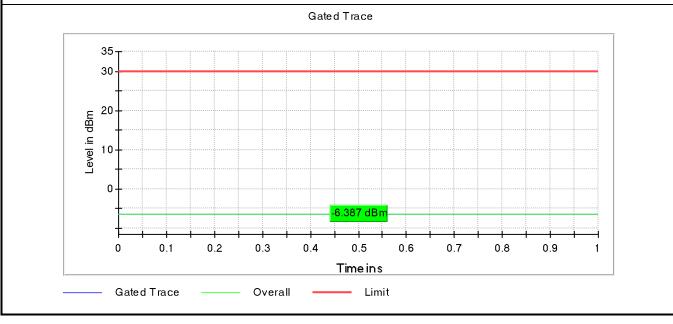
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#### Results

Test Mode	Tx On (ms)	Tx On + Tx Off (ms)	Duty Cycle
Mode 1			100%

- Note 1: T means the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control Level for the tested mode of operation.
- Note 2: According to KDB 558074, when test for Radiated Emission Band Edge and Radiated Emission, for average detector set: VBW ≥ 1/T will be used.



Report no.: 4395104.58 Page 59 / 77

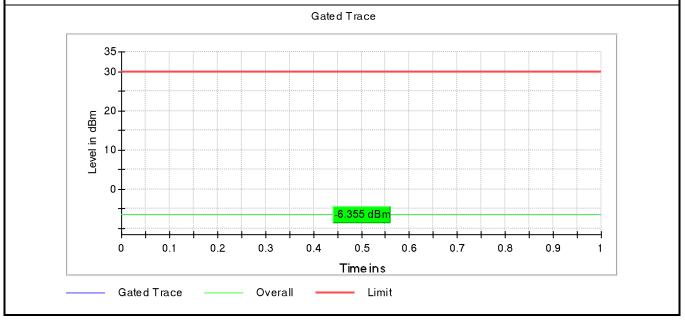
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Test Mode	Tx On (ms)	Tx On + Tx Off (ms)	Duty Cycle
Mode 2			100%

Note 1: T means the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control Level for the tested mode of operation.

Note 2: According to KDB 558074, when test for Radiated Emission Band Edge and Radiated Emission, for average detector set: VBW ≥ 1/T will be used.



Report no.: 4395104.58 Page 60 / 77

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com

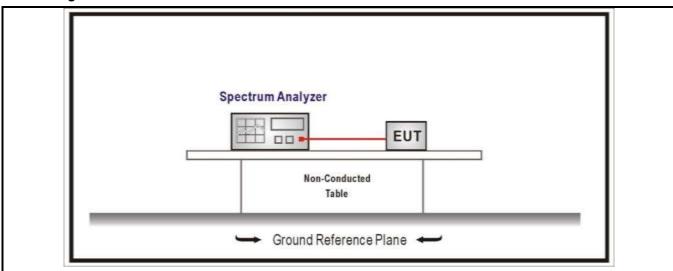


# 4.6 DTS Bandwidth VERDICT: PASS

Standard FCC Part 15 Subpart C Paragraph 15.247 (a)(2)

Systems using digital modulation techniques operate in the 2400-2483.5 MHz .The minimum 6 dB bandwidth shall be at by least 500 kHz

#### **Test Configuration**



#### **Performed measurements**

Port under test	Anter	Antenna port	
Test method applied	$\boxtimes$	Conducted measurement	
		Radiated measurement	
Test setup	Refer to the Annex 3 for test setup photo(s).		
Operating mode(s) used	Mode 1, Mode 2		
Remark			

Report no.: 4395104.58 Page 61 / 77



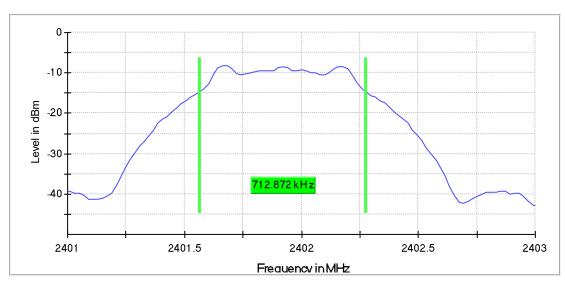
## **Results**

Mode	CH.	Test Freq. (MHz)	6dB Occupied Bandwidth (kHz)	Limit (kHz)	Result
,	37	2402	712,87	>500	Pass
!	39	2480	732,67	>500	Pass

## 6dB Occupied Bandwidth

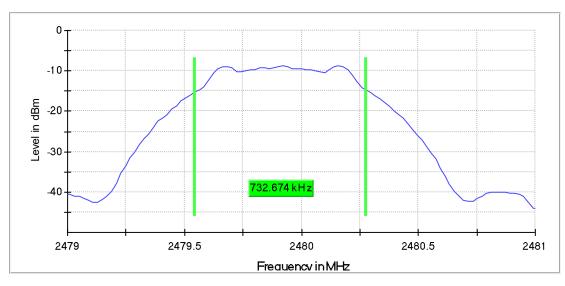
## Mode 1 / CH37 (2402MHz)

6 dB Bandwidth



## Mode 1 / CH39 (2480MHz)

6 dB Bandwidth



Supplementary information: RBW=100 kHz, VBW=300 kHz

Report no.: 4395104.58 Page 62 / 77

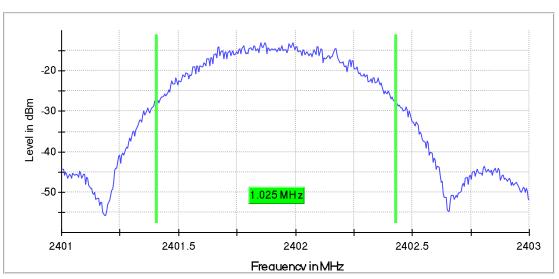


Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
1	37	2402	1.02	Within frequency range	Pass
ı	39	2480	1.02	Within frequency range	Pass

## 99% Occupied Bandwidth

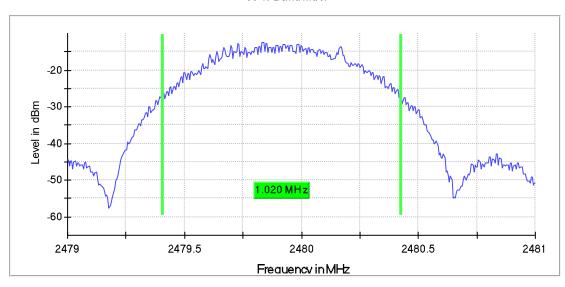
## Mode 1 / CH37 (2402 MHz)

99 % Bandwidth



## Mode 1 / CH39 (2480 MHz)

99 % Bandwidth



Supplementary information: RBW=30 kHz, VBW=100 kHz

Report no.: 4395104.58 Page 63 / 77

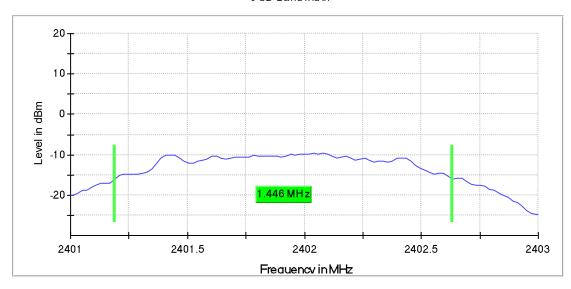


Mode	CH.	Test Freq. (MHz)	6dB Occupied Bandwidth (kHz)	Limit (kHz)	Result
	37	2402	1445,54	>500	Pass
2	39	2480	1465,34	>500	Pass

#### 6dB Occupied Bandwidth

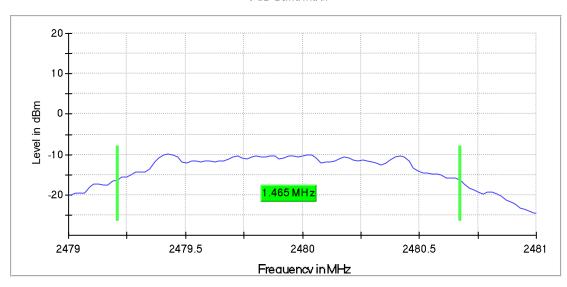
## Mode 2 / CH37 (2402MHz)

#### 6 dB Bandwidth



## Mode 1 / CH39 (2480MHz)

#### 6 dB Bandwidth



Supplementary information: RBW=100 kHz, VBW=300 kHz

Report no.: 4395104.58 Page 64 / 77

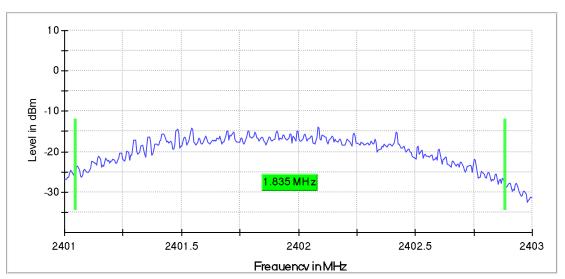


Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
2	37	2402	1,83	Within frequency range	Pass
2	39	2480	1,83	Within frequency range	Pass

#### 99% Occupied Bandwidth

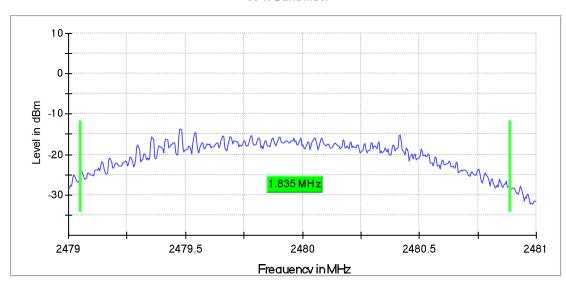
## Mode 2 / CH37 (2402 MHz)

99 % Bandwidth



## Mode 2 / CH39 (2480 MHz)

99 % Bandwidth



Supplementary information: RBW=30 kHz, VBW=100 kHz

Report no.: 4395104.58 Page 65 / 77

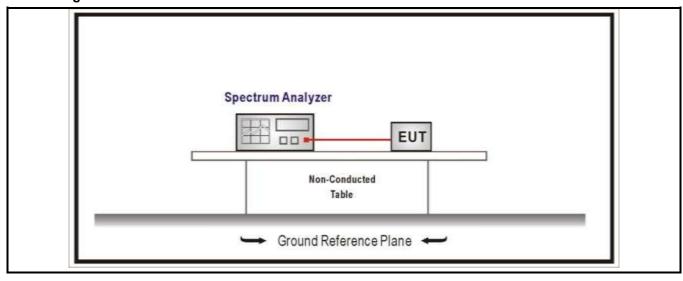
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# 4.7 Fundamental emission output power VERDICT: PASS

Stan	Standard FCC F		FCC Pa	art 15 Subpart C Paragraph 15.247 (b)(3)		
$\boxtimes$	] GTX <6dBi			Pout≤30dBm		
	GTX >	>6dBi				
		Non-Fix point-point		Pout≤30-( GTX -6)		
		Fix point-point		Pout≤30-[(GTX-6)]/3		
		Point-to-multipoint		Pout≤30-(GTX-6)		
		Overlap Beams		Pout≤30-[(GTX-6)]/3		
		Aggregate power transmitted simultan on all beams	eously	Pout≤30-[(GTX-6)]/3		
	singby LE directional beam		I	Pout≤30-[(GTX-6)]/3+8dB		
	Note 1 : GTX directional gain of transmitting antennas. Note 2 : Pout is maximum peak conducted output power .					

## **Test Configuration**



#### **Performed measurements**

Port under test	Antenna port		
Test method applied	$\boxtimes$	Conducted measurement	
		Radiated measurement	
Test setup	Refer to the Annex 3 for test setup photo(s).		
Operating mode(s) used Mode 1, Mode 2		1, Mode 2	
Remark	mark RBW=2 MHz, VBW=10 MHz		

Report no.: 4395104.58 Page 66 / 77



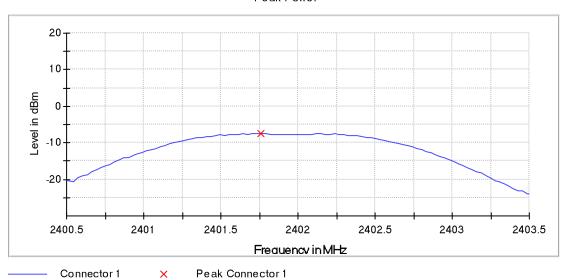
#### Results

Mode	Channel	Test Frequency (MHz)	Conducted Power Output (dBm)	EIRP (dBm)	Limit (dBm)	Result
	37	2402	-7,4	-2,4	≤30	Pass
Mode 1	17	2440	-8,3	-3,3	≤30	Pass
	39	2480	-7,6	-2,6	≤30	Pass
	37	2402	-7,2	-2,2	≤30	Pass
Mode 2	17	2440	-8,1	-3,1	≤30	Pass
	39	2480	-7,3	-2,3	≤30	Pass

## **Test figure**

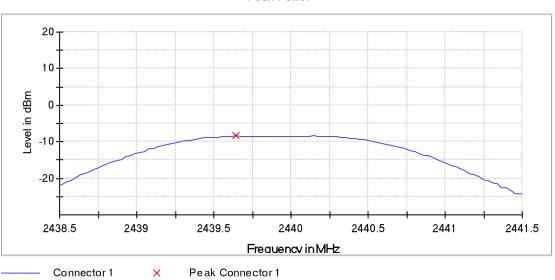
Mode 1, Channel 37

Peak Power



Mode 1, Channel 17

Peak Power

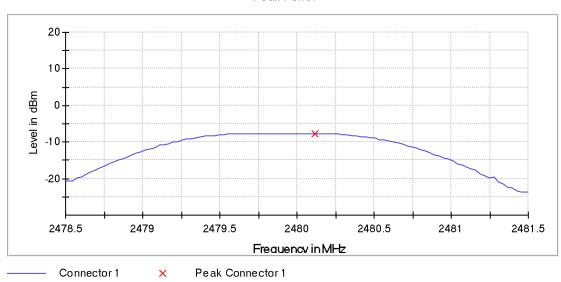


Report no.: 4395104.58 Page 67 / 77



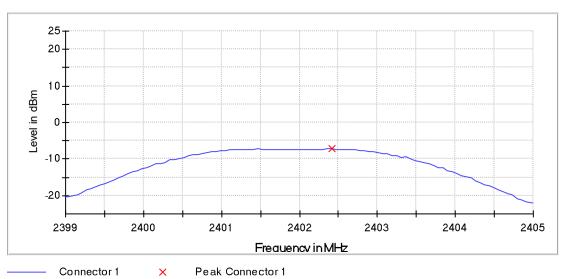
## Mode 1, Channel 39





## Mode 2, Channel 37

#### Peak Power

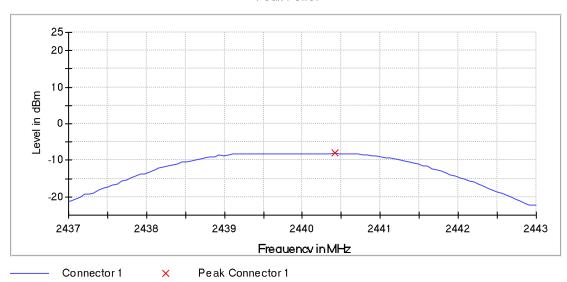


Report no.: 4395104.58 Page 68 / 77



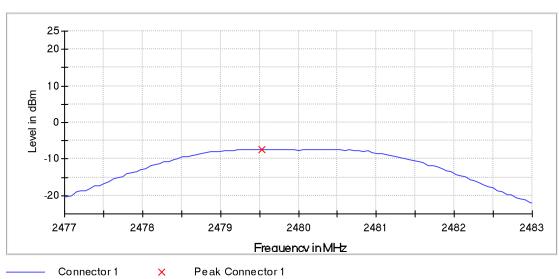
## Mode 2, Channel 17





## Mode 2, Channel 39

#### Peak Power



Report no.: 4395104.58 Page 69 / 77

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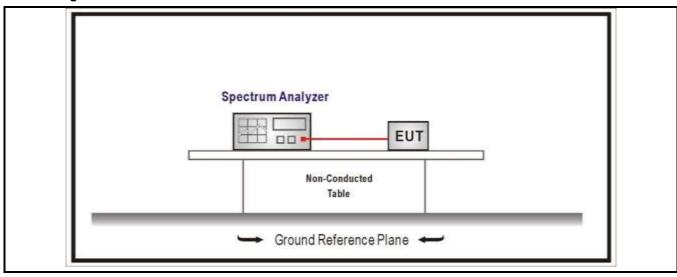
**PASS** 

**VERDICT:** 

# 4.8 Power Density

StandardFCC Part 15 Subpart C Paragraph 15.247 (b)(3)Power Spectral Density≤8dBm/3kHz

## **Test Configuration**



#### **Performed measurements**

Port under test	Antei	Antenna port		
Test method applied	$\boxtimes$	Conducted measurement		
		Radiated measurement		
Test setup	Refe	Refer to the Annex 3 for test setup photo(s).		
Operating mode(s) used	Mode	Mode 1, Mode 2		
Remark	RBW	RBW=10 kHz, VBW=30 kHz		

#### **Results**

Mode	Channel	Test Frequency (MHz)	Power Output (dBm)	Limit (dBm/3kHz)	Result
	37	2402	-12,557	≤8	Pass
Mode 1	17	2440	-14,025	≤8	Pass
	39	2480	-13,107	≤8	Pass
	37	2402	-15,179	≤8	Pass
Mode 2	17	2440	-16,050	≤8	Pass
	39	2480	-16,535	≤8	Pass

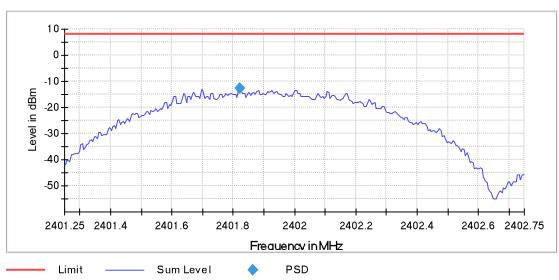
Report no.: 4395104.58 Page 70 / 77



## **Test figure**

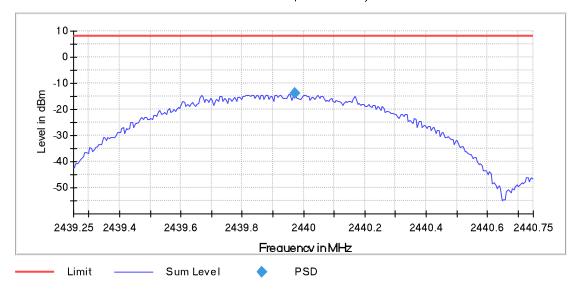
Mode 1, Channel 37





Mode 1, Channel 17

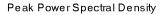
Peak Power Spectral Density

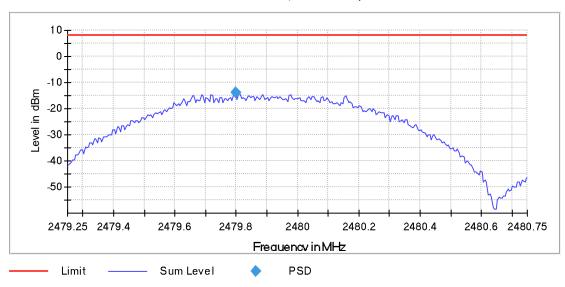


Report no.: 4395104.58 Page 71 / 77



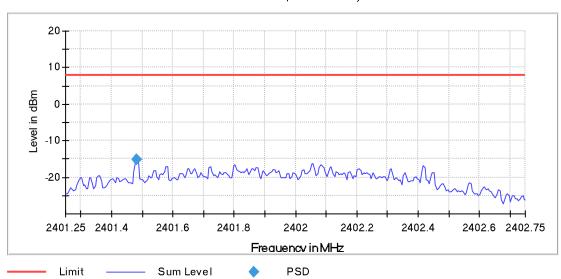
## Mode 1, Channel 39





## Mode 2, Channel 37

#### Peak Power Spectral Density

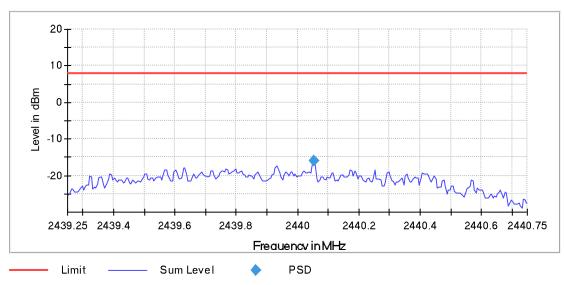


Report no.: 4395104.58 Page 72 / 77



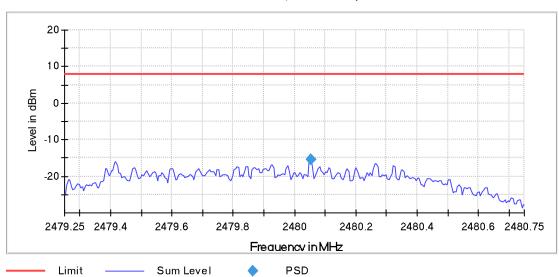
## Mode 2, Channel 17





## Mode 2, Channel 39

#### Peak Power Spectral Density



Report no.: 4395104.58 Page 73 / 77



# 5 **IDENTIFICATION OF THE EQUIPMENT UNDER TEST**

The photographs show the tested device.

Refer to document 4395104\_Internal photos and 4395104\_External photos

Report no.: 4395104.58 Page 74 / 77



# **ANNEX 1 – MEASUREMENT UNCERTAINTY**

Test Item	Uncertainty
Occupied Channel Bandwidth	±0,7%
RF Output power, conducted	±0,6dB
Power Spectral Density, Conducted	±0,6dB
Unwanted Emissions, Conducted	±0.7dB
Spurious (30-1000MHz)	±4,4dB
Spurious (1-12,75GHz)	±4,4dB

Report no.: 4395104.58 Page 75 / 77



## **ANNEX 2 - USED EQUIPMENT**

Emissions in non-restricted frequency bands/ Emissions in restricted frequency bands

Item	Instrumentation	Manufacturer	Model No.	Serial No.	DEKRA No.	Cal. Due date
1	EMI receiver	R&S	ESCI	101206	G/L858	2023/07/07
2	Antenna	SCHWARZBECK	VULB9163	506	G/L864	2023/10/23
	(30MHz-3GHz)					
3	Chamber	ETS	/	/	G/L856	2024/06/10
4	Antenna (1GHz-18GHz)	R&S	HF907	102306	G/L1236	2023/02/23
5	Horn antenna preamplifier	Schwarzbeek	SCU-18	102234	G/L1236-1	2023/02/21
6	Spectrum analyzer	R&S	FSV	SN101012	G/L1235	2023/01/17
7	HF antenna	ETS	3160-09	00164643	G/L1237	2023/01/16
	(18 – 26.5 GHz)					
8	High frequency antenna preamplifier (18 – 26.5 GHz)	Schwarzbeck	SCU-26	1879064	G/L1237-1	2023/01/10
9	Broadband horn antenna (15 – 40 GHz)	Schwarzbeck	BBHA9170	00908	GZ1901	2023/04/30
10	High frequency antenna preamplifier (18 – 26.5 GHz)	Schwarzbeck	SCU-26	1879064	G/L1237-1	2023/01/10
11	Annular magnetic field antenna	TESEQ	HLA6121	540045	GZ1905	2023/05/06

## Duty cycle/Band Edge/Fundamental emission output power/DTS Bandwidth/Power Spectral Density

•	•				•	-
Item	Instrumentation	Manufacturer	Model	Serial no.	DEKRA No.	Cal Due date
1	Spectrum analyzer	R&S	FSV	SN101012	G/L1235	2023/01/17
2	Chamber	ETS	/	1	G/L856	2024/06/10
3	OSP	R&S	OSP 150	101907	GZ1894	2023/04/27

Report no.: 4395104.58 Page 76 / 77

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## **ANNEX 3 - TEST PHOTOS**

Refer to document 4395104\_Test setup.

--- END ---

Report no.: 4395104.58 Page 77 / 77