

**FCC LISTED, REGISTRATION
NUMBER: 905266**

**IC LISTED REGISTRATION NUMBER
IC 4621**

AT4 wireless, S.A.

Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2

29590 Campanillas/ Málaga/ España

Tel. 952 61 91 00 - Fax 952 61 91 13

MÁLAGA, C.I.F. A29 507 456

Registro Mercantil de Málaga, Tomo 1169,

Libro 82, Folio 133, Hoja MA3729

TEST REPORT

REFERENCE STANDARD:

USA FCC Part 15.247, 15.109 and 15.207

NIE : 29742RET.002

Approved by
(name / position & signature) : A. Llamas / RF Lab. Manager

Elaboration date : 2009-11-16

Identification of item tested : PDA

Trademark : Genus

Model and/or type reference : TSN-1

Serial number : Serial number (PSN): EBL 0001277, EBL 0002015

Other identification of the product : Commercial name: TERRESTAR GENUS

FCC ID: OBW120897

IC: 3282A-120897

Features : GSM850/GSM900/GSM1800/GSM1900/WCDMA FDD V/ WCDMA FDD
II / GMR-1 3G / BT / WiFi / A-GPS

Description : PDA

Applicant : ELEKTROBIT INC.

Address : 22745 29TH DRIVE SE, SUITE 200 BOTHELL, WASHINGTON 98021
USA

CIF/NIF/Passport : 91-1746142

Contact person: : Tuomo Väinämö

Telephone / Fax : +358 40 3442000 / : +358 8 343 032

e-mail: : tuomo.vainamo@elektrobit.com

Test samples supplier : Same as applicant

Manufacturer : Same as applicant

Test method requested	See Standard																																																																																																				
Standard	<p>USA FCC Part 15.247 07-10-08 Edition: Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz.</p> <p>FCC part 15.247 and Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum System DA 00-705 Released March 30, 2000.</p> <p>USA FCC Part 15.207 07-10-08 Edition: Conducted limits.</p> <p>USA FCC Part 15.109 07-10-08 Edition: Receiver radiated emission.</p>																																																																																																				
Test procedure	<p>PEET034: Medidas radioeléctricas a equipos de radio de espectro ensanchado en la banda de 2,4 GHz.</p> <p>PEEM002: Medida de la emisión conducida según EN55022</p>																																																																																																				
Non-standardized test method	N/A																																																																																																				
Used instrumentation	<p><u>Conducted Measurements</u></p> <table border="1"> <thead> <tr> <th></th> <th></th> <th>Last Cal. date</th> <th>Cal. due date</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Spectrum analyser Agilent PSA E4440A</td> <td>2008/01</td> <td>2010/01</td> </tr> <tr> <td>2.</td> <td>Spectrum analyser R&S ESU 40</td> <td>2007/11</td> <td>2009/11</td> </tr> <tr> <td>3.</td> <td>Bluetooth test set Anritsu MT8852A</td> <td>N.A.</td> <td>N.A.</td> </tr> <tr> <td>4.</td> <td>DC power supply R&S NGPE 40/40</td> <td>2008/11</td> <td>2011/11</td> </tr> <tr> <td>5.</td> <td>EMI Test Receiver R&S ESIB26</td> <td>2009/09</td> <td>2011/09</td> </tr> <tr> <td>6.</td> <td>Transient limiter. HP 11947A</td> <td>2007/01</td> <td>2010/01</td> </tr> <tr> <td>7.</td> <td>Line Impedance Stabilization Network (L.I.S.N.) R&S. ESH2-Z5</td> <td>2008/01</td> <td>2010/01</td> </tr> </tbody> </table> <p><u>Radiated Measurements</u></p> <table border="1"> <thead> <tr> <th></th> <th></th> <th>Last Cal. date</th> <th>Cal. due date</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Semianechoic Absorber Lined Chamber IR 11. BS</td> <td>N.A.</td> <td>N.A.</td> </tr> <tr> <td>2.</td> <td>Control Chamber IR 12.BC</td> <td>N.A.</td> <td>N.A.</td> </tr> <tr> <td>3.</td> <td>Hybrid Bilog antenna Sunol Sciences Corporation JB6</td> <td>2008/10</td> <td>2011/10</td> </tr> <tr> <td>4.</td> <td>Antenna mast EM 1072 NMT</td> <td>N.A.</td> <td>N.A.</td> </tr> <tr> <td>5.</td> <td>Rotating table EM 1084-4. ON</td> <td>N.A.</td> <td>N.A.</td> </tr> <tr> <td>6.</td> <td>Double-ridge Guide Horn antenna 1-18 GHz HP 11966E</td> <td>2008/03</td> <td>2011/03</td> </tr> <tr> <td>7.</td> <td>Double-ridge Guide Horn antenna 18-40 GHz Agilent 119665J</td> <td>2008/09</td> <td>2011/09</td> </tr> <tr> <td>8.</td> <td>EMI Test Receiver R&S ESIB26</td> <td>2009/09</td> <td>2011/09</td> </tr> <tr> <td>9.</td> <td>RF pre-amplifier Miteq JS4-12002600-30-5A.</td> <td>2008/07</td> <td>2010/07</td> </tr> <tr> <td>10.</td> <td>Multi Device Controller EMCO 2090</td> <td>N.A.</td> <td>N.A.</td> </tr> <tr> <td>11.</td> <td>Spectrum Analyzer R&S ESU40</td> <td>2007/11</td> <td>2009/11</td> </tr> <tr> <td>12.</td> <td>Spectrum Analyzer Agilent E4440A</td> <td>2008/01</td> <td>2010/01</td> </tr> <tr> <td>13.</td> <td>RF pre-amplifier Miteq AFS5-04001300-15-10P-6.</td> <td>2008/07</td> <td>2010/07</td> </tr> <tr> <td>14.</td> <td>RF pre-amplifier Schaffner CPA 9231.</td> <td>2009/03</td> <td>2011/03</td> </tr> <tr> <td>15.</td> <td>Bluetooth test set Anritsu MT8852A.</td> <td>N.A.</td> <td>N.A.</td> </tr> <tr> <td>16.</td> <td>Antenna tripod EMCO 11968C.</td> <td>N.A.</td> <td>N.A.</td> </tr> </tbody> </table>			Last Cal. date	Cal. due date	1.	Spectrum analyser Agilent PSA E4440A	2008/01	2010/01	2.	Spectrum analyser R&S ESU 40	2007/11	2009/11	3.	Bluetooth test set Anritsu MT8852A	N.A.	N.A.	4.	DC power supply R&S NGPE 40/40	2008/11	2011/11	5.	EMI Test Receiver R&S ESIB26	2009/09	2011/09	6.	Transient limiter. HP 11947A	2007/01	2010/01	7.	Line Impedance Stabilization Network (L.I.S.N.) R&S. ESH2-Z5	2008/01	2010/01			Last Cal. date	Cal. due date	1.	Semianechoic Absorber Lined Chamber IR 11. BS	N.A.	N.A.	2.	Control Chamber IR 12.BC	N.A.	N.A.	3.	Hybrid Bilog antenna Sunol Sciences Corporation JB6	2008/10	2011/10	4.	Antenna mast EM 1072 NMT	N.A.	N.A.	5.	Rotating table EM 1084-4. ON	N.A.	N.A.	6.	Double-ridge Guide Horn antenna 1-18 GHz HP 11966E	2008/03	2011/03	7.	Double-ridge Guide Horn antenna 18-40 GHz Agilent 119665J	2008/09	2011/09	8.	EMI Test Receiver R&S ESIB26	2009/09	2011/09	9.	RF pre-amplifier Miteq JS4-12002600-30-5A.	2008/07	2010/07	10.	Multi Device Controller EMCO 2090	N.A.	N.A.	11.	Spectrum Analyzer R&S ESU40	2007/11	2009/11	12.	Spectrum Analyzer Agilent E4440A	2008/01	2010/01	13.	RF pre-amplifier Miteq AFS5-04001300-15-10P-6.	2008/07	2010/07	14.	RF pre-amplifier Schaffner CPA 9231.	2009/03	2011/03	15.	Bluetooth test set Anritsu MT8852A.	N.A.	N.A.	16.	Antenna tripod EMCO 11968C.	N.A.	N.A.
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INDEX

Competences and guarantees	4
General conditions	4
Uncertainty	4
Usage of samples.....	5
Testing period	5
Environmental conditions	6
Summary	7
Remarks and comments	7
Testing verdicts	7
APPENDIX A: Test result	8
APPENDIX B: Measuring results for electromagnetic conducted emission.....	83
APPENDIX C: Photographs	112

Competences and guarantees

AT4 wireless is a laboratory with a measurement facility in compliance with the requirements of Section 2.948 of the FCC rules and has been added to the list of facilities whose measurements data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Registration Number: 905266.

AT4 wireless is a laboratory with a measurement site in compliance with the requirements of RSS 212, Issue 1 (Provisional) and has been added to the list of filed sites of the Canadian Certification and Engineering Bureau. Reference File Number: IC 4621.

In order to assure the traceability to other national and international laboratories, AT4 wireless has a calibration and maintenance programme for its measurement equipment.

AT4 wireless guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at AT4 wireless at the time of performance of the test.

AT4 wireless is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

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.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of AT4 wireless.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of AT4 wireless and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the AT4 wireless internal documents:

PODT000: : Procedimiento para el cálculo de incertidumbres de medida.

FEM12_07: Formato de cálculo de incertidumbre a aplicar en la medida de la tensión perturbadora en bornes de alimentación según EN 55022.

Usage of samples

Samples undergoing test have been selected by: **the client**.

Sample M/01 is formed by the following elements:

<u>Control No.</u>	<u>Description</u>	<u>Model</u>	<u>Serial No.</u>	<u>Date of reception</u>
29742/69	Mobile phone with integral antenna	TSN-1	EBL 0002015	05/11/09

Sample M/02 is formed by the following elements:

<u>Control No.</u>	<u>Description</u>	<u>Model</u>	<u>Serial No.</u>	<u>Date of reception</u>
29742/32	Mobile phone with antenna connector	TSN-1	EBL 0001277	30/09/09
29742/19	Dummy battery	---	---	28/09/09

Sample S/03 is composed of the following elements:

<u>Control N°</u>	<u>Description</u>	<u>Model</u>	<u>Serial N°</u>	<u>Date of reception</u>
29609/73	PDA	TSN-1	EBL0001821	2009-11-05
29609/74	AC/DC adapter	FN10-UB	---	2009-11-09
29609/79	Battery	---	---	2009-11-09

Sample S/04 is composed of the following elements:

<u>Control N°</u>	<u>Description</u>	<u>Model</u>	<u>Serial N°</u>	<u>Date of reception</u>
29609/73	PDA	TSN-1	EBL0001821	2009-11-05
29609/79	Battery	---	---	2009-11-09
29609/64	USB Cable	---	---	2009-11-02

With the sample S/04 it was used the next auxiliary element:

<u>Control N°</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Serial N°</u>	<u>Date of reception</u>
2914	Laptop PC	DELL	N5543C	MY4728E801	Property of AT4 wireless.

1. Sample M/01 has undergone following test(s).
Radiated tests indicated in appendix A .
2. Sample M/02 has undergone following test(s).
All tests indicated in appendix A, except radiated tests.
3. Samples S/03 & S/04 have undergone the next test(s):
Continuous conducted emission, power leads, in appendix B.

Testing period

The performed test started on 2009-10-09 and finished on 2009-11-11.

The tests have been performed at AT4 wireless.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 23.6 °C Max. = 24.6 °C
Relative humidity	Min. = 48.4 % Max. = 53.2 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

In the semianechoic chamber (21 meters x 11 meters x 8 meters), the following limits were not exceeded during the test.

Temperature	Min. = 23.6 °C Max. = 24.6 °C
Relative humidity	Min. = 48.4 % Max. = 53.2 %
Air pressure	Min. = 1015 mbar Max. = 1015 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

In the chamber for conducted measurements the following limits were not exceeded during the test:

Temperature	Min. = 24.8 °C Max. = 25.2 °C
Relative humidity	Min. = 49.7 % Max. = 50.1 %
Air pressure	Min. = 1019 mbar Max. = 1020 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

Summary

Considering the results of the performed test according to standard USA FCC Parts 15.247, 15.207 and 15.109, the item under test is **IN COMPLIANCE** with the requested specifications specified in the standard.

NOTE: The results presented in this Test Report apply only to the particular item under test established in page 1 of this document, as presented for test on the date(s) shown in section, "USAGE OF SAMPLES, TESTING PERIOD AND ENVIRONMENTAL CONDITIONS".

Remarks and comments

None.

Testing verdicts

Not applicable: NA

Pass.....: P

Fail: F

Not measured.....: NM

FCC PART 15 PARAGRAPH	VERDICT			
	NA	P	F	NM
15.247 Subclause (a) (1). 20 dB Bandwidth and Carrier frequency separation		P		
15.247 Subclause (a) (1) (iii). Number of hopping channels		P		
15.247 Subclause (a) (1) (iii). Time of occupancy (Dwell Time)		P		
15.247 Subclause (b). Maximum peak output power (radiated) and antenna gain		P		
15.247 Subclause (c). Band-edge of radiated emissions (Transmitter)		P		
15.247 Subclause (c). Emission limitations conducted (Transmitter)		P		
15.247 Subclause (c). Emission limitations radiated (Transmitter)		P		
15.109. Radiated emission limits for receiver		P		
15.207. Conducted limits		P		

APPENDIX A: Test result

INDEX

TEST CONDITIONS	10
Section 15.247 Subclause (a) (1). 20 dB Bandwidth and Carrier frequency separation	11
Section 15.247 Subclause (a) (1) (iii). Number of hopping channels.....	18
Section 15.247 Subclause (a) (1) (iii). Time of occupancy (Dwell Time)	24
Section 15.247 Subclause (b). Maximum peak output power and antenna gain	33
Section 15.247 Subclause (d). Band-edge compliance of conducted emissions (Transmitter)	45
Section 15.247 Subclause (d). Band-edge compliance of radiated emissions (Transmitter).....	52
Section 15.247 Subclause (d). Emission limitations conducted (Transmitter).....	62
Section 15.247 Subclause (d). Emission limitations radiated (Transmitter)	68
Section 15.109. Receiver spurious radiation.....	77

TEST CONDITIONS

Power supply (V):

$$V_{\text{nominal}} = 3.7 \text{ Vdc}$$

Type of power supply = DC voltage from rechargeable Li-Ion polymer battery.

Type of antenna = Integral antenna.

Maximum Gain for antenna = 3.95 dBi

TEST FREQUENCIES:

Lowest channel: 2402 MHz

Middle channel: 2441 MHz

Highest channel: 2480 MHz

The test set-up was made in accordance to the general provisions of ANSI C63.4: 2003.

CONDUCTED MEASUREMENTS

The equipment under test was set up in a shielded room and it is connected to a Bluetooth signalling unit (Bluetooth test set) and to the spectrum analyser using a 6 dB power splitter. The reading in the spectrum analyser is corrected taking into account the power splitter loss.

RADIATED MEASUREMENTS

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m for the frequency range 30 MHz-1000 MHz (30 MHz-1000 MHz Bilog antenna) and at a distance of 1m for the frequency range 1 GHz-25 GHz (1 GHz-18 GHz Double ridge horn antenna and 18 GHz-40 GHz horn antenna).

For radiated emissions in the range 1 GHz-25 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive (wooden) platform one meter above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

An additional horn antenna is used to control the equipment under test with the Bluetooth signalling unit (Bluetooth test set).

Section 15.247 Subclause (a) (1). 20 dB Bandwidth and Carrier frequency separation

SPECIFICATION

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

RESULTS

(See next plots)

Modulation: GFSK

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
20 dB Spectrum bandwidth (kHz)	935.90	932.69	932.69
Measurement uncertainty (kHz)	±11		

Modulation: $\pi/4$ -DQPSK (2Mbps)

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
20 dB Spectrum bandwidth (kHz)	1336.54	1330.13	1336.54
Measurement uncertainty (kHz)	±11		

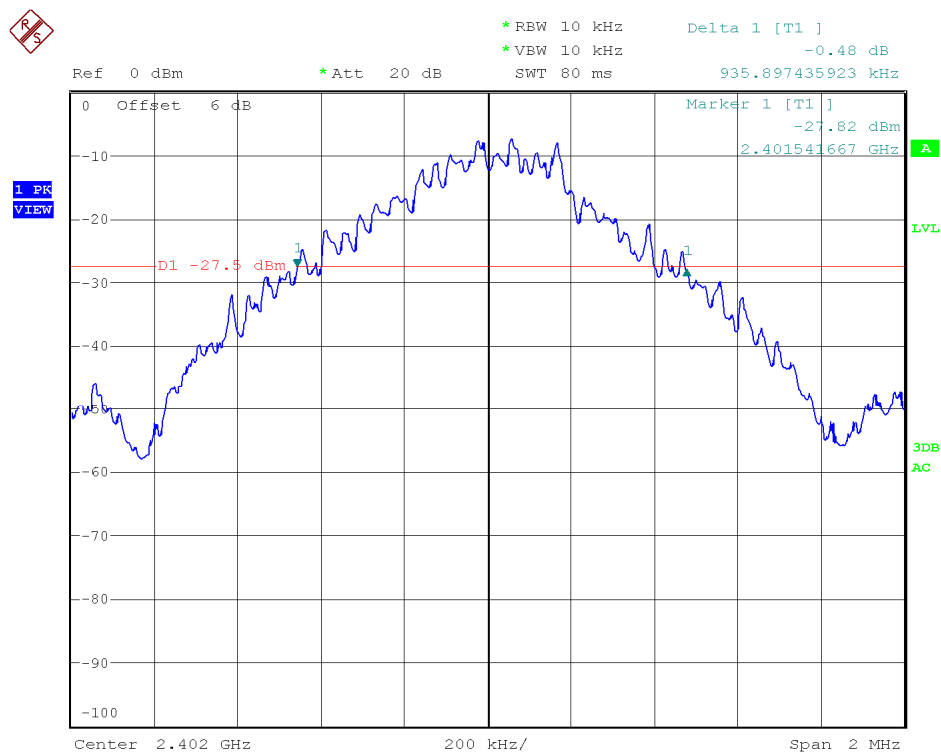
Modulation: 8-DPSK (3Mbps)

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
20 dB Spectrum bandwidth (kHz)	1320.51	1317.31	1317.31
Measurement uncertainty (kHz)	±11		

Modulation: GFSK

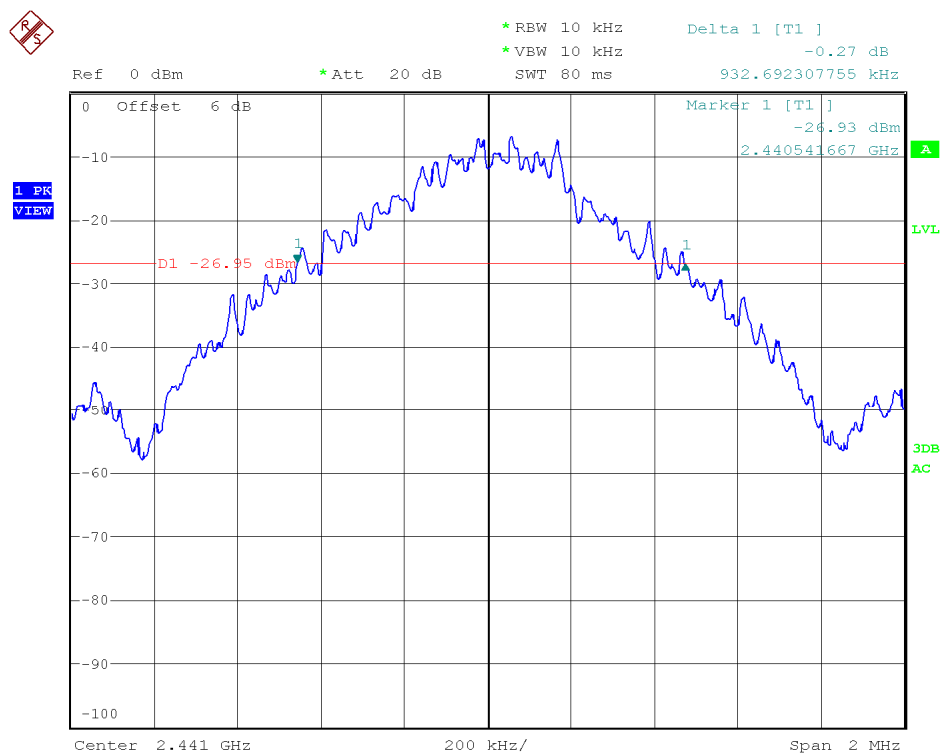
20 dB BANDWIDTH.

Lowest Channel: 2402 MHz.



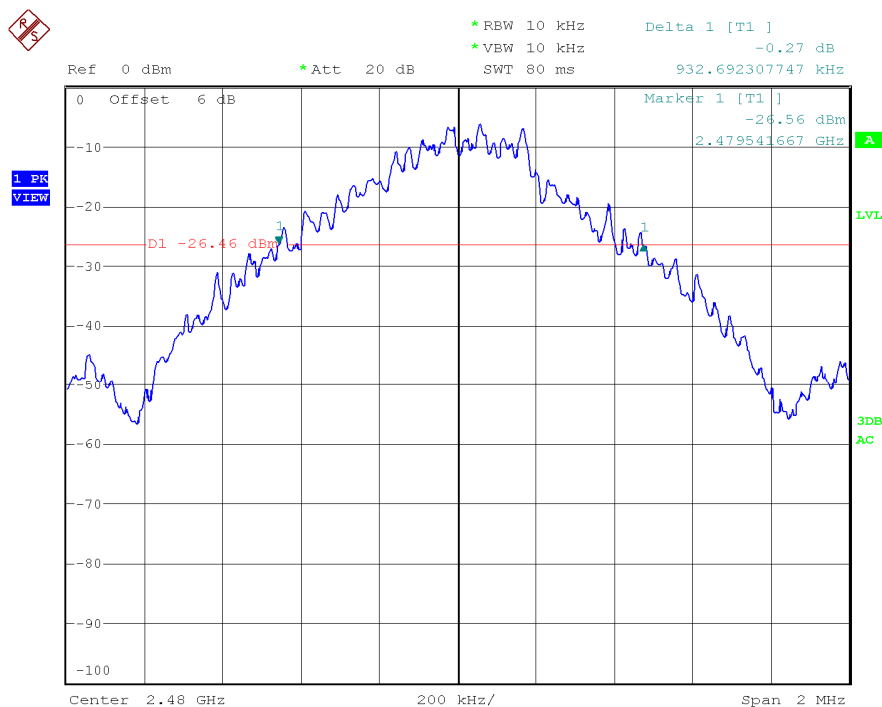
20 dB BANDWIDTH

Middle Channel: 2441 MHz.

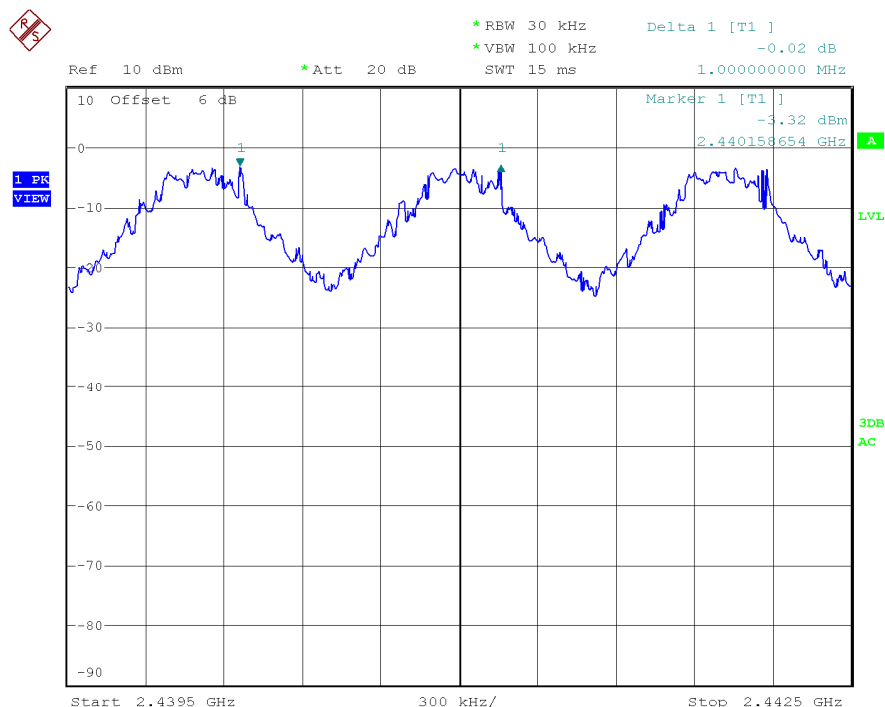


20 dB BANDWIDTH

Highest Channel: 2480 MHz.



Carrier frequency separation



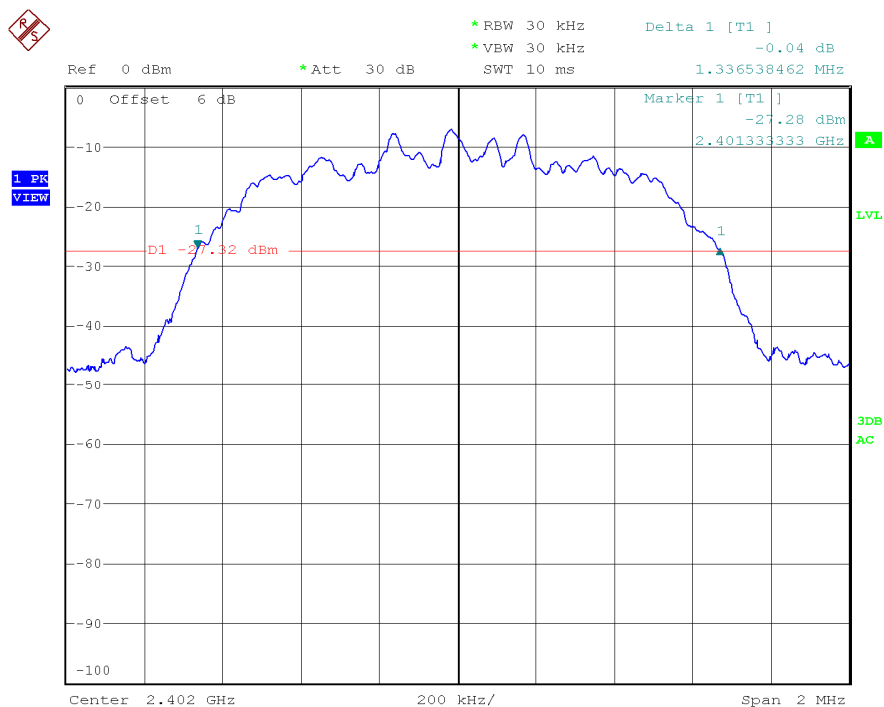
The hopping channel carrier frequencies are separated by a minimum of the 20 dB bandwidth of the hopping channel.

Verdict: PASS

Modulation: $\Pi/4$ -DQPSK

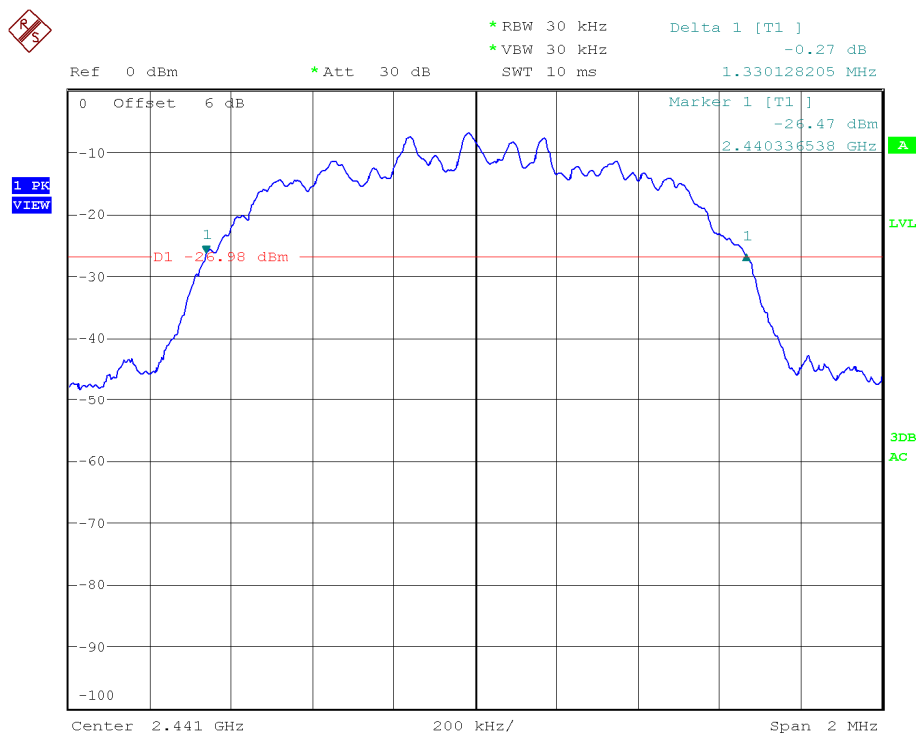
20 dB BANDWIDTH.

Lowest Channel: 2402 MHz.



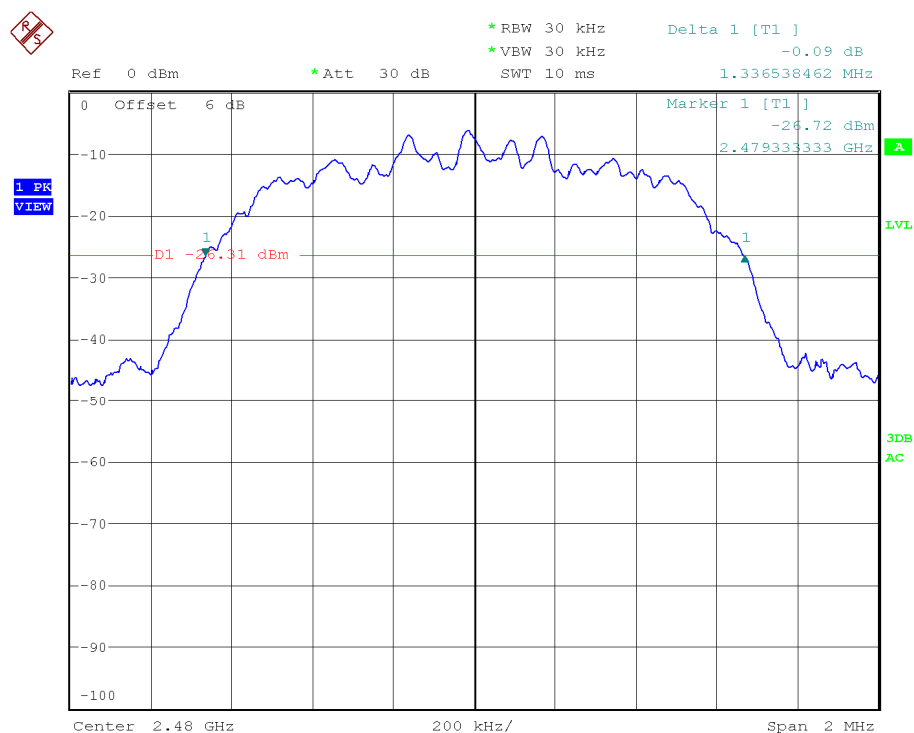
20 dB BANDWIDTH

Middle Channel: 2441 MHz.

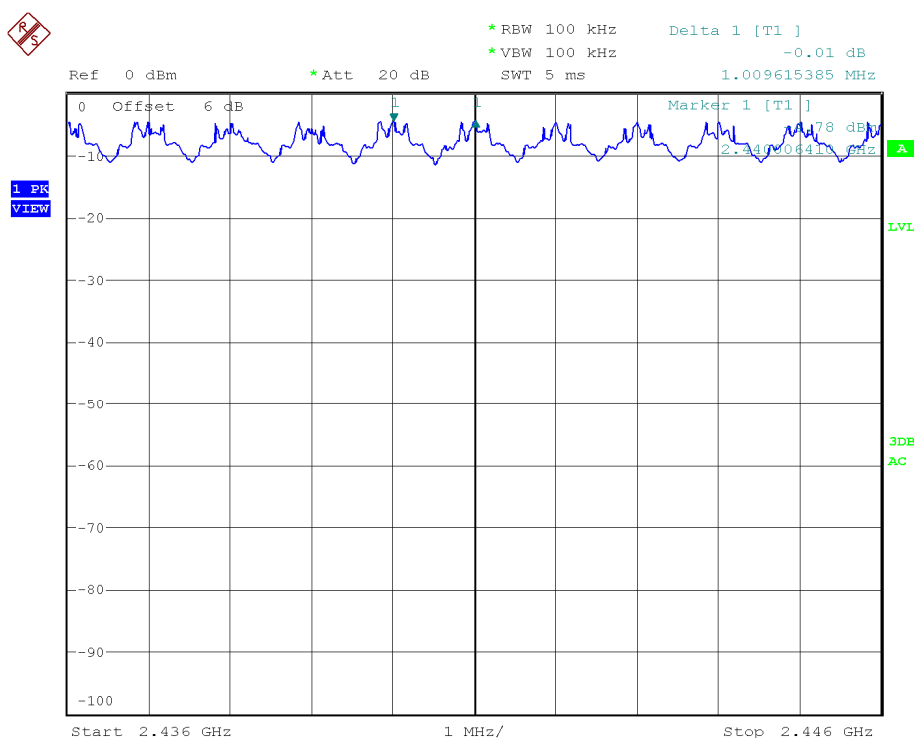


20 dB BANDWIDTH

Highest Channel: 2480 MHz.



Carrier frequency separation



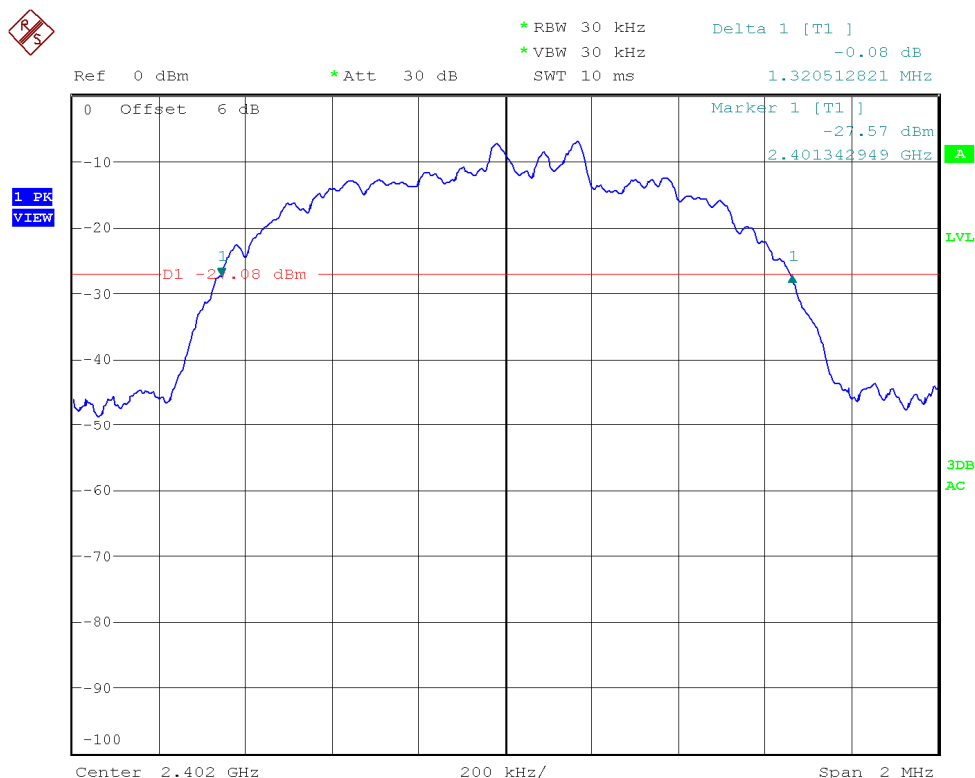
The hopping channel carrier frequencies are separated by a minimum of the two-thirds of the 20 dB bandwidth of the hopping channel

Verdict: PASS

Modulation: 8-DPSK

20 dB BANDWIDTH

Lowest Channel: 2402 MHz.



20 dB BANDWIDTH

Middle Channel: 2441 MHz.

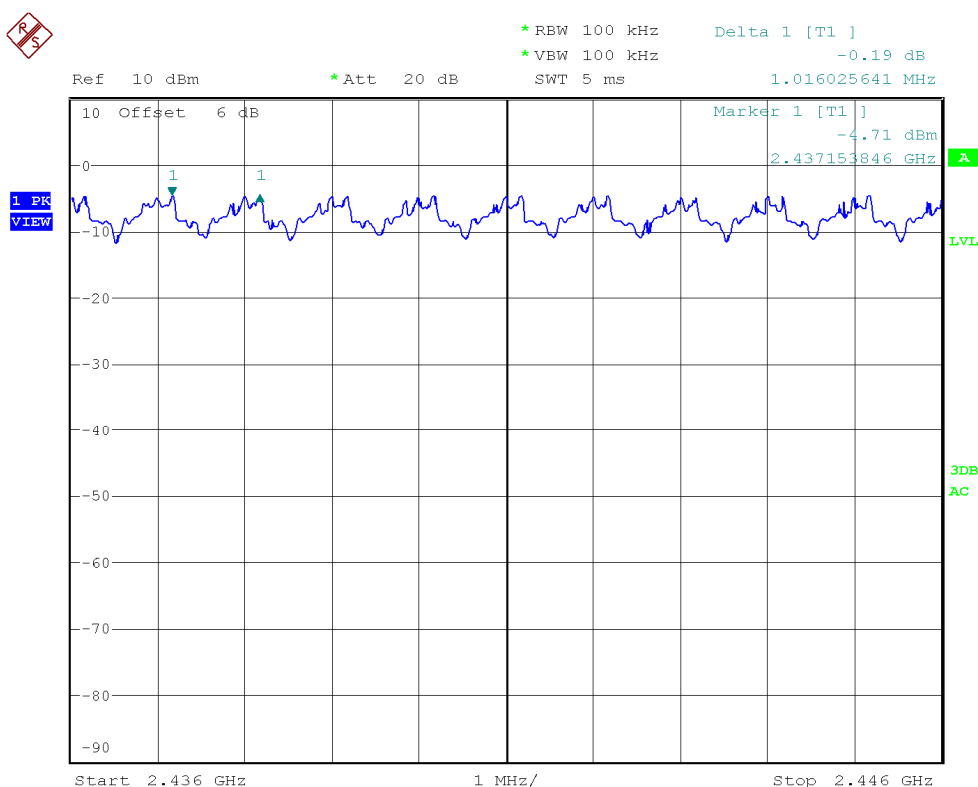


20 dB BANDWIDTH

Highest Channel: 2480 MHz.



Carrier frequency separation



The hopping channel carrier frequencies are separated by a minimum of the two-thirds of the 20 dB bandwidth of the hopping channel.

Verdict: PASS

Section 15.247 Subclause (a) (1) (iii). Number of hopping channels

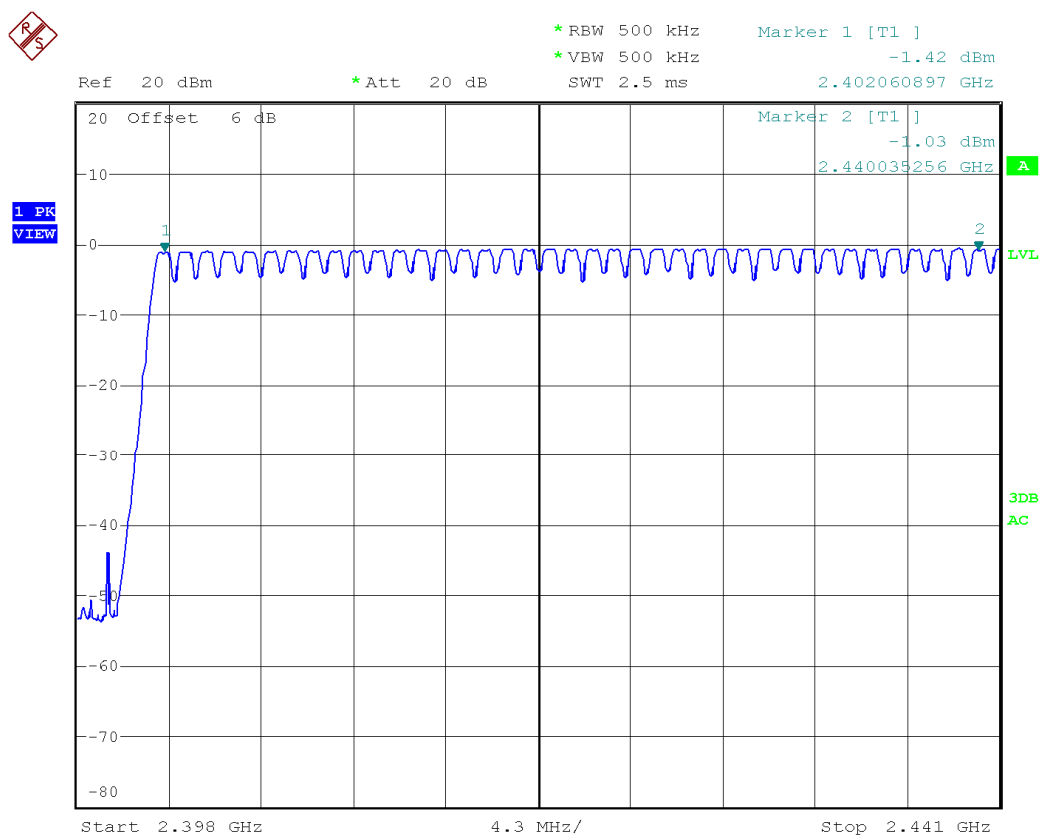
SPECIFICATION

Frequency hopping system in the 2400-2483.5 MHz band shall use at least 15 channels.

RESULTS

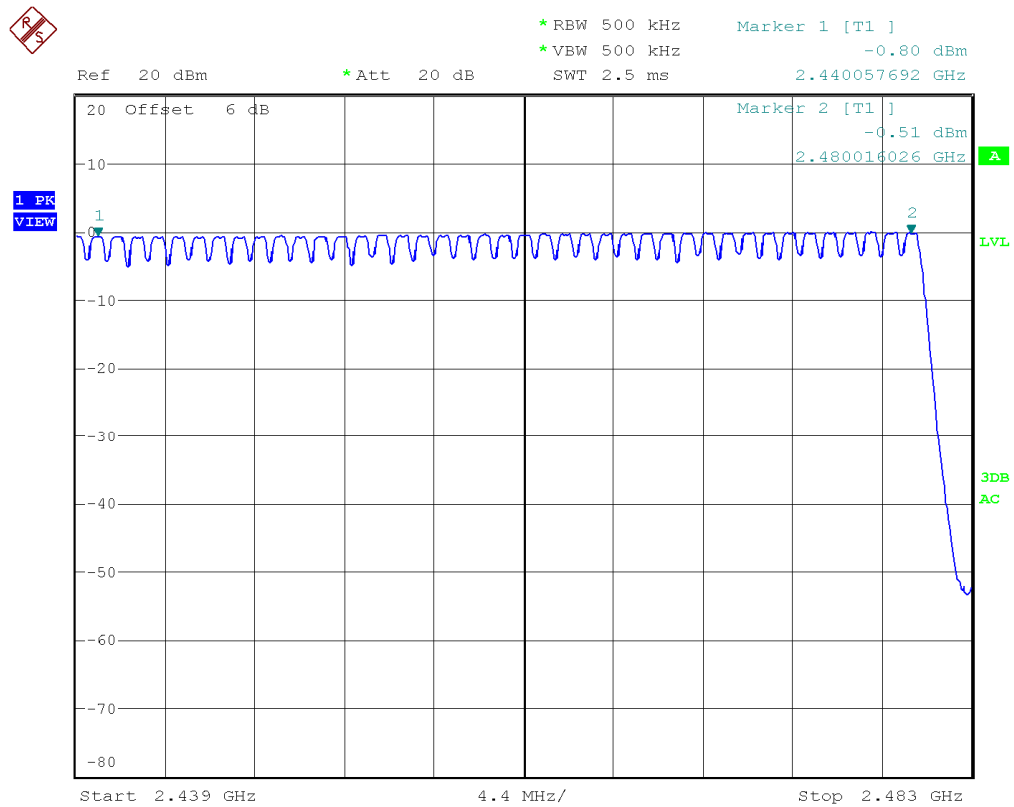
The number of hopping channels is 79 for all three modes (see next plots).

Modulation: GFSK



Number of hopping frequencies: 39

Number of hopping frequencies: 40

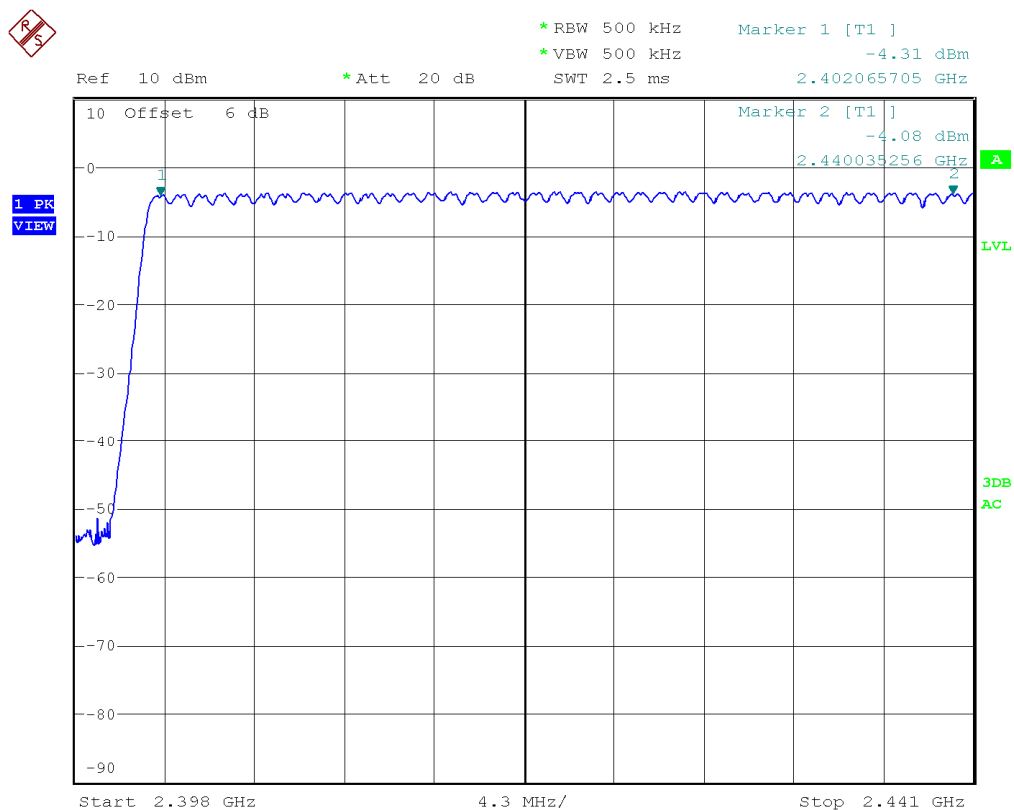


Total number of hopping frequencies: 79

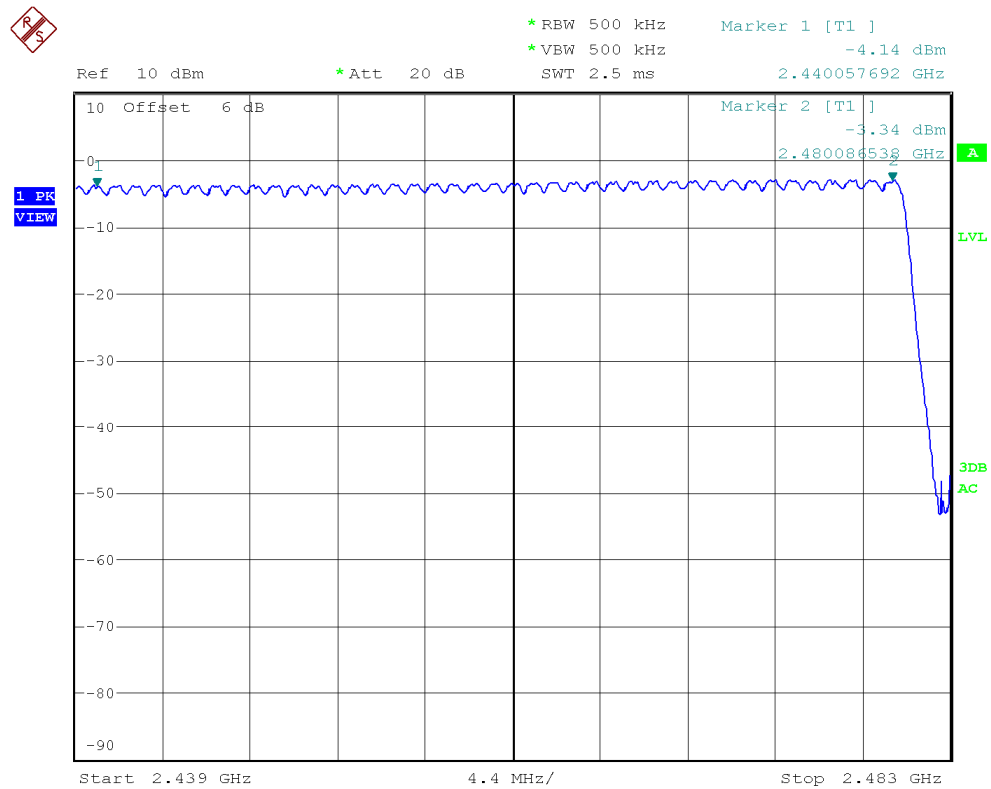
Verdict: PASS

Modulation: $\Pi/4$ -DQPSK

Number of hopping frequencies: 39



Number of hopping frequencies: 40

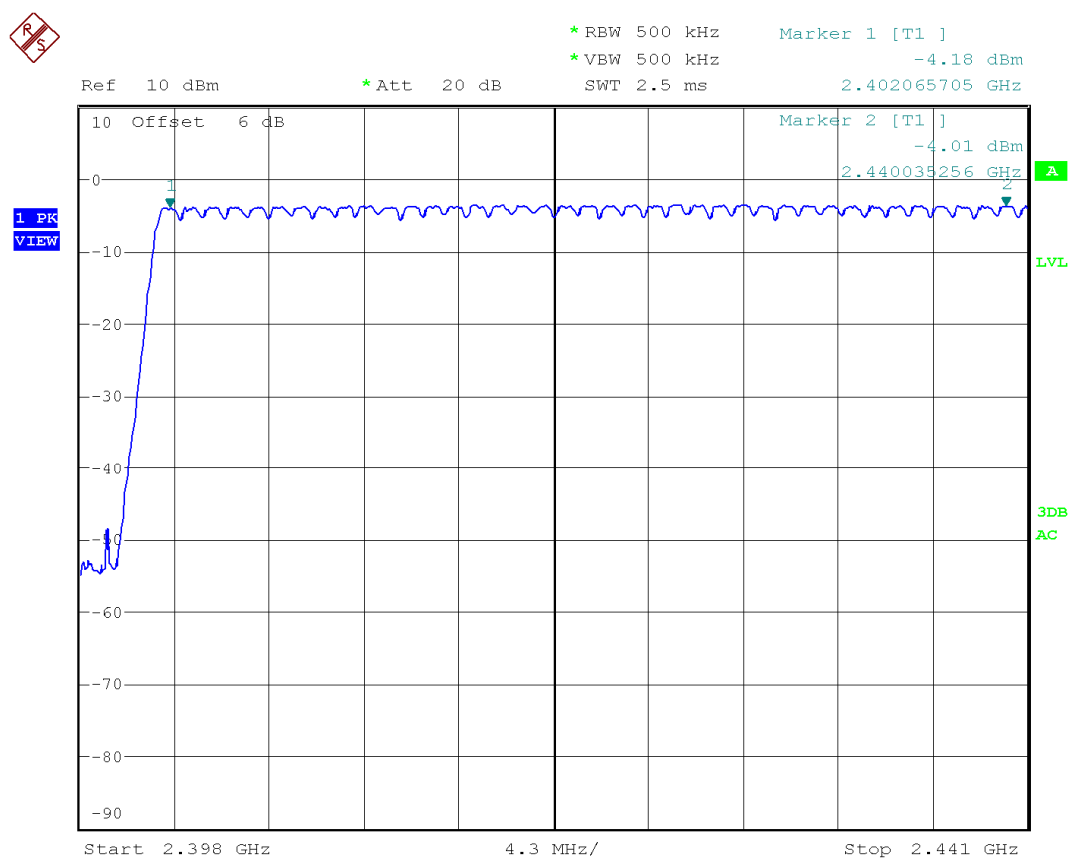


Total number of hopping frequencies: 79

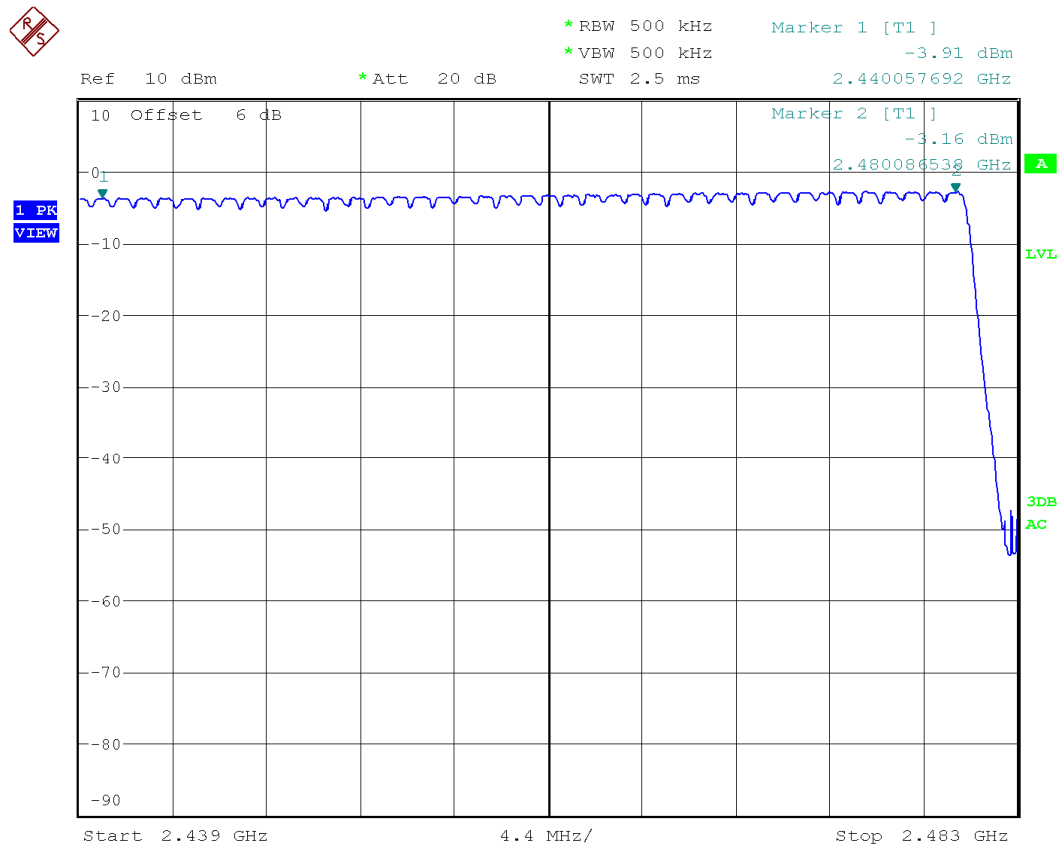
Verdict: PASS

Modulation: 8-DPSK

Number of hopping frequencies: 39



Number of hopping frequencies: 40



Total number of hopping frequencies: 79

Verdict: PASS

Section 15.247 Subclause (a) (1) (iii). Time of occupancy (Dwell Time)

SPECIFICATION

The average time of occupancy on any channel shall not be greater than 0.4 seconds (400 ms) within a period of 0.4 seconds multiplied by the number of hopping channels employed = $0.4 \times 79 = 31.6$ seconds.

RESULTS

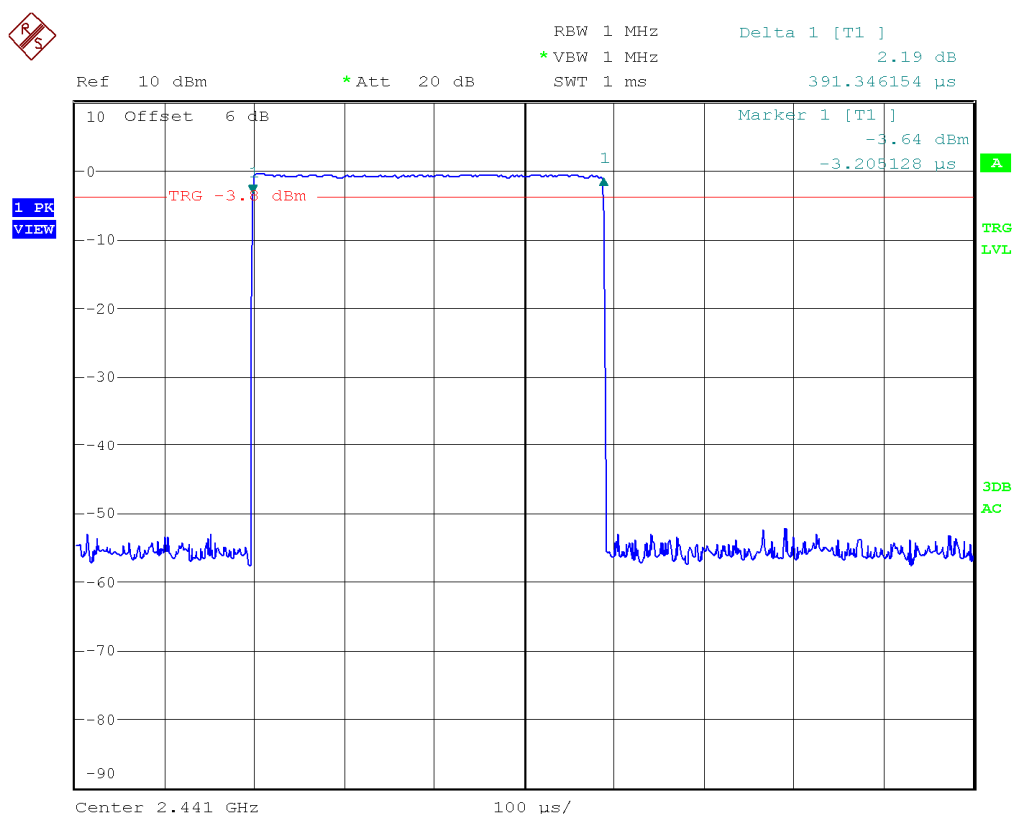
Modulation: GFSK

1. TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH1.

The system makes worst case 1600 hops per second or 1 time slot has a length of $625\mu\text{s}$ with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/2 = 800$ hops per second with 79 channels. So you have each channel $800/79 = 10.13$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $10.13 \times 31.6 = 320.11$ times of appearance.

Each Tx-time per appearance is $391.3\mu\text{s}$ (see next plot).

So we have $320.11 \times 391.3\mu\text{s} = 125.26\text{ ms}$ per 31.6 seconds.



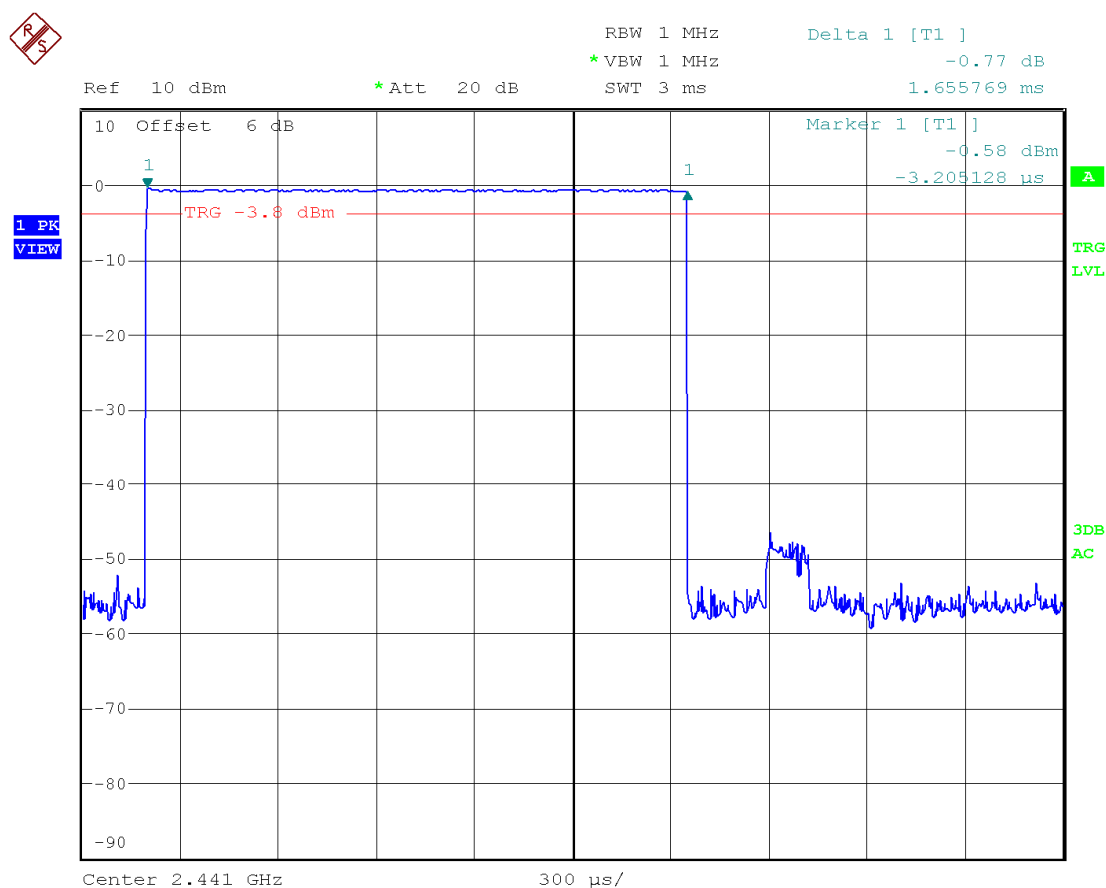
Verdict: PASS

2. TIME OF OCCUPANCY (DWEELL TIME) FOR PACKET TYPE DH3.

A DH3 Packet needs 3 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/4 = 400$ hops per second with 79 channels. So you have each channel $400/79 = 5.1$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $5.1 \times 31.6 = 161.16$ times of appearance.

Each Tx-time per appearance is 1.656 ms (see next plot).

So we have $161.16 \times 1.656 \text{ ms} = 266.88 \text{ ms}$ per 31.6 seconds.



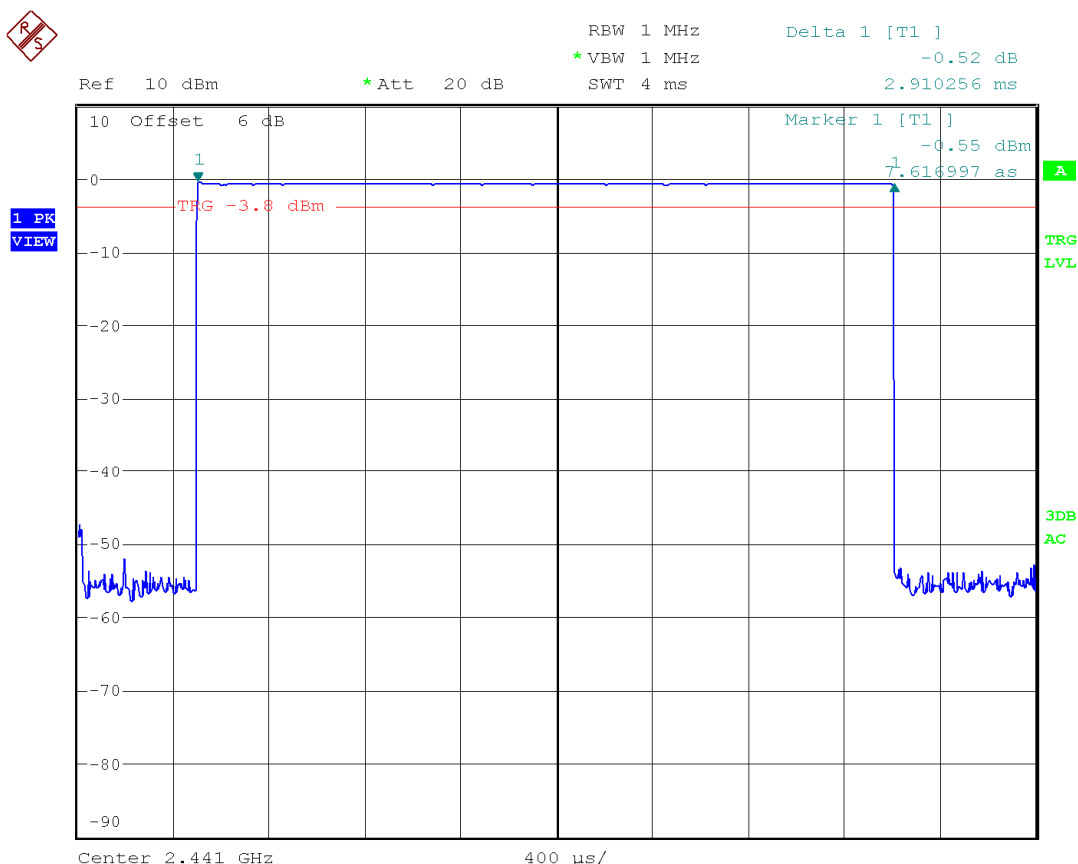
Verdict: PASS

3. TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH5.

A DH5 Packet needs 5 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/6 = 266.67$ hops per second with 79 channels. So you have each channel $266.67/79 = 3.37$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $3.37 \times 31.6 = 106.49$ times of appearance.

Each Tx-time per appearance is 2.910 ms (see next plot).

So we have $106.49 \times 2.910 \text{ ms} = 309.88 \text{ ms}$ per 31.6 seconds.



Verdict: PASS

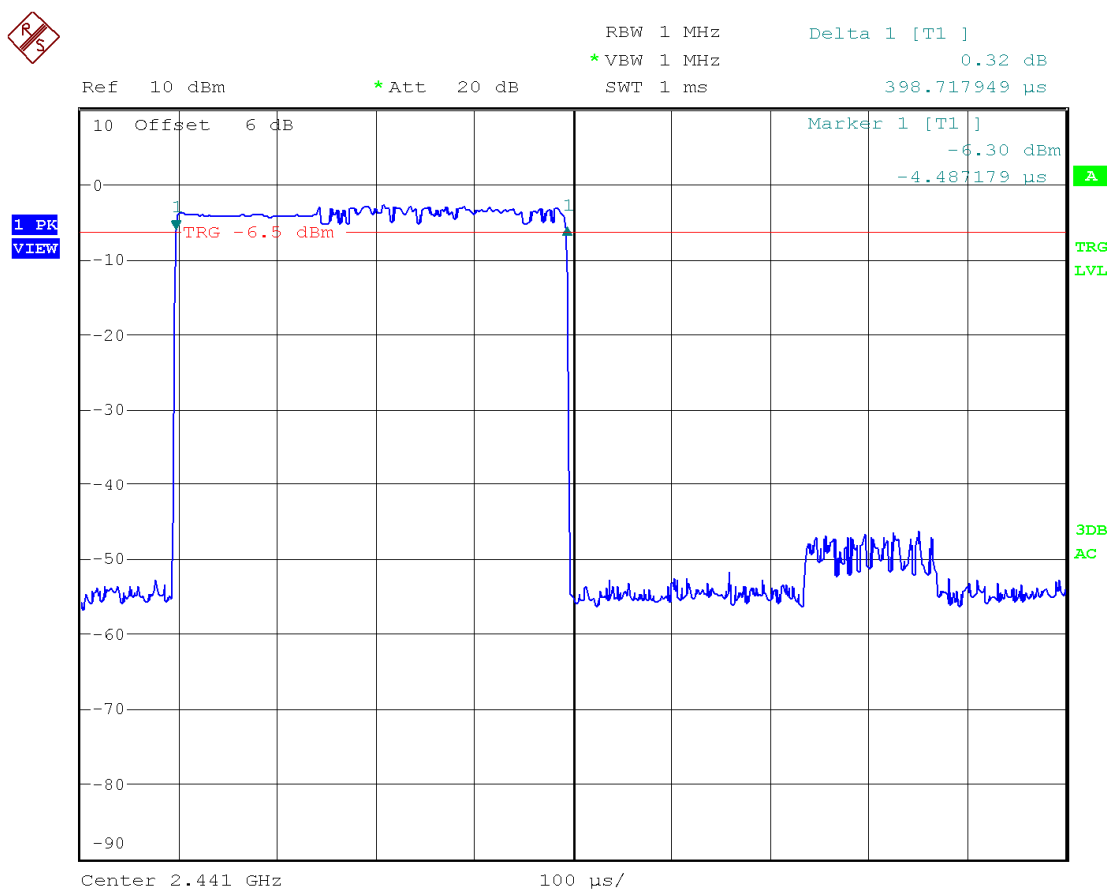
Modulation: $\Pi/4$ -DQPSK

1. TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH1.

The system makes worst case 1600 hops per second or 1 time slot has a length of $625\mu\text{s}$ with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/2 = 800$ hops per second with 79 channels. So you have each channel $800/79 = 10.13$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $10.13 \times 31.6 = 320.11$ times of appearance.

Each Tx-time per appearance is $398.7\mu\text{s}$ (see next plot).

So we have $320.11 \times 398.7\mu\text{s} = 127.63\text{ ms}$ per 31.6 seconds.



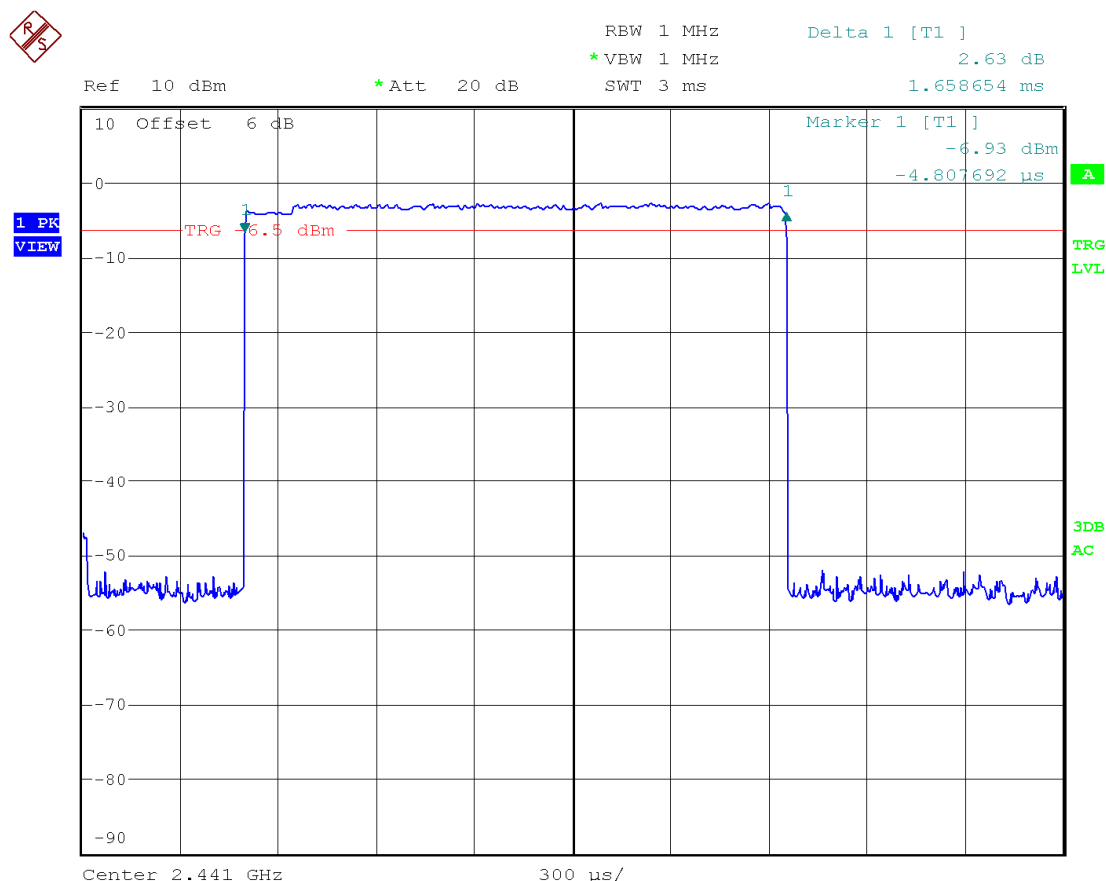
Verdict: PASS

2. TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH3.

A DH3 Packet needs 3 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/4 = 400$ hops per second with 79 channels. So you have each channel $400/79 = 5.1$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $5.1 \times 31.6 = 161.16$ times of appearance.

Each Tx-time per appearance is 1.659 ms (see next plot).

So we have $161.16 \times 1.659 \text{ ms} = 267.36 \text{ ms}$ per 31.6 seconds.



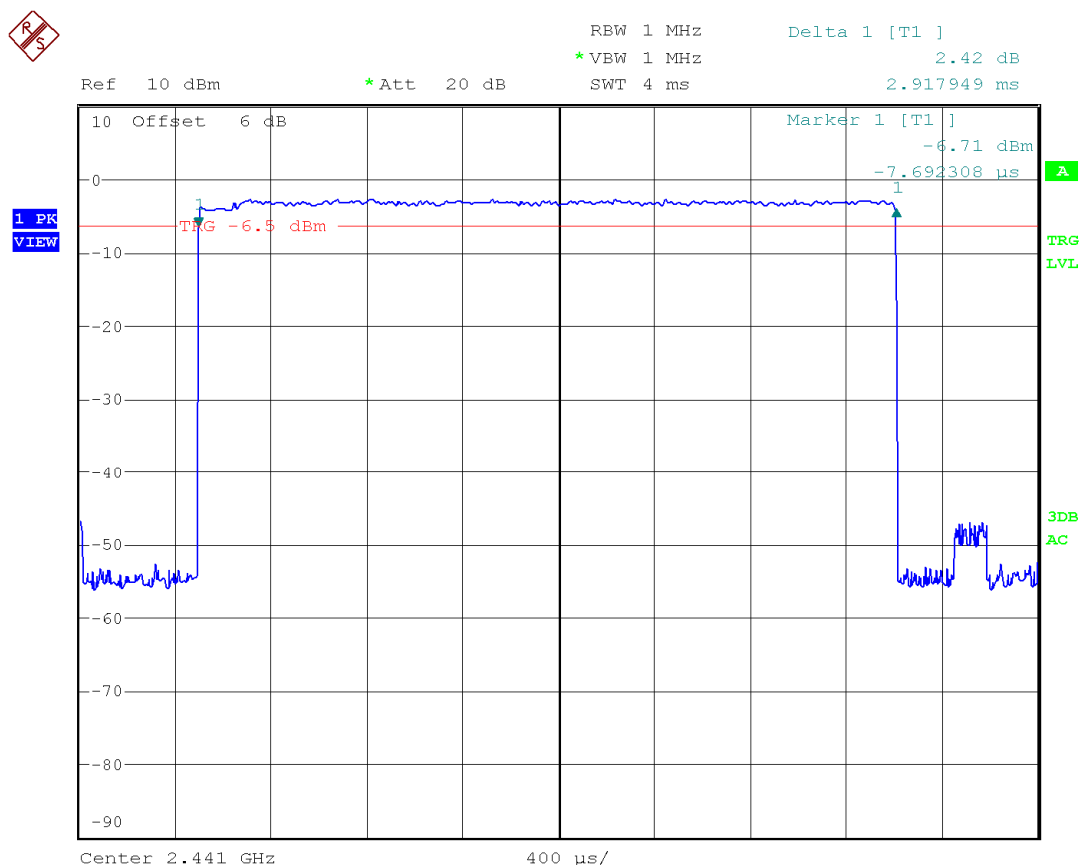
Verdict: PASS

3. TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH5.

A DH5 Packet needs 5 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/6 = 266.67$ hops per second with 79 channels. So you have each channel $266.67/79 = 3.37$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $3.37 \times 31.6 = 106.49$ times of appearance.

Each Tx-time per appearance is 2.918 ms (see next plot).

So we have $106.49 \times 2.918 \text{ ms} = 310.74 \text{ ms}$ per 31.6 seconds.



Verdict: PASS

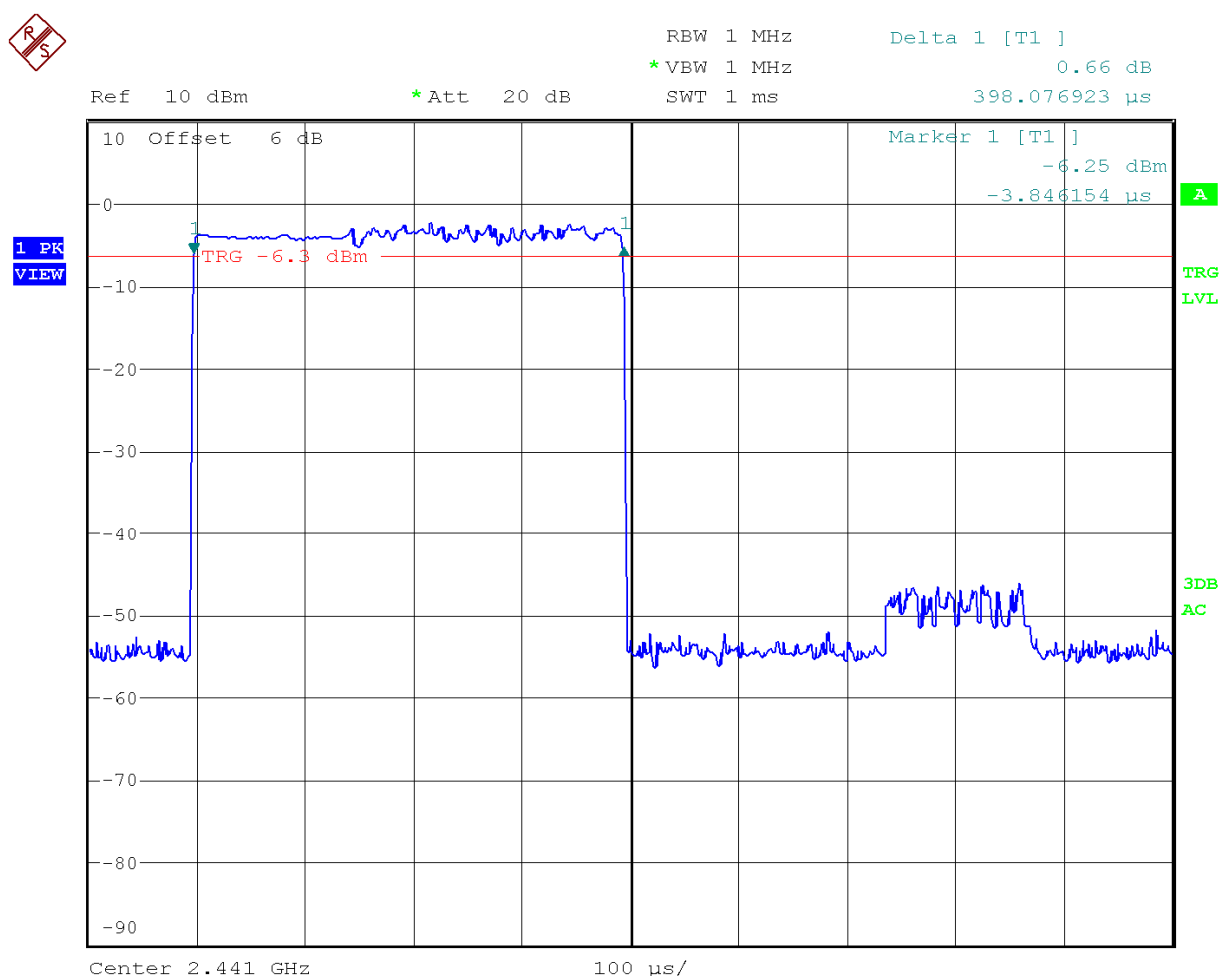
Modulation: 8-DPSK

1. TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH1.

The system makes worst case 1600 hops per second or 1 time slot has a length of $625\mu\text{s}$ with 79 channels. A DH1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/2 = 800$ hops per second with 79 channels. So you have each channel $800/79 = 10.13$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $10.13 \times 31.6 = 320.11$ times of appearance.

Each Tx-time per appearance is $398.1\mu\text{s}$ (see next plot).

So we have $320.11 \times 398.1\mu\text{s} = 127.43\text{ ms}$ per 31.6 seconds.



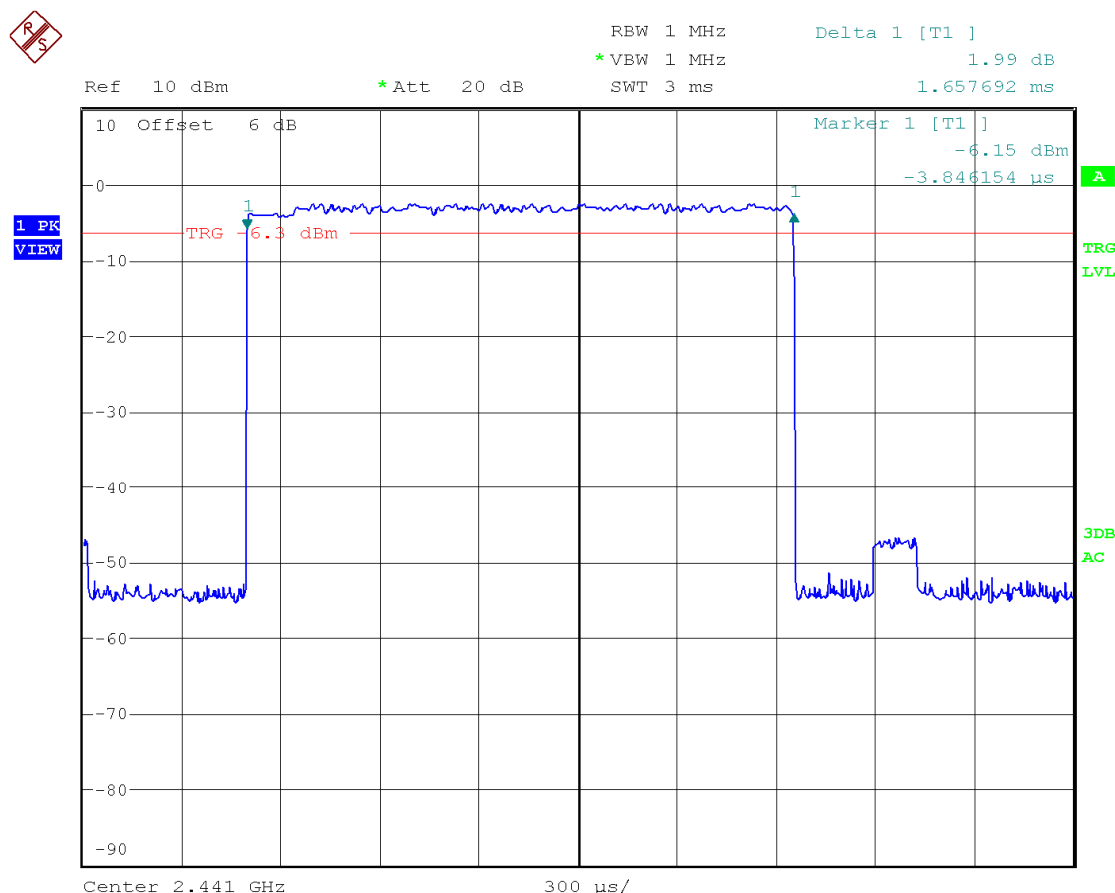
Verdict: PASS

2. TIME OF OCCUPANCY (DWEELL TIME) FOR PACKET TYPE DH3.

A DH3 Packet needs 3 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/4 = 400$ hops per second with 79 channels. So you have each channel $400/79 = 5.1$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $5.1 \times 31.6 = 161.16$ times of appearance.

Each Tx-time per appearance is 1.658 ms (see next plot).

So we have $161.16 \times 1.658 \text{ ms} = 267.20 \text{ ms}$ per 31.6 seconds.



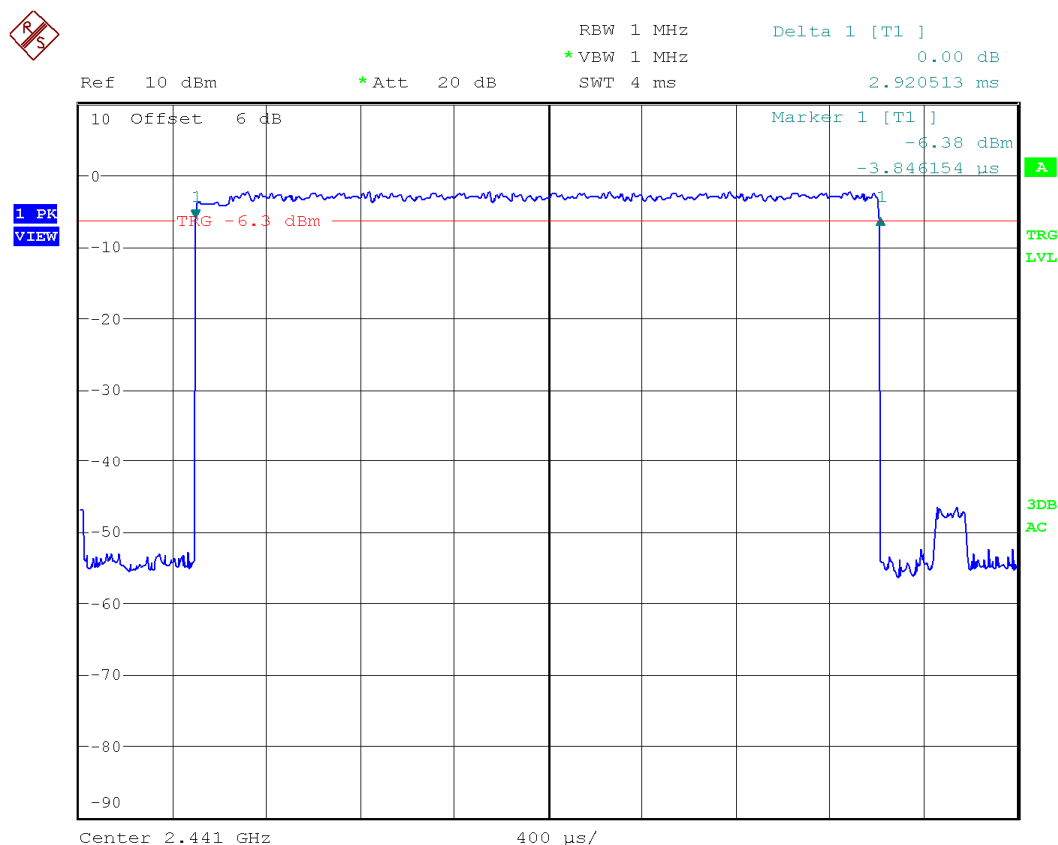
Verdict: PASS

3. TIME OF OCCUPANCY (DWELL TIME) FOR PACKET TYPE DH5.

A DH5 Packet needs 5 time slots for transmitting and 1 time slot for receiving. Then the system makes worst case $1600/6 = 266.67$ hops per second with 79 channels. So you have each channel $266.67/79 = 3.37$ times per second and so for a period of $0.4 \times 79 = 31.6$ seconds you have $3.37 \times 31.6 = 106.49$ times of appearance.

Each Tx-time per appearance is 2.920 ms (see next plot).

So we have $106.49 \times 2.920 \text{ ms} = 310.95 \text{ ms}$ per 31.6 seconds.



Verdict: PASS

Section 15.247 Subclause (b). Maximum peak output power and antenna gain

SPECIFICATION

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels: 1 watt (30 dBm).

RESULTS

MAXIMUM PEAK OUTPUT POWER (CONDUCTED). See next plots.

Modulation: GFSK

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Maximum peak power (dBm)	-0.84	-0.44	0.20
Measurement uncertainty (dB)	±1.5		

The maximum declared antenna gain for this device is 3.95 dBi, therefore the maximum theoretical peak radiated power (EIRP) in the three measurement channels for this device is 4.15 dBm or 2.60 mW.

The actual peak radiated power (EIRP) was measured for the lowest, middle and highest frequency (see next plots).

Modulation: $\Pi/4$ -DQPSK (2Mbps)

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Maximum peak power (dBm)	-2.48	-2.93	-1.86
Measurement uncertainty (dB)	±1.5		

The maximum declared antenna gain for this device is 3.95 dBi, therefore the maximum theoretical peak radiated power (EIRP) in the three measurement channels for this device is 2.09 dBm or 1.62 mW.

The actual peak radiated power (EIRP) was measured for the lowest, middle and highest frequency (see next plots).

Modulation: 8-DPSK (3Mbps)

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Maximum peak power (dBm)	-2.09	-1.79	-0.97
Measurement uncertainty (dB)	±1.5		

The maximum declared antenna gain for this device is 3.95 dBi, therefore the maximum theoretical peak radiated power (EIRP) in the three measurement channels for this device is 2.98 dBm or 1.99 mW.

The actual peak radiated power (EIRP) was measured for the lowest, middle and highest frequency (see next plots).

MAXIMUM PEAK OUTPUT POWER (RADIATED).

Modulation: GFSK

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Correction Factor (dB)	35.0	35.1	35.2
Maximum EIRP peak power (dBm)	-3.92	-1.73	-1.75
Measurement uncertainty (dB)	±4.0		

Modulation: Π/4-DQPSK (2 Mbps)

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Correction Factor (dB)	35.0	35.1	35.2
Maximum EIRP peak power (dBm)	-4.98	-2.70	-2.76
Measurement uncertainty (dB)	±4.0		

Modulation: 8-DPSK (3Mbps)

	Lowest frequency 2402 MHz	Middle frequency 2441 MHz	Highest frequency 2480 MHz
Correction Factor (dB)	35.0	35.1	35.2
Maximum EIRP peak power (dBm)	-4.68	-2.47	-2.51
Measurement uncertainty (dB)	±4.0		

Maximum peak gain: 3.95 dBi

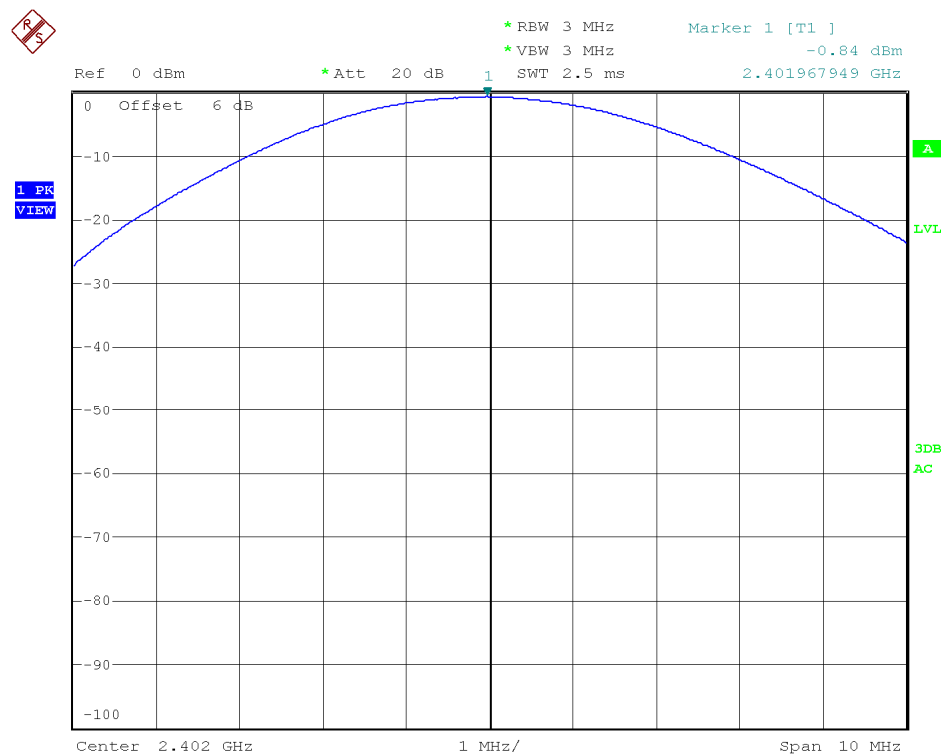
The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Verdict: PASS

PEAK OUTPUT POWER (CONDUCTED).

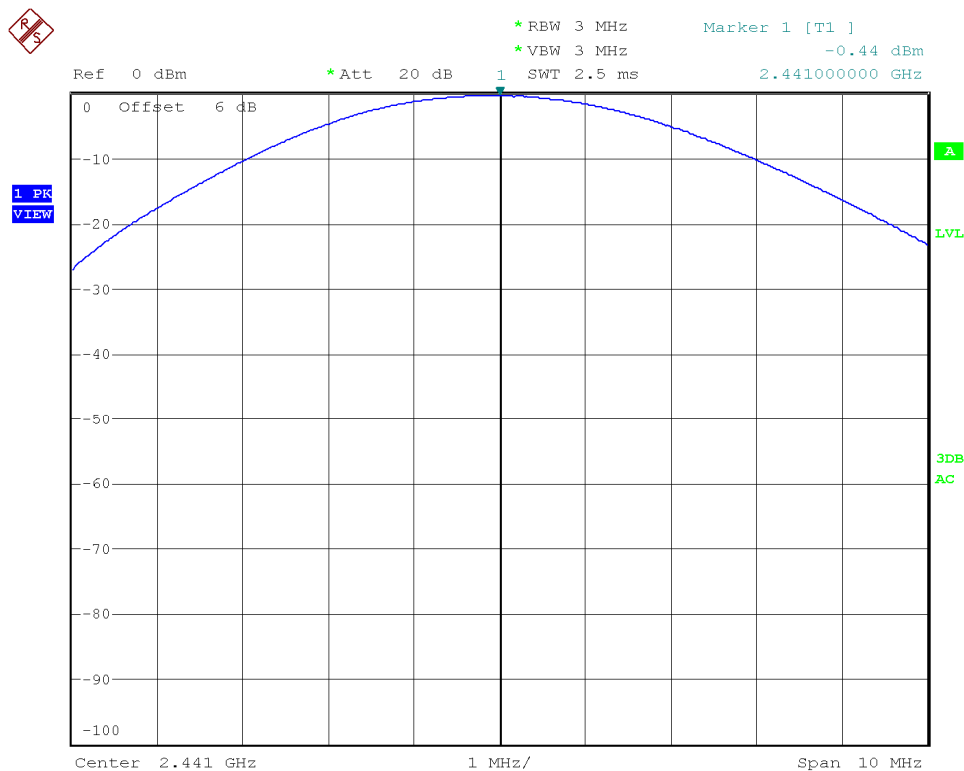
Modulation: GFSK

Lowest Channel: 2402 MHz.



Modulation: GFSK

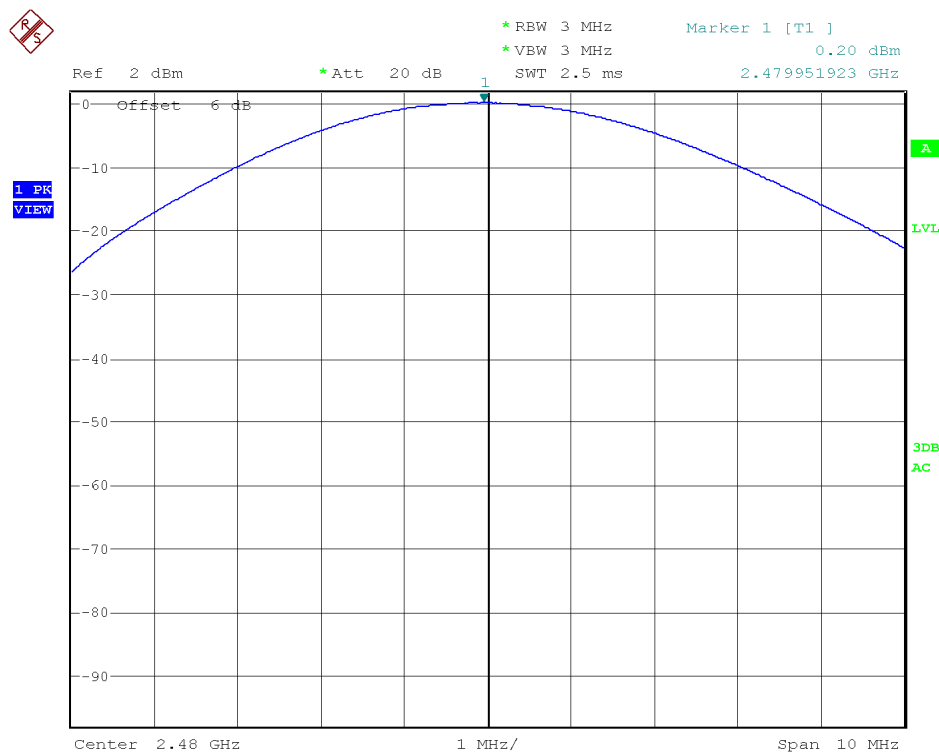
Middle Channel: 2441 MHz.



PEAK OUTPUT POWER (CONDUCTED).

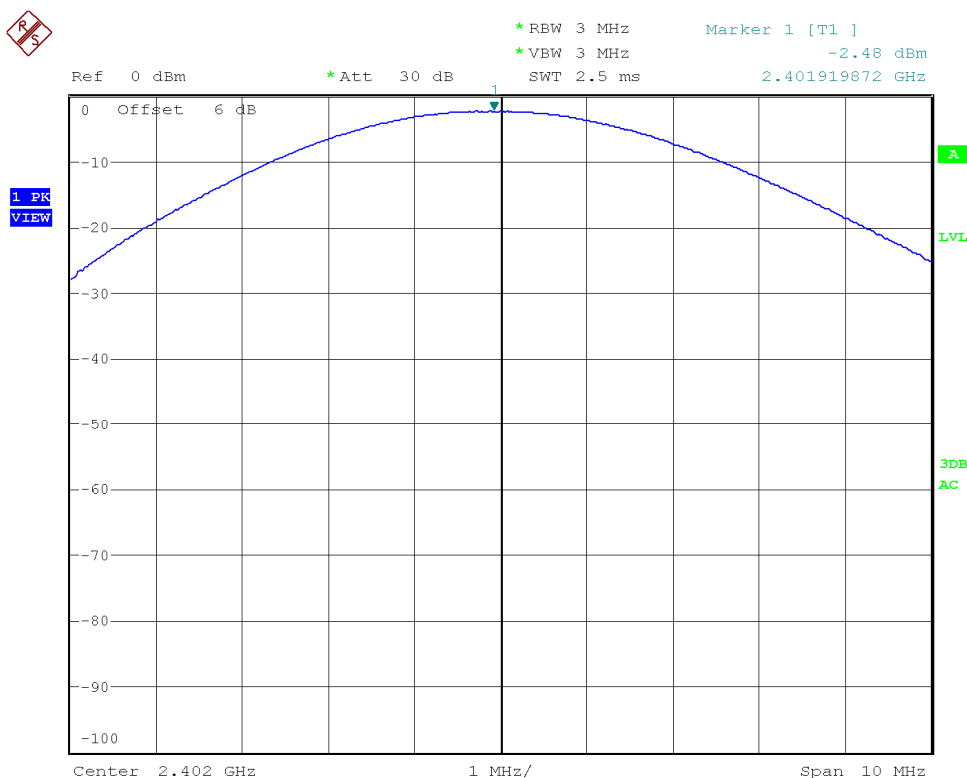
Modulation: GFSK

Highest Channel: 2480 MHz.



Modulation: $\Pi/4$ -DQPSK

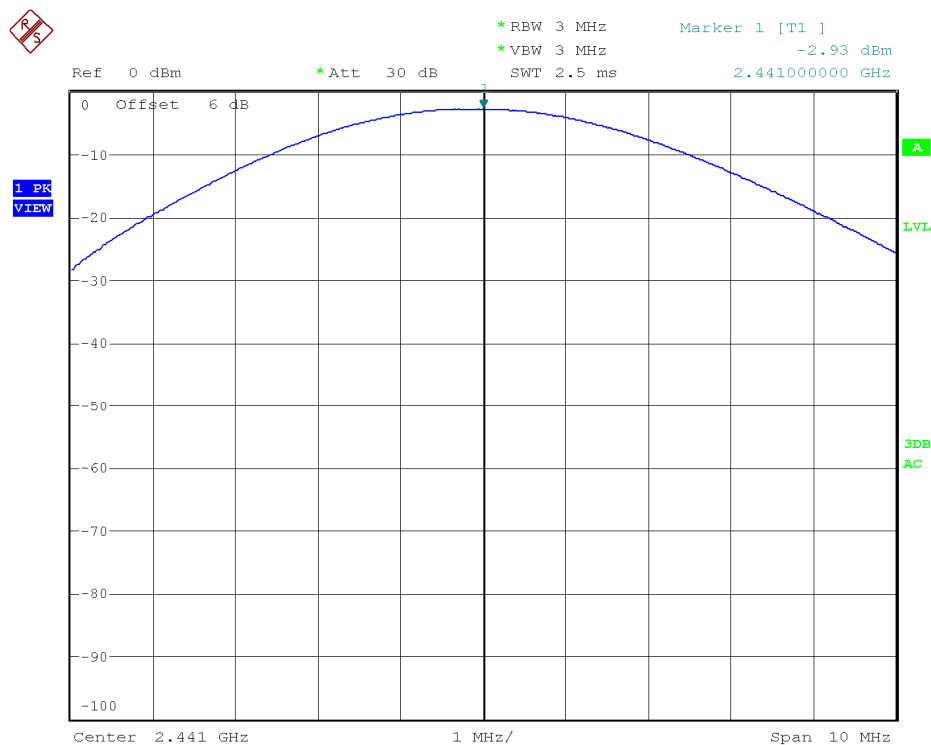
Lowest Channel: 2402 MHz



PEAK OUTPUT POWER (CONDUCTED)

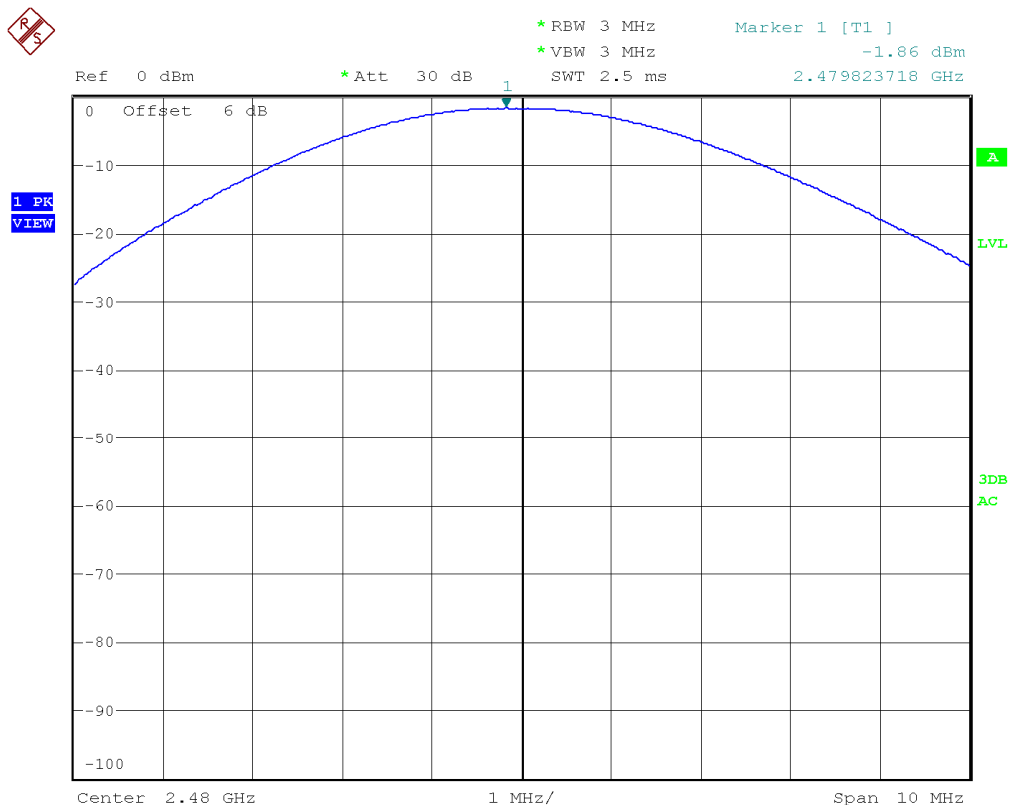
Modulation: $\Pi/4$ -DQPSK

Middle Channel: 2441 MHz.



Modulation: $\Pi/4$ -DQPSK

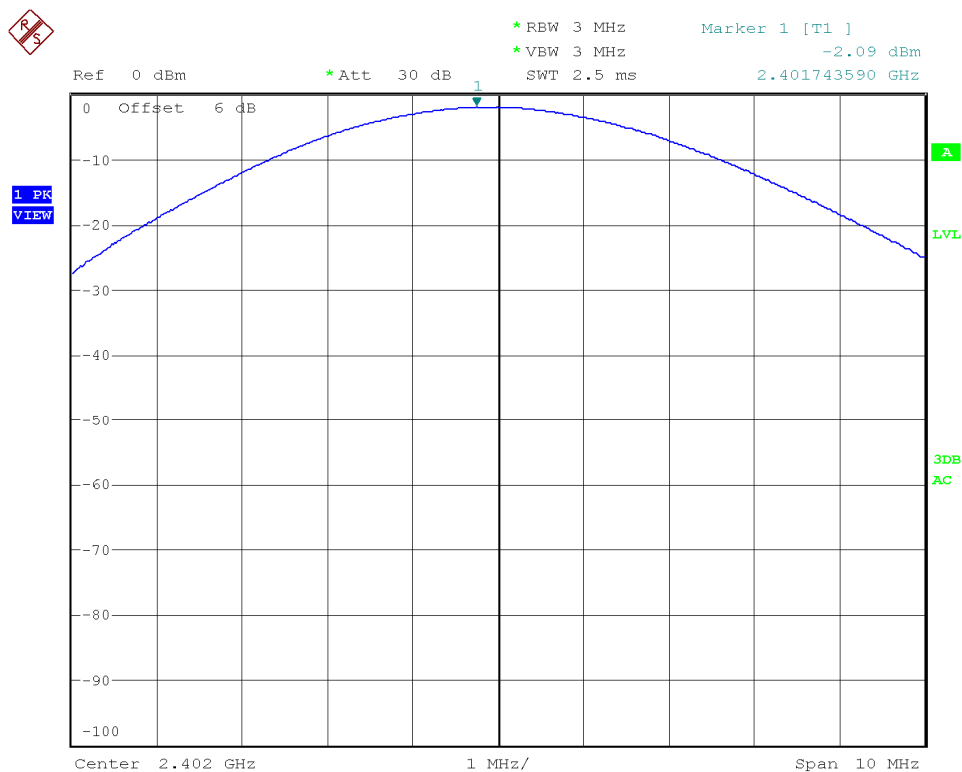
Highest Channel: 2480 MHz.



PEAK OUTPUT POWER (CONDUCTED).

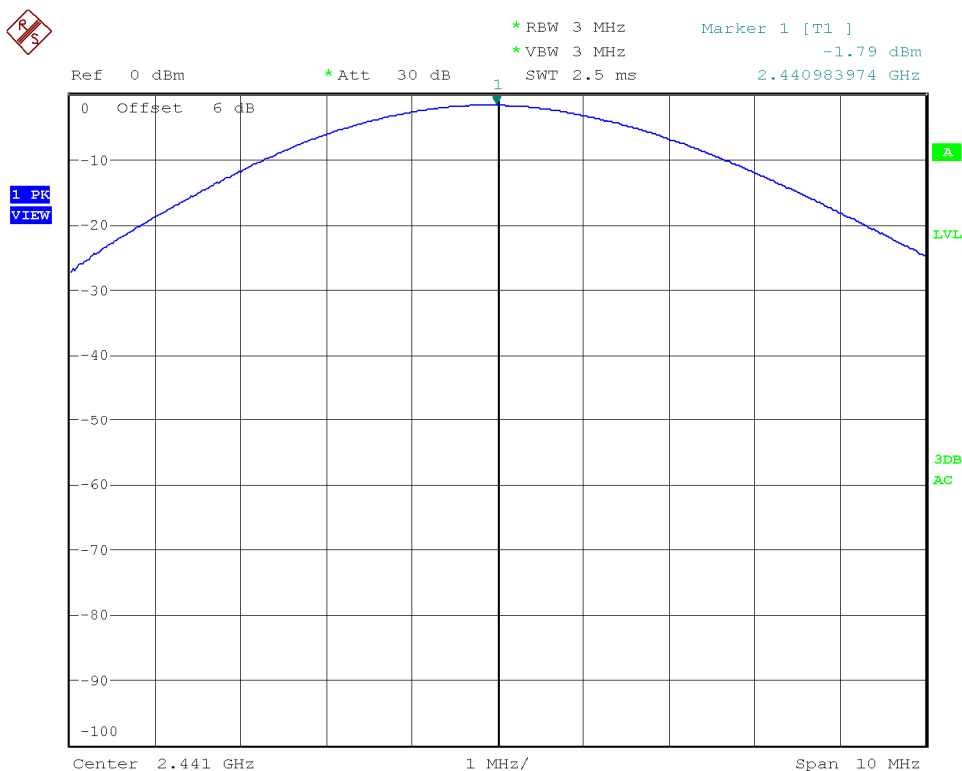
Modulation: 8-DPSK

Lowest Channel: 2402 MHz



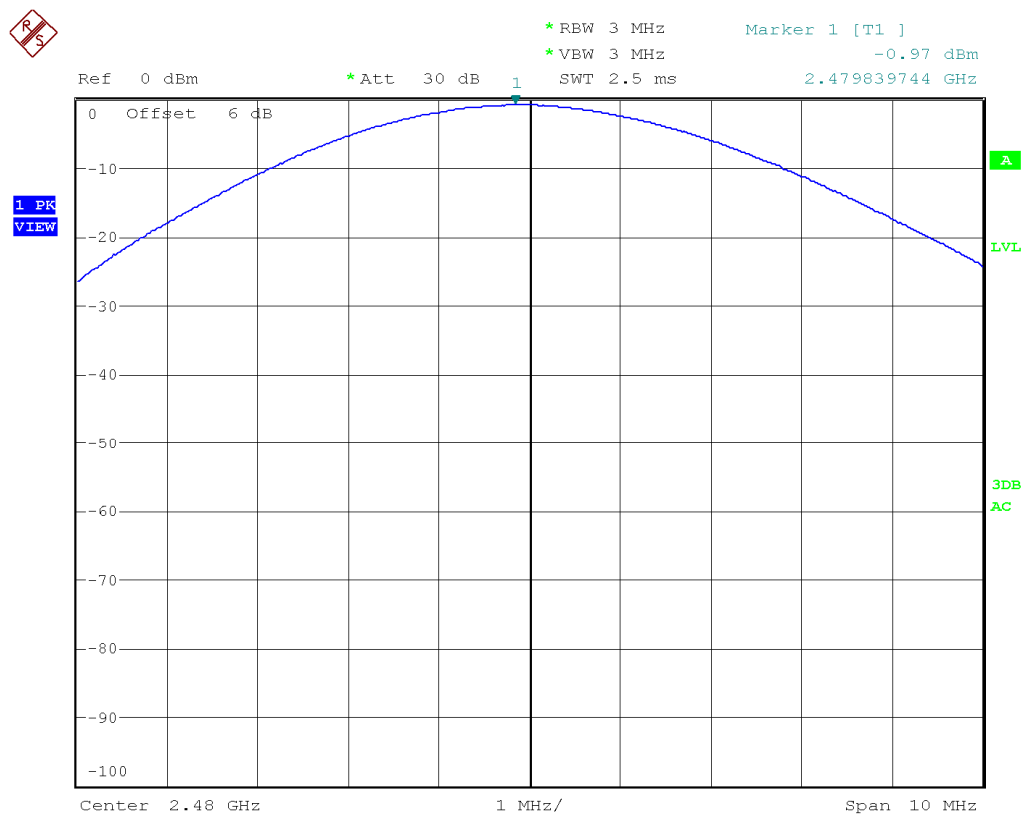
Modulation: 8-DPSK

Middle Channel: 2441 MHz.



PEAK OUTPUT POWER (CONDUCTED).

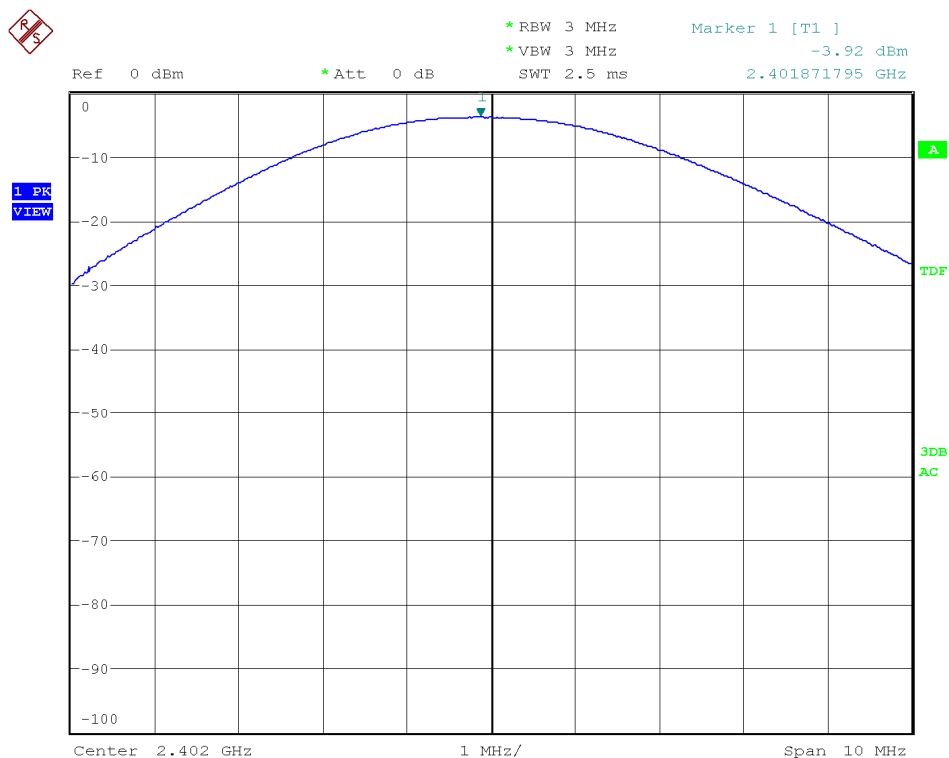
Modulation: 8-DPSK Highest Channel: 2480 MHz.



PEAK OUTPUT POWER (RADIATED).

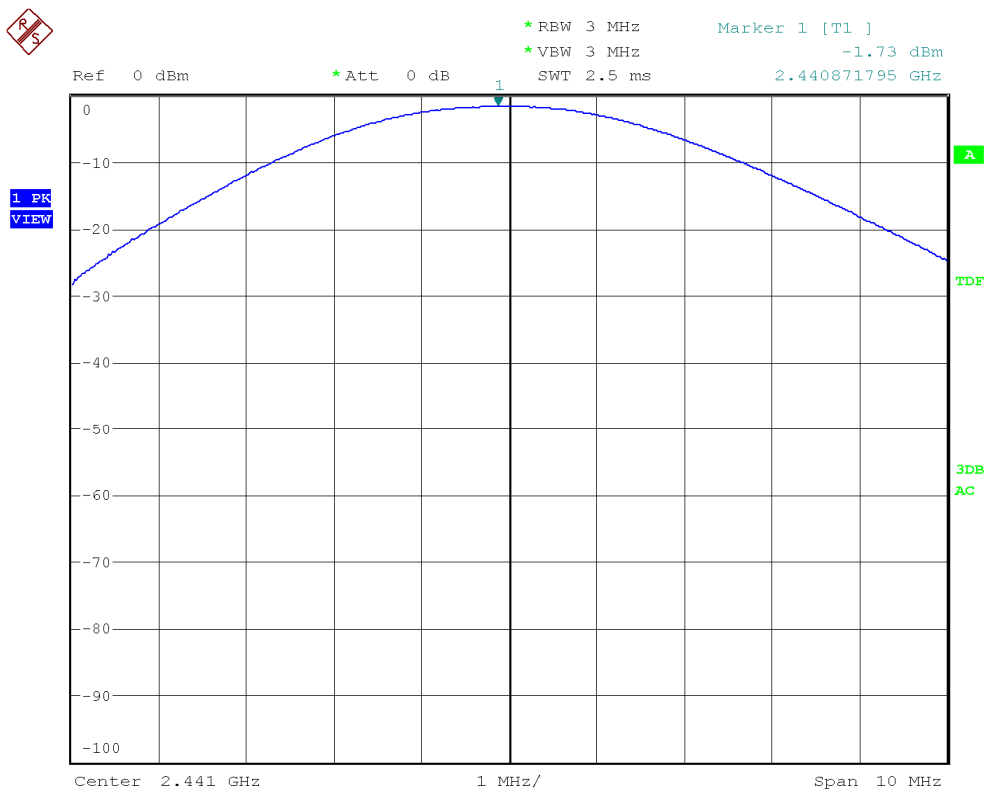
Modulation: GFSK

Lowest Channel: 2402 MHz.



Modulation: GFSK

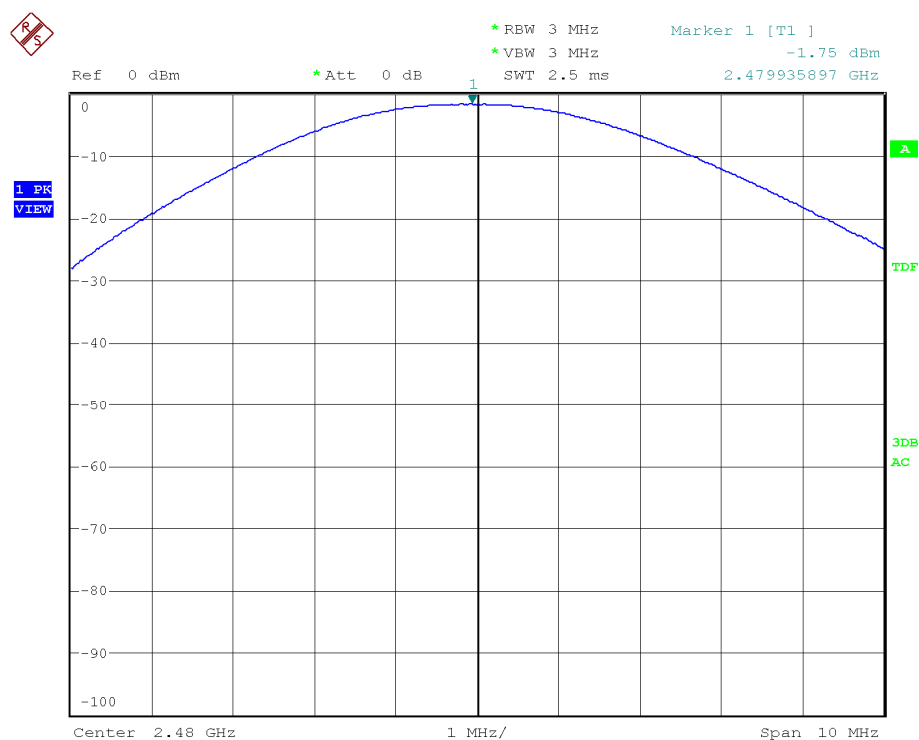
Middle Channel: 2441 MHz.



PEAK OUTPUT POWER (RADIATED).

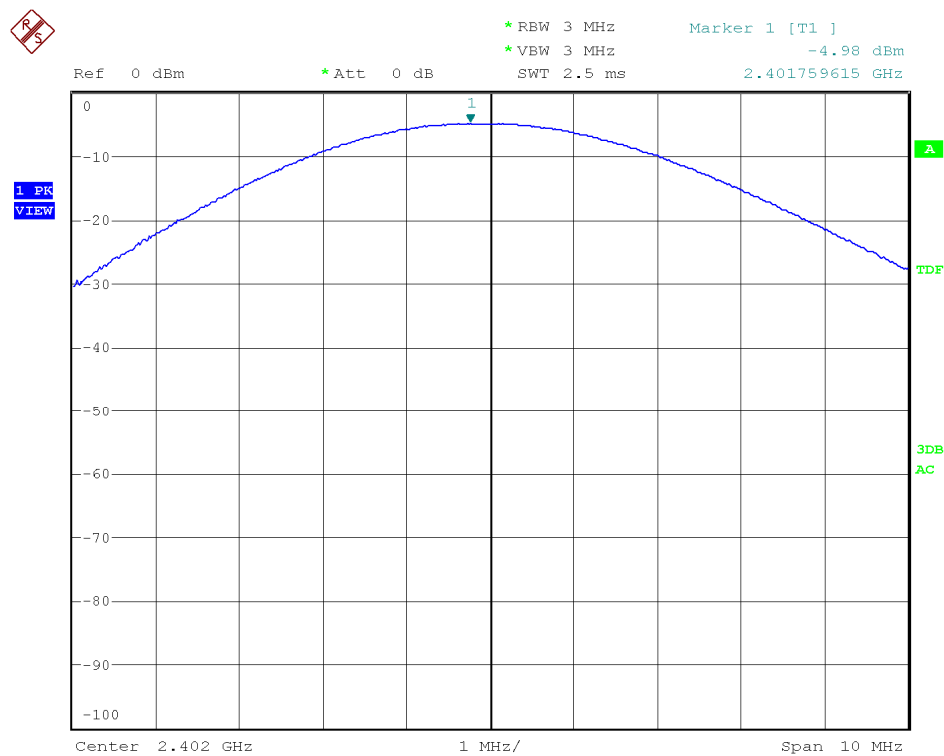
Modulation: GFSK

Highest Channel: 2480 MHz.



Modulation: $\Pi/4$ -DQPSK

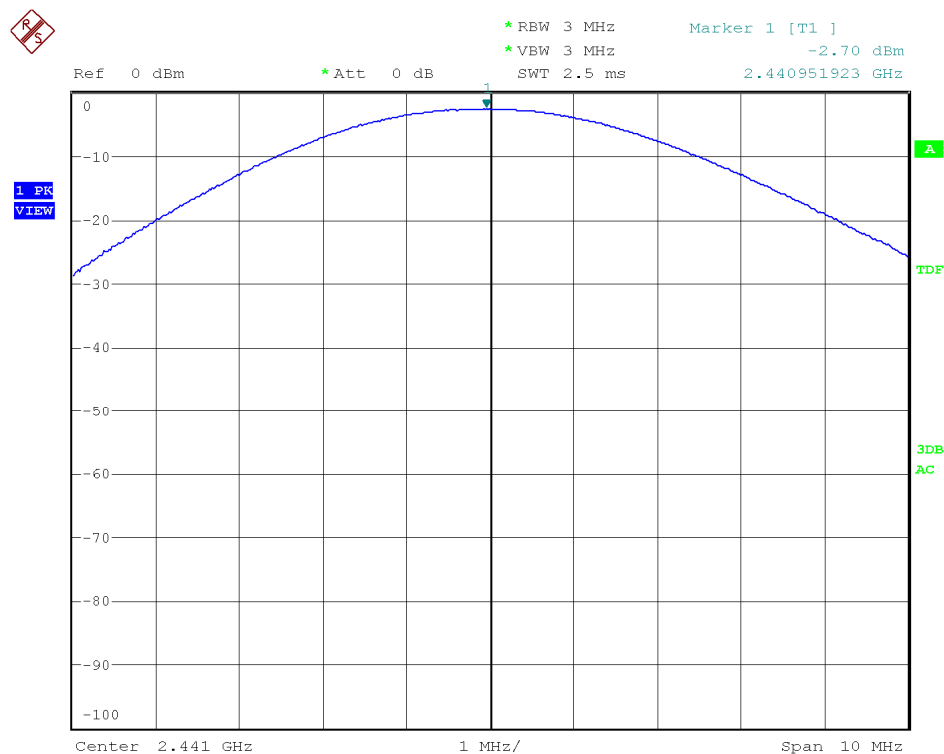
Lowest Channel: 2402 MHz.



PEAK OUTPUT POWER (RADIATED).

Modulation: $\Pi/4$ -DQPSK

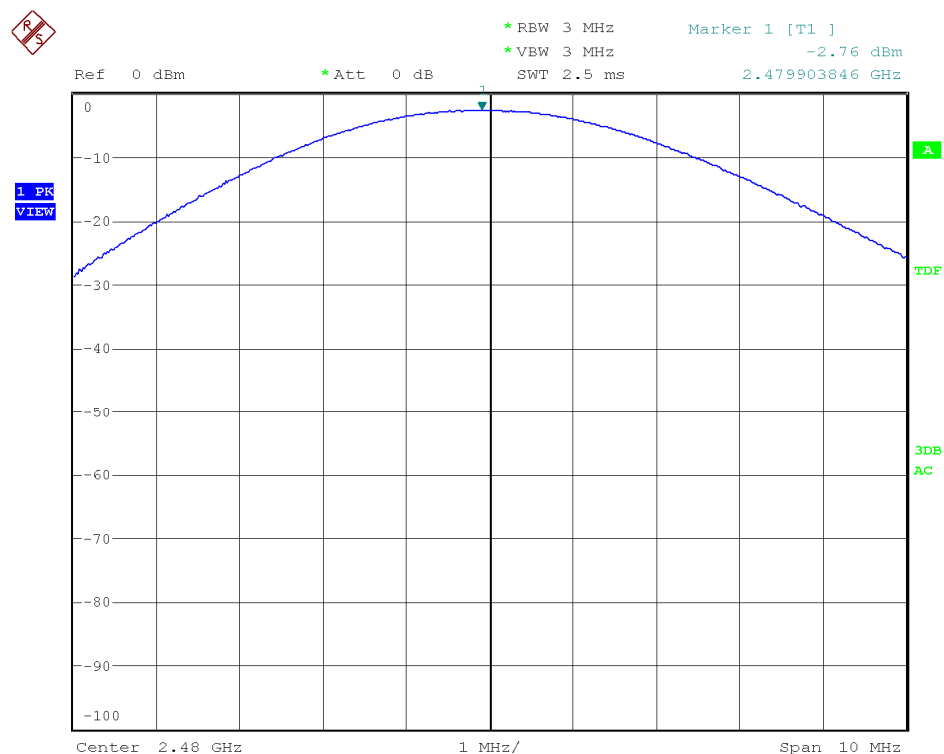
Middle Channel: 2441 MHz.



PEAK OUTPUT POWER (RADIATED).

Modulation: $\Pi/4$ -DQPSK

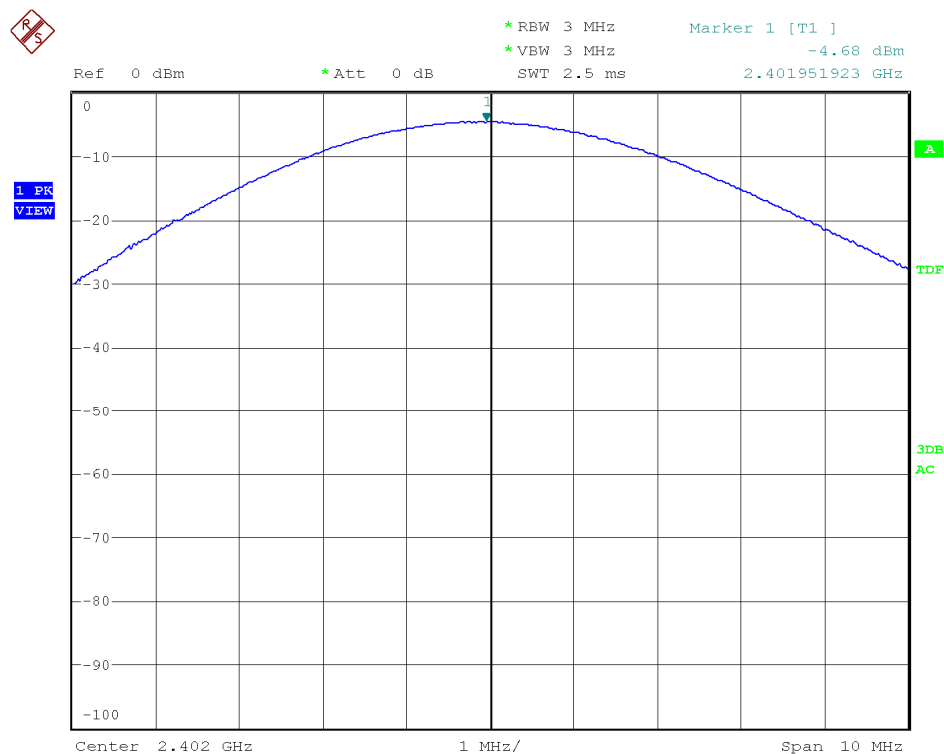
Highest Channel: 2480 MHz.



PEAK OUTPUT POWER (RADIATED).

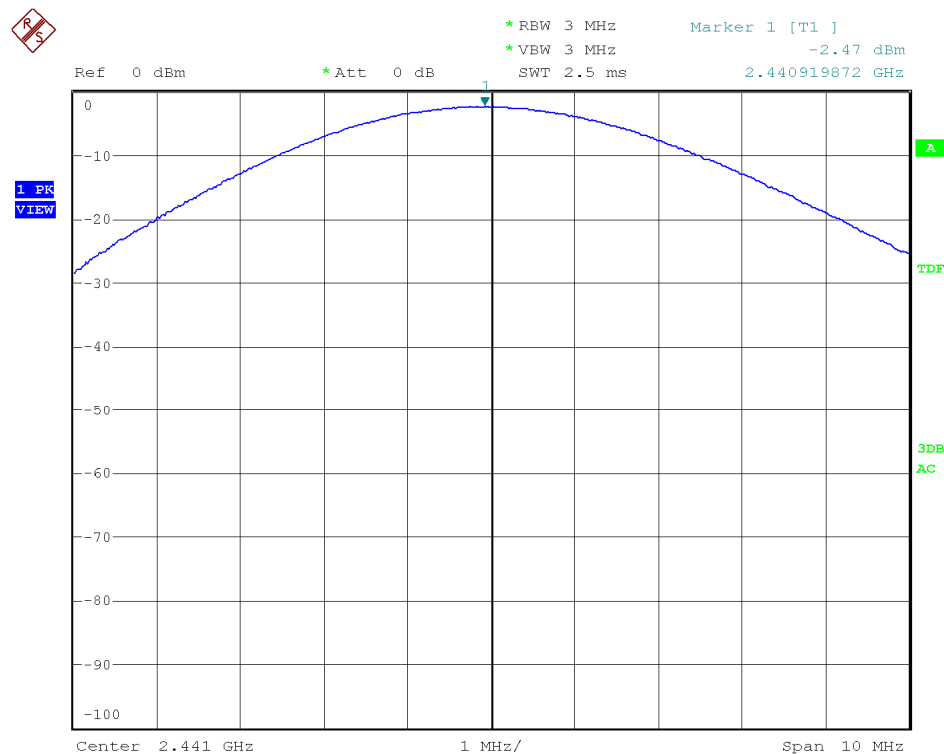
Modulation: 8-DPSK

Lowest Channel: 2402 MHz.



Modulation: 8-DPSK

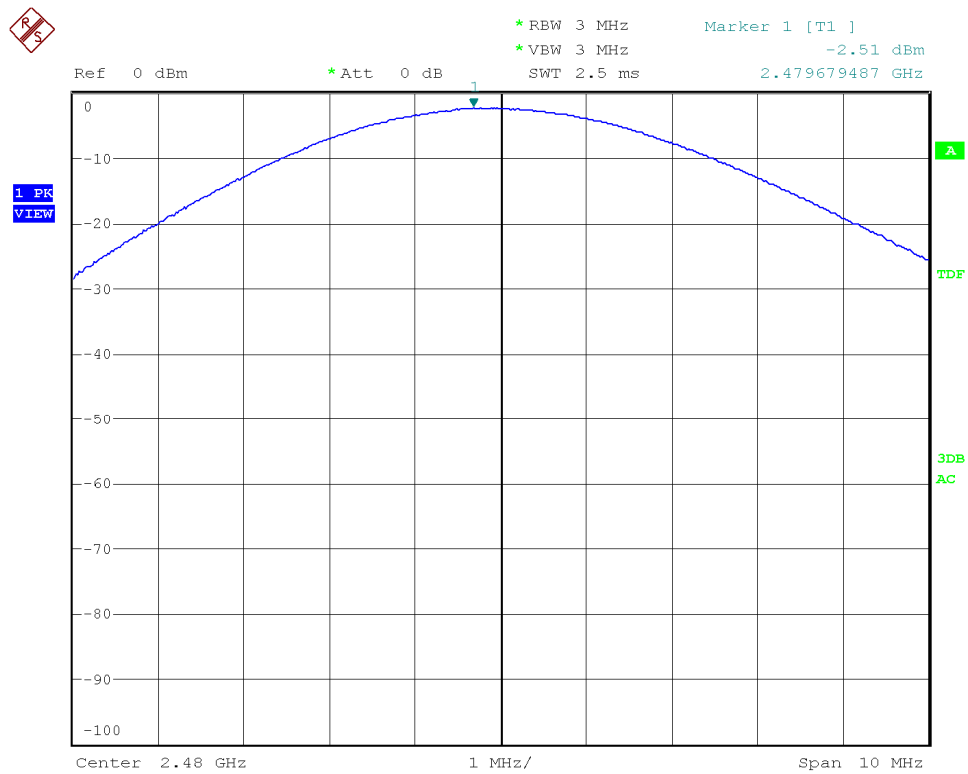
Middle Channel: 2441 MHz.



PEAK OUTPUT POWER (RADIATED).

Modulation: 8-DPSK

Highest Channel: 2480 MHz.



Section 15.247 Subclause (d). Band-edge compliance of conducted emissions (Transmitter)

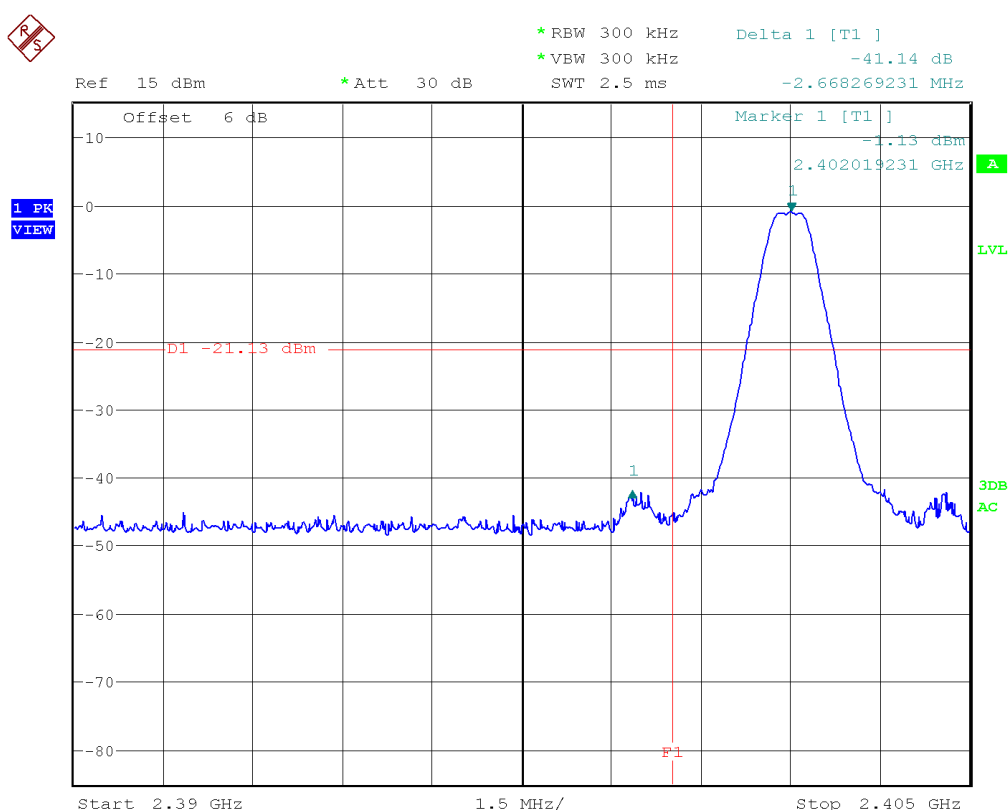
SPECIFICATION

Emissions outside the frequency band in which the intentional radiator is operating shall be at least 20dB below the highest level of the desired power.

RESULTS:

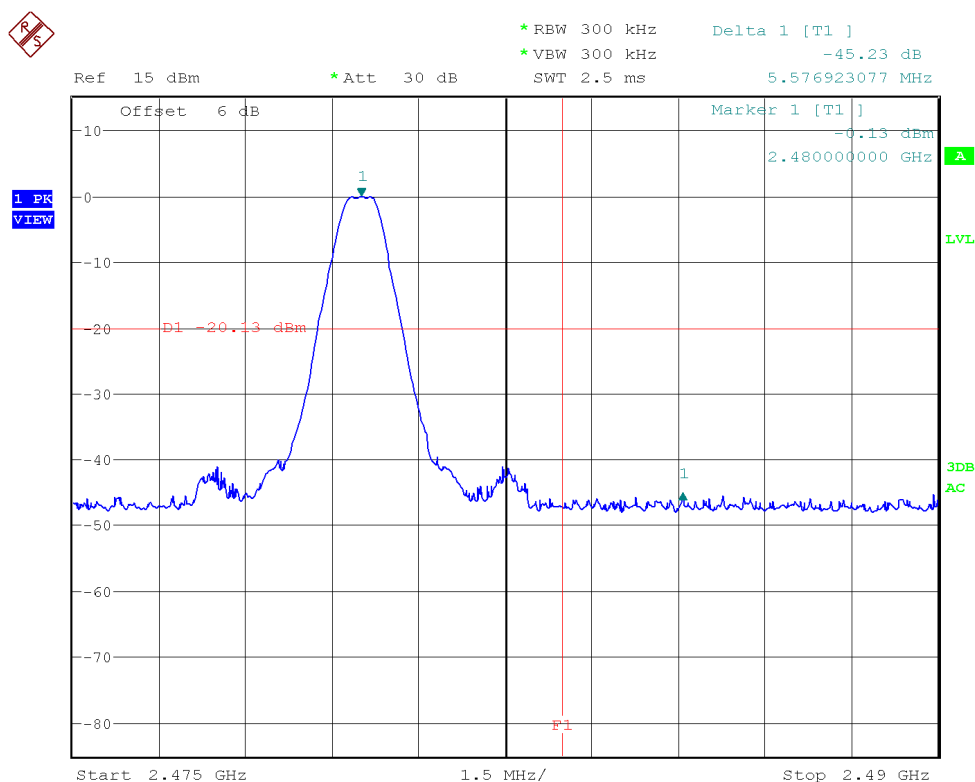
Modulation: GFSK

1. LOW FREQUENCY SECTION 2402 MHz (HOPPING OFF). See next plot.



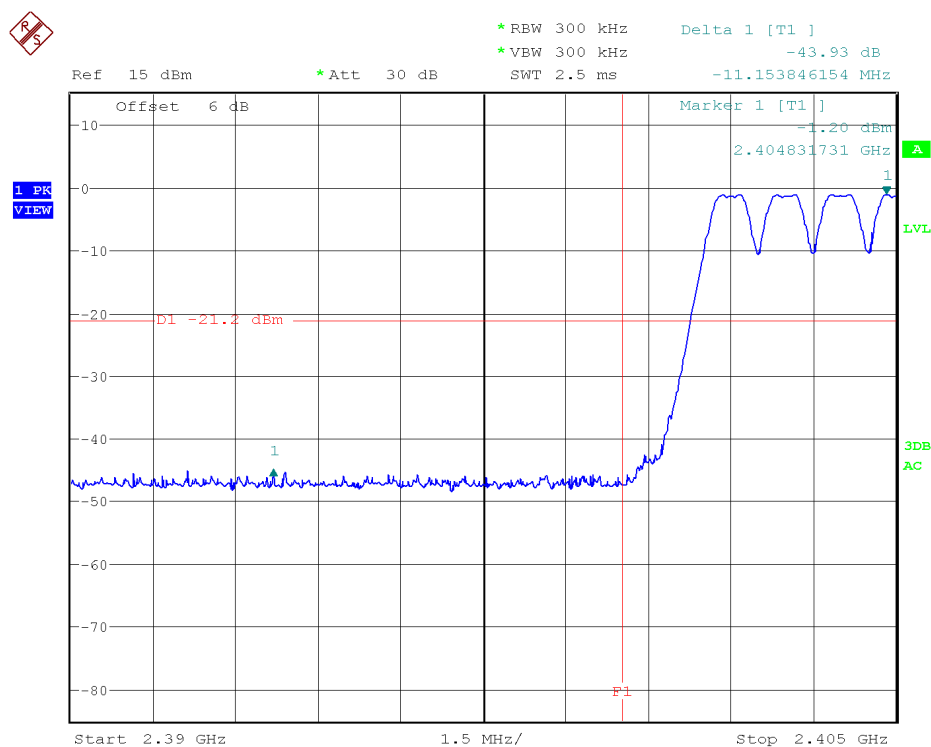
Verdict: PASS

2. HIGH FREQUENCY SECTION 2480 MHz (HOPPING OFF). See next plot.



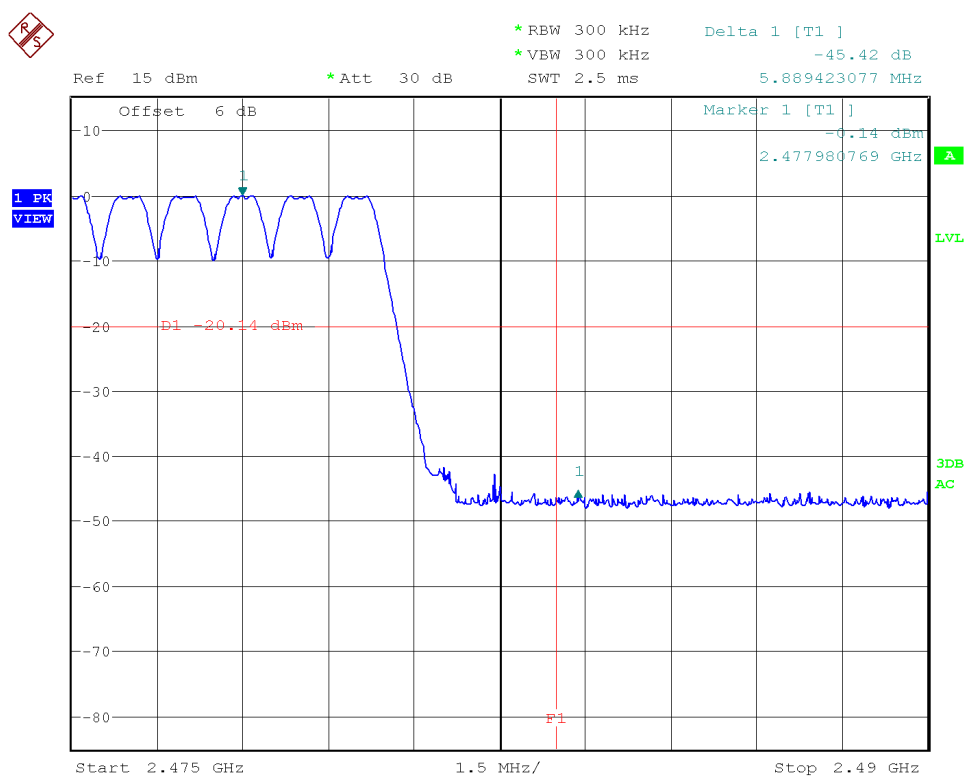
Verdict: PASS

3. LOW FREQUENCY SECTION (HOPPING ON). See next plot.



Verdict: PASS

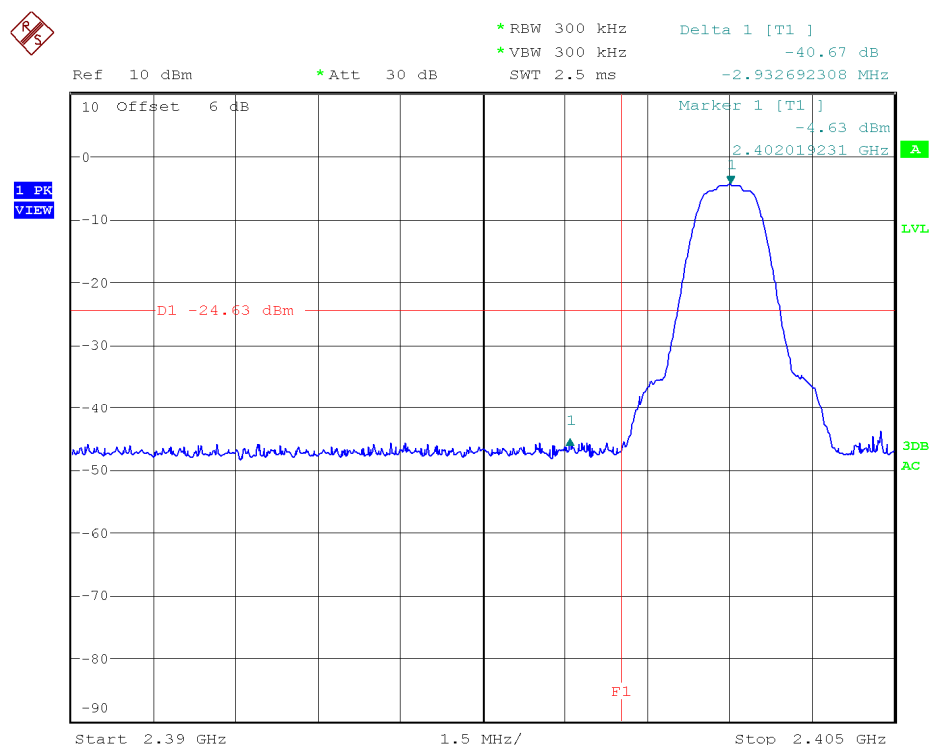
4. HIGH FREQUENCY SECTION (HOPPING ON). See next plot.



Verdict: PASS

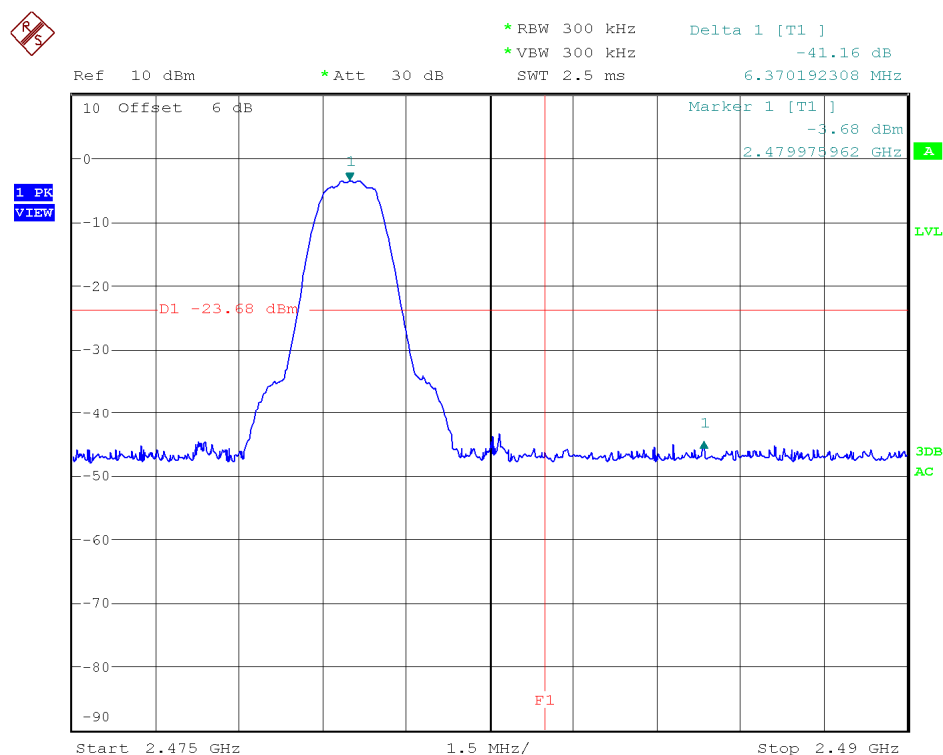
Modulation: $\Pi/4$ -DQPSK

1. LOW FREQUENCY SECTION 2402 MHz (HOPPING OFF). See next plot.



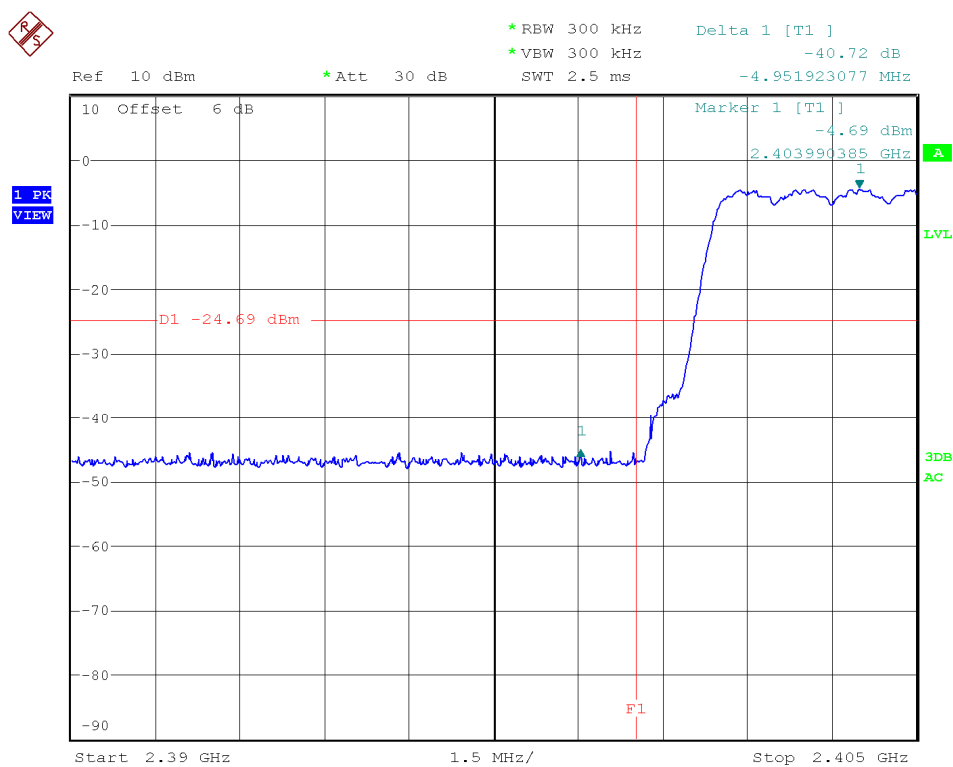
Verdict: PASS

2. HIGH FREQUENCY SECTION 2480 MHz (HOPPING OFF). See next plot.



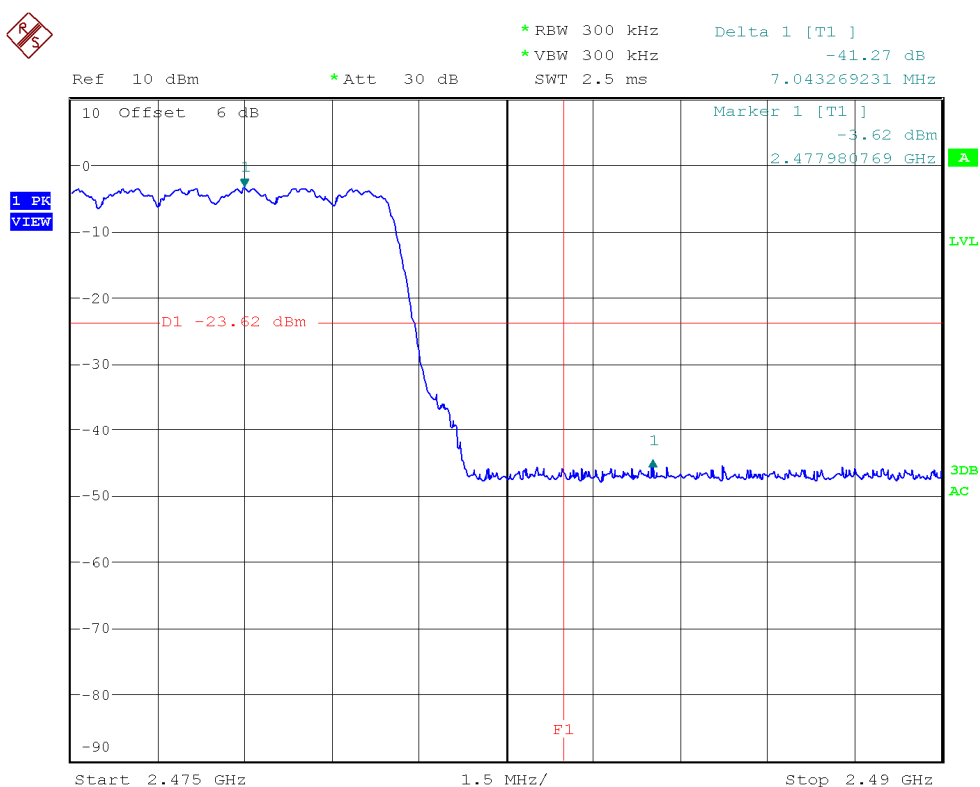
Verdict: PASS

3. LOW FREQUENCY SECTION (HOPPING ON). See next plot.



Verdict: PASS

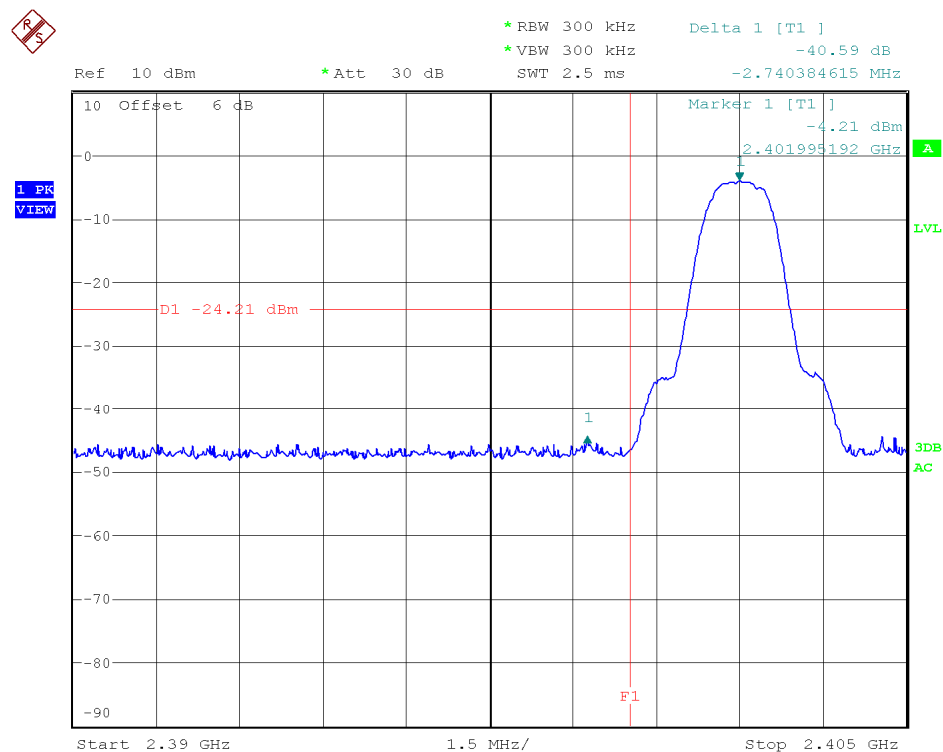
4. HIGH FREQUENCY SECTION (HOPPING ON). See next plot.



Verdict: PASS

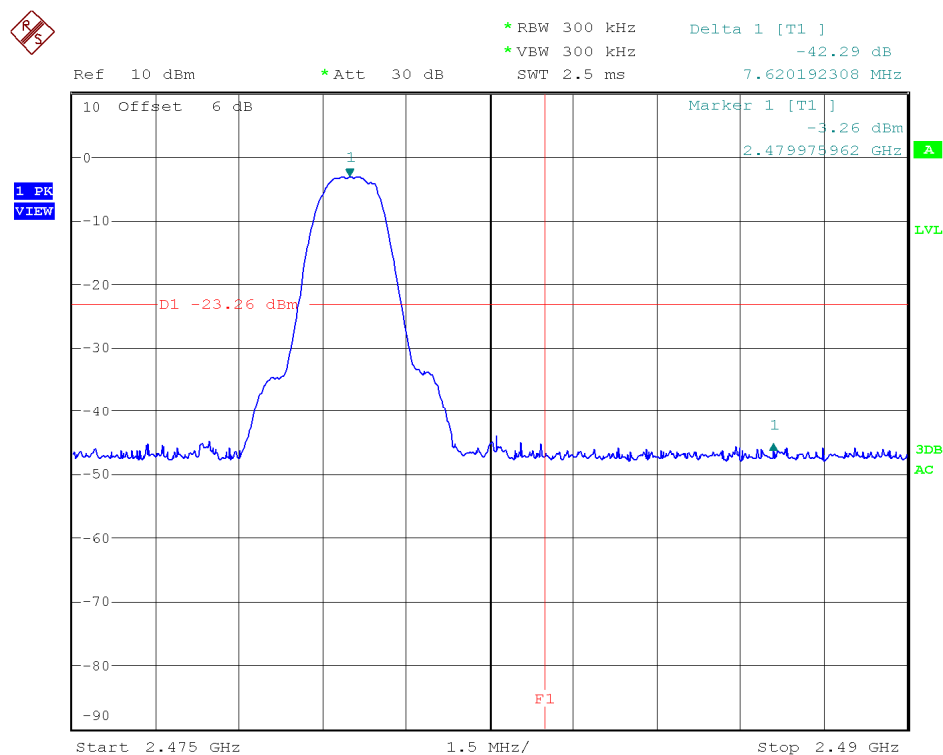
Modulation: 8-DPSK

1. LOW FREQUENCY SECTION 2402 MHz (HOPPING OFF). See next plot.



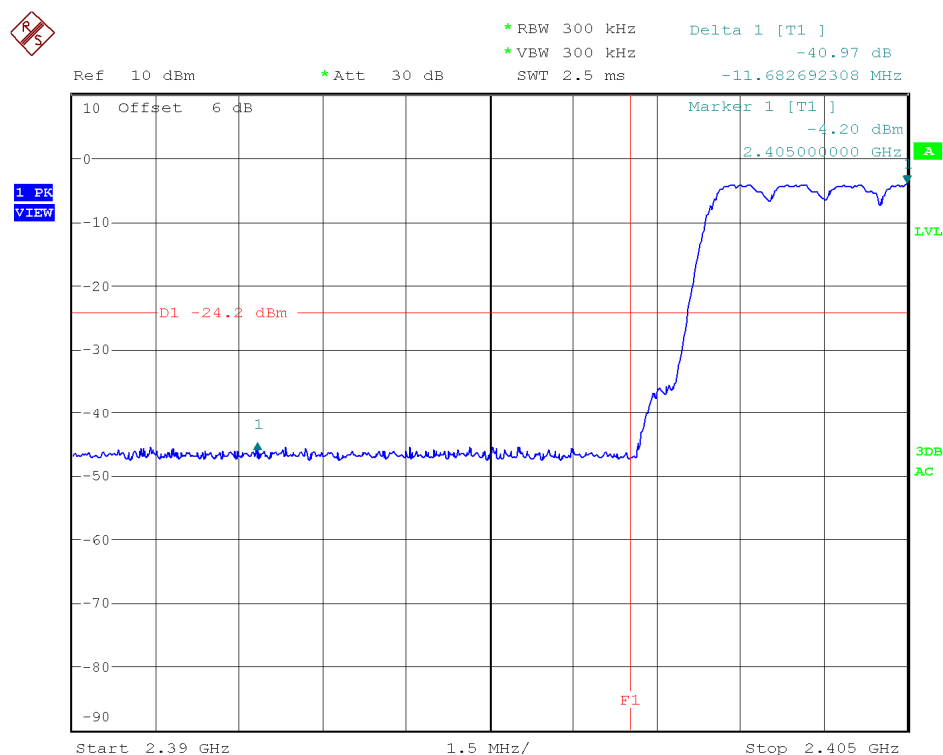
Verdict: PASS

2. HIGH FREQUENCY SECTION 2480 MHz (HOPPING OFF). See next plot.



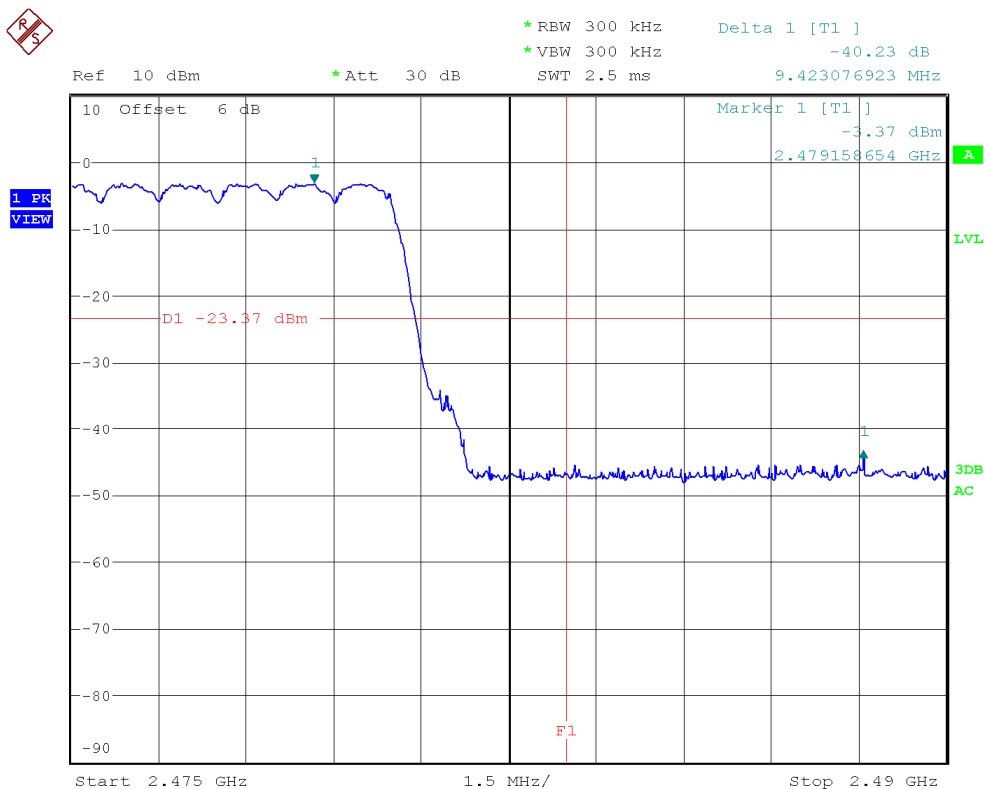
Verdict: PASS

3. LOW FREQUENCY SECTION (HOPPING ON). See next plot.



Verdict: PASS

4. HIGH FREQUENCY SECTION (HOPPING ON). See next plot.



Verdict: PASS

Section 15.247 Subclause (d). Band-edge compliance of radiated emissions (Transmitter)

SPECIFICATION:

Emissions outside the frequency band in which the intentional radiator is operating shall be at least 20 dB below the highest level of the desired power.

RESULTS:

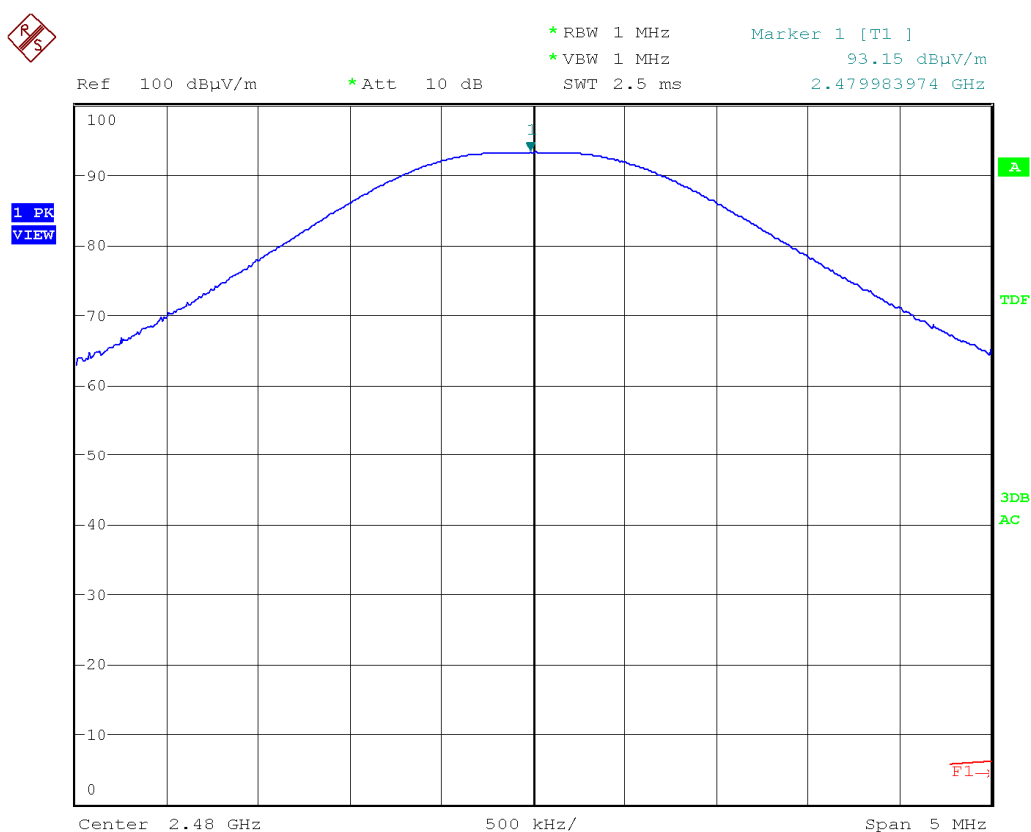
Band-edge compliance of radiated emissions

Maximum peak and average field strength of fundamental emission at 3 m distance

HIGHEST CHANNEL (2480 MHz):

Modulation: GFSK

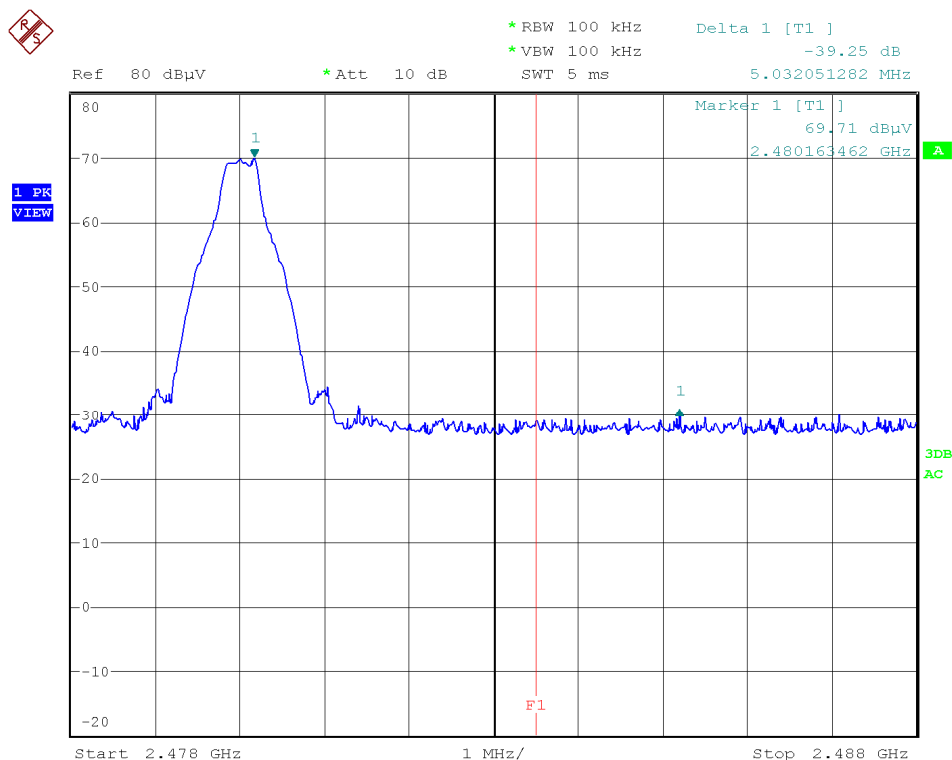
Maximum field strength at 3 m. Peak value.



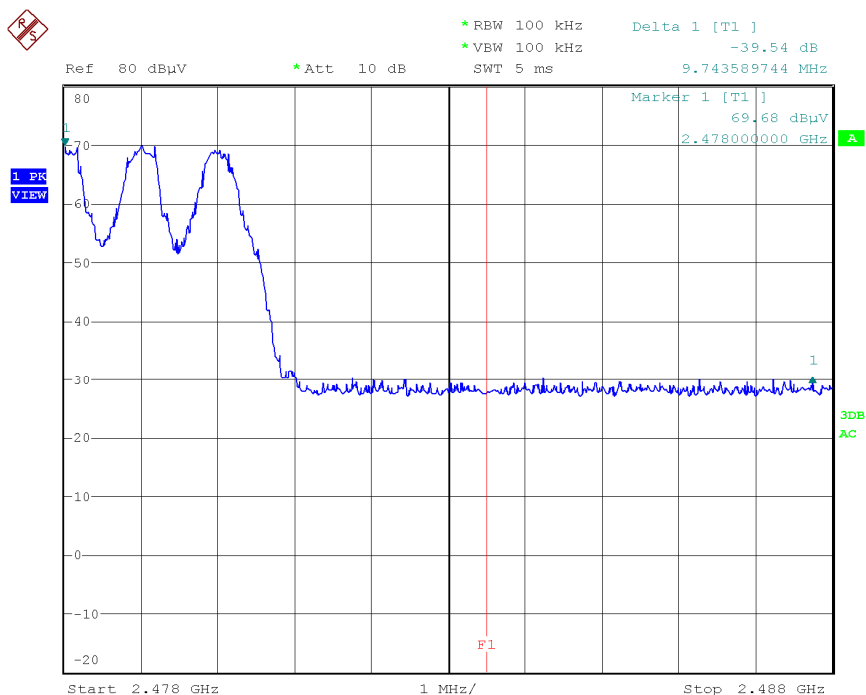
Note: The correction factor is already included in the spectrum analyzer as a transducer factor so that the marker shows directly the field strength level.

BAND-EDGE COMPLIANCE. RADIATED. Marker-Delta Method.

Single carrier



Hopping mode



Note: No correction is applied for this relative measurement.

Band edge compliance of radiated emissions

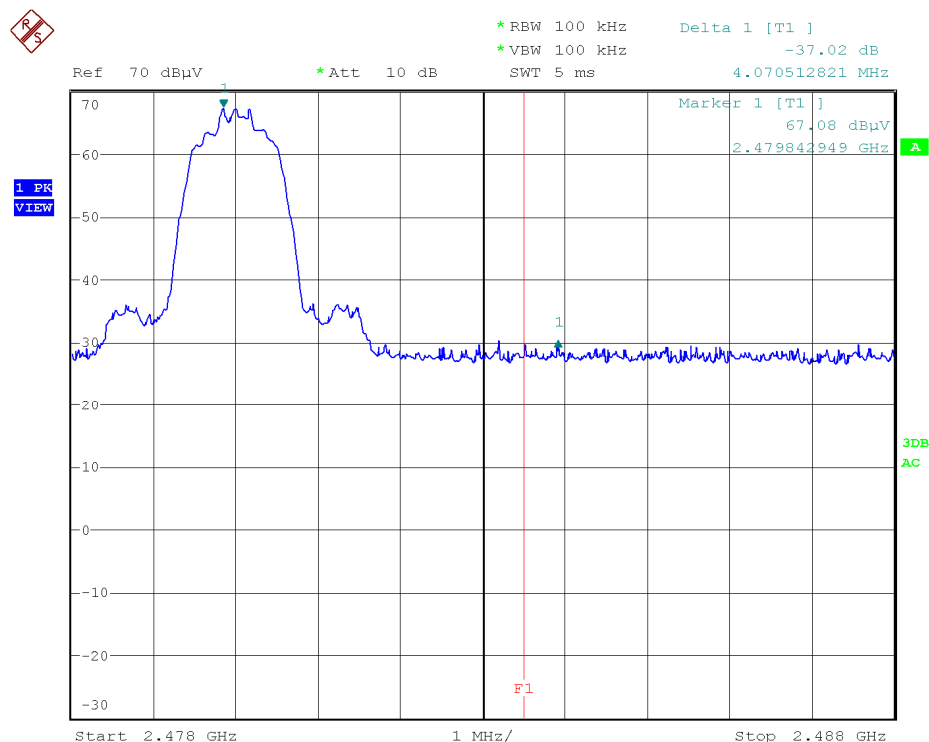
Fundamental max. average value 3 m	Delta value	Calculated value 3 m	Limit
82.93 dB μ V/m	39.25 dB (single carrier) 39.54 dB (hopping mode)	43.68 dB μ V/m (single carrier) 43.39 dB μ V/m (hopping mode)	54 dB μ V/m

Fundamental max. Peak value 3 m	Delta value	Calculated value 3 m	Limit
93.15 dB μ V/m	39.25 dB (single carrier) 39.54 dB (hopping mode)	53.9 dB μ V/m (single carrier) 53.61 dB μ V/m (hopping mode)	74 dB μ V/m

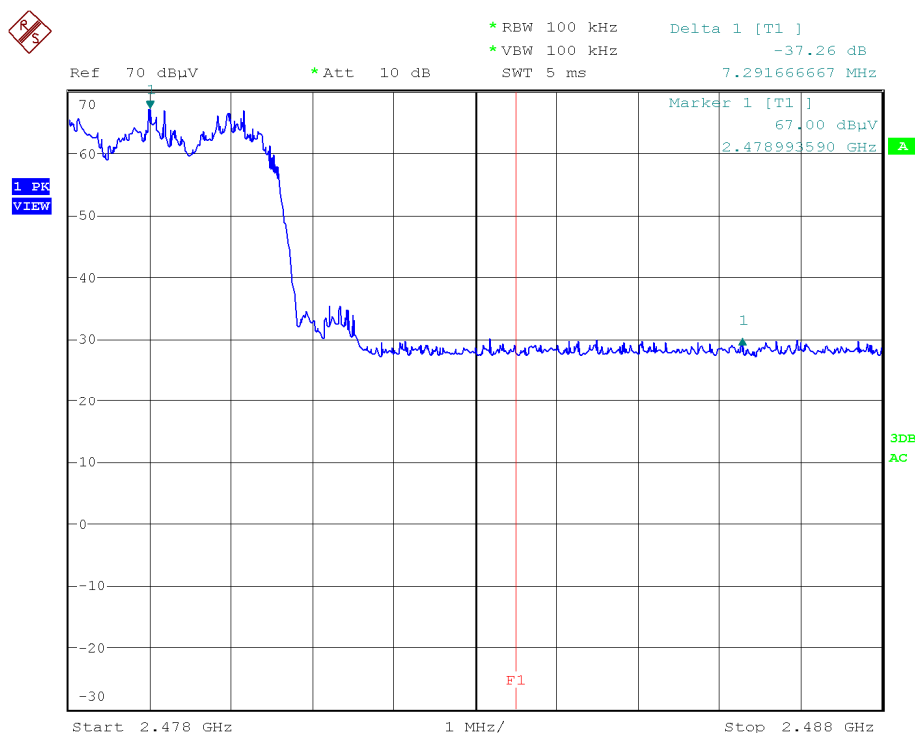
Verdict: PASS

BAND-EDGE COMPLIANCE. RADIATED. Marker-Delta Method.

Single carrier



Hopping mode



Note: No correction is applied for this relative measurement.

Band edge compliance of radiated emissions

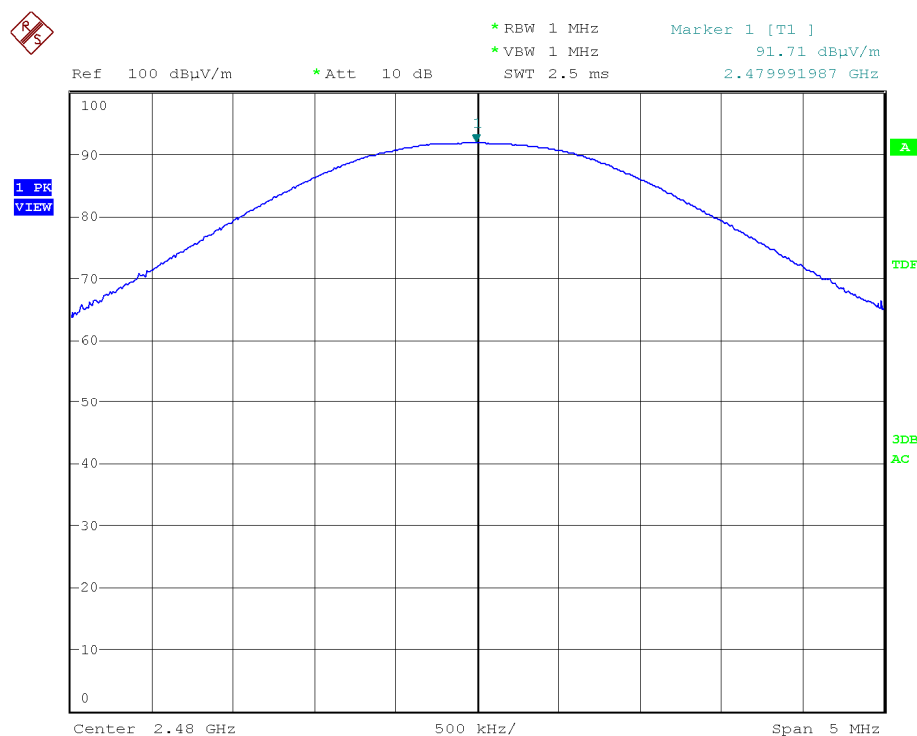
Fundamental max. average value 3 m	Delta value	Calculated value 3 m	Limit
79.93 dB μ V/m	37.02 dB (single carrier) 37.26 dB (hopping mode)	42.41 dB μ V/m (single carrier) 42.67 dB μ V/m (hopping mode)	54 dB μ V/m

Fundamental max. Peak value 3 m	Delta value	Calculated value 3 m	Limit
91.62 dB μ V/m	37.02 dB (single carrier) 37.26 dB (hopping mode)	54.60 dB μ V/m (single carrier) 54.36 dB μ V/m (hopping mode)	74 dB μ V/m

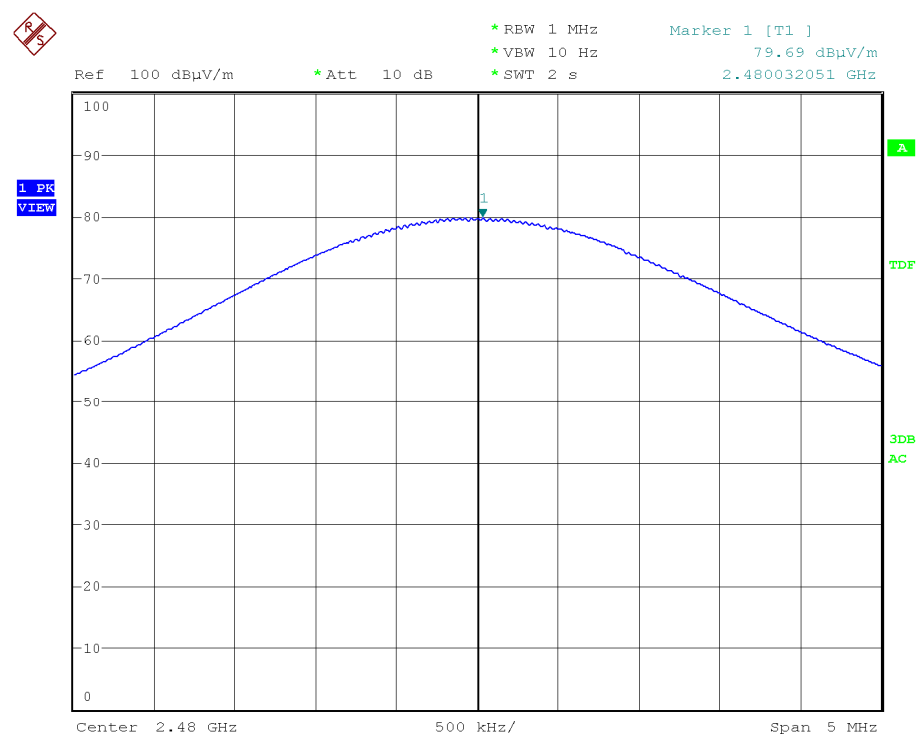
Verdict: PASS

Modulation: 8-DPSK

Maximum field strength at 3 m. Peak value.



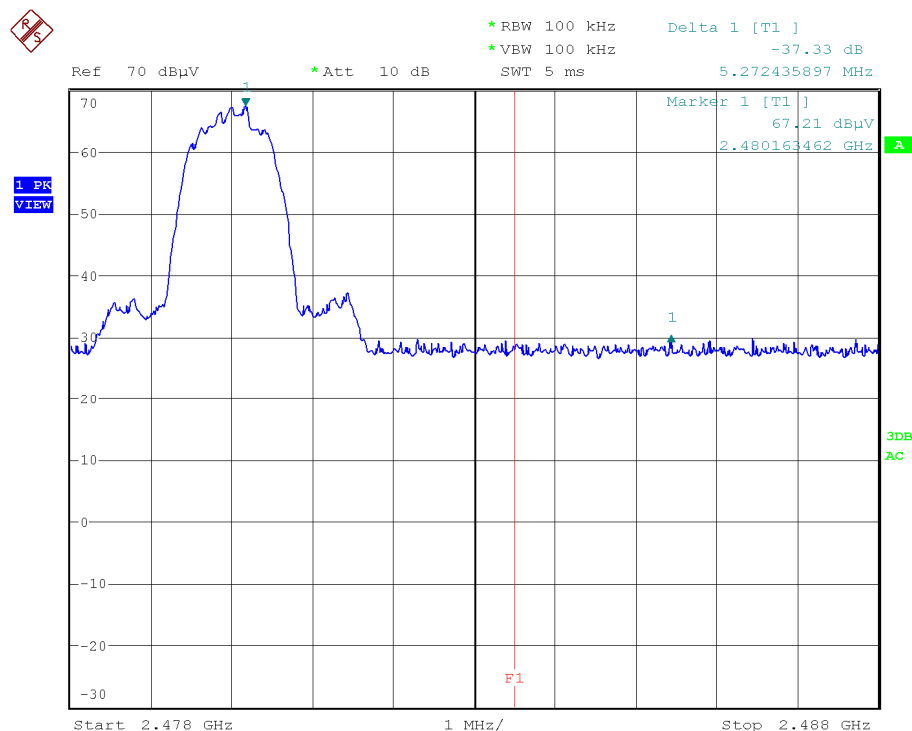
Maximum field strength at 3 m. Average value.



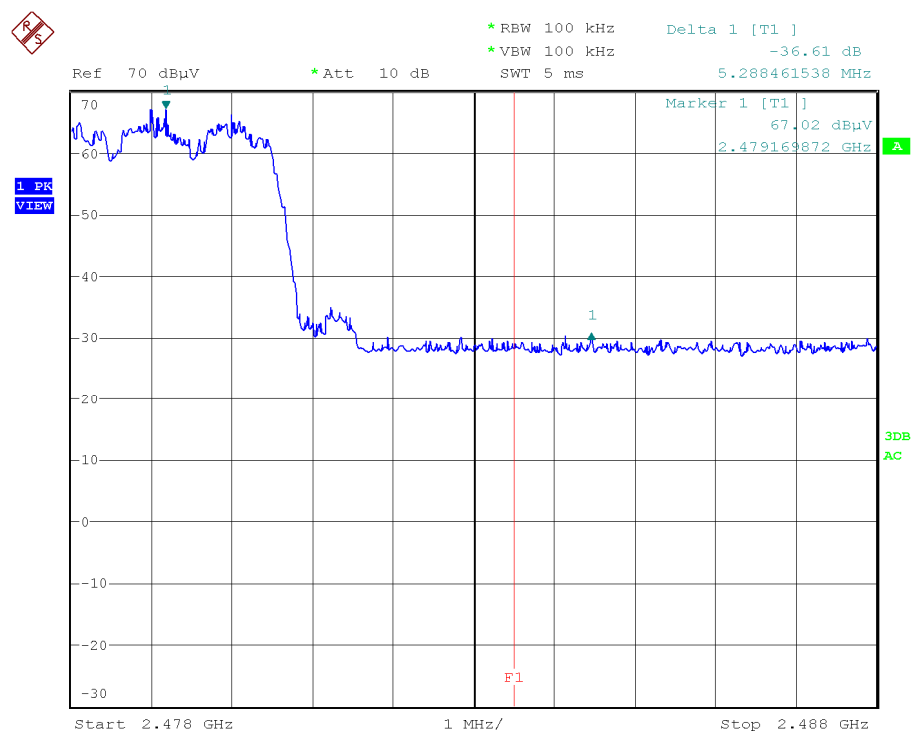
Note: The correction factor is already included in the spectrum analyzer as a transducer factor so that the marker shows directly the field strength level.

BAND-EDGE COMPLIANCE. RADIATED. Marker-Delta Method.

Single carrier



Hopping mode



Note: No correction is applied for this relative measurement.

Band edge compliance of radiated emissions

Fundamental max. average value 3 m	Delta value	Calculated value 3 m	Limit
79.69 dB μ V/m	37.33 dB (single carrier) 36.61 dB (hopping mode)	42.36 dB μ V/m (single carrier) 43.08 dB μ V/m (hopping mode)	54 dB μ V/m

Fundamental max. Peak value 3 m	Delta value	Calculated value 3 m	Limit
91.71 dB μ V/m	37.33 dB (single carrier) 36.61 dB (hopping mode)	54.38 dB μ V/m (single carrier) 55.10 dB μ V/m (hopping mode)	74 dB μ V/m

Verdict: PASS

Section 15.247 Subclause (d). Emission limitations conducted (Transmitter)

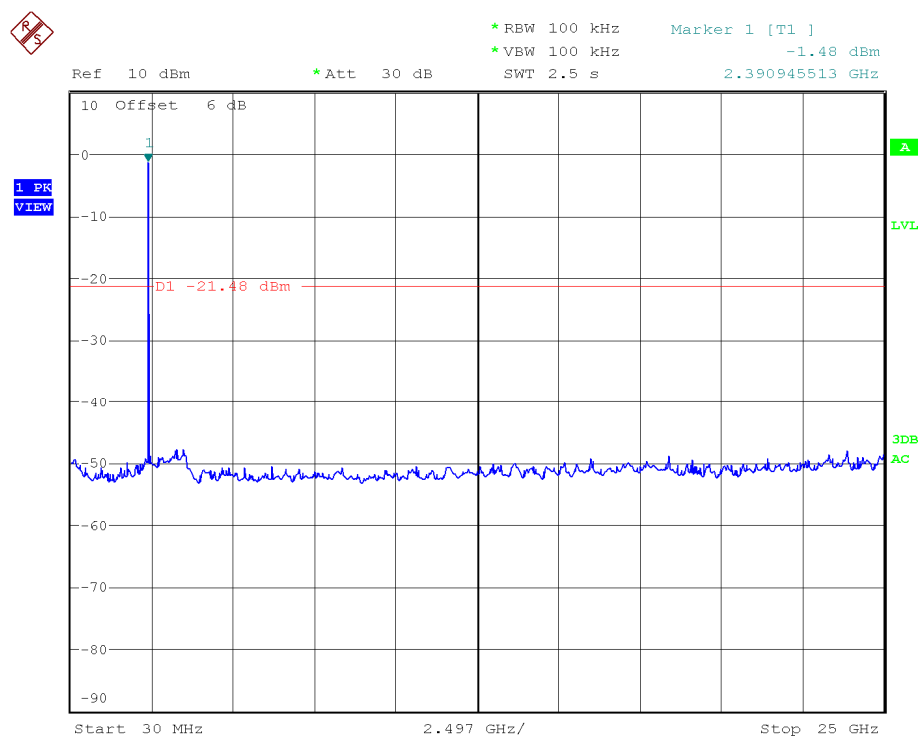
SPECIFICATION

In any 100 kHz bandwidths outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

RESULTS:

Modulation: GFSK

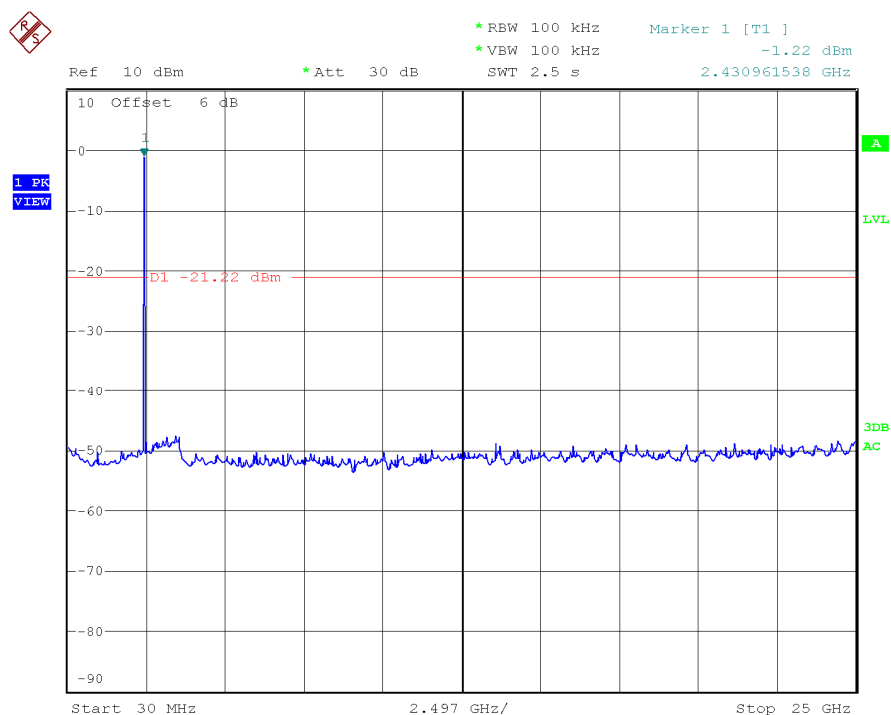
1. LOWEST CHANNEL (2402 MHz): 30 MHz-25 GHz (see next plot).



Note: The peak above the limit is the carrier frequency.

Verdict: PASS

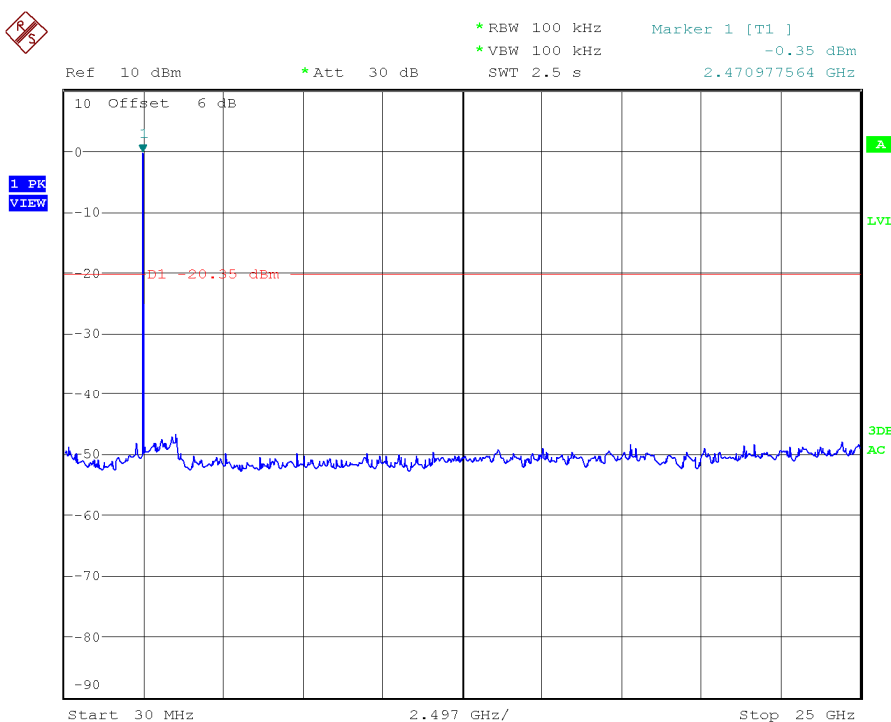
2. MIDDLE CHANNEL (2441 MHz): 30 MHz-25 GHz (see next plot).



Note: The peak above the limits is the carrier frequency.

Verdict: PASS

3. HIGH CHANNEL (2480 MHz): 30 MHz-25 GHz (see next plot).

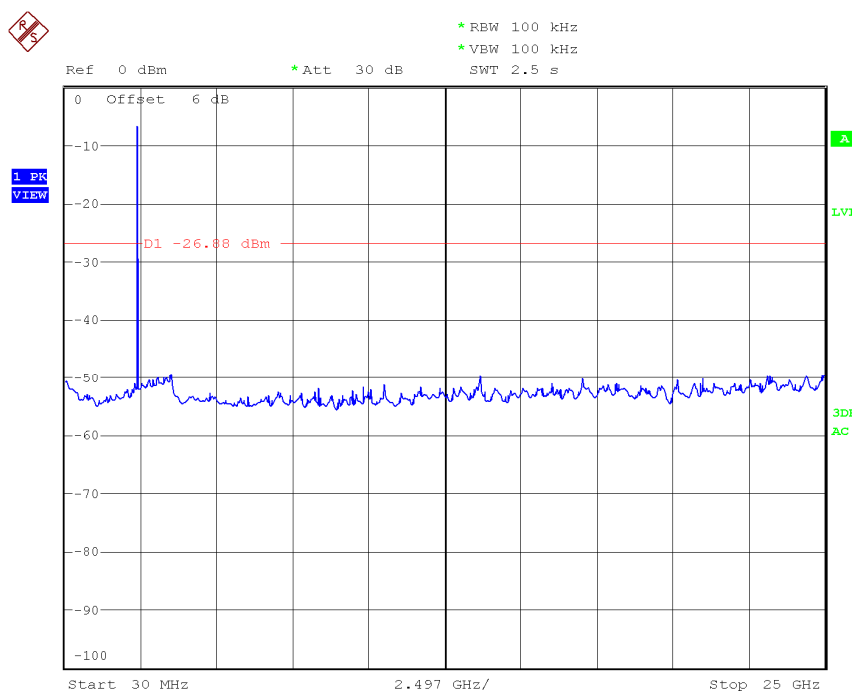


Note: The peak above the limits is the carrier frequency.

Verdict: PASS

Modulation: $\Pi/4$ -DQPSK

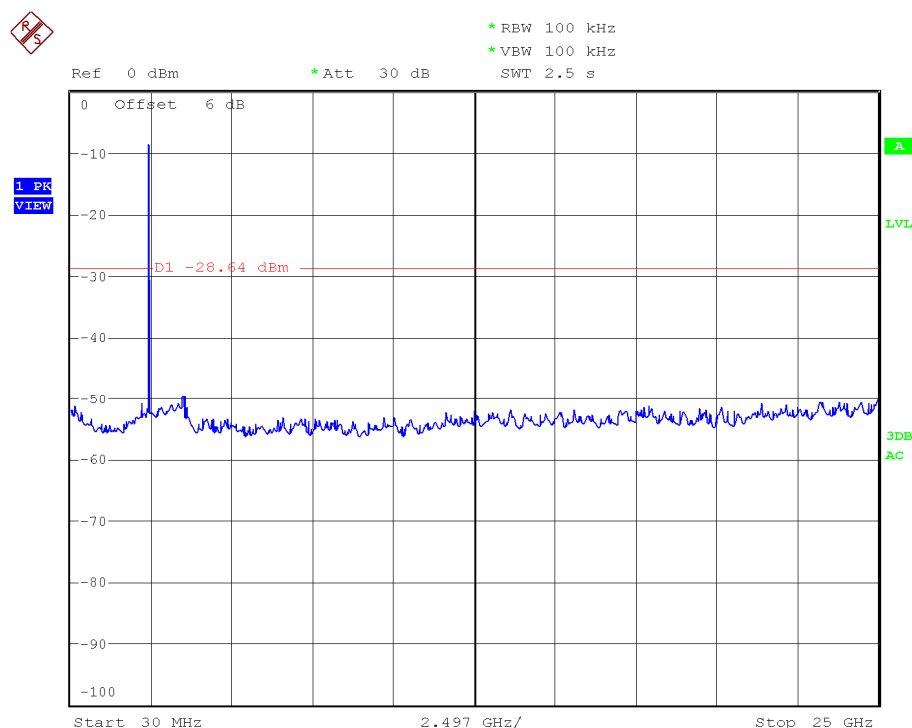
1. LOWEST CHANNEL (2402 MHz): 30 MHz-25 GHz (see next plot).



Note: The peak above the limits is the carrier frequency.

Verdict: PASS

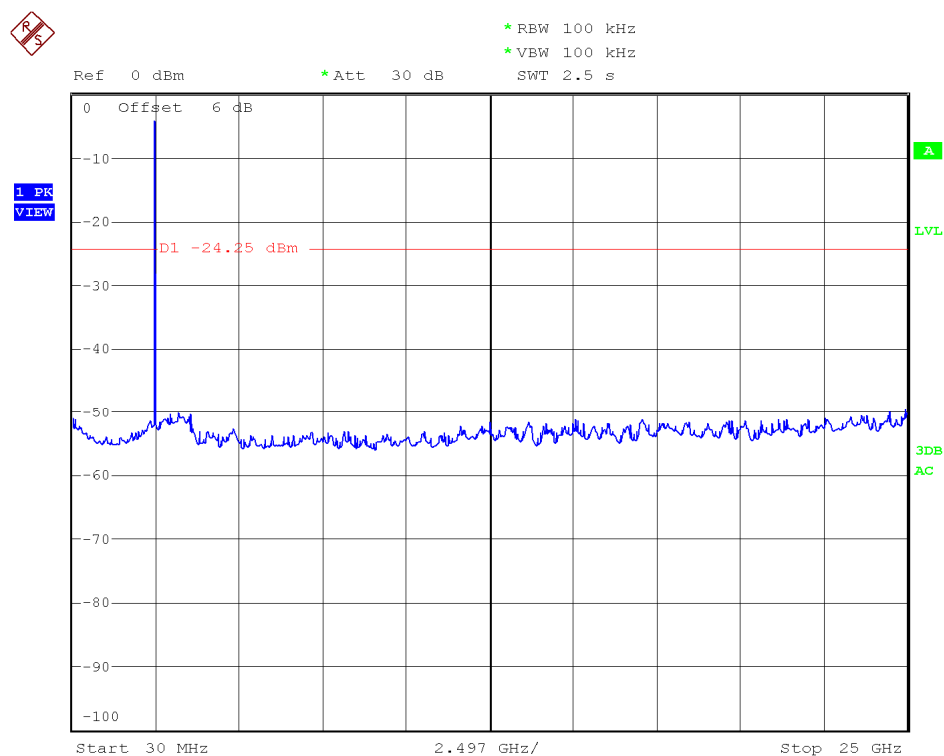
2. MIDDLE CHANNEL (2441 MHz): 30 MHz-25 GHz (see next plot).



Note: The peaks above the limits are the carrier frequencies.

Verdict: PASS

3. HIGH CHANNEL (2480 MHz): 30 MHz-25 GHz (see next plot).

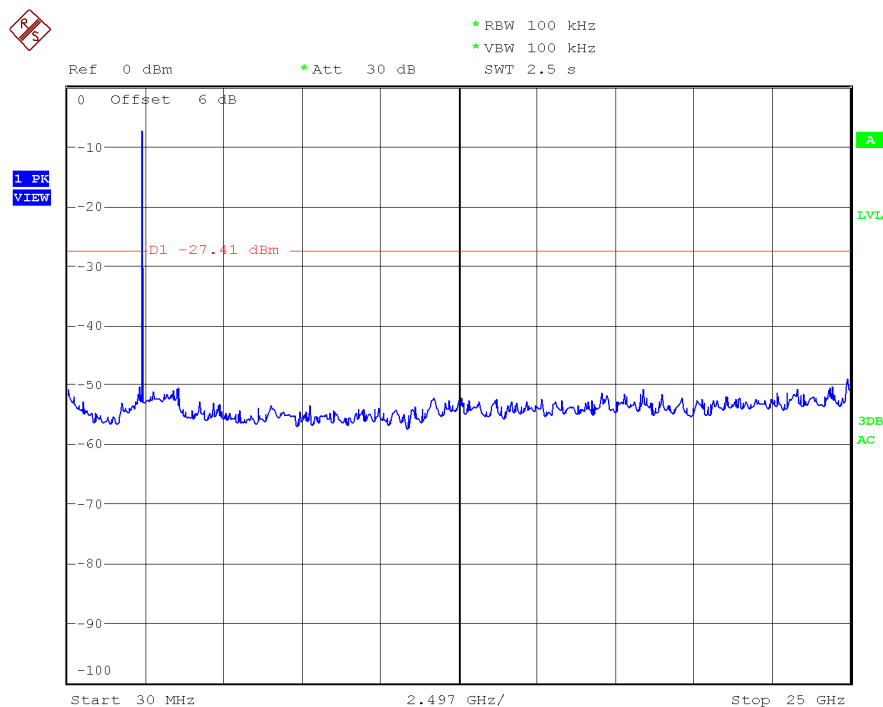


Note: The peak above the limit is the carrier frequency.

Verdict: PASS

Modulation: 8-DPSK

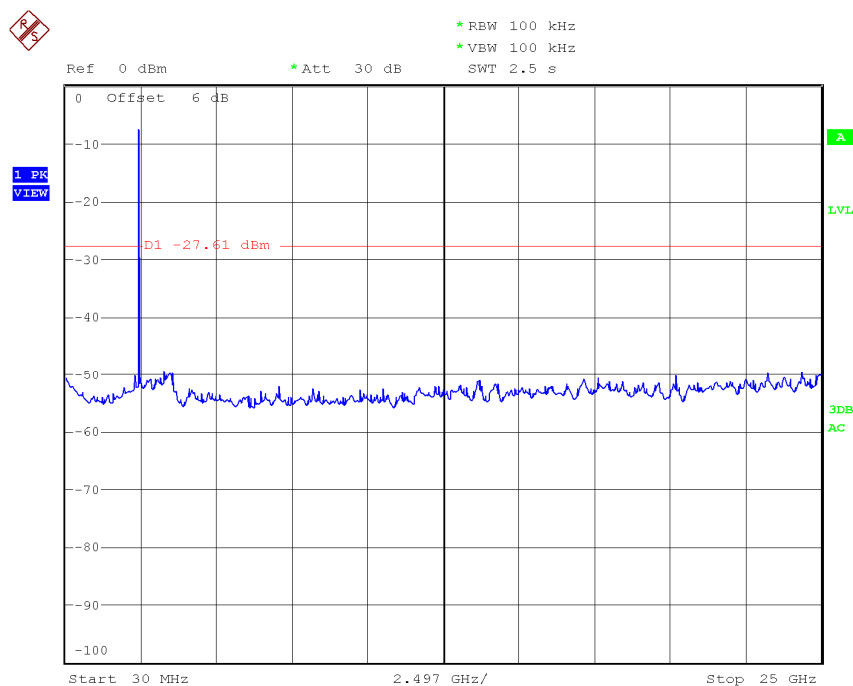
1. LOWEST CHANNEL (2402 MHz): 30 MHz-25 GHz (see next plot).



Note: The peak above the limits is the carrier frequency.

Verdict: PASS

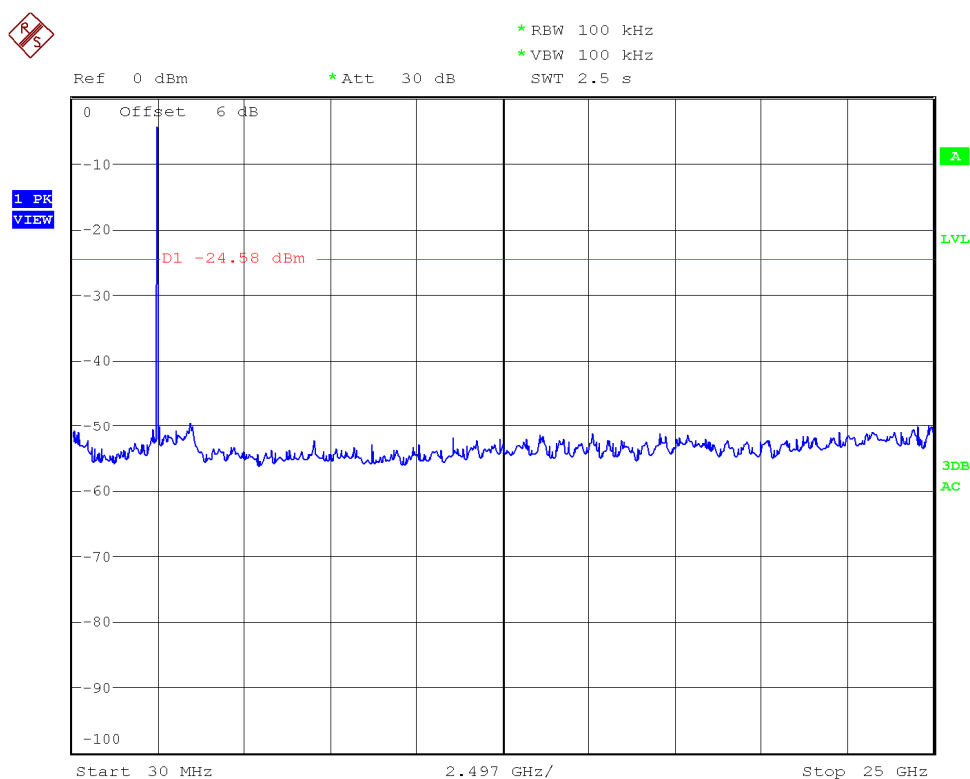
2. MIDDLE CHANNEL (2441 MHz): 30 MHz-25 GHz (see next plot).



Note: The peaks above the limit are the carrier frequencies.

Verdict: PASS

3. HIGH CHANNEL (2480 MHz): 30 MHz-25 GHz (see next plot).



Note: The peak above the limit is the carrier frequency.

Verdict: PASS

Section 15.247 Subclause (d). Emission limitations radiated (Transmitter)

SPECIFICATION

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)):

Frequency Range (MHz)	Field strength ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	300
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RESULTS:

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

All tests were performed in a semi-anechoic chamber at a distance of 3 m for the frequency range 30 MHz-1000 MHz and at distance of 1m for the frequency range 1 GHz-25 GHz.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

The equipment transmits continuously in the selected channel so it is not necessary a duty cycle correction factor.

Frequency range 30 MHz-1000 MHz.

No spurious signals found in all the range for all modulation modes.

Frequency range 1 GHz-25 GHz

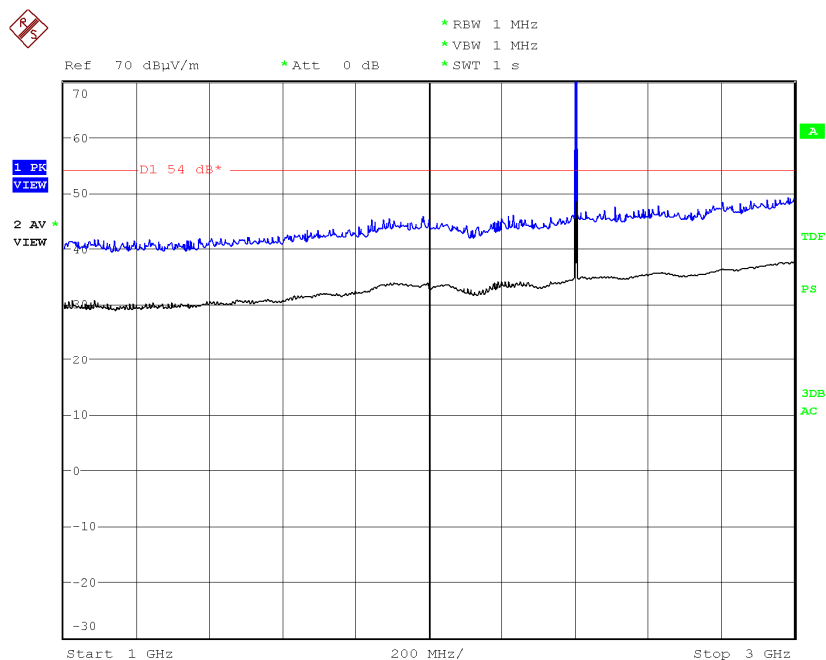
No spurious signals found in all the range for all modulation modes.

Additionally, no spurious signals were found inside the restricted bands 2310-2390 MHz and 2483.5-2500 MHz and at the harmonic frequencies for the three operating channels and modulation modes.

Verdict: PASS

FREQUENCY RANGE 1 GHz to 3 GHz.

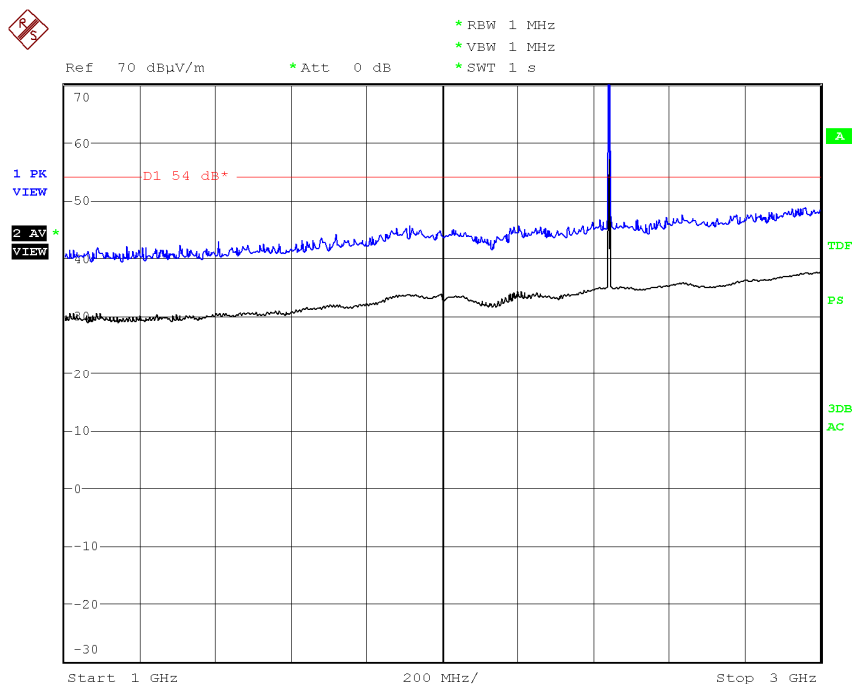
CHANNEL: Lowest (2402 MHz).



Note: The peak shown in the plot is the carrier frequency.

(This plot is valid for all modulation modes).

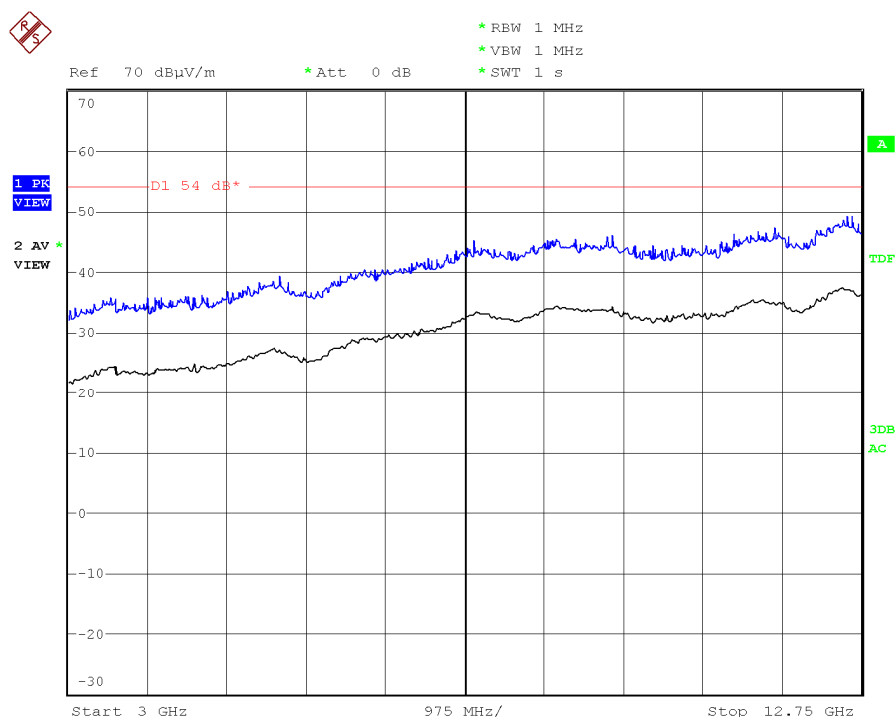
CHANNEL: Middle (2441 MHz).



Note: The peak shown in the plot is the carrier frequency.

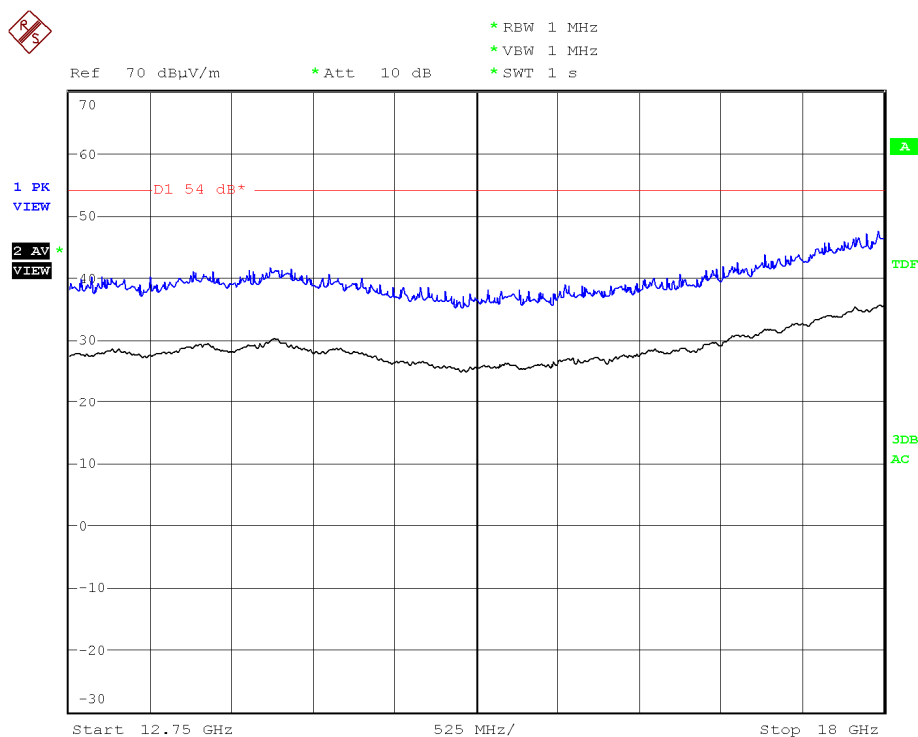
(This plot is valid for all modulation modes).

FREQUENCY RANGE 3 GHz to 12.75 GHz.



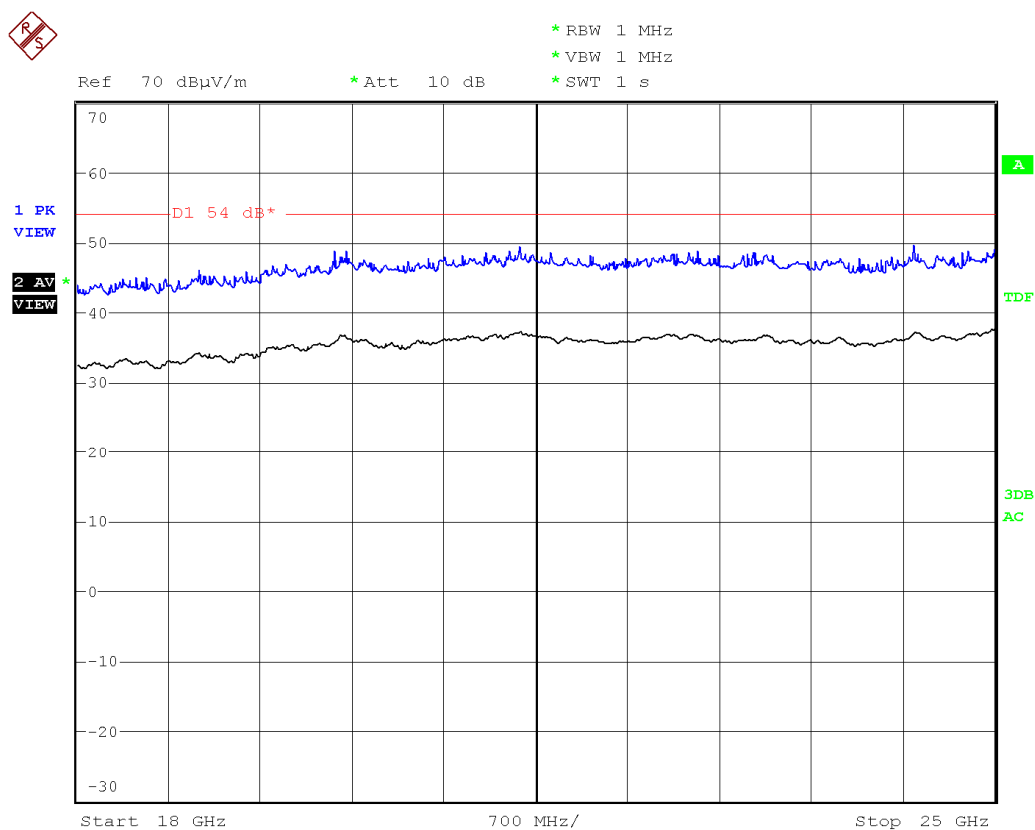
(This plot is valid for all three channels and all modulation modes).

FREQUENCY RANGE 12.75 GHz to 18 GHz.



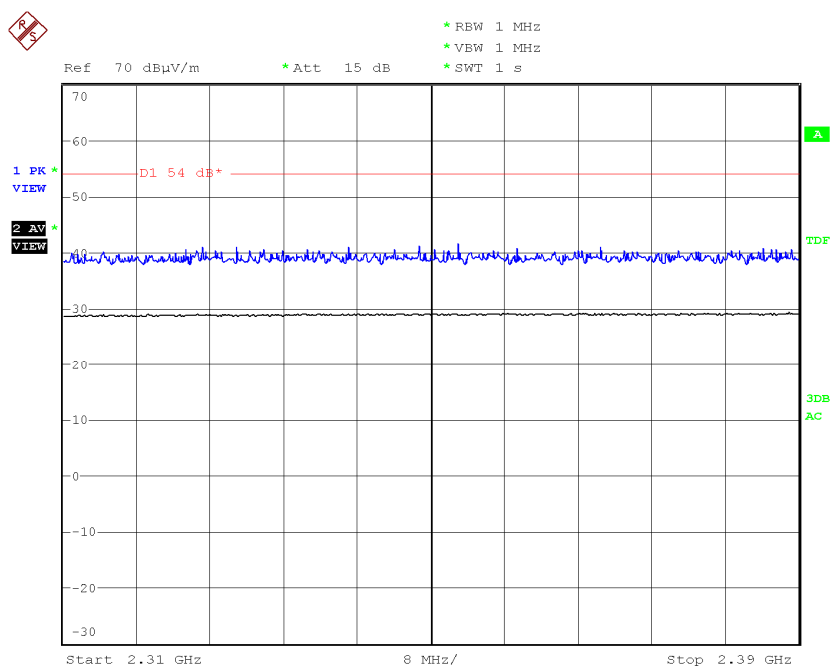
(This plot is valid for all three channels and all modulation modes).

FREQUENCY RANGE 18 GHz to 25 GHz.



(This plot is valid for all three channels and all modulation modes).

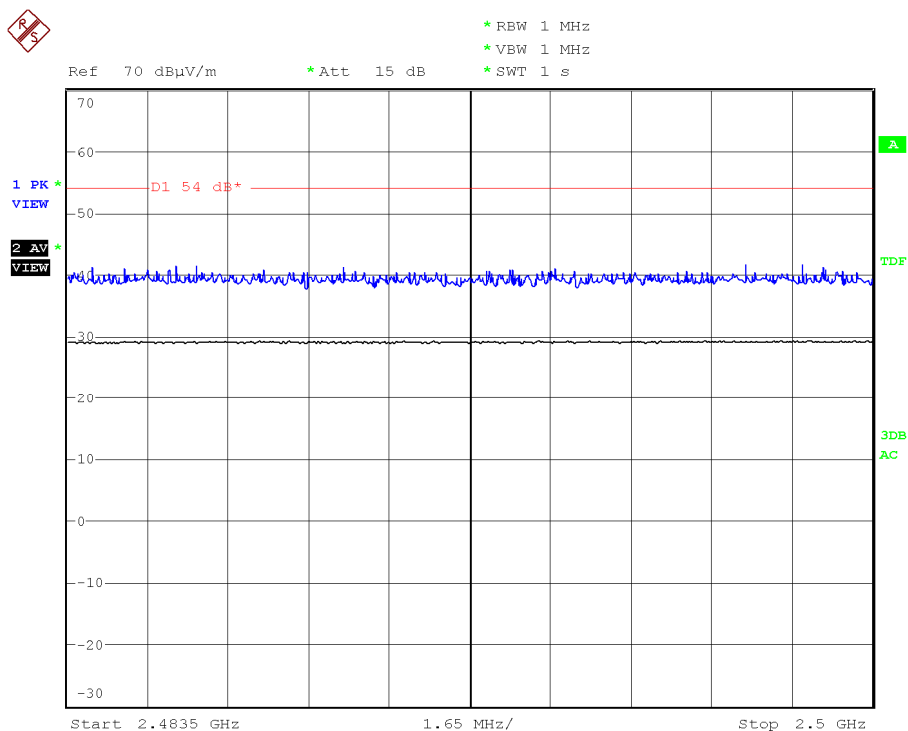
FREQUENCY RANGE 2.31 GHz to 2.39 GHz. (RESTRICTED BAND)



(This plot is valid for all three channels and all modulation modes).

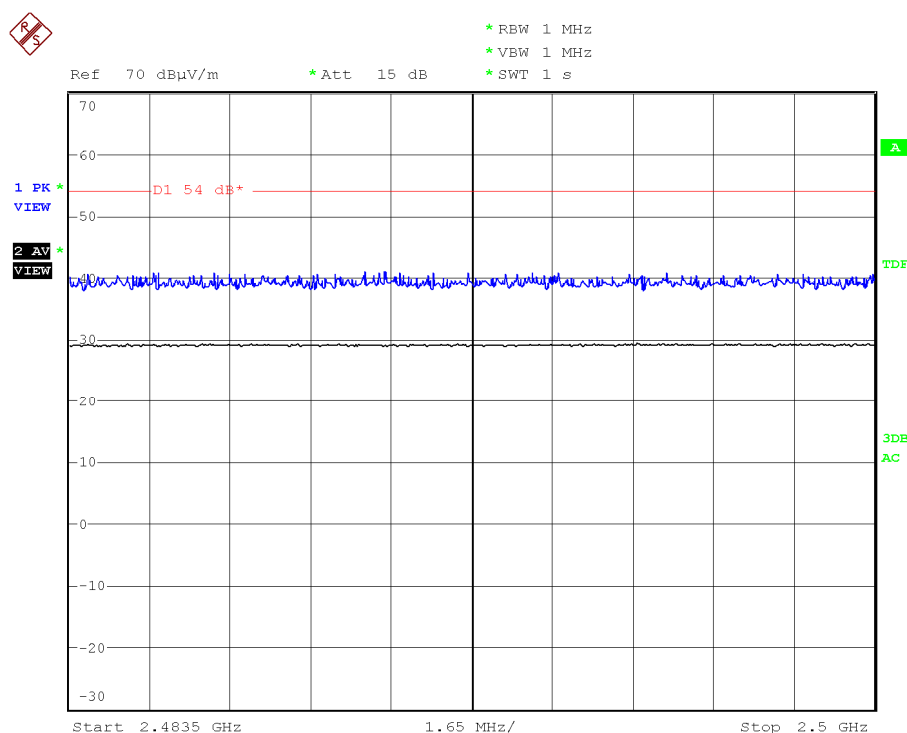
FREQUENCY RANGE 2.4835 GHz to 2.5 GHz. (RESTRICTED BAND)

CHANNEL: Lowest (2402 MHz).



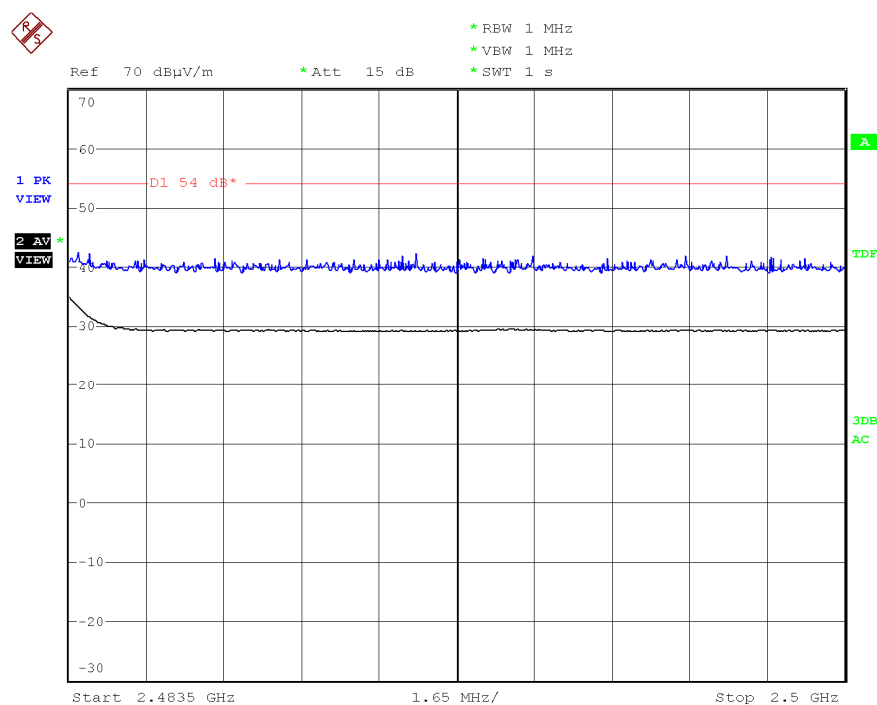
(This plot is valid for all modulation modes).

CHANNEL: Middle (2441 MHz).



(This plot is valid for all modulation modes).

CHANNEL: Highest (2480 MHz).



(This plot is valid for all modulation modes).

Section 15.109. Receiver spurious radiation

SPECIFICATION

The field strength shall not exceed the following values:

Frequency Range (MHz)	Field strength ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	300
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RESULTS:

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

All tests were performed in a semi-anechoic chamber at a distance of 3 m for the frequency range 30 MHz-1000 MHz and at distance of 1m for the frequency range 1 GHz-25 GHz.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyser. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

Note: It is not possible to select individual receiving channels in the equipment under test. The equipment under test is set in inquiry scan mode with the receiver open and scanning through receiving channels.

Frequency range 30 MHz-1000 MHz.

No spurious signals were detected in all the range.

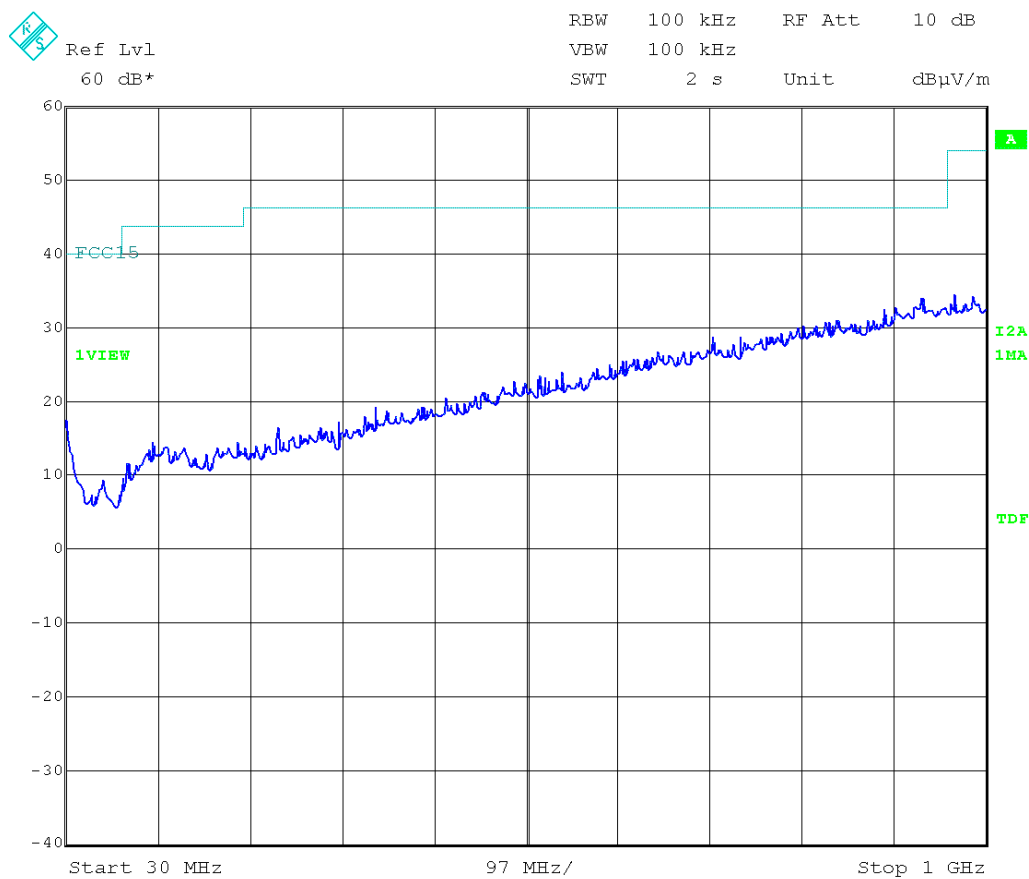
Frequency range 1 GHz-25 GHz.

No spurious signals were detected in all the range.

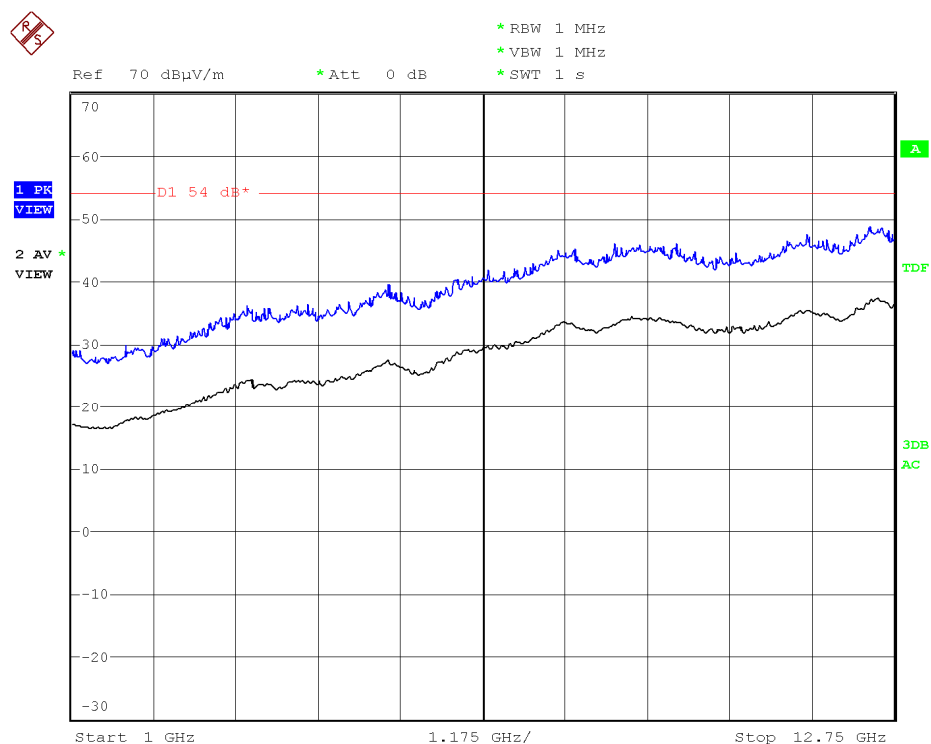
Additionally, no spurious signals were found inside the restricted bands 2310-2390 MHz and 2483.5-2500 MHz.

Verdict: PASS.

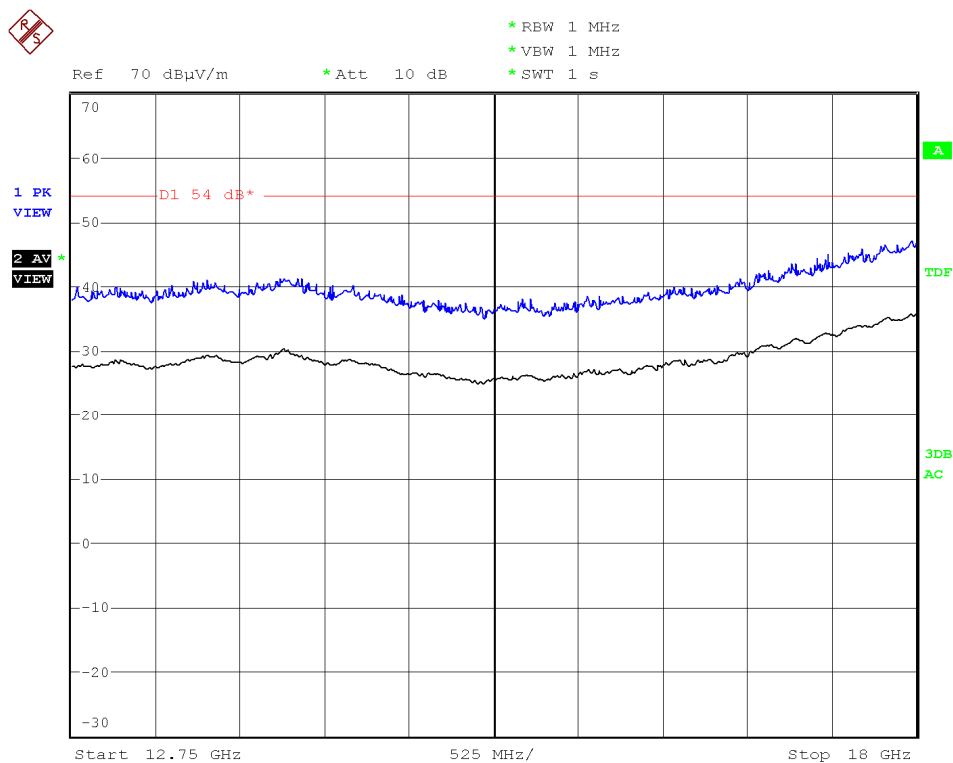
FREQUENCY RANGE 30 MHz-1000 MHz.



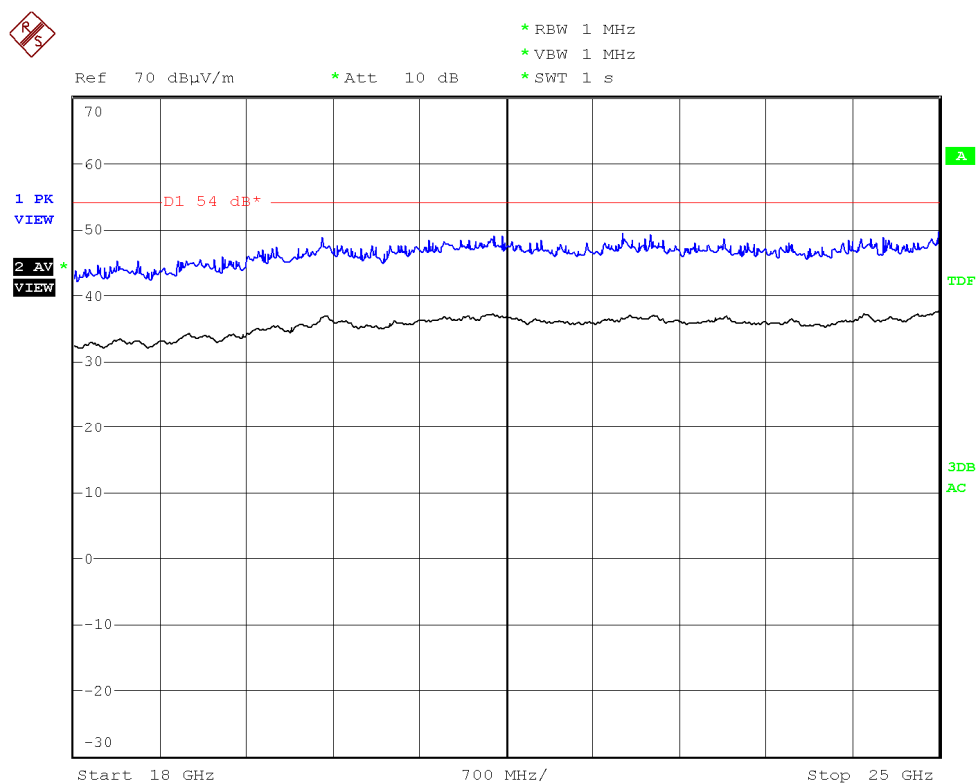
FREQUENCY RANGE 1 GHz-12.75 GHz.



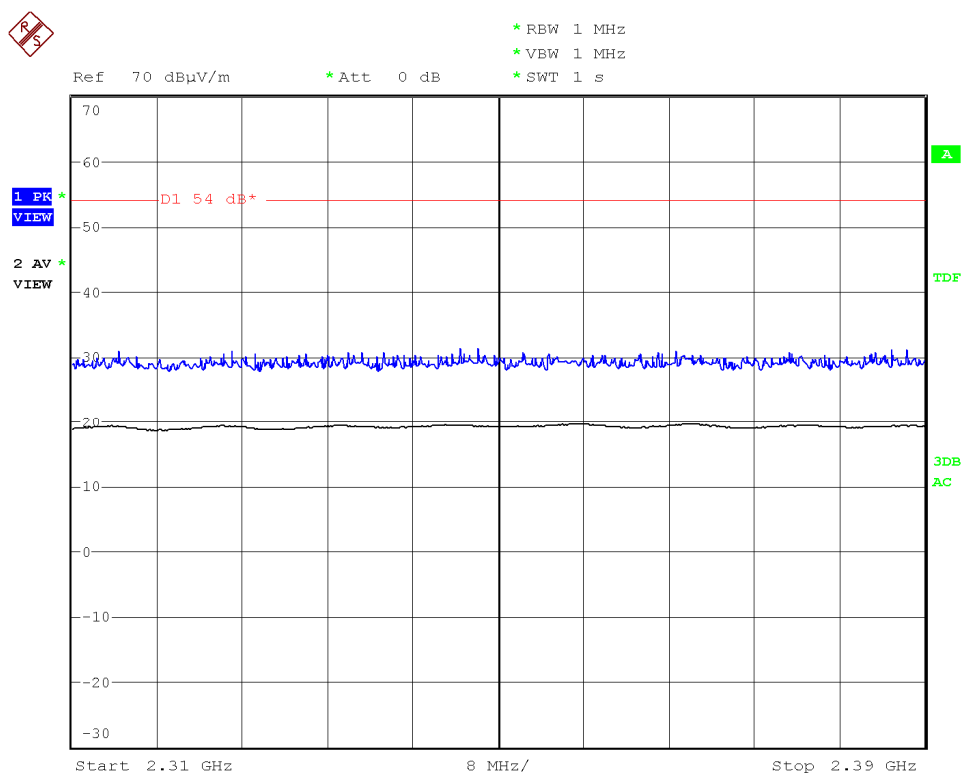
FREQUENCY RANGE 12.75 GHz-18 GHz.



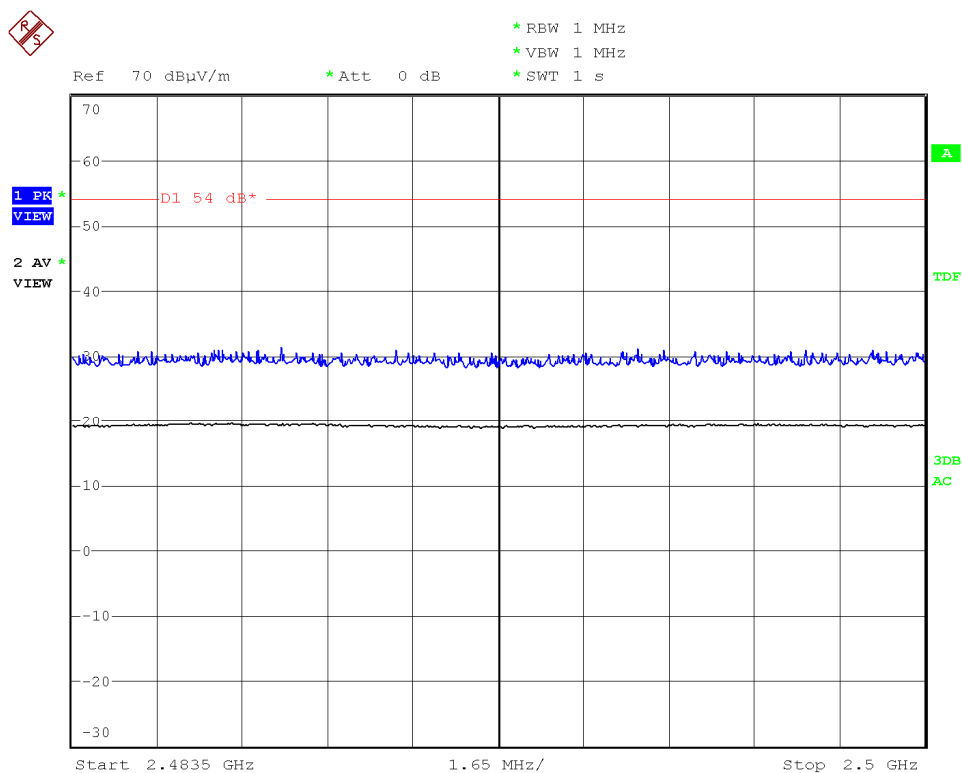
FREQUENCY RANGE 18 GHz-25 GHz.



FREQUENCY RANGE 2.31 GHz to 2.39 GHz. (RESTRICTED BAND)



FREQUENCY RANGE 2.4835 GHz to 2.5 GHz. (RESTRICTED BAND)



APPENDIX B: Measuring results for electromagnetic conducted emission

CONTENT:

DESCRIPTION OF THE OPERATION MODES.....	85
CONTINUOUS CONDUCTED EMISSION ON POWER LEADS	86

DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. Every operation mode takes a failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

In the following table appears the operation modes used by the samples tested to that it refers the present test report.

OPERATION MODE	DESCRIPTION
OM#07	EUT ON. TCH 850 MHz. Bluetooth Tx. Charging batteries.
OM#08	EUT ON. TCH 1900MHz. Bluetooth Tx. Charging batteries.
OM#09	EUT ON. TCH UMTS FDD II. Bluetooth Tx. Charging batteries.
OM#010	EUT ON. TCH UMTS FDD V. Bluetooth Tx. Charging batteries.
OM#011	EUT ON. TCH WiFi. Bluetooth Tx. Charging batteries.
OM#012	EUT ON. TCH SAT. Bluetooth Tx. Charging batteries.

*Power supply: 115Vac / 60 Hz or by means of the laptop PC USB port, depending of the used sample.

CONTINUOUS CONDUCTED EMISSION ON POWER LEADS

LIMITS:	Product standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART C.
	Test standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART C.

CLASS B

The applied limit for continuous conducted emissions in power leads, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0,15 to 0,5	66-56	56-46
0,5 to 5	56	46
5 to 30	60	50

TESTED SAMPLES:	S/03 & 04
TESTED OPERATION MODES:	OM#07 to OM#12
TEST RESULTS :	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

CCmmnnhh	Description	Result
CC03070N	Neutral wire noise.	P
CC0307L1	Phase wire noise.	P
CC03080N	Neutral wire noise.	P
CC0308L1	Phase wire noise.	P
CC03090N	Neutral wire noise.	P
CC0309L1	Phase wire noise.	P
CC03100N	Neutral wire noise.	P
CC0310L1	Phase wire noise.	P
CC03110N	Neutral wire noise.	P
CC0311L1	Phase wire noise.	P
CC03120N	Neutral wire noise.	P
CC0312L1	Phase wire noise.	P

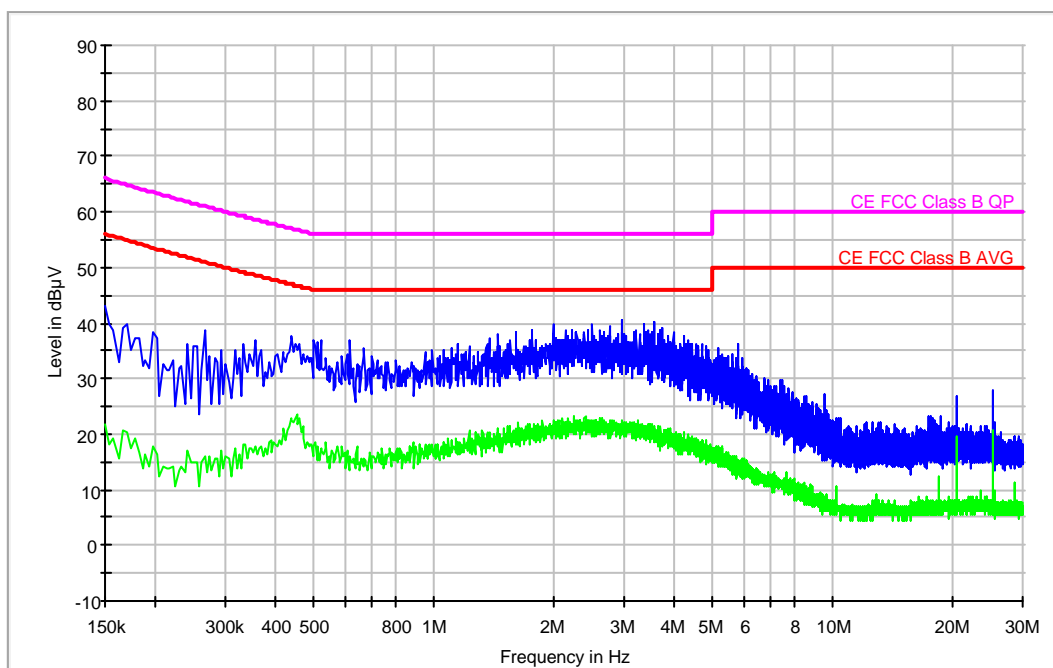
CC04070N	Neutral wire noise.	P
CC0407L1	Phase wire noise.	P
CC04080N	Neutral wire noise.	P
CC0408L1	Phase wire noise.	P
CC04090N	Neutral wire noise.	P
CC0409L1	Phase wire noise.	P
CC04100N	Neutral wire noise.	P
CC0410L1	Phase wire noise.	P
CC04110N	Neutral wire noise.	P
CC0411L1	Phase wire noise.	P
CC04120N	Neutral wire noise.	P
CC0412L1	Phase wire noise.	P

Continuous Conducted emission : CC03070N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#07
 Date: 2009-11-10 20:09
 Setup: EMI conducted
 Mode: EUT ON. TCH mode 850MHz + BT Tx. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

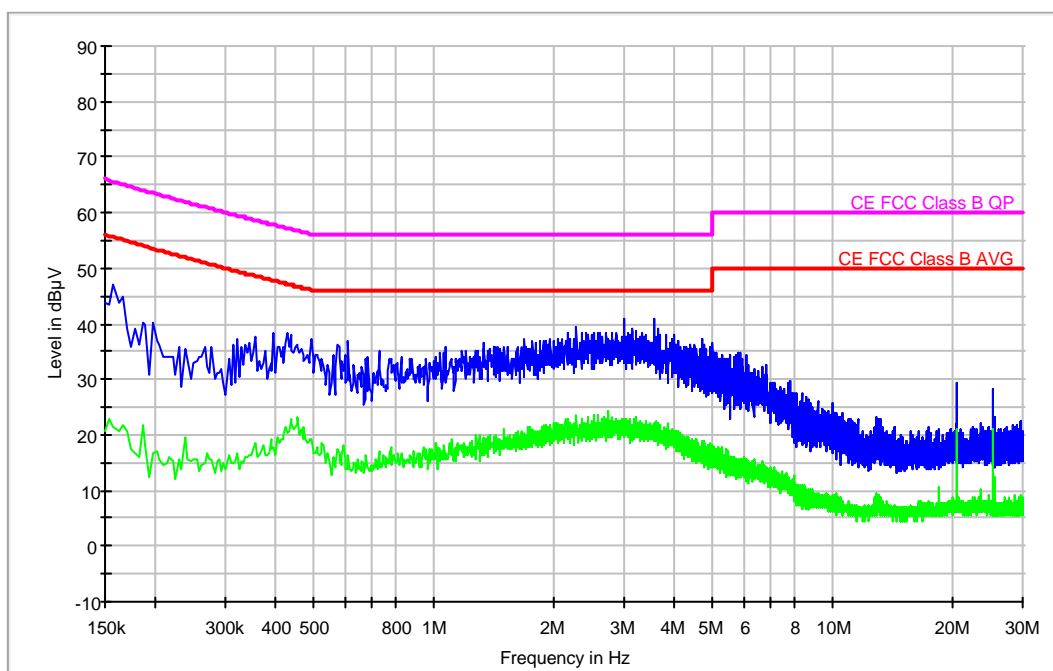
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)
0.150000	43.2	21.7
0.358000	37.1	17.9
0.522000	36.8	17.5
0.618000	36.9	16.0
1.150000	36.4	18.6
1.994000	39.8	21.6
2.962000	40.5	21.3
3.582000	40.1	21.2
5.810000	36.1	15.1
9.566000	27.1	8.0
18.758000	23.3	7.5
25.254000	28.0	20.8

Continuous Conducted emission : CC0307L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#07
 Date: 2009-11-10 19:59
 Setup: EMI conducted
 Mode: EUT ON. TCH mode 850MHz + BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

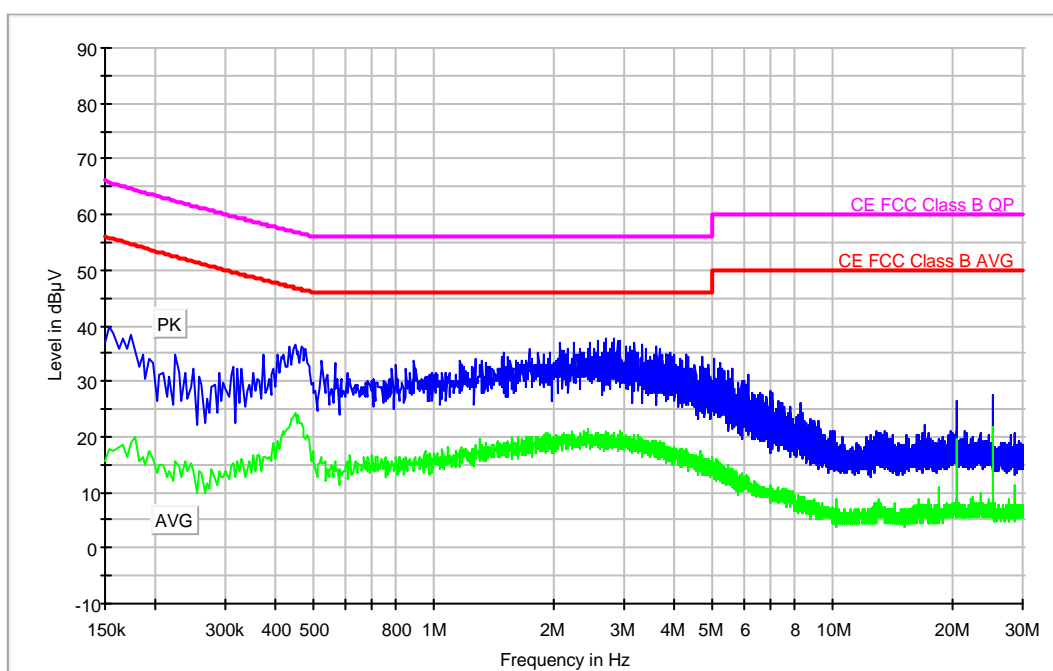
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)
0.158000	46.9	21.6
0.358000	37.6	18.4
0.494000	37.4	19.1
0.610000	37.1	16.5
1.334000	36.5	19.1
2.054000	37.5	21.2
2.998000	40.8	22.6
3.566000	40.8	22.0
5.782000	34.8	15.1
8.162000	27.5	10.9
12.838000	23.2	9.7
20.482000	29.5	20.3

Continuous Conducted emission : CC03080N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#08
 Date: 2009-11-10 20:14
 Setup: EMI conducted
 Mode: EUT ON. TCH mode 1900MHz + BT Tx. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

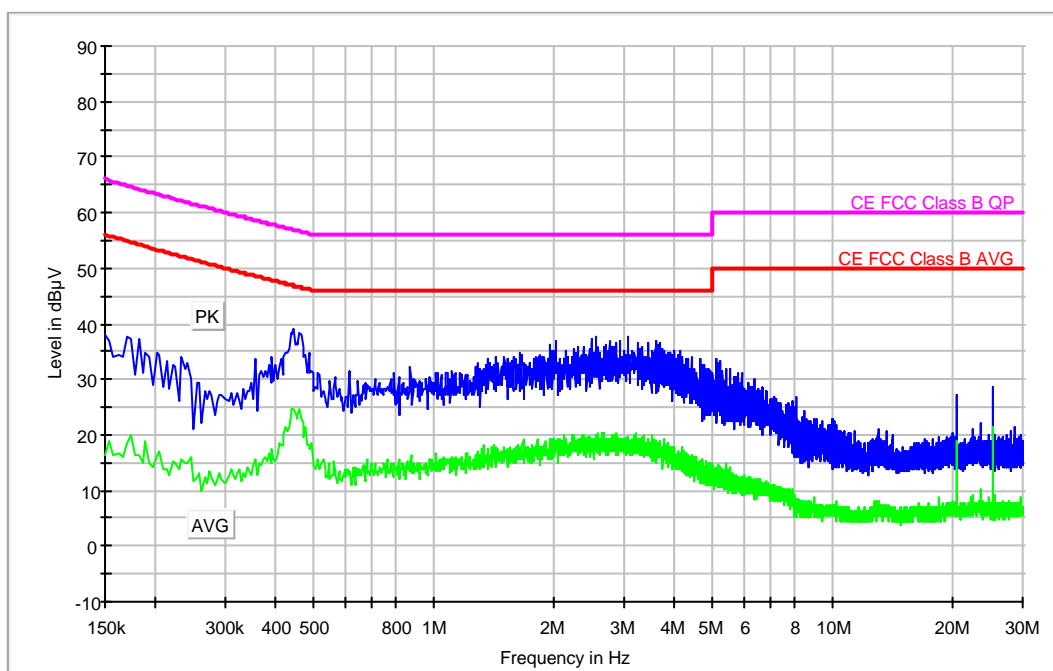
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.154000	39.7	17.9
0.330000	32.3	16.0
0.450000	36.5	24.4
0.566000	33.2	15.8
1.270000	33.9	18.4
2.082000	36.8	20.1
2.842000	37.7	20.7
3.326000	36.7	19.6
5.222000	33.4	14.3
8.266000	26.0	8.6
17.058000	22.1	7.5
25.254000	27.5	21.8

Continuous Conducted emission : CC0308L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#08
 Date: 2009-11-10 20:16
 Setup: EMI conducted
 Mode: EUT ON. TCH mode 1900MHz + BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

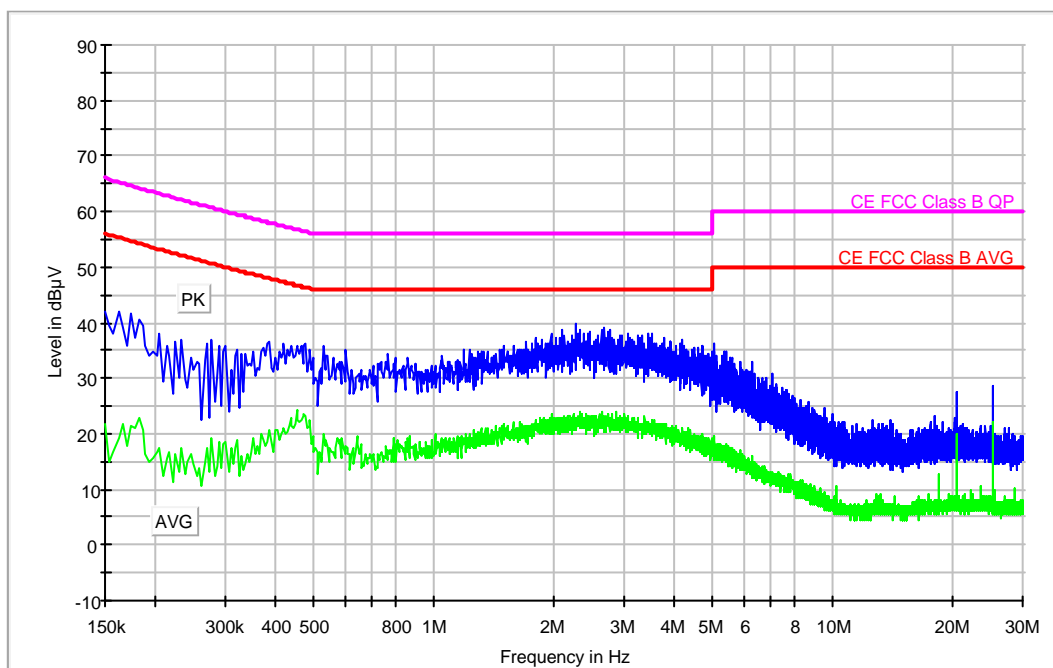
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)
0.182000	37.3	16.2
0.358000	33.5	15.5
0.446000	39.0	24.8
0.874000	32.1	15.1
1.286000	33.0	17.1
2.030000	37.1	18.9
3.058000	37.6	19.1
3.626000	37.0	18.8
5.234000	33.2	14.0
8.142000	26.8	8.6
13.042000	21.2	6.8
25.254000	28.6	21.4

Continuous Conducted emission : CC03090N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#09
 Date: 2009-11-10 20:32
 Setup: EMI conducted
 Mode: EUT ON. TCH mode UMTS FDD II+ BT Tx. Neutral wire noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

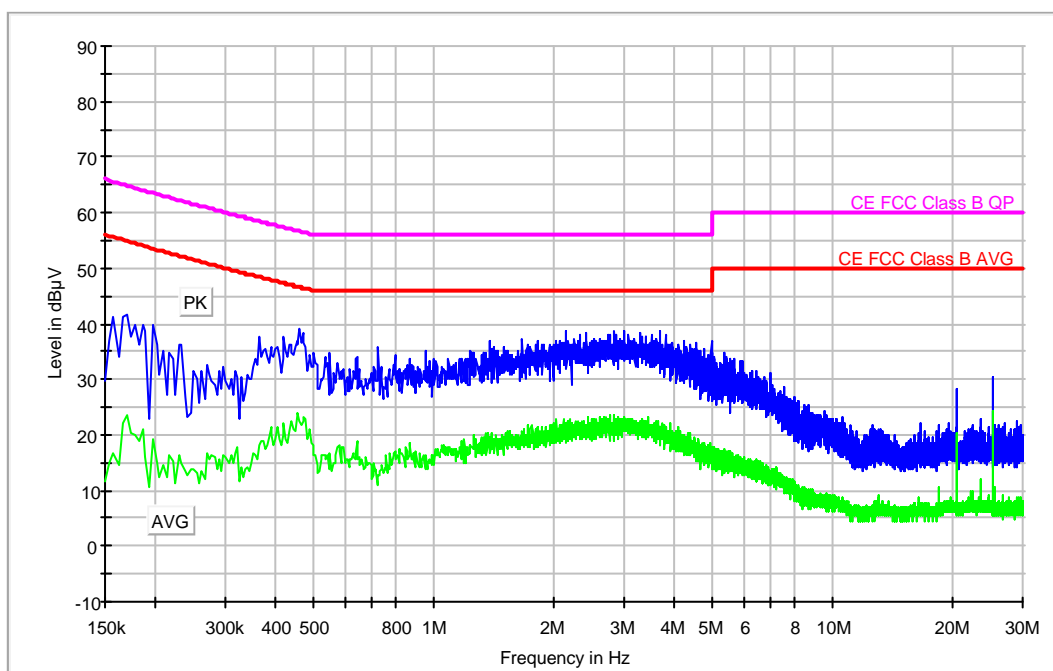
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.162000	42.1	19.4
0.278000	37.1	19.2
0.478000	36.2	23.1
0.602000	35.0	17.7
1.226000	35.0	19.8
2.098000	38.6	23.0
2.270000	39.9	22.6
3.522000	37.9	22.4
5.398000	34.7	16.7
8.042000	26.3	10.5
17.942000	23.1	7.5
25.254000	28.5	22.2

Continuous Conducted emission : CC0309L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#09
 Date: 2009-11-10 20:35
 Setup: EMI conducted
 Mode: EUT ON. TCH mode UMTS FDD II+ BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

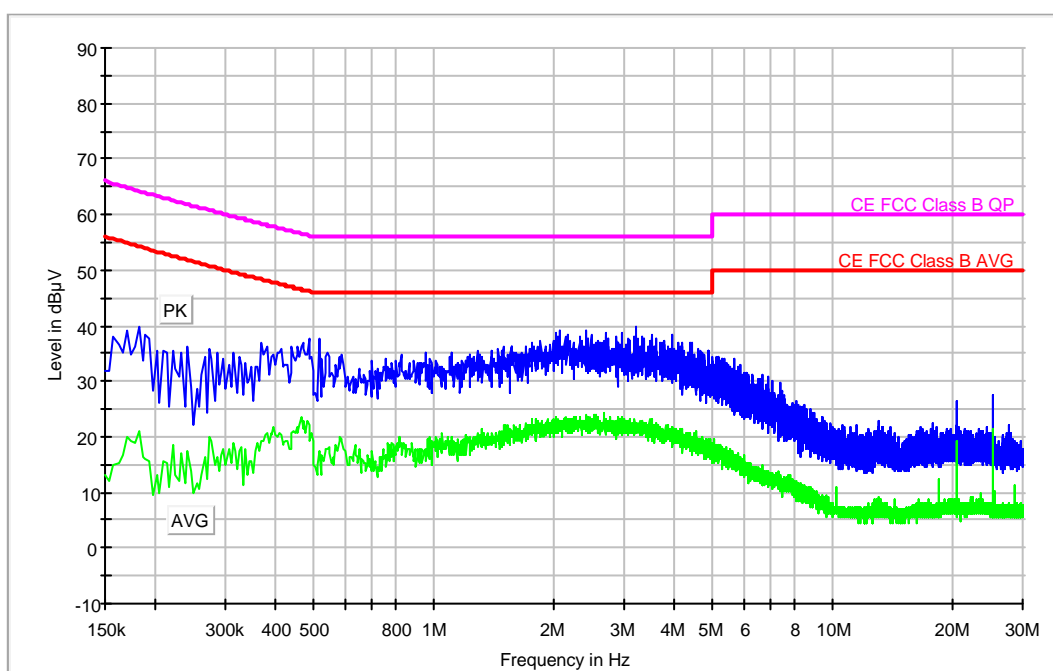
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)
0.170000	41.4	23.4
0.358000	33.5	16.5
0.462000	39.1	22.4
0.726000	35.7	12.7
1.238000	35.2	18.2
1.670000	37.5	20.6
3.002000	38.9	21.8
3.706000	38.6	21.1
5.358000	34.7	17.3
8.066000	26.9	10.1
16.554000	22.1	7.5
25.254000	30.6	24.2

Continuous Conducted emission : CC03100N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#10
 Date: 2009-11-10 20:44
 Setup: EMI conducted
 Mode: EUT ON. TCH mode UMTS FDD V+ BT Tx. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

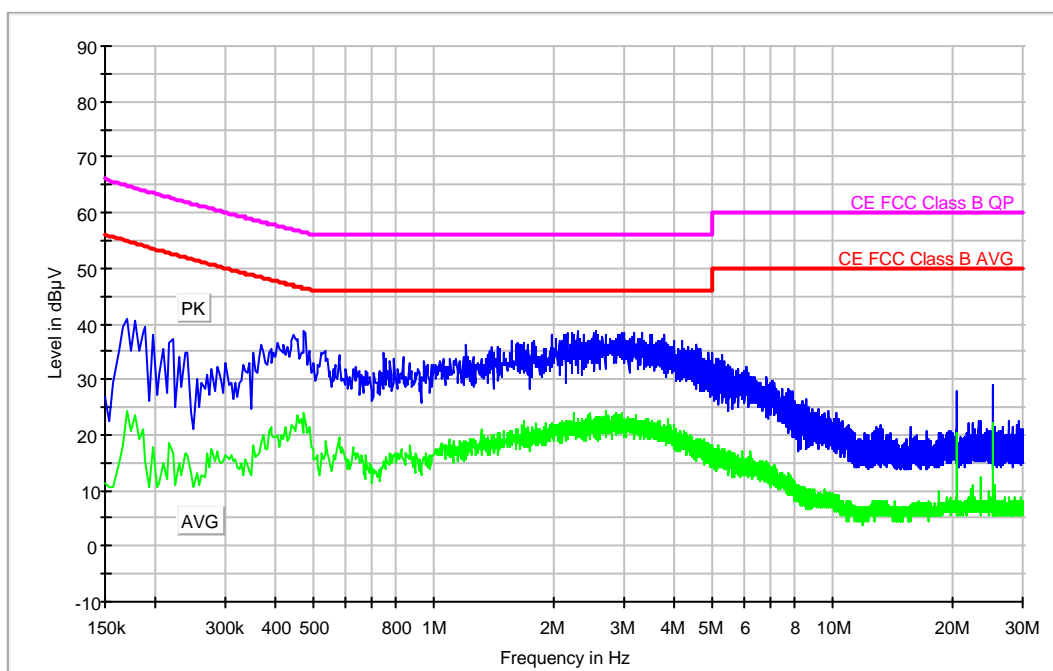
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)
0.182000	39.7	20.9
0.314000	35.1	18.9
0.518000	37.8	17.3
0.830000	34.9	18.9
1.286000	35.6	20.7
2.070000	39.3	21.0
3.218000	39.7	22.3
3.958000	38.2	20.8
5.198000	34.4	18.6
8.122000	26.4	10.9
12.978000	22.7	8.6
25.254000	27.7	21.3

Continuous Conducted emission : CC0310L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#10
 Date: 2009-11-10 20:41
 Setup: EMI conducted
 Mode: EUT ON. TCH mode UMTS FDD V + BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

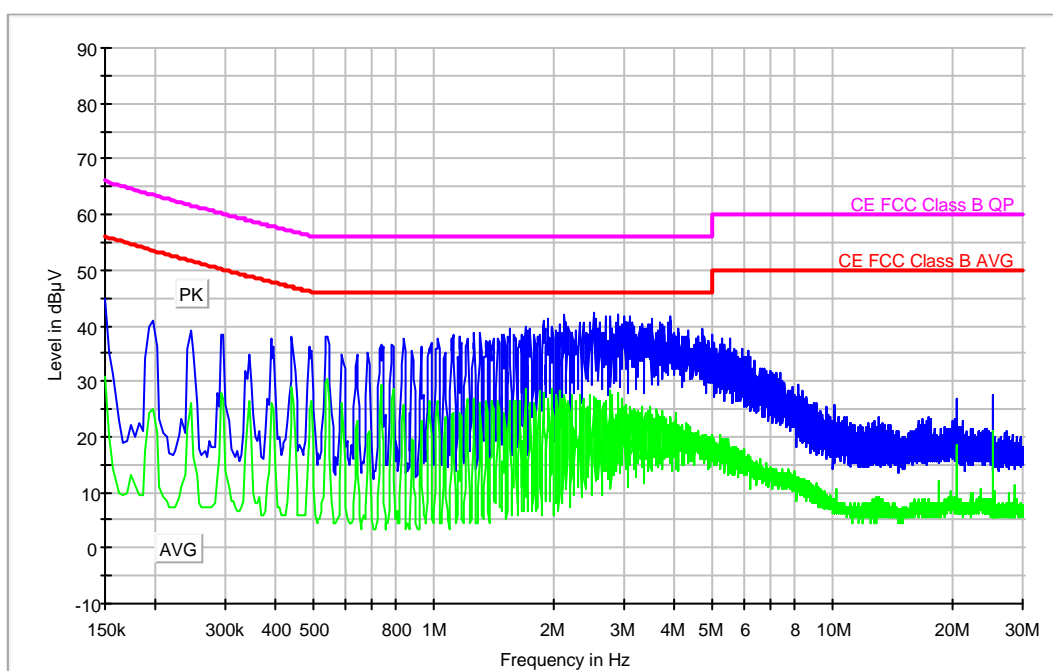
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)
0.170000	41.1	24.2
0.354000	34.9	18.2
0.474000	38.8	23.9
0.750000	34.7	15.3
1.210000	36.4	18.9
1.978000	37.8	21.6
2.542000	38.7	21.7
3.326000	38.4	22.6
5.302000	34.5	16.3
8.566000	26.4	9.6
13.214000	21.8	7.5
25.254000	29.1	22.2

Continuous Conducted emission : CC03110N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#11
 Date: 2009-11-10 21:37
 Setup: EMI conducted
 Mode: EUT ON. TCH mode WIFI+ BT on. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

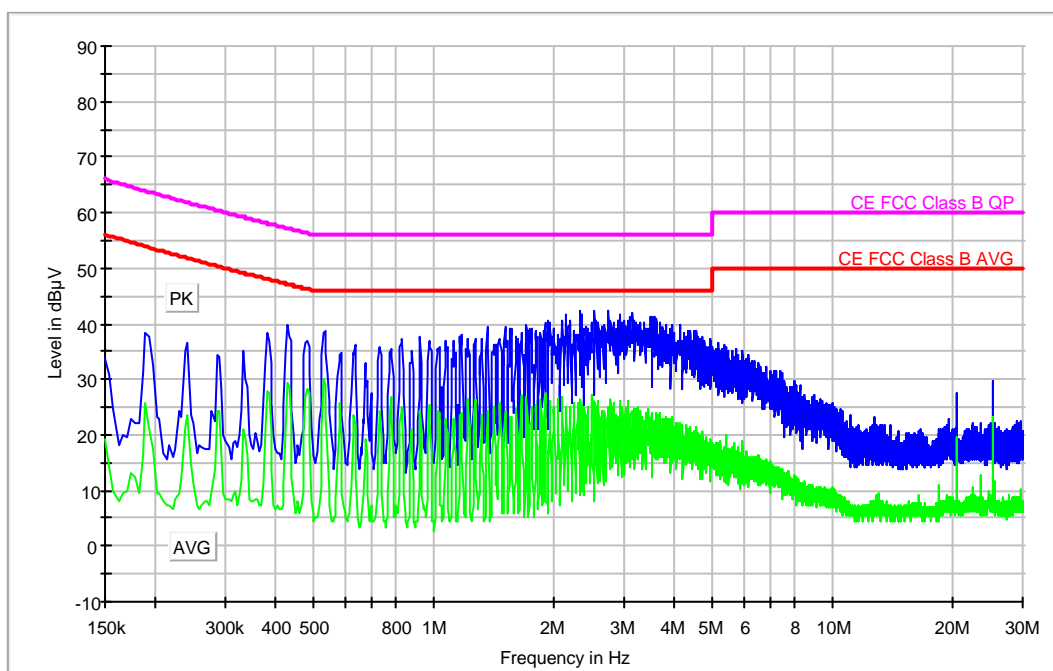
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	44.9	30.7
0.294000	38.4	28.1
0.538000	38.1	29.6
0.842000	37.7	25.2
1.310000	38.6	25.0
1.934000	41.3	26.7
2.510000	42.4	24.5
3.914000	41.5	23.6
5.518000	37.5	17.9
8.222000	29.4	12.5
17.378000	23.6	8.7
25.254000	27.5	21.2

Continuous Conducted emission : CC0311L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#11
 Date: 2009-11-10 21:40
 Setup: EMI conducted
 Mode: EUT ON. TCH mode WIFI+ BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

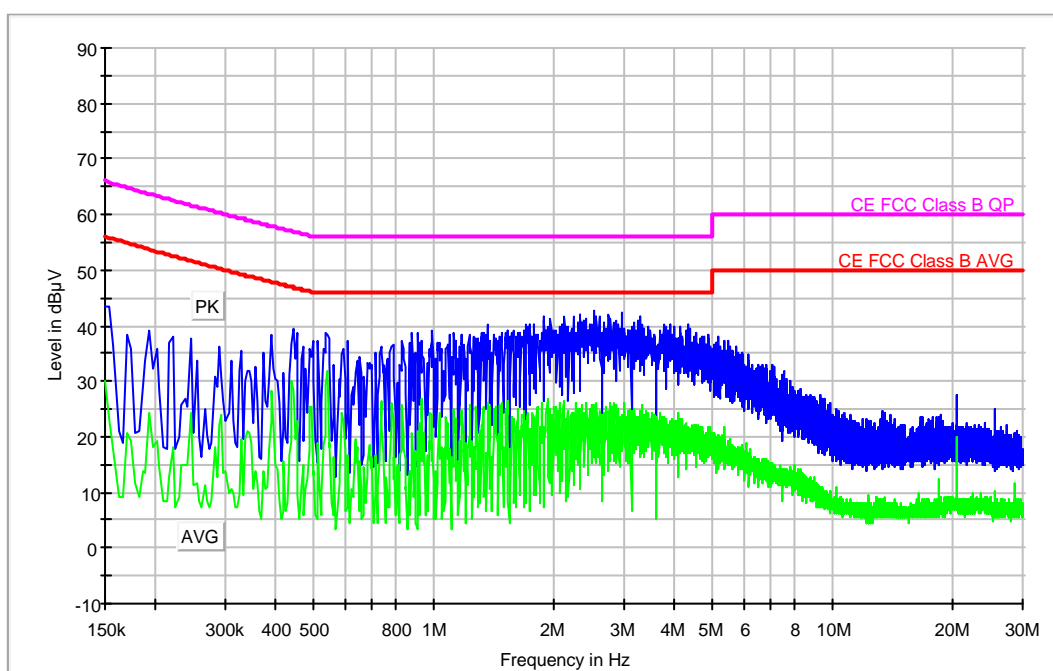
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)
0.190000	38.5	25.6
0.334000	35.0	21.2
0.430000	39.9	29.5
0.834000	37.2	24.8
1.362000	39.4	22.9
2.094000	40.7	27.0
2.534000	42.5	26.1
3.562000	41.4	22.0
5.182000	36.4	15.6
8.054000	29.7	11.7
12.814000	23.2	6.8
25.254000	29.6	23.3

Continuous Conducted emission : CC03120N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#12
 Date: 2009-11-10 22:59
 Setup: EMI conducted
 Mode: EUT ON. Tx SAT + BT ON. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

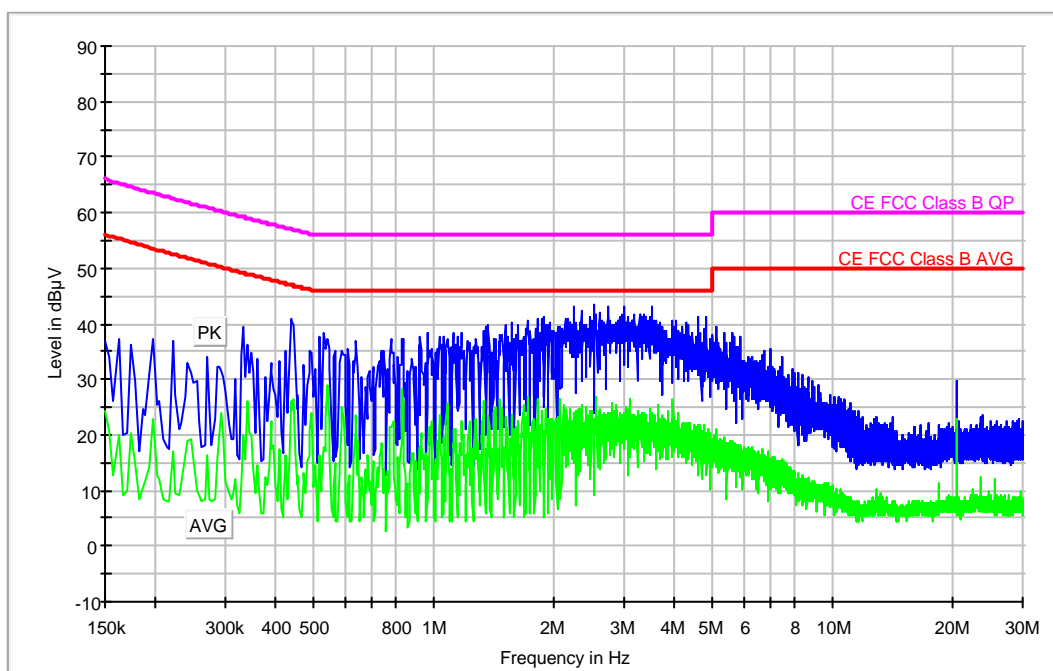
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	43.6	30.0	
0.330000	35.4	19.7	
0.538000	38.8	29.5	
0.834000	37.4	25.8	
0.994000	39.1	18.6	
1.886000	41.6	21.9	
2.514000	42.6	25.0	
3.306000	41.5	20.4	
5.166000	38.0	20.5	
7.922000	29.0	13.7	
13.390000	24.7	7.5	
20.482000	27.6	19.9	

Continuous Conducted emission : CC0312L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/03
 Operation mode: OM#12
 Date: 2009-11-10 23:00
 Setup: EMI conducted
 Mode: EUT ON. Tx SAT + BT ON. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

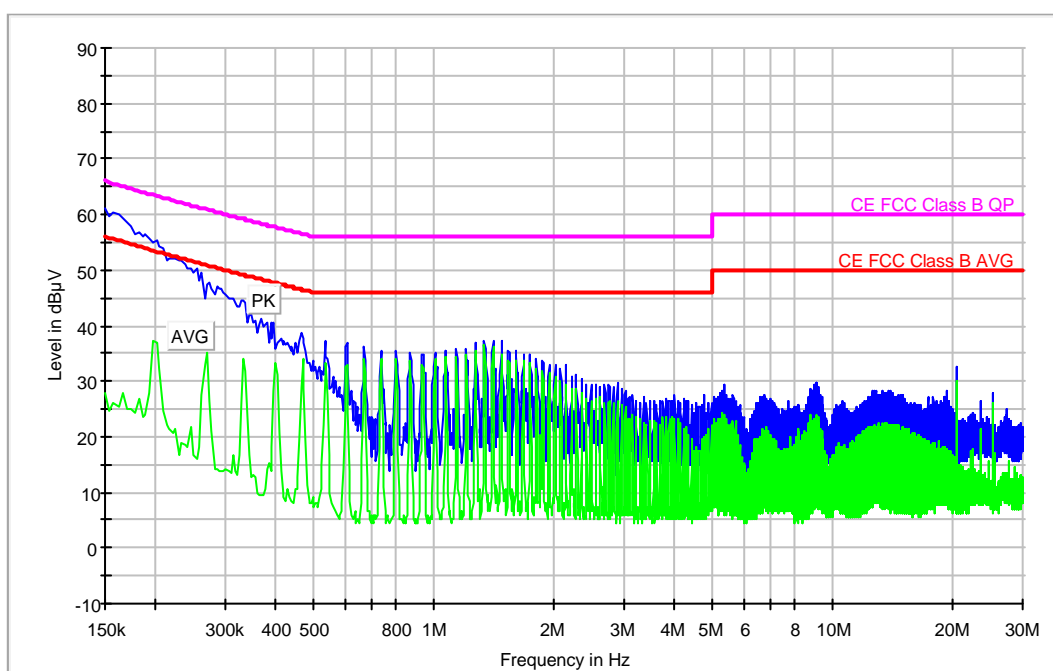
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)	Comment
0.222000	36.8	17.1	
0.334000	39.4	20.0	
0.438000	40.8	26.0	
0.782000	37.4	21.6	
1.362000	39.7	19.4	
1.894000	41.2	20.8	
2.514000	43.3	21.7	
3.534000	43.0	23.8	
5.130000	39.6	21.0	
8.186000	31.2	12.1	
14.218000	23.4	7.5	
20.482000	29.9	22.8	

Continuous Conducted emission : CC04070N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#07
 Date: 2009-11-11 01:05
 Setup: EMI conducted
 Mode: EUT ON. TCH mode 850MHz + BT Tx. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

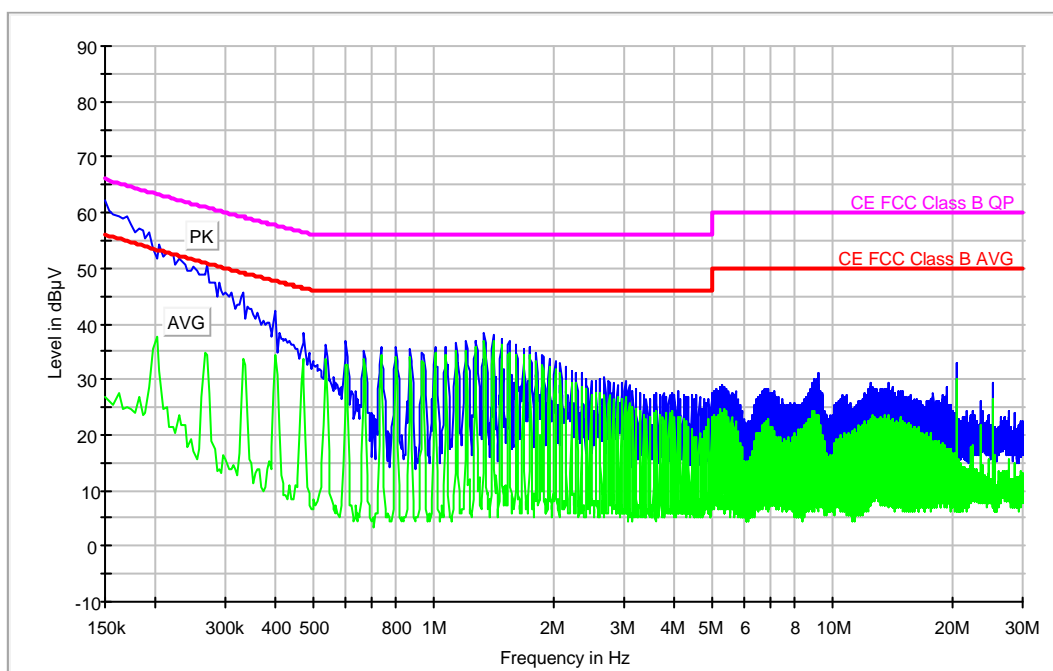
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	61.1	27.9	
0.534000	37.4	31.4	
0.606000	37.1	32.9	
1.342000	37.3	36.5	
1.410000	37.5	36.3	
2.150000	33.0	29.2	
4.030000	27.5	20.6	
5.370000	29.3	24.0	
9.066000	29.8	20.8	
12.550000	28.4	19.5	
20.478000	32.7	29.9	

Continuous Conducted emission : CC0407L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#07
 Date: 2009-11-11 01:06
 Setup: EMI conducted
 Mode: EUT ON. TCH mode 850MHz + BT Tx. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

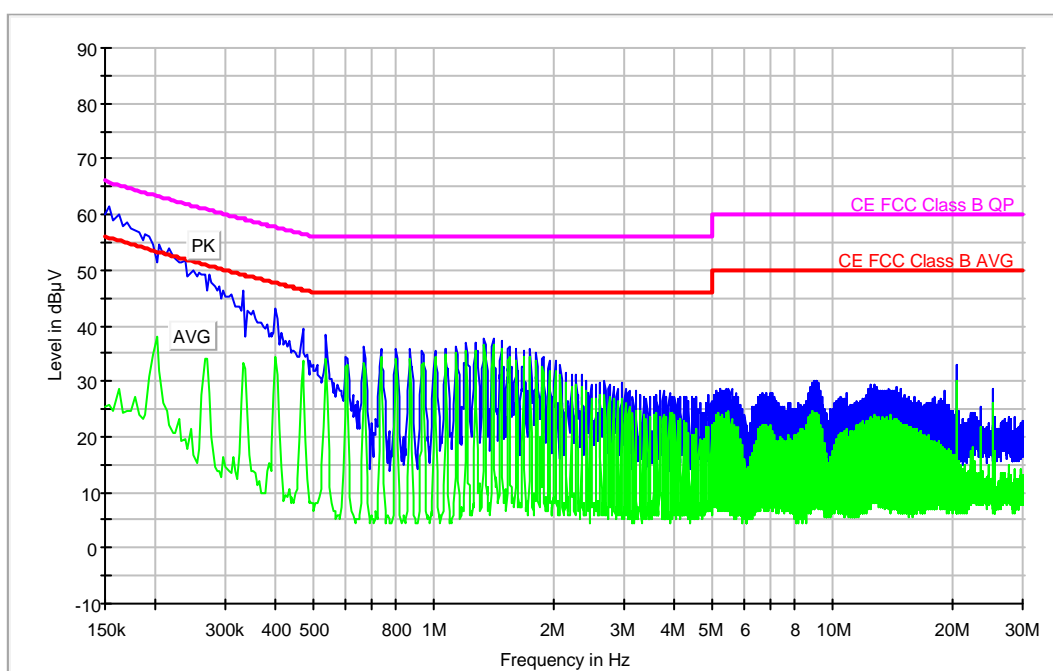
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)	Comment
0.150000	62.0	26.9	
0.538000	36.2	33.8	
0.602000	37.1	32.7	
1.342000	38.2	36.8	
1.410000	38.0	36.9	
2.150000	32.1	29.5	
4.094000	27.9	23.3	
5.302000	28.9	24.1	
9.202000	31.1	23.5	
12.486000	29.5	21.8	
20.478000	32.9	30.0	

Continuous Conducted emission : CC04080N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#08
 Date: 2009-11-11 01:07
 Setup: EMI conducted
 Mode: EUT ON. TCH mode 1900MHz + BT ON. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

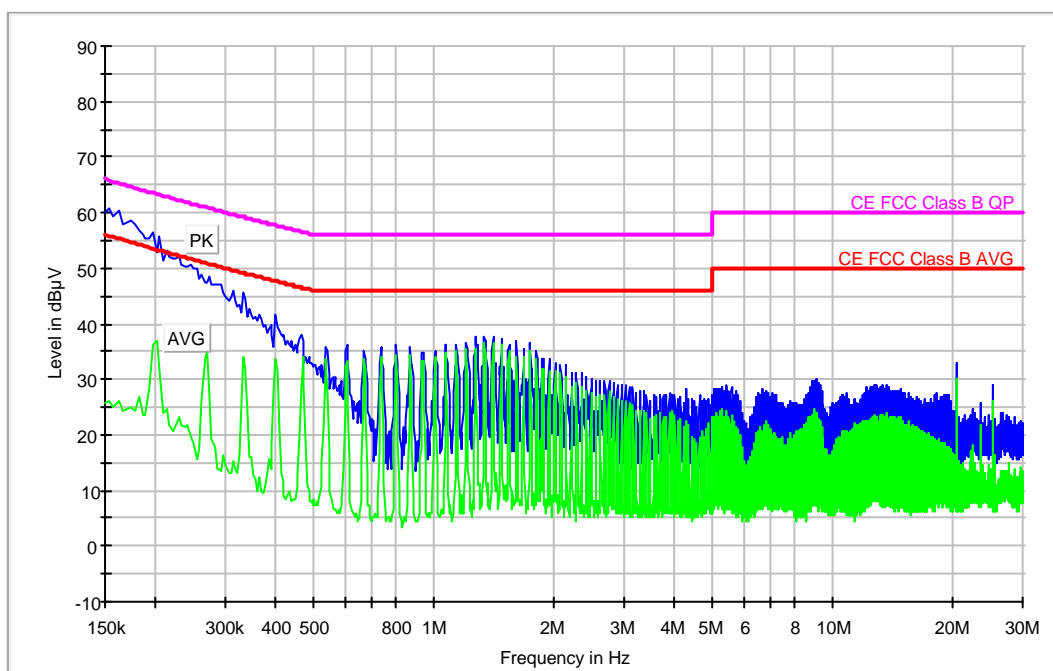
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.154000	61.4	25.8	
0.538000	38.4	34.1	
0.670000	36.1	33.5	
1.342000	37.8	36.7	
1.410000	37.6	36.7	
2.150000	31.6	29.9	
3.694000	28.4	23.5	
5.574000	28.8	23.2	
9.066000	30.2	24.2	
12.758000	29.5	24.1	
20.482000	33.1	29.8	

Continuous Conducted emission : CC0408L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#08
 Date: 2009-11-11 01:08
 Setup: EMI conducted
 Mode: EUT ON. TCH mode 1900MHz + BT ON. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

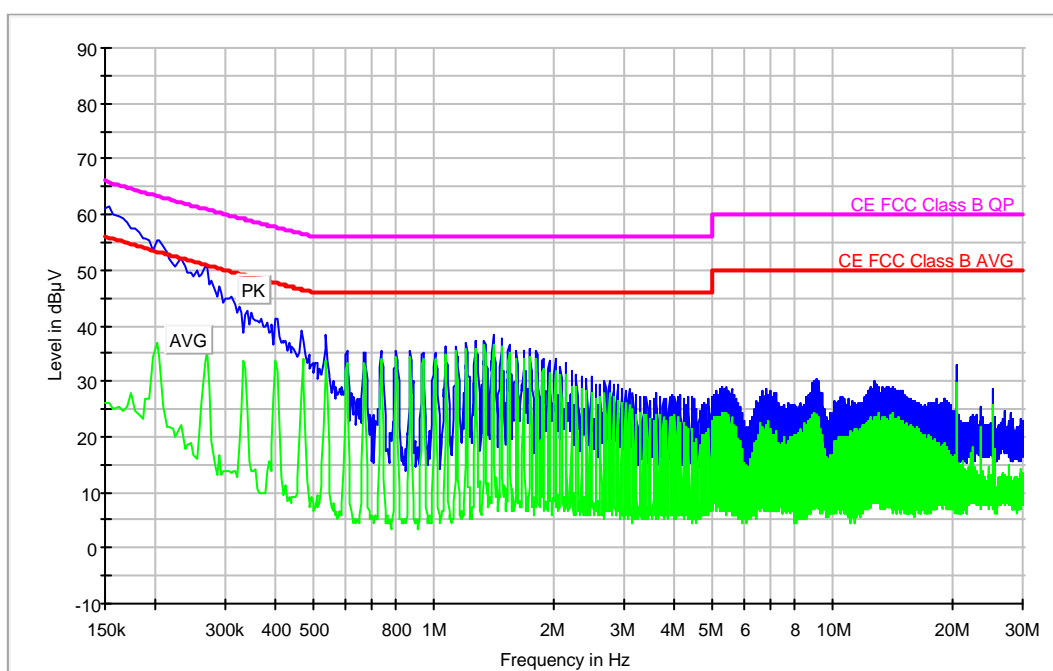
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)	Comment
0.154000	60.8	26.2	
0.402000	41.7	33.7	
0.606000	36.4	33.2	
1.274000	37.8	35.3	
1.410000	37.8	36.6	
2.150000	32.5	30.3	
4.298000	28.2	22.6	
5.442000	29.0	23.1	
9.066000	30.2	24.1	
12.758000	29.0	22.1	
20.482000	33.1	29.9	

Continuous Conducted emission : CC04090N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#09
 Date: 2009-11-11 01:10
 Setup: EMI conducted
 Mode: EUT ON. TCH mode UMTS FDD II + BT ON. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

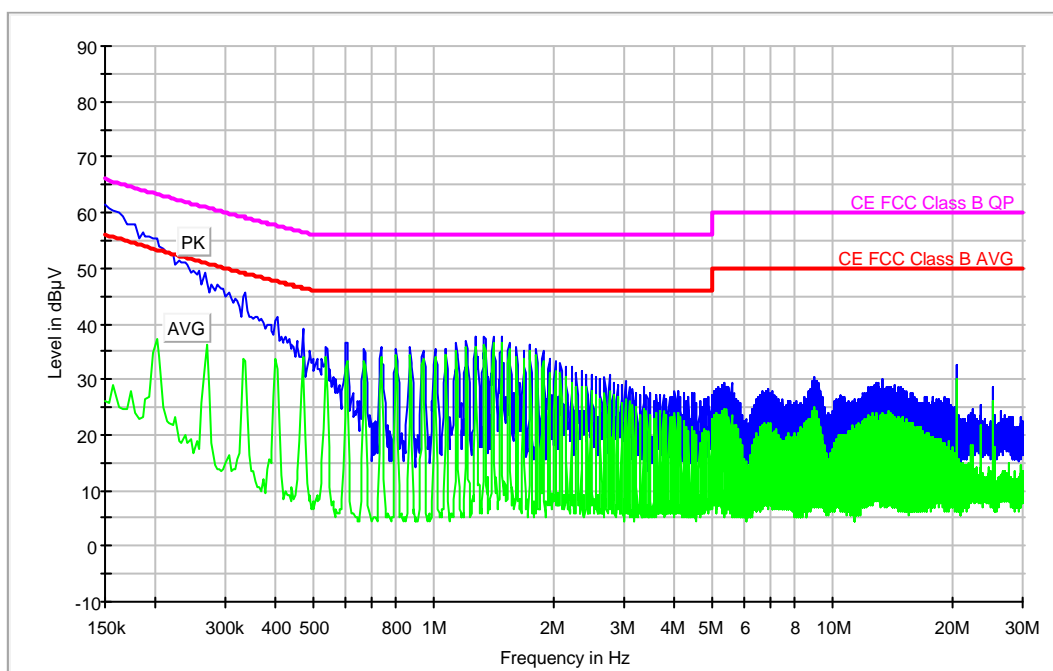
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.154000	61.4	26.0	
0.538000	38.4	33.8	
0.806000	35.5	34.3	
1.342000	37.5	36.4	
1.410000	38.3	36.7	
2.150000	33.4	31.0	
3.626000	27.8	24.0	
5.442000	28.9	24.3	
9.066000	30.4	23.8	
12.690000	29.9	19.4	
20.482000	32.9	29.9	

Continuous Conducted emission : CC0409L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#09
 Date: 2009-11-11 01:11
 Setup: EMI conducted
 Mode: EUT ON. TCH mode UMTS FDD II + BT ON. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

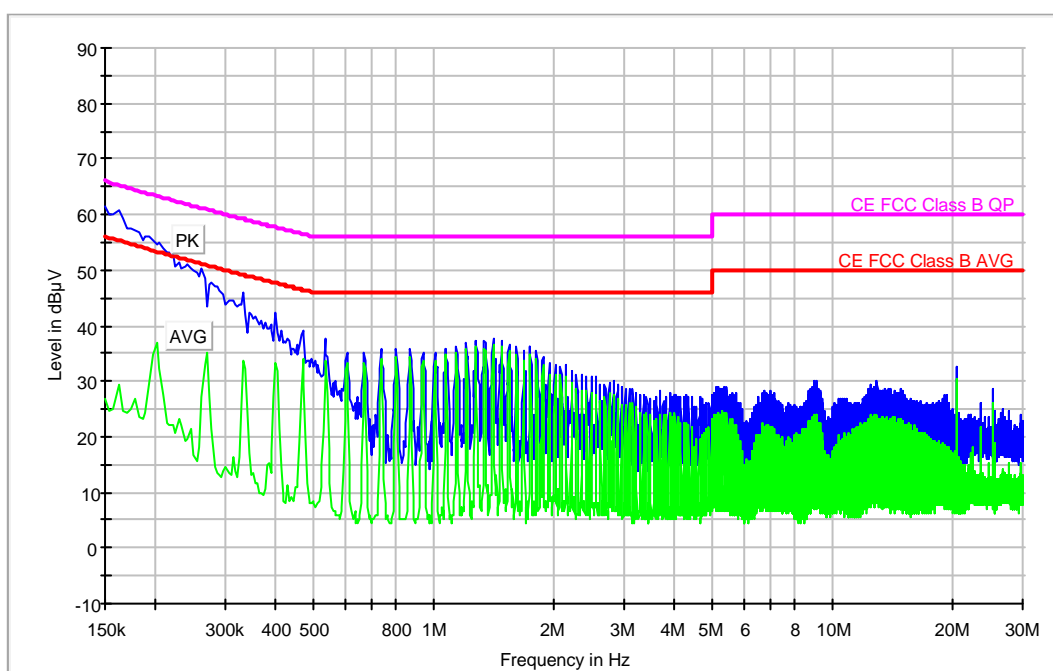
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)	Comment
0.150000	61.6	26.2	
0.602000	36.7	31.9	
1.342000	37.6	36.3	
1.410000	37.8	36.5	
2.218000	32.4	29.4	
3.358000	28.7	24.6	
5.574000	29.3	23.5	
9.002000	30.3	24.9	
13.366000	29.9	23.1	
20.482000	32.4	30.0	

Continuous Conducted emission : CC04100N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#10
 Date: 2009-11-11 01:12
 Setup: EMI conducted
 Mode: EUT ON. TCH mode UMTS FDD V + BT ON. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

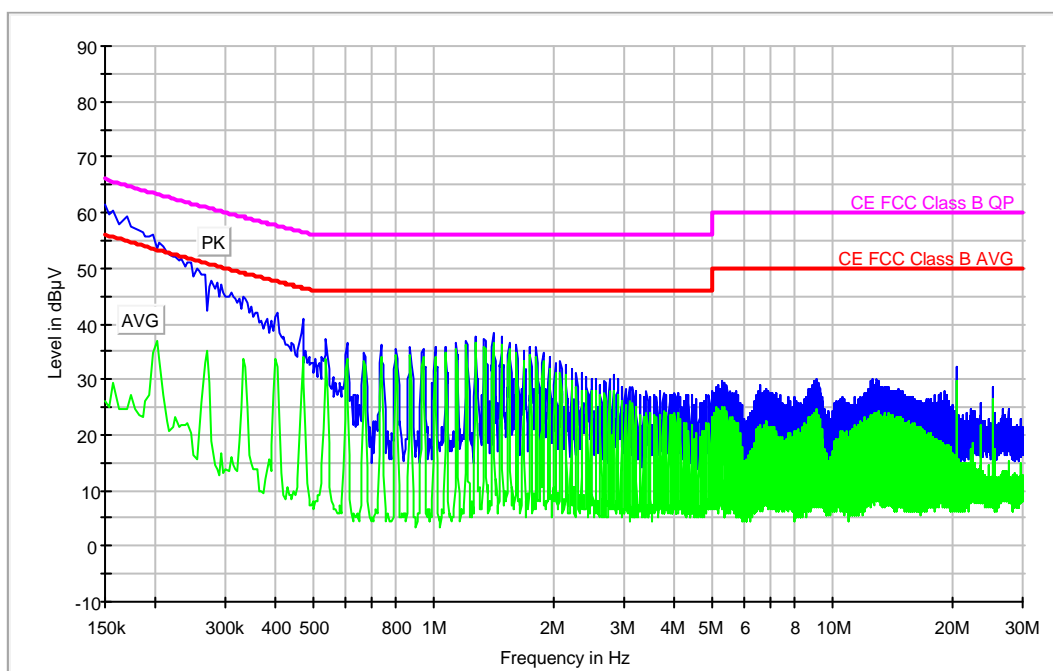
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	61.6	26.7	
0.534000	37.6	30.8	
0.874000	35.7	34.4	
1.342000	37.3	36.0	
1.410000	37.6	36.6	
2.150000	32.9	30.9	
3.694000	28.4	23.9	
5.374000	29.0	24.1	
9.138000	29.9	23.9	
12.834000	29.9	22.8	
20.478000	32.6	30.5	

Continuous Conducted emission : CC0410L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#10
 Date: 2009-11-11 01:13
 Setup: EMI conducted
 Mode: EUT ON. TCH mode UMTS FDD V + BT ON. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

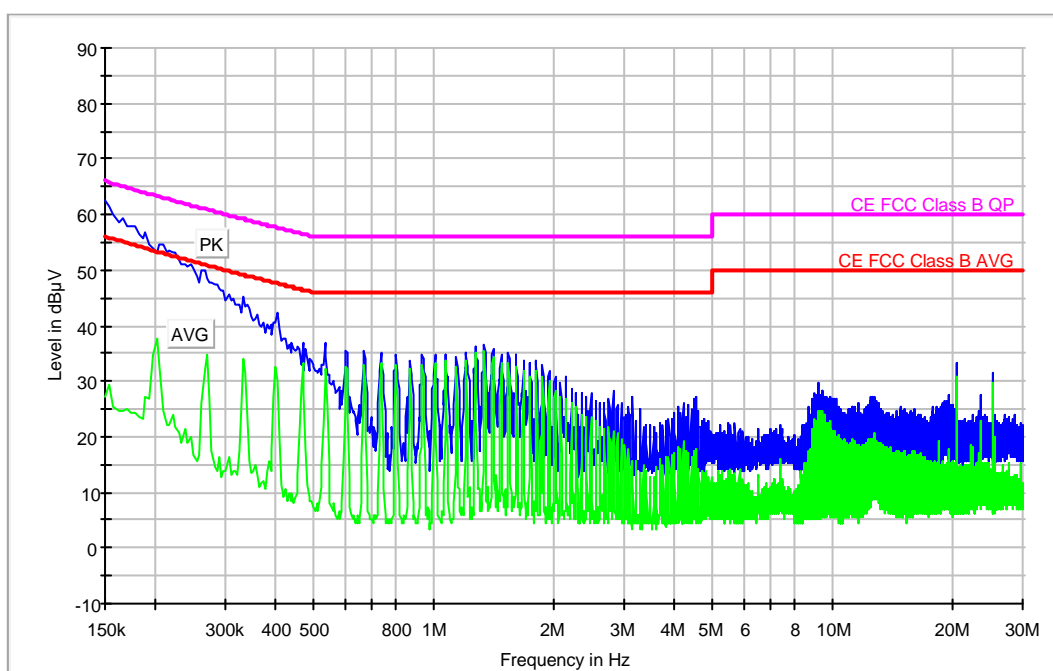
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)	Comment
0.150000	61.4	26.2	
0.470000	40.8	34.1	
0.606000	36.5	33.5	
1.278000	37.6	36.6	
1.410000	38.2	36.4	
2.150000	32.6	30.6	
4.974000	27.8	23.4	
5.310000	29.7	25.1	
9.138000	29.9	24.8	
12.966000	30.2	23.8	
20.482000	32.2	29.7	

Continuous Conducted emission : CC04110N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#11
 Date: 2009-11-10 23:36
 Setup: EMI conducted
 Mode: EUT ON. TCH mode WIFI + BT ON. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

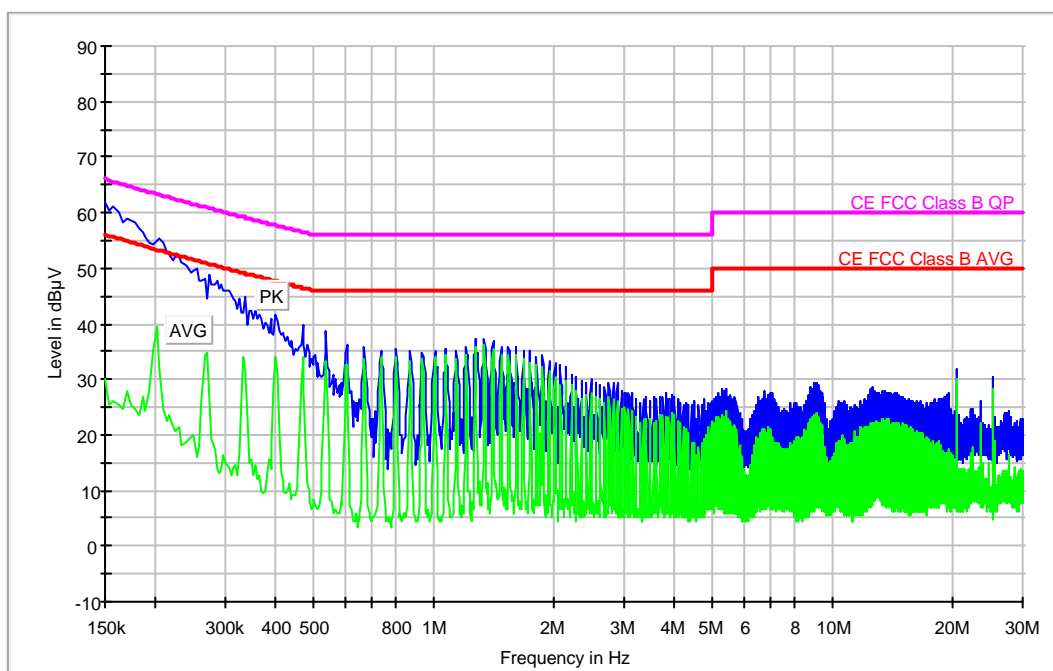
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	62.6	27.3	
0.670000	35.4	33.1	
1.342000	36.5	35.4	
1.410000	35.8	34.3	
2.146000	30.6	27.0	
4.562000	27.2	17.7	
5.502000	22.4	13.7	
9.258000	29.6	24.6	
12.814000	27.4	20.5	
20.482000	33.3	30.7	

Continuous Conducted emission : CC0411L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#11
 Date: 2009-11-10 23:35
 Setup: EMI conducted
 Mode: EUT ON. TCH mode WIFI + BT ON. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

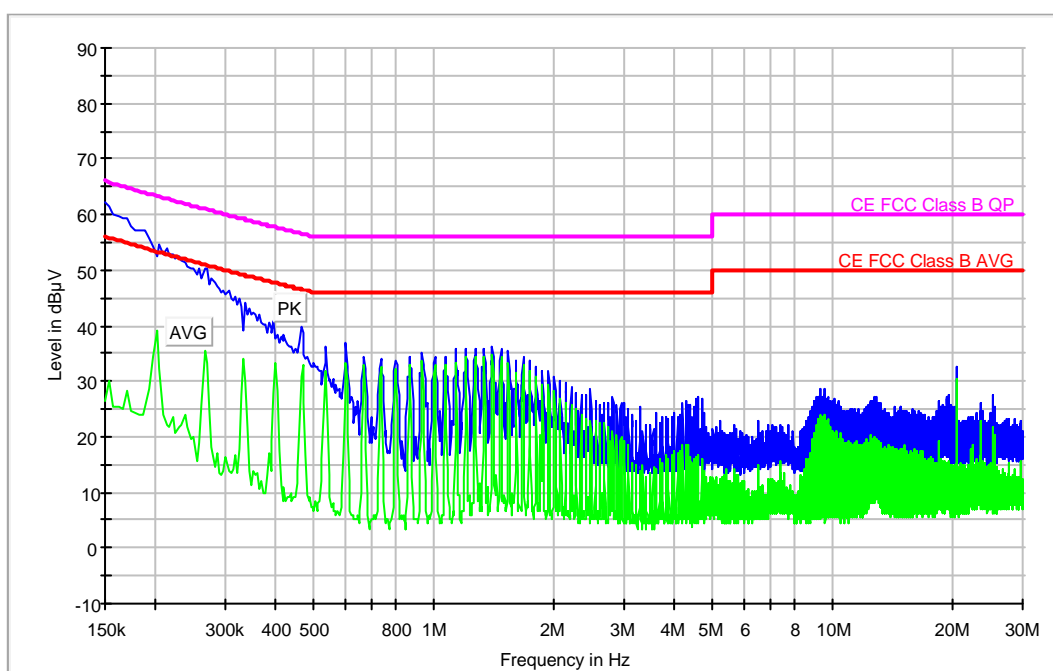
Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)	Comment
0.150000	61.9	30.1	
0.538000	38.6	33.4	
0.606000	36.2	32.4	
1.342000	37.5	36.3	
1.410000	36.9	35.5	
2.146000	32.2	29.6	
3.826000	27.4	23.3	
5.434000	28.2	24.1	
8.990000	29.5	23.5	
12.546000	28.5	21.3	
20.478000	31.9	29.8	

Continuous Conducted emission : CC04120N

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#12
 Date: 2009-11-10 23:20
 Setup: EMI conducted
 Mode: EUT ON. Tx SAT + BT ON. Neutral noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

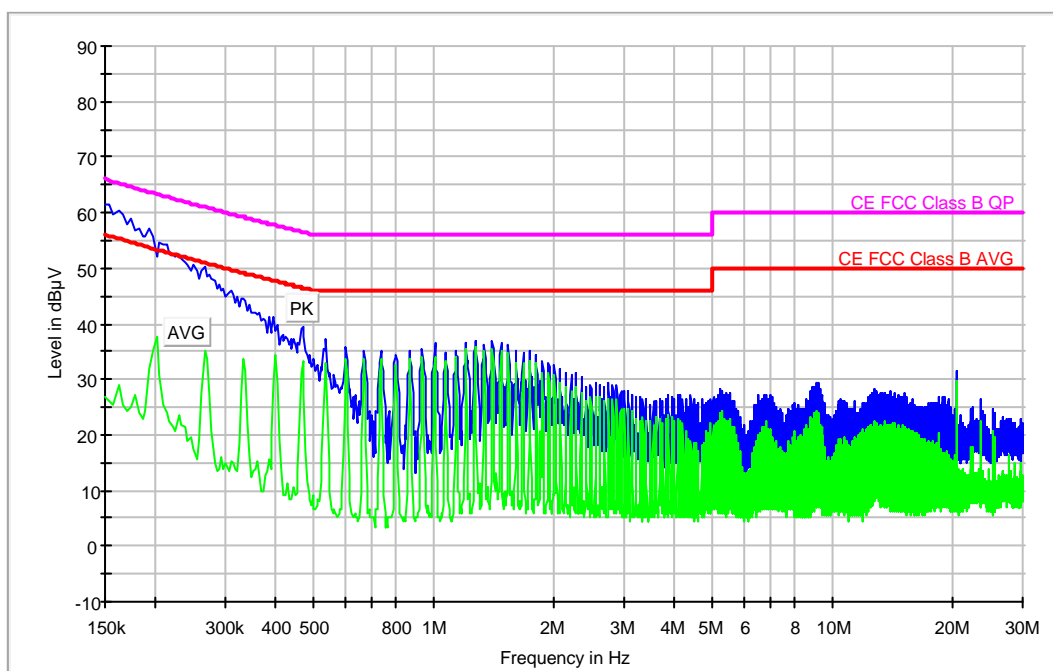
Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)	Comment
0.150000	62.3	26.5	
0.538000	36.2	31.7	
0.602000	36.8	33.3	
1.338000	36.0	34.5	
1.406000	36.2	34.9	
2.142000	29.8	26.1	
4.622000	27.2	16.7	
6.494000	22.8	14.9	
9.514000	28.6	24.0	
12.862000	27.4	19.7	
20.482000	32.6	30.4	

Continuous Conducted emission : CC0412L1

Detector : Peak / Average / Cuasi-peak

Project: 29742REM.002
 Company: ELEKTROBIT
 Sample: S/04
 Operation mode: OM#12
 Date: 2009-11-10 23:20
 Setup: EMI conducted
 Mode: EUT ON. Tx SAT + BT ON. Phase noise.

EC FCC Class B ESIB26 CC



Subrange Maximum

Frequency (MHz)	MaxPeak-ClearWrite (dBμV)	Average-ClearWrite (dBμV)	Comment
0.150000	61.6	26.7	
0.538000	37.2	32.8	
0.602000	35.7	33.6	
1.274000	36.8	35.7	
1.406000	37.1	35.4	
2.146000	31.2	28.5	
4.422000	27.1	18.8	
5.226000	28.2	24.1	
9.114000	29.4	24.2	
12.798000	28.1	20.9	
20.478000	31.6	29.6	

APPENDIX C: Photographs

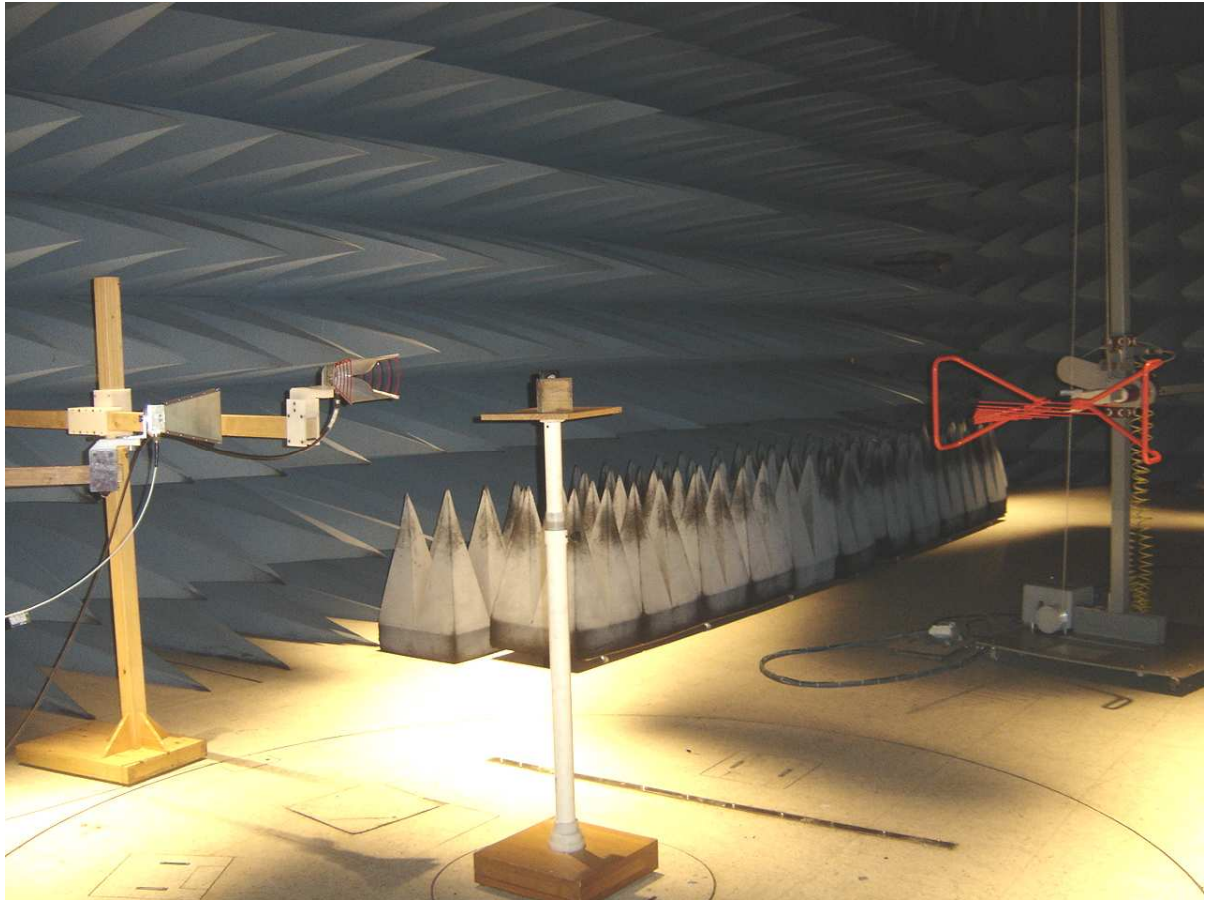
EQUIPMENT FOR RADIATED MEASUREMENTS



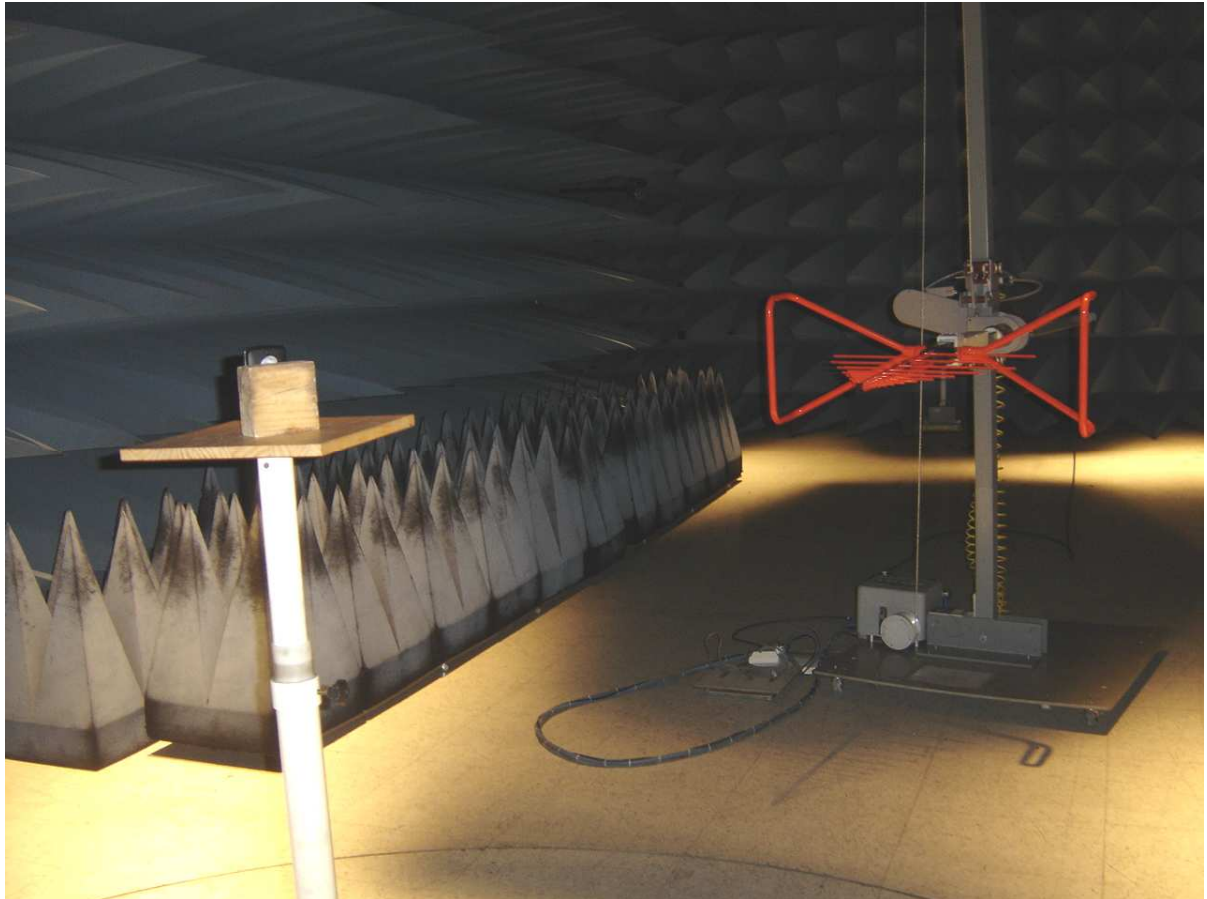
EQUIPMENT FOR CONDUCTED MEASUREMENTS



GENERAL SET-UP FOR RADIATED MEASUREMENTS



TEST SET-UP FOR RADIATED MEASUREMENTS BELOW 1 GHz



TEST SET-UP FOR RADIATED MEASUREMENTS ABOVE 1GHz



TEST SET-UP FOR CONDUCTED MEASUREMENTS

