IMQ S.p.A. – Società con Socio Unico
Via Quintiliano, 43 I-20138 MILANO
tel 0250731 – info@imq.it – www.imq.it

LAB N° 0121

TEST REPORT
No. ARSQ00053-01a

performed in accordance with

FCC Rules: Code of Federal Regulations (CFR) no. 47
Part 15 Subpart C Section 15.247

PRODUCT	Bluetooth® Classic module
MODEL(s) TESTED	SPBT3.0DP1
FCC ID	S9NSPBT30DP1
TRADE MARK(s)	STMicroelectronics

APPLICANT	STMicroelectronics S.r.l. ~ Centro Direzionale Colleoni - Palazzo Andromeda 3 I-20864 Agrate Brianza (MB)

Tested by	Roberto Radice	
Approved by	Giovanni Di Turi *[Laboratory manager]*	

Revision Sheet

Release No.	Date	Revision Description
Rev. 0	2016-05-13	First edition Digital signed - ARSQ00053-01a_TR_FCC 15.247_STMICROELECTRONICS_Modulo SPBT3.0DP1

1. GENERAL DATA

SAMPLE		
Samples received on	**2016-04-04**	**(item sent and sampling by applicant)**
IMQ reference samples	**BEM**	**81291**
Samples tested No.	1	
Object under analysis recognition	**Not carried out** Except where stated, characteristics of products were taken from client description and were not verified by the laboratory	
TEST LOCATION		
Testing dates	2015-04-22 ÷ 2016-04-27	
Testing laboratory	IMQ S.p.A. - Via Quintiliano, 43 – I-20138 Milano	
ENVIRONMENTAL CONDITIONING		
Parameter	***Measured***	
Ambient Temperature	20 ÷ 25 °C	
Relative Humidity	50 ÷ 60 %	
Atmospheric Pressure	900 ÷ 1000 mbar	

REMARKS

Throughout this report a point (coma) is used as the decimal separator.

The ability or reliability of this product to perform its intended function in a particular application has not been investigated.

IMQ declines any responsibility derived from missing or wrong information provided aside by the applicant.

2. REFERENCE DOCUMENT

DOCUMENT		DATE	TITLE
☒	47 CFR Part 15	2015	Radio Frequency Device
☒	ANSI C63.4	2014	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
☒	ANSI C63.10	2013	American National Standard for Testing Unlicensed Wireless Devices

3. EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL DATA

MODEL (basic)	Description
SPBT3.0DP1	Bluetooth® Classic module

FCC ID	S9NSPBT30DP1

Manufacturer	STMicroelectronics S.r.l. ~ Centro Direzionale Colleoni - Palazzo Andromeda 3 I-20864 Agrate Brianza (MB)

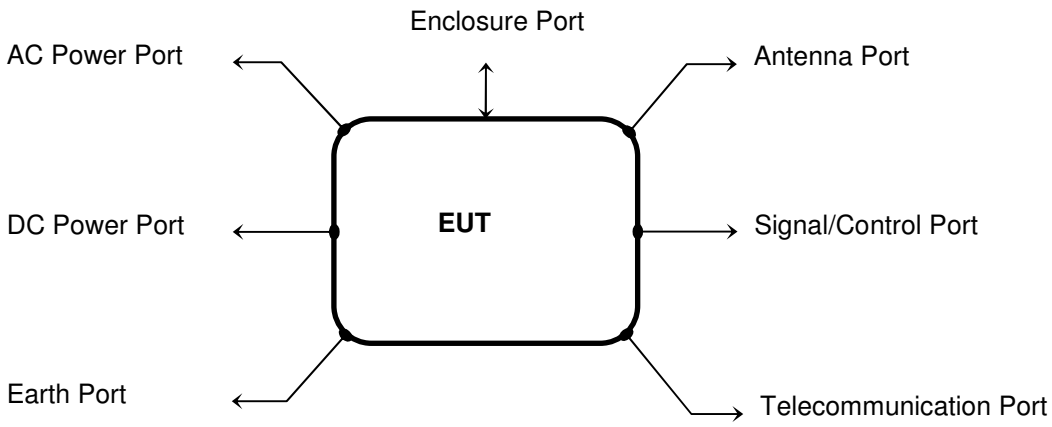
Equipment classification	According to the definition 15.3 (o) EUT is a **Intentional Radiator operating within the bands 2400 ÷ 2483.5 MHz** so it shall fulfill provisions of 47CFR Part 15 Subpart C – Intentional radiators – and Section 15.247

Type of equipment	Radio module
Operating frequency	2402 ÷ 2480 MHz
Equipment Class	DSS
Max radiated power	104,52 dBµV/m (at 3m. distance)
Modulation	GFSK / π/4-DQPSK / 8DPSK
Channel Spacing	1MHz
Channel bandwidth	1MHz
Antenna	Dedicated antenna (Antenova P/N A5839) peak gain: +2.1 dBi average gain: -1.2 dBi
Number of channels	79

Bluetooth GFSK / π/4-DQPSK / 8DPSK							
Channel No.	**Frequency (MHz)**	**Channel No.**	**Frequency (MHz)**	**Channel No.**	**Frequency (MHz)**	**Channel No.**	**Frequency (MHz)**
1	2402	2	2403	3	2404	4	2405
5	2406	6	2407	7	2408	8	2409
9	2410	10	2411	11	2412	12	2413
13	2414	14	2415	15	2416	16	2417
17	2418	18	2419	19	2420	20	2421
21	2422	22	2423	23	2424	24	2425
25	2426	26	2427	27	2428	28	2429
29	2430	30	2431	31	2432	32	2433
33	2434	34	2435	35	2436	36	2437
37	2438	38	2439	39	2440	40	2441
41	2442	42	2443	43	2444	44	2445
45	2446	46	2447	47	2448	48	2449
49	2450	50	2451	51	2452	52	2453
53	2454	54	2455	55	2456	56	2457
57	2458	58	2459	59	2460	60	2461
61	2462	62	2463	63	2464	64	2465
65	2466	66	2467	67	2468	68	2469
69	2470	70	2471	71	2472	72	2473
73	2474	74	2475	75	2476	76	2477
77	2478	78	2479	79	2480		

4. TEST CONFGURATION OF EQUIPMENT UNDER TEST

EUT PORTS



Port	Description	Max length
Enclosure	Open frame board	/
AC power	Not present	/
DC power	DC power supply 3.3 V DC	/
Signal/ Control	I/O pin (see also schematics data sheet)	/
Antenna	Integrated on PCB	/

STATE OF THE EUT DURING TESTS

Ref.	Mode	Description
#1	Operating	Bluetooth EDR: Continuous transmission (single channel transmission 2402MHz, 2441MHz, 2480MHz) with different modulation types: GFSK 1Mbit/s; π/4-DQPSK 2Mbit/s; 8DPSK 3Mibt/s Signal pattern PRBS9 The EUT is installed on module device board (dongle). The dongle is powered from the USB cable port. The EUT is in continuously transmitting with max. RF power setting
#2	Operating	Bluetooth EDR: Continuous transmission on pseudo-random sequence on all channel (hopping mode) The EUT is installed on module device board (dongle). The dongle is powered from the USB cable port. The EUT is in continuously transmitting with max. RF power setting

SUPPORT EQUIPMENT

Defined as equipment needed for correct operation or loading of the EUT, but not considered as tested:

Equipment	Manufacturer	Model
Dongle furnished by manufacturer for supply and management of radio module	ST Microelectronics	PC32B V01
Software used for testing: Bluetooth HCI TOOLBOX R3.0B5 (ST-Ericsson) This software was running on PC connected via USB to the Dongle. It was used to enable the test operation modes #1 and #2		

ELECTROMAGNETICALLY RELEVANT COMPONENTS

Component	No.	Manufacturer	Model
Microprocessor	1	ST	Cortex-M4

RFI SUPPRESSION DEVICES

Component	No.	Manufacturer	Model
/	/	/	/

EMI PROTECTION DEVICES

Component	No.	Manufacturer	Model
/	/	/	/

EUT TECHNICAL DOCUMENTATION

Document	Reference
Datasheet – Preliminary data	SPBT3.0DP1 – January 2016
Module Block Diagram	SPBT3.0DP1
Schematic diagram	Doc. Ref. SPBT3.0DP1 – Drawing n° DM00284638.V1
Component layout	Doc. Ref. SPBT3.0DP1 – Drawing n° DM00284641-V1
Bill of Materials	Doc. Ref. SPBT3.0DP1 – Drawing n° DM00284637-V1

5. METHODS OF MEASUREMENT

All compliance measurements have been carried out using the procedures described in the standard ANSI C63.4-2014, ANSI C63.10-2013 and Section 15.31 of CFR47 Part 15 (2015) – Subpart A (General). Additional test requirements have been adopted according to the reference Section indicated in the § 6 of this test report.
FREQUENCY RANGE INVESTIGATED
Conducted emission tests: from 150 kHz to 30MHz
Radiated emission tests: from 9 kHz to tenth harmonic of fundamental.

6. SUMMARY OF TEST RESULTS

POSSIBLE TEST CASE VERDICTS	
Test object does meet the requirement	PASS
Test object does not meet the requirement	FAIL
Test case does not apply to the test object	N.A.
Test not performed	N.P.

CFR47 Part 15	TITLE	RESULT
§ 15.203 § 15.247 (b)(4)(i)	Antenna Requirements	PASS
§ 15.207 (a)	Power Line Conducted Emission	PASS
§ 15.209 (a) (f)	Radiated Emission	PASS
§ 15.247 (d)	Out-of-band emissions	PASS
§ 15.247 (d)	100 kHz Bandwidth of Frequency Band Edges	PASS
§ 15.247 (a)	Frequency Hopping Spread Spectrum Specifications	
§ 15.247(a)	20 dB Bandwidth	PASS
§ 15.247(a)(1)	Carrier frequency (Hopping Channel) Separation	PASS
§ 15.247(a)(1)(iii)	Number of Hopping Channels Used	PASS
§ 15.247(a)(1)(iii)	Time occupancy (Dwell Time) of Each Ch. within a 0,4 x Nch (sec) Period	PASS
§ 15.247(a)(2)	6dB Minimum Bandwidth	N.A.
§ 15.247(b)	Maximum Peak Output Power	
§ 15.247(b) (1)	Peak Output Power, radiated (EIRP)	PASS
§ 15.247(b) (3)	RF power output, radiated (EIRP)	N.A.
§ 15.247(b) (4)	Antenna gain	N.A.
§ 15.247(c)	Operation with directional antenna gains greater than 6 dBi	N.A.
§ 15.247 (e)	Power Spectral Density	N.A.
§ 15.247 (f)	Hybrid systems	N.A
§ 15.247 (g)	FHSS Transmission characteristics	PASS
§ 15.247 (h)	Recognition of occupied channel and multiple transmission system	N.A
§ 15.247(i) (§ 47CFR 1.1307(b)(1))	RF humane exposure	PASS

7. TEST RESULTS

7.1 ANTENNA REQUIREMENTS

TEST REQUIREMENT
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Antenna specifications	
N° of authorized antenna types	1
Antenna type	Integral antenna on PCB
Maximum total gain	+2.1 dBi
External power amplifiers	Not present

TEST RESULT
The EUT meets the requirements of section 15.203 and 15.204

7.2 POWER LINE CONDUCTED EMISSION

TEST REQUIREMENT	
Test setup	ANSI C63.4
Test facility	Shielded chamber
Frequency range	150 kHz – 30 MHz
IF bandwidth	9 kHz
EMC class	B
EUT operating condition	#1

LIMITS

Band of operations	Quasi-Peak (dBµV)	Average Limit (dBµV)
0.15 ÷ 0.5	66 ÷ 56	56 ÷ 46
0.5 ÷ 5	56	46
5 ÷ 30	60	50

TEST RESULT

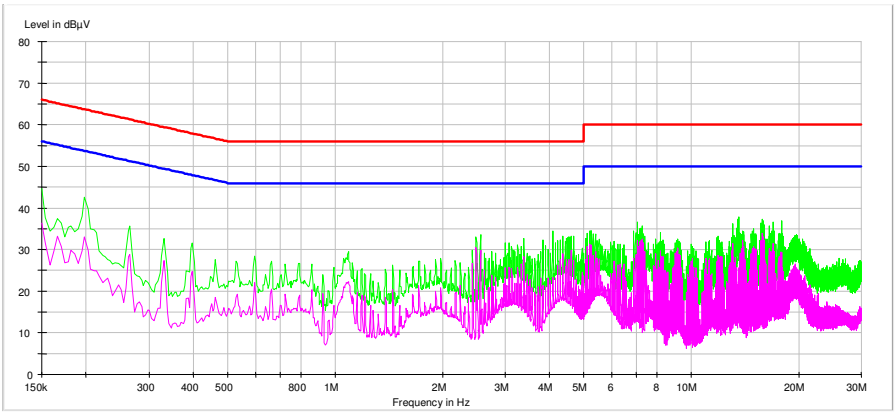
The EUT meets the requirements of sections 15.207 (a).

TEST PROCEDURE

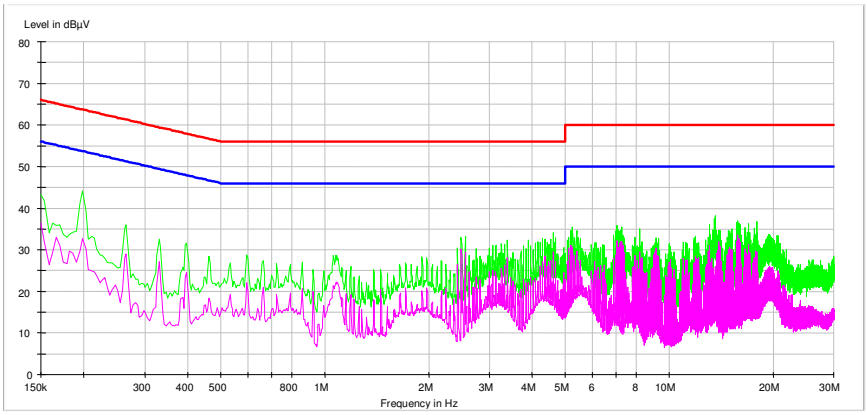
1) The EUT was placed on a wooden table of size, 80 cm by 80 cm, raised 80 cm in which is located 40 cm away from the vertical wall the shielded room.
2) Each EUT power cord input cord was individually connected through a 50Ω/50µH LISN to the input power source.
3) Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
4) The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 MHz to 30 MHz.
5) The measurements were made with the detector set to PEAK and AVERAGE amplitude within a bandwidth of 9 kHz during the measurements.
6) The measurements with Quasi-Peak detector are performed only for frequencies for which the Peak values are ≥ (Q.P. limit - 6 dB).

MEASUREMENTS RESULT: Conducted disturbance on AC power supply of Personal Computer where the dongle is connected.

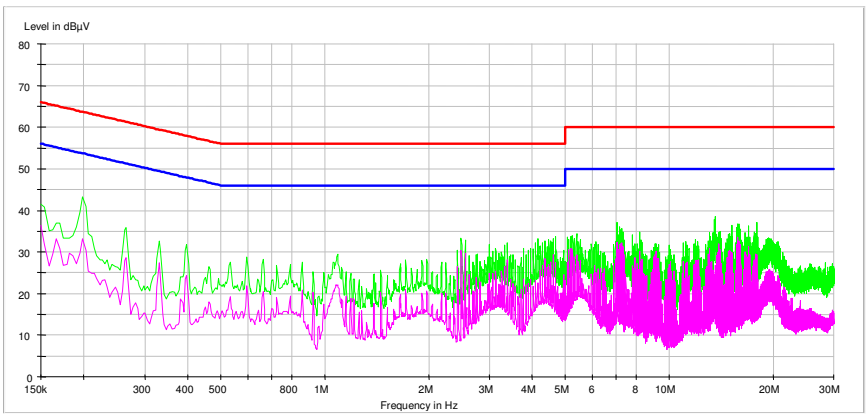
Test condition: Lower channel (2402MHz) – EDR Modulation: GFSK 1Mbit/s



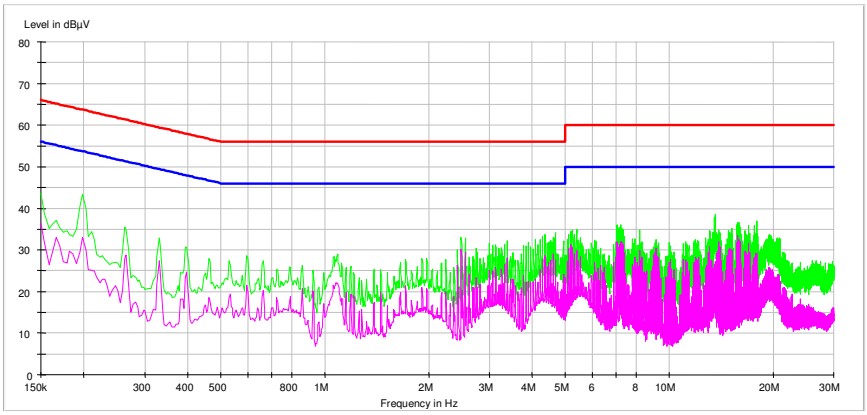
Test condition: Middle channel (2441MHz) – EDR Modulation: GFSK 1Mbit/s



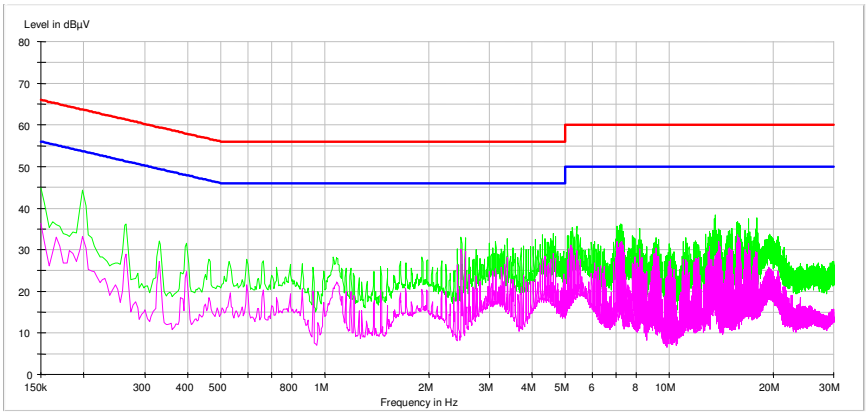
Test condition: Higher channel (2480MHz) – EDR Modulation: GFSK 1Mbit/s



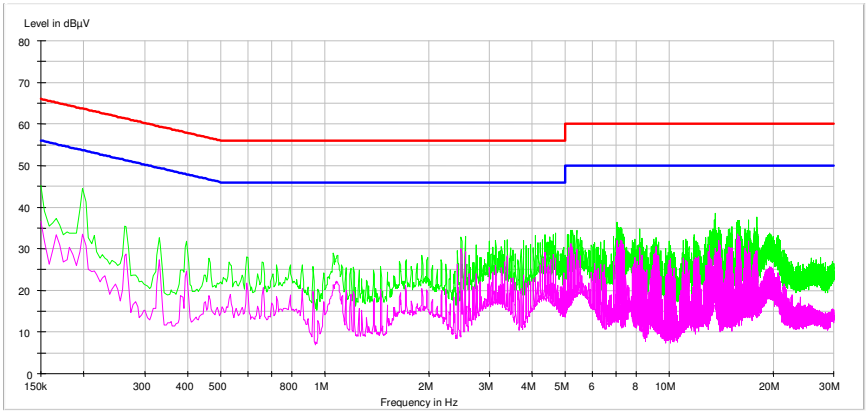
Test condition: Lower channel (2402MHz) – EDR Modulation: π/4-DQPSK 2Mbit/s



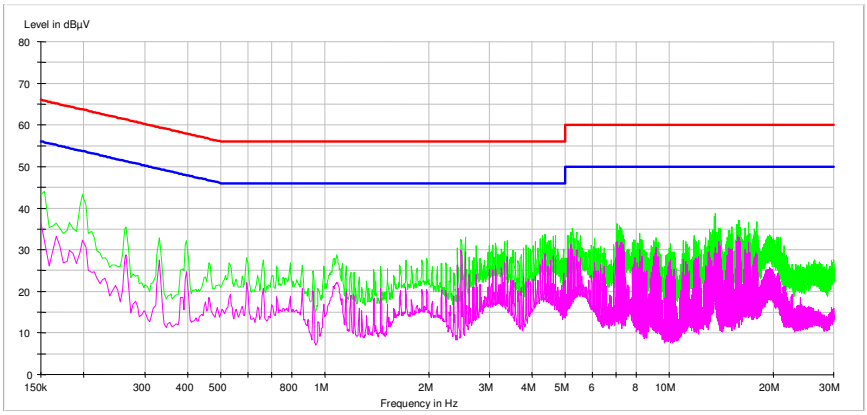
Test condition: Middle channel (2441MHz) – EDR Modulation: π/4-DQPSK 2Mbit/s



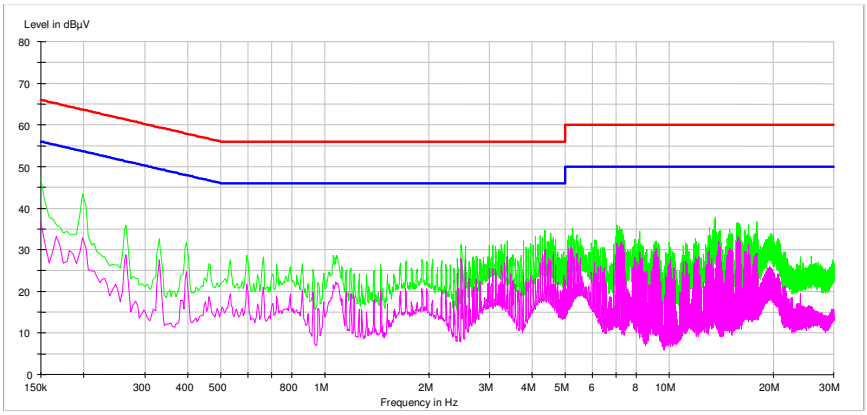
Test condition: Higher channel (2480MHz) – EDR Modulation: π/4-DQPSK 2Mbit/s



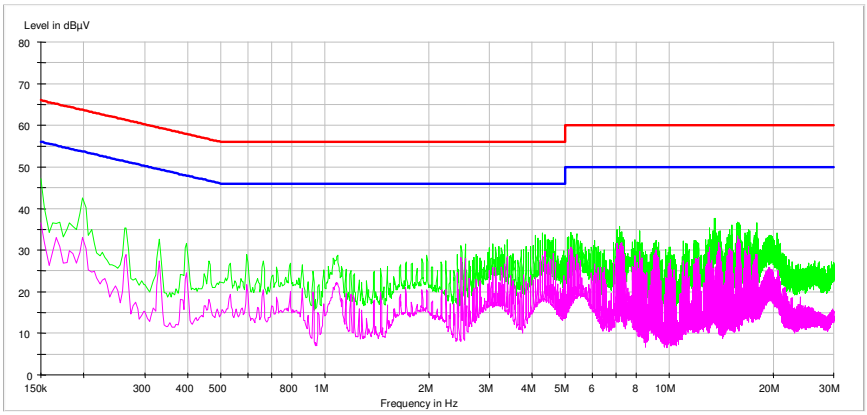
Test condition: Lower channel (2402MHz) – EDR Modulation: 8DPSK 3Mbit/s



Test condition: Middle channel (2441MHz) – EDR Modulation: 8DPSK 3Mbit/s



Test condition: Higher channel (2480MHz) – EDR Modulation: 8DPSK 3Mbit/s



7.3 RADIATED DISTURBANCES

TEST REQUIREMENT	
Test setup	ANSI C63.4
Test facility	Semi-anechoic chamber
Test distance	3 meters
Frequency range	9 kHz to tenth harmonic of fundamental
IF bandwidth (below 30 MHz)	9 kHz
IF bandwidth (below 1,000 MHz)	120 kHz
IF bandwidth (above 1,000 MHz)	1 MHz
EMC class	B
EUT operating condition	#1
Remark: In accordance with part 15.31 (f) (2), where the measurement distance was specified to be 30 or 300 meters, a correction factor was applied in order to permit measurement to be performed at a separation distance. The applied formula for limits at 3 meter is:Extrapolation (dB) = 40log (300meter / 3meter) = +80db Extrapolation (dB) = 40log (30meter / 3meter) = +40db	

LIMITS

Band of operations	Peak (dBµV/m)	Average Limit (dBµV/m)
Restricted bands (§ 15.205)	74	54
Other bands	According to 15.209 or fundamental –20dB (which is greater)	

TEST RESULT

The EUT has been tested in 3 orthogonal axes at the frequencies lowest, middle and highest.
The results reported are worst case.
The measurement of spurious emission of EUT in receiver mode is deemed to be fulfilled as no limits are exceeded in transmitter mode (condition considered more burdensome).
The EUT meets the requirements of sections 15.205 (b), 15.209 and 15.247.

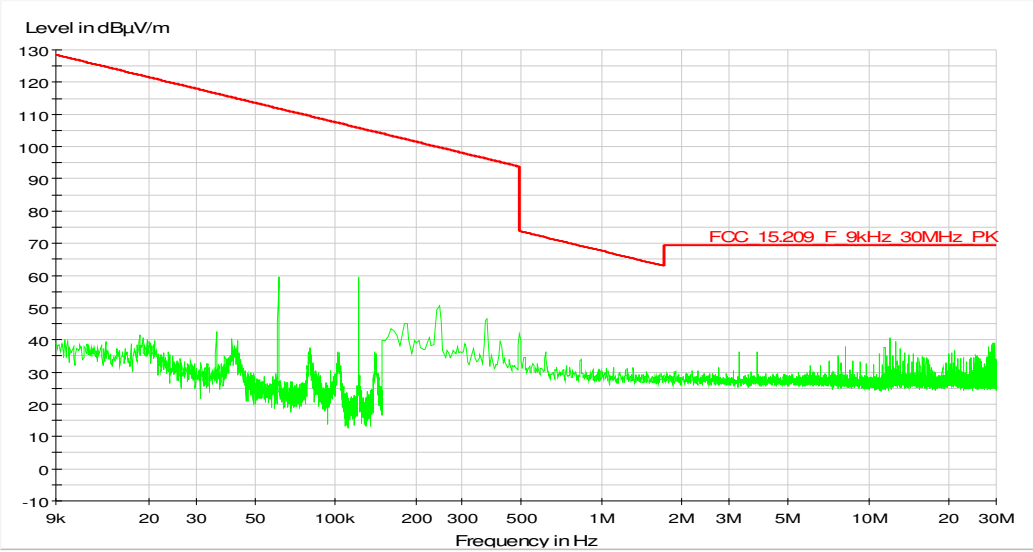
TEST PROCEDURE

1) The EUT was placed on turntable which is 0.8 m above the ground plane
2) The turntable shall rotate from 0° to 360° degrees to determine the position of maximum emission level.
3) The EUT is positioned 3 m away from the receiving antenna which varied from 1 to 4 m to find the highest emission.
4) The measurements were made with the detector set to PEAK and AVERAGE amplitude within a bandwidth of 100 kHz below 1000 MHz and 1 MHz above 1000 MHz.
5) The receiving antenna was positioned in both horizontal and vertical polarization.
6) The measurements with Quasi-Peak detector, below 1000 MHz are performed only for frequencies for which the Peak values are ≥ (Q.P. limit - 6 dB).

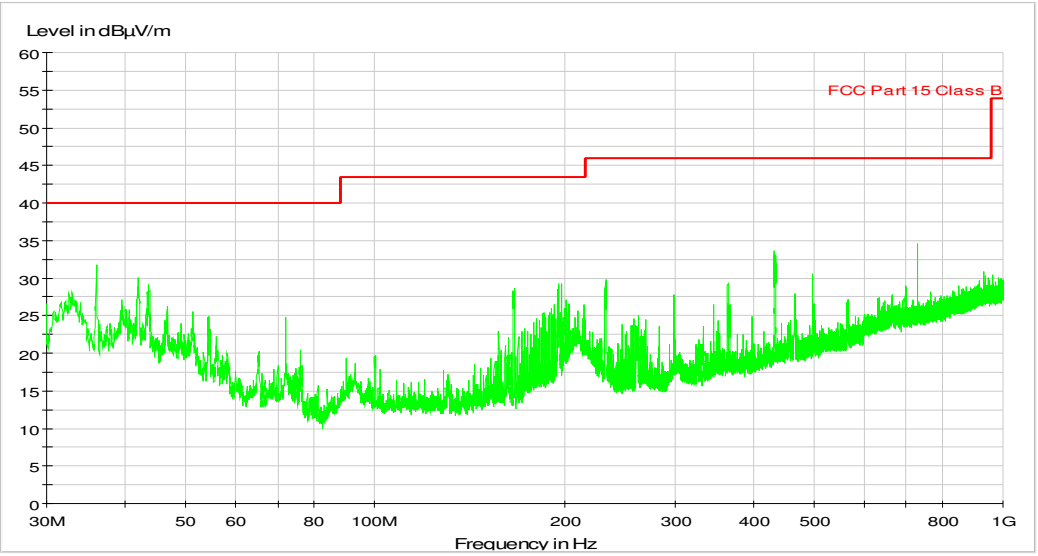
MEASUREMENTS RESULTS - RADIATED

BLUETOOTH EDR – MODULATION GFSK 1Mbit/s (LOWER CHANNEL 2402MHZ)

9 kHz÷30 MHz



30÷1,000 MHz



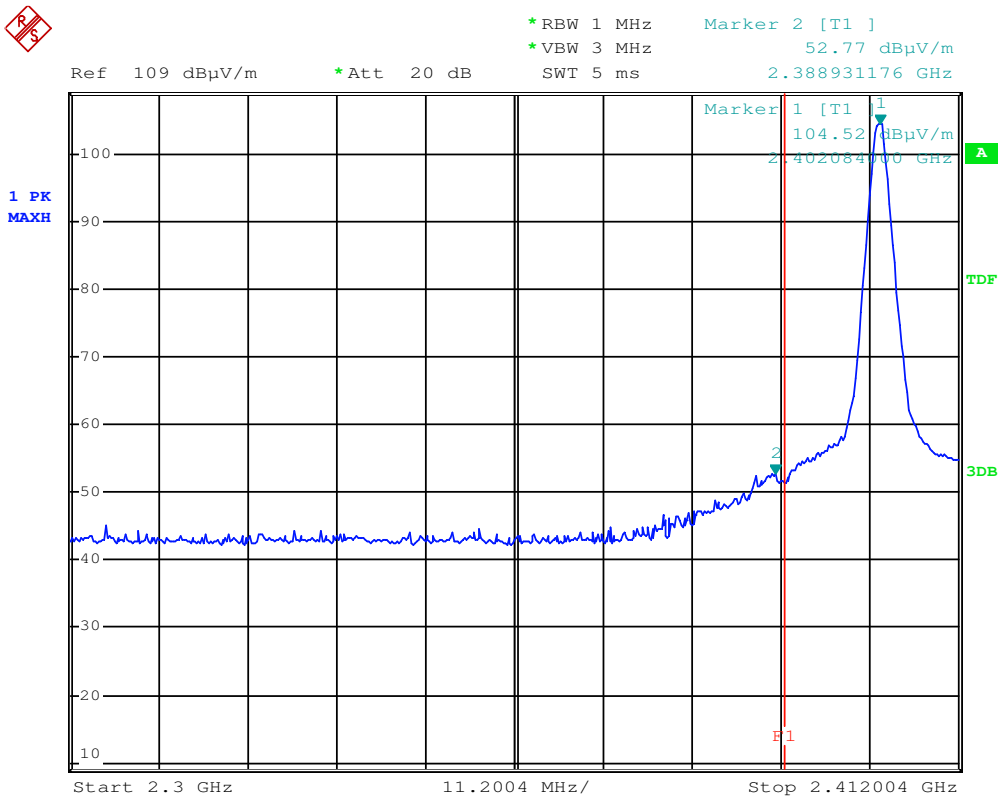
1÷26 GHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2402 (fundamental)	109.61	27.30	5.18	-37.57	**104.52**	-----	------	------
4804	50.44	31.30	7.31	-36.98	**52.07**	5000	74.00	>21
7206	48.38	36.00	9.09	-37.00	**56.47**	5000	74.00	>17
9608	41.93	38.10	10.71	-37.17	**53.57**	5000	74.00	>20
12010	47.41	39.50	12.01	-36.71	**62.30**	5000	74.00	>11
14412	37.02	42.20	12.93	-34.90	**57.25**	5000	74.00	>16
16814	36.84	40.50	13.69	-34.50	**56.53**	5000	74.00	>17
f>16814	not significant	---	---	---	---	5000	74.00	---

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2402 (fundamental)	92.20	27.30	5.18	-37.57	**87.11**	-----	------	------
4804	41.44	31.30	7.31	-36.98	**43.07**	500	54.00	>10
7206	38.41	36.00	9.09	-37.00	**46.50**	500	54.00	>7
9608	31.62	38.10	10.71	-37.17	**43.26**	500	54.00	>10
12010	33.77	39.50	12.01	-36.71	**48.66**	500	54.00	>5
14412	25.06	42.20	12.93	-34.90	**45.29**	500	54.00	>8
16814	23.87	40.50	13.69	-34.50	**43.56**	500	54.00	>10
f>16814	not significant	---	---	---	---	500	54.00	---

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Lower band edge

Peak



Spurious Emission in restricted band near 2400-2483.5 MHz

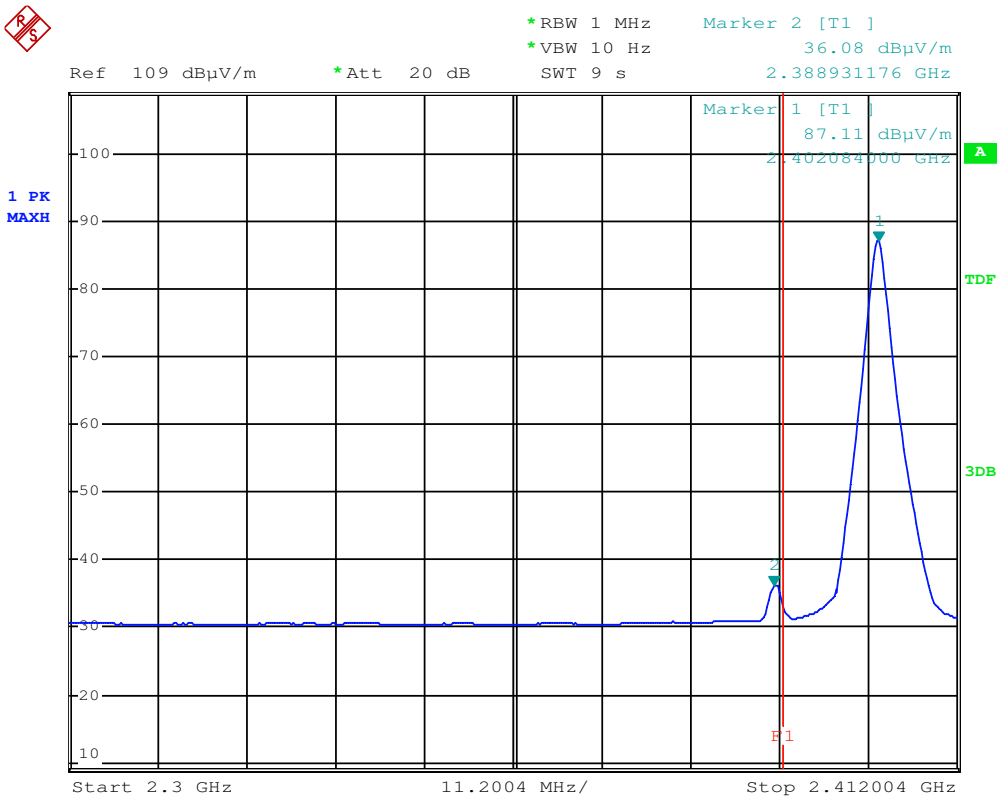
PEAK RESULT (RBW=1MHz; VBW=3MHz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	PK Limit	PK Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2388.93	57.86	27.30	5.18	-37.57	**52.77**	5000	74.00	21.23

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Lower band edge

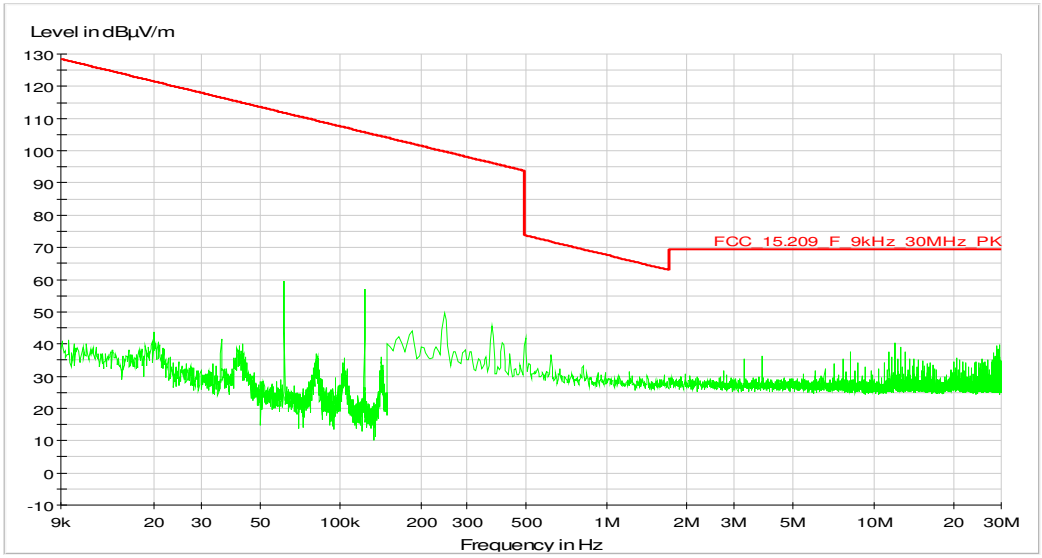
Average



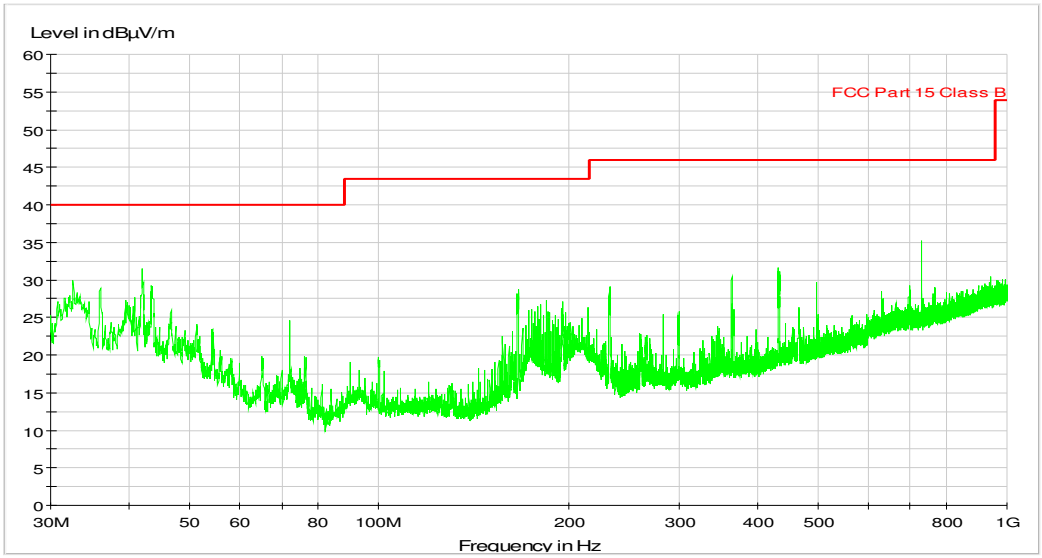
Spurious Emission in restricted band near 2400-2483.5 MHz								
AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	AV Limit	AV Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2388.93	41.17	27.30	5.18	-37.57	**36.08**	500	54.00	17.92
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.								

BLUETOOTH EDR – MODULATION GFSK 1Mbit/s (MIDDLE CHANNEL 2441MHZ)

9 kHz÷30 MHz



30÷1,000 MHz



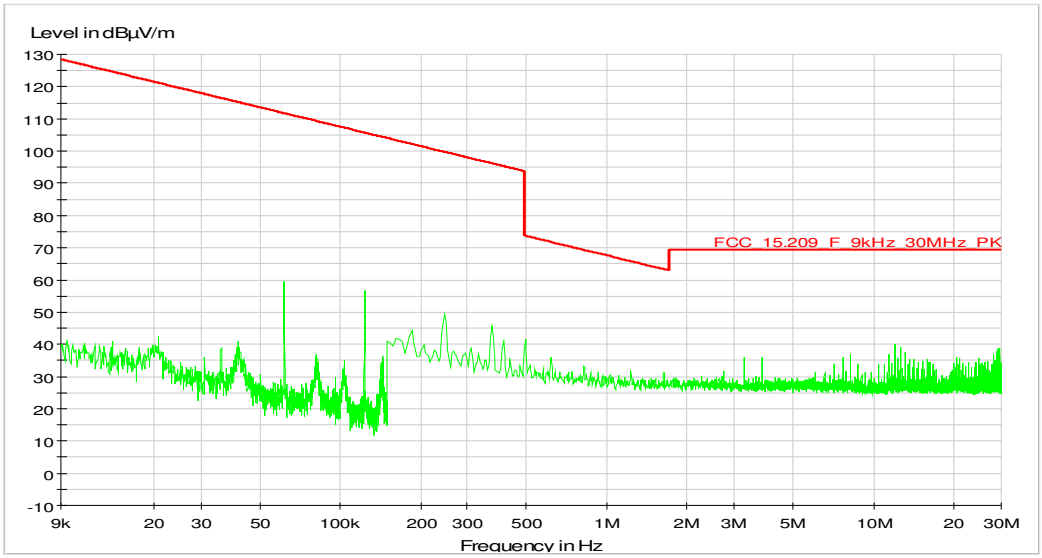
1÷26 GHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2441 (fundamental)	108.01	27.30	5.18	-37.57	**102.92**	-----	------	------
4882	50.33	31.45	7.34	-36.90	**52.22**	5000	74.00	>21
7323	48.41	36.15	9.15	-37.00	**56.71**	5000	74.00	>17
9764	40.37	38.20	10.61	-37.15	**52.03**	5000	74.00	>21
12205	45.99	39.10	12.17	-36.00	**61.26**	5000	74.00	>12
14646	36.83	41.4	13.04	-35.30	**55.97**	5000	74.00	>18
17087	35.42	41.0	13.60	-34.46	**55.56**	5000	74.00	>18
f>17087	not significant	---	---	---	---	5000	74.00	---

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2441 (fundamental)	92.92	27.30	5.18	-37.57	**87.83**	-----	------	------
4882	41.71	31.45	7.34	-36.90	**43.60**	500	54.00	>10
7323	37.47	36.15	9.15	-37.00	**45.77**	500	54.00	>8
9764	31.87	38.20	10.61	-37.15	**43.53**	500	54.00	>10
12205	31.77	39.10	12.17	-36.00	**47.04**	500	54.00	>6
14646	26.99	41.4	13.04	-35.30	**46.13**	500	54.00	>7
17087	25.65	41.0	13.60	-34.46	**45.79**	500	54.00	>8
f>17087	not significant	---	---	---	---	500	54.00	---

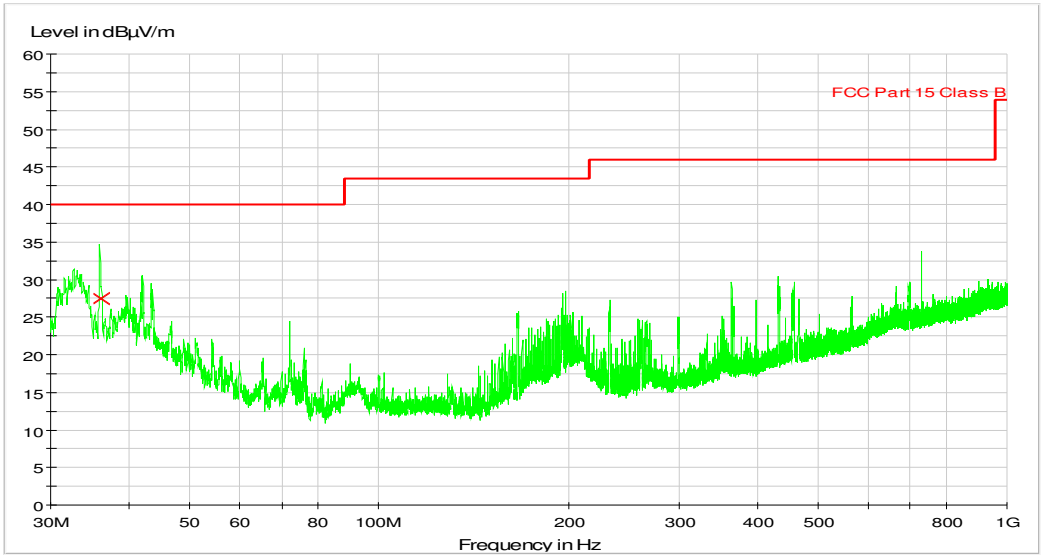
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

BLUETOOTH EDR – MODULATION GFSK 1Mbit/s (HIGHER CHANNEL 2480MHZ)

9 kHz÷30 MHz



30÷1,000 MHz



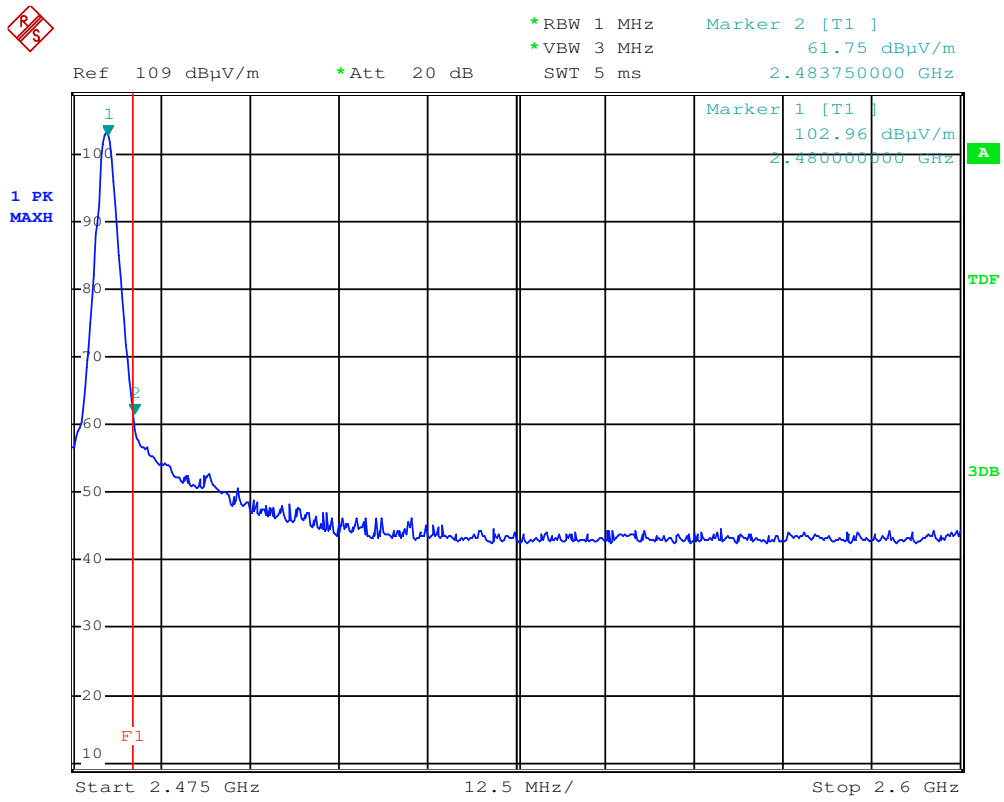
1÷26 GHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2480 (fundamental)	107.95	27.40	5.18	-37.57	**102.96**	-----	------	------
4960	50.39	31.50	7.34	-36.90	**52.33**	5000	74.00	>21
7440	48.57	36.40	9.42	-36.90	**57.49**	5000	74.00	>16
9920	39.59	38.40	10.69	-37.10	**51.58**	5000	74.00	>22
12400	45.22	38.90	12.32	-35.70	**60.74**	5000	74.00	>13
14880	38.45	39.90	12.97	-36.00	**55.32**	5000	74.00	>18
17360	35.65	43.20	14.10	-34.46	**58.49**	5000	74.00	>15
f>17360	not significant	---	---	---	---	5000	74.00	---

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2480 (fundamental)	91.81	27.40	5.18	-37.57	**86.82**	-----	------	------
4960	42.23	31.50	7.34	-36.90	**44.17**	500	54.00	>9
7440	37.64	36.40	9.42	-36.90	**46.56**	500	54.00	>7
9920	31.61	38.40	10.69	-37.10	**43.60**	500	54.00	>10
12400	31.39	38.90	12.32	-35.70	**46.91**	500	54.00	>7
14880	29.15	39.90	12.97	-36.00	**46.02**	500	54.00	>7
17360	25.06	43.20	14.10	-34.46	**47.90**	500	54.00	>6
f>17360	not significant	---	---	---	---	500	54.00	---

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Higher band edge

Peak



Spurious Emission in restricted band near 2400-2483.5 MHz

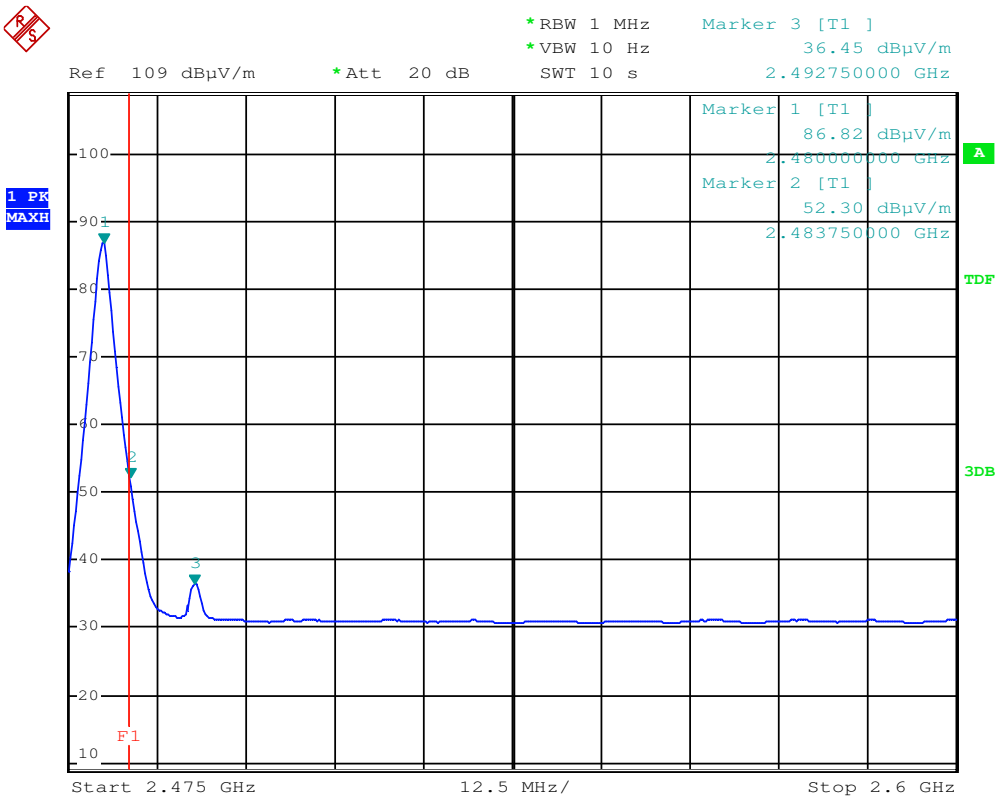
PEAK RESULT (RBW=1MHz; VBW=3MHz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	PK Limit	PK Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2483.75	66.47	27.40	5.18	-37.57	**61.75**	5000	74.00	12.25

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Higher band edge

Average



Spurious Emission in restricted band near 2400-2483.5 MHz

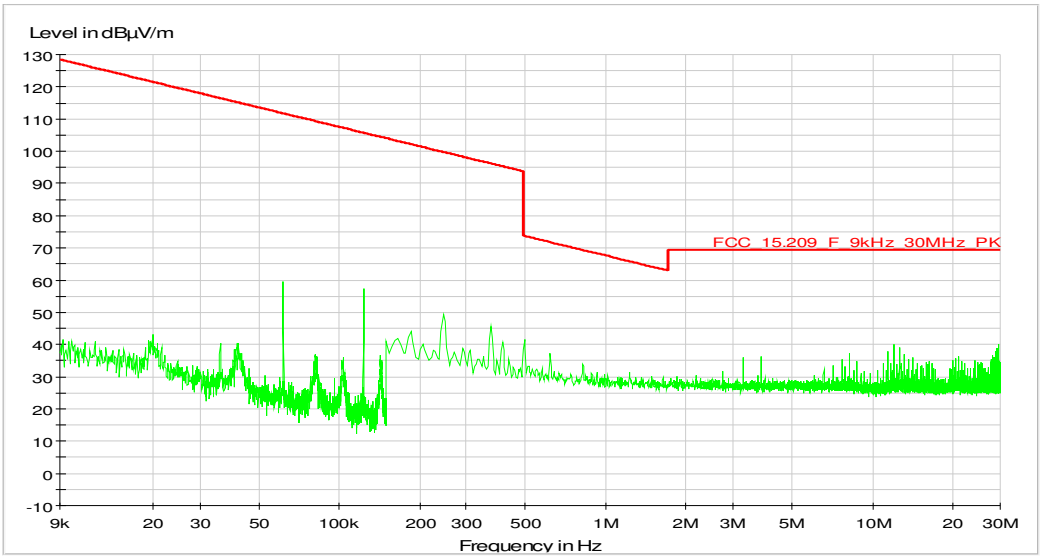
AVERAGE RESULT (RBW=1MHz; VBW=10Hz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	AV Limit	AV Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2483.75	57.29	27.40	5.18	-37.57	**52.30**	500	54.00	1.70
2492.75	41.44	27.40	5.18	-37.57	**36.45**	500	54.00	17.55

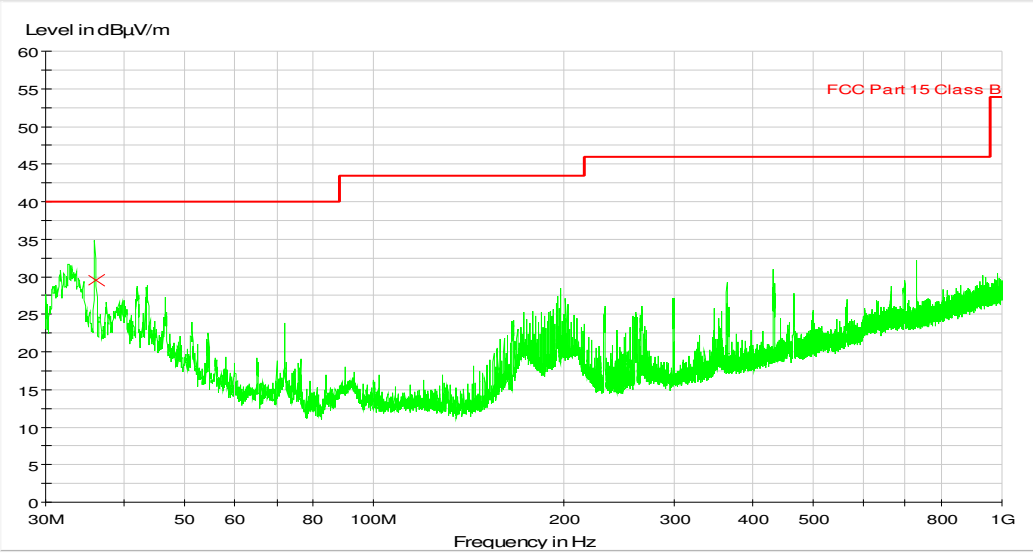
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

BLUETOOTH EDR – MODULATION π/4-DQPSK 2Mbit/s (LOWER CHANNEL 2402MHZ)

9 kHz÷30 MHz



30÷1,000 MHz



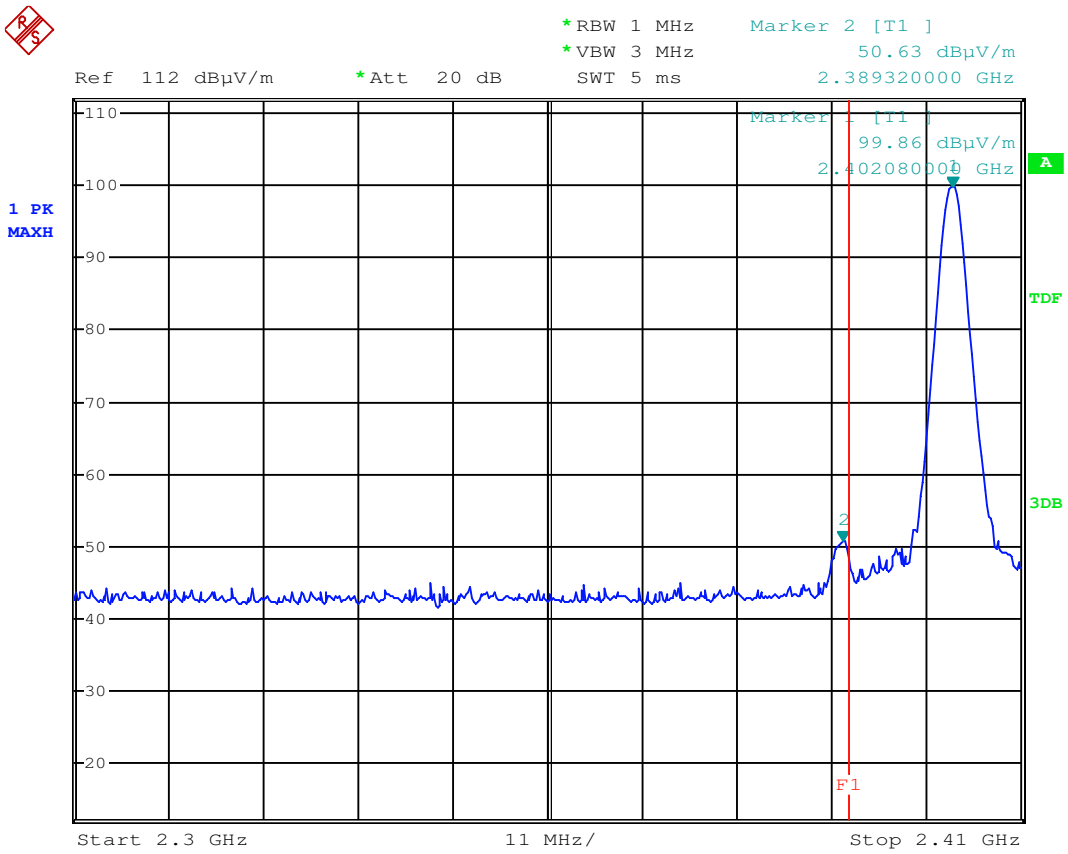
1÷26 GHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2402 (fundamental)	105.02	27.30	5.18	-37.57	**99.93**	-----	------	------
4804	50.64	31.30	7.31	-36.98	**52.27**	5000	74.00	>21
7206	45.91	36.00	9.09	-37.00	**54.00**	5000	74.00	20
9608	42.18	38.10	10.71	-37.17	**53.82**	5000	74.00	>20
12010	45.23	39.50	12.01	-36.71	**60.12**	5000	74.00	>13
14412	36.00	42.20	12.93	-34.90	**56.23**	5000	74.00	>17
16814	36.02	40.50	13.69	-34.50	**55.71**	5000	74.00	>18
f>16814	not significant	---	---	---	---	5000	74.00	---

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2402 (fundamental)	86.24	27.30	5.18	-37.57	**81.15**	-----	------	------
4804	41.63	31.30	7.31	-36.98	**43.26**	500	54.00	>10
7206	36.01	36.00	9.09	-37.00	**44.10**	500	54.00	>9
9608	34.93	38.10	10.71	-37.17	**46.57**	500	54.00	>7
12010	32.62	39.50	12.01	-36.71	**47.51**	500	54.00	>6
14412	24.78	42.20	12.93	-34.90	**45.01**	500	54.00	>8
16814	24.15	40.50	13.69	-34.50	**43.84**	500	54.00	>10
f>16814	not significant	---	---	---	---	500	54.00	---

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Lower band edge

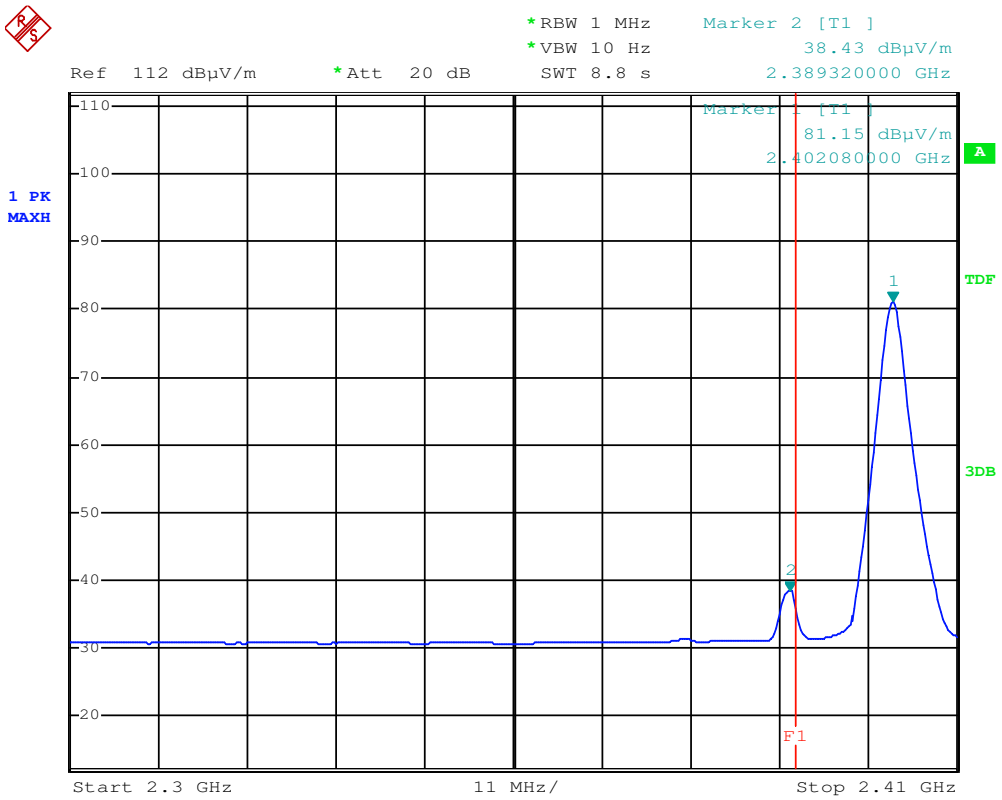
Peak



Spurious Emission in restricted band near 2400-2483.5 MHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	PK Limit	PK Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2389.32	55.72	27.30	5.18	-37.57	**50.63**	5000	74.00	23.37
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.								

Radiated Band-edge compliance - Lower band edge

Average



Spurious Emission in restricted band near 2400-2483.5 MHz

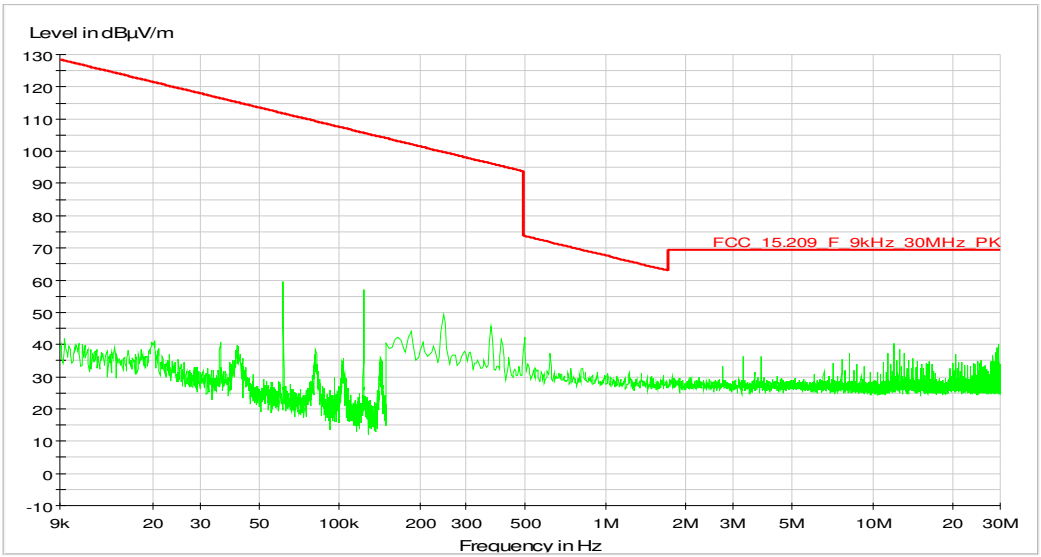
AVERAGE RESULT (RBW=1MHz; VBW=10Hz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	AV Limit	AV Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2389.32	43.52	27.30	5.18	-37.57	**38.43**	500	54.00	15.57

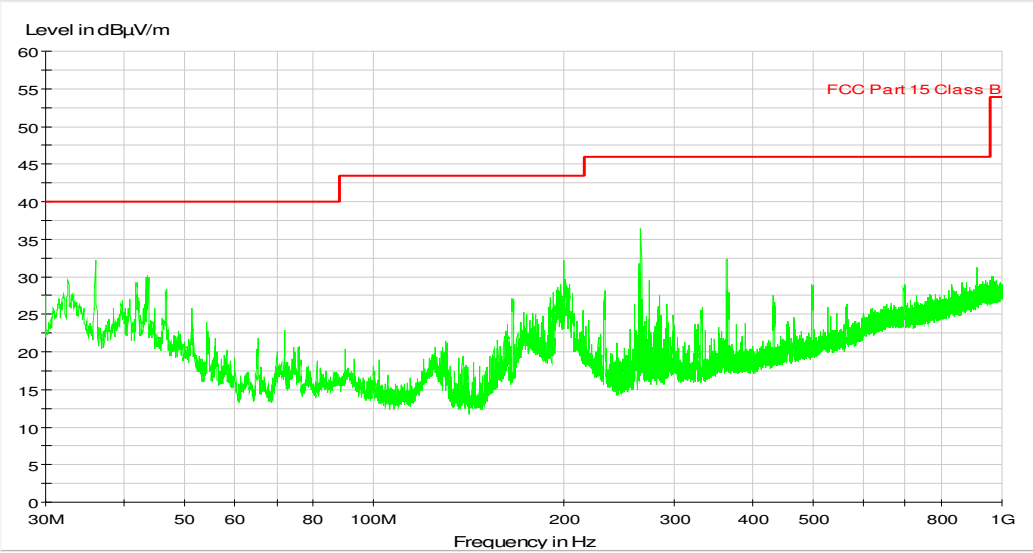
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

BLUETOOTH EDR – MODULATION π/4-DQPSK 2Mbit/s (MIDDLE CHANNEL 2441MHZ)

9 kHz÷30 MHz



30÷1,000 MHz



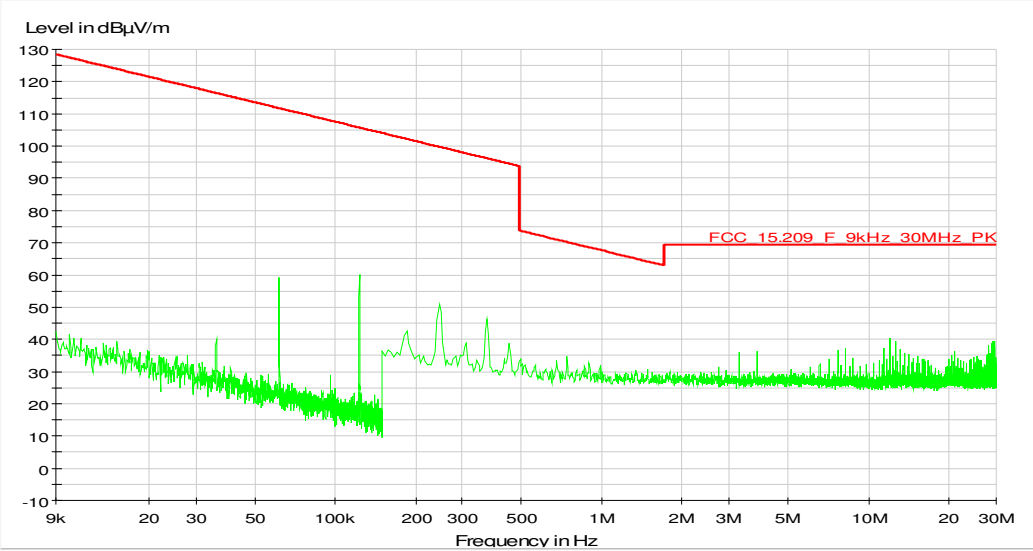
1÷26 GHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2441 (fundamental)	105.60	27.30	5.18	-37.57	**100.51**	-----	------	------
4882	50.84	31.45	7.34	-36.90	**52.73**	5000	74.00	>21
7323	44.58	36.15	9.15	-37.00	**52.88**	5000	74.00	>21
9764	40.62	38.20	10.61	-37.15	**52.28**	5000	74.00	>21
12205	45.75	39.10	12.17	-36.00	**61.02**	5000	74.00	>12
14646	37.13	41.4	13.04	-35.30	**56.27**	5000	74.00	>17
17087	35.79	41.0	13.60	-34.46	**55.93**	5000	74.00	>18
f>17087	not significant	---	---	---	---	5000	74.00	---

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2441 (fundamental)	86.52	27.30	5.18	-37.57	**81.43**	-----	------	------
4882	42.42	31.45	7.34	-36.90	**44.31**	500	54.00	>9
7323	35.41	36.15	9.15	-37.00	**43.71**	500	54.00	>10
9764	33.44	38.20	10.61	-37.15	**45.10**	500	54.00	>8
12205	31.47	39.10	12.17	-36.00	**46.74**	500	54.00	>7
14646	27.07	41.4	13.04	-35.30	**46.21**	500	54.00	>7
17087	25.71	41.0	13.60	-34.46	**45.85**	500	54.00	>8
f>17087	not significant	---	---	---	---	500	54.00	---

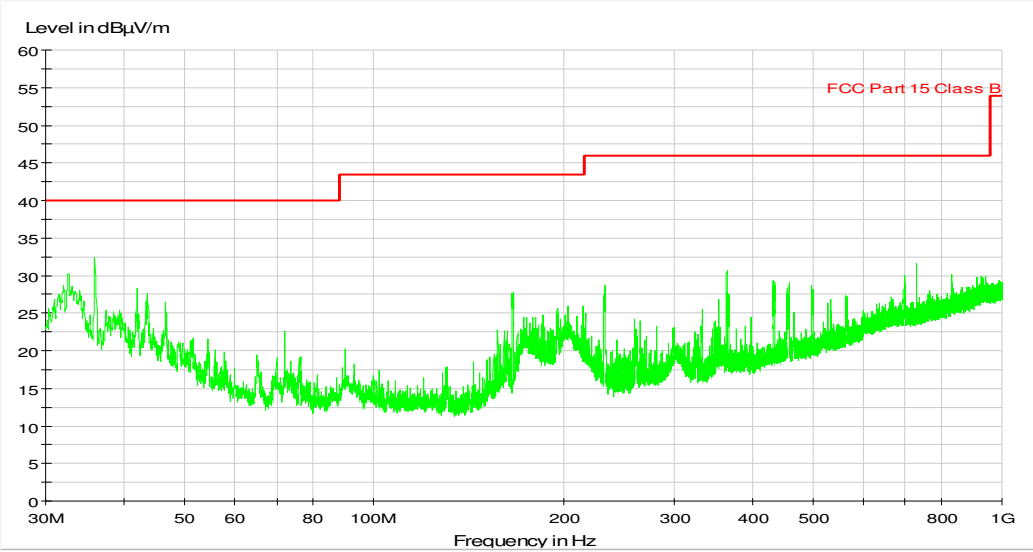
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

BLUETOOTH EDR – MODULATION π/4-DQPSK 2Mbit/s (HIGHER CHANNEL 2480MHZ)

9 kHz÷30 MHz



30÷1,000 MHz



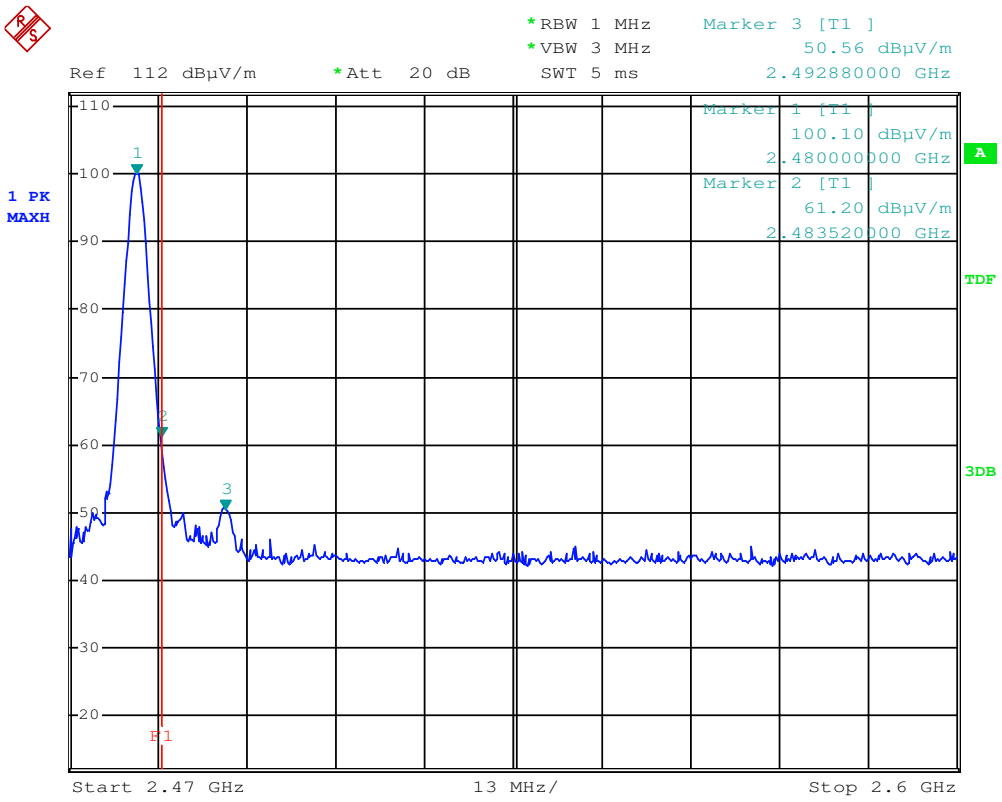
1÷26 GHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2480 (fundamental)	105.09	27.40	5.18	-37.57	**100.10**	-----	------	------
4960	50.74	31.50	7.34	-36.90	**52.68**	5000	74.00	>21
7440	45.32	36.40	9.42	-36.90	**54.24**	5000	74.00	>19
9920	38.90	38.40	10.69	-37.10	**50.89**	5000	74.00	>23
12400	45.13	38.90	12.32	-35.70	**60.65**	5000	74.00	>13
14880	38.34	39.90	12.97	-36.00	**55.21**	5000	74.00	>18
17360	33.51	43.20	14.10	-34.46	**56.35**	5000	74.00	>17
f>17360	not significant	---	---	---	---	5000	74.00	---

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2480 (fundamental)	86.24	27.40	5.18	-37.57	**81.25**	-----	------	------
4960	42.02	31.50	7.34	-36.90	**43.96**	500	54.00	>10
7440	35.21	36.40	9.42	-36.90	**44.13**	500	54.00	>9
9920	31.21	38.40	10.69	-37.10	**43.20**	500	54.00	>10
12400	29.86	38.90	12.32	-35.70	**45.38**	500	54.00	>8
14880	29.07	39.90	12.97	-36.00	**45.94**	500	54.00	>8
17360	23.43	43.20	14.10	-34.46	**46.27**	500	54.00	>7
f>17360	not significant	---	---	---	---	500	54.00	---

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Higher band edge

Peak



Spurious Emission in restricted band near 2400-2483.5 MHz

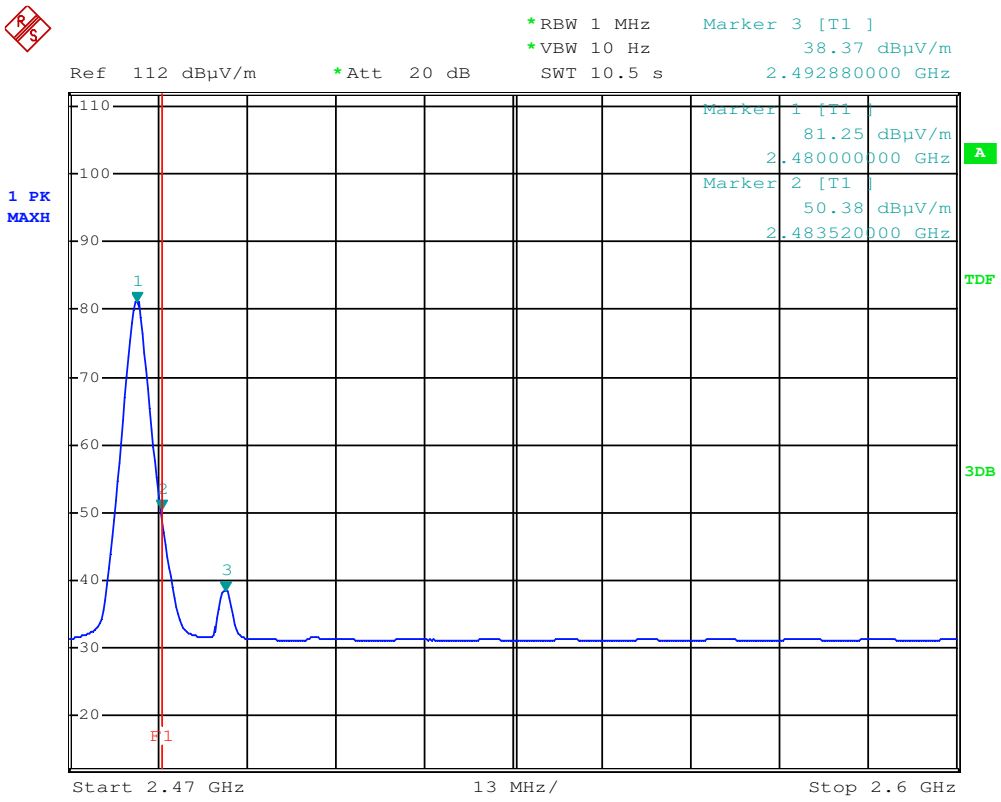
PEAK RESULT (RBW=1MHz; VBW=3MHz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	PK Limit	PK Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2483.52	66.19	27.40	5.18	-37.57	**61.20**	5000	74.00	12.80
2492.88	55.55	27.40	5.18	-37.57	**50.56**	5000	74.00	23.44

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Higher band edge

Average



Spurious Emission in restricted band near 2400-2483.5 MHz

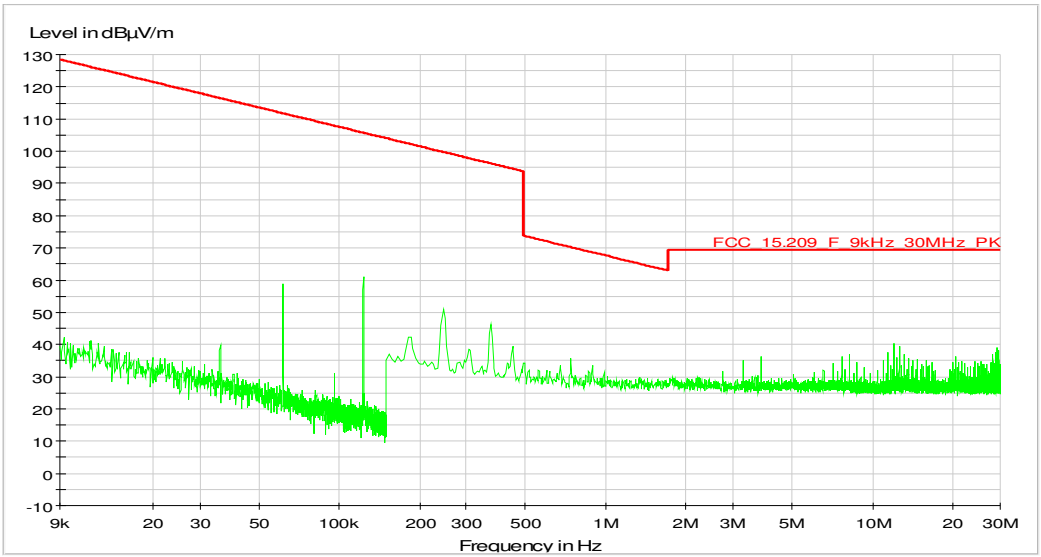
AVERAGE RESULT (RBW=1MHz; VBW=10Hz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	AV Limit	AV Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2483.52	55.37	27.40	5.18	-37.57	**50.38**	500	54.00	3.62
2492.88	43.36	27.40	5.18	-37.57	**38.37**	500	54.00	15.63

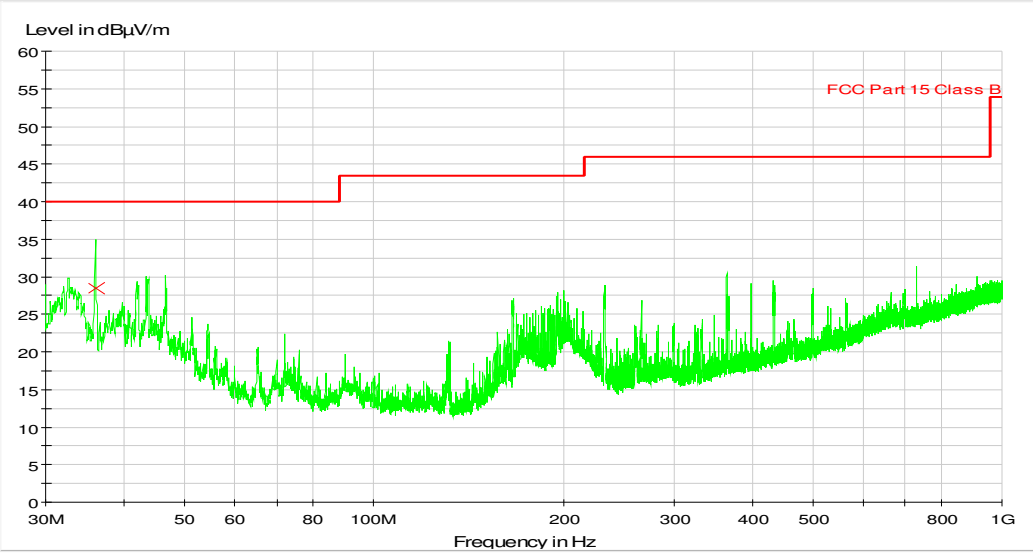
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

BLUETOOTH EDR – MODULATION 8DPSK 3Mbit/s (LOWER CHANNEL 2402MHZ)

9 kHz÷30 MHz



30÷1,000 MHz



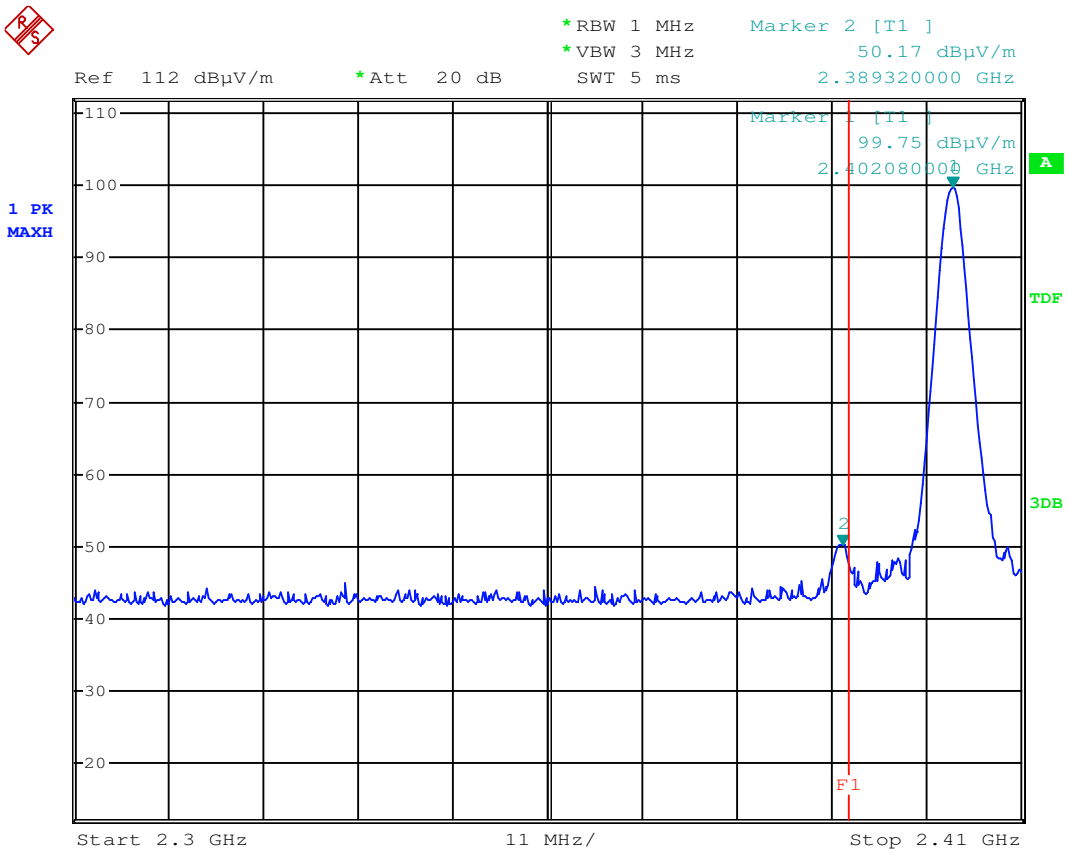
1÷26 GHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2402 (fundamental)	104.84	27.30	5.18	-37.57	**99.75**	-----	------	------
4804	50.39	31.30	7.31	-36.98	**52.02**	5000	74.00	>21
7206	44.85	36.00	9.09	-37.00	**52.94**	5000	74.00	>21
9608	41.81	38.10	10.71	-37.17	**53.45**	5000	74.00	>20
12010	45.77	39.50	12.01	-36.71	**60.66**	5000	74.00	>13
14412	35.80	42.20	12.93	-34.90	**56.03**	5000	74.00	>17
16814	36.23	40.50	13.69	-34.50	**55.92**	5000	74.00	>18
f>16814	not significant	---	---	---	---	5000	74.00	---

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2402 (fundamental)	86.32	27.30	5.18	-37.57	**81.23**	-----	------	------
4804	41.59	31.30	7.31	-36.98	**43.22**	500	54.00	>10
7206	35.29	36.00	9.09	-37.00	**43.38**	500	54.00	>10
9608	34.76	38.10	10.71	-37.17	**46.40**	500	54.00	>7
12010	32.42	39.50	12.01	-36.71	**47.31**	500	54.00	>6
14412	24.92	42.20	12.93	-34.90	**45.15**	500	54.00	>8
16814	24.37	40.50	13.69	-34.50	**44.06**	500	54.00	>9
f>16814	not significant	---	---	---	---	500	54.00	---

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Lower band edge

Peak



Spurious Emission in restricted band near 2400-2483.5 MHz

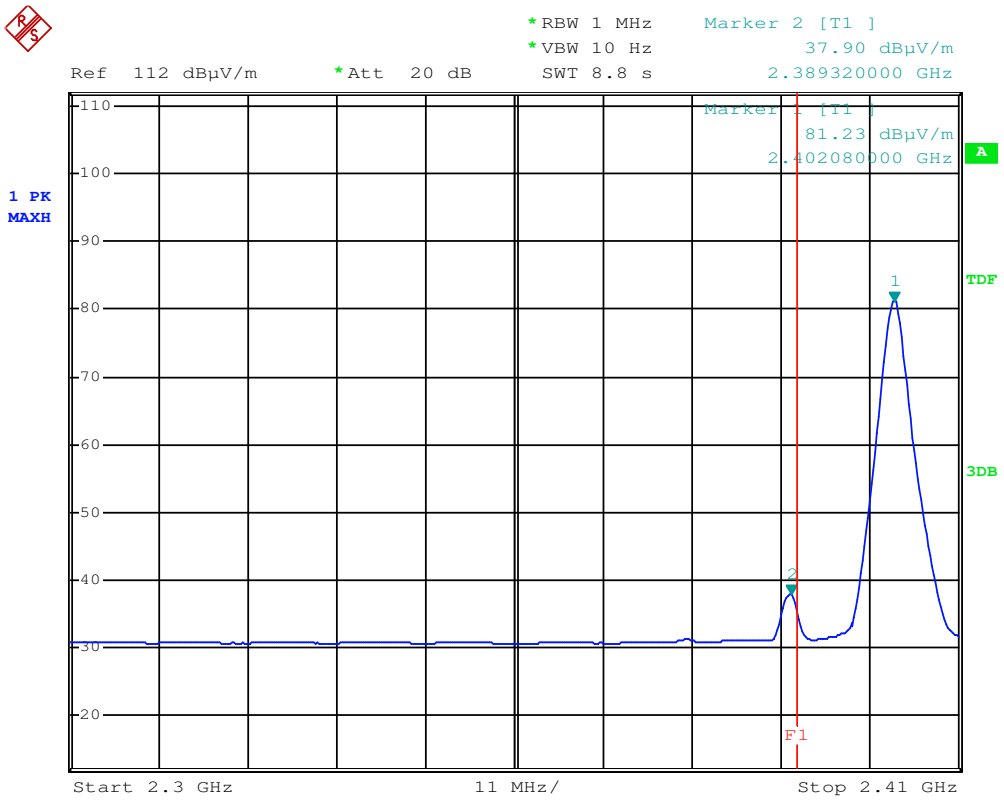
PEAK RESULT (RBW=1MHz; VBW=3MHz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	PK Limit	PK Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2389.32	55.26	27.30	5.18	-37.57	**50.17**	5000	74.00	23.83

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Lower band edge

Average



Spurious Emission in restricted band near 2400-2483.5 MHz

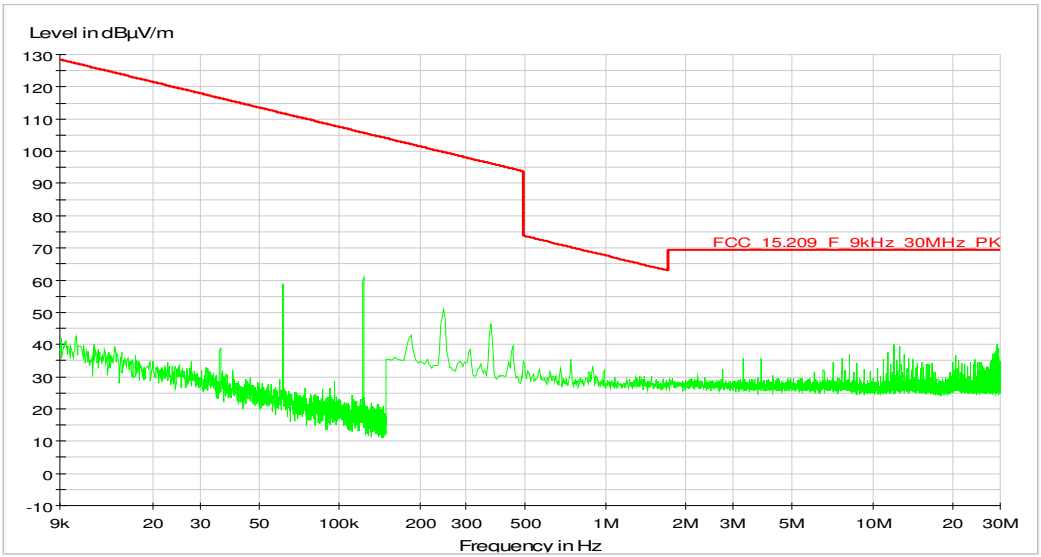
AVERAGE RESULT (RBW=1MHz; VBW=10Hz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	AV Limit	AV Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2389.32	42.99	27.30	5.18	-37.57	**37.90**	500	54.00	16.10

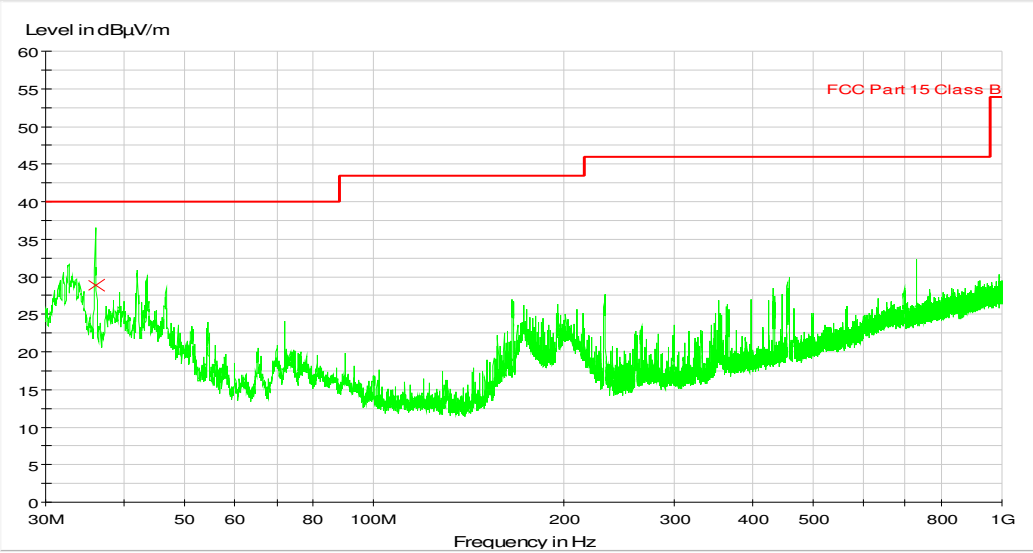
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

BLUETOOTH EDR – MODULATION 8DPSK 3Mbit/s (MIDDLE CHANNEL 2441MHZ)

9 kHz÷30 MHz



30÷1,000 MHz



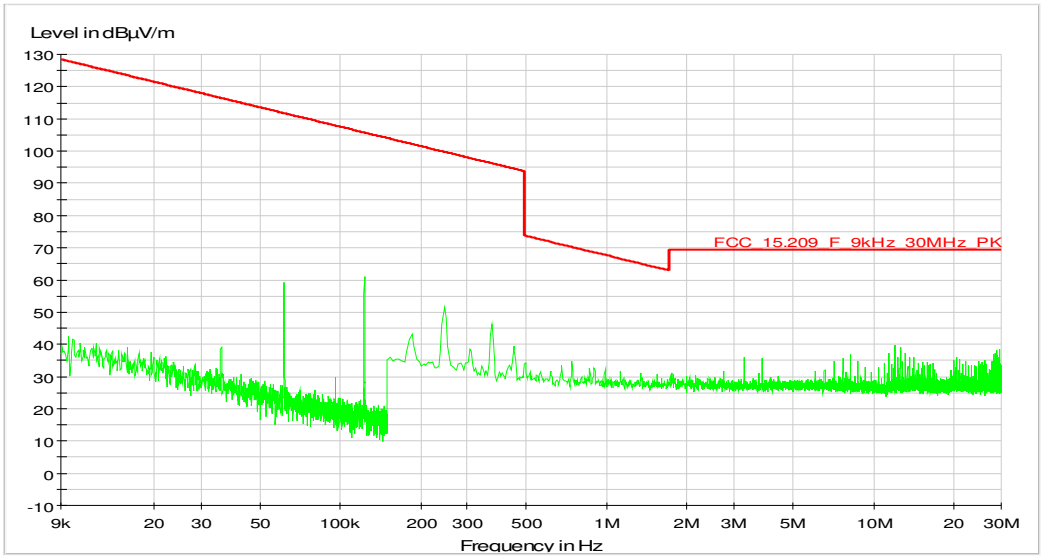
1÷26 GHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2441 (fundamental)	105.43	27.30	5.18	-37.57	**100.34**	-----	------	------
4882	50.88	31.45	7.34	-36.90	**52.77**	5000	74.00	>21
7323	45.00	36.15	9.15	-37.00	**53.30**	5000	74.00	>20
9764	40.50	38.20	10.61	-37.15	**52.16**	5000	74.00	>21
12205	45.82	39.10	12.17	-36.00	**61.09**	5000	74.00	>12
14646	36.71	41.4	13.04	-35.30	**55.85**	5000	74.00	>18
17087	35.50	41.0	13.60	-34.46	**55.64**	5000	74.00	>18
f>17087	not significant	---	---	---	---	5000	74.00	---

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2441 (fundamental)	86.51	27.30	5.18	-37.57	**81.42**	-----	------	------
4882	42.65	31.45	7.34	-36.90	**44.54**	500	54.00	>9
7323	35.12	36.15	9.15	-37.00	**43.42**	500	54.00	>10
9764	33.39	38.20	10.61	-37.15	**45.05**	500	54.00	>8
12205	31.02	39.10	12.17	-36.00	**46.29**	500	54.00	>7
14646	26.89	41.4	13.04	-35.30	**46.03**	500	54.00	>7
17087	25.50	41.0	13.60	-34.46	**45.64**	500	54.00	>8
f>17087	not significant	---	---	---	---	500	54.00	---

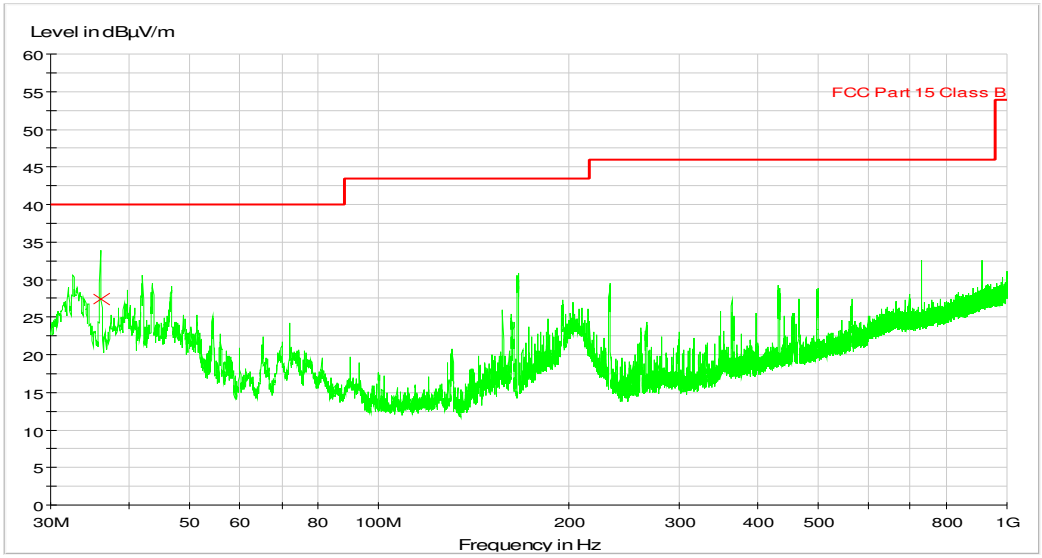
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

BLUETOOTH EDR – MODULATION 8DPSK 3Mbit/s (HIGHER CHANNEL 2480MHZ)

9 kHz÷30 MHz



30÷1,000 MHz



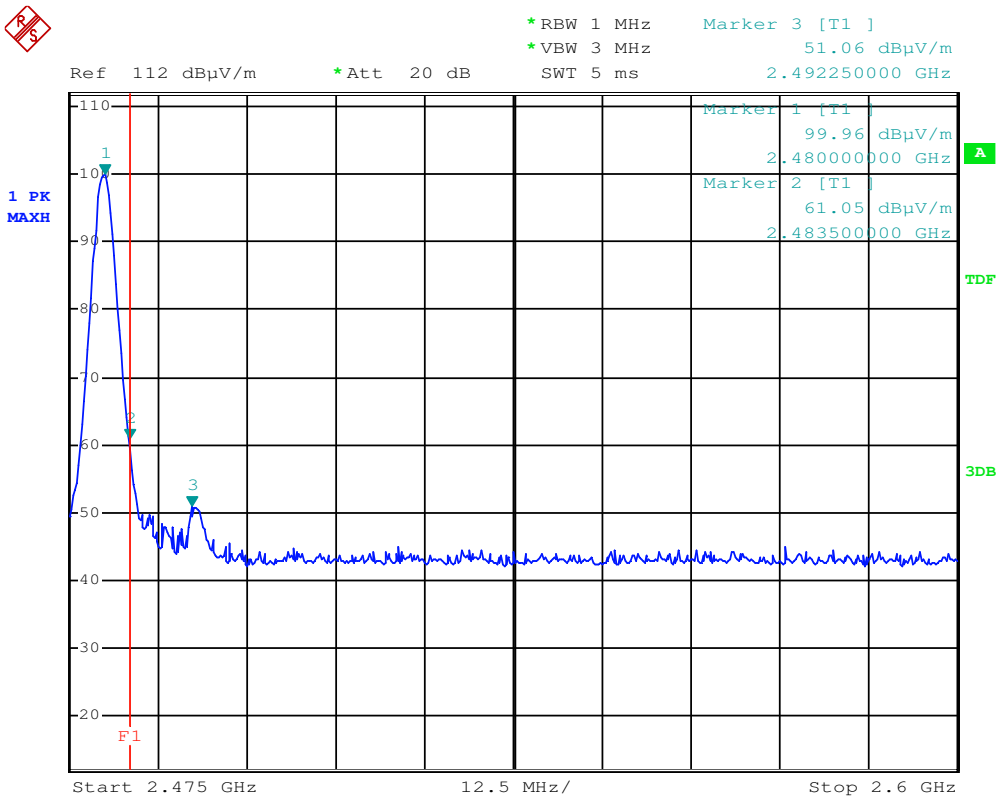
1÷26 GHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2480 (fundamental)	104.99	27.40	5.18	-37.57	**100.00**	-----	------	------
4960	50.55	31.50	7.34	-36.90	**52.49**	5000	74.00	>21
7440	45.05	36.40	9.42	-36.90	**53.97**	5000	74.00	>20
9920	38.84	38.40	10.69	-37.10	**50.83**	5000	74.00	>23
12400	45.47	38.90	12.32	-35.70	**60.99**	5000	74.00	>13
14880	38.24	39.90	12.97	-36.00	**55.11**	5000	74.00	>18
17360	33.31	43.20	14.10	-34.46	**56.15**	5000	74.00	>17
f>17360	not significant	---	---	---	---	5000	74.00	---

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB3/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2480 (fundamental)	86.22	27.40	5.18	-37.57	**81.23**	-----	------	------
4960	41.89	31.50	7.34	-36.90	**43.83**	500	54.00	>10
7440	35.10	36.40	9.42	-36.90	**44.02**	500	54.00	>9
9920	31.16	38.40	10.69	-37.10	**43.15**	500	54.00	>10
12400	29.99	38.90	12.32	-35.70	**45.51**	500	54.00	>8
14880	29.00	39.90	12.97	-36.00	**45.87**	500	54.00	>8
17360	23.38	43.20	14.10	-34.46	**46.22**	500	54.00	>7
f>17360	not significant	---	---	---	---	500	54.00	---

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Higher band edge

Peak



Spurious Emission in restricted band near 2400-2483.5 MHz

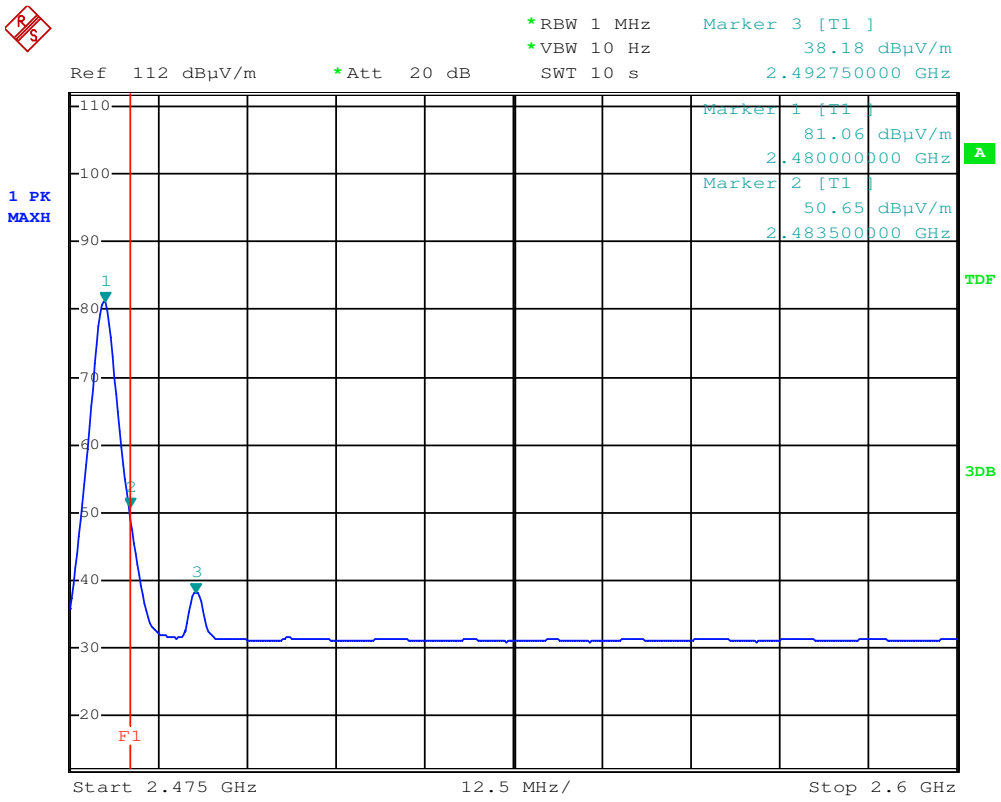
PEAK RESULT (RBW=1MHz; VBW=3MHz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	PK Limit	PK Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2483.50	66.04	27.40	5.18	-37.57	**61.05**	5000	74.00	12.95
2492.25	56.05	27.40	5.18	-37.57	**51.06**	5000	74.00	22.94

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Radiated Band-edge compliance - Higher band edge

Average



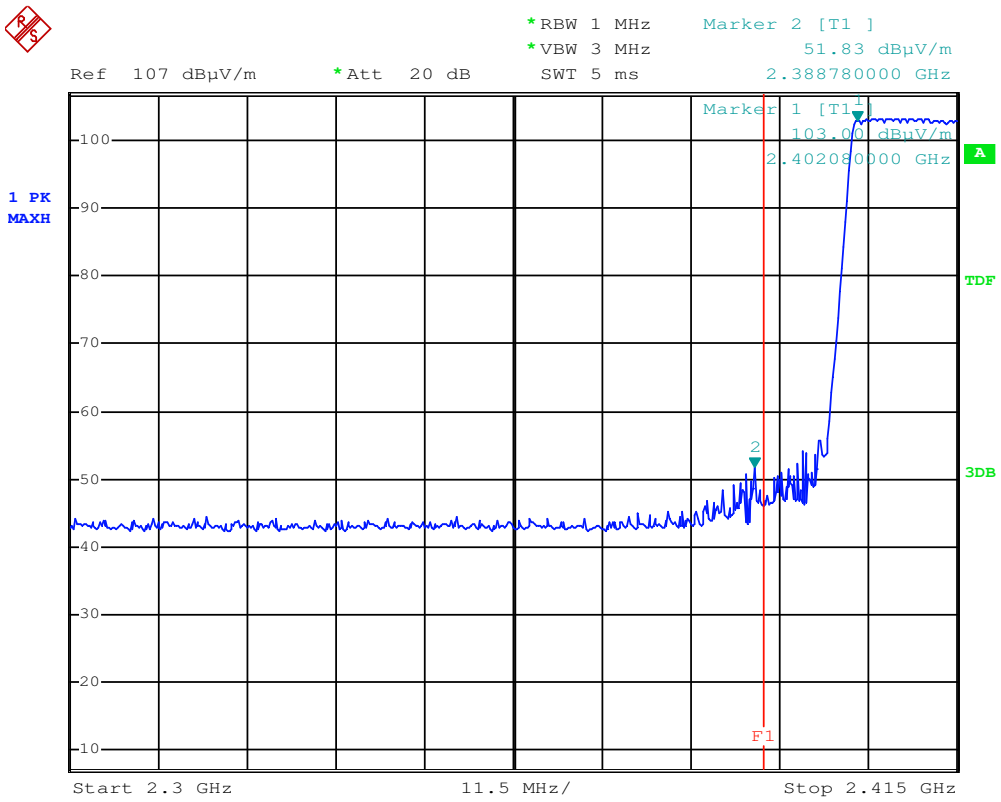
Spurious Emission in restricted band near 2400-2483.5 MHz

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	AV Limit	AV Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2483.50	55.64	27.40	5.18	-37.57	**50.65**	500	54.00	3.35
2492.75	43.17	27.40	5.18	-37.57	**38.18**	500	54.00	15.82

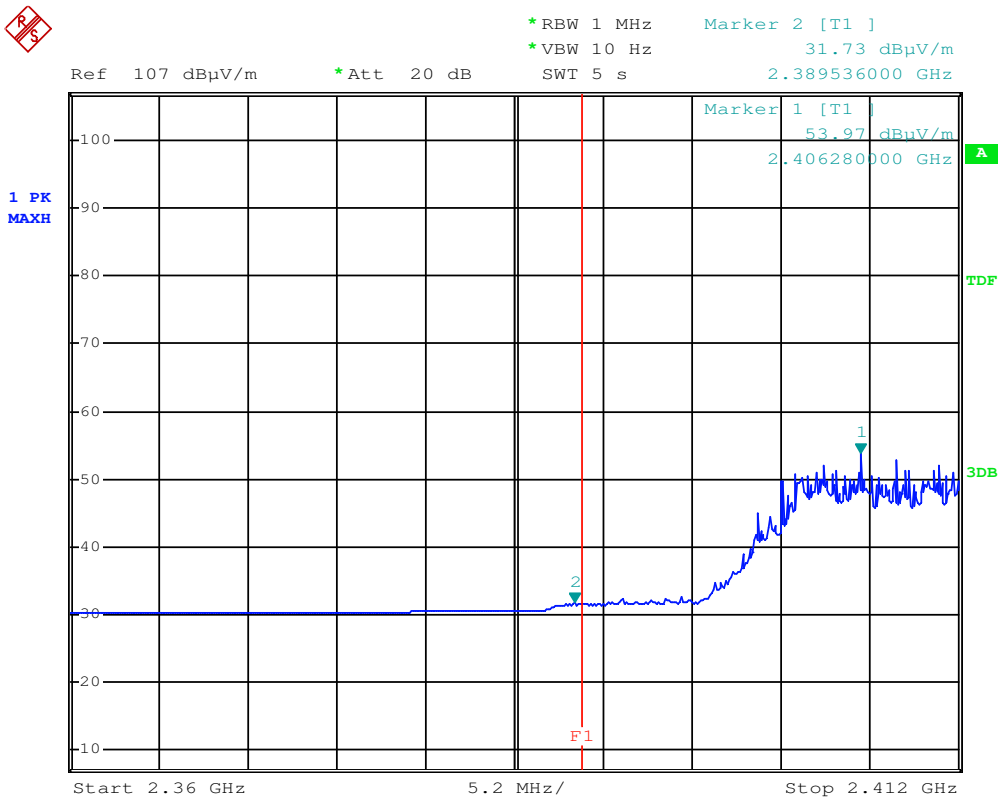
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

Bluetooth EDR – Hopping mode
Radiated Band-edge compliance - Lower band edge
Peak



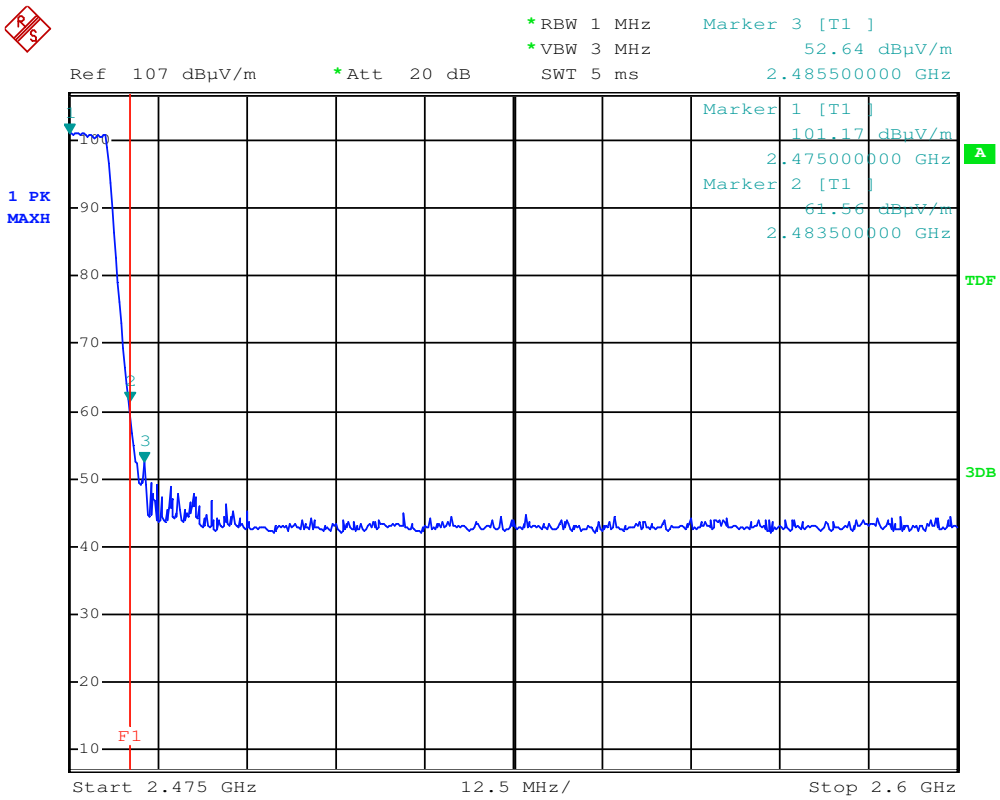
Spurious Emission in restricted band near 2400-2483.5 MHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	PK Limit	PK Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2388.78	56.92	27.30	5.18	-37.57	**51.83**	5000	74.00	22.17
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.								

Bluetooth EDR – Hopping mode
Radiated Band-edge compliance - Lower band edge
Average



Spurious Emission in restricted band near 2400-2483.5 MHz								
AVERAGE RESULT (RBW=1MHz; VBW=10Hz)								
Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	AV Limit	AV Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2389.53	36.82	27.30	5.18	-37.57	**31.73**	500	54.00	22.27
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.								

Bluetooth EDR – Hopping mode
Radiated Band-edge compliance - Higher band edge
Peak

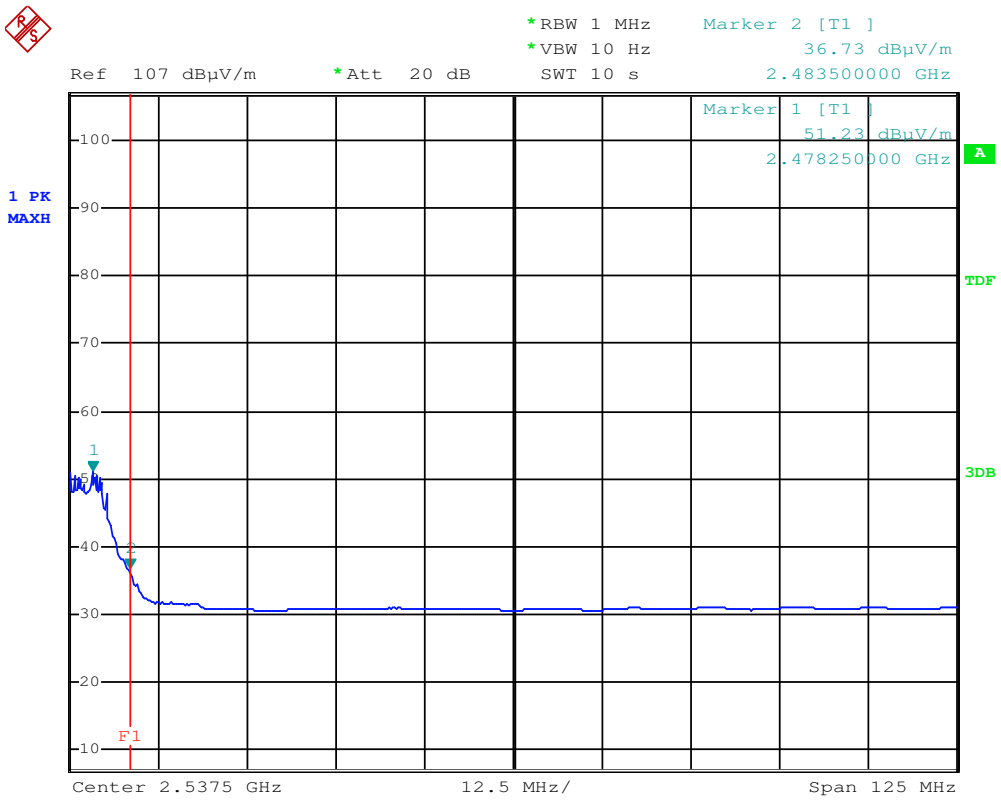


Spurious Emission in restricted band near 2400-2483.5 MHz								
PEAK RESULT (RBW=1MHz; VBW=3MHz)								
Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	PK Limit	PK Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2483.50	66.65	27.30	5.18	-37.57	**61.56**	5000	74.00	12.44
2485.50	57.73	27.30	5.18	-37.57	**52.64**	5000	74.00	21.36
NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.								

Bluetooth EDR – Hopping mode

Radiated Band-edge compliance - Higher band edge

Average



Spurious Emission in restricted band near 2400-2483.5 MHz

AVERAGE RESULT (RBW=1MHz; VBW=10Hz)

Frequency	Reading value	Antenna Factor	Cable Loss	Pre-Amp. Gain	Correcting reading	AV Limit	AV Limit	Margin
(MHz)	(dBµV)	(dB3/m)	(dB)	(dB)	(dBµV/m)	(µV/m)	(dBµV/m)	(dB)
2483.50	41.82	27.30	5.18	-37.57	**36.73**	500	54.00	17.27

NOTE: The measures above are the worst case on 3 axes X Y and Z and both polarization.

7.4 OUT-OF-BAND EMISSIONS

TEST REQUIREMENT	
Spectrum analyzer settings	
Span	/
Resolution bandwidth (RBW)	100 kHz
Video bandwidth (VBW)	300 kHz
Sweep time (SWT)	as necessary to capture the entire dwell time
Detector function	Peak
Trace	Max hold
Attenuator	/
Deviation to test procedure	None
EUT operating condition	#1
Remark	None

TEST PROCEDURE
A spectrum analyzer is connected to the antenna port of the transmitter. The measure has been executed with the lowest transmit channel, the highest transmit channel and one located somewhere in the middle of the band. The measurement takes into account the loss generated by the used cable.

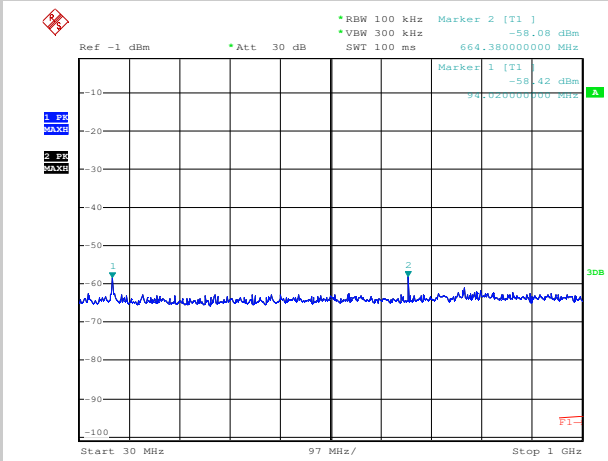
LIMITS
-20 dB below peak output power

TEST RESULT
The EUT meets the requirements of sections 15.247 (d) All out of band spurious emissions are more 20 dB below the in band power of the fundamental.

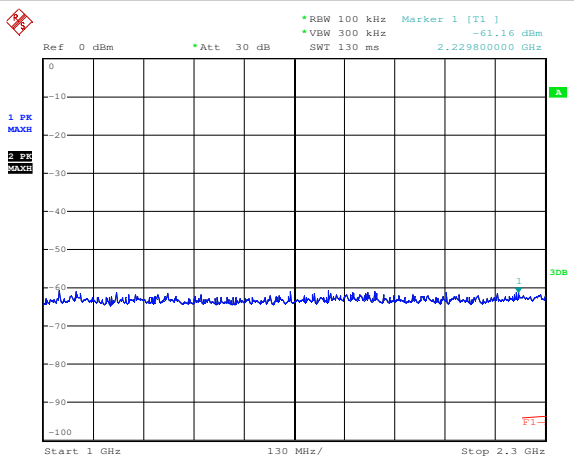
MEASUREMENTS RESULTS - CONDUCTED

BLUETOOTH EDR – MODULATION GFSK 1MBIT/S (LOWER CHANNEL 2402MHZ)

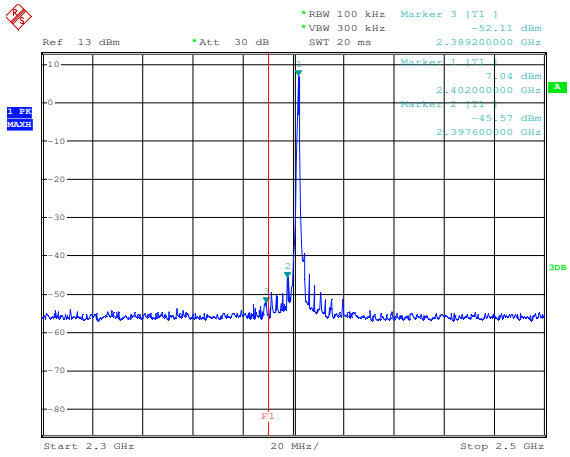
Plot 1 (30÷1000MHz)



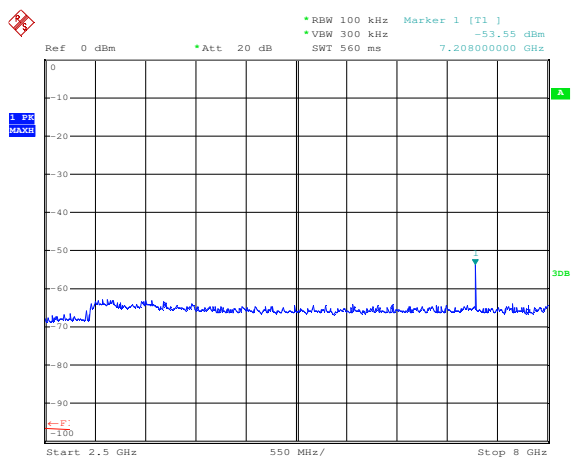
Plot 2 (1÷2.3GHz)



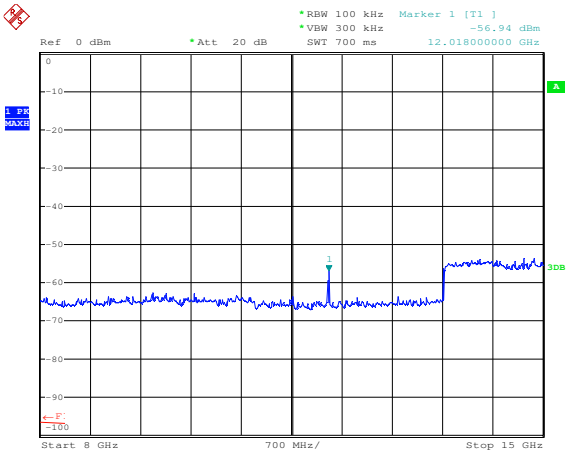
Plot 3 (2.3÷2.5GHz)



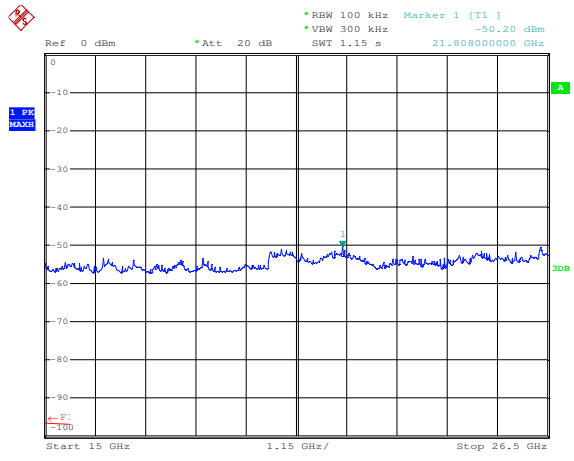
Plot 4 (2.5÷8GHz)



Plot 5 (8÷15GHz)

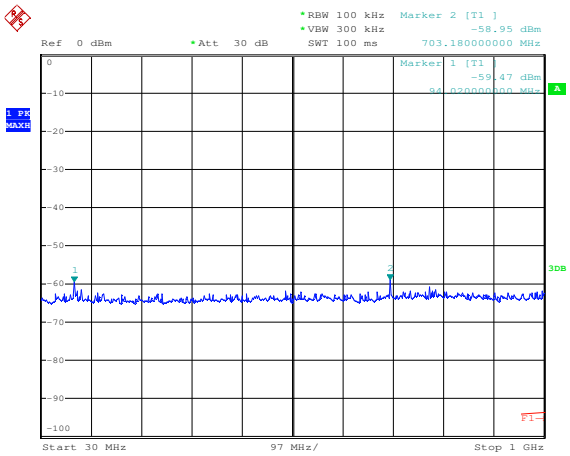


Plot 6 (15÷26.5GHz)

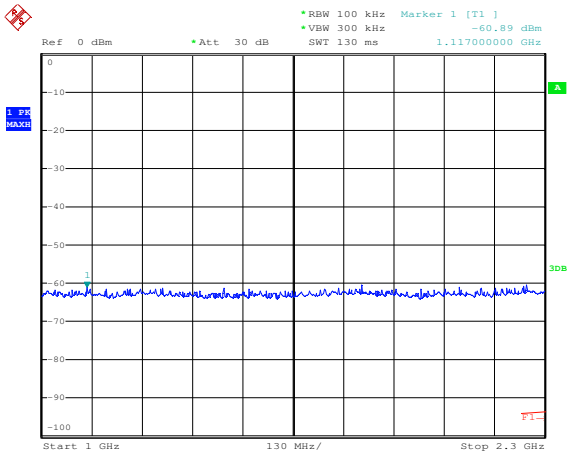


BLUETOOTH EDR – MODULATION GFSK 1MBIT/S (MIDDLE CHANNEL 2441MHZ)

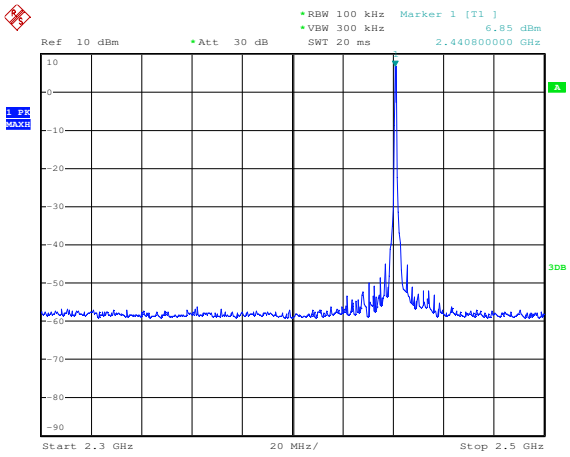
Plot 1 (30÷1000MHz)



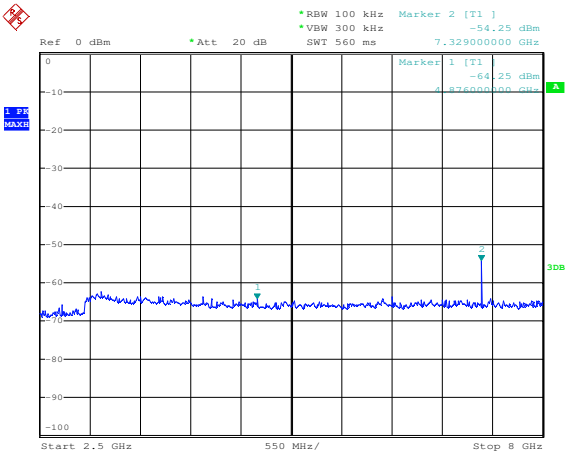
Plot 2 (1÷2.3GHz)



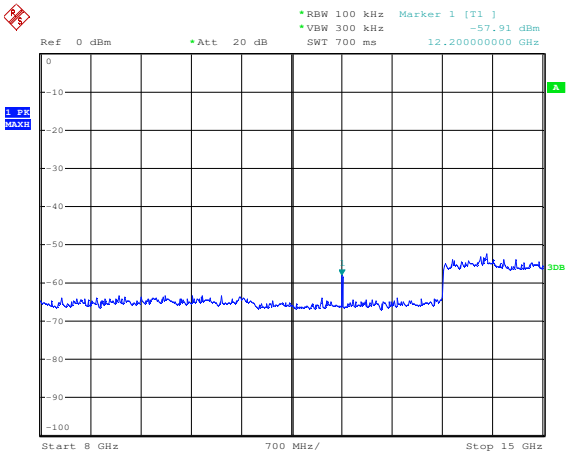
Plot 3 (2.3÷2.5GHz)



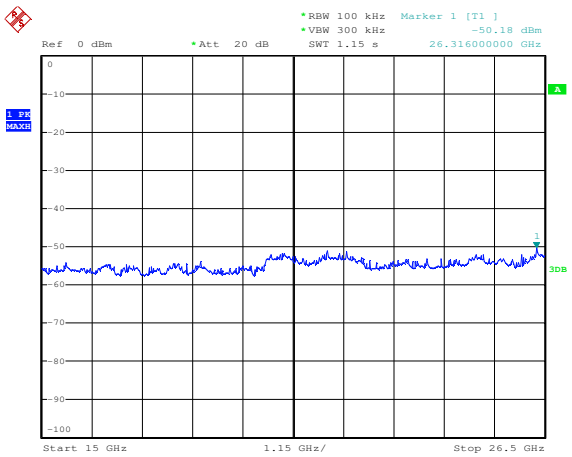
Plot 4 (2.5÷8GHz)



Plot 5 (8÷15GHz)

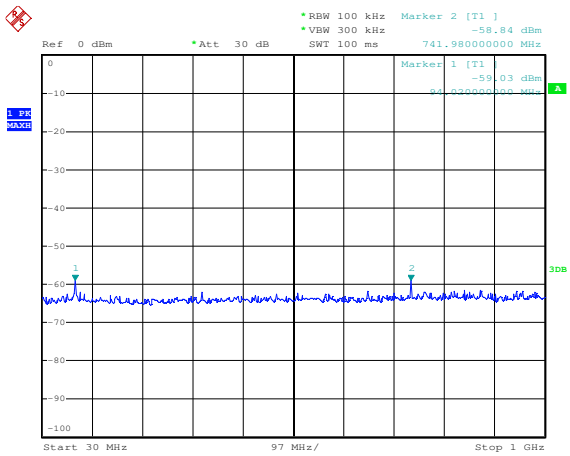


Plot 6 (15÷26.5GHz)

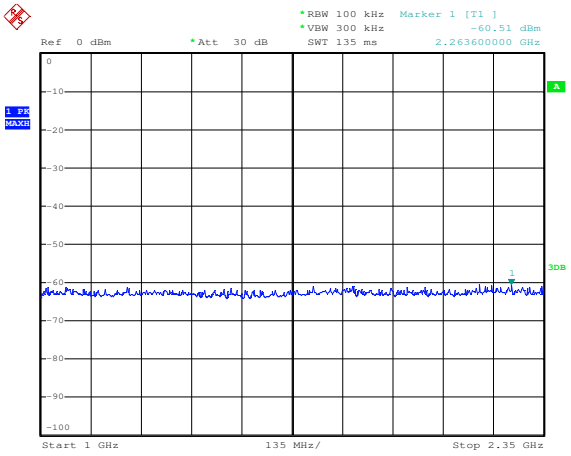


BLUETOOTH EDR – MODULATION GFSK 1MBIT/S (HIGHER CHANNEL 2480MHZ)

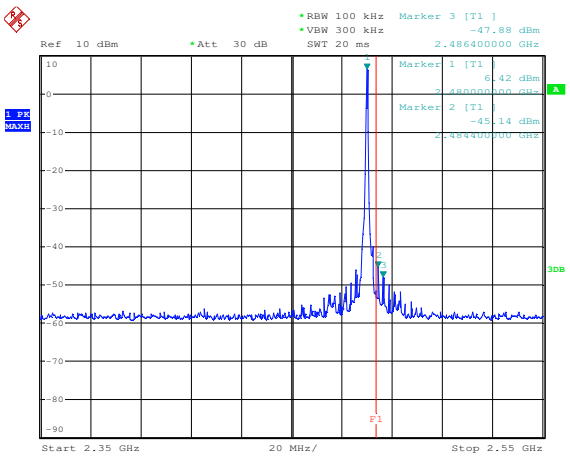
Plot 1 (30÷1000MHz)



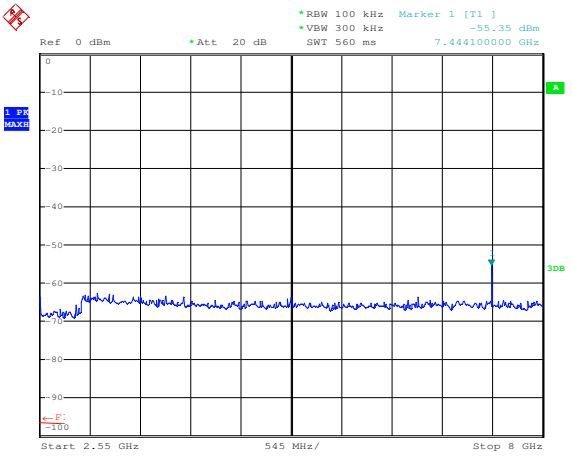
Plot 2 (1÷2.35GHz)



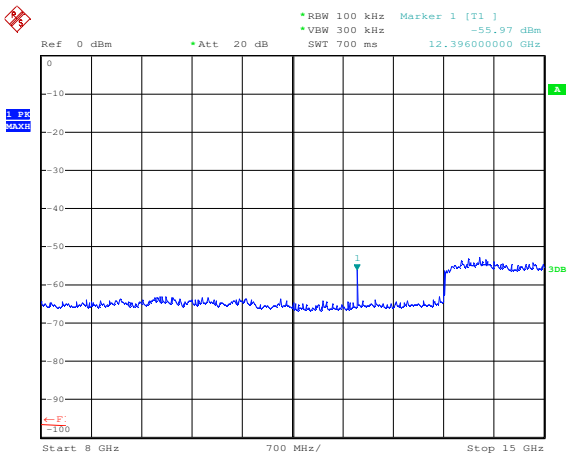
Plot 3 (2.35÷2.55GHz)



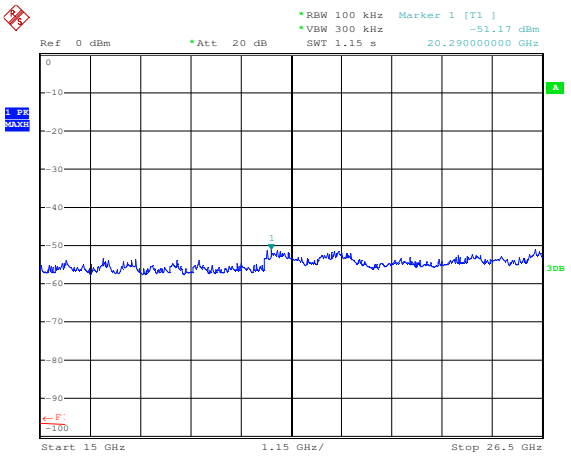
Plot 4 (2.55÷8GHz)



Plot 5 (8÷15GHz)

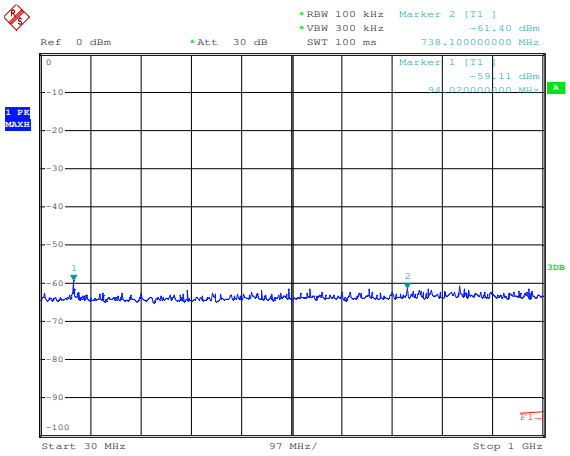


Plot 6 (15÷26.5GHz)

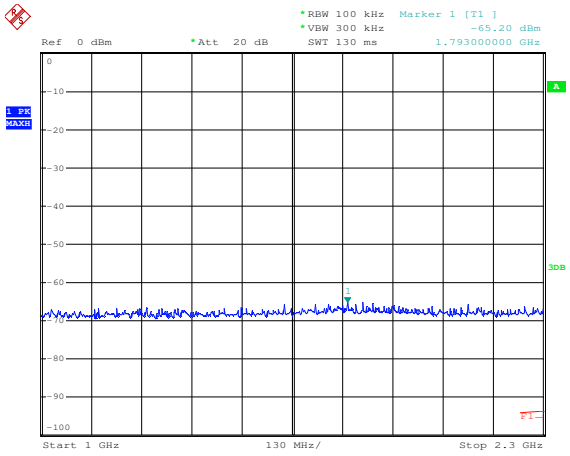


BLUETOOTH EDR – MODULATION π/4-DQPSK 2Mbit/s (LOWER CHANNEL 2402MHZ)

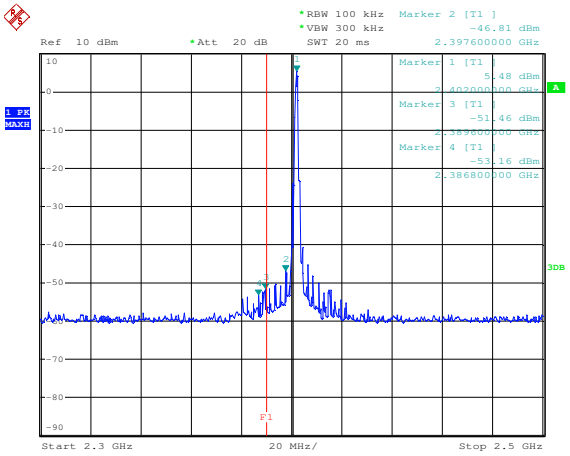
Plot 1 (30÷1000MHz)



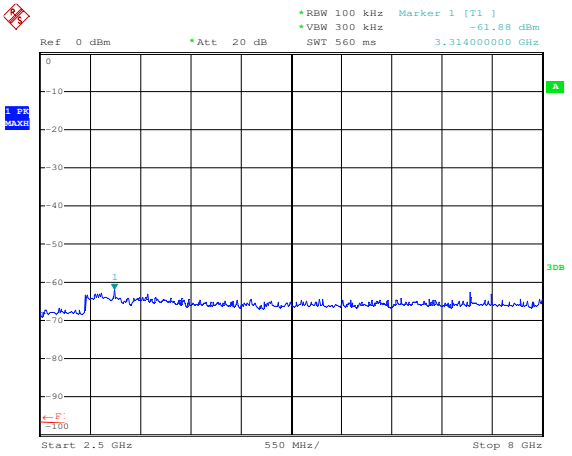
Plot 2 (1÷2.3GHz)



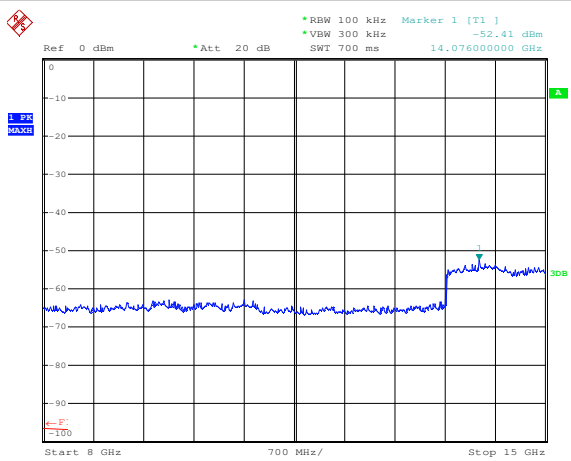
Plot 3 (2.3÷2.5GHz)



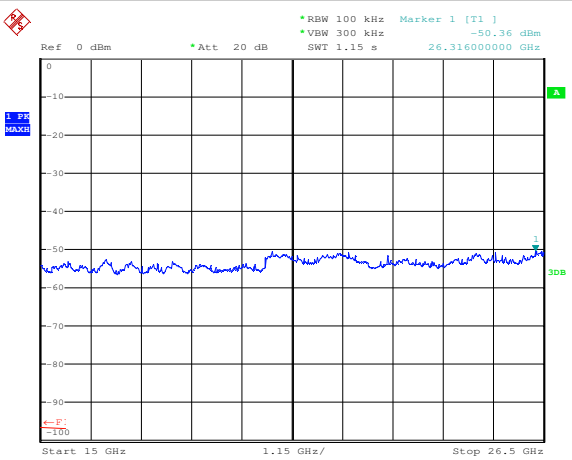
Plot 4 (2.5÷8GHz)



Plot 5 (8÷15GHz)

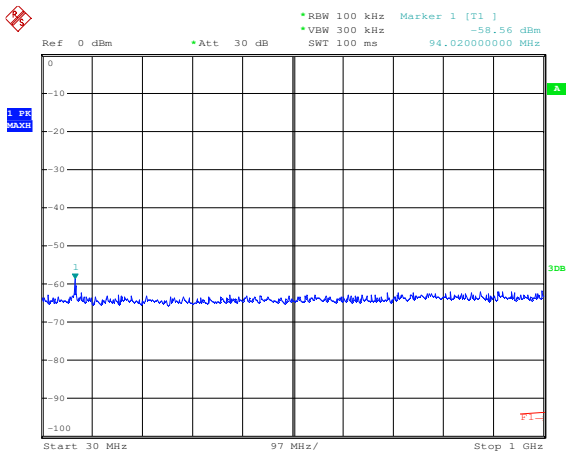


Plot 6 (15÷26.5GHz)

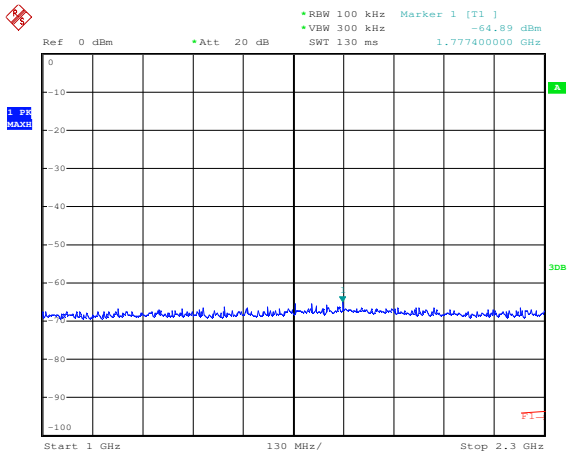


BLUETOOTH EDR – MODULATION π/4-DQPSK 2Mbit/s (MIDDLE CHANNEL 2441MHZ)

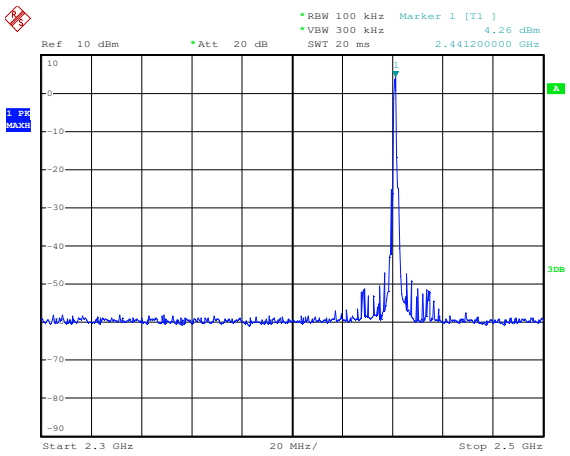
Plot 1 (30÷1000MHz)



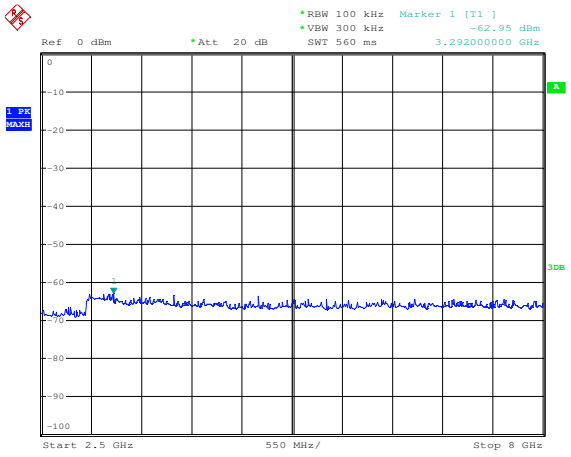
Plot 2 (1÷2.3GHz)



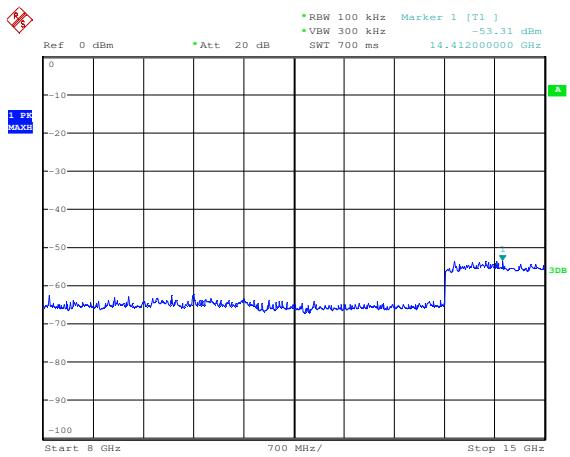
Plot 3 (2.3÷2.5GHz)



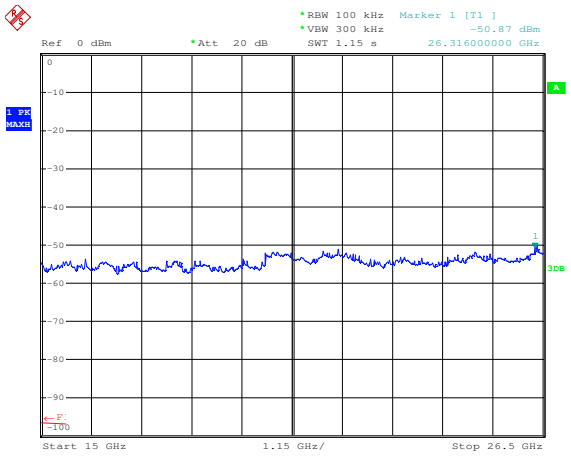
Plot 4 (2.5÷8GHz)



Plot 5 (8÷15GHz)

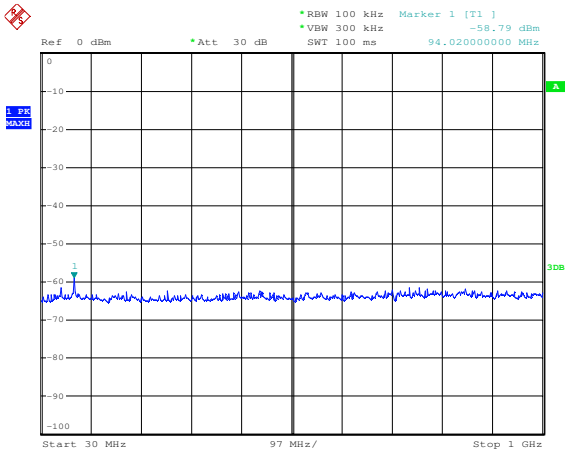


Plot 6 (15÷26.5GHz)

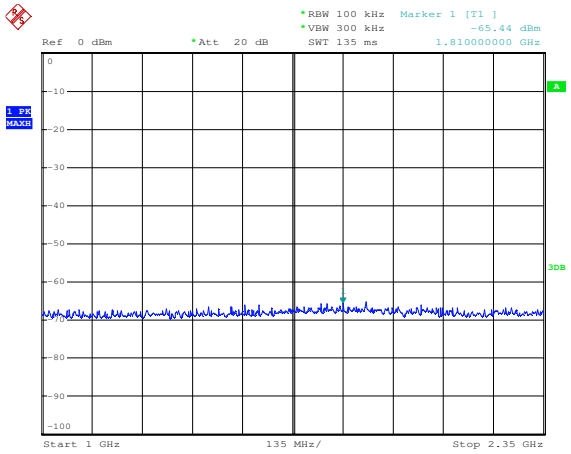


BLUETOOTH EDR – MODULATION π/4-DQPSK 2Mbit/s (HIGHER CHANNEL 2480MHZ)

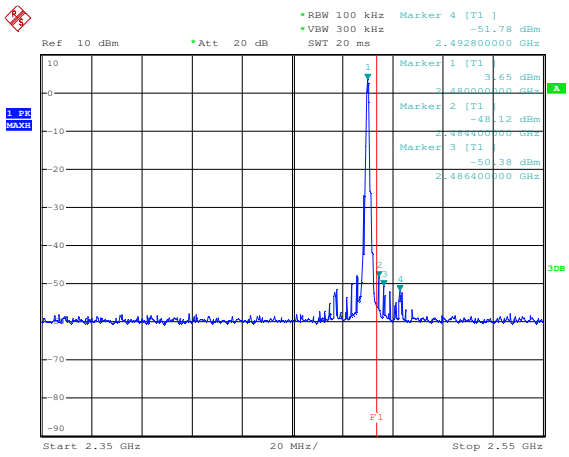
Plot 1 (30÷1000MHz)



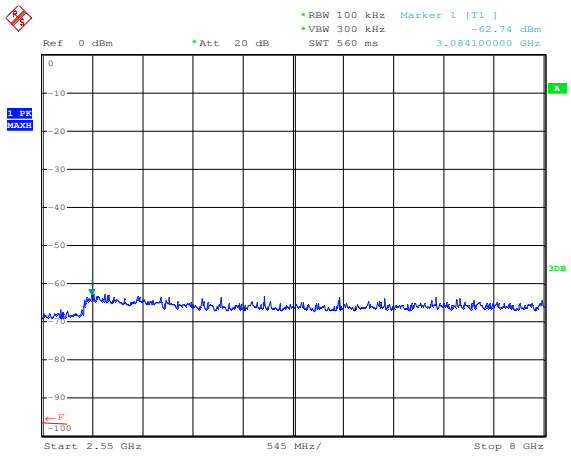
Plot 2 (1÷2.35GHz)



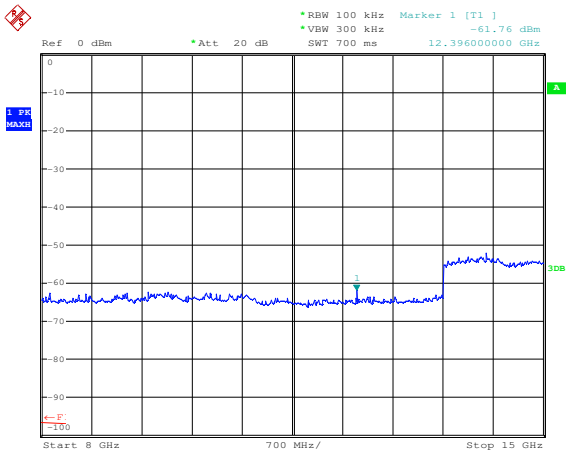
Plot 3 (2.35÷2.55GHz)



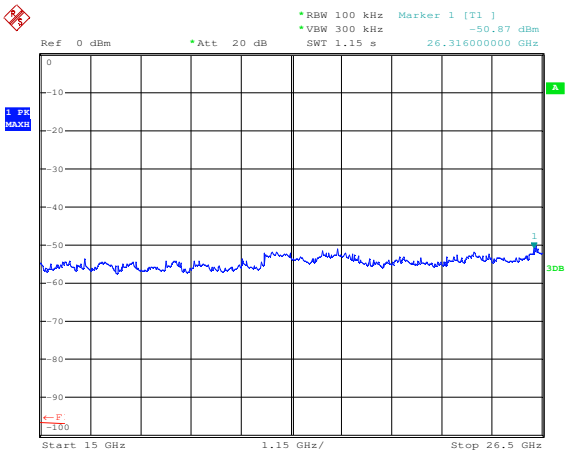
Plot 4 (2.55÷8GHz)



Plot 5 (8÷15GHz)

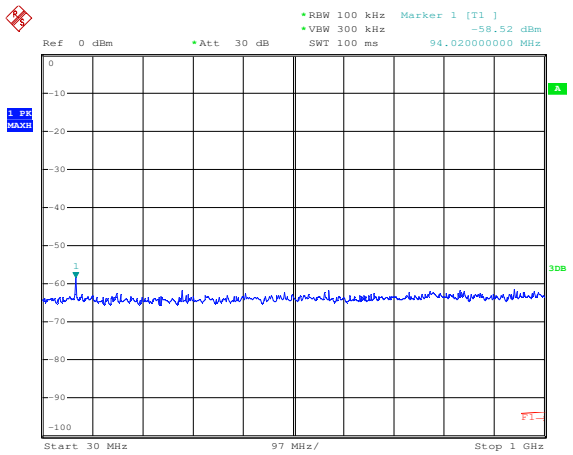


Plot 6 (15÷26.5GHz)

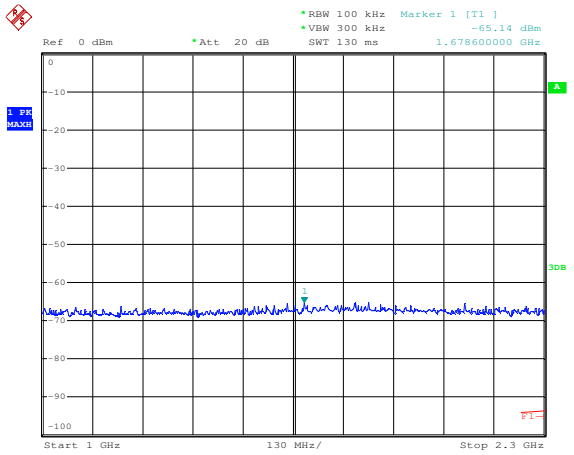


BLUETOOTH EDR – MODULATION 8DPSK 3Mbit/s (LOWER CHANNEL 2402MHZ)

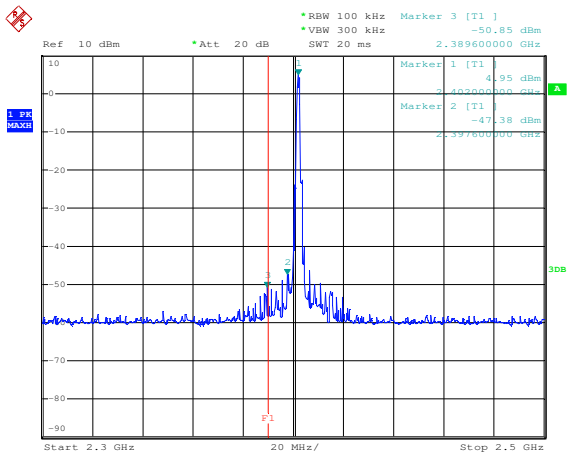
Plot 1 (30÷1000MHz)



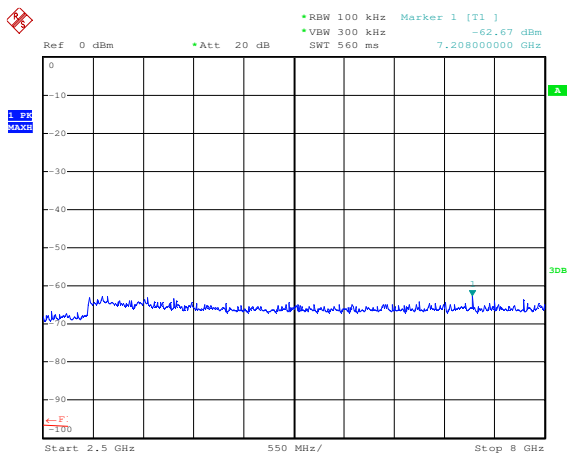
Plot 2 (1÷2.3GHz)



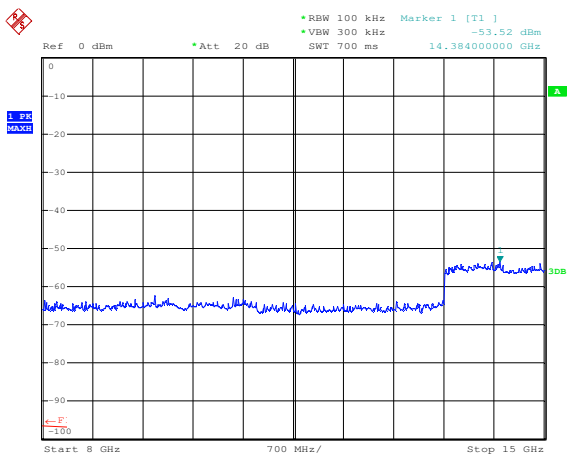
Plot 3 (2.3÷2.5GHz)



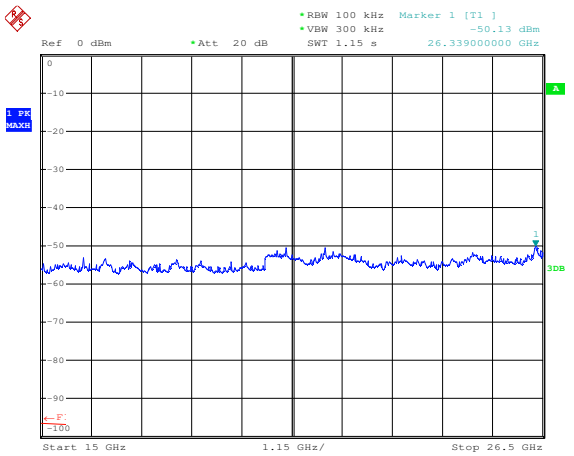
Plot 4 (2.5÷8GHz)



Plot 5 (8÷15GHz)

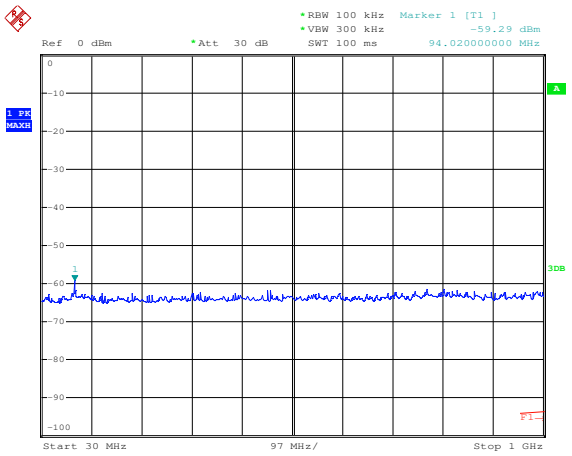


Plot 6 (15÷26.5GHz)

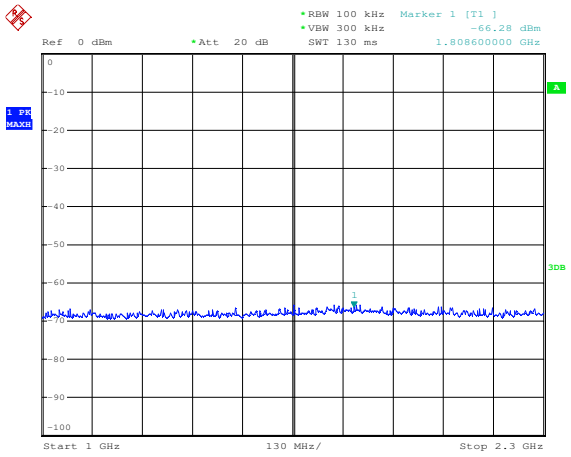


BLUETOOTH EDR – MODULATION 8DPSK 3Mbit/s (MIDDLE CHANNEL 2441MHZ)

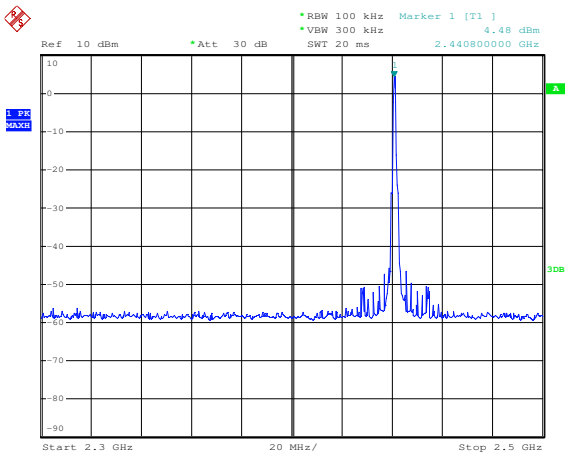
Plot 1 (30÷1000MHz)



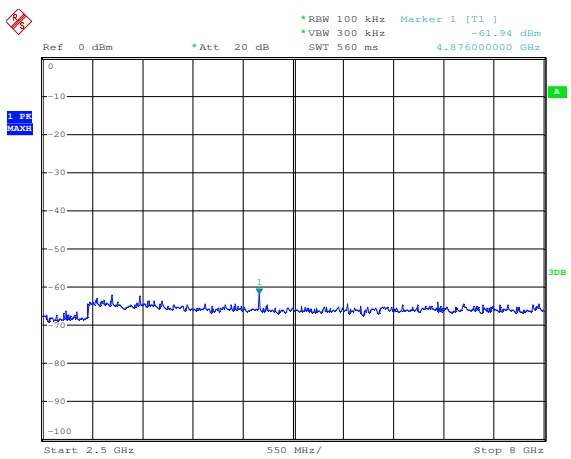
Plot 2 (1÷2.3GHz)



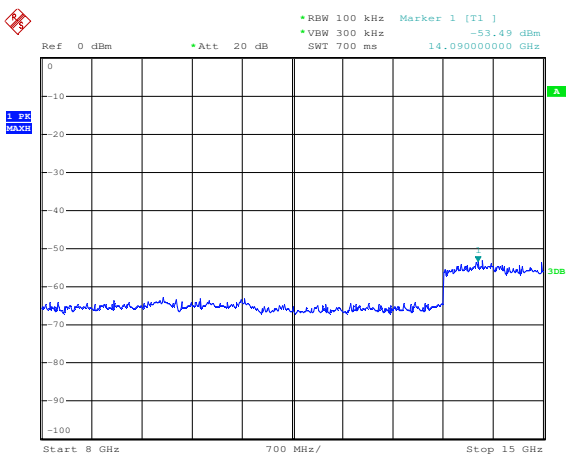
Plot 3 (2.3÷2.5GHz)



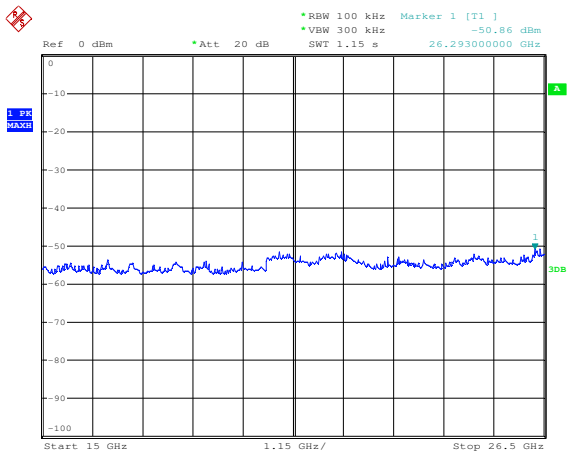
Plot 4 (2.5÷8GHz)



Plot 5 (8÷15GHz)

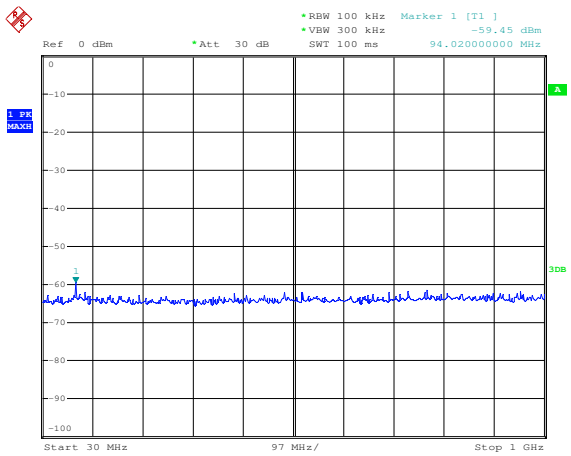


Plot 6 (15÷26.5GHz)

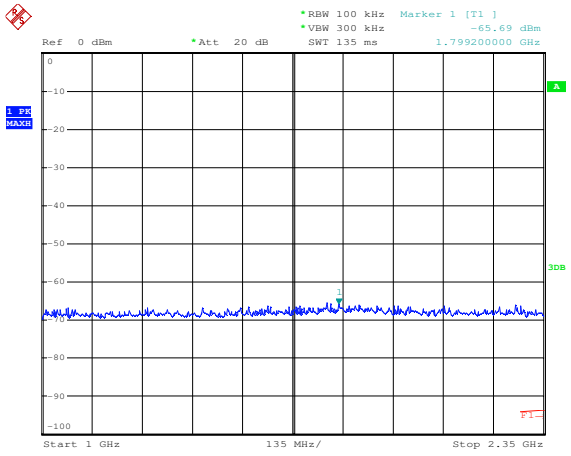


BLUETOOTH EDR – MODULATION 8DPSK 3Mbit/s (HIGHER CHANNEL 2480MHZ)

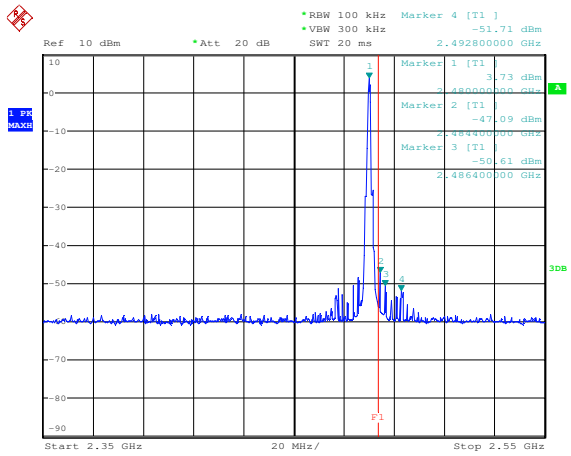
Plot 1 (30÷1000MHz)



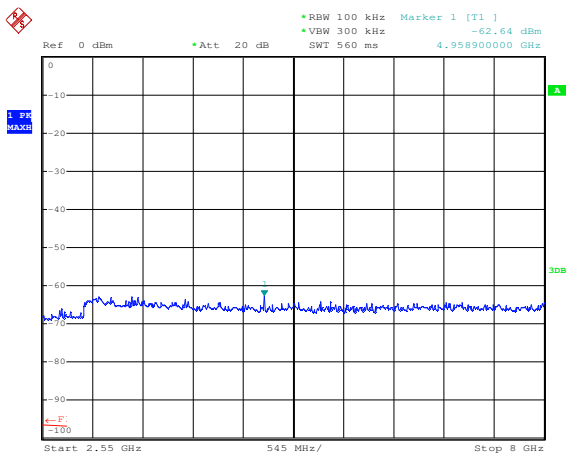
Plot 2 (1÷2.35GHz)



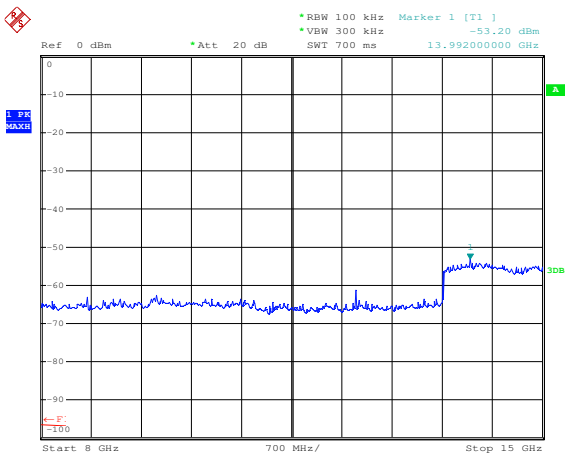
Plot 3 (2.35÷2.55GHz)



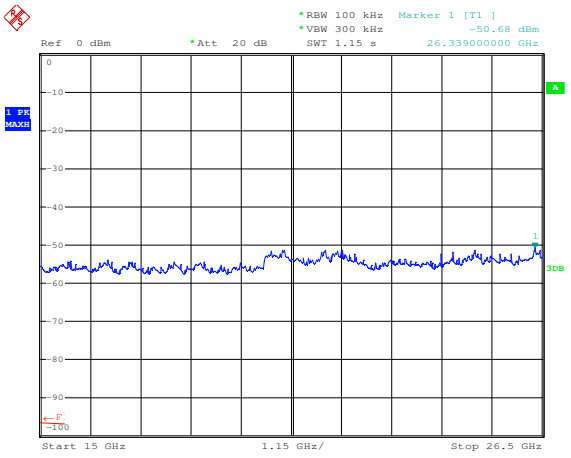
Plot 4 (2.55÷8GHz)



Plot 5 (8÷15GHz)



Plot 6 (15÷26.5GHz)



7.5 -20dB BANDWIDTH

TEST REQUIREMENT	
Spectrum analyzer settings	
Span	Wide enough to capture the peak level of the emission
Resolution bandwidth (RBW)	30 kHz
Video bandwidth (VBW)	100 kHz
Sweep time (SWT)	AUTO
Detector function	Peak
Trace	max hold
Attenuator	/
Deviation to test procedure	None
EUT operating condition	#1
Remark	None

TEST PROCEDURE
The transmitter output was connected to the spectrum analyzer through a temporary RF 50Ω connector. After trace stabilisation, the 2 marker shall be sets -20dB respect to the signal peak. The delta level between 2 marker is the -20dB bandwidth.

LIMITS
None; for reporting purpose only

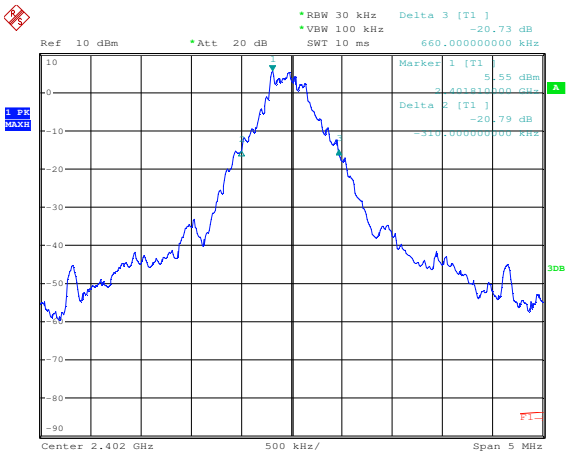
TEST RESULT
The EUT meets the requirements of sections 15.247 (a)

MEASUREMENTS RESULTS

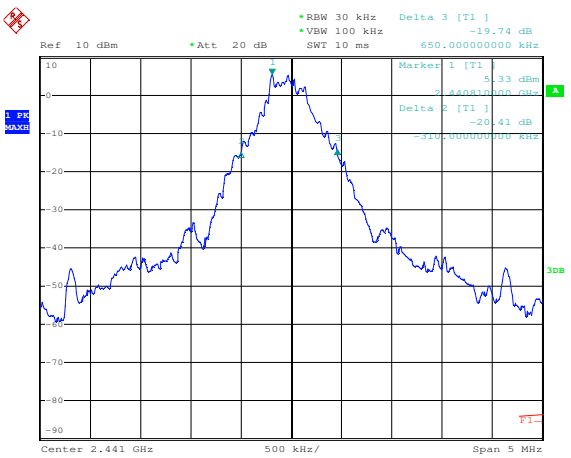
BLUETOOTH EDR – MODULATION GFSK 1MBIT/S

Channel (No.)	Frequency (MHz)	Channel Bandwidth at -20dB (kHz)	Plot (No.)
Low	2402	970	1
Middle	2441	960	2
High	2480	960	3

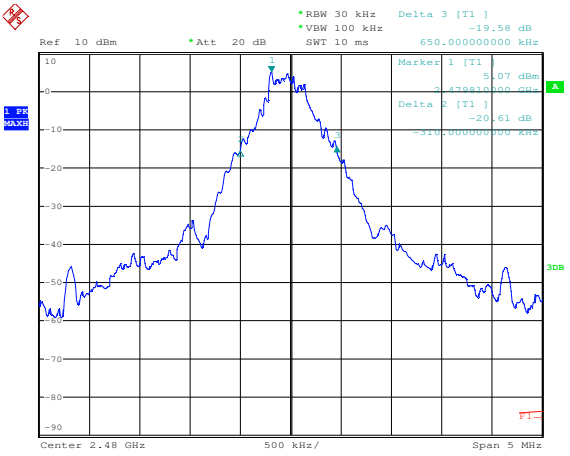
Plot 1



Plot 2



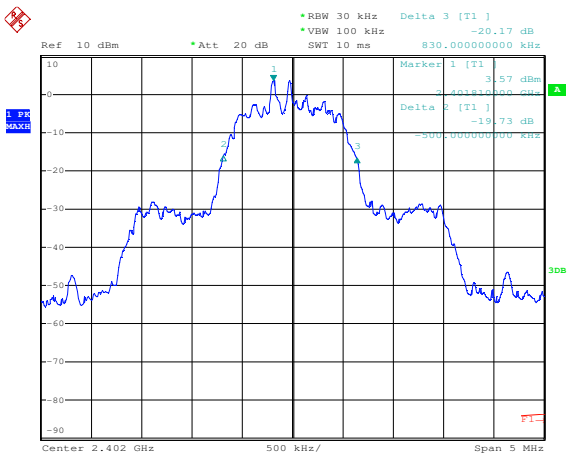
Plot 3



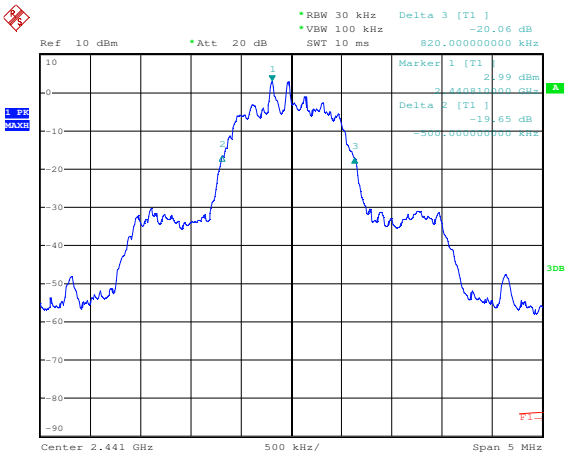
BLUETOOTH EDR – MODULATION π/4-DQPSK 2Mbit/s

Channel (No.)	Frequency (MHz)	Channel Bandwidth at -20dB (kHz)	Plot (No.)
Low	2402	1130	1
Middle	2441	1120	2
High	2480	1120	3

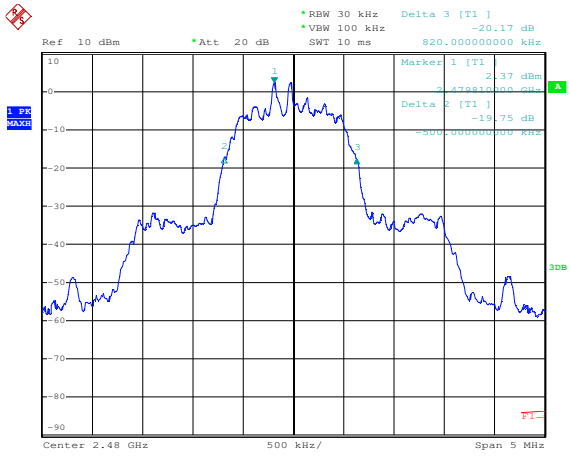
Plot 1



Plot 2



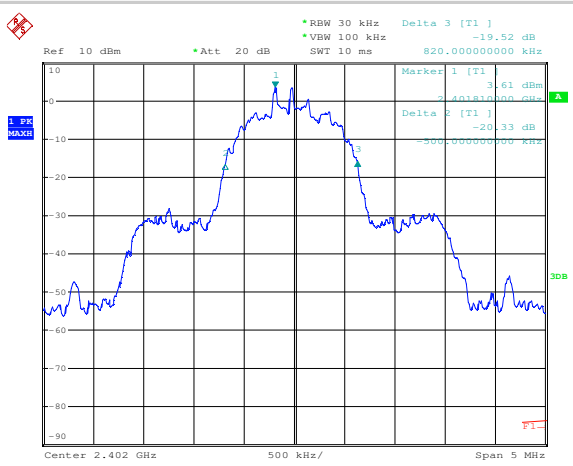
Plot 3



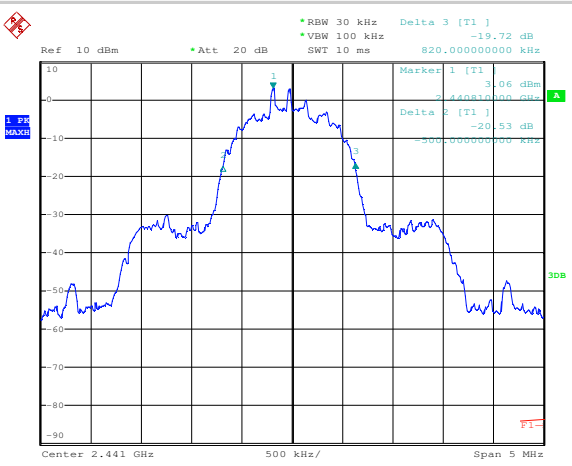
BLUETOOTH EDR – MODULATION 8DPSK 3Mbit/s

Channel (No.)	Frequency (MHz)	Channel Bandwidth at -20dB (kHz)	Plot (No.)
Low	2402	1120	1
Middle	2441	1120	2
High	2480	1120	3

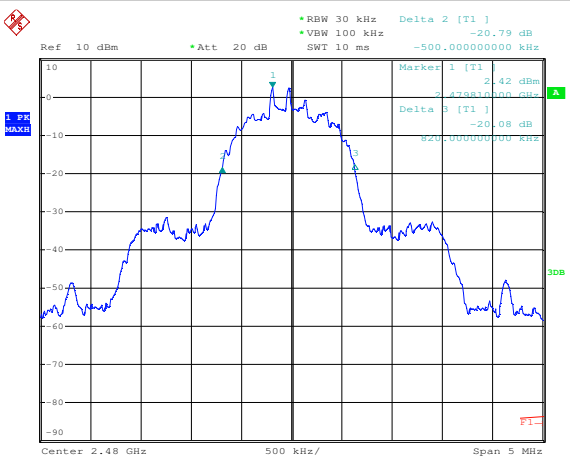
Plot 1



Plot 2



Plot 3



7.6 CARRIER FREQUENCY SEPARATION

TEST REQUIREMENT	
Spectrum analyzer settings	
Span	Wide enough to capture the peaks of two adjacent channels
Resolution bandwidth (RBW)	100 kHz
Video bandwidth (VBW)	300 kHz
Sweep time (SWT)	AUTO
Detector function	Peak
Trace	Max hold
Attenuator	/
Deviation to test procedure	None
EUT operating condition	#2 (Hopping mode)
Remark	None

TEST PROCEDURE
The transmitter output was connected to the spectrum analyzer through a temporary RF 50Ω connector. Resolution bandwidth setting at 100kHz and the Video Bandwidth at 300kHz. Once the trace is stabilized, by the marker-delta function the separation between the peaks of the adjacent channels was determined.

LIMITS
≥ 25 kHz

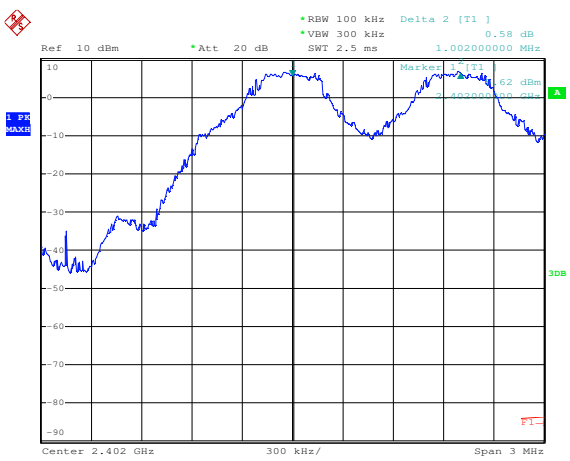
TEST RESULT
The EUT meets the requirements of section 15.247 (a) (1)

MEASUREMENTS RESULTS

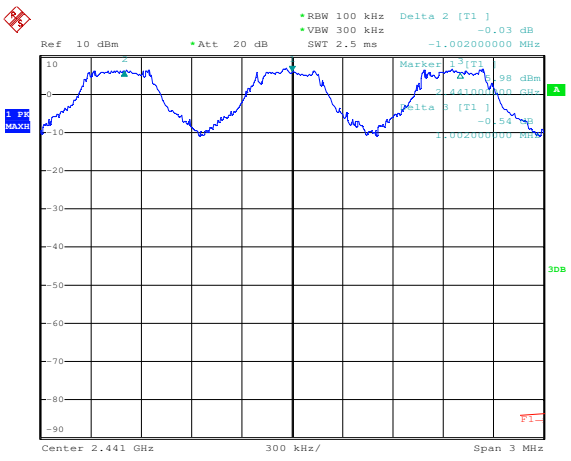
BLUETOOTH EDR – HOPPING MODE

Channel (No.)	Frequency (MHz)	Channel frequency separation (kHz)	Plot (No.)
Low	2402	1002.00	1
Middle	2441	1002.00	2
High	2480	1002.00	3

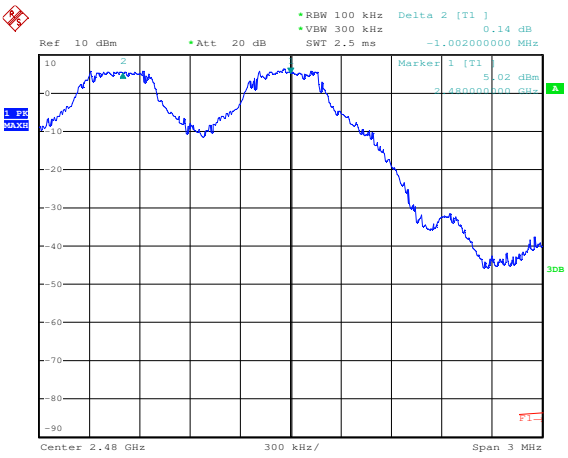
Plot 1



Plot 2



Plot 3



7.7 NUMBER OF HOPPING FREQUENCIES

TEST REQUIREMENT	
Spectrum analyzer settings	
Span	Wide enough to capture the peaks of all channels
Resolution bandwidth (RBW)	100 kHz
Video bandwidth (VBW)	300 kHz
Sweep time (SWT)	AUTO
Detector function	Peak
Trace	Max hold
Attenuator	/
Deviation to test procedure	None
EUT operating condition	#2 (Hopping mode)
Remark	None

TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through a temporary RF 50Ω connector. Resolution bandwidth setting at 100kHz and the Video Bandwidth at 300kHz.

Once the trace is stabilized, by the marker-delta function the separation between the first peak and the last peak.

The spectrum was broken in two plots to show all the hopping channels.

LIMITS

At least 15 hopping channels

TEST RESULT

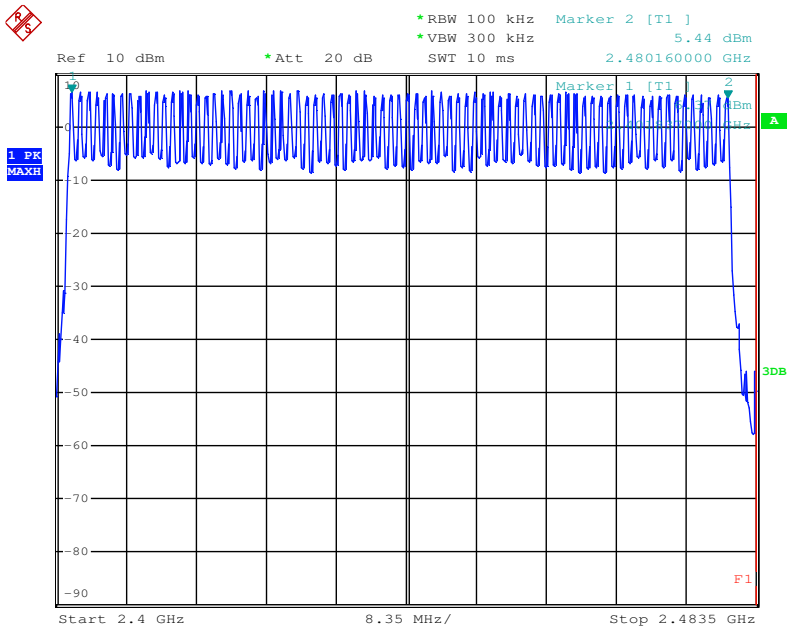
The EUT meets the requirements of section 15.247 (a) (1) (iii)

MEASUREMENTS RESULTS

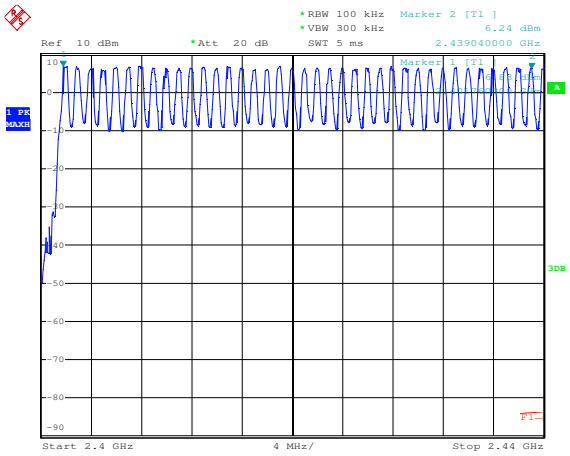
BLUETOOTH EDR – HOPPING MODE

Channel (No.)	Frequency (MHz)	N° of Hopping Channel	Plot (No.)
All channel	2402÷2480	79	1
Low to Middle	2402÷2440	39	2
Middle to High	2440÷2480	40	3

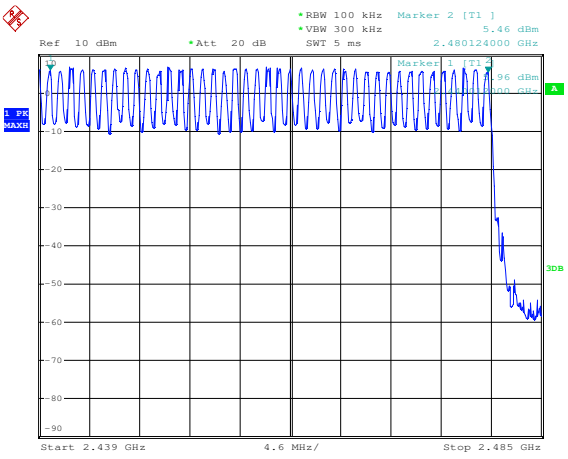
Plot 1



Plot 2



Plot 3



7.8 TIME OCCUPANCY (DWELL TIME)

TEST REQUIREMENT	
Spectrum analyzer settings	
Span	Zero span, centred on a hopping channel
Resolution bandwidth (RBW)	1 MHz (single packet) / 100 kHz (n° of packets)
Video bandwidth (VBW)	3 MHz (single packet) / 300 kHz (n° of packets)
Sweep time (SWT)	AUTO (single packet) / 5s. (n° of packets)
Detector function	Peak
Trace	Max hold
Attenuator	/
Deviation to test procedure	None
EUT operating condition	#2 (Hopping mode)
Remark	None

TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through a temporary RF 50Ω connector. Resolution bandwidth setting at 1MHz and the Video Bandwidth at 3MHz.

The average time of occupancy is obtained by measuring first the dwell time of a single packet (DH1, DH3 and DH5 packet) with the delta marker function, using a zero span centered on a hopping channel and counting then the number of hops per channel in a 31.6s period (0.4s times the number of hopping channels).

LIMITS

The average time of occupancy on any channel shall not be greater than 0.4s within a period of 0.4s multiplied by the number of hopping channel employed.

TEST RESULT

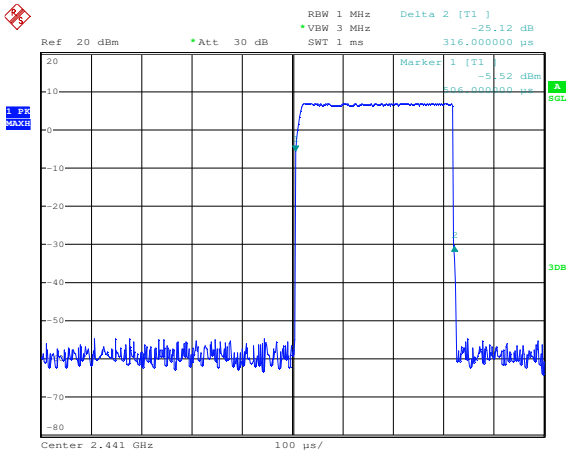
The EUT meets the requirements of section 15.247 (a) (1) (iii)

MEASUREMENTS RESULTS

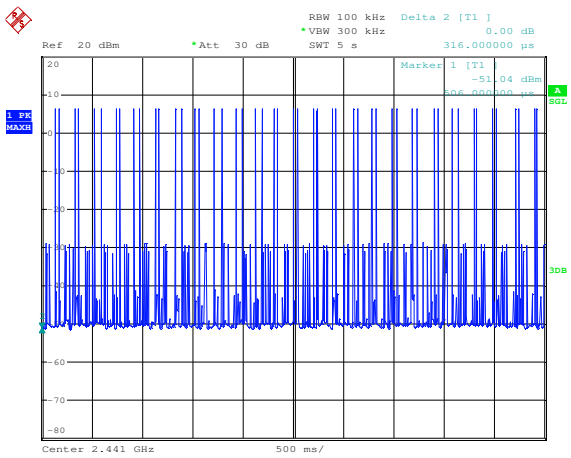
BLUETOOTH EDR – HOPPING MODE

Channel (No.)	Packet type	Packet duration (ms)	N° of Hops x Channel in a 31.6s period	Average time of occupancy (ms)	Limit (ms)	Plot (No.)
Middle channel	DH1	0.31600	316	99.856	400	1÷2
Middle channel	DH3	1.40000	177	247.80	400	3÷4
Middle channel	DH5	2.88800	114	329.23	400	5÷6

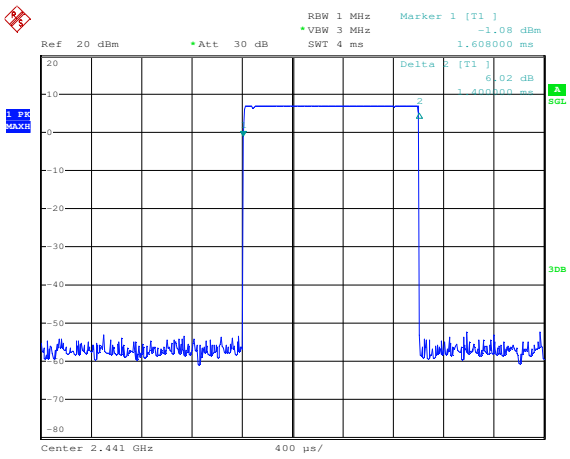
Plot 1 (DH1 packet)



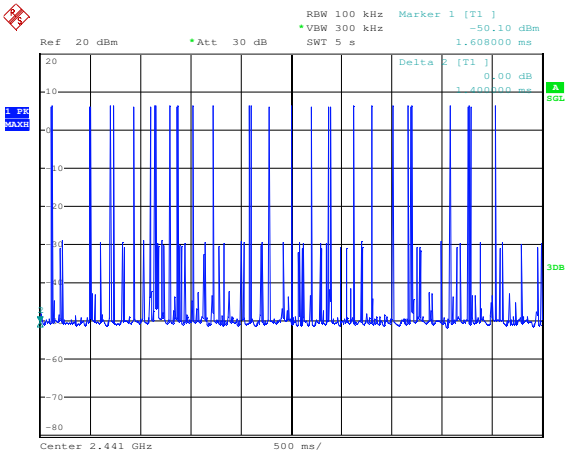
Plot 2 (DH1 packet) – N° of packets in 5s. (50 hops)

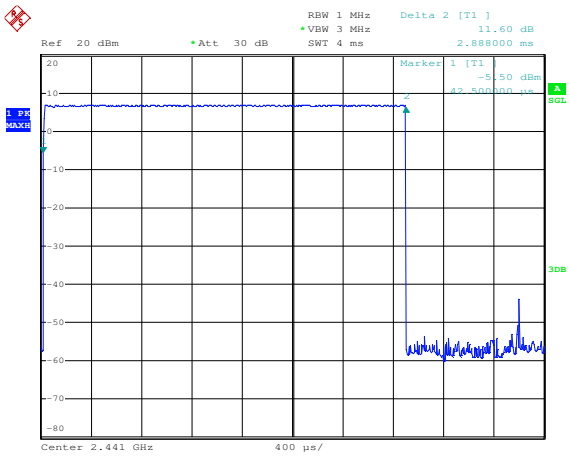
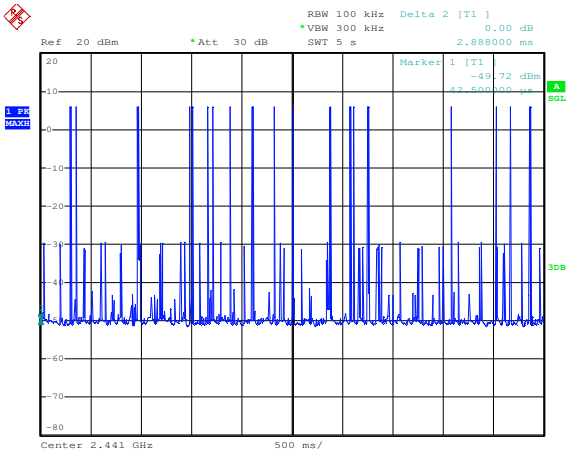


Plot 3 (DH3 packet)



Plot 4 (DH3 packet) – N° of packets in 5s. (28 hops)



Plot 5 (DH5 packet)	Plot 6 (DH5 packet) – N° of packets in 5s. (18 hops)
	

7.9 MAXIMUM PEAK OUTPUT POWER (DE FACTO EIRP)

TEST REQUIREMENT	
Spectrum analyzer settings	
Resolution bandwidth (RBW)	3 MHz
Video bandwidth (VBW)	10 MHz
Sweep time (SWT)	2,5 ms
Detector function	Peak
Trace	max hold
Test distance	/
EUT operating condition	#1
Remark	none

TEST PROCEDURE
Conducted measurements:
The transmitter output was connected to the spectrum analyzer through a temporary RF 50Ω connector type SMA.
Radiated measurements:
As the EUT is supplied with a dedicated antenna, the effective radiated power is measured in a 3 m anechoic chamber with the substitution antenna method. The field strength levels shall be converted to equivalent conducted power levels for comparison to the applicable output power limit refer to KDB 412172.

LIMITS
0.125 Watt (21dBm) ⇒ (EDR)

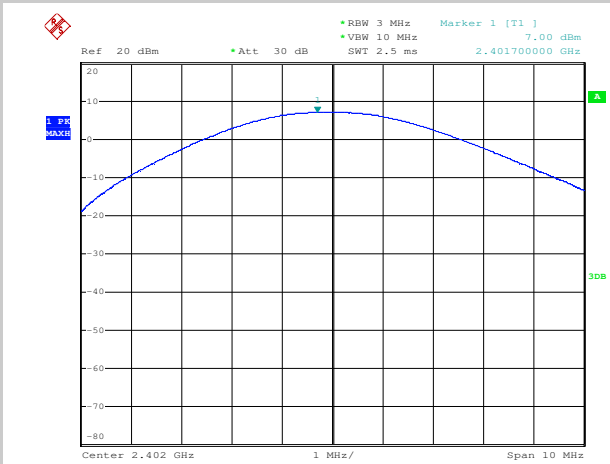
TEST RESULT
The EUT meets the requirements of sections 15.247 (b) (1)

MEASUREMENTS RESULTS (CONDUCTED)

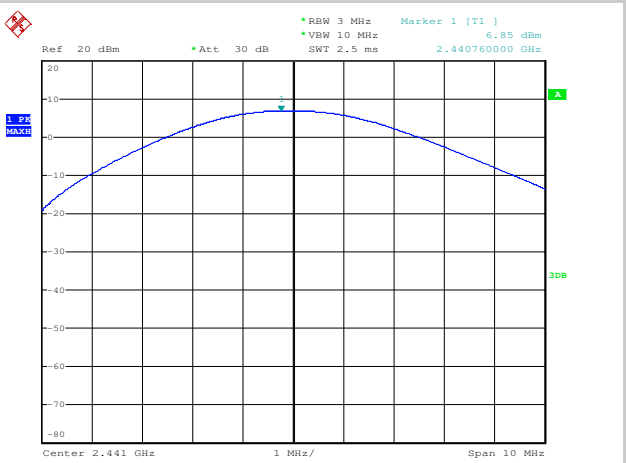
BLUETOOTH EDR – MODULATION GFSK 1Mbit/s

Channel (No.)	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Plot (No.)
Low	2402	+7.00	+21	1
Middle	2441	+6.85	+21	2
High	2480	+6.45	+21	3

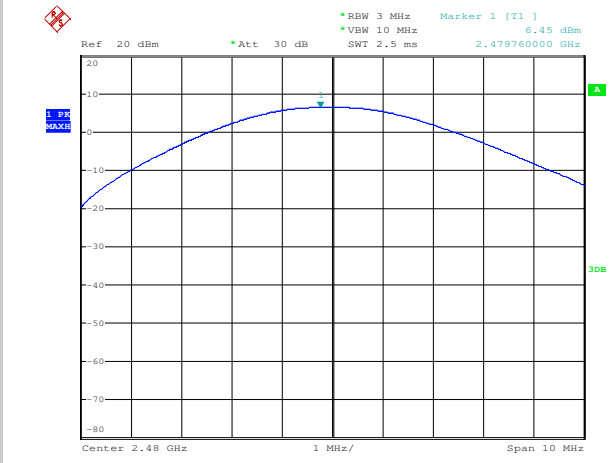
Plot 1



Plot 2



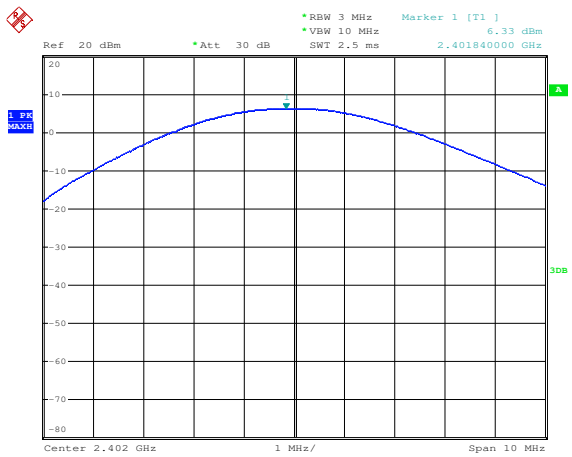
Plot 3



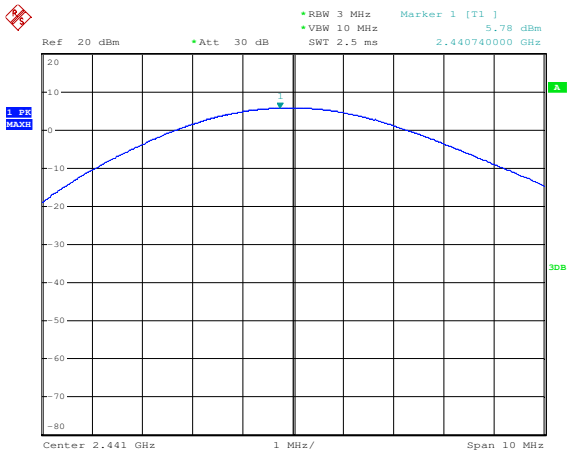
BLUETOOTH EDR – MODULATION π/4-DQPSK 2Mbit/s

Channel (No.)	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Plot (No.)
Low	2402	+6.33	+21	1
Middle	2441	+5.78	+21	2
High	2480	+5.11	+21	3

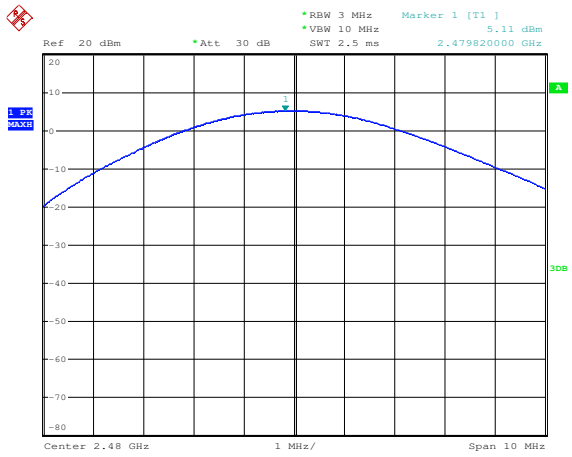
Plot 1



Plot 2



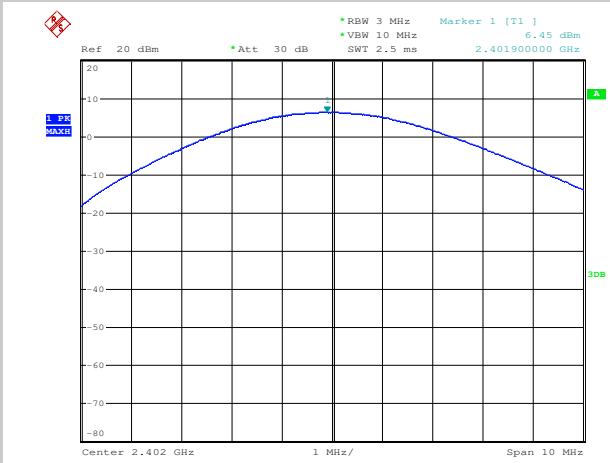
Plot 3



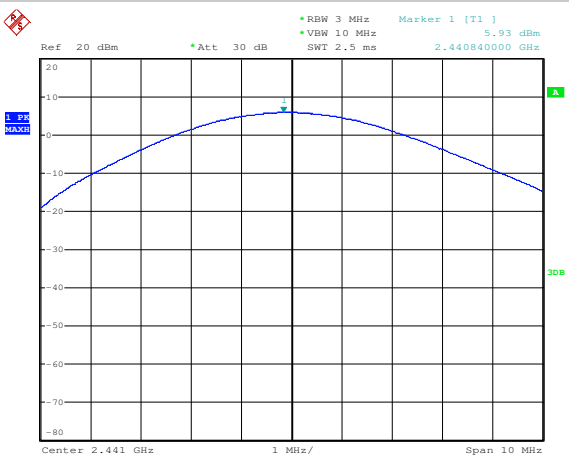
BLUETOOTH EDR – MODULATION 8DPSK 3Mbit/s

Channel (No.)	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Plot (No.)
Low	2402	+6.45	+21	1
Middle	2441	+5.93	+21	2
High	2480	+5.32	+21	3

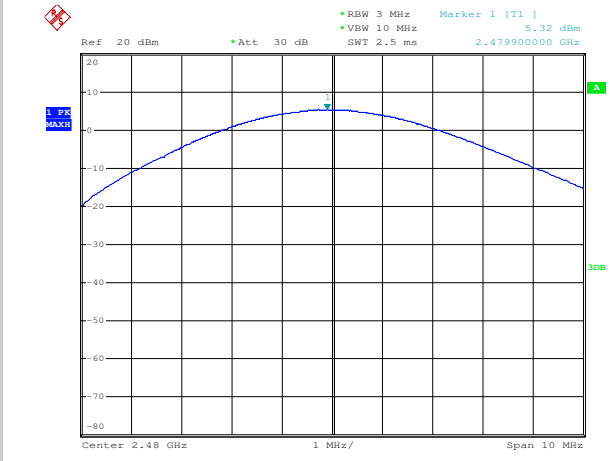
Plot 1



Plot 2



Plot 3



MEASUREMENTS RESULTS (RADIATED)

BLUETOOTH EDR – MODULATION GFSK 1Mbit/s

Channel (No.)	Frequency (MHz)	Radiated Output Power (at 3m. distance) (dBµV/m)	Calculated E.I.R.P (dBm)	Limit (dBm)
Low	2402	104.52	9.29	21
Middle	2441	102.92	7.69	21
High	2480	102.96	7.73	21

BLUETOOTH EDR – MODULATION π/4-DQPSK 2Mbit/s

Channel (No.)	Frequency (MHz)	Radiated Output Power (at 3m. distance) (dBµV/m)	Calculated E.I.R.P (dBm)	Limit (dBm)
Low	2402	99.93	4.70	21
Middle	2441	100.51	5.28	21
High	2480	100.10	4.87	21

BLUETOOTH EDR – MODULATION 8DPSK 3Mbit/s

Channel (No.)	Frequency (MHz)	Radiated Output Power (at 3m. distance) (dBµV/m)	Calculated E.I.R.P (dBm)	Limit (dBm)
Low	2402	99.75	4.52	21
Middle	2441	100.34	5.11	21
High	2480	100.00	4.77	21

7.10 RF EXPOSURE EVALUATION

TEST REQUIREMENT	
Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines § 1.1307(b)(1).	
EUT classification (fixed, mobile or portable devices)	Portable according to § 2.1093(b) of this Chapter
LIMITS	According to § 2.1093 of this Chapter, by means of the following guidelines: OET Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies (447498 D01 General RF Exposure Guidance v06)

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

447498 D01 General RF Exposure Guidance v06 – Appendix A

MHz	**5**	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	**10**	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

The *test separation distances* ≥ 5 *mm* is applied to determine SAR test exclusion.

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

447498 D01 General RF Exposure Guidance v06 – Appendix A

Channel No.	Frequency (MHz)	Measured Radiated power (at 3 m distance)	E.I.R.P.	Distance	$\frac{max.\ power\ (mW)}{min.distance\ (mm)} \times \sqrt{f_{(GHz)}}$	Limits
		(dBuV/m)	(mW)	(mm)		
Lowest	2402	104.52	8.49	5	2.63	≤ 3.0 for 1-g head SAR or ≤ 7.5 for 10-g extremity SAR
Max level measured in this test condition: Bluetooth EDR – Modulation GFSK 1Mbit/s						

Channel No.	Frequency (MHz)	Measured Radiated power (at 3 m distance)	E.I.R.P.	Distance	$\frac{max.\ power\ (mW)}{min.distance\ (mm)} \times \sqrt{f_{(GHz)}}$	Limits
		(dBuV/m)	(mW)	(mm)		
Middle	2441	102.92	5.87	5	1.83	≤ 3.0 for 1-g head SAR or ≤ 7.5 for 10-g extremity SAR
Max level measured in this test condition: Bluetooth EDR – Modulation GFSK 1Mbit/s						

Channel No.	Frequency (MHz)	Measured Radiated power (at 3 m distance)	E.I.R.P.	Distance	$\frac{max.\ power\ (mW)}{min.distance\ (mm)} \times \sqrt{f_{(GHz)}}$	Limits
		(dBuV/m)	(mW)	(mm)		
Highest	2480	102.96	5.93	5	1.86	≤ 3.0 for 1-g head SAR or ≤ 7.5 for 10-g extremity SAR
Max level measured in this test condition: Bluetooth EDR – Modulation GFSK 1Mbit/s						

TEST RESULT

This value is less than the low threshold limit. No SAR test is required.

8. MEASUREMENTS AND TESTS UNCERTAINTY

Unless otherwise stated the uncertainties for the tests and measurements are evaluated in according to IMQ Operational Instruction IO-LAB-001 and IO-LAB-004. and requirement of NIST Technical Note 1297 and NIS 81: 1994 "The Treatment of Uncertainty in EMC Measurements"
The expanded uncertainty was calculated for all measurements and tests listed in this test report according to CISPR 16-4-2 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainty in EMC Measurements", with UKAS document LAB 34 and is documented in the quality system accordance to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device
Internal Procedure PI-037 ensures that the requirements for traceability of calibrations, of all test equipment requiring calibration, and calibration intervals are met.

Methods/Standard	Parameter	Expanded Uncertainty	Unit	Confidence level	Coverage Factor	Degree of freedom
Continuous disturbance	QP detector 9 – 150 kHz	2,47	dB	95%	2,00	25
	QP detector 150 k – 30 MHz	2,61	dB	95%	2,00	26
	QP detector using Voltage Probe	2,45	dB	95%	2,00	26
	QP detector using ISN	3,15	dB	95%	2,00	> 60
	QP detector using Current Probe	2,15	dB	95%	2,00	35
Radiated disturbance	QP detector (30 MHz - 100 MHz) H polarization	4,33	dB	95%	2,00	> 60
	QP detector (30 MHz - 100 MHz) V polarization	4,22	dB	95%	2,00	> 60
	QP detector (100 MHz - 200 MHz) H polarization	3,40	dB	95%	2,00	> 60
	QP detector (100 MHz - 200 MHz) V polarization	4,76	dB	95%	2,00	> 60
	QP detector (200 MHz - 1000 MHz) H polarization	3,91	dB	95%	2,00	> 60
	QP detector (200 MHz - 1000 MHz) V polarization	3,82	dB	95%	2,00	> 60
	P detector 1-6 GHz	4,77	dB	95%	2,00	> 60
	P detector 6 – 18 GHz	5,14	dB	95%	2,00	> 60

9. LIST OF MEASURING EQUIPMENT AND CALIBRATION INFORMATION

IMQ Serial Number	Instrument	Manufacturer	Type	Last Cal.	Cal. Period.	Calibration Company
P01709	Shielded semi-anechoic chamber	SIDT	/	03-15	24	IMQ
P02486	Turntable controller unit	FRANKONIA	FCTAM01	/	/	/
P02488	Mast antenna	FRANKONIA	FAM4	/	/	/
S05562	EMI Receiver	ROHDE & SCHWARZ	ESU 8	05-15	12	Rohde & Schwarz
S03631	LISN 1 PHASE	ROHDE & SCHWARZ	ENV216	03-16	12	I.N.R.I.M.
S02508	Loop Antenna	ROHDE & SCHWARZ	HFH2-Z2	01-15	24	SEIBERSDORF
S06463	Log antenna	ARA	VULB9160	04-16	36	SEIBERSDORF
S04272	Horn antenna	SCHWARZBECK	BBHA 9120D	07-14	36	NPL
S03668	Horn antenna	SCHWARZBECK	BBHA 9170	08-13	36	Liberty Labs
S03629	Spectrum Analyzer	Rohde & Schwarz	FSP40	04-16	12	Rohde & Schwarz
S03542	Preamplifier	Hewlett Packard	HP 8449B	04-16	24	IMQ
W-00199/E	Software	ROHDE & SCHWARZ	EMC32 Ver. 6.30	/	/	/
H-00165	PC	/	/	/	/	/

END OF TEST REPORT