

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CBT_RM-714_08.docx	Date of Report:	09-Dec-2011
Number of pages:	30	Customer's Contact person:	Bruno Ramelli
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FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Phone RM-714 / Battery BL-4U / AC charger AC-16 / Data cable CA-190CD / Headset WH-102		
FCC ID:	PPIRM-714	IC:	661U-RM714
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), Public Notice DA 00-705, DTS procedures KDB 558074, IC standards, RSS-210 (Issue 8, December 2010). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signature for the contents:			

Hannu Söderholm, Senior Engineer, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	05-Dec-2011
Testing completed	08-Dec-2011
The customer's contact person	Bruno Ramelli
Test Plan referred to	T:\Projects\RM-714\TestPlan\RS_testplan_RM-714.xls
Notes	-
Document name	T:\Projects\RM-714\EMC\FCC15CBT_RM-714_08.docx

1.1. EUT and Accessory Information

The EUT is a 9-band mobile phone:

GSM850/900/1800/1900/GPRS/EGPRS

WCDMA I/II(1900)/IV(1700)/V(850)/VIII/HSDPA/HSUPA

WLAN/Bluetooth

The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-714	004402136826652	0420		Vp hwi11w47	42725
Battery	BL-4U	4620408224i20179507;0670560				42731
AC charger	AC-16	409049111158XX00006;0675491	0.3	-	-	42542
Data cable	CA-190CD	-	-	-	-	42720
Headset	WH-102	06943230363MA614499				42734

1.2. Summary of Test Results

Bluetooth:

Section in CFR 47	Section in RSS-GEN or RSS-210	Name of the test	Result
15.247(b)(1)	A8(0.4(2))	Conducted peak output power	PASSED
15.247(d)	A8(0.5)	Band edge compliance of RF emissions	NP
15.247(d)	A8(0.5)	Spurious RF conducted emissions	PASSED
15.247(d), 15.209	A8(0.5)	Spurious radiated emissions	NP
15.207	7.2.2	AC powerline conducted emissions	NP
15.247(a)(1)	A8(0.1(1))	20dB(bandwidth)	PASSED
15.247(a)(1)	A8(0.1(2))	Carrier frequency separation	PASSED
15.247(a)(1)(iii)	A8(0.1(4))	Number of hopping frequencies	PASSED
15.247(a)(1)(iii)	A8(0.1(4))	Time of occupancy	PASSED

PASSED

FAILED

NP

The EUT complies with the essential requirements in the standard.

The EUT does not comply with the essential requirements in the standard.

The test was not performed by the TCC Nokia Laboratory.

CONTENTS

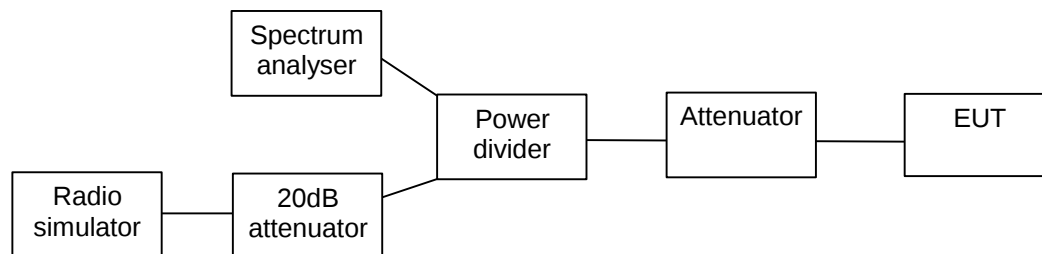
1. Summary for FCC Part 15C Compliance Test Report.....	2
1.1. EUT and Accessory Information	2
1.2. Summary of Test Results	2
2. Conducted peak output power (15.247(b)(1), RSS-210 A8.4 (2))	5
2.1. Test Setup	5
2.2. Test method and limit.....	5
2.3. Bluetooth Test results	6
3. Spurious RF conducted emissions (FCC §15.247(d), RSS-210 A8.5)	9
3.1. Test Setup	9
3.2. Test method and limit.....	9
3.3. Bluetooth Test results	10
4. 20 dB bandwidth 15.247(a)(1), A8.1 (a).....	13
4.1. Test Setup	13
4.2. Test method and limit.....	13
4.3. Bluetooth Test results	14
5. Carrier frequency separation 15.247(a)(1), A8.1 (b)	18
5.1. Test Setup	18
5.2. Test method and limit.....	18
5.3. Bluetooth Test results	19
6. Number of hopping frequencies 15.247(a)(1)(iii), A8.1 (d)	21
6.1. Test Setup	21
6.2. Test method and limit.....	21
6.3. Bluetooth Test results	22
7. Time of occupancy 15.247(a)(1)(iii), A8.1 (d)	24
7.1. Test Setup	24

7.2.	Test method and limit.....	24
7.3.	Bluetooth Test results	25
8.	Test Equipment.....	29
8.1.	Conducted measurements	29
8.2.	Radiated measurements	29

2. Conducted peak output power (15.247(b)(1), RSS-210 A8.4 (2))

EUT with DUT number	RM-714, DUT 42725
Accessories with DUT numbers	BL-4U, DUT 42731 ; AC-16, DUT 42542 ; CA-190CD, DUT 42720 ; WH-102, DUT 42734
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	USB Charging used
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.9 / 66 / 101.3
Date of measurements	08-Dec-2011
Measured by	Timo Raiskio

2.1. Test Setup



2.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for conducted peak output power measurements

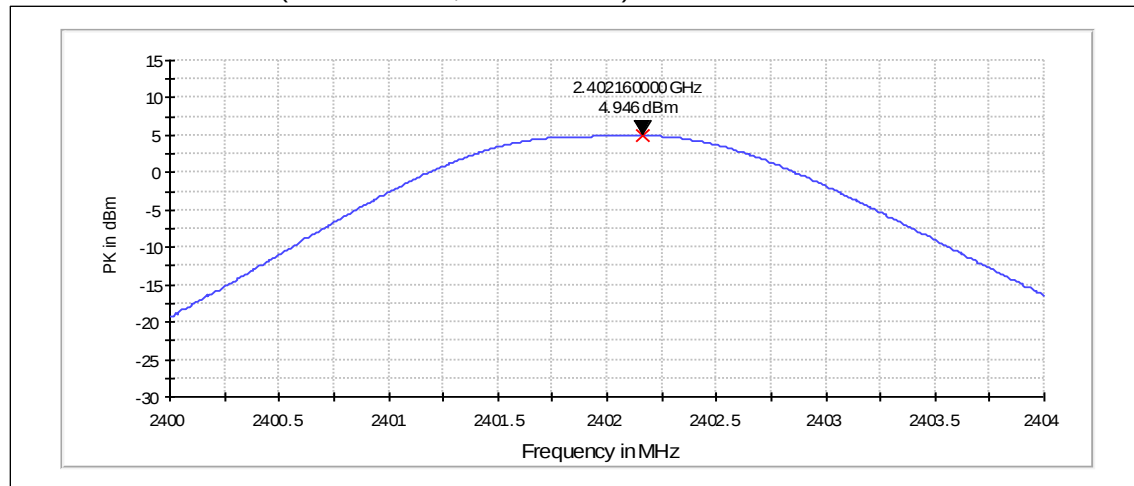
Frequency range [MHz]	Limit [W]	Limit [dBm]
2400 – 2483.5	<= 1	<= 30

2.3. Bluetooth Test results

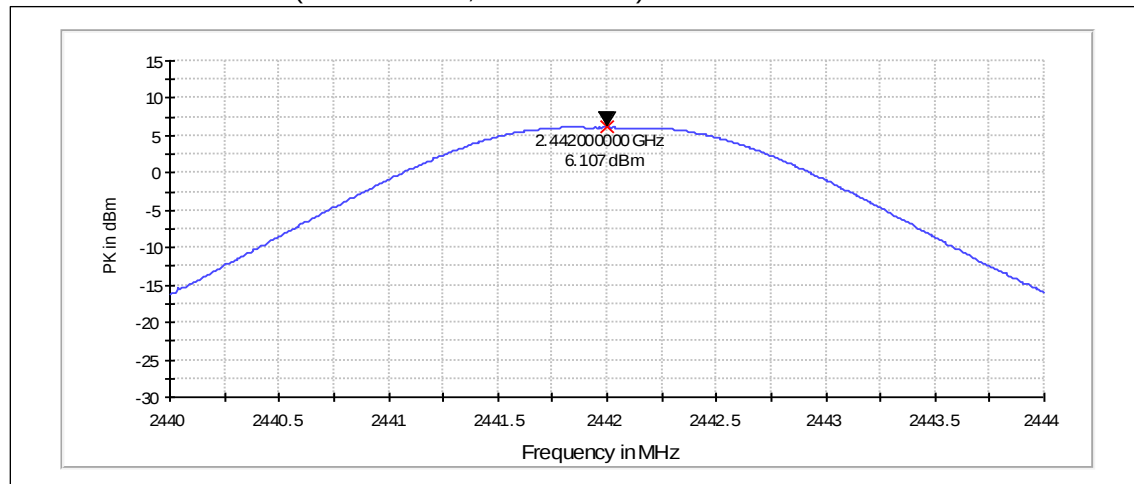
2.3.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	4.95	3.126	PASSED
40 / 2442	6.11	4.083	PASSED
78 / 2480	5.88	3.873	PASSED

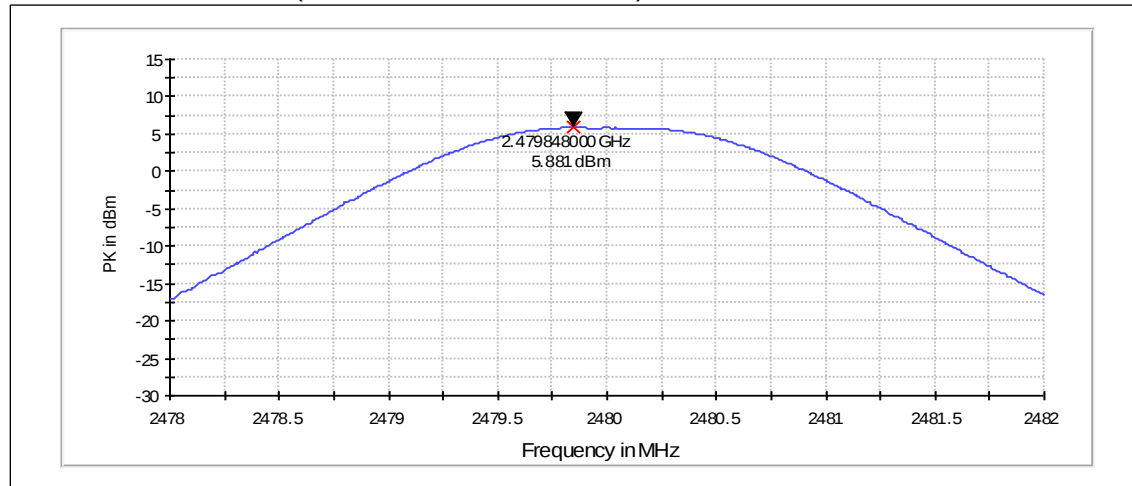
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz)



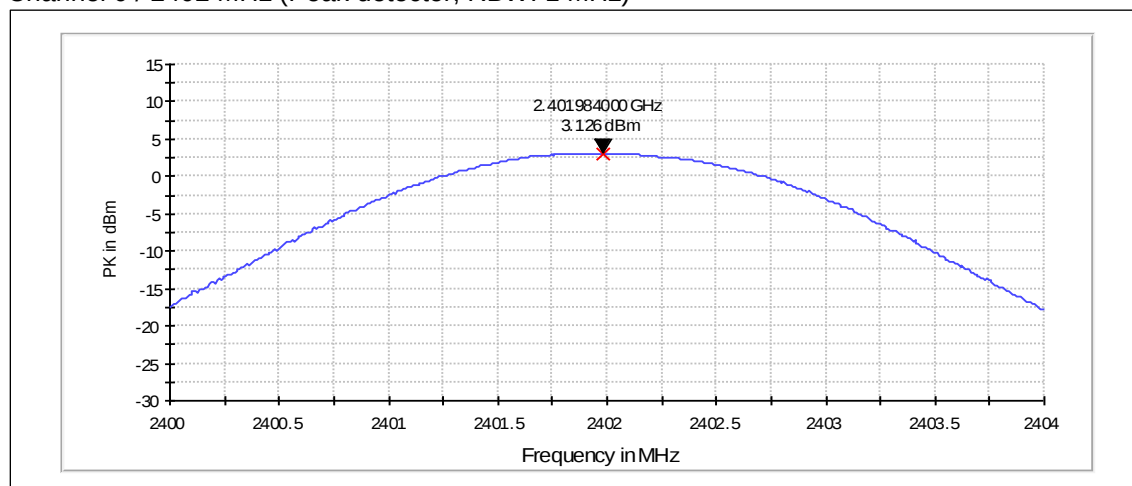
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz)



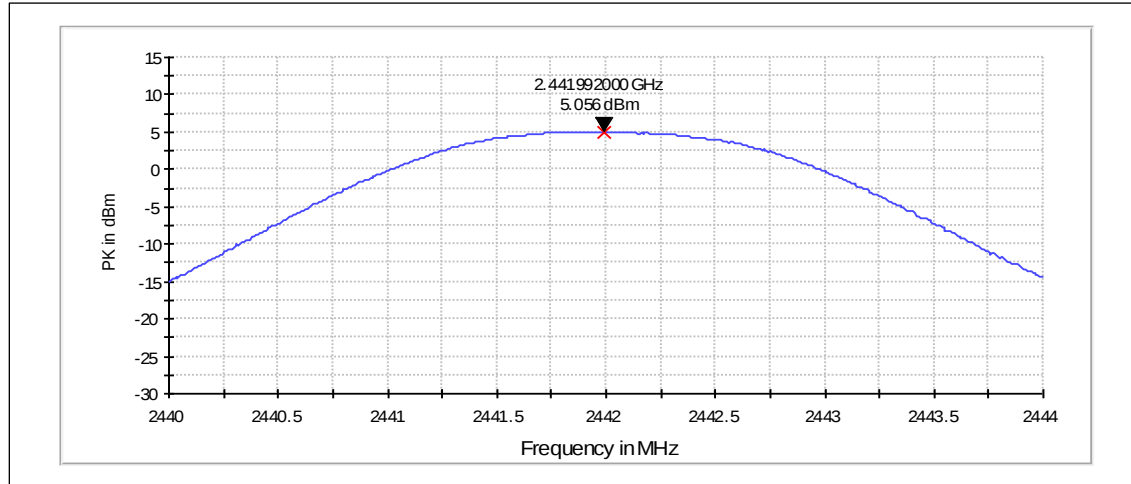
2.3.2 8DPSK modulation, PRBS packet type

Channel / f_c [MHz]	P [dBm]	P [mW]	Result
0 / 2402	3.13	2.056	PASSED
40 / 2442	5.06	3.206	PASSED
78 / 2480	4.47	2.799	PASSED

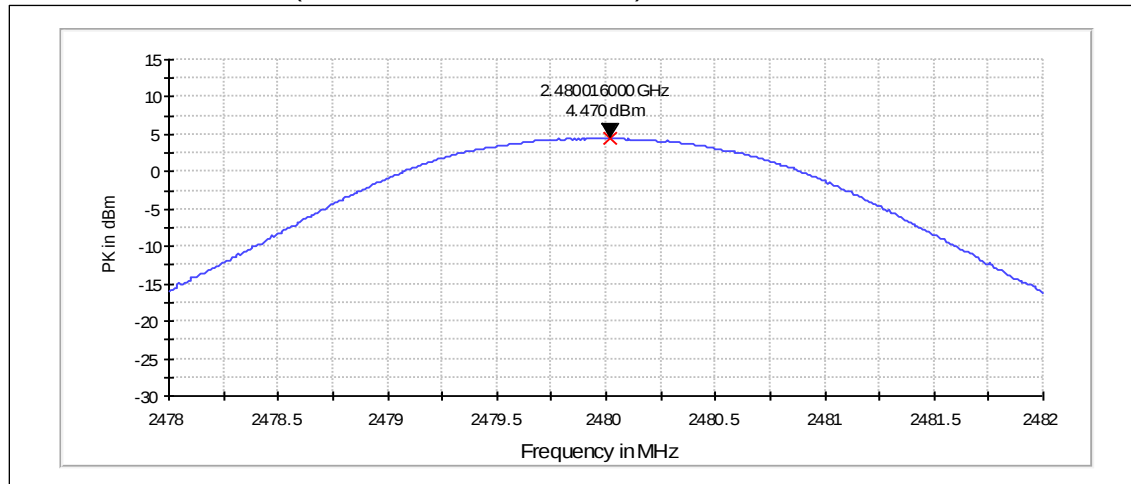
Channel 0 / 2402 MHz (Peak detector, RBW: 1 MHz)



Channel 40 / 2442 MHz (Peak detector, RBW: 1 MHz)



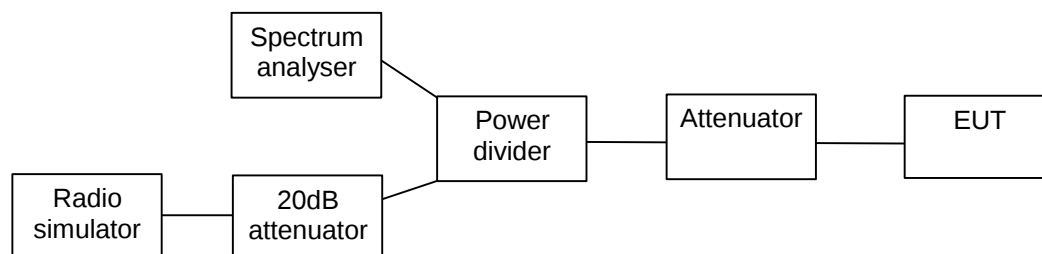
Channel 78 / 2480 MHz (Peak detector, RBW: 1 MHz)



3. Spurious RF conducted emissions (FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-714, DUT 42725
Accessories with DUT numbers	BL-4U, DUT 42731 ; AC-16, DUT 42542 ; CA-190CD, DUT 42720 ; WH-102, DUT 42734
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	USB Charging used
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.9 / 66 / 101.3
Date of measurements	08-Dec-2011
Measured by	Timo Raiskio

3.1. Test Setup



3.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

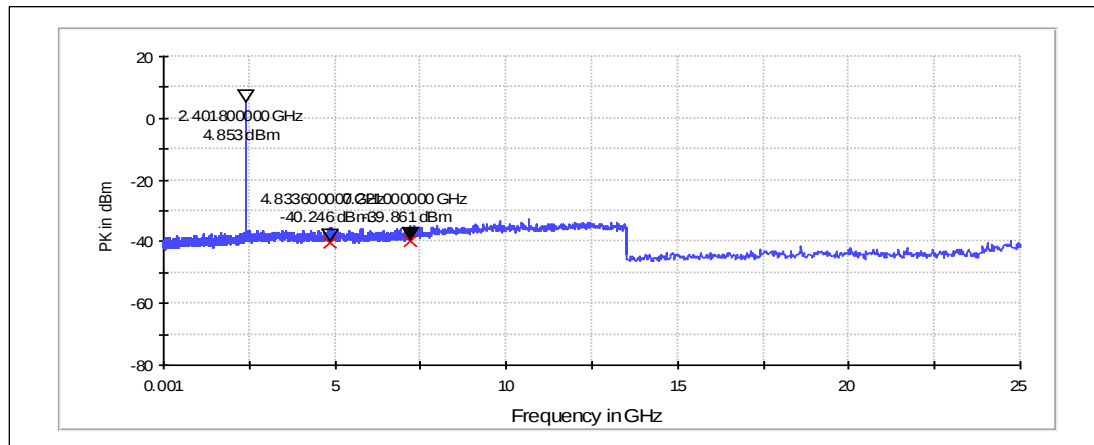
Limits for spurious RF conducted emissions measurements

Frequency range [MHz]	Limit [dBc]
1 – 25000	<= -20

3.3. Bluetooth Test results

3.3.1 GFSK modulation, PRBS packet type

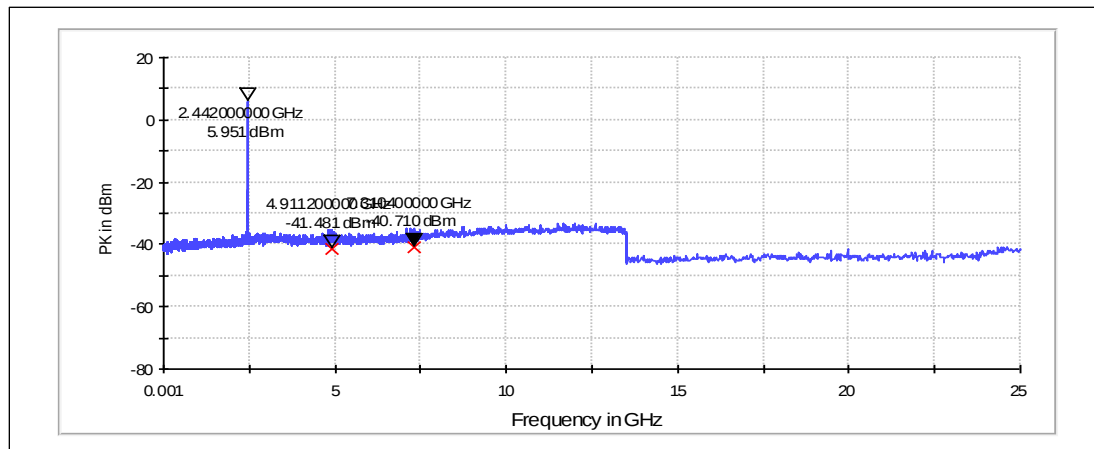
Channel 0 / 2402 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4833.6	-40.25	PASSED
7221	-39.86	PASSED

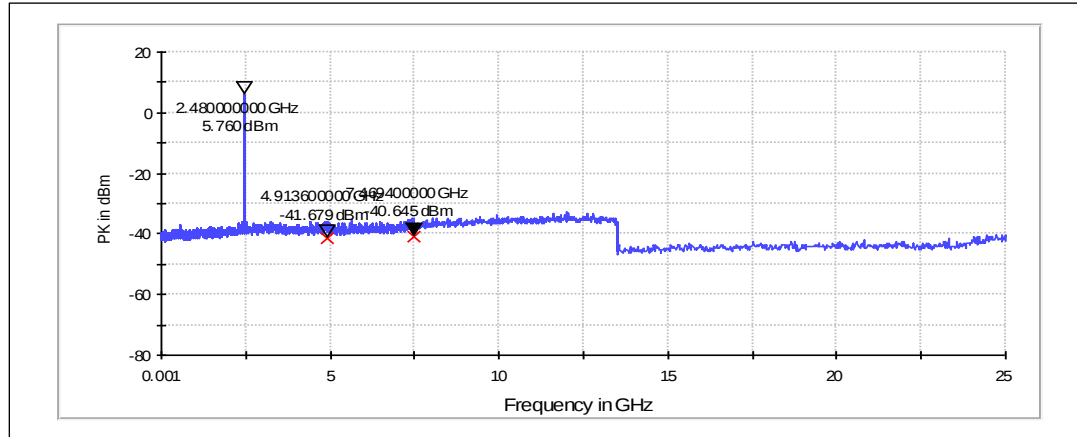
Channel 40 / 2442 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4911.2	-41.48	PASSED
7310.4	-40.71	PASSED

Channel 78 / 2480 MHz

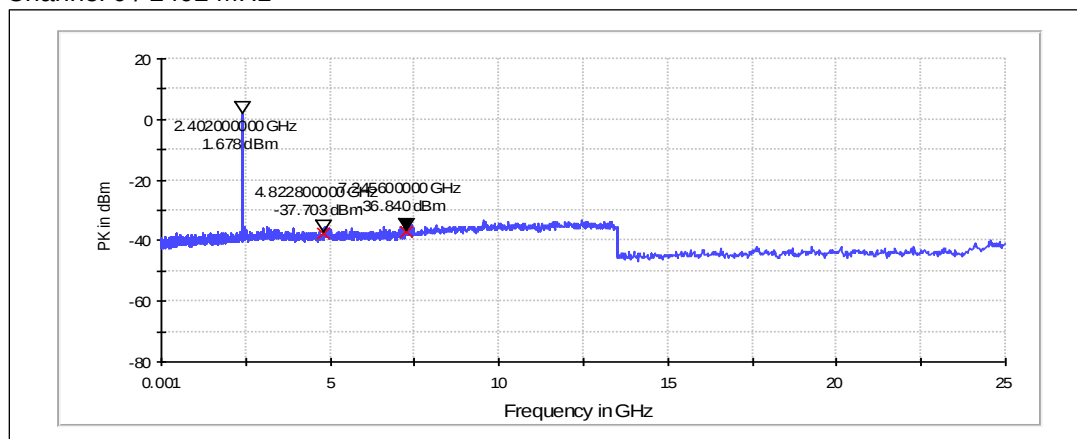


Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4913.6	-41.68	PASSED
7469.4	-40.64	PASSED

3.3.2 8DPSK modulation, PRBS packet type

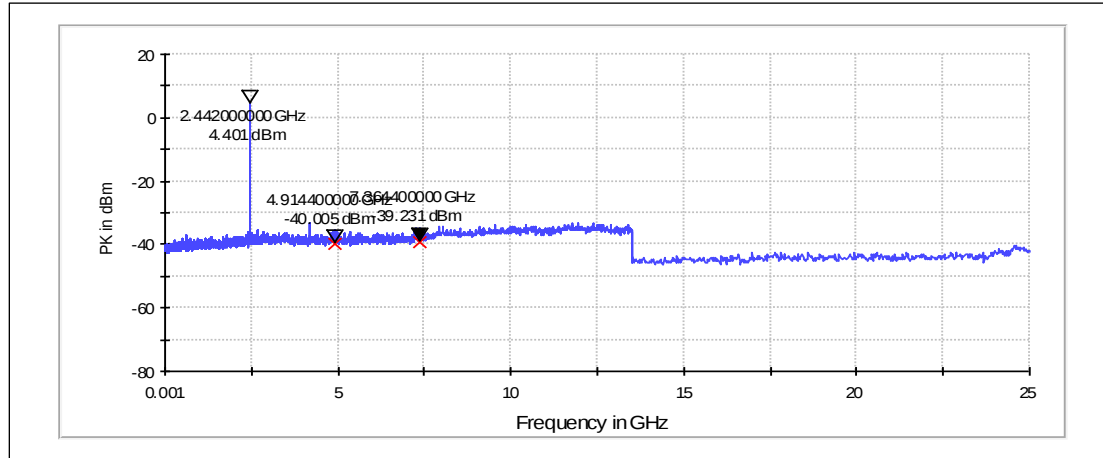
Channel 0 / 2402 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4822.8	-37.7	PASSED
7245.6	-36.84	PASSED

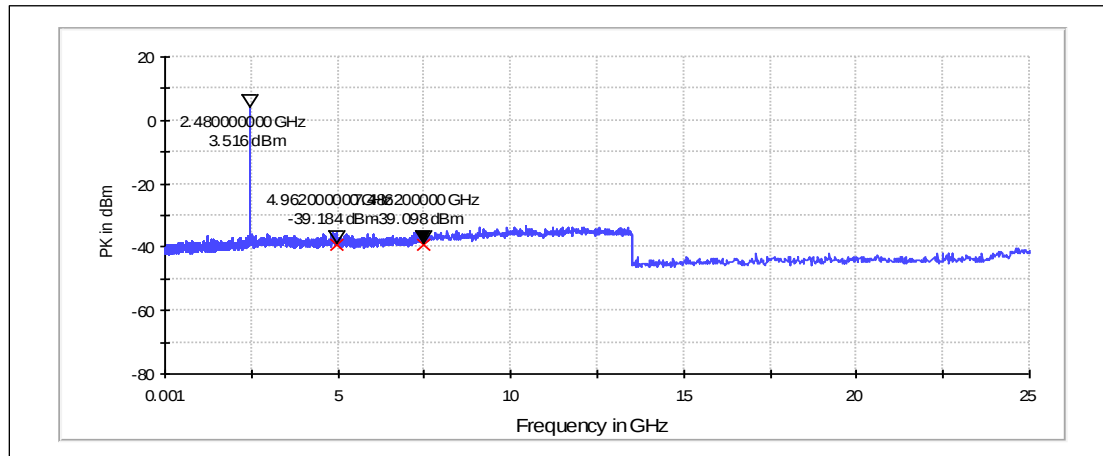
Channel 40 / 2442 MHz



Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4914.4	-40.01	PASSED
7364.4	-39.23	PASSED

Channel 78 / 2480 MHz



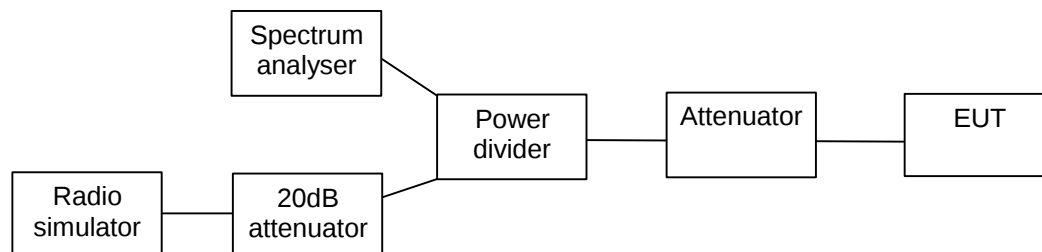
Peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	P [dBc]	Result
4962	-39.18	PASSED
7486.2	-39.1	PASSED

4. 20 dB bandwidth 15.247(a)(1), A8.1 (a)

EUT with DUT number	RM-714, DUT 42725
Accessories with DUT numbers	BL-4U, DUT 42731 ; AC-16, DUT 42542 ; CA-190CD, DUT 42720 ; WH-102, DUT 42734
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	USB Charging used
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.9 / 66 / 101.3
Date of measurements	08-Dec-2011
Measured by	Timo Raiskio

4.1. Test Setup



4.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for 20 dB bandwidth measurements

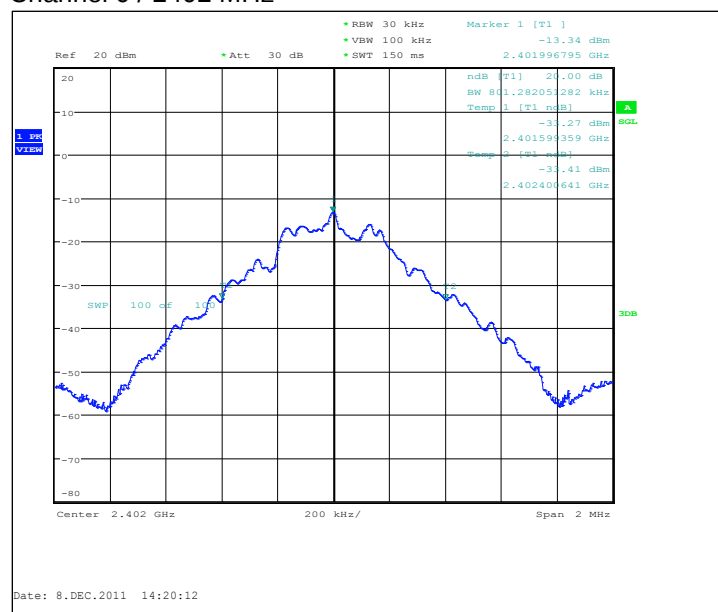
Limit [MHz]
N/A

4.3. Bluetooth Test results

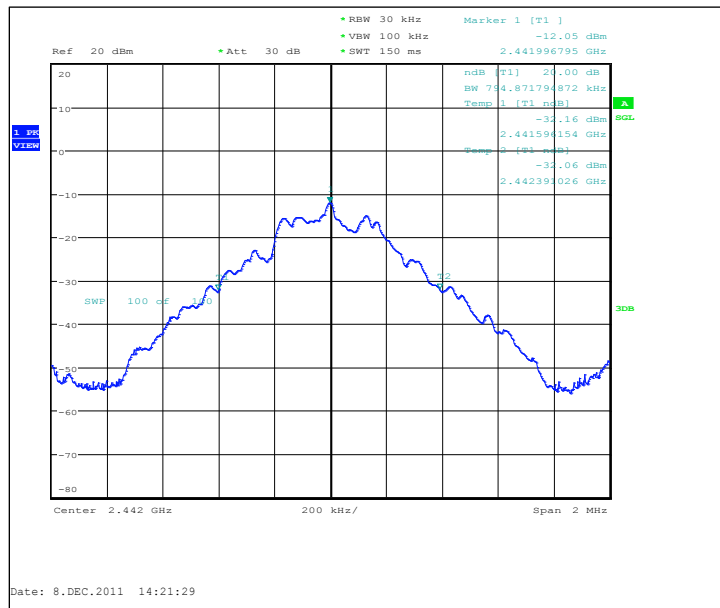
4.3.1 GFSK modulation, PRBS packet type

Channel / f _C [MHz]	20 dB bandwidth [kHz]
0 / 2402	801.3
40 / 2442	794.9
78 / 2480	794.9

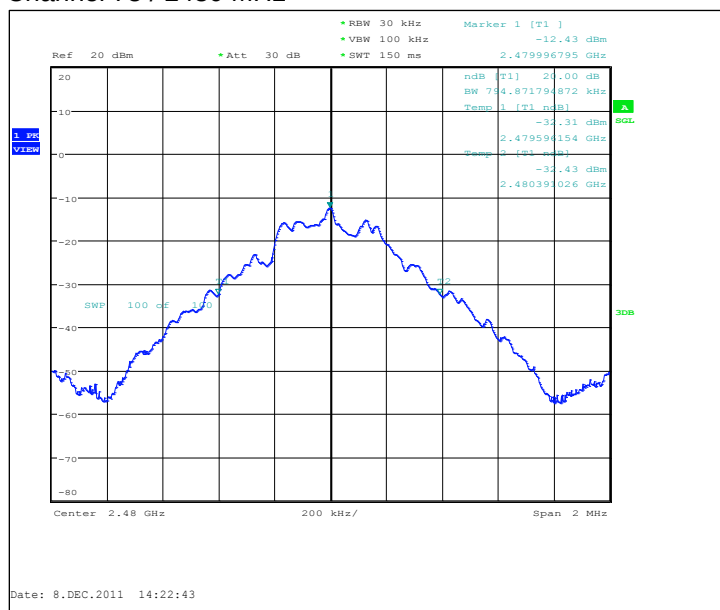
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



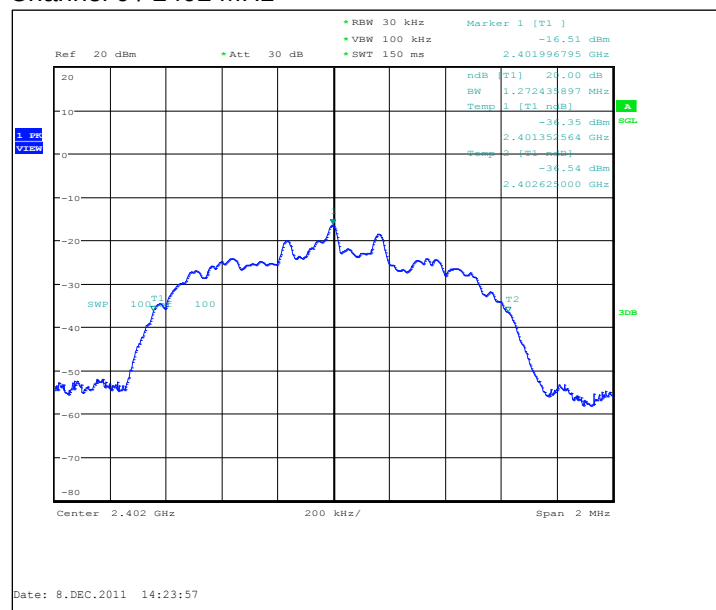
Channel 78 / 2480 MHz



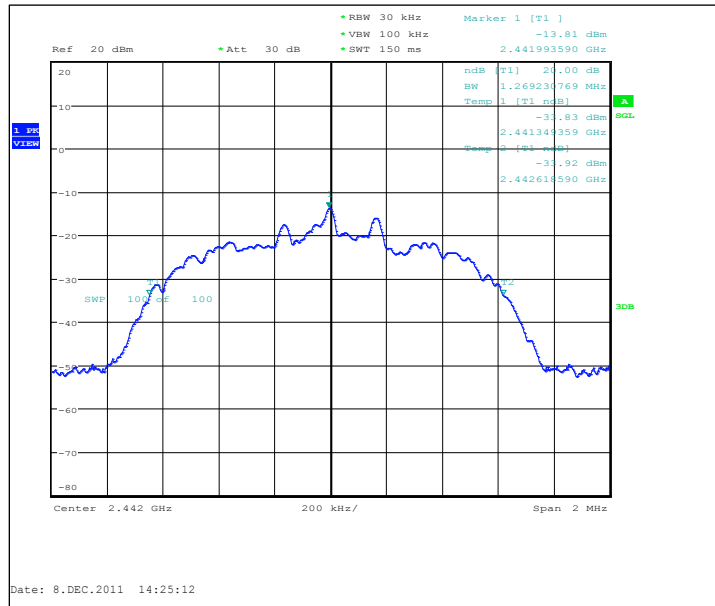
4.3.2 8DPSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]
0 / 2402	1272.4
40 / 2442	1269.2
78 / 2480	1272.4

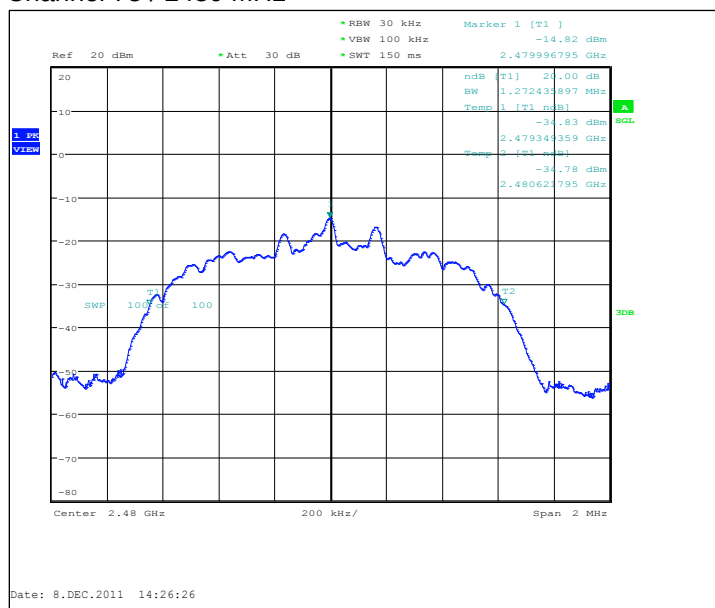
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



Channel 78 / 2480 MHz

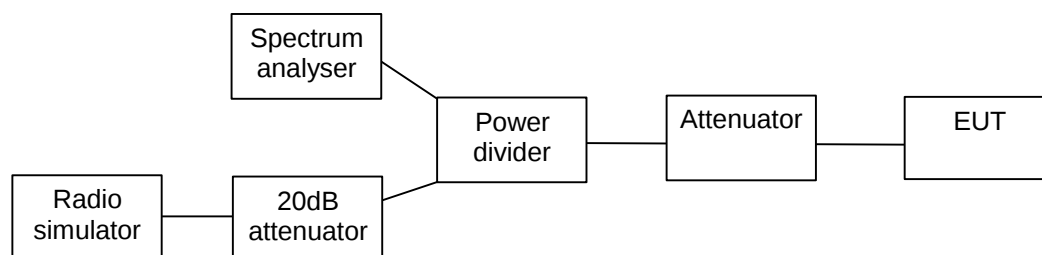


5. Carrier frequency separation

15.247(a)(1), A8.1 (b)

EUT with DUT number	RM-714, DUT 42725
Accessories with DUT numbers	BL-4U, DUT 42731 ; AC-16, DUT 42542 ; CA-190CD, DUT 42720 ; WH-102, DUT 42734
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	USB Charging used
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.9 / 66 / 101.3
Date of measurements	08-Dec-2011
Measured by	Timo Raiskio

5.1. Test Setup



5.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for carrier frequency separation measurements

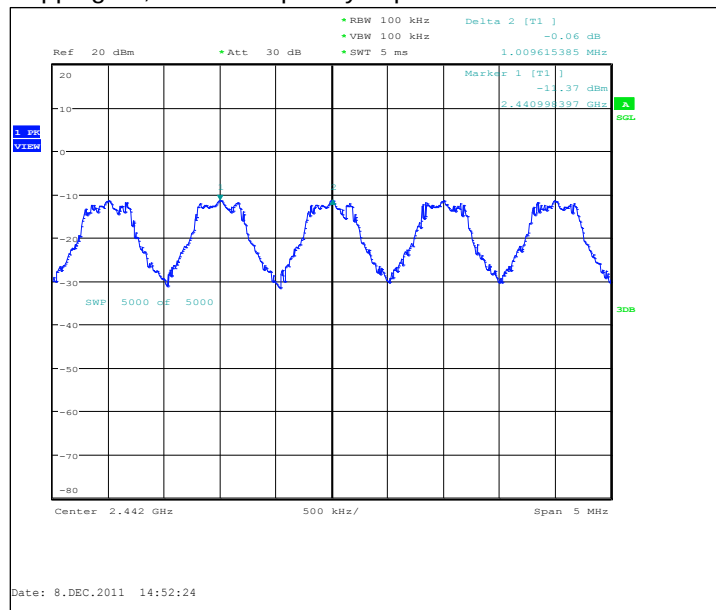
Limit [MHz]
≥ 0.025 or $2/3$ of the 20 dB bandwidth

5.3. Bluetooth Test results

5.3.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
1009.6	PASSED

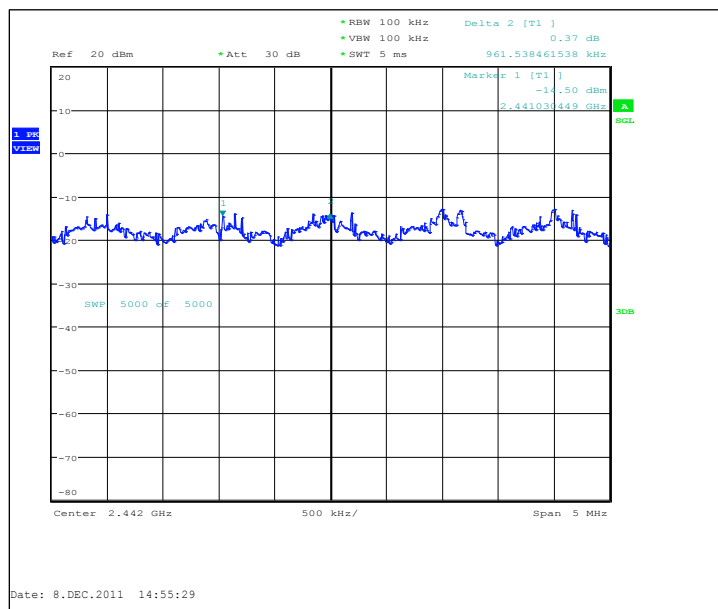
Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



5.3.2 8DPSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
961.5	PASSED

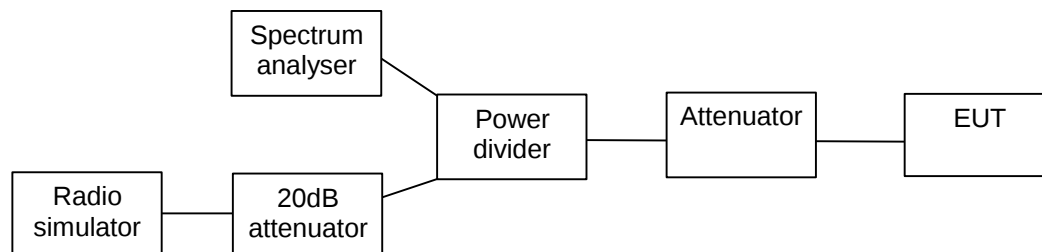
Hopping on, carrier frequency separation of channels 39 / 2441 MHz and 40 / 2442 MHz



6. Number of hopping frequencies 15.247(a)(1)(iii), A8.1 (d)

EUT with DUT number	RM-714, DUT 42725
Accessories with DUT numbers	BL-4U, DUT 42731 ; AC-16, DUT 42542 ; CA-190CD, DUT 42720 ; WH-102, DUT 42734
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	USB Charging used
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.9 / 66 / 101.3
Date of measurements	08-Dec-2011
Measured by	Timo Raiskio

6.1. Test Setup



6.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

Limits for number of hopping frequencies measurements

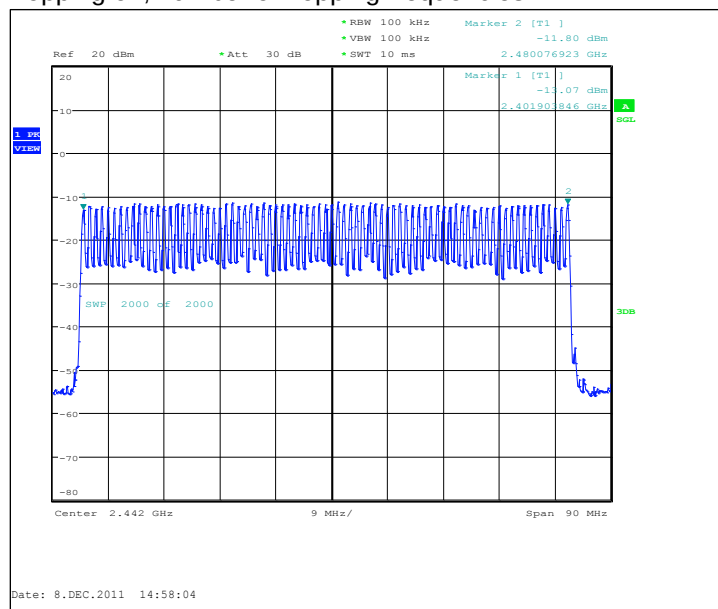
Limit [number]
>= 15

6.3. Bluetooth Test results

6.3.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
78	PASSED

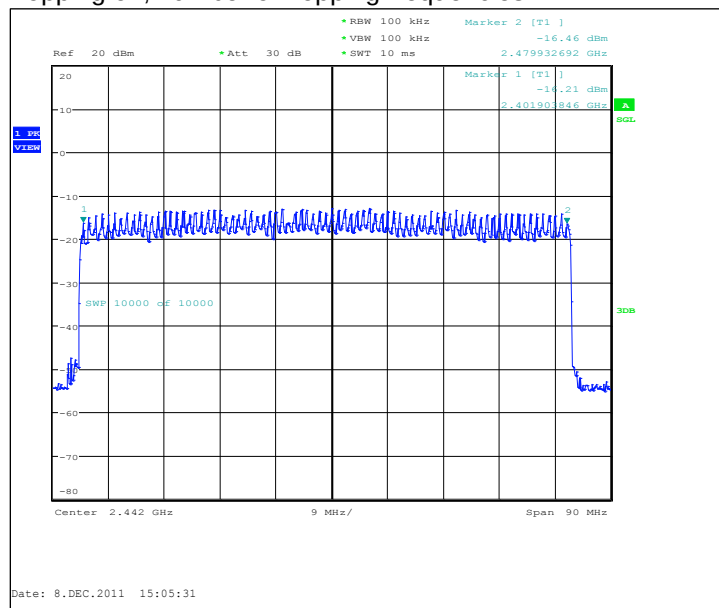
Hopping on, number of hopping frequencies



6.3.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
78	PASSED

Hopping on, number of hopping frequencies

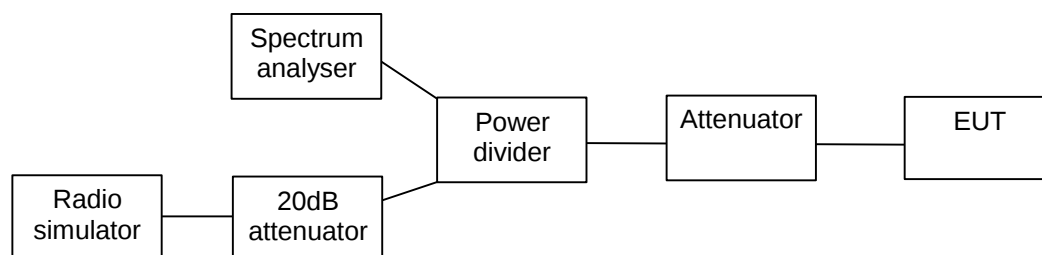


7. Time of occupancy

15.247(a)(1)(iii), A8.1 (d)

EUT with DUT number	RM-714, DUT 42725
Accessories with DUT numbers	BL-4U, DUT 42731 ; AC-16, DUT 42542 ; CA-190CD, DUT 42720 ; WH-102, DUT 42734
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	USB Charging used
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.9 / 66 / 101.3
Date of measurements	08-Dec-2011
Measured by	Timo Raiskio

7.1. Test Setup



7.2. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-210.

The total time of occupancy is get by multiplying the measured number of transmissions occurred during 31.6 second period with the duration of one transmission.

Limits for time of occupancy measurements

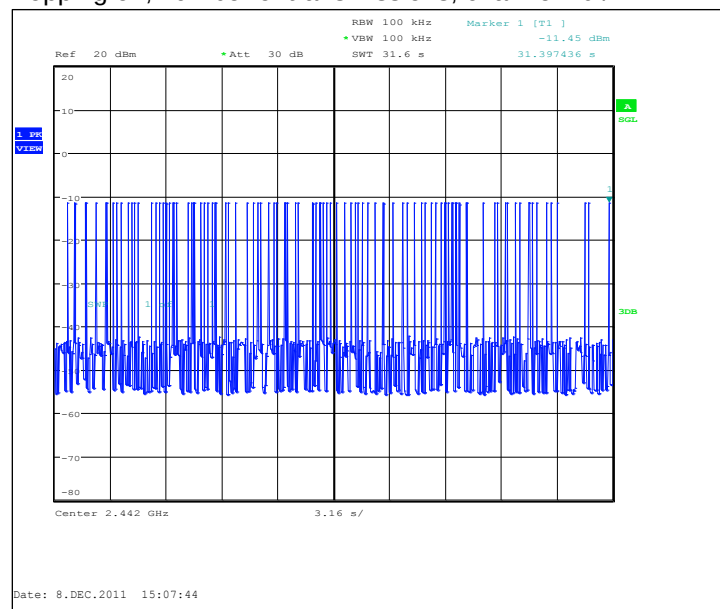
Limit [s]
<= 0.4

7.3. Bluetooth Test results

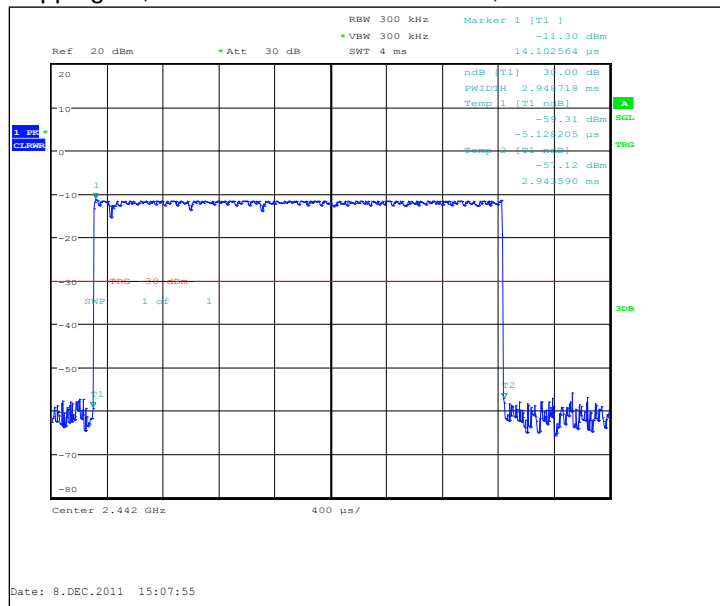
7.3.1 GFSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [ms]	Time of occupancy [s]	Result
88	2.949	0.259	PASSED

Hopping on, number of transmissions, channel 40 / 2442 MHz



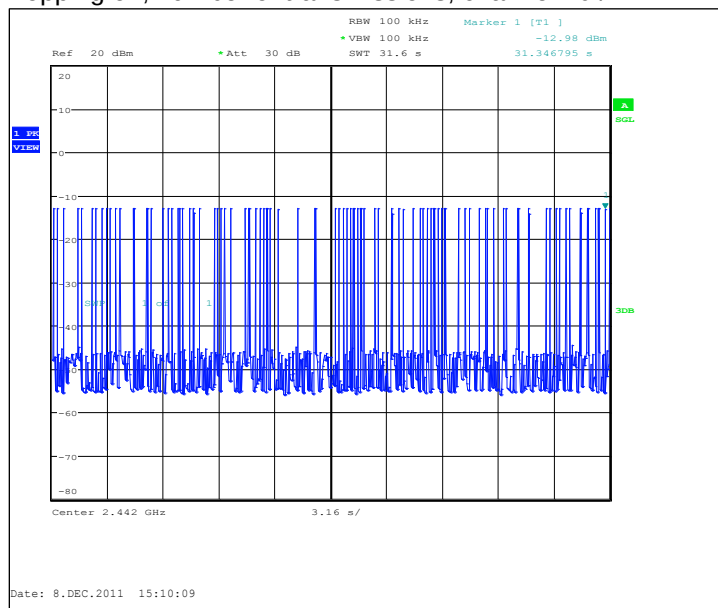
Hopping on, duration of one transmission, channel 40 / 2442 MHz



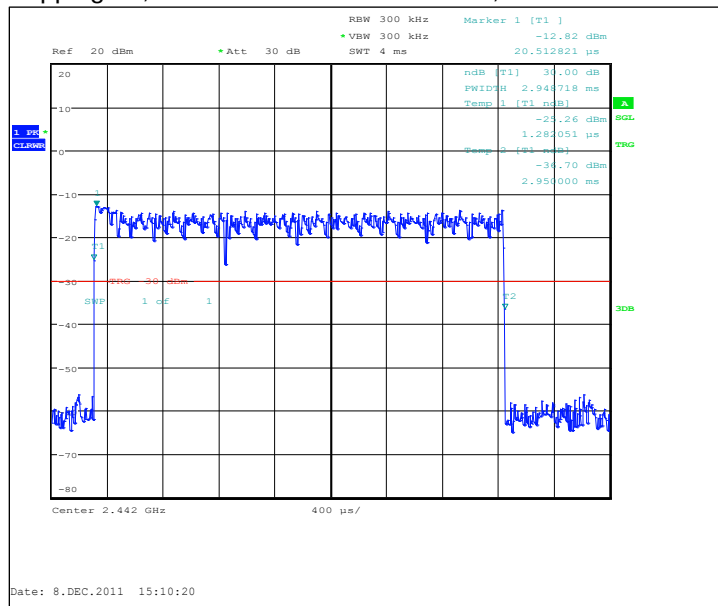
7.3.2 8DPSK modulation, PRBS packet type

Measured number of transmissions	Duration of one transmission [ms]	Time of occupancy [s]	Result
84	2.949	0.248	PASSED

Hopping on, number of transmissions, channel 40 / 2442 MHz



Hopping on, duration of one transmission, channel 40 / 2442 MHz



8. Test Equipment

8.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38112	Power supply	6632A	Agilent	22/24/27, 15C
TM38631	Signal Generator	83640L	Agilent	22/24/27, 15C, 15B
OM06312	Signal Generator	E4422B	Agilent	22/24
TM37678	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
TM30600	Impulse limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
TM26491	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum Analyzer	FSU26	R&S	22/24/27, 15C
TM22806	Battery	BAT 20/E	Fiskars	15C, 15B
TM22805	UPS	PS 20/1.2	Fiskars	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
-	Temperature test chamber	VT 4002	Vötsch	22/24
2058	Receiver	ESPC	R&S	15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Communication Tester	CMU200	R&S	22/24/27
2009	LISN 50 μ H	ENV216	R&S	15C, 15B
2010	LISN 50 μ H	ENV216	R&S	15C, 15B
2012	Power splitter	11667B	Agilent	22/24/27, 15C
2013	Attenuator	8493C	Agilent	22/24/27, 15C
2014	Attenuator	8493C	Agilent	22/24/27, 15C
2019	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
2020	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E

8.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38114	Power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38631	Signal Generator	83640L	Agilent	22/24/27, 15C, 15B
TM38323	Preamplifier	PA-02 18-26 GHz	EMC Automation	22/24/27, 15C, 15B
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM26497	Antenna	3115	Emco	22/24/27, 15C, 15B
TM37678	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15B
-	Turntable	2188	EMCO	22/24/27, 15C, 15B
-	Turntable controller	2090	EMCO	22/24/27, 15C, 15B
-	RF system panel	TS-RSP	R&S	22/24/27, 15C, 15B
-	RF system panel	TS-RSP	R&S	22/24/27, 15C, 15B
-	Mini mast	2075-2	ETS Lindgren	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
TM38843	Mini mast	2075	Emco	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	Emco	22/24/27, 15C, 15B
TM30643	LISN 50 μ H	LISN-5-20-2	FCC	22/24/27, 15C, 15B
TM30644	LISN 50 μ H	LISN-5-20-2	FCC	22/24/27, 15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C, 15B
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
TM39180	Laser distance meter	Disto Pro	Leica	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	Miteq	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	Miteq	22/24/27, 15C, 15B
TM30599	Semi anechoic chambre	UNKNOWN	TDK	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	-	22/24/27, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24/27, 15C, 15B
-	High pass filter	WHKX 1.6/15G-12SS	Wainwright	22/24/27, 15C, 15B
TM37545	Tunable notch filter	800.0/960.0-0.2/40-8SSK	Wainwright	22
TM26512	Tunable notch filter	WRCD1850/1910-0.2/40-10SSK	Wainwright	24
-	Band reject filter	WRCG1877/1883-1870/1890-40/6EE	Wainwright	24
-	Band reject filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
-	Band reject filter	WRCG832/838-825/848-40/5SS	Wainwright	22
TM23892	Controller	G-1000SDX	Yaesu	22/24/27
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27, 15C