

FCC Part 15C Compliance Test Report

Test Report no.:	Bej_FCC_0923_05.doc	Date of Report:	06-Oct -2008
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FCC listing no.:	94436		
IC recognition no.:	3608		
Tested devices/ accessories:	Phone RM-600 / Battery BP-4L, AC charger AC-8E, Headset HS-125		
FCC ID:	PYARM-600	IC:	661V-RM600
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-GEN (Issue 2, June 2007) and RSS-210 (Issue 7, June 2007). 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:			

Jia Dongsheng, Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	15-Sep-2008
Testing completed	25-Sep-2008
The customer's contact person	None
Test Plan referred to	T:\Projects\RM-449\TestPlan_RS\RS_Testplan_RM-449.xls
Notes	-
Document name	T:\Projects\RM-600\EMC\Results\FCC\Bej_FCC_0923_05.doc

1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band I / V) mobile phone with GPRS, EGPRS and Bluetooth. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-449	004401103174963	0691	-	100.21.55	41660
Phone	RM-449	004401103175028	0691	-	100.21.55	41656
Battery	BP-4L	-	-	-	-	41658
Battery	BP-4L	-	-	-	-	41348
AC Charger	AC-8E	-	-	-	-	41659
AC Charger	AC-8E	-	-	-	-	41662
Headset	HS-125	-	-	-	-	41657
Headset	HS-125	-	-	-	-	41661

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)	A8.4 (2)	Conducted peak output power	NP
15.247(d)	A8.5	Band edge compliance of RF emissions	NP
15.247(d)	A8.5	Spurious RF conducted emissions	NP
15.247(d), 15.209	A8.5	Spurious radiated emissions	NP
15.207	7.2.2	AC powerline conducted emissions	PASSED
15.247(a)(1)	A8.1 (1)	20 dB bandwidth	PASSED
15.247(a)(1)	A8.1 (2)	Carrier frequency separation	PASSED
15.247(a)(1)(iii)	A8.1 (4)	Number of hopping frequencies	PASSED
15.247(a)(1)(iii)	A8.1 (4)	Time of occupancy	PASSED

PASSED	The EUT complies with the essential requirements in the standard.
FAILED	The EUT does not comply with the essential requirements in the standard.
NP	The test was not performed by the TCC Nokia Tampere Laboratory.

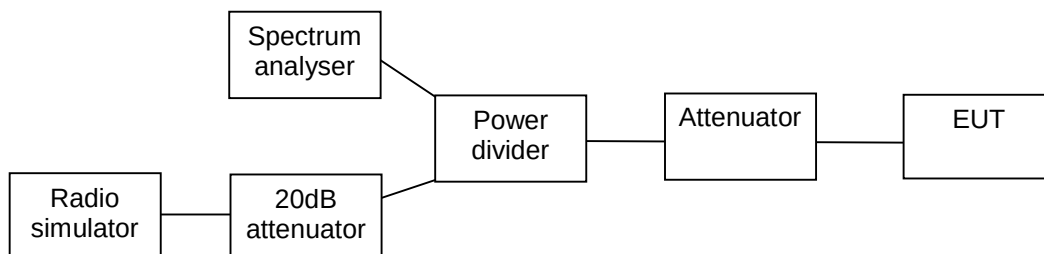
The test results of PYARM-450 are re-used for certification of the PYARM-600. The table above indicates the results, which will be re-used.

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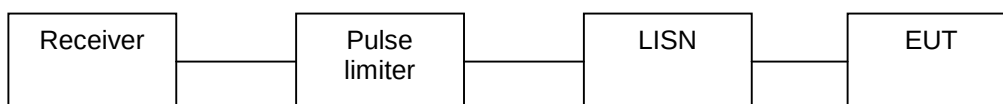
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2. Test setups

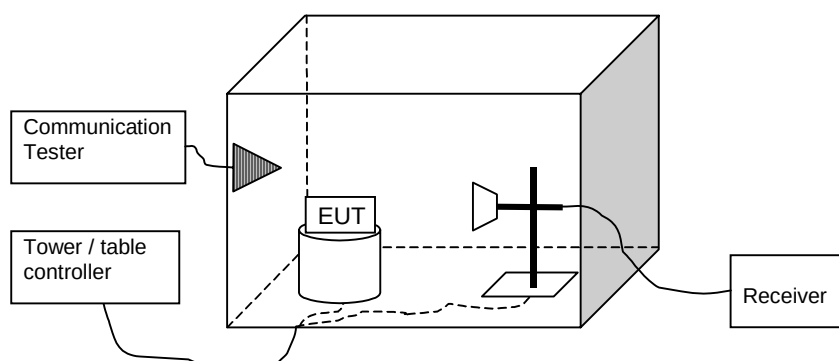
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



3. AC powerline conducted emissions (FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-449 DUT 41660
Accessories with DUT numbers	BP-4L DUT 41658, AC-8E DUT 41659, HS-125 DUT 41657
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 41 / 103.0
Date of measurements	18-Sep-2008
Measured by	Jari Jantunen

3.1. Test method and limit

The measurement is made according to Public notice DA 00-705 and IC standard RSS-GEN as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

$$U [dB\mu V] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

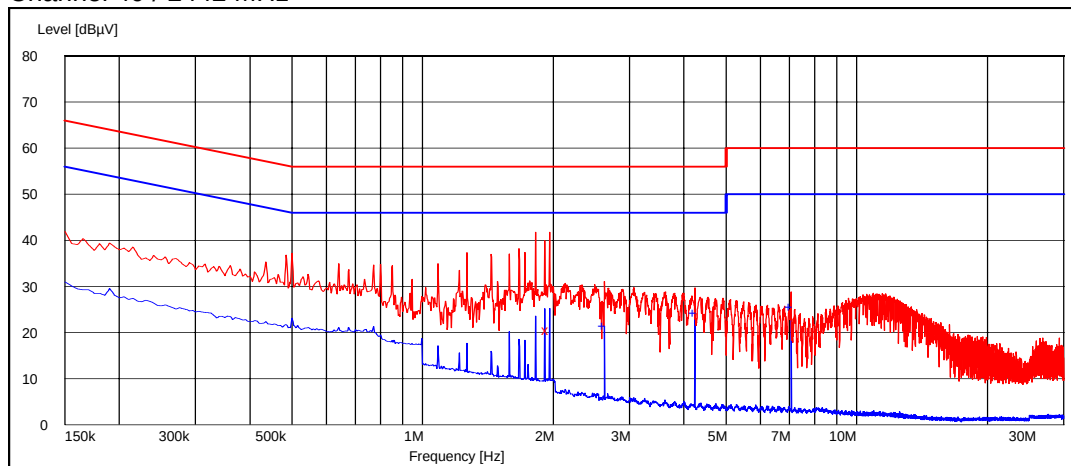
CISPR 22 Class B limits

Frequency range [MHz]	Quasi peak limit [dBμV]	Average limit [dBμV]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

3.2. Bluetooth Test results

3.2.1 GFSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

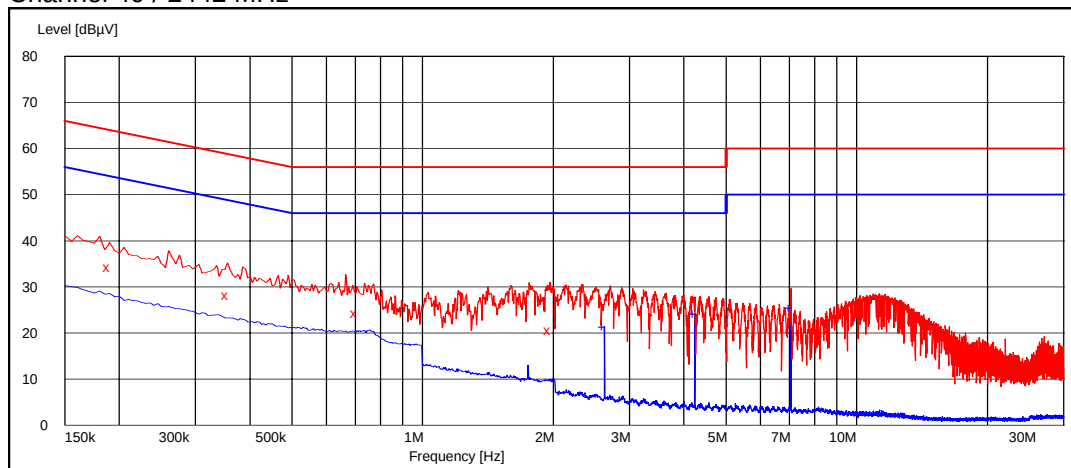
Frequency [MHz]	U [dBμV]	Line	Result
1.945000	20.60	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
2.625000	21.40	N	PASSED
4.240000	24.20	N	PASSED
7.065000	25.60	L1	PASSED

3.2.2 8DPSK modulation, PRBS packet type

Channel 40 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.190000	34.20	L1	PASSED
0.355000	28.20	L1	PASSED
0.705000	24.30	L1	PASSED
1.965000	20.70	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
2.625000	21.40	N	PASSED
4.240000	24.00	L1	PASSED
7.065000	25.50	L1	PASSED

4. 20 dB bandwidth (FCC §15.247(a)(1), RSS-210 A8.1 (1))

EUT with DUT number	RM-449 DUT 41656
Accessories with DUT numbers	BP-4L DUT 41348 / AC-8E DUT 41662 / HS-125 DUT 41661
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102.7
Date of measurements	23-Sep-2008
Measured by	Petteri Suni

4.1. 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

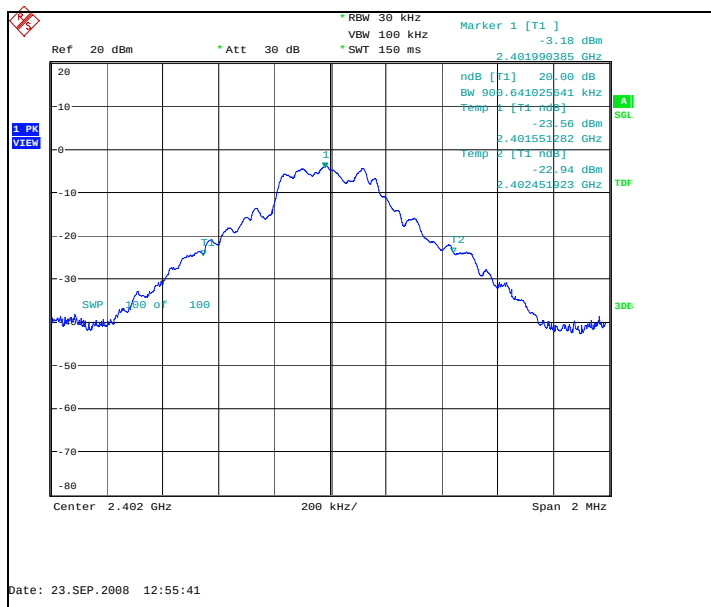
Limit [MHz]
N/A

4.2. Bluetooth Test results

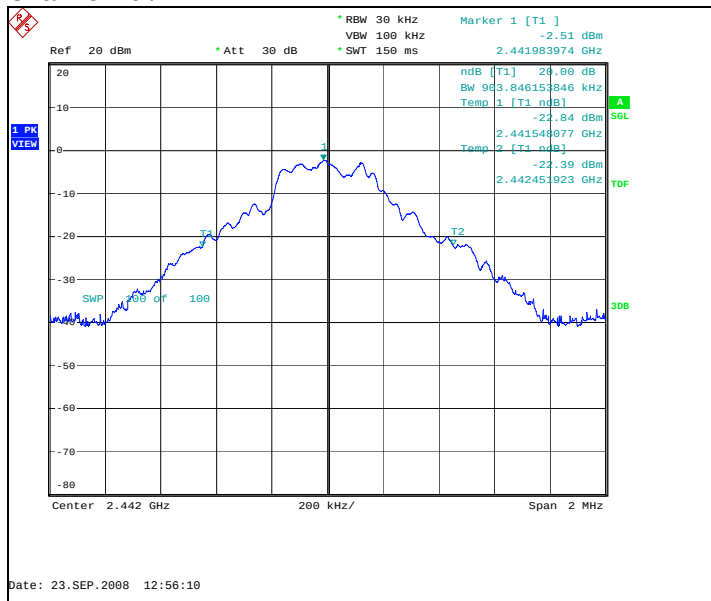
4.2.1 GFSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	900.641	PASSED
40 / 2442	903.846	PASSED
78 / 2480	907.051	PASSED

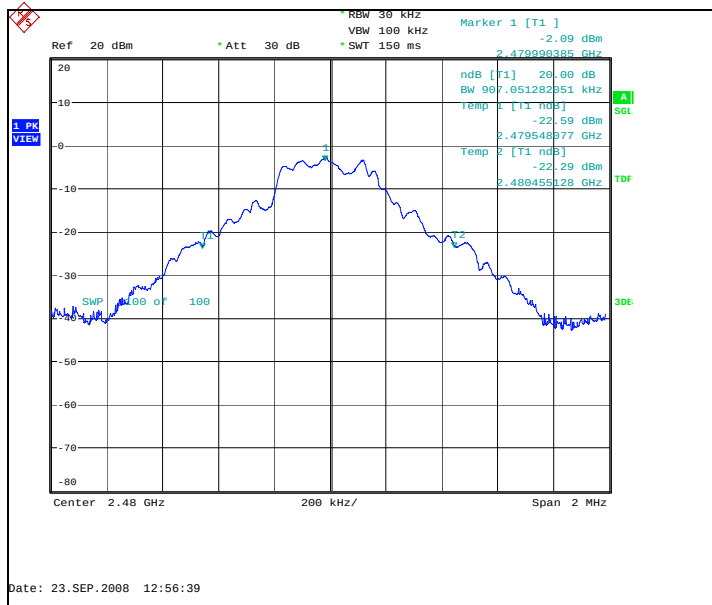
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



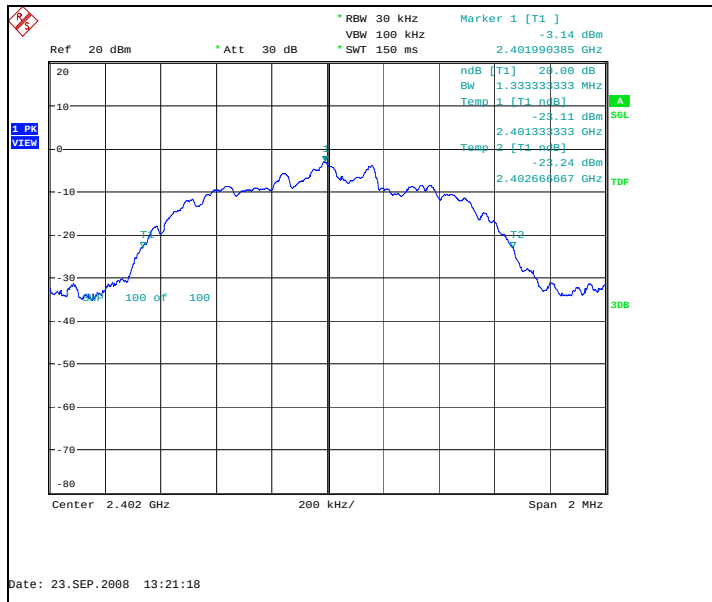
Channel 78 / 2480 MHz



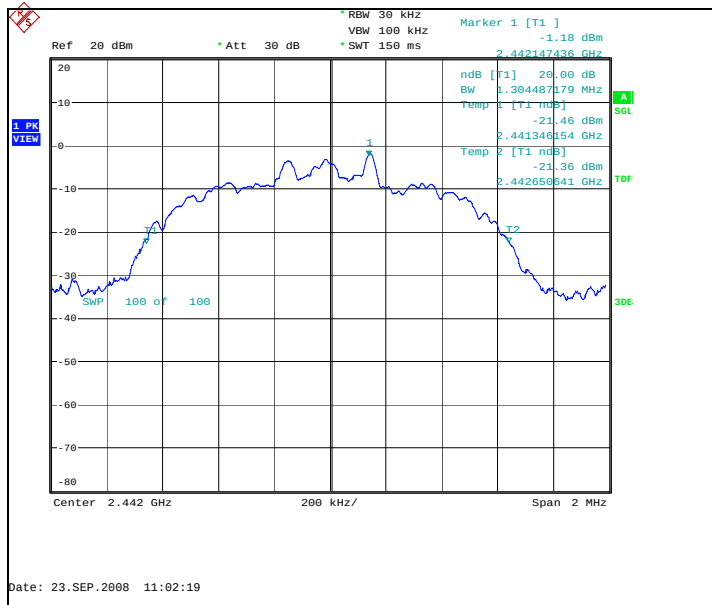
4.2.2 8DPSK modulation, PRBS packet type

Channel / f_c [MHz]	20 dB bandwidth [kHz]	Result
0 / 2402	1333.333	PASSED
40 / 2442	1330.128	PASSED
78 / 2480	1333.333	PASSED

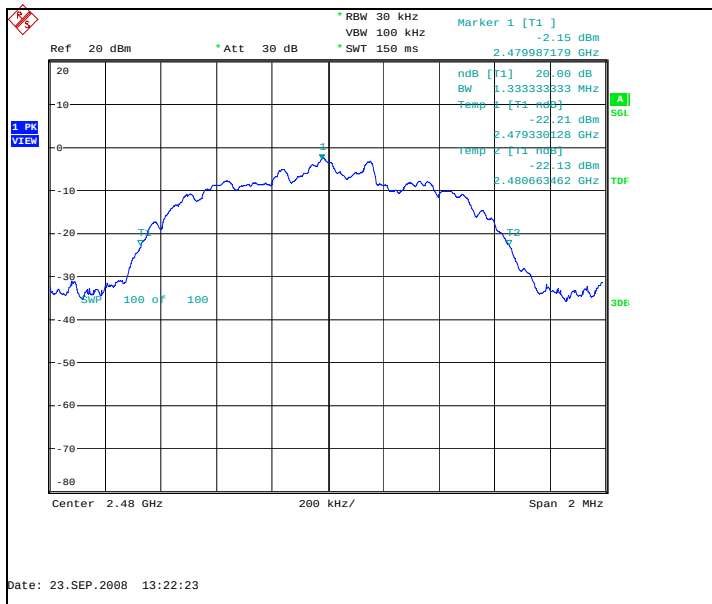
Channel 0 / 2402 MHz



Channel 40 / 2442 MHz



Channel 78 / 2480 MHz



5. Carrier frequency separation (FCC §15.247(a)(1), RSS-210 A8.1 (2))

EUT with DUT number	RM-449 DUT 41656
Accessories with DUT numbers	BP-4L DUT 41348 / AC-8E DUT 41662 / HS-125 DUT 41661
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102.9
Date of measurements	24-Sep-2008
Measured by	Petteri Suni

5.1. 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

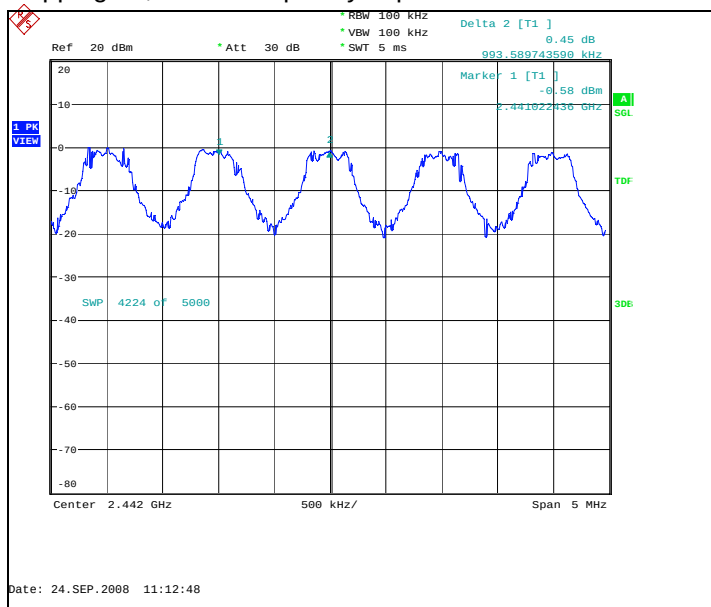
Limit [MHz]
≥ 0.025 or $2/3$ of the 20 dB bandwidth

5.2. Bluetooth Test results

5.2.1 GFSK modulation, PRBS packet type

Carrier frequency separation [kHz]	Result
993.59	PASSED

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



Carrier frequency separation [kHz]	Result
993.59	PASSED

Ref 20 dBm Att 30 dB SWT 5 ms RBW 100 kHz VBW 100 kHz Delta 2 [T1] 0.24 dB

993.580743599 kHz

Marker 1 [T1] -0.42 dBm 2.441922835 GHz

SWP 4208 0° 5000

Center 2.442 GHz 500 kHz/ Span 5 MHz

Date: 24.SEP.2008 11:07:52

6. Number of hopping frequencies (FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-449 DUT 41656
Accessories with DUT numbers	BP-4L DUT 41348 / AC-8E DUT 41662 / HS-125 DUT 41661
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102.7
Date of measurements	23-Sep-2008
Measured by	Petteri Suni

6.1. 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

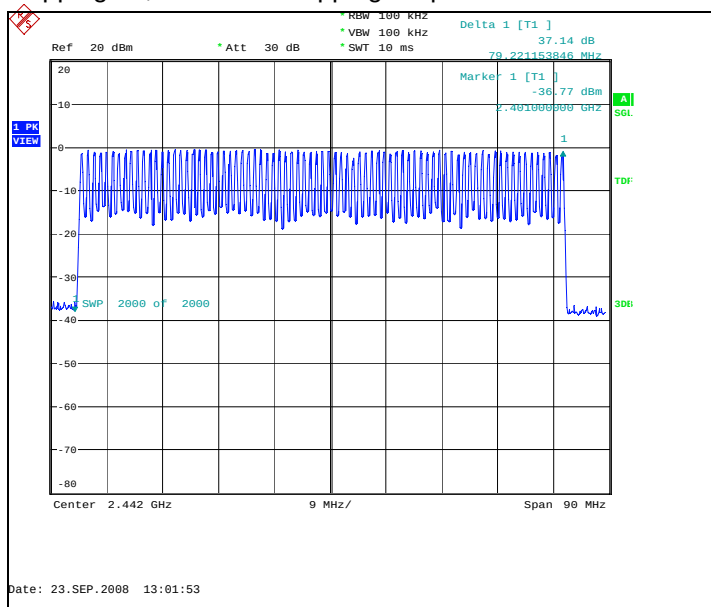
Limit [number]
≥ 15

6.2. Bluetooth Test results

6.2.1 GFSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
79	PASSED

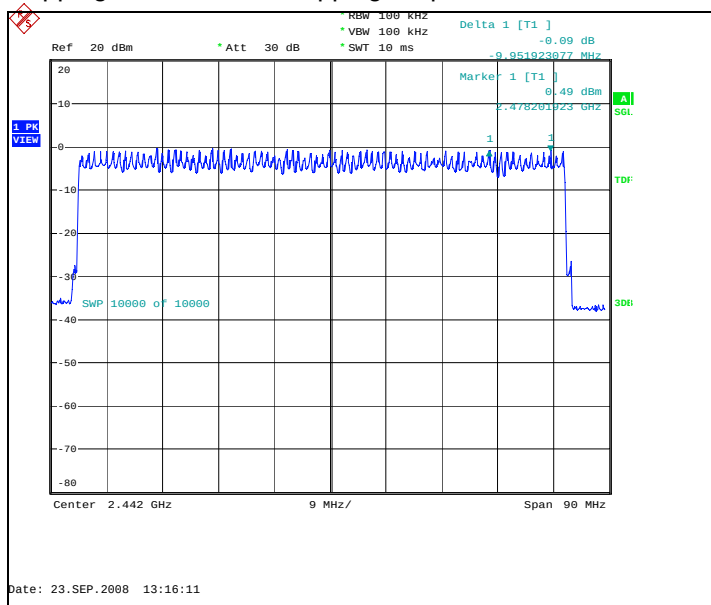
Hopping on, number of hopping frequencies



6.2.2 8DPSK modulation, PRBS packet type

Measured number of hopping frequencies	Result
76	PASSED

Hopping on, number of hopping frequencies



7. Time of occupancy (FCC §15.247(a)(1)(iii), RSS-210 A8.1 (4))

EUT with DUT number	RM-449 DUT 41656
Accessories with DUT numbers	BP-4L DUT 41348 / AC-8E DUT 41662 / HS-125 DUT 41661
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 102.7
Date of measurements	23-Sep-2008
Measured by	Petteri Suni

7.1. Test method and limit

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

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

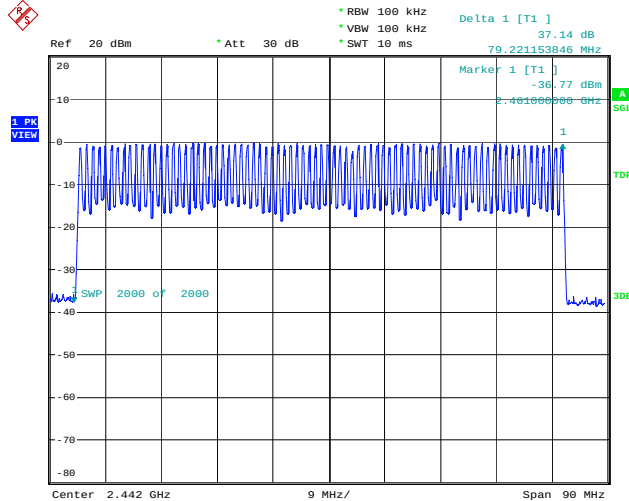
Limit [s]
≤ 0.4

7.2. Bluetooth test results

7.2.1 GFSK modulation, PRBS packet type

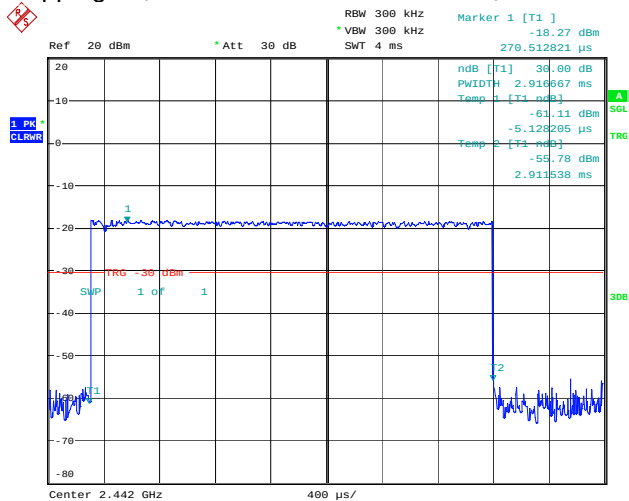
Measured number of transmissions	Duration of one transmission [μs]	Time of occupancy [s]	Result
99	2,917	0.288750	PASSED

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



Date: 23.SEP.2008 13:01:53

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

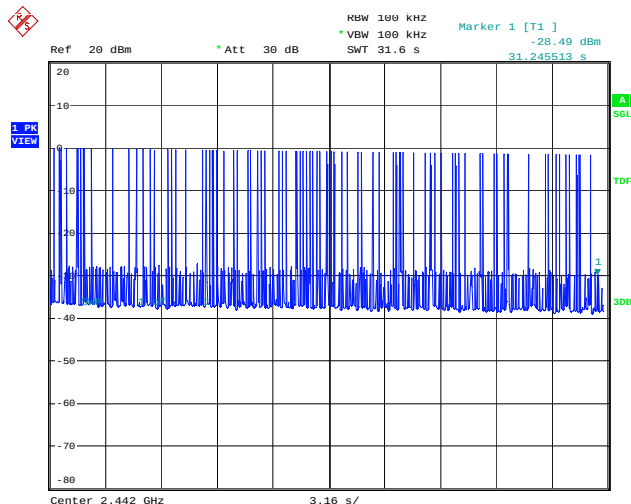


Date: 23.SEP.2008 13:03:01

7.2.2 8DPSK modulation, PRBS packet type

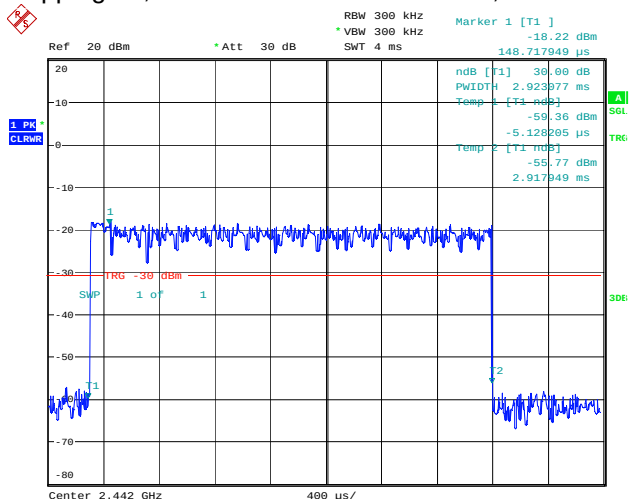
Measured number of transmissions	Duration of one transmission [μ s]	Time of occupancy [s]	Result
79	2,923	0.230923	PASSED

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



Date: 25.SEP.2008 10:28:06

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



Date: 25.SEP.2008 10:28:16

8. Test Equipment

8.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30597	Power splitter	11667A	Agilent	22/24/27, 15C
TM37499	Power splitter	11667A	Agilent	22/24/27, 15C
TM38111	Multimeter	34401A	Agilent	22/24/27, 15C
TM38112	DC power supply	6632A	Agilent	22/24/27, 15C
TM22901	Attenuator	8496A	Agilent	22/24/27, 15C
TM30636	Artificial mains net	L2-16	PMM	15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM30600	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum analyzer	FSU	R&S	22/24/27, 15C
TM22835	Multimeter	87	Fluke	15C, 15B
TM37500	Microwave switch system	7116-MSW	Keithley	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transformatic	22/24/27, 15C, 15B
	Temperature chamber	VT4002	Vötsch	22/24/27, 15C
2058	EMI Test receiver	ESPC	R&S	15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

8.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	22/24/27, 15C, 15B
TM38845	EMI receiver	ESI 40	R&S	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	22/24/27, 15C, 15B
TM37516	Biconilog antenna	HL562	R&S	22/24/27, 15C, 15B
TM26496	Double ridged waveguide antenna	3115	EMCO	22/24/27, 15C, 15B
TM39158	Horn antenna	3116	EMCO	22/24/27, 15C, 15B
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	22/24/27, 15C, 15B
TM37501	Dipole antenna	3125-870	EMCO	22/24/27
TM37502	Dipole antenna	3125-1880	EMCO	22/24/27
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM38631	Signal generator	83640L	Agilent	22/24/27, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24/27, 15C, 15B
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24/27
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24/27
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Mast/Turntable controller	HD-100	Deisel	22/24/27, 15C, 15B
TM26500	Turntable	DS412	Deisel	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	EMCO	22/24/27, 15C, 15B
TM38843	Antenna mast	2075	EMCO	22/24/27, 15C, 15B
TM38114	DC power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38323	Preamplifier	PA-02 18-26 GHz	EMC Automation	22/24/27, 15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transformativ	22/24/27, 15C, 15B
TM23892	Yaesu controller	G-1000SDX	Yaesu	22/24/27, 15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

