

FCC Part 15C Compliance Test Report

Test Report no.:	Bej_FCC_0843_06.doc	Date of Report:	31-Oct-2008
Number of pages:	17	Customer's Contact person:	Hu Helen
Testing laboratory:	TCC Nokia Beijing Laboratory Beijing Economic and Technological Development Area No.5 Donghuan Zhonglu Beijing PRC China 100176 Tel. +86 10 8711 8888 Fax. +86 10 8711 4550	Customer:	Nokia Corporation Beijing Economic and Technological Development Area No.5 Donghuan Zhonglu Beijing PRC China 100176 Tel. +86 10 8711 8888 Fax. +86 10 8711 4550
FCC listing no.:	975940		
IC recognition no.:	661AH-1		
Tested devices/ accessories:	Phone RM-458 / Battery BL-4S, AC-charger AC-8E, Headset HS-48.		
FCC ID:	QTLRM-458	IC:	661AB-RM458
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:			
	Zou Ming, Engineer		

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	15-Oct-2008
Testing completed	21-Oct-2008
The customer's contact person	Hu Helen
Test Plan referred to	T:\Projects\Projects\RM-458\TestPlan_RS\RS_Testplan_RM-458.xls
Notes	-
Document name	T:\Projects\RM-458\EMC\Results\FCC\Bej_FCC_0843_06.doc

1.1. EUT and Accessory Information

The EUT is a 3-band (GSM900/1800/1900) mobile phone with GPRS, EGPRS and Bluetooth. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-458	004401101584429	0201		lu07w41_08w38	51040
AC-charger	AC-8E	3997918362060300097;0675387	-	-	-	51034
Battery	BL-4S	3820668341210985734;0670577	-	-	-	51041
Headset	HS-48	06945818263K2100333	-	-	-	51042

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

PASSED
FAILED
NP

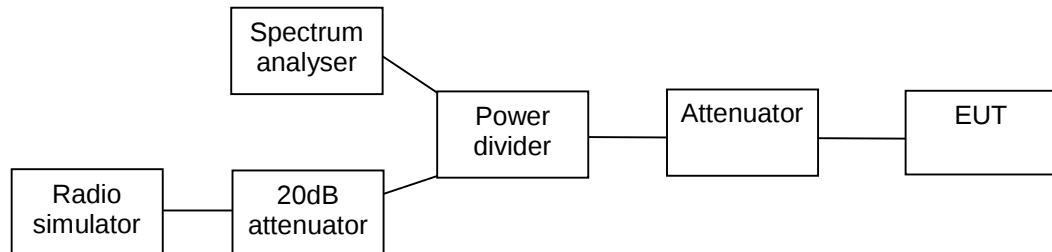
The EUT complies with the essential requirements in the standard.
The EUT does not comply with the essential requirements in the standard.
The test was not performed by the TCC Nokia Beijing Laboratory.

CONTENTS

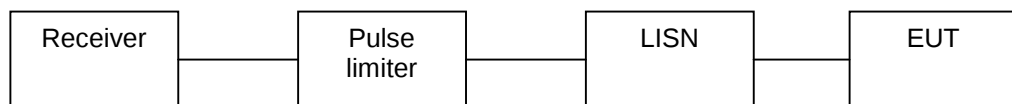
1. Summary for FCC Part 15C Compliance Test Report.....	2
1.1. EUT and Accessory Information	2
1.2. Summary of Test Results	2
2. Test setups.....	4
2.1. Conducted RF test setup	4
2.2. AC powerline conducted emissions test setup.....	4
2.3. Radiated test setup	4
3. Band edge compliance of RF emissions (FCC §15.247(d), RSS-210 A8.5).....	5
3.1. Test method and limit.....	5
3.2. Bluetooth Test results	6
4. Spurious radiated emissions (FCC §15.247(d), §15.209, RSS-210 A8.5).....	10
4.1. Test method and limit.....	10
4.2. Bluetooth Test results	11
5. AC powerline conducted emissions (FCC §15.107, RSS-GEN 7.2.2).....	14
5.1. Test method and limit.....	14
5.2. Bluetooth Test results	15
6. Test Equipment.....	17
6.1. Conducted measurements	17
6.2. Radiated measurements	17

2. Test setups

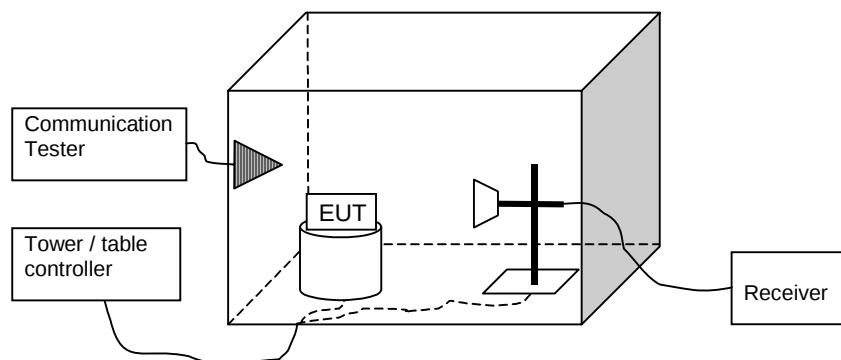
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



3. Band edge compliance of RF emissions (FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-458 DUT 51040
Accessories with DUT numbers	BL-4S, DUT 51041; AC-8E, DUT 51034; HS-48, DUT 51042
Operation Voltage [V] / [Hz]	110 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 58 / 100.8
Date of measurements	21-Oct-2008
Measured by	Zou Ming

3.1. Test method and limit

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

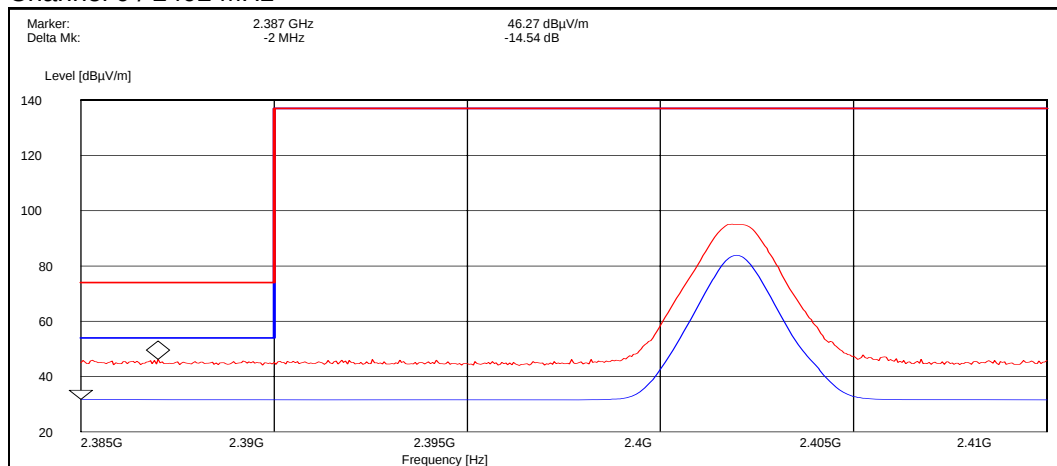
Limits for band edge compliance of RF emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit Average [dBμV/m]	Limit Peak [dBμV/m]
Below 2390 and above 2483.5	≤ 54	≤ 74

3.2. Bluetooth Test results

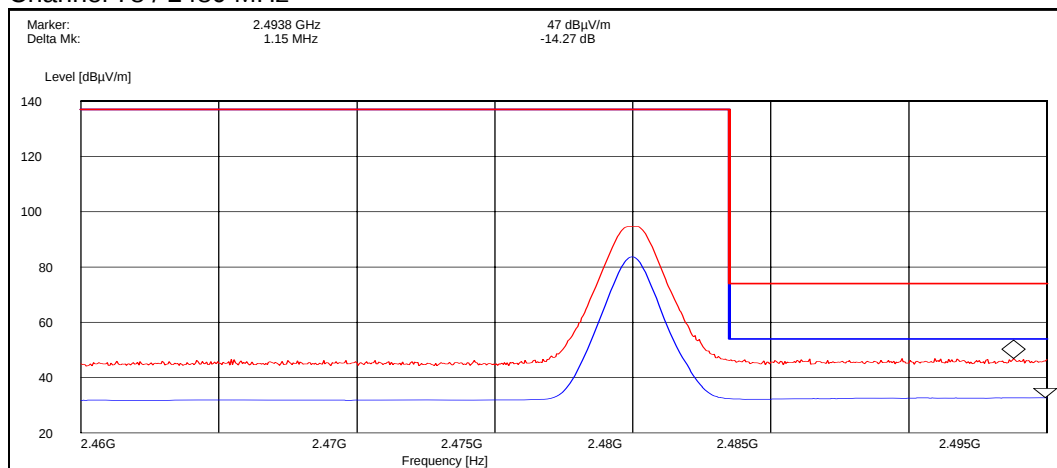
3.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz



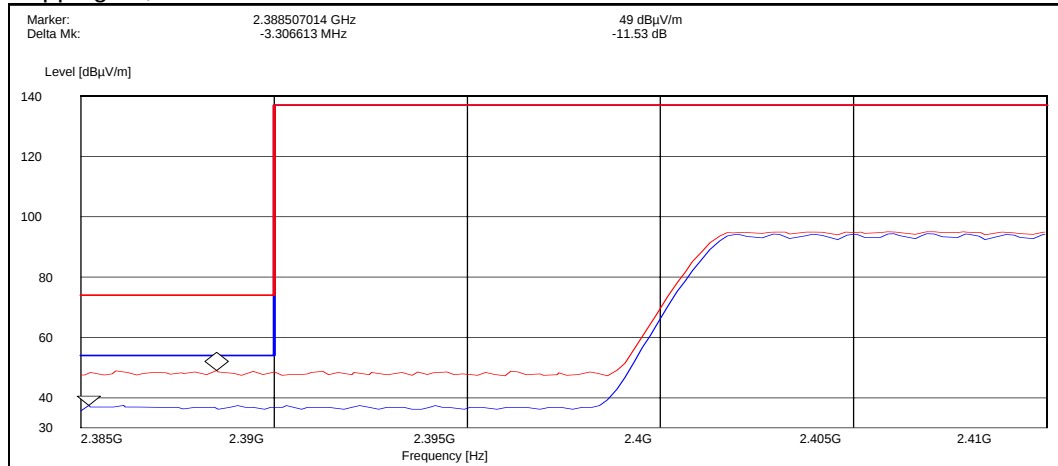
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	46.30	PASSED
Average	31.70	PASSED

Channel 78 / 2480 MHz



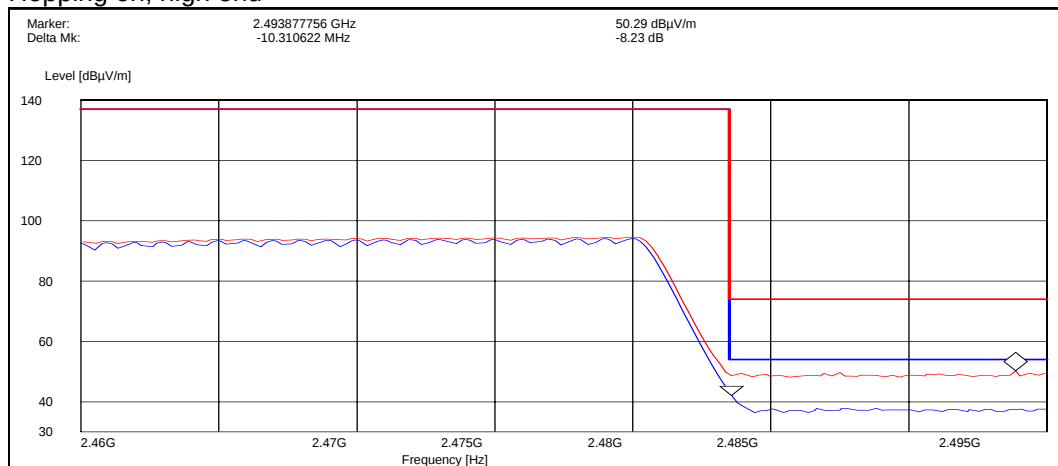
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	47.00	PASSED
Average	32.70	PASSED

Hopping on, low end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	49.00	PASSED
Average	37.50	PASSED

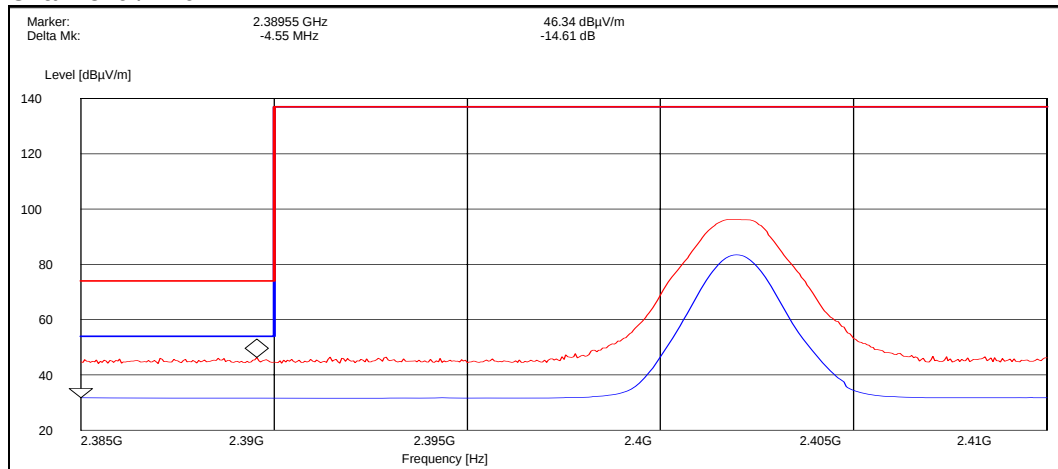
Hopping on, high end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	50.30	PASSED
Average	42.10	PASSED

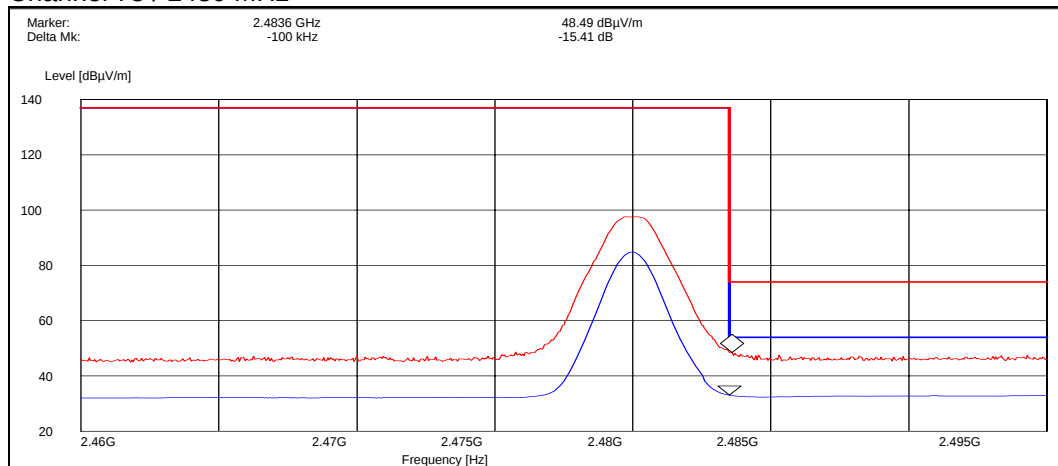
3.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz



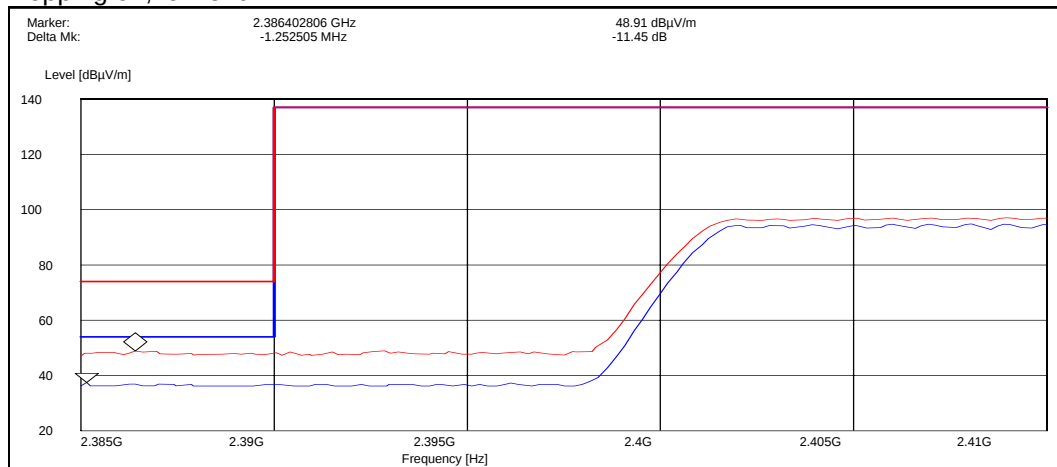
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	46.30	PASSED
Average	31.70	PASSED

Channel 78 / 2480 MHz



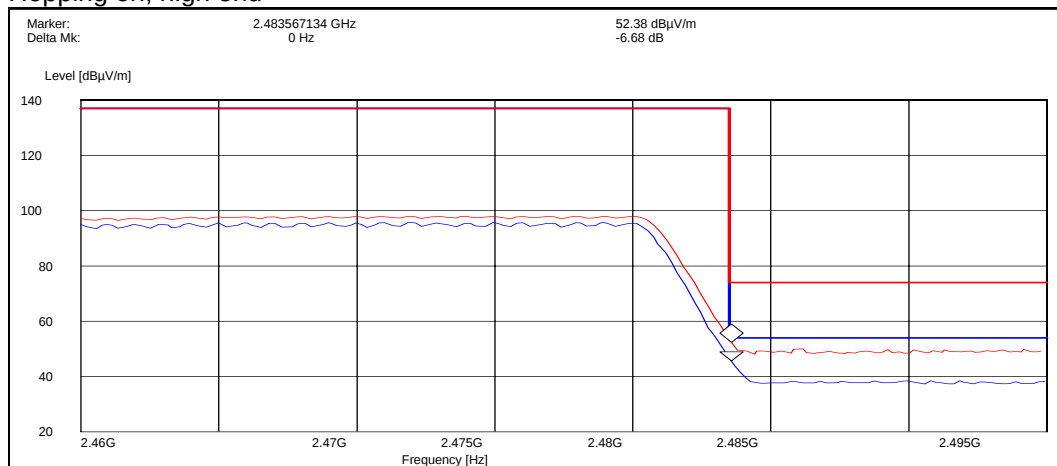
Detector (RBW: 1 MHz)	E [dBμV/m]	Result
Peak	48.50	PASSED
Average	33.10	PASSED

Hopping on, low end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	48.90	PASSED
Average	37.50	PASSED

Hopping on, high end



Detector (RBW: 1 MHz)	E [dB μ V/m]	Result
Peak	52.40	PASSED
Average	45.70	PASSED

4. Spurious radiated emissions (FCC §15.247(d), §15.209, RSS-210 A8.5)

EUT with DUT number	RM-458, DUT 51040
Accessories with DUT numbers	BL-4S, DUT 51041; AC-8E, DUT 51034; HS-48, DUT 51042
Operation Voltage [V] / [Hz]	110 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 58 / 100.8
Date of measurements	21-Oct-2008
Measured by	Zou Ming

4.1. Test method and limit

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

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The measurement results are obtained as described below:

$$E [\mu V/m] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{TOT} = L_{CABLES} + AF - G_{PREAMP}$).

Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	Detector
30 – 88	100	40	Quasi peak
88 – 216	150	43.5	Quasi peak
216 – 960	200	46	Quasi peak
960 – 1000	500	54	Quasi peak
Above 1000	500	54	Average
Above 1000	5000	74	Peak

4.2. Bluetooth Test results

4.2.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	40.60	107.15	40.70	-0.1	HORIZONTAL	PASSED
7206.000000	43.30	146.22	39.00	4.3	VERTICAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	27.70	24.27	27.80	-0.1	HORIZONTAL	PASSED
7206.000000	30.70	34.28	26.40	4.3	HORIZONTAL	PASSED

Channel 40 / 2442 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
32.804810	12.60	4.27	34.90	-22.3	VERTICAL	PASSED
38.095391	7.20	2.29	33.10	-25.9	VERTICAL	PASSED
206.011824	20.40	10.47	56.10	-35.7	VERTICAL	PASSED

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
7336.673347	43.60	151.36	39.00	4.6	HORIZONTAL	PASSED
7353.703407	43.70	153.11	39.00	4.7	HORIZONTAL	PASSED
7394.791583	43.60	151.36	39.10	4.5	VERTICAL	PASSED
17499.497996	53.00	446.68	35.90	17.1	VERTICAL	PASSED
17968.945892	55.50	595.66	35.60	19.9	VERTICAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB $\mu\text{V/m}$]	E [$\mu\text{V/m}$]	U _{RX} [dB μV]	A _{TOT} [dB]	Polarisation	Result
7340.673347	30.80	34.67	26.20	4.6	HORIZONTAL	PASSED
7355.203407	30.80	34.67	26.10	4.7	HORIZONTAL	PASSED
7393.291583	31.00	35.48	26.40	4.6	VERTICAL	PASSED
17495.497996	40.00	100.00	22.90	17.1	VERTICAL	PASSED
17971.445892	42.60	134.90	22.70	19.9	VERTICAL	PASSED

Channel 78 / 2480 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	42.00	125.89	41.80	0.2	HORIZONTAL	PASSED
7440.000000	43.70	153.11	39.40	4.3	VERTICAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	28.00	25.12	27.80	0.2	VERTICAL	PASSED
7440.000000	31.00	35.48	26.70	4.3	HORIZONTAL	PASSED

4.2.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	40.60	107.15	40.70	-0.1	HORIZONTAL	PASSED
7206.000000	43.60	151.36	39.30	4.3	HORIZONTAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	27.70	24.27	27.80	-0.1	HORIZONTAL	PASSED
7206.000000	30.70	34.28	26.40	4.3	HORIZONTAL	PASSED

Channel 40 / 2442 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
30.600000	16.10	6.38	37.00	-20.9	VERTICAL	PASSED
37.895391	11.10	3.59	36.90	-25.8	VERTICAL	PASSED

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2833.004008	50.20	323.59	46.80	3.4	VERTICAL	PASSED
7344.195391	43.30	146.22	38.70	4.6	VERTICAL	PASSED
7393.283567	43.80	154.88	39.20	4.6	HORIZONTAL	PASSED
7394.795591	43.80	154.88	39.30	4.5	HORIZONTAL	PASSED
17478.949900	52.50	421.70	35.40	17.1	VERTICAL	PASSED
17988.483968	55.30	582.10	35.20	20.1	VERTICAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2836.004008	37.30	73.28	34.00	3.3	VERTICAL	PASSED
7349.195391	30.70	34.28	26.00	4.7	VERTICAL	PASSED

7395.783567	31.10	35.89	26.60	4.5	HORIZONTAL	PASSED
7401.795591	31.10	35.89	26.60	4.5	HORIZONTAL	PASSED
17472.949900	40.00	100.00	22.90	17.1	VERTICAL	PASSED
17993.483968	42.80	138.04	22.60	20.2	VERTICAL	PASSED

Channel 78 / 2480 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4960.000000	40.90	110.92	40.70	0.2	HORIZONTAL	PASSED
7440.000000	43.90	156.68	39.60	4.3	HORIZONTAL	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4960.000000	28.10	25.41	27.90	0.2	HORIZONTAL	PASSED
7440.000000	31.20	36.31	26.90	4.3	HORIZONTAL	PASSED

5. AC powerline conducted emissions (FCC §15.107, RSS-GEN 7.2.2)

EUT with DUT number	RM-458, DUT 51040
Accessories with DUT numbers	BL-4S, DUT 51041; AC-8E, DUT 51034; HS-48, DUT 51042
Operation Voltage [V] / [Hz]	110 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 34 / 102.1
Date of measurements	27-Oct-2008
Measured by	Zou Ming

5.1. Test method and limit

The measurement is made according to ANSI C63.4-2003 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:

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

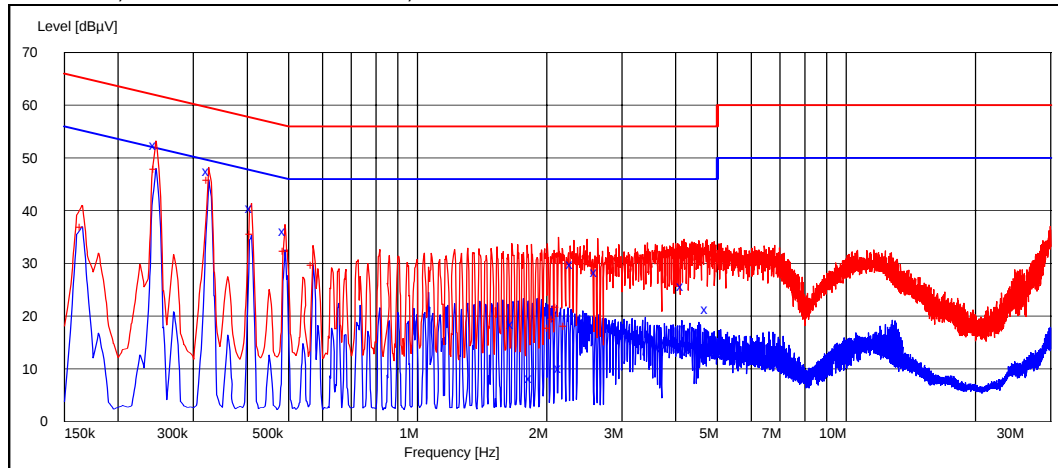
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

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

5.2. Bluetooth Test results

TX mode, channel 40 / 2442 MHz, GFSK modulation



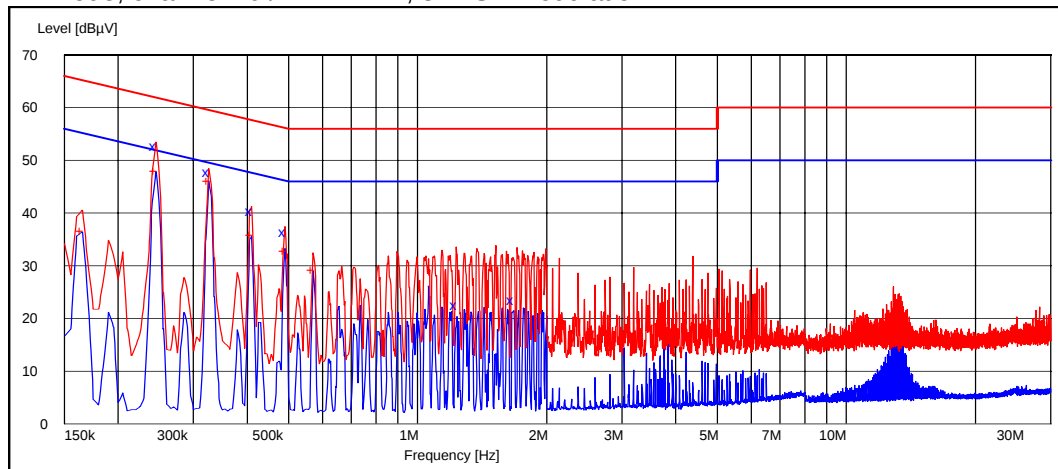
Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.245000	52.50	N	PASSED
0.325000	47.60	N	PASSED
0.410000	40.40	N	PASSED
0.490000	36.10	N	PASSED
1.670000	18.40	N	PASSED
1.845000	8.30	N	PASSED
2.155000	10.20	L1	PASSED
2.295000	29.90	L1	PASSED
2.480000	15.70	L1	PASSED
2.615000	28.30	L1	PASSED
4.155000	25.70	L1	PASSED
4.745000	21.40	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.165000	36.90	N	PASSED
0.245000	47.80	N	PASSED
0.325000	45.70	N	PASSED
0.410000	35.50	N	PASSED
0.490000	32.30	N	PASSED
0.570000	29.70	N	PASSED
2.030000	17.70	L1	PASSED
2.080000	19.40	L1	PASSED
2.125000	21.70	L1	PASSED
2.220000	18.10	N	PASSED

TX mode, channel 40 / 2442 MHz, 8DPSK modulation



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.245000	52.70	N	PASSED
0.325000	47.70	N	PASSED
0.410000	40.40	N	PASSED
0.490000	36.40	N	PASSED
1.230000	22.50	N	PASSED
1.670000	23.40	N	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.165000	36.50	N	PASSED
0.245000	48.00	N	PASSED
0.325000	46.00	N	PASSED
0.410000	35.80	N	PASSED
0.490000	32.80	N	PASSED
0.570000	29.20	N	PASSED

6. Test Equipment

6.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
BJPCPT0039	LISN	ESH3-Z5	BJPCPT0039	15C, 15B
BJPCPT0040	TEST RECEIVER	ESCS30	BJPCPT0040	15C, 15B
BJPCPT0069	LISN	ESH3-Z5	BJPCPT0069	15C, 15B
BJPCPT0079	LISN	ESH3-Z5	BJPCPT0079	15C, 15B
BJPCPT0191	PULSE LIMITER	ESH3-Z2	BJPCPT0191	15C, 15B

6.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
BJPCPT0129	Relay Unit	TS-RSP	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0130	Relay Unit	TS-RSP	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0080	Device Controller	EMCO2090	ETS-EMCO	22/24/27, 15C, 15B
BJPCTC0048	RF Preamplifier 10MHz-3GHz (Metal chassis)	AFS4-00100300-10-10P-4	MITEQ	22/24/27, 15C, 15B
BJPCTC0007	Ultra Broadband Antenna 30MHz-3000MHz	HL562	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0162	Horn Antenna 1GHz-18GHz	HF906	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCTC0029	Horn Antenna 1GHz-18GHz	HF906	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCTC0049	RF preamplifier 3GHz-18GHz	BLMA-0118-1A-BT	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCTC0072	3m anechoic chamber	-	ETS-Lindgren	22/24/27, 15C, 15B
BJPCTC0075	Turntable	Model 2088	ETS-EMCO	22/24/27, 15C, 15B
BJPCPT0072	EMI Test Receiver 20Hz-26.5GHz	ESIB26	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0150	High Pass filter	WHKS 1200-10SS	Wainwright instruments	22/24/27, 15C, 15B
BJPCTC0034	Notch Filter	WRCT800/880-0.2/40-5SSK	Wainwright instruments	22, 15B
BJPCPT0151	Notch Filter	WRCD1800/2000-0.2/40-5SSK	Wainwright instruments	24, 15B
BJPCTC0017	Radio Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
BJPCPT0154	Filter	WRCT2402/2480-2400/2483.5-30-20SS	Wainwright instruments	15C, 15B
BJPCTC0058	Bluetooth tester	CBT	Rohde&Schwarz	15C, 15B
BJPCTC0064	WCDMA II FILTER	WRCG1877/1883-1870/1890-40/6SS	Wainwright instruments	24, 15B
BJPCTC0065	WCDMA V FILTER	WRCG832/838-825/845-40/5SS	Wainwright instruments	22, 15B