

FCC Part 15B Compliance Test Report

Test Report no.:	FCC15B_RM-644_06.docx	Date of Report:	13-Sep-2010
Number of pages:	11	Customer's Contact person:	Hu Dongji
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FCC listing no.:	975940		
IC recognition no.:	661AH-1		
Tested devices/ accessories:	Phone RM-644 / Battery BL-5CB / AC-charger AC-3E / USB Data cable CA-101 / laptop IBM T40 / Printer HP C6427A		
FCC ID:	QTLRM-644	IC:	661AB-RM644
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart B, ANSI C63.4 (2003), ICES-003, CISPR 22, RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009). 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, System Manager

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	30-Aug-2010
Testing completed	13-Sep-2010
The customer's contact person	Hu Dongji
Test Plan referred to	T:\Projects\RM-644\TestPlan\RS_testplan_RM-644.xls
Notes	-
Document name	FCC15B_RM-644_06.docx

1.1. EUT and Accessory Information

The EUT is a 2-band (GSM850/1900) mobile phone with GPRS and Bluetooth.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-644	001004004060027	0202	-	ck101_10w33	51832
Battery	BL-5CB	0670620495540R057110200107	-	-	-	51815
AC-charger	AC-3E	4419298432052200110;0675370	-	-	-	51810
Laptop	IBM T40	99FMPGT	-	-	-	51044
USB Data cable	CA-101	07306349242Q1205244	-	-	-	51788
Printer	HP C6427A	MY15B18156JJ	-	-	-	51838

1.2. Summary of Test Results

Bluetooth:

Section in CFR 47	Section in ICES-003 (RSS-133)	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	PASSED
15.109, a	5.5 (6.6)	Radiated emissions	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.

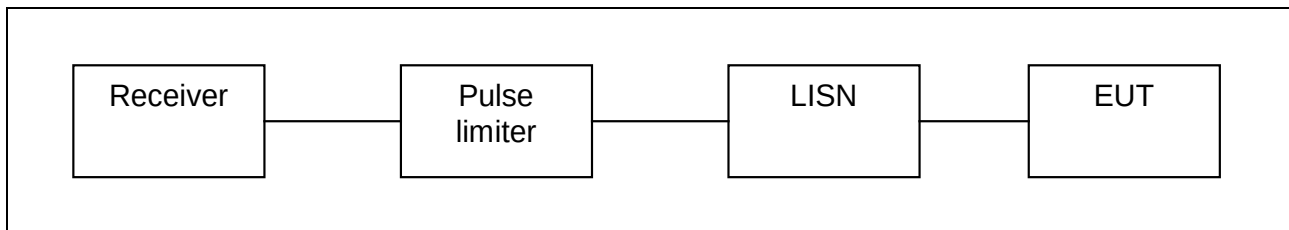
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2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-644, DUT 51832
Accessories with DUT numbers	BL-5CB, DUT 51815 ; AC-3E, DUT 51810 ; CA-101, DUT 51788 ; IBM T40, DUT 51044 ; HP C6427A, DUT 51838
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	Data was transferring between phone and PC during BT testing.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 57 / 100.7
Date of measurements	13-Sep-2010
Measured by	Zou Ming

2.1. Test Setup



2.2. 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:

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

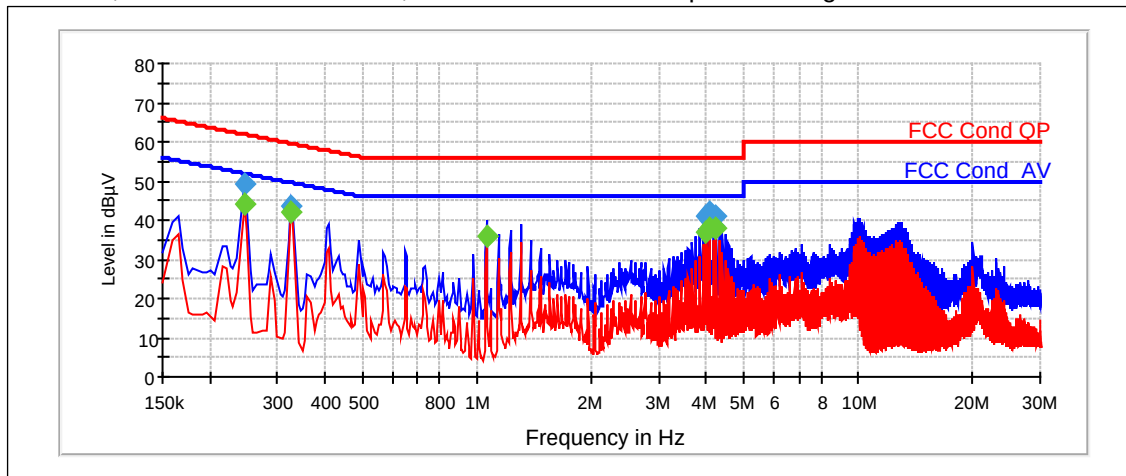
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

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

2.2.1 Bluetooth Test Results

TX mode, channel 40 / 2442 MHz, measured from mobile phone charger



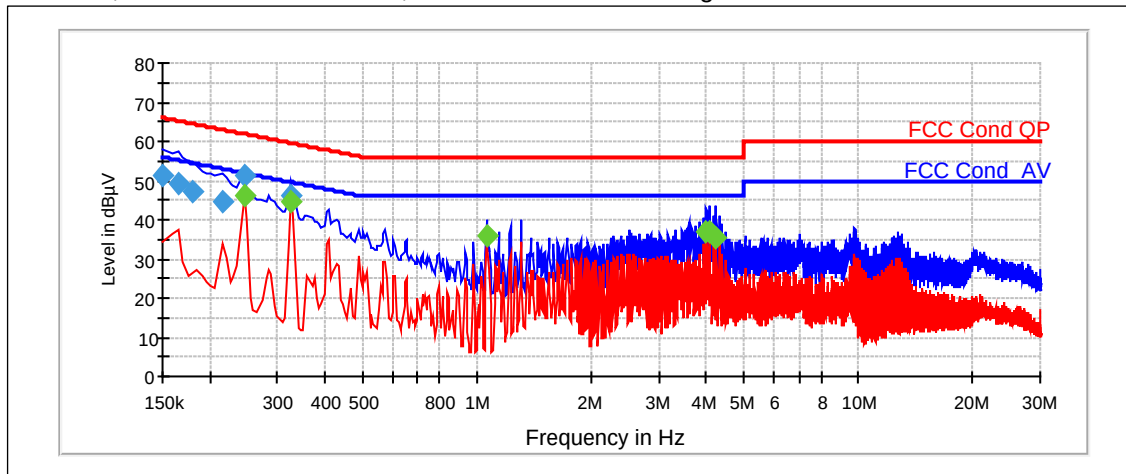
Quasi peak

Frequency [MHz]	U [dBμV]	IF-BW[kHz]	Line	Margin	Result
0.245	49.16	9	N	12.72	PASSED
0.325	43.63	9	L1	15.98	PASSED
4	40.78	9	L1	15.2	PASSED
4.08	42.19	9	L1	13.8	PASSED
4.165	38.61	9	N	17.4	PASSED
4.245	41.18	9	L1	14.8	PASSED

Average

Frequency [MHz]	U [dBμV]	IF-BW[kHz]	Line	Margin	Result
0.245	43.96	9	L1	7.92	PASSED
0.325	42.13	9	N	7.48	PASSED
1.06	35.97	9	N	10	PASSED
4	36.97	9	L1	9	PASSED
4.08	38.15	9	L1	7.8	PASSED
4.245	37.7	9	N	8.3	PASSED

TX mode, channel 40 / 2442 MHz, measured from PC charger



Quasi peak

Frequency [MHz]	U [dBμV]	IF-BW[kHz]	Line	Margin	Result
0.15	51.41	9	N	14.6	PASSED
0.165	49.16	9	L1	16.01	PASSED
0.18	47.09	9	N	17.39	PASSED
0.215	44.57	9	L1	18.41	PASSED
0.245	51.38	9	L1	10.52	PASSED
0.325	46.21	9	N	13.38	PASSED

Average

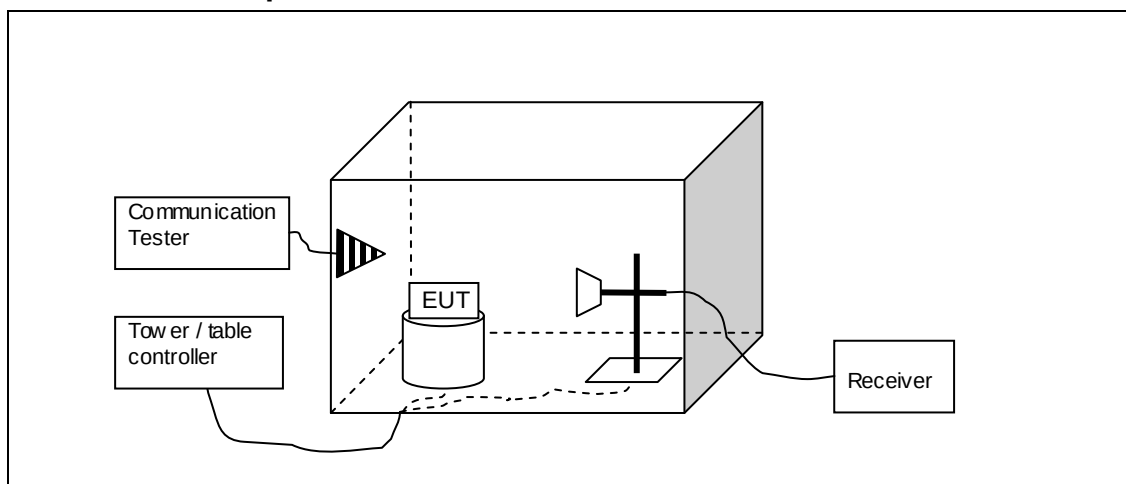
Frequency [MHz]	U [dBμV]	IF-BW[kHz]	Line	Margin	Result
0.245	46.09	9	L1	5.82	PASSED
0.325	44.45	9	N	5.18	PASSED
1.06	35.97	9	L1	10	PASSED
4	36.92	9	N	9.1	PASSED
4.08	37.14	9	N	8.9	PASSED
4.245	35.56	9	N	10.4	PASSED

3. Radiated emissions

(FCC §15.109, ICES-003 section 5.5, RSS-132 4.6, RSS-133 6.6)

EUT with DUT number	RM-644, DUT 51832
Accessories with DUT numbers	BL-5CB, DUT 51815 ; AC-3E, DUT 51810 ; IBM T40, DUT 51044 ; CA-101, DUT 51788 ; HP C6427A, DUT 51838
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	Data was transferring between mobile phone and PC during the BT testing.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 64 / 101.1
Date of measurements	07-Sep-2010
Measured by	Jia Dongsheng

3.1. Test Setup



3.2. Test method and limit

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

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.

The EUT is placed on a nonconductive plate at 80 cm height.

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 ($A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$).

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range [MHz]	Quasi peak limit [dBμV/m]	Average limit [dBμV/m]	Peak limit [dBμV/m]
30 - 230	40	-	-
230 – 1000	47	-	-
Above 1000	-	54	74

3.3. Bluetooth Test results

3.3.1 GFSK modulation, PRBS packet type

TX mode, Channel 0 / 2402 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
4805.6	46.38	208.545	46.63	-0.25	VERTICAL	PASSED
7205	46.59	213.624	41.57	5.02	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
4805.6	29.16	28.698	29.41	-0.25	VERTICAL	PASSED
7205	33.1	45.206	28.08	5.02	HORIZONTAL	PASSED

TX mode, Channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
196.594	38.94	88.491	62.94	-24	VERTICAL	PASSED
221.023	29.84	31.046	52.91	-23.07	HORIZONTAL	PASSED
257.085	39.41	93.379	60.89	-21.48	HORIZONTAL	PASSED
264.982	28.16	25.586	49.28	-21.12	HORIZONTAL	PASSED
444.308	27.46	23.61	43.42	-15.96	HORIZONTAL	PASSED
488.508	27.32	23.23	42.17	-14.85	HORIZONTAL	PASSED
529.883	21.55	11.95	36.19	-14.64	HORIZONTAL	PASSED

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
1596.596	49.65	303.809	52	-2.35	VERTICAL	PASSED
2916.936	51.45	373.508	41.58	9.87	VERTICAL	PASSED
3928.454	43.95	157.543	45.4	-1.45	HORIZONTAL	PASSED
4894.389	46.93	222.024	46.91	0.02	VERTICAL	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
1596.596	29.67	30.437	32.02	-2.35	VERTICAL	PASSED
2916.936	39.21	91.306	29.34	9.87	VERTICAL	PASSED
3928.454	28.09	25.375	29.54	-1.45	HORIZONTAL	PASSED
4894.389	29.76	30.772	29.74	0.02	VERTICAL	PASSED

TX mode, 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
4960.4	49.02	282.586	48.95	0.07	VERTICAL	PASSED
7437.5	49.65	303.844	44.56	5.09	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
4960.4	30.32	32.821	30.25	0.07	VERTICAL	PASSED
7437.5	33.71	48.484	28.62	5.09	HORIZONTAL	PASSED

4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	RF Emission Software	EMC32 Test Software	R&S	22/24/27, 15C, 15B
BJPCWH0020	DC Power supply	Hp6632B	HP	22/24/27, 15C
BJPCPT0040	Receiver	ESCS30	R&S	15C,15B
BJPCPT0073	Signal Generator	SMR 20	R&S	22/24/27, 15C, 15B
BJPCPT0079	LISN 50 µH	ESH3-Z5	R&S	15C,15B
BJPCPT0131	Communication Tester	CMU200	R&S	15C,15B
BJPCPT0191	Pulse Limiter	ESH3-Z2	R&S	15C,15B
BJPCTC0017	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
BJPCTC0067	Bluetooth Tester	CBT	R&S	22/24/27, 15C
BJPCTC0089	Temperature Test chamber	VT4002	Votsch industrietechnik	22/24/27, 15C
BJPCTC0090	FSP spectrum analyzer	FSP30	R&S	22/24/27, 15C
BJPCTC0094	GPIO-RS232 convertor	GPIO-RS232	NI	22/24/27, 15C
BJPCTC0112	Power Splitter	11667B	Agilent	22/24/27, 15C
BJPCTC0114	Signal Generator	E8357C	Agilent	22/24/27, 15C
BJPCTC0115	Communication Tester	CMU200	R&S	22/24/27, 15B, 15C

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	RF Emission Software	EMC32 Test Software	R&S	22/24/27, 15C, 15B
BJPCPT0072	Receiver	ESI B26	R&S	22/24/27, 15C, 15B
BJPCPT0130	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
BJPCPT0150	High Pass Filter	WHKS1200-10SS	Wainwright	22/24/27, 15C, 15B
BJPCPT0151	Band Reject Filter	WRCD1880/2000-0.2/40-5SSK	Wainwright	24, 15B
BJPCPT0154	Band Reject Filter	WRCT2402/2480-2400/2483.5-30-20SS	Wainwright	15C, 15B
BJPCPT0162	Antenna	HF906	R&S	22/24/27, 15C, 15B
BJPCTC0007	Antenna	HL562	R&S	22/24/27, 15C, 15B
BJPCTC0029	Antenna	HF906	R&S	22/24/27, 15C, 15B
BJPCTC0034	Band Reject Filter	WRCT 800/880-0.2/40-5SSK	Wainwright	22, 15B
BJPCTC0049	Preamplifier	Blma 0118-1A-Bt	Bonn	22/24/27, 15C, 15B
BJPCTC0055	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
BJPCTC0058	Bluetooth Tester	CBT	R&S	15C, 15B
BJPCTC0064	Band Reject Filter	WRCG1877/1883-1870/1890-40/6SS	Wainwright	24, 15B
BJPCTC0065	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	27, 15B
BJPCTC0071	Multi-Device Controller	2090	EMCO	22/24/27, 15C, 15B
BJPCTC0072	Anechoic Chamber	3 m Semi / Full Anechoic Chamber	ETS	22/24/27, 15C, 15B
BJPCTC0073	MAST	Model-TR/POL	ETS	22/24/27, 15C, 15B
BJPCTC0074	MAST	Model 2070-2	ETS	22/24/27, 15C, 15B
BJPCTC0075	Turntable	Model 2188	ETS-EMCO	22/24/27, 15C, 15B
BJPCTC0096	Preamplifier	AFS4-00100300-20-23P-6	Miteq	22/24/27, 15C, 15B
BJPCTC0113	Receiver	ESI B26	R&S	22/24/27, 15B, 15C
BJPCTC0115	Communication Tester	CMU200	R&S	22/24/27, 15B, 15C