

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15C_RM-699_05.doc	Date of Report:	14-Oct-2010
Number of pages:	14	Customer's Contact person:	Shao Xu
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FCC listing no.:	975940		
IC recognition no.:	661AH-1		
Tested devices/ accessories:	Phone RM-699 / Battery BL-4D / AC-charger AC-8E / Headset WH-102		
FCC ID:	QTKRM-699	IC:	661AD-RM699
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 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:			

Teuvo Miettinen, Test Engineer, EMC

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	01-Apr-2010
Testing completed	14-Apr-2010
The customer's contact person	Shao Xu
Test Plan referred to	T:\Projects\Projects\RM-632\TestPlan\RS_testplan_RM-632.xls
Notes	-
Document name	FCC15C_RM-632_07.doc

1.1. EUT and Accessory Information

The EUT is a 7-band (GSM850/900/1800/1900) and WCDMA Band (I/II(1900)/VIII) mobile phone with GPRS, EGPRS, HSDPA, HSUPA and WLAN and Bluetooth. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-632	004401109337705	0200B	-	041.007 RD	51629
Battery	BL-4D	4181579161001101133;0670603	-	-	-	51399
AC-charger	AC-8E	4868679464320602195;0675387	-	-	-	51633
Headset	WH-102	0694323923554107290	-	-	-	51587

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	NP
15.247(d)	A8(0.5)	Band edge compliance of RF emissions	PASSED
15.247(d)	A8(0.5)	Spurious RF conducted emissions	NP
15.247(d), 15.209	A8(0.5)	Spurious radiated emissions	PASSED
15.207	7.2.2	AC powerline conducted emissions	NP
15.247(a)(1)	A8(0.1(1))	20dB(bandwidth)	NP
15.247(a)(1)	A8(0.1(2))	Carrier frequency separation	NP
15.247(a)(1)(iii)	A8(0.1(4))	Number of hopping frequencies	NP
15.247(a)(1)(iii)	A8(0.1(4))	Time of occupancy	NP

WLAN:

Section in CFR 47	Section in RSS-GEN or RSS-210	Name of the test	Result
15.247(b)(1)	A8(0.4(4))	Conducted peak output power	NP
15.247(d)	A8(0.5)	Band edge compliance of RF emissions	NP
15.247(d)	A8(0.5)	Spurious RF conducted emissions	NP
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)(2)	A8(0.1(1))	6dB(bandwidth)	NP
15.247(a)(1)(iii)	A8(0.1(4))	Power spectral density	NP

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 Laboratory.

The test results of RM-632 are re-used for certification of the RM-699. The table above indicates the results, which will be re-used.

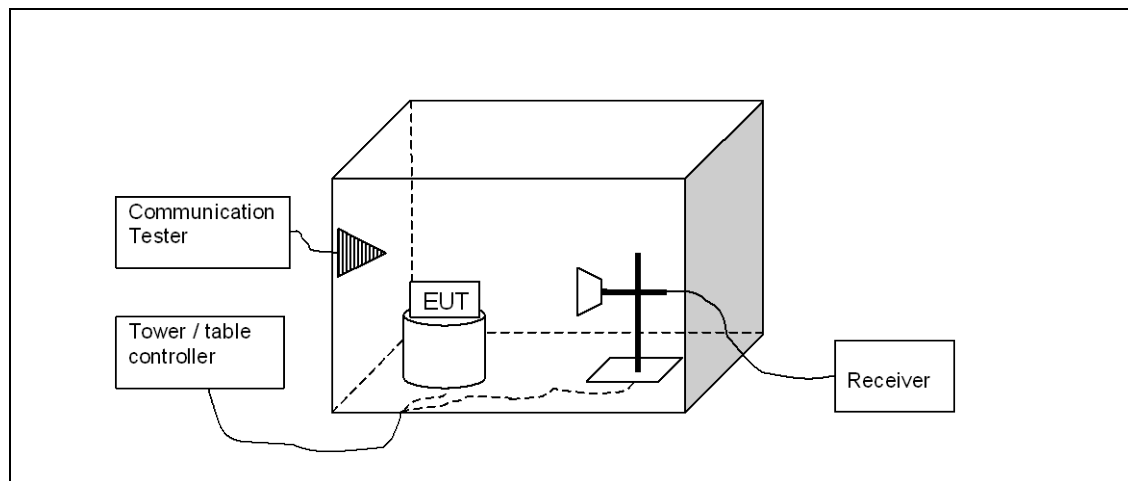
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2. Band edge compliance of RF emissions (FCC §15.247(d), RSS-210 A8.5)

EUT with DUT number	RM-632, DUT 51629
Accessories with DUT numbers	BL-4D, DUT 51399 ; AC-8E, DUT 51633 ; WH-102, DUT 51587
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 34 / 101.6
Date of measurements	14-Apr-2010
Measured by	Yin Hongpeng

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.

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

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

2.3. Bluetooth Test results

2.3.1 GFSK modulation, PRBS packet type

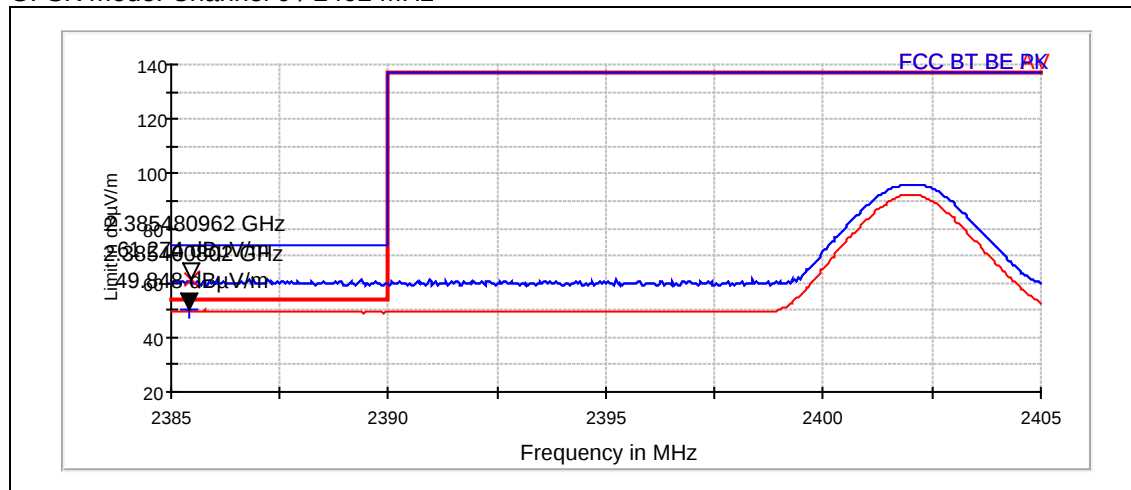
Average (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Result
0 / 2402	49.85	310.744	46.65	3.2	PASSED
Hopping on, low end	51.24	364.623	48.04	3.2	PASSED
78 / 2480	51.23	364.268	47.56	3.67	PASSED
Hopping on, high end	52.53	423.378	48.86	3.67	PASSED

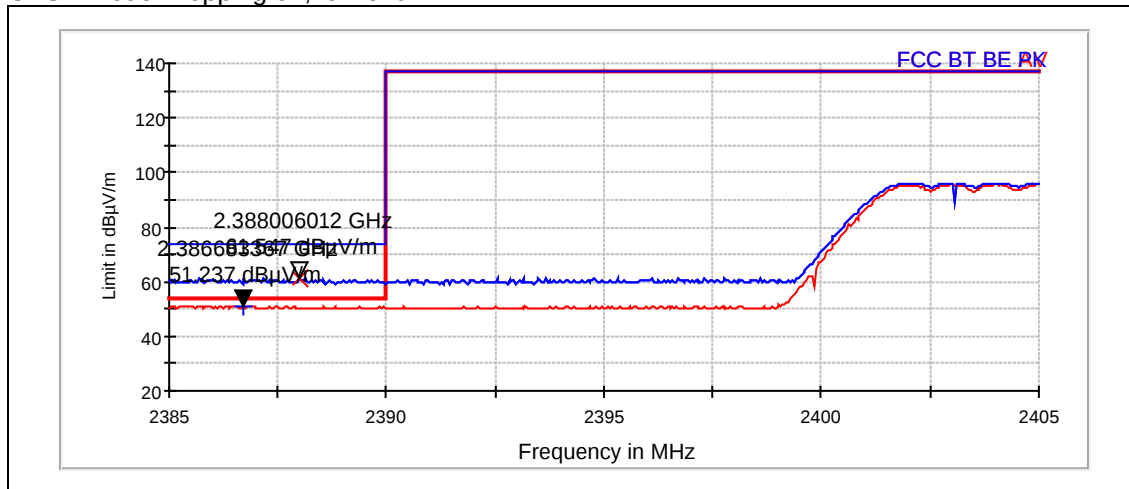
Peak (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Result
0 / 2402	61.27	1157.977	58.07	3.2	PASSED
Hopping on, low end	61.55	1195.016	58.35	3.2	PASSED
78 / 2480	63.2	1445.591	59.53	3.67	PASSED
Hopping on, high end	62.69	1362.26	59.02	3.67	PASSED

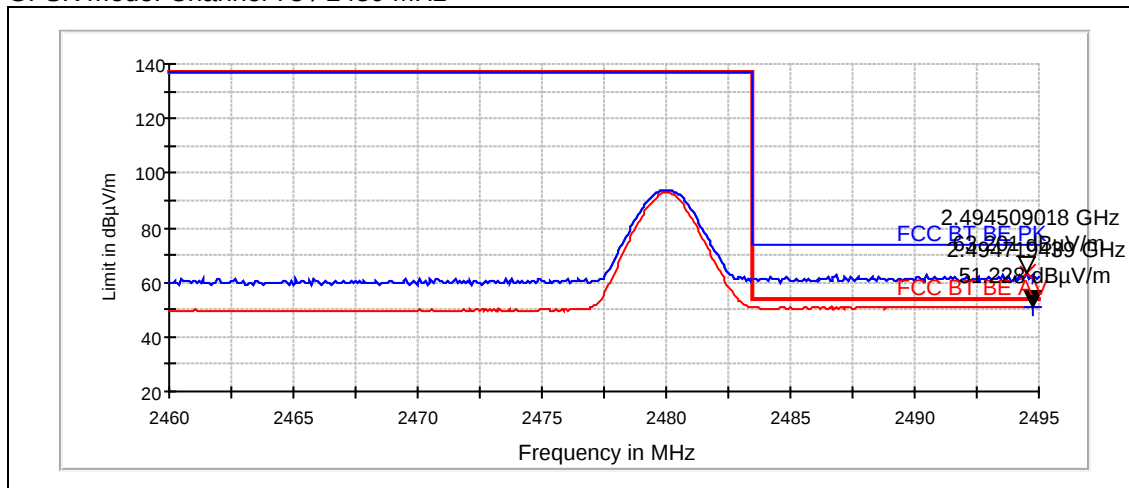
GFSK mode. Channel 0 / 2402 MHz



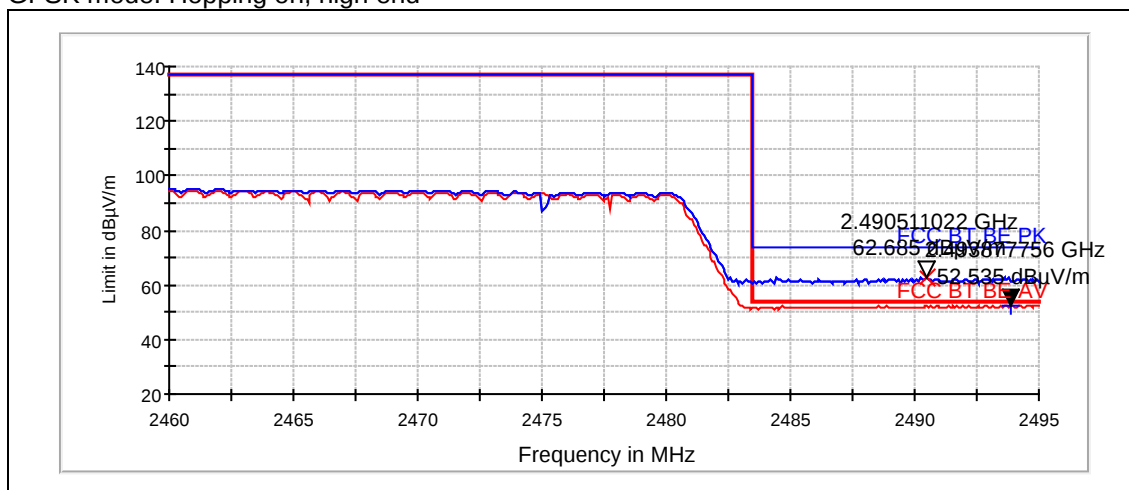
GFSK mode. Hopping on, low end



GFSK mode. Channel 78 / 2480 MHz



GFSK mode. Hopping on, high end



2.3.2 8DPSK modulation, PRBS packet type

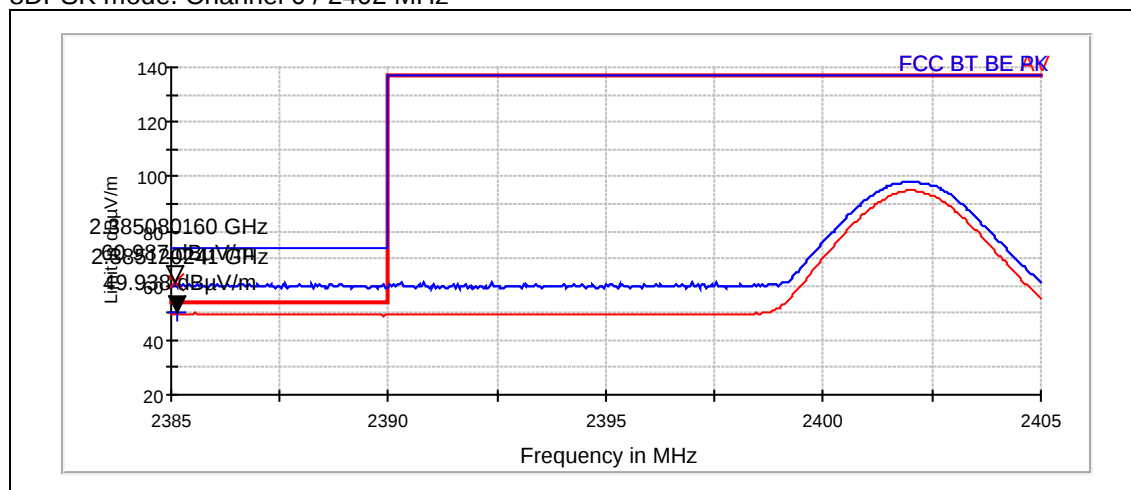
Average (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Result
0 / 2402	49.94	313.992	46.74	3.2	PASSED
Hopping on, low end	51.04	356.318	47.84	3.2	PASSED
78 / 2480	51.4	371.611	47.73	3.67	PASSED
Hopping on, high end	52.59	425.86	48.92	3.67	PASSED

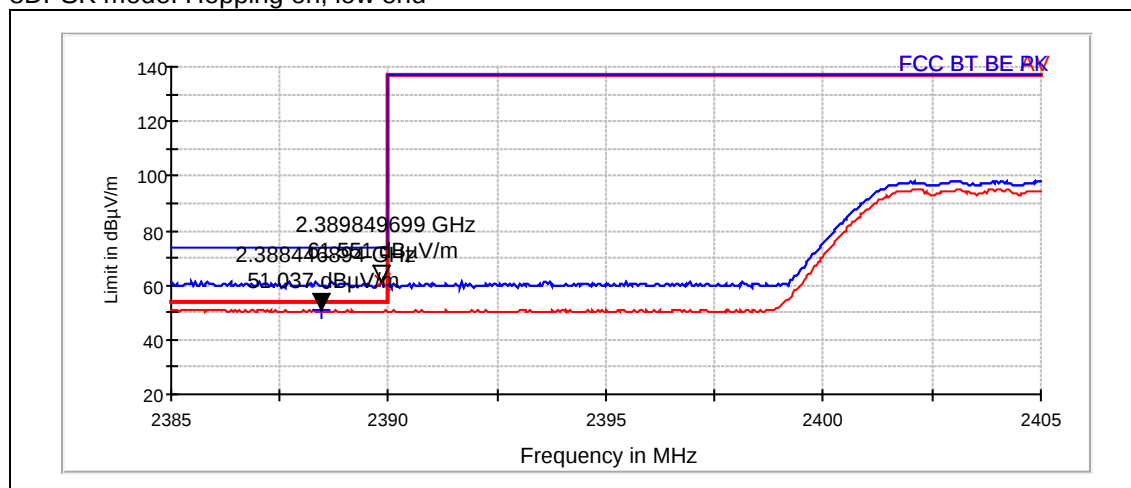
Peak (RBW: 1 MHz, VBW: 1 MHz)

Channel / f_c [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Result
0 / 2402	60.99	1120.36	57.79	3.2	PASSED
Hopping on, low end	61.55	1195.463	58.35	3.2	PASSED
78 / 2480	62.72	1367.318	59.05	3.67	PASSED
Hopping on, high end	62.74	1371.169	59.07	3.67	PASSED

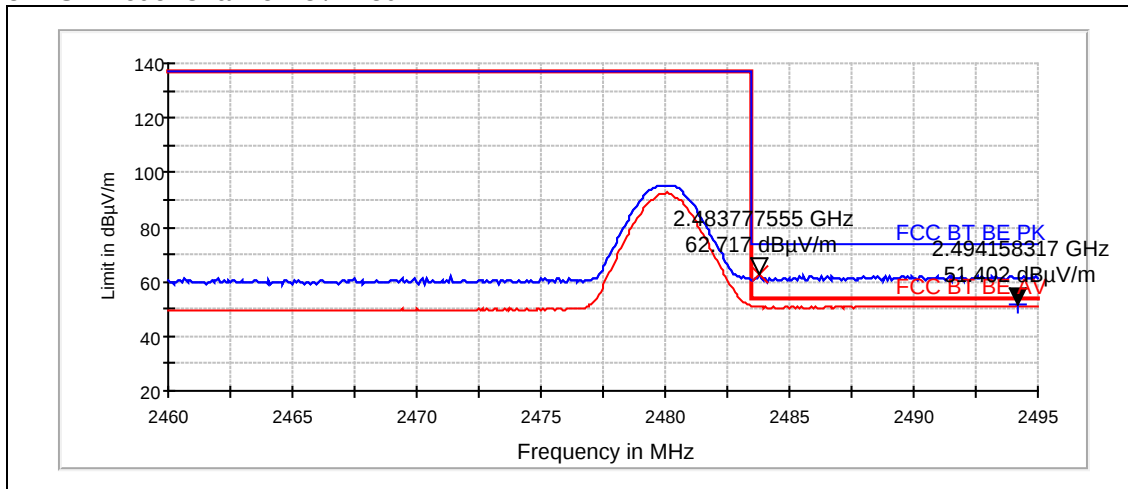
8DPSK mode. Channel 0 / 2402 MHz



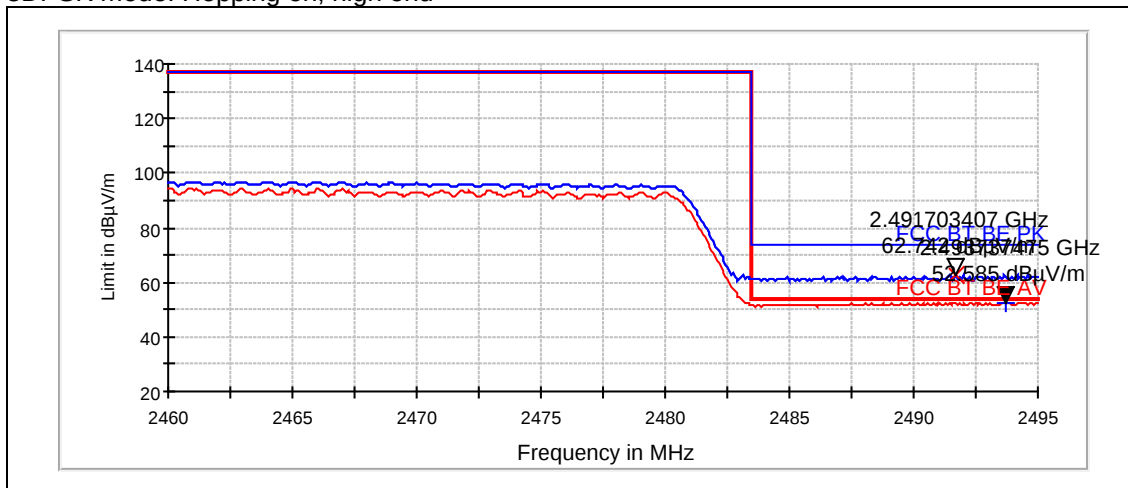
8DPSK mode. Hopping on, low end



8DPSK mode. Channel 78 / 2480 MHz



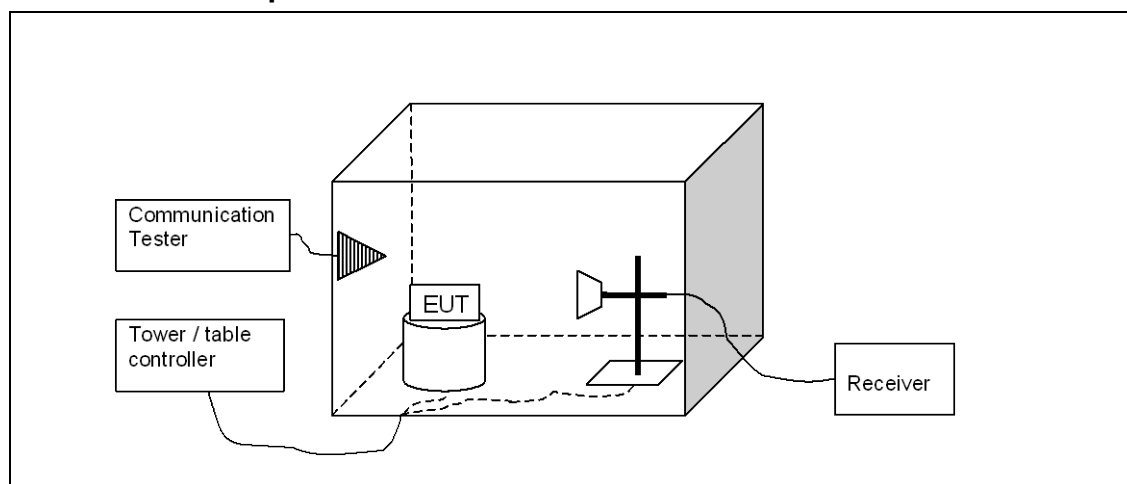
8DPSK mode. Hopping on, high end



3. Spurious radiated emissions (FCC §22.917(a), §24.238(a), §2.1053, RSS-132 4.5, RSS-133 6.5)

EUT with DUT number	RM-632, DUT 51629
Accessories with DUT numbers	BL-4D, DUT 51399 ; AC-8E, DUT 51633 ; WH-102, DUT 51587
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 34 / 101.6
Date of measurements	14-Apr-2010
Measured by	Jia Dongsheng

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

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

Frequency range [MHz]	Limit [$\mu V/m$]	Limit [dB $\mu V/m$]	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

3.3. Bluetooth Test results

3.3.1 GFSK modulation, PRBS packet type

Channel 0 / 2402 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4802.7	29.17	28.728	29.18	-0.01	HORIZONTAL	PASSED
7204.3	32.34	41.4	28.07	4.27	HORIZONTAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4802.7	41.71	121.815	41.72	-0.01	HORIZONTAL	PASSED
7204.3	45.6	190.458	41.33	4.27	HORIZONTAL	PASSED

Channel 40 / 2442 MHz

Quasi peak (RBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
36.953	26.9	22.123	35.32	-8.42	VERTICAL	PASSED
37.095	19.37	9.304	27.9	-8.53	VERTICAL	PASSED
37.104	19.76	9.732	28.29	-8.53	VERTICAL	PASSED
37.114	18.37	8.29	26.91	-8.54	VERTICAL	PASSED
77.084	17.02	7.095	37.65	-20.63	HORIZONTAL	PASSED

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2809.721	39.64	95.929	29.5	10.14	VERTICAL	PASSED
2884.17	39.27	91.897	28.99	10.28	HORIZONTAL	PASSED
3922.845	28.25	25.837	29.14	-0.89	VERTICAL	PASSED
3926.352	28.14	25.521	29.07	-0.93	HORIZONTAL	PASSED
17963.024	46.21	204.291	26.71	19.5	VERTICAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2809.721	53.49	472.389	43.35	10.14	VERTICAL	PASSED
2884.17	52.54	423.643	42.26	10.28	HORIZONTAL	PASSED
3922.845	40.83	110.027	41.72	-0.89	VERTICAL	PASSED
3926.352	40.66	107.87	41.59	-0.93	HORIZONTAL	PASSED
17963.024	59.51	945.04	40.01	19.5	VERTICAL	PASSED

Channel 78 / 2480 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4961.6	30.58	33.818	30.16	0.42	VERTICAL	PASSED
7438.1	32.64	42.865	28.41	4.23	HORIZONTAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4961.6	43.77	154.277	43.35	0.42	VERTICAL	PASSED
7438.1	45.3	183.992	41.07	4.23	HORIZONTAL	PASSED

3.3.2 8DPSK modulation, PRBS packet type

Channel 0 / 2402 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4803.8	29.09	28.487	29.16	-0.07	VERTICAL	PASSED
7204.3	32.33	41.362	28.06	4.27	HORIZONTAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4803.8	42.05	126.59	42.12	-0.07	VERTICAL	PASSED
7204.3	45.33	184.735	41.06	4.27	HORIZONTAL	PASSED

Channel 40 / 2442 MHz

Quasi peak (RBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
75.219	28.35	26.152	49.05	-20.7	VERTICAL	PASSED
77.505	30.29	32.696	50.91	-20.62	VERTICAL	PASSED
77.557	14.73	5.448	35.35	-20.62	VERTICAL	PASSED
77.653	15.4	5.885	36.01	-20.61	VERTICAL	PASSED
78.275	29.73	30.658	50.32	-20.59	VERTICAL	PASSED

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2797.555	39.78	97.51	29.83	9.95	HORIZONTAL	PASSED
2813.829	40.07	100.821	29.54	10.53	HORIZONTAL	PASSED
3902.404	28.78	27.469	29.39	-0.61	HORIZONTAL	PASSED
3929.963	28.24	25.811	29.2	-0.96	VERTICAL	PASSED
17986.772	46.15	203.072	26.65	19.5	HORIZONTAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2797.555	52.48	420.485	42.53	9.95	HORIZONTAL	PASSED
2813.829	53.33	463.714	42.8	10.53	HORIZONTAL	PASSED
3902.404	41.92	124.724	42.53	-0.61	HORIZONTAL	PASSED
3929.963	40.9	110.879	41.86	-0.96	VERTICAL	PASSED
17986.772	59.9	988.781	40.4	19.5	HORIZONTAL	PASSED

Channel 78 / 2480 MHz

Average(RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.9	30.58	33.791	30.16	0.42	HORIZONTAL	PASSED
7440.8	32.56	42.462	28.46	4.1	HORIZONTAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.9	43.21	144.71	42.79	0.42	HORIZONTAL	PASSED
7440.8	45.56	189.714	41.46	4.1	HORIZONTAL	PASSED

4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
BJPCHW0020	DC Power supply	Hp6632B	HP	22/24/27, 15C
BJPCPT0040	Receiver	ESCS30	R&S	15C, 15B
BJPCPT0069	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
BJPCPT0073	Signal Generator	SMR 20	R&S	22/24/27, 15C, 15B
BJPCPT0079	LISN 50 μ H	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	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

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	BT / WLAN Antenna	SPA 2400/75/9/0/V	Huber-Suhner	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	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-	Wainwright	24, 15B
BJPCPT0154	Band Reject Filter	WRCT2402/2480-	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-	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-	Wainwright	24, 15B
BJPCTC0065	Band Reject Filter	WRCG832/838-	Wainwright	27, 15B
BJPCTC0071	Multi-Device Controller	2090	EMCO	22/24/27, 15C, 15B
BJPCTC0072	Anechoic Chamber	3 m Semi / Full	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-	Miteq	22/24/27, 15C, 15B