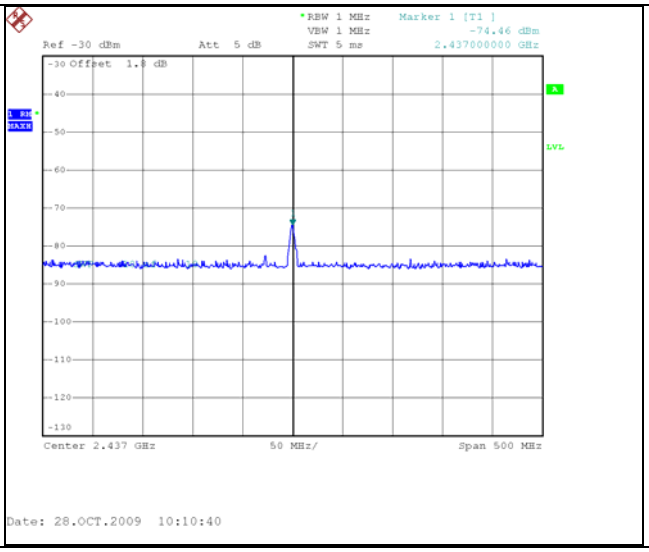
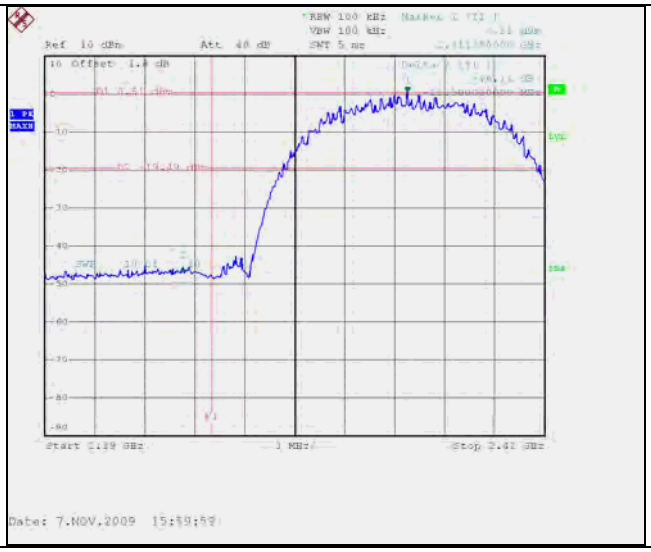
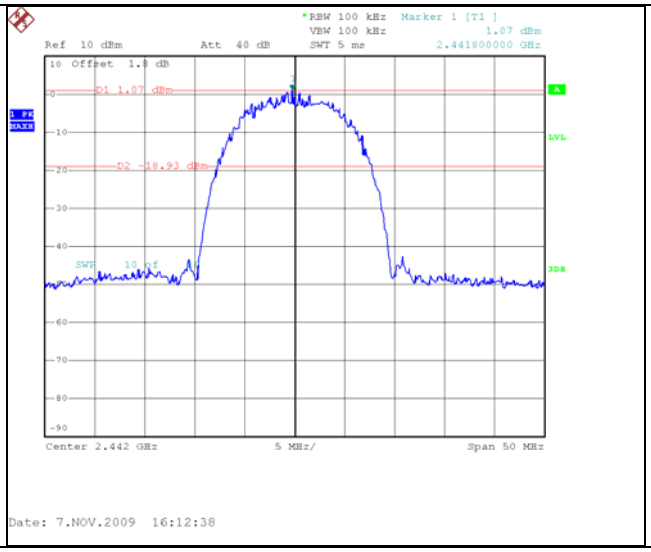
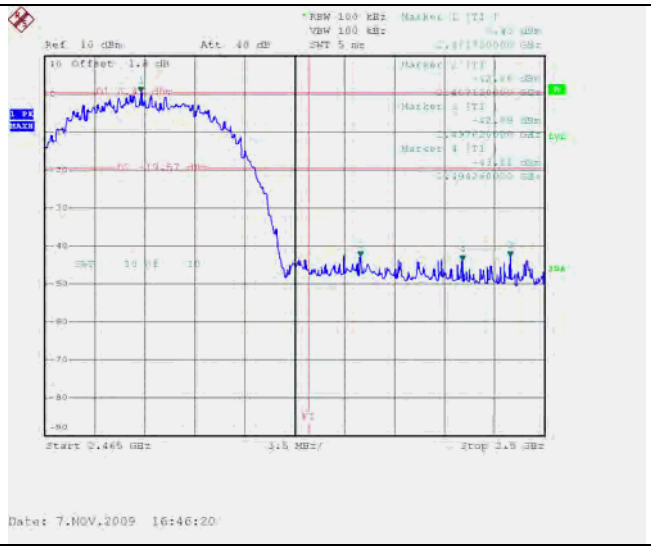
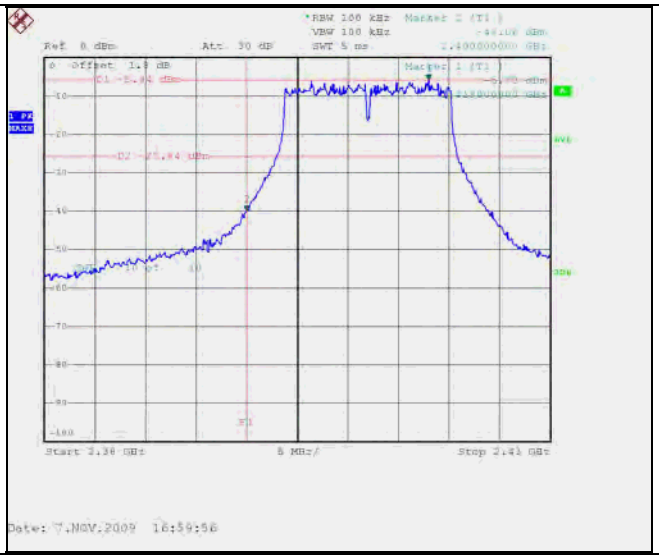
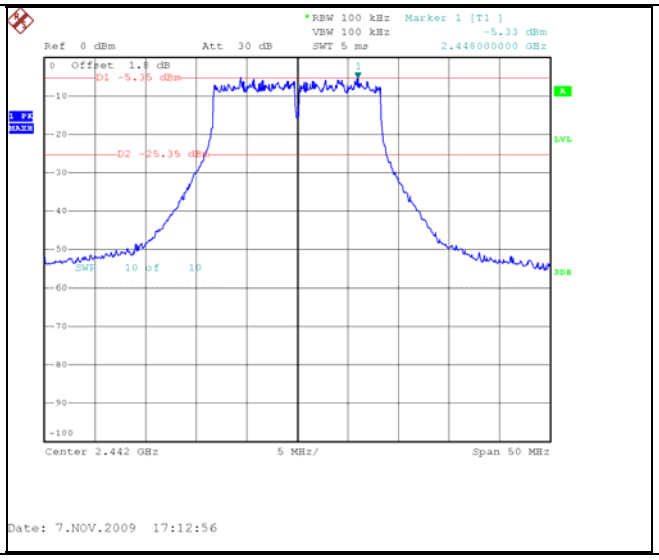
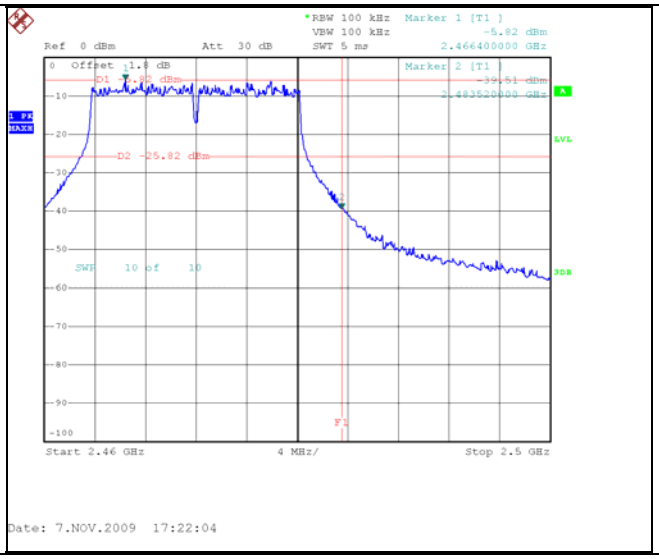
Plots of Conducted Emission

Frequency	Receive Mode / worst case	
1.600 GHz -74.46 dBm		

Plots of 100 kHz Bandwidth of Frequency Band Edges

Frequency	802.11b
2412 MHz « 20dBc	
2442 MHz N/A	
2472 MHz « 20dBc	

Frequency	802.11g	
2412 MHz « 20dBc		
2442 MHz N/A		
2472 MHz « 20dBc		

7.2.4 Radiated Emission

EUT	:	mbook bz
Test Standard	:	FCC Part15 Subpart C Section 15.247(c), 15.209 RSS-210 Annex 8.5
Test Date	:	October 28, 2009
Operating Condition	:	Wireless LAN. The EUT was operated at transmitting condition continuously during the test.
Environment Condition	:	19 °C/ 43 %
Result	:	Passed

Radiated Emission Test Data(below 1 GHz)

Frequency [MHz]	Reading [dBμV]	Polarization [*H/**V]	Ant.Factor [dB/m]	Cable Loss [dB]	Limit [dBμV/m]	Emission Level [dBμV/m]	Margin [dB]
54.26	20.48	V	12.21	1.66	40.00	34.36	5.64
129.89	19.07	V	12.31	1.42	43.50	32.80	10.70
141.98	18.07	V	13.01	2.62	46.00	33.70	12.30
560.21	18.63	H	18.88	5.39	46.00	42.90	3.10
640.00	16.69	H	20.27	5.81	46.00	42.78	3.22
599.84	17.49	H	19.89	5.58	46.00	42.96	3.04

Radiated Emission Test Data (above 1 GHz)

Frequency [MHz]	Reading [dBμV]	Pre-Amp Gain [dB]	Ant.Factor [dB/m]	Cable Loss [dB]	Limit [dBμV/m]	Emission Level [dBμV/m]	Margin [dB]
Low Channel (2412 MHz)							
5024.00	34.96	30.00	31.71	13.01	53.98	49.68	4.30
Middle Channel (2442 MHz)							
4884.21	34.91	30.00	31.71	13.01	53.98	49.63	4.35
High Channel (2472 MHz)							
4944.00	33.32	30.00	31.71	13.02	53.98	48.05	5.93

Radiated Restricted Band Edge Test Data

Frequency [MHz]	Reading [dBuV]	Pre-Amp Gain[dB]	Ant Factor [dB/m]	Cable Loss [dB]	Limit [dBuV/m]	Emission Level [dBuV/m]	Margin [dB]	Detect
Low Channel(2412MHz)								
2342.85	29.59	30.00	26.29	11.12	74	37.06	36.94	PK
2342.85	20.78	30.00	26.29	11.12	54	29.28	25.77	AV
2335.70	30.50	30.00	26.29	11.13	74	37.94	36.06	PK
2335.70	21.21	30.00	26.29	11.13	54	28.61	25.39	AV
High Channel(2472MHz)43.15								
2496.48	33.71	30.00	26.29	11.14	74	41.12	32.88	PK
2496.48	21.15	30.00	26.29	11.14	54	28.61	25.39	AV
2494.12	35.74	30.00	26.29	11.14	74	43.15	30.85	PK
2494.12	22.10	30.00	26.29	11.14	54	29.50	24.50	AV

NOTES:

1. All modes of operation were investigated and the worst-case emissions are reported.
2. This test being a result which used RF amplifier.
3. AF = Antenna Factor CL = Cable Loss F/S = Field Strength
4. POL H = Horizontal POL V = Vertical

7.2.5 Power Spectral Density

EUT	:	mbook bz
Test Standard	:	FCC Part15 Subpart C Section 15.247(e) RSS-210 Annex 8.2 (b)
Test Date	:	November 7, 2009
Operating Condition	:	Wireless LAN. The EUT was operated at transmitting condition continuously during the test.
Environment Condition	:	25 °C/ 41 %
Result	:	Passed

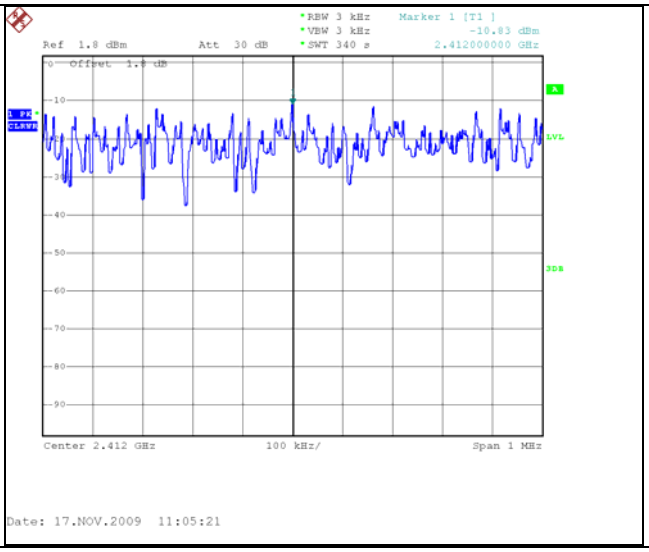
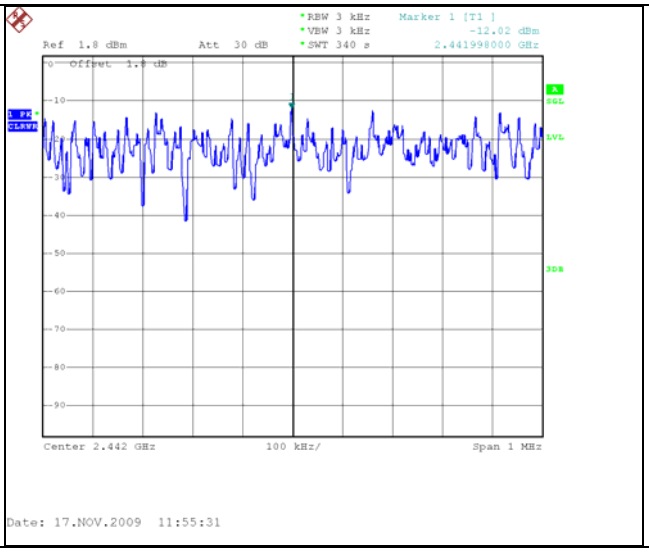
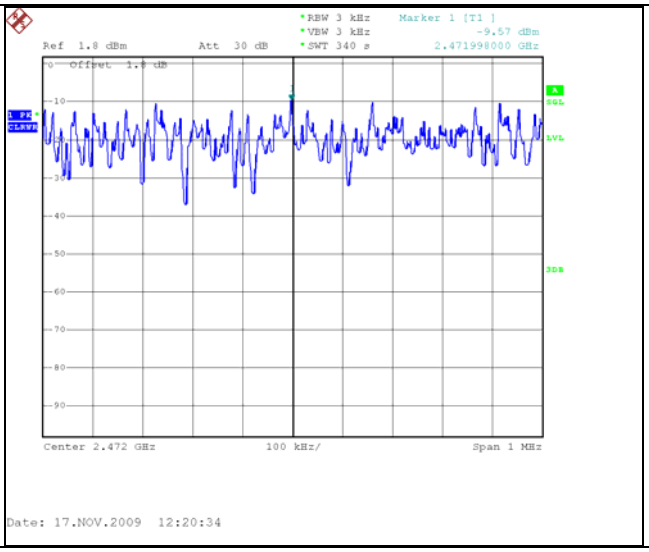
Power Spectral Density Test Data

Mode	Frequency (MHz)	Power Spectral Density (dBm)	Limit
802.11b	2412	-10.83	8 dBm
	2442	-12.02	
	2472	-9.57	
802.11g	2412	-18.63	
	2442	-19.36	
	2472	-16.82	

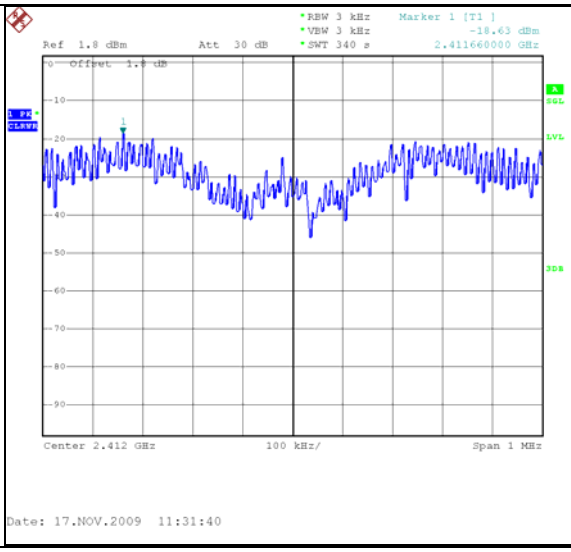
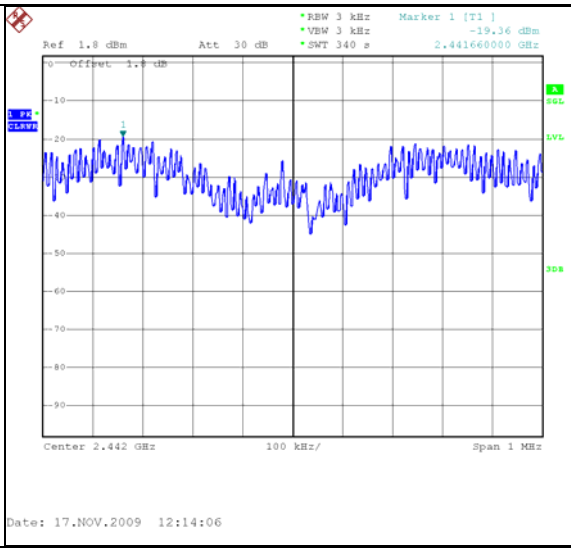
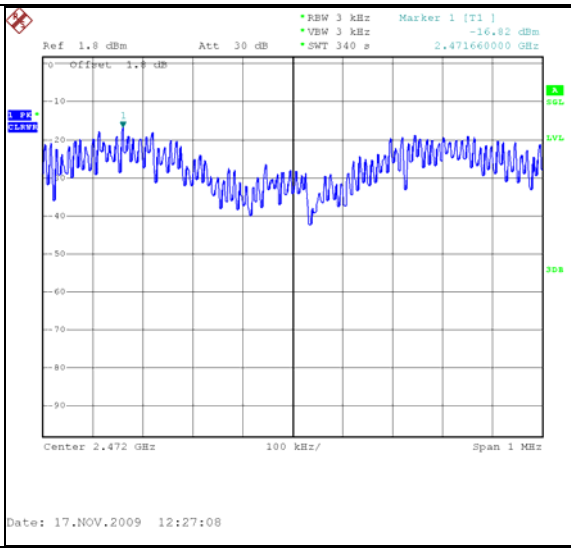
NOTES:

1. Measure conducted Maximum Peak Output of relevant channel using Spectrum analyzer.
2. RBW 3kHz, VBW 3kHz

Plots of Power Spectral Density (802.11b)

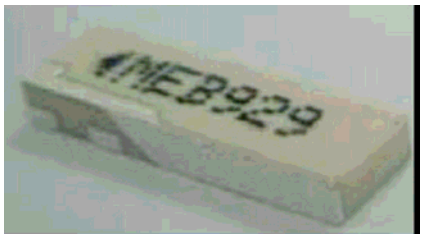
Frequency	Power Spectral Density measured conducted of 802.11b	
2412 MHz -10.83 dBm		
2442 MHz -12.02 dBm		
2472 MHz -9.57 dBm		

Plots of Power Spectral Density (802.11g)

Frequency	Power Spectral Density measured conducted of 802.11g	
2412 MHz -18.63 dBm		
2442 MHz -19.36 dBm		
2472 MHz -16.82 dBm		

7.2.6 Antenna Requirement

Products	Dielectric Chip Antenna
Manufacturer	Patron
Model	ACS2450ICAMEB
Frequency Range [MHz]	2400~2485
Polarization	Linear
Max Gain	-0.9 dBi



Structure

7.3 Bluetooth

7.3.1 Channel Separation

EUT	:	mbook bz
Test Standard	:	FCC Part15 Subpart C Section 15.247(a)(1) RSS-210 Annex 8.1 (a)
Test Date	:	November 10, 2009
Operating Condition	:	Bluetooth The EUT was operated at transmitting condition continuously during the test.
Environment Condition	:	24 °C/ 43 %
Result	:	Passed

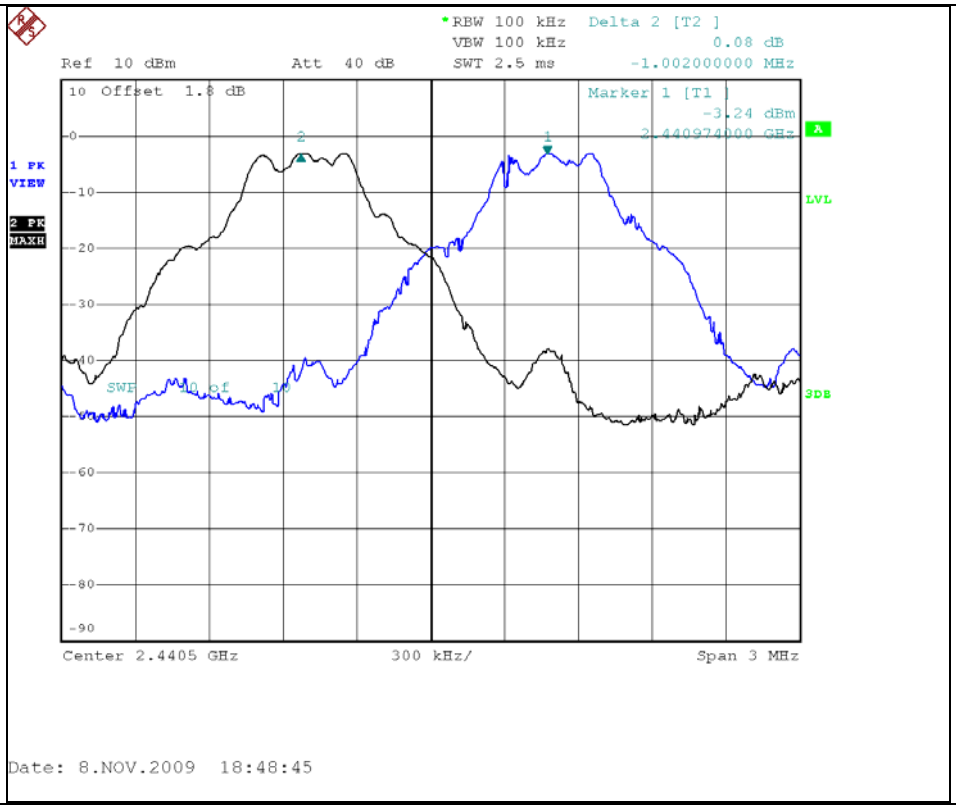
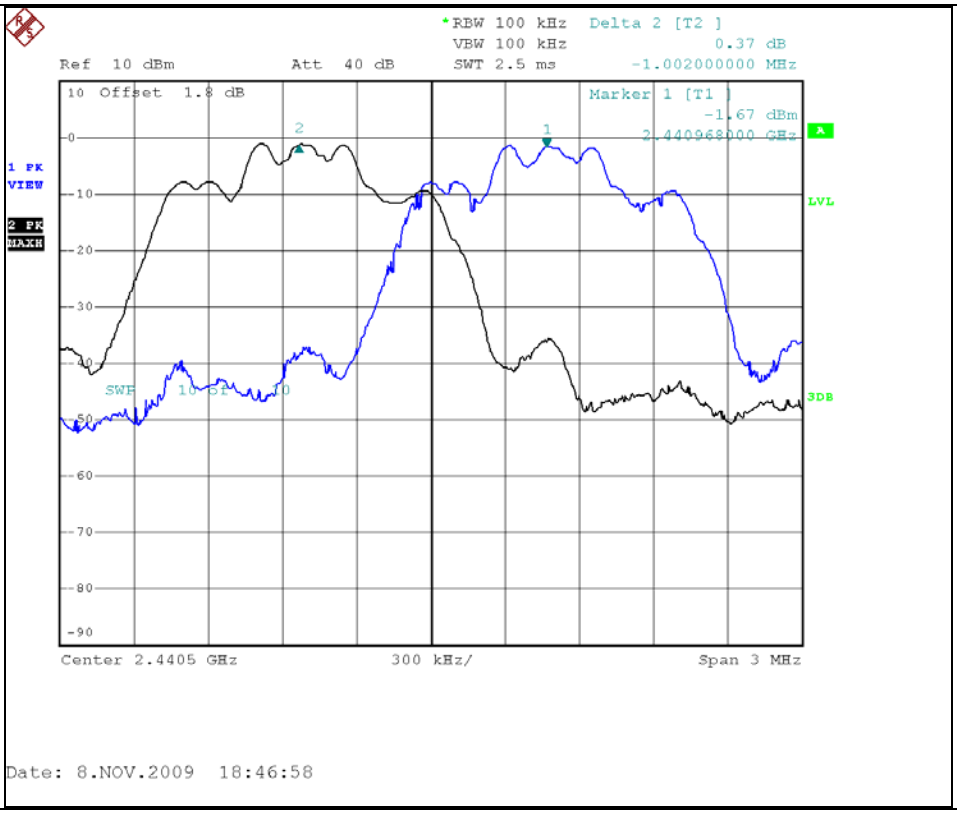
Channel Separation Test Data

Mode	Channel Separation	Limit
Basic	1 MHz	N/A
EDR	1 MHz	

NOTES:

1. Measure conducted channel sepzration of relevant channel using Spectrum Analyzer.
2. RBW 100kHz, VBW 100kHz, Sweep Time 2.5mS.
3. Compare with two channels.

Plots of Channel Separation

Mode	Channel Separation
Basic	
EDR	

7.3.2 20 dB Bandwidth

EUT	:	mbook bz
Test Standard	:	FCC Part15 Subpart C Section 15.247(a)(1) RSS-210 Annex 8.1 (a)
Test Date	:	November 10, 2009
Operating Condition	:	Bluetooth The EUT was operated at transmitting condition continuously during the test.
Environment Condition	:	24 °C/ 43 %
Result	:	Passed

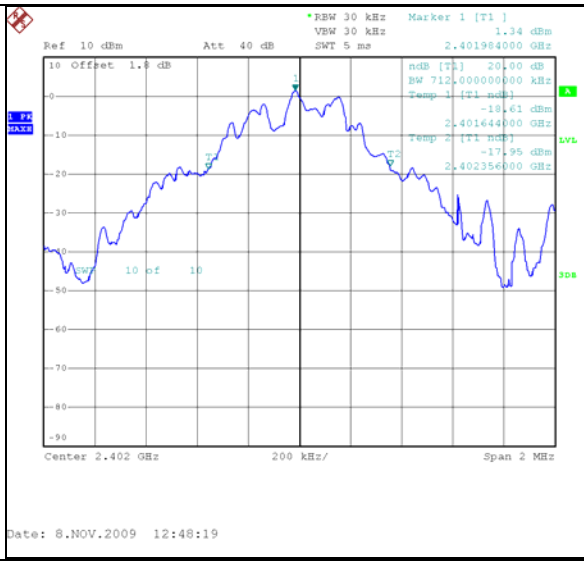
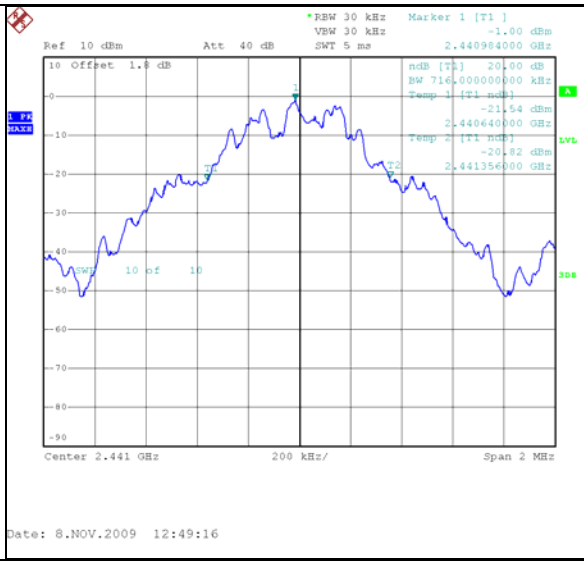
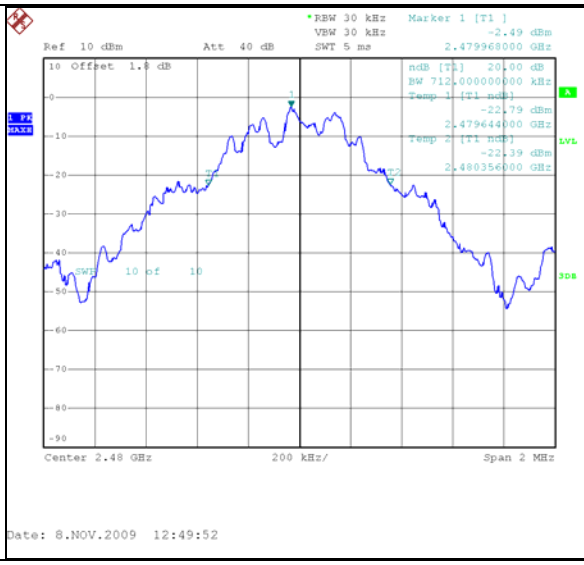
20 dB Bandwidth Test Data

Frequency (MHz)	20 dB Bandwidth (kHz)		Limit
2402	Basic (GFSK)	712	N/A
	EDR (8PSK)	1 108	
2441	Basic (GFSK)	716	
	EDR (8PSK)	1 112	
2480	Basic (GFSK)	712	
	EDR (8PSK)	1 120	

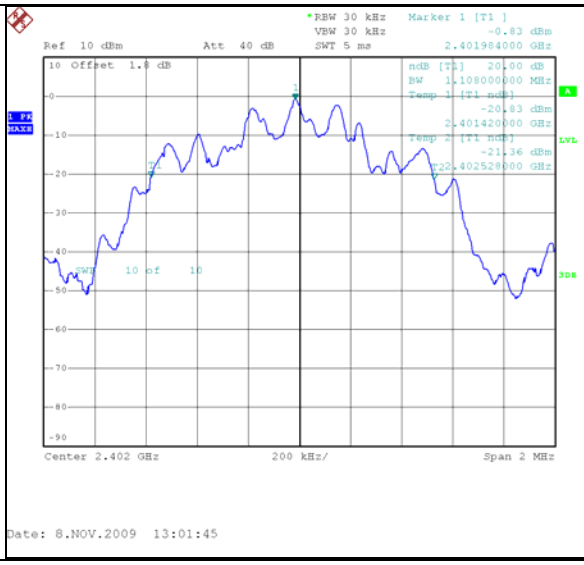
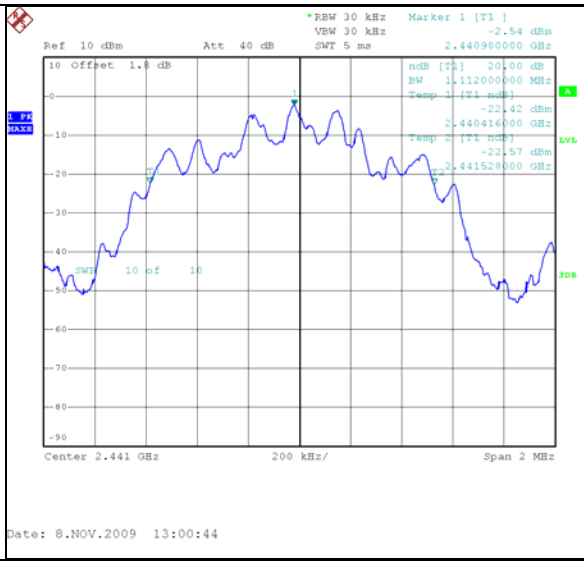
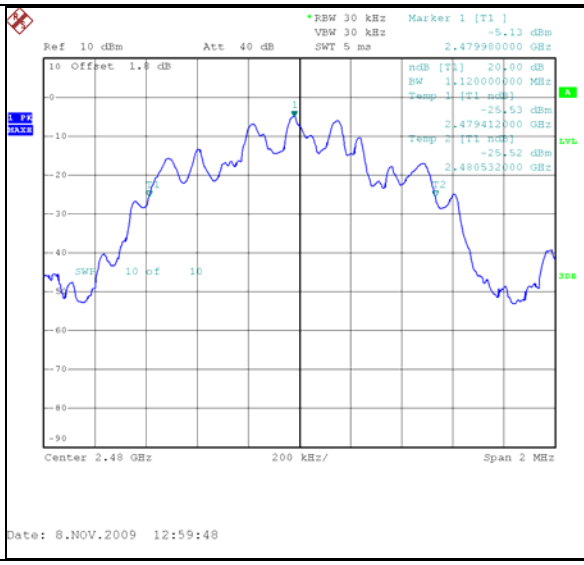
NOTES:

4. Measure conducted 20 dB bandwidth of relevant channel using Spectrum Analyzer.
5. RBW 30kHz, VBW 30kHz, Sweep Time 50mS.
6. 20 dB less than both bandwidth than maximum peak power.

Plots of 20 dB Bandwidth (Basic / GFSK)

Frequency	20 dB Bandwidth (Basic / GFSK)	
2402 MHz 712 kHz		
2441 MHz 716 kHz		
2480 MHz 712 kHz		

Plots of 20 dB Bandwidth (EDR / 16PSK)

Frequency	20 dB Bandwidth (EDR / 16PSK)	
2402 MHz 1 108 kHz		
2441 MHz 1 112 kHz		
2480 MHz 1 120 kHz		

7.3.3 Average time of occupancy

EUT	:	mbook bz
Test Standard	:	FCC Part15 Subpart C Section 15.247(a)(1) RSS-210 Annex 8.1 (d)
Test Date	:	November 6, 2009
Operating Condition	:	Bluetooth The EUT was operated in normal operation.
Environment Condition	:	24 °C/ 43 %
Result	:	Passed

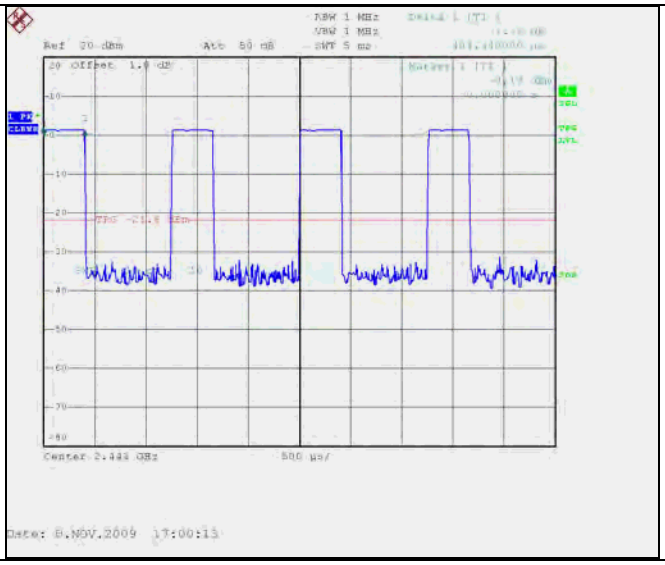
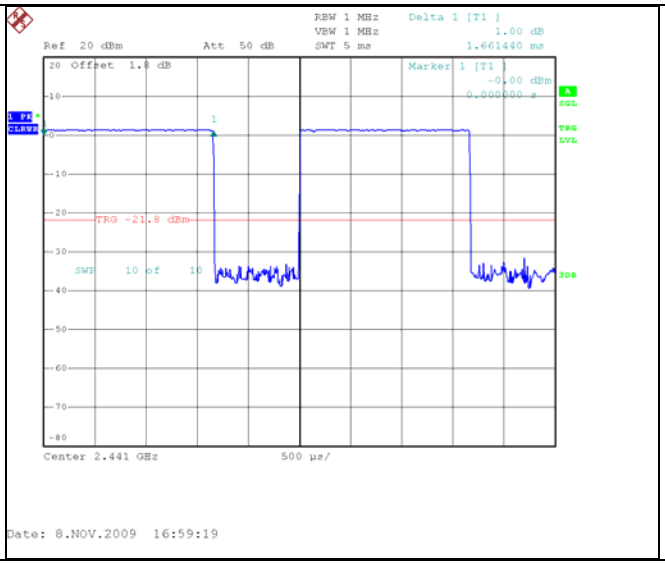
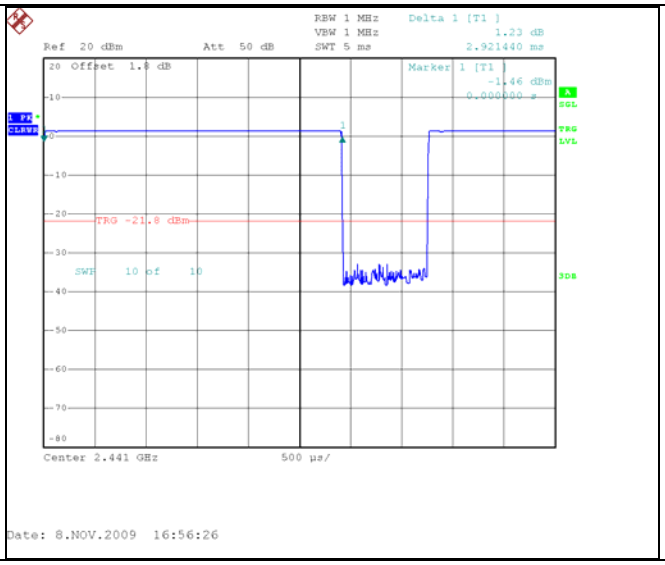
Average time of occupancy Test Data

Mode	Packet Type	Slot	Duration Time	Occupancy Time	Limit
Basic (GFSK)	DH1	1	0.401	42.77	400 ms
	DH3	3	1.661	177.17	
	DH5	5	2.921	311.57	
EDR (8PSK)	DH1	1	0.421	44.91	
	DH3	3	1.671	178.24	
	DH5	5	2.921	311.57	

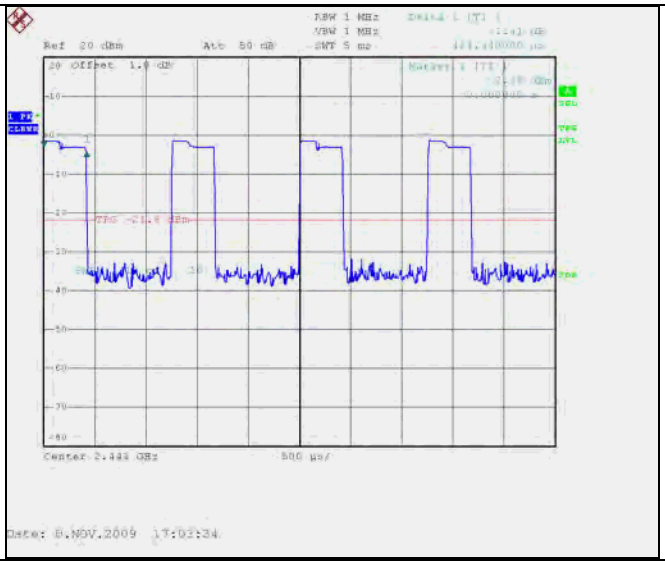
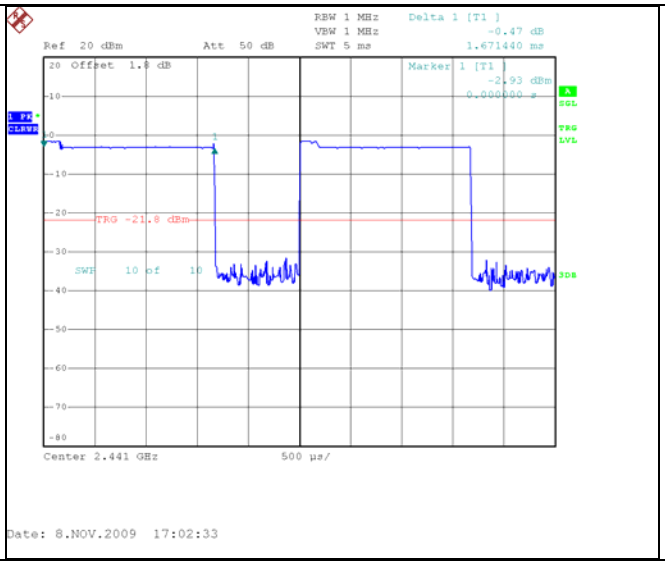
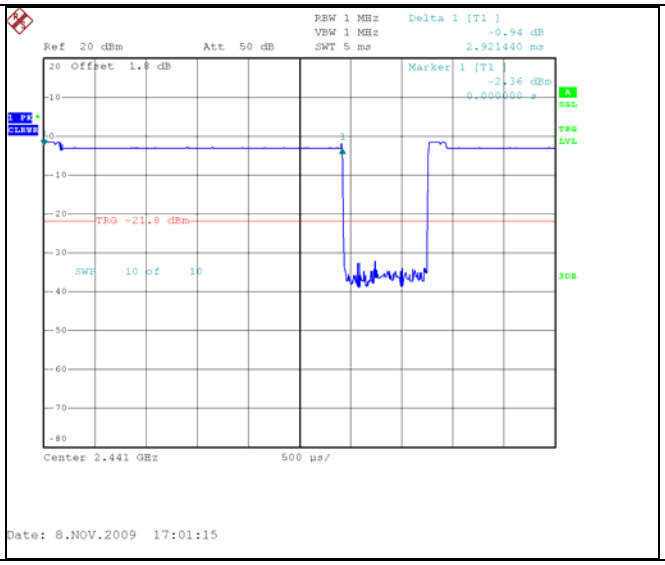
NOTES:

1. According to Section 15.247(a)(1)(iii) the average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.
2. The time period to be observed is “0.4 s x 79 = 31.6 seconds”.
3. According to the Bluetooth specification the system transmits at a rate of 1600 hops per second. For DH5 packet five time slot is used for TX and one time slot for RX.
4. That means a total of (1600 / 6) transmissions occurs in one second. The average time of occupancy is calculated as following:
   “[{(1600 / 6) x 2.926 ms} x (0.4 x 79)] / 79 = 312.11 ms”

Plots of Duration Time (Basic / GFSK)

Frequency	Duration (Basic / GFSK)
DH1 0.401 ms	
DH3 1.661 ms	
DH5 2.821 ms	

Plots of Duration Time (EDR / 16PSK)

Frequency	Duration (EDR / 16PSK)
DH1 0.421 ms	
DH3 1.671 ms	
DH5 2.921 ms	

7.3.4 Maximum Peak Output Power

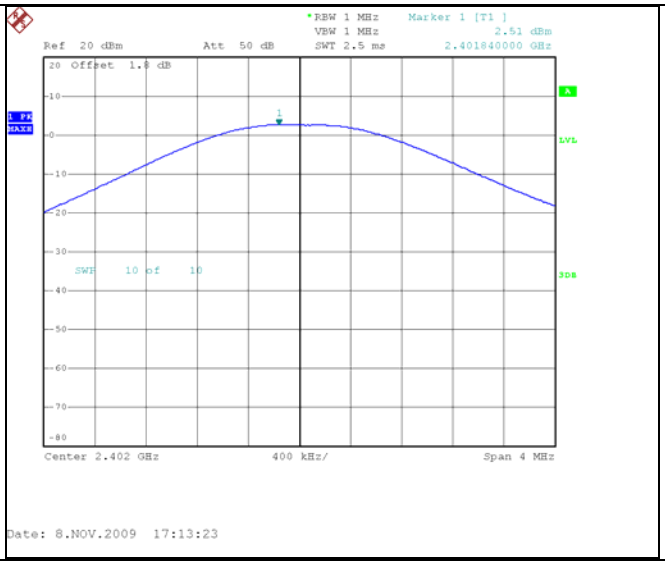
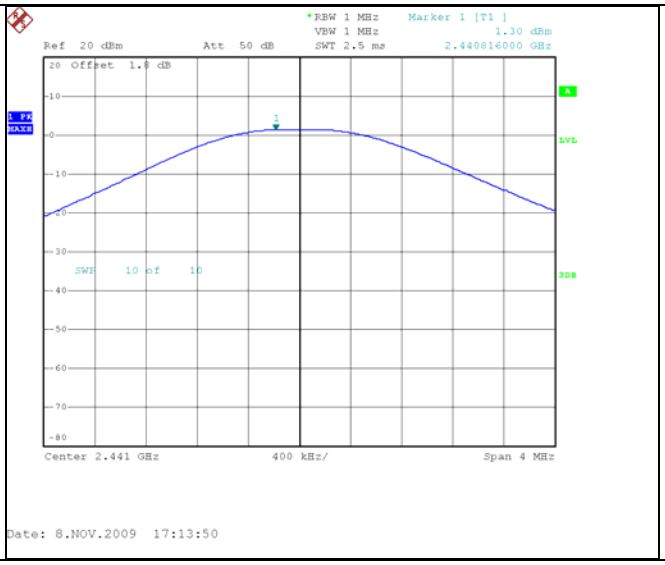
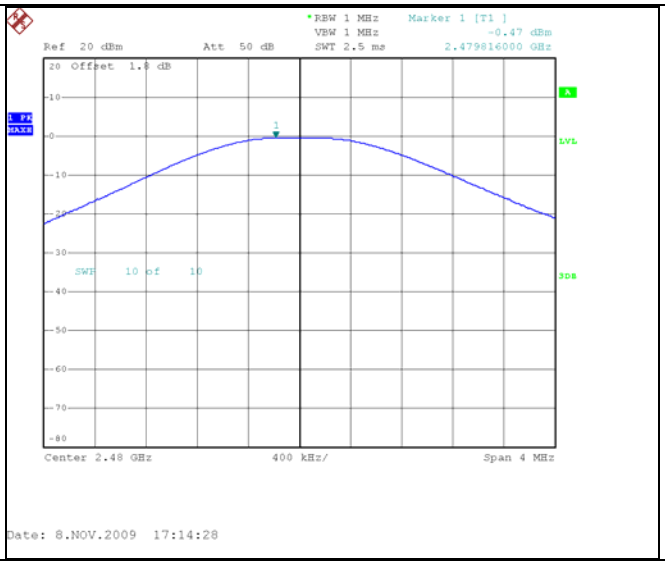
EUT	:	mbook bz
Test Standard	:	FCC Part15 Subpart C Section 15.247(b)(1) RSS-210 Annex 8.4 (2)
Test Date	:	November 10, 2009
Operating Condition	:	Bluetooth The EUT was operated at transmitting condition continuously during the test.
Environment Condition	:	24 °C/ 43 %
Result	:	Passed

Maximum Peak Output Power Test Data

Frequency (MHz)	Maximum Peak Output Power (dBm)	Limit
2402	2.51	Less than 125 mW
2440	1.30	
2480	-0.47	

NOTES:
1. Measure conducted Maximum Peak Output of relevant channel using Spectrum analyzer.

Plots of Maximum Peak Output Power

Frequency	Maximum Peak Output Power
2402 MHz 2.51 dBm	
2441 MHz 1.30 dBm	
2480 MHz -0.47 dBm	

7.3.5 Conducted Emission

& 100 kHz Bandwidth of Frequency Band Edges

EUT	:	mbook bz
Test Standard	:	FCC Part15 Subpart C Section 15.247(c) RSS-210 Annex 8.5
Test Date	:	November 6, 2009
Operating Condition	:	Bluetooth The EUT was operated at transmitting condition continuously during the test.
Environment Condition	:	24 °C/ 43 %
Result	:	Passed

7.3.4.1 Conducted Emission Test

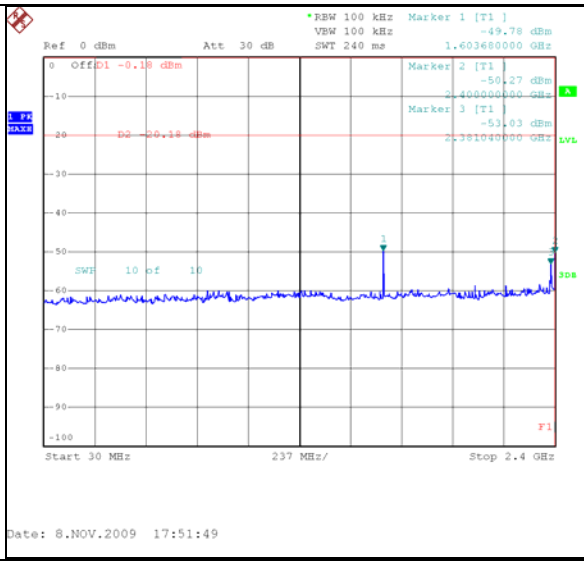
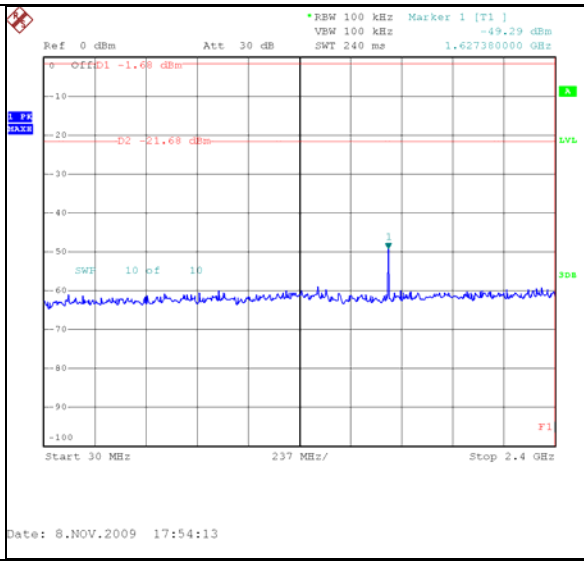
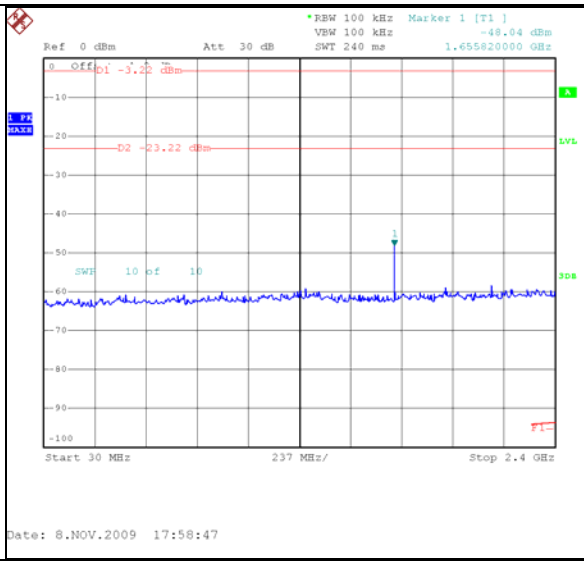
Result : Please refer to the attached Plots for details :

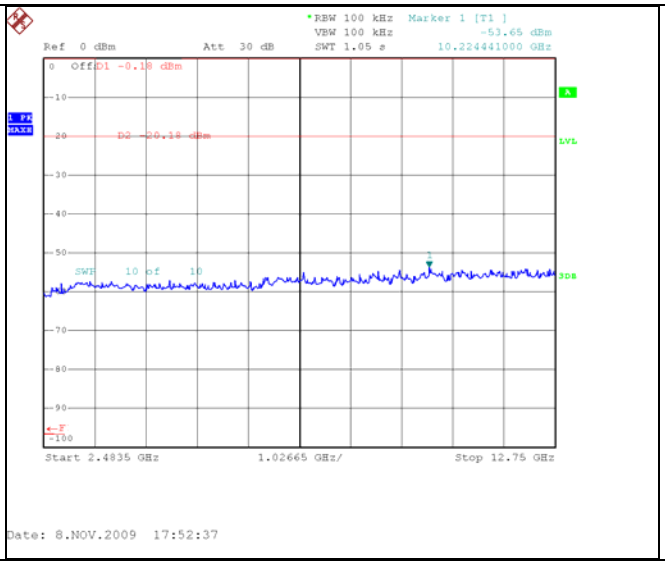
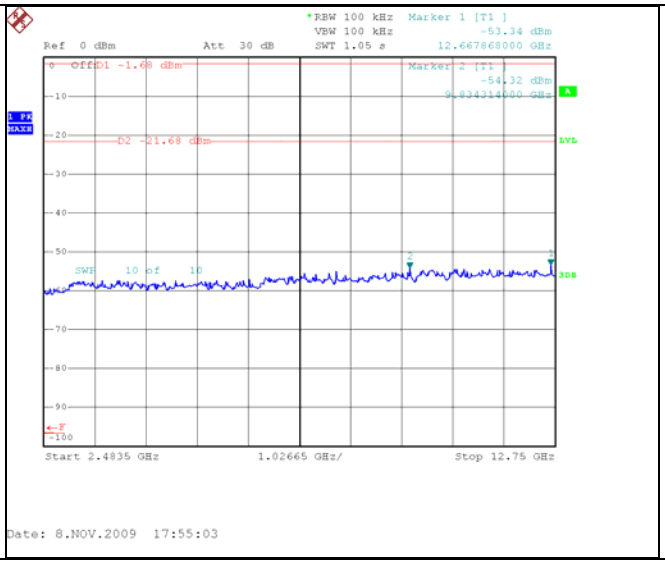
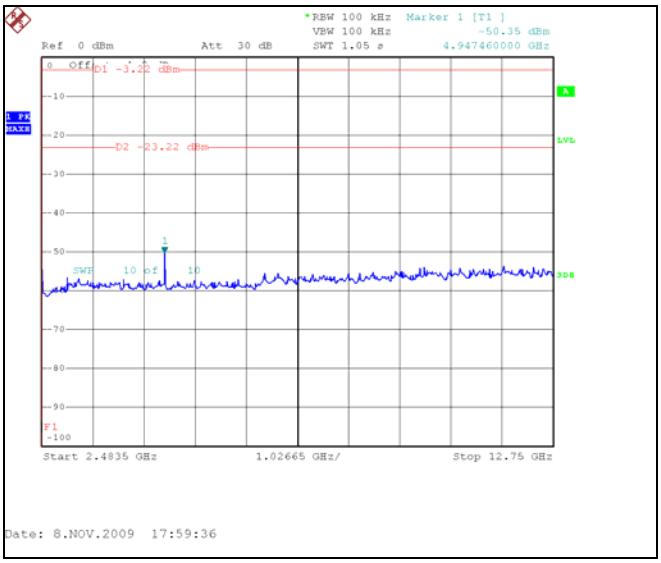
7.3.4.2 100 kHz Bandwidth of Frequency Band Edges

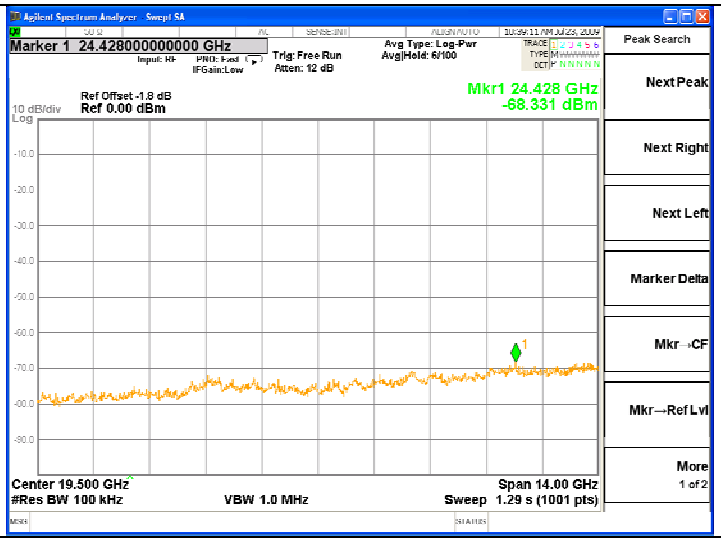
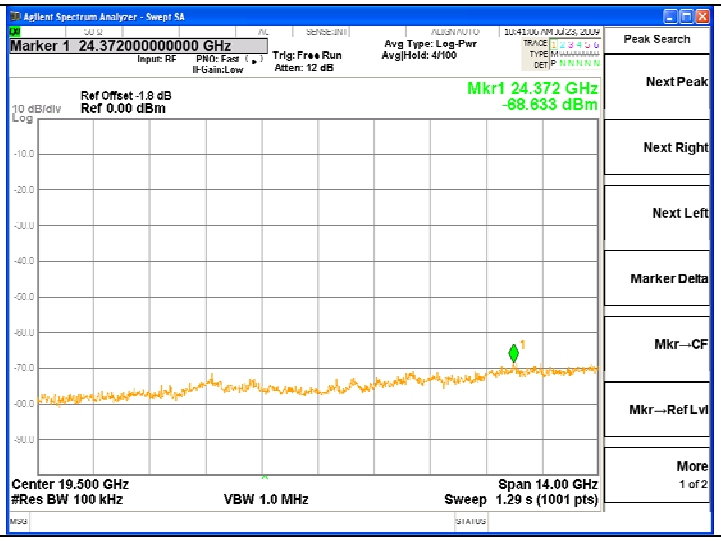
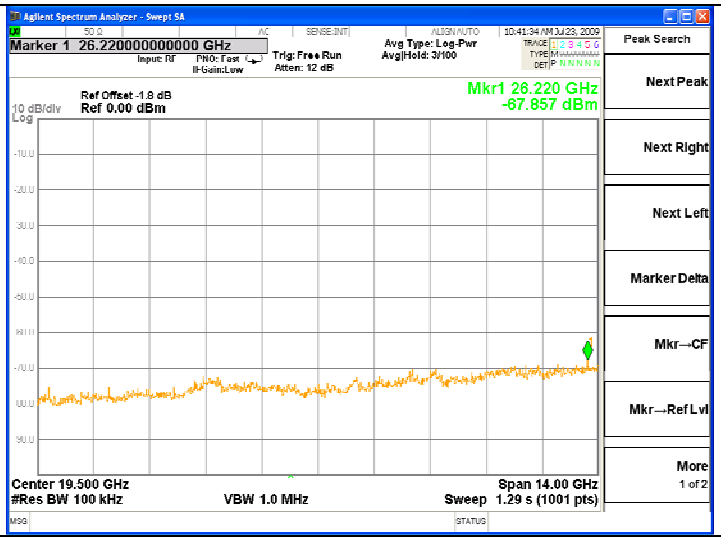
The test was performed to make a direct field strength measurement at the bandedge frequencies. Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209. There is a restricted band starting at 2483.5 MHz and another restricted band from 2310 - 2390 MHz.

All emissions below noise floor of 7 dBuV/m.

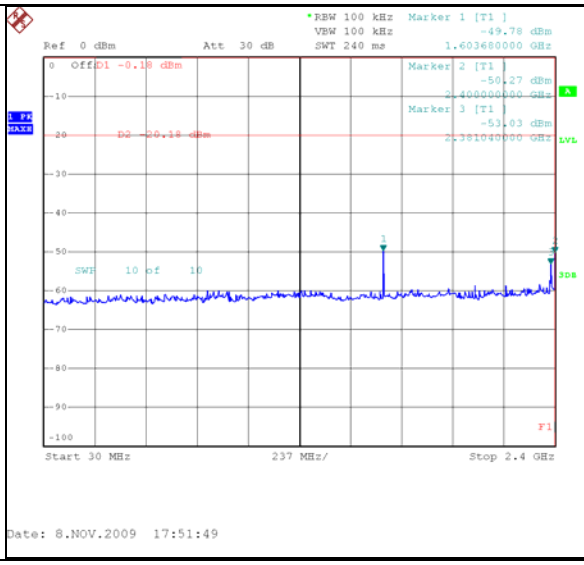
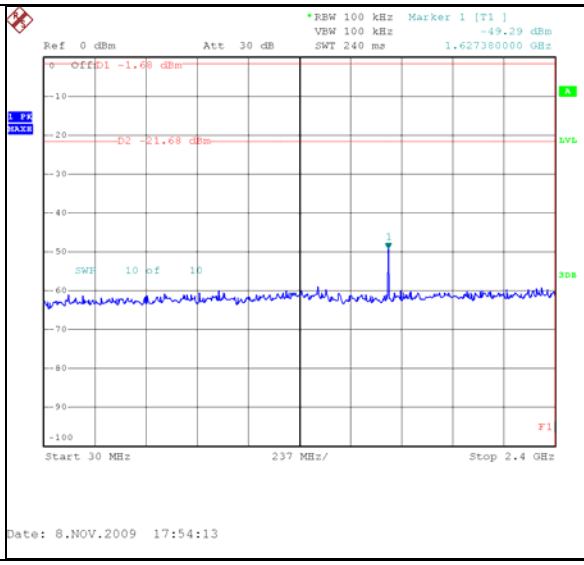
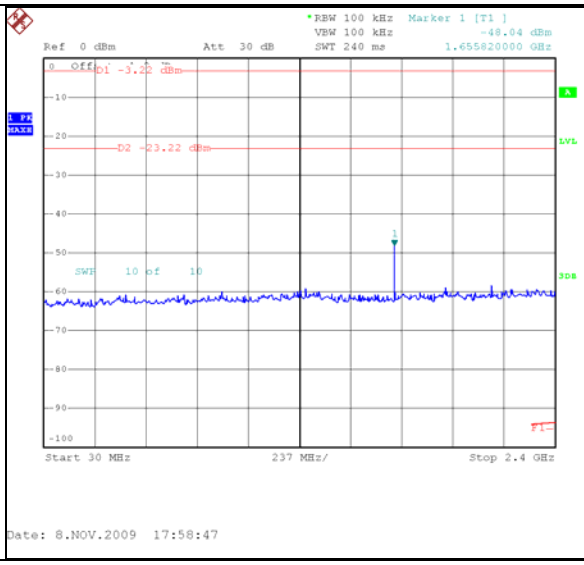
Plots of Conducted Emission(Basic / GFSK)

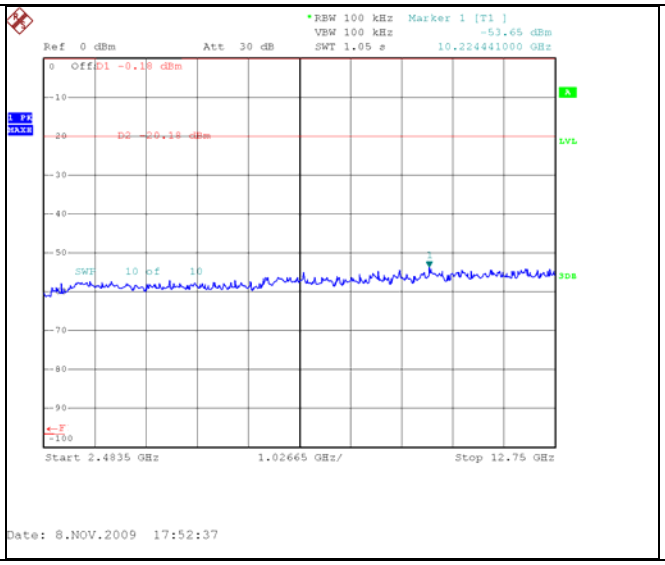
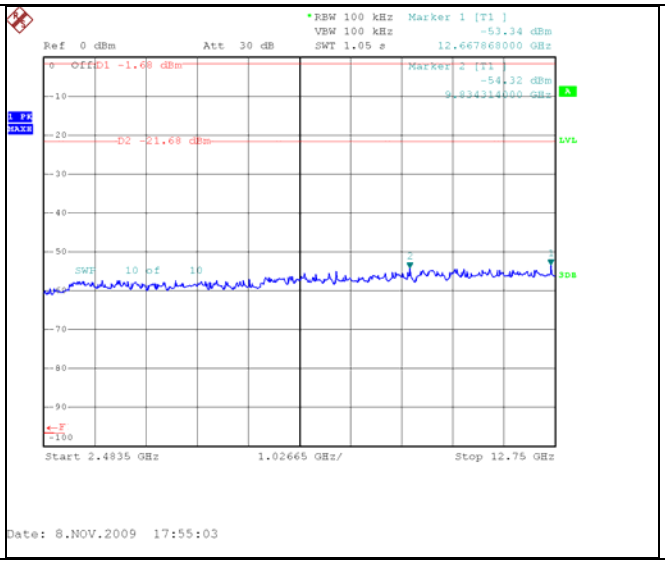
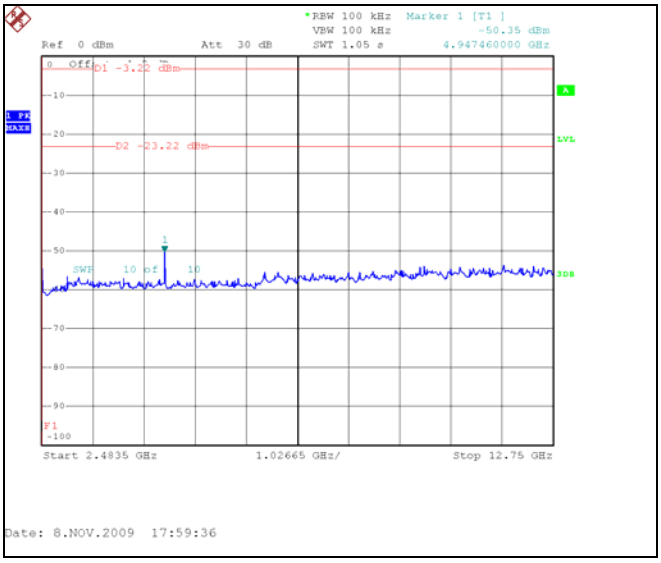
Frequency	30 MHz ~ 2400 MHz	
2402 MHz « 20dBc		
2441 MHz « 20dBc		
2480 MHz « 20dBc		

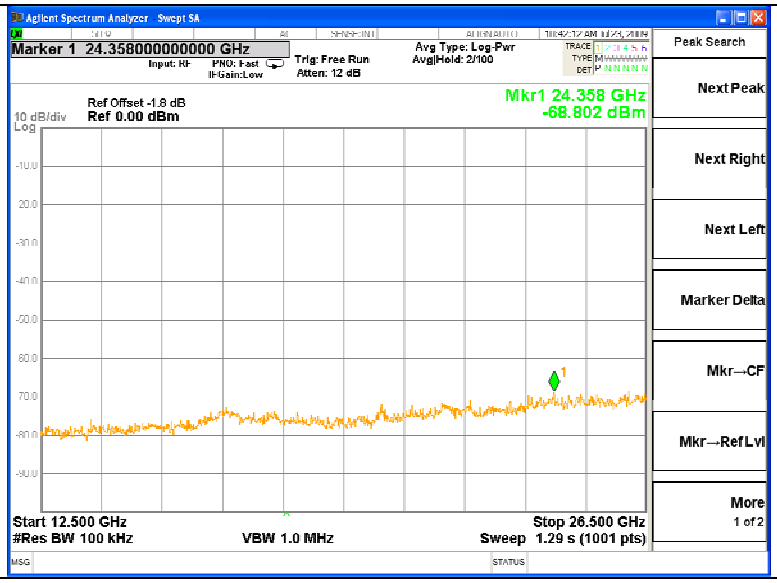
Frequency	2483.5 MHz ~ 12.75 GHz
2402 MHz « 20dBc	
2441 MHz « 20dBc	
2480 MHz « 20dBc	

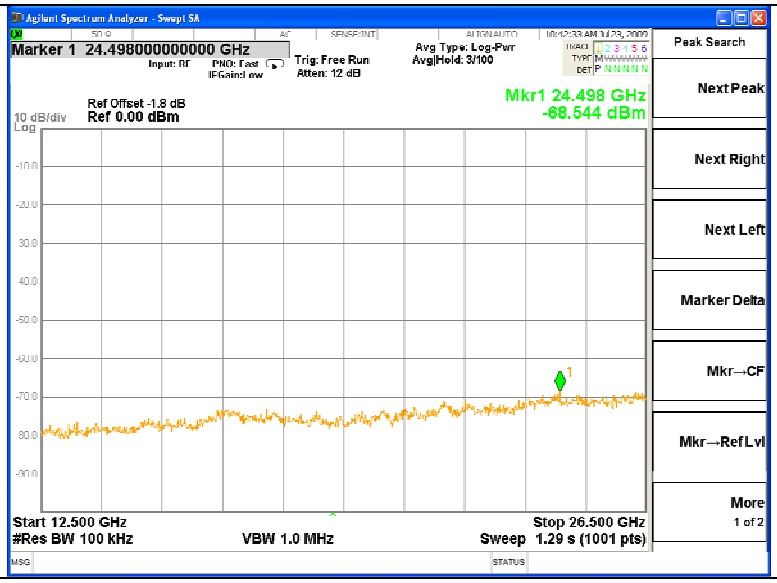
Frequency	12.75 GHz ~ 26.5 GHz
2412 MHz « 20dBc	
2442 MHz « 20dBc	
2472 MHz « 20dBc	

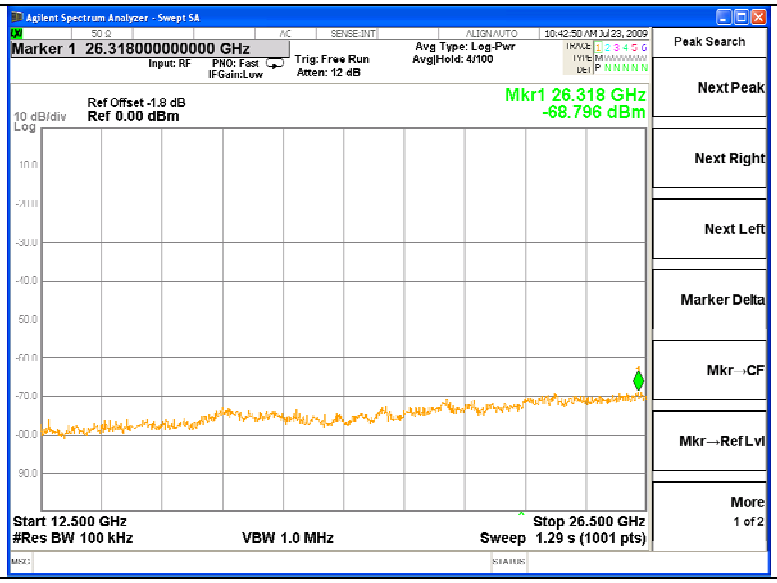
Plots of Conducted Emission(EDR / 16PSK)

Frequency	30 MHz ~ 2400 MHz	
2402 MHz « 20dBc		
2441 MHz « 20dBc		
2480 MHz « 20dBc		

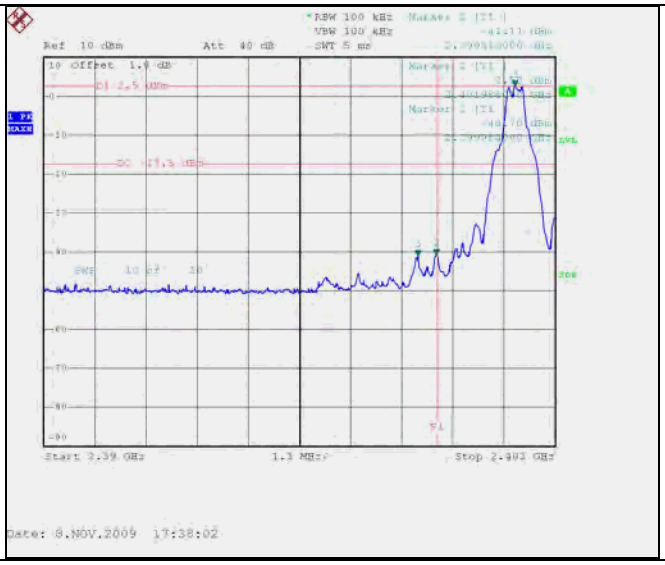
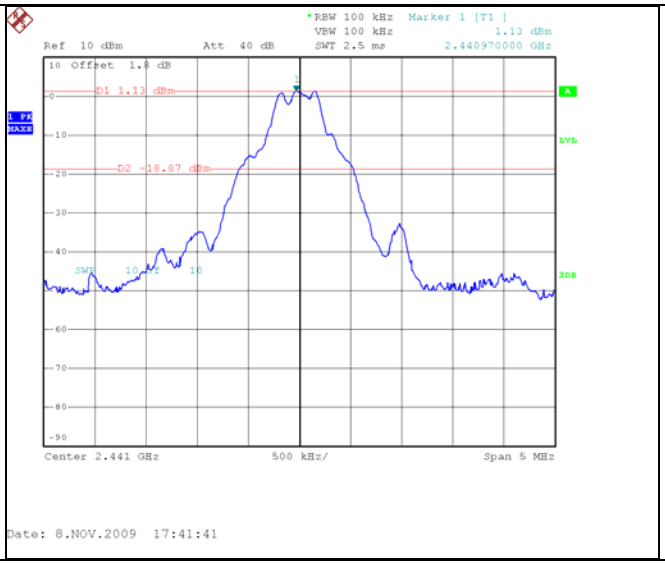
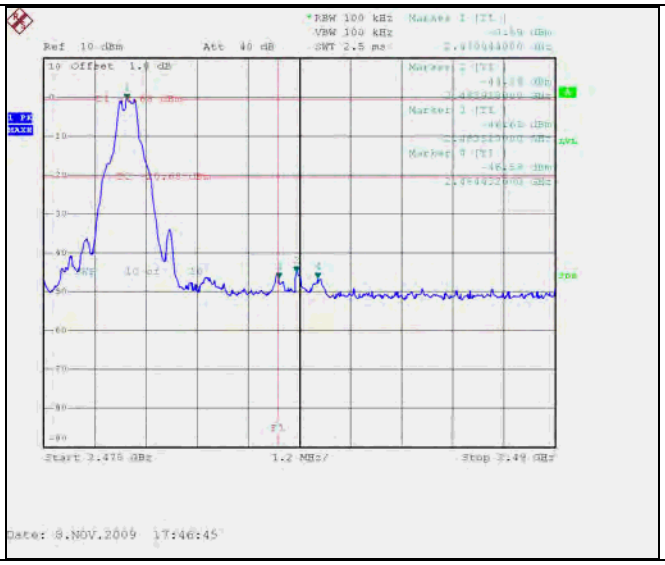
Frequency	2483.5 MHz ~ 12.75 GHz	
2402 MHz « 20dBc		
2441 MHz « 20dBc		
2480 MHz « 20dBc		

Frequency	12.75 GHz ~ 26.5 GHz
2412 MHz « 20dBc	

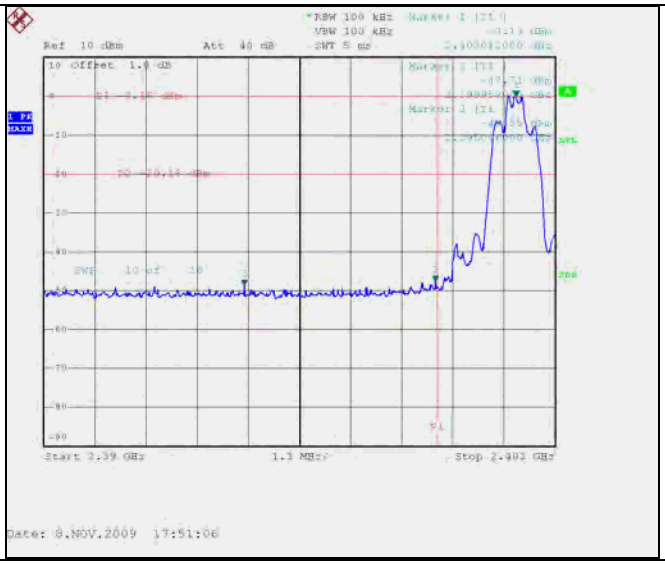
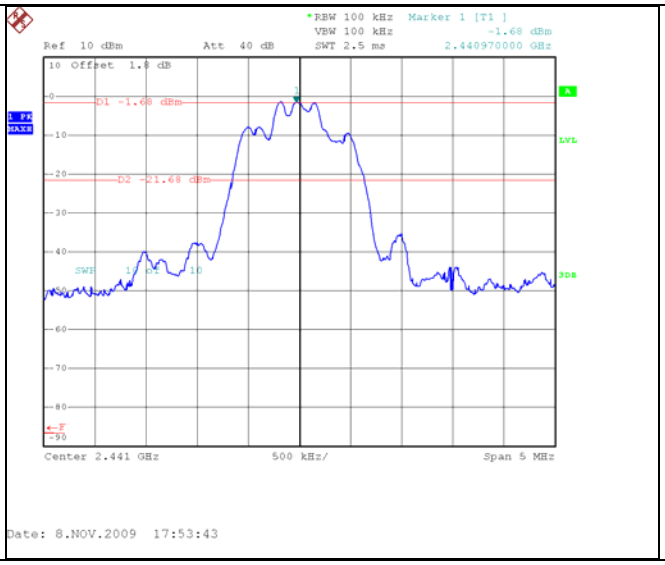
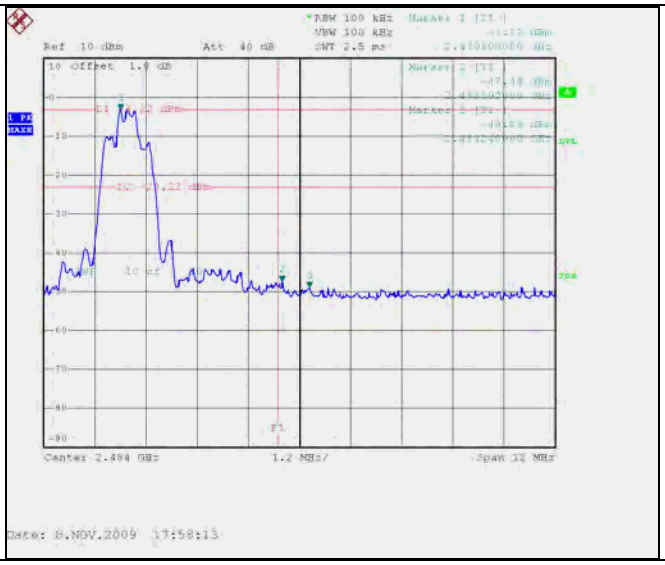
2442 MHz « 20dBc	

2472 MHz « 20dBc	

Plots of 100 kHz Bandwidth of Frequency Band Edges(Basic / GFSK)

Frequency	100 kHz Bandwidth of Frequency Band Edges
2402 MHz « 20dBc	
2441 MHz N/A	
2480 MHz « 20dBc	

Plots of 100 kHz Bandwidth of Frequency Band Edges(EDR / 16PSK)

Frequency	100 kHz Bandwidth of Frequency Band Edges
2402 MHz « 20dBc	
2441 MHz N/A	
2480 MHz « 20dBc	

7.3.6 Radiated Emission

EUT	:	mbook bz
Test Standard	:	FCC Part15 Subpart C Section 15.247©, 15.209 RSS-210 Annex 8.5
Test Date	:	November 07, 2009
Operating Condition	:	Blutooth The EUT was operated at transmitting condition continuously during the test.
Environment Condition	:	19 °C/ 36 %
Result	:	Passed

Radiated Emission Test Data(below 1 GHz)

Frequency [MHz]	Reading [dBμV]	Polarization [*H/**V]	Ant.Factor [dB/m]	Cable Loss [dB]	Limit [dBμV/m]	Emission Level [dBμV/m]	Margin [dB]
70.38	18.45	V	10.51	1.84	40.00	30.80	9.20
101.88	16.14	H	12.31	1.42	43.50	29.87	13.63
172.02	20.08	H	12.61	2.91	43.50	35.60	7.90
245.77	20.05	H	11.59	3.48	46.00	35.12	10.88
489.97	14.85	V	17.53	5.03	46.00	37.40	8.60
533.13	17.34	V	18.30	5.26	46.00	40.90	5.10
599.86	17.38	H	19.89	5.58	46.00	42.85	3.15

Radiated Emission Test Data (above 1 GHz)

Frequency [MHz]	Reading [dBμV]	Pre-Amp Gain [dB]	Ant.Factor [dB/m]	Cable Loss [dB]	Limit [dBμV/m]	Emission Level [dBμV/m]	Margin [dB]
Low Channel (2402 MHz)							
4804.00	33.15	30.00	31.71	13.01	53.98	47.87	6.11
Middle Channel (2441 MHz)							
4882.00	33.76	30.00	31.71	13.01	53.98	48.48	5.50
High Channel (2480 MHz)							
5007.00	35.48	30.00	31.71	13.02	53.98	50.21	3.77

Radiated Restricted Band Edge Test Data

Frequency [MHz]	Reading [dBuV]	Pre-Amp Gain[dB]	Ant Factor [dB/m]	Cable Loss [dB]	Limit [dBuV/m]	Emission Level [dBuV/m]	Margin [dB]	Detect
Low Channel(2412MHz)								
2355.64	33.85	30.00	26.29	11.12	74	41.3	32.7	PK
2355.64	22.14	30.00	26.29	11.12	54	29.57	24.43	AV
2342.50	34.20	30.00	26.29	11.12	74	41.6	32.4	PK
2342.50	22.49	30.00	26.29	11.12	54	29.92	24.08	AV
High Channel(2472MHz)								
2493.52	34.98	30.00	26.29	11.14	74	42.42	31.58	PK
2493.52	23.87	30.00	26.29	11.14	54	31.29	22.71	AV
2490.26	34.15	30.00	26.29	11.14	74	41.55	32.45	PK
2490.26	23.82	30.00	26.29	11.14	54	31.28	22.72	AV

NOTES:

1. All modes of operation were investigated and the worst-case emissions are reported.
2. This test being a result which used RF amplifier.
3. AF = Antenna Factor CL = Cable Loss F/S = Field Strength
4. POL H = Horizontal POL V = Vertical

7.3.7 Minimum Hopping Channels

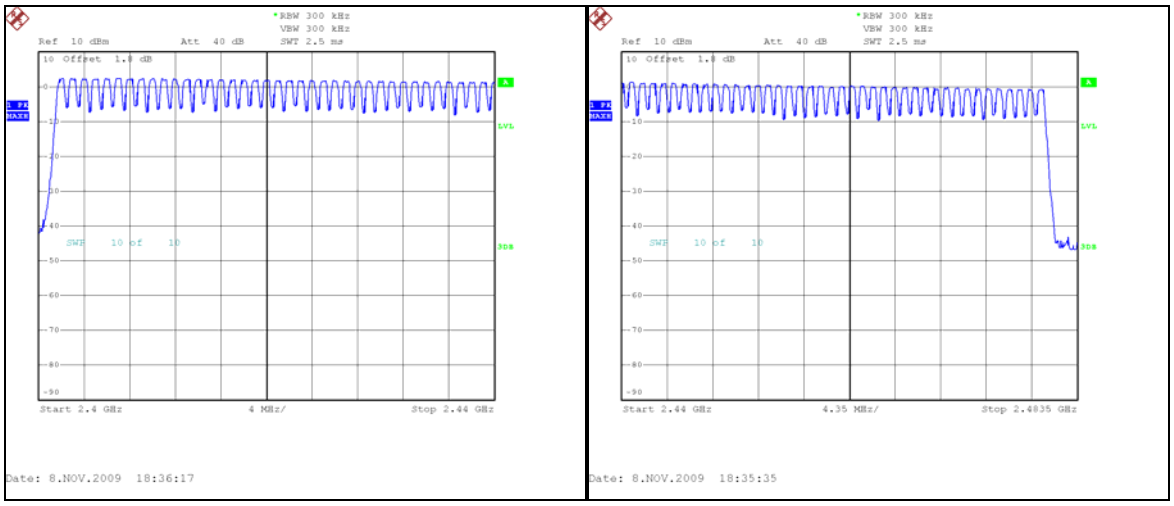
Test Standard	:	FCC Part15 Subpart C Section 15.247(a)(1) RSS-210 Annex 8.4 (2)
Operating Condition	:	The EUT was operated at transmitting condition continuously during the test.
Temperature/Humidity	:	22.0 °C/ 41 %

Minimum Hopping Channels Test Data

Number of hopping channels	Limit
79	More than 15 channels

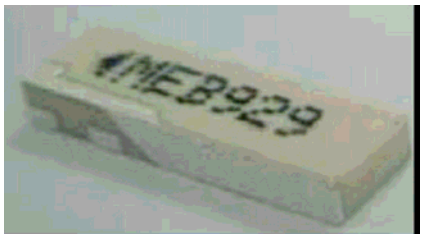
NOTES:

1. Minimum Hopping Channels using Spectrum Analyzer.
2. With the analyzer set to MAX HOLD readings were taken for 1 ~ 2 minutes in each band.



7.3.8 Antenna Requirement

Products	Dielectric Chip Antenna
Manufacturer	Patron
Model	ACS2450ICAMEB
Frequency Range [MHz]	2400~2485
Polarization	Linear
Max Gain	-0.9 dBi



Structure

8. TEST EQUIPMENTS LIST

The listing below denotes the test equipments utilized for the test(s).

EQUIPMENT		MODEL	MANUFACTURE	SERIAL NUMBER	Calibration Due date
1	Test Receiver	ESPI	Rohde & Schwarz	10012	10/10/30
2	Spectrum analyzer	FSP13SE	Rohde & Schwarz	15892	10/07/07
3	Spectrum analyzer	N9020A	Agilent	US46220101	10/09/30
4	Signal Generator	GT9000	Gigatronics	9604010	10/10/30
5	Frequency Counter	R5372	Advantest	41855204	10/10/29
6	Shield Room (7m x 4m x 3m)	N/A	SJEMC	0004	N/A
7	Turn Table	OSC-30	N/A	BWS-01	N/A
8	Antenna Mast	JAC-3	Dail EMC	N/A	N/A
9	Temperature & Humidity chanber	EN-GLMP-54	Enex	N/A	10/10/30
10	Bilog Antenna	VULB9160	Schwarzbeck	VULB9160-3122	10/01/24
11	Bilog Antenna	VULB9161	Schwarzbeck	VULB9161-4067	09/11/19
12	Bilog Antenna	VULB9161	Schwarzbeck	VULB9161-4068	09/12/11
13	Horn Antenna	BBHA 9120 D	Schwarzbeck	BBHA 9120 D 234	11/03/16
14	Horn Antenna	BBHA 9170	Schwarzbeck	BBHA9170157	10/03/15
15	Power Meter	E4418A	Agilent	GB38272621	10/10/29
16	Power Sensor	E9301B	Agilent	US40010238	10/10/29
17	Power supply	IPS-30B03DD	Interact	42052	10/10/29
18	Bandreject filter	3TNF-800/1000-0.2 N/N	K&L Microwave	441	10/02/06
19	RF Amplifier	8447E	HP	2945A02712	10/10/30
20	LISN	L1-115	Com-Power	241018	10/01/20
21	EMI Receiver	ESVN30	Rohde & Schwarz	832854/010	10/07/25
22	Open Site Cable	N/A	N/A	N/A	N/A
23	Antenna Turntable Controller	JAC-2	JAEMC	N/A	N/A