

Test Report No. S08ICM01442/EMC/01
dated 10 Sep 2008



PSB Singapore

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FORMAL REPORT ON TESTING IN ACCORDANCE WITH
FCC Parts 15B & C : 2007
OF A
NEXTEL HANDSET (LIBERO)
[Model : IGP801]
[FCC ID : WSM-IGP801]

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TEST FACILITY TÜV SÜD PSB Pte Ltd,
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FCC REG. NO. 90937 (3m & 10m OATS)
99142 (10m Semi-Anechoic Chamber)
871638 (3m Semi-Anechoic Chamber)
325572 (10m Semi-Anechoic Chamber)

IND. CANADA REG. NO. IC 4257 (3m and 10m Semi-Anechoic Chambers)

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QUOTATION NUMBER Q08ICM00246

JOB NUMBER S08ICM01442

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TEST SUMMARY

The product was tested in accordance with the customer's specifications.

Test Results Summary

Test Standard	Description	Pass / Fail
FCC Part 15: 2007		
15.107(a), 15.207	Conducted Emissions	Pass
15.109(a), 15.205, 15.209	Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)	Pass
15.247(a)(1)	Carrier Frequency Separation	Pass
	Spectrum Bandwidth (20dB Bandwidth Measurement)	Pass
15.247(a)(1)(iii)	Number of Hopping Frequencies	Pass
	Average Frequency Dwell Time	Pass
15.247(b)(1)	Maximum Peak Power	Pass
15.247(d)	RF Conducted Spurious Emissions	Pass
15.247(d)	Band Edge Compliance (Conducted)	Pass
15.247(d)	Band Edge Compliance (Radiated)	Pass
15.247(e)	Peak Power Spectral Density	Pass
1.1310	Maximum Permissible Exposure	Refer to page 54 for details
15.35(c)	Duty Cycle Factor Computation	Refer to page 55-57 for details



TEST SUMMARY

Notes

1. Three channels as listed below, which respectively represents the lower, middle and upper Bluetooth channels of the Equipment Under Test (EUT) were chosen and tested. For each channel, the EUT was configured to operate in the test mode.

<u>Transmit Channel</u>	<u>Frequency (GHz)</u>
Channel 0	2.402
Channel 39	2.441
Channel 78	2.480

2. All the measurements in section 15.247 were done based on conducted measurements.
3. The EUT is a Class B device when in non-transmitting state and meets the FCC Part15B Class B requirements.
4. All test measurement procedures are according to ANSI C63.4: 2003.

Modifications

1. No modifications were made.



PRODUCT DESCRIPTION

Description	: The Equipment Under Test (EUT) is a NEXTEL HANDSET (LIBERO) .
Manufacturer	: iWOW Communication Pte Ltd 1 Lorong 2 Toa Payoh #04-01 Yellow Pages Building Singapore 319637
Model Number	: IGP801
FCC ID	: WSM-IGP801
Serial Number	: Nil
Microprocessor	: Refer t manufacturer
Operating / Transmitting Frequency	: GSM 900MHz, 1800MHz & 1900MHz IDEN 800MHz & 900MHz Bluetooth 2.402GHz – 2.480GHz
Clock / Oscillator Frequency	: Refer t manufacturer
Modulation	: Refer to manufacturer's user manual / operating manual.
Antenna Gain	: Refer to manufacturer's user manual / operating manual.
Port / Connectors	: Refer to manufacturer's user manual / operating manual.
Rated Input Power	: 110V 60Hz
Accessories	: Nextel Power Adapetr Model PSA105R-050Q Input 100V-240V 60Hz/50Hz, 0.3A Output 5Vdc, max. 1A 850mAh Li-ion Battery



SUPPORTING EQUIPMENT DESCRIPTION

The EUT was tested as a stand-alone unit without any supporting equipment.

EUT OPERATING CONDITIONS

FCC Part 15

1. Conducted Emissions
2. Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)
3. Spectrum Bandwidth (20dB Bandwidth Measurement)
4. Maximum Peak Power
5. RF Conducted Spurious Emissions
6. Peak Power Spectral Density
7. Maximum Permissible Exposure
8. Duty Cycle Factor Computation

All Tests

The EUT was exercised by operating in maximum Bluetooth continuous transmission with frequency hopping off, i.e transmitting at lower, middle and upper channels respectively at one time.

Radiated Emissions

The EUT was exercised by operating in following modes during the tests:

- maximum Bluetooth continuous transmission with frequency hopping off, i.e transmitting at lower, middle and upper channels respectively at one time.
- Co-transmission of GSM + IDEN + Bluetooth at maximum RF at lower, middle and upper channels respectively at one time.

FCC Part 15

1. Carrier Frequency Separation
2. Number of Hopping Frequencies
3. Average Frequency Dwell Time
4. Band Edge Compliance (Conducted)
5. Band Edge Compliance (Radiated)

The EUT was exercised by operating in maximum Bluetooth continuous transmission with frequency hopping on.



CONDUCTED EMISSION TEST

FCC Parts 15.107(a) and 15.207 Conducted Emission Limits

Frequency Range (MHz)	Limit Values (dBμV)	
	Quasi-peak (QP)	Average (AV)
0.15 - 0.5	66 – 56 *	56 – 46 *
0.5 - 5.0	56	46
5.0 - 30.0	60	50

* Decreasing linearly with the logarithm of the frequency

FCC Parts 15.107(a) and 15.207 Conducted Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer-SA7	E7403A	US41160167	20 May 2009
Schaffner LISN – LISN10 (for EUT)	NNB42	04/10055	03 Jul 2009

CONDUCTED EMISSION TEST

FCC Parts 15.107(a) and 15.207 Conducted Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50 Ω /50 μ H EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment were powered separately from another LISN.

FCC Parts 15.107(a) and 15.207 Conducted Emission Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A scan was made on the NEUTRAL line over the required frequency range using an EMI test receiver.
3. High peaks, relative to the limit line, were then selected.
4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz. Both Quasi-peak and Average measurements were made.
5. Steps 2 to 4 were then repeated for the LIVE line.

Sample Calculation Example

At 20 MHz	Q-P limit (Class B) = 1000 μ V = 60.0 dB μ V
Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.2 dB	
Q-P reading obtained directly from EMI Receiver = 40.0 dB μ V (Calibrated for system losses)	
Therefore, Q-P margin = 40.0 - 60.0 = -20.0	i.e. 20.0 dB below Q-P limit

CONDUCTED EMISSION TEST



Conducted Emissions Test Setup (Front View)



Conducted Emissions Test Setup (Rear View)

CONDUCTED EMISSION TEST

FCC Parts 15.107(a) and 15.207 Conducted Emission Results

Test Input Power	110V 60Hz	Temperature	23°C
Line Under Test	AC Mains	Relative Humidity	60%
Operating Mode	GSM + IDEN + Bluetooth	Atmospheric Pressure	1030mbar
		Tested By	Vijoy Simon

Frequency (MHz)	Q-P Value (dBμV)	Q-P Margin (dB)	AV Value (dBμV)	AV Margin (dB)	Line	Channel
0.3231	33.9	-25.7	24.1	-25.5	Neutral	Low
0.7729	29.8	-26.2	21.1	-24.9	Neutral	Low
1.0962	29.6	-26.4	21.7	-24.3	Live	Low
1.1339	31.2	-24.8	22.3	-23.7	Live	Low
1.2574	29.8	-26.2	20.3	-25.7	Neutral	Low
11.5217	31.0	-29.0	22.1	-27.9	Live	Low

Test Input Power	110V 60Hz	Temperature	23°C
Line Under Test	AC Mains	Relative Humidity	60%
Operating Mode	Bluetooth	Atmospheric Pressure	1030mbar
		Tested By	Vijoy Simon

Frequency (MHz)	Q-P Value (dBμV)	Q-P Margin (dB)	AV Value (dBμV)	AV Margin (dB)	Line	Channel
0.1619	36.6	-28.8	33.3	-22.1	Neutral	0
0.2437	39.6	-22.4	31.4	-20.6	Live	0
0.3238	36.4	-23.2	26.7	-22.9	Live	0
0.4060	32.7	-25.0	24.8	-22.9	Neutral	0
0.6097	31.8	-24.2	25.0	-21.0	Live	0
0.6906	32.6	-23.4	23.8	-22.2	Live	0

Notes

- All possible modes of operation were investigated from 150kHz to 30MHz. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
- A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
- EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
9kHz - 30MHz
RBW: 10kHz VBW: 30kHz
- Conducted Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 9kHz – 30MHz is ±3.0dB.



RADIATED EMISSION TEST

FCC Part 15.205 Restricted Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	Above 38.6
13.36 - 13.41			

FCC Parts 15.109(a) and 15.209 Radiated Emission Limits

Frequency Range (MHz)	Quasi-Peak Limit Values (dBµV/m) @ 3m
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
Above 960	54.0*

* Above 1GHz, average detector was used. A peak limit of 20dB above the average limit does apply.

FCC Parts 15.109(a) and 15.209 Radiated Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date
R&S Test Receiver (20Hz-26.5GHz) – ESMI3	ESMI	829214/005 829550/004	21 Nov 2008
MITEQ Preamplifier (0.1-26.5GHz) – PA4	NSP2650-N	604879	26 Jan 2009
Schaffner Preamplifier (9kHz-2GHz) – PA19	CPA9231A	18763	11 Jan 2009
Schaffner Bilog Antenna – BL4	CBL6112B	2593	19 May 2009
Horn Antenna – H15	3115	0003-6088	14 Mar 2009
Mirco-Tronics 2.4GHz Bandstop Filter	BRM50701	042	13 Aug 2009



RADIATED EMISSION TEST

FCC Parts 15.109(a) and 15.209 Radiated Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

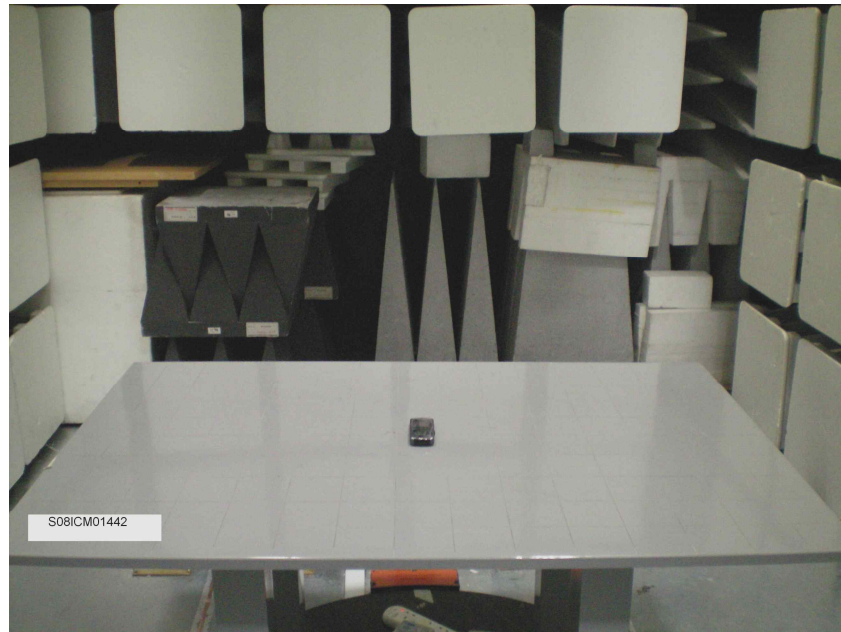
FCC Parts 15.109(a) and 15.209 Radiated Emission Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A prescan was carried out to pick the worst emission frequencies from the EUT. For EUT which is a portable device, the prescan was carried out by rotating the EUT through three orthogonal axes to determine which altitude and equipment arrangement produces such emissions.
3. The test was carried out at the selected frequency points obtained from the prescan in step 2. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
4. A Quasi-peak measurement was made for that frequency point if it was less than or equal to 1GHz. For frequency point that above 1GHz, both Peak and Average measurements were carried out.
5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured.
6. The frequency range covered was from 30MHz to 10th harmonics of the EUT fundamental frequency, using the Bi-log antenna for frequencies from 30MHz up to 1GHz, and the Horn antenna above 1GHz.

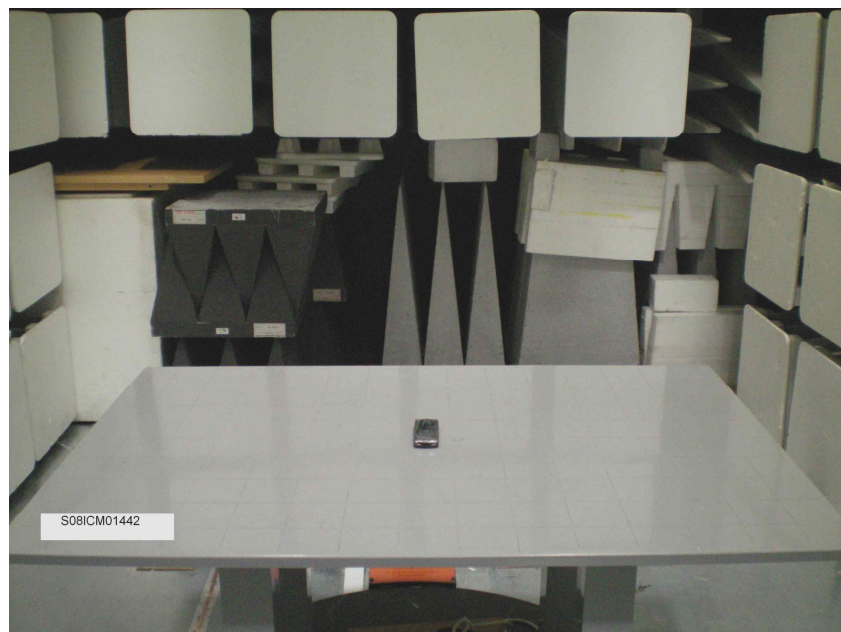
Sample Calculation Example

At 300 MHz	Q-P limit (Class B) = 200 μ V/m = 46.0 dB μ V/m
Log-periodic antenna factor & cable loss at 300 MHz = 18.5 dB	
Q-P reading obtained directly from EMI Receiver = 40.0 dB μ V/m (Calibrated level including antenna factors & cable losses)	
Therefore, Q-P margin = 40.0 - 46.0 = -6.0	i.e. 6 dB below Q-P limit

RADIATED EMISSION TEST



Radiated Emissions Test Setup (Front View)



Radiated Emissions Test Setup (Rear View)

RADIATED EMISSION TEST

FCC Parts 15.109(a), 15.205 and 15.209 Radiated Emission Results

Test Input Power	110V 60Hz	Temperature	23°C
Test Distance	3m	Relative Humidity	60%
Orientation	Lying down (Worst Orientation)	Atmospheric Pressure	1030mbar
Operating Mode	GSM + IDEN + Bluetooth	Tested By	Vijoy Simon

Spurious Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dBμV/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)	Channel
163.8920	20.4	-23.1	192	100	V	Mid
393.5780	25.5	-20.5	246	100	V	Mid
221.5860	16.1	-29.9	343	100	H	Mid
61.5680	23.1	-16.9	222	100	H	Mid
271.6590	19.7	-26.3	252	100	H	Mid
445.8280	25.1	-20.9	131	100	V	Mid

Spurious Emissions above 1GHz

Frequency (GHz)	Peak Value (dBμV/m)	Average Value (dBμV/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)	Channel
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--

Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. "--" indicates no emissions were found and shows compliance to the limits.
3. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
4. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
30MHz - 1GHz
RBW: 120kHz VBW: 1MHz
>1GHz
RBW: 1MHz VBW: 1MHz
5. The upper frequency of radiated emission investigations was according to requirements stated in Section 15.33(a) for intentional radiators & Section 15.33(b) for unintentional radiators.



RADIATED EMISSION TEST

Notes (Continued)

6. Radiated Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz is $\pm 4.6\text{dB}$.



RADIATED EMISSION TEST

FCC Parts 15.109(a), 15.205 and 15.209 Radiated Emission Results

Test Input Power	110V 60Hz	Temperature	23°C
Test Distance	3m	Relative Humidity	60%
Orientation	Lying down (Worst Orientation)	Atmospheric Pressure	1030mbar
Operating Mode	Bluetooth	Tested By	Vijoy Simon

Spurious Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dBµV/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)	Channel
108.5330	23.9	-16.1	267	298	V	39
149.7630	23.6	-16.4	52	301	H	39
214.5530	19.1	-20.9	0	400	H	39
375.5450	27.5	-19.5	17	301	H	39
897.7900	34.7	-12.3	254	201	H	39
901.7170	23.6	-22.4	122	198	V	39

Spurious Emissions above 1GHz

Frequency (GHz)	Peak Value (dBµV/m)	Average Value (dBµV/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)	Channel
4.8819	46.1	42.0	-12.0	160	178	V	39
7.4399	48.2	44.1	-9.9	39	183	V	78
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--



RADIATED EMISSION TEST

Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. "--" indicates no emissions were found and shows compliance to the limits.
3. Quasi-peak measurement was used for frequency measurement up to 1GHz. Average and peak measurements were used for emissions above 1GHz. The average measurement was done by averaging over a complete cycle of the pulse train, including the blanking interval as the pulse train duration does not exceed 0.1 second.
4. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
5. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
30MHz - 1GHz
RBW: 120kHz VBW: 1MHz
>1GHz
RBW: 1MHz VBW: 1MHz
6. The upper frequency of radiated emission investigations was according to requirements stated in Section 15.33(a) for intentional radiators & Section 15.33(b) for unintentional radiators.
7. The channel in the table refers to the transmit channel of the EUT.
8. Radiated Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz is $\pm 4.6\text{dB}$.



CARRIER FREQUENCY SEPARATION TEST

FCC Part 15.247(a)(1) Carrier Frequency Separation Limits

The EUT shows compliance to the requirements of this section, which states the adjacent carrier frequencies must be separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, the EUT may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW (21dBm).

FCC Part 15.247(a)(1) Carrier Frequency Separation Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer-SA7	E7403A	US41160167	20 May 2009

FCC Part 15.247(a)(1) Carrier Frequency Separation Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 100kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(a)(1) Carrier Frequency Separation Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The start and stop frequencies of the spectrum analyser were set to 2.400GHz and 2.405GHz.
3. The spectrum analyser was set to max hold to capture the two adjacent transmitting frequencies within the span. The signal capturing was continuous until no further signals were detected.
4. The carrier frequency separation of the two adjacent transmitting / operating frequency was measured by finding the carrier frequency difference between the two adjacent channels.
5. The steps 2 to 4 were repeated with the following start and stop frequencies settings:
 - a. 2.439GHz to 2.443GHz
 - b. 2.478GHz to 2.481GHz

CARRIER FREQUENCY SEPARATION TEST



Carrier Frequency Separation Test Setup

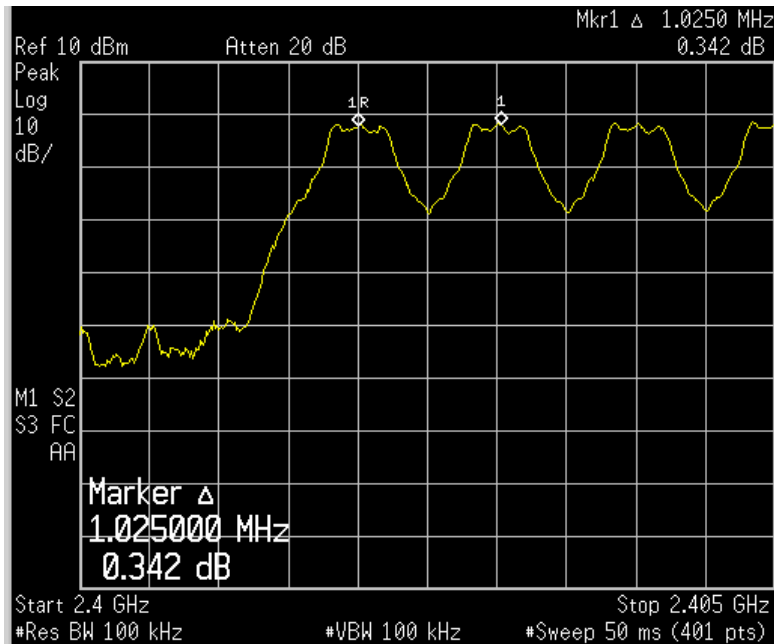
FCC Part 15.247(a)(1) Carrier Frequency Separation Results

Test Input Power	110V 60Hz	Temperature	22°C
Attached Plots	1 - 4	Relative Humidity	60%
		Atmospheric Pressure	1040mbar
		Tested By	Anthony Toh

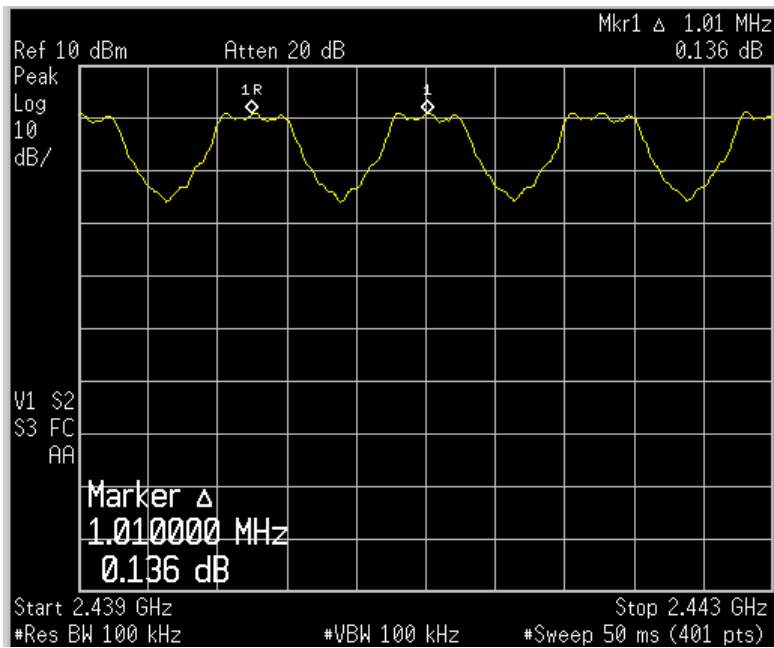
Adjacent Channels	Channel Separation (MHz)
0 and 1 (2.402GHz and 2.403GHz)	1.0000
38 and 39 (2.440GHz and 2.441GHz)	1.0100
39 and 40 (2.441GHz and 2.442GHz)	1.0100
77 and 78 (2.479GHz and 2.480GHz)	1.0125

CARRIER FREQUENCY SEPARATION TEST

Carrier Frequency Separation Plots



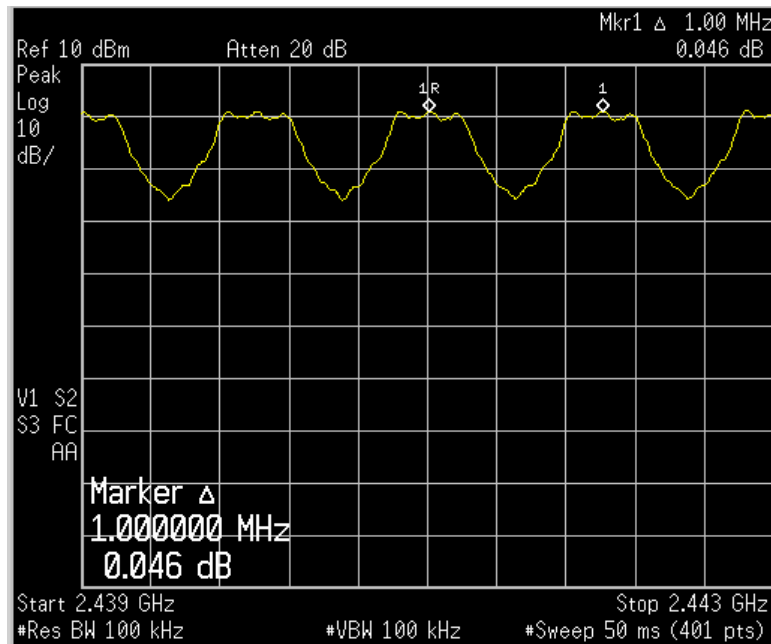
Plot 1 - Channels 0 and 1 Separation



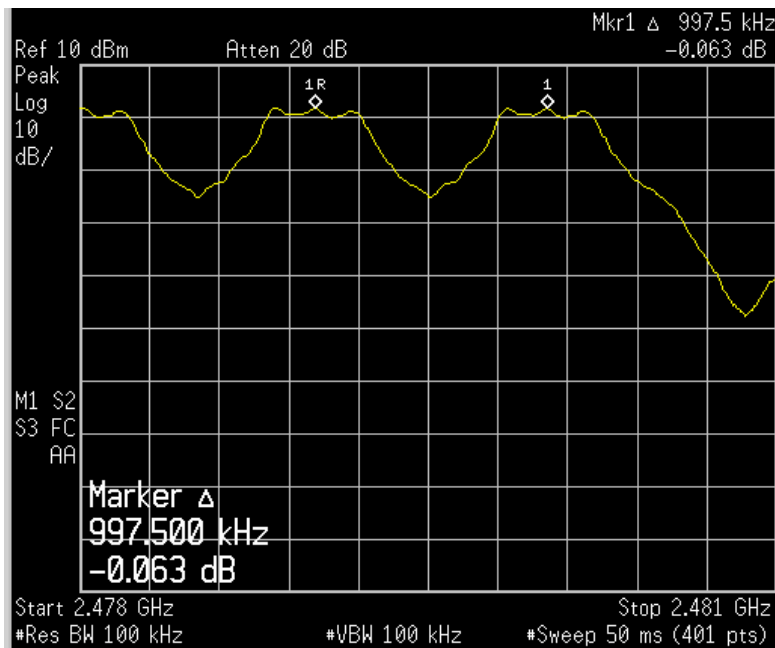
Plot 2 - Channels 39 and 40 Separation

CARRIER FREQUENCY SEPARATION TEST

Carrier Frequency Separation Plots



Plot 3 - Channels 40 and 41 Separation



Plot 4 - Channels 77 and 78 Separation

SPECTRUM BANDWIDTH (20dB BANDWIDTH MEASUREMENT) TEST

FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Limits

The EUT shows compliance to the requirements of this section, which states that the 20dB bandwidth of the hopping channel shall be the channel frequency separation by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer-SA7	E7403A	US41160167	20 May 2009

FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 10kHz and 30kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 0 (2.402GHz).
2. The center frequency of the spectrum analyser was set to the transmitting frequency with the frequency span wide enough to capture the 20dB bandwidth of the transmitting frequency.
3. The spectrum analyser was set to max hold to capture the transmitting frequency. The signal capturing was continuous until no further changes were observed.
4. The peak of the transmitting frequency was detected with the marker peak function of the spectrum analyser. The frequencies below the 20dB peak frequency at lower (f_L) and upper (f_H) sides of the transmitting frequency were marked and measured by using the marker-delta function of the spectrum analyser.
5. The 20dB bandwidth of the transmitting frequency is the frequency difference between the marked lower and upper frequencies, $|f_H - f_L|$.
6. The steps 2 to 5 were repeated with the transmitting frequency was set to Channel 39 (2.441GHz) and Channel 78 (2.480GHz) respectively.

SPECTRUM BANDWIDTH (20dB BANDWIDTH MEASUREMENT) TEST



Spectrum Bandwidth (20dB Bandwidth Measurement) Test Setup

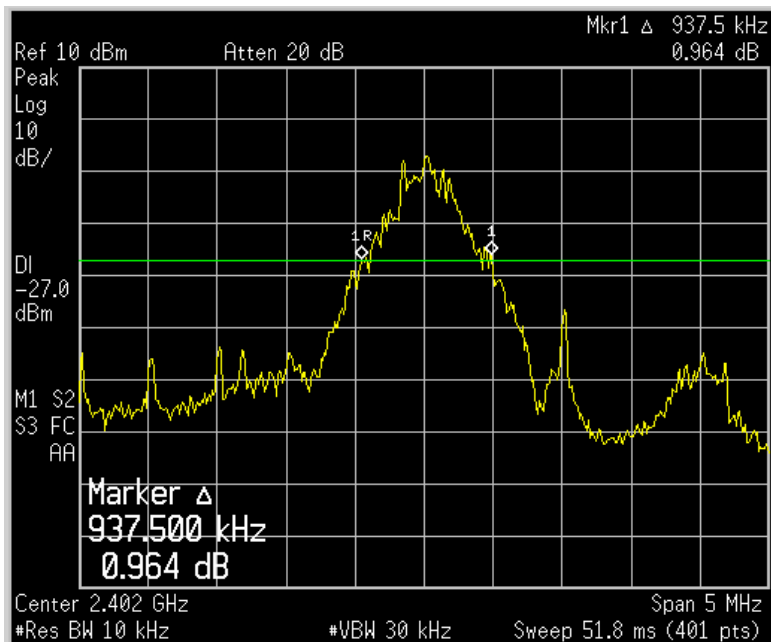
FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Results

Test Input Power	110V 60Hz	Temperature	22°C
Attached Plots	5 - 7	Relative Humidity	60%
		Atmospheric Pressure	1030mbar
		Tested By	Anthony Toh

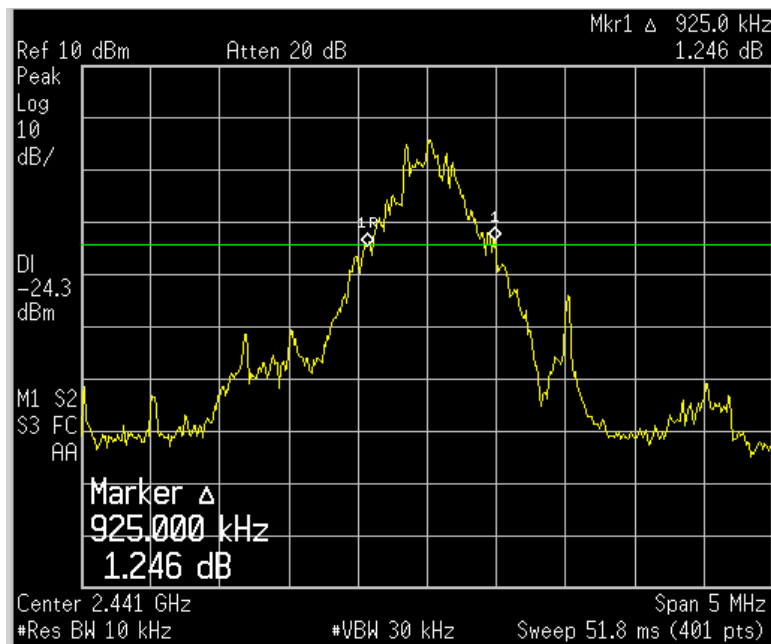
Channel	Channel Frequency (GHz)	20dB Bandwidth (MHz)
0	2.4020	0.9375
39	2.4410	0.9250
78	2.4800	0.9125

SPECTRUM BANDWIDTH (20dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots



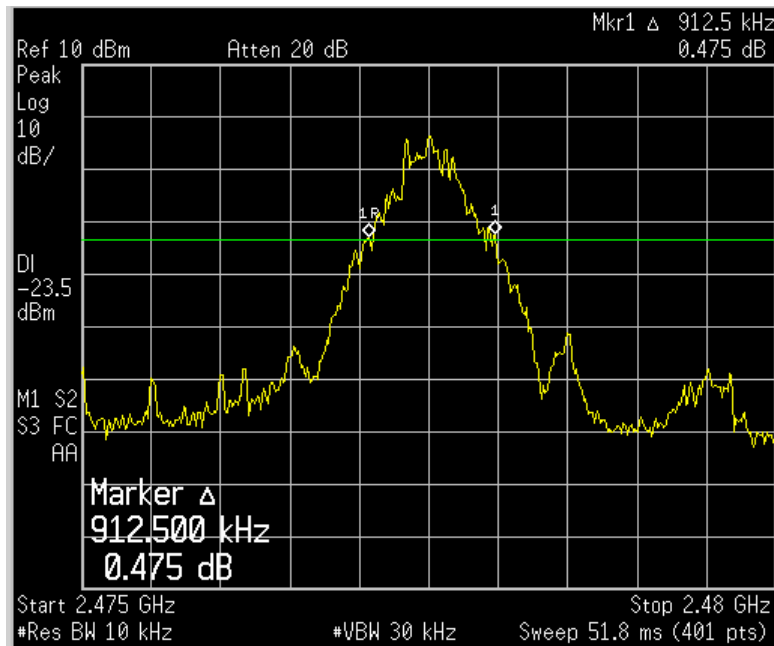
Plot 5 – Channel 0



Plot 6 – Channel 39

SPECTRUM BANDWIDTH (20dB BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots



Plot 7 – Channel 78

NUMBER OF HOPPING FREQUENCIES TEST

FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Limits

The EUT shows compliance to the requirements of this section, which states the EUT shall use at least 15 channels.

FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer-SA7	E7403A	US41160167	20 May 2009

FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 10kHz and 30kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The start and stop frequencies of the spectrum analyser were set to 2.40GHz and 2.422GHz.
3. The spectrum analyser was set to max hold to capture all the transmitting frequencies within the span. The signal capturing was continuous until all the transmitting frequencies were captured and no further signals were detected.
4. The numbers of transmitting frequencies were counted and recorded.
5. The steps 2 to 4 were repeated with the following start and stop frequencies settings:
 - a. 2.421GHz to 2.441GHz
 - b. 2.440GHz to 2.460GHz
 - c. 2.459GHz to 2.481GHz
6. The total number of hopping frequencies is the sum of the number of the hopping frequencies found for each span.

NUMBER OF HOPPING FREQUENCIES TEST



Number of Hopping Frequencies Test Setup

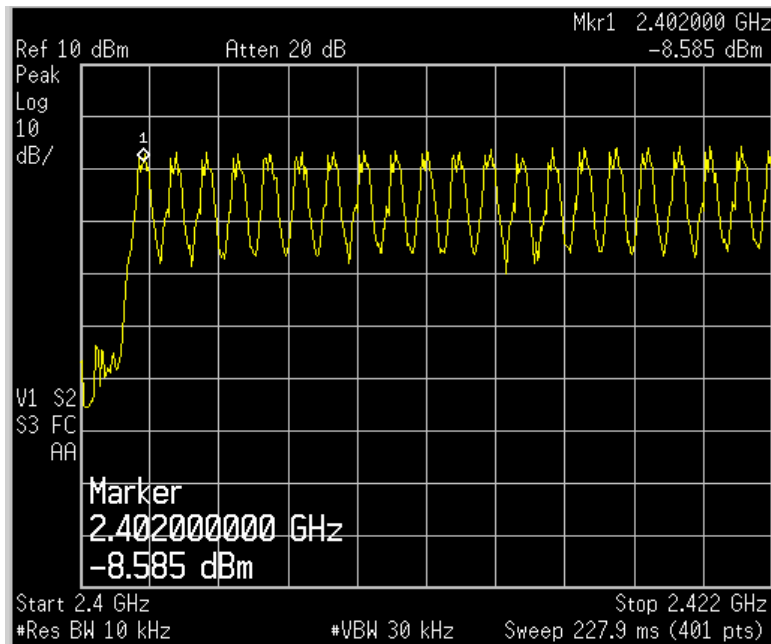
FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Results

Test Input Power	110V 60Hz	Temperature	22°C
Attached Plots	8 - 11	Relative Humidity	60%
		Atmospheric Pressure	1040mbar
		Tested By	Anthony Toh

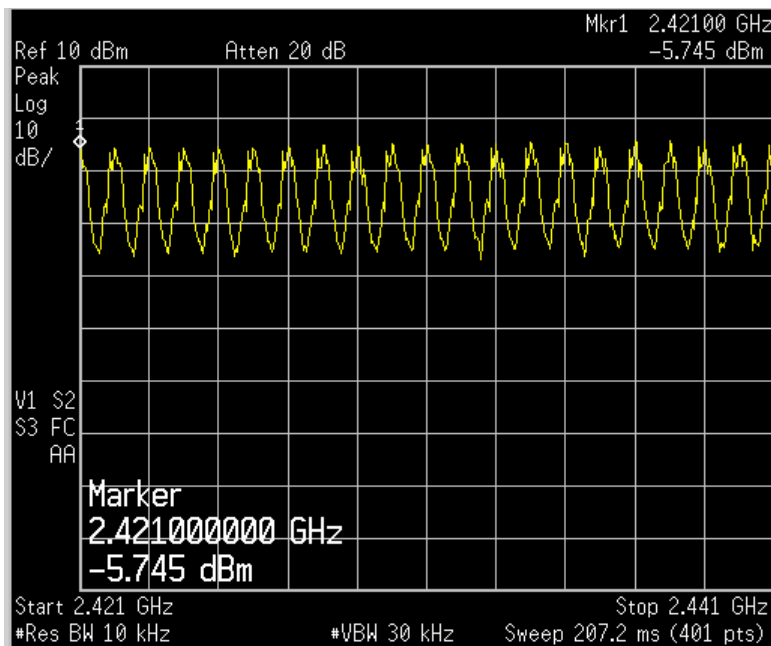
The EUT was found to have 79 hopping frequencies. Please refer to the attached plots.

NUMBER OF HOPPING FREQUENCIES TEST

Number Of Hopping Frequencies Plots



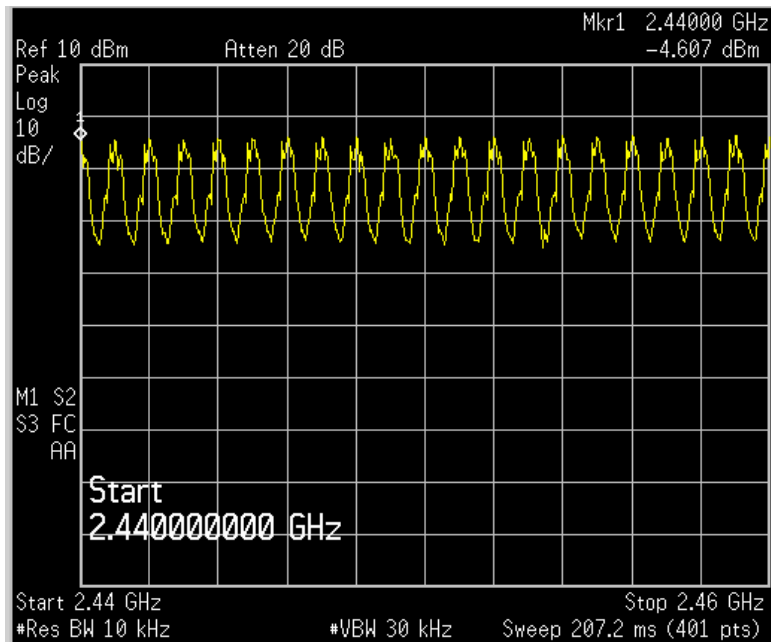
Plot 8 - Channels 0 to 19



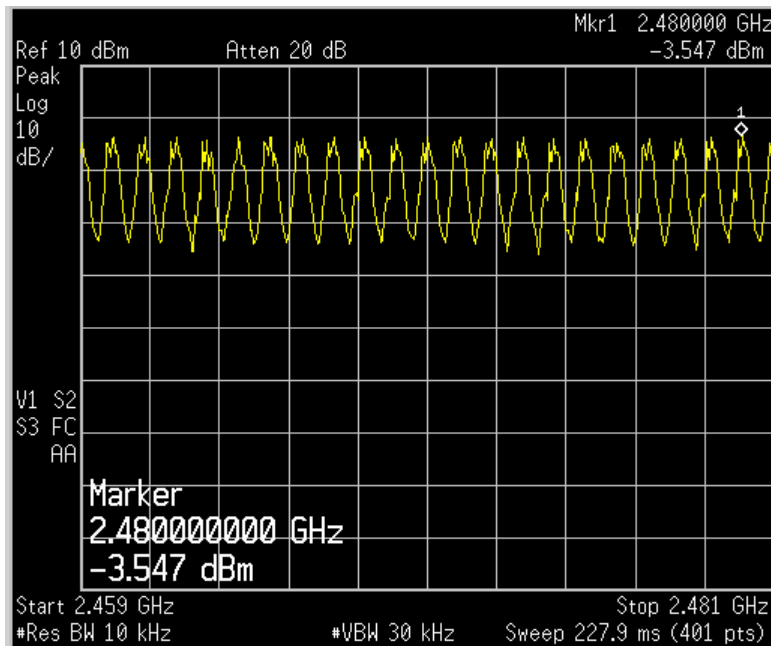
Plot 9 - Channels 20 to 38

NUMBER OF HOPPING FREQUENCIES TEST

Number Of Hopping Frequencies Plots



Plot 10 - Channels 39 to 57



Plot 11 - Channels 58 to 78



AVERAGE FREQUENCY DWELL TIME TEST

FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Time Limits

The EUT shows compliance to the requirements of this section, which states the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Time Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer-SA7	E7403A	US41160167	20 May 2009

FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 1MHz and 3MHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The center frequency of the spectrum analyser was set to 2.402GHz with zero frequency span (spectrum analyser acts as an oscilloscope).
3. The sweep time of the spectrum analyser was adjusted until a stable signal can be seen on the spectrum analyser.
4. The duration (dwell time) of a packet was measured using the marker-delta function of the spectrum analyser. The average dwell time of the transmitting frequency was computed based on general expression as shown below:
$$\text{Average Frequency Dwell Time} = \left[\text{measured time slot length} \times \text{hopping rate} / \text{number of hopping channels} \right] \times \left[0.4 \times \text{number of hopping channels} \right]$$
5. The steps 2 to 4 were repeated with the center frequency of the spectrum analyser were set to 2.440GHz and 2.480GHz respectively.

AVERAGE FREQUENCY DWELL TIME TEST



Average Frequency Dwell Time Test Setup

FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Time Results

Test Input Power	110V 60Hz	Temperature	22°C
Attached Plots	12 - 14	Relative Humidity	60%
Hopping Rate	1600 hops / s	Atmospheric Pressure	1040mbar
Number of Hopping Channels	79 channels	Tested By	Anthony Toh

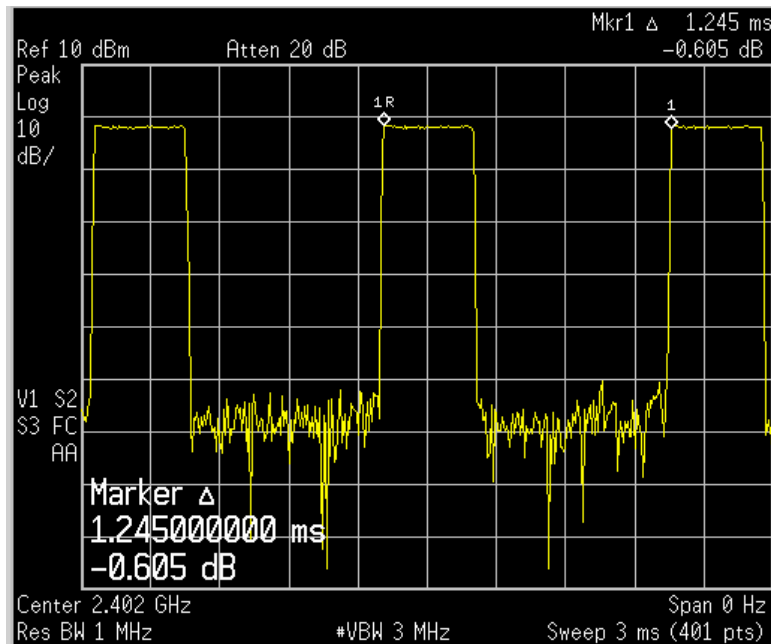
Channel	Channel Frequency (GHz)	Average Frequency Dwell Time (s)	Average Occupancy Limit (s)
0	2.402	0.1992	0.4
39	2.440	0.2003	0.4
78	2.480	0.1992	0.4

Notes

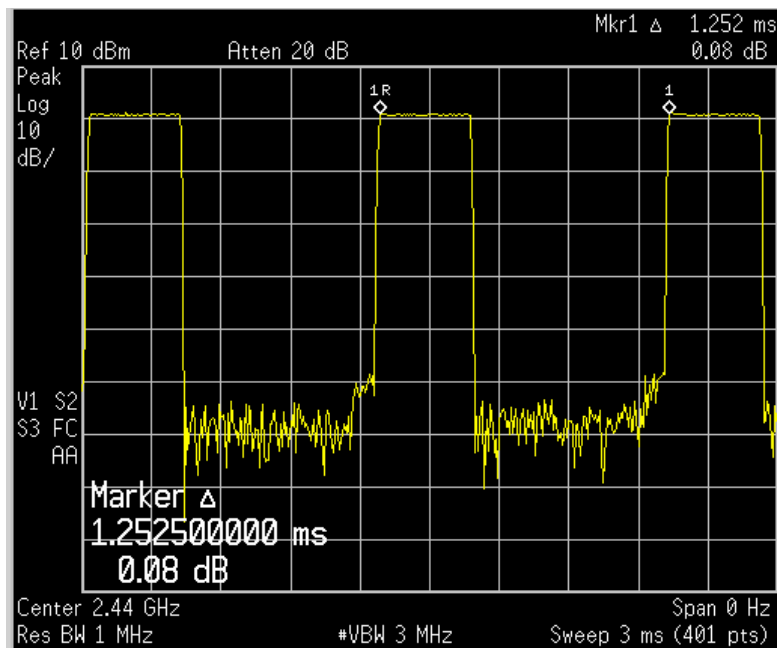
- The EUT operates based on 1-slot transmission and 1-slot reception basis. As such, there are [$1600 / (1 + 1)$] transmissions per second and the time occupancy per channel is [measured time slot length / 2].
- Average Frequency Dwell Time = [measured time slot length / 2 x hopping rate / 2 / number of hopping channels] x [0.4 x number of hopping channels]

AVERAGE FREQUENCY DWELL TIME TEST

Average Frequency Dwell Time Plots



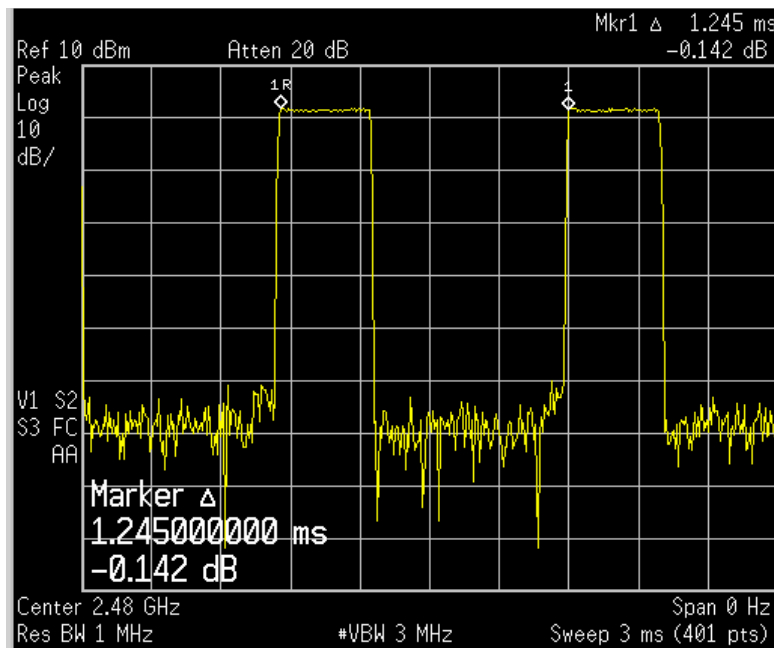
Plot 12 - Channel 0



Plot 13 - Channel 39

AVERAGE FREQUENCY DWELL TIME TEST

Average Frequency Dwell Time Plots



MAXIMUM PEAK POWER TEST

FCC Part 15.247(b)(1) Maximum Peak Power Limits

The EUT shows compliance to the requirements of this section, which states the EUT employing at least 75 non-overlapping hopping channels shall not exceed 1W (30dBm). For the EUT employs other frequency hopping systems, the peak power shall not greater than 0.125W (21dBm).

FCC Part 15.247(b)(1) Maximum Peak Power Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer-SA7	E7403A	US41160167	20 May 2009
R&S Universal Radio Communication Tester	CMU 200	837587/068	17 Aug 2008

FCC Part 15.247(b)(1) Maximum Peak Power Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the Universal Radio Communication Tester, which set into power analyser mode via a low-loss coaxial cable.
4. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(b)(1) Maximum Peak Power Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 0 (2.402GHz).
2. The maximum peak power of the transmitting frequency was detected and recorded.
3. The Equivalent Isotropic Radiated Power (EIRP) of the EUT was computed by adding its antenna gain to the measured maximum peak power.
4. The steps 2 to 3 were repeated with the transmitting frequency was set to Channel 39 (2.440GHz) and Channel 78 (2.480GHz) respectively.

MAXIMUM PEAK POWER TEST



Maximum Peak Power Test Setup

FCC Part 15.247(b)(1) Maximum Peak Power Results

Test Input Power	110V 60Hz	Temperature	23°C
Antenna Gain	0.0 dBi	Relative Humidity	58%
		Atmospheric Pressure	1030mbar
		Tested By	Vijoy Simon

Channel	Channel Frequency (GHz)	Maximum Peak Power (W)	Maximum EIRP (W)	Limit (W)
0	2.402	0.0024	0.0024	1.0
39	2.441	0.0024	0.0024	1.0
78	2.480	0.0024	0.0024	1.0

Notes

1. Power analyser of Universal Radio Communication Tester was used for power measurement with peak detection as mode of measurement. The power analyser mode supports a wideband power measurement ranging from 100kHz to 2700MHz.



RF CONDUCTED SPURIOUS EMISSIONS TEST

FCC Part 15.247(d) RF Conducted Spurious Emissions Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

FCC Part 15.247(d) RF Conducted Spurious Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer-SA7	E7403A	US41160167	20 May 2009

FCC Part 15.247(d) RF Conducted Spurious Emissions Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(d) RF Conducted Spurious Emissions Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 0 (2.402GHz).
2. The start and stop frequencies of the spectrum analyser were set to 30MHz and 10GHz.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. The steps 2 to 3 were repeated with frequency span was set from 10GHz to 25GHz.
5. The steps 2 to 4 were repeated with the transmitting frequency was set to Channel 39 (2.441GHz) and Channel 78 (2.480GHz) respectively.

RF CONDUCTED SPURIOUS EMISSIONS TEST



RF Conducted Spurious Emissions Test Setup

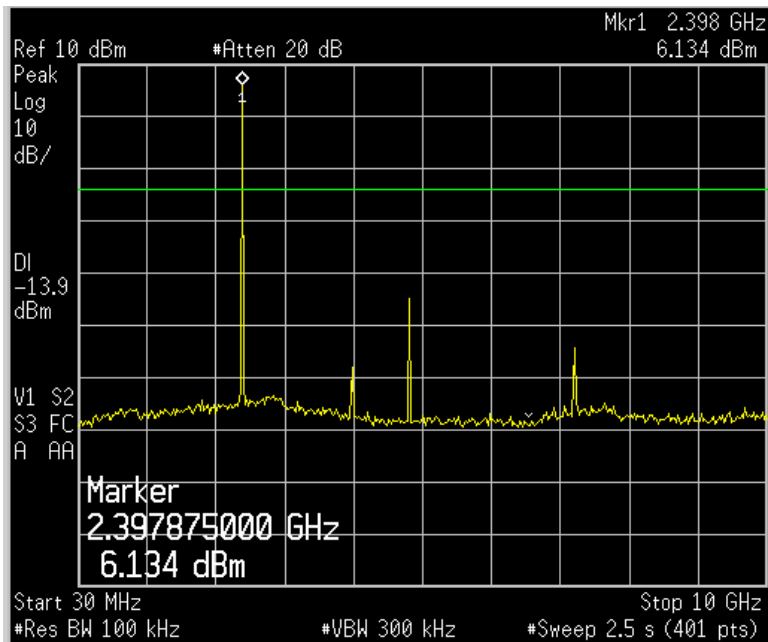
FCC Part 15.247(d) RF Conducted Spurious Emissions Results

Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	15 - 20	Relative Humidity	60%
		Atmospheric Pressure	1030mbar
		Tested By	Vijoy Simon

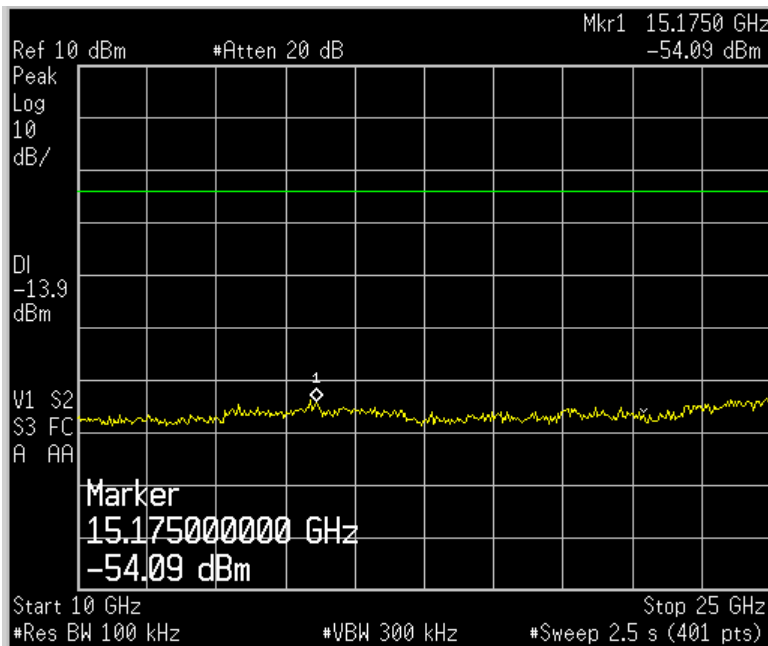
All spurious signals found were below the specified limit. Please refer to the attached plots.

RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots



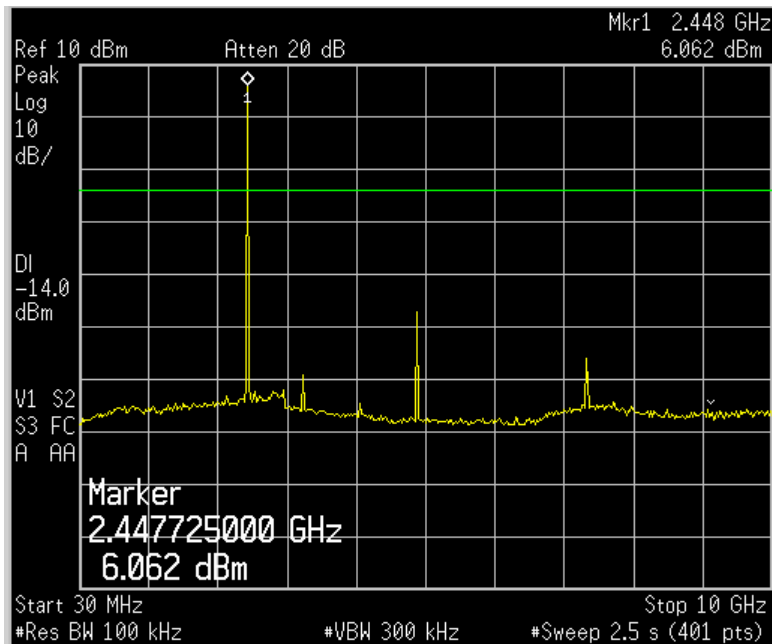
Plot 15 – Channel 0



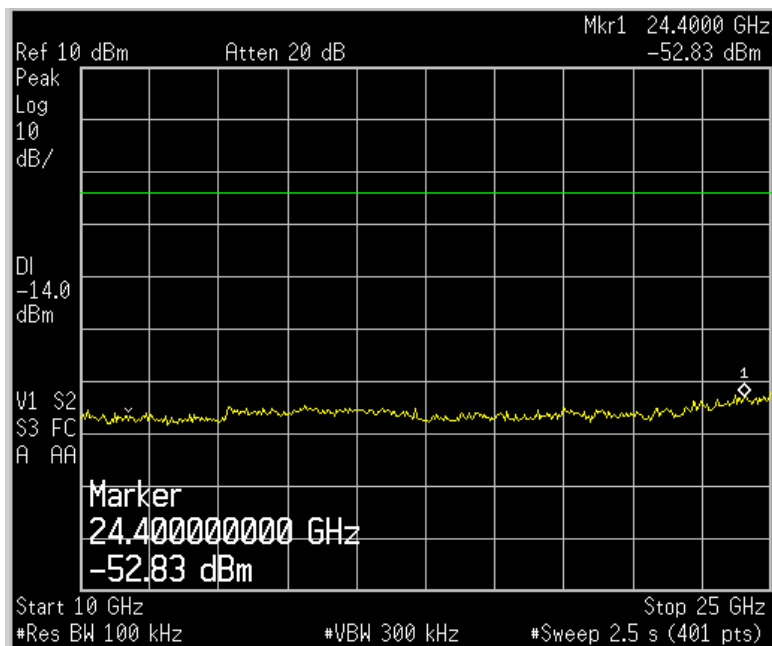
Plot 16 – Channel 0

RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots



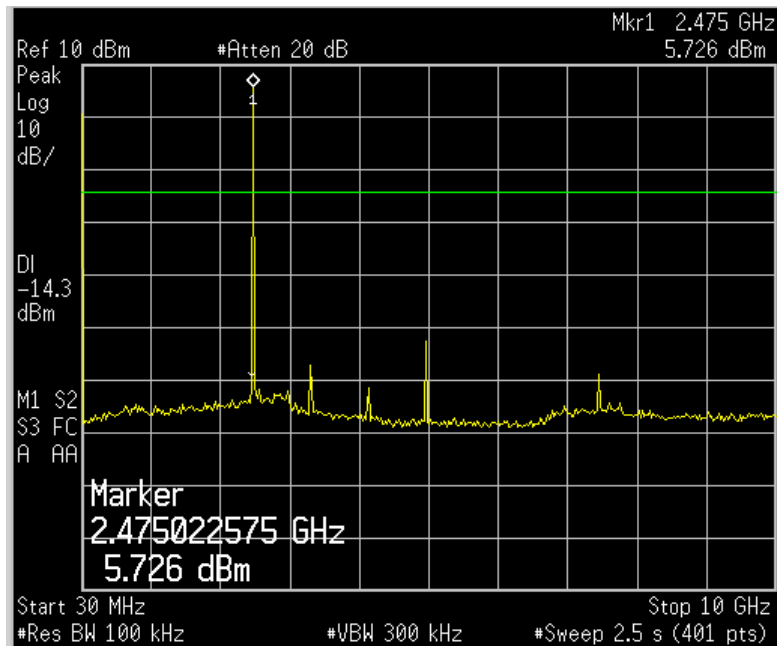
Plot 17 - Channel 39



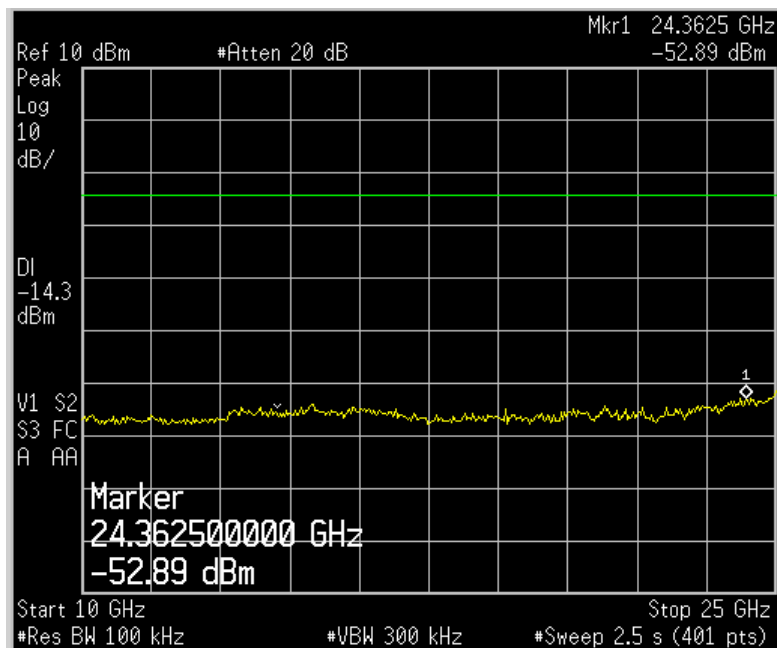
Plot 18 - Channel 39

RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots



Plot 19 – Channel 78



Plot 20 – Channel 78

BAND EDGE COMPLIANCE (CONDUCTED) TEST

FCC Part 15.247(d) Band Edge Compliance (Conducted) Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

FCC Part 15.247(d) Band Edge Compliance (Conducted) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer-SA7	E7403A	US41160167	20 May 2009

FCC Part 15.247(d) Band Edge Compliance (Conducted) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(d) Band Edge Compliance (Conducted) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. The steps 2 to 3 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.

BAND EDGE COMPLIANCE (CONDUCTED) TEST



Band Edge Compliance (Conducted) Test Setup

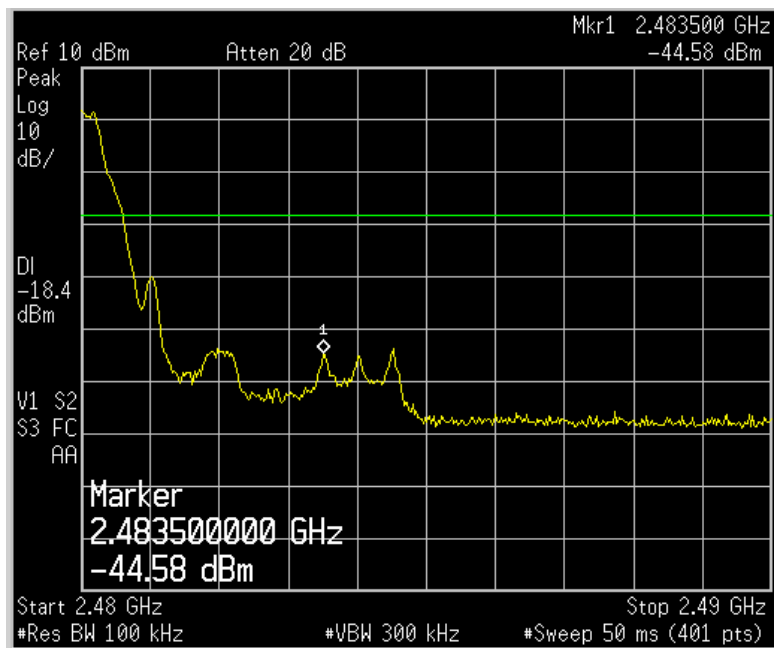
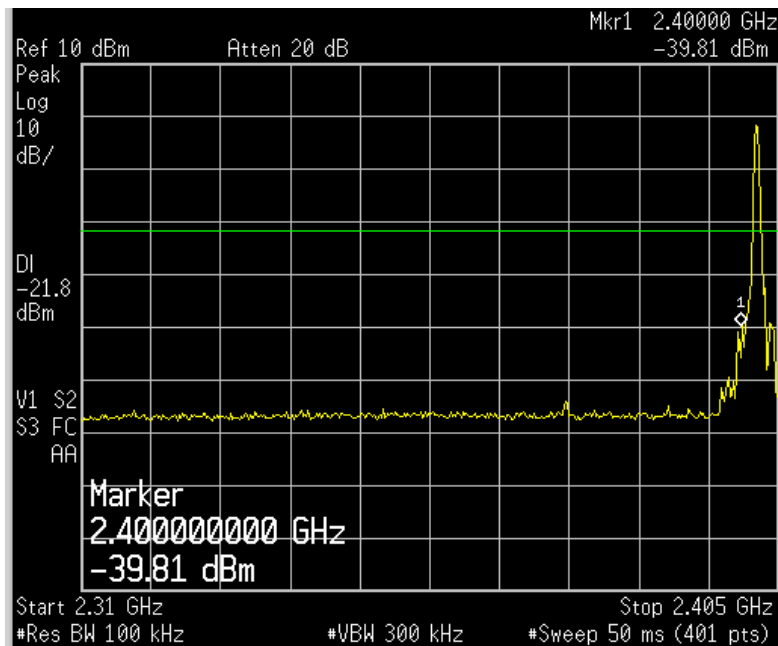
FCC Part 15.247(d) Band Edge Compliance (Conducted) Results

Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	21 - 22	Relative Humidity	60%
		Atmospheric Pressure	1030mbar
		Tested By	Anthony Toh

No significant signal was found and they were below the specified limit.

BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots



BAND EDGE COMPLIANCE (RADIATED) TEST

FCC Part 15.247(d) Band Edge Compliance (Radiated) Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power. In addition, radiated emissions which fall in the restricted bands shall comply to the radiated emission limits specified in 15.209.

FCC Part 15.247(d) Band Edge Compliance (Radiated) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
R&S Test Receiver (20Hz-26.5GHz) – ESMI3	ESMI	829214/005 829550/004	21 Nov 2008
MITEQ Preamplifier (0.1-26.5GHz) – PA4	NSP2650-N	604879	26 Jan 2009
Horn Antenna – H15	3115	0003-6088	14 Mar 2009

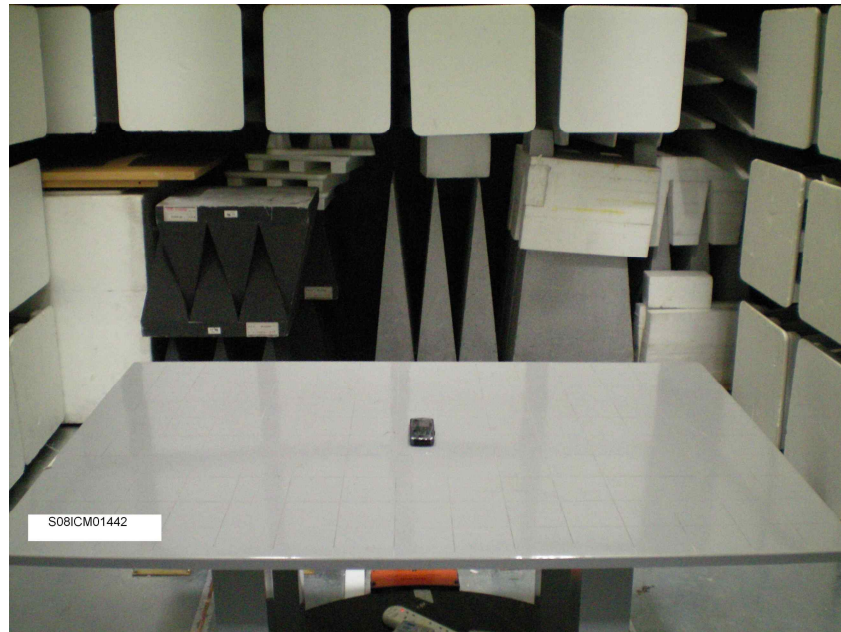
FCC Part 15.247(d) Band Edge Compliance (Radiated) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz to show compliance of spurious at band edges are at least 20dB below the carriers. For restricted band spurious at band edges, peak and average measurement plots were taken using the following setting:
 - a. Peak Plot:
RBW = VBW = 1MHz
 - b. Average Plot
RBW = 1MHz, VBW = 10Hz
4. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(d) Band Edge Compliance (Radiated) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. The steps 2 to 3 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.

BAND EDGE COMPLIANCE (RADIATED) TEST



Band Edge Compliance (Radiated) Test Setup



BAND EDGE COMPLIANCE (RADIATED) TEST

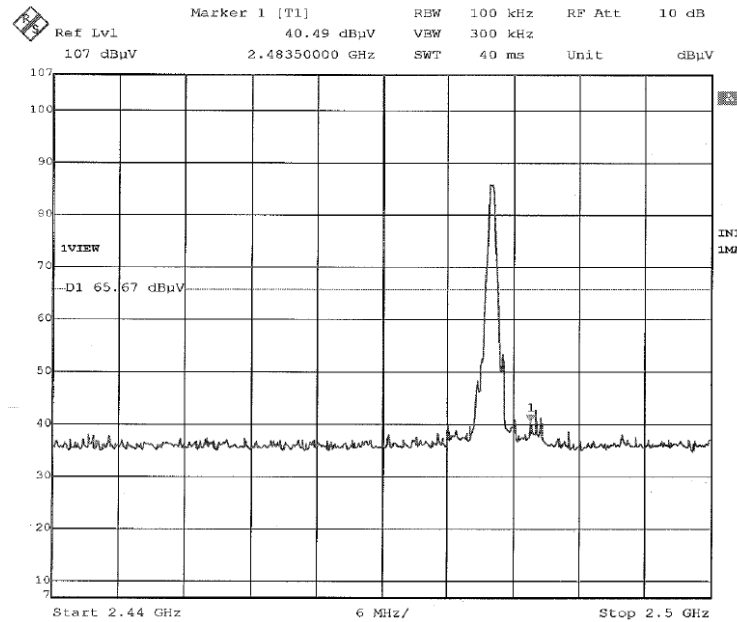
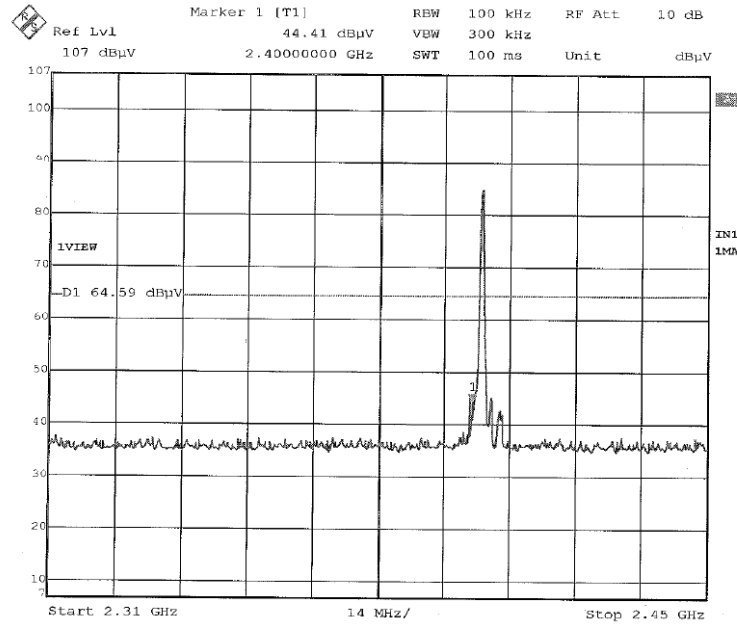
FCC Part 15.247(d) Band Edge Compliance (Radiated) Results

Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	23 - 28	Relative Humidity	60%
		Atmospheric Pressure	1030mbar
		Tested By	Vijoy Simon

No significant signal was found and they were below the specified limit.

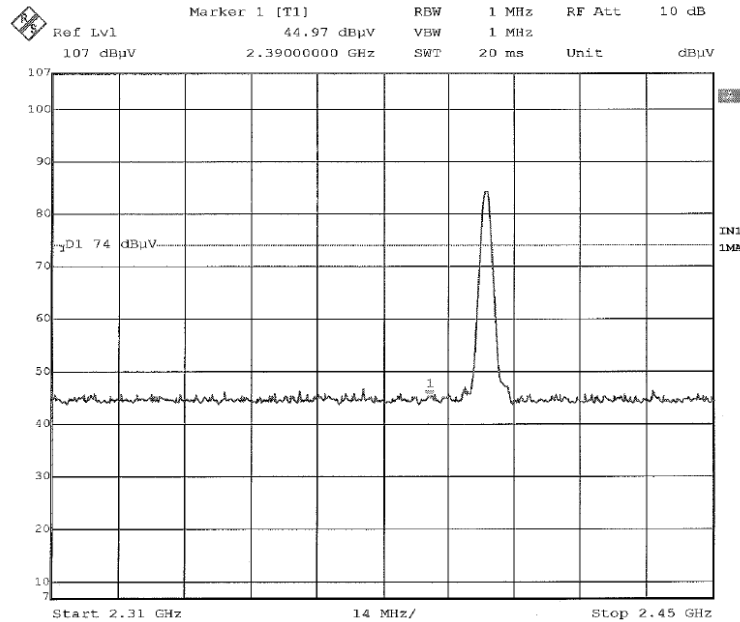
BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)

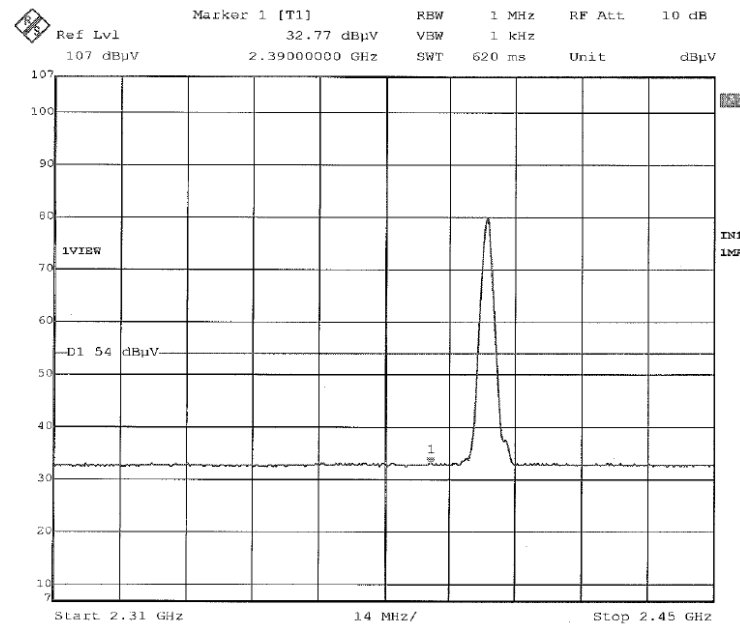


BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



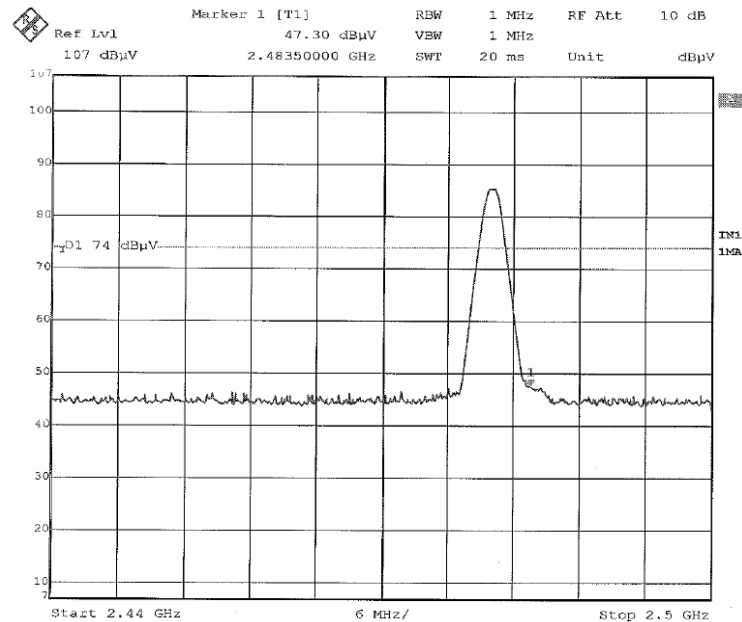
Plot 25 – Peak Plot at Lower Band Edge at 2.4000GHz



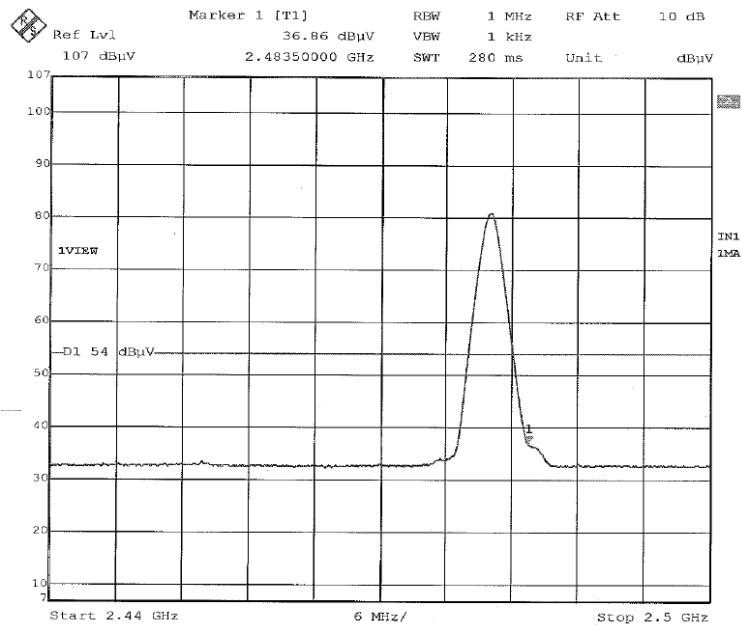
Plot 26 – Average Plot at Lower Band Edge at 2.4000GHz

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band)



Plot 27 – Peak Plot at Upper Band Edge at 2.4835GHz



Plot 28 – Average Plot at Upper Band Edge at 2.4835GHz

PEAK POWER SPECTRAL DENSITY TEST

FCC Part 15.247(e) Peak Power Spectral Density Limits

The EUT shows compliance to the requirements of this section, which states the peak power spectral density conducted from the intentional radiator (EUT) to the antenna shall not be greater than 8dBm (6.3mW) in any 3kHz band during any time interval of continuous transmission.

FCC Part 15.247(e) Peak Power Spectral Density Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Agilent EMC Analyzer-SA7	E7403A	US41160167	20 May 2009

FCC Part 15.247(e) Peak Power Spectral Density Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 3kHz and 10kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(e) Peak Power Spectral Density Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 0 (2.402GHz).
2. The sweep time of the spectrum analyser was set to the value of the ratio of the frequency span divided by the RBW.
3. The peak power density of the transmitting frequency was detected and recorded.
4. The step 3 was repeated with the transmitting frequency was set to Channel 39 (2.441GHz) and Channel 78 (2.480GHz) respectively.

PEAK POWER SPECTRAL DENSITY TEST



Peak Power Spectral Density Test Setup

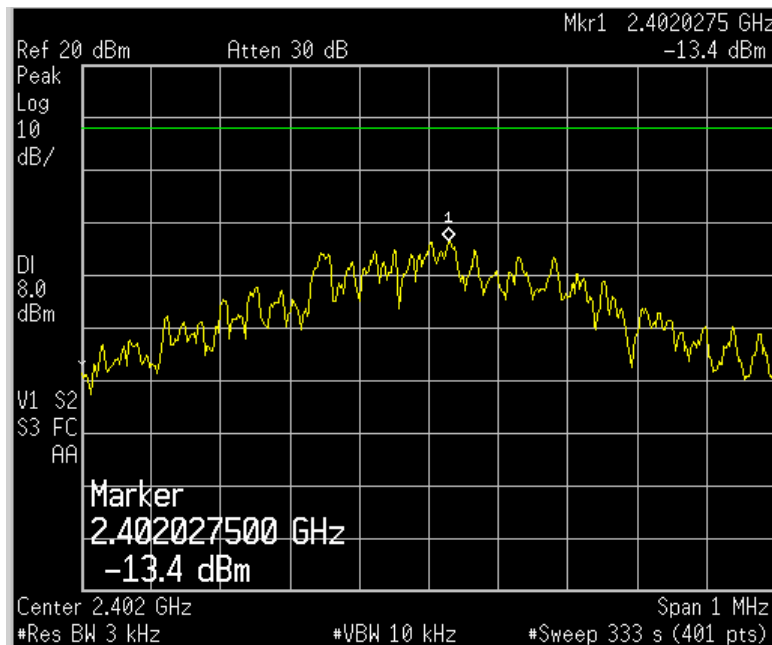
FCC Part 15.247(e) Peak Power Spectral Density Results

Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	29 - 31	Relative Humidity	60%
		Atmospheric Pressure	1030mbar
		Tested By	Vijoy Simon

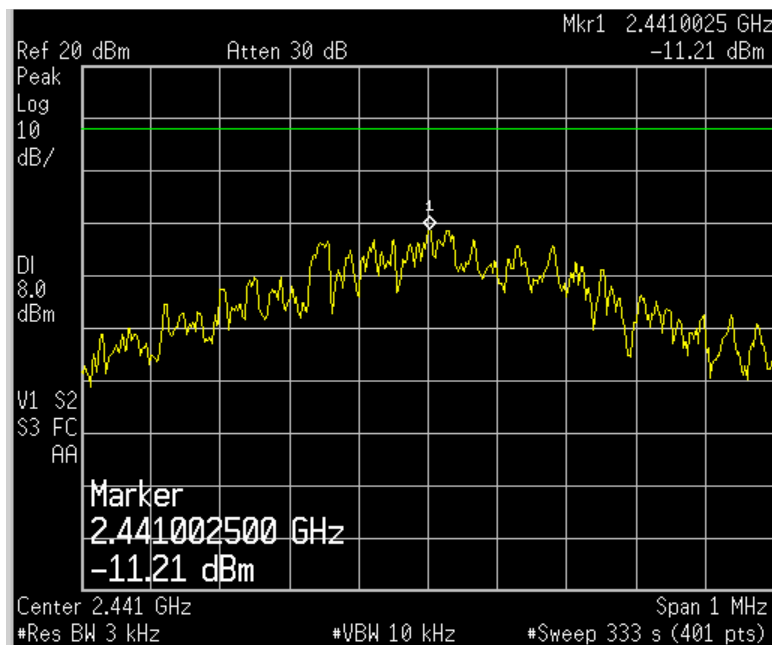
Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)
0	2.4020	0.046	6.3
39	2.4410	0.076	6.3
78	2.4800	0.096	6.3

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots



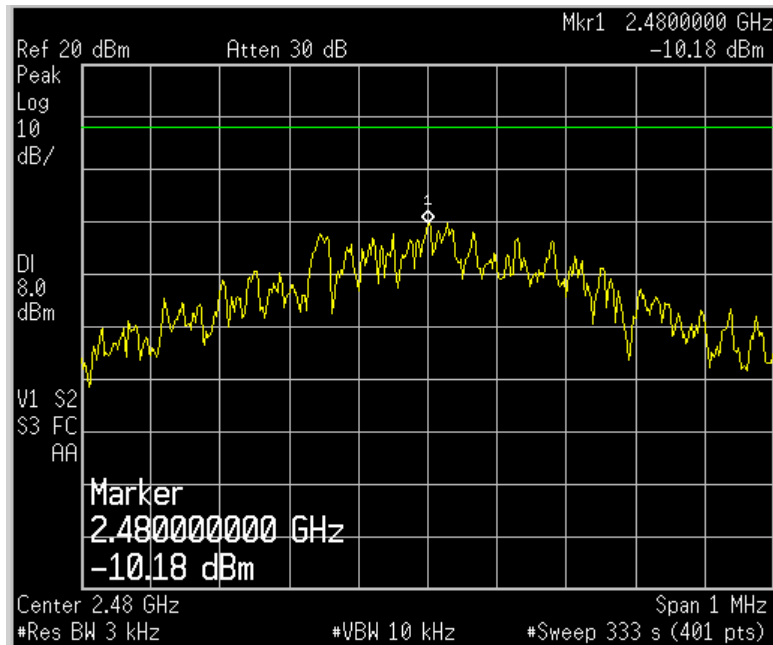
Plot 29 – Channel 1



Plot 30 – Channel 39

PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots



Plot 31 – Channel 78



MAXIMUM PERMISSIBLE EXPOSURE (MPE) TEST

FCC Part 1.1310 Maximum Permissible Exposure (MPE) Limits

The EUT shows compliance to the requirements of this section, which states the MPE limits for general population / uncontrolled exposure are as shown below:

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (min)
0.3 - 1.34	614	1.63	100 ^{Note 2}	30
1.34 - 30	824 / f	2.19 / f	180 / f ² ^{Note 2}	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	-	-	f / 1500	30
1500 - 100000	-	-	1.0	30
Notes				
1. f = frequency in MHz				
2. Plane wave equivalent power density				

FCC Part 1.1310 Maximum Permissible Exposure Computation

The minimum safe distance between the EUT and field probe was computed from the following formula:

$$d = \sqrt{[(30GP) / 377S]}$$

where

S	=	Power density, 10W/m ²
P	=	0.0024W
d	=	Minimum safety distance, m
G	=	Numerical isotropic gain, 1.0 (0.0dBi)

Substituting the relevant parameters into the formula:

$$d = \sqrt{[(30GP) / 377S]}$$

$$= 0.0044\text{m}$$

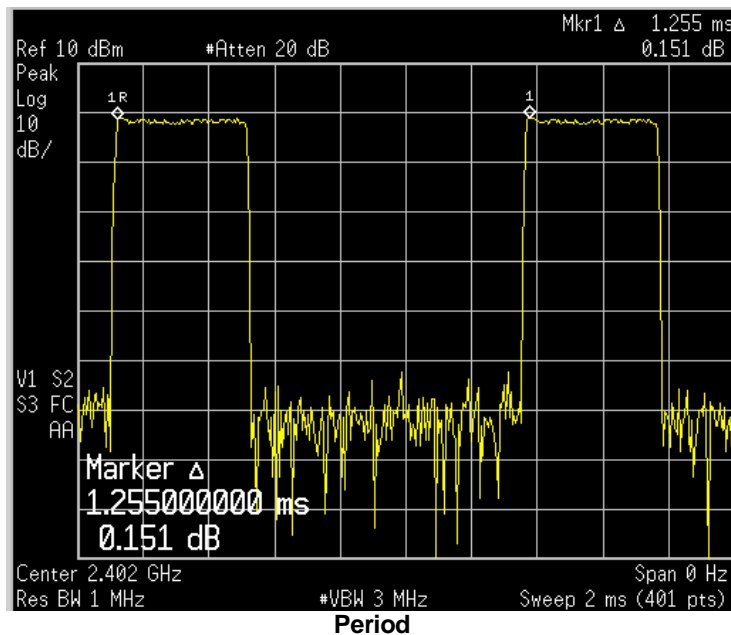
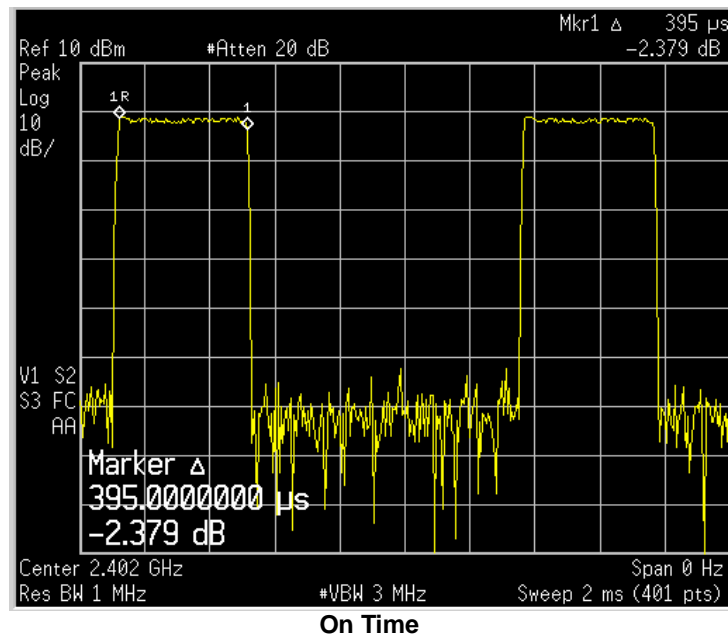
$$= 0.44\text{cm}$$

∴ The distance between users and the EUT shall be maintained at a minimum distance of 0.44cm during normal operation in order to ensure RF exposure to the users is within the allowable safety margin.

DUTY CYCLE FACTOR COMPUTATION

FCC Part 15.35(c) Duty Cycle Correction Factor

Channel 0 (lower ch)

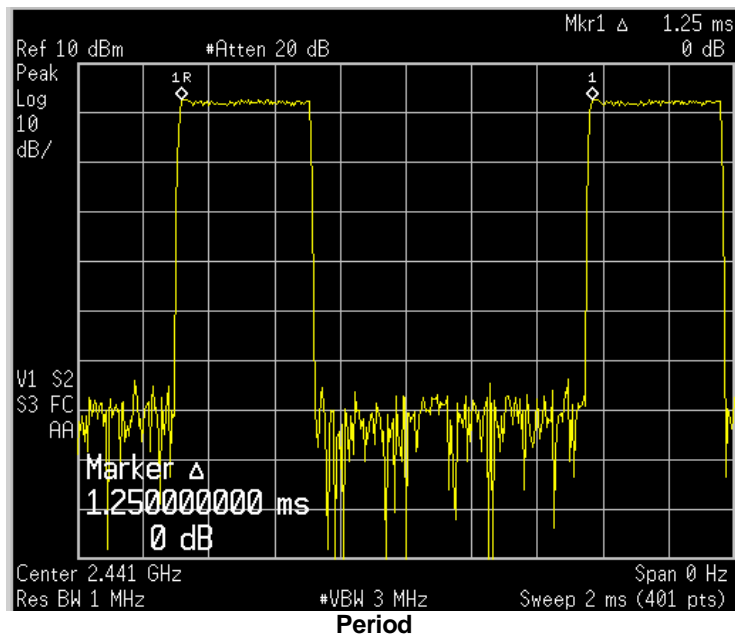
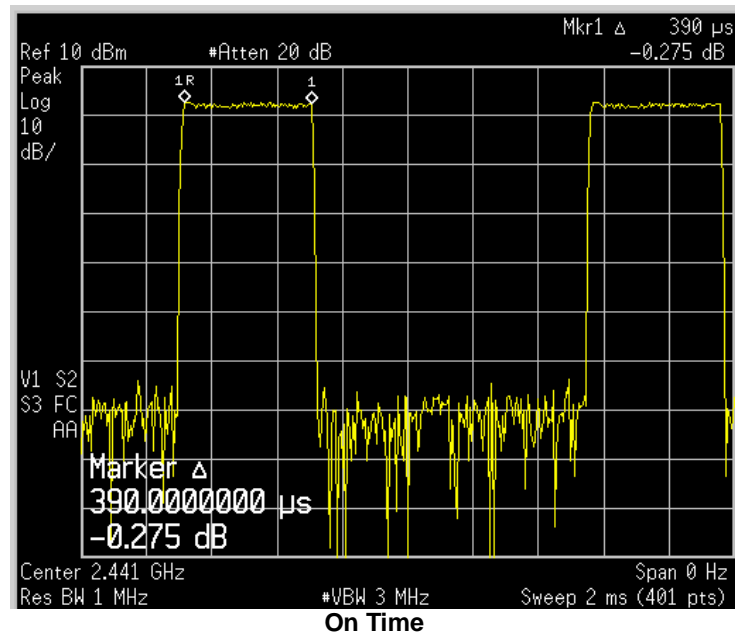


$$\begin{aligned}
 \text{Duty Cycle Factor} &= 20 \log [\text{Total On time} / \text{Period}] \\
 &= 20 \log [(0.395 / 1.255) / 2] \\
 &= \mathbf{-4.03dB}
 \end{aligned}$$

DUTY CYCLE FACTOR COMPUTATION

FCC Part 15.35(c) Duty Cycle Correction Factor

Channel 39 (mid ch)

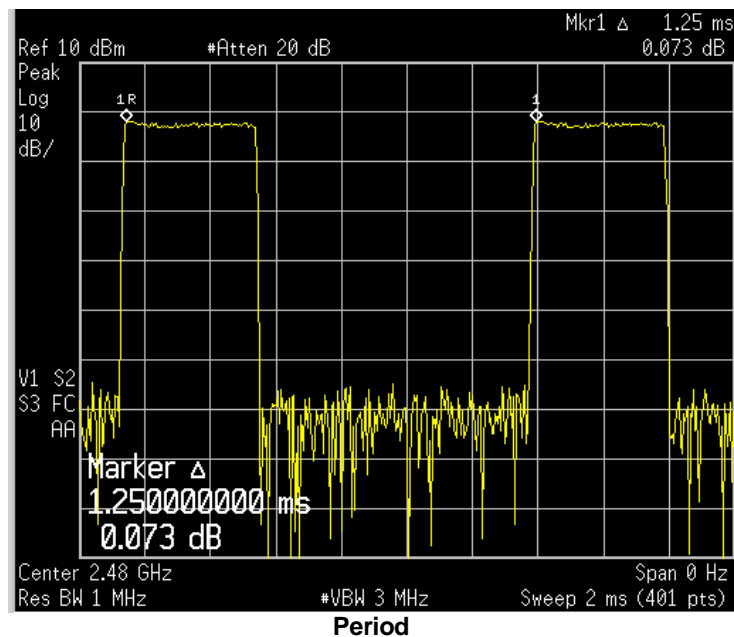
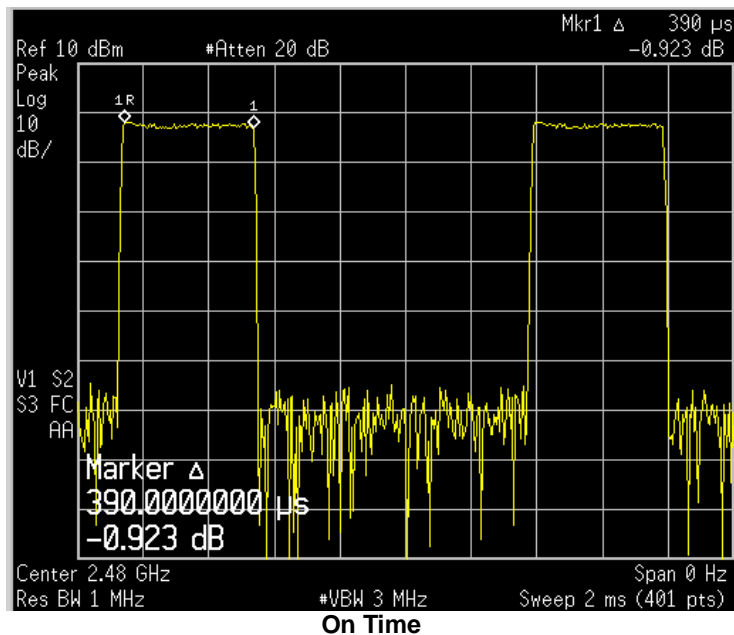


$$\begin{aligned}
 \text{Duty Cycle Factor (worst- case)} &= 20 \log [\text{Total On time} / \text{Period}] \\
 &= 20 \log [(0.390 / 1.25 / 2)] \\
 &= \mathbf{-4.10dB}
 \end{aligned}$$

DUTY CYCLE FACTOR COMPUTATION

FCC Part 15.35(c) Duty Cycle Correction Factor

Channel 78 (high ch)



$$\begin{aligned}
 \text{Duty Cycle Factor (worst- case)} &= 20 \log [\text{Total On time} / \text{Period}] \\
 &= 20 \log [(0.390 / 1.25 / 2)] \\
 &= \mathbf{-4.10dB}
 \end{aligned}$$

Test Report No. S08ICM01442/EMC/01
dated 10 Sep 2008



PSB Singapore

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1. Results of the testing/calibration in the form of a report will be issued immediately after the service has been completed or terminated.
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January 2008

EUT PHOTOGRAPHS / DIAGRAMS

ANNEX A

ANNEX A

EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS / DIAGRAMS

ANNEX A

EUT PHOTOGRAPHS



Front View



Rear View

EUT PHOTOGRAPHS / DIAGRAMS

ANNEX A

EUT PHOTOGRAPHS



Power Adapter Front View



Power Adapter Rear View

EUT PHOTOGRAPHS / DIAGRAMS

ANNEX A

EUT PHOTOGRAPHS

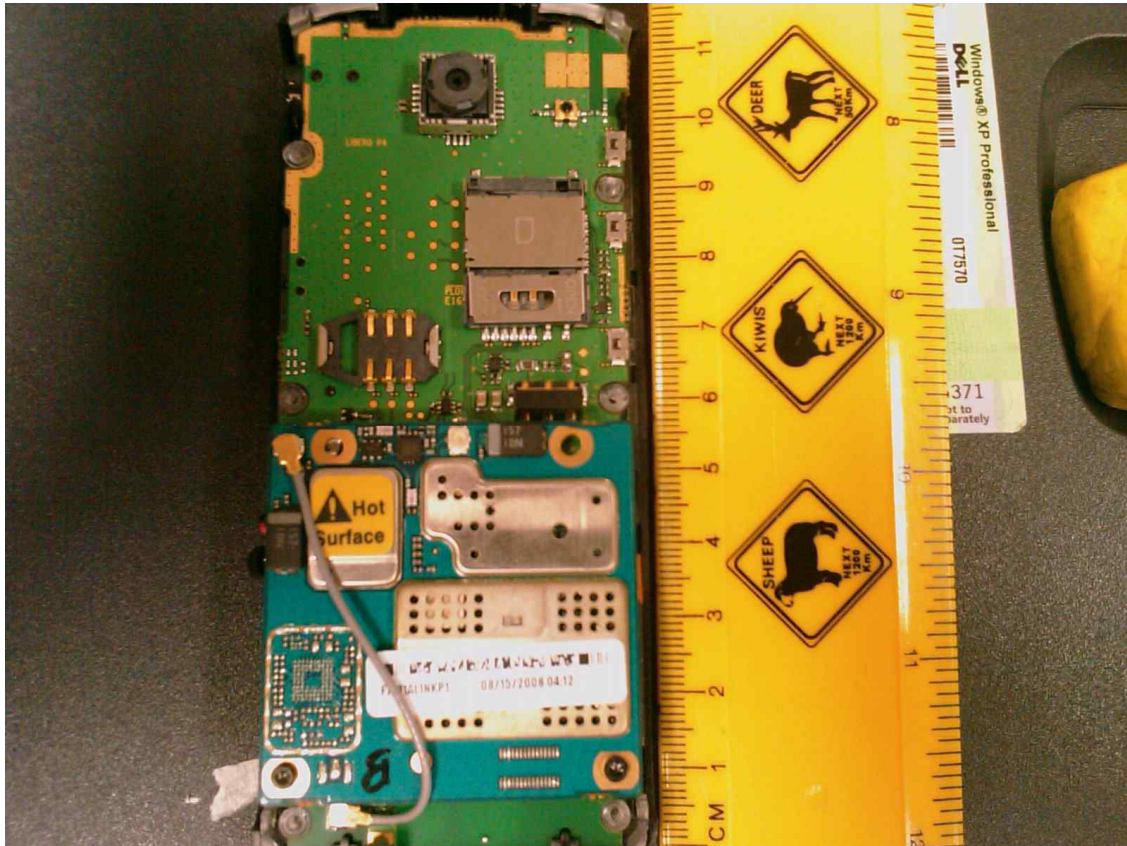


Component Side

EUT PHOTOGRAPHS / DIAGRAMS

ANNEX A

EUT PHOTOGRAPHS



Trace Side

FCC LABEL & POSITION

ANNEX B

ANNEX B

FCC LABEL & POSITION

FCC LABEL & POSITION

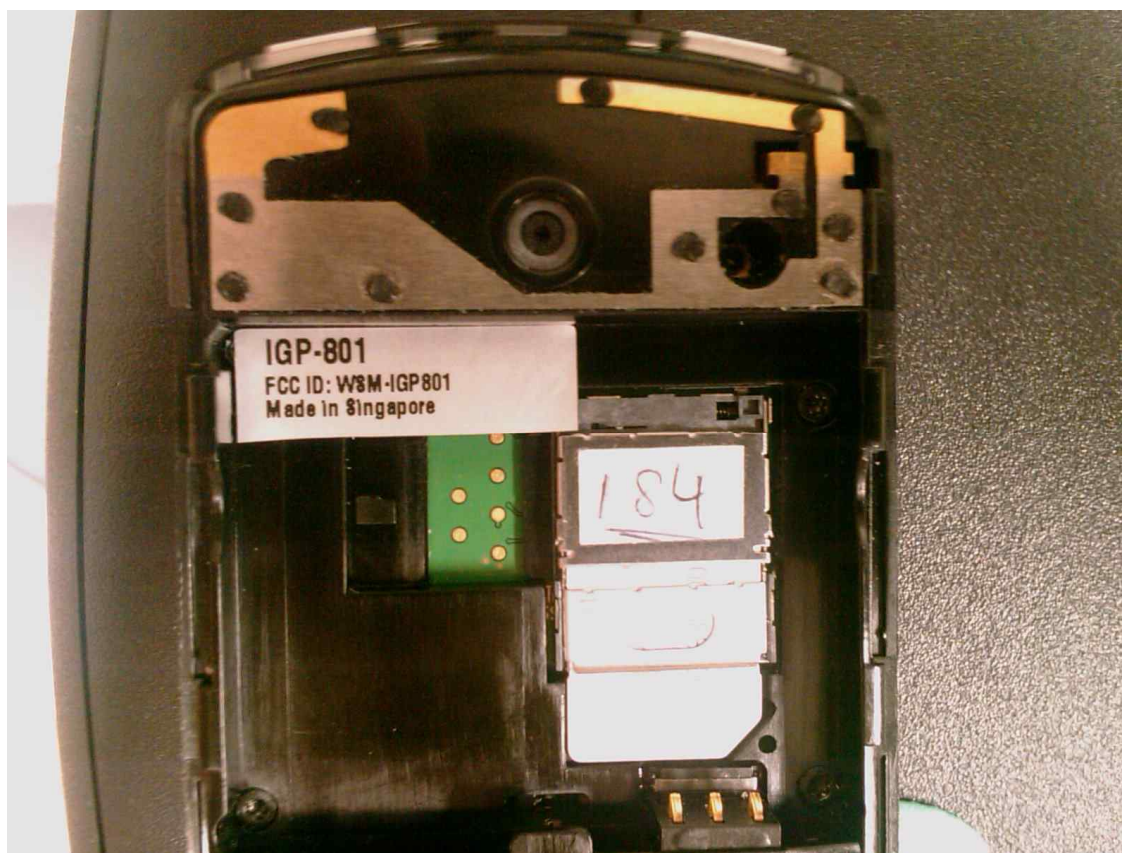
ANNEX B

Labelling requirements per Section 2.925 & 15.19

The label shown will be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.



Sample Label



Physical Location of FCC Label on EUT



**USER MANUAL TECHNICAL DESCRIPTION BLOCK
& CIRCUIT DIAGRAMS**

ANNEX C

ANNEX C

**USER MANUAL
TECHNICAL DESCRIPTION
BLOCK & CIRCUIT DIAGRAMS**
(Please refer to manufacturer for details)