

TEST REPORT

REPORT NUMBER: I08GE7399-FCC-BT

ON

Type of Equipment: Windows Mobile Smart Phone
Type of Designation: Vodafone 1231+
Manufacturer: ZTE CORPORATION

ACCORDING TO
FCC Part 15, FREQUENCY Hopping Spread Spectrum
Transceiver

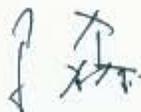
PART 15 subpart C 15.247

China Telecommunication Technology Labs.

Month date, year

Nov, 19, 2008

Signature



Ma Xin

Deputy Director

FCC ID: Q78-VDF1231PLUS

Report Date: 2008-09-19

Test Firm Name: China Telecommunication Technology Labs

Registration Number: 840587

Statement

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported tests were carried out on a sample equipment to demonstrate limited compliance with FCC Parts 15, subpart C 15.247. The sample tested was found to comply with the requirements defined in the applied rules.

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1 General Information

1.1 Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with FCC Parts 15, subpart C 15.247.

The test results of this test report relate exclusively to the item(s) tested as specified in section 2.

The following deviation from, additions to, or exclusions from the test specifications have been made. See Annex B.

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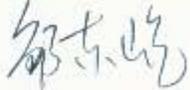
1.2 Testers

Name: An Shaogeng
Position: Engineer
Department: Department of EMC test
Signature: 

Editor of this test report:

Name: Li Guoqing
Position: Engineer
Department: Department of EMC test
Date: 2008-11-19
Signature: 

Technical responsibility for area of testing:

Name: Zou Dongyi
Position: Manager
Department: Department of EMC test
Date: 2008-11-19
Signature: 

1.3 Testing Laboratory information

1.3.1 Location

Name: China Telecommunication Technology Labs.
Address: No. 11, Yue Tan Nan Jie, Xi Cheng District
BEIJING
P. R. CHINA, 100083
Tel: +86 10 68094053
Fax: +86 10 68011404
Email: emc@chinattl.com

1.3.2 Details of accreditation status

Accredited by: China National Accreditation for Laboratory (CNAL)
Registration number: CNAL Registration No.L0570
Standard: ISO/IEC 17025:2005

1.3.3 Test location, where different from section 1.3.1

Name: -----
Street: -----
City: -----
Country: -----
Telephone: -----
Fax: -----
Postcode: -----

1.4 Details of applicant or manufacturer

1.4.1 Applicant

Name: ZTE CORPORATION
Address: ZTE Plaza, Keji Road South, Hi-Tech Industrial
Park, Nanshan District, Shenzhen, Guangdong,
518057, P.R.China
Country: China
Telephone: +86-21-68896840
Fax: +86-21-50701080
Contact: Zhangmin
Telephone: 021-68896835
Email: Zhang.min13@zte.com.cn

1.4.2 Manufacturer (if different from applicant in section 1.4.1)

Name: --
Address: --

1.4.3 Manufactory (if different from applicant in section 1.4.1)

Name: --
Address: --

2 Test Item

2.1 General Information

Manufacturer: ZTE CORPORATION
 Name: Windows Mobile Smart Phone
 Model Number: Vodafone 1231+
 Serial Number: --
 Production Status: Production
 Receipt date of test item: 2008-09-02

2.2 Outline of EUT

E.U.T. is a T Windows Mobile Smart Phone.

2.3 Modifications Incorporated in EUT

The EUT has not been modified from what is described by the brand name and unique type identification stated above.

2.4 Equipment Configuration

Equipment configuration list:

Item	Generic Description	Manufacturer	Type	Serial No.	Remarks
A	Mobile Station	ZTE CORPORATION	Vodafone 1231+	--	None
B	Adapter	ZTE CORPORATION	STC-A22O50U5-A	--	None
C	Battery	ZTE CORPORATION	Li3711T42P3h513 857	--	None
D	Headset	Merry Electronics Ltd Full-Sound Electrical Products.Ltd	HMZ3-C4-OMTP	--	None

Cables:

Item	Cable Type	Manufacturer	Length	Shield	Quantity	Remarks
1	DC cable on Adapter	Unknown	1.8m	No	1	None

2.5 Other Information

- (a) Adaptor information:
 Input: 100-240VAC 200mA
 Output: 5.0V 700mA
- (b) Battery information:
 3.7VDC

3 Summary of Test Results

A brief summary of the tests carried out is shown as following.

	Name of Test	Result
1、	Peak power	Pass
2、	Band edge (conducted)	Pass
3、	Band edge (radiated)	Pass
4、	Frequency separation	Pass
5、	Number of hopping frequency	Pass
6、	Time of occupancy	Pass
7、	Spurious emission (conducted)	Pass
8、	Spurious emission (radiated)	Pass
9、	Power line Conducted Emissions	Pass
Note: none		

4 Test Results

4.1 Peak power

Specifications:	15.247 (b)(3)(i),(ii)and(iii)					
Date of Tests	2008-09-09					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	Fix channel transmit					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Universal Radio Communications Tester	R&S	CMU200	100233	2009-02-22	Normal

Test Setup:

The Universal Radio Communications Tester was used to set the TX channel and power level. The transmitter output is connected to Spectrum analyzer through a coupling.

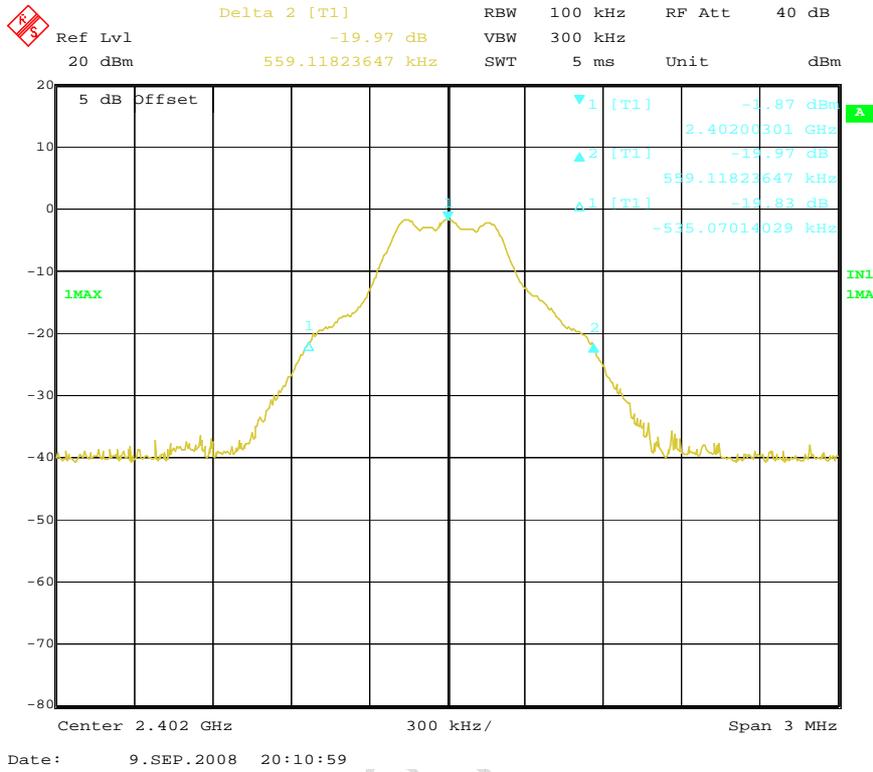
Test Results:

channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Result
0	2402	-1.87	30	Pass
39	2441	0.25	30	Pass
78	2480	-0.08	30	pass

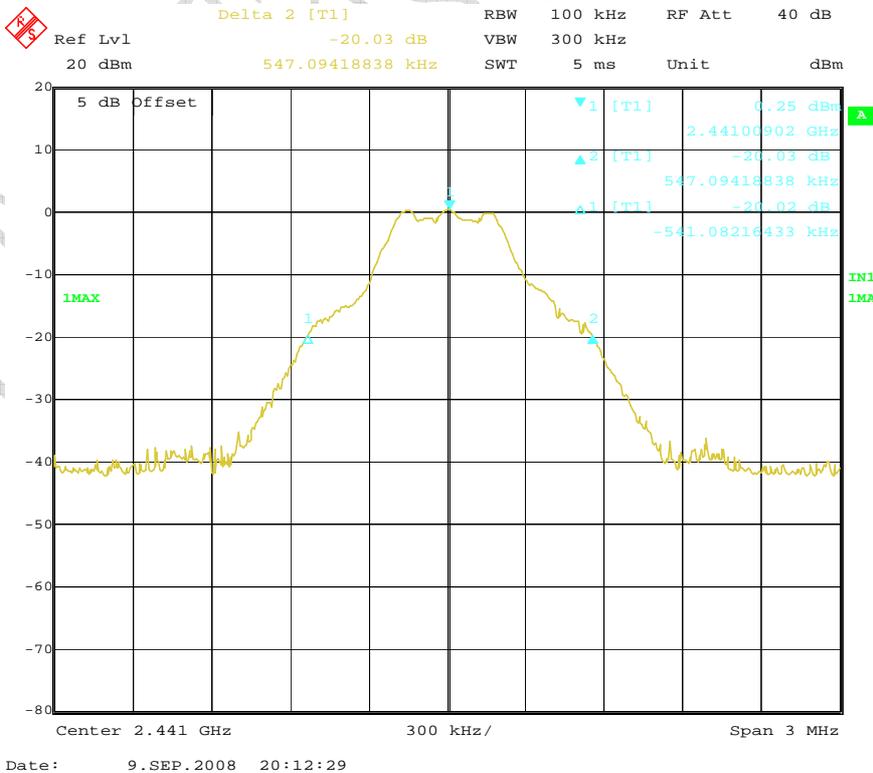
FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-BT

Test Data:
Channel 0:



Channel 39

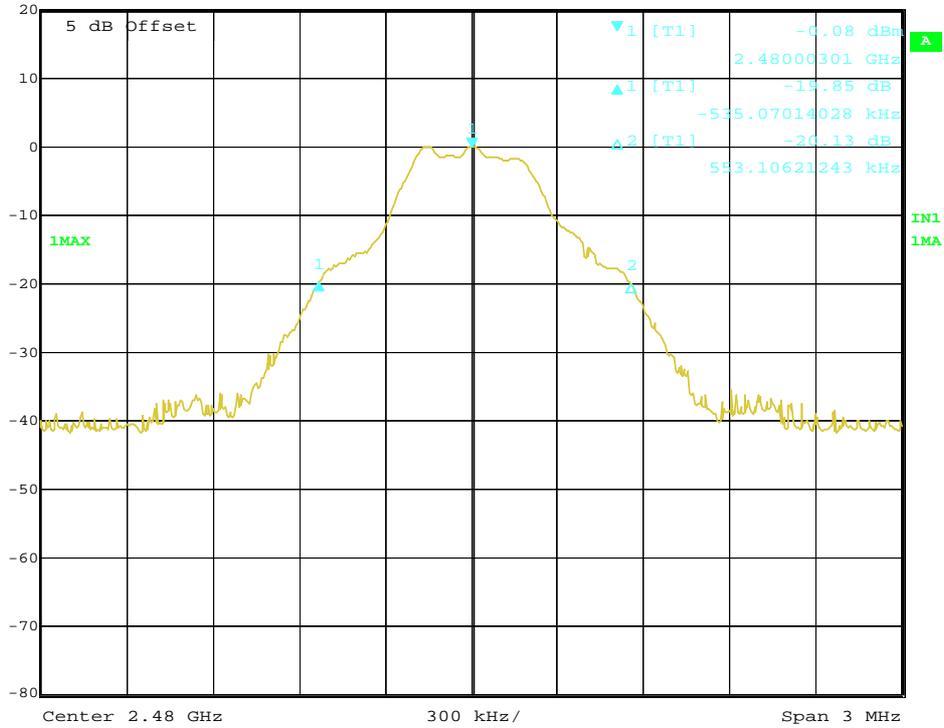


FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-BT

Channel 78

	Delta 1 [T1]	RBW	100 kHz	RF Att	40 dB
	Ref Lvl	-19.85 dB	VBW	300 kHz	
	20 dBm	-535.07014028 kHz	SWT	5 ms	Unit dBm



Date: 9.SEP.2008 20:15:03

CHINATEL LABS

4.2 Band edges (conducted)

Specifications:	15.247 (d)					
Date of Tests	2008-09-09					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	Fix channel transmit					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Universal Radio Communications Tester	R&S	CMU200	100233	2009-02-22	Normal

Test Setup:

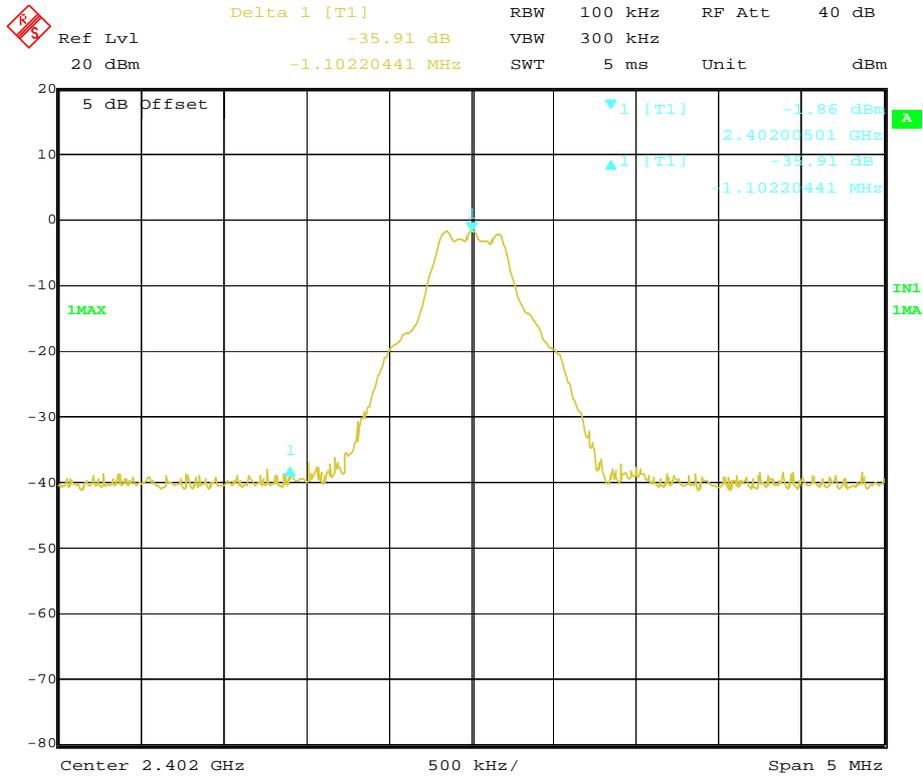
The Universal Radio Communications Tester was used to set the TX channel and power level. The transmitter output is connected to Spectrum analyzer through a coupling.

FCC Parts 15 subpart C 15.247
 Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-BT

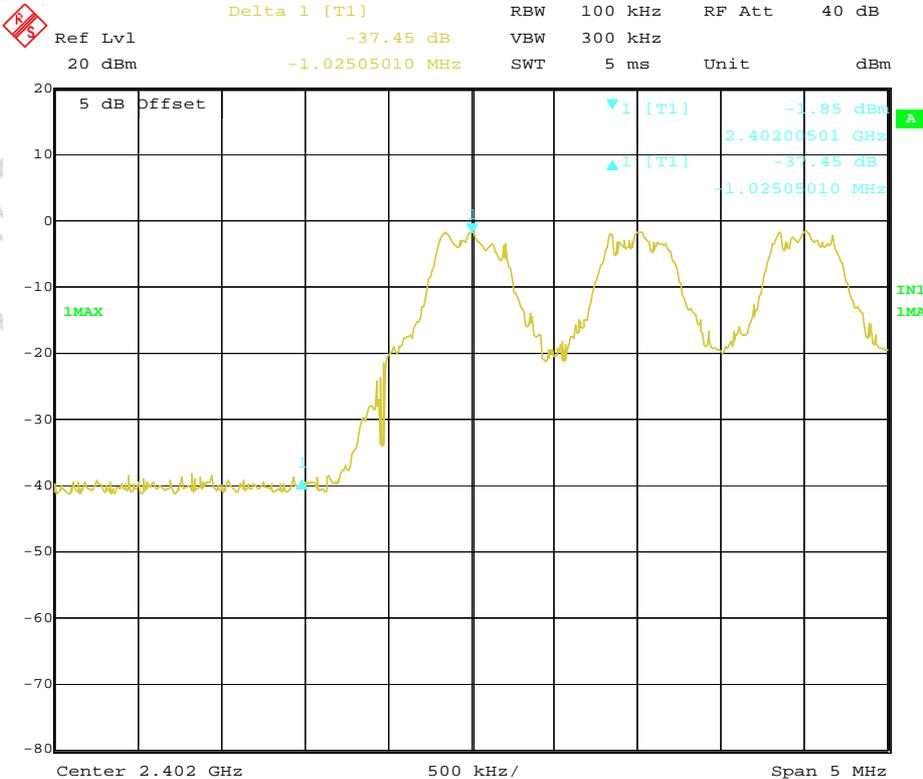
Test data:

Channel 0, fixed mode, left band-edge



Date: 9.SEP.2008 20:47:01

Hopping mode, left band-edge

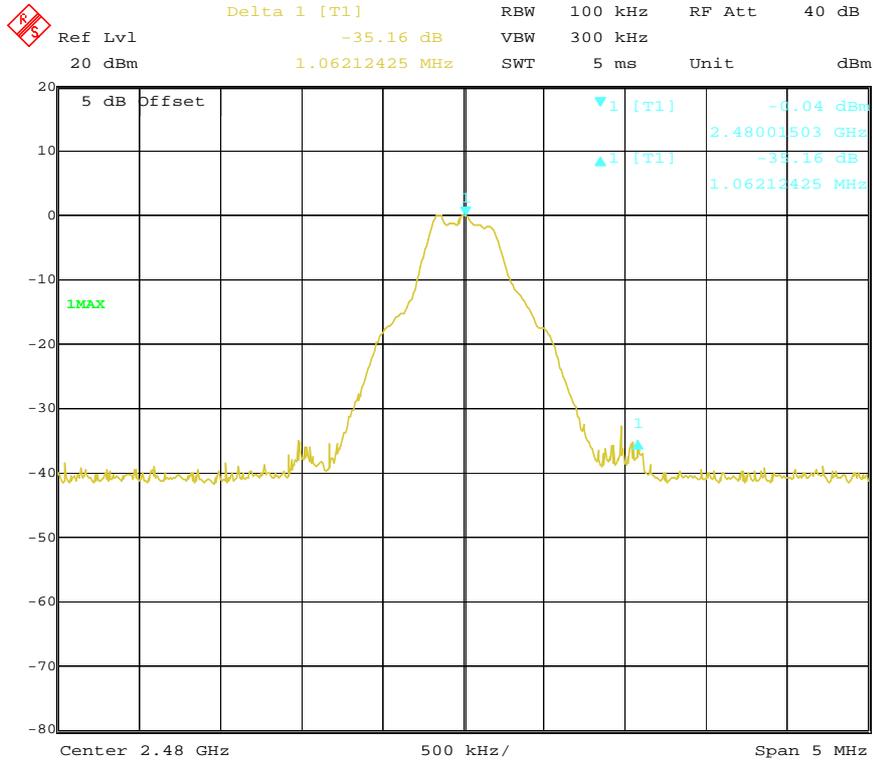


Date: 9.SEP.2008 20:45:15

FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

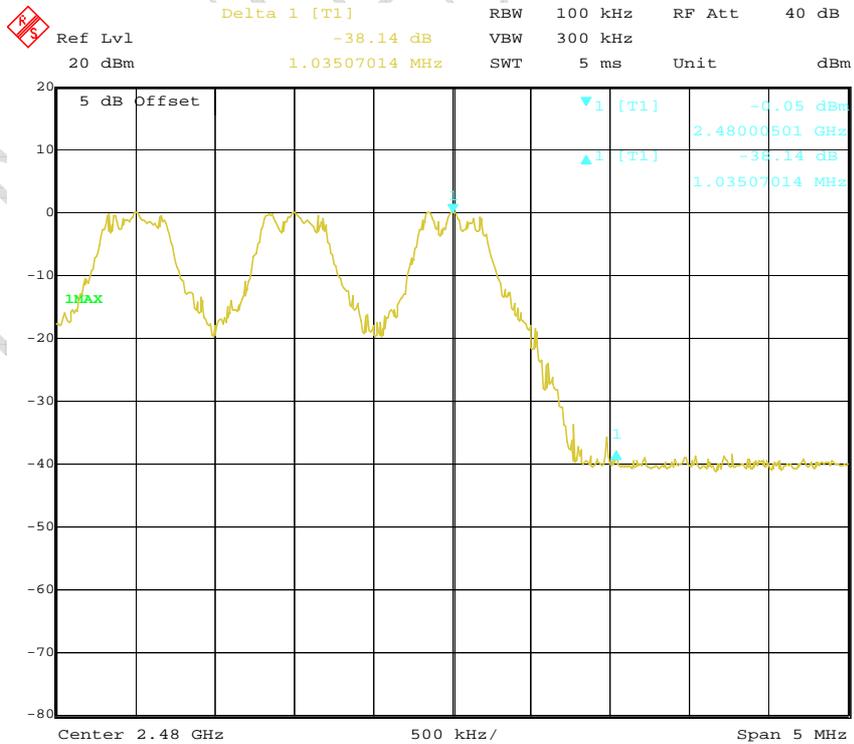
REPORT NO.: I08GE7399-FCC-BT

Channel 78, fixed mode, right band-edge



Date: 9.SEP.2008 20:49:44

Hopping mode, right band-edge



Date: 9.SEP.2008 20:40:54

4.3 Band edges measurement (Radiated)

Specifications:	15.247 (c); 15.205(a) and 15.209(a)					
Date of Tests	2008-09-09					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	Fix channel transmit					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Horn Antenna	R/S	HF906	100037	2010-01-09	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3m	--	2010-11-16	Normal
7330	Universal Radio Communications Tester	R&S	CMU200	100233	2009-02-22	Normal

Test Setup:

The EUT was placed in an anechoic chamber. The Universal Radio Communications Tester was used to set the TX channel and power level. The transmitter output is connected to Spectrum analyzer through a Horn antenna.

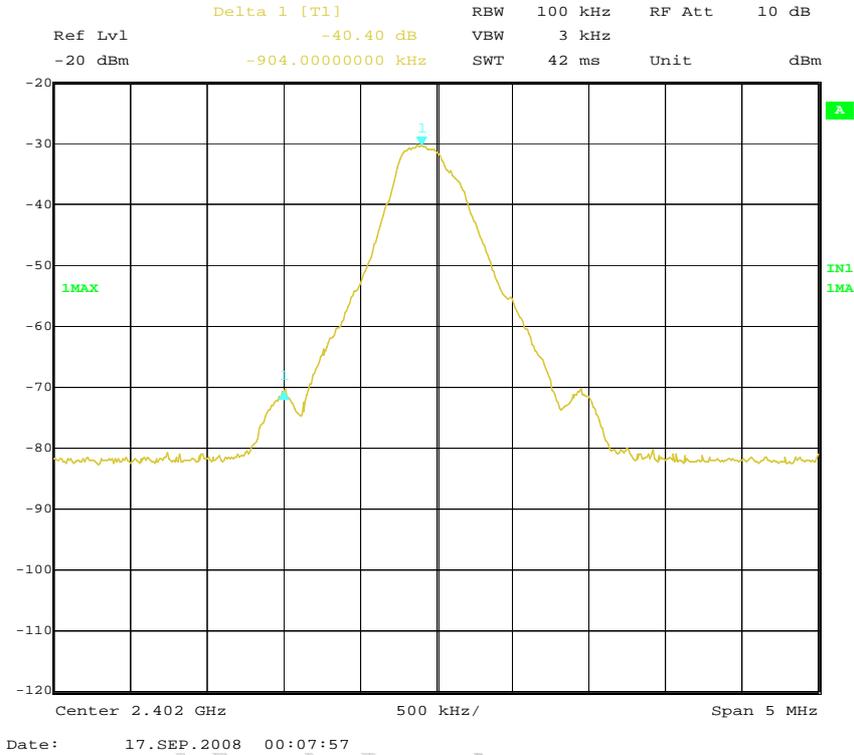
Test method:

Use peak and average detector to measure band edges.
Test should be performing under Vertical and Horizontal modes.

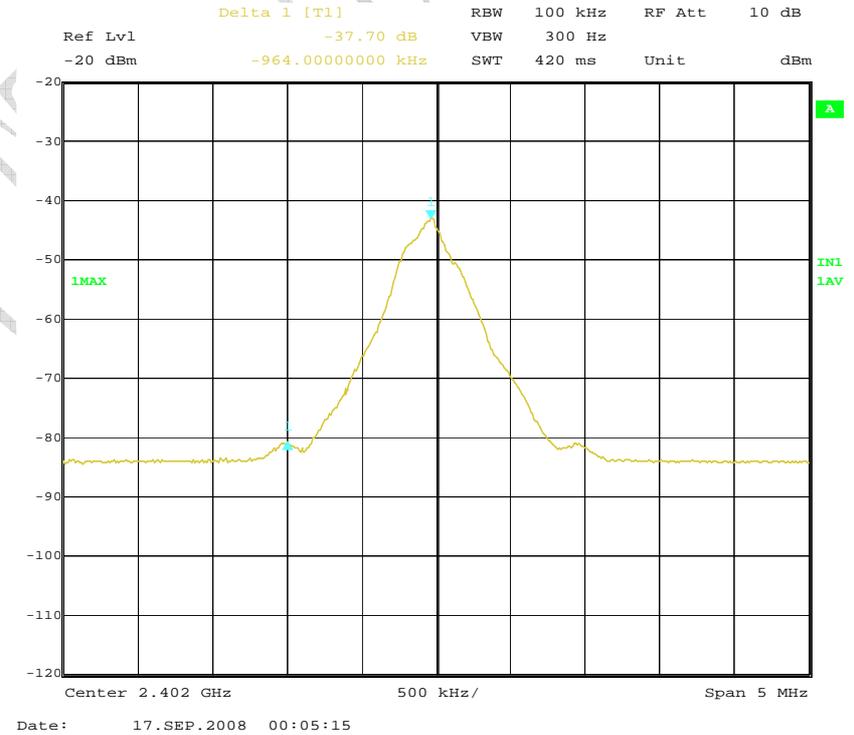
FCC Parts 15 subpart C 15.247
 Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-BT

Test data:
 Channel 0
 Vertical
 Peak mode:



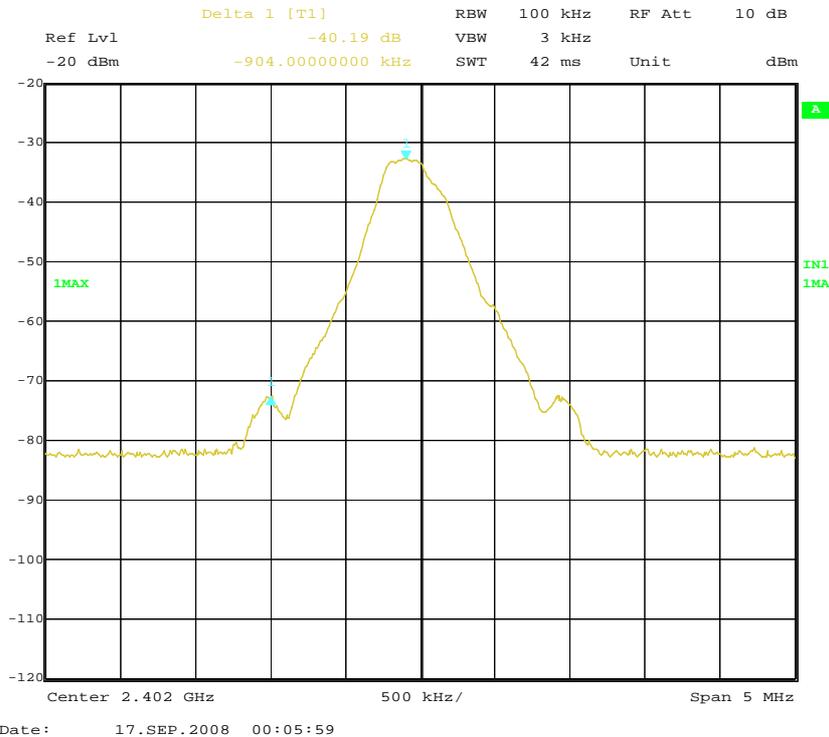
Average mode:



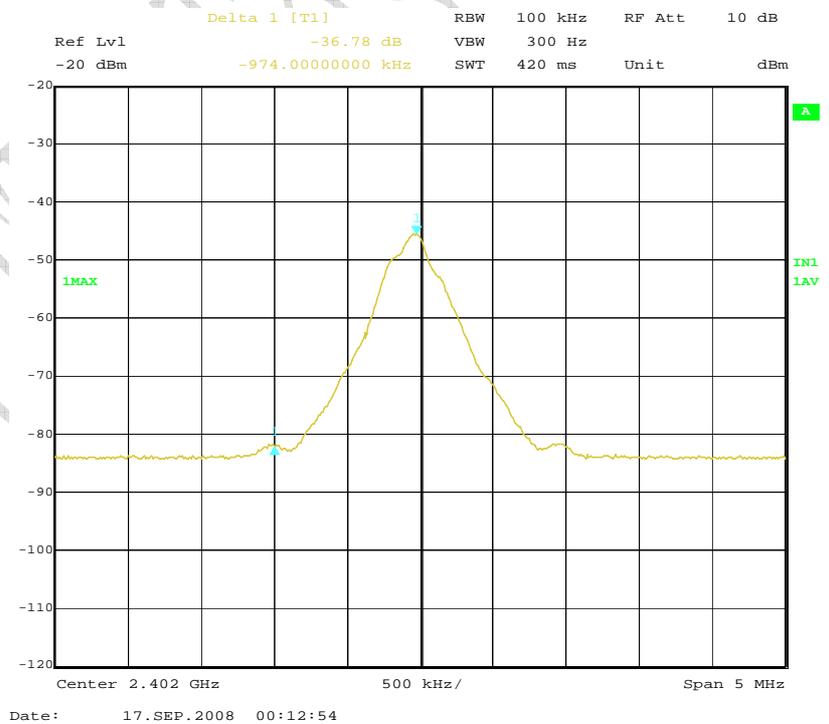
FCC Parts 15 subpart C 15.247
 Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-BT

Channel 0
 Horizontal
 Peak mode:



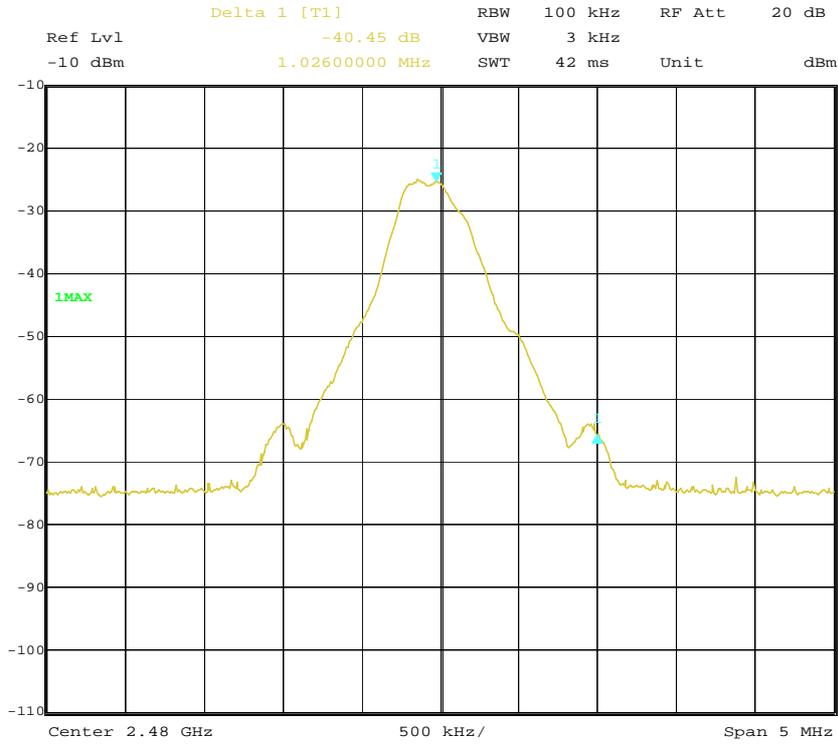
Average mode:



FCC Parts 15 subpart C 15.247
 Equipment: Vodafone 1231+

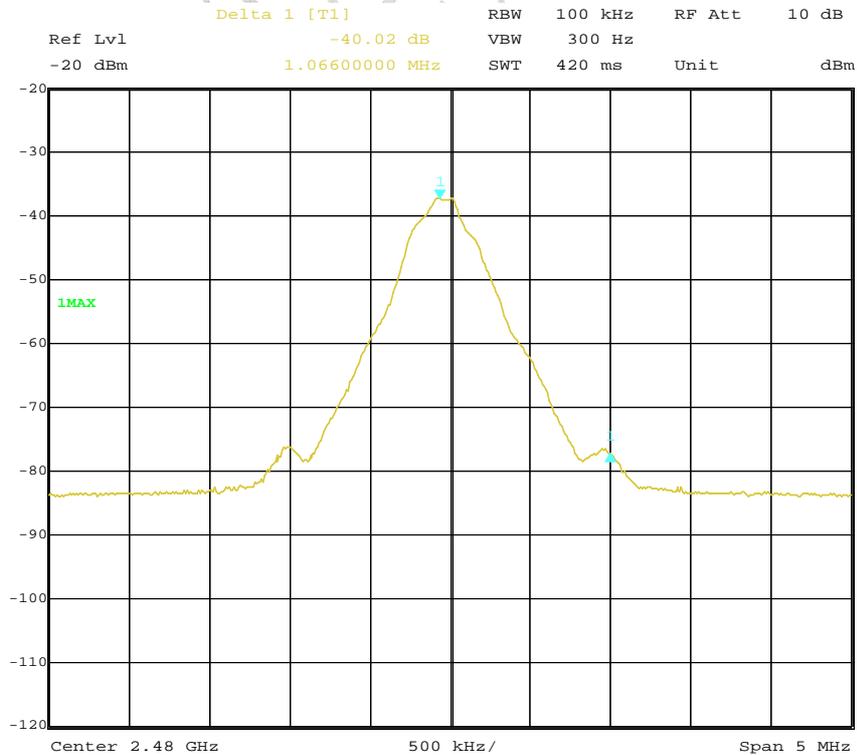
REPORT NO.: I08GE7399-FCC-BT

Channel 78
 Vertical
 Peak mode:



Date: 16.SEP.2008 23:57:05

Average mode:

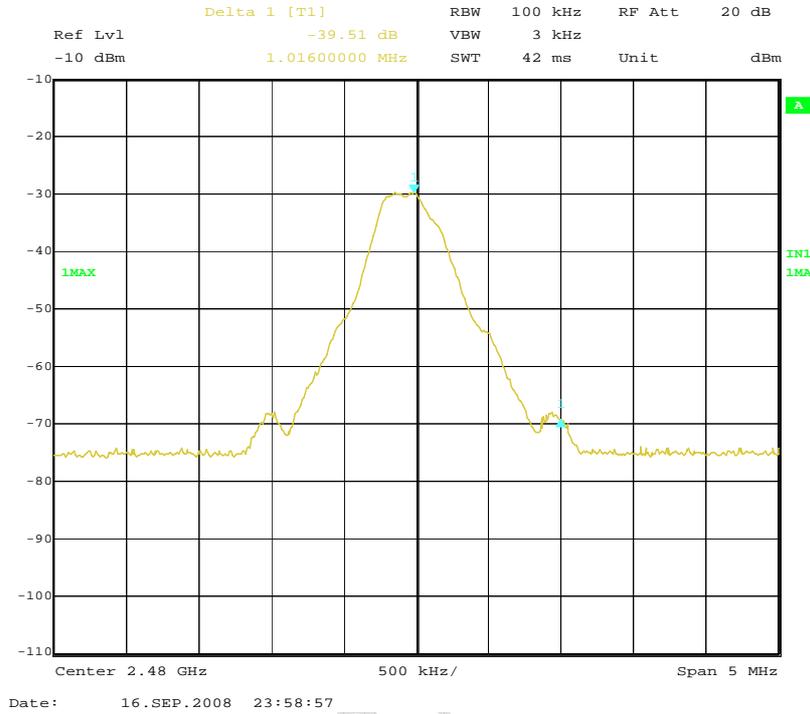


Date: 16.SEP.2008 23:54:52

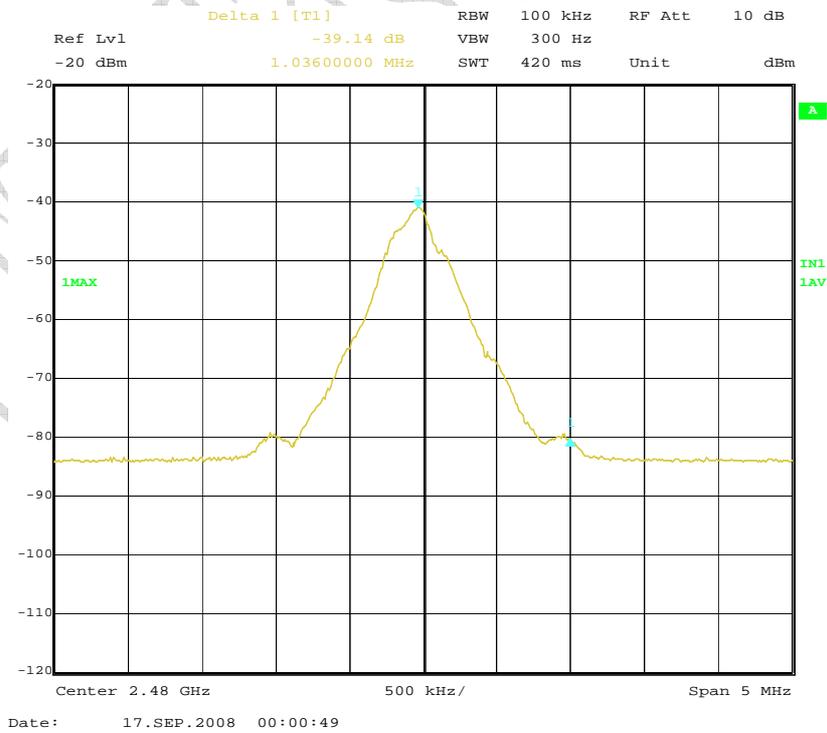
FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-BT

Channel 78
Horizontal
Peak mode:



Average mode:



4.4 Frequency separation

Specifications:	15.247(a)(1)					
Date of Test	2008-09-09					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	Fix channel transmit					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Universal Radio Communications Tester	R&S	CMU200	100233	2009-02-22	Normal

Test Setup

The Universal Radio Communications Tester was used to set the TX channel and power level. The transmitter output is connected to Spectrum analyzer through a coupling.

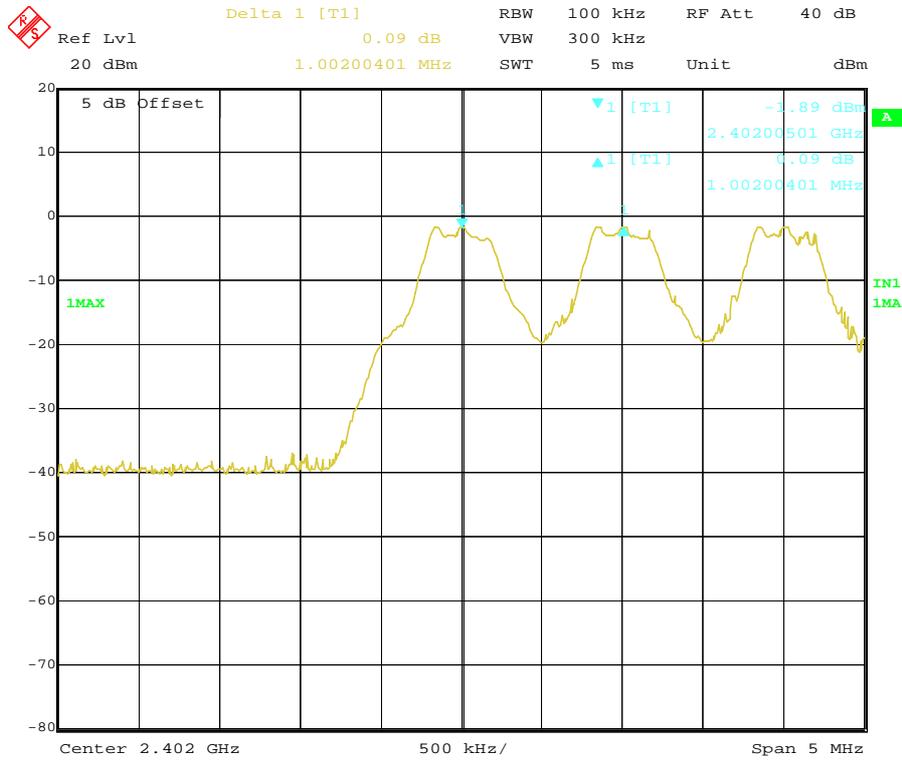
Test Result:

Channel separation (kHz)	20dB Bandwidth (kHz)		Limit (kHz)	Result
1002.00	Ch 0	1094	>25	Pass
	Ch 39	1088	>25	Pass
	Ch 78	1088	>25	Pass

FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

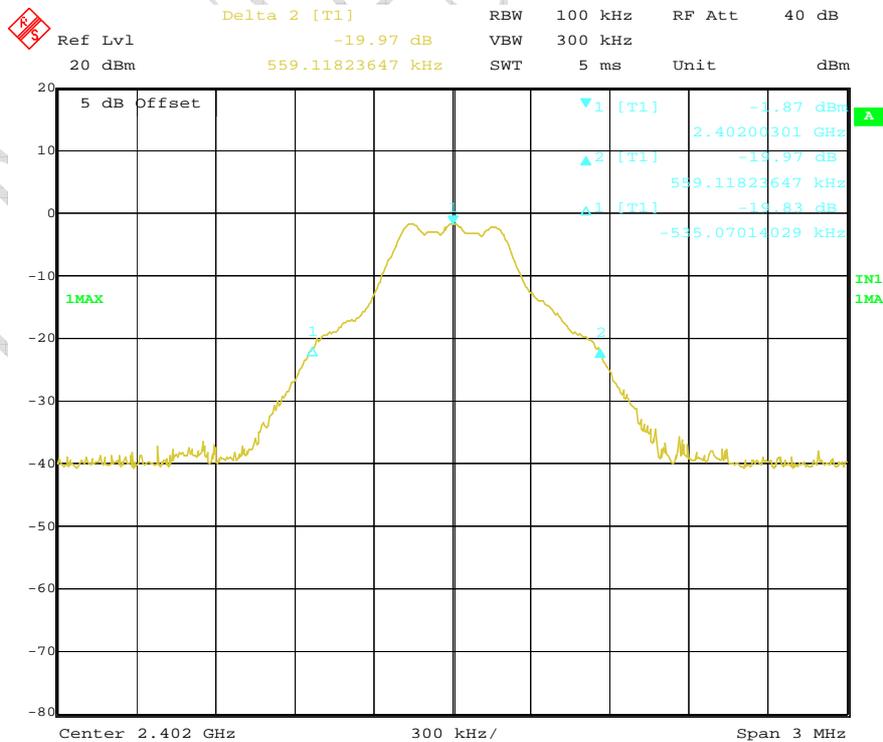
REPORT NO.: I08GE7399-FCC-BT

Test data:
Channel Separation



Date: 9.SEP.2008 20:08:32

20dB Bandwidth (Ch 0)

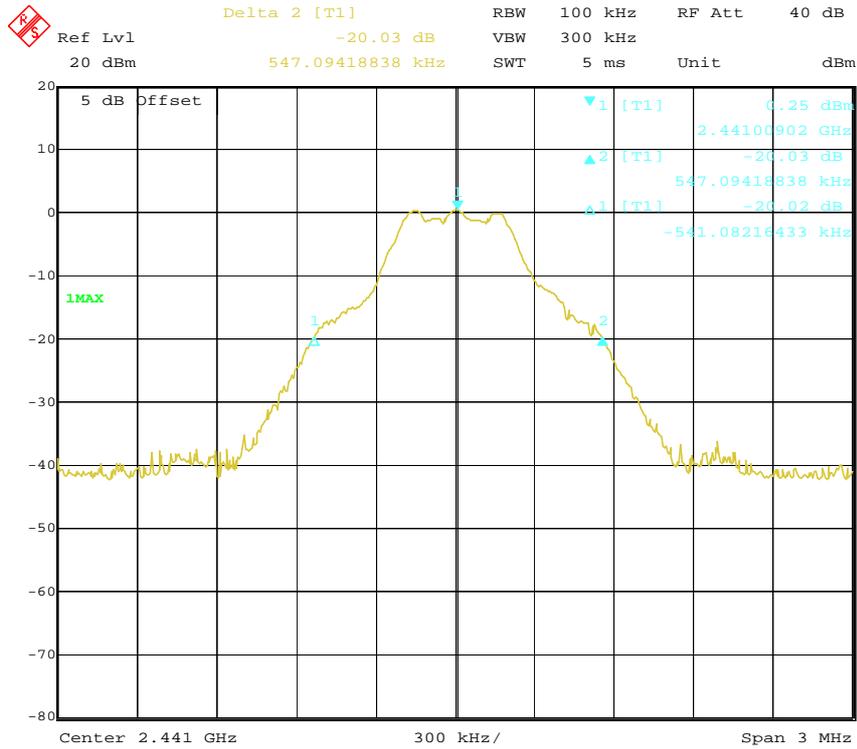


Date: 9.SEP.2008 20:10:59

FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

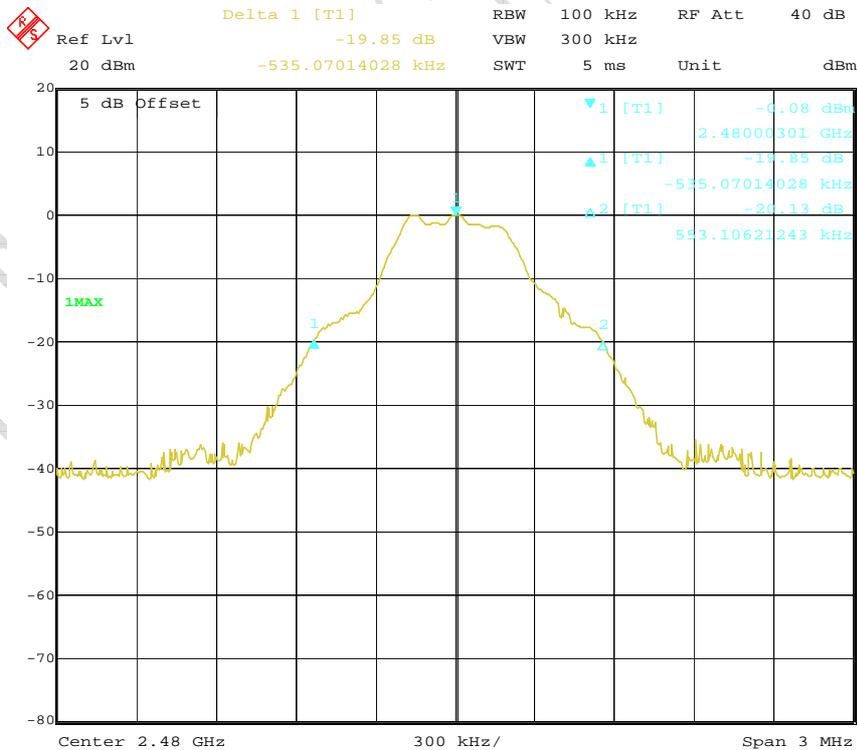
REPORT NO.: I08GE7399-FCC-BT

20dB Bandwidth (Ch 39)



Date: 9.SEP.2008 20:12:29

20dB Bandwidth (Ch 78)



Date: 9.SEP.2008 20:15:03

4.5 Number of hopping frequency

Specifications:	15.247(a)(1)(ii)					
Date of Test	2008-09-09					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	hopping					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Universal Radio Communications Tester	R&S	CMU200	100233	2009-02-22	Normal

Test Setup

The Universal Radio Communications Tester was used to set the TX channel and power level. The transmitter output is connected to Spectrum analyzer through a coupling.

Test Result:

Result (No. of Ch)	Limit (No. of Ch)	Result
79	>75	Pass

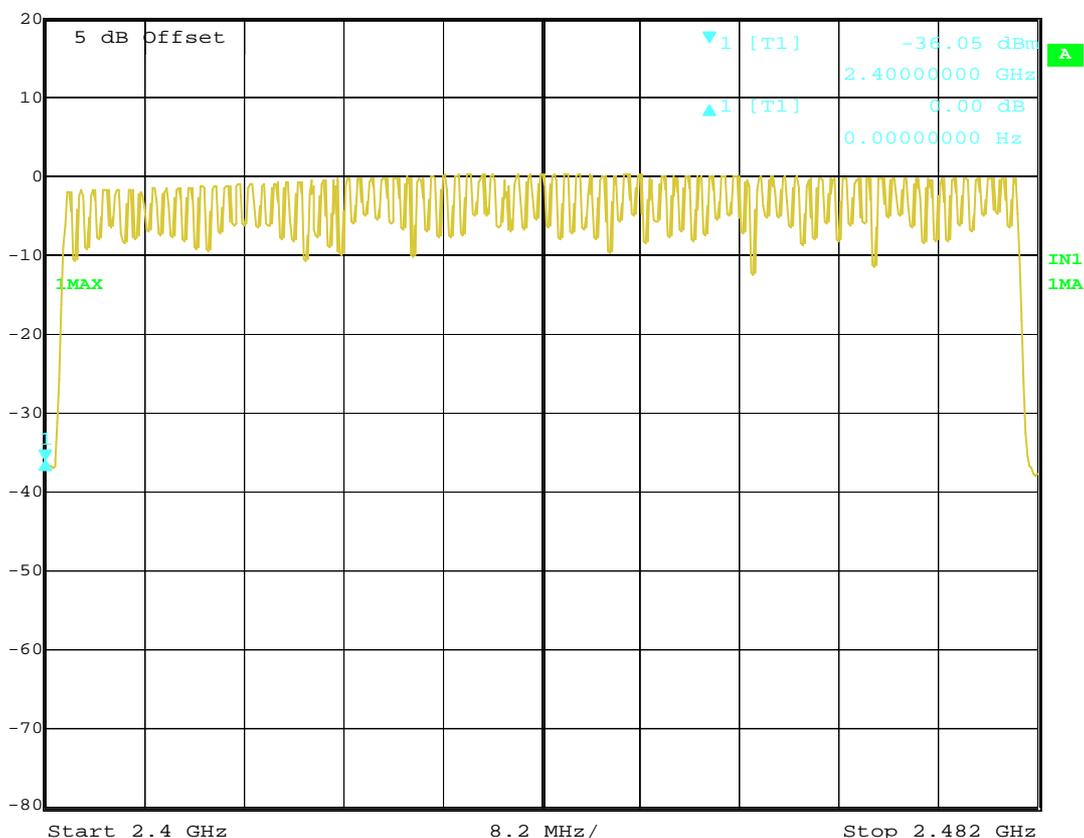
FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-BT

Test data:

Channel Number

	Delta 1 [T1]	RBW	300 kHz	RF Att	40 dB
	Ref Lvl	0.00 dB	VBW	1 MHz	
	20 dBm	0.00000000 Hz	SWT	5 ms	Unit dBm



Date: 9.SEP.2008 20:04:15



4.6 Time of occupancy

Specifications:	15.247(a)(1)(iii)					
Date of Test	2008-09-09					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	Fix channel					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Universal Radio Communications Tester	R&S	CMU200	100233	2009-02-22	Normal

Test Setup

The Universal Radio Communications Tester was used to set the TX channel and power level. The transmitter output is connected to Spectrum analyzer through a coupling.

Test Result:

Function for DH5:

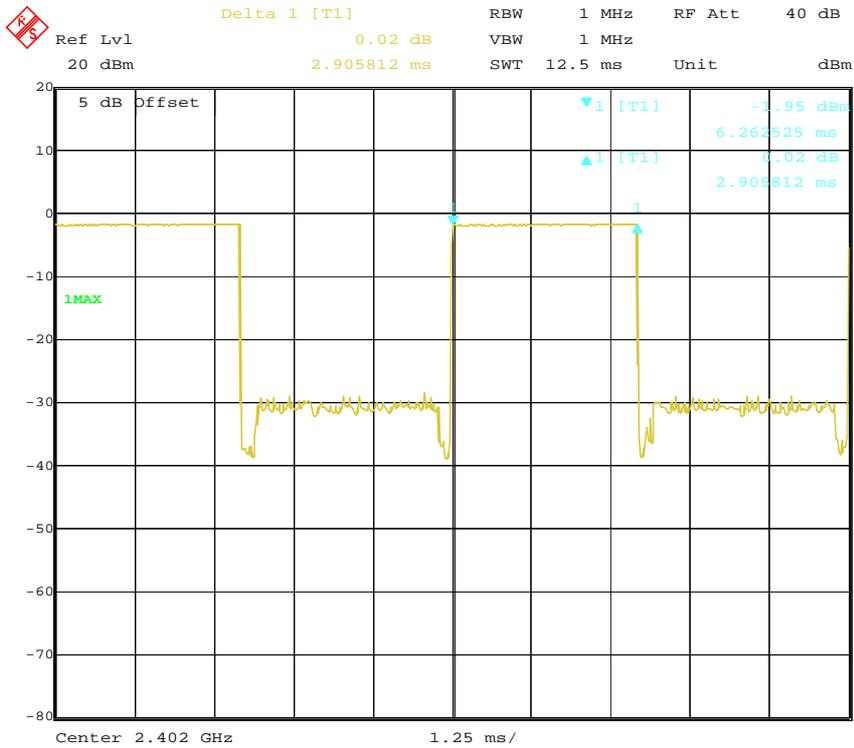
$$\text{Total Dwell Time} = \text{pulsetime} \times \left(\frac{1600}{6}\right) / 79 \times 31.6$$

Channel	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
0	2.906	309.97	31.6	400	Pass
39	2.906	309.97	31.6		Pass
78	2.906	309.97	31.6		Pass

FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

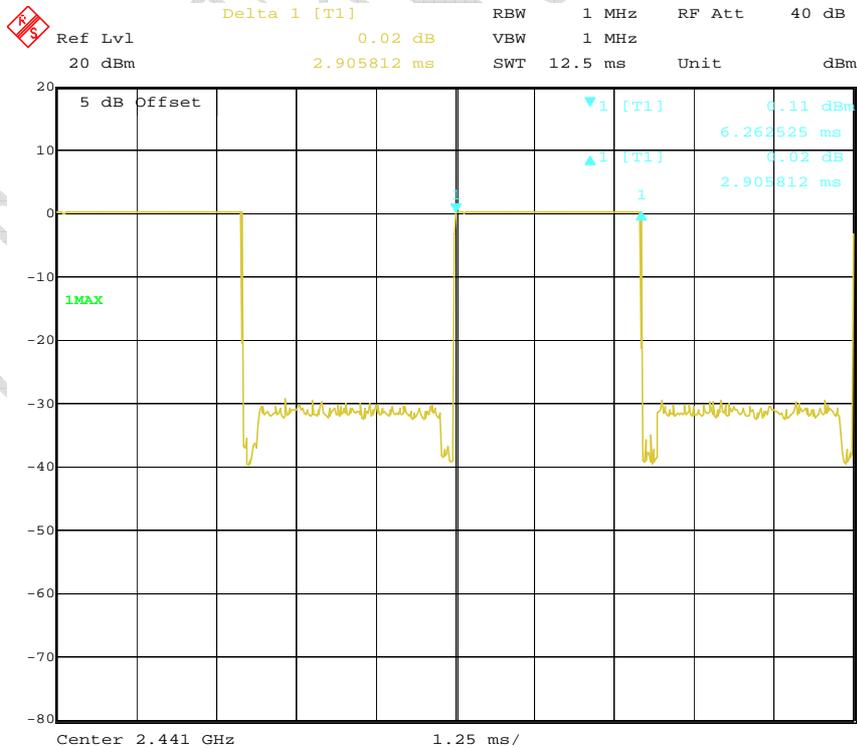
REPORT NO.: I08GE7399-FCC-BT

Test data:
Channel 0



Date: 9.SEP.2008 19:55:16

Channel 39

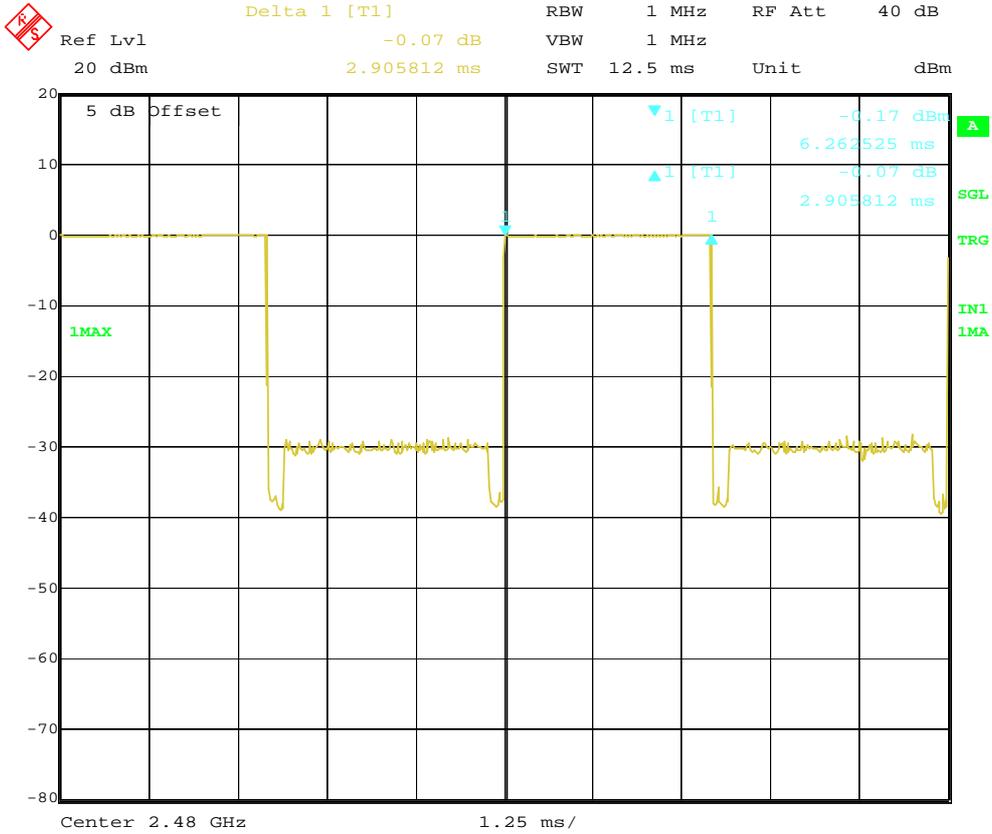


Date: 9.SEP.2008 19:53:47

FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-BT

Channel 78



Date: 9.SEP.2008 19:53:13

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4.7 Spurious Measurement (Conducted)

Specifications:	15.209(a) and 15.205(a)					
Date of Test	2008-09-09					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	Fix channel transmit					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Universal Radio Communications Tester	R&S	CMU200	100233	2009-02-22	Normal

Test Setup

The Universal Radio Communications Tester was used to set the TX channel and power level. The transmitter output is connected to Spectrum analyzer through a coupling.

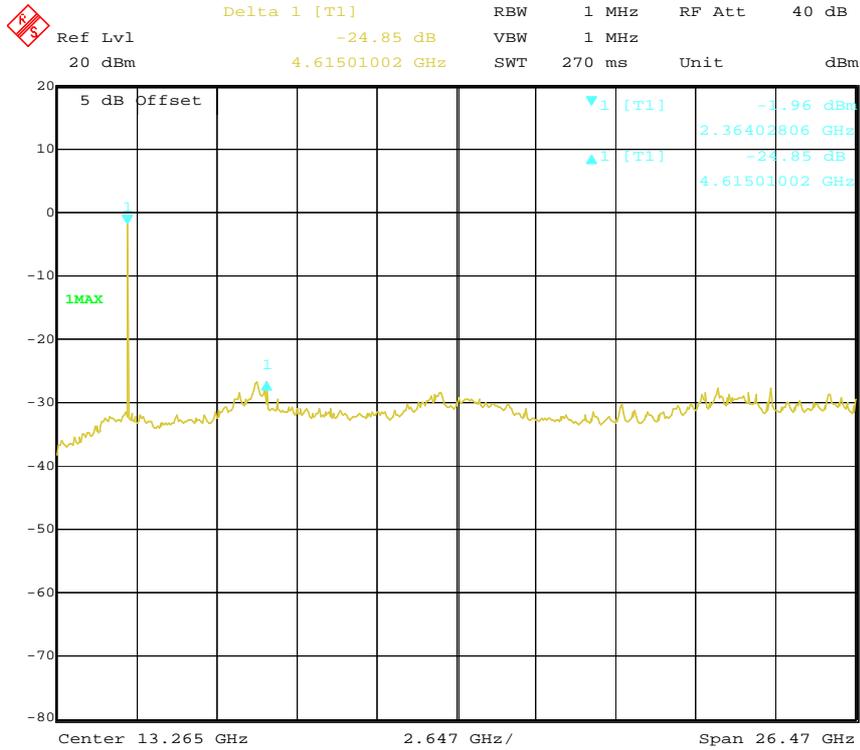
Test Result:

Channel	Result
0	Pass
39	Pass
78	Pass

FCC Parts 15 subpart C 15.247
Equipment: Vodafone 1231+

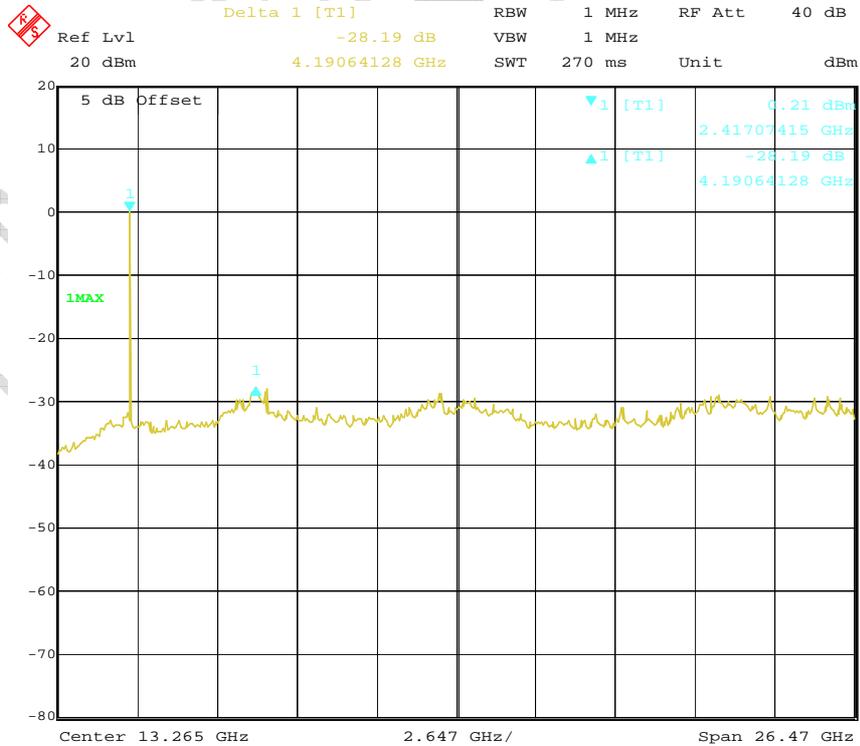
REPORT NO.: I08GE7399-FCC-BT

Test data:
Channel 0



Date: 9.SEP.2008 19:45:57

Channel 39

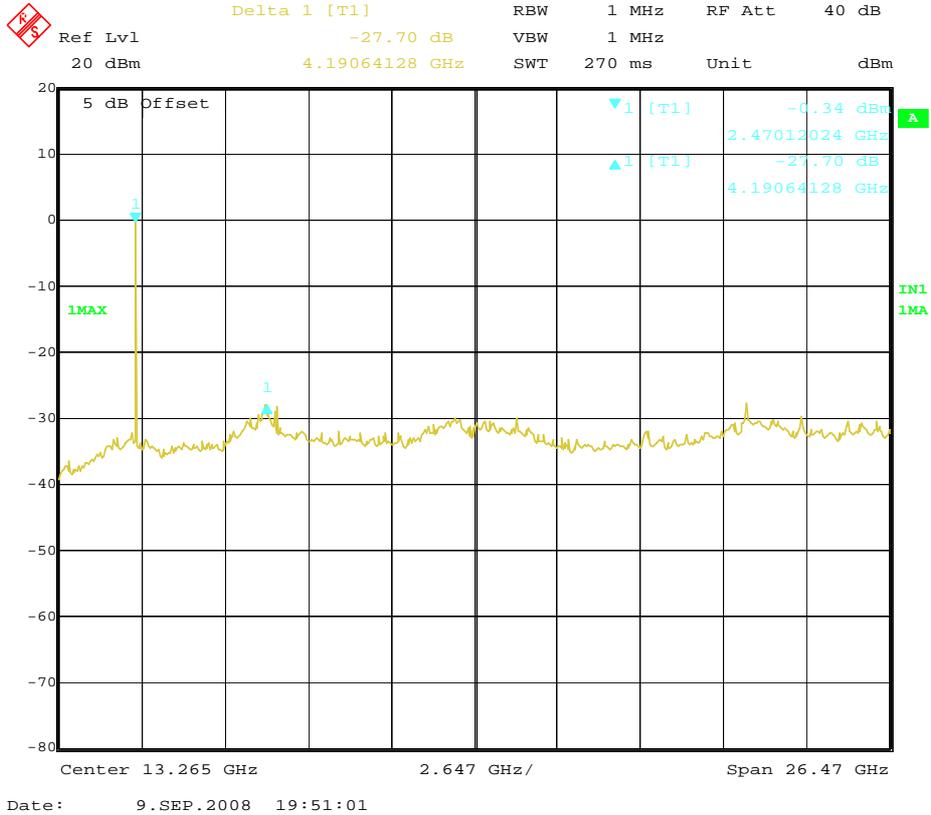


Date: 9.SEP.2008 19:48:07

FCC Parts 15 subpart C 15.247
 Equipment: Vodafone 1231+

REPORT NO.: I08GE7399-FCC-BT

Channel 78



TTL TEST

4.8 Radiated Spurious Measurement

Specifications:	15.209(a) and 15.205(a)					
Date of Test	2008-09-12					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	hopping					
Test Results:	Fix channel transmit					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
713	Fully-Anechoic Chamber	ETS	11.8m×6.5m×6.3 m	--	2010-11-16	Normal
7330	Universal Radio Communications Tester	R&S	CMU200	100233	2009-02-22	Normal

Test Setup

The EUT was placed in an anechoic chamber. The CMU 200 was used to set the TX channel and power level. The transmitter output is connected to Spectrum analyzer through a Bilog antenna (for frequency under 1GHz) or a horn antenna (for frequency above 1GHz).

Limit:

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test result:
9kHz-30MHz

There is No frequency exceeds and near limit line in 20dB scope blow.

30MHz-1GHz:

Frequency [MHz]	Level [dBuV/m]	Limit [dBuV/m]	Antenna height [cm]	Turntable azimuth [degree]	Antenna polarization [V/H]
43.860000	22.30	40	103	316	VERTICAL
87.600000	20.80	40	172	98	VERTICAL
937.620000	26.20	46	183	333	VERTICAL

Note: --

Above 1GHz:

Channel 0:

Frequency[GHz]	Level[dBuV/m]	Limit[dBuV/m]	Antenna Polarization[V/H]	Detector
--	--	--	--	Peak
--	--	--	--	Average

Channel 39:

Frequency[GHz]	Level[dBuV/m]	Limit[dBuV/m]	Antenna Polarization[V/H]	Detector
--	--	--	--	Peak
--	--	--	--	Average

Channel 78:

Frequency[GHz]	Level[dBuV/m]	Limit[dBuV/m]	Antenna Polarization[V/H]	Detector
--	--	--	--	Peak
--	--	--	--	Average

Note:

1. Test from 1GHz up to 10th harmonic of operating frequency.
2. 2.4~2.4835GHz band is the operating frequency.

4.9 Power line Conducted Emissions

Specifications:	ANSI C63.4 voltage mains test					
Date of Test	2008-09-11					
Test conditions:	Ambient Temperature: 15°C-35°C Relative Humidity: 30%-60% Air pressure: 86-106kPa					
Operation Mode	Hopping					
Test Results:	Pass					
Test equipment Used:						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Cal Due	State
7805	EMI Test Receiver	R/S	ESI26	100211	2009-01-03	Normal
7330	Artificial Mains Network	R/S	ESH2-Z5	837480/002	2009-01-9	Normal
714	Shielding Room	ETS	--	19003	2010-11-16	Normal
7330	Universal Radio Communications Tester	R&S	CMU200	100233	2009-02-22	Normal

Test Setup

The EUT was placed in a shielding room. The Universal Radio Communications Tester was used to set the TX channel and power level. The ac adapter output is connected to Spectrum analyzer through an AMN (Artificial Mains Network).

Limits of the conducted disturbance at the AC mains ports:

Frequency range	Limit(Quasi-peak)	Limit(Average)
0.15 MHz to 0.5 MHz	66 dBµV – 56 dBµV	56 dBµV – 46 dBµV
>0.5 MHz to 5MHz	56 dBµV	46 dBµV
>5 MHz to 30 MHz	60 dBµV	50 dBµV

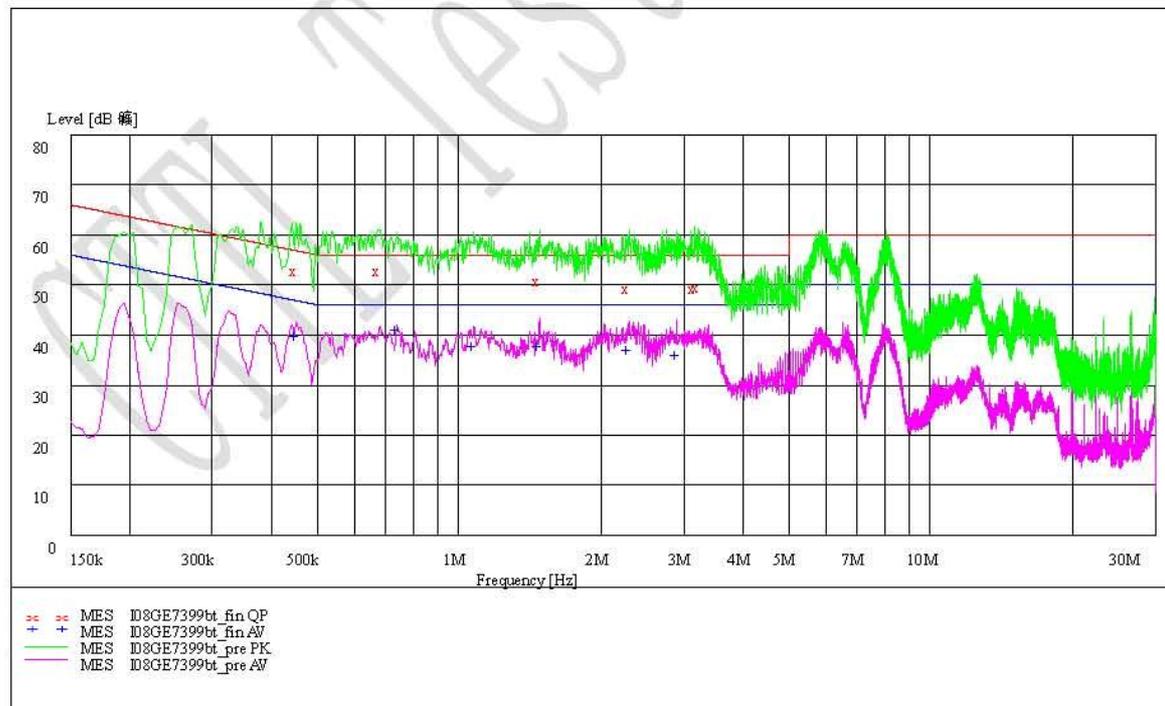
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

Test Result:

Pass					
Detector (QP/AV)	Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Line	PE
QP	0.451500	55.40	57	L1	FLO
QP	0.676500	55.30	56	N	FLO
QP	1.482000	53.40	56	L1	FLO
QP	2.292000	51.70	56	L1	FLO
QP	3.165000	51.90	56	L1	FLO
QP	3.232500	52.10	56	L1	FLO
AV	0.451500	42.10	47	L1	FLO
AV	0.739500	43.50	46	L1	FLO
AV	1.077000	40.10	46	L1	FLO
AV	1.482000	40.20	46	L1	FLO
AV	2.292000	39.40	46	L1	FLO
AV	2.895000	38.50	46	L1	FLO

Remarks: No frequency exceeds the limit.

Test data:



Annex A EUT Photos



Front view



Back view



Adaptor



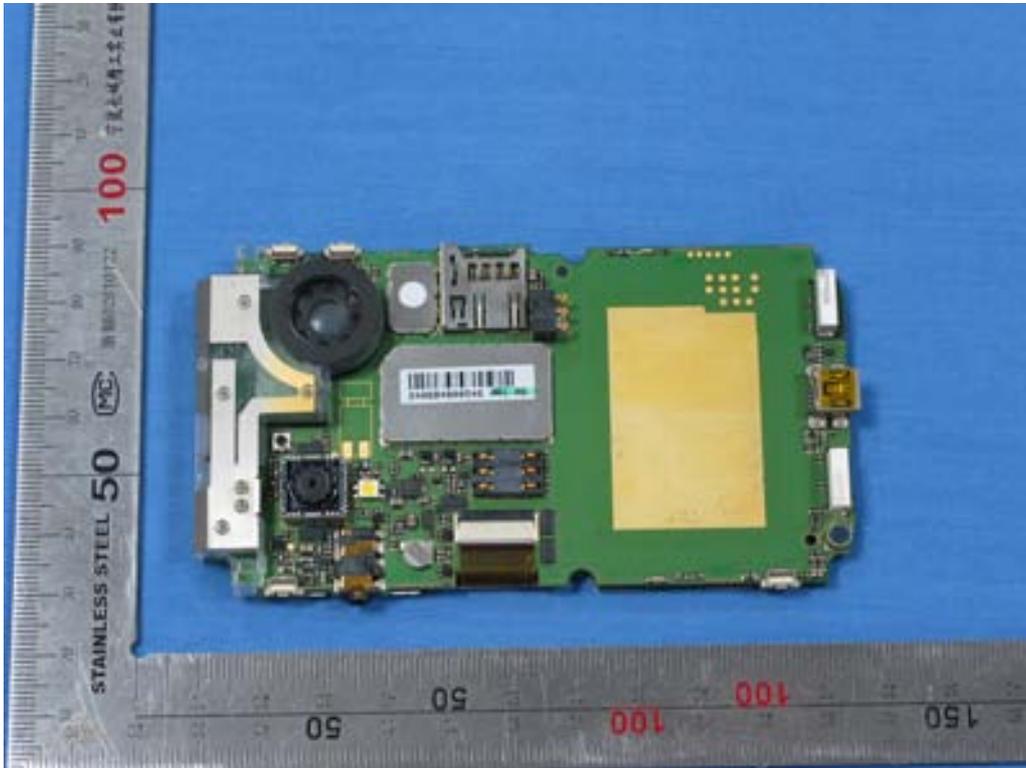
Battery



Earphone

TTL TEST

Annex B Internal Photos



Main board (face)



Main board (back)

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

————— **The End of this Report** —————

China Test Report