

EMC

TEST REPORT

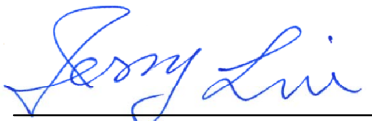
Report No. : EME-060111
Model No. : 36207, 36207,
MB6207, 4313382
Issued Date : Feb. 20, 2006

Applicant : SENTON Enterprises Limited
Flat 10, 17/F., Fotan Ind. Centre, 26-28 Au Pui Wan St.,
Fo Tan, Shatin, N. T. Hong Kong

Test By : Intertek Testing Services Taiwan Ltd.
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
Shiang-Shan District, Hsinchu City, Taiwan

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Project Engineer



Jerry Liu

Reviewed By



Kevin Chen

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Summary of Tests**Cordless Phone -Model: 36207
FCC ID: PEG36207**

Test	Reference	Results
Power Line Conducted Emission test	15.207	Complies
Radiated Emission test	15.249(c), 15.209	Complies

1. General information**1.1 Identification of the EUT**

Applicant	: SENTON Enterprises Limited
Product	: Cordless Phone
Model No.	: 36207
FCC ID.	: PEG36207
Frequency Range (Base)	: 2403.05MHz ~ 2405.00MHz
Frequency Range (Handset)	: 2474.00MHz ~ 2475.95MHz
Channel Number	: 40 channels
Frequency of Each Channel (Base)	: 2402.55MHz + 0.05k MHz k=0~39
Frequency of Each Channel (Handset)	: 2474MHz + 0.05k MHz k=0~39
Type of Modulation	: FM
Power Supply (Base)	: 120Vac, 60Hz with adapter (U090020D)
Power Supply (Handset)	: 3.6Vdc Battery
Power Cord	: N/A
Sample Received	: RJ-11 unshielded cable 10meter × 1
Sample Received	: Jan. 25, 2006
Test Date(s)	: Jan. 27, 2006 ~ Feb. 17, 2006

A DoC report has been generated for the client.

1.2 Additional information about the EUT

The EUT is a Cordless Phone; it consists of handset unit and base unit.

The models listed below are identical to model 36207 (EUT).
Different brand serves as marking strategy.

Trade Name	Model Number
Unical	36207
Bell Phone	36207
Moutain Bell	MB6207
Nexxtech	4313382

For more detail features, please refer to User's manual as file name "Users Manual.pdf"

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : 0dBi max

Antenna Type : Soldering antenna

Connector Type : Lead Wire

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.	FCC ID
Exchange Board	Teltone	250-00193-07	94948	FCC DoC Approved
Telephone	TENTEL	K-903S	0514000941	FCC DoC Approved

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Paragraph 15.249 for non-spread spectrum devices.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

During radiated emission test, the EUT was operated in continuously transmitting. The EUT was operated in charging and ringing mode in conducted emission test.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	04/17/2006
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	08/07/2006
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	07/24/2006
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	EC365	11/01/2006
Horn Antenna	EMCO	1GHz~18GHz	3115	EC338	08/16/2007
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	EC351	07/08/2007
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	EC368	02/19/2007
Pre-Amplifier	MITEQ	100MHz~26.5GHz	919981	EC373	12/29/2007
Pre-Amplifier	MITEQ	26GHz~40GHz	828825	EC374	1/27/2006
Controller	HDGmbH	N/A	HD 100	EP317-1	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP317-2	N/A
Turn Table	HDGmbH	N/A	DS 420S	EP317-3	N/A
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	01/12/2007

Note: The above equipments are within the valid calibration period.

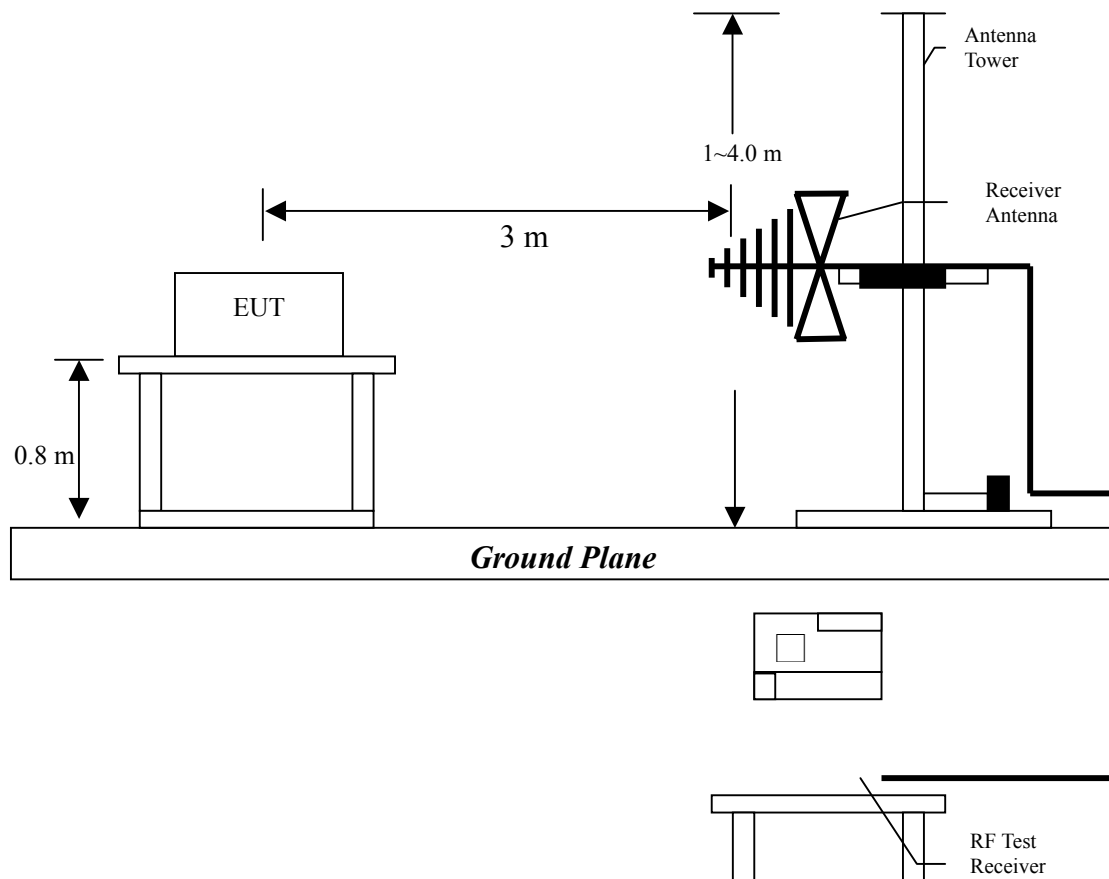
3. Radiated emission test FCC 15.249 (C)

3.1 Operating environment

Temperature: 23 °C
Relative Humidity: 56 %
Atmospheric Pressure: 1023 hPa

3.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



The signal is maximized through rotation and placement in the three orthogonal axes. Radiated emissions were investigated cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report. The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

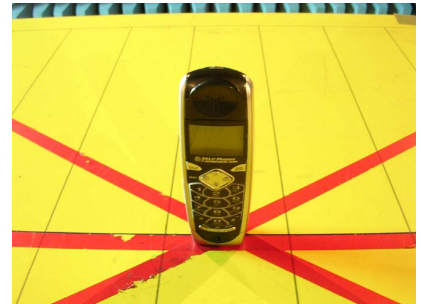
This test was verified at three orthogonal axes, and the test configuration was listed below:



Setup 1



Setup 2



Setup 3

After verifying three axes, the worst case was occurred at setup 1 configuration. The final test was executed under this configuration and recorded in this report.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

3.3 Emission limit

3.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m@3m)	(dBuV/m@3m)	(uV/m@3m)	(dBuV/m@3m)
2400-2483.5	50	94	500	54

3.3.2 General radiated emission limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

Frequency MHz	15.209 Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.

Expanded uncertainty (k=2) of radiated emission measurement is ± 4.98 dB.

3.4 Radiated spurious emission test data

3.4.1 Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under continuously transmitting mode. Channel 1, 40 were verified. The worst case occurred at Tx channel 1.

EUT : 36207
 Test Unit : Base
 Worst Case : Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
90.150	QP	V	7.38	6.75	14.13	43.50	-29.38	151	208
286.140	QP	V	13.70	0.98	14.68	46.00	-31.33	201	15
414.170	QP	V	16.47	3.51	19.98	46.00	-26.02	100	171
557.720	QP	V	19.53	2.25	21.78	46.00	-24.22	161	126
712.980	QP	V	22.29	2.64	24.93	46.00	-21.08	100	158
796.350	QP	V	23.19	11.84	35.03	46.00	-10.97	158	305
55.240	QP	H	14.11	9.51	23.62	40.00	-16.39	204	212
88.270	QP	H	9.45	7.51	16.96	43.50	-26.55	100	157
235.610	QP	H	11.74	1.24	12.98	46.00	-33.02	157	198
493.710	QP	H	18.64	1.98	20.62	46.00	-25.38	108	206
652.710	QP	H	21.52	2.3	23.82	46.00	-22.19	149	111
759.520	QP	H	23.02	2.87	25.89	46.00	-20.11	258	352

Remark:

1. Corrected Level = Reading Level + Correction Factor

2. Correction Factor = Antenna Factor + Cable Loss

The test was performed on EUT under continuously transmitting mode. Channel 1, 40 were verified. The worst case occurred at Tx channel 1.

EUT : 36207
Test Unit : Handset
Worst Case : Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
41.620	QP	V	12.38	7.24	19.62	40.00	-20.39	100	254
88.270	QP	V	8.50	6.88	15.38	43.50	-28.13	142	174
392.810	QP	V	16.40	2.17	18.57	46.00	-27.43	204	57
800.240	QP	V	23.29	7.64	30.93	46.00	-15.07	217	106
827.340	QP	V	23.62	9.14	32.76	46.00	-13.24	107	309
912.770	QP	V	24.32	10.14	34.46	46.00	-11.55	210	114
88.240	QP	H	9.45	7.22	16.67	43.50	-26.84	205	101
154.270	QP	H	13.60	6.07	19.67	43.50	-23.83	147	289
173.610	QP	H	13.48	5.61	19.09	43.50	-24.42	233	151
633.340	QP	H	21.55	2.97	24.52	46.00	-21.49	252	214
827.310	QP	H	24.04	9.04	33.08	46.00	-12.93	100	52
903.100	QP	H	24.59	3.24	27.83	46.00	-18.18	181	107

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss

3.5 Measurement results: frequency above 1GHz

EUT : 36207

Test Unit : Base

Test Condition : Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
2403.050	PK	V	30.31	33.04	63.35	114	-50.65	114	316
2403.050	AV	V	30.31	27.83	58.14	94	-35.86	114	316
2403.050	PK	H	30.31	32.99	63.3	114	-50.7	138	330
2403.050	AV	H	30.31	27.7	58.01	94	-35.99	138	330

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:

1GHz-3GHz: 20dBuV

3GHz-14GHz: 27dBuV

14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV

3GHz-14GHz: 16dBuV

14GHz-26.5GHz: 28dBuV

EUT : 36207

Test Unit : Base

Test Condition : Tx at channel 40

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
2405.000	PK	V	30.31	32.2	62.51	114	-51.49	115	318
2405.000	AV	V	30.31	26.72	57.03	94	-36.97	115	318
2405.000	PK	H	30.31	32.15	62.46	114	-51.54	138	333
2405.000	AV	H	30.31	26.9	57.21	94	-36.79	138	333

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:

1GHz-3GHz: 20dBuV

3GHz-14GHz: 27dBuV

14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV

3GHz-14GHz: 16dBuV

14GHz-26.5GHz: 28dBuV

EUT : 36207
Test Unit : Handset
Test Condition : Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
2474.000	PK	V	30.31	40.97	71.28	114	-42.72	143	162
2474.000	AV	V	30.31	39.52	69.83	94	-24.17	143	162
2474.000	PK	H	30.31	50.74	81.05	114	-32.95	101	317
2474.000	AV	H	30.31	50.24	80.55	94	-13.45	101	317

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:

1GHz-3GHz: 20dBuV

3GHz-14GHz: 27dBuV

14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV

3GHz-14GHz: 16dBuV

14GHz-26.5GHz: 28dBuV

EUT : 36207
Test Unit : Handset
Test Condition : Tx at channel 40

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
2475.950	PK	V	30.31	40.46	70.77	114	-43.23	142	162
2475.950	AV	V	30.31	38.82	69.13	94	-24.87	142	162
2475.950	PK	H	30.31	50.16	80.47	114	-33.53	101	318
2475.950	AV	H	30.31	49.47	79.78	94	-14.22	101	318

Remark:

1. Corrected Level = Reading Level + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:

1GHz-3GHz: 20dBuV

3GHz-14GHz: 27dBuV

14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV

3GHz-14GHz: 16dBuV

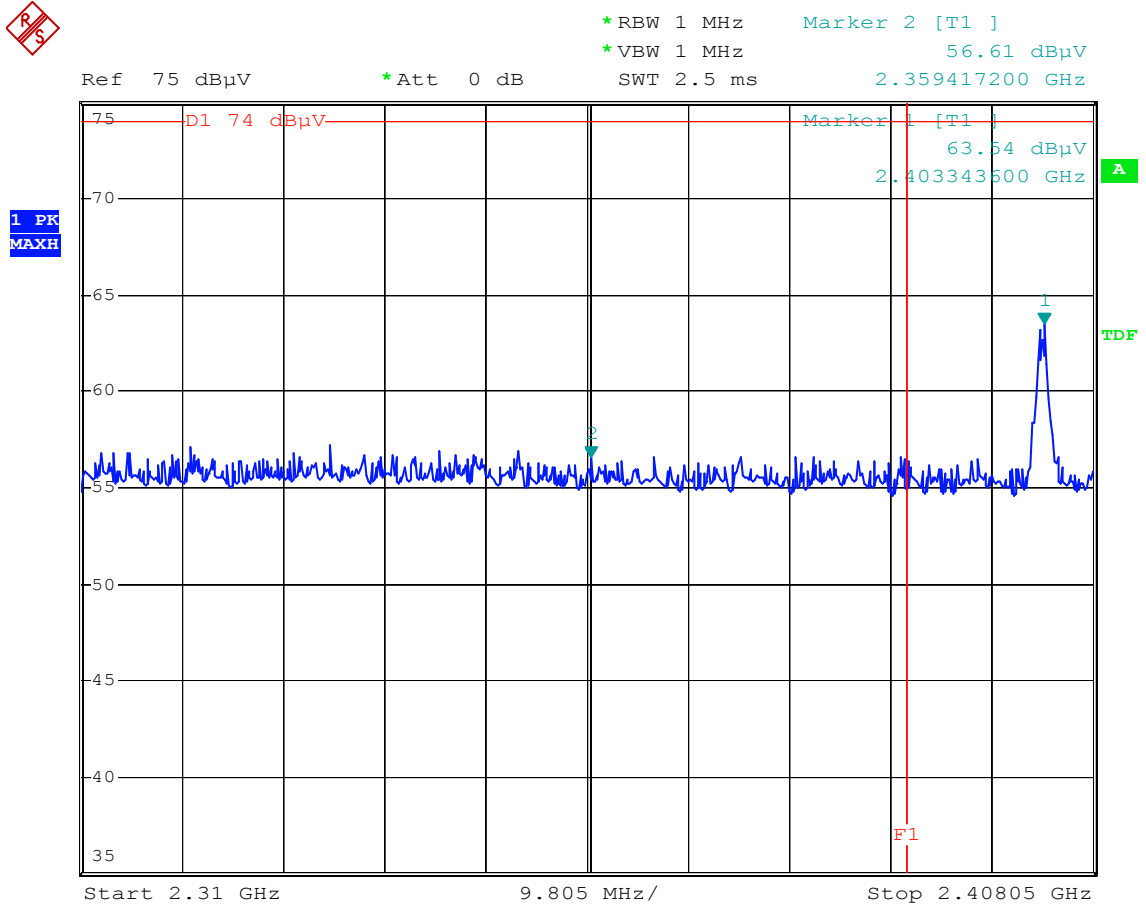
14GHz-26.5GHz: 28dBuV

4. Radiated emission on the band edge FCC 15.249(C)

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental (Base: 2403.05MHz ~ 2405.00MHz, Handset: 2474.00MHz ~ 2475.95MHz) or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Please see the plot below.

Test Mode: Base



Comment: 36207 BS Band-edge at low CH (PK)

Date: 8.FEB.2006 10:45:59



*RBW 1 MHz Marker 2 [T1]
 *VBW 10 Hz 43.52 dBμV
 *Att 0 dB
 SWT 25 s 2.344513600 GHz

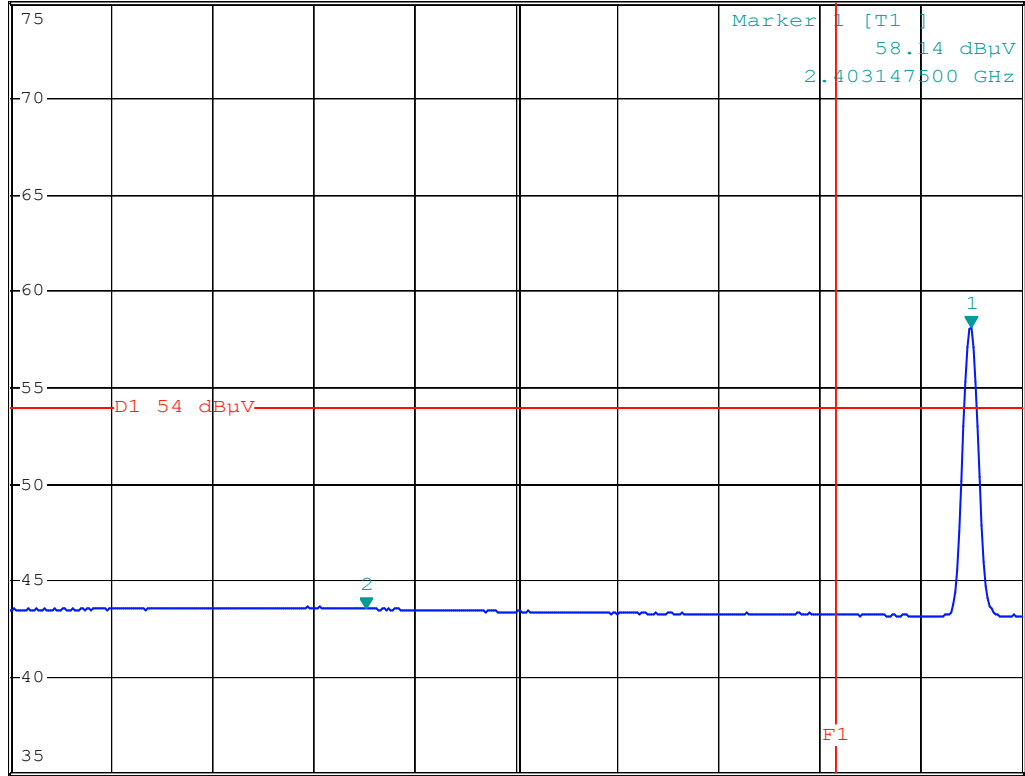
Ref 75 dBμV

*Att 0 dB

SWT 25 s

2.344513600 GHz

1 PK
MAXH



Start 2.31 GHz

9.805 MHz/

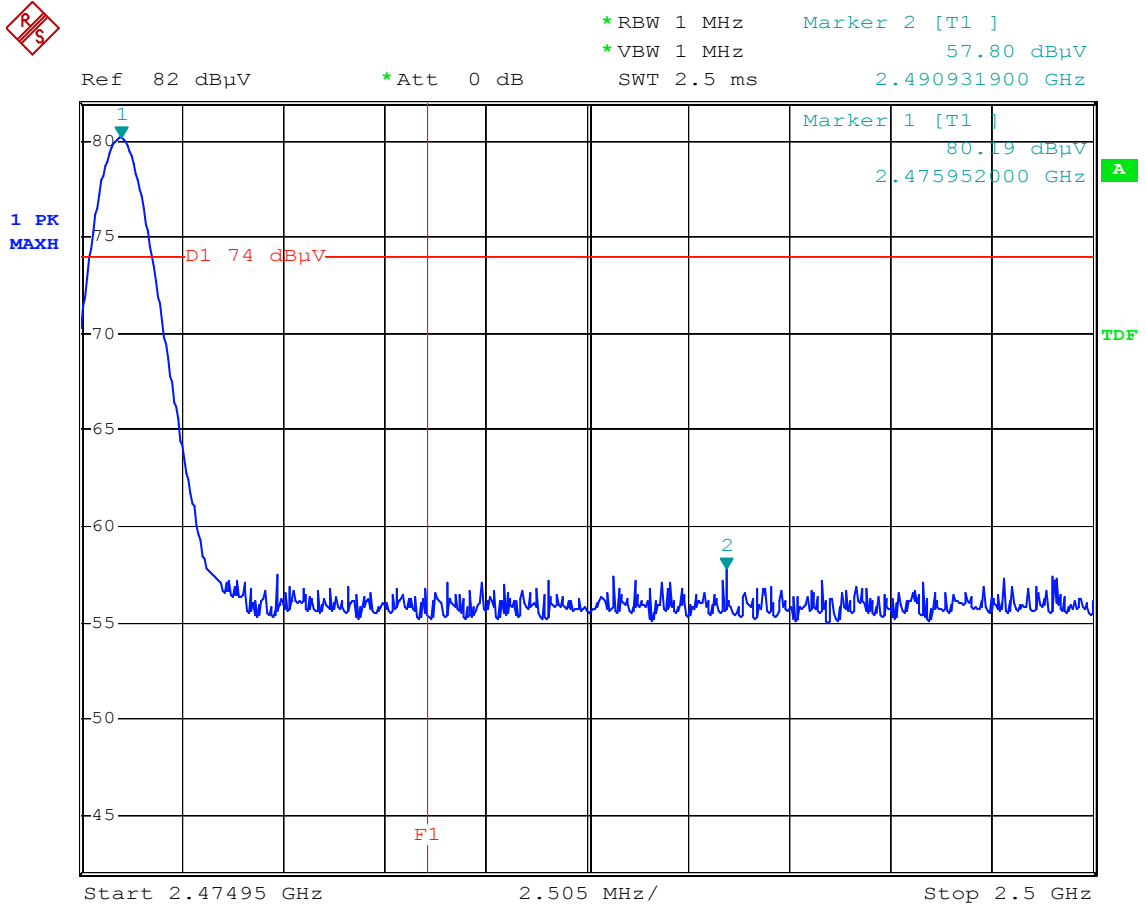
Stop 2.40805 GHz

Comment: 36207 BS Band-edge at low CH (AV)

Comment: F1=2390MHz

Date: 8.FEB.2006 10:48:09

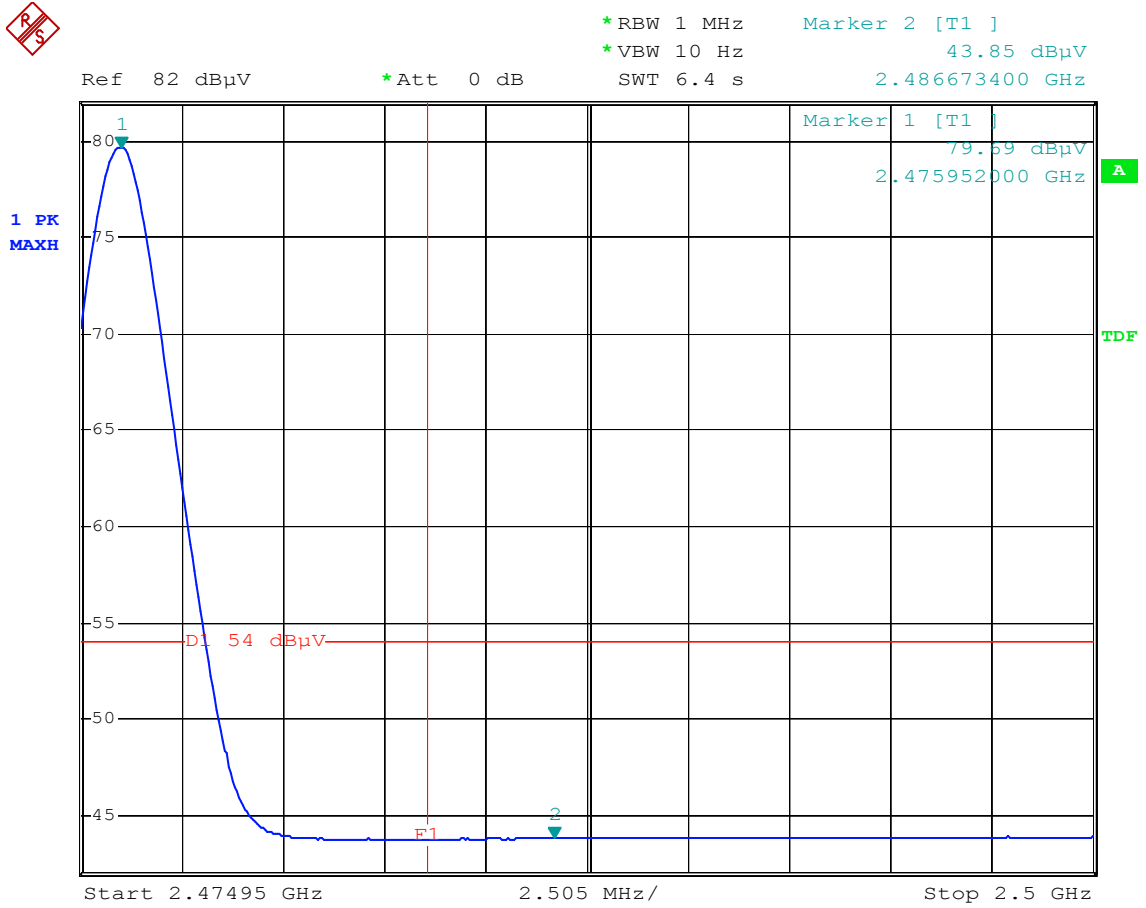
Test Mode: Handset



Comment: 36207 HS Band-edge at high CH (PK)

Comment: F1=2483.5MHz

Date: 8.FEB.2006 11:23:50



Comment: 36207 HS Band-edge at high CH (AV)

Comment: F1=2483.5MHz

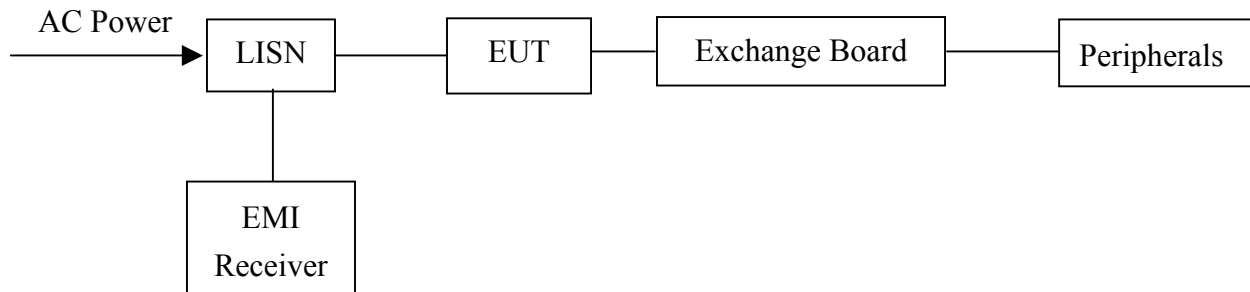
Date: 8.FEB.2006 11:21:41

5. Conducted emission test FCC 15.207

5.1 Operating environment

Temperature: 23 °C
Relative Humidity: 53 %
Atmospheric Pressure: 1023 hPa

5.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement.

The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

5.3 Emission limit

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

*Decreases with the logarithm of the frequency.

5.4 Uncertainty of Conducted Emission

Expanded uncertainty (k=2) of conducted emission measurement is ± 2.6 dB.

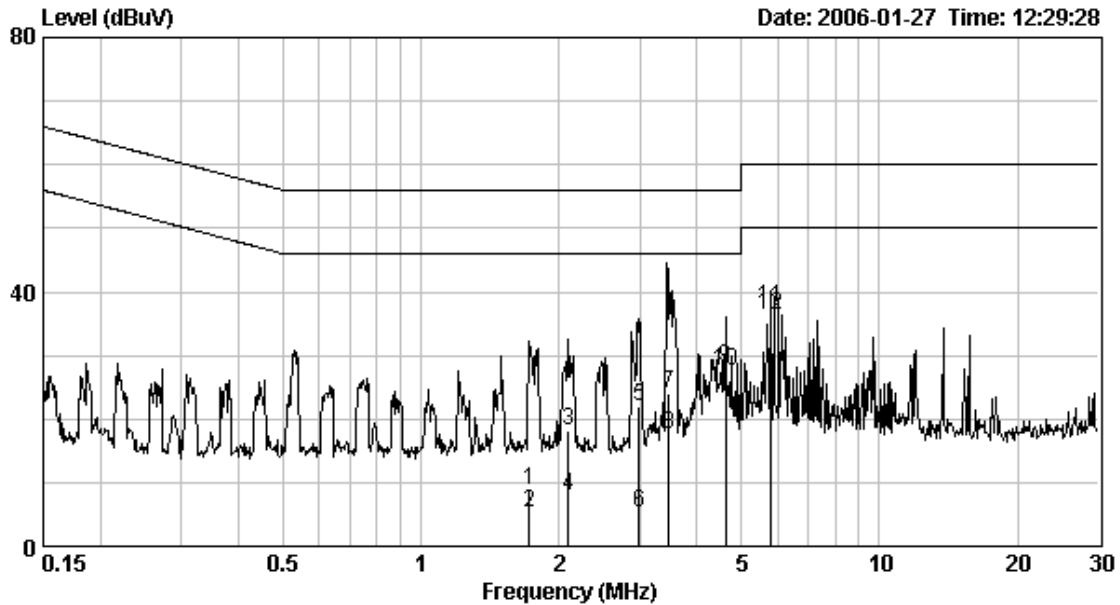
5.5 Power Line Conducted Emission test data

Phase : Line
 EUT : 36207
 Test Condition : Charging with ringing

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB)	
						Qp	Av
1.721	0.10	8.68	56.00	5.22	46.00	-47.32	-40.78
2.097	0.11	18.12	56.00	8.03	46.00	-37.88	-37.97
2.993	0.15	22.10	56.00	5.38	46.00	-33.90	-40.62
3.467	0.17	24.01	56.00	17.70	46.00	-31.99	-28.30
4.622	0.22	28.27	56.00	27.40	46.00	-27.73	-18.60
5.778	0.26	37.48	60.00	36.40	50.00	-22.52	-13.60

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase : Neutral
 EUT : 36207
 Test Condition : Charging with ringing

Frequency (MHz)	Corr. Factor (dB)	Level	Limit	Level	Limit	Margin	
		Qp (dBuV)	Qp (dBuV)	AV (dBuV)	Av (dBuV)	Qp	Av
3.350	0.17	29.61	56.00	18.07	46.00	-26.39	-27.93
5.778	0.20	38.97	60.00	37.32	50.00	-21.03	-12.68
5.893	0.20	39.39	60.00	38.18	50.00	-20.61	-11.82
6.008	0.20	38.15	60.00	36.00	50.00	-21.85	-14.00
6.114	0.20	37.41	60.00	34.16	50.00	-22.59	-15.84
7.280	0.20	34.07	60.00	30.83	50.00	-25.93	-19.17

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

