EUROFINS ETS PRODUCT SERVICE GMBH

TEST - REPORT

FCC RULES PARTS 22H and 24E
IC RADIO STANDARDS RSS 132 and RSS 133

FCC ID: JYCC610

Model Name: C610

Test report no.: G5M208010006-P-2224

ACCREDITED

Certificate 1983-01

Eurofins ETS Product Service GmbH
Storkower Str. 38c, 15526 Reichenwalde,
Germany

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1 General information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.
The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.
Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.
Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.
The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that is performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.
The test report may only be reproduced or published in full.
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Operator:

22.04.2008		W. Meng	i.A.
Date	ETS-Lab.	Name	Signature

Technical responsibility for area of testing:

22.04.2008		K. Damm	
Date	ETS	Name	Signature

1.2 Testing laboratory

1.2.1 Location

EUROFINS ETS PRODUCT SERVICE GMBH
Storkower Strasse 38c
D-15526 Reichenwalde b. Berlin
Germany
Telephone : +49 33631 888 00
Telefax : +49 33631 888 660

1.2.2 Details of accreditation status

DAR ACCREDITED TESTING LABORATORY
DAR-REGISTRATION NUMBER: DAT-P-268/08

RECOGNIZED NOTIFIED BODY EMC
REGISTRATION NUMBER: BNetzA-bS EMV-07/61

RECOGNIZED NOTIFIED BODY R&TTE
REGISTRATION NUMBER: BNetzA-bS-02/51-53

FCC FILED TEST LABORATORY
REG.-NO. 96970

A2LA ACCREDITED TESTING LABORATORY
CERTIFICATE NO. 1983.01

BLUETOOTH QUALIFICATION TEST FACILITY (BQTF)
ACCREDITED BY BLUETOOTH QUALIFICATION REVIEW BOARD

INDUSTRY CANADA FILED TEST LABORATORY
REG. NO. IC 3470

1.3 Details of approval holder

Name	: Pantech Co., Ltd.
Street	: Pantech Bldg, I-2 DMC, Sangam-dong
Town	: Mapo-gu, Seoul
Country	: Korea
Telephone	: +82-2-2030-1320
Fax	: +82-2-2030-2519
Contact	: Mr. B.W. Kim
E-Mail	: +82-2-2030-1320

1.4 Application details

Date of receipt of application	: 05.02.2008
Date of receipt of test item	: 05.02.2008
Date of test	: 17.03.2008- 17.04.2008

1.5 Test item

Description of test item	: UMTS GSM phone
Type identification	: C610
Serial number	: without
Photos	: See annex A.

Technical data

Frequency range Tx - GSM 850	: 824.2 - 848.80 MHz	
Frequency range Tx - PCS	: 1850.2 - 1909.8 MHz	
Frequency range Rx - GSM 850	: 869.2 - 893.8 MHz	
Frequency range Rx - PCS	: 1930.2 - 1989.8 MHz	
Antenna Type	: internal antenna	
Antenna Gain	: **GSM 850** -3,0 dBi	**PCS 1900** -2.0 dBi
Power supply	: 3,7 V DC	
Operating mode	: duplex	
Type of modulation	: GMSK (GSM modulation)	
Emission	: GXW	

Manufacturer:
(if applicable)

Name	:
Street	:
Town	:
Country	:

1.6 Test standards

Technical standard	:	FCC Parts: 22H, 24E, 2, 15 IC Standards: RSS 132, RSS 133
Additional information	:	Because of using the GSM 850 as an alternative technology in 850 MHz band, not all test cases of FCC Part 22 are required. This device contains UMTS Band II and IV frequencies. This filing is only applicable for GSM 850/1900 MHz operations.

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed. ☒

or

The deviations as specified in 2.5 were ascertained in the course of the tests performed. ☐

2.2 Test environment

Temperature	:	25 ° C
Relative humidity content	:	20 ... 75 %
Air pressure	:	86 ... 103 kPa

2.3 Test equipment utilized

No.	Test equipment	Type	Manufacturer
ETS 0014	Log Periodical Antenna	HL 025	R & S
ETS 0059	Kikusui amplifier	PCR 2000L	Keytek/ EMC
ETS 0085	Shielded room	SR 1	Frankonia
ETS 0251	Climatic chamber	VT 4004	Vötsch
ETS 0281	Spectrum Analyzer	FSM	R & S
ETS 0288	Artificial mains	ESH2-Z5	R & S
ETS 0294	Biconical antenna	HK 116	R & S
ETS 0295	LPD antenna	HL 223	R & S
ETS 0310	Anechoic chamber	AC 3	Frankonia
ETS 0375	Vector Signal Gener.	SMIQ03B	R & S
ETS 0376	Signal Generator	SMP22	R & S
ETS 0378	Advanced Signal Conditioning Unit	ASCU190	R & S
ETS 0379	Advanced Signal Conditioning Unit	ASCU180	R & S
ETS 0380	Advanced Signal Conditioning Unit	ASCU900	R & S
ETS 0382	Vector Signal Gener.	SMIQ03B	R & S
ETS 0383	Spectrum Analyzer	FSU26	R & S
ETS 0384	Main Frame Signal and Conditioning Unit	SSCU-GW	R & S
ETS 0385	Protocol Slave	CRTU-RU (CRTU-G)	R & S
ETS 0386	Power meter	NRVD	R & S
ETS 0390	System PC PC3600	TS-PC36	R & S
ETS 0394	Advanced Signal Conditioning Unit	ASCUFDD-WCDMA	R & S
ETS 0413	Signal Analyzer	FSIQ 26	R & S
ETS 0416	Power Supply	EX752M	TTi
ETS 0473	GSM / UMTS System Simulator	TS 8950	R&S
ETS 0476	EMI Test receiver	ESCS 30	R&S
ETS 0484	Radio Communication Tester	CMU 200	R&S

2.4 General test procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 5.2 using a 50 µH LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-2003 6.4 using a spectrum analyzer. The resolution bandwidth of the spectrum analyzer was 100 kHz for measurements below 1 GHz and RBW 1 MHz was used above 1 GHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

FORMULA OF CONVERSION FACTORS for Field strength: The Field Strength at 3 m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBµV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

Freq. (MHz)	METER READING + ACF + CABLE LOSS (to the receiver) = FS
33	20 dBµV + 10.36 dB + 6 dB = 36.36 dBµV/m @ 3 m

ANSI STANDARD C63.4-2003 6.2.1 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1 m by 1.5 m (non metallic table). The UUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to at least 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings.
Measurements were made by Eurofins ETS Product Service GmbH at the registered open field test site located at Storkower Str. 38c, 15526 Reichenwalde, Germany.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1 m to 4 m. The antenna was placed in both the horizontal and vertical planes.

ANTENNA & GROUND:
This unit uses internal antenna.

2.5 Test results

☒ 1st test ☐ test after modification ☐ production test

SECT.	TEST CASE	FCC 47 CFR PART	IC RSS-	Required	Test passed	Test failed
3	*TRANSMITTER PARAMETERS*					
3.1	RF power output conducted	2.1046 22.913(a) 24.232(c)	Gen §4.6 132 §4.4 133 §4.3	☒	☒	☐
3.2	RF power output radiated (ERP, EIRP)	22.913(a) 24.232(c)	132 §4.4 133 §4.3	☒	☒	☐
3.3	Occupied bandwidth	2.1049	Gen §4.4.1	☒	☒	☐
3.3	Emission bandwidth	22.917(b) 24.238(b)	-	☒	☒	☐
3.4	Frequency stability	2.1055 22.355 24.235	Gen §4.5 132 §4.3 133 §4.2	☒	☒	☐
3.5	Spurious emission conducted (antenna terminal)	2.1051 22.917 24.238	Gen §4.7 132 §4.5 133 §4.4	☐	☐	☐
3.6	Spurious emission radiated	2.1053 22.917 24.238	Gen §4.7 132 §4.5 133 §4.4	☒	☒	☐
3.7	Block edge compliance	22.917(b) 24.238(b)	132 §4.5.1.1 133 §4.4	☒	☒	☐
3.8	AC power line conducted emissions	15.207	-	☒	☒	☐
4	*RECEIVER PARAMETERS*					
4.1	Radiated emissions	2.1053 15.109	Gen 4.8 132 §4.6 133 §4.5	☐	☐	☐

3 Transmitter parameters

3.1 RF power output, conducted

Reference

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	CFR part 22.913(a), 2.1046	CFR part 24.232(c), 2.1046
IC	RSS-132 Issue 2, §4.4 RSS-Gen Issue 1, §4.6	RSS-133 Issue 3, §4.3 RSS-Gen Issue 1, §4.6

Method of measurement

The transmitter output was connected to a calibrated coaxial attenuator, the other end of which was connected to a spectrum analyzer. Transmitter output was read off the spectrum analyzer in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the spectrum analyzer reading.
An HP power meter was also used to measure the RF power.
Tests were performed at three frequencies (low, middle, and high channels) and on all power levels, which can be set-up on the transmitters.

Limits

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	38,5 dBm (7 Watts), ERP	33 dBm (2 Watts), EIRP
IC	38 dBm (6.3 Watts), ERP	33 dBm (2 Watts), EIRP

Test results

	Frequency channel	Peak output power	AVG output power
Cellular telephone 850 MHz	128	33.17 dBm	--
	188	32.99 dBm	--
	251	33.28 dBm	--
PCS 1900 MHz	512	29.55 dBm	--
	661	29.30 dBm	--
	810	29.12 dBm	--

Comment: See attached diagrams.

Test equipment: ETS 0413, ETS 0416, ETS 0484

3.2 RF power output, radiated

Reference

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	CFR part 22.913(a)	CFR part 24.232(c)
IC	RSS-132 Issue 2, §4.4	RSS-133 Issue 3, §4.3

Method of measurement

The EUT was positioned on a non-conductive turntable, 0.8 m above the ground plane on an open test site. The radiated emission at the fundamental frequency was measured at 3 m distance with a test antenna and spectrum analyzer.

Worst case emission was recorded with the rotation of the turntable and the raising and lowering of the test antenna.

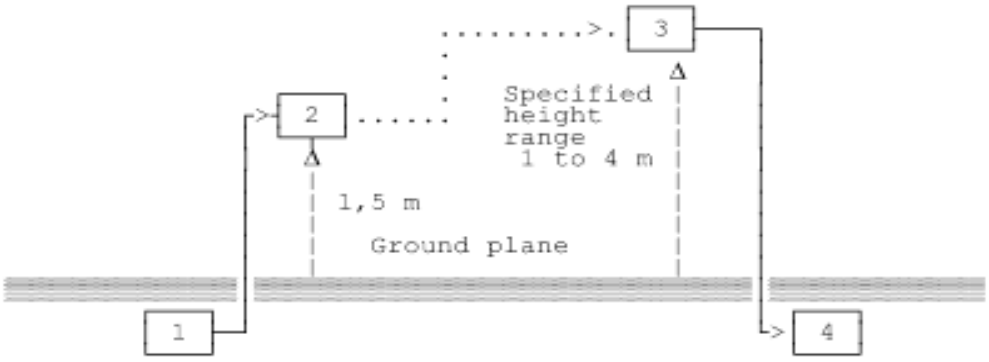
ERP in frequency band 824.2 - 848.8 MHz, and EIRP in frequency band 1850.2 - 1909.8 MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824.2 - 848.8 MHz) or horn antenna (1850.2 - 1909.8 MHz) connected to a signal generator.

Substitution RF power measurement at Eurofins ETS Product Service GmbH

General:

The applied substitution method follows ANSI/TIA/EIA-603, ANSI/TIA/EIA-102.CAAA or the appropriate ETSI rules respectively.

The actual signal generated by the EUT can be determined by means of a substitution measurement in which a known signal source replaces the device to be measured.



1) Signal generator;
2) Substitution antenna;
3) Test antenna;
4) Spectrum analyzer or selective voltmeter.

The substitution antenna replaces the transmitter antenna at the same position and in vertical polarization. The frequency of the signal generator shall be adjusted to the measurement frequency. The test antenna shall be raised or lowered, if necessary, to ensure that the maximum signal is still received. The input signal to the substitution antenna shall be adjusted in level until an equal or a known related level to that detected from the transmitter is obtained in the measurement receiver.
If a fully anechoic chamber is used as test site in order to provide free space conditions there is no need to change the height of the antenna.
The measurement will be repeated in horizontal position.

Calibration:
In order to make this kind of measurement more effective and to avoid subjective measurement faults ETS has installed automatic computer controlled measurement procedures.
With the above described substitution method a test site is calibrated over the full frequency range which is used in suitable frequency steps. For a certain power level on the substitution antenna the received power over the whole frequency range is documented. All necessary antenna gains, cable losses, filter losses and amplifications of preamplifiers are taken in consideration. The summary of this calibration measurement performs a transducer factor that is related to the considered test site and a certain measurement distance. Differences of the radiated power levels of different test samples are determined by internal attenuation of the measurement receiver. The proper function of such test site will be maintained by short term plausibility checks and periodical re-calibration.

Testing:
The test sample is put on the table at the defined position and the measurement receiver receives and documents the radiated power. On test sites with ground plane the measurement antenna will be lowered and raised to maximum values at significant frequencies.
For peak power measurements the sample is turned by the turntable over 360 degree in order to find the direction with the maximum radiation or to document the max reading with the MAXHOLD function during the rotation.

Limits

	Cellular telephone 850 MHz	**PCS 1900 MHz**
FCC	38,5 dBm (7 Watts), ERP	33 dBm (2 Watts), EIRP
IC	38 dBm (6.3 Watts), ERP	33 dBm (2 Watts), EIRP

Test Results

	Frequency channel	Radiated power ERP	Radiated power EIRP
Cellular telephone 850 MHz	128	24.98 dBm	--
	188	24.68 dBm	--
	251	24.35 dBm	--
PCS 1900 MHz	512	--	19.26 dBm
	661	--	20.20 dBm
	810	--	19.55 dBm

Comment: See attached diagrams.

Test equipment: ETS 0014, ETS 0281, ETS 0295, ETS 0310, ETS 0416, ETS 0484

3.3 Occupied bandwidth, emission bandwidth

Reference

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	CFR part 22.917(b), 2.1049	CFR part 24.238(b), 2.1049
IC	RSS-Gen Issue 1, §4.4.1	RSS-Gen Issue 1, §4.4.1

Method of measurement

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power.
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The RF output of the transceiver was connected to the input of the spectrum analyzer through sufficient attenuation.
Occupied Bandwidth was measured with a occupied bandwidth function of the analyzer.
To find the Emission Bandwidth (-26 dB) the delta markers were set –26 dB below transmitter power.

Test results

	Frequency channel	Occupied bandwidth	Emission bandwidth
Cellular telephone 850 MHz	128	246.492 kHz	306.613 kHz
	188	244.488 kHz	310.621 kHz
	251	248.496 kHz	310.621 kHz
PCS 1900 MHz	512	246.492 kHz	312.625 kHz
	661	244.488 kHz	316.633 kHz
	810	246.492 kHz	314.629 kHz

Comment: See attached diagrams.

Test equipment: ETS 0413, ETS 0416, ETS 0484

3.4 Frequency stability

Reference

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	CFR part 22.355, 2.1055	CFR part 24.235, 2.1055
IC	RSS-132 Issue 2, §4.3 RSS-Gen Issue 1, §4.5	RSS-133 Issue 3, §4.2 RSS-Gen Issue 1, §4.5

Method of measurement

The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable, exited the chamber through an opening made for that purpose.
After the temperature stabilized the frequency output was recorded from the counter.

Limits

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	± 2.5 ppm	Must stay within the authorized frequency block
IC	± 2.5 ppm	± 2.5 ppm

Test results

Frequency stability vs. temperature

	ϑ / ° C	**Frequency error (Hz)**	**Frequency error (ppm)**
Cellular telephone 850 MHz	-30	-87	-0,10404
	-20	78	0,09328
	-10	-56	-0,06697
	0	-23	-0,02751
	+10	-45	-0,05381
	+20	-25	-0,02990
	+30	-32	-0,03827
	+40	-55	-0,06577
	+50	-42	-0,05023

	ϑ / ° C	Frequency error (Hz)	Frequency error (ppm)
PCS 1900 MHz	-30	-57	-0,03032
	-20	-77	-0,04096
	-10	-45	-0,02394
	0	-63	-0,03351
	+10	-32	-0,01702
	+20	-45	-0,02394
	+30	-71	-0,03777
	+40	-51	-0,02713
	+50	-98	-0,05213

Frequency stability vs. voltage

	U_B / V	**Frequency error (Hz)**	**Frequency error (ppm)**
Cellular telephone 850 MHz	3,70	-25	-0,02990
	3,50	-24	-0,02870
	3,30	-26	-0,03109
	3,10	-115	-0,13753

	U_B / V	Frequency error (Hz)	Frequency error (ppm)
PCS 1900 MHz	3,70	-45	-0,02394
	3,50	-51	-0,02713
	3,30	-55	-0,02926
	3,10	-83	-0,04415

Test equipment: ETS 0251, ETS 0416, ETS 0484

3.5 Spurious emission conducted (antenna terminal)

Reference

	Cellular Telephone 850 MHz	PCS 1900 MHz
FCC	CFR part 22.917, 2.1051	CFR part 24.238, 2.1051
IC	RSS-132 Issue 2, §4.5 RSS-Gen Issue 1, §4.7	RSS-133 Issue 3, §4.4 RSS-Gen Issue 1, §4.7

Method of measurement

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission. The magnitude of spurious emission which are attenuated more than 20 dB below the permissible value need not be specified. Tests are performed for lowest, middle and highest transmitter block frequency.

Limits

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	Pc - (43 + 10 log (P) dB)	Pc - (43 + 10 log (P) dB)
IC	Pc - (43 + 10 log (P) dB)	Pc - (43 + 10 log (P) dB)

Test results

	Harmonic	TCX 128 [MHz]	Level [dBm]	TCX 188 [MHz]	Level [dBm]	TCX 251 [MHz]	Level [dBm
Cellular telephone 850 MHz	1	--	--	--	--	--	--
	2	--	--	--	--	--	--
	3	--	--	--	--	--	--
	4	--	--	--	--	--	--
	5	--	--	--	--	--	--
	6	--	--	--	--	--	--
	7	--	--	--	--	--	--
	8	--	--	--	--	--	--
	9	--	--	--	--	--	--
	10	--	--	--	--	--	--

	Harmonic	TCX 128 [MHz]	Level [dBm]	TCX 188 [MHz]	Level [dBm]	TCX 251 [MHz]	Level [dBm
PCS 1900 MHz	1	--	--	--	--	--	--
	2	--	--	--	--	--	--
	3	--	--	--	--	--	--
	4	--	--	--	--	--	--
	5	--	--	--	--	--	--
	6	--	--	--	--	--	--
	7	--	--	--	--	--	--
	8	--	--	--	--	--	--
	9	--	--	--	--	--	--
	10	--	--	--	--	--	--

Comment: Not required.

Test equipment: ETS 0375, ETS 0376, ETS 0377, ETS 0378, ETS 0379, ETS 0380, ETS 0382, ETS 0383,ETS 0384, ETS 0385, ETS 0386, ETS 0390, ETS 0394, ETS 0473

3.6 Spurious emission radiated

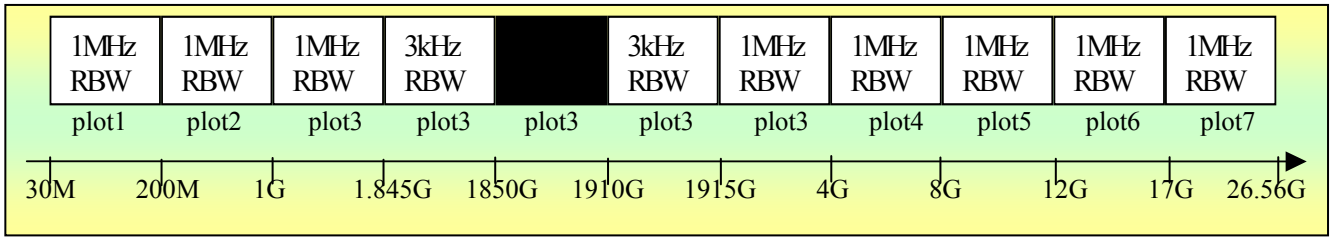
Reference

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	CFR part 22.917, 2.1053	CFR part 24.238, 2.1053
IC	RSS-132 Issue 2, §4.5 RSS-Gen Issue 1, §4.7	RSS-133 Issue 3, §4.4 RSS-Gen Issue 1, §4.7

Method of measurement

The EUT was positioned on a non-conductive turntable, 0.8m above the ground plane.
The radiated emission at the fundamental frequency was measured at 3 m distance with a test antenna and spectrum analyzer.

Worst case emission was recorded with the rotation of the turntable and the raising and lowering of the test antenna.



ERP was measured using a substitution method. The EUT was replaced by horn antenna connected to a signal generator.

The frequency range up to tenth harmonic was investigated.

The tests of spurious radiated emission have been carried out with the EKS-Software from Rohde & Schwarz.

The analyzer gives automatic the measurements of spectral plots to the EKS software.

In the 1st 1 MHz band outside the band edge nearest the channel of interest a 3 kHz res. BW is used.
The measurements from 30 MHz to 1845 GHz and 1915 GHz to 26.56 GHz were performed with a measurement bandwidth of 1 MHz.

Calculation of test results:

Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

The peak and average spurious emission plots was measured with the average limits.
In the Table being listed the critical peak and average value an exhibit the compliance with the above calculated Limits.

Limits

	Cellular telephone 850 MHz	**PCS 1900 MHz**
FCC	Pc - (43 + 10 log (P) dB)	Pc - (43 + 10 log (P) dB)
IC	Pc - (43 + 10 log (P) dB)	Pc - (43 + 10 log (P) dB)

Test results

Summary table with radiated data of the test plots for Carrier Test Frequency 824,2 MHz

Spectral Plot	Frequency Marker Indication [MHz]	Indication Power Level [dBm]	External Attn. [dB]	Worst Case Emission Level [dBm]	Compliance Limit [dBm]	Results
vertical	177,174	-63,76	0	-63,76	-13	-50,76
horizontal	92,004	-46,04	0	-46,04	-13	-33,04
vertical	875,944	-34,01	0	-34,01	-13	-21,01
horizontal	854,293	-30,72	0	-30,72	-13	-17,72
vertical	3.561,000	-43,89	0	-43,89	-13	-30,89
horizontal	3.411,000	-45,28	0	-45,28	-13	-32,28
vertical	7.599,000	-41,6	0	-41,6	-13	-28,6
horizontal	6.974,000	-38,68	0	-38,68	-13	-25,68
vertical	11,,599	-37,57	0	-37,57	-13	-24,57
horizontal	11.655,000	-35,73	0	-35,73	-13	-22,73

Summary table with radiated data of the test plots for Carrier Test Frequency 836,2 MHz

Spectral Plot	Frequency Marker Indication [MHz]	Indication Power Level [dBm]	External Attn.[dB]	Worst Case Emission Level [dBm]	Compliance Limit [dBm]	Results
vertical	175,471	-64,44	0	-64,44	-13	-51,44
horizontal	39,198	-45,76	0	-45,76	-13	-32,76
vertical	875,944	-34,03	0	-34,03	-13	-21,03
horizontal	866,289	-31,4	0	-31,4	-13	-18,4
vertical	3.982,000	-45,03	0	-45,03	-13	-32,03
horizontal	3.381,000	-45,26	0	-45,26	-13	-32,26
vertical	7.607,000	-42,05	0	-42,05	-13	-29,05
horizontal	6.998,000	-39,12	0	-39,12	-13	-26,12
vertical	11.679,000	-37,47	0	-37,47	-13	-24,47
horizontal	11.671,000	-35,6	0	-35,6	-13	-22,6

Summary table with radiated data of the test plots for Carrier Test Frequency 848,8 MHz

Spectral Plot	Frequency Marker Indication [MHz]	Indication Power Level [dBm]	External Attn.[dB]	Worst Case Emission Level [dBm]	Compliance Limit [dBm]	Results
vertical	176,493	-63,03	0	-63,03	-13	-50,03
horizontal	187,735	-46,11	0	-46,11	-13	-33,11
vertical	854,000	-27,56	0	-27,56	-13	-14,56
horizontal	867,752	-30,25	0	-30,25	-13	-17,25
vertical	3.531,000	-44,57	0	-44,57	-13	-31,57
horizontal	3.940,000	-45,6	0	-45,6	-13	-32,6
vertical	7.639,000	-33,55	0	-33,55	-13	-20,55
horizontal	7.639,000	-34,61	0	-34,61	-13	-21,61
vertical	11.511,000	-36,92	0	-36,92	-13	-23,92
horizontal	11.110,000	-35,05	0	-35,05	-13	-22,05

Comment: See attached diagrams.

PCS 1900

Summary table with radiated data of the test plots for Carrier Test Frequency 1850.2 MHz

Spectral Plot	Frequency Marker Indication [MHz]	Indication Power Level [dBm]	External Attn. [dB]	Worst Case Emission Level [dBm]	Compliance Limit [dBm]	Results
vertical	179,559	-63,42	0	-63,42	-13	-50,42
horizontal	43,968	-64,44	0	-64,44	-13	-51,44
vertical	983,968	-38,4	0	-38,4	-13	-25,4
horizontal	854,108	-39,16	0	-39,16	-13	-26,16
vertical	3.958,000	-27,4	0	-27,4	-13	-14,4
horizontal	3.925,000	-28,16	0	-28,16	-13	-15,16
vertical	7.407,000	-38,57	0	-38,57	-13	-25,57
horizontal	7.655,000	-43,31	0	-43,31	-13	-30,31
vertical	11.102,000	-31,73	0	-31,73	-13	-18,73
horizontal	11.102,000	-36,25	0	-36,25	-13	-23,25
vertical	17.940,000	-30,93	0	-30,93	-13	-17,93
horizontal	17.928,000	-31,1	0	-31,1	-13	-18,1
vertical	26.040,000	-35,63	0	-35,63	-13	-22,63
horizontal	26.023,000	-35,68	0	-35,68	-13	-22,68

Summary table with radiated data of the test plots for Carrier Test Frequency 1880.0 MHz

Spectral Plot	Frequency Marker Indication [MHz]	Indication Power Level [dBm]	External Attn.[dB]	Worst Case Emission Level [dBm]	Compliance Limit [dBm]	Results
vertical	175,812	-63,6	0	-63,6	-13	-50,6
horizontal	41,242	-64,12	0	-64,12	-13	-51,12
vertical	982,365	-39,79	0	-39,79	-13	-26,79
horizontal	854,108	-38,44	0	-38,44	-13	-25,44
vertical	3.540,000	-27,05	0	-27,05	-13	-14,05
horizontal	3.975,000	-28,5	0	-28,5	-13	-15,5
vertical	7.527,000	-42,31	0	-42,31	-13	-29,31
horizontal	7.503,000	-43,23	0	-43,23	-13	-30,23
vertical	11.279,000	-27,12	0	-27,12	-13	-14,12
horizontal	11.639,000	-37,42	0	-37,42	-13	-24,42
vertical	17.615,000	-31,04	0	-31,04	-13	-18,04
horizontal	17.940,000	-30,97	0	-30,97	-13	-17,97
vertical	25.989,000	-35,38	0	-35,38	-13	-22,38
horizontal	26.006,000	-35,9	0	-35,9	-13	-22,9

Summary table with radiated data of the test plots for Carrier Test Frequency 1909.8 MHz

Spectral Plot	Frequency Marker Indication [MHz]	Indication Power Level [dBm]	External Attn.[dB]	Worst Case Emission Level [dBm]	Compliance Limit [dBm]	Results
vertical	173,768	-63,77	0	-63,77	-13	-50,77
horizontal	40,561	-64,02	0	-64,02	-13	-51,02
vertical	987,174	-39,8	0	-39,8	-13	-26,8
horizontal	863,727	-38,68	0	-38,68	-13	-25,68
vertical	3.933,000	-26,96	0	-26,96	-13	-13,96
horizontal	3.858,000	-27,64	0	-27,64	-13	-14,64
vertical	7.615,000	-41,64	0	-41,64	-13	-28,64
horizontal	7.623,000	-42,86	0	-42,86	-13	-29,86
vertical	11.463,000	-32,57	0	-32,57	-13	-19,57
horizontal	11.463,000	-29,02	0	-29,02	-13	-16,02
vertical	16.906,000	-30,7	0	-30,7	-13	-17,7
horizontal	17.928,000	-30,47	0	-30,47	-13	-17,47
vertical	25.972,000	-33,73	0	-33,73	-13	-20,73
horizontal	26.108,000	-35,27	0	-35,27	-13	-22,27

Comment: See attached diagrams.

Test equipment: ETS 0014, ETS 0294, ETS 0295, ETS 0310, ETS 0416, ETS 0484

3.7 Block edge compliance

Reference

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	CFR part 22.917(b)	CFR part 24.238(b)
IC	RSS-132 Issue 2, §4.5.1.1	RSS-133 Issue 3, §4.4

Method of measurement

In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter my be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth.

Limits

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	Pc - (43 + 10 log (P) dB)	Pc - (43 + 10 log (P) dB)
IC	Pc - (43 + 10 log (P) dB)	Pc - (43 + 10 log (P) dB)

Test results

	Frequency channel	RBW kHz	Worst case emission level dBm
Cellular telephone 850 MHz	128	3 kHz	32.97
	251	3 kHz	33.07
PCS 1900 MHz	512	3 kHz	29.60
	810	3 kHz	29.30

Comment: See attached diagrams.

Test equipment: ETS 0413, ETS 0416, ETS 0484

3.8 AC power line conducted emissions

Reference

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	CFR part 15.207	CFR part 15.207
IC	Not applicable	Not applicable

Method of measurement

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.

Limits

	Cellular telephone 850 MHz	PCS 1900 MHz	
FCC	Frequency of emission [MHz]	Conducted limit field strength [dBµV] Quasi Peak	Average
	0.15 - 0.5	66 to 56	56 - 46
	0.5 - 5	56	46
	5 - 30	60	50
IC	Not applicable		

Test results

Frequency	Level	
	Quasi-peak	Average
150 kHz	Lower limit line	Lower limit line

Comment: See attached diagrams.

Test equipment: ETS 0059, ETS 0085, ETS 0288, ETS 0476

4 Receiver parameters

4.1 Radiated emissions

Reference

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	CFR part 15.109, 2.1053	CFR part 15.109, 2.1053
IC	RSS-132 Issue 2, 4.6 RSS-Gen Issue 1, §4.8	RSS-133 Issue 3, §4.5 RSS-Gen Issue 1, §4.8

Method of measurement

The receiver shall be operated in the normal receive mode near the mid-point of the band(s) over which the receiver is designed to operate.

The measurement method is the radiated emission measurement. The measurement starts at 30 MHz and ends at least 3 times the highest tunable local oscillator frequency (6 GHz).

Limits

	Cellular telephone 850 MHz	PCS 1900 MHz
FCC	Spurious frequency [MHz]	Field strength microvolt/m at 3 meters
	30 - 88	100
	88 - 216	150
	216 - 960	200
	above 960	500
IC	Not applicable	

Test Results

	Frequency marker indication [MHz]	Antenna polarization	Worst case emission level µV/m	Compliance limit µV/M	Results µV/m
Cellular telephone 850 MHz	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--

	Frequency marker indication [MHz]	Antenna polarization	Worst case emission level µV/m	Compliance limit µV/M	Results µV/m
PCS 1900 MHz	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--
	--	--	--	--	--

Not required.

Test equipment: ETS 0014, ETS 0294, ETS 0295, ETS 0310, ETS 0416, ETS 0484

ANNEX

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