

TEST REPORT For FCC

Test Report No. : 2012010082
Date of Issue : January 20, 2012
FCC ID : UBUXPDA-SPCI
Model/Type No. : XPDA-S PCI
Kind of Product : Pandora
Rule Part(s) : §24(E), §22(H), , §15(C), §2
Applicant : ITWell Co., Ltd.
Applicant Address : #505 Gayang Techno Town 1487 Gayang-Dong, Gangseo-Gu, Seoul 157-810 Korea
Manufacturer : ITWell Co., Ltd.
Manufacturer Address : #505 Gayang Techno Town 1487 Gayang-Dong, Gangseo-Gu, Seoul 157-810 Korea
Contact Person : HOIL KIM / Senior Research Engineer
Telephone : +82-2-360-2359
Received Date : December 20, 2011
Test period : Start : January 03, 2012 End : January 19, 2012
Test Results : ☒ In Compliance ☐ Not in Compliance

The test results presented in this report relate only to the object tested.

Tested by

Y. T. Lee

Young-taek, Lee
Test Engineer
Date: January 20, 2012

Reviewed by

Y. J. Park

Young-Joon, Park
Technical Manager
Date: January 20, 2012



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386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea

Tel: +82-31-339-9970 Fax: +82-31-339-9855

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REPORT REVISION HISTORY

Date	Revision	Revision
January 20, 2012	Issued (2012010082)	Rev. 2.1
February 7, 2012	Modify	Rev. 2.2

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1.0 General Product Description

Trade name	Pandora
Model name	XPDA-S PCI
Serial number	Prototype
EUT condition	Pre-production, not damaged
GPRS/WCDMA Module	Huawei Technologies Co., Ltd FCC ID: QISMU509C
Antenna type	INTENNA Gain: 0.02 dBi for GSM850, Gain: -0.72 dBi for PCS1900 (Max)
RF output power	GSM 850 – 33.02 dBm ERP / PCS 1900 – 31.72 dBm EIRP WCDMA 850 – 23.92 dBm ERP / WCDMA 1900 – 24.23 dBm EIRP
Power Source	DC 7.4 V (Battery)

1.1 Tested Frequency

Frequency	Channel	GSM850	Channel	PCS1900
Low frequency (MHz)	128	824.2	512	1850.2
Middle frequency (MHz)	192	837.0	661	1880.0
High frequency (MHz)	251	848.8	810	1909.8

Frequency	Channel	WCDMA 850	Channel	WCDMA 1900
Low frequency (MHz)	4132	826.4	9262	1852.4
Middle frequency (MHz)	4182	836.4	9400	1880.0
High frequency (MHz)	4233	846.6	9538	1907.6

1.2 Test Conditions

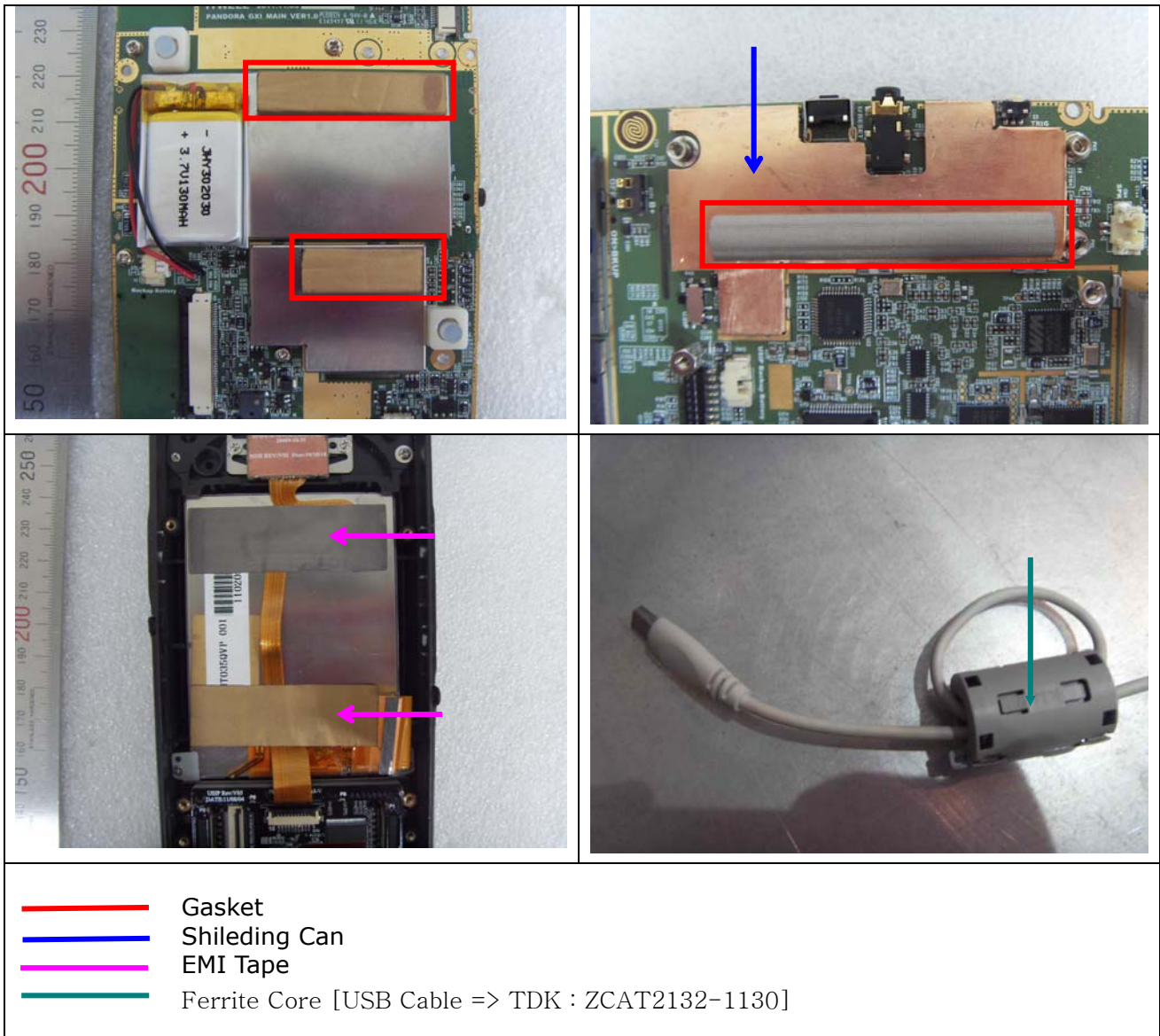
Print	Continuous printing mode connected via USB cable between the EUT and PC
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1.3 Model Differences

Not applicable

1.4 Device Modifications

The following modifications were necessary for compliance and was applied by applicant.





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1.5 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
I.T.E. Power Supply	BridgePower Corp.	JPW128KA0902N05	-	-
Cradle	-	-	-	-
Personal Computer	SAMSUNG	DB-A75	-	DoC
Keyboard (PS/2 type)	MONTEREY INTERNATIONAL CORP.	K6515	ZCH3011	DoC
Mouse (USB type)	INTECH ELECTRONICS CORP.	3D-510	510080601804	DoC
LCD Monitor	Lite-On Technology Corp.	VS17	CNN5130QMC	DoC
Earphone 1	-	-	-	-
Earphone 2	-	-	-	-





1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.7 Test Facility

The measurement facility is located at 386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea.

1.8 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	 805871
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986 T-1843
KOREA	KCC	EMI (10 meter Open Area Test Site and two conducted sites) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 No. 51, KR0025
International	KOLAS	EMC	

2.0 Summary of tests

	Parameter	Limit	Test Condition	Status (note1)
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I. FCC Part Section(s)

PCS Licensed Transmitter Module is certified by FCC(FCC ID: QISMU509C)
Refer to the test report of FCC ID: QISMU509C

II. Additional items

22.913	Transmitter Carrier Output Power and Effective Radiated Power	-	Radiated, Substitution	C
24.232	Transmitter Carrier Output Power and Equivalent Isotropic Radiated Power	-	Radiated, Substitution	C
2.1049	Occupied Bandwidth	-	Conducted	C
15.209	Field Strength of Harmonics	15.209(a)	Radiated	C
15.207	AC Conducted Emissions	15.207(a)	Line Conducted	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:
ANSI C63.4-2003



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2.1 Effective Radiated Power(ERP)-GSM

FCC Part

FCC Part 22.913(a)

Test Method Used

Substitution measurements
As detailed in ANSI TIA-603

Test Results

Test mode : GSM 850

Frequency (MHz)	Channel No.	Output Power ERP (dBm)
824.2	128	32.94
837.0	192	33.02
848.8	251	32.77

Test mode : WCDMA 850

Frequency (MHz)	Channel No.	Output Power ERP (dBm)
826.4	4132	23.61
836.4	4182	23.92
846.6	4233	23.77



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2.2 Equivalent Isotropic Radiated Power(EIRP)

FCC Part

FCC Part 24.232

Test Method Used

Substitution measurements
As detailed in ANSI TIA-603

Test Results

Test mode : PCS 1900

Frequency (MHz)	Channel No.	Output Power EIRP (dBm)
1850.2	512	31.72
1880.0	661	31.50
1909.8	810	31.14

Test mode : WCDMA 1900

Frequency (MHz)	Channel No.	Output Power EIRP (dBm)
1852.4	9262	24.23
1880.0	9400	24.08
1907.6	9538	23.81



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2.3 Occupied Bandwidth

FCC Part

FCC Part 2.1049, part 22 subpart H, part 24 subpart E

Test Method Used

As detailed in ANSI TIA-603-C-2004

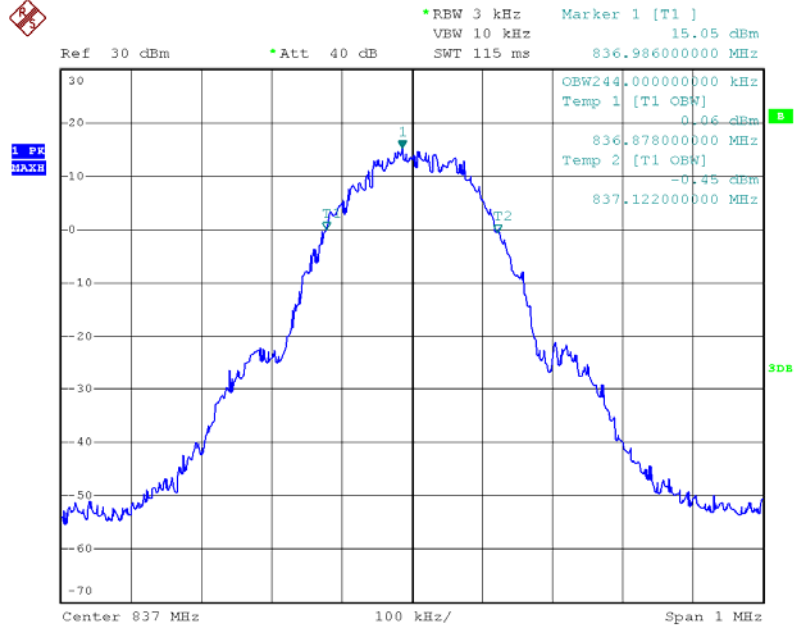
Test Results

Mode	Channel No.	Frequency (MHz)	Occupied Bandwidth(MHz)
GSM 850	192	837	0.244
PCS 1900	661	1880	0.244
WCDMA 850	4182	836.4	4.18
WCDMA 1900	9400	1880	4.16

See next pages for actual measured spectrum plots.

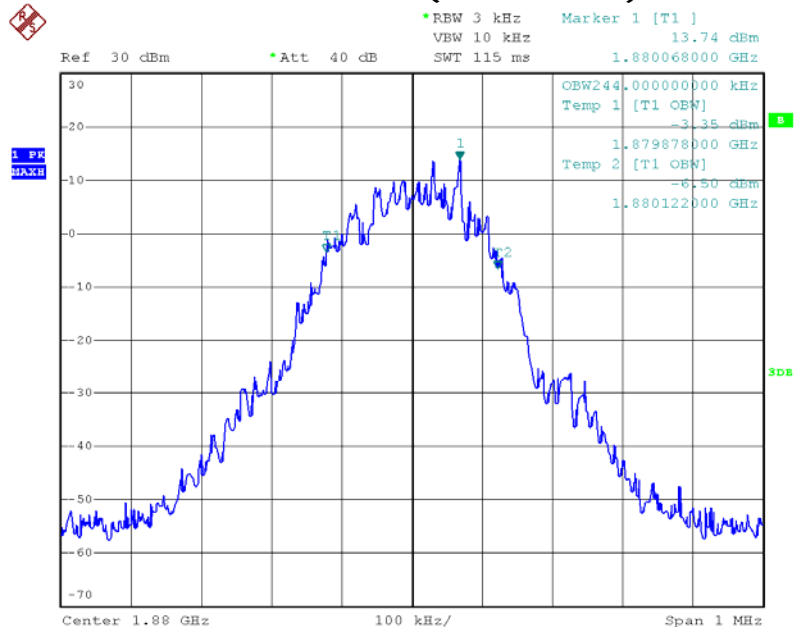
Occupied Bandwidth

GSM 850 (Channel 192)



Date: 7.FEB.2012 19:44:30

PCS 1900 (Channel 661)



Date: 7.FEB.2012 19:49:16



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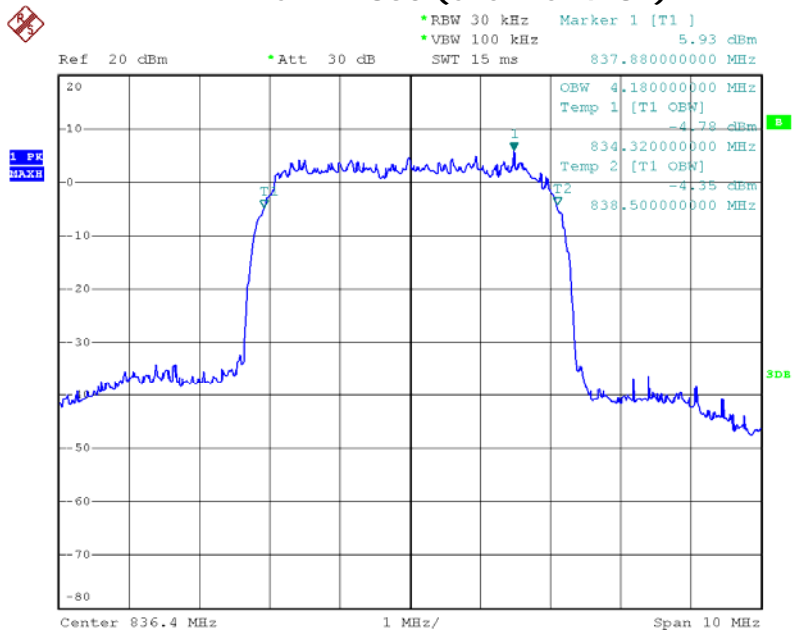
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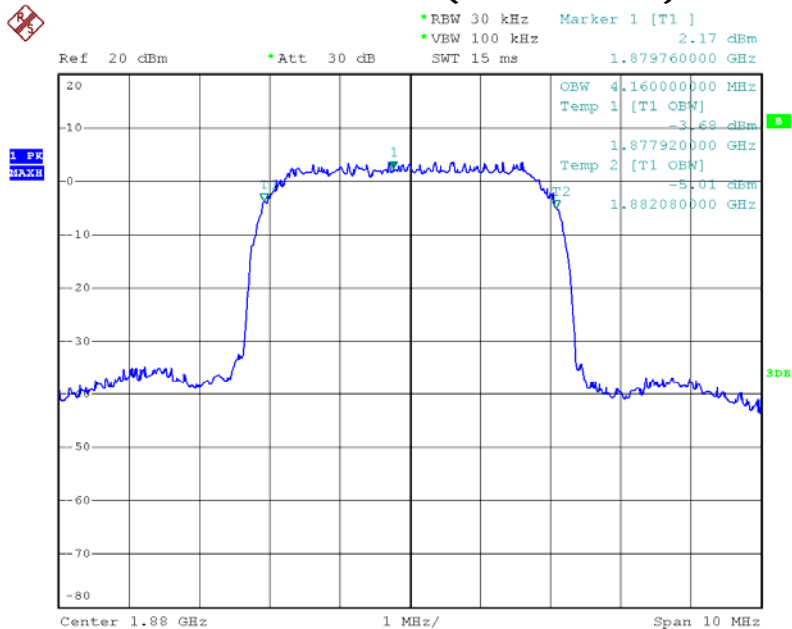
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WCDMA 850 (Channel 4182)



Date: 7.FEB.2012 19:40:06

WCDMA 1900 (Channel 9400)



Date: 7.FEB.2012 19:38:43

2.4 Field Strength of Emissions

Test Date

January 13, 2012

Test Location

☒ Testing was performed at a test distance of 3 meter Open Area Test Site

Test Procedures

The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity. The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10th harmonic.

RBW = 120 kHz (30MHz ~ 1 GHz)

VBW ≥ RBW

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz

Detector function = Quasi-peak

Trace = max hold

Sweep = auto

Limit

- 15.209(a)

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m
30-88	100**	40
88-216	150**	43.5
216-960	200**	46
Above 960	500	54

** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.



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Test Results

EUT	Pandora	Test Mode	GSM850
Model	XPDA-S PCI	Frequency Range	30-1000 MHz
Channel	Channel 192 (Worst Case)	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
720.03	42.9	3.1	Quasi-peak

Test Data

Frequency [MHz]	Reading [dB μ V/m]	Pol.	Height [m]	Correction Factor [dB(1/m)]	Limits [dB μ V/m]	Result [dB μ V/m]	Margin [dB]
75.95	56.3	H	3.1	-21.2	40.0	35.1	4.9
83.96	54.9	H	2.1	-20.4	40.0	34.5	5.5
720.03	47.4	H	1.0	-4.5	46.0	42.9	3.1
800.06	43.3	V	1.9	-2.8	46.0	40.5	5.5
800.06	43.1	H	1.0	-2.8	46.0	40.3	5.7
912.09	42.5	H	1.0	-0.4	46.0	42.1	3.9

Test Results

EUT	Pandora	Test Mode	PCS1900
Model	XPDA-S PCI	Frequency Range	30-1000 MHz
Channel	Channel 512 (Worst Case)	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
720.034	43.0	3.0	Quasi-Peak

Test Data

Frequency [MHz]	Reading [dB μ V/m]	Pol.	Height [m]	Correction Factor [dB(1/m)]	Limits [dB μ V/m]	Result [dB μ V/m]	Margin [dB]
75.95	56.1	H	3.1	-21.2	40.0	34.9	5.1
83.96	54.8	H	2.1	-20.4	40.0	34.4	5.6
720.03	47.5	H	1.0	-4.5	46.0	43.0	3.0
800.06	43.2	V	1.9	-2.8	46.0	40.4	5.6
800.06	43.1	H	1.0	-2.8	46.0	40.3	5.7
912.09	42.2	H	1.0	-0.4	46.0	41.8	4.2



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Test Results

EUT	Pandora	Test Mode	WCDMA 850
Model	XPDA-S PCI	Frequency Range	30-1000 MHz
Channel	Channel 4182 (Worst Case)	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
720.03	43.1	2.9	Quasi-peak

Test Data

Frequency [MHz]	Reading [dBμV/m]	Pol.	Height [m]	Correction Factor [dB(1/m)]	Limits [dBμV/m]	Result [dBμV/m]	Margin [dB]
75.95	56.1	H	3.1	-21.2	40.0	34.9	5.1
83.96	54.7	H	2.1	-20.4	40.0	34.3	5.7
720.03	47.6	H	1.0	-4.5	46.0	43.1	2.9
800.06	43.3	V	1.9	-2.8	46.0	40.5	5.5
800.06	43.2	H	1.0	-2.8	46.0	40.4	5.6
912.09	42.1	H	1.0	-0.4	46.0	41.7	4.3



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Test Results

EUT	Pandora	Test Mode	WCDMA 1900
Model	XPDA-S PCI	Frequency Range	30-1000 MHz
Channel	Channel 9400 (Worst Case)	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBUV/m)	Margin (dB)	Remark
720.034	43.0	3.0	Quasi-Peak

Test Data

Frequency [MHz]	Reading [dBμV/m]	Pol.	Height [m]	Correction Factor [dB(1/m)]	Limits [dBμV/m]	Result [dBμV/m]	Margin [dB]
75.95	56.2	H	3.1	-21.2	40.0	35.0	5.0
83.96	54.7	H	2.1	-20.4	40.0	34.3	5.7
720.03	47.5	H	1.0	-4.5	46.0	43.0	3.0
800.06	43.3	V	1.9	-2.8	46.0	40.5	5.5
800.06	43.1	H	1.0	-2.8	46.0	40.3	5.7
912.09	42.0	H	1.0	-0.4	46.0	41.6	4.4



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Test Results(GSM 850)

EUT	Pandora	Test Mode	GSM 850
Model	XPDA-S PCI	Frequency Range	1-10GHz
Channel	Channel 192 (Worst Case)	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	-

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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Test Results(GSM 1900)

EUT	Pandora	Test Mode	GSM 1900
Model	XPDA-S PCI	Frequency Range	1-10GHz
Channel	Channel 512 (Worst Case)	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	-

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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Test Results(WCDMA 850)

EUT	Pandora	Test Mode	WCDMA 850
Model	XPDA-S PCI	Frequency Range	1-10GHz
Channel	Channel 4182 (Worst Case)	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	-

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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Test Results(WCDMA 1900)

EUT	Pandora	Test Mode	WCDMA 1900
Model	XPDA-S PCI	Frequency Range	1-10GHz
Channel	Channel 9400 (Worst Case)	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	-

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

2.5 AC Conducted Emissions

Test Date

January 12, 2012

Test Location

Shielded Room

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Measurement Data: Complies

Limit

- 15.207(a)

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency.

Test Results

Model	XPDA-S PCI	Test Mode	GSM850 mode(Worst Case)
Channel	192	Detector function	Quasi-Peak / Average

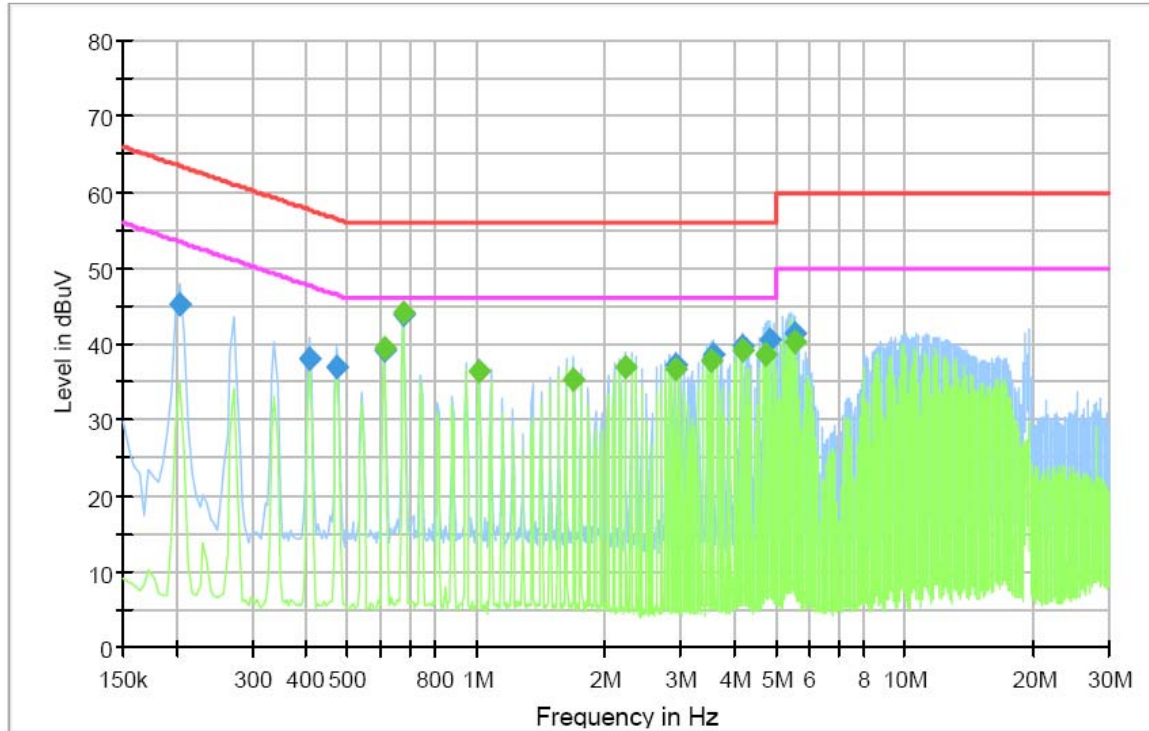
The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
0.6765	44.3	1.7	Average

Test Data

[HOT]



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.204000	45.2	1000.0	9.000	On	L1	10.1	18.2	63.4
0.406500	38.0	1000.0	9.000	On	L1	10.0	19.8	57.7
0.474000	37.0	1000.0	9.000	On	L1	10.0	19.4	56.4
0.609000	39.3	1000.0	9.000	On	L1	10.1	16.7	56.0
0.676500	44.0	1000.0	9.000	On	L1	10.1	12.0	56.0
2.908500	37.2	1000.0	9.000	On	L1	9.9	18.8	56.0
3.588000	38.7	1000.0	9.000	On	L1	9.8	17.3	56.0
4.195500	39.7	1000.0	9.000	On	L1	9.8	16.3	56.0
4.875000	40.5	1000.0	9.000	On	L1	9.8	15.5	56.0
5.550000	41.5	1000.0	9.000	On	L1	9.8	18.5	60.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.609000	39.5	1000.0	9.000	On	L1	10.1	6.5	46.0
0.676500	44.3	1000.0	9.000	On	L1	10.1	1.7	46.0
1.014000	36.3	1000.0	9.000	On	L1	10.0	9.7	46.0
1.693500	35.3	1000.0	9.000	On	L1	9.9	10.7	46.0
2.233500	37.0	1000.0	9.000	On	L1	9.9	9.0	46.0
2.908500	36.7	1000.0	9.000	On	L1	9.9	9.3	46.0
3.520500	37.8	1000.0	9.000	On	L1	9.8	8.2	46.0
4.195500	39.3	1000.0	9.000	On	L1	9.8	6.8	46.0
4.740000	38.7	1000.0	9.000	On	L1	9.8	7.3	46.0
5.550000	40.3	1000.0	9.000	On	L1	9.8	9.7	50.0



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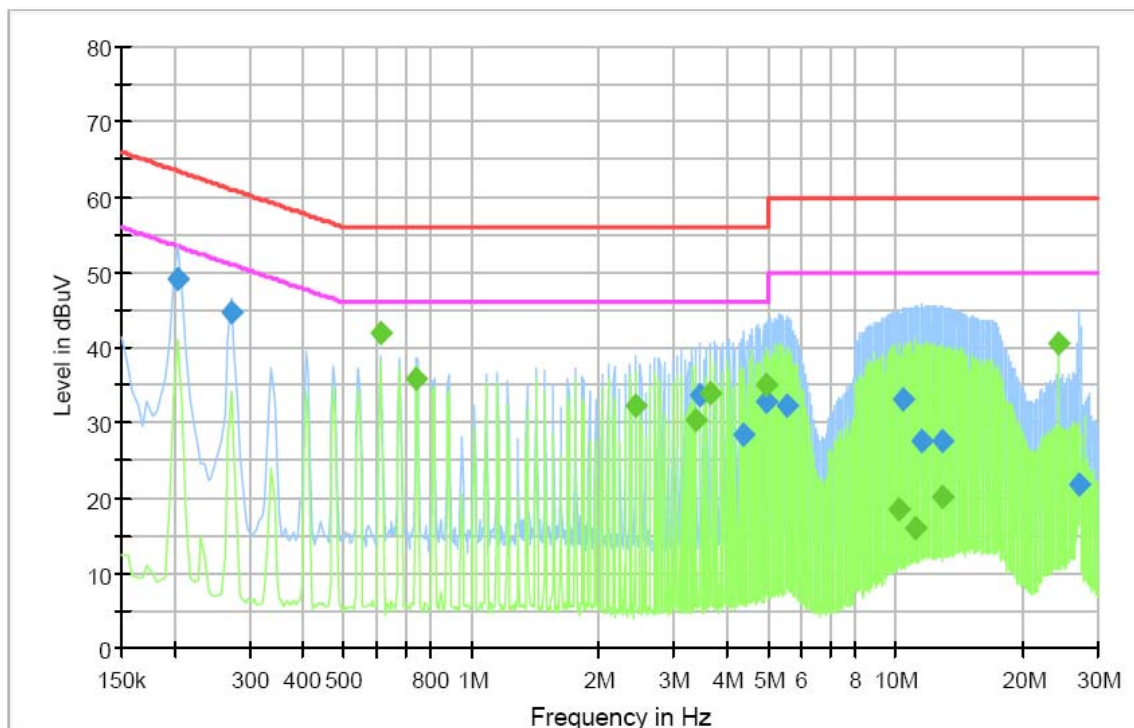
CTK Co., Ltd.

386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea

Tel: +82-31-339-9970 Fax: +82-31-339-9855

www.e-ctk.com

[NEUTRAL]



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.204000	49.1	1000.0	9.000	On	N	10.2	14.3	63.4
0.271500	44.6	1000.0	9.000	On	N	10.1	16.5	61.1
3.457500	33.5	1000.0	9.000	On	N	9.8	22.5	56.0
4.407000	28.5	1000.0	9.000	On	N	9.8	27.5	56.0
4.947000	32.7	1000.0	9.000	On	N	9.8	23.3	56.0
5.559000	32.1	1000.0	9.000	On	N	9.8	27.9	60.0
10.365000	33.2	1000.0	9.000	On	N	9.7	26.8	60.0
11.584500	27.7	1000.0	9.000	On	N	9.7	32.3	60.0
12.871500	27.5	1000.0	9.000	On	N	9.8	32.5	60.0
27.226500	21.7	1000.0	9.000	On	N	10.2	38.3	60.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.609000	41.9	1000.0	9.000	On	N	10.0	4.1	46.0
0.744000	35.9	1000.0	9.000	On	N	10.1	10.1	46.0
2.440500	32.3	1000.0	9.000	On	N	9.9	13.7	46.0
3.390000	30.4	1000.0	9.000	On	N	9.8	15.6	46.0
3.660000	33.8	1000.0	9.000	On	N	9.8	12.2	46.0
4.947000	34.9	1000.0	9.000	On	N	9.8	11.1	46.0
10.230000	18.4	1000.0	9.000	On	N	9.7	31.6	50.0
11.179500	15.9	1000.0	9.000	On	N	9.7	34.1	50.0
12.871500	20.1	1000.0	9.000	On	N	9.8	29.9	50.0
24.144000	40.7	1000.0	9.000	On	N	10.1	9.3	50.0



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APPENDIX A – Test Equipment Used For Tests

Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Signal Analyzer	Agilent	N9020A	MY48011598	2012-11-10
Spectrum Analyzer	Rohde & Schwarz	FSP-30	100994	2012-11-10
EMI Test Receiver	Rohde & Schwarz	ESVS30	826638/008	2012-07-07
ULTRA Broadband Antenna	Rohde & Schwarz	HL562	100203	2013-07-05
LOOP ANTENNA	EMCO	6502	9107-2652	2012-10-29
Attenuator	HP	8494A	3308A33351	2012-11-14
EPM Series Power Meter	HP	E4418A	GB38272734	2012-11-10
Power Sensor	HP	8487A	3318A03524	2012-07-07
Audio Analyzer	HP	8903B	2747A03432	2012-11-10
ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2012-11-21
SYNTHESIZED SWEEPER	HP	8341B	2819A01563	2012-11-10
Modulation Analyzer	HP	8901B	3438A05228	2012-11-18
Attenuator	BIRD	1000-WA-MFN-30	236	2012-11-14
Temp&Humi Chamber	Kunpoong	JT-TH-556-1	9QE5-002	2013-01-12
DC POWER SUPPLY	Agilent	E3632A	MY40011638	2012-11-10
EMC Analyzer	Agilent	E7405A	MY45110859	2012-02-11
Horn Antenna	ETS-Lindgren	3115	00078894	2013-03-22
Horn Antenna	ETS-Lindgren	3115	00078895	2013-03-22
Antenna(Biconical)	EMCO	3110	9202-1510	2012-06-10
Antenna(Log Periodic)	EMCO	3146	9607-4567	2012-06-10
OPT H64 AMPLIFIER	HP	8447F	3113A06814	2012-03-31
PREAMPLIFIER	Agilent	8449B	3008A02307	2012-11-17
EMI Test Receiver	Rohde & Schwarz	ESHS30	828144/022	2012-02-09
LISN	Rohde & Schwarz	ENV216	101150	2012-02-10
EMI Test Receiver	Rohde & Schwarz	ESCI3	100032	2012-02-09
AC Power Source	California Instruments	2001RP	08770	2012-02-09
Radio Communication Tester	R&S	CMU200	106765	2012-02-09