

# TEST REPORT

## 1. Applicant

**Name** : POINTMOBILE CO.,LTD  
**Address** : Gasan-dong, B-9F Kabul Great Valley 32, Digital-ro9-gil, Geumcheon  
gu, Seoul, Korea 153-709

## 2. Products

**Name** : Mobile Computer  
**Model** : PM40  
**Manufacturer** : POINTMOBILE CO.,LTD

**3. Test Standard** : FCC CFR 47 Part 22, 24

**4. Test Method** : ANSI C63.4-2009

**5. Test Results** : Positive

**6. Date of Application** : October 15, 2013

**7. Date of Issue** : November 1, 2013

Tested by



Jong-gon Ban

Telecommunication Center  
Senior Engineer

Approved by



Jeong-min Kim

Telecommunication Center  
Manager

*The test results contained apply only to the test sample(s) supplied by the applicant, and this test report shall not be reproduced in full or in part without approval of the KTL in advance.*

# Korea Testing Laboratory

**Test Report revision History**

Revision	Date	Comments
00	2013-11-01	Initial Version
01	2013-12-19	ERP sample calculation added
02	2014-01-29	-

## TABLE OF CONTENTS

<b>1. ADMINISTRATIVE INFORMATION</b> .....	<b>4</b>
1.1. Applicant (Client) .....	4
1.2. Manufacturer Data (only if different from Applicant) .....	4
1.3. Testing Laboratory Data .....	4
<b>2. EUT INFORMATION</b> .....	<b>5</b>
2.1. General Description of the EUT .....	5
<b>3. SUMMARY OF TEST RESULTS</b> .....	<b>6</b>
<b>4. MEASUREMENT &amp; RESULTS</b> .....	<b>7</b>
4.1. Effective Radiated Power .....	7
4.1.1. Test Procedure .....	7
4.1.2. Limit.....	7
4.1.3. ERP Sample Calculation.....	7
4.1.4. Test Results.....	8
4.2. Field Strength of Spurious Radiation .....	9
4.2.1. Limit.....	9
4.2.2. Test Results (GSM850).....	9
4.2.3. Test Results (GSM1900).....	10
4.2.4. Results (WCDMA850).....	11
4.2.5. Test Results (WCDMA1900).....	12
<b>5. TEST EQUIPMENTS</b> .....	<b>13</b>

## 1. Administrative Information

### 1.1. Applicant (Client)

<b>Company Name</b>	<b>POINTMOBILE CO.,LTD</b>
Address	Gasan-dong, B-9F Kabul Great Valley 32, Digital-ro9-gil, Geumcheon-gu, Seoul, Korea 153-709
<b>Contact Person</b>	
Name	Jinny Cho
E-mail	jinny.cho@pointmobile.co.kr
Phone	+82-2-7090-2676

### 1.2. Manufacturer Data (only if different from Applicant)

<b>Company Name</b>	
Address	
<b>Contact Person</b>	
Name	
E-mail	
Phone	

### 1.3. Testing Laboratory Data

The following list shows all places and laboratories involved for test result generation.

<b>Company Name</b>	<b>Korea Testing Laboratory</b>
Address	723 Haeon-ro, Sangnok-Gu, Ansan-Si, Gyeonggi-Do, 426-901 KOREA
<b>Contact Person</b>	
Name	Jong-gon Ban
E-mail	banjg@ktl.re.kr
Phone	+82-31-500-0133
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## 2. EUT Information

### 2.1. General Description of the EUT

The following section lists all specifications of EUT (Equipment Under Test) involved in test. Additionally, KTL has received sufficient documentation from the client and/or manufacturer to perform the tests

General Information		
FCC ID	V2X-PM40	
Model Number	PM40	
Antenna Type	Internal Antenna	
Type of Transmitter	GSM/GPRS/EDGE850/1900, WCDMA850/1900	
SKUs	PM40G152146K0C	BT, WiFi, GSM, UMTS, GPS, Camera, 1D scanner, Standard Battery
	PM40G152246K0C	BT, WiFi, GSM, UMTS, GPS, Camera, 1D scanner, Extended Battery
	PM40G172146K0C	BT, WiFi, GSM, UMTS, GPS, Camera, 2D scanner, Standard Battery
	PM40G172246K0C	BT, WiFi, GSM, UMTS, GPS, Camera, 2D scanner, Extended Battery
Test sample	<b><u>BT, WiFi, GSM, UMTS, GPS, Camera, 2D scanner, Extended Battery</u></b>	
Tx Frequency	824.2 – 848.8 MHz (GSM850) 826.4 – 846.6 MHz (WCDMA850) 1850.2 – 1909.8 MHz (GSM1900) 1852.4 – 1907.6 MHz (WCDMA1900)	
Antenna Gain	GSM850/UMTS850: -1.5 dBi, GSM1900/UMTS1900 : -2.0 dBi	
Battery options	Li-ion, 3.8 V (standard:1800mAh, extended: 3600mAh)	
Device Dimension	Overall (Length x width) : 135.5 mm x 67 mm Overall Diagonal :138mm Display Diagonal : 73 mm	
Date(s) tested	2013.10.28 ~ 2013.10.31	
RF Module certificate info. GSM/UMTS	FCC ID: QIPPHS8-P Name of Grantee: Cinterion Wireless Modules GmbH  Report Reference No.: 10_phs8_p_mde_cinte_1108_fcce 10_phs8_p_mde_cinte_1108_fccd 10_phs8_p_mde_cinte_1108_fcce	

### 3. SUMMARY OF TEST RESULTS

The following table represents the list of measurements required under the FCC CFR47 Part 22 & 24.

FCC Rules	Test Items	Results	Remarks
*22.913(a), 24.232(c)	Conducted RF power output	N/A	
2.1049	Occupied bandwidth	N/A	
22.917, 24.238	Conducted Spurious Emission	N/A	
22.355, 24.235	Frequency Stability	N/A	
22.913(a), 24.232(c)	ERP & EIRP	Pass	
22.917, 24.238	Radiated Spurious Emissions	Pass	

\*refer to the SAR report

Note:

- Conducted test items are not performed according to reduced test plan.
- The GSM/WCDMA module reports is used for FCC certification.
- So only the radiated emission test items are performed.

## 4. Measurement & Results

### 4.1. Effective Radiated Power

#### 4.1.1. Test Procedure

The radiated and spurious measurements were made Fully-anechoic chamber at a 3-meter test range. The EUT was placed on the rotating device at 1.5m and at a distance of 3-meters from the receive antenna. The rotating device which can rotate horizontal axis was mounted on the turn unit to facilitate rotation around a vertical axis. The measurement was made for each horizontal/vertical position combination with receive antenna horizontally polarized. This measurement was repeated with receive antenna vertically polarized. The substitution antenna will replace the EUT antenna it the same position and in vertical polarization. The frequency of the signal generator shall be set to the frequencies that were measured on the EUT. The signal generator, output level, shall be adjusted until an equal or a known related level to what was measured from the EUT is obtained in the spectrum analyzer. This level was recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

All modes of operation were investigated, and the worst-case results are reported.

#### 4.1.2. Limit

FCC 22.913(b) : The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

FCC 24.232(b) : The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

#### 4.1.3. ERP Sample Calculation

Frequency(M Hz)	Measured Level [dBm]	Substitute Level(dBm)	Ant Gain (dBd)	Cable Loss (dB)	Polarization [H/V]	ERP [dBm]
824.2	-24.29	30.99	-0.48	1.05	H	30.42

$$\begin{aligned} \text{ERP} &= \text{Substitute Level (dBm)} - \text{Ant. Gain} - \text{Cable Loss} \\ &= 30.99 - (-0.48) - 1.05 = 30.42 \end{aligned}$$

#### 4.1.4. Test Results

##### • GSM 850 Test Data

Frequency (MHz)	Measured Level [dBm]	Substitute Level(dBm)	Ant Gain (dBd)	Cable Loss (dB)	Polarization [H/V]	ERP [dBm]
824.2	-24.29	30.99	-0.48	1.05	H	30.42
836.6	-22.58	31.49	-0.54	1.09	H	30.94
848.8	-21.80	32.26	-0.62	1.11	H	31.77
848.8 (EDGE 251ch)	-28.66	26.62	-0.62	1.11	H	26.13

##### • GSM 1900 Test Data

Frequency(M Hz)	Measured Level [dBm]	Substitute Level(dBm)	Ant Gain (dBi)	Cable Loss (dB)	Polarization [H/V]	EIRP [dBm]
1850.2	-34.17	30.78	1.85	1.58	H	27.35
1880.0	-32.73	32.55	1.91	1.62	H	29.02
1909.8	-31.72	33.79	1.92	1.65	H	30.22
1909.8 (EDGE 810)	-35.41	30.09	1.92	1.65	H	26.52

##### • WCDMA 850 Test Data

Frequency(M Hz)	Measured Level [dBm]	Substitute Level(dBm)	Ant Gain (dBd)	Cable Loss (dB)	Polarization [H/V]	ERP [dBm]
826.6	-31.99	21.87	-0.48	1.05	H	21.31
835	-31.05	21.53	-0.54	1.09	H	20.98
846.4	-32.33	23.23	-0.62	1.11	H	22.73

##### • WCDMA1900 Test Data

Frequency(M Hz)	Measured Level [dBm]	Substitute Level(dBm)	Ant Gain (dBi)	Cable Loss (dB)	Polarization [H/V]	EIRP [dBm]
1852.4	-37.59	28.26	1.86	1.56	H	24.84
1880.0	-36.95	28.70	1.91	1.62	H	25.17
1907.6	-36.69	28.09	1.93	1.64	H	24.52



## 4.2. Field Strength of Spurious Radiation

### 4.2.1. Limit

FCC 22.917(a) & 24.238(a) : The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.

- Limit : -13 dBm

### 4.2.2. Test Results (GSM850)

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	E.R.P [dBm]	Polarization [H/V]	Limit [dBm]
Operating Frequency : 824.2 MHz					
2472.6	-53.93	10.78	-43.15	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 836.6 MHz					
2,509.5	-52.61	10.82	-41.79	H	-13
5,126.3	-55.60	10.81	-44.79	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 848.8 MHz					
1697.6	-48.30	8.02	-40.28	H	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

4.2.3. Test Results (GSM1900)

Frequency (MHz)	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	E.R.P [dBm]	Polarization [H/V]	Limit [dBm]
Operating Frequency : 1850.2 MHz					
-	-	-	-	-	--
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 1880.0 MHz					
-	-	-	-	-	--
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 1909.8 MHz					
-	-	-	-	-	--
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Note: No emission levels higher than the ambient noise level are detected.

4.2.4. Results (WCDMA850)

Frequency (MHz)	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	E.R.P [dBm]	Polarization [H/V]	Limit [dBm]
Operating Frequency : 826.4 MHz					
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 836.6 MHz					
5,125.8	-69.21	10.81	-58.40	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 846.6 MHz					
-	-	-	-	-	-
-	-	-	-	-	-

4.2.5. Test Results (WCDMA1900)

Frequency (MHz)	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	E.R.P [dBm]	Polarization [H/V]	Limit [dBm]
Operating Frequency : 1852.4 MHz					
3704.8	-66.44	12.09	-54.35	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 1880.0 MHz					
3762.0	-67.56	12.23	-55.33	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Operating Frequency : 1907.6 MHz					
3815.2	-68.63	12.35	-56.28	V	-13
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

## 5. TEST EQUIPMENTS

No.	Equipment	Manufacturer	Model	S/N	Calibration Due date
1	Spectrum Analyzer	Agilent	E4407B	US41443316	02-21-2014
2	Synthesized Sweeper	HP	83620A	3250A01653	02-04-2014
3	Digital RF Signal Generator	Agilent	E4438C	US41460859	02-21-2014
4	Signal Generator	R&S	SMIQ O3	DE22348	02-04-2014
5	PSA Series Spectrum Analyzer	Agilent	E4448A	US44300484	02-25-2014
6	DC Power Supply	Agilent	E4356A	MY41000296	02-04-2014
7	DC Power Supply	Agilent	E3645A	MY40000851	02-04-2014
8	AC Power Supply	Agilent	6811B	MY41000446	02-01-2014
9	Oscilloscope	Agilent	DSO6054A	MY44001104	02-04-2014
10	Directional Coupler	Agilent	87300C	MY44300126	02-13-2014
11	Directional Coupler	Agilent	773D	MY28390213	02-13-2014
12	VHF Attenuator	HP	355D	2522A45959	03-18-2014
13	Coaxial Attenuator	Weinschel	56-20	N8527	02-13-2014
14	Coaxial Attenuator	Agilent	8491B	50109	02-10-2014
15	Power Divider	HP	11636A	09084	03-18-2014
16	Power Splitter	HP	11667A	21063	03-18-2014
17	Frequency Counter	Anritsu	MF2412B	6200303497	02-08-2014
18	Temp/Humidity Chamber	ESPEC	SH-641	92007482	02-08-2014
19	Function/Arbitrary Waveform Generator	Agilent	33220A	MY44029652	01-20-2014
20	EMI Receiver	R&S	ESIB26	100280	02-06-2014
21	Pre-Amplifier	HP	83017A	MY39500982	03-18-2014
22	Pre-Amplifier	SONA INSTRUMENT	310	284609	01-29-2014
24	Biconi-Log Antenna	Schwarzbeck	VULB9168	9168-181	04-21-2014
25	Double Ridge Wave Guide	ETS-Lindgren	3115	9012-3595	10-21-2014
26	Universal Radio Communication tester	R&S	CMU200	110019	02-12-2014
27	Spectrum Analyzer	R&S	FSP30	100229	02-04-2014
28	Pre-Amplifier	R&S	SCU18	1337144	02-04-2014