

TEST REPORT



Dt&C Co., Ltd.

42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC2402-0019

2. Customer

• Name (FCC) : Point Mobile Co., LTD.

• Address (FCC) : B-9F Kabul Great Valley, 32, Digital-ro 9-gil, Geumcheon-gu, Seoul South Korea 08512

3. Use of Report : Spot Check Verification Test

4. Product Name / Model Name : Mobile Computer / PM84W

FCC ID : V2X-PM84W

5. FCC Regulation(s): Part 15.225, Part 15.247, Part 15.407

Test Method used: KDB558074 D01v05r02, KDB789033 D02v02r01, ANSI C63.10-2013

6. Date of Test : 2023.12.12 ~ 2024.01.05



7. Location of Test : Permanent Testing Lab On Site Testing

8. Testing Environment : See appended test report.

9. Test Result : Refer to the attached test result.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

This test report is not related to KOLAS accreditation.

Affirmation	Tested by	Technical Manager
	Name : SeungMin Gil 	Name : JaeJin Lee  (Signature)

2024 . 02 . 28 .

Dt&C Co., Ltd.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2402-0019	Feb, 28. 2024	Initial issue	SeungMin Gil	JaeJin Lee

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1. General Information

1.1. Description of EUT

Equipment Class	NFC: Low Power Communications Device Transmitter (DXX) Bluetooth: Part 15 Spread Spectrum Transmitter (DSS) Bluetooth LE, WLAN(2.4GHz): Digital Transmission System (DTS) WLAN(5GHz): Unlicensed National Information Infrastructure TX(NII)
Product Name	Mobile Computer
Model Name	PM84W
Add Model Name	-
Firmware Version Identification Number	84.01
EUT Serial Number	Conducted: 23287A0007, Radiated: 23289A0004
Power Supply	DC 3.87 V

1.2. Declaration by the applicant / manufacturer

N/A

1.3. Testing Laboratory

Dt&C Co., Ltd.		
The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042.		
The test site complies with the requirements of Part 2.948 according to ANSI C63.4-2014.		
- FCC & IC MRA Designation No. : KR0034		
- ISED#: 5740A		
www.dtnet.net		
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1.4. Testing Environment

Ambient Condition	
▪ Temperature	+20 °C ~ +24 °C
▪ Relative Humidity	+30 % ~ +35 %

1.5. Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C63.4-2014 and ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Radiated emission (1 GHz Below)	4.8 dB (The confidence level is about 95 %, $k = 2$)
Radiated emission (1 GHz ~ 18 GHz)	4.8 dB (The confidence level is about 95 %, $k = 2$)
Radiated emission (18 GHz Above)	4.9 dB (The confidence level is about 95 %, $k = 2$)

1.6. Test Equipment List

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	23/06/23	24/06/23	US47360812
Spectrum Analyzer	Agilent Technologies	N9020A	22/12/16 23/12/15	23/12/16 24/12/15	MY50110097
Spectrum Analyzer	KEYSIGHT	N9030B	22/12/16 23/12/15	23/12/16 24/12/15	MY55480168
DC Power Supply	Agilent Technologies	66332A	22/12/16 23/12/15	23/12/16 24/12/15	GB37470191
Multimeter	FLUKE	17B+	22/12/16 23/12/15	23/12/16 24/12/15	36390701WS
Signal Generator	Rohde Schwarz	SMBV100A	22/12/16 23/12/15	23/12/16 24/12/15	255571
Signal Generator	ANRITSU	MG3695C	22/12/16 23/12/15	23/12/16 24/12/15	173501
Thermohygrometer	BODYCOM	BJ5478	22/12/16 23/12/15	23/12/16 24/12/15	120612-1
Thermohygrometer	BODYCOM	BJ5478	22/12/16 23/12/15	23/12/16 24/12/15	120612-2
Thermohygrometer	BODYCOM	BJ5478	23/06/23	24/06/23	N/A
Loop Antenna	ETS-Lindgren	6502	22/04/22	24/04/22	203480
Hybrid Antenna	Schwarzbeck	VULB 9160	22/12/16 23/12/15	23/12/16 24/12/15	3362
Horn Antenna	ETS-Lindgren	3117	23/06/23	24/06/23	00143278
Horn Antenna	A.H.Systems Inc.	SAS-574	23/06/23	24/06/23	155
PreAmplifier	tsj	MLA-0118-B01-40	22/12/16 23/12/15	23/12/16 24/12/15	1852267
PreAmplifier	tsj	MLA-1840-J02-45	23/06/23	24/06/23	16966-10728
PreAmplifier	H.P	8447D	22/12/16 23/12/15	23/12/16 24/12/15	2944A07774
High Pass Filter	Wainwright Instruments	WHKX12-935-1000-15000-40SS	23/06/23	24/06/23	8
High Pass Filter	Wainwright Instruments	WHKX10-2838-3300-18000-60SS	23/06/23	24/06/23	1
High Pass Filter	Wainwright Instruments	WHNX8.0/26.5-6SS	23/06/23	24/06/23	3
Attenuator	Hefei Shunze	SS5T2.92-10-40	23/06/23	24/06/23	16012202
Attenuator	Aeroflex/Weinschel	56-3	23/06/23	24/06/23	Y2370
Attenuator	SMAJK	SMAJK-2-3	23/06/23	24/06/23	3
Attenuator	SMAJK	SMAJK-2-3	23/06/23	24/06/23	2
Attenuator	Aeroflex/Weinschel	86-10-11	23/06/23	24/06/23	408
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2496A MA2411B	22/12/16 23/12/15	23/12/16 24/12/15	1338004 1911481
Cable	DT&C	Cable	23/01/04 24/01/03	24/01/04 25/01/03	G-2
Cable	HUBER+SUHNER	SUCOFLEX 100	23/01/04 24/01/03	24/01/04 25/01/03	G-3
Cable	DT&C	Cable	23/01/04 24/01/03	24/01/04 25/01/03	G-4
Cable	OMT	YSS21S	23/01/04 24/01/03	24/01/04 25/01/03	G-5
Cable	Junkosha	MWX241	23/01/03 24/01/03	24/01/03 25/01/03	mmW-1
Cable	Junkosha	MWX241	23/01/03 24/01/03	24/01/03 25/01/03	mmW-4
Cable	HUBER+SUHNER	SUCOFLEX100	23/01/04 24/01/03	24/01/04 25/01/03	M-1
Cable	HUBER+SUHNER	SUCOFLEX100	23/01/04 24/01/03	24/01/04 25/01/03	M-2
Cable	JUNKOSHA	MWX241/B	23/01/04 24/01/03	24/01/04 25/01/03	M-3
Cable	JUNKOSHA	J12J101757-00	23/01/04 24/01/03	24/01/04 25/01/03	M-7
Cable	HUBER+SUHNER	SUCOFLEX106	23/01/04 24/01/03	24/01/04 25/01/03	M-9
Cable	DT&C	Cable	23/01/04 24/01/03	24/01/04 25/01/03	RFC-42
Test Software	tsj	Radiated Emission Measurement	NA	NA	Version 2.00.0185

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.

Note2: The cable is not a regular calibration item, so it has been calibrated by Dt&C itself.

2. Explanations for Reference Test Data

2.1. Introduction

The purpose of this report is to refer to the reference device test data for the variant device according to KDB 484596 D01v02r01.

Reference device information

FCC ID: V2X-PM84

Capability	Equipment Class	FCC Rule part
NFC	DXX	15.225
Bluetooth(BDR/EDR)	DSS	15.247
Bluetooth LE	DTS	15.247
WLAN(2.4GHz)	DTS	15.247
WLAN(5GHz)	NII	15.407
WWAN(GSM)	PCE	22, 24
WWAN(WCDMA)	PCE	22, 24, 27
WWAN(LTE)	PCE	22, 24, 27, 90

The applicant takes full responsibility that the test data as referenced in test report represent compliance for FCC ID: V2X-PM84W

2.2. Explain the Differences

The variant device(FCC ID: V2X-PM84W) uses the same materials, form factors, PCB layouts, components as Reference device(FCC ID: V2X-PM84). And the all components and RF circuits for WLAN/BT(BDR,EDR, LE)/NFC of variant device are the same as reference device.

The difference between the variant device and reference device is as below:

- Removed WWAN(GSM/WCDMA/LTE) components

2.3. Spot Check Verification Data

KDB 484596 D01v02r01 Section 3

The variant filings must demonstrate that the referenced test data remain valid for the variant device by including spot-check measurements that meet the following criteria:

- Spot-check measurements shall be made in correspondence to the worst-case scenario reported in the reference device filing, i.e., for those conditions that are the closest to non-compliance.
- Spot-check measurements, while being always compliant with the applicable rule part(s) for the test under consideration, may show a deviation d_{dB} from the reference data no larger than 3 dB (applicable for both field and power quantities):

$$d_{dB} = |V_{dB} - R_{dB}| \leq 3 \text{ dB} , (1)$$

where between V_{dB} , the variant spot-check level in dB, and R_{dB} is the corresponding measurement level in dB for the reference model.

- An alternative to the limit of eq. (1) is available, and is based on considering how far the reference data R_{dB} is from the compliance threshold C_{dB} (also expressed in dB), for the particular test under consideration. In this case, if $M_{dB} = |C_{dB} - R_{dB}|$ is the margin in dB from the compliance limit, a spot check may be considered acceptable when the deviation d_{dB} from the reference data satisfies the following condition:

$$d_{dB} = |V_{dB} - R_{dB}| \leq (3 + M_{dB} / 20) \text{ dB} , \text{ for } 0 \leq M_{dB} \leq 60 \text{ dB} \tag{2}$$

$$d_{dB} = |V_{dB} - R_{dB}| = 6 \text{ dB} , \text{ for } M_{dB} > 60 \text{ dB}$$

When using the option in eq. (2), d_{dB} increases linearly from 3 dB to 6 dB (as shown in Fig. 2):

- for $M_{dB} = 0$ dB, then $d_{dB} = 3$ dB, that is when R_{dB} is right at the compliance threshold C_{dB} , thus the margin $M_{dB} = 0$ and the variant can only be allowed to go lower than R_{dB} ;
- for $M_{dB} = 60$ dB, then $d_{dB} = 6$ dB, i.e., the reference model data is 60 dB below the compliance threshold M_{dB} .

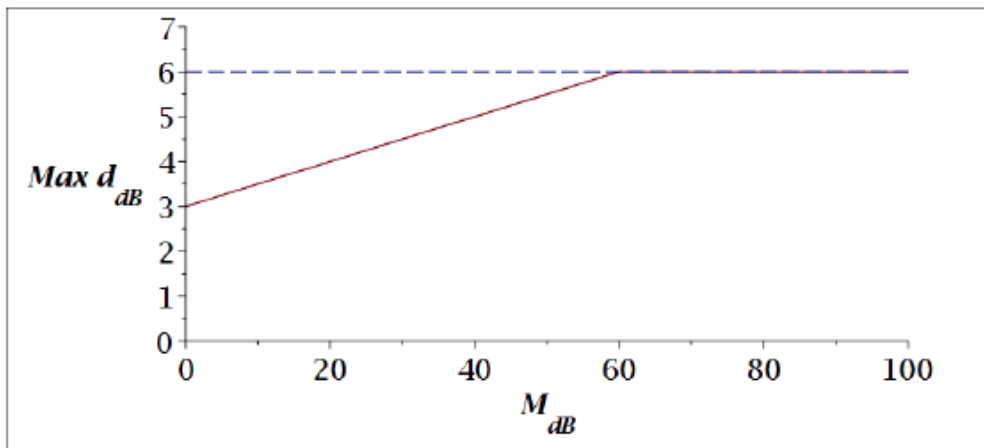


Figure 2 – The piecewise linear function for the maximum spot-check deviation, as given by eq. (2)

Comparison results between reference device and variant device Conducted Output Power

Capability (Equipment Class)	Mode	TX Frequency(MHz)	FCC ID: V2X-PM84 Reference Device Result(dBm)	FCC ID: V2X-PM84W Variant Device Result(dBm)	Deviation (dB)
Bluetooth (DSS)	1 Mbps	2 402	6.68	6.61	-0.07
		2 441	7.02	7.18	0.16
		2 480	7.31	7.50	0.19
Bluetooth LE (DTS)	2 Mbps	2 402	3.86	4.16	0.30
		2 440	4.97	5.24	0.27
		2 478	3.86	4.17	0.31
WLAN: 2.4GHz (DTS)	802.11n(HT20)	2 412	25.83	25.11	-0.72
		2 437	25.87	25.05	-0.82
		2 462	25.48	25.36	-0.12
WLAN: 5GHz (NII)	802.11a	5 180	15.03	14.96	-0.07
		5 260	14.47	14.85	0.38
		5 720	15.40	15.22	-0.18
		5 745	16.07	15.82	-0.25

Radiated Test Items

Capability (Equipment Class)	Mode	TX Freq. (MHz)	Test item	Detector Mode	FCC ID: V2X-PM84 Reference Device		FCC ID: V2X-PM84W Variant Device		Deviation (dB)
					Frequency (MHz)	Result (dBuV/m)	Frequency (MHz)	Result (dBuV/m)	
Bluetooth (DSS)	1 Mbps	2 480	Band edge	Peak	2 485.03	57.72	2 485.07	57.23	-0.49
	1 Mbps	2 402	Spurious emission	Peak	4 804.08	53.90	4 803.26	53.82	-0.08
Bluetooth LE (DTS)	2 Mbps	2 478	Band edge	Average	2 485.00	49.10	2 486.23	49.27	0.17
	2 Mbps	2 478	Spurious emission	Average	4 954.76	43.99	4 955.19	44.32	0.33
WLAN: 2.4GHz (DTS)	802.11n(HT40)	2 452	Band edge	Average	2 483.56	51.31	2 484.61	49.57	-1.74
	802.11n(HT40)	2 452	Spurious emission	Average	4 903.07	42.62	4 903.50	42.75	0.13
WLAN: 5GHz (NII)	802.11ac(VHT80)	5 210	Band edge	Average	5 149.37	51.10	5 149.76	49.48	-1.62
	802.11n(HT40)	5 230	Spurious emission	Peak	10 460.75	52.66	10 460.82	53.29	0.63
	802.11n(HT40)	5 310	Band edge	Average	5 350.38	50.61	5 350.48	48.10	-2.51
	802.11n(HT20)	5 300	Spurious emission	Average	10 600.94	42.85	10 601.42	42.64	-0.21
	802.11a	5 500	Band edge	Average	5 458.10	47.51	5 459.78	46.09	-1.42
	802.11a	5 720	Spurious emission	Average	11 440.30	43.53	11 439.40	43.35	-0.18
	802.11n(HT40)	5 755	Band edge	Peak	5 714.30	63.24	5 714.47	61.85	-1.39
NFC (DXX)	ASK	13.56	In-band emission	Peak	13.56	62.50	13.56	62.00	-0.50
	ASK	13.56	Out-of band emission	Peak	40.67	34.4	40.67	32.7	-1.7

Note: The variant spot-check level meek KDB 484596D01 v02r01 Section 3 eq.(1).

2.4. Reference Section

Reference FCC ID: V2X-PM84

Equipment Class	Capability	FCC part	Frequency Range(MHz)	Exhibit type	Report title	Reference Sections
DXX	NFC	15.225	13.56	Original Grant	Test Report(DXX-NFC)	All sections
DSS	Bluetooth(BDR/EDR)	15.247	2402~2480MHz	Original Grant	Test Report(DSS-BT)	All sections
DTS	Bluetooth LE	15.247	2402~2480MHz	Original Grant	Test Report(DTS-LE)	All sections
DTS	WLAN	15.247	2412~2462MHz	Original Grant	Test Report(DTS-WLAN)	All sections
NII	WLAN	15.407	5180~5240MHz, 5240~5320MHz, 5500~5720MHz, 5745~5825MHz	Original Grant	Test Report(UNII-WLAN)	All sections except the DFS Testing