FCC TEST REPORT

Reference No. : **GPER2105000061EG**
Applicant : **INNOPRESSO, Inc.**
Equipment Under Test (EUT) :
Product Name : Mokibo Folio Keyboard Case
Model Name : MKB420

FCC Authorization Type : Certificate of Conformity
Applied Standards : FCC Part 15 Subpart B,
ANSI C 63.4:2014

FCC ID : **2ATQS-MKB420**

Date of Receipt : **April 21, 2021**
Date of Test : **June 2, 2021 ~ August 3, 2022**
Date of Issue : **August 4, 2022**
Test Results : **Complied**

Tested by : ----------
Jaehyeok Lee

Reviewed by : ----------
Paul Kang

This test report does not assure KOLAS accreditation.
1) The results of this test report are effective only to the items tested.
2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

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Revision History

Revision	Report Number	Description
0	F690501-RF-EMG000586	Initial
1	F690501-RF-EMG000586-1	Additional Description of Operation Mode
2	F690501-RF-EMG000586-2	Re-tested for Conducted Emission

1. General Information

1.1 Client Information

Applicant	INNOPRESSO, Inc.
Applicant Address	3dong 406ho B2G Center 17001, beon,20, Pangyo-ro 289 Beongil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488, Republic of Korea.
Manufacturer	INNOPRESSO, Inc.
Manufacturer Address	3dong 406ho B2G Center 17001, beon,20, Pangyo-ro 289 Beongil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488, Republic of Korea.

1.2 Test Laboratory

Name and Address	SGS Korea Co., Ltd.
- Giheung Laboratory	35, Giheungdanji-ro 121beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
- Gunpo Laboratory	4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 15807, Republic of Korea
FCC Registration No.	KR0150
Phone	+ 82 31 428 5719
Fax	+ 82 31 427 2370
e-mail	paul.kang@sgs.com

1.3 General Information of E.U.T.

Classification	Description
Product Name	Mokibo Folio Keyboard Case
Model Name	MKB420
Serial No.	None
EMI Classification	Class B
Highest Internal Frequency	2402 ㎒
Test Voltage	120 V~, 60 ㎐
Rated Voltage	3.7Vd.c., 590 ㎃ h, 2.183 Wh, 100-240 V~,50/60 ㎐
H/W Version	0.5
S/W Version	0.2.7
Function	Bluetooth Keyboard For Tablet, laptop

1.4 Operating Modes and Conditions

Operating Mode	Operating Condition
1) Operate during charging	Measured with the EUT operating while charging.

Note : The software used for the measurement is described in the test item description.

1.5 Auxiliary Equipments

Description	Model	Serial No.	Manufacturer	FCC ID
Travel Adaptor	EP-TA800	-	SoluM	-
USB(2.0)Cable	EP-DG980	-	RF Tech	-

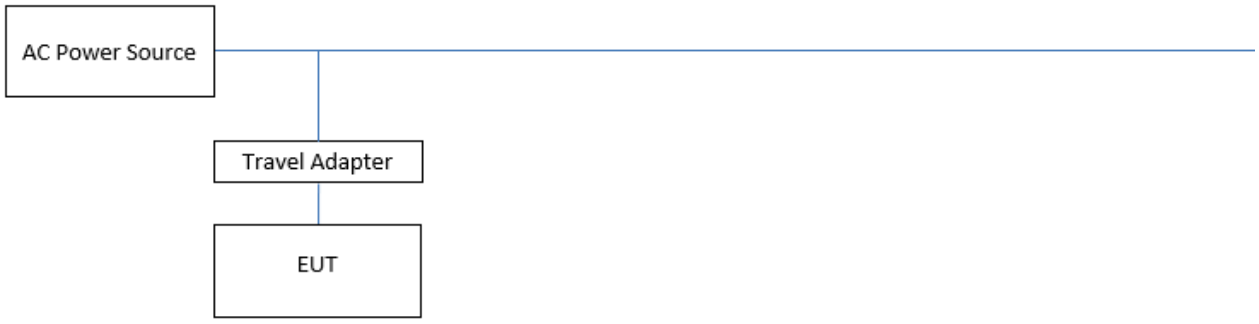
1.6 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length	Shield	
AC Power Source	AC OUT	Travel Adapter	AC IN	-	-	-
USB Cable	C-Type IN		C-Type OUT	-	-	-
	C-Type OUT	EUT	C-Type IN	1.0	Unshield	No.

1.7 System Configurations

Description	Model	Serial No.	Manufacturer	Note.
Main PCB Board	MainPCB Rev.0.5	-	INNOPRESSO Inc.	-
Battery	TW401790	XU100690-17005	SHENZHEN TAIWOO BATTERY CO.,LTD	China

1.8 Test System Layout



1.9 Modifications

There was no modified item during the test.

1.10 Applicable Standards for Testing

Standards	Status	Deviation
FCC Part 15 Subpart B	Applicable	No Deviation

1.11 Summary of Test Results

Test Item	Standards	Results
Conducted Emission	FCC Part 15 Subpart B Section 15.109, ANSI C 63.4:2014	Complied
Radiated Emission	FCC Part 15 Subpart B Section 15.109, ANSI C 63.4:2014	Complied

Note : Test methods of all test items are performed according to the basic standards in this table.

EMISSION

2.1 Test Results

Test Items	Basic Standards	Test Results
Conducted Emission	FCC Part 15 Subpart B Section 15.109 ANSI C 63.4:2014	**Complied**
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ANSI C 63.4:2014	**Complied**

2.2 Test Method and Limits

2.2.1 Test Method

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Conducted Emission	0.15 MHz ~ 30 MHz	9 kHz	-
Radiated Emission	30 MHz ~ 1 GHz	120 kHz	10 m & 3 m
	Above 1 GHz	1 MHz	3 m

Note : 10 m method of radiated emission measurement is only applied to Class A equipment over the frequency range of 30 MHz ~ 1 GHz. Except this, 3 m method is applied to Class B equipment over the frequency range of 30 MHz ~ 1 GHz and Class A and Class B equipment above 1 GHz.

2.2.2 Test Limits

-Conducted Emission Limits at Mains Port

Frequency Range	Limits(dB(μV))		Class
	Quasi-peak	Average	
0.15 MHz ~ 0.5 MHz	79	66	**Class A**
0.5 MHz ~ 30 MHz	73	60	
0.15 MHz ~ 0.5 MHz	66 to 56	56 to 46	**Class B**
0.5 MHz ~ 5 MHz	56	46	
5 MHz ~ 30 MHz	60	50	

Note : The lower limit shall apply at the transition frequencies. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

-Radiated Emission Limits below 1 GHz

Frequency Range	Limits(dB(μV/m))	Class
	Quasi-peak	
30 MHz ~ 88 MHz	39.1	**Class A (10m method)**
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.4	
960 MHz ~ 1 GHz	49.5	
30 MHz ~ 88 MHz	40.0	**Class B (3m method)**
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.0	
960 MHz ~ 1 GHz	54.0	

-Radiated Emission Limits above 1 GHz（3m method）

Frequency Range	Limits(dB(μV/m))		Class
	Average	Peak	
Above 1 GHz	59.5	79.5	**Class A**
Above 1 GHz	54.0	74.0	**Class B**

Note : The limits of class A equipment is extrapolated using an extrapolation factor of 20 dB/decade because it was measured at 3 m distance not 10 m distance.

2.3 Conducted Emission

The initial preliminary exploratory scans were performed over the measuring frequency range(0.15 ㎒ to 30 ㎒) using a max hold mode incorporating a Peak detector and CISPR-Average detector and using the EMI measuring software. The final test data was measured using a Quasi-Peak detector and CISPR-Average detector.

Note. Measuring software
- Giheung Lab.: EMC32(V10.40.10) from R&S
- Gunpo Lab.: EMC32(V V8.52.0) from R&S
- Dongtan Lab.: EMC32(V10.40.00) from R&S

2.3.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Cal Due. Date
Two-Line V-Network	ENV216	R & S	100190	2023.05.13
Test Receiver	ESCI 7	R & S	100911	2023.02.23

Note : The calibration period of every equipment is 1 year.

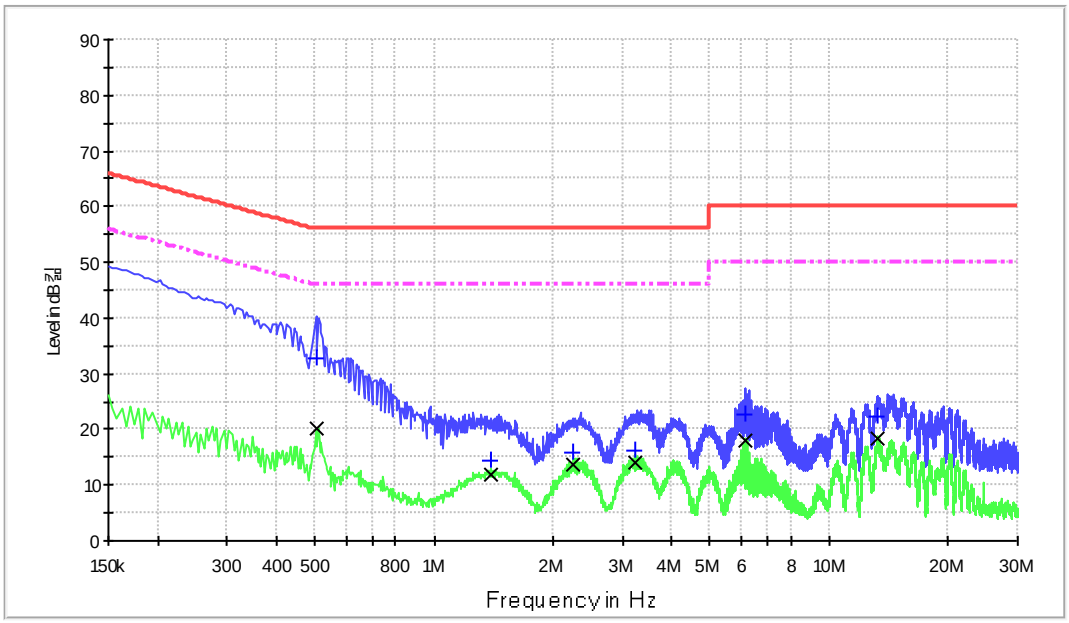
2.3.2 Test Site

Shield Room in Gunpo Laboratory

2.3.3 Environment Conditions and data

- Conducted Emission at AC Mains Port

Temperature	(Minimum 22.4, Maximum 23.2) ℃
Humidity	(Minimum 51.0, Maximum 55.0) % R.H.
Atmospheric Pressure	(Minimum 100.4, Maximum 100.4) ㎪
Test Date	August 3, 2022

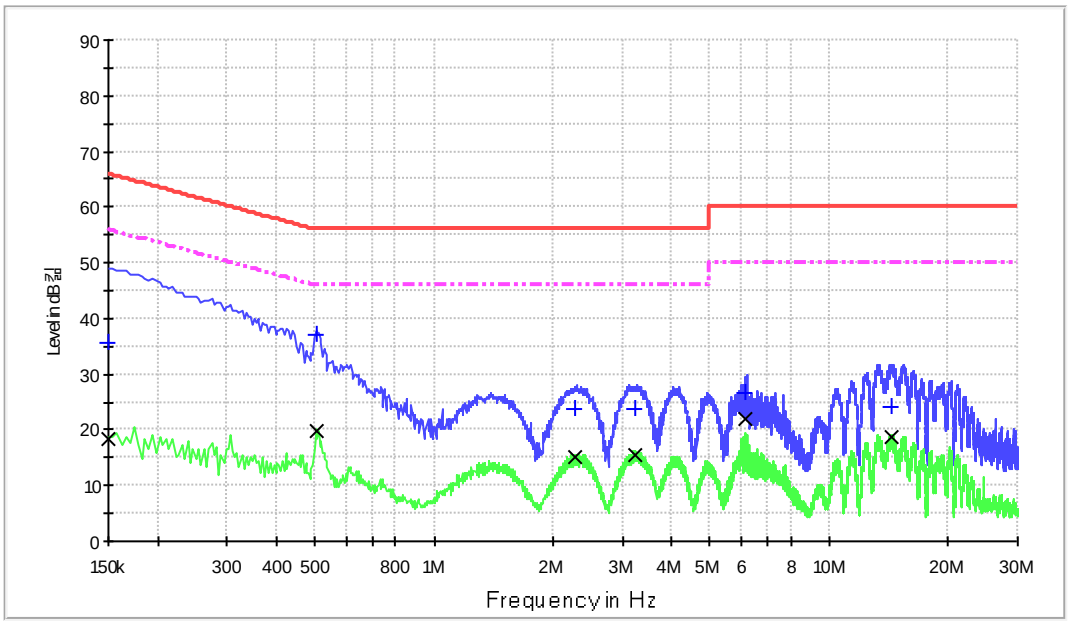


Limit and Margin-QP

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.502 000	32.6	9.000	Off	L1	9.7	23.4	56.0
1.394 000	14.3	9.000	Off	L1	9.7	41.7	56.0
2.258 000	16.0	9.000	Off	L1	9.7	40.0	56.0
3.242 000	16.3	9.000	Off	L1	9.7	39.7	56.0
6.142 000	22.7	9.000	Off	L1	9.8	37.3	60.0
13.302 000	22.3	9.000	Off	L1	9.9	37.7	60.0

Limit and Margin-CAV

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - CAV (dB)	Limit - CAV (dBµV)
0.502 000	20.1	9.000	Off	L1	9.7	25.9	46.0
1.394 000	11.8	9.000	Off	L1	9.7	34.2	46.0
2.258 000	13.7	9.000	Off	L1	9.7	32.3	46.0
3.242 000	14.1	9.000	Off	L1	9.7	31.9	46.0
6.142 000	18.1	9.000	Off	L1	9.8	31.9	50.0
13.302 000	18.3	9.000	Off	L1	9.9	31.7	50.0



Limit and Margin-QP

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.150000	35.7	9.000	Off	N	9.7	30.3	66.0
0.502000	37.2	9.000	Off	N	9.8	18.8	56.0
2.270000	23.7	9.000	Off	N	9.8	32.3	56.0
3.226000	23.8	9.000	Off	N	9.8	32.2	56.0
6.142000	26.6	9.000	Off	N	9.9	33.4	60.0
14.326000	24.2	9.000	Off	N	10.0	35.8	60.0

Limit and Margin-CAV

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - CAV (dB)	Limit - CAV (dBµV)
0.150000	35.7	9.000	Off	N	9.7	30.3	66.0
0.502000	37.2	9.000	Off	N	9.8	18.8	56.0
2.270000	23.7	9.000	Off	N	9.8	32.3	56.0
3.226000	23.8	9.000	Off	N	9.8	32.2	56.0
6.142000	26.6	9.000	Off	N	9.9	33.4	60.0
14.326000	24.2	9.000	Off	N	10.0	35.8	60.0

Measurement Uncertainty : See Appendix A

Note: • Corr.: Cable Loss + LISN Factor • Result = Level + Corr. • Margin = Limit – Result

2.4 Radiated Emission

The initial preliminary exploratory scans were performed over the measuring frequency range (30 ㎒ to 18 ㎓) using a max hold mode incorporating a Peak detector by using the EMI measuring software. The final test data was measured using a Quasi-Peak detector below 1 ㎓.

Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

Note. Measuring software
- Giheung Lab.: EMC32(V9.26.01) from R&S
- Gunpo Lab.: EP5RE(V5.3.70) from TOYO
- Dongtan Lab.: EMC32(V10.40.10) from R&S

2.4.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Cal Due. Date
Horn Antenna	HF906	R & S	100326	2022-02-04
Signal Conditioning Unit	SCU 18	R & S	10117	2021-06-10
Test Receiver	ESU26	R & S	100109	2022-02-19
Hybrid Antenna	VULB9163	SCHWARZBECK	01126	2021-12-22
Amplifier	8447F	HP	2944A03909	2021-08-06
3m SEMI-ANECHOIC CHAMBER	-	SY CORPORATION	-	-

Note : The Hybrid Antenna calibration period is 2 years, but the other equipment calibration period are 1 year.

2.4.2 Test Site

3m SEMI-ANECHOIC CHAMBER Gunpo Laboratory (Below 1 ㎓, Above 1 ㎓)

2.4.3 Environment Conditions and data

Radiated Emission Test

- Below 1 ㎓ (3 m method)

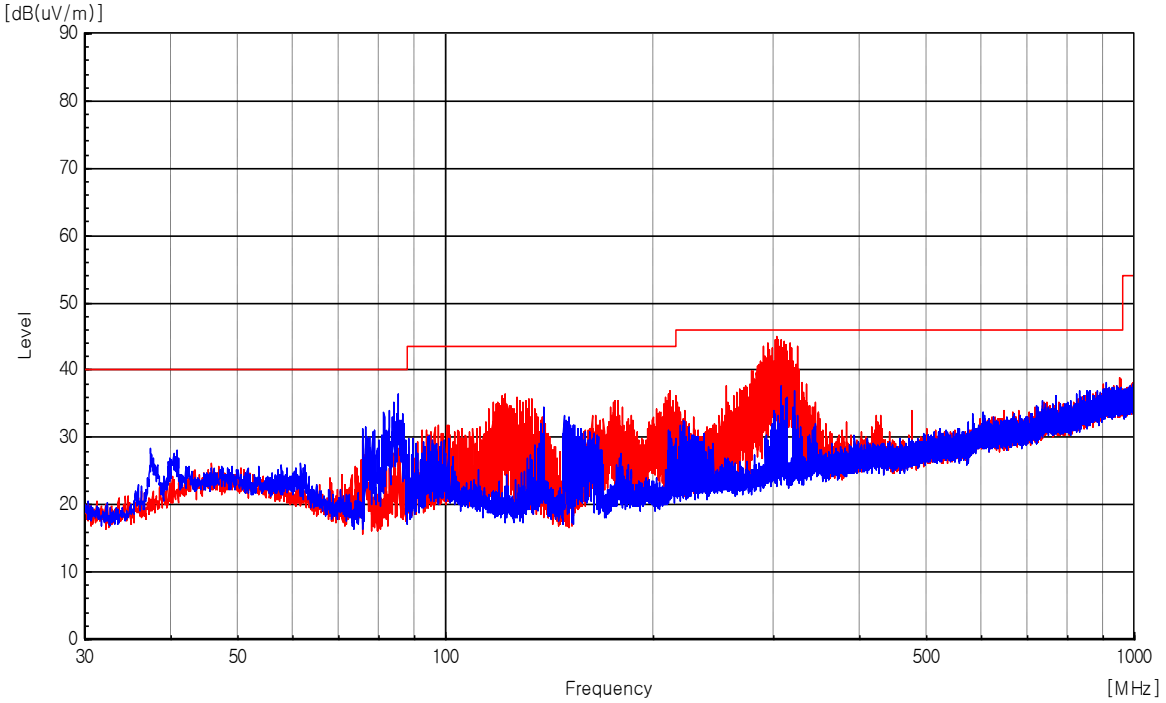
Temperature	(Minimum 21.5, Maximum 22.7) ℃
Humidity	(Minimum 42.0, Maximum 46.0) % R.H.
Atmospheric Pressure	(Minimum 100.6, Maximum 100.7) ㎪
Test Date	June 2, 2021

- Above 1 ㎓ (3 m method)

Temperature	(Minimum 21.5, Maximum 22.7) ℃
Humidity	(Minimum 42.0, Maximum 46.0) % R.H.
Atmospheric Pressure	(Minimum 100.6, Maximum 100.7) ㎪
Test Date	June 2, 2021

Radiated Emission Test Data

- Below 1 GHz (3 m method)

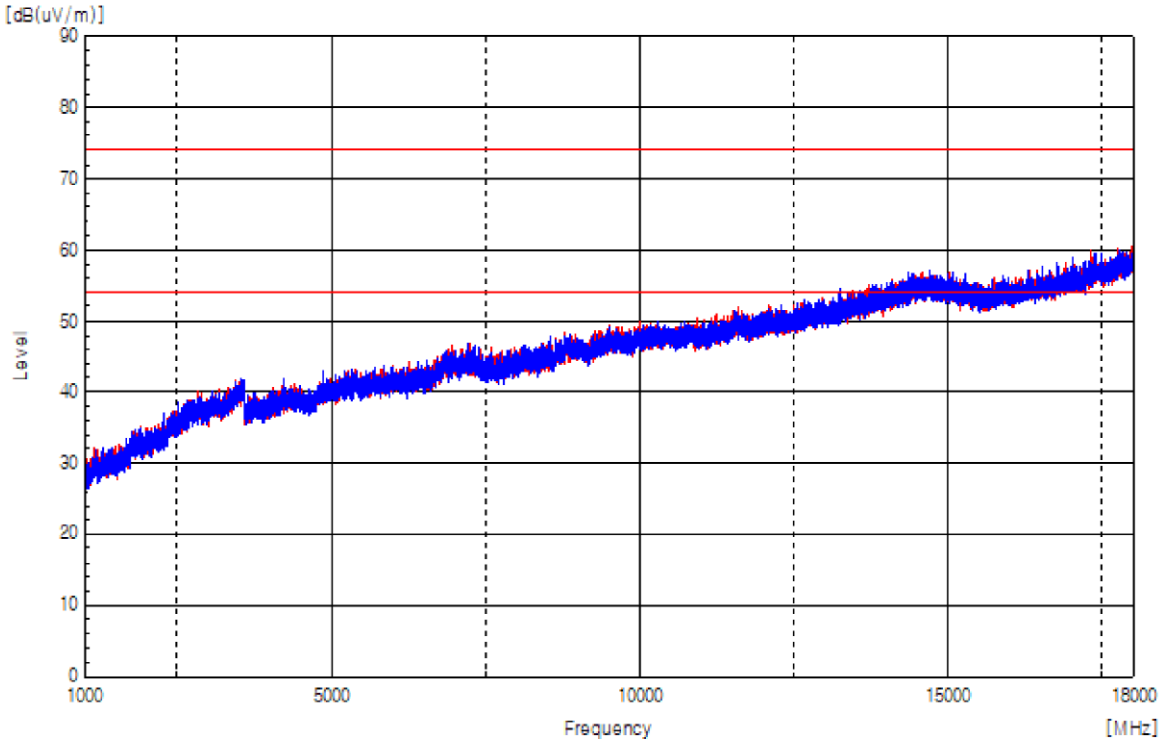


Freq. (MHz)	Reading (dBμV)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/S (dBμV/m)	Limit (dBμV/m)	Margin (dB)
85.41	45.80	V	111	125	14.12	1.19	28.03	33.08	40.00	6.92
122.35	43.00	H	40	320	15.26	1.43	27.91	31.78	43.50	11.72
138.72	46.90	V	191	150	13.90	1.52	27.85	34.47	43.50	9.03
211.67	46.10	H	290	150	16.47	1.88	27.48	36.97	43.50	6.53
301.96	44.90	H	197	120	19.00	2.28	27.31	38.87	46.00	7.13
307.50	42.60	V	1	106	19.05	2.29	27.35	36.59	46.00	9.41

Measurement Uncertainty: See Appendix A

Note:
- AF = Antenna Factor
- CL = Cable Loss
- F/S = Field Strength
- Pol.(H) = Horizontal
- Pol.(V) = Vertical
- Amp. = Amplifier Gain
- Margin = Limit – F/S
- F/S = Level + AF + CL – Amp.
- A : Angle
- H : Height

- Above 1 GHz (3 m method)



Freq.	Level (dBμV)		Pol.	A	H	AF	CL	Amp.	CF	F/S	Limit	Margin
(MHz)	Peak	C-AV	(H/V)	(°)	(cm)	(dB)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
3170.33	47.70	-	H	355	120	30.38	7.86	45.46	0.00	40.48	74.00	33.52
3170.33	-	17.20	H	355	120	30.38	7.86	45.46	0.00	9.98	54.00	44.02
3440.92	48.50	-	H	356	150	31.05	7.90	45.56	0.00	41.89	74.00	32.11
3440.92	-	17.40	H	356	150	31.05	7.90	45.56	0.00	10.79	54.00	43.21
3528.04	47.70	-	V	141	170	31.04	8.41	45.47	0.00	41.68	74.00	32.32
3528.04	-	17.30	V	141	170	31.04	8.41	45.47	0.00	11.28	54.00	42.72
4218.67	46.00	-	V	166	140	32.10	9.08	45.31	0.00	41.87	74.00	32.13
4218.67	-	17.50	V	166	140	32.10	9.08	45.31	0.00	13.37	54.00	40.63
11043.00	25.40	-	V	4	110	38.20	15.14	45.67	0.00	33.07	74.00	40.93
11043.00	-	18.40	V	4	110	38.20	15.14	45.67	0.00	26.07	54.00	27.93
11542.00	25.30	-	H	2	105	38.68	16.20	45.32	0.00	34.86	74.00	39.14
11542.00	-	18.60	H	2	105	38.68	16.20	45.32	0.00	28.16	54.00	25.84

Measurement Uncertainty: See Appendix A

Note:
- AF = Antenna Factor
- CL = Cable Loss
- F/S = Field Strength
- Pol.(H) = Horizontal
- Pol.(V) = Vertical
- Amp. = Amplifier Gain
- Margin = Limit – F/S
- F/S = Level + AF + CL – Amp.
- A : Angle
- H : Height

See Appendix A (Radiated Emission)

Appendix A : Measurement Uncertainty

- Gunpo Laboratory

Test Method		Measurement Uncertainty	
Conducted Emission		ENV216	3.4 dB (The confidential level is 95 %, *k*=2)
Radiated Emission	30 MHz ~ 1 000 MHz	Horizontal	4.90 dB (The confidential level is 95 %, *k*=2)
		Vertical	4.82 dB (The confidential level is 95 %, *k*=2)
	1 GHz ~ 18 GHz	Horizontal	3.62 dB (The confidential level is 95 %, *k*=2)
		Vertical	3.64 dB (The confidential level is 95 %, *k*=2)

- End of the Report -