TEST REPORT

Dt&C

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 : DREFCC2107-0116(1)

2. Customer

   • Name : duit design lab

   • Address : b-410ho, tera tower1, 167, Songpa-daero, Songpa-gu, Seoul, Republic of Korea

3. Use of Report : FCC Supplier's Declaration of Conformity

4. Product Name / Model Name : Pet automatic feeder / TT-1000

5. Test Method Used : ANSI C63.4:2014
   FCC Part 15 Subpart B
   (All other devices)

6. Date of Test : Jun. 21. 2021 ~ Jul. 02. 2021

7 Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

(Address : Refer to the attached)

8. Testing Environment : Temperature (22 ~ 24) °C , Humidity (50 ~ 51) % R.H.

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.

KS Q ISO / IEC 17025 and KOLAS accreditation.

This laboratory is not accredited for the test results marked. " * "

Affirmation	Tested by Name : KyungMin Jeong	Technical Manager Name : HyungJun Kim

The above test report is the accredited test result by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

Jun. 30. 2023.

Dt&C Co., Ltd.
Accredited by KOLAS, Republic of KOREA

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1. General Remarks

This report contains the result of tests performed by :

Dt&C Co., Ltd.
42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042
http://www.dtnc.net
Tel: +82-31-321-2664 Fax: +82-31-321-1664

2. Test Laboratory

Address of Laboratory

☒	BS	42, Yurim-ro 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, 17042, Korea
☐	SF-1	46, Yurim-ro 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, 17042, Korea
☒	SF-2	38, Yurim-ro 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, 17042, Korea
☐	SF-3	28, Baengnyeong-ro 20beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, 17042, Korea

Dt&C Co., Ltd. has been accredited / filed / authorized by the agencies listed in the following table;

Certificate	Nation	Agency	Code	Remark
Accreditation	Korea	KOLAS	393	ISO/IEC 17025
	South Africa	SABS	0006	ISO/IEC 17025
	Ghana	NCA	NCA agreement 23rd,Oct,2018	-
Site Filing	USA	FCC	KR0034 101842 678747, 596748, 804488, 165783	Accredited 2.948 Listed
	Canada	IC	5740A-3 5740A-4	Registered
	Japan	VCCI	C-1427, R-3385, R-14076, R-14180, R-4496, T-11442, G-10338, G-10754, G-10815, G-20051	Registered
Certification	Korea	KC	KR0034	Designation
	Germany	TUV	CARAT 089112 0008 Rev.00	ISO/IEC 17025
	Russia	RMRS	17.10189.296	ISO/IEC 17025

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competent of calibration and testing laboratory”.

3. General Information of EUT

Applicant	duit design lab b-410ho, tera tower1, 167, Songpa-daero, Songpa-gu, Seoul, Republic of Korea
Manufacturer	duit design lab b-410ho, tera tower1, 167, Songpa-daero, Songpa-gu, Seoul, Republic of Korea
Factory	DAEJIN IM CO., LTD 1371-6, Samcheonbyeongma-ro, Bongdam-eup, Hwaseong-si, Gyeonggi-do, Republic of Korea
Product Name	Pet automatic feeder
Model Name	TT-1000
Add Model Name	TT-5000
Add Model Difference	Add derived model with external color change (No difference in circuit and electrical characteristics) color-mushroom
SW version	1.0
HW version	1.0
Maximum Internal Frequency	40 MHz
Rated Power (Used for adapter)	INPUT : AC 100-240 V , 50/60 Hz, 0.25 A OUTPUT : DC 6 V, 1.0 A
Remarks	*Adapter Model : SK01T-0600100Z Manufacturer : Shenzhen Simsukian Electronics Technology CO., LTD INPUT : AC 100-240 V , 50/60 Hz, 0.25 A OUTPUT : DC 6 V, 1.0 A

Related Submittal(s) / Grant(s)
Original submittal only

4. EUT Operations and Test Configurations

4.1 Principle of Configuration Selection

Emission :
The equipment under test (EUT) was configured to measure its highest possible radiation level.
The test modes were adapted accordingly in reference to the instructions for use.
For each testing mode different configurations were used,
Refer to the individual tests.

4.2 EUT Operation Mode

No.	Mode	Description
1	Normal	EUT feeds continuously when the push of a button.

4.3 Test Configuration Mode

No.	Mode	Description
1	Normal	EUT is connected to adapter.

4.4 Supported Equipment

Used*	Product Type	Manufacturer	Model	Remarks
AE	adapter	Shenzhen Simsukian Electronics Technology CO., LTD	SK01T-0600100Z	N/A

*Abbreviations:
AE - Auxiliary/Associated Equipment, or
SIM - Simulator

4.5 EUT In/Output Port

Name	Type*	Cable Max. >3m	Cable Shielded	Cable Back shell	Remarks
AC IN	AC	-	Non shield	Plastic	N/A
DC IN	DC	1.5	Non shield	Plastic	N/A

*Abbreviations:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port GND = Ground
TP = Telecommunication Ports

4.6 Test Voltage and Frequency

Case	Voltage (V)	Frequency (DC/AC-Hz)	Phases	Remarks
1	AC 120	60	Single	None

5. Test Summary

Test Items	Applied Standards	Results
Conducted Disturbance	ANSI C63.4 : 2014	**C**
Radiated Disturbance	ANSI C63.4 : 2014	**C**
C=Comply N/C=Not Comply N/T=Not Tested N/A=Not Applicable		

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

-Conducted Disturbance

Frequency [MHz]	Phase	Result [dBµV]	Detector	Limit [dBµV]	Margin [dB]
0.42021	L	31.96	CAV	47.44	15.48

-Radiated Disturbance

Frequency [MHz]	Pol.	Result [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]
46.416	Vertical	26.83	QP	40.00	13017

6. Test Environment

Test Items	Test date (YYYY-MM-DD)	Temp. (℃)	Humidity (% R.H.)	Pressure (kPa)
Conducted Disturbance	2021-06-21	22	50	-
Radiated Disturbance	2021-07-02	24	51	

7. Test Results : Emission

7.1 Conducted Disturbance

ANSI C63.4	Mains terminal disturbance voltage	Result
Method: The AMN placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN. The measuring port of the LISN for EUT was connected to spectrum analyzer. Using conducted emission test software, the emissions were scanned with peak detector mode. After scanning over the frequency range, suspected emissions were selected to perform final measurement. When performing final measurement, the receiver was used which has Quasi-Peak detector and CISPR Average detector. For (0.15 ~ 30) MHz frequency range, Quasi-Peak detector with 10 kHz RBW and 30 kHz VBW was used. By varying the configuration of the test sample and the cable routing it was attempted to maximize the emission.		**Comply**

Fully configured sample scanned over the following frequency range	**Frequency range on each side of line**	**Measurement Point**
	150 kHz to 30 MHz	**Mains**
EUT mode (Refer to clauses 4)	**Test configuration mode**	**1**
	EUT Operation mode	**1**

Limits – Class A

Frequency (MHz)	**Limit dBµV**	
	Quasi-Peak	**Average**
0.15 to 0.50	79	66
0.50 to 30	73	60

Limits – Class B

Frequency (MHz)	**Limit dBµV**	
	Quasi-Peak	**Average**
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Measurement Instrument					
Description	**Model**	**Manufacturer**	**Identifier**	**Cal. Date**	**Cal. Due**
MEASUREMENT SOFTWARE	EMI-C VER. 2.00.0165	TSJ	N/A	N/A	N/A
EMI TEST RECEIVER	ESR7	ROHDE&SCHWARZ	101061	2021-01-28	2022-01-28
TWO-LINE V-NETWORK	ENV216	ROHDE&SCHWARZ	101979	2020-12-04	2021-12-04
TRANSIENT LIMITER	TL-B0930A	EMCIS	11002	2020-08-31	2021-08-31

Calculation

N : Neutral phase, L1 : Live phase
C.FACTOR(dB) : Pulse Limiter(dB) + Cable loss(dB) + Insertion loss of LISN(dB)
Result(dBµV) : Reading Value(dBµV) + C.FACTOR(dB)
Margin(dB) : Limit(dBµV) - Result(dBµV)

Mains terminal disturbance voltage _Test setup photo			
Test configuration mode	**1**	**EUT Operation mode**	**1**

Mains terminal disturbance voltage _Measurement data			
Test configuration mode	**1**	**EUT Operation mode**	**1**
Test voltage (V)	**AC 120**	**Test Frequency (Hz)**	**60**

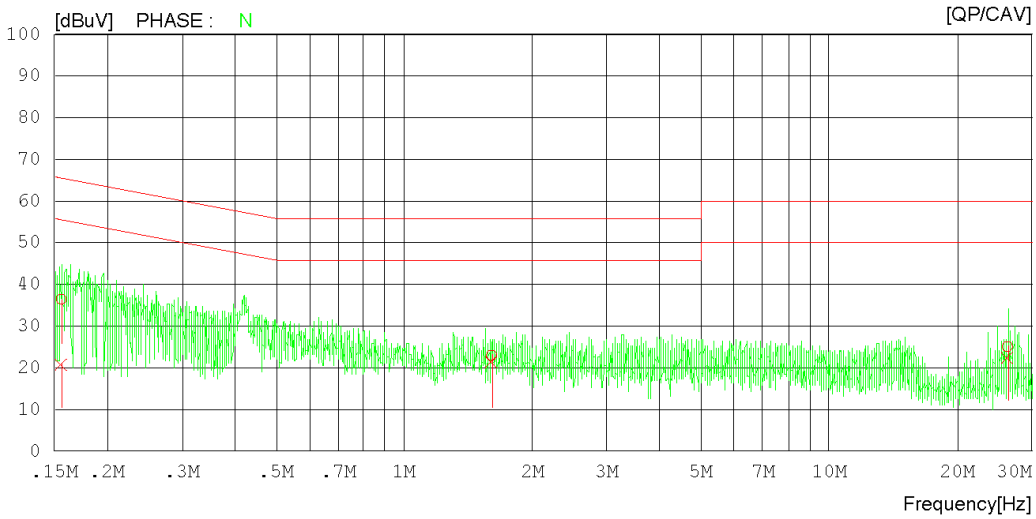
Results of Conducted Emission

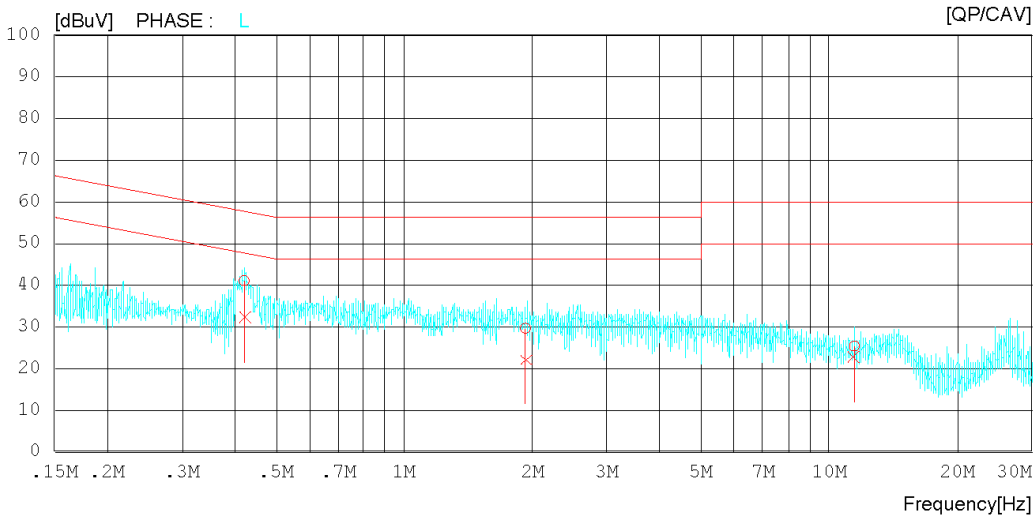
DT&C
Date 2021-06-21

Order No. DTNC2106-04775
Power Supply 120 'C 60 Hz
Temp/Humi/Atm 22 'C 50 % R.H. 99.6 kPa
Test Condition Normal

Memo

LIMIT : FCC Part.15 B_CLASS B_QP
FCC Part.15 B_CLASS B_AV





Results of Conducted Emission

DT&C
Date 2021-06-21

Order No. DTNC2106-04775
Power Supply 120 'C 60 Hz
Temp/Humi/Atm 22 'C 50 % R.H. 99.6 kPa
Test Condition Normal

Memo

LIMIT : FCC Part.15 B_CLASS B_QP
FCC Part.15 B_CLASS B_AV

NO	FREQ	READING QP	READING CAV	C.FACTOR	RESULT QP	RESULT CAV	LIMIT QP	LIMIT CAV	MARGIN QP	MARGIN CAV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15590	16.41	0.99	20.08	36.49	21.07	65.68	55.68	29.19	34.61	N
2	1.60440	3.09	1.17	19.96	23.05	21.13	56.00	46.00	32.95	24.87	N
3	26.32040	4.55	1.96	20.56	25.11	22.52	60.00	50.00	34.89	27.48	N
4	0.42021	20.69	11.74	20.22	40.91	31.96	57.44	47.44	16.53	15.48	L
5	1.93100	9.51	1.93	19.97	29.48	21.90	56.00	46.00	26.52	24.10	L
6	11.47820	4.27	1.52	20.92	25.19	22.44	60.00	50.00	34.81	27.56	L

7.2 Radiated Disturbance

ANSI C63.4	Radiated disturbance 30 MHz – 1 GHz	Result
Method: Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 or 3 meter below 1GHz and 3 meter above 1GHz. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable. For final measurement below 1 GHz frequency range, Quasi-Peak detector with (RBW = 120 kHz Bandwidth) was used. For final measurement above 1 GHz frequency range, Peak detector with (RBW = 1 MHz Bandwidth) and CISPR Average detector with (RBW = 1 MHz Bandwidth) were used.		**Comply**

EUT mode (Refer to clauses 4)	**Test configuration mode**	**1**
	EUT Operation mode	**1**

Radiated Disturbance below 1 000 MHz

Frequency range (MHz)	**Quasi-peak limit dBµV/m**		
	Class A		**Class B**
	3 m distance	**10 m distance**	**3 m distance**
30 to 88	49.1	39.1	40
88 to 216	53.5	43.5	43.5
216 to 960	56.4	46.4	46
960 to 1 000	59.5	49.5	54

According to 15.109(g), as an alternative to the radiated emission limit shown above, digital devices may be shown to comply with the standards(CISPR), Pub. 22 shown as below.

Frequency range (MHz)	**Quasi-peak limit dBµV/m**	
	Class A (10 m distance)	**Class B (10 m distance)**
30 to 230	40	30
230 to 1 000	47	37

Radiated Disturbance for above 1 000 MHz at a measurement distance of 3 m

Frequency range (GHz)	**Peak limit dBµV/m**		**Average limit dBµV/m**	
	Class A	**Class B**	**Class A**	**Class B**
1 to 40	80	74	60	54

The test frequency range of Radiated Disturbance measurements are listed below.

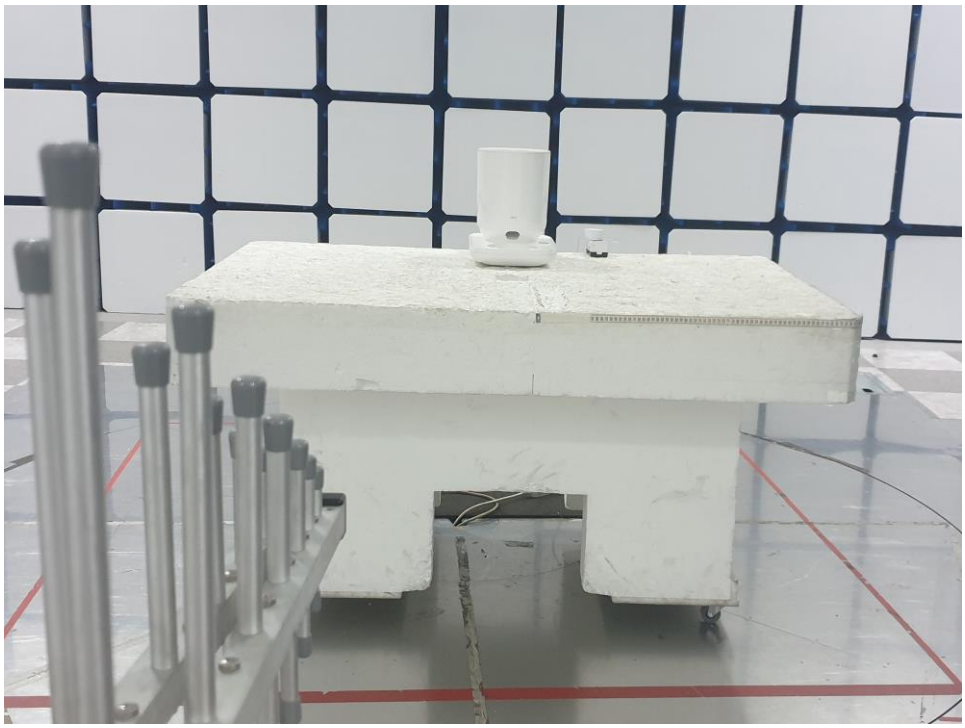
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	**Upper frequency of measurement range (MHz)**
Below 108	1 000
108 – 500	2 000
500 – 1 000	5 000
Above 1 000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

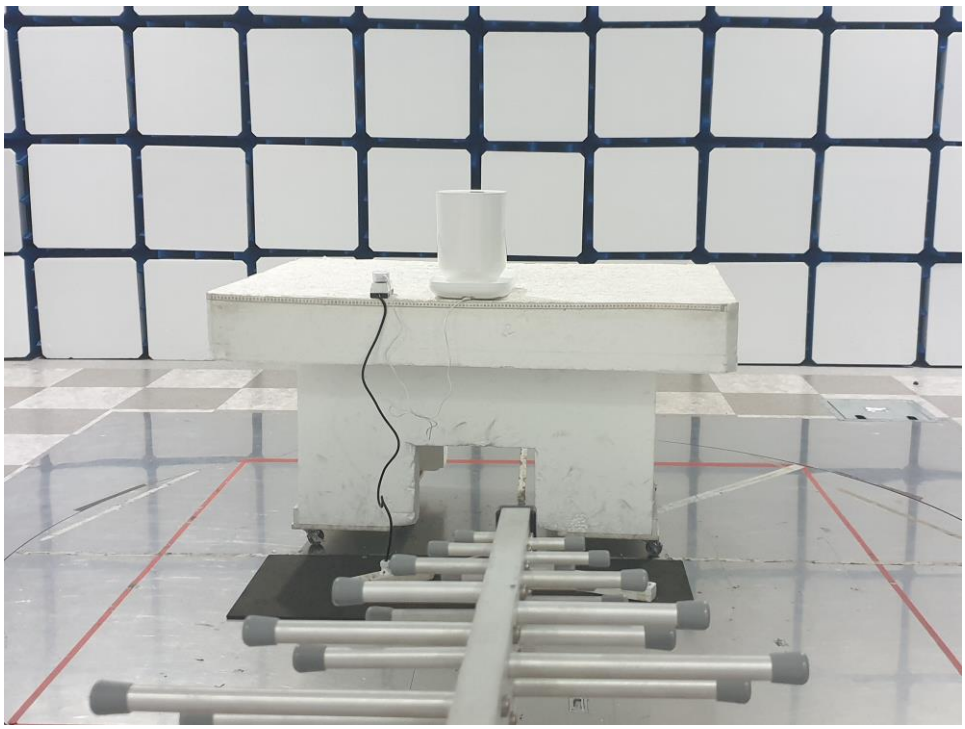
Measurement Instrument					
Description	**Model**	**Manufacturer**	**Identifier**	**Cal. Date**	**Cal. Due**
MEASUREMENT SOFTWARE	EMI-R VER. 2.00.0177	TSJ	N/A	N/A	N/A
EMI TEST RECEIVER	ESU40	ROHDE&SCHWARZ	100525	2020-12-14	2021-12-14
TRILOG BROAD BAND ANTENNA	VULB9160	SCHWARZBECK	9160-3339	2020-10-05	2022-10-05
6 DB ATTENUATOR	2708A	HP	18403	2020-10-05	2022-10-05
LOW NOISE PRE AMPLIFIER	MLA-100K01-B01-26	TSJ	1252741	2021-02-08	2022-02-08
(NOTE : THE MEASUREMENT ANTENNAS WERE CALIBRATED IN ACCORDANCE TO THE REQUIREMENTS OF C63.5-2017.)					

Calculation

Result(dBuV/m) : Reading Value(dBuV) + Cable loss(dB) - Pre amplifier gain(dB) + Ant. Factor(dB)
Margin : Limit(dBuV/m) - Result(dBuV/m)

Radiated Disturbance at (30 ~ 1 000) MHz _Test setup photo			
Test configuration mode	**1**	**EUT Operation mode**	**1**





Radiated disturbance at (30 ~ 1000) MHz _Measurement data			
Test configuration mode	**1**	**EUT Operation mode**	**1**
Test voltage (V)	**AC 120**	**Test Frequency (Hz)**	**60**

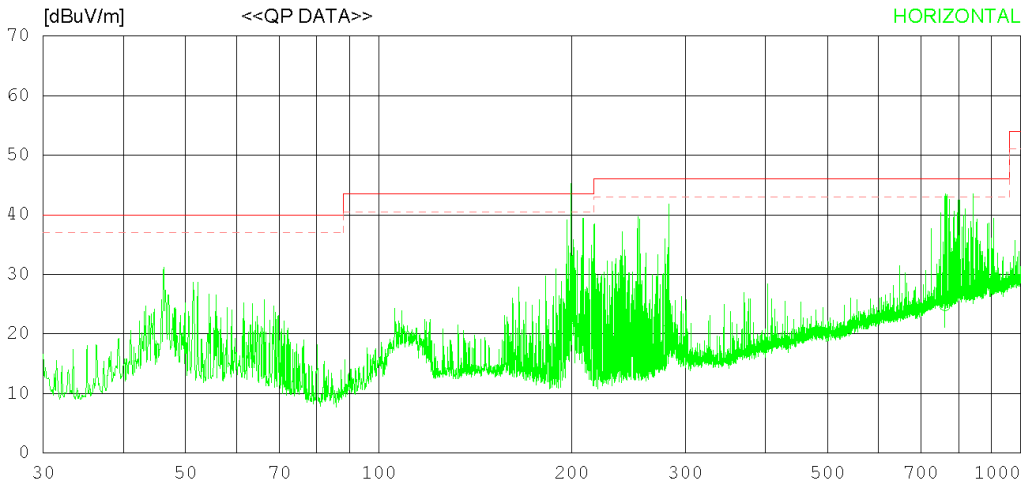
Date 2021-07-02

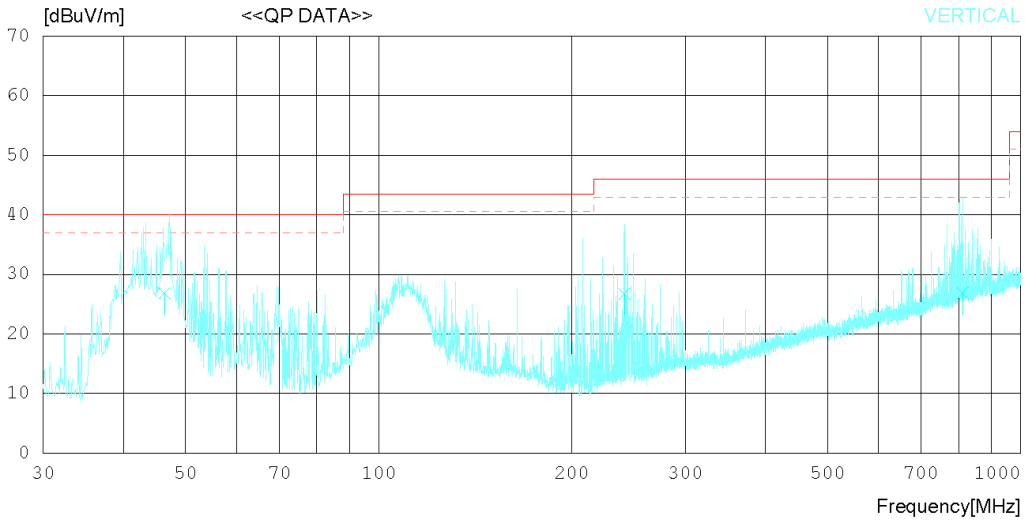
Order No. DTNC2106-04775
Power Supply 120 V 60 Hz
Temp/Humi 24 'C 51 % R.H.
Test Condition Normal

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m)
MARGIN: 3 dB

Antenna Factor
1. EMC-228_VULB9160_9160-3339_with ATT_18403_2020.10.05
Cable Loss
1. #24_C1_ANT to BOTTOM_3m_창의_9K-1G_2021-02-19
2. #25_C2_Amp to BOTTOM_3m_창의_9K-1G_2021-02-19
3. #26_C3_Amp to Receiver_3m_창의_9K-1G_2021-02-19
Pre Amp Gain
1. EMC-110_AMP_MLA-100K01-B01-26_1252741_2021.02.08





Date 2021-07-02

Order No. DTNC2106-04775
Power Supply 120 V 60 Hz
Temp/Humi 24 'C 51 % R.H.
Test Condition Normal

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m)
MARGIN: 3 dB

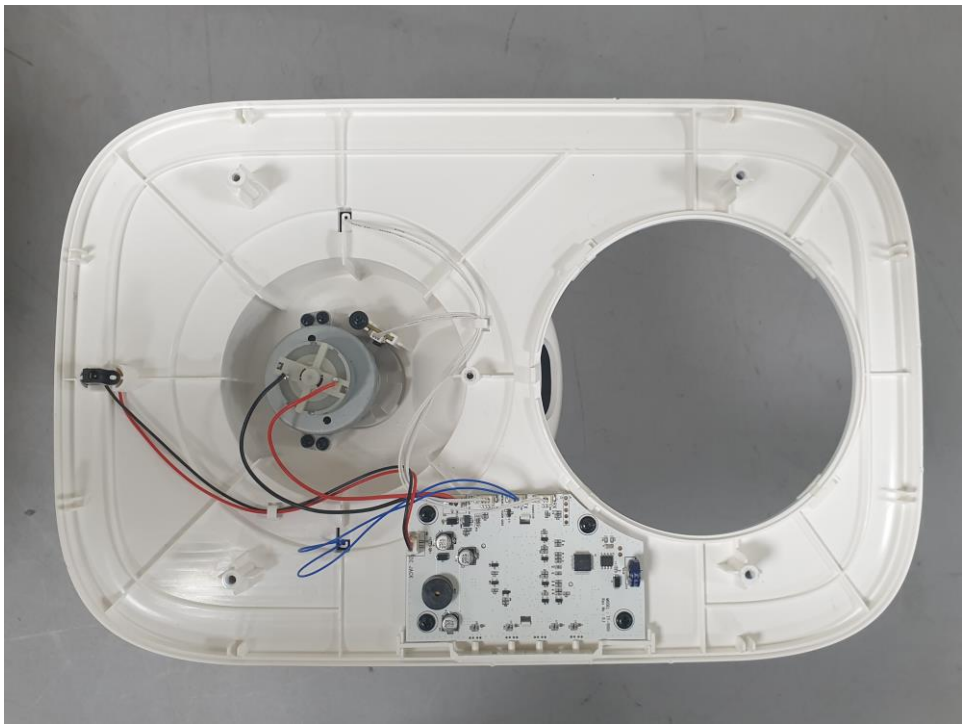
Antenna Factor
1. EMC-228_VULB9160_9160-3339_with ATT_18403_2020.10.05
Cable Loss
1. #24_C1_ANT to BOTTOM_3m_창의_9K-1G_2021-02-19
2. #25_C2_Amp to BOTTOM_3m_창의_9K-1G_2021-02-19
3. #26_C3_Amp to Receiver_3m_창의_9K-1G_2021-02-19
Pre Amp Gain
1. EMC-110_AMP_MLA-100K01-B01-26_1252741_2021.02.08

No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- HORIZONTAL ------										
1	198.834	31.10	16.10	2.00	26.64	22.56	43.50	20.94	143	156
2	281.859	25.90	19.04	2.38	26.57	20.75	46.00	25.25	105	350
3	761.823	18.50	28.20	4.17	26.13	24.74	46.00	21.26	126	202
----- VERTICAL ------										
4	46.416	35.00	17.44	0.99	26.60	26.83	40.00	13.17	285	158
5	241.265	33.50	17.65	2.18	26.60	26.73	46.00	19.27	102	191
6	811.534	19.90	28.80	4.33	26.17	26.86	46.00	19.14	124	135

8. Photographs of EUT

Front View of Product

Rear View of Product


Inside View of Product

Front View of Adapter


Rear View of Adapter

Label View of Adapter


9. Revision History

Date	Description	Revised By	Reviewed By
Jul. 14. 2021	Initial report	Hun Lee	HyungJun Kim
Jun. 30. 2023	- Changed Address (Applicant, Manufacturer, Factory)	KyungMin Jeong	DaeHwa Eun

-End of test report-