

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 : DREFCC2008-0195

2. Customer

• Name : MOTREX CO., LTD.

• Address : Seoyoung Bldg., 25, Hwangsaeul-ro 258beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea

3. Use of Report : Grant of Certification

4. Product Name / Model Name / FCC ID : SMART DISPLAY / MS310AKA4 / BP9-MS310AKA4

5. Test Method Used : ANSI C63.4:2014

FCC Part 15 Subpart B

(FM Broadcast receiver)



6. Date of Test : Jun. 09. 2020 ~ Jun. 16. 2020

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

8. Testing Environment : Temperature (18 ~ 21) °C , Humidity (39 ~ 42) % 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.

Affirmation	Tested by	Technical Manager
	Name : JooHo Kim 	Name : HyungJun Kim 

Aug. 04. 2020 .

DT&C Co., Ltd.

Not abided by KS Q ISO / IEC 17025 and KOLAS accreditation.

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

CONTENTS

1. General Remarks	3
2. Test Laboratory.....	3
3. General Information of EUT.....	4
4. EUT Operations and Test Configurations	5
4.1 Principle of Configuration Selection	5
4.2 EUT Operation Mode.....	5
4.3 Test Configuration Mode.....	5
4.4 Supported Equipment	6
4.5 EUT In/Output Port	6
4.6 Test Voltage and Frequency	6
5. Test Summary	7
6. Test Environment.....	7
7. Test Results : Emission.....	8
7.1 Conducted Disturbance	8
7.2 Radiated Disturbance	10
7.3 Antenna Power Conduction	54
8. Revision History.....	56

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.dtnet.net>

Tel: +82-31-321-2664 Fax: +82-31-321-1664

2. Test Laboratory

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 23 rd , 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-4076, R-4180, R-4496, T-1442, G-10338, G-754, G-10815, G-20051	Registered
Certification	Korea	KC	KR0034	Designation
	Germany	TUV	CARAT 089112 0006 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	MOTREX CO., LTD. Seoyoung Bldg., 25, Hwangsaеul-ro 258beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
Manufacturer	MOTREX CO., LTD. Seoyoung Bldg., 25, Hwangsaеul-ro 258beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
Factory	MOTREX CO., LTD. 62-7,Pungsesandan 4-ro, Pungse-myeon, Dongnam-gu, Cheonan-si, Chungcheongnam-do, Korea
Product Name	SMART DISPLAY
Model Name	MS310AKA4
Add Model Name	None
Maximum Internal Frequency	1 000 MHz
Software Version	Rev 0.1
Hardware Version	Rev0.1
Rated Power	DC 12 V
FCC ID	BP9-MS310AKA4
Remarks	

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	AM	The EUT is connected to the SIGNAL GENERATOR and is receiving radio frequency(MF). The EUT is wirelessly connected to the router and continuously sends and receives data. And we have verified the data.(WIFI5.8G)
2	FM	The EUT is connected to the SIGNAL GENERATOR and is receiving radio frequency(VHF II). The EUT is wirelessly connected to the router and continuously sends and receives data. And we have verified the data.(WIFI2.4G)
3	USB	The EUT is connected to USB memory to play the music. (1 kHz tone). The EUT is wirelessly connected to the router and continuously sends and receives data. And we have verified the data.(WIFI5.2G) The EUT is wirelessly connected to the phone and continuously sends and receives data.(Bluetooth)

4.3 Test Configuration Mode

No.	Mode	Description
1	Receiving (AM/FM)	EUT is connected to DC power EUT is connected to the SIGNAL GENERATOR EUT is wirelessly connected to the router
2	USB	EUT is connected to DC power EUT is connected to USB memory The EUT is wirelessly connected to the phone

4.4 Supported Equipment

Used*	Product Type	Manufacturer	Model	Remarks
AE	MULTI MEDIABOX	N/A	N/A	N/A
AE	Speaker	N/A	N/A	N/A
AE	PHONE	LG	VS-980	N/A
AE	USB MEMORY	Sandisk	ULTRA FLAIR 3.0	N/A
AE	ANT.	N/A	N/A	N/A
AE	ROUTER	RoHS	NEXT-7004N	N/A
AE	KEYBOARD	N/A	N/A	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
DC IN	DC	1.8	Non shield	Plastic	None
Antenna	I/O	3.0	Shield	Plastic	None
Multimediabox	I/O	1.5	Non shield	Plastic	None
SPEAKER	I/O	1.6	Non shield	Plastic	None
KEYBOARD	I/O	1.0	Non shield	Plastic	None

*Abbreviations:

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

4.6 Test Voltage and Frequency

Case	Voltage (V)	Frequency (Hz)	Phases	Remarks
1	DC 12 V	-	-	None

5. Test Summary

Test Items	Applied Standards	Results
Conducted Disturbance	ANSI C63.4 : 2014	N/A (Note 1)
Radiated Disturbance	ANSI C63.4 : 2014	C
Antenna Power Conduction	ANSI C63.4 : 2014	C
Note 1) The EUT is not a device connected to the AC mains.		
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]
-	-	-	-	-	-

-Radiated Disturbance

Frequency [MHz]	Pol.	Result [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]
39136.440	V	49.73	Cispr - Average	54.00	4.27

-Antenna Power Conduction

Frequency [MHz]	Result [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]
-	-	-	-	-

6. Test Environment

Test Items	Test date (YYYY-MM-DD)	Temp. (°C)	Humidity (% R.H.)	Pressure (kPa)
Radiated Disturbance	2020-06-09 2020-06-10	18 21	39 42	-
Antenna Power Conduction	2020-06-16	21	40	

7. Test Results : Emission

7.1 Conducted Disturbance

ANSI C63.4	Mains terminal disturbance voltage			Result	
<u>Method:</u> 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.				Not Applicable	
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		N/A		
	EUT Operation mode		N/A		
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
-	-	-	-	-	-

Mains terminal disturbance voltage _ Measurement data			
Test configuration mode	N/A	EUT Operation mode	N/A
Test voltage (V)	N/A	Test Frequency (Hz)	N/A

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)

7.2 Radiated Disturbance

ANSI C63.4 BETS-7	Radiated disturbance 30 MHz –40 GHz**			Result
<u>Method:</u> 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, 2	
	EUT Operation mode		1, 2, 3	
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		5 th 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	2019.12.20	2020.12.20
TRILOG BROADBAND TEST-ANTENNA WITH 6DB ATT	VULB9160	SCHWARZBECK	9160-3339	2018.10.22	2020.10.22
	2708A	HP	18403	2018.10.22	2020.10.22
LOW NOISE PRE AMPLIFIER	MLA-100K01-B01-26	TSJ	1252741	2020.02.13	2021.02.13
HORN ANTENNA	3117	ETS-LINDGREN	00152093	2020.03.26	2021.03.26
HORN ANTENNA	EM-6969	ELECTRO-METRICS	156	2019.02.13	2021.02.13
PREAMPLIFIER	MLA-0618-B03-34	TSJ	1785642	2019.12.31	2020.12.31
HORN ANTENNA WITH	3116C	ETS-LINDGREN	00213177	2019.12.12	2021.12.12
PREAMPLIFIER	JS44-18004000-35-8P	L3 NARDA-MITEQ	2046884	2019.11.04	2020.11.04
(NOTE : THE MEASUREMENT ANTENNAS WERE CALIBRATED IN ACCORDANCE TO THE REQUIREMENTS OF C63.5-2017.)					

Radiated disturbance at (30 ~ 1000) MHz _Measurement data			
Test configuration mode	1	EUT Operation mode	1
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

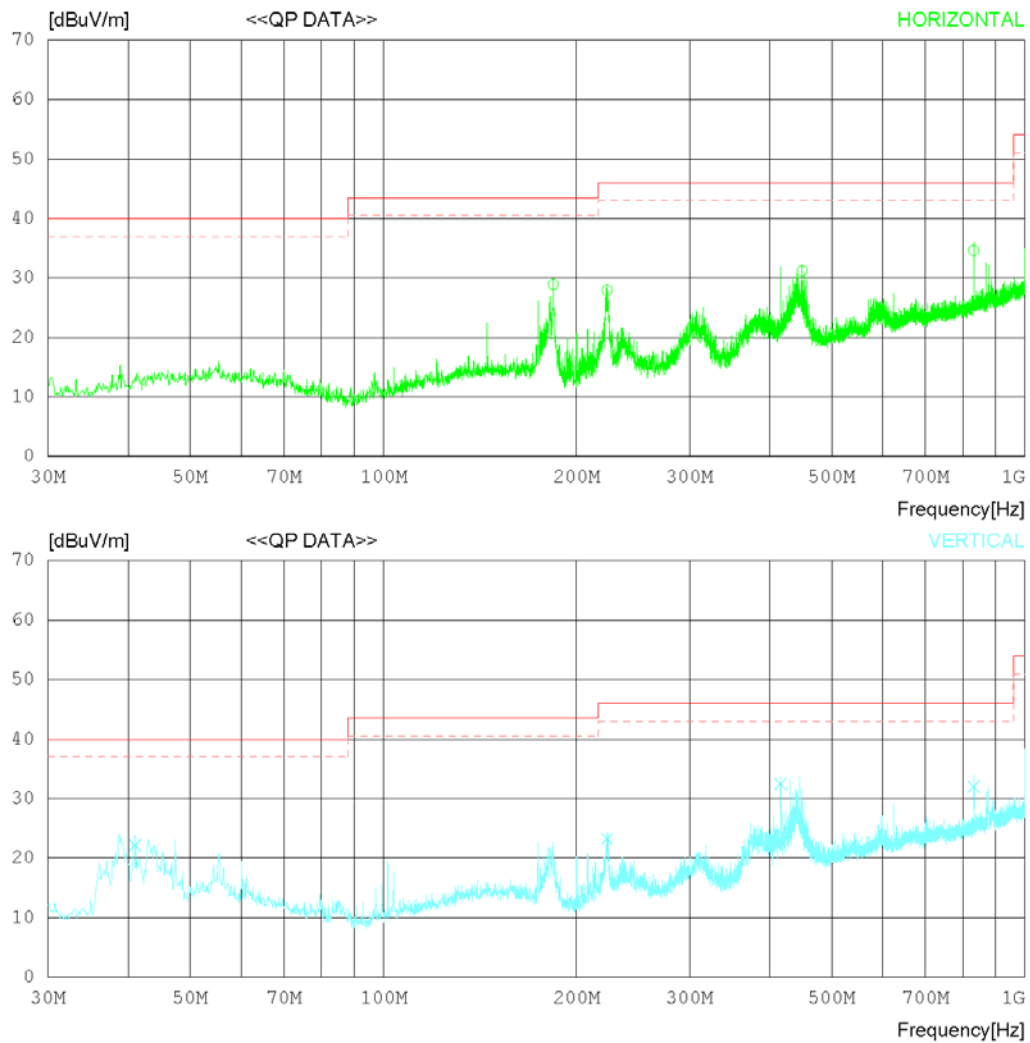
RADIATED EMISSION

Date 2020-06-09

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 'C 39 % R.H.
Test Condition AM

Memo

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



RADIATED EMISSION

Date 2020-06-09

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 °C 39 % R.H.
Test Condition AM

Memo

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

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	183.984	36.35	16.84	1.34	25.62	28.91	43.50	14.59	155	1
2	223.147	35.12	17.06	1.45	25.66	27.97	46.00	18.03	164	1
3	449.635	31.74	23.00	2.06	25.63	31.17	46.00	14.83	234	243
4	832.005	28.62	28.78	2.96	25.75	34.61	46.00	11.39	143	358
----- Vertical -----										
5	41.034	29.99	17.31	0.68	25.81	22.17	40.00	17.83	134	171
6	223.268	30.42	17.06	1.45	25.67	23.26	46.00	22.74	268	155
7	415.928	34.33	21.90	2.01	25.77	32.47	46.00	13.53	122	1
8	832.005	26.02	28.78	2.96	25.75	32.01	46.00	13.99	184	169

Radiated disturbance at (1 ~ 6) GHz _Peak measurement data			
Test configuration mode	1	EUT Operation mode	1
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

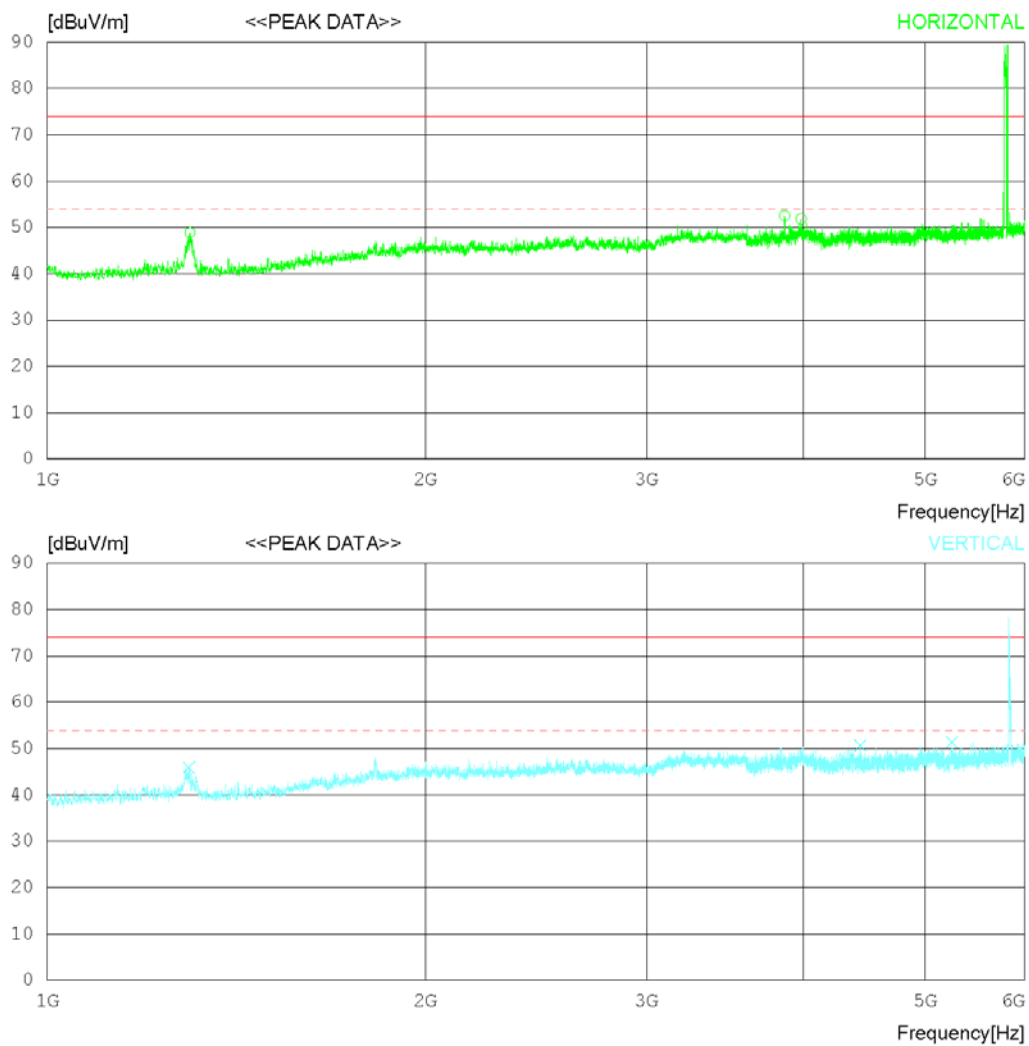
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition AM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



*Remark : (5,745~ 5,825) MHz is WIFI 5.8 G frequency.

RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 °C 42 % R.H.
Test Condition AM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1299.375	49.80	29.30	5.14	35.33	48.91	74.0	25.09	291	122
2	3863.125	43.52	33.43	9.29	33.73	52.51	74.0	21.49	143	358
3	3983.125	42.17	33.53	9.69	33.56	51.83	74.0	22.17	100	358
----- Vertical -----										
4	1296.875	46.78	29.31	5.13	35.33	45.89	74.0	28.11	249	48
5	4438.750	41.78	33.60	9.40	34.12	50.66	74.0	23.34	386	18
6	5251.875	41.50	34.40	10.36	34.90	51.36	74.0	22.64	223	48

Radiated disturbance at (1 ~ 6) GHz _Average measurement data			
Test configuration mode	1	EUT Operation mode	1
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

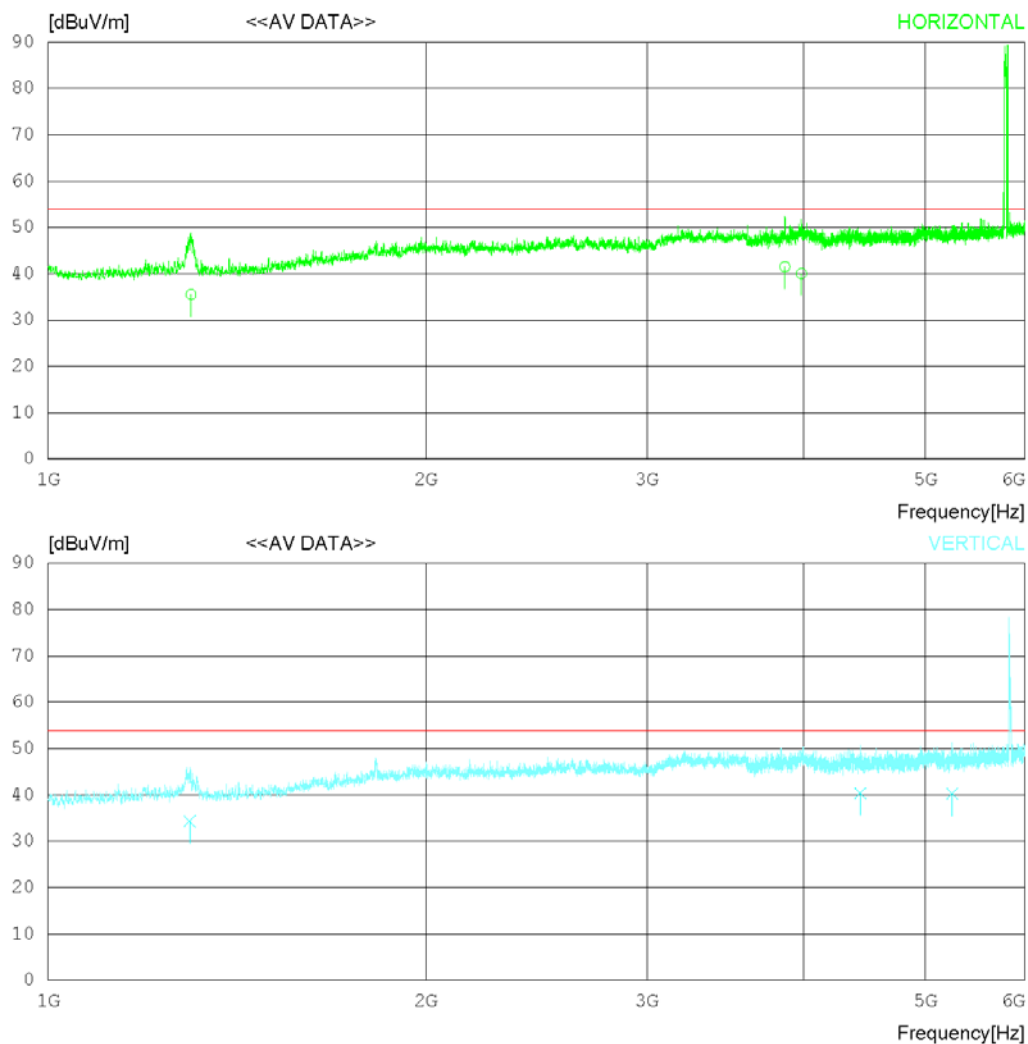
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Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition AM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



*Remark : (5,745~ 5,825) MHz is WIFI 5.8 G frequency.

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Temp/Humi 21 °C 42 % R.H.
Test Condition AM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1299.675	36.40	29.30	5.14	35.33	35.51	54.00	18.49	275	156
2	3863.240	32.50	33.43	9.29	33.73	41.49	54.00	12.51	157	321
3	3983.246	30.40	33.53	9.69	33.56	40.06	54.00	13.94	102	327
----- Vertical -----										
4	1296.564	35.20	29.31	5.13	35.33	34.31	54.00	19.69	233	104
5	4438.124	31.50	33.60	9.40	34.12	40.38	54.00	13.62	372	104
6	5251.375	30.40	34.40	10.36	34.90	40.26	54.00	13.74	257	97

Radiated disturbance at (6 ~ 18) GHz _Peak measurement data			
Test configuration mode	1	EUT Operation mode	1
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

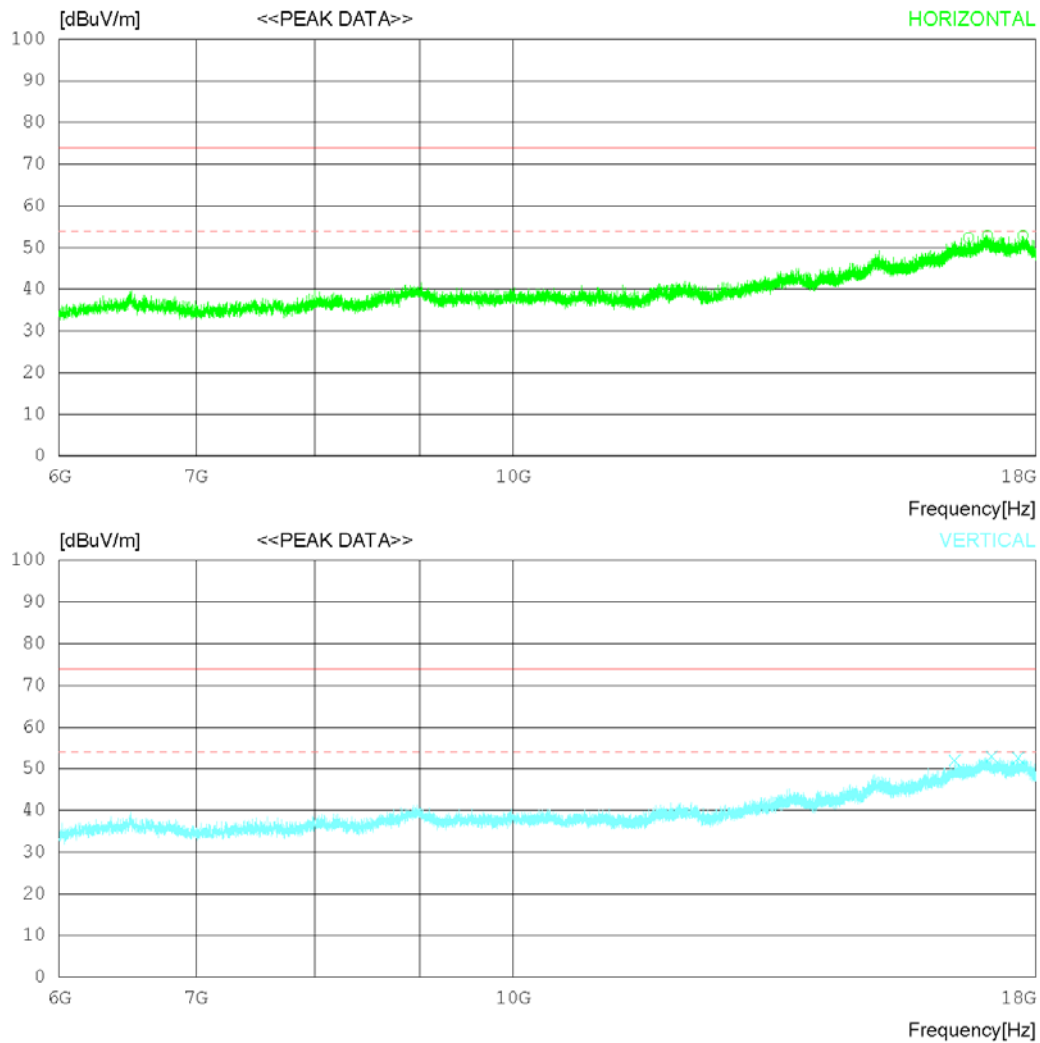
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Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition AM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



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Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 °C 42 % R.H.
Test Condition AM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	16689.750	29.50	37.20	21.91	36.21	52.40	74.0	21.6	100	358
2	17048.250	28.30	37.59	23.42	36.46	52.85	74.0	21.15	333	355
3	17738.250	29.40	38.12	22.71	37.38	52.85	74.0	21.15	134	358
----- Vertical -----										
4	16430.250	29.20	36.91	21.94	36.14	51.91	74.0	22.09	165	358
5	17126.250	29.00	37.65	22.80	36.55	52.90	74.0	21.1	220	358
6	17650.500	29.20	38.05	22.56	37.24	52.57	74.0	21.43	100	358

Radiated disturbance at (6 ~ 18) GHz _Average measurement data			
Test configuration mode	1	EUT Operation mode	1
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

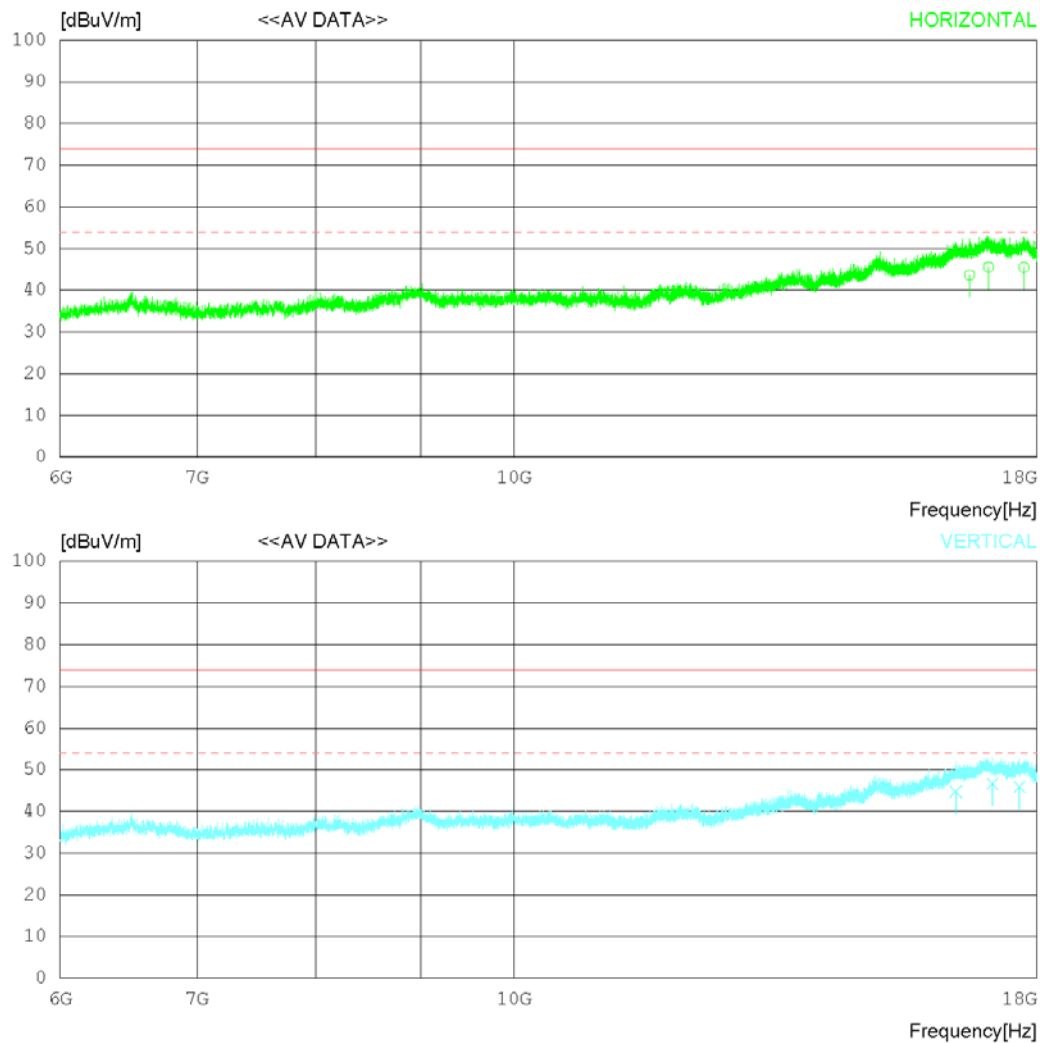
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Power Supply DC 12 V
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LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



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Test Condition AM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	16688.370	20.80	37.20	21.91	36.21	43.70	54.00	10.30	108	35
2	17048.370	21.04	37.59	23.42	36.46	45.59	54.00	8.41	333	355
3	17737.650	22.05	38.12	22.70	37.38	45.49	54.00	8.51	134	100
----- Vertical -----										
4	16432.020	22.03	36.91	21.94	36.14	44.74	54.00	9.26	154	323
5	17127.140	22.69	37.65	22.80	36.55	46.59	54.00	7.41	197	214
6	17652.270	22.50	38.05	22.56	37.24	45.87	54.00	8.13	120	90

Radiated disturbance at (18 ~ 40) GHz _Peak measurement data			
Test configuration mode	1	EUT Operation mode	1
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

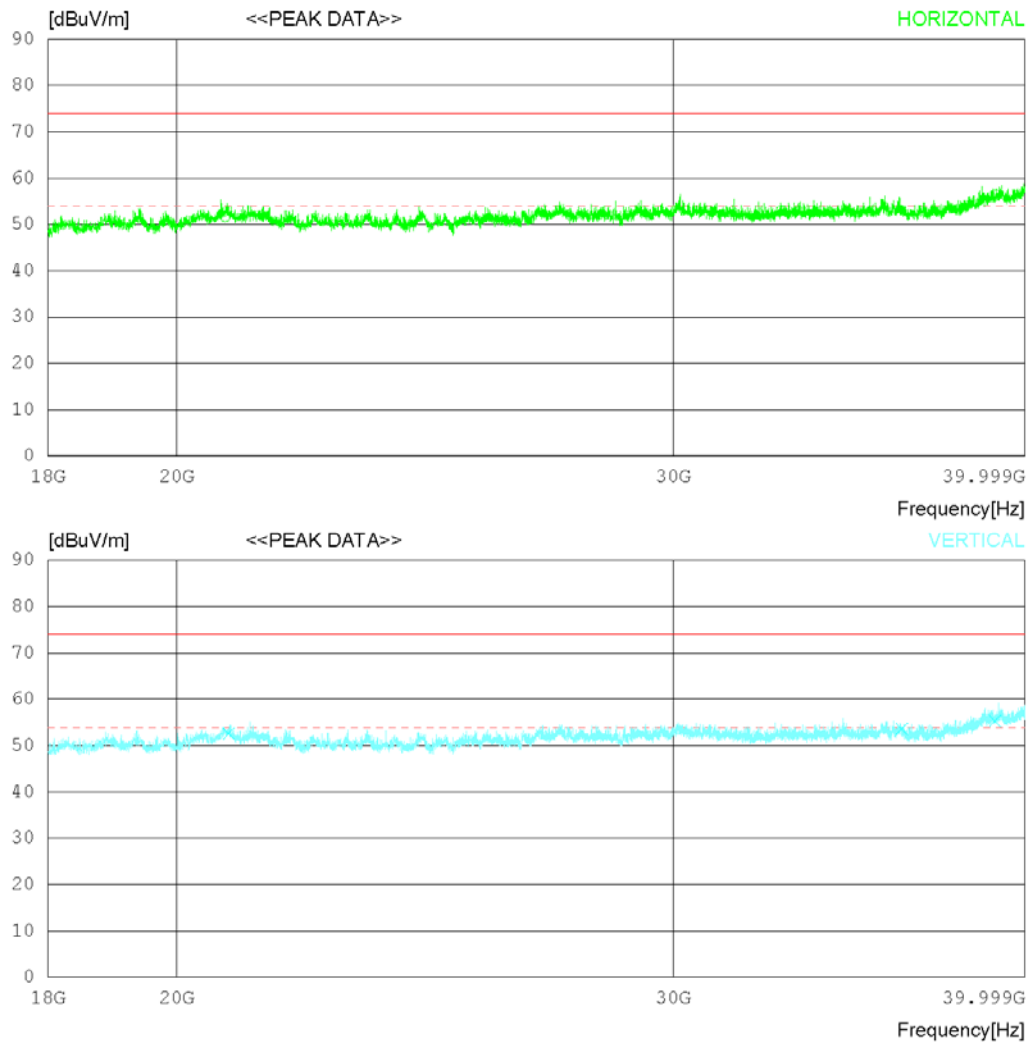
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LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



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Test Condition AM

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LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	20805.000	39.30	45.60	20.14	53.36	51.68	74.0	22.32	142	358
2	32789.500	35.50	46.99	23.21	52.73	52.97	74.0	21.03	167	358
3	39051.250	35.20	47.65	25.70	52.25	56.30	74.0	17.7	322	358
----- Vertical -----										
4	20865.500	40.10	45.60	20.26	53.39	52.57	74.0	21.43	214	174
5	36174.750	36.60	46.65	24.11	53.76	53.60	74.0	20.4	230	0
6	39043.000	34.20	47.64	25.72	52.25	55.31	74.0	18.69	174	0

Radiated disturbance at (18 ~ 40) GHz _Average measurement data			
Test configuration mode	1	EUT Operation mode	1
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

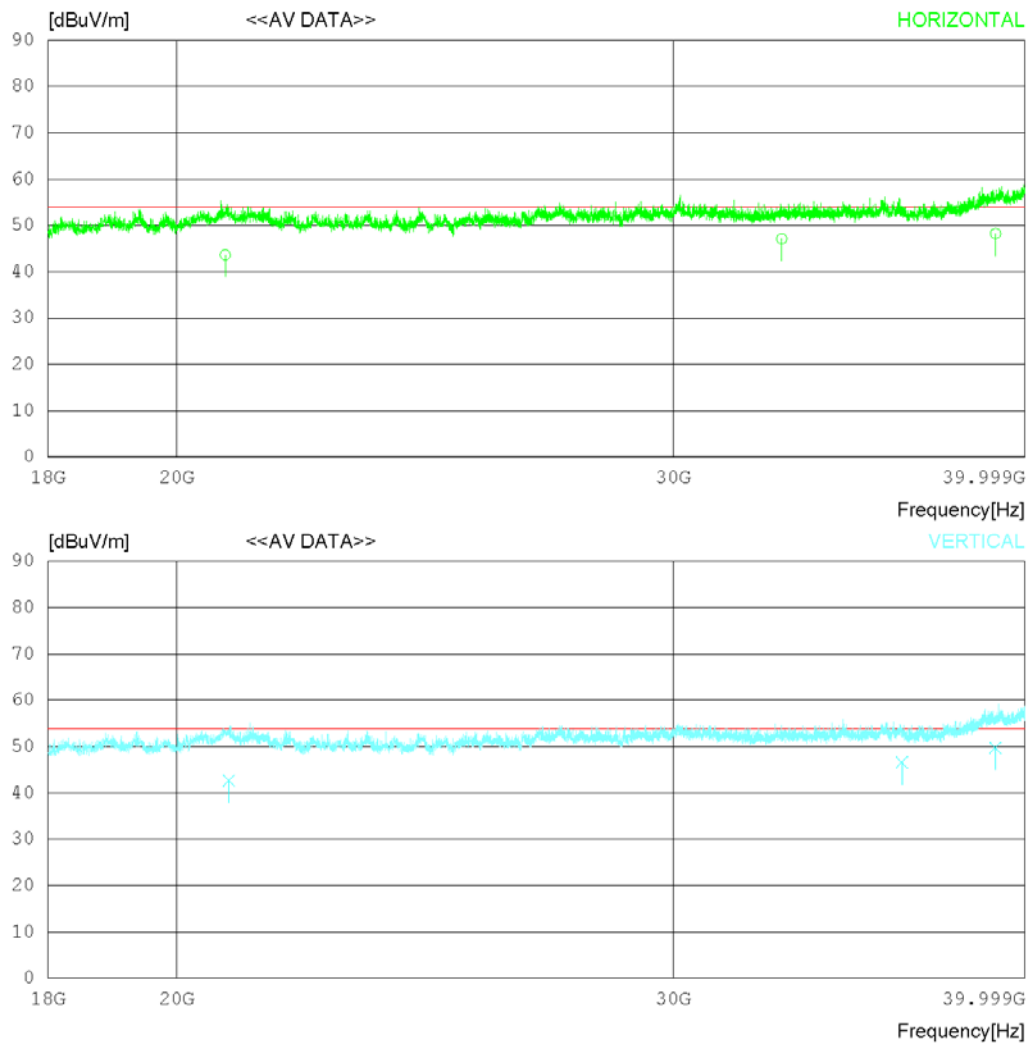
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition AM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition AM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	20805.120	31.25	45.60	20.14	53.36	43.63	54.00	10.37	230	120
2	32789.570	29.63	46.99	23.21	52.73	47.10	54.00	6.90	274	332
3	39051.210	27.11	47.65	25.70	52.25	48.21	54.00	5.79	175	273
----- Vertical -----										
4	20865.540	30.22	45.60	20.26	53.39	42.69	54.00	11.31	120	132
5	36174.330	29.60	46.65	24.11	53.76	46.60	54.00	7.40	234	262
6	39043.080	28.62	47.64	25.72	52.25	49.73	54.00	4.27	277	312

Radiated disturbance at (30 ~ 1000) MHz _Measurement data			
Test configuration mode	1	EUT Operation mode	2
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

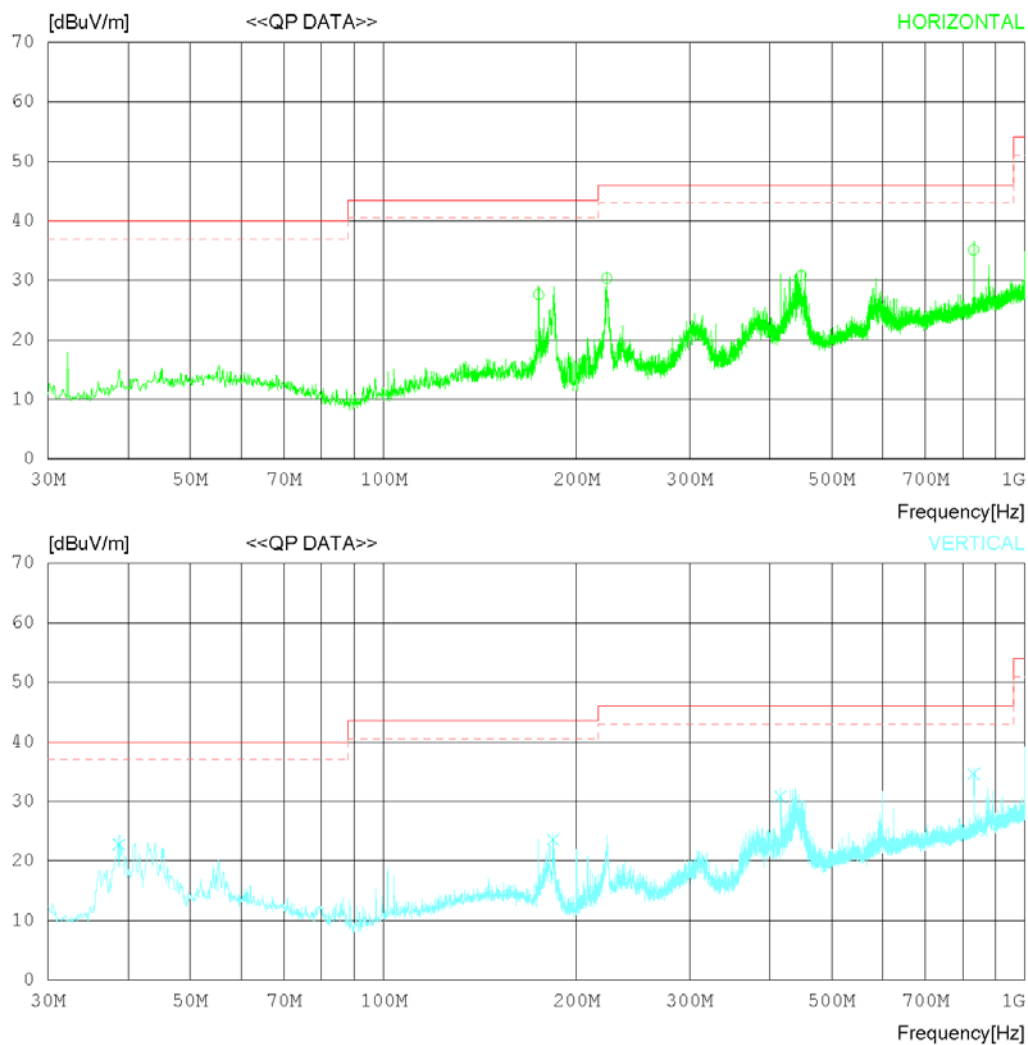
RADIATED EMISSION

Date 2020-06-09

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 'C 39 % R.H.
Test Condition FM

Memo

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



RADIATED EMISSION

Date 2020-06-09

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 °C 39 % R.H.
Test Condition FM

Memo

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

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	174.527	34.35	17.60	1.30	25.64	27.61	43.50	15.89	194	228
2	223.025	37.51	17.05	1.45	25.66	30.35	46.00	15.65	207	1
3	448.058	31.38	22.98	2.06	25.64	30.78	46.00	15.22	326	0
4	832.126	29.13	28.79	2.96	25.75	35.13	46.00	10.87	134	264
----- Vertical -----										
5	38.730	31.24	16.69	0.66	25.81	22.78	40.00	17.22	132	220
6	183.984	31.03	16.84	1.34	25.62	23.59	43.50	19.91	166	1
7	415.928	32.68	21.90	2.01	25.77	30.82	46.00	15.18	148	1
8	832.126	28.62	28.79	2.96	25.75	34.62	46.00	11.38	106	162

Radiated disturbance at (1 ~ 6) GHz _Peak measurement data			
Test configuration mode	1	EUT Operation mode	2
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

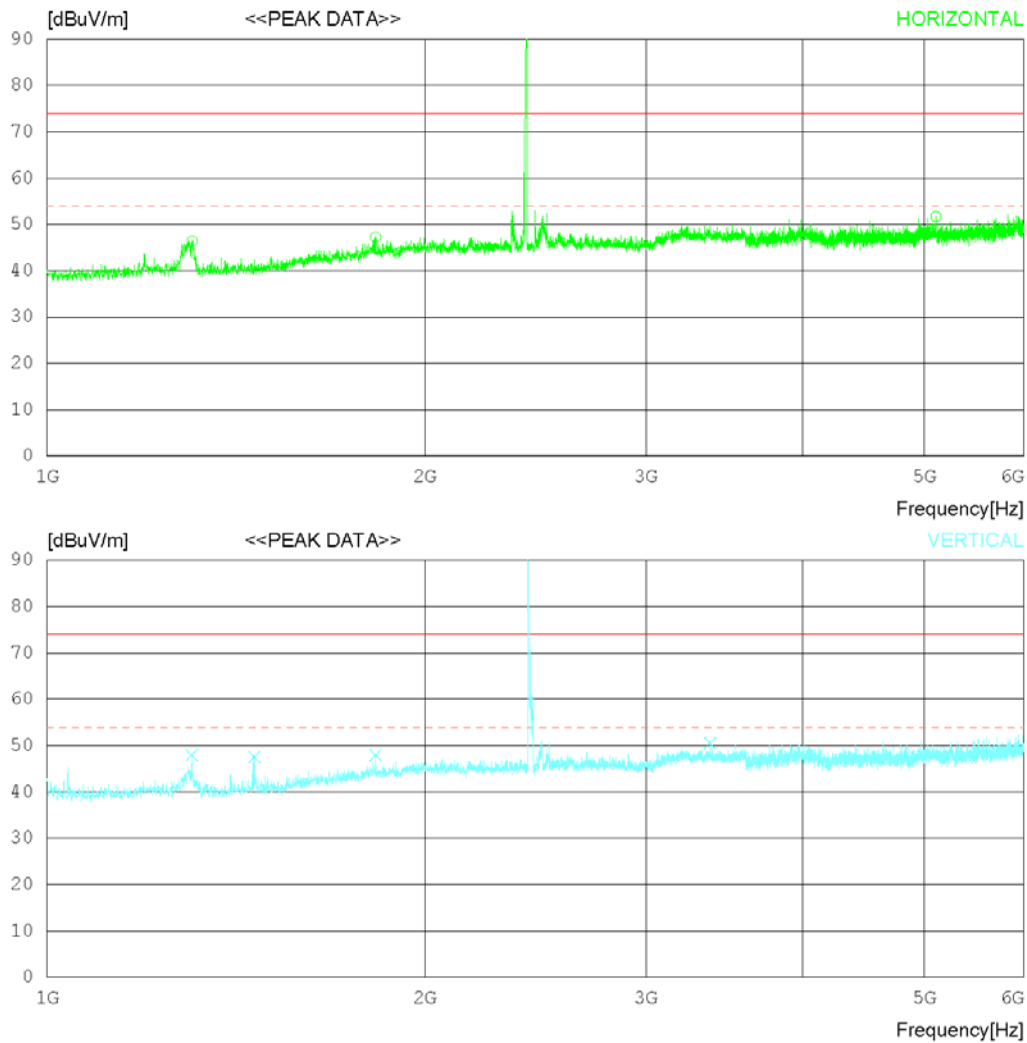
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 'C 39 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



*Remark : (2,412 ~ 2,472) MHz is WIFI 2.4 G frequency.

RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 °C 39 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1305.000	47.90	28.72	5.17	35.32	46.47	74.0	27.53	236	358
2	1826.875	44.30	30.51	7.02	34.58	47.25	74.0	26.75	154	208
3	5107.500	42.10	34.12	10.35	34.88	51.69	74.0	22.31	141	357
----- Vertical -----										
4	1304.375	49.40	28.73	5.16	35.32	47.97	74.0	26.03	210	1
5	1463.125	48.80	27.90	6.01	35.10	47.61	74.0	26.39	124	183
6	1826.250	45.00	30.51	7.02	34.58	47.95	74.0	26.05	165	1
7	3375.000	43.60	32.80	8.56	34.41	50.55	74.0	23.45	232	29

Radiated disturbance at (1 ~ 6) GHz _Average measurement data			
Test configuration mode	1	EUT Operation mode	2
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

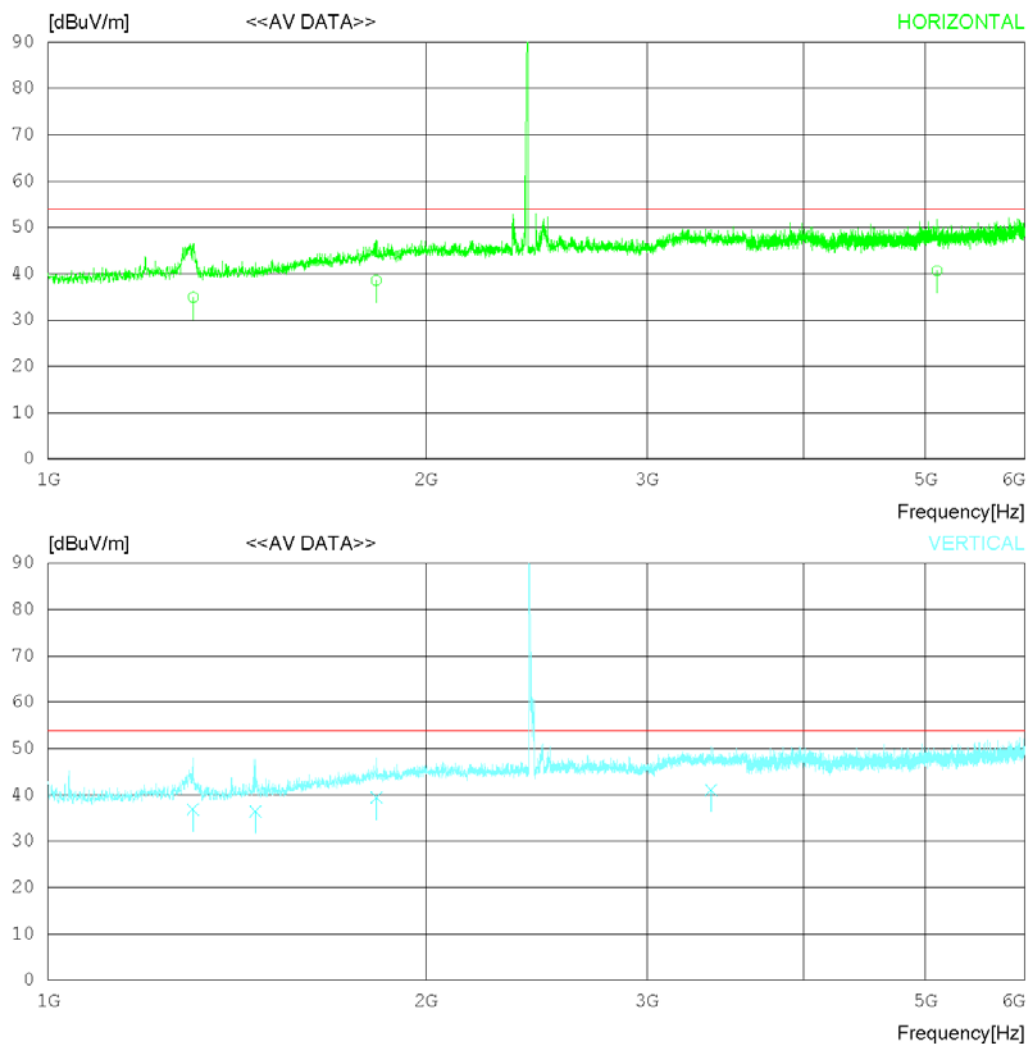
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 'C 39 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



*Remark : (2,412 ~ 2,472) MHz is WIFI 2.4 G frequency.

RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 °C 39 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1305.341	36.34	28.71	5.17	35.32	34.90	54.00	19.10	231	325
2	1825.394	35.62	30.50	7.02	34.59	38.55	54.00	15.45	154	241
3	5107.391	31.06	34.11	10.35	34.88	40.64	54.00	13.36	136	320
----- Vertical -----										
4	1304.325	38.32	28.73	5.16	35.32	36.89	54.00	17.11	165	45
5	1463.021	37.61	27.90	6.01	35.10	36.42	54.00	17.58	194	132
6	1826.841	36.46	30.51	7.02	34.58	39.41	54.00	14.59	246	54
7	3375.395	34.08	32.80	8.55	34.41	41.02	54.00	12.98	121	84

Radiated disturbance at (6 ~ 18) GHz _Peak measurement data			
Test configuration mode	1	EUT Operation mode	2
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

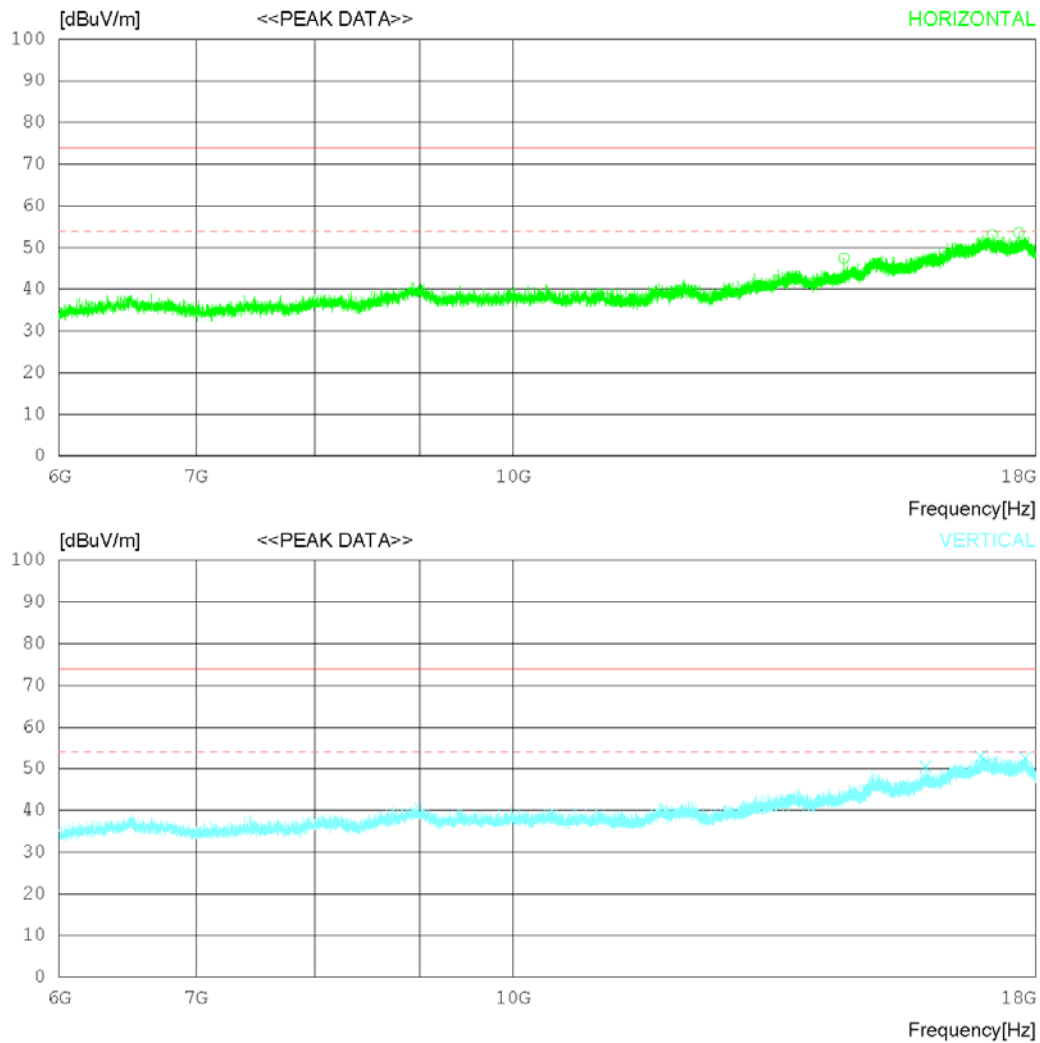
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 °C 42 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	14505.750	31.20	34.69	19.16	37.59	47.46	74.0	26.54	130	156
2	17143.500	29.30	37.66	22.67	36.57	53.06	74.0	20.94	121	77
3	17656.500	30.20	38.06	22.57	37.25	53.58	74.0	20.42	230	358
----- Vertical -----										
4	15907.500	30.40	36.33	20.21	36.44	50.50	74.0	23.5	132	239
5	16924.500	28.80	37.46	23.17	36.35	53.08	74.0	20.92	210	358
6	17791.500	29.10	38.16	22.79	37.47	52.58	74.0	21.42	100	167

Radiated disturbance at (6 ~ 18) GHz _Average measurement data			
Test configuration mode	1	EUT Operation mode	2
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

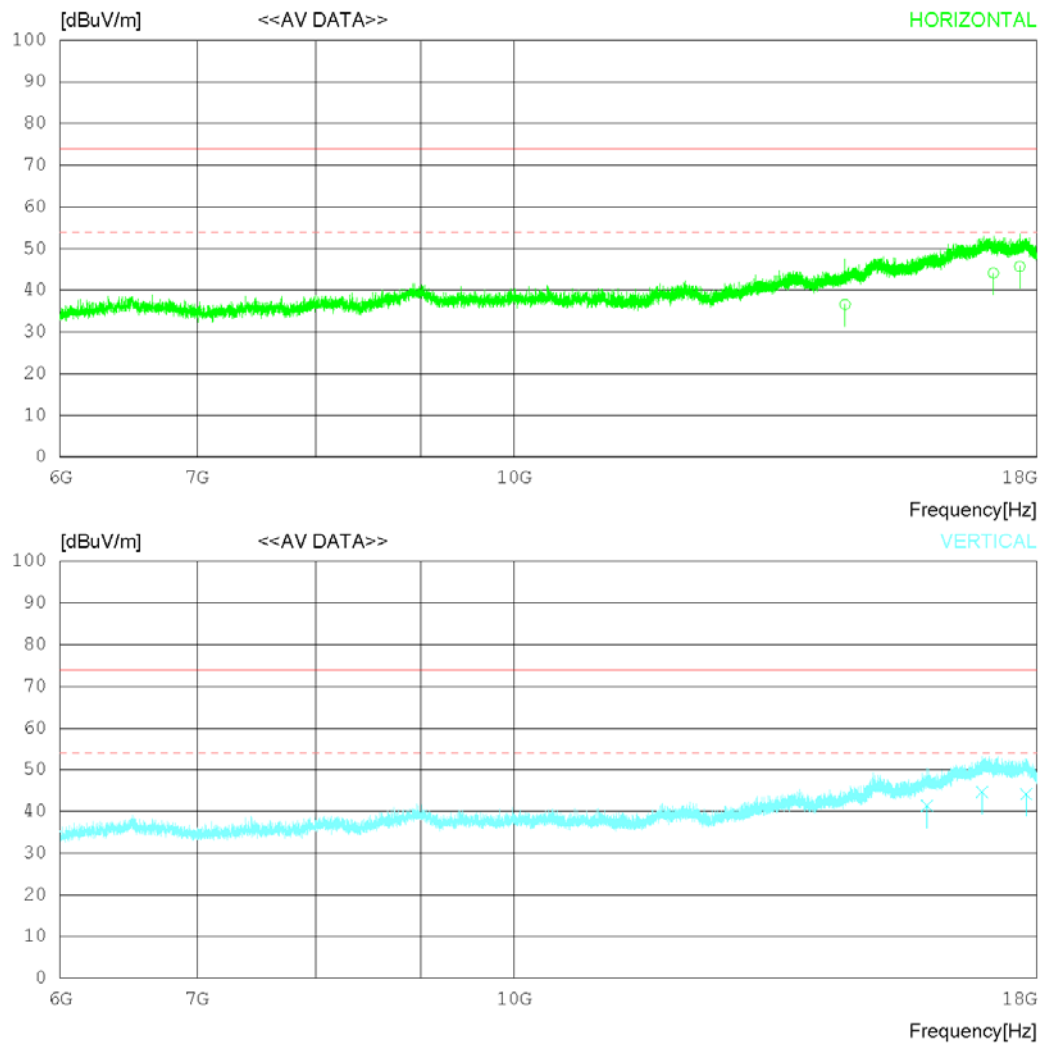
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	14507.250	20.30	34.69	19.17	37.59	36.57	54.00	17.43	100	156
2	17142.610	20.36	37.66	22.68	36.57	44.13	54.00	9.87	121	77
3	17655.910	22.34	38.06	22.56	37.25	45.71	54.00	8.29	230	358
----- Vertical -----										
4	15906.740	21.25	36.33	20.21	36.44	41.35	54.00	12.65	154	220
5	16923.380	20.37	37.46	23.15	36.35	44.63	54.00	9.37	194	314
6	17790.220	20.64	38.16	22.80	37.46	44.14	54.00	9.86	121	154

Radiated disturbance at (18 ~ 40) GHz _Peak measurement data			
Test configuration mode	1	EUT Operation mode	2
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

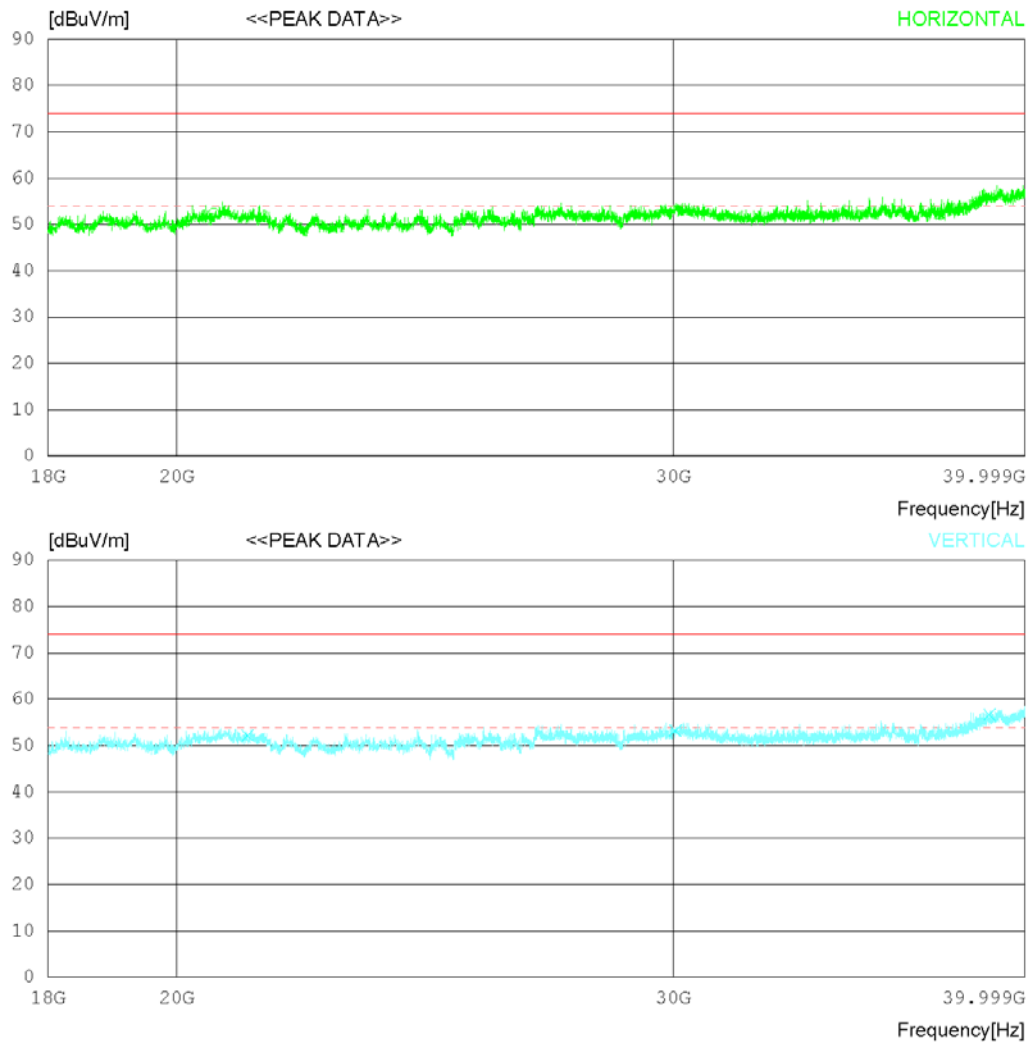
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 °C 42 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	20609.750	40.40	45.50	19.77	53.27	52.40	74.0	21.6	214	358
2	37316.000	34.70	46.00	24.30	52.85	52.15	74.0	21.85	180	30
3	38435.250	35.00	46.71	25.10	52.28	54.53	74.0	19.47	220	60
----- Vertical -----										
4	21192.750	39.70	45.60	20.40	53.54	52.16	74.0	21.84	321	0
5	30061.500	36.00	47.50	21.91	52.20	53.21	74.0	20.79	154	0
6	38861.500	35.90	47.42	25.62	52.26	56.68	74.0	17.32	174	41

Radiated disturbance at (18 ~ 40) GHz _Average measurement data			
Test configuration mode	1	EUT Operation mode	2
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

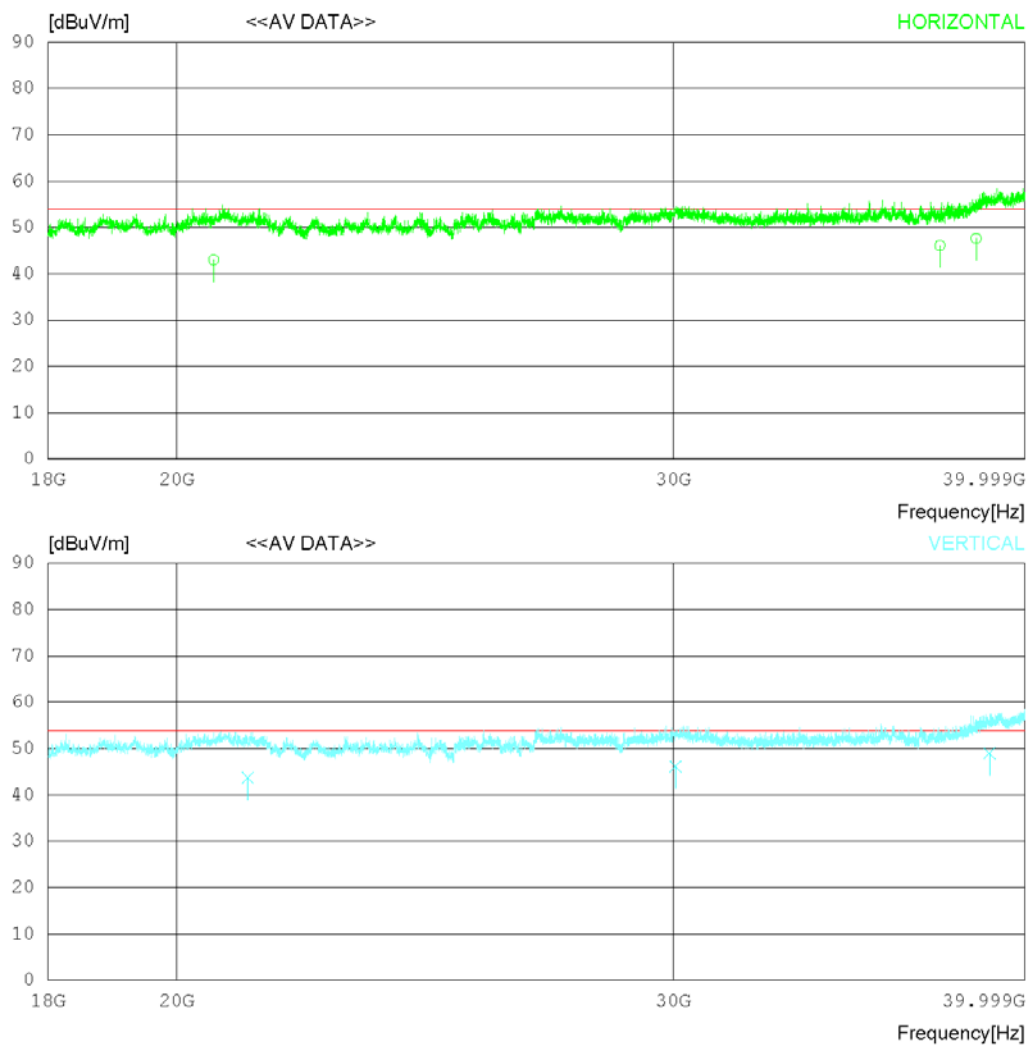
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition FM

Memo

LIMIT : FCC Part15 Subpart B Class B (3m) - GHz(Average)
FCC Part15 Subpart B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	20609.710	30.98	45.50	19.77	53.27	42.98	54.00	11.02	124	176
2	37316.040	28.63	46.00	24.30	52.85	46.08	54.00	7.92	256	230
3	38435.240	28.11	46.71	25.10	52.28	47.64	54.00	6.36	335	188
----- Vertical -----										
4	21192.740	31.25	45.60	20.40	53.54	43.71	54.00	10.29	120	42
5	30061.560	28.96	47.50	21.91	52.20	46.17	54.00	7.83	223	74
6	38861.540	28.21	47.42	25.62	52.26	48.99	54.00	5.01	312	66

Radiated disturbance at (30 ~ 1000) MHz _Measurement data			
Test configuration mode	2	EUT Operation mode	3
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

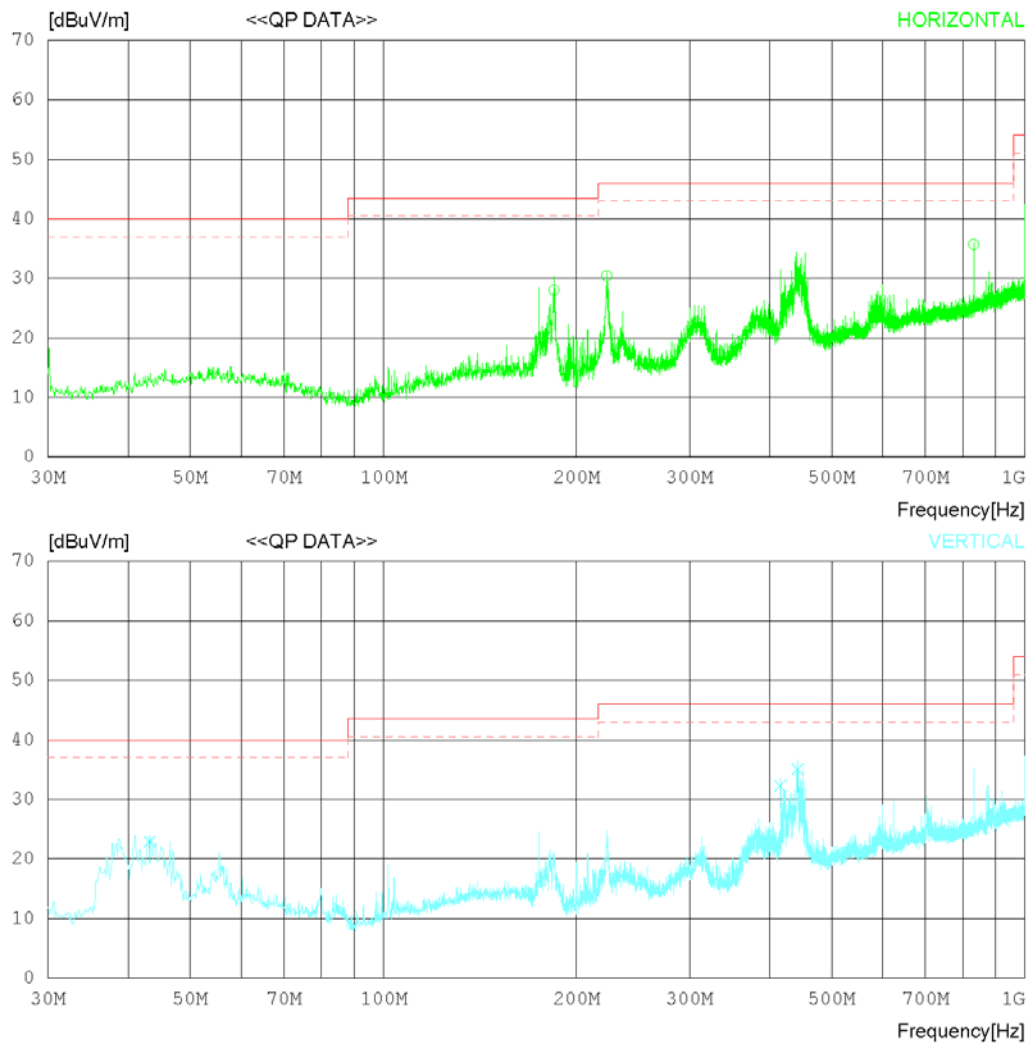
RADIATED EMISSION

Date 2020-06-09

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 'C 39 % R.H.
Test Condition USB

Memo

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



RADIATED EMISSION

Date 2020-06-09

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 °C 39 % R.H.
Test Condition USB

Memo

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

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	184.469	35.46	16.82	1.34	25.62	28.00	43.50	15.50	198	175
2	222.783	37.62	17.04	1.45	25.66	30.45	46.00	15.55	235	7
3	832.005	29.68	28.78	2.96	25.75	35.67	46.00	10.33	154	358
----- Vertical -----										
4	43.216	30.42	17.60	0.71	25.81	22.92	40.00	17.08	135	214
5	415.928	34.12	21.90	2.01	25.77	32.26	46.00	13.74	144	189
6	442.724	35.74	22.93	2.05	25.66	35.06	46.00	10.94	176	1

Radiated disturbance at (1 ~ 6) GHz _Peak measurement data			
Test configuration mode	2	EUT Operation mode	3
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

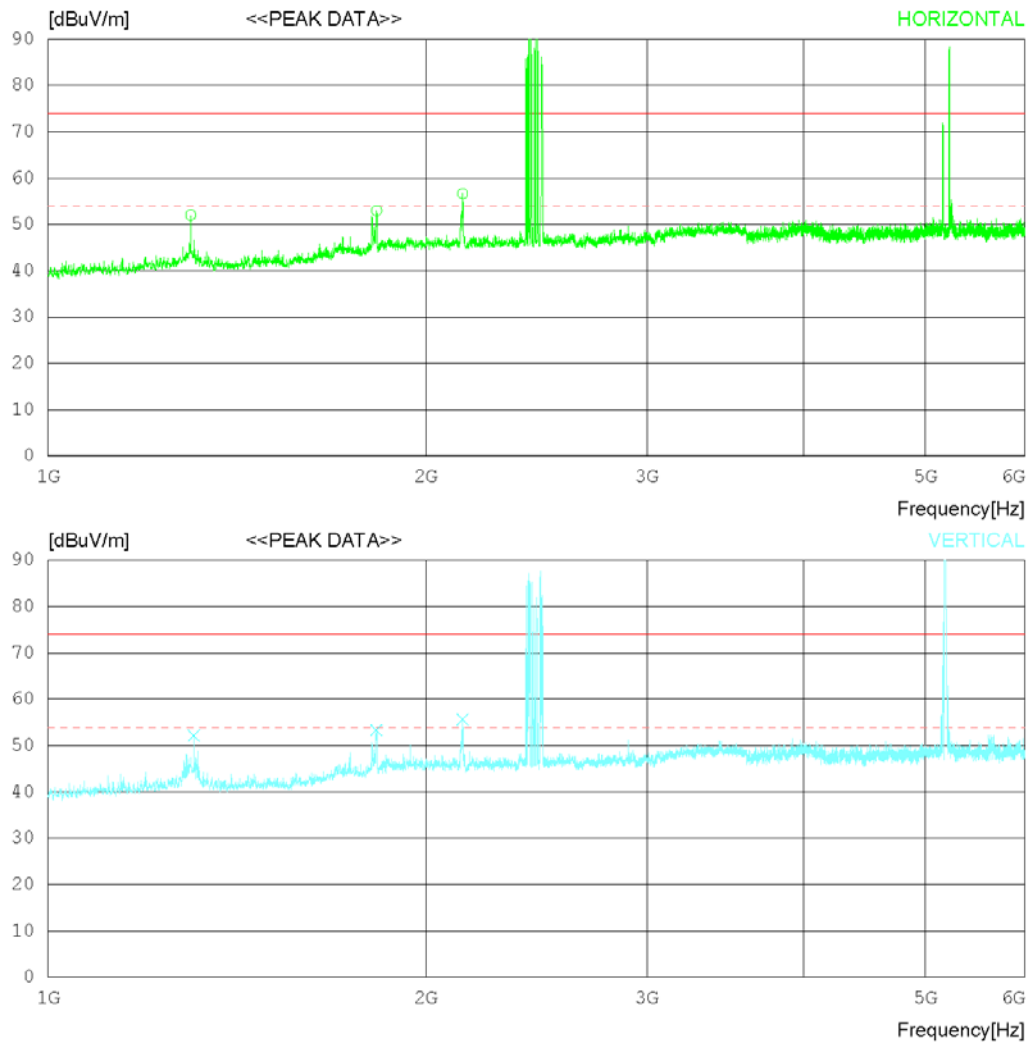
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 'C 39 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



* Remark : (2,402 ~ 2,480) MHz is BT frequency.
(5,150 ~ 5,350) MHz is WIFI 5 G frequency.

RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 °C 39 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1299.375	52.90	29.30	5.14	35.33	52.01	74.0	21.99	331	1
2	1826.875	49.90	30.63	7.02	34.58	52.97	74.0	21.03	189	335
3	2139.375	52.50	31.72	6.82	34.42	56.62	74.0	17.38	216	1
----- Vertical -----										
4	1306.875	53.10	29.20	5.17	35.32	52.15	74.0	21.85	152	358
5	1825.625	50.30	30.61	7.02	34.59	53.34	74.0	20.66	280	344
6	2139.375	51.50	31.72	6.82	34.42	55.62	74.0	18.38	310	270

Radiated disturbance at (1 ~ 6) GHz _Average measurement data			
Test configuration mode	2	EUT Operation mode	3
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

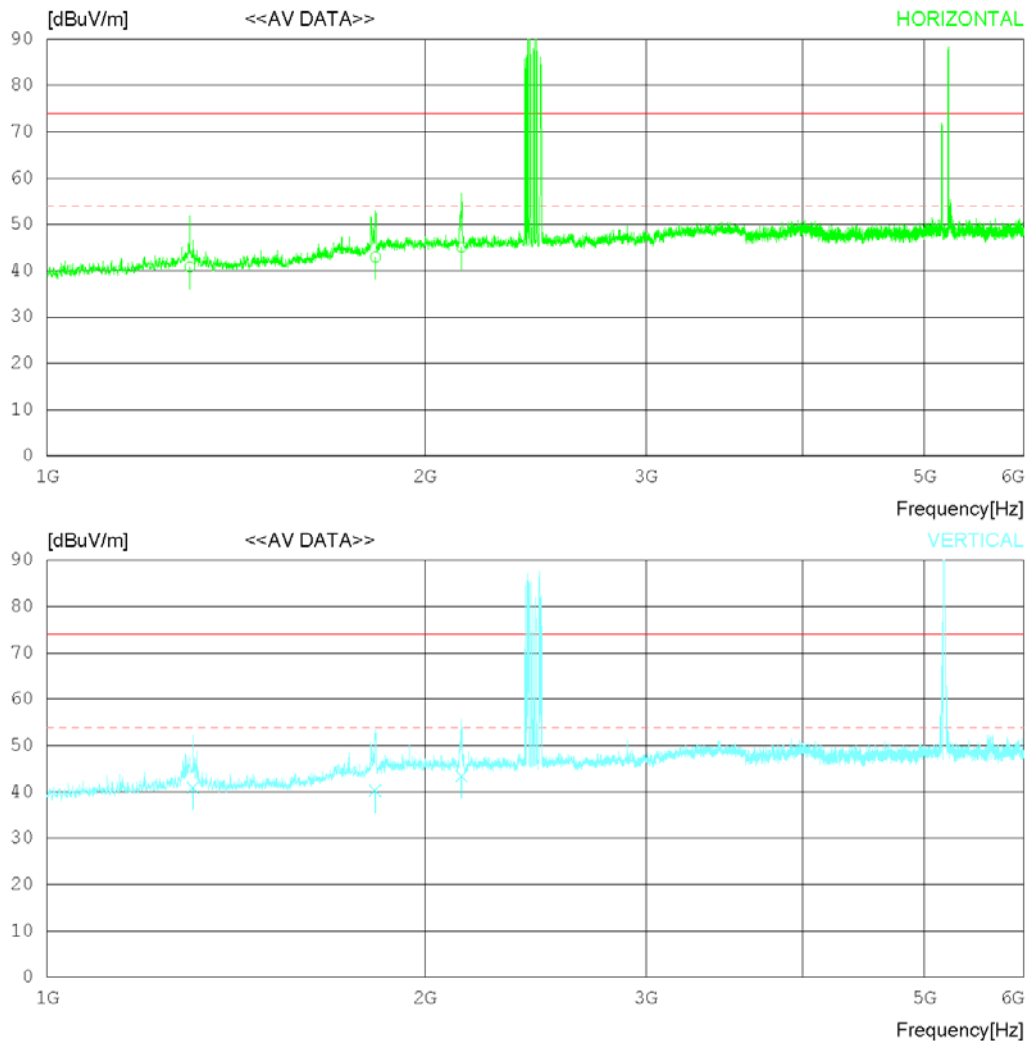
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 'C 39 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



* Remark : (2,402 ~ 2,480) MHz is BT frequency.
(5,150 ~ 5,350) MHz is WIFI 5 G frequency.

RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 18 °C 39 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1299.375	41.70	29.30	5.14	35.33	40.81	54.00	13.19	345	63
2	1826.701	39.90	30.63	7.02	34.58	42.97	54.00	11.03	178	352
3	2139.310	41.00	31.72	6.82	34.42	45.12	54.00	8.88	200	194
----- Vertical -----										
4	1306.763	41.90	29.21	5.17	35.32	40.96	54.00	13.04	163	279
5	1825.090	37.20	30.60	7.02	34.59	40.23	54.00	13.77	257	350
6	2139.306	39.30	31.72	6.82	34.42	43.42	54.00	10.58	304	256

Radiated disturbance at (6 ~ 18) GHz _Peak measurement data			
Test configuration mode	2	EUT Operation mode	3
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

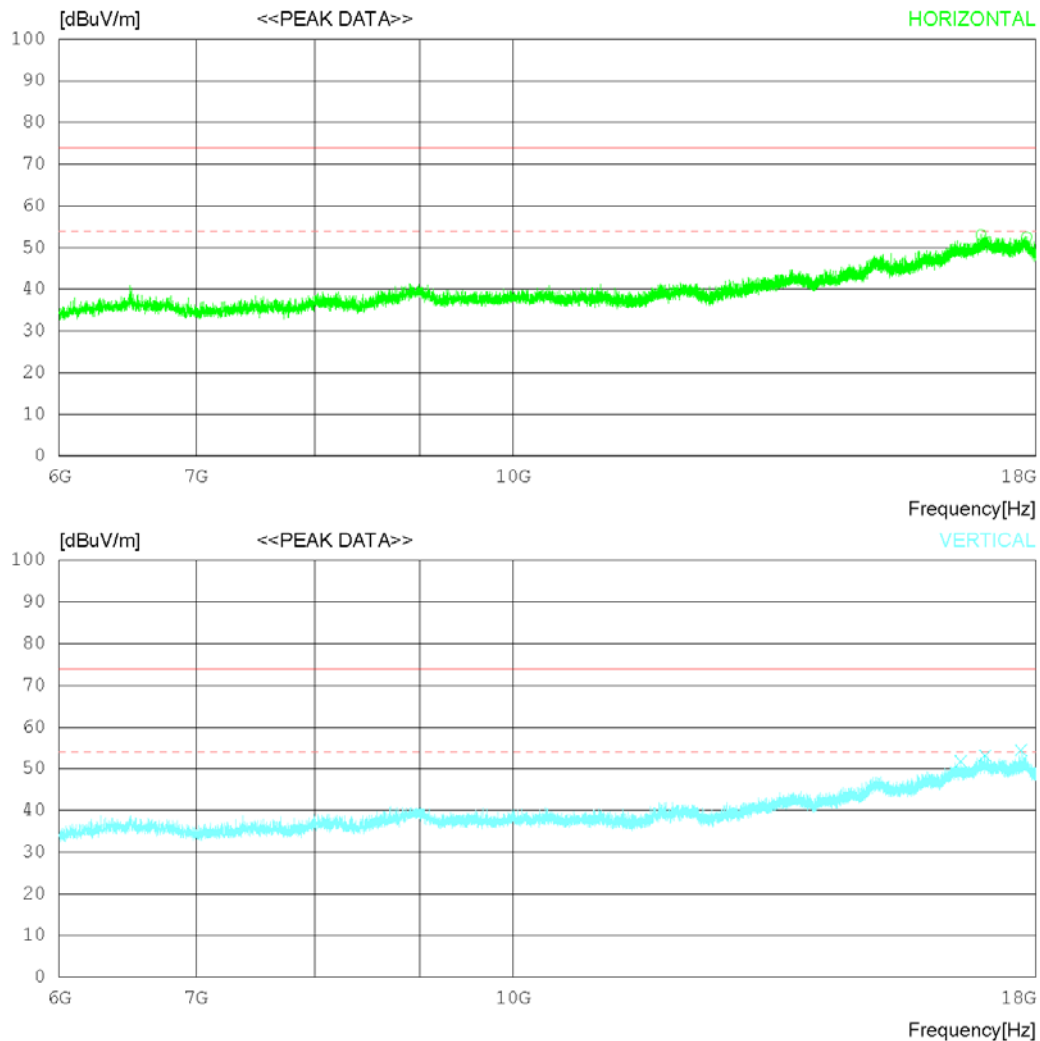
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 °C 42 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	16923.750	28.80	37.46	23.17	36.35	53.08	74.0	20.92	300	358
2	17815.500	29.10	38.18	22.73	37.50	52.51	74.0	21.49	160	358
----- Vertical -----										
3	16540.500	29.10	37.03	21.81	36.12	51.82	74.0	22.18	154	358
4	17002.500	28.20	37.55	23.79	36.40	53.14	74.0	20.86	202	0
5	17704.500	31.00	38.09	22.64	37.33	54.40	74.0	19.6	154	358

Radiated disturbance at (6 ~ 18) GHz _Average measurement data			
Test configuration mode	2	EUT Operation mode	3
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

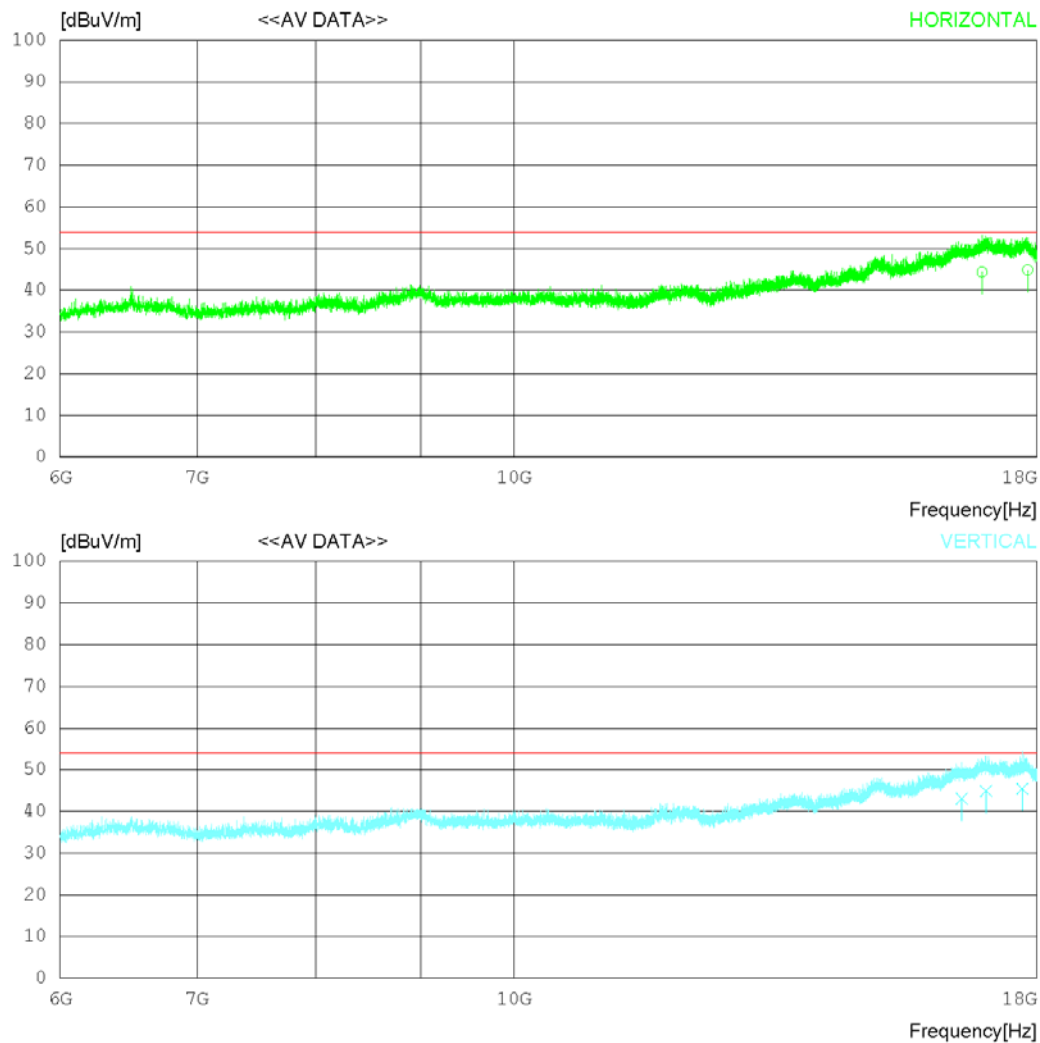
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 °C 42 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	16922.320	20.11	37.46	23.15	36.35	44.37	54.00	9.63	235	141
2	17814.210	21.45	38.18	22.74	37.50	44.87	54.00	9.13	320	302
----- Vertical -----										
3	16541.040	20.34	37.03	21.81	36.12	43.06	54.00	10.94	154	324
4	17001.730	19.97	37.55	23.79	36.40	44.91	54.00	9.09	182	55
5	17703.390	22.01	38.09	22.64	37.33	45.41	54.00	8.59	137	303

Radiated disturbance at (18 ~ 40) GHz _Peak measurement data			
Test configuration mode	2	EUT Operation mode	3
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

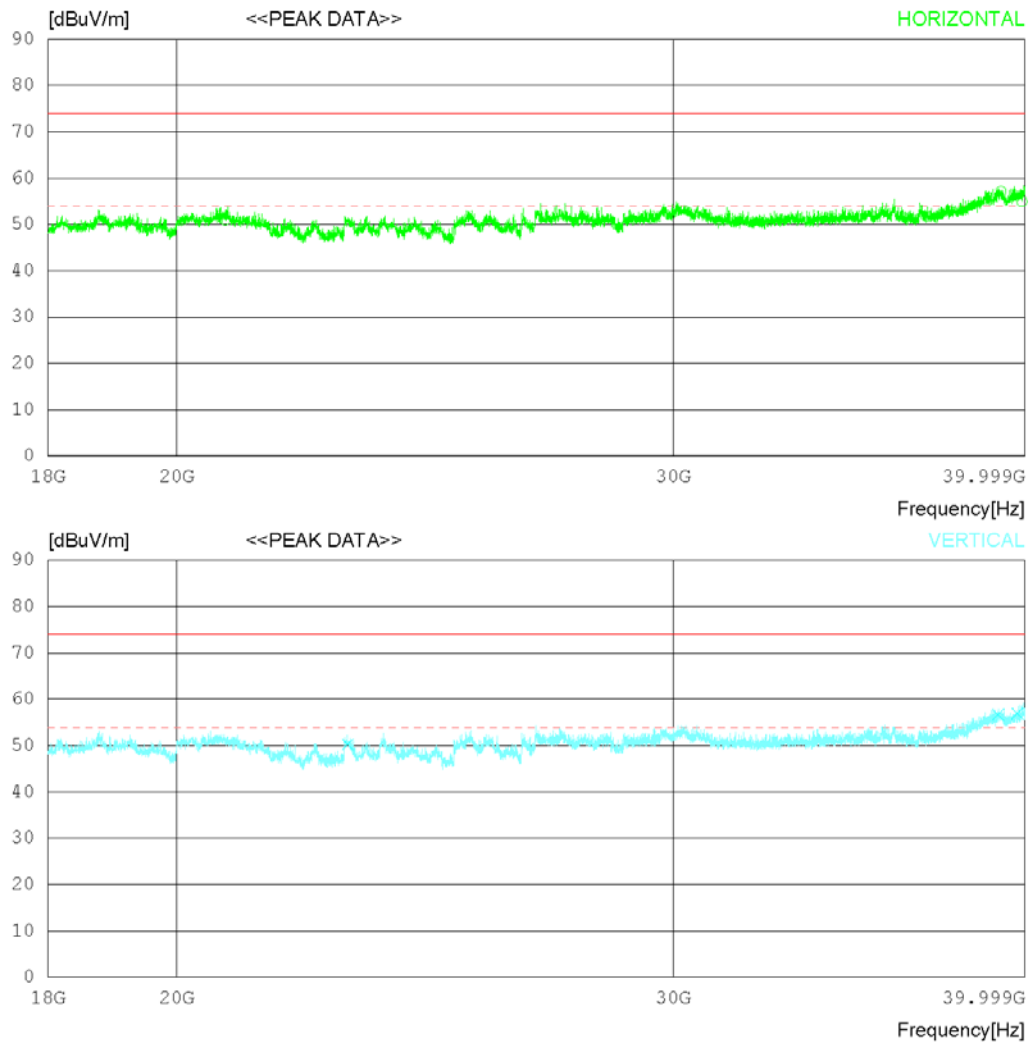
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 °C 42 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Peak)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	20807.750	38.60	45.60	20.15	53.36	50.99	74.0	23.01	214	358
2	39227.250	36.00	47.93	25.45	52.24	57.14	74.0	16.86	154	358
3	39898.250	33.60	49.10	24.46	52.21	54.95	74.0	19.05	320	358
----- Vertical -----										
4	23002.250	38.90	45.30	20.05	54.00	50.25	74.0	23.75	187	336
5	39136.500	35.50	47.77	25.57	52.24	56.60	74.0	17.4	203	2
6	39763.500	35.60	48.83	24.66	52.21	56.88	74.0	17.12	371	173

Radiated disturbance at (18 ~ 40) GHz _Average measurement data			
Test configuration mode	2	EUT Operation mode	3
Test voltage (V)	DC 12 V	Test Frequency (Hz)	-

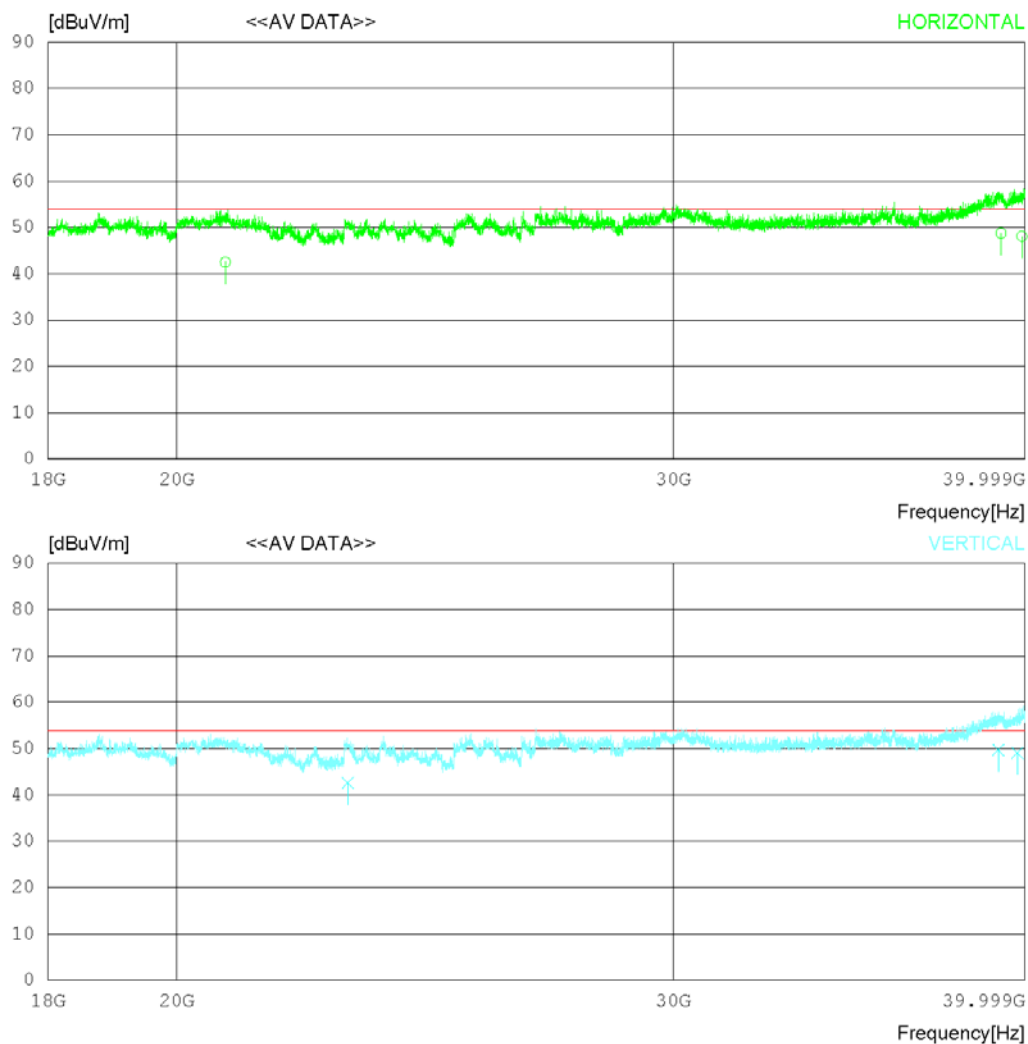
RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 'C 42 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)



RADIATED EMISSION

Date 2020-06-10

Order No. DTNC2005-03779
Power Supply DC 12 V
Temp/Humi 21 °C 42 % R.H.
Test Condition USB

Memo

LIMIT : FCC Part15 Subpart.B Class B (3m) - GHz(Average)
FCC Part15 Subpart.B Class B (3m) - GHz(Average)

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	20807.160	30.12	45.60	20.15	53.36	42.51	54.00	11.49	120	162
2	39227.210	27.62	47.93	25.45	52.24	48.76	54.00	5.24	261	223
3	39898.210	26.74	49.10	24.46	52.21	48.09	54.00	5.91	247	177
----- Vertical -----										
4	23002.210	31.26	45.30	20.05	54.00	42.61	54.00	11.39	127	264
5	39136.440	28.63	47.77	25.57	52.24	49.73	54.00	4.27	225	78
6	39763.370	27.78	48.83	24.66	52.21	49.06	54.00	4.94	236	223

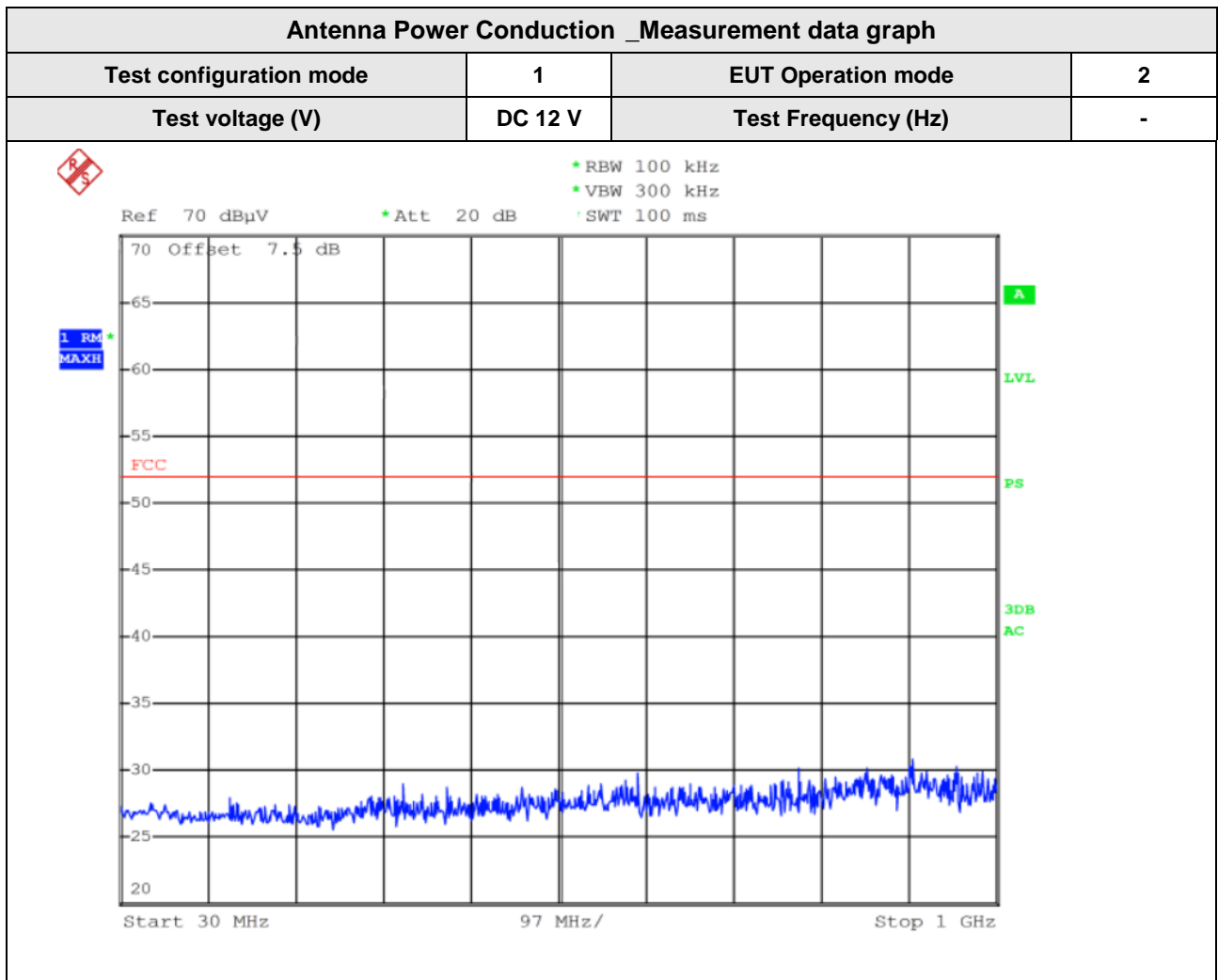
Calculation

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

7.3 Antenna Power Conduction

ANSI C63.4	Antenna power conduction		Result
<u>Method:</u> Power on the receive antenna terminals was to be determined by measurement of the voltage present at these terminals. Antenna conducted power measurements was performed with the EUT antenna terminals connected directly to measuring instrument using a impedance-Matching network to connect the measurement Instrument to the antenna terminals of the EUT. The losses in decibels in impedance-matching network and cables was added to the measured values in dBμV. The measurements were repeated with the receiver tuned to a frequency until all of frequencies had been successively measured. Power in the receive antenna terminals in the ratio of V ² /R, where V is the loss-corrected voltage measured at the antenna terminals, and R is the impedance of the measuring instrument			Comply
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Limit	
	30 MHz to 2 150 MHz	2 nW (51.7 dBμV)	
	54 MHz to 300 MHz 300 MHz to 450 MHz 450 MHz to 804 MHz	-26 dBmV (34 dBμV) -20 dBmV (40 dBμV) -15 dBmV (45 dBμV)	
Measurement Point	Tuner port		
EUT mode (Refer to clauses 4)	Test configuration mode	1	
	EUT Operation mode	2	

Measurement Instrument					
Description	Model	Manufacturer	Identifier	Cal. Date	Cal. Due
EMI TEST RECEIVER	ESCI	ROHDE & SCHWARZ	100364	2020.02.25	2021.02.25
IMPEDANCE MATCHING PAD	8AP50NM75NF	COPPER MOUNTAIN TECHNOLOGIES	16012	2019.12.10	2020.12.10
SPLITTER	ZFRSC-123-S+	MINI CIRCUITS	SF139801142	2019.07.15	2020.07.15



8. Revision History

Date	Description	Revised By	Reviewed By
Aug. 04. 2020	Initial report	JooHo Kim	HyungJun Kim

-End of test report-