

EMC TEST REPORT

Test item : Enterprise Handheld Computer
Model No. : EF500
Order No. : DTNC1507-03438
Date of receipt : 2015-07-09
Test duration : 2015-08-03 ~ 2015-11-22
Date of Issue : 2015-11-23
Applicant : Bluebird Inc.
(SEI tower 13~14F) 39, Eonju-ro 30-gil, Gangnam-gu, Seoul, Korea
Test laboratory : DT&C Co., Ltd.
42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935

Test specification : ANSI C 63.4:2009
FCC Part 15 Subpart B
(Class B personal computers and peripherals)

Test environment : Temperature : (19 ~ 22) °C,
Humidity : (40 ~ 43) % R.H.

Test result : ☒ Comply ☐ Not Comply

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose.
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Tested by:



Engineer
JunSeo Park

Reviewed by:



Technical Manager
MyungJin Song

PRESIDENT OF DT&C Co., Ltd.

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1. General Remarks

This report contains the result of tests performed by:

Dt&C Co., Ltd.

Address : 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935

<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	Mark
Accreditation	Korea	KOLAS	393	ISO/IEC 17025
Site Filing	USA	FCC	KR0034 101842 678747, 596748, 804488, 165783	Accredited 2.948 Listed
	Canada	IC	5740A-1 5740A-2	Registered
	Japan	VCCI	C-1427 R-1364, R-3385, R-4076, R-4180, T-1442, G-338, G754, G-815	Registered
Certification	Korea	KC	KR0034	Designation
	Germany	TUV	CARAT 13 11 86721 001	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

Kind of Equipment	Enterprise Handheld Computer
Model No.	EF500
Add Model No	EF500R
Serial No	None
FCC ID	SS4EF500
Supplied Power for Test	AC 120 V, 60 Hz
Applicant	Bluebird Inc. (SEI tower 13~14F) 39, Eonju-ro 30-gil, Gangnam-gu, Seoul, Korea
Manufacturer	Bluebird Inc. (SEI tower 13~14F) 39, Eonju-ro 30-gil, Gangnam-gu, Seoul, Korea

Related Submittal(s) / Grant(s)

Original submittal only.

4. Test Summary

4.1 Applied standards and test results

Test Items	Applied Standards	Results
Conducted Disturbance	ANSI C63.4:2009	C
Radiated Disturbance	ANSI C63.4:2009	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.

4.2 Test environment and conditions

Test Items	Test date (YYYY-MM-DD)	Temp (°C)	Humidity (% R.H.)
Conducted Disturbance	2015-08-03	21	40
	2015-11-22	22	43
Radiated Disturbance	2015-08-05	19	40
	2015-08-27	22	40
	2015-11-22	22	43

5. Test Set-up and operation mode

5.1 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.

5.2 Test Operation Mode

- Normal Operating(Portable) MODE : BARCODE SCANNER:, MP3, MP4, REAR CAMERA
- PC LINK MODE : Test on After connecting LAPTOP
- CHARGING MODE : Test on After connecting ADAPTER

Mode Number	Mode Name
Mode 1	PC Link MODE
Mode 2	MP3 MODE
Mode 3	MP4 MODE
Mode 4	FRONT CAMERA MODE
Mode 5	REAR CAMERA MODE
Mode 6	Charging MODE

5.3 Support Equipment Used

< PC Link MODE>

Unit	Model No.	Serial No.	Manufacturer	CABLE				Back shell	FCC ID
				Connect type	Length (m)	shield	With Ferrite		
KEYBOARD	KU-1156	724720-KD1	HP	USB	1.7	Non-shield	X	Plastic	-
MOUSE	M-UAE96	NONE	Logitech	USB	1.7	Non-shield	O(NOTE)	Plastic	-
LCD MONITOR	23MT55D	406KKLP4C808	LG	POWER DSUB	1.8 1.8	Non-shield Shield	X X	Plastic Plastic	-
ADAPTER	LCAP26-E	EE94N627089070103	Genmao Electronics (Suzhou) Co., Ltd.	POWER DC POWER	1.6 1.7	Non-shield Non-shield	X X	Plastic Plastic	-
PC	DCSM	F92QFBX	DELL	POWER DSUB PARALLEL USB USB USB STEREO LAN	1.8 1.8 2.0 1.7 1.7 0.5 2.0 -	Non-shield Shield Shield Non-shield Non-shield Shield Non-shield Non-shield	X X X X X X X X	Plastic Plastic Plastic Plastic Plastic Plastic Plastic Plastic	-
HDD	9ZR8N1-500	NA0H4ANH	Seagate	USB	0.5	shield	X	Plastic	-
PRINTER	SRP-770	N/A	Bixolon	POWER PARALLEL	1.8 2.0	Non-shield shield	X X	Plastic Plastic	-
Headset	COV909	N/A	COSY	STEREO	2.0	Non-shield	X	Plastic	-

< Normal Operating(Portable) MODE >

Unit	Model No.	Serial No.	Manufacturer	CABLE				Back shell	FCC ID
				Connect type	Length (m)	shield	With Ferrite		
Switching power supply	PSA105R-050Q CH	P145200807A2	Phihong(Dongguan) Electronica co.,Ltd	DC OUT POWER	1.8 -	Non-shield Non-shield	-	-	-
EAR PHONE	NONE	NONE	SAMSUNG	AUDIO	1.40	Non-shield	-	-	-

< CHARGING MODE >

Unit	Model No.	Serial No.	Manufacturer	CABLE				Back shell	FCC ID
				Connect type	Length (m)	shield	With Ferrite		
AP	N804	12020701446	ipTIME	-	-	-	-	-	-
Switching power supply	PSA105R-050Q CH	P145200807 A2	Phihong(Dongguan) Electronica co.,Ltd	DC OUT POWER	1.8 -	Non-shield Non-shield	-	-	-

* NOTE) The cable with ferrite core is provided by manufacturer.

6. Test Results : Emission

6.1 Conducted Disturbance

6.1.1 Measurement Procedure

In the range of 0.15 MHz to 30 MHz, the conducted disturbance was measured and set-up was made accordance with **ANSI C63.4**.

If the EUT is table top equipment, it was placed on a wooden table with a height of 0.8 m above the reference ground plane and 0.4 m from the conducting wall of the shielded room.

Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height up to 0.15 m above the reference ground plane.

Connect the EUT's power source lines to the PC power through the LISN. All the other peripherals are connected to the 2nd LISN, if any.

Unused measuring port of the LISN was resistively terminated by 50 ohm terminator.

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.

For further description of the configuration refer to the picture of the test set-up.

6.1.2 Limit for Conducted Disturbance

(1) Conducted disturbance at mains ports.

Frequency range (MHz)	Limits dB(μV)			
	Quasi-peak		Average	
	Class A	Class B	Class A	Class B
0.15 to 0.50	79	66 to 56	66	56 to 46
0.50 to 5	73	56	60	46
5 to 30		60		50
Note 1 The lower limit shall apply at the transition frequencies.				
Note 2 The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Note) 1. Emission Level = Reading Value + Correction Factor.

2. Correction Factor = Cable Loss + Insertion Loss of LISN

3. Margin = Limit - Emission level

Test Result

< MODE 1 >

Results of Conducted Emission

DT&C

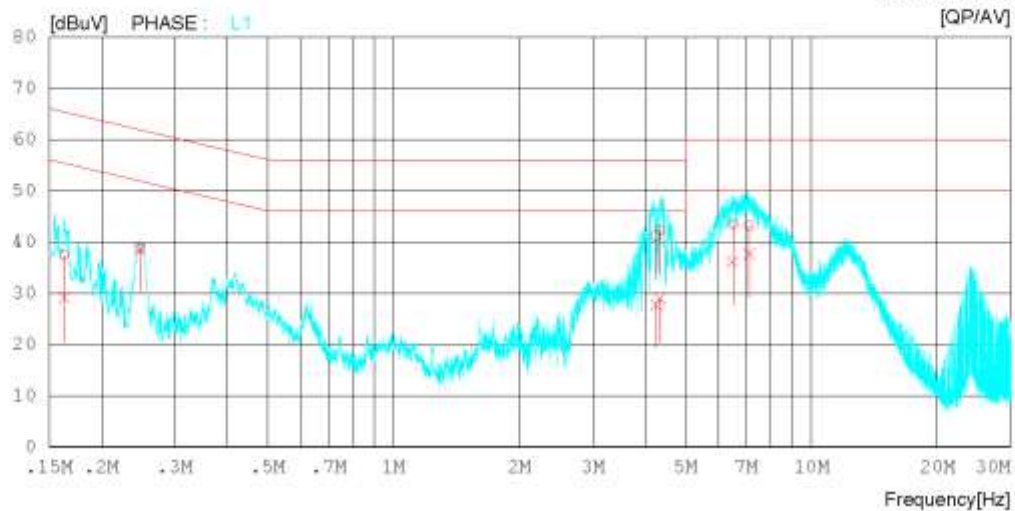
Date : 2015-11-22

Order No. : DTNC1510-05261
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 22 °C 43 % R.H.
Operator :

Memo : PC LINK

LIMIT : CISPR22_B QP
CISPR22_B AV



Results of Conducted Emission

DT&C

Date : 2015-11-22

Order No. : DTNC1510-05261
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 22 °C 43 % R.H.
Operator :

Memo : PC LINK

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16242	34.5	26.5	1.7	36.2	28.2	65.3	55.3	29.1	27.1	N
2	0.24753	37.9	37.8	1.1	39.0	38.9	61.8	51.8	22.8	12.9	N
3	4.27660	41.5	28.2	0.2	41.7	28.4	56.0	46.0	14.3	17.6	N
4	4.33980	42.0	28.9	0.2	42.2	29.1	56.0	46.0	13.8	16.9	N
5	6.53460	42.4	35.6	0.3	42.7	35.9	60.0	50.0	17.3	14.1	N
6	7.01960	42.0	36.4	0.3	42.3	36.7	60.0	50.0	17.7	13.3	N
7	0.16294	35.7	27.4	1.7	37.4	29.1	65.3	55.3	27.9	26.2	L1
8	0.24758	37.6	37.5	1.1	38.7	38.6	61.8	51.8	23.1	13.2	L1
9	4.24460	40.9	27.3	0.3	41.2	27.6	56.0	46.0	14.8	18.4	L1
10	4.34500	42.0	28.7	0.3	42.3	29.0	56.0	46.0	13.7	17.0	L1
11	6.48260	43.0	35.7	0.4	43.4	36.1	60.0	50.0	16.6	13.9	L1
12	7.09760	42.7	37.2	0.4	43.1	37.6	60.0	50.0	16.9	12.4	L1

< MODE 7 >

Results of Conducted Emission

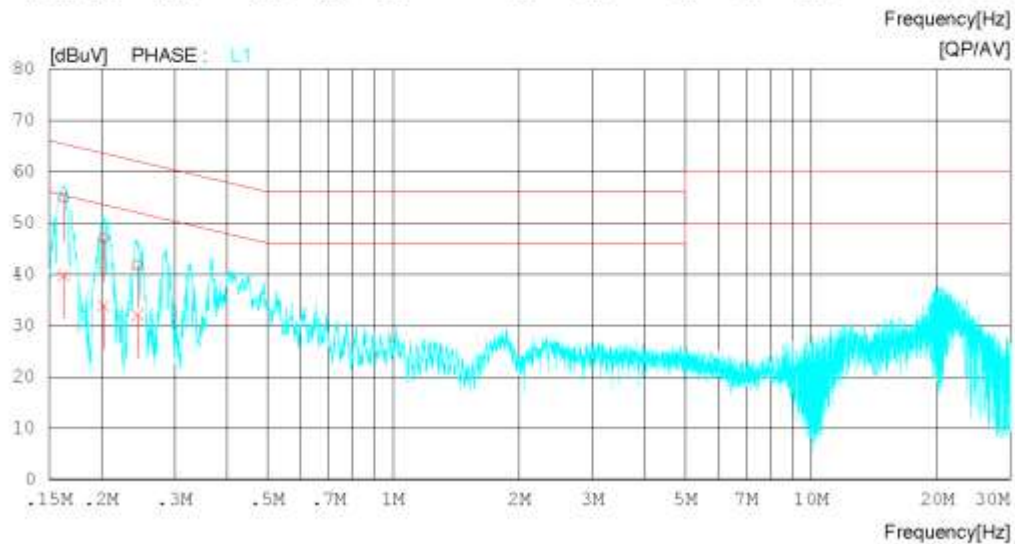
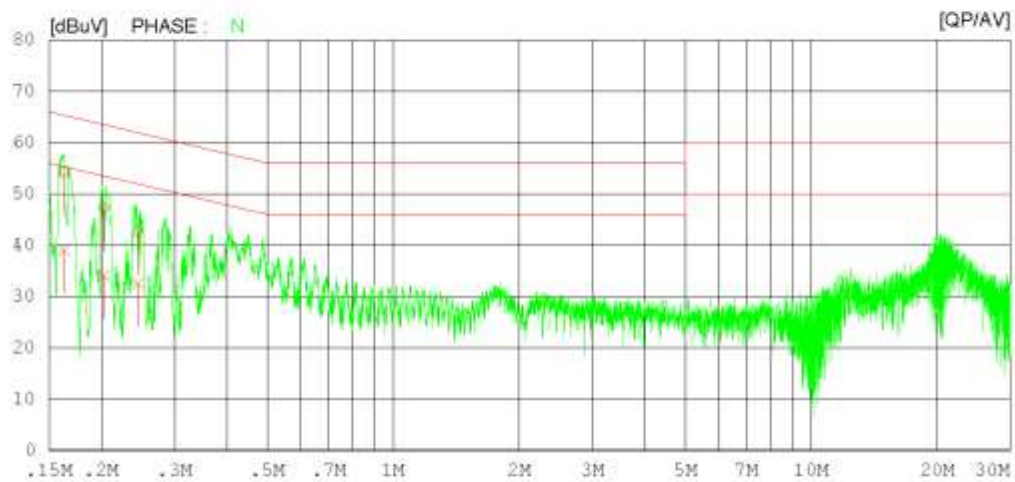
DT&C
Date : 2015-08-03

Order No. : DTNC1507-03438
Type :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 21 °C 40 % R.H.
Operator :

Memo : Charging

LIMIT : CISPR22_B QP
CISPR22_B AV



Results of Conducted Emission

DT&C
Date : 2015-08-03

Order No. : DTNC1507-03438
Type :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 21 °C 40 % R.H.
Operator :

Memo : Charging

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16292	52.5	37.3	1.8	54.3	39.1	65.3	55.3	11.0	16.2	N
2	0.20250	45.8	32.6	1.4	47.2	34.0	63.5	53.5	16.3	19.5	N
3	0.24451	41.3	31.3	1.2	42.5	32.5	61.9	51.9	19.4	19.4	N
4	0.16257	53.1	37.9	1.8	54.9	39.7	65.3	55.3	10.4	15.6	L1
5	0.20250	45.6	32.5	1.4	47.0	33.9	63.5	53.5	16.5	19.6	L1
6	0.24387	40.6	30.7	1.2	41.8	31.9	62.0	52.0	20.2	20.1	L1

6.2 Radiated Disturbance

6.2.1 Measurement Procedure

The radiated disturbance was measured and set-up was made accordance with **ANSI C63.4**.

If the EUT is tabletop equipment, it was placed on a wooden table with a height of 0.8 m above the reference ground plane and 3 m or 10 m away from the interference receiving antenna in the **10m semi-anechoic chamber**.

Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height up to 0.15 m above the reference ground plane.

Rotate the EUT from (0 - 360)° and position the receiving antenna at heights from (1 - 4) m above the reference ground plane continuously to determine associated with higher emission levels and record them.

The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

For below 1 GHz frequency range, Quasi-Peak detector with (RBW = 100 kHz, VBW = 300 kHz, SWEEP TIME = AUTO, TRACE = MAX HOLD, SWEEP POINT = 8001) was used.

For above 1 GHz frequency range, Peak detector with (RBW = 1 MHz, VBW = 1 MHz, SWEEP TIME = AUTO, TRACE = MAX HOLD and SWEEP POINT = 8001) and

CISPR Average detector with

(RBW = 1 MHz, VBW = 10 Hz, SWEEP TIME = AUTO, TRACE = MAX HOLD and SWEEP POINT = 8001) were used.

For further description of the configuration refer to the picture of the test set-up.

6.2.2 Limit for Radiated Disturbance

- 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

(1) Limit for Radiated Emission below 1 000 MHz

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

Note 1 The lower limit shall apply at the transition frequency.

Note 2 Additional provisions may be required for cases where interference occurs.

Note 3 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)	Class A Equipment (10 m distance)	Class B Equipment (10 m distance)
	Quasi-peak (dBμV/m)	Quasi-peak (dBμV/m)
30 to 230	40	30
230 to 1 000	47	37

(2) Limits for Radiated Emission above 1 000 MHz at a measuring distance of 3 m

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

Note)1. Emission Level = Reading Value + loss - gain + Ant Factor

2. Margin = Limit - Emission level

3. Loss = Cable loss, Gain = Amp gain, Ant Factor = Antenna Factor

Test Result

< 30 MHz ~ 1 GHz _ MODE 1 >

RADIATED EMISSION

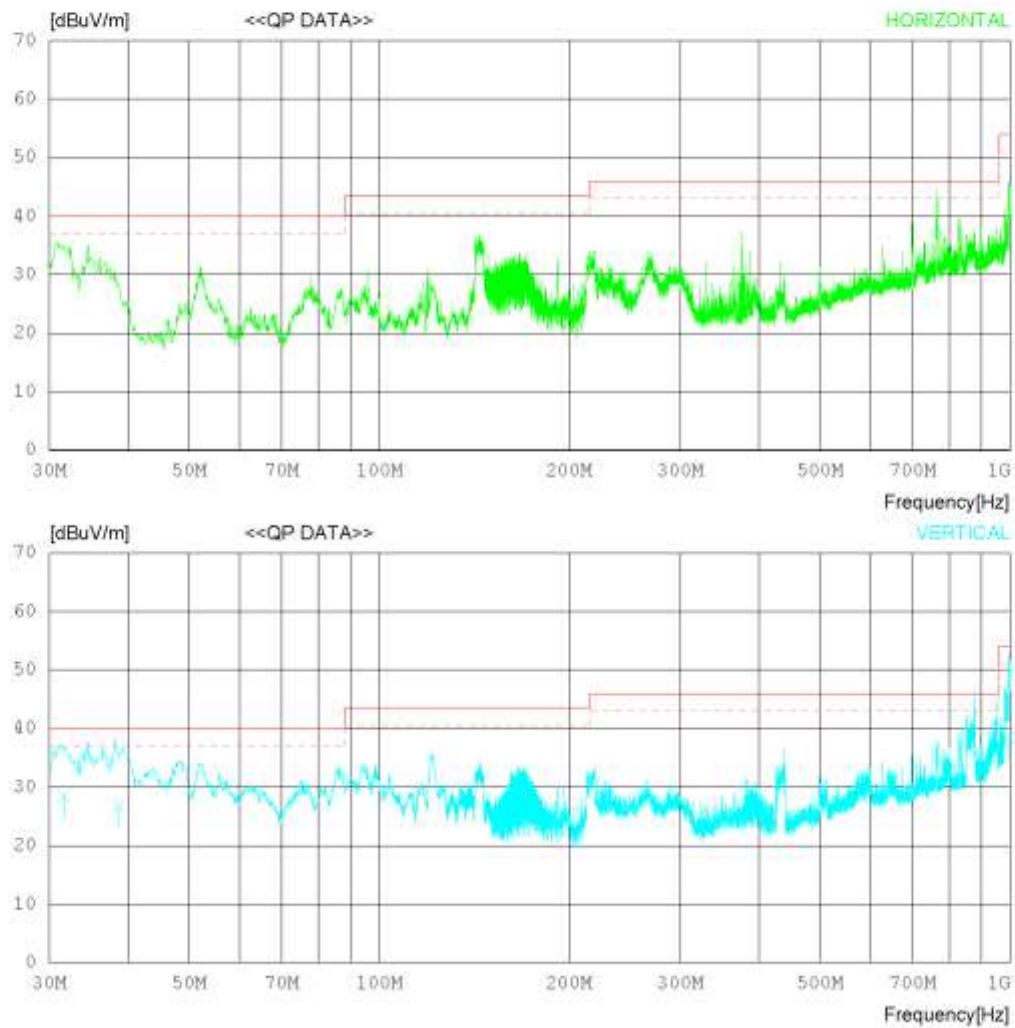
Date : 2015-11-22

Order No. : DTNC1510-05261
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 °C 43 % R.H.
Operator :

Memo : PC LINK

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



RADIATED EMISSION

Date : 2015-11-22

Oder No. : DTNC1510-05261	Reference No. :
Model No. :	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 22 'C 43 % R.H.
Test Condition :	Operator :

Memo : PC LINK

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	763.240	30.2	19.7	9.6	22.4	37.1	46.0	8.9	344	124
----- Vertical -----										
2	31.667	31.5	17.8	1.7	22.6	28.4	40.0	11.6	224	175
3	38.640	33.1	14.2	2.0	22.6	26.7	40.0	13.3	134	208
4	880.906	27.1	20.4	10.2	21.8	35.9	46.0	10.1	142	161
5	994.529	27.9	21.2	10.9	21.5	38.5	54.0	15.5	226	208

< (1 ~ 6) GHz _ Peak _ MODE 1 >

RADIATED EMISSION

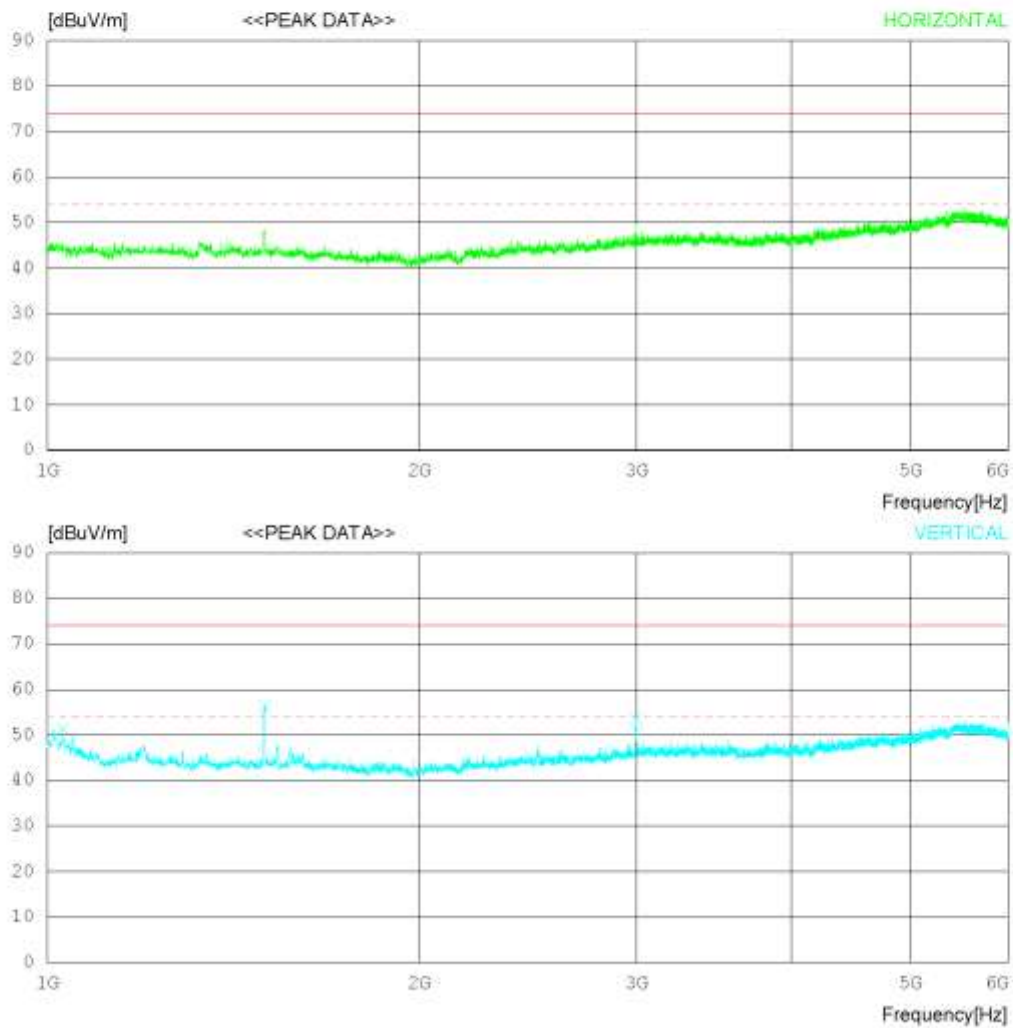
Date : 2015-11-22

Order No. : DTNC1510-05261
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 °C 43 % R.H.
Operator :

Memo : PC LINK

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV



RADIATED EMISSION

Date : 2015-11-22

Order No. : DTNC1510-05261
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 °C 43 % R.H.
Operator :

Memo : PC LINK

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV

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	5576.250	43.7	34.6	10.5	37.7	51.1	74.0	22.9	100	137
----- Vertical -----										
2	1029.375	56.8	24.0	10.9	40.4	51.3	74.0	22.7	100	358
3	1499.375	61.2	25.4	9.5	39.7	56.4	74.0	17.6	100	352
4	3000.000	54.6	29.0	8.7	38.7	53.6	74.0	20.4	100	358

< (1 ~ 6) GHz _ Average _ MODE 1 >

RADIATED EMISSION

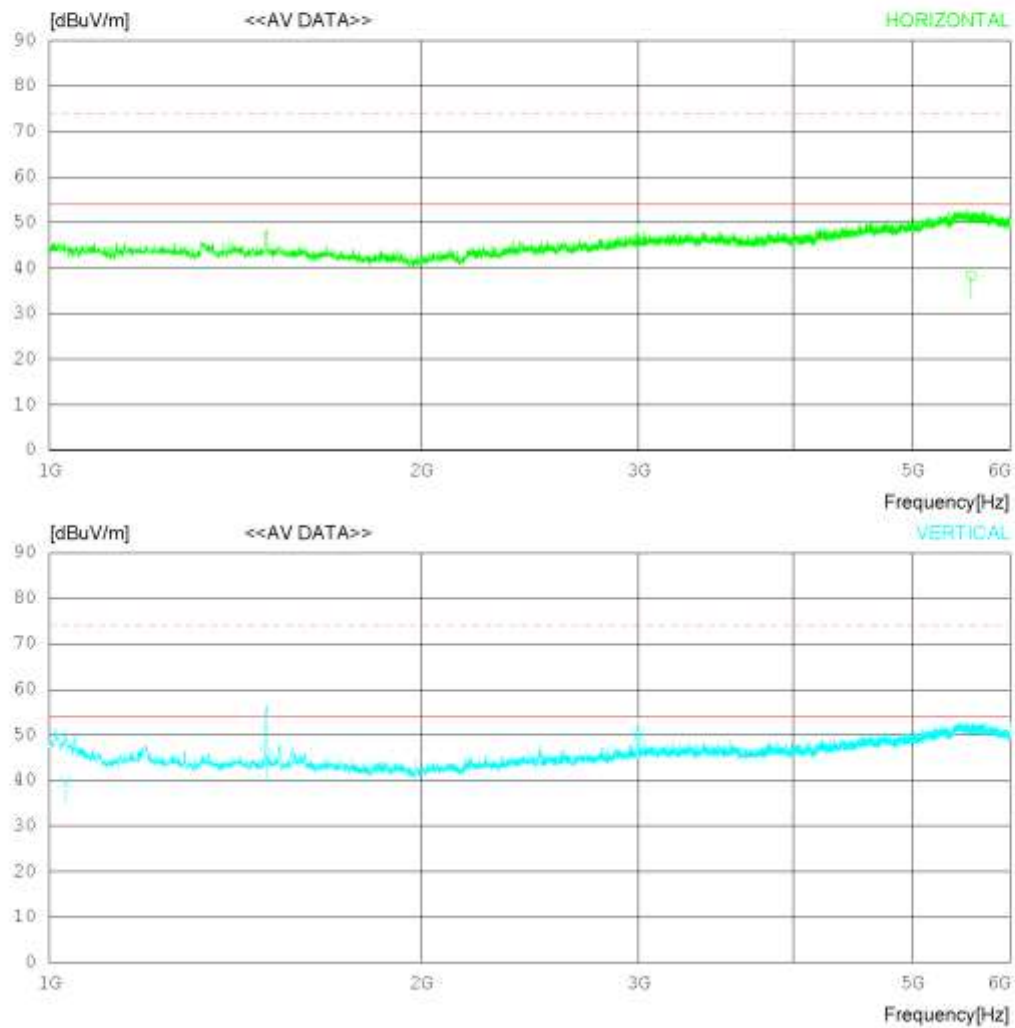
Date : 2015-11-22

Order No. : DTNC1510-05261
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 °C 43 % R.H.
Operator :

Memo : PC LINK

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK



RADIATED EMISSION

Date : 2015-11-22

Order No. : DTNC1510-05261
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 43 % R.H.
Operator :

Memo : PC LINK

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK

No.	FREQ [MHz]	READING AV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	5576.998	30.9	34.6	10.5	37.7	38.3	54.0	15.7	100	231
----- Vertical -----										
2	1029.887	45.2	24.0	10.9	40.4	39.7	54.0	14.3	100	277
3	1499.298	50.1	25.4	9.5	39.7	45.3	54.0	8.7	100	112
4	3000.414	50.8	29.0	8.7	38.7	49.8	54.0	4.2	100	320

< 30 MHz ~ 1 GHz _ MODE 2 >

RADIATED EMISSION

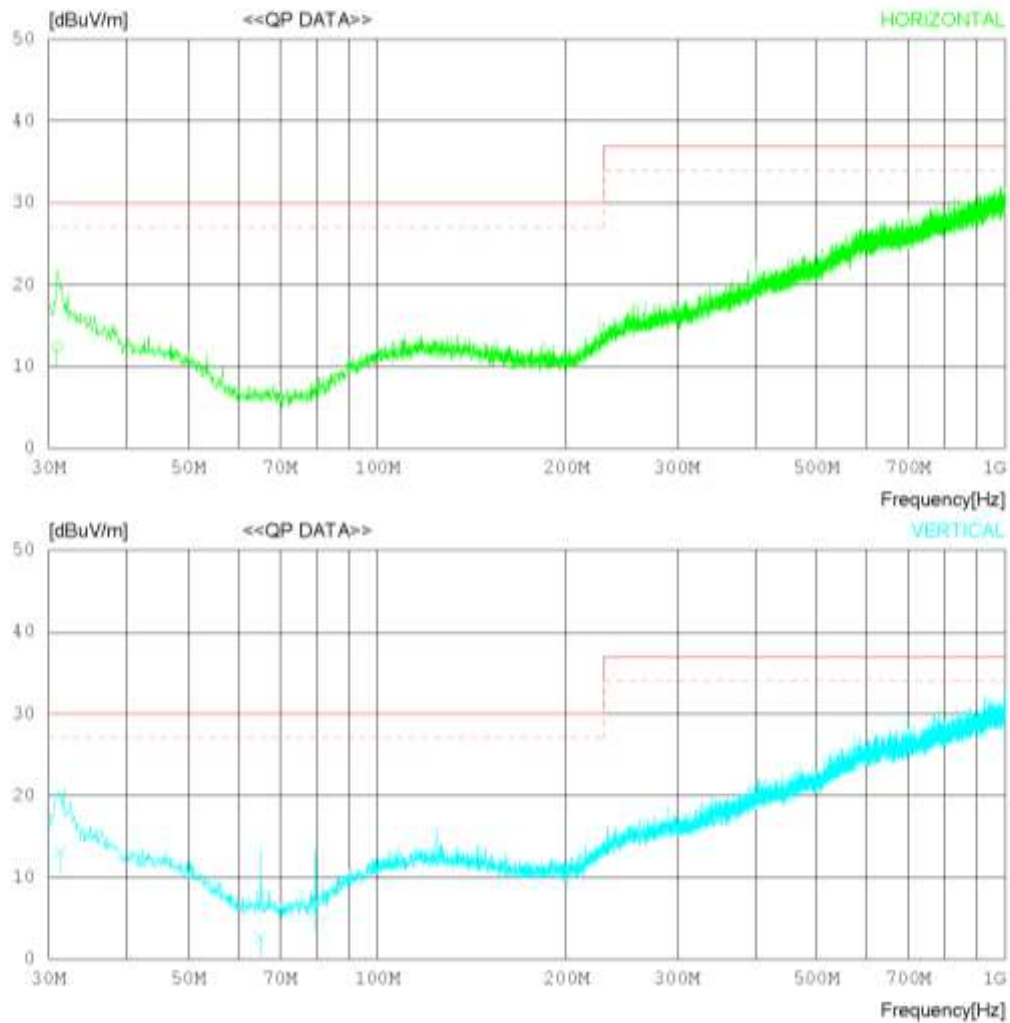
Date : 2015-08-05

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : MP3

LIMIT : CISPR Pub.22 Class B (10m)
MARGIN: 3 dB



RADIATED EMISSION

Date : 2015-08-05

Oder No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : MP3

LIMIT : CISPR Pub.22 Class B (10m)
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	30.970	18.2	15.5	1.3	22.6	12.4	30.0	17.6	377	293
----- Vertical -----										
2	31.281	18.9	15.5	1.3	22.6	13.1	30.0	16.9	226	157
3	65.284	18.2	5.1	1.9	22.6	2.6	30.0	27.4	236	186
4	79.712	20.3	6.3	2.1	22.7	6.0	30.0	24.0	188	279

< (1 ~ 6) GHz _ Peak _ MODE 2 >

RADIATED EMISSION

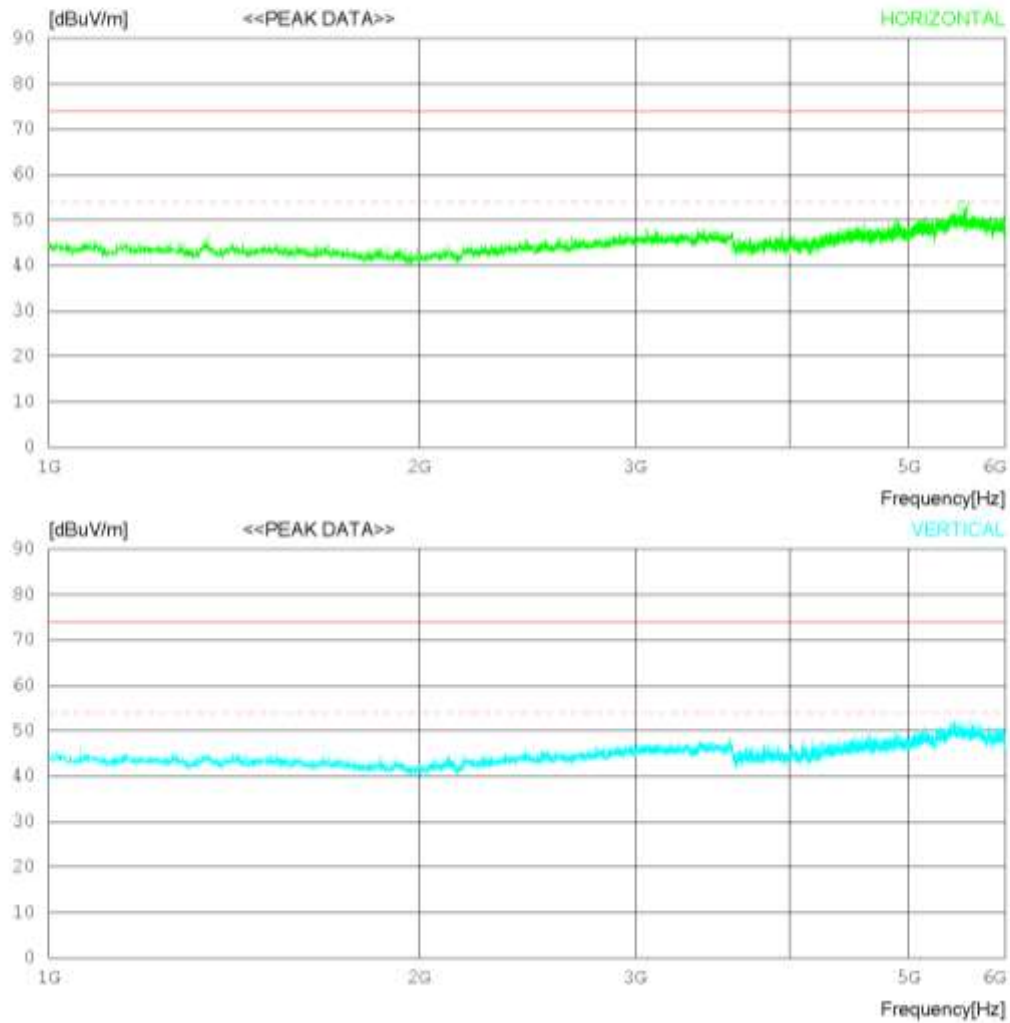
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : MP3

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : MP3

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV

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	5543.750	45.6	34.8	10.5	37.7	53.2	74.0	20.8	100	64
----- Vertical -----										
2	1317.500	48.8	24.8	10.0	40.0	43.6	74.0	30.4	100	359

< (1 ~ 6) GHz _ Average _ MODE 2 >

RADIATED EMISSION

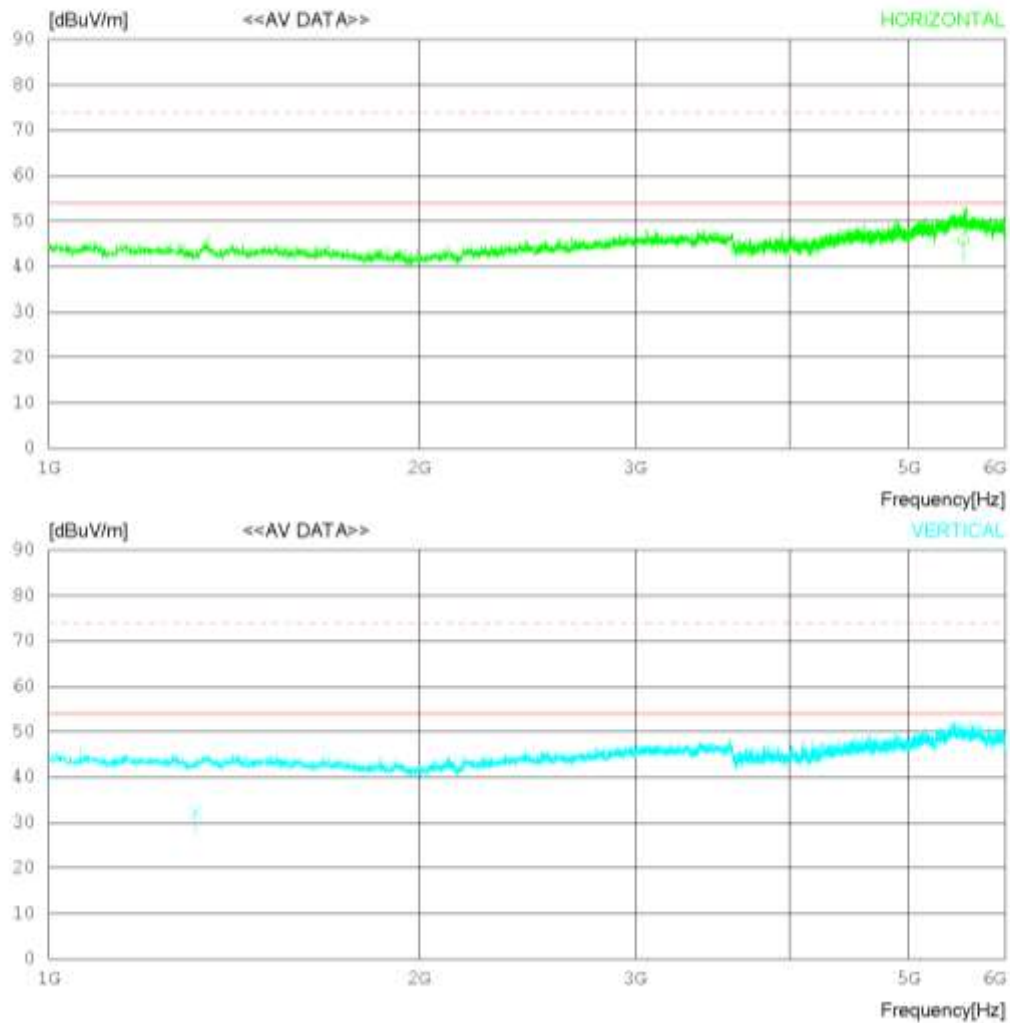
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : MP3

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : MP3

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK

No.	FREQ [MHz]	READING AV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	5542.996	38.2	34.8	10.5	37.7	45.8	54.0	8.2	100	132
----- Vertical -----										
2	1316.793	37.7	24.8	10.0	40.0	32.5	54.0	21.5	100	224

< 30 MHz ~ 1 GHz _ MODE 3 >

RADIATED EMISSION

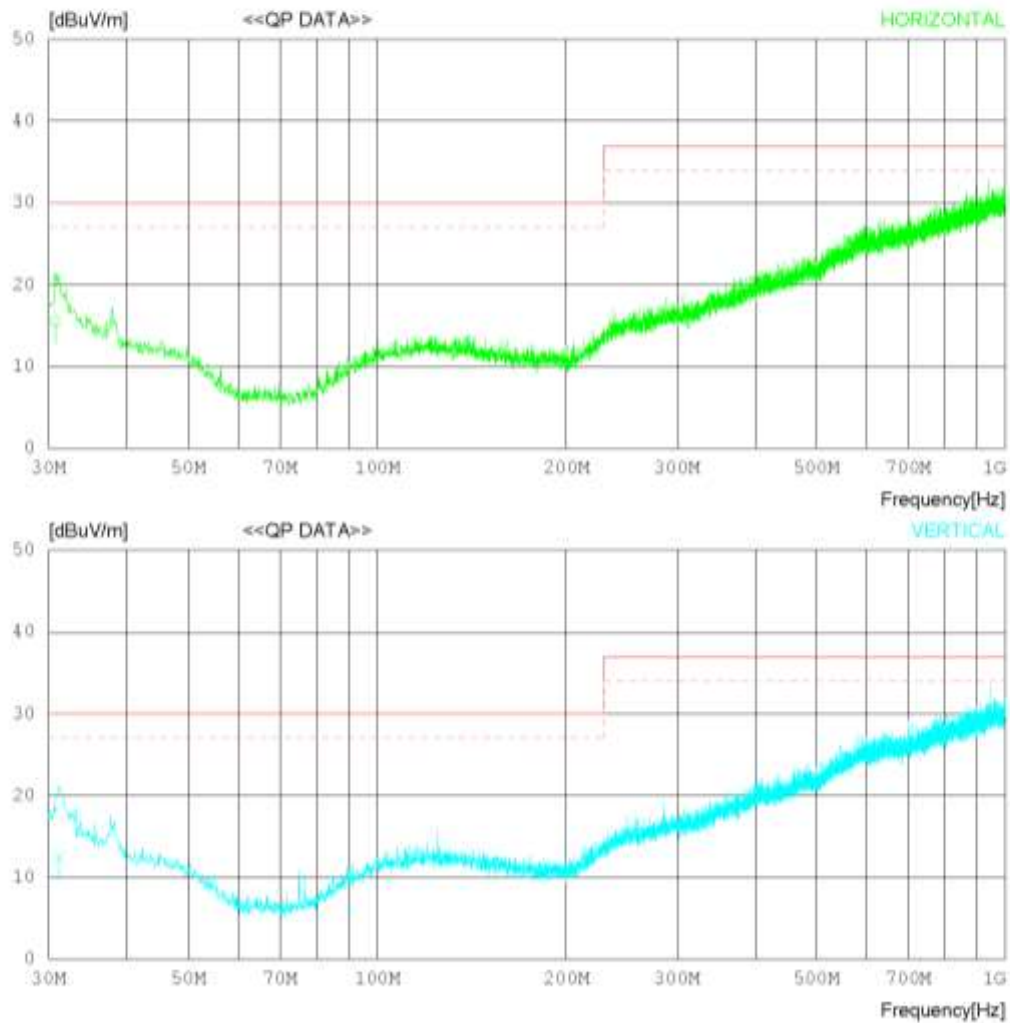
Date : 2015-08-05

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : MP4

LIMIT : CISPR Pub.22 Class B (10m)
MARGIN: 3 dB



RADIATED EMISSION

Date : 2015-08-05

Oder No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : MP4

LIMIT : CISPR Pub.22 Class B (10m)
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	30.779	21.2	15.6	1.3	22.6	15.5	30.0	14.5	299	355
----- Vertical -----										
2	31.213	18.2	15.5	1.3	22.6	12.4	30.0	17.6	227	196

< (1 ~ 6) GHz _ Peak _ MODE 3 >

RADIATED EMISSION

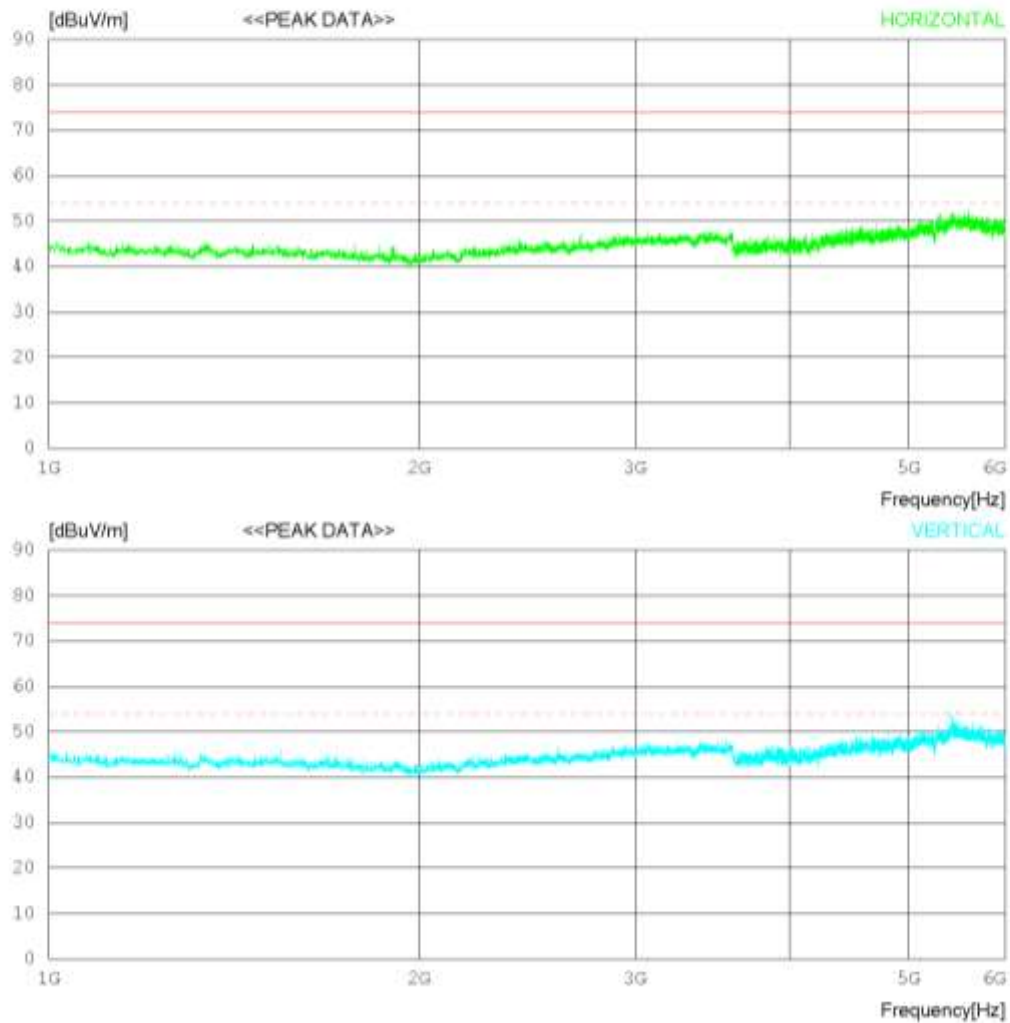
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : MP4

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : MP4

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV

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	1337.500	48.6	24.9	9.9	39.9	43.5	74.0	30.5	100	0
----- Vertical -----										
2	5425.000	45.7	34.6	10.5	37.7	53.1	74.0	20.9	100	357

< (1 ~ 6) GHz _ Average _ MODE 3 >

RADIATED EMISSION

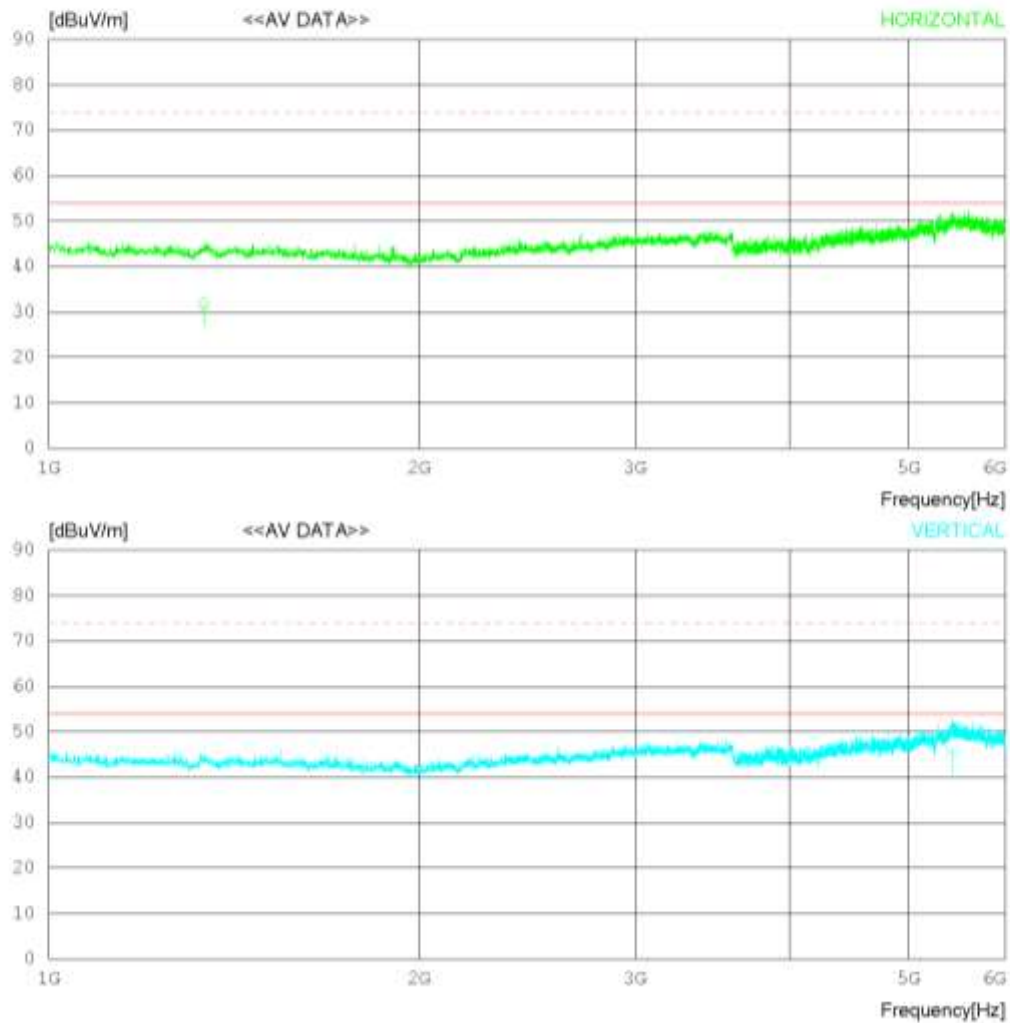
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : MP4

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : MP4

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK

No.	FREQ [MHz]	READING AV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1336.987	36.9	24.9	9.9	39.9	31.8	54.0	22.2	100	243
----- Vertical -----										
2	5426.112	38.2	34.6	10.5	37.7	45.6	54.0	8.4	100	177

< 30 MHz ~ 1 GHz _ MODE 4 >

RADIATED EMISSION

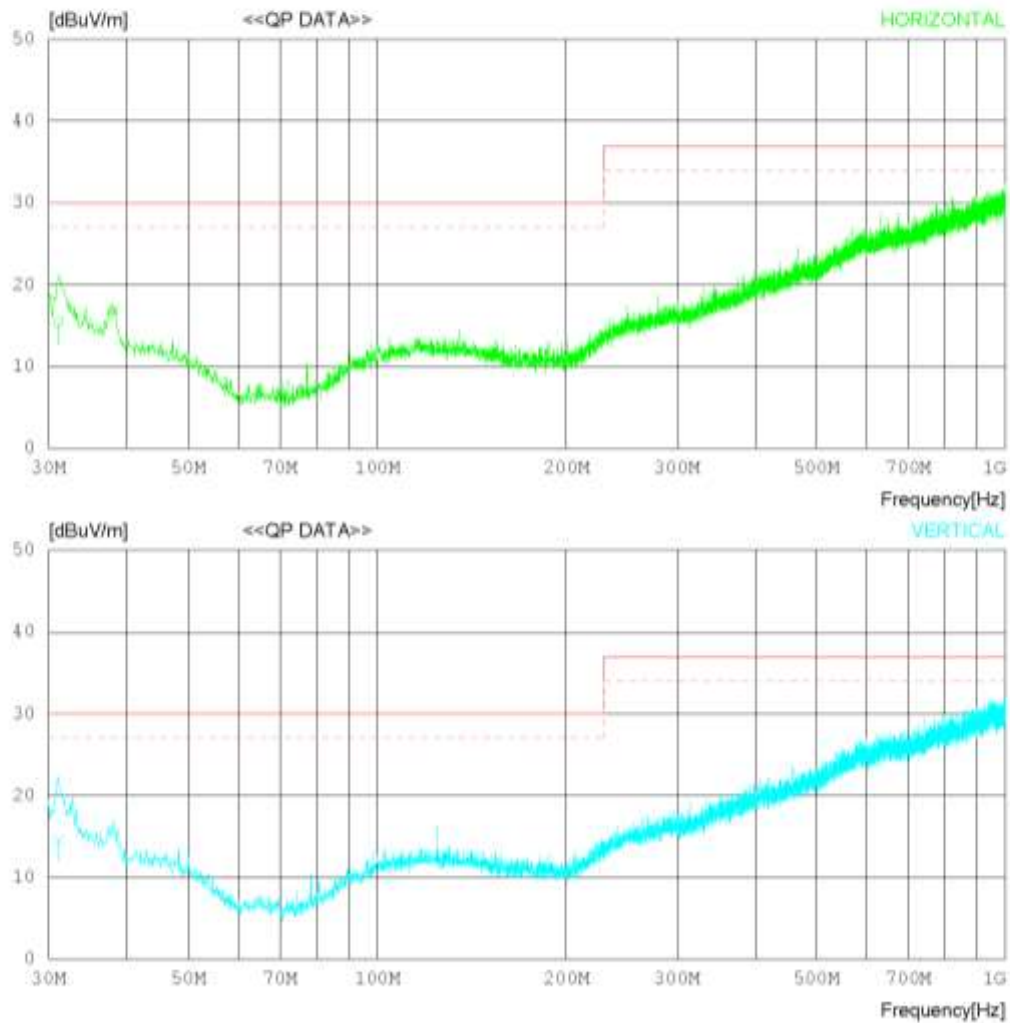
Date : 2015-08-05

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : FRONT CAM

LIMIT : CISPR Pub.22 Class B (10m)
MARGIN: 3 dB



RADIATED EMISSION

Date : 2015-08-05

Oder No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : FRONT CAM

LIMIT : CISPR Pub.22 Class B (10m)
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	31.091	21.2	15.5	1.3	22.6	15.4	30.0	14.6	129	116
----- Vertical -----										
2	31.091	20.3	15.5	1.3	22.6	14.5	30.0	15.5	230	206

< (1 ~ 6) GHz _ Peak _ MODE 4 >

RADIATED EMISSION

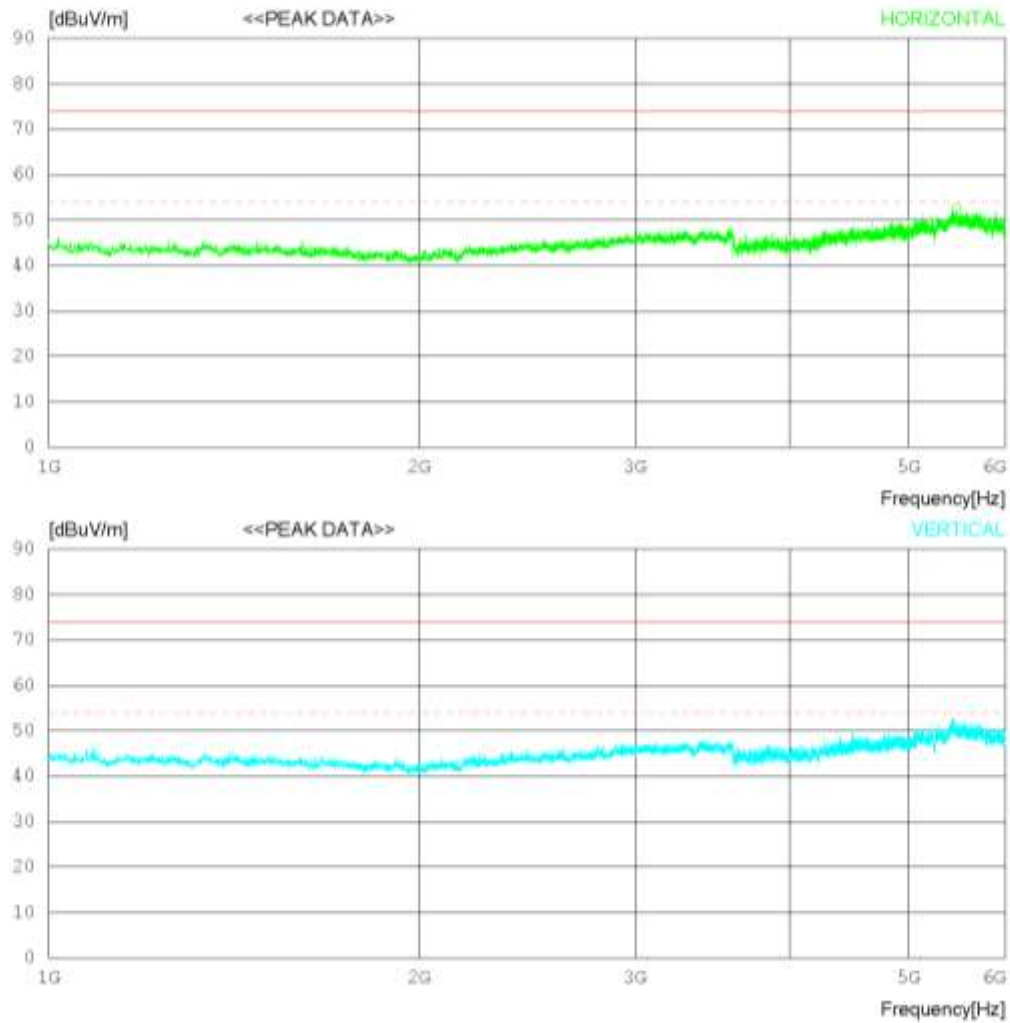
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : FRONT CAM

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : FRONT CAM

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV

No.	FREQ	READING PEAK	ANT FACTOR	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	5471.875	44.8	34.8	10.5	37.7	52.4	74.0	21.6	100	0
----- Vertical -----										
2	1090.625	51.5	24.2	10.6	40.3	46.0	74.0	28	100	359

< (1 ~ 6) GHz _ Average _ MODE 4 >

RADIATED EMISSION

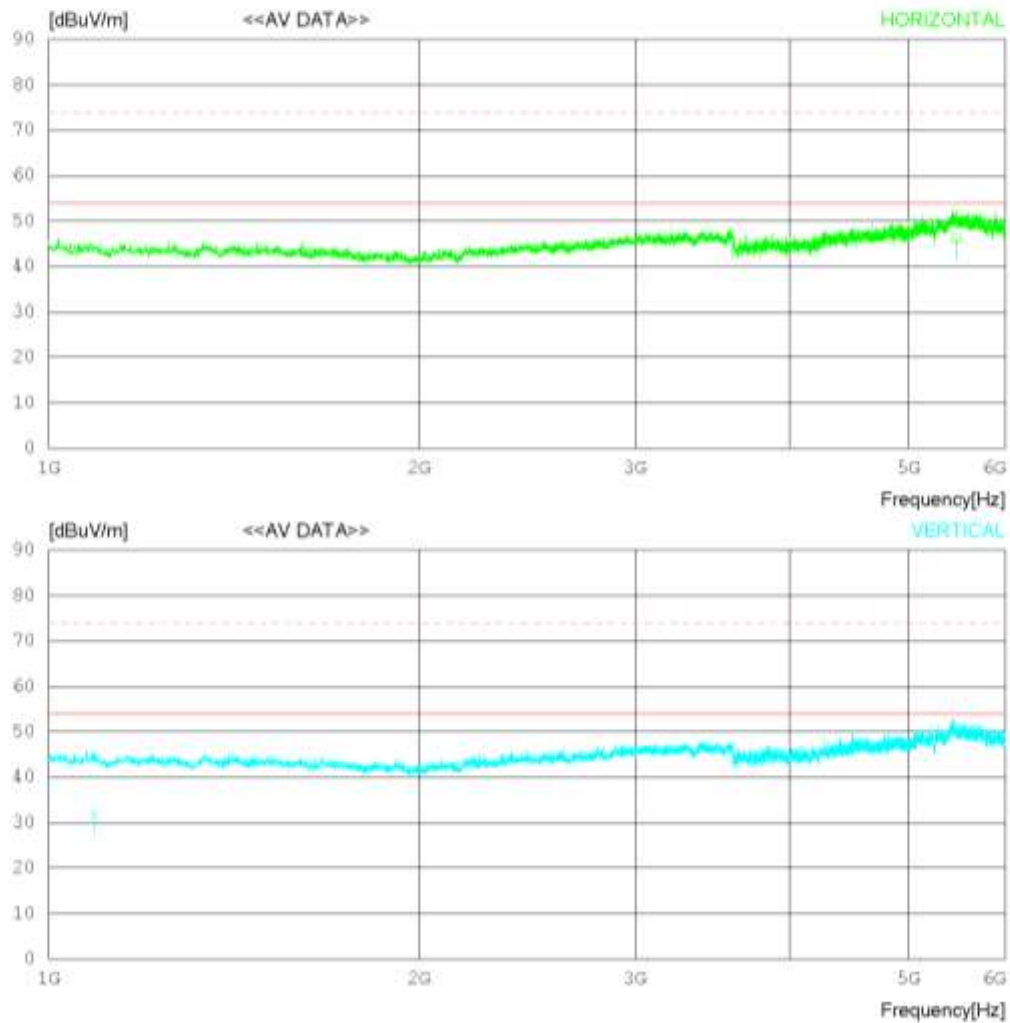
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : FRONT CAM

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : FRONT CAM

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK

No.	FREQ [MHz]	READING AV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	5470.996	38.6	34.8	10.5	37.7	46.2	54.0	7.8	100	124
----- Vertical -----										
2	1089.654	37.5	24.2	10.6	40.3	32.0	54.0	22.0	100	322

< 30 MHz ~ 1 GHz _ MODE 5 >

RADIATED EMISSION

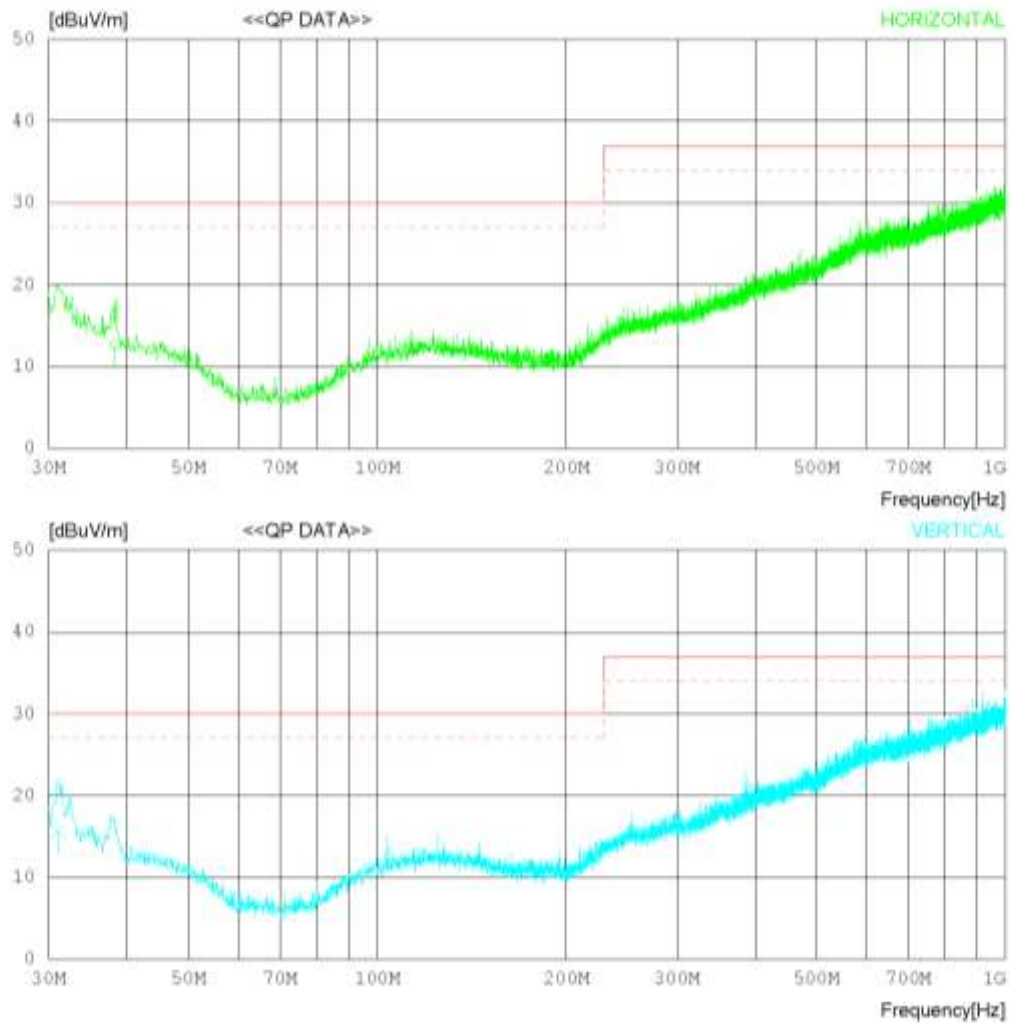
Date : 2015-08-05

Order No. : DTNC1507-03439
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 230 V 50 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : REAR CAM

LIMIT : CISPR Pub.22 Class B (10m)
MARGIN: 3 dB



RADIATED EMISSION

Date : 2015-08-05

Oder No. : DTNC1507-03439
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 230 V 50 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : REAR CAM

LIMIT : CISPR Pub.22 Class B (10m)
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	38.245	20.8	13.0	1.5	22.6	12.7	30.0	17.3	100	219
----- Vertical -----										
2	31.091	21.3	15.5	1.3	22.6	15.5	30.0	14.5	301	211

< (1 ~ 6) GHz _ Peak _ MODE 5 >

RADIATED EMISSION

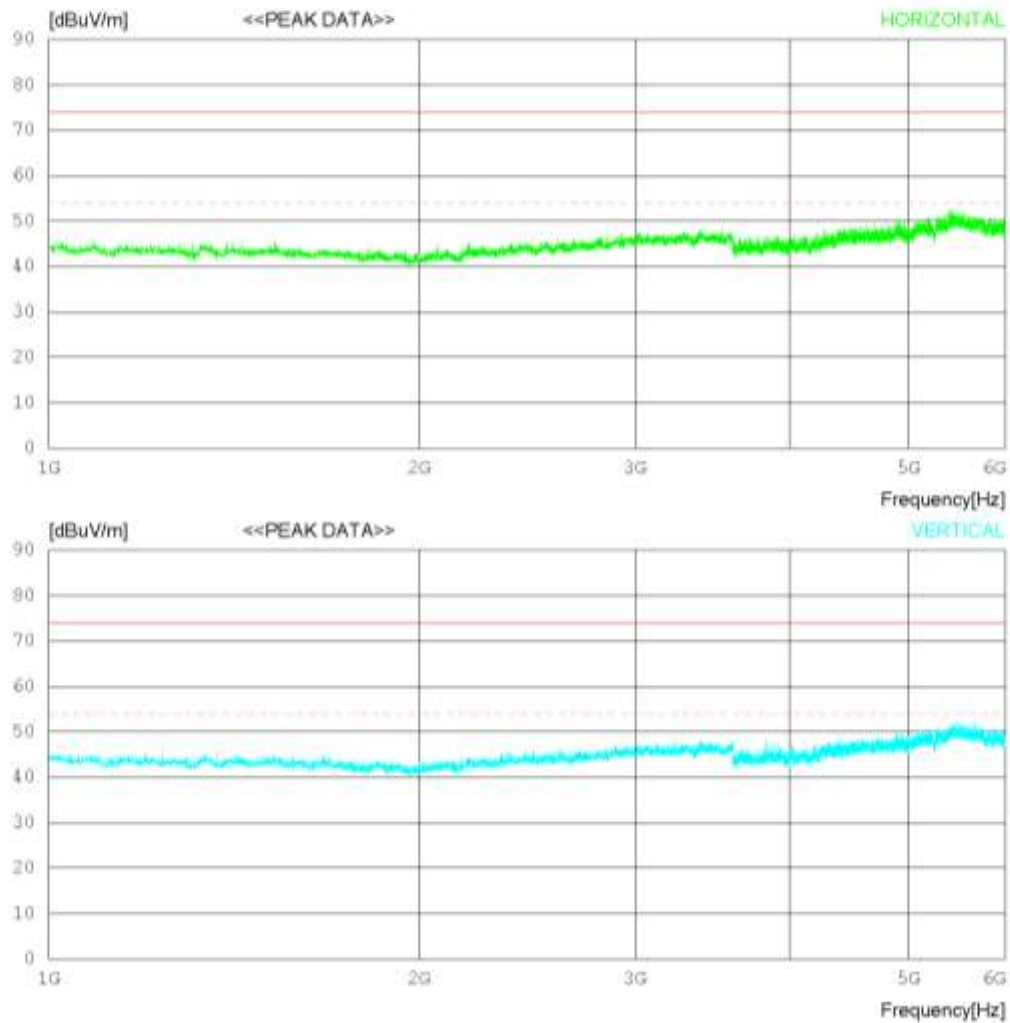
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : REAR CAM

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : REAR CAM

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV

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	5423.750	43.8	34.6	10.5	37.7	51.2	74.0	22.8	100	38
----- Vertical -----										
2	1125.000	49.1	24.3	10.5	40.3	43.6	74.0	30.4	100	297

< (1 ~ 6) GHz _ Average _ MODE 5 >

RADIATED EMISSION

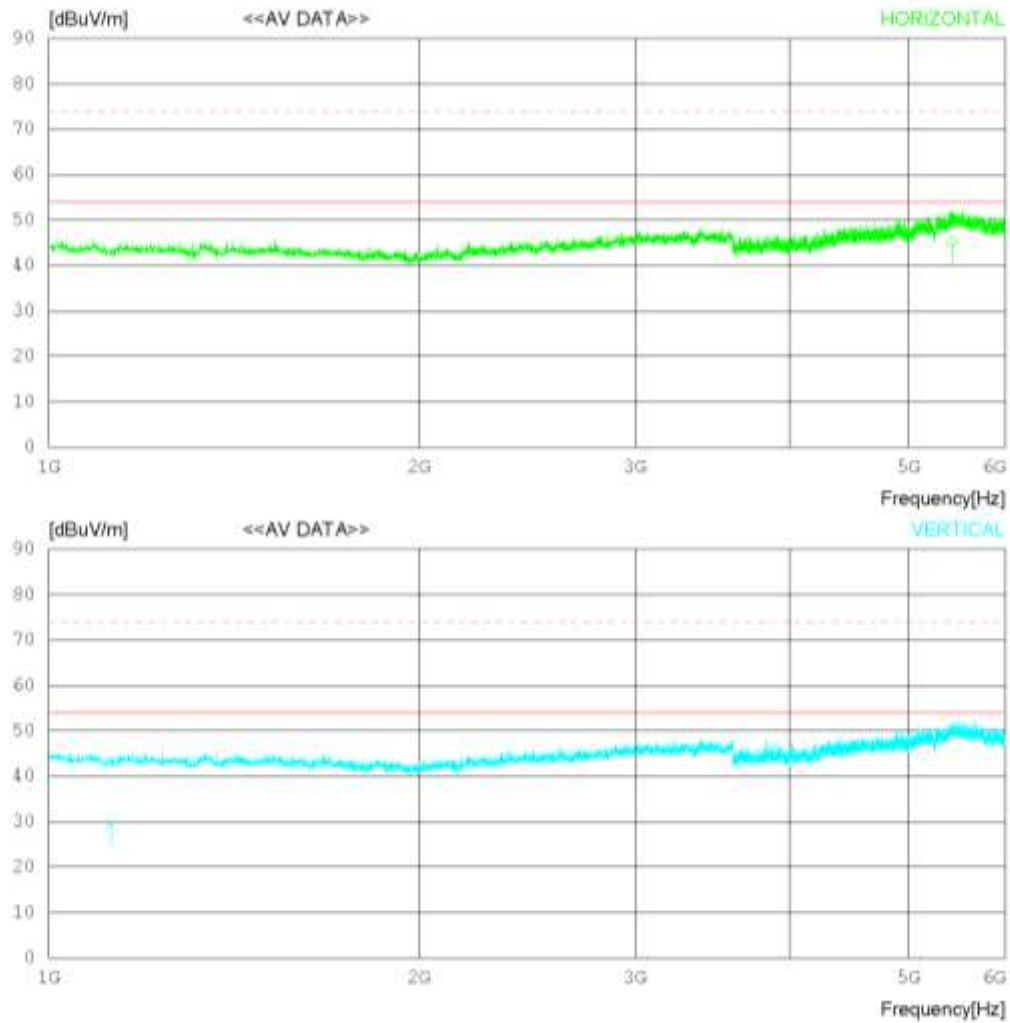
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : REAR CAM

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : REAR CAM

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK

No.	FREQ [MHz]	READING AV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	5423.975	37.8	34.6	10.5	37.7	45.2	54.0	8.8	100	182
----- Vertical -----										
2	1124.792	34.8	24.3	10.5	40.3	29.3	54.0	24.7	100	224

< 30 MHz ~ 1 GHz _ MODE 6 >

RADIATED EMISSION

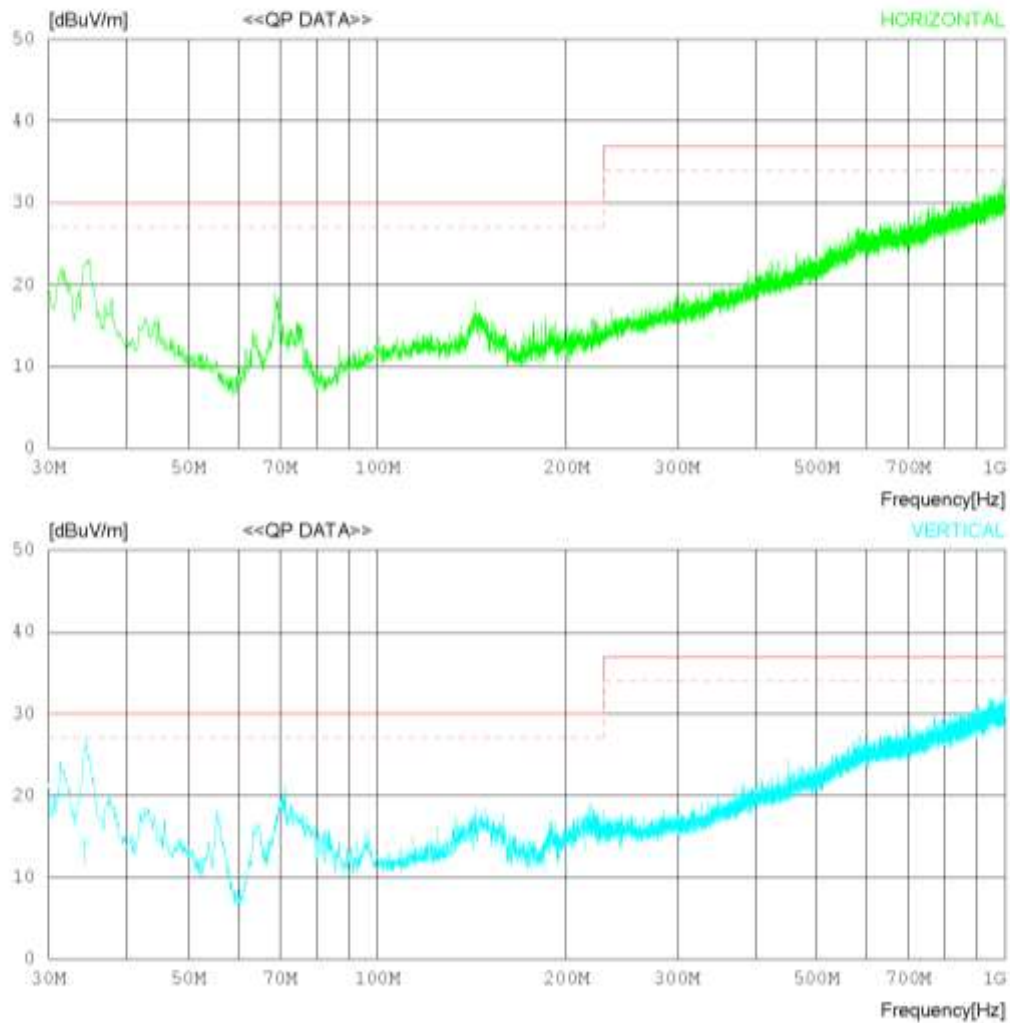
Date : 2015-08-05

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : Charging

LIMIT : CISPR Pub.22 Class B (10m)
MARGIN: 3 dB



RADIATED EMISSION

Date : 2015-08-05

Oder No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 'C 40 % R.H.
Operator :

Memo : Charging

LIMIT : CISPR Pub.22 Class B (10m)
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]
----- Vertical -----										
1	34.292	20.6	15.0	1.3	22.6	14.3	30.0	15.7	199	0

< (1 ~ 6) GHz _ Peak _ MODE 6 >

RADIATED EMISSION

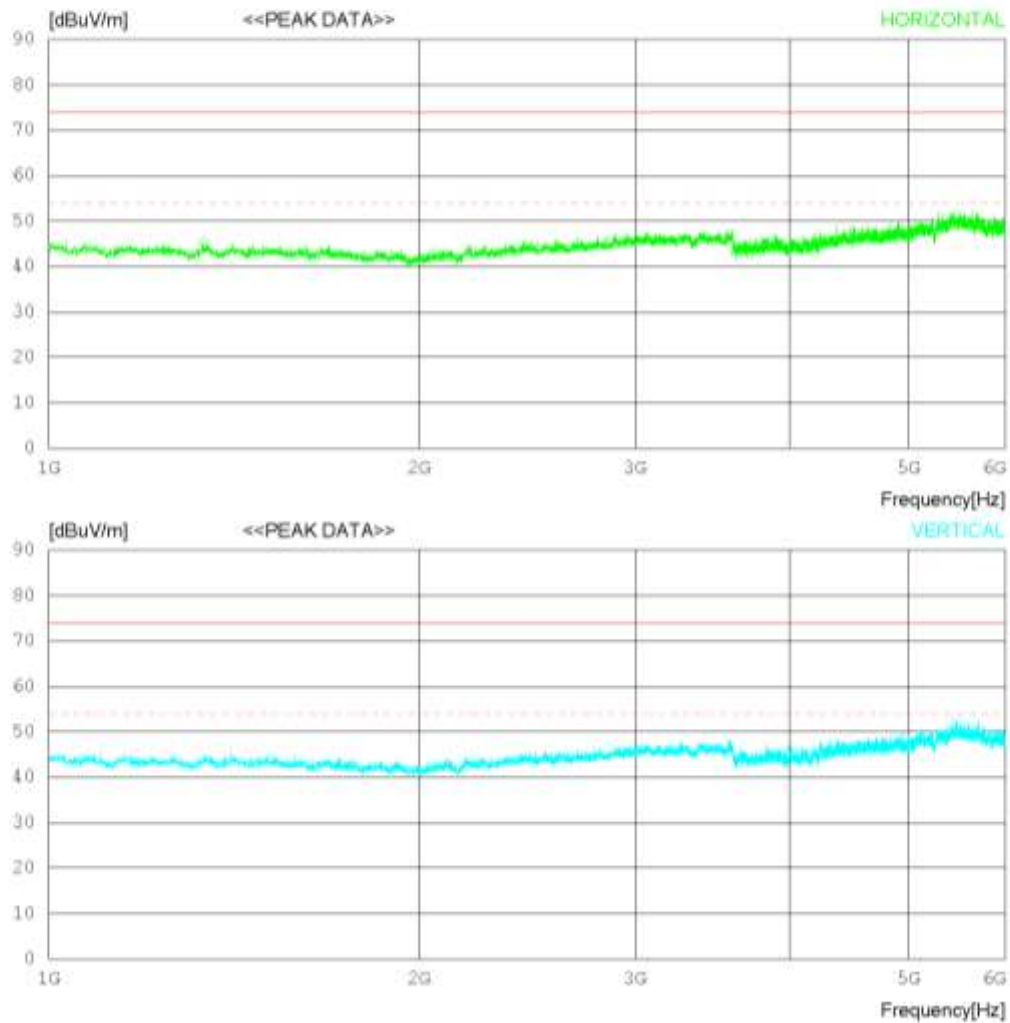
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : Charging

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : Charging

LIMIT : 1_FCC_1-18G_PK
1_FCC_1-18G_AV

No.	FREQ	READING PEAK	ANT FACTOR	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	1335.625	50.3	24.9	9.9	39.9	45.2	74.0	28.8	100	298
----- Vertical -----										
2	5470.625	44.6	34.8	10.5	37.7	52.2	74.0	21.8	100	239

< (1 ~ 6) GHz _ Average _ MODE 6 >

RADIATED EMISSION

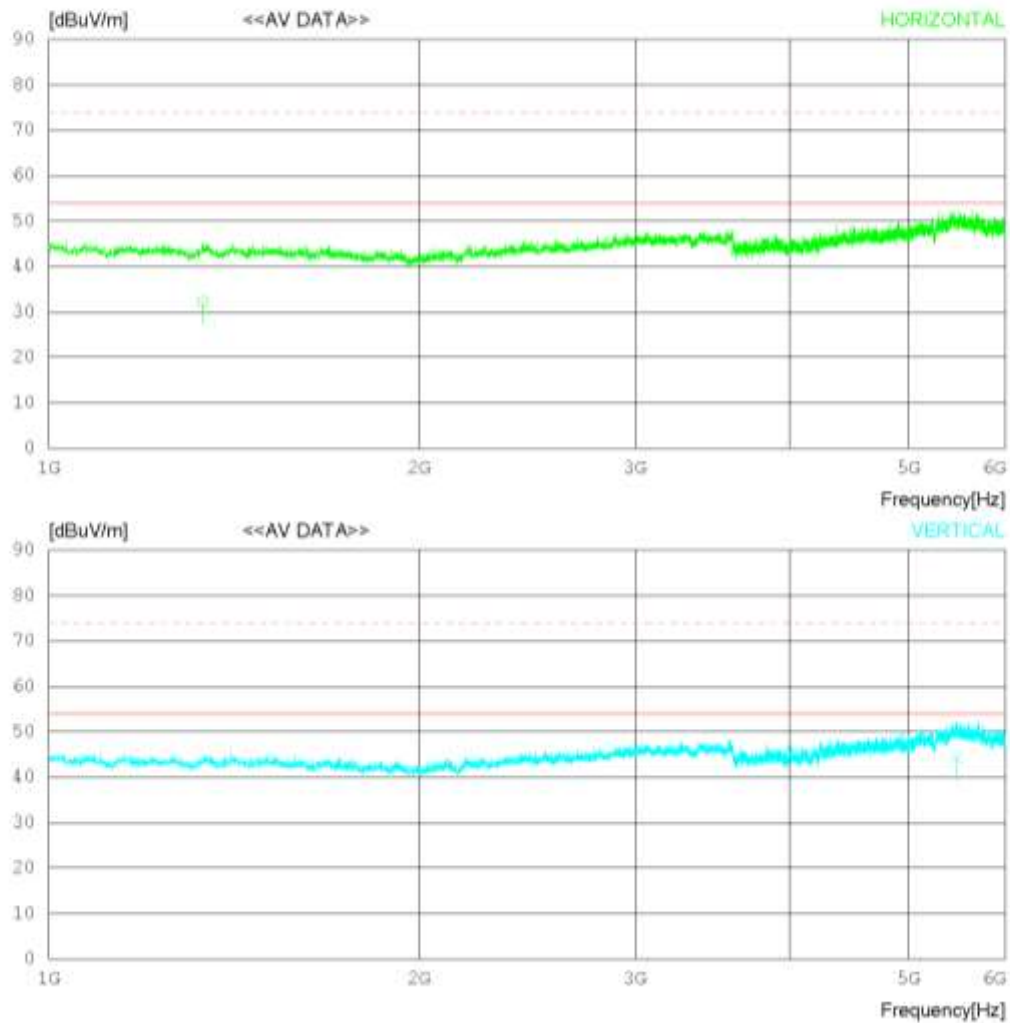
Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : Charging

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK



RADIATED EMISSION

Date : 2015-08-27

Order No. : DTNC1507-03438
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 22 'C 40 % R.H.
Operator :

Memo : Charging

LIMIT : 1_FCC_1-18G_AV
1_FCC_1-18G_PK

No.	FREQ [MHz]	READING AV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1334.998	37.3	24.9	9.9	39.9	32.2	54.0	21.8	100	236
----- Vertical -----										
2	5469.274	36.6	34.8	10.5	37.7	44.2	54.0	9.8	100	192

Appendix 1

List of Test and Measurement Instruments

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment is identified by the Test Laboratory.

1. Conducted Disturbance

Name of Instrument	Model No.	Manufacturer	Serial No.	Cal. Date	Next Cal. Date
☒ MEASUREMENT SOFTWARE	EMI-C VER. 2.00.0143	TSJ	N/A	N/A	N/A
☐ SPECTRUM ANALYZER	8591E	H/P	3649A05889	N/A	N/A
☐ ARTIFICIAL MAINS NETWORK	PMM L2-16B	NARDA S.T.S. / PMM	000WX20305	2015.06.26	2016.06.26
☐ LISN	KNW-407	KYORITSU	8-317-8	2015.01.07	2016.01.07
☐ 50 OHM TERMINATOR	CT-01	TME	N/A	2015.01.06	2016.01.06
☒ EMI TEST RECEIVER	ESCI	ROHDE & SCHWARZ	100364	2015.02.25	2016.02.25
☒ LISN	ESH2-Z5	ROHDE & SCHWARZ	828739/006	2015.09.10	2016.09.10
☒ LISN	LISN1600	TTI	197204	2015.06.26	2016.06.26
☒ 50 OHM TERMINATOR	CT-01	TME	N/A	2015.01.06	2016.01.06

2. Radiated Disturbance

Name of Instrument	Model No.	Manufacturer	Serial No.	Cal. Date	Next Cal. Date
☒ MEASUREMENT SOFTWARE	EMI-R VER. 2.00.0121	TSJ	N/A	N/A	N/A
☒ EMI TEST RECEIVER	ESU	ROHDE & SCHWARZ	100538	2015.02.06	2016.02.06
☒ BILOG ANTENNA	CBL6112B	SCHWARZBECK	2737	2014.12.10	2016.12.10
☒ HORN ANTENNA	BBHA9120A	SCHWARZBECK	322	2014.05.12	2016.05.12
☒ PREAMPLIFIER	8449B	AGILENT	3008A01590	2015.02.25	2016.02.25
☒ AMPLIFIER	8447E	H/P	2945A02865	2015.01.06	2016.01.06
☐ HORN ANTENNA	SAS-574	A.H. SYSTEMS, INC.	155	2015.09.03	2017.09.03
☐ PREAMPLIFIER	PAM-1840VH	A.H. SYSTEMS, INC.	163	2014.12.12	2015.12.12

Appendix 2

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None	Original	N/A	N/A