

EMC TEST REPORT

Test item : 200CH HANDHELD RADIO SCANNER
Model No. : PRO-649
Order No. : DTNC1601-00158
Date of receipt : 2016-01-11
Test duration : 2016-01-13 ~ 2016-03-05
Date of Issue : 2016-03-23

Applicant : The Whistler Group, Inc.
168 Ayer Road, Littleton, MA 01460, USA

Test laboratory : DT&C Co., Ltd.
42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, South Korea 449-935

Test specification : ANSI C 63.4:2014
FCC Part 15 Subpart B
(Scanning receiver)

Test environment : Temperature : (16 ~ 19) °C,
Humidity : (38 ~ 45) % 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.
This test report shall not be reproduced except in full, without the written approval of Dt&C Co., Ltd.

Tested by:



Engineer
DaeHwa Eun

Reviewed by:



Technical Manager
YoungKyu Shin

PRESIDENT OF DT&C Co., Ltd.

CONTENTS

1. General Remarks	3
2. Test Laboratory	3
3. General Information of EUT	4
4. Test Summary	5
4.1 Applied standards and test results.....	5
4.2 Test environment and conditions	5
4.3 Test result Summary	6
5. Test Set-up and operation mode	7
5.1 Principle of Configuration Selection	7
5.2 Test Operation Mode.....	7
5.3 Support Equipment Used	7
6. Test Results : Emission	8
6.1 Conducted Disturbance	8
6.2 Radiated Disturbance	17
6.3 Antenna Power Conduction.....	43
Appendix 1	45
List of Test and Measurement Instruments.....	45
Appendix 2	47
Report Revision History	47
Appendix 3	48
Changed Item	48

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, South 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	200CH HANDHELD RADIO SCANNER
Model No.	PRO-649
Add Model No	WS1010
Serial No	None
FCC ID	HSXSC01
Supplied Power for Test	120 V, 60 Hz
Applicant	The Whistler Group, Inc. 168 Ayer Road, Littleton, MA 01460, USA
Manufacturer	RDX, Inc 307 Daeryung Techno Twon 3, 115 Gasan Digital 2-ro, Guemcheon-gu, Seoul, Korea
Factory	Radix Telecom Phils., Industries Inc. P-IMES Bldg.2. Block 16, Phase IV Peza Rosario Cavite, Philippines

Related Submittal(s) / Grant(s)

Refer to Appendix 3 (Changed Item)

4. Test Summary

4.1 Applied standards and test results

Test Items	Applied Standards	Results
Conducted Disturbance	ANSI C63.4:2014	C
Radiated Disturbance	ANSI C63.4:2014	C
Antenna Power Conduction	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.

4.2 Test environment and conditions

< PRO-649 >

Test Items	Test date (YYYY-MM-DD)	Temp (°C)	Humidity (% R.H.)
Conducted Disturbance	2016-01-13	16	41
Radiated Disturbance	2016-01-18	17	40
	2016-01-20	17	39
Antenna Power Conduction	2016-01-20	17	39

< WS1010 >

Test Items	Test date (YYYY-MM-DD)	Temp (°C)	Humidity (% R.H.)
Conducted Disturbance	2016-02-25	16	38
Radiated Disturbance	2016-03-04	17	39
	2016-03-05	19	45

4.3 Test result Summary

(1) Conducted Emission

< PRO-649 >

Frequency [MHz]	Phase	Result [dB μ V]	Detector	Limit [dB μ V]	Margin [dB]
0.56206	L	36.7	Average	46.0	9.3

< WS1010 >

Frequency [MHz]	Phase	Result [dB μ V]	Detector	Limit [dB μ V]	Margin [dB]
4.00781	N	30.3	Average	46.0	15.7

(2) Radiated Emission

< PRO-649 >

Frequency [MHz]	Pol.	Result [dB(μ V/m)]	Detector	Limit [dB(μ V/m)]	Margin [dB]
58.873	V	32.5	Quasi-Peak	40.0	7.5

< WS1010 >

Frequency [MHz]	Pol.	Result [dB(μ V/m)]	Detector	Limit [dB(μ V/m)]	Margin [dB]
34.117	V	23.7	Quasi-Peak	30.0	6.3

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

- MODE 1: The EUT was set to constantly scan all bands.
- MODE 2: The EUT was set to connect USB cable to the scanning receiver for receiving data and status.

5.3 Support Equipment Used

Unit	Model No.	Serial No.	Manufacturer	CABLE				Back shell	FCC ID
				Connect type	Length (m)	shield	With Ferrite		
200CH Desktop Radio Scanner With FM Radio	PRO-650	N/A	The Whistler Group, Inc.	POWER STEREO	1.8 1.0	Non-shield Shield	X	Plastic Plastic	DOC
Headset	COV-903	N/A	COSY	STEREO	2.0	Non-shield	X	Plastic	DOC
ADAPTOR	GQ05-090040-AU	N/A	3YE	POWER	1.8	Non-shield	X	Plastic	DOC

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 Average detector.

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

< PRO-649 _ MODE 1 >

Results of Conducted Emission

DTNC

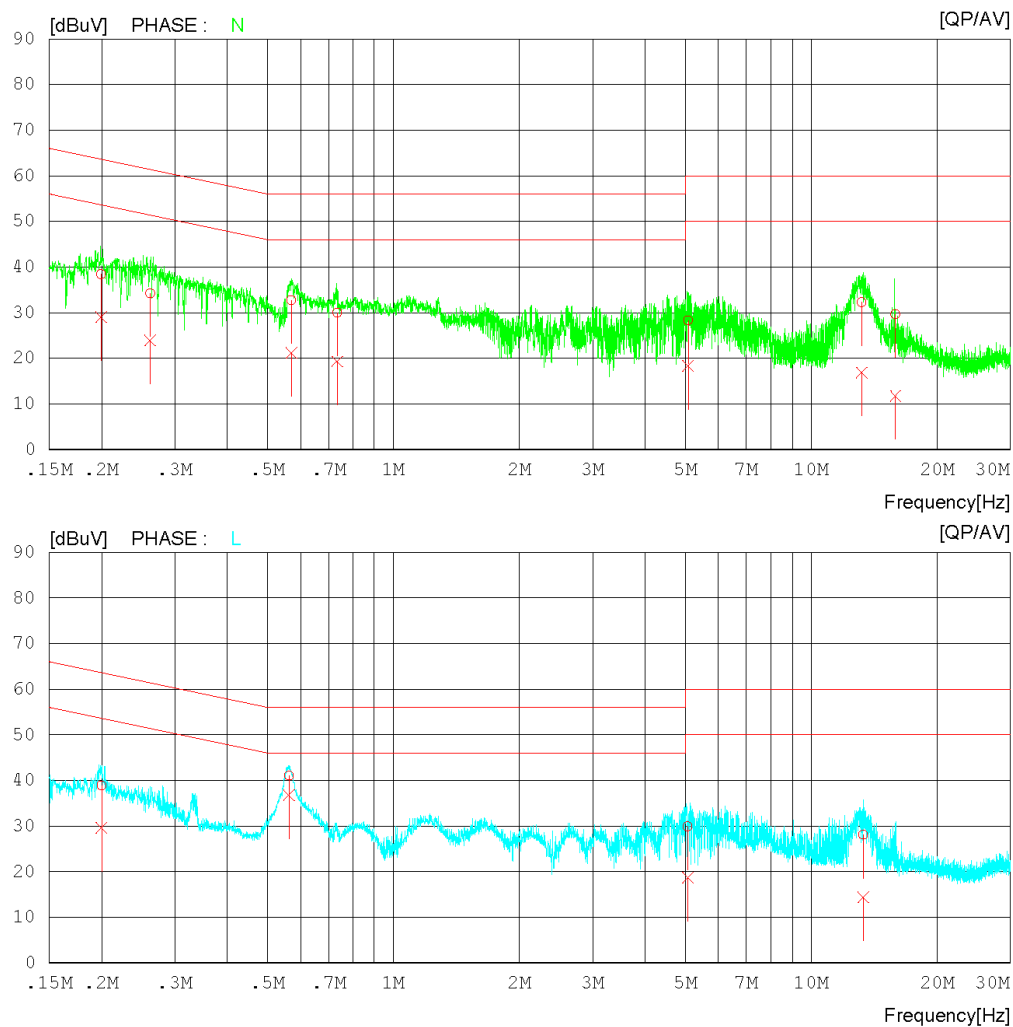
Date : 2016-01-13

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : 1

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 16 °C 41 % R.H.
Operator :

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV



Results of Conducted Emission

DTNC

Date : 2016-01-13

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : 1

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 16 °C 41 % R.H.
Operator :

Memo :

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	0.19971	28.3	19.0	10.1	38.4	29.1	63.6	53.6	25.2	24.5	N
2	0.26147	24.1	13.9	10.1	34.2	24.0	61.4	51.4	27.2	27.4	N
3	0.56942	22.7	11.1	10.1	32.8	21.2	56.0	46.0	23.2	24.8	N
4	0.73316	20.0	9.2	10.1	30.1	19.3	56.0	46.0	25.9	26.7	N
5	5.06940	18.0	8.0	10.3	28.3	18.3	60.0	50.0	31.7	31.7	N
6	13.21400	21.7	6.2	10.6	32.3	16.8	60.0	50.0	27.7	33.2	N
7	15.91120	19.1	1.1	10.6	29.7	11.7	60.0	50.0	30.3	38.3	N
8	0.20000	28.8	19.4	10.1	38.9	29.5	63.6	53.6	24.7	24.1	L
9	0.56206	30.8	26.6	10.1	40.9	36.7	56.0	46.0	15.1	9.3	L
10	5.06300	19.5	8.3	10.3	29.8	18.6	60.0	50.0	30.2	31.4	L
11	13.32800	17.2	3.5	10.8	28.0	14.3	60.0	50.0	32.0	35.7	L

< PRO-649 _ MODE 2 >

Results of Conducted Emission

DTNC

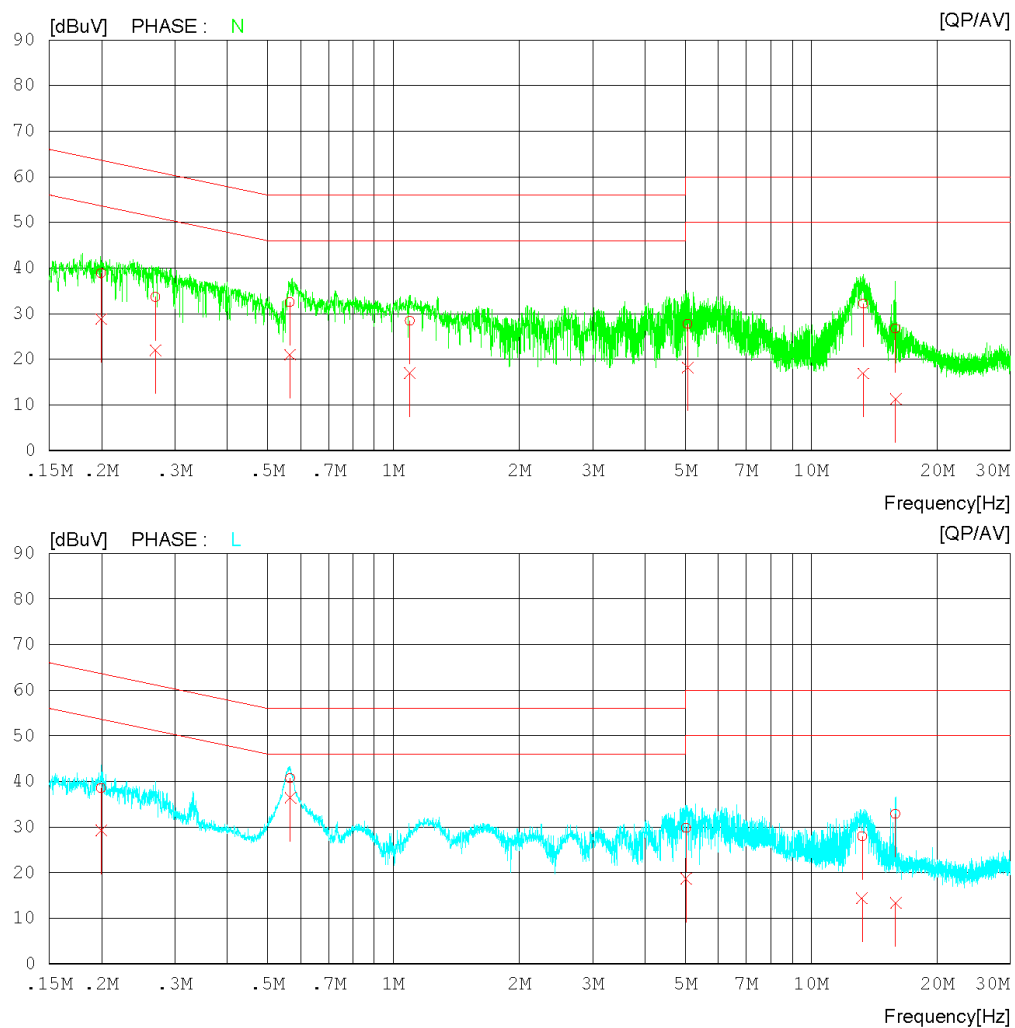
Date : 2016-01-13

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : 2

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 16 °C 41 % R.H.
Operator :

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV



Results of Conducted Emission

DTNC

Date : 2016-01-13

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : 2

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 16 °C 41 % R.H.
Operator :

Memo :

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	0.19960	28.8	18.8	10.1	38.9	28.9	63.6	53.6	24.7	24.7	N
2	0.26910	23.6	11.9	10.1	33.7	22.0	61.1	51.1	27.4	29.1	N
3	0.56511	22.4	10.9	10.1	32.5	21.0	56.0	46.0	23.5	25.0	N
4	1.09480	18.3	6.8	10.2	28.5	17.0	56.0	46.0	27.5	29.0	N
5	5.06400	17.5	7.9	10.3	27.8	18.2	60.0	50.0	32.2	31.8	N
6	13.32740	21.6	6.3	10.6	32.2	16.9	60.0	50.0	27.8	33.1	N
7	15.91860	16.1	0.7	10.6	26.7	11.3	60.0	50.0	33.3	38.7	N
8	0.19978	28.4	19.1	10.1	38.5	29.2	63.6	53.6	25.1	24.4	L
9	0.56650	30.6	26.3	10.1	40.7	36.4	56.0	46.0	15.3	9.6	L
10	5.01920	19.4	8.4	10.3	29.7	18.7	60.0	50.0	30.3	31.3	L
11	13.23780	17.1	3.5	10.8	27.9	14.3	60.0	50.0	32.1	35.7	L
12	15.91800	22.0	2.5	10.8	32.8	13.3	60.0	50.0	27.2	36.7	L

< WS1010 _ MODE 1 >

Results of Conducted Emission

DTNC

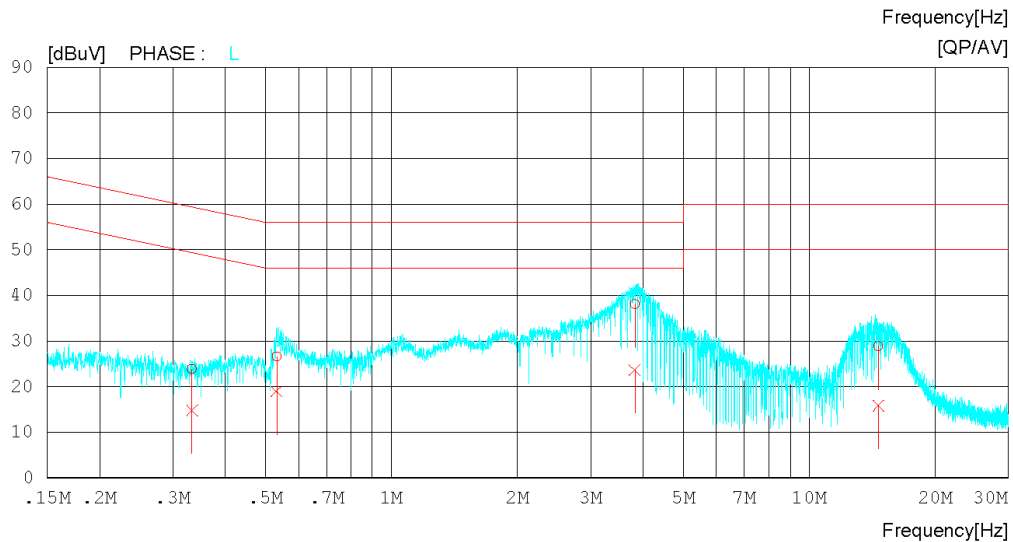
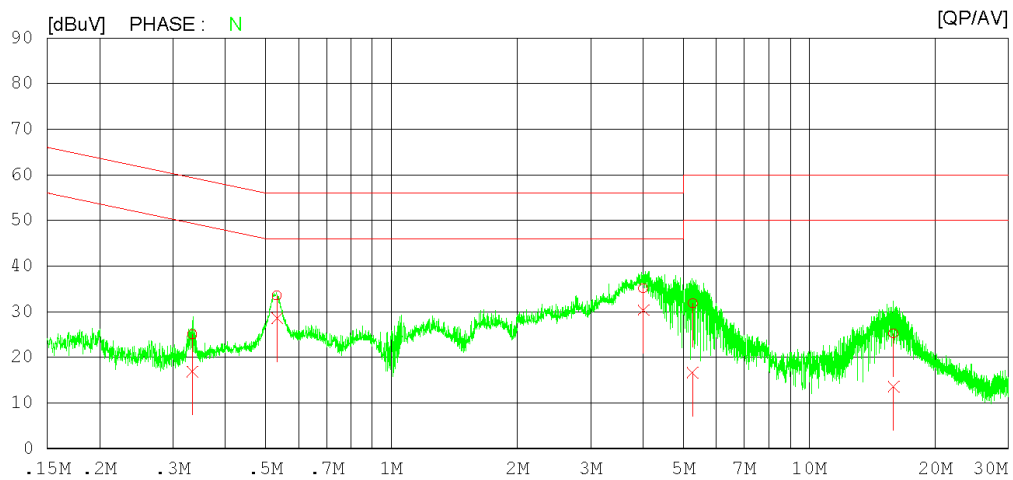
Date : 2016-02-25

Order No. :
Model No. : WS1010
Serial No. :
Test Condition : 1

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 16 °C 38 % R.H.
Operator :

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV



Results of Conducted Emission

DTNC

Date : 2016-02-25

Order No. :
Model No. : WS1010
Serial No. :
Test Condition : 1

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 16 °C 38 % R.H.
Operator :

Memo :

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	0.33410	14.9	6.8	10.1	25.0	16.9	59.3	49.3	34.3	32.4	N
2	0.53210	23.4	18.5	10.1	33.5	28.6	56.0	46.0	22.5	17.4	N
3	4.00781	24.9	20.1	10.2	35.1	30.3	56.0	46.0	20.9	15.7	N
4	5.26142	21.4	6.2	10.4	31.8	16.6	60.0	50.0	28.2	33.4	N
5	15.92404	14.6	3.0	10.6	25.2	13.6	60.0	50.0	34.8	36.4	N
6	0.33292	13.7	4.7	10.1	23.8	14.8	59.4	49.4	35.6	34.6	L
7	0.53120	16.4	8.8	10.1	26.5	18.9	56.0	46.0	29.5	27.1	L
8	3.82077	27.9	13.4	10.2	38.1	23.6	56.0	46.0	17.9	22.4	L
9	14.65026	18.0	5.0	10.8	28.8	15.8	60.0	50.0	31.2	34.2	L

< WS1010 _ MODE 2 >

Results of Conducted Emission

DTNC

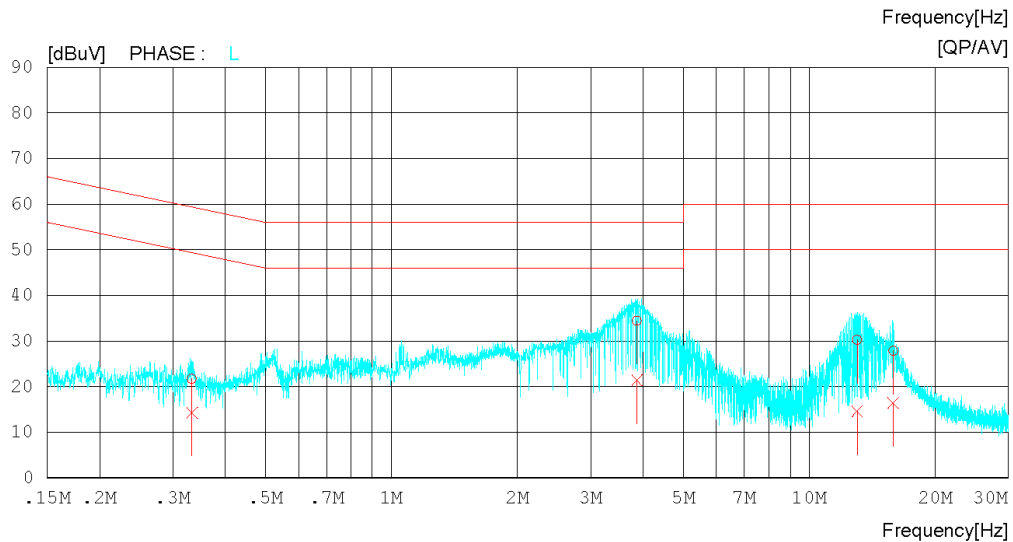
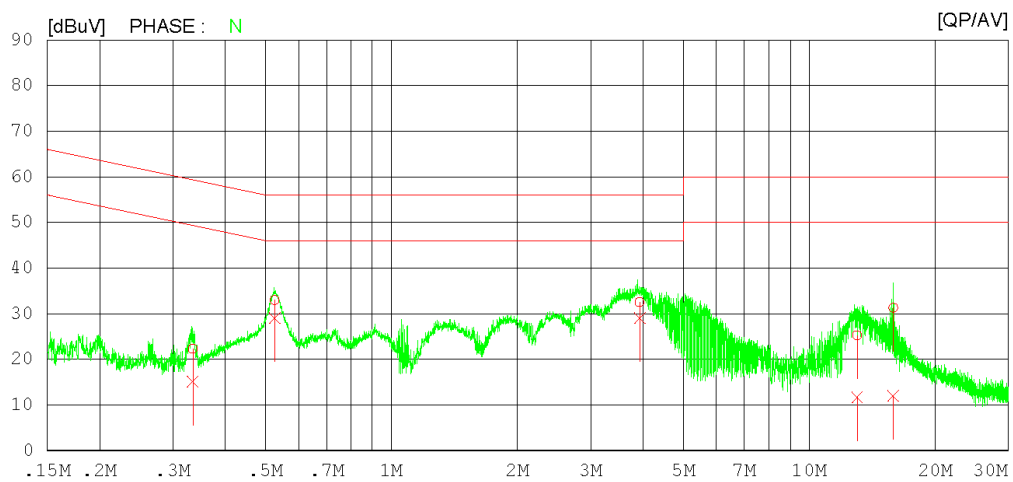
Date : 2016-02-25

Order No. :
Model No. : WS1010
Serial No. :
Test Condition : 2

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 16 °C 38 % R.H.
Operator :

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV



Results of Conducted Emission

DTNC

Date : 2016-02-25

Order No. :
Model No. : WS1010
Serial No. :
Test Condition : 2

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 16 °C 38 % R.H.
Operator :

Memo :

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	0.33433	12.2	5.0	10.1	22.3	15.1	59.3	49.3	37.0	34.2	N
2	0.52493	22.9	19.0	10.1	33.0	29.1	56.0	46.0	23.0	16.9	N
3	3.93049	22.3	18.8	10.2	32.5	29.0	56.0	46.0	23.5	17.0	N
4	13.02237	14.6	1.0	10.6	25.2	11.6	60.0	50.0	34.8	38.4	N
5	15.88744	20.6	1.4	10.6	31.2	12.0	60.0	50.0	28.8	38.0	N
6	0.33315	11.5	4.2	10.1	21.6	14.3	59.4	49.4	37.8	35.1	L
7	3.86831	24.2	11.2	10.2	34.4	21.4	56.0	46.0	21.6	24.6	L
8	13.02333	19.5	3.9	10.7	30.2	14.6	60.0	50.0	29.8	35.4	L
9	15.90026	17.0	5.6	10.8	27.8	16.4	60.0	50.0	32.2	33.6	L

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 120 kHz RBW was used.

Peak detector with 1 MHz RBW and 1 MHz VBW were used for above 1 GHz frequency range, also used linear average detector with defined in CISPR 16-1-1.

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

PRO-649 _ < 30 MHz ~ 1 GHz _ MODE 1 >

RADIATED EMISSION

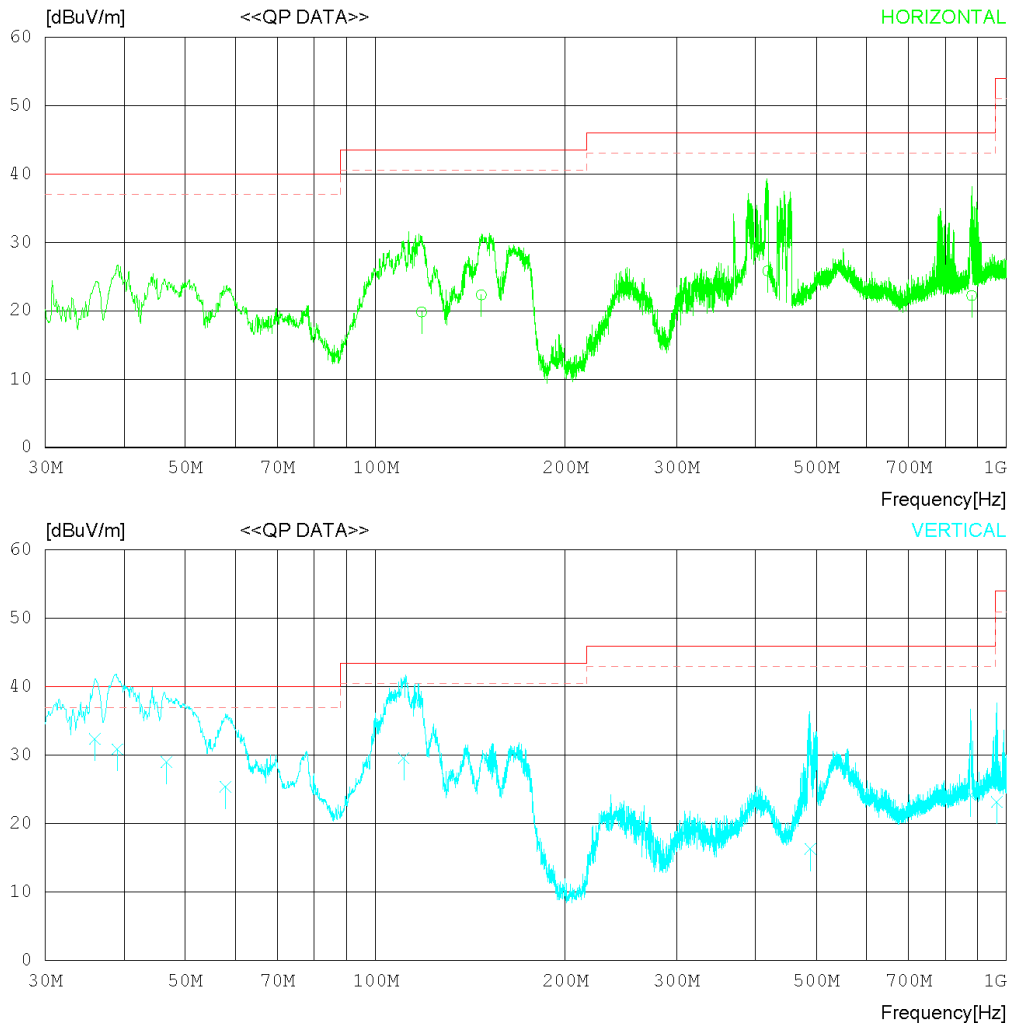
Date : 2016-01-18

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : SCAN

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 17 °C 40 % R.H.
Operator :

Memo :

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



RADIATED EMISSION

Date : 2016-01-18

Order No. : DTNC1601-00158	Reference No. :
Model No. : PRO-649	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 17 °C 40 % R.H.
Test Condition : SCAN	Operator :

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	118.386	34.4	11.2	0.8	26.6	19.8	43.5	23.7	400	169
2	147.199	35.0	12.8	1.0	26.5	22.3	43.5	21.2	282	156
3	418.717	34.1	16.2	1.8	26.3	25.8	46.0	20.2	199	358
4	880.880	22.0	23.2	3.3	26.3	22.2	46.0	23.8	100	260
----- Vertical -----										
5	35.941	49.2	9.3	0.5	26.6	32.4	40.0	7.6	100	12
6	39.000	46.9	10.1	0.5	26.6	30.9	40.0	9.1	200	187
7	46.700	43.4	11.5	0.7	26.6	29.0	40.0	11.0	169	359
8	57.888	39.6	11.8	0.6	26.6	25.4	40.0	14.6	200	196
9	110.901	45.1	10.3	0.8	26.6	29.6	43.5	13.9	100	139
10	488.958	23.0	17.5	2.1	26.3	16.3	46.0	29.7	183	359
11	876.514	24.0	23.2	3.3	26.3	24.2	46.0	21.8	100	87
12	965.857	22.0	24.4	3.6	26.8	23.2	54.0	30.8	100	240

PRO-649 _ < (1 ~ 6) GHz _ Peak _ MODE 1 >

RADIATED EMISSION

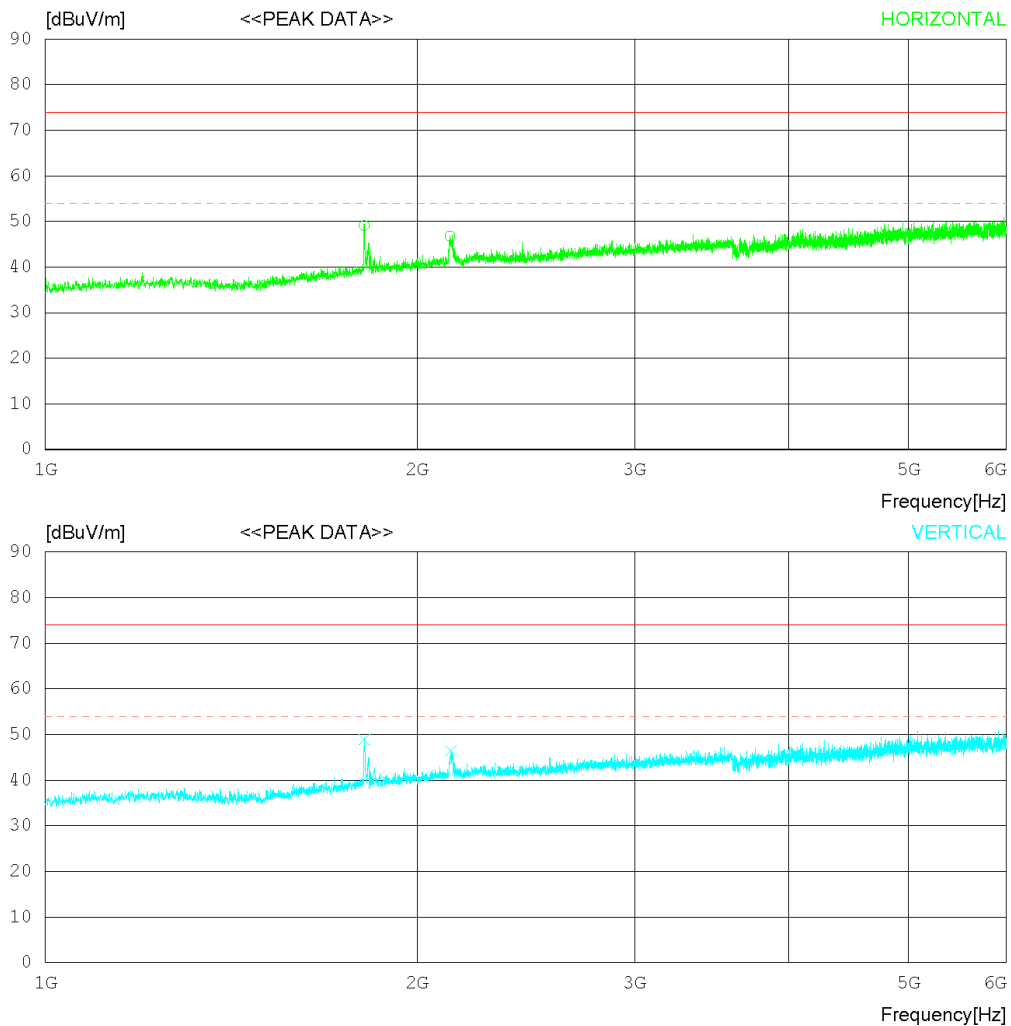
Date : 2016-01-20

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : SCAN

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 17 °C 39 % R.H.
Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Peak)
FCC Part15 Subpart.B Class B (3m) - 18G(Avg)



RADIATED EMISSION

Date : 2016-01-20

Order No.	: DTNC1601-00158	Reference No.	:
Model No.	: PRO-649	Power Supply	: 120 V 60 Hz
Serial No.	:	Temp/Humi	: 17 °C 39 % R.H.
Test Condition	: SCAN	Operator	:

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m) - 18G(Peak)
FCC Part15 Subpart B Class B (3m) - 18G(Avg)

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	1811.875	62.0	30.6	4.3	47.8	49.1	74.0	24.9	100	358
2	2126.250	57.7	32.1	4.7	47.7	46.8	74.0	27.2	100	93
----- Vertical -----										
3	1811.875	61.8	30.6	4.3	47.8	48.9	74.0	25.1	100	1
4	2130.625	57.3	32.1	4.7	47.7	46.4	74.0	27.6	100	248

PRO-649 _ < (1 ~ 6) GHz _ Average _ MODE 1 >

RADIATED EMISSION

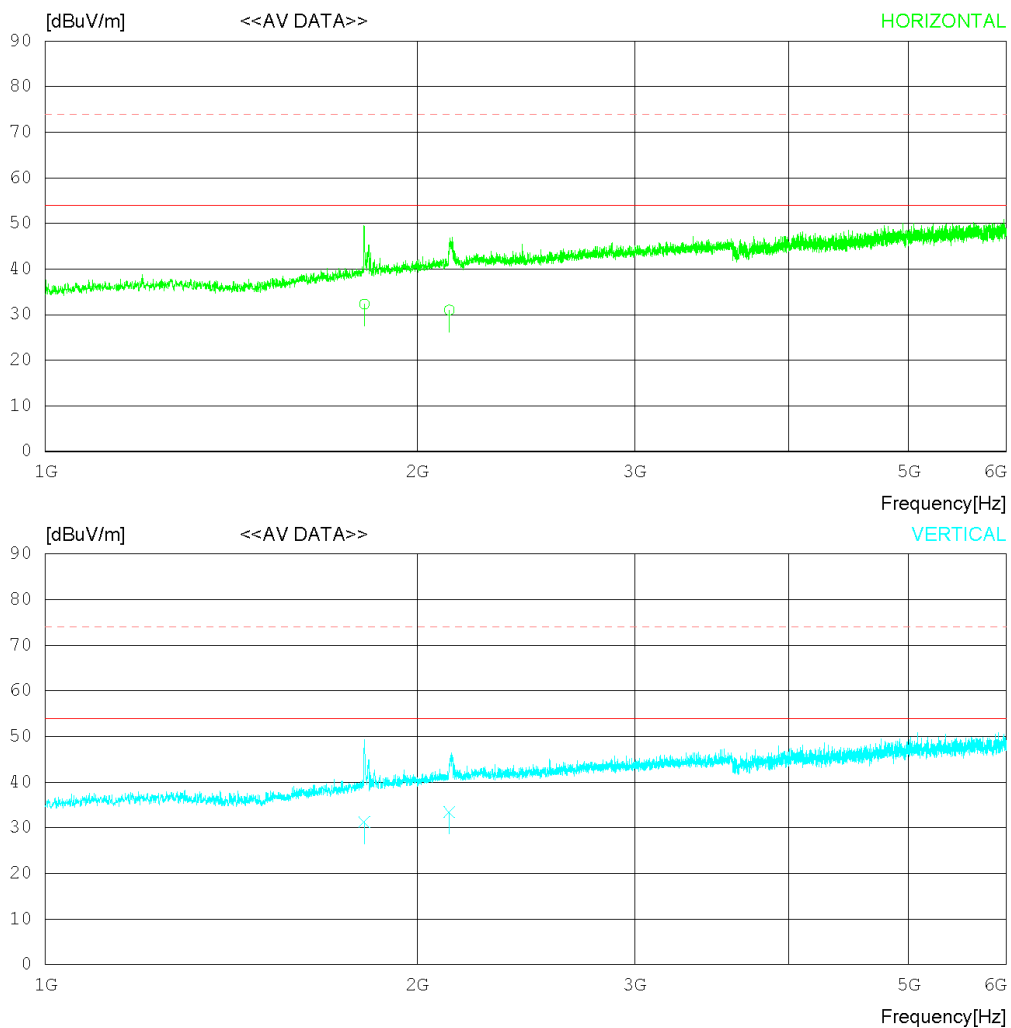
Date : 2016-01-20

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : SCAN

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 17 °C 39 % R.H.
Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)



RADIATED EMISSION

Date : 2016-01-20

Order No. : DTNC1601-00158	Reference No. :
Model No. : PRO-649	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 17 °C 39 % R.H.
Test Condition : SCAN	Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)

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	1812.232	45.2	30.6	4.3	47.8	32.3	54.0	21.7	100	351
2	2123.720	42.0	32.1	4.7	47.8	31.0	54.0	23.0	100	93
----- Vertical -----										
3	1811.800	44.1	30.6	4.3	47.8	31.2	54.0	22.8	100	194
4	2123.721	44.4	32.1	4.7	47.8	33.4	54.0	20.6	100	169

PRO-649 _ < 30 MHz ~ 1 GHz _ MODE 2 >

RADIATED EMISSION

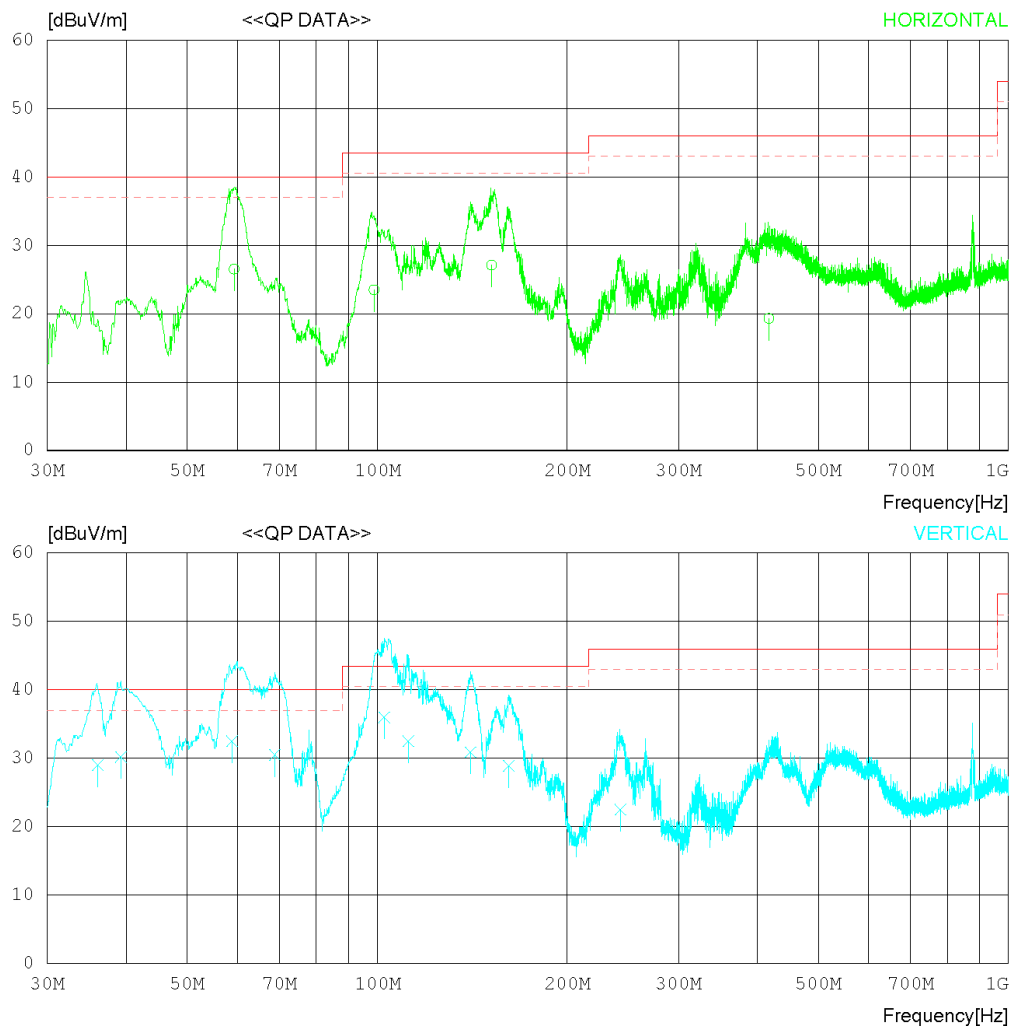
Date : 2016-01-18

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : PC/IF

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 17 °C 40 % R.H.
Operator :

Memo :

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



RADIATED EMISSION

Date : 2016-01-18

Order No. : DTNC1601-00158	Reference No. :
Model No. : PRO-649	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 17 °C 40 % R.H.
Test Condition : PC/IF	Operator :

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	59.294	40.8	11.7	0.6	26.6	26.5	40.0	13.5	300	275
2	98.797	40.5	8.8	0.8	26.6	23.5	43.5	20.0	300	0
3	151.665	39.7	12.9	1.0	26.5	27.1	43.5	16.4	277	170
4	417.164	27.6	16.2	1.8	26.3	19.3	46.0	26.7	254	209
----- Vertical -----										
5	36.091	45.7	9.4	0.5	26.6	29.0	40.0	11.0	100	1
6	39.215	46.2	10.1	0.5	26.6	30.2	40.0	9.8	100	182
7	58.873	46.7	11.8	0.6	26.6	32.5	40.0	7.5	100	201
8	68.803	46.0	10.5	0.6	26.6	30.5	40.0	9.5	100	31
9	102.628	52.5	9.3	0.8	26.6	36.0	43.5	7.5	100	197
10	111.918	47.9	10.4	0.8	26.6	32.5	43.5	11.0	100	238
11	140.461	43.8	12.6	1.0	26.5	30.9	43.5	12.6	100	201
12	161.553	41.4	12.9	1.1	26.5	28.9	43.5	14.6	100	201
13	242.632	36.1	11.4	1.4	26.4	22.5	46.0	23.5	100	196

PRO-649 _ < (1 ~ 6) GHz _ Peak _ MODE 2 >

RADIATED EMISSION

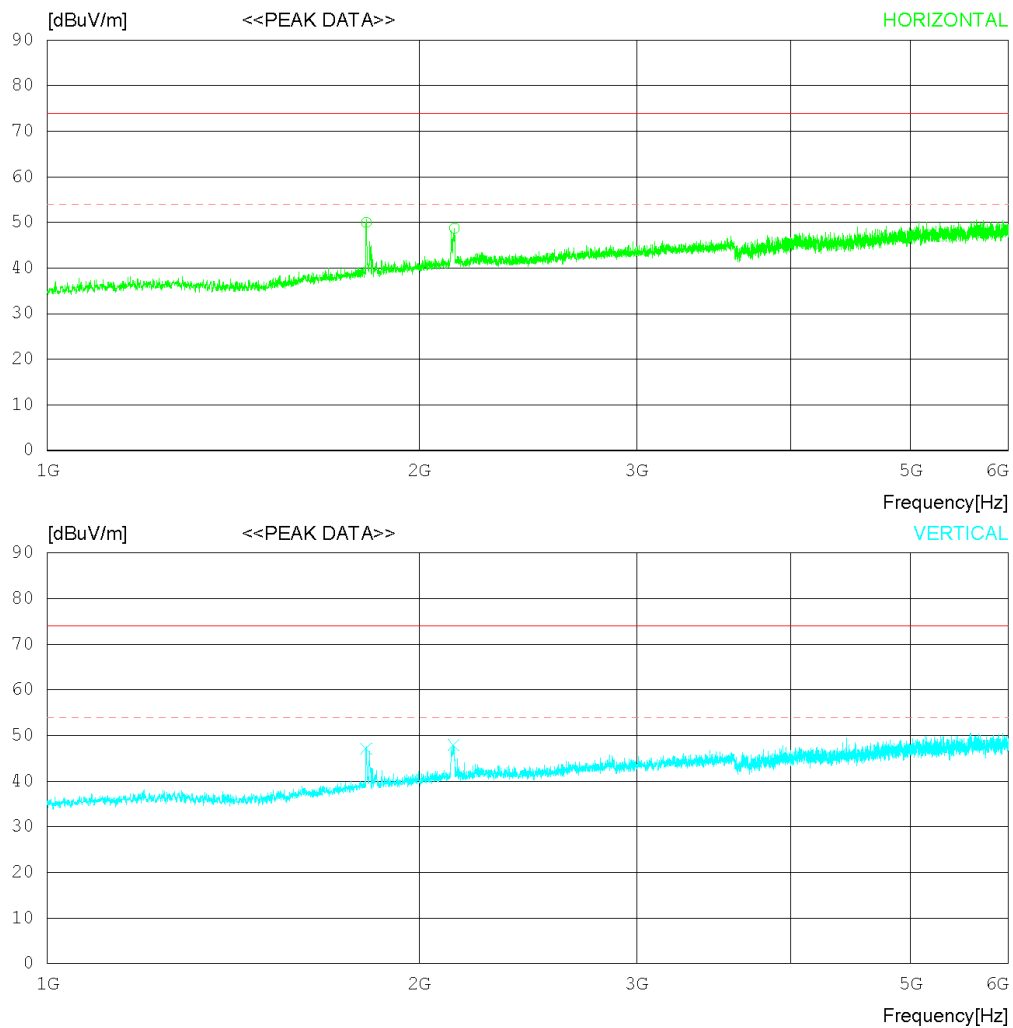
Date : 2016-01-20

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : PC/IF

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 17 °C 39 % R.H.
Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Peak)
FCC Part15 Subpart.B Class B (3m) - 18G(Avg)



RADIATED EMISSION

Date : 2016-01-20

Order No. : DTNC1601-00158	Reference No. :
Model No. : PRO-649	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 17 °C 39 % R.H.
Test Condition : PC/IF	Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Peak)
FCC Part15 Subpart.B Class B (3m) - 18G(Avg)

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	1812.500	62.9	30.6	4.3	47.8	50.0	74.0	24	100	358
2	2136.250	59.6	32.1	4.7	47.7	48.7	74.0	25.3	100	358
----- Vertical -----										
3	1812.500	60.0	30.6	4.3	47.8	47.1	74.0	26.9	100	252
4	2133.125	58.8	32.1	4.7	47.7	47.9	74.0	26.1	100	0

PRO-649 _ < (1 ~ 6) GHz _ Average _ MODE 2 >

RADIATED EMISSION

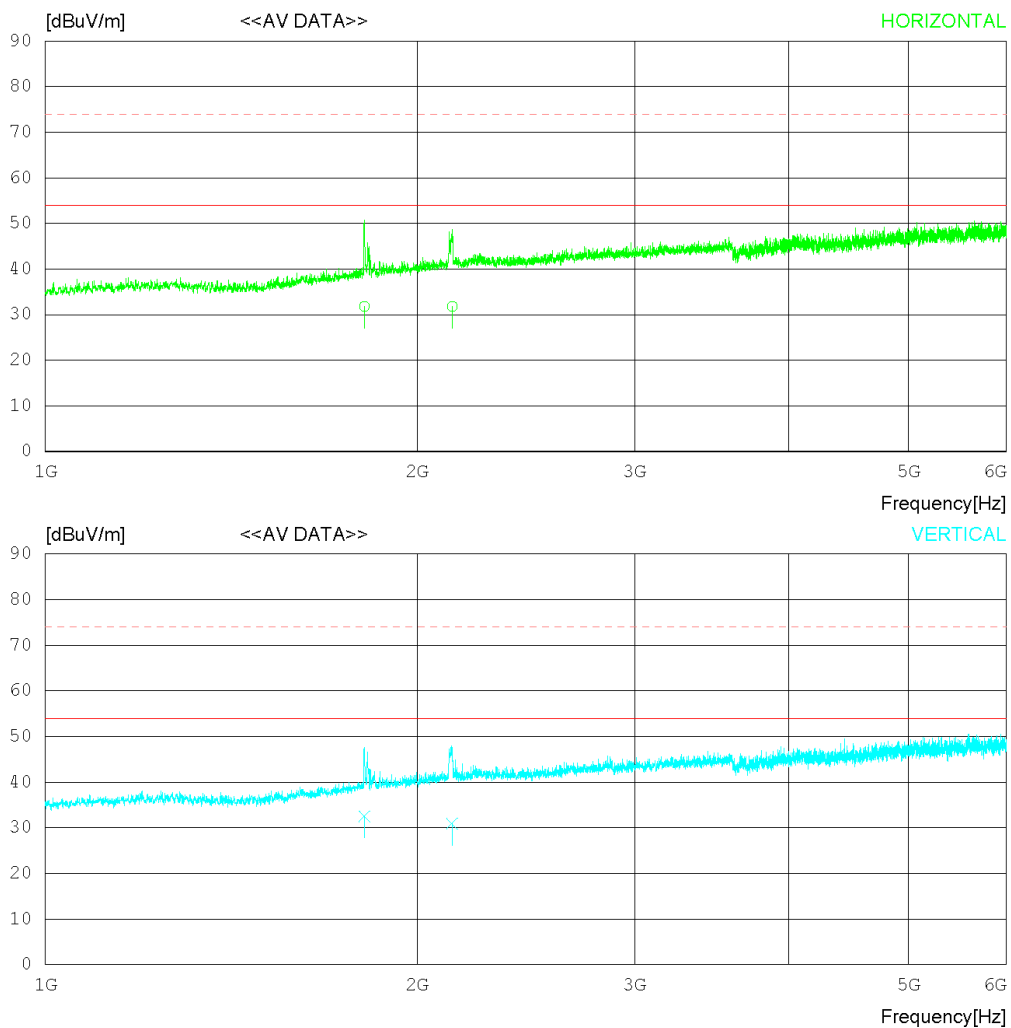
Date : 2016-01-20

Order No. : DTNC1601-00158
Model No. : PRO-649
Serial No. :
Test Condition : PC/IF

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 17 °C 39 % R.H.
Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)



RADIATED EMISSION

Date : 2016-01-20

Order No. : DTNC1601-00158	Reference No. :
Model No. : PRO-649	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 17 °C 39 % R.H.
Test Condition : PC/IF	Operator :

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)

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	1812.790	44.7	30.6	4.3	47.8	31.8	54.0	22.2	100	232
2	2136.250	42.7	32.1	4.7	47.7	31.8	54.0	22.2	100	358
----- Vertical -----										
3	1812.540	45.4	30.6	4.3	47.8	32.5	54.0	21.5	100	194
4	2134.125	41.8	32.1	4.7	47.7	30.9	54.0	23.1	100	217

WS1010 _ < 30 MHz ~ 1 GHz _ MODE 1 >

RADIATED EMISSION

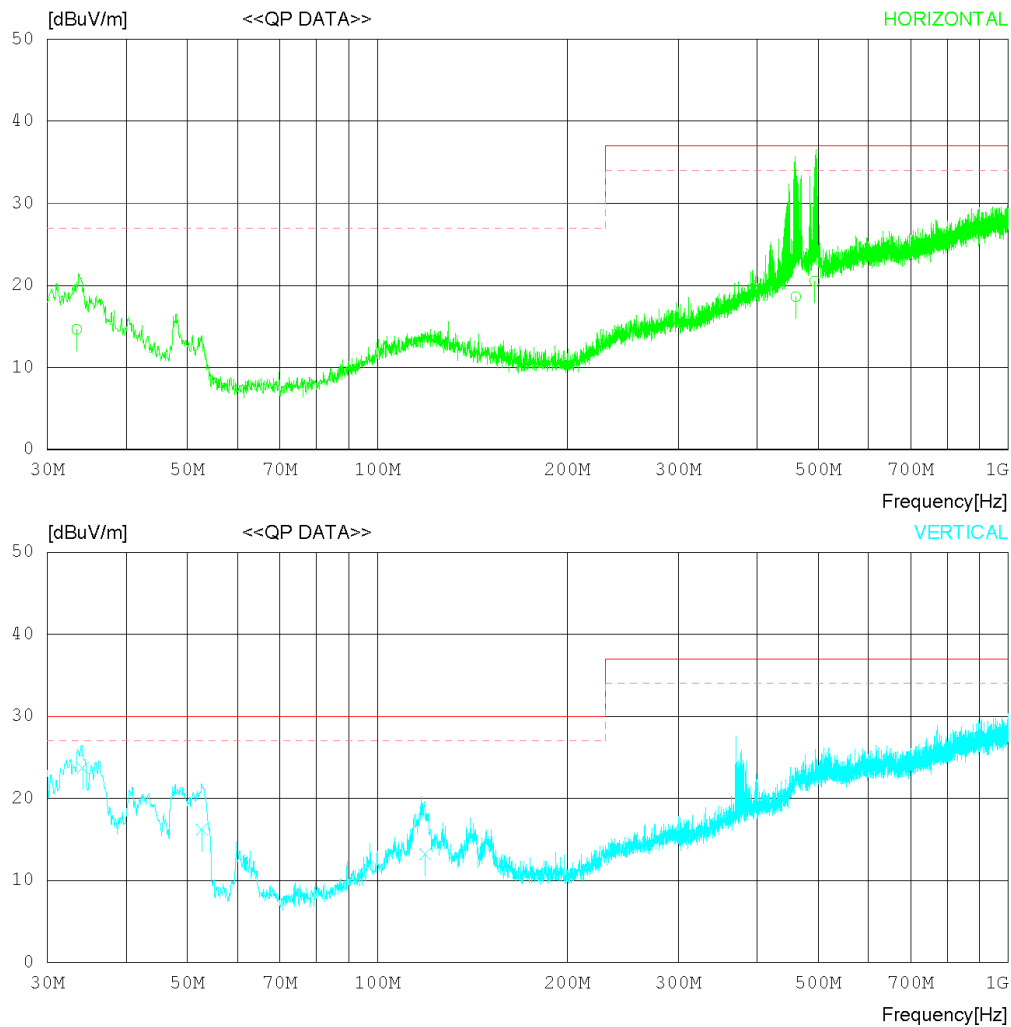
Date : 2016-03-04

Order No. :
Model No. : WS1010
Serial No. :
Test Condition : 1

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 17 °C 39 % R.H.
Operator :

Memo :

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



RADIATED EMISSION

Date : 2016-03-04

Order No. :	Reference No. :
Model No. : WS1010	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 17 °C 39 % R.H.
Test Condition : 1	Operator :

Memo :

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	33.400	18.6	16.9	1.3	22.2	14.6	30.0	15.4	200	358
2	460.426	20.9	16.9	5.4	24.6	18.6	37.0	18.4	200	211
3	493.526	22.1	17.4	5.5	24.5	20.5	37.0	16.5	263	208
----- Vertical -----										
4	34.117	28.1	16.5	1.3	22.2	23.7	30.0	6.3	322	169
5	52.674	29.0	7.8	1.7	22.3	16.2	30.0	13.8	320	0
6	119.057	21.2	12.2	2.6	22.8	13.2	30.0	16.8	100	357

WS1010 _ < (1 ~ 6) GHz _ Peak _ MODE 1 >

RADIATED EMISSION

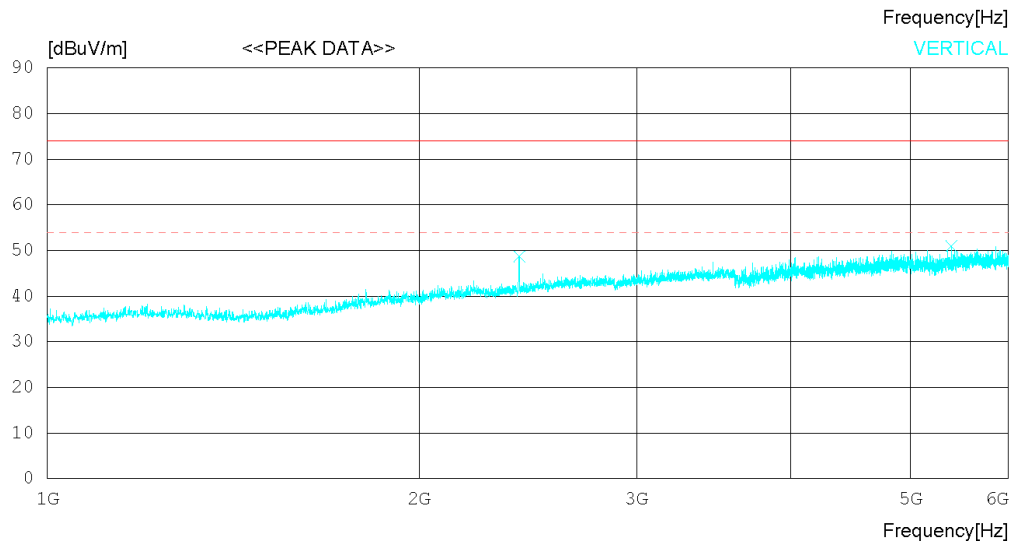
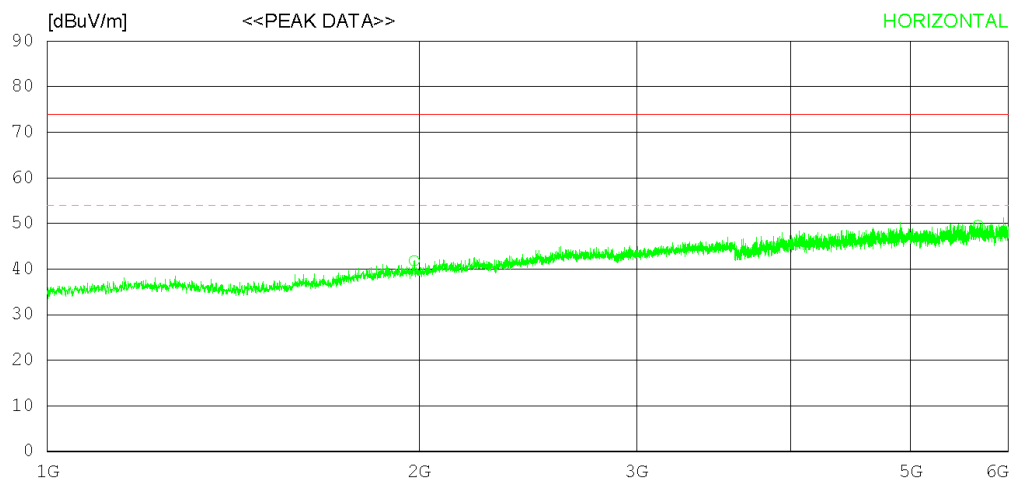
Date : 2016-03-05

Order No. :
Model No. : WS1010
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 °C 45 % R.H.
Operator :

Memo : 1

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Peak)
FCC Part15 Subpart.B Class B (3m) - 18G(Avg)



RADIATED EMISSION

Date : 2016-03-05

Order No. :	Reference No. :
Model No. : WS1010	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 19 °C 45 % R.H.
Test Condition :	Operator :

Memo : 1

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Peak)
FCC Part15 Subpart.B Class B (3m) - 18G(Avg)

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	1981.875	54.0	31.4	4.5	48.1	41.8	74.0	32.2	100	358
2	5668.750	53.8	34.5	8.2	46.9	49.6	74.0	24.4	100	358
----- Vertical -----										
3	2410.625	59.7	31.7	5.1	47.8	48.7	74.0	25.3	100	0
4	5395.625	55.9	34.2	8.0	47.1	51.0	74.0	23	100	27

WS1010 _ < (1 ~ 6) GHz _ Average _ MODE 1 >

RADIATED EMISSION

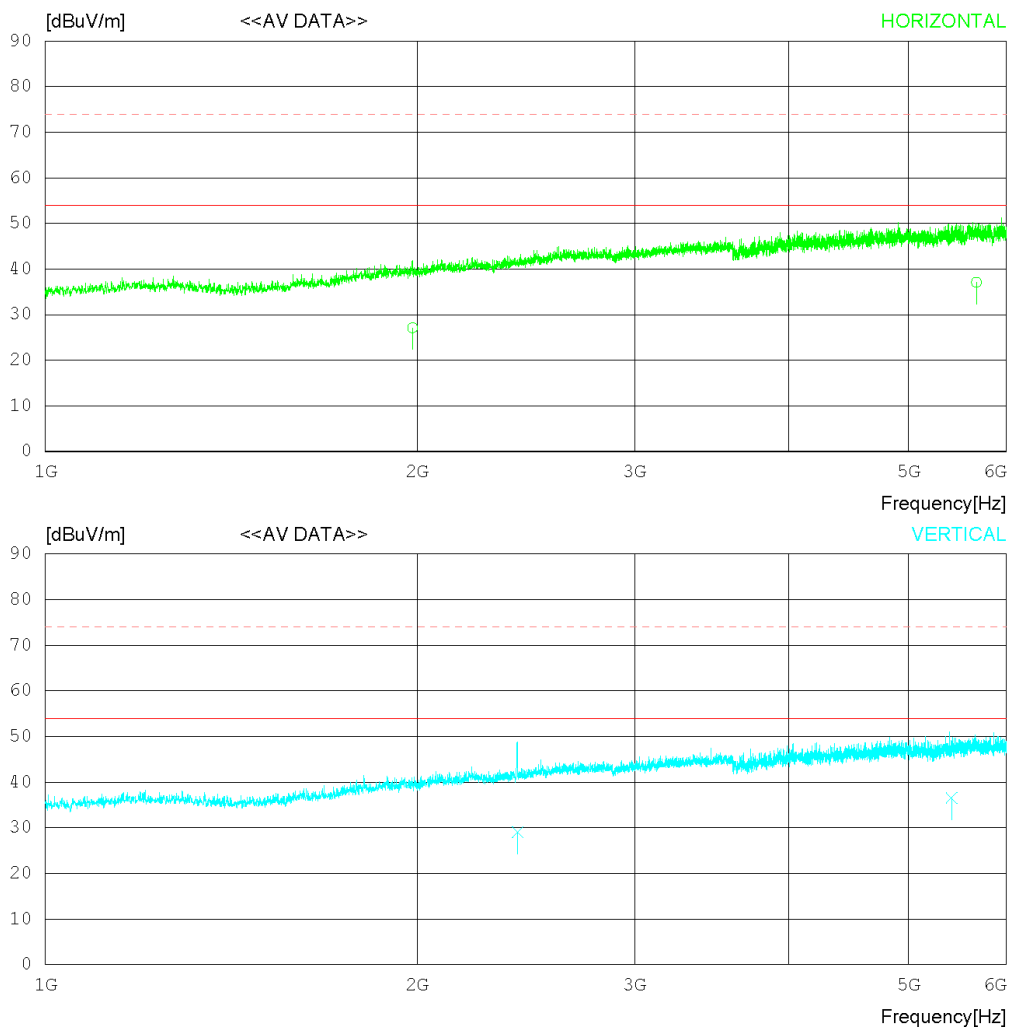
Date : 2016-03-05

Order No. :
Model No. : WS1010
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 °C 45 % R.H.
Operator :

Memo : 1

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)



RADIATED EMISSION

Date : 2016-03-05

Order No. :	Reference No. :
Model No. : WS1010	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 19 °C 45 % R.H.
Test Condition :	Operator :

Memo : 1

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)

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	1982.805	39.3	31.4	4.5	48.1	27.1	54.0	26.9	100	358
2	5672.019	41.3	34.5	8.2	46.9	37.1	54.0	16.9	100	358
----- Vertical -----										
3	2412.893	40.0	31.7	5.1	47.8	29.0	54.0	25.0	100	167
4	5415.388	41.4	34.2	8.0	47.1	36.5	54.0	17.5	100	27

WS1010 _ < 30 MHz ~ 1 GHz _ MODE 2 >

RADIATED EMISSION

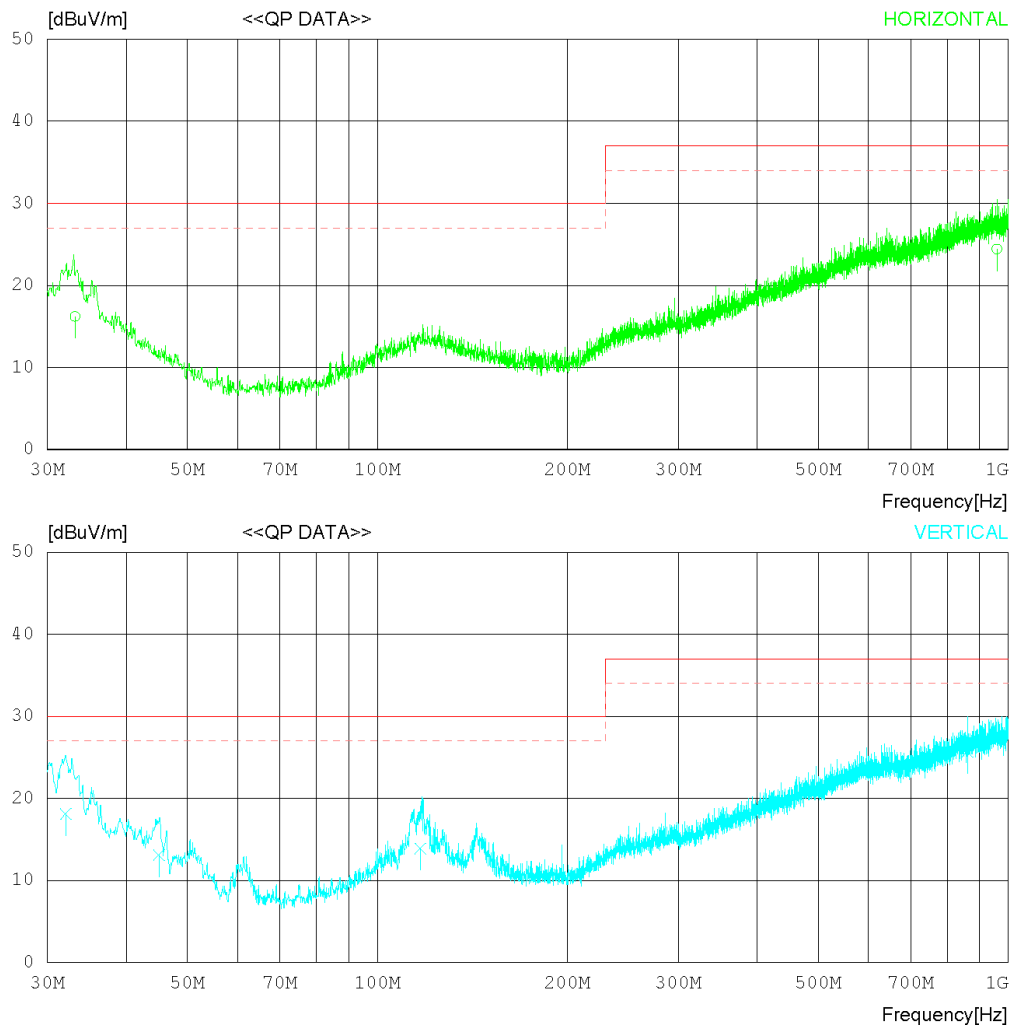
Date : 2016-03-04

Order No. :
Model No. : WS1010
Serial No. :
Test Condition : 2

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 17 °C 39 % R.H.
Operator :

Memo :

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



RADIATED EMISSION

Date : 2016-03-04

Order No. : Model No. : WS1010 Serial No. : Test Condition : 2	Reference No. : Power Supply : 120 V 60 Hz Temp/Humi : 17 °C 39 % R.H. Operator :
---	--

Memo :

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	33.196	20.1	17.0	1.3	22.2	16.2	30.0	13.8	325	74
2	959.346	18.2	20.9	8.2	22.9	24.4	37.0	12.6	199	0
----- Vertical -----										
3	32.061	21.4	17.6	1.3	22.2	18.1	30.0	11.9	300	169
4	45.046	22.6	11.1	1.6	22.2	13.1	30.0	16.9	100	266
5	117.113	22.0	12.0	2.6	22.7	13.9	30.0	16.1	100	315
6	861.354	20.6	20.3	7.7	22.9	25.7	37.0	11.3	200	174

WS1010 _ < (1 ~ 6) GHz _ Peak _ MODE 2 >

RADIATED EMISSION

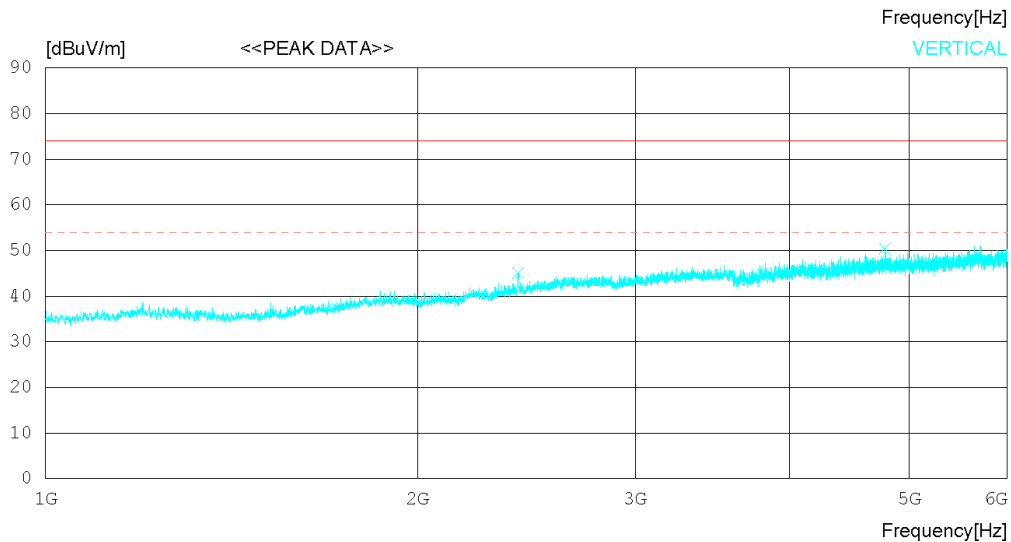
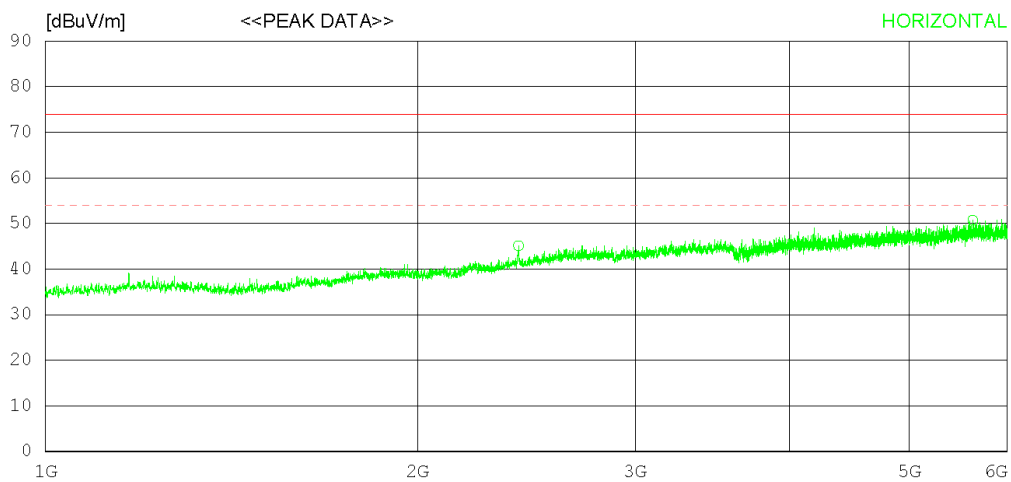
Date : 2016-03-05

Order No. :
Model No. : WS1010
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 °C 45 % R.H.
Operator :

Memo : 2

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Peak)
FCC Part15 Subpart.B Class B (3m) - 18G(Avg)



RADIATED EMISSION

Date : 2016-03-05

Order No. :	Reference No. :
Model No. : WS1010	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 19 °C 45 % R.H.
Test Condition :	Operator :

Memo : 2

LIMIT : FCC Part15 Subpart B Class B (3m) - 18G(Peak)
FCC Part15 Subpart B Class B (3m) - 18G(Avg)

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	2413.750	56.1	31.7	5.1	47.8	45.1	74.0	28.9	100	133
2	5625.000	55.0	34.5	8.1	46.9	50.7	74.0	23.3	100	1
----- Vertical -----										
3	2412.500	56.1	31.7	5.1	47.8	45.1	74.0	28.9	100	173
4	4778.125	56.4	33.8	7.5	47.3	50.4	74.0	23.6	100	114

WS1010 _ < (1 ~ 6) GHz _ Average _ MODE 2 >

RADIATED EMISSION

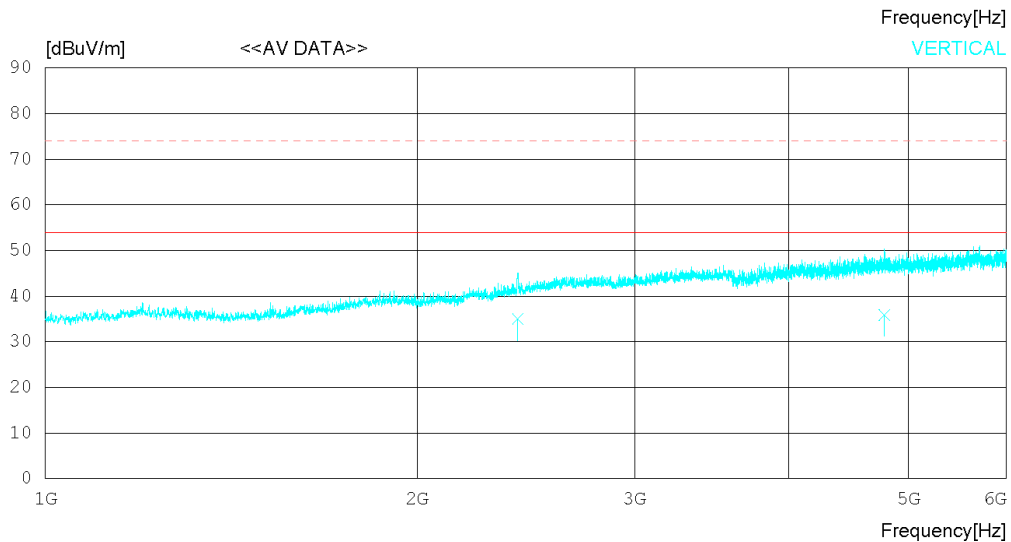
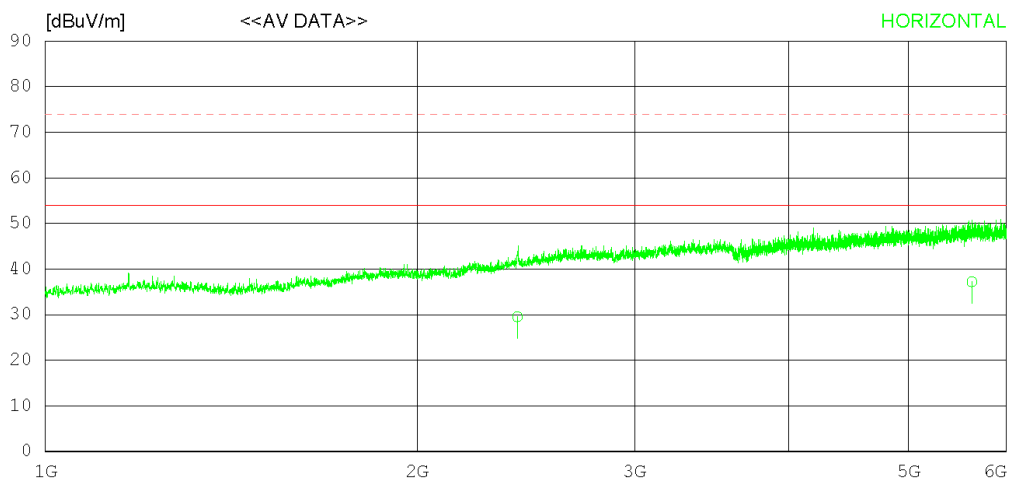
Date : 2016-03-05

Order No. :
Model No. : WS1010
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 19 °C 45 % R.H.
Operator :

Memo : 2

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)



RADIATED EMISSION

Date : 2016-03-05

Order No. :	Reference No. :
Model No. : WS1010	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 19 °C 45 % R.H.
Test Condition :	Operator :

Memo : 2

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)

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	2411.504	40.5	31.7	5.1	47.8	29.5	54.0	24.5	100	258
2	5625.902	41.5	34.5	8.1	46.9	37.2	54.0	16.8	100	241
----- Vertical -----										
3	2413.299	46.0	31.7	5.1	47.8	35.0	54.0	19.0	100	312
4	4779.917	41.9	33.8	7.5	47.3	35.9	54.0	18.1	100	217

6.3 Antenna Power Conduction

6.3.1 Measurement Procedure

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 dB μ V.

The measurements were repeated with the receiver tuned to a frequency until all of frequencies had been successively measured.

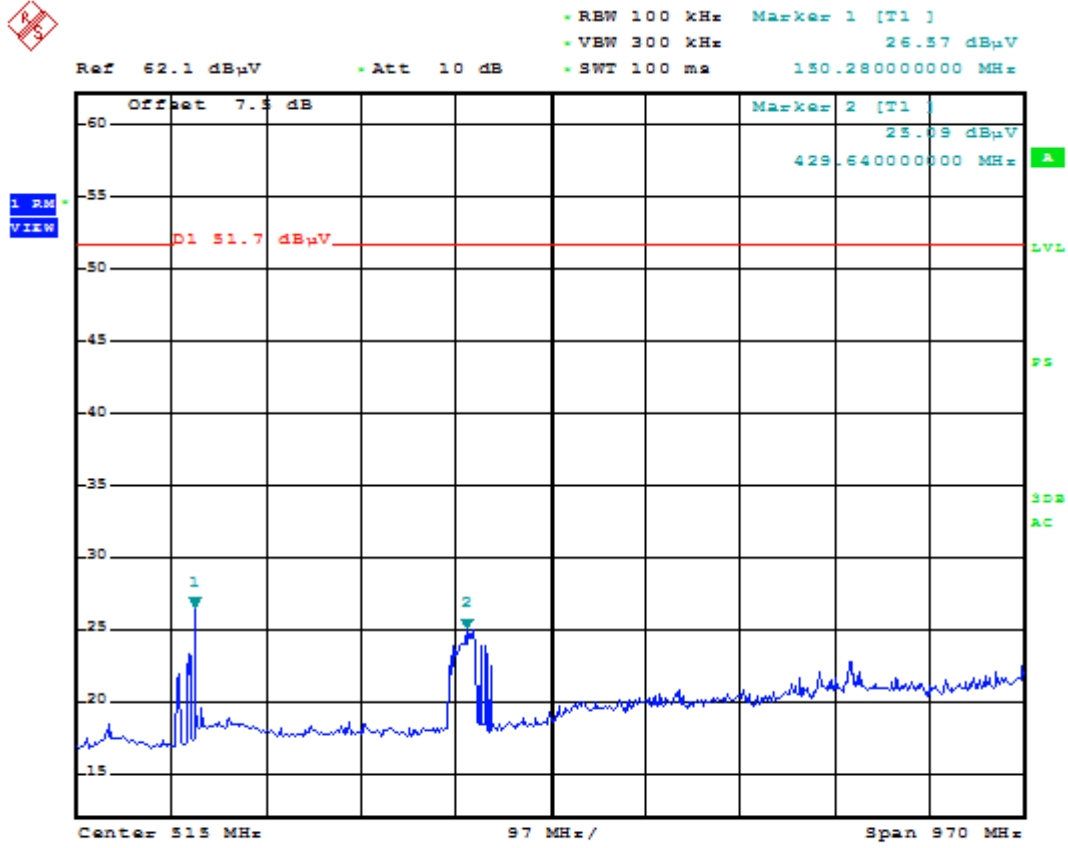
Power in the receive antenna terminals in the ratio of V^2/R , where V is the loss-corrected voltage measured at the antenna terminals, and R is the impedance of the measuring instrument.

6.3.2 Limit for Antenna Power Conduction

- Limit : **2nW(51.7 dB μ V)**

Test Result

< PRO-649 >



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
☐ 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	2016.01.05	2017.01.05
☐ 50 OHM TERMINATOR	CT-01	TME	N/A	2016.01.05	2017.01.05
☒ EMI TEST RECEIVER	ESCI7	ROHDE & SCHWARZ	100910	2016.02.25	2017.02.25
☒ LISN	ESH2-Z5	ROHDE & SCHWARZ	828739/006	2015.09.10	2016.09.10
☒ PULSE LIMITER	ESH3-Z2	ROHDE & SCHWARZ	101334	2016.01.05	2017.01.05
☒ 50 OHM TERMINATOR	CT-01	TME	N/A	2016.01.05	2017.01.05

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	2016.02.05	2017.02.05
☒ TRILOG BROADBAND TEST-ANTENNA	VULB9160	SCHWARZBECK	9160-3362	2014.07.31	2016.07.31
☒ LOW NOISE PRE AMPLIFIER	MLA-100K01-B01-26	TSJ	1252741	2016.02.25	2017.02.25
☒ HORN ANTENNA	3117	ETS-LINDGREN	00152093	2016.02.26	2018.02.26
☒ EMI TEST RECEIVER	ESU	ROHDE & SCHWARZ	100014	2016.01.06	2017.01.06
☒ AMPLIFIER	8447E	H/P	2945A02865	2016.01.06	2017.01.06
☒ BILOG ANTENNA	CBL6112B	SCHAFFNER	2737	2014.12.10	2016.12.10

3. Antenna Power Conduction

Name of Instrument	Model No.	Manufacturer	Serial No.	Cal. Date	Next Cal. Date
☒ EMI TEST RECEIVER	ESCI	ROHDE & SCHWARZ	100364	2016.02.25	2017.02.25
☐ SPLITTER	ZFRSC-42	MINI CIRCUITS	SF624000603	2015.06.26	2016.06.26

Appendix 2

Report Revision History

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

Appendix 3

Changed item

Addition of the adapter as requested by the buyer.

Linear Adapter (Basic type)	SMPS Adapter (Additional type)
Manufacturer : Song Lian Model name : GA-09D-0310B Input : 120V AC 60Hz 200mA Output : 9V DC 400mA 3.6W	Manufacturer : 3YE Model name : GQ05-090040-AU Input : 100-240V ~ 50/60Hz 0.3A Max Output : 9V 400mA