

EMC TEST REPORT

Test item : DIGITAL TRUNKING HANDHELD RADIO SCANNER
Model No. : PRO-651
Order No. : DTNC1601-00156
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.
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Tested by:



Engineer
DaeHwa Eun

Reviewed by:



Technical Manager
YoungKyu Shin

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, 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	DIGITAL TRUNKING HANDHELD RADIO SCANNER
Model No.	PRO-651
Add Model No	WS1040
Serial No	None
FCC ID	HSXSC03
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-651 >

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

< WS1040 >

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-651 >

Frequency [MHz]	Phase	Result [dB μ V]	Detector	Limit [dB μ V]	Margin [dB]
0.55409	L	36.2	Average	46.0	9.8

< WS1040 >

Frequency [MHz]	Phase	Result [dB μ V]	Detector	Limit [dB μ V]	Margin [dB]
3.86369	N	34.5	Average	46.0	11.5

(2) Radiated Emission

< PRO-651 >

Frequency [MHz]	Pol.	Result [dB(μ V/m)]	Detector	Limit [dB(μ V/m)]	Margin [dB]
42.263	V	35.5	Quasi-Peak	40.0	4.5

< WS1040 >

Frequency [MHz]	Pol.	Result [dB(μ V/m)]	Detector	Limit [dB(μ V/m)]	Margin [dB]
148.823	V	22.4	Quasi-Peak	30.0	7.6

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 notebook PC 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		
Notebook PC	X502C	D5N0CV821534 227	ASUS	POWER USB	1.8 0.3	Non-shield Shield	X	Plastic Plastic	DOC
Notebook PC Adaptor	ADP-65GD B	69YW34N0VW6	LITE-ON TECHNOLOGY	POWER POWER	1.8 1.5	Non-shield Non-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-651 _ MODE 1 >

Results of Conducted Emission

DTNC

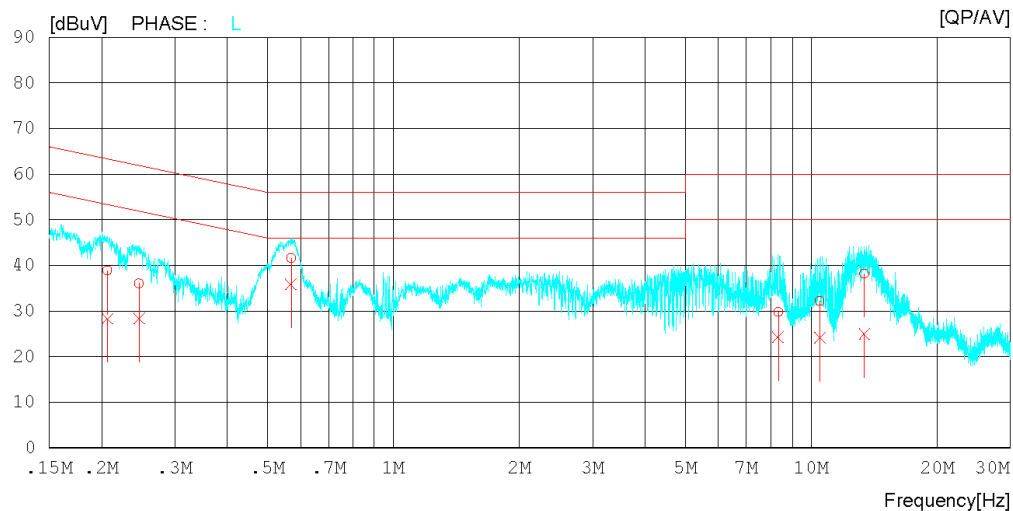
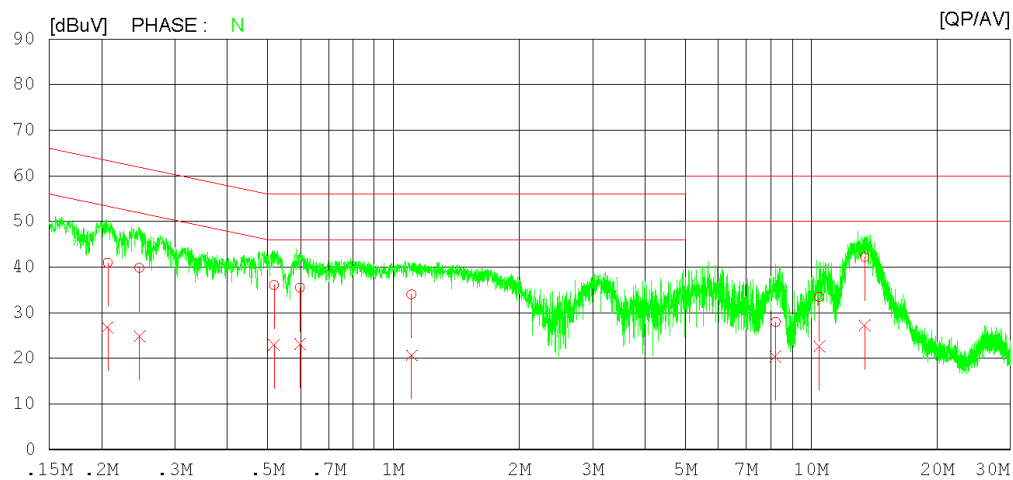
Date : 2016-01-13

Order No. : DTNC1601-00156
Model No. : PRO-651
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. : DTNC1601-00156
Model No. : PRO-651
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	0.20680	30.8	16.6	10.1	40.9	26.7	63.3	53.3	22.4	26.6	N
2	0.24670	29.7	14.7	10.1	39.8	24.8	61.9	51.9	22.1	27.1	N
3	0.51743	25.9	12.8	10.1	36.0	22.9	56.0	46.0	20.0	23.1	N
4	0.59746	25.3	13.0	10.1	35.4	23.1	56.0	46.0	20.6	22.9	N
5	1.10560	23.8	10.5	10.2	34.0	20.7	56.0	46.0	22.0	25.3	N
6	8.22220	17.4	9.9	10.5	27.9	20.4	60.0	50.0	32.1	29.6	N
7	10.47160	22.8	11.9	10.6	33.4	22.5	60.0	50.0	26.6	27.5	N
8	13.43500	31.6	16.6	10.6	42.2	27.2	60.0	50.0	17.8	22.8	N
9	0.20663	28.7	18.2	10.1	38.8	28.3	63.3	53.3	24.5	25.0	L
10	0.24603	25.8	18.2	10.1	35.9	28.3	61.9	51.9	26.0	23.6	L
11	0.56930	31.5	25.7	10.1	41.6	35.8	56.0	46.0	14.4	10.2	L
12	8.33740	19.2	13.6	10.6	29.8	24.2	60.0	50.0	30.2	25.8	L
13	10.48680	21.5	13.5	10.6	32.1	24.1	60.0	50.0	27.9	25.9	L
14	13.40020	27.3	14.1	10.8	38.1	24.9	60.0	50.0	21.9	25.1	L

< PRO-651 _ MODE 2 >

Results of Conducted Emission

DTNC

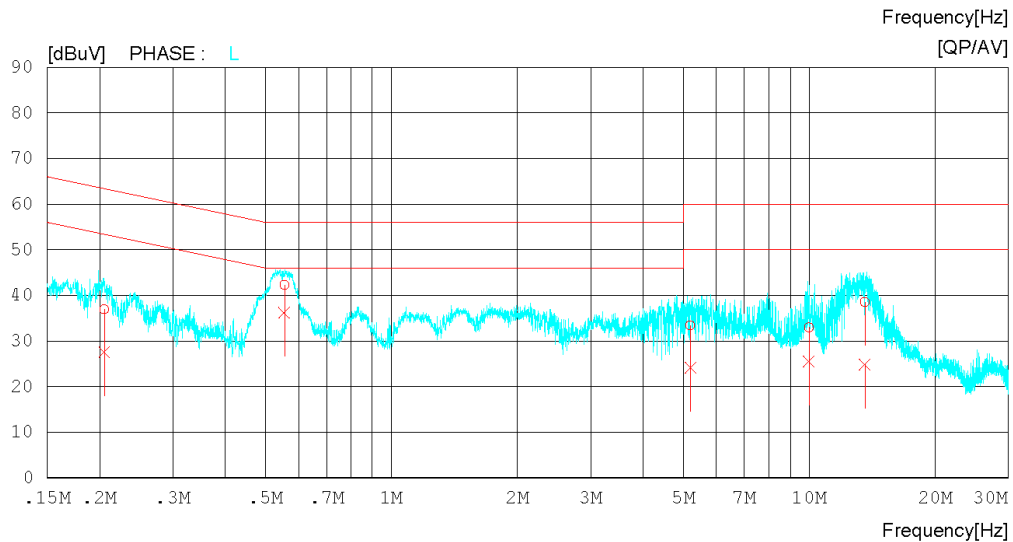
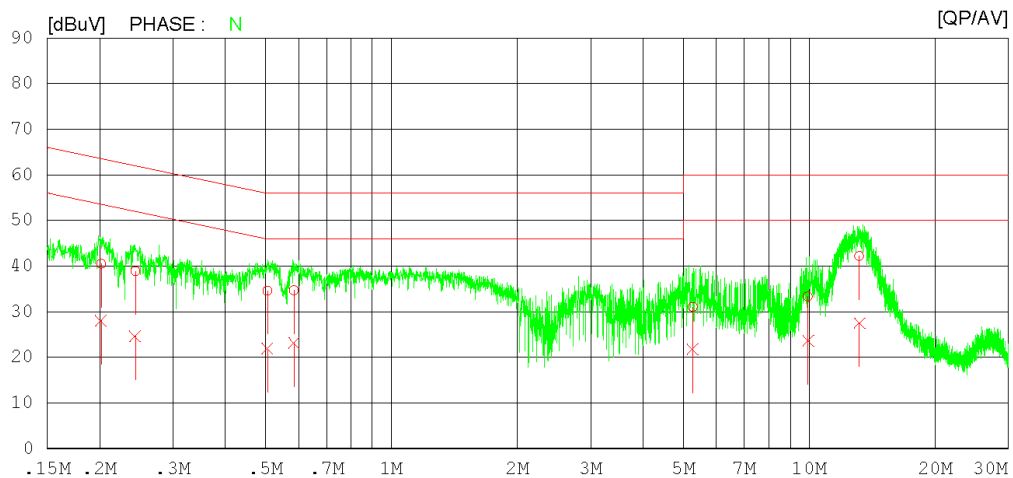
Date : 2016-01-13

Order No. : DTNC1601-00156
Model No. : PRO-651
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. : DTNC1601-00156
Model No. : PRO-651
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	0.20163	30.3	17.9	10.1	40.4	28.0	63.5	53.5	23.1	25.5	N
2	0.24357	28.8	14.5	10.1	38.9	24.6	62.0	52.0	23.1	27.4	N
3	0.50450	24.5	11.7	10.1	34.6	21.8	56.0	46.0	21.4	24.2	N
4	0.58427	24.6	13.0	10.1	34.7	23.1	56.0	46.0	21.3	22.9	N
5	5.26140	20.7	11.3	10.4	31.1	21.7	60.0	50.0	28.9	28.3	N
6	9.93420	22.6	13.0	10.6	33.2	23.6	60.0	50.0	26.8	26.4	N
7	13.17860	31.6	16.9	10.6	42.2	27.5	60.0	50.0	17.8	22.5	N
8	0.20540	26.8	17.4	10.1	36.9	27.5	63.4	53.4	26.5	25.9	L
9	0.55409	32.2	26.1	10.1	42.3	36.2	56.0	46.0	13.7	9.8	L
10	5.19680	23.1	13.8	10.3	33.4	24.1	60.0	50.0	26.6	25.9	L
11	9.98340	22.3	14.9	10.6	32.9	25.5	60.0	50.0	27.1	24.5	L
12	13.58340	27.7	14.0	10.8	38.5	24.8	60.0	50.0	21.5	25.2	L

< WS1040 _ MODE 1 >

Results of Conducted Emission

DTNC

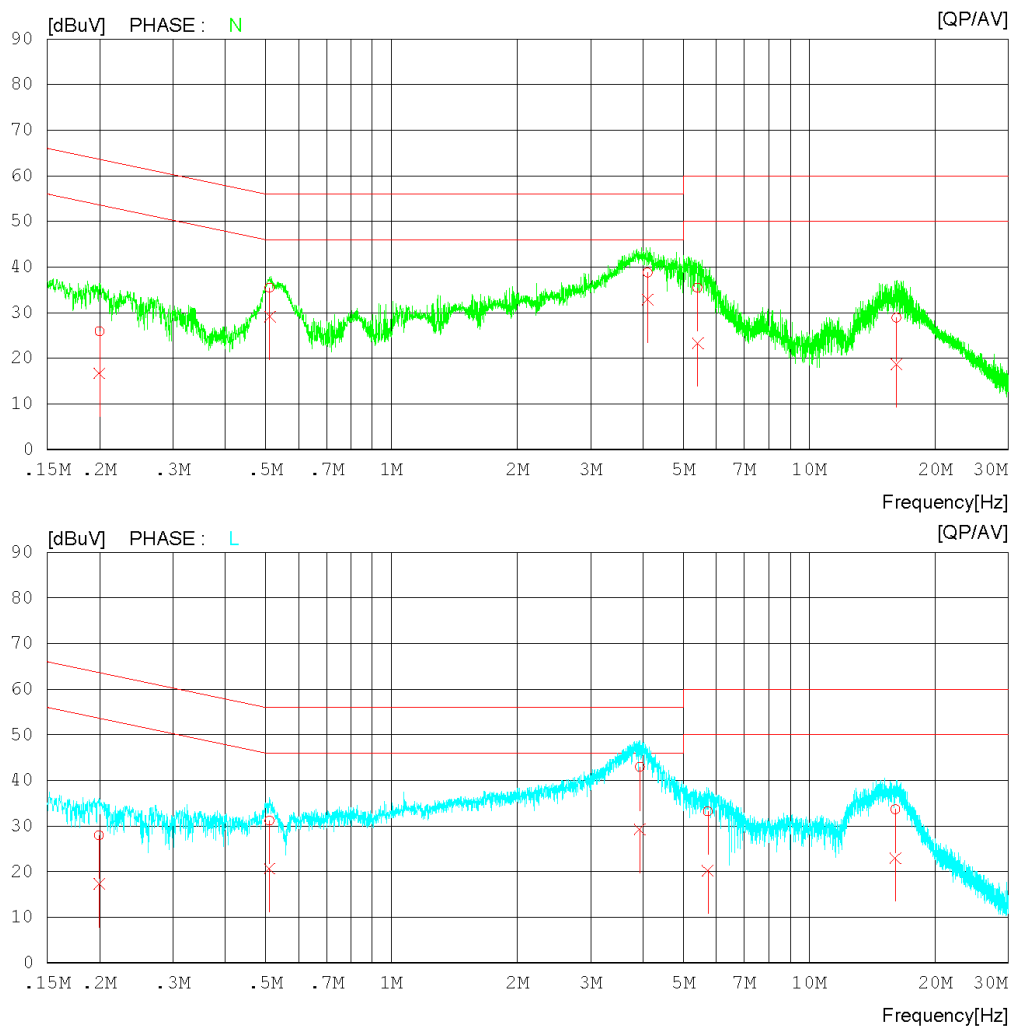
Date : 2016-02-25

Order No. :
Model No. : WS1040
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. : WS1040
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	0.19999	15.8	6.6	10.1	25.9	16.7	63.6	53.6	37.7	36.9	N
2	0.51115	25.4	19.1	10.1	35.5	29.2	56.0	46.0	20.5	16.8	N
3	4.10632	28.6	22.7	10.2	38.8	32.9	56.0	46.0	17.2	13.1	N
4	5.41239	25.1	12.9	10.4	35.5	23.3	60.0	50.0	24.5	26.7	N
5	16.16769	18.2	8.0	10.7	28.9	18.7	60.0	50.0	31.1	31.3	N
6	0.19983	17.8	7.2	10.1	27.9	17.3	63.6	53.6	35.7	36.3	L
7	0.51070	21.0	10.5	10.1	31.1	20.6	56.0	46.0	24.9	25.4	L
8	3.93140	32.7	19.1	10.2	42.9	29.3	56.0	46.0	13.1	16.7	L
9	5.71886	22.7	9.8	10.4	33.1	20.2	60.0	50.0	26.9	29.8	L
10	16.08821	22.8	12.1	10.8	33.6	22.9	60.0	50.0	26.4	27.1	L

< WS1040 _ MODE 2 >

Results of Conducted Emission

DTNC

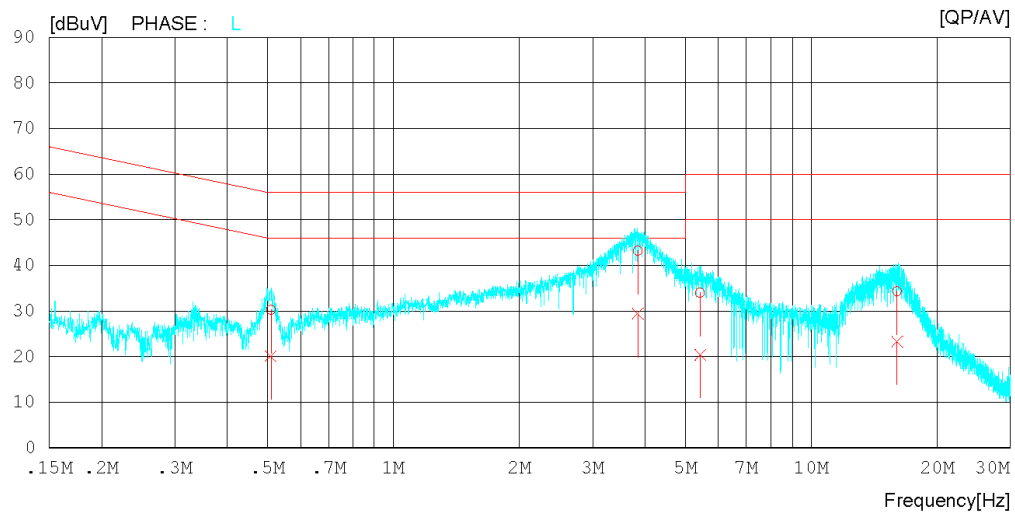
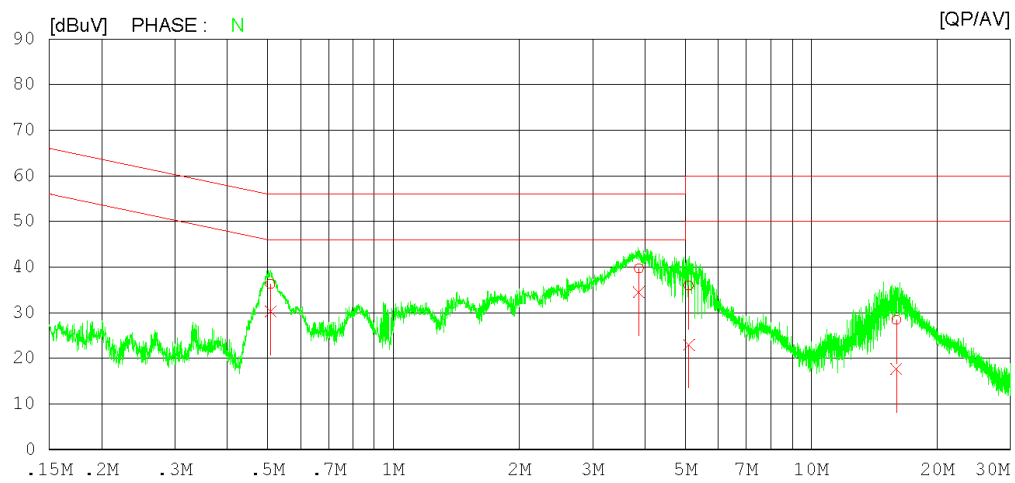
Date : 2016-02-25

Order No. :
Model No. : WS1040
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. : WS1040
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	0.50793	26.2	20.2	10.1	36.3	30.3	56.0	46.0	19.7	15.7	N
2	3.86369	29.5	24.3	10.2	39.7	34.5	56.0	46.0	16.3	11.5	N
3	5.09655	25.6	12.6	10.3	35.9	22.9	60.0	50.0	24.1	27.1	N
4	15.99705	17.8	7.1	10.6	28.4	17.7	60.0	50.0	31.6	32.3	N
5	0.50877	20.1	10.0	10.1	30.2	20.1	56.0	46.0	25.8	25.9	L
6	3.84323	33.0	19.1	10.2	43.2	29.3	56.0	46.0	12.8	16.7	L
7	5.42459	23.6	10.0	10.4	34.0	20.4	60.0	50.0	26.0	29.6	L
8	16.07436	23.5	12.5	10.8	34.3	23.3	60.0	50.0	25.7	26.7	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-651 _ < 30 MHz ~ 1 GHz _ MODE 1 >

RADIATED EMISSION

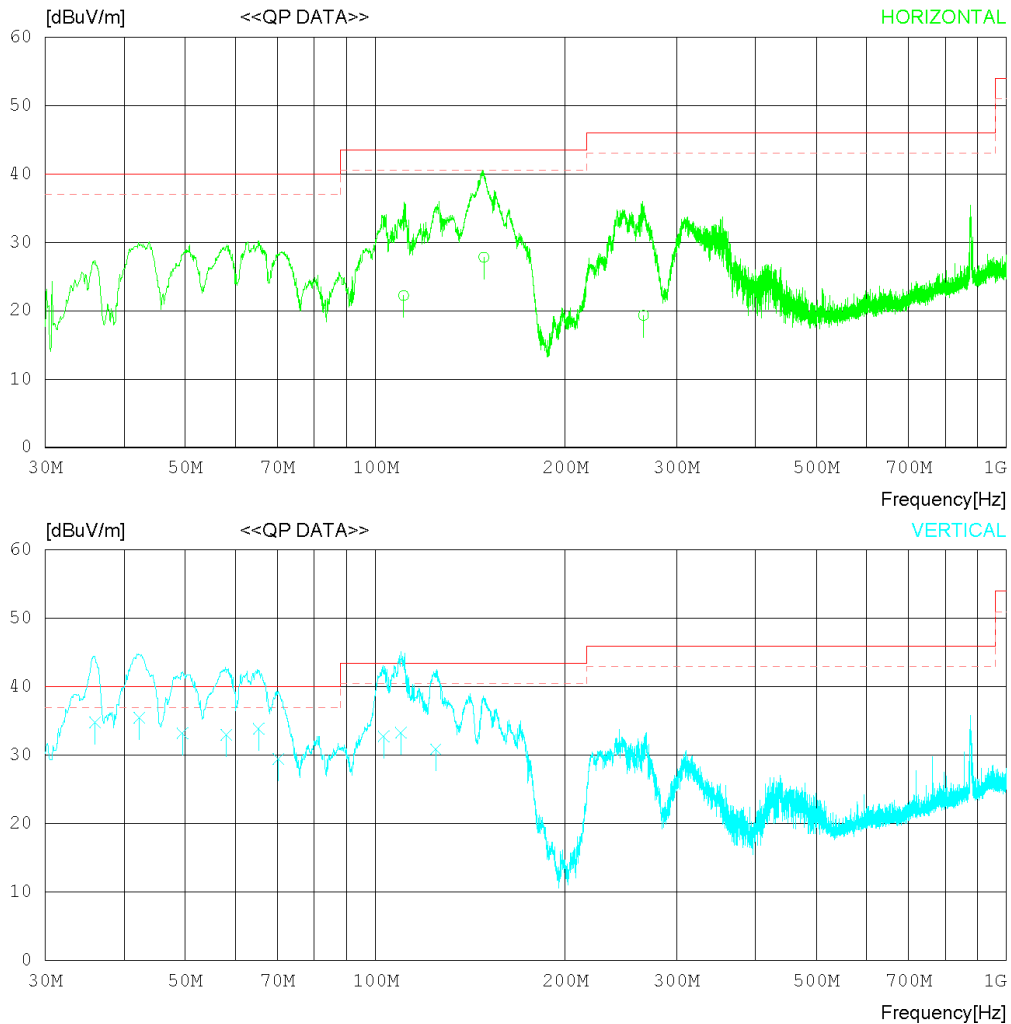
Date : 2016-01-18

Order No. : DTNC1601-00156
Model No. : PRO-651
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. : DTNC1601-00156	Reference No. :
Model No. : PRO-651	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	110.868	37.7	10.3	0.8	26.6	22.2	43.5	21.3	300	196
2	148.551	40.5	12.8	1.0	26.5	27.8	43.5	15.7	400	359
3	265.941	32.0	12.2	1.5	26.4	19.3	46.0	26.7	301	0
----- Vertical -----										
4	35.953	51.6	9.3	0.5	26.6	34.8	40.0	5.2	100	107
5	42.263	50.9	10.7	0.5	26.6	35.5	40.0	4.5	100	164
6	49.461	47.3	11.8	0.7	26.6	33.2	40.0	6.8	100	10
7	58.086	47.2	11.8	0.6	26.6	33.0	40.0	7.0	100	152
8	65.359	48.9	11.0	0.6	26.6	33.9	40.0	6.1	100	159
9	70.208	45.2	10.3	0.6	26.6	29.5	40.0	10.5	100	1
10	103.041	49.3	9.3	0.8	26.6	32.8	43.5	10.7	100	107
11	109.857	48.9	10.2	0.8	26.6	33.3	43.5	10.2	100	1
12	124.568	44.9	11.7	0.9	26.6	30.9	43.5	12.6	100	29

PRO-651 _ < (1 ~ 6) GHz _ Peak _ MODE 1 >

RADIATED EMISSION

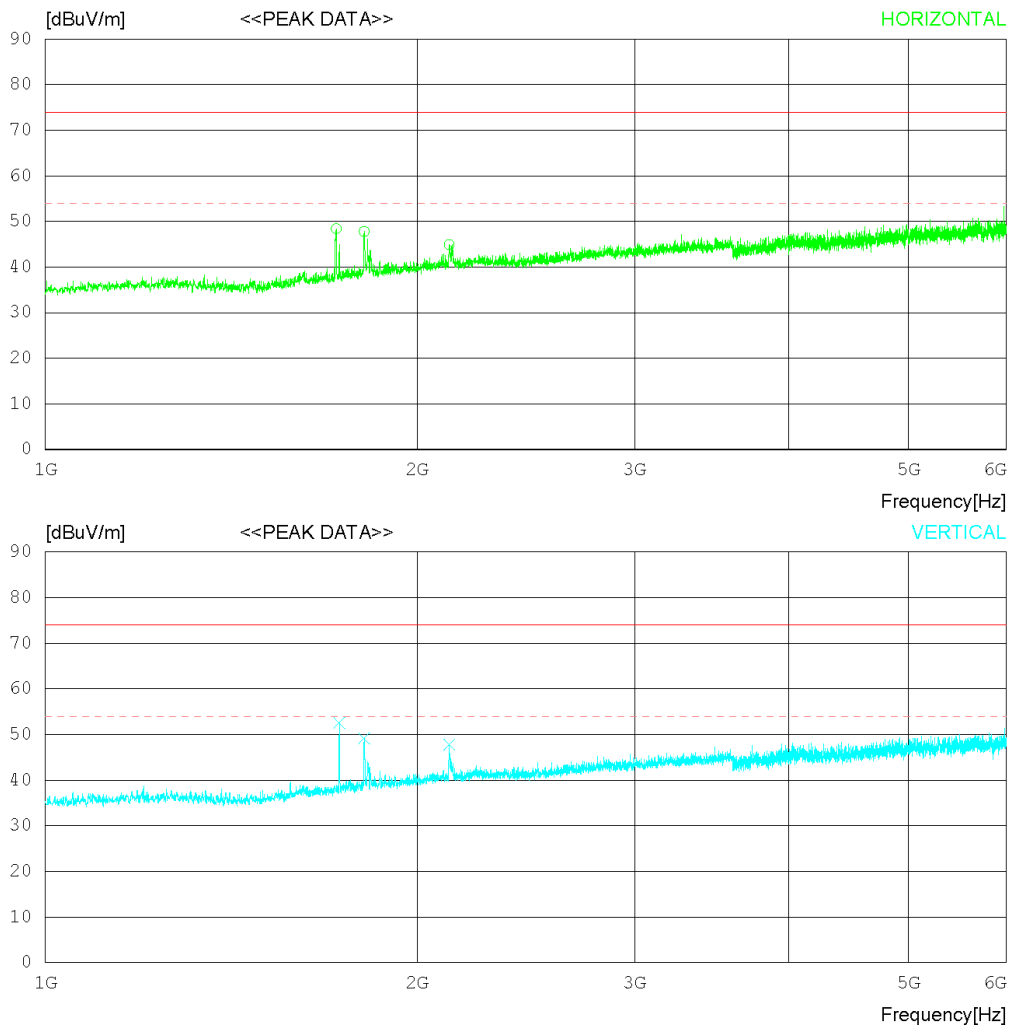
Date : 2016-01-20

Order No. : DTNC1601-00156
Model No. : PRO-651
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. : DTNC1601-00156	Reference No. :
Model No. : PRO-651	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	1720.000	61.9	30.0	4.1	47.6	48.4	74.0	25.6	100	1
2	1811.875	60.7	30.6	4.3	47.8	47.8	74.0	26.2	100	1
3	2123.750	55.9	32.1	4.7	47.8	44.9	74.0	29.1	100	335
----- Vertical -----										
4	1730.000	66.0	30.1	4.1	47.6	52.6	74.0	21.4	100	59
5	1811.875	62.1	30.6	4.3	47.8	49.2	74.0	24.8	100	99
6	2123.125	58.8	32.1	4.7	47.8	47.8	74.0	26.2	100	164

PRO-651 _ < (1 ~ 6) GHz _ Average _ MODE 1 >

RADIATED EMISSION

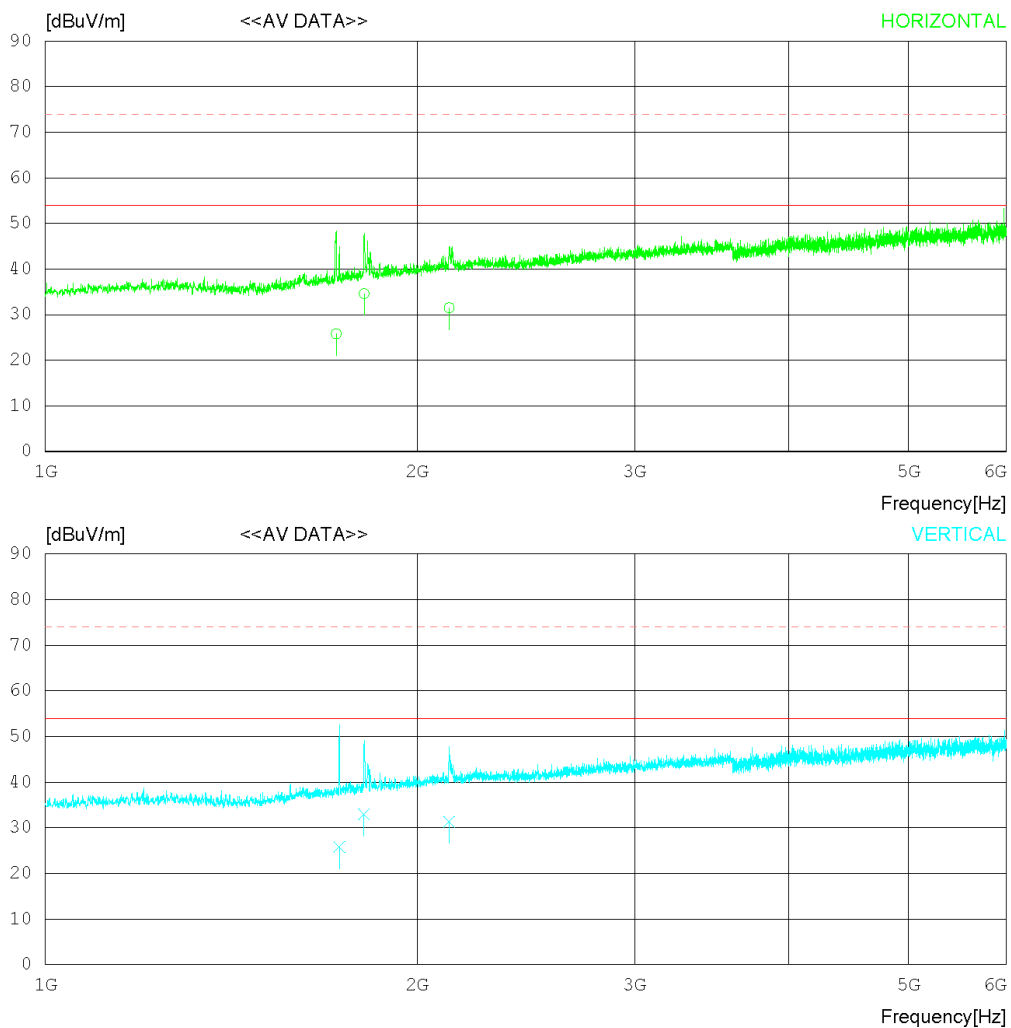
Date : 2016-01-20

Order No. : DTNC1601-00156
Model No. : PRO-651
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. : DTNC1601-00156	Reference No. :
Model No. : PRO-651	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	1720.000	39.3	30.0	4.1	47.6	25.8	54.0	28.2	100	44
2	1811.795	47.5	30.6	4.3	47.8	34.6	54.0	19.4	100	161
3	2123.132	42.5	32.1	4.7	47.8	31.5	54.0	22.5	100	335
----- Vertical -----										
4	1730.000	39.2	30.1	4.1	47.6	25.8	54.0	28.2	100	59
5	1811.294	45.9	30.6	4.3	47.8	33.0	54.0	21.0	100	170
6	2123.513	42.3	32.1	4.7	47.8	31.3	54.0	22.7	100	164

PRO-651 _ < 30 MHz ~ 1 GHz _ MODE 2 >

RADIATED EMISSION

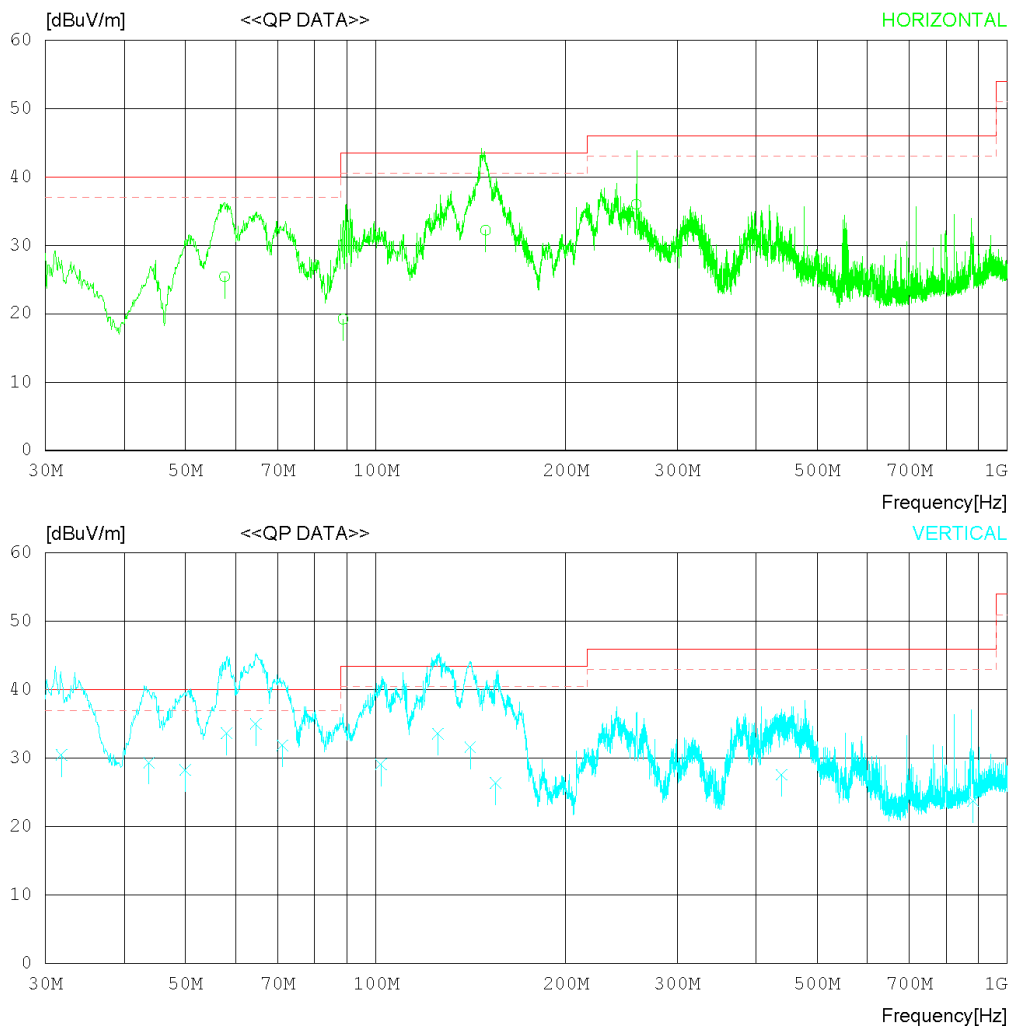
Date : 2016-01-18

Order No. : DTNC1601-00156
Model No. : PRO-651
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. : DTNC1601-00156	Reference No. :
Model No. : PRO-651	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	57.645	39.6	11.8	0.6	26.6	25.4	40.0	14.6	205	301
2	88.768	37.5	7.5	0.8	26.6	19.2	43.5	24.3	100	359
3	149.262	44.9	12.8	1.0	26.5	32.2	43.5	11.3	199	189
4	258.626	49.0	12.0	1.4	26.4	36.0	46.0	10.0	100	159
----- Vertical -----										
5	31.800	47.3	9.3	0.5	26.6	30.5	40.0	9.5	139	46
6	43.761	44.4	11.0	0.6	26.6	29.4	40.0	10.6	200	359
7	49.926	42.3	11.9	0.7	26.6	28.3	40.0	11.7	200	359
8	58.063	47.9	11.8	0.6	26.6	33.7	40.0	6.3	200	207
9	64.556	49.9	11.1	0.6	26.6	35.0	40.0	5.0	100	199
10	71.192	47.8	10.1	0.6	26.6	31.9	40.0	8.1	100	183
11	101.916	45.7	9.2	0.8	26.6	29.1	43.5	14.4	200	359
12	125.346	47.6	11.7	0.9	26.6	33.6	43.5	9.9	200	158
13	141.125	44.4	12.7	1.0	26.5	31.6	43.5	11.9	200	359
14	154.886	39.0	12.9	1.0	26.5	26.4	43.5	17.1	200	359
15	438.723	35.1	16.8	2.0	26.3	27.6	46.0	18.4	100	192
16	882.635	23.6	23.2	3.3	26.3	23.8	46.0	22.2	200	359

PRO-651 _ < (1 ~ 6) GHz _ Peak _ MODE 2 >

RADIATED EMISSION

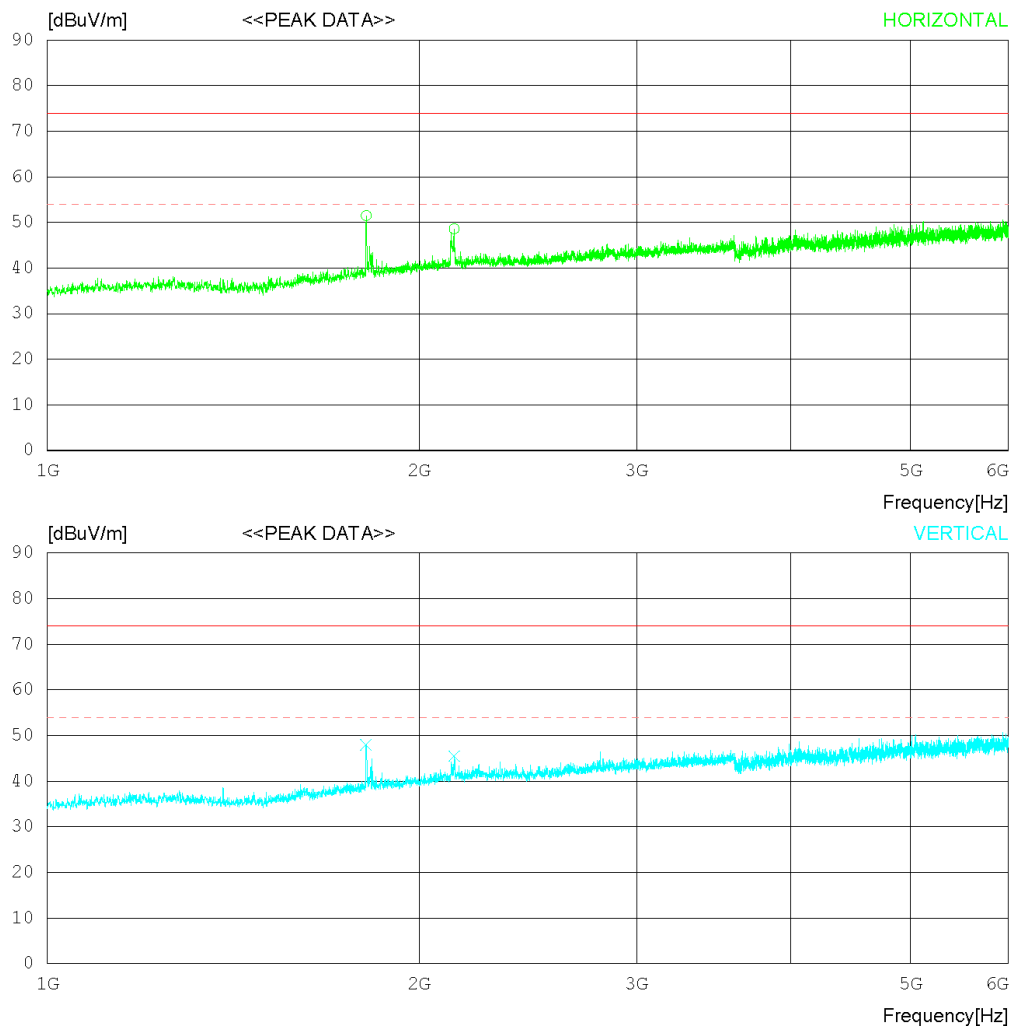
Date : 2016-01-20

Order No. : DTNC1601-00156
Model No. : PRO-651
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. : DTNC1601-00156	Reference No. :
Model No. : PRO-651	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	1811.875	64.4	30.6	4.3	47.8	51.5	74.0	22.5	100	1
2	2135.000	59.5	32.1	4.7	47.7	48.6	74.0	25.4	100	1
----- Vertical -----										
3	1811.250	60.9	30.6	4.3	47.8	48.0	74.0	26	100	1
4	2135.000	56.4	32.1	4.7	47.7	45.5	74.0	28.5	100	110

PRO-651 _ < (1 ~ 6) GHz _ Average _ MODE 2 >

RADIATED EMISSION

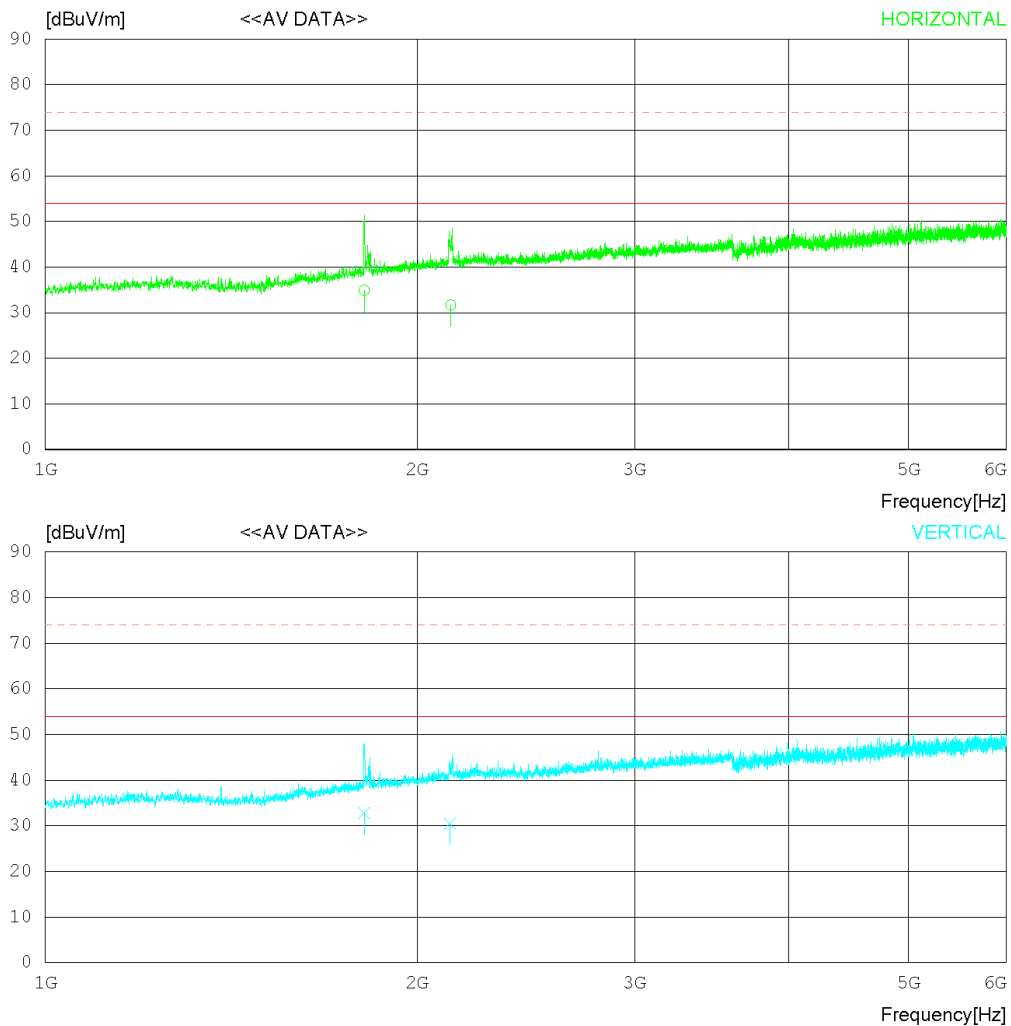
Date : 2016-01-20

Order No. : DTNC1601-00156
Model No. : PRO-651
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. : DTNC1601-00156	Reference No. :
Model No. : PRO-651	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	1811.875	47.8	30.6	4.3	47.8	34.9	54.0	19.1	100	331
2	2129.379	42.6	32.1	4.7	47.7	31.7	54.0	22.3	100	16
----- Vertical -----										
3	1811.576	45.7	30.6	4.3	47.8	32.8	54.0	21.2	100	307
4	2125.390	41.4	32.1	4.7	47.7	30.5	54.0	23.5	100	110

WS1040 _ < 30 MHz ~ 1 GHz _ MODE 1 >

RADIATED EMISSION

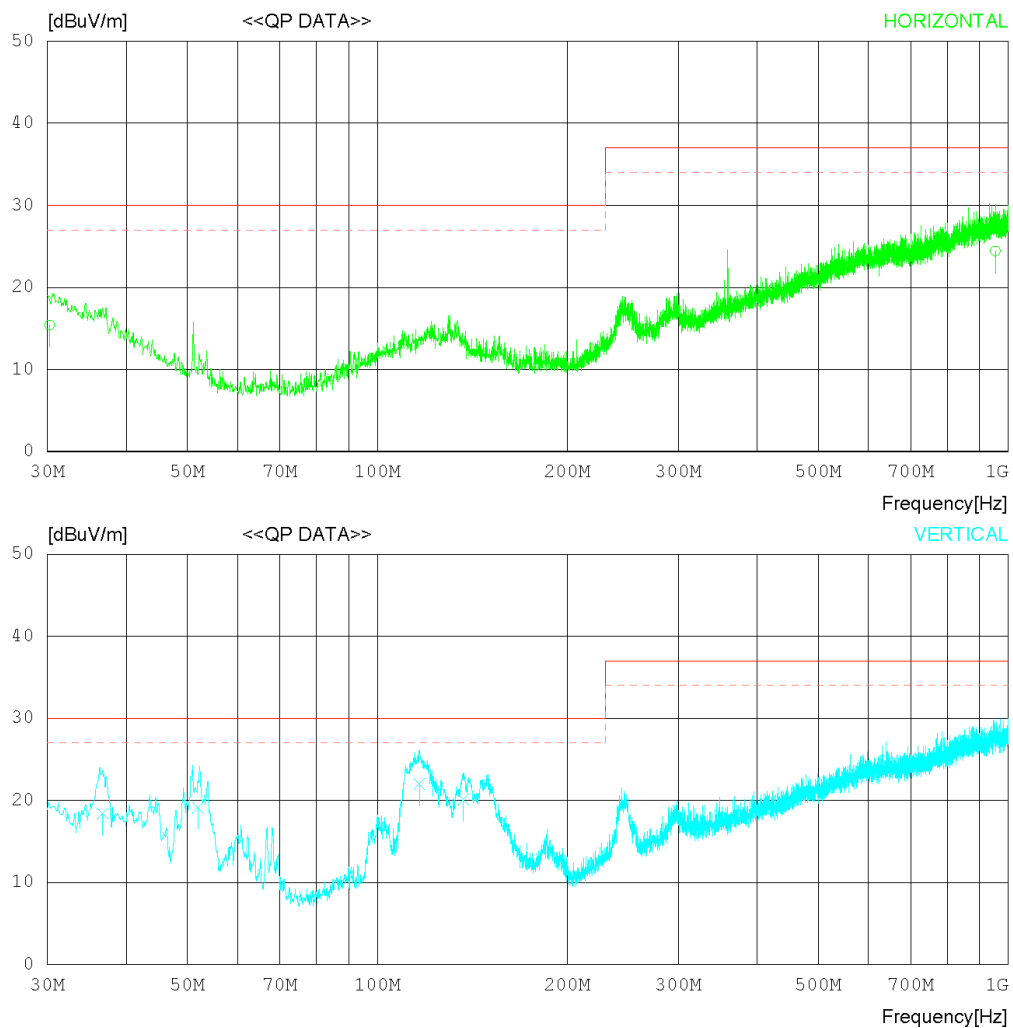
Date : 2016-03-04

Order No. :
Model No. : WS1040
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. : WS1040	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	30.250	17.8	18.5	1.3	22.2	15.4	30.0	14.6	300	167
2	953.409	18.2	20.9	8.2	22.9	24.4	37.0	12.6	205	184
----- Vertical -----										
3	36.687	24.1	15.2	1.3	22.2	18.4	30.0	11.6	100	236
4	52.013	31.7	8.0	1.7	22.3	19.1	30.0	10.9	173	253
5	116.546	30.1	12.0	2.6	22.7	22.0	30.0	8.0	100	83
6	136.819	29.0	11.2	2.8	22.9	20.1	30.0	9.9	100	7

WS1040 _ < (1 ~ 6) GHz _ Peak _ MODE 1 >

RADIATED EMISSION

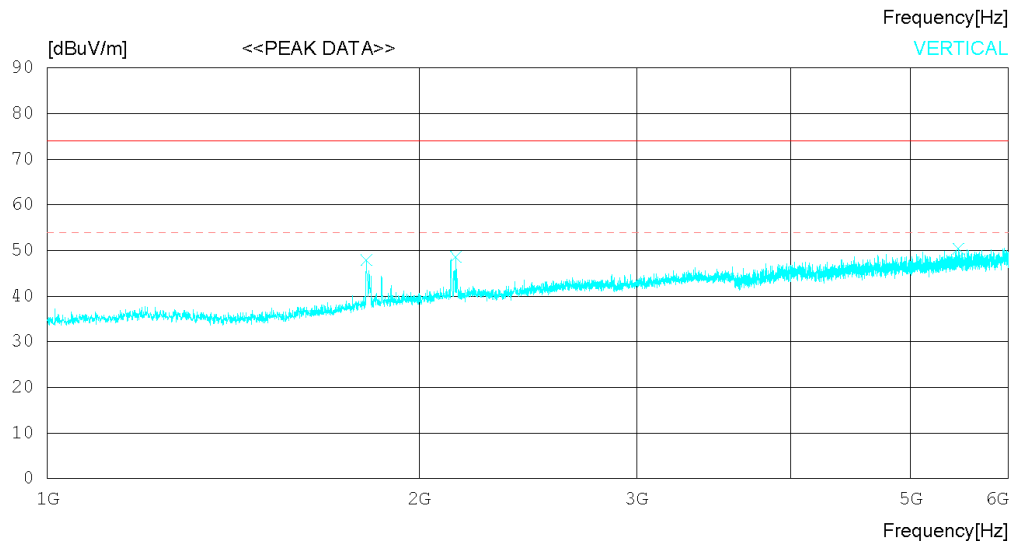
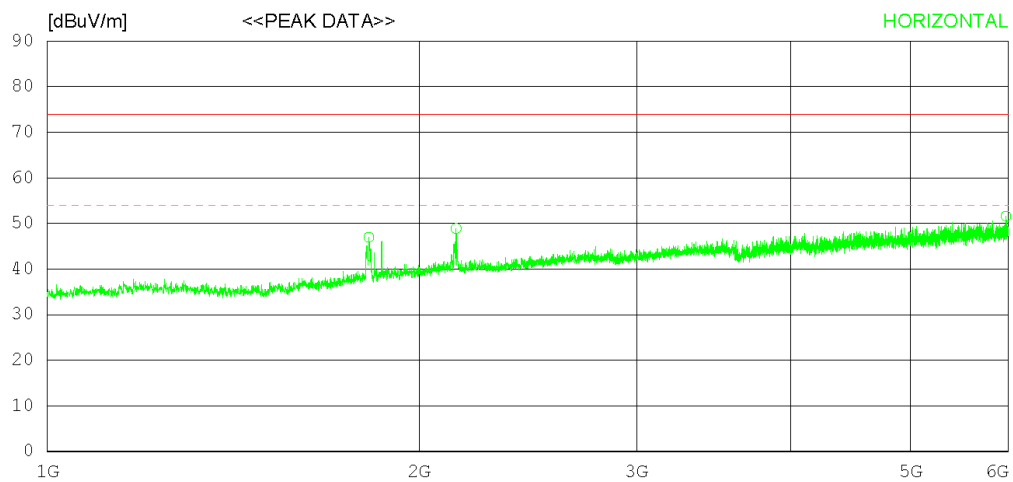
Date : 2016-03-05

Order No. :
Model No. : WS1040
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. : Model No. : WS1040 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)

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	1820.625	60.1	30.4	4.3	47.8	47.0	74.0	27	100	102
2	2142.500	60.2	31.7	4.7	47.7	48.9	74.0	25.1	100	356
3	5972.500	54.9	34.9	8.3	46.5	51.6	74.0	22.4	100	358
----- Vertical -----										
4	1813.125	61.1	30.3	4.3	47.8	47.9	74.0	26.1	100	21
5	2141.875	59.9	31.7	4.7	47.7	48.6	74.0	25.4	100	106
6	5467.500	55.0	34.3	8.1	47.0	50.4	74.0	23.6	100	1

WS1040 _ < (1 ~ 6) GHz _ Average _ MODE 1 >

RADIATED EMISSION

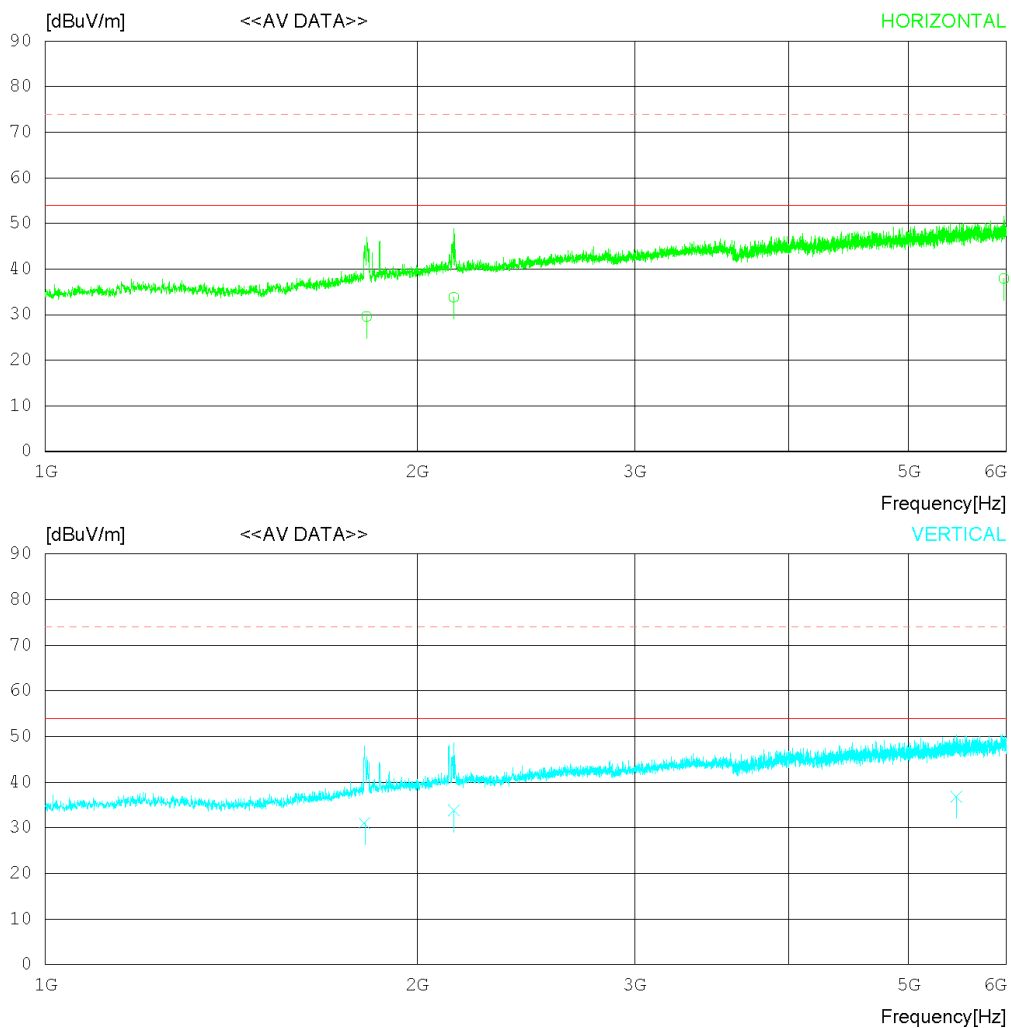
Date : 2016-03-05

Order No. :
Model No. : WS1040
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. : WS1040	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	1820.248	42.7	30.4	4.3	47.8	29.6	54.0	24.4	100	312
2	2141.927	45.1	31.7	4.7	47.7	33.8	54.0	20.2	100	228
3	5971.764	41.2	34.9	8.3	46.5	37.9	54.0	16.1	100	320
----- Vertical -----										
4	1814.240	44.2	30.3	4.3	47.8	31.0	54.0	23.0	100	78
5	2142.241	45.1	31.7	4.7	47.7	33.8	54.0	20.2	100	255
6	5468.385	41.4	34.3	8.1	47.0	36.8	54.0	17.2	100	164

WS1040 _ < 30 MHz ~ 1 GHz _ MODE 2 >

RADIATED EMISSION

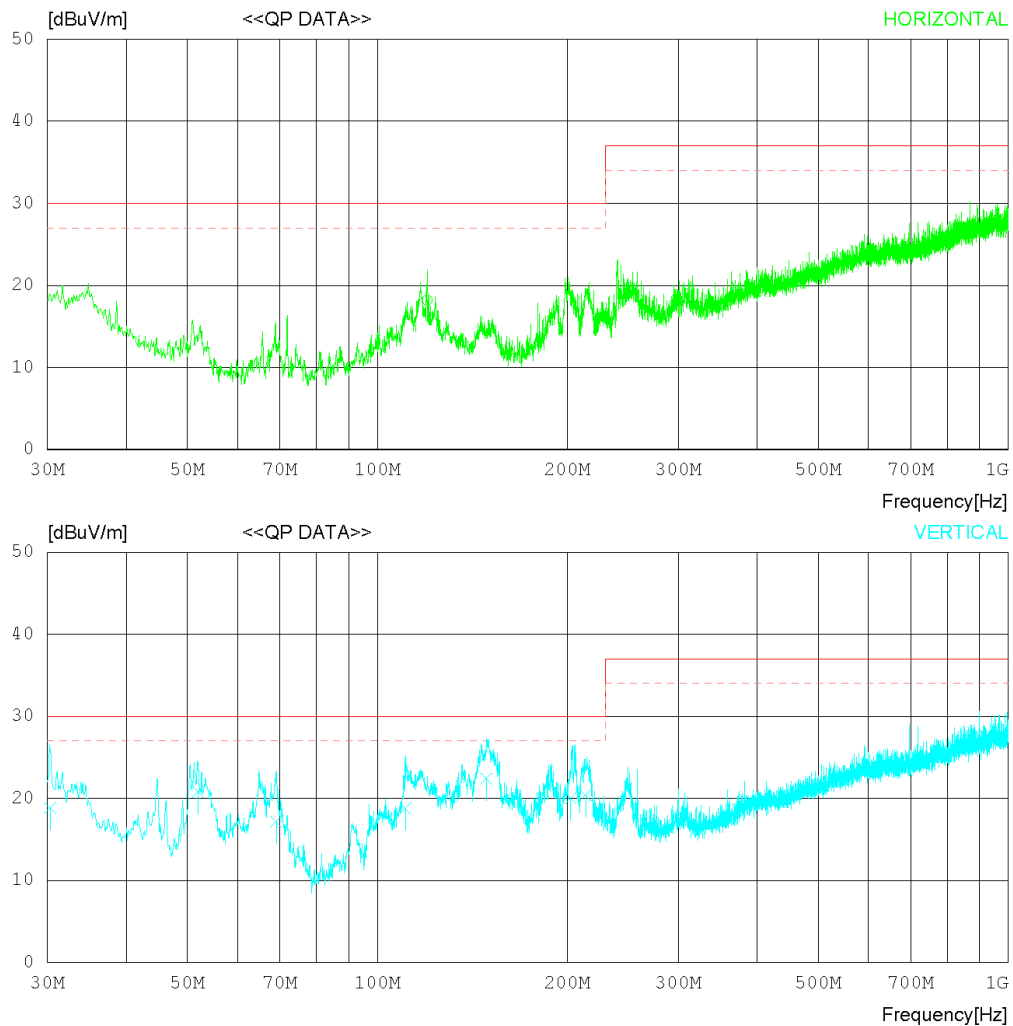
Date : 2016-03-04

Order No. :
Model No. : WS1040
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. :	Reference No. :
Model No. : WS1040	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 17 °C 39 % R.H.
Test Condition : 2	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	119.966	26.2	12.2	2.6	22.8	18.2	30.0	11.8	400	148
----- Vertical -----										
2	30.318	21.3	18.4	1.3	22.2	18.8	30.0	11.2	200	251
3	51.946	33.4	8.0	1.7	22.3	20.8	30.0	9.2	100	111
4	69.112	31.2	6.5	1.9	22.4	17.2	30.0	12.8	100	169
5	110.751	27.6	11.5	2.4	22.7	18.8	30.0	11.2	100	111
6	148.823	32.0	10.6	2.8	23.0	22.4	30.0	7.6	100	157
7	202.377	30.8	9.4	3.3	23.5	20.0	30.0	10.0	100	330
8	213.761	30.4	10.1	3.5	23.6	20.4	30.0	9.6	100	324

WS1040 _ < (1 ~ 6) GHz _ Peak _ MODE 2 >

RADIATED EMISSION

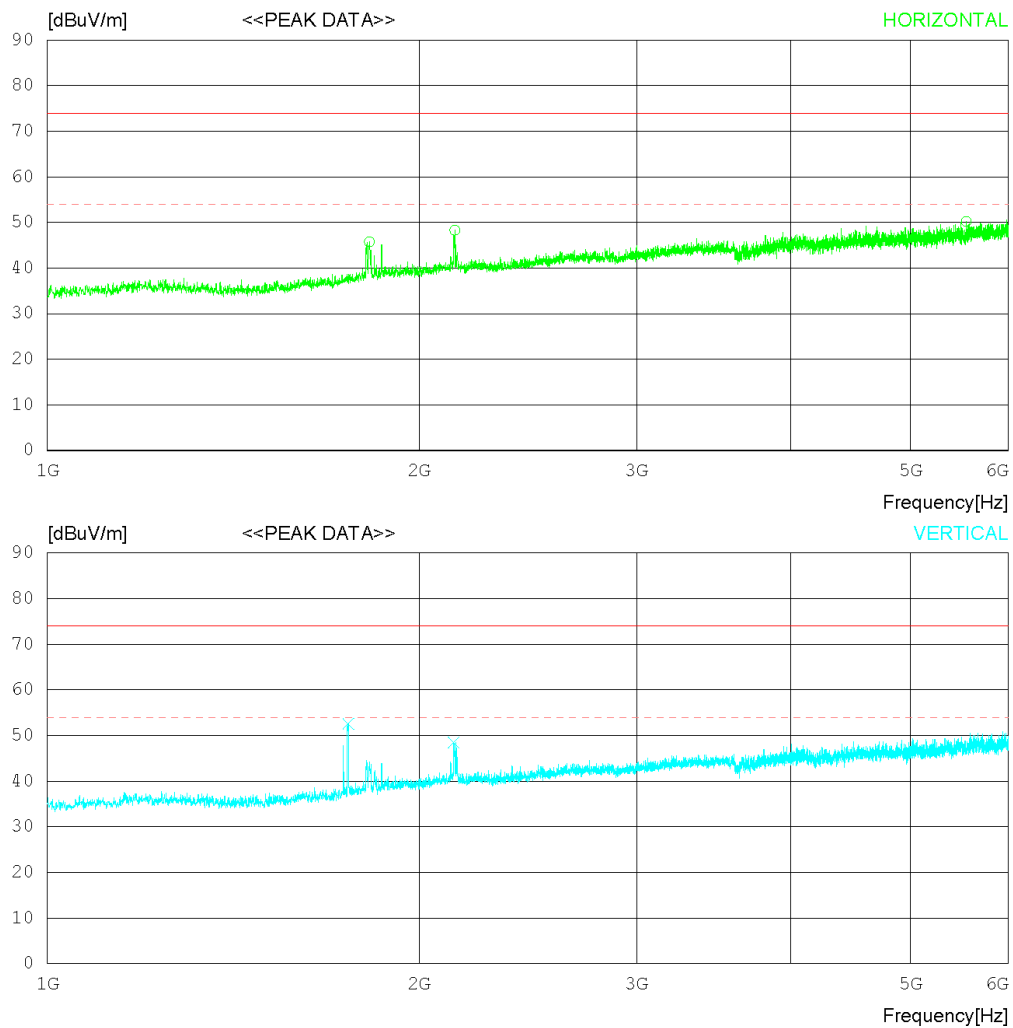
Date : 2016-03-05

Order No. :
Model No. : WS1040
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. : Model No. : WS1040 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)

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	1822.500	58.8	30.4	4.3	47.8	45.7	74.0	28.3	100	310
2	2137.500	59.6	31.7	4.7	47.7	48.3	74.0	25.7	100	0
3	5546.875	54.7	34.4	8.1	47.0	50.2	74.0	23.8	100	86
----- Vertical -----										
4	1752.500	66.4	29.6	4.2	47.7	52.5	74.0	21.5	100	358
5	2133.125	59.8	31.7	4.7	47.7	48.5	74.0	25.5	100	358

WS1040 _ < (1 ~ 6) GHz _ Average _ MODE 2 >

RADIATED EMISSION

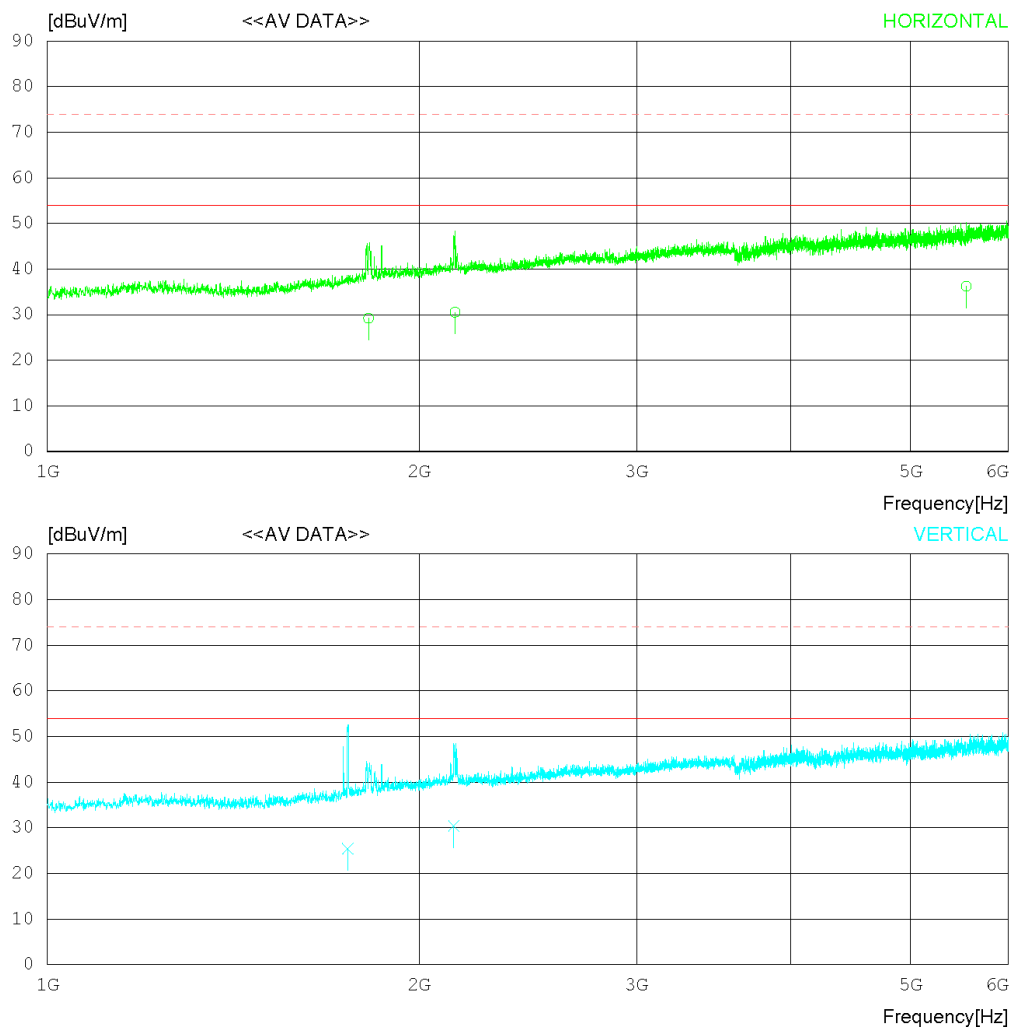
Date : 2016-03-05

Order No. :
Model No. : WS1040
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. : WS1040	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	1820.226	42.3	30.4	4.3	47.8	29.2	54.0	24.8	100	285
2	2138.409	41.8	31.7	4.7	47.7	30.5	54.0	23.5	100	161
3	5546.828	40.7	34.4	8.1	47.0	36.2	54.0	17.8	100	310
----- Vertical -----										
4	1750.729	39.3	29.6	4.2	47.7	25.4	54.0	28.6	100	263
5	2133.778	41.7	31.7	4.7	47.7	30.4	54.0	23.6	100	177

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.

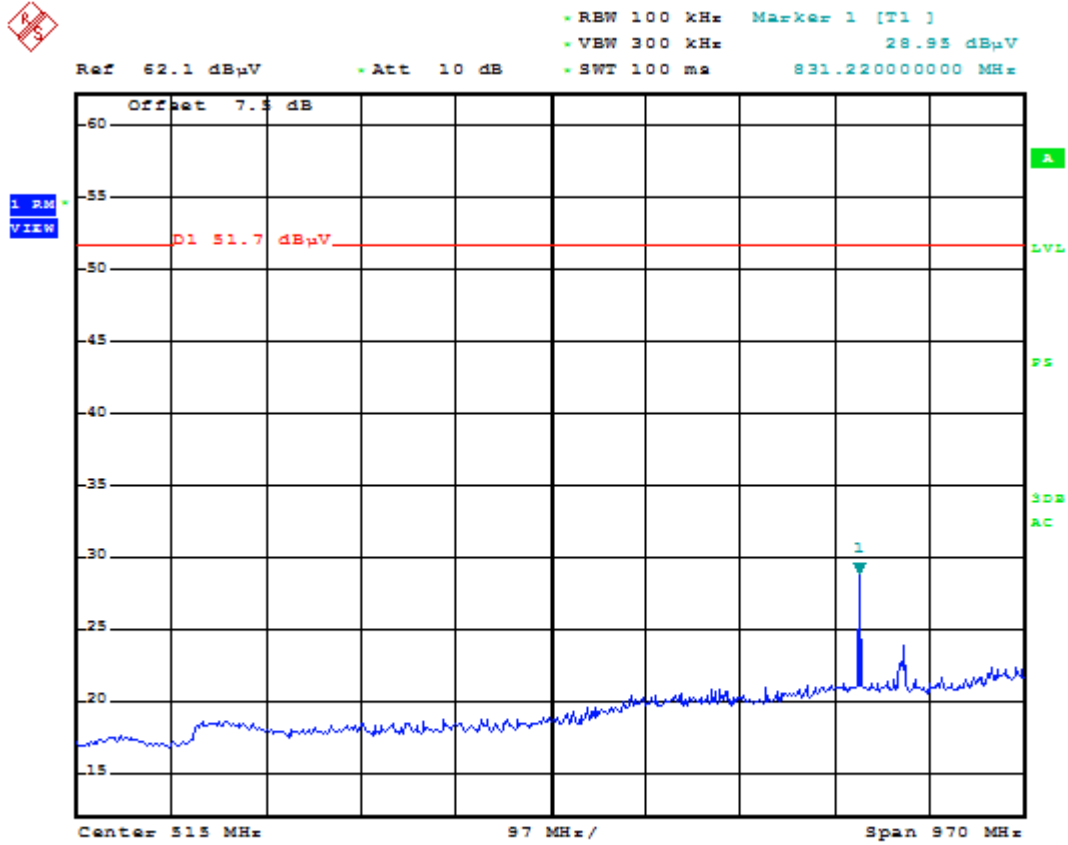
Power in the receive antenna terminals in the ratio of V^2 / R , where V is the loss-corrected voltage measured at the antenna terminals, and R is the impedance of the measuring instrument.

6.3.2 Limit for Antenna Power Conduction

- Limit : **2nW(51.7 dB μ V)**

Test Result

< PRO-651 >



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
☒ PREAMPLIFIER	MLA-100M18-B01-42	TSJ	1872271	2015.05.26	2016.05.26
☒ 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