

EMC TEST REPORT

Test item : GSM/WCDMA/LTE Phone with Bluetooth, WLAN and NFC
Model No. : LG-H630
Order No. : DTNC1504-02037
Date of receipt : 2015-04-24
Test duration : 2015-05-11 ~ 2015-05-13
Date of Issue : 2015-05-15
Applicant : LG Electronics MobileComm U.S.A., Inc.
1000 Sylvan Avenue, Englewood Cliffs NJ 07632
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 : (20 ~ 22) °C,
Humidity : (35 ~ 49) % 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
HyungJun Kim

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

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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	GSM/WCDMA/LTE Phone with Bluetooth, WLAN and NFC
Model No.	LG-H630
Add Model No	LGH630, H630, LG-H635C, LGH635C, H635C, LG-H635c, LGH635c, H635c, G-H635AR, LGH635AR, H635AR, LG-H635ar, LGH635ar, H635ar
Serial No	None
FCC ID	ZNFH630
Supplied Power for Test	AC 120 V, 60 Hz
Operation Frequency	2.5 GHz
Applicant	LG Electronics MobileComm U.S.A., Inc. 1000 Sylvan Avenue, Englewood Cliffs NJ 07632
Manufacturer	LG Electronics MobileComm U.S.A., Inc. 1000 Sylvan Avenue, Englewood Cliffs NJ 07632

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	2015-05-11	22	35
Radiated Disturbance	2015-05-12	20	49
	2015-05-13	20	49

4.3 Test result Summary

(1) Conducted Emission

Frequency [MHz]	Phase	Result [dBμV]	Detector	Limit [dBμV]	Margin [dB]
0.24981	N	42.6	Average	51.8	9.2

(2) Radiated Emission

Frequency [MHz]	Pol.	Result [dB(μV/m)]	Detector	Limit [dB(μV/m)]	Margin [dB]
3000.000	V	48.2	Quasi-Average	54.0	5.8

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

- EUT was connected PC by USB cable and continuously operated
'READ' & 'WRITE' & 'DELETE' function.

5.3 Support Equipment Used

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	DOC
MOUSE	M-UAE96	NONE	Logitech	USB	1.7	Non-shield	O(NOTE)	Plastic	DOC
LCD MONITOR	M2450D-PN	202KCYQ8Q586	LG	POWER DVI	1.8 1.8	Non-shield Shield	X X	Plastic Plastic	DOC
ADAPTER	PA-1650-68	OBDDN612314035937	LITE-ON TECHNOLOGY	POWER DC POWER	1.6 1.7	Non-shield Non-shield	X X	Plastic Plastic	DOC
PC	DCSM	F92QFBX	DELL	POWER DVI	1.8	Non-shield	X	Plastic	DOC
				PARALLEL	1.8	Shield	X	Plastic	
				USB	2.0	Shield	X	Plastic	
				USB	1.7	Non-shield	X	Plastic	
				USB	1.7	Non-shield	X	Plastic	
				STEREO	0.5	Shield	X	Plastic	
				LAN	2.0	Non-shield	X	Plastic	
				Serial	-	Non-shield	X	Plastic	
HDD	9ZR8N1-500	NA0H4ANH	Seagate	USB	2.0	Shield	X	Metal	
PRINTER	SRP-770	N/A	Bixolon	POWER PARALLEL Serial	0.5 2.0 2.0	shield Non-shield Shield.	X X X	Plastic Plastic Metal	DOC
Headset	COV909	N/A	COSY	STEREO	2.0	Non-shield	X	Plastic	DOC

* 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

Results of Conducted Emission

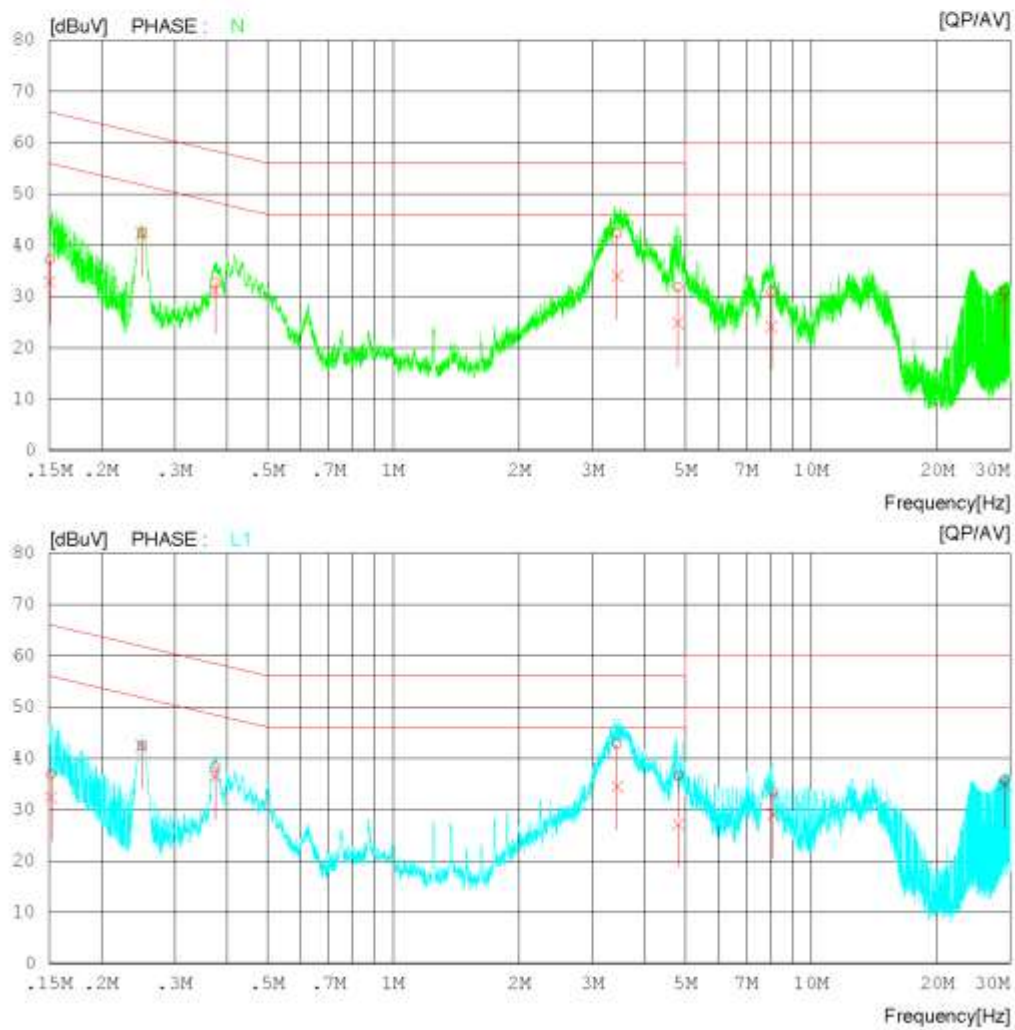
DT&C
Date : 2015-05-11

Order No. : DTNC1504-02037
Type :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 22 °C 35 % R.H.
Operator :

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV



Results of Conducted Emission

DT&C
Date : 2015-05-11

Order No. : DTNC1504-02037
Type :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi. : 22 °C 35 % 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	0.15063	35.1	31.0	1.9	37.0	32.9	66.0	56.0	29.0	23.1	N
2	0.24982	41.3	41.3	1.1	42.4	42.4	61.8	51.8	19.4	9.4	N
3	0.37465	31.8	30.2	0.9	32.7	31.1	58.4	48.4	25.7	17.3	N
4	3.43720	41.8	33.4	0.5	42.3	33.9	56.0	46.0	13.7	12.1	N
5	4.79280	31.3	24.3	0.5	31.8	24.8	56.0	46.0	24.2	21.2	N
6	8.03440	30.3	23.6	0.5	30.8	24.1	60.0	50.0	29.2	25.9	N
7	29.09060	30.2	29.3	0.6	30.8	29.9	60.0	50.0	29.2	20.1	N
8	0.15158	34.9	30.4	1.9	36.8	32.3	65.9	55.9	29.1	23.6	L1
9	0.24981	41.4	41.5	1.1	42.5	42.6	61.8	51.8	19.3	9.2	L1
10	0.37448	37.3	35.5	0.9	38.2	36.4	58.4	48.4	20.2	12.0	L1
11	3.43560	42.2	33.9	0.5	42.7	34.4	56.0	46.0	13.3	11.6	L1
12	4.81200	36.1	26.6	0.5	36.6	27.1	56.0	46.0	19.4	18.9	L1
13	8.11120	32.7	28.5	0.5	33.2	29.0	60.0	50.0	26.8	21.0	L1
14	29.08340	35.0	34.0	0.7	35.7	34.7	60.0	50.0	24.3	15.3	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 >

RADIATED EMISSION

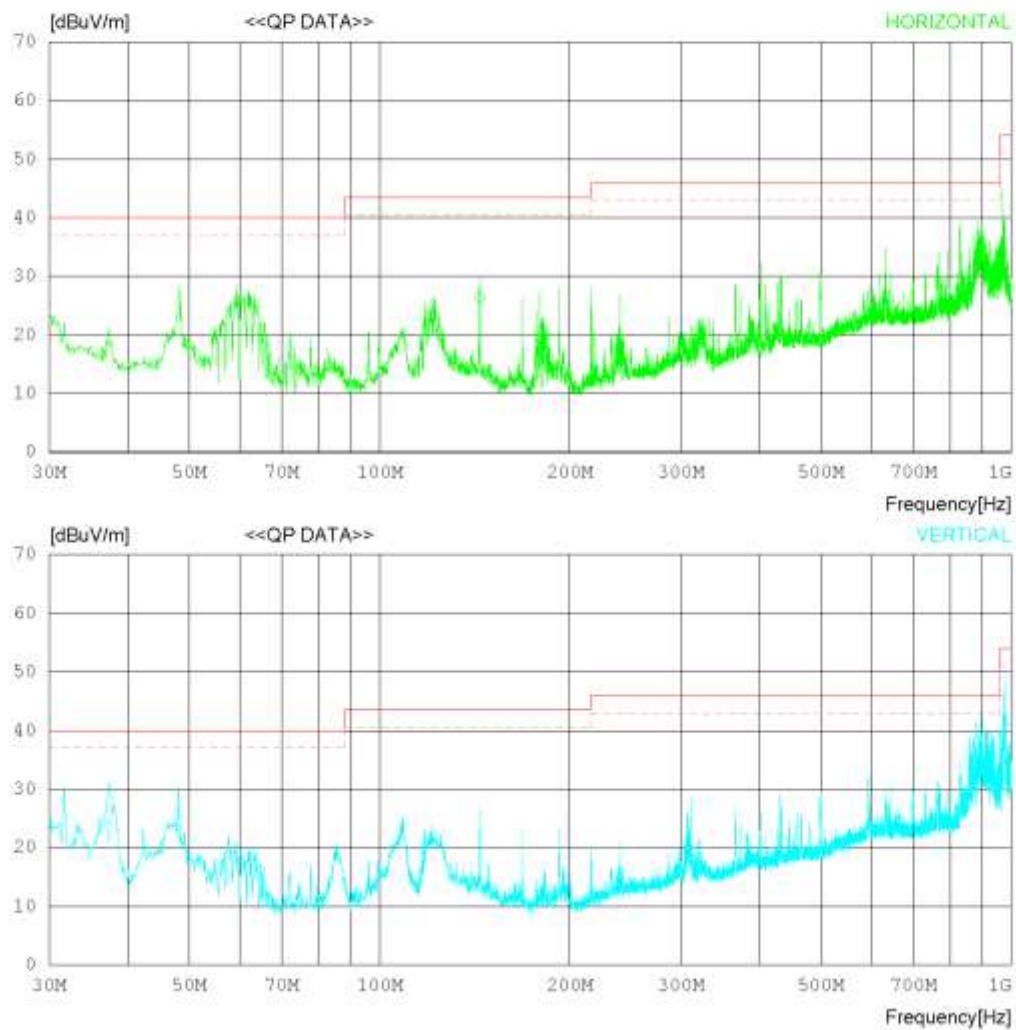
Date : 2015-05-13

Order No. : DTNC1504-02037
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 20 °C 49 % R.H
Operator :

Memo :

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



RADIATED EMISSION

Date : 2015-05-13

Order No. : DTNC1504-02037	Reference No. :
Model No. :	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 20 °C 49 % R.H
Test Condition :	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	143.973	36.9	10.8	1.6	22.9	26.4	43.5	17.1	229	249
2	829.701	25.4	20.2	4.2	22.0	27.8	46.0	18.2	341	313
----- Vertical -----										
3	37.275	31.4	14.9	0.8	22.6	24.5	40.0	15.5	100	288
4	48.066	38.1	9.5	0.9	22.6	25.9	40.0	14.1	100	0
5	896.039	35.0	20.5	4.5	21.7	38.3	46.0	7.7	100	36
6	975.112	37.6	21.0	4.7	21.5	41.8	54.0	12.2	100	18

< (1 ~ 6) GHz _ Peak >

RADIATED EMISSION

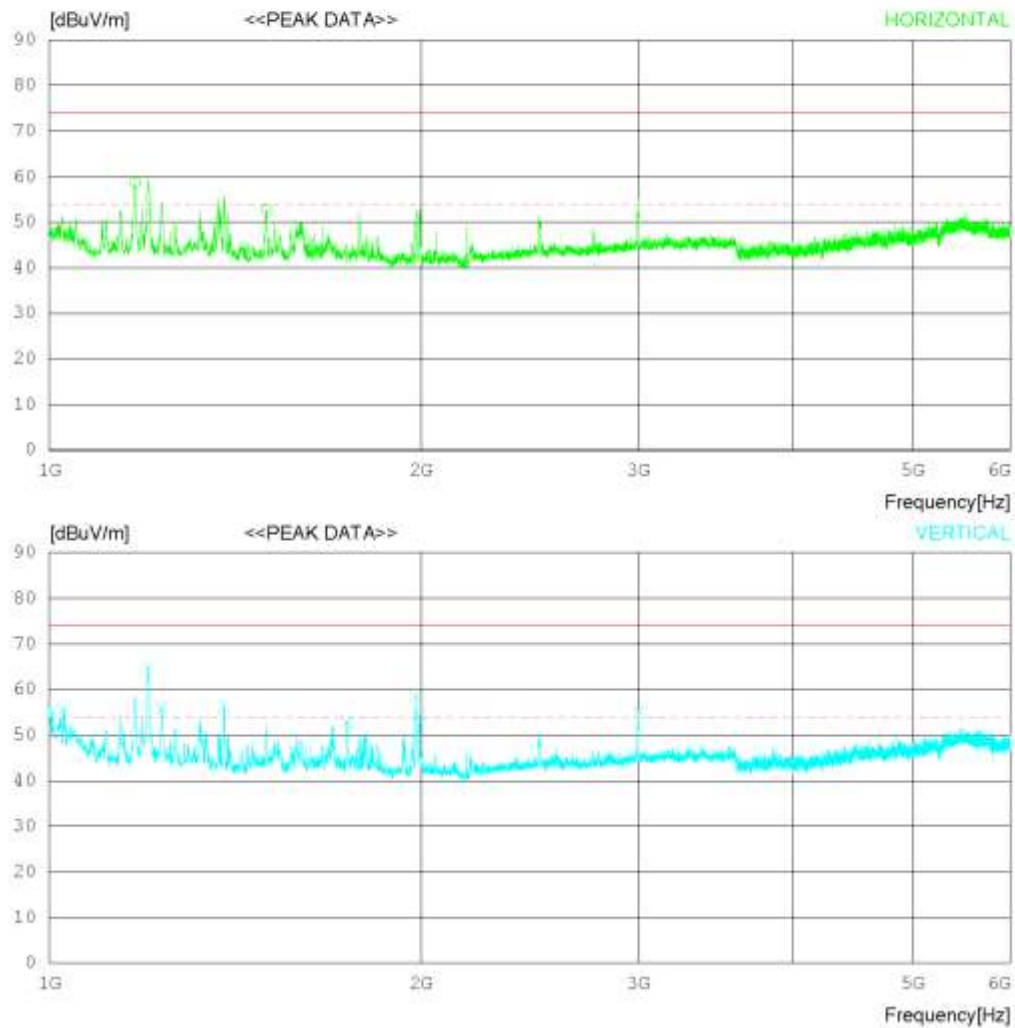
Date : 2015-05-12

Order No. : DTNC1504-02037
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 20 °C 49 % R.H
Operator :

Memo :

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



*Remark : There was no emission frequency range above 6 GHz.

RADIATED EMISSION

Date : 2015-05-12

Order No. : DTNC1504-02037	Reference No. :
Model No. :	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 20 'C 49 % R.H
Test Condition :	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	1173.125	64.8	24.4	9.6	40.2	58.6	74.0	15.4	100	43
2	1499.375	58.3	25.4	8.8	39.7	52.8	74.0	21.2	100	307
----- Vertical -----										
3	1005.000	61.7	23.9	10.0	40.4	55.2	74.0	18.8	100	0
4	1026.875	62.1	24.0	10.0	40.4	55.7	74.0	18.3	100	315
5	1203.125	71.0	24.5	9.5	40.1	64.9	74.0	9.1	100	0
6	1233.750	62.0	24.6	9.4	40.1	55.9	74.0	18.1	100	0
7	1385.625	62.1	25.0	9.1	39.9	56.3	74.0	17.7	100	289
8	1742.500	58.6	25.4	8.2	39.3	52.9	74.0	21.1	100	0
9	1980.000	64.2	25.4	7.7	38.9	58.4	74.0	15.6	100	0
10	1994.375	60.3	25.4	7.6	38.9	54.4	74.0	19.6	100	122
11	3000.000	56.7	29.0	8.2	38.7	55.2	74.0	18.8	100	320

< (1 ~ 6) GHz _ Average >

RADIATED EMISSION

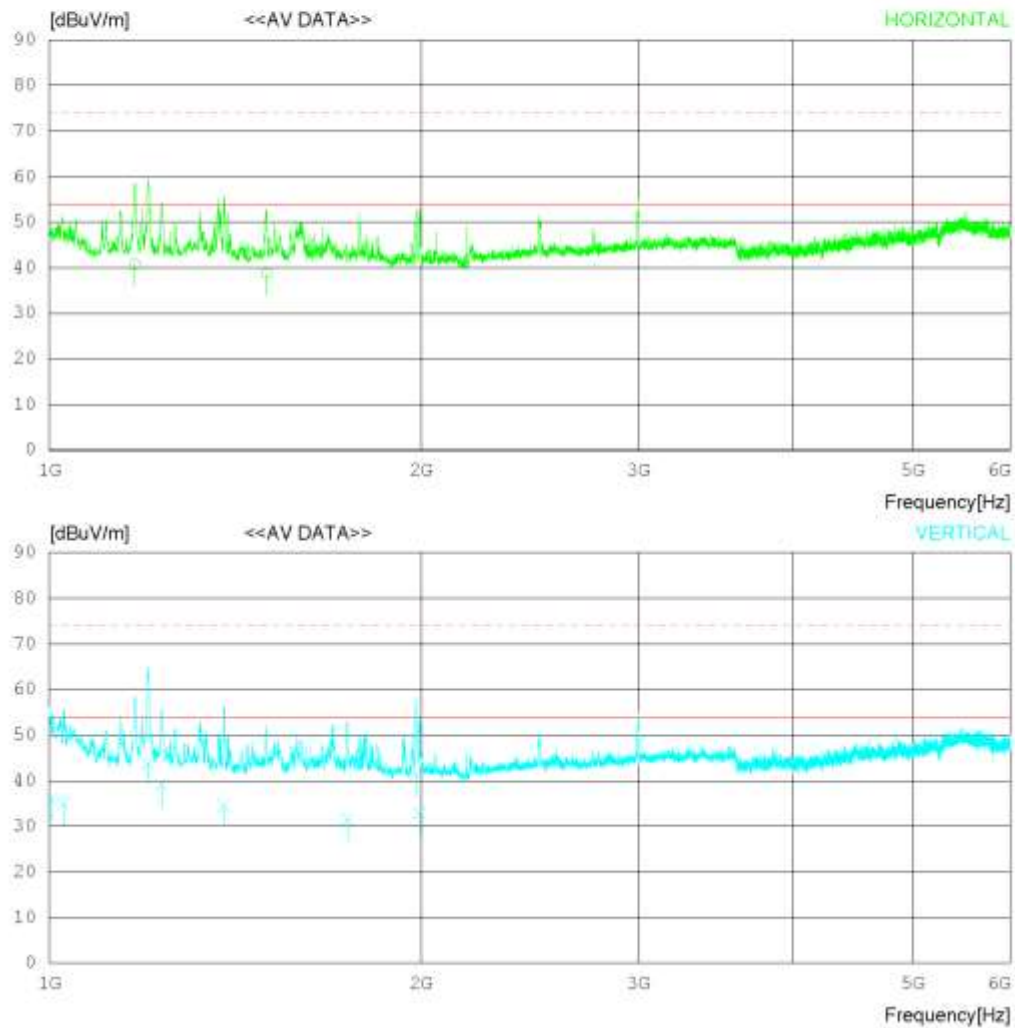
Date : 2015-05-12

Order No. : DTNC1504-02037
Model No. :
Serial No. :
Test Condition :

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 20 °C 49 % R.H
Operator :

Memo :

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



*Remark : There was no emission frequency range above 6 GHz.

RADIATED EMISSION

Date : 2015-05-12

Order No. : DTNC1504-02037	Reference No. :
Model No. :	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 20 'C 49 % R.H
Test Condition :	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	1173.125	47.0	24.4	9.6	40.2	40.8	54.0	13.2	100	43
2	1499.375	44.3	25.4	8.8	39.7	38.8	54.0	15.2	100	307
----- Vertical -----										
3	1005.000	42.5	23.9	10.0	40.4	36.0	54.0	18.0	100	0
4	1026.875	41.4	24.0	10.0	40.4	35.0	54.0	19.0	100	315
5	1233.750	45.1	24.6	9.4	40.1	39.0	54.0	15.0	100	0
6	1385.625	40.3	25.0	9.1	39.9	34.5	54.0	19.5	100	289
7	1742.500	37.2	25.4	8.2	39.3	31.5	54.0	22.5	100	0
8	1980.000	47.1	25.4	7.7	38.9	41.3	54.0	12.7	100	0
9	1994.375	38.8	25.4	7.6	38.9	32.9	54.0	21.1	100	122
10	3000.000	49.7	29.0	8.2	38.7	48.2	54.0	5.8	100	320
11	1203.125	49.9	24.5	9.5	40.1	43.8	54.0	10.2	100	0

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	2014.06.26	2015.06.26
☐ 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
☐ ARTIFICIAL MAINS NETWORK	ESH2-Z5	ROHDE & SCHWARZ	828739/006	2014.09.11	2015.09.11
☒ LISN	LISN1600	TTI	197204	2014.06.27	2015.06.27
☒ 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	100014	2015.01.06	2016.01.06
☒ 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
☒ PXA SIGNAL ANALYZER	N9030A	AGILENT	MY53310140	2014.10.21	2015.10.21
☒ HORN ANTENNA	SAS-574	A.H. SYSTEMS, INC.	155	2013.05.27	2015.05.27
☒ 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