TEST REPORT

Dt&C

DT&C Co., Ltd.

42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DREFCC1706-0148(1)
2. Customer
   - Name : i3-Technologeies N.V.
   - Address : Nijverheidslaan 60 Deerlijk Belgium 8540
3. Use of Report : Grant of Certification
4. Product Name / Model Name : i3SYNC Touch USB / i3SYNC Touch USB Dongle
5. Test Method Used : ANSI C63.4:2014
   FCC Part 15 Subpart B
   (Class B personal computers and peripherals)
6. Date of Test : 2017-05-10
7. Testing Environment : Temperature 21 °C , Humidity 40 % R.H.
8. Test Result : Refer to the attached Test Result

Affirmation	Tested by Name : JinYoung Hwang (Signature)	Technical Manager Name : KyoungHwan Bae (Signature)

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.

2018. 07. 12.

DT&C Co., Ltd.

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

CONTENTS

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 17042

http://www.dtnc.net

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

2. Test Laboratory

DT&C Co., Ltd. has been accredited / filed / authorized by the agencies listed in the following table;

Certificate	Nation	Agency	Code	Remark
Accreditation	Korea	KOLAS	393	ISO/IEC 17025
	South Africa	SABS	0006	ISO/IEC 17025
Site Filing	USA	FCC	KR0034 101842 678747, 596748, 804488, 165783	Accredited 2.948 Listed
	Canada	IC	5740A-3 5740A-4	Registered
	Japan	VCCI	C-1427 R-1364, R-3385, R-4076, R-4180, T-1442, G-10338, G-754, G-10815	Registered
Certification	Korea	KC	KR0034	Designation
	Germany	TUV	CARAT 17 11 89112 005	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	i3SYNC Touch USB
Model Name	i3SYNC Touch USB Dongle
Add Model Name	None
Serial No.	None
Type of Sample Tested	Pre-Production
Rating Power Supply	DC 5 V
Supplied Power for Test	AC 120 V, 60 Hz
FCC ID	2ALTTSY-T300UD
Applicant	i3-Technologeies N.V. Nijverheidslaan 60 Deerlijk Belgium 8540
Manufacturer	RNware Co., Ltd. (Bon-dong), #202, ICT Park Bldg, 205, Songhyeon-ro, Dalseo-gu, Daegu, 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 C63.4:2014	**C**
Radiated Disturbance	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

Test Items	Test date (YYYY-MM-DD)	Temp (℃)	Humidity (% R.H.)
Conducted Disturbance	2017-05-10	21	40
Radiated Disturbance	2017-05-10	21	40

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

- After connecting the equipment to be tested to the Note PC, after connecting with ANYSYNC TOUCH TX and BT, the status of receiving the mouse operation connected to ANYSYNC TOUCH PLUS RX.

5.3 Support Equipment Used

Unit	Model No.	Serial No.	Manufacturer	CABLE			Backshell	FCC ID
				Connect type	Length (m)	shield		
Adapter	HSTNN-CA40	N/A	CHICONY POWER	POWER DC OUT	1.2 2.0	Non-shield Non-shield	Plastic Plastic	-
ANYSYNC TOUCH TX	AT-1000N	N/A	RNware Co., Ltd.	POWER HDMI	1.2 -	Non-shield -	Plastic Plastic	-
Monitor	P2417Hb	CN-0jjRX2-74261-674-07YL-A00	DELL	POWER HDMI	1.2 2.0	Non-shield Shield	Plastic Plastic	-
Note PC	HSTNN-Q95C	5CD6256M2B	HP	POWER LAN	1.2 3.0	Non-shield Non-shield	Plastic Plastic	-
Mouse	MODGUO	SA0902009883	HP	USB	1.1	Shield	Plastic	-
ANYSYNC TOUCH RX	AT-E1000P	N/A	RNware Co., Ltd.	POWER HDMI	1.2 2.0	Non-shield Shield	Plastic Plastic	-

NOTE

- See “APPENDIX 2 Photographs” for actual system test setup

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 appropriate power mains / peripherals 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 + PULSE LIMITER

3. Margin = Limit - Emission level

Test Result

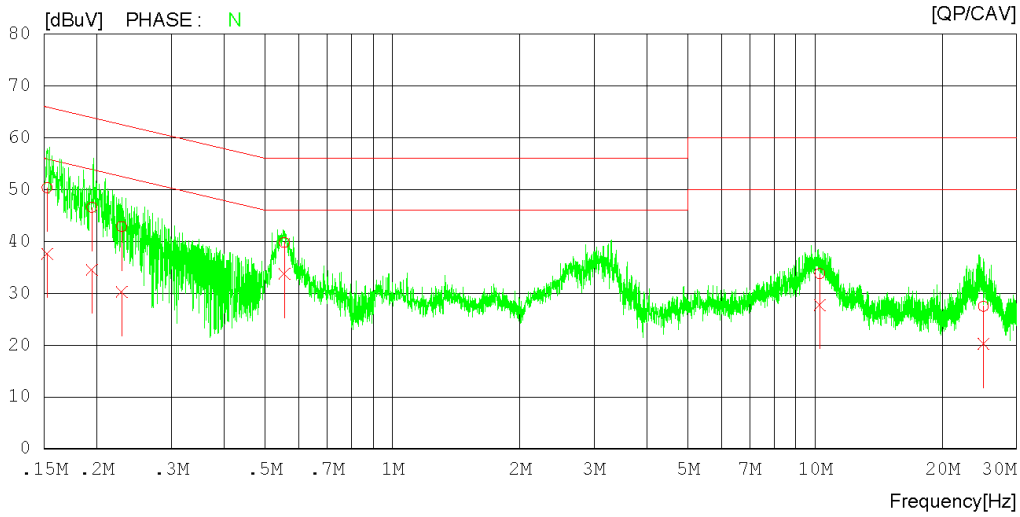
Results of Conducted Emission

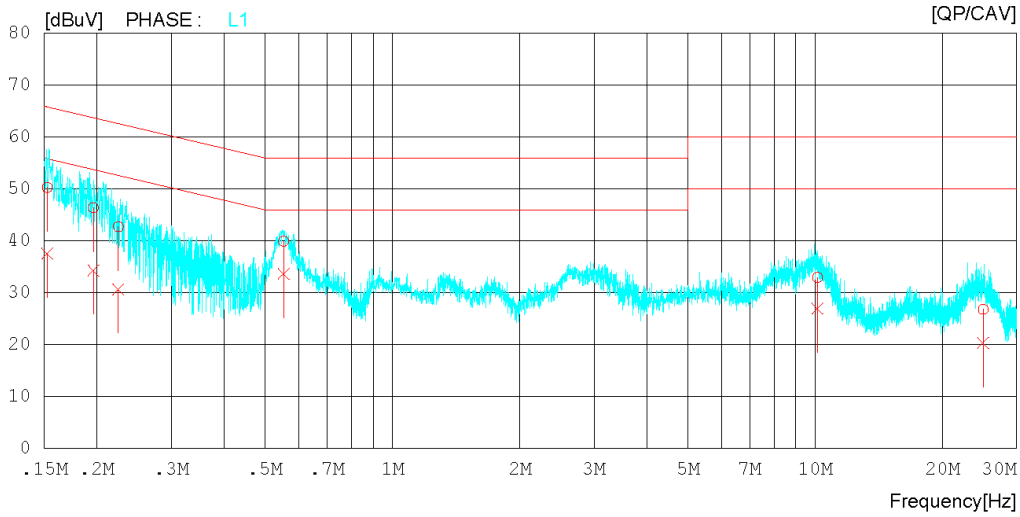
DT&C
Date : 2017-05-10

Order No. : DTNC1705-03422
Power Supply : 120 V 60 Hz
Temp/Humi/Atm : 21 'C 40 % R.H. 101.2 kPa
Test Condition :

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





Results of Conducted Emission

DT&C
Date : 2017-05-10

Order No. : DTNC1705-03422
Power Supply : 120 V 60 Hz
Temp/Humi/Atm : 21 'C 40 % R.H. 101.2 kPa
Test Condition :

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING CAV	C.FACTOR	RESULT QP	RESULT CAV	LIMIT QP	LIMIT CAV	MARGIN QP	MARGIN CAV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15221	40.25	27.52	10.07	50.32	37.59	65.88	55.88	15.56	18.29	N
2	0.19427	36.45	24.43	10.07	46.52	34.50	63.85	53.85	17.33	19.35	N
3	0.22859	32.75	20.12	10.07	42.82	30.19	62.50	52.50	19.68	22.31	N
4	0.55450	29.65	23.59	10.09	39.74	33.68	56.00	46.00	16.26	12.32	N
5	10.25468	23.38	17.32	10.39	33.77	27.71	60.00	50.00	26.23	22.29	N
6	25.02990	16.60	9.38	10.85	27.45	20.23	60.00	50.00	32.55	29.77	N
7	0.15255	40.21	27.49	10.08	50.29	37.57	65.86	55.86	15.57	18.29	L1
8	0.19591	36.33	24.25	10.08	46.41	34.33	63.78	53.78	17.37	19.45	L1
9	0.22450	32.67	20.62	10.08	42.75	30.70	62.65	52.65	19.90	21.95	L1
10	0.55261	29.84	23.54	10.11	39.95	33.65	56.00	46.00	16.05	12.35	L1
11	10.13919	22.57	16.56	10.40	32.97	26.96	60.00	50.00	27.03	23.04	L1
12	25.00993	15.98	9.49	10.87	26.85	20.36	60.00	50.00	33.15	29.64	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 **3 m 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.

Also Peak and Average detector with 1 MHz RBW were used for above 1 GHz frequency range.

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	5th harmonic of the highest frequency or 40 GHz, whichever is lower

(1) Limit for Radiated Emission below 1 000MHz

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 000MHz 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

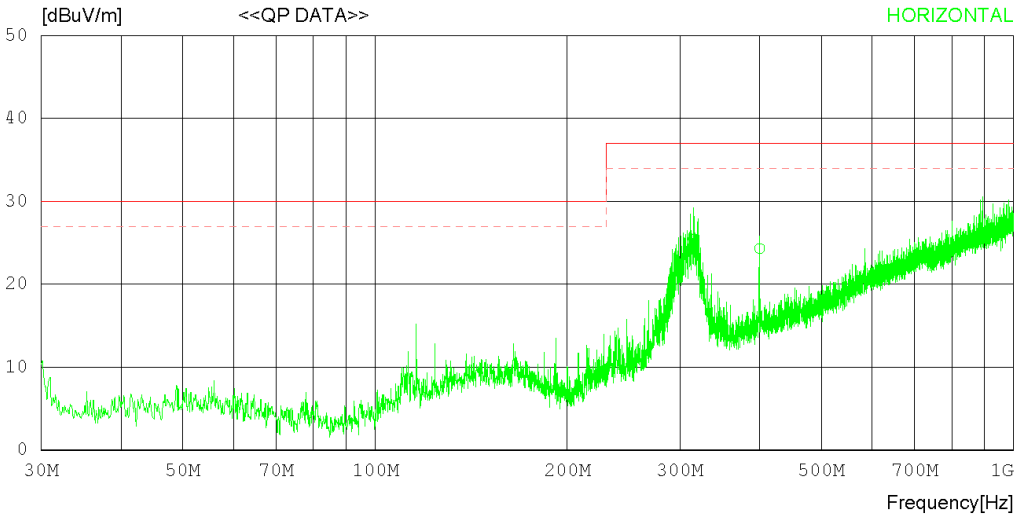
< 30 MHz ~ 1 GHz >

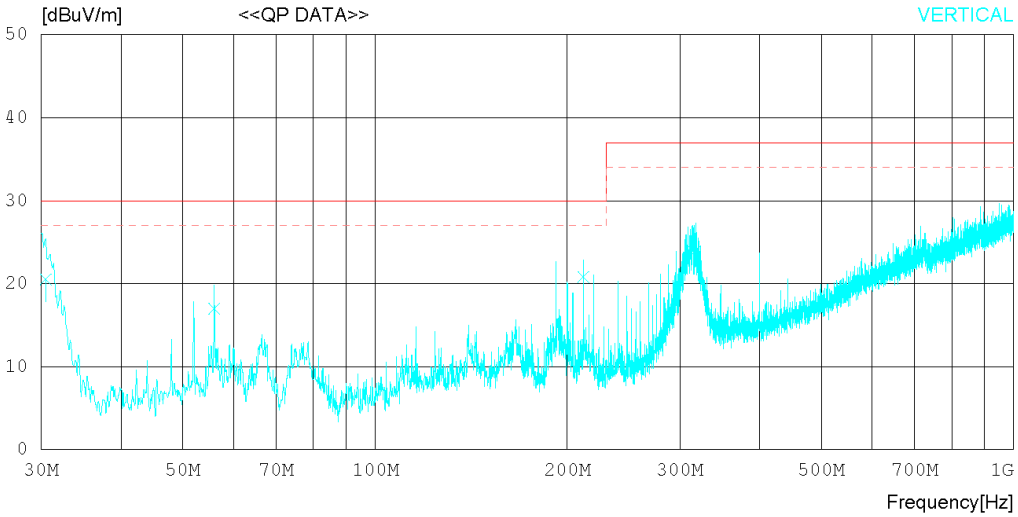
RADIATED EMISSION

Date 2017-05-10

Order No.	DTNC1705-03422
Power Supply	AC 120 V 60 Hz
Temp/Humi	21 'C 40 % R.H.
Test Condition	

LIMIT : CLASS B
MARGIN: 3 dB





RADIATED EMISSION

Date 2017-05-10

Order No. DTNC1705-03422
Power Supply AC 120 V 50 Hz
Temp/Humi 21 'C 40 % R.H.
Test Condition

LIMIT : CLASS B
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	314.930	36.50	13.93	4.80	29.78	25.45	37.00	11.55	400	99
2	400.045	32.60	15.92	5.47	29.68	24.31	37.00	12.69	400	225
----- Vertical ------										
3	30.485	38.90	10.89	1.35	30.64	20.50	30.00	9.50	100	358
4	55.948	34.10	11.55	1.89	30.55	16.99	30.00	13.01	100	61
5	211.992	36.90	10.00	3.87	29.98	20.79	30.00	9.21	100	358
6	316.142	34.80	13.96	4.81	29.77	23.80	37.00	13.20	100	358

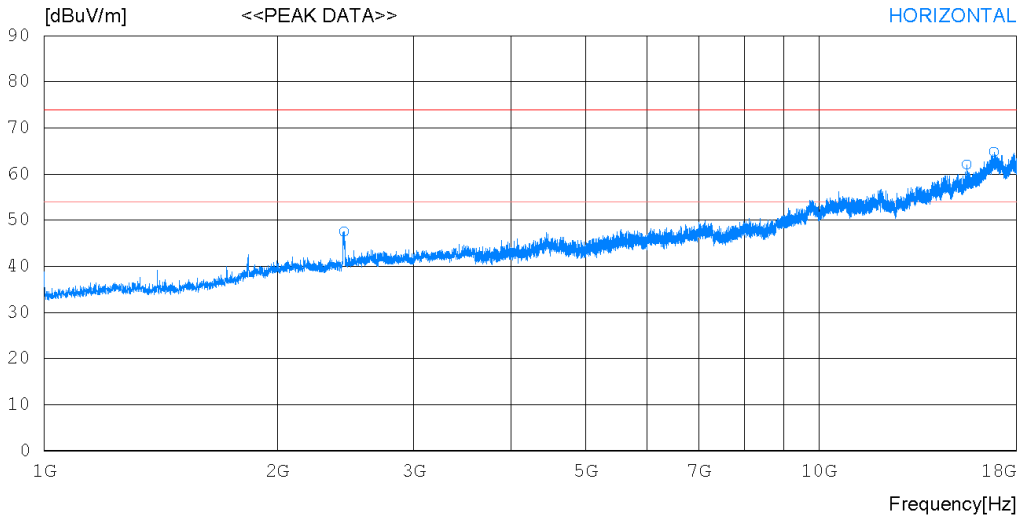
< (1 ~ 18) GHz _ Peak >

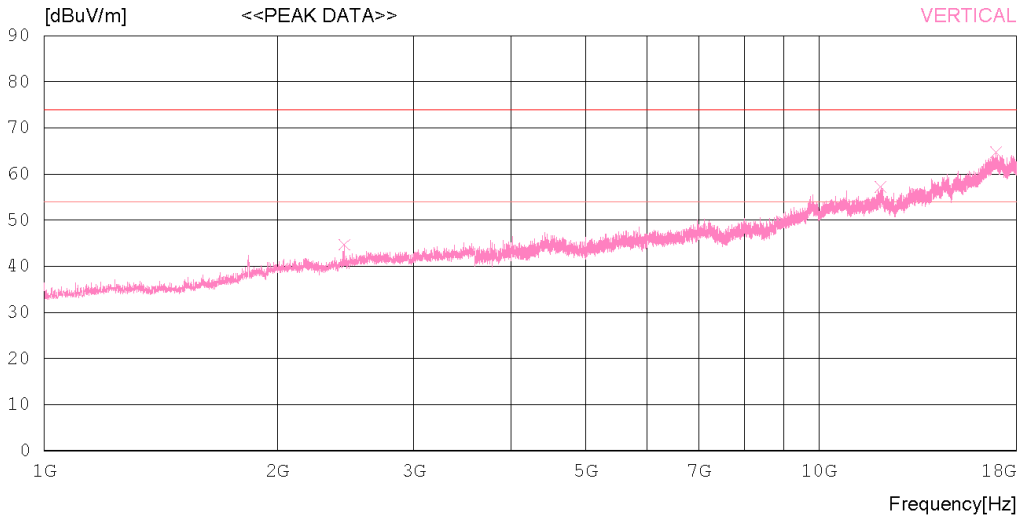
RADIATED EMISSION

Date 2017-05-10

Order No.	DTNC1705-03422
Power Supply	AC120 V 60 Hz
Temp/Humi	21 'C 40 % R.H.
Test Condition	

LIMIT : FCC_CLASS B_PK_1-18G
FCC_CLASS B_AV_1-18G





RADIATED EMISSION

Date 2017-05-10

Order No. DTNC1705-03422
Power Supply AC120 V 60 Hz
Temp/Humi 21 'C 40 % R.H.
Test Condition

LIMIT : FCC_CLASS B_PK_1-18G
FCC_CLASS B_AV_1-18G

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	2439.375	50.80	31.82	3.44	38.55	47.51	74.0	26.49	100	358
2	15534.000	47.90	39.73	10.93	36.46	62.10	74.0	11.9	100	217
3	16831.500	47.30	41.80	11.20	35.48	64.82	74.0	9.18	100	358
----- Vertical ------										
4	2440.000	47.90	31.82	3.44	38.55	44.61	74.0	29.39	100	42
5	12021.000	45.70	39.02	9.75	37.29	57.18	74.0	16.82	100	1
6	16932.000	47.20	41.77	11.06	35.33	64.70	74.0	9.3	100	235

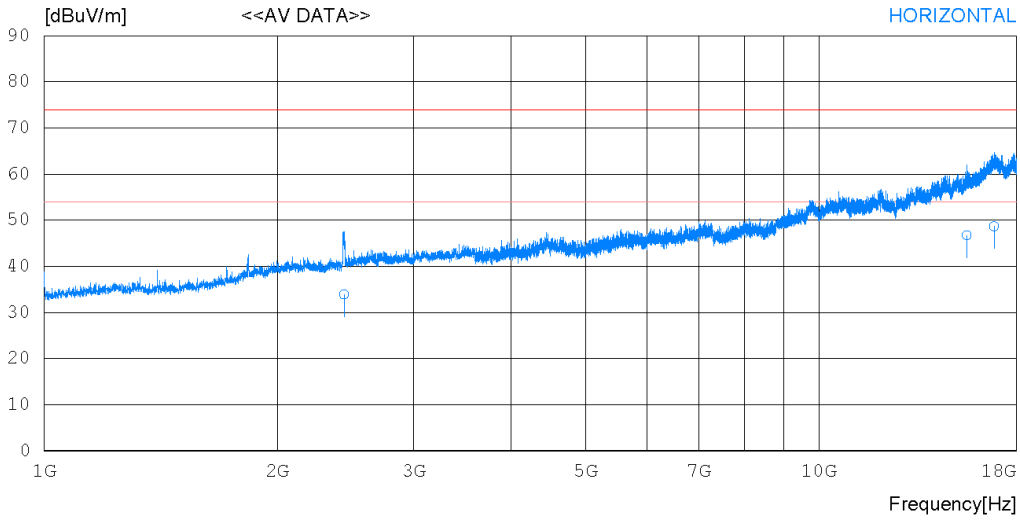
< (1 ~ 18) GHz _ Average >

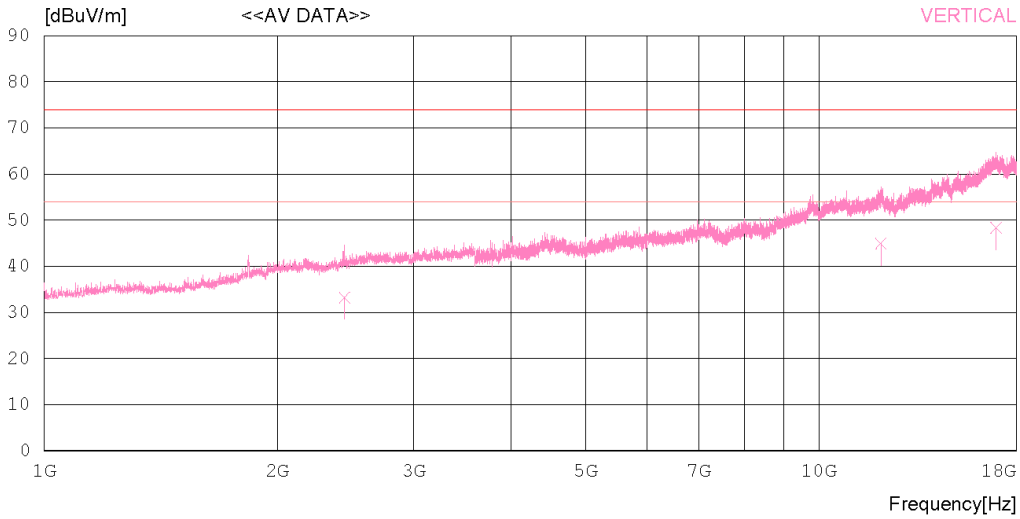
RADIATED EMISSION

Date 2017-05-10

Order No.	DTNC1705-03422
Power Supply	AC120 V 60 Hz
Temp/Humi	21 'C 40 % R.H.
Test Condition	

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





RADIATED EMISSION

Date 2017-05-10

Order No. DTNC1705-03422
Power Supply AC120 V 60 Hz
Temp/Humi 21 'C 40 % R.H.
Test Condition

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

No.	FREQ [MHz]	READING CAV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	2438.675	37.10	31.82	3.44	38.55	33.81	54.00	20.19	100	0
2	15533.220	32.50	39.73	10.93	36.46	46.70	54.00	7.30	100	286
3	16832.110	31.10	41.80	11.20	35.48	48.62	54.00	5.38	100	314
----- Vertical ------										
4	2441.313	36.50	31.82	3.44	38.55	33.21	54.00	20.79	100	351
5	12022.640	33.40	39.02	9.74	37.29	44.87	54.00	9.13	100	25
6	16931.210	30.80	41.77	11.06	35.33	48.30	54.00	5.70	100	227

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
☒	EMI TEST RECEIVER	ESR	ROHDE & SCHWARZ	101767	2017.01.03	2018.01.03
☒	LISN	NNLK 8129	SCHWARZBECK	8129-272	2016.08.03	2017.08.03
☒	LISN	NNLK8121	SCHWARZBECK	NNLK8121-580	2016.08.03	2017.08.03
☒	PULSE LIMITER	ESH3-Z2	ROHDE & SCHWARZ	101334	2017.01.03	2018.01.03
☒	TERMINATION	CT-01	TME	N/A	2017.01.03	2018.01.03

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	ESR7	ROHDE & SCHWARZ	101061	2017.02.16	2018.02.16
☒	TRILOG BROADBAND TEST-ANTENNA	VULB9160	SCHWARZBECK	9160-3362	2016.08.05	2018.08.05
☒	LOW NOISE PRE AMPLIFIER	MLA-010K01-B01-27	TSJ	1844538	2017.03.06	2018.03.06
☒	PREAMPLIFIER	8449B	AGILENT TECHNOLOGIES	3008A01590	2017.02.20	2018.02.20
☒	EMI TEST RECEIVER	ESU	ROHDE & SCHWARZ	100469	2016.07.18	2017.07.18
☒	HORN ANTENNA	3117	ETS-LINDGREN	00152145	2016.02.26	2018.02.26

Appendix 2

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
2018-07-12	- This report was reissued due to changes in the use of report. (FCC Declaration of Conformity Marking → FCC Certification of Conformity Marking) - Changed Product's name (i3SYNC Touch Dongle → i3SYNC Touch USB) - Changed Model name (i3SYNC TOUCH USB Dongle → i3SYNC Touch USB Dongle)	JinYoung Hwang	KyoungHwan Bae