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TEST REPORT

KCTL Inc.
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KCTL

1. Client

- Name : DLOGIXS CO., LTD
- Address : Dlogixs Bldg., 18, Beolmal-ro 118 Beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, Korea
- Date of Receipt : 2018-04-25

2. Use of Report : -

3. Name of Product and Model : Neuro beat Compact / NB-CS-00B-10

4. Manufacturer and Country of Origin : DLOGIXS CO., LTD / Korea

5. FCC ID : 2APRMNBCS00B10

6. Date of Test : 2018-05-16 to 2018-05-17

7. Test Standards : FCC Part 15 Subpart C, 15.249

8. Test Results : Refer to the test result in the test report

Affirmation	Tested by Name : Dokyun Lee (Signature)	Technical Manager Name : Bongok Ko (Signature)

2018-09-20

KCTL Inc.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2018-09-20	Originally issued	-

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[Contents]

1. Client information 4
2. Laboratory information 5
3. Description of E.U.T. 6
3.1 Basic description 6
3.2 General description 6
3.3 Test frequency 7
3.4 Test Voltage 7
4. Summary of test results 8
4.1 Standards & results 8
4.2 Measurement Uncertainty 8
5. Test results 9
5.1 Antenna Requirement 9
5.2 Spurious Emission, Band edge and Restricted bands 10
5.3 Conducted Emission 18
6. Test equipment used for test 20

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1. Client information

Applicant:	DLOGIXS CO., LTD
Address:	Dlogixs Bldg., 18, Beolmal-ro 118 Beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, Korea
Telephone number:	+82 31 8033 7511
Facsimile number:	+82 31 441 9745
Contact person:	Minkyung Kim / kimmk@dlogixs.com

Manufacturer:	DLOGIXS CO., LTD
Address:	Dlogixs Bldg., 18, Beolmal-ro 118 Beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, Korea

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2. Laboratory information

Address

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea

Telephone Number: +82 31 285 0894

Facsimile Number: +82 505 299 8311

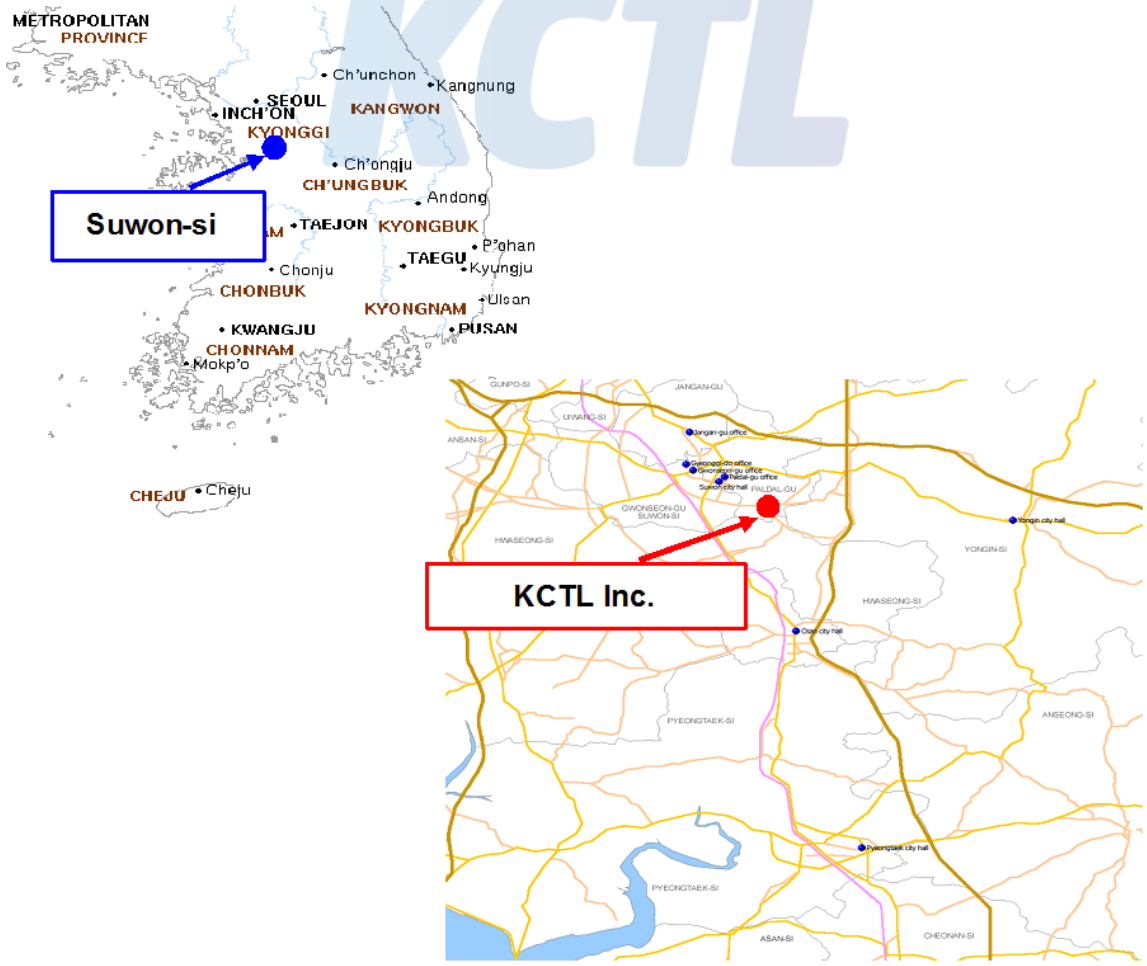
FCC Site Designation No: KR0040, FCC Site Registration No: 687132

VCCI Registration No. : R-3327, G-198, C-3706, T-1849

Industry Canada Registration No. : 8035A

KOLAS NO.: KT231

SITE MAP



3. Description of E.U.T.

3.1 Basic description

Applicant	DLOGIXS CO., LTD
Address of Applicant	Dlogixs Bldg., 18, Beolmal-ro 118 Beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, Korea
Manufacturer	DLOGIXS CO., LTD
Address of Manufacturer	Dlogixs Bldg., 18, Beolmal-ro 118 Beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, Korea
Type of equipment	Neuro beat Compact
Basic Model	NB-CS-00B-10
Serial number	N/A

3.2 General description

Frequency Range	2 402 ㎒ ~ 2 480 ㎒
Type of Modulation	GFSK, π/4DQPSK, 8DPSK
The number of channels	79 ch
Type of Antenna	PCB Antenna
Antenna Gain	Module 1 (ANT 1) : 1.829 ㏈i Module 2 (ANT 2) : -0.177 ㏈i (Approved module)
Transmit Power	Module 1 (ANT 1) : 4.65 ㏈m Module 2 (ANT 2) : -0.06 ㏈m (Approved module)
Power supply	DC 7.4 V
Product SW/HW version	0.48 / REV 10
Radio SW/HW version	0.48 / REV 10
Test SW Version	CSR Module : Bluesuite 2.4.8 Eclipse Module : Mars. 1 Release (4.5.1)
RF power setting in TEST SW	CSR : 63 (GFSK), 104 (π/4DQPSK, 8DPSK) Eclipse : 2 (GFSK, π/4DQPSK, 8DPSK)

Note1) : The above EUT information was declared by the manufacturer.
Note2) : Two BT modules are included in the device with PCB pattern antenna.
- Module 1 (ANT1) : Product module.
- Module 2 (ANT2) : Approved Bluetooth module (module name : GWBMA1x, FCC ID : QECGWBMA1X).

3.3 Test frequency

	Frequency
Lowest frequency	2 402 ㎒
Middle frequency	2 441 ㎒
Highest frequency	2 480 ㎒

3.4 Test Voltage

Mode	Voltage
Nominal Voltage	DC 7.4 V

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4. Summary of test results

4.1 Standards & results

FCC Rule	Parameter	Report Section	Test Result
15.203	Antenna Requirement	5.1	C
15.249(d), 15.205(a), 15.209(a)	Spurious Emission, BandEdge, Restricted Band	5.2	C
15.207(a)	Conducted Emissions	5.3	C
15.215	Bandwidth	-	NT (Note$_2$)
Note$_{1)}$: C = Complies, NC = Not Complies, NT = Not Tested, NA = Not Applicable Note$_{2)}$: Please refer to original Test report no. AGC03817160902FE03 for the test items.			

- The general test methods used to test on this device are ANSI C63.10-2013

4.2 Measurement Uncertainty

Measurement Item	Expanded Uncertainty U = *k*Uc (*k* = 2)	
Radiated Spurious Emissions	30 ㎒ ~ 300 ㎒:	+4.94 ㏈, -5.06 ㏈
		+4.93 ㏈, -5.05 ㏈
	300 ㎒ ~ 1 000 ㎒:	+4.97 ㏈, -5.08 ㏈
		+4.84 ㏈, -4.96 ㏈
	1 ㎓ ~ 25 ㎓:	+6.03 ㏈, -6.05 ㏈
Conducted Emissions	9 ㎑ ~ 150 ㎑:	3.75 ㏈
	150 ㎑ ~ 30 ㎒:	3.36 ㏈

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5. Test results

5.1 Antenna Requirement

5.1.1 Regulation

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

5.1.2 Result

-Complied

The transmitter has permanently attached PCB antenna (internal antenna) on board.

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5.2 Spurious Emission, Band edge and Restricted bands

5.2.1 Regulation

Test Limit

Standard FCC 15.249

Fundamental Frequency (㎒)	Field strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
900 - 928 ㎒	50	500
2400 - 2483.5 ㎒	50	500
5725 - 5875 ㎒	50	500
24.0 - 24.25 ㎓	250	2500

Standard FCC 15.209

Frequency (㎒)	Distance (Meters)	Field Strengths Limit	
		μV/m	dB(μV)/m
0.009 - 0.490	300	2400/F(㎑)	---
0.490 – 1.705	30	24000/F(㎑)	---
1.705 - 30	30	30	---
30 - 88	3	100	40.0
88 - 216	3	150	43.5
216 - 960	3	200	46.0
960 - 1000	3	500	54.0
Above 1000	3	Other: 74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark: (1) Emission level dBμV = 20 log Emission level μV/m.
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

5.2.2 Measurement Procedure

The method of measurement used to test this FHSS device is ANSI C63.10-2013.

Spurious Radiated Emissions:

1. The preliminary radiated measurements were performed to determine the frequency producing the maximum emissions in an semi-anechoic chamber at a distance of 3 meters.
2. The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360°.
3. The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 9 ㎑ to 30 ㎒ using the loop antenna, and from 30 to 1 000 ㎒ using the Bi-Log antenna, and from 1 000 ㎒ to 26 500 ㎒ using the horn antenna.
4. To obtain the final measurement data, the EUT was arranged on a turntable situated on a 4 × 4 meter in an semi-anechoic chamber. The EUT was tested at a distance 3 meters.
5. Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.
6. The 0.8m height is for below 1 G testing, and 1.5m is for above 1G testing.

- **Procedure for unwanted emissions measurements below 1 000 ㎒**

The procedure for unwanted emissions measurements below 1 000 ㎒ is as follows:

a) Follow the requirements in 12.7.4.

b) Compliance shall be determined using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

- **Procedure for peak unwanted emissions measurements above 1 000 ㎒**

The procedure for peak unwanted emissions measurements above 1 000 ㎒ is as follows:

a) Follow the requirements in 12.7.4.

b) Peak emission levels are measured by setting the instrument as follows:

1) RBW = 1 ㎒.

2) VBW ≥ [3 ㎒ RBW].

3) Detector = peak.

4) Sweep time = auto.

5) Trace mode = max hold.

6) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, then the time required for the trace to stabilize will increase by a factor of approximately 1 / D, where *D* is the duty cycle. For example, at 50 ％ duty cycle, the measurement time will increase by a factor of two, relative to measurement time for continuous transmission.

- **Procedures for average unwanted emissions measurements above 1 000 ㎒**

Method VB-A is averaging using reduced video bandwidth. The procedure for this method is as follows:

a) RBW = 1 ㎒.

b) Video bandwidth:

1) If the EUT is configured to transmit with D ≥ 98 ％, then set VBW ≤ RBW / 100 (i.e., 10 ㎑), but not less than 10 ㎐.

2) If the EUT D is < 98%, then set VBW ≥ 1 / T, where T is defined in item a1) of 12.2.

c) Video bandwidth mode or display mode:

1) The instrument shall be set with video filtering applied in the power domain. Typically, this requires setting the detector mode to RMS (power averaging) and setting the average-VBW type to power (rms).

2) As an alternative, the instrument may be set to linear detector mode. Video filtering shall be applied in linear voltage domain (rather than in a log or ㏈ domain). Some instruments require linear display mode to accomplish this. Others have a setting for average-VBW type, which can be set to “voltage” regardless of the display mode.

d) Detector = peak.

e) Sweep time = auto.

f) Trace mode = max hold.

g) Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98% duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where D is the duty cycle. For example, use at least 200 traces if the duty cycle is 25%. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 50 traces should be averaged.)

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5.2.3 Test Result

- Complied

1. Conducted Spurious Emissions was shown in figure 3.
   Note: We took the insertion loss of the cable into consideration within the measuring instrument.
2. Measured value of the Field strength of spurious Emissions (Radiated)
3. It tested x,y and z – 3 axis each, mentioned only worst case data at this report.

- Below 1 ㎓ data (Worst-case: GFSK)

Middle Channel (2 441 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 ㎒										
1.66	9	H	36.20	1.20	-32.72	19.62	-11.90	24.30	63.20	38.90
23.30	9	H	35.80	1.55	-32.68	19.23	-11.90	23.90	69.50	45.60
Quasi-Peak DATA. Emissions below 1 ㎓										
55.46	120	V	41.60	1.54	-28.97	13.07	-14.36	27.24	40.00	12.76
159.98	120	H	49.60	2.77	-36.89	16.10	-18.02	31.58	43.50	11.92
183.62	120	H	33.80	2.97	-34.86	15.22	-16.67	17.13	43.50	26.37
335.91	120	H	25.90	4.13	-35.40	20.10	-11.17	14.73	46.00	31.27
455.95	120	H	36.90	4.88	-35.73	22.60	-8.25	28.65	46.00	17.35
778.84	120	H	30.90	6.51	-34.75	25.55	-2.69	28.21	46.00	17.79

NOTE 1. Factor = Cable loss + Amp gain + Antenna factor
NOTE 2. Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

- Above 1 ㎓ data

GFSK_Lowest channel (2 402 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	DCCF [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 593.52[1)]	1 000	H	80.25	3.04	-60.62	26.17	-31.41	-	48.84	74.00	25.16
2 383.94[1,2)]	1 000	H	69.04	3.70	-59.22	28.53	-26.99	-	42.05	74.00	31.95
3 246.72	1 000	V	75.52	4.30	-59.93	30.37	-25.26	-	50.26	74.00	23.74
4 803.64[1,3)]	1 000	H	78.91	5.34	-61.69	32.80	-23.55	-	55.37	74.00	18.63
5 909.72	1 000	V	71.49	6.04	-61.82	34.26	-21.52	-	49.97	74.00	24.03
21 572.92	1 000	V	47.38	12.00	-49.47	45.00	7.53	-	54.90	74.00	19.10
25 996.64	1 000	V	44.88	13.70	-46.60	45.70	12.80	-	57.68	74.00	16.32
Average DATA. Emissions above 1 ㎓											
1 593.52[1)]	1 000	H	61.49	3.04	-60.62	26.17	-31.41	-	30.08	54.00	23.92
2 383.94[1,2)]	1 000	H	61.75	3.70	-59.22	28.53	-26.99	-	34.76	54.00	19.24
4 803.70[1,3)]	1 000	H	69.34	5.34	-61.69	32.80	-23.55	-	45.79	54.00	8.21

[1)] Restricted band.
[2)] Bandedge.
[3)] Harmonic.

GFSK_Middle channel (2 441 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	DCCF [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 593.44[1)]	1 000	V	79.05	3.04	-60.62	26.17	-31.41	-	47.64	74.00	26.36
3 288.13	1 000	H	74.04	4.32	-60.01	30.48	-25.21	-	48.83	74.00	25.17
4 881.69[1,2)]	1 000	V	75.18	5.39	-61.23	32.84	-23.00	-	52.19	74.00	21.81
5 910.17	1 000	V	70.29	6.04	-61.83	34.27	-21.52	-	48.78	74.00	25.22
21 944.27	1 000	V	46.93	12.10	-49.51	45.00	7.59	-	54.51	74.00	19.49
25 974.06	1 000	V	45.07	13.60	-46.55	45.70	12.75	-	57.82	74.00	16.18
Average DATA. Emissions above 1 ㎓											
1 594.50[1)]	1 000	V	70.02	3.04	-60.63	26.18	-31.41	-	38.61	54.00	15.39
4 881.69[1,2)]	1 000	V	65.50	5.39	-61.23	32.84	-23.00	-	42.50	54.00	11.50

[1)] Restricted band.
[2)] Harmonic.

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GFSK_Highest channel (2 480 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	DCCF [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 595.50[1)]	1 000	V	78.14	3.04	-60.60	26.18	-31.38	-	46.76	74.00	27.24
2 488.28[1,2)]	1 000	H	69.02	3.77	-59.09	28.73	-26.59	-	42.42	74.00	31.58
2 997.66	1 000	V	73.77	4.14	-59.40	29.70	-25.56	-	48.21	74.00	25.79
4 960.23[1,3)]	1 000	H	77.25	5.44	-60.80	32.88	-22.48	-	54.77	74.00	19.23
5 910.63	1 000	V	71.18	6.04	-61.83	34.27	-21.52	-	49.67	74.00	24.33
21 553.53	1 000	V	47.23	12.00	-49.48	45.00	7.52	-	54.75	74.00	19.25
25 811.50	1 000	V	45.72	13.50	-46.73	45.60	12.37	-	58.09	74.00	15.91
Average DATA. Emissions above 1 ㎓											
1 595.50[1)]	1 000	V	60.84	3.04	-60.60	26.18	-31.38	-	29.46	54.00	24.54
2 488.28[1,2)]	1 000	H	55.67	3.77	-59.09	28.73	-26.59	-	29.08	54.00	24.92
4 960.23[1,3)]	1 000	H	66.58	5.44	-60.80	32.88	-22.48	-	44.10	54.00	9.90

[1)] Restricted band.
[2)] Bandedge.
[3)] Harmonic.

8DPSK_Lowest channel (2 402 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	DCCF [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 593.63[1)]	1 000	V	76.74	3.04	-60.59	26.17	-31.38	-	45.35	74.00	28.65
2 381.59[1,2)]	1 000	H	68.61	3.70	-59.22	28.53	-26.99	-	41.62	74.00	32.38
3 242.34	1 000	H	80.53	4.29	-59.91	30.35	-25.27	-	55.27	74.00	18.73
4 803.63[1,3)]	1 000	H	78.28	5.34	-61.69	32.80	-23.55	-	54.73	74.00	19.27
5 910.17	1 000	V	70.51	6.04	-61.83	34.27	-21.52	-	49.00	74.00	25.00
21 581.16	1 000	H	47.82	12.00	-49.47	45.00	7.53	-	55.35	74.00	18.65
25 956.53	1 000	H	44.92	13.60	-46.59	45.70	12.71	-	57.63	74.00	16.37
Average DATA. Emissions above 1 ㎓											
1 593.63[1)]	1 000	V	60.38	3.04	-60.59	26.17	-31.38	-	29.00	54.00	25.00
2 381.59[1,2)]	1 000	H	55.15	3.70	-59.22	28.53	-26.99	-	28.16	54.00	25.84
4 803.63[1,3)]	1 000	H	69.41	5.34	-61.69	32.80	-23.55	-	45.86	54.00	8.14

[1)] Restricted band.
[2)] Bandedge.
[3)] Harmonic.

8DPSK_Middle channel (2 441 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	DCCF [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 592.32[1)]	1 000	V	80.14	3.03	-60.60	26.17	-31.40	-	48.74	74.00	25.26
3 203.83	1 000	V	69.23	4.27	-59.83	30.25	-25.31	-	43.92	74.00	30.08
4 842.61[1,2)]	1 000	H	76.00	5.36	-61.45	32.82	-23.27	-	52.73	74.00	21.27
5 910.17	1 000	V	71.29	6.04	-61.83	34.27	-21.52	-	49.77	74.00	24.23
21 619.41	1 000	V	46.24	12.00	-49.47	45.00	7.53	-	53.77	74.00	20.23
26 005.94	1 000	V	45.16	13.70	-46.59	45.70	12.81	-	57.96	74.00	16.04
Average DATA. Emissions above 1 ㎓											
1 592.32[1)]	1 000	V	63.11	3.03	-60.60	26.17	-31.40	-	31.71	54.00	22.29
4 841.65[1,2)]	1 000	H	68.39	5.36	-61.45	32.82	-23.27	-	45.12	54.00	8.88

[1)] Restricted band.
[2)] Bandedge.

8DPSK_Highest channel (2 480 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	DCCF [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 599.87[1)]	1 000	V	77.35	3.04	-60.60	26.20	-31.36	-	45.99	74.00	28.01
3 325.63	1 000	V	77.30	4.35	-60.03	30.58	-25.10	-	52.20	74.00	21.80
4 881.62[1,2)]	1 000	H	77.44	5.39	-61.23	32.84	-23.00	-	54.44	74.00	19.56
5 910.17	1 000	V	70.83	6.04	-61.83	34.27	-21.52	-	49.31	74.00	24.69
21 889.28	1 000	H	46.71	12.10	-49.52	45.00	7.58	-	54.29	74.00	19.71
25 879.77	1 000	H	45.48	13.60	-46.67	45.60	12.53	-	58.01	74.00	15.99
Average DATA. Emissions above 1 ㎓											
1 599.87[1)]	1 000	V	59.96	3.04	-60.60	26.20	-31.36	-	28.60	54.00	25.40
4 881.62[1,2)]	1 000	H	68.07	5.39	-61.23	32.84	-23.00	-	45.07	54.00	8.93

[1)] Restricted band.
[2)] Harmonic.

Eclipse & CSR Module Simultaneous data

- Above 1 ㎓ data

Lowest channel (2 402 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
2 376.08[1)]	1 000	H	78.36	3.70	-59.22	28.53	-	-26.99	51.38	74.00	22.62
2 484.03	1 000	V	74.42	3.77	-59.10	28.72	-	-26.61	47.81	74.00	26.19
4 803.98	1 000	V	73.50	5.34	-61.69	32.80	-	-23.55	49.95	74.00	24.05
17 507.45	1 000	H	58.12	10.65	-62.12	43.34	-	-8.13	50.00	74.00	24.00
24 405.81	1 000	H	46.68	12.80	-48.20	45.10	-	9.70	56.38	74.00	17.62
24 786.72	1 000	V	46.60	12.80	-47.80	45.20	-	10.20	56.80	74.00	17.20
Average DATA. Emissions above 1 ㎓											
2 376.08[1)]	1 000	H	59.21	3.70	-59.22	28.53	-	-26.99	32.22	54.00	21.78
2 484.03	1 000	V	56.94	3.77	-59.10	28.72	-	-26.61	30.33	54.00	23.67
4 803.98	1 000	V	66.19	5.34	-61.69	32.80	-	-23.55	42.64	54.00	11.36

[1)] Restricted band

5.3 Conducted Emission

5.3.1 Regulation

According to §15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50 μH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (㎒)	Conducted limit (㏈㎶)	
	Qausi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency.

According to §15.107(a), for unintentional device, except for Class A digital devices, line conducted emission limits are the same as the above table.

5.3.2 Measurement Procedure

1) The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 ㎝ in which is located 40 ㎝ away from the vertical wall and 1.5m away from the side wall of the shielded room.

2) Each current-carrying conductor of the EUT power cord was individually connected through a 50Ω/50μH LISN, which is an input transducer to a Spectrum Analyzer or an EMI/Field Intensity Meter, to the input power source.

3) Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.

4) The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 ㎒ to 30 ㎒.

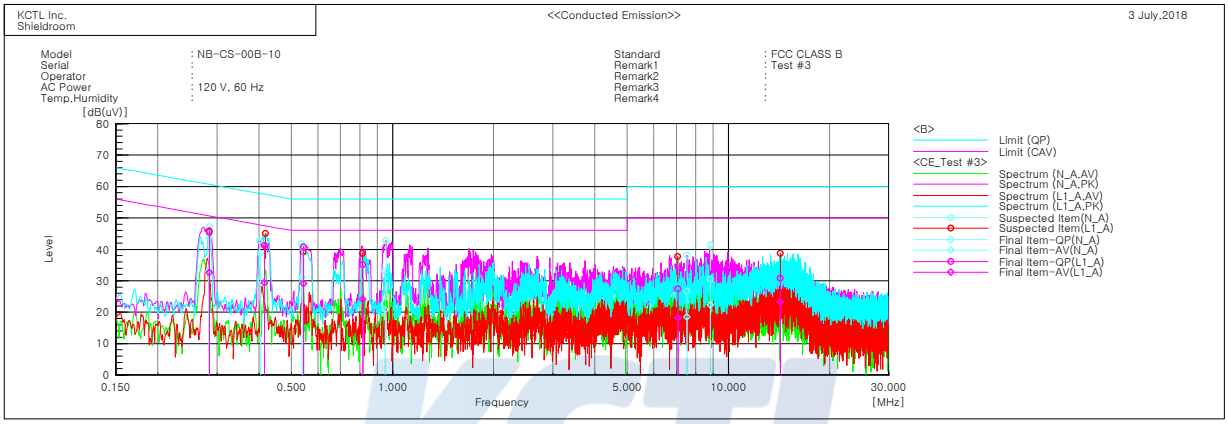
5) The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 ㎑ or to QUASI-PEAK and AVERAGE within a bandwidth of 9 ㎑. The EUT was in transmitting mode during the measurements.

5.3.3 Test Result

- Complied

Figure 6. plot of Conducted Emission

- Conducted worst-case data: GFSK_Middle channel (2 441 ㎒)



Final Result

--- N_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.28416	34.1	23.3	9.8	43.9	33.1	60.7	50.7	16.8	17.6
2	0.40458	28.5	20.2	10.1	38.6	30.3	57.8	47.8	19.2	17.5
3	0.53819	30.6	21.1	10.1	40.7	31.2	56.0	46.0	15.3	14.8
4	0.95038	23.1	10.7	10.0	33.1	20.7	56.0	46.0	22.9	25.3
5	7.52141	16.4	8.2	10.2	26.6	18.4	60.0	50.0	33.4	31.6
6	8.83169	20.1	12.0	10.3	30.4	22.3	60.0	50.0	29.6	27.7

--- L1_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.28495	35.5	22.8	9.8	45.3	32.6	60.7	50.7	15.4	18.1
2	0.41507	31.1	19.3	10.1	41.2	29.4	57.5	47.5	16.3	18.1
3	0.5428	30.7	19.0	10.1	40.8	29.1	56.0	46.0	15.2	16.9
4	0.81608	25.1	14.1	10.0	35.1	24.1	56.0	46.0	20.9	21.9
5	7.06724	17.2	8.0	10.2	27.4	18.2	60.0	50.0	32.6	31.8
6	14.27051	20.1	12.5	10.6	30.7	23.1	60.0	50.0	29.3	26.9

6. Test equipment used for test

	Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
■	DC Power Supply	AGILENT	E3632A	MY40016393	18.12.21
■	Bluetooth Tester	TESCOM	TC-3000C	3000C000270	18.08.02
■	EMI TEST RECEIVER	R & S	ESCI	100732	18.08.24
■	Bi-Log Antenna	SCHWARZBECK	VULB 9168	583	20.05.04
■	Amplifier	SONOMA INSTRUMENT	310N	186280	19.04.05
■	Amplifier	SONOMA INSTRUMENT	310N	284608	18.08.24
■	ATTENUATOR	Weinschel ENGINEERING	1	AE7348	19.05.14
■	Horn antenna	ETS.lindgren	3116	00086632	19.04.20
■	Horn antenna	ETS.lindgren	3117	155787	18.10.20
■	AMPLIFIER	L-3 Narda-MITEQ	AMF-7D-01001800-22-10P	2003683	18.06.12
■	AMPLIFIER	L-3 Narda-MITEQ	JS44-18004000-33-8P	2000997	18.08.09
■	LOOP Antenna	R & S	HFH2-Z2	892665/035	19.01.25
■	Antenna Mast	Innco Systems	MA4640-XP-ET	-	-
■	Turn Table	Innco Systems	DT2000	79	-
■	Antenna Mast	Innco Systems	MA4000-EP	303	-
■	Turn Table	Innco Systems	DT2000	79	-
■	Highpass Filter	WT	WT-A1698-HS	WT160411001	19.05.14
■	Vector Signal Generator	R & S	SMBV100A	257566	19.01.05
■	Signal Generator	R & S	SMR40	100007	19.05.15
■	Cable Assembly	RadiAll	23017617680 00PJ	17.30.38	-
■	Cable Assembly	gigalane	RG-400	-	-
■	Cable Assembly	HUER+SUHNER	SUCOFLEX 104	MY4342/4	-

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