



TEST REPORT

100, Jangjateo-ro, Hobeop-myeon,
Icheon-si, Gyeonggi-do, 17396, Korea
Tel: 031-637-8898 / Fax: 0505-116-8895

1. Client

- Name : COOLSSHA
- Address..... : 818,819, 95 Maehwasandan-ro, Siheung-si, Gyeonggi-do, Republic of Korea

2. Use of Report..... : FCC Approval

3. Sample Description

- Product Name : Auto toothbrush
- Model Name : CS-501000D

4. Date of Receipt..... : 2025-05-08

5. Date of Test : 2025-06-12 ~ 2025-06-13

6. Test Method : FCC Part 15 Subpart C

7. Test Results : Refer to the test results

- ※ The results shown in this test report are the results of testing the samples provided.
- ※ This test report is prepared according to the requirements of ISO / IEC 17025.

Affirmation	Tested by	Technical Manager
	Jong-Myoung, Shin (Sign)	Kyung-Taek, Lee (Sign)

Jun 24, 2025

EMC Labs Co., Ltd.



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Version

TEST REPORT NO.	DATE	DESCRIPTION
KR0140-RF2506-007	Jun 24, 2025	Initial Issue



1. Applicant & Manufacturer & Test Laboratory Information

1.1 Applicant Information

Applicant	COOLSSHA
Applicant Address	818,819, 95 Maehwasandan-ro, Siheung-si, Gyeonggi-do, Republic of Korea
Contact Person	Bongsoon, Jin
Telephone No.	+82-31-504-3337
Fax No.	-
E-mail	coolsha4100@naver.com

1.2. Manufacturer Information

Manufacturer	COOLSSHA
Manufacturer Address	818,819, 95 Maehwasandan-ro, Siheung-si, Gyeonggi-do, Republic of Korea

1.3 Test Laboratory Information

Laboratory	EMC Labs Co., Ltd.
Laboratory Address	100, Jangjateo-ro, Hobeop-myeon, Icheon-si, Gyeonggi-do, Republic of Korea
Contact Person	Jong-Myoung, Shin
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FCC Designation No.	KR0140
FCC Registration No.	580000
IC Site Registration No.	28751



2. Equipment under Test(EUT) Information

2.1 General Information

Product Name	Auto toothbrush
Model Name	CS-501000D
FCC ID	2BQAU-CS-501000D
Rated Voltage	AC 120 V

2.2 Additional Information

Operating Frequency	64.99 kHz
Number of channel	1
Modulation Type	ASK
Antenna Type	Coil Antenna
Firmware Version	1.0
Hardware Version	1.0

2.3 Test Frequency

Test mode	Test Frequency (kHz)		
	Low Frequency	Middle Frequency	High Frequency
WPC	64.99	–	–

2.4 Mode of operation during the test

- The EUT continuous transmission mode during the test with set at Low Channel, Middle Channel, and High Channel. To get a maximum radiated emission levels from the EUT, the EUT was moved throughout the XY, YZ, XZ planes.

2.5 Modifications of EUT

- None



3. Test Summary

Applied	FCC Rule	Test Items	Test Condition	Result
<input checked="" type="checkbox"/>	15.203	Antenna Requirement	–	C
<input checked="" type="checkbox"/>	15.215	20 dB Bandwidth	Radiated	C
<input checked="" type="checkbox"/>	15.209	Radiated Emission		C
<input checked="" type="checkbox"/>	15.207	Conducted Emissions	AC Line Conducted	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: For radiated emission tests below 30 MHz were performed on semi-anechoic chamber which is correlated with OATS.

The sample was tested according to the following specification: ANSI C63.10:2013.

Compliance was determined by specification limits of the applicable standard according to customer requirements.



4. Used equipment on test

	Description	Manufacturer	Model Name	Serial Name	Next Cal.
<input type="checkbox"/>	TEMP & HUMID CHAMBER	JFM	JFMA-001	20200929-01	2025.11.06
<input type="checkbox"/>	CONTROLLER	AMWON TECHNOLOGY	TEMI2500	S7800VK191 0707	2025.11.06
<input type="checkbox"/>	PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	MY45304057	2025.11.07
<input type="checkbox"/>	MXG ANALOG SIGNAL GENERATOR	AGILENT	N5183A	MY50141890	2025.11.07
<input type="checkbox"/>	SYSTEM DC POWER SUPPLY	AGILENT	6674A	MY53000118	2025.11.07
<input type="checkbox"/>	VECTOR SIGNAL GENERATOR	ROHDE & SCHWARZ	SMBV100A	257524	2025.11.07
<input type="checkbox"/>	DIRECTIONAL COUPLER	AGILENT	773D	2839A01855	2025.11.07
<input type="checkbox"/>	ATTENUATOR	AGILENT	8493C	73193	2025.11.07
<input type="checkbox"/>	TERMINATION	HEWLETT PACKARD	909D	07492	2025.11.07
<input type="checkbox"/>	POWER DIVIDER	HEWLETT PACKARD	11636A	06916	2025.11.07
<input checked="" type="checkbox"/>	SLIDE-AC	DAEKWANG TECH	SV-1023	NONE	2025.11.07
<input checked="" type="checkbox"/>	DIGITAL MULTIMETER	HUMANTECHSTORE	15B+	50561541WS	2025.11.07
<input type="checkbox"/>	ATTENUATOR	ACE RF COMM	ATT SMA 20W 20dB 8GHz	A-0820.SM20.2	2026.04.04
<input type="checkbox"/>	DC POWER SUPPLY	AGILENT	E3634A	MY40012120	2026.02.13
<input type="checkbox"/>	USB Peak Power Sensor	Anritsu	MA24408A	12321	2025.11.08
<input type="checkbox"/>	High Pass Filter	WT Microwave INC.	WT-A3314-HS	WT22111804-1	2025.11.07
<input type="checkbox"/>	High Pass Filter	WT Microwave INC.	WT-A1935-HS	WT22111804-2	2025.12.06
<input type="checkbox"/>	SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSU26	200444	2026.02.13
<input type="checkbox"/>	ATTENUATOR	Mini-Circuits	BW-K3-2W44+	2318-1	2026.02.13
<input type="checkbox"/>	ATTENUATOR	Mini-Circuits	BW-K3-2W44+	2318-2	2026.05.08
<input type="checkbox"/>	Balanced Temperature and Humidity Control System	ESPEC CORP.	SH-241	92004650	2026.05.07
<input checked="" type="checkbox"/>	ACTIVE LOOP ANTENNA	TESEQ	HLA 6121	55685	2026.12.20
<input checked="" type="checkbox"/>	Biconilog ANT	Schwarzbeck	VULB 9160	3260	2026.04.01
<input type="checkbox"/>	Biconilog ANT	Schwarzbeck	VULB9168	902	2026.08.28
<input type="checkbox"/>	Horn ANT	Schwarzbeck	BBHA9120D	974	2025.11.29
<input type="checkbox"/>	Horn ANT	Schwarzbeck	BBHA9120D	1497	2026.01.03
<input type="checkbox"/>	Amplifier	TESTEK	TK-PA18H	200104-L	2026.05.23
<input type="checkbox"/>	Horn ANT	Schwarzbeck	BBHA9170	01188	2026.03.20
<input type="checkbox"/>	Horn ANT	Schwarzbeck	BBHA9170	01189	2026.03.20
<input type="checkbox"/>	AMPLIFIER	TESTEK	TK-PA1840H	220105-L	2026.03.17
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW44	101952	2026.03.17
<input checked="" type="checkbox"/>	Test Receiver	ROHDE & SCHWARZ	ESR7	101616	2025.06.27
<input checked="" type="checkbox"/>	TWO LINE V-NETWORK	ROHDE & SCHWARZ	ENV216	102596	2025.08.20
<input checked="" type="checkbox"/>	PULSE LIMITER	lignex1	EPL-30	NONE	2026.01.04



5. Antenna Requirement

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 Result

Complies

(The transmitter has a Coil Antenna.)



6. 20 dB Bandwidth

6.1 Test Setup

Refer to the APPENDIX I.

6.2 Limit

N/A

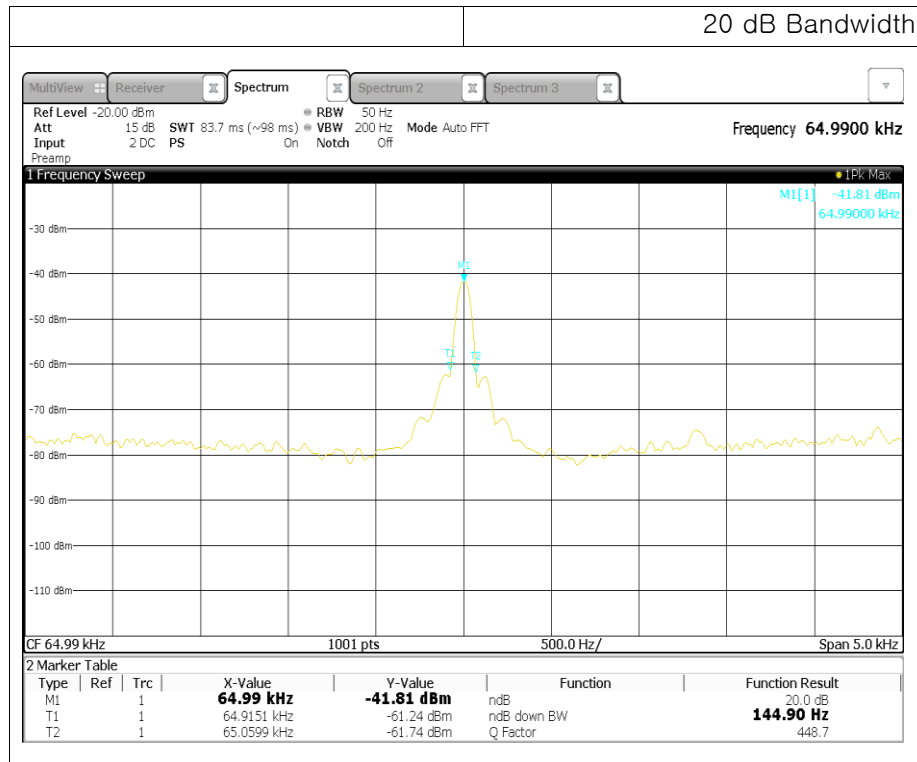
6.3 Test Procedure

1. The 20 dB Bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.
2. Spectrum analyzer setting use following test procedure
RBW = 1 % ~ 5 % OBW
VBW \geq 3 \times RBW
Span = 2 ~ 5 times the OBW
Detector = Peak
Trace = Max hold
3. The trace was allowed to stabilize
4. Determine the reference value = Set the spectrum analyzer marker to the highest level of the displayed trace
5. Using the marker-delta function of the instrument, determine the “-xx dB down amplitude” using [(reference value) - xx].
6. Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.



6.4 Test Result

Tested Frequency(kHz)	20dB Bandwidth(Hz)
64.99	144.90





7. Radiated Emissions

7.1 Test Setup

Refer to the APPENDIX I.

7.2 Limit

Part 15.209(a): General requirement

Frequency [MHz]	Field Strength [uV/m]	Measurement Distance [Meters]
0.009 ~ 0.490	2 400/F (kHz)	300
0.490 ~ 1.705	24 000/F (kHz)	30
1.705 ~ 30	30	30
30 ~ 88	100**	3
88 ~ 216	150**	3
216 ~ 960	200**	3
Above 960	500	3

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 – 72 MHz, 76 – 88 MHz, 174 – 216 MHz or 470 – 806 MHz.

However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

7.3 Test Procedure

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.

During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

– Measurement Data: Comply (refer to the next page)

7.4 Test Result

- Test Frequency: 64.99 kHz
- Measurement Distance: 3 m

Test Frequency (kHz)	Freq. (MHz)	Ant	Detector	Reading Value (dBuV)	T.F (dB/m)	Distance Factor	Field Strength @3m (dBuV/m)	Limit (dBuV/m)	Margin (dB)
64.99	*0.065	H	QP	58.80	20.54	80	–0.66	36.93	37.59
	0.129	H	PK	57.46	20.67	80	–1.87	18.65	20.52
	0.195	H	PK	59.73	20.67	80	0.40	12.31	11.91
	8.723	H	PK	19.53	21.60	40	1.13	29.54	28.41
	40.170	H	PK	16.45	19.42	0	35.87	40.00	4.13
	46.960	H	PK	17.16	19.92	0	37.08	40.00	2.92
	63.430	H	PK	17.80	19.35	0	37.15	40.00	2.85

Note 1: * = Fundamental emission

Note 2: Loop antenna orientation (Below 30 MHz)

“P”= Parallel, “V”= perpendicular, “G”= ground–parallel

Bilog antenna polarization (Above 30 MHz)

“H”= Horizontal, “V”= Vertical

Note 3: No other spurious and harmonic emissions were reported greater than listed emissions above table.

Note 4: Sample calculation

Margin = Limit – Field Strength

Field Strength = Reading + T.F – Distance factor

T.F = AF + CL – AG

Distance factor = $20\log(\text{Measurement distance} / \text{The measured distance})^2$

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain



8. Conducted Emission

8.1 Test Setup

See test photographs for the actual connections between EUT and support equipment.

8.2 Limit

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 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohm line impedance stabilization network (LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Conducted Limit (dBUV)	
	Quasi-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

8.3 Test Procedure

Conducted emissions from the EUT were measured according to the ANSI C63.10.

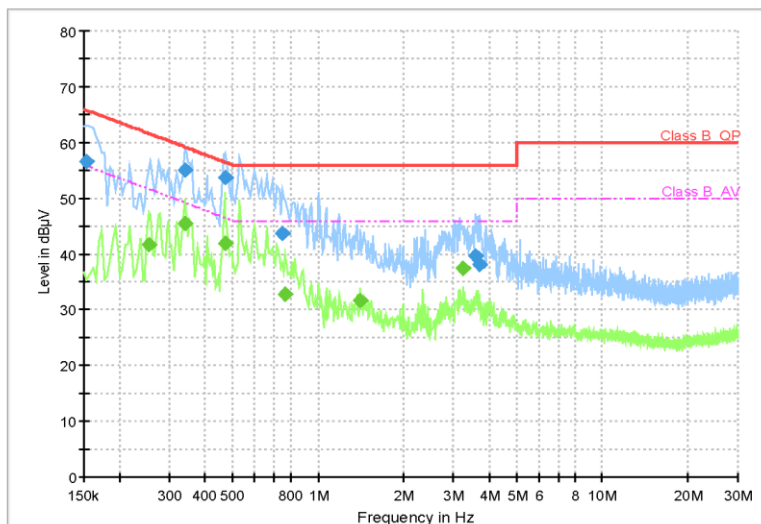
1. The test procedure is performed in a 6.5 m \times 3.5 m \times 3.5 m (L \times W \times H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) \times 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

8.4 Test Result

- AC Line Conducted Emission (Graph)

CS-501000D_L1

Conducted Emission

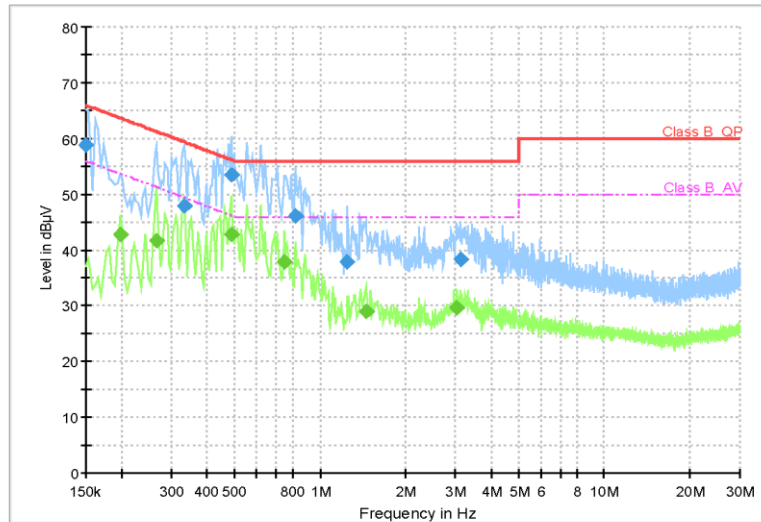


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.154	56.56	---	65.78	9.23	9	L1	19.5
0.254	---	41.59	51.63	10.03	9	L1	19.4
0.342	---	45.47	49.16	3.68	9	L1	19.5
0.342	55.10	---	59.16	4.05	9	L1	19.5
0.470	---	41.83	46.51	4.69	9	L1	19.7
0.470	53.64	---	56.51	2.88	9	L1	19.7
0.750	43.57	---	56.00	12.43	9	L1	19.7
0.770	---	32.72	46.00	13.28	9	L1	19.7
1.410	---	31.71	46.00	14.29	9	L1	19.7
3.230	---	37.45	46.00	8.55	9	L1	19.6
3.590	39.70	---	56.00	16.30	9	L1	19.6
3.720	38.14	---	56.00	17.86	9	L1	19.6

CS-501000D_N

Conducted Emission



Final Result

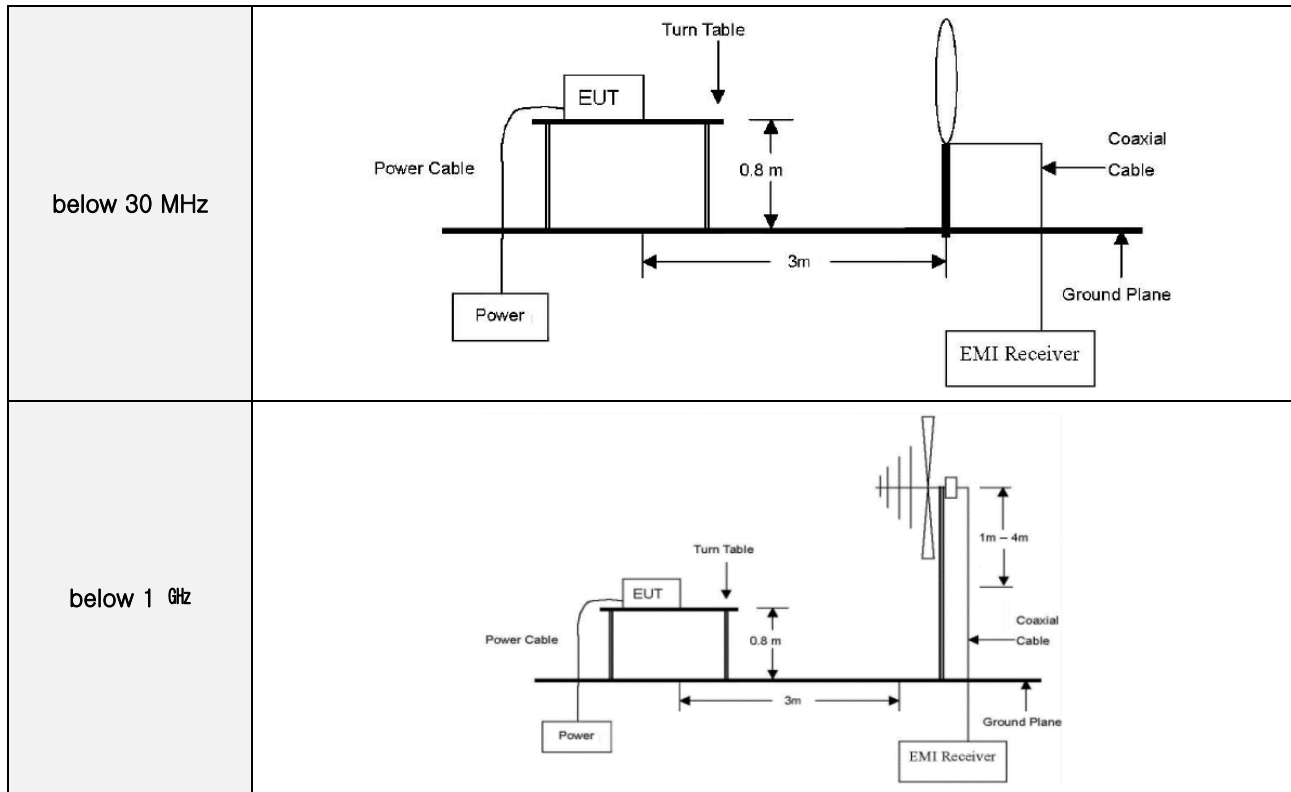
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.150	58.89	---	66.00	7.11	9	N	19.4
0.198	---	42.72	53.69	10.98	9	N	19.6
0.266	---	41.78	51.24	9.46	9	N	19.5
0.334	47.99	---	59.35	11.36	9	N	19.5
0.486	---	42.73	46.24	3.50	9	N	19.8
0.486	53.41	---	56.24	2.83	9	N	19.8
0.750	---	37.88	46.00	8.12	9	N	19.7
0.820	46.10	---	56.00	9.90	9	N	19.7
1.250	37.87	---	56.00	18.13	9	N	19.7
1.450	---	29.06	46.00	16.94	9	N	19.6
3.040	---	29.59	46.00	16.41	9	N	19.6
3.130	38.35	---	56.00	17.65	9	N	19.6

APPENDIX I

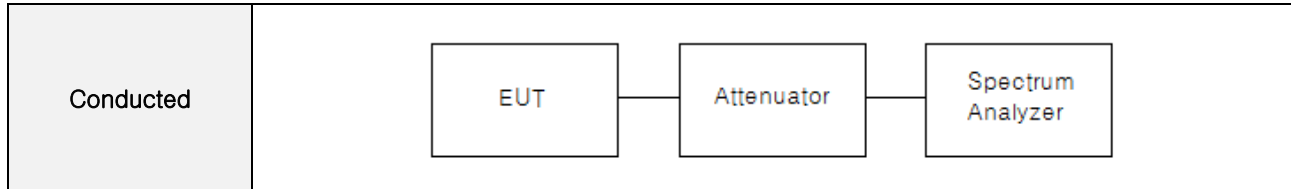
TEST SETUP



- Radiated Measurement



- Conducted Measurement



APPENDIX II

UNCERTAINTY



Measurement Item	Expanded Uncertainty $U = kU_c (k=2)$
Radiated Spurious Emissions	5.82 dB
Conducted Emissions	2.00 dB