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TEST REPORT

FCC NFC Test for SM-A908B

Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-1908-FC036-R3

DATE OF ISSUE
10 September 2019

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TEST REPORT

FCC NFC Test for SM-A908B

REPORT NO.
HCT-RF-1908-FC036-R3

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FCC ID
A3LSMA908B

Applicant	**SAMSUNG Electronics Co., Ltd.** 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Eut Type Model Name	Mobile Phone SM-A908B
RF Output Field Strength	17.17 dBuV/m @30 m
Modulation type	ASK
FCC Classification	Low Power Communication Device – Transmitter
FCC Rule Part(s)	FCC Part 15.225 Subpart C

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test results were applied only to the test methods required by the standard.

Tested by
Jeong Ho Kim (signature)

Technical Manager
Jong Seok Lee (signature)

HCT CO., LTD.
Soo Chan Lee
SooChan Lee / CEO

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	27 August 2019	Initial Release
1	5 September 2019	Added the ISO 17025 KOLAS logo. On page 13. Test procedure revised On page 23. Retest plot added
2	7 September 2019	-Add the HCT Accreditation No. for ISO 17025 KOLAS -Changed the * mark except for page 3
3	10 September 2019	-* identification mark do not use for different identification mark

This laboratory is not accredited for the test results marked *.

The above Test Report is the accredited test result by KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Engineering Statement:
The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

CONTENTS

1. EUT DESCRIPTION

Model	SM-A908B
Additional Model	-
EUT Type	Mobile Phone
Power Supply	DC 3.85 V
Battery Information	Model: EB-BA908ABY Type: Li-ion Battery
Travel Adapter Information	Model : EP-TA800 Manufacture: SOLUM
Data Cable Information	Model : EP-DA905BBE Manufacture: Luxshare
Ear-jack Information	Model : GHSS028-K4 Manufacture: BUJEON Electronics
Frequency of Operation	13.5595 MHz
Transmit Power	17.17 dBuV/m @30 m
Modulation Type	ASK
Antenna type	LDS
Date(s) of Tests	July 17, 2019 ~ August 23, 2019

2. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) is used in the measurement of the test device.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.225 under the FCC Rules Part 15 Subpart C.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013).

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.
Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.
Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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."

(1) The antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of § 15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of

ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

7. DESCRIPTION OF TESTS

7.1. Radiated Test

Limit (Operation within the band 13.110 MHz – 14.010 MHz)

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
13.553 – 13.567	15,848	30
13.410 ≤ f ≤ 13.553 13.567 ≤ f ≤ 13.710	334	30
13.110 ≤ f ≤ 13.410 13.710 ≤ f ≤ 14.010	106	30

Note:

1. 15,848 uV/m = 84.0 dBuV/m
2. 334 uV/m = 50.47 dBuV/m
3. 106 uV/m = 40.51 dBuV/m

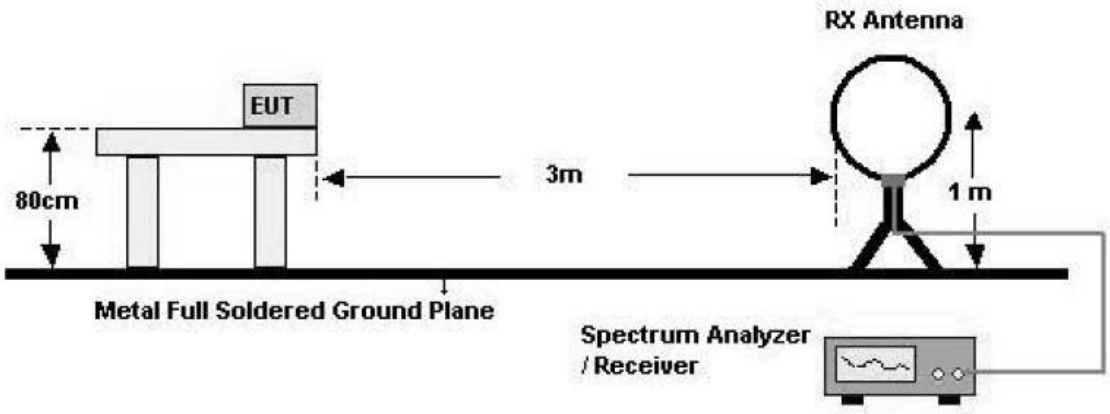
Limit (Radiated Spurious Emissions)

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	※100	3
88-216	※150	3
216-960	※200	3
Above 960	500	3

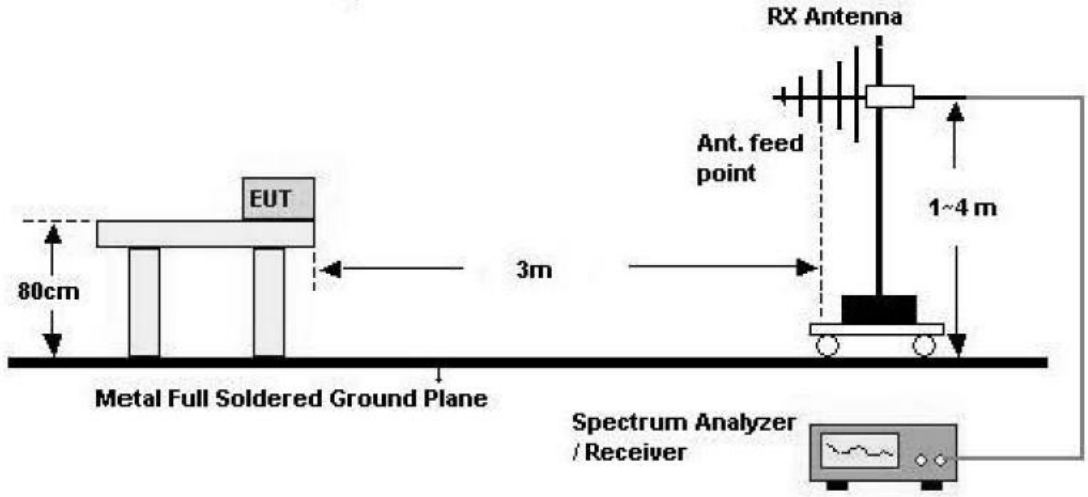
※:
Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or
470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Test Configuration

Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz

Test Procedure of inband

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m (Below 30 MHz)
7. Spectrum Setting
   - Detector = Peak
   - Trace = Maxhold
   - RBW = 9 kHz
   - VBW ≥ 3 x RBW
8. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

Test Procedure of Radiated spurious emissions(Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) = 40log(3 m/300 m) = - 80 dB
   Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m
8. Spectrum Setting
   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Maxhold
   - RBW = 9 kHz
   - VBW ≥ 3 x RBW
9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

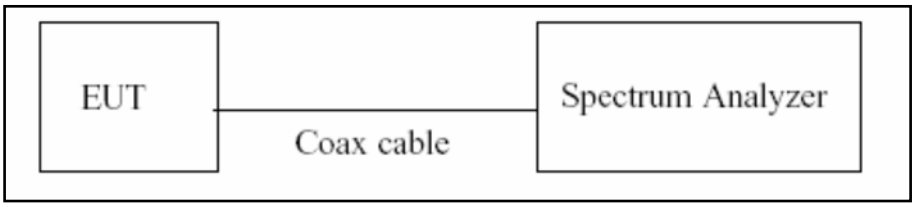
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions(Above 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. Spectrum Setting
   - Frequency Range = 30 MHz ~ 1 GHz
   - Detector = Peak
   - Trace = Maxhold
   - RBW = 100 kHz
   - VBW ≥ 3 x RBW
6. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
7. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

7.2. 20dB Bandwidth

Test Configuration



Test Procedure

The 20 dB bandwidth was measured by using a spectrum analyzer.

(Procedure 6.9.2 in ANSI 63.10-2013)

1) RBW = 1% ~ 5% of the OBW
2) VBW = approximately three times RBW
3) Span = between two times and five times the OBW
4) Detector = Peak
5) Trace mode = Max hold
6) Allow the trace to stabilize

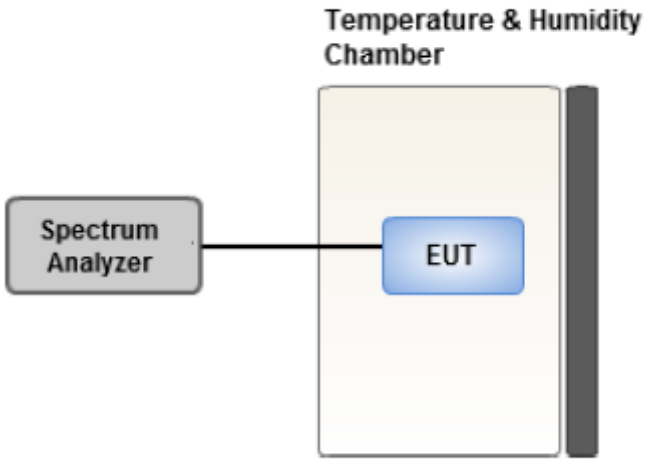
Note :

We tested Occupied Bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.

Limit

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency.

Test Configuration



Test Procedure.

For battery operated equipment, the equipment tests shall be performed using a new battery.

1) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.
2) Set the temperature control on the chamber to the highest specified in the regulatory requirements

for the type of device and allow the oscillator heater and the chamber temperature to stabilize.

3) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON

and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after

the EUT is energized. Four measurements in total are made.

4) The freque
5) ncy tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

Note:

1) Temperature:

The temperature is varied from -20°C to + 50°C using an environmental chamber.

2) Primary Supply Voltage :

The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment.

For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battety operating end point which shall be specified by the manufacturer.

7.4. AC Power line Conducted Emissions

Limit

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 μH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56[a]	56 to 46[a]
0.50 to 5	56	46
5 to 30	60	50

[a]Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.
5. The EUT is the device operating below 30 MHz.
   - For unterminated the Antenna, the AC line conducted tests are performed with the antenna connected
   - For terminated the Antenna, the AC line conducted tests are performed with a dummy load connected to the EUT antenna output terminal.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

7.5. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone + external accessories(Earphone, etc)
   - Worstcase : Stand alone
2. EUT Axis : Y,Z
3. All type and bitrate were investigated and the worst case results are reported.
   (Worst case : Type A, 106 kbps)
4. All position of loop antenna were investigated and the worst case configuration results are reported.
   - Position : Horizontal, Vertical, Parallel to the ground plane
   - Worstcase : Horizontal

AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone+Earphone+Travel Adapter, Stand alone+Travel Adapter
   - Worstcase : Stand alone+Travel Adapter

20dB Bandwidth & Frequency Stability

1. All type and bitrate were investigated and the worst case results are reported.
   (Worst case : Type A, 106 kbps)

8. SUMMARY TEST OF RESULTS

Regulation	Requirement	Result
Part 15.225 (a)	Radiated Electric Field Emissions (13.553MHz to 13.567MHz)	Pass
Part 15.225 (b)	Radiated Electric Field Emissions (13.410 ≤ f ≤ 13.553, 13.567 ≤ f ≤ 13.710)	Pass
Part 15.225 (c)	Radiated Electric Field Emissions (13.110 ≤ f ≤ 13.410, 13.710 ≤ f ≤ 14.010)	Pass
Part 15.209	Radiated Electric Field Emissions (9kHz to 30MHz)	Pass
Part 15.209	Radiated Electric Field Emissions (30MHz to 1GHz)	Pass
Part 15.225 (e)	Frequency Stability	Pass
Part 15.207	AC power conducted emissions (150kHz to 30MHz)	Pass
Part 15.215 (c)	20 dB Bandwidth	Pass

9. TEST RESULT

9.1 Operation within the band 13.110 MHz – 14.010 MHz

Measured Frequency Range : 13.553 MHz-13.567 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor +Cable Loss (dB/m)	Distance Correction (dB)	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5595	37.63	19.54	-40.00	17.17	84.00	66.83
13.5591	32.47	19.54	-40.00	12.01	84.00	71.99

Measured Frequency Range : 13.410 MHz-13.553 MHz and 13.567 MHz-13.710 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor +Cable Loss (dB/m)	Distance Correction (dB)	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5529	31.99	19.54	-40.00	11.53	50.47	38.94
13.5671	31.14	19.54	-40.00	10.68	50.47	39.79

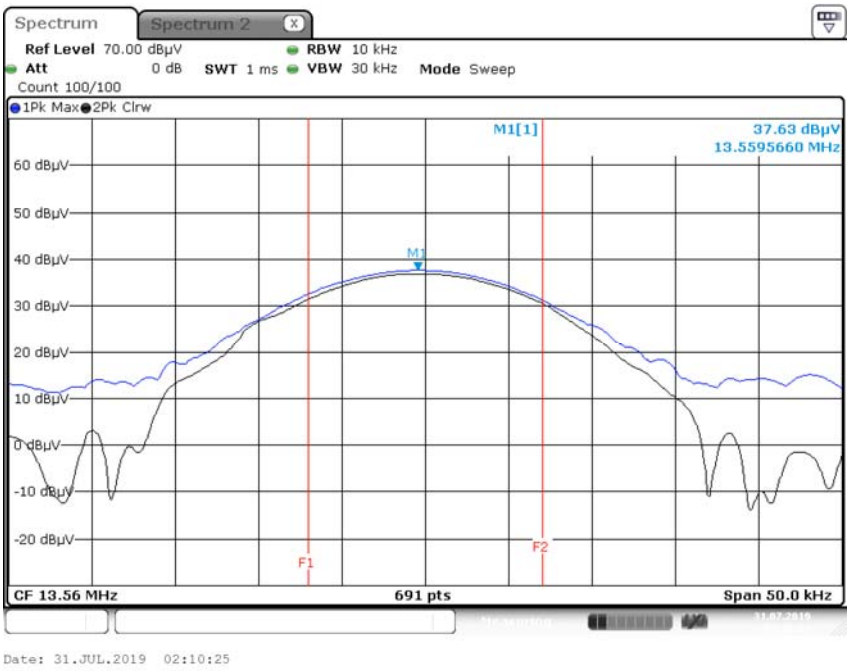
Measured Frequency Range : 13.110 MHz – 13.410 MHz and 13.710 MHz-14.010 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor +Cable Loss (dB/m)	Distance Correction (dB)	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.3483	19.61	19.54	-40.00	-0.85	40.51	41.36
13.7723	19.54	19.54	-40.00	-0.92	40.51	41.43

Note:

1. With Tag(worst case)

▣ Test Plot

With Tag (Worst case : Z-H)



Note:

Plot of worst case are only reported.

9.2 Radiated Emission 9 kHz – 30 MHz

Measured Frequency Range : 9 kHz - 30 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor +Cable Loss (dB/m)	Distance Correction (dB)	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
10.675	18.78	19.54	-40.00	-1.68	29.54	31.22
21.311	13.55	19.54	-40.00	-6.91	29.54	36.45
27.1345	11.05	19.99	-40.00	-8.96	29.54	38.50
27.7466	12.27	19.99	-40.00	-7.74	29.54	37.28

Note:

1. With Tag(worst case)
2. Data of worst case are only reported.

9.3 Radiated Emission 30 MHz – 1000 MHz

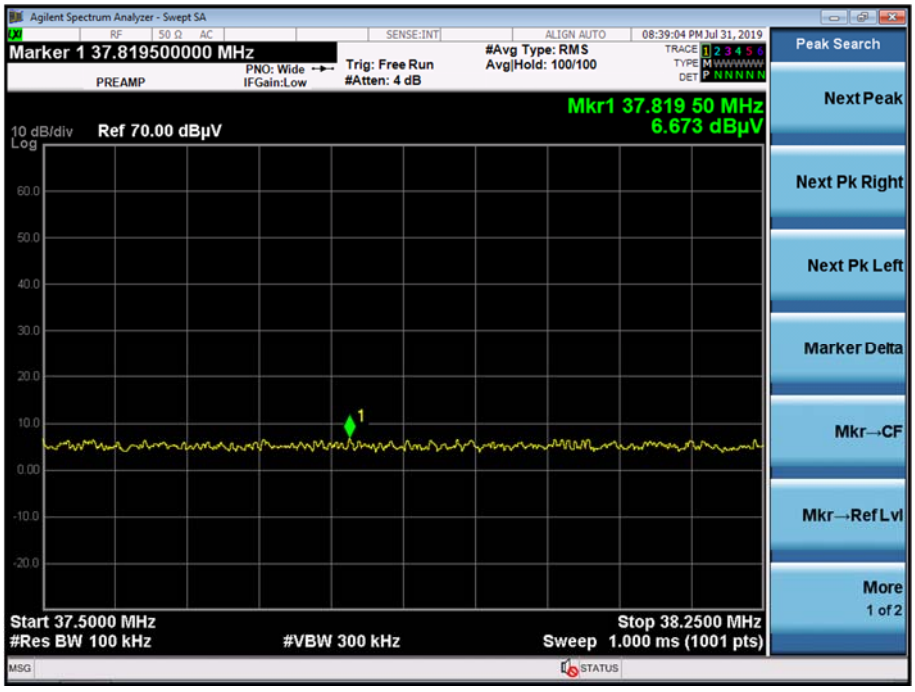
Measured Frequency Range : 30 MHz - 1000 MHz							
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Ant. Pol (H/V)	Total (dBuV/m)	Limit (dBuV/m)	Margin (dB)
※37.8195	6.673	18.50	0.49	H	25.663	40.00	14.337
53.7850	6.702	18.20	0.56	H	25.462	40.00	14.538
97.9150	7.726	15.50	0.78	V	24.006	40.00	15.994
※115.8600	6.785	17.70	0.86	H	25.345	43.50	18.155
※133.7250	7.359	18.35	0.91	H	26.619	43.50	16.881
180.6800	6.172	18.80	0.98	V	25.952	43.50	17.548

Note:

1. '※' is the result for restricted band.
2. With Tag(worst case)
3. Data of worst case are only reported.

▣ **Test Plot**

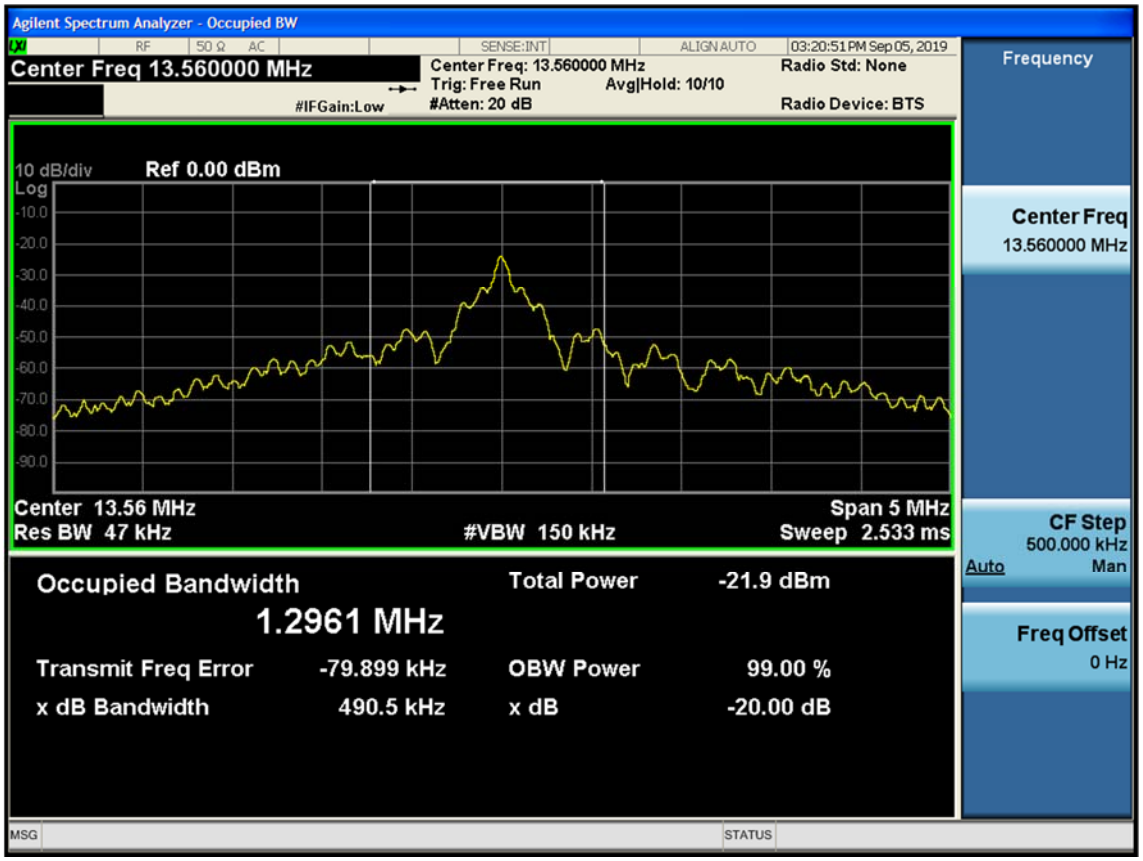
With Tag



Note:

Plot of worst case are only reported

9.4 20 dB Bandwidth



9.5 Frequency Stability

Startup

PERATING FREQUENCY	13.56 MHz
REFERENCE VOLTAGE	3.85 VDC
DEVIATION LIMIT	0.01 % = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.85	-20	13.560051	51	0.0003789
100%		-10	13.560046	46	0.0003403
100%		0	13.560041	41	0.0003054
100%		+10	13.560039	39	0.0002858
100%		+20(Ref.)	13.560034	34	0.0002476
100%		+30	13.560038	38	0.0002771
100%		+40	13.560047	47	0.0003502
100%		+50	13.560053	53	0.0003914
LOW	3.65	+20	13.560051	51	0.0003760
HIGH	4.4	+20	13.560049	49	0.0003606

2 minutes

PERATING FREQUENCY	13.56 MHz
REFERENCE VOLTAGE	3.85 VDC
DEVIATION LIMIT	0.01 % = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.85	-20	13.560046	46	0.0003404
100%		-10	13.560040	40	0.0002918
100%		0	13.560035	35	0.0002609
100%		+10	13.560033	33	0.0002440
100%		+20(Ref.)	13.560029	29	0.0002110
100%		+30	13.560032	32	0.0002338
100%		+40	13.560040	40	0.0002951
100%		+50	13.560044	44	0.0003222
LOW	3.65	+20	13.560048	48	0.0003535
HIGH	4.4	+20	13.560042	42	0.0003106

5 minutes

PERATING FREQUENCY	13.56 MHz
REFERENCE VOLTAGE	3.85 VDC
DEVIATION LIMIT	0.01 % = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.85	-20	13.560052	52	0.0003849
100%		-10	13.560046	46	0.0003378
100%		0	13.560041	41	0.0003030
100%		+10	13.560039	39	0.0002865
100%		+20(Ref.)	13.560036	36	0.0002669
100%		+30	13.560040	40	0.0002948
100%		+40	13.560051	51	0.0003733
100%		+50	13.560056	56	0.0004135
LOW	3.65	+20	13.560054	54	0.0003963
HIGH	4.4	+20	13.560052	52	0.0003833

10 minutes

PERATING FREQUENCY	13.56 MHz
REFERENCE VOLTAGE	3.85 VDC
DEVIATION LIMIT	0.01 % = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.85	-20	13.560057	57	0.0004235
100%		-10	13.560051	51	0.0003792
100%		0	13.560046	46	0.0003422
100%		+10	13.560044	44	0.0003233
100%		+20(Ref.)	13.560039	39	0.0002909
100%		+30	13.560042	42	0.0003131
100%		+40	13.560050	50	0.0003699
100%		+50	13.560056	56	0.0004135
LOW	3.65	+20	13.560057	57	0.0004169
HIGH	4.4	+20	13.560054	54	0.0004018

9.6 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

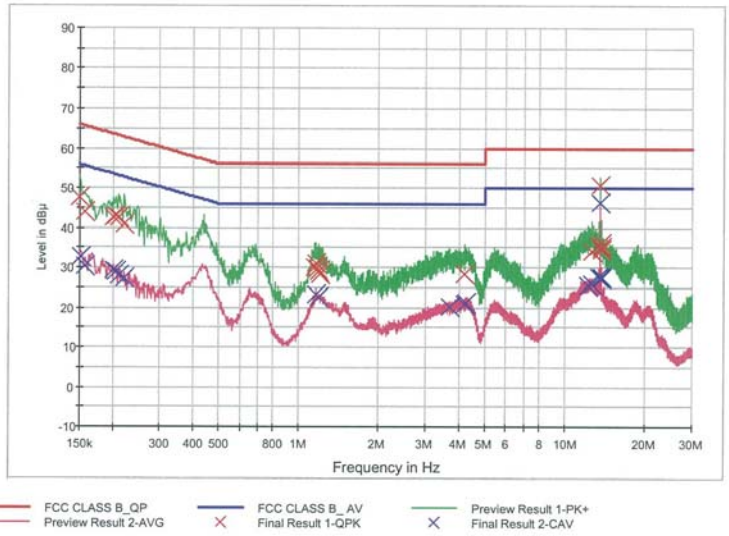
NFC_L1 1 / 2

HCT TEST Report

Common Information

EUT:	SM-A908B
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC Mode_L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	47.6	9.000	Off	L1	9.7	18.4	66.0
0.158000	43.8	9.000	Off	L1	9.7	21.8	65.6
0.202000	42.5	9.000	Off	L1	9.7	21.0	63.5
0.206000	42.7	9.000	Off	L1	9.7	20.7	63.4
0.210000	42.6	9.000	Off	L1	9.7	20.6	63.2
0.220000	40.7	9.000	Off	L1	9.7	22.1	62.8
1.144000	30.0	9.000	Off	L1	9.8	26.0	56.0
1.164000	30.9	9.000	Off	L1	9.8	25.1	56.0
1.172000	29.8	9.000	Off	L1	9.8	26.2	56.0
1.190000	29.0	9.000	Off	L1	9.8	27.0	56.0
1.204000	28.2	9.000	Off	L1	9.8	27.8	56.0
4.210000	28.4	9.000	Off	L1	10.0	27.6	56.0
12.570000	34.0	9.000	Off	L1	10.3	26.0	60.0
13.458000	35.4	9.000	Off	L1	10.4	24.6	60.0
13.560000	50.6	9.000	Off	L1	10.4	9.4	60.0
13.642000	35.0	9.000	Off	L1	10.4	25.0	60.0
13.668000	36.3	9.000	Off	L1	10.4	23.7	60.0
13.684000	34.4	9.000	Off	L1	10.4	25.6	60.0

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NFC_L1

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Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.152000	32.8	9.000	Off	L1	9.7	23.1	55.9
0.158000	30.5	9.000	Off	L1	9.7	25.1	55.6
0.202000	29.3	9.000	Off	L1	9.7	24.2	53.5
0.206000	29.0	9.000	Off	L1	9.7	24.3	53.4
0.210000	28.0	9.000	Off	L1	9.7	25.2	53.2
0.220000	27.1	9.000	Off	L1	9.7	25.7	52.8
1.164000	23.1	9.000	Off	L1	9.8	22.9	46.0
1.190000	22.7	9.000	Off	L1	9.8	23.3	46.0
3.690000	20.2	9.000	Off	L1	10.0	25.8	46.0
4.196000	20.8	9.000	Off	L1	10.0	25.2	46.0
4.210000	20.9	9.000	Off	L1	10.0	25.1	46.0
4.278000	21.2	9.000	Off	L1	10.0	24.8	46.0
12.122000	25.6	9.000	Off	L1	10.3	24.4	50.0
12.570000	26.1	9.000	Off	L1	10.3	23.9	50.0
13.458000	27.8	9.000	Off	L1	10.4	22.2	50.0
13.560000	46.3	9.000	Off	L1	10.4	3.7	50.0
13.642000	27.2	9.000	Off	L1	10.4	22.8	50.0
13.656000	27.5	9.000	Off	L1	10.4	22.5	50.0

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Conducted Emissions (Line 2)

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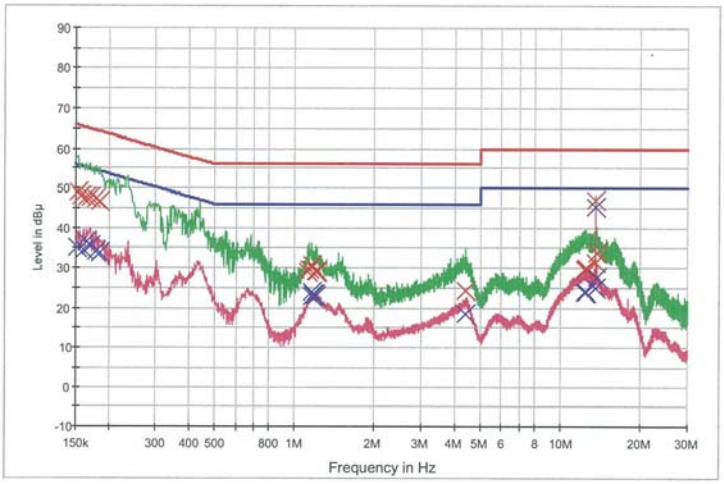
HCT TEST Report

Common Information

EUT:	SM-A908B
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC Mode_N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	48.9	9.000	Off	N	9.8	16.8	65.8
0.158000	48.1	9.000	Off	N	9.8	17.5	65.6
0.164000	47.7	9.000	Off	N	9.8	17.6	65.3
0.170000	47.7	9.000	Off	N	9.8	17.3	65.0
0.178000	47.4	9.000	Off	N	9.8	17.1	64.6
0.186000	46.5	9.000	Off	N	9.8	17.7	64.2
1.122000	28.9	9.000	Off	N	10.0	27.1	56.0
1.136000	29.7	9.000	Off	N	10.0	26.3	56.0
1.158000	30.7	9.000	Off	N	10.0	25.3	56.0
1.198000	29.1	9.000	Off	N	10.0	26.9	56.0
1.214000	28.9	9.000	Off	N	10.0	27.1	56.0
4.414000	24.1	9.000	Off	N	10.2	31.9	56.0
12.392000	29.8	9.000	Off	N	10.6	30.2	60.0
12.408000	29.7	9.000	Off	N	10.6	30.3	60.0
12.514000	30.0	9.000	Off	N	10.6	30.0	60.0
13.472000	31.5	9.000	Off	N	10.6	28.5	60.0
13.560000	46.9	9.000	Off	N	10.6	13.1	60.0
13.666000	33.7	9.000	Off	N	10.6	26.3	60.0

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NFC_N

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	35.1	9.000	Off	N	9.8	20.7	55.9
0.160000	34.3	9.000	Off	N	9.8	21.2	55.5
0.164000	36.5	9.000	Off	N	9.8	18.8	55.3
0.170000	35.3	9.000	Off	N	9.8	19.6	55.0
0.178000	34.1	9.000	Off	N	9.8	20.5	54.6
0.186000	33.7	9.000	Off	N	9.8	20.5	54.2
1.158000	23.0	9.000	Off	N	10.0	23.0	46.0
1.162000	23.8	9.000	Off	N	10.0	22.2	46.0
1.170000	23.2	9.000	Off	N	10.0	22.8	46.0
1.184000	23.2	9.000	Off	N	10.0	22.8	46.0
1.198000	22.8	9.000	Off	N	10.0	23.2	46.0
4.414000	18.3	9.000	Off	N	10.2	27.7	46.0
12.358000	23.9	9.000	Off	N	10.6	26.1	50.0
12.392000	23.8	9.000	Off	N	10.6	26.2	50.0
12.514000	24.0	9.000	Off	N	10.6	26.0	50.0
13.492000	24.8	9.000	Off	N	10.6	25.2	50.0
13.560000	45.2	9.000	Off	N	10.6	4.8	50.0
13.666000	27.6	9.000	Off	N	10.6	22.4	50.0

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10. LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	12/12/2018	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/18/2019	Annual	100584
ESPAC	SU-642 /Temperature Chamber	03/12/2019	Annual	0093008124
Agilent	N9020A / Signal Analyzer	05/23/2019	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	11/20/2018	Annual	MY49431210
Agilent	N1911A / Power Meter	04/10/2019	Annual	MY45100523
Agilent	N1921A / Power Sensor	04/10/2019	Annual	MY52260025
Agilent	87300B / Directional Coupler	11/20/2018	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	05/24/2019	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	06/18/2019	Annual	KR75303960
WEINSCHEL	2-20 / Attenuator(20 dB)	10/26/2018	Annual	BR0592
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A
HCT CO., LTD.	FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	N/A	N/A
Rohde & Schwarz	CBT / Bluetooth Tester	05/16/2019	Annual	100422

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

Radiated Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	08/23/2018	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	03/22/2019	Biennial	760
Schwarzbeck	VULB 9160 / TRILOG Antenna	08/09/2018	Biennial	9160-3368
Schwarzbeck	BBHA 9120D / Horn Antenna	08/01/2019	Biennial	1151
Schwarzbeck	BBHA 9120D / Horn Antenna	04/29/2019	Biennial	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/03/2018	Annual	100688
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/28/2018	Annual	101068-SZ
Agilent	N9020A / Signal Analyzer	05/23/2019	Annual	MY51110085
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	05/23/2019	Annual	8
Wainwright Instruments	WHKX7.0/18G-8SS / High Pass Filter	05/03/2019	Annual	29
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/19/2019	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/03/2019	Annual	2
Api tech.	18B-03 / Attenuator (3 dB)	06/04/2019	Annual	1
H+S	5910-N-50-010 / Attenuator(10 dB)	11/08/2018	Annual	NONE
CERNEX	CBLU1183540 / Power Amplifier	07/01/2019	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	07/01/2019	Annual	22965
CERNEX	CBL18265035 / Power Amplifier	01/03/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/18/2019	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	03/26/2019	Annual	3000C000276

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.

2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

11. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-1908-FC036-P