HCT CO.,LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 FAX: +82-31-645-6401

FCC NFC REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
June 18, 2020

Test Site/Location:
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2006-FC006

FCC ID:	**A3LSMA516V**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model:	SM-A516V
EUT Type:	Mobile Phone
RF Output Field Strength:	13.99 dBuV/m @30 m
Frequency of Operation:	13.56 MHz
Modulation type:	ASK
FCC Classification:	Low Power Communication Device – Transmitter
FCC Rule Part(s):	FCC Part 15.225 Subpart C

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.

REVIEWED BY

Report prepared by : Jin Gwan Lee
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
Manager of Telecommunication Testing Center

This test results were applied only to the test methods required by the standard.

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)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2006-FC006	June 18, 2020	- First Approval Report

This test results were applied only to the test methods required by the standard.

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)

Table of Contents

1. EUT DESCRIPTION

Model	SM-A516V
Additional Model	-
EUT Type	Mobile Phone
Power Supply	DC 3.88 V
Battery Information	Model: EB-BA516AMY Type: Li-ion Battery
Travel Adapter Information	Model : EP-TA200 Manufacture: DONG YANG E&P
Data Cable Information	Model : EP-DR140ABZ Manufacture: RFTech
Ear-jack Information	Model : EHS64AVFWE Manufacture: ALMUS
Frequency of Operation	13.56 MHz
Transmit Power	Without Tag: 13.99 dBuV/m @30 m With Tag: 13.75 dBuV/m @30 m
Modulation Type	ASK
Date(s) of Tests	May 12, 2020 ~ June 02, 2020

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)

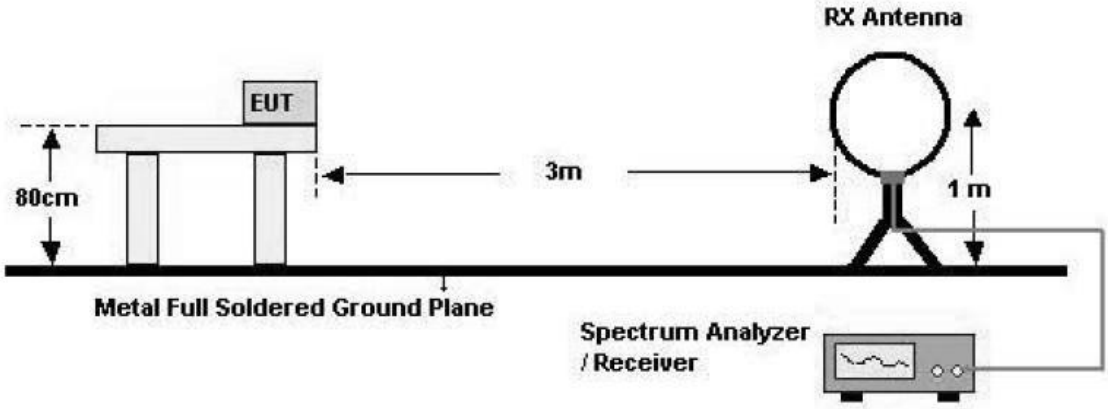
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	※100	3
88-216	※150	3
216-960	※200	3
Above 960	500	3

※:

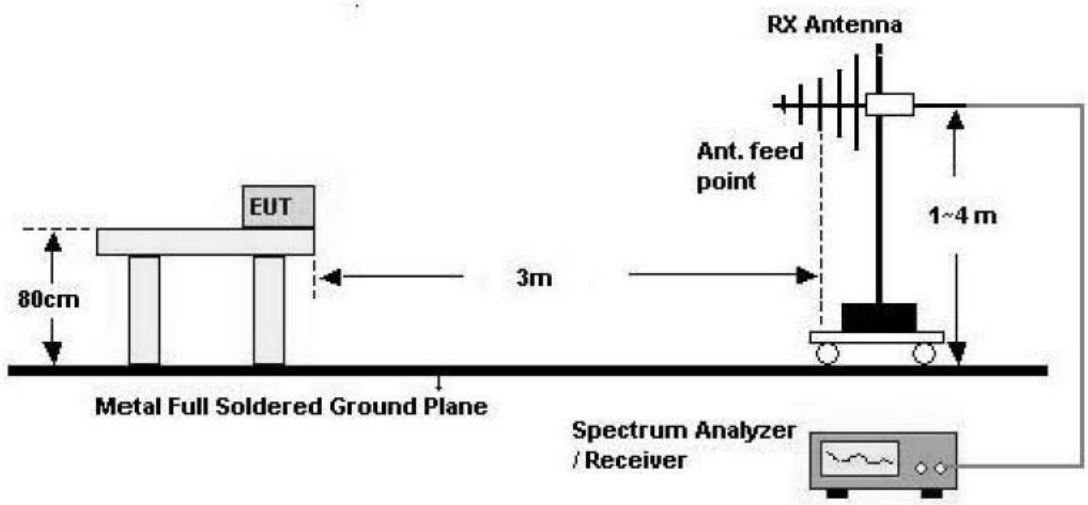
Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part,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

Test Configuration

Below 30 MHz



30 MHz - 1 GHz



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 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 = 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.

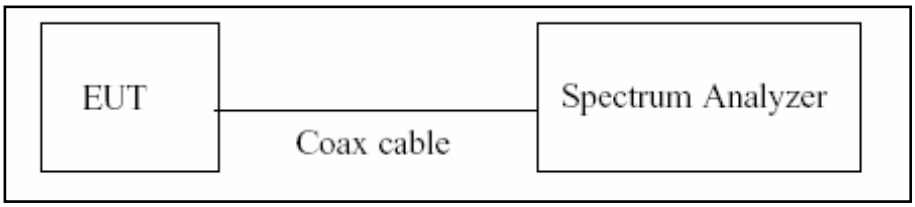
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

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 :

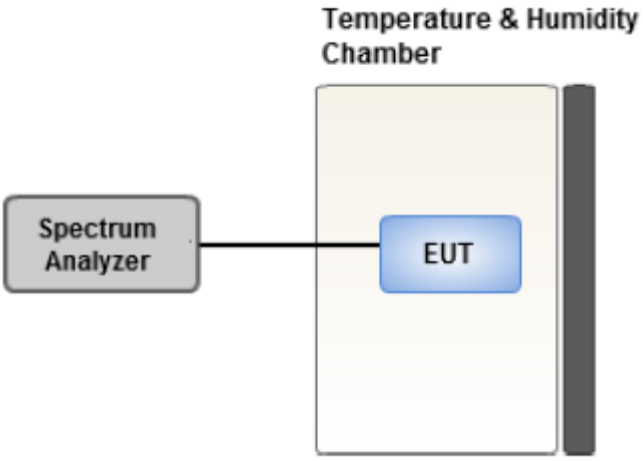
We tested Occupied Bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.

7.3. Frequency Stability

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. TEST SUMMARY

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)	Ant. POL	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5599	35.82	18.17	-40.00	H	13.99	84.00	70.01
13.5589	31.29	18.17	-40.00	V	9.46	84.00	74.54

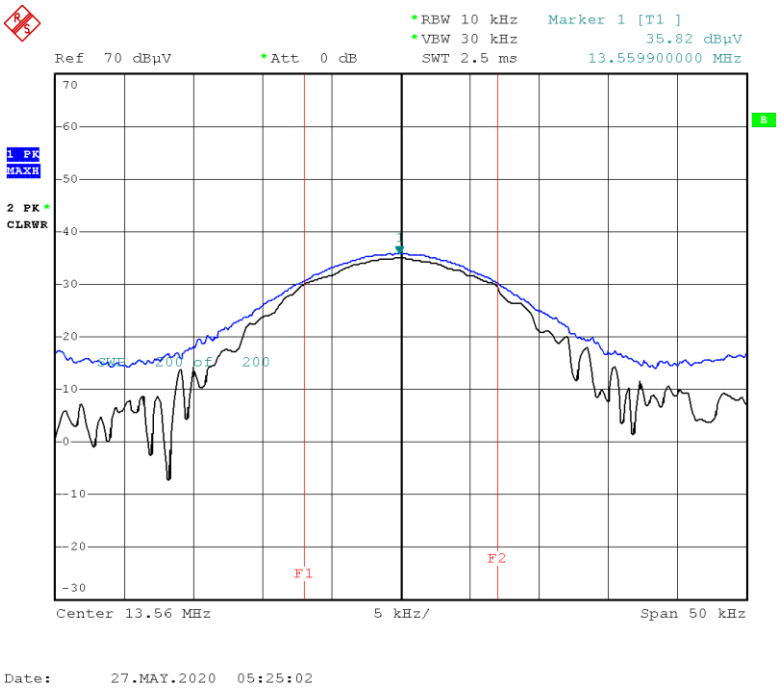
Measured Frequency Range : 13.410 MHz-13.553 MHz and 13.567 MHz-13.710 MHz							
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor +Cable Loss (dB/m)	Distance Correction (dB)	Ant. POL	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5530	30.62	18.17	-40.00	H	8.79	50.47	41.68
13.5670	29.86	18.17	-40.00	V	8.03	50.47	42.44

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)	Ant. POL	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.3470	20.26	18.17	-40.00	H	-1.57	40.51	42.08
13.7718	20.46	18.17	-40.00	V	-1.37	40.51	41.88

Note:

Without Tag (worst case)

▣ Test Plot



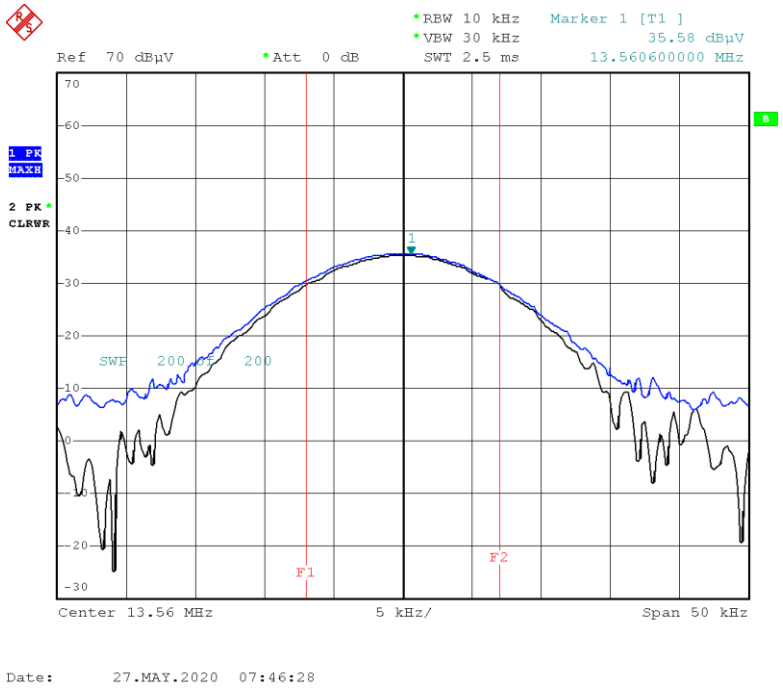
Note:

Plot of worst case are only reported.

With Tag Mode (only fundamental)

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)	Ant. POL	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5606	35.58	18.17	-40.00	H	13.75	84.00	70.25
13.5604	32.46	18.17	-40.00	V	10.63	84.00	73.37

▣ Test Plot



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)	Ant. POL	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
7.0636	13.11	18.17	-40.00	H	-8.72	29.54	38.26
14.0740	12.63	17.89	-40.00	H	-9.48	29.54	39.02
27.1147	8.62	17.89	-40.00	H	-13.49	29.54	43.03
27.4862	7.98	17.89	-40.00	V	-14.13	29.54	43.67

Note:

1. Without Tag (worst case)

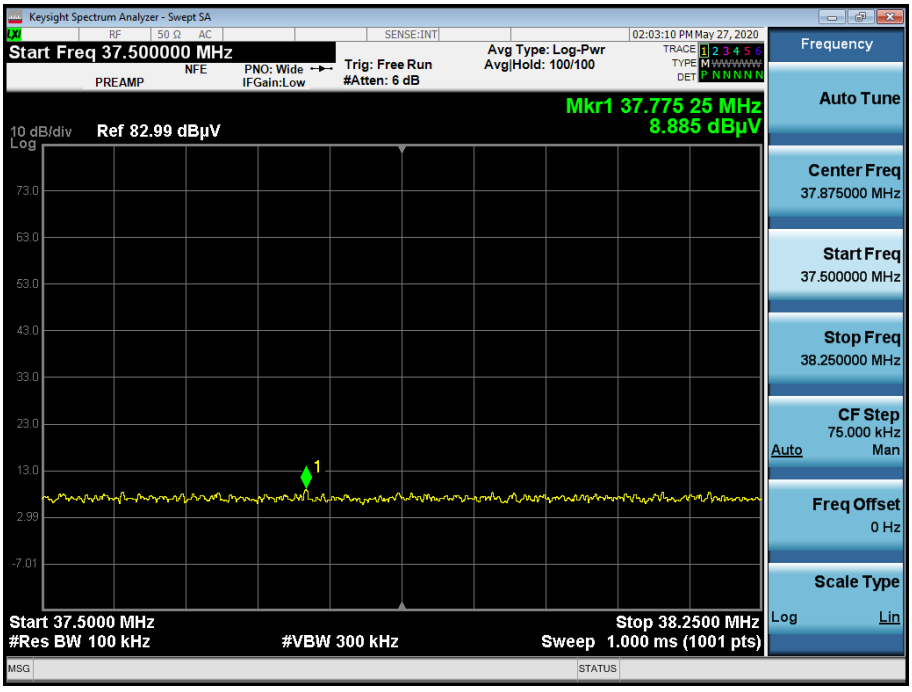
9.3. Radiated Emission 30 MHz – 1000 MHz

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)
37.7753※	8.885	14.90	0.55	H	24.34	40.00	15.67
41.1054	8.660	14.90	0.55	H	24.11	40.00	15.89
47.5808	8.294	14.00	0.62	V	22.91	40.00	17.09
146.7900	9.455	13.80	1.12	H	24.38	43.50	19.13
150.3074※	8.955	13.80	1.12	H	23.88	43.50	19.63
172.8164※	9.546	13.00	1.19	V	23.74	43.50	19.76

Note:

1. '※' is the result for restricted band.
2. Without Tag (worst case)

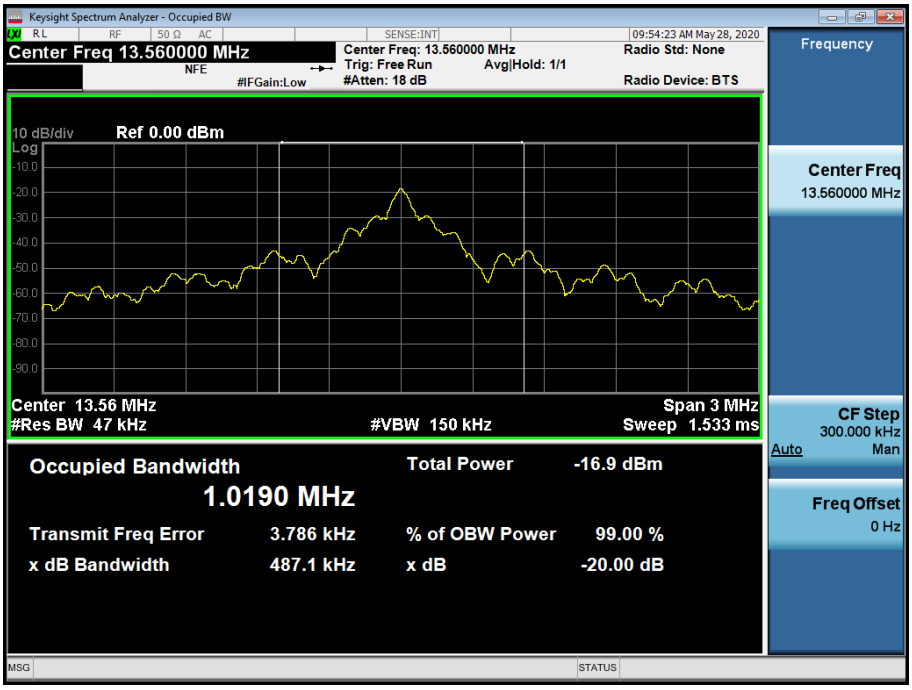
▣ Test Plot



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: 3.88 VDC

DEVIATION LIMIT: ±0.01 % = ±1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.88	-20	13.560011	11	0.0000784
100%		-10	13.560066	66	0.0004884
100%		0	13.560066	66	0.0004881
100%		+10	13.560078	78	0.0005740
100%		+20(Ref.)	13.560024	24	0.0001742
100%		+30	13.560097	97	0.0007131
100%		+40	13.560100	100	0.0007347
100%		+50	13.560021	21	0.0001512
LOW	3.68	+20	13.560050	50	0.0003662
HIGH	4.38	+20	13.560077	77	0.0005705

2 minutes

PERATING FREQUENCY: 13.56 MHz

REFERENCE VOLTAGE: 3.88 VDC

DEVIATION LIMIT: ±0.01 % = ±1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.88	-20	13.560087	87	0.0006408
100%		-10	13.560081	81	0.0006005
100%		0	13.560097	97	0.0007128
100%		+10	13.560051	51	0.0003787
100%		+20(Ref.)	13.560070	70	0.0005153
100%		+30	13.560073	73	0.0005395
100%		+40	13.560062	62	0.0004608
100%		+50	13.560078	78	0.0005719
LOW	3.68	+20	13.560053	53	0.0003886
HIGH	4.38	+20	13.560075	75	0.0005559

5 minutes

PERATING FREQUENCY: 13.56 MHz

REFERENCE VOLTAGE: 3.88 VDC

DEVIATION LIMIT: ±0.01 % = ±1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.88	-20	13.560091	91	0.0006683
100%		-10	13.560036	36	0.0002633
100%		0	13.560025	25	0.0001824
100%		+10	13.560035	35	0.0002607
100%		+20(Ref.)	13.560019	19	0.0001412
100%		+30	13.560055	55	0.0004080
100%		+40	13.560081	81	0.0005991
100%		+50	13.560034	34	0.0002475
LOW	3.68	+20	13.560086	86	0.0006330
HIGH	4.38	+20	13.560009	9	0.0000687

10 minutes

PERATING FREQUENCY: 13.56 MHz

REFERENCE VOLTAGE: 3.88 VDC

DEVIATION LIMIT: ±0.01 % = ±1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.88	-20	13.560085	85	0.0006243
100%		-10	13.560011	11	0.0000774
100%		0	13.560092	92	0.0006809
100%		+10	13.560046	46	0.0003360
100%		+20(Ref.)	13.560011	11	0.0000805
100%		+30	13.560047	47	0.0003471
100%		+40	13.560032	32	0.0002330
100%		+50	13.560045	45	0.0003326
LOW	3.68	+20	13.560088	88	0.0006461
HIGH	4.38	+20	13.560032	32	0.0002366

9.6. POWERLINE CONDUCTE EMISSIONS

Conducted Emissions (Line 1)

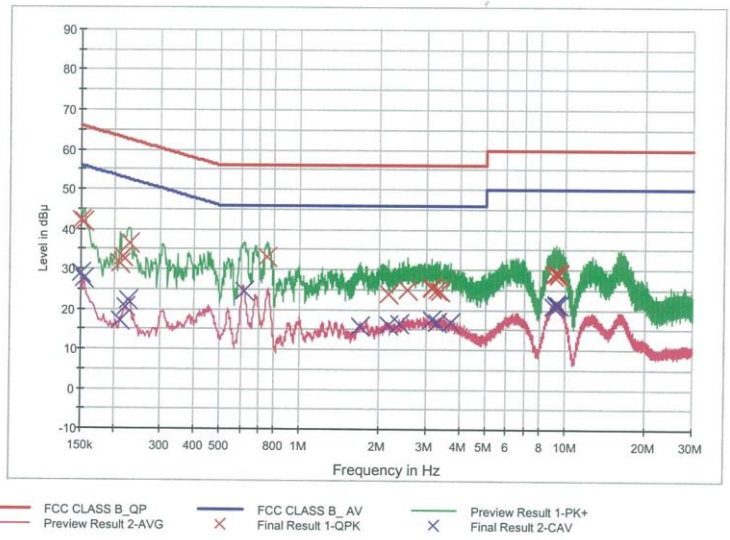
NFC MODE_L1 1 / 2

HCT TEST Report

Common Information

EUT:	SM-A516V
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	42.2	9.000	Off	L1	9.8	23.8	66.0
0.154000	41.7	9.000	Off	L1	9.8	24.0	65.8
0.210000	31.3	9.000	Off	L1	9.8	31.9	63.2
0.216000	32.9	9.000	Off	L1	9.8	30.0	63.0
0.228000	36.5	9.000	Off	L1	9.8	26.0	62.5
0.754000	33.1	9.000	Off	L1	9.8	22.9	56.0
2.152000	24.0	9.000	Off	L1	9.9	32.0	56.0
2.536000	25.0	9.000	Off	L1	9.9	31.0	56.0
3.134000	25.5	9.000	Off	L1	9.9	30.5	56.0
3.138000	25.2	9.000	Off	L1	9.9	30.8	56.0
3.302000	25.0	9.000	Off	L1	9.9	31.0	56.0
3.374000	24.7	9.000	Off	L1	9.9	31.3	56.0
8.996000	28.6	9.000	Off	L1	10.2	31.4	60.0
9.192000	29.1	9.000	Off	L1	10.2	30.9	60.0
9.254000	29.0	9.000	Off	L1	10.2	31.0	60.0
9.382000	28.8	9.000	Off	L1	10.2	31.2	60.0
9.418000	29.1	9.000	Off	L1	10.2	30.9	60.0
9.458000	28.9	9.000	Off	L1	10.2	31.1	60.0

2020-06-02 오전 10:40:55

NFC MODE_L1 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	29.0	9.000	Off	L1	9.8	27.0	56.0
0.154000	27.5	9.000	Off	L1	9.8	28.3	55.8
0.210000	17.3	9.000	Off	L1	9.8	36.0	53.2
0.220000	20.4	9.000	Off	L1	9.8	32.4	52.8
0.226000	22.1	9.000	Off	L1	9.8	30.4	52.6
0.620000	24.5	9.000	Off	L1	9.8	21.5	46.0
1.682000	15.6	9.000	Off	L1	9.9	30.4	46.0
2.152000	16.0	9.000	Off	L1	9.9	30.0	46.0
2.362000	16.4	9.000	Off	L1	9.9	29.6	46.0
3.138000	17.4	9.000	Off	L1	9.9	28.6	46.0
3.302000	16.9	9.000	Off	L1	9.9	29.1	46.0
3.694000	16.6	9.000	Off	L1	10.0	29.4	46.0
8.956000	20.8	9.000	Off	L1	10.2	29.2	50.0
8.996000	20.9	9.000	Off	L1	10.2	29.1	50.0
9.178000	21.3	9.000	Off	L1	10.2	28.7	50.0
9.192000	21.4	9.000	Off	L1	10.2	28.6	50.0
9.418000	21.2	9.000	Off	L1	10.2	28.8	50.0
9.458000	21.1	9.000	Off	L1	10.2	28.9	50.0

2020-06-02 오전 10:40:55

Conducted Emissions (Line 2)

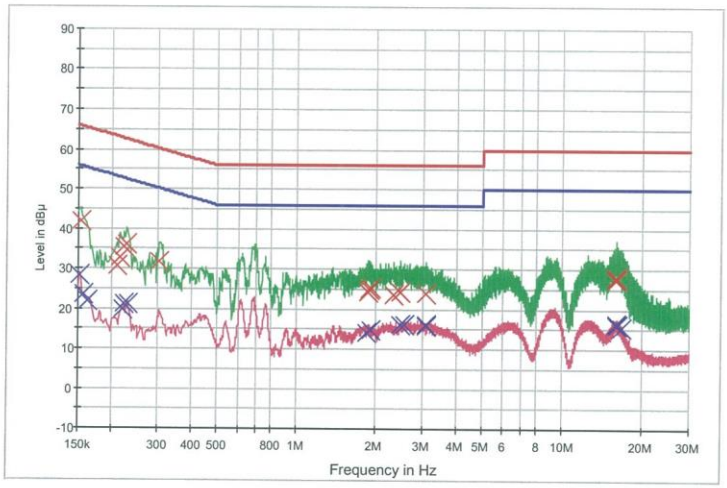
NFC MODE_N 1 / 2

HCT TEST Report

Common Information

EUT:	SM-A516V
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	41.8	9.000	Off	N	9.8	24.0	65.8
0.210000	30.6	9.000	Off	N	9.8	32.6	63.2
0.216000	32.6	9.000	Off	N	9.8	30.4	63.0
0.224000	35.4	9.000	Off	N	9.8	27.3	62.7
0.228000	36.2	9.000	Off	N	9.8	26.3	62.5
0.304000	31.7	9.000	Off	N	9.8	28.4	60.1
1.850000	24.1	9.000	Off	N	9.9	31.9	56.0
1.882000	24.9	9.000	Off	N	9.9	31.1	56.0
1.890000	25.2	9.000	Off	N	9.9	30.8	56.0
2.322000	23.6	9.000	Off	N	9.9	32.4	56.0
2.468000	24.3	9.000	Off	N	9.9	31.7	56.0
3.056000	23.9	9.000	Off	N	9.9	32.1	56.0
15.848000	27.8	9.000	Off	N	10.5	32.2	60.0
15.938000	27.5	9.000	Off	N	10.5	32.5	60.0
15.978000	27.6	9.000	Off	N	10.5	32.4	60.0
15.982000	27.9	9.000	Off	N	10.5	32.1	60.0
16.012000	27.6	9.000	Off	N	10.5	32.4	60.0
16.180000	27.5	9.000	Off	N	10.5	32.5	60.0

2020-06-02 오전 10:49:10

NFC MODE_N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	28.2	9.000	Off	N	9.8	27.6	55.9
0.158000	23.5	9.000	Off	N	9.8	32.0	55.6
0.162000	21.9	9.000	Off	N	9.8	33.4	55.4
0.220000	20.0	9.000	Off	N	9.8	32.9	52.8
0.224000	21.2	9.000	Off	N	9.8	31.5	52.7
0.230000	21.2	9.000	Off	N	9.8	31.2	52.4
1.826000	14.2	9.000	Off	N	9.9	31.8	46.0
1.890000	14.9	9.000	Off	N	9.9	31.1	46.0
2.468000	16.0	9.000	Off	N	9.9	30.0	46.0
2.544000	16.2	9.000	Off	N	9.9	29.8	46.0
3.056000	16.0	9.000	Off	N	9.9	30.0	46.0
3.068000	15.8	9.000	Off	N	9.9	30.2	46.0
15.938000	16.4	9.000	Off	N	10.5	33.6	50.0
15.978000	16.1	9.000	Off	N	10.5	33.9	50.0
15.982000	16.1	9.000	Off	N	10.5	33.9	50.0
16.012000	16.3	9.000	Off	N	10.5	33.7	50.0
16.120000	16.1	9.000	Off	N	10.5	33.9	50.0
16.630000	15.3	9.000	Off	N	10.5	34.7	50.0

2020-06-02 오전 10:49:10

10. LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	09/11/2019	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/18/2019	Annual	100033
ESPAC	SU-642 /Temperature Chamber	03/18/2020	Annual	0093008124
Agilent	N9020A / Signal Analyzer	05/11/2020	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	05/06/2020	Annual	MY53310623
Agilent	N1911A / Power Meter	04/07/2020	Annual	MY45101406
Agilent	N1921A / Power Sensor	03/23/2020	Annual	MY55220026
Agilent	87300B / Directional Coupler	11/11/2019	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	05/25/2020	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	06/18/2019	Annual	KR75303960
Weinschel	2-20 / Attenuator(20 dB)	07/02/2019	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
Emco	2090 / Controller	N/A	N/A	060520
Ets	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	05/18/2020	Biennial	1513-175
Schwarzbeck	VULB 9160 / Hybrid Antenna	08/09/2018	Biennial	3368
Schwarzbeck	VULB 9168 / Hybrid Antenna	08/31/2018	Biennial	00895
Schwarzbeck	BBHA 9120D / Horn Antenna	11/18/2019	Biennial	9120D-1191
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	11/29/2019	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/11/2019	Annual	836650/016
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/26/2019	Annual	101068-SZ
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/21/2020	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	02/10/2020	Annual	1
CERNEX WEINSCHEL	CBLU1183540B-01/Broadband Bench Top LNA 56-10 / Attenuator(10 dB)	12/24/2019	Annual	N/A
CERNEX Api tech.	CBL06185030 / Broadband Low Noise Amplifier 18B-03 / Attenuator (3 dB)	12/24/2019	Annual	N/A
Wainwright Instruments	WHKX10-2700-3000-18000-40SS / High Pass Filter	12/24/2019	Annual	N/A
Wainwright Instruments	WHKX8-6090-7000-18000-40SS / High Pass Filter	12/24/2019	Annual	N/A
T&M SYSTEM	COAXIAL ATTENUATOR / Thru	12/24/2019	Annual	N/A
CERNEX	CBL18265035 / Power Amplifier	12/26/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	03/23/2020	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	03/18/2020	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.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

11. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2006-FC006-P