

FCC NFC REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

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Date of Issue:
February 10, 2021

Test Site/Location:
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si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2102-FC004

FCC ID:	A3LSMA326U
APPLICANT:	SAMSUNG Electronics Co., Ltd.
Model:	SM-A326U
Additional Model:	SM-A326U1/DS, SM-S326DL
EUT Type:	Mobile Phone
RF Output Field Strength:	12.84 dBuV/m @30 m
Frequency of Operation:	13.56 MHz
Modulation type:	ASK
FCC Classification:	Low Power Communication Device Transmitter (DXX)
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.

Report No.: HCT-RF-2102-FC004

REVIEWED BY



Report prepared by : Woong Jin Kim
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 (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2102-FC004	February 10, 2021	- First Approval Report

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1. EUT DESCRIPTION

Model	SM-A326U
Additional Model	SM-A326U1/DS, SM-S326DL
EUT Type	Mobile Phone
Power Supply	DC 3.86 V
Frequency of Operation	13.56 MHz
Transmit Power	12.84 dBuV/m @30 m
Modulation Type	ASK
Date(s) of Tests	December 22, 2020 ~ February 04, 2021
Serial number	Radiated: R3CNC01K89M Conducted: 4C19CDC0BB1C7ECE

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)

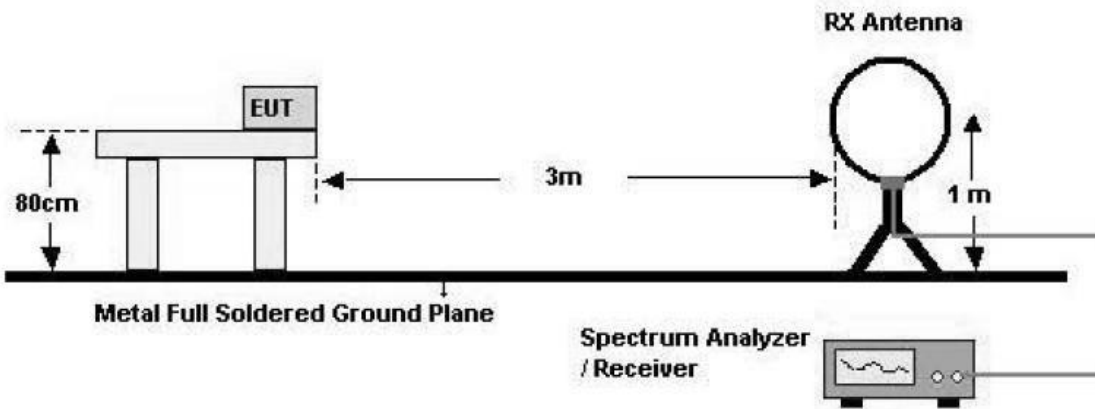
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	* 100	3
88-216	* 150	3
216-960	* 200	3
Above 960	500	3

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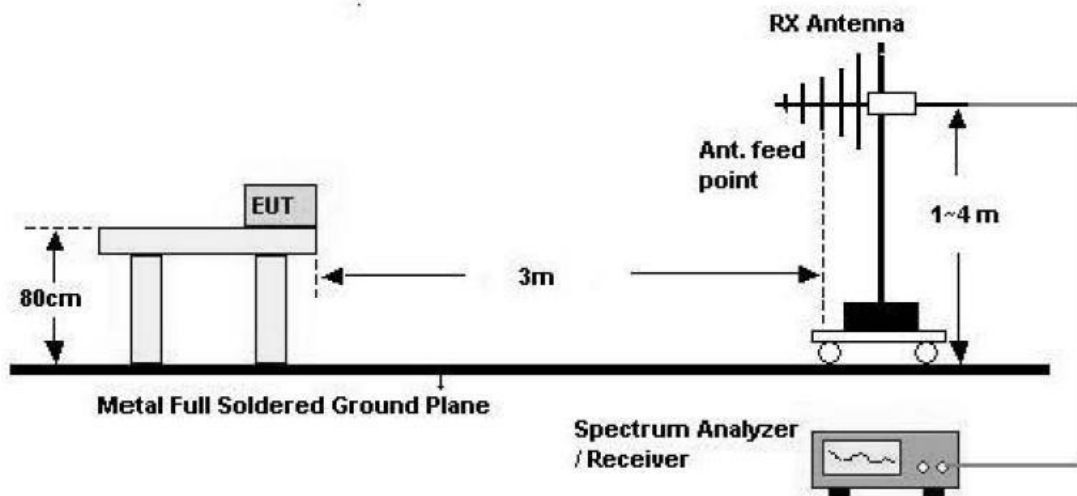
Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, 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 = $40\log(3\text{ m}/30\text{ m}) = -40\text{ dB}$
Measurement Distance : 3 m (Below 30 MHz)

7. Spectrum Setting

- Detector = Peak
- Trace = Maxhold
- RBW = 9 kHz
- VBW $\geq 3 \times$ 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) = $40\log(3 \text{ m}/300 \text{ m}) = - 80 \text{ dB}$
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40\log(3 \text{ m}/30 \text{ m}) = - 40 \text{ dB}$
Measurement Distance : 3 m
8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 9 kHz
 - VBW $\geq 3 \times$ 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.

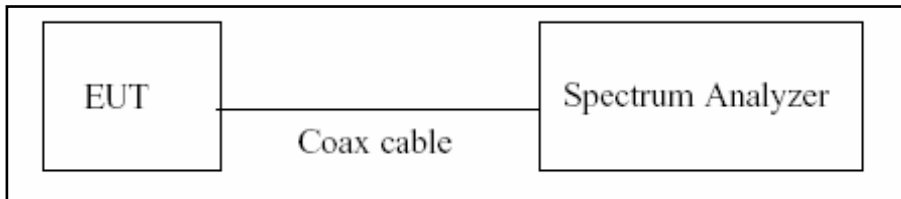
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

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. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
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. Spectrum Setting
 - Frequency Range = 30 MHz ~ 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \geq 3 x RBW
7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. 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 :

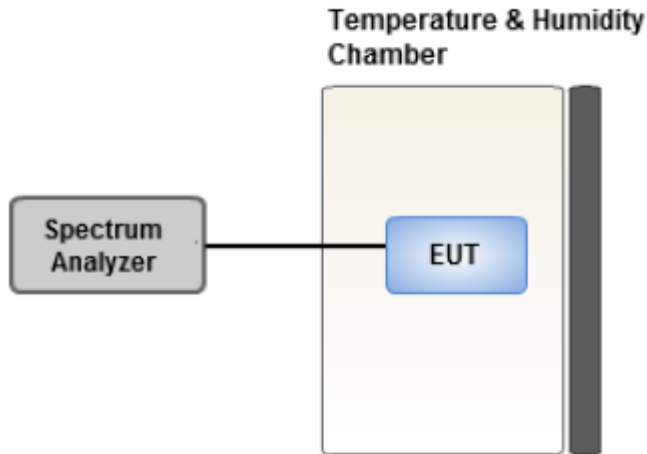
We tested Occupied Bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.

7.3. Frequency Stability

Limit

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ 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 frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency.

Note:

- 1) Temperature:
The temperature is varied from -20°C to $+50^{\circ}\text{C}$ 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 battery 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 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	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 : Z
3. All type and bitrate were investigated and the worst case results are reported.
 - Worst case : Type A, 106 kbps
4. All mode of without tag and with tag were investigated and the worst case configuration results are reported.
 - Worstcase : Without Tag
5. 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
6. SM-A326U, SM-A326U1/DS, SM-S326DL were tested and the worst case results are reported.
 - Worst case : SM-A326U

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
2. All modes(For unterminated the Antenna, terminated the Antenna) of operation were investigated and the worst case configuration results are reported.
 - Worstcase : Unterminated the Antenna
3. SM-A326U, SM-A326U1/DS, SM-S326DL were tested and the worst case results are reported.
 - Worst case : SM-A326U

20dB Bandwidth & Frequency Stability

1. All type and bitrate were investigated and the worst case results are reported.
 - Worst case : Type A, 106 kbps
2. SM-A326U, SM-A326U1/DS, SM-S326DL were tested and the worst case results are reported.
 - Worst case : SM-A326U

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 ($13.410 \leq f \leq 13.553$, $13.567 \leq f \leq 13.710$)	Pass
Part 15.225 (c)	Radiated Electric Field Emissions ($13.110 \leq f \leq 13.410$, $13.710 \leq f \leq 14.010$)	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

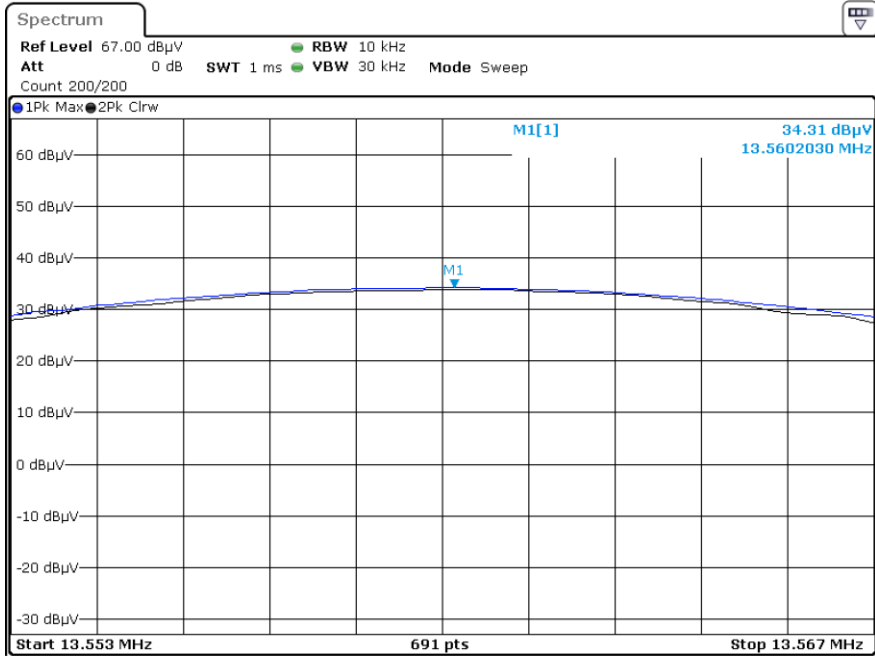
Measured Frequency Range : 13.553 MHz-13.567 MHz							
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor +Cable Loss (dB/m)	Distance Correction (dB)	Ant. POL	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5602	34.31	18.53	-40.00	H	12.84	84.00	71.16
13.5593	30.02	18.53	-40.00	V	8.55	84.00	75.45

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)
13.5529	28.81	18.53	-40.00	H	7.34	50.47	43.13
13.5671	28.61	18.53	-40.00	H	7.14	50.47	43.33

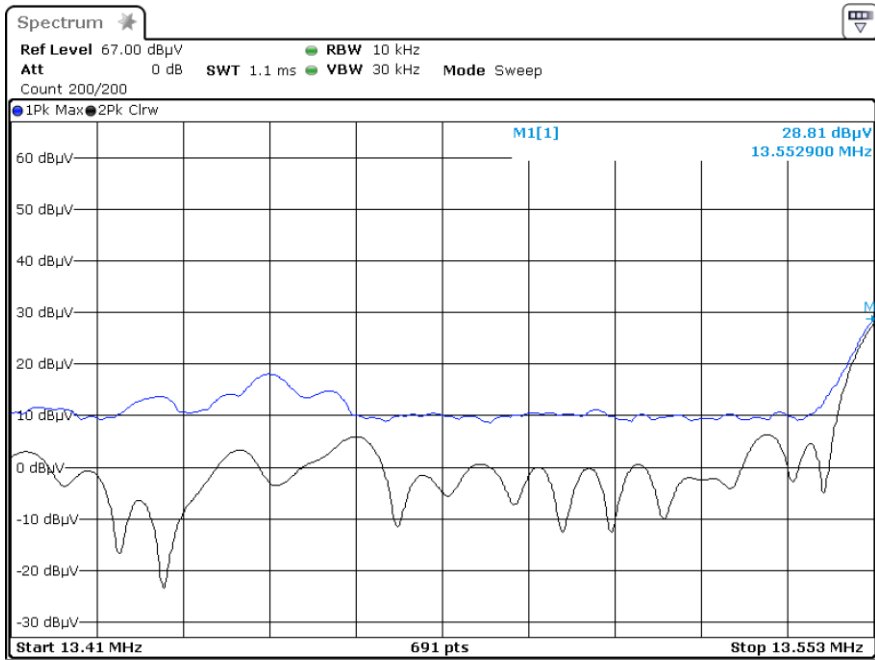
Measured Frequency Range : 13.110 MHz – 13.410 MHz and 13.710 MHz-14.010 MHz							
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor +Cable Loss (dB/m)	Distance Correction (dB)	Ant. POL	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.3477	12.79	18.53	-40.00	H	-8.68	40.51	49.19
13.7506	11.53	18.53	-40.00	H	-9.94	40.51	50.45

Test Plot

13.553 MHz ~ 13.567 MHz



Worst Case (13.410 MHz-13.553 MHz)



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)
8.5220	15.120	18.53	-40.00	H	-6.35	29.54	35.89
10.5709	12.510	18.53	-40.00	H	-8.96	29.54	38.50
27.1132	9.710	18.93	-40.00	H	-11.36	29.54	40.90
27.1285	9.520	18.93	-40.00	V	-11.55	29.54	41.09

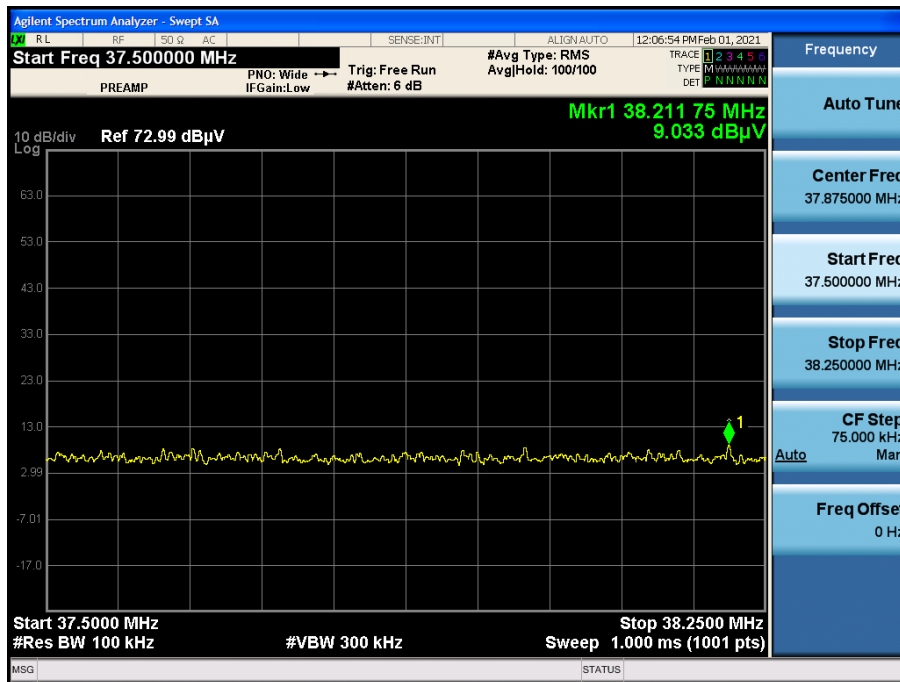
9.3. Radiated Emission 30 MHz – 1000 MHz

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)
# 38.2117	9.033	17.50	0.53	H	27.06	40.00	12.94
57.9380	8.120	18.20	0.70	H	27.02	40.00	12.98
76.6430	8.439	15.50	0.97	V	24.91	40.00	15.09
# 116.0990	8.877	17.70	1.07	H	27.65	43.50	15.85
# 135.5964	8.949	18.60	1.15	H	28.70	43.50	14.80
158.4330	8.120	18.80	1.23	V	28.15	43.50	15.35

Note:

1. ‘#’ is the result for restricted band.

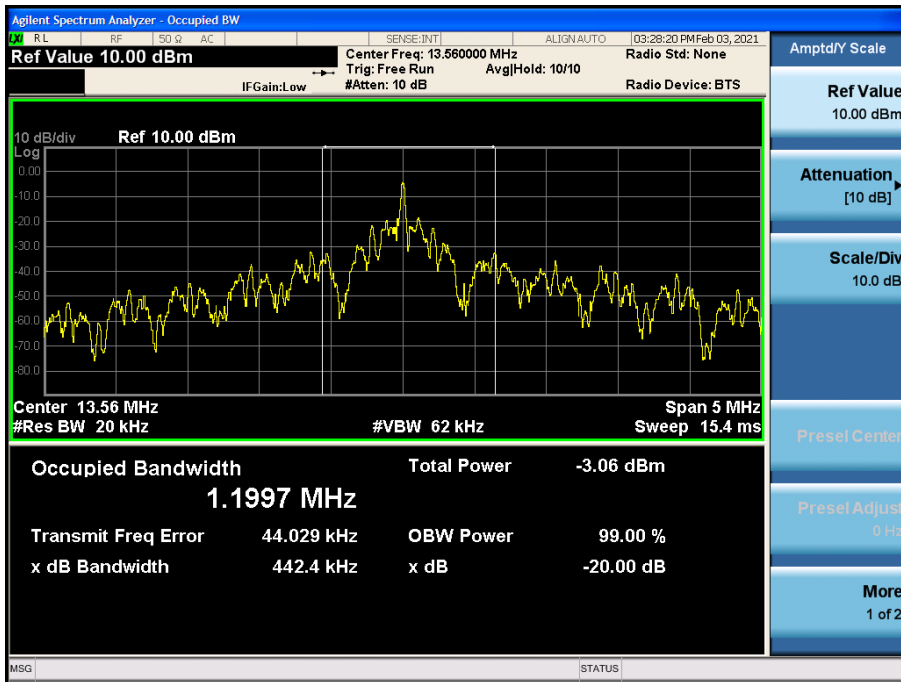
■ **Test Plot**



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: 3.86 VDC
 DEVIATION LIMIT: ±0.01 % = ±1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.86	-20	13.560111	111	0.0008186
100%		-10	13.560100	100	0.0007375
100%		0	13.560097	97	0.0007153
100%		+10	13.560091	91	0.0006711
100%		+20(Ref.)	13.560086	86	0.0006342
100%		+30	13.560084	84	0.0006195
100%		+40	13.560082	82	0.0006047
100%		+50	13.560078	78	0.0005752
End. Point	3.40	+20	13.560085	85	0.0006268

2 minutesOPERATING FREQUENCY: 13.56 MHzREFERENCE VOLTAGE: 3.86 VDCDEVIATION LIMIT: ±0.01 % = ±1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.86	-20	13.560107	107	0.0007891
100%		-10	13.560101	101	0.0007448
100%		0	13.560094	94	0.0006932
100%		+10	13.560092	92	0.0006785
100%		+20(Ref.)	13.560090	90	0.0006637
100%		+30	13.560088	88	0.0006490
100%		+40	13.560084	84	0.0006195
100%		+50	13.560076	76	0.0005605
End. Point	3.40	+20	13.560089	89	0.0006563

5 minutesOPERATING FREQUENCY: 13.56 MHzREFERENCE VOLTAGE: 3.86 VDCDEVIATION LIMIT: ±0.01 % = ±1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.86	-20	13.560099	99	0.0007301
100%		-10	13.560098	98	0.0007227
100%		0	13.560091	91	0.0006711
100%		+10	13.560088	88	0.0006490
100%		+20(Ref.)	13.560089	89	0.0006563
100%		+30	13.560082	82	0.0006047
100%		+40	13.560078	78	0.0005752
100%		+50	13.560071	71	0.0005236
End. Point	3.40	+20	13.560085	85	0.0006268

10 minutesOPERATING FREQUENCY: 13.56 MHzREFERENCE VOLTAGE: 3.86 VDCDEVIATION LIMIT: ±0.01 % = ±1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.86	-20	13.560096	96	0.0007080
100%		-10	13.560092	92	0.0006785
100%		0	13.560088	88	0.0006490
100%		+10	13.560086	86	0.0006342
100%		+20(Ref.)	13.560082	82	0.0006047
100%		+30	13.560076	76	0.0005605
100%		+40	13.560072	72	0.0005310
100%		+50	13.560075	75	0.0005531
End. Point	3.40	+20	13.560081	81	0.0005973

9.6. POWERLINE CONDUCTE EMISSIONS

Conducted Emissions (Line 1)

NFC_T_L1

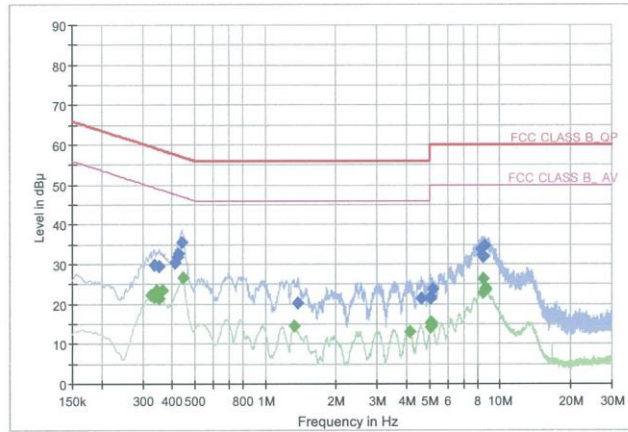
1 / 2

Test Report

Common Information

EUT : SM-A326U
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : NFC(T)_L1
 Operator Name:
 Comment:

Full Spectrum



Preview Result 2-AVG Preview Result 1-PK+ FCC CLASS B_QP
 FCC CLASS B_AV Final Result QPK Final Result CAV

Final Result QPK

Frequency (MHz)	QuasiPeak	Limit (dBμV)	Margin	Bandwidth	Line	Filter	Corr. (dB)
0.339000	29.62	59.23	29.61	9.000	L1	OFF	9.6
0.352500	29.29	58.90	29.61	9.000	L1	OFF	9.6
0.413250	30.42	57.58	27.16	9.000	L1	OFF	9.6
0.422250	31.73	57.40	25.68	9.000	L1	OFF	9.6
0.426750	32.46	57.32	24.85	9.000	L1	OFF	9.6
0.440250	35.38	57.06	21.68	9.000	L1	OFF	9.6
1.382000	20.26	56.00	35.74	9.000	L1	OFF	9.7
4.649000	21.28	56.00	34.72	9.000	L1	OFF	9.9
5.060750	21.21	60.00	38.79	9.000	L1	OFF	9.9
5.069750	21.38	60.00	38.62	9.000	L1	OFF	9.9
5.085500	21.54	60.00	38.46	9.000	L1	OFF	9.9
5.159750	23.51	60.00	36.49	9.000	L1	OFF	9.9
8.278250	33.86	60.00	26.14	9.000	L1	OFF	10.0
8.433500	32.43	60.00	27.57	9.000	L1	OFF	10.0
8.447000	32.42	60.00	27.58	9.000	L1	OFF	10.0
8.487500	32.02	60.00	27.98	9.000	L1	OFF	10.0
8.501000	31.86	60.00	28.14	9.000	L1	OFF	10.0
8.642750	34.64	60.00	25.36	9.000	L1	OFF	10.0

Final Result_CAV

2021-02-01

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NFC_T_L1

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Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.325500	22.08	49.57	27.49	9.000	L1	OFF	9.6
0.336750	21.78	49.28	27.51	9.000	L1	OFF	9.6
0.343500	23.34	49.12	25.78	9.000	L1	OFF	9.6
0.352500	21.43	48.90	27.48	9.000	L1	OFF	9.6
0.363750	23.43	48.64	25.21	9.000	L1	OFF	9.6
0.444750	26.41	46.97	20.56	9.000	L1	OFF	9.6
1.323500	14.34	46.00	31.66	9.000	L1	OFF	9.7
4.127000	13.08	46.00	32.92	9.000	L1	OFF	9.8
5.076500	14.09	50.00	35.91	9.000	L1	OFF	9.9
5.087750	15.29	50.00	34.71	9.000	L1	OFF	9.9
5.101250	14.41	50.00	35.59	9.000	L1	OFF	9.9
5.157500	15.33	50.00	34.67	9.000	L1	OFF	9.9
8.474000	26.12	50.00	23.88	9.000	L1	OFF	10.0
8.541500	22.67	50.00	27.33	9.000	L1	OFF	10.0
8.656250	23.51	50.00	26.49	9.000	L1	OFF	10.0
8.667500	23.36	50.00	26.64	9.000	L1	OFF	10.0
8.703500	23.76	50.00	26.24	9.000	L1	OFF	10.0
8.714750	23.87	50.00	26.13	9.000	L1	OFF	10.0

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NFC_UT_L1

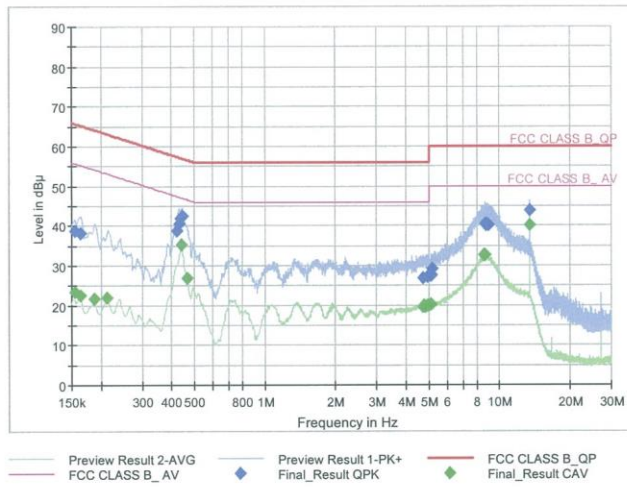
1 / 2

Test Report

Common Information

EUT : SM-A326U
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : NFC(UnT)_L1
 Operator Name:
 Comment:

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak	Limit (dBuV)	Margin	Bandwidth	Line	Filter	Corr. (dB)
0.154500	38.57	65.75	27.19	9.000	L1	OFF	9.6
0.163500	38.10	65.28	27.18	9.000	L1	OFF	9.6
0.422250	38.65	57.40	18.75	9.000	L1	OFF	9.6
0.431250	40.34	57.23	16.88	9.000	L1	OFF	9.6
0.438000	41.89	57.10	15.21	9.000	L1	OFF	9.6
0.444750	42.36	56.97	14.61	9.000	L1	OFF	9.6
4.754750	26.94	56.00	29.06	9.000	L1	OFF	9.9
4.975250	27.19	56.00	28.81	9.000	L1	OFF	9.9
4.995500	27.35	56.00	28.65	9.000	L1	OFF	9.9
5.121500	27.72	60.00	32.28	9.000	L1	OFF	9.9
5.148500	27.42	60.00	32.58	9.000	L1	OFF	9.9
5.173250	29.16	60.00	30.84	9.000	L1	OFF	9.9
8.685500	40.37	60.00	19.63	9.000	L1	OFF	10.0
8.710250	40.36	60.00	19.64	9.000	L1	OFF	10.0
8.777750	40.23	60.00	19.77	9.000	L1	OFF	10.0
8.894750	40.26	60.00	19.74	9.000	L1	OFF	10.0
8.982500	40.10	60.00	19.90	9.000	L1	OFF	10.0
13.561250	43.97	60.00	16.03	9.000	L1	OFF	10.2

Final_Result_CAV

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NFC_UT_L1

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Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.154500	23.45	55.75	32.30	9.000	L1	OFF	9.6
0.163500	22.53	55.28	32.76	9.000	L1	OFF	9.6
0.188250	21.57	54.11	32.55	9.000	L1	OFF	9.6
0.213000	21.80	53.09	31.29	9.000	L1	OFF	9.6
0.442500	35.07	47.02	11.95	9.000	L1	OFF	9.6
0.465000	26.84	46.60	19.76	9.000	L1	OFF	9.6
4.754750	19.75	46.00	26.25	9.000	L1	OFF	9.9
4.820000	19.81	46.00	26.19	9.000	L1	OFF	9.9
4.858250	19.51	46.00	26.49	9.000	L1	OFF	9.9
4.968500	19.96	46.00	26.04	9.000	L1	OFF	9.9
4.995500	19.98	46.00	26.02	9.000	L1	OFF	9.9
5.123750	20.15	50.00	29.85	9.000	L1	OFF	9.9
8.573000	32.53	50.00	17.47	9.000	L1	OFF	10.0
8.658500	32.63	50.00	17.37	9.000	L1	OFF	10.0
8.685500	32.59	50.00	17.41	9.000	L1	OFF	10.0
8.712500	32.61	50.00	17.39	9.000	L1	OFF	10.0
8.737250	32.59	50.00	17.41	9.000	L1	OFF	10.0
13.559000	39.99	50.00	10.01	9.000	L1	OFF	10.2

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Conducted Emissions (Line 2)

NFC_UNT_N

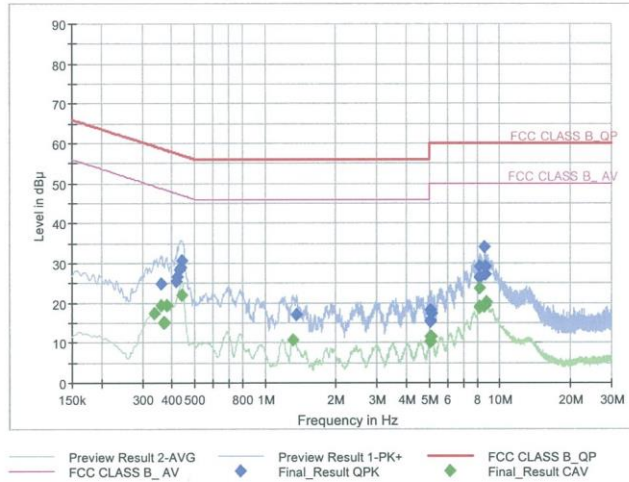
1 / 2

Test Report

Common Information

EUT : SM-A326U
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : NFC(T)_N
 Operator Name:
 Comment:

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak	Limit (dBuV)	Margin	Bandwidth	Line	Filter	Corr. (dB)
0.361500	24.84	58.69	33.86	9.000	N	OFF	9.6
0.415500	25.40	57.54	32.14	9.000	N	OFF	9.6
0.422250	26.49	57.40	30.91	9.000	N	OFF	9.6
0.431250	28.22	57.23	29.01	9.000	N	OFF	9.6
0.435750	28.84	57.14	28.30	9.000	N	OFF	9.6
0.442500	30.49	57.02	26.53	9.000	N	OFF	9.6
1.364000	16.90	56.00	39.10	9.000	N	OFF	9.7
5.054000	18.20	60.00	41.80	9.000	N	OFF	9.9
5.067500	15.60	60.00	44.40	9.000	N	OFF	9.9
5.078750	15.41	60.00	44.59	9.000	N	OFF	9.9
5.085500	15.50	60.00	44.50	9.000	N	OFF	9.9
5.137250	17.36	60.00	42.64	9.000	N	OFF	9.9
8.217500	26.43	60.00	33.57	9.000	N	OFF	10.0
8.228750	26.36	60.00	33.64	9.000	N	OFF	10.0
8.242250	29.04	60.00	30.96	9.000	N	OFF	10.0
8.633750	34.17	60.00	25.83	9.000	N	OFF	10.0
8.721500	27.11	60.00	32.89	9.000	N	OFF	10.0
8.735000	29.04	60.00	30.96	9.000	N	OFF	10.0

Final Result_CAV

2021-02-01

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NFC_UNT_N

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Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.336750	17.43	49.28	31.85	9.000	N	OFF	9.6
0.361500	19.34	48.69	29.35	9.000	N	OFF	9.6
0.368250	15.11	48.54	33.43	9.000	N	OFF	9.6
0.375000	14.92	48.39	33.47	9.000	N	OFF	9.6
0.381750	19.32	48.24	28.92	9.000	N	OFF	9.6
0.440250	21.88	47.06	25.18	9.000	N	OFF	9.6
1.312250	10.65	46.00	35.35	9.000	N	OFF	9.7
5.054000	10.10	50.00	39.90	9.000	N	OFF	9.9
5.065250	10.25	50.00	39.75	9.000	N	OFF	9.9
5.074250	11.44	50.00	38.56	9.000	N	OFF	9.9
5.096750	10.42	50.00	39.58	9.000	N	OFF	9.9
5.119250	11.66	50.00	38.34	9.000	N	OFF	9.9
8.217500	18.77	50.00	31.23	9.000	N	OFF	10.0
8.228750	18.91	50.00	31.09	9.000	N	OFF	10.0
8.251250	23.57	50.00	26.43	9.000	N	OFF	10.0
8.631500	18.98	50.00	31.02	9.000	N	OFF	10.0
8.658500	19.28	50.00	30.72	9.000	N	OFF	10.0
8.784500	20.14	50.00	29.86	9.000	N	OFF	10.0

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NFC_UT_N

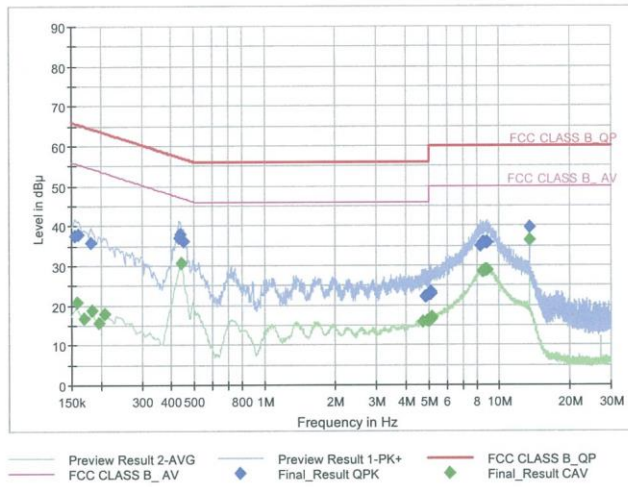
1 / 2

Test Report

Common Information

EUT : SM-A326U
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : NFC(UnT)_N
 Operator Name:
 Comment:

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak	Limit (dBμV)	Margin	Bandwidth	Line	Filter	Corr. (dB)
0.154500	37.52	65.75	28.24	9.000	N	OFF	9.6
0.161250	37.68	65.40	27.72	9.000	N	OFF	9.6
0.181500	35.69	64.42	28.73	9.000	N	OFF	9.6
0.433500	36.93	57.19	20.26	9.000	N	OFF	9.6
0.438000	37.91	57.10	19.19	9.000	N	OFF	9.6
0.449250	36.00	56.89	20.89	9.000	N	OFF	9.6
4.829000	22.31	56.00	33.69	9.000	N	OFF	9.9
4.905500	22.22	56.00	33.78	9.000	N	OFF	9.9
5.087750	22.68	60.00	37.32	9.000	N	OFF	9.9
5.101250	22.76	60.00	37.24	9.000	N	OFF	9.9
5.121500	23.34	60.00	36.66	9.000	N	OFF	9.9
5.130500	23.06	60.00	36.94	9.000	N	OFF	9.9
8.336750	35.00	60.00	25.00	9.000	N	OFF	10.0
8.496500	35.64	60.00	24.36	9.000	N	OFF	10.0
8.588750	35.89	60.00	24.11	9.000	N	OFF	10.0
8.777750	35.90	60.00	24.10	9.000	N	OFF	10.0
8.874500	35.88	60.00	24.12	9.000	N	OFF	10.1
13.561250	39.55	60.00	20.45	9.000	N	OFF	10.3

Final_Result_CAV

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NFC_UT_N

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Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.159000	20.63	55.52	34.88	9.000	N	OFF	9.6
0.170250	16.68	54.95	38.27	9.000	N	OFF	9.6
0.183750	18.81	54.31	35.50	9.000	N	OFF	9.6
0.197250	15.51	53.73	38.21	9.000	N	OFF	9.6
0.208500	17.83	53.27	35.43	9.000	N	OFF	9.6
0.440250	30.50	47.06	16.55	9.000	N	OFF	9.6
4.732250	15.88	46.00	30.12	9.000	N	OFF	9.9
4.939250	16.02	46.00	29.98	9.000	N	OFF	9.9
5.087750	16.24	50.00	33.76	9.000	N	OFF	9.9
5.119250	16.67	50.00	33.33	9.000	N	OFF	9.9
5.132750	16.39	50.00	33.61	9.000	N	OFF	9.9
5.207000	16.88	50.00	33.12	9.000	N	OFF	9.9
8.496500	28.57	50.00	21.43	9.000	N	OFF	10.0
8.564000	28.68	50.00	21.32	9.000	N	OFF	10.0
8.750750	28.87	50.00	21.13	9.000	N	OFF	10.0
8.849750	28.90	50.00	21.10	9.000	N	OFF	10.1
8.901500	28.77	50.00	21.23	9.000	N	OFF	10.1
13.559000	36.38	50.00	13.62	9.000	N	OFF	10.3

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10. LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	09/04/2020	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/10/2020	Annual	100584
ESPACE	SU-642 / Temperature Chamber	03/18/2020	Annual	0093008124
Agilent	N9030A / Signal Analyzer	01/11/2021	Annual	MY49431210
Hewlett Packard	E3632A / DC Power Supply	06/12/2020	Annual	KR75303960
Agilent	8493C / Attenuator(10 dB)	06/26/2020	Annual	07560
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A

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	05/18/2020	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	03/22/2019	Biennial	760
Schwarzbeck	VULB 9160 / TRILOG Antenna	08/19/2020	Biennial	9160-3368
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	07/28/2020	Annual	102168
Agilent	N9030A / Signal Analyzer	01/11/2021	Annual	MY49431210
Api tech.	18B-03 / Attenuator (3 dB)	03/02/2020	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	03/02/2020	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	03/02/2020	Annual	22964

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-2102-FC004-P