

FCC NFC REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: December 11, 2020
Address: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea	Test Site/Location: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon- si, Gyeonggi-do, 17383 KOREA
	Report No.: HCT-RF-2012-FC005

FCC ID:	A3LSMA326B
APPLICANT:	SAMSUNG Electronics Co., Ltd.
Model:	SM-A326B/DS
Additional Model:	SM-A326B
EUT Type:	Mobile Phone
RF Output Field Strength:	13.38 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.

Report No.: HCT-RF-2012-FC005

REVIEWED BY



Report prepared by : Jeong Ho Kim
Engineer of Telecommunication Testing Center

Report approved by : Kwon Jeong
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-2012-FC005	December 11, 2020	- First Approval Report

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1. EUT DESCRIPTION

Model	SM-A326B/DS
Additional Model	SM-A326B
EUT Type	Mobile Phone
Power Supply	DC 3.86 V
Frequency of Operation	13.56 MHz
Transmit Power	Without Tag: 13.38 dBuV/m @30 m With Tag: 12.53 dBuV/m @30 m
Modulation Type	ASK
Date(s) of Tests	November 04, 2020 ~ December 08, 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)

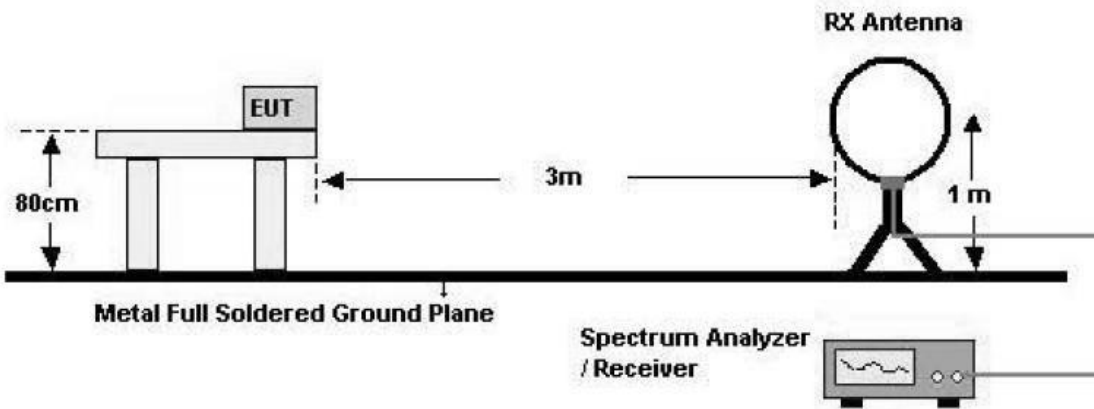
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	* 100	3
88-216	* 150	3
216-960	* 200	3
Above 960	500	3

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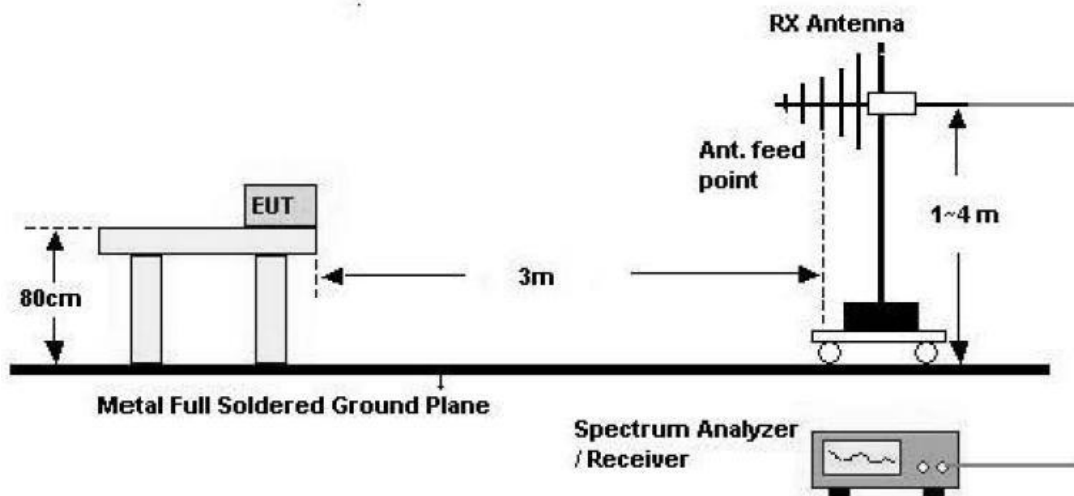
Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part,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

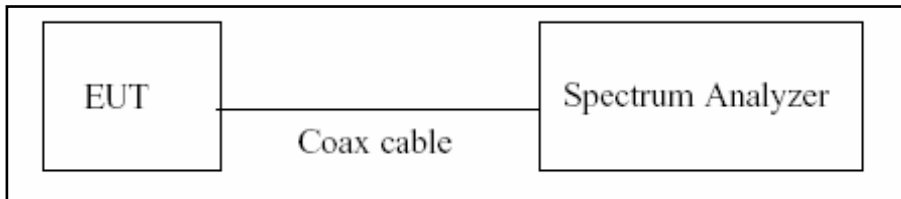
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

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 :

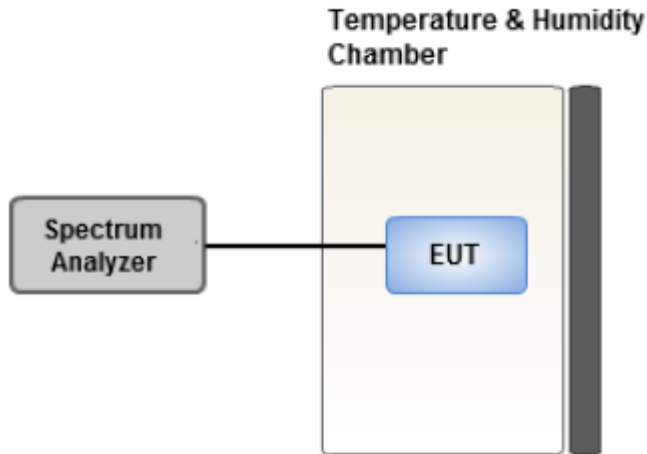
We tested Occupied Bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.

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 position of loop antenna were investigated and the worst case configuration results are reported.
 - Position : Horizontal, Vertical, Parallel to the ground plane
 - Worstcase : Horizontal
5. SM-A326B/DS, SM-A326B were tested and the worst case results are reported.
(Worst case : SM-A326B/DS)

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-A326B/DS, SM-A326B were tested and the worst case results are reported.
(Worst case : SM-A326B/DS)

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-A326B/DS, SM-A326B were tested and the worst case results are reported.
(Worst case : SM-A326B/DS)

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)
13.5595	34.72	18.66	-40.00	Z-H	13.38	84.00	70.62
13.5592	30.40	18.66	-40.00	Z-V	9.06	84.00	74.94

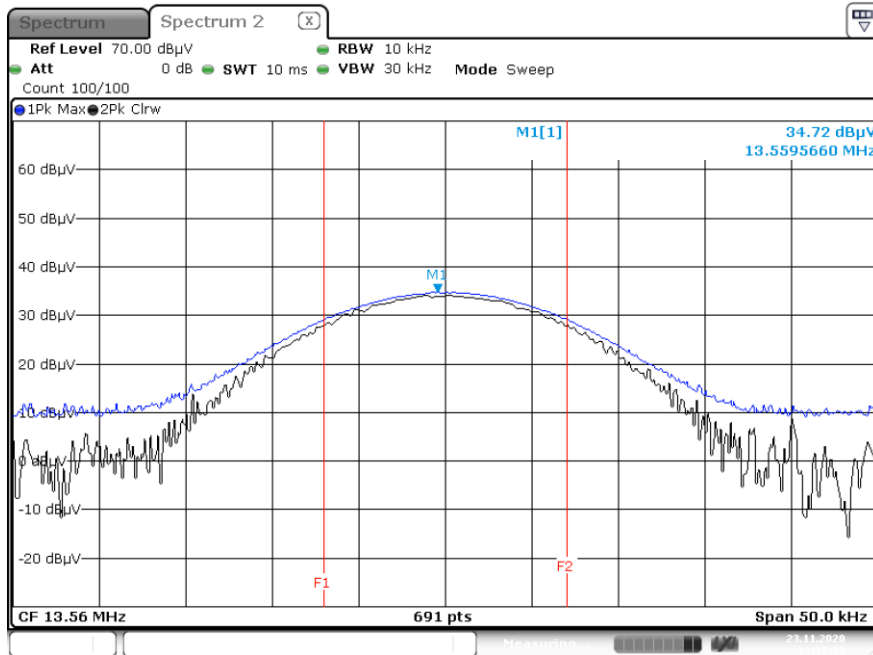
Measured Frequency Range : 13.410 MHz-13.553 MHz and 13.567 MHz-13.710 MHz							
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor +Cable Loss (dB/m)	Distance Correction (dB)	Ant. POL	Total (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5529	28.69	18.66	-40.00	Z-H	7.35	50.47	43.12
13.5670	28.88	18.66	-40.00	Z-H	7.54	50.47	42.93

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)
13.3490	17.72	18.66	-40.00	Z-H	-3.62	40.51	44.13
13.7731	17.21	18.66	-40.00	Z-H	-4.13	40.51	44.64

Note:

Without Tag (worst case)

Test Plot



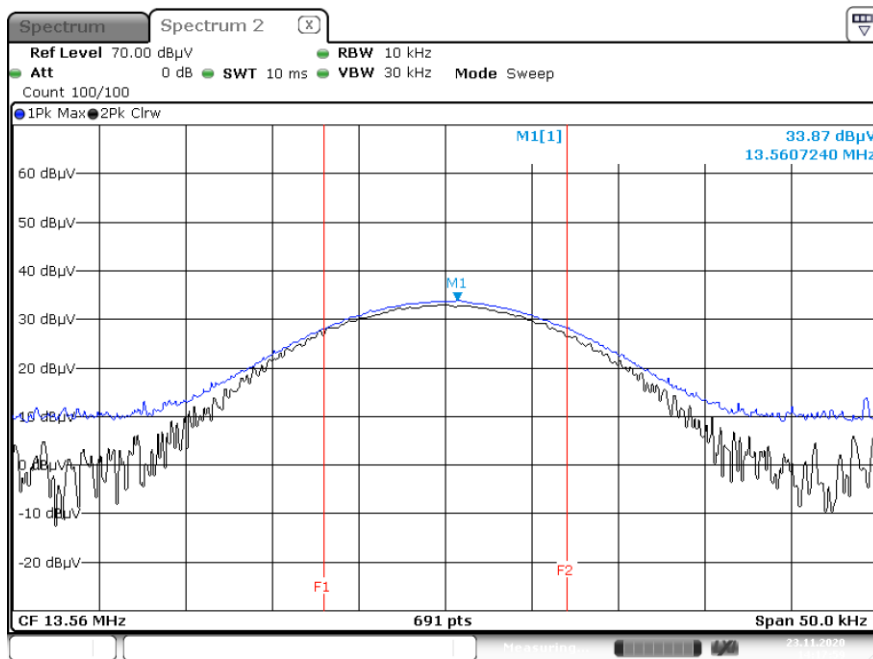
Note:

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)
13.5599	33.87	18.66	-40.00	Z-H	12.53	84.00	71.47
13.5596	32.44	18.66	-40.00	Y-V	11.10	84.00	72.90

■ 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)
7.5880	18.43	18.66	-40.00	Z-H	-2.91	29.54	32.45
18.1640	18.51	18.66	-40.00	Z-H	-2.83	29.54	32.37
27.1058	10.99	19.06	-40.00	Z-H	-9.95	29.54	39.49
27.1048	10.48	19.06	-40.00	Y-V	-10.46	29.54	40.00

Note:

1. Without Tag (worst case)

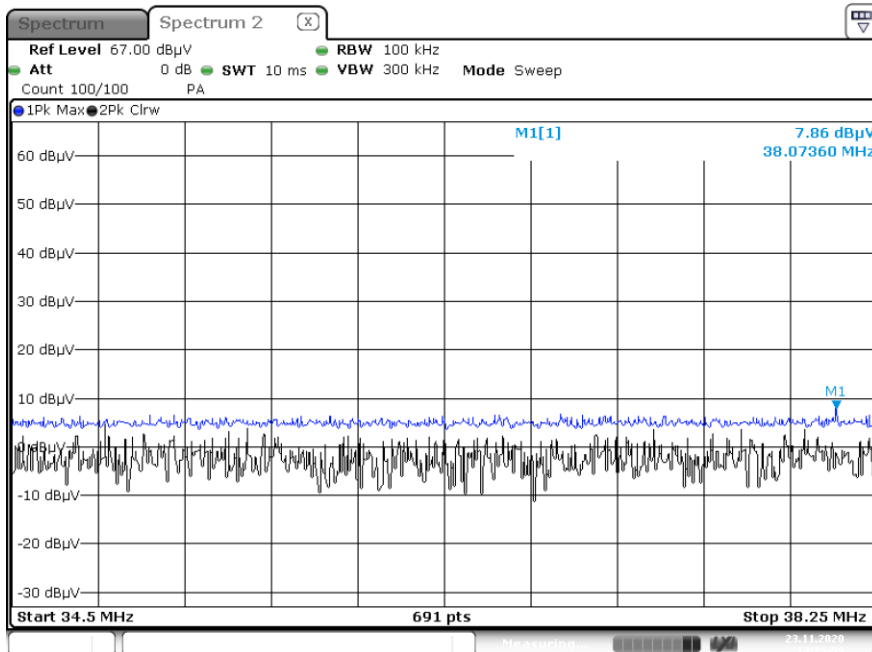
9.3. Radiated Emission 30 MHz – 1000 MHz

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)
35.7612	7.67	18.50	0.71	H	26.88	40.00	13.12
38.0736 [#]	7.86	18.80	0.76	H	27.42	40.00	12.58
78.1790	6.80	14.90	1.06	V	22.76	40.00	17.24
108.7160 [#]	7.47	16.10	1.26	H	24.83	43.50	18.67
124.3130 [#]	7.37	17.20	1.32	H	25.89	43.50	17.61
153.6980	8.00	19.30	1.46	V	28.76	43.50	14.74

Note:

1. “#” is the result for restricted band.
2. Without Tag (worst case)

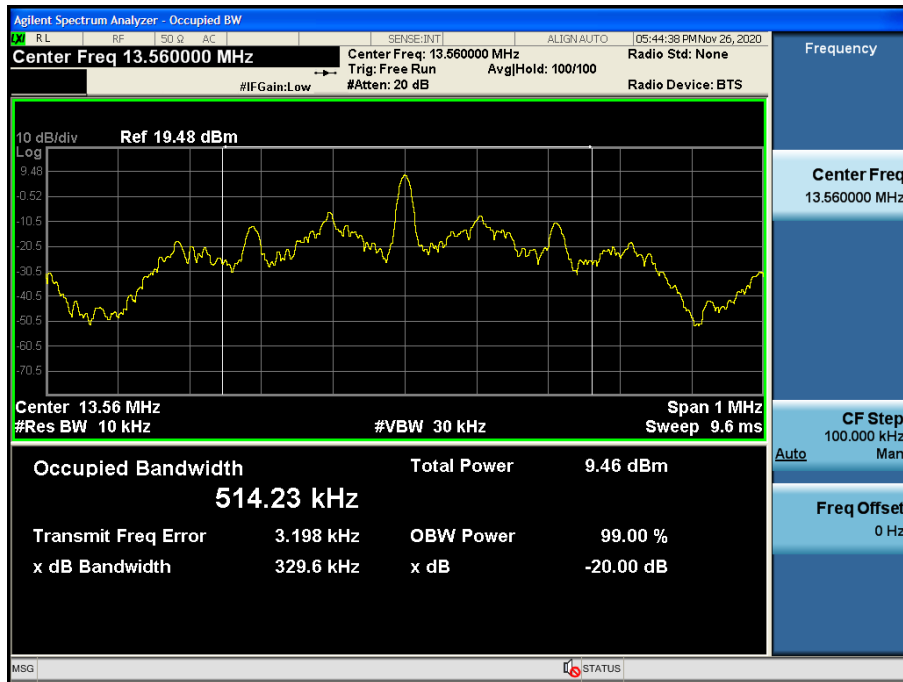
Test Plot



Note:

Plot of worst case are only reported

9.4. 20 dB Bandwidth



9.5. Frequency Stability

Startup

OPERATING 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	13.560047	47	0.0003466
100%		-10	13.560041	41	0.0003024
100%		0	13.560036	36	0.0002655
100%		+10	13.560034	34	0.0002507
100%		+20(Ref.)	13.560029	29	0.0002139
100%		+30	13.560033	33	0.0002434
100%		+40	13.560041	41	0.0003024
100%		+50	13.560046	46	0.0003392
High		4.43	+20	13.560045	45
Low	3.60	+20	13.560046	46	0.0003392

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	13.560045	45	0.0003319
100%		-10	13.560038	38	0.0002802
100%		0	13.560035	35	0.0002581
100%		+10	13.560032	32	0.0002360
100%		+20(Ref.)	13.560031	31	0.0002286
100%		+30	13.560033	33	0.0002434
100%		+40	13.560042	42	0.0003097
100%		+50	13.560047	47	0.0003466
High		4.43	+20	13.560045	45
Low	3.60	+20	13.560046	46	0.0003392

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	13.560046	46	0.0003375
100%		-10	13.560040	40	0.0002971
100%		0	13.560036	36	0.0002649
100%		+10	13.560033	33	0.0002434
100%		+20(Ref.)	13.560032	32	0.0002342
100%		+30	13.560034	34	0.0002507
100%		+40	13.560042	42	0.0003063
100%		+50	13.560047	47	0.0003449
High		4.43	+20	13.560045	45
Low	3.60	+20	13.560045	45	0.0003316

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	13.560045	45	0.0003334
100%		-10	13.560040	40	0.0002950
100%		0	13.560038	38	0.0002802
100%		+10	13.560036	36	0.0002655
100%		+20(Ref.)	13.560035	35	0.0002561
100%		+30	13.560037	37	0.0002729
100%		+40	13.560042	42	0.0003122
100%		+50	13.560048	48	0.0003515
High		4.43	+20	13.560046	46
Low	3.60	+20	13.560047	47	0.0003431

9.6. POWERLINE CONDUCTE EMISSIONS

Conducted Emissions (Line 1)

Test

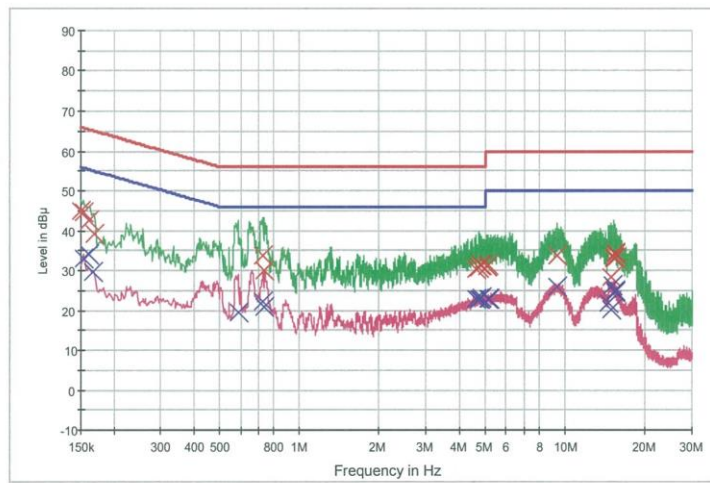
1 / 2

HCT TEST Report

Common Information

EUT: SM-A326B/DS
 Manufacturer: SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions: NFC TERM MODE_L1

FCC CLASS B_Exten Cable



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

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	44.8	9.000	Off	L1	9.8	21.2	66.0
0.154000	44.5	9.000	Off	L1	9.8	21.3	65.8
0.160000	42.5	9.000	Off	L1	9.8	22.9	65.5
0.168000	39.1	9.000	Off	L1	9.8	26.0	65.1
0.730000	33.6	9.000	Off	L1	9.8	22.4	56.0
0.738000	30.1	9.000	Off	L1	9.8	25.9	56.0
4.600000	30.3	9.000	Off	L1	10.0	25.7	56.0
4.704000	30.8	9.000	Off	L1	10.0	25.2	56.0
4.802000	31.4	9.000	Off	L1	10.0	24.6	56.0
4.818000	31.5	9.000	Off	L1	10.0	24.5	56.0
5.056000	30.9	9.000	Off	L1	10.0	29.1	60.0
5.106000	31.3	9.000	Off	L1	10.0	28.7	60.0
9.296000	33.9	9.000	Off	L1	10.2	26.1	60.0
14.850000	28.2	9.000	Off	L1	10.4	31.8	60.0
15.264000	33.2	9.000	Off	L1	10.4	26.8	60.0
15.322000	33.9	9.000	Off	L1	10.4	26.1	60.0
15.334000	34.4	9.000	Off	L1	10.4	25.6	60.0
15.344000	32.9	9.000	Off	L1	10.4	27.1	60.0

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Test

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	33.0	9.000	Off	L1	9.8	22.8	55.8
0.160000	34.0	9.000	Off	L1	9.8	21.4	55.5
0.166000	29.7	9.000	Off	L1	9.8	25.5	55.2
0.586000	19.5	9.000	Off	L1	9.8	26.5	46.0
0.728000	22.3	9.000	Off	L1	9.8	23.7	46.0
0.734000	20.8	9.000	Off	L1	9.8	25.2	46.0
4.600000	22.7	9.000	Off	L1	10.0	23.3	46.0
4.704000	23.0	9.000	Off	L1	10.0	23.0	46.0
4.802000	23.0	9.000	Off	L1	10.0	23.0	46.0
4.818000	23.1	9.000	Off	L1	10.0	22.9	46.0
5.106000	22.8	9.000	Off	L1	10.0	27.2	50.0
5.174000	23.0	9.000	Off	L1	10.0	27.0	50.0
9.296000	25.9	9.000	Off	L1	10.2	24.1	50.0
14.604000	21.9	9.000	Off	L1	10.3	28.1	50.0
14.850000	20.2	9.000	Off	L1	10.4	29.8	50.0
15.016000	26.4	9.000	Off	L1	10.4	23.6	50.0
15.322000	25.0	9.000	Off	L1	10.4	25.0	50.0
15.334000	24.7	9.000	Off	L1	10.4	25.3	50.0

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Test

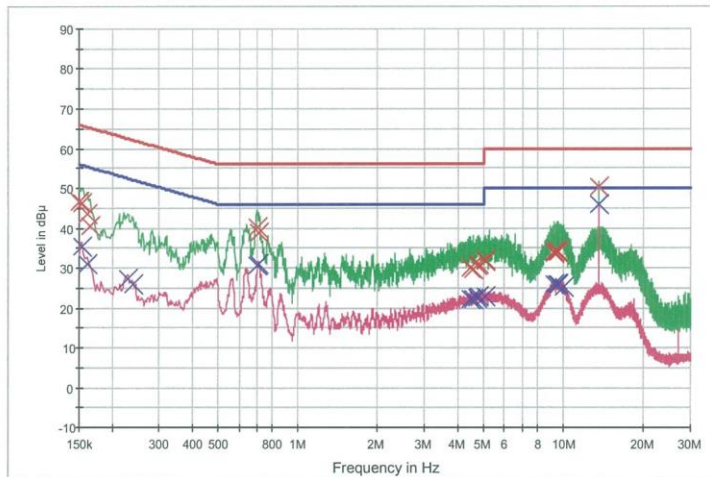
1 / 2

HCT TEST Report

Common Information

EUT: SM-A326B/DS
 Manufacturer: SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions: NFC UNTERM MODE_L1

FCC CLASS B_Exten Cable



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

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	46.7	9.000	Off	L1	9.8	19.3	66.0
0.154000	46.4	9.000	Off	L1	9.8	19.4	65.8
0.160000	43.5	9.000	Off	L1	9.8	21.9	65.5
0.164000	40.4	9.000	Off	L1	9.8	24.9	65.3
0.700000	40.1	9.000	Off	L1	9.8	15.9	56.0
0.714000	38.8	9.000	Off	L1	9.8	17.2	56.0
4.436000	30.0	9.000	Off	L1	10.0	26.0	56.0
4.564000	29.7	9.000	Off	L1	10.0	26.3	56.0
4.732000	30.6	9.000	Off	L1	10.0	25.4	56.0
4.800000	30.9	9.000	Off	L1	10.0	25.1	56.0
5.082000	31.5	9.000	Off	L1	10.0	28.5	60.0
5.100000	31.9	9.000	Off	L1	10.0	28.1	60.0
9.234000	33.8	9.000	Off	L1	10.2	26.2	60.0
9.248000	34.0	9.000	Off	L1	10.2	26.0	60.0
9.426000	33.9	9.000	Off	L1	10.2	26.1	60.0
9.444000	34.3	9.000	Off	L1	10.2	25.7	60.0
9.580000	34.2	9.000	Off	L1	10.2	25.8	60.0
13.560000	50.2	9.000	Off	L1	10.3	9.8	60.0

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Test

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	35.3	9.000	Off	L1	9.8	20.5	55.8
0.160000	31.1	9.000	Off	L1	9.8	24.4	55.5
0.228000	27.3	9.000	Off	L1	9.8	25.2	52.5
0.240000	25.9	9.000	Off	L1	9.8	26.2	52.1
0.704000	30.7	9.000	Off	L1	9.8	15.3	46.0
0.714000	31.0	9.000	Off	L1	9.8	15.0	46.0
4.436000	22.4	9.000	Off	L1	10.0	23.6	46.0
4.564000	22.2	9.000	Off	L1	10.0	23.8	46.0
4.732000	22.7	9.000	Off	L1	10.0	23.3	46.0
4.800000	22.9	9.000	Off	L1	10.0	23.1	46.0
5.082000	23.0	9.000	Off	L1	10.0	27.0	50.0
5.100000	23.0	9.000	Off	L1	10.0	27.0	50.0
9.248000	26.0	9.000	Off	L1	10.2	24.0	50.0
9.426000	26.1	9.000	Off	L1	10.2	23.9	50.0
9.444000	26.1	9.000	Off	L1	10.2	23.9	50.0
9.580000	26.1	9.000	Off	L1	10.2	23.9	50.0
9.956000	25.1	9.000	Off	L1	10.2	24.9	50.0
13.560000	45.8	9.000	Off	L1	10.3	4.2	50.0

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Conducted Emissions (Line 2)

Test

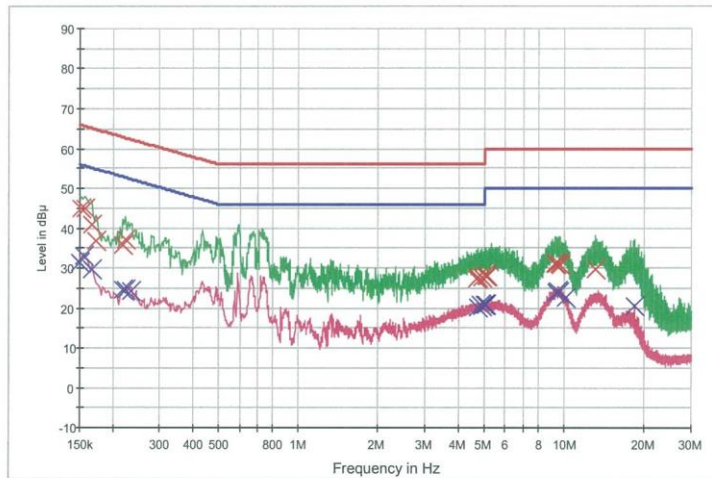
1 / 2

HCT TEST Report

Common Information

EUT: SM-A326B/DS
 Manufacturer: SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions: NFC TERM MODE_N

FCC CLASS B_Exten Cable



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

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	44.8	9.000	Off	N	9.8	21.1	65.9
0.158000	44.8	9.000	Off	N	9.8	20.8	65.6
0.166000	40.8	9.000	Off	N	9.8	24.3	65.2
0.172000	36.9	9.000	Off	N	9.8	27.9	64.9
0.218000	35.9	9.000	Off	N	9.8	27.0	62.9
0.222000	37.3	9.000	Off	N	9.8	25.5	62.7
4.650000	27.4	9.000	Off	N	10.0	28.6	56.0
4.716000	27.5	9.000	Off	N	10.0	28.5	56.0
4.878000	27.5	9.000	Off	N	10.0	28.5	56.0
5.006000	28.2	9.000	Off	N	10.0	31.8	60.0
5.078000	28.1	9.000	Off	N	10.0	31.9	60.0
5.138000	28.0	9.000	Off	N	10.0	32.0	60.0
9.250000	31.0	9.000	Off	N	10.2	29.0	60.0
9.318000	30.9	9.000	Off	N	10.2	29.1	60.0
9.336000	31.0	9.000	Off	N	10.2	29.0	60.0
9.568000	30.9	9.000	Off	N	10.2	29.1	60.0
9.602000	30.6	9.000	Off	N	10.2	29.4	60.0
13.066000	29.8	9.000	Off	N	10.4	30.2	60.0

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Test

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	31.4	9.000	Off	N	9.8	24.6	56.0
0.156000	33.0	9.000	Off	N	9.8	22.7	55.7
0.166000	29.8	9.000	Off	N	9.8	25.4	55.2
0.218000	24.5	9.000	Off	N	9.8	28.4	52.9
0.222000	24.7	9.000	Off	N	9.8	28.0	52.7
0.234000	24.2	9.000	Off	N	9.8	28.1	52.3
4.716000	20.1	9.000	Off	N	10.0	25.9	46.0
4.834000	20.7	9.000	Off	N	10.0	25.3	46.0
4.878000	20.5	9.000	Off	N	10.0	25.5	46.0
5.006000	21.0	9.000	Off	N	10.0	29.0	50.0
5.072000	21.0	9.000	Off	N	10.0	29.0	50.0
5.078000	20.7	9.000	Off	N	10.0	29.3	50.0
9.318000	24.0	9.000	Off	N	10.2	26.0	50.0
9.404000	24.3	9.000	Off	N	10.2	25.7	50.0
9.492000	23.8	9.000	Off	N	10.2	26.2	50.0
9.534000	24.0	9.000	Off	N	10.2	26.0	50.0
10.064000	22.7	9.000	Off	N	10.3	27.3	50.0
18.258000	20.4	9.000	Off	N	10.6	29.6	50.0

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Test

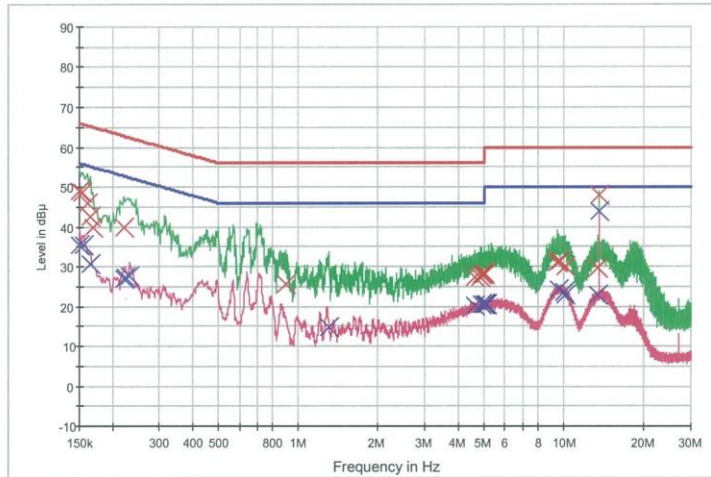
1 / 2

HCT TEST Report

Common Information

EUT: SM-A326B/DS
 Manufacturer: SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions: NFC UNTERM MODE_N

FCC CLASS B_Exten Cable



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

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	48.9	9.000	Off	N	9.8	17.1	66.0
0.154000	48.7	9.000	Off	N	9.8	17.1	65.8
0.160000	46.0	9.000	Off	N	9.8	19.5	65.5
0.164000	42.5	9.000	Off	N	9.8	22.8	65.3
0.168000	39.8	9.000	Off	N	9.8	25.3	65.1
0.220000	39.9	9.000	Off	N	9.8	22.9	62.8
0.898000	25.5	9.000	Off	N	9.8	30.5	56.0
4.604000	27.3	9.000	Off	N	10.0	28.7	56.0
4.850000	27.3	9.000	Off	N	10.0	28.7	56.0
4.914000	27.9	9.000	Off	N	10.0	28.1	56.0
5.022000	28.3	9.000	Off	N	10.0	31.7	60.0
5.040000	27.9	9.000	Off	N	10.0	32.1	60.0
9.384000	31.2	9.000	Off	N	10.2	28.8	60.0
9.564000	31.5	9.000	Off	N	10.2	28.5	60.0
9.634000	31.3	9.000	Off	N	10.2	28.7	60.0
10.160000	29.9	9.000	Off	N	10.3	30.1	60.0
13.328000	29.8	9.000	Off	N	10.4	30.2	60.0
13.560000	47.8	9.000	Off	N	10.4	12.2	60.0

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Test

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	35.6	9.000	Off	N	9.8	20.4	56.0
0.156000	35.4	9.000	Off	N	9.8	20.3	55.7
0.164000	30.8	9.000	Off	N	9.8	24.5	55.3
0.220000	26.8	9.000	Off	N	9.8	26.0	52.8
0.224000	27.4	9.000	Off	N	9.8	25.2	52.7
0.232000	27.6	9.000	Off	N	9.8	24.7	52.4
1.308000	14.8	9.000	Off	N	9.8	31.2	46.0
4.604000	20.2	9.000	Off	N	10.0	25.8	46.0
4.914000	20.5	9.000	Off	N	10.0	25.5	46.0
5.040000	20.4	9.000	Off	N	10.0	29.6	50.0
5.070000	20.5	9.000	Off	N	10.0	29.5	50.0
5.112000	20.5	9.000	Off	N	10.0	29.5	50.0
9.552000	24.4	9.000	Off	N	10.2	25.6	50.0
9.562000	24.2	9.000	Off	N	10.2	25.8	50.0
10.014000	23.6	9.000	Off	N	10.3	26.4	50.0
10.160000	22.9	9.000	Off	N	10.3	27.1	50.0
13.328000	22.9	9.000	Off	N	10.4	27.1	50.0
13.560000	44.0	9.000	Off	N	10.4	6.0	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	09/04/2020	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/10/2020	Annual	100584
ESPEC	SU-642 / Temperature Chamber	07/30/2020	Annual	0093000718
Agilent	N9030A / Signal Analyzer	03/23/2020	Annual	MY49432108
HP	E3632A / DC Power Supply	09/16/2020	Annual	MY40004427
HP	8493C / Attenuator(10 dB)(DC-26.5 GHz)	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	08/02/2019	Biennial	01039
Schwarzbeck	BBHA 9120D / Horn Antenna	06/28/2019	Biennial	1300
Rohde & Schwarz	FSP(10 Hz ~ 40 GHz) / Spectrum Analyzer	05/13/2020	Annual	101055
Agilent	N9030A / Signal Analyzer	03/23/2020	Annual	MY49432108
Weinschel	2-3 / Attenuator (3 dB)	10/07/2020	Annual	BR0617
H+S	5910-N-50-010 / Attenuator(10 dB)	10/28/2020	Annual	None
CERNEX	CBL26405040 / Power Amplifier	03/23/2020	Annual	25956

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-2012-FC005-P