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74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea
**TEL: +82-31-645-6300** **FAX: +82-31-645-6401**

# FCC NFC REPORT

## FCC Certification

**Applicant Name:**
SAMSUNG Electronics Co.,Ltd.

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

**Date of Issue:**
February 29, 2016
**Test Site/Location:**
HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majang-myeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
**Report No.:** HCT-R-1602-F052
**HCT FRN:** 0005866421
**IC Recognition No.:** 5944A-5

| | |
|---|---|
| **FCC ID** | **: A3LSMJ120ZN** |
| **APPLICANT** | **: SAMSUNG Electronics Co.,Ltd.** |

| | |
|---|---|
| **FCC Model(s):** | SM-J120ZN |
| **EUT Type:** | Mobile Phone |
| **RF Output Field Strength:** | 7.50 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 |

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.

**HCT CO., LTD.** Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

**Report prepared by**
**: Kyung Soo Kang**
**Test Engineer of RF Team**

**Approved by**
**: Sang Jun Lee**
**Manager of RF Team**

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

# Version

| TEST REPORT NO. | DATE | DESCRIPTION |
|---|---|---|
| HCT-R-1602-F052 | February 29, 2016 | - First Approval Report |
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| | | |

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# 1. GENERAL INFORMATION

| | |
|---|---|
| **Applicant:** | SAMSUNG Electronics Co.,Ltd. |
| **Address:** | 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea |
| **FCC ID:** | A3LSMJ120ZN |
| **EUT Type:** | Mobile Phone |
| **Model name(s):** | SM-J120ZN |
| **Date(s) of Tests:** | February 15 ~ February 26, 2016 |
| **Place of Tests:** | HCT Co., Ltd.<br>74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea<br>(IC Recognition No. : 5944A-5) |

# 2. EUT DESCRIPTION

| | |
|---|---|
| **Model Name** | SM-J120ZN |
| **EUT Type** | Mobile Phone |
| **Power Supply** | DC 3.8 V |
| **Battery Infomation** | Model: EB-BJ120CBE<br>Type: Li-ion Battery |
| **Frequency of Operation** | 13.5600 MHz |
| **Transmit Power** | 7.50 dBuV/m @30 m |
| **Modulation Type** | ASK |
| **Antenna Specification** | Manufacturer: AQ Corporation<br>Antenna type: FPCB Antenna |

# 3. TEST METHODOLOGY

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

## 3.1 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.

## 3.2 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.

## 3.3 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 6.3 of ANSI C63.10. (Version: 2013).

## 3.4 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.

## 3.5 STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance With
FCC Part 15.Subpart C

| Regulation | Measurement standard | Range |
|---|---|---|
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(a) | ANSI C63.10:2013 | 13.553MHz to 13.567MHz |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(d) | ANSI C63.10:2013 | outside of the 13.110-14.010 MHz band |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209 | ANSI C63.10:2013 | 9kHz to 30MHz |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209 | ANSI C63.10:2013 | 30MHz to 1GHz |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.207 | ANSI C63.10:2013 | 150kHz to 30MHz |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(e) | ANSI C63.10:2013 | 0.01% of nominal |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.215(c) | ANSI C63.10:2013 | - |

# 4. 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.
All equipment(spectrum, antenna, accessory, etc.) for measurement is calibrated in accordance with the requirements of ANSI C63.5 (Version: 2006).

# 5. FACILITIES AND ACCREDITATIONS

## 5.1 FACILITIES

The 10 m semi anechoic chamber used to collect the Conducted and Radiated data is located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4 (Version: 2014). Detailed description of test facilities was submitted to the Commission and accepted dated July 07, 2015 (Registration Number: 90661)

## 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned loop, 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.”

# 6. 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.”
* The antennas of this E.U.T are permanently attached.
*The E.U.T Complies with the requirement of §15.203

# 7. TEST SUMMARY

The results in this report apply only to sample tested

| Regulation | Test Type | Range | Result |
|---|---|---|---|
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(a) | Radiated Electric Field Emissions | 13.553MHz to 13.567MHz | Pass |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(b) | Radiated Electric Field Emissions | 13.410MHz to 13.553MHz and 13.567MHz to 13.710MHz | Pass |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(c) | Radiated Electric Field Emission | 13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz | Pass |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209 (d) | Radiated Electric Field Emissions | 9kHz to 30MHz | Pass |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209 | Radiated Electric Field Emissions | 30MHz to 1GHz | Pass |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.207 | AC power conducted emissions | 150kHz to 30MHz | Pass |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(e) | Frequency Stability | 0.01% of nominal | Pass |
| Title 47 of the CFR: Part 15 Subpart (c), Clause 15.215(c) | 20 dB Bandwidth | - | Pass |

# 8. RADIATED EMISSION MEASUREMENT

## Requirement(s): 15.209, 15.225

Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

**Minimum Standard: FCC Part 15.225 / 15.209**

| Rule Part | Frequency (MHz) | Limit |
|---|---|---|
| Part 15.209 | 0.009 ~ 0.490 | 2400/F(kHz) uV/m@300 m |
| | 0.490 ~1.705 | 24000/F(kHz) uV/m@30 m |
| | 1.705 ~ 30 | 30 uV/m@30 m |
| | 30 ~ 88 | 100 ** uV/m@3 m |
| | 88 ~ 216 | 150 ** uV/m@3 m |
| | 216 ~ 960 | 200 ** uV/m@3 m |
| | Above 960 | 500 uV/m@3 m |

** 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.

## 15.225 Operation within the band 13.110 – 14.010 MHz.

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (= 84 dBuV/m) at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (=50.5dBuV/m) at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter (=40.5 dBuV/m) at 30 meters.

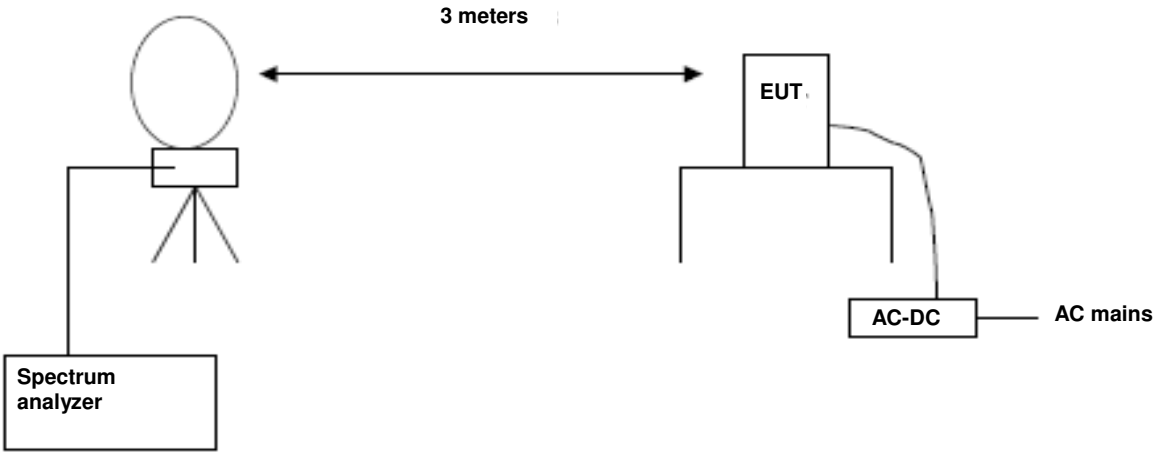
(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

(e) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(f) In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

## 8.1. RADIATED EMISSION 9 kHz – 30 MHz

### Test Set-up




### Test Procedure

The EUT was placed on a non-conductive table located on a large open test site.
The loop antenna was placed at a location 3m from the EUT. Radiated emissions were measured with the loop antenna both parallel and perpendicular to the plane of the EUT loop antenna and with x, y, z planes in EUT.

The limit is converted from microvolts/meter to decibel microvolts/meter. Sample Calculation:

Corrected Amplitude = Raw Amplitude(dBµV/m) + ACF(dB) + Cable Loss(dB) – Distance Correction Factor

The spectrum analyzer is set to:
Frequency Range = 9 kHz ~ 1 GHz
RBW = 9 kHz (9 kHz ~ 30 MHz)
= 120 kHz (30 MHz ~ 1 GHz)

Trace Mode = max hold
Detector Mode = peak / Quasi-peak
Sweep time = auto

## ▣ Test Results

| 13.553 MHz-13.567 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV/m)@3m | Ant.Factor+Cable Loss (dB/m) | Distance Correction (dB) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 13.5600(H) | 28.55 | 18.95 | -40.00 | 7.50 | 84.00 | 76.50 |
| 13.5603(V) | 25.19 | 18.95 | -40.00 | 4.14 | 84.00 | 79.86 |

| 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) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 13.5537 | 17.43 | 18.95 | -40.00 | -3.62 | 50.47 | 54.09 |
| 13.5674 | 17.02 | 18.95 | -40.00 | -4.03 | 50.47 | 54.50 |

| 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) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 13.2132 | 11.25 | 18.95 | -40.00 | -9.80 | 40.51 | 50.31 |
| 13.7803 | 12.34 | 18.95 | -40.00 | -8.71 | 40.51 | 49.22 |

| 9 kHz -30 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV/m)@3m | Ant.Factor+Cable Loss (dB/m) | Distance Correction (dB) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 8.5330 | 11.21 | 19.44 | -40.00 | -9.35 | 29.54 | 38.89 |
| 23.4232 | 11.67 | 18.56 | -40.00 | -9.77 | 29.54 | 39.31 |
| 27.1071 | 10.91 | 18.20 | -40.00 | -10.89 | 29.54 | 40.43 |
| 27.1205 | 10.55 | 18.20 | -40.00 | -11.25 | 29.54 | 40.79 |

## ▣ Test Results (Open Site)

| 13.553 MHz-13.567 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV/m)@3m | Ant.Factor+Cable Loss (dB/m) | Distance Correction (dB) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 13.5600(H) | 35.05 | 18.95 | -40.00 | 14.00 | 84.00 | 70.00 |
| 13.5603(V) | 31.69 | 18.95 | -40.00 | 10.64 | 84.00 | 73.36 |

| 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) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 13.5537 | 23.43 | 18.95 | -40.00 | 2.38 | 50.47 | 48.09 |
| 13.5674 | 23.02 | 18.95 | -40.00 | 1.97 | 50.47 | 48.50 |

| 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) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 13.2132 | 11.25 | 18.95 | -40.00 | -9.80 | 40.51 | 50.31 |
| 13.7803 | 12.34 | 18.95 | -40.00 | -8.71 | 40.51 | 49.22 |

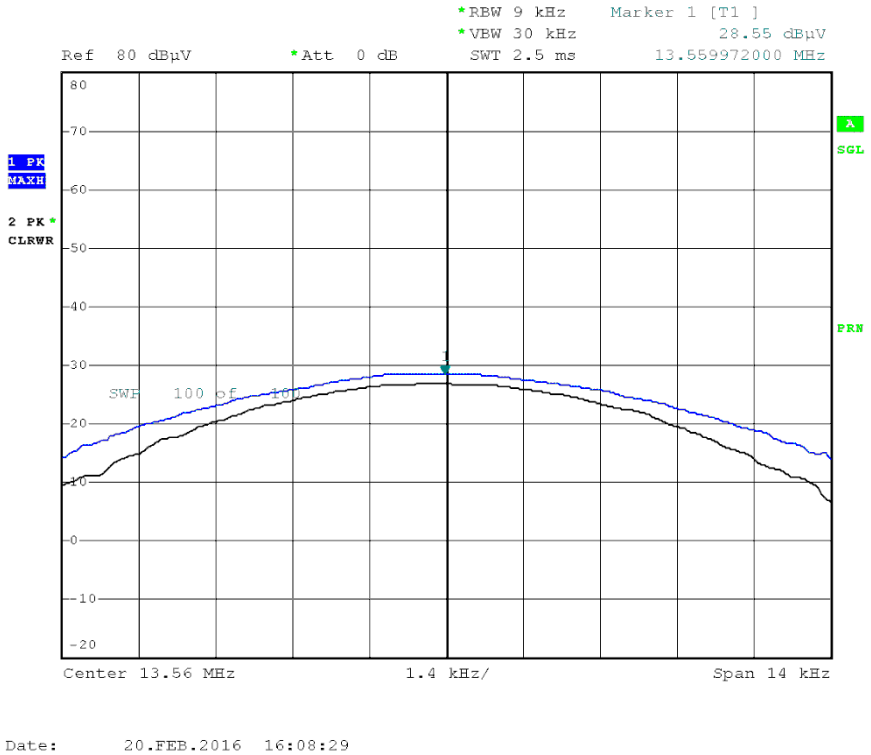
| 9 kHz -30 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV/m)@3m | Ant.Factor+Cable Loss (dB/m) | Distance Correction (dB) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 8.5330 | 11.21 | 19.44 | -40.00 | -9.35 | 29.54 | 38.89 |
| 23.4232 | 11.67 | 18.56 | -40.00 | -9.77 | 29.54 | 39.31 |
| 27.1071 | 10.91 | 18.20 | -40.00 | -10.89 | 29.54 | 40.43 |
| 27.1205 | 10.55 | 18.20 | -40.00 | -11.25 | 29.54 | 40.79 |

Note :

1. Distance Correction Below 30MHz = 40log(3m/30m) = - 40 dB
   Measurement Distance : 3 m (Below 30 MHz)
2. Factor = Antenna Factor + Cable Loss
3. Result Level = Read Level + Factor + Distance Correction
4. Margin = Limit – Result Level
5. We have done x, y, z planes in EUT
6. Antenna rotated about its vertical/horizontal axis for maximum response at each azimuth position around the EUT.
7. Worst case of operating mode is type A, analog mode and 106 kbps.

## ▣ RESULT PLOTS

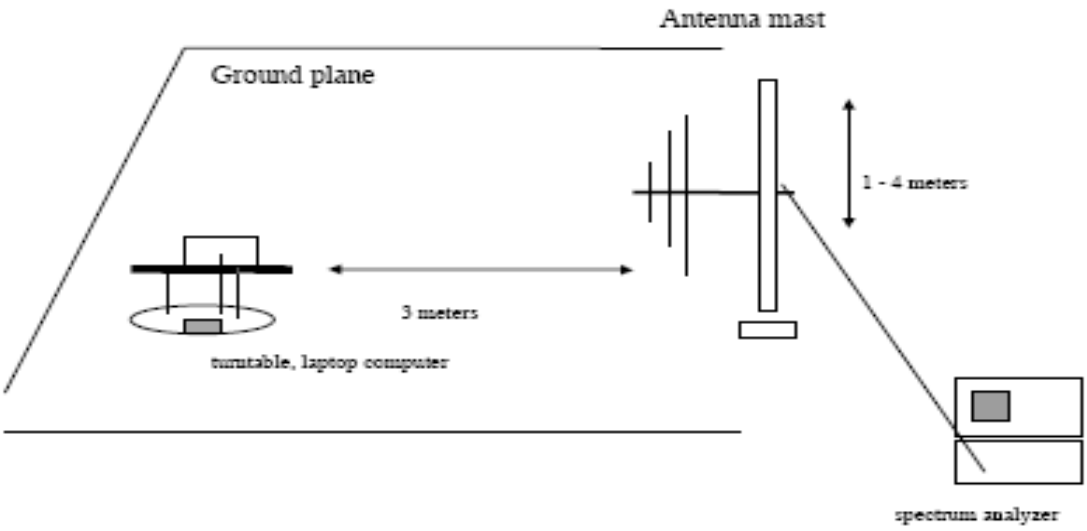
**Radiated Emissions (9kHz~30MHz) plot**




**Note : Only the worst case plots for Radiated Emissions.**

## 8.2. RADIATED EMISSION 30 MHz – 1000 MHz

Test Set-up




Test Procedures: Radiated emissions were measured according to ANSI C63.10.

The EUT was set to transmit at the highest output power.

The EUT was set 3 meter away from the measuring antenna.

### ▣ Test Results

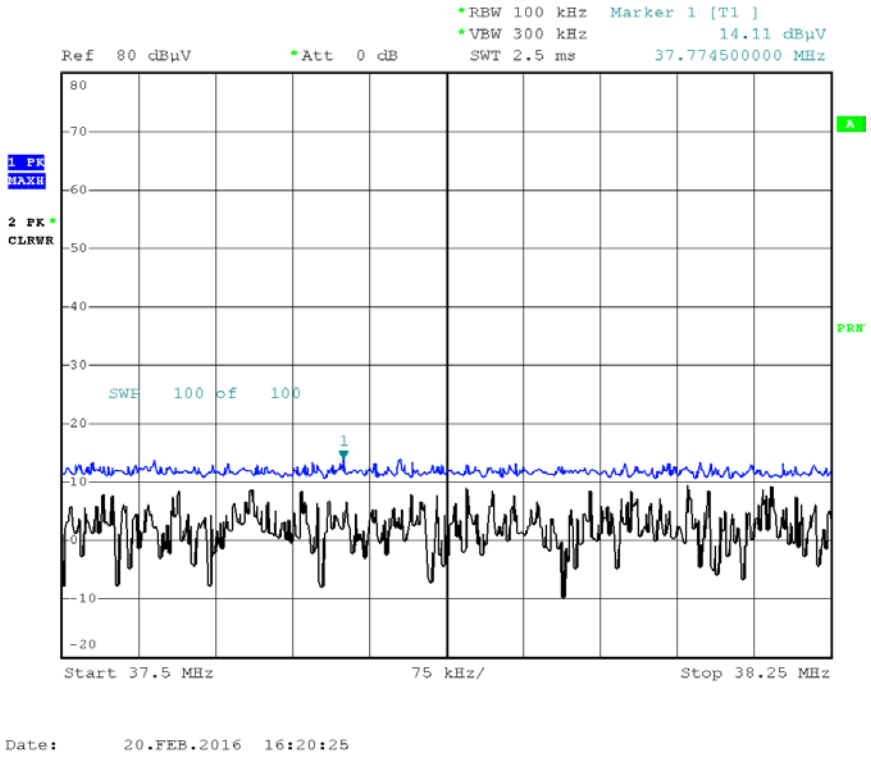
| Frequency | Reading | Ant. factor | Cable loss | Ant. POL | Total | Limit | Margin |
|---|---|---|---|---|---|---|---|
| MHz | dBμV | dB /m | dB | (H/V) | dBμV/m | dBμV/m | dB |
| *37.77 | 14.11 | 11.95 | 0.04 | H | 26.10 | 40.00 | 13.90 |
| 45.44 | 12.61 | 12.30 | 0.04 | H | 24.95 | 40.00 | 15.05 |
| 86.84 | 13.51 | 7.96 | 0.82 | V | 22.29 | 40.00 | 17.71 |
| 100.23 | 13.37 | 9.27 | 0.85 | H | 23.49 | 43.50 | 20.01 |
| *129.55 | 13.66 | 12.24 | 1.10 | H | 27.00 | 43.50 | 16.50 |
| *166.34 | 13.18 | 12.84 | 1.23 | V | 27.25 | 43.50 | 16.25 |

Remark

1. Result Level = Read Level + (Antenna Factor+ Cable Loss)
2. Margin = Limit – Result Level
3. '*' is the result for restricted band.

## ▣ RESULT PLOTS

**Radiated Emissions (30MHz~1000MHz) plot**




**Note : Only the worst case plots for Radiated Emissions.**

# 9. EMISSION BANDWIDTH PLOT.

## Requirement(s):

Test Set-up: The EUT was connected to a spectrum analyzer.

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

RBW = Auto

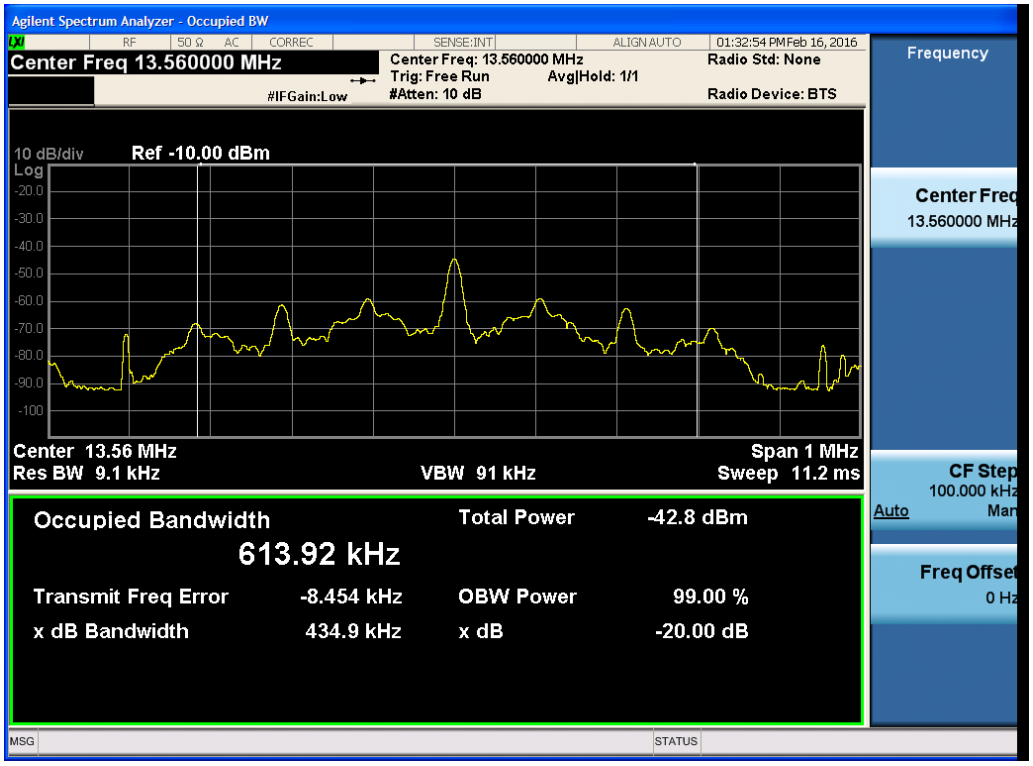
VBW = Auto

Span = Adequately in the operating Tx.

Detector = Peak

Trace mode = Max hold

Allow the trace to stabilize



# 10. FREQUENCY TOLERANCE

Procedure: Part 15.225, ANSI 63.10

If required, the operating or transmitting frequency of an intentional radiator should be measured in accordance with the following procedure to ensure that the device operates outside certain precluded frequency bands and within the frequency range. No modulation needs to be supplied to the intentional radiator during these tests, unless modulation is required to produce an output, e.g., single-sideband suppressed carrier transmitters.

The frequency stability of the transmitter is measured by:

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

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

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

Measurement Result:

PERATING FREQUENCY: 13.56 MHz
REFERENCE VOLTAGE: 3.8 VDC
DEVIATION LIMIT: 0.01% = 1356 Hz

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (MHz) | Frequency Dev. (Hz) | Frequency Dev (%) |
|---|---|---|---|---|---|
| 100% | 3.8 | -20 | 13.559833 | -167 | -0.0012316 |
| 100% | | -10 | 13.559844 | -156 | -0.0011504 |
| 100% | | 0 | 13.559849 | -151 | -0.0011136 |
| 100% | | +10 | 13.559857 | -143 | -0.0010546 |
| 100% | | +20(Ref.) | 13.559866 | -134 | -0.0009882 |
| 100% | | +30 | 13.559872 | -128 | -0.0009440 |
| 100% | | +40 | 13.559879 | -121 | -0.0008923 |
| 100% | | +50 | 13.559886 | -114 | -0.0008407 |
| 115% | 4.37 | +20 | 13.559869 | -131 | -0.0009661 |
| 85% | 3.23 | +20 | 13.559871 | -129 | -0.0009513 |

# 11. POWERLINE CONDUCTE EMISSIONS

**LIMIT**

For an intentional radiator which 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 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

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

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 Appendix 1 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

**Test Plots**

**Unterminate the Antenna**

**Conducted Emissions (Line 1)**

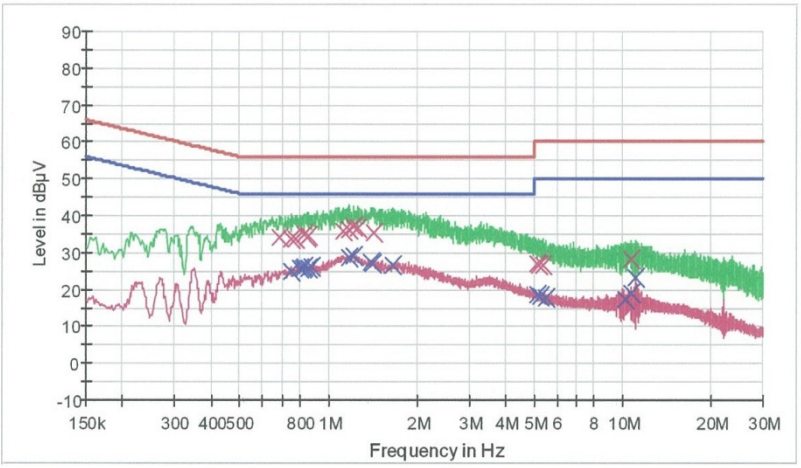
EMI Auto Test(16) 1 / 2

# HCT TEST Report

## Common Information

| | |
|---|---|
| EUT: | SM-J120ZN |
| Manufacturer: | SAMSUNG |
| Test Site: | SHIELD ROOM |
| Operating Conditions: | NFC MODE (UNTERMINATION) |

FCC CLASS B




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

## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.686000 | 34.3 | 9.000 | Off | L1 | 9.7 | 21.7 | 56.0 |
| 0.752000 | 33.9 | 9.000 | Off | L1 | 9.7 | 22.1 | 56.0 |
| 0.772000 | 33.5 | 9.000 | Off | L1 | 9.7 | 22.5 | 56.0 |
| 0.832000 | 35.0 | 9.000 | Off | L1 | 9.7 | 21.0 | 56.0 |
| 0.844000 | 33.9 | 9.000 | Off | L1 | 9.7 | 22.1 | 56.0 |
| 0.856000 | 34.3 | 9.000 | Off | L1 | 9.7 | 21.7 | 56.0 |
| 1.126000 | 35.8 | 9.000 | Off | L1 | 9.7 | 20.2 | 56.0 |
| 1.184000 | 36.3 | 9.000 | Off | L1 | 9.7 | 19.7 | 56.0 |
| 1.214000 | 37.2 | 9.000 | Off | L1 | 9.7 | 18.8 | 56.0 |
| 1.260000 | 36.8 | 9.000 | Off | L1 | 9.7 | 19.2 | 56.0 |
| 1.266000 | 36.7 | 9.000 | Off | L1 | 9.7 | 19.3 | 56.0 |
| 1.430000 | 35.2 | 9.000 | Off | L1 | 9.7 | 20.8 | 56.0 |
| 5.130000 | 26.9 | 9.000 | Off | L1 | 9.9 | 33.1 | 60.0 |
| 5.148000 | 26.9 | 9.000 | Off | L1 | 9.9 | 33.1 | 60.0 |
| 5.152000 | 27.1 | 9.000 | Off | L1 | 9.9 | 32.9 | 60.0 |
| 5.176000 | 26.5 | 9.000 | Off | L1 | 9.9 | 33.5 | 60.0 |
| 5.352000 | 26.5 | 9.000 | Off | L1 | 9.9 | 33.5 | 60.0 |
| 10.714000 | 28.1 | 9.000 | Off | L1 | 10.0 | 31.9 | 60.0 |

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EMI Auto Test(16) 2 / 2

## Final Result 2

| Frequency (MHz) | CAverage (dBµV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.752000 | 25.0 | 9.000 | Off | L1 | 9.7 | 21.0 | 46.0 |
| 0.802000 | 25.8 | 9.000 | Off | L1 | 9.7 | 20.2 | 46.0 |
| 0.816000 | 25.6 | 9.000 | Off | L1 | 9.7 | 20.4 | 46.0 |
| 0.832000 | 26.0 | 9.000 | Off | L1 | 9.7 | 20.0 | 46.0 |
| 0.856000 | 25.6 | 9.000 | Off | L1 | 9.7 | 20.4 | 46.0 |
| 0.876000 | 26.0 | 9.000 | Off | L1 | 9.7 | 20.0 | 46.0 |
| 1.184000 | 28.7 | 9.000 | Off | L1 | 9.7 | 17.3 | 46.0 |
| 1.216000 | 29.1 | 9.000 | Off | L1 | 9.7 | 16.9 | 46.0 |
| 1.220000 | 29.2 | 9.000 | Off | L1 | 9.7 | 16.8 | 46.0 |
| 1.398000 | 27.6 | 9.000 | Off | L1 | 9.7 | 18.4 | 46.0 |
| 1.416000 | 27.1 | 9.000 | Off | L1 | 9.7 | 18.9 | 46.0 |
| 1.650000 | 26.5 | 9.000 | Off | L1 | 9.7 | 19.5 | 46.0 |
| 5.130000 | 18.5 | 9.000 | Off | L1 | 9.9 | 31.5 | 50.0 |
| 5.218000 | 18.2 | 9.000 | Off | L1 | 9.9 | 31.8 | 50.0 |
| 5.512000 | 17.9 | 9.000 | Off | L1 | 9.9 | 32.1 | 50.0 |
| 10.268000 | 17.4 | 9.000 | Off | L1 | 10.0 | 32.6 | 50.0 |
| 10.714000 | 19.1 | 9.000 | Off | L1 | 10.0 | 30.9 | 50.0 |
| 11.020000 | 23.0 | 9.000 | Off | L1 | 10.1 | 27.0 | 50.0 |

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**Conducted Emissions (Line 2)**

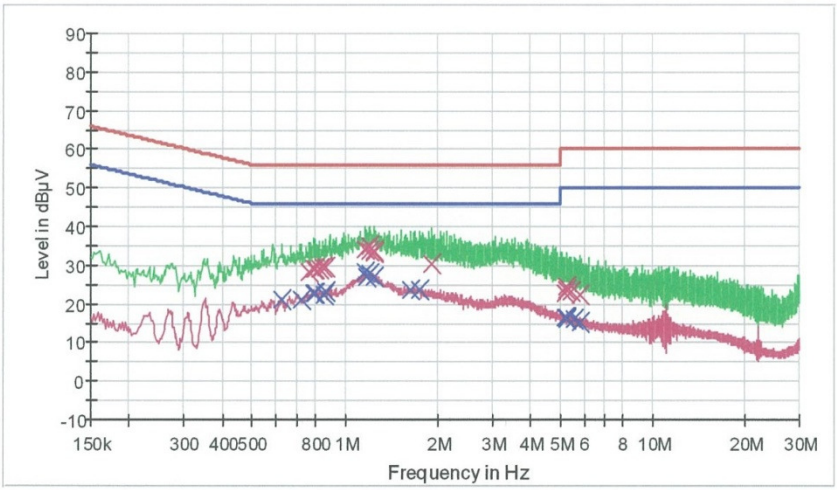
EMI Auto Test(16) 1 / 2

# HCT TEST Report

## Common Information

| | |
|---|---|
| EUT: | SM-J120ZN |
| Manufacturer: | SAMSUNG |
| Test Site: | SHIELD ROOM |
| Operating Conditions: | NFC MODE (UNTERMINATION) |

FCC CLASS B




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

## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.764000 | 28.0 | 9.000 | Off | N | 9.7 | 28.0 | 56.0 |
| 0.794000 | 29.1 | 9.000 | Off | N | 9.7 | 26.9 | 56.0 |
| 0.798000 | 28.9 | 9.000 | Off | N | 9.7 | 27.1 | 56.0 |
| 0.826000 | 29.1 | 9.000 | Off | N | 9.7 | 26.9 | 56.0 |
| 0.846000 | 29.4 | 9.000 | Off | N | 9.7 | 26.6 | 56.0 |
| 0.868000 | 29.4 | 9.000 | Off | N | 9.7 | 26.6 | 56.0 |
| 1.164000 | 33.9 | 9.000 | Off | N | 9.7 | 22.1 | 56.0 |
| 1.204000 | 33.6 | 9.000 | Off | N | 9.7 | 22.4 | 56.0 |
| 1.210000 | 34.8 | 9.000 | Off | N | 9.7 | 21.2 | 56.0 |
| 1.246000 | 33.7 | 9.000 | Off | N | 9.7 | 22.3 | 56.0 |
| 1.252000 | 33.1 | 9.000 | Off | N | 9.7 | 22.9 | 56.0 |
| 1.910000 | 30.2 | 9.000 | Off | N | 9.7 | 25.8 | 56.0 |
| 5.206000 | 22.9 | 9.000 | Off | N | 9.8 | 37.1 | 60.0 |
| 5.220000 | 24.6 | 9.000 | Off | N | 9.8 | 35.4 | 60.0 |
| 5.228000 | 23.8 | 9.000 | Off | N | 9.8 | 36.2 | 60.0 |
| 5.252000 | 23.4 | 9.000 | Off | N | 9.8 | 36.6 | 60.0 |
| 5.446000 | 23.0 | 9.000 | Off | N | 9.8 | 37.0 | 60.0 |
| 5.800000 | 22.4 | 9.000 | Off | N | 9.9 | 37.6 | 60.0 |

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EMI Auto Test(16) 2 / 2

## Final Result 2

| Frequency (MHz) | CAverage (dBµV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.626000 | 21.1 | 9.000 | Off | N | 9.6 | 25.0 | 46.0 |
| 0.720000 | 21.2 | 9.000 | Off | N | 9.7 | 24.8 | 46.0 |
| 0.794000 | 22.9 | 9.000 | Off | N | 9.7 | 23.1 | 46.0 |
| 0.798000 | 22.9 | 9.000 | Off | N | 9.7 | 23.1 | 46.0 |
| 0.862000 | 22.5 | 9.000 | Off | N | 9.7 | 23.5 | 46.0 |
| 0.868000 | 23.0 | 9.000 | Off | N | 9.7 | 23.0 | 46.0 |
| 1.164000 | 28.2 | 9.000 | Off | N | 9.7 | 17.8 | 46.0 |
| 1.182000 | 27.1 | 9.000 | Off | N | 9.7 | 18.9 | 46.0 |
| 1.202000 | 27.8 | 9.000 | Off | N | 9.7 | 18.2 | 46.0 |
| 1.252000 | 27.0 | 9.000 | Off | N | 9.7 | 19.0 | 46.0 |
| 1.638000 | 23.7 | 9.000 | Off | N | 9.7 | 22.3 | 46.0 |
| 1.744000 | 23.8 | 9.000 | Off | N | 9.7 | 22.2 | 46.0 |
| 5.206000 | 16.3 | 9.000 | Off | N | 9.8 | 33.7 | 50.0 |
| 5.220000 | 16.5 | 9.000 | Off | N | 9.8 | 33.5 | 50.0 |
| 5.228000 | 16.3 | 9.000 | Off | N | 9.8 | 33.7 | 50.0 |
| 5.252000 | 16.1 | 9.000 | Off | N | 9.8 | 33.9 | 50.0 |
| 5.552000 | 16.1 | 9.000 | Off | N | 9.8 | 33.9 | 50.0 |
| 5.800000 | 15.3 | 9.000 | Off | N | 9.9 | 34.7 | 50.0 |

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**Terminate the Antenna**

**Conducted Emissions (Line 1)**

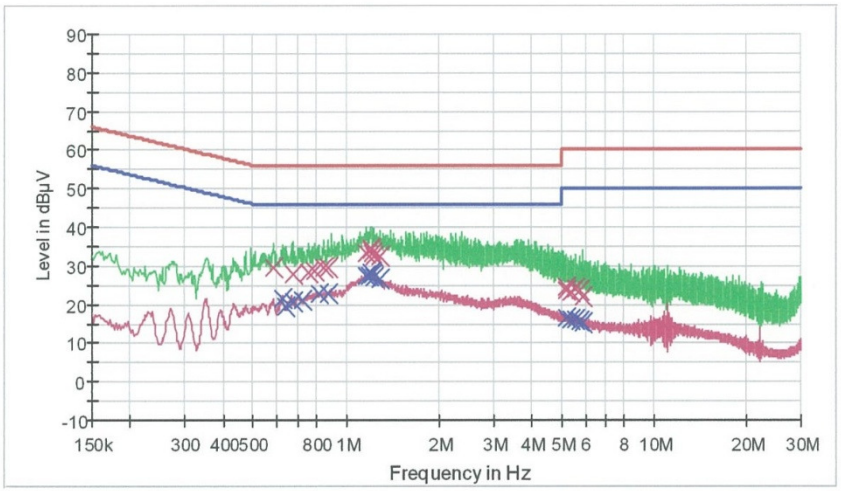
EMI Auto Test(16) 1 / 2

# HCT TEST Report

## Common Information

| | |
|---|---|
| EUT: | SM-J120ZN |
| Manufacturer: | SAMSUNG |
| Test Site: | SHIELD ROOM |
| Operating Conditions: | NFC MODE (TERMINATION) |

FCC CLASS B




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

## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.584000 | 29.3 | 9.000 | Off | N | 9.6 | 26.7 | 56.0 |
| 0.674000 | 28.0 | 9.000 | Off | N | 9.6 | 28.0 | 56.0 |
| 0.760000 | 28.3 | 9.000 | Off | N | 9.7 | 27.7 | 56.0 |
| 0.790000 | 28.8 | 9.000 | Off | N | 9.7 | 27.2 | 56.0 |
| 0.848000 | 29.6 | 9.000 | Off | N | 9.7 | 26.4 | 56.0 |
| 0.874000 | 29.4 | 9.000 | Off | N | 9.7 | 26.6 | 56.0 |
| 1.160000 | 33.1 | 9.000 | Off | N | 9.7 | 22.9 | 56.0 |
| 1.204000 | 34.7 | 9.000 | Off | N | 9.7 | 21.3 | 56.0 |
| 1.208000 | 33.9 | 9.000 | Off | N | 9.7 | 22.1 | 56.0 |
| 1.216000 | 33.4 | 9.000 | Off | N | 9.7 | 22.6 | 56.0 |
| 1.236000 | 32.6 | 9.000 | Off | N | 9.7 | 23.4 | 56.0 |
| 1.292000 | 32.3 | 9.000 | Off | N | 9.7 | 23.7 | 56.0 |
| 5.172000 | 23.5 | 9.000 | Off | N | 9.8 | 36.5 | 60.0 |
| 5.180000 | 24.3 | 9.000 | Off | N | 9.8 | 35.7 | 60.0 |
| 5.370000 | 23.2 | 9.000 | Off | N | 9.8 | 36.8 | 60.0 |
| 5.532000 | 24.1 | 9.000 | Off | N | 9.8 | 35.9 | 60.0 |
| 5.714000 | 23.7 | 9.000 | Off | N | 9.9 | 36.3 | 60.0 |
| 5.856000 | 22.0 | 9.000 | Off | N | 9.9 | 38.0 | 60.0 |

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EMI Auto Test(16) 2 / 2

## Final Result 2

| Frequency (MHz) | CAverage (dBµV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.624000 | 21.5 | 9.000 | Off | N | 9.6 | 24.5 | 46.0 |
| 0.640000 | 19.3 | 9.000 | Off | N | 9.6 | 26.7 | 46.0 |
| 0.674000 | 20.8 | 9.000 | Off | N | 9.6 | 25.2 | 46.0 |
| 0.722000 | 21.0 | 9.000 | Off | N | 9.7 | 25.0 | 46.0 |
| 0.818000 | 22.9 | 9.000 | Off | N | 9.7 | 23.1 | 46.0 |
| 0.874000 | 22.6 | 9.000 | Off | N | 9.7 | 23.4 | 46.0 |
| 1.160000 | 27.4 | 9.000 | Off | N | 9.7 | 18.6 | 46.0 |
| 1.196000 | 27.3 | 9.000 | Off | N | 9.7 | 18.7 | 46.0 |
| 1.208000 | 28.0 | 9.000 | Off | N | 9.7 | 18.0 | 46.0 |
| 1.216000 | 27.7 | 9.000 | Off | N | 9.7 | 18.3 | 46.0 |
| 1.236000 | 26.8 | 9.000 | Off | N | 9.7 | 19.2 | 46.0 |
| 1.292000 | 26.4 | 9.000 | Off | N | 9.7 | 19.6 | 46.0 |
| 5.166000 | 16.4 | 9.000 | Off | N | 9.8 | 33.6 | 50.0 |
| 5.180000 | 16.5 | 9.000 | Off | N | 9.8 | 33.5 | 50.0 |
| 5.370000 | 16.1 | 9.000 | Off | N | 9.8 | 33.9 | 50.0 |
| 5.532000 | 15.9 | 9.000 | Off | N | 9.8 | 34.1 | 50.0 |
| 5.714000 | 15.6 | 9.000 | Off | N | 9.9 | 34.4 | 50.0 |
| 5.856000 | 15.1 | 9.000 | Off | N | 9.9 | 34.9 | 50.0 |

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**Conducted Emissions (Line 2)**

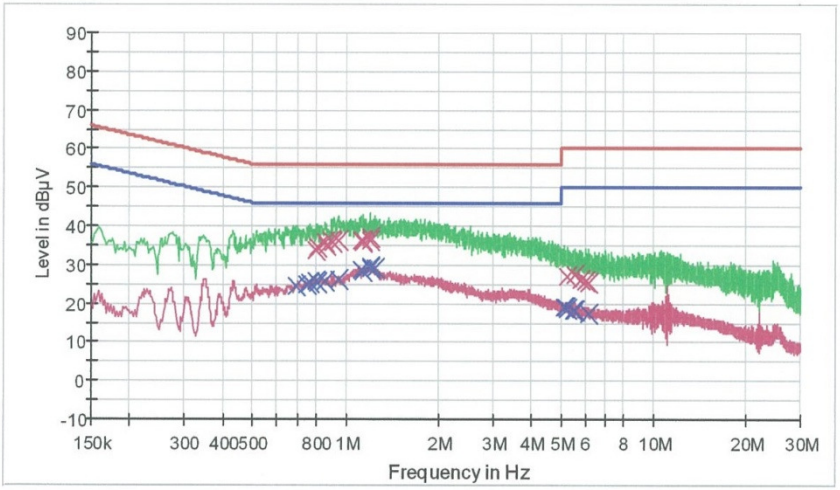
EMI Auto Test(16) 1 / 2

# HCT TEST Report

## Common Information

| | |
|---|---|
| EUT: | SM-J120ZN |
| Manufacturer: | SAMSUNG |
| Test Site: | SHIELD ROOM |
| Operating Conditions: | NFC MODE (TERMINATION) |

FCC CLASS B




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

## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.800000 | 33.6 | 9.000 | Off | L1 | 9.7 | 22.4 | 56.0 |
| 0.810000 | 34.6 | 9.000 | Off | L1 | 9.7 | 21.4 | 56.0 |
| 0.858000 | 35.8 | 9.000 | Off | L1 | 9.7 | 20.2 | 56.0 |
| 0.864000 | 34.9 | 9.000 | Off | L1 | 9.7 | 21.1 | 56.0 |
| 0.898000 | 36.0 | 9.000 | Off | L1 | 9.7 | 20.0 | 56.0 |
| 0.904000 | 35.8 | 9.000 | Off | L1 | 9.7 | 20.2 | 56.0 |
| 0.946000 | 36.4 | 9.000 | Off | L1 | 9.7 | 19.6 | 56.0 |
| 1.126000 | 36.2 | 9.000 | Off | L1 | 9.7 | 19.8 | 56.0 |
| 1.134000 | 36.0 | 9.000 | Off | L1 | 9.7 | 20.0 | 56.0 |
| 1.140000 | 36.2 | 9.000 | Off | L1 | 9.7 | 19.8 | 56.0 |
| 1.198000 | 36.2 | 9.000 | Off | L1 | 9.7 | 19.8 | 56.0 |
| 1.206000 | 37.2 | 9.000 | Off | L1 | 9.7 | 18.8 | 56.0 |
| 5.248000 | 27.0 | 9.000 | Off | L1 | 9.9 | 33.0 | 60.0 |
| 5.266000 | 27.0 | 9.000 | Off | L1 | 9.9 | 33.0 | 60.0 |
| 5.534000 | 27.4 | 9.000 | Off | L1 | 9.9 | 32.6 | 60.0 |
| 5.792000 | 26.3 | 9.000 | Off | L1 | 9.9 | 33.7 | 60.0 |
| 6.030000 | 25.8 | 9.000 | Off | L1 | 9.9 | 34.2 | 60.0 |
| 6.124000 | 25.3 | 9.000 | Off | L1 | 9.9 | 34.7 | 60.0 |

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EMI Auto Test(16) 2 / 2

## Final Result 2

| Frequency (MHz) | CAverage (dBµV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|---|
| 0.690000 | 24.5 | 9.000 | Off | L1 | 9.7 | 21.5 | 46.0 |
| 0.752000 | 24.9 | 9.000 | Off | L1 | 9.7 | 21.1 | 46.0 |
| 0.768000 | 25.2 | 9.000 | Off | L1 | 9.7 | 20.8 | 46.0 |
| 0.800000 | 25.6 | 9.000 | Off | L1 | 9.7 | 20.4 | 46.0 |
| 0.808000 | 25.5 | 9.000 | Off | L1 | 9.7 | 20.5 | 46.0 |
| 0.858000 | 25.6 | 9.000 | Off | L1 | 9.7 | 20.4 | 46.0 |
| 0.946000 | 26.1 | 9.000 | Off | L1 | 9.7 | 19.9 | 46.0 |
| 1.126000 | 28.8 | 9.000 | Off | L1 | 9.7 | 17.2 | 46.0 |
| 1.134000 | 28.4 | 9.000 | Off | L1 | 9.7 | 17.6 | 46.0 |
| 1.198000 | 29.1 | 9.000 | Off | L1 | 9.7 | 16.9 | 46.0 |
| 1.206000 | 29.4 | 9.000 | Off | L1 | 9.7 | 16.6 | 46.0 |
| 1.242000 | 28.9 | 9.000 | Off | L1 | 9.7 | 17.1 | 46.0 |
| 5.148000 | 18.8 | 9.000 | Off | L1 | 9.9 | 31.2 | 50.0 |
| 5.196000 | 18.8 | 9.000 | Off | L1 | 9.9 | 31.2 | 50.0 |
| 5.248000 | 18.5 | 9.000 | Off | L1 | 9.9 | 31.5 | 50.0 |
| 5.488000 | 18.1 | 9.000 | Off | L1 | 9.9 | 31.9 | 50.0 |
| 5.534000 | 18.3 | 9.000 | Off | L1 | 9.9 | 31.7 | 50.0 |
| 6.124000 | 17.3 | 9.000 | Off | L1 | 9.9 | 32.8 | 50.0 |

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# 12. LIST OF TEST EQUIPMENT

## 12.1 LIST OF TEST EQUIPMENT(Conducted Test)

| Manufacturer | Model / Equipment | Calibration Date | Calibration Interval | Serial No. |
|---|---|---|---|---|
| Rohde & Schwarz | ENV216/ LISN | 12/28/2015 | Annual | 100073 |
| Rohde & Schwarz | ESCI / TEST RECEIVER | 12/28/2015 | Annual | 100584 |
| Agilent | E4440A/ Spectrum Analyzer | 03/18/2015 | Annual | US45303008 |
| Agilent | N9020A / SIGNAL ANALYZER | 06/30/2015 | Annual | MY51110085 |
| Agilent | N9020A / SIGNAL ANALYZER | 07/02/2015 | Annual | MY50510304 |
| Agilent | N1911A/Power Meter | 07/09/2015 | Annual | MY45100523 |
| Agilent | N1921A /POWER SENSOR | 07/09/2015 | Annual | MY45241059 |
| Agilent | 87300B/Directional Coupler | 11/30/2015 | Annual | 3116A03621 |
| Hewlett Packard | 11667B / Power Splitter | 06/15/2015 | Annual | 5001 |
| Hewlett Packard | E3632A / DC POWER SUPPLY | 03/11/2015 | Annual | KR75303962 |
| Agilent | 8493C / Attenuator(10 dB) | 07/21/2015 | Annual | 07560 |

## 12.2 LIST OF TEST EQUIPMENT(Radiated Test)

| Manufacturer | Model / Equipment | Calibration Date | Calibration Interval | Serial No. |
|---|---|---|---|---|
| Schwarzbeck | VULB 9160/ TRILOG Antenna | 10/10/2014 | Biennial | 3368 |
| HD | MA240/ Antenna Position Tower | N/A | N/A | 556 |
| EMCO | 1050/ Turn Table | N/A | N/A | 114 |
| HD GmbH | HD 100/ Controller | N/A | N/A | 13 |
| HD GmbH | KMS 560/ SlideBar | N/A | N/A | 12 |
| Schwarzbeck | BBHA 9120D/ Horn Antenna | 05/07/2015 | Biennial | 937 |
| Schwarzbeck | BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz) | 04/30/2015 | Biennial | BBHA9170124 |
| Rohde & Schwarz | FSP / Spectrum Analyzer | 01/15/2016 | Annual | 839117/011 |
| Rohde & Schwarz | LOOP ANTENNA | 02/04/2016 | Biennial | 100179 |
| CERNEX | CBL18265035 / POWER AMP | 07/27/2015 | Annual | 22966 |
| CERNEX | CBL06185030 / POWER AMP | 07/21/2015 | Annual | 22965 |
| CERNEX | CBLU1183540 / POWER AMP | 07/21/2015 | Annual | 22964 |