FCC CFR47 PART 15 SUBPART C

NFC

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone + BT/BLE, DTS b/g/n and NFC

MODEL NUMBER : SM-J320F/DD, SM-J320FN

FCC ID: A3LSMJ320FN

REPORT NUMBER: 16K22740-E4V3

ISSUE DATE: FEB 25, 2016

Prepared for
SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
--	02/04/16	Initial issue	Junwhan Lee
V2	02/23/16	Added radiated emission data (0.15 ~ 30MHz)	Junwhan Lee
V3	02/25/16	Revised section 7 (20dB bandwidth)	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: GSM/WCDMA/LTE Phone + BT/BLE, DTS b/g/n and NFC

MODEL NUMBER: SM-J320F/DD, SM-J320FN

SERIAL NUMBER: R31H1001HSX , R38GC08YA0F (RADIATED, CONDUCTED)

DATE TESTED: JAN 29, 2016 - FEB 03, 2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:

CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Chamber 1
☐ Chamber 2

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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.32 dB
Radiated Disturbance, Below 1GHz	4.14 dB

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is GSM/WCDMA/LTE Phone + BT/BLE, DTS b/g/n and NFC.
This test report addresses the DXX (NFC) operational mode.

SM-J320F/DD and SM-J320FN are same hardware but for different number of SIM card slot. SM-J320FN has one slot. SM-J320F/DD is dual SIM version.
Also travel charger of these two model was different.

In accordance with difference of travel chager, AC power line conducted test and radiated spurious emissions test below 1GHz were conducted by each model.
SM-J320F/DD was used for the other tests.

5.2. MAXIMUM OUTPUT POWER

The testing was performed at 1 meter. The transmitter maximum E-field at 30m distance is 15.19 dBuV/m which convert from 1 meter data.

5.3. WORST-CASE CONFIGURATION AND MODE

The NFC function was tested at its' fundamental and only operational frequency of 13.56 MHz. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that the Z-orientation was the worst-case orientation; therefore all final radiated testing was performed with the EUT in the Z-orientation while generating continuous emissions.

5.4. MODIFICATIONS

No modifications were made during testing.

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

- SM-J320F/DD

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	ETA0U84IWE	R37GBRA0031RC3	N/A
Data Cable	SAMSUNG	ECB-DU68WE	N/A	N/A
Earphone	SAMSUNG	EHS61ASFWE	N/A	N/A

- SM-J320FN

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	ETA0U83EWE	DW1FC09KS/A-E	N/A
Data Cable	SAMSUNG	ECB-DU68WE	N/A	N/A
Earphone	SAMSUNG	EHS61ASFWE	N/A	N/A

I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	0.8m	N/A
2	Audio	1	Mini-Jack	Unshielded	1.0m	N/A

TEST SETUP

The EUT is a stand-alone device configured and tested in a worst-case setup.
Note: worst case is using worst case orientation with AC charger and headset attached to the EUT with NFC signal continuously transmitting.

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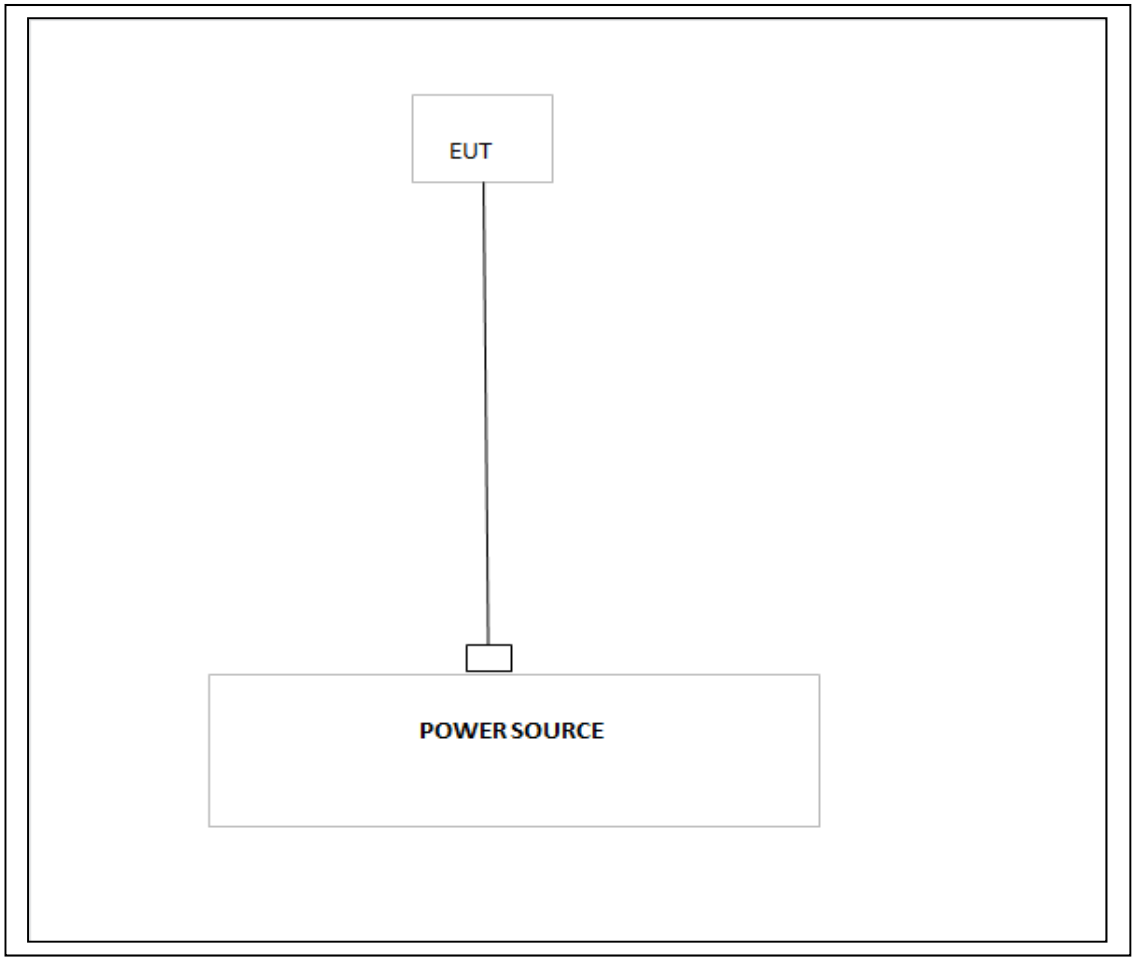
SETUP DIAGRAM FOR TESTS

Radiated Emissions Below 30 MHz:



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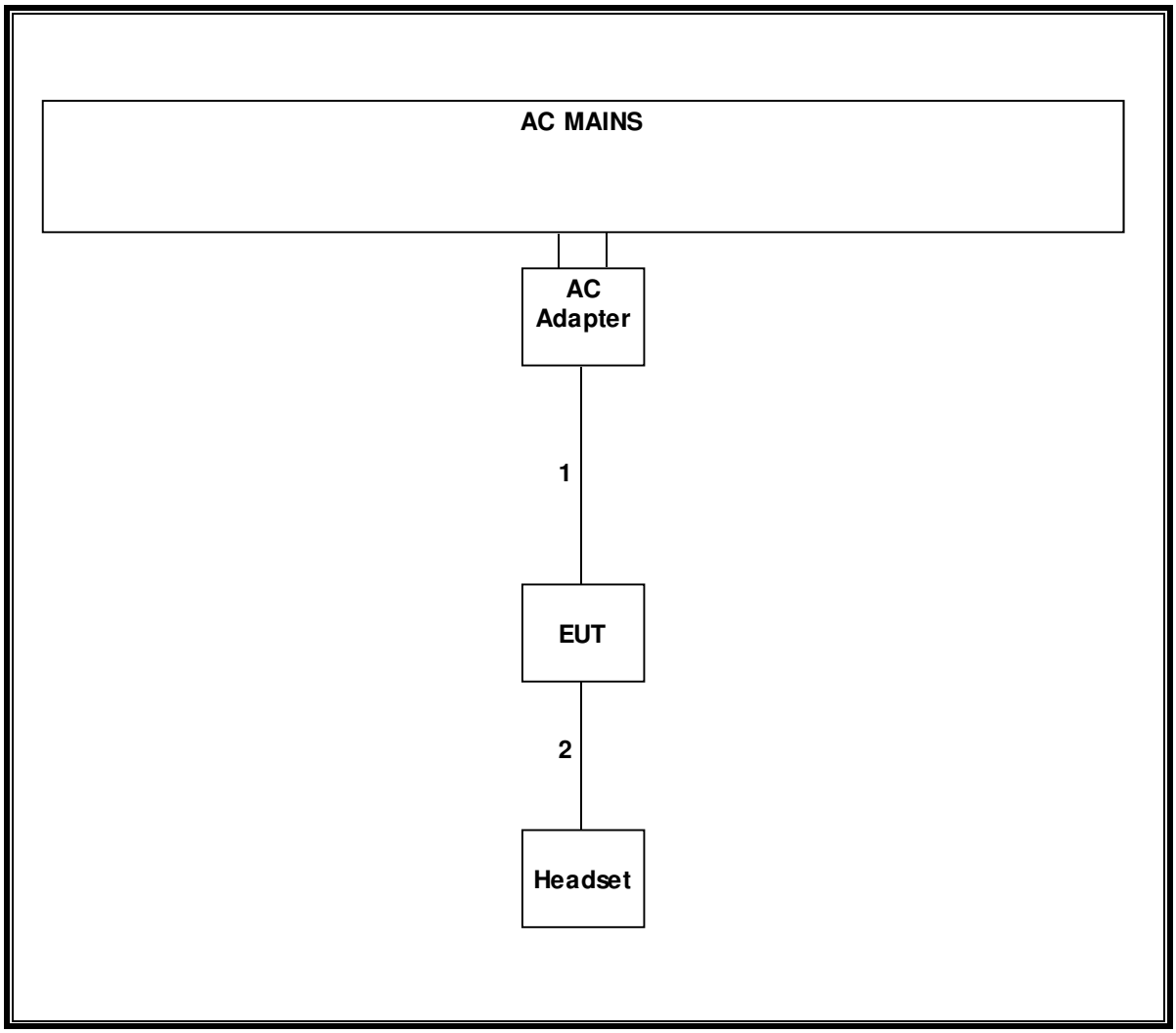
Radiated Emissions Above 30 MHz, AC Line Conducted Emissions:



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6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	11-17-16
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-17
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	11-25-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-18-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-19-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-19-16
DC Power Supply	Agilent / HP	E3640A	MY54226395	08-18-16
Temperature Chamber	ESPEC	SH-642	93001109	08-18-16
LISN	R&S	ENV216	101836	08-19-16
LISN	R&S	ENV216	101837	08-19-16

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7. 20dB BANDWIDTH

LIMITS

§15.215

(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated

§15.225

Operation within the band 13.110 – 14.010MHz

TEST PROCEDURE

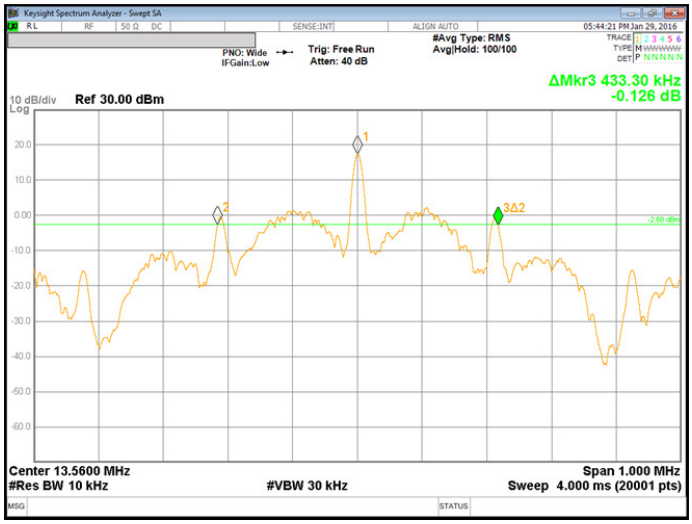
The spectrum analyzer connected receive antenna and the EUT placed on near the receive antenna. The RBW is set to 10KHz. The VBW is set to 3 times the RBW. The sweep time is coupled.

RESULTS

Frequency [MHz]	20dB Bandwidth [KHz]
13.56	433.3

Note : The measured point from marker 2 to marker 3 is within the frequency operation band 13.110MHz ~ 14.011MHz

20dB Bandwidth Plot



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8. RADIATED EMISSION TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMIT

§15.225

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

(d) The field strength of any emissions appearing outside of the 13.110– 14.010 MHz and shall not exceed the general radiated emission limits in § 15.209 as follows:
§15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (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.
§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

Formula for converting the filed strength from uV/m to dBuV/m is:
Limit (dBuV/m) = 20 log limit (uV/m)

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In addition:

§15.209 (d) The emission limits shown the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

§15.209 (d) The provisions in §§ 15.225, measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

TEST PROCEDURE

ANSI C63.10-2009

The EUT is an intentional radiator that incorporates a digital device. The highest fundamental frequency generated or used in the device is 13.56 MHz. The frequency range was investigated from 0.15 MHz to the 10^{th} harmonic of the highest fundamental frequency, or 1000 MHz, whichever is greater (1000MHz)

RESULTS

No non-compliance noted:

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8.1.1. FUNDAMENTAL AND SPURIOUS EMISSIONS (0.15 – 30 MHz)

8.1.1.1. SM-J320F/DD

FCC Part 15, Subpart B & C **1 Meter Distance Measurement At Chamber 1**

Company: Samsung
Project #: 16K22740
Model #: SM-J320F/DD
Tester: Steven.Kim
Date: 2016/01/30

Frequency (MHz)	PK (dBu/V)	QP (dBu/V)	AV (dBuV)	AF dB/m	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes
Loop Antenna Face on: Z position worst												
13.56	54.07		N/A	19.03	-59.08	14.02	N/A	84.00	N/A	-70.0	N/A	Fundamental @ 1m Dist
13.55	41.61		N/A	19.03	-59.08	1.56	N/A	50.48	N/A	-48.9	N/A	13.41MHz-13.553MHz
13.57	43.12		N/A	19.03	-59.08	3.06	N/A	50.48	N/A	-47.4	N/A	13.567MHz-13.71MHz
13.35	36.58		N/A	19.06	-59.08	-3.44	N/A	40.51	N/A	-44.0	N/A	13.110-13.410MHz
13.77	34.98		N/A	19	-59.08	-5.11	N/A	41.51	N/A	-46.6	N/A	13.71-14.01MHz
9.63	21.74		N/A	19.61	-59.08	-17.73	N/A	29.54	N/A	-47.3	N/A	9k-13.11MHz
14.39	23.32		N/A	18.9	-59.08	-16.87	N/A	29.54	N/A	-46.4	N/A	14.01MHz-30MHz
Loop Antenna Face off: Z position												
13.56	53.09		N/A	19.03	-59.08	13.04	N/A	84.00	N/A	-71.0	N/A	Fundamental @ 1m Dist
13.55	41.27		N/A	19.03	-59.08	1.22	N/A	50.48	N/A	-49.3	N/A	13.41MHz-13.553MHz
13.57	42.01		N/A	19.03	-59.08	1.95	N/A	50.48	N/A	-48.5	N/A	13.567MHz-13.71MHz
13.35	36.18		N/A	19.06	-59.08	-3.84	N/A	40.51	N/A	-44.4	N/A	13.110-13.410MHz
13.77	33.83		N/A	19	-59.08	-6.26	N/A	40.51	N/A	-46.8	N/A	13.71-14.01MHz
13.02	22.34		N/A	19.12	-59.08	-17.63	N/A	29.54	N/A	-47.2	N/A	9k-13.11MHz
14.19	21.41		N/A	18.93	-59.08	-18.74	N/A	29.54	N/A	-48.3	N/A	14.01MHz-30MHz

* No more emissions were found up to 30MHz

Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.

P.K. = Peak
Q.P. = Quasi Peak Reading
A.F. = Antenna factor

Rev. 10.23.09

Note : Radiated test of below 30MHz was performed inside anechoic chamber.
For check the correlation with open air site, comparison test was conducted between chamber and open site. The test results indicated that there is a close correlation.

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8.1.1.2. SM-J320FN

FCC Part 15, Subpart B & C 1 Meter Distance Measurement At Chamber 1

Company: Samsung
Project #: 16K22740
Model #: SM-J320FN
Tester: Steven.Kim
Date: 2016/01/30

Frequency (MHz)	PK (dBu/V)	QP (dBu/V)	AV (dBuV)	AF dB/m	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes
Loop Antenna Face on: Z position worst												
13.56	55.24		N/A	19.03	-59.08	15.19	N/A	84.00	N/A	-68.8	N/A	Fundamental @ 1m Dist
13.55	42.68		N/A	19.03	-59.08	2.63	N/A	50.48	N/A	-47.9	N/A	13.41MHz-13.553MHz
13.57	44.04		N/A	19.03	-59.08	3.98	N/A	50.48	N/A	-46.5	N/A	13.567MHz-13.71MHz
13.35	37.99		N/A	19.06	-59.08	-2.03	N/A	40.51	N/A	-42.5	N/A	13.110-13.410MHz
13.77	36.29		N/A	19	-59.08	-3.80	N/A	41.51	N/A	-45.3	N/A	13.71-14.01MHz
13.05	22.32		N/A	19.11	-59.08	-17.65	N/A	29.54	N/A	-47.2	N/A	9k-13.11MHz
14.11	17.24		N/A	18.94	-59.08	-22.90	N/A	29.54	N/A	-52.4	N/A	14.01MHz-30MHz
Loop Antenna Face off: Z position												
13.56	53.61		N/A	19.03	-59.08	13.56	N/A	84.00	N/A	-70.4	N/A	Fundamental @ 1m Dist
13.55	41.1		N/A	19.03	-59.08	1.05	N/A	50.48	N/A	-49.4	N/A	13.41MHz-13.553MHz
13.57	42.42		N/A	19.03	-59.08	2.36	N/A	50.48	N/A	-48.1	N/A	13.567MHz-13.71MHz
13.35	35.23		N/A	19.06	-59.08	-4.79	N/A	40.51	N/A	-45.3	N/A	13.110-13.410MHz
13.77	34.21		N/A	19	-59.08	-5.88	N/A	40.51	N/A	-46.4	N/A	13.71-14.01MHz
12.93	21.23		N/A	19.13	-59.08	-18.72	N/A	29.54	N/A	-48.3	N/A	9k-13.11MHz
14.35	18.19		N/A	18.9	-59.08	-21.99	N/A	29.54	N/A	-51.5	N/A	14.01MHz-30MHz

* No more emissions were found up to 30MHz

Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.

P.K. = Peak
Q.P. = Quasi Peak Reading
A.F. = Antenna factor

Rev. 10.23.09

Note : Radiated test of below 30MHz was performed inside anechoic chamber.
For check the correlation with open air site, comparison test was conducted between chamber and open site. The test results indicated that there is a close correlation.

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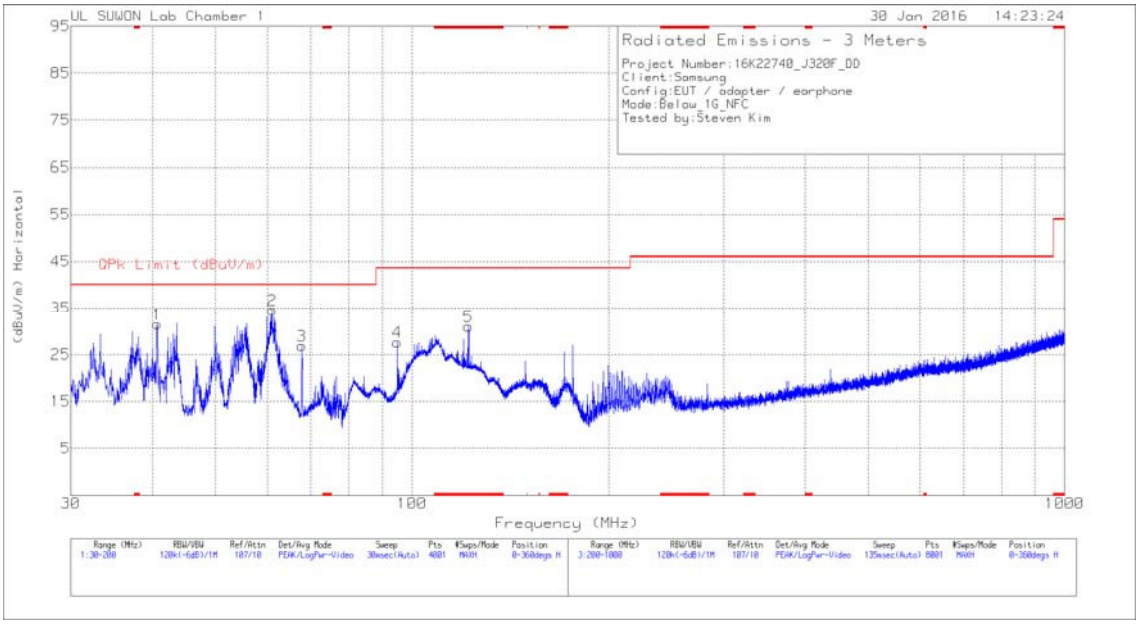
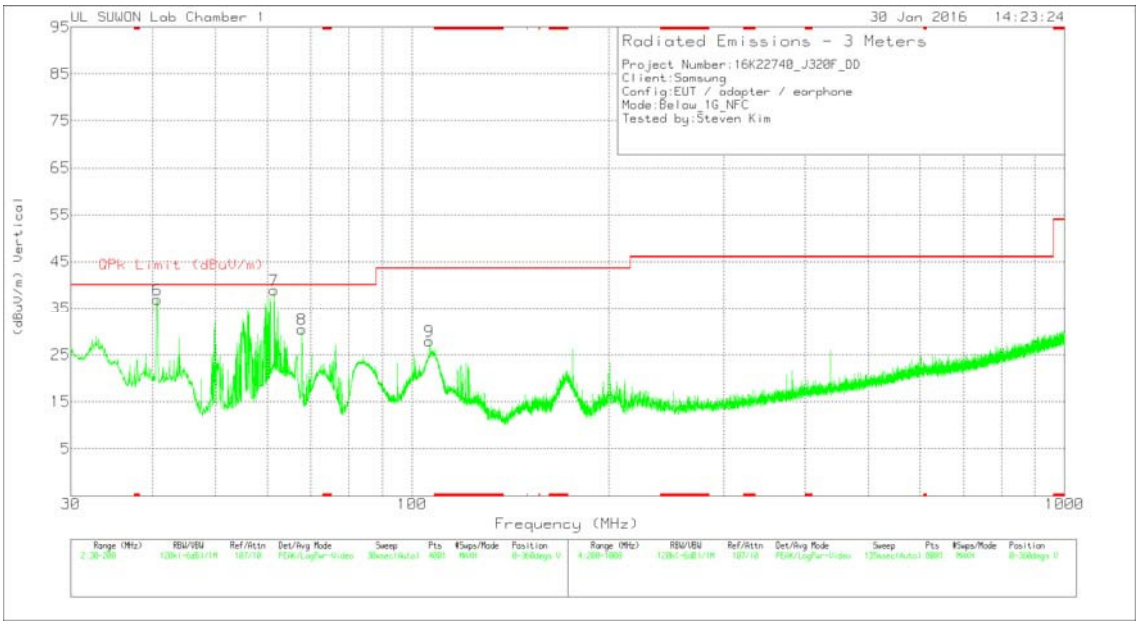
8.1.2. TX SPURIOUS EMISSION 30 TO 1000 MHz

8.1.2.1. SM-J320F/DD

HORIZONTAL



VERTICAL



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Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	40.6675	49.31	Pk	12.6	-30.3	31.61	40	-8.39	0-360	300	H
2	61.025	52.21	Pk	12.3	-29.9	34.61	40	-5.39	0-360	400	H
3	67.7825	46.41	Pk	10.3	-29.8	26.91	40	-13.09	0-360	300	H
4	94.94	46.5	Pk	10.5	-29.3	27.7	43.52	-15.82	0-360	300	H
5	* 122.055	50.27	Pk	9.8	-29	31.07	43.52	-12.45	0-360	200	H
6	40.6675	54.6	Pk	12.6	-30.3	36.9	40	-3.1	0-360	100	V
7	61.45	56.65	Pk	12.2	-29.9	38.95	40	-1.05	0-360	100	V
8	67.7825	49.93	Pk	10.3	-29.8	30.43	40	-9.57	0-360	100	V
9	106.2025	46.04	Pk	11.1	-29.2	27.94	43.52	-15.58	0-360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
40.6809	52.87	Qp	12.6	-30.3	35.17	40	-4.83	60	101	V
61.4838	28.47	Qp	12.2	-29.9	10.77	40	-29.23	101	275	V
61.3735	46.69	Qp	12.2	-29.9	28.99	40	-11.01	113	167	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Qp - Quasi-Peak detector

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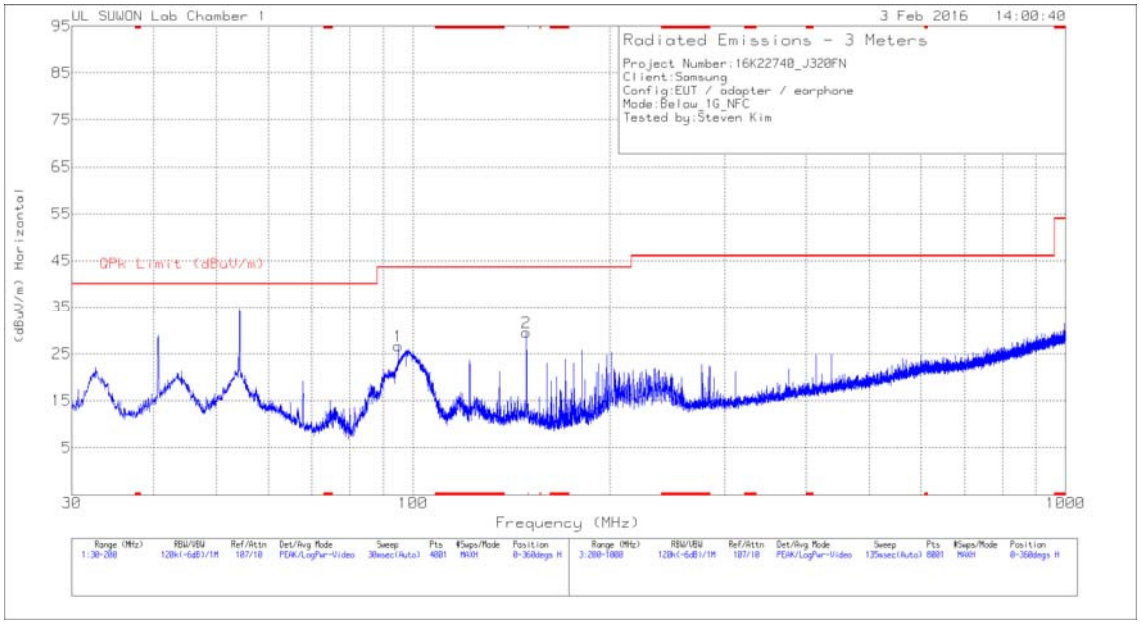
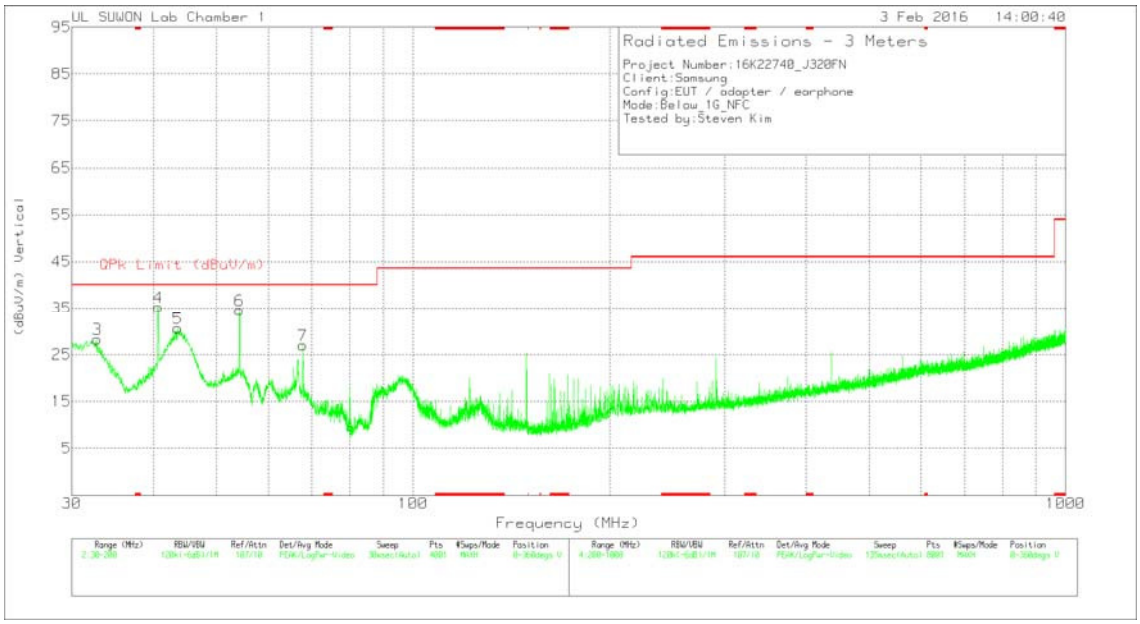
8.1.2.2. SM-J320FN

HORIZONTAL



VERTICAL



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Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	94.94	45.45	Pk	10.5	-29.3	26.65	43.52	-16.87	0-360	400	H
2	149.17	50	Pk	8.1	-28.6	29.5	43.52	-14.02	0-360	200	H
3	32.805	48.43	Pk	10.4	-30.5	28.33	40	-11.67	0-360	101	V
4	40.6675	52.92	Pk	12.6	-30.3	35.22	40	-4.78	0-360	101	V
5	43.6425	47.6	Pk	13.3	-30.2	30.7	40	-9.3	0-360	101	V
6	54.225	51.34	Pk	13.3	-30	34.64	40	-5.36	0-360	101	V
7	67.7825	46.52	Pk	10.3	-29.8	27.02	40	-12.98	0-360	101	V

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
40.6809	52.02	Qp	12.6	-30.3	34.32	40	-5.68	59	100	V
54.2417	47.8	Qp	13.3	-30	31.1	40	-8.9	224	113	V

Qp - Quasi-Peak detector

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9. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207

(a) Except as shown in paragraphs (b) and (c) of this section, 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 50µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

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
Notes: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

TEST PROCEDURE

ANSI C63.10-2009

RESULTS

No non-compliance noted:

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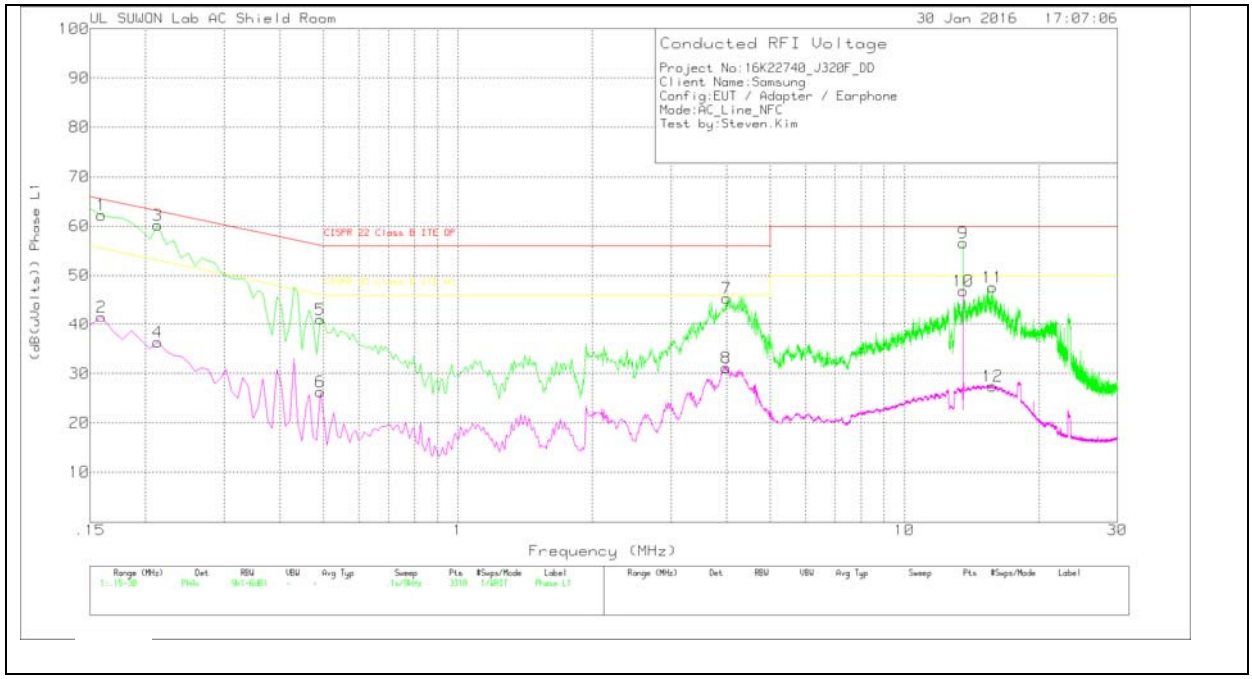
9.1. SM-J320F/DD

WORST EMISSIONS

LINE 1 PLOT



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LINE 1 RESULTS

Trace Markers

Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_L1	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.159	52.25	Pk	10	0	62.25	65.52	-3.27	-	-
2	.159	31.53	Av	10	0	41.53	-	-	55.52	-13.99
3	.213	50.32	Pk	9.9	0	60.22	63.09	-2.87	-	-
4	.213	26.43	Av	9.9	0	36.33	-	-	53.09	-16.76
5	.492	30.87	Pk	10.2	0	41.07	56.13	-15.06	-	-
6	.492	16.08	Av	10.2	0	26.28	-	-	46.13	-19.85
7	4.002	35.43	Pk	9.8	.1	45.33	56	-10.67	-	-
8	3.984	21.2	Av	9.8	.1	31.1	-	-	46	-14.9
9	13.56	46.31	Pk	10.1	.2	56.61	60	-3.39	-	-
10	13.56	36.51	Av	10.1	.2	46.81	-	-	50	-3.19
11	15.756	37.14	Pk	10.2	.2	47.54	60	-12.46	-	-
12	15.783	17.08	Av	10.2	.2	27.48	-	-	50	-22.52

Pk - Peak detector

Av - Average detection

Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_L1	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
.1617	48.85	Qp	10.1	0	58.95	65.38	-6.43	-	-
.1995	45.72	Qp	10	0	55.72	63.63	-7.91	-	-

Qp – Quasi-Peak detector

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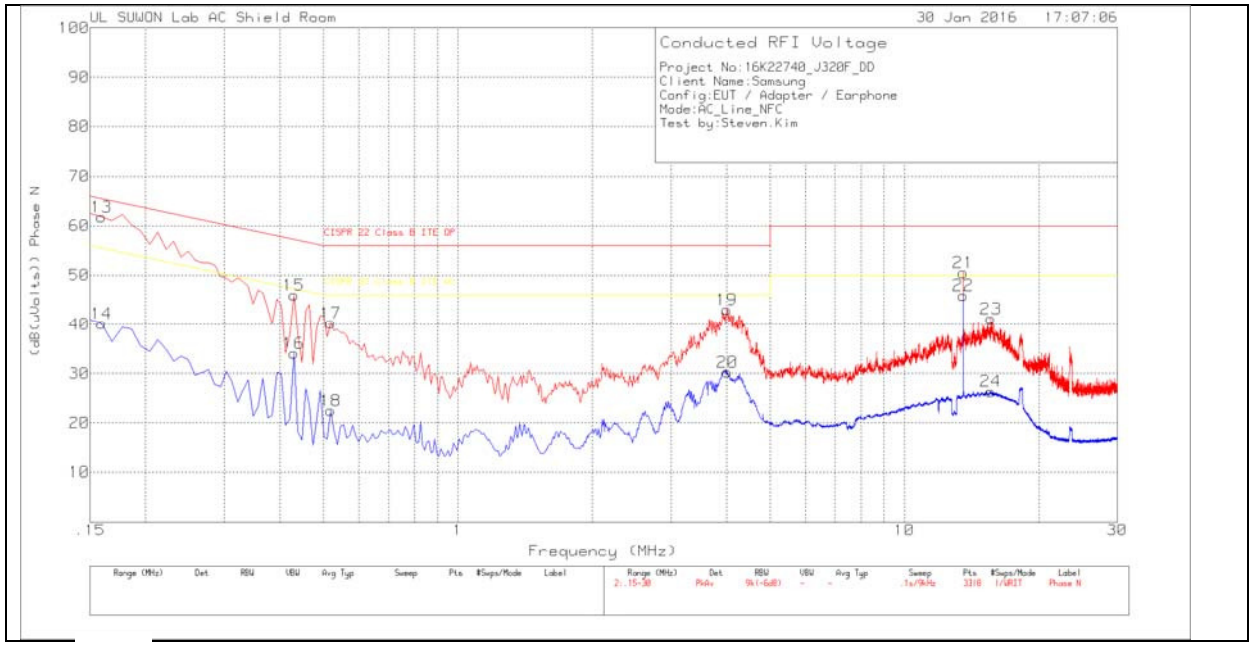
LINE 2 PLOT



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LINE 2 RESULTS

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_N	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.159	51.85	Pk	10	0	61.85	65.52	-3.67	-	-
14	.159	30.22	Av	10	0	40.22	-	-	55.52	-15.3
15	.429	35.84	Pk	10.1	0	45.94	57.27	-11.33	-	-
16	.429	23.98	Av	10.1	0	34.08	-	-	47.27	-13.19
17	.519	30.21	Pk	10.1	0	40.31	56	-15.69	-	-
18	.519	12.41	Av	10.1	0	22.51	-	-	46	-23.49
19	4.0065	33.12	Pk	9.8	.1	43.02	56	-12.98	-	-
20	4.02	20.33	Av	9.8	.1	30.23	-	-	46	-15.77
21	13.56	40.1	Pk	10.2	.2	50.5	60	-9.5	-	-
22	13.56	35.52	Av	10.2	.2	45.92	-	-	50	-4.08
23	15.639	30.61	Pk	10.4	.2	41.21	60	-18.79	-	-
24	15.621	15.78	Av	10.4	.2	26.38	-	-	50	-23.62

Pk - Peak detector

Av - Average detection

Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_N	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
.1671	49.29	Qp	10.1	0	59.39	65.1	-5.71	-	-
.1608	49.03	Qp	10	0	59.03	65.42	-6.39	-	-
.1869	46.88	Qp	10	0	56.88	64.17	-7.29	-	-
.1995	45.93	Qp	9.9	0	55.83	63.63	-7.8	-	-
.3705	33.09	Qp	10.1	0	43.19	58.49	-15.3	-	-
.3993	32.35	Qp	10.1	0	42.45	57.87	-15.42	-	-

Qp – Quasi-Peak detector

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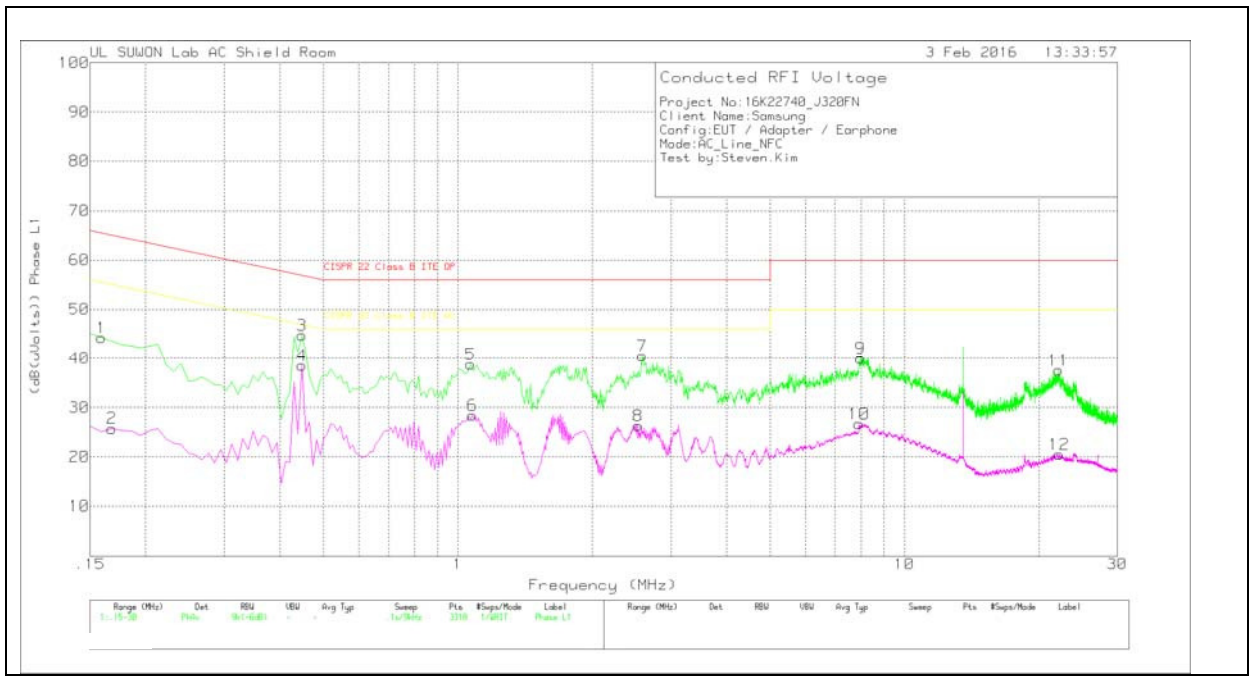
9.2. SM-J320FN

WORST EMISSIONS

LINE 1 PLOT



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LINE 1 RESULTS

Trace Markers

Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_L1	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.159	34.22	Pk	10	0	44.22	65.52	-21.3	-	-
2	.168	15.56	Av	10.2	0	25.76	-	-	55.06	-29.3
3	.447	34.69	Pk	10.1	0	44.79	56.93	-12.14	-	-
4	.447	28.44	Av	10.1	0	38.54	-	-	46.93	-8.39
5	1.068	28.87	Pk	9.9	0	38.77	56	-17.23	-	-
6	1.077	18.52	Av	9.9	0	28.42	-	-	46	-17.58
7	2.589	30.67	Pk	9.8	.1	40.57	56	-15.43	-	-
8	2.535	16.4	Av	9.8	.1	26.3	-	-	46	-19.7
9	7.989	30.08	Pk	9.9	.1	40.08	60	-19.92	-	-
10	7.917	16.7	Av	9.9	.1	26.7	-	-	50	-23.3
11	22.182	26.88	Pk	10.5	.2	37.58	60	-22.42	-	-
12	22.2	9.79	Av	10.5	.2	20.49	-	-	50	-29.51

Pk - Peak detector

Av - Average detection

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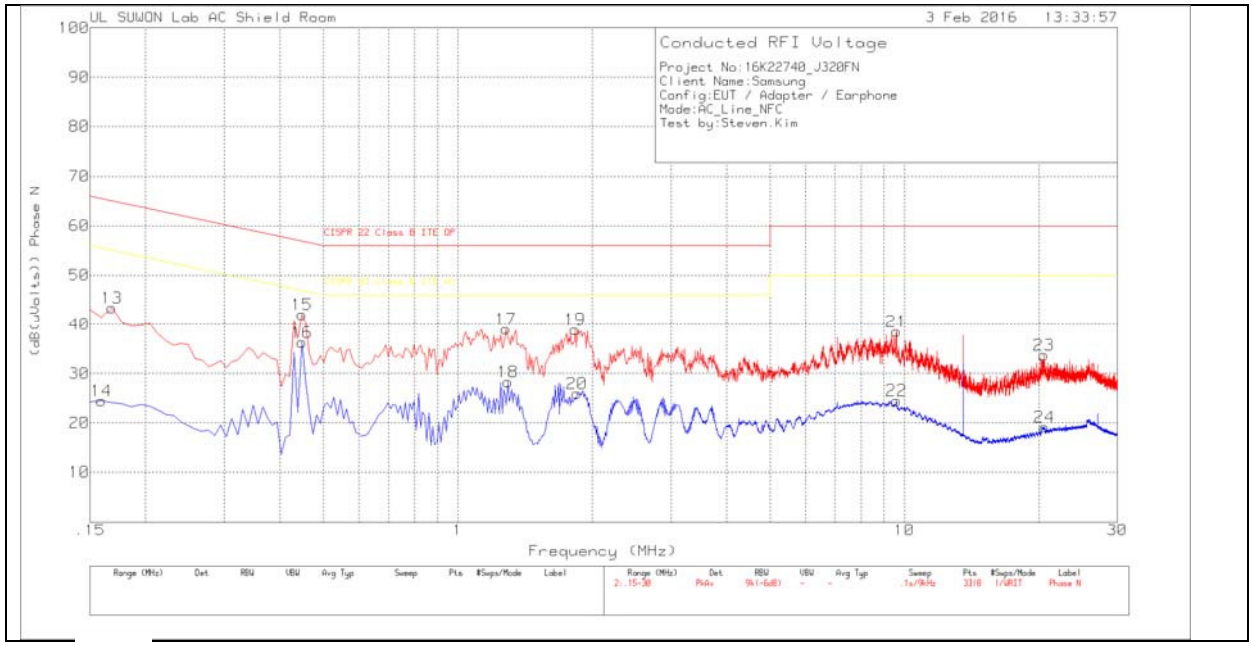
LINE 2 PLOT



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LINE 2 RESULTS

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_N	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.168	33.15	Pk	10.2	0	43.35	65.06	-21.71	-	-
14	.159	14.42	Av	10	0	24.42	-	-	55.52	-31.1
15	.447	31.95	Pk	10.1	0	42.05	56.93	-14.88	-	-
16	.447	26.29	Av	10.1	0	36.39	-	-	46.93	-10.54
17	1.284	29.13	Pk	9.8	.1	39.03	56	-16.97	-	-
18	1.293	18.36	Av	9.8	.1	28.26	-	-	46	-17.74
19	1.833	29.09	Pk	9.8	.1	38.99	56	-17.01	-	-
20	1.851	16.08	Av	9.8	.1	25.98	-	-	46	-20.02
21	9.6	28.39	Pk	10	.2	38.59	60	-21.41	-	-
22	9.6	14.32	Av	10	.2	24.52	-	-	50	-25.48
23	20.571	22.9	Pk	10.6	.2	33.7	60	-26.3	-	-
24	20.616	8.33	Av	10.6	.2	19.13	-	-	50	-30.87

Pk - Peak detector

Av - Average detection

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10. FREQUENCY STABILITY

LIMIT

§15.225 (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.

TEST PROCEDURE

ANSI C63.10 §6.8

RESULTS

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 KHz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	13.560348952	-0.420	100
3.80	40	13.560346092	-0.209	100
3.80	30	13.560344271	-0.075	100
3.80	***20***	***13.560343257***	***0***	***100***
3.80	10	13.560342495	0.056	100
3.80	0	13.560342703	0.041	100
3.80	-10	13.560343167	0.007	100
3.80	-20	13.560341831	0.105	100
3.80	-30	13.560341493	0.130	100

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)		Delta (ppm)	Limit (ppm)
3.80	***20***	***13.560343257***	***0***	***100***
4.20	20	13.560343100	0.012	100
3.40	20	13.560343124	0.010	100

No non-compliance noted.

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