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EMI TEST REPORT
FCC CERTIFICATION

Applicant: **SAMSUNG Electronics Co., Ltd.** **129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea**	**Date of Issue: January 11, 2021** **Test Report No. HCT-EM-2101-FC010** **Test Site: HCT CO., LTD.**

FCC ID : **A3LSMA725M**

Rule Part(s) / Standard(s) :		47 CFR PART 15 Subpart B Class B ANSI C63.4-2014
Product Name	:	Mobile Phone
Model Name	:	SM-A725M/DS
Series Model Name	:	SM-A725M
Date of Test	:	January 06, 2021 to January 08, 2021

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2014. (See Test Report if any modifications were made for compliance)
I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested By

Geon-Hee Jeon
Test Engineer
EMC Team
Certification Division

Reviewed

Jeong-Hyun Choi
Technical Manager
EMC Team
Certification Division

REVISION HISTORY

The revision history for this document is shown in table.

Report No.	Issue Date	Information About Changes
0	January 11, 2021	Initial Release

The above Test Report is not related to the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation), which signed the ILAC-MRA.

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1. GENERAL INFORMATION

1.1 Description of EUT

FCC ID	A3LSMA725M	
Model Name	SM-A725M/DS	
Series Model Name	SM-A725M	
Product Name	Mobile Phone	
Frequency Band	GSM 850/1900, WCDMA B2/4/5, LTE B2/4/5/7/12/13/17/26/38/40/41/66, BT, WLAN a/b/g/n/ac(SISO), NFC	
Power Voltage	Travel adaptor	Input: AC (100 to 240) V, (50 to 60) Hz, 0.7 A Output: (PDO) DC 5.0 V, 3.0 A or DC 9.0 V, 2.77 A, (PPS) DC 3.3-5.9 V, 3.0 A or DC 3.3-11.0 V, 2.25 A
	Battery	Li-ion Battery, Low: 3.65 V, Normal: 3.86 V, High: 4.4 V

1.2 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Model Name	Serial Number	Manufacturer
EUT	SM-A725M/DS	-	SAMSUNG
TA	EP-TA800	-	SOLUM
Data Cable	EP-DA705B	-	CRESYN
Earphone	EHS64AVF	-	CRESYN
Micro SD Card	-	-	SAMSUNG

1.3 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	USB Type C	Y	N/A	(P) 1.0
	Earphone	N/A	N	(D) 1.2

* The marked “(D)” means the data cable and “(P)” means the power cable.

1.4 Noise Suppression Parts on Cable. (I/O Cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	USB Type C	N	N/A	Y	Both End
	Earphone	N	N/A	Y	EUT End

1.5 Test Facility

Test site is located at 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea.
Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4-2014.
The Normalized site attenuations (30 MHz to 1 GHz) and Site validation (1 GHz to 18 GHz) were performed in accordance with the standard in ANSI C63.4-2014.
Our laboratories are accredited and designated in accordance with the provisions of Radio Waves ACT and International Standard ISO/IEC 17025:2017. (National Radio Research Agency, Designation No. KR0032)

1.6 Calibration of Measuring Instrument

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturers recommendations for utilizing calibration equipment, which is traceable to recognized national standards.
Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5:2017

1.7 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014.
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.

Test Item	Test Site (Chamber)	Expanded Uncertainty
Radiated Emissions (30 MHz to 1 GHz)	3 m Semi Anechoic Chamber #1	4.9 dB
Radiated Emissions (1 GHz to 18 GHz)	3 m Semi Anechoic Chamber #1	4.6 dB
Radiated Emissions (18 GHz to 40 GHz)	3 m Semi Anechoic Chamber #1	5.6 dB

2. LIST OF TEST EQUIPMENT

	Type	Model Name	Manufacturer	Serial Number	Calibration Cycle	Calibration Date
Conducted Emission (Not applicable)						
☐	EMI Test Receiver	ESCI	Rohde & Schwarz	100584	1 year	06.10.2020
☐	LISN	ENV216	Rohde & Schwarz	102245	1 year	09.04.2020
☐	LISN	ENV216	Rohde & Schwarz	100073	1 year	04.27.2020
☐	Radio communication analyzer	MT8820C	ANRITSU	6201138643	1 year	08.19.2020
☐	Antenna (for Communication)	USLP9142	Schwarzbeck	USLP 9142-200	-	-
☐	Software	EMC32	Rohde & Schwarz	-	-	-
Radiated Emission						
-For measurement below 1 GHz						
☒	EMI Test Receiver	ESU40	Rohde & Schwarz	100524	1 year	05.12.2020
☒	Bi-Log Antenna	VULB 9168	Schwarzbeck	255	2 year	03.26.2019
☒	Antenna master	MA4640-XP-ET	INNCO Systems	-	N/A	-
☒	Antenna master controller	CO3000	INNCO Systems	CO3000/870/ 35990515/L	N/A	-
☒	Turn Table	1060	INNCO Systems	-	N/A	-
☒	Turn Table controller	CO2000	INNCO Systems	CO2000/095/ 7590304/L	N/A	-
☒	Radio communication analyzer	MT8820C	ANRITSU	6201138643	1 year	08.19.2020
☒	Antenna (for Communication)	USLP9142	Schwarzbeck	USLP 9142-200	-	-
☐	UXM 5G Wireless Test Platform	E7515B	KEYSIGHT	MY58300756	-	-
☐	Antenna (for Communication)	USLP9142	Schwarzbeck	USLP 9142-201	-	-
☒	Software	EMC32	Rohde & Schwarz	-	-	-
-For measurement above 1 GHz						
☒	EMI Test Receiver	ESU40	Rohde & Schwarz	100524	1 year	05.12.2020
☒	Antenna master	MA4640-XP-ET	INNCO Systems	-	N/A	-
☒	Antenna master controller	CO3000	INNCO Systems	CO3000/870/ 35990515/L	N/A	-
☒	Turn Table	1060	INNCO Systems	-	N/A	-
☒	Turn Table controller	CO2000	INNCO Systems	CO2000/095/ 7590304/L	N/A	-
☒	Low Noise Amplifier	TK-PA18H	TESTEK	170034-L	1 year	03.03.2020
☒	Low Noise Amplifier	TK-PA1840H	TESTEK	170030-L	1 year	02.13.2020
☒	Horn Antenna	BBHA 9120D	Schwarzbeck	01836	1 year	07.23.2020
☒	Horn Antenna	BBHA 9170	Schwarzbeck	BBHA 9170#786	1 year	11.18.2020
☒	Radio communication analyzer	MT8820C	ANRITSU	6201138643	1 year	08.19.2020
☒	Antenna (for Communication)	USLP9142	Schwarzbeck	USLP 9142-200	-	-
☐	UXM 5G Wireless Test Platform	E7515B	KEYSIGHT	MY58300756	-	-
☐	Antenna (for Communication)	USLP9142	Schwarzbeck	USLP 9142-201	-	-
☒	Software	EMC32	Rohde & Schwarz	-	-	-

3. DESCRIPTION OF TEST

3.1 Measurement of Conducted Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 7.3

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN).
If the EUT is connected to the PC through USB, the AC power-line adapter of the PC is directly connected to a line impedance stabilization network (LISN).
Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration.
c. The frequency range from 150 kHz to 30 MHz was searched.

[Conducted Emission Limits]

Frequency (MHz)	Resolution Bandwidth (kHz)	Quasi-Peak (dB(μV))	Average (dB(μV))
0.15 to 0.5	9	66 to 56*	56 to 46*
0.5 to 5	9	56	46
5 to 30	9	60	50

**Decreases with the logarithm of the frequency.*

3.2 Measurement of Radiated Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 8.3

a. The EUT was placed on the top of a turn table 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 m away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from 1 m to 4 m above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 m to 4 m and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Quasi-Peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
f. The test-receiver system was set to Peak and Average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
g. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.(1 GHz to 40 GHz)

[Radiated Emission Limits]

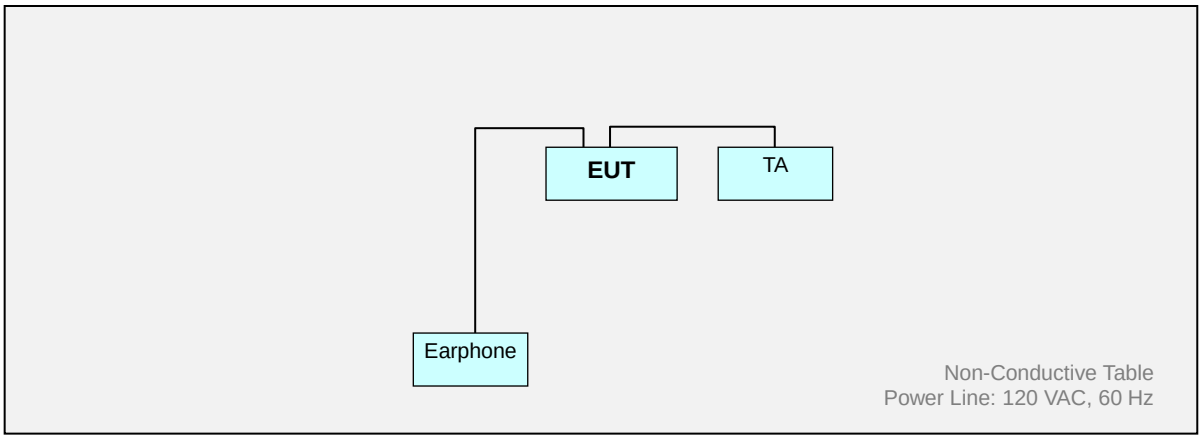
Frequency (MHz)	Antenna Distance (m)	Field Strength (μV/m)	Quasi-Peak (dB(μV)/m)
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0
Frequency (MHz)	Antenna Distance (m)	Peak (dB(μV)/m)	Average (dB(μV)/m)
Above 1 000	3	74	54

3.2.1 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5^{th} harmonic of the highest frequency or 40 ㎓, whichever is lower

3.3 Configuration of Tested System



4. PRELIMINARY TEST

During preliminary tests, the following operating mode was investigated.

Receiver mode(GSM 850 Low/Middle/High ch Idle)
Receiver mode(WCDMA B5 Low/Middle/High ch Idle)
Receiver mode(LTE B5 Low/Middle/High ch Idle)
Receiver mode(LTE B26 Low/Middle/High ch Idle)
Receiver mode(LTE B12 Low/Middle/High ch Idle)
Receiver mode(LTE B13 Low/Middle/High ch Idle)
Receiver mode(LTE B17 Low/Middle/High ch Idle)

NOTE. The worst band is tested.

4.1 Conducted Emission (Not applicable)

It was tested the following operating mode, after connecting all peripheral devices.

Operating Mode: Not Applicable

NOTE.
Compliance with Part 15B requirement for the conducted emissions is covered by SAMSUNG test report.

4.2 Radiated Emission

It was tested the following operating mode, after connecting all peripheral devices.

Operating Mode:

Radiated Emission below 1 GHz	:	LTE B26+B5 Low ch Idle LTE B26+B5 Middle ch Idle LTE B26+B5 High ch Idle LTE B12+B13+B17 Low ch Idle LTE B12+B13+B17 Middle ch Idle* LTE B12+B13+B17 High ch Idle
Radiated Emission above 1 GHz	:	LTE B26+B5 Middle ch Idle LTE B12+B13+B17 Middle ch Idle*

NOTE.
1. Three orientations have been investigated and the worst case orientation (x-axis: The display of EUT placed on the table is facing upwards) is reported.
2. The worst case of operating mode is reported. [*].

5. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

5.1 Conducted Emission(Not applicable)

The test results of conducted emission at mains ports provide the following information:

Used Test Standard	47 CFR PART 15 Subpart B Class B ANSI C63.4-2014
Frequency Range	150 kHz to 30 MHz
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Operating Mode	Not applicable
Test Site	-
Temperature	- °C
Relative Humidity	- %
Test Date	-

5.2 Radiated Emission

5.2.1 For Measurement Below 1 GHz

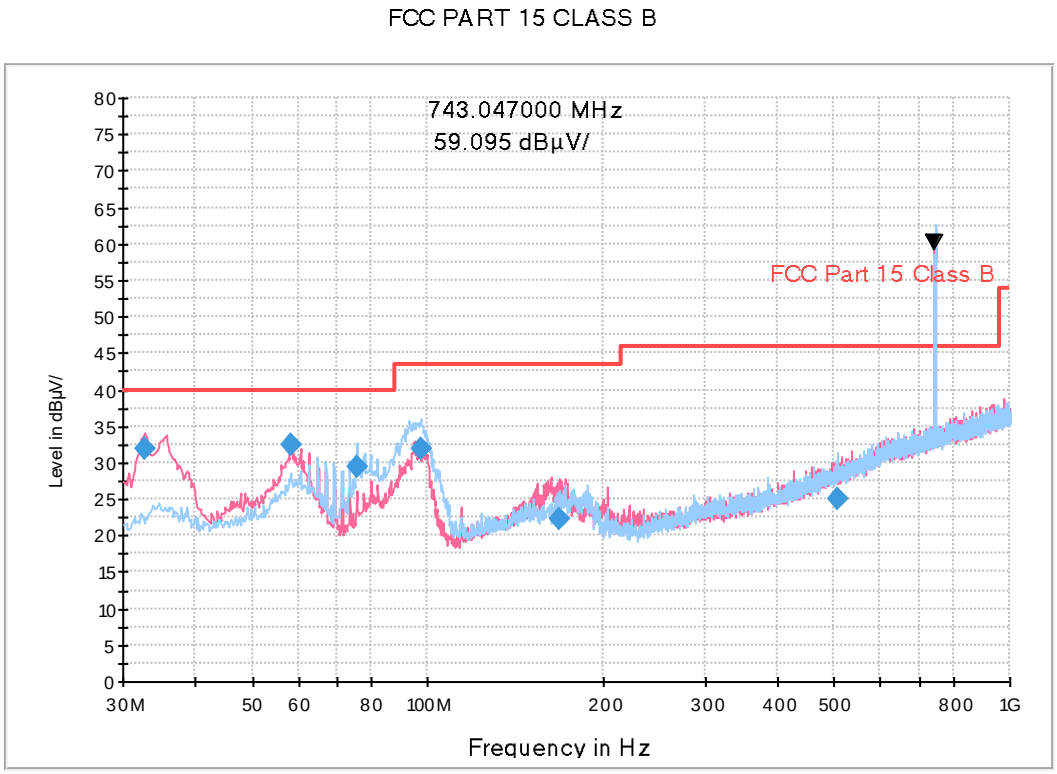
The test results of radiated emission provide the following information:

Used Test Standard	47 CFR PART 15 Subpart B Class B ANSI C63.4-2014
Frequency Range	30 MHz to 1 000 MHz
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Worst Case of Operating Mode	LTE B12+B13+B17 Middle ch Idle
Measurement Distance	3 m
Test Site	3 m Semi Anechoic Chamber #1
Temperature	21.4 / 22.7 / 21.9 °C
Relative Humidity	45.9 / 46.8 / 46.2 %
Test Date	January 06 / January 07 / January 08, 2021

- Calculation Formula:

1. POL. H = Horizontal, POL. V = Vertical
2. QuasiPeak = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor + Cable Loss
4. Margin = Limit - QuasiPeak

Figure 1: Radiated Emission (30 MHz to 1 GHz), LTE B12+B13+B17 Middle ch Idle



NOTE. 1. Carrier Frequency: RX 743.047MHz
2. These are signals for fundamental frequency from the base station

Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
32.680880	31.8	174.9	V	145.0	18.5	8.2	40.0
58.371280	32.5	100.0	V	11.0	19.5	7.5	40.0
75.600000	29.4	274.9	H	119.0	16.7	10.6	40.0
97.198880	31.9	193.7	H	118.0	14.9	11.6	43.5
168.634080	22.4	100.0	V	128.0	19.2	21.1	43.5
505.155440	25.0	100.0	H	1.0	25.3	21.0	46.0

5.2.2 For Measurement Above 1 GHz

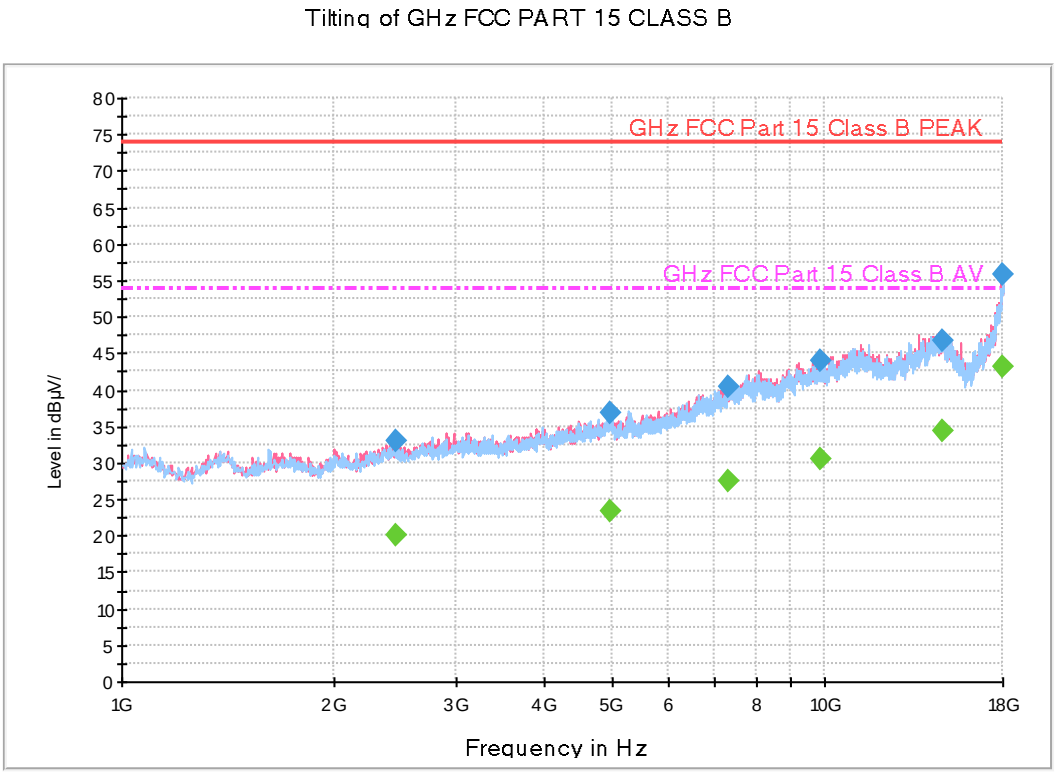
The test results of radiated emission provide the following information:

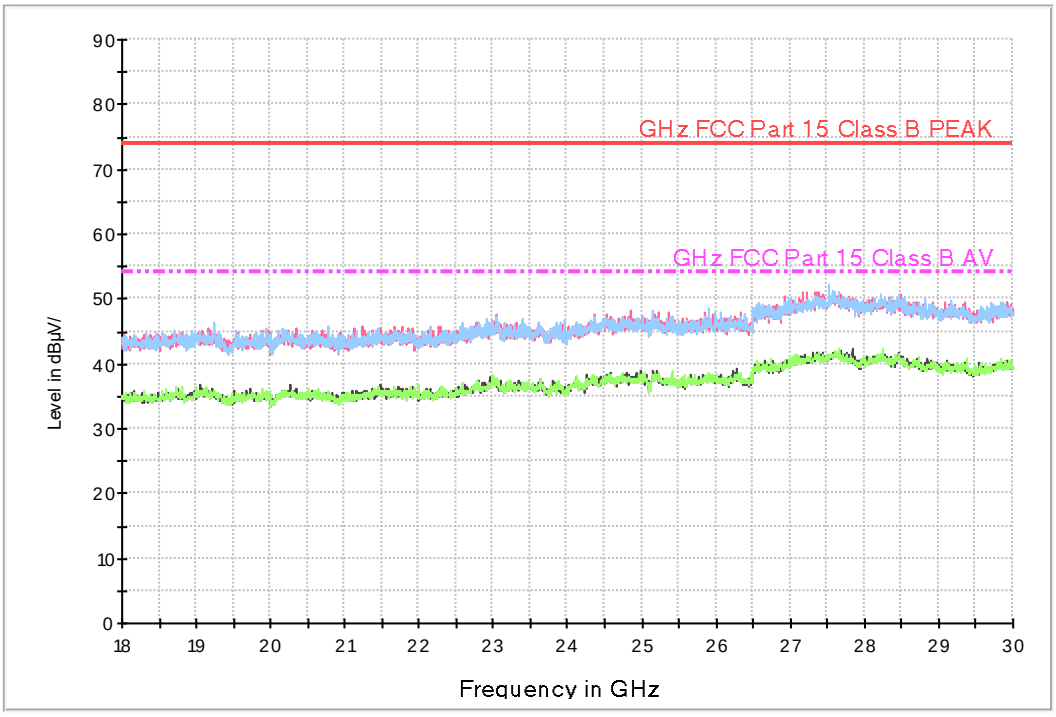
Used Test Standard	47 CFR PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
Highest Frequency	5 825 MHz
Tested Frequency Range	1 GHz to 30 GHz
Worst Case of Operating Mode	LTE B12+B13+B17 Middle ch Idle
Measurement Distance	3 m
Test Site	3 m Semi Anechoic Chamber #1
Temperature	21.4 / 21.9 °C
Relative Humidity	45.9 / 46.2 %
Test Date	January 06/ January 08, 2021

- Calculation Formula:

1. POL. H = Horizontal, POL. V = Vertical
2. Peak or CAverage = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor+ Cable Loss –Amplifier Gain
4. Margin = Limit - Peak or CAverage

Figure 2: Radiated Emission (1 GHz to 30 GHz), LTE B12+B13+B17 Middle ch Idle





Frequency (MHz)	Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2461.345000	33.0	350.0	V	50.0	-24.2	41.0	74.0
4973.305000	36.9	100.0	V	4.0	-17.8	37.1	74.0
7297.160000	40.4	125.7	H	62.0	-12.5	33.6	74.0
9885.020000	43.9	249.9	V	0.0	-8.7	30.1	74.0
14766.930000	46.8	100.0	V	198.0	-0.8	27.2	74.0
17984.554740	55.9	110.5	H	8.0	9.4	18.1	74.0

Frequency (MHz)	CAverage (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2461.345000	20.1	350.0	V	50.0	-24.2	33.9	54.0
4973.305000	23.5	100.0	V	4.0	-17.8	30.5	54.0
7297.160000	27.6	125.7	H	62.0	-12.5	26.4	54.0
9885.020000	30.5	249.9	V	0.0	-8.7	23.5	54.0
14766.930000	34.3	100.0	V	198.0	-0.8	19.7	54.0
17984.554740	43.1	110.5	H	8.0	9.4	10.9	54.0

6. CONCLUSION

The data collected shows that the **Product Name: Mobile Phone and Model Name: SM-A725M/DS** complies with §15.107 and §15.109 of the FCC rules.

7. APPENDIX A. TEST SETUP PHOTO

Please refer to EMI Test Setup Photo and test setup photo file no. as follows;

Rev. No.	Issue Date	File No.
0	January 11, 2021	HCT-EM-2101-FC010-P

End of report