

FCC BT LE REPORT

Certification

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Suwon-si, Gyeonggi-do, 1	16677, Rep. of Korea	Report No.: HCT-RF-1904-FC031-R1
FCC ID:	A3LSMT725C	

APPLICANT: SAMSUNG Electronics Co., Ltd.

According to the Evaluation report, all of the data contained herein is reused from the reference

FCC ID : A3LSMT725 report.

Model:	SM-T725C
EUT Type:	Tablet
Average Output Power:	6.74 dBm (4.721 mW)
Frequency Range:	2402 MHz -2480 MHz
Modulation type	GFSK
FCC Classification:	Digital Transmission System(DTS)
FCC Rule Part(s):	Part 15.247

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 prepared by : Jeong Ho Kim Engineer of Telecommunication testing center



Approved by : Jong Seok Lee Manager of Telecommunication testing center

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<u>Version</u>

TEST REPORT NO. DATE		DESCRIPTION
HCT-RF-1904-FC031	April 29, 2019	- First Approval Report
HCT-RF-1904-FC031-R1 May 03, 2019		- KDB 558074 version update for revision number



Table of Contents

1. EUT DESCRIPTION	ł
2. TEST METHODOLOGY	5
EUT CONFIGURATION	5
EUT EXERCISE	5
GENERAL TEST PROCEDURES	5
DESCRIPTION OF TEST MODES	5
3. INSTRUMENT CALIBRATION	5
4. FACILITIES AND ACCREDITATIONS	5
FACILITIES	5
EQUIPMENT	5
5. ANTENNA REQUIREMENTS	5
6. MEASUREMENT UNCERTAINTY	7
7. DESCRIPTION OF TESTS	3
8. SUMMARY TEST OF RESULTS	3
9. TEST RESULT	ł
9.1 DUTY CYCLE	ł
9.2 6dB BANDWIDTH)
9.3 OUTPUT POWER	3
9.4 POWER SPECTRAL DENSITY)
9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS)
9.6 RADIATED SPURIOUS EMISSIONS 82	2
9.7 RADIATED RESTRICTED BAND EDGES	5
9.8 POWERLINE CONDUCTED EMISSIONS	I
10. LIST OF TEST EQUIPMENT	
11. ANNEX A_ TEST SETUP PHOTO	7



1. EUT DESCRIPTION

Model	SM-T725C				
ЕИТ Туре	Tablet				
Power Supply	DC 3.85 V				
Battery Information	Model: EB-BT725ABU				
	Type: Li-ion battery	Type: Li-ion battery			
Travel Adapter Information	Model : EP-TA200				
	Manufacture: SOLUM				
Keyboard Information	Model : EJ-FT720				
	Manufacture: SAMSUNG				
Charging Doc Information	Model : EE-D3200				
	Manufacture: SAMSUNG				
Frequency Range	2402 MHz - 2480 MHz				
		1M Bit/s : 6.94 dBm (4.948 mW)			
	Peak (For information only)	2M Bit/s : 7.11 dBm (5.137 mW)			
		125K Bit/s : 6.80 dBm (4.786 mW)			
Max. RF Output Power		500K Bit/s : 6.83 dBm (4.824 mW)			
Max. RF Oulput Fower		1M Bit/s : 6.64 dBm (4.613 mW)			
	Average	2M Bit/s : 6.74 dBm (4.721 mW)			
	Avelage	125K Bit/s : 6.63 dBm (4.603 mW)			
		500K Bit/s : 6.61 dBm (4.581 mW)			
Modulation Type	GFSK				
Bluetooth Version	5.0				
Number of Channels	40 Channels				
	Antenna type: Metal				
Antenna Specification	Peak Gain : -5.50 dBi				
Date(s) of Tests	January 17, 2019 ~ March 14, 2019 / April 1,2019 ~ April 29,2019				



2. TEST METHODOLOGY

FCC KDB 558074 D01 15.247 Meas Guidance v05r01 dated February 11, 2019 entitled "guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices and the measurement procedure described in ANSI C63.10(Version : 2013) 'the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices'.

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 purpse of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 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 below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3.75 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 equipment's, 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."

* The antennas of this E.U.T are permanently attached.

* 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.

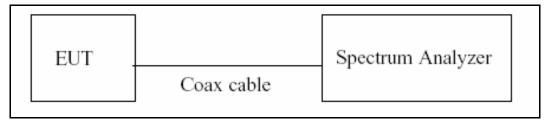
Parameter	Expanded Uncertainty (±dB)	
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82	
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40	
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80	
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70	
Radiated Disturbance (18 GHz ~ 40 GHz)	5.71	



7. DESCRIPTION OF TESTS

7.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to the zero-span measurement method.

The largest availble value of RBW is 8 MHz and VBW is 50 MHz.

The zero-span method of measuring duty cycle shall not be used if $T \le 6.25$ microseconds. (50/6.25 = 8)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/T.

- 1. RBW = 8 MHz (the largest available value)
- 2. VBW = 8 MHz (≥ RBW)
- 3. SPAN = 0 Hz
- 4. Detector = Peak
- 5. Number of points in sweep > 100
- 6. Trace mode = Clear write
- 7. Measure $T_{\text{total}} \, \text{and} \, T_{\text{on}}$
- 8. Calculate Duty Cycle = T_{on}/T_{total} and Duty Cycle Factor = 10*log(1/Duty Cycle)

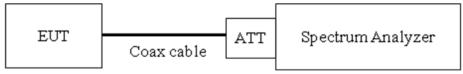


7.2. 6dB Bandwidth

<u>Limit</u>

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to (Procedure 11.8.1 in ANSI 63.10-2013)

- 1) RBW = 100 kHz
- 2) VBW \geq 3 x RBW
- 3) Detector = Peak
- 4) Trace mode = max hold
- 5) Sweep = auto couple
- 6) Allow the trace to stabilize
- 7) We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

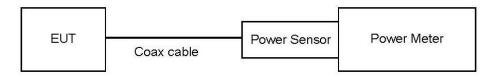


7.3. Output Power

<u>Limit</u>

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

The transmitter output is connected to the Power Meter.

- Peak Power (Procedure 11.9.1.3 in ANSI 63.10-2013)
- : Measure the peak power of the transmitter.
- Average Power (Procedure 8.3.2.3 in KDB 558074 v05r02, Procedure 11.9.2.3 in ANSI 63.10-2013)
 - 1) Measure the duty cycle.
 - 2) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
 - 3) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

- Conducted Output Power(Peak) = Reading Value + ATT loss + Cable loss
- Conducted Output Power(Average) = Reading Value + ATT loss + Cable loss + Duty Cycle Factor

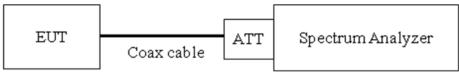


7.4. Power Spectral Density

<u>Limit</u>

The transmitter power density average over 1-second interval shall not be greater than 8dBm in any 3kHz BW.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure 11.10 in ANSI 63.10-2013.

The spectrum analyzer is set to :

- 1) Set analyzer center frequency to DTS channel center frequency.
- 2) Set span to at least 1.5 times the OBW.
- 3) RBW = $3 \text{ kHz} \le \text{RBW} \le 100 \text{ kHz}$.
- 4) VBW \geq 3 x RBW.
- 5) Sweep = auto couple
- 6) Detector = power averaging (rms) or sample detector (when rms not available).
- 7) Ensure that the number of measurement points in the sweep \geq [2 × span / RBW].
- 8) Employ trace averaging (rms) modeover a minimum of 100 traces
- 9) Use the peak marker function to determine the maximum amplitude level.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
 If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Sample Calculation

Power Spectral Density = Reading Value + ATT loss + Cable loss + Duty Cycle Factor



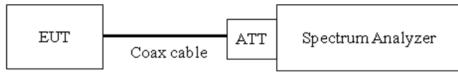
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

<u>Limit</u>

The maximum conducted (average) output power was used to demonstrate compliance, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

[Conducted > 30 dBc]

Test Configuration



Test Procedure

The transmitter output is connected to the spectrum analyzer.

(Procedure 11.11 in ANSI 63.10-2013)

- 1) RBW = 100 kHz
- 2) VBW \geq 3 x RBW
- 3) Set span to encompass the spectrum to be examined
- 4) Detector = Peak
- 5) Trace Mode = max hold
- 6) Sweep time = auto couple
- 7) Ensure that the number of measurement points $\geq 2^{*}$ Span/RBW
- 8) Allow trace to fully stabilize.
- 9) Use peak marker function to determine the maximum amplitude level.

Measurements are made over the 30 MHz to 25 GHz range with the transmitter set to the lowest, middle, and highest channels.



Factors for frequency

Freq(MHz)	Factor(dB)
30	11.35
100	9.88
200	10.24
300	10.18
400	10.28
500	10.30
600	10.37
700	10.40
800	10.40
900	10.39
1000	10.44
2000	10.69
2400*	10.68
2500*	10.70
3000	10.73
4000	10.94
5000	10.88
6000	10.91
7000	11.40
8000	11.37
9000	11.53
10000	11.61
11000	11.61
12000	11.73
13000	11.88
14000	11.95
15000	12.03
16000	12.09
17000	12.07
18000	12.13
19000	12.12
20000	12.19
21000	12.22
22000	12.36
23000	12.65
24000	12.39
25000	12.58
26000	12.07

Note : 1. '*' is fundamental frequency range.

2. Factor = Attenuator loss + Cable loss



7.6. Radiated Test

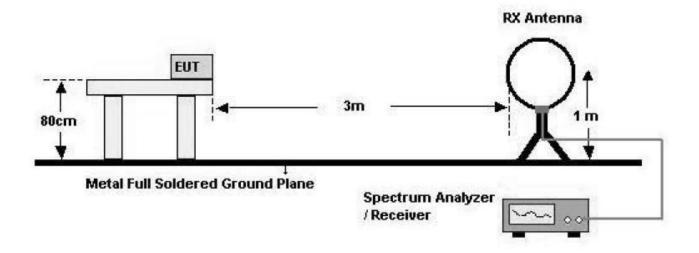
<u>Limit</u>

FCC

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	

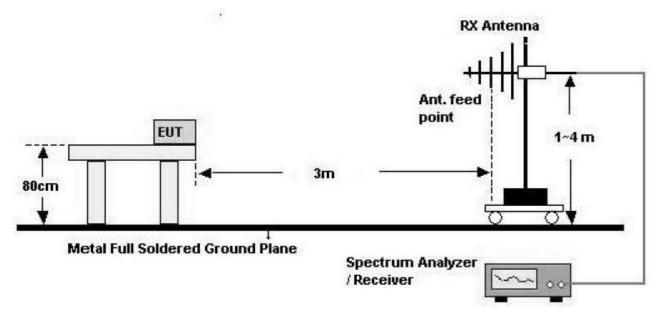
Test Configuration

Below 30 MHz

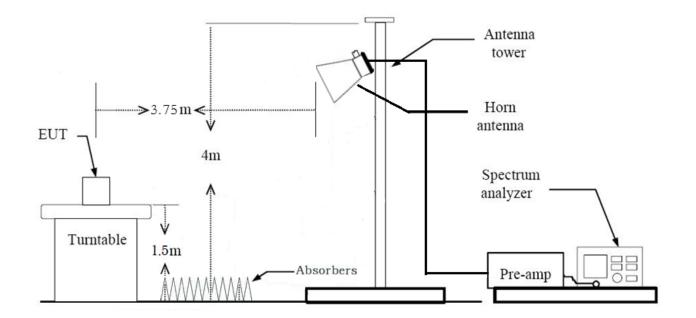




30 MHz - 1 GHz



Above 1 GHz





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 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 ≥ 3*RBW
- 9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
- 10. The test results for below 30 MHz is correlated to an open site.

The result on OFS is about 2 dB higher than semi-anechoic chamber(10 m chamber)

Test Procedure of Radiated spurious emissions(Below 1GHz)

- 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. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 5. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \ge 3*RBW
 - (2) Measurement Type(Quasi-peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Quasi-Peak
 - RBW = 120 kHz
 - *In general, (1) is used mainly
- 6. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)



Test Procedure of Radiated spurious emissions (Above 1 GHz)

- 1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
- 2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3.75 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 5. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).

*Distance extrapolation factor = 20*log (test distance / specific distance) (dB)

- 6. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 7. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 8. The unit was tested with its standard battery.
- 9. Spectrum Setting (Method 8.6 in KDB 558074 v05r02 Procedure 11.12 in ANSI 63.10-2013)
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW ≥ 3*RBW
 - (2) Measurement Type(Average):
 - Duty cycle < 98%, duty cycle variations are less than $\pm 2\%$
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = RMS
 - Averaging type = power (*i.e.*, RMS)
 - RBW = 1 MHz
 - VBW ≥ 3*RBW
 - Sweep time = auto.
 - Trace mode = average (at least 100 traces).
 - Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.
 - Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.

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.



11. Total(Measurement Type : Peak)

= Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

Total(Measurement Type : Average)

- = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) Amp Gain(G) + Distance Factor(D.F)
- + Duty Cycle Factor



Test Procedure of Radiated Restricted Band Edge

- 1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
- 2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3.75 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 5. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).

*Distance extrapolation factor = 20*log (test distance / specific distance) (dB)

- 6. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 7. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 8. The unit was tested with its standard battery.
- 9. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW ≥ 3*RBW
 - (2) Measurement Type(Average):
 - Duty cycle < 98%, duty cycle variations are less than $\pm 2\%$
 - Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
 - Detector = RMS
 - Averaging type = power (*i.e.*, RMS)
 - RBW = 1 MHz
 - VBW ≥ 3*RBW
 - Sweep time = auto.
 - Trace mode = average (at least 100 traces).
 - Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.
 - Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.
- 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.



11. Total(Measurement Type : Peak)

= Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

Total(Measurement Type : Average)

= Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F) + Duty Cycle Factor



7.7. AC Power line Conducted Emissions

<u>Limit</u>

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).

	Limits (dBµV)		
Frequency Range (MHz)	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	

*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.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

7.8. Worst case configuration and mode

Radiated Spurious Emissions

- 1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories(Keyboard, Charging Doc, Earphone, etc)
 - Worstcase : Stand alone
- 2. EUT Axis: Y
- 3. All data rate & packet length of operation were investigated and the test results are worst case in lowest packet length.

*Worst case(data rate) : 1M Bit/s

*Worst case(packet length) : 37 Byte

Radiated Restricted Band Edge

- 1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories(Keyboard, Charging Doc, Earphone, etc)
 - Worstcase : Stand alone
- 2. EUT Axis: X
- 3. All packet length of operation were investigated and the test results are worst case in lowest packet length. *Worst case(packet length) : 37 Byte

AC Power line Conducted Emissions

- 1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone + External accessories(Keyboard, Charging Doc, Earphone, etc)+Travel Adapter, Stand alone + Travel Adapter
 - Worstcase : Stand alone + Travel Adapter

Conducted test

- 1. The EUT was configured with packet length of highest power.
 - * Packet length of highest power: 37 Byte



8. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	§15.247(a)(2)	> 500 kHz		PASS
Conducted Maximum Peak Output Power	§15.247(b)(3)	< 1 Watt		PASS
Power Spectral Density	§15.247(e)	< 8 dBm / 3 kHz Band	Conducted	PASS
Band Edge (Out of Band Emissions)	§15.247(d)	Conducted > 30 dBc		PASS
AC Power line Conducted Emissions	§15.207	cf. Section 7.7		PASS
Radiated Spurious Emissions	§15.247(d), 15.205, 15.209	cf. Section 7.6	Dedicted	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 7.6	Radiated	PASS



9.1 DUTY CYCLE

Data rate (Bit/s)	Packet length (Byte)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
1M	37	0.3914	0.6245	0.6268	2.03
	255	2.1350	2.5000	0.8540	0.69
2M -	37	0.2065	0.6257	0.3300	4.82
	255	1.0770	1.8730	0.5750	2.40
125K	37	3.1040	3.7520	0.8273	0.82
1255	255	17.0500	17.5000	0.9743	0.11
500K	37	1.0700	1.8750	0.5707	2.44
	255	4.5600	5.0100	0.9102	0.41



IM Bit/s (37 Byte) Test Plots

Agilent Spectrum Analyzer - Sw					
Center Freg 2.4020		INT REF	ALIGN AUTO #Avg Type: RMS	12:33:00 PM Feb 28, 2019 TRACE 1 2 3 4 5 6	Frequency
Conter Freq 2.4020	PNO: Fast ↔ IEGain:Low	Trig: Free Run Atten: 26 dB	• //	TYPE WIMMINAM	
	IFGain:Low	Atten: 20 dB			Auto Tune
Ref Offset 1 10 dB/div Ref 25.00	0.7 dB dBm			ΔMkr3 624.5 μs -1.22 dB	
15.0			304		Center Freq
5.00 X2		<u></u> 1 <u>∆2</u>			2.402000000 GHz
-5.00		¥			
-15.0					Start Freq
-25.0					2.402000000 GHz
-35.0		htt understa	1. 1. 1.		
-45.0 Wilyndwladwrwynia		Warnstalling	Arren frederi	440	Stop Freq
-55.0					2.402000000 GHz
-65.0					
Center 2.402000000				Span 0 Hz	CF Step
Res BW 8 MHz	#VBV	V 8.0 MHz	Sweep	1.267 ms (1001 pts)	8.000000 MHz
MKR MODE TRC SCL	X		NCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 <u>Δ2</u> 1 t (Δ) 2 F 1 t	<u>391.4 μs</u> (Δ) 206.5 μs	-7.55 dB 5.47 dBm			
3 Δ4 1 t (Δ) 4 F 1 t	624.5 μs (Δ) 206.5 μs	-1.22 dB 5.47 dBm			Freq Offset 0 Hz
5				=	0 H2
7					
9					
10				×	
<		III		>	
MSG			STATU	JS	

IM Bit/s (255 Byte) Test Plots

RL	um Analyzer - S	wept SA Ω AC			IN	r REF		ALIGN AUTO	12:46:43 PMF	eh 28, 2019	
enter Fi	req 2.4020	000000 G	Hz PNO: Fast Gain:Low		rig: Free F	Run	#Avg	Type: RMS	TRACE	123456 WWWWWWW PNNNNN	Frequency
0 dB/div	Ref Offset	10.7 dB						Δ	Mkr3 2.5 0.	00 ms .03 dB	Auto Tur
°g 15.00 5.00					X	·,			1	2 34	Center Fre 2.402000000 GH
5.0											Start Fre 2.402000000 GF
5.0 5.0 5.0				Ulegord (M					امه خیا 	µu4∧./	Stop Fre 2.402000000 GF
es BW 8			#VE	3W 8.0	0 MHz			Sweep 5.	000 ms (1		CF Ste 8.000000 MH <u>Auto</u> Ma
KR MODE TF 1 Δ2 1 2 F 1 3 Δ4 1 4 F 1 5 5 5	t (∆) t t (∆)	<u>2</u> . 2.	135 ms (, 245 ms 500 ms (, 245 ms	Δ)	Y 0.13 d 5.85 dBr 0.03 d 5.85 dBr	B n B	CTION	FUNCTION WIDTH	FUNCTION	VALUE	Freq Offso
6 7 8 9											
1										>	



2M Bit/s (37 Byte) Test Plots

Agilent Spec	trum An	alyzer - Swe	pt SA												
LXI RL	RF					I	NT REF				IGN AUTO		MFeb 28, 2019		Frequency
Center F	-req 2	2.40200	1	PNO: Fast Gain:Low		Frig: Free Atten: 26			#Avg	Туре: І	RMS	T	ACE 12345 (PE WIAMANAN DET PNNNN	÷ .	requercy
10 dB/div	Ref Ref	Offset 10	7 dB	Sumeon								∆Mkr3 ∣	625.7 µs 2.66 dB		Auto Tune
Log 15.0 5.00					\rightarrow	< <mark>2</mark>		. ⊘ ¹	Δ2				▲ 3∆4		Center Freq 2.40200000 GHz
-15.0 -25.0 -35.0			t at ba	. Be also to t	مارانه ار				dan ta ak		de alto a	die tes tate al			Start Freq 2.402000000 GHz
-45.0 -55.0 -65.0		ropoplasello	hardan da						u ar dha b	ALL AND	<u>n a an a</u>	Mindrigelises sele			Stop Freq 2.40200000 GHz
Center 2 Res BW	8 MH:	z		#VE	3W 8.	0 MHz						.267 ms	Span 0 Hz (1001 pts)		CF Step 8.000000 MHz Auto Man
MKR MODE		<i>(</i> Δ)	×	06.5 us (۸)	Y 3.36		FUNCT	ION	FUNCT	ION WIDTH	FUNCT	ION VALUE		
2 F 3 Δ4	1 t	(Δ)	5	38.3 μs 25.7 μs (, 38.3 μs		2.74 dE 2.66 2.74 dE	3m dB						=		Freq Offset 0 Hz
7 8 9 10 11															
KSG					_					_	STATU	S	>		

2M Bit/s (255 Byte) Test Plots

Agilent Spectrum Analy								
Center Freq 2.4			INT REF		ALIGN AUTO	03:04:50 PM TRACE	123456	Frequency
	IFG		Atten: 20 dB			Mkr3 1.8	PNNNNN	Auto Tune
10 dB/div Ref 2	ffset 10.7 dB 2 0.00 dBm						.41 dB	
Log 10.0				1∆2		3∆4		Center Freq
0.00	X2			ĭ				2.402000000 GHz
-10.0								
-20.0								Start Freq
-30.0								2.402000000 GHz
-40.0	handfame			hurp Marine	his and the strategy	m		
-60.0								Stop Freq
-70.0								2.402000000 GHz
Center 2.402000						Sr	oan 0 Hz	0.5.01
Res BW 8 MHz	Source and	#VBW 8.	0 MHz		Sweep 3.			CF Step 8.000000 MHz
MKR MODE TRC SCL	×		Y	FUNCTION	FUNCTION WIDTH	FUNCTION	I VALUE	<u>Auto</u> Man
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	91:	77 ms (Δ) 3.3 μs	-0.06 dB 5.86 dBm					Freq Offset
4 F 1 t		73 ms (∆) 3.3 µs	-2.41 dB 5.86 dBm					0 Hz
6								
7 8								
9								
11			Ш				>	
MSG					STATUS			



I25K Bit/s (37 Byte) Test Plots

Center Freq 2.402000000 GHz Trig: Free Run HFGaint.ow #Avg Type: RMS Trace ID 284.56 Type Frequency PN0: Fast →→ IFGaint.ow Trig: Free Run Atten: 20 dB AMkr3 3.752 ms 0.86 dB Auto Tun 10 dB/div 0.00 Center Free 2.00 0.00 dBm 0.86 dB Center Free 2.402000000 GH 200 102 102 304 Center Free 2.402000000 GH Center Free 2.402000000 GH 200 102 102 102 102 102 102 100 102 102 102 102 102 102 102 100 102 <td< th=""><th>Agilent Spect</th><th></th><th>yzer - S</th><th>wept SA</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<>	Agilent Spect		yzer - S	wept SA														
Center 1402000000 GHz Free Run IFGaintLow Trig: Free Run Atten: 20 dB Center 10.7 dB Center Free 2.402000000 GH 0.00 0.		RF				1-		I	NT REF		#894							Frequency
Ref 20.00 dBm ΔMRR'S 3, 752 ms 10 dB/div Ref 20.00 dBm 0.86 dE 10 dB/div 11Δ2 3Δ4 1 10 dB/div X2 11Δ2 3Δ4 1 10 dB/div X2 1 1 2 3Δ4 1 10 dB/div X2 1 1 1 2 3Δ4 1 2 4 1 2 1 1 2 1 1 2 1	Center F	req z.	40Z(0000	Р	NO: Fast					#AV9	1 ypv	. 130		T) E		N N	
100 102 304 Center Free 200														Δ				Auto Tune
30.0	10.0 0.00				⟨ ₂						Ŷ	<u>1Δ</u> 2	2	3∆4				Center Freq 2.402000000 GHz
Stop Free <	-30.0			2011 10 10 10														Start Freq 2.402000000 GHz
Res BW 8 MHz #VBW 8.0 MHz Sweep 7.533 ms (1001 pts) 8.00000 MH MKR MODE CRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE Auto Mat 1 Δ2 1 t (Δ) 3.104 ms (Δ) 0.91 dB Auto Mat 3 Δ4 1 t (Δ) 3.752 ms (Δ) 0.86 dB Auto Mat 3 Δ4 1 t 1.031 ms 4.96 dBm Auto Mat 5 1 t 1.031 ms 4.96 dBm Auto Mat 6 A 1 t 1.031 ms 4.96 dBm Auto Auto 7 8 A Auto Auto Auto Auto Auto	-60.0											en-M.	vr ¹ ~1/1					Stop Freq 2.402000000 GHz
2 F 1 t 1.831 ms 4.96 dBm F F T <tht< th=""> <tht< th=""> <tht< th=""> <</tht<></tht<></tht<>	Res BW	8 MHz	0000			#V	BW			FUNC	TION				533 ms	(1001 p	ts)	CF Step 8.000000 MHz <u>Auto</u> Man
	2 F 3 Δ4 4 F 5 6	1 t 1 t (1.8 3.7	31 ms 52 ms		4.96 dE 0.86	3m dB								111	Freq Offset 0 Hz
	8 9 10 11							Ш						CTATI IC				

I25K Bit/s (255 Byte) Test Plots

IXI T	u <mark>m Analyzer - Swept SA</mark> RF 50 Ω AC		INT	REF	ALIGN AUTO	03:28:59 PM Feb 28, 2019	Frequency
Center Fi	req 2.40200000	D GHZ PNO: Fast ← IFGain:Low	► Trig: Free F Atten: 20 d	lun	g Type: RMS	TRACE 23456 TYPE WAAAAAAA DET P NNNNN	
10 dB/div	Ref Offset 10.7 dB Ref 20.00 dBm				Δ	Mkr3 17.50 ms 0.01 dB	Auto Tune
Log 10.0 0.00		X.			3∆4		Center Freq 2.402000000 GHz
-20.0							Start Freq 2.402000000 GHz
-50.0 -60.0 -70.0							Stop Freq 2.402000000 GHz
Res BW 8		#VB	W 8.0 MHz			Span 0 Hz 0.00 ms (1001 pts)	CF Step 8.000000 MHz Auto Man
MKR MODE TF 1 Δ2 1 2 F 1 3 Δ4 1 4 F 1 5 5 5	t (Δ) t	17.05 ms (Δ 18.08 ms 17.50 ms (Δ 18.10 ms	5.91 dBn	n 3	FUNCTION WIDTH	FUNCTION VALUE	Freq Offset
6 7 8 9 10							
K MSG			Ш		STATUS	>	



■ 500K Bit/s (37 Byte) Test Plots

Agiler	nt Spe	ctru		alyzer - S															
(X) Cen	⊺ ifer	Ere	RF	50 2.4020	Ω # 0000		Hz			NT REF	#Av	у Тур	ALIGN AUT	0	03:31:35 P TRA	CE 1234	5.6	Freq	uency
								ast ⊶>	Trig: Free Atten: 20						TY D	PE WAAAAA ET P N N N	N N		
			Def	Offset	10.7		- ouiii							Δ	Vikr3 1	875 n	IS	A	uto Tune
10 d	B/div			f 20.00											-	0.02 d	в		
Log 10.0									,		014	2		3∆	4			Ca	nter Freg
0.00	F]		>	(<mark>2</mark>		ĭ		,						00000 GHz
-10.0	\vdash																		
-20.0	⊢					-												s	tart Freq
-30.0	\vdash					-													00000 GHz
-40.0	H					A. 160.	ملطيعهم					Ma John	anternet						
-50.0							of other.	ana a									1	S	top Freq
-60.0																			0000 GHz
-70.0																			
Cen Res				00000	GH	2		#\/D\A	/ 8.0 MHz				0		s) 000 ms	pan 0 l			CF Step
	MODE			2				#VDV									5	8.00 Auto	0000 MHz Man
1	ADDE	180		(Δ)				ns (Δ)	۲ 0.31		FUNCTION	FU	NCTION WIE	ЛН	FUNCTI	JN VALUE	Î		
2 3	F Δ4	1	t t	(Δ)		1	<u>.975 n</u> .875 n	1s (Δ)	5.58 dE -0.02	dB								Fre	eq Offset
4	F	1	t			1	.975 n	1 S	5.58 dE	3m				\rightarrow			=		0 Hz
67																			
8																			
10 11																			
<									ш								~		
MSG													ST/	ATUS					

■ 500K Bit/s (255 Byte) Test Plots

Agilent Spectr	um Analyzer - Swe	pt SA								
<mark>₩</mark> ⊤ Center F	RF 50 Ω req 2.40200	AC 0000 GH	z		REF	#Avg	ALIGN AUTO J Type: RMS	TRAC	4Feb 28, 2019 E 1 2 3 4 5 6	Frequency
		PI	NO: Fast ↔ Gain:Low	Trig: Free R Atten: 20 di				TYF		
10 dB/div	Ref Offset 10. Ref 20.00 d						Δ	Mkr3 5.	010 ms 1.28 dB	Auto Tune
Log 10.0						6∆4				Center Freq
0.00		X <u>a</u>			ŤŤ					2.402000000 GHz
-10.0					++					
-20.0										Start Freq
-30.0										2.402000000 GHz
-50.0		Inter			W W			والغ	(
-60.0										Stop Freq 2.402000000 GHz
-70.0										2.40200000 GH2
Center 2.4 Res BW 8	402000000 G MHz	Hz	#VBW	8.0 MHz			Sweep 1		pan 0 Hz 1001 pts)	CF Step 8.000000 MHz
MKR MODE TH		× 45	60 ms (Δ)	۲ 1.29 dE		CTION	FUNCTION WIDTH	FUNCTIO	IN VALUE	<u>Auto</u> Man
2 F 1 3 $\Delta 4 1$	t	3.6	15 ms (Δ) 10 ms (Δ)	4.60 dBm 1.28 dE	1					Freq Offset
4 F 1			15 ms	4.60 dBm						0 Hz
6										
8										
10									~	
<				Ш						
MSG							STATUS			



9.2 6dB BANDWIDTH

Mode	Channel	6 dB Bandwidth	Limit		
(Bit/s)	Channer	(kHz)	(kHz)		
	0	667.3			
1M	19	668.6	> 500		
	39	667.1			
	0	1133.0			
2M	19	1135.0	> 500		
	39	1134.0			
	0	606.4			
125K	19	610.7	> 500		
	39	608.7			
	0	667.2			
500K	19	668.3	> 500		
	39	662.3			



IM Bit/s Test Plots

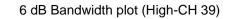


6 dB Bandwidth plot (Low-CH 0)

6 dB Bandwidth plot (Mid-CH 19)



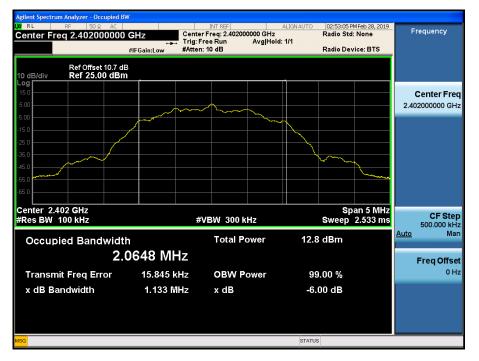








2M Bit/s Test Plots



6 dB Bandwidth plot (Low-CH 0)

6 dB Bandwidth plot (Mid-CH 19)



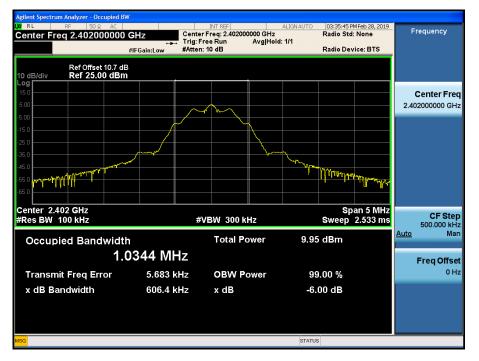




6 dB Bandwidth plot (High-CH 39)



125K Bit/s Test Plots



6 dB Bandwidth plot (Low-CH 0)

6 dB Bandwidth plot (Mid-CH 19)



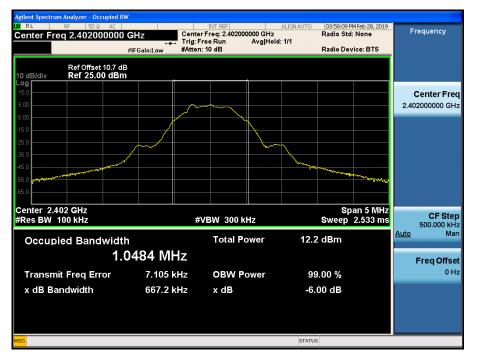




6 dB Bandwidth plot (High-CH 39)



500K Bit/s Test Plots

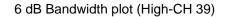


6 dB Bandwidth plot (Low-CH 0)

6 dB Bandwidth plot (Mid-CH 19)











9.3 OUTPUT POWER

Peak Power

Data rate	Packet length	LE N	lode	Measured	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel	Power(dBm)	
		2402	0	6.053	
	37	2440	19	5.825	
1M		2480	39	6.944	
I IVI		2402	0	5.945	
	255	2440	19	5.776	
		2480	39	6.845	
		2402	0	6.187	
	37	2440	19	5.977	
2M		2480	39	7.107	
ZIVI	255	2402	0	6.073	
		2440	19	5.865	
		2480	39	7.001	30
		2402	0	5.885	- 30
	37	2440	19	5.658	-
125K		2480	39	6.800	
1255		2402	0	5.725	
	255	2440	19	5.631	
		2480	39	6.683	
		2402	0	5.860	
500K	37	2440	19	5.665	
		2480	39	6.834	
		2402	0	5.827	
	255	2440	19	5.632	-
		2480	39	6.749	



Average Power

Data rate	Packet length	LE N	lode	Measured Power	Duty Cycle Factor	Result	Limit	
(Bit/s)	(Byte)	Frequency [MHz]	Channel	(dBm)	(dB)	(dBm)	(dBm)	
		2402	0	3.59	2.03	5.62		
	37	2440	19	3.49	2.03	5.51		
114		2480	39	4.62	2.03	6.64		
1M		2402	0	4.87	0.69	5.56		
	255	2440	19	4.77	0.69	5.45		
		2480	39	5.94	0.69	6.63		
		2402	0	0.88	4.82	5.70		
	37	2440	19	0.94	4.82	5.75	 30	
214		2480	39	1.92	4.82	6.74		
2M	255	2402	0	3.20	2.40	5.61		
		2440	19	3.05	2.40	5.45		
		2480	39	4.32	2.40	6.72		
	37	2402	0	4.79	0.82	5.62		
		2440	19	4.63	0.82	5.45		
40516		2480	39	5.81	0.82	6.63		
125K	255	2402	0	5.50	0.11	5.61		
		2440	19	5.32	0.11	5.43		
		2480	39	6.31	0.11	6.42		
	37	2402	0	3.34	2.44	5.77		
		2440	19	3.15	2.44	5.59		
5001/		2480	39	4.17	2.44	6.61		
500K	255	2402	0	5.22	0.41	5.63		
		2440	19	5.04	0.41	5.44		
		2480	39	6.12	0.41	6.53		

Note :

- 1. Spectrum reading values are not plot data.
 - The power results in plot is already including the actual values of loss for the attenuator and cable combination.
- 2. Spectrum offset = Attenuator loss + Cable loss
- We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
 So, 10.70 dB is offset for 2.4 GHz Band.



9.4 POWER SPECTRAL DENSITY

Frequency		Data rate	Test Result						
Frequency (MHz)	Channel		Measured PSD (dBm)	Duty Cycle Factor	Result (dBm)	Limit (dBm)			
2402	0		-12.817	2.029	-10.788				
2440	19	1M	-13.100	2.029	-11.071				
2480	39		-12.748	2.029	-10.719				
2402	0		-17.544	4.815	-12.729				
2440	19	2M	-17.432	4.815	-12.617				
2480	39		-16.211 4.815 -		-11.396	8.0			
2402	0		-2.059	0.823	-1.236	0.0			
2440	19	125K	-2.518	0.823	-1.695				
2480	39		-1.153	0.823	-0.330				
2402	0		-8.603	2.436	-6.167				
2440	19	500K	-8.026	2.436	-5.590				
2480	39		-7.049	2.436	-4.613				

Note :

1. Spectrum reading values are not plot data.

The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.

- 2. Spectrum offset = Attenuator loss + Cable loss
- 3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. So, 10.70 dB is offset for 2.4 GHz Band.

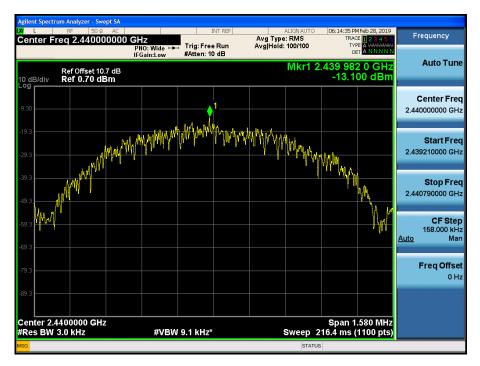


IM Bit/s Test Plots



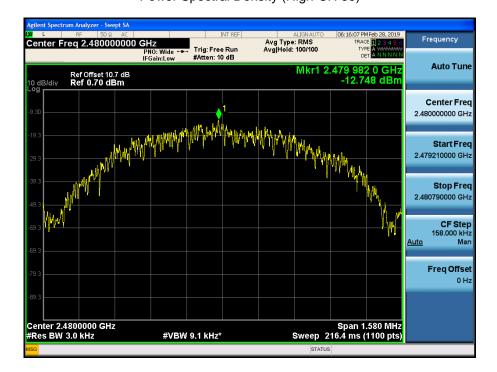
Power Spectral Density (Low-CH 0)

Power Spectral Density (Mid-CH 19)



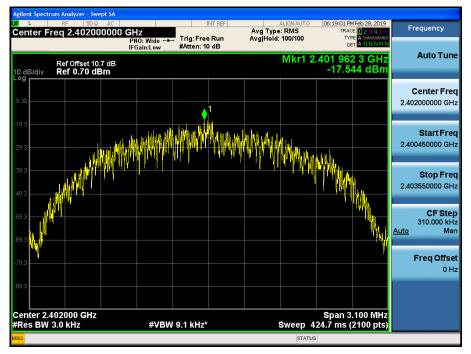


Power Spectral Density (High-CH 39)



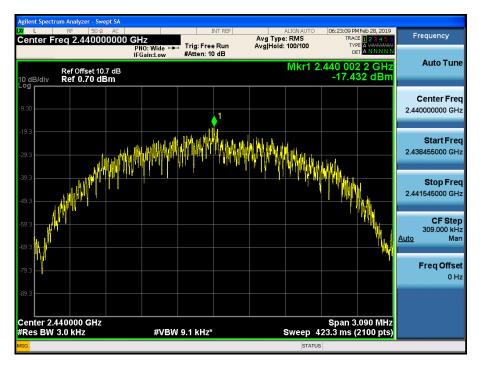


2M Bit/s Test Plots

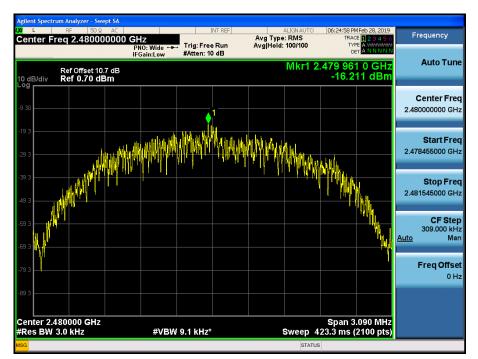


Power Spectral Density (Low-CH 0)

Power Spectral Density (Mid-CH 19)



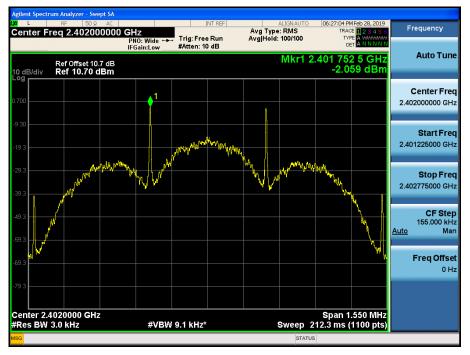




Power Spectral Density (High-CH 39)

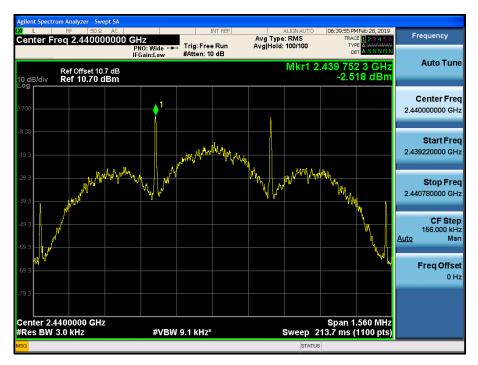


125K Bit/s Test Plots



Power Spectral Density (Low-CH 0)

Power Spectral Density (Mid-CH 19)



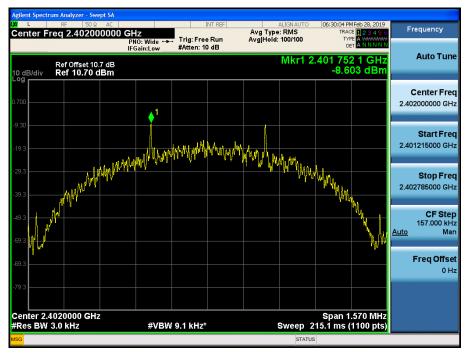




Power Spectral Density (High-CH 39)



500K Bit/s Test Plots



Power Spectral Density (Low-CH 0)

Power Spectral Density (Mid-CH 19)







Power Spectral Density (High-CH 39)



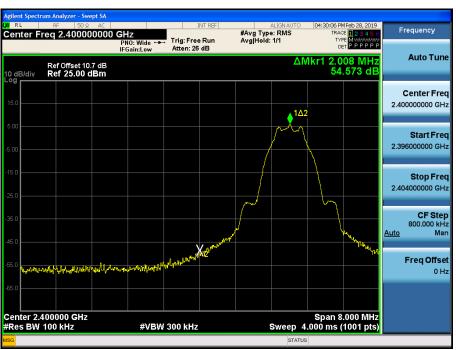
9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Result : please refer to the plot below.

In order to simplify the report, attached plots were only the worst case channel and data rate.

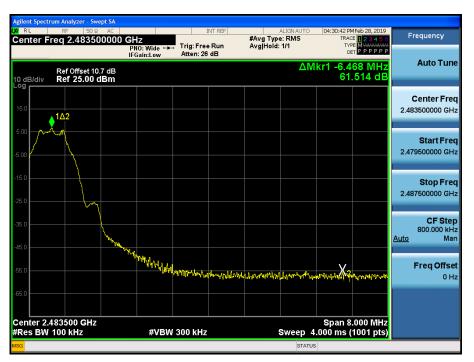


1M Bit/s Test Plots (BandEdge)



Low-CH 0

High-CH 39

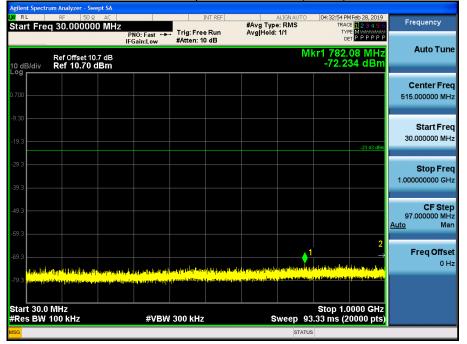




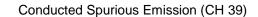
IM Bit/s Test Plots (Conducted Spurious Emission)

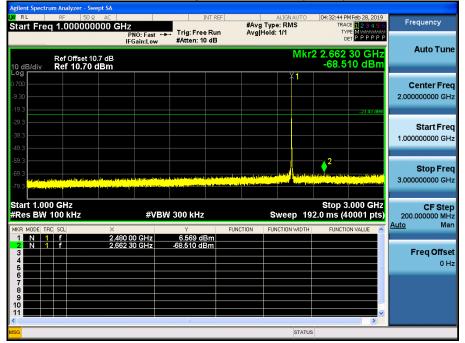
30 MHz ~ 1 GHz

Conducted Spurious Emission (CH 39)



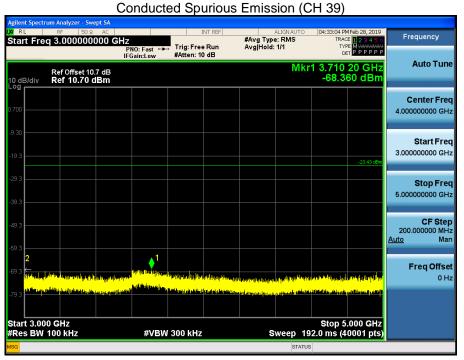
1 GHz ~ 3 GHz



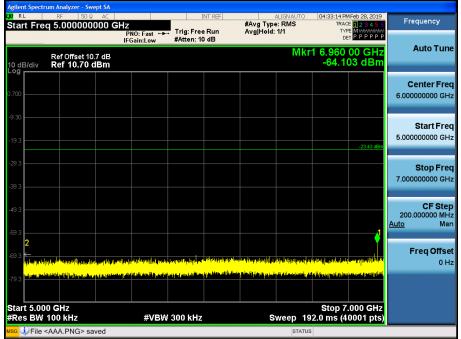




3 GHz ~ 5 GHz

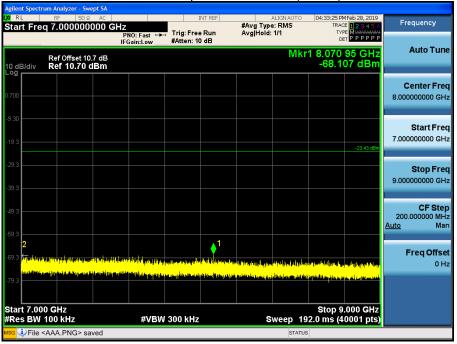


5 GHz ~ 7 GHz





7 GHz ~ 9 GHz



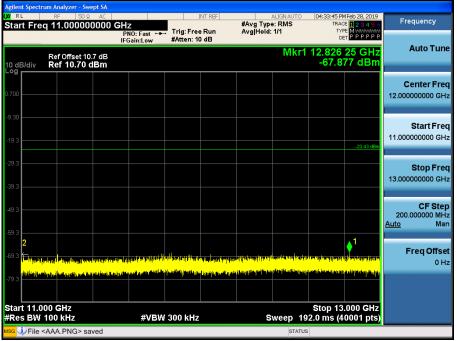
Conducted Spurious Emission (CH 39)

9 GHz ~ 11 GHz

m Analy Frequency Start Freq 9.000000000 GHz #Avg Type: RMS Avg|Hold: 1/1 HZ PNO: Fast ↔ Trig: Free Run IFGain:Low #Atten: 10 dB TYPE MINANANANA DET PPPPP Auto Tune Mkr1 10.923 05 GHz -67.131 dBm Ref Offset 10.7 dB Ref 10.70 dBm **Center Freq** 10.000000000 GHz Start Freq 9.000000000 GHz Stop Freq 11.000000000 GHz **CF Step** 200.000000 MHz <u>uto</u> Man Auto Freq Offset 0 Hz Stop 11.000 GHz Sweep 192.0 ms (40001 pts) Start 9.000 GHz #Res BW 100 kHz #VBW 300 kHz File <AAA.PNG> saved



11 GHz ~ 13 GHz



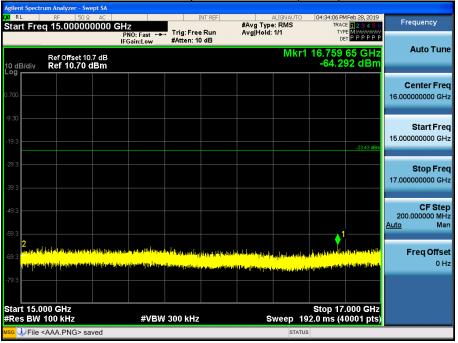
Conducted Spurious Emission (CH 39)

13 GHz ~ 15 GHz

ent Spectrum Analyzer - Swept S R #Avg Type: RMS Avg|Hold: 1/1 Start Freq 13.000000000 GHz PNO: Fast ---- Trig: Free Run IFGain:Low #Atten: 10 dB Auto Tune Mkr1 14.961 00 GHz -65.560 dBm Ref Offset 10.7 dB Ref 10.70 dBm 10 dB/div **Center Freq** 14.000000000 GHz Start Freq 13 00000000 GHz Stop Freq 15.00000000 GHz CF Step 200.000000 MHz Auto Mar Freq Offset 0 Hz Start 13.000 GHz #Res BW 100 kHz Stop 15.000 GHz Sweep 192.0 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved

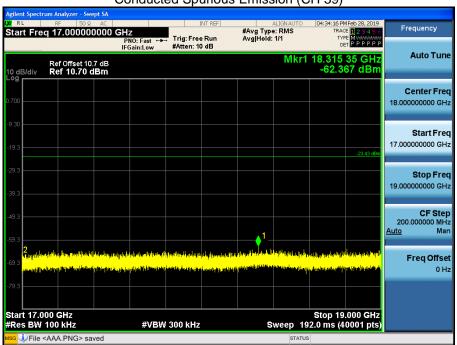


15 GHz ~ 17 GHz



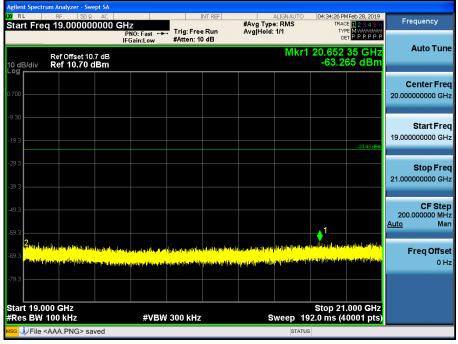
Conducted Spurious Emission (CH 39)

17 GHz ~ 19 GHz



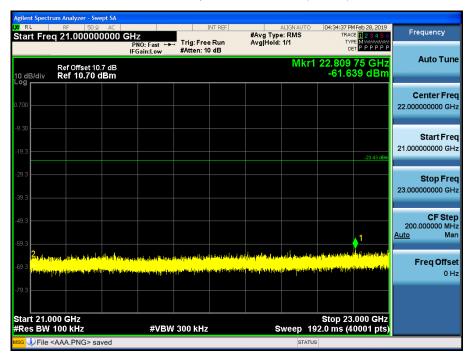


19 GHz ~ 21 GHz



Conducted Spurious Emission (CH 39)

21 GHz ~ 23 GHz





FCC ID: A3LSMT725C

23 GHz ~ 25 GHz

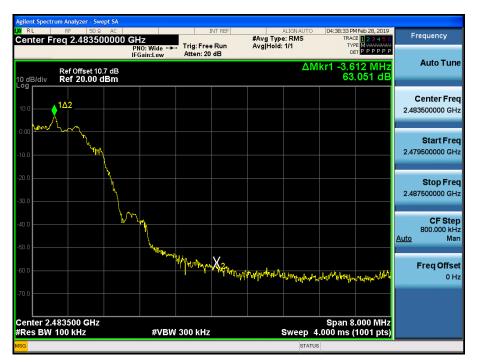




2M Bit/s Test Plots (BandEdge)



High-CH 39

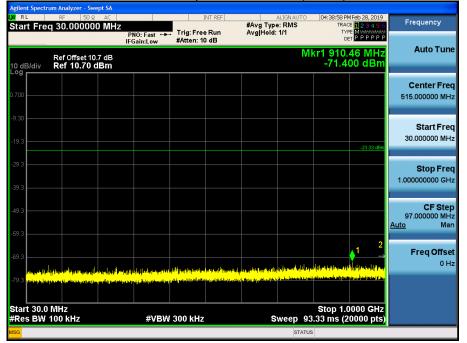




I 2M Bit/s Test Plots (Conducted Spurious Emission)

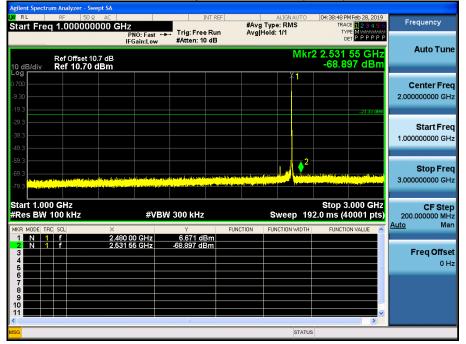
30 MHz ~ 1 GHz

Conducted Spurious Emission (CH 39)



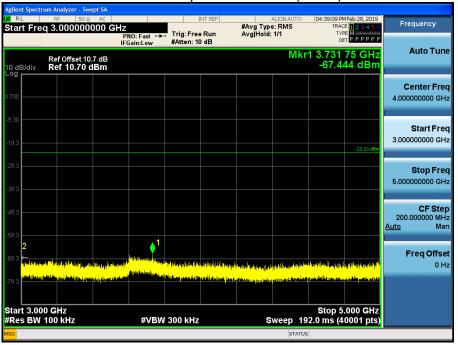
1 GHz ~ 3 GHz







3 GHz ~ 5 GHz



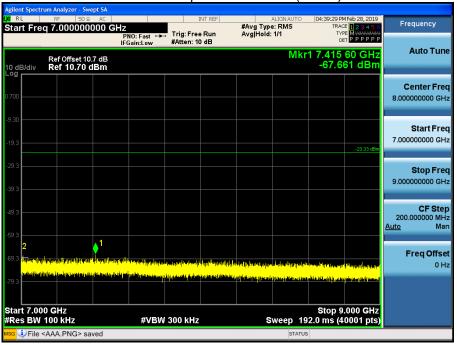
Conducted Spurious Emission (CH 39)

5 GHz ~ 7 GHz

um Analy Frequency Start Freq 5.000000000 GHz #Avg Type: RMS Avg|Hold: 1/1 HZ PNO: Fast ↔ Trig: Free Run IFGain:Low #Atten: 10 dB TYPE MINIMUM Auto Tune Mkr1 6.960 00 GHz -64.594 dBm Ref Offset 10.7 dB Ref 10.70 dBm **Center Freq** 6.00000000 GHz Start Freq 5.00000000 GHz Stop Freq 7.00000000 GHz **CF Step** 200.000000 MHz <u>uto</u> Man Auto Freq Offset 0 Hz Stop 7.000 GHz Sweep 192.0 ms (40001 pts) Start 5.000 GHz #Res BW 100 kHz #VBW 300 kHz



7 GHz ~ 9 GHz



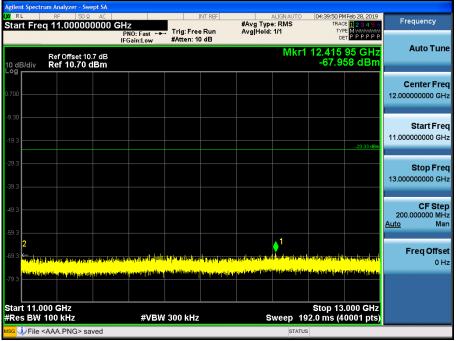
Conducted Spurious Emission (CH 39)

9 GHz ~ 11 GHz

um Analy Frequency Start Freq 9.000000000 GHz #Avg Type: RMS Avg|Hold: 1/1 HZ PNO: Fast ↔ Trig: Free Run IFGain:Low #Atten: 10 dB TYPE MINANANANA DET PPPPP Auto Tune Mkr1 10.458 05 GHz -68.554 dBm Ref Offset 10.7 dB Ref 10.70 dBm **Center Freq** . 10.000000000 GHz Start Freq 9.000000000 GHz Stop Freq 11.000000000 GHz **CF Step** 200.000000 MHz <u>uto</u> Man Auto 01 Freq Offset 0 Hz Stop 11.000 GHz Sweep 192.0 ms (40001 pts) Start 9.000 GHz #Res BW 100 kHz #VBW 300 kHz File <AAA.PNG> saved



11 GHz ~ 13 GHz



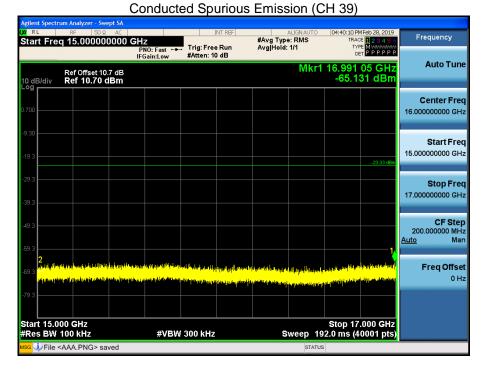
Conducted Spurious Emission (CH 39)

13 GHz ~ 15 GHz

ent Spectrum Analyzer - Swept S/ R Start Freq 13.000000000 GHz PN0: Fast ---- IFGain:Low #Atten: 10 dB #Avg Type: RMS Avg|Hold: 1/1 TYPE MWWWWWW DET P P P P P Auto Tune Mkr1 14.985 70 GHz -64.606 dBm Ref Offset 10.7 dB Ref 10.70 dBm 10 dB/div **Center Freq** 14.000000000 GHz Start Freq 13 00000000 GHz Stop Freq 15.00000000 GHz CF Step 200.000000 MHz Auto Mar Freq Offset 0 Hz Start 13.000 GHz #Res BW 100 kHz Stop 15.000 GHz Sweep 192.0 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved



15 GHz ~ 17 GHz

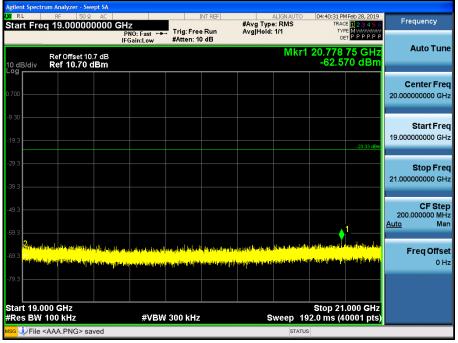


17 GHz ~ 19 GHz

ent Spectrum Analyzer - Swept SA R Start Freq 17.000000000 GHz PN0: Fast ---- IFGain:Low #Atten: 10 dB #Avg Type: RMS Avg|Hold: 1/1 TYPE MWWWWW DET P P P P P Auto Tune Mkr1 18.324 45 GHz -63.200 dBm Ref Offset 10.7 dB Ref 10.70 dBm 10 dB/div **Center Freq** 18.000000000 GHz Start Freq 17 00000000 GHz Stop Freq 19.00000000 GHz CF Step 200.000000 MHz Auto Mar Freq Offset 0 Hz Start 17.000 GHz #Res BW 100 kHz Stop 19.000 GHz Sweep 192.0 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved

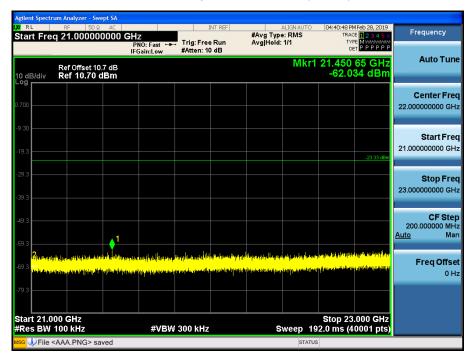


19 GHz ~ 21 GHz



Conducted Spurious Emission (CH 39)

21 GHz ~ 23 GHz





FCC ID: A3LSMT725C

23 GHz ~ 25 GHz

RL	RF 50 Ω	AC		1	INT REF		ALIGN AUTO		1Feb 28, 2019	E
Start Fre	q 23.00000	F	Z NO: Fast ↔ Gain:Low	Trig: Free #Atten: 10		#Avg Type Avg Hold:		TYP	E 123456 M M M M M M M M M M M M M M M M M M M	Frequency
0 dB/div	Ref Offset 10 Ref 10.70 (Mkr1	24.796 -57.48	95 GHz 85 dBm	Auto Tun
.700										Center Fre 24.000000000 G⊦
9.30									-23.33 dBm	Start Fre 23.000000000 G⊦
29.3 39.3										Stop Fre 25.000000000 G⊦
49.3	وروابه وروابه والمراجع والمراجع				ander af langer i forst for same	ata la karang karang sa pila	cutari ta stitu ti dana		1 Waradibiełkałk	CF Ste 200.000000 MH <u>Auto</u> Ma
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	100 GH2		#VBW	/ 300 kHz		s	ween 19	3.0p 25. 2.0 ms (4	.000 GHz 0001 pts)	
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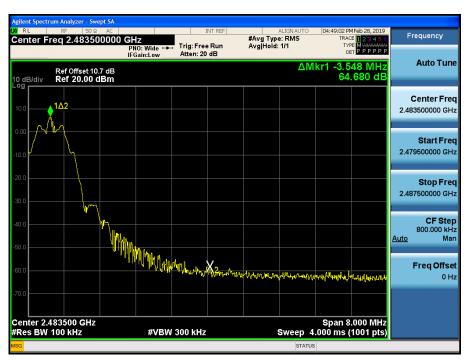


125K Bit/s Test Plots (BandEdge)



Low-CH 0

High-CH 39

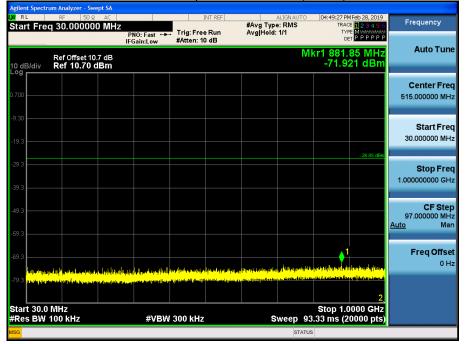




I25K Bit/s Test Plots (Conducted Spurious Emission)

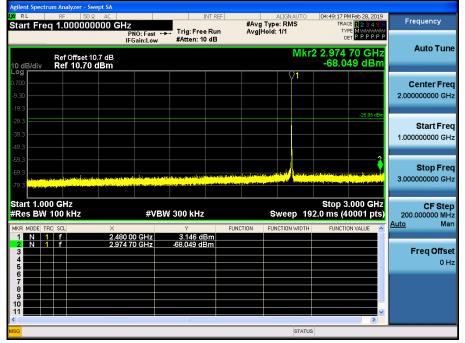
30 MHz ~ 1 GHz

Conducted Spurious Emission (CH 39)



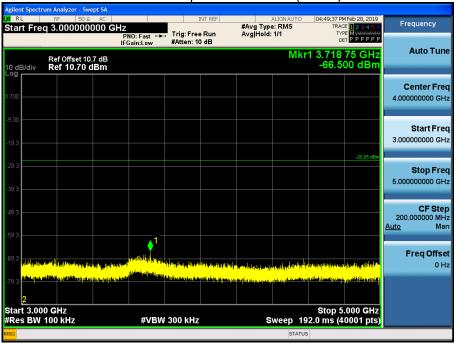
1 GHz ~ 3 GHz





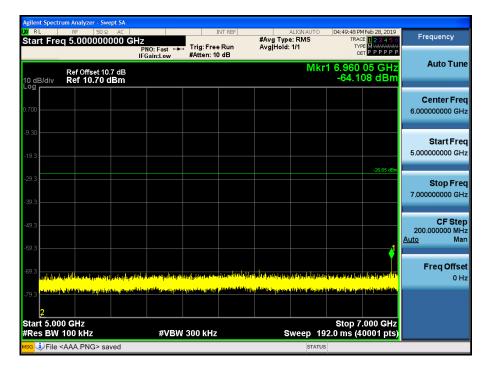


3 GHz ~ 5 GHz



Conducted Spurious Emission (CH 39)

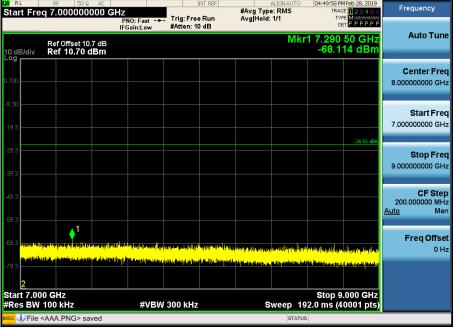
5 GHz ~ 7 GHz





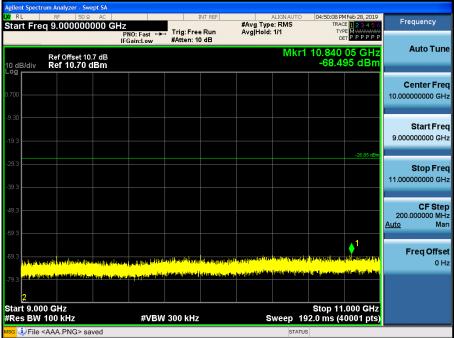
7 GHz ~ 9 GHz

Conducted Spurious Emission (CH 39)



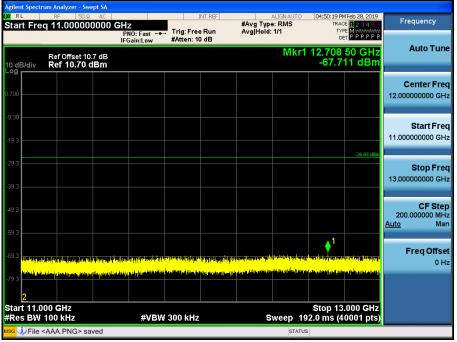
9 GHz ~ 11 GHz

Conducted Spurious Emission (CH 39)





11 GHz ~ 13 GHz



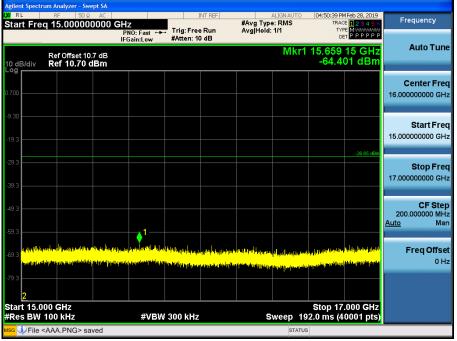
Conducted Spurious Emission (CH 39)

13 GHz ~ 15 GHz

ent Spectrum Analyzer - Swept S XIRL RF 150.9. AU Start Freq 13.000000000 GHz PN0: Fast →→ Trig: Free Run IFGain:Low #Atten: 10 dB #Avg Type: RMS Avg|Hold: 1/1 TYPE MWWWWWW DET P P P P P Mkr1 14.979 60 GHz -65.207 dBm Auto Tune Ref Offset 10.7 dB Ref 10.70 dBm 10 dB/div **Center Freq** 14.000000000 GHz Start Freq 13 00000000 GHz Stop Freq 15.00000000 GHz CF Step 200.000000 MHz Auto Mar Freq Offset 0 Hz Start 13.000 GHz #Res BW 100 kHz Stop 15.000 GHz Sweep 192.0 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved



15 GHz ~ 17 GHz



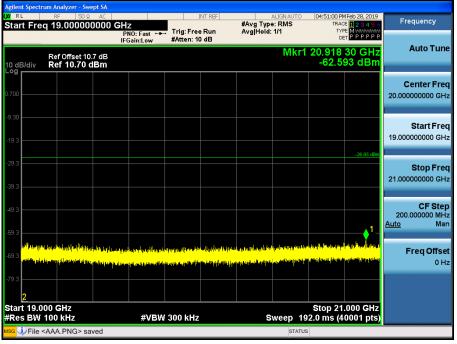
Conducted Spurious Emission (CH 39)

17 GHz ~ 19 GHz

ent Spectrum Analyzer - Swept S R Start Freq 17.000000000 GHz PN0: Fast ---- IFGain:Low #Atten: 10 dB #Avg Type: RMS Avg|Hold: 1/1 TYPE MWWWWWWW DET P P P P P Auto Tune Mkr1 18.381 05 GHz -62.576 dBm Ref Offset 10.7 dB Ref 10.70 dBm 10 dB/div **Center Freq** 18.000000000 GHz Start Freq 17 00000000 GHz Stop Freq 19.00000000 GHz CF Step 200.000000 MHz Auto Mar Freq Offset 0 Hz Start 17.000 GHz #Res BW 100 kHz Stop 19.000 GHz Sweep 192.0 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved

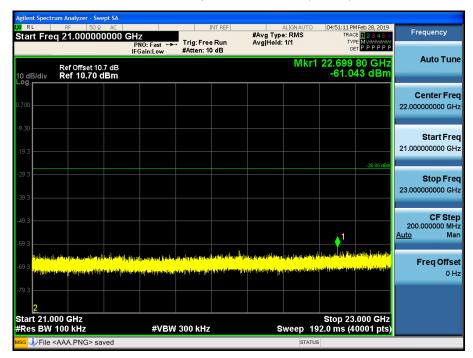


19 GHz ~ 21 GHz



Conducted Spurious Emission (CH 39)

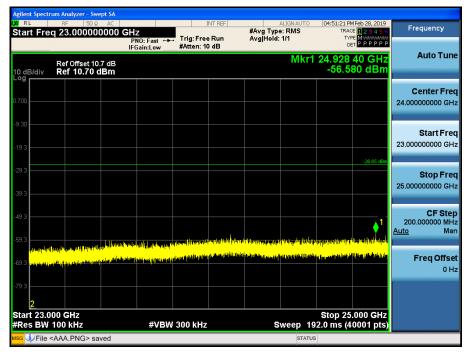
21 GHz ~ 23 GHz





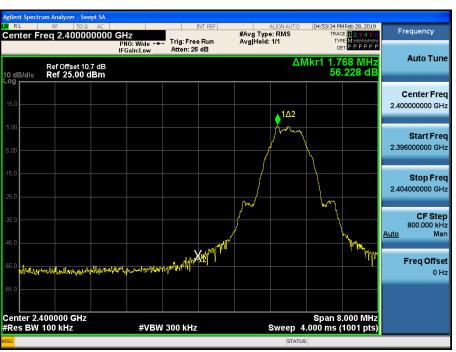
FCC ID: A3LSMT725C

23 GHz ~ 25 GHz



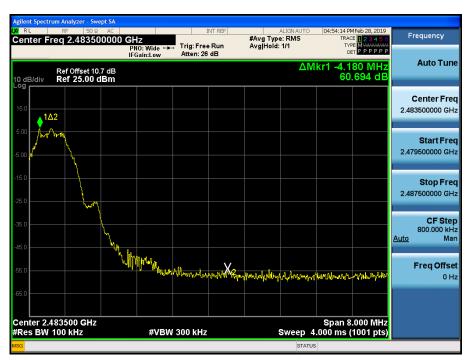


500K Bit/s Test Plots (BandEdge)



Low-CH 0

High-CH 39

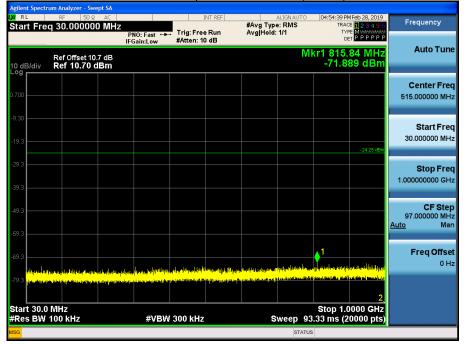




500K Bit/s Test Plots (Conducted Spurious Emission)

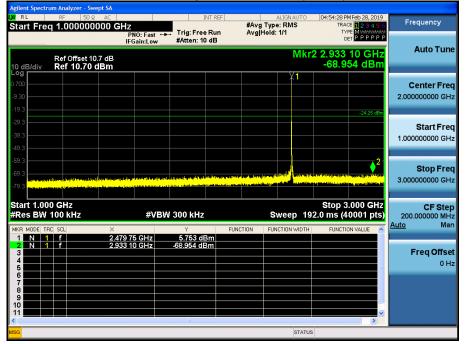
30 MHz ~ 1 GHz

Conducted Spurious Emission (CH 39)



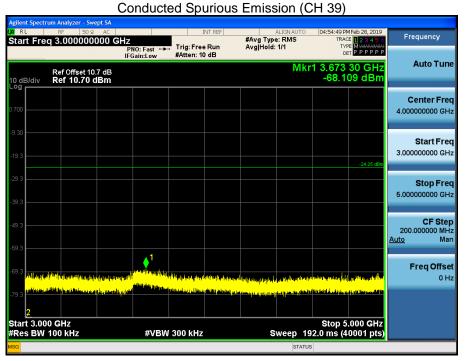
1 GHz ~ 3 GHz



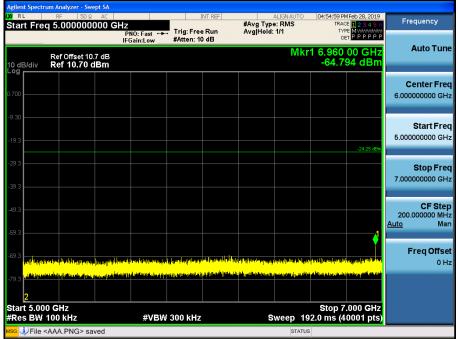




3 GHz ~ 5 GHz

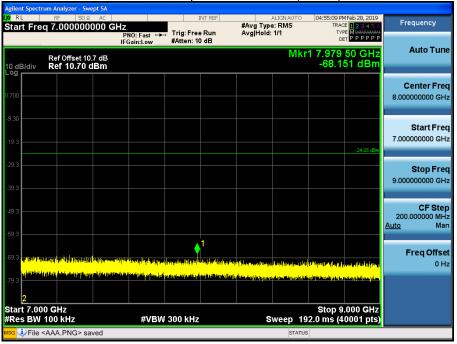


5 GHz ~ 7 GHz





7 GHz ~ 9 GHz



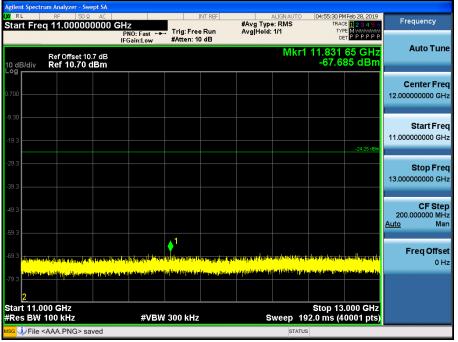
Conducted Spurious Emission (CH 39)

9 GHz ~ 11 GHz

im Analy Frequency Start Freq 9.000000000 GHz #Avg Type: RMS Avg|Hold: 1/1 HZ PNO: Fast ↔ Trig: Free Run IFGain:Low #Atten: 10 dB TYPE MINIMUM Auto Tune Mkr1 10.487 70 GHz -68.245 dBm Ref Offset 10.7 dB Ref 10.70 dBm **Center Freq** 10.000000000 GHz Start Freq 9.000000000 GHz Stop Freq 11.000000000 GHz **CF Step** 200.000000 MHz <u>uto</u> Man Auto Ø Freq Offset 0 Hz Stop 11.000 GHz Sweep 192.0 ms (40001 pts) Start 9.000 GHz #Res BW 100 kHz #VBW 300 kHz File <AAA.PNG> saved



11 GHz ~ 13 GHz



Conducted Spurious Emission (CH 39)

13 GHz ~ 15 GHz

ent Spectrum Analyzer - Swept SA R Start Freq 13.000000000 GHz PN0: Fast ---- IFGain:Low #Atten: 10 dB #Avg Type: RMS Avg|Hold: 1/1 TYPE MWWWWWW DET P P P P P Auto Tune Mkr1 14.990 05 GHz -64.744 dBm Ref Offset 10.7 dB Ref 10.70 dBm 10 dB/div **Center Freq** 14.000000000 GHz Start Freq 13 00000000 GHz Stop Freq 15.00000000 GHz CF Step 200.000000 MHz Auto Mar Freq Offset 0 Hz Start 13.000 GHz #Res BW 100 kHz Stop 15.000 GHz Sweep 192.0 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved