

FCC BT REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.		Date of Issue: March 17, 2019 Location: HCT CO., LTD.,		
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Suwon-si, Gyeonggi-	do, 16677, Rep. of Korea	Report No.: HCT-RF-1903-FC028-R1		
FCC ID:	A3LSMT725	물건 이 집에 가장 같은 것이 가지 않는 것이 많이 많이 없다.		

APPLICANT: SAMSUNG Electronics Co., Ltd.

Model:	SM-T725
Additional Model:	SM-T725N, SM-T727
EUT Type:	Tablet
Max. RF Output Power:	11.21 dBm (13.22 mW)
Frequency Range:	2402 MHz - 2480 MHz (Bluetooth)
Modulation type	GFSK(Normal), π /4DQPSK and 8DPSK(EDR)
FCC Classification:	FCC Part 15 Spread Spectrum Transmitter
FCC Rule Part(s):	Part 15 subpart C 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

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Approved by : Kwon Jeong Manager of Telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1903-FC028 March 15, 2019 - First Approval Report		- First Approval Report
HCT-RF-1903-FC028-R1	March 17, 2019	 Added the KDB procedure. Revised the worst case configuration on page 24-25.



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1. EUT DESCRIPTION

Model	SM-T725
Additional Model	SM-T725N, SM-T727
EUT Type	Tablet
Power Supply	DC 3.85 V
Battery Information	Model: EB-BT725ABU
	Type: Li-ion battery
Travel Adapter Information	Model : EP-TA200
Traver Adapter Information	Manufacture: SOLUM
	Model : EJ-FT720
Keyboard Information	Manufacture: SAMSUNG
	Model : EE-D3200
Charging Doc Information	Manufacture: SAMSUNG
Frequency Range	2402 MHz - 2480 MHz
Max. RF Output Power	11.21 dBm (13.22 mW)
BT Operating Mode	Normal, EDR, AFH
Modulation Type	GFSK(Normal), π /4DQPSK and 8DPSK(EDR)
Modulation Technique	FHSS
Number of Channels	79Channels, Minimum 20 Channels(AFH)
Antenna Specification	Antenna type: Metal Peak Gain : -5.50 dBi
Date(s) of Tests	January 17, 2019 ~ March 14, 2019



2. Requirements for Bluetooth transmitter(15.247)

This Bluetooth module has been tested by a Bluetooth Qualification Lab, and we confirm the following:

- 1) This system is hopping pseudo-randomly.
- 2) Each frequency is used equally on the average by each transmitter.
- 3) The receiver input bandwidths that match the hopping channel bandwidths of their corresponding transmitters
- 4) The receiver shifts frequencies in synchronization with the transmitted signals.

• 15.247(g): The system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this Section 15.247 should the transmitter be presented with a continuous data (or information) stream.

• 15.247(h): The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.



3. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Device (ANSI C63.10-2013) is used in the measurement of the test device.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 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). To record the final measurements, the analyzer detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 120 kHz for frequencies below 1 GHz or 1 MHz for frequencies above 1 GHz. For average measurements above 1 GHz, the analyzer was set to peak detector with a reduced VBW setting(RBW = 1 MHz, VBW = 1/T Hz, where T = Pulse width).

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.



4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been

calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

Espectially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. 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."



6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

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

* The E.U.T Complies with the requirement of §15.203

7. 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

8. DESCRIPTION OF TESTS

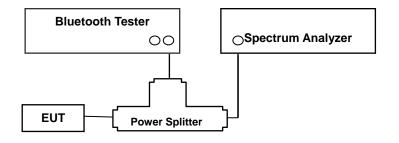
8.1. Conducted Maximum Peak Output Power

<u>Limit</u>

The maximum peak output power of the intentional radiator shall not exceed the following:

- 1. For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 nonoverlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 W. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 W.
- 2. The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer. The Spectrum Analyzer is set to the peak detector mode. This test is performed with hopping off.

The Spectrum Analyzer is set to (7.8.5 in ANSI 63.10-2013 & Procedure 10(b)(6)(i) in KDB 558074 v05r01)

- 1) Span: approximately 5 times the 20 dB bandwidth, centered on a hopping channel
- 2) RBW > the 20 dB bandwidth of the emission being measured
- 3) VBW \geq RBW
- 4) Sweep = Auto
- 5) Detector = Peak
- 6) Trace = Max hold

Sample Calculation

Output Power = Spectrum Reading Power + Power Splitter loss + Cable loss(2 ea)

= 10 dBm + 6 dB + 1.5 dB = 17.5 dBm

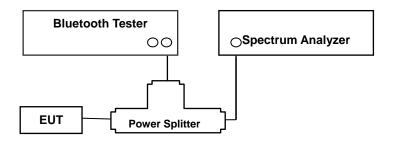


8.2. Conducted Band Edge(Out of Band Emissions)

<u>Limit</u>

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Configuration



Test Procedure

This test is performed with hopping off and hopping on.

The Spectrum Analyzer is set to (6.10.4 in ANSI 63.10-2013 & Procedure 8.5 and 8.6 in KDB 558074 v05r01)

- 1) Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation
- Reference level: As required to keep the signal from exceeding the maximum instrument input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level.
- 3) Attenuation: Auto (at least 10 dB preferred).
- 4) Sweep time: Coupled.
- 5) RBW: 100 kHz
- 6) VBW: 300 kHz
- 7) Detector: Peak
- 8) Trace: Max hold

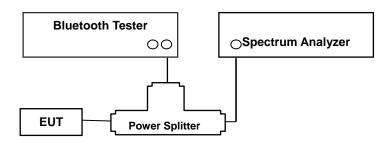


8.3. Frequency Separation & 20 dB Bandwidth

<u>Limit</u>

According to §15.247(a)(1), Frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Test Configuration



Test Procedure

The Channel Separation test is performed with hopping on. And the 20 dB Bandwidth test is performed with hopping off.

The Spectrum Analyzer is set to (7.8.2 in ANSI 63.10-2013 & Procedure 10(b)(6)(iii) in KDB 558074 v05r01)

- 1) Span: Wide enough to capture the peaks of two adjacent channels
- 2) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- 3) VBW ≥ RBW
- 4) Sweep: Auto
- 5) Detector: Peak
- 6) Trace: Max hold
- 7) All the trace to stabilize.
- 8) Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Compliance of an EUT with the appropriate regulatory limit shall be determined. A plot of the data shall be included in the test report.

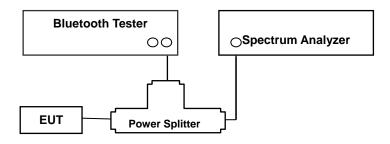


8.4. Number of Hopping Frequencies

<u>Limit</u>

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5 MHz bands shall use at least 15 hopping frequencies.

Test Configuration



Test Procedure

The Bluetooth frequency hopping function of the EUT was enabled.

The Spectrum Analyzer is set to (7.8.3 in ANSI 63.10-2013 & Procedure 10(b)(4) in KDB 558074 v05r01)

- 1) Span: the frequency band of operation
- 2) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- 3) VBW ≥ RBW
- 4) Sweep: Auto
- 5) Detector: Peak
- 6) Trace: Max hold
- 7) Allow the trace to stabilize.

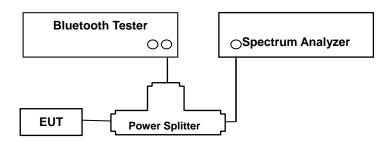


8.5. Time of Occupancy

<u>Limit</u>

According to \$15.247(a)(1)(iii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

Test Configuration



Test Procedure

This test is performed with hopping off.

The Spectrum Analyzer is set to (7.8.4 in ANSI 63.10-2013 & Procedure 10(b)(6)(iv) in KDB 558074 v05r01)

- 1) Span: Zero span, centered on a hopping channel
- RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
- 3) Sweep = as necessary to capture the entire dwell time per hopping channel
- 4) Detector: Peak
- 5) Trace: Max hold

The marker-delta function was used to determine the dwell time.



Sample Calculation

The following calculation process is not relevant to our measurement results. It is just an example.

* Non-AFH Mode

- DH 5 (GFSK) : 2.890 * (1600/6)/79 * 31.6 = 308.27 (ms)
- 2-DH 5 (π/4DQPSK) : 2.890 * (1600/6)/79 * 31.6 = 308.27 (ms)
- 3-DH 5 (8DPSK) : 2.890 * (1600/6)/79 * 31.6 = 308.27 (ms)

* AFH Mode

- DH 5 (GFSK) : 2.890 * (800/6)/20 * 8.0 = 154.13 (ms)
- 2-DH 5 (π/4DQPSK) : 2.890 * (800/6)/20 * 8.0 = 154.13 (ms)
- 3-DH 5 (8DPSK) : 2.890 * (800/6)/20 * 8.0 = 154.13 (ms)

Note :

DH5 Packet need 5 time slot for transmitting and 1 time slot for receiving.

Then the system makes worst case 1600/6 hops per second with 79 channels. So the system have each channel 3.3755 times per second and so for 31.6 seconds the system have 106.667 times of appearance. Each tx-time per appearance of DH5 is 2.890 ms.

Dwell time = Tx-time * 106.667 = 308.27 (ms)

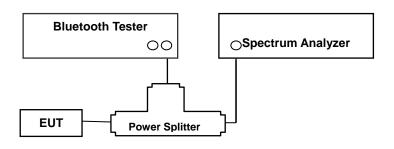


8.6. Conducted Spurious Emissions

<u>Limit</u>

Conducted > 20 dBc

Test Configuration



Test Procedure

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer.

The Spectrum Analyzer is set to (7.8.8 in ANSI 63.10-2013 & Procedure 8.5 and 8.6 in KDB 558074 v05r01)

- 1) Span: 30 MHz to 10 times the operating frequency in GHz.
- 2) RBW: 100 kHz
- 3) VBW: 300 kHz
- 4) Sweep: Coupled
- 5) Detector: Peak

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

This test is performed with hopping off.



Factors for frequency

Freq(MHz)	Factor(dB)
30	7.18
100	6.35
200	7.04
300	6.58
400	6.26
500	5.95
600	6.17
700	6.34
800	6.72
900	7.08
1000	7.38
2000	7.21
2400*	7.40
2500*	7.44
3000	7.88
4000	8.95
5000	9.57
6000	6.68
7000	9.99
8000	8.34
9000	9.61
10000	10.47
11000	8.96
12000	9.73
13000	8.84
14000	9.50
15000	11.54
16000	8.14
17000	11.73
18000	9.71
19000	10.40
20000	11.69
21000	10.72
22000	12.31
23000	9.85
24000	12.52
25000	11.07
26000	10.50

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

2. Factor = Cable loss + Splitter loss



8.7. Radiated Test

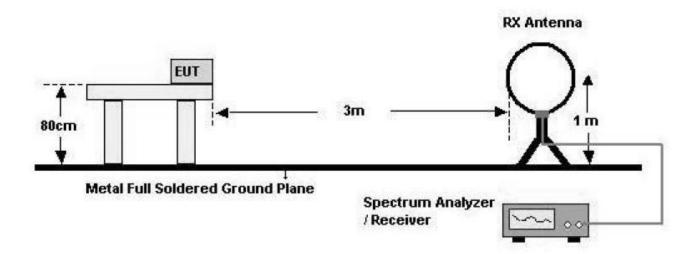
<u>Limit</u>

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

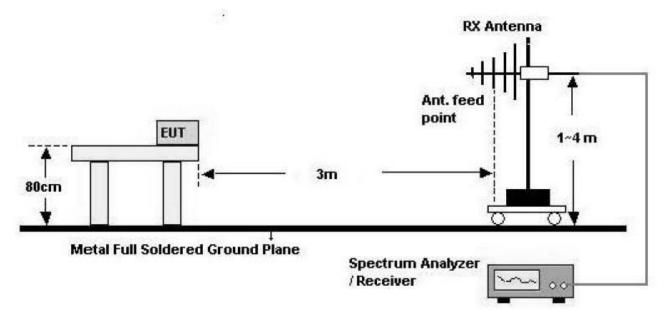
Test Configuration

Below 30 MHz

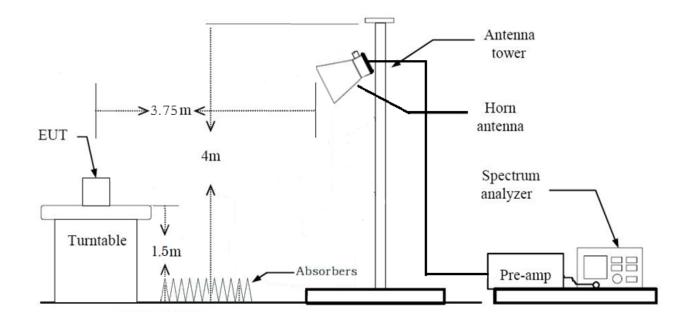




30 MHz - 1 GHz



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 m/30 m) = 40 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 ≥ 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. Radiated test is performed with hopping off.
- 2. The EUT is placed on a turntable, which is 1.5 m 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. EUT is set 3.75 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 6. 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)
- 7. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 8. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 9. The unit was tested with its standard battery.
- 10. Spectrum Setting
 - (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):
 - We performed using a reduced video BW method was done with the analyzer in linear mode
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \ge 1/T Hz, where T = pulse width in seconds
 - The actual setting value of VBW = 1 kHz
- 11. 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.
- 12. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) Amp Gain(G) + Distance Factor(D.F)



Test Procedure of Radiated Restricted Band Edge

- 1. Radiated test is performed with hopping off.
- 2. The EUT is placed on a turntable, which is 1.5 m 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. EUT is set 3.75 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 6. 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)
- 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):
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \ge 3*RBW
 - (2) Measurement Type(Average):
 - Average value of pulsed emissions
 - Unless otherwise specified, when the radiated emission limits are expressed in terms of the average value of the emission and pulsed operation is employed, the average measurement shall determined from the peak field strength after correcting for the worst-case duty cycle as described in 7.5 in ANSI 63.10-2013 & Procedure 9(b) in KDB 558074 v05r01
 - DCCF = 20*log₁₀(Pulse width / Period of the pulse train)
- 10. Total(Measurement Type : Peak)
 - = Peak Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

Total(Measurement Type : Average)

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



- 11. Duty Cycle Correction Factor (79 channel hopping)
 - a. Time to cycle through all channels= Δ t= τ [ms] x 79 channels = 229.100 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H ' =1
 - c. Worst Case Dwell Time = τ [ms] x H ' = 2.9 ms
 - d. Duty Cycle Correction = 20log (Worst Case Dwell Time/ 100ms) dB = -30.752 dB
- 12. Duty Cycle Correction Factor(AFH mode minimum channel number case 20 channels)
 - a. Time to cycle through all channels= Δ t= τ [ms] x 20 channels = 58.00 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H' = 2
 - c. Worst Case Dwell Time = T [ms] x H ' = 5.800 ms
 - d. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) dB = -24.7314 dB



8.8. 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.
- 5. The EUT is the device operating below 30 MHz.
 - For unterminated the Antenna, the AC line conducted tests are performed with the antenna connected
 - For terminated the Antenna, the AC line conducted tests are performed with a dummy load connected to the EUT antenna output terminal.

Sample Calculation

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



8.9. 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
 - Radiated Spurious Emissions : Y
- 3. All data rate of operation were investigated and the test results are worst case in highest datarate of each mode.
 - GFSK : DH5
 - π/4DQPSK : 2-DH5
 - 8DPSK : 3-DH5
- 4. SM-T725, SM-T725N, SM-T727 were tested and the worst case results are reported.

(Worst case : SM-T725)

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
 - Radiated Restricted Band Edge : X
- 3. We applied DCCF in the test result which hopping channel number is 20.
- 4. All data rate of operation were investigated and the test results are worst case in highest datarate of each mode.
 - GFSK : DH5
 - $\pi/4DQPSK$: 2-DH5
 - 8DPSK : 3-DH5
- 5. SM-T725, SM-T725N, SM-T727 were tested and the worst case results are reported. (Worst case : SM-T725)

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
- 2. SM-T725, SM-T725N, SM-T727 were tested and the worst case results are reported.

(Worst case : SM-T725)



Conducted test

- 1. The EUT was configured with data rate of highest power.
 - GFSK : DH5
 - π/4DQPSK : 2-DH5
 - 8DPSK : 3-DH5
- 2. AFH & Non-AFH were tested and the worst case results are reported.

(Worst case : Non-AFH)

3. SM-T725, SM-T725N, SM-T727 were tested and the worst case results are reported. (Worst case : SM-T725)



9. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
20 dB Bandwidth	§15.247(a)(1)	N/A		PASS
Occupied Bandwidth	N/A	N/A		N/A
Conducted Maximum Peak Output Power	§15.247(b)(1)	< 0.125 W		PASS
Carrier Frequency Separation	§15.247(a)(1)	> 25 kHz or >2/3 of the 20dB BW		PASS
Number of Hopping Frequencies	§15.247(a)(1)(iii)	≥ 15	Conducted	PASS
Time of Occupancy	§15.247(a)(1)(iii)	< 400 ms		PASS
Conducted Spurious Emissions	§15.247(d) > 20 dB for all out-of band emissions			PASS
Band Edge (Out of Band Emissions)	§15.247(d)	> 20 dB for all out-of band emissions		PASS
AC Power line Conducted Emissions	§15.207(a)	cf. Section 8.8		N/A (Note1)
Radiated Spurious Emissions	§15.247(d), 15.205, cf. Section 8.7 15.209			PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 8.7	Radiated	PASS
Receiver Spurious Emissions	N/A	cf. Section 8.9		PASS



10. TEST RESULT

10.1 PEAK POWER

Channel	Frequency	Output Power (GFSK)		Limit
	(MHz)	(dBm)	(mW)	(mW)
Low	2402	9.600	9.12	
Mid	2441	8.995	7.93	125
High	2480	9.226	8.37	

Channel (Mular)		Output Power (8DPSK)		Limit
	(MHz)	(dBm)	(mW)	(mW)
Low	2402	11.213	13.22	
Mid	2441	10.965	12.49	125
High	2480	10.837	12.13	

Channel	Frequency (MHz)	Outpu (π/4D	Limit	
	(10172)	(dBm)	(mW)	(mW)
Low	2402	11.015	12.63	
Mid	2441	10.662	11.65	125
High	2480	10.640	11.59	

Note:

1. Spectrum reading values are not plot data.

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

 We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the splitter and cable combination is 7.36 dB at 2402 MHz and is 7.44 dB at 2480 MHz.

So, 7.4 dB is offset. And the offset gap in the 2.4 GHz range do not affect the conducted peak power final result.

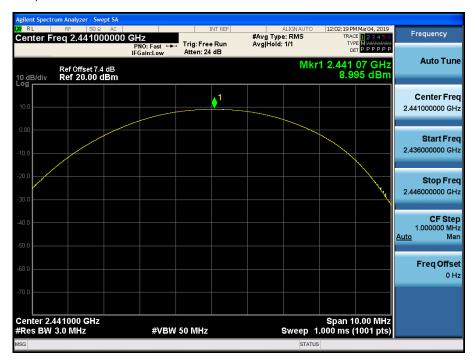


Test Plots (GFSK)

Peak Power (CH.0)

gilent Spectrum Analyzer - Swept SA RL RF 50 Q AC Center Freq 2.402000000	PNO: Fast 🔸	, Trig: Free Run Atten: 24 dB	ALIO #Avg Type: F Avg Hold: 1/1	RMS	2:07 PM Mar 04, 2019 TRACE 1 2 3 4 5 6 TYPE M WWWWWW DET P P P P P P	Frequency
Ref Offset 7.4 dB 0 dB/div Ref 20.00 dBm	IFGain:Low	Atten: 24 dB		Mkr1 2.4	402 21 GHz 9.600 dBm	Auto Tune
10.0		↓ ¹				Center Fre 2.402000000 GH
0.00						Start Fre 2.397000000 GH
20.0						Stop Fre 2.407000000 GF
						CF Ste 1.000000 MH <u>Auto</u> Ma
50.0						Freq Offs 0 F
70.0 Senter 2.402000 GHz				Sp	an 10.00 MHz	
Res BW 3.0 MHz	#VBW	50 MHz	Sw	status	ms (1001 pts)	

Test Plots (GFSK) Peak Power (CH.39)

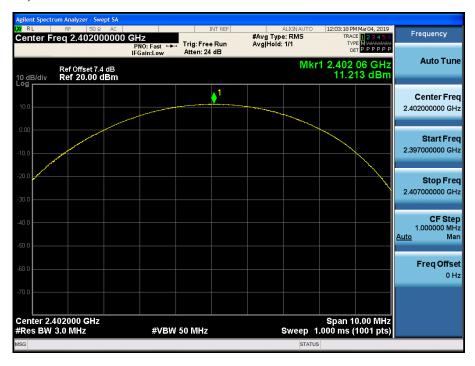




Test Plots (GFSK) Peak Power (CH.78)

Agilent Spectr	rum Analyzer - Swept SA					
	RF 50 Ω AC req 2.48000000) GHz PN0: East ↔→	INT REF	ALIGNAUT #Avg Type: RMS Avg Hold: 1/1	TRACE 1 2 3 4 5 6	Frequency
		IFGain:Low	Atten: 24 dB		TYPE MWWWWW DET PPPPP	
10 dB/div Log	Ref Offset 7.4 dB Ref 20.00 dBm			M	kr1 2.479 90 GHz 9.226 dBm	Auto Tune
			▲1			Center Freq
10.0						2.480000000 GHz
0.00						Start Fred
-10.0						2.475000000 GHz
-20.0						Stop Fred
-30.0						2.485000000 GHz
-40.0						CF Step
						1.000000 MH <u>Auto</u> Mar
-50.0						
-60.0						Freq Offse 0 Hi
-70.0						
Center 2.4 #Res BW	480000 GHz 3.0 MHz	#VBW	50 MHz	Sweep	Span 10.00 MHz 1.000 ms (1001 pts)	
MSG					ATUS	

Test Plots (8DPSK) Peak Power (CH.0)



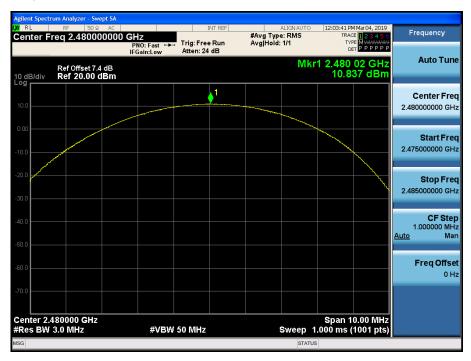


Test Plots (8DPSK)

Peak Power (CH.39)

X RL	rum Analyzer - Swi RF 50 Ω req 2.44100	AC 10000 GH P	1Z NO: Fast ↔ Gain:Low			#Avg Type Avg Hold:		TRAC	Mar 04, 2019 E 1 2 3 4 5 6 M M M M M M M M M	Frequency
10 dB/div	Ref Offset 7.4 Ref 20.00 d	dB	Sameow				Mkr	1 2.441 10.9	12 GHz 65 dBm	Auto Tune
10.0					↓ ¹					Center Fre 2.441000000 GH
-10.0										Start Fre 2.436000000 GH
-20.0										Stop Fre 2.446000000 GH
-40.0										CF Ste 1.000000 MH <u>Auto</u> Ma
60.0										Freq Offso 0 ⊦
70.0	441000 GHz							Snap 1	0.00 MHz	
#Res BW			#VBW	50 MHz			Sweep 1	.000 ms (1001 pts)	

Test Plots (8DPSK) Peak Power (CH.78)





Test Plots (π /4DQPSK)

Peak Power (CH.0)

Agilent Spectrum Analyzer - 5 V RL RF 50 Center Freq 2.402	DOOOOO GH2	Z D: Fast ↔→→ ain:Low	Trig: Free Atten: 24		#Avg Type Avg Hold:		TRAC	1 Mar 04, 2019 E <mark>1 2 3 4 5 6</mark> E M WWWWWW T P P P P P P P	Frequency
Ref Offset 10 dB/div Ref 20.00	7.4 dB					Mkr	1 2.402 11.0	16 GHz 15 dBm	Auto Tune
10.0				↓ ¹					Center Freq 2.402000000 GHz
-10.0									Start Freq 2.397000000 GHz
-20.0									Stop Fred 2.407000000 GHz
-40.0									CF Step 1.000000 MH; <u>Auto</u> Mar
-60.0									Freq Offse 0 H:
-70.0 Center 2.402000 GH	7						Snan 1	0.00 MHz	
#Res BW 3.0 MHz		#VBW 5	50 MHz		2	Sweep 1.	000 ms (1001 pts)	

Test Plots (π/4DQPSK) Peak Power (CH.39)





Test Plots ($\pi/4DQPSK$)

Peak Power (CH.78)

Agilent Spectr	r <mark>um Analyzer - Swe</mark> RF 50 ຊ			1	NT REF		ALIGN AUTO	12:03:06 PM	1 Mar 04, 2019	_
	req 2.48000	0000 GI	-Iz NO: Fast ↔			#Avg Type Avg Hold:	e: RMS	TRAC	E 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offset 7.4 Ref 20.00 d	IF dB	Gain:Low	Atten: 24	dB		Mkr	1 2.479	92 GHz 40 dBm	Auto Tune
10.0					1					Center Freq 2.480000000 GHz
-10.0										Start Freq 2.475000000 GHz
-20.0										Stop Fred 2.485000000 GHz
-40.0										CF Step 1.000000 MH <u>Auto</u> Mar
-50.0										Freq Offse
-70.0										
Center 2.4 #Res BW	480000 GHz 3.0 MHz		#VBW	50 MHz			Sweep 1	Span 1 .000 ms (0.00 MHz 1001 pts)	
MSG							STATUS	3		



10.2 BAND EDGES

Without hopping

Quiteida Fraguenov Dand	GFSK	8DPSK	π/4DQPSK	Limit
Outside Frequency Band	(dB)	(dB)	(dB)	(dBc)
Lower	56.225	55.940	56.286	20
Upper	67.089	65.738	65.434	20

With hopping

Outside Frequency Dand	GFSK	8DPSK	π/4DQPSK	Limit
Outside Frequency Band	(dB)	(dB)	(dB)	(dBc)
Lower	58.800	60.260	54.621	20
Upper	66.502	67.838	67.077	20

Note :

1. Spectrum reading values are not plot data.

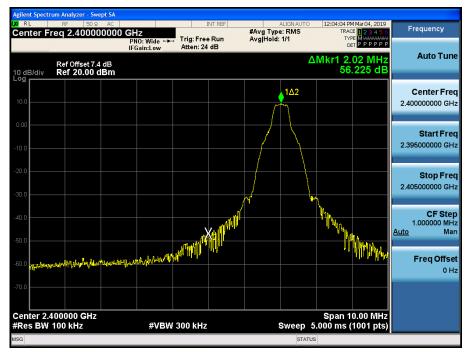
The power results in plot is already including the actual values of loss for the splitter and cable combination.

2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the splitter and cable combination is 7.36 dB at 2402 MHz and is 7.44 dB at 2480 MHz. So, 7.4 dB is offset.

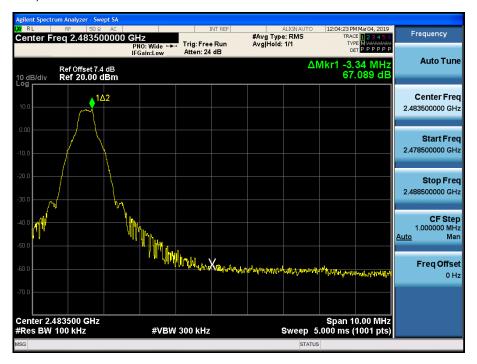


Test Plots without hopping (GFSK)

Band Edges (CH.0)



Test Plots without hopping (GFSK) Band Edges (CH.78)



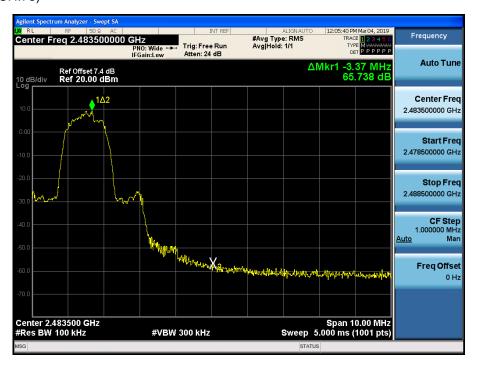


Test Plots without hopping (8DPSK)

Band Edges (CH.0)



Test Plots without hopping (8DPSK) Band Edges (CH.78)



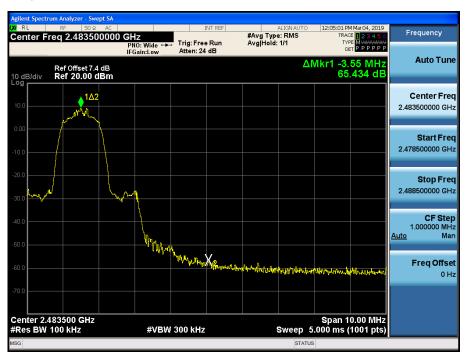


Test Plots without hopping (π /4DQPSK)

Band Edges (CH.0)



Test Plots without hopping (π /4DQPSK) Band Edges (CH.78)





Test Plots with hopping (GFSK)

Band Edges (CH.0)



Test Plots with hopping (GFSK) Band Edges (CH.78)



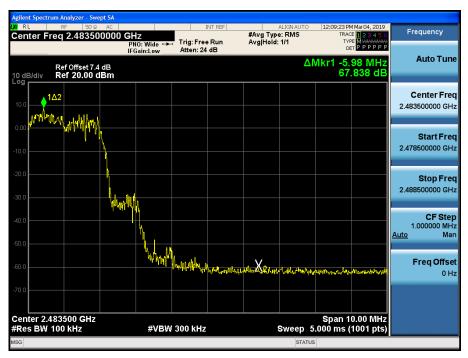


Test Plots with hopping (8DPSK)

Band Edges (CH.0)



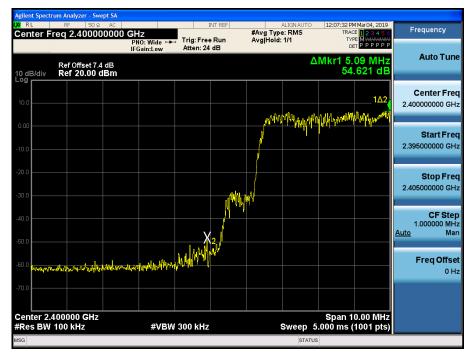
Test Plots with hopping (8DPSK) Band Edges (CH.78)





Test Plots with hopping (π /4DQPSK)

Band Edges (CH.0)



Test Plots with hopping (π /4DQPSK) Band Edges (CH.78)





10.3 FREQUENCY SEPARATION / OCCUPIED BANDWIDTH (99% BW)

99% BW (kHz)									
Channel	GFSK	8DPSK	π/4DQPSK						
CH.0	852.01	1184.6	1173.9						
CH.39	851.10	1178.6	1173.5						
CH.78	845.20	1185.1	1172.3						

20dB BW (kHz)									
Channel	GFSK	8DPSK	π/4DQPSK						
CH.0	950.6	1306	1311						
CH.39	945.9	1303	1292						
CH.78	951.3	1304	1312						

	Limit		
GFSK	8DPSK	(kHz)	
			>25 kHz
958	1028	1004	or
			>2/3 of the 20dB BW



FCC ID: A3LSMT725

Test Plots (GFSK)

Channel Separation

Agilent Spect											
Center F	RF		AC 10000 GH	7	II	NT REF	#Avg Ty	ALIGNAUTO		4 Mar 04, 2019 E 1 2 3 4 5 6	Frequency
Contor I	roq.	2.111100	PN	O: Wide ↔ ain:Low	Trig: Free #Atten: 20		AvgHold	4: 1/1	TYI Di	E MWWWWW PPPPP	
				ain:Luw	WALLETT. 20	40		A 1	1kr3 1.0		Auto Tune
10 dB/div		f Offset 7.4 f 17.40 c								353 dB	
Log 7.40		v			6	<u>1∆2</u>			3∆ 4		O un tran Energy
-2.60	~	~~~X2	n -		~~~~	<i>4</i> ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~	my		Center Freq 2.441000000 GHz
مهمیر ایرون	\checkmark		2	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~	~	m	and the second		mon	2.441000000 GH2
-22.6											
-32.6											Start Freq
-42.6											2.439500000 GHz
-52.6											
-62.6											Stop Freq
-72.6											2.442500000 GHz
Center 2 #Res BW				#VBW	/ 100 kHz			Sweep	Span 3 3.176 ms	.000 MHz (900 pts)	CF Step 300.000 kHz
MKR MODE 1			×		Y	FUNC	TION FL	INCTION WIDTH		IN VALUE	<u>Auto</u> Man
1 Δ2 2 F	1 f	(Δ)	95 2.440 021	8 kHz (Δ)	-0.264 d						
3 ∆4	1 f	(Δ)	1.044	1 MHz (Δ)	0.353 (dB					Freq Offset
4 =	1 f		2.440 978	GHz	6.422 dE	\$m				=	0 Hz
6											
8											
10											
11					ш					>	
MSG								STATU	3		
									8		

Test Plots (8DPSK) Channel Separation





Test Plots (π/4DQPSK)

Channel Separation

Agilent Spectr												
Center F	RF			7	I	NT REF	#Ava	ALIGN AUTO Type: RMS		M Mar 04, 2019 E 1 2 3 4 5 6	Fr	equency
Center F	eq	2.44100	Р	12 NO:Wide ↔ Gain:Low	Trig: Free #Atten: 20			old: 1/1	TY			
10 dB/div		f Offset 7.4 f 17.40 d						ΔN	1kr3 1.0 0	04 MHz .121 dB		Auto Tune
-2.60	\sim	Xem	m	·····		1∆2 \4			<u></u> 3∆4 √^^	~~~~~		enter Freq 1000000 GHz
-22.6 -32.6 -42.6											2.439	Start Freq 9500000 GHz
-52.6 -62.6 -72.6											2.442	Stop Freq 2500000 GHz
Center 2. #Res BW				#VBV	V 100 kHz			Sweep	Span 3 3.176 ms	.000 MHz (900 pts)		CF Step 300.000 kHz
MKR MODE TH		(Δ)		5 MHz (Δ)	Y 1.581 (NCTION	FUNCTION WIDTH	FUNCTIO	ON VALUE	<u>Auto</u>	Man
2 F 1 3 Δ4 1 4 F 1 5		(Δ)	2.439 84 1.00 2.440 99	14 MHz (Δ)	4.891 dE 0.121 d 6.472 dE	dB				=	i	F req Offset 0 Hz
6 7 8 9 10												
11					ш					>		
MSG								STATUS	5			



Test Plots (GFSK)

20 dB Bandwidth & Occupied Bandwidth (CH.0)



Test Plots (GFSK) 20 dB Bandwidth & Occupied Bandwidth (CH.39)





FCC ID: A3LSMT725

Test Plots (GFSK)

20 dB Bandwidth & Occupied Bandwidth (CH.78)



Test Plots (8DPSK) 20 dB Bandwidth & Occupied Bandwidth (CH.0)





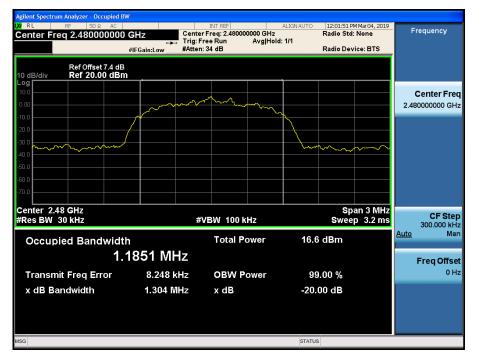
Test Plots (8DPSK)

20 dB Bandwidth & Occupied Bandwidth (CH.39)



Test Plots (8DPSK)

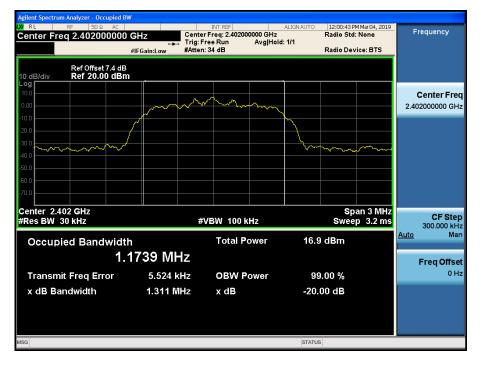
20 dB Bandwidth & Occupied Bandwidth (CH.78)





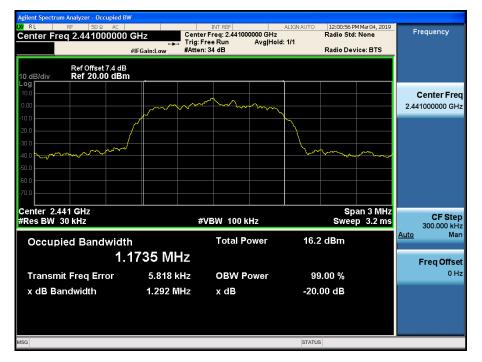
Test Plots (π /4DQPSK)

20 dB Bandwidth & Occupied Bandwidth (CH.0)



Test Plots (π/4DQPSK)

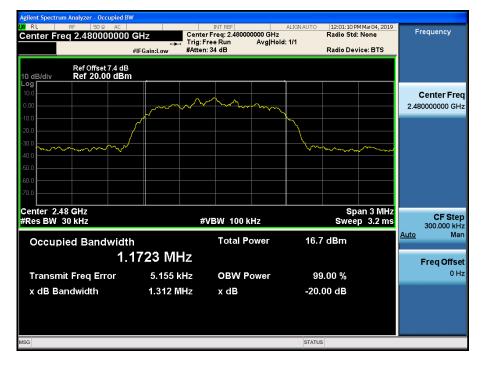
20 dB Bandwidth & Occupied Bandwidth (CH.39)





Test Plots (π /4DQPSK)

20 dB Bandwidth & Occupied Bandwidth (CH.78)





10.4 NUMBER OF HOPPING FREQUENCY

GFSK	8DPSK	π/4DQPSK	Limit
79	79	79	>15

Note :

In case of AFH mode, minimum number of hopping channels is 20.



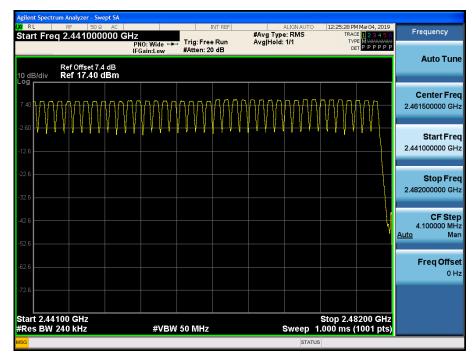
Test Plots (GFSK)

Number of Channels (2.4 GHz - 2.441 GHz)

RL	trum Analyzer - Swept S RF 50 ฉ Ar eq 2.400000000) GHz	INT REF	ALIGN AUTO #Avg Type: RMS Avg Hold: 1/1	12:24:53 PM Mar 04, 2019 TRACE 123456	Frequency
10 dB/div	Ref Offset 7.4 dB Ref 17.40 dBn		#Atten: 20 dB			Auto Tun
-og 7.40						Center Fre 2.420500000 GH
2.60	<u> </u>		<u> </u>		· · · · · · · · · · · · · · · · · · ·	Start Fre 2.400000000 G⊦
32.6						Stop Fre 2.441000000 GF
12.6 52.6						CF Ste 4.100000 MH <u>Auto</u> Ma
72.6						Freq Offs 0 H
itart 2.4	0000 GHz / 240 kHz	#VBM	240 kHz	Sweep 1	Stop 2.44100 GHz .000 ms (1001 pts)	
5G				STATUS		

Test Plots (GFSK)

Number of Channels (2.441 GHz - 2.4835 GHz)





Test Plots (8DPSK)

Number of Channels (2.4 GHz - 2.441 GHz)

Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Start Freq 2.400000000	GHz	#Avg Type	RMS TRAC	1 Mar 04, 2019 E 1 2 3 4 5 6 Frequ	ency
Ref Offset 7.4 dB	PNO: Wide Trig: Free IFGain:Low #Atten: 20		DE	TPPPPP	to Tune
7.40	$\gamma^{a_{b}}$	ᠬᢦ᠕ᡊᡎᡬ᠕ᢛ᠋ᢩᢣᡷᡃᡟ	ᢞ᠋ᡙᡐ᠋ᠰᠰᡀᡔᢩ		ter Freq 0000 GHz
-2.60				St 2.400000	art Fred
-22.6				St 2.441000	op Free 0000 GH
-42.6					CF Stej 0000 MH Mai
-62.6				Fre	q Offse 0 Hi
-72.6 Start 2.40000 GHz #Res BW 240 kHz	#VBW 240 kHz		Stop 2.44 Sweep 1.000 ms (100 GHz	
MSG	#VDW 240 KH2		status		

Test Plots (8DPSK)

Number of Channels (2.441 GHz - 2.4835 GHz)

Agilent Spectrum Analyzer - Swept SA				
RL RF 50 Q AC Start Freq 2.441000000 GH		#Avg Type: RMS	TRACE 1 2 3 4 5 6	Frequency
Ref Offset 7.4 dB 10 dB/div Ref 17.40 dBm	PNO: Wide ↔ Trig: Free Ru IFGain:Low #Atten: 20 dE			Auto Tune
- 09 7.40	ᢣᢛᢦᡊᠽ᠆ᡎ᠇ᠯᡊᢦᢛᡆᠵᢘᠲᡊ	ᡊᢇᡊᡀᡗᡊᡊᡘ		Center Fred 2.461500000 GHz
-2.60				Start Fred 2.441000000 GH:
32.6			Уц	Stop Free 2.482000000 GH:
-42.6				CF Ste 4.100000 MH <u>Auto</u> Ma
-62.6				Freq Offse 0 H
726 Start 2.44100 GHz			Stop 2.48200 GHz	
#Res BW 240 kHz	#VBW 50 MHz	Sweep	1.000 ms (1001 pts)	



Test Plots (π/4DQPSK)

Number of Channels (2.4 GHz - 2.441 GHz)

agilent Spectrum Analyzer - Sw 0 RL RF Soc Start Freq 2.400000	2 AC	INT REF	ALIGNAUTO #Avg Type: RMS Avg Hold: 1/1	12:26:05 PM Mar 04, 2019 TRACE 123456 TYPE MWWWWW	Frequency
Ref Offset 7.	IFGain:Low	#Atten: 20 dB	<u> </u>	DETPPPPP	Auto Tune
- og 7.40	ᡗ᠇᠆ᠠᢉ᠊ᢦᠰᡀᡀᠰᡇᠰᠢᠰ	ᡃᡟᡊ᠇ᢌ᠕ᡁᡊᠺ᠋ᢅᡎᡨᡐᠬᡇ᠆	ᡃᢧ᠆ᢅᢦᠠᡗᢞ᠋ᢩ᠕ᠰᢦᠰᢧᠬᡁᠰᠧ᠕	ᢞᡃᠾᠰᡎᠺ᠕ᢩᠰᡭ᠕᠕᠆ᡁ	Center Fred 2.420500000 GHz
12.6					Start Fred 2.400000000 GH
32.6					Stop Free 2.441000000 GH
42.6 52.6					CF Ste 4.100000 MH <u>Auto</u> Ma
62.6					Freq Offse 0 H
^{72.6} Start 2.40000 GHz ≉Res BW 240 kHz	#VBW	240 kHz	Sweep 1	Stop 2.44100 GHz .000 ms (1001 pts)	
SG			STATUS		

Test Plots (π/4DQPSK)

Number of Channels (2.441 GHz - 2.4835 GHz)

gilent Spect	trum Analyzer - Sw RF 50 Ω	ept SA AC			NT REF		ALIGN AUTO	12:26:40 PM	1 Mar 04, 2019	
	eq 2.441000	000 GHz	NO: Wide 🔸		Run	#Avg Type Avg Hold:	e: RMS	TRAC	E 1 2 3 4 5 6 E M WWWWWWW T P P P P P P	Frequency
10 dB/div	Ref Offset 7.4	4 dB	Gain:Low	#Atten: 20						Auto Tun
	᠉ᡄᠡᠰ᠋ᢆᠰᡧᡘ	ᢦᢦᠰᢦ᠆ᢩᠰ	᠋ᠬ᠕ᡥ᠋ᢩ᠕ᠰᡐᢁ	᠋ᢩᢂᢟᡎᡗᡃᡐᡐᢇ	ᢩᠰᡨᠰ ^ᡊ ᡇᠬ᠆ᡁᢁ	ᡟᠰ᠆ᡎᠰ	ᡘᡃ᠋ᠬ᠕ᢧᢉᡝ᠕	ᡝᡞᠰᠢ	vy	Center Fre 2.461500000 GH
12.60										Start Fre 2.441000000 G⊦
32.6									М	Stop Fre 2.482000000 GH
12.6										CF Ste 4.100000 Mi Auto Mi
52.6 52.6										Freq Offs
72.6										
	4100 GHz 240 kHz		#VBW	50 MHz				Stop 2.48 .000 ms (
sg							STATUS	1		



10.5 TIME OF OCCUPANCY (DWELL TIME)

	Channel	GFSK	8DPSK	π/4DQPSK
Pulse Time	Low	2.885	2.890	2.885
(ms)	Mid	2.885	2.890	2.890
	High	2.885	2.890	2.885

Non-AFH Mode

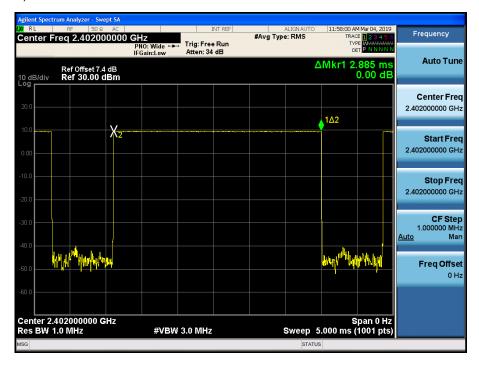
	Channel	GFSK	8DPSK	π/4DQPSK	Period Time (s)	Limit (ms)
Total of Dwell	Low	307.73	308.27	307.73	31.6	
(ms)	Mid	307.73	308.27	308.27	31.6	400
	High	307.73	308.27	307.73	31.6	

AFH Mode

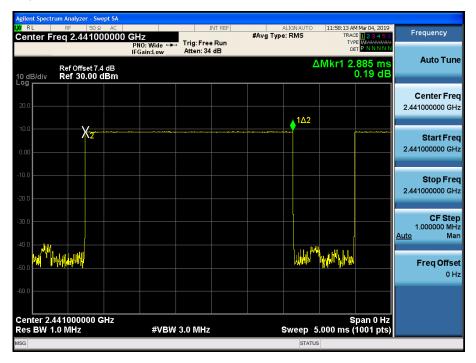
	Channel	GFSK	8DPSK	π/4DQPSK	Period Time (s)	Limit (ms)
Total of Dwell	Low	153.87	154.13	153.87	8.0	
(ms)	Mid	153.87	154.13	154.13	8.0	400
	High	153.87	154.13	153.87	8.0	



Test Plots (GFSK) Dwell Time (CH.0)



Test Plots (GFSK) Dwell Time (CH.39)

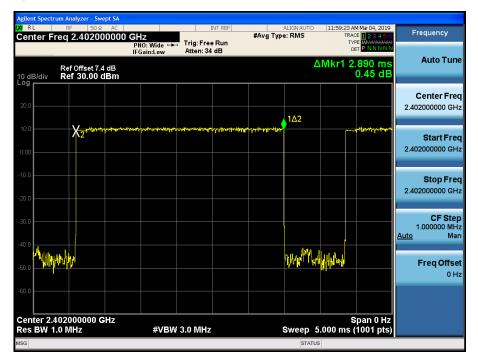




Test Plots (GFSK) Dwell Time (CH.78)



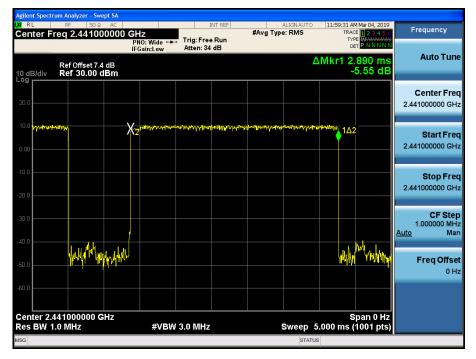
Test Plots (8DPSK) Dwell Time (CH.0)



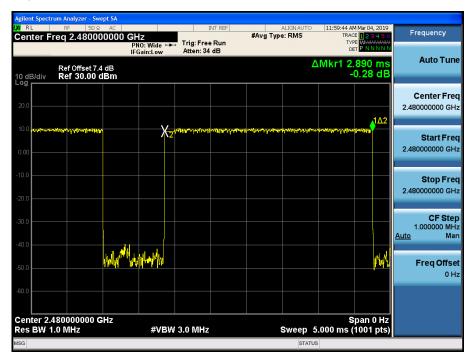


Test Plots (8DPSK)

Dwell Time (CH.39)



Test Plots (8DPSK) Dwell Time (CH.78)

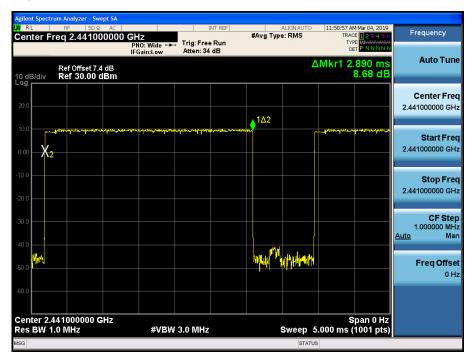




Test Plots (π/4DQPSK) Dwell Time (CH.0)



Test Plots (π/4DQPSK) Dwell Time (CH.39)





Test Plots (π /4DQPSK)

Dwell Time (CH.78)

LXI RL	rum Analyzer - Swept RF 50 Ω req 2.480000	AC 000 GHz PNO:	Wide 🔸			#Avg Type	ALIGN AUTO e: RMS	TRAC	M Mar 04, 2019 26 1 2 3 4 5 6 26 WAAAAAA 26 D N N N N N	Frequency
10 dB/div	Ref Offset 7.4 d Ref 30.00 dB	IFGair IB S m	n:Low	Atten: 34	ab		Δ	Mkr1 2.	885 ms 0.28 dB	Auto Tune
20.0						<u>↓</u> 1∆2				Center Fred 2.480000000 GHz
10.0 X	, 2 ^{4^m}	and and a second second	وي المراجب معروم	walation of the second s						Start Fred 2.480000000 GHz
-10.0										Stop Fred 2.480000000 GH;
-30.0										CF Step 1.000000 MH: <u>Auto</u> Mar
-50.0						Vinger Mr.	h,knirthpfyr			Freq Offse 0 H:
	480000000 GH	z						S	pan 0 Hz	
Res BW 1	I.O MIHZ		#VBW	3.0 MHz			Sweep 5. STATUS	.000 ms (1001 pts)	



10.6 SPURIOUS EMISSIONS

10.6.1 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.



Test Plots (8DPSK)- 30 MHz - 1 GHz Spurious Emission (CH.39)

•	Spectrum Analyz									
IXI RL Start	RF Freq 30.00	50Ω AC			INT REF	#Avg Typ	ALIGNAUTO e: RMS	TRAC	1 Mar 04, 2019 E 1 2 3 4 5 6	Frequency
			PNO: Fast IFGain:Low	Atten: 20		Avg Hold:	1/1	TYF	Е Милилии ТРРРРРР	
	D-600		II GUIILEON				M	kr1 872.	49 MHz	Auto Tune
10 dB/		set 7.4 dB 7 .40 dBm						-64.9	58 dBm	
									2	Center Freq
7.40										515.000000 MHz
-2.60										Start Freq
-12.6									-11.35 dBm	30.000000 MHz
-12.0										
-22.6										Stop Freq
										1.000000000 GHz
-32.6										
-42.6										CF Step
										97.000000 MHz <u>Auto</u> Man
-52.6										
								1		Freq Offset
-62.6 —			ومعادلة والمعادمة والمع	ليوسي المالي	hato - Lla		والمتعلقين ال	ili and ili and in differ	handa karilika wikila	0 Hz
-72.6	a international de la constitución de la constitución de la constitución de la constitución de la constitución La constitución de la constitución d	alara ara da	anda ang taong talah kang ta Kang tang tang talah kang ta	and the state of the second		and the second	a an an air an	numan an fire Life all	يتد از وأور المسافقة أ. هنانا	
	30.0 MHz							Stop 1.0	000 GHz	
	BW 100 kH	Z	#VE	3W 300 kHz		S		.33 ms (2	0000 pts)	
MSG							STATUS			

Test Plots (8DPSK)- 1 GHz – 3 GHz Spurious Emission (CH.39)

	um Analyzer - Swe							
	RF 50 Ω g 1.0000000		INT	TREF #Av	ALIGNAUTO g Type: RMS	12:28:11 PM Mar 0 TRACE	3456	Frequency
Start I Te	q 1.000000	PNO: Fast IFGain:Low		Run Avg	Hold: 1/1		WANNA	
10 dB/div	Ref Offset 7.4 Ref 17.40 c				Mkr	1 2.415 85 -62.133 c		Auto Tune
2.60					⊘ 2	-11	1.35 dBm	Center Freq 2.000000000 GHz
-22.6 -32.6 -42.6								Start Freq 1.000000000 GHz
-52.6 -62.6 -72.6			Land a fan fyfd Date fynest a ffi			n an ann ann ann ann an ann an ann ann		Stop Freq 3.000000000 GHz
Start 1.00 #Res BW	100 kHz	#V	BW 300 kHz	FUNCTION	Sweep 19	Stop 3.000 2.0 ms (4000 FUNCTION VAL	i pts)	CF Step 200.000000 MHz <u>Auto</u> Man
1 N 1 2 N 1 3 4 5 6 6 7 8 9 10 1		2.415 85 GHz 2.402 00 GHz	-62,133 dBn 8,650 dBn	n				Freq Offset 0 Hz
K MSG			ш		STATU	5	>	

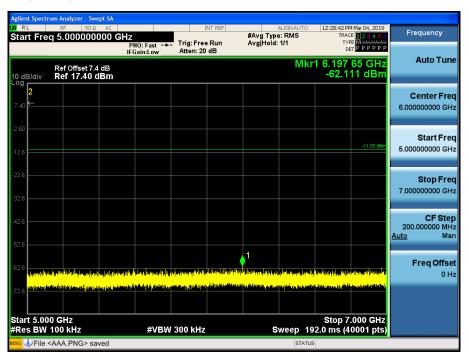


Test Plots(8DPSK)- 3 GHz - 5 GHz

Spurious Emission (CH.39)

URL	RF 50Ω 4	SA IC	INT REF	ALIGNAUTO	12:28:32 PM Mar 04, 2019	E
Start Fre	q 3.00000000	0 GHz PNO: Fast ← IFGain:Low	►. Trig: Free Run Atten: 20 dB	#Avg Type: RMS Avg Hold: 1/1	TRACE 123456 TYPE MMMMMM DET PPPPP	Frequency
I0 dB/div	Ref Offset 7.4 dE Ref 17.40 dB	3 m		Mkr	1 3.622 80 GHz -60.287 dBm	Auto Tun
-0 g 2 7.40 ←						Center Fre 4.000000000 GH
2.60					-11.35 dBm	Start Fre 3.000000000 G⊦
32.6						Stop Fre 5.000000000 G⊦
42.6						CF Ste 200.000000 MH <u>Auto</u> Ma
52.6	and the second secon	1	⁴⁹⁸ (karalase (kasedase)	kilishi salalah juga wasa sa ji ji kasal wasi	ling a tanang ng kasang si kasa da	Freq Offso 0 ⊦
	and the same to add the trace and the g	and a share of the second s	<mark>din (kanadara), jang kanalarang dinakanang kanalarang kanalarang kanalarang kanalarang kanalarang kanalarang ka Lang kanalarang kanalarang kanalarang kanalarang kanalarang kanalarang kanalarang kanalarang kanalarang kanalar</mark>	er bir van merke gezoen gezoen gezoen gezoen gezoen die bie die bie die bie bie bie bie bie bie bie bie bie b	n de (de la de la calacita de la cal	
Start 3.00 Res BW		#VB	W 300 kHz	Sweep 19	Stop 5.000 GHz 2.0 ms (40001 pts)	

Test Plots (8DPSK)- 5 GHz - 7 GHz Spurious Emission (CH.39)

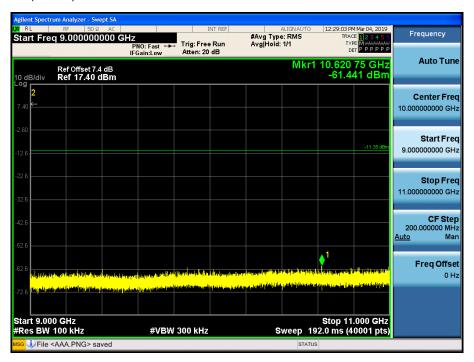




Test Plots(8DPSK)- 7 GHz - 9 GHz Spurious Emission (CH.39)

RL	RF 50 Ω			1	NT REF		ALIGNAUTO		Mar 04, 2019	Frequency
tart Fre	q 7.0000000	Р	NO: Fast ↔ Gain:Low	Trig: Free Atten: 20		#Avg Typ Avg Hold:		TYP	123456 M wwwww PPPPPP	Frequency
dB/div	Ref Offset 7.4 Ref 17.40 di						Mkr	1 7.486 -61.9	40 GHz 79 dBm	Auto Tur
2 .40 ←										Center Fre 8.000000000 GF
2.6									-11.35 dBm	Start Fre 7.000000000 GH
2.6										Stop Fre 9.000000000 GF
2.6										CF Ste 200.000000 Mi <u>Auto</u> Mi
2.6	a de la secta de la facta d									Freq Offs 0 I
2.6	o GHz	de Joseph de Nelles ja	a Marine Di Anton Marine.	al na a fail _d ha fan fan fan fan fan fan fan fan fan fa	ing na laisen fyrgen.			Stop 9.	000 GHz	
Res BW	100 kHz		#VBW	300 kHz		S	weep 19	2.0 ms (4	0001 pts)	

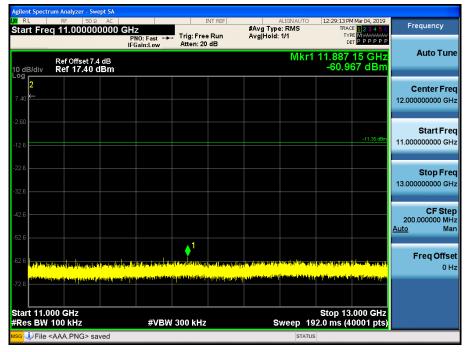
Test Plots(8DPSK)- 9 GHz - 11 GHz Spurious Emission (CH.39)



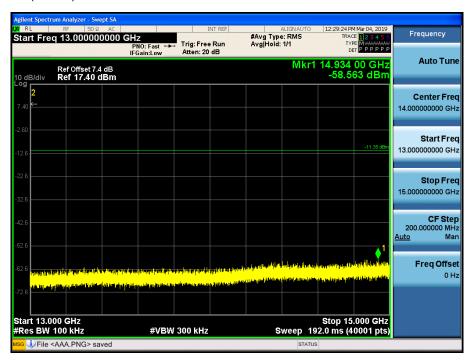


Test Plots(8DPSK) 11 GHz - 13 GHz

Spurious Emission (CH.39)



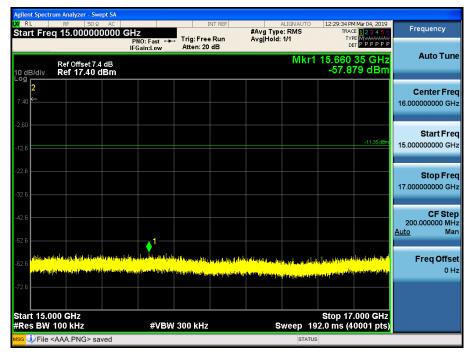
Test Plots (8DPSK)- 13 GHz – 15 GHz Spurious Emission (CH.39)



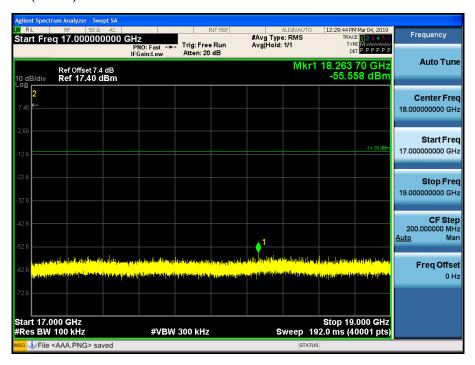


Test Plots(8DPSK)– 15 GHz - 17 GHz

Spurious Emission (CH.39)

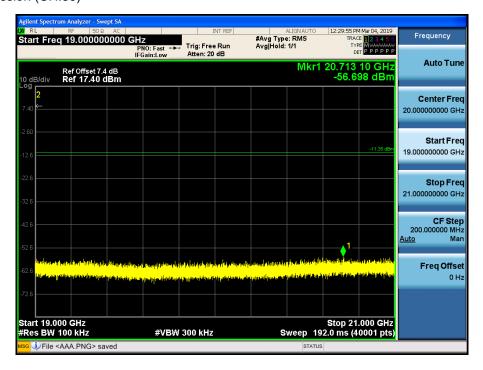


Test Plots(8DPSK)- 17 GHz - 19 GHz Spurious Emission (CH.39)

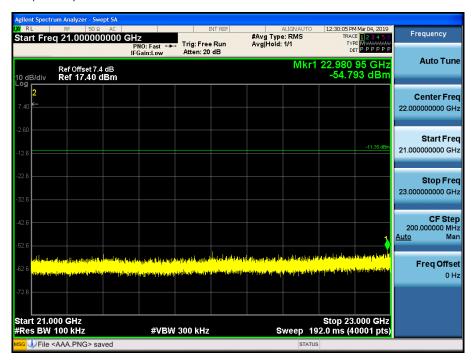




Test Plots (8DPSK)- 19 GHz - 21 GHz Spurious Emission (CH.39)



Test Plots (8DPSK)- 21 GHz - 23 GHz Spurious Emission (CH.39)





Test Plots (8DPSK)- 23 GHz - 25 GHz Spurious Emission (CH.39)

RL	RF 50 Ω	AC		1	INT REF		ALIGN AUTO		1 Mar 04, 2019	Frequency
Start Fre	q 23.00000	P	Z NO: Fast ↔ Gain:Low	- Trig: Free Atten: 20		#Avg Type Avg Hold:		TRAC TYP DE	E 123456 E MWWWWWW T P P P P P P	Frequency
0 dB/div	Ref Offset 7.4 Ref 17.40 d						Mkr1	24.899 -49.5	50 GHz 47 dBm	Auto Tun
.og 2 7.40 ←										Center Fre 24.000000000 GH
2.60									-11,35 dBm	Start Fre 23.000000000 G⊦
32.6										Stop Fre 25.000000000 G⊦
42.6 52.6	العقريقيل بل راجيل مريق أخف والم	In the other of					n . Nati an dikina	ana a pana ta pana ta pana	1 ••••••••••••••••••••••••••••••••••••	CF Ste 200.000000 MH <u>Auto</u> Ma
1994.44 52.6 <mark>(197-147</mark> 72.6	langshi yandi net kinadili. _{Ali} pata _{ing} gata <u>ning</u> a kina		de la place de la place de la constitución de la constitución de la constitución de la constitución de la const A blacementa de la constitución de l A blacementa de la constitución de	an a	ylaiseasi kantiisiin	in produktion and the	a na minina na mana na Na mana na mana n	alata ana ang ang ang ang ang ang ang ang an	n ni lý jagoskú troge	Freq Offs 0 F
Start 23.0	000 GHz 100 kHz		#VBW	/ 300 kHz		s	weep 19	Stop 25 2.0 ms (4	.000 GHz 0001 pts)	



10.6.2 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30MHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin	
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB	
No Critical peaks found								

Note:

1. The reading of emissions are attenuated more than 20 dB below the permissible

limits or the field strength is too small to be measured.

- 2. Distance extrapolation factor = 40*log (specific distance / test distance) (dB)
- 3. Limit line = specific Limits (dBuV) + Distance extrapolation factor
- 4. Radiated test is performed with hopping off.
- 5. 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)

Frequency Range : Below 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin		
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB		
No Critical peaks found									

Note:

- 1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
- 2. Radiated test is performed with hopping off.



FCC ID: A3LSMT725

Frequency Range : Above 1 GHz

Frequency	Reading	A.F + C.L - A.G + D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4804	49.74	1.83	V	51.57	73.98	22.41	PK
4804	35.48	1.83	V	37.31	53.98	16.67	AV
7206	48.21	9.65	V	57.86	73.98	16.12	PK
7206	35.92	9.65	V	45.57	53.98	8.41	AV
4804	50.80	1.83	Н	52.63	73.98	21.35	PK
4804	36.94	1.83	Н	38.77	53.98	15.21	AV
7206	49.87	9.65	Н	59.52	73.98	14.46	PK
7206	36.09	9.65	Н	45.74	53.98	8.24	AV

Operation Mode: CH Low(GFSK)

Operation Mode: CH Low(8DPSK)

Frequency [MHz]	Reading [dBuV]	A.F + C.L - A.G + D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4804	50.06	1.83	V	51.89	73.98	22.09	PK
4804	36.93	1.83	V	38.76	53.98	15.22	AV
7206	48.84	9.65	V	58.49	73.98	15.49	PK
7206	36.15	9.65	V	45.8	53.98	8.18	AV
4804	50.30	1.83	Н	52.13	73.98	21.85	PK
4804	36.98	1.83	Н	38.81	53.98	15.17	AV
7206	49.61	9.65	Н	59.26	73.98	14.72	PK
7206	36.19	9.65	Н	45.84	53.98	8.14	AV

Operation Mode: CH Low(π/4DQPSK)

Frequency	Reading	A.F + C.L - A.G + D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4804	50.35	1.83	V	52.18	73.98	21.80	PK
4804	36.74	1.83	V	38.57	53.98	15.41	AV
7206	49.83	9.65	V	59.48	73.98	14.50	PK
7206	36.13	9.65	V	45.78	53.98	8.20	AV
4804	50.58	1.83	Н	52.41	73.98	21.57	PK
4804	37.08	1.83	Н	38.91	53.98	15.07	AV
7206	50.07	9.65	Н	59.72	73.98	14.26	PK
7206	36.18	9.65	Н	45.83	53.98	8.15	AV



Operation Mode: CH Mid(GFSK)

Frequency [MHz]	Reading [dBuV]	A.F + C.L - A.G + D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4882	50.34	2.31	V	52.65	73.98	21.33	PK
4882	36.58	2.31	V	38.89	53.98	15.09	AV
7323	49.12	9.96	V	59.08	73.98	14.90	PK
7323	36.14	9.96	V	46.1	53.98	7.88	AV
4882	51.52	2.31	Н	53.83	73.98	20.15	PK
4882	36.74	2.31	н	39.05	53.98	14.93	AV
7323	50.45	9.96	н	60.41	73.98	13.57	PK
7323	36.34	9.96	Н	46.3	53.98	7.68	AV

Operation Mode: CH Mid(8DPSK)

Frequency	Reading	A.F + C.L - A.G + D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4882	49.83	2.31	V	52.14	73.98	21.84	PK
4882	36.60	2.31	V	38.91	53.98	15.07	AV
7323	49.98	9.96	V	59.94	73.98	14.04	PK
7323	35.62	9.96	V	45.58	53.98	8.40	AV
4882	50.12	2.31	Н	52.43	73.98	21.55	PK
4882	36.65	2.31	Н	38.96	53.98	15.02	AV
7323	50.22	9.96	Н	60.18	73.98	13.80	PK
7323	36.34	9.96	Н	46.3	53.98	7.68	AV

Operation Mode: CH Mid(π /4DQPSK)

Frequency [MHz]	Reading [dBuV]	A.F + C.L - A.G + D.F	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
		[dB]					
4882	49.39	2.31	V	51.7	73.98	22.28	PK
4882	36.61	2.31	V	38.92	53.98	15.06	AV
7323	49.34	9.96	V	59.3	73.98	14.68	PK
7323	36.05	9.96	V	46.01	53.98	7.97	AV
4882	50.48	2.31	Н	52.79	73.98	21.19	PK
4882	36.72	2.31	Н	39.03	53.98	14.95	AV
7323	50.55	9.96	Н	60.51	73.98	13.47	PK
7323	36.20	9.96	Н	46.16	53.98	7.82	AV



Operation Mode: CH High(GFSK)

Frequency [MHz]	Reading [dBuV]	A.F + C.L - A.G + D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	50.27	2.26	V	52.53	73.98	21.45	PK
4960	35.81	2.26	V	38.07	53.98	15.91	AV
7440	49.38	9.78	V	59.16	73.98	14.82	PK
7440	35.62	9.78	V	45.4	53.98	8.58	AV
4960	50.55	2.26	Н	52.81	73.98	21.17	PK
4960	36.95	2.26	н	39.21	53.98	14.77	AV
7440	50.05	9.78	Н	59.83	73.98	14.15	PK
7440	35.81	9.78	Н	45.59	53.98	8.39	AV

Operation Mode: CH High(8DPSK)

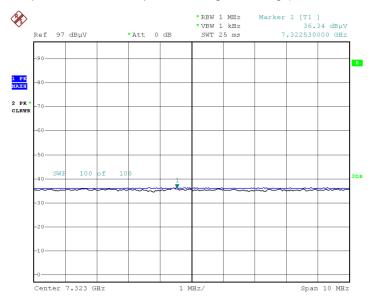
Frequency	Reading	A.F + C.L - A.G + D.F	Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4960	49.76	2.26	V	52.02	73.98	21.96	PK
4960	36.71	2.26	V	38.97	53.98	15.01	AV
7440	48.58	9.78	V	58.36	73.98	15.62	PK
7440	35.67	9.78	V	45.45	53.98	8.53	AV
4960	50.76	2.26	Н	53.02	73.98	20.96	PK
4960	37.01	2.26	Н	39.27	53.98	14.71	AV
7440	49.13	9.78	Н	58.91	73.98	15.07	PK
7440	35.68	9.78	Н	45.46	53.98	8.52	AV

Operation Mode: CH High (π /4DQPSK)

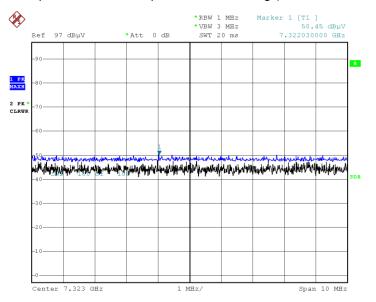
Frequency [MHz]	Reading [dBuV]	A.F + C.L - A.G + D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4960	50.51	2.26	V	52.77	73.98	21.21	PK
4960	36.68	2.26	V	38.94	53.98	15.04	AV
7440	49.40	9.78	V	59.18	73.98	14.80	PK
7440	35.61	9.78	V	45.39	53.98	8.59	AV
4960	50.72	2.26	Н	52.98	73.98	21.00	PK
4960	36.79	2.26	Н	39.05	53.98	14.93	AV
7440	49.72	9.78	Н	59.5	73.98	14.48	PK
7440	35.66	9.78	Н	45.44	53.98	8.54	AV



RESULT PLOTS (Worst case : H)



Radiated Spurious Emissions plot – Average Reading (GFSK, Ch.39 3rd Harmonic)



Radiated Spurious Emissions plot - Peak Reading (GFSK, Ch.39 3rd Harmonic)

Date: 7.MAR.2019 15:20:29

Note:

Plot of worst case are only reported.

Date: 7.MAR.2019 15:22:45



10.6.3 RADIATED RESTRICTED BAND EDGES

Operation ModeNormal(GFSK)Operating Frequency2402 MHz, 2480 MHzChannel NoCH 0, CH 78

Frequency [MHz]	Reading [dBuV]	A.F + C.L + D.F [dB]	Pol. [H/V]	Duty Cycle Correction [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	53.95	0.85	H	0	54.80	73.98	19.18	PK
2390.0	53.95	0.85	H	-24.73	30.07	53.98	23.91	AV
2390.0	52.74	0.85	V	0	53.59	73.98	20.39	PK
2390.0	52.74	0.85	V	-24.73	28.86	53.98	25.12	AV
2483.5	64.05	1.13	Н	0	65.18	73.98	8.80	PK
2483.5	64.05	1.13	Н	-24.73	40.45	53.98	13.53	AV
2483.5	62.40	1.13	V	0	63.53	73.98	10.45	PK
2483.5	62.40	1.13	V	-24.73	38.80	53.98	15.18	AV

Operation Mode Operating Frequency Channel No EDR(8DPSK)

CH 0, CH 78

2402 MHz, 2480 MHz

Frequency [MHz]	Reading [dBuV]	A.F + C.L + D.F [dB]	Pol. [H/V]	Duty Cycle Correction [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	54.42	0.85	<u> , ,</u> Н	0	55.27	73.98	18.71	PK
2390.0	54.42	0.85	Н	-24.73	30.54	53.98	23.44	AV
2390.0	53.91	0.85	V	0	54.76	73.98	19.22	PK
2390.0	53.91	0.85	V	-24.73	30.03	53.98	23.95	AV
2483.5	65.73	1.13	Н	0	66.86	73.98	7.12	PK
2483.5	65.73	1.13	Н	-24.73	42.13	53.98	11.85	AV
2483.5	64.02	1.13	V	0	65.15	73.98	8.83	PK
2483.5	64.02	1.13	V	-24.73	40.42	53.98	13.56	AV



Operation Mode

 $EDR(\pi/4DQPSK)$

Operating Frequency

2402 MHz, 2480 MHz

Channel No

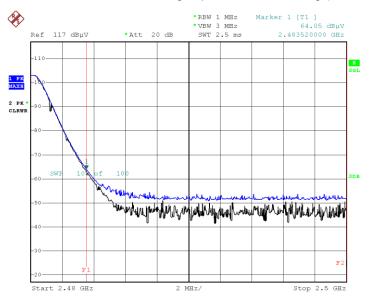
CH 0, CH 78

Frequency [MHz]	Reading [dBuV]	A.F + C.L + D.F [dB]	Pol. [H/V]	Duty Cycle Correction [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	54.21	0.85	Н	0	55.06	73.98	18.92	PK
2390.0	54.21	0.85	Н	-24.73	30.33	53.98	23.65	AV
2390.0	53.71	0.85	V	0	54.56	73.98	19.42	PK
2390.0	53.71	0.85	V	-24.73	29.83	53.98	24.15	AV
2483.5	65.86	1.13	Н	0	66.99	73.98	6.99	PK
2483.5	65.86	1.13	Н	-24.73	42.26	53.98	11.72	AV
2483.5	63.74	1.13	V	0	64.87	73.98	9.11	PK
2483.5	63.74	1.13	V	-24.73	40.14	53.98	13.84	AV

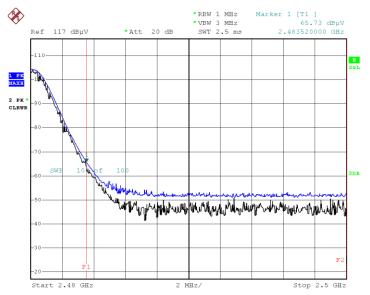


RESULT PLOTS (Worst case : H)

Radiated Restricted Band Edges plot – Peak Reading (GFSK, Ch.78)



Date: 7.MAR.2019 15:32:59

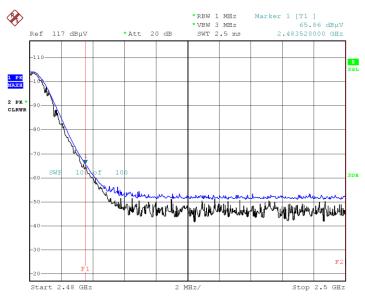


Radiated Restricted Band Edges plot - Peak Reading (8DPSK, Ch.78)

Date: 7.MAR.2019 15:39:52



Radiated Restricted Band Edges plot – Peak Reading (π /4DQPSK, Ch.78)



Date: 7.MAR.2019 15:38:10

Note:

Plot of worst case are only reported.



10.7 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

Test

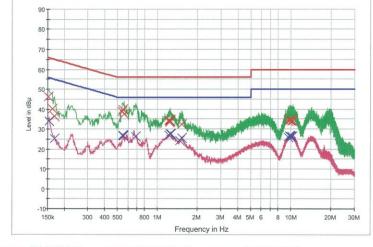
1/2

HCT TEST Report



EUT: Manufacturer: Test Site: Operating Conditions: SM-T725 SAMSUNG SHIELD ROOM BT MODE L1

FCC CLASS B_Exten Cable





Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	46.1	9.000	Off	L1	9.7	19.7	65.9
0.162000	40.0	9.000	Off	L1	9.7	25.3	65.4
0.168000	36.3	9.000	Off	L1	9.7	28.7	65.1
0.544000	38.9	9.000	Off	L1	9.8	17.1	56.0
0.552000	39.8	9.000	Off	L1	9.8	16.2	56.0
0.562000	37.5	9.000	Off	L1	9.8	18.5	56.0
1.216000	34.4	9.000	Off	L1	9.8	21.6	56.0
1.228000	33.3	9.000	Off	L1	9.8	22.7	56.0
1.234000	34.6	9.000	Off	L1	9.8	21.4	56.0
1.238000	34.0	9.000	Off	L1	9.9	22.0	56.0
1.246000	34.2	9.000	Off	L1	9.9	21.8	56.0
1.522000	32.5	9.000	Off	L1	9.9	23.5	56.0
9.526000	33.9	9.000	Off	L1	10.2	26.1	60.0
9.778000	34.4	9.000	Off	L1	10.2	25.6	60.0
9.840000	34.4	9.000	Off	L1	10.2	25.6	60.0
9.924000	34.6	9.000	Off	L1	10.2	25.4	60.0
10.080000	34.2	9.000	Off	L1	10.2	25.8	60.0
10.344000	33.9	9.000	Off	L1	10.2	26.1	60.0



Test

2/2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	34.0	9.000	Off	L1	9.7	21.8	55.8
0.168000	25.3	9.000	Off	L1	9.7	29.8	55.1
0.548000	26.7	9.000	Off	L1	9.8	19.3	46.0
0.552000	27.0	9.000	Off	L1	9.8	19.0	46.0
0.556000	26.5	9.000	Off	L1	9.8	19.5	46.0
0.684000	26.4	9.000	Off	L1	9.8	19.6	46.0
1.214000	26.8	9.000	Off	L1	9.8	19.2	46.0
1.246000	27.5	9.000	Off	L1	9.9	18.5	46.0
1.254000	27.6	9.000	Off	L1	9.9	18.4	46.0
1.262000	27.5	9.000	Off	L1	9.9	18.5	46.0
1.474000	24.3	9.000	Off	L1	9.9	21.7	46.0
1.522000	25.5	9.000	Off	L1	9.9	20.5	46.0
9.526000	25.9	9.000	Off	L1	10.2	24.1	50.0
9.778000	26.5	9.000	Off	L1	10.2	23.5	50.0
9.840000	26.4	9.000	Off	L1	10.2	23.6	50.0
9.924000	26.4	9.000	Off	L1	10.2	23.6	50.0
10.046000	26.4	9.000	Off	L1	10.2	23.6	50.0
10.202000	26.3	9.000	Off	L1	10.2	23.7	50.0



Conducted Emissions (Line 2)

Test

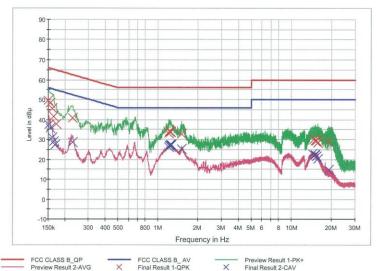
1/2

HCT TEST Report

Common Information

EUT: Manufacturer: Test Site: Operating Conditions: SM-T725 SAMSUNG SHIELD ROOM BT MODE N





Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	49.5	9.000	Off	N	9.8	16.5	66.0
0.156000	48.2	9.000	Off	N	9.8	17.4	65.7
0.160000	45.5	9.000	Off	N	9.8	19.9	65.5
0.164000	41.6	9.000	Off	N	9.8	23.7	65.3
0.172000	37.9	9.000	Off	N	9.8	27.0	64.9
0.228000	40.7	9.000	Off	N	9.9	21.8	62.5
1.204000	33.0	9.000	Off	N	10.0	23.0	56.0
1.212000	34.0	9.000	Off	N	10.0	22.0	56.0
1.234000	34.2	9.000	Off	N	10.0	21.8	56.0
1.238000	34.0	9.000	Off	N	10.0	22.0	56.0
1.250000	33.8	9.000	Off	N	10.0	22.2	56.0
1.504000	32.7	9.000	Off	N	10.1	23.3	56.0
14.650000	29.9	9.000	Off	N	10.7	30.1	60.0
15.006000	29.4	9.000	Off	N	10.7	30.6	60.0
15.216000	29.5	9.000	Off	N	10.7	30.5	60.0
15.328000	29.5	9.000	Off	N	10.7	30.5	60.0
15.744000	28.2	9.000	Off	N	10.7	31.8	60.0
19.022000	29.0	9.000	Off	N	10.8	31.0	60.0



Test

2/2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	37.3	9.000	Off	N	9.8	18.6	55.9
0.156000	35.9	9.000	Off	N	9.8	19.8	55.7
0.160000	31.1	9.000	Off	N	9.8	24.3	55.5
0.164000	28.9	9.000	Off	N	9.8	26.4	55.3
0.168000	27.4	9.000	Off	N	9.8	27.7	55.1
0.228000	28.7	9.000	Off	N	9.9	23.8	52.5
1.202000	26.3	9.000	Off	N	10.0	19.7	46.0
1.212000	26.9	9.000	Off	N	10.0	19.1	46.0
1.236000	27.4	9.000	Off	N	10.0	18.6	46.0
1.250000	27.5	9.000	Off	N	10.0	18.6	46.0
1.254000	27.3	9.000	Off	N	10.0	18.7	46.0
1.504000	25.4	9.000	Off	N	10.1	20.6	46.0
14.404000	23.0	9.000	Off	N	10.6	27.0	50.0
15.006000	22.4	9.000	Off	N	10.7	27.6	50.0
15.026000	22.3	9.000	Off	N	10.7	27.7	50.0
15.328000	21.6	9.000	Off	N	10.7	28.4	50.0
15.744000	20.1	9.000	Off	N	10.7	29.9	50.0
19.022000	14.8	9.000	Off	N	10.8	35.2	50.0



11 LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration	Calibration	Serial No.	
	••	Date	Interval		
Rohde & Schwarz	ENV216 / LISN	12/12/2018	Annual	102245	
Rohde & Schwarz	ESCI / Test Receiver	06/27/2018	Annual	100033	
ESPAC	SU-642 /Temperature Chamber	03/30/2018	Annual	0093008124	
Agilent	N9020A / Signal Analyzer	06/08/2018	Annual	MY51110085	
Agilent	N9030A / Signal Analyzer	11/20/2018	Annual	MY49431210	
Agilent	N1911A / Power Meter	04/16/2018	Annual	MY45100523	
Agilent	N1921A / Power Sensor	04/16/2018	Annual	MY52260025	
Agilent	87300B / Directional Coupler	11/20/2018	Annual	3116A03621	
Hewlett Packard	11667B / Power Splitter	06/07/2018	Annual	05001	
Hewlett Packard	E3632A / DC Power Supply	06/26/2018	Annual	KR75303960	
Agilent	8493C / Attenuator(10 dB)	07/10/2018	Annual	07560	
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A	
HCT CO., LTD.	FCC WLAN&BT&BLE Conducted Test Software	N1/A	N1/A	N1/A	
	v3.0	N/A	N/A	N/A	
Rohde & Schwarz	CBT / Bluetooth Tester	05/17/2018	Annual	100422	

Note:

- 1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
- 2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.



Radiated Test

		Calibration	Calibration		
Manufacturer	Model / Equipment	Date	Interval	Serial No.	
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p	
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A	
Audix	EM1000 / Controller	N/A	N/A	060520	
Audix	Turn Table	N/A	N/A	N/A	
Rohde & Schwarz	Loop Antenna	08/23/2018	Biennial	1513-175	
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760	
Schwarzbeck	VULB 9168 / Hybrid Antenna	08/09/2018	Annual	3368	
Schwarzbeck	BBHA 9120D / Horn Antenna	06/30/2017	Biennial	1300	
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541	
Rohde & Schwarz	FSP(9 kHz ~ 40 GHz) / Spectrum Analyzer	07/24/2018	Annual	100843	
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	01/03/2019	Annual	F6	
Wainwright Instruments	WHFX7.0/18G-8SS / High Pass Filter	05/09/2018	Annual	29	
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/29/2018	Annual	2	
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/03/2019	Annual	2	
Weinschel	2-3 / Attenuator (3 dB)	10/10/2018	Annual	BR0617	
H+S	5910-N-50-010 / Attenuator(10 dB)	11/08/2018	Annual	NONE	
CERNEX	CBLU1183540B-01 / Power Amplifier	12/21/2018	Annual	25540	
CERNEX	CBL06185030 / Power Amplifier	03/28/2018	Annual	28550	
CERNEX	CBL18265035 / Power Amplifier	01/03/2019	Annual	22966	
CERNEX	CBL26405040 / Power Amplifier	06/29/2018	Annual	25956	
TESCOM	TC-3000C / Bluetooth Tester	03/27/2018	Annual	3000C000276	

Note:

- 1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
- 2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.



12 ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-1903-FC027-P
2	HCT-RF-1903-FC028-P
3	HCT-RF-1903-FC029-P
4	HCT-RF-1903-FC030-P
5	HCT-RF-1903-FC031-P
6	HCT-RF-1903-FC032-P