

FCC LTE REPORT

Certification

Applicant Name:

SAMSUNG Electronics Co., Ltd.

Address:

129, Samsung-ro, Yeongtong-gu,

Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue: January 30, 2019 Location: HCT CO., LTD.,

74, Seoicheon-ro 578beon-gil, Majang-myeon,

Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA Report No.: HCT-RF-1901-FC023

FCC ID:

A3LSMM305F

APPLICANT: SAMSUNG Electronics Co., Ltd.

Model(s):	SM-M305M/DS
Additional Model(s):	SM-M305F/DS, SM-M305F, SM-M305M
EUT Type:	Mobile Phone
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§27, §2

Mode	Ty Frequency	Emission Designator		ERP	
(MHz)	Tx Frequency (MHz)		Modulation	Max. Power (W)	Max. Power (dBm)
LTE – Band13 (5) 779.5 –784.5	4M53G7D	QPSK	0.041	16.17	
	119.5 -104.5	4M53W7D	16QAM	0.030	14.77
LTE – Band13 (10)	782.0	9M04G7D	QPSK	0.041	16.11
LTL - Danu 15 (10)	102.0	9M03W7D	16QAM	0.030	14.80

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section §2.947. I assume full

responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

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





Report prepared by : Jae Ryang Do Engineer of Telecommunication Testing Center Report approved by : Jong Seok Lee Manager of Telecommunication Testing Center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1901-FC023	January 30, 2019	- First Approval Report

Report No.: HCT-RF-1901-FC023

CO.,LTD.

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name: S.	
	AMSUNG Electronics Co., Ltd.
Address: 12	29, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of
K	prea
FCC ID: A	3LSMM305F
Application Type: C	ertification
FCC Classification: P	CS Licensed Transmitter Held to Ear (PCE)
FCC Dute Dert(a):	
FCC Rule Part(s):	27, §2
EUT Type: M	obile Phone
Model(s): S	M-M305M/DS
Additional Model(s): S	M-M305F/DS, SM-M305F, SM-M305M
. ,	
Tx Frequency: 7	79.5 MHz –784.5 MHz (LTE – Band 13 (5MHz))
	32 MHz (LTE – Band 13 (10 MHz))
Date(s) of Tests: Ja	anuary 09, 2019 ~ January 25, 2019
	, ,



2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS and LTE. It also supports IEEE 802.11/ a/b/g/n/ac, Bluetooth, BT LE.

2.2. MEASURING 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, which is traceable to recognized national standards.

2.3. TEST FACILITY

The Fully-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.

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3
	- ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0
Dano Luge	- ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna	- KDB 971168 D01 v03r01 – Section 6.0
Terminal	- ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- N/A (See SAR Report)
	- KDB 971168 D01 v03r01 – Section 5.7
Peak- to- Average Ratio	- ANSI C63.26-2015 – Section 5.2.3.4
	- ANSI C63.26-2015 – Section 5.2.6(only GSM)
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8
Effective Isotropic Radiated Power	- ANSI C63.26-2015 – Section 5.2
	- ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2
	- ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 RADIATED POWER

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power"

measurement capability for signals with continuous operation.

- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW \ge 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points > 2 x span / RBW
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with

continuous operation.

- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize

Test Note

- 1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
- 2. A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

The power is calculated by the following formula;

 $P_{d(dBm)} = Pg_{(dBm)} - cable loss_{(dB)} + antenna gain_{(dB)}$

Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value.

These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

- 4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- 5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

3.3 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603-E-2016.

Test Settings

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW ≥ 3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points > 2 x span / RBW
- 5. Detector = Peak
- 6. Trace mode = Max Hold
- 7. The trace was allowed to stabilize
- 8. Test channel : Low/ Middle/ High
- 9. Frequency range : We are performed all frequency to 10th harmonics from 9 kHz.

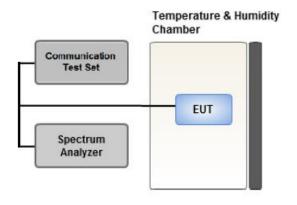
Test Note

- Measurements value show only up to 3 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.
- 2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.

The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data



3.4 OCCUPIED BANDWIDTH.



Test setup

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

The EUT makes a call to the communication simulator.

The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

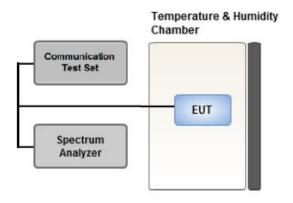
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

Test Settings

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW \ge 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within
 - 1-5% of the 99% occupied bandwidth observed in Step 7



3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

Test Overview

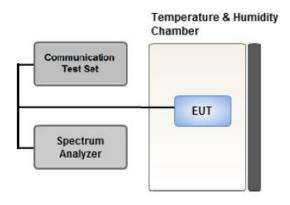
The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Settings

- 1. RBW = 1 MHz
- 2. VBW ≥ 3 MHz
- 3. Detector = RMS
- 4. Trace Mode = trace average
- 5. Sweep time = auto
- 6. Number of points in sweep ≥ 2 * Span / RBW



3.6 BAND EDGE



Test setup

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW > 1% of the emission bandwidth
- 4. VBW > $3 \times RBW$
- 5. Detector = RMS
- 6. Number of sweep points \geq 2 x Span/RBW
- 7. Trace mode = trace average
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

Test Notes

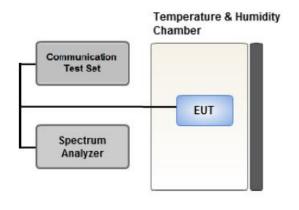
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.



3.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

1. Temperature:

The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

- 2. Primary Supply Voltage:
 - Unless otherwise specified, vary primary supply voltage from 85% to 115% of the nominal value for other than hand carried battery equipment.
 - .- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

Test Settings

- The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

3.8 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
- The worst case is reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data.
- Please refer to the table below.

[Worst case]						
Test Description	Modulation	RB size	RB offset	Axis		
Effective Isotropic Radiated Power	QPSK, 16QAM	1	0	х		
Radiated Spurious and Harmonic Emissions	QPSK	1	0	Z		

Note:

- SM-M305M/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-M305M/DS)



3.9 WORST CASE(CONDUCTED TEST)

- Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power. Conducted Output Power value can be confirmed on the SAR report.

[Worst case]						
Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset	
Occupied Bandwidth	QPSK, 16QAM	5, 10	Low, Mid, High	Full RB	0	
		5	Low	1	0	
	* QPSK		High	1	24	
Pond Edge		10	Low	1	0	
Band Edge		5, 10	High	1	49	
			Low,	Full RB	0	
			High		U	
Spurious and Harmonic Emissions at			Low,			
	* QPSK	5, 10	Mid,	1	0	
Antenna Terminal			High			

[Worst case]

Note:

- SM-M305M/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-M305M/DS)

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
REOHDE & SCHWARZ	SCU 18 / AMPLIFIER	10094	04/17/2018	Annual	04/17/2019
Wainwright	WHK1.2/15G-10EF/H.P.F	4	04/04/2018	Annual	04/04/2019
Wainwright	WHK3.3/18G-10EF/H.P.F	2	04/04/2018	Annual	04/04/2019
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	5001	06/07/2018	Annual	06/07/2019
Agilent	E3632A/DC Power Supply	KR75303243	05/09/2018	Annual	05/09/2019
Schwarzbeck	UHAP/ Dipole Antenna	557	03/31/2017	Biennial	03/31/2019
Schwarzbeck	UHAP/ Dipole Antenna	558	03/31/2017	Biennial	03/31/2019
ESPEC	SU-642 / Chamber	93000718	08/07/2018	Annual	08/07/2019
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	09/14/2018	Annual	09/14/2019
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	10/04/2018	Annual	10/04/2019
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/25/2017	Biennial	04/25/2019
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	04/25/2017	Biennial	04/25/2019
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY52090906	06/08/2018	Annual	06/08/2019
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/21/2018	Annual	06/21/2019
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/22/2018	Annual	10/22/2019
Agilent	8960 (E5515C)/ Base Station	MY48360800	09/27/2018	Annual	09/27/2019
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	08/23/2018	Biennial	08/23/2020
Schwarzbeck	VULB9160/ Bilog Antenna	9160-3368	08/09/2018	Biennial	08/09/2020
Schwarzbeck	VULB9160/ Hybrid Antenna	760	04/06/2017	Biennial	04/06/2019
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6201502997	08/13/2018	Annual	08/13/2019
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	02/08/2018	Annual	02/08/2019
REOHDE &	SMB100A/ SIGNAL GENERATOR	177633	07/19/2018	Annual	07/19/2019
SCHWARZ REOHDE & SCHWARZ	(100kHz~40GHz) ESU40 / EMI TEST RECEIVER	100524	07/27/2018	Annual	07/27/2019
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

Note:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

5. MEASUREMENT UNCERTAINTY

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

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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



6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §27.53(c)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§2.1046	N/A	See Note1
Frequency stability / variation of ambient temperature	§2.1055, § 27.54	Emission must remain in band	PASS

Note:

1. See SAR Report

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Effective Radiated Power	27.50(b)(10)	< 3 Watts max. ERP	PASS
Radiated Spurious and Harmonic	§2.1053,	< 43 + 10log10 (P[Watts]) for	PASS
Emissions	§27.53(g)	all out-of band emissions	
Undesirable Emissions in the 1559 – 1610 MHz band	2.1053, 27.53(f)	< -70dBW/MHz EIRP (wideband) < -80dBW EIRP (narrowband)	PASS

Note regarding all Emission Mask test plots:

The FCC limit is $65 + 10\log_{10}(P_{[Watts]}) = -35$ dBm in a 6.25 kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 10 kHz was used instead to show compliance. By using a 10 kHz bandwidth, the limit was adjusted by $10\log_{10}(10 \text{ kHz}/6.25 \text{ kHz}) = 2.04$ dB. Thus, the limit shown in all emission mask plots for all available modulation types was -35 dBm + 2.04 dB = -32.96 dBm.

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

Ch	./ Freq.	Measured Substitute		Ant. Gain	C.L	Pol.	ERP	
channel	Freq.(MHz)	Level(dBm)	Level(dBm)	Level(dBm) (dBd)		P0I.	w	dBm
128	824.20	-21.37	38.40	-10.61	0.95	Н	0.483	26.84

ERP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

- 1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
- 2) During the test, the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

7.2 EIRP Sample Calculation

Ch	./ Freq.	Measured	Substitute	Ant. Gain	C.L	Pol.	EIRP	
channel	Freq.(MHz)	Level(dBm)	Level(dBm)	vel(dBm) (dBi)		FUI.	w	dBm
20175	1,732.50	-15.75	18.45	9.90	1.76	Н	0.456	26.59

EIRP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

- 1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
- 2) During the test , the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.



7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW GSM BW = 249 kHz G = Phase Modulation X = Cases not otherwise covered W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W GSM BW = 249 kHz G = Phase Modulation 7 = Quantized/Digital Info W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W WCDMA BW = 4.17 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D LTE BW = 4.48 MHz G = Phase Modulation 7 = Quantized/Digital Info D = Data transmission; telemetry; telecommand

<u>16QAM Modulation</u> Emission Designator = 4M48W7D LTE BW = 4.48 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission; telemetry; telecommand



8. TEST DATA

8.1 EFFECTIVE RADIATED POWER

Freq	Mod	Modulation	Measured	Substitute	Ant.	C.L	Pol	Limit	EF	RP
(MHz)	(Bandwidth)		Level (dBm)	Level (dBm)	Gain(dBd)			W	W	dBm
779.5		QPSK	-31.42	27.32	-10.32	0.83	Н		0.041	16.17
779.5		16-QAM	-32.82	25.92	-10.32	0.83	Н		0.030	14.77
782.0	LTE B13	QPSK	-31.85	27.05	-10.33	0.83	Н	< 3.00	0.039	15.89
702.0	(5 MHz)	16-QAM	-33.23	25.67	-10.33	0.83	Н	< 3.00	0.028	14.51
701 E		QPSK	-32.28	26.88	-10.34	0.83	Н		0.037	15.72
784.5		16-QAM	-33.69	25.47	-10.34	0.83	Н		0.027	14.31

Freq	Mod	Modulation	Measured	Substitute	Ant.	C.L	C.L Pol	Limit	EF	RP
(MHz)	(Bandwidth)		Level (dBm)	Level (dBm)	Gain(dBd)			W	W	dBm
792.0	LTE B13	QPSK	-31.63	27.27	-10.33	0.83	Н	< 3.00	0.041	16.11
782.0	(10 MHz)	16-QAM	-32.94	25.96	-10.33	0.83	Н	< 3.00	0.030	14.80



8.2 RADIATED SPURIOUS EMISSIONS

OPERATING FREQUENTY:	<u>779.50 MHz</u>
MEASURED OUTPUT POWER:	<u>16.17 dBm = 0.041 W</u>
MODE:	LTE B13
MODULATION SIGNAL:	<u>5 MHz QPSK</u>
DISTANCE:	<u>3 meters</u>
LIMIT: 43 + 10 log10 (W) =	<u>29.17 dBc</u>

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
	1,559.0	-56.50	6.73	-64.85	1.23	Н	-61.50	77.67
23205 (779.5)	2,338.5	-57.36	7.87	-62.66	1.56	V	-58.50	74.67
(110.0)	3,118.0	-56.22	9.21	-60.81	1.83	V	-55.58	71.75
	1,564.0	-57.32	6.76	-65.80	1.23	V	-62.43	78.60
23230 (782.0)	2,346.0	-57.20	7.92	-62.50	1.55	н	-58.28	74.45
(102.0)	3,128.0	-56.23	9.21	-60.69	1.82	V	-55.45	71.62
	1,569.0	-57.13	6.78	-65.74	1.23	н	-62.34	78.51
23255 (784.5)	2,353.5	-56.26	7.97	-61.56	1.53	н	-57.27	73.44
(704.0)	3,138.0	-56.93	9.20	-61.50	1.84	V	-56.29	72.46



OPERATING FREQUENTY:	<u>782.00 MHz</u>
MEASURED OUTPUT POWER:	<u>16.11 dBm = 0.041 W</u>
MODE:	LTE B13
MODULATION SIGNAL:	<u>10 MHz QPSK</u>
DISTANCE:	<u>3 meters</u>
LIMIT: 43 + 10 log10 (W) =	<u>29.11 dBc</u>

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
	1,564.0	-56.52	6.76	-69.30	1.23	V	-61.63	77.73
23230 (782.0)	2,346.0	-56.52	7.92	-66.12	1.55	V	-57.60	73.71
(102.0)	3,128.0	-57.17	9.21	-65.93	1.82	V	-56.39	72.50



1559 MHz ~ 1610 MHz BAND

OPERATING FREQUENTY:	<u>779.5 MHz, 782.0 MHz, 784.5 MHz</u>
MEASURED OUTPUT POWER:	<u>5 MHz QPSK</u>
DISTANCE:	<u>3 meters</u>

WIDEBAND EMISSION LIMIT:

-70 dBW/ MHz (= -40 dBm/ MHz)

Operating Frequency (MHz)	Measured Frequency (MHz)	EMISSION TYPE	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
779.5	1577.14		-54.68	6.90	-63.16	1.24	н	-59.65	19.65
782.0	1560.48	WIDEBAND	-55.06	6.73	-63.41	1.23	н	-60.06	20.06
784.5	1577.36		-54.72	6.90	-63.20	1.24	Н	-59.69	19.69

OPERATING FREQUENTY: <u>782.0 MHz</u>

MEASURED OUTPUT POWER:

DISTANCE:

WIDEBAND EMISSION LIMIT:

<u>-70 dBW/ MHz (= -40 dBm/ MHz)</u>

Operating Frequency (MHz)	Measured Frequency (MHz)	EMISSION TYPE	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
782.0	1604.82	WIDEBAND	-55.33	7.14	-63.98	1.25	V	-60.24	20.24

10 MHz QPSK

3 meters



8.3 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
	5 MIL-		QPSK	25	0	4.5292
10	5 MHz	700.0	16-QAM	25	0	4.5312
13	10 MHz	782.0	QPSK	50	0	9.0423
			16-QAM	50	0	9.0253

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 31 ~ 34.



8.4 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
		779.5	3.7119	27.976	-66.946	-38.970	
40	5	782.0	3.6960	27.976	-67.386	-39.410	10.00
13		784.5	3.6905	27.976	-67.217	-39.241	-13.00
	10	782.0	3.6895	27.976	-67.172	-39.196	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 47 ~ 50.

2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0

3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)

4. Factor(dB) = Cable Loss + Attenuator + Power Splitter

Frequency Range (GHz)	Factor [dB]
0.03 – 1	25.270
1 – 5	27.976
5 – 10	28.591
10 – 15	29.116
15 – 20	29.489
Above 20	30.131

8.5 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 35 ~ 46.

8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

<u>LTE 13</u>

OPERATING FREQUENCY:

CHANNEL:

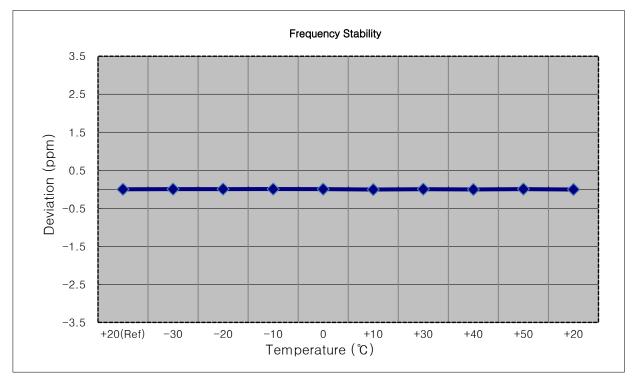
<u>779,500,000 Hz</u> <u>23205 (5 MHz)</u> <u>3.85 VDC</u>

REFERENCE VOLTAGE:

DEVIATION LIMIT:

Emission must remain in band

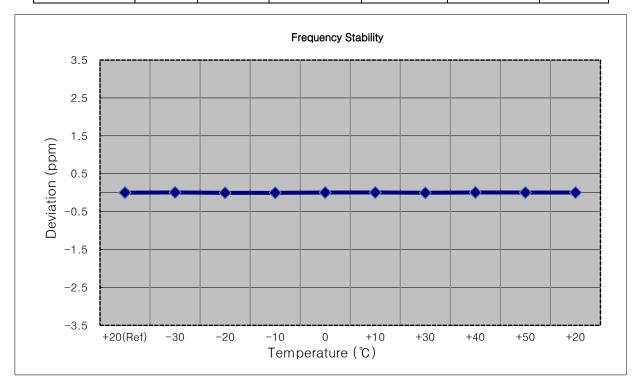
Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°°)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	779 499 996	0.00	0.000 000	0.0000
100%		-30	779 499 999	3.00	0.000 000	0.0038
100%	-	-20	779 500 000	3.90	0.000 001	0.0050
100%		-10	779 500 001	5.10	0.000 001	0.0065
100%	3.85	0	779 499 999	3.00	0.000 000	0.0038
100%		+10	779 499 991	-4.80	-0.000 001	-0.0062
100%		+30	779 499 999	2.50	0.000 000	0.0032
100%		+40	779 499 993	-3.60	0.000 000	-0.0046
100%		+50	779 500 000	3.60	0.000 000	0.0046
Batt. Endpoint	3.40	+20	779 499 992	-4.20	-0.000 001	-0.0054





MODE:	<u>LTE 13</u>
OPERATING FREQUENCY:	<u>782,000,000 Hz</u>
CHANNEL:	<u>23230 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.85 VDC</u>
DEVIATION LIMIT:	Emission must remain in band

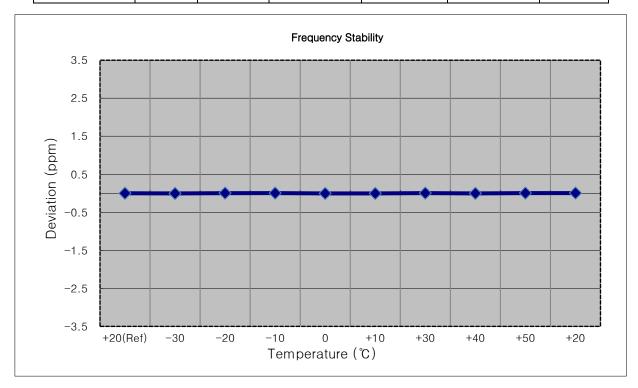
Voltage	Power	Temp.	Frequency	Frequency	Deviation		
(%)	(VDC)	(°°)	(Hz)	Error (Hz)	(%)	ppm	
100%		+20(Ref)	781 999 997	0.00	0.000 000	0.0000	
100%		-30	782 000 001	4.70	0.000 001	0.0060	
100%		-20	781 999 993	-3.20	0.000 000	-0.0041	
100%		-10	781 999 993	-3.60	0.000 000	-0.0046	
100%	3.85	0	781 999 999	2.50	0.000 000	0.0032	
100%		+10	782 000 001	4.30	0.000 001	0.0055	
100%		+30	781 999 994	-2.40	0.000 000	-0.0031	
100%		+40	782 000 001	4.50	0.000 001	0.0058	
100%		+50	781 999 999	2.20	0.000 000	0.0028	
Batt. Endpoint	3.40	+20	781 999 999	2.80	0.000 000	0.0036	





MODE:	LTE 13
OPERATING FREQUENCY:	<u>784,500,000 Hz</u>
CHANNEL:	<u>23255 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.85 VDC</u>
DEVIATION LIMIT:	Emission must remain in band

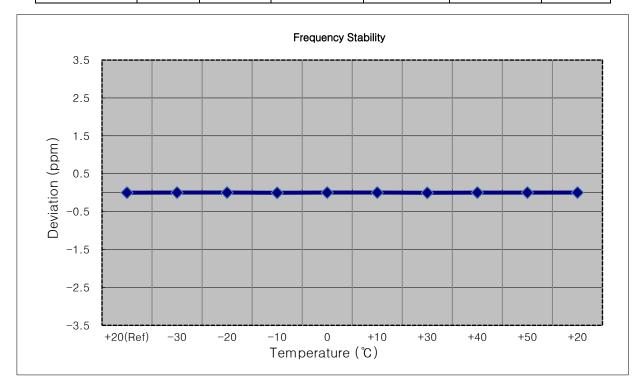
Voltage	Power	Temp.	Frequency	Frequency	Deviation		
(%)	(VDC)	(°°)	(Hz)	Error (Hz)	(%)	ppm	
100%		+20(Ref)	784 500 003	0.00	0.000 000	0.0000	
100%		-30	784 500 000	-3.70	0.000 000	-0.0047	
100%	-	-20	784 500 005	2.10	0.000 000	0.0027	
100%		-10	784 500 007	3.60	0.000 000	0.0046	
100%	3.85	0	784 500 000	-3.20	0.000 000	-0.0041	
100%		+10	784 500 000	-3.00	0.000 000	-0.0038	
100%		+30	784 500 006	3.10	0.000 000	0.0040	
100%		+40	784 500 001	-2.80	0.000 000	-0.0036	
100%		+50	784 500 006	3.10	0.000 000	0.0040	
Batt. Endpoint	3.40	+20	784 500 007	3.90	0.000 000	0.0050	





MODE:	<u>LTE 13</u>
OPERATING FREQUENCY:	<u>782,000,000 Hz</u>
CHANNEL:	<u>23230 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>3.85 VDC</u>
DEVIATION LIMIT:	Emission must remain in band

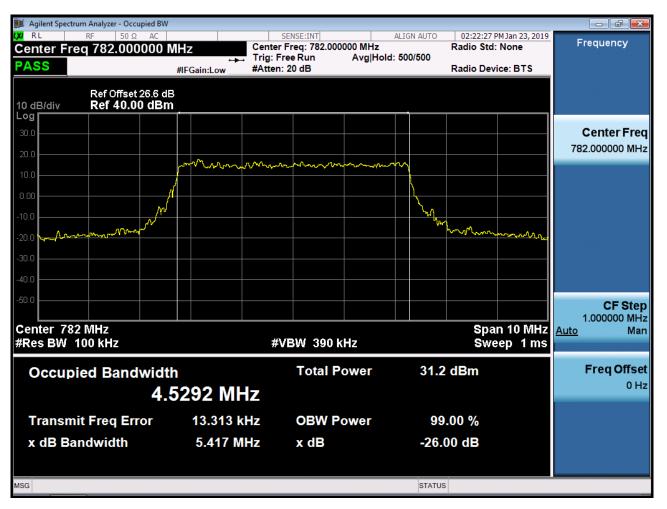
Voltage	Power	Temp.	Frequency	Frequency	Deviation		
(%)	(VDC)	(°°)	(Hz)	Error (Hz)	(%)	ppm	
100%		+20(Ref)	781 999 997	0.00	0.000 000	0.0000	
100%		-30	782 000 000	2.70	0.000 000	0.0035	
100%	-	-20	782 000 000	2.80	0.000 000	0.0036	
100%		-10	781 999 995	-2.50	0.000 000	-0.0032	
100%	3.85	0	782 000 000	2.90	0.000 000	0.0037	
100%		+10	782 000 000	2.60	0.000 000	0.0033	
100%		+30	781 999 995	-2.40	0.000 000	-0.0031	
100%		+40	781 999 999	1.50	0.000 000	0.0019	
100%		+50	781 999 999	1.50	0.000 000	0.0019	
Batt. Endpoint	3.40	+20	782 000 000	2.30	0.000 000	0.0029	





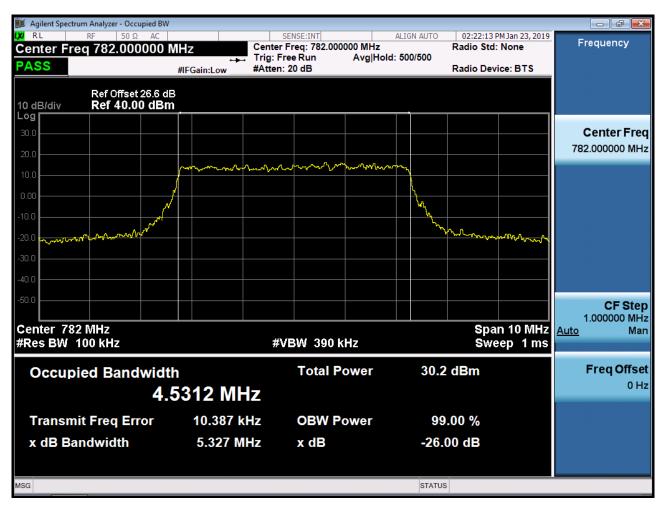
9. TEST PLOTS





BAND 13. Occupied Bandwidth Plot (Ch.23230 QPSK RB 25) 5 MHz





BAND 13. Occupied Bandwidth Plot (Ch.23230 16-QAM RB 25) 5 MHz



	um Analyzer - Occupie								
Center Fre	RF 50 Ω 2 q 782.0000					GN AUTO	02:28:29 F Radio Std: Radio Devi		Frequency
10 dB/div	Ref Offset 26 Ref 40.00								
30.0									Center Freq 782.000000 MHz
10.0		f harmon for the second	hartona	ᡔ᠕ᡃᡗᡘᠬ᠋᠆ᡔᢛᡃᡙ/ᡰᠢᢧ᠙ᡎᠴᠯᠵᡟ	᠆ᡊ᠇᠆ᡣ᠕ᡁᠰᢂᡔᠬ᠇ᡎᠬ	۸ ۱			
-10.0	a weat Planson	MAN .				h N	James and		
-20.0 -30.0	www.com.com.com								
-40.0									CF Step
Center 782 #Res BW 2			#V	/BW 820 kH	z		Spa Swe	n 20 MHz ep 1 ms	2.000000 MHz <u>Auto</u> Man
Occupi	ied Bandw	vidth 9.0423 M	Hz	Total Po	wer	31.1	dBm		Freq Offset 0 Hz
Transm	it Freq Erro	r 28.192	kHz	OBW Por	wer	99.	.00 %		
x dB Ba	ndwidth	10.46	MHz	x dB		-26.0	00 dB		
MSG						STATUS			

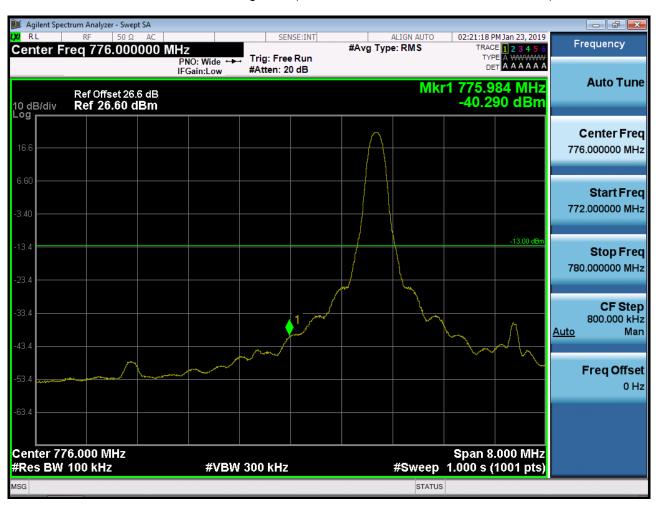
BAND 13. Occupied Bandwidth Plot (Ch.23230 QPSK RB 50) 10 MHz



	m Analyzer - Occupied BV	V						
(XI RL	RF 50 Ω AC q 782.000000	MU-	SENSE:INT Center Freq: 782.00	0000 MHz	ALIGN AUTO	02:28:15 PM Radio Std:	1 Jan 23, 2019	Frequency
PASS	q 782.00000		Trig: Free Run	Avg Hold	: 500/500			
PASS		#IFGain:Low	#Atten: 20 dB			Radio Devid	e: BTS	
10 dB/div	Ref Offset 26.6 d Ref 40.00 dB							
	Kei 40.00 ub							
30.0								Center Freq
20.0								782.000000 MHz
10.0		porthe the and the	whan telling the market	᠕ᢇ᠋ᠼ᠊ᢪᡰᡁᠬᡟᡖᠰᢑᠬᡗᠰᡅ	m V			
					l l			
0.00		M						
-10.0								
-20.0	La materia and the				- halle	www.hulennierg	Man when	
-30.0								
-40.0								
-50.0								CF Step
Center 782	MHz					Span	20 MHz	2.000000 MHz Auto Man
#Res BW 2			#VBW 820	kHz		Swee	ep 1 ms	
Occupi	ed Bandwid	th	Total I	Power	30.2	dBm		Freq Offset
9.0253 MHz							0 Hz	
Transmi	t Freq Error	32.577 k	Hz OBW F	Power	99	.00 %		
x dB Bar		10.57 M						
x dB Bar	lawiaun	10.57 M	Hz x dB		-20.0	00 dB		
MSG					STATUS			

BAND 13. Occupied Bandwidth Plot (Ch.23230 16-QAM RB 50) 10 MHz





Band 13 Lower Band Edge Plot (5M BW Ch.23205 QPSK_RB1 OFFSET_0)



	ectrum Analyzer - Swept SA						
K RL	RF 50 Ω AC Freq 776.000000		SENSE:INT	ALIGN #Avg Type: RN	IS TRAC	M Jan 23, 2019 E <mark>1 2 3 4 5 6</mark>	Frequency
Center		PNO: Wide +++ Tr	ig: Free Run .tten: 20 dB		TYP DE		
10 dB/div Log	Ref Offset 26.6 dB Ref 26.60 dBm				Mkr1 775.9 -29.5	84 MHz 94 dBm	Auto Tune
16.6							Center Freq 776.000000 MHz
-3.40							Start Freq 772.000000 MHz
-13.4						-13.00 dBm	Stop Freq 780.000000 MHz
-33.4							CF Step 800.000 kHz <u>Auto</u> Man
-43.4							Freq Offset 0 Hz
-63.4	76.000 MHz				Snap 9	000 MHz	
	V 100 kHz	#VBW 30	0 kHz	#Sv	Span 8. veep 1.000 s (1001 pts)	
MSG					STATUS		

Band 13 Lower Band Edge Plot (5M BW Ch.23205 QPSK_RB_25)



📕 Agilent Spectrum Analyzer - Swept SA RL ALIGN AUTO 02:20:54 PM Jan 23, 2019 SENSE:INT Frequency TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A Center Freq 769.000000 MHz #Avg Type: RMS Trig: Free Run PNO: Wide ↔→ IFGain:Low #Atten: 20 dB Auto Tune Mkr1 774.988 MHz Ref Offset 26.6 dB Ref -10.00 dBm -41.844 dBm 10 dB/div Log **Center Freq** 769.000000 MHz -32.96 dB Start Freq 763.000000 MHz Stop Freq مار بوسیر اوار 775.000000 MHz **CF** Step 1.200000 MHz <u>Auto</u> Man **Freq Offset** 0 Hz Start 763.000 MHz #Res BW 10 kHz Stop 775.000 MHz #VBW 30 kHz #Sweep 1.000 s (1001 pts) MSG STATUS

Band 13 Lower Emission Mask (763 MHz ~ 775 MHz) Plot (5M BW Ch.23205 QPSK_RB25_0)



Agilent Spee	ctrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT		ALIGN AUTO	02:27:51	M Jan 23, 2019	
	req 776.000000	PNO: Wide +++ Trig	g: Free Run ten: 20 dB	#Avg Typ		TRAC	E 1 2 3 4 5 6 E A WWWW T A A A A A A	Frequency
) dB/div	Ref Offset 26.6 dB Ref 26.60 dBm				Mki	r1 775.9 -46.5	52 MHz 33 dBm	Auto Tu
6.6 								Center Fr 776.000000 M
40								Start Fr 772.000000 M
3.4							-13.00 dBm	Stop Fr 780.000000 M
.4			1					CF St 800.000 k <u>Auto</u> N
.4							RMS	Freq Offs 0
enter 77	/6.000 MHz					Span 8	.000 MHz	
es BW	100 kHz	#VBW 300	kHz		#Sweep	1.000 s (.000 MHz 1001 pts)	

Band 13 Lower Band Edge Plot (10M BW Ch.23230 QPSK_RB1 OFFSET_0)



enter ZZ	76.000 MHz					Span 8.000 M 1.000 s (1001 p	1Hz
63.4							
53.4							0 H
							FreqOffse
I3.4	and and an						Auto Ma
3.4		man and a star of the star of the star					CF Ste
3.4			1				780.000000 MH
3.4						-13.00	Stop Fre
.40							772.000000 MH
5.60 				(,		Start Fre
							770.000000 MIT
16.6							Center Fre 776.000000 MH
0 dB/div og r	Ref Offset 26.6 dB Ref 26.60 dBm				Mkr	1 775.952 M -28.782 dE	Hz Auto Tun Bm
		PNO: Wide ++ IFGain:Low	Trig: Free Run #Atten: 20 dB				
RL	RF 50 Ω AC	MHz	SENSE:INT	#Avg Typ	ALIGN AUTO e: RMS	02:27:07 PM Jan 23, TRACE 1 2 3	

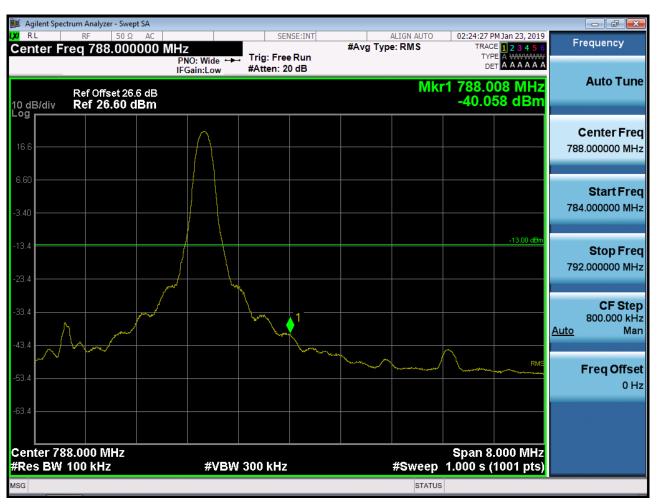
BAND 13. Lower & Upper Band Edge Plot (10M BW Ch.23230 QPSK RB_50)



Band 13 Lower Emission Mask (763 MHz ~ 775 MHz) Plot (10M BW Ch.23230 QPSK_RB50_0)







Band 13 Upper Band Edge Plot (5M BW Ch.23255 QPSK_RB1_Offset 24)



	ctrum Analyzer - Swept SA					
X RL Center F	RF 50 Ω AC req 788.000000	MHz PNO: Wide ↔ IFGain:Low	SENSE:INT Trig: Free Run #Atten: 20 dB	ALIGN AUTO #Avg Type: RMS	02:23:40 PM Jan 23, 2019 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	Frequency
I0 dB/div	Ref Offset 26.6 dB Ref 26.60 dBm			Mk	1 788.072 MHz -26.823 dBm	Auto Tune
16.6						Center Fred 788.000000 MHz
6.60 3.40 						Start Free 784.000000 MH:
23.4			1		-13.00 dBm	Stop Free 792.000000 MH
13.4					RMS	CF Ste j 800.000 kH <u>Auto</u> Ma
i3.4						Freq Offse 0 H
	88.000 MHz				Span 8.000 MHz	
Res BW	100 kHz	#VBW	300 kHz	#Sweep	1.000 s (1001 pts)	

Band 13 Upper Band Edge Plot (5M BW Ch.23255 QPSK_RB_25)



Band 13 Upper Emission Mask (793 MHz ~805 MHz) Plot (5M BW Ch.23255 QPSK_RB25_0)







Band 13 Upper Band Edge Plot (10M BW Ch.23230 QPSK_RB1_Offset_49)



📕 Agilent Spec	ctrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGN AUTO	02:29:26 PM Jan 23, 2019	
	req 788.000000	MHz PNO: Wide ↔ IFGain:Low		#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	Frequency
0 dB/div og r	Ref Offset 26.6 dB Ref 26.60 dBm			Mk	1 788.000 MHz -28.074 dBm	Auto Tuno
16.6						Center Fre 788.000000 MH
5.60 						Start Fre 784.000000 MH
23.4			1		-13.00 dBm	Stop Fre 792.000000 MH
3.4					RMS	CF Ste 800.000 kH <u>Auto</u> Ma
3.4						Freq Offs 0 H
	38.000 MHz				Span 8.000 MHz	
Res BW	100 kHz	#VBV	/ 300 kHz	#Sweep	1.000 s (1001 pts)	

Band 13 Upper Band Edge Plot (10M BW Ch.23230 QPSK_ QPSK_RB_50)



Band 13 Upper Emission Mask (793 MHz ~805 MHz) Plot (10M BW Ch.23230 QPSK_RB50_0)

	trum Analyzer - Swep	ot SA								
IXI RL	RF 50 Ω req 799.000			SEI	NSE:INT	#Avg Typ	ALIGN AUTO		PM Jan 23, 2019 CE <mark>1 2 3 4 5 6</mark>	Frequency
Center P	req 799.000		PNO: Wide ↔ Gain:Low	Trig: Free #Atten: 2		#109 JP		TYI Di		Auto Tuno
10 dB/div Log	Ref Offset 26. Ref -10.00 (6 dB d Bm					Mk	r1 793.0 -46.1	00 MHz 74 dBm	Auto Tune
-20.0										Center Freq 799.000000 MHz
-30.0									-32.96 dBm	
-40.0 1										Start Freq 793.000000 MHz
-50.0	Hanny May May Manda	al way and and the	white the second second	PUtawan						Stop Freq 805.000000 MHz
-70.0				r Yaarand or of the set	harden for the state of the sta	har and a second second second	Manadayaad	alar-la-valenny lorg	RMS Angelingelings/hydrologi Angelingelings/hydrologi	CF Step 1.200000 MHz
-80.0										<u>Auto</u> Man
-90.0										Freq Offset 0 Hz
-100										
Start 793.	000 MHz							Stop 805	.000 MHz	
#Res BW			#VBW	30 kHz			#Sweep	1.000 s ((1001 pts)	
MSG							STATUS	3		



	trum Analyzer - S										
enter F	^{RF} 50 req 5.015	Ω AC 000000	PNO: Fas		Trig: Free		#Avg	ALIGN AUTO	TR	3 PM Jan 23, 2019 ACE 1 2 3 4 5 6 YPE A WWWW DET A A A A A A	Frequency
dB/div	Ref 10.0	0 dBm	IFGain:Lo	w	#Atten: 20	dB		Μ	kr1 3.7 ⁻	11 9 GHz 946 dBm	Auto Tu
9 00 1.0 1.0											Center Fre 5.015000000 GH
o o											Start Fr 30.000000 M
			*****			tayayiki tayin tababa	******				Stop Fro 10.000000000 Gi
art 30 M es BW	/IHz 1.0 MHz		#\	/BW 3	8.0 MHz			Sweep 1	Stop 1 7.33 ms (0.000 GHz 20001 pts)	CF Ste 997.000000 M Auto M
R MODE TF	RC SCL		7 <u>11 9 GHz</u> 777.8 MHz		Y 66.946 dB -4.513 dB	m	NCTION	FUNCTION WIDT	H FUNC	TION VALUE	Freq Offs
					III						
								STAT	IS		

BAND 13. Conducted Spurious Plot (23205ch_5MHz_QPSK_RB 1_0)



kgilent Spec	trum Analyzer - S	wept SA			SEN	SE:INT		ALIGN AUTO	02.22.40	PM Jan 23, 2019	
	req 5.015		GHz PNO: Fas IFGain:Lo		Trig: Free #Atten: 20	Run	#Avg	Type: RMS	TRA	CE 1 2 3 4 5 6 PE A WWWW ET A A A A A A	Frequency
lB/div	Ref 10.0) dBm						M	(r1 3.69 -67.3	6 0 GHz 86 dBm	Auto Tur
											Center Fr 5.015000000 GI
											Start Fr 30.000000 M
										RMS	Stop Fr 10.000000000 G
rt 30 M s BW	/IHz 1.0 MHz		#\	/BW 3	3.0 MHz			Sweep 17	Stop 10 .33 ms (2	0.000 GHz 20001 pts)	CF Sto 997.000000 M Auto M
MODE TF N 1 N 1	RC SCL		696 0 GHz 780.2 MHz		Y 67.386 dB -4.345 dB	m	NCTION	FUNCTION WIDTH	FUNCT	ON VALUE	Freq Offs
										•	
								STATU			

BAND 13. Conducted Spurious Plot (23230ch_5MHz_QPSK_RB 1_0)



Agilent Spec	trum Analyzer - 1 RF 5	Swept SA 0 Ω AC			CEN	SE:INT		ALIGN AUTO	02:24:41	PM Jan 23, 2019	
	req 5.015		GHz PNO: Fast IFGain:Low		Trig: Free #Atten: 20	Run	#Avg	Type: RMS	TRA	ACE 1 2 3 4 5 6 ACE A <th>Frequency</th>	Frequency
dB/div	Ref 10.0	0 dBm						MI	(r1 3.69 -67.2	0 5 GHz 17 dBm	Auto Tui
g .0 .0 .0											Center Fr 5.015000000 GI
o o											Start Fr 30.000000 M
										RMS	Stop Fr 10.000000000 G
art 30 M es BW	/IHz 1.0 MHz		#V	BW 3	.0 MHz			Sweep 17	Stop 10 7.33 ms (2	0.000 GHz 20001 pts)	CF Sto 997.000000 M Auto M
N 1 N 1 N 1	f		690 5 GHz 787.2 MHz	-6	Y 67.217 dB -3.729 dB	m	NCTION	FUNCTION WIDTH	FUNCT	ION VALUE	Freq Offs
					III					•	
								STATU			

BAND 13. Conducted Spurious Plot (23255ch_5MHz_QPSK_ RB 1_0)



Agilent Spec	trum Analyze: RF	r - Swept SA 50 Ω AC			ENSE:INT		ALIGN AUTO	02:28:00	PM Jan 23, 2019	
		5000000) GHz PNO: Fast IFGain:Low		e Run	#Avg Ty	ype: RMS	TRA TY	CE 1 2 3 4 5 6 (PE A WWWWW DET A A A A A A	
dB/div	Ref 10	.00 dBm					Mk	r1 3.68 -67.1	9 5 GHz 72 dBm	Auto Tun
) g .00 0.0 0.0										Center Fre 5.015000000 G⊦
).0).0).0										Start Fre 30.000000 MH
).0).0).0				1					RMS	Stop Fre 10.000000000 GH
	1.0 MHz		#VI	BW 3.0 MH			Sweep 17	.33 ms (2		CF Ste 997.000000 Mi Auto Mi
I N 1 2 N 1 3	RC SCL	× 3	.689 5 GHz 778.2 MHz	۲ -67.172 d -3.104 d	Bm	NCTION F	UNCTION WIDTH	FUNCT	ION VALUE	Freq Offs 0 F

BAND 13. Conducted Spurious Plot (Ch.23230 10 MHz QPSK RB 1, Offset 0)

10. APPENDIX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-1901-FC020-P
2	HCT-RF-1901-FC021-P
3	HCT-RF-1901-FC022-P
4	HCT-RF-1901-FC023-P
5	HCT-RF-1901-FC024-P
6	HCT-RF-1901-FC025-P
7	HCT-RF-1901-FC026-P