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FCC LTE REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.		Date of Issue: July 16, 2021 Location:		
Address:		HCT CO., LTD.,		
129, Samsung-ro, Yeongtong-gu,		74, Seoicheon-ro 578beon-gil, Majang-myeon,		
Suwon-si, Gyeonggi-do, 166	77, Rep. of Korea	Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA Report No.: HCT-RF-2107-FC038		
FCC ID:	A3LSMG715U1			
APPLICANT:	SAMSUNG Electro	nics Co., Ltd.		

According to the Evaluation report, all of the data contained herein is reused from the reference FCC ID : A3LSMG715U report.

Model(s):	SM-G715U1
EUT Type:	Mobile Phone
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§90, §2

Mode	Tx Frequency			ERP		
(MHz)	(MHz)		Modulation	Max. Power	Max. Power	
(141112)	(141112)	Designator		(W)	(dBm)	
	790.5 –795.5	4M53G7D	QPSK	0.100	20.01	
LTE – Band14 (5)		4M54W7D	16QAM	0.076	18.81	
		4M52W7D	64QAM	0.061	17.84	
		9M03G7D	QPSK	0.103	20.11	
LTE – Band14 (10)	793.0	9M01W7D	16QAM	0.078	18.90	
		9M02W7D	64QAM	0.063	18.00	

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)



REVIEWED BY

4 mer.

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

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *. The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

* The report shall not be reproduced except in full(only partly) without approval of the laboratory.



<u>Version</u>

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2107-FC038	July 16, 2021	- First Approval Report

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.



Table of Contents

REVIEWED BY
1. GENERAL INFORMATION
2. INTRODUCTION
2.1. DESCRIPTION OF EUT
2.2. MEASURING INSTRUMENT CALIBRATION6
2.3. TEST FACILITY
3. DESCRIPTION OF TESTS
3.1 TEST PROCEDURE
3.2 RADIATED POWER
3.3 RADIATED SPURIOUS EMISSIONS
3.4 OCCUPIED BANDWIDTH
3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL11
3.6 BAND EDGE
3.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE
3.8 WORST CASE(RADIATED TEST)15
3.9 WORST CASE(CONDUCTED TEST) 16
4. LIST OF TEST EQUIPMENT
5. MEASUREMENT UNCERTAINTY
6. SUMMARY OF TEST RESULTS
7. SAMPLE CALCULATION
8. TEST DATA
8.1 EFFECTIVE RADIATED POWER
8.2 RADIATED SPURIOUS EMISSIONS
8.3 OCCUPIED BANDWIDTH
8.4 CONDUCTED SPURIOUS EMISSIONS
8.5 BAND EDGE
8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE
9. TEST PLOTS
10. APPENDIX A TEST SETUP PHOTO



MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMG715U1
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§90, §2
EUT Type:	Mobile Phone
Model(s):	SM-G715U1
Tx Frequency:	790.5 MHz –795.5 MHz (LTE – Band 14 (5MHz)) 793.0 MHz (LTE – Band 14 (10 MHz))
Date(s) of Tests:	December 17, 2019 ~ January 08, 2020
Serial number:	Radiated: UEH1488S Conducted: UEH1480S



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 (HT20/40/80), Bluetooth, BT LE, NFC, ANT+.

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
	- 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)
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/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

1. 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. For spurious 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 spurious emissions is calculated by the following formula;

Result_(dBm) = Pg_(dBm) - cable loss _(dB) + antenna gain _(dBi)

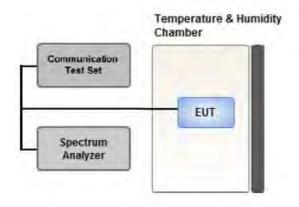
Where: P_g is the generator output power into the substitution antenna.

If the fundamental frequency is below 1GHz, RF output power has been converted to EIRP.

 $EIRP_{(dBm)} = ERP_{(dBm)} + 2.15$



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.

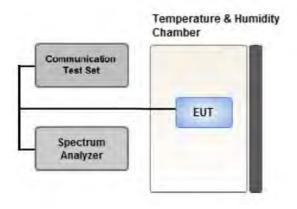
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

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 \geq 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.

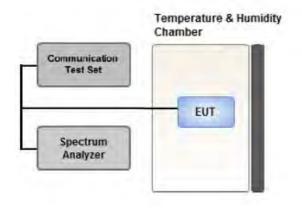
All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

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 $\ge 2 \times \text{Span} / \text{RBW}$



3.6 BAND EDGE



<u>Test setup</u>

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



Report No.: HCT-RF-2107-FC038

Test Notes

§90.543(e)

- 1. On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.
- 2. On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.
- 3. On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.
- 4. Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.
- 5. Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

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

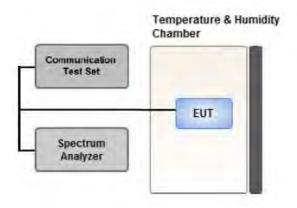
the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

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

1. 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.

[Worst case]						
Test Description Modulation RB size RB offset Axis						
	QPSK,					
Effective Radiated Power	16QAM,	1	0	Z		
	64QAM					
Radiated Spurious and Harmonic Emissions	QPSK	1	0	Z		



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, 64QAM	5, 10	Mid	Full RB	0		
		5	Low	1	0		
	QPSK	5	High	1	24		
		10	Mid	1	0		
Band Edge				1	49		
			5	Low,	Full RB	0	
			High		0		
		10	Mid	Full RB	0		
			Low,				
Spurious and Harmonic Emissions at	QPSK	5	Mid,	1	0		
Antenna Terminal	QI ⁻ ON		High				
		10	Mid	1	0		



Report No.: HCT-RF-2107-FC038

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibrati on Interval	Calibration Due
T&M SYSTEM	FBSR-02B(WHK1.2/15G-10EF)/H.P.F	-	03/02/2021	Annual	03/02/2022
T&M SYSTEM	FBSR-02B(WHK3.3/18G-10EF)/H.P.F	-	03/02/2021	Annual	03/02/2022
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/07/2021	Annual	04/07/2022
Hewlett Packard	E3632A/DC Power Supply	MY40004427	09/16/2020	Annual	09/16/2021
Schwarzbeck	UHAP/ Dipole Antenna	557	04/05/2021	Biennial	04/05/2023
Schwarzbeck	UHAP/ Dipole Antenna	558	04/05/2021	Biennial	04/05/2023
ESPEC	SU-642 / Chamber	93008124	03/15/2021	Annual	03/15/2022
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	08/29/2019	Biennial	08/29/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	09/25/2019	Biennial	09/25/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	10/13/2020	Biennial	10/13/2022
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	02/11/2020	Biennial	02/11/2022
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY50200093	11/17/2020	Annual	11/17/2021
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/01/2021	Annual	06/01/2022
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/14/2020	Annual	10/14/2021
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/26/2020	Annual	08/26/2021
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-333	03/19/2020	Biennial	03/19/2022
Schwarzbeck	VULB9160/ Bilog Antenna	3150	03/03/2021	Biennial	03/03/2023
Schwarzbeck	VULB9168/ Hybrid Antenna	760	02/22/2021	Biennial	02/22/2023
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6262116770	07/22/2020	Annual	07/22/2021
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/07/2021	Annual	01/07/2022
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/05/2021	Annual	07/05/2022
KEYSIGHT	N9030B / Signal Analyzer(5Hz~40.0GHz)	MY55480167	06/02/2021	Annual	06/02/2022
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.

2. Espectially, all antenna for measurement is calibrated in accordance with the requirements of C63.5

(Version : 2017).

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)	5.05



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, §90.543(e)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
On all frequencies between 769- 775 MHz and 799-805 MHz.	§90.543(e)	< 65 + 10log10 (P[Watts])	PASS <u>(See Note2)</u>
Conducted Output Power	§2.1046	N/A	See Note1
Frequency stability / variation of ambient temperature	§2.1055, §90.539(e)	< 2.5 ppm	PASS

Note:

- 1. See SAR Report
- 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.

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Effective Radiated Power	§90.542(a)(7)	< 3 Watts max. ERP	PASS
Radiated Spurious and Harmonic	§2.1053,	< 43 + 10log10 (P[Watts]) for	PASS
Emissions	§90.543(e)	all out-of band emissions	1 700
Undesirable Emissions in	§2.1053,	< -70dBW/MHz EIRP (wideband)	PASS
the 1559 – 1610 MHz band	§90.543(f)	< -80dBW EIRP (narrowband)	PA22



7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

Ch	/ Freq.	Measured	Substitute	Ant. Gain	C.L	Pol.	EF	RP	
channel	Freq.(MHz)	Level(dBm)	Level(dBm)	(dBd)	U.L	P01.	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.	EIR	RP
channel	Freq.(MHz)	Level(dBm)	Level(dBm)	(dBi)	U.L	POI.	w	dBm
132322	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

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

QAM Modulation

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		Modulation	Measured	Substitute		C.L		Pol	Limit	EF	RP
(MHz)	(Bandwidth)		Level (dBm)	Level (dBm)	Gain(dBd)			w	w	dBm	
		QPSK	-31.41	31.38	-10.11	1.26	Н		0.100	20.01	
790.5		16-QAM	-32.61	30.18	-10.11	1.26	Н		0.076	18.81	
		64-QAM	-33.58	29.21	-10.11	1.26	Н		0.061	17.84	
		QPSK	-31.82	31.11	-10.12	1.26	Н		0.094	19.73	
793.0	LTE B14 (5 MHz)	16-QAM	-33.05	29.88	-10.12	1.26	Н	< 3.00	0.071	18.50	
	(0	64-QAM	-33.94	28.99	-10.12	1.26	Н		0.058	17.61	
		QPSK	-32.25	30.79	-10.13	1.26	Н		0.087	19.41	
795.5		16-QAM	-33.36	29.68	-10.13	1.26	Н		0.068	18.30	
		64-QAM	-34.38	28.66	-10.13	1.26	Н		0.053	17.28	

Freq	Mod	Modulation	Measured	Substitute	Ant.	C.L	Pol	Limit	EF	۲P
(MHz) (E	(Bandwidth)		Level (dBm)	Level (dBm)	Gain(dBd)			W	W	dBm
		QPSK	-31.44	31.49	-10.12	1.26	Н		0.103	20.11
793.0	LTE B14 (10 MHz)	16-QAM	-32.65	30.28	-10.12	1.26	Н	< 3.00	0.078	18.90
	(10 10112)	64-QAM	-33.55	29.38	-10.12	1.26	Н		0.063	18.00



8.2 RADIATED SPURIOUS EMISSIONS

OPERATING FREQUENCY:	<u>790.50 MHz</u>
MEASURED OUTPUT POWER:	<u>22.16 dBm = 0.164 W</u>
MODE:	<u>LTE B14</u>
MODULATION SIGNAL:	<u>5 MHz QPSK</u>
DISTANCE:	<u>3 meters</u>
■ LIMIT: 43 + 10 log10 (W) =	<u>35.16 dBc</u>

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
	1,581.0	-54.03	9.05	-63.13	1.80	V	-55.88	78.04
23305 (790.5)	2,371.5	-50.65	10.05	-54.40	2.25	Н	-46.60	68.75
(790.5)	3,162.0	-50.33	11.28	-51.50	2.61	V	-42.83	64.99
	1,586.0	-51.76	9.12	-61.07	1.81	н	-53.76	75.92
23330 (793.0)	2,379.0	-49.22	10.05	-52.71	2.25	Н	-44.91	67.06
(100.0)	3,172.0	-49.47	11.35	-50.31	2.61	V	-41.57	63.72
	1,591.0	-54.39	9.18	-63.92	1.81	Н	-56.55	78.70
23355 (795.5)	2,386.5	-50.47	10.09	-54.15	2.26	Н	-46.32	68.48
(100.0)	3,182.0	-51.79	11.35	-52.85	2.64	V	-44.14	66.29



OPERATING FREQUENCY:	<u>793.00 MHz</u>
MEASURED OUTPUT POWER:	<u>22.26 dBm = 0.168 W</u>
I MODE:	<u>LTE B14</u>
MODULATION SIGNAL:	10 MHz QPSK
DISTANCE:	<u>3 meters</u>
LIMIT: 43 + 10 log10 (W) =	<u>35.76 dBc</u>

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
	1,586.0	-54.42	9.12	-63.73	1.81	V	-56.42	78.68
23330 (793.0)	2,379.0	-57.33	10.05	-60.82	2.25	Н	-53.02	75.28
(100.0)	3,172.0	-50.12	11.35	-50.96	2.61	V	-42.22	64.48



1559 MHz ~ 1610 MHz BAND

OPERATING FREQUENCY:	<u>790.5 MHz, 793.0 MHz, 795.5 MHz</u>
MEASURED OUTPUT POWER:	<u>5 MHz QPSK</u>
DISTANCE:	<u>3 meters</u>
WIDEBAND EMISSION LIMIT:	<u>-80 dBW/ MHz (= -50 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)
790.5	1576.7		-56.92	9.05	-66.02	1.80	Н	-58.77	8.77
793.0	1581.8	Narrow Band	-58.57	9.05	-67.67	1.80	н	-60.42	10.42
795.5	1586.7		-62.81	9.18	-72.34	1.81	Н	-64.97	14.97

Note:

The lower narrowband limit was applied because the spurious emission was not found.

OPERATING FREQUENCY:	<u>793.0 MHz</u>
MEASURED OUTPUT POWER:	10 MHz QPSK
DISTANCE:	<u>3 meters</u>
WIDEBAND EMISSION LIMIT:	<u>-80 dBW/ MHz (= -50 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)
793.0	1577.2	Narrow Band	-60.05	9.05	-69.15	1.80	V	-61.90	11.90

Note:

The lower narrowband limit was applied because the spurious emission was not found.



8.3 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data(MHz)
			QPSK	25	0	4.5335
	5 MHz		16-QAM	25	0	4.5352
14		700.0	64-QAM	25	0	4.5230
14		793.0	QPSK	50	0	9.0293
10 MHz		16-QAM	50	0	9.0091	
			64-QAM	50	0	9.0169

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 33 ~ 38.



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)
		790.5	3.7184	27.976	-67.375	-39.399	
14	5	793.0	3.6965	27.976	-67.448	-39.472	-13.00
14		795.5	3.7124	27.976	-67.394	-39.418	-13.00
	10	793.0	3.6795	27.976	-67.485	-39.509	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 55 ~ 58.

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

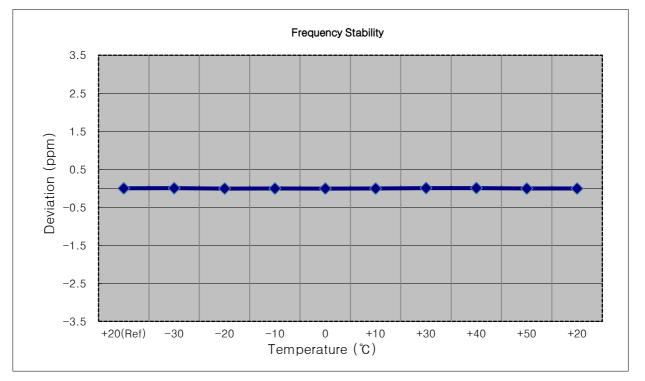
- Plots of the EUT's Band Edge are shown Page 39 ~ 54.



8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

I MODE:	<u>LTE 14</u>
OPERATING FREQUENCY:	<u>790,500,000 Hz</u>
CHANNEL:	<u>23305 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.85 VDC</u>
DEVIATION LIMIT:	<u>2.5ppm</u>

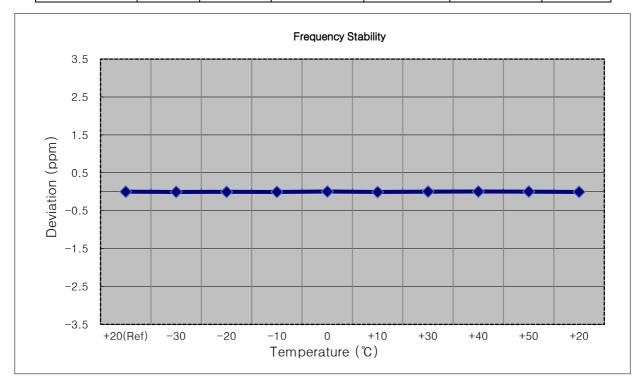
Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	790 499 996	0.00	0.000 000	0.0000
100%		-30	790 499 998	2.50	0.000 000	0.0032
100%		-20	790 499 991	-5.20	-0.000 001	-0.0066
100%		-10	790 499 991	-4.50	-0.000 001	-0.0057
100%	3.850	0	790 499 991	-5.00	-0.000 001	-0.0063
100%		+10	790 499 992	-4.20	-0.000 001	-0.0053
100%		+30	790 500 000	4.30	0.000 001	0.0054
100%		+40	790 500 001	4.60	0.000 001	0.0058
100%		+50	790 499 992	-3.50	0.000 000	-0.0044
Batt. Endpoint	3.600	+20	790 499 993	-3.40	0.000 000	-0.0043





MODE:	<u>LTE 14</u>
OPERATING FREQUENCY:	<u>793,000,000 Hz</u>
CHANNEL:	<u>23330 (5 MHz)</u>
REFERENCE VOLTAGE:	3.85 VDC
DEVIATION LIMIT:	<u>2.5ppm</u>

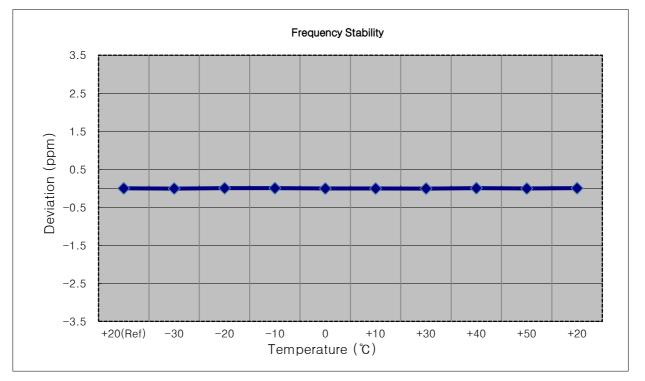
Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	792 999 998	0.00	0.000 000	0.0000
100%		-30	792 999 993	-5.20	-0.000 001	-0.0066
100%		-20	792 999 995	-3.50	0.000 000	-0.0044
100%		-10	792 999 994	-4.30	-0.000 001	-0.0054
100%	3.850	0	793 000 001	3.10	0.000 000	0.0039
100%		+10	792 999 993	-5.50	-0.000 001	-0.0069
100%		+30	793 000 001	2.70	0.000 000	0.0034
100%		+40	793 000 002	3.70	0.000 000	0.0047
100%		+50	793 000 001	2.50	0.000 000	0.0032
Batt. Endpoint	3.600	+20	792 999 993	-4.80	-0.000 001	-0.0061





I MODE:	<u>LTE 14</u>
OPERATING FREQUENCY:	<u>795,500,000 Hz</u>
CHANNEL:	<u>23355 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.85 VDC</u>
DEVIATION LIMIT:	<u>2.5ppm</u>

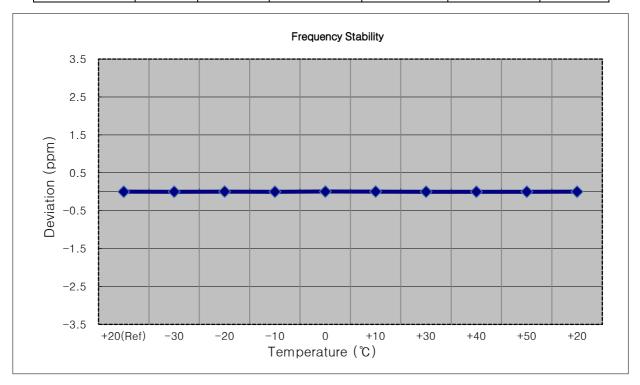
Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	795 500 003	0.00	0.000 000	0.0000
100%		-30	795 499 999	-4.70	-0.000 001	-0.0059
100%		-20	795 500 006	2.80	0.000 000	0.0035
100%		-10	795 500 007	3.20	0.000 000	0.0040
100%	3.850	0	795 499 999	-4.60	-0.000 001	-0.0058
100%		+10	795 499 999	-4.50	-0.000 001	-0.0057
100%		+30	795 499 999	-4.70	-0.000 001	-0.0059
100%		+40	795 500 006	2.90	0.000 000	0.0036
100%		+50	795 500 000	-3.40	0.000 000	-0.0043
Batt. Endpoint	3.600	+20	795 500 006	2.90	0.000 000	0.0036





MODE:	<u>LTE 14</u>
OPERATING FREQUENCY:	<u>793,000,000 Hz</u>
CHANNEL:	<u>23330 (10 MHz)</u>
REFERENCE VOLTAGE:	3.85 VDC
DEVIATION LIMIT:	<u>2.5ppm</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm	
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)		
100%		+20(Ref)	793 000 002	0.00	0.000 000	0.0000	
100%		-30	793 000 001	-1.10	0.000 000	-0.0014	
100%		-20 793 000 003 1.		1.50	0.000 000	0.0019	
100%		-10	793 000 001	-1.00	0.000 000	-0.0013	
100%	3.850	0	793 000 005	3.10	0.000 000	0.0039	
100%		+10	793 000 004	1.80	0.000 000	0.0023	
100%	•	+30	793 000 001	-1.00	0.000 000	-0.0013	
100%		+40	793 000 001	-0.80	0.000 000	-0.0010	
100%		+50	793 000 001	-0.80	0.000 000	-0.0010	
Batt. Endpoint	3.600	+20	793 000 002	0.70	0.000 000	0.0009	





FCC ID: A3LSMG715U1

9. TEST PLOTS



	m Analyzer - Occu	•									_	
Center Fre			-17	Cente	SENSE:INT r Freq: 793.0	00000 MHz	ALIGN AU		7:32 AM Dec Std: Non		F	requency
PASS	q 735.000		•	Trig:	Free Run n: 20 dB		ld: 500/50	0	Device: B			
1,455		#	FGain:Low	#Atter	1: 20 dB			Radio	Device: E	15		
10 dB/div	Ref Offset Ref 40.0											
Log 30.0												Center Freq
												3.000000 MHz
20.0		,	m	man	mm.	wwww	mar				10	0.000000 11112
10.0												
0.00		کر ا										
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-20.0		ard .						· hu				
-30.0	mound								A. Martin	s-Uhr		
-40.0												
-50.0												CF Step
Center 793	MHz								Span 10	MHZ	Auto	1.000000 MHz Man
#Res BW 1				#	VBW 390	kHz			Sweep	1 ms		man
Occupi	ed Band	width			Total	Power	3	1.1 dBn	n			Freq Offset
	4.5335 MHz											0 Hz
_					0.014				,			
	Transmit Freq Error 510				Hz OBW Power			99.00 %				
x dB Bar	ndwidth		5.430	MHz	x dB		-/	26.00 di	3			
MSG							Г <mark>і</mark> о sт	TATUS				
							-					

BAND 14. Occupied Bandwidth Plot (Ch.23330 QPSK RB 25) 5 MHz



🊺 Ag	ilent Spec	trum Analyzer - Occ	upied BW											
LXI RI	-	RF 50 Ω req 793.000	2 AC	111-1			SENSE:INT Freq: 793.0	00000 MHz	ALIC	GN AUTO	11:07:02 A	M Dec 18, 2019	Fr	equency
		req 793.000		Trig: F	ree Run	Avg Ho	0/500							
PAS	<u> </u>			#IFGain	Low	#Atten	: 20 dB				Radio Dev	ice: BTS		
	B/div	Ref Offset Ref 40.0												
Log 30.0													C	enter Freq
20.0														.000000 MHz
10.0				mm	M.m.	᠕᠕ᡁᠬ᠘᠇		mann	wm	ı				
0.00			ſ							h				
-10.0			- A							hu				
			a contrad							- '\ \ \	1			
-30.0	an and the	Maranard									bry www.	manne		
-40.0														
-50.0														
00.0													1	CF Step .000000 MHz
		93 MHz										n 10 MHz		Man
#Re:	s BW	100 kHz				#\	VBW 390	kHz			Swe	ep 1 ms		
0	ccur	bied Band	lwidth	n			Total	Power		30.1	dBm		I	Freq Offset
	4.5352 MHz												0 Hz	
T	Transmit Freq Error 9.544 kH				Hz	z OBW Power			99.00 %					
x	x dB Bandwidth 5.280 M				Hz	z xdB			-26.00 dB					
MSG									0		;			
									-					

BAND 14. Occupied Bandwidth Plot (Ch.23330 16-QAM RB 25) 5 MHz



🍺 Agilent Spectrum Analyze	r - Occupied BW							
Center Freq 793	50 Ω AC		SENSE:INT Center Freq: 793.	00000 MHz	ALIGN AUTO	11:07:17 AM Radio Std:	Dec 18, 2019	Frequency
PASS		++	Trig: Free Run		d: 500/500			
FASS	i	#IFGain:Low	#Atten: 20 dB			Radio Devi	ce: BTS	
10 dB/div Ref	offset 26.8 dB 40.00 dBm							
Log 30.0								Center Freq
20.0								793.000000 MHz
		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	warman and and and and and and and and and a	$\sqrt{1}$	APA-L			
10.0								
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-10.0	میں				M J			
-20.0	Marall				<b>_</b>	ᢂᡁ		
-30.0						4 - 4 H LA	*~~/**\r~b_#1	
-40.0								
-50.0								CF Step
Center 793 MHz						Spar	10 MHz ו	1.000000 MHz Auto Man
#Res BW 100 kH:	z		#VBW 39	0 kHz			ep 1 ms	
Occupied Ba	andwidth		Total	Power	29.1	dBm		Freq Offset
	4.5	230 MI	Hz					0 Hz
Transmit Free	Error	Hz OBW Power		99.00 %				
x dB Bandwidth 5.364 M			1Hz x dB	Hz x dB		00 dB		
мsg 🗼 Alignment Con	npleted				<b>I</b> o STATUS			

## BAND 14. Occupied Bandwidth Plot (Ch.23330 64-QAM RB 25) 5 MHz



🊺 Agi	lent Spectru	m Analyzer - Occu	upied BW											- # <b>X</b>
LXI RL	-			<b>U</b> 7			NSE:INT	00000 MHz	ALIC	SN AUTO	11:15:10 / Radio Std	M Dec 18, 2019	Fre	quency
Trig: Free								e Run Avg Hold: 500/500						
PASS #IFGain:Low #Atten: 20							20 dB				Radio Dev	ice: BIS		
10 dE	3/div	Ref Offset Ref 40.0												
Log 30.0													C	enter Freg
20.0														000000 MHz
10.0				^I VW ⁿ m ⁿ m	᠆ᠬ᠊ᠬᢇ᠕	Amarana	mmm	~mllor-qr-hr	~ <b>~</b> կյտել					
0.00			<u> </u>							<u>\</u>				
-10.0			M							٦ _w				
-20.0		0-								՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝՝	<u> </u>			
-30.0 =	marcall	MUNIA CARACTER CONTRACT									may when a	W. Marting		
-40.0														
-50.0														
													20	CF Step
	ter 793											n 20 MHz		Man
#Res	SBW 2	00 kHz				#V	BW 820	kHz			Swe	eep 1 ms		
0	ccupi	ed Band	width				Total	Power		31.0	dBm		F	req Offset
	9.0293 MHz											0 Hz		
Tr	Transmit Freq Error 29.202 kHz				Hz	<b>OBW</b> Power			99.00 %					
x	x dB Bandwidth 10.27 MHz				Hz	x dB			-26.00 dB					
MSG									]	STATUS				
	_									<b>v</b>				

BAND 14. Occupied Bandwidth Plot (Ch.23330 QPSK RB 50) 10 MHz



🇾 Agilent Spectro	um Analyzer - Occupied BV	V						
(X) RL	RF 50 Ω AC eq 793.000000	MU-7	SENSE:INT Center Freg: 793.0	00000 MHz	ALIGN AUTO	11:14:39 A	MDec 18, 2019	Frequency
PASS	-q 795.000000	#IFGain:Low	Takes Date Date	Avg Hold	I: 500/500	Radio Devi		
10 dB/div	Ref Offset 26.8 c Ref 40.00 dB							
20.0								Center Freq 793.000000 MHz
10.0		Mol-Mhandala	amente and and a second and a second s	yndergedergelera	mart vi			
0.00		v						
-10.0	A the second				- June			
-20.0 -30.0 pmp//m/h	K.J. Byst Bergh H. Marthad br					Murh Volged	malullar	
-40.0								
-30.0								CF Step 2.000000 MHz
Center 793 #Res BW 2			#VBW 820	kHz			n 20 MHz ep 1 ms	<u>Auto</u> Man
Occup	ied Bandwid	th	Total	Power	30.0	dBm		Freq Offset
	9.	.0091 MI	lz					0 Hz
Transm	it Freq Error	39.615 k	Hz OBW	Power	99	.00 %		
x dB Ba	ndwidth	10.28 M	IHz x dB		-26.	00 dB		
MSG					STATUS			
Mod					- North Status			

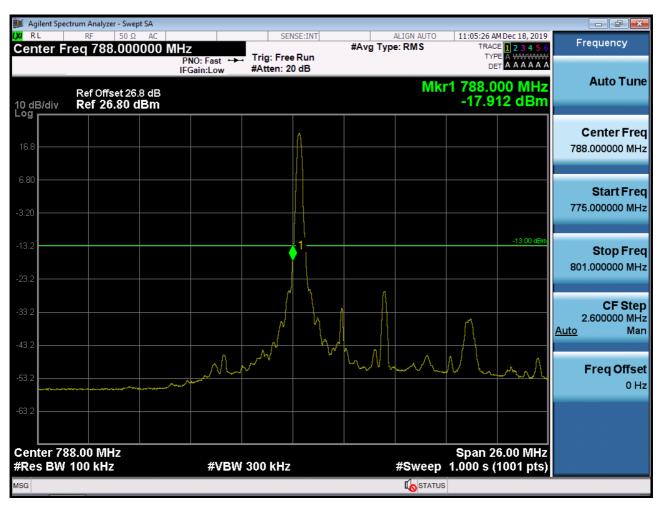
### BAND 14. Occupied Bandwidth Plot (Ch.23330 16-QAM RB 50) 10 MHz



	Agilent Sj	pectrum An	nalyzer - Occu	upied BW											
<mark>LXI</mark>	RL	RF		AC	1.1			SENSE:INT Freq: 793.00	0000 MHz	ALIC	IN AUTO	11:14:54 A	M Dec 18, 2019	F	requency
		Freq /	793.000		ΠΖ		. Trig: F	ree Run	Avg Ho	ld: 50	0/500				
	455				#IFGain	Low	#Atten:	20 dB				Radio Dev	ice: BTS		
	d <u>B/div</u>		tef Offset tef 40.0												
Lo   30	-														Center Freq
															3.000000 MHz
20	.0					<b>-</b> - <b>1</b> -								15	5.000000 Mil 12
10	.0				میلاردها <mark>می</mark> سر	ᡣᠬ᠆ᡅᡘ	᠂᠃ᢔᠾ _{ᡗᡜᢛ} ᠬᠬᡐᡕᡕ	www.www.v.	and a second	hiveley					
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-50	.0									_			<u> </u>		CF Step
		700 84										0		:	2.000000 MHz
		793 MI N 200					#\	/BW 820	kHz				n 20 MHz ep 1 ms	<u>Auto</u>	Man
	Оссі	upied	Band	width				Total I	Power		28.9	dBm			Freq Offset
				9.0	169	) WI	IZ								0 Hz
	Trans	smit F	req Err	or	31	.831 k	Hz	OBW I	Power		99	.00 %			
	x dB	Band	width		10	).44 M	Hz	x dB			-26.	00 dB			
MSG	ì									0	STATUS				
_	-				_					-	-			_	

BAND 14. Occupied Bandwidth Plot (Ch.23330 64-QAM RB 50) 10 MHz





BAND 14 Lower Band Edge Plot (5M BW Ch.23305 QPSK_RB1 OFFSET_0)



									um Analyzer - Swep	
Frequency	M Dec 18, 2019 E <b>1 2 3 4 5 6</b>	11:04:41 A TRAC	ALIGN AUTO e: RMS	#Avg Typ	ENSE:INT	SE		AC	RF 50 Ω	(IRL
Auto Turo		TYF De		411 811		Trig: Fre #Atten: 2	PNO: Fast ↔→→ IFGain:Low			
Auto Tune	00 MHz 32 dBm	1 788.0 -21.9	Mki					∃dB Bm	Ref Offset 26. <b>Ref 26.80 d</b>	l0 dB/div
Center Freq										16.8
788.000000 MHz										
Start Freq 775.000000 MHz										6.80
	-13.00 dBm									3.20
<b>Stop Freq</b> 801.000000 MHz	-13.00 0611				1					.13.2
05.04.0			L.			/				23.2
<b>CF Step</b> 2.600000 MHz <u>Auto</u> Man		had a second sec				and the second				33.2
Freq Offset		han								43.2
0 Hz							-		**************************************	53.2
										63.2
	6.00 MHz (1001 pts)	Span 2	#Swoon		7	300 kHz	#\/B\\(			Center 78 #Res BW
	iou i pis)		#Sweep		2	500 KH2	#VDVV			

## BAND 14 Lower Band Edge Plot (5M BW Ch.23305 QPSK_RB_25)



	ilent Spectrum Analyzer - Swept SA							
Cen	∟ RF 50 Ω AC Iter Freq 772.000000 M	/Hz	Run	#Avg Type: RI	N AUTO MS	11:05:45 AM Dec 18, TRACE 1 2 3 TYPE A WW	456	Frequency
		PNO: Wide - Trig: Free IFGain:Low #Atten: 20				DET A A A	AAA	Auto Tune
10 dE Log i	Ref Offset 26.8 dB B/div <b>Ref -10.00 dBm</b>				MKr1	773.590 M -65.363 dl	HZ 3m	Auto Func
209								Center Freq
-20.0								772.000000 MHz
-30.0						-35.0	) dBm	Start Freq
-40.0								769.000000 MHz
50.0								
-50.0								<b>Stop Freq</b> 775.000000 MHz
-60.0					<b>→</b> ¹ +			
-70.0	๛๛ฺ๚ๅ๛๛๛๛๚๛๛๚๚๛๛๚๚๛๛๚๚๛๛๛๚๚๛๚๛๛๚๚๚๚๚๛๚๛๛๛๛	๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛	<b>₽</b> ₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽	hrvert and the served in the servert		Ŋœlydlurt/Maran angl I	1~1 ₁ 1.1.1	<b>CF Step</b> 600.000 kHz
-80.0								<u>Auto</u> Man
								Freq Offset
-90.0								0 Hz
-100								
Star	t 769.000 MHz				C	top 775.000 N	147	
	s BW 10 kHz	#VBW 30 kHz			weep 1	.000 s (1001	ots)	
MSG				ų	STATUS			

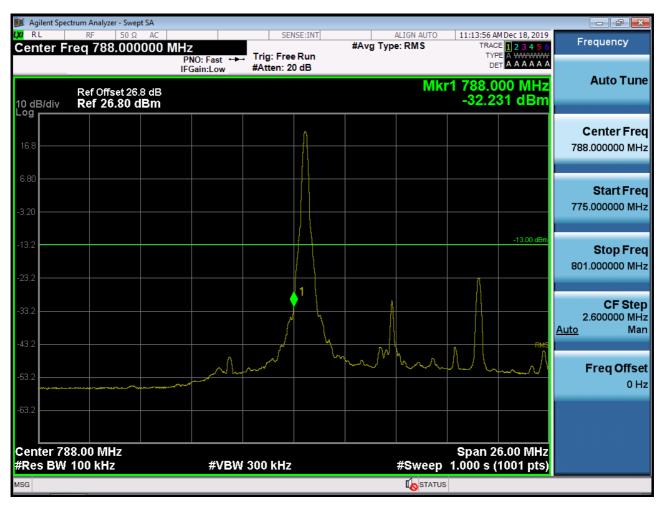
BAND 14 Lower Emission Mask (769 MHz ~ 775 MHz) Plot (5M BW Ch.23305 QPSK_RB1_0)-1



		rum Analyzer	•										x
LXI RI		RF	50 Ω AC			SEI	NSE:INT	#Avg Typ	ALIGN AUTO		Dec 18, 2019	Frequency	
Cen	ter Fr	eq 772.	.000000	PNO	:Wide ↔⊷ in:Low	Trig: Free #Atten: 2		#Avg Typ		TYPI DE	<b>1</b> 2 3 4 5 6 A WWWWW A A A A A A A		
10 dE Log	3/div	Ref Offs Ref -10	et 26.8 dB .00 dBn	3 n					Mk	1 773.6 -65.52	92 MHz 26 dBm	Auto Tui	ne
-20.0												Center Fre 772.000000 Mi	- 11
-30.0 -40.0											-35.00 dBm	<b>Start Fr</b> 769.000000 MI	- 1
-50.0 -60.0												<b>Stop Fr</b> 775.000000 MI	11
-70.0 -80.0	~~~~~~	hten jaho volutanik	erresistry of a set	\$ <u>Lupt-s-</u> +\$t	₽₽₩₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽	reditation for a local day		Paster and proper	ษณา- <b>()</b> คัญหางปัวสูงสู่คิญก	hofer on the set of the	ht.a.p.1.1244-144	CF Ste 600.000 kl <u>Auto</u> M	
-90.0												Freq Offs 01	set Hz
		000 MHz 10 kHz	· ·		#\/B\M	30 kHz			#Sween	Stop 775. 1.000 s (′	000 MHz		
MSG	5-1344				#VDVV	JU KHZ			#Sweep		oor pts)		

BAND 14 Lower Emission Mask (769 MHz ~ 775 MHz) Plot (5M BW Ch.23305 QPSK_RB25_0)-2





BAND 14 Lower Band Edge Plot (10M BW Ch.23330 QPSK_RB1 OFFSET_0)



	ctrum Analyzer - Swept SA					
(X) RL Center F	RF 50 Ω AC req 788.000000 M		SENSE:INT	ALIGN AUTO #Avg Type: RMS	11:13:12 AM Dec 18, 2019 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast ↔ IFGain:Low	Trig: Free Run #Atten: 20 dB			A . 4 . 7
10 dB/div Log	Ref Offset 26.8 dB Ref 26.80 dBm			Mk	r1 788.000 MHz -28.963 dBm	Auto Tune
16.8						Center Freq 788.000000 MHz
-3.20					••••••••••	Start Freq 775.000000 MHz
-13.2					-13.00 dBm	Stop Freq 801.000000 MHz
-33.2					RMS	<b>CF Step</b> 2.600000 MHz <u>Auto</u> Man
-53.2						<b>Freq Offset</b> 0 Hz
-63.2					Span 26.00 MHz 1.000 s (1001 pts)	
#Res BW	100 kHz	#VBW	300 kHz	#Sweep		

BAND 14. Lower & Upper Band Edge Plot (10M BW Ch.23330 QPSK RB_50)



	ctrum Analyzer - Swept SA						
Center F	RF 50 Ω AC req 772.000000 Ν	AHZ PNO: Wide ↔ Trig: Fre		ALIGN #Avg Type: RM		4:15 AM Dec 18, 2019 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	Frequency
10 dB/div Log	Ref Offset 26.8 dB Ref -10.00 dBm	IFGain:Low #Atten: 2	0 dB		Mkr1 77 -6	/3.974 MHz 5.477 dBm	Auto Tune
-20.0							Center Freq 772.000000 MHz
-30.0						-35.00 dBm	Start Freq 769.000000 MHz
-50.0					1		Stop Freq 775.000000 MHz
-70.0	лүлканун ^у Үландо ^н үндүлдүлдүлдүн сүрөлөнүн Цурон ү	านการให้มูลกระหม่อได้เห็นหรูกรู้จึงกรุงระบบ-และสิทธิต และเรา 	**************************************	f=287-#34.59f=44+49fyHedfadf994	16.44 ⁻¹ 16.45-41-41	RMS marana	<b>CF Step</b> 600.000 kHz <u>Auto</u> Man
-90.0							Freq Offset 0 Hz
Start 769	.000 MHz 10 kHz	#VBW 30 kHz		#51	Stop	775.000 MHz 0 s (1001 pts)	
MSG					STATUS		

BAND 14 Lower Emission Mask (769 MHz ~ 775 MHz) Plot (10M BW Ch.23330 QPSK_RB51_0)-1



	ctrum Analyzer - Swept SA					
LXI RL	RF 50 Ω /		SENSE:INT	ALIGN AUTO #Avg Type: RMS	11:13:31 AM Dec 18, 2019	Frequency
Center F	req 772.0000(	DU MHZ PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 20 dB		TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	
10 dB/div Log	Ref Offset 26.8 c Ref -10.00 dE	dB Sm		Mkı	1 769.126 MHz -65.500 dBm	Auto Tune
-20.0						Center Freq 772.000000 MHz
-30.0					-35.00 dBm	Start Freq 769.000000 MHz
-50.0						<b>Stop Freq</b> 775.000000 MHz
-70.0 -80.0	ananan katan jarah kanalan kalanga	rundy-Yentheukkhilisyan-arth-bh-b	ปรุณาชาวารสีการการสุดรูสุดรูสุดรูสุดรูสุดรูสุดรูสุดรูสุดร	laftinetijfferonomonomonomonomonomonomonomonomonomono	การมันและมาร์ไทยในระทุกรับปรัตรัฐมาร์	<b>CF Step</b> 600.000 kHz <u>Auto</u> Man
-90.0						<b>Freq Offset</b> 0 Hz
-100 Start 769. #Res BW		#VBW	30 kHz	#Sween	Stop 775.000 MHz 1.000 s (1001 pts)	
MSG			50-M12			

BAND 14 Lower Emission Mask (769 MHz ~ 775 MHz) Plot (10M BW Ch.23330 QPSK_RB50_0)-2





BAND 14 Upper Band Edge Plot (5M BW Ch.23355 QPSK_RB1_Offset 24)



	nt Spectrum Analyzer - Swept SA						
(X) RL	er Freq 798.0000		SENSE:		ALIGN AUTO	11:09:08 AM Dec 18, 2019 TRACE 1 2 3 4 5 6	Frequency
Cerne	er Fred 798.0000	PNO: Wide ↔→ IFGain:Low	Trig: Free Ru #Atten: 20 dE	in	,per time	TYPE A WWWW DET A A A A A A	
10 dB/c	Ref Offset 26.8 d	dB m			Mki	1 798.000 MHz -21.577 dBm	Auto Tune
16.8 —							Center Freq 798.000000 MHz
6.80 mm		·····					Start Freq 796.000000 MHz
-13.2 -			how 1	×		-13.00 dBm	Stop Freq 800.000000 MHz
-33.2				and the second s	C	RMS	<b>CF Step</b> 400.000 kHz <u>Auto</u> Man
-53.2 —							<b>Freq Offset</b> 0 Hz
	er 798.000 MHz					Span 4.000 MHz 1.000 s (1001 pts)	
	BW 100 kHz	#VBW	300 kHz				
MSG					<b>I</b> STATUS		

## BAND 14 Upper Band Edge Plot (5M BW Ch.23355 QPSK_RB_25)



	ectrum Analyzer - Swept SA						
Center F	RF 50 Ω AC Freq 802.000000	MHz	SENSE:INT	#Avg Ty	ALIGN AUTO	11:10:14 AM Dec 18, 2019 TRACE 1 2 3 4 5 6	Frequency
		PNO: Wide ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB				
10 dB/div Log	Ref Offset 26.8 dB Ref -10.00 dBm				Mki	1 799.000 MHz -51.751 dBm	Auto Tune
-20.0							Center Freq 802.000000 MHz
-30.0							
30.0						-35.00 dBm	Start Freq
-40.0							799.000000 MHz
-50.0	my humming t	N N	hj				Stop Freq 805.000000 MHz
-60.0	and the stand	and marganeterson	LUNU BURER A	al ^{fo} nythetalle whyserallabl	Alevan in the second second	RMS	CF Step
-80.0							600.000 kHz <u>Auto</u> Man
-90.0							Freq Offset
400							0 Hz
-100							
	.000 MHz				" <b>o</b>	Stop 805.000 MHz	
#Res BW	TU KHZ	#VBW 3	30 KHZ		#Sweep	1.000 s (1001 pts)	
MSG					IN STATUS		

BAND 14 Upper Emission Mask (799 MHz ~805 MHz) Plot (5M BW Ch.23355 QPSK_RB1_24)



	trum Analyzer - Swept	: SA									
LXIRL		AC		SEN	ISE:INT	#Avg Typ	ALIGN AUTO		M Dec 18, 2019	F	requency
Center Fi	eq 802.000	P	Z NO: Wide ↔⊷ Gain:Low	Trig: Free #Atten: 2		#Avg Typ	e: RIVIS	TYP	E A WWWW A A A A A A A		
10 dB/div Log	Ref Offset 26.8 <b>Ref -10.00 d</b>	3 dB IBm					Mk	r1 799.0 -43.0	60 MHz 16 dBm		Auto Tune
-20.0											Center Freq 2.000000 MHz
-30.0	whenhalingestations	durin a							-35.00 dBm	799	Start Freq 9.000000 MHz
-50.0		an a	Viert-growendersonge	[●] ₩₩₩₩₩₩₩₩₩₩		WH.Jpajaka ⁿ anjakani	Lange Way Lange Lange	mannannannan	RMS	805	Stop Freq 5.000000 MHz
-70.0										<u>Auto</u>	<b>CF Step</b> 600.000 kHz Man
-90.0											<b>Freq Offset</b> 0 Hz
-100	000 MHz							Stop 805	.000 MHz		
#Res BW			#VBW	30 kHz			#Sweep	1.000 s (	1001 pts)		
мsg 🧼 Align	ment Completed	ł					<b>I</b> STATUS				

BAND 14 Upper Emission Mask (799 MHz ~805 MHz) Plot (5M BW Ch.23355 QPSK_RB25_0)-2





BAND 14 Upper Band Edge Plot (10M BW Ch.23330 QPSK_RB1_Offset_49)



	ctrum Analyzer - Swept SA								
Center F	RF 50 Ω AC req 798.000000 M	ЛНz	SENS	I	#Avg Typ	ALIGN AUTO e: RMS	TRAC	MDec 18, 2019 E 1 2 3 4 5 6	Frequency
		PNO: Wide +++ IFGain:Low	Trig: Free F #Atten: 20				TYP DE		
10 dB/div Log	Ref Offset 26.8 dB <b>Ref 26.80 dBm</b>					Mk	1 798.0 -28.1	08 MHz 59 dBm	Auto Tu
16.8									Center Fr 798.000000 M
6.80									Otort Fr
-3.20									Start Fr 796.000000 M
-13.2								-13.00 dBm	Stop Fr 800.000000 M
-23.2			And and a second s	1					
-33.2				and the second	and the state of t	and and any and a second	₱──\i-aaf#\$- <u>₽</u> ₽U-},a	RMS	CF St 400.000 k <u>Auto</u> M
-43.2									Freq Offs
-53.2									0
Center 79 #Res BW	98.000 MHz 100 kHz	#VBW	300 kHz			#Sweep	Span 4. 1.000 s (	.000 MHz 1001 pts)	
MSG						<b>I</b> STATUS			

BAND 14 Upper Band Edge Plot (10M BW Ch.23330 QPSK_QPSK_RB_50)



	um Analyzer - Swept SA						
Center Fre	RF 50 Ω AC eq 802.000000		SENSE:INT	#Avg Typ	ALIGN AUTO e: RMS	11:17:25 AM Dec 18, TRACE 1 2 3	4 5 6 Frequency
	•	PNO: Wide ↔ IFGain:Low	Trig: Free Run #Atten: 20 dB			DET A A A	ΑΑΑ
10 dB/div Log	Ref Offset 26.8 dE Ref -10.00 dBn	; n			Mkı	1 801.274 M -51.455 dl	Hz Auto Tune Bm
3							Center Freq
-20.0							802.000000 MHz
-30.0						-35.0	o dBm Start Freq
-40.0							799.000000 MHz
-50.0		1					
-50.0	M-1.	MA					<b>Stop Freq</b> 805.000000 MHz
	and a second and a second s	amulunilukinnyingray (	hard war and the second sec	Marman and and a strain and a strain and a strain a strai	and the state of the second state of the secon	ward the latter growthat have by the	CF Step
-70.0							600.000 kHz Auto Man
-80.0							
-90.0							Freq Offset
-100							
Start 799.0 #Res BW 1		#\/B\M	30 kHz		#Sween	Stop 805.000 N 1.000 s (1001	
MSG		#VDVV	JU KHZ		#Sweep		

BAND 14 Upper Emission Mask (793 MHz ~805 MHz) Plot (10M BW Ch.23330 QPSK_RB1_49)-1



	ctrum Analyzer - Swept SA					
LXI RL	RF 50 Ω AC		SENSE:INT	ALIGN AUTO	11:16:38 AM Dec 18, 2019	Frequency
Center F	req 802.00000	O MIHZ PNO: Wide ↔→→ IFGain:Low	Trig: Free Run #Atten: 20 dB	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	
10 dB/div Log	Ref Offset 26.8 dl Ref -10.00 dBr	B M		Mk	r1 799.048 MHz -44.448 dBm	Auto Tune
-20.0						Center Freq 802.000000 MHz
-30.0	- Iston Andre Antonio Constante and Antonio Con	Provent and a set of the set of t			-35.00 dBm	Start Freq 799.000000 MHz
-50.0		ang na ang ng n	high han dif i shekara	And have been all and a support of the second se	RMS RMS	<b>Stop Freq</b> 805.000000 MHz
-70.0						<b>CF Step</b> 600.000 kHz <u>Auto</u> Man
-90.0						<b>Freq Offset</b> 0 Hz
-100 Start 799.					Stop 805.000 MHz	
#Res BW	10 kHz	#VBW	30 kHz	#Sweep	1.000 s (1001 pts)	

#### BAND 14 Upper Emission Mask (793 MHz ~805 MHz) Plot (10M BW Ch.23330 QPSK_RB50_0)-2



🗾 Agilent Spect		•								- é	×
LXI RL		50 Ω AC		SENS	E:INT	#Avg Typ	ALIGN AUTO		M Dec 18, 2019 CE <b>1 2 3 4 5</b> 6	Frequenc	v
Center Fr	eq 5.01	5000000	GHZ PNO: Fast ↔	Trig: Free I		#Avg Typ	e. Rivis	TY	PE A WWWWW		-
			IFGain:Low	#Atten: 20	dB			D			
							M	(r1 3.71	8 4 GHz	Auto 1	Tune
10 dB/div	Ref 10.	00 dBm						-67.3	75 dBm		
0.00	<b>∂</b> ²									Center	Freq
-10.0										5.01500000	) GHz
-20.0											_
-30.0										Start	Freq
-40.0										30.00000	MHz
-50.0											
-60.0			^·	1							
			<u> </u>			بالبد يعمد بتغاده				Stop	Freq
-70.0					in the second second					10.00000000	) GHz
-80.0											
Start 30 M								Eton 40		05	24
#Res BW			#\/P)	W 3.0 MHz			woon 17	5.0p 10 7.33 ms (2	.000 GHz	997.000000	Step
			#VD1							Auto	Man
MKR MODE TR	C SCL	Х		Y	FUNCTI	ION FUN	NCTION WIDTH	FUNCTI	ON VALUE		
1 N 1 2 N 1	f	პ.	718 4 GHz 789.2 MHz	-67.375 dBr -4.329 dBr	n n						
3										Freq O	ffset
4 5											0 Hz
6									-		
7											
8											
10											
11											
									,		
MSG							UN STATU	5			

#### BAND 14. Conducted Spurious Plot (23305ch_5MHz_QPSK_RB 1_0)



🎉 Agilent Spect	rum Analyze	•									a 🗙
LXIRL	RF	50 Ω AC		SEN	ISE:INT	#4.40	ALIGN AUTO Type: RMS		AM Dec 18, 2019 CE <b>1 2 3 4 5 6</b>	Frequen	су
Center Fr	eq 5.0'	1500000	UGHZ PNO: Fast +	Trig: Free	Run	#Avg	Type. RMS	TY	PE A WWWWW		
			IFGain:Low	#Atten: 2				D			
							М	kr1 3 69	6 5 GHz	Auto	Tune
10 dB/div	Dof 10	).00 dBm						-67 4	48 dBm		
Log											
0.00										Cente	r Freg
-10.0	Ĭ									5.01500000	
										3.01300000	JO GHZ
-20.0											
-30.0										Star	t Freq
-40.0										30.00000	
-50.0										30.00000	
-60.0										Stor	Freq
-70.0			and the second			-	and the second		RMS	10.00000000	
-80.0										10.00000000	
Start 30 M	IHz							Stop 10	.000 GHz	CF	Step
#Res BW	1.0 MHz	Z	#VB	W 3.0 MHz			Sweep 1	7.33 ms (2	20001 pts)	997.00000	
		Х		Y	ELIN		FUNCTION WIDTH	EUNCTI	ON VALUE	Auto	Man
	f		3.696 5 GHz	-67.448 dE			1 Sherion Mari	i ronen			
2 N 1	f	-	791.7 MHz	-4.431 dE	3m					Freq	Offect
3										Fiequ	
5									E		0 Hz
6											
7 8	+ $+$										
9											
10											
11											
MSG							I STATL	15			
Mag							LO STAT				

#### BAND 14. Conducted Spurious Plot (23330ch_5MHz_QPSK_RB 1_0)



jji Agilent Spect	trum Analy		SA											
LXIRL	RF	50 Ω	AC	211-		SEN	SE:INT	#Δ.	AL g Type:			AM Dec 18, 201 CE <mark>1 2 3 4 5</mark>		Frequency
Center Fr	eq 5.	015000		PNO: Fast	-	Trig: Free	Run	#7.13	g type.	KW 3	TY	PE A WWWW	¥	
				IFGain:Low		#Atten: 20	dB				D	ET A A A A A	A	
										Mk	r1 3.71	2 4 GHz		Auto Tune
10 dB/div	Ref 1	10.00 dE	Bm								-67.3	94 dBm		
Log	2													
0.00														Center Freq
-10.0								_					5	.015000000 GHz
-20.0														
-30.0														Start Freq
-40.0	++-													30.000000 MHz
-50.0								_						
-60.0					<u>_</u> 1↓									
-70.0												RM		Stop Freq
and the second							معاقا النامي بالمطعور يريها						10	.000000000 GHz
-80.0														
Start 30 N	1H7	I									Ston 10	.000 GHz		CF Step
#Res BW		17		#∖	/BW	3.0 MHz			Sw	eep 17	.33 ms (2	20001 pts		997.000000 MHz
5											-		Aut	<u>o</u> Man
MKR MODE TR	C SCL		X 37	12 4 GHz		Y -67.394 dB		NCTION	FUNC	TION WIDTH	FUNCTI	ON VALUE		
2 N 1	f			98.2 MHz		-3.775 dB	m							<b>F O</b> [_]
3 4														Freq Offset
5														0 Hz
6														
7 8														
9														
10														
•												•		
MSG											3			
	_				_					<b>~</b>				

#### BAND 14. Conducted Spurious Plot (23355ch_5MHz_QPSK_ RB 1_0)



	ctrum Analyzer - Swept SA						
Center F	RF 50 Ω AC req 5.0150000		SENSE: Trig: Free Ru #Atten: 20 dB	#Av	ALIGN AUTO g Type: RMS	11:14:30 AM Dec 18, 201 TRACE 1 2 3 4 5 TYPE A WWWW DET A A A A A	Frequency
10 dB/div	Ref 10.00 dBn	n			Mk	r1 3.679 5 GH -67.485 dBn	Auto Tune
0.00 10.0 20.0							Center Fred 5.015000000 GH;
30.0 40.0 50.0							Start Free 30.000000 MH
60.0 70.0 80.0			1			Riv	<b>Stop Free</b> 10.000000000 GH
Start 30 M Res BW	1.0 MHz	# <b>V</b> E	W 3.0 MHz	FUNCTION	Sweep 17	Stop 10.000 GH .33 ms (20001 pts	CF Stej 997.000000 MH <u>Auto</u> Ma
1 N 1 2 N 1 3 4 5 6 7	1 f	3.679 5 GHz 789.2 MHz	-67. <u>485 dBm</u> -3.131 dBm	Forchow			Freq Offse
8 9 10 11			III			•	-
SG							

#### BAND 14. Conducted Spurious Plot (Ch.23330 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-2107-FC038-P