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FCC LTE REPORT

Certification

Applicant Name:
Franklin Technology Inc.Date of Issue:
December 28, 2018
Location:Address:
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Seoul, 08502 South Korea

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

Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA **Report No.:** HCT-RF-1812-FC016-R1

XHG-F800HPVL

APPLICANT:

FCC ID:

Franklin Technology Inc.

Model(s): EUT Type: FCC Classification: FCC Rule Part(s): F800HPVL VoLTE Home Phone Connect TNB-Licensed Non-Broadcast Station Transmitter §27, §2

	T	Emission		ERP		
	Tx Frequency (MHz)			Max. Power (W)	Max. Power (dBm)	
LTE – Band13 (5)	779.5 –784.5	4M53G7D	QPSK	0.303	24.82	
		4M51W7D	16QAM	0.254	24.05	
LTE – Band13 (10)	782.0	9M01G7D	- QPSK	0.297	24.73	
		9M04W7D	16QAM	0.252	24.01	

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)

AP

Report prepared by : Jae Ryang Do Engineer of Telecommunication Testing Center Report approved by : Kwon Jeong Manager of Telecommunication Testing Center

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<u>Version</u>

TEST REPORT NO.	DATE	DESCRIPTION		
HCT-RF-1812-FC016	December 11, 2018	- First Approval Report		
HCT-RF-1812-FC016-R1	December 28, 2018	- Revised the E.R.P		

Report No.:HCT-RF-1812-FC016-R1

CO.,LTD.

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	Franklin Technology Inc.
Address:	906 JEI Platz, 186, Gasan digital 1-ro, Gumcheon-gu Seoul, 08502 South
	Korea
FCC ID:	XHG-F800HPVL
Application Type:	Certification
FCC Classification:	TNB-Licensed Non-Broadcast Station Transmitter
FCC Rule Part(s):	§27, §2
EUT Type:	VoLTE Home Phone Connect
Model(s):	F800HPVL
Tx Frequency:	779.5 MHz –784.5 MHz (LTE – Band 13 (5MHz))
	782 MHz (LTE – Band 13 (10 MHz))
Date(s) of Tests:	November 26, 2018 ~ December 03, 2018
Peak. Ant gain:	5.63 dBi



2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a VoLTE Home Phone Connect with LTE.

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.



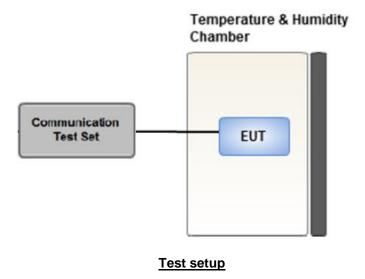
3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used			
Occupied Pendwidth	- KDB 971168 D01 v03r01 – Section 4.3			
Occupied Bandwidth	- ANSI C63.26-2015 – Section 5.4.4			
Dand Edge	- KDB 971168 D01 v03r01 – Section 6.0			
Band Edge	- 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			
	- 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 & 5.6			
Effective Isotropic Radiated Power	- ANSI C63.26-2015 – Section 5.2.4.2 & 5.2.5.5			
Dediated Sourious and Harmonia Entireira	- KDB 971168 D01 v03r01 – Section 6.2			
Radiated Spurious and Harmonic Emissions	- ANSI/TIA-603-E-2016 – Section 2.2.12			



3.2 EFFECTIVE RADIATED POWER



Test Overview

When an average power meter is used to perform RF output power measurements, the fundamental condition that measurements be performed only over durations of active transmissions at maximum output power level applies.

Conducted Output Power was tested in accordance with KDB971168 D01 Power Meas License Digital Systems v03r01, Section 5.2.

Test Note

1. The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided is:

ERP or EIRP = $P_{Meas} + G_T$

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm)

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW

 G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

3.3 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.



3.4 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 \ge 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.

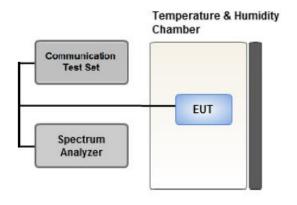
Test Note

- 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



3.5 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.

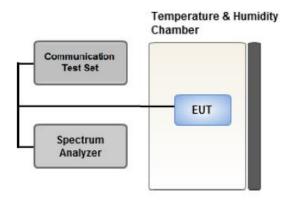
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

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



3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

Test Overview

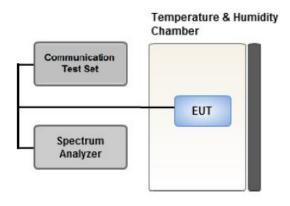
The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured 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 = Peak
- 4. Trace Mode = max hold
- 5. Sweep time = auto
- 6. Number of points in sweep ≥ 2 * Span / RBW



3.7 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

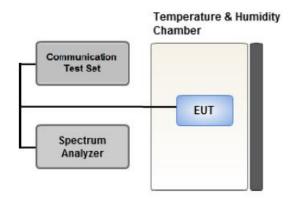
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a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



3.8 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.



3.9 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			
Radiated Spurious and Harmonic Emissions	QPSK	1	0	Z			

F 1 A /



3.10 WORST CASE(CONDUCTED TEST)

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

* Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power.



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
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/19/2018	Annual	07/19/2019
REOHDE & SCHWARZ	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
Effective Radiated Power	27.50(b)(10)	< 3 Watts max. ERP	PASS
Frequency stability / variation of ambient temperature	§2.1055, § 27.54	Emission must remain in band	PASS

6.2 Test Condition : Radiated Test

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

Note regarding all Emission Mask test plots:

The FCC limit is $65 + 10log_{10}(P_{[Watts]}) = -35$ 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 $10log_{10}(10 \text{ kHz}/6.25 \text{ kHz}) = 2.04$ 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. 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

Frequency (MHz)	Channel	Resource	Block Size Block		Conducted Power [dBm]		E.R.P [dBm]	
		BIOCK SIZE	Offset	QPSK	16QAM	QPSK	16QAM	
		1	0	21.34	20.57	24.82	24.05	
		1	12	20.78	19.99	24.26	23.47	
		1	24	20.49	19.81	23.97	23.29	
779.5	23205	12	0	19.76	18.79	23.24	22.27	
		12	6	19.76	18.74	23.24	22.22	
		12	11	19.60	18.58	23.08	22.06	
		25	0	19.90	18.87	23.38	22.35	
	23230	1	0	20.47	19.87	23.95	23.35	
		1	12	20.60	19.77	24.08	23.25	
		1	24	21.12	20.30	24.60	23.78	
782.0		12	0	19.47	18.44	22.95	21.92	
		12	6	19.69	18.66	23.17	22.14	
		12	11	19.72	18.62	23.20	22.10	
		25	0	19.61	18.63	23.09	22.11	
	23255	1	0	20.60	19.89	24.08	23.37	
		1	12	21.29	20.43	24.77	23.91	
		1	24	21.33	20.46	24.81	23.94	
784.5		12	0	19.73	18.63	23.21	22.11	
		12	6	20.32	19.21	23.80	22.69	
		12	11	20.38	19.39	23.86	22.87	
		25	0	20.03	19.04	23.51	22.52	

LTE Conducted Average Output Powers (5 MHz Band 13 LTE)

Note:

- 1. E.R.P = Conducted Power + Peak. Ant Gain(dBd)
- 2. Peak. Ant Gain(dBi) = 5.63 dBi
- 3. Peak. Ant Gain(dBd) = 5.63 2.15 = 3.48 dBd
- 3. Limit = 3 Watts(=34.77dBm)



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Frequency	Channel	Resource	Resource Block		ed Power 3m]	E.F [dB	
(MHz)		Block Size	Offset	QPSK	16QAM	QPSK	16QAM
		1	0	21.17	20.36	24.65	23.84
		1	24	20.72	19.89	24.20	23.37
		1	49	21.25	20.53	24.73	24.01
782.0	23230	25	0	19.71	18.74	23.19	22.22
		25	12	19.75	18.77	23.23	22.25
		25	24	20.18	19.07	23.66	22.55
		50	0	19.78	18.79	23.26	22.27

LTE Conducted Average Output Powers (10 MHz Band 13 LTE)

Note:

- 1. E.R.P = Conducted Power + Peak. Ant Gain(dBd)
- 2. Peak. Ant Gain(dBi) = 5.63 dBi
- 3. Peak. Ant Gain(dBd) = 5.63 2.15 = 3.48 dBd
- 3. Limit = 3 Watts(=34.77dBm)



8.2 RADIATED SPURIOUS EMISSIONS

MODE:	<u>LTE B13</u>
MODULATION SIGNAL:	<u>5 MHz QPSK</u>
DISTANCE:	<u>3 meters</u>
LIMIT:	<u>43 + 10 log10 (W)</u>

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
	1,559.0	-48.85	6.73	-53.34	1.23	н	-49.99	36.99
23205 (779.5)	2,338.5	-47.98	7.87	-51.50	1.56	V	-47.34	34.34
(113.3)	3,118.0	-52.13	9.21	-55.24	1.83	V	-50.01	37.01
	1,564.0	-47.27	6.76	-51.72	1.23	н	-48.35	35.35
23230 (782.0)	2,346.0	-44.80	7.92	-48.24	1.55	V	-44.02	31.02
(102.0)	3,128.0	-50.54	9.21	-53.57	1.82	V	-48.33	35.33
	1,569.0	-48.26	6.78	-52.67	1.23	н	-49.27	36.27
23255 (784.5)	2,353.5	-46.51	7.97	-50.16	1.53	н	-45.87	32.87
(101.0)	3,138.0	-50.33	9.20	-53.39	1.84	Н	-48.18	35.18

Note:

1. Limit = 43 + 10 log₁₀ (W) = -13.0 dBm



MODE:	<u>LTE B13</u>
MODULATION SIGNAL:	<u>10 MHz QPSK</u>
DISTANCE:	<u>3 meters</u>
LIMIT:	<u>43 + 10 log10 (W)</u>

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
	1,564.0	-46.83	6.76	-59.61	1.23	Н	-51.94	38.94
23230 (782.0)	2,346.0	-48.52	7.92	-58.12	1.55	Н	-49.60	36.60
(102.0)	3,128.0	-52.69	9.21	-61.45	1.82	V	-51.91	38.91

Note:

1. Limit = 43 + 10 log₁₀ (W) = -13.0 dBm



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	1575.41		-54.69	6.84	-63.24	1.24	V	-59.78	19.78
782.0	1564.82	WIDEBAND	-46.06	6.76	-54.54	1.23	н	-51.17	11.17
784.5	1564.72		-46.25	6.76	-54.74	1.23	Н	-51.36	11.36

OPERATING FREQUENTY: 782.0 MHz MEASURED OUTPUT POWER: 10 MHz QPSK

DISTANCE:

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)
782.0	1590.39	WIDEBAND	-54.62	7.01	-63.44	1.24	V	-59.82	19.82

3 meters



8.3 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)	
	5 MHz		QPSK	25	0	4.5301	
10	5 IVITIZ	700.0	16-QAM	25	0	4.5082	
13			782.0	QPSK	50	0	9.0128
10 MHz		16-QAM	50	0	9.0359		

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 33 ~ 36.

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	3.7269	27.976	-67.143	-39.167	
10	5	782.0	3.6745	27.976	-67.266	-39.290	12.00
13		784.5	3.7020	27.976	-67.334	-39.358	-13.00
	10	782.0	3.6780	27.976	-67.167	-39.191	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 49 ~ 52.

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

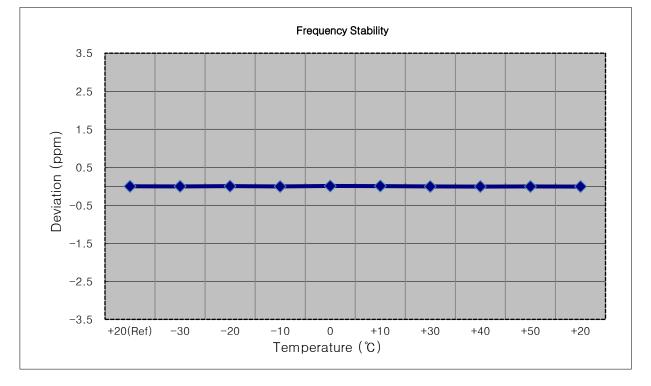
8.5 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 37 ~ 48.

8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

MODE:	<u>LTE 13</u>
OPERATING FREQUENCY:	<u>779,500,000 Hz</u>
CHANNEL:	<u>23205 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.80 VDC</u>
DEVIATION LIMIT:	Emission must remain in band

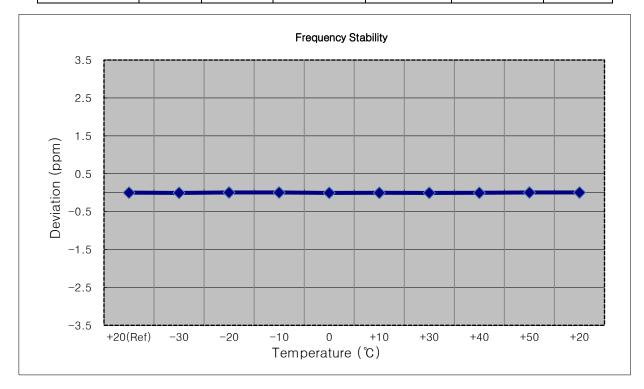
Voltage	Power	Temp.	Frequency Frequency		Deviation	
(%)	(VDC)	(°°)	(Hz)	(Hz) Error (Hz)		ppm
100%		+20(Ref)	779 499 997	0.00	0.000 000	0.0000
100%		-30	779 499 994	-2.70	0.000 000	-0.0035
100%	3.80	-20	779 500 000	3.50	0.000 000	0.0045
100%		-10	779 499 994	-3.10	0.000 000	-0.0040
100%		0	779 500 002	5.40	0.000 001	0.0069
100%		+10	779 500 000	3.80	0.000 000	0.0049
100%		+30	779 499 993	-4.10	-0.000 001	-0.0053
100%		+40	779 499 991	-5.90	-0.000 001	-0.0076
100%		+50	779 499 993	-3.40	0.000 000	-0.0044
Batt. Endpoint	3.40	+20	779 499 992	-4.90	-0.000 001	-0.0063





MODE:	<u>LTE 13</u>
OPERATING FREQUENCY:	<u>782,000,000 Hz</u>
CHANNEL:	<u>23230 (5 MHz)</u>
REFERENCE VOLTAGE:	3.80 VDC
DEVIATION LIMIT:	Emission must remain in band

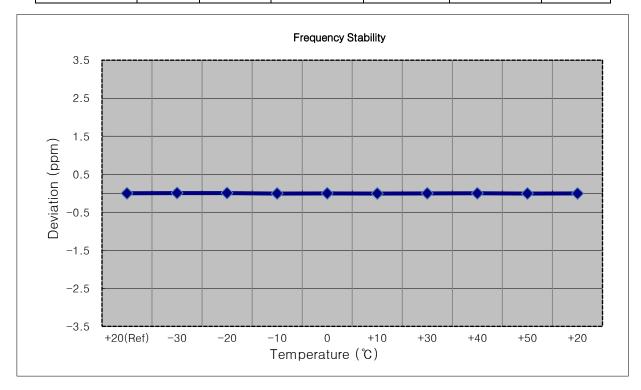
Voltage	Power	Temp.	Frequency Frequency		Deviation	
(%)	(VDC)	(℃) (Hz) Error (Hz)		(%)	ppm	
100%		+20(Ref)	782 000 004	0.00	0.000 000	0.0000
100%		-30	782 000 000	-4.00	-0.000 001	-0.0051
100%	3.80	-20	782 000 007	3.10	0.000 000	0.0040
100%		-10	782 000 008	4.30	0.000 001	0.0055
100%		0	781 999 999	-4.60	-0.000 001	-0.0059
100%		+10	782 000 000	-3.50	0.000 000	-0.0045
100%		+30	782 000 000	-3.80	0.000 000	-0.0049
100%		+40	782 000 001	-2.20	0.000 000	-0.0028
100%		+50	782 000 007	3.80	0.000 000	0.0049
Batt. Endpoint	3.40	+20	782 000 007	3.80	0.000 000	0.0049





MODE:	<u>LTE 13</u>
OPERATING FREQUENCY:	<u>784,500,000 Hz</u>
CHANNEL:	<u>23255 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.80 VDC</u>
DEVIATION LIMIT:	Emission must remain in band

Voltage	Power	Temp.	Frequency Frequency		Deviation		
(%)	(VDC)	(°°)	(°C) (Hz) Error (Hz)		(%)	ppm	
100%		+20(Ref)	779 499 994	0.00	0.000 000	0.0000	
100%		-30	779 499 998	4.20	0.000 001	0.0054	
100%	3.80	-20	779 499 999	5.20	0.000 001	0.0067	
100%		-10	779 499 989	-5.20	-0.000 001	-0.0067	
100%		0	779 499 991	-2.50	0.000 000	-0.0032	
100%		+10	779 499 988	-6.20	-0.000 001	-0.0080	
100%		+30	779 499 991	-2.60	0.000 000	-0.0033	
100%		+40	779 499 993	-1.10	0.000 000	-0.0014	
100%		+50	779 499 989	-5.20	-0.000 001	-0.0067	
Batt. Endpoint	3.40	+20	779 499 990	-3.30	0.000 000	-0.0042	

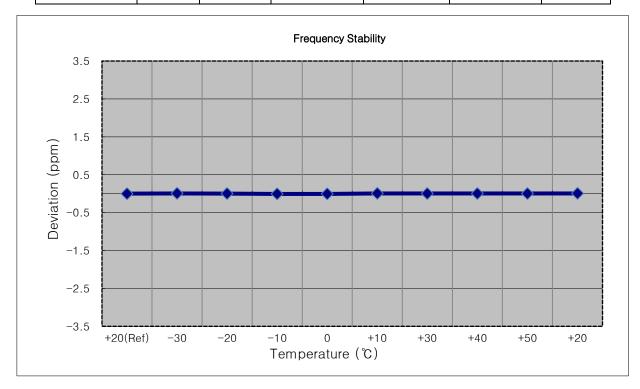




Report No.:HCT-RF-1812-FC016-R1

MODE:	LTE 13
OPERATING FREQUENCY:	<u>782,000,000 Hz</u>
CHANNEL:	<u>23230 (10 MHz)</u>
REFERENCE VOLTAGE:	3.80 VDC
DEVIATION LIMIT:	Emission must remain in band

Voltage	Power	Temp.	Frequency Frequency		Deviation		
(%)	(%) (VDC)		(Hz)	Error (Hz)	(%)	ppm	
100%		+20(Ref)	782 000 003	0.00	0.000 000	0.0000	
100%		-30	782 000 010	6.20	0.000 001	0.0079	
100%	3.80	-20	782 000 006	2.70	0.000 000	0.0035	
100%		-10	781 999 999	-4.30	-0.000 001	-0.0055	
100%		0	781 999 999	-4.70	-0.000 001	-0.0060	
100%		+10	782 000 008	5.00	0.000 001	0.0064	
100%		+30	782 000 008	4.30	0.000 001	0.0055	
100%		+40	782 000 008	4.30	0.000 001	0.0055	
100%		+50	782 000 006	3.00	0.000 000	0.0038	
Batt. Endpoint	3.40	+20	782 000 009	5.30	0.000 001	0.0068	





9. TEST PLOTS



		um Analyzer - Occ	upied BW										×
Cen	-	RF 50 Ω eq 782.000	2 AC		Center F	NSE:INT req: 782.000		ALIGN A	Ra	5:29:50 PM	Nov 23, 2018 None	Frequency	
PAS	S		#	↔ #IFGain:Low	Trig: Fre #Atten: 2		Avg Hold	3: 000/00		idio Devic	e: BTS		
		Ref Offset											
10 dE	3/div	Ref 40.0	0 dBm										
30.0												Center Fre	eq
20.0												782.000000 MI	Hz
10.0				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	harman	manha	mm	\sim					
0.00			/										
-10.0			h					<u> </u>	h				
-20.0	m m	han and the state of the state	hand hand						h	male			
-30.0								+		~~ ~ (r.			
-40.0													
-50.0												CF Ste	ep
Cent	ter 78:	2 MH7								Snan	10 MHz	1.000000 M	
		100 kHz			#VE	3W 390 k	Hz			Swee	ep 1 ms		
0	guoo	ied Band	width			Total P	ower	2	28.5 dE	Зm		Freq Offs	et
				301 MI	Hz							01	Hz
.	ranem	it Freq Er		24.449		OBW P	ower		99.00	9/-			
		indwidth		5.145 N		x dB	ower		-26.00				
×	ив ва	nawiath		3.143 N		Хав			20.00	αв			
MSG								T -	TATUS				
MSG		_						40 S	TATUS				_

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



	nalyzer - Occupied BW				_				
Center Fred	50 Ω AC 782.000000 M	Hz	Center Fre	SE:INT q: 782.00000		ALIGN AUTO	05:29:36 Radio Std	PM Nov 23, 2018 : None	Frequency
PASS		+→ #IFGain:Low	Trig: Free #Atten: 20		vg Hold:	500/500	Radio Dev	vice: BTS	
10 dB/div	Ref Offset 26.2 dB Ref 40.00 dBm	Guineow							
30.0									Center Freq 782.000000 MHz
20.0		man man	ym John Mar	ham	᠕ᠬᢇᠬᡳᠻᡁᠯ᠆	^{رس} م			
0.00									
-10.0	www.						harmon		
-30.0								- Archine	
-40.0									CF Step
Center 782 M #Res BW 100			#\/BI	W 390 kHz			Spa Sw	an 10 MHz eep 1 ms	1.000000 MHz
	Bandwidth			Total Pov		27 /	4 dBm	eep mis	Freq Offset
Occupied		082 M⊦				21			0 Hz
Transmit F	req Error	20.958 k	Hz	OBW Pow	/er	99	9.00 %		
x dB Band	width	5.017 M	Hz	x dB		-26.	00 dB		
MSG							s		

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



	ım Analyzer - Occu										
Center Fre	RF 50 Ω		17		NSE:INT req: 782.000	000 MHz	ALIGN		05:34:23 P Radio Std:	MNov 23, 2018	Frequency
PASS			⊷ IFGain:Low	. Trig: Free #Atten: 2		Avg Ho	ld: 500/5		Radio Dev	ice: BTS	
10 dB/div	Ref Offset Ref 40.0										
Log 30.0											Center Freq
20.0											782.000000 MHz
10.0			MWWANNALLA	fther was a for the	ᢇ᠇᠗ᡙᠧ᠕ᡟ᠆᠆ᠰᡟ᠋ᡁ	_{ᡊᢏᠣᢞᡃᠥ} ᡘᢦᢪᢆᢆᡗᡀᡀ					
0.00											
-10.0		1					\	- 1			
-20.0	an Wan							"how	horal and and a	8. I)	
-30.0									ملائدين <u>ب</u> ر	"wall-you low you	
-40.0											
-50.0											CF Step 2.000000 MHz
Center 782 #Res BW 2				#VE	3W 820 k	Hz			Spa Swe	n 20 MHz ep 1 ms	<u>Auto</u> Man
Occupi	ed Band	width			Total P	ower		28.7	dBm		Freq Offset
		9.0 ′	128 MI	Ηz							0 Hz
Transmi	it Freq Err	or	41.730	Hz	OBW P	ower		99.	00 %		
x dB Ba	ndwidth		10.11 N	IHz	x dB			-26.0	0 dB		
MSG							(STATUS			

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



🔰 Agilent Spectrum Analyzer - Occupied B	N							
ເ× RL RF 50Ω AC Center Freq 782.000000	MHz	SENSE:INT Center Freq: 782.00	00000 MHz	ALIGN AUTO	05:34:09 Pt Radio Std:	Nov 23, 2018 None	Frequency	
PASS	#IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold	1: 500/500	Radio Devi	ce: BTS		
Ref Offset 26.2 / 10 dB/div Ref 40.00 dB	dB							
30.0							Center Freq 782.000000 MHz	
10.0	Multiplestopurper	youth and a start and a start a start	walle and wat					
0.00				+				
-10.0								
-20.0 -30.0				<u>М</u> ,	whohnmanth	while where where		
-40.0								
-50.0							CF Step 2.000000 MHz	
Center 782 MHz #Res BW 200 kHz		#VBW 820	kHz		Spai Swe	n 20 MHz ep 1 ms	Auto Mar	
Occupied Bandwid		Total	Power	27.	5 dBm		Freq Offset 0 Hz	
9	.0359 MI	lz					0112	
Transmit Freq Error	28.425 k	Hz OBW	Power	99	0.00 %			
x dB Bandwidth	10.03 M	lHz x dB		-26.	00 dB			
MSG				I STATU	S			

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



📕 Agilent Spec	ctrum Analyzer - Swept SA RF 50 Ω AC		ENSE:INT		ALIGN AUTO	05:28:42 PM Nov 23, 2018	
	req 776.000000		ee Run	#Avg Typ		TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	Frequency Auto Tun
0 dB/div .og	Ref Offset 26.2 dB Ref 26.20 dBm				Mk	1 775.984 MHz -48.601 dBm	
6.2							Center Fre 776.000000 MH
.80							Start Fre 772.000000 MH
3.8						-13.00 dBm	Stop Fre 780.000000 M⊦
3.8							CF Ste 800.000 kH <u>Auto</u> Ma
3.8	ng met all with the all and an all and a state of the all and a	and the second					Freq Offs 0 H
3.8 enter 77	76.000 MHz					Span 8.000 <u>MHz</u>	
	100 kHz	#VBW 300 kH	Z		#Sweep	Span 8.000 MHz 1.000 s (1001 pts)	

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



							trum Analyzer - Swept SA	
Frequency	05:27:58 PM Nov 23, 2018 TRACE 1 2 3 4 5 6	ALIGN AUTO	#Avg Ty	NSE:INT		MHz	RF 50 Ω AC req 776.000000	LXI RL Center
					Trig: Fre #Atten: 2	PNO: Wide ↔ IFGain:Low		
Auto Tune	1 775.992 MHz -32.740 dBm	Mkr					Ref Offset 26.2 dB Ref 26.20 dBm	10 dB/div Log
Center Freq 776.000000 MHz								16.2
Start Freq 772.000000 MHz		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						-3.80
Stop Freq	-13.00 dBm							-3.60
780.000000 MHz				1				-23.8
CF Step 800.000 kHz <u>Auto</u> Man							and the second s	-33.8
Freq Offset 0 Hz								-53.8
								-63.8
	Span 8.000 MHz 1.000 s (1001 pts)	#Sweep		2	N 300 kHz	#VBV	6.000 MHz 100 kHz	Center 7 #Res BW
		I STATUS						MSG

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



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





nalyzer - Swept SA			
50 Ω AC SEN 776.000000 MHz PNO: Wide →→ IFGain:Low #Atten: 20		05:33:44 PM Nov 23, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A A A A A A A	Frequency
Offset 26.2 dB f 26.20 dBm	Mk	r1 775.992 MHz -46.693 dBm	Auto Tune
			Center Freq 776.000000 MHz
			Start Freq 772.000000 MHz
		-13.00 dBm	Stop Freq 780.000000 MHz
	1		CF Step 800.000 kHz <u>Auto</u> Man
			Freq Offset 0 Hz
0 MHz kHz #VBW 300 kHz	#Swoon	Span 8.000 MHz 1.000 s (1001 pts)	
KHZ #VBW 300 KHZ	#Sweep		

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



Agilent Spec	ctrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGN AUTO	05:33:01 PM Nov 23, 2018	
enter F	req 776.00000	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	Frequency
) dB/div °g	Ref Offset 26.2 dB Ref 26.20 dBm			Mk	r1 775.960 MHz -31.743 dBm	Auto Tun
6.2						Center Fre 776.000000 M⊦
.20					RMS	Start Fre 772.000000 M⊦
3.8					-13.00 dBm	Stop Fre
3.8			1			CF Ste 800.000 ki
.8	and potential design of the					Auto Ma
).8						Freq Offs 0 F
3.8						
	76.000 MHz 100 kHz	#VBV	V 300 kHz	#Sweep	Span 8.000 MHz 1.000 s (1001 pts)	
G						

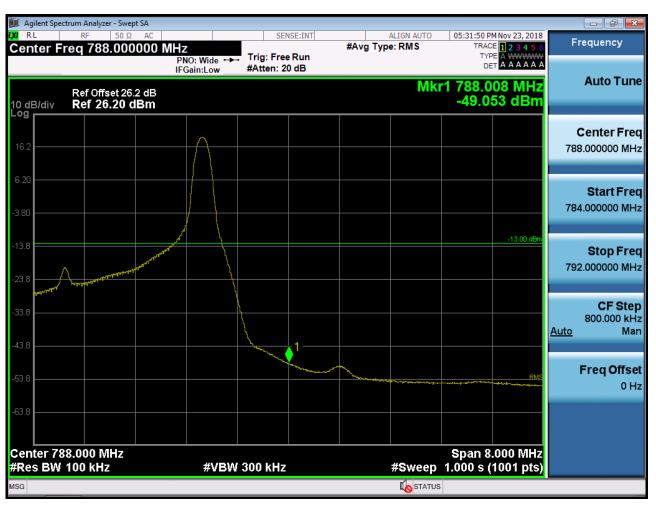
BAND 13. Lower & Upper Band Edge Plot (10M BW Ch.23230 QPSK RB_50)



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					
Center F	RF 50 Ω AC req 788.000000 I	MHz	SENSE:INT	ALIGN AUTO #Avg Type: RMS	05:31:03 PM Nov 23, 2018 TRACE 1 2 3 4 5 6	Frequency
		PNO: Wide ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB			
10 dB/div Log	Ref Offset 26.2 dB Ref 26.20 dBm			Mk	r1 788.000 MHz -32.359 dBm	Auto Tune
16.2						Center Freq 788.000000 MHz
6.20	*******					Start Freq 784.000000 MHz
-3.80					-13.00 dBm	Stop Freq
-23.8			. 1			792.000000 MHz
-33.8					RMS	CF Step 800.000 kHz <u>Auto</u> Man
-53.8						Freq Offset
-63.8						
Center 78 #Res BW	38.000 MHz 100 kHz	#VBW	300 kHz	#Sweep	Span 8.000 MHz 1.000 s (1001 pts)	
MSG					3	

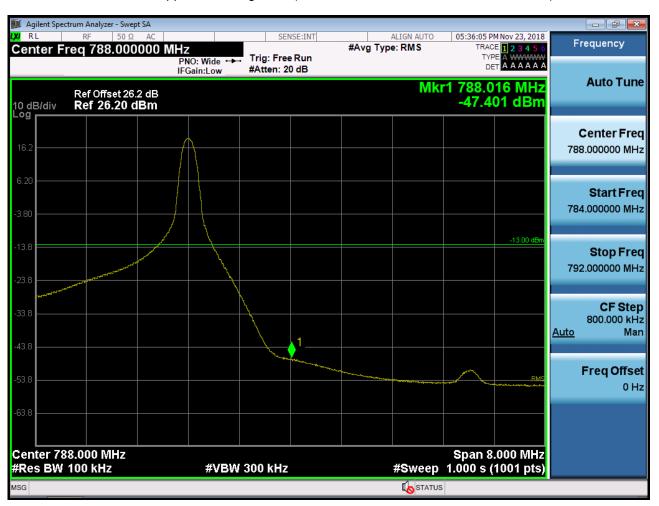
Band 13 Upper Band Edge Plot (5M BW Ch.23255 QPSK_RB_25)



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

	pectrum Analyzer - Swep	et SA									d X
LXI RL	RF 50 Ω			SEN	ISE:INT	#Avg Typ	ALIGN AUTO		4 Nov 23, 2018	Freque	ncy
Center	Freq 799.000		PNO: Wide +++	Trig: Free		#/18 199	e. 11110	TYP			
			IFGain:Low	#Atten: 20	0 dB					Aut	o Tune
	Ref Offset 26.	2 dB					Mk	r1 793.2	52 MHz	Aut	orune
10 dB/div Log	Ref -10.00	dBm						-57.14	46 dBm		
										Cent	er Freq
-20.0										799.0000	
										735.0000	00 10112
-30.0											
									-32.96 dBm	Sta	rt Freq
-40.0										793.0000	000 MHz
-50.0										Oto	n Erog
										805.0000	p Freq
-60.0	Margarden and Margare									805.000	
	The	we with the	Hageneraph marting	1. Mar. 1					RMS		
-70.0				warune anyanya	ዾዀኯኯዸቝቘጚዸዀዸዺኯኯዸኯ	Law Brandston barangan	1/1-h/14/14/110	di'),ariyarakal'ndijikiya	-สามะสุมะณ _์ สหสุดสุดรู		F Step
										Auto	Man
-80.0											
										Ener	Offeret
-90.0										Freq	0ffset 0 Hz
											0 H2
-100											
Stort 70								Oton 905			
	3.000 MHz N 10 kHz		#VBW	30 kHz			#Sweep	Stop 805. 1.000 s (′	1001 mHz		
MSG			(A.A74)								
mod							Norki Us				





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



	trum Analyzer - Swept SA					
Center F	RF 50 Ω AC req 788.000000	MHz	SENSE:INT	ALIGN AUTO #Avg Type: RMS	05:35:20 PM Nov 23, 2018 TRACE 1 2 3 4 5 6	Frequency
		PNO: Wide ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB			
10 dB/div	Ref Offset 26.2 dB Ref 26.20 dBm			Mk	r1 788.096 MHz -36.077 dBm	Auto Tune
						Center Freq
16.2						788.000000 MHz
6.20						
						Start Freq
-3.80						784.000000 MHz
-13.8					-13.00 dBm	Stop Freq
						792.000000 MHz
-23.8						
-33.8			1			CF Step 800.000 kHz
-43.8				and and the second and a second second second	RMS	<u>Auto</u> Man
40.0						Freq Offset
-53.8						0 Hz
-63.8						
	8.000 MHz				Span 8.000 MHz	
#Res BW	100 KHZ	#VBW	300 kHz	#Sweep	1.000 s (1001 pts)	

Band 13 Upper Band Edge Plot (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)





Agilent Spect X RL	trum Analyzer - Swept RF 50 Ω	SA AC	CEN	SE:INT	ALIGN AUTO	05:28:56 PM Nov 23, 2018	
	eq 5.01500			## Run	vg Type: RMS	TRACE 1 2 3 4 5 TYPE A WWWW DET A A A A A A	Frequency
10 dB/div	Ref 10.00 d	Bm			MI	kr1 3.726 9 GHz -67.143 dBm	Auto Tune
- og 0.00 10.0 20.0							Center Frec 5.015000000 GHz
30.0 40.0 50.0							Start Free 30.000000 MH
60.0 70.0 80.0			1				Stop Free 10.000000000 GH
tart 30 M Res BW		#V	BW 3.0 MHz		Sweep 17	Stop 10.000 GHz 7.33 ms (20001 pts)	CF Ste 997.000000 MH Auto Ma
MKR MODE TR 1 N 1 2 N 1 3 4 5	C SCL f f	X 3.726 9 GHz 777.8 MHz	Ƴ -67.143 dB -5.821 dB	FUNCTION m	FUNCTION WIDTH	FUNCTION VALUE	Freq Offse
6 7 8 9 10 11							
sg			III			8	

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



🔟 Agilent Spec 📈 R L	trum Analyzer - Swep RF 50 Ω	t SA AC	SEN	SE:INT	ALIGN AUTO	05:30:11 PM Nov 23, 201	8 _
Center Fi	req 5.01500	0000 GHz PNO: Fast IFGain:Low	+++ Trig: Free	#A Run	vg Type: RMS	TRACE 1 2 3 4 5 TYPE A WWWW DET A A A A A	6 W A
10 dB/div Log	Ref 10.00 c	IBm			MI	kr1 3.674 5 GH: -67.266 dBn	Auto Tune
0.00 -10.0							Center Freq 5.015000000 GHz
-30.0 -40.0 -50.0							Start Free 30.000000 MH;
-60.0 -70.0 -80.0			1			RM	Stop Fred 10.000000000 GH:
Start 30 N #Res BW		#V	BW 3.0 MHz		Sweep 17	Stop 10.000 GH 7.33 ms (20001 pts	CF Ster 997.000000 MH Auto Ma
MKR MODE TF 1 N 1 2 N 1 3 4 5	f	X <u>3.674 5 GHz</u> 780.7 MHz	Ƴ -67.266 dB -6.274 dB	FUNCTION m m	FUNCTION WIDTH	FUNCTION VALUE	
6 7 8 9 10 11							-
ISG					I STATU	s	

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



RL RF 50 Ω AC enter Freq 5.015000000		SENSE					
	0 GH7	SENSE		ALIGN AUTO g Type: RMS		MNov 23, 2018	Frequency
	PNO: Fast ← IFGain:Low	Trig: Free R #Atten: 20 d					
dB/div Ref 10.00 dBm				Mk	r1 3.702 -67.33	2 0 GHz 34 dBm	Auto Tune
2 .00 .00							Center Fred 5.015000000 GHz
0.0 0.0 0.0							Start Fred 30.000000 MH;
D.0 D.0 D.0 D.0			, en , so t- un t- , et t- , e			RMS	Stop Frec 10.000000000 GHz
tart 30 MHz Res BW 1.0 MHz	#VB1	N 3.0 MHz		Sweep 17	.33 ms (20		CF Step 997.000000 MH: <u>Auto</u> Mar
R MODE TRC SCI X 1 N 1 f 3 2 N 1 f 3 3 4 4 4 4 5 4 4 4 4	8.702 0 GHz 787.2 MHz	Ƴ <u>-67.334 dBm</u> -5.154 dBm	FUNCTION	FUNCTION WIDTH	FUNCTIO		Freq Offse 0 H;
6 7 8 9 9 0 1							
		III				4	

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



🔰 Agilent Spectrum Analyzer - S	wept SA					
		SENSE		ALIGN AUTO	05:33:59 PM Nov 23, 2018 TRACE 1 2 3 4 5 6	Frequency
Center Freq 5.015	PNO: Fast IFGain:Low		lun	rype. Rivis		
10 dB/div Ref 10.0	0 dBm			Mk	r1 3.678 0 GHz -67.167 dBm	Auto Tune
-10.0						Center Freq 5.015000000 GHz
-30.0						Start Freq 30.000000 MHz
-60.0 -70.0 -80.0					RMS	Stop Freq 10.000000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#V	BW 3.0 MHz		Sweep 17	Stop 10.000 GHz 33 ms (20001 pts)	CF Step 997.000000 MHz Auto Man
MKR MODE TRC SCL	× 3.678 0 GHz	Y -67.167 dBn		FUNCTION WIDTH	FUNCTION VALUE	Auto Man
2 N 1 f 3 4 5	778.2 MHz	-5.813 dBn			=	Freq Offset 0 Hz
6 7 8 9 10						
<pre></pre>		III		I STATUS	• • • • • • • • • • • • • • • • • • •	

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



10. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-1812-FC016-P
2	HCT-RF-1812-FC017-P