

FCC Test Report

(PART 27)

Report No.: RF160831C13

FCC ID: HFS-M99

Test Model: QTAXU1

Received Date: Aug. 31, 2016

Test Date: Sep. 12, 2016 ~ Sep. 14, 2016

Issued Date: Sep. 21, 2016

Applicant: Quanta Computer Inc.

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Release Control Record

ssue No.	Description	Date Issued
F160831C13	Original Release	Sep. 21, 201
		·



1 Certificate of Conformity

Product:	1.39 inch Smart Watch
Test Model:	QTAXU1
Sample Status:	Engineering Sample
Applicant:	Quanta Computer Inc.
Test Date:	Sep. 12, 2016 ~ Sep. 14, 2016
Standards:	FCC Part 27, Subpart C

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :

hen

Date: Sep. 21, 2016

Sep. 21, 2016

Date:

Rona Chen / Specialist

Approved by :

Stanley Wu / Assistant Manager



Applied Standard: FCC Part 27 & Part 2 (LTE 13)							
FCC Clause	Test Item	Result	Remarks				
2.1046 27.50(b)(10) Maximum Peak Output Power		Pass	Meet the requirement of limit.				
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.				
2.1049 27.53(g)	Occupied Bandwidth	Pass	Meet the requirement of limit.				
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.				
27.53(g)	Band Edge Measurements	Pass	Meet the requirement of limit.				
2.1051 27.53(g)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.				
2.1053 27.53(g)(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -13.03 dB at 1564.00 MHz.				

2 Summary of Test Results

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB



2.2 Test Site and Instruments

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Jan. 21, 2016	Jan. 20, 2017
Spectrum Analyzer Agilent	N9010A	MY52220314	Oct. 23, 2015	Oct. 22, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2015	Dec. 16, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Jan. 04, 2016	Jan. 03, 2017
Double Ridge Guide Horn Antenna EMCO	3115	5619	Jan. 04, 2016	Jan. 03, 2017
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Jan. 07, 2016	Jan. 06, 2017
Agilent Communications Tester-Wireless	8960 Series 10	MY53201073	Jul. 03, 2015	Jul. 02, 2017
Preamplifier EMCI	EMC 012645	980115	Dec. 21, 2015	Dec. 20, 2016
Preamplifier EMCI	EMC 184045	980116	Dec. 21, 2015	Dec. 20, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2015	Dec. 27, 2016
Power Meter Anritsu	ML2495A	1232002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor Anritsu	MA2411B	1207325	Sep. 21, 2015	Sep. 20, 2016
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 12, 2015	Oct. 11, 2016
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 12, 2015	Oct. 11, 2016
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 12, 2015	Oct. 11, 2016
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer	MT8820C	6201300640	Aug. 10, 2015	Aug. 09, 2017

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

- 2. The test was performed in HwaYa Chamber 10.
- 3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
- 4. The FCC Site Registration No. is 690701.
- 5. The IC Site Registration No. is IC7450F-10.



3 General Information

3.1 General Description of EUT

Product	1.39 inch Smart Watch	1.39 inch Smart Watch				
Test Model	QTAXU1					
Status of EUT	Engineering Sample					
Power Supply Rating	3.85 Vdc (Li-ion battery)					
Modulation Type	LTE	QPSK, 16QAM				
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5 ~ 784.5 MHz				
Frequency Range	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0 MHz				
Emission Designator	LTE Band 13 (Channel Bandwidth: 5 MHz)	4M51G7D				
Emission Designator	LTE Band 13 (Channel Bandwidth: 10 MHz)	8M93G7D				
	LTE Band 13 (Channel Bandwidth: 5 MHz)	76.03mW				
Max. ERP Power	LTE Band 13 (Channel Bandwidth: 10 MHz)	55.21mW				
Antenna Type	Fixed External Antenna					
Accessory Device	Refer to Note as below					
Data Cable Supplied Refer to Note as below						

Note:

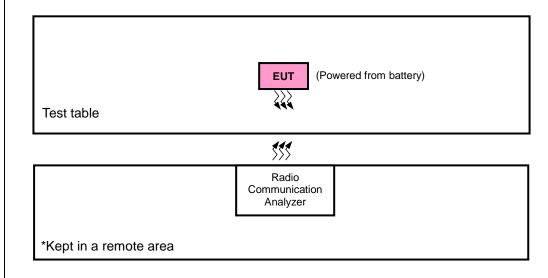
1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Battery	WELLTECH ENERGY INC.	EXGU111K2003	3.85 Vdc, 450 mAh
Wireless Charger	N/A	QXU1	
LTE Chip	Qualcomm	WTR2965	
WLAN Chip	Qualcomm	WCN3620	
NFC Chip	NXP	PN5482D2EV	

2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.



3.2 Configuration of System under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Radio Communication Analyzer	Anritsu	6201300640	N/A	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).

2. Items 1 acted as communication partners to transfer data.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	ERP / EIRP	Radiated Emission
LTE Band 13	X-plane	X-axis



LTE Band 13

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
	ERP	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
	Frequency	23205 to 23255	23230	5 MHz	QPSK	1 RB / 0 RB Offset
-	Stability	23230	23230	10 MHz	QPSK	1 RB / 24 RB Offset
	Occupied	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
-	Bandwidth	23230	23230	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
	Peak to Average	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Ratio	23230	23230	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23205 5 MHz	5 MHz	QPSK	1 RB / 0 RB Offset	
		23205 to 23255	23205		QFSK	25 RB / 0 RB Offset
		23205 10 23255	00055		QPSK	1 RB / 24 RB Offset
	Dan d Edua		23255	5 MHz	QPSK	25 RB / 0 RB Offset
-	Band Edge		00000		0001/	1 RB / 0 RB Offset
		00000	23230	10 MHz	QPSK	50 RB / 0 RB Offset
		23230 —	00000	40.1411	QPSK	1 RB / 49 RB Offset
			23230	10 MHz		50 RB / 0 RB Offset
	Conducted	23205 to 23255	23230	5 MHz	QPSK	1 RB / 0 RB Offset
-	Emission	23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 65 % RH	3.85 Vdc	Anson Lin
Frequency Stability	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Occupied Bandwidth	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Band Edge	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Peak to Average Ratio	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Condcudeted Emission	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Radiated Emission	25 deg. C, 65 % RH	3.85 Vdc	Getaz Yang



3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2 FCC 47 CFR Part 27 KDB 971168 D01 Power Meas License Digital Systems v02r02 ANSI/TIA/EIA-603-D 2010

Note: All test items have been performed and recorded as per the above standards.



4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 776-787 MHz band are limited to 3 watts ERP

4.1.2 Test Procedures

EIRP / ERP Measurement:

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5 MHz for WCDMA and 10 MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G.
- d. EIRP = Output power level of S.G TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power 2.15 dBi.

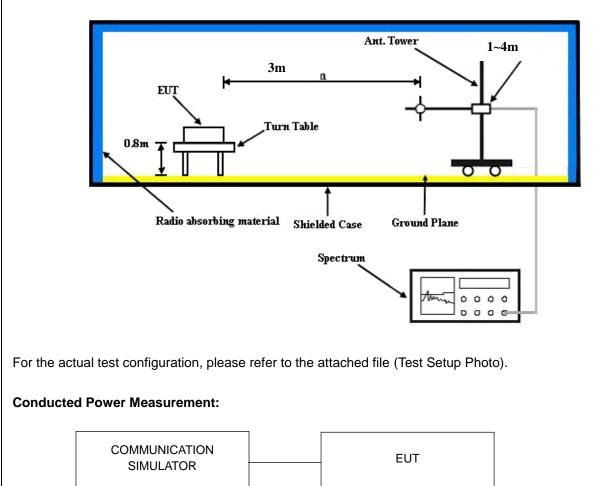
Conducted Power Measurement:

- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



4.1.3 Test Setup

EIRP / ERP Measurement:





4.1.4 Test Results

Conducted Output Power (dBm)

				QPSK			16QAM			
Band / BW	RB Size	RB Offset	Low Ch 23205	Mid Ch 23230	High Ch 23255	3GPP MPR	Low Ch 23205	Mid Ch 23230	High Ch 23255	3GPP MPR
			779.5 MHz	782.0 MHz	784.5 MHz	(dB)	779.5 MHz	782.0 MHz	784.5 MHz	(dB)
	1	0	22.99	23.02	22.90	0	21.93	21.96	21.84	1
	1	12	22.61	22.64	22.52	0	21.55	21.58	21.46	1
	1	24	22.90	22.93	22.81	0	21.84	21.87	21.75	1
13 / 5M	12	0	21.90	21.93	21.81	1	20.84	20.87	20.75	2
	12	6	21.70	21.73	21.61	1	20.64	20.67	20.55	2
	12	13	22.08	22.11	21.99	1	21.02	21.05	20.93	2
	25	0	21.82	21.85	21.73	1	20.76	20.79	20.67	2

Band / BW	RB Size	RB Offset	QPSK Mid Ch 23230 782.0 MHz	3GPP MPR (dB)	16QAM Mid Ch 23230 782.0 MHz	3GPP MPR (dB)
	1	0	23.11	0	22.06	1
	1	24	22.73	0	21.68	1
40 / 40 4	1	49	23.02	0	21.97	1
13 / 10M	25	0	22.02	1	20.97	2
	25	12	21.82	1	20.77	2
	25	25	22.20	1	21.15	2



				LTE Band 13						
			Channel Ba	andwidth: 5 MHz	/ QPSK					
Plane	ne Channel Frequency LVL Correction (MHz) (dBm) Factor (dB) ERP (dBm) ERP (mW)									
	23205	779.5	-11.46	32.24	18.63	72.95				
	23230	782.0	-11.35	32.17	18.67	73.62	н			
x	23255	784.5	-11.39	32.11	18.57	71.94				
	23205	779.5	-16.98	32.43	13.30	21.38				
	23230	782.0	-16.90	32.42	13.37	21.73	V			
	23255	784.5	-16.96	32.46	13.35	21.63				
			Channel Ba	ndwidth: 5 MHz	/ 16QAM					
	23205	779.5	-12.85	32.24	17.24	52.97				
	23230	782.0	-12.70	32.17	17.32	53.95	н			
V	23255	784.5	-12.73	32.11	17.23	52.84				
X	23205	779.5	-17.81	32.43	12.47	17.66				
	23230	782.0	-17.74	32.42	12.53	17.91	V			
	23255	784.5	-17.86	32.46	12.45	17.58				

ERP Power (dBm)

	LTE Band 13											
	Channel Bandwidth: 10 MHz / QPSK											
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)					
x	23230	782.0	-11.21	32.17	18.81	76.03	Н					
^	23230	782.0	-16.79	32.42	13.48	22.28	V					
		(Channel Bar	dwidth: 10 MHz	/ 16QAM							
x	23230	782.0	-12.60	32.17	17.42	55.21	Н					
^	23230	782.0	-17.66	32.42	12.61	18.24	V					



4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

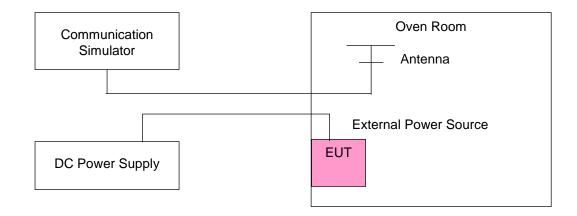
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.2.2 Test Procedure

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5
 °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the communication simulator.

4.2.3 Test Setup





4.2.4 Test Results

Frequency Error vs. Voltage

	Frequency	Error (ppm)	
Voltage (Volts)	LTE B	Limit (ppm)	
(10110)	5 MHz	10 MHz	
3.85	0.004603581	0.002173913	2.5
3.4	0.004219949	0.00370844	2.5
4.2	0.001534527	0.004731458	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.4 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

	Frequency		
Temp. (℃)	LTE B	Limit (ppm)	
	5 MHz	10 MHz	
-30	0.003452685	0.002685422	2.5
-20	0.003836317	0.002173913	2.5
-10	0.004347826	0.004219949	2.5
0	0.003452685	0.004475703	2.5
10	0.001534527	0.002685422	2.5
20	-0.004859335	-0.004987212	2.5
30	-0.003196931	-0.004092072	2.5
40	-0.004475703	-0.002685422	2.5
50	-0.003964194	-0.002813299	2.5



4.3 Occupied Bandwidth Measurement

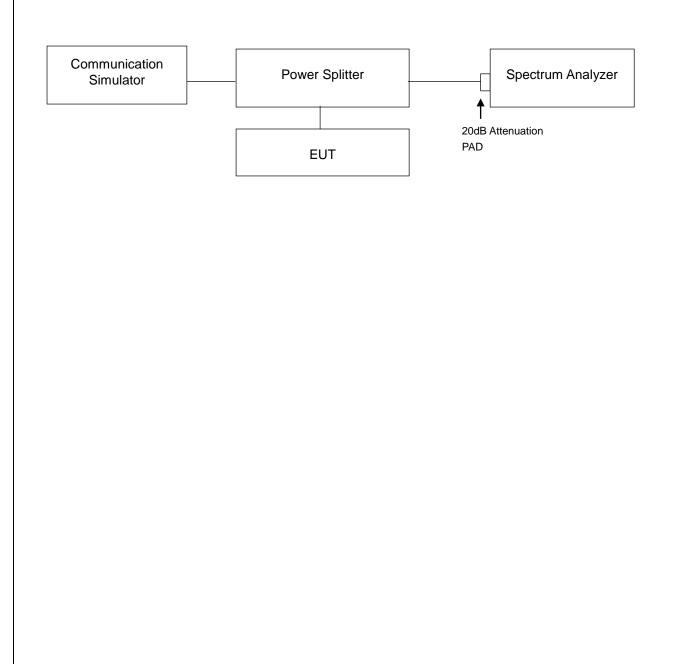
4.3.1 Limits of Occupied Bandwidth Measurement

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.

4.3.2 Test Procedure

- a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

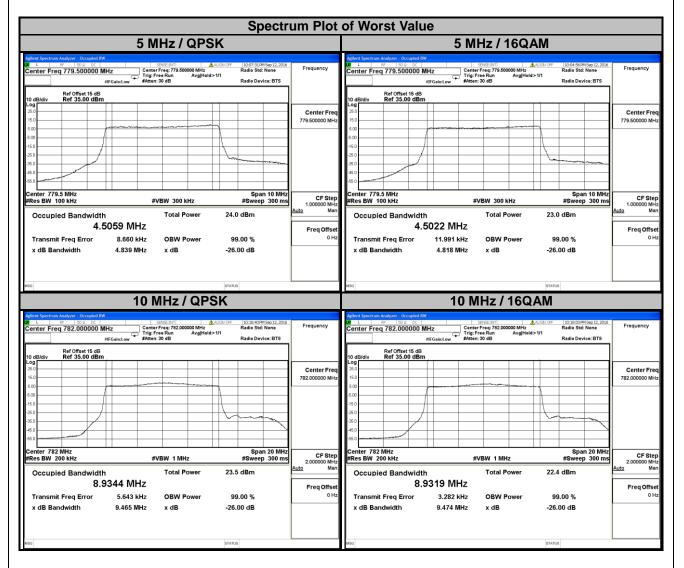
4.3.3 Test Setup





4.3.4 Test Result

LTE Band 13										
(Channel Band	width: 5 MH	z	C	hannel Band	width: 10 MH	lz			
Channel	Frequency	99 % Occupied Bandwidth (MHz)		Channel	Frequency	99 % Oo Bandwid	ccupied th (MHz)			
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM			
23205	779.5	4.5059	4.5022							
23230	782.0	4.4715	4.4673	23230	782.0	8.9344	8.9319			
23255	784.5	4.5041	4.4999							





4.4 Band Edge Measurement

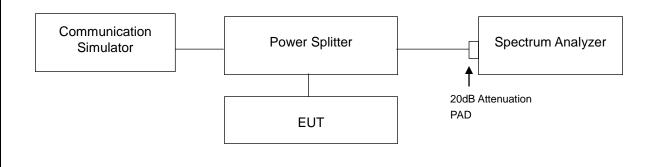
4.4.1 Limits of Band Edge Measurement

For operations in the 776-787 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations

For operations in the 1710–1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

4.4.2 Test Setup



4.4.3 Test Procedures

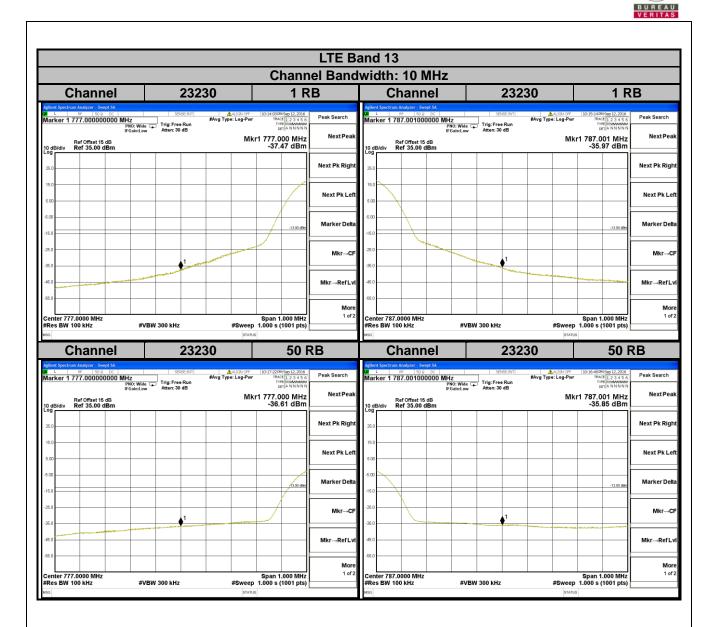
- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 5 MHz/10 MHz).
- c. Record the max trace plot into the test report.



4.4.4 Test Results

Band Edge

	LTE Band 13 Channel Bandwidth: 5 MHz												
		Channel Bar	dwidth: 5 MHz										
Channel	23205	1 RB	Channel	23255	1 RB								
Agilent Spectrum Analyzer - Swept SA	SENCE:INT	10:01:35 PM Sep 12, 2016 Back Search	Agilent Spectrum Analyzer - Swept SA	SENSE:INT	OFF 10:03:06 PM Sep 12, 2016 Back Search								
Marker 1 776.999000000 MHz PNO: W IFGain:L	#Avg Type: Log-Pv	TRACE 1 2 3 4 5 6 Peak Search	Marker 1 787.001000000 MHz PNO: Wi IFGain:L	#Avg Type: Log Ide () Trig: Free Run	Pwr TRACE 1 2 3 4 5 6 TYPE MWWWWWW DET A NNNNN								
Ref Offset 15 dB 10 dB/div Ref 35.00 dBm		kr1 776.999 MHz -27.85 dBm	k Ref Offset 15 dB 10 dB/div Ref 35.00 dBm		Mkr1 787.001 MHz -25.95 dBm								
25.0		Next Pk Rigi			Next Pk Right								
5.00		Next Pk Le	n 5.00		Next Pk Left								
-5.00		Marker Del	-5.00		-13.00 dbn Marker Delta								
-25.0	1	Mkr→C	F -25.0	1	MkrCF								
-35.0 -45.0		Mkr→RefL			Mkr-RefLv								
-55.0	A/RW 200 LUT #Suga	Span 1.000 MHz 1 of	2 Center 787.0000 MHz	WDW 200 kHz #01	Span 1.000 MHz 1 of 2								
Center 777.0000 MHz #Res BW 100 kHz #	STA	Span 1.000 MHz 1 of p 1.000 s (1001 pts)	e 2 Center 787.0000 MHz #Res BW 100 kHz #	-	Span 1.000 MHz 1 of 2 reep 1.000 s (1001 pts)								
Center 777.0000 MHz #Res BW 100 kHz #		Span 1.000 MHz 1 of p 1.000 s (1001 pts)	e Center 787.0000 MHz #Res BW 100 kHz two Channel		Span 1.000 MHz 1 of 2 veep 1.000 s (1001 pts)								
Center 777.0000 MHz #	51A 23205 SBIGE.INT	Span 1.000 MHz 1 of pp 1.000 s (1001 pts) 1 Dus 25 RB 100224MSpp 12.2010 Peak Search wr PhotE [2.2.34.5	e 2 2 2 2 2 2 2 2 2 2 2 2 2	23255	Span 1.000 MHz 1 of 2 reep 1.000 s (1001 pts) 25 RB 27 HD03-8PM Sep 12, 2010 Peak Search Physic [1,2,3,4,6,6] Peak Search								
Center 777.0000 MHz # Res BW 100 kHz # Channel Addred Spectrum (Addred) - Swert SA Addred Spectrum (Addred) - Swert SA Marker 1 776.996000000 MHz PHO: WE PhO: WE PhO: WE Contact Addred Spectrum (Addred) - Swert SA Pho: WE Pho:	23205 2000 Min States 4 C Trig: Free Run Attan: 30 dB	Span 1.000 MHz 1 of 1000 s (1001 pts) 1 of 25 RB 100224PMSep12.2010	e center 787.0000 MHz #Res BW 100 kHz #BS Channel Addred Spectrum Androne - Swept SA H L 100 (200 CC) Marker 1 787.001000000 MHz Proceeding	23255 SREEMI & AAU27 dia Trig: Free Run Attrig: Stee Run Attrig: Stee Run	Span 1.000 MHz 1 of 2 reep 1.000 s (1001 pts) 3174/14 25 RB CP 000 S (1001 pts) 1000 s (1001 pts)								
Center 777.0000 MHz # #Res BW 100 kHz # Channel Admt Spectrus Analyser 1 Swap 5.4	23205 2000 Min States 4 C Trig: Free Run Attan: 30 dB	Span 1.000 MHz 1 of span 1.000 s (1001 pts) 1 of Z5 RB Peak Search 100024MM Spi 12, 2016, WHZ Peak Search WT WAXE [2 2 4 5 0 Peak Search WT 1776, 996 MHZ Next Peak	e c c c c c c c c c c c c c	23255 SREEMI & AAU27 dia Trig: Free Run Attrig: Stee Run Attrig: Stee Run	Span 1.000 MHz 1 of 2 Span 1.000 MHz 1 of 2 Colspan="2">Span 1.000 MHz 1 of 2 Span 1.000 MHz 1 of 2 Span 1.000 MHz 1 of 2 Span 1.000 MHz Peak Search TRACT [1.2.3 + 5.0 Peak Search MKr1 787.001 MHz Next Peak								
Center 777.0000 MHz Res BW 100 kHz # MIST Channel Addred Spectrum Judyrer Swert SA De L PP ISSO RE Marker 1 776.996000000 MHz PRO W Ref 076set 15 dB 10 dB/div Ref 076set 15 dB 10 dB/div	23205 2000 Min States 4 C Trig: Free Run Attan: 30 dB	Span 1.000 MHz 1 of sp 1.000 s (1001 pts) 1 of 25 RB Peak Search WM (2.2.4.5.0) Peak Search W (76.996 MHz) NextPea -32.51 dBm NextPea	e center 787.0000 MHz ## #Res BW 100 kHz ## Insci Channel Channel Marker 1787.001000000 MHz Marker 1787.001000000 MHz Ref Offset 15 dB 10 dBidly Ref 35.00 dBm 25.0 15.0	23255 SREEMI & AAU27 dia Trig: Free Run Attrig: Stee Run Attrig: Stee Run	Span 1.000 MHz 1 of 2 creep 1.000 s (1001 pts) 1 25 RB Span 1.000 MHz Peak Search Peak Search NYN NY Peak Search NYN NY Peak Search Mkr1 787.001 MHz -33.63 dBm NextPeak								
Center 777.0000 MHz # #Res BW 100 kHz # Mol Channel Addent Spectrum Analyzer / Swed St. # 10 / 10	23205 2000 Min States 4 C Trig: Free Run Attan: 30 dB	Span 1.000 MHz 1 of Span 1.000 s (1001 pts) 1 of 25 RB 1002 AMM Sp 12, 2010 Image: Span 1.000 MHz Peak Search Image: Span 1.000 s (1001 pts) Next Peak Search Image: Span 1.000 MHz Next Peak Search	e c center 787.0000 MHz #Res BW 100 kHz #Ind Channel Channel Marker 1787.001000000 MHz Picket 10 dBidly Ref 35.00 dBm 10 dBidly Ref 35.00 dBm 150 500 500	23255 SREEMI & AAU27 dia Trig: Free Run Attrig: Stee Run Attrig: Stee Run	Span 1.000 MHz 1 of 2 reep 1.000 s (1001 pts) 25 RB Peak Search "Per Transmission of the standing of th								
Center 777.0000 MHz Refs BW 100 kHz	23205 2000 Min States 4 C Trig: Free Run Attan: 30 dB	Span 1.000 MHz 1 of sp 1.000 s (1001 pts) 1 of 25 RB Peak Search mmail [2 2 4 5 0 fm] Peak Search mmail [2 2 4 5 0 fm] Next Pk Rigit .32.51 dBm Next Pk Rigit Next Pk Le Next Pk Le	Center 787.0000 MHz # Res BW 100 kHz # HIS Channel Marker 1787.00100000 MHz # Marker 1787.00100000 MHz # HIGHL Ref 500 000 MHZ # HIGHL REF 5.00 dBm 10 dBidly Ref 55.00 dBm 150 500 500 500 500 500 500 500 500 500	23255 SREEMI & AAU27 dia Trig: Free Run Attrig: Stee Run Attrig: Stee Run	1 of 2 Span 1.000 MHz 1 of 2 Status Status Status Status Status Status Press Status Marcial (2.3.6) Peak Status Marcial (2.3.6) Marcial (2.3.6								
Center 777.0000 MHz Res BW 100 kHz	23205 2000 Min States 4 C Trig: Free Run Attan: 30 dB	Span 1.000 MHz 1 of sp 1.000 s (1001 pts) 1 of 25 RB Peak Search mmd [1 2 3 4 6 0 free] 1 3 2 6 6 0 free] 1	Center 787.0000 MHz #Rest 787.0000 MHz #Rest 787.0000 MHz #Rest 7787.0000 MHz #Rest 7787.0000000 MHz #Rest 7787.001000000 MHz #Rest 7787.001000000 MHz #Rest 7787.001000000 MHz #Rest 7787.0010000000 MHz #Rest 7787.0010000000 MHz #Rest 7787.00100000000 #Rest 75.00 dBm #Rest 7787.000 dBm #Rest 7787.0000 dBm #Rest 7787.0000 dBm #Rest 7787.0000 dBm #Rest 7787.00000 dBm #Rest 7787.00000 dBm #Rest 7787.0000000000000000000000000000000000	23255 SREEMI & AAU27 dia Trig: Free Run Attrig: Stee Run Attrig: Stee Run	1 of 2 Span 1.000 MHz 1 of 2 Status Status Status Status Status Status Status Peak Search Tereform NNNN Mext Peak Search Tereform NNNN Next Peak Search Tereform NNNN Next Peak Next Peak Next Peak Marker Delta								
Center 777.0000 MHz Refs BW 100 KHz	23205 2000 Min States 4 C Trig: Free Run Attan: 30 dB	Span 1.000 MHz 1 of sp 1.000 s (1001 pts) 1 of 25 RB Peak Search m 1002-24M Sep 12,2010 mm (2, 2, 3 + 5) Peak Search m m (2, 2, 3 + 5) Peak Search m m (2, 2, 3 + 5) Peak Search m m (2, 2, 3 + 5) Peak Search m m (2, 2, 3 + 5) Peak Search m m (2, 2, 3 + 5) Peak Search m Next Peak Next Peak -32.51 dBm Next Pk Rigit -300.66 Marker Deb -300.66 MkrC	Center 787.0000 MHz # # # Ref 300 000 MHz # # # # # # # # Channel #	23255 SREEMI & AAU27 dia Trig: Free Run Attrig: Stee Run Attrig: Stee Run	Span 1.000 MHz 1 of 2 Span 1.000 s (1001 pts) Peak Search Stratus Peak Search CP 1000-self-table Peak Search Mkr1 787.001 MHz -33.63 dBm Next Peak Image: Search Next Peak Marker Detta Mkr1 787.001 MHz Mext Peak Mext Peak Mkr Mext Peak Marker Detta								





			Band 13		
		Channel Bai	ndwidth: 5 MHz		
Channel	23205	1 RB	Channel	23255	1 RB
Reysight Spectrum Analyzer - Swept SA RF 50 Ω Marker 1 774.016000000 MHz PNO: W IFGaint.	SENSE:INT ALIGN AUT #Avg Type: Log-P Trig: Free Run ww #Atten: 30 dB	wr TRACE 1 2 3 4 5 6 Peak Search	Keysight Spectrum Analyzer - Swept SA	SENSE:INT ALIGN A #Avg Type: Log- Trig: Free Run #Atten: 30 dB	UTO 06:47:20 PM Oct 11, 2016 Pwr TRACE [1 2 3 4 5 6 TYPE MWWWWW DET A N N N N N
Ref Offset 15 dB 10 dB/div Ref 20.00 dBm		NextPe -59.691 dBm			Mkr1 800.380 MHz -59.860 dBm
10.0		Next Pk Rig	ht 10.0		Next Pk Righ
10.0		Next Pk L	-10.0		Next Pk Le
30.0		DL1 -33 00 dBm	20.0		0.1 -33 00 dBm
40.0		Mkr→			Mkr→C
	1961 - ang diskonski tangar ngaragi di katalihan 1961 - yang 1964 - yang	ja.saukuskijelle-vrabijeli.iMente Mkr→Refi	4		Mr-srathana Mkr-RefL
70.0		Stop 775.000 MHz	2 Start 793.000 MHz		Mor Stop 805.000 MHz
Start 763.000 MHz			re 12 Start 793.000 MHz		1.05
Start 763.000 MHz		Stop 775.000 MHz 1 o 16.40 ms (1001 pts)	re 12 Start 793.000 MHz		Stop 805.000 MHz 1 of p 16.40 ms (1001 pts) 1
Start 763.000 MHz ress BW 10 kHz Channel Channel Interferenting Audyter Energi 54 To 250000000 MHz Harker 1 777.4.220000000 MHz	SERVELINT SERVELINT Marco Trig: Free Run Marco Trig: Free Run	Stop 775.000 MHz 1 c 0 16.40 ms (1001 pts) 1001 pts) 25 RB 1000 00:554 PM 00:11,2010 The Eliz 3.4 s to The Eliz 3.4 s to	re 2 3 5 5 5 5 5 5 5 5 5 5 5 5 5	SENSE INT ALIGN A BAG Type Log- Trig: Free Run AvgType Log-	Stop 505.000 MHz p 16.40 ms (1001 pts) 25 RB
Start 763.000 MHz Res BW 10 KHz 50 Channel Prycets Jonation - Start Start Channel Million	ала 23205 500с.1017 Алур Алур Алур Кор Алур Кор А	Stop 775.000 MHz 1 c 1 64.0 ms (1001 pts) 1 c 25 RB [an 34.5] 100 04.554 MOC1 11.2010 100 94.554 MOC1 11.2010 101 94.554 MOC1 11.2010	start 793.000 MHz #Res BW 10 kHz #mod Channel Image: Start 793.0900000 MHz Image: Start 793.09000000 MHz Marker 1 793.09000000 MHz PF: 500 pc PF: 500 pc	23255 Stots JMT AJDA A Trig: Free Run Grow Artter to 0 dB Avg Type: Log- Avg Type: Log- Avg Type: Log-	Stop 805,000 MHz 1 of pp 16.40 ms (1001 pts) 1 stop 10,40 ms (1001 pts) 25 RB 1 stop 10,40 ms (1001 pts) unro 06,400 MHz (11,100) unro 06,400 MHz (11,200) unro 06,400 MHz (11,200) </td
Start 763,000 MHz Res BW 10 KHz fr Channel Projektion Audyre: Seet 54 or 300 a 000 MHz Marker 1 774.820000000 MHz PWC:W IFGault Ref Offset 15 dB	ала 23205 500с.1017 Алур Алур Алур Кор Алур Кор А	Stop 77.5.000 MHz 1 c 1 16.40 ms (1001 pts) 1 c 25 RB CO 064554 PM Oct 11, 2016 TAGE [1 2 3 4 5 0 TAGE [1 2 3 4	re 22 23 24 24 24 24 24 25 24 24 25 25 25 25 25 25 25 25 25 25	23255 Stots JMT AJDA A Trig: Free Run Grow Artter to 0 dB Avg Type: Log- Avg Type: Log- Avg Type: Log-	Stop 805,000 MHz 1 of pp 16.40 ms (1001 pts) 1 25 RB 1 uno 06-66 PM doc 11, 23 as 5 Pewer Trace[1 2 3 as 5 Peak Search to the form of the
Start 763.000 MHz Res BW 10 kHz 4 Channel Channel Marker 1 774.820000000 MHz PP 100 C PP 1	ала 23205 500с.1017 Алур Алур Алур Кор Алур Кор А	Stop 775.000 MHz 1 c 16.40 ms (1001 pts) 1 c 25 RB Image: Comparison of the state of the stat	re 2 2 2 2 2 2 2 2 2 2 2 2 2	23255 Stots JMT AJDA A Trig: Free Run Grow Artter to 0 dB Avg Type: Log- Avg Type: Log- Avg Type: Log-	Stop 805,000 MHz 1 of pp 16.40 ms (1001 pts) 1 of 25 RB Israelia 000 1 of 1 (100 pts) 000 1 of 1 (100 pts) 000 1 of 1 (100 pts) 001 1 of 1 (100 pts) 002 1 of 1 (100 pts) 003 1 of 1 (100 pts) 004 of 1 (100 pts) 1 of 1 (100 pts) 004 of 1 (100 pts) 1 of 1 (100 pts) 004 of 1 (100 pts) 1 of 1 (100 pts) 005 of 1 (100 pts) 1 of 1 (100 pts) 006 of 1 (100 pts) 1 of 1 (100 pts) 007 of 1 (100 pts) 1 of 1 (100 pts) 008 of 1 (100 pts) 1 of 1 (100 pts) 009 of 1 (100 pts) 1 of 1 (100 pts) 009 of 1 (100 pts) 1 of 1 (100 pts) 009 of 1 (100 pts) 1 of 1 (100 pts) 000 of 1 (100 pts) 1 of 1 (100 pts) 000 of 1 (100 pts) 1 of 1 (100 pts) 000 of 1 (100 pts) 1 of 1 (100 pts) 000 of 1 (100 pts) 1 of 1 (100 pts) 000 of 1 (100 pts) 1 of 1 (100 pts) 000 of 1 (100 pts) </td
Start 763.000 MHz # Files BW 10 kHz # Start 763.000 MHz # Channel * Start 782 Start 782 * Start 782 Start 782 Start 782 * Start 782 Start 782 Start 782 * <t< td=""><td>ала 23205 500с.1017 Алур Алур Алур Кор Алур Кор А</td><td>Stop 775.000 MHz 1 c 16.40 ms (1001 pts) 1 c 25 RB Control 1.2010 10.40 ms (1001 pts) Peak Search 10.40 ms (1001 pts) Next Pk Rig 10.40 ms (1001 pts) Next Pk Rig 10.40 ms (1001 pts) Next Pk Rig</td><td>re 2 2 3 3 2 2 2 3 2 2 3 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3</td><td>23255 Stots JMT AJDA A Trig: Free Run Grow Artter to 0 dB Avg Type: Log- Avg Type: Log- Avg Type: Log-</td><td>Stop 805,000 MHz pp 16.40 ms (1001 pts) 1 of 25 RB Image: Constraint of the stop of the stop</td></t<>	ала 23205 500с.1017 Алур Алур Алур Кор Алур Кор А	Stop 775.000 MHz 1 c 16.40 ms (1001 pts) 1 c 25 RB Control 1.2010 10.40 ms (1001 pts) Peak Search 10.40 ms (1001 pts) Next Pk Rig 10.40 ms (1001 pts) Next Pk Rig 10.40 ms (1001 pts) Next Pk Rig	re 2 2 3 3 2 2 2 3 2 2 3 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3	23255 Stots JMT AJDA A Trig: Free Run Grow Artter to 0 dB Avg Type: Log- Avg Type: Log- Avg Type: Log-	Stop 805,000 MHz pp 16.40 ms (1001 pts) 1 of 25 RB Image: Constraint of the stop
Start 763.000 MHz Res SW 10 kHz See	ала 23205 500с.1017 Алур Алур Алур Конс Алур Калар Алур Кал	Stop 775.000 MHz 1 c 16.40 ms (1001 pts) 1 c 25 RB Control and the state of the	re 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3	23255 Stots JMT AJDA A Trig: Free Run Grow Artter to 0 dB Avg Type: Log- Avg Type: Log- Avg Type: Log-	Stop 805,000 MHz pp 16.40 ms (1001 pts) 1 of 25 RB Image: Constraint of the stop
Start 763.000 MHz Res BW 10 kHz See	ала 23205 500с.1017 Алур Алур Алур Конс Алур Калар Алур Кал	Stop 775.000 MHz 1 c 16.40 ms (1001 pts) 1 c 25 RB Image: Comparison of the second seco	re 2 2 3 3 3 3 3 3 4 4 4 4 4 4 5 4 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5	23255 Stots JMT AJDA A Trig: Free Run Grow Artter to 0 dB Avg Type: Log- Avg Type: Log- Avg Type: Log-	Stop 805,000 MHz pp 16.40 ms (1001 pts) 1 of 250 RB Image: Control of the standard standar
		Stop 775.000 MHz 1 c 16.40 ms (1001 pts) 1 c 25 RB Image: Comparison of the second seco	re 2 2 3 3 3 3 3 3 4 4 4 4 4 5 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5	23255	Stop 805,000 MHz pp 16.40 ms (1001 pts) 1 of 250 RB Image: Control of the standard standar

For the 763 - 775 MHz and 793 - 805 MHz band ,the FCC limit is 65+10log(P[watt]) 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 on the spectrum analyzer.

10log(10kHz/6.25kHz) = 2.04 dB

Emission Mask

Limit line = -35 dBm + 2.04 dB =-32.96 dBm



					Chanı		and 13 width: 10 M	ИНz				
С	hannel		23	230	1 F		Chann		232	30	1 R	В
	ctrum Analyzer - Swept SA <u>RF</u> S0 Ω DC 774.796000000 M Ref Offset 15 dB Ref 20.00 dBm	IHZ PNO: Wide ♀ IFGain:Low	Trig: Free Run #Atten: 30 dB	#Avg Type: Lo Avg Hold:>100	g-Pwr TRACE 1 2 3 4 5 6	Peak Search Next Peak	Keysight Spectrum Analyzer - Swet	PNO: Wide G	SENSE:INT Trig: Free Run #Atten: 30 dB	#Avg Type: Log-Pwr Avg Hold:>100/100		Peak Search
10.0						Next Pk Right	10.0					Next Pk Rig
10.00						Next Pk Left	-10.0					Next Pk Lo
30.0					0L1 -33.00 dBn	Marker Delta	-20.0				DL1 -33.00 dBm	Marker De
-40.0						Mkr→CF	-40.0					Mkr→C
	า.ไรกับรู้ปรูเมือ ⁴ อาเวล _อ ส _เ สระบบระปรุษษศ	والمعاد والمرداني والمرداني	เขาสีแล่งกระสะให้สูงได้สะสะ	Higaidrentensteinfilmen	nielusesenne astronomie	Mkr⊸RefLvl		1 eryesztraczeńska skara	ส	h.i.4844h.an	(19), Alain 1997, and 19, and 1	Mkr→RefL
-70.0							-70.0					Ma
start 763.0	000 MHz 10 kHz	#VBW	30 kHz*	#Swe	Stop 775.000 MHz	More 1 of 2	Start 793.000 MHz #Res BW 10 kHz	#VBV	/ 30 kHz*	#Sweep	Stop 805.000 MHz 16.40 ms (1001 pts)	
Res BW 1	10 kHz	#VBW	30 kHz*		ep 16.40 ms (1001 pts) status	1 of 2	#Res BW 10 kHz		/ 30 kHz*	STATU	16.40 ms (1001 pts)	1 c
Res BW 1	000 MHz 10 kHz Channel	#VBW			ep 16.40 ms (1001 pts)	1 of 2	Start 793.000 MHz #Res BW 10 kHz Chann		4 30 kHz* 232	STATU	16.40 ms (1001 pts)	1 c
FRes BW	10 kHz	IHz PNO: Wide	23		ep 16.40 ms (1001 pts) status 500 Auto 06:51:06 PM oct 11, 2016 g-Pure TRACE 12 2 3 4 5 Trace 12 2 3 4 5	1 of 2	#Res BW 10 kHz	PNO: Wide C	232	STATU	16.40 ms (1001 pts) 50 F 06.52-46 PM Oct 11, 2016 T TRACE [1 2 3 4 5 6 TRACE [1 3 4 5 6	1 c
Keysight Spec	to kHz		23	230 #Avg Type: Lo	ep 16.40 ms (1001 pts) status 50	RB	#Res BW 10 kHz	ept SA DC DOOOO MHZ PNO: Wide G IFGainLow dB	232 SENSE:INT	ALIGN AUTO #Avg Type: Log-Pwr Avg Hold:>100/100	16.40 ms (1001 pts) 5 50 F 106-52-46 PM Ort 11, 2015	1 o RB Peak Search
Keysight Speed	10 kHz Channel thum Analyter - Swept SA RF 50 2 0C 7774.652000000 N Ref Offset 15 dB	IHz PNO: Wide	23	230 #Avg Type: Lo	ep 16.40 ms (1001 pts) starue 500 400 665156 PMort11.2016 6-PMr 100 700 700 700 700 700 700 700	RB	Res BW 10 kHz	ept SA DC DOOOO MHZ PNO: Wide G IFGainLow dB	232	ALIGN AUTO #Avg Type: Log-Pwr Avg Hold:>100/100	16.40 ms (1001 pts) 55 50 F 106:52:46 PM Oct 11, 2016 TRACE [1:2:3:45:5 TYPE NWWWW DET A N N N N xr1 793.036 MHz	
Keysight Spec Marker 1 10 dB/div	10 kHz Channel thum Analyter - Swept SA RF 50 2 0C 7774.652000000 N Ref Offset 15 dB	IHz PNO: Wide	23	230 #Avg Type: Lo	ep 16.40 ms (1001 pts) starue 500 400 665156 PMort11.2016 6-PMr 100 700 700 700 700 700 700 700	RB Peak Search Next Peak	#Res BW 10 kHz	ept SA DC DOOOO MHZ PNO: Wide G IFGainLow dB	232	ALIGN AUTO #Avg Type: Log-Pwr Avg Hold:>100/100	16.40 ms (1001 pts) 55 50 F 106:52:46 PM Oct 11, 2016 TRACE [1:2:3:45:5 TYPE NWWWW DET A N N N N xr1 793.036 MHz	1 o RB Peak Search Next Pei
#Res BW 1 ##450	10 kHz Channel thum Analyter - Swept SA RF 50 2 0C 7774.652000000 N Ref Offset 15 dB	IHz PNO: Wide	23	230 #Avg Type: Lo	ep 16.40 ms (1001 pts) starue 500 400 665156 PMort11.2016 6-PMr 100 700 700 700 700 700 700 700	1 of 2 RB Peak Search Next Peak Next Pk Right	#Res BW 10 kHz #55	ept SA DC DOOOO MHZ PNO: Wide G IFGainLow dB	232	ALIGN AUTO #Avg Type: Log-Pwr Avg Hold:>100/100	16.40 ms (1001 pts) 55 50 F 106:52:46 PM Oct 11, 2016 TRACE [1:2:3:45:5 TYPE NWWWW DET A N N N N xr1 793.036 MHz	1 o RB Peak Search Next Peak Next Pk Rig
Res BW 1	10 kHz Channel Chanses Ref 50 a cc 777.652000000 N Ref Offset 15 dB	IHz PNO: Wide	23	230 #Avg Type: Lo	AUTO 05:105 PM Oct 11,2016 PPW TTAG 200 00:10 00 00 00 00 00 00 00 00 00 00 00 00 0	1 of 2 RB Peak Search Next Pk Right Next Pk Left	Kees BW 10 kHz Marker 1 793.035000 10 aBldity Ref 20.00 c	ept SA DC DOOOO MHZ PNO: Wide G IFGainLow dB	232	ALIGN AUTO #Avg Type: Log-Pwr Avg Hold:>100/100	16.4 0 ms (1001 pts) 18 50 F 106:32:46 PM 0011,2016 7 Trace [2:3:4:5:0 001 AVM/WWW 001 AVM/WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	RB Peak Search Next Pe Next Pk Rig Next Pk L
Res BW 1	10 kHz Channel Chanses Channel Chan C	IHZ PNO: Wide C+ IF GainLow	23.	230 #Arg Type: Lo AvgHold>100	AUTO 05:105 PM Oct 11,2016 PPW TTAG 200 00:10 00 00 00 00 00 00 00 00 00 00 00 00 0	1 of 2 RB Peak Search Next Peak Next Pk Right Next Pk Left Marker Delka	#Res BW 10 kHz trian Chann Stype Social Science Marker 1 793.038600 Bed Director Bed Director 0 dBlody Ref Offset 15	Bel PRO: Wide C PRO: WIDE C	232	ALIGN AUTO #Avg Type: Log-Pwr Avg Hold:>100/100	16.40 ms (1001 pts)	RB Peak Search Next Pe Next Pk Rig Next Pk Rig Next Pk L

For the 763 - 775 MHz and 793 - 805 MHz band ,the FCC limit is 65+10log(P[watt]) 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 on the spectrum analyzer.

 $10\log(10kHz/6.25kHz) = 2.04 \text{ dB}$

Limit line = -35 dBm + 2.04 dB =-32.96 dBm

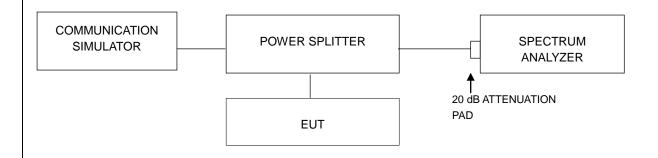


4.5 Peak to Average Ratio

4.5.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.5.2 Test Setup



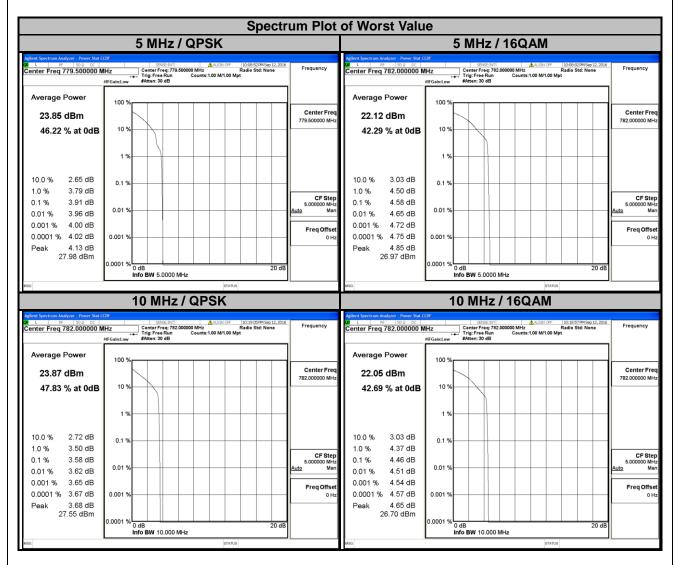
4.5.3 Test Procedures

- 1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
- 2. Set the number of counts to a value that stabilizes the measured CCDF curve;
- 3. Record the maximum PAPR level associated with a probability of 0.1 %.



4.5.4 Test Results

	LTE Band 13										
(Channel Band	dwidth: 5 MH	z	C	hannel Band	width: 10 MH	lz				
Channel	Frequency			Frequency (dB)		_					
	(MHz)	QPSK	16QAM		(MHz)	QPSK	16QAM				
23205	779.5	3.91	4.33			3.58	4.46				
23230	782.0	3.77	4.58	23230	782.0						
23255	784.5	3.51	4.18								



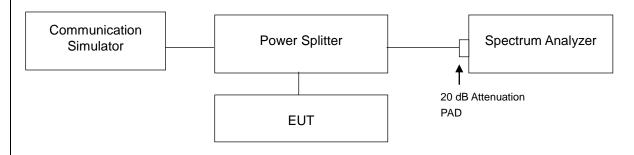


4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission is equal to -13 dBm.

4.6.2 Test Setup



4.6.3 Test Procedure

- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- b. Measuring frequency range is from 30 MHz to 8 GHz. 10 dB attenuation pad is connected with spectrum. RBW=1 MHz and VBW=3 MHz are used for conducted emission measurement.



4.6.4 Test Results

Frequency Range: 30 MHz ~ 8 GHz

LTE Band 13																					
	Channel 23230																				
	5 MHz / QPSK									10 MHz / QPSK											
Agilent Spectrum Analyzer - Swept SA C 5900 DC 5900 DC 9000 DC 1000931PM Sep 12, 2010 Marker 1 3, 240220511026 GHz Avg Type: Log-Pwr TMACE [2, 345.5							Peak Search	L)II	Agilent Spectrum Analyzer - Swept SA						M Sep 12, 2016 CE 1 2 3 4 5 6	Peak Search					
10 dB/div	PNO: Fast C Trig: Free Run IFGainLow #Atten: 30 dB Ref Offset 15 dB 10 dB/div Ref 35.00 dBm				Avg Type: Log-Pwr TRACE 12 3 # 50 Pyre Ministration or Physical Network Mkr1 3.740 2 GHz -30.52 dBm			NextPeak	PHO: Fast Tig: Free Rur IFGainLow #Atten: 30 dB 10 dB/div Ref 35.00 dBm			e Run 0 dB	Avg Type: Log-Pwr Treat 12 3 4 5 6 Tree Marking OFF NATINA Mkr1 3.083 9 GHz -29.78 dBm				Next Peak				
25.0									Next Pk Right	25.0											Next Pk Right
5.00									Next Pk Left	15.0 5.00											Next Pk Left
-5.00								13.00 dBm	Marker Delta	-5.00										-13.00 dBm	Marker Delta
-25.0			1 1		and a bit way of a state				Mkr→CF	-25.0			d		1			والمعادم			Mkr→CF
-35.0 -45.0									Mkr→RefLvl	-35.0 -45.0											Mkr→RefLvl
-55.0 Start 30 M							Stop 8.000		More 1 of 2		rt 30 MH:									.000 GHz	More 1 of 2
#Res BW	#Res BW 1.0 MHz #VBW 3.0 MHz #Sweep 505.3 ms (20000 pts)									s BW 1.0			#VBV	/ 3.0 MHz		#S	weep 50	5.3 ms (2	20000 pts)		



4.7 Radiated Emission Measurement

- 4.7.1 Limits of Radiated Emission Measurement
- a. The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission is equal to -13 dBm.
- For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/ MHz. The limit of emission is equal to -40 dBm.

4.7.2 Test Procedure

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- c. EIRP = Output power level of S.G TX cable loss + Antenna gain of substitution horn.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power 2.15 dBi.

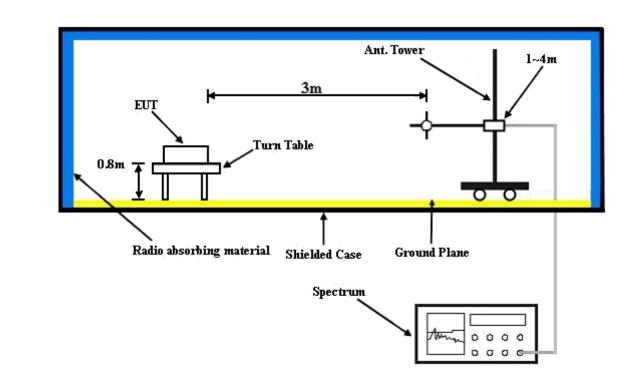
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup





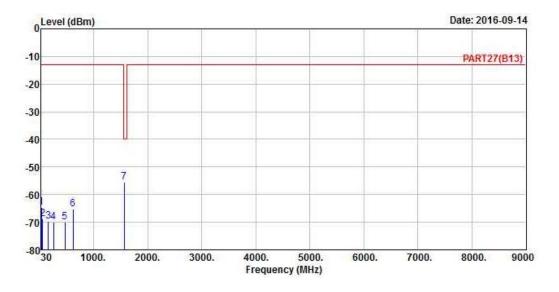
For the actual test configuration, please refer to the attached file (Test Setup Photo).



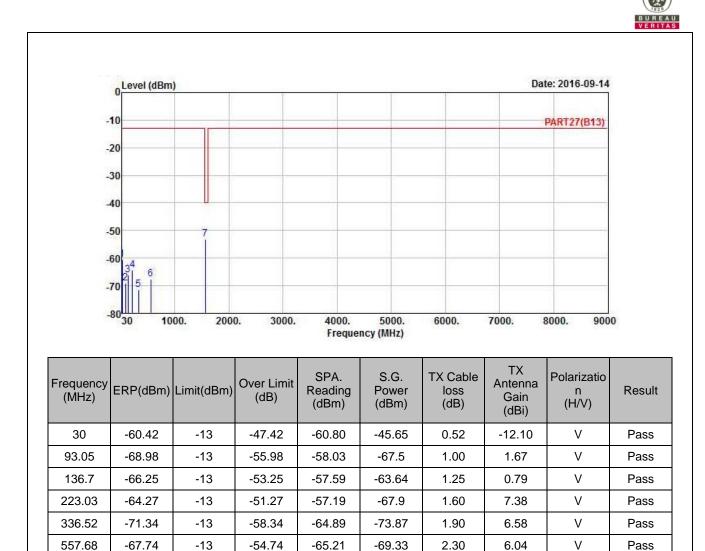
4.7.5 Test Results

LTE Band 13

Channel Bandwidth: 10 MHz / QPSK



Frequency (MHz)	ERP(dBm)	Limit(dBm)	Over Limit (dB)	SPA. Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarizatio n (H/V)	Result
30	-64.51	-13	-51.51	-64.51	-49.74	0.52	-12.10	Н	Pass
52.31	-68.87	-13	-55.87	-68.87	-57.06	1.00	-8.66	Н	Pass
159.98	-69.74	-13	-56.74	-69.74	-67.62	1.31	1.34	Н	Pass
260.86	-69.82	-13	-56.82	-69.82	-72.77	1.45	6.55	Н	Pass
465.53	-69.95	-13	-56.95	-69.95	-72.43	1.80	6.43	Н	Pass
617.82	-65.37	-13	-52.37	-65.37	-67.19	2.10	6.07	Н	Pass
1564	-55.37	-40	-15.37	-39.34	-58.36	3.31	8.45	Н	Pass



-53.02

1564

-40

-13.02

-36.99

-56.01

3.31

8.45

V

Pass



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).



Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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