TEST REPORT

DT&C Co., Ltd.
42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC1710-0233
2. Customer
   - Name : BLUEBIRD INC.
   - Address (FCC) : (Dogok-dong, SEI Tower 13,14) 39, Eonjuro30-gil, Gangnam-gu, Seoul South Korea
     Address (IC) : (Dogok-dong, SEI Tower13,14)39, Eonjuro30-gil, Gangnam-gu Seoul 06292 Korea (Republic Of)
3. Use of Report : FCC & IC Original Grant
4. Product Name / Model Name : Printer intergrated Tablet / PT550
   FCC ID : SS4PT550 / IC : 22515-PT550
5. Test Method Used : KDB Procedure
   Test Specification : FCC Part 22, 24, 27
   132 Issue 3, 133 Issue 6, 139 Issue 3
6. Date of Test : 2017.08.03 ~ 2017.08.28
7. Testing Environment : See appended test report.
8. Test Result : Refer to the attached test result.

Affirmation	Tested by Name : JaeHyeok Bang (Signature)	Technical Manager Name : Geunki Son (Signature)

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2017 . 10 . 26 .

DT&C Co., Ltd.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description
DRTFCC1710-0233	Oct. 26, 2017	Initial issue

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1. GENERAL INFORMATION

Applicant Name: **Bluebird Inc.**

Address (FCC): **(Dogok-dong, SEI Tower 13,14) 39, Eonjuro30-gil, Gangnam-gu, Seoul South Korea**

Address (IC): **(Dogok-dong, SEI Tower13,14)39, Eonjuro30-gil, Gangnam-gu Seoul 06292 Korea (Republic Of)**

FCC ID	:	SS4PT550
IC	:	22515-PT550
FCC Classification	:	Licensed Transmitter (PCB)
EUT Type	:	Printer intergrated Tablet
Model Name	:	PT550
Add Model Name	:	NA
Supplying power	:	DC 9.0 V
Hardware version		Rev0.2
Software version		R 1.0
Antenna Information	:	Internal Antenna
Antenna Gain	:	LTE Band 5: -10.957dBi LTE Band 4: -0.338dBi LTE Band 2: -0.269dBi

Mode	TX Frequency (MHz)	Emission Designator	Modulation	ERP(For the FCC)		EIRP(For the IC)	
				Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)
LTE Band 5	829 ~ 844	8M97G7D	QPSK	21.37	0.137	23.52	0.225
LTE Band 5	829 ~ 844	8M95W7D	16QAM	20.34	0.108	22.49	0.177
LTE Band 5	826.5 ~ 846.5	4M50G7D	QPSK	21.16	0.131	23.31	0.214
LTE Band 5	826.5 ~ 846.5	4M50W7D	16QAM	20.19	0.104	22.34	0.171
LTE Band 5	825.5 ~ 847.5	2M70G7D	QPSK	21.47	0.140	23.62	0.230
LTE Band 5	825.5 ~ 847.5	2M70W7D	16QAM	20.75	0.119	22.90	0.195
LTE Band 5	824.7 ~ 848.3	1M09G7D	QPSK	21.36	0.137	23.51	0.224
LTE Band 5	824.7 ~ 848.3	1M10W7D	16QAM	20.50	0.112	22.65	0.184

Mode	TX Frequency (MHz)	Emission Designator	Modulation	EIRP (FCC & IC)	
				Max power(dBm)	Max power(W)
LTE Band 4	1720 ~ 1745	17M9G7D	QPSK	25.77	0.378
LTE Band 4	1720 ~ 1745	17M9W7D	16QAM	25.11	0.324
LTE Band 4	1717.5 ~ 1747.5	13M5G7D	QPSK	25.73	0.374
LTE Band 4	1717.5 ~ 1747.5	13M5W7D	16QAM	25.10	0.324
LTE Band 4	1715 ~ 1750	8M95G7D	QPSK	25.70	0.372
LTE Band 4	1715 ~ 1750	8M96W7D	16QAM	24.64	0.291
LTE Band 4	1712.5 ~ 1752.5	4M49G7D	QPSK	25.82	0.382
LTE Band 4	1712.5 ~ 1752.5	4M50W7D	16QAM	24.88	0.308
LTE Band 4	1711.5 ~ 1753.5	2M70G7D	QPSK	25.76	0.377
LTE Band 4	1711.5 ~ 1753.5	2M70W7D	16QAM	24.98	0.315
LTE Band 4	1710.7 ~ 1754.3	1M09G7D	QPSK	25.89	0.388
LTE Band 4	1710.7 ~ 1754.3	1M09W7D	16QAM	25.04	0.319
LTE Band 2	1860 ~ 1900	17M9G7D	QPSK	25.84	0.384
LTE Band 2	1860 ~ 1900	17M9W7D	16QAM	25.23	0.333
LTE Band 2	1857.5 ~ 1902.5	13M5G7D	QPSK	25.72	0.373
LTE Band 2	1857.5 ~ 1902.5	13M4W7D	16QAM	25.12	0.325
LTE Band 2	1855 ~ 1905	8M95G7D	QPSK	25.35	0.343
LTE Band 2	1855 ~ 1905	8M97W7D	16QAM	24.41	0.276
LTE Band 2	1852.5 ~ 1907.5	4M51G7D	QPSK	25.41	0.348
LTE Band 2	1852.5 ~ 1907.5	4M50W7D	16QAM	24.89	0.308
LTE Band 2	1851.5 ~ 1908.5	2M71G7D	QPSK	26.00	0.398
LTE Band 2	1851.5 ~ 1908.5	2M70W7D	16QAM	25.29	0.338
LTE Band 2	1850.7 ~ 1909.3	1M09G7D	QPSK	26.03	0.401
LTE Band 2	1850.7 ~ 1909.3	1M09W7D	16QAM	25.45	0.351

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2. INTRODUCTION

2.1 EUT DESCRIPTION

The Equipment under Test (EUT) supports WCDMA, LTE, WLAN, Bluetooth

2.2. EUT CAPABILITIES

This ETU contains the following capabilities:
850/1900 GPRS/EDGE, 850/1900 WCDMA/HSUPA, Multi-band LTE, 802.11b/g/n WLAN(2.4GHz), Bluetooth(BDR, EDR, LE)

2.3. TESTING ENVIRONMENT

Ambient Condition	
▪ Temperature	+21 ℃ ~ +25 ℃
▪ Relative Humidity	42 % ~ 45 %

2.4 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.

2.5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C 63.4-2014. All measurement uncertainty values are shown with a coverage factor of *k* = 2 to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Radiated Disturbance (Below 1 GHz)	± 5.1 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (1 GHz ~ 18 GHz)	± 5.4 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (Above 18 GHz)	± 5.3 dB (The confidence level is about 95 %, k = 2)

2.6. TEST FACILITY

DT&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042. The site is constructed in conformance with the requirements.

- FCC MRA Accredited Test Firm No. : KR0034

- IC Test site No. : 5740A-3

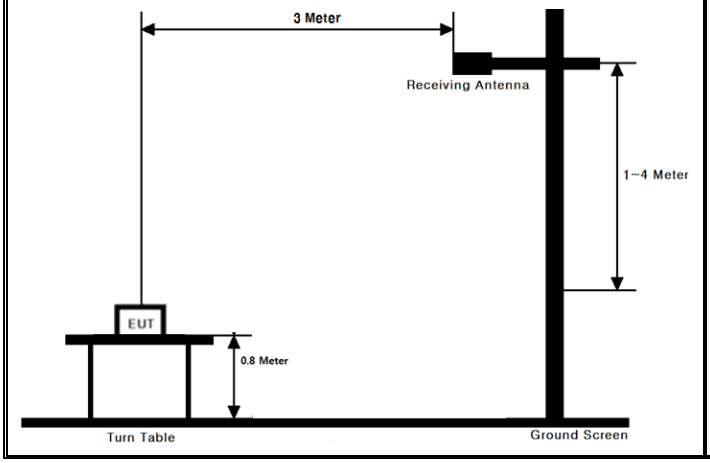
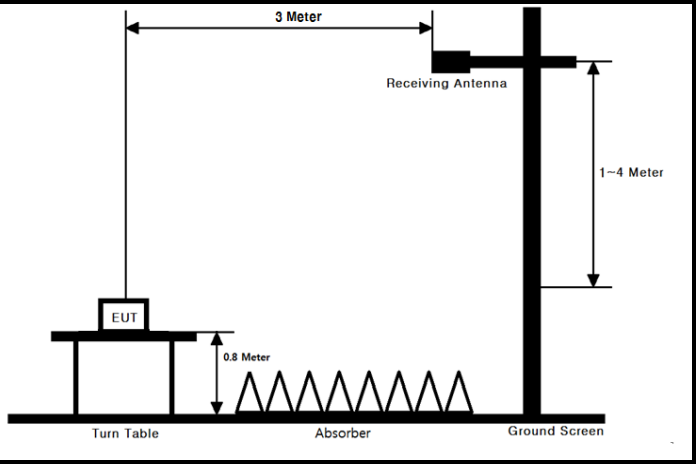
www.dtnc.net

Telephone	:	+ 82-31-321-2664
FAX	:	+ 82-31-321-1664

3. DESCRIPTION OF TESTS

3.1 ERP & EIRP (Effective Radiated Power & Equivalent Isotropic Radiated Power)

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 0.8-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **ANSI/TIA-603-E-2016 - Section 2.2.17**
- **KDB971168 D01v02r02 - Section 5.2.1**

Test setting

1. Set span to at least 1.5 times the OBW.
2. Set RBW = 1-5 % of the OBW, not to exceed 1 MHz.
3. Set VBW ≥ 3 x RBW.
4. Set number of points in sweep ≥ 2 × span / RBW.
5. Sweep time = auto couple.
6. Detector = RMS (power averaging).
7. If the EUT can be configured to transmit continuously (i.e., burst duty cycle ≥ 98 %), then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98 %), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep.
   Ensure that the sweep time is less than or equal to the transmission burst duration.
9. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

The receiver antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminal of the substitute antenna is measured.

The ERP/EIRP is calculated using the following formula:

ERP/EIRP = The conducted power at the substitute antenna`s terminal [dBm] + Substitute Antenna gain [dBd for ERP , dBi for EIRP]

For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference
Between the gain of the horn antenna and an isotropic antenna are taken into consideration.

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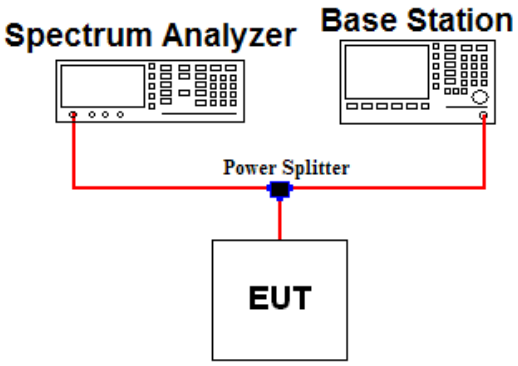
3.2 PEAK TO AVERAGE RATIO

Test set-up



Test Procedure

- **KDB971168 D01v02r02 - Section 5.7.1**

A peak to average ratio measurement is performed at the conducted port of the EUT.
The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The present of time the signal spends at or above the level defines the probability for that particular power level.

Test setting

The spectrum Analyzer`s CCDF measurement function is enabled.

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. Set the measurement interval as follows:
   1) For continuous transmissions, set to 1 ms.
   2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
4. Record the maximum PAPR level associated with a probability of 0.1 %

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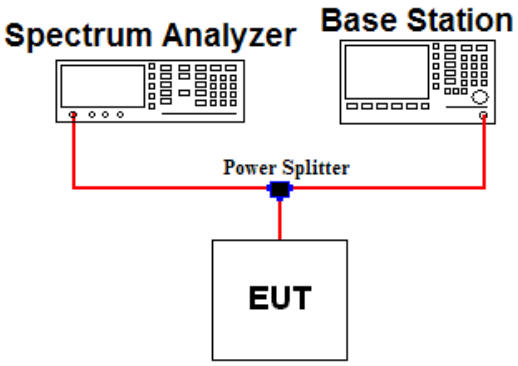
3.3 OCCUPIED BANDWIDTH.

Test set-up



Test Procedure

- **KDB971168 D01v02r02 - Section 4.2**

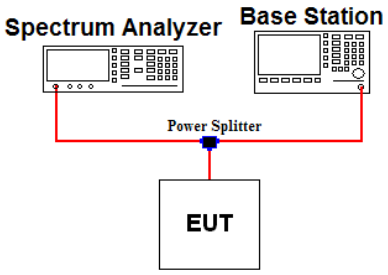
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power of a given emission.

Test setting

1. The signal analyzer`s automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 ~ 5 % of the expected OBW & VBW ≥ 3 X RBW
3. Detector = Peak
4. Trance mode = Max hold
5. Sweep = Auto couple
6. The trace was allowed to stabilize
7. If necessary, step 2 ~ 6 were repeated after changing the RBW such that it would be within 1 ~ 5 % of the 99 % occupied bandwidth observed in step 6.

3.4 BAND EDGE EMISSIONS AT ANTENNA TERMINAL

Test set-up



Test Procedure

- **KDB971168 D01v02r02 - Section 6**

All out of band emissions are measured by means of a calibrated spectrum analyzer. The EUT was setup to maximum output power at its lowest and highest channel with all bandwidths, modulations and RB configurations.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB or requirements on note 3 in case of band 7 and 41.

Test setting

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 X RBW
5. Detector = RMS & Trace mode = Max hold
6. Sweep time = Auto couple or 1 s for band edge
7. Number of sweep point ≥ 2 X span / RBW
8. The trace was allowed to stabilize

Note 1: Per Part 22.917(b)(1) / 24.238(b) / 27.53(h)(3) 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 to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

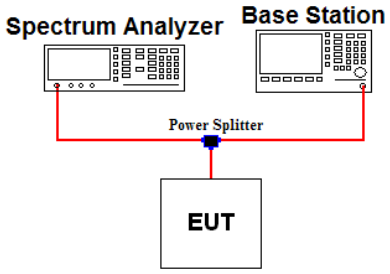
Note 2: Per Part 27(g) for operations in the 600 MHz band and the 698-746 MHz band, compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Note 3: For part 27.53(m)(4) the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.

Note 4: Per part 27.53(m)(6) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 MHz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

Test set-up



Test Procedure

- **KDB971168 D01v02r02 - Section 6**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The EUT was setup to maximum output power at its low, middle, high channel with all bandwidths, modulations and RB configurations. The spectrum is scanned from 9 kHz up to a frequency including its 10^{th} harmonic.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB or 55 + 10 log(P) in case of band 7 and 41.

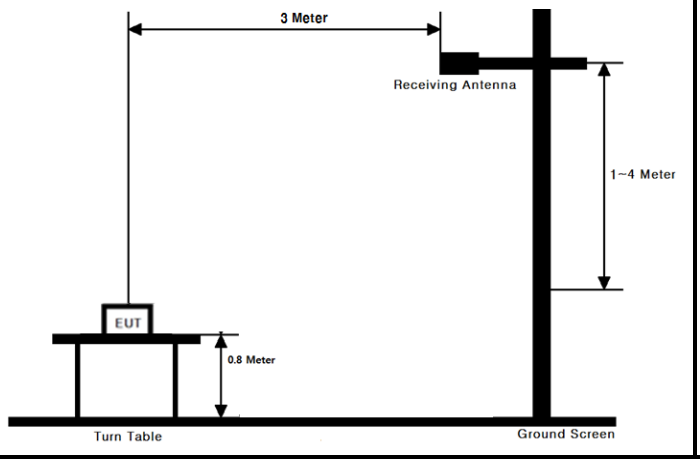
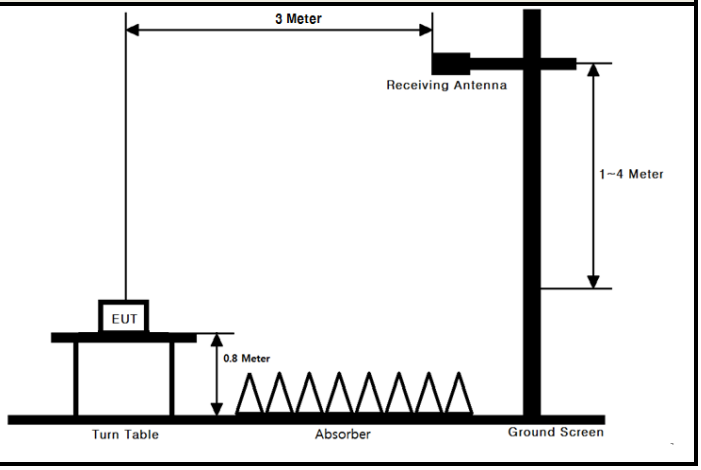
Test setting

1. RBW = 100 kHz(Below 1 GHz) or 1 MHz(Above 1 GHz) & VBW ≥ 3 X RBW (Refer to Note 1)
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

Note 1: Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1GHz and 1MHz or greater for frequencies greater than 1GHz.

3.6 UNDESIRABLE EMISSIONS

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 test site. The equipment under test is placed on a non-conductive table 0.8-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **ANSI/TIA-603-E-2016 - Section 2.2.12**
- **KDB971168 D01v02r02 - Section 5.8**

Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW ≥ 3 X RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

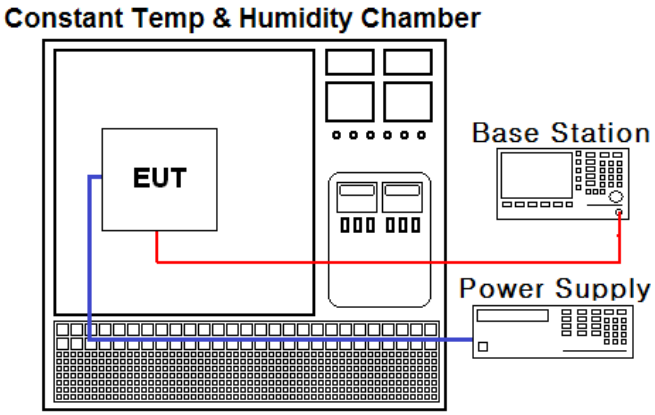
For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1 GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

This measurement was performed with the EUT oriented in 3 orthogonal axis.

3.7 FREQUENCY STABILITY

Test Set-up



Test Procedure

- **ANSI/TIA-603-E-2016**
- **KDB971168 D01v02r02 - Section 9**

The frequency stability of the transmitter is measured by:

a.) **Temperature:**
The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.

b.) **Primary Supply Voltage:**
The primary supply voltage is varied from 85 % to 115 % of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification:

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block for Part 24, 27. The frequency stability of the transmitter shall be maintained within ± 0.000 25 % (± 2.5 ppm) of the center frequency for Part 22.

Time Period and Procedure:

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 one minute 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.

4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal. Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	16/10/11	17/10/11	MY46471251
Spectrum Analyzer	Agilent Technologies	N9020A	17/01/11	18/01/11	MY50200828
Spectrum Analyzer	Agilent Technologies	N9030A	16/10/18	17/10/18	MY53310140
DC power supply	Agilent Technologies	66332A	16/09/08	17/09/08	GB42110550
Multimeter	FLUKE	17B	17/04/12	18/04/12	26030065WS
Temp & Humi Test Chamber	SJ Science	SJ-TH-S50	17/01/25	18/01/25	SJ-TH-S50-120203
Thermohygrometer	BODYCOM	BJ5478	17/01/11	18/01/11	1209
Radio Communication Analyzer	Anritsu	MT8820C	17/01/03	18/01/03	6201274516
Attenuator	SMAJK	SMAJK-2-3	16/10/11	17/10/11	2
Signal Generator	Rohde Schwarz	SMBV100A	17/01/04	18/01/04	255571
Signal Generator	Rohde Schwarz	SMF100A	17/04/21	18/04/21	102341
Loop Antenna	Schwarzbeck	FMZB1513	16/04/22	18/04/22	1513-128
BILOG ANTENNA	Schwarzbeck	VULB 9160	16/11/11	18/11/11	3151
Dipole Antenna	Schwarzbeck	VHA9103	17/03/14	19/03/14	2116
Dipole Antenna	Schwarzbeck	VHA9103	16/04/15	18/04/15	2117
Dipole Antenna	Schwarzbeck	UHA9105	17/03/14	19/03/14	2261
Dipole Antenna	Schwarzbeck	UHA9105	16/04/15	18/04/15	2262
HORN ANT	ETS	3117	16/05/13	18/05/13	00140394
HORN ANT	ETS	3117	16/02/26	18/02/26	00152145
HORN ANT	A.H.Systems	SAS-574	17/04/25	19/04/25	154
HORN ANT	A.H.Systems	SAS-574	15/09/03	17/09/03	155
PreAmplifier	TSJ	MLA-010K01-B01-27	17/03/06	18/03/06	1844539
Amplifier	RF Bay Inc	MPA-40-40	17/04/12	18/04/12	21151801
Amplifier	EMPOWER	BBS3Q7ELU	16/09/08	17/09/08	1020
PreAmplifier	Agilent	8449B	16/10/19	17/10/19	3008A02108
PreAmplifier	A.H.Systems Inc.	PAM-1840VH	16/12/04	17/12/04	163
High-pass filter	Wainwright	WHKX12-935-1000-15000-40SS	16/09/09	17/09/09	7
High-pass filter	Wainwright	WHKX12-2580-3000-18000-80SS	16/09/09	17/09/09	3
High-pass filter	Wainwright	WHNX5.0	16/09/08	17/09/08	8
Power Splitter	Anritsu	K241B	17/01/11	18/01/11	016681

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5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Status Note 1
2.1046	-	Conducted Output Power	N/A	Conducted	C
2.1049	RSS-GEN[6.6]	Occupied Bandwidth	N/A		C
24.232(d) 27.50(d.5)	RSS-132 [5.4] RSS-133 [6.4] RSS-139 [6.5]	Peak to Average Ratio	< 13 dB		C
2.1051 22.917(a) 24.238(a) 27.53(h)	RSS-132 [5.5] RSS-133 [6.5] RSS-139 [6.6]	Band Edge / Conducted Spurious Emissions	> 43 + 10log$_{10}$(P) dB at Band edge and for all out-of-band emissions		C
2.1055 22.355 24.235 27.54	RSS-132 [5.3] RSS-133 [6.3] RSS-139 [6.4]	Frequency Stability	< 2.5 ppm (Part 22), (RSS-132, 133) Fundamental emissions must stay within Authorized frequency block (Part 24, 27), (RSS-139)		C
22.913(a.2)	RSS-132 [5.4]	Radiated Output Power (B5)	< 7 Watts max. ERP (Part 22) < 11.5 Watts max. EIRP (RSS-132)	Radiated	C
24.232(c)	RSS-133 [6.4]	Radiated Output Power (B2)	< 2 Watts max. EIRP		C
27.50(d.4)	RSS-139 [6.5]	Radiated Output Power (B4)	< 1 Watts max. EIRP		
2.1053 22.917(a) 24.238(a) 27.53(h)	RSS-132 [5.5] RSS-133 [6.5] RSS-139 [6.6]	Undesirable Emissions	> 43 + 10log$_{10}$(P) dB for all out-of-band emissions		C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

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6. SAMPLE CALCULATION

A. Emission Designator

LTE Band 5(QPSK)

Emission Designator = **8M97G7D**
LTE OBW = 8.967 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 5(16QAM)

Emission Designator = **8M95W7D**
LTE OBW = 8.950 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 4(QPSK)

Emission Designator = **17M9G7D**
LTE OBW = 17.921 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 4(16QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.875 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 2(QPSK)

Emission Designator = **17M9G7D**
LTE OBW = 17.907 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 2(16QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.904 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

B. For substitution method

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Spectrum Reading Value(dBm)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1720	QPSK	1/0	-20.18	Y	H	19.95	5.82	25.77	0.378

ERP or EIRP = Level @ Ant Terminal LEVEL(dBm) + Tx Ant. Gain

1) The EUT mounted on a non-conductive turntable is 0.8 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 substituted antenna gain is the rating of ERP, EIRP or Radiated spurious emission.

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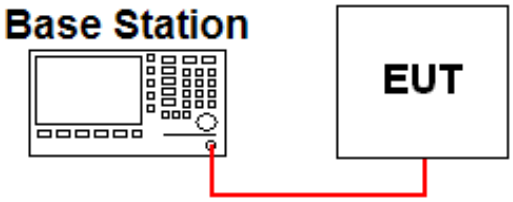
7. TEST DATA

7.1 CONDUCTED OUTPUT POWER

A base station simulator was used to establish communication with the EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



▪ Band 5

Conducted Power [dBm]									
RB Alloc			1 RB			MID RB			FULL RB
B.W(MHz)	Freq.(MHz)	Modulation	LOW	MID	HIGH	LOW	MID	HIGH	
10	829	QPSK	22.890	22.830	22.370	21.590	21.590	21.550	21.690
		16QAM	21.900	21.730	22.110	20.720	20.600	20.800	20.630
	836.5	QPSK	22.930	22.940	22.950	21.550	21.700	21.660	21.590
		16QAM	22.070	22.250	22.240	20.590	20.760	20.660	20.590
	844	QPSK	22.910	23.020	22.700	21.700	21.660	21.600	21.730
		16QAM	22.030	22.190	21.960	20.840	20.800	20.760	20.700
5	826.5	QPSK	22.770	22.840	22.740	21.560	21.480	21.430	21.510
		16QAM	21.920	21.830	21.870	20.480	20.410	20.460	20.660
	836.5	QPSK	22.940	22.970	22.810	21.590	21.620	21.640	21.520
		16QAM	21.920	21.980	22.200	20.570	20.650	20.770	20.580
	846.5	QPSK	22.660	22.750	22.840	21.710	21.540	21.520	21.670
		16QAM	22.260	21.970	21.940	20.680	20.600	20.560	20.750
3	825.5	QPSK	22.960	22.680	22.670	21.670	21.510	21.430	21.550
		16QAM	22.000	21.880	21.750	20.730	20.650	20.710	20.710
	836.5	QPSK	22.830	22.890	22.940	21.690	21.590	21.620	21.500
		16QAM	22.110	22.010	22.090	20.830	20.830	20.950	20.670
	847.5	QPSK	22.930	22.860	22.870	21.740	21.560	21.550	21.620
		16QAM	22.070	21.940	22.140	20.880	20.840	20.720	20.820
1.4	824.7	QPSK	22.740	22.670	22.560	22.440	22.560	22.370	21.580
		16QAM	22.010	21.940	21.980	21.580	21.500	21.420	20.560
	836.5	QPSK	22.800	22.810	22.750	22.560	22.640	22.620	21.620
		16QAM	21.600	21.840	22.030	21.840	21.870	21.860	20.620
	848.3	QPSK	22.710	22.690	22.670	22.590	22.590	22.550	21.660
		16QAM	21.640	21.860	22.100	21.790	21.960	21.930	20.710

Note 1: The conducted output power was measured using the Anritsu MT8820C

▪ Band 4

Conducted Power [dBm]									
RB Alloc			1 RB			MID RB			FULL RB
B.W(MHz)	Freq.(MHz)	Modulation	LOW	MID	HIGH	LOW	MID	HIGH	
20	1720	QPSK	23.440	23.450	23.240	22.240	22.150	22.100	22.100
		16QAM	22.740	22.480	22.630	21.080	21.110	21.060	21.150
	1732.5	QPSK	23.410	23.300	23.320	22.330	22.190	22.160	22.280
		16QAM	22.730	22.550	22.240	21.340	21.260	21.150	21.200
	1745	QPSK	23.710	23.400	23.320	22.370	22.400	22.250	22.420
		16QAM	22.950	22.510	22.330	21.410	21.320	21.490	21.440
15	1717.5	QPSK	23.220	23.340	23.410	21.960	22.140	22.100	22.060
		16QAM	22.120	22.490	22.620	21.040	21.190	21.020	21.100
	1732.5	QPSK	23.570	23.410	23.540	22.300	22.180	22.150	22.280
		16QAM	22.770	22.220	22.730	21.320	21.300	21.290	21.370
	1747.5	QPSK	23.760	23.470	23.560	22.510	22.200	22.230	22.270
		16QAM	22.910	22.680	22.720	21.430	21.410	21.330	21.360
10	1715	QPSK	23.200	23.260	23.470	22.070	21.980	22.080	21.900
		16QAM	22.650	22.570	22.600	21.160	21.140	21.380	21.040
	1732.5	QPSK	23.510	23.630	23.410	22.310	22.210	22.290	22.300
		16QAM	22.730	22.800	22.660	21.530	21.350	21.420	21.340
	1750	QPSK	23.370	23.650	23.550	22.370	22.250	22.190	22.180
		16QAM	22.810	22.840	22.710	21.600	21.290	21.420	21.280
5	1712.5	QPSK	23.080	23.110	23.300	21.940	21.970	22.020	21.920
		16QAM	22.410	22.350	22.460	20.980	21.060	21.010	21.110
	1732.5	QPSK	23.530	23.490	23.330	22.290	22.210	22.200	22.260
		16QAM	22.680	22.730	22.630	21.320	21.140	21.200	21.330
	1752.5	QPSK	23.600	23.500	23.380	22.240	22.210	22.310	22.250
		16QAM	22.770	22.650	22.810	21.290	21.160	21.260	21.410
3	1711.5	QPSK	23.180	23.170	23.190	22.060	22.080	22.050	22.010
		16QAM	22.550	22.460	22.520	21.300	21.270	21.300	21.250
	1732.5	QPSK	23.230	23.390	23.430	22.230	22.240	22.180	22.190
		16QAM	22.810	22.600	22.880	21.490	21.530	21.550	21.460
	1753.5	QPSK	23.520	23.520	23.530	22.280	22.300	22.310	22.290
		16QAM	22.830	22.770	22.850	21.560	21.430	21.430	21.500
1.4	1710.7	QPSK	23.160	23.300	23.190	23.210	23.160	23.140	22.000
		16QAM	22.530	22.580	22.580	22.360	22.410	22.400	21.120
	1732.5	QPSK	23.120	23.450	23.500	23.080	23.270	23.210	22.150
		16QAM	22.730	22.710	22.560	22.570	22.630	22.580	21.240
	1754.3	QPSK	23.390	23.490	23.460	23.310	23.250	23.220	22.240
		16QAM	22.930	22.730	22.590	22.290	22.610	22.650	21.400

Note 1: The conducted output power was measured using the Anritsu MT8820C

▪ Band 2

Conducted Power [dBm]									
RB Alloc			1 RB			MID RB			FULL RB
B.W(MHz)	Freq.(MHz)	Modulation	LOW	MID	HIGH	LOW	MID	HIGH	
20	1720	QPSK	23.680	23.550	23.400	22.700	22.490	22.440	22.570
		16QAM	22.760	23.090	22.930	21.710	21.530	21.480	21.690
	1732.5	QPSK	23.730	23.350	23.340	22.610	22.450	22.410	22.530
		16QAM	23.400	22.820	22.420	21.520	21.260	21.550	21.530
	1745	QPSK	23.550	23.490	23.240	22.650	22.680	22.480	22.590
		16QAM	23.060	23.200	22.600	21.580	21.650	21.570	21.590
15	1717.5	QPSK	23.680	23.570	23.400	22.580	22.510	22.470	22.600
		16QAM	23.250	23.090	22.770	21.620	21.670	21.510	21.610
	1732.5	QPSK	23.520	23.300	23.500	22.600	22.410	22.410	22.520
		16QAM	23.060	22.360	22.480	21.590	21.540	21.480	21.610
	1747.5	QPSK	23.580	23.560	23.130	22.720	22.510	22.500	22.560
		16QAM	22.750	23.050	22.930	21.660	21.620	21.470	21.580
10	1715	QPSK	23.870	23.650	23.460	22.650	22.630	22.630	22.530
		16QAM	23.000	23.260	23.080	21.830	21.830	21.870	21.660
	1732.5	QPSK	23.540	23.430	23.350	22.540	22.430	22.360	22.440
		16QAM	23.000	22.920	22.940	21.670	21.610	21.460	21.460
	1750	QPSK	23.630	23.310	23.000	22.630	22.500	22.440	22.600
		16QAM	23.220	23.060	22.460	21.810	21.490	21.550	21.620
5	1712.5	QPSK	23.590	23.390	23.560	22.510	22.530	22.590	22.560
		16QAM	23.050	23.200	23.050	21.610	21.700	21.540	21.680
	1732.5	QPSK	23.280	23.240	23.270	22.480	22.370	22.320	22.430
		16QAM	22.960	22.820	22.800	21.440	21.270	21.510	21.630
	1752.5	QPSK	23.390	23.520	22.990	22.520	22.460	22.400	22.500
		16QAM	22.930	22.910	22.780	21.500	21.670	21.490	21.540
3	1711.5	QPSK	23.370	23.620	23.440	22.380	22.520	22.480	22.380
		16QAM	23.240	23.140	23.210	21.850	21.900	21.880	21.700
	1732.5	QPSK	23.340	23.130	23.320	22.500	22.160	22.350	22.420
		16QAM	23.000	22.860	22.970	21.670	21.590	21.590	21.610
	1753.5	QPSK	23.380	23.300	23.180	22.470	22.450	22.460	22.420
		16QAM	23.050	22.970	22.500	21.740	21.780	21.740	21.790
1.4	1710.7	QPSK	23.090	23.160	23.170	23.160	23.300	23.250	22.210
		16QAM	23.230	23.150	23.210	22.790	22.920	22.940	21.700
	1732.5	QPSK	23.150	23.110	23.060	23.080	23.050	23.140	22.150
		16QAM	22.940	22.970	22.910	22.560	22.620	22.740	21.550
	1754.3	QPSK	23.120	23.330	23.200	23.430	23.260	23.190	22.410
		16QAM	22.870	22.680	22.490	22.470	22.350	22.260	21.420

Note 1: The conducted output power was measured using the Anritsu MT8820C

7.2 OCCUPIED BANDWIDTH

- Plots of the EUT's Occupied Bandwidth are shown in Clause 8.1

7.3 PEAK TO AVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown in Clause 8.2

7.4 BAND EDEG EMISSIONS (Conducted)

- Plots of the EUT's Band Edge Emissions are shown in Clause 8.3

7.5 SPURIOUS AND HARMONICS EMISSIONS (Conducted)

- Plots of the EUT's Spurious Emissions are shown in Clause 8.4

7.6 ERP & EIRP

7.6.1 LTE Band 5

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	829	QPSK	1/0	Z	H	20.14	1.23	21.37	0.137
		16QAM	1/0	Z	H	19.11	1.23	20.34	0.108
	836.5	QPSK	1/25	Z	H	19.53	1.22	20.75	0.119
		16QAM	1/25	Z	H	18.55	1.22	19.77	0.095
	844	QPSK	1/25	Z	H	19.55	1.21	20.76	0.119
		16QAM	1/25	Z	H	18.76	1.21	19.97	0.099
5	826.5	QPSK	1/12	Z	H	19.93	1.23	21.16	0.131
		16QAM	1/12	Z	H	18.96	1.23	20.19	0.104
	836.5	QPSK	1/12	Z	H	19.58	1.22	20.80	0.120
		16QAM	1/12	Z	H	18.57	1.22	19.79	0.095
	846.5	QPSK	1/12	Z	H	19.45	1.21	20.66	0.116
		16QAM	1/12	Z	H	18.55	1.21	19.76	0.095
3	825.5	QPSK	1/0	Z	H	19.81	1.23	21.04	0.127
		16QAM	1/0	Z	H	18.90	1.23	20.13	0.103
	836.5	QPSK	1/0	Z	H	19.71	1.22	20.93	0.124
		16QAM	1/0	Z	H	19.26	1.22	20.48	0.112
	847.5	QPSK	1/0	Z	H	20.26	1.21	21.47	0.140
		16QAM	1/0	Z	H	19.54	1.21	20.75	0.119
1.4	824.7	QPSK	1/0	Z	H	19.43	1.23	20.66	0.116
		16QAM	1/0	Z	H	18.63	1.23	19.86	0.097
	836.5	QPSK	1/0	Z	H	19.50	1.22	20.72	0.118
		16QAM	1/0	Z	H	18.68	1.22	19.90	0.098
	848.3	QPSK	1/0	Z	H	20.15	1.21	21.36	0.137
		16QAM	1/0	Z	H	19.29	1.21	20.50	0.112

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.6.2 LTE Band 4

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1720	QPSK	1/0	Y	H	19.95	5.82	25.77	0.378
		16QAM	1/0	Y	H	19.29	5.82	25.11	0.324
	1732.5	QPSK	1/0	Y	H	18.87	5.75	24.62	0.290
		16QAM	1/0	Y	H	18.08	5.75	23.83	0.242
	1745	QPSK	1/0	Y	H	19.62	5.67	25.29	0.338
		16QAM	1/0	Y	H	18.67	5.67	24.34	0.272
15	1717.5	QPSK	1/74	Y	H	18.91	5.84	24.75	0.299
		16QAM	1/74	Y	H	17.79	5.84	23.63	0.231
	1732.5	QPSK	1/0	Y	H	19.76	5.75	25.51	0.356
		16QAM	1/0	Y	H	18.82	5.75	24.57	0.286
	1747.5	QPSK	1/0	Y	H	20.07	5.66	25.73	0.374
		16QAM	1/0	Y	H	19.44	5.66	25.10	0.324
10	1715	QPSK	1/49	Y	H	18.58	5.85	24.43	0.277
		16QAM	1/49	Y	H	17.99	5.85	23.84	0.242
	1732.5	QPSK	1/25	Y	H	18.89	5.75	24.64	0.291
		16QAM	1/25	Y	H	18.04	5.75	23.79	0.239
	1750	QPSK	1/25	Y	H	20.06	5.64	25.70	0.372
		16QAM	1/25	Y	H	19.00	5.64	24.64	0.291
5	1712.5	QPSK	1/24	Y	H	19.04	5.87	24.91	0.310
		16QAM	1/24	Y	H	18.46	5.87	24.33	0.271
	1732.5	QPSK	1/0	Y	H	19.14	5.75	24.89	0.308
		16QAM	1/0	Y	H	18.20	5.75	23.95	0.248
	1752.5	QPSK	1/0	Y	H	20.19	5.63	25.82	0.382
		16QAM	1/0	Y	H	19.25	5.63	24.88	0.308
3	1711.5	QPSK	1/14	Y	H	19.06	5.87	24.93	0.311
		16QAM	1/14	Y	H	18.35	5.87	24.22	0.264
	1732.5	QPSK	1/14	Y	H	18.92	5.75	24.67	0.293
		16QAM	1/14	Y	H	17.86	5.75	23.61	0.230
	1753.5	QPSK	1/14	Y	H	20.14	5.62	25.76	0.377
		16QAM	1/14	Y	H	19.36	5.62	24.98	0.315
1.4	1710.7	QPSK	1/2	Y	H	18.94	5.88	24.82	0.303
		16QAM	1/2	Y	H	17.84	5.88	23.72	0.236
	1732.5	QPSK	1/5	Y	H	18.57	5.75	24.32	0.270
		16QAM	1/5	Y	H	17.85	5.75	23.60	0.229
	1754.3	QPSK	1/2	Y	H	20.28	5.61	25.89	0.388
		16QAM	1/2	Y	H	19.43	5.61	25.04	0.319

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.6.3 LTE Band 2

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1860	QPSK	1/0	Y	H	20.54	5.02	25.56	0.360
		16QAM	1/0	Y	H	20.21	5.02	25.23	0.333
	1880	QPSK	1/0	Y	H	20.80	4.91	25.71	0.372
		16QAM	1/0	Y	H	20.18	4.91	25.09	0.323
	1900	QPSK	1/0	Y	H	21.03	4.81	25.84	0.384
		16QAM	1/0	Y	H	19.95	4.81	24.76	0.299
15	1857.5	QPSK	1/0	Y	H	20.10	5.03	25.13	0.326
		16QAM	1/0	Y	H	19.45	5.03	24.48	0.281
	1880	QPSK	1/0	Y	H	20.81	4.91	25.72	0.373
		16QAM	1/0	Y	H	20.21	4.91	25.12	0.325
	1902.5	QPSK	1/0	Y	H	19.93	4.80	24.73	0.297
		16QAM	1/0	Y	H	18.61	4.80	23.41	0.219
10	1855	QPSK	1/0	Y	H	20.30	5.05	25.35	0.343
		16QAM	1/0	Y	H	19.36	5.05	24.41	0.276
	1880	QPSK	1/0	Y	H	19.49	4.91	24.40	0.275
		16QAM	1/0	Y	H	18.59	4.91	23.50	0.224
	1905	QPSK	1/0	Y	H	20.19	4.79	24.98	0.315
		16QAM	1/0	Y	H	19.03	4.79	23.82	0.241
5	1852.5	QPSK	1/12	Y	H	20.35	5.06	25.41	0.348
		16QAM	1/12	Y	H	19.83	5.06	24.89	0.308
	1880	QPSK	1/12	Y	H	19.19	4.91	24.10	0.257
		16QAM	1/12	Y	H	18.14	4.91	23.05	0.202
	1907.5	QPSK	1/12	Y	H	19.28	4.77	24.05	0.254
		16QAM	1/12	Y	H	18.81	4.77	23.58	0.228
3	1851.5	QPSK	1/0	Y	H	20.94	5.06	26.00	0.398
		16QAM	1/0	Y	H	20.23	5.06	25.29	0.338
	1880	QPSK	1/0	Y	H	19.79	4.91	24.70	0.295
		16QAM	1/0	Y	H	19.16	4.91	24.07	0.255
	1908.5	QPSK	1/0	Y	H	19.27	4.77	24.04	0.254
		16QAM	1/0	Y	H	18.86	4.77	23.63	0.231
1.4	1850.7	QPSK	1/0	Y	H	20.96	5.07	26.03	0.401
		16QAM	1/0	Y	H	20.38	5.07	25.45	0.351
	1880	QPSK	1/0	Y	H	19.57	4.91	24.48	0.281
		16QAM	1/0	Y	H	19.09	4.91	24.00	0.251
	1909.3	QPSK	1/0	Y	H	19.15	4.76	23.91	0.246
		16QAM	1/0	Y	H	18.51	4.76	23.27	0.212

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.7 UNDESIRABLE EMISSIONS (Radiated)

7.7.1 LTE Band 5

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
									(dBm)	(dBc)	
10	829	1/0	QPSK	1649.23	Z	H	-35.94	5.92	-30.02	51.39	34.37
				2473.87	Y	H	-35.05	6.20	-28.85	50.22	
				3298.68	Z	H	-49.22	7.90	-41.32	62.69	
				4122.86	Y	H	-40.21	9.31	-30.90	52.27	
		1/0	16QAM	1649.24	Z	H	-36.55	5.92	-30.63	50.97	33.34
				2473.82	Y	H	-35.44	6.20	-29.24	49.58	
				3298.38	Z	H	-49.34	7.89	-41.45	61.79	
				4122.83	Y	H	-41.14	9.31	-31.83	52.17	
	836.5	1/25	QPSK	1673.15	Z	H	-39.98	5.93	-34.05	54.80	33.75
				2509.70	Y	H	-38.28	6.19	-32.09	52.84	
				3346.39	Z	H	-49.96	8.02	-41.94	62.69	
				4182.91	Y	H	-36.68	9.37	-27.31	48.06	
		1/25	16QAM	1673.17	Z	H	-40.37	5.93	-34.44	54.21	32.77
				2509.75	Y	H	-38.41	6.19	-32.22	51.99	
				3346.58	Z	H	-44.47	8.02	-36.45	56.22	
				4182.65	Y	H	-48.21	9.37	-38.84	58.61	
	844	1/25	QPSK	1688.19	Z	H	-42.05	5.94	-36.11	56.87	33.76
				2532.27	Y	H	-42.92	6.20	-36.72	57.48	
				3376.25	Z	H	-47.92	8.10	-39.82	60.58	
				4220.71	Y	H	-49.53	9.37	-40.16	60.92	
		1/25	16QAM	1688.18	Z	H	-43.00	5.94	-37.06	57.03	32.97
				2532.18	Y	H	-43.88	6.20	-37.68	57.65	
				3376.18	Z	H	-48.12	8.10	-40.02	59.99	
				4220.61	Y	H	-49.80	9.37	-40.43	60.40	

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
									(dBm)	(dBc)	
5	826.5	1/12	QPSK	1653.05	Z	H	-35.20	5.93	-29.27	50.43	34.16
				2479.50	Y	H	-34.36	6.20	-28.16	49.32	
				3305.99	Z	H	-48.98	7.92	-41.06	62.22	
				4132.78	Y	H	-40.85	9.32	-31.53	52.69	
		1/12	16QAM	1653.01	Z	H	-36.35	5.93	-30.42	50.61	33.19
				2479.54	Y	H	-34.74	6.20	-28.54	48.73	
				3306.09	Z	H	-49.64	7.92	-41.72	61.91	
				4132.55	Y	H	-41.72	9.32	-32.40	52.59	
	836.5	1/12	QPSK	1672.98	Z	H	-40.12	5.93	-34.19	54.99	33.80
				2509.44	Y	H	-37.61	6.19	-31.42	52.22	
				3345.88	Z	H	-44.18	8.02	-36.16	56.96	
				4182.56	Y	H	-47.42	9.37	-38.05	58.85	
		1/12	16QAM	1673.09	Z	H	-41.00	5.93	-35.07	54.86	32.79
				2509.38	Y	H	-38.28	6.19	-32.09	51.88	
				3346.08	Z	H	-44.71	8.02	-36.69	56.48	
				4182.78	Y	H	-48.19	9.37	-38.82	58.61	
	846.5	1/12	QPSK	1693.03	Z	H	-43.21	5.94	-37.27	57.93	33.66
				2539.46	Y	H	-39.31	6.21	-33.10	53.76	
				3386.03	Z	H	-43.32	8.12	-35.20	55.86	
				4232.77	Y	H	-47.20	9.36	-37.84	58.50	
		1/12	16QAM	1693.14	Z	H	-44.17	5.94	-38.23	57.99	32.76
				2539.40	Y	H	-39.46	6.21	-33.25	53.01	
				3386.01	Z	H	-43.51	8.12	-35.39	55.15	
				4232.51	Y	H	-47.72	9.36	-38.36	58.12	

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B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
									(dBm)	(dBc)	
3	825.5	1/0	QPSK	1648.46	Z	H	-37.09	5.92	-31.17	52.21	34.04
				2472.70	Y	H	-35.01	6.20	-28.81	49.85	
				3296.79	Z	H	-49.19	7.89	-41.30	62.34	
				4121.24	Y	H	-41.00	9.31	-31.69	52.73	
		1/0	16QAM	1648.44	Z	H	-37.89	5.92	-31.97	52.10	33.13
				2472.80	Y	H	-35.38	6.20	-29.18	49.31	
				3296.85	Z	H	-49.38	7.89	-41.49	61.62	
				4121.21	Y	H	-41.51	9.31	-32.20	52.33	
	836.5	1/0	QPSK	1670.57	Z	H	-40.80	5.93	-34.87	55.80	33.93
				2505.64	Y	H	-37.45	6.19	-31.26	52.19	
				3340.95	Z	H	-42.39	8.01	-34.38	55.31	
				4176.19	Y	H	-46.84	9.37	-37.47	58.40	
		1/0	16QAM	1670.51	Z	H	-41.25	5.93	-35.32	55.80	33.48
				2505.75	Y	H	-38.27	6.19	-32.08	52.56	
				3341.04	Z	H	-43.24	8.01	-35.23	55.71	
				4175.94	Y	H	-47.14	9.37	-37.77	58.25	
	847.5	1/0	QPSK	1692.41	Z	H	-43.67	5.94	-37.73	59.20	34.47
				2538.64	Y	H	-44.15	6.21	-37.94	59.41	
				3384.94	Z	H	-43.56	8.12	-35.44	56.91	
				4231.18	Y	H	-47.54	9.36	-38.18	59.65	
		1/0	16QAM	1692.42	Z	H	-44.22	5.94	-38.28	59.03	33.75
				2538.68	Y	H	-45.21	6.21	-39.00	59.75	
				3385.06	Z	H	-44.46	8.12	-36.34	57.09	
				4231.29	Y	H	-47.83	9.36	-38.47	59.22	

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B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
									(dBm)	(dBc)	
1.4	824.7	1/0	QPSK	1648.44	Z	H	-36.43	5.92	-30.51	51.17	33.66
				2472.74	Y	H	-35.06	6.20	-28.86	49.52	
				3297.10	Z	H	-48.41	7.89	-40.52	61.18	
				4121.22	Y	H	-40.91	9.31	-31.60	52.26	
		1/0	16QAM	1648.52	Z	H	-36.82	5.92	-30.90	50.76	32.86
				2472.68	Y	H	-35.36	6.20	-29.16	49.02	
				3296.72	Z	H	-48.70	7.89	-40.81	60.67	
				4121.23	Y	H	-41.13	9.31	-31.82	51.68	
	836.5	1/0	QPSK	1672.14	Z	H	-38.64	5.93	-32.71	53.43	33.72
				2508.12	Y	H	-37.95	6.19	-31.76	52.48	
				3344.27	Z	H	-43.90	8.02	-35.88	56.60	
				4180.32	Y	H	-47.25	9.37	-37.88	58.60	
		1/0	16QAM	1672.22	Z	H	-38.98	5.93	-33.05	52.95	32.90
				2508.03	Y	H	-38.84	6.19	-32.65	52.55	
				3344.27	Z	H	-44.35	8.02	-36.33	56.23	
				4180.27	Y	H	-48.68	9.37	-39.31	59.21	
	848.3	1/0	QPSK	1695.67	Z	H	-43.21	5.94	-37.27	58.63	34.36
				2543.46	Y	H	-44.14	6.21	-37.93	59.29	
				3391.35	Z	H	-43.69	8.14	-35.55	56.91	
				4239.19	Y	H	-47.95	9.35	-38.60	59.96	
		1/0	16QAM	1695.64	Z	H	-43.29	5.94	-37.35	57.85	33.50
				2543.43	Y	H	-47.02	6.21	-40.81	61.31	
				3391.37	Z	H	-44.17	8.14	-36.03	56.53	
				4239.43	Y	H	-49.29	9.35	-39.94	60.44	

Note 1: Limit Calculation = 43 + $10\log_{10}$ (P[Watts])

Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

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7.7.2 LTE Band 4

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
20	1720	1/0	QPSK	3422.10	Z	H	-49.96	8.24	-41.72	67.49	38.77
				5133.20	X	V	-43.72	10.34	-33.38	59.15	
				6844.48	X	V	-37.41	11.51	-25.90	51.67	
				8555.54	Y	V	-44.71	13.22	-31.49	57.26	
		1/0	16QAM	3422.16	Z	H	-50.08	8.24	-41.84	66.95	38.11
				5133.35	X	V	-44.90	10.34	-34.56	59.67	
				6844.35	X	V	-37.86	11.51	-26.35	51.46	
				8555.58	Y	V	-44.78	13.22	-31.56	56.67	
	1732.5	1/0	QPSK	3447.30	Z	H	-50.23	8.33	-41.90	66.52	37.62
				5170.76	X	V	-44.41	10.40	-34.01	58.63	
				6894.35	X	V	-39.12	11.51	-27.61	52.23	
				8617.99	Y	V	-44.02	13.32	-30.70	55.32	
		1/0	16QAM	3447.23	Z	H	-49.93	8.33	-41.60	65.43	36.83
				5170.81	X	V	-44.91	10.40	-34.51	58.34	
				6894.47	X	V	-39.18	11.51	-27.67	51.50	
				8617.87	Y	V	-44.32	13.32	-31.00	54.83	
	1745	1/0	QPSK	3472.04	Z	H	-49.63	8.41	-41.22	66.51	38.29
				5208.16	X	V	-44.82	10.46	-34.36	59.65	
				6944.40	X	V	-38.17	11.63	-26.54	51.83	
				8680.51	Y	V	-44.22	13.32	-30.90	56.19	
		1/0	16QAM	3472.30	Z	H	-49.73	8.41	-41.32	65.66	37.34
				5208.32	X	V	-45.67	10.46	-35.21	59.55	
				6944.23	X	V	-38.31	11.63	-26.68	51.02	
				8680.23	Y	V	-44.45	13.32	-31.13	55.47	

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B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
15	1717.5	1/74	QPSK	3448.19	Z	H	-50.24	8.33	-41.91	66.66	37.75
				5172.44	X	V	-43.82	10.40	-33.42	58.17	
				6896.69	X	V	-39.41	11.51	-27.90	52.65	
				8620.72	Y	V	-43.87	13.32	-30.55	55.30	
		1/74	16QAM	3448.17	Z	H	-49.85	8.33	-41.52	65.15	36.63
				5172.49	X	V	-44.34	10.40	-33.94	57.57	
				6896.54	X	V	-39.73	11.51	-28.22	51.85	
				8620.86	Y	V	-44.14	13.32	-30.82	54.45	
	1732.5	1/0	QPSK	3451.65	Z	H	-49.01	8.34	-40.67	66.18	38.51
				5177.51	X	V	-43.56	10.41	-33.15	58.66	
				6903.30	X	V	-39.17	11.63	-27.54	53.05	
				8629.28	Y	V	-43.77	13.32	-30.45	55.96	
		1/0	16QAM	3451.78	Z	H	-49.07	8.34	-40.73	65.30	37.57
				5177.30	X	V	-43.89	10.41	-33.48	58.05	
				6903.36	X	V	-39.69	11.63	-28.06	52.63	
				8629.36	Y	V	-44.09	13.32	-30.77	55.34	
	1747.5	1/0	QPSK	3481.65	Z	H	-49.54	8.45	-41.09	66.82	38.73
				5222.55	X	V	-46.53	10.47	-36.06	61.79	
				6963.57	X	V	-39.63	11.63	-28.00	53.73	
				8704.16	Y	V	-44.89	13.32	-31.57	57.30	
		1/0	16QAM	3481.60	Z	H	-49.58	8.45	-41.13	66.23	38.10
				5222.43	X	V	-46.44	10.47	-35.97	61.07	
				6963.36	X	V	-39.97	11.63	-28.34	53.44	
				8704.37	Y	V	-44.95	13.32	-31.63	56.73	

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B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
10	1715	1/49	QPSK	3438.98	Z	H	-49.17	8.30	-40.87	65.30	37.43
				5158.16	X	V	-44.06	10.38	-33.68	58.11	
				6877.66	X	V	-41.70	11.51	-30.19	54.62	
				8957.14	Y	V	-44.07	13.31	-30.76	55.19	
		1/49	16QAM	3438.65	Z	H	-49.11	8.30	-40.81	64.65	36.84
				5158.11	X	V	-44.70	10.38	-34.32	58.16	
				6877.63	X	V	-41.63	11.51	-30.12	53.96	
				8957.22	Y	V	-43.76	13.31	-30.45	54.29	
	1732.5	1/25	QPSK	3465.43	Z	H	-51.18	8.39	-42.79	67.43	37.64
				5197.85	X	V	-45.35	10.45	-34.90	59.54	
				6930.40	X	V	-39.85	11.63	-28.22	52.86	
				8663.13	Y	V	-44.92	13.32	-31.60	56.24	
		1/25	16QAM	3465.03	Z	H	-51.33	8.39	-42.94	66.73	36.79
				5197.75	X	V	-45.77	10.45	-35.32	59.11	
				6930.33	X	V	-39.84	11.63	-28.21	52.00	
				8662.81	Y	V	-44.88	13.32	-31.56	55.35	
	1750	1/25	QPSK	3550.34	Z	H	-46.99	8.54	-38.45	64.15	38.70
				5250.18	X	V	-44.79	10.49	-34.30	60.00	
				7000.35	X	V	-39.91	11.76	-28.15	53.85	
				8750.65	Y	V	-44.15	13.32	-30.83	56.53	
		1/25	16QAM	3500.08	Z	H	-47.69	8.51	-39.18	63.82	37.64
				5250.26	X	V	-44.31	10.49	-33.82	58.46	
				7000.33	X	V	-39.48	11.76	-27.72	52.36	
				8750.16	Y	V	-43.92	13.32	-30.60	55.24	

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B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
5	1712.5	1/24	QPSK	3429.63	Z	H	-49.25	8.26	-40.99	65.90	37.91
				5143.96	X	V	-44.55	10.35	-34.20	59.11	
				6858.51	X	V	-40.61	11.51	-29.10	54.01	
				8573.35	Y	V	-44.07	13.22	-30.85	55.76	
		1/24	16QAM	3429.33	Z	H	-49.49	8.26	-41.23	65.56	37.33
				5144.08	X	V	-44.36	10.35	-34.01	58.34	
				6858.68	X	V	-40.58	11.51	-29.07	53.40	
				8573.35	Y	V	-43.99	13.22	-30.77	55.10	
	1732.5	1/0	QPSK	3460.58	Z	H	-50.63	8.37	-42.26	67.15	37.89
				5191.21	X	V	-46.70	10.44	-36.26	61.15	
				6921.34	X	V	-39.40	11.63	-27.77	52.66	
				8651.56	Y	V	-43.90	13.32	-30.58	55.47	
		1/0	16QAM	3460.73	Z	H	-50.60	8.37	-42.23	66.18	36.95
				5191.03	X	V	-46.98	10.43	-36.55	60.50	
				6921.18	X	V	-39.43	11.63	-27.80	51.75	
				8651.37	Y	V	-44.65	13.32	-31.33	55.28	
	1752.5	1/0	QPSK	3500.62	Z	H	-45.41	8.51	-36.90	62.72	38.82
				5250.88	X	V	-45.04	10.49	-34.55	60.37	
				7001.51	X	V	-40.97	11.76	-29.21	55.03	
				8751.63	Y	V	-43.71	13.32	-30.39	56.21	
		1/0	16QAM	3500.67	Z	H	-45.68	8.51	-37.17	62.05	37.88
				5250.82	X	V	-45.42	10.49	-34.93	59.81	
				7001.19	X	V	-40.96	11.76	-29.20	54.08	
				8751.77	Y	V	-43.89	13.32	-30.57	55.45	

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B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
3	1711.5	1/14	QPSK	3425.40	Z	H	-49.56	8.25	-41.31	66.24	37.93
				5138.34	X	V	-46.04	10.35	-35.69	60.62	
				6851.02	X	V	-39.59	11.51	-28.08	53.01	
				8563.79	Y	V	-44.73	13.22	-31.51	56.44	
		1/14	16QAM	3425.38	Z	H	-49.93	8.25	-41.68	65.90	37.22
				5138.22	X	V	-46.15	10.34	-35.81	60.03	
				6850.89	X	V	-40.93	11.51	-29.42	53.64	
				8563.95	Y	V	-44.43	13.22	-31.21	55.43	
	1732.5	1/14	QPSK	3467.47	Z	H	-51.49	8.40	-43.09	67.76	37.67
				5201.05	X	V	-47.22	10.45	-36.77	61.44	
				6935.17	X	V	-38.62	11.63	-26.99	51.66	
				8669.00	Y	V	-44.06	13.32	-30.74	55.41	
		1/14	16QAM	3467.55	Z	H	-51.77	8.40	-43.37	66.98	36.61
				5201.20	X	V	-47.68	10.45	-37.23	60.84	
				6934.98	X	V	-38.74	11.63	-27.11	50.72	
				8668.79	Y	V	-44.24	13.32	-30.92	54.53	
	1753.5	1/14	QPSK	3509.45	Z	H	-45.68	8.51	-37.17	62.93	38.76
				5264.07	X	V	-45.89	10.49	-35.40	61.16	
				7019.10	X	V	-40.72	11.76	-28.96	54.72	
				8773.68	Y	V	-42.94	13.32	-29.62	55.38	
		1/14	16QAM	3509.55	Z	H	-45.51	8.51	-37.00	61.98	37.98
				5264.37	X	V	-45.97	10.50	-35.47	60.45	
				7019.13	X	V	-41.02	11.76	-29.26	54.24	
				8773.86	Y	V	-43.96	13.32	-30.64	55.62	

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
1.4	1710.7	1/2	QPSK	3421.49	Z	H	-49.84	8.24	-41.60	66.42	37.82
				5131.94	X	V	-44.76	10.33	-34.43	59.25	
				6842.53	X	V	-39.91	11.51	-28.40	53.22	
				8553.20	Y	V	-45.02	13.22	-31.80	56.62	
		1/2	16QAM	3421.24	Z	H	-49.97	8.23	-41.74	65.46	36.72
				5131.93	X	V	-45.02	10.33	-34.69	58.41	
				6842.26	X	V	-39.84	11.51	-28.33	52.05	
				8553.35	Y	V	-45.00	13.22	-31.78	55.50	
	1732.5	1/5	QPSK	3465.86	Z	H	-51.34	8.39	-42.95	67.27	37.32
				5199.05	X	V	-44.92	10.45	-34.47	58.79	
				6931.79	X	V	-39.09	11.63	-27.46	51.78	
				8664.92	Y	V	-44.59	13.32	-31.27	55.59	
		1/5	16QAM	3465.85	Z	H	-51.48	8.39	-43.09	66.69	36.60
				5198.79	X	V	-44.83	10.45	-34.38	57.98	
				6931.95	X	V	-38.77	11.63	-27.14	50.74	
				8664.71	Y	V	-44.54	13.32	-31.22	54.82	
	1754.3	1/2	QPSK	3508.40	Z	H	-43.98	8.51	-35.47	61.36	38.89
				5262.68	X	V	-44.21	10.49	-33.72	59.61	
				7017.03	X	V	-41.83	11.76	-30.07	55.96	
				8771.22	Y	V	-43.93	13.32	-30.61	56.50	
		1/2	16QAM	3508.39	Z	H	-43.96	8.51	-35.45	60.49	38.04
				5262.74	X	V	-44.37	10.49	-33.88	58.92	
				7016.95	X	V	-41.96	11.76	-30.20	55.24	
				8771.06	Y	V	-43.99	13.32	-30.67	55.71	

Note 1: Limit Calculation = 43 + $10\log_{10}$ (P[Watts])

Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

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7.7.3 LTE Band 2

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
20	1860	1/0	QPSK	3702.14	X	V	-36.31	8.49	-27.82	53.38	38.56
				5553.33	Y	H	-41.22	10.67	-30.55	56.11	
				7404.35	X	V	-42.60	12.23	-30.37	55.93	
				9255.44	X	H	-38.03	13.40	-24.63	50.19	
		1/0	16QAM	3702.17	X	V	-36.48	8.49	-27.99	53.22	38.23
				5553.31	Y	H	-41.17	10.67	-30.50	55.73	
				7404.60	X	V	-41.71	12.23	-29.48	54.71	
				9255.48	X	H	-37.84	13.40	-24.44	49.67	
	1880	1/0	QPSK	3742.17	X	V	-36.19	8.51	-27.68	53.39	38.71
				5613.29	Y	H	-40.15	10.71	-29.44	55.15	
				7484.33	X	V	-41.90	12.23	-29.67	55.38	
				9355.49	X	H	-39.50	13.49	-26.01	51.72	
		1/0	16QAM	3742.15	X	V	-36.19	8.51	-27.68	52.77	38.09
				5613.41	Y	H	-40.21	10.71	-29.50	54.59	
				7484.32	X	V	-42.17	12.23	-29.94	55.03	
				9355.49	X	H	-40.03	13.49	-26.54	51.63	
	1900	1/0	QPSK	3782.16	X	V	-35.33	8.52	-26.81	52.65	38.84
				5673.22	Y	H	-40.03	10.81	-29.22	55.06	
				7564.34	X	V	-43.42	12.35	-31.07	56.91	
				9455.26	X	H	-40.56	13.38	-27.18	53.02	
		1/0	16QAM	3782.23	X	V	-35.47	8.52	-26.95	51.71	37.76
				5673.32	Y	H	-41.26	10.81	-30.45	55.21	
				7654.38	X	V	-44.01	12.46	-31.55	56.31	
				9455.46	X	H	-40.92	13.38	-27.54	52.30	

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
15	1857.5	1/0	QPSK	3701.74	X	V	-36.33	8.49	-27.84	52.97	38.13
				5552.64	Y	H	-41.24	10.67	-30.57	55.70	
				7403.52	X	V	-42.44	12.23	-30.21	55.34	
				9254.18	X	H	-37.71	13.40	-24.31	49.44	
		1/0	16QAM	3701.65	X	V	-36.42	8.49	-27.93	52.41	37.48
				5552.51	Y	H	-41.30	10.67	-30.63	55.11	
				7403.09	X	V	-42.40	12.23	-30.17	54.65	
				9254.10	X	H	-38.14	13.40	-24.74	49.22	
	1880	1/0	QPSK	3746.68	X	V	-36.29	8.51	-27.78	53.50	38.72
				5620.07	Y	H	-41.05	10.72	-30.33	56.05	
				7493.29	X	V	-41.83	12.23	-29.60	55.32	
				9366.44	X	H	-39.84	13.49	-26.35	52.07	
		1/0	16QAM	3746.72	X	V	-36.10	8.51	-27.59	52.71	38.12
				5620.03	Y	H	-41.34	10.72	-30.62	55.74	
				7493.13	X	V	-42.24	12.23	-30.01	55.13	
				9366.81	X	H	-40.54	13.49	-27.05	52.17	
	1902.5	1/0	QPSK	3791.69	X	V	-35.71	8.53	-27.18	51.91	37.73
				5687.57	Y	H	-40.90	10.83	-30.07	54.80	
				7583.16	X	V	-43.48	12.35	-31.13	55.86	
				9479.09	X	H	-41.33	13.38	-27.95	52.68	
		1/0	16QAM	3791.67	X	V	-35.86	8.53	-27.33	50.74	36.41
				5687.41	Y	H	-40.67	10.83	-29.84	53.25	
				7583.49	X	V	-43.08	12.35	-30.73	54.14	
				9479.28	X	H	-41.66	13.38	-28.28	51.69	

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
10	1855	1/0	QPSK	3701.21	X	V	-35.99	8.49	-27.50	52.85	38.35
				5551.63	Y	H	-41.74	10.67	-31.07	56.42	
				7402.45	X	V	-42.61	12.23	-30.38	55.73	
				9252.90	X	H	-38.51	13.40	-25.11	50.46	
		1/0	16QAM	3701.26	X	V	-36.10	8.49	-27.61	52.02	37.41
				5551.82	Y	H	-41.43	10.67	-30.76	55.17	
				7402.26	X	V	-42.49	12.23	-30.26	54.67	
				9252.88	X	H	-38.28	13.40	-24.88	49.29	
	1880	1/12	QPSK	3751.27	X	V	-35.89	8.51	-27.38	51.78	37.40
				5626.76	Y	H	-38.43	10.73	-27.70	52.10	
				7502.37	X	V	-42.67	12.35	-30.32	54.72	
				9377.90	X	H	-39.55	13.49	-26.06	50.46	
		1/12	16QAM	3751.17	X	V	-36.08	8.51	-27.57	51.07	36.50
				5626.83	Y	H	-39.73	10.73	-29.00	52.50	
				7502.45	X	V	-42.89	12.35	-30.54	54.04	
				9377.90	X	H	-39.83	13.49	-26.34	49.84	
	1905	1/0	QPSK	3801.23	X	V	-35.98	8.53	-27.45	52.43	37.98
				5701.74	Y	H	-42.80	10.85	-31.95	56.93	
				7602.13	X	V	-43.32	12.46	-30.86	55.84	
				9502.81	X	H	-40.17	13.38	-26.79	51.77	
		1/0	16QAM	3801.21	X	V	-36.07	8.53	-27.54	51.36	36.82
				5701.63	Y	H	-43.57	10.85	-32.72	56.54	
				7602.15	X	V	-43.35	12.46	-30.89	54.71	
				9502.82	X	H	-40.20	13.38	-26.82	50.64	

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B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
5	1852.5	1/12	QPSK	3704.97	X	V	-36.21	8.49	-27.72	53.13	38.41
				5557.51	Y	H	-42.88	10.67	-32.21	57.62	
				7410.07	X	V	-42.58	12.23	-30.35	55.76	
				9262.57	X	H	-38.56	13.40	-25.16	50.57	
		1/12	16QAM	3704.98	X	V	-36.40	8.49	-27.91	52.80	37.89
				5557.33	Y	H	-42.89	10.67	-32.22	57.11	
				7409.90	X	V	-42.61	12.23	-30.38	55.27	
				9262.62	X	H	-38.38	13.40	-24.98	49.87	
	1880	1/12	QPSK	3760.02	X	V	-35.91	8.51	-27.40	51.50	37.10
				5639.90	Y	H	-39.85	10.75	-29.10	53.20	
				7519.79	X	V	-44.01	12.35	-31.66	55.76	
				9400.05	X	H	-40.07	13.38	-26.69	50.79	
		1/12	16QAM	3759.95	X	V	-35.94	8.51	-27.43	50.48	36.05
				5640.09	Y	H	-40.35	10.75	-29.60	52.65	
				7519.91	X	V	-44.59	12.35	-32.24	55.29	
				9400.10	X	H	-40.53	13.38	-27.15	50.20	
	1907.5	1/12	QPSK	3814.98	X	V	-35.89	8.55	-27.34	51.39	37.05
				5722.42	Y	H	-40.18	10.88	-29.30	53.35	
				7630.12	X	V	-44.96	12.46	-32.50	56.55	
				9537.51	X	H	-38.81	13.38	-25.43	49.48	
		1/12	16QAM	3815.00	X	V	-35.65	8.55	-27.10	50.68	36.58
				5722.62	Y	H	-41.33	10.88	-30.45	54.03	
				7630.13	X	V	-45.23	12.46	-32.77	56.35	
				9537.84	X	H	-39.29	13.38	-25.91	49.49	

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B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
3	1851.5	1/0	QPSK	3700.30	X	V	-35.98	8.49	-27.49	53.49	39.00
				5550.72	Y	H	-42.59	10.67	-31.92	57.92	
				7400.91	X	V	-42.45	12.23	-30.22	56.22	
				9251.27	X	H	-38.65	13.40	-25.25	51.25	
		1/0	16QAM	3700.53	X	V	-36.09	8.49	-27.60	52.89	38.29
				5550.69	Y	H	-42.54	10.67	-31.87	57.16	
				7401.09	X	V	-42.80	12.23	-30.57	55.86	
				9251.30	X	H	-38.61	13.40	-25.21	50.50	
	1880	1/0	QPSK	3757.55	X	V	-36.17	8.51	-27.66	52.36	37.70
				5636.34	Y	H	-39.86	10.75	-29.11	53.81	
				7515.05	X	V	-44.11	12.35	-31.76	56.46	
				9393.71	X	H	-40.20	13.49	-26.71	51.41	
		1/0	16QAM	3757.40	X	V	-36.23	8.51	-27.72	51.79	37.07
				5636.37	Y	H	-41.85	10.75	-31.10	55.17	
				7515.03	X	V	-44.45	12.35	-32.10	56.17	
				9393.43	X	H	-40.24	13.49	-26.75	50.82	
	1908.5	1/0	QPSK	3814.50	X	V	-35.60	8.55	-27.05	51.09	37.04
				5721.82	Y	H	-39.24	10.88	-28.36	52.40	
				7629.04	X	V	-45.16	12.46	-32.70	56.74	
				9536.14	X	H	-39.95	13.38	-26.57	50.61	
		1/0	16QAM	3814.47	X	V	-35.53	8.55	-26.98	50.61	36.63
				5721.69	Y	H	-39.52	10.88	-28.64	52.27	
				7628.84	X	V	-45.05	12.46	-32.59	56.22	
				9536.23	X	H	-39.93	13.38	-26.55	50.18	

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
									(dBm)	(dBc)	
1.4	1850.7	1/0	QPSK	3700.62	X	V	-36.38	8.49	-27.89	53.92	39.03
				5550.83	Y	H	-42.29	10.67	-31.62	57.65	
				8400.90	X	V	-43.51	13.12	-30.39	56.42	
				9251.27	X	H	-38.55	13.40	-25.15	51.18	
		1/0	16QAM	3700.51	X	V	-36.42	8.49	-27.93	53.38	38.45
				5550.88	Y	H	-42.25	10.67	-31.58	57.03	
				7400.88	X	V	-43.32	12.23	-31.09	56.54	
				9251.10	X	H	-37.82	13.40	-24.42	49.87	
	1880	1/0	QPSK	3759.12	X	V	-36.15	8.51	-27.64	52.12	37.48
				5638.62	Y	H	-39.68	10.75	-28.93	53.41	
				7518.25	X	V	-44.22	12.35	-31.87	56.35	
				9397.62	X	H	-40.28	13.49	-26.79	51.27	
		1/0	16QAM	3759.07	X	V	-36.21	8.51	-27.70	51.70	37.00
				5638.68	Y	H	-39.95	10.75	-29.20	53.20	
				7518.17	X	V	-44.53	12.35	-32.18	56.18	
				9397.88	X	H	-39.85	13.49	-26.36	50.36	
	1909.3	1/0	QPSK	3817.64	X	V	-35.91	8.55	-27.36	51.27	36.91
				5726.55	Y	H	-39.72	10.89	-28.83	52.74	
				7635.41	X	V	-44.10	12.46	-31.64	55.55	
				9544.34	X	H	-40.49	13.38	-27.11	51.02	
		1/0	16QAM	3817.67	X	V	-35.75	8.55	-27.20	50.47	36.27
				5726.47	Y	H	-39.39	10.89	-28.50	51.77	
				7635.51	X	V	-44.08	12.46	-31.62	54.89	
				9544.35	X	H	-39.82	13.38	-26.44	49.71	

Note 1: Limit Calculation = 43 + $10\log_{10}$ (P[Watts])

Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

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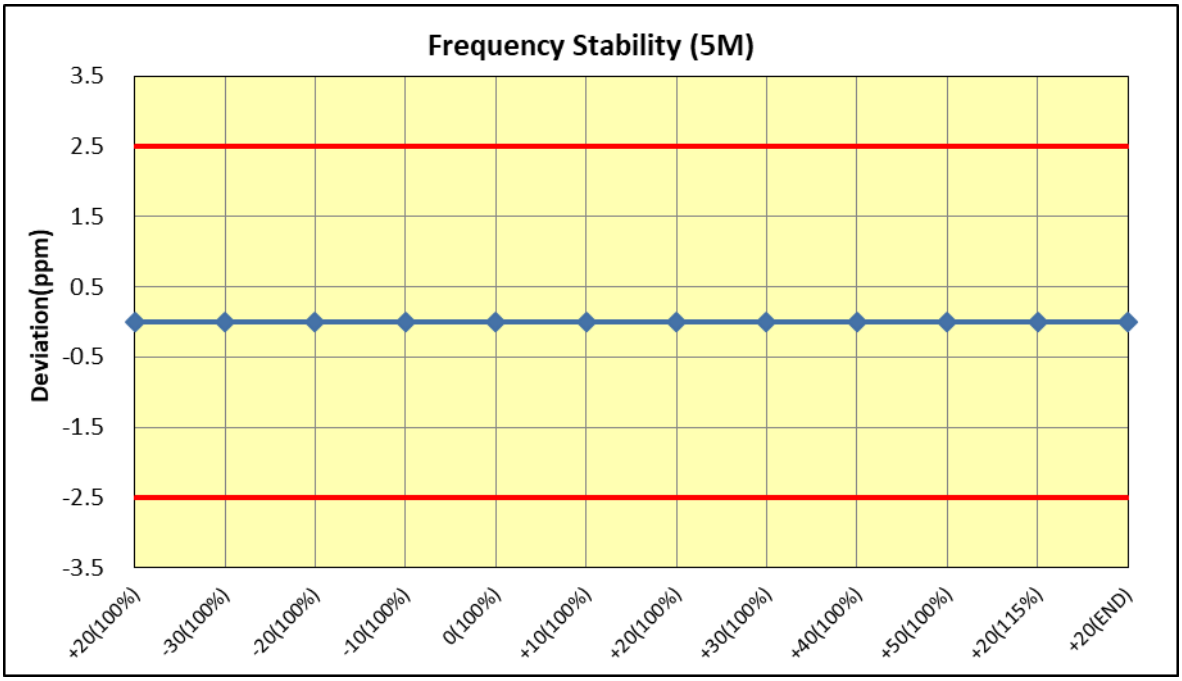
7.8 FREQUENCY STABILITY

7.8.1 LTE Band 5

OPERATING FREQUENCY : 836.5 MHz
REFERENCE VOLTAGE : 9.00 VDC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100%	9.00	+20(Ref)	836,499,993	-7	-0.0084	-0.000000837
100%		-30	836,499,995	-5	-0.0060	-0.000000598
100%		-20	836,499,995	-5	-0.0060	-0.000000598
100%		-10	836,499,993	-7	-0.0084	-0.000000837
100%		0	836,499,994	-6	-0.0072	-0.000000717
100%		+10	836,499,994	-6	-0.0072	-0.000000717
100%		+20	836,499,993	-7	-0.0084	-0.000000837
100%		+30	836,500,004	4	0.0048	0.000000478
100%		+40	836,500,002	2	0.0024	0.000000239
100%		+50	836,500,002	2	0.0024	0.000000239
115%	10.35	+20	836,499,992	-4	-0.0048	-0.000000478
BATT.ENDPOINT	8.40	+20	836,499,992	-8	-0.0096	-0.000000956

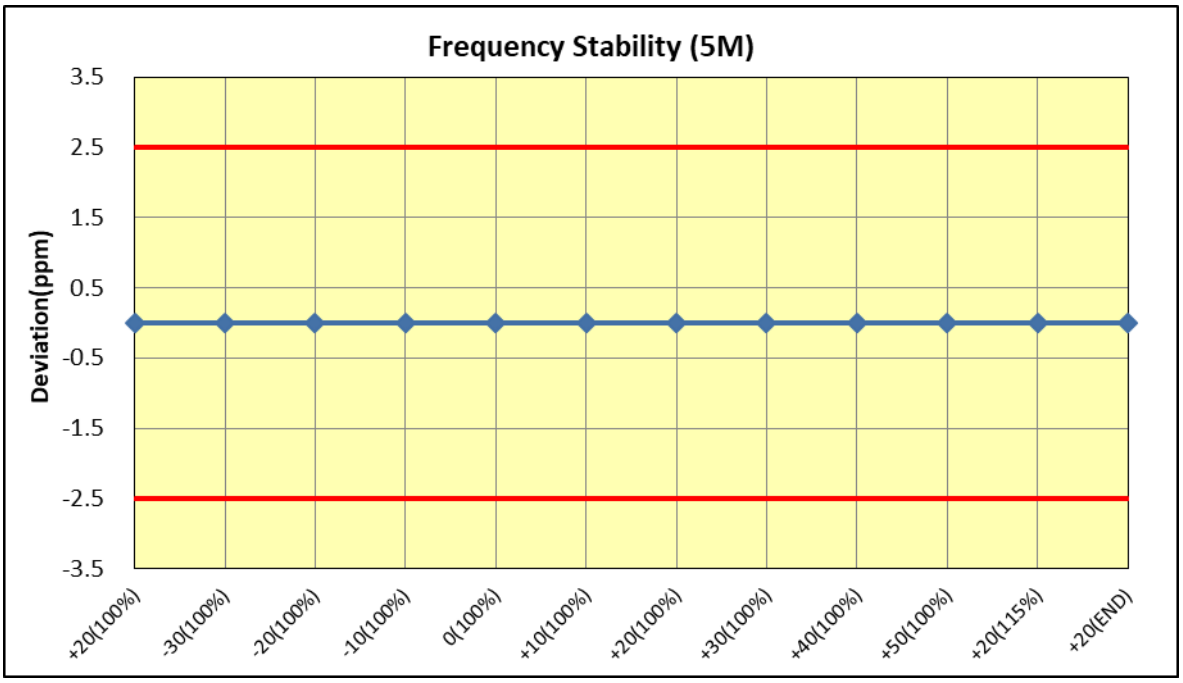


Note. Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. as such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

7.8.2 LTE Band 4

OPERATING FREQUENCY : 1732.5 MHz
REFERENCE VOLTAGE 9.00 VDC
LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays wthin the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100%	9.00	+20(Ref)	1,732,499,993	-7	-0.0040	-0.000000404
100%		-30	1,732,499,997	-3	-0.0017	-0.000000173
100%		-20	1,732,499,996	-4	-0.0023	-0.000000231
100%		-10	1,732,499,994	-6	-0.0035	-0.000000346
100%		0	1,732,499,994	-6	-0.0035	-0.000000346
100%		+10	1,732,499,995	-5	-0.0029	-0.000000289
100%		+20	1,732,499,993	-7	-0.0040	-0.000000404
100%		+30	1,732,499,992	-8	-0.0046	-0.000000462
100%		+40	1,732,499,993	-7	-0.0040	-0.000000404
100%		+50	1,732,499,994	-6	-0.0035	-0.000000346
115%	10.35	+20	1,732,499,995	-5	-0.0029	-0.000000289
BATT.ENDPOINT	8.40	+20	1,732,499,995	-5	-0.0029	-0.000000289

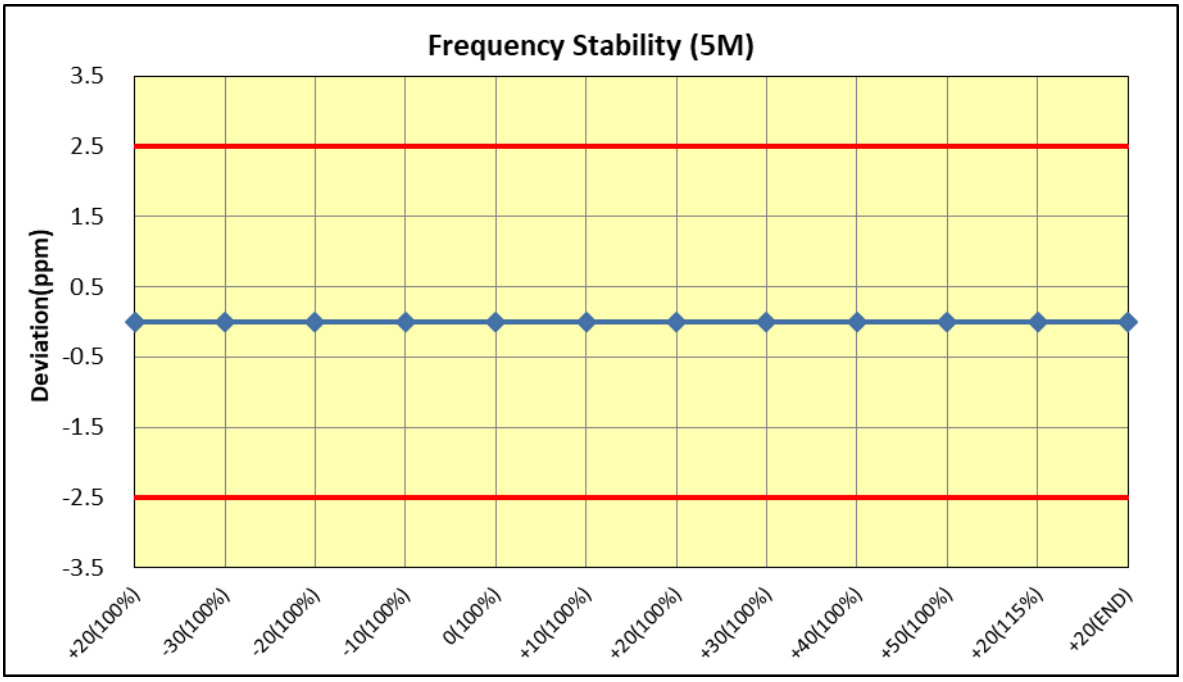


Note. Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. as such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

7.8.3 LTE Band 2

OPERATING FREQUENCY : 1880 MHz
CHANNEL : 18900
REFERENCE VOLTAGE : 9.00 VDC
LIMIT(FCC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays wthin the authorized frequency block.
DEVIATION LIMIT(IC) : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100%	9.00	+20(Ref)	1,880,000,001	1	0.0005	0.000000053
100%		-30	1,879,999,999	-1	-0.0005	-0.000000053
100%		-20	1,879,999,994	-6	-0.0032	-0.000000319
100%		-10	1,879,999,993	-7	-0.0037	-0.000000372
100%		0	1,879,999,993	-7	-0.0037	-0.000000372
100%		+10	1,879,999,995	-5	-0.0027	-0.000000266
100%		+20	1,880,000,001	1	0.0005	0.000000053
100%		+30	1,879,999,994	-6	-0.0032	-0.000000319
100%		+40	1,879,999,995	-5	-0.0027	-0.000000266
100%		+50	1,879,999,995	-5	-0.0027	-0.000000266
115%	10.35	+20	1,879,999,996	-6	-0.0021	-0.000000213
BATT.ENDPOINT	8.40	+20	1,879,999,996	-4	-0.0021	-0.000000213



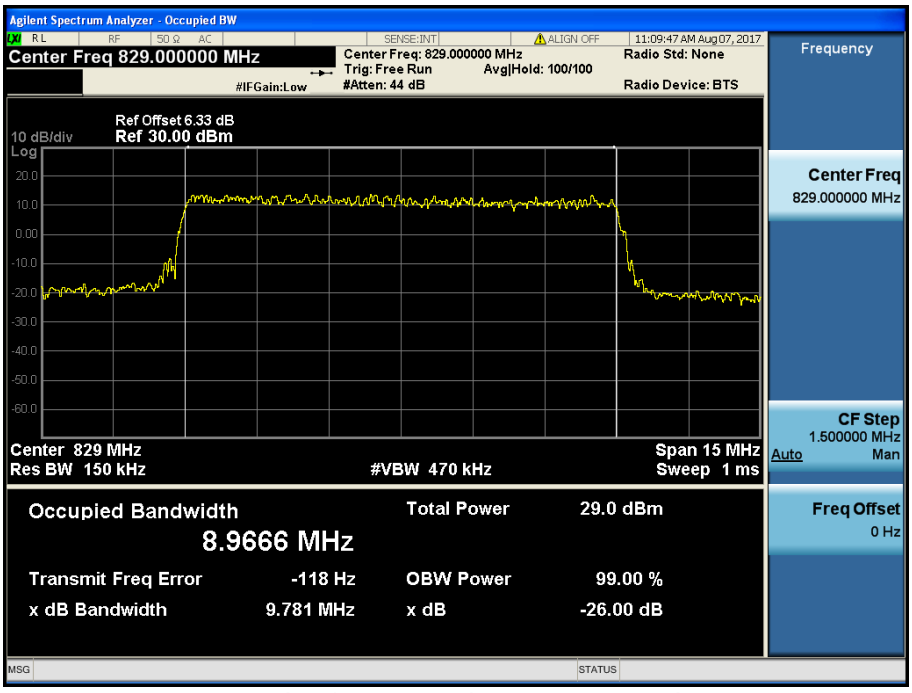
Note. Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. as such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

8. TEST PLOTS

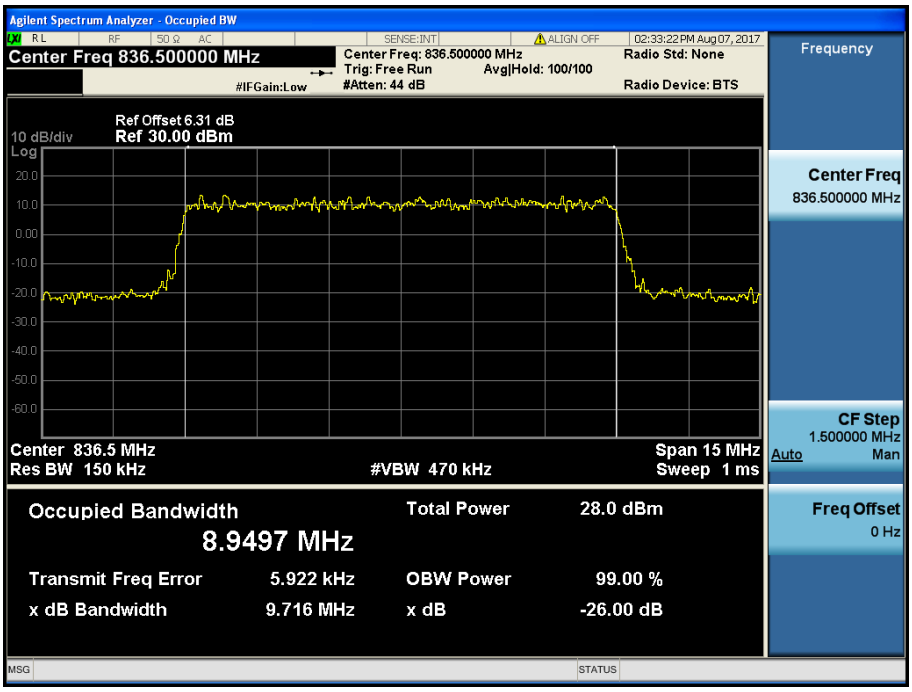
**Note: All bandwidths, RB configurations, and modulations were investigated.
The worst case test results are reported.**

8.1 OCCUPIED BANDWIDTH

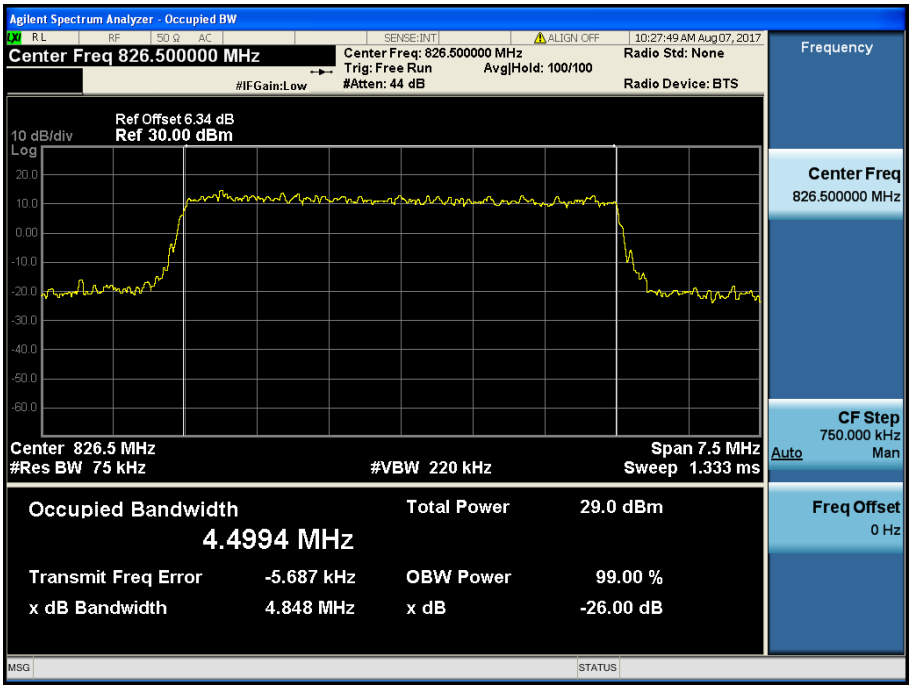
8.1.1 LTE Band 5



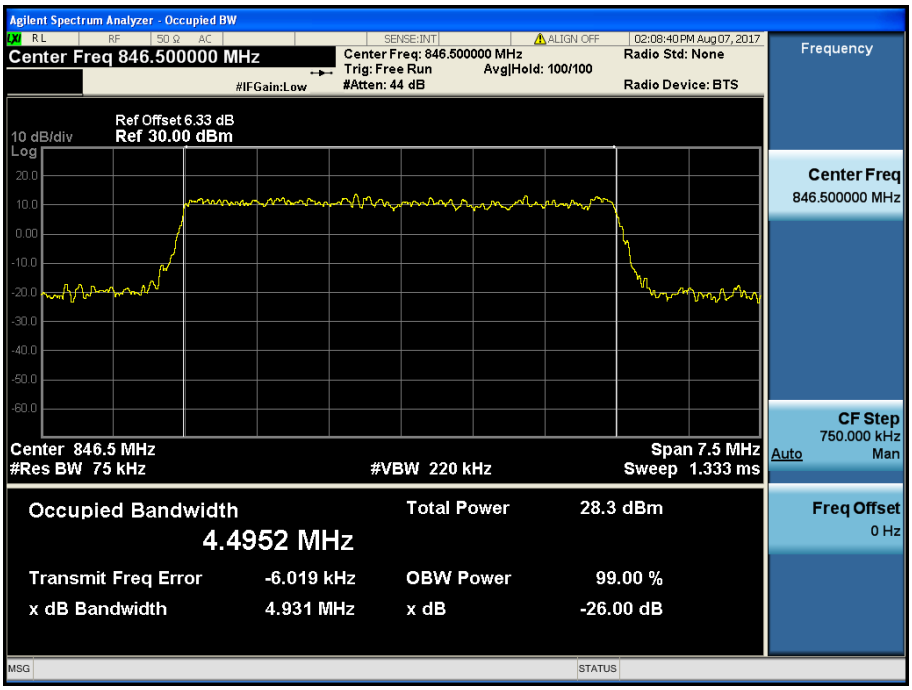
LTE Band 5 / 10 MHz / QPSK - RB Size 50



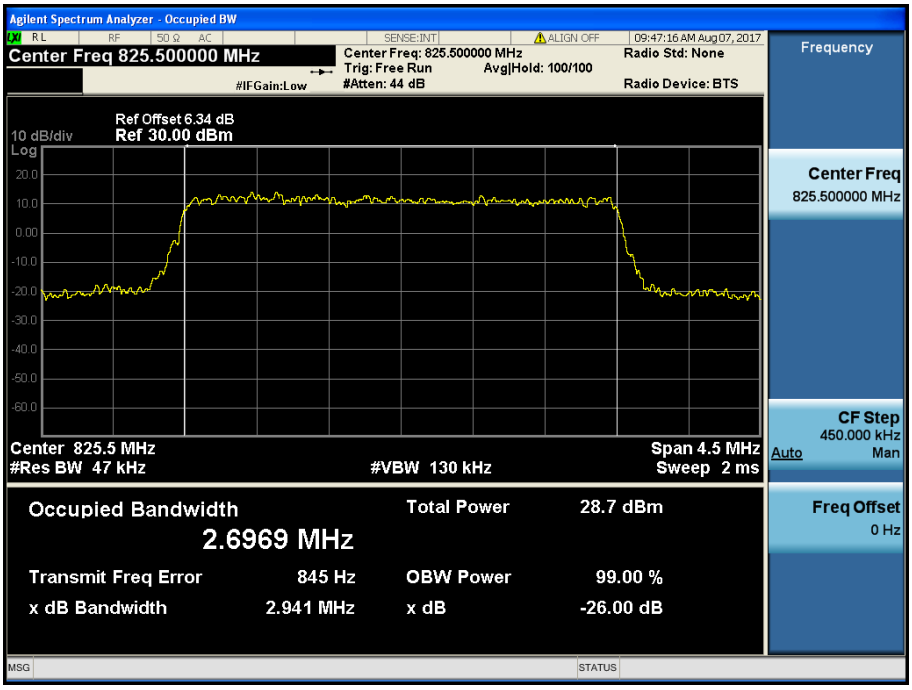
LTE Band 5 / 10 MHz / 16QAM - RB Size 50



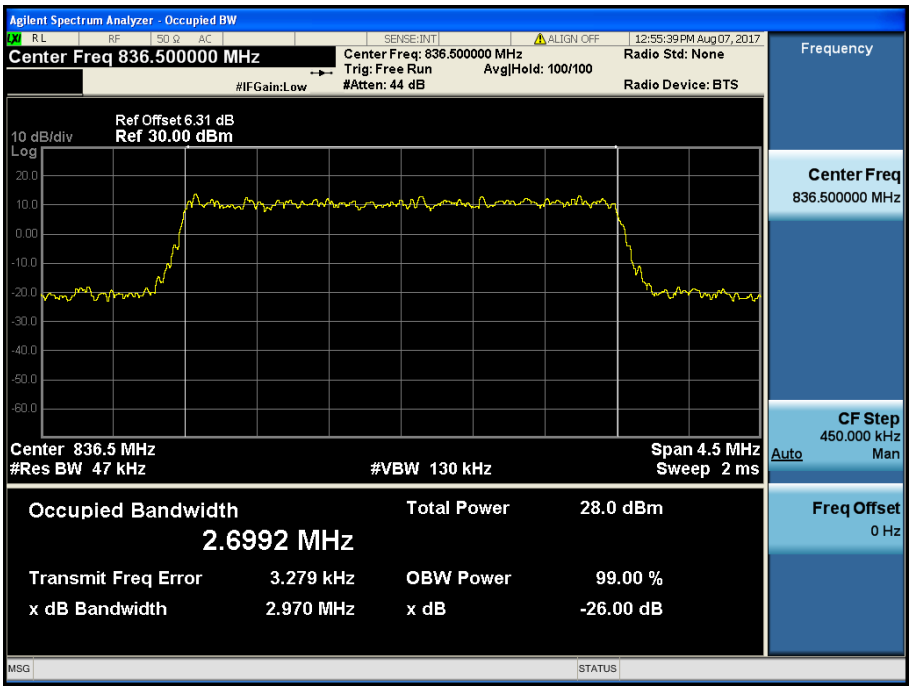
LTE Band 5 / 5 MHz / QPSK - RB Size 25



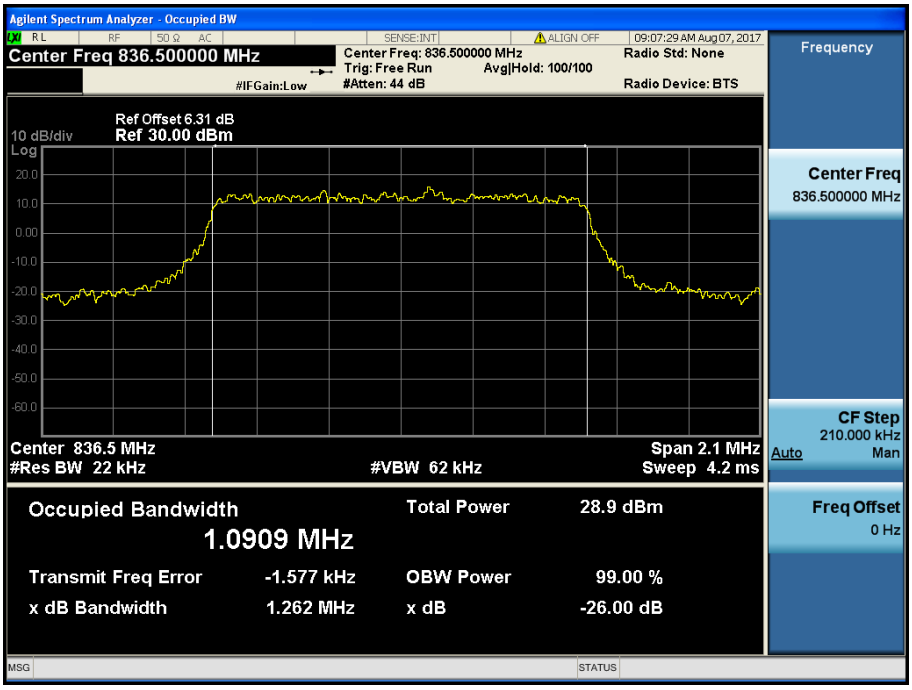
LTE Band 5 / 5 MHz / 16QAM - RB Size 25



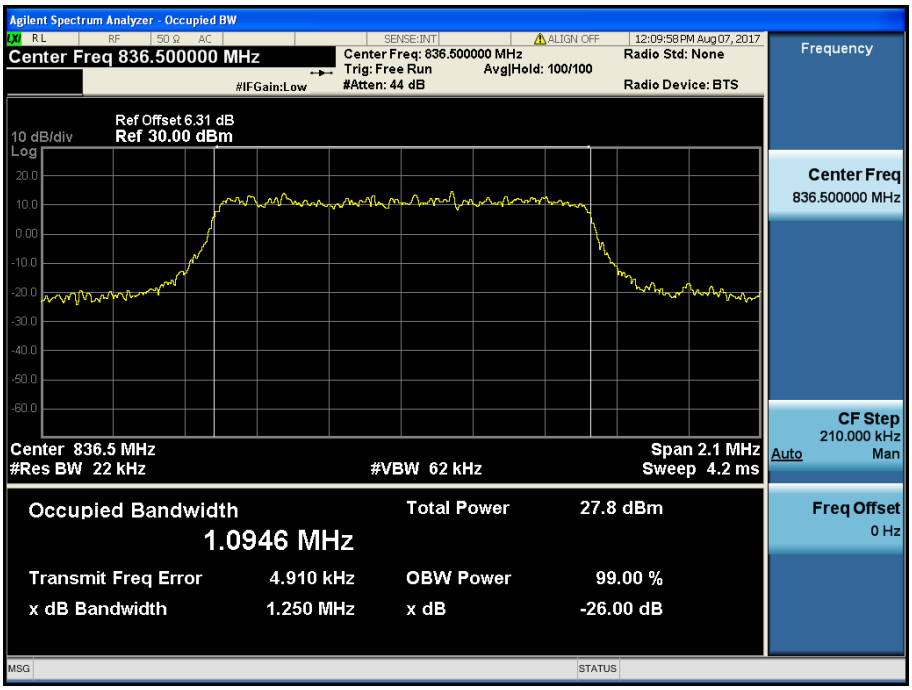
LTE Band 5 / 3 MHz / QPSK - RB Size 15



LTE Band 5 / 3 MHz / 16QAM - RB Size 15

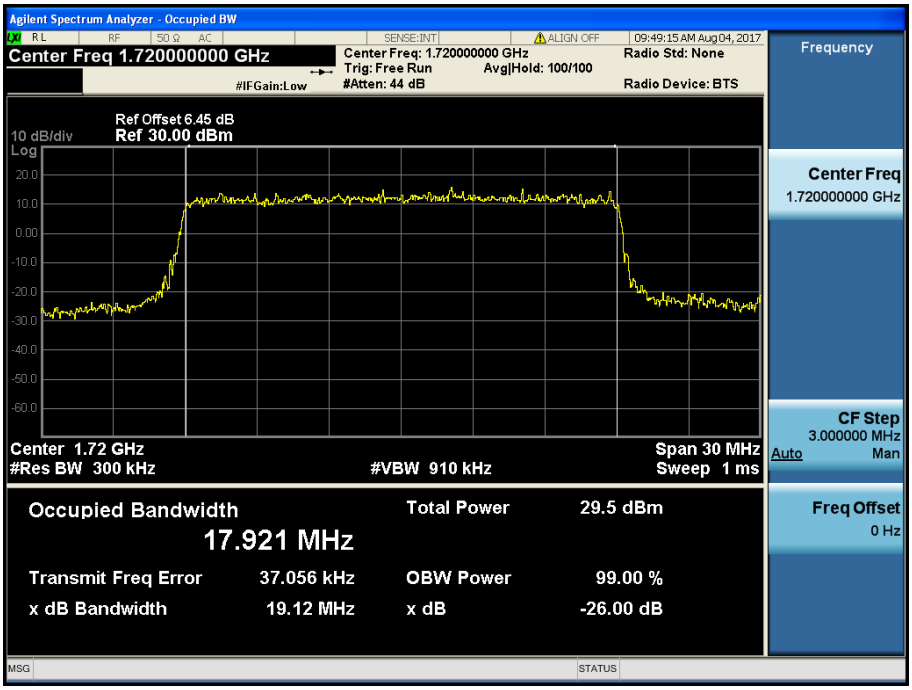


LTE Band 5 / 1.4 MHz / QPSK - RB Size 6

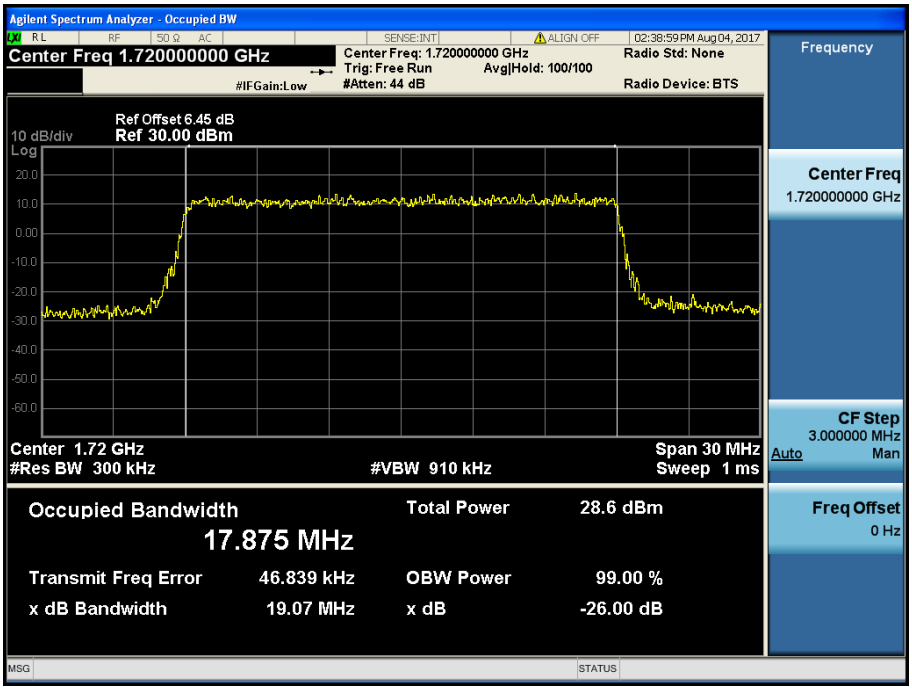


LTE Band 5 / 1.4 MHz / 16QAM - RB Size 6

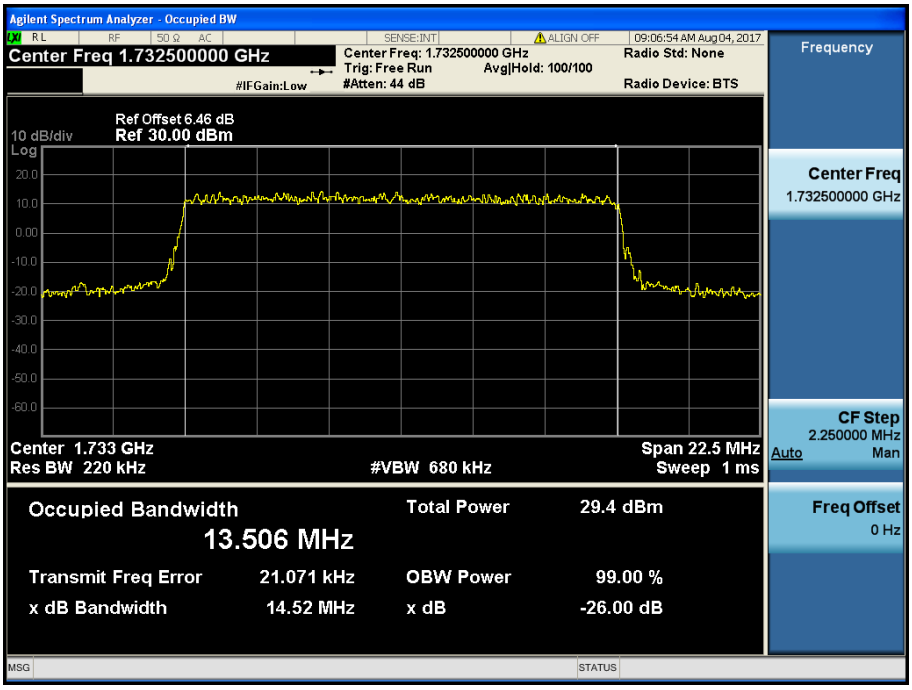
8.1.2 LTE Band 4



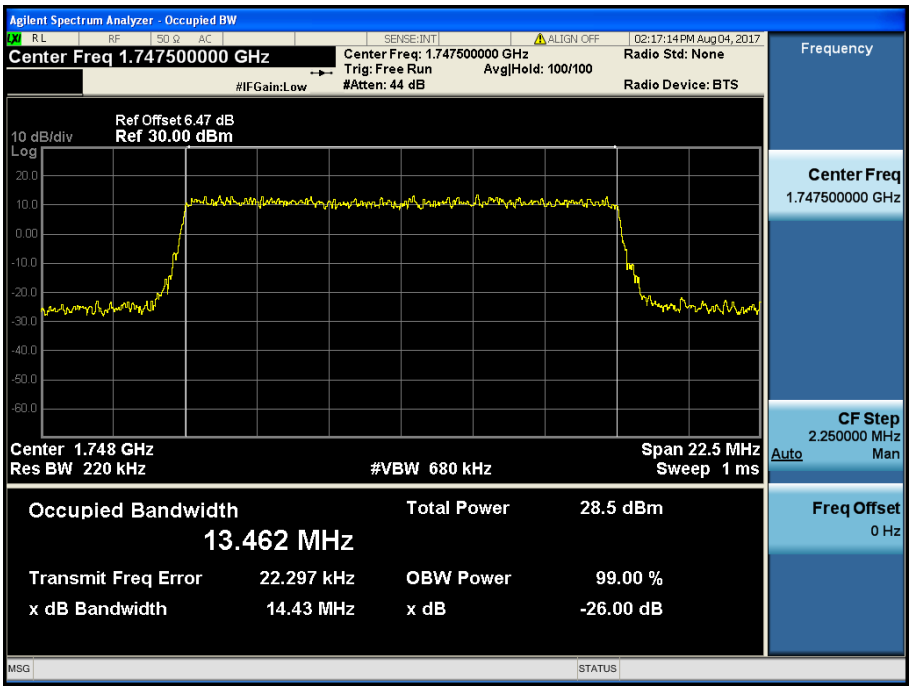
LTE Band 4 / 20 MHz / QPSK - RB Size 100



LTE Band 4 / 20 MHz / 16QAM - RB Size 100



LTE Band 4 / 15 MHz / QPSK - RB Size 75



LTE Band 4 / 15 MHz / 16QAM - RB Size 75