

FCC Test Report

(PART 24)

Report No.: RF171122C17-1

FCC ID: HD5-CT60L1N

Test Model: CT60L1N

Received Date: Nov. 22, 2017

Test Date: Nov. 23, 2017 ~ Dec. 24, 2017

Issued Date: Jan. 08, 2017

Applicant: Honeywell International Inc.

Address: 9680 Old Bailes Road, Fort Mill, SC 29707 USA

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
(R.O.C)

Test Location: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan
Hsien 333, Taiwan, R.O.C.

FCC Registration /
Designation Number: 788550 / TW0003



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 Summary of Test Results.....	5
2.1 Measurement Uncertainty.....	5
2.2 Test Site And Instruments	6
3 General Information	8
3.1 General Description of EUT	8
3.2 Configuration of System under Test.....	10
3.2.1 Description of Support Units	10
3.3 Test Mode Applicability and Tested Channel Detail	11
3.4 EUT Operating Conditions	16
3.5 General Description of Applied Standards.....	16
4 Test Types and Results	17
4.1 Output Power Measurement.....	17
4.1.1 Limits of Output Power Measurement	17
4.1.2 Test Procedures.....	17
4.1.3 Test Setup.....	18
4.1.4 Test Results	19
4.2 Frequency Stability Measurement	35
4.2.1 Limits of Frequency Stability Measurement.....	35
4.2.2 Test Procedure	35
4.2.3 Test Setup.....	35
4.2.4 Test Results	36
4.3 Occupied Bandwidth Measurement.....	52
4.3.1 Test Procedure	52
4.3.2 Test Setup.....	52
4.3.3 Test Result	53
4.4 Band Edge Measurement	60
4.4.1 Limits of Band Edge Measurement	60
4.4.2 Test Setup.....	60
4.4.3 Test Procedures.....	60
4.4.4 Test Results	61
4.5 Peak to Average Ratio	75
4.5.1 Limits of Peak to Average Ratio Measurement	75
4.5.2 Test Setup.....	75
4.5.3 Test Procedures.....	75
4.5.4 Test Results	76
4.6 Conducted Spurious Emissions	83
4.6.1 Limits of Conducted Spurious Emissions Measurement.....	83
4.6.2 Test Setup.....	83
4.6.3 Test Procedure	83
4.6.4 Test Results	84
4.7 Radiated Emission Measurement.....	132
4.7.1 Limits of Radiated Emission Measurement	132
4.7.2 Test Procedure	132
4.7.3 Deviation from Test Standard	132
4.7.4 Test Setup.....	133
4.7.5 Test Results	134
5 Pictures of Test Arrangements.....	170
Appendix – Information on the Testing Laboratories	171

Release Control Record

Issue No.	Description	Date Issued
RF171122C17-1	Original Release	Jan. 08, 2017

1 Certificate of Conformity

Product: Dolphin CT60

Brand: Honeywell

Test Model: CT60L1N

Sample Status: Engineering sample

Applicant: Honeywell International Inc.

Test Date: Nov. 23, 2017 ~ Dec. 24, 2017

Standards: FCC Part 24, Subpart E

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 : Evonne Liu, **Date:** Jan. 08, 2017
Evonne Liu / Specialist

Approved by : Dylan Chiou, **Date:** Jan. 08, 2017
Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1046 24.232(d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -25.79 dB at 7620 MHz.

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	Expanded 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 & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Feb. 17, 2017	Feb. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 16, 2016	Dec. 15, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	100115	Nov. 23, 2017	Nov. 22, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 13, 2016	Dec. 12, 2017
			Dec. 06, 2017	Dec. 05, 2018
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 27, 2016	Dec. 26, 2017
Double Ridge Guide Horn Antenna EMCO	3115	5619	Dec. 15, 2016	Dec. 14, 2017
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 13, 2016	Dec. 12, 2017
			Dec. 06, 2017	Dec. 05, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 14, 2016	Dec. 13, 2017
			Dec. 01, 2017	Nov. 30, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 23, 2017	Jun. 22, 2018
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 24, 2017	Oct. 23, 2018
Loop Antenna	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier EMCI	EMC001340	980201	Nov. 01, 2017	Oct. 30, 2018
Bluetooth Tester	CBT	100946	Jul. 29, 2016	Jul. 28, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 184045	980116	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 330H	980112	Oct. 13, 2017	Oct. 12, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-8 000&3000	140811+170717	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM- 1000(140807)	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 20, 2017	Oct. 19, 2018
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

- 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 IC Site Registration No. is IC7450F-10.

3 General Information

3.1 General Description of EUT

Product	Dolphin CT60	
Brand	Honeywell	
Test Model	CT60L1N	
Status of EUT	Engineering sample	
HW Version	V1.0	
HW P/N	DVT3	
SW Version	OS.01.001-HON.01.003	
SW P/N	329D	
Power Supply Rating	3.6 Vdc (Li-ion battery)	
Modulation Type	GSM/GPRS	GMSK
	EDGE	GMSK, 8PSK
	WCDMA	QPSK
	CDMA	QPSK, OQPSK, HPSK
	LTE	QPSK, 16QAM, 64QAM
Frequency Range	GSM/GPRS/EDGE	1850.2 ~ 1909.8 MHz
	WCDMA	1852.4 ~ 1907.6 MHz
	CDMA	1851.3 ~ 1908.8 MHz
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1850.7 ~ 1909.3 MHz
	LTE Band 2 (Channel Bandwidth: 3 MHz)	1851.5 ~ 1908.5 MHz
	LTE Band 2 (Channel Bandwidth: 5 MHz)	1852.5 ~ 1907.5 MHz
	LTE Band 2 (Channel Bandwidth: 10 MHz)	1855.0 ~ 1905.0 MHz
	LTE Band 2 (Channel Bandwidth: 15 MHz)	1857.5 ~ 1902.5 MHz
	LTE Band 2 (Channel Bandwidth: 20 MHz)	1860.0 ~ 1900.0 MHz
	LTE Band 25 (Channel Bandwidth: 1.4 MHz)	1850.7 ~ 1914.3 MHz
	LTE Band 25 (Channel Bandwidth: 3 MHz)	1851.5 ~ 1913.5 MHz
	LTE Band 25 (Channel Bandwidth: 5 MHz)	1852.5 ~ 1912.5 MHz
	LTE Band 25 (Channel Bandwidth: 10 MHz)	1855.0 ~ 1910.0 MHz
	LTE Band 25 (Channel Bandwidth: 15 MHz)	1857.5 ~ 1907.5 MHz
	LTE Band 25 (Channel Bandwidth: 20 MHz)	1860.0 ~ 1905.0 MHz
Max. EIRP Power	GSM/GPRS	946.46 mW
	EDGE	381.15 mW
	WCDMA	204.69 mW
	CDMA	196.34 mW
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	243.22 mW
	LTE Band 2 (Channel Bandwidth: 3 MHz)	246.60 mW
	LTE Band 2 (Channel Bandwidth: 5 MHz)	258.23 mW
	LTE Band 2 (Channel Bandwidth: 10 MHz)	309.74 mW
	LTE Band 2 (Channel Bandwidth: 15 MHz)	321.37 mW
	LTE Band 2 (Channel Bandwidth: 20 MHz)	330.37 mW
	LTE Band 25 (Channel Bandwidth: 1.4 MHz)	133.66 mW
	LTE Band 25 (Channel Bandwidth: 3 MHz)	143.55 mW
	LTE Band 25 (Channel Bandwidth: 5 MHz)	153.82 mW

Emission Designator	LTE Band 25 (Channel Bandwidth: 10 MHz)	154.53 mW
	LTE Band 25 (Channel Bandwidth: 15 MHz)	160.69 mW
	LTE Band 25 (Channel Bandwidth: 20 MHz)	181.97 mW
	GSM/GPRS	245KGXW
	EDGE	249KG7W
	WCDMA	4M15F9W
	CDMA	1M27F9W
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 2 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 2 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 2 (Channel Bandwidth: 10 MHz)	8M98W7D
	LTE Band 2 (Channel Bandwidth: 15 MHz)	13M4G7D
	LTE Band 2 (Channel Bandwidth: 20 MHz)	17M9W7D
	LTE Band 25 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 25 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 25 (Channel Bandwidth: 5 MHz)	4M56G7D
	LTE Band 25 (Channel Bandwidth: 10 MHz)	8M98W7D
	LTE Band 25 (Channel Bandwidth: 15 MHz)	13M4G7D
	LTE Band 25 (Channel Bandwidth: 20 MHz)	17M9W7D
Antenna Type	PIFA Antenna	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

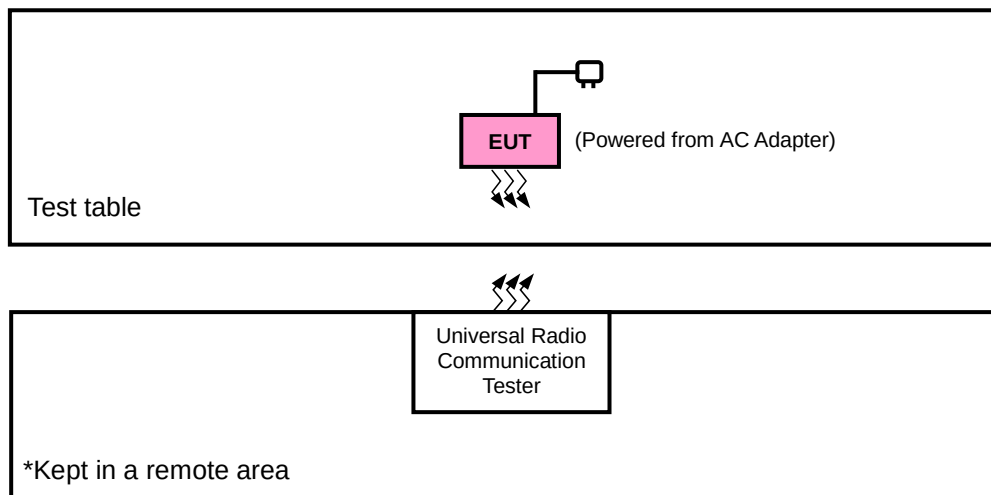
1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Battery	Inventus	CT50-BTSC	3.6 Vdc, 4040 mAh, 14.6Wh

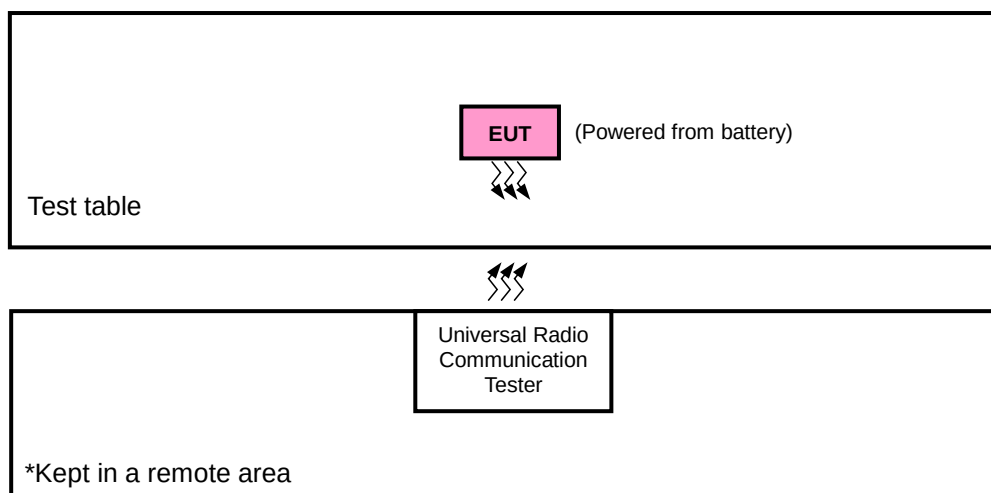
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.I.R.P. 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.

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	EIRP	Radiated Emission
GSM	Y-plane	X-axis
EDGE	Y-plane	X-axis
WCDMA	Y-plane	X-axis
CDMA	Y-plane	X-axis
LTE Band 2	Y-plane	X-axis
LTE Band 25	Y-plane	X-axis

GSM

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	512 to 810	512, 661, 810	GSM, EDGE
-	Frequency Stability	512 to 810	512, 810	GSM, EDGE
-	Occupied Bandwidth	512 to 810	512, 661, 810	GSM, EDGE
-	Band Edge	512 to 810	512, 810	GSM, EDGE
-	Peak to Average Ratio	512 to 810	512, 661, 810	GSM, EDGE
-	Conducted Emission	512 to 810	512, 661, 810	GSM, EDGE
-	Radiated Emission	512 to 810	512, 661, 810	GSM, EDGE

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
-	Frequency Stability	9262 to 9538	9262, 9538	WCDMA
-	Occupied Bandwidth	9262 to 9538	9262, 9400, 9538	WCDMA
-	Band Edge	9262 to 9538	9262, 9538	WCDMA
-	Peak to Average Ratio	9262 to 9538	9262, 9400, 9538	WCDMA
-	Conducted Emission	9262 to 9538	9262, 9400, 9538	WCDMA
-	Radiated Emission	9262 to 9538	9262, 9400, 9538	WCDMA

CDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	25 to 1175	25, 600, 1175	1xRTT
-	Frequency Stability	25 to 1175	25, 1175	1xRTT
-	Occupied Bandwidth	25 to 1175	25, 600, 1175	1xRTT
-	Band Edge	25 to 1175	25, 600, 1175	1xRTT
-	Peak to Average Ratio	25 to 1175	25, 1175	1xRTT
-	Conducted Emission	25 to 1175	25, 600, 1175	1xRTT
-	Radiated Emission	25 to 1175	25, 600, 1175	1xRTT

LTE Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	18607 to 19193	18607, 19193	1.4 MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 19185	3 MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 19175	5 MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 19150	10 MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 19125	15 MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 19100	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset

		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Band Edge	18607 to 19193	18607	1.4 MHz	QPSK	1 RB / 0 RB Offset 6 RB / 0 RB Offset
			19193	1.4 MHz	QPSK	1 RB / 5 RB Offset 6 RB / 0 RB Offset
		18615 to 19185	18615	3 MHz	QPSK	1 RB / 0 RB Offset 15 RB / 0 RB Offset
			19185	3 MHz	QPSK	1 RB / 14 RB Offset 15 RB / 0 RB Offset
		18625 to 19175	18625	5 MHz	QPSK	1 RB / 0 RB Offset 25 RB / 0 RB Offset
			19175	5 MHz	QPSK	1 RB / 24 RB Offset 25 RB / 0 RB Offset
		18650 to 19150	18650	10 MHz	QPSK	1 RB / 0 RB Offset 50 RB / 0 RB Offset
			19150	10 MHz	QPSK	1 RB / 49 RB Offset 50 RB / 0 RB Offset
		18675 to 19125	18675	15 MHz	QPSK	1 RB / 0 RB Offset 75 RB / 0 RB Offset
			19125	15 MHz	QPSK	1 RB / 74 RB Offset 75 RB / 0 RB Offset
		18700 to 19100	18700	20 MHz	QPSK	1 RB / 0 RB Offset 100 RB / 0 RB Offset
			19100	20 MHz	QPSK	1 RB / 99 RB Offset 100 RB / 0 RB Offset
-	Conducted Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	18700 to 19100	18700, 18900, 19100	20 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.

LTE Band 25

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26090 to 26640	26090, 26365, 26640	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	26047 to 26683	26047, 26683	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26055 to 26675	26055, 26675	3 MHz	QPSK	1 RB / 0 RB Offset
		26065 to 26665	26065, 26665	5 MHz	QPSK	1 RB / 0 RB Offset
		26090 to 26640	26090, 26640	10 MHz	QPSK	1 RB / 0 RB Offset
		26115 to 26615	26115, 26615	15 MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590	26140, 26590	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		26090 to 26640	26090, 26365, 26640	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 7 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 12 RB Offset
		26090 to 26640	26090, 26365, 26640	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
		26115 to 26615	26115, 26365, 26615	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Band Edge	26047 to 26683	26047	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
		26055 to 26675	26683	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
			26055	3 MHz	QPSK	1 RB / 0 RB Offset
			26675	3 MHz	QPSK	1 RB / 14 RB Offset
		26065 to 26665				15 RB / 0 RB Offset
			26065	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			26665	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset

		26090 to 26640	26090	10 MHz	QPSK	1 RB / 0 RB Offset
			26640	10 MHz	QPSK	50 RB / 0 RB Offset
		26115 to 26615	26115	15 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
			26615	15 MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590				75 RB / 0 RB Offset
			26140	20 MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
			26590	20 MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
						1 RB / 99 RB Offset
						100 RB / 0 RB Offset
EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Conducted Emission	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK	1 RB / 5 RB Offset
		26055 to 26675	26055, 26365, 26675	3 MHz	QPSK	1 RB / 7 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK	1 RB / 12 RB Offset
		26090 to 26640	26090, 26365, 26640	10 MHz	QPSK	1 RB / 24 RB Offset
		26115 to 26615	26115, 26365, 26615	15 MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	26140 to 26590	26140, 26365, 26590	20 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
EIRP	26 deg. C, 58 % RH	3.6 Vdc	Wayne Lin
Frequency Stability	26 deg. C, 58 % RH	3.6 Vdc	Wayne Lin
Occupied Bandwidth	26 deg. C, 58 % RH	3.6 Vdc	Wayne Lin
Band Edge	26 deg. C, 58 % RH	3.6 Vdc	Wayne Lin
Peak to Average Ratio	26 deg. C, 58 % RH	3.6 Vdc	Wayne Lin
Conducted Emission	26 deg. C, 58 % RH	3.6 Vdc	Wayne Lin
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang / Jisyong Wang

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 24

KDB 971168 D01 Power Meas License Digital Systems v02r02

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

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

Mobile / Portable station are limited to 2 watts e.i.r.p.

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 1 MHz for GSM, GPRS & EDGE, 5 MHz for WCDMA and CDMA, 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 (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$. E.R.P power can be calculated from E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$.

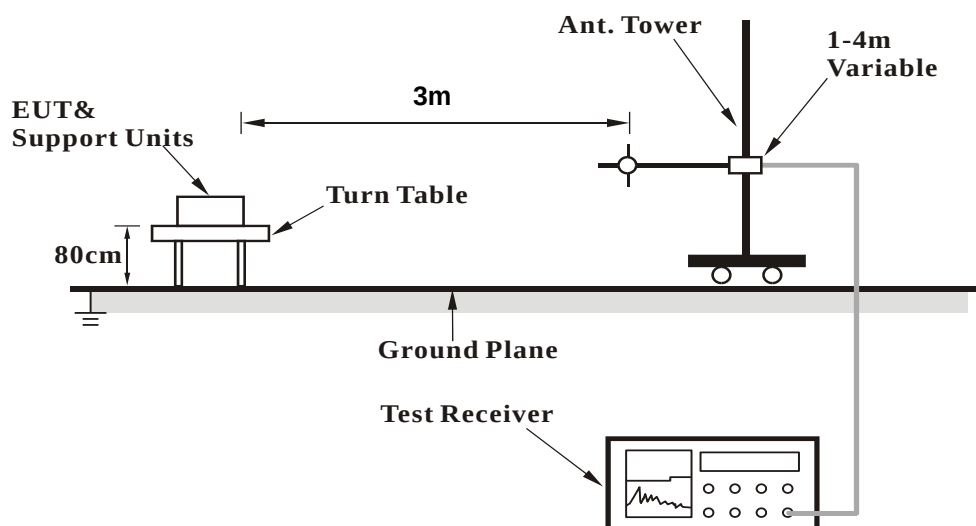
Conducted Power Measurement:

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA, CDMA, and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

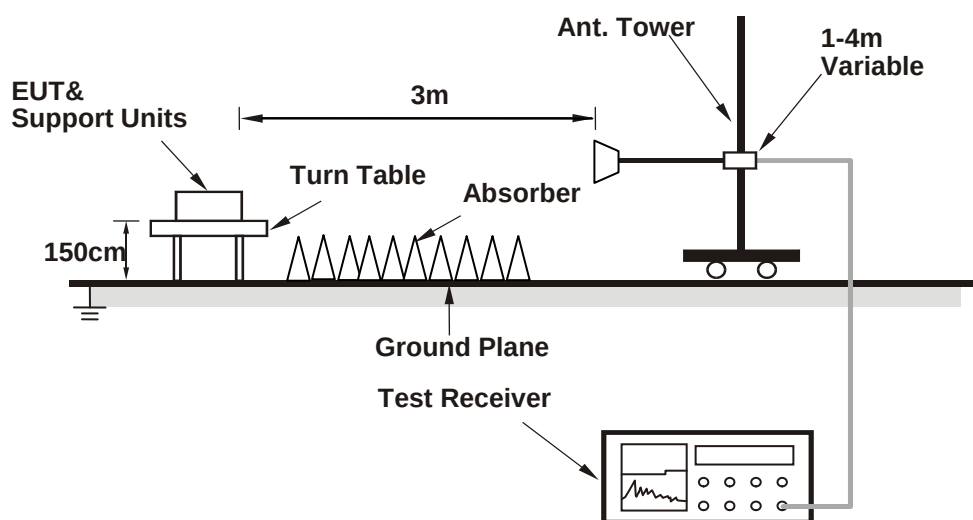
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

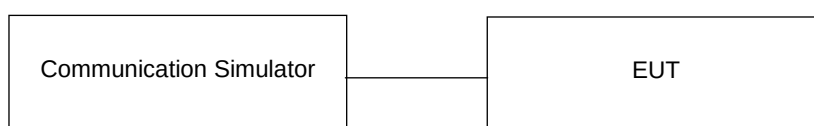


<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GSM (GMSK, 1Tx-slot)	30.07	30.56	30.89
GPRS (GMSK, 1Tx-slot)	29.62	30.11	30.44
GPRS (GMSK, 2Tx-slot)	27.50	27.99	28.32
GPRS (GMSK, 3Tx-slot)	25.33	25.82	26.15
GPRS (GMSK, 4Tx-slot)	24.06	24.55	24.88
EDGE (8PSK, 1Tx-slot)	26.90	27.39	27.72
EDGE (8PSK, 2Tx-slot)	23.88	24.37	24.70
EDGE (8PSK, 3Tx-slot)	22.03	22.52	22.85
EDGE (8PSK, 4Tx-slot)	20.76	21.25	21.58

Band	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	24.01	24.15	24.18
HSDPA Subtest-1	23.00	23.14	23.17
HSDPA Subtest-2	23.05	23.19	23.22
HSDPA Subtest-3	22.52	22.66	22.69
HSDPA Subtest-4	22.53	22.67	22.70
HSUPA Subtest-1	23.01	23.15	23.18
HSUPA Subtest-2	21.05	21.19	21.22
HSUPA Subtest-3	22.13	22.27	22.30
HSUPA Subtest-4	21.02	21.16	21.19
HSUPA Subtest-5	23.06	23.20	23.23

Band	CDMA		
Channel	25	600	1175
Frequency (MHz)	1851.25	1880	1908.75
RC1+SO55	23.83	23.82	23.88
RC3+SO55	23.90	23.78	23.84
RC3+SO32 (+F-SCH)	23.87	23.79	23.85
RC3+SO32 (+SCH)	23.88	23.77	23.83
RTAP 153.6	23.89	23.78	23.84
RETAP 4096	23.73	23.62	23.68

LTE Band 2															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		18700	18900	19100				Channel		18675	18900	19125	
		Frequency (MHz)		1860.0	1880.0	1900.0				Frequency (MHz)		1857.5	1880.0	1902.5	
20M	QPSK	1	0	24.77	24.90	24.81	0	15M	QPSK	1	0	24.70	24.89	24.74	0
		1	50	24.72	24.73	24.42	0			1	37	24.65	24.66	24.35	0
		1	99	24.51	24.70	24.57	0			1	74	24.44	24.63	24.50	0
		50	0	23.80	23.82	23.76	1			36	0	23.73	23.75	23.69	1
		50	25	23.75	23.78	23.70	1			36	19	23.68	23.71	23.63	1
		50	50	23.51	23.81	23.59	1			36	39	23.44	23.74	23.52	1
		100	0	23.73	23.79	23.77	1			75	0	23.66	23.72	23.70	1
		1	0	23.87	23.88	23.90	1		16QAM	1	0	23.80	23.90	23.84	1
	16QAM	1	50	23.89	23.90	23.82	1			1	37	23.84	23.84	23.75	1
		1	99	23.48	23.85	23.86	1			1	74	23.41	23.78	23.79	1
		50	0	22.74	22.83	22.68	2			36	0	22.67	22.76	22.61	2
		50	25	22.67	22.81	22.58	2			36	19	22.60	22.74	22.51	2
		50	50	22.69	22.72	22.60	2			36	39	22.62	22.65	22.53	2
		100	0	22.57	22.61	22.63	2			75	0	22.50	22.54	22.56	2
		1	0	22.88	22.89	22.90	2		64QAM	1	0	22.81	22.90	22.85	2
	64QAM	1	50	22.90	22.90	22.83	2			1	37	22.85	22.85	22.76	2
		1	99	22.49	22.86	22.87	2			1	74	22.42	22.79	22.80	2
		50	0	21.75	21.84	21.69	3			36	0	21.68	21.77	21.62	3
		50	25	21.68	21.82	21.59	3			36	19	21.61	21.75	21.52	3
		50	50	21.70	21.73	21.61	3			36	39	21.63	21.66	21.54	3
		100	0	21.58	21.62	21.64	3			75	0	21.51	21.55	21.57	3
		1	0	21.88	21.89	21.90	3			1	0	21.81	21.90	21.85	3
10M	QPSK	1	0	24.64	24.85	24.68	0	5M	QPSK	1	0	24.56	24.77	24.60	0
		1	24	24.59	24.60	24.29	0			1	12	24.51	24.52	24.21	0
		1	49	24.38	24.57	24.44	0			1	24	24.30	24.49	24.36	0
		25	0	23.67	23.69	23.63	1			12	0	23.59	23.61	23.55	1
		25	12	23.62	23.65	23.57	1			12	6	23.54	23.57	23.49	1
		25	25	23.38	23.68	23.46	1			12	13	23.30	23.60	23.38	1
		50	0	23.60	23.66	23.64	1			25	0	23.52	23.58	23.56	1
		1	0	23.74	23.85	23.78	1		16QAM	1	0	23.66	23.77	23.70	1
	16QAM	1	24	23.78	23.78	23.69	1			1	12	23.70	23.70	23.61	1
		1	49	23.35	23.72	23.73	1			1	24	23.27	23.64	23.65	1
		25	0	22.61	22.70	22.55	2			12	0	22.53	22.62	22.47	2
		25	12	22.54	22.68	22.45	2			12	6	22.46	22.60	22.37	2
		25	25	22.56	22.59	22.47	2			12	13	22.48	22.51	22.39	2
		50	0	22.44	22.48	22.50	2			25	0	22.36	22.40	22.42	2
		1	0	22.75	22.86	22.79	2		64QAM	1	0	22.67	22.78	22.71	2
	64QAM	1	24	22.79	22.79	22.70	2			1	12	22.71	22.71	22.62	2
		1	49	22.36	22.73	22.74	2			1	24	22.28	22.65	22.66	2
		25	0	21.62	21.71	21.56	3			12	0	21.54	21.63	21.48	3
		25	12	21.55	21.69	21.46	3			12	6	21.47	21.61	21.38	3
		25	25	21.57	21.60	21.48	3			12	13	21.49	21.52	21.40	3
		50	0	21.45	21.49	21.51	3			25	0	21.37	21.41	21.43	3
		1	0	21.88	21.89	21.90	3			1	0	21.81	21.89	21.85	3
3M	QPSK	1	0	24.49	24.70	24.53	0	1.4M	QPSK	1	0	24.41	24.62	24.45	0
		1	7	24.44	24.45	24.14	0			1	2	24.36	24.37	24.06	0
		1	14	24.23	24.42	24.29	0			1	5	24.15	24.34	24.21	0
		8	0	23.52	23.54	23.48	1			3	0	23.44	23.46	23.40	0
		8	3	23.47	23.50	23.42	1			3	1	23.39	23.42	23.34	0
		8	7	23.23	23.53	23.31	1			3	3	23.15	23.45	23.23	0
		15	0	23.45	23.51	23.49	1			6	0	23.37	23.43	23.41	1
		1	0	23.59	23.70	23.63	1		16QAM	1	0	23.51	23.62	23.55	1
	16QAM	1	7	23.63	23.63	23.54	1			1	2	23.55	23.55	23.46	1
		1	14	23.20	23.57	23.58	1			1	5	23.12	23.49	23.50	1
		8	0	22.46	22.55	22.40	2			3	0	22.38	22.47	22.32	1
		8	3	22.39	22.53	22.30	2			3	1	22.31	22.45	22.22	1
		8	7	22.41	22.44	22.32	2			3	3	22.33	22.36	22.24	1
		15	0	22.29	22.33	22.35	2			6	0	22.21	22.25	22.27	2
		1	0	22.60	22.71	22.64	2		64QAM	1	0	22.52	22.63	22.56	2
	64QAM	1	7	22.64	22.64	22.55	2			1	2	22.56	22.56	22.47	2
		1	14	22.21	22.58	22.59	2			1	5	22.13	22.50	22.51	2
		8	0	21.47	21.56	21.41	3			3	0	21.39	21.48	21.33	2
		8	3	21.40	21.54	21.31	3			3	1	21.32	21.46	21.23	2
		8	7	21.42	21.45	21.33	3			3	3	21.34	21.37	21.25	2
		15	0	21.30	21.34	21.36	3			6	0	21.22	21.26	21.28	3
		1	0	21.88	21.89	21.90	3			1	0	21.81	21.89	21.85	3

LTE Band 25															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26140	26365	26590				Channel		26115	26365	26615	
		Frequency (MHz)		1860.0	1882.5	1905.0				Frequency (MHz)		1857.5	1882.5	1907.5	
20M	QPSK	1	0	23.55	23.33	23.22	0	15M	QPSK	1	0	23.47	23.25	23.14	0
		1	50	23.21	23.17	22.99	0			1	37	23.13	23.09	22.91	0
		1	99	23.17	23.22	23.04	0			1	74	23.09	23.14	22.96	0
		50	0	22.38	22.31	22.19	1			36	0	22.30	22.23	22.11	1
		50	25	22.36	22.34	22.19	1			36	19	22.28	22.26	22.11	1
		50	50	22.22	22.27	22.15	1			36	39	22.14	22.19	22.07	1
		100	0	22.32	22.31	22.18	1			75	0	22.24	22.23	22.10	1
		1	0	22.47	22.51	22.65	1		16QAM	1	0	22.39	22.43	22.57	1
	16QAM	1	50	22.49	22.61	22.06	1			1	37	22.41	22.53	21.98	1
		1	99	22.28	22.69	22.01	1			1	74	22.20	22.61	21.93	1
		50	0	21.32	21.38	21.30	2			36	0	21.24	21.30	21.22	2
		50	25	21.22	21.22	21.17	2			36	19	21.14	21.14	21.09	2
		50	50	21.10	21.11	21.11	2			36	39	21.02	21.03	21.03	2
		100	0	21.34	21.36	21.24	2			75	0	21.26	21.28	21.16	2
		1	0	21.68	21.72	21.71	2		64QAM	1	0	21.60	21.64	21.63	2
	64QAM	1	50	21.67	21.71	21.70	2			1	37	21.59	21.63	21.62	2
		1	99	21.62	21.66	21.65	2			1	74	21.54	21.58	21.57	2
		50	0	20.51	20.55	20.54	3			36	0	20.43	20.47	20.46	3
		50	25	20.52	20.56	20.55	3			36	19	20.44	20.48	20.47	3
		50	50	20.51	20.55	20.54	3			36	39	20.43	20.47	20.46	3
		100	0	20.49	20.53	20.52	3			75	0	20.41	20.45	20.44	3
10M	QPSK	1	0	23.38	23.16	23.05	0	5M	QPSK	1	0	23.30	23.08	22.97	0
		1	24	23.04	23.00	22.82	0			1	12	22.96	22.92	22.74	0
		1	49	23.00	23.05	22.87	0			1	24	22.92	22.97	22.79	0
		25	0	22.21	22.14	22.02	1			12	0	22.13	22.06	21.94	1
		25	12	22.19	22.17	22.02	1			12	6	22.11	22.09	21.94	1
		25	25	22.05	22.10	21.98	1			12	13	21.97	22.02	21.90	1
		50	0	22.15	22.14	22.01	1			25	0	22.07	22.06	21.93	1
		1	0	22.30	22.34	22.48	1		16QAM	1	0	22.22	22.26	22.40	1
	16QAM	1	24	22.32	22.44	21.89	1			1	12	22.24	22.36	21.81	1
		1	49	22.11	22.52	21.84	1			1	24	22.03	22.44	21.76	1
		25	0	21.15	21.21	21.13	2			12	0	21.07	21.13	21.05	2
		25	12	21.05	21.05	21.00	2			12	6	20.97	20.97	20.92	2
		25	25	20.93	20.94	20.94	2			12	13	20.85	20.86	20.86	2
		50	0	21.17	21.19	21.07	2			25	0	21.09	21.11	20.99	2
		1	0	21.55	21.59	21.58	2		64QAM	1	0	21.49	21.53	21.52	2
	64QAM	1	24	21.54	21.58	21.57	2			1	12	21.48	21.52	21.51	2
		1	49	21.49	21.53	21.52	2			1	24	21.43	21.47	21.46	2
		25	0	20.38	20.42	20.41	3			12	0	20.32	20.36	20.35	3
		25	12	20.39	20.43	20.42	3			12	6	20.33	20.37	20.36	3
		25	25	20.38	20.42	20.41	3			12	13	20.32	20.36	20.35	3
		50	0	20.36	20.40	20.39	3			25	0	20.30	20.34	20.33	3
3M	QPSK	1	0	23.22	23.00	22.89	0	1.4M	QPSK	1	0	23.17	22.95	22.84	0
		1	7	22.88	22.84	22.66	0			1	2	22.83	22.79	22.61	0
		1	14	22.84	22.89	22.71	0			1	5	22.79	22.84	22.66	0
		8	0	22.05	21.98	21.86	1			3	0	22.15	22.22	22.21	0
		8	3	22.03	22.01	21.86	1			3	1	22.14	22.21	22.19	0
		8	7	21.89	21.94	21.82	1			3	3	22.13	22.22	22.21	0
		15	0	21.99	21.98	21.85	1			6	0	21.94	21.93	21.80	1
		1	0	22.14	22.18	22.32	1		16QAM	1	0	22.09	22.13	22.27	1
	16QAM	1	7	22.16	22.28	21.73	1			1	2	22.11	22.23	21.68	1
		1	14	21.95	22.36	21.68	1			1	5	21.90	22.31	21.63	1
		8	0	20.99	21.05	20.97	2			3	0	21.22	21.23	22.00	1
		8	3	20.89	20.89	20.84	2			3	1	21.18	21.18	21.56	1
		8	7	20.77	20.78	20.78	2			3	3	22.15	21.15	21.43	1
		15	0	21.01	21.03	20.91	2			6	0	20.96	20.98	20.86	2
		1	0	21.43	21.47	21.46	2		64QAM	1	0	21.38	21.42	21.41	2
	64QAM	1	7	21.42	21.46	21.45	2			1	2	21.37	21.41	21.40	2
		1	14	21.37	21.41	21.40	2			1	5	21.32	21.36	21.35	2
		8	0	20.26	20.30	20.29	3			3	0	20.21	20.25	20.24	2
		8	3	20.27	20.31	20.30	3			3	1	20.22	20.26	20.25	2
		8	7	20.26	20.30	20.29	3			3	3	20.21	20.25	20.24	2
		15	0	20.24	20.28	20.27	3			6	0	20.19	20.23	20.22	3

EIRP Power (dBm)

GSM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	512	1850.2	-16.34	36.57	20.23	105.49	H
	661	1880.0	-16.42	37.22	20.80	120.34	
	810	1909.8	-16.28	37.18	20.90	123.08	
	512	1850.2	-7.89	37.65	29.76	946.46	V
	661	1880.0	-8.05	37.58	29.53	898.05	
	810	1909.8	-7.76	37.48	29.72	937.56	

EDGE							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	512	1850.2	-17.33	36.57	19.24	83.98	H
	661	1880.0	-17.36	37.22	19.86	96.92	
	810	1909.8	-17.15	37.18	20.03	100.74	
	512	1850.2	-11.84	37.65	25.81	381.15	V
	661	1880.0	-11.93	37.58	25.65	367.54	
	810	1909.8	-11.76	37.48	25.72	373.25	

WCDMA							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	9262	1852.4	-20.33	36.57	16.24	42.09	H
	9400	1880.0	-20.41	37.22	16.81	48.02	
	9538	1907.6	-20.34	37.18	16.84	48.33	
	9262	1852.4	-14.54	37.65	23.11	204.69	V
	9400	1880.0	-14.76	37.58	22.82	191.56	
	9538	1907.6	-14.64	37.48	22.84	192.31	

CDMA							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	25	1851.25	-18.47	36.57	18.10	64.60	H
	600	1880.00	-18.55	37.22	18.67	73.69	
	1175	1908.75	-18.24	37.18	18.94	78.38	
	25	1851.25	-14.76	37.65	22.89	194.58	V
	600	1880.00	-14.81	37.58	22.77	189.37	
	1175	1908.75	-14.55	37.48	22.93	196.34	

LTE Band 2							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18607	1850.7	-18.69	36.57	17.88	61.40	H
	18900	1880.0	-18.95	37.22	18.27	67.14	
	19193	1909.3	-18.79	37.18	18.40	69.12	
	18607	1850.7	-14.33	37.65	23.32	214.78	V
	18900	1880.0	-14.03	37.58	23.55	226.46	
	19193	1909.3	-13.62	37.48	23.86	243.22	
Channel Bandwidth: 1.4 MHz / 16QAM							
Y	18607	1850.7	-19.78	36.57	16.79	47.77	H
	18900	1880.0	-20.04	37.22	17.18	52.24	
	19193	1909.3	-19.88	37.18	17.31	53.78	
	18607	1850.7	-15.36	37.65	22.29	169.43	V
	18900	1880.0	-15.09	37.58	22.49	177.42	
	19193	1909.3	-14.65	37.48	22.83	191.87	
Channel Bandwidth: 1.4 MHz / 64QAM							
Y	18607	1850.7	-20.86	36.57	15.71	37.26	H
	18900	1880.0	-21.09	37.22	16.13	41.02	
	19193	1909.3	-20.91	37.18	16.28	42.42	
	18607	1850.7	-16.41	37.65	21.24	133.05	V
	18900	1880.0	-16.14	37.58	21.44	139.32	
	19193	1909.3	-15.74	37.48	21.74	149.28	

LTE Band 2							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18615	1851.5	-18.62	36.57	17.95	62.40	H
	18900	1880.0	-18.90	37.22	18.32	67.92	
	19185	1908.5	-18.66	37.18	18.53	71.22	
	18615	1851.5	-14.20	37.65	23.45	221.31	V
	18900	1880.0	-13.95	37.58	23.63	230.67	
	19185	1908.5	-13.56	37.48	23.92	246.60	
Channel Bandwidth: 3 MHz / 16QAM							
Y	18615	1851.5	-19.67	36.57	16.90	49.00	H
	18900	1880.0	-19.96	37.22	17.26	53.21	
	19185	1908.5	-19.73	37.18	17.46	55.67	
	18615	1851.5	-15.22	37.65	22.43	174.98	V
	18900	1880.0	-15.02	37.58	22.56	180.30	
	19185	1908.5	-14.65	37.48	22.83	191.87	
Channel Bandwidth: 3 MHz / 64QAM							
Y	18615	1851.5	-20.78	36.57	15.79	37.95	H
	18900	1880.0	-21.00	37.22	16.22	41.88	
	19185	1908.5	-20.77	37.18	16.42	43.81	
	18615	1851.5	-16.27	37.65	21.38	137.40	V
	18900	1880.0	-16.11	37.58	21.47	140.28	
	19185	1908.5	-15.68	37.48	21.80	151.36	

LTE Band 2							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18625	1852.5	-18.44	36.57	18.13	65.04	H
	18900	1880.0	-18.73	37.22	18.49	70.63	
	19175	1907.5	-18.49	37.18	18.70	74.06	
	18625	1852.5	-14.03	37.65	23.62	230.14	V
	18900	1880.0	-13.78	37.58	23.80	239.88	
	19175	1907.5	-13.36	37.48	24.12	258.23	
Channel Bandwidth: 5 MHz / 16QAM							
Y	18625	1852.5	-19.58	36.57	16.99	50.03	H
	18900	1880.0	-19.86	37.22	17.36	54.45	
	19175	1907.5	-19.60	37.18	17.59	57.36	
	18625	1852.5	-15.16	37.65	22.49	177.42	V
	18900	1880.0	-14.80	37.58	22.78	189.67	
	19175	1907.5	-14.48	37.48	23.00	199.53	
Channel Bandwidth: 5 MHz / 64QAM							
Y	18625	1852.5	-20.72	36.57	15.85	38.48	H
	18900	1880.0	-20.85	37.22	16.37	43.35	
	19175	1907.5	-20.26	37.18	16.93	49.27	
	18625	1852.5	-16.33	37.65	21.32	135.52	V
	18900	1880.0	-15.99	37.58	21.59	144.21	
	19175	1907.5	-15.70	37.48	21.78	150.66	

LTE Band 2							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18650	1855.0	-17.68	36.57	18.89	77.48	H
	18900	1880.0	-17.94	37.22	19.28	84.72	
	19150	1905.0	-17.66	37.18	19.53	89.66	
	18650	1855.0	-13.16	37.65	24.49	281.19	V
	18900	1880.0	-12.98	37.58	24.60	288.40	
	19150	1905.0	-12.57	37.48	24.91	309.74	
Channel Bandwidth: 10 MHz / 16QAM							
Y	18650	1855.0	-18.77	36.57	17.80	60.28	H
	18900	1880.0	-18.96	37.22	18.26	66.99	
	19150	1905.0	-18.67	37.18	18.52	71.06	
	18650	1855.0	-14.25	37.65	23.40	218.78	V
	18900	1880.0	-14.06	37.58	23.52	224.91	
	19150	1905.0	-13.60	37.48	23.88	244.34	
Channel Bandwidth: 10 MHz / 64QAM							
Y	18650	1855.0	-19.86	36.57	16.71	46.90	H
	18900	1880.0	-19.97	37.22	17.25	53.09	
	19150	1905.0	-19.69	37.18	17.50	56.18	
	18650	1855.0	-15.33	37.65	22.32	170.61	V
	18900	1880.0	-15.11	37.58	22.47	176.60	
	19150	1905.0	-14.62	37.48	22.86	193.20	

LTE Band 2							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18675	1857.5	-17.44	36.57	19.13	81.88	H
	18900	1880.0	-17.72	37.22	19.50	89.13	
	19125	1902.5	-17.52	37.18	19.67	92.60	
	18675	1857.5	-13.06	37.65	24.59	287.74	V
	18900	1880.0	-12.72	37.58	24.86	306.20	
	19125	1902.5	-12.41	37.48	25.07	321.37	
Channel Bandwidth: 15 MHz / 16QAM							
Y	18675	1857.5	-18.53	36.57	18.04	63.71	H
	18900	1880.0	-18.77	37.22	18.45	69.98	
	19125	1902.5	-18.61	37.18	18.58	72.04	
	18675	1857.5	-14.13	37.65	23.52	224.91	V
	18900	1880.0	-13.79	37.58	23.79	239.33	
	19125	1902.5	-13.50	37.48	23.98	250.03	
Channel Bandwidth: 15 MHz / 64QAM							
Y	18675	1857.5	-19.62	36.57	16.95	49.57	H
	18900	1880.0	-19.81	37.22	17.41	55.08	
	19125	1902.5	-19.62	37.18	17.57	57.10	
	18675	1857.5	-15.16	37.65	22.49	177.42	V
	18900	1880.0	-14.88	37.58	22.70	186.21	
	19125	1902.5	-14.56	37.48	22.92	195.88	

LTE Band 2							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18700	1860.0	-17.25	36.57	19.32	85.55	H
	18900	1880.0	-17.63	37.22	19.59	90.99	
	19100	1900.0	-17.39	37.18	19.80	95.41	
	18700	1860.0	-12.89	37.65	24.76	299.23	V
	18900	1880.0	-12.62	37.58	24.96	313.33	
	19100	1900.0	-12.29	37.48	25.19	330.37	
Channel Bandwidth: 20 MHz / 16QAM							
Y	18700	1860.0	-18.31	36.57	18.26	67.02	H
	18900	1880.0	-18.68	37.22	18.54	71.45	
	19100	1900.0	-18.44	37.18	18.75	74.92	
	18700	1860.0	-13.92	37.65	23.73	236.05	V
	18900	1880.0	-13.70	37.58	23.88	244.34	
	19100	1900.0	-13.31	37.48	24.17	261.22	
Channel Bandwidth: 20 MHz / 64QAM							
Y	18700	1860.0	-19.34	36.57	17.23	52.87	H
	18900	1880.0	-19.73	37.22	17.49	56.10	
	19100	1900.0	-19.53	37.18	17.66	58.29	
	18700	1860.0	-14.95	37.65	22.70	186.21	V
	18900	1880.0	-14.75	37.58	22.83	191.87	
	19100	1900.0	-14.36	37.48	23.12	205.12	

LTE Band 25							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	26047	1850.7	-22.39	36.57	14.18	26.19	H
	26365	1882.5	-22.25	37.22	14.97	31.43	
	26683	1914.3	-23.16	39.09	15.93	39.17	
	26047	1850.7	-17.68	37.65	19.97	99.33	V
	26365	1882.5	-16.39	37.58	21.19	131.61	
	26683	1914.3	-16.66	37.92	21.26	133.66	
Channel Bandwidth: 1.4 MHz / 16QAM							
Y	26047	1850.7	-22.56	36.57	14.01	25.19	H
	26365	1882.5	-22.24	37.22	14.98	31.51	
	26683	1914.3	-23.33	38.09	14.76	29.92	
	26047	1850.7	-18.88	37.65	18.77	75.35	V
	26365	1882.5	-17.59	37.58	19.99	99.84	
	26683	1914.3	-17.86	37.92	20.06	101.39	
Channel Bandwidth: 1.4 MHz / 64QAM							
Y	26047	1850.7	-22.66	36.57	13.91	24.62	H
	26365	1882.5	-22.34	37.22	14.88	30.79	
	26683	1914.3	-23.43	38.09	14.66	29.24	
	26047	1850.7	-20.38	37.65	17.27	53.35	V
	26365	1882.5	-18.99	37.58	18.59	72.33	
	26683	1914.3	-19.06	37.92	18.86	76.91	

LTE Band 25							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	26055	1851.5	-22.33	36.57	14.24	26.56	H
	26365	1882.5	-22.19	37.22	15.03	31.87	
	26675	1913.5	-23.12	39.11	15.99	39.72	
	26055	1851.5	-17.38	37.65	20.27	106.44	V
	26365	1882.5	-16.19	37.58	21.39	137.82	
	26675	1913.5	-16.36	37.93	21.57	143.55	
Channel Bandwidth: 3 MHz / 16QAM							
Y	26055	1851.5	-22.40	36.57	14.17	26.13	H
	26365	1882.5	-22.20	37.22	15.02	31.80	
	26675	1913.5	-23.30	38.14	14.84	30.48	
	26055	1851.5	-18.68	37.65	18.97	78.90	V
	26365	1882.5	-17.39	37.58	20.19	104.54	
	26675	1913.5	-17.66	37.93	20.27	106.41	
Channel Bandwidth: 3 MHz / 64QAM							
Y	26055	1851.5	-22.50	36.57	14.07	25.54	H
	26365	1882.5	-22.30	37.22	14.92	31.07	
	26675	1913.5	-23.40	38.14	14.74	29.79	
	26055	1851.5	-20.08	37.65	17.57	57.16	V
	26365	1882.5	-18.89	37.58	18.69	74.01	
	26675	1913.5	-19.06	37.93	18.87	77.09	

LTE Band 25							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	26065	1852.5	-22.25	36.57	14.32	27.05	H
	26365	1882.5	-22.13	37.22	15.09	32.31	
	26665	1912.5	-23.01	38.11	15.10	32.36	
	26065	1852.5	-17.08	37.65	20.57	114.05	V
	26365	1882.5	-15.99	37.58	21.59	144.31	
	26665	1912.5	-16.09	37.96	21.87	153.82	
Channel Bandwidth: 5 MHz / 16QAM							
Y	26065	1852.5	-22.33	36.57	14.24	26.56	H
	26365	1882.5	-22.15	37.22	15.07	32.17	
	26665	1912.5	-23.08	38.14	15.06	32.06	
	26065	1852.5	-18.38	37.65	19.27	84.55	V
	26365	1882.5	-17.28	37.58	20.30	107.23	
	26665	1912.5	-17.35	37.96	20.61	115.08	
Channel Bandwidth: 5 MHz / 64QAM							
Y	26065	1852.5	-22.43	36.57	14.14	25.95	H
	26365	1882.5	-22.25	37.22	14.97	31.43	
	26665	1912.5	-23.18	38.14	14.96	31.33	
	26065	1852.5	-19.88	37.65	17.77	59.85	V
	26365	1882.5	-18.38	37.58	19.20	83.23	
	26665	1912.5	-18.65	37.96	19.31	85.31	

LTE Band 25							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	26090	1855.0	-22.15	36.57	14.42	27.68	H
	26365	1882.5	-22.03	37.22	15.19	33.07	
	26640	1910.0	-22.94	38.19	15.25	33.50	
	26090	1855.0	-16.68	37.65	20.97	125.05	V
	26365	1882.5	-15.89	37.58	21.69	147.67	
	26640	1910.0	-15.26	37.15	21.89	154.53	
Channel Bandwidth: 10 MHz / 16QAM							
Y	26090	1855.0	-22.16	36.57	14.41	27.62	H
	26365	1882.5	-22.08	37.22	15.14	32.69	
	26640	1910.0	-22.99	38.19	15.20	33.11	
	26090	1855.0	-17.78	37.65	19.87	97.07	V
	26365	1882.5	-16.89	37.58	20.69	117.30	
	26640	1910.0	-16.76	38.15	21.39	137.72	
Channel Bandwidth: 10 MHz / 64QAM							
Y	26090	1855.0	-22.26	36.57	14.31	26.99	H
	26365	1882.5	-22.18	37.22	15.04	31.94	
	26640	1910.0	-23.09	38.19	15.10	32.36	
	26090	1855.0	-19.18	37.65	18.47	70.32	V
	26365	1882.5	-18.29	37.58	19.29	84.98	
	26640	1910.0	-18.06	38.15	20.09	102.09	

LTE Band 25							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	26115	1857.5	-22.06	36.57	14.51	28.26	H
	26365	1882.5	-21.94	37.22	15.28	33.76	
	26615	1907.5	-22.84	38.23	15.39	34.59	
	26115	1857.5	-16.28	37.65	21.37	137.12	V
	26365	1882.5	-15.59	37.58	21.99	158.23	
	26615	1907.5	-15.16	37.22	22.06	160.69	
Channel Bandwidth: 15 MHz / 16QAM							
Y	26115	1857.5	-22.15	36.57	14.42	27.68	H
	26365	1882.5	-21.99	37.22	15.23	33.37	
	26615	1907.5	-22.90	38.23	15.33	34.12	
	26115	1857.5	-17.18	37.65	20.47	111.46	V
	26365	1882.5	-16.59	37.58	20.99	125.69	
	26615	1907.5	-16.16	37.22	21.06	127.64	
Channel Bandwidth: 15 MHz / 64QAM							
Y	26115	1857.5	-22.25	36.57	14.32	27.05	H
	26365	1882.5	-22.09	37.22	15.13	32.61	
	26615	1907.5	-23.00	38.23	15.23	33.34	
	26115	1857.5	-18.38	37.65	19.27	84.55	V
	26365	1882.5	-17.99	37.58	19.59	91.05	
	26615	1907.5	-17.26	38.22	20.96	124.74	

LTE Band 25							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	26140	1860.0	-21.95	36.57	14.62	28.99	H
	26365	1882.5	-21.83	37.22	15.39	34.63	
	26590	1905.0	-22.74	38.72	15.98	39.63	
	26140	1860.0	-15.88	37.65	21.77	150.35	V
	26365	1882.5	-15.09	37.58	22.49	177.54	
	26590	1905.0	-14.96	37.56	22.60	181.97	
Channel Bandwidth: 20 MHz / 16QAM							
Y	26140	1860.0	-22.12	36.57	14.45	27.87	H
	26365	1882.5	-21.92	37.22	15.30	33.92	
	26590	1905.0	-22.83	38.72	15.89	38.82	
	26140	1860.0	-16.68	37.65	20.97	125.05	V
	26365	1882.5	-15.89	37.58	21.69	147.67	
	26590	1905.0	-15.66	37.56	21.90	154.88	
Channel Bandwidth: 20 MHz / 64QAM							
Y	26140	1860.0	-23.12	36.57	13.45	22.14	H
	26365	1882.5	-22.02	37.22	15.20	33.14	
	26590	1905.0	-22.93	38.72	15.79	37.93	
	26140	1860.0	-18.08	37.65	19.57	90.59	V
	26365	1882.5	-17.09	37.58	20.49	112.02	
	26590	1905.0	-17.06	37.56	20.50	112.20	

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stability Measurement

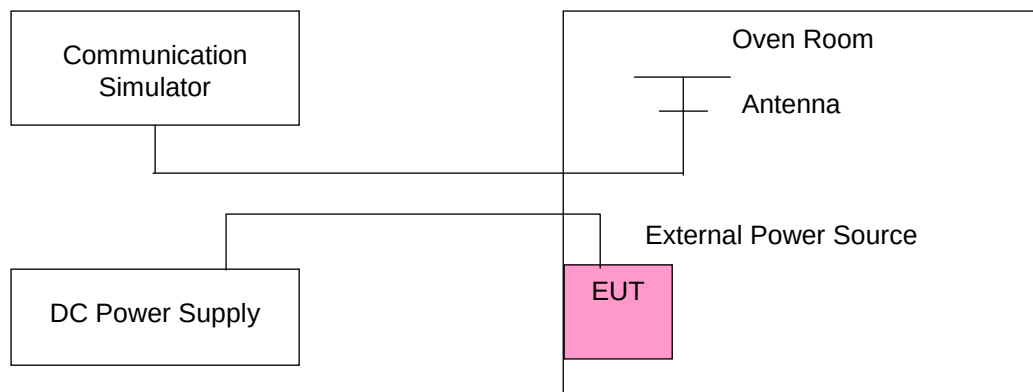
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

4.2.2 Test Procedure

- 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.
- 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.
- 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

Voltage (Volts)	GSM				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1850.200002	0.001	1909.800001	0.001	2.5
3.3	1850.200002	0.001	1909.800003	0.002	2.5
4.2	1850.200001	0.001	1909.800004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	GSM				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1850.200002	0.001	1909.800003	0.002	2.5
-20	1850.200003	0.002	1909.800004	0.002	2.5
-10	1850.200002	0.001	1909.800003	0.002	2.5
0	1850.200003	0.002	1909.800003	0.001	2.5
10	1850.200002	0.001	1909.800004	0.002	2.5
20	1850.199996	-0.002	1909.799998	-0.001	2.5
30	1850.199999	-0.001	1909.799998	-0.001	2.5
40	1850.199997	-0.002	1909.799998	-0.001	2.5
50	1850.199997	-0.002	1909.799997	-0.002	2.5
55	1850.199999	-0.001	1909.799999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	EDGE				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1850.200003	0.001	1909.800004	0.002	2.5
3.3	1850.200001	0.001	1909.800001	0.001	2.5
4.2	1850.200002	0.001	1909.800002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	EDGE				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1850.200002	0.001	1909.800002	0.001	2.5
-20	1850.200003	0.002	1909.800003	0.001	2.5
-10	1850.200002	0.001	1909.800004	0.002	2.5
0	1850.200003	0.002	1909.800001	0.001	2.5
10	1850.200002	0.001	1909.800004	0.002	2.5
20	1850.199997	-0.002	1909.799997	-0.002	2.5
30	1850.199998	-0.001	1909.799999	-0.001	2.5
40	1850.199998	-0.001	1909.799997	-0.002	2.5
50	1850.199997	-0.001	1909.799997	-0.001	2.5
55	1850.199999	-0.001	1909.799998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1852.400002	0.001	1907.600004	0.002	2.5
3.3	1852.400001	0.001	1907.600001	0.001	2.5
4.2	1852.400002	0.001	1907.600003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1852.400002	0.001	1907.600001	0.001	2.5
-20	1852.400003	0.002	1907.600003	0.002	2.5
-10	1852.400002	0.001	1907.600001	0.001	2.5
0	1852.400003	0.002	1907.600002	0.001	2.5
10	1852.400003	0.002	1907.600002	0.001	2.5
20	1852.399999	-0.001	1907.599998	-0.001	2.5
30	1852.399999	-0.001	1907.599998	-0.001	2.5
40	1852.399997	-0.001	1907.599998	-0.001	2.5
50	1852.399999	-0.001	1907.599996	-0.002	2.5
55	1852.399997	-0.002	1907.599998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	CDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1851.250003	0.001	1908.750002	0.001	2.5
3.3	1851.250003	0.002	1908.750002	0.001	2.5
4.2	1851.250004	0.002	1908.750001	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	CDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1851.250004	0.002	1908.750004	0.002	2.5
-20	1851.250001	0.001	1908.750002	0.001	2.5
-10	1851.250002	0.001	1908.750002	0.001	2.5
0	1851.250004	0.002	1908.750003	0.002	2.5
10	1851.250003	0.002	1908.750002	0.001	2.5
20	1851.249999	-0.001	1908.749997	-0.002	2.5
30	1851.249997	-0.002	1908.749999	-0.001	2.5
40	1851.249997	-0.001	1908.749998	-0.001	2.5
50	1851.249998	-0.001	1908.749998	-0.001	2.5
55	1851.249998	-0.001	1908.749998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1850.700001	0.001	1909.300002	0.001	2.5
3.3	1850.700001	0.001	1909.300004	0.002	2.5
4.2	1850.700002	0.001	1909.300001	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1850.700004	0.002	1909.300003	0.002	2.5
-20	1850.700003	0.002	1909.300003	0.001	2.5
-10	1850.700004	0.002	1909.300001	0.001	2.5
0	1850.700004	0.002	1909.300002	0.001	2.5
10	1850.700002	0.001	1909.300001	0.001	2.5
20	1850.699998	-0.001	1909.299996	-0.002	2.5
30	1850.699999	-0.001	1909.299998	-0.001	2.5
40	1850.699998	-0.001	1909.299997	-0.001	2.5
50	1850.699996	-0.002	1909.299998	-0.001	2.5
55	1850.699997	-0.002	1909.299999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1851.500003	0.001	1907.500003	0.001	2.5
3.3	1851.500002	0.001	1907.500002	0.001	2.5
4.2	1851.500003	0.002	1907.500002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1851.500003	0.002	1907.500004	0.002	2.5
-20	1851.500002	0.001	1907.500004	0.002	2.5
-10	1851.500004	0.002	1907.500002	0.001	2.5
0	1851.500002	0.001	1907.500002	0.001	2.5
10	1851.500001	0.001	1907.500001	0.001	2.5
20	1851.499996	-0.002	1907.499997	-0.001	2.5
30	1851.499997	-0.002	1907.499996	-0.002	2.5
40	1851.499997	-0.002	1907.499998	-0.001	2.5
50	1851.499998	-0.001	1907.499998	-0.001	2.5
55	1851.499997	-0.002	1907.499998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1852.500001	0.001	1907.500001	0.001	2.5
3.3	1852.500004	0.002	1907.500001	0.001	2.5
4.2	1852.500003	0.002	1907.500003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1852.500001	0.001	1907.500004	0.002	2.5
-20	1852.500002	0.001	1907.500003	0.002	2.5
-10	1852.500003	0.001	1907.500003	0.001	2.5
0	1852.500004	0.002	1907.500003	0.002	2.5
10	1852.500003	0.001	1907.500001	0.001	2.5
20	1852.499997	-0.002	1907.499998	-0.001	2.5
30	1852.499997	-0.002	1907.499999	-0.001	2.5
40	1852.499998	-0.001	1907.499999	-0.001	2.5
50	1852.499997	-0.002	1907.499997	-0.002	2.5
55	1852.499998	-0.001	1907.499997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1855.000002	0.001	1905.000003	0.001	2.5
3.3	1855.000004	0.002	1905.000004	0.002	2.5
4.2	1855.000002	0.001	1905.000003	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1855.000002	0.001	1905.000001	0.001	2.5
-20	1855.000004	0.002	1905.000003	0.002	2.5
-10	1855.000003	0.001	1905.000004	0.002	2.5
0	1855.000003	0.002	1905.000001	0.001	2.5
10	1855.000002	0.001	1905.000002	0.001	2.5
20	1854.999997	-0.002	1904.999996	-0.002	2.5
30	1854.999997	-0.001	1904.999998	-0.001	2.5
40	1854.999998	-0.001	1904.999997	-0.001	2.5
50	1854.999999	-0.001	1904.999998	-0.001	2.5
55	1854.999998	-0.001	1904.999998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1857.500003	0.002	1902.500003	0.002	2.5
3.3	1857.500003	0.002	1902.500004	0.002	2.5
4.2	1857.500002	0.001	1902.500004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1857.500004	0.002	1902.500004	0.002	2.5
-20	1857.500004	0.002	1902.500004	0.002	2.5
-10	1857.500002	0.001	1902.500002	0.001	2.5
0	1857.500002	0.001	1902.500003	0.002	2.5
10	1857.500003	0.002	1902.500002	0.001	2.5
20	1857.499999	-0.001	1902.499998	-0.001	2.5
30	1857.499997	-0.002	1902.499997	-0.002	2.5
40	1857.499997	-0.002	1902.499997	-0.002	2.5
50	1857.499996	-0.002	1902.499996	-0.002	2.5
55	1857.499999	-0.001	1902.499998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1860.000003	0.001	1900.000002	0.001	2.5
3.3	1860.000003	0.002	1900.000003	0.002	2.5
4.2	1860.000003	0.002	1900.000004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1860.000001	0.001	1900.000004	0.002	2.5
-20	1860.000002	0.001	1900.000002	0.001	2.5
-10	1860.000001	0.001	1900.000003	0.002	2.5
0	1860.000003	0.001	1900.000004	0.002	2.5
10	1860.000002	0.001	1900.000002	0.001	2.5
20	1859.999997	-0.002	1899.999998	-0.001	2.5
30	1859.999997	-0.002	1899.999997	-0.002	2.5
40	1859.999999	-0.001	1899.999997	-0.001	2.5
50	1859.999997	-0.001	1899.999998	-0.001	2.5
55	1859.999999	-0.001	1899.999996	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1850.700003	0.002	1914.300002	0.001	2.5
3.3	1850.700002	0.001	1914.300002	0.001	2.5
4.2	1850.700001	0.001	1914.300002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1850.700002	0.001	1914.300004	0.002	2.5
-20	1850.700003	0.001	1914.300001	0.001	2.5
-10	1850.700002	0.001	1914.300002	0.001	2.5
0	1850.700003	0.002	1914.300001	0.001	2.5
10	1850.700004	0.002	1914.300002	0.001	2.5
20	1850.699999	-0.001	1914.299997	-0.002	2.5
30	1850.699997	-0.001	1914.299997	-0.002	2.5
40	1850.699998	-0.001	1914.299999	-0.001	2.5
50	1850.699998	-0.001	1914.299996	-0.002	2.5
55	1850.699998	-0.001	1914.299997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1851.500001	0.001	1913.500003	0.002	2.5
3.3	1851.500004	0.002	1913.500002	0.001	2.5
4.2	1851.500003	0.001	1913.500003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1851.500003	0.001	1913.500004	0.002	2.5
-20	1851.500001	0.001	1913.500003	0.002	2.5
-10	1851.500004	0.002	1913.500001	0.001	2.5
0	1851.500002	0.001	1913.500003	0.002	2.5
10	1851.500002	0.001	1913.500003	0.002	2.5
20	1851.499996	-0.002	1913.499996	-0.002	2.5
30	1851.499998	-0.001	1913.499998	-0.001	2.5
40	1851.499997	-0.002	1913.499997	-0.002	2.5
50	1851.499998	-0.001	1913.499997	-0.002	2.5
55	1851.499996	-0.002	1913.499997	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1852.500002	0.001	1912.500004	0.002	2.5
3.3	1852.500002	0.001	1912.500001	0.001	2.5
4.2	1852.500004	0.002	1912.500004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1852.500003	0.002	1912.500002	0.001	2.5
-20	1852.500003	0.001	1912.500003	0.001	2.5
-10	1852.500002	0.001	1912.500003	0.002	2.5
0	1852.500003	0.001	1912.500001	0.001	2.5
10	1852.500004	0.002	1912.500003	0.001	2.5
20	1852.499997	-0.002	1912.499998	-0.001	2.5
30	1852.499997	-0.002	1912.499998	-0.001	2.5
40	1852.499997	-0.002	1912.499997	-0.001	2.5
50	1852.499999	-0.001	1912.499998	-0.001	2.5
55	1852.499996	-0.002	1912.499998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1855.000002	0.001	1910.000004	0.002	2.5
3.3	1855.000004	0.002	1910.000004	0.002	2.5
4.2	1855.000002	0.001	1910.000002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1855.000003	0.002	1910.000002	0.001	2.5
-20	1855.000002	0.001	1910.000002	0.001	2.5
-10	1855.000002	0.001	1910.000003	0.002	2.5
0	1855.000001	0.001	1910.000003	0.002	2.5
10	1855.000003	0.002	1910.000003	0.002	2.5
20	1854.999997	-0.002	1909.999996	-0.002	2.5
30	1854.999997	-0.002	1909.999999	-0.001	2.5
40	1854.999998	-0.001	1909.999998	-0.001	2.5
50	1854.999998	-0.001	1909.999997	-0.002	2.5
55	1854.999998	-0.001	1909.999998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1857.500002	0.001	1907.500004	0.002	2.5
3.3	1857.500004	0.002	1907.500004	0.002	2.5
4.2	1857.500002	0.001	1907.500002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1857.500003	0.002	1907.500002	0.001	2.5
-20	1857.500002	0.001	1907.500003	0.001	2.5
-10	1857.500002	0.001	1907.500002	0.001	2.5
0	1857.500002	0.001	1907.500004	0.002	2.5
10	1857.500002	0.001	1907.500004	0.002	2.5
20	1857.499998	-0.001	1907.499997	-0.002	2.5
30	1857.499996	-0.002	1907.499997	-0.002	2.5
40	1857.499996	-0.002	1907.499997	-0.002	2.5
50	1857.499998	-0.001	1907.499998	-0.001	2.5
55	1857.499998	-0.001	1907.499999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.6	1860.000001	0.001	1905.000001	0.001	2.5
3.3	1860.000004	0.002	1905.000002	0.001	2.5
4.2	1860.000001	0.001	1905.000004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.3 Vdc to 4.2 Vdc.

Frequency Error vs. Temperature

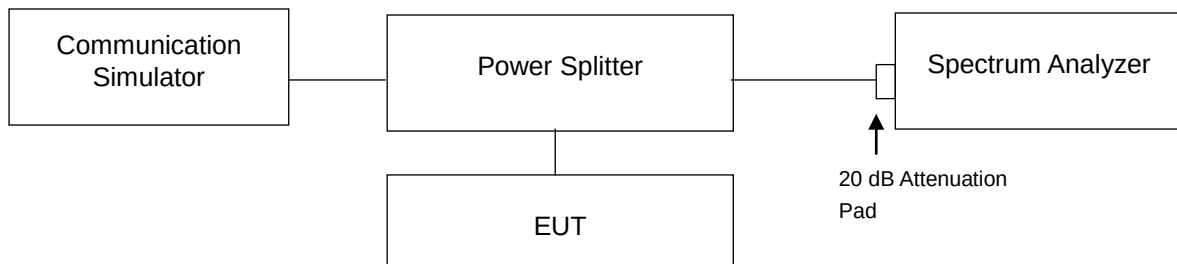
Temp. (°C)	LTE Band 25				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1860.000002	0.001	1905.000002	0.001	2.5
-20	1860.000004	0.002	1905.000003	0.001	2.5
-10	1860.000004	0.002	1905.000001	0.001	2.5
0	1860.000001	0.001	1905.000002	0.001	2.5
10	1860.000001	0.001	1905.000004	0.002	2.5
20	1859.999998	-0.001	1904.999998	-0.001	2.5
30	1859.999996	-0.002	1904.999998	-0.001	2.5
40	1859.999996	-0.002	1904.999997	-0.002	2.5
50	1859.999996	-0.002	1904.999998	-0.001	2.5
55	1859.999996	-0.002	1904.999997	-0.001	2.5

4.3 Occupied Bandwidth Measurement

4.3.1 Test Procedure

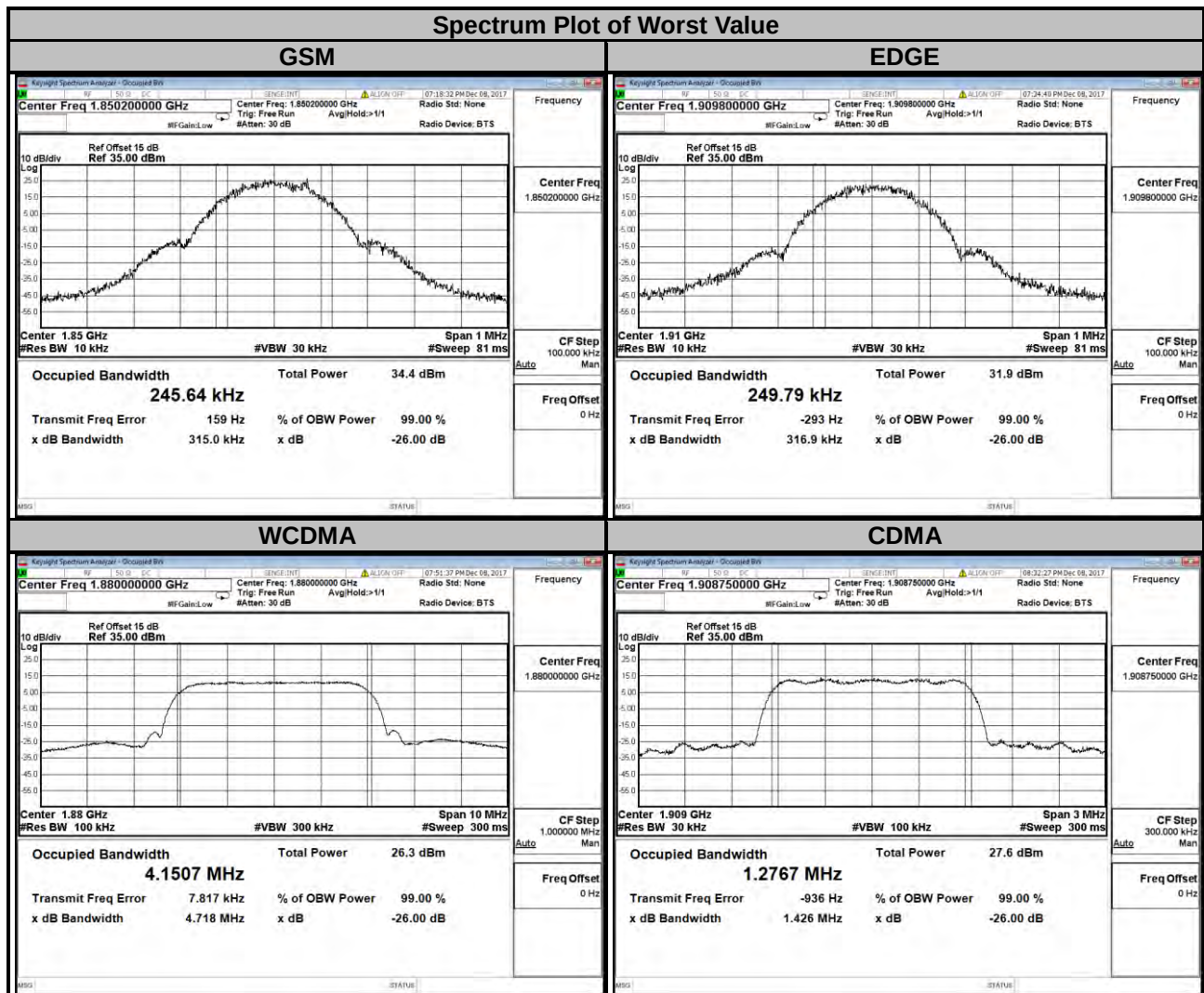
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.2 Test Setup



4.3.3 Test Result

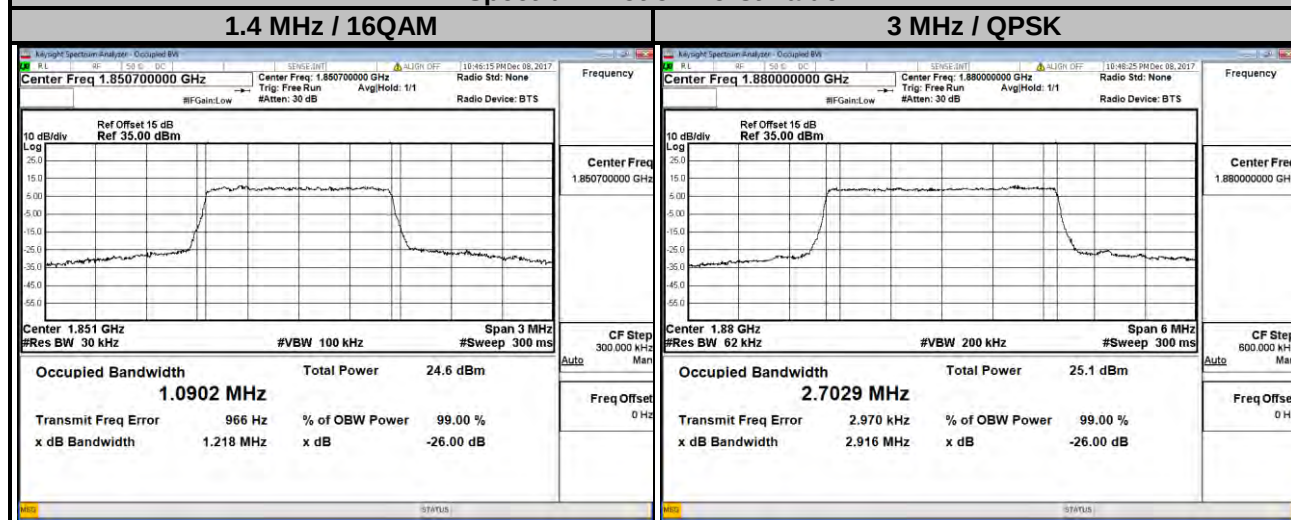
Channel	Frequency (MHz)	99 % Occupied Bandwidth (kHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)
		GSM	EDGE			
512	1850.2	245.64	247.48	9262	1852.4	4.1369
661	1880.0	244.29	247.03	9400	1880.0	4.1507
810	1909.8	244.61	249.79	9538	1907.6	4.1454
Channel	Frequency (MHz)	99 % Occupied Bandwidth (kHz)				
		CDMA				
25	1851.25	1.2736				
600	1880.00	1.2735				
1175	1908.75	1.2767				



LTE Band 2

Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
18607	1850.7	1.0876	1.0902	1.0889	18615	1851.5	2.7028	2.6996	2.6992
18900	1880.0	1.0873	1.0876	1.0889	18900	1880.0	2.7029	2.6980	2.6968
19193	1909.3	1.0874	1.0895	1.0884	19185	1908.5	2.7011	2.6968	2.6985

Spectrum Plot of Worst Value



LTE Band 2

Channel Bandwidth: 5 MHz

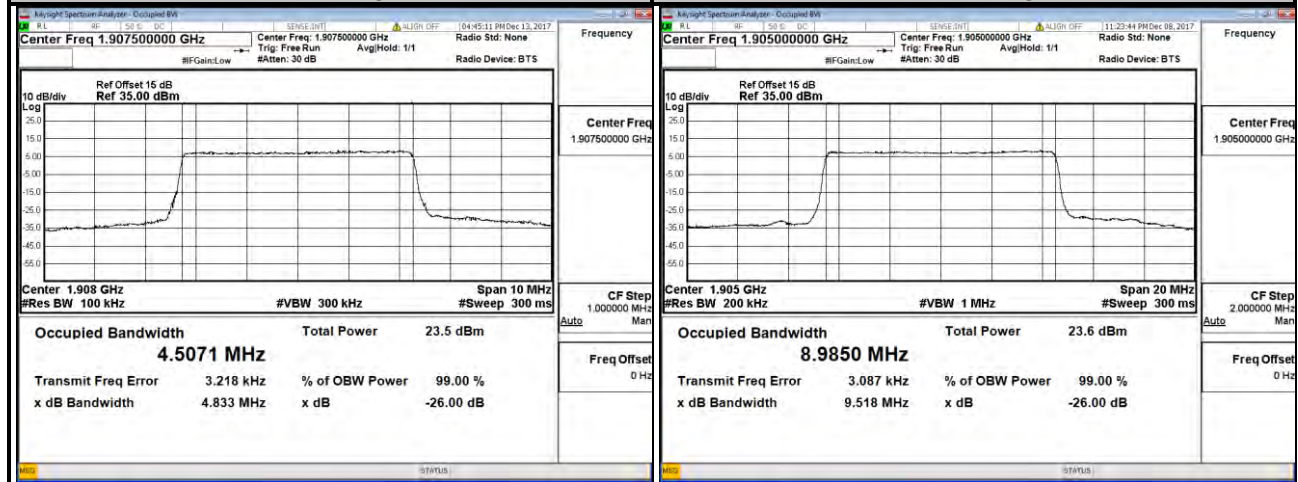
Channel Bandwidth: 10 MHz

Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
18625	1852.5	4.4933	4.4913	4.4922	18650	1855.0	8.9599	8.9616	8.9790
18900	1880.0	4.4962	4.4974	4.5033	18900	1880.0	8.9772	8.9778	8.9785
19175	1907.5	4.4917	4.4933	4.5071	19150	1905.0	8.9813	8.9850	8.9821

Spectrum Plot of Worst Value

5 MHz / 64QAM

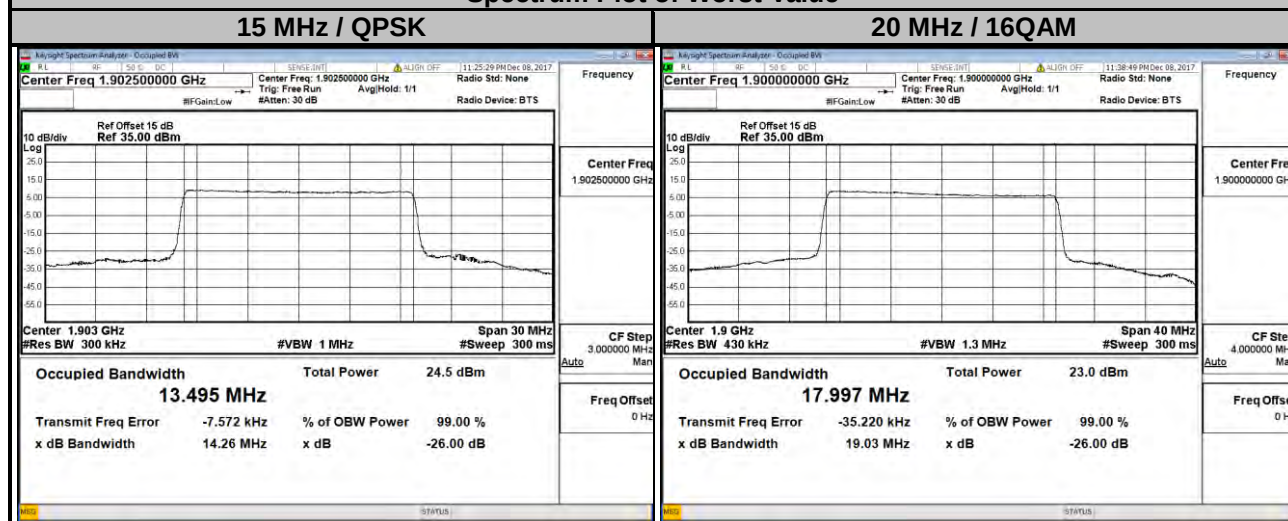
10 MHz / 16QAM



LTE Band 2

Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
18675	1857.5	13.428	13.419	13.442	18700	1860.0	17.894	17.912	17.934
18900	1880.0	13.464	13.454	13.445	18900	1880.0	17.939	17.957	17.943
19125	1902.5	13.495	13.485	13.422	19100	1900.0	17.973	17.997	17.891

Spectrum Plot of Worst Value



LTE Band 25

Channel Bandwidth: 1.4 MHz

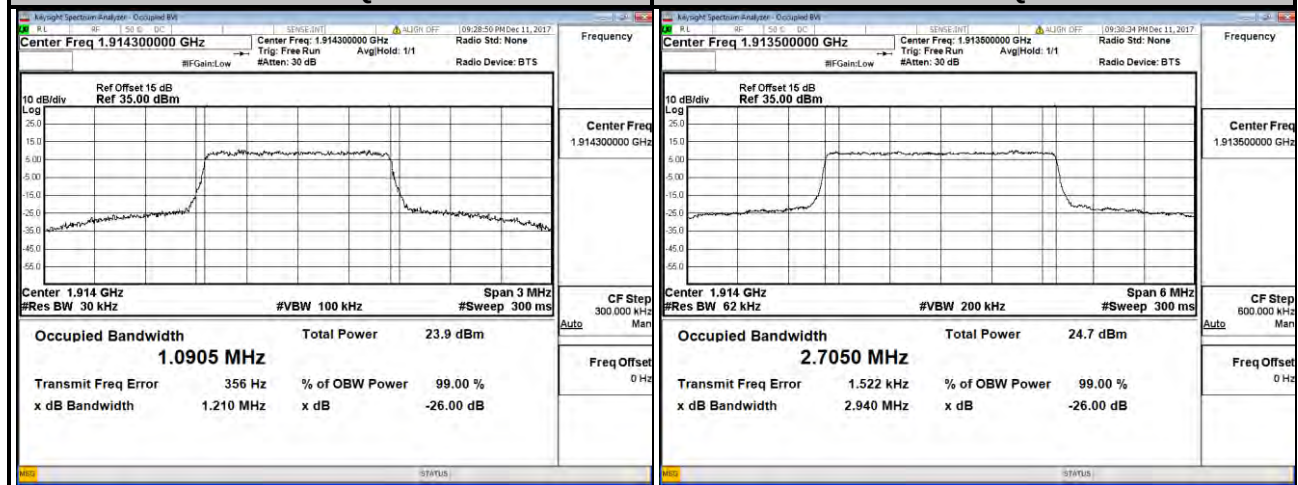
Channel Bandwidth: 3 MHz

Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
26047	1850.7	1.0890	1.0887	1.0879	26055	1851.5	2.7035	2.7018	2.6984
26365	1882.5	1.0876	1.0863	1.0881	26365	1882.5	2.7446	2.6960	2.6984
26683	1914.3	1.0879	1.0905	1.0871	26675	1913.5	2.7050	2.6989	2.6986

Spectrum Plot of Worst Value

1.4 MHz / QPSK

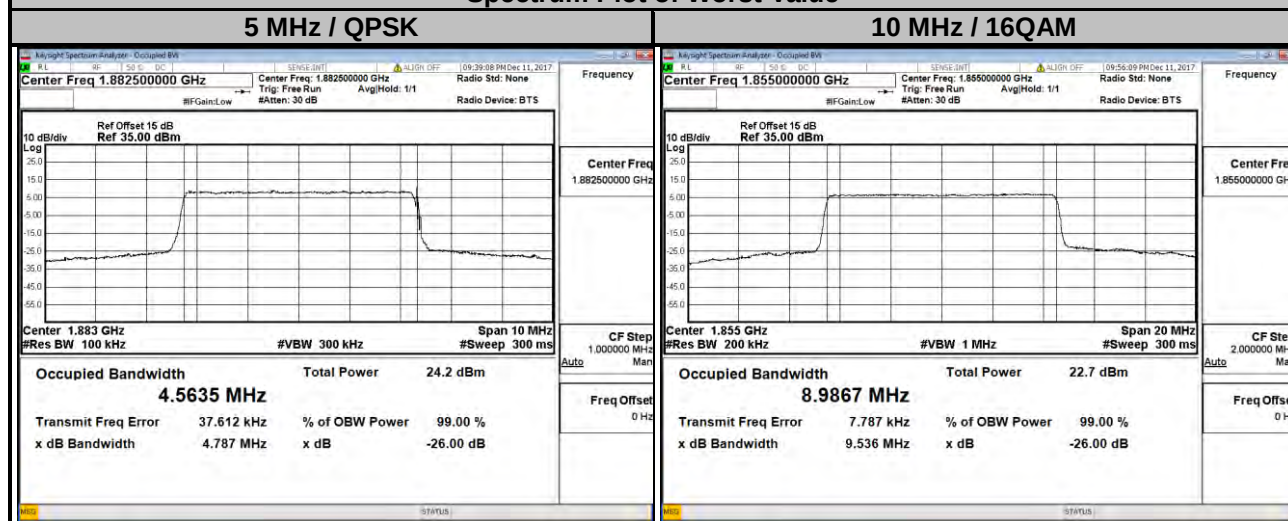
3 MHz / 16QAM



LTE Band 25

Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
26065	1852.5	4.4965	4.4973	4.4922	26090	1855.0	8.9843	8.9867	8.9790
26365	1882.5	4.5635	4.5033	4.5033	26365	1882.5	8.9811	8.9745	8.9785
26665	1912.5	4.4975	4.4981	4.5071	26640	1910.0	8.9787	8.9780	8.9821

Spectrum Plot of Worst Value



LTE BAND 25

Channel Bandwidth: 15 MHz

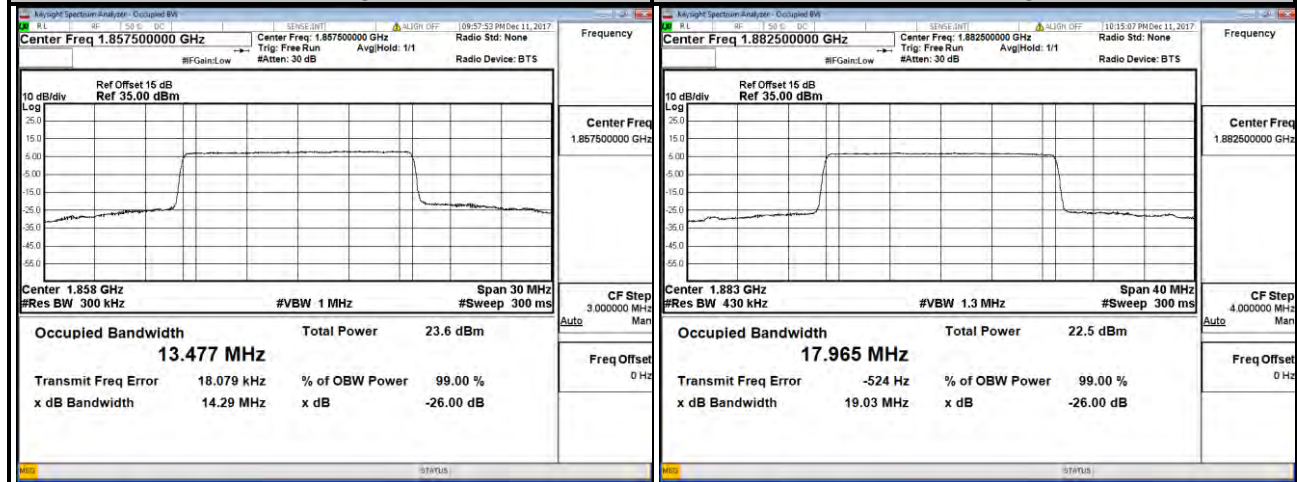
Channel Bandwidth: 20 MHz

Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
26115	1857.5	13.477	13.462	13.442	26140	1860.0	17.939	17.948	17.934
26365	1882.5	13.471	13.455	13.445	26365	1882.5	17.945	17.965	17.943
26615	1907.5	13.446	13.436	13.422	26590	1905.0	17.886	17.898	17.891

Spectrum Plot of Worst Value

15 MHz / QPSK

20 MHz / 16QAM

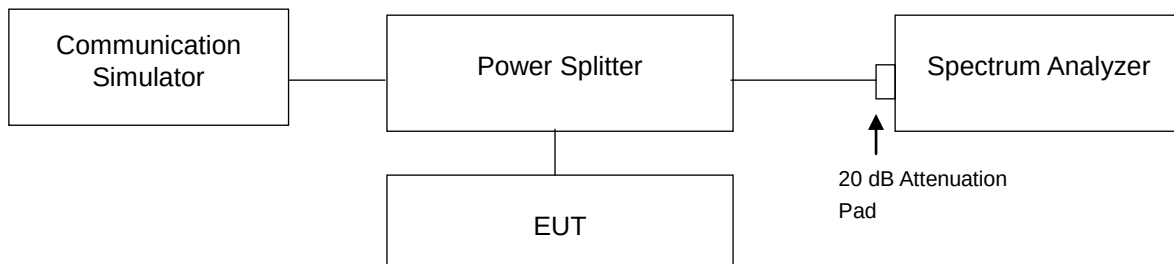


4.4 Band Edge Measurement

4.4.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

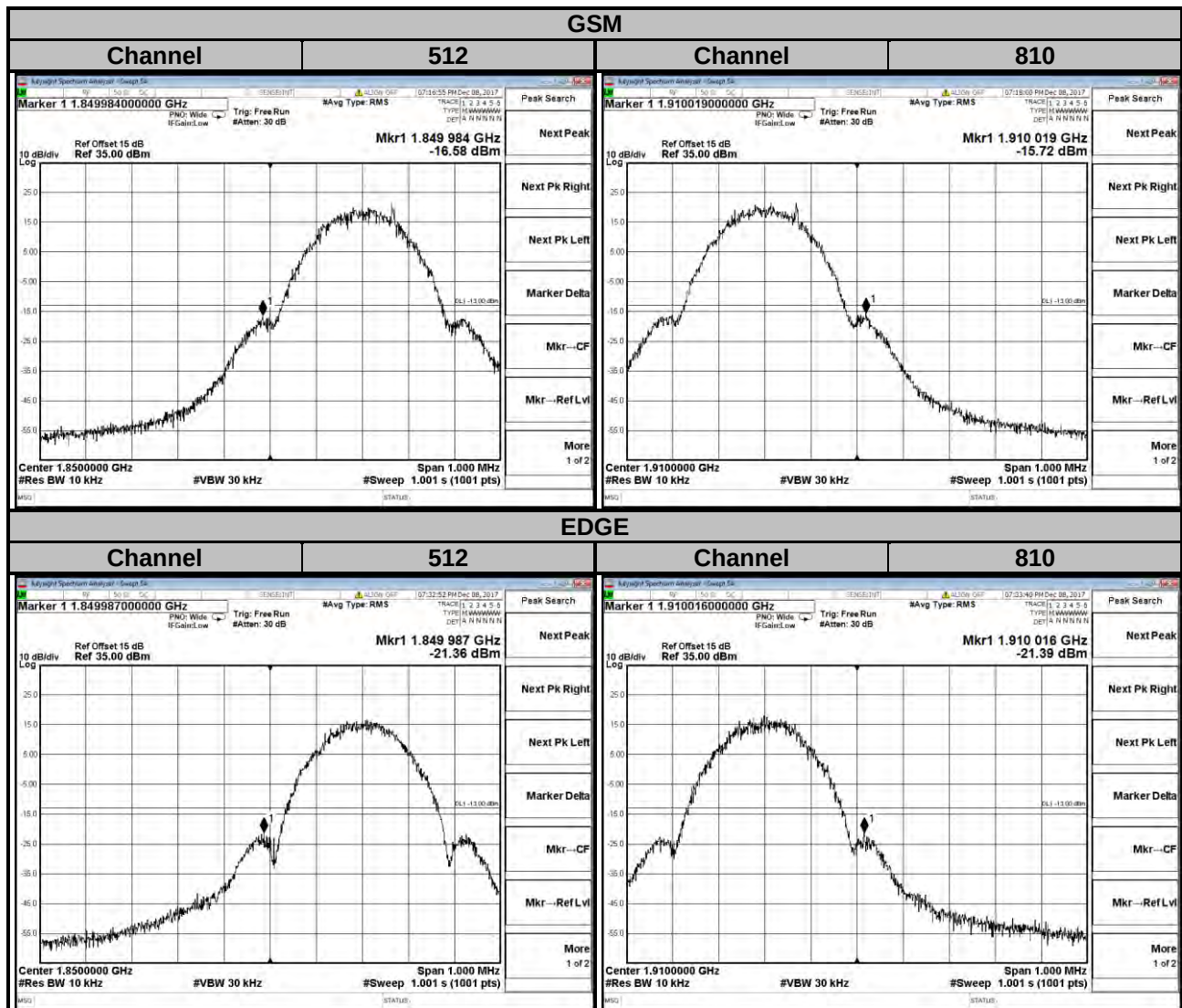
4.4.2 Test Setup

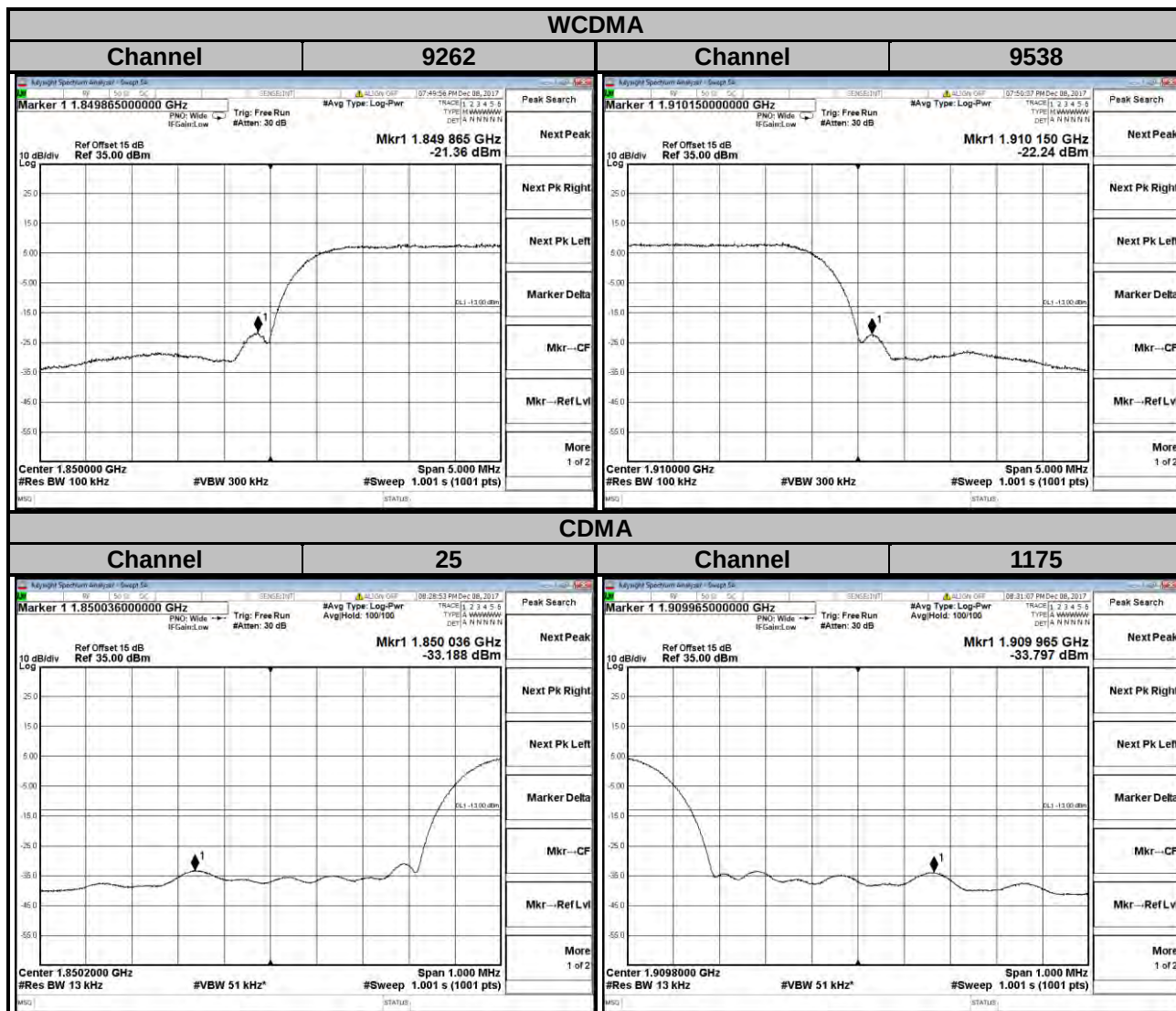


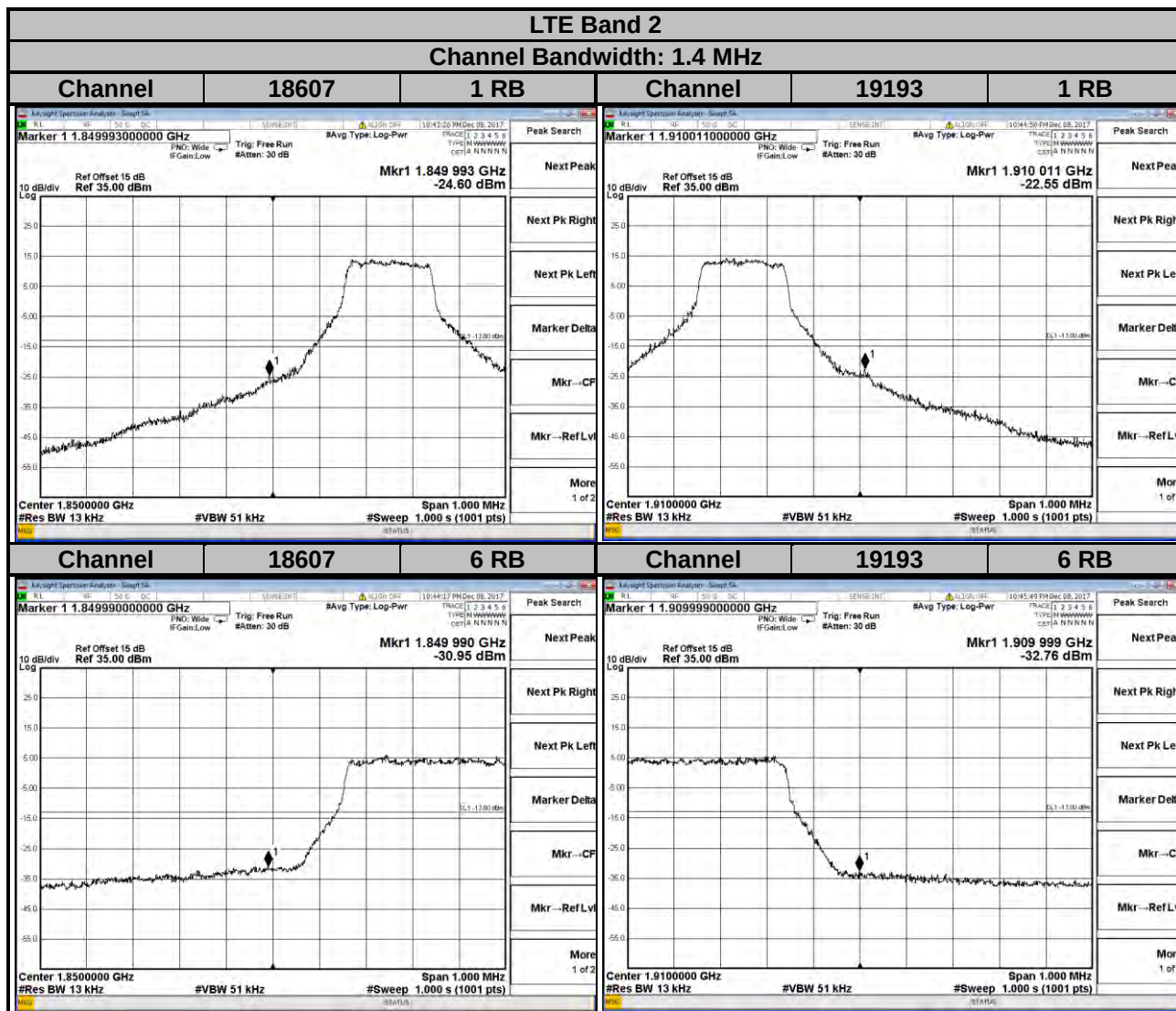
4.4.3 Test Procedures

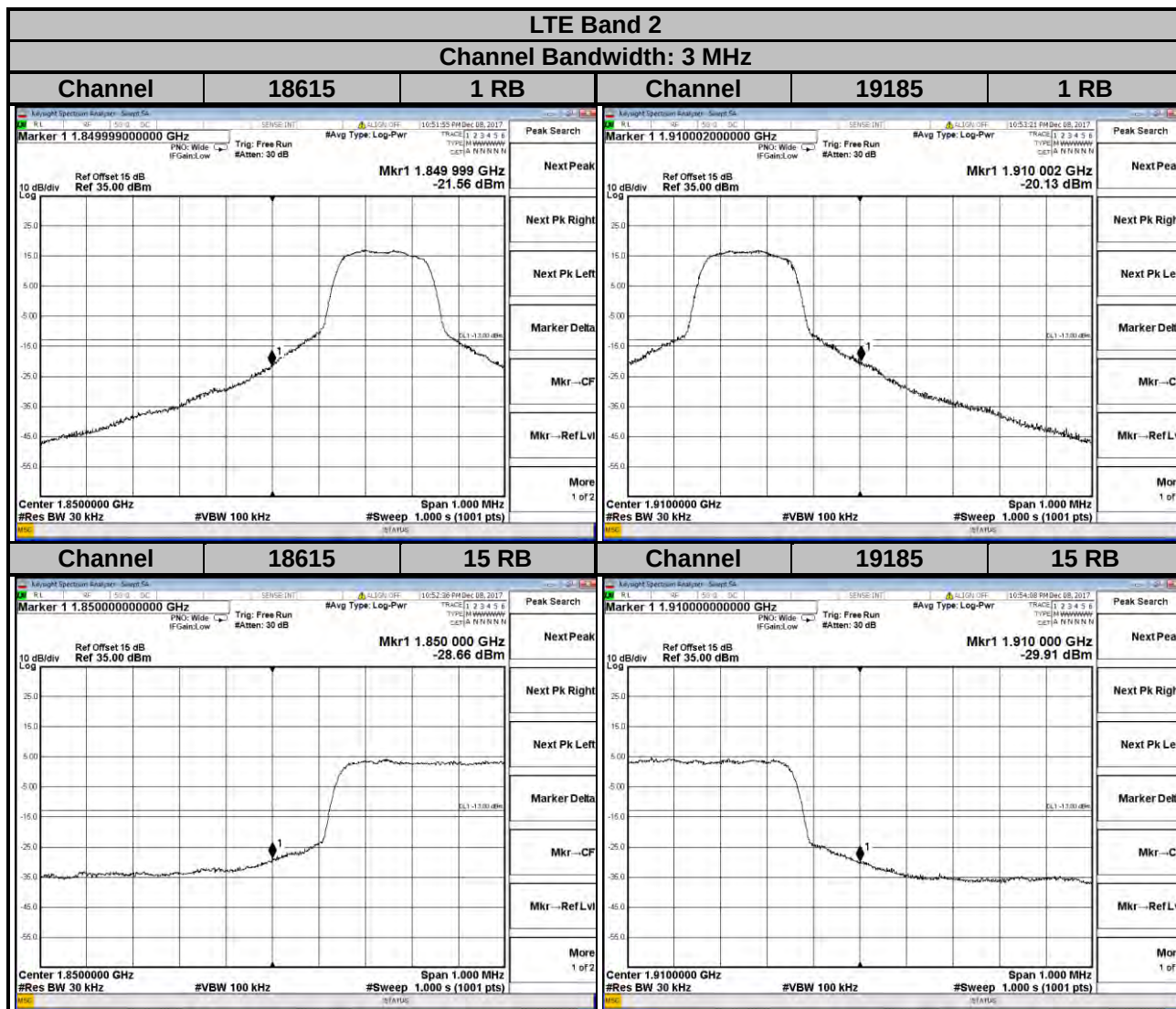
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 10 kHz and VB of the spectrum is 30 kHz (GSM/GPRS/EDGE).
- The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 13 kHz and VB of the spectrum is 51 kHz (CDMA / LTE Bandwidth 1.4 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
- 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).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 180 kHz and VB of the spectrum is 560 kHz (LTE Bandwidth 20 MHz).
- Record the max trace plot into the test report.

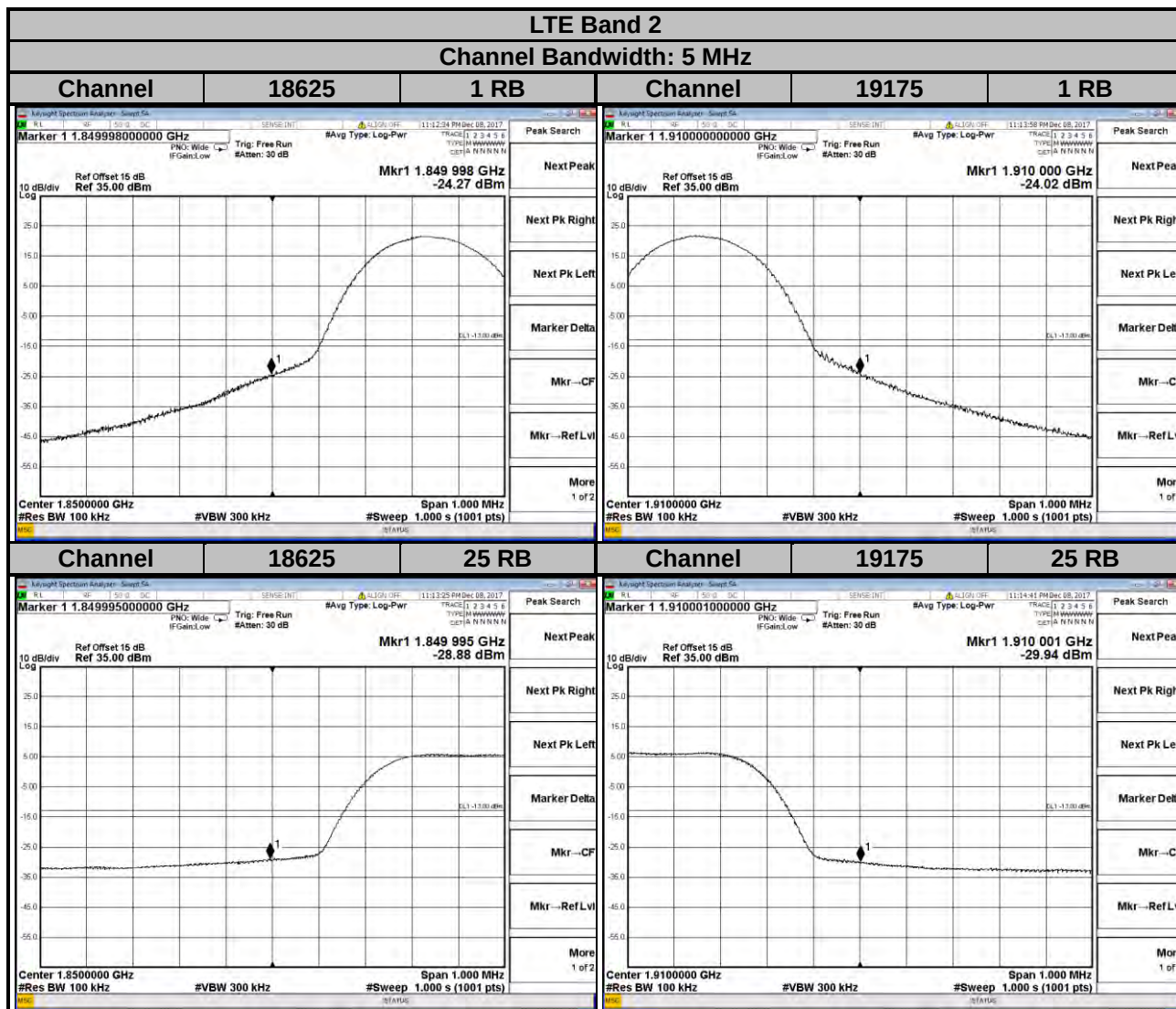
4.4.4 Test Results

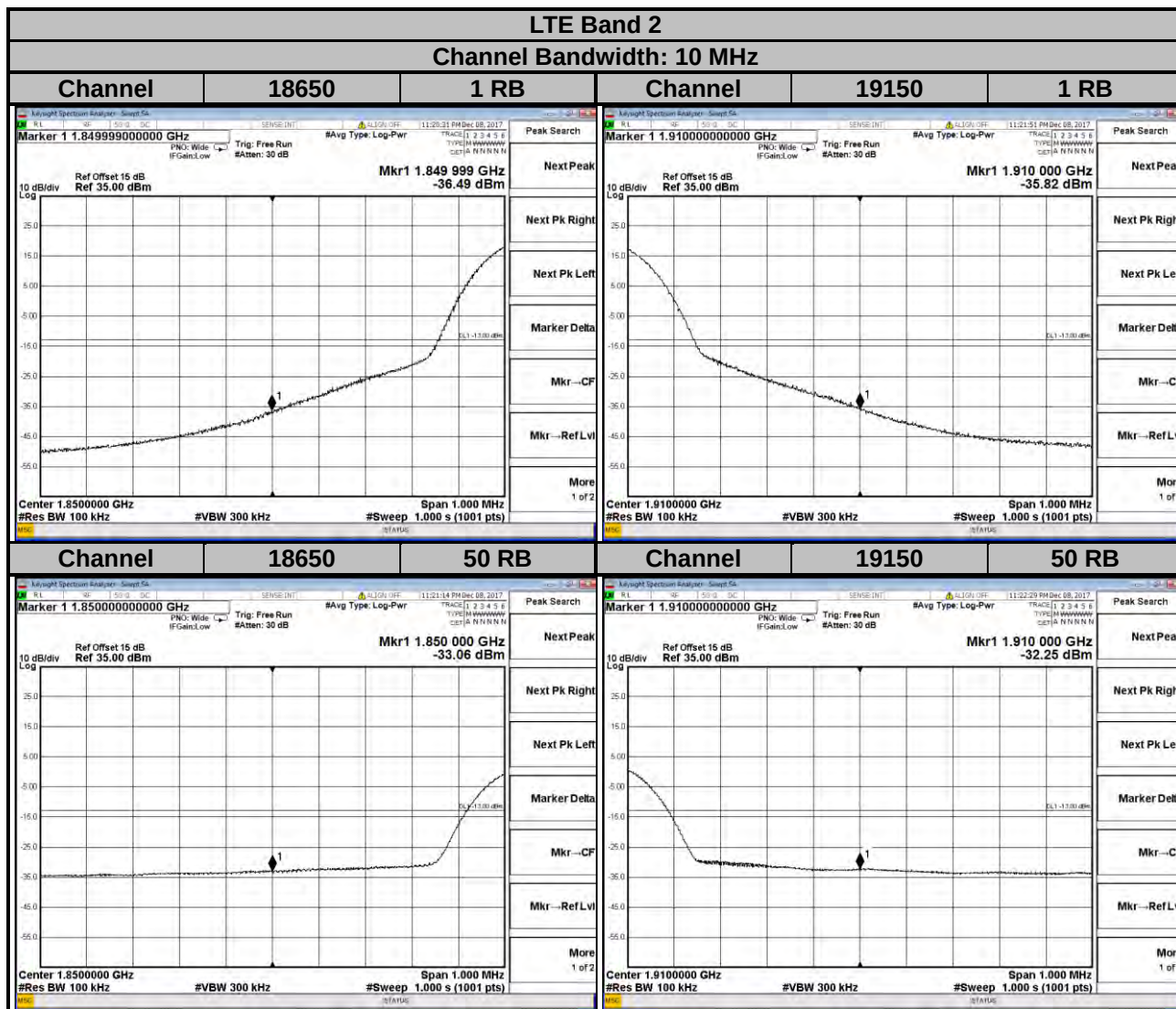


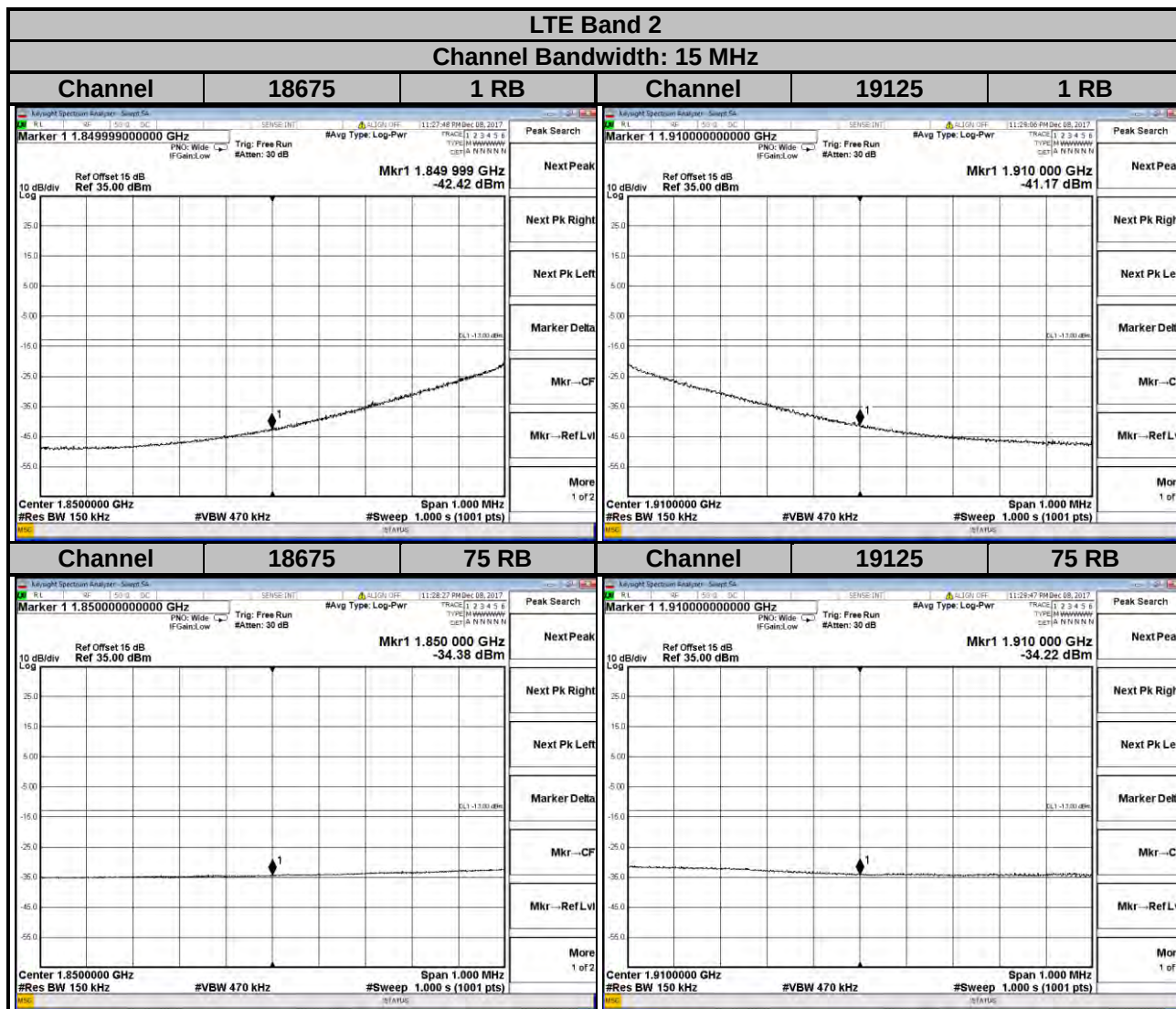


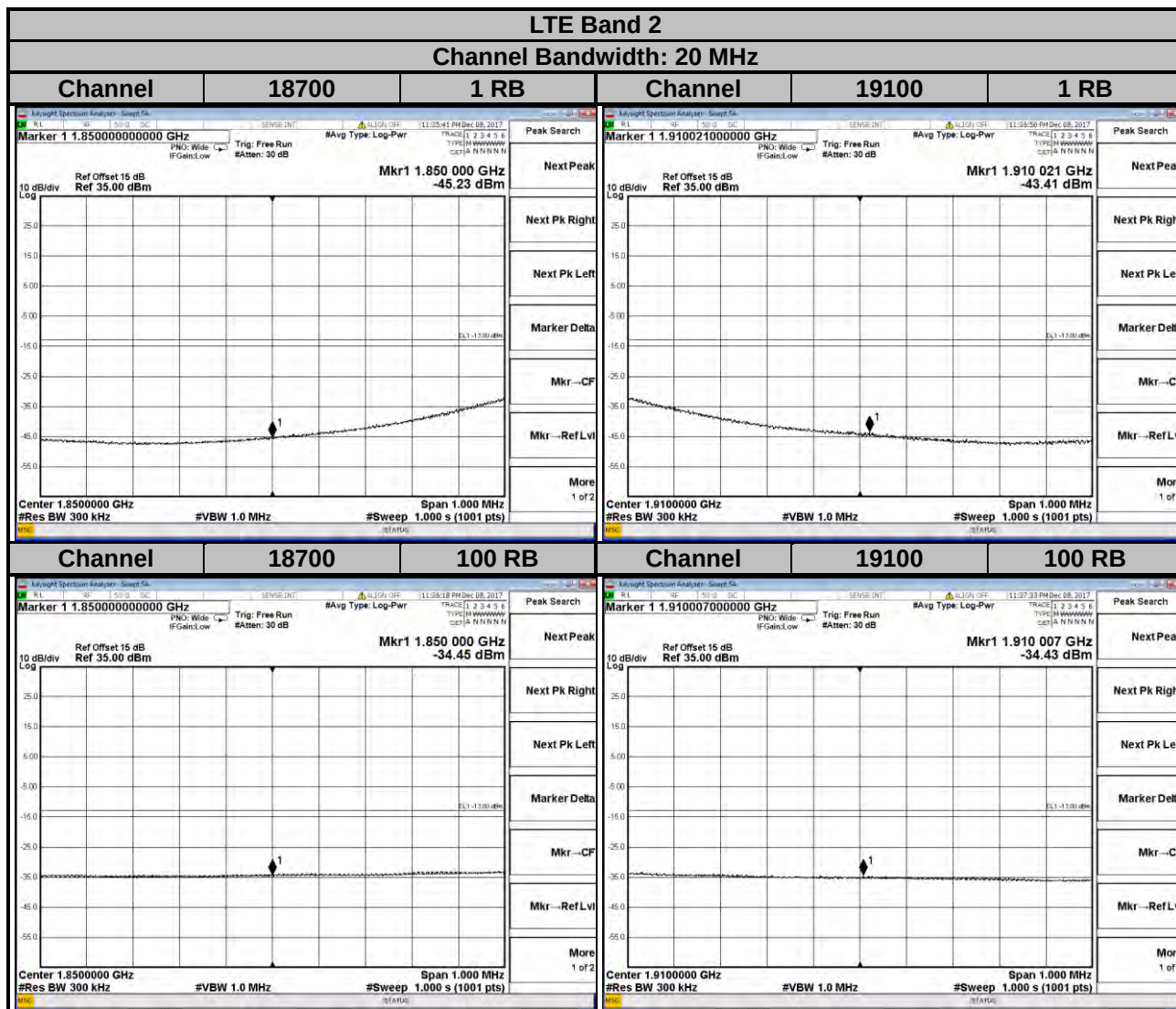


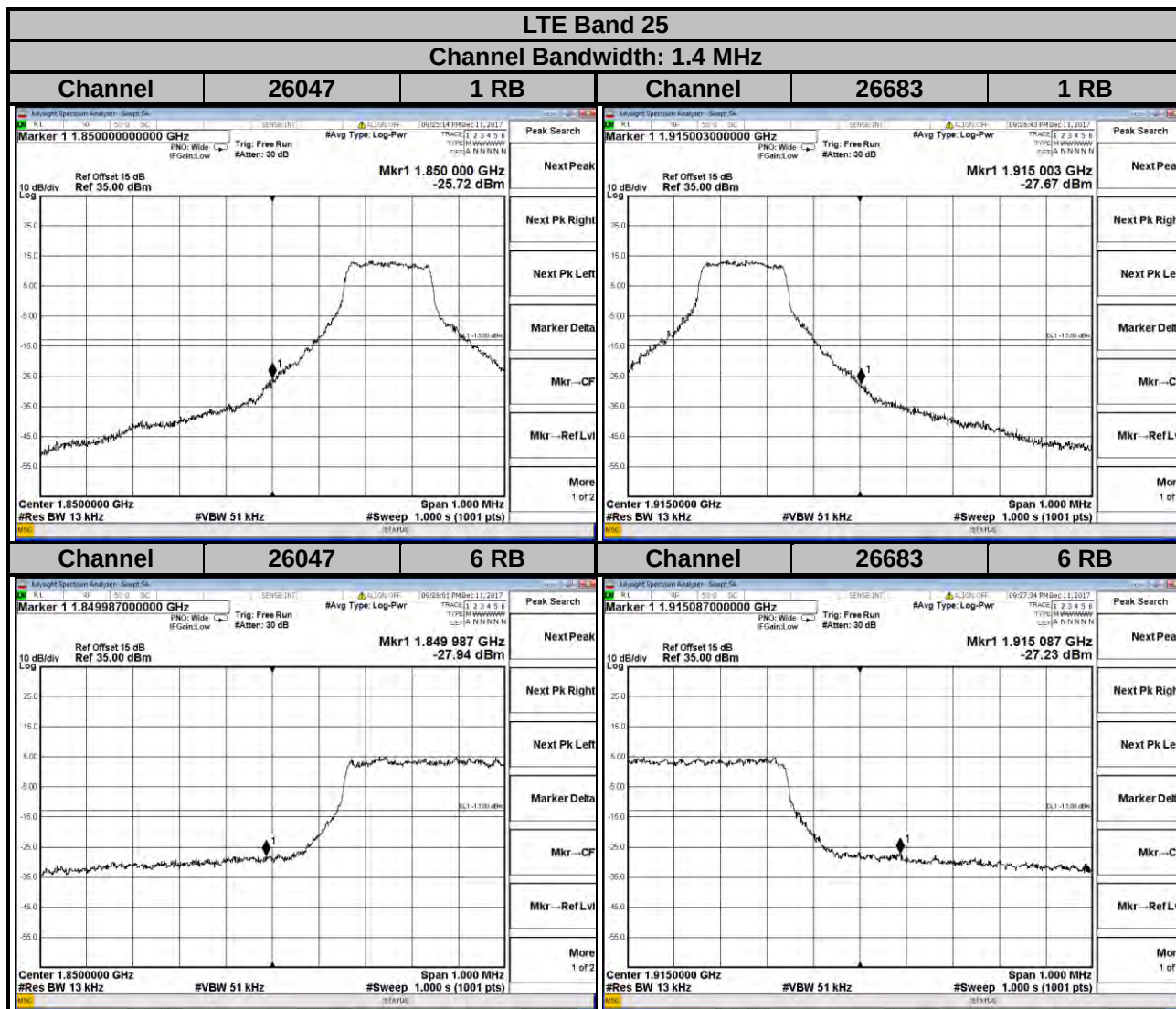


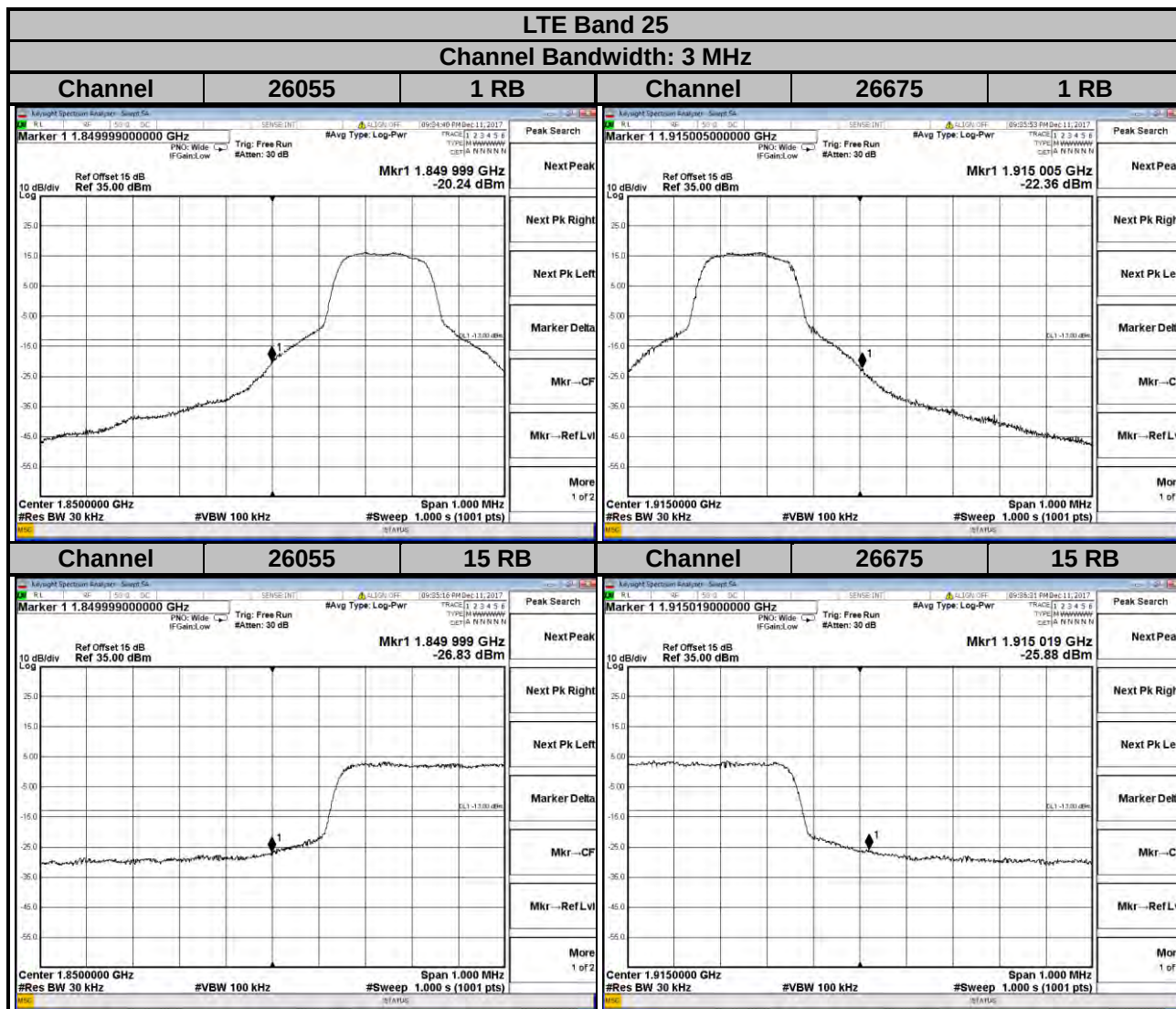


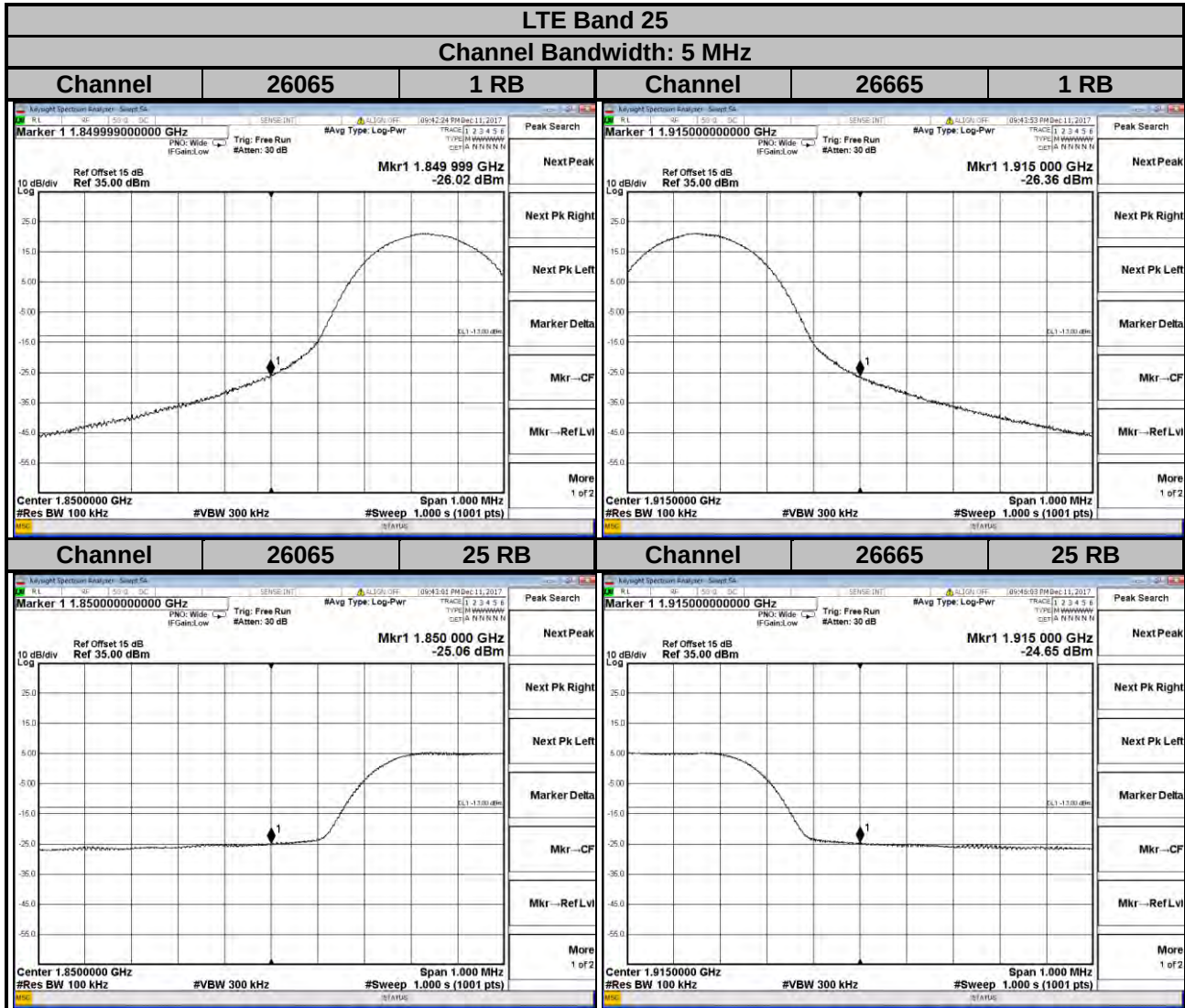


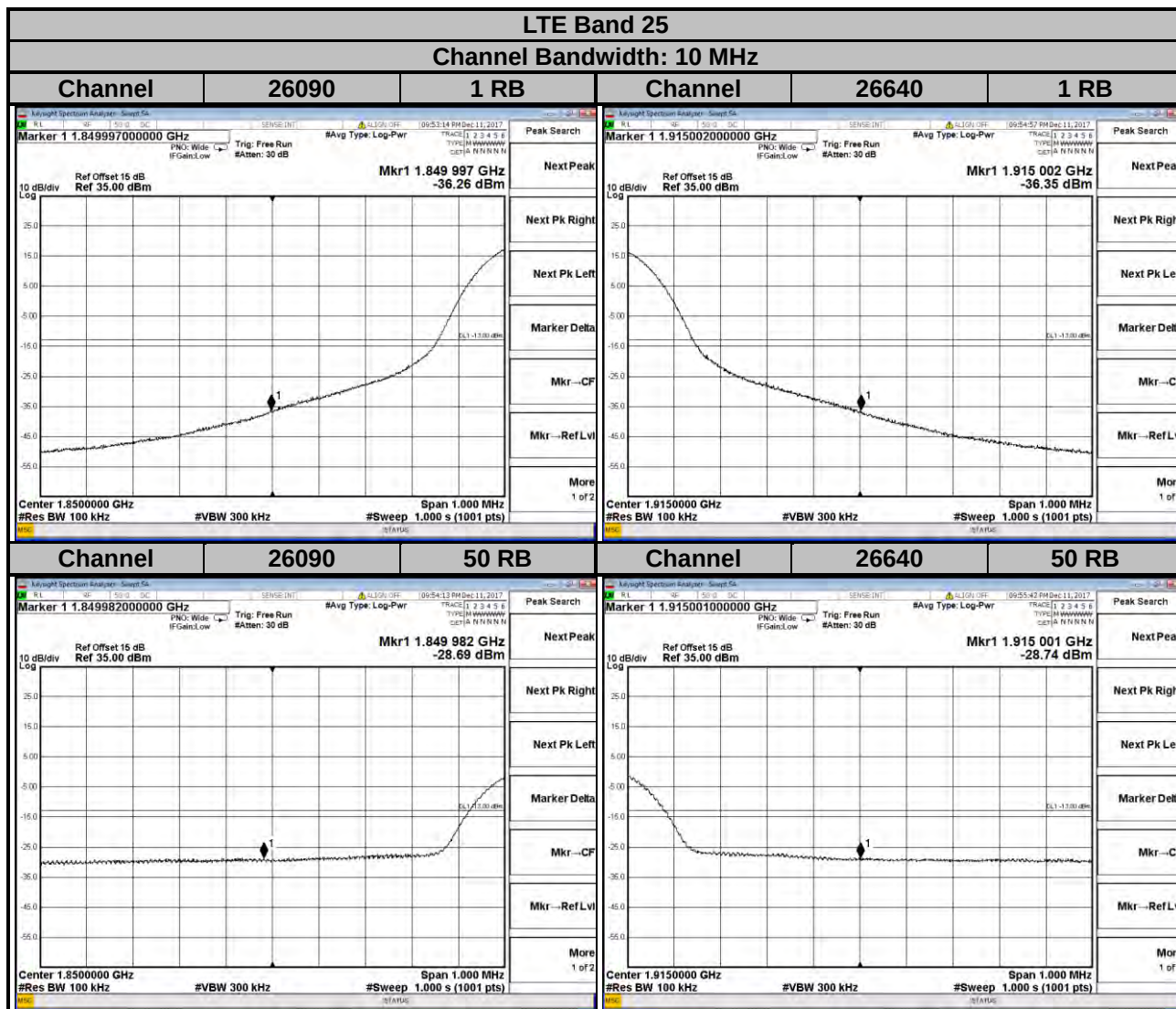


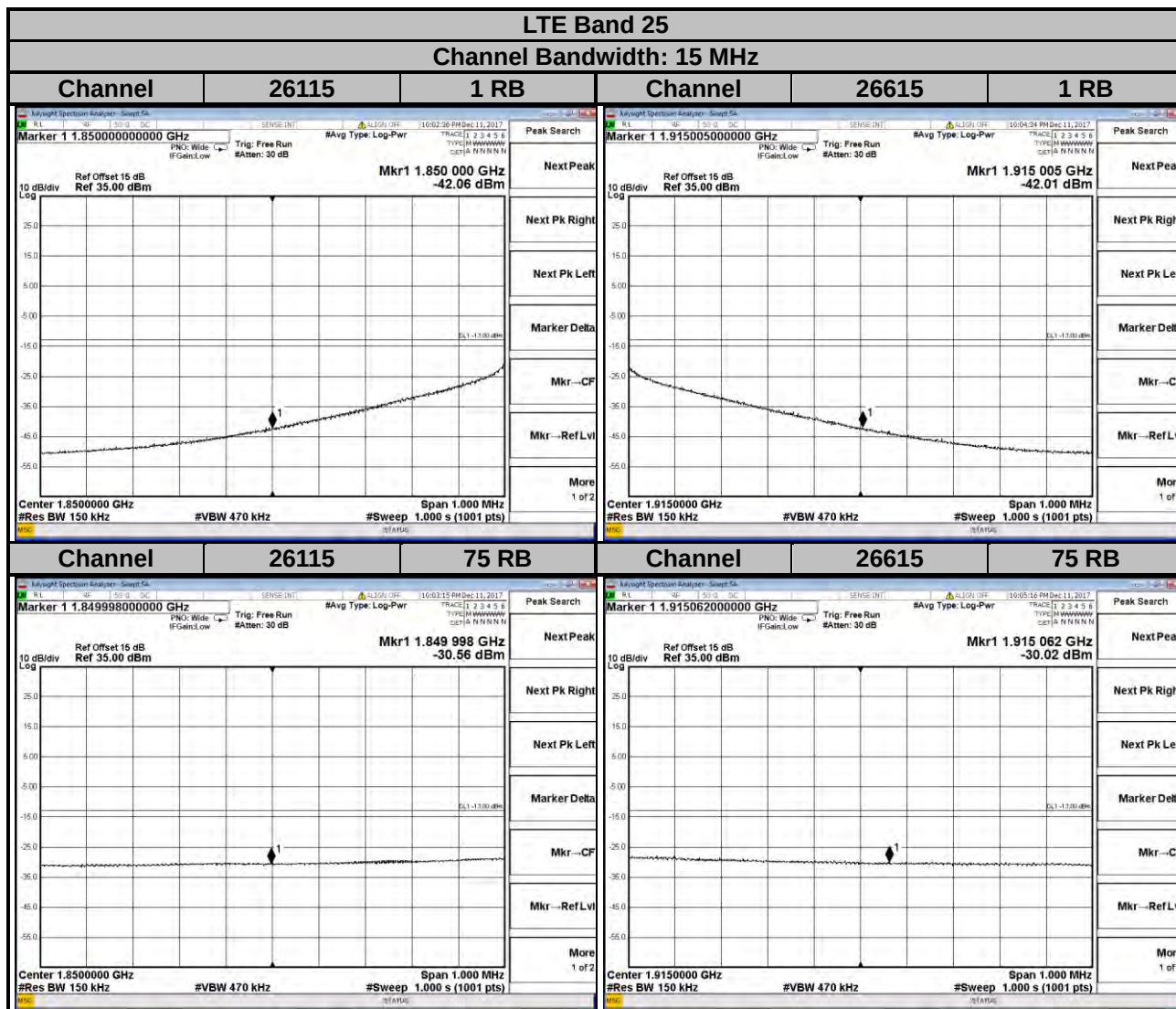


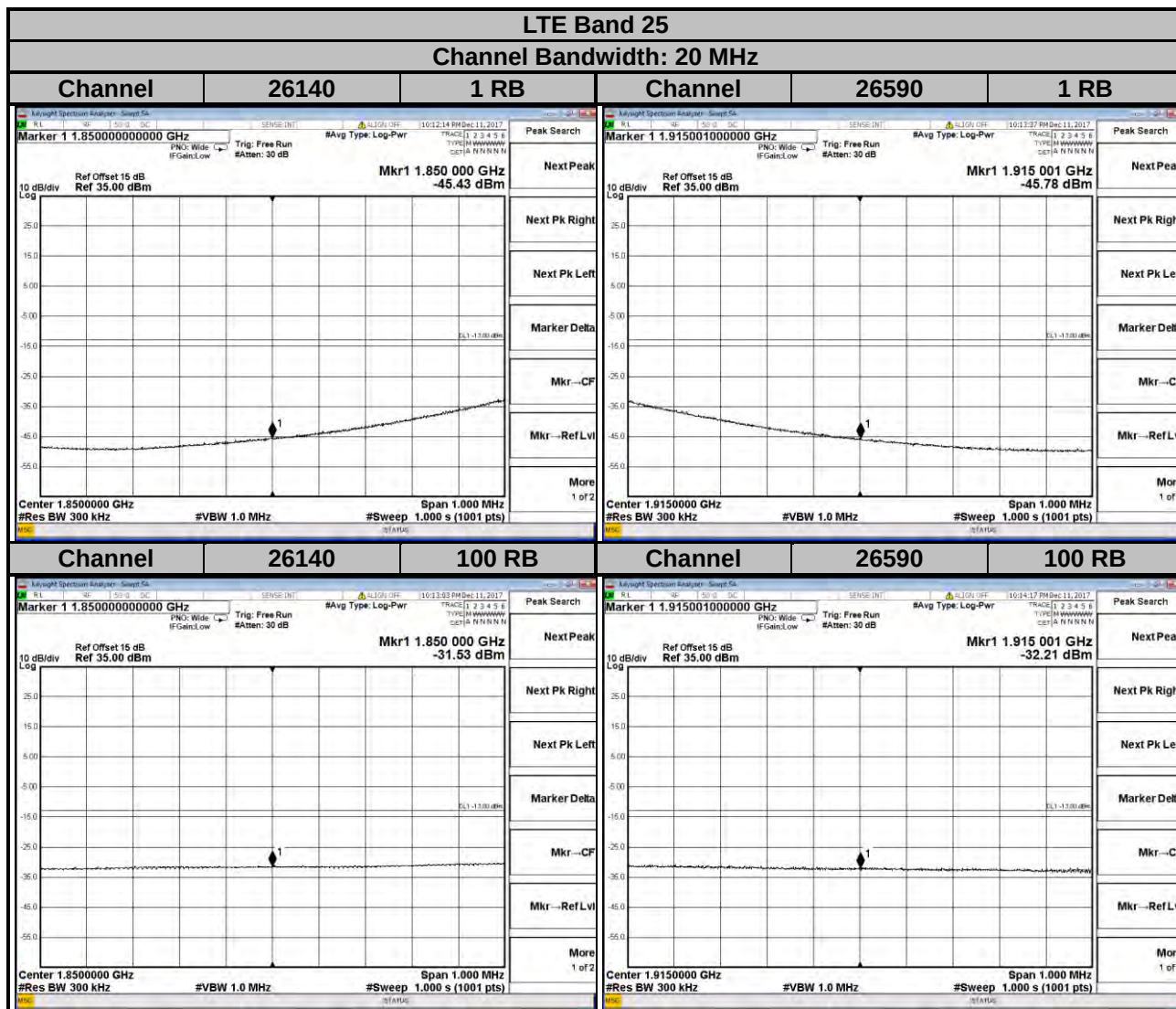










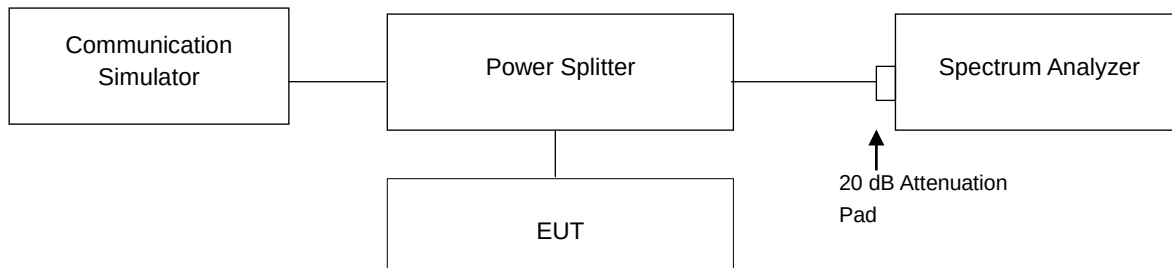


4.5 Peak to Average Ratio

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

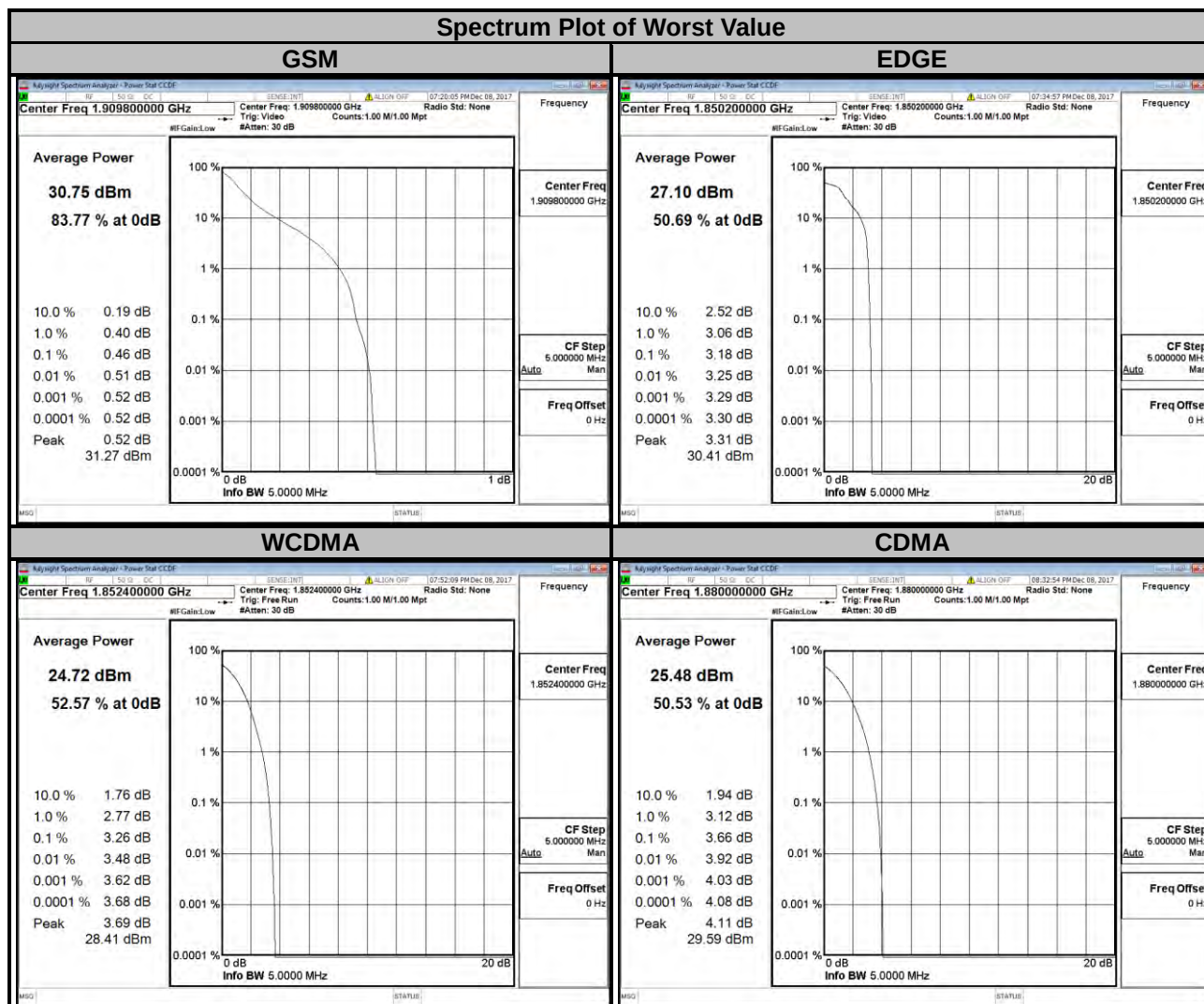


4.5.3 Test Procedures

1. Set resolution/measurement bandwidth $\geq$ 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

Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)
		GSM	EDGE			
512	1850.2	0.40	3.18	9262	1852.4	3.26
661	1880.0	0.43	3.07	9400	1880.0	3.23
810	1909.8	0.46	2.99	9538	1907.6	3.19
Channel	Frequency (MHz)	Peak to Average Ratio (dB)				
		CDMA				
25	1851.25	3.35				
600	1880.00	3.66				
1175	1908.75	3.09				

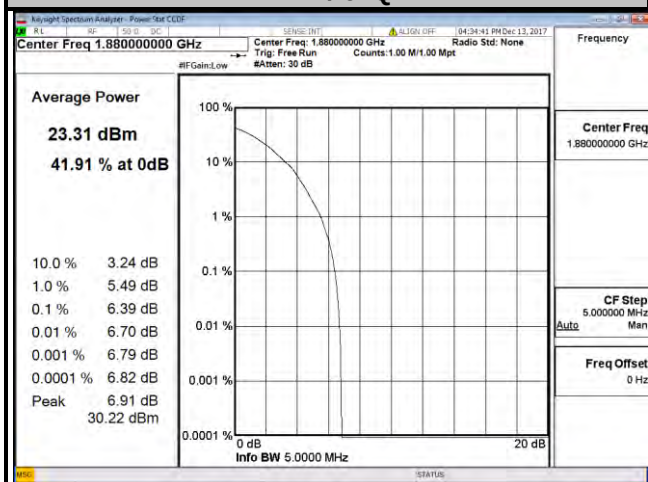


LTE Band 2

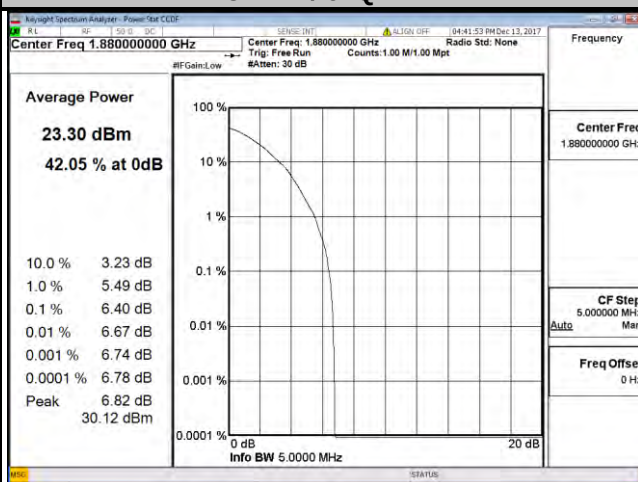
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
18607	1850.7	4.50	5.28	6.02	18615	1851.5	4.43	5.20	6.00
18900	1880.0	4.99	5.77	6.39	18900	1880.0	4.92	5.68	6.40
19193	1909.3	4.37	5.16	5.94	19185	1908.5	4.49	5.36	6.05

Spectrum Plot of Worst Value

1.4 MHz / 64QAM



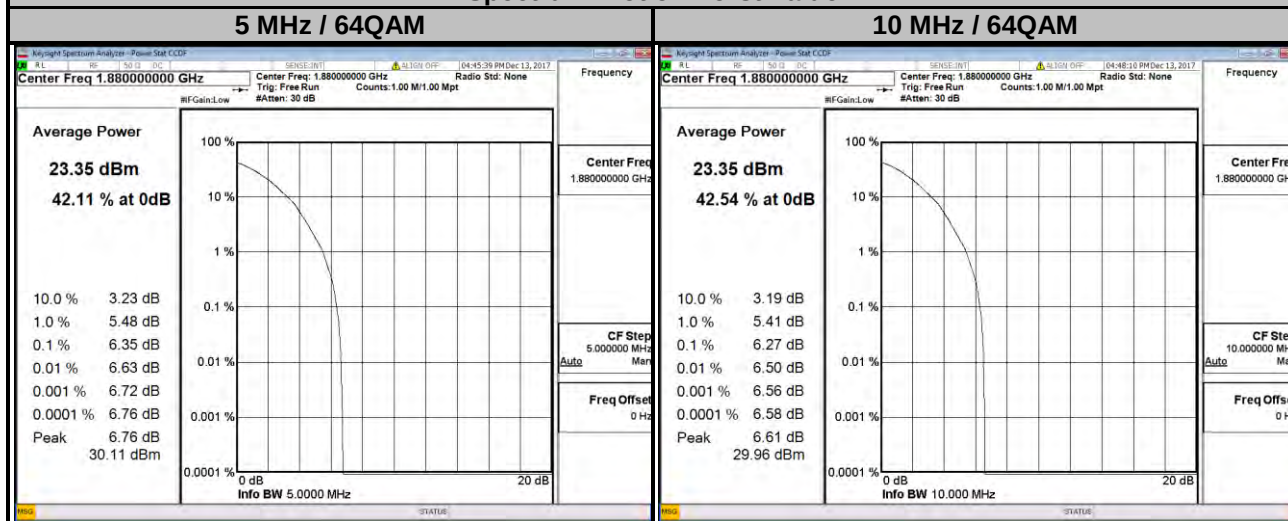
3 MHz / 64QAM



LTE Band 2

Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
18625	1852.5	4.44	5.19	5.96	18650	1855.0	4.40	5.14	5.92
18900	1880.0	4.89	5.63	6.35	18900	1880.0	4.75	5.53	6.27
19175	1907.5	4.57	5.27	6.07	19150	1905.0	4.55	5.33	5.98

Spectrum Plot of Worst Value

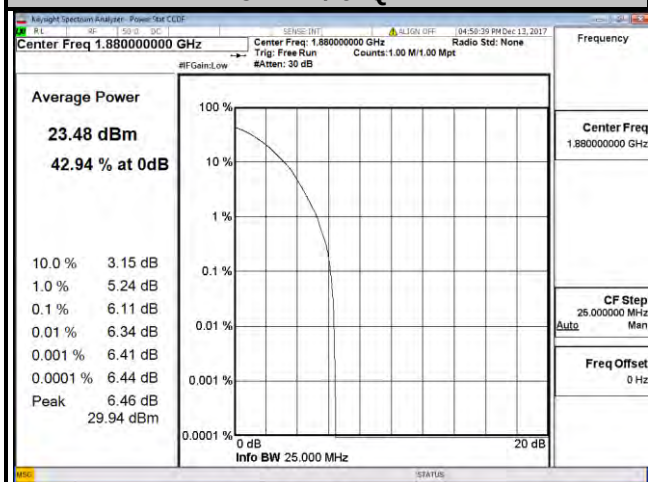


LTE Band 2

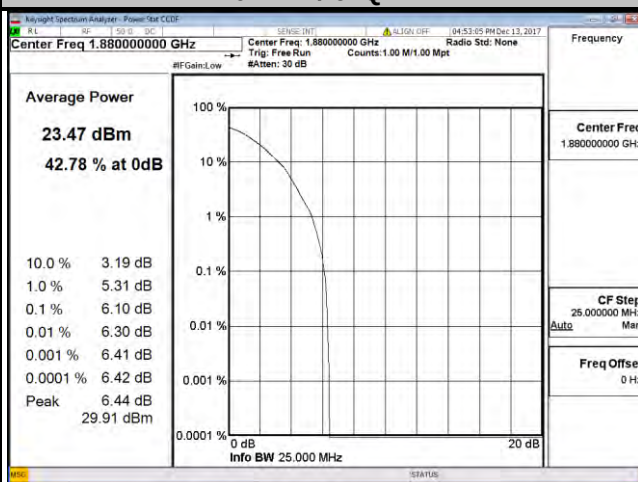
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
18675	1857.5	4.34	5.05	5.86	18700	1860.0	4.36	5.15	5.88
18900	1880.0	4.63	5.35	6.11	18900	1880.0	4.59	5.33	6.10
19125	1902.5	4.40	5.25	5.87	19100	1900.0	4.32	5.09	5.75

Spectrum Plot of Worst Value

15 MHz / 64QAM



20 MHz / 64QAM

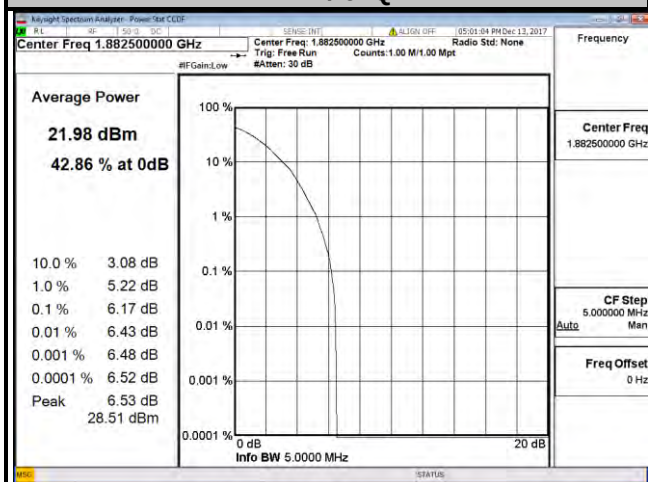


LTE Band 25

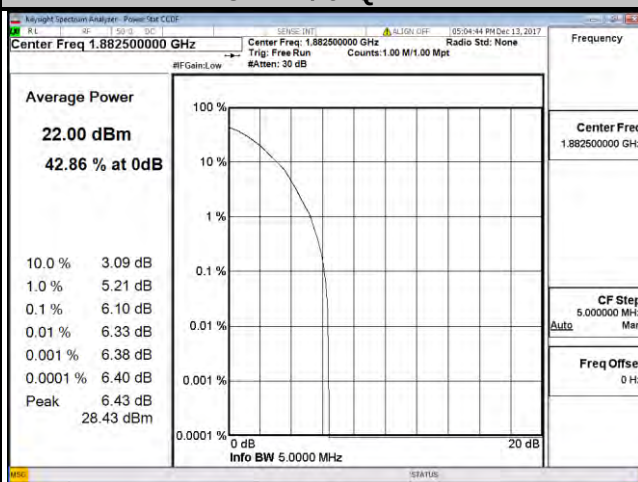
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
26047	1850.7	4.32	5.11	5.88	26055	1851.5	4.24	5.03	5.85
26365	1882.5	4.60	5.43	6.17	26365	1882.5	4.60	5.40	6.10
26683	1914.3	4.18	4.96	5.80	26675	1913.5	4.19	5.01	5.81

Spectrum Plot of Worst Value

1.4 MHz / 64QAM



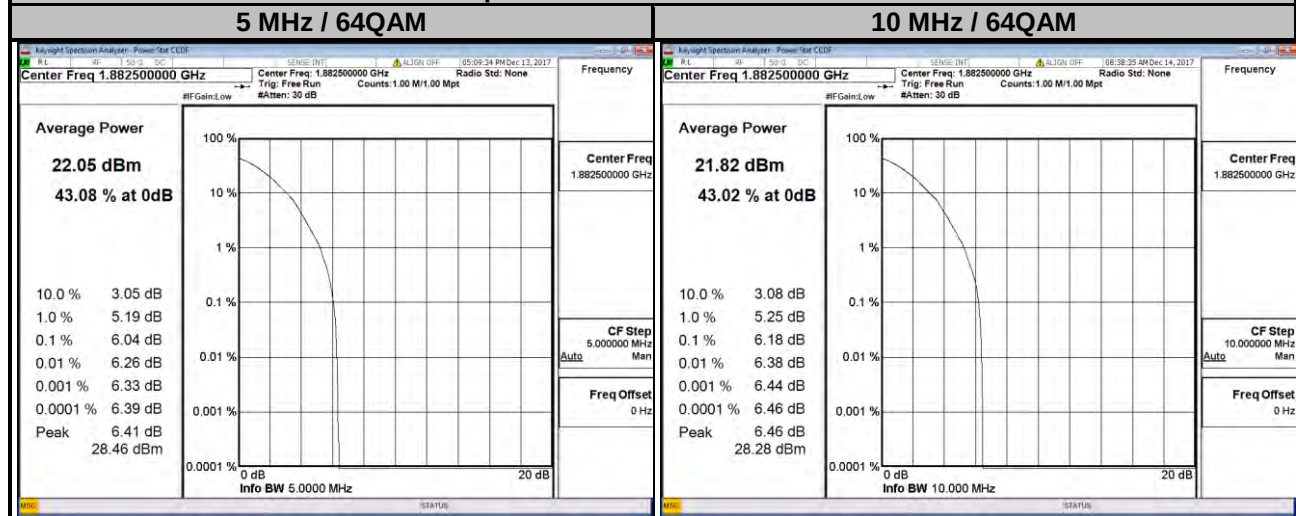
3 MHz / 64QAM



LTE Band 25

Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
26065	1852.5	4.21	5.02	5.84	26090	1855.0	4.19	4.96	5.86
26365	1882.5	4.45	5.24	6.04	26365	1882.5	4.47	5.27	6.18
26665	1912.5	4.24	5.06	5.88	26640	1910.0	4.43	5.23	6.07

Spectrum Plot of Worst Value

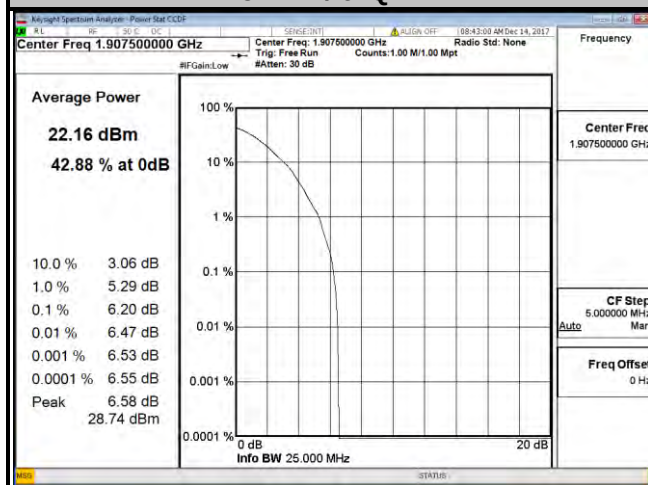


LTE Band 25

Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
26115	1857.5	4.22	5.00	5.75	26140	1860.0	4.20	4.97	5.92
26365	1882.5	4.44	5.29	6.10	26365	1882.5	4.50	5.34	6.20
26615	1907.5	4.58	5.38	6.20	26590	1905.0	4.56	5.40	6.24

Spectrum Plot of Worst Value

15 MHz / 64QAM



20 MHz / 64QAM

