

FCC Test Report

(Part 24 – GSM, WCDMA Band 2, LTE Band 2, 25)

Report No.: RF210105C01-6

FCC ID: PZWBHTM70QWG

Test Model: BHT-M70-QWG

Received Date: Dec. 29, 2020

Test Date: Dec. 29, 2020 ~ Sep. 02, 2021

Issued Date: Sep. 29, 2021

Applicant: DENSO WAVE INCORPORATED

Address: 1 Yoshiike Kusagi Agui-cho, Chita-gun Aichi 470-2297, Japan

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

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

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, Taiwan

**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 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.

Table of Contents

Release Control Record	4
1 Certificate of Conformity.....	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Test Site and Instruments.....	7
3 General Information.....	9
3.1 General Description of EUT	9
3.2 Configuration of System under Test.....	12
3.2.1 Description of Support Units.....	13
3.3 Test Mode Applicability and Tested Channel Detail	14
3.4 EUT Operating Conditions	24
3.5 General Description of Applied Standards and References	24
4 Test Types and Results	25
4.1 Output Power Measurement	25
4.1.1 Limits of Output Power Measurement.....	25
4.1.2 Test Procedures.....	25
4.1.3 Test Setup.....	25
4.1.4 Test Results	26
4.2 Modulation Characteristics Measurement.....	40
4.2.1 Limits of Modulation Characteristics.....	40
4.2.2 Test Procedure	40
4.2.3 Test Setup.....	40
4.2.4 Test Results	41
4.3 Frequency Stability Measurement	44
4.3.1 Limits of Frequency Stability Measurement	44
4.3.2 Test Procedure	44
4.3.3 Test Instruments	44
4.3.4 Conducted Setup.....	44
4.3.5 Test Results	45
4.4 Occupied Bandwidth Measurement	60
4.4.1 Test Procedure	60
4.4.2 Test Setup.....	60
4.4.3 Test Result.....	61
4.5 Band Edge Measurement	77
4.5.1 Limits of Band Edge Measurement	77
4.5.2 Test Setup.....	77
4.5.3 Test Procedures.....	77
4.5.4 Test Results	78
4.6 Peak to Average Ratio	92
4.6.1 Limits of Peak to Average Ratio Measurement	92
4.6.2 Test Setup.....	92
4.6.3 Test Procedures.....	92
4.6.4 Test Results	93
4.7 Conducted Spurious Emissions	101
4.7.1 Limits of Conducted Spurious Emissions Measurement.....	101
4.7.2 Test Setup.....	101
4.7.3 Test Procedure	101
4.7.4 Test Results	102
4.8 Radiated Emission Measurement	120
4.8.1 Limits of Radiated Emission Measurement.....	120
4.8.2 Test Procedure	120
4.8.3 Deviation from Test Standard	120
4.8.4 Test Setup.....	121

4.8.5 Test Results	122
5 Pictures of Test Arrangements	184
Appendix – Information of the Testing Laboratories	185

Release Control Record

Issue No.	Description	Date Issued
RF210105C01-6	Original release	Sep. 29, 2021

1 Certificate of Conformity

Product: 2D Code Handy Terminal

Brand: DENSO

Test Model: BHT-M70-QWG

Sample Status: Engineering sample

Applicant: DENSO WAVE INCORPORATED

Test Date: Dec. 29, 2020 ~ Sep. 02, 2021

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 RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen, **Date:** Sep. 29, 2021
Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Sep. 29, 2021
Bruce Chen / Senior Engineer

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective Isotropically Radiated Power	Pass	Meet the requirement of limit.
2.1046 24.232 (d)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238	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 -17.77dB at 34.85MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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:

HwaYa Chamber 10:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.44 dB
	30MHz ~ 200MHz	2.93 dB
	200MHz ~ 1000MHz	2.95 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

HwaYa Chamber 3:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.86 dB
	200MHz ~ 1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Test Mode A (Test Date: Dec. 29, 2020 ~ Sep. 02, 2021)

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Agilent	N9038A	MY55420137	Apr. 16, 2020	Apr. 15, 2021
			Apr. 09, 2021	Apr. 08, 2022
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 07, 2020	Dec. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 16, 2020	Apr. 15, 2021
			Apr. 12, 2021	Apr. 11, 2022
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 22, 2020	Nov. 21, 2021
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Nov. 06, 2020	Nov. 05, 2021
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
			Apr. 13, 2021	Apr. 12, 2022
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2020	Nov. 24, 2021
Bluetooth Tester	CBT	100946	Aug. 06, 2020	Aug. 05, 2022
Preamplifier EMCI	EMC 012645	980115	Oct. 07, 2020	Oct. 06, 2021
Preamplifier EMCI	EMC 184045	980116	Oct. 07, 2020	Oct. 06, 2021
Preamplifier EMCI	EMC 330H	980112	Oct. 07, 2020	Oct. 06, 2021
Power Meter Anritsu	ML2495A	1232001	Dec. 29, 2020	Dec. 28, 2021
Power Sensor Anritsu	MA2411B	1207334	Dec. 29, 2020	Dec. 28, 2021
RF Coaxial Cable EMCI	EMC104-SM-SM-8 000	171005	Oct. 07, 2020	Oct. 06, 2021
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(1 40807)	Oct. 07, 2020	Oct. 06, 2021
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 07, 2020	Oct. 06, 2021
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
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 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.

Test Mode B (Test Date: Aug. 06, 2021)

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jul. 05, 2021	Jul. 04, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 07, 2021	Jun. 06, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 04, 2020	Nov. 03, 2021
HORN Antenna SCHWARZBECK	9120D	209	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 22, 2021	Mar. 21, 2022
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-S M-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

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

2. The test was performed in HwaYa Chamber 3.

3 General Information

3.1 General Description of EUT

Product	2D Code Handy Terminal	
Brand	DENSO	
Test Model	BHT-M70-QWG	
Sample Status	Engineering sample	
Power Supply Rating	5.0 Vdc (host equipment) 5.0 / 9.0 / 12.0 Vdc (adapter) 3.6 Vdc (battery)	
Modulation Type	GSM, GPRS: GMSK EDGE: 8PSK WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM	
Operating Frequency	GSM/GPRS/EDGE	1850.2MHz ~ 1909.8MHz
	WCDMA Band 2	1852.4MHz ~ 1907.6MHz
	LTE Band 2 (Channel Bandwidth 1.4MHz)	1850.7MHz ~ 1909.3MHz
	LTE Band 2 (Channel Bandwidth 3MHz)	1851.5MHz ~ 1908.5MHz
	LTE Band 2 (Channel Bandwidth 5MHz)	1852.5MHz ~ 1907.5MHz
	LTE Band 2 (Channel Bandwidth 10MHz)	1855.0MHz ~ 1905.0MHz
	LTE Band 2 (Channel Bandwidth 15MHz)	1857.5MHz ~ 1902.5MHz
	LTE Band 2 (Channel Bandwidth 20MHz)	1860.0MHz ~ 1900.0MHz
	LTE Band 25 (Channel Bandwidth 1.4MHz)	1850.7MHz ~ 1914.3MHz
	LTE Band 25 (Channel Bandwidth 3MHz)	1851.5MHz ~ 1913.5MHz
	LTE Band 25 (Channel Bandwidth 5MHz)	1852.5MHz ~ 1912.5MHz
	LTE Band 25 (Channel Bandwidth 10MHz)	1855.0MHz ~ 1910.0MHz
	LTE Band 25 (Channel Bandwidth 15MHz)	1857.5MHz ~ 1907.5MHz
	LTE Band 25 (Channel Bandwidth 20MHz)	1860.0MHz ~ 1905.0MHz

Max. EIRP Power	GSM	1327.394mW (31.23dBm)	
	WCDMA Band 2	347.536mW (25.41dBm)	
		QPSK	16QAM
	LTE Band 2 (Channel Bandwidth 1.4MHz)	233.346mW (23.68dBm)	194.089mW (22.88dBm)
	LTE Band 2 (Channel Bandwidth 3MHz)	234.423mW (23.70dBm)	194.984mW (22.90dBm)
	LTE Band 2 (Channel Bandwidth 5MHz)	236.048mW (23.73dBm)	197.697mW (22.96dBm)
	LTE Band 2 (Channel Bandwidth 10MHz)	227.510mW (23.57dBm)	196.789mW (22.94dBm)
	LTE Band 2 (Channel Bandwidth 15MHz)	227.510mW (23.57dBm)	197.697mW (22.96dBm)
	LTE Band 2 (Channel Bandwidth 20MHz)	242.661mW (23.85dBm)	199.526mW (23.00dBm)
	LTE Band 25 (Channel Bandwidth 1.4MHz)	237.137mW (23.75dBm)	195.884mW (22.92dBm)
	LTE Band 25 (Channel Bandwidth 3MHz)	238.232mW (23.77dBm)	194.089mW (22.88dBm)
	LTE Band 25 (Channel Bandwidth 5MHz)	236.592mW (23.74dBm)	200.447mW (23.02dBm)
	LTE Band 25 (Channel Bandwidth 10MHz)	237.684mW (23.76dBm)	196.789mW (22.94dBm)
	LTE Band 25 (Channel Bandwidth 15MHz)	239.332mW (23.79dBm)	199.067mW (22.99dBm)
	LTE Band 25 (Channel Bandwidth 20MHz)	239.883mW (23.80dBm)	202.768mW (23.07dBm)
Emission Designator	GSM/GPRS	248KGXW	
	EDGE	246KG7W	
	WCDMA Band 2	4M14F9W	
		QPSK	16QAM
	LTE Band 2 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W
	LTE Band 2 (Channel Bandwidth 3MHz)	2M70G7D	2M70D7W
	LTE Band 2 (Channel Bandwidth 5MHz)	4M49G7D	4M50D7W
	LTE Band 2 (Channel Bandwidth 10MHz)	8M98G7D	8M98D7W
	LTE Band 2 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W
	LTE Band 2 (Channel Bandwidth 20MHz)	17M9G7D	18M0D7W
	LTE Band 25 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W
	LTE Band 25 (Channel Bandwidth 3MHz)	2M70G7D	2M70D7W
	LTE Band 25 (Channel Bandwidth 5MHz)	4M49G7D	4M49D7W
	LTE Band 25 (Channel Bandwidth 10MHz)	8M97G7D	8M97D7W
	LTE Band 25 (Channel Bandwidth 15MHz)	13M5G7D	13M5D7W
	LTE Band 25 (Channel Bandwidth 20MHz)	17M9G7D	18M0D7W
Antenna Type	Refer to Note as below		
Antenna Connector	Refer to Note as below		
Accessory Device	Refer to Note as below		
Cable Supplied	Refer to Note as below		

Note:

1. The EUT contains following accessory devices.

Battery (accessory)	
Brand	DENSO
Model	BT3
Rating	3.6Vdc, 3050mAh, 10.98Wh

Adapter (Optional)	
Brand	CHANNEL WELL
Model	2ACP0183C
Input Power	100-240Vac, 0.5A, 50/60Hz
Output Power	5.0Vdc / 3.0A, 15W 9.0Vdc / 2.0A, 18.0W, 12.0Vdc / 1.5A, 18.0W

USB Cable (Optional)	
Brand	NIEN-YI
Model	NYS3892-0
Signal Line	1.45m shielded cable

QC3.0 charge single Cradle (Optional)	
Brand	DENSO
Model	CU-M70UQ

LAN Cradle with Spare battery charge (Optional)	
Brand	DENSO
Model	CU-M70L

USB Cradle with spare battery charge (Optional)	
Brand	DENSO
Model	CU-M70U

AC Adapter (CU-M70U & CU-M70L cradle use) (Optional)	
Brand	Sunny
Model	SYS1548-5012-T3
Input Power	100-240V~1.5A MAX 50-60Hz
Output Power	+12.0V / 4.16A
Power Cable	DC: 1.16m non-shielded cable with 1 core AC: 1.71m non-shielded cable without core

*After pre-testing, Cradle model: CU-M70L was the worst for the final tests.

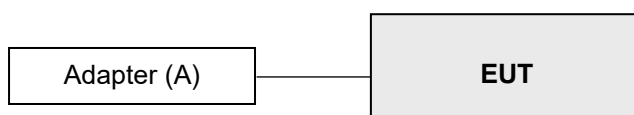
2. The following antennas were provided to the EUT.

Band	Freq. Range (MHz)	Gain (dBi)
GSM 1900	1850.2 ~ 1909.8	1.74
WCDMA Band 2	1852.4 ~ 1907.6	1.74
LTE Band 2	1850.7 ~ 1909.3	1.74
LTE Band 25	1850.7 ~ 1914.3	1.74

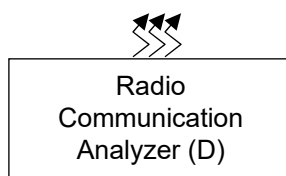
* The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Configuration of System under Test

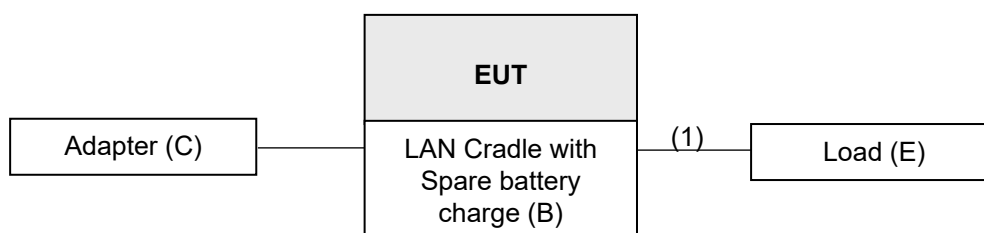
Test Mode A



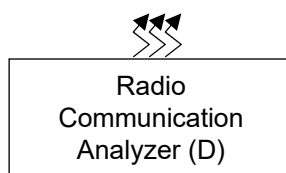
Remote site



Test Mode B



Remote site



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Adapter	CHANNEL WELL	2ACP0183C	NA	NA	-
B	LAN Cradle with Spare battery charge	DENSO	CU-M70L	NA	NA	-
C	Adapter	Sunny	SYS1548-5012-T3	NA	NA	-
D	Radio Communication Analyzer	Anritsu	MT8821C	6261806803	NA	-
E	Load	NA	NA	NA	NA	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item D acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	1.5	N	0	-

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	Radiated Emission
GSM	X-plane
WCDMA Band 2	X-plane
LTE Band 2	X-plane
LTE Band 25	X-plane

Test results are presented in the report as below.

Test Mode	Test Condition
A	EUT with adapter
B	EUT with cradle model: CU-M70L

GSM Mode

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
A	EIRP	512 to 810	512 (1850.2MHz), 661 (1880.0MHz), 810 (1909.8MHz)	GSM, GPRS, EDGE
A	Modulation Characteristics	512 to 810	661 (1880.0MHz)	GSM, GPRS, EDGE
A	Frequency Stability	512 to 810	512 (1850.2MHz), 810 (1909.8MHz)	GSM, EDGE
A	Occupied Bandwidth	512 to 810	512 (1850.2MHz), 661 (1880.0MHz), 810 (1909.8MHz)	GSM, GPRS, EDGE
A	Band Edge	512 to 810	512(1850.2MHz), 810(1909.8MHz)	GSM, GPRS, EDGE
A	Peak To Average Ratio	512 to 810	512 (1850.2MHz), 661 (1880.0MHz), 810 (1909.8MHz)	GSM, GPRS, EDGE
A	Conducted Emission	512 to 810	512 (1850.2MHz), 661 (1880.0MHz), 810 (1909.8MHz)	GSM, GPRS, EDGE
A, B	Radiated Emission Below 1GHz	512 to 810	661 (1880.0MHz)	GSM, EDGE
A	Radiated Emission Above 1GHz	512 to 810	512 (1850.2MHz), 661 (1880.0MHz), 810 (1909.8MHz)	GSM, EDGE

Note: For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.

WCDMA Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
A	EIRP	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
A	Modulation Characteristics	9262 to 9538	9400 (1880.0MHz)	WCDMA, HSDPA, HSUPA
A	Frequency Stability	9262 to 9538	9262 (1852.4MHz), 9538 (1907.6MHz)	WCDMA
A	Occupied Bandwidth	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
A	Band Edge	9262 to 9538	9262 (1852.4MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
A	Peak To Average Ratio	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
A	Conducted Emission	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
A, B	Radiated Emission Below 1GHz	9262 to 9538	9400 (1880.0MHz)	WCDMA
A	Radiated Emission Above 1GHz	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA

Note: For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.

LTE Band 2

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A	EIRP	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 2 RB Offset 1 RB / 5 RB Offset 3 RB / 0 RB Offset 3 RB / 1 RB Offset 3 RB / 3 RB Offset 6 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 7 RB Offset 1 RB / 14 RB Offset 8 RB / 0 RB Offset 8 RB / 3 RB Offset 8 RB / 7 RB Offset 15 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 12 RB Offset 1 RB / 24 RB Offset 12 RB / 0 RB Offset 12 RB / 6 RB Offset 12 RB / 13 RB Offset 25 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 1 RB / 49 RB Offset 25 RB / 0 RB Offset 25 RB / 12 RB Offset 25 RB / 25 RB Offset 50 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 37 RB Offset 1 RB / 74 RB Offset 36 RB / 0 RB Offset 36 RB / 19 RB Offset 36 RB / 39 RB Offset 75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 50 RB Offset 1 RB / 99 RB Offset 50 RB / 0 RB Offset 50 RB / 25 RB Offset 50 RB / 50 RB Offset 100 RB / 0 RB Offset
A	Modulation Characteristics	18700 to 19100	18900 (1880.0MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A	Frequency Stability	18607 to 19193	18607 (1850.7MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	6 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 19185 (1908.5MHz)	3MHz	QPSK	15 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 19175 (1907.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 19150 (1905.0MHz)	10MHz	QPSK	50 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 19125 (1902.5MHz)	15MHz	QPSK	75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	100 RB / 0 RB Offset
A	Occupied Bandwidth	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM	6 RB / 0RB Offset
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK / 16QAM	15 RB / 0RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK / 16QAM	25RB / 0RB Offset
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK / 16QAM	50RB / 0RB Offset
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM	75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset
A	Band Edge	18607 to 19193	18607 (1850.7MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 19185 (1908.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 19175 (1907.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 19150 (1905.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 19125 (1902.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	1 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
A	Peak to Average Ratio	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM	3 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK / 16QAM	1 RB / 14 RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset
A	Conducted Emission	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A, B	Radiated Emission Below 1GHz	18607 to 19193	18900 (1880.0MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission Above 1GHz	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The measured output power for QPSK mode is higher than the measured output power for 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under QPSK mode only.

LTE Band 25

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A	EIRP	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 2 RB Offset 1 RB / 5 RB Offset 3 RB / 0 RB Offset 3 RB / 1 RB Offset 3 RB / 3 RB Offset 6 RB / 0 RB Offset
		26055 to 26675	26055 (1851.5MHz), 26365 (1882.5MHz), 26675 (1913.5MHz)	3MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 7 RB Offset 1 RB / 14 RB Offset 8 RB / 0 RB Offset 8 RB / 3 RB Offset 8 RB / 7 RB Offset 15 RB / 0 RB Offset
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 12 RB Offset 1 RB / 24 RB Offset 12 RB / 0 RB Offset 12 RB / 6 RB Offset 12 RB / 13 RB Offset 25 RB / 0 RB Offset
		26090 to 26640	26090 (1855.0MHz), 26365 (1882.5MHz), 26640 (1910.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 24 RB Offset 1 RB / 49 RB Offset 25 RB / 0 RB Offset 25 RB / 12 RB Offset 25 RB / 25 RB Offset 50 RB / 0 RB Offset
		26115 to 26615	26115 (1857.5MHz), 26365 (1882.5MHz), 26615 (1907.5MHz)	15MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 37 RB Offset 1 RB / 74 RB Offset 36 RB / 0 RB Offset 36 RB / 19 RB Offset 36 RB / 39 RB Offset 75 RB / 0 RB Offset
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset 1 RB / 50 RB Offset 1 RB / 99 RB Offset 50 RB / 0 RB Offset 50 RB / 25 RB Offset 50 RB / 50 RB Offset 100 RB / 0 RB Offset
A	Modulation Characteristics	26140 to 26590	26365 (1882.5MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A	Frequency Stability	26047 to 26683	26047 (1850.7MHz), 26683 (1914.3MHz)	1.4MHz	QPSK	6 RB / 0 RB Offset
		26055 to 26675	26055 (1851.5MHz), 26675 (1913.5MHz)	3MHz	QPSK	15 RB / 0 RB Offset
		26065 to 26665	26065 (1852.5MHz), 26665 (1912.5MHz)	5MHz	QPSK	25 RB / 0 RB Offset
		26090 to 26640	26090 (1855.0MHz), 26640 (1910.0MHz)	10MHz	QPSK	50 RB / 0 RB Offset
		26115 to 26615	26115 (1857.5MHz), 26615 (1907.5MHz)	15MHz	QPSK	75 RB / 0 RB Offset
		26140 to 26590	26140 (1860.0MHz), 26590 (1905.0MHz)	20MHz	QPSK	100 RB / 0 RB Offset
A	Occupied Bandwidth	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK / 16QAM	6 RB / 0RB Offset
		26055 to 26675	26055 (1851.5MHz), 26365 (1882.5MHz), 26675 (1913.5MHz)	3MHz	QPSK / 16QAM	15 RB / 0RB Offset
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK / 16QAM	25RB / 0RB Offset
		26090 to 26640	26090 (1855.0MHz), 26365 (1882.5MHz), 26640 (1910.0MHz)	10MHz	QPSK / 16QAM	50RB / 0RB Offset
		26115 to 26615	26115 (1857.5MHz), 26365 (1882.5MHz), 26615 (1907.5MHz)	15MHz	QPSK / 16QAM	75 RB / 0 RB Offset
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK / 16QAM	100 RB / 0 RB Offset
A	Band Edge	26047 to 26683	26047 (1850.7MHz), 26683 (1914.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset 1 RB / 5 RB Offset 6 RB / 0 RB Offset
		26055 to 26675	26055 (1851.5MHz), 26675 (1913.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset 1 RB / 14 RB Offset 15 RB / 0 RB Offset
		26065 to 26665	26065 (1852.5MHz), 26665 (1912.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset 1 RB / 24 RB Offset 25 RB / 0 RB Offset
		26090 to 26640	26090 (1855.0MHz), 26640 (1910.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset 50 RB / 0 RB Offset
		26115 to 26615	26115 (1857.5MHz), 26615 (1907.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset 1 RB / 74 RB Offset 75 RB / 0 RB Offset
		26140 to 26590	26140 (1860.0MHz), 26590 (1905.0MHz)	20MHz	QPSK	1 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
A	Peak to Average Ratio	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26055 to 26675	26055 (1851.5MHz), 26365 (1882.5MHz), 26675 (1913.5MHz)	3MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26090 to 26640	26090 (1855.0MHz), 26365 (1882.5MHz), 26640 (1910.0MHz)	10MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26115 to 26615	26115 (1857.5MHz), 26365 (1882.5MHz), 26615 (1907.5MHz)	15MHz	QPSK / 16QAM	1 RB / 0 RB Offset
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK / 16QAM	1 RB / 0 RB Offset
A	Conducted Emission	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		26055 to 26675	26055 (1851.5MHz), 26365 (1882.5MHz), 26675 (1913.5MHz)	3MHz	QPSK	1 RB / 0 RB Offset
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		26090 to 26640	26090 (1855.0MHz), 26365 (1882.5MHz), 26640 (1910.0MHz)	10MHz	QPSK	1 RB / 0 RB Offset
		26115 to 26615	26115 (1857.5MHz), 26365 (1882.5MHz), 26615 (1907.5MHz)	15MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A, B	Radiated Emission Below 1GHz	26140 to 26590	26365 (1882.5MHz)	20MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission Above 1GHz	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK	1 RB / 0 RB Offset
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK	1 RB / 0 RB Offset

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The measured output power for QPSK mode is higher than the measured output power for 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Modulation Characteristics	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Frequency Stability	25deg. C, 60%RH	3.6Vdc	James Yang
Occupied Bandwidth	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Band Edge	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Peak To Average Ratio	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Conducted Emission	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Radiated Emission	22deg. C, 66%RH 22deg. C, 68%RH	120Vac, 60Hz	Tim Chen Greg Lin

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 and References

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

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

Conducted Power Measurement:

The EUT was set up for the maximum power with GSM, WCDMA, 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.

Maximum EIRP / ERP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$$\text{EIRP} = P_{\text{Meas}} + G_T$$

$$\text{ERP} = P_{\text{Meas}} + G_T - 2.15$$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas} , e.g., dBm or dBW)

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

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

4.1.3 Test Setup

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency	1850.2	1880	1909.8
GSM	29.32	29.49	29.40
GPRS 1Tx Slot	29.30	29.47	29.38
GPRS 2Tx Slot	28.76	28.99	28.87
GPRS 3Tx Slot	27.51	27.88	27.71
GPRS 4Tx Slot	26.94	26.97	26.87
EDGE 1Tx Slot (MCS9)	25.38	25.62	25.36
EDGE 2Tx Slot (MCS9)	24.50	24.62	24.73
EDGE 3Tx Slot (MCS9)	23.40	23.62	23.77
EDGE 4Tx Slot (MCS9)	22.51	22.77	22.63

Band	WCDMA II		
TX Channel	9262	9400	9538
Rx Channel	9662	9800	9938
Frequency	1852.4	1880	1907.6
RMC 12.2K	23.67	23.61	23.65
HSDPA Subtest-1	22.63	22.45	22.60
HSDPA Subtest-2	22.70	22.45	22.70
HSDPA Subtest-3	22.18	21.94	22.18
HSDPA Subtest-4	22.15	21.99	22.15
DC-HSDPA Subtest-1	22.54	22.45	22.58
DC-HSDPA Subtest-2	22.70	22.45	22.73
DC-HSDPA Subtest-3	22.17	21.92	22.18
DC-HSDPA Subtest-4	22.15	21.99	22.15
HSUPA Subtest-1	22.63	22.42	22.66
HSUPA Subtest-2	20.67	20.45	20.71
HSUPA Subtest-3	21.66	21.44	21.68
HSUPA Subtest-4	20.65	20.44	20.68
HSUPA Subtest-5	22.70	22.40	22.70

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	21.88	22.11	21.83
		1	50	21.51	21.76	21.71
		1	99	21.60	21.85	21.80
		50	0	20.57	20.82	20.77
		50	25	20.52	20.77	20.72
		50	50	20.51	20.76	20.71
		100	0	20.54	20.79	20.74
20M	16QAM	1	0	21.01	21.26	21.21
		1	50	20.95	21.20	21.15
		1	99	20.93	21.18	21.13
		50	0	19.66	19.91	19.86
		50	25	19.65	19.90	19.85
		50	50	19.63	19.88	19.83
		100	0	19.62	19.87	19.82

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	21.03	21.79	21.83
		1	37	21.43	21.67	21.61
		1	74	21.59	21.81	21.71
		36	0	20.57	20.81	20.77
		36	19	20.47	20.74	20.65
		36	39	20.44	20.71	20.69
		75	0	20.49	20.72	20.74
15M	16QAM	1	0	20.97	21.22	21.13
		1	37	20.94	21.14	21.10
		1	74	20.85	21.09	21.08
		36	0	19.63	19.89	19.84
		36	19	19.62	19.84	19.84
		36	39	19.55	19.87	19.82
		75	0	19.55	19.78	19.80

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	21.02	21.83	21.76
		1	24	21.45	21.57	21.63
		1	49	21.42	21.69	21.71
		25	0	20.54	20.65	20.71
		25	12	20.49	20.68	20.61
		25	25	20.32	20.55	20.53
		50	0	20.41	20.65	20.72
10M	16QAM	1	0	20.81	21.13	21.08
		1	24	20.78	21.20	21.03
		1	49	20.82	21.07	20.98
		25	0	19.55	19.87	19.71
		25	12	19.52	19.77	19.75
		25	25	19.53	19.80	19.69
		50	0	19.47	19.76	19.70

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	21.99	21.74	21.71
		1	12	21.38	21.75	21.41
		1	24	21.39	21.76	21.59
		12	0	20.34	20.78	20.59
		12	6	20.29	20.69	20.55
		12	13	20.41	20.69	20.47
		25	0	20.45	20.64	20.48
5M	16QAM	1	0	20.85	21.22	21.10
		1	12	20.81	21.16	21.02
		1	24	20.83	21.02	20.98
		12	0	19.52	19.80	19.72
		12	6	19.49	19.79	19.72
		12	13	19.48	19.74	19.70
		25	0	19.44	19.78	19.59

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	21.96	21.80	21.83
		1	7	21.43	21.74	21.59
		1	14	21.47	21.74	21.70
		8	0	20.38	20.66	20.68
		8	3	20.40	20.66	20.55
		8	7	20.37	20.59	20.66
		15	0	20.46	20.62	20.61
3M	16QAM	1	0	20.93	21.16	21.14
		1	7	20.79	21.06	21.03
		1	14	20.70	20.98	21.09
		8	0	19.52	19.81	19.62
		8	3	19.55	19.80	19.74
		8	7	19.52	19.71	19.77
		15	0	19.62	19.72	19.67

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	21.94	21.88	21.65
		1	2	21.38	21.54	21.58
		1	5	21.41	21.64	21.71
		3	0	21.47	21.75	21.64
		3	1	21.32	21.76	21.53
		3	3	21.35	21.55	21.63
		6	0	20.50	20.56	20.59
1.4M	16QAM	1	0	20.94	21.05	21.14
		1	2	20.73	21.11	20.94
		1	5	20.73	21.02	21.13
		3	0	20.61	20.67	20.79
		3	1	20.46	20.86	20.75
		3	3	20.58	20.69	20.67
		6	0	19.53	19.77	19.71

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26140	26365	26590
		Frequency (MHz)		1860	1882.5	1905
20M	QPSK	1	0	22.06	21.97	22.05
		1	50	22.04	21.95	22.01
		1	99	22.01	21.90	22.00
		50	0	21.10	20.98	21.08
		50	25	21.09	20.98	21.08
		50	50	21.07	20.96	21.06
		100	0	21.06	20.95	21.05
20M	16QAM	1	0	21.33	21.22	21.32
		1	50	21.21	21.10	21.20
		1	99	21.19	21.08	21.18
		50	0	20.26	20.15	20.25
		50	25	20.21	20.10	20.20
		50	50	20.18	20.07	20.17
		100	0	20.22	20.11	20.21

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26115	26365	26615
		Frequency (MHz)		1857.5	1882.5	1907.5
15M	QPSK	1	0	22.05	21.89	21.99
		1	37	21.99	21.86	22.00
		1	74	21.92	21.85	21.90
		36	0	21.03	20.89	21.00
		36	19	21.07	20.92	21.06
		36	39	20.97	20.93	20.96
		75	0	21.06	20.89	21.02
15M	16QAM	1	0	21.23	21.17	21.25
		1	37	21.15	21.01	21.18
		1	74	21.10	21.06	21.15
		36	0	20.23	20.10	20.24
		36	19	20.19	20.07	20.16
		36	39	20.15	20.03	20.16
		75	0	20.17	20.09	20.14

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26090	26365	26640
		Frequency (MHz)		1855	1882.5	1910
10M	QPSK	1	0	22.02	21.75	21.93
		1	24	21.90	21.79	21.87
		1	49	21.82	21.72	21.82
		25	0	20.99	20.83	21.00
		25	12	20.94	20.88	20.94
		25	25	20.84	20.83	20.87
		50	0	21.04	20.78	20.92
10M	16QAM	1	0	21.17	21.06	21.20
		1	24	21.09	20.97	21.04
		1	49	20.98	20.92	21.07
		25	0	20.14	20.08	20.19
		25	12	20.17	19.93	20.14
		25	25	20.04	19.84	20.14
		50	0	20.07	19.96	20.16

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26065	26365	26665
		Frequency (MHz)		1852.5	1882.5	1912.5
5M	QPSK	1	0	21.84	21.82	21.81
		1	12	22.00	21.93	21.77
		1	24	21.93	21.77	21.84
		12	0	21.04	20.83	20.88
		12	6	20.90	20.90	20.85
		12	13	20.85	20.80	20.79
		25	0	21.02	20.73	20.81
5M	16QAM	1	0	21.17	21.08	21.28
		1	12	21.14	20.98	21.14
		1	24	21.03	20.99	21.04
		12	0	20.19	19.97	20.06
		12	6	20.12	19.94	20.18
		12	13	20.14	19.95	20.11
		25	0	20.07	19.97	20.04

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26055	26365	26675
		Frequency (MHz)		1851.5	1882.5	1913.5
3M	QPSK	1	0	22.03	21.90	21.96
		1	7	21.97	21.81	21.90
		1	14	21.95	21.81	21.88
		8	0	21.03	20.77	20.99
		8	3	20.91	20.98	20.92
		8	7	20.87	20.87	20.97
		15	0	21.02	20.87	20.86
3M	16QAM	1	0	21.14	21.13	21.14
		1	7	21.08	20.92	21.07
		1	14	21.14	21.01	21.06
		8	0	20.06	20.03	20.08
		8	3	19.97	19.90	20.04
		8	7	20.02	19.98	20.09
		15	0	20.02	19.98	20.08

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26047	26365	26683
		Frequency (MHz)		1850.7	1882.5	1914.3
1.4M	QPSK	1	0	22.00	21.82	21.88
		1	2	21.97	21.72	21.89
		1	5	21.83	21.83	21.90
		3	0	21.90	21.81	22.01
		3	1	21.89	21.82	21.94
		3	3	21.90	21.76	21.87
		6	0	20.90	20.73	20.90
1.4M	16QAM	1	0	21.17	21.11	21.18
		1	2	21.16	20.97	21.12
		1	5	21.05	21.02	20.98
		3	0	21.12	20.99	21.17
		3	1	21.07	20.93	20.97
		3	3	21.08	20.87	21.11
		6	0	20.14	20.02	20.11

EIRP Power (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency	1850.2	1880	1909.8
GSM	31.06	31.23	31.14
GPRS 1Tx Slot	31.04	31.21	31.12
GPRS 2Tx Slot	30.50	30.73	30.61
GPRS 3Tx Slot	29.25	29.62	29.45
GPRS 4Tx Slot	28.68	28.71	28.61
EDGE 1Tx Slot (MCS9)	27.12	27.36	27.10
EDGE 2Tx Slot (MCS9)	26.24	26.36	26.47
EDGE 3Tx Slot (MCS9)	25.14	25.36	25.51
EDGE 4Tx Slot (MCS9)	24.25	24.51	24.37

Band	WCDMA II		
TX Channel	9262	9400	9538
Rx Channel	9662	9800	9938
Frequency	1852.4	1880	1907.6
RMC 12.2K	25.41	25.35	25.39
HSDPA Subtest-1	24.37	24.19	24.34
HSDPA Subtest-2	24.44	24.19	24.44
HSDPA Subtest-3	23.92	23.68	23.92
HSDPA Subtest-4	23.89	23.73	23.89
DC-HSDPA Subtest-1	24.28	24.19	24.32
DC-HSDPA Subtest-2	24.44	24.19	24.47
DC-HSDPA Subtest-3	23.91	23.66	23.92
DC-HSDPA Subtest-4	23.89	23.73	23.89
HSUPA Subtest-1	24.37	24.16	24.40
HSUPA Subtest-2	22.41	22.19	22.45
HSUPA Subtest-3	23.40	23.18	23.42
HSUPA Subtest-4	22.39	22.18	22.42
HSUPA Subtest-5	24.44	24.14	24.44

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	23.62	23.85	23.57
		1	50	23.25	23.50	23.45
		1	99	23.34	23.59	23.54
		50	0	22.31	22.56	22.51
		50	25	22.26	22.51	22.46
		50	50	22.25	22.50	22.45
		100	0	22.28	22.53	22.48
20M	16QAM	1	0	22.75	23.00	22.95
		1	50	22.69	22.94	22.89
		1	99	22.67	22.92	22.87
		50	0	21.40	21.65	21.60
		50	25	21.39	21.64	21.59
		50	50	21.37	21.62	21.57
		100	0	21.36	21.61	21.56

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	22.77	23.53	23.57
		1	37	23.17	23.41	23.35
		1	74	23.33	23.55	23.45
		36	0	22.31	22.55	22.51
		36	19	22.21	22.48	22.39
		36	39	22.18	22.45	22.43
		75	0	22.23	22.46	22.48
15M	16QAM	1	0	22.71	22.96	22.87
		1	37	22.68	22.88	22.84
		1	74	22.59	22.83	22.82
		36	0	21.37	21.63	21.58
		36	19	21.36	21.58	21.58
		36	39	21.29	21.61	21.56
		75	0	21.29	21.52	21.54

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	22.76	23.57	23.50
		1	24	23.19	23.31	23.37
		1	49	23.16	23.43	23.45
		25	0	22.28	22.39	22.45
		25	12	22.23	22.42	22.35
		25	25	22.06	22.29	22.27
		50	0	22.15	22.39	22.46
10M	16QAM	1	0	22.55	22.87	22.82
		1	24	22.52	22.94	22.77
		1	49	22.56	22.81	22.72
		25	0	21.29	21.61	21.45
		25	12	21.26	21.51	21.49
		25	25	21.27	21.54	21.43
		50	0	21.21	21.50	21.44

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	23.73	23.48	23.45
		1	12	23.12	23.49	23.15
		1	24	23.13	23.50	23.33
		12	0	22.08	22.52	22.33
		12	6	22.03	22.43	22.29
		12	13	22.15	22.43	22.21
		25	0	22.19	22.38	22.22
5M	16QAM	1	0	22.59	22.96	22.84
		1	12	22.55	22.90	22.76
		1	24	22.57	22.76	22.72
		12	0	21.26	21.54	21.46
		12	6	21.23	21.53	21.46
		12	13	21.22	21.48	21.44
		25	0	21.18	21.52	21.33

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	23.70	23.54	23.57
		1	7	23.17	23.48	23.33
		1	14	23.21	23.48	23.44
		8	0	22.12	22.40	22.42
		8	3	22.14	22.40	22.29
		8	7	22.11	22.33	22.40
		15	0	22.20	22.36	22.35
3M	16QAM	1	0	22.67	22.90	22.88
		1	7	22.53	22.80	22.77
		1	14	22.44	22.72	22.83
		8	0	21.26	21.55	21.36
		8	3	21.29	21.54	21.48
		8	7	21.26	21.45	21.51
		15	0	21.36	21.46	21.41

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	23.68	23.62	23.39
		1	2	23.12	23.28	23.32
		1	5	23.15	23.38	23.45
		3	0	23.21	23.49	23.38
		3	1	23.06	23.50	23.27
		3	3	23.09	23.29	23.37
		6	0	22.24	22.30	22.33
1.4M	16QAM	1	0	22.68	22.79	22.88
		1	2	22.47	22.85	22.68
		1	5	22.47	22.76	22.87
		3	0	22.35	22.41	22.53
		3	1	22.20	22.60	22.49
		3	3	22.32	22.43	22.41
		6	0	21.27	21.51	21.45

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26140	26365	26590
		Frequency (MHz)		1860	1882.5	1905
20M	QPSK	1	0	23.80	23.71	23.79
		1	50	23.78	23.69	23.75
		1	99	23.75	23.64	23.74
		50	0	22.84	22.72	22.82
		50	25	22.83	22.72	22.82
		50	50	22.81	22.70	22.80
		100	0	22.80	22.69	22.79
20M	16QAM	1	0	23.07	22.96	23.06
		1	50	22.95	22.84	22.94
		1	99	22.93	22.82	22.92
		50	0	22.00	21.89	21.99
		50	25	21.95	21.84	21.94
		50	50	21.92	21.81	21.91
		100	0	21.96	21.85	21.95

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26115	26365	26615
		Frequency (MHz)		1857.5	1882.5	1907.5
15M	QPSK	1	0	23.79	23.63	23.73
		1	37	23.73	23.60	23.74
		1	74	23.66	23.59	23.64
		36	0	22.77	22.63	22.74
		36	19	22.81	22.66	22.80
		36	39	22.71	22.67	22.70
		75	0	22.80	22.63	22.76
15M	16QAM	1	0	22.97	22.91	22.99
		1	37	22.89	22.75	22.92
		1	74	22.84	22.80	22.89
		36	0	21.97	21.84	21.98
		36	19	21.93	21.81	21.90
		36	39	21.89	21.77	21.90
		75	0	21.91	21.83	21.88

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26090	26365	26640
		Frequency (MHz)		1855	1882.5	1910
10M	QPSK	1	0	23.76	23.49	23.67
		1	24	23.64	23.53	23.61
		1	49	23.56	23.46	23.56
		25	0	22.73	22.57	22.74
		25	12	22.68	22.62	22.68
		25	25	22.58	22.57	22.61
		50	0	22.78	22.52	22.66
10M	16QAM	1	0	22.91	22.80	22.94
		1	24	22.83	22.71	22.78
		1	49	22.72	22.66	22.81
		25	0	21.88	21.82	21.93
		25	12	21.91	21.67	21.88
		25	25	21.78	21.58	21.88
		50	0	21.81	21.70	21.90

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26065	26365	26665
		Frequency (MHz)		1852.5	1882.5	1912.5
5M	QPSK	1	0	23.58	23.56	23.55
		1	12	23.74	23.67	23.51
		1	24	23.67	23.51	23.58
		12	0	22.78	22.57	22.62
		12	6	22.64	22.64	22.59
		12	13	22.59	22.54	22.53
		25	0	22.76	22.47	22.55
5M	16QAM	1	0	22.91	22.82	23.02
		1	12	22.88	22.72	22.88
		1	24	22.77	22.73	22.78
		12	0	21.93	21.71	21.80
		12	6	21.86	21.68	21.92
		12	13	21.88	21.69	21.85
		25	0	21.81	21.71	21.78

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26055	26365	26675
		Frequency (MHz)		1851.5	1882.5	1913.5
3M	QPSK	1	0	23.77	23.64	23.70
		1	7	23.71	23.55	23.64
		1	14	23.69	23.55	23.62
		8	0	22.77	22.51	22.73
		8	3	22.65	22.72	22.66
		8	7	22.61	22.61	22.71
		15	0	22.76	22.61	22.60
3M	16QAM	1	0	22.88	22.87	22.88
		1	7	22.82	22.66	22.81
		1	14	22.88	22.75	22.80
		8	0	21.80	21.77	21.82
		8	3	21.71	21.64	21.78
		8	7	21.76	21.72	21.83
		15	0	21.76	21.72	21.82

*EIRP = Conducted + antenna gain (1.74dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26047	26365	26683
		Frequency (MHz)		1850.7	1882.5	1914.3
1.4M	QPSK	1	0	23.74	23.56	23.62
		1	2	23.71	23.46	23.63
		1	5	23.57	23.57	23.64
		3	0	23.64	23.55	23.75
		3	1	23.63	23.56	23.68
		3	3	23.64	23.50	23.61
		6	0	22.64	22.47	22.64
1.4M	16QAM	1	0	22.91	22.85	22.92
		1	2	22.90	22.71	22.86
		1	5	22.79	22.76	22.72
		3	0	22.86	22.73	22.91
		3	1	22.81	22.67	22.71
		3	3	22.82	22.61	22.85
		6	0	21.88	21.76	21.85

*EIRP = Conducted + antenna gain (1.74dBi)

4.2 Modulation Characteristics Measurement

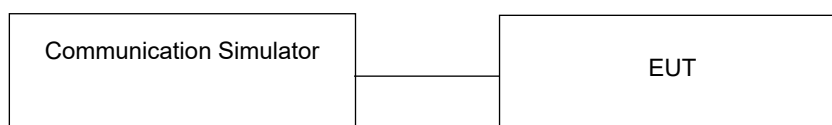
4.2.1 Limits of Modulation Characteristics

N/A

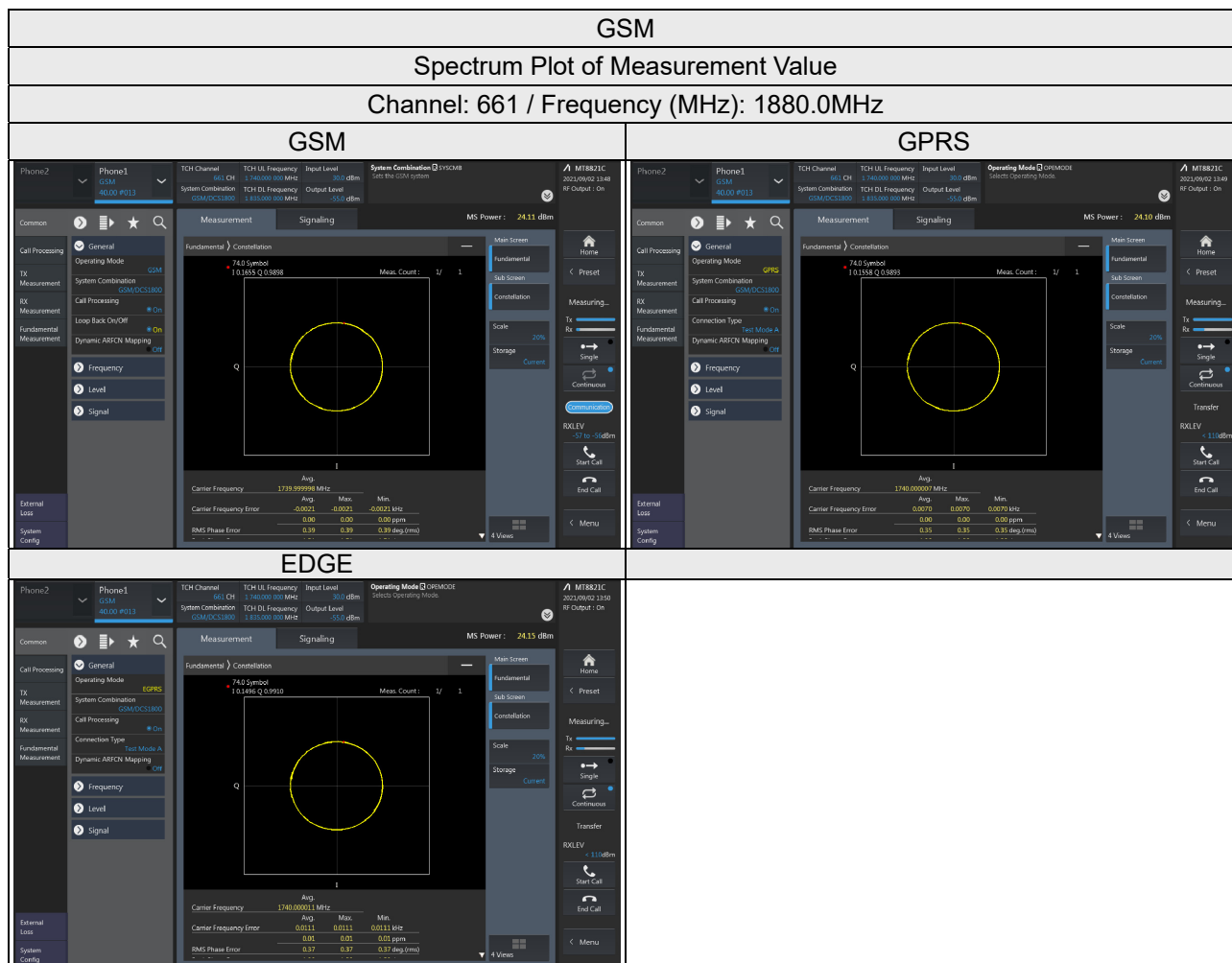
4.2.2 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector, the frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.3 Test Setup



4.2.4 Test Results

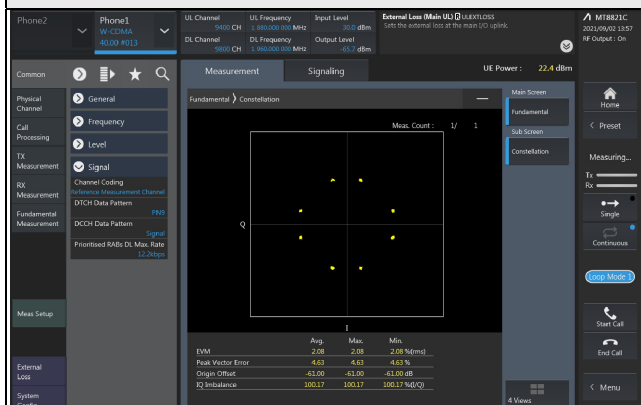


WCDMA Band 2

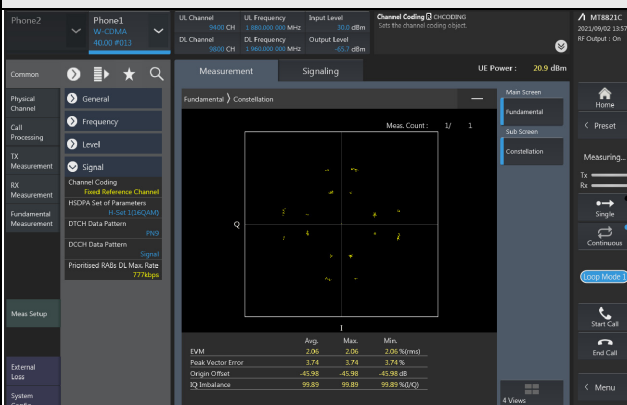
Spectrum Plot of Measurement Value

Channel: 9400 / Frequency (MHz): 1880.0MHz

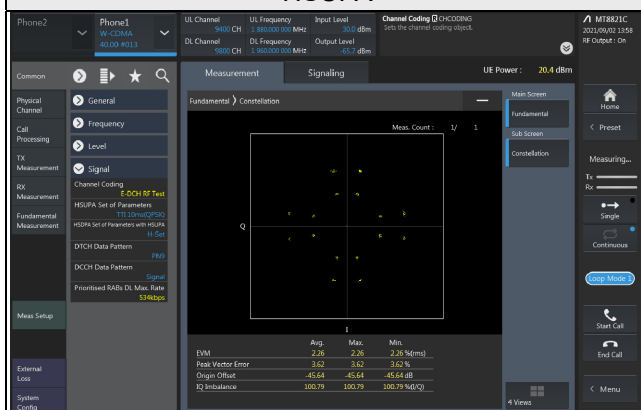
WCDMA



HSDPA



HSUPA

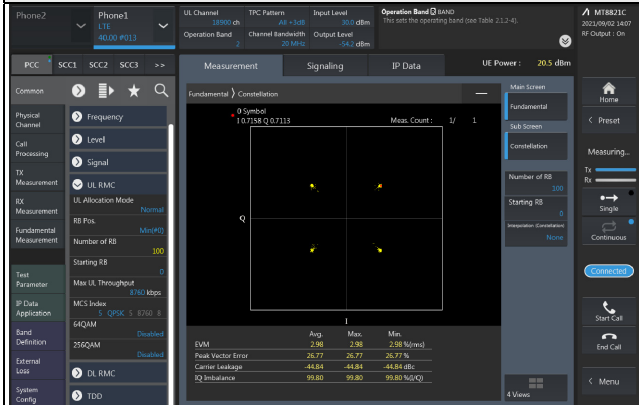


LTE Band 2

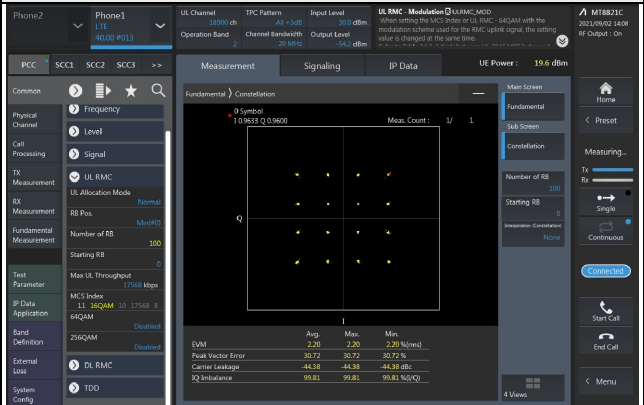
Spectrum Plot of Measurement Value

Channel: 18900 / Frequency (MHz): 1880.0MHz

QPSK



16QAM

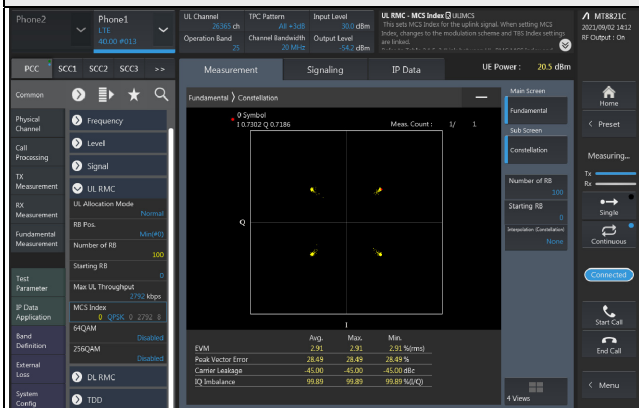


LTE Band 25

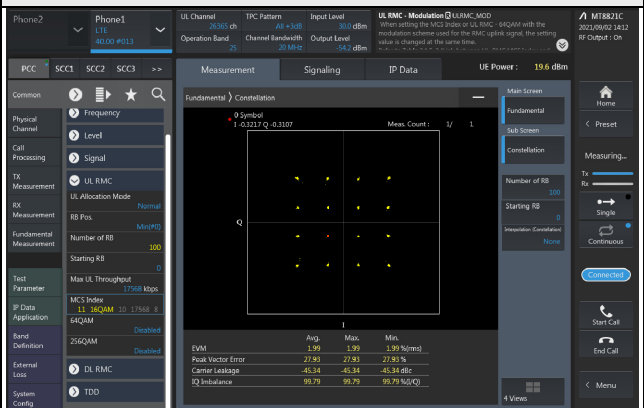
Spectrum Plot of Measurement Value

Channel: 26365 / Frequency (MHz): 1882.5MHz

QPSK



16QAM



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

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

4.3.2 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 $\pm 0.5^{\circ}\text{C}$ 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.

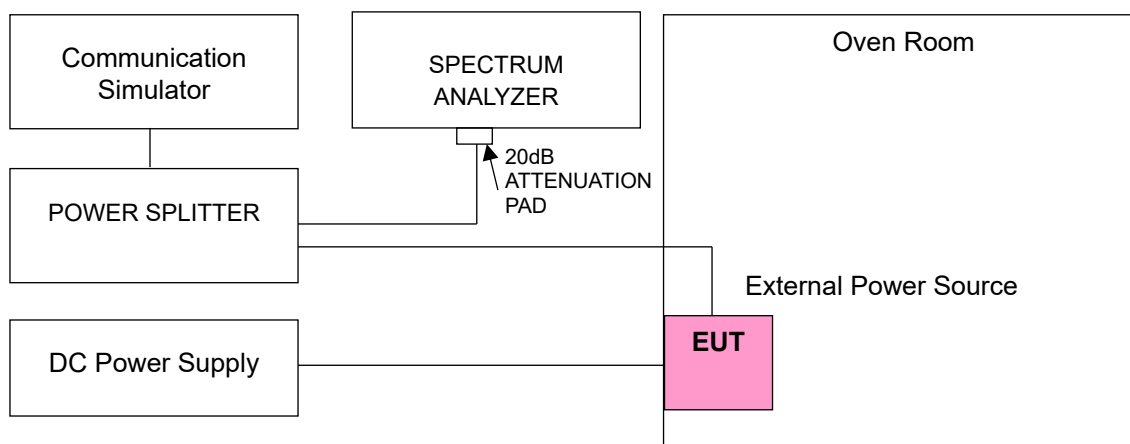
4.3.3 Test Instruments

Test Date: Sep. 02, 2021

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Radio Communication Analyzer Anritsu	MT8821C	6261806803	Jan. 22, 2021	Jan. 21, 2022
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 24, 2020	Dec. 23, 2021
Digital Multimeter Fluke	87-III	70360742	Jun. 24, 2021	Jun. 23, 2022
DC Power Supply Topward	6306A	727263	NA	NA

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

4.3.4 Conducted Setup



4.3.5 Test Results

Frequency Error vs. Voltage

Voltage (Vdc)	GSM			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1850.200037	0.020	1909.800018	0.009
3.06	1850.200023	0.012	1909.800029	0.015
4.14	1850.200035	0.019	1909.800036	0.019

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	GSM			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.200020	0.011	1909.800028	0.015
-20	1850.200026	0.014	1909.800029	0.015
-10	1850.200033	0.018	1909.800021	0.011
0	1850.200016	0.009	1909.800021	0.011
10	1850.200027	0.015	1909.800010	0.005
20	1850.199986	-0.008	1909.799981	-0.010
30	1850.199987	-0.007	1909.799981	-0.010
40	1850.199963	-0.020	1909.799979	-0.011
50	1850.199961	-0.021	1909.799960	-0.021

Frequency Error vs. Voltage

Voltage (Vdc)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1850.200016	0.009	1909.800025	0.013
3.06	1850.200038	0.021	1909.800015	0.008
4.14	1850.200039	0.021	1909.800021	0.011

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.200021	0.011	1909.800033	0.017
-20	1850.200031	0.017	1909.800025	0.013
-10	1850.200028	0.015	1909.800038	0.020
0	1850.200012	0.006	1909.800034	0.018
10	1850.200017	0.009	1909.800039	0.020
20	1850.199977	-0.012	1909.799977	-0.012
30	1850.199981	-0.010	1909.799979	-0.011
40	1850.199976	-0.013	1909.799974	-0.014
50	1850.199984	-0.009	1909.799966	-0.018

Frequency Error vs. Voltage

Voltage (Vdc)	WCDMA Band 2			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1852.400036	0.019	1907.600037	0.019
3.06	1852.400029	0.016	1907.600035	0.018
4.14	1852.400028	0.015	1907.600039	0.020

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	WCDMA Band 2			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.400026	0.014	1907.600019	0.010
-20	1852.400034	0.018	1907.600039	0.020
-10	1852.400016	0.009	1907.600023	0.012
0	1852.400015	0.008	1907.600023	0.012
10	1852.400030	0.016	1907.600028	0.015
20	1852.399972	-0.015	1907.599982	-0.009
30	1852.399973	-0.015	1907.599973	-0.014
40	1852.399974	-0.014	1907.599990	-0.005
50	1852.399988	-0.006	1907.599968	-0.017

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	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	1909.300000	0.001
3.06	1850.700003	0.002	1909.300003	0.001
4.14	1850.700003	0.002	1909.300002	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.700001	0.001	1909.300002	0.001
-20	1850.700004	0.002	1909.300003	0.002
-10	1850.700002	0.001	1909.300003	0.002
0	1850.700002	0.001	1909.300001	0.001
10	1850.700004	0.002	1909.300003	0.001
20	1850.699998	-0.001	1909.299999	-0.001
30	1850.699999	-0.001	1909.299996	-0.002
40	1850.699999	-0.001	1909.299997	-0.001
50	1850.699998	-0.001	1909.299998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1851.500001	0.001	1908.500003	0.001
3.06	1851.500003	0.002	1908.500004	0.002
4.14	1851.500002	0.001	1908.500002	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1851.500003	0.002	1908.500005	0.003
-20	1851.500002	0.001	1908.500002	0.001
-10	1851.500002	0.001	1908.500004	0.002
0	1851.500002	0.001	1908.500001	0.001
10	1851.500003	0.002	1908.500003	0.002
20	1851.499997	-0.002	1908.499997	-0.002
30	1851.499997	-0.002	1908.499999	-0.001
40	1851.499997	-0.002	1908.499999	-0.001
50	1851.499997	-0.001	1908.499998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1852.500004	0.002	1907.500003	0.002
3.06	1852.500004	0.002	1907.500003	0.001
4.14	1852.500002	0.001	1907.500003	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.500003	0.002	1907.500002	0.001
-20	1852.500003	0.002	1907.500003	0.002
-10	1852.500001	0.001	1907.500002	0.001
0	1852.500002	0.001	1907.500003	0.002
10	1852.500002	0.001	1907.500001	0.001
20	1852.499998	-0.001	1907.499998	-0.001
30	1852.499999	-0.001	1907.499996	-0.002
40	1852.499998	-0.001	1907.499998	-0.001
50	1852.499997	-0.002	1907.499997	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1855.000003	0.002	1905.000003	0.002
3.06	1855.000004	0.002	1905.000004	0.002
4.14	1855.000003	0.002	1905.000003	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.000001	0.001	1905.000004	0.002
-20	1855.000003	0.001	1905.000002	0.001
-10	1855.000003	0.001	1905.000001	0.001
0	1855.000002	0.001	1905.000004	0.002
10	1855.000002	0.001	1905.000001	0.001
20	1854.999999	-0.001	1904.999996	-0.002
30	1854.999997	-0.001	1904.999998	-0.001
40	1854.999996	-0.002	1904.999997	-0.001
50	1854.999996	-0.002	1904.999998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1857.500002	0.001	1902.500003	0.001
3.06	1857.500001	0.001	1902.500004	0.002
4.14	1857.500003	0.001	1902.500003	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

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

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1860.000003	0.002	1900.000004	0.002
3.06	1860.000001	0.001	1900.000003	0.002
4.14	1860.000004	0.002	1900.000001	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.000003	0.002	1900.000001	0.001
-20	1860.000002	0.001	1900.000004	0.002
-10	1860.000004	0.002	1900.000003	0.002
0	1860.000003	0.001	1900.000002	0.001
10	1860.000002	0.001	1900.000004	0.002
20	1859.999999	-0.001	1899.999998	-0.001
30	1859.999998	-0.001	1899.999998	-0.001
40	1859.999997	-0.002	1899.999998	-0.001
50	1859.999999	-0.001	1899.999998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1850.700002	0.001	1914.300004	0.002
3.06	1850.700004	0.002	1914.300004	0.002
4.14	1850.700001	0.001	1914.300003	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.700002	0.001	1914.300002	0.001
-20	1850.700003	0.002	1914.300003	0.002
-10	1850.700004	0.002	1914.300002	0.001
0	1850.700002	0.001	1914.300001	0.001
10	1850.700002	0.001	1914.300003	0.002
20	1850.699999	-0.001	1914.299998	-0.001
30	1850.699998	-0.001	1914.299998	-0.001
40	1850.699997	-0.002	1914.299997	-0.001
50	1850.699996	-0.002	1914.299998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1851.500003	0.002	1913.500002	0.001
3.06	1851.500003	0.002	1913.500002	0.001
4.14	1851.500003	0.002	1913.500004	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1851.500004	0.002	1913.500008	0.004
-20	1851.500004	0.002	1913.500002	0.001
-10	1851.500002	0.001	1913.500002	0.001
0	1851.500002	0.001	1913.500001	0.001
10	1851.500001	0.001	1913.500001	0.001
20	1851.499999	-0.001	1913.499997	-0.001
30	1851.499996	-0.002	1913.499997	-0.002
40	1851.499998	-0.001	1913.499998	-0.001
50	1851.499998	-0.001	1913.499998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1852.500004	0.002	1912.500003	0.002
3.06	1852.500003	0.002	1912.500003	0.002
4.14	1852.500003	0.001	1912.500001	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 5MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.500007	0.004	1912.500003	0.002
-20	1852.500002	0.001	1912.500003	0.002
-10	1852.500003	0.002	1912.500003	0.002
0	1852.500002	0.001	1912.500002	0.001
10	1852.500004	0.002	1912.500003	0.002
20	1852.499997	-0.002	1912.499998	-0.001
30	1852.499998	-0.001	1912.499998	-0.001
40	1852.499997	-0.002	1912.499998	-0.001
50	1852.499999	-0.001	1912.499998	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1855.000004	0.002	1910.000004	0.002
3.06	1855.000001	0.001	1910.000002	0.001
4.14	1855.000004	0.002	1910.000003	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.000001	0.001	1910.000005	0.003
-20	1855.000001	0.001	1910.000004	0.002
-10	1855.000003	0.002	1910.000002	0.001
0	1855.000001	0.001	1910.000003	0.001
10	1855.000002	0.001	1910.000002	0.001
20	1854.999999	-0.001	1909.999997	-0.002
30	1854.999999	-0.001	1909.999998	-0.001
40	1854.999997	-0.002	1909.999997	-0.002
50	1854.999998	-0.001	1909.999999	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1857.500001	0.001	1907.500003	0.002
3.06	1857.500002	0.001	1907.500003	0.002
4.14	1857.500001	0.001	1907.500003	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 15MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1857.500003	0.002	1907.500002	0.001
-20	1857.500004	0.002	1907.500001	0.001
-10	1857.500003	0.002	1907.500003	0.002
0	1857.500003	0.001	1907.500004	0.002
10	1857.500002	0.001	1907.500004	0.002
20	1857.499997	-0.001	1907.499997	-0.002
30	1857.499998	-0.001	1907.499999	-0.001
40	1857.499999	-0.001	1907.499998	-0.001
50	1857.499996	-0.002	1907.499996	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1860.000001	0.001	1905.000003	0.001
3.06	1860.000002	0.001	1905.000002	0.001
4.14	1860.000003	0.002	1905.000002	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.000001	0.001	1905.000005	0.003
-20	1860.000002	0.001	1905.000001	0.001
-10	1860.000003	0.002	1905.000003	0.002
0	1860.000001	0.001	1905.000001	0.001
10	1860.000002	0.001	1905.000003	0.001
20	1859.999997	-0.001	1904.999999	-0.001
30	1859.999997	-0.002	1904.999996	-0.002
40	1859.999998	-0.001	1904.999996	-0.002
50	1859.999998	-0.001	1904.999997	-0.002

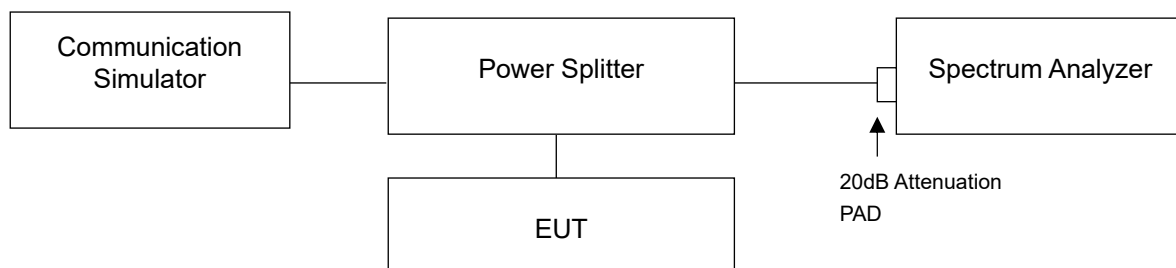
4.4 Occupied Bandwidth Measurement

4.4.1 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. Measurement method, please refer to section 5.4.4 of ANSI C63.26. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

For the 26dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

4.4.2 Test Setup

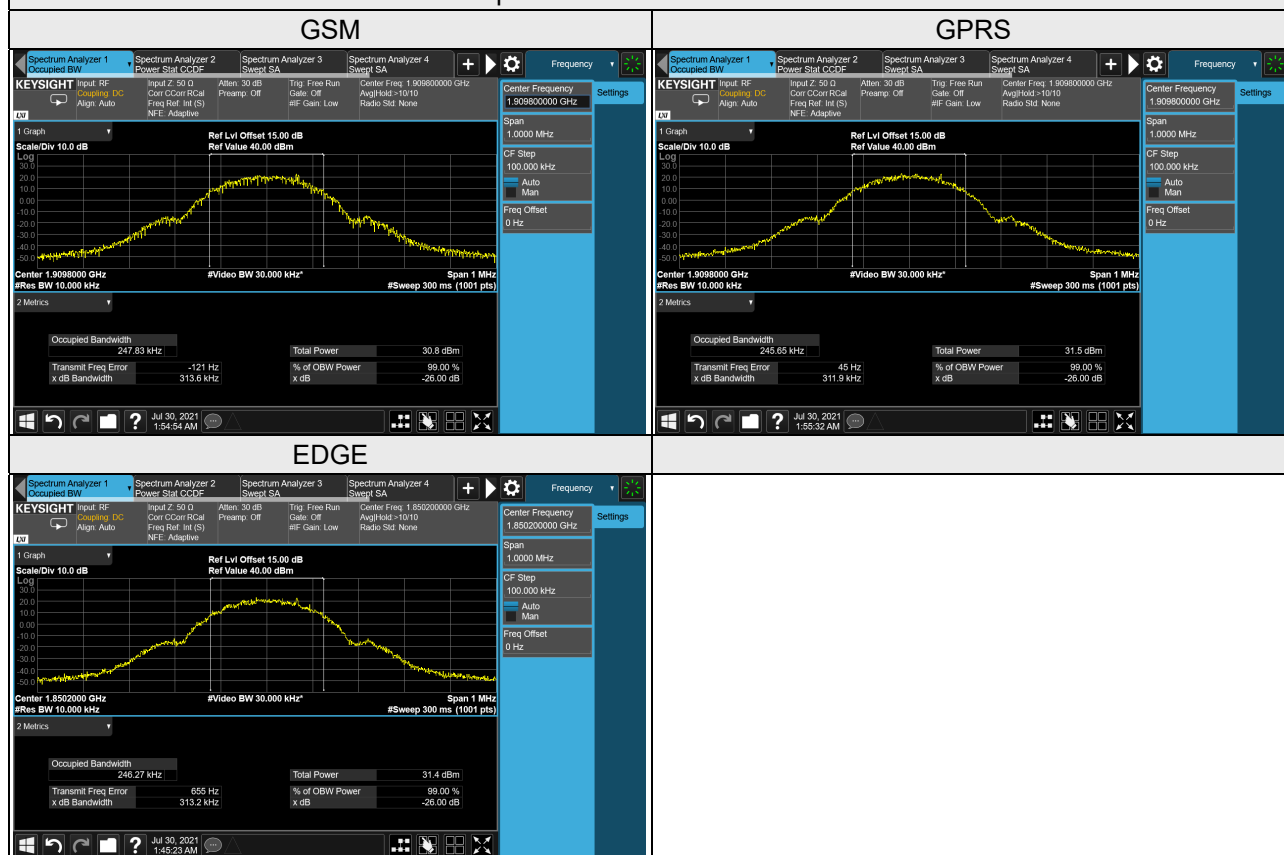


4.4.3 Test Result

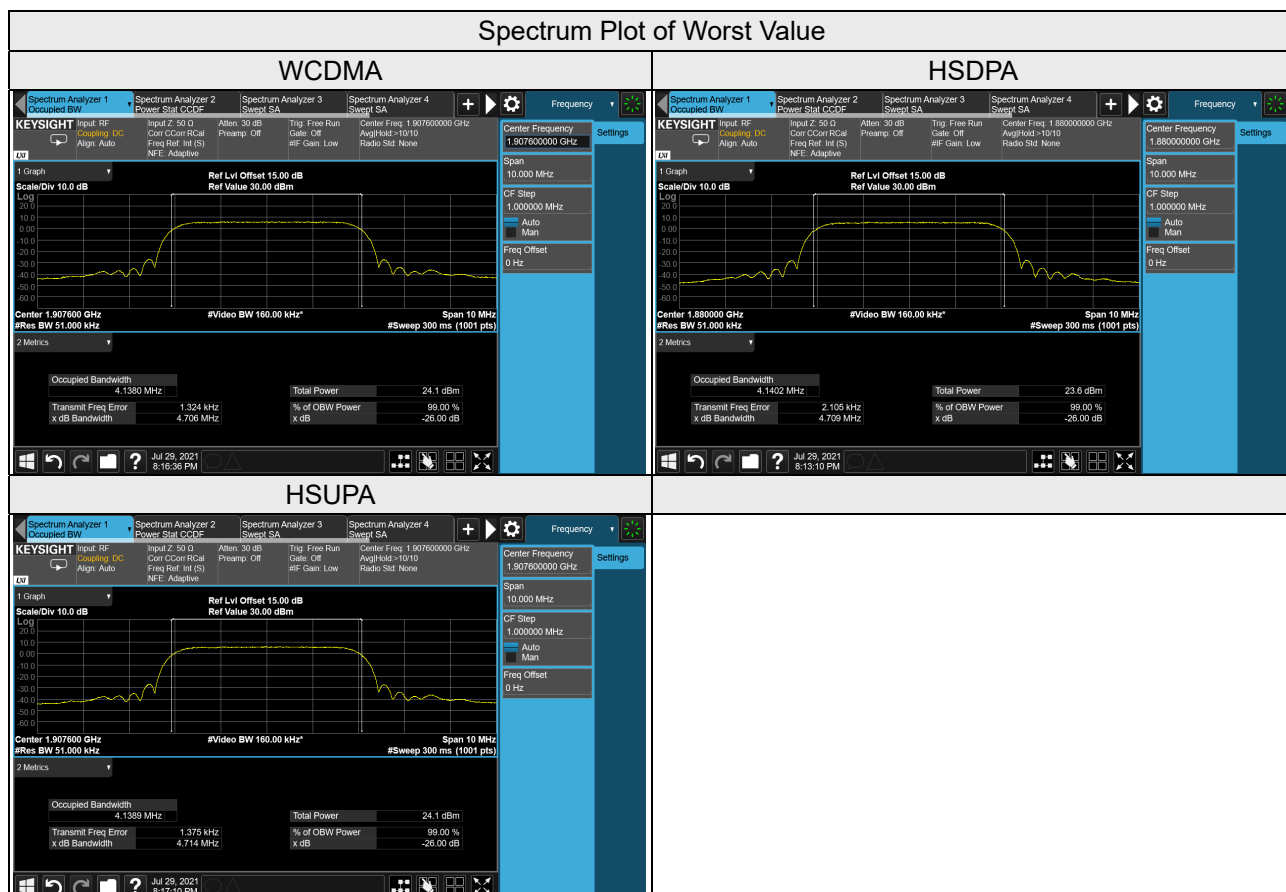
Occupied Bandwidth

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)		
		GSM	GPRS	EDGE
512	1850.2	245.75	245.63	246.27
661	1880.0	246.79	244.87	245.43
810	1909.8	247.83	245.65	245.43

Spectrum Plot of Worst Value



Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		WCDMA	HSDPA	HSUPA
9262	1852.4	4.1354	4.1372	4.1367
9400	1880.0	4.1371	4.1402	4.1389
9538	1907.6	4.1380	4.1387	4.1389

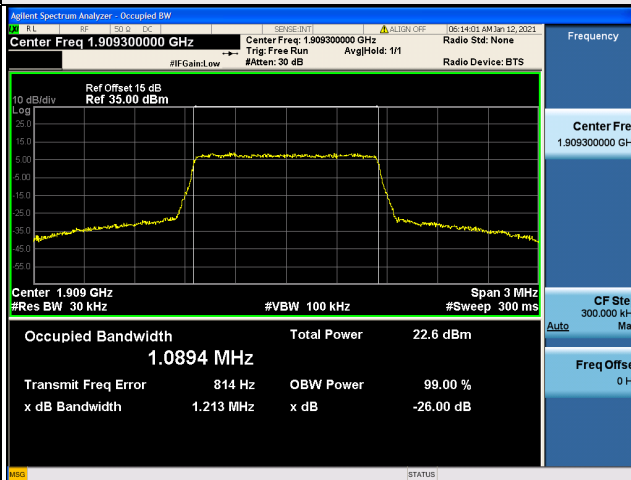


LTE Band 2, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18607	1850.7	1.09	1.09
18900	1880.0	1.09	1.09
19193	1909.3	1.09	1.09
LTE Band 2, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18615	1851.5	2.70	2.70
18900	1880.0	2.70	2.70
19185	1908.5	2.70	2.70
LTE Band 2, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18625	1852.5	4.49	4.49
18900	1880.0	4.49	4.49
19175	1907.5	4.49	4.50
LTE Band 2, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18650	1855.0	8.96	8.97
18900	1880.0	8.97	8.98
19150	1905.0	8.98	8.98
LTE Band 2, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18675	1857.5	13.45	13.43
18900	1880.0	13.46	13.44
19125	1902.5	13.45	13.45

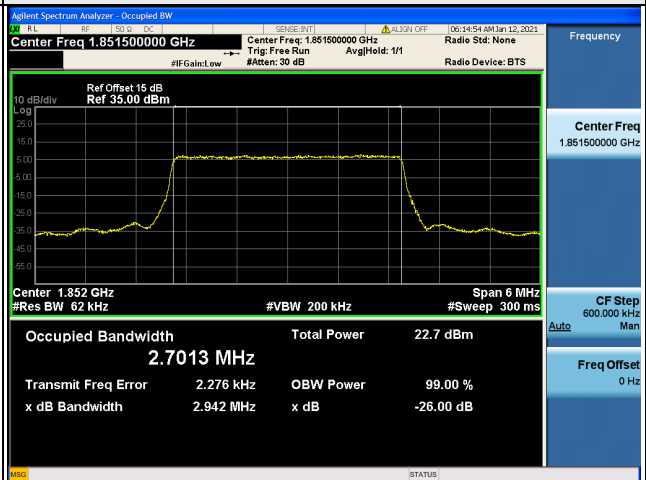
LTE Band 2, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
18700	1860.0	17.90	17.92
18900	1880.0	17.93	17.95
19100	1900.0	17.91	17.93

Spectrum Plot of Worst Value

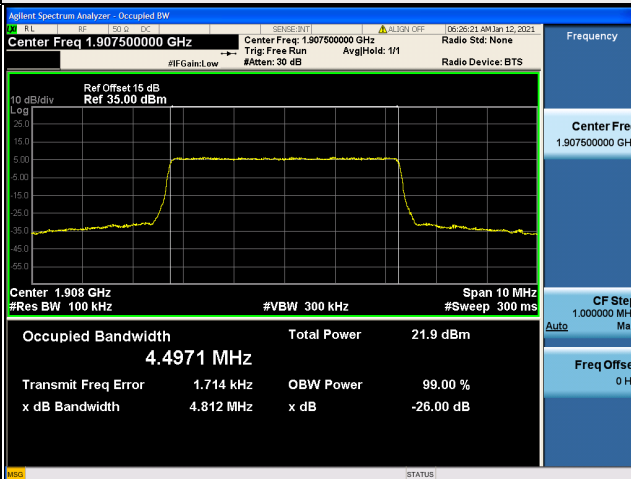
1.4MHz / 16QAM



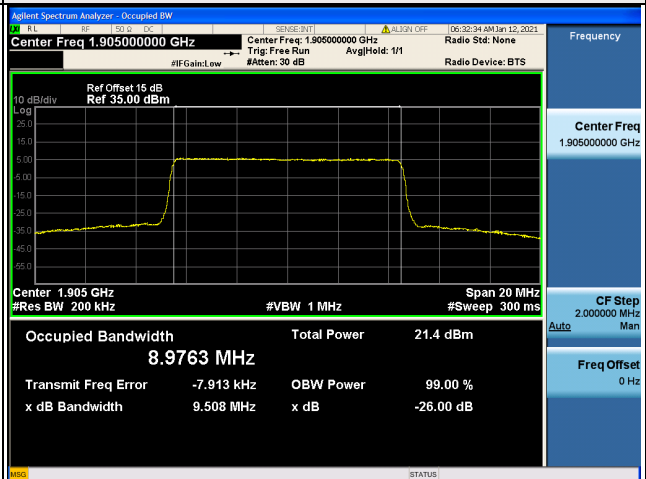
3MHz / QPSK



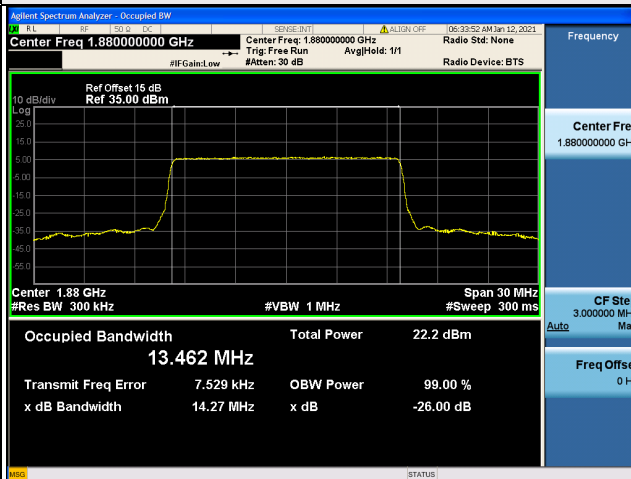
5MHz / 16QAM



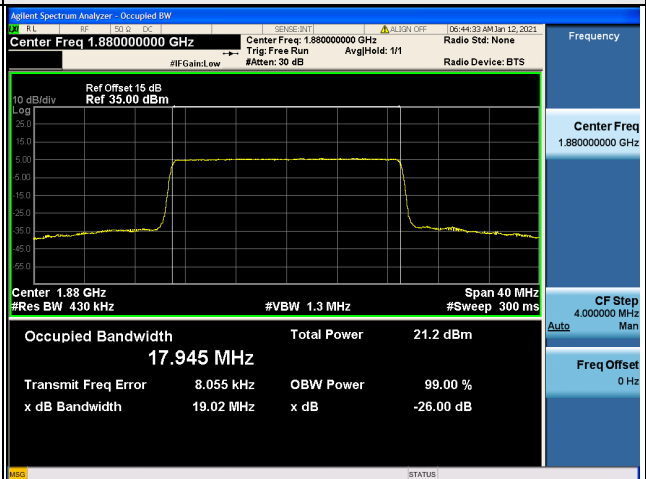
10MHz / 16QAM



15MHz / QPSK



20MHz / 16QAM

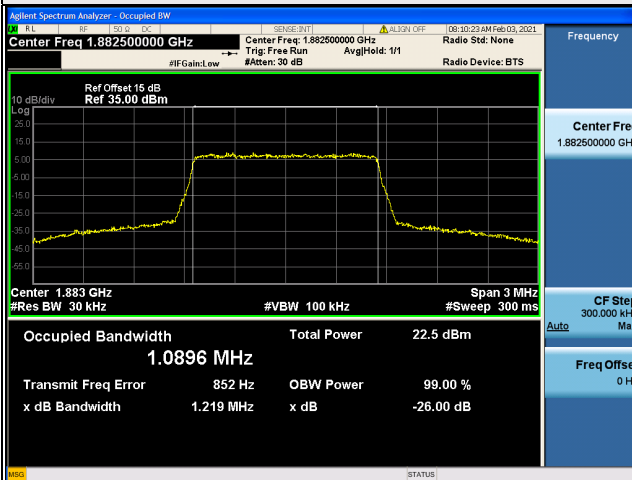


LTE Band 25, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
26047	1850.7	1.09	1.09
26365	1882.5	1.09	1.09
26683	1914.3	1.09	1.09
LTE Band 25, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
26055	1851.5	2.70	2.70
26365	1882.5	2.70	2.70
26675	1913.5	2.70	2.70
LTE Band 25, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
26065	1852.5	4.49	4.49
26365	1882.5	4.49	4.49
26665	1912.5	4.48	4.49
LTE Band 25, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
26090	1855.0	8.97	8.97
26365	1882.5	8.97	8.97
26640	1910.0	8.95	8.95
LTE Band 25, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
26115	1857.5	13.44	13.43
26365	1882.5	13.46	13.45
26615	1907.5	13.43	13.42

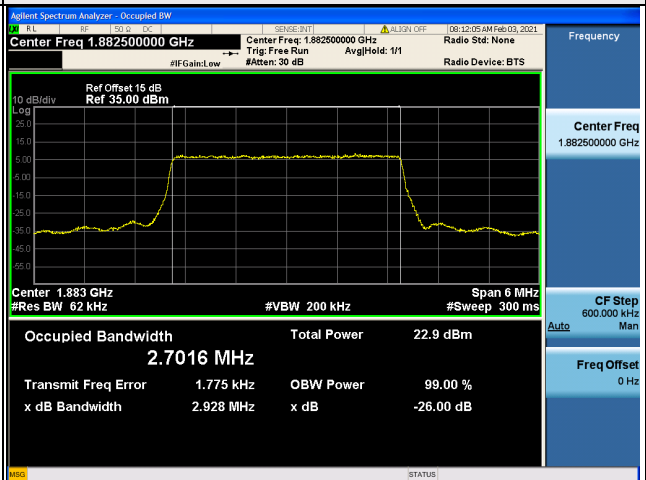
LTE Band 25, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
26140	1860.0	17.90	17.91
26365	1882.5	17.93	17.95
26590	1905.0	17.90	17.92

Spectrum Plot of Worst Value

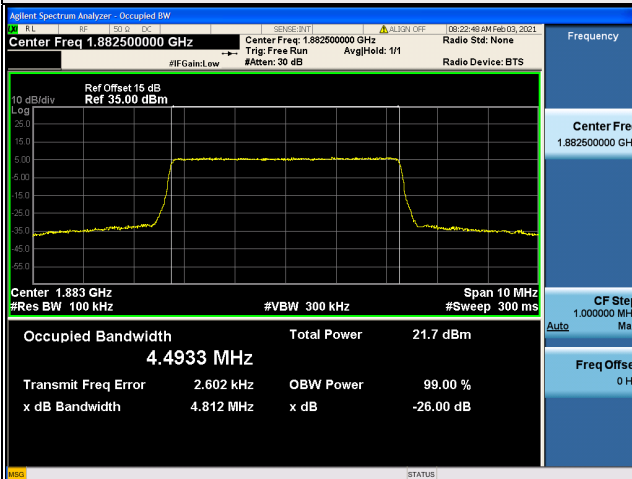
1.4MHz / 16QAM



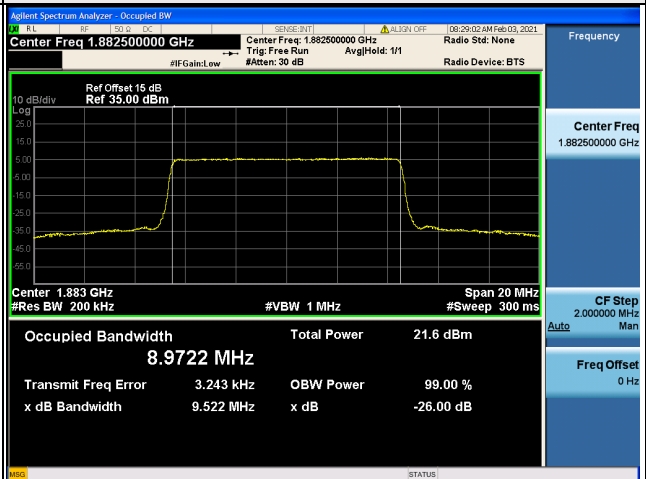
3MHz / QPSK



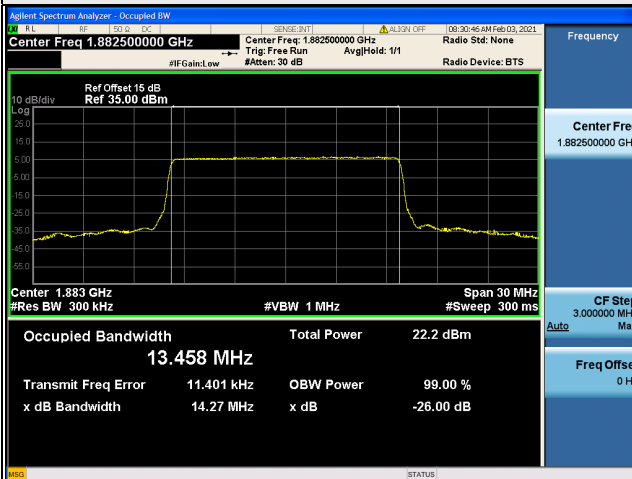
5MHz / 16QAM



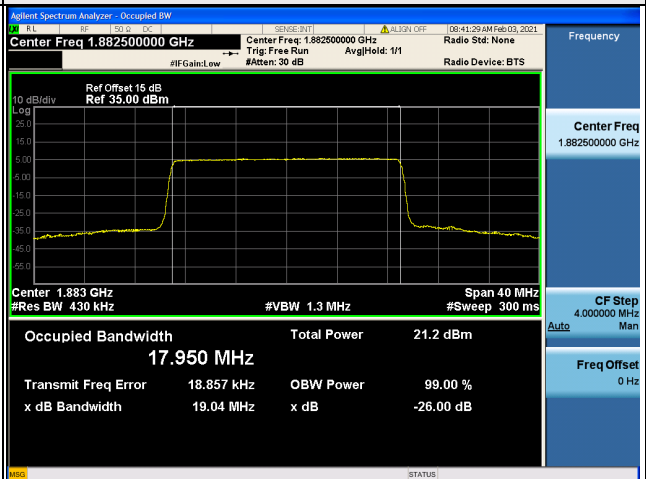
10MHz / QPSK



15MHz / QPSK



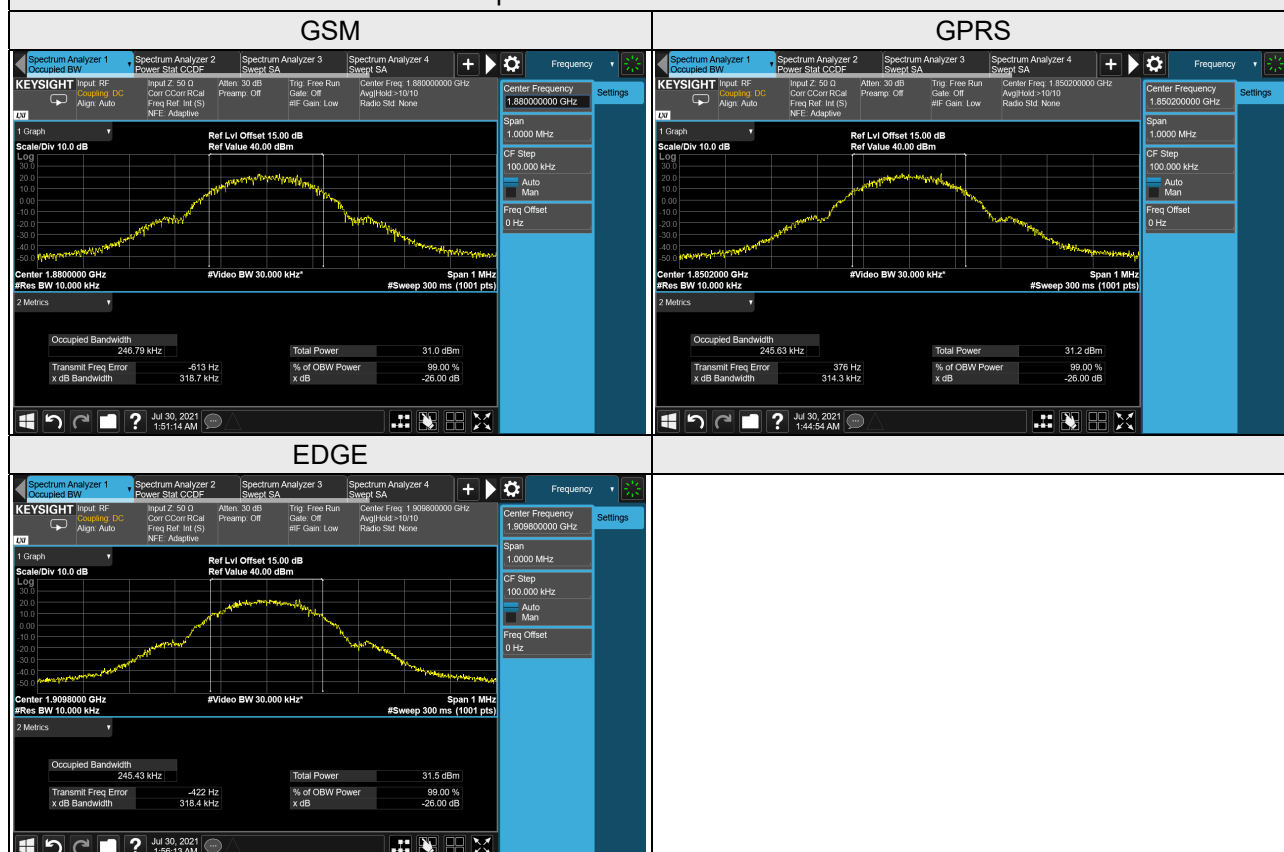
20MHz / 16QAM



26dB Bandwidth

Channel	Frequency (MHz)	26dB Bandwidth (kHz)		
		GSM	GPRS	EDGE
512	1850.2	312.90	314.30	313.20
661	1880.0	318.70	308.70	313.60
810	1909.8	313.60	311.90	318.40

Spectrum Plot of Worst Value



Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		WCDMA	HSDPA	HSUPA
9262	1852.4	4.707	4.711	4.709
9400	1880.0	4.707	4.709	4.709
9538	1907.6	4.706	4.710	4.714

Spectrum Plot of Worst Value

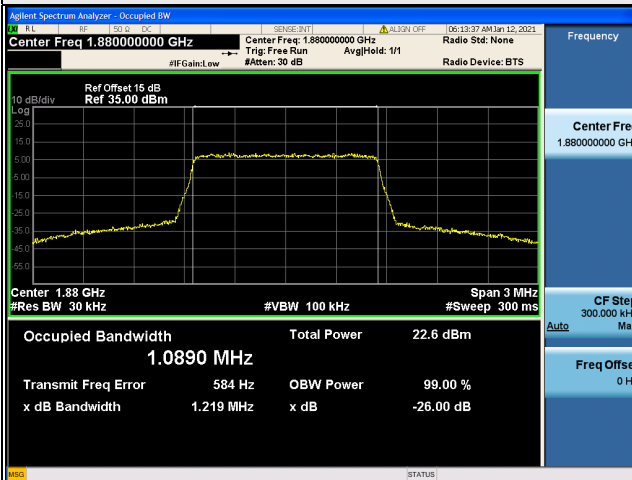


LTE Band 2, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18607	1850.7	1.22	1.21
18900	1880.0	1.22	1.22
19193	1909.3	1.22	1.21
LTE Band 2, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18615	1851.5	2.94	2.93
18900	1880.0	2.93	2.92
19185	1908.5	2.92	2.93
LTE Band 2, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18625	1852.5	4.82	4.81
18900	1880.0	4.82	4.81
19175	1907.5	4.80	4.81
LTE Band 2, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18650	1855.0	9.52	9.52
18900	1880.0	9.52	9.52
19150	1905.0	9.55	9.51
LTE Band 2, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18675	1857.5	14.25	14.22
18900	1880.0	14.28	14.24
19125	1902.5	14.28	14.24

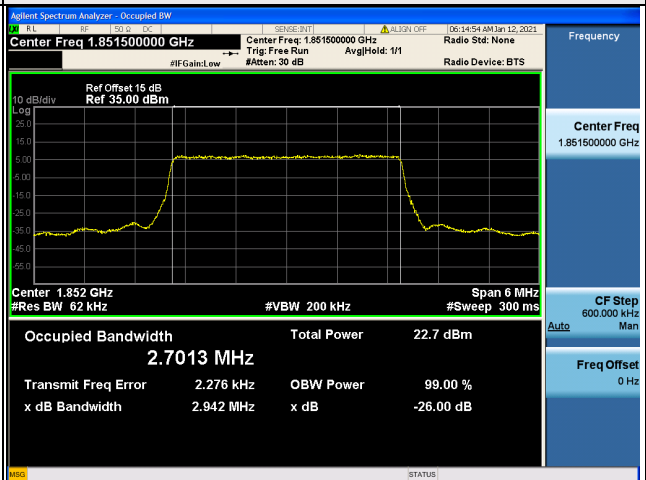
LTE Band 2, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
18700	1860.0	19.02	19.00
18900	1880.0	19.05	19.02
19100	1900.0	19.02	19.01

Spectrum Plot of Worst Value

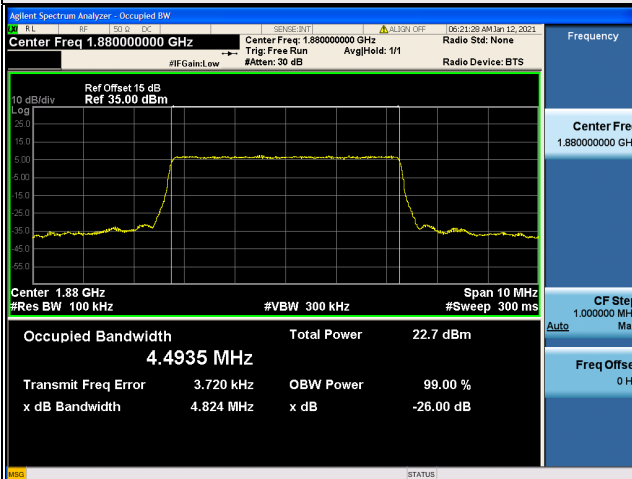
1.4MHz / 16QAM



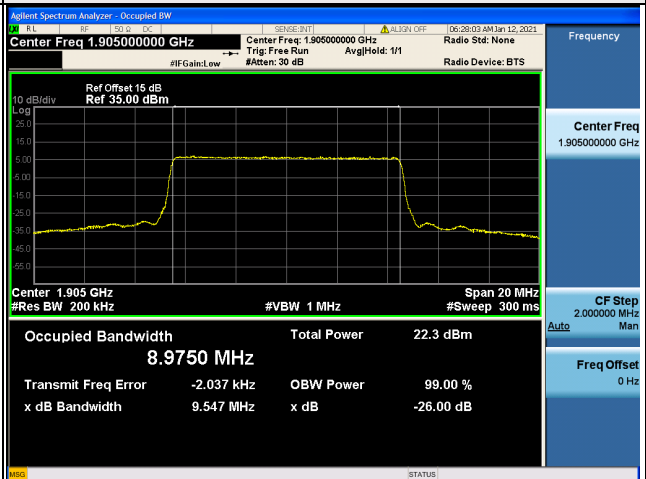
3MHz / QPSK



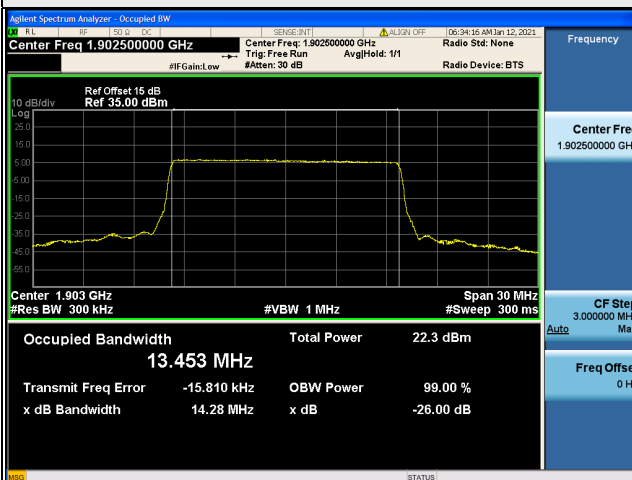
5MHz / QPSK



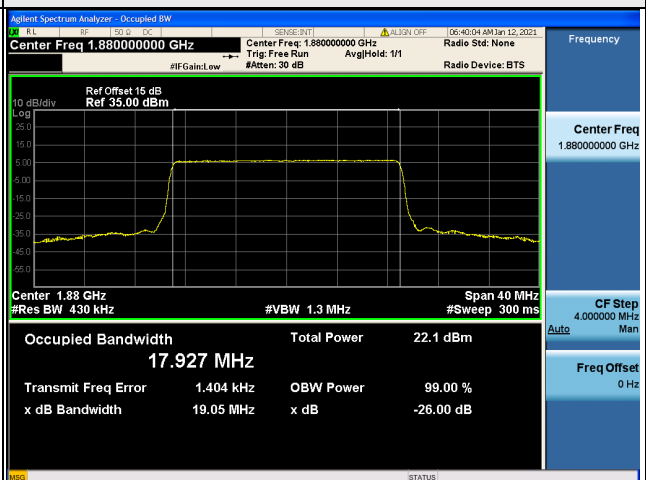
10MHz / QPSK



15MHz / QPSK



20MHz / QPSK

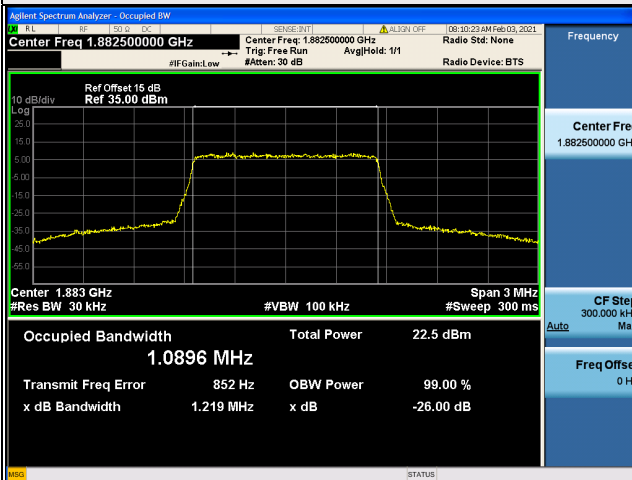


LTE Band 25, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
26047	1850.7	1.21	1.21
26365	1882.5	1.21	1.22
26683	1914.3	1.22	1.21
LTE Band 25, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
26055	1851.5	2.93	2.94
26365	1882.5	2.93	2.93
26675	1913.5	2.92	2.91
LTE Band 25, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
26065	1852.5	4.82	4.81
26365	1882.5	4.81	4.81
26665	1912.5	4.79	4.79
LTE Band 25, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
26090	1855.0	9.52	9.51
26365	1882.5	9.53	9.52
26640	1910.0	9.51	9.50
LTE Band 25, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
26115	1857.5	14.23	14.24
26365	1882.5	14.27	14.24
26615	1907.5	14.27	14.23

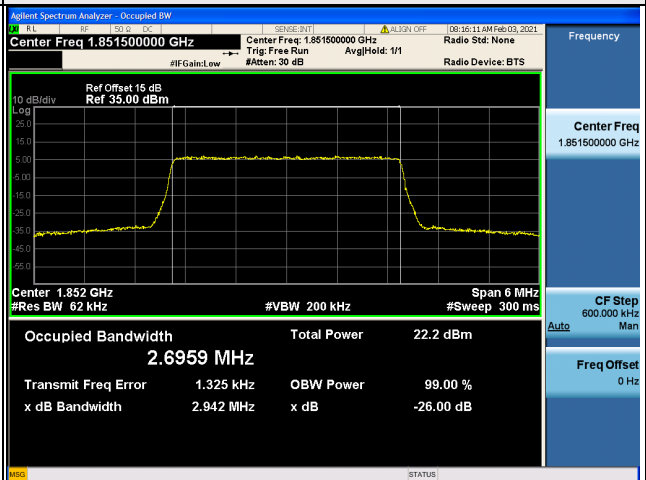
LTE Band 25, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		QPSK	16QAM
26140	1860.0	19.02	19.00
26365	1882.5	19.02	19.04
26590	1905.0	19.01	18.99

Spectrum Plot of Worst Value

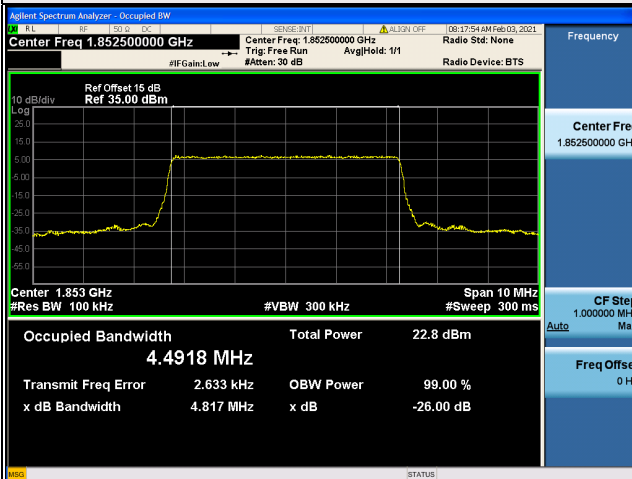
1.4MHz / 16QAM



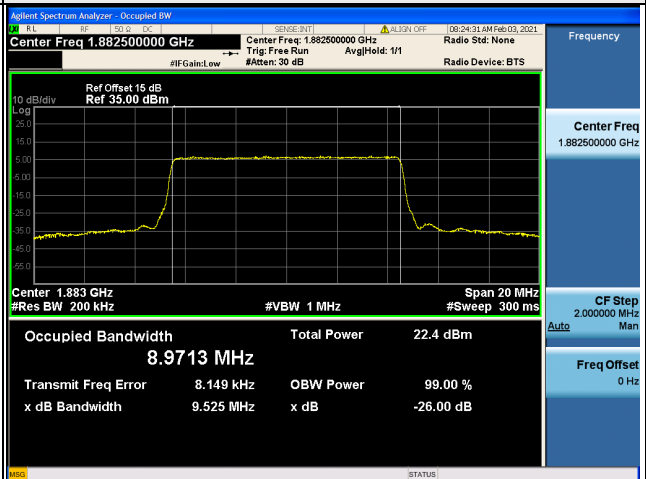
3MHz / 16QAM



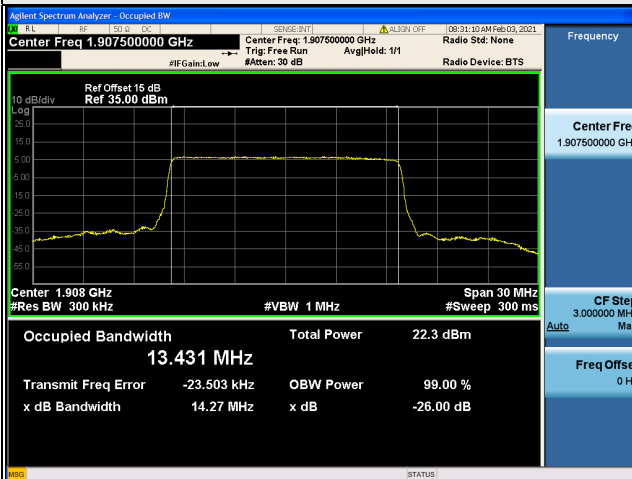
5MHz / QPSK



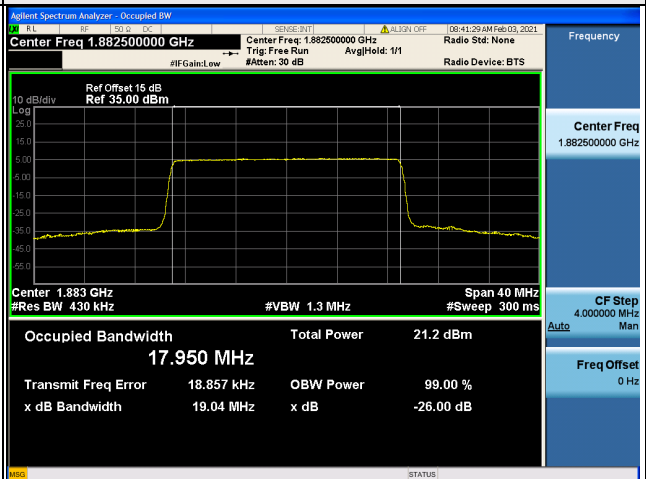
10MHz / QPSK



15MHz / QPSK



20MHz / 16QAM

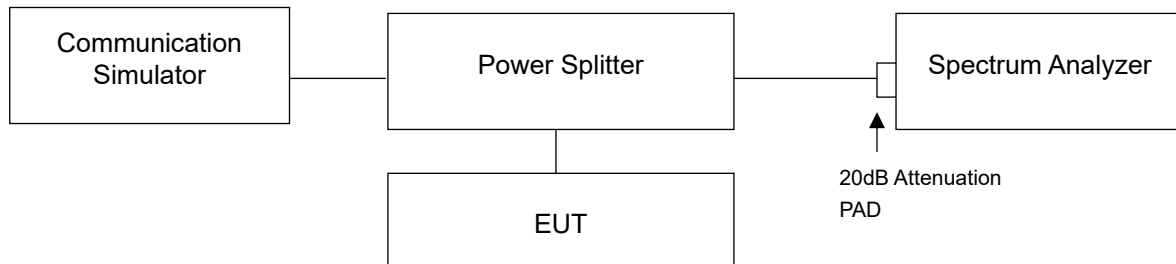


4.5 Band Edge Measurement

4.5.1 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.

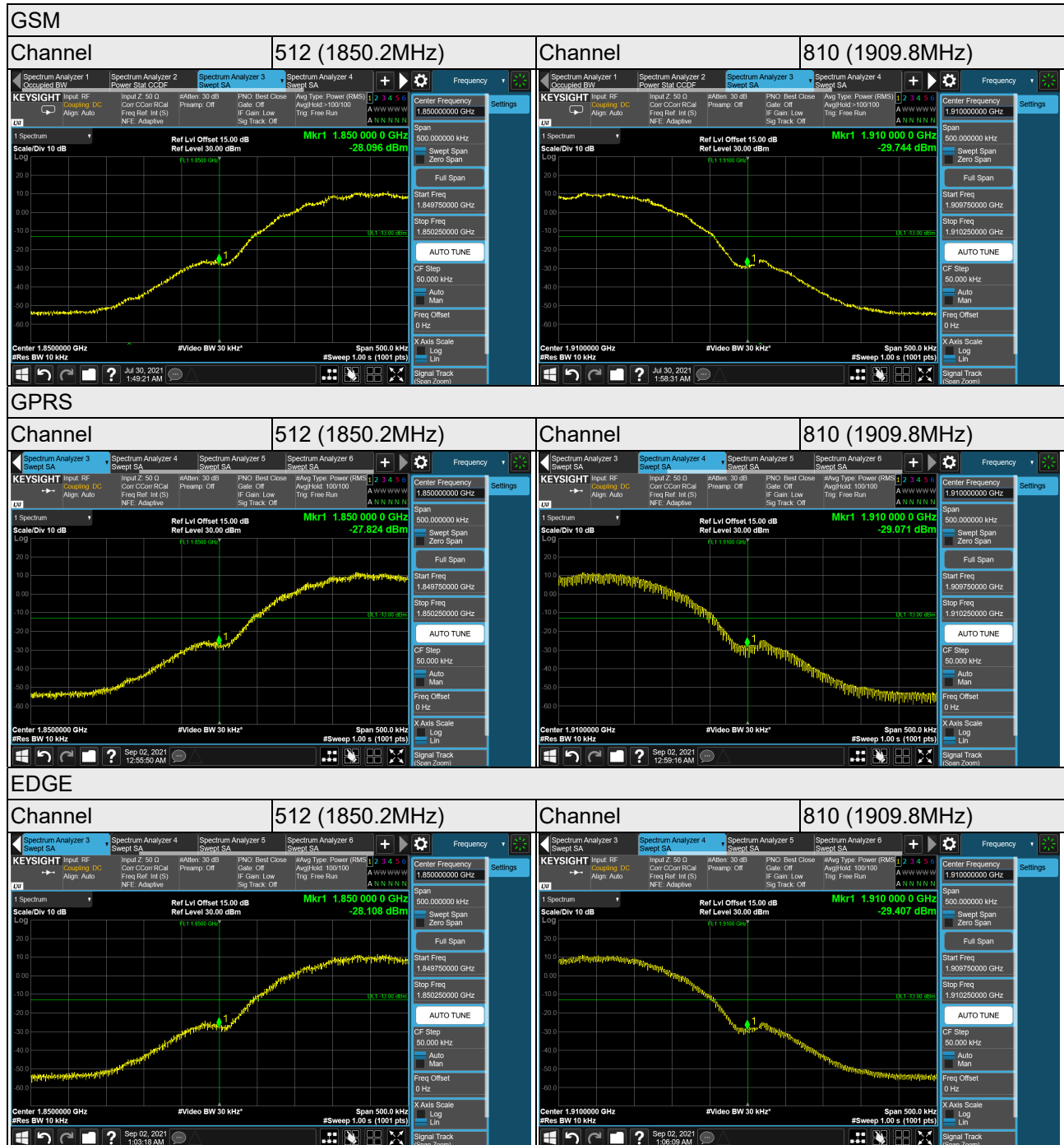
4.5.2 Test Setup



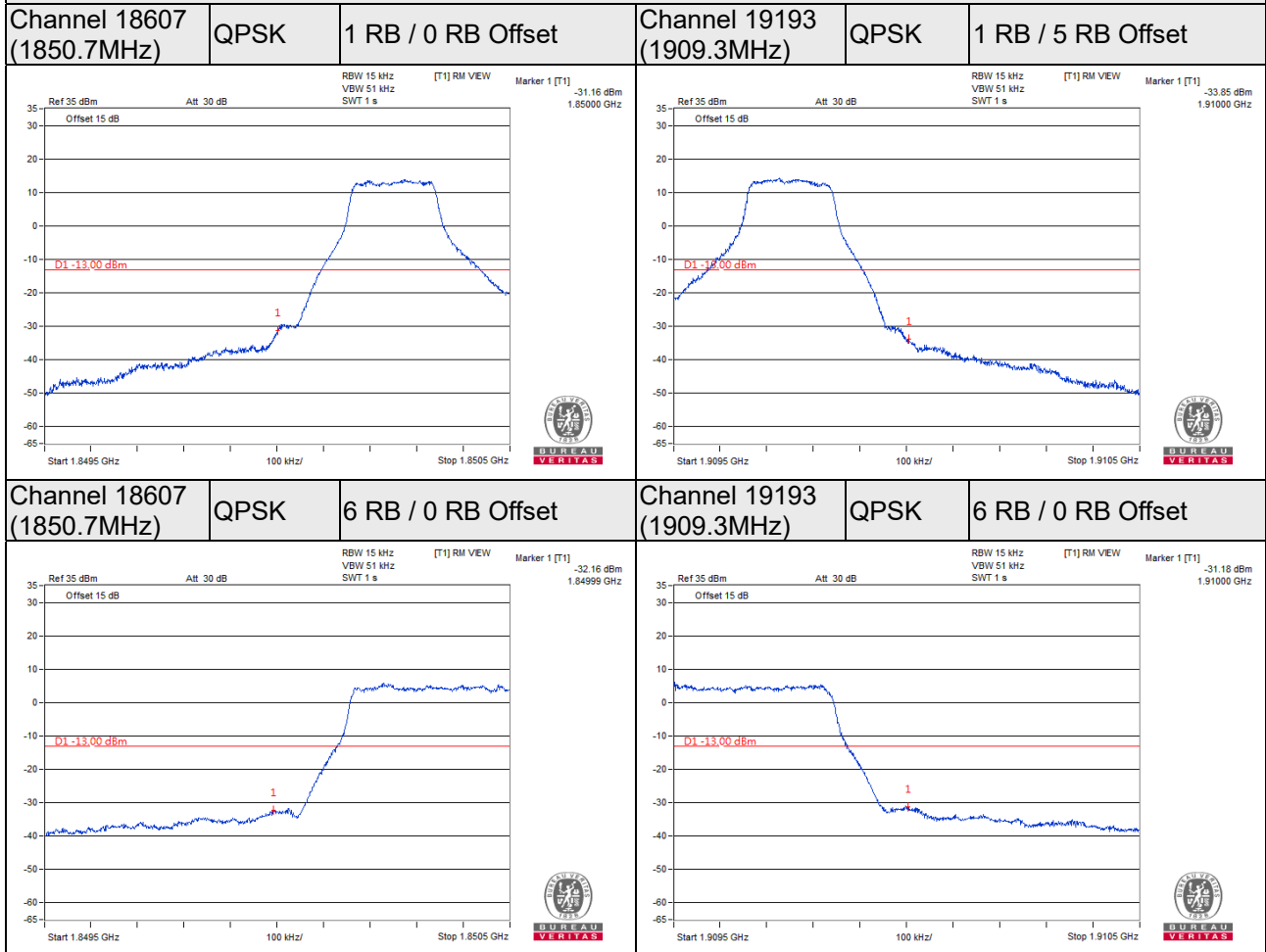
4.5.3 Test Procedures

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 500kHz. RB of the spectrum is 10kHz and VB of the spectrum is 30kHz (GSM / GPRS / EDGE).
- The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (WCDMA / HSDPA / HSUPA).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 15kHz and VB of the spectrum is 51kHz (LTE Channel Bandwidth 1.4MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Channel Bandwidth 3MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (LTE Channel Bandwidth 5MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (LTE Channel Bandwidth 20MHz).
- Record the max trace plot into the test report.

4.5.4 Test Results

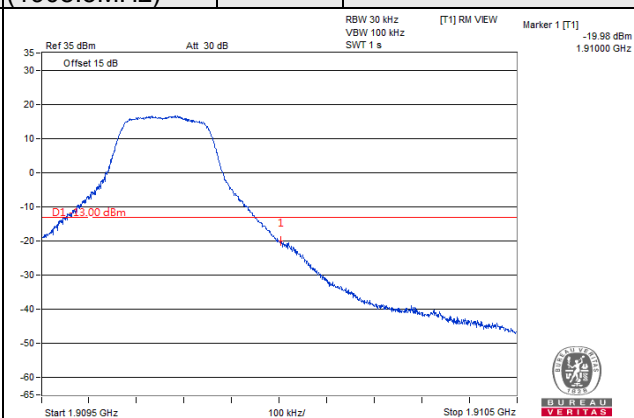
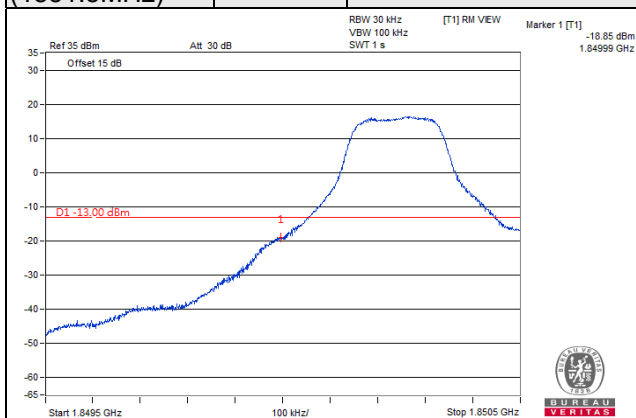


LTE Band 2, Channel Bandwidth 1.4MHz

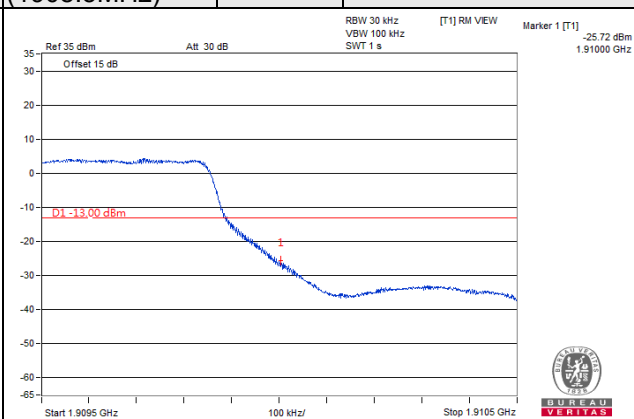
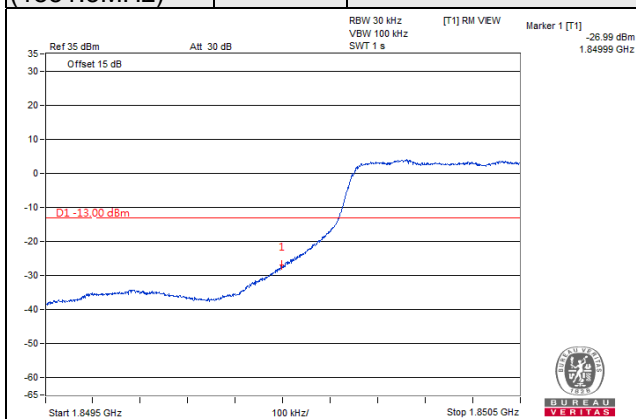


LTE Band 2, Channel Bandwidth 3MHz

Channel 18615 (1851.5MHz)	QPSK	1 RB / 0 RB Offset	Channel 19185 (1908.5MHz)	QPSK	1 RB / 14 RB Offset
------------------------------	------	--------------------	------------------------------	------	---------------------

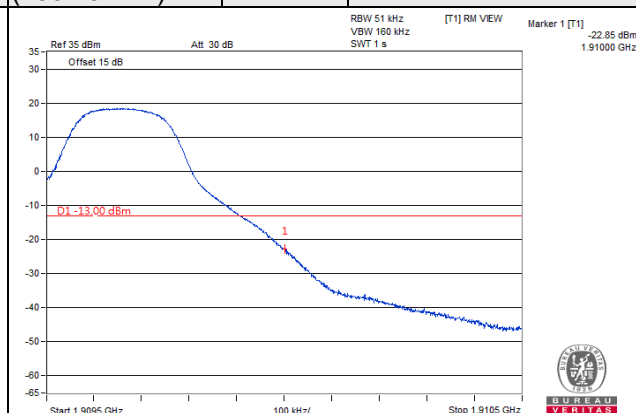
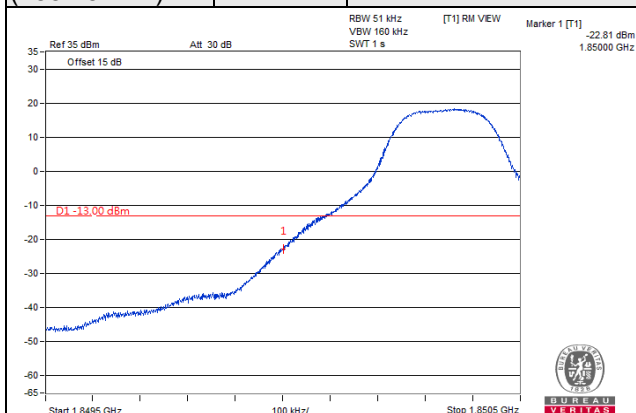


Channel 18615 (1851.5MHz)	QPSK	15 RB / 0 RB Offset	Channel 19185 (1908.5MHz)	QPSK	15 RB / 0 RB Offset
------------------------------	------	---------------------	------------------------------	------	---------------------

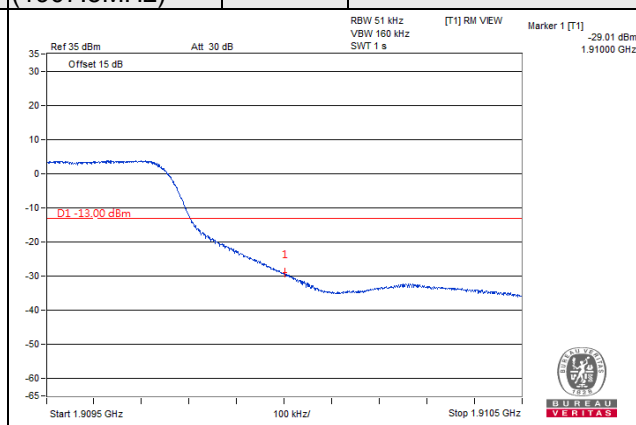
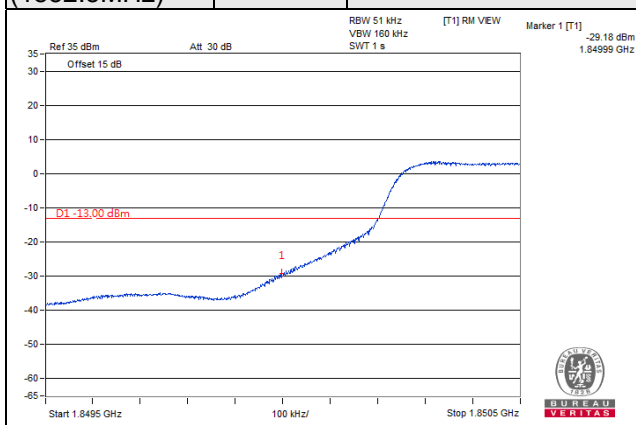


LTE Band 2, Channel Bandwidth 5MHz

Channel 18625 (1852.5MHz)	QPSK	1 RB / 0 RB Offset	Channel 19175 (1907.5MHz)	QPSK	1 RB / 24 RB Offset
------------------------------	------	--------------------	------------------------------	------	---------------------

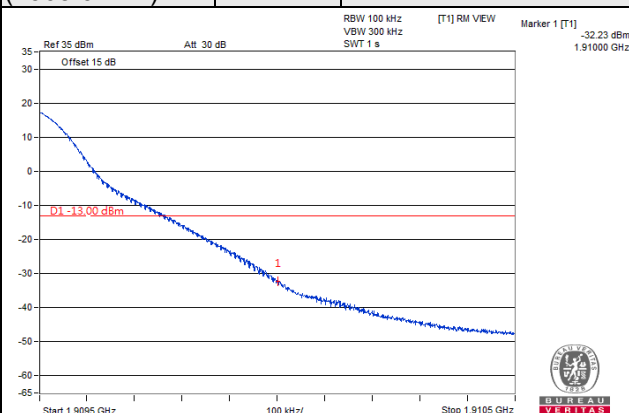
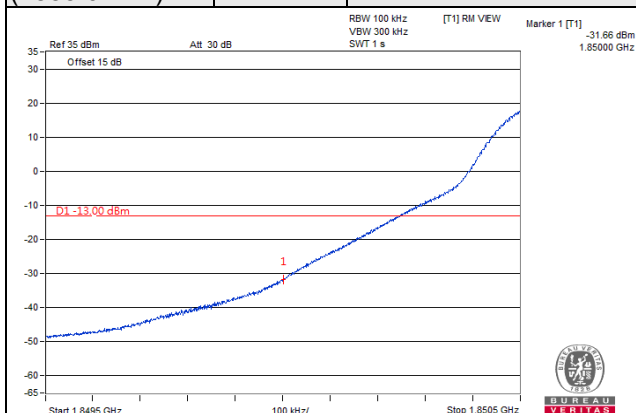


Channel 18625 (1852.5MHz)	QPSK	25 RB / 0 RB Offset	Channel 19175 (1907.5MHz)	QPSK	25 RB / 0 RB Offset
------------------------------	------	---------------------	------------------------------	------	---------------------

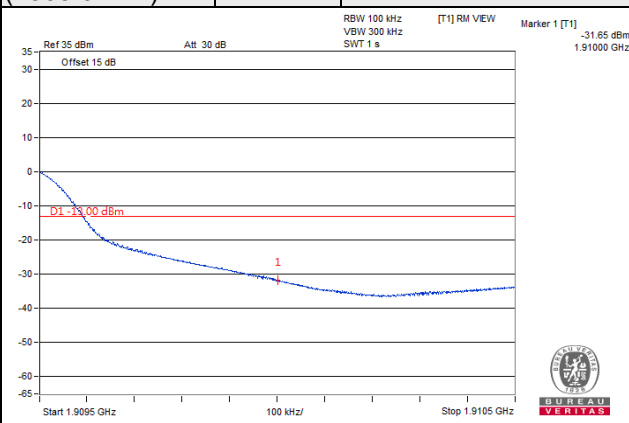
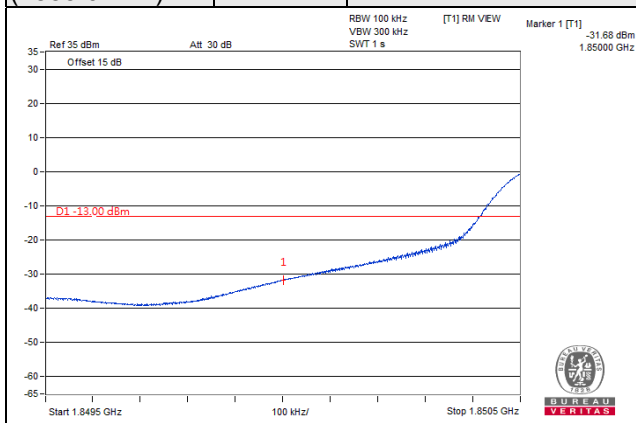


LTE Band 2, Channel Bandwidth 10MHz

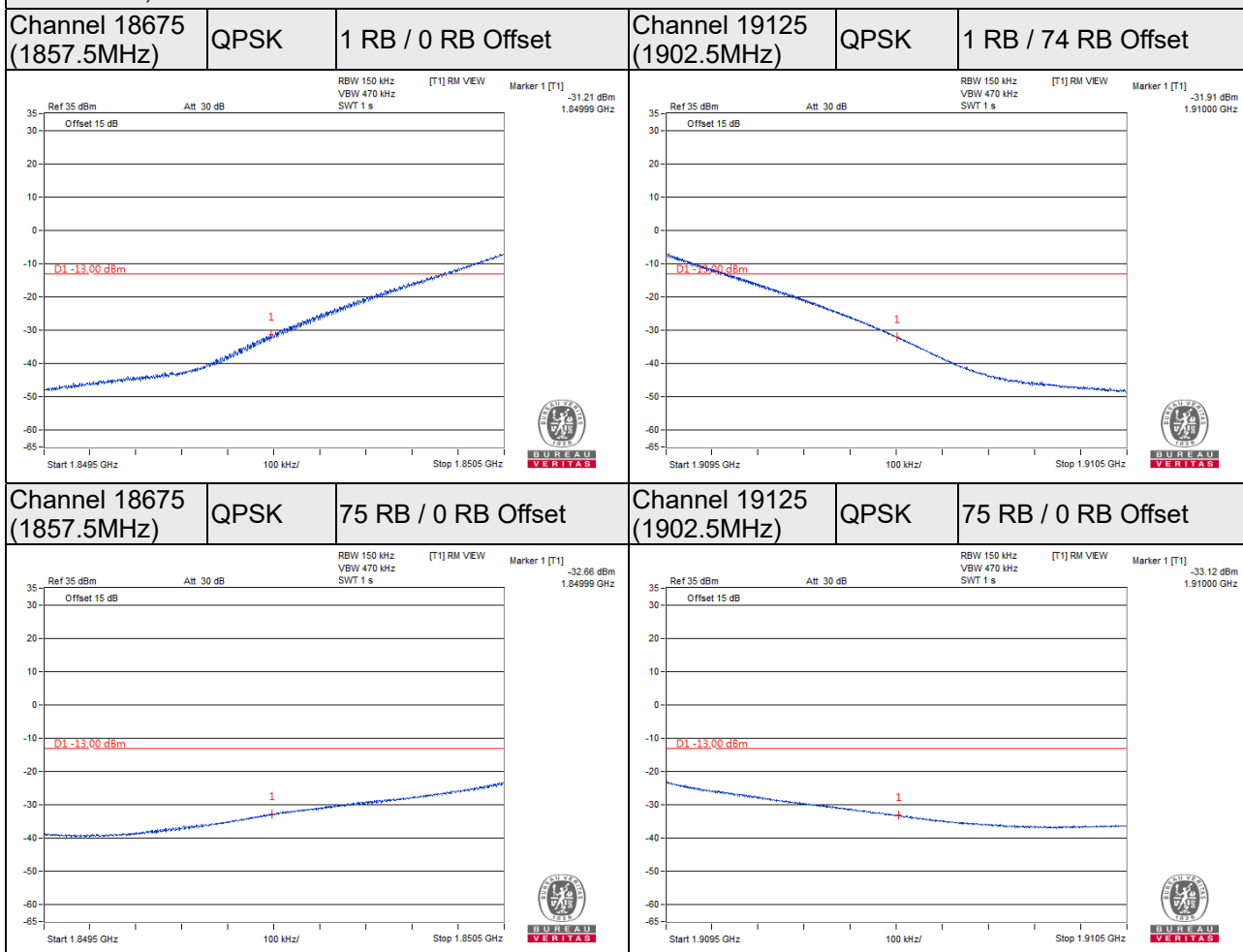
Channel 18650 (1855.0MHz)	QPSK	1 RB / 0 RB Offset	Channel 19150 (1905.0MHz)	QPSK	1 RB / 49 RB Offset
------------------------------	------	--------------------	------------------------------	------	---------------------



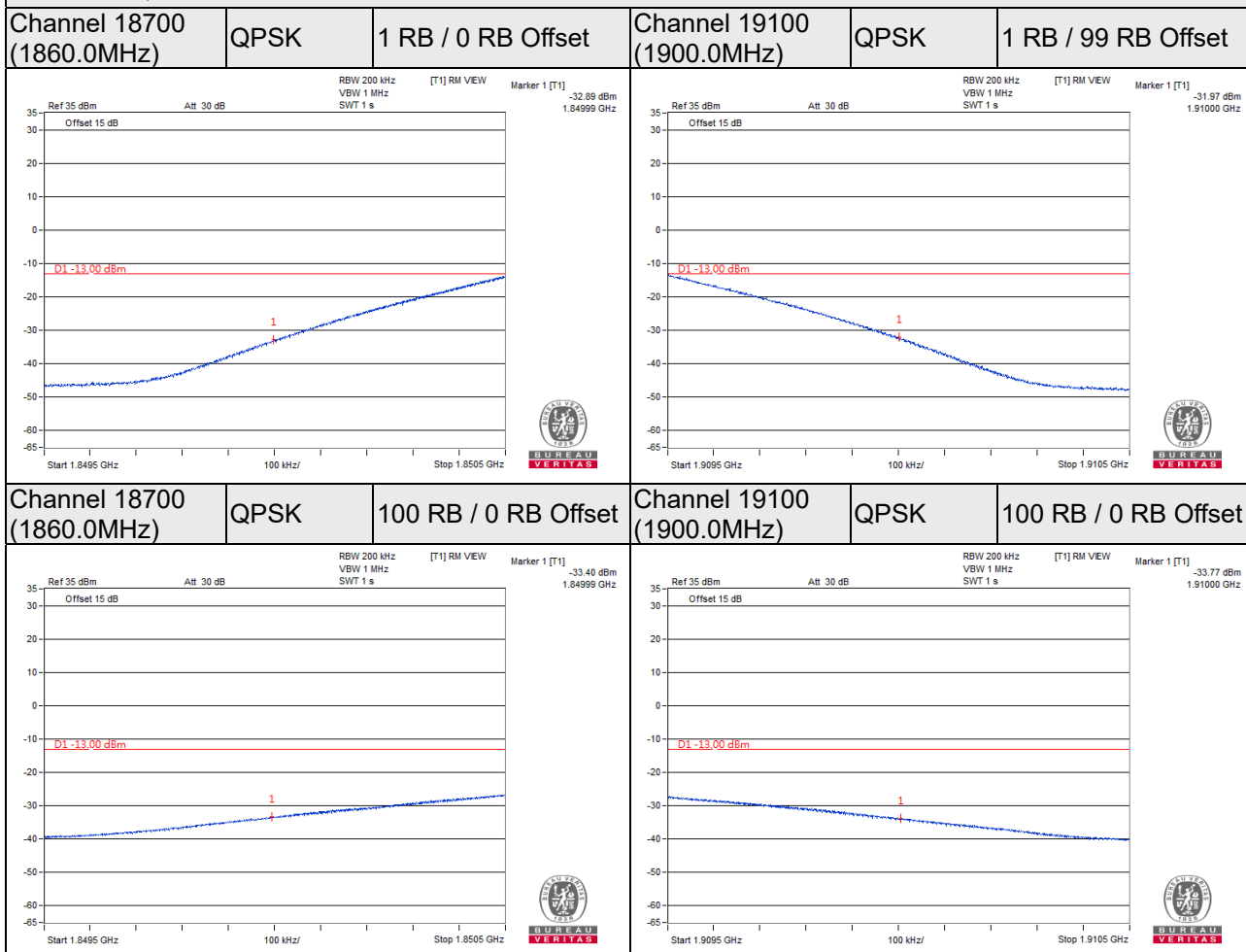
Channel 18650 (1855.0MHz)	QPSK	50 RB / 0 RB Offset	Channel 19150 (1905.0MHz)	QPSK	50 RB / 0 RB Offset
------------------------------	------	---------------------	------------------------------	------	---------------------



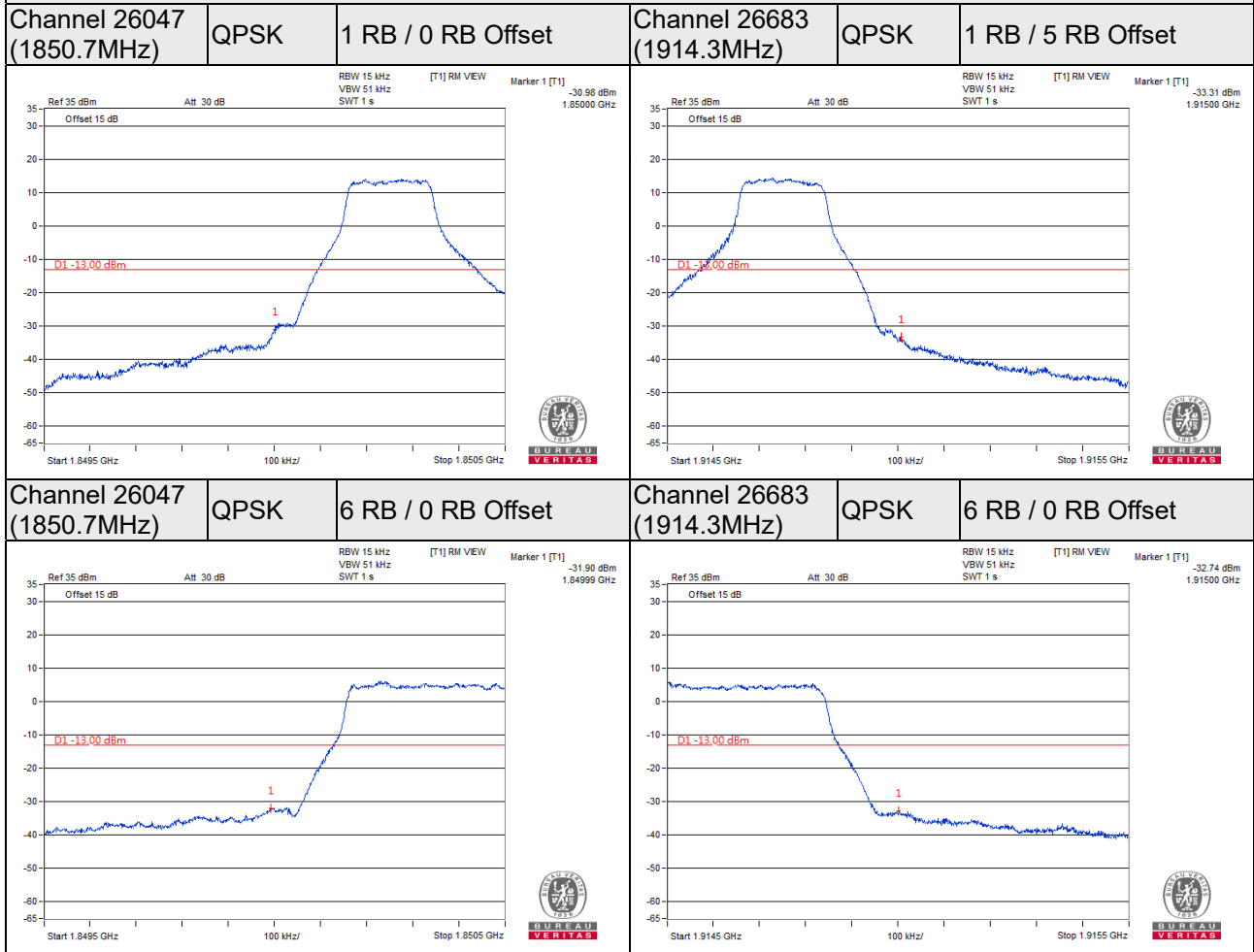
LTE Band 2, Channel Bandwidth 15MHz



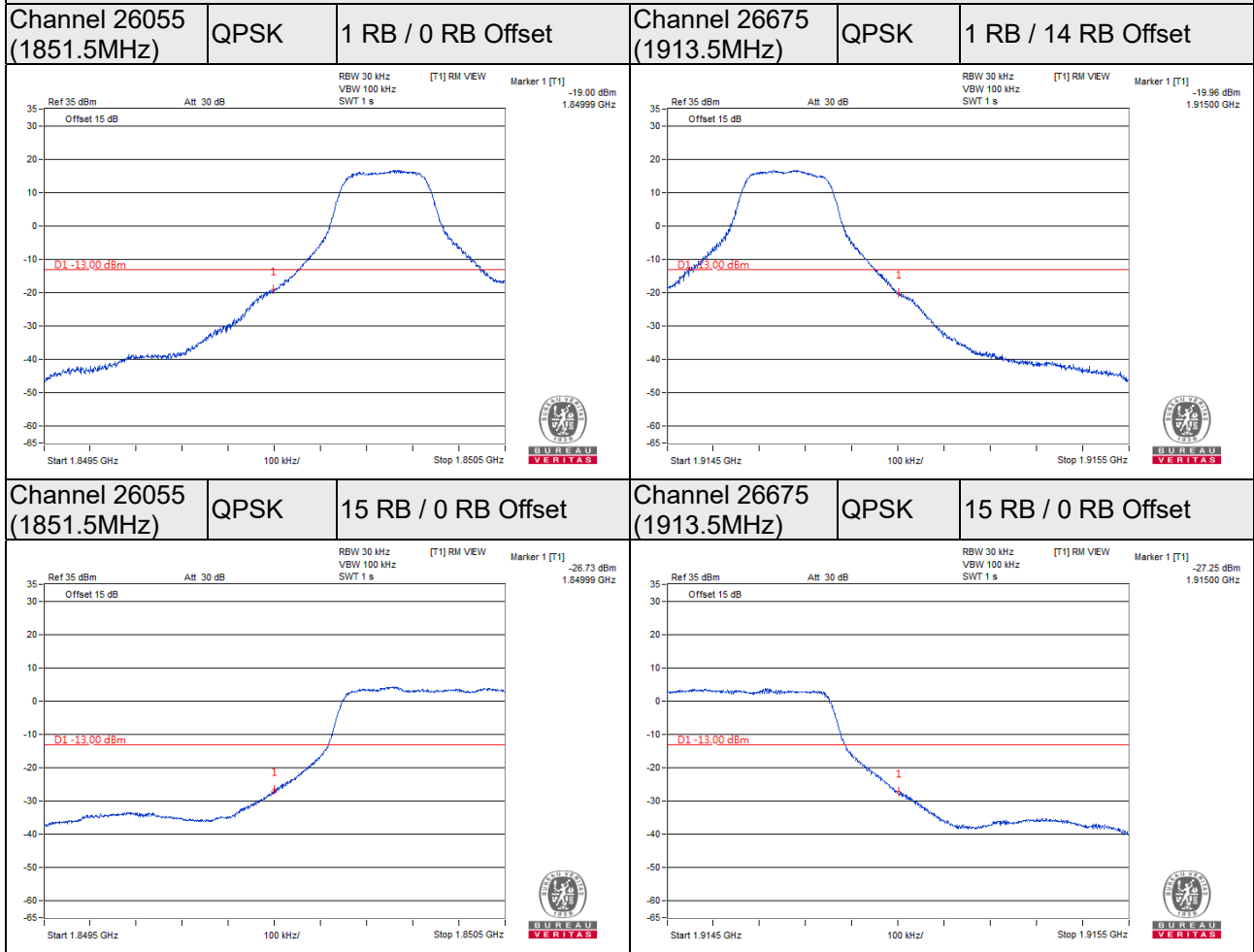
LTE Band 2, Channel Bandwidth 20MHz



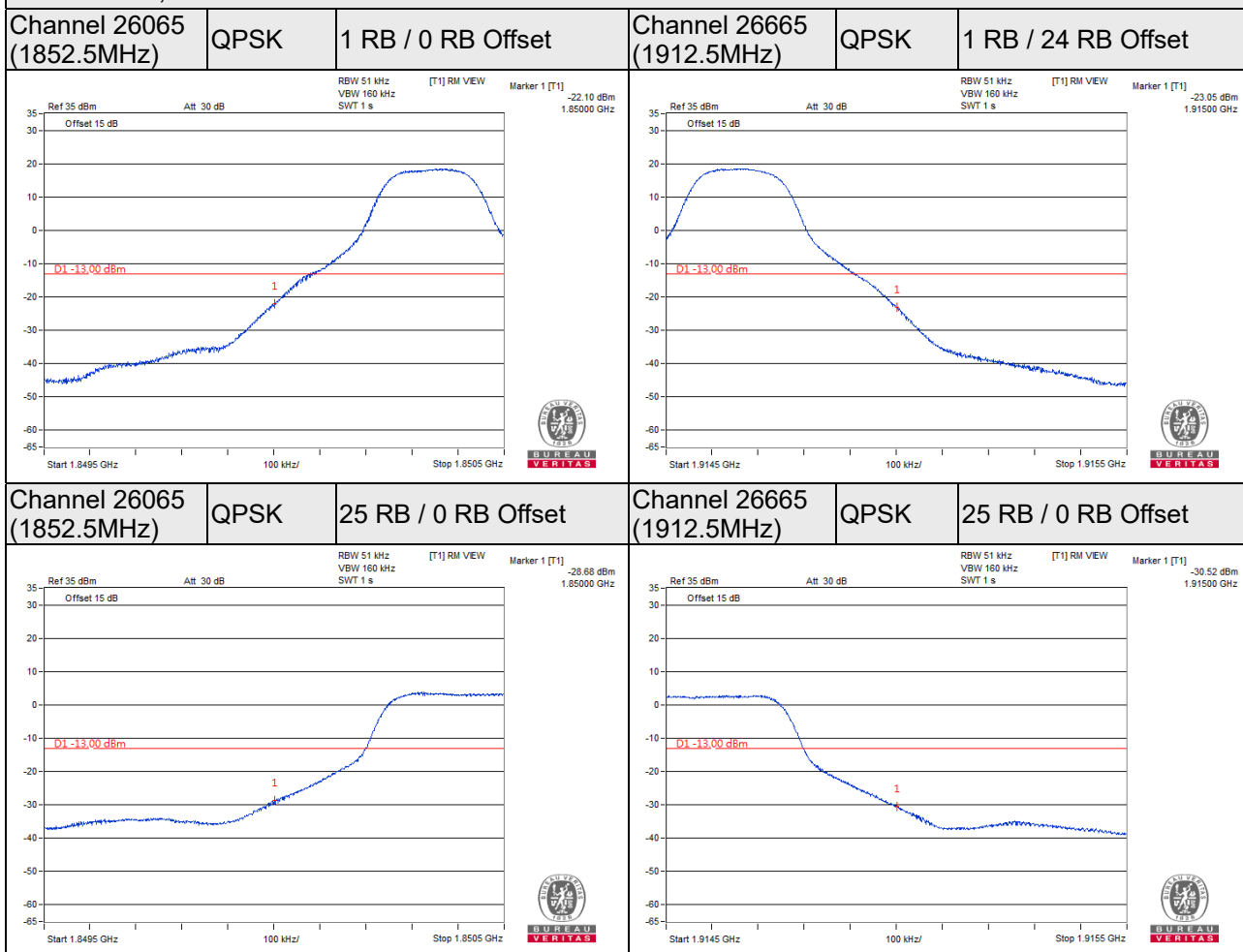
LTE Band 25, Channel Bandwidth 1.4MHz



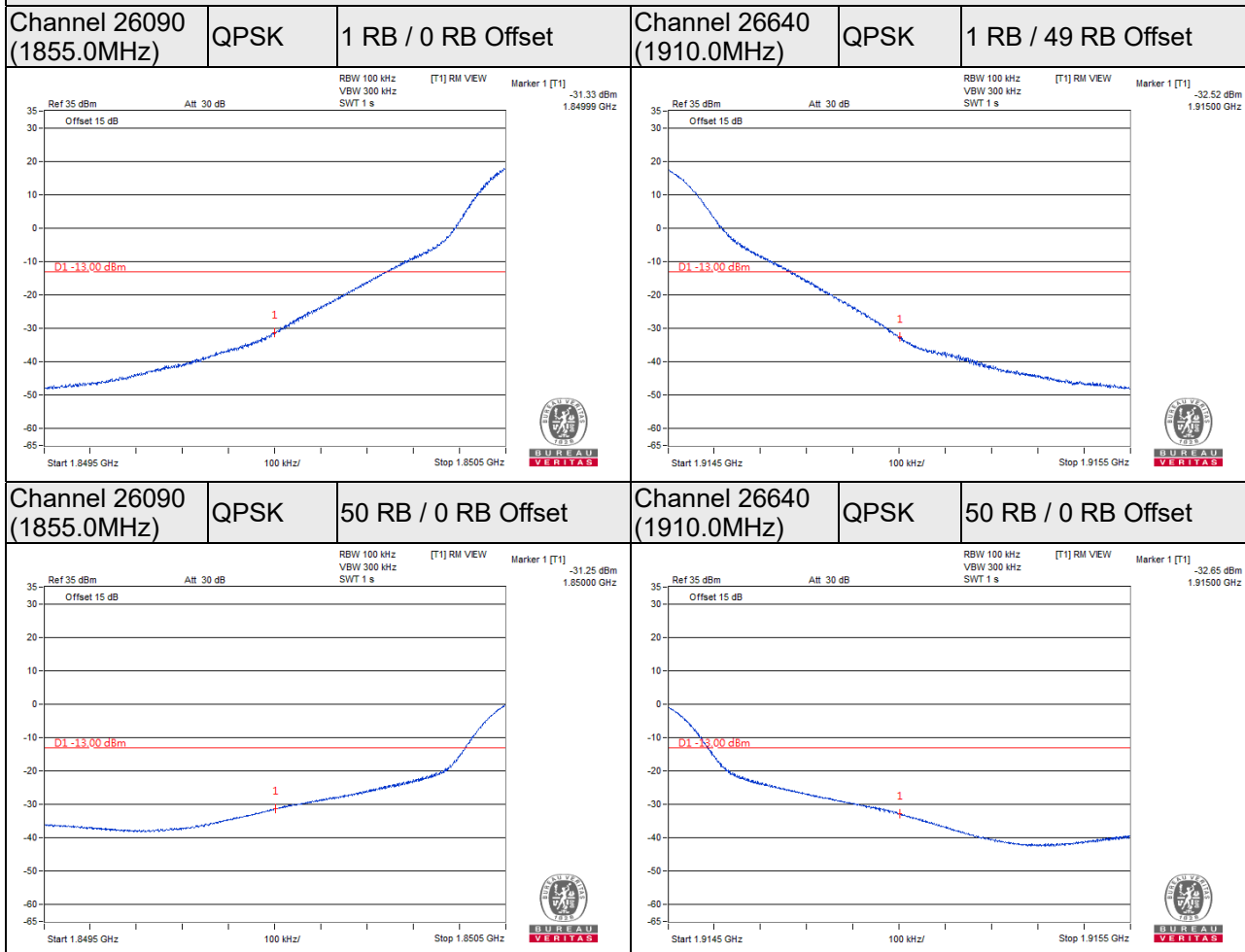
LTE Band 25, Channel Bandwidth 3MHz



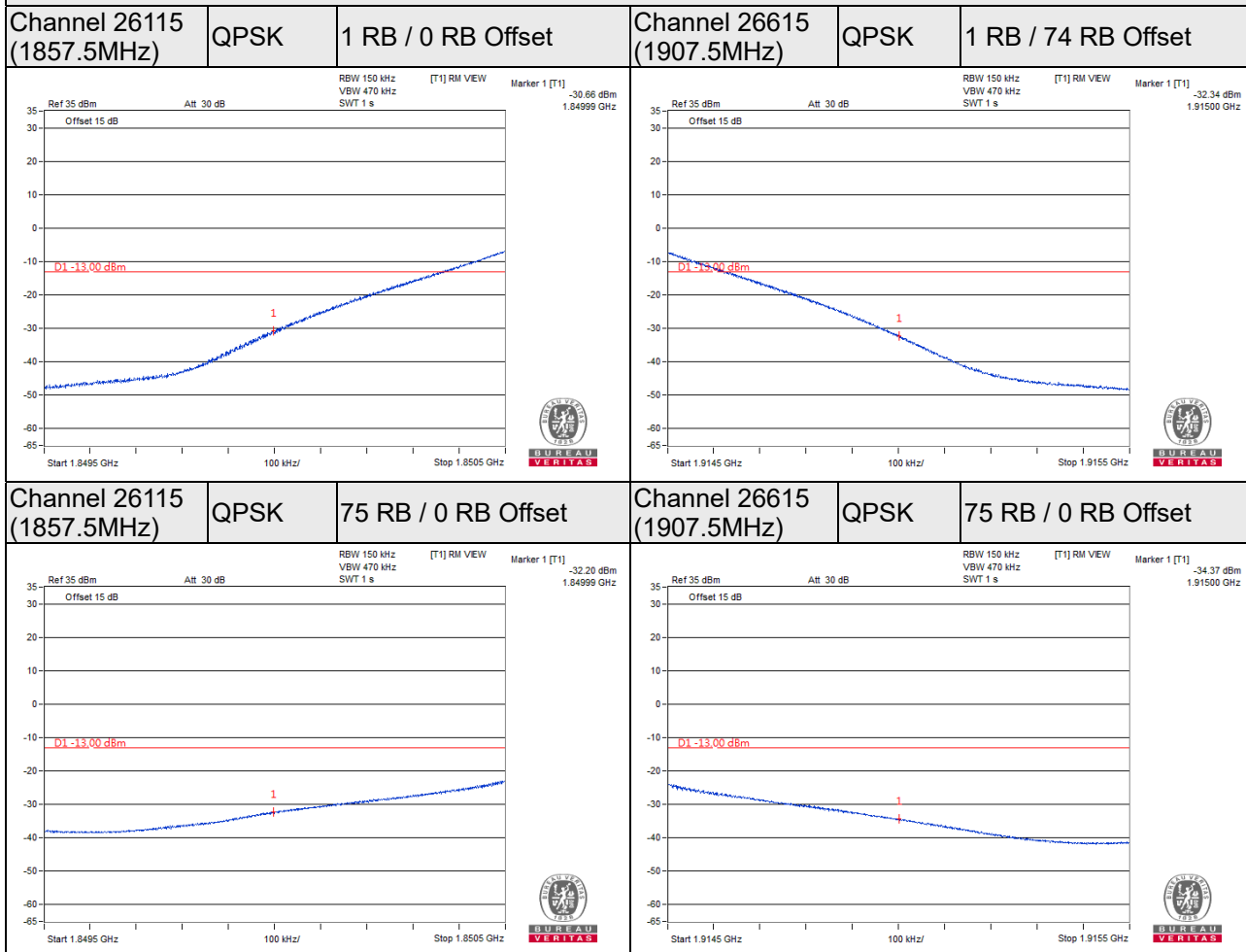
LTE Band 25, Channel Bandwidth 5MHz



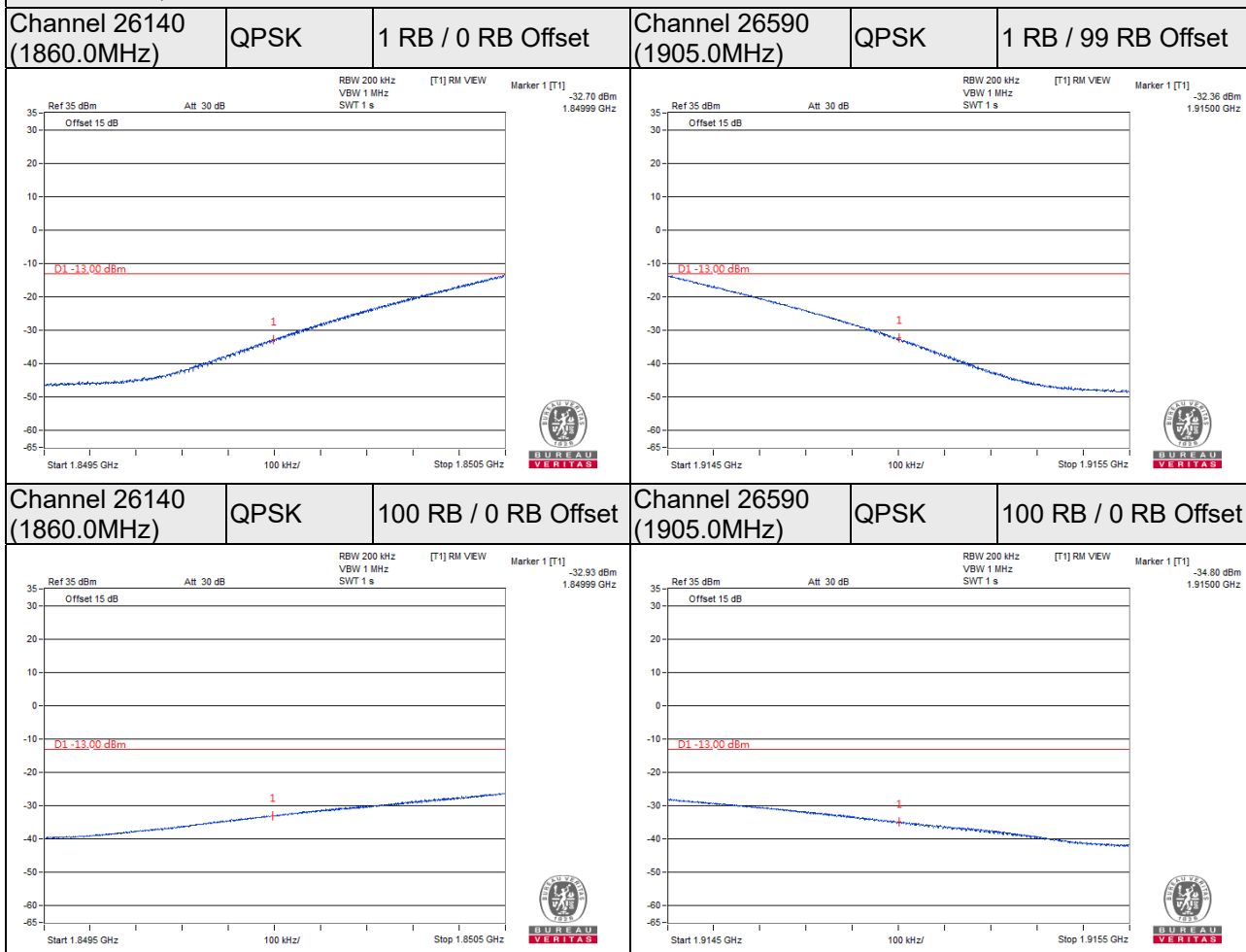
LTE Band 25, Channel Bandwidth 10MHz



LTE Band 25, Channel Bandwidth 15MHz



LTE Band 25, Channel Bandwidth 20MHz

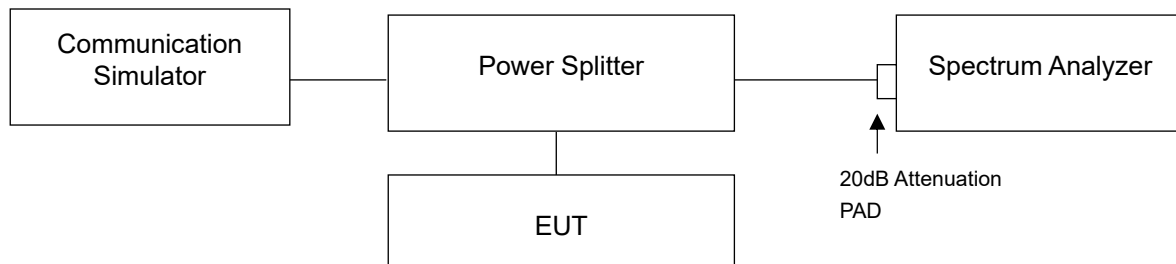


4.6 Peak to Average Ratio

4.6.1 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

4.6.2 Test Setup



4.6.3 Test Procedures

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

4.6.4 Test Results

Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		GSM	GPRS	EDGE
512	1850.2	2.64	2.63	2.64
661	1880.0	2.63	2.63	2.64
810	1909.8	2.64	2.63	2.63

