FCC Radio Test Report

FCC ID: 2AB7X-WISEPOSPRO

This report concerns: Original Grant

Project No.	: 1906H001
Equipment	: WisePOS Pro
Test Model	: WSP71
Series Model	: WSP72, WSP73
Applicant	: BBPOS International Limited
Address	: Suite 1903-04, 19/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, N.T. HK

Date of Receipt	: Jun. 25, 2019
Date of Test	: Jun. 25, 2019 ~ Aug. 28, 2019
Issued Date	: Sep. 12, 2019
Tested by	: BTL Inc.

Technical Manager : Krain. Wu
(Krain Wu)

Authorized Signatory : young chai
(Young Chai)

BTL INC.

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Certificate #5123.03

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NIST, A2LA, or any agency of the U.S. Government.

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BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and is not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Sep. 12, 2019

1. GENERAL SUMMARY

Equipment	:	WisePOS Pro
Brand Name	:	BBPOS
Test Model	:	WSP71
Series Model	:	WSP72, WSP73
Applicant	:	BBPOS International Limited
Manufacturer	:	BBPOS International Limited
Address	:	Suite 1903-04, 19/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, N.T. HK
Date of Test	:	Jun. 25, 2019 ~ Aug. 28, 2019
Test Sample	:	Engineering Sample No.: SH19070367
Standard(s)	:	47 CFR FCC Part 22 Subpart H 47 CFR FCC Part 2 ANSI/TIA/EIA-603-E-2016 FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1906H001) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

Test results included in this report are only for the WCDMA Band V and LTE Band 5 part.

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 22 Subpart H & Part 2			
Standard(s) Section	Test Item	Verdict	Tested By
2.1046 22.913(a)	Effective Radiated Power	PASS	Summer Xu
2.1049	Occupied Bandwidth	PASS	Summer Xu
2.1051 22.917(a)	Conducted Spurious Emissions	PASS	Summer Xu
2.1053 22.917(a)	Radiated Spurious Emissions	PASS	Summer Xu
22.917(a)	Band Edge Measurements	PASS	Summer Xu
-	Peak To Average Ratio	PASS	Summer Xu
2.1055 22.355	Frequency Stability	PASS	Summer Xu

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.
BTL's Test Firm Registration Number for FCC: 476765
BTL's Designation Number for FCC: CN1241

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor) k=1.96 or k=2(which provide confidence levels of respectively 90% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). Measurement Uncertainty for a Level of Confidence of 95 %, U=2xUc(y).

The BTL measurement uncertainty as below table:

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
SH-CB01	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	4.12
		30MHz ~ 200MHz	H	3.20
		200MHz ~ 1,000MHz	V	3.12
		200MHz ~ 1,000MHz	H	3.18

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB01 (3m)	CISPR	1GHz ~ 6GHz	4.40
		6GHz ~ 18GHz	4.86

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB01 (3m)	CISPR	18 ~ 26.5 GHz	3.64
		26.5 ~ 40 GHz	3.78

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	WisePOS Pro			
Brand Name	BBPOS			
Test Model	WSP71			
Series Model	WSP72, WSP73			
Model Difference(s)	WSP71: WisePOS Pro device only; WSP72: WisePOS Pro device with hand strap; WSP73: WisePOS Pro device with pistol grip.			
Software Version	970ADGAAK2_BB_V009			
Hardware Version	7MD_V01			
Antenna Type	External Antenna			
Antenna Gain	WCDMA V	1.5 dBi		
	LTE Band 5			
Modulation Type	WCDMA	UL: QPSK DL: QPSK		
	WCDMA(HSDPA/HSUPA)	16QAM		
	LTE	UL: QPSK,16QAM DL: QPSK,16QAM		
Operation Frequency	WCDMA Band V	826.4MHz ~ 846.6MHz		
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	824.7 MHz ~ 848.3 MHz		
	LTE Band 5 (Channel Bandwidth: 3MHz)	825.5 MHz ~ 847.5 MHz		
	LTE Band 5 (Channel Bandwidth: 5MHz)	826.5 MHz ~ 846.5 MHz		
	LTE Band 5 (Channel Bandwidth: 10MHz)	829.0 MHz ~ 844.0 MHz		
Max. ERP Power	WCDMA	QPSK	21.20	dBm
	WCDMA_HSDPA	16QAM	20.24	dBm
	WCDMA_HSUPA	16QAM	20.36	dBm
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	QPSK	21.18	dBm
		16QAM	20.49	dBm
	LTE Band 5 (Channel Bandwidth: 3MHz)	QPSK	21.26	dBm
		16QAM	20.69	dBm
	LTE Band 5 (Channel Bandwidth: 5MHz)	QPSK	21.14	dBm
		16QAM	20.61	dBm
	LTE Band 5 (Channel Bandwidth: 10MHz)	QPSK	21.14	dBm
		16QAM	20.62	dBm
Power Source	1. DC Voltage supplied from AC/DC adapter 2. Supplied from Li-ion battery pack			
Power Rating	1. I/P: 100-240V ~ 50/60Hz 1.0A O/P: 5V⎓3A/9V⎓3A 2. 6400mAH 3.8V			

Note:
1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. WCDMA (UL: QPSK; DL: QPSK) mode was found to be the worst case and recorded.

3.2 DESCRIPTION OF TEST MODES AND TEST CONDITION

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 on X-plane for EIRP and X-axis for radiated emission.
Following channel(s) was (were) selected for the final test as listed below:

WCDMA MODE			
Test Item	Available Channel	Tested Channel	Mode
ERP	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
Output Power	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
Conducted Emission	4132 to 4233	4182	WCDMA
Radiated Emission	4132 to 4233	4182	WCDMA
Band Edge	4132 to 4233	4132, 4233	WCDMA
Peak to Average Ratio	4132 to 4233	4132, 4182, 4233	WCDMA
Frequency Stability	4132 to 4233	4182	WCDMA

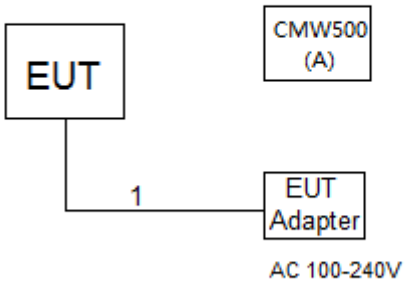
CC

LTE BAND 5					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & ERP	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	1RB/25RB/50RB
Occupied Bandwidth	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK, 16QAM	6 RB
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM	15 RB
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	25 RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	50 RB
Conducted Emission	20407 to 20643	20525	1.4MHz	QPSK	1 RB
	20425 to 20625	20525	5MHz	QPSK	1 RB
	20450 to 20600	20525	10MHz	QPSK	1 RB
Radiated Emission	20407 to 20643	20525	1.4MHz	QPSK	1 RB
	20425 to 20625	20525	5MHz	QPSK	1 RB
	20450 to 20600	20525	10MHz	QPSK	1 RB
Band Edge	20407 to 20643	20407	1.4MHz	QPSK	1 RB
					6 RB
		20643	1.4MHz	QPSK	1 RB
					6 RB
	20415 to 20635	20415	3MHz	QPSK	1 RB
					15 RB
		20635	3MHz	QPSK	1 RB
					15 RB
	20425 to 20625	20425	5MHz	QPSK	1 RB
					25 RB
		20625	5MHz	QPSK	1 RB
					25 RB
	20450 to 20600	20450	10MHz	QPSK	1 RB
					50 RB
		20600	10MHz	QPSK	1 RB
					50 RB
Peak To Average Ratio	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK, 16QAM	1 RB
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM	1 RB
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	1 RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	1 RB
Frequency Stability	20407 to 20643	20525	1.4MHz	QPSK	1 RB
	20415 to 20635	20525	3MHz	QPSK	1 RB
	20425 to 20625	20525	5MHz	QPSK	1 RB
	20450 to 20600	20525	10MHz	QPSK	1 RB

EUT TEST CONDITIONS:

Test Item	Environmental Conditions	Test Voltage
ERP	24.5°C, 53%RH	DC 4.0V
Output Power	24.5°C, 53%RH	DC 4.0V
Occupied Bandwidth	24.5°C, 53%RH	DC 4.0V
Conducted Emission	24.5°C, 53%RH	DC 4.0V
Radiated Emission	22°C, 55%RH	AC 120V/60Hz
Band Edge	24.5°C, 53%RH	DC 4.0V
Peak to Average Ratio	24.5°C, 53%RH	DC 4.0V
Frequency Stability	Normal and Extreme	Normal and Extreme

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATIONOFSYSTEMTESTED



3.4 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.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	CMW500	N/A	N/A	131463

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1m

4. TEST RESULT

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMIT

Mobile / Portable station are limited to 7 watts e.r.p.

4.1.2 TEST PROCEDURE

EIRP/ ERP:

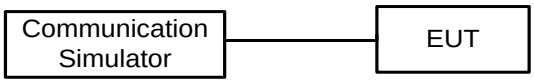
1. EIRP= Output Power +Antenan gain
   ERP power= EIPR power-2.15dBi.

Output Power:

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA 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 LAYOUT

Output Power Measurement



4.1.4 TEST DEVIATION

No deviation

4.1.5 TEST RESULTS

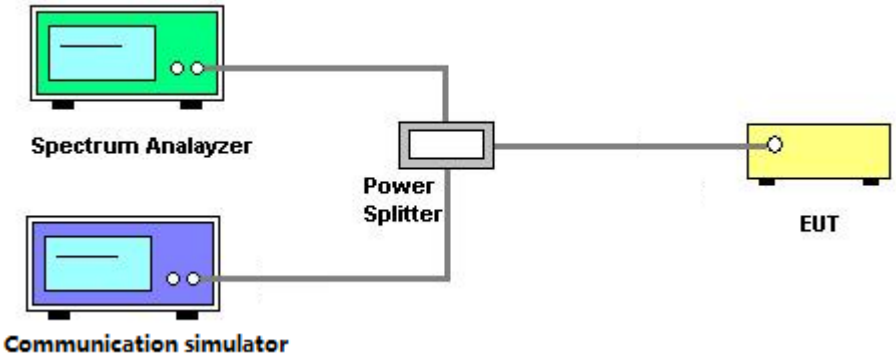
Please refer to the Appendix A.

4.2 OCCUPIED BANDWIDTH MEASUREMENT

4.2.1 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 and 26dB bandwidth.

4.2.2 TEST SETUP LAYOUT



4.2.3 TEST DEVIATION

No deviation

4.2.4 TEST RESULTS

Please refer to the Appendix B.

4.3 CONDUCTED EMISSIONS MEASUREMENT

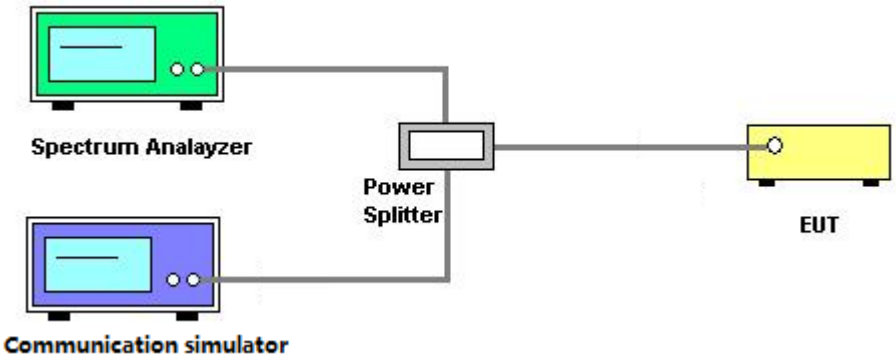
4.3.1 LIMIT

The 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. The emission limit equal to -13dBm.

4.3.2 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v03r01 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured. Set RBW>=1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

4.3.3 TEST SETUP LAYOUT



4.3.4 TEST DEVIATION

No deviation

4.3.5 TEST RESULTS

Please refer to the Appendix C.

4.4 RADIATED EMISSIONS MEASUREMENT

4.4.1 LIMIT

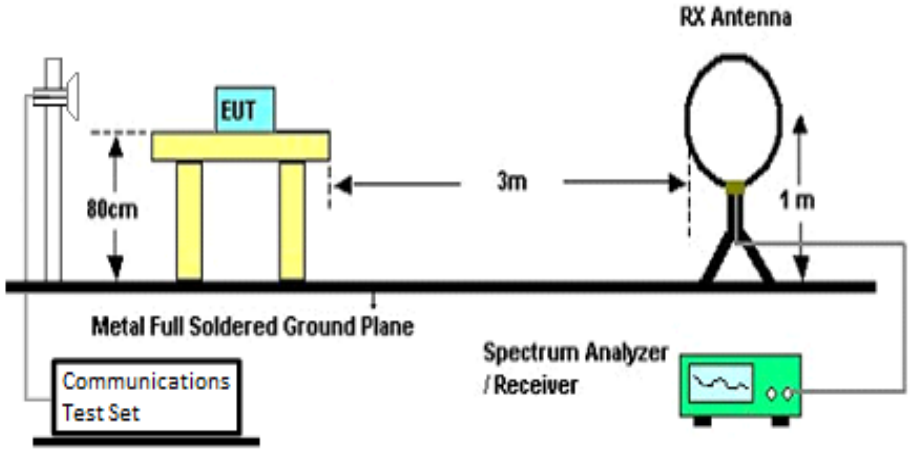
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13dBm.

4.4.2 TEST PROCEDURES

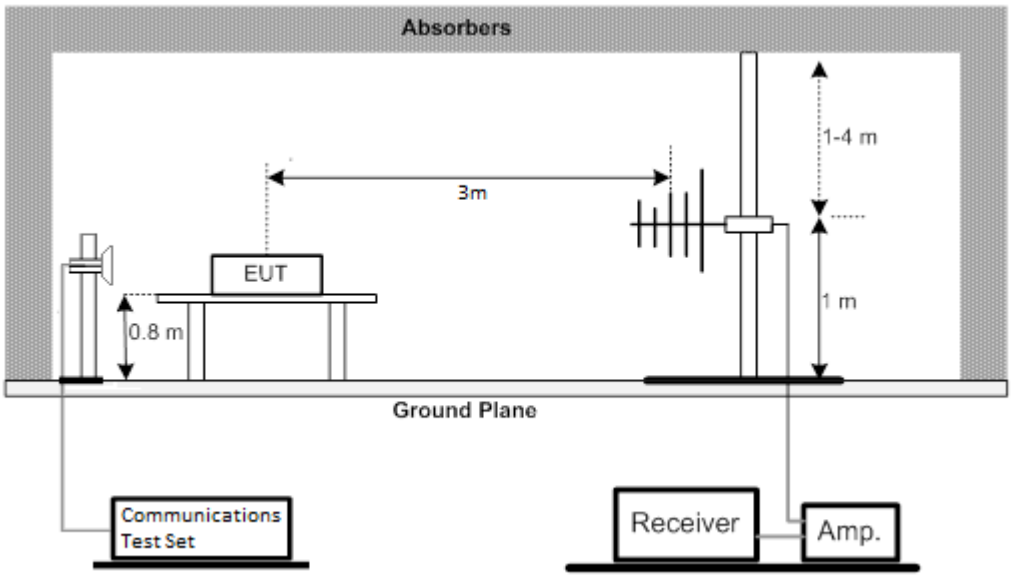
1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step a. Record the power level of S.G
3. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.4.3 TEST SETUP LAYOUT

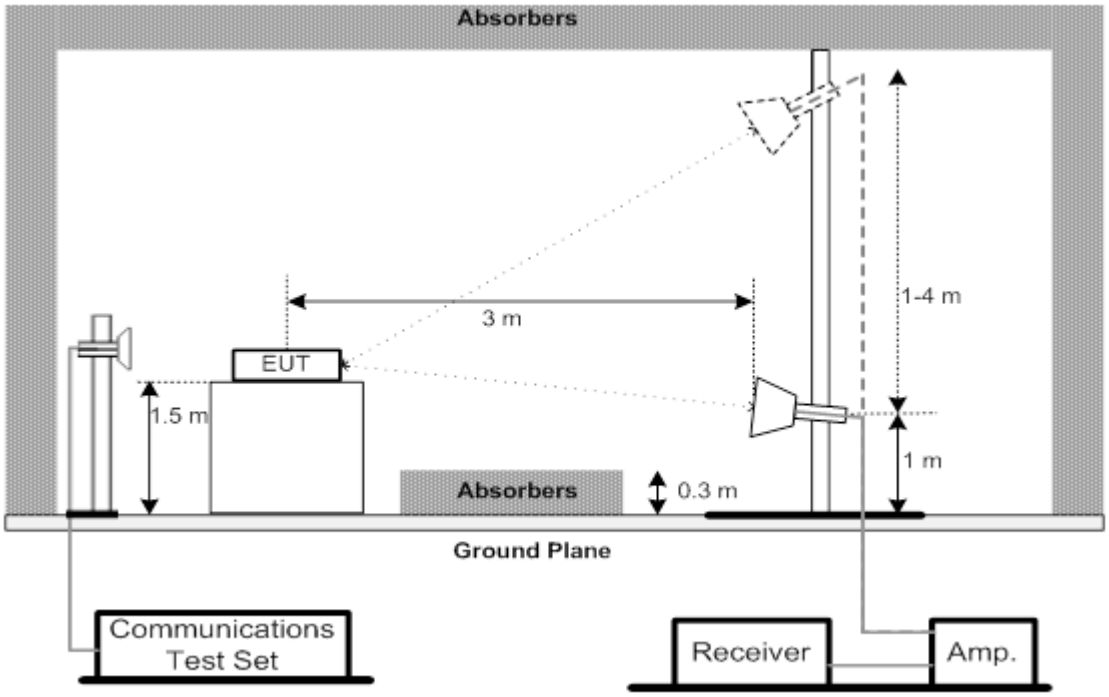
Below 30MHz



30MHz to 1GHz



Above 1GHz



4.4.4 TEST DEVIATION

No deviation

4.4.5 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix D.

4.4.6 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Appendix E.

4.4.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix F.

4.5 BAND EDGE MEASUREMENT

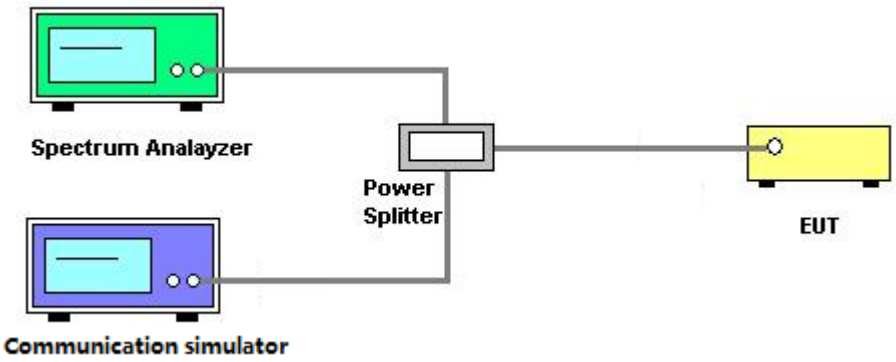
4.5.1 LIMIT

A 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 PROCEDURES

1. All measurements were done at low and high operational frequency range.
2. The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).
3. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 15kHz and VB of the spectrum is 43kHz (LTE Bandwidth 1.4MHz).
4. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 30kHz and VB of the spectrum is 91kHz (LTE Bandwidth 3MHz).
5. 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 150kHz (LTE Bandwidth 5MHz).
6. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 10MHz).
7. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Bandwidth 15MHz).
8. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 200kHz and VB of the spectrum is 620kHz (LTE Bandwidth 20MHz).

4.5.3 TEST SETUP LAYOUT



4.5.4 TEST DEVIATION

No deviation

4.5.5 TEST RESULTS

Please refer to the Appendix G.

4.6 PEAK TO AVERAGE RATIO MEASUREMENT

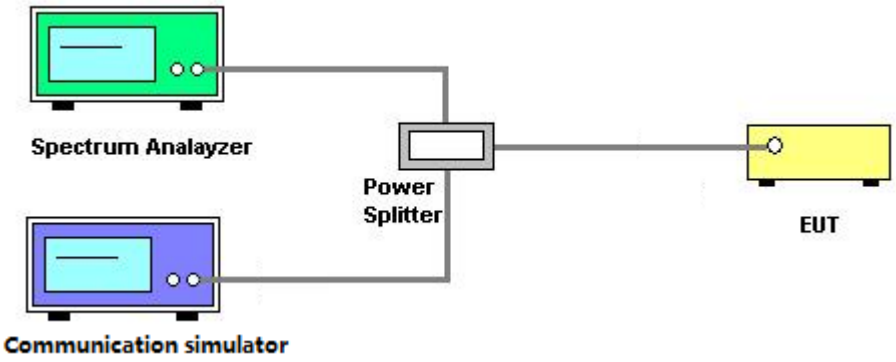
4.6.1 LIMIT

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 PROCEDURES

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

4.6.3 TEST SETUP LAYOUT



4.6.4 TEST DEVIATION

No deviation

4.6.5 TEST RESULTS

Please refer to the Appendix H.

4.7 FREQUENCY STABILITY MEASUREMENT

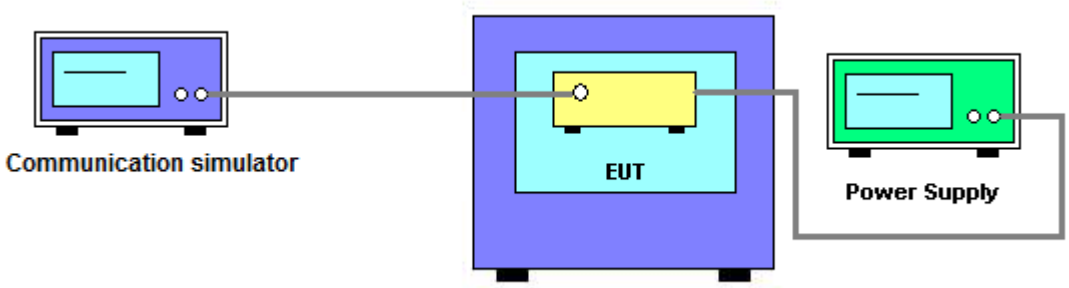
4.7.1 LIMIT

±1.5 ppm is for base and fixed station. ±2.5 ppm is for mobile station.

4.7.2 TEST PROCEDURES

1. 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.
2. 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.
3. 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.
4. The frequency error was recorded frequency error from the communication simulator.

4.7.3 TEST SETUP LAYOUT



4.7.4 TEST DEVIATION

No deviation

4.7.5 TEST RESULTS

Please refer to the Appendix I.

5. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emission Measurement(9K-30M)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Loop Antenna	EMCI	EMCI LPA600	275	Mar. 29, 2020
2	EMI Test Receiver	R&S	ESCI	100082	Mar. 29, 2020
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

For WCDMA

Radiated Emission Measurement(30M-1G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
3	MXE EMI Receiver	Keysight	N9038A	MY57150106	Mar. 29, 2020
4	Test Cable	emci	EMC104-SM-SM-7000	170330	Apr. 17, 2020
5	Test Cable	emci	EMC104-SM-SM-1000	170331	Apr. 17, 2020
6	Test Cable	emci	EMC104-SM-NM-3500	170621	Apr. 17, 2020
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019

Radiated Emission Measurement(1G-18G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pre-Amplifier	emci	EMC184045SE	980409	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC012645SE	980421	Mar. 29, 2020
3	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
4	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1787	Mar. 29, 2020
5	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3116C	00203919	Mar. 29, 2020
6	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
7	Cable	N/A	EMC102-SM-SM-6000	170336	Apr. 17, 2020
8	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019

For LTE

Radiated Emission Measurement(30M-1G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
3	MXE EMI Receiver	Keysight	N9038A	MY57150106	Mar. 29, 2020
4	Test Cable	emci	EMC104-SM-SM-7000	170330	Apr. 17, 2020
5	Test Cable	emci	EMC104-SM-SM-1000	170331	Apr. 17, 2020
6	Test Cable	emci	EMC104-SM-NM-3500	170621	Apr. 17, 2020
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019

Radiated Emission Measurement(1G-18G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pre-Amplifier	emci	EMC184045SE	980409	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC012645SE	980421	Mar. 29, 2020
3	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
4	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1787	Mar. 29, 2020
5	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3116C	00203919	Mar. 29, 2020
6	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
7	Cable	N/A	EMC102-SM-SM-6000	170336	Apr. 17, 2020
8	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019

For WCDMA

Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019
2	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
4	Power Divider	JUK	PD-2SF-2060	N/A	N/A

Frequency Stability Measurement					
	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	8960 SERIES 10 WIRELESS COMMUNICATIONS TEST SET	Agilent	E5515C	GB45070942	Nov. 20, 2019
2*	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
4	Power Divider	JUK	PD-2SF-2060	N/A	N/A
5	Temperature And Humidity Box	Blue pand	BPHS-120B	170616454	Nov. 20, 2019

For LTE

Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
2	Power Divider	JUK	PD-4SF-2060	N/A	N/A
3	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019
4	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020

Frequency Stability Measurement					
	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
2*	Power Divider	JUK	PD-4SF-2060	N/A	N/A
3	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019
4	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020
5	Temperature And Humidity Box	Blue pand	BPHS-120B	170616454	Nov. 20, 2019

Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.
* All calibration period of equipment list is three year.

APPENDIX A - OUTPUT POWER

Output Power (dBm):

Modulation	Band	WCDMA V		
	Tx Channel	4132CH	4182CH	4233CH
	Frequency	826.4MHz	836.4MHz	846.6MHz
QPSK	RMC 12.2K	21.75	21.74	21.85
16QAM	HSDPA Subtest-1	20.70	20.70	20.89
	HSDPA Subtest-2	20.05	20.14	20.10
	HSDPA Subtest-3	19.70	19.66	19.74
	HSDPA Subtest-4	19.57	19.81	19.87
	HSUPA Subtest-1	20.61	20.67	20.95
	HSUPA Subtest-2	20.79	20.76	21.01
	HSUPA Subtest-3	19.71	19.70	19.92
	HSUPA Subtest-4	20.77	20.78	20.94
	HSUPA Subtest-5	20.71	20.72	20.77

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20407CH	20525CH	20643CH
				824.7MHz	836.5MHz	848.3MHz
5 / 1.4M	QPSK	1	0	21.68	21.67	21.60
		1	2	21.77	21.69	21.72
		1	5	21.66	21.63	21.61
		3	0	21.80	21.72	21.67
		3	1	21.81	21.75	21.75
		3	2	21.83	21.74	21.70
		6	0	20.72	20.66	20.66
	16QAM	1	0	20.96	21.10	20.69
		1	2	21.06	21.14	20.78
		1	5	20.91	21.10	20.70
		3	0	20.93	20.96	20.86
		3	1	20.91	20.99	20.93
		3	2	20.91	20.97	20.91
		6	0	19.96	19.66	19.89

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20415CH	20525CH	20635CH
				825.5MHz	836.5MHz	847.5MHz
5 / 3M	QPSK	1	0	21.79	21.72	21.56
		1	7	21.91	21.82	21.73
		1	14	21.76	21.66	21.60
		8	0	20.69	20.71	20.67
		8	4	20.73	20.70	20.67
		8	7	20.68	20.66	20.57
		15	0	20.70	20.69	20.66
	16QAM	1	0	21.24	20.84	20.70
		1	7	21.34	20.96	20.78
		1	14	21.16	20.78	20.62
		8	0	19.89	19.75	19.82
		8	4	19.92	19.77	19.82
		8	7	19.88	19.74	19.74
		15	0	19.77	19.68	19.73

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20425CH	20525CH	20625CH
				826.5MHz	836.5MHz	846.5MHz
5 / 5M	QPSK	1	0	21.71	21.64	21.62
		1	13	21.79	21.70	21.72
		1	24	21.67	21.60	21.59
		12	0	20.65	20.72	20.68
		12	6	20.77	20.74	20.72
		12	11	20.75	20.73	20.65
		25	0	20.70	20.72	20.65
	16QAM	1	0	20.97	21.18	20.74
		1	13	21.00	21.26	20.82
		1	24	20.86	21.17	20.72
		12	0	19.75	19.89	19.72
		12	6	19.89	19.91	19.76
		12	11	19.88	19.87	19.68
		25	0	19.77	19.81	19.62

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20450CH	20525CH	20600CH
				829.0MHz	836.5MHz	844.0MHz
5 / 10M	QPSK	1	0	21.67	21.73	21.62
		1	25	21.64	21.77	21.73
		1	49	21.68	21.78	21.79
		25	0	20.66	20.69	20.72
		25	13	20.65	20.74	20.69
		25	25	20.70	20.75	20.77
		50	0	20.69	20.82	20.66
	16QAM	1	0	20.82	21.09	20.79
		1	25	20.88	21.27	20.87
		1	49	20.68	21.08	20.68
		25	0	19.73	19.86	19.81
		25	13	19.80	19.83	19.82
		25	25	19.75	19.81	19.70
		50	0	19.72	19.85	19.73

ERP Power (dBm):

Modulation	Band	WCDMA V		
	Tx Channel	4132CH	4182CH	4233CH
	Frequency	826.4MHz	836.4MHz	846.6MHz
QPSK	RMC 12.2K	21.10	21.09	21.20
16QAM	HSDPA Subtest-1	20.05	20.05	20.24
	HSDPA Subtest-2	19.40	19.49	19.45
	HSDPA Subtest-3	19.05	19.01	19.09
	HSDPA Subtest-4	18.92	19.16	19.22
	HSUPA Subtest-1	19.96	20.02	20.30
	HSUPA Subtest-2	20.14	20.11	20.36
	HSUPA Subtest-3	19.06	19.05	19.27
	HSUPA Subtest-4	20.12	20.13	20.29
	HSUPA Subtest-5	20.06	20.07	20.12

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20407CH	20525CH	20643CH
				824.7MHz	836.5MHz	848.3MHz
5 / 1.4M	QPSK	1	0	21.03	21.02	20.95
		1	2	21.12	21.04	21.07
		1	5	21.01	20.98	20.96
		3	0	21.15	21.07	21.02
		3	1	21.16	21.10	21.10
		3	2	21.18	21.09	21.05
		6	0	20.07	20.01	20.01
	16QAM	1	0	20.31	20.45	20.04
		1	2	20.41	20.49	20.13
		1	5	20.26	20.45	20.05
		3	0	20.28	20.31	20.21
		3	1	20.26	20.34	20.28
		3	2	20.26	20.32	20.26
		6	0	19.31	19.01	19.24

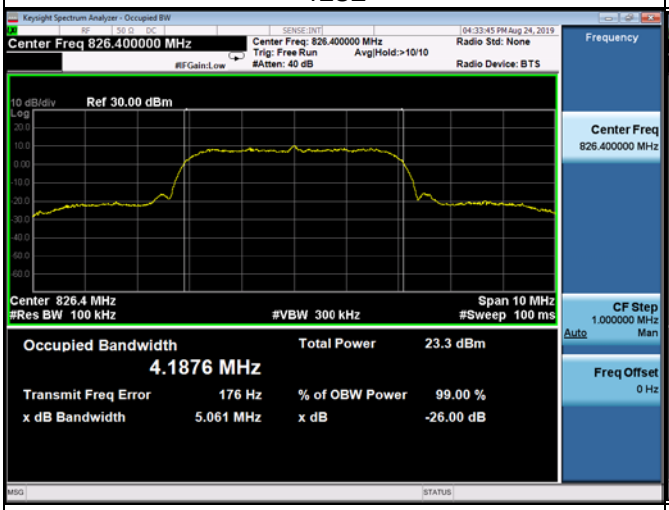
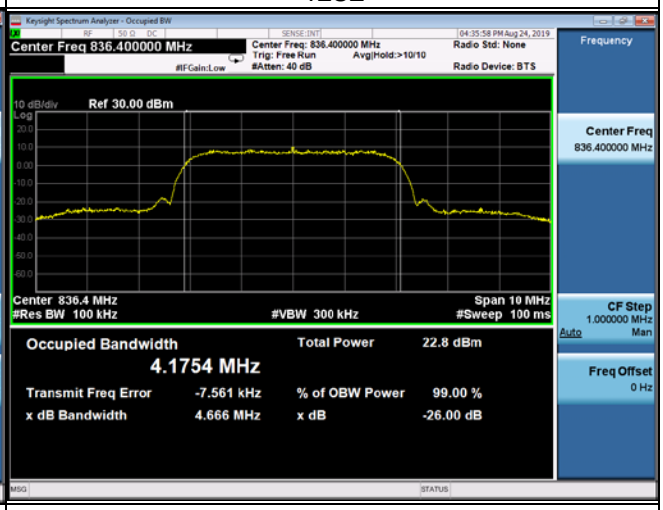
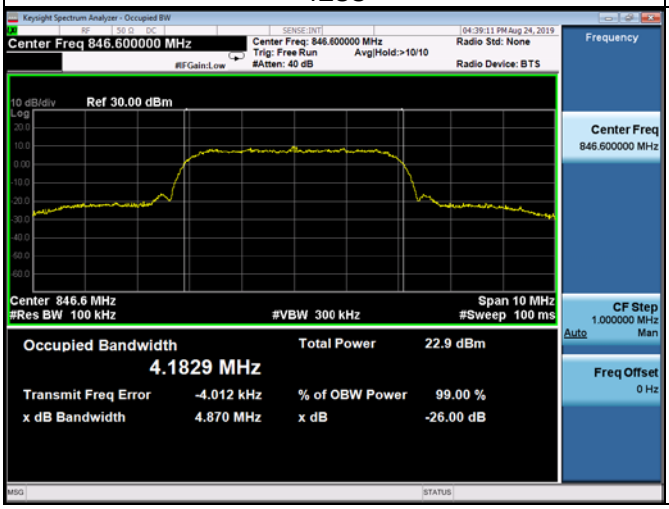
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20415CH	20525CH	20635CH
				825.5MHz	836.5MHz	847.5MHz
5 / 3M	QPSK	1	0	21.14	21.07	20.91
		1	7	21.26	21.17	21.08
		1	14	21.11	21.01	20.95
		8	0	20.04	20.06	20.02
		8	4	20.08	20.05	20.02
		8	7	20.03	20.01	19.92
		15	0	20.05	20.04	20.01
	16QAM	1	0	20.59	20.19	20.05
		1	7	20.69	20.31	20.13
		1	14	20.51	20.13	19.97
		8	0	19.24	19.10	19.17
		8	4	19.27	19.12	19.17
		8	7	19.23	19.09	19.09
		15	0	19.12	19.03	19.08

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20425CH	20525CH	20625CH
				826.5MHz	836.5MHz	846.5MHz
5 / 5M	QPSK	1	0	21.06	20.99	20.97
		1	13	21.14	21.05	21.07
		1	24	21.02	20.95	20.94
		12	0	20.00	20.07	20.03
		12	6	20.12	20.09	20.07
		12	11	20.10	20.08	20.00
		25	0	20.05	20.07	20.00
	16QAM	1	0	20.32	20.53	20.09
		1	13	20.35	20.61	20.17
		1	24	20.21	20.52	20.07
		12	0	19.10	19.24	19.07
		12	6	19.24	19.26	19.11
		12	11	19.23	19.22	19.03
		25	0	19.12	19.16	18.97

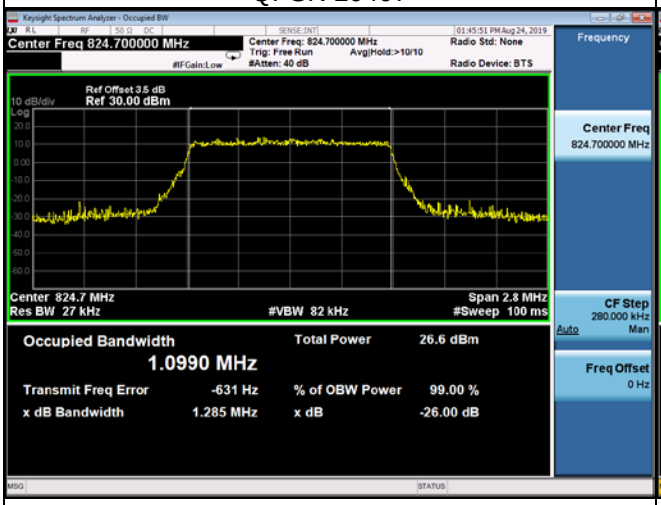
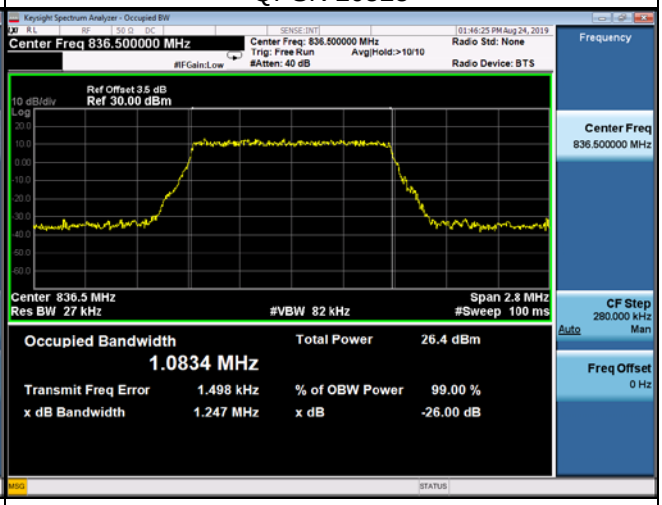
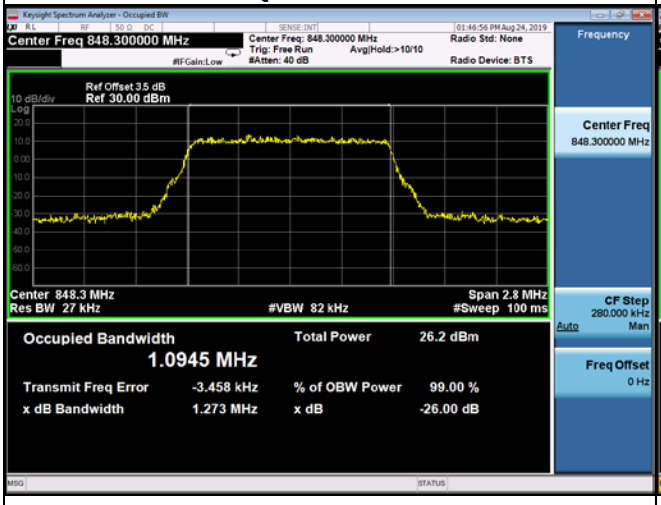
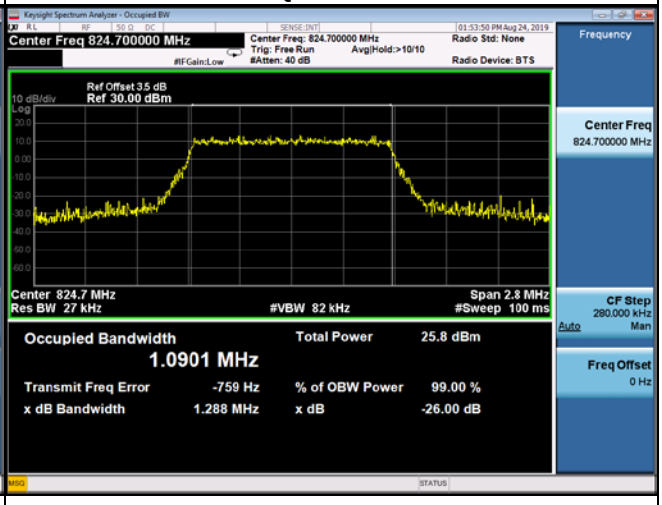
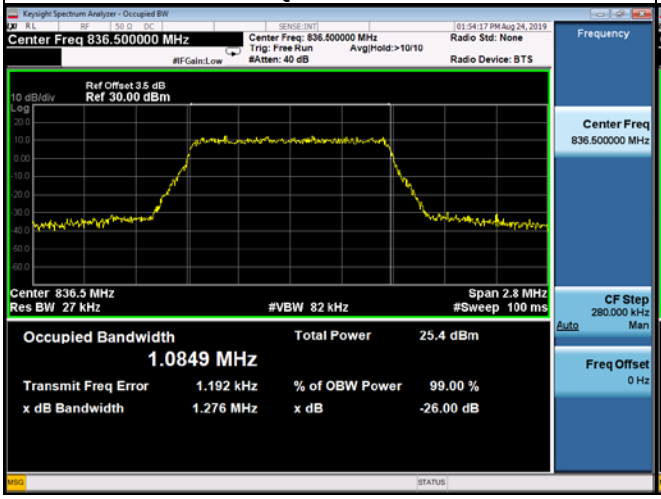
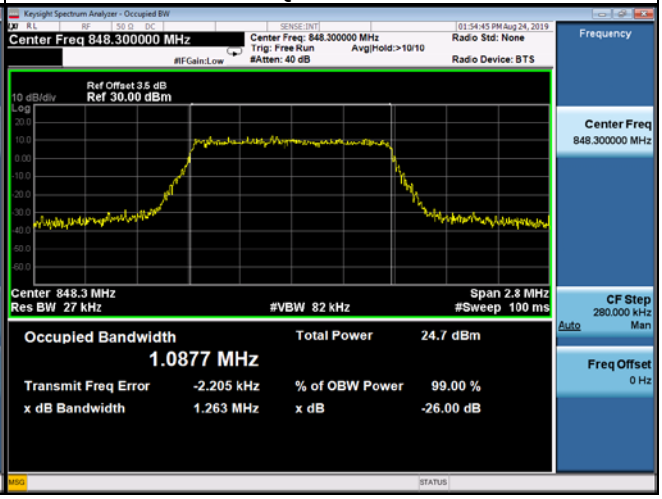
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20450CH	20525CH	20600CH
				829.0MHz	836.5MHz	844.0MHz
5 / 10M	QPSK	1	0	21.02	21.08	20.97
		1	25	20.99	21.12	21.08
		1	49	21.03	21.13	21.14
		25	0	20.01	20.04	20.07
		25	13	20.00	20.09	20.04
		25	25	20.05	20.10	20.12
		50	0	20.04	20.17	20.01
	16QAM	1	0	20.17	20.44	20.14
		1	25	20.23	20.62	20.22
		1	49	20.03	20.43	20.03
		25	0	19.08	19.21	19.16
		25	13	19.15	19.18	19.17
		25	25	19.10	19.16	19.05
		50	0	19.07	19.20	19.08

APPENDIX B - OCCUPIED BANDWIDTH

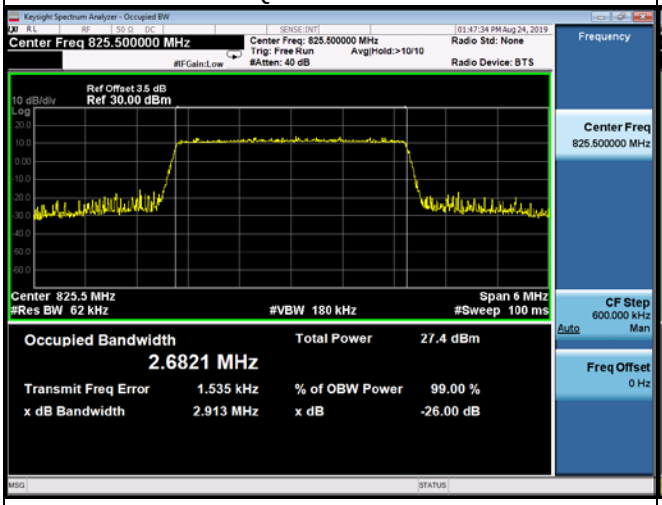
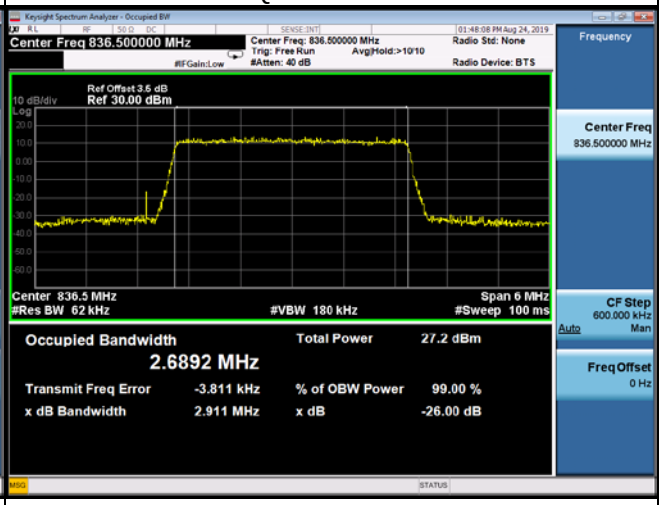
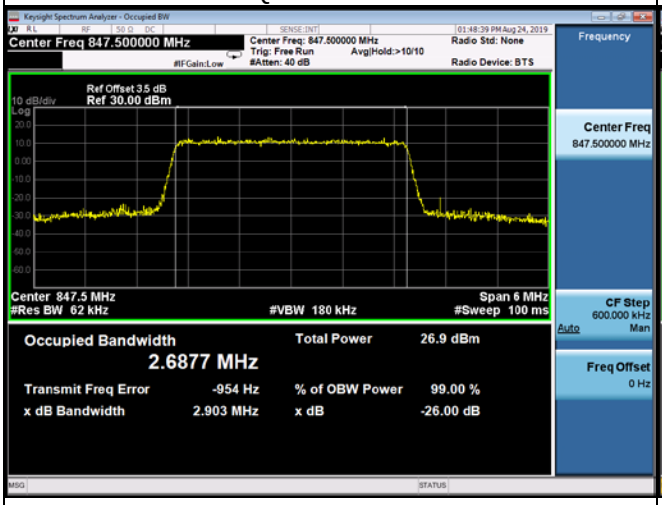
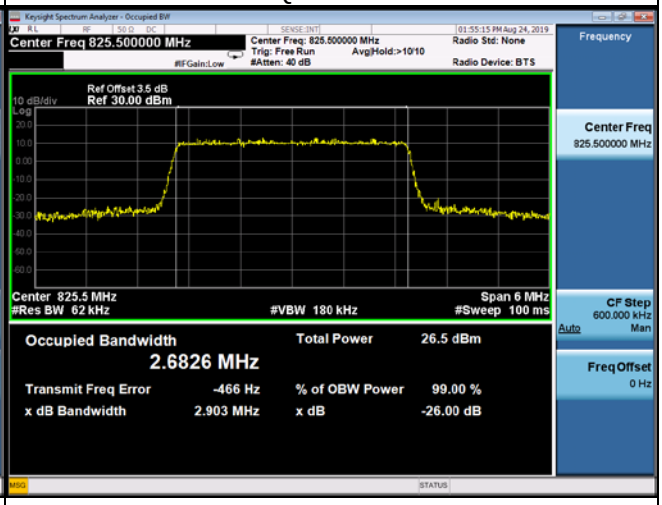
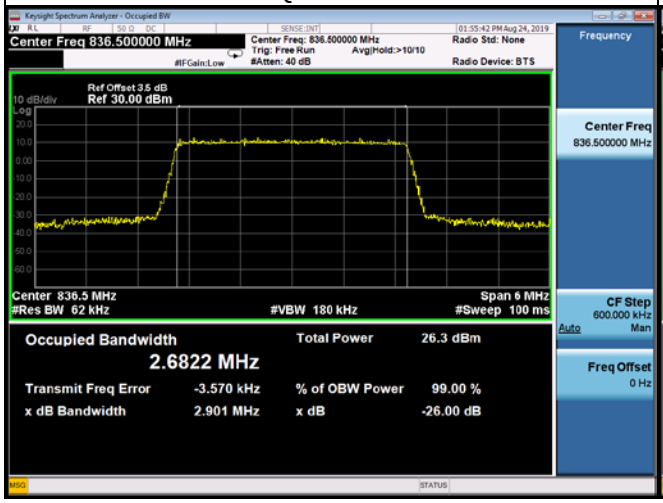
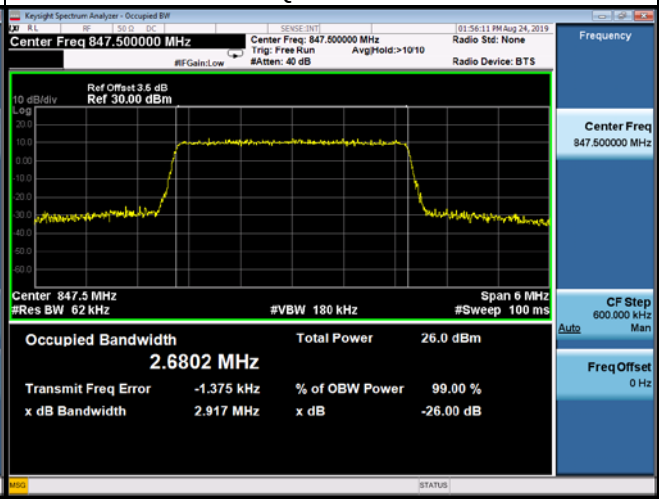
WCDMA Band V					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
4132	826.4	4.1876	4132	826.4	5.0610
4182	836.4	4.1754	4182	836.4	4.6660
4233	846.6	4.1829	4233	846.6	4.8700

Spectrum Plot	
4132	4182
	
4233	-
	-

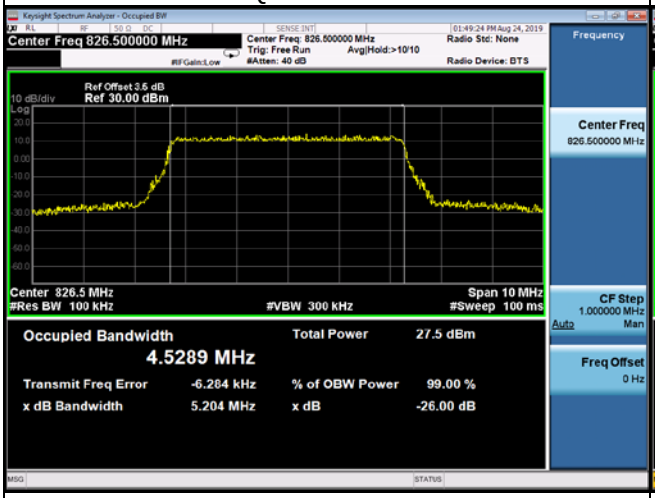
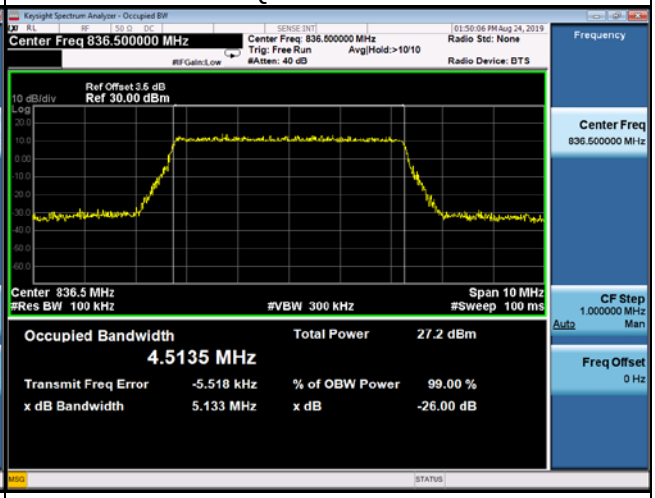
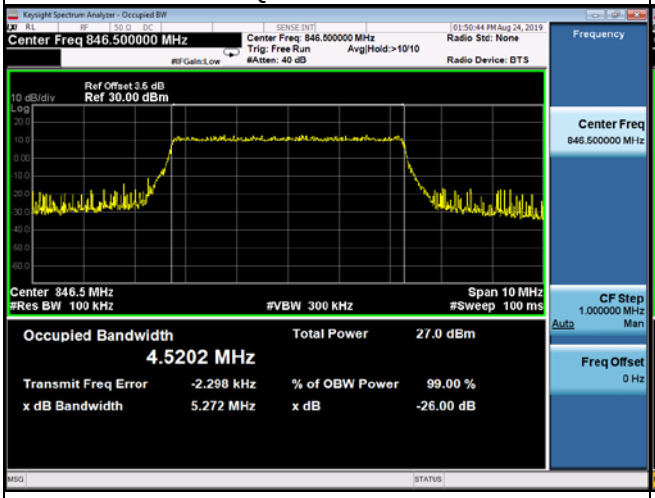
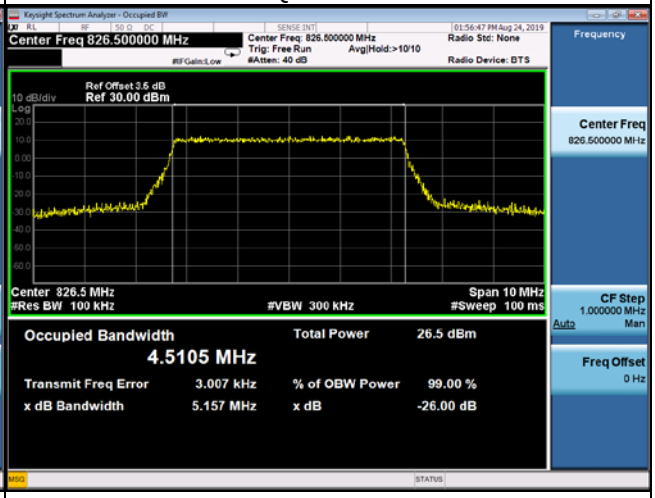
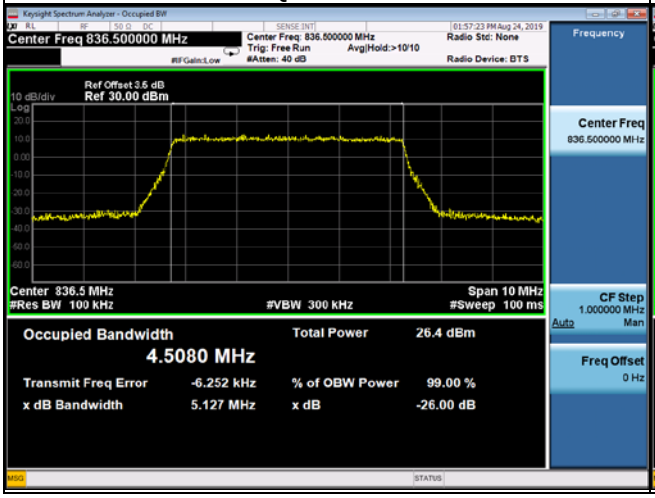
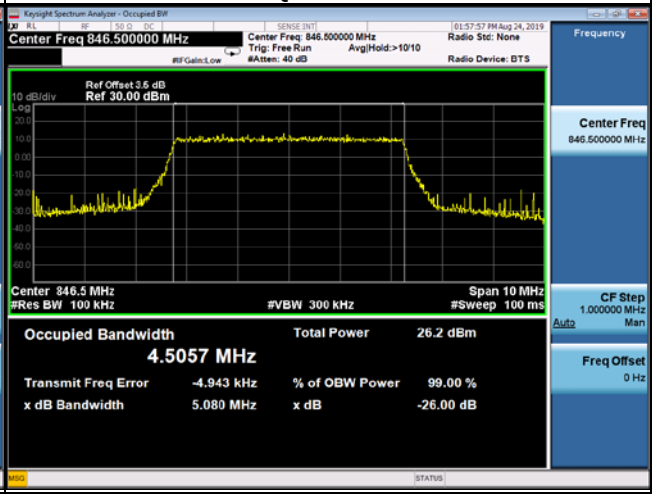
LTE Band 5_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20407	824.7	1.0990	20407	824.7	1.0901
20525	836.5	1.0834	20525	836.5	1.0849
20643	848.3	1.0945	20643	848.3	1.0877
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20407	824.7	1.2850	20407	824.7	1.2880
20525	836.5	1.2470	20525	836.5	1.2760
20643	848.3	1.2730	20643	848.3	1.2630

Spectrum Plot	
QPSK-20407	QPSK-20525
	
QPSK-20643	16QAM-20407
	
16QAM-20525	16QAM-20643
	

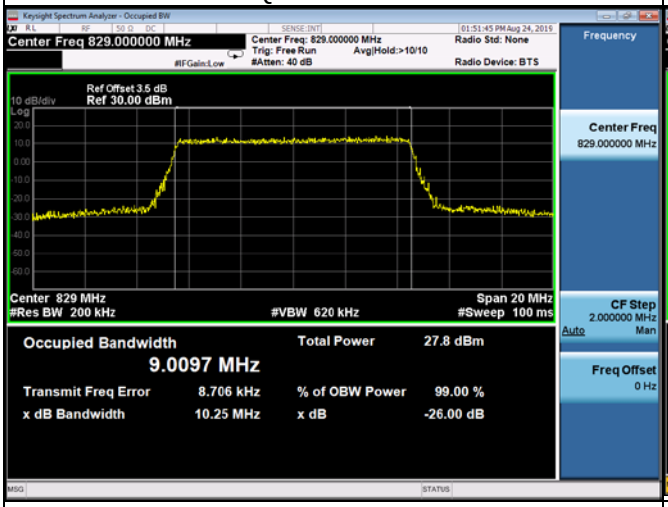
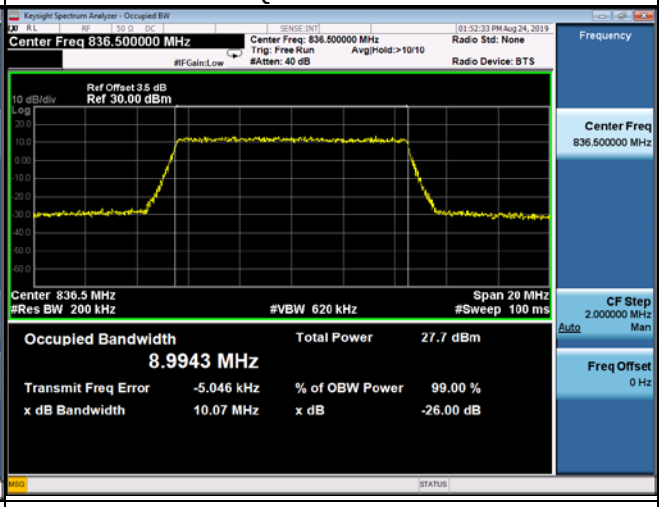
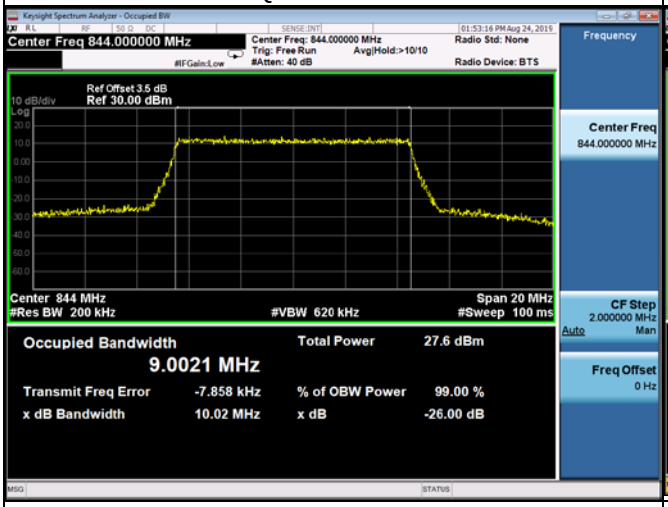
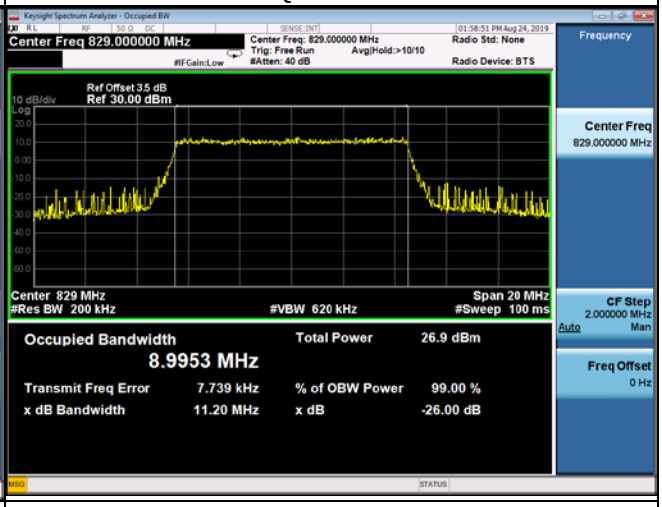
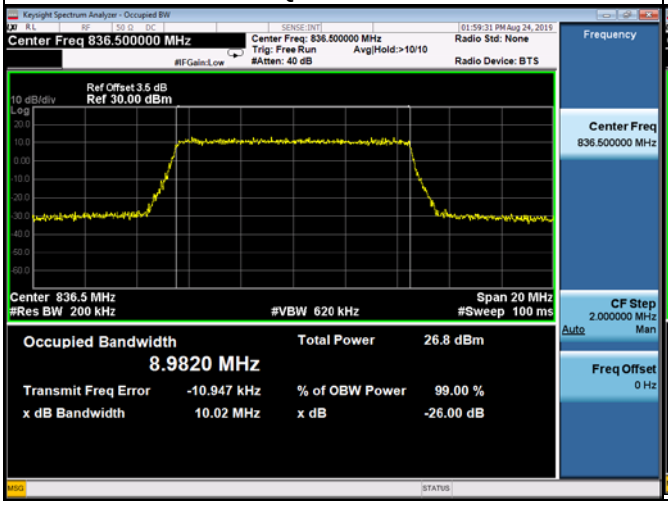
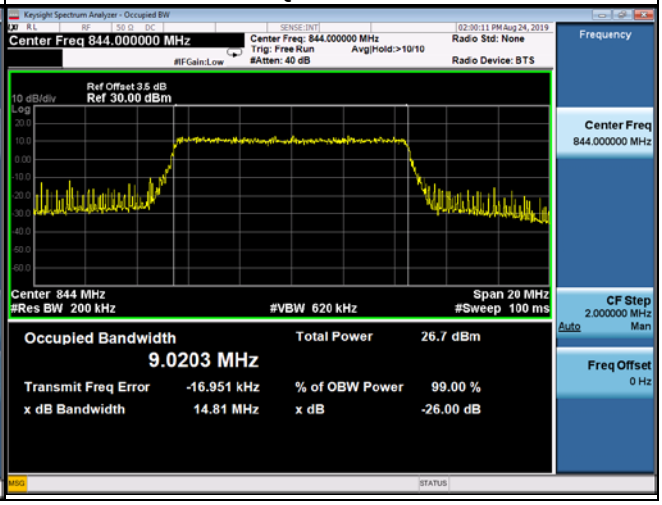
LTE Band 5_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20415	825.5	2.6821	20415	825.5	2.6826
20525	836.5	2.6892	20525	836.5	2.6822
20635	847.5	2.6877	20635	847.5	2.6802
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20415	825.5	2.9130	20415	825.5	2.9030
20525	836.5	2.9110	20525	836.5	2.9010
20635	847.5	2.9030	20635	847.5	2.9170

Spectrum Plot	
QPSK-20415	QPSK-20525
	
QPSK-20635	16QAM-20415
	
16QAM-20525	16QAM-20635
	

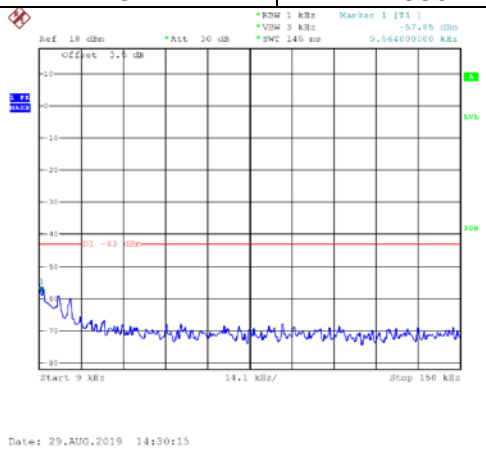
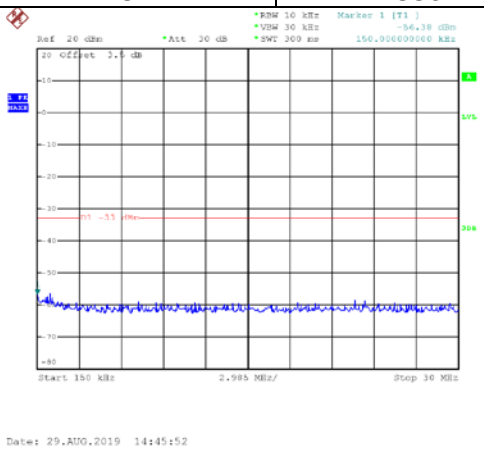
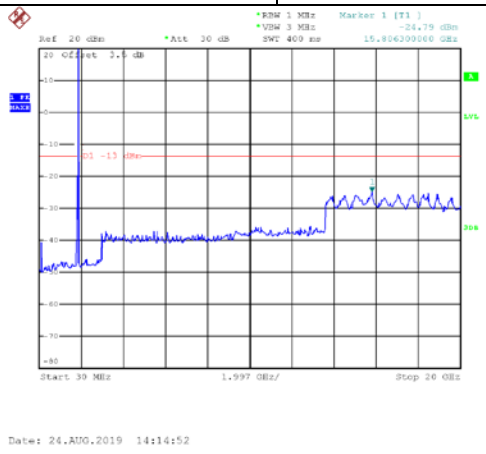
LTE Band 5_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20425	826.5	4.5289	20425	826.5	4.5105
20525	836.5	4.5135	20525	836.5	4.5080
20625	846.5	4.5202	20625	846.5	4.5057
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20425	826.5	5.2040	20425	826.5	5.1570
20525	836.5	5.1330	20525	836.5	5.1270
20625	846.5	5.2720	20625	846.5	5.0800

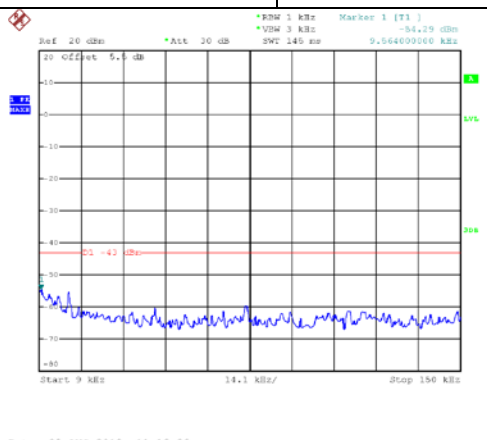
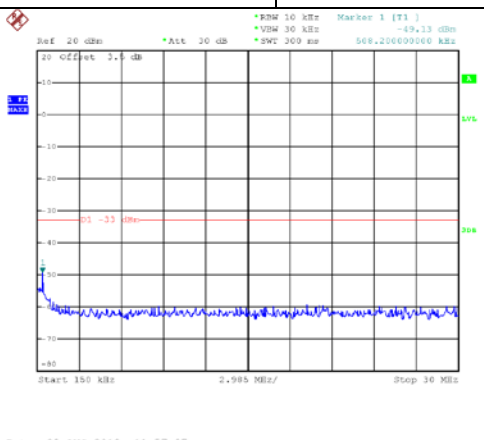
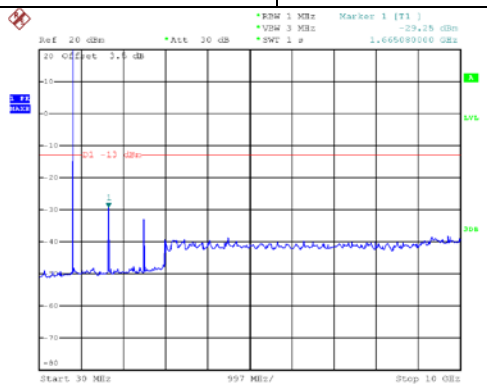
Spectrum Plot	
QPSK-20425	QPSK-20525
	
QPSK-20625	16QAM-20425
	
16QAM-20525	16QAM-20625
	

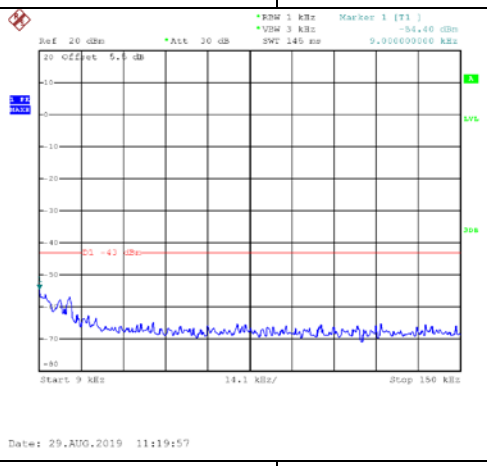
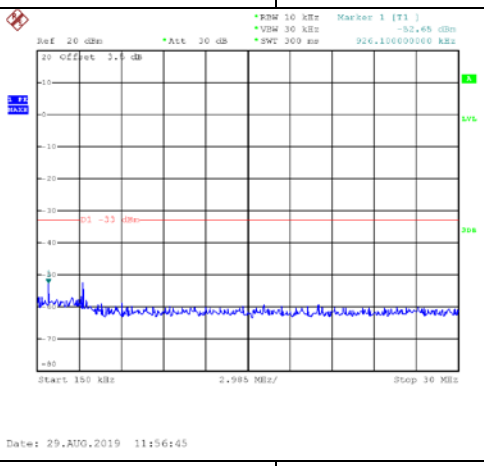
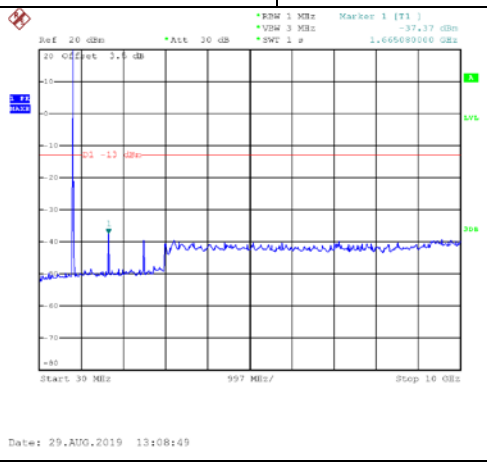
LTE Band 5_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20450	829.0	9.0097	20450	829.0	8.9953
20525	836.5	8.9943	20525	836.5	8.9820
20600	844.0	9.0021	20600	844.0	9.0203
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20450	829.0	10.250	20450	829.0	11.200
20525	836.5	10.070	20525	836.5	10.020
20600	844.0	10.020	20600	844.0	14.810

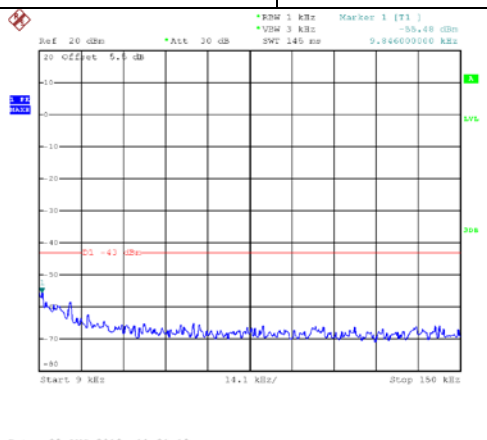
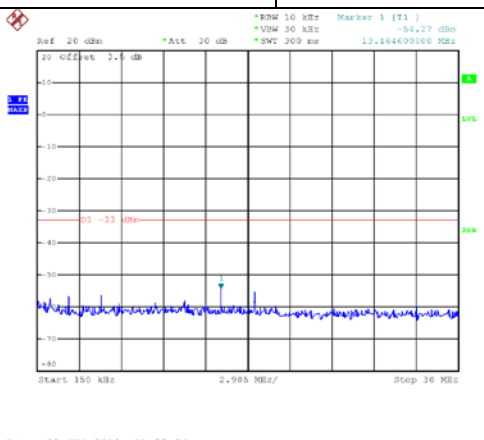
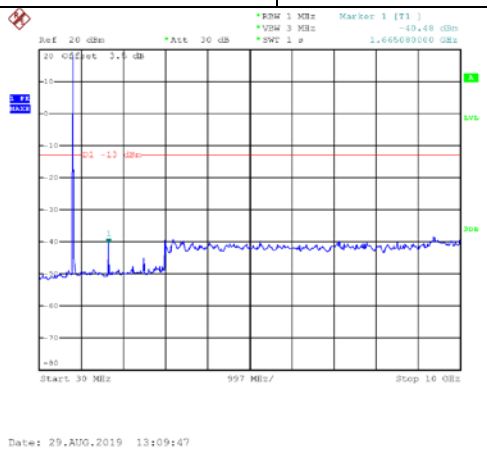
Spectrum Plot	
QPSK-20450	QPSK-20525
	
QPSK-20600	16QAM-20450
	
16QAM-20525	16QAM-20600
	

APPENDIX C - CONDUCTED EMISSIONS

WCDMA Band V			
Channel	Frequency(MHz)	Channel	Frequency(MHz)
4182	836.4	4182	836.4
			
Channel	Frequency(MHz)	-	-
4182	836.4	-	-
		-	

LTE Band 5_1.4M			
Channel	Frequency(MHz)	Channel	Frequency(MHz)
20525	836.5	20525	836.5
			
Channel	Frequency(MHz)	-	-
20525	836.5	-	-
		-	

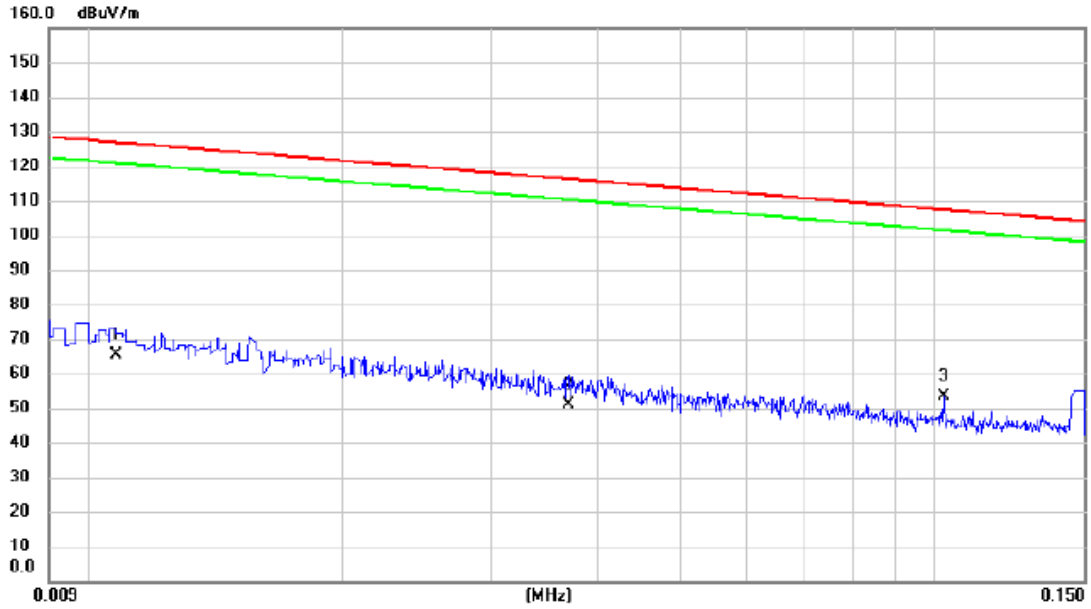
<table>
<tr><td colspan="4">LTE Band 5_5M</td></tr>
<tr><td>Channel</td><td>Frequency(MHz)</td><td>Channel</td><td>Frequency(MHz)</td></tr>
<tr><td>20525</td><td>836.5</td><td>20525</td><td>836.5</td></tr>
<tr><td>  </td><td colspan="2">  </td></tr>
<tr><td>Channel</td><td>Frequency(MHz)</td><td>-</td><td>-</td></tr>
<tr><td>20525</td><td>836.5</td><td>-</td><td>-</td></tr>
<tr><td>  </td><td colspan="2">-</td></tr>
</table>

LTE Band 5_10M			
Channel	Frequency(MHz)	Channel	Frequency(MHz)
20525	836.5	20525	836.5
			
Channel	Frequency(MHz)	-	-
20525	836.5	-	-
		-	

APPENDIX D - RADIATED EMISSION (9KHZ TO 30MHZ)

Test Mode:	TX Mode

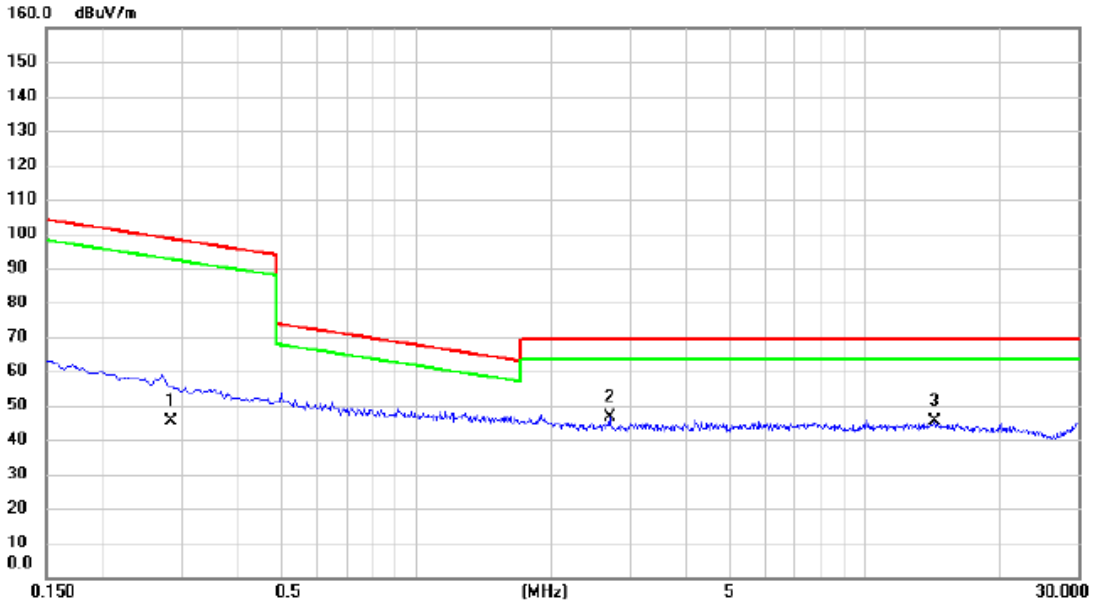
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0108	-12.70	77.91	65.21	126.94	-61.73	AVG	
2		0.0370	-16.67	67.60	50.93	116.24	-65.31	AVG	
3	*	0.1025	-4.56	57.85	53.29	107.39	-54.10	QP	

Test Mode:	TX Mode

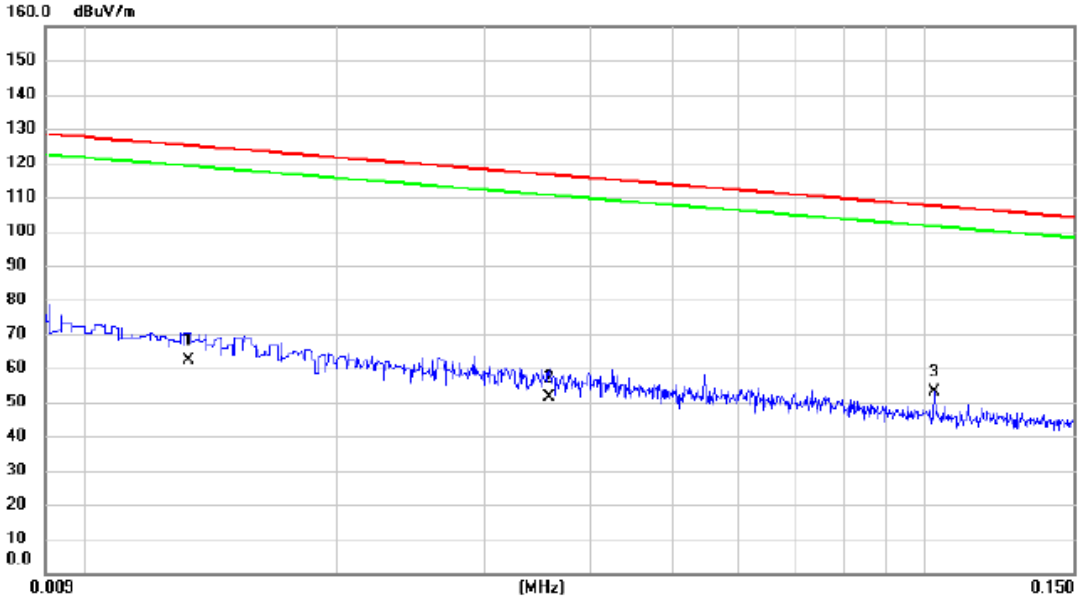
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.2850	-3.90	49.21	45.31	98.51	-53.20	AVG	
2	*	2.7015	8.23	38.24	46.47	69.54	-23.07	QP	
3		14.2980	7.35	38.14	45.49	69.54	-24.05	QP	

Test Mode:	TX Mode

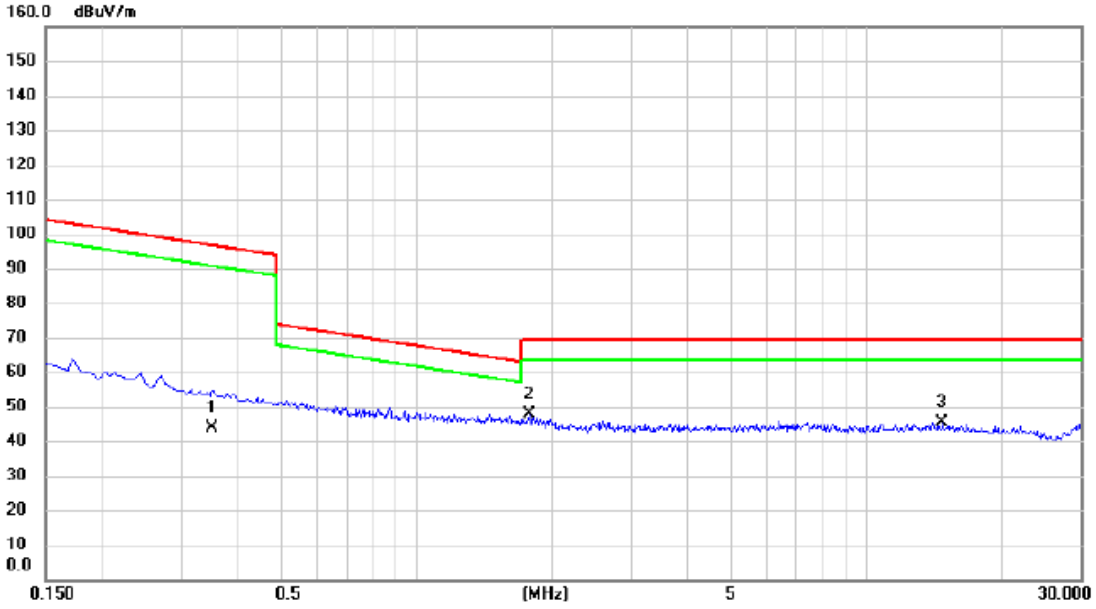
Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0133	-14.30	76.39	62.09	125.13	-63.04	AVG	
2		0.0357	-16.40	67.99	51.59	116.55	-64.96	AVG	
3	*	0.1025	-4.90	57.85	52.95	107.39	-54.44	QP	

Test Mode:	TX Mode

Ant 90°

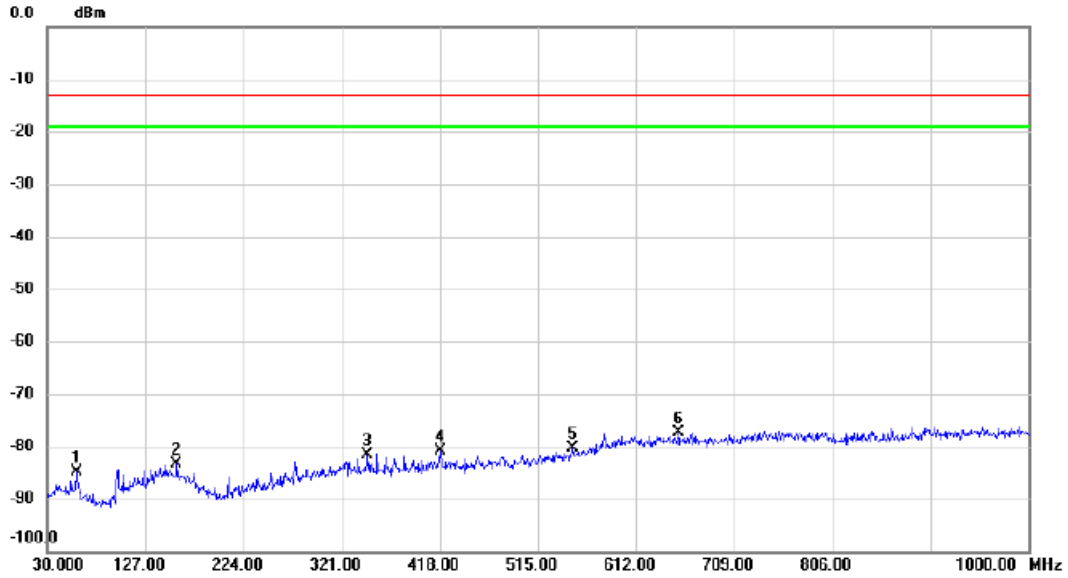


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.3525	-3.80	47.55	43.75	96.66	-52.91	AVG	
2	*	1.7790	8.54	39.33	47.87	69.54	-21.67	QP	
3		14.7930	7.42	38.06	45.48	69.54	-24.06	QP	

APPENDIX E - RADIATED EMISSION (30MHZ TO 1GHZ)

Test Mode:	WCDMA Band V_TX Mode

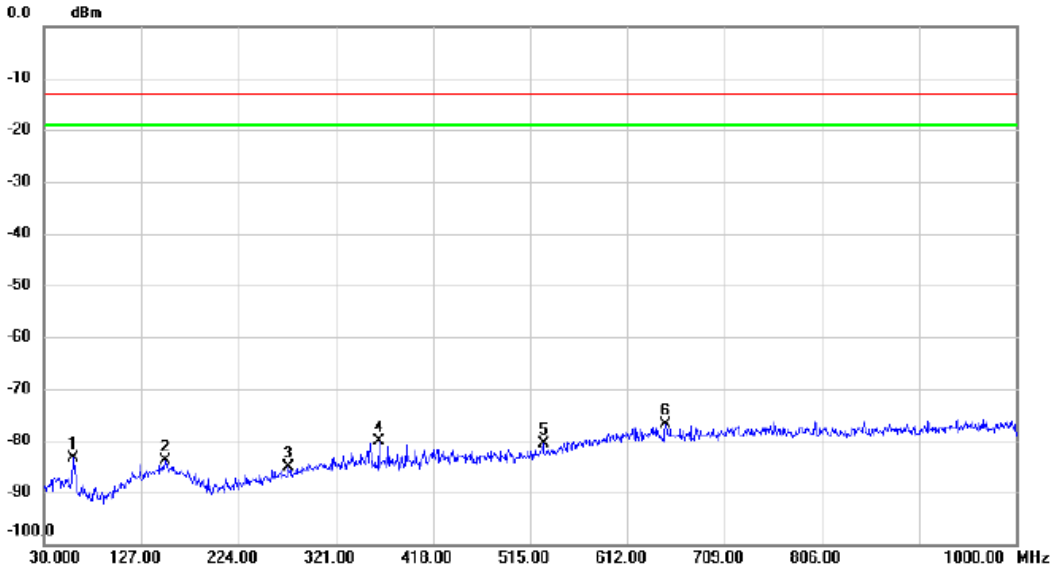
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		58.5180	-67.80	-17.06	-84.86	-13.00	-71.86	peak	
2		157.4580	-69.48	-13.97	-83.45	-13.00	-70.45	peak	
3		346.5110	-68.84	-12.69	-81.53	-13.00	-68.53	peak	
4		418.4850	-68.93	-11.86	-80.79	-13.00	-67.79	peak	
5		549.4350	-70.56	-9.88	-80.44	-13.00	-67.44	peak	
6	*	654.1950	-70.25	-7.01	-77.26	-13.00	-64.26	peak	

Test Mode:	WCDMA Band V_TX Mode

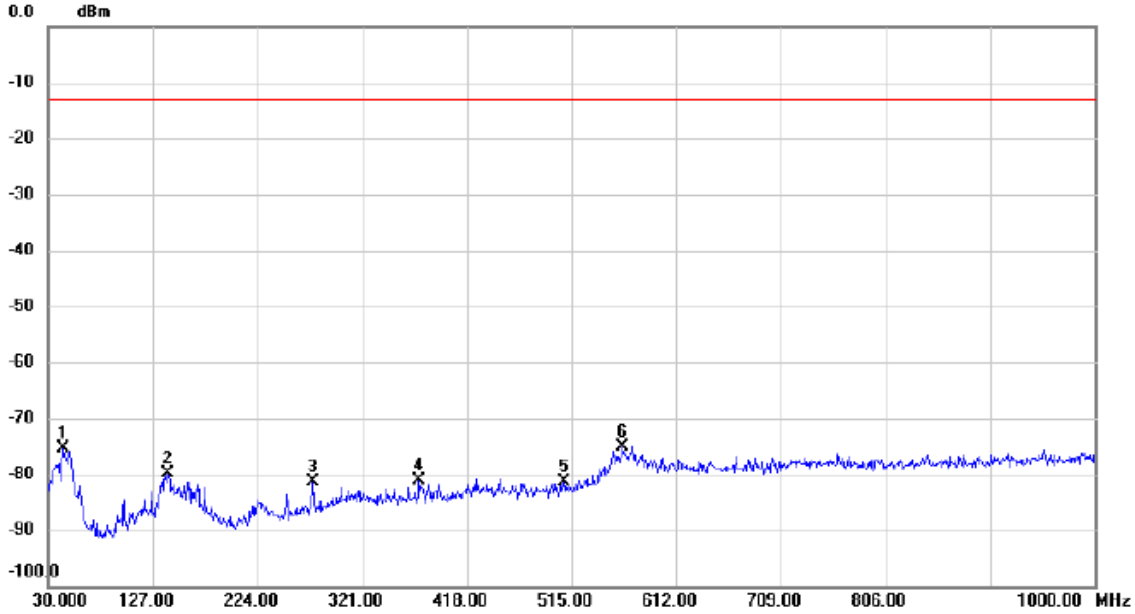
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		58.5180	-66.26	-17.06	-83.32	-13.00	-70.32	peak	
2		151.2500	-70.26	-13.62	-83.88	-13.00	-70.88	peak	
3		273.8580	-70.60	-14.56	-85.16	-13.00	-72.16	peak	
4		364.4560	-67.58	-12.61	-80.19	-13.00	-67.19	peak	
5		527.9980	-70.05	-10.48	-80.53	-13.00	-67.53	peak	
6	*	649.8300	-69.87	-7.00	-76.87	-13.00	-63.87	peak	

Test Mode:	LTE Band 5_TX Mode

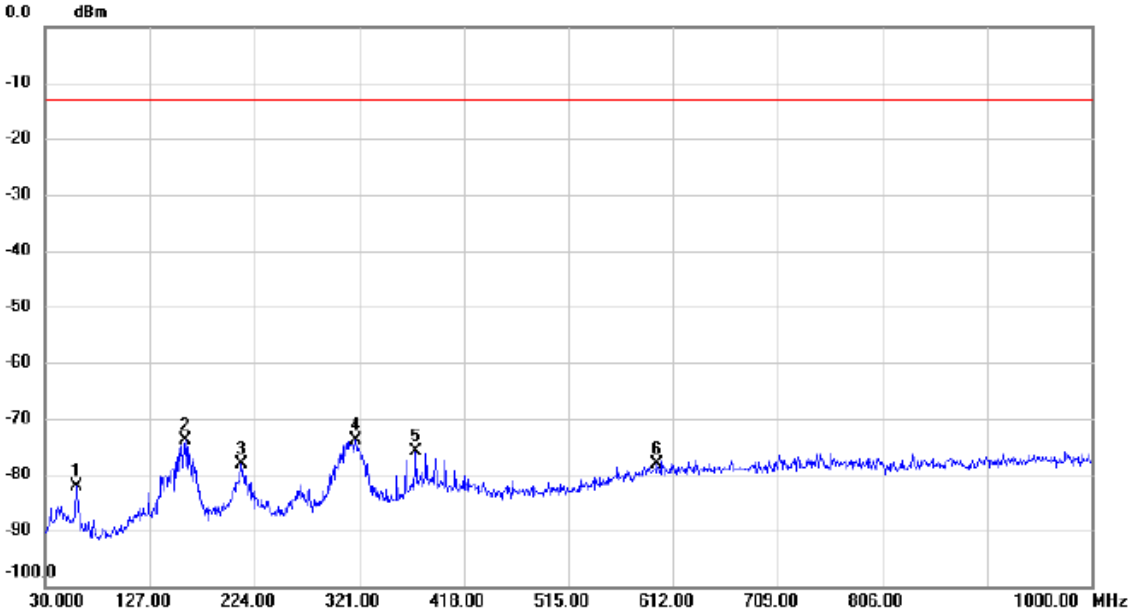
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		44.1620	-58.70	-16.74	-75.44	-13.00	-62.44	peak	
2		139.9980	-65.37	-14.41	-79.78	-13.00	-66.78	peak	
3		275.6040	-66.93	-14.44	-81.37	-13.00	-68.37	peak	
4		373.4770	-68.45	-12.72	-81.17	-13.00	-68.17	peak	
5		507.9190	-70.38	-11.03	-81.41	-13.00	-68.41	peak	
6	*	561.7540	-65.90	-9.24	-75.14	-13.00	-62.14	peak	

Test Mode:	LTE Band 5_TX Mode

Horizontal

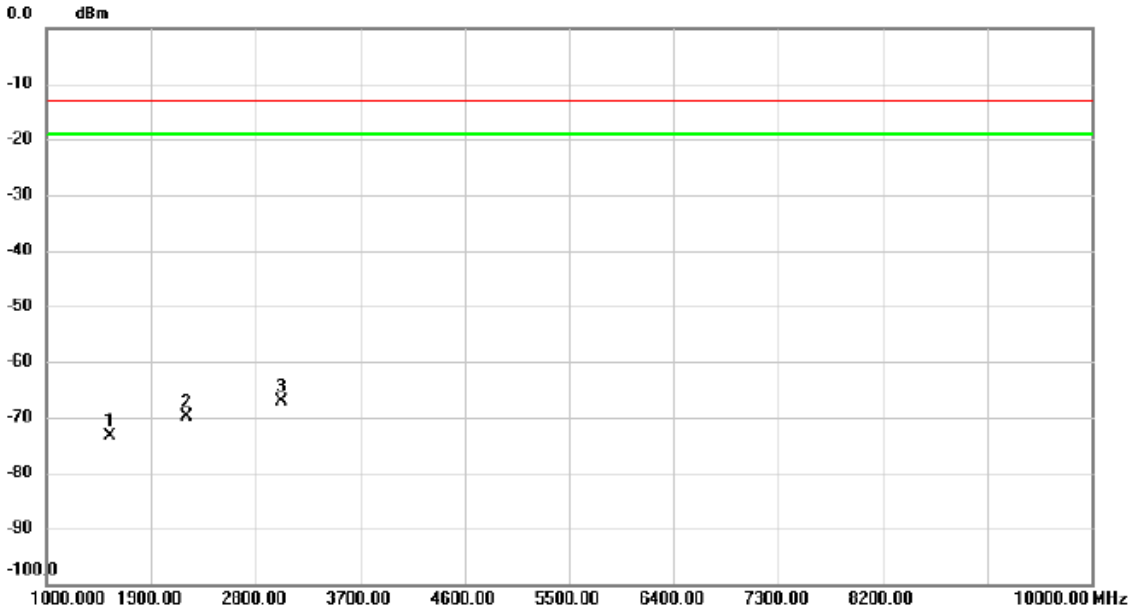


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		58.7120	-64.99	-17.07	-82.06	-13.00	-69.06	peak	
2		159.6890	-59.90	-14.09	-73.99	-13.00	-60.99	peak	
3		211.4870	-60.89	-17.23	-78.12	-13.00	-65.12	peak	
4	*	317.2170	-60.89	-13.06	-73.95	-13.00	-60.95	peak	
5		373.4770	-63.16	-12.72	-75.88	-13.00	-62.88	peak	
6		597.6440	-70.70	-7.38	-78.08	-13.00	-65.08	peak	

APPENDIX F - RADIATED EMISSION (ABOVE 1GHZ)

Test Mode:	WCDMA Band V_TX CH4182

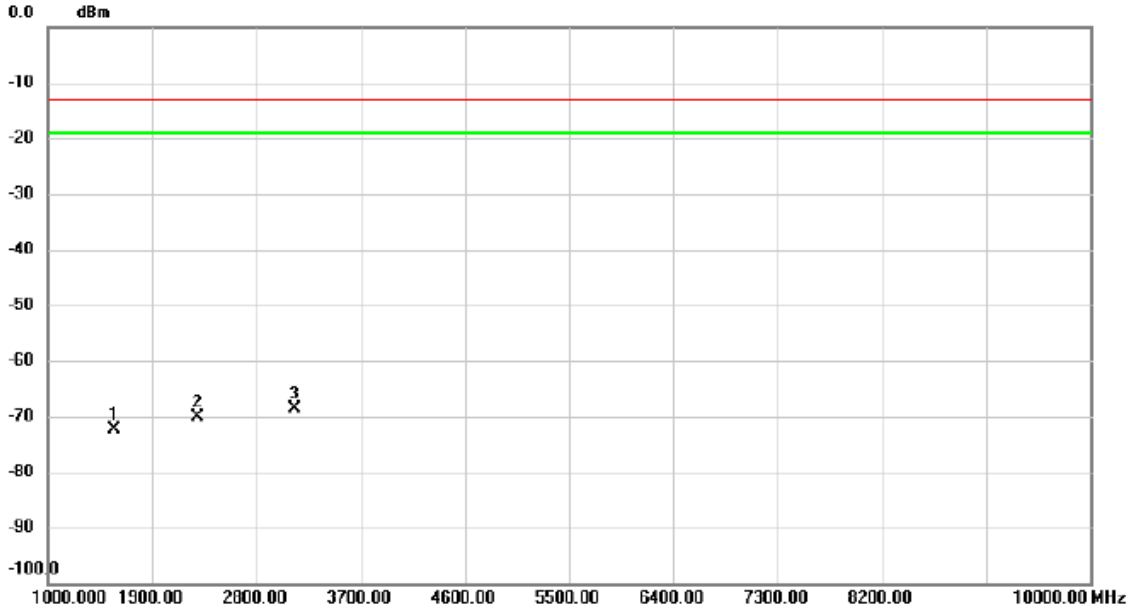
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		1547.200	-54.83	-18.42	-73.25	-13.00	-60.25	peak	
2		2206.600	-53.85	-16.01	-69.86	-13.00	-56.86	peak	
3	*	3024.100	-53.50	-13.71	-67.21	-13.00	-54.21	peak	

Test Mode:	WCDMA Band V_TX CH4182

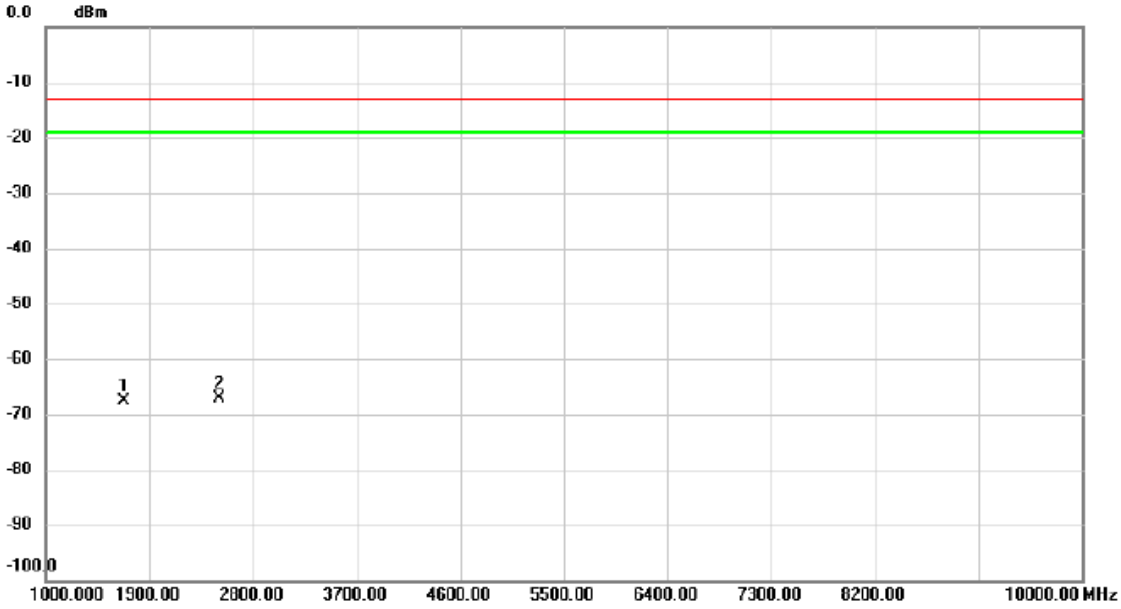
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		1564.900	-54.01	-18.35	-72.36	-13.00	-59.36	peak	
2		2294.800	-54.28	-15.76	-70.04	-13.00	-57.04	peak	
3	*	3131.500	-55.05	-13.64	-68.69	-13.00	-55.69	peak	

Test Mode:	LTE Band 5_TX CH20525_1.4M

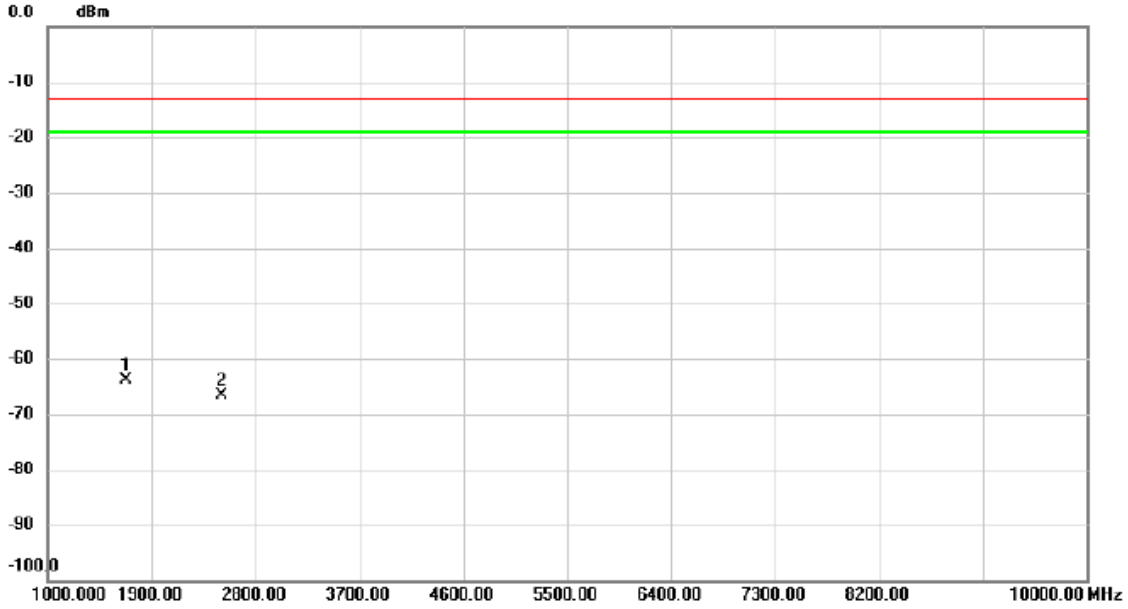
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		1672.300	-49.62	-17.92	-67.54	-13.00	-54.54	peak	
2	*	2508.400	-51.91	-15.13	-67.04	-13.00	-54.04	peak	

Test Mode:	LTE Band 5_TX CH20525_1.4M

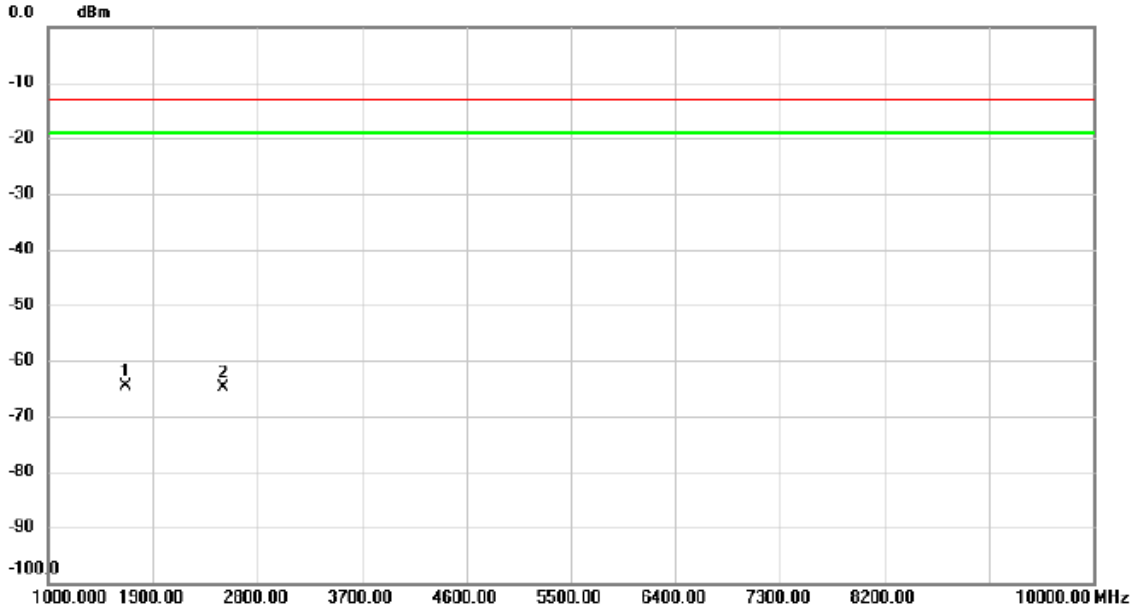
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1672.300	-46.07	-17.92	-63.99	-13.00	-50.99	peak	
2		2508.700	-51.48	-15.13	-66.61	-13.00	-53.61	peak	

Test Mode:	LTE Band 5_TX CH20525_5M

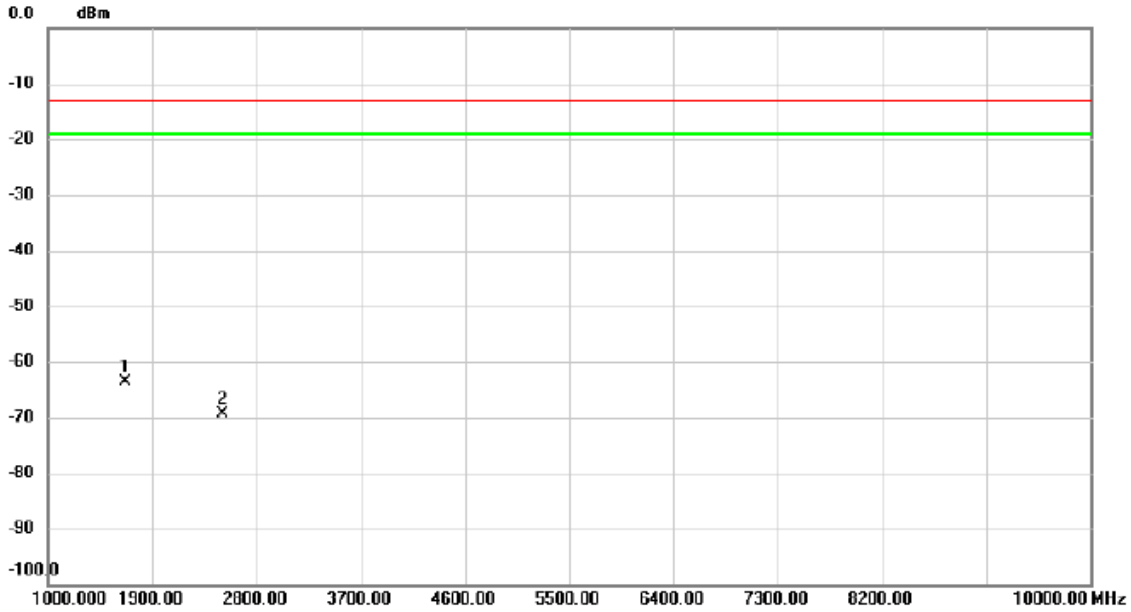
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1668.400	-46.59	-17.94	-64.53	-13.00	-51.53	peak	
2		2503.000	-49.62	-15.15	-64.77	-13.00	-51.77	peak	

Test Mode:	LTE Band 5_TX CH20525_5M

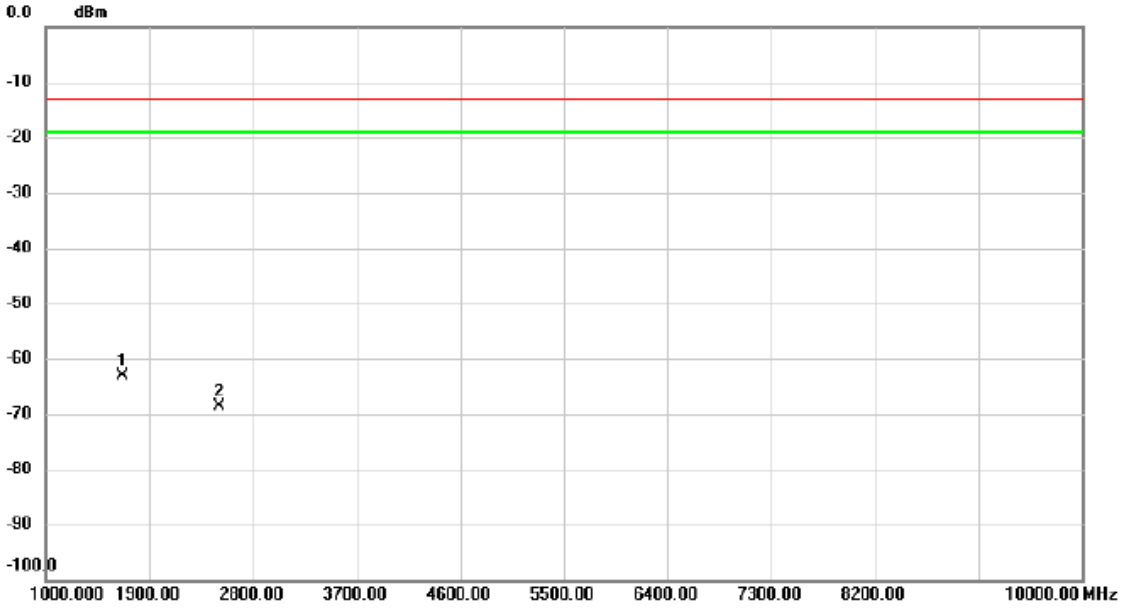
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1669.000	-45.56	-17.94	-63.50	-13.00	-50.50	peak	
2		2508.343	-54.35	-15.13	-69.48	-13.00	-56.48	peak	

Test Mode:	LTE Band 5_TX CH20525_10M

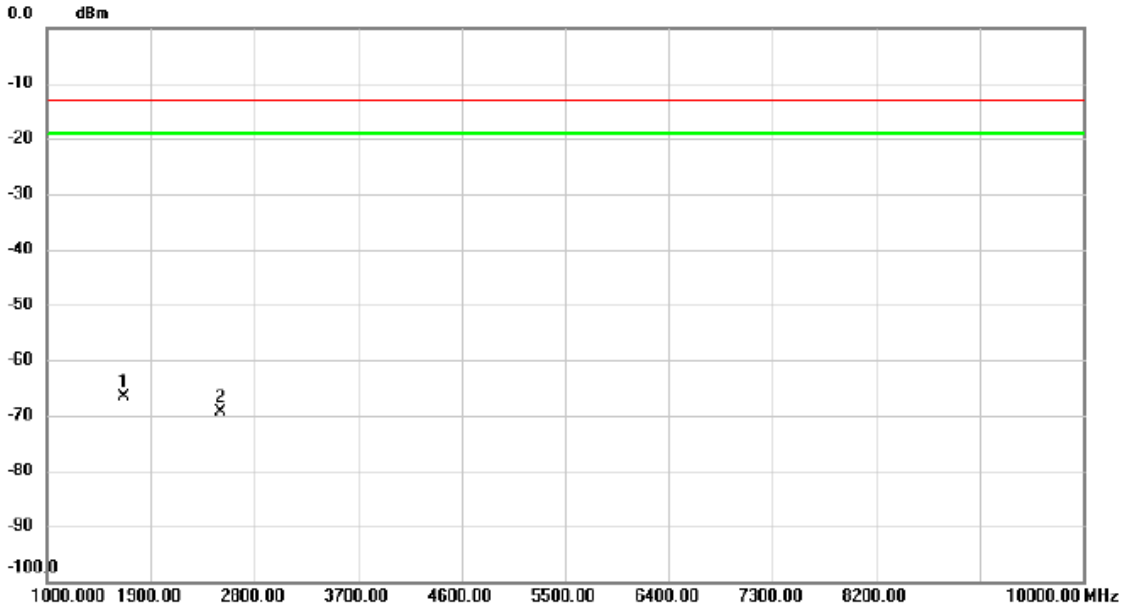
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1664.200	-45.12	-17.95	-63.07	-13.00	-50.07	peak	
2		2508.037	-53.55	-15.14	-68.69	-13.00	-55.69	peak	

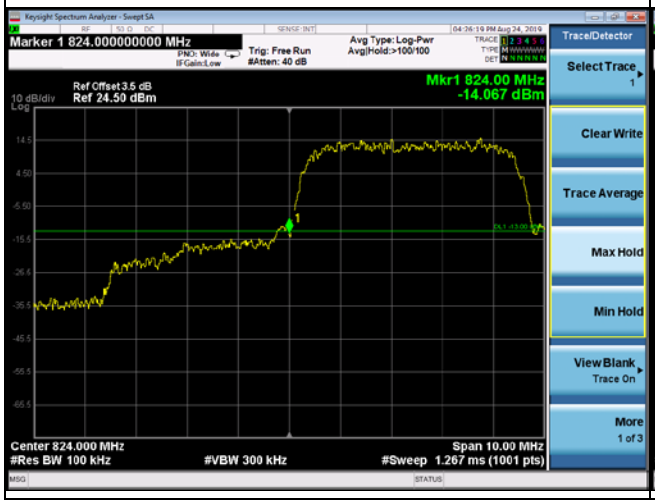
Test Mode:	LTE Band 5_TX CH20525_10M

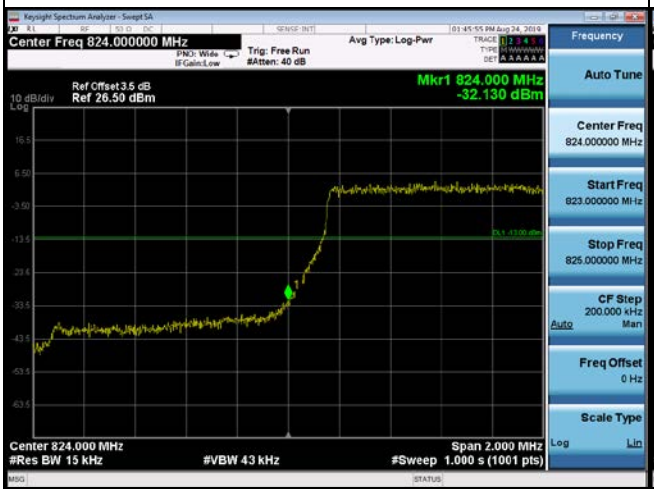
Horizontal

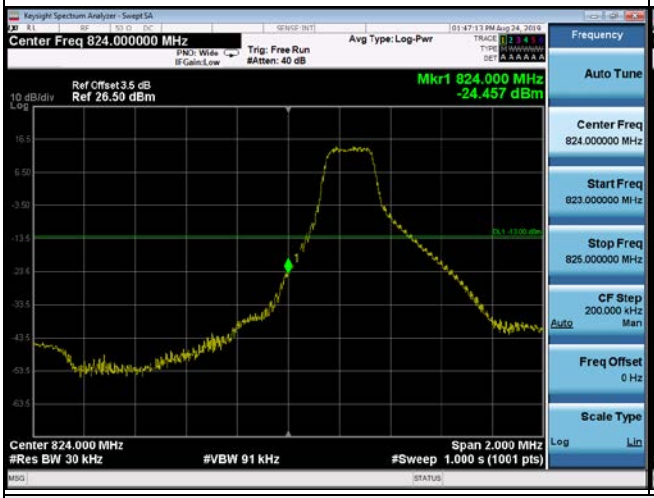
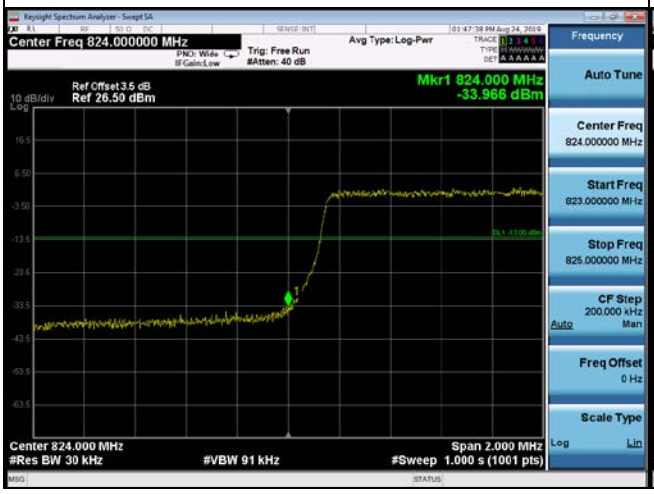
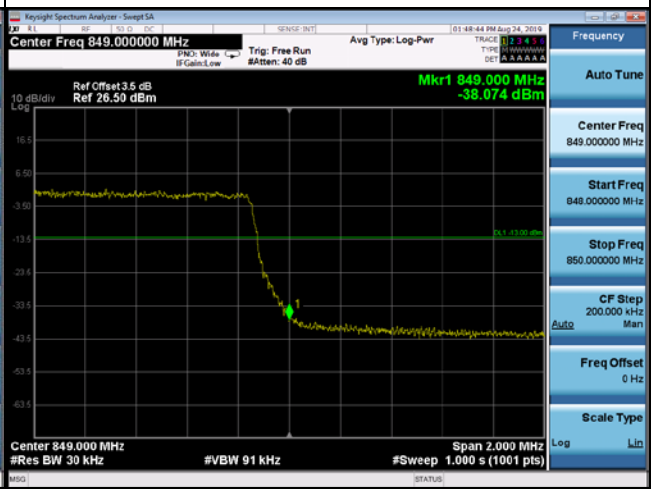


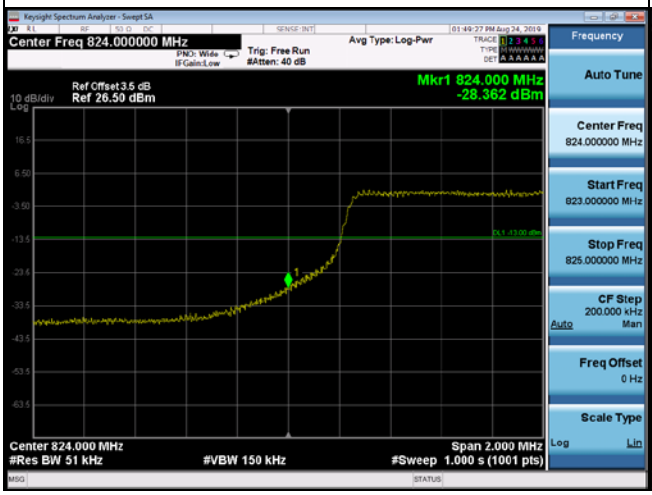
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	*	1664.500	-48.70	-17.95	-66.65	-13.00	-53.65	peak	
2		2507.434	-54.17	-15.14	-69.31	-13.00	-56.31	peak	

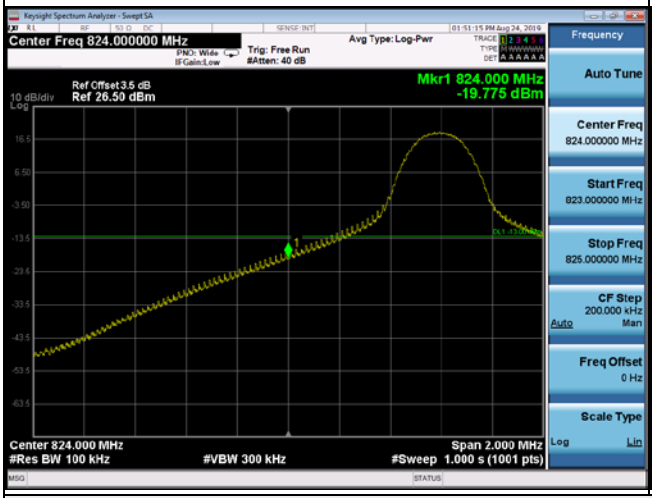
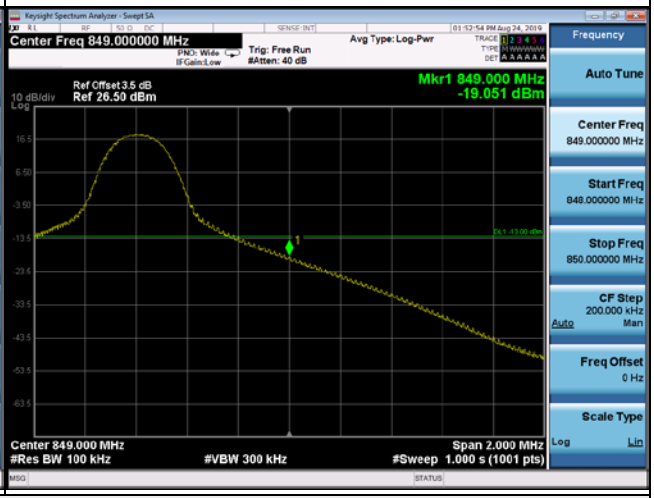
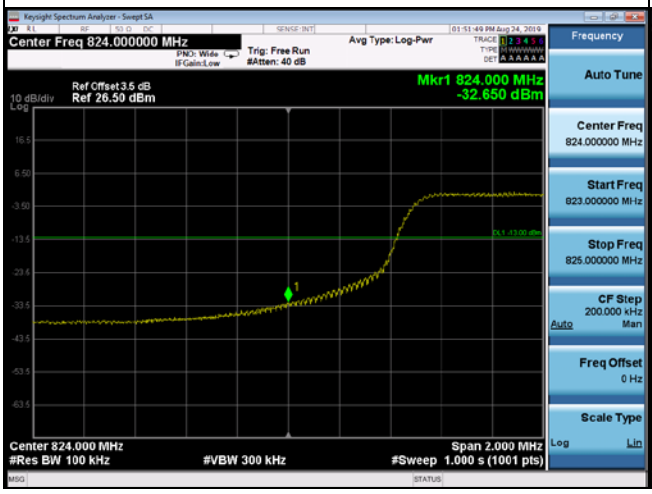
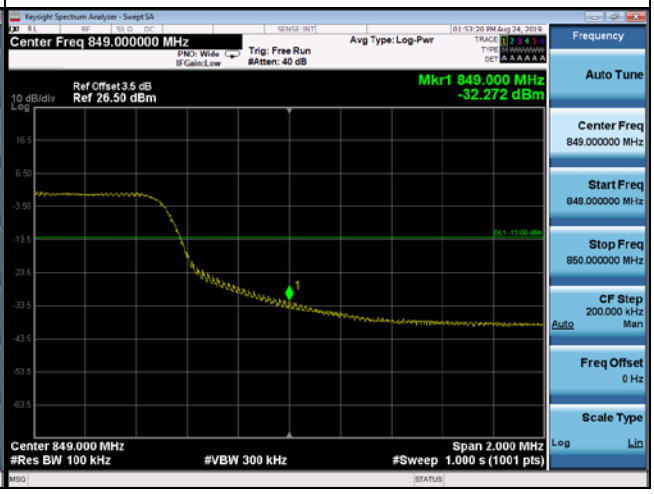
APPENDIX G - BAND EDGE

WCDMA Band V			
Channel	4132	Channel	4233
			

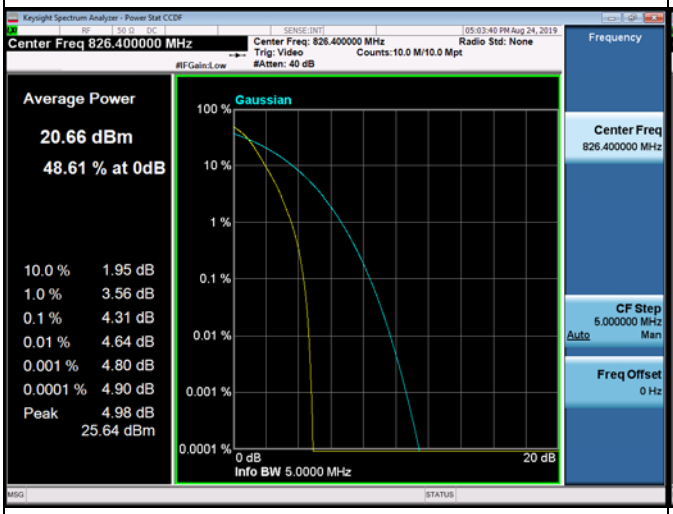
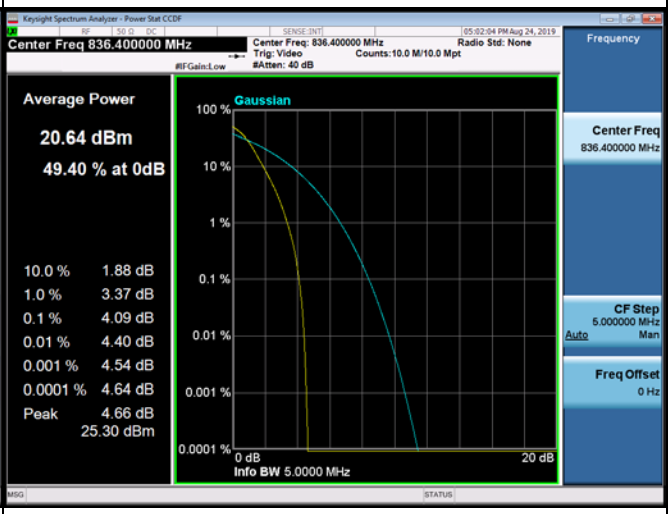
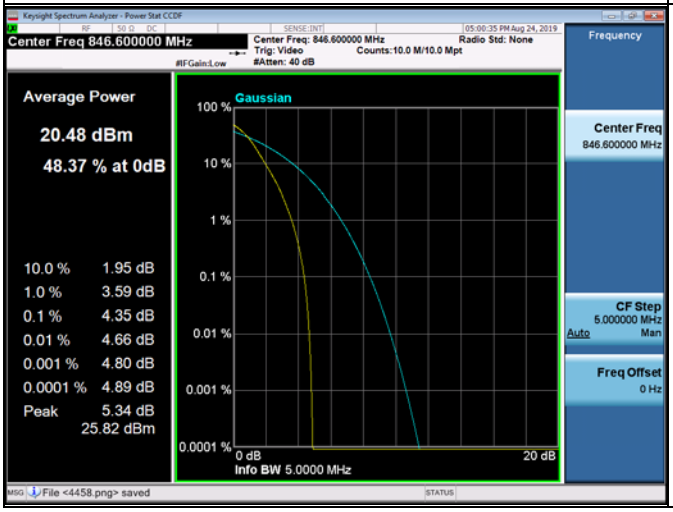
LTE Band 5_1.4M			
1RB#0		1RB#5	
Channel	20407	Channel	20643
			
6RB#0			
Channel	20407	Channel	20643
			

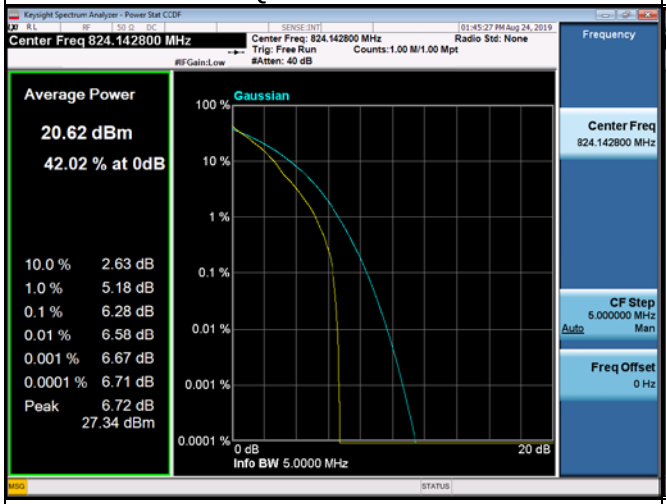
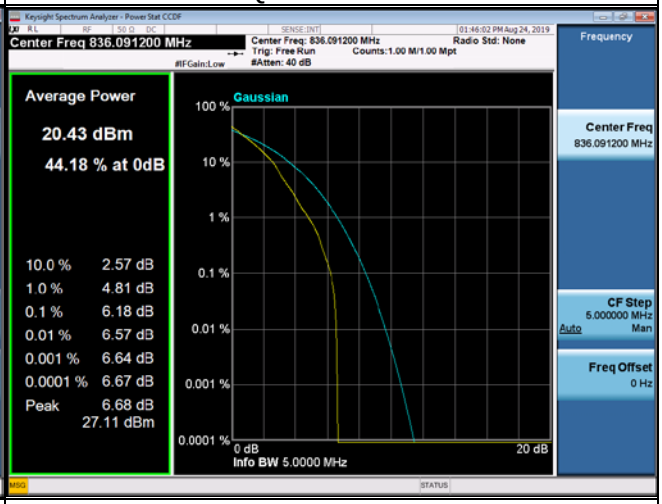
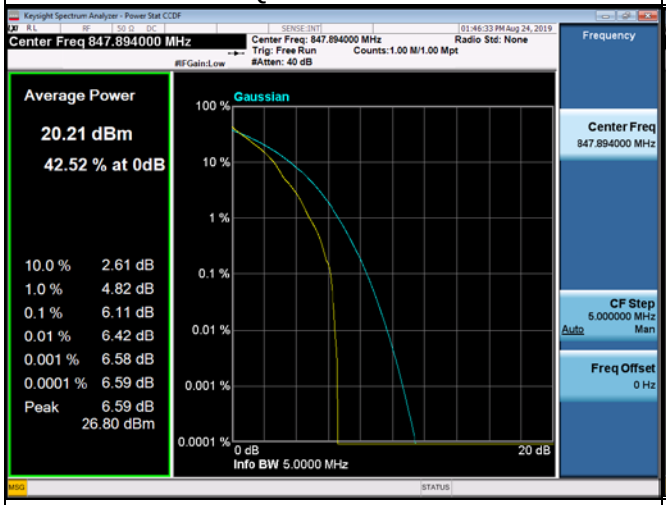
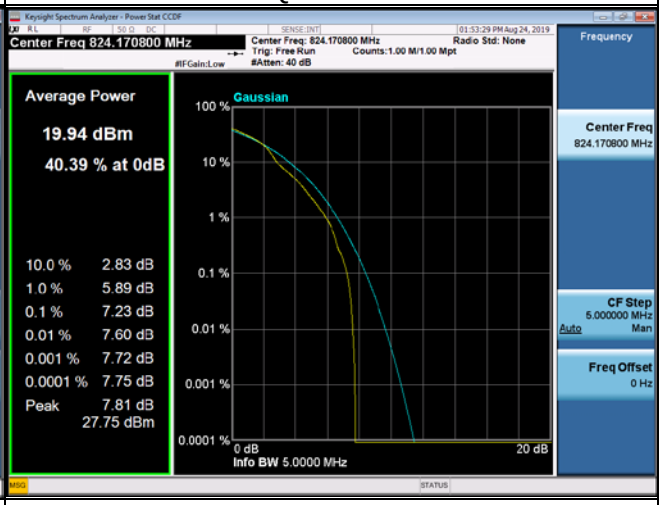
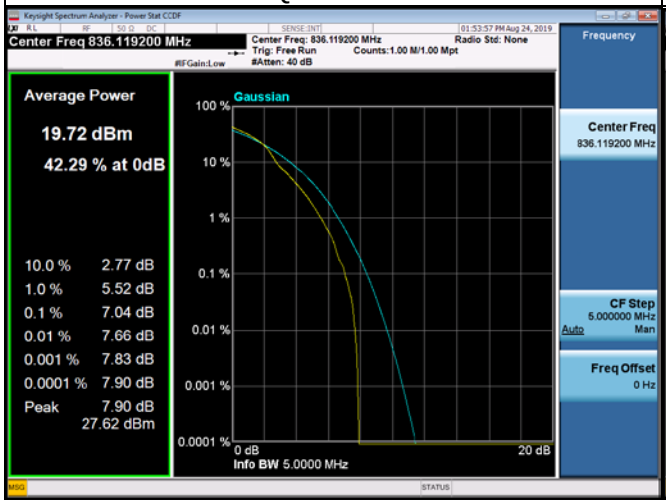
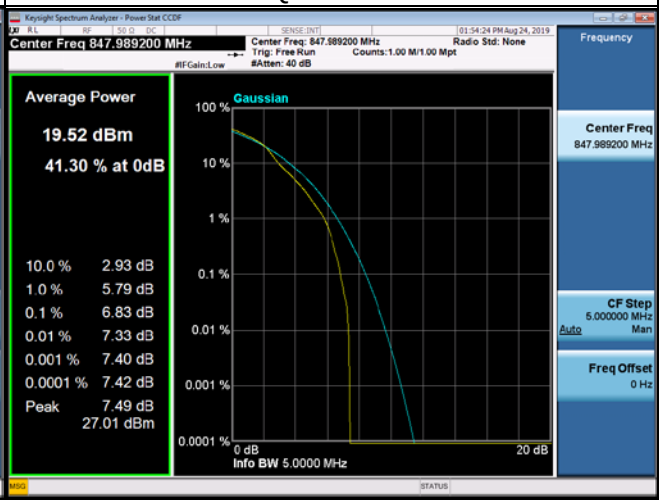
LTE Band 5_3M			
1RB#0		1RB#14	
Channel	20415	Channel	20635
			
15RB#0			
Channel	20415	Channel	20635
			

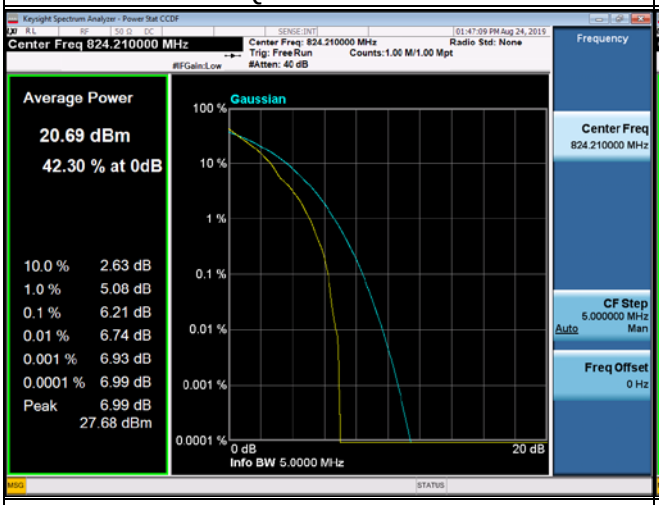
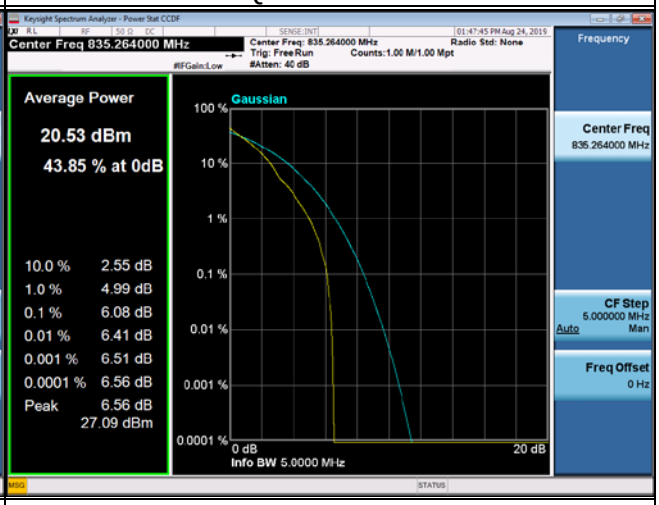
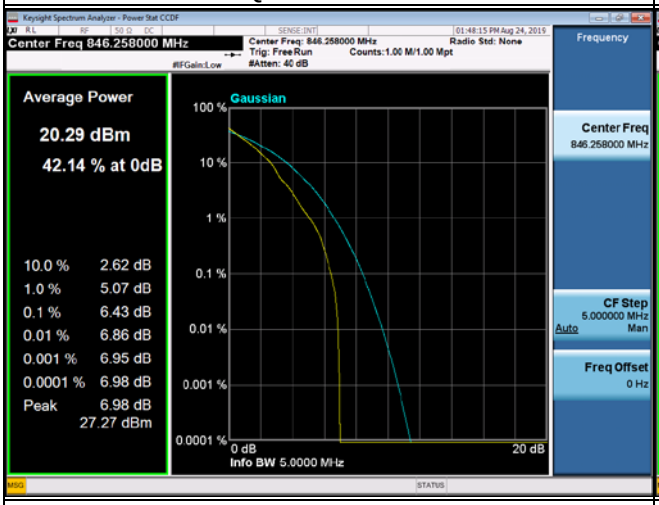
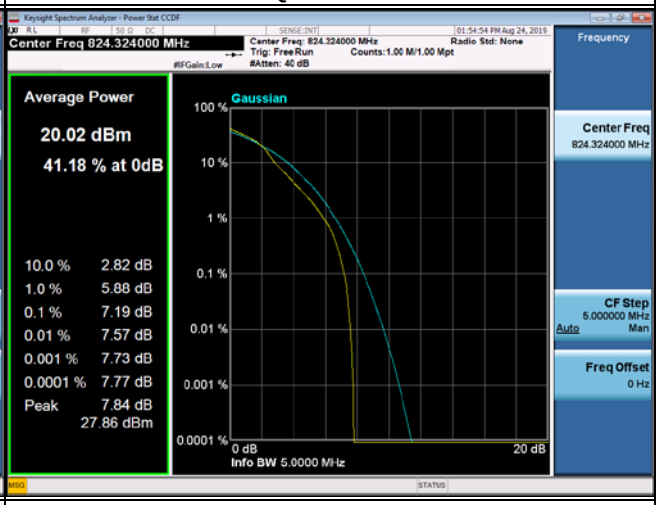
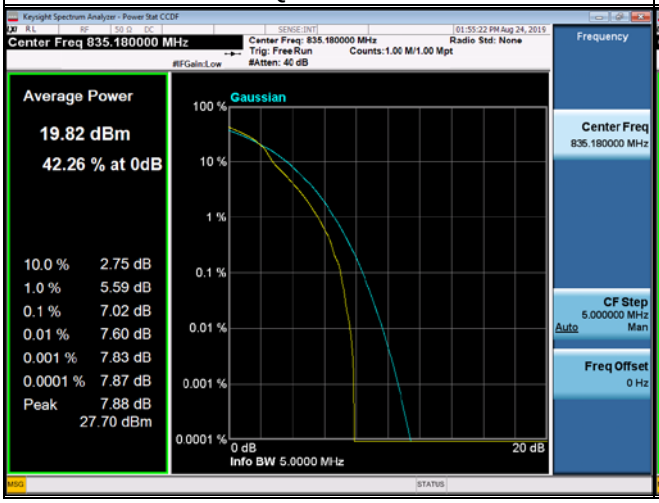
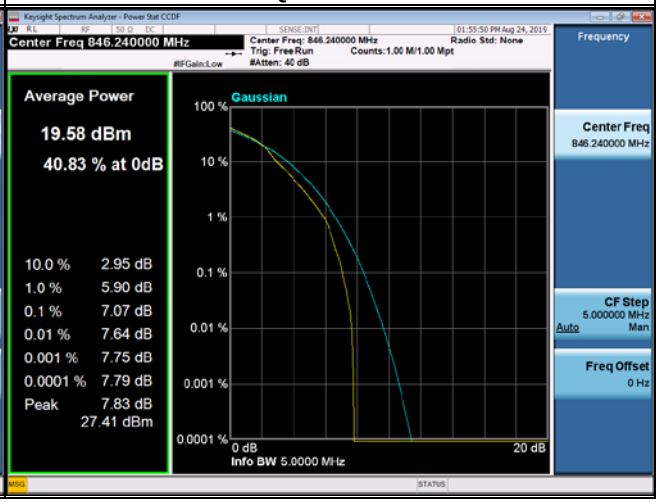
LTE Band 5_5M			
1RB#0		1RB#24	
Channel	20425	Channel	20625
			
25RB#0			
Channel	20425	Channel	20625
			

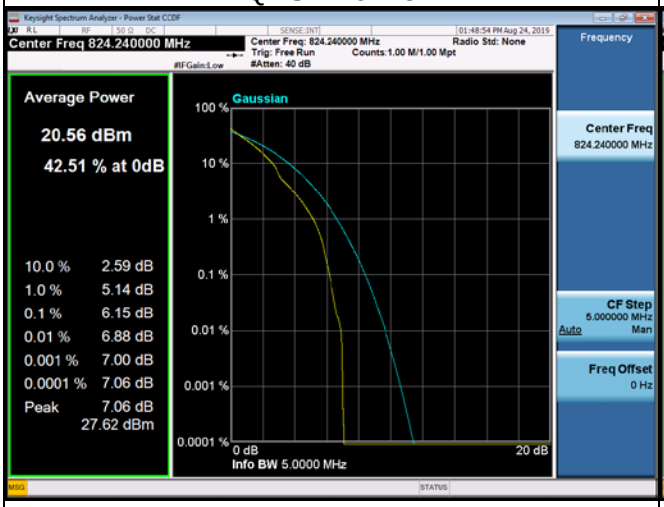
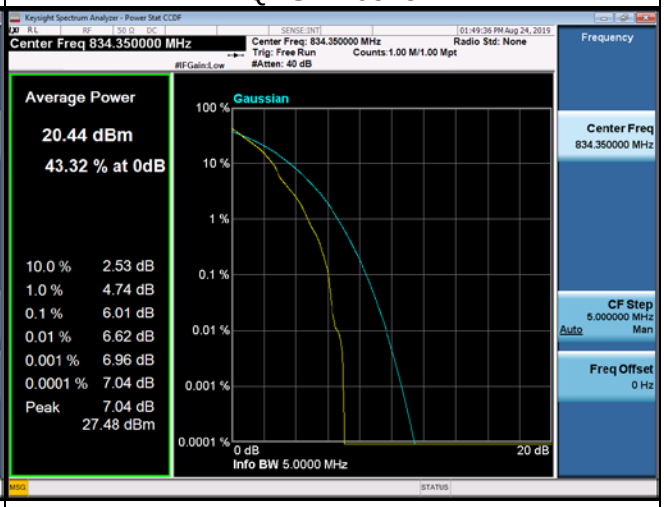
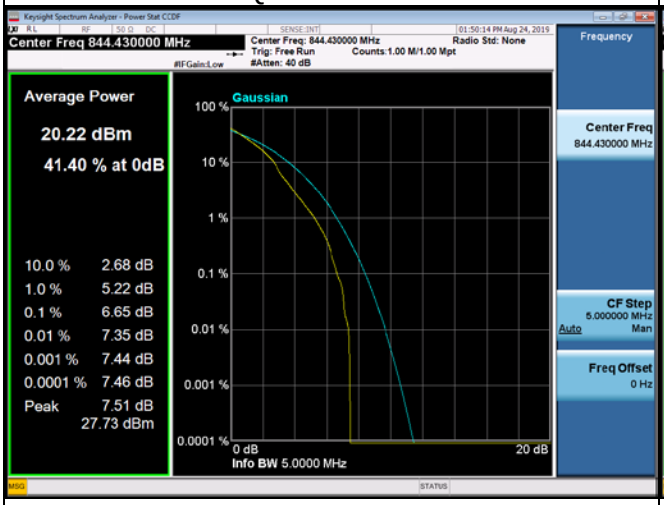
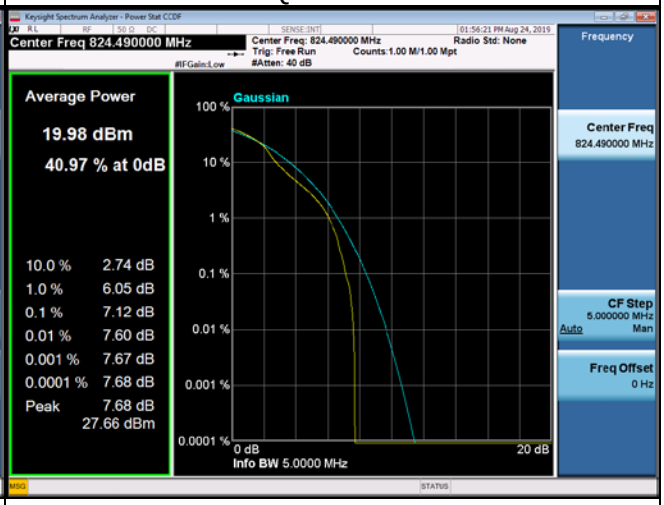
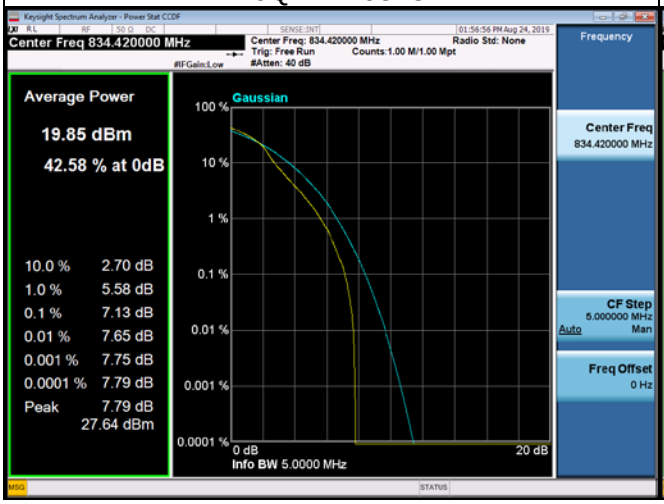
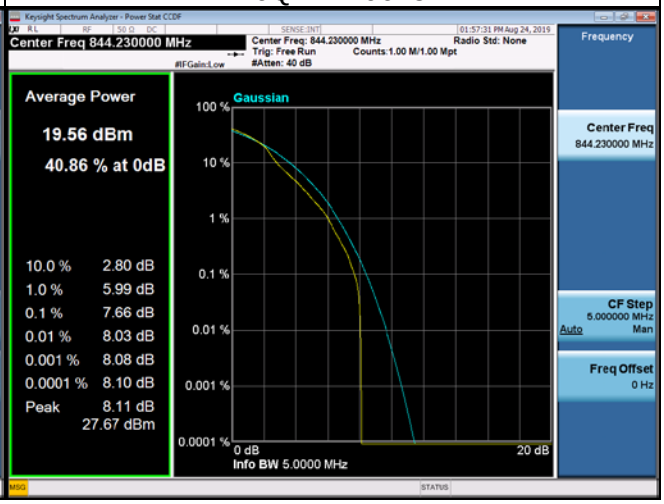
LTE Band 5_10M			
1RB#0		1RB#49	
Channel	20450	Channel	20600
			
50RB#0			
Channel	20450	Channel	20600
			

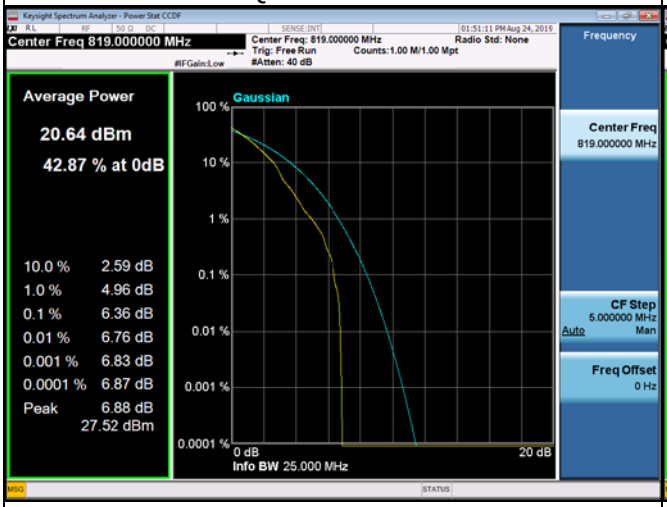
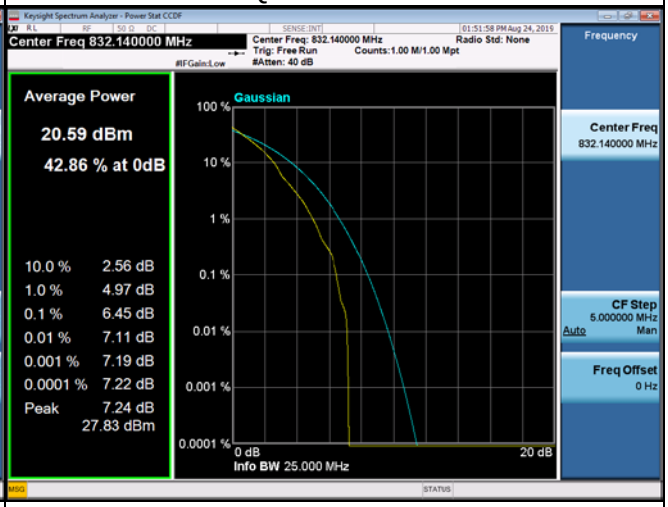
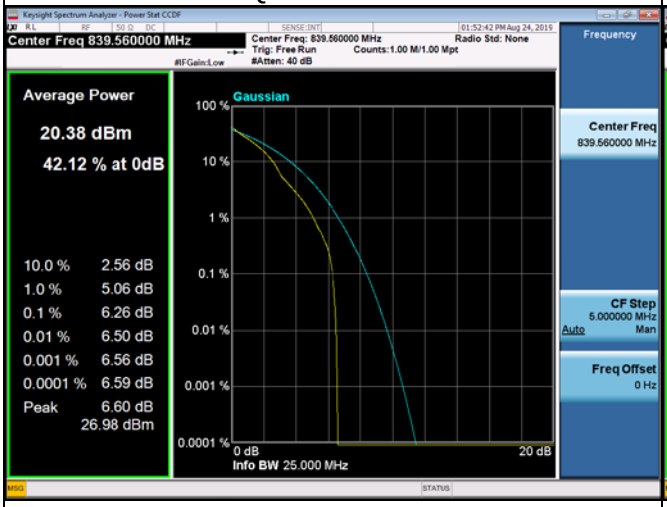
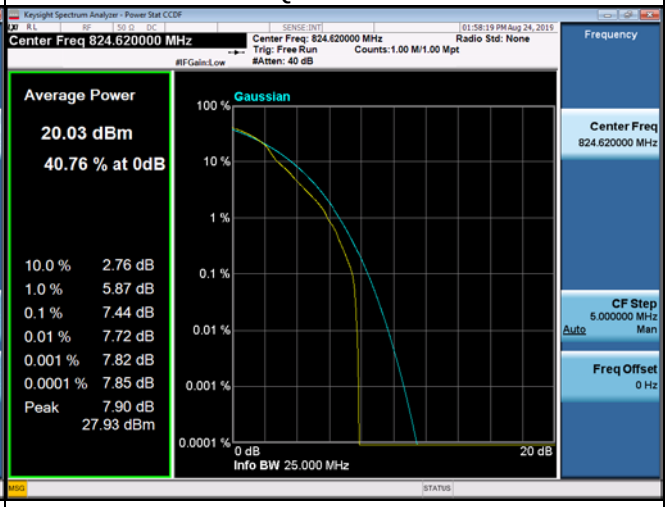
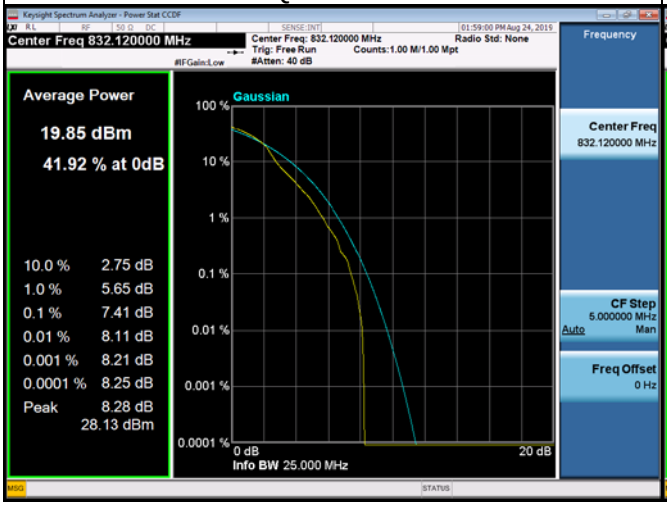
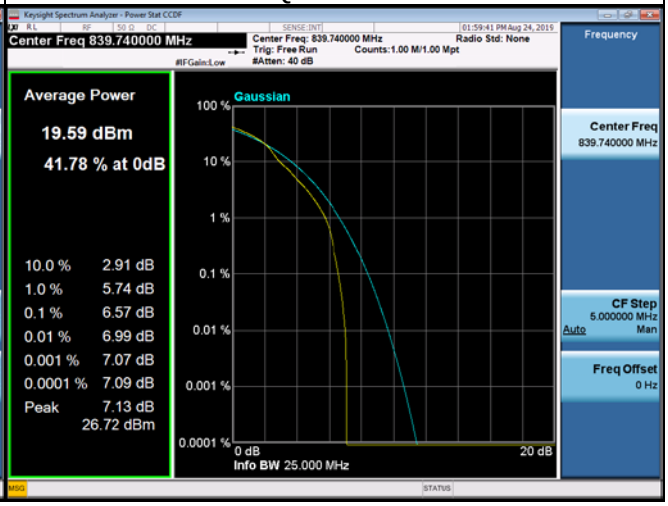
APPENDIX H - PEAK TO AVERAGE RATIO

WCDMA Band V Spectrum Plot	
4132	4182
	
4233	-
	-

LTE Band 5 Spectrum Plot_1.4M	
QPSK-20407	QPSK-20525
	
QPSK-20643	16QAM-20407
	
16QAM-20525	16QAM-20643
	

LTE Band 5 Spectrum Plot_3M	
QPSK-20415	QPSK-20525
	
QPSK-20635	16QAM-20415
	
16QAM-20525	16QAM-20635
	

LTE Band 5 Spectrum Plot_5M	
QPSK-20425	QPSK-20525
	
QPSK-20625	16QAM-20425
	
16QAM-20525	16QAM-20625
	

LTE Band 5 Spectrum Plot_10M	
QPSK-20450	QPSK-20525
	
QPSK-20600	16QAM-20450
	
16QAM-20525	16QAM-20600
	

APPENDIX I - FREQUENCY STABILITY

Test Mode:	WCDMA Band V_CH4182

Temperature vs. Frequency Stabiility

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
0	3.45	0.004124821	±2.5
10	7.30	0.008727881	
20	7.62	0.009110473	
30	2.37	0.002833572	
40	5.42	0.006480153	
50	1.48	0.001769488	
Max. Deviation (ppm)	7.62	0.009110473	

Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
4.25	3.21	0.003837877	±2.5
4.0	1.72	0.002056432	
3.6	5.24	0.006264945	
Max. Deviation (ppm)	5.24	0.006264945	

Test Mode:	LTE Band 5_CH20525_1.4M

Temperature vs. Frequency Stabiility

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
0	-2.18	-0.002606097	±2.5
10	1.97	0.002355051	
20	3.42	0.004088464	
30	-1.64	-0.00196055	
40	-3.22	-0.003849372	
50	-4.31	-0.005152421	
Max. Deviation (ppm)	-4.31	-0.005152421	

Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
3.8	-2.83	-0.003383144	±2.5
4.0	3.02	0.003610281	
4.2	-1.80	-0.002151823	
Max. Deviation (ppm)	3.02	0.003610281	

Test Mode:	LTE Band 5_CH20525_3M

Temperature vs. Frequency Stabiility

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
0	3.72	0.004447101	±2.5
10	-1.88	-0.00224746	
20	-3.05	-0.003646145	
30	-2.37	-0.002833234	
40	2.54	0.003036461	
50	4.00	0.004781829	
Max. Deviation (ppm)	4.00	0.004781829	

Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
3.8	2.87	0.003430962	±2.5
4.0	2.65	0.003167962	
4.2	-4.29	-0.005128512	
Max. Deviation (ppm)	-4.29	-0.005128512	

Test Mode:	LTE Band 5_CH20525_5M

Temperature vs. Frequency Stabiility

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
0	-1.21	-0.001446503	±2.5
10	3.65	0.004363419	
20	-2.74	-0.003275553	
30	3.22	0.003849372	
40	2.78	0.003323371	
50	5.21	0.006228332	
Max. Deviation (ppm)	5.21	0.006228332	

Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
3.8	-1.89	-0.002259414	±2.5
4.0	-3.27	-0.003909145	
4.2	2.83	0.003383144	
Max. Deviation (ppm)	-3.27	-0.003909145	

Test Mode:	LTE Band 5_CH20525_10M

Temperature vs. Frequency Stabiility

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
0	1.05	0.00125523	±2.5
10	-3.71	-0.004435146	
20	2.34	0.00279737	
30	-4.21	-0.005032875	
40	2.37	0.002833234	
50	2.13	0.002546324	
Max. Deviation (ppm)	-4.21	-0.005032875	

Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
3.8	-3.46	-0.004136282	±2.5
4.0	-3.02	-0.003610281	
4.2	3.41	0.004076509	
Max. Deviation (ppm)	-3.46	-0.004136282	

End of Test Report