FCC Radio Test Report

FCC ID: 2ANJN-VT1611-EG91

Original Grant

Report No.	:	TB-FCC174179
Applicant	:	Anytrek Corporation
Equipment Under Test (EUT)		
EUT Name	:	TrackLight
Model No.	:	VT1611
S/N	:	VT-2006904-01000001
Brand Name	:	ANYTREK
Sample ID	:	20200527-07_1-01
Receipt Date	:	2020-06-11
Test Date	:	2020-06-12 to 2020-07-12
Issue Date	:	2020-07-13
Standards	:	47 CFR FCC Part 2, Part 90
Test Method	:	ANSI C63.26 2015
Conclusions	:	**PASS**

In the configuration tested, the EUT complied with the standards specified above,

Test/Witness Engineer	:	Jack Deng
Engineer Supervisor	:	Ivan Su
Engineer Manager	:	Ray Lai

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

TB-RF-074-1.0

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Revision History

Report No.	Version	Description	Issued Date
TB-FCC174179	Rev.01	Initial issue of report	2020-07-13

1. General Information about EUT

1.1 Client Information

Applicant	:	Anytrek Corporation
Address	:	4405 E Airport Dr, Suite 106, Ontario, CA 91761
Manufacturer	:	Shenzhen Anxingzhiyuan Technology Co., Ltd.
Address	:	No.302, Building No.6, COFCO(Fuan)Robot Intelligent Building Industrial Park, No.90 Dayang Road, Fuhai Street, Baoan District, Shenzhen, Guangdong, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	TrackLight	
Models No.	:	VT1611	
Model Difference	:	N/A	
Product Description	:	Frequency Bands: LTE Band 26:TX: 814MHz-824MHz, RX: 859MHz-869MHz	
		Antenna Type:	PCB Antenna
		Antenna Gain:	0.42dBi
		Modulation Type:	QPSK, 16QAM
		Bandwidth:	LTE Band 26: 1.4MHz/3MHz/5MHz/10MHz
		LTE Category:	1
		Max. E.R.P.:	24.12dBm
Power Rating	:	Input: DC 12*1A or DC 3.7V by 3000mAh Li-Po.	
Software Version	:	V1.0.52	
Hardware Version	:	V7.01	
For LTE Category 1, 16QAM only supports 25%RB.			

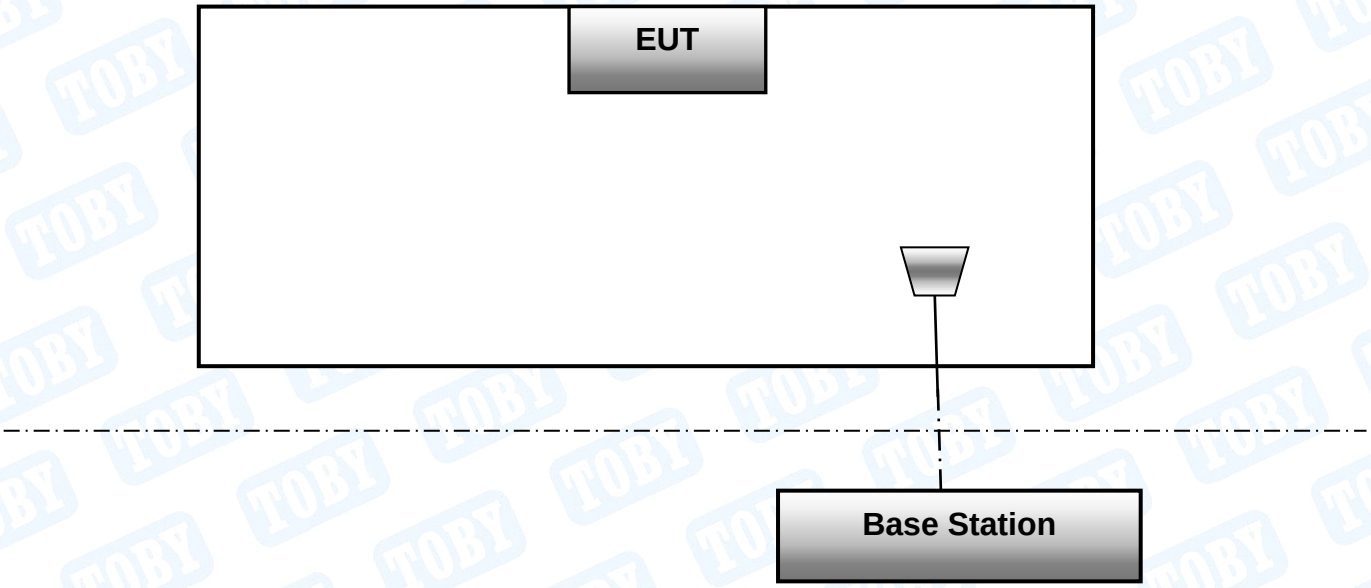
Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) Channel List

LTE Band 26(1.4MHz)		LTE Band 26(3MHz)	
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
26697	**814.70**	**26705**	**815.50**
26698	814.60	26706	814.60
……	……	……	……
26739	818.90	26739	818.90
26740	**819.00**	**26740**	**819.00**
26741	819.10	26741	819.10
……	…..	……	…..
26782	823.20	26774	822.40
26783	**823.30**	**26775**	**822.50**
LTE Band 26(5MHz)		**LTE Band 26(10MHz)**	
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
26715	**816.50**	……	……
26698	816.60	……	……
……	……	……	……
26739	818.90	……	…..
26740	**819.00**	**26740**	**819.00**
26741	819.10	……	…..
……	…..	……	…..
26764	822.40	……	…..
26765	**821.50**	……	…..

1.3 Block Diagram Showing the Configuration of System Tested



The above block diagram of setup is the normal mode. And more detail please refer to the test setup of each test item of bellow.

1.4 Description of Support Units

The EUT has been tested as an independent unit.

1.5 Description of Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 v03r01 and ANSI C63.26 2015 Power Meas. License Digital Systems with maximum output power. Radiated measurements are performed by rotating the EUT in three different or tho-gonal test planes to find the maximum emission.

Remark:
1. The mark “v “ means that this configuration is chosen for testing
2. The mark “--“ means that this bandwidth is not supported.
3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated

ITEMS	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
RF Output Power	26	V	V	V	V	--	--	V	V	V	V	V	V	V	V
Peak-to-Average Ratio	26	--	--	--	V	--	--	V	V			V	--	V	--
99% & -26 dB Occupied Bandwidth	26	V	V	V	V	--	--	V	V	V			V	V	V
Spurious Emissions at Antenna Terminal	26	V	V	V	V	--	--	V	V	V		V	V	V	V
Field Strength of Spurious Radiation	26	V	V	V	V	--	--	V	V	V				V	
Emission Masks	26	V	V	V	V	--	--	V	V	V		V	V	V	V
Frequency stability	26	V	V	V	V	--	--	V	V	V				V	
The EUT is LTE Category 1, 16QAM only supports 25%RB. So the 16QAM only test 25%RB.															

Note:

(1) During the testing procedure, the EUT is in link mode with base station emulator at maximum power level in each test mode.

(2) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. The worst case was found positioned on Z-plane as the normal use. Therefore only the test data of this Z-plane was used for radiated emission measurement test.

1.6 Measurement Uncertainty

Test Item	Parameters	Expanded Uncertainty (U_{Lab})
RF Power, conducted	/	±0.82 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.50 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB

1.7 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.
At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025：2005 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01. FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A.

2. Test Summary

Test Item	Section in CFR 47	Result
RF Output Power	2.1046/90.635(b)	**PASS**
Peak-to-Average Ratio	KDB 971168 D01(5.7)	**PASS**
99% & -26 dB Occupied Bandwidth	2.1049/ 90.209	**PASS**
Spurious Emissions at Antenna Terminal	2.1051 / 90.691	**PASS**
Field Strength of Spurious Radiation	2.1053 /90.691	**PASS**
Emission Masks	2.1051 / 90.691	**PASS**
Frequency stability vs. temperature	2.1055 / 90.213	**PASS**
Frequency stability vs. voltage	2.1055 / 90.213	**PASS**
Pass: The EUT complies with the essential requirements in the standard.		

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Radiation Emission	EZ-EMC	EZ	FA-03A2RE

4. Test Equipment

Radiation Emission Test					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 13, 2019	Jul. 12, 2020
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 13, 2019	Jul. 12, 2020
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jul. 13, 2019	Jul. 12, 2020
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar.01, 2020	Feb. 28, 2021
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.01, 2020	Feb. 28, 2021
Horn Antenna	ETS-LINDGREN	BBHA 9170	BBHA9170582	Aug.07, 2019	Aug. 06, 2020
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 13, 2019	Jul. 12, 2020
Pre-amplifier	Sonoma	310N	185903	Mar.01, 2020	Feb. 28, 2021
Pre-amplifier	HP	8449B	3008A00849	Mar.01, 2020	Feb. 28, 2021
Pre-amplifier	SKET	LNPA_1840G-50	SK201904032	Jul. 27, 2019	Jul. 26, 2020
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.01, 2020	Feb. 28, 2021
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna Conducted Emission					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Cal. Due Date**
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 13, 2019	Jul. 12, 2020
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul. 13, 2019	Jul. 12, 2020
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Sep. 16, 2019	Sep. 15, 2020
Vector Signal Generator	Agilent	N5182A	MY50141294	Sep. 16, 2019	Sep. 15, 2020
Analog Signal Generator	Agilent	N5181A	MY50141953	Sep. 16, 2019	Sep. 15, 2020
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO26	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO29	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO31	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17I00015SNO33	Sep. 16, 2019	Sep. 15, 2020
Wideband Radio Comunication Tester	Rohde & Schwarz	CMW500	144382	Sep. 16, 2019	Sep. 15, 2020
Universal Radio Communication Tester	Rohde&Schwarz	CMU200	103903	Jul. 13, 2019	Jul. 12, 2020

5. Conducted RF Output Power

5.1 Test Standard and Limit

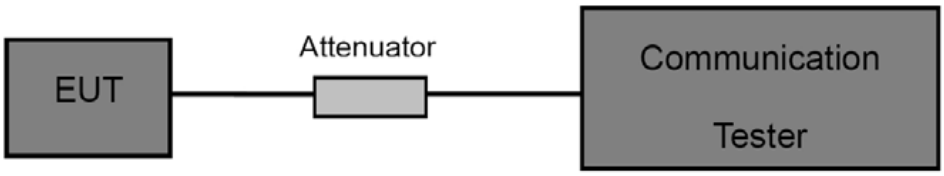
5.1.1 Test Standard

FCC part 2.1046
FCC Part 90.635(b)

5.1.2 Test Limit

RF Output Power
LTE Band 26(814MHz-824MHz**)**
100W(50dBm)

5.2 Test Setup



5.3 Test Procedure

(1) The EUT is coupled to the Base Station with the suitable Attenuator, the path loss is calibrated to correct the reading.
(2) A call is set up by the Base Station to the generic call set up procedure.
(3) Set EUT at maximum power level through base station by power level command.
(4) Then read record the power value from the Base Station in dBm.

5.4 Deviation From Test Standard

No deviation

5.5 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

5.6 Test Data

Please refer to the Attachment A.

6. Peak-Average Ratio

6.1 Test Standard and Limit

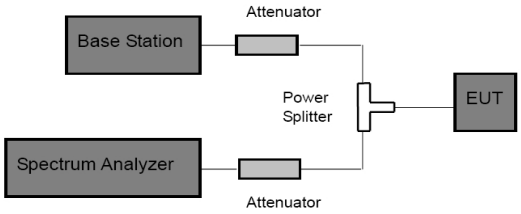
6.1.1 Test Standard

FCC Part 90

6.1.2 Test Limit

Peak-to-Average Ratio
The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

6.2 Test Setup



6.3 Test Procedure

According with KDB 971168

(1) The signal analyzer's CCDF measurement profile is enabled.
(2) Frequency = carrier center frequency.
(3) Measurement BW>Emission bandwidth of signal.
(4) The signal analyzer was set to collect one million samples to generate the CCDF curve.
(5) Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level.
(6) The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which of the transmitter is operating at maximum power.

6.4 Deviation From Test Standard

No deviation

6.5 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

6.6 Test Data

Please refer to the Attachment B.

7. Occupied Bandwidth

7.1 Test Standard and Limit

7.1.1 Test Standard

FCC Part 2.1049

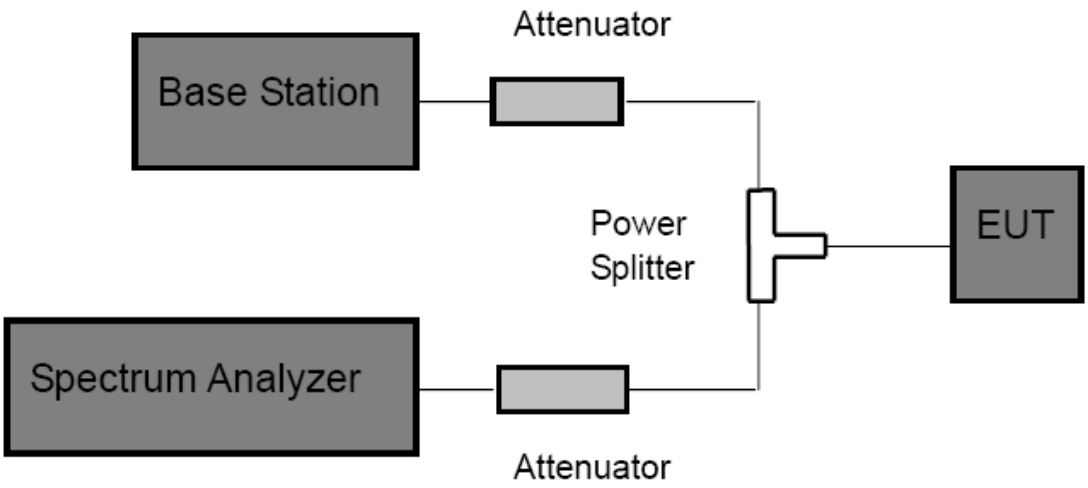
FCC Part 90.209

7.1.2 Test Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as 99% power and -26dBC occupied bandwidths.

7.2 Test Setup



7.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.

(2) The resolution bandwidth of the Spectrum Analyzer is set to at least 1% of the occupied bandwidth. VBW= 3 times RBW.

(3) The low, middle and the high channels are selected to perform tests respectively.

(4) Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak; make a line whose value is 26dB lower than the peak; mark two points which the line intersected the waveform at; finally record the delta of the two points as the occupied bandwidth and the plot.

(5) Set the Spectrum Analyzer Occupied bandwidth function to measure the 99% occupied bandwidth.

7.4 Deviation From Test Standard

No deviation

7.5 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

7.6 Test Data

Please refer to the Attachment C.

8. Out of Band Emission at Antenna Terminals

8.1 Test Standard and Limit

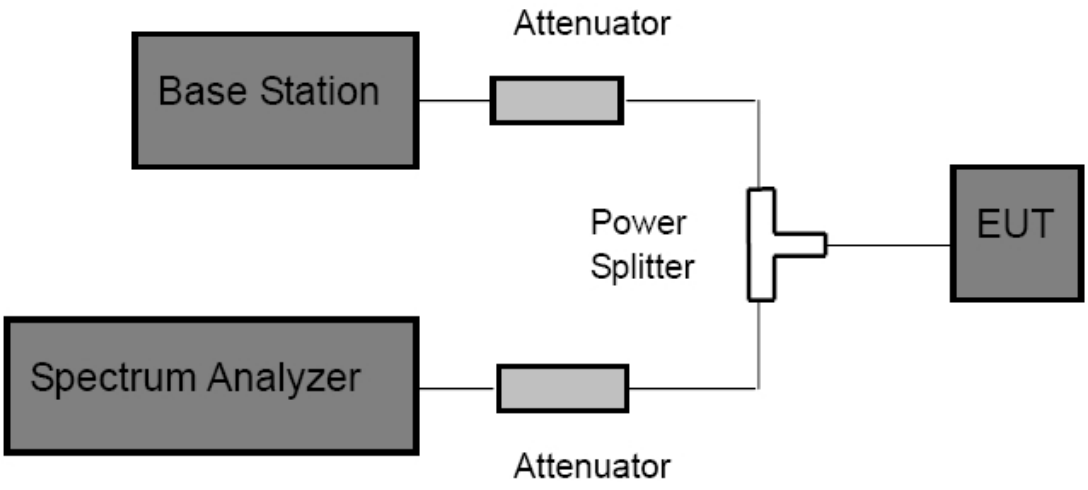
8.1.1 Test Standard

FCC Part 2: 2.1051
FCC Part 90.691

8.1.2 Test Limit

Rule Part 90.691 specifies that "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." this becomes a constant specification limit of -13 dBm.

8.2 Test Setup



8.3 Test Procedure

1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

2 The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

3 For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.

4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter.

8.4 Deviation From Test Standard

No deviation

8.5 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

8.6 Test Data

Please refer to the Attachment D.

9. Emission Mask

9.1 Test Standard and Limit

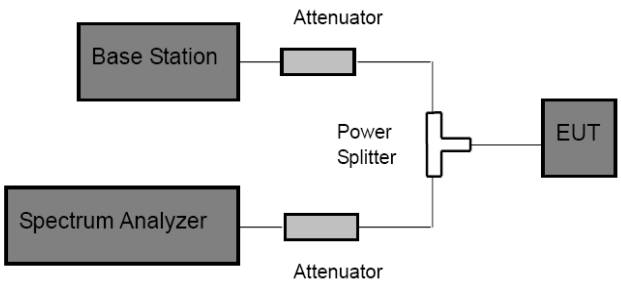
9.1.1 Test Standard

FCC Part 2: 2.1051
FCC Part 90.691

9.1.2 Test Limit

Rule Part 90.691(a) specifies that " For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz."

9.2 Test Setup



9.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.
(2) Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter.

9.4 Deviation From Test Standard

No deviation

9.5 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

9.6 Test Data

Please refer to the Attachment E.

10. Radiated Output Power

10.1 Test Standard and Limit

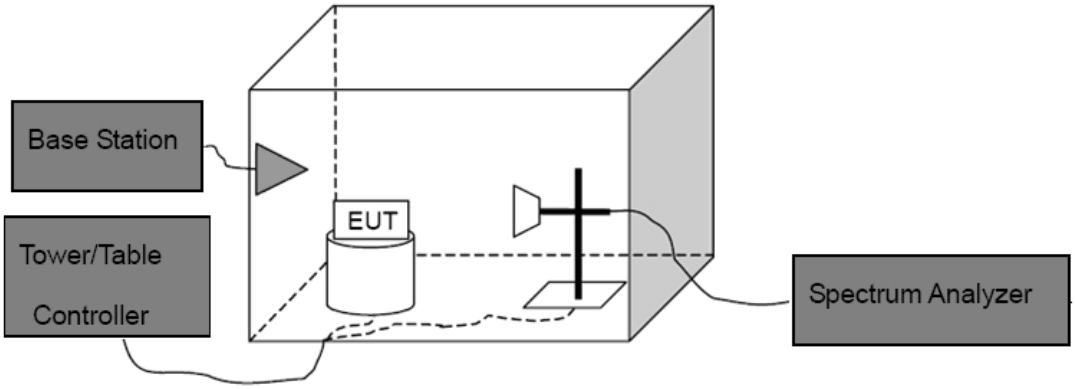
10.1.1 Test Standard

FCC Part 2.1046
FCC part 90.635(B)

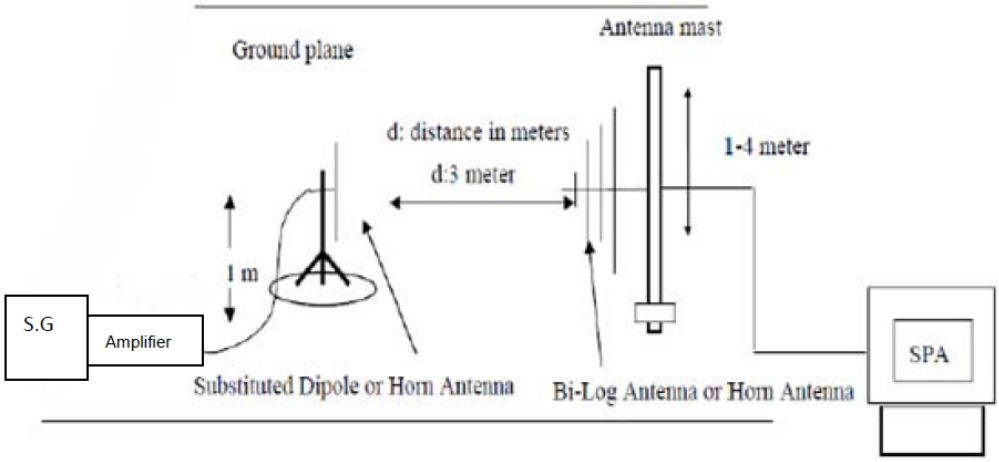
10.1.2 Test Limit

E.R.P
LTE Band 26(814MHz-824MHz**)**
100W(50dBm)

10.2 Test Setup



Above 1G



Substituted Method

10.3 Test Procedure

(1) The EUT was placed on an non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW=3 MHz, VBW=3 MHz and peak detector settings.

(2) During the measurement, the EUT was enforced in maximum power and linked with the Base Station. The highest was recorded from analyzer power level (LVT) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.

(3) Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to C63.26. The EUT was replaced by dipole antenna (for frequency below 1 GHz) or Horn antenna (for frequency above 1 GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a TX cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.

Note: In test, the S.G Connect the Pre-amplifier(Sonoma 310N Pre-amplifier for frequency below 1 GHz, HP 8449B Pre-amplifier for frequency above 1 GHz)

Then the EUT's EIRP and ERP was calculated with the correction factor:
ERP=S.G.Level +Antenna Gain Cord.(dBd)-Cable Loss(dB)
EIRP=S.G.Level+Antenna Gain Cord.(dBi)-Cable Loss(dB)

10.4 Deviation From Test Standard

No deviation

10.5 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

10.6 Test Data

Please refer to the Attachment F.
Measurement Data (worst case)

11. Radiated Out Band of Emissions

11.1 Test Standard and Limit

11.1.1 Test Standard

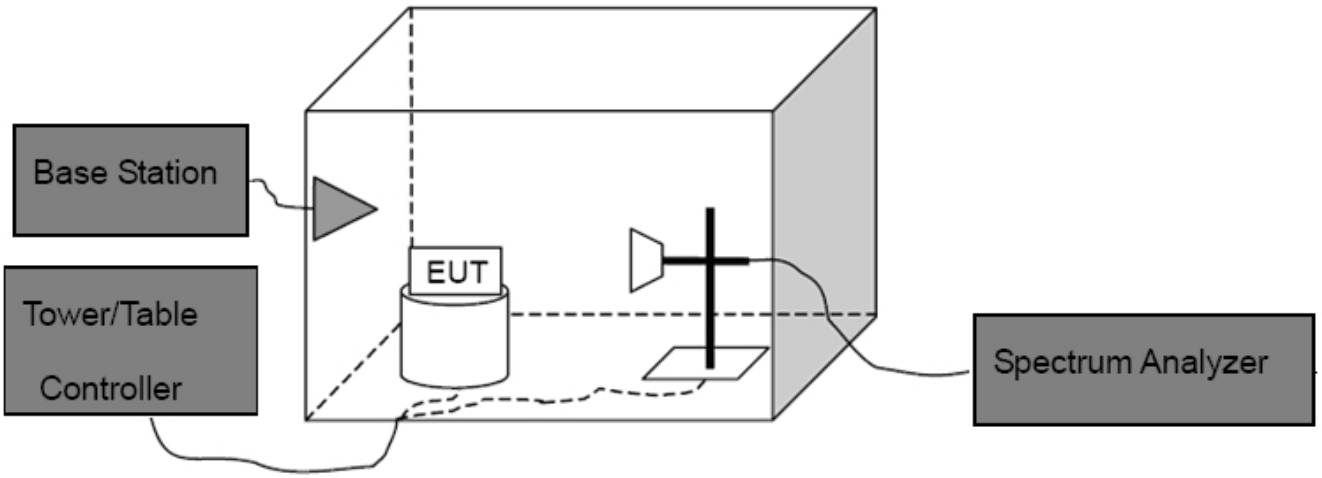
FCC Part 2.1053

FCC Part 90.691

11.1.2 Test 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+10log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

11.2 Test Setup



11.3 Test Procedure

(1) The test system setup as show in the block diagram above.

(2) The EUT was placed on an non-conductive rotating platform in an anechoic chamber. The radiated spurious emissions from 30MHz to 10th harmonious of fundamental frequency were measured at 3 m with a test antenna and a spectrum analyzer with RBW=1 MHz, VBW=1 MHz, peak detector settings.

(3) During the measurement, the EUT was enforced in maximum power and linked with a base station. All the spurious emissions at 3m were measured by rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.

(4) When found the maximum level of emissions from the EUT. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB=10 log(TX power in Watts/0.001)-the absolute level

Spurious attenuation limit in dB=43+10 log(power out in Watts)

11.4 Deviation From Test Standard

No deviation

11.5 EUT Operating Condition

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

11.6 Test Data

Please refer to the Attachment G.
Measurement Data (worst case)

12. Frequency Stability

12.1 Test Standard and Limit

12.1.1 Test Standard

FCC Part 2.1055(a)(1)(b)
FCC Part 90.213

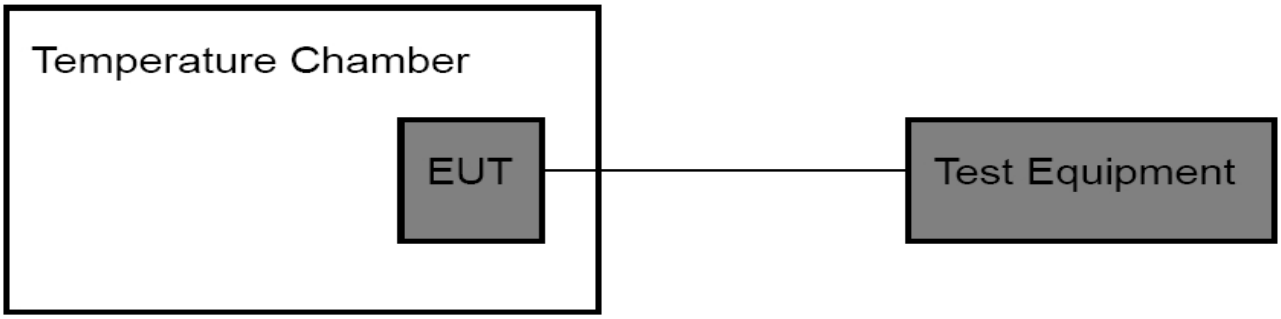
12.1.2 Limit

According to the Sec. 90.213.(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table. Minimum Frequency Stability
[Parts per million (ppm)]

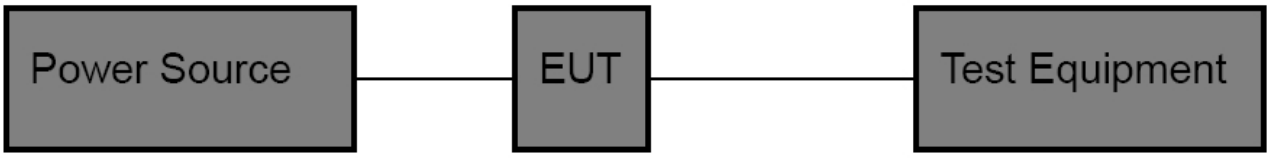
Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
809-824	1.5	2.5	2.5

12.2 Test Setup

For Temperature Test:



For Voltage Test:



12.3 Test Procedure

Test Procedures for Temperature Variation:
(1) The EUT was set up in the thermal chamber and connected with the base station.
(2) With power off, the temperature was decreased to -30℃ and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
(3) With power off, the temperature was raised in 10℃ set up to 50℃ and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
(4) If the EUT cannot be turned on at -30℃, the testing lowest temperature will be raised in 10℃ step until the EUT can be turned on.
Test Procedures for Voltage Variation:
(1) The EUT was placed in a temperature chamber at 25±5℃ and connected with the base station.
(2) Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
(3) The variation in frequency was measured for the worst case.

12.4 Deviation From Test Standard

No deviation

12.5 EUT Operating Condition

The Equipment Under Test was set to Communication with the Base Station.

12.6 Test Data

Please refer to the Attachment H.

ATTACHMENT A--CONDUCTED RF OUTPUT POWER

FDD-LTE Band 26						
Channel Bandwidth: 1.4 MHz						
Modulation	RB Size	RB Offset	Conducted Power (dBm)			Result
			Low CH	Middle CH	High CH	
QPSK	1	0	23.88	23.99	23.89	PASS
	1	3	24.18	24.12	24.15	PASS
	1	5	23.97	23.85	23.83	PASS
	3	0	23.87	23.86	23.78	PASS
	3	1	23.85	23.89	23.65	PASS
	3	3	23.81	23.75	23.79	PASS
	6	0	22.90	22.86	22.88	PASS
16QAM	1	0	22.63	22.56	22.59	PASS
	1	3	22.78	22.74	22.82	PASS
	1	5	22.68	22.53	22.56	PASS
	3	0	22.62	22.48	22.43	PASS
	3	1	22.70	22.56	22.28	PASS
	3	3	22.72	22.62	22.68	PASS
	6	0	21.76	21.59	21.74	PASS
Channel Bandwidth: 3 MHz						
Modulation	RB Size	RB Offset	Conducted Power (dBm)			Result
			Low CH	Middle CH	High CH	
QPSK	1	0	23.89	23.96	23.78	PASS
	1	8	23.79	24.13	23.58	PASS
	1	14	23.70	24.23	23.69	PASS
	8	0	22.94	23.03	23.14	PASS
	8	4	22.91	23.03	22.96	PASS
	8	7	22.85	23.03	22.89	PASS
	15	0	22.83	23.03	23.12	PASS
16QAM	1	0	22.59	22.70	22.68	PASS
	1	8	22.44	22.80	22.85	PASS
	1	14	22.45	22.79	22.62	PASS
	8	0	21.77	22.02	22.57	PASS
	8	4	21.74	22.18	21.34	PASS
	8	7	21.69	22.22	22.15	PASS
	15	0	21.64	22.11	21.34	PASS

FDD-LTE Band 26						
Channel Bandwidth: 5 MHz						
Modulation	RB Size	RB Offset	Conducted Power (dBm)			Result
			Low CH	Middle CH	High CH	
QPSK	1	0	23.76	23.72	23.58	PASS
	1	12	24.24	24.20	23.97	PASS
	1	24	23.80	23.98	23.58	PASS
	12	0	22.87	23.00	22.86	PASS
	12	7	22.74	23.11	22.87	PASS
	12	13	22.90	23.06	22.68	PASS
	25	0	22.90	23.00	22.89	PASS
16QAM	1	0	22.25	22.03	22.12	PASS
	1	12	21.17	22.55	22.65	PASS
	1	24	22.32	22.46	22.54	PASS
	12	0	22.14	21.77	21.86	PASS
	12	7	21.84	21.87	21.96	PASS
	12	13	21.77	21.76	21.88	PASS
	25	0	21.82	21.85	21.89	PASS
Channel Bandwidth: 10 MHz						
Modulation	RB Size	RB Offset	Conducted Power (dBm)			Result
			Low CH	Middle CH	High CH	
QPSK	1	0	----	23.86	----	PASS
	1	25	----	23.52	----	PASS
	1	49	----	23.28	----	PASS
	25	0	----	22.65	----	PASS
	25	12	----	22.74	----	PASS
	25	25	----	22.36	----	PASS
	50	0	----	22.18	----	PASS
16QAM	1	0	----	22.28	----	PASS
	1	25	----	22.65	----	PASS
	1	49	----	22.47	----	PASS
	25	0	----	21.85	----	PASS
	25	12	----	21.66	----	PASS
	25	25	----	21.87	----	PASS

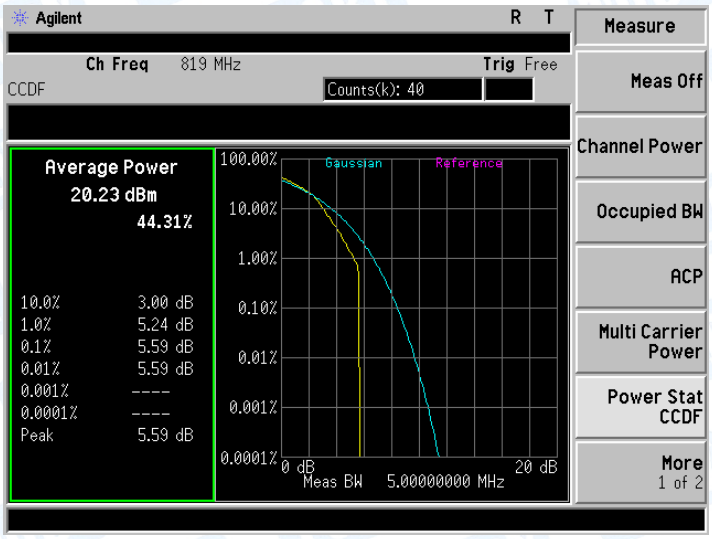
ATTACHMENT B--PEAK-AVERAGE RATIO

Test Mode	CH	Modulation	RB Size	RB Offset	PAPR with 0.1% probability (dB)	Limit (dB)	Result
LTE BAND 26 1.4MHz	Middle	QPSK	6	0	6.97	≤13	PASS
	Middle	16QAM	6	0	5.59	≤13	PASS
LTE BAND 26 3MHz	Middle	QPSK	15	0	6.04	≤13	PASS
	Middle	16QAM	15	0	5.79	≤13	PASS
LTE BAND 26 5MHz	Middle	QPSK	25	0	5.27	≤13	PASS
	Middle	16QAM	25	0	4.88	≤13	PASS
LTE BAND 26 10MHz	Middle	QPSK	50	0	5.69	≤13	PASS
	Middle	16QAM	25	0	5.59	≤13	PASS

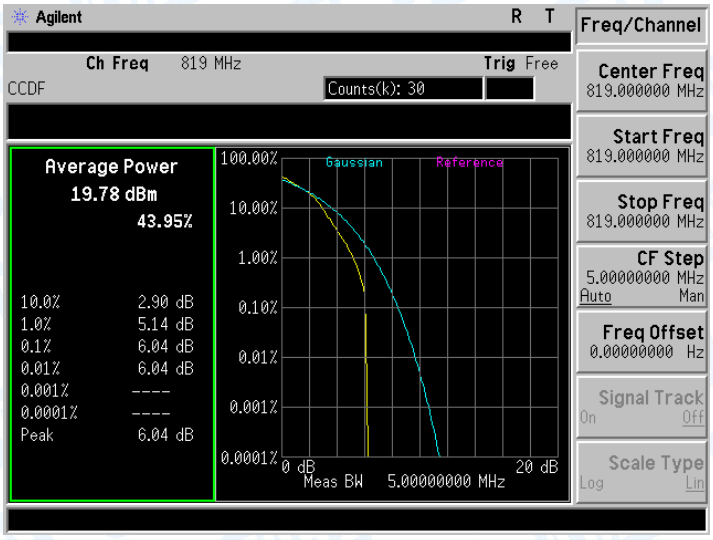
Note: Only show the worst case data

LTE Band 26 1.4MHz-QPSK

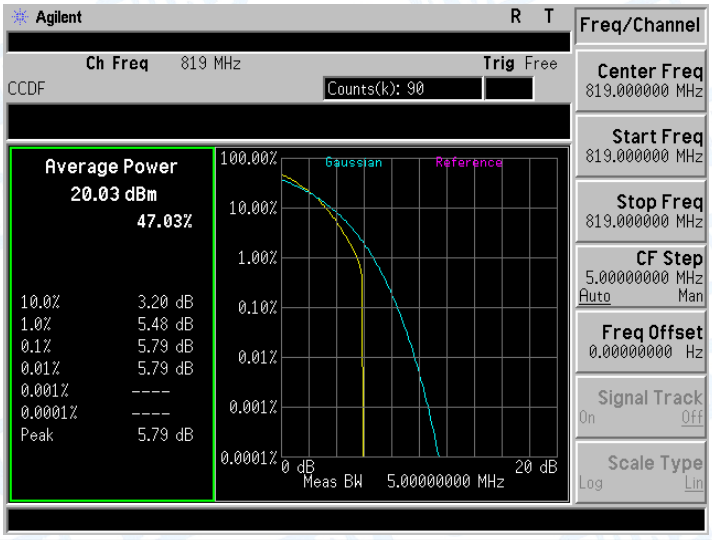
LTE Band 26 1.4MHz-16QAM



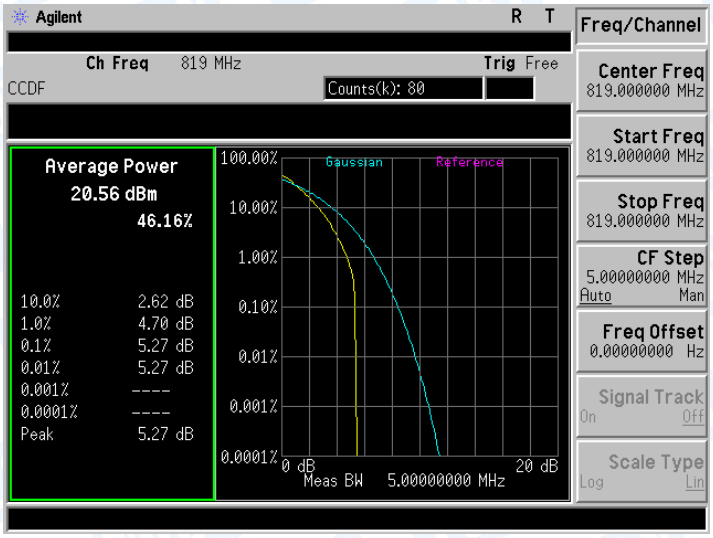
LTE Band 26 3MHz-QPSK



LTE Band 26 3MHz-16QAM

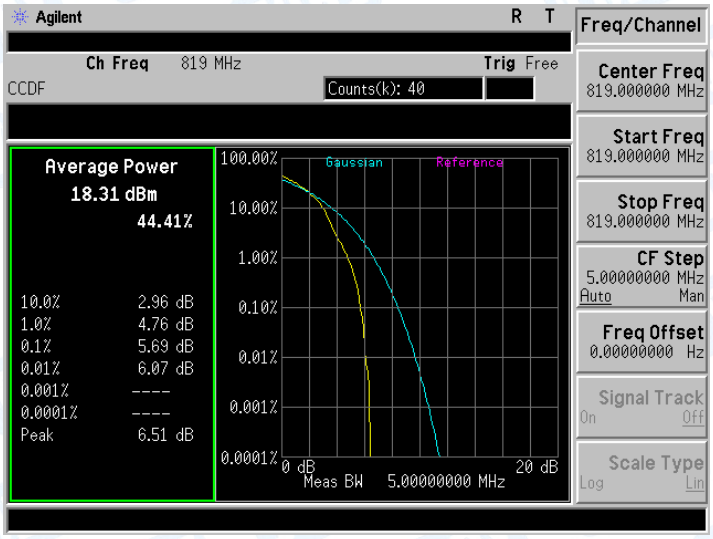


LTE Band 26 5MHz-QPSK

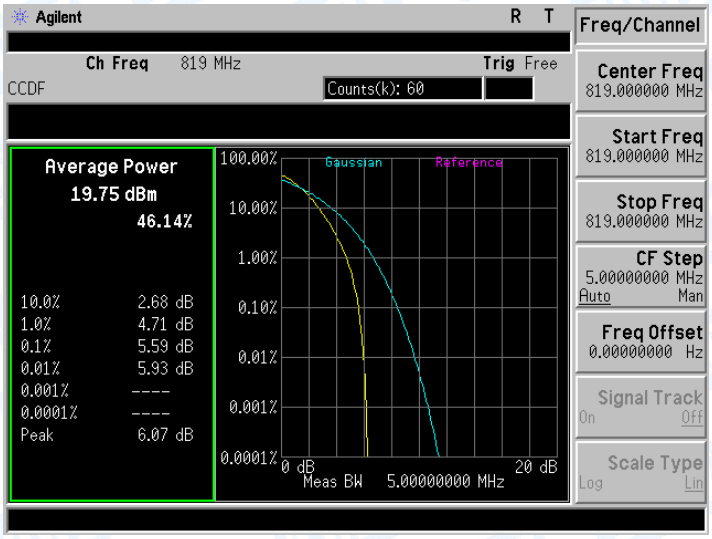


LTE Band 26 5MHz-16QAM

LTE Band 26 10MHz-QPSK



LTE Band 26 10MHz-16QAM

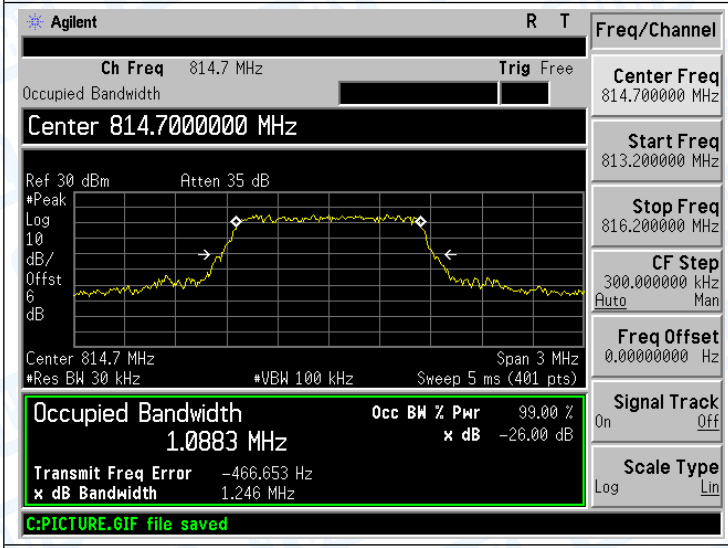


ATTACHMENT C--OCCUPY BANDWIDTH

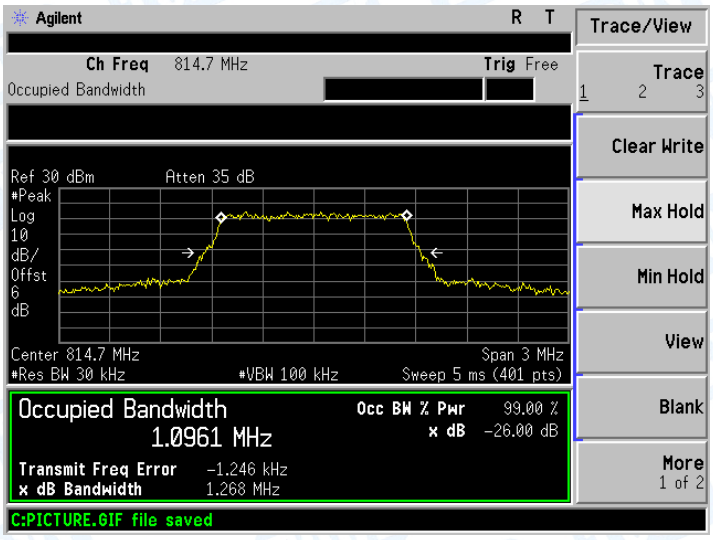
LTE Band 26							
Mode	Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	99% OBW (MHz)	-26dB Bandwidth (MHz)
1.4MHz	26697	814.70	QPSK	6	0	1.0883	1.246
			16QAM	6	0	1.0961	1.268
	26740	819.00	QPSK	6	0	1.0922	1.273
			16QAM	6	0	1.0819	1.275
	26783	823.30	QPSK	6	0	1.0889	1.276
			16QAM	6	0	1.1017	1.298
3MHz	26705	815.50	QPSK	15	0	2.6771	2.925
			16QAM	15	0	2.6816	2.923
	26740	819.00	QPSK	15	0	2.6753	2.894
			16QAM	15	0	2.6833	2.917
	26775	822.50	QPSK	15	0	2.6901	2.934
			16QAM	15	0	2.6814	2.933
5MHz	26715	816.50	QPSK	25	0	4.4954	4.959
			16QAM	25	0	4.4943	5.029
	26740	819.00	QPSK	25	0	4.5263	5.022
			16QAM	25	0	4.5067	5.002
	26765	821.50	QPSK	25	0	4.5040	5.040
			16QAM	25	0	4.5105	5.016
10MHz	26740	819.00	QPSK	50	0	8.9614	9.665
			16QAM	25	0	4.5325	5.267

Occupy Bandwidth Test Plot

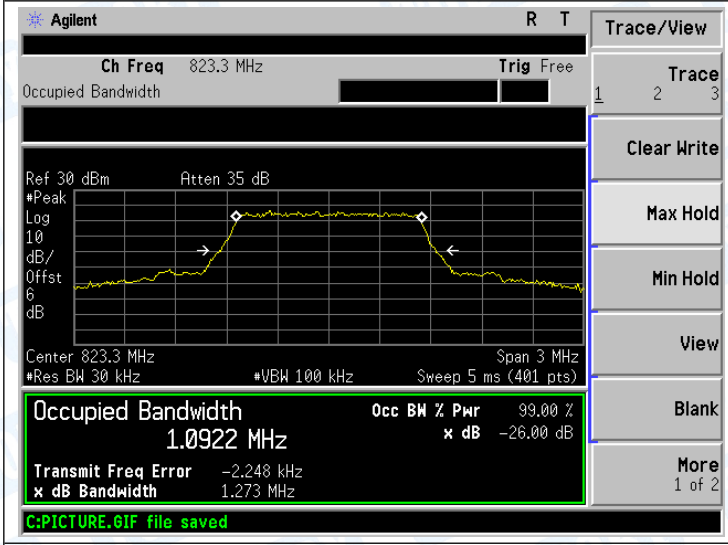
LTE BAND 26 (1.4MHz QPSK-Low CH)



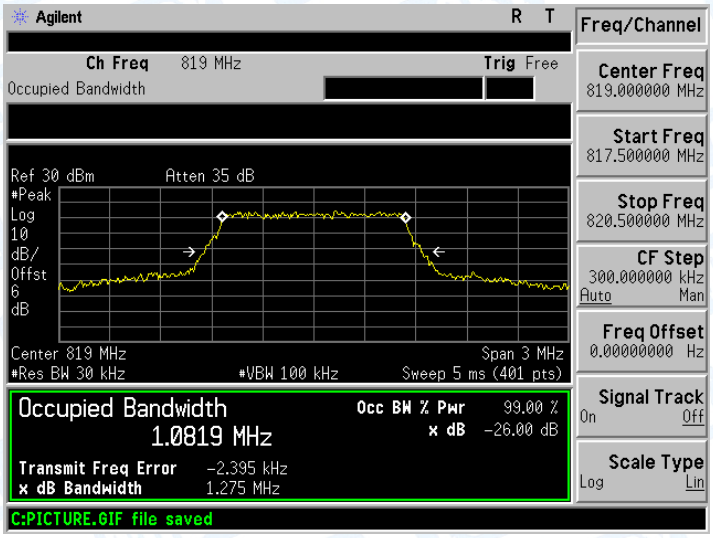
LTE BAND 26 (1.4MHz 16QAM-Low CH)



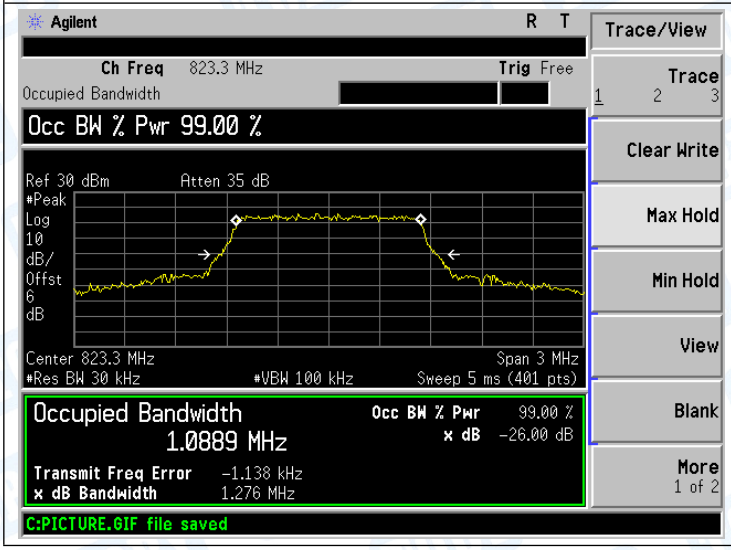
LTE BAND 26 (1.4MHz QPSK-Middle CH)



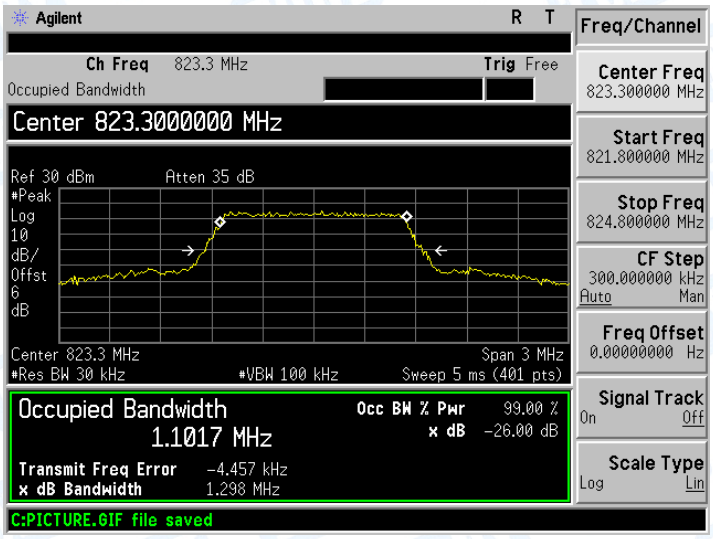
LTE BAND 26 (1.4MHz 16QAM- Middle CH)



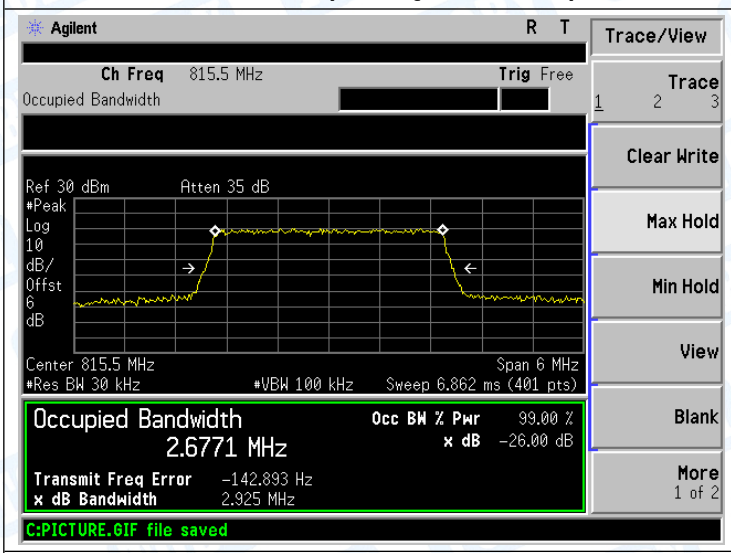
LTE BAND 26 (1.4MHz QPSK-High CH)



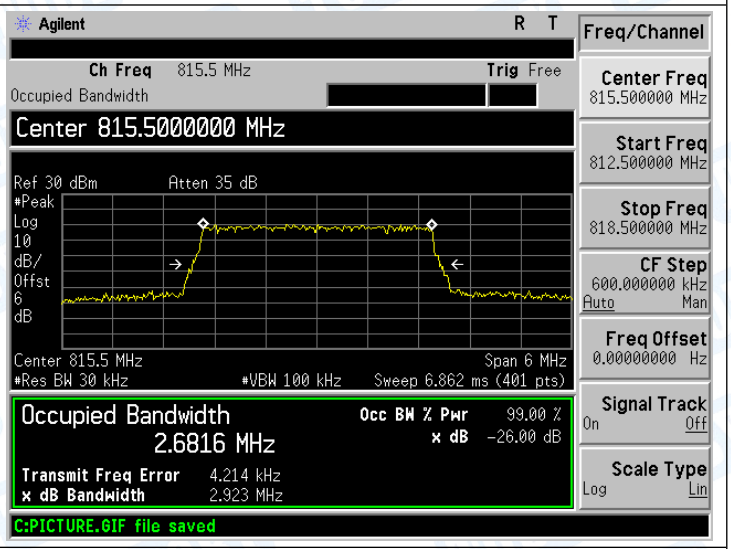
LTE BAND 26 (1.4MHz 16QAM-High CH)



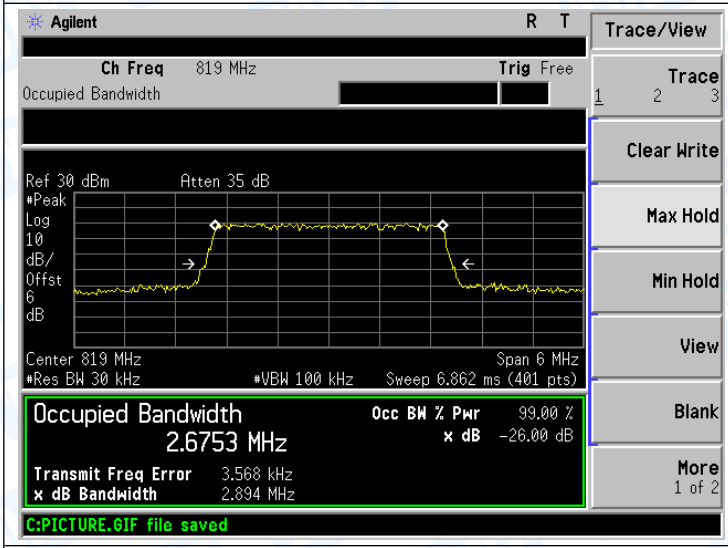
LTE BAND 26 (3MHz QPSK-Low CH)



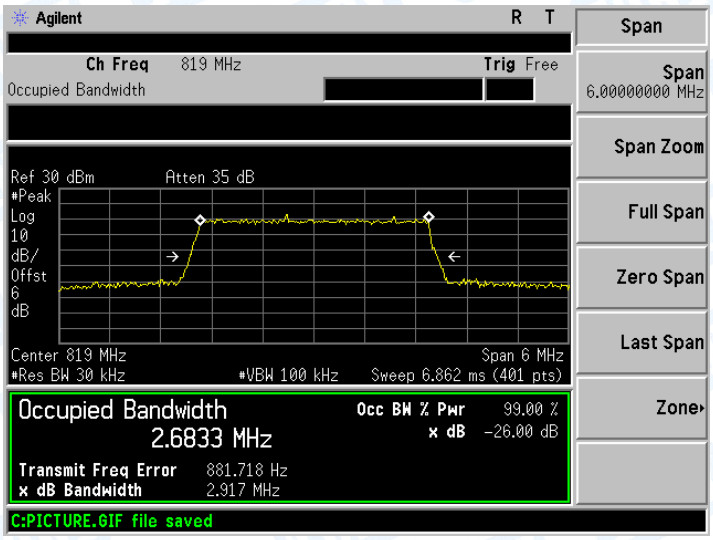
LTE BAND 26 (3MHz 16QAM-Low CH)



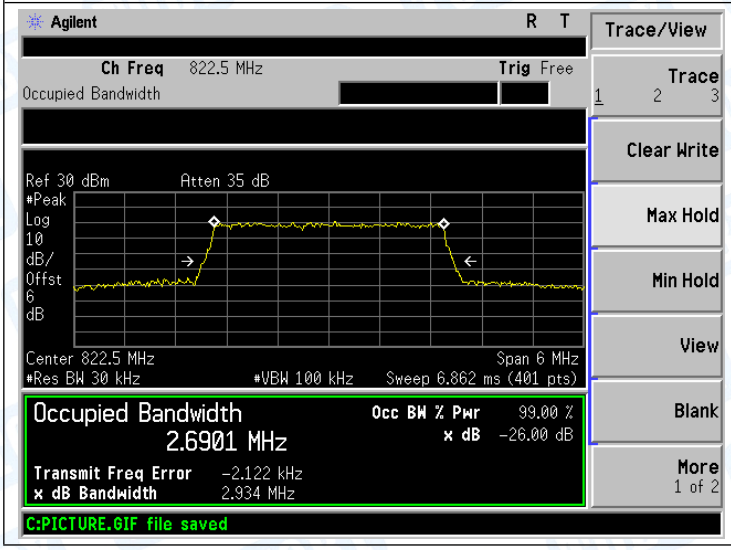
LTE BAND 26 (3MHz QPSK-Middle CH)



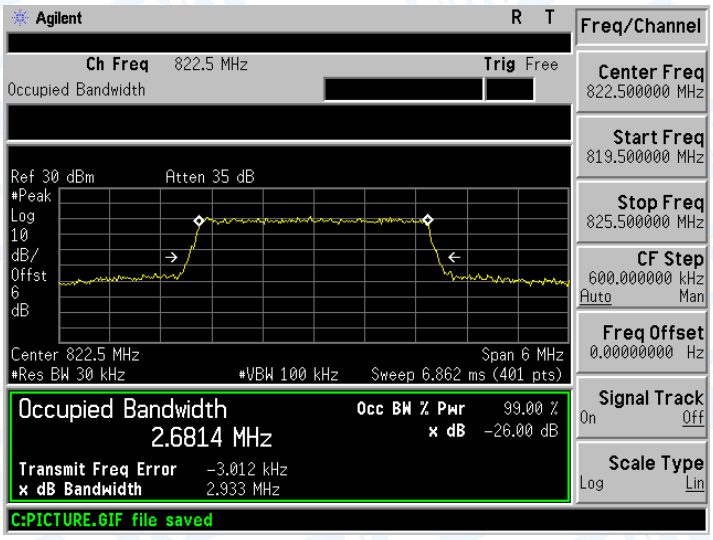
LTE BAND 26 (3MHz 16QAM- Middle CH)



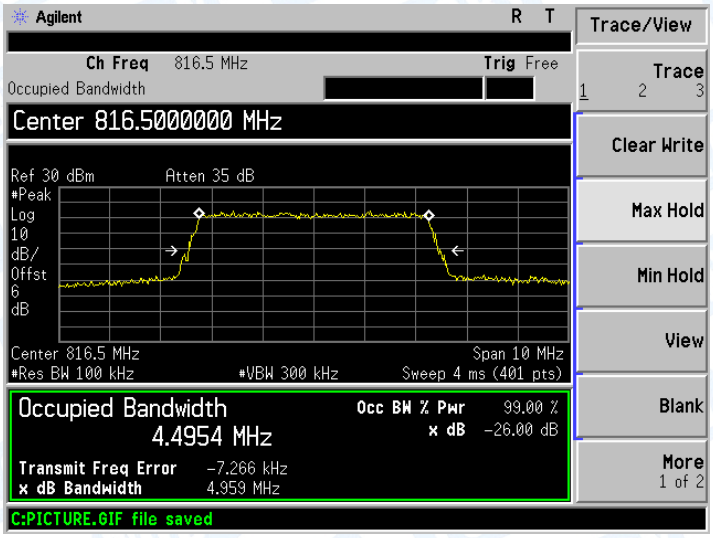
LTE BAND 26 (3MHz QPSK-High CH)



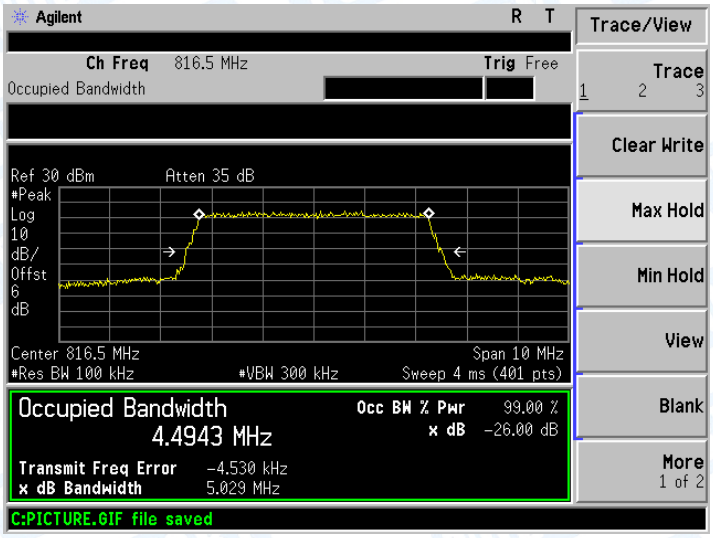
LTE BAND 26 (3MHz 16QAM-High CH)



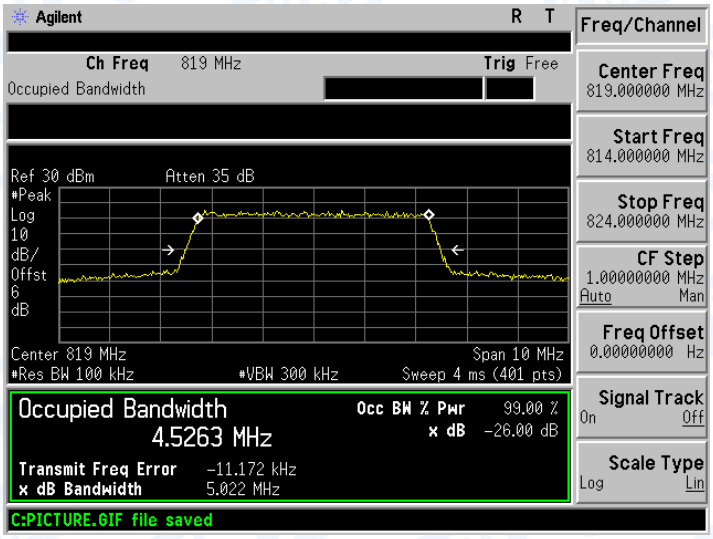
LTE BAND 26 (5MHz QPSK-Low CH)



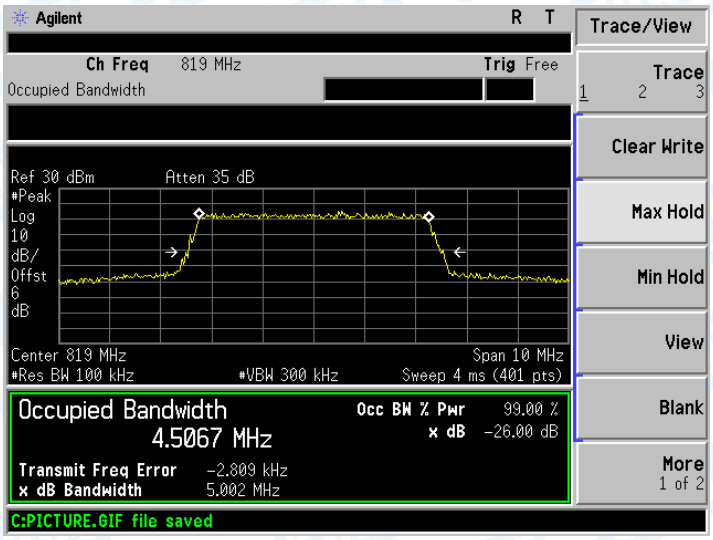
LTE BAND 26 (5MHz 16QAM-Low CH)



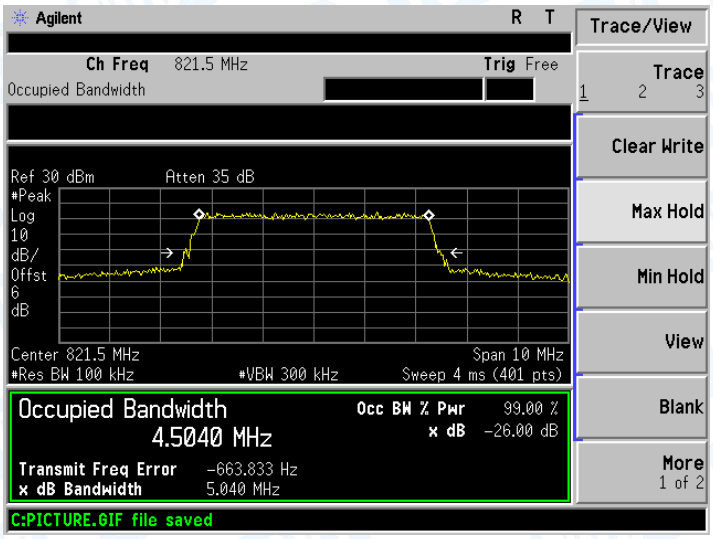
LTE BAND 26 (5MHz QPSK-Middle CH)



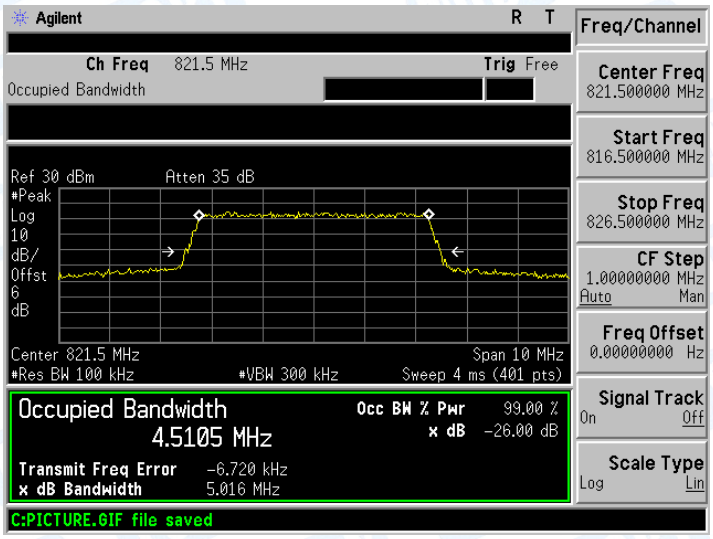
LTE BAND 26 (5MHz 16QAM- Middle CH)

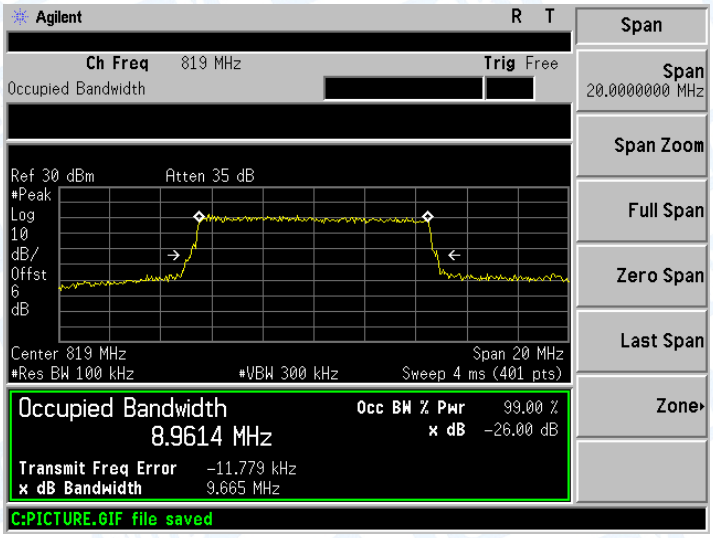
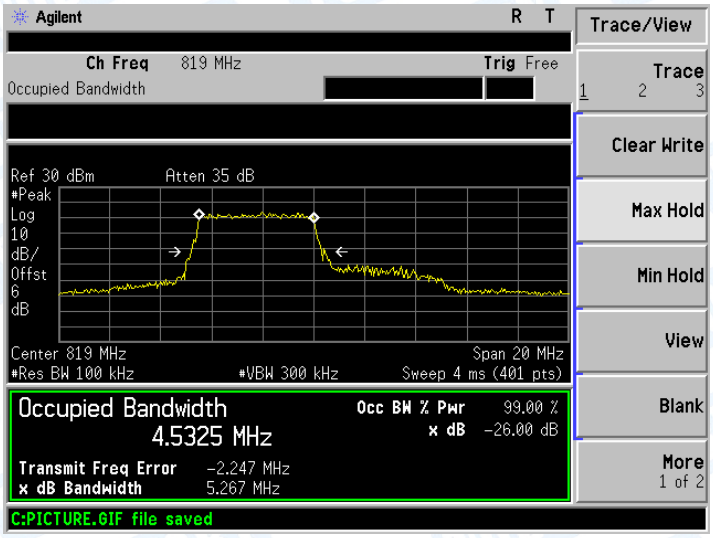


LTE BAND 26 (5MHz QPSK-High CH)

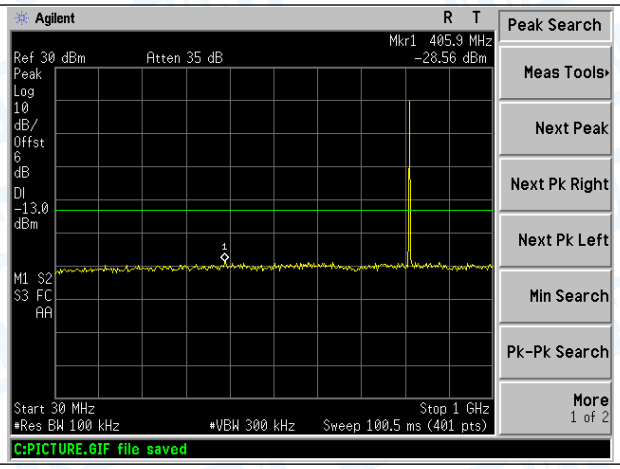
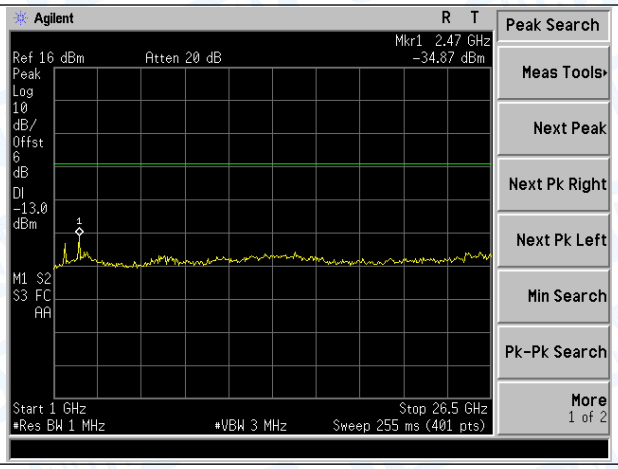
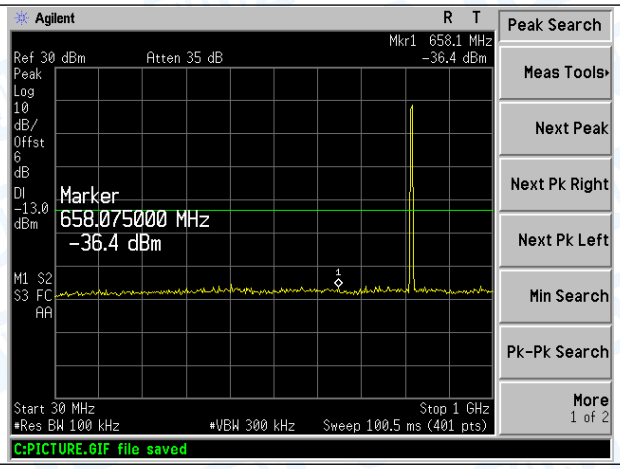
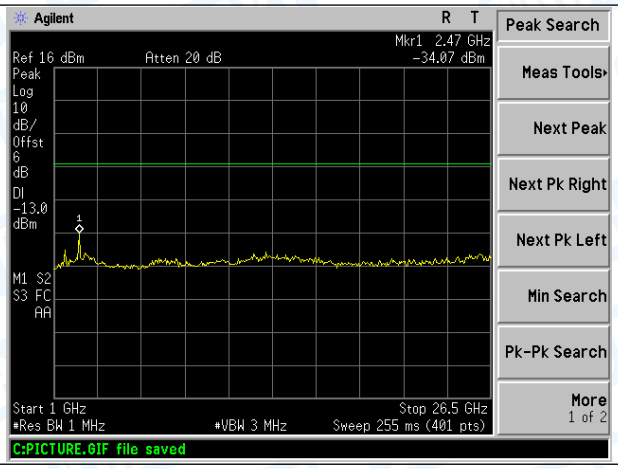
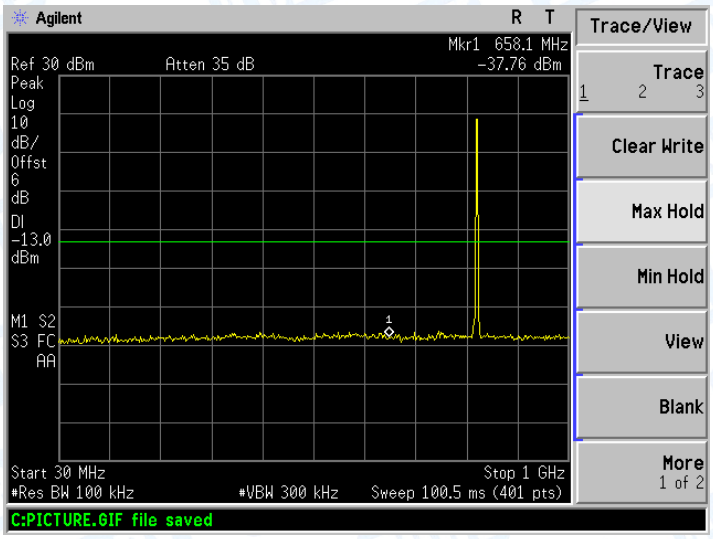
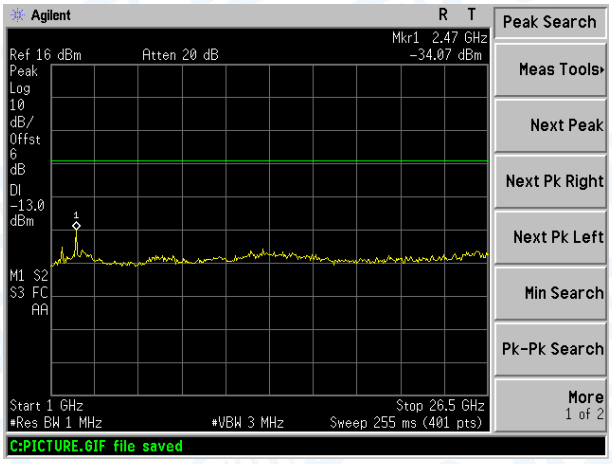


LTE BAND 26 (5MHz 16QAM-High CH)



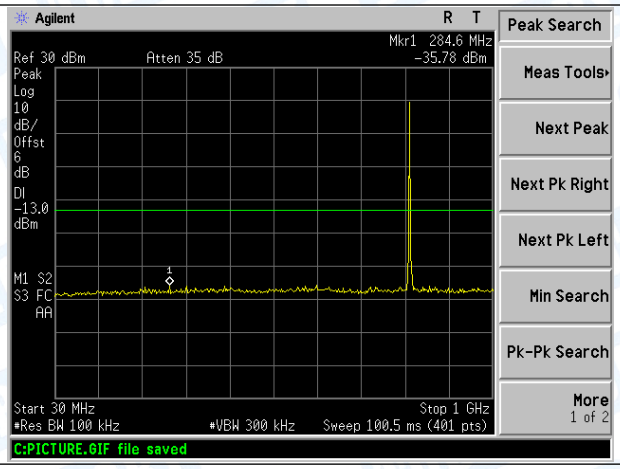
LTE BAND 26 (10MHz QPSK)	LTE BAND 26 (10MHz 16QAM)
	

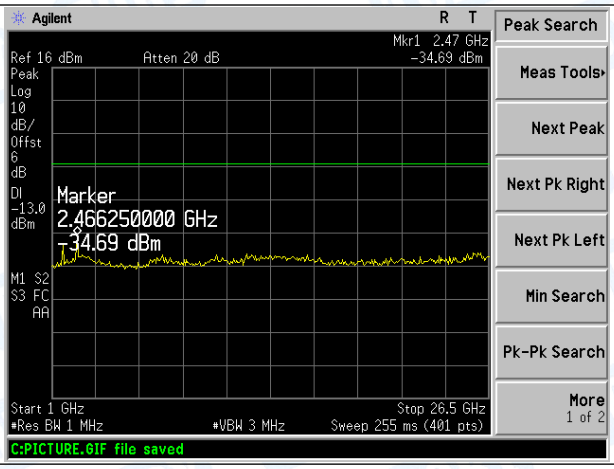
ATTACHMENT D--OUT OF BAND EMISSION AT ANTENNA TERMINALS

30MHz-1GHz	1GHz-26.5GHz
LTE BAND 26 (1.4MHz RB Size 6& RB Offset 0 QPSK-Low CH)	
	
LTE BAND 26 (1.4MHz RB Size 6& RB Offset 0 QPSK-Middle CH)	
	
LTE BAND 26 (1.4MHz RB Size 6& RB Offset 0 QPSK-High CH)	
	

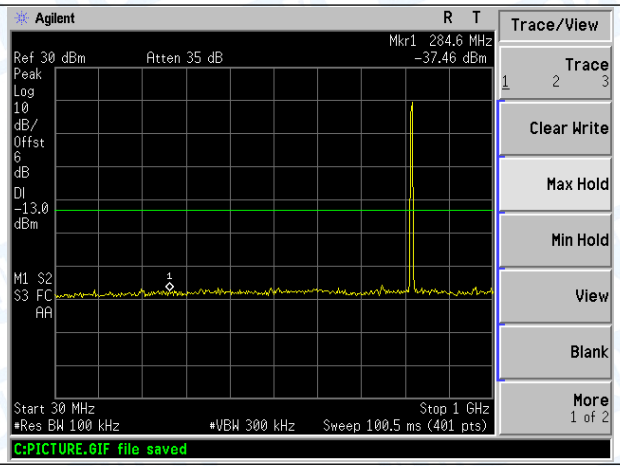
30MHz-1GHz	1GHz-26.5GHz

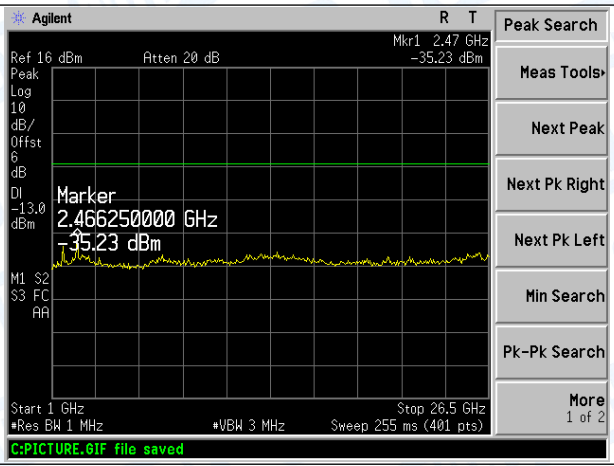
LTE BAND 26 (1.4MHz RB Size 6& RB Offset 0 16QAM-Low CH)



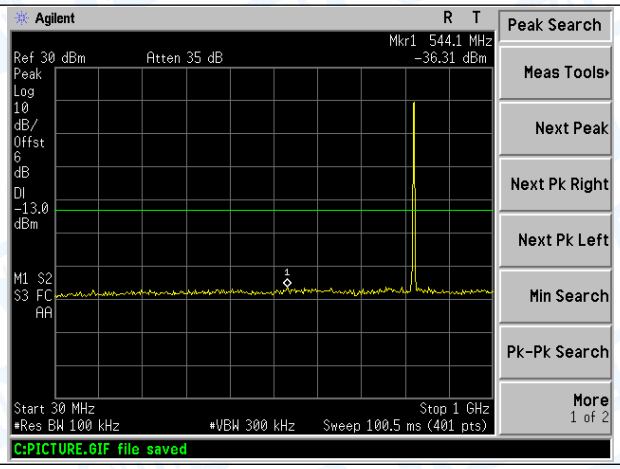


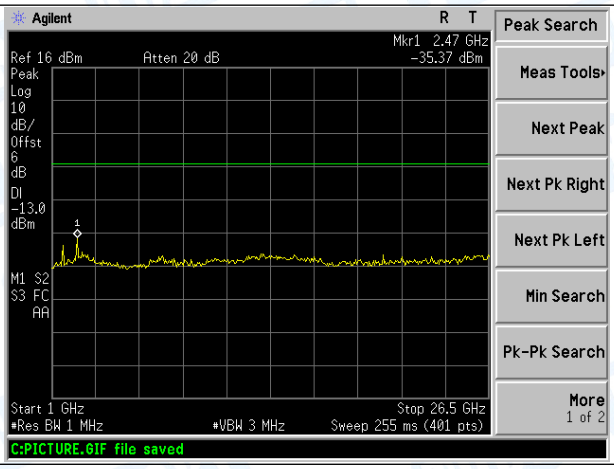
LTE BAND 26 (1.4MHz RB Size 6& RB Offset 0 16QAM-Middle CH)

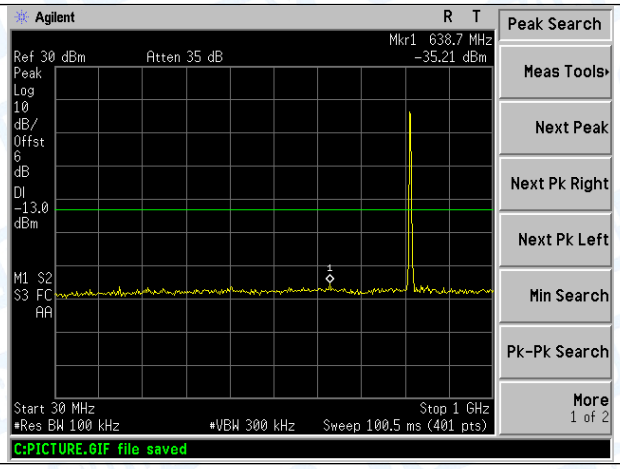
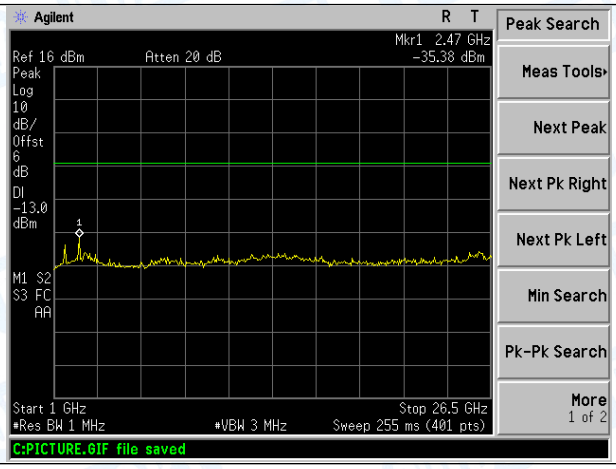
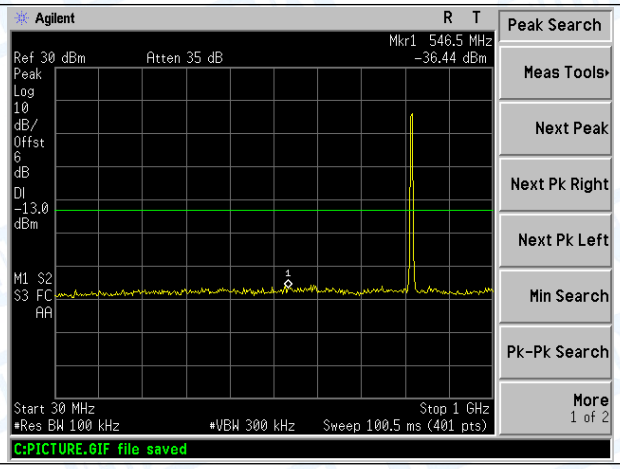
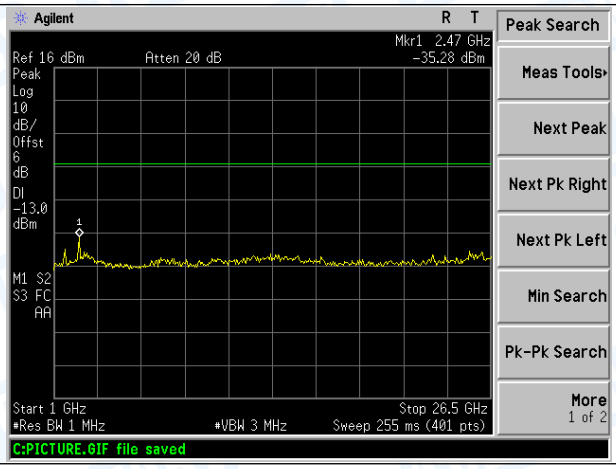
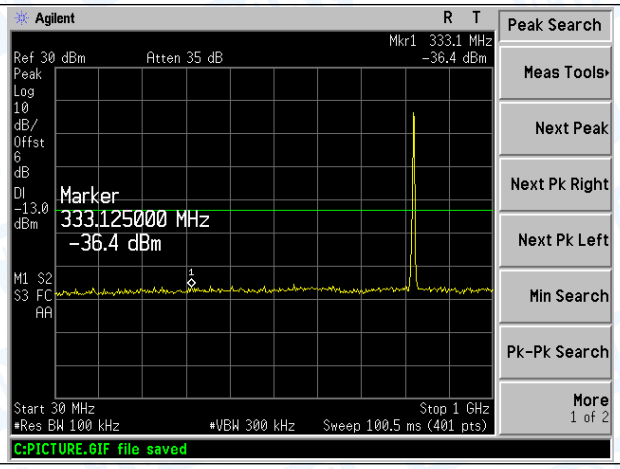
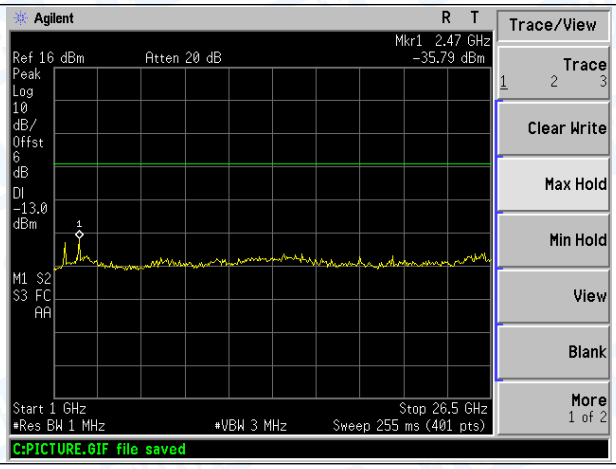


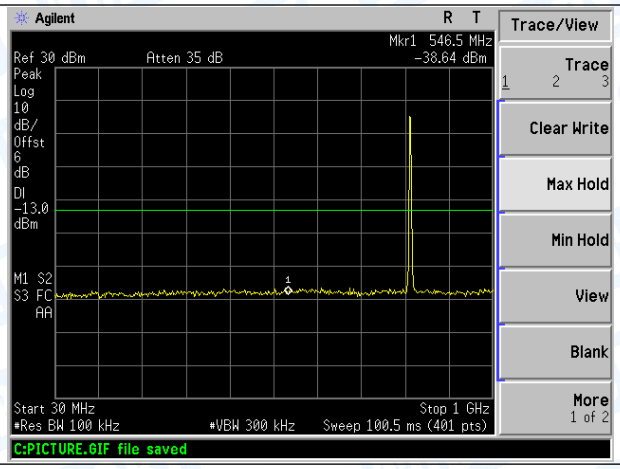
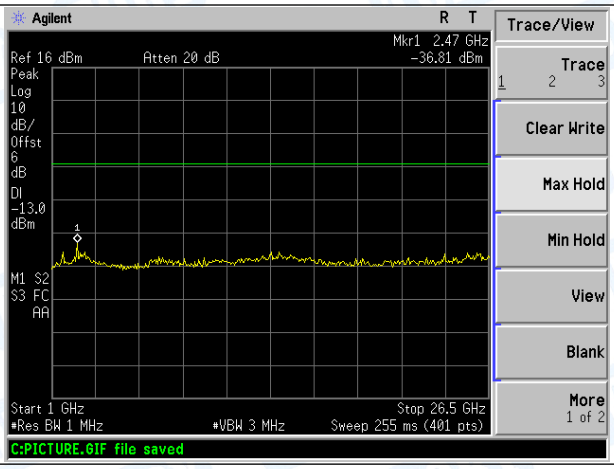
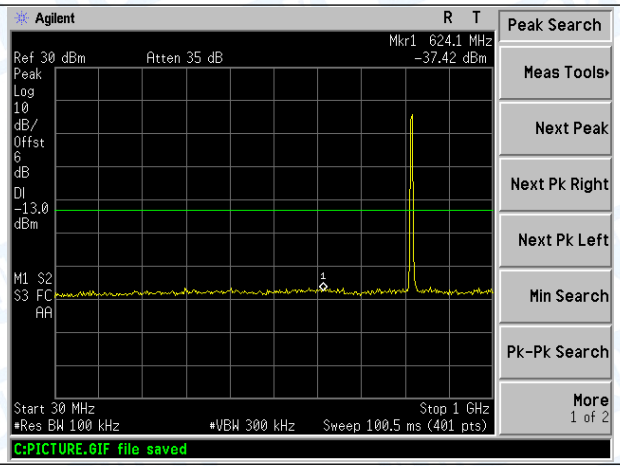
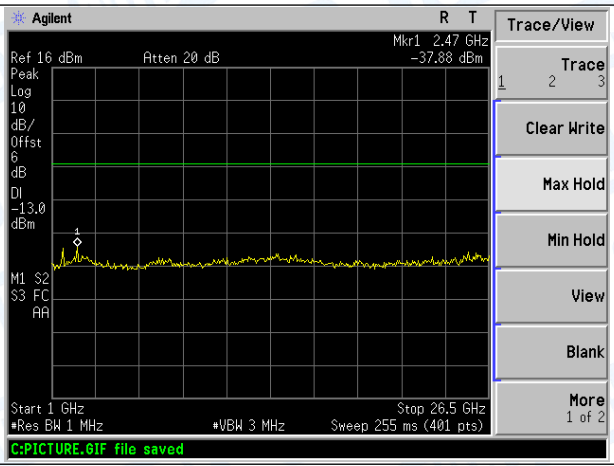
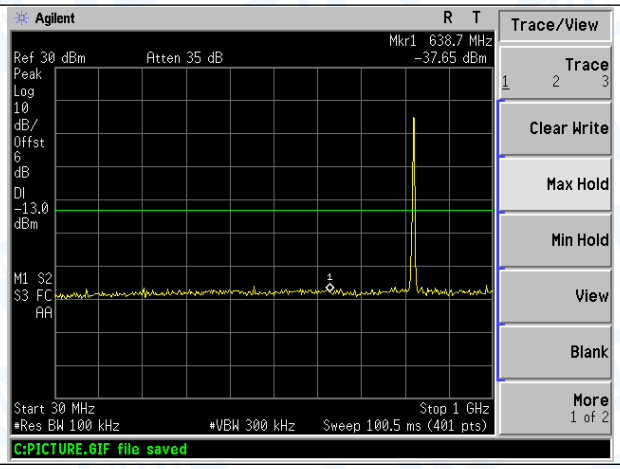
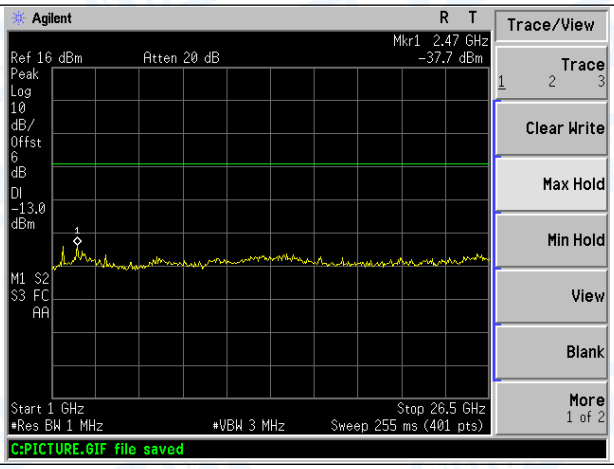


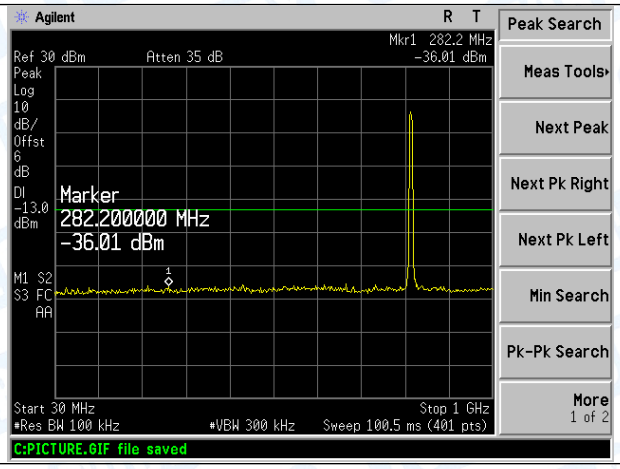
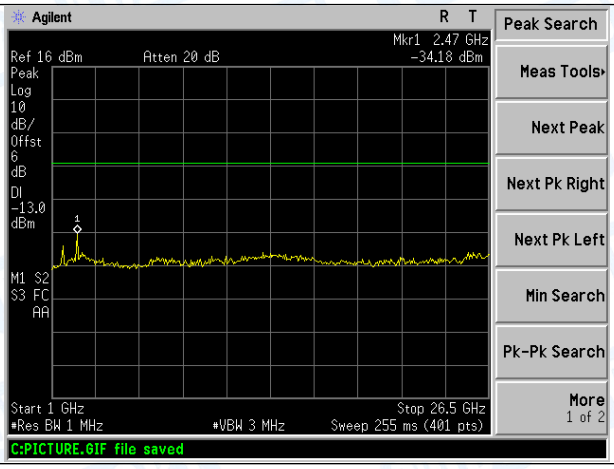
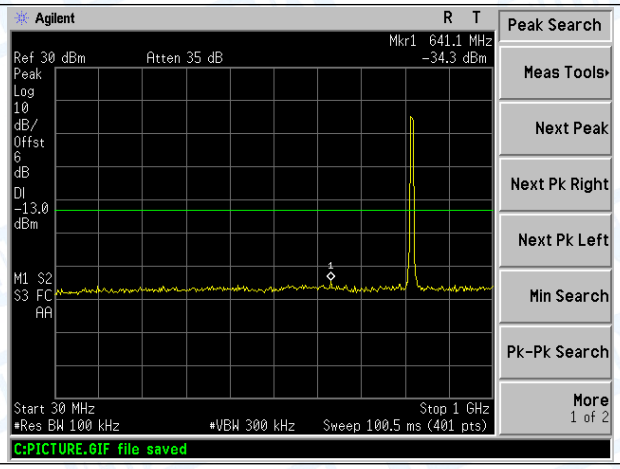
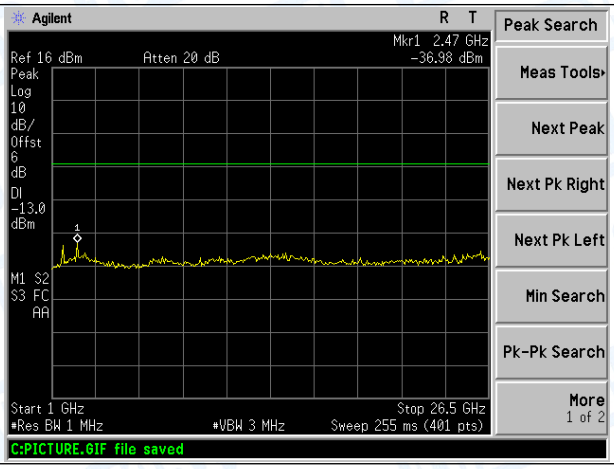
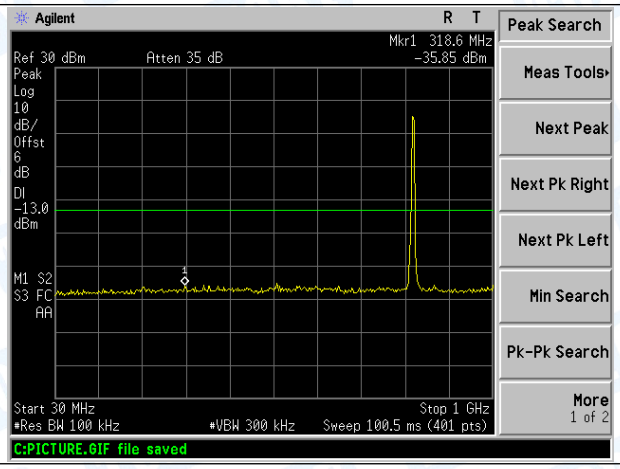
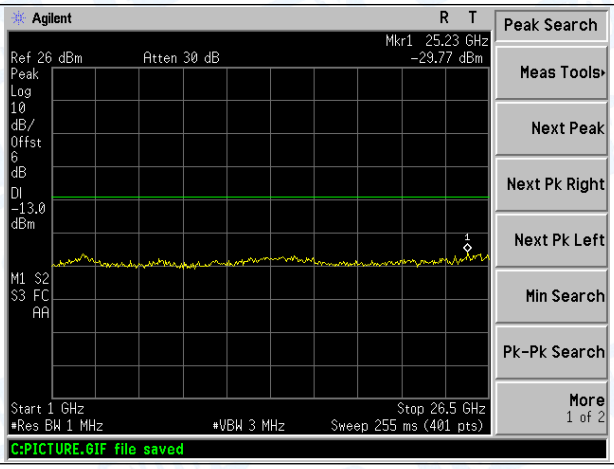
LTE BAND 26 (1.4MHz RB Size 6& RB Offset 0 16QAM-High CH)





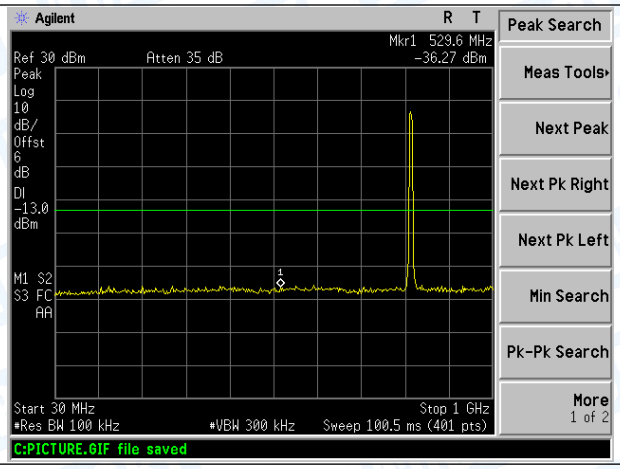
30MHz-1GHz	1GHz-26.5GHz
LTE BAND 26 (3MHz RB Size 15& RB Offset 0 QPSK-Low CH)	
	
LTE BAND 26 (3MHz RB Size 15& RB Offset 0 QPSK-Middle CH)	
	
LTE BAND 26 (3MHz RB Size 15& RB Offset 0 QPSK-High CH)	
	

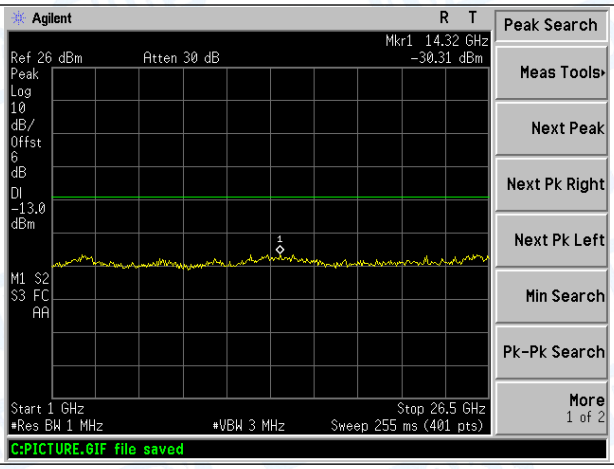
30MHz-1GHz	1GHz-26.5GHz
LTE BAND 26 (3MHz RB Size 15& RB Offset 0 16QAM-Low CH)	
	
LTE BAND 26 (3MHz RB Size 15& RB Offset 0 16QAM-Middle CH)	
	
LTE BAND 26 (3MHz RB Size 15& RB Offset 0 16QAM-High CH)	
	

30MHz-1GHz	1GHz-26.5GHz
LTE BAND 26 (5MHz RB Size 25& RB Offset 0 QPSK-Low CH)	
	
LTE BAND 26 (5MHz RB Size 25& RB Offset 0 QPSK-Middle CH)	
	
LTE BAND 26 (5MHz RB Size 25& RB Offset 0 QPSK-High CH)	
	

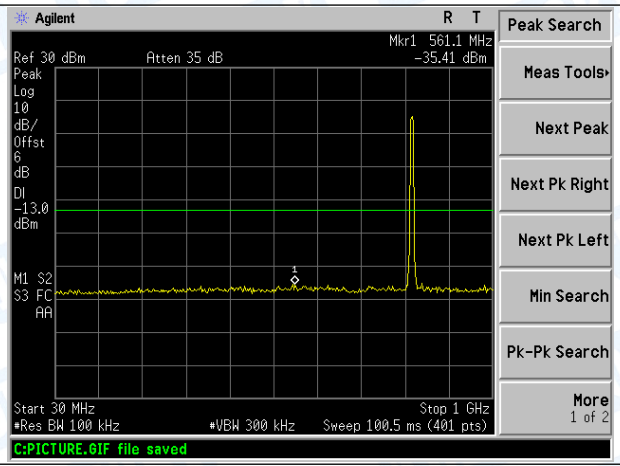
30MHz-1GHz	1GHz-26.5GHz

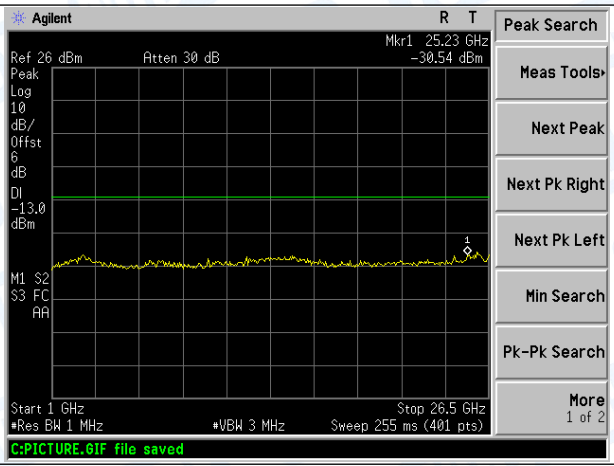
LTE BAND 26 (5MHz RB Size 25& RB Offset 0 16QAM-Low CH)



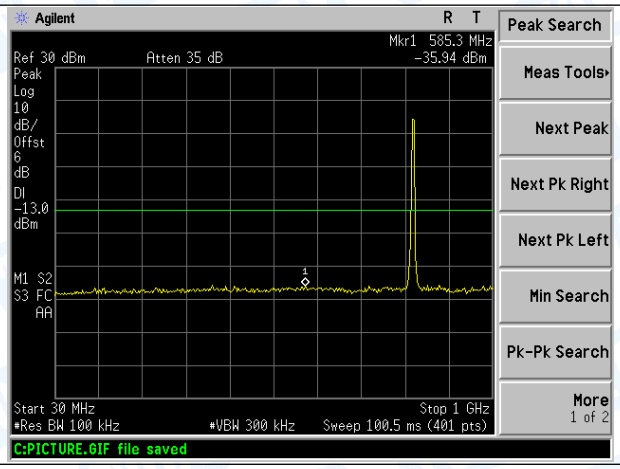


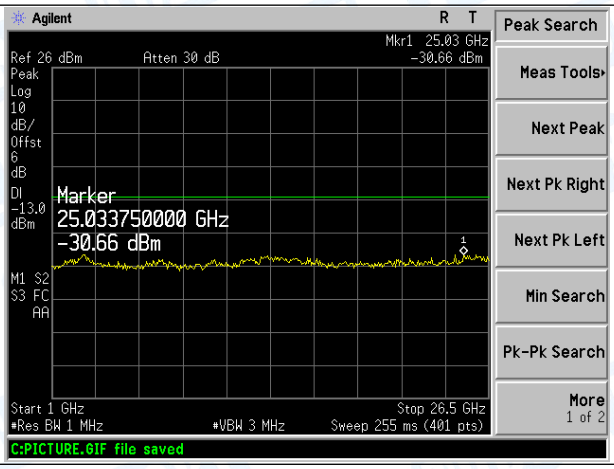
LTE BAND 26 (5MHz RB Size 25& RB Offset 0 16QAM-Middle CH)

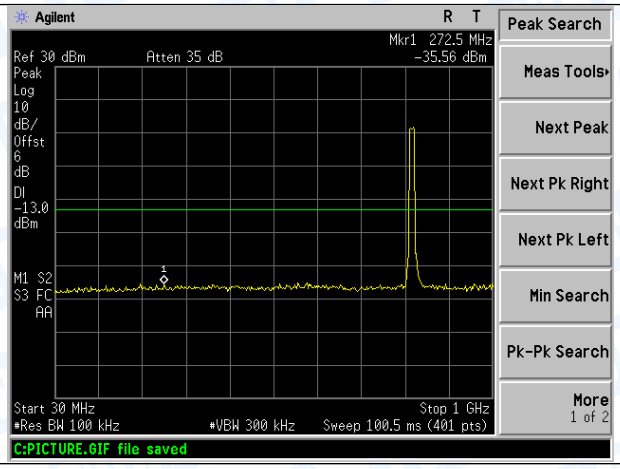
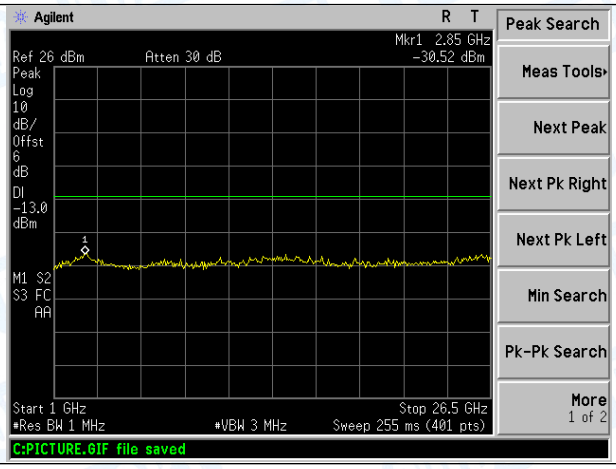
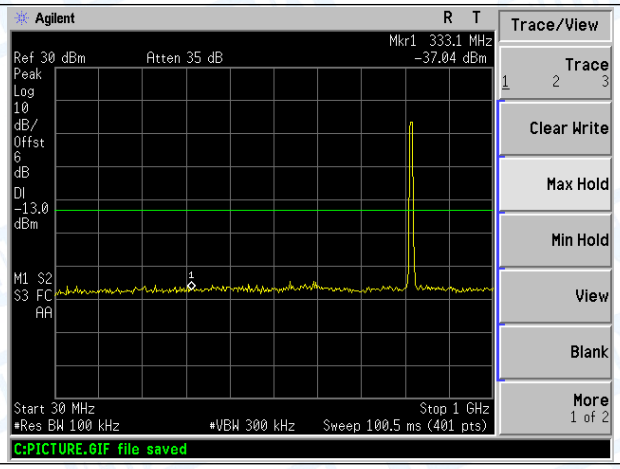
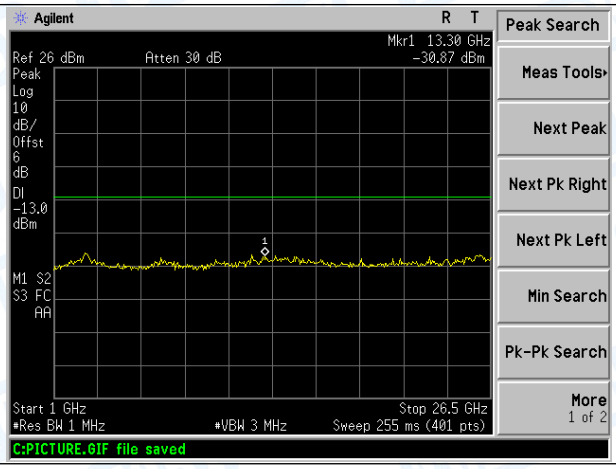




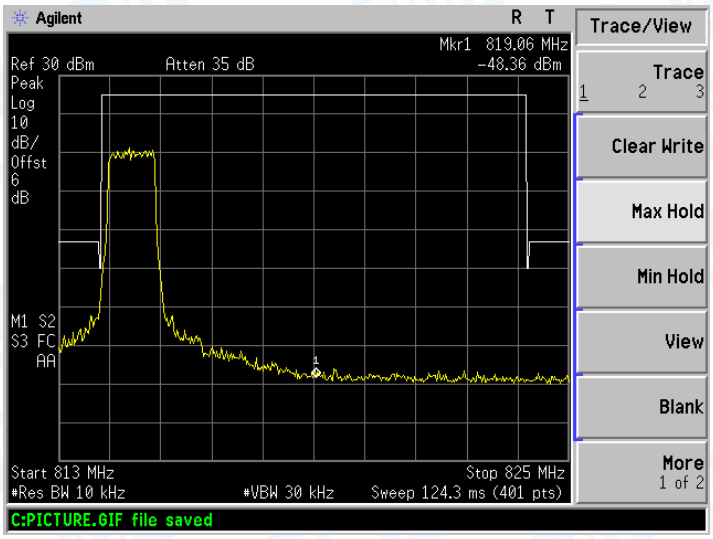
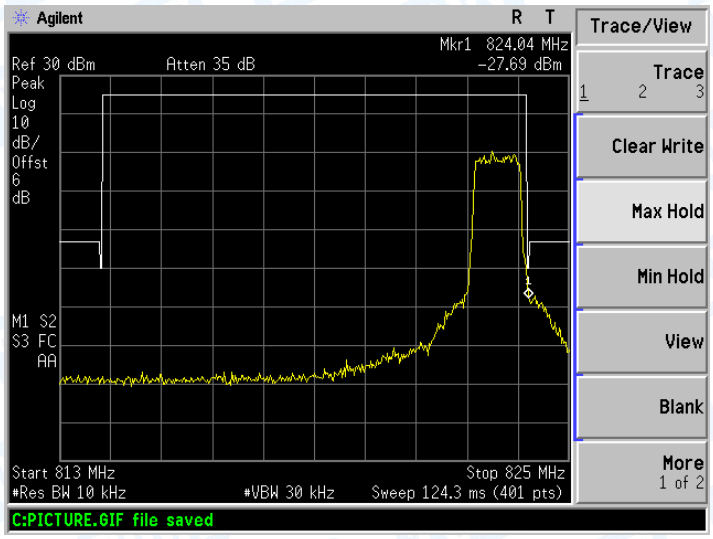
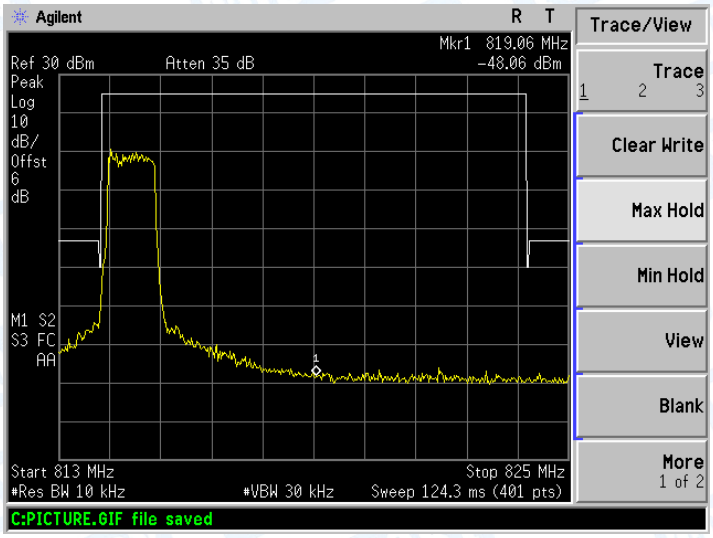
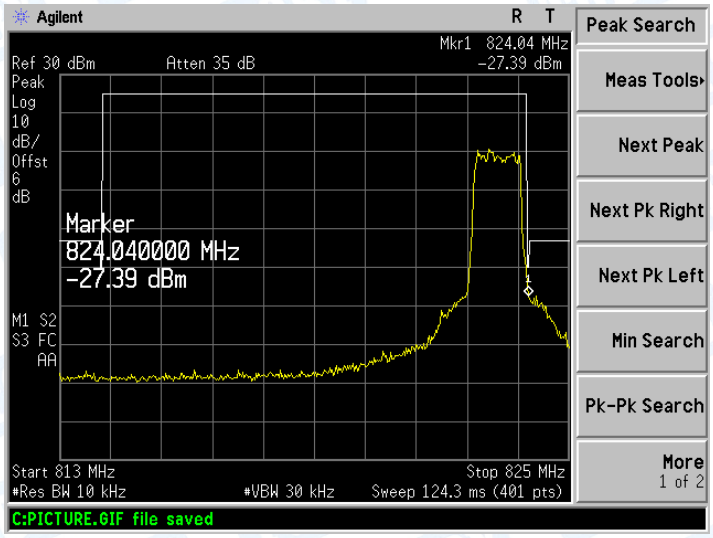
LTE BAND 26 (5MHz RB Size 25& RB Offset 0 16QAM-High CH)





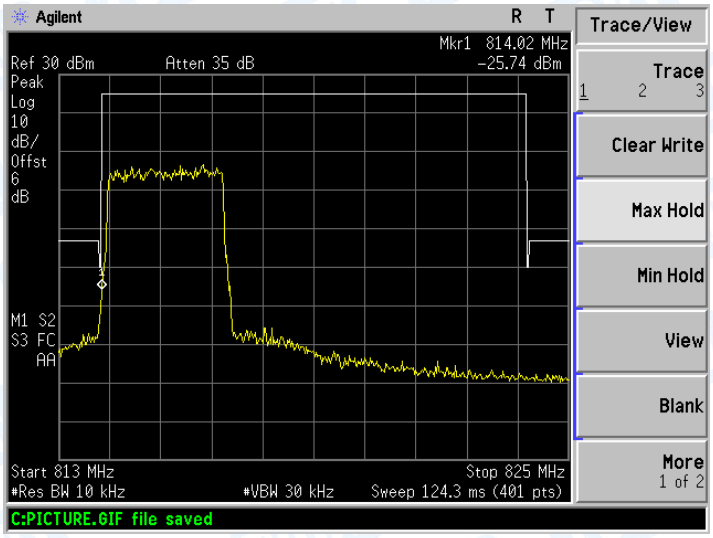
30MHz-1GHz	1GHz-26.5GHz
LTE BAND 26 (10MHz RB Size 50& RB Offset 0 QPSK)	
	
LTE BAND 4 (10MHz RB Size 25& RB Offset 0 16QAM)	
	

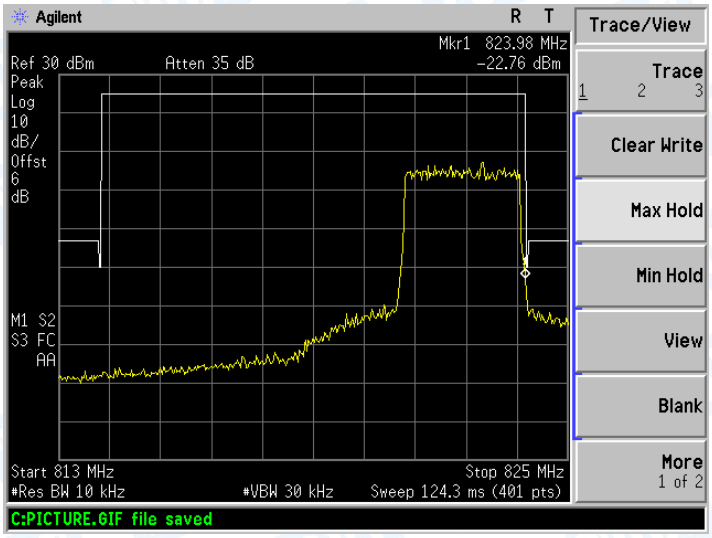
ATTACHMENT E--EMISSION MASKS

Low Channel	High Channel
LTE BAND 26 (1.4MHz RB Size 6& RB Offset 0 QPSK)	
	
LTE BAND 26 (1.4MHz RB Size 6& RB Offset 0 16QAM)	
	

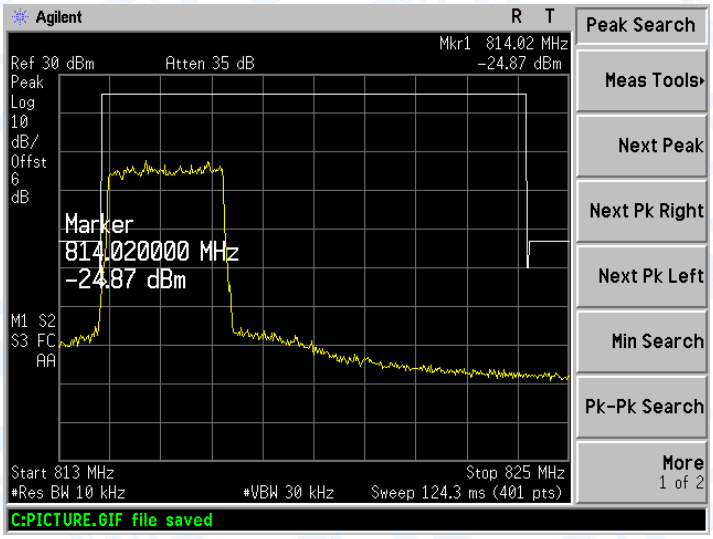
Low Channel	High Channel

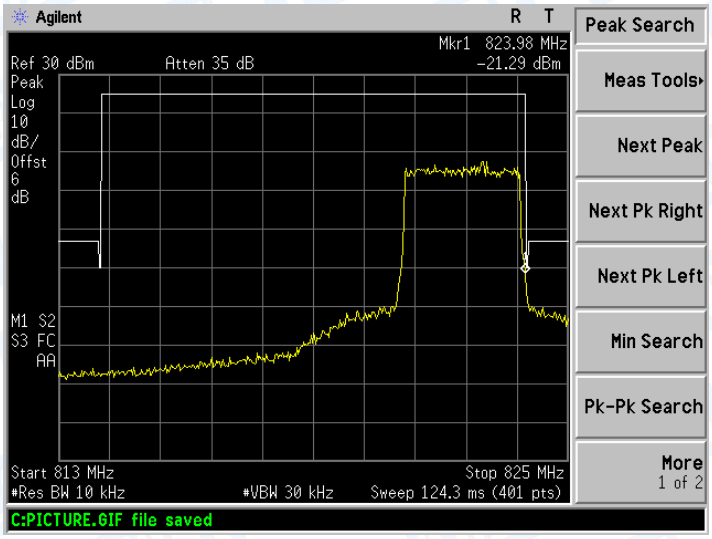
LTE BAND 26 (3MHz RB Size 15& RB Offset 0 QPSK)

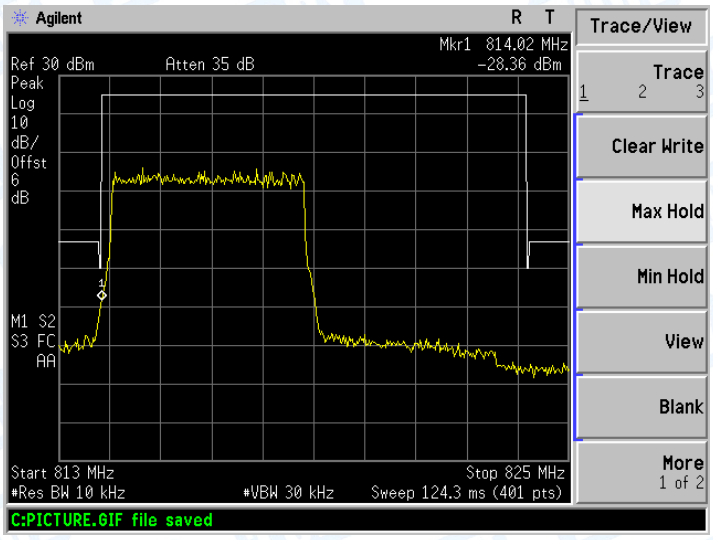
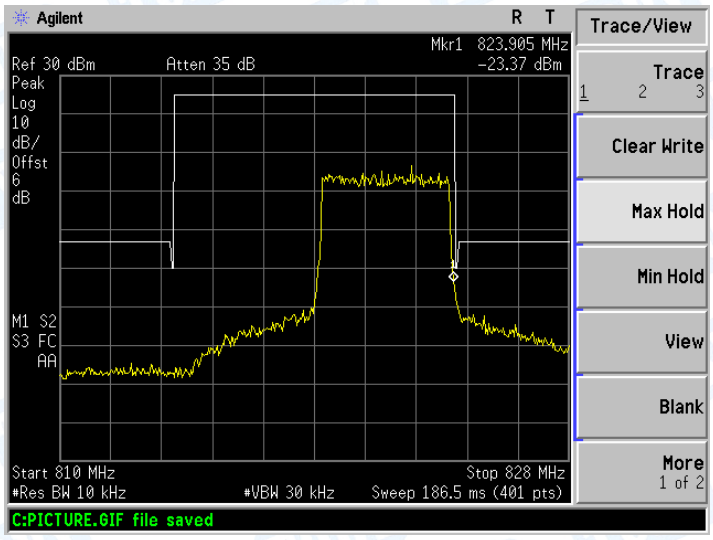
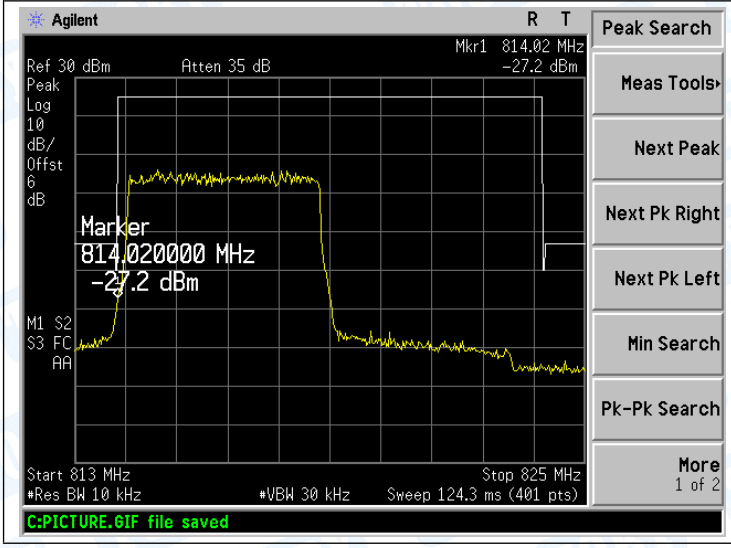
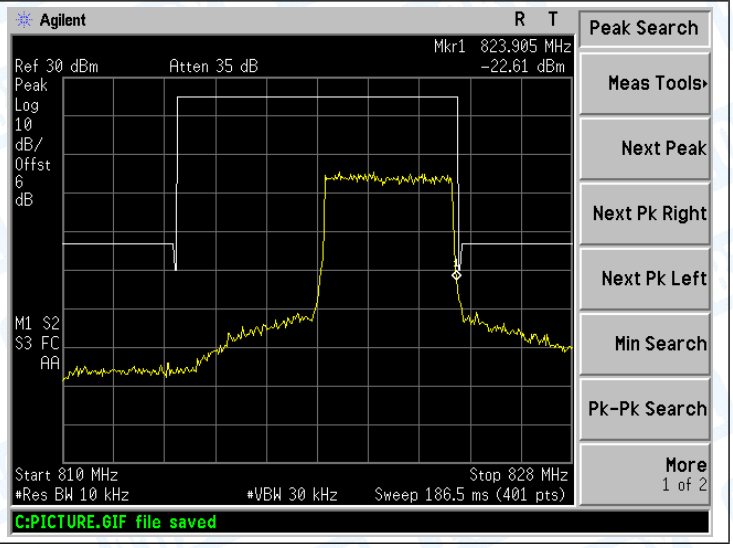




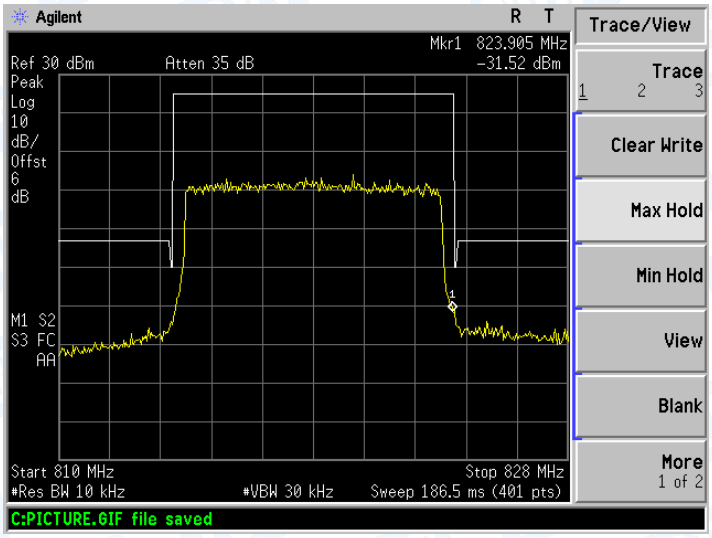
LTE BAND 26 (3MHz RB Size 15& RB Offset 0 16QAM)



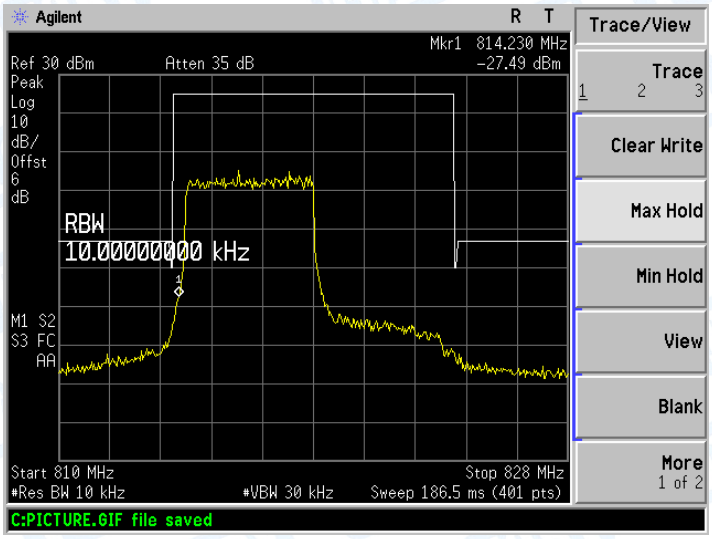


Low Channel	High Channel
LTE BAND 26 (5MHz RB Size 25& RB Offset 0 QPSK)	
	
LTE BAND 26 (5MHz RB Size 15& RB Offset 0 16QAM)	
	

LTE BAND 26 (10MHz RB Size 50& RB Offset 0 QPSK)



LTE BAND 26 (10MHz RB Size 25& RB Offset 0 16QAM)



ATTACHMENT F--RADIATED OUTPUT POWER

Radiated Power (ERP) for LTE Band 26 / 1.4M									
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)	EIRP (W)
	Size	offset							
QPSK	1	0	Lowest	H	21.38	3.46	1.26	23.58	0.228
				V	18.15	3.46	1.26	20.35	0.108
	1	0	Middle	H	20.98	3.82	1.26	23.54	0.226
				V	17.67	3.82	1.26	20.23	0.105
	1	0	Highest	H	20.34	4.16	1.26	23.24	0.211
				V	17.38	4.16	1.26	20.28	0.107
16QAM	1	0	Lowest	H	20.76	3.46	1.26	22.96	0.198
				V	17.05	3.46	1.26	19.25	0.084
	1	0	Middle	H	20.09	3.82	1.26	22.65	0.184
				V	17.01	3.82	1.26	19.57	0.091
	1	0	Highest	H	19.46	4.16	1.26	22.36	0.172
				V	16.97	4.16	1.26	19.87	0.097
Limit								**50**	**100**

Radiated Power (ERP) for LTE Band 26 / 3M									
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)	EIRP (W)
	Size	offset							
QPSK	1	0	Lowest	H	21.92	3.46	1.26	24.12	0.258
				V	19.05	3.46	1.26	21.25	0.133
	1	0	Middle	H	21.01	3.82	1.26	23.57	0.228
				V	18.09	3.82	1.26	20.65	0.116
	1	0	Highest	H	20.08	4.16	1.26	22.98	0.199
				V	17.12	4.16	1.26	20.02	0.100
16QAM	1	0	Lowest	H	20.68	3.46	1.26	22.88	0.194
				V	17.48	3.46	1.26	19.68	0.093
	1	0	Middle	H	20.31	3.82	1.26	22.87	0.194
				V	16.69	3.82	1.26	19.25	0.084
	1	0	Highest	H	20.35	4.16	1.26	23.25	0.211
				V	17.24	4.16	1.26	20.14	0.103
Limit								**50**	**100**

Radiated Power (ERP) for LTE Band 26 / 5M									
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)	EIRP (W)
	Size	offset							
QPSK	1	0	Lowest	H	21.27	3.46	1.26	23.47	0.222
				V	18.68	3.46	1.26	20.88	0.122
	1	0	Middle	H	21.01	3.82	1.26	23.57	0.228
				V	18.45	3.82	1.26	21.01	0.126
	1	0	Highest	H	19.97	4.16	1.26	22.87	0.194
				V	17.22	4.16	1.26	20.12	0.103
16QAM	1	0	Lowest	H	20.34	3.46	1.26	22.54	0.179
				V	18.67	3.46	1.26	20.87	0.122
	1	0	Middle	H	20.30	3.82	1.26	22.86	0.193
				V	17.58	3.82	1.26	20.14	0.103
	1	0	Highest	H	19.95	4.16	1.26	22.85	0.193
				V	17.09	4.16	1.26	19.99	0.100
Limit								**50**	**100**

Radiated Power (ERP) for LTE Band 26 / 10M									
Modulation	RB		Channel	Antenna (H&V)	SG Level (dBm)	Antenna Factor (dBd)	Cable Loss (dB)	EIRP (dBm)	EIRP (W)
	Size	offset							
QPSK	1	0	Middle	H	20.65	3.46	1.26	22.85	0.193
				V	17.05	3.46	1.26	19.25	0.084
16QAM	1	0	Middle	H	20.48	3.82	1.26	23.04	0.201
				V	17.80	3.82	1.26	20.36	0.109
Limit								**50**	**100**

ATTACHMENT G--RADIATED OUT BAND OF EMISSIONS

Measurement Data (worst case)

Test mode:	LTE BAND 26 1.4MHz(RB size 1 & RB offset 0) for QPSK						
Channel:	Middle			Date of Test:	2020-06-25		
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
1638.45	Horizontal	-66.81	7.49	3.97	-55.35	-13.00	Pass
2457.51	H	-61.33	7.03	5.05	-49.25		
3276.84	H	-64.18	12.48	5.98	-45.72		
1638.45	Vertical	-68.22	8.02	3.97	-56.23	-13.00	Pass
2457.51	V	-64.48	10.47	5.05	-48.96		
3276.84	V	-68.75	16.92	5.98	-45.85		

Remark: 1, The testing has been conformed to 10*819.0MHz=819.0MHz.
2, All other emissions more than 50 dB below the limit.
3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss

Test mode:	LTE BAND 26 3MHz(RB size 1 & RB offset 0) for QPSK						
Channel:	Middle			Date of Test:	2020-06-25		
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
1638.45	Horizontal	-67.78	7.49	3.97	-56.32	-13.00	Pass
2457.51	H	-60.64	7.03	5.05	-48.56		
3276.84	H	-63.32	12.48	5.98	-44.86		
1638.45	Vertical	-67.95	8.02	3.97	-55.96	-13.00	Pass
2457.51	V	-64.54	10.47	5.05	-49.02		
3276.84	V	-68.16	16.92	5.98	-45.26		

Remark: 1, The testing has been conformed to 10*819.0MHz=819.0MHz.
2, All other emissions more than 50 dB below the limit.
3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss

Test mode:	LTE BAND 26 5MHz(RB size 1 & RB offset 0) for QPSK						
Channel:	Middle			Date of Test:	2020-06-25		
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
1638.45	Horizontal	-67.31	7.49	3.97	-55.85	-13.00	Pass
2457.51	H	-61.30	7.03	5.05	-49.22		
3276.84	H	-63.68	12.48	5.98	-45.22		
1638.45	Vertical	-67.85	8.02	3.97	-55.86	-13.00	Pass
2457.51	V	-63.38	10.47	5.05	-47.86		
3276.84	V	-67.88	16.92	5.98	-44.98		

Remark: 1, The testing has been conformed to 10*819.0MHz=819.0MHz.
2, All other emissions more than 50 dB below the limit.
3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss

Test mode:	LTE BAND 26 10MHz(RB size 1 & RB offset 0) for QPSK						
Channel:	Middle			Date of Test:	2020-06-25		
Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
	Polarization (H&V)	Read Level (dBm)	Antenna Correct Factor (dBi)	Cable Loss (dB)	Emission Level (dBm)		
1638.45	Horizontal	-67.98	7.49	3.97	-56.52	-13.00	Pass
2457.51	H	-61.64	7.03	5.05	-49.56		
3276.84	H	-64.33	12.48	5.98	-45.87		
1638.45	Vertical	-67.68	8.02	3.97	-55.69	-13.00	Pass
2457.51	V	-61.77	10.47	5.05	-46.25		
3276.84	V	-68.16	16.92	5.98	-45.26		

Remark: 1, The testing has been conformed to 10*819.0MHz=819.0MHz.
2, All other emissions more than 50 dB below the limit.
3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss

ATTACHMENT H--FREQUENCY STABILITY

Temperature Variation					
Reference Frequency: LTE Band 26 QPSK(1.4MHz) Middle channel=26740 Frequency=819.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-30	16	0.0195	±1.5	Pass
	-20	22	0.0268		
	-10	5	0.0061		
	0	55	0.0670		
	10	52	0.0640		
	20	5	0.0064		
	30	28	0.0342		
	40	26	0.0313		
	50	47	0.0572		
Reference Frequency: LTE Band 26 QPSK(3MHz) Middle channel=26740 Frequency=819.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-30	13	0.0159	±1.5	Pass
	-20	38	0.0465		
	-10	46	0.0566		
	0	1	0.0009		
	10	-2	0.0025		
	20	42	0.0514		
	30	27	0.0333		
	40	21	0.0259		
	50	13	0.0163		
Reference Frequency: LTE Band 26 QPSK(5MHz) Middle channel=26740 Frequency=819.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-30	18	0.0220	±1.5	Pass
	-20	17	0.0206		
	-10	44	0.0540		
	0	55	0.0678		
	10	16	0.0194		
	20	0	0.0003		
	30	48	0.0585		
	40	33	0.0400		
	50	27	0.0332		
Reference Frequency: LTE Band 26 QPSK(10MHz) Middle channel=26740 Frequency=819.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.7	-30	20	0.0244	±1.5	Pass
	-20	43	0.0525		
	-10	45	0.0552		
	0	1	0.0006		
	10	26	0.0318		
	20	-15	0.0185		
	30	13	0.0154		
	40	40	0.0484		
	50	51	0.0629		

Temperature Variation					
Reference Frequency: LTE Band 26 16QAM(1.4MHz) Middle channel=26740 Frequency=819.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
6.0	-30	20	0.0244	±1.5	Pass
	-20	44	0.0535		
	-10	3	0.0036		
	0	48	0.0582		
	10	41	0.0497		
	20	53	0.0643		
	30	-9	0.0108		
	40	58	0.0704		
	50	-19	0.0237		
Reference Frequency: LTE Band 26 16QAM(3MHz) Middle channel=26740 Frequency=819.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
6.0	-30	25	0.0305	±1.5	Pass
	-20	11	0.0132		
	-10	53	0.0646		
	0	34	0.0414		
	10	-6	0.0075		
	20	31	0.0382		
	30	-4	0.0054		
	40	-7	0.0082		
	50	61	0.0741		
Reference Frequency: LTE Band 26 16QAM(5MHz) Middle channel=26740 Frequency=819.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
6.0	-30	24	0.0293	±1.5	Pass
	-20	6	0.0069		
	-10	27	0.0332		
	0	0	0.0005		
	10	34	0.0412		
	20	44	0.0543		
	30	15	0.0181		
	40	9	0.0112		
	50	8	0.0097		
Reference Frequency: LTE Band 26 16QAM(10MHz) Middle channel=26740 Frequency=819.0MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
6.0	-30	28	0.0342	±1.5	Pass
	-20	14	0.0175		
	-10	68	0.0825		
	0	32	0.0393		
	10	66	0.0802		
	20	31	0.0374		
	30	25	0.0307		
	40	28	0.0344		
	50	-9	0.0109		

Voltage Variation					
Reference Frequency: LTE Band 26 QPSK(1.4MHz) Middle channel=26740 Frequency=819.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	3.2	55	0.0672	±1.5	Pass
	3.7	54	0.0660		
	4.2	93	0.1139		
Reference Frequency: LTE Band 26 QPSK(3MHz) Middle channel=26740 Frequency=819.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	3.2	78	0.0957	±1.5	Pass
	3.7	35	0.0431		
	4.2	58	0.0705		
Reference Frequency: LTE Band 26 QPSK(5MHz) Middle channel=26740 Frequency=819.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	3.2	20	0.0239	±1.5	Pass
	3.7	21	0.0259		
	4.2	94	0.1151		
Reference Frequency: LTE Band 26 QPSK(10MHz) Middle channel=26740 Frequency=819.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	3.2	46	0.0562	±1.5	Pass
	3.7	23	0.0280		
	4.2	53	0.0646		

Voltage Variation					
Reference Frequency: LTE Band 26 16QAM(1.4MHz) Middle channel=26740 Frequency=819.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	3.2	41	0.0504	±1.5	Pass
	3.7	13	0.0157		
	4.2	65	0.0796		
Reference Frequency: LTE Band 26 16QAM(3MHz) Middle channel=26740 Frequency=819.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	3.2	25	0.0305	±1.5	Pass
	3.7	11	0.0133		
	4.2	29	0.0350		
Reference Frequency: LTE Band 26 16QAM(5MHz) Middle channel=26740 Frequency=819.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	3.2	69	0.0842	±1.5	Pass
	3.7	47	0.0576		
	4.2	54	0.0658		
Reference Frequency: LTE Band 26 16QAM(10MHz) Middle channel=26740 Frequency=819.0MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	3.2	94	0.1143	±1.5	Pass
	3.7	105	0.1284		
	4.2	108	0.1323		

------End of Report------