

FCC Radio Test Report

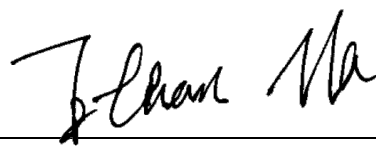
FCC ID: QISMAR-LX3AM

This report concerns: Original Grant

Project No. : 1904C018
Equipment : Smart Phone
Test Model : MAR-LX3Am
Series Model : N/A
Applicant : Huawei Technologies Co., Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, China

Date of Receipt : Apr. 04, 2019
Date of Test : Apr. 04, 2019 ~ Apr. 19, 2019
Issued Date : May 20, 2019
Tested by : BTL Inc.

Technical Manager

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(Ethan Ma)

Authorized Signatory

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Certificate #5123.02

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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.	Apr. 24, 2019
R01	Updated the Software Version.	May 15, 2019
R02	Changed the FCC ID QISMAR-LX3Am to QISMAR-LX3AM.	May 20, 2019

1. GENERAL SUMMARY

Equipment : Smart Phone
Brand Name : HUAWEI
Test Model : MAR-LX3Am
Series Model : N/A
Applicant : Huawei Technologies Co., Ltd.
Manufacturer : Huawei Technologies Co., Ltd.
Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, 518129, China
Date of Test : Apr. 04, 2019 ~ Apr. 19, 2019
Test Sample : Engineering Sample No.: D190403577 for conducted, D190403530 for
radiated.
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-4-1904C018) 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 GSM850, 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	Judgment	Tested By
2.1046 22.913(a)	Radiated power	PASS	Paul Li
2.1046 22.913(a)	Maximum Output Power	PASS	Paul Li
2.1049(h) 22.917(a)	Occupied Bandwidth	PASS	Paul Li
2.1051 22.917(a)	Conducted Spurious Emissions	PASS	Paul Li
2.1053 22.917(a)	Radiated Spurious Emissions	PASS	Paul Li
22.917(a)	Band Edge Measurements	PASS	Paul Li
-	Peak To Average Ratio	PASS	Paul Li
2.1055 22.355	Frequency Stability	PASS	Paul Li

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's Test Firm Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

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 %, $U=2 \times U_c(y)$.

The BTL measurement uncertainty as below table:

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	3.82
		30MHz ~ 200MHz	H	3.78
		200MHz ~ 1,000MHz	V	4.10
		200MHz ~ 1,000MHz	H	4.06

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03	CISPR	1GHz ~ 18GHz	V	3.12
		1GHz ~ 18GHz	H	3.68

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	Smart Phone	
Brand Name	HUAWEI	
Test Model	MAR-LX3Am	
Series Model	N/A	
Model Difference(s)	N/A	
Hardware Version	HL4MARM	
Software Version	9.0.1.156(SP1C900E141R1P6)	
Antenna Type	Internal Antenna	
Antenna Gain	Main Antenna	-7.2 dBi
	Second Antenna	-3.6 dBi
IMEI No.	Conducted	865004040000552
	Radiated	865004040000263
Modulation Type	GSM/GPRS	GMSK
	EDGE	GMSK, 8PSK
	WCDMA	UL: BPSK DL: QPSK
	WCDMA(HSDPA/HSUPA)	16QAM
	LTE	UL: QPSK, 16QAM, 64QAM DL: QPSK, 16QAM, 64QAM
Operation Frequency	GSM /EDGE/GPRS	824.2MHz ~ 848.8MHz
	WCDMA Band V	826.4MHz ~ 846.6MHz
	LTE 5 (Channel Bandwidth: 1.4MHz)	824.7 MHz ~ 848.3 MHz
	LTE 5 (Channel Bandwidth: 3MHz)	825.5 MHz ~ 847.5 MHz
	LTE 5 (Channel Bandwidth: 5MHz)	826.5 MHz ~ 846.5 MHz
	LTE 5 (Channel Bandwidth: 10MHz)	829.0 MHz ~ 844.0 MHz

Max. ERP Power	GSM/GPRS	GMSK	22.34	dBm
	EDGE	8PSK	15.76	dBm
	WCDMA	BPSK	14.73	dBm
	WCDMA_HSDPA	16QAM	14.07	dBm
	WCDMA_HSUPA	16QAM	14.26	dBm
	LTE 5 (Channel Bandwidth: 1.4MHz)	QPSK	14.35	dBm
		16QAM	13.68	dBm
		64QAM	12.29	dBm
	LTE 5 (Channel Bandwidth: 3MHz)	QPSK	14.44	dBm
		16QAM	13.54	dBm
		64QAM	12.27	dBm
	LTE 5 (Channel Bandwidth: 5MHz)	QPSK	14.44	dBm
		16QAM	13.77	dBm
		64QAM	12.32	dBm
	LTE 5 (Channel Bandwidth: 10MHz)	QPSK	14.46	dBm
		16QAM	13.77	dBm
		64QAM	12.21	dBm
Power Source	1# DC voltage supplied from AC/DC adapter. 2# Supplied from battery. 3# Supplied from USB.			
Power Rating	1# I/P:100-240V ~50/60Hz, 0.5A O/P: 5V  2A OR 9V  2A 2# DC 3.82V, 3240mAh 3# DC 5V			

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2.The EUT contains following accessory devices.

Item	Manufacturer	Factory	Model	Description
Adapter	Huawei Technologies Co., Ltd.	Salcomp (Shenzhen) Co., Ltd.	HW-090200EH0	I/P:100-240V ~50/60Hz, 0.5A O/P:5V  2A OR 9V  2A
		HUIZHOU BYD ELECTRONIC CO., LTD.	HW-090200BH0 HW-090200UH0 HW-059200EHQ	
		SHENZHEN HUNTKEY ELECTRIC CO., LTD.	HW-090200EH0 HW-090200BH0 HW-090200UH0	
		Huawei Technologies Co., Ltd.	HW-090200UH1	
Battery	Huawei Technologies Co., Ltd.	SCUD (FUJIAN) Electronics Co., Ltd.	HB356687ECW	Rated capacity: 3240mAh Nominal Voltage:  +3.82V Charging Voltage:  +4.40V
		Huizhou Desay Battery Co., Ltd.		
		Sunwoda Electronic Co., Ltd.		
Earphone	-	Jiangxi Lianchuang Hongsheng Electronic Co., LTD.	MEND1532B528A02 MEND1532B528B00	-
		Boluo County Quancheng Electronic Co., Ltd.	1293-3283-3.5mm-322 1293-3283-3.5mm-336	
		FOXCONN INTERCONNECT TECHNOLOGY LIMITED	EPAB542-2WH05-DH EPAB542-2WH06-DH	

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:

GSM MODE			
Test Item	Available Channel	Tested Channel	Mode
ERP	128 to 251	128, 190, 251	GSM, EDGE
Maximum Output Power	128 to 251	128, 190, 251	GSM, EDGE
Occupied Bandwidth	128 to 251	128, 190, 251	GSM, EDGE
Conducted Emission	128 to 251	190	GSM, EDGE
Radiated Emission	128 to 251	190	GSM, EDGE
Band Edge	128 to 251	128, 251	GSM, EDGE
Peak to Average Ratio	128 to 251	128, 190, 251	GSM, EDGE
Frequency Stability	128 to 251	190	GSM

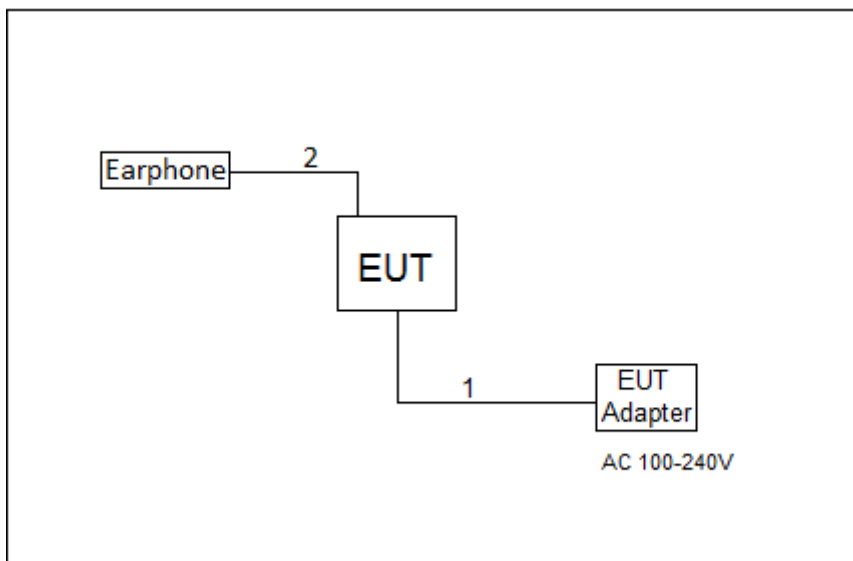
WCDMA MODE			
Test Item	Available Channel	Tested Channel	Mode
ERP	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
Maximum Output Power	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
Conducted Emission	4132 to 4233	4182	WCDMA
Radiated Emission	4132 to 4233	4182	WCDMA
Band Edge	4132 to 4233	4132,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

LTE BAND 5					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
ERP	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK, 16QAM, 64QAM	1RB/3RB/6RB
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM, 64QAM	1RB/8RB/15RB
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM, 64QAM	1RB/12RB/25RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM, 64QAM	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	22.1°C, 48.7%RH	DC 3.80V
Maximum Output Power	22.1°C, 48.7%RH	DC 3.80V
Occupied Bandwidth	22.1°C, 48.7%RH	DC 3.80V
Conducted Emission	22.1°C, 48.7%RH	DC 3.80V
Radiated Emission	24°C, 68%RH	AC 120V/60Hz
Band Edge	22.1°C, 48.7%RH	DC 3.80V
Peak to Average Ratio	22.1°C, 48.7%RH	DC 3.80V
Frequency Stability	Normal and Extreme	Normal and Extreme

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATIONOFSYSTEMTESTED FOR RADIATED



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.
-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.2m	DC Cable
2	NO	NO	1.0m	Audio Cable

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:

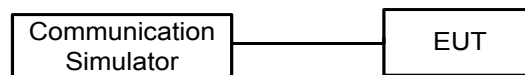
1. EIRP= Output Power +Antenan gain
ERP power= EIPR power-2.15dBi.

Maximum 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

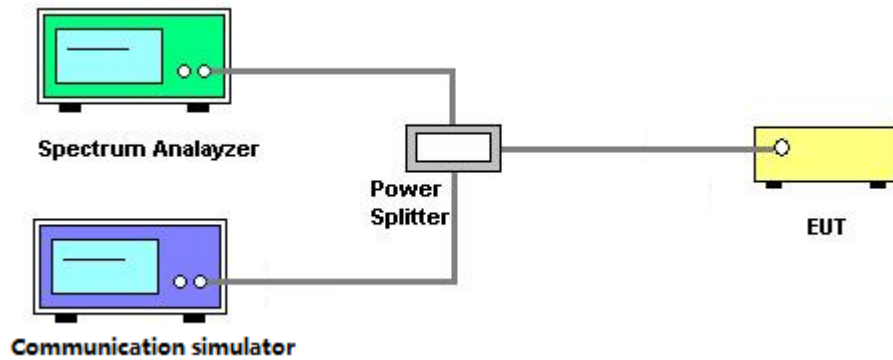
Please refer to the Appendix A.

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

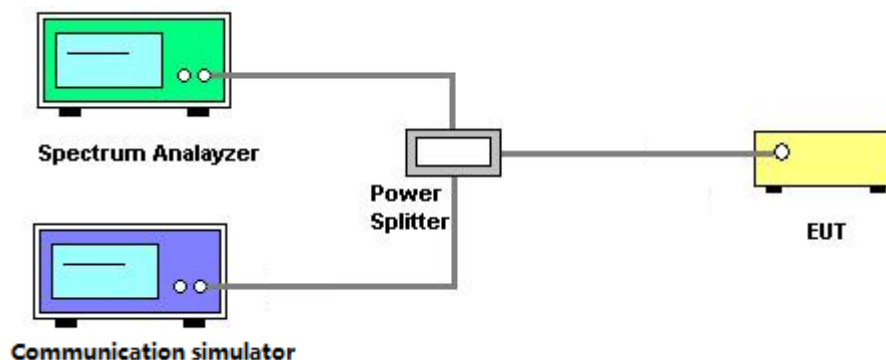
4.3.1 LIMIT

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 $RBW \geq 1\%$ 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.
6. The limit line is derived from $43 + 10 \log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10 \log(P)](dB)$
 $= [30 + 10 \log(P)](dBm) - [43 + 10 \log(P)](dB)$
 $= -13dBm$

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

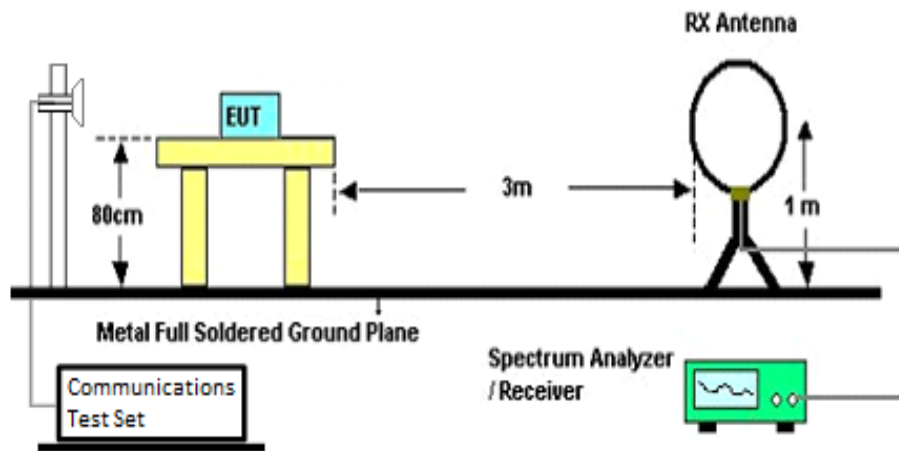
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm.

4.4.2 TEST PROCEDURES

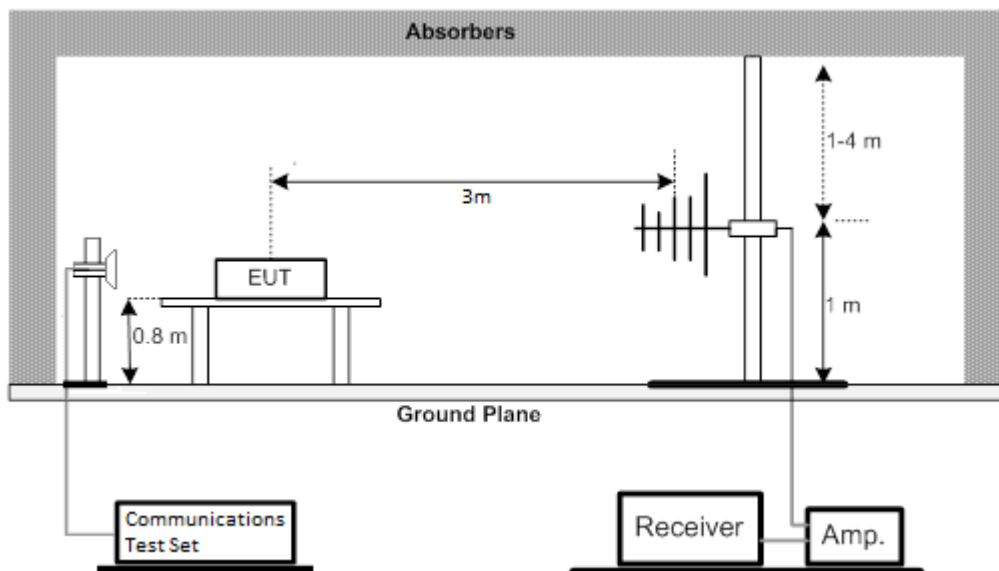
1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
4. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi}.$
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.4.3 TEST SETUP LAYOUT

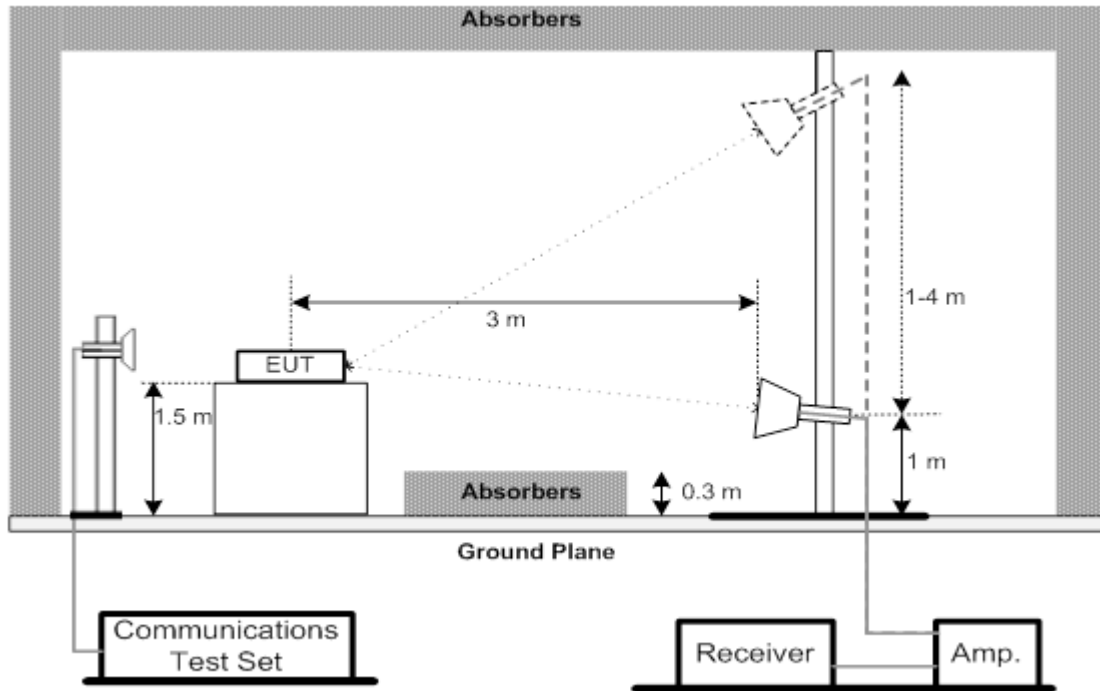
Below 30MHz



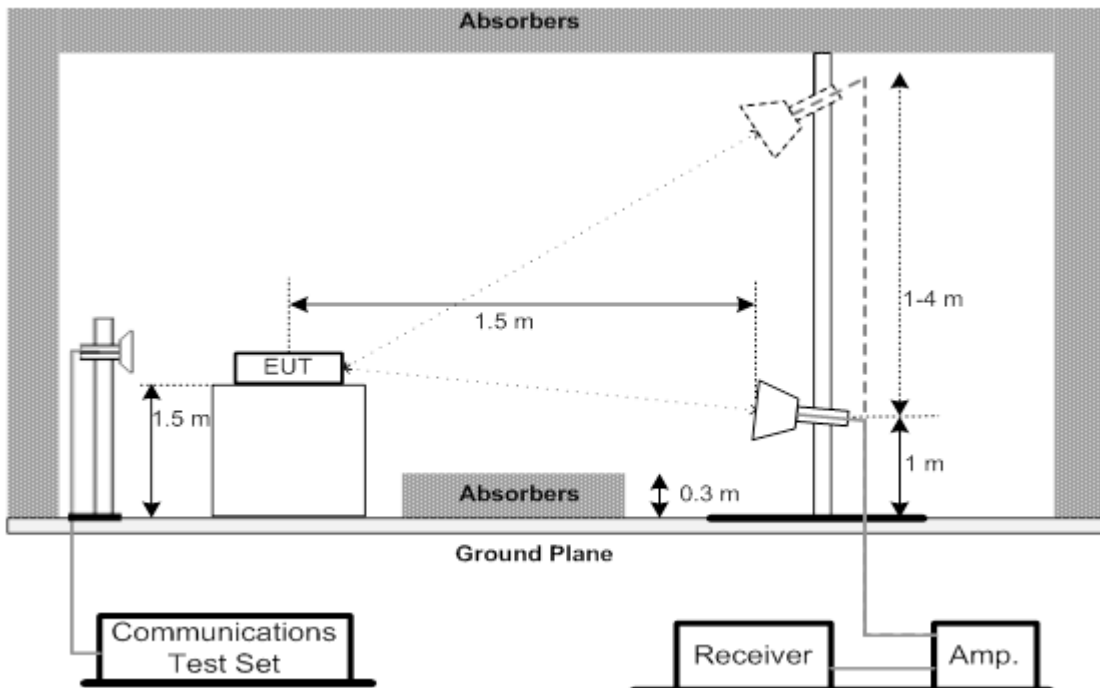
30MHz to 1GHz



1GHz to 18GHz



Above 18GHz



4.4.4 TEST DEVIATION

No deviation

4.4.5 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix D.

Remark:

(1) All adapters had been pre-test and in this report only recorded the worst case.

4.4.6 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Appendix E.

Remark:

(1) All adapters had been pre-test and in this report only recorded the worst case.

4.4.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix F.

Remark:

(1) All adapters had been pre-test and in this report only recorded the worst case.

4.5 BAND EDGE MEASUREMENT

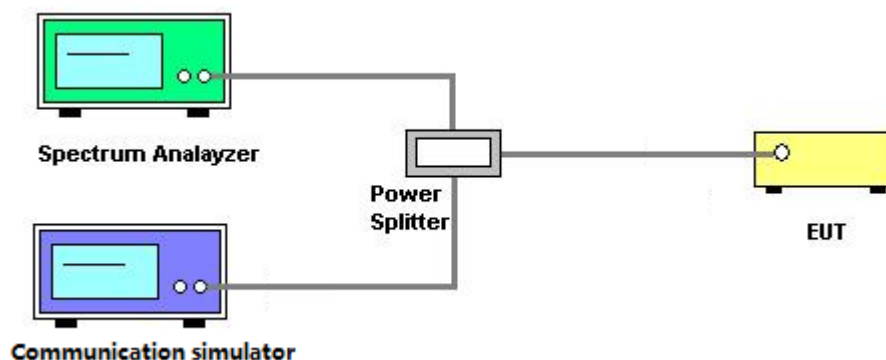
4.5.1 LIMIT

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 1.5MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GSM/GPRS/EDGE).
3. 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).
4. 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).
5. 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).
6. 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).
7. 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).
8. 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).
9. 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

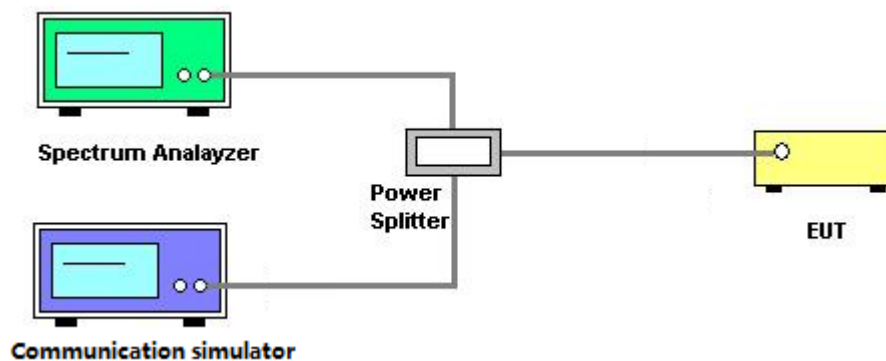
4.6.1 LIMIT

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

4.6.3 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

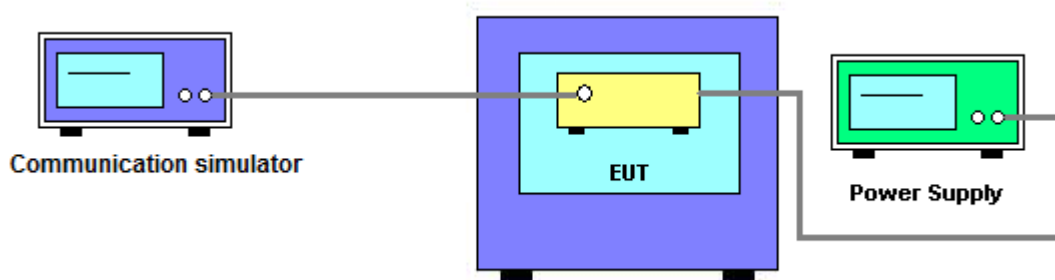
4.7.1 LIMIT

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 $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
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					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 09, 2020
2	Amplifier	Agilent	8449B	3008A02274	Mar. 10, 2020
3	Amplifier	HP	8447D	2944A09673	Aug. 11, 2019
4	HighPass Filter	Wairwright Instruments Gmbh	WHK 1.5/15G-10ST	11	Mar. 10, 2020
5	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 1710/1785-1690/180 5-60/12SS	38	Mar. 10, 2020
6	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 824/849-810/863-60/ 9SS	7	Mar. 10, 2020
7	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 880/915-860/935-60/ 9SS	14	Mar. 10, 2020
8	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 1850/1910-1830/193 0-60/10SS	17	Mar. 10, 2020
9	HighPass Filter	Wairwright Instruments Gmbh	WHK3.1/18G-10SS	24	Mar. 10, 2020
10	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
11	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 10, 2020
12	Receiver	Agilent	N9038A	MY52130039	Aug. 11, 2019
13	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
14	Cable	emci	LMR-400(30MHz-1G Hz)(8m+5m)	N/A	May. 25, 2019
15	Cable	mitron	B10-01-01-12M	18072744	Jul. 30, 2019
16	Controller	ETS-Lindgren	2090	N/A	N/A
17	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
18	Loop Antenna	EM	EM-6876-1	230	Jan. 15, 2020
19	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 09, 2020
20	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 30, 2019

Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
2	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Mar. 10, 2020
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Mar. 10, 2020
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
5	Spectrum Analyzer	R&S	FSP40	100185	Aug. 11, 2019

Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 10, 2020
2*	Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Sep. 26, 2020
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Mar. 10, 2020
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 10, 2020
5	Const Temp. & Humidity Chamber	Bell	BTH-50C	20170306001	Mar. 10, 2020

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 - MAXIMUM OUTPUT POWER

Maximum Output Power (dBm):

GSM850		Burst Output Power		
		128CH	190CH	251CH
		824.2MHz	836.6MHz	848.8MHz
GSM (CS)		31.33	31.49	31.55
GPRS/EDGE (GMSK)	1 Tx Slot	31.4	31.54	31.69
	2 Tx Slot	27.98	28.06	28.13
	3 Tx Slot	25.92	26.05	26.16
	4 Tx Slot	24.49	24.62	24.63
EDGE (8PSK)	1 Tx Slot	24.91	24.92	25.11
	2 Tx Slot	22.03	22.02	22.12
	3 Tx Slot	20.07	20.12	20.13
	4 Tx Slot	18.75	18.85	18.88

Modulation	Band	WCDMA V		
	Tx Channel	4132CH	4182CH	4233CH
	Frequency	826.4MHz	836.4MHz	846.6MHz
BPSK	RMC 12.2K	23.83	23.78	23.84
	RMC 64K	23.88	23.86	23.78
	RMC 144K	23.78	23.86	23.87
	RMC 384K	24.04	24.08	23.97
16QAM	HSDPA Subtest-1	23.42	23.31	23.38
	HSDPA Subtest-2	22.99	22.91	22.88
	HSDPA Subtest-3	22.41	22.37	22.4
	HSDPA Subtest-4	22.35	22.41	22.5
16QAM	HSUPA Subtest-1	22.57	22.43	22.52
	HSUPA Subtest-2	21.51	21.49	21.54
	HSUPA Subtest-3	22.34	22.52	22.33
	HSUPA Subtest-4	21.88	21.92	21.9
	HSUPA Subtest-5	23.61	23.49	23.44

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	23.63	23.64	23.56
		1	2	23.32	23.46	23.42
		1	5	23.70	23.67	23.65
		3	0	23.59	23.51	23.51
		3	1	23.24	23.14	23.28
		3	2	23.39	23.47	23.06
		6	0	22.49	22.60	22.48
		6	0	22.49	22.60	22.48
	16QAM	1	0	22.79	23.01	22.77
		1	2	22.57	22.78	22.52
		1	5	22.73	23.03	22.61
		3	0	22.55	22.59	22.60
		3	1	22.51	22.37	22.59
		3	2	22.49	22.55	22.22
		6	0	21.60	21.67	21.58
		6	0	21.60	21.67	21.58
	64QAM	1	0	21.55	21.63	21.59
		1	2	21.51	21.58	21.56
		1	5	21.62	21.61	21.55
		3	0	21.64	21.58	21.49
		3	1	21.56	21.52	21.44
		3	2	21.49	21.51	21.47
		6	0	20.69	20.71	20.68
		6	0	20.69	20.71	20.68

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	23.54	23.79	23.60
		1	7	22.88	23.02	23.18
		1	14	23.66	23.67	23.49
		8	0	22.57	22.62	22.49
		8	4	22.60	22.60	22.53
		8	7	22.61	22.56	22.45
		15	0	22.67	22.70	22.46
		15	0	22.67	22.70	22.46
	16QAM	1	0	22.78	22.89	22.74
		1	7	22.02	22.28	22.07
		1	14	22.85	22.82	22.58
		8	0	21.53	21.57	21.46
		8	4	21.69	21.57	21.45
		8	7	21.49	21.46	21.59
		15	0	21.64	21.50	21.59
		15	0	21.64	21.50	21.59
	64QAM	1	0	21.62	21.48	21.53
		1	7	21.51	21.46	21.57
		1	14	21.55	21.56	21.44
		8	0	20.81	20.74	20.77
		8	4	20.75	20.72	20.69
		8	7	20.71	20.65	20.66
		15	0	20.64	20.55	20.63
		15	0	20.64	20.55	20.63

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	23.65	23.62	23.62
		1	13	23.79	23.66	23.61
		1	24	23.77	23.79	23.44
		12	0	22.68	22.72	22.72
		12	6	22.63	22.69	22.63
		12	11	22.60	22.64	22.66
		25	0	22.78	22.79	22.69
	16QAM	1	0	23.07	22.98	23.04
		1	13	23.10	23.01	23.05
		1	24	23.07	23.12	22.92
		12	0	21.82	21.67	21.70
		12	6	21.77	21.73	21.70
		12	11	21.73	21.73	21.48
		25	0	21.55	21.71	21.67
	64QAM	1	0	21.53	21.67	21.64
		1	13	21.48	21.63	21.61
		1	24	21.59	21.54	21.53
		12	0	20.62	20.54	20.59
		12	6	20.81	20.74	20.72
		12	11	20.62	20.66	20.58
		25	0	20.47	20.49	20.54

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	23.79	23.70	23.81
		1	25	23.32	23.57	23.44
		1	49	23.71	23.68	23.58
		25	0	22.73	22.72	22.76
		25	13	22.65	22.88	22.72
		25	25	22.72	22.68	22.75
		50	0	22.65	22.70	22.73
	16QAM	1	0	22.95	23.03	22.63
		1	25	22.60	22.83	22.40
		1	49	22.92	23.12	22.54
		25	0	21.72	21.68	21.58
		25	13	21.72	21.81	21.71
		25	25	21.63	21.66	21.69
		50	0	21.62	21.61	21.55
	64QAM	1	0	21.56	21.54	21.51
		1	25	21.48	21.39	21.49
		1	49	21.52	21.38	21.47
		25	0	20.63	20.65	20.66
		25	13	20.59	20.63	20.71
		25	25	20.72	20.65	20.56
		50	0	20.68	20.51	20.59

ERP Power (dBm):

GSM850		ERP Power		
		128CH	190CH	251CH
		824.2MHz	836.6MHz	848.8MHz
GSM (CS)		21.98	22.14	22.20
GPRS/EDGE (GMSK)	1 Tx Slot	22.05	22.19	22.34
	2 Tx Slot	18.63	18.71	18.78
	3 Tx Slot	16.57	16.70	16.81
	4 Tx Slot	15.14	15.27	15.28
EDGE (8PSK)	1 Tx Slot	15.56	15.57	15.76
	2 Tx Slot	12.68	12.67	12.77
	3 Tx Slot	10.72	10.77	10.78
	4 Tx Slot	9.40	9.50	9.53

Modulation	Band	WCDMA V		
	Tx Channel	4132CH	4182CH	4233CH
	Frequency	826.4MHz	836.4MHz	846.6MHz
BPSK	RMC 12.2K	14.48	14.43	14.49
	RMC 64K	14.53	14.51	14.43
	RMC 144K	14.43	14.51	14.52
	RMC 384K	14.69	14.73	14.62
16QAM	HSDPA Subtest-1	14.07	13.96	14.03
	HSDPA Subtest-2	13.64	13.56	13.53
	HSDPA Subtest-3	13.06	13.02	13.05
	HSDPA Subtest-4	13.00	13.06	13.15
16QAM	HSUPA Subtest-1	13.22	13.08	13.17
	HSUPA Subtest-2	12.16	12.14	12.19
	HSUPA Subtest-3	12.99	13.17	12.98
	HSUPA Subtest-4	12.53	12.57	12.55
	HSUPA Subtest-5	14.26	14.14	14.09

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	14.28	14.29	14.21
		1	2	13.97	14.11	14.07
		1	5	14.35	14.32	14.30
		3	0	14.24	14.16	14.16
		3	1	13.89	13.79	13.93
		3	2	14.04	14.12	13.71
		6	0	13.14	13.25	13.13
	16QAM	1	0	13.44	13.66	13.42
		1	2	13.22	13.43	13.17
		1	5	13.38	13.68	13.26
		3	0	13.20	13.24	13.25
		3	1	13.16	13.02	13.24
		3	2	13.14	13.20	12.87
		6	0	12.25	12.32	12.23
	64QAM	1	0	12.20	12.28	12.24
		1	2	12.16	12.23	12.21
		1	5	12.27	12.26	12.20
		3	0	12.29	12.23	12.14
		3	1	12.21	12.17	12.09
		3	2	12.14	12.16	12.12
		6	0	11.34	11.36	11.33

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	14.19	14.44	14.25
		1	7	13.53	13.67	13.83
		1	14	14.31	14.32	14.14
		8	0	13.22	13.27	13.14
		8	4	13.25	13.25	13.18
		8	7	13.26	13.21	13.10
		15	0	13.32	13.35	13.11
	16QAM	1	0	13.43	13.54	13.39
		1	7	12.67	12.93	12.72
		1	14	13.50	13.47	13.23
		8	0	12.18	12.22	12.11
		8	4	12.34	12.22	12.10
		8	7	12.14	12.11	12.24
		15	0	12.29	12.15	12.24
	64QAM	1	0	12.27	12.13	12.18
		1	7	12.16	12.11	12.22
		1	14	12.20	12.21	12.09
		8	0	11.46	11.39	11.42
		8	4	11.40	11.37	11.34
		8	7	11.36	11.30	11.31
		15	0	11.29	11.20	11.28

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	14.30	14.27	14.27
		1	13	14.44	14.31	14.26
		1	24	14.42	14.44	14.09
		12	0	13.33	13.37	13.37
		12	6	13.28	13.34	13.28
		12	11	13.25	13.29	13.31
		25	0	13.43	13.44	13.34
	16QAM	1	0	13.72	13.63	13.69
		1	13	13.75	13.66	13.70
		1	24	13.72	13.77	13.57
		12	0	12.47	12.32	12.35
		12	6	12.42	12.38	12.35
		12	11	12.38	12.38	12.13
		25	0	12.20	12.36	12.32
	64QAM	1	0	12.18	12.32	12.29
		1	13	12.13	12.28	12.26
		1	24	12.24	12.19	12.18
		12	0	11.27	11.19	11.24
		12	6	11.46	11.39	11.37
		12	11	11.27	11.31	11.23
		25	0	11.12	11.14	11.19

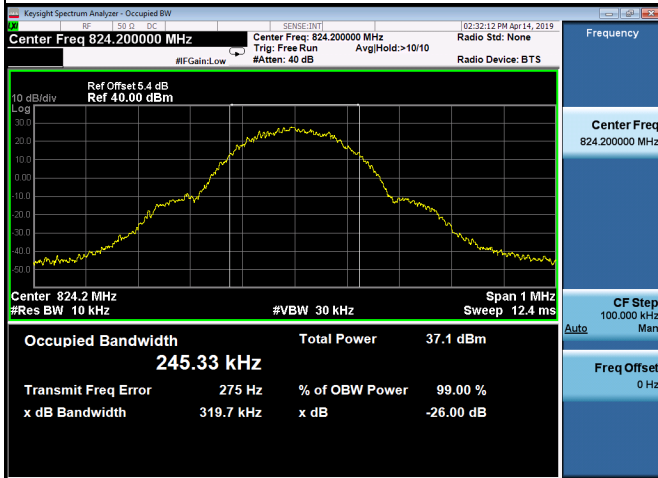
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20450CH	20525CH	20600CH
				829.0MHz	836.5MHz	844.0MHz
5 / 10M	QPSK	1	0	14.44	14.35	14.46
		1	25	13.97	14.22	14.09
		1	49	14.36	14.33	14.23
		25	0	13.38	13.37	13.41
		25	13	13.30	13.53	13.37
		25	25	13.37	13.33	13.40
		50	0	13.30	13.35	13.38
	16QAM	1	0	13.60	13.68	13.28
		1	25	13.25	13.48	13.05
		1	49	13.57	13.77	13.19
		25	0	12.37	12.33	12.23
		25	13	12.37	12.46	12.36
		25	25	12.28	12.31	12.34
		50	0	12.27	12.26	12.20
	64QAM	1	0	12.21	12.19	12.16
		1	25	12.13	12.04	12.14
		1	49	12.17	12.03	12.12
		25	0	11.28	11.30	11.31
		25	13	11.24	11.28	11.36
		25	25	11.37	11.30	11.21
		50	0	11.33	11.16	11.24

APPENDIX B - OCCUPIED BANDWIDTH

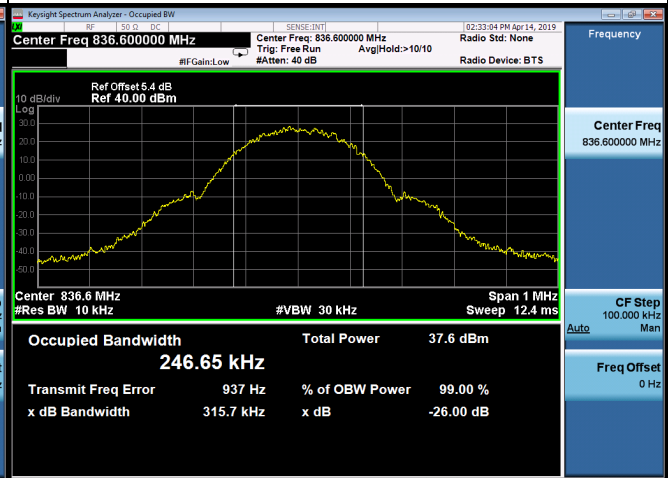
GSM850					
GSM			EDGE		
CS			8PSK		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
128	824.2	0.245	128	824.2	0.254
190	836.6	0.247	190	836.6	0.255
251	848.8	0.245	251	848.8	0.257
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
128	824.2	0.320	128	824.2	0.325
190	836.6	0.316	190	836.6	0.326
251	848.8	0.322	251	848.8	0.317

Spectrum Plot

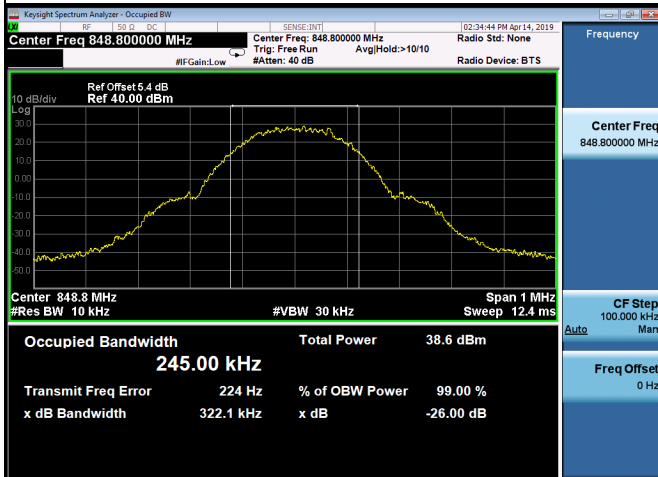
GSM -128



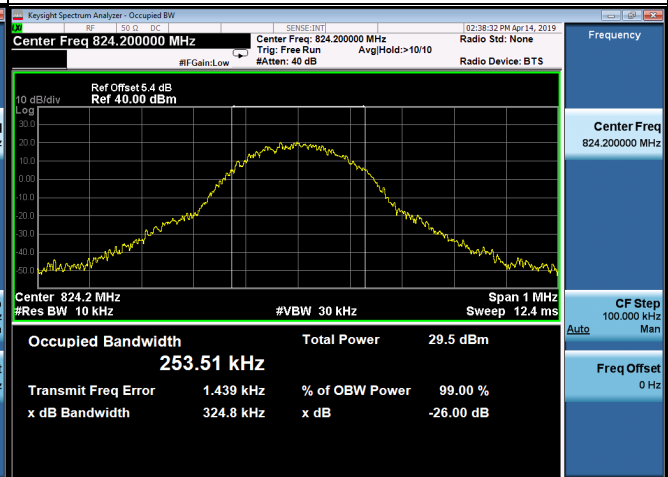
GSM-190



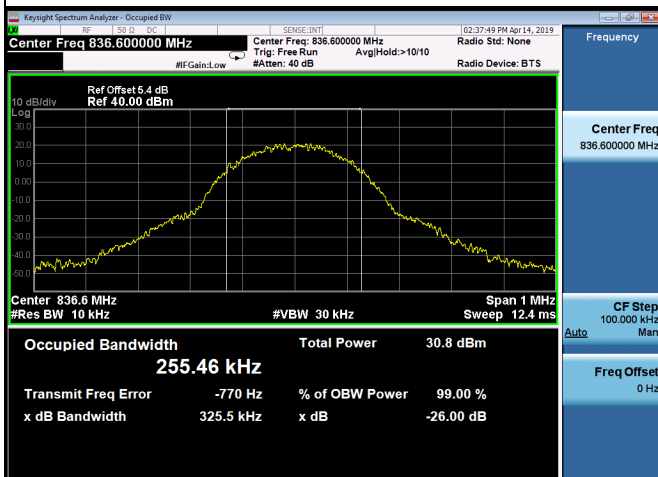
GSM-251



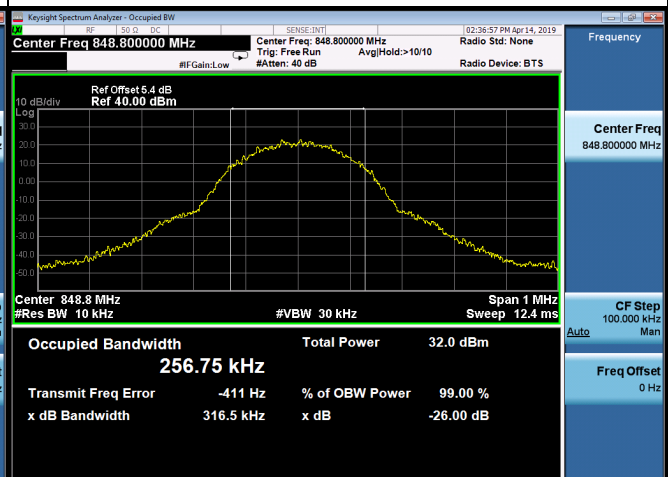
EDGE-128



EDGE-190



EDGE-251



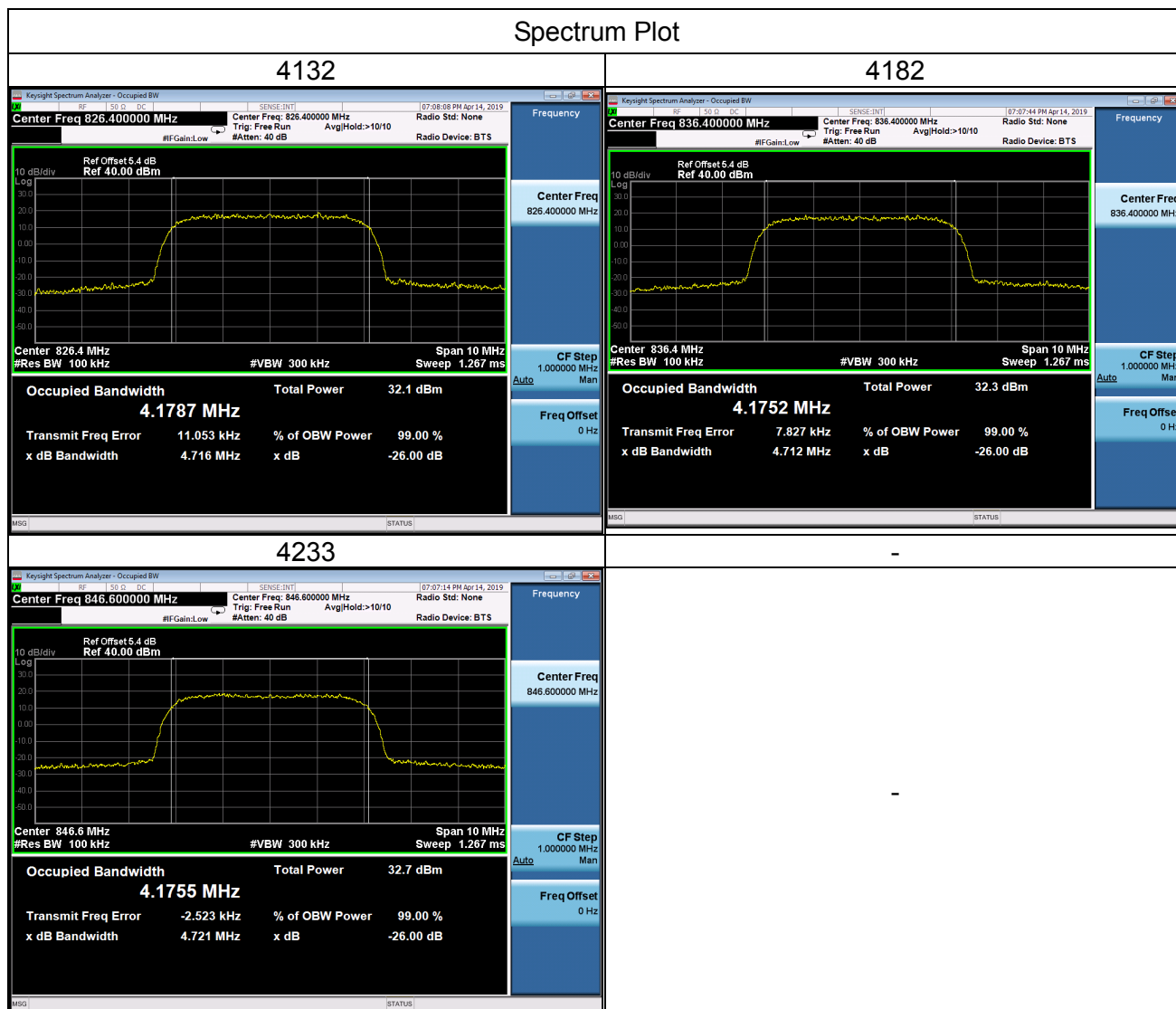
WCDMA Band V					
BPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
4132	826.4	4.159	4132	826.4	4.699
4182	836.4	4.167	4182	836.4	4.707
4233	846.6	4.179	4233	846.6	4.713



WCDMA_HSDPA Band V					
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
4132	826.4	4.149	4132	826.4	4.723
4182	836.4	4.169	4182	836.4	4.725
4233	846.6	4.173	4233	846.6	4.729



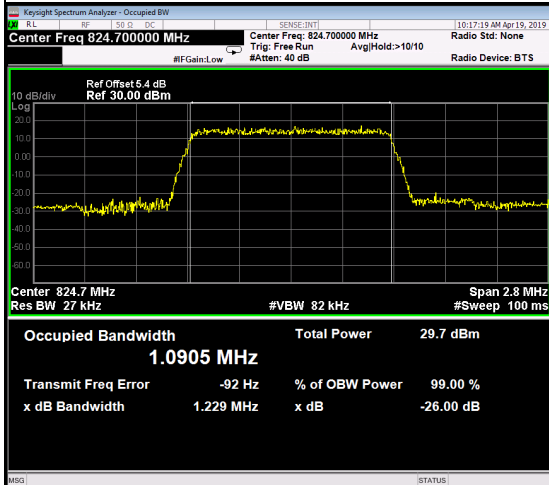
WCDMA_HSUPA Band V					
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
4132	826.4	4.179	4132	826.4	4.716
4182	836.4	4.175	4182	836.4	4.712
4233	846.6	4.176	4233	846.6	4.721



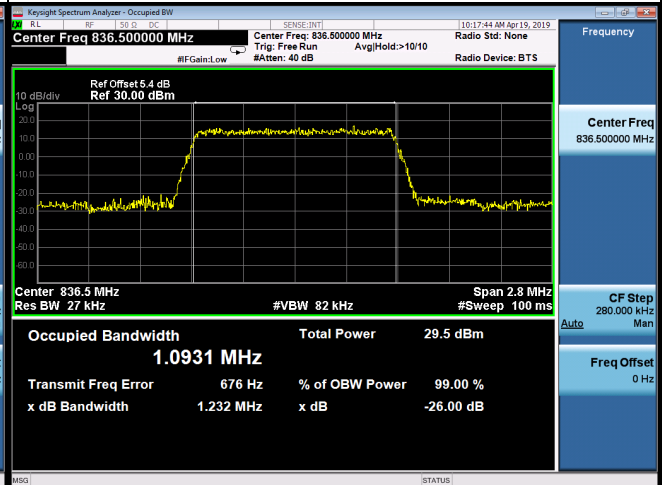
LTE Band 5_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20407	824.7	1.091	20407	824.7	1.090
20525	836.5	1.093	20525	836.5	1.086
20643	848.3	1.091	20643	848.3	1.089
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20407	824.7	1.229	20407	824.7	1.233
20525	836.5	1.232	20525	836.5	1.242
20643	848.3	1.227	20643	848.3	1.230

Spectrum Plot

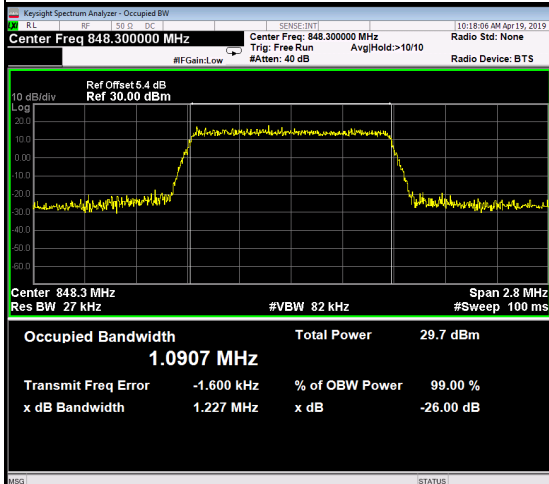
QPSK-20407



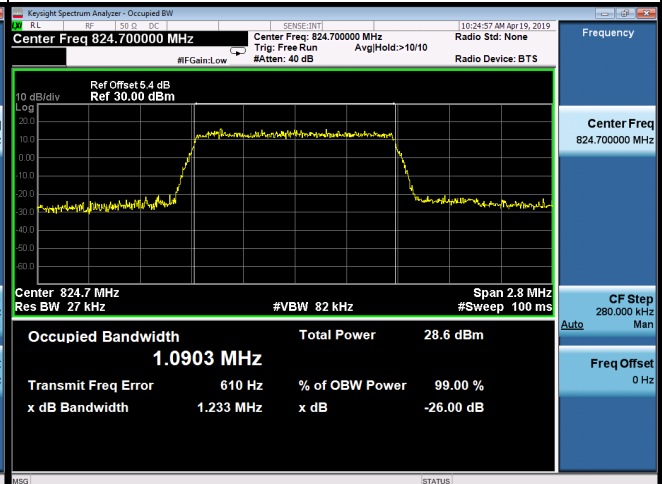
QPSK-20525



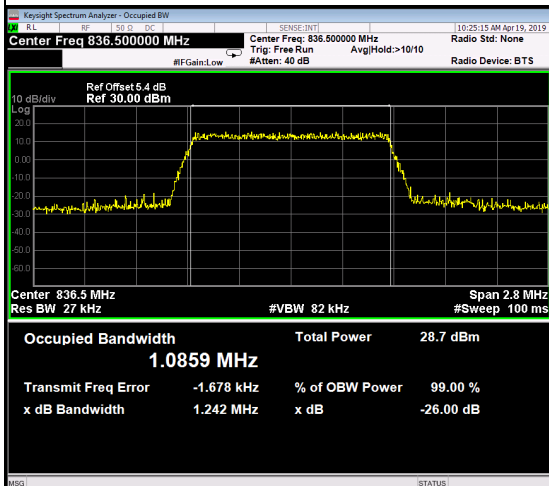
QPSK-20643



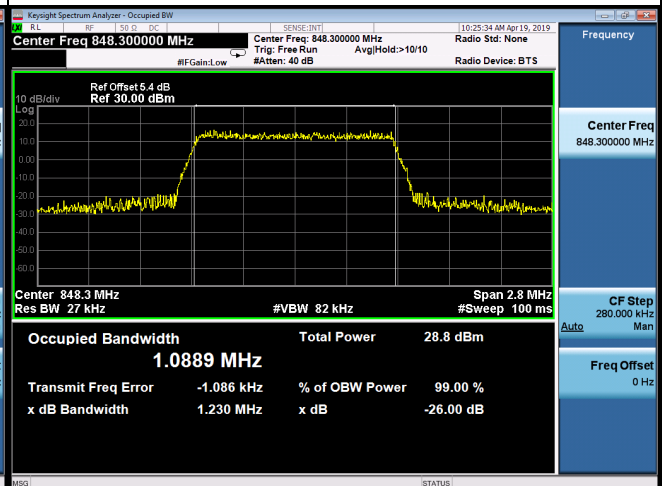
16QAM-20407



16QAM-20525



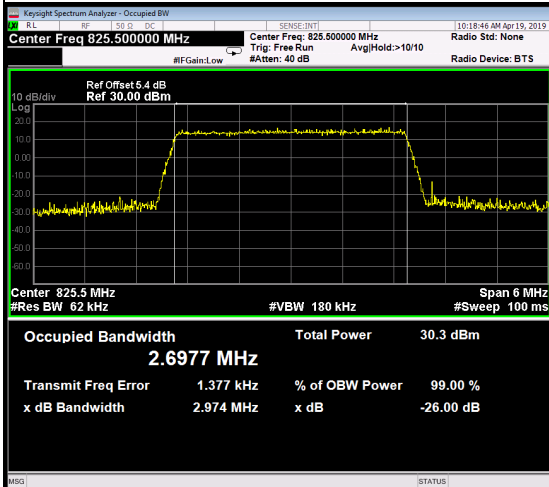
16QAM-20643



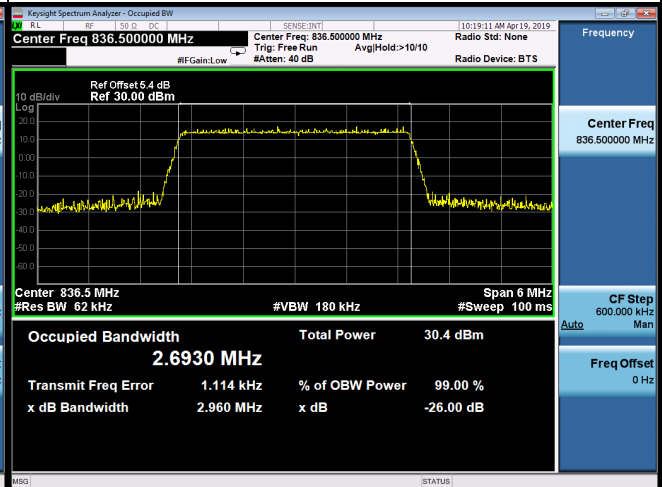
LTE Band 5_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20415	825.5	2.698	20415	825.5	2.702
20525	836.5	2.693	20525	836.5	2.700
20635	847.5	2.707	20635	847.5	2.697
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20415	825.5	2.974	20415	825.5	2.973
20525	836.5	2.960	20525	836.5	2.965
20635	847.5	2.967	20635	847.5	2.963

Spectrum Plot

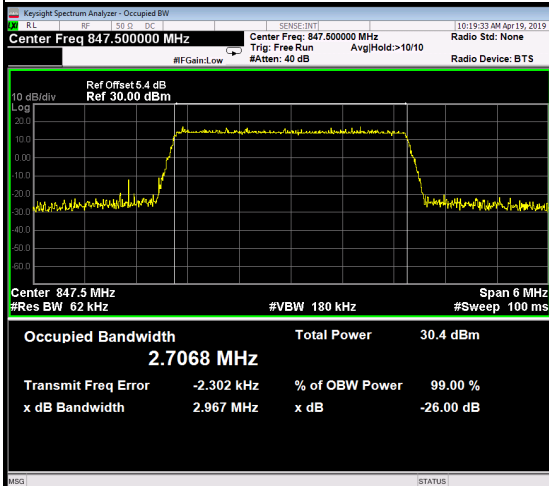
QPSK-20415



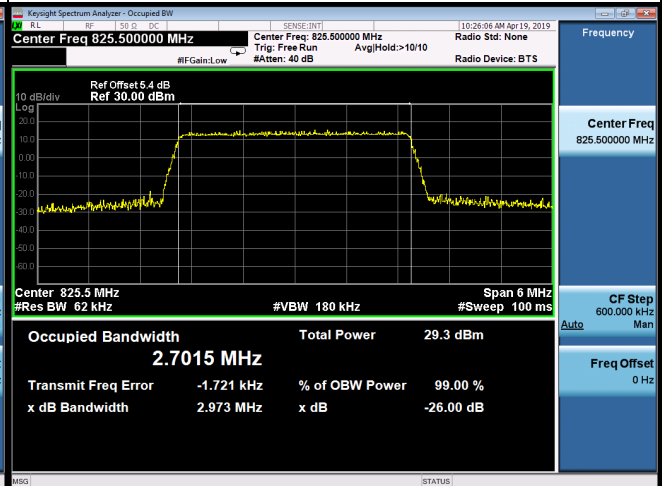
QPSK-20525



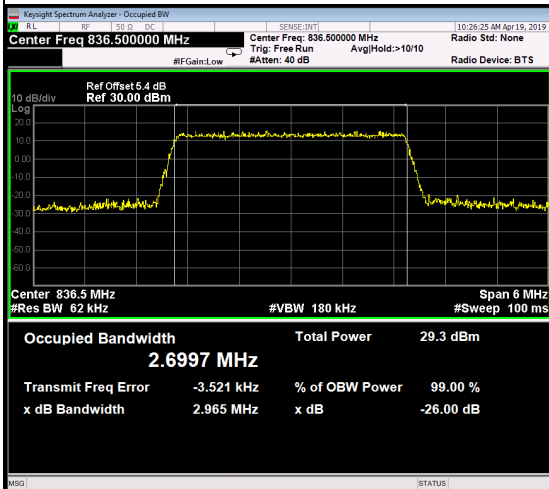
QPSK-20635



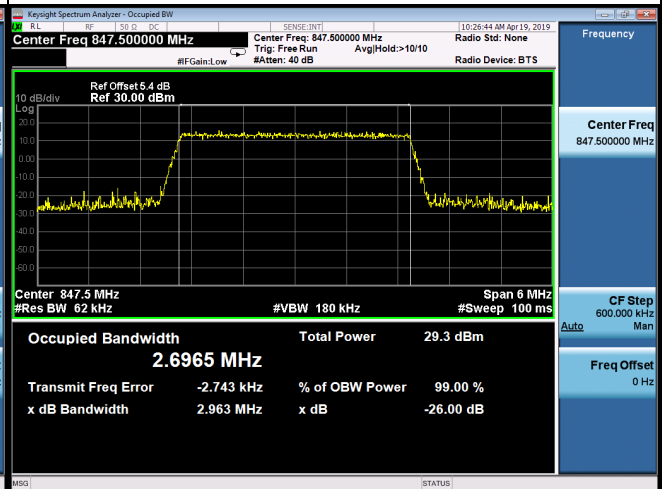
16QAM-20415



16QAM-20525



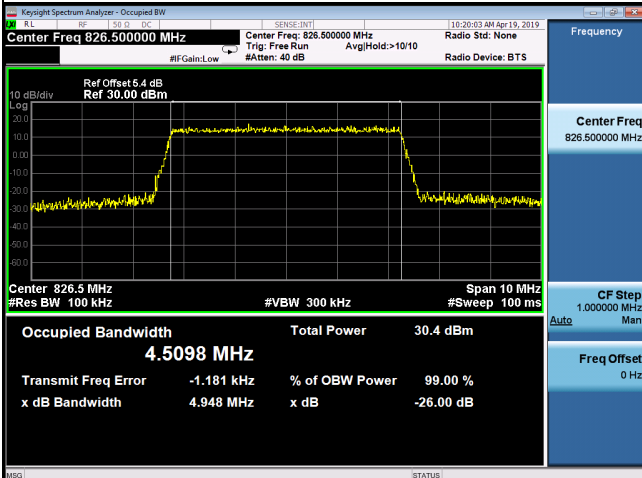
16QAM-20635



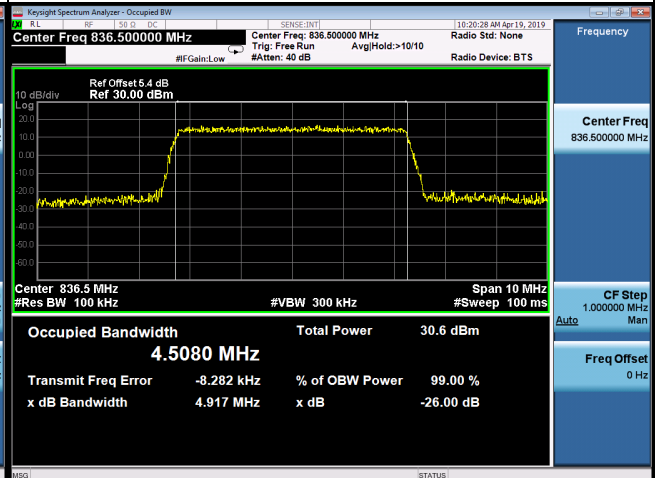
LTE Band 5_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20425	826.5	4.510	20425	826.5	4.500
20525	836.5	4.508	20525	836.5	4.506
20625	846.5	4.514	20625	846.5	4.510
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20425	826.5	4.948	20425	826.5	4.931
20525	836.5	4.917	20525	836.5	4.948
20625	846.5	4.940	20625	846.5	4.971

Spectrum Plot

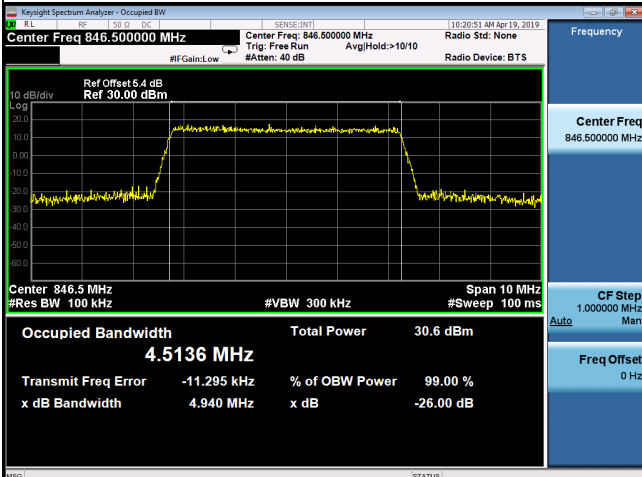
QPSK-20425



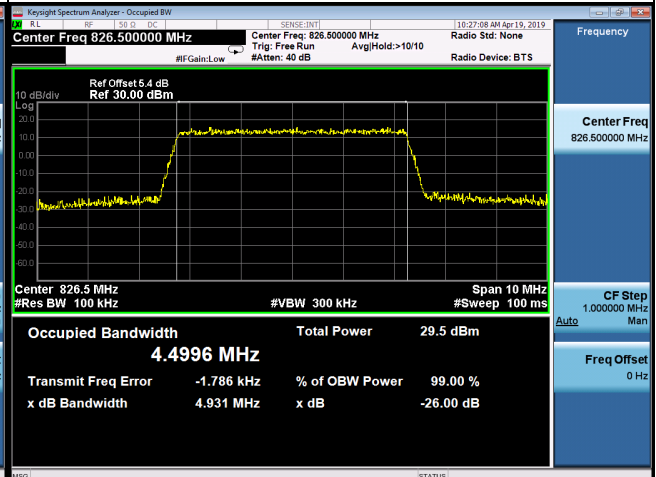
QPSK-20525



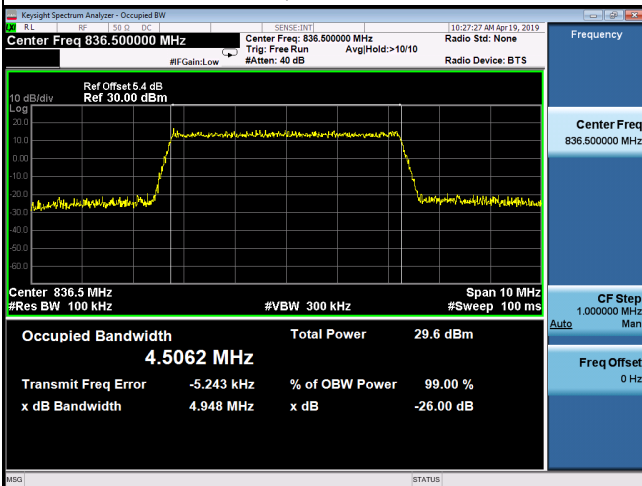
QPSK-20625



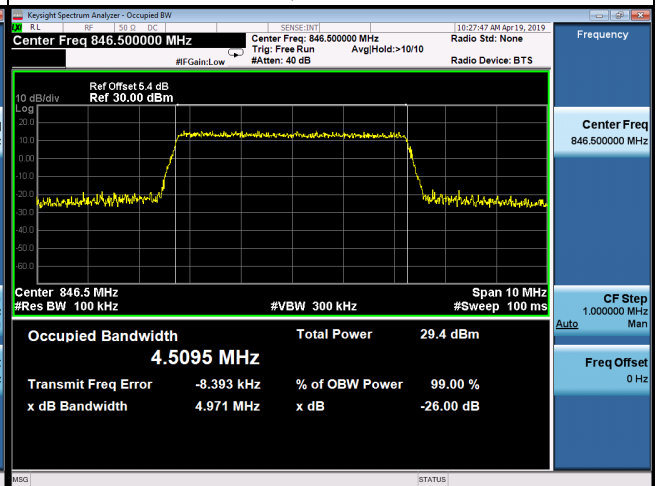
16QAM-20425



16QAM-20525



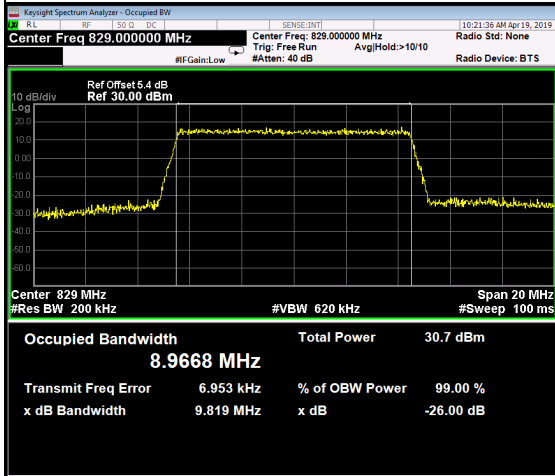
16QAM-20625



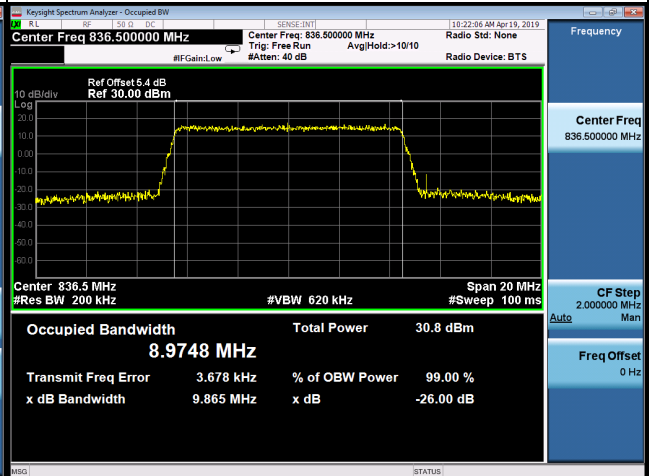
LTE Band 5_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20450	829.0	8.967	20450	829.0	8.971
20525	836.5	8.975	20525	836.5	9.008
20600	844.0	8.973	20600	844.0	9.014
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20450	829.0	9.819	20450	829.0	9.845
20525	836.5	9.865	20525	836.5	9.918
20600	844.0	9.831	20600	844.0	9.907

Spectrum Plot

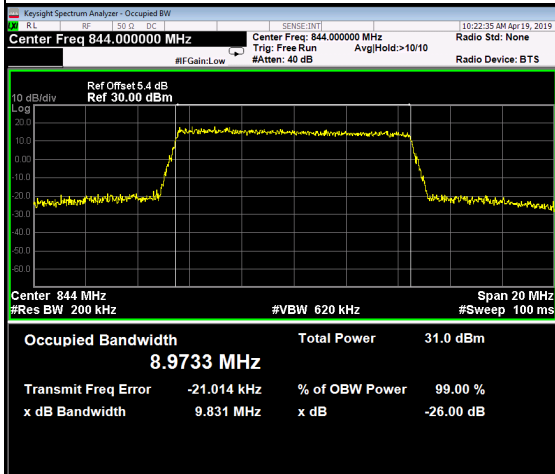
QPSK-20450



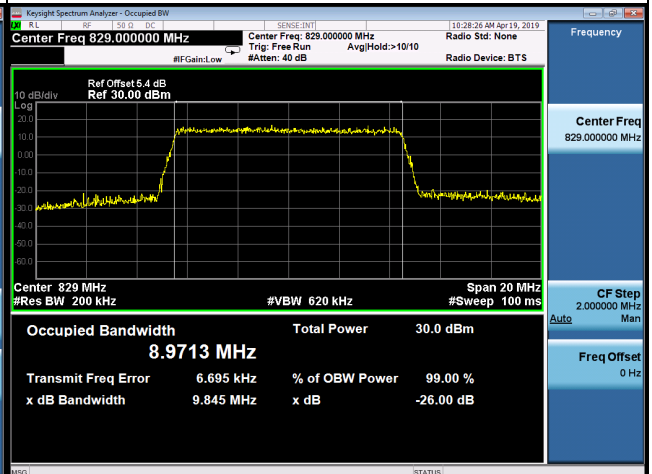
QPSK-20525



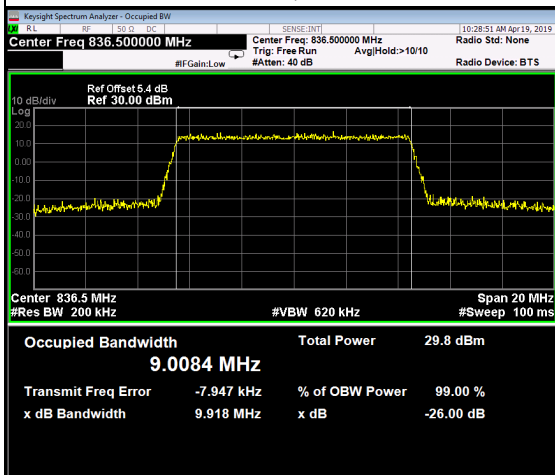
QPSK-20600



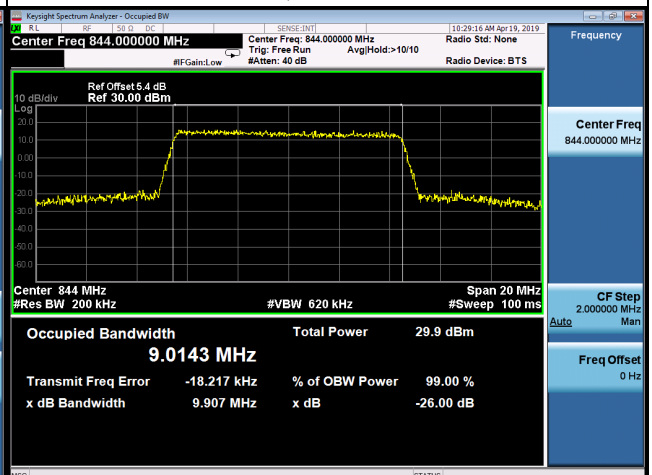
16QAM-20450



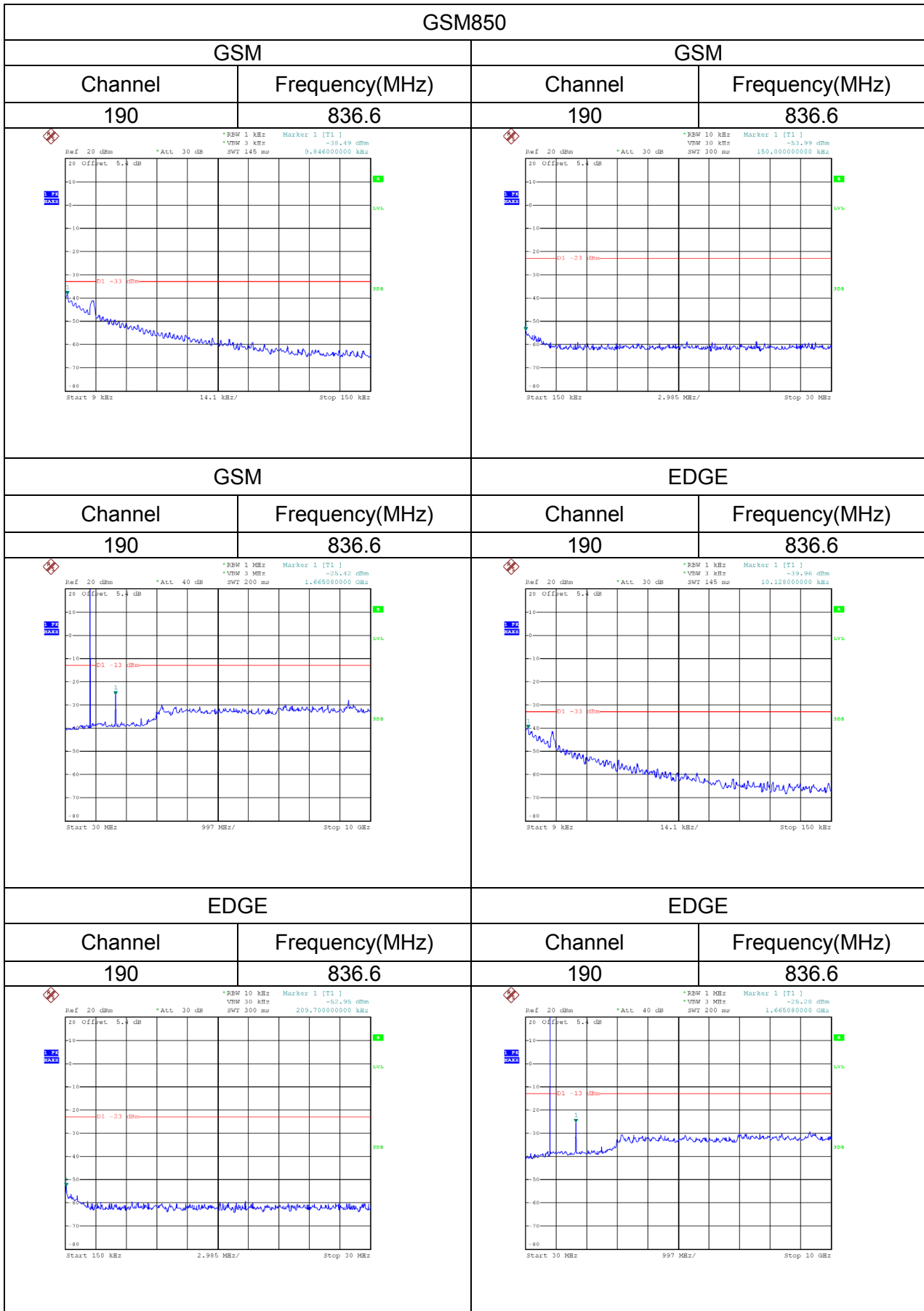
16QAM-20525

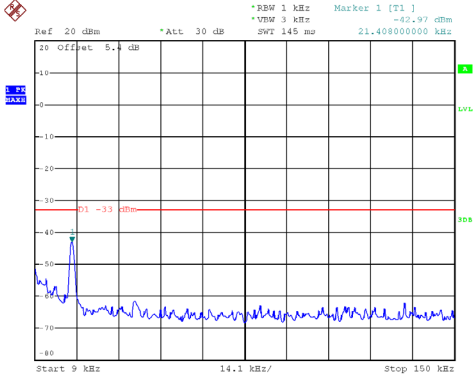
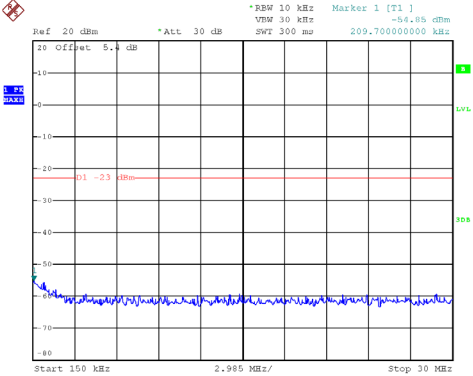
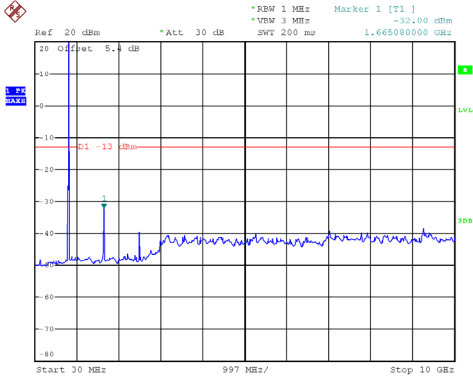


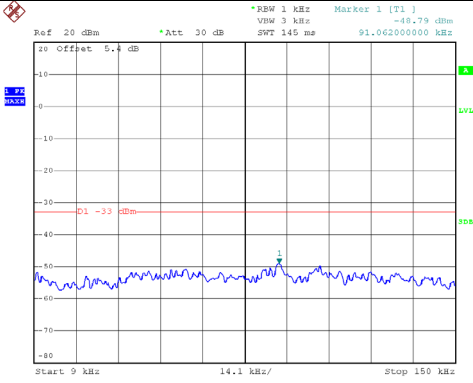
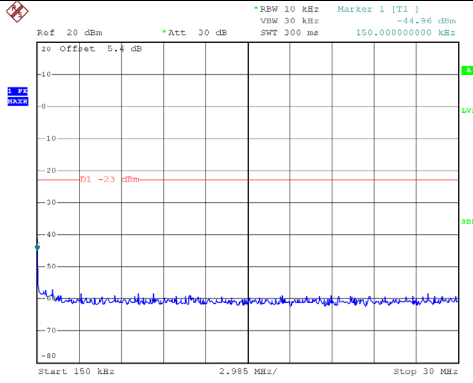
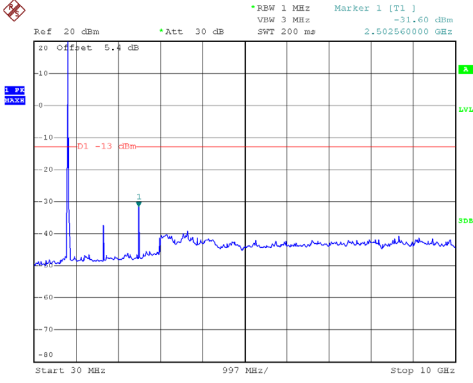
16QAM-20600



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	-	-
		-	

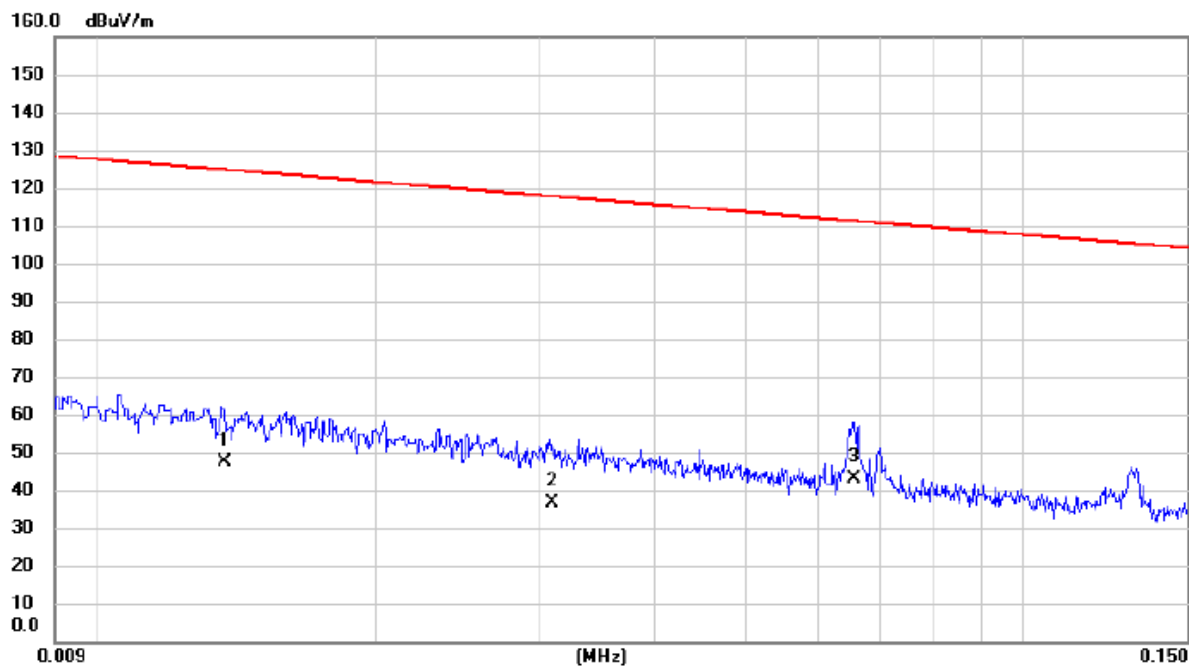
LTE Band 5_5M			
Channel	Frequency(MHz)	Channel	Frequency(MHz)
20525	836.5	20525	836.5
Channel	Frequency(MHz)	-	-
20525	836.5	-	-
		-	

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

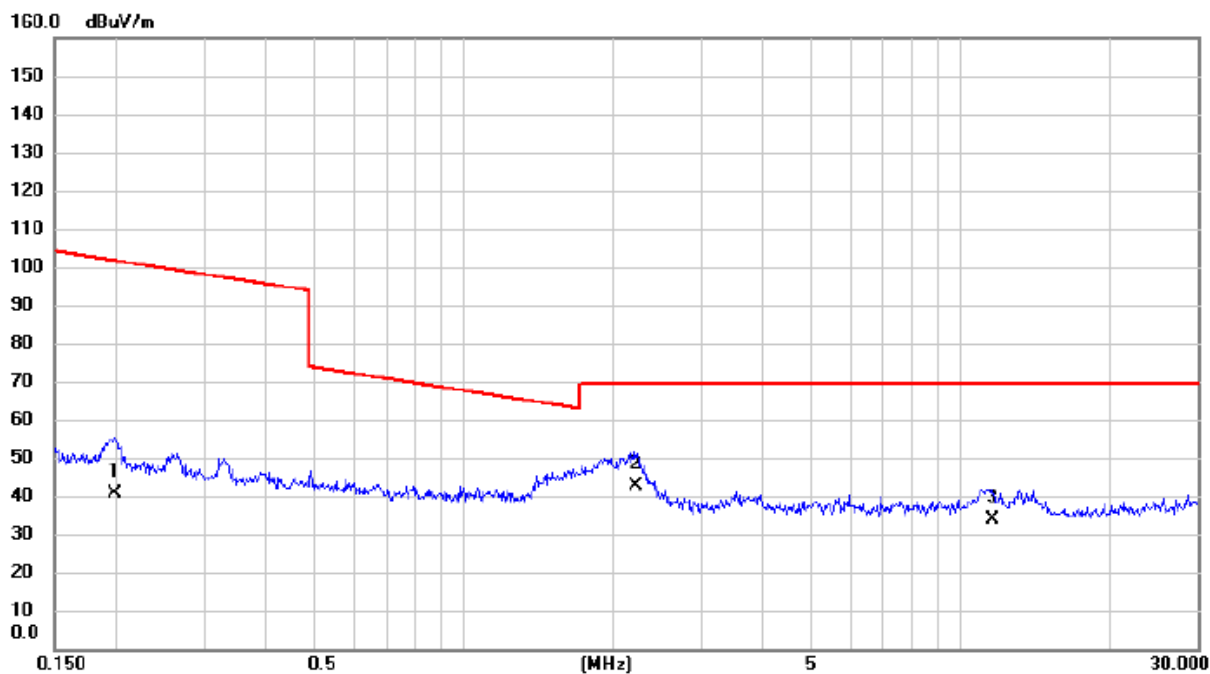
Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.0137	31.50	15.71	47.21	124.87	-77.66	AVG	
2		0.0310	22.90	13.86	36.76	117.78	-81.02	AVG	
3	*	0.0656	29.20	13.68	42.88	111.27	-68.39	AVG	

Test Mode: TX Mode

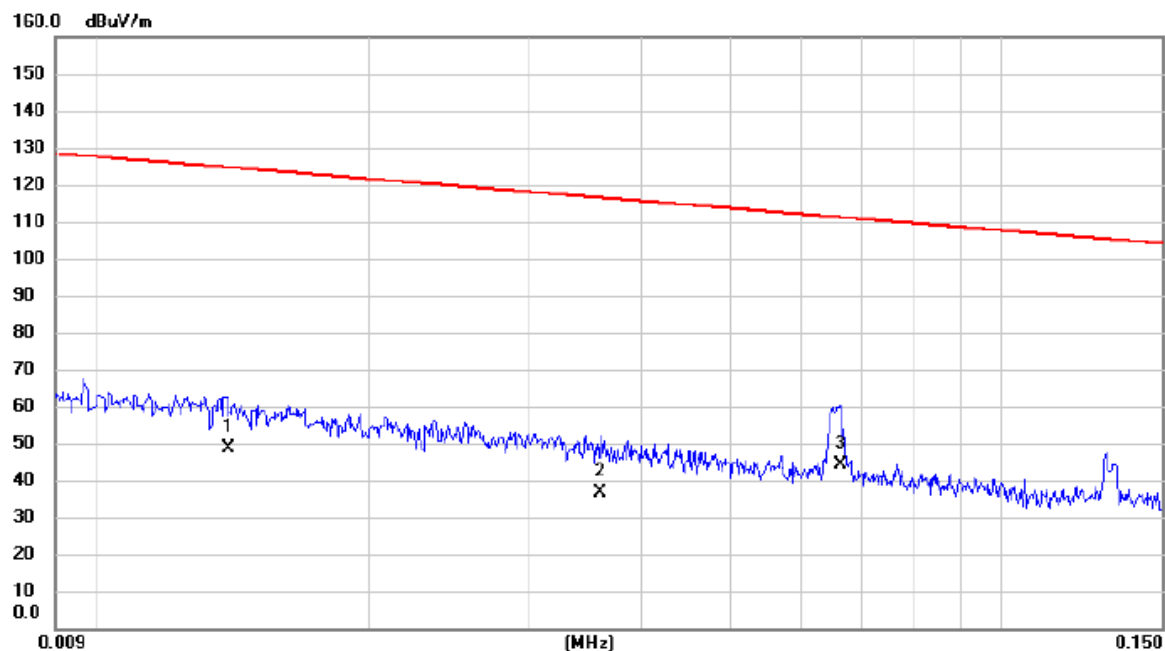
Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.1986	26.80	13.61	40.41	101.65	-61.24	AVG	
2	*	2.2132	30.90	11.69	42.59	69.54	-26.95	QP	
3		11.6208	22.30	11.61	33.91	69.54	-35.63	QP	

Test Mode: TX Mode

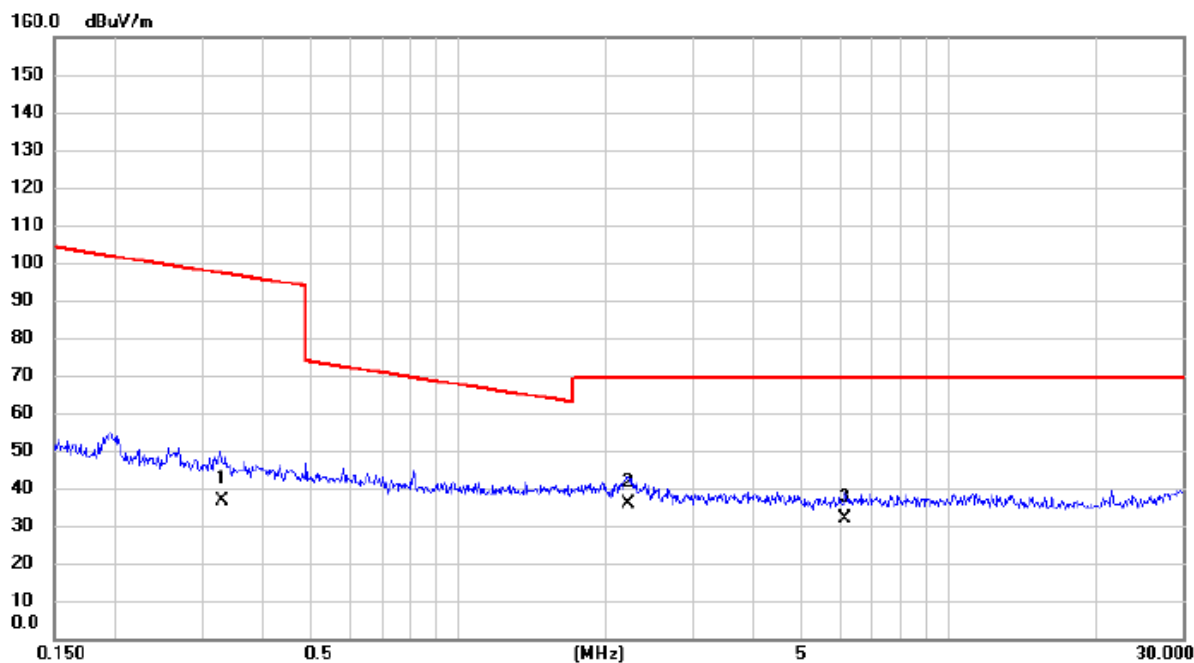
Ant 90°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.0140	32.93	15.62	48.55	124.68	-76.13	AVG	
2		0.0360	22.80	13.88	36.68	116.48	-79.80	AVG	
3	*	0.0663	30.60	13.67	44.27	111.17	-66.90	AVG	

Test Mode: TX Mode

Ant 90°

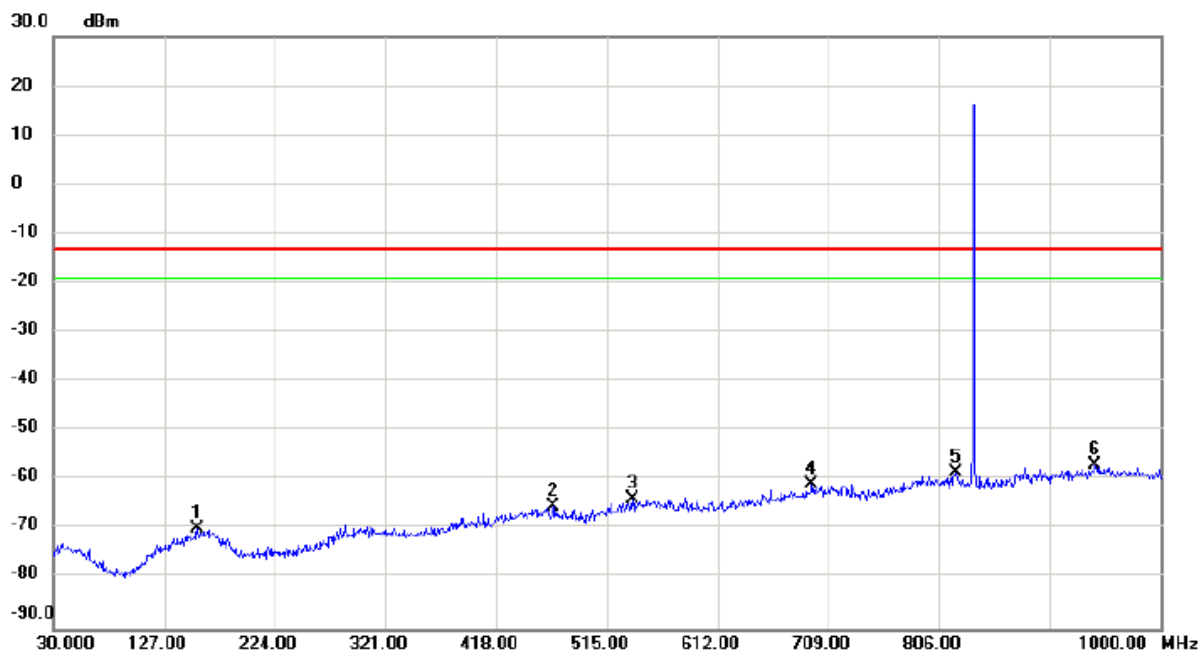


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.3286	23.10	13.47	36.57	97.27	-60.70	AVG	
2	*	2.2250	24.11	11.68	35.79	69.54	-33.75	QP	
3		6.1534	20.70	11.04	31.74	69.54	-37.80	QP	

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

Test Mode: GSM850_TX CH190_GSM_with Accessory Devices_Main Antenna

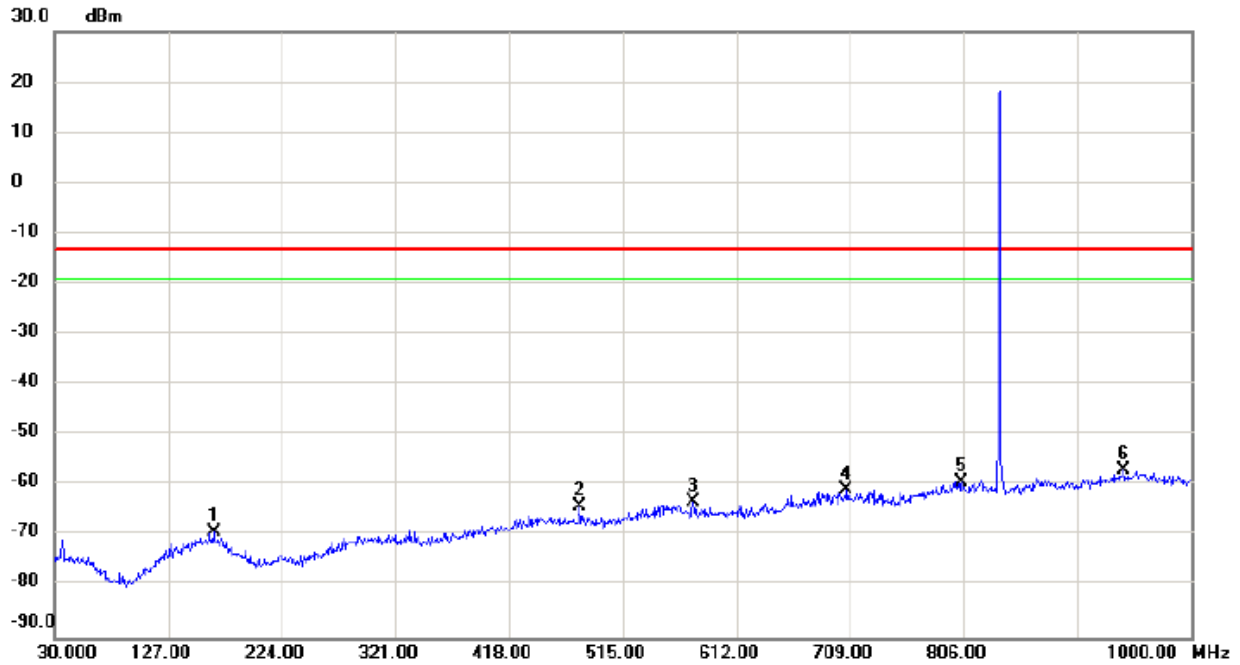
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		156.100	-68.87	-0.94	-69.81	-13.00	-56.81	peak	
2		467.470	-67.45	2.20	-65.25	-13.00	-52.25	peak	
3		537.310	-67.53	3.76	-63.77	-13.00	-50.77	peak	
4		694.450	-67.82	6.99	-60.83	-13.00	-47.83	peak	
5		820.550	-67.10	8.64	-58.46	-13.00	-45.46	peak	
6	*	942.770	-68.07	11.12	-56.95	-13.00	-43.95	peak	

Test Mode: GSM850_TX CH190_GSM_with Accessory Devices_Main Antenna

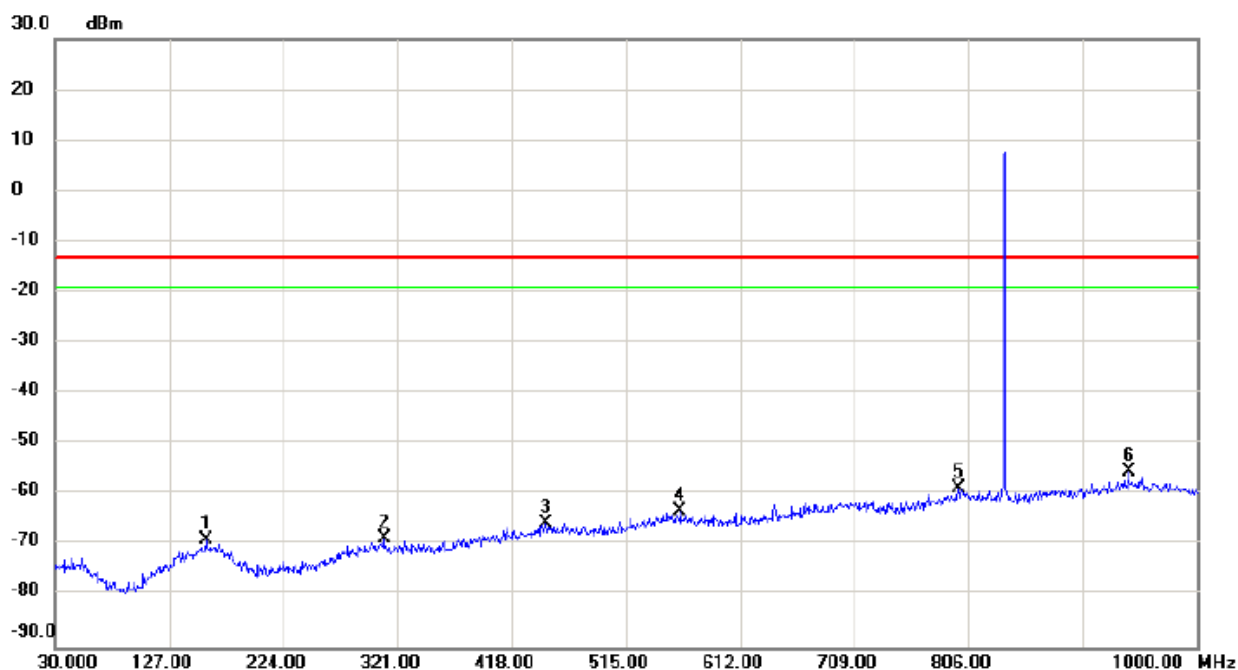
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		165.800	-68.33	-0.95	-69.28	-13.00	-56.28	peak	
2		478.140	-65.93	1.96	-63.97	-13.00	-50.97	peak	
3		575.140	-67.27	4.12	-63.15	-13.00	-50.15	peak	
4		706.090	-67.79	7.10	-60.69	-13.00	-47.69	peak	
5		804.060	-68.20	8.90	-59.30	-13.00	-46.30	peak	
6	*	942.770	-68.10	11.12	-56.98	-13.00	-43.98	peak	

Test Mode: GSM850_ TX CH190_EDGE_with Accessory Devices_Main Antenna

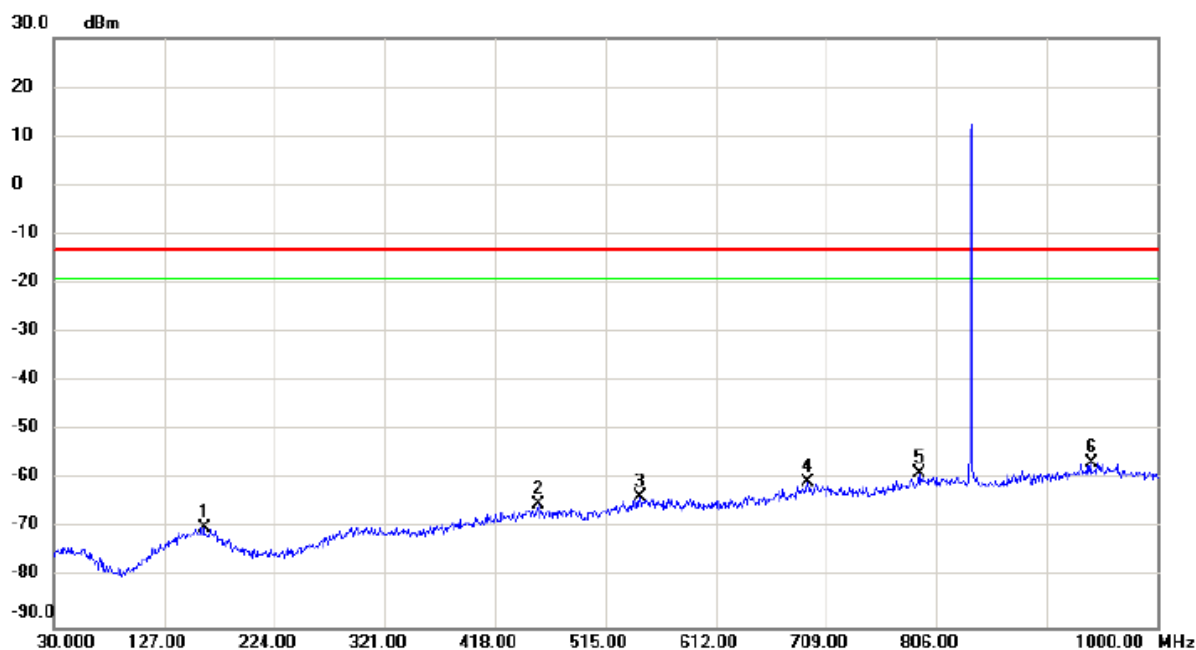
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		158.040	-68.19	-0.78	-68.97	-13.00	-55.97	peak	
2		309.360	-67.97	-0.51	-68.48	-13.00	-55.48	peak	
3		447.100	-68.11	2.47	-65.64	-13.00	-52.64	peak	
4		561.560	-67.40	4.35	-63.05	-13.00	-50.05	peak	
5		797.270	-67.48	8.80	-58.68	-13.00	-45.68	peak	
6 *		941.800	-66.32	11.07	-55.25	-13.00	-42.25	peak	

Test Mode: GSM850_TX CH190_EDGE_with Accessory Devices_Main Antenna

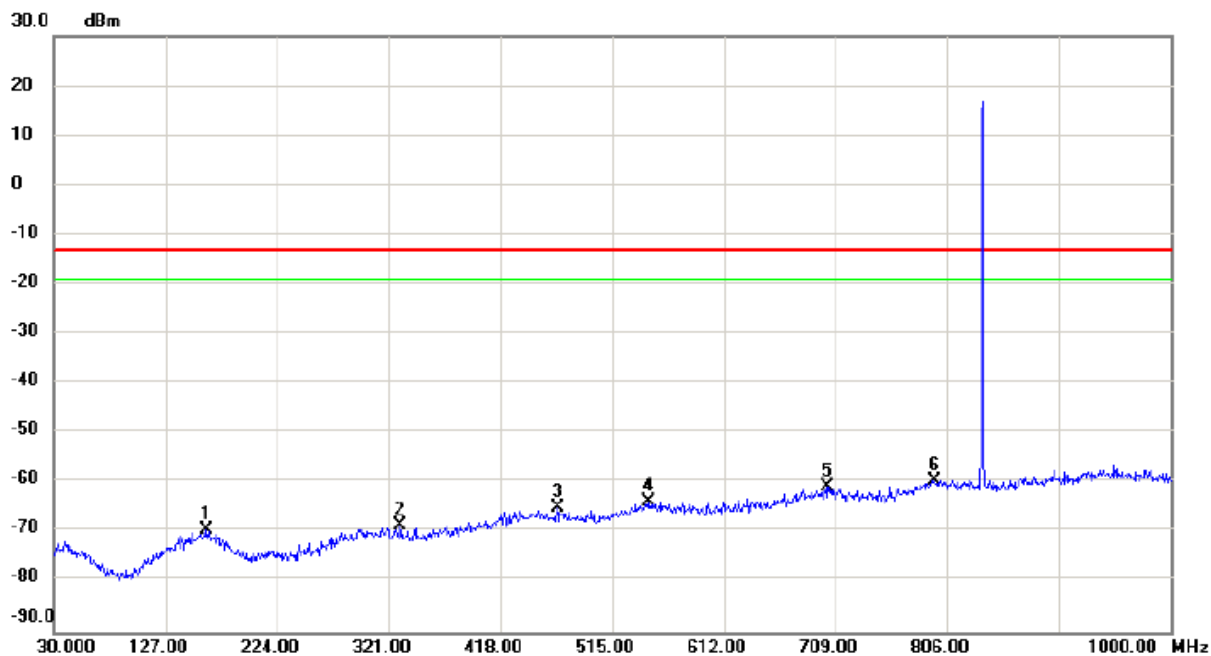
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		161.920	-69.02	-0.71	-69.73	-13.00	-56.73	peak	
2		455.830	-67.36	2.46	-64.90	-13.00	-51.90	peak	
3		545.070	-67.60	4.23	-63.37	-13.00	-50.37	peak	
4		692.510	-67.45	6.89	-60.56	-13.00	-47.56	peak	
5		790.480	-66.97	8.39	-58.58	-13.00	-45.58	peak	
6 *		941.800	-67.62	11.07	-56.55	-13.00	-43.55	peak	

Test Mode: GSM850_TX CH190_GSM_without Accessory Devices_Main Antenna

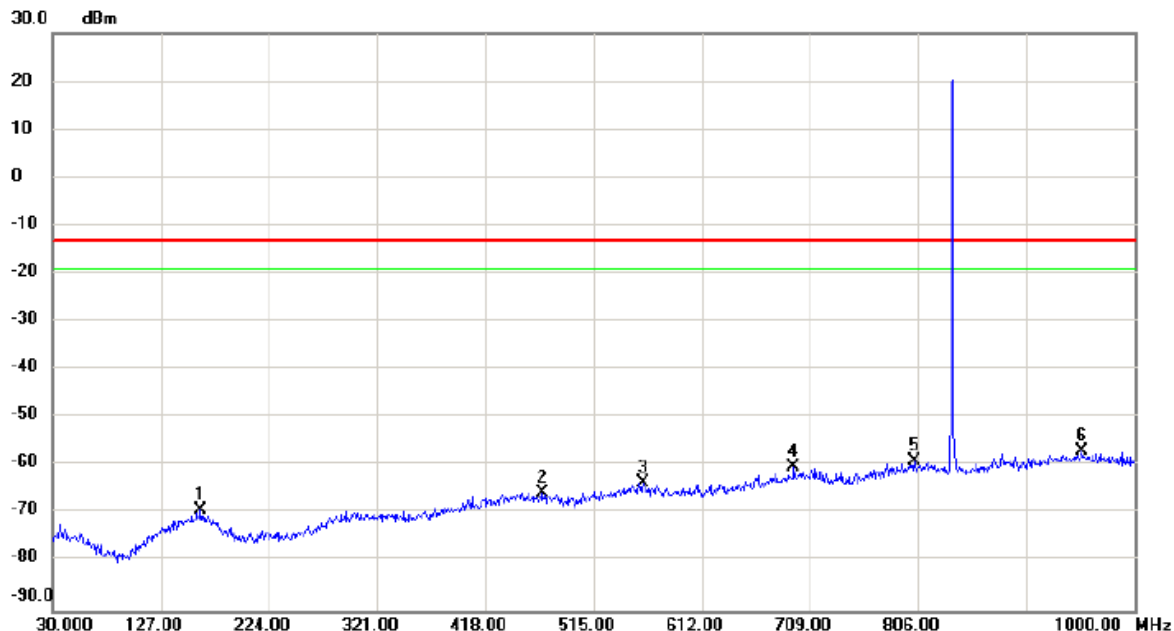
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		161.920	-68.89	-0.71	-69.60	-13.00	-56.60	peak	
2		330.700	-67.60	-0.80	-68.40	-13.00	-55.40	peak	
3		467.470	-67.27	2.20	-65.07	-13.00	-52.07	peak	
4		546.040	-68.02	4.29	-63.73	-13.00	-50.73	peak	
5		701.240	-67.84	7.22	-60.62	-13.00	-47.62	peak	
6	*	794.360	-68.13	8.62	-59.51	-13.00	-46.51	peak	

Test Mode: GSM850_TX CH190_GSM_without Accessory Devices_Main Antenna

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		162.890	-68.48	-0.77	-69.25	-13.00	-56.25	peak	
2		468.440	-67.64	2.18	-65.46	-13.00	-52.46	peak	
3		559.620	-67.83	4.38	-63.45	-13.00	-50.45	peak	
4		694.450	-67.11	6.99	-60.12	-13.00	-47.12	peak	
5		802.120	-68.00	8.93	-59.07	-13.00	-46.07	peak	
6 *		952.470	-68.22	11.35	-56.87	-13.00	-43.87	peak	

Test Mode: GSM850_TX CH190_EDGE_without Accessory Devices_Main Antenna

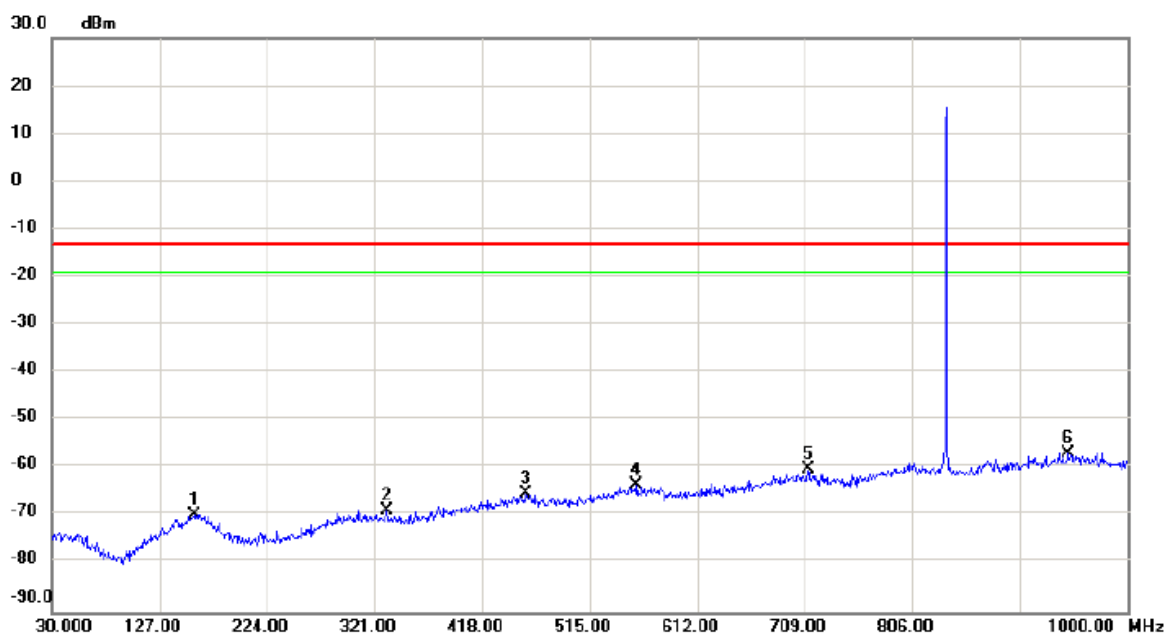
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		159.010	-68.69	-0.68	-69.37	-13.00	-56.37	peak	
2		306.450	-68.49	-0.46	-68.95	-13.00	-55.95	peak	
3		571.260	-67.31	4.18	-63.13	-13.00	-50.13	peak	
4		703.180	-67.56	7.17	-60.39	-13.00	-47.39	peak	
5		808.910	-67.14	8.81	-58.33	-13.00	-45.33	peak	
6 *		941.800	-66.99	11.07	-55.92	-13.00	-42.92	peak	

Test Mode: GSM850_TX CH190_EDGE_without Accessory Devices_Main Antenna

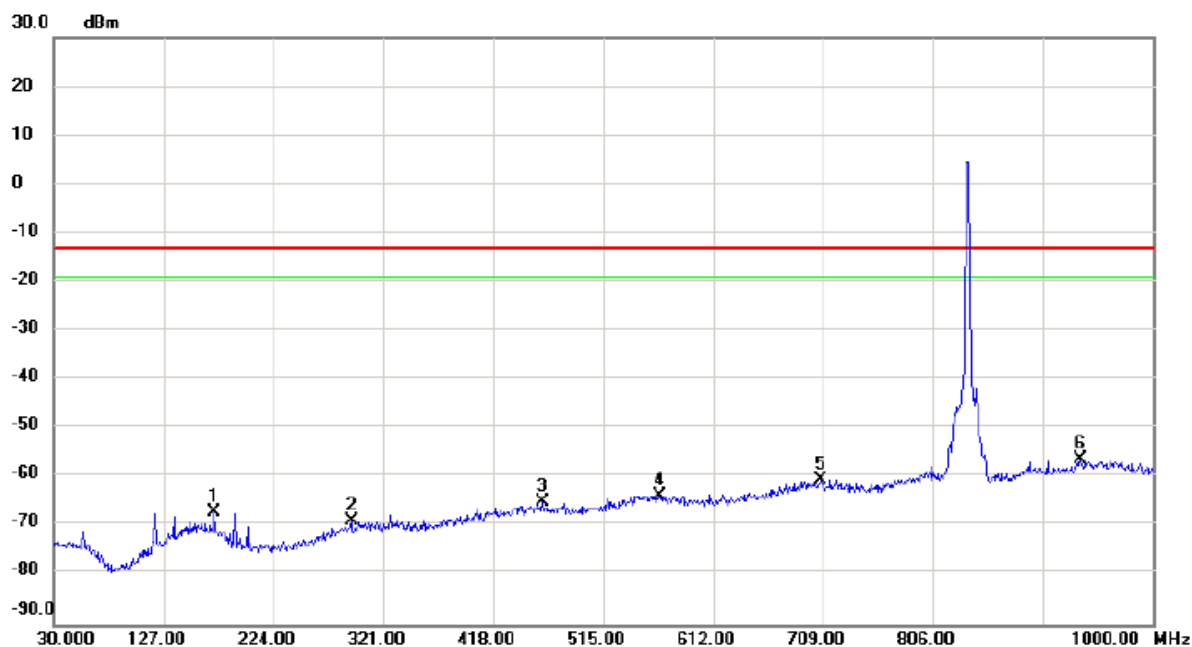
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		158.040	-68.97	-0.78	-69.75	-13.00	-56.75	peak	
2		331.670	-68.05	-0.82	-68.87	-13.00	-55.87	peak	
3		457.770	-67.72	2.42	-65.30	-13.00	-52.30	peak	
4		557.680	-67.82	4.41	-63.41	-13.00	-50.41	peak	
5		711.910	-67.24	6.94	-60.30	-13.00	-47.30	peak	
6	*	946.650	-68.02	11.28	-56.74	-13.00	-43.74	peak	

Test Mode: WCDMA Band V_TX CH4182_Main Antenna

Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		171.620	-65.68	-1.47	-67.15	-13.00	-54.15	peak	
2		293.355	-68.05	-0.76	-68.81	-13.00	-55.81	peak	
3		460.680	-67.46	2.36	-65.10	-13.00	-52.10	peak	
4		564.470	-67.94	4.30	-63.64	-13.00	-50.64	peak	
5		706.575	-67.40	7.08	-60.32	-13.00	-47.32	peak	
6 *		935.495	-67.09	10.83	-56.26	-13.00	-43.26	peak	

Test Mode:

WCDMA Band V_TX CH4182_Main Antenna

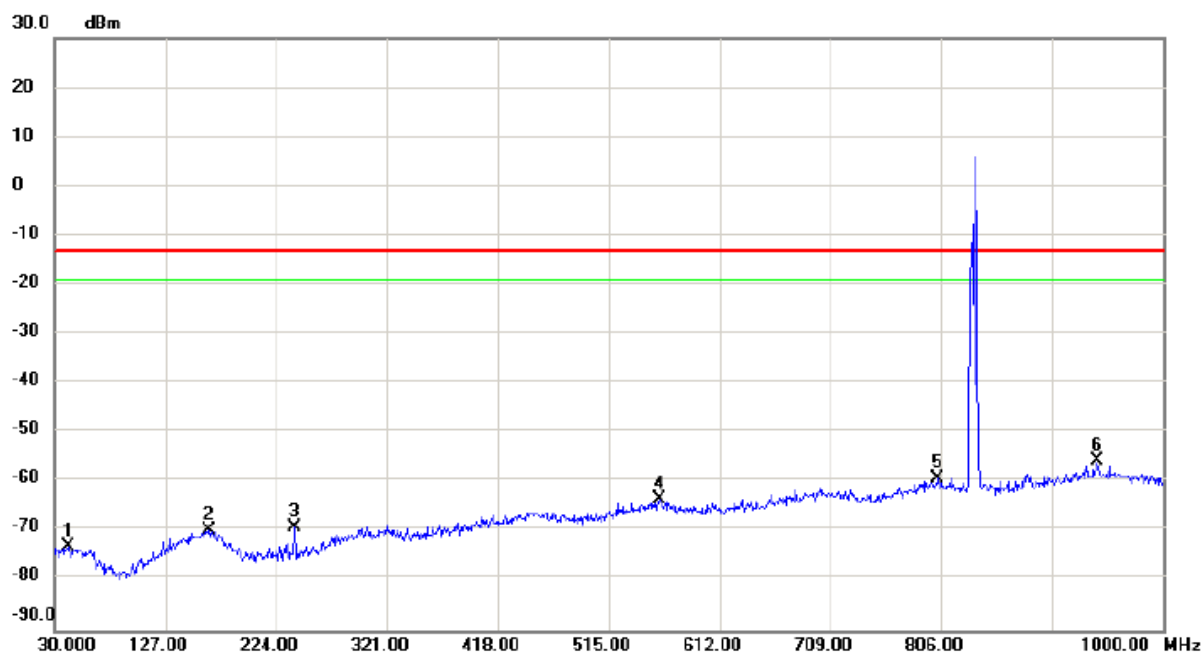
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		159.980	-63.71	-0.60	-64.31	-13.00	-51.31	peak	
2		299.660	-67.18	-0.39	-67.57	-13.00	-54.57	peak	
3		461.650	-67.41	2.33	-65.08	-13.00	-52.08	peak	
4		550.890	-67.84	4.52	-63.32	-13.00	-50.32	peak	
5		709.000	-66.62	7.02	-59.60	-13.00	-46.60	peak	
6	*	898.150	-63.95	9.36	-54.59	-13.00	-41.59	peak	

Test Mode: LTE Band 5_TX CH20525_1.4M_Main Antenna

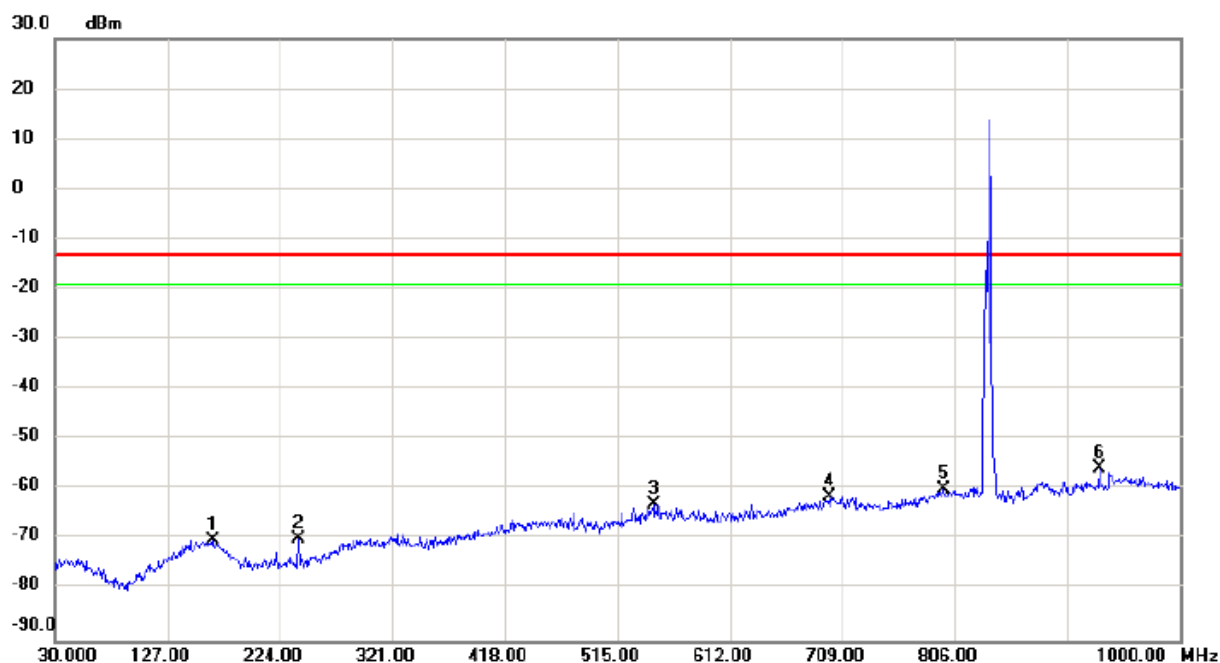
Vertical



Test Mode:

LTE Band 5_TX CH20525_1.4M_Main Antenna

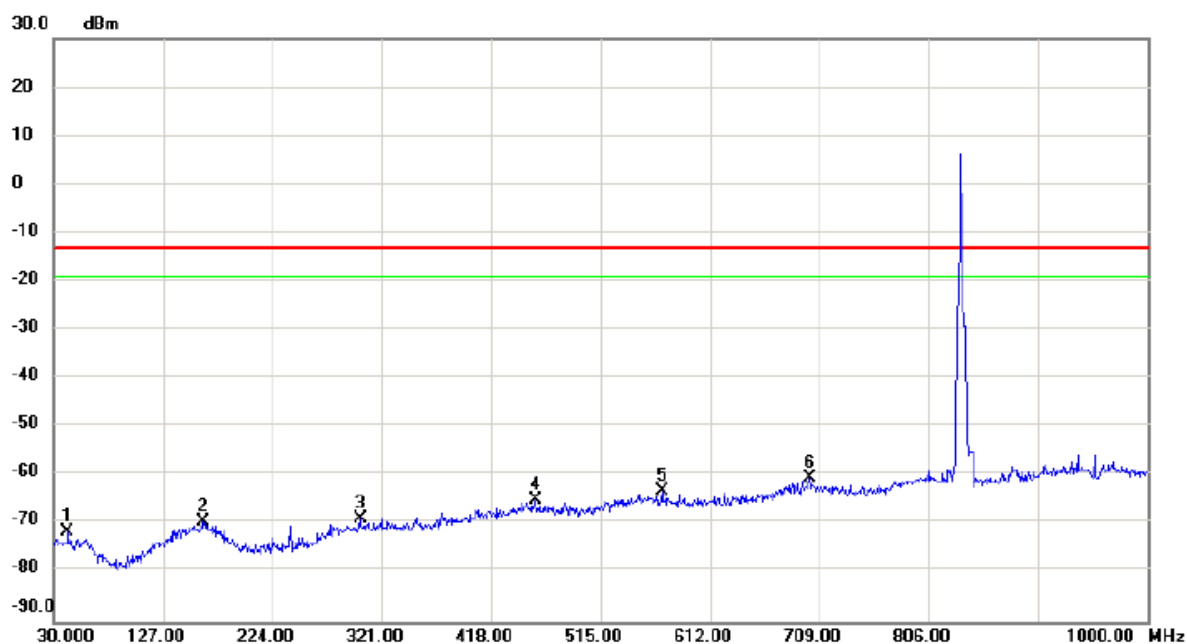
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		165.800	-68.98	-0.95	-69.93	-13.00	-56.93	peak	
2		239.520	-65.05	-4.69	-69.74	-13.00	-56.74	peak	
3		546.040	-67.07	4.29	-62.78	-13.00	-49.78	peak	
4		698.330	-68.39	7.17	-61.22	-13.00	-48.22	peak	
5		796.300	-68.50	8.74	-59.76	-13.00	-46.76	peak	
6	*	930.160	-66.27	10.62	-55.65	-13.00	-42.65	peak	

Test Mode: LTE Band 5_TX CH20525_5M_Main Antenna

Vertical

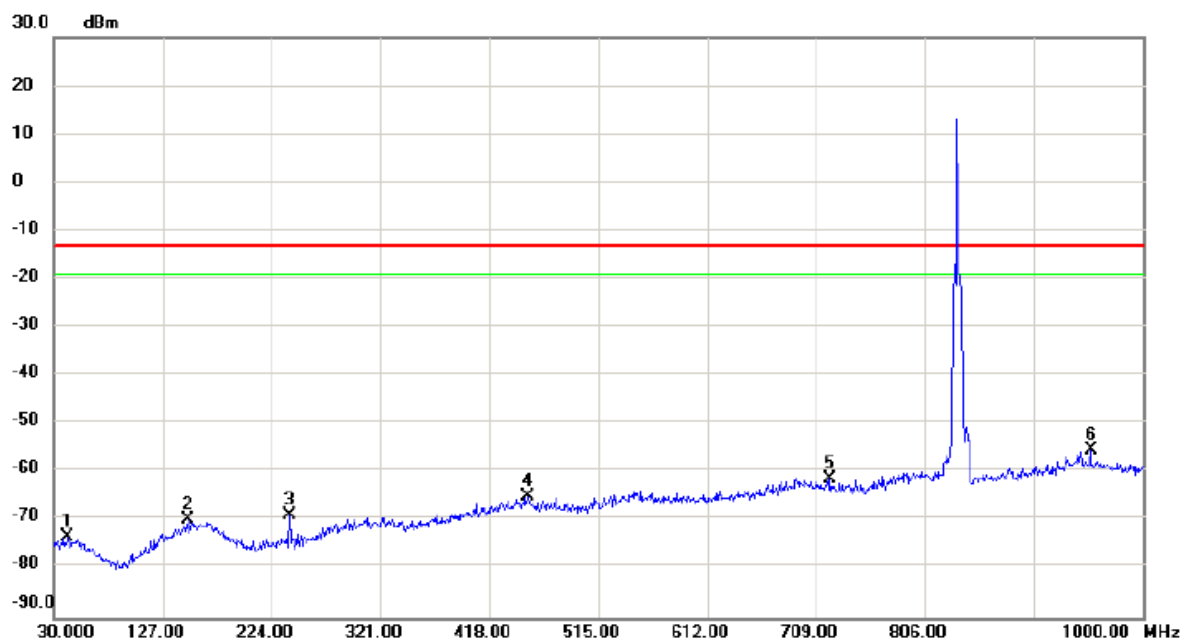


No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		42.610	-66.94	-4.70	-71.64	-13.00	-58.64	peak	
2		161.920	-68.77	-0.71	-69.48	-13.00	-56.48	peak	
3		301.600	-68.33	-0.39	-68.72	-13.00	-55.72	peak	
4		456.800	-67.26	2.45	-64.81	-13.00	-51.81	peak	
5		569.320	-67.50	4.21	-63.29	-13.00	-50.29	peak	
6	*	700.270	-67.72	7.25	-60.47	-13.00	-47.47	peak	

Test Mode:

LTE Band 5_TX CH20525_5M_Main Antenna

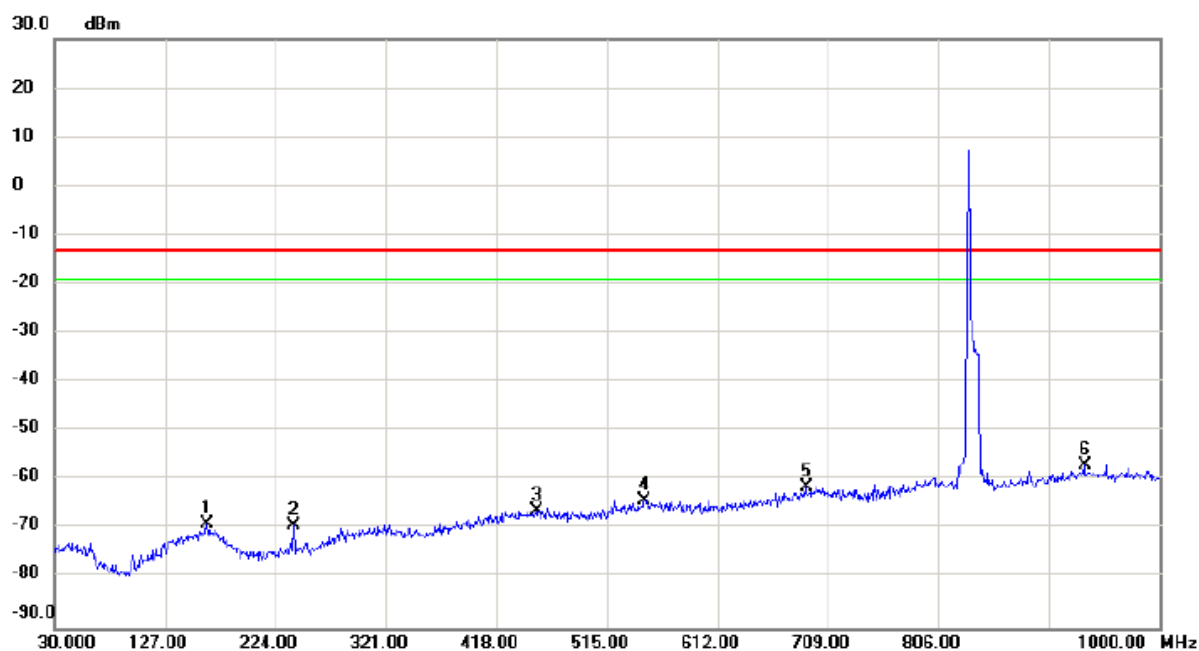
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		42.610	-68.77	-4.70	-73.47	-13.00	-60.47	peak	
2		149.310	-68.28	-1.53	-69.81	-13.00	-56.81	peak	
3		240.490	-64.14	-4.66	-68.80	-13.00	-55.80	peak	
4		451.950	-67.60	2.55	-65.05	-13.00	-52.05	peak	
5		721.610	-67.92	6.69	-61.23	-13.00	-48.23	peak	
6	*	953.440	-66.72	11.33	-55.39	-13.00	-42.39	peak	

Test Mode: LTE Band 5_TX CH20525_10M_Main Antenna

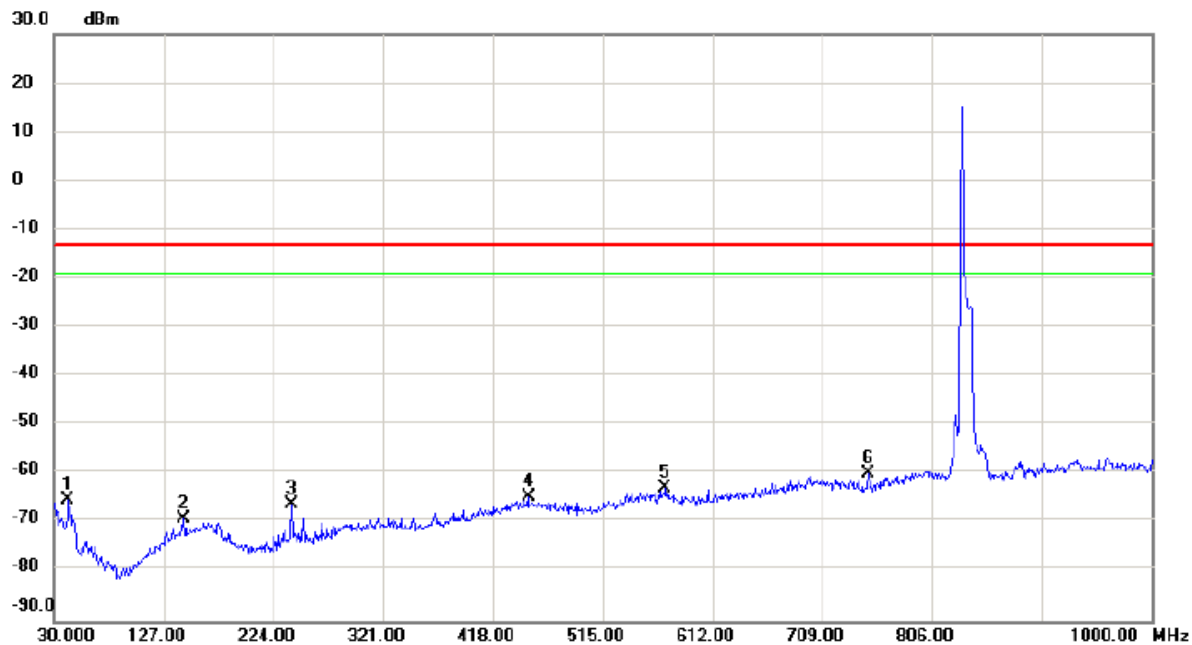
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		163.860	-68.06	-0.83	-68.89	-13.00	-55.89	peak	
2		240.490	-64.35	-4.66	-69.01	-13.00	-56.01	peak	
3		452.920	-68.66	2.54	-66.12	-13.00	-53.12	peak	
4		547.980	-68.39	4.41	-63.98	-13.00	-50.98	peak	
5		689.600	-68.15	6.75	-61.40	-13.00	-48.40	peak	
6 *		934.040	-67.52	10.78	-56.74	-13.00	-43.74	peak	

Test Mode: LTE Band 5_TX CH20525_10M_Main Antenna

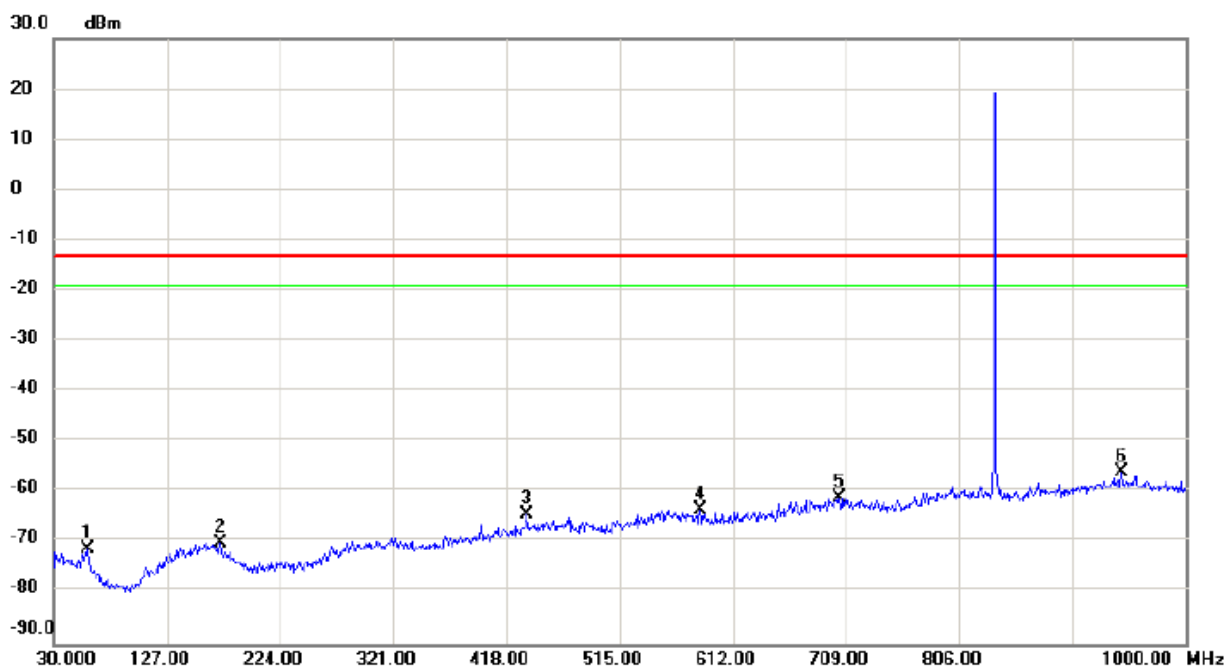
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		42.610	-60.42	-4.70	-65.12	-13.00	-52.12	peak	
2		144.460	-67.21	-1.83	-69.04	-13.00	-56.04	peak	
3		239.520	-61.59	-4.69	-66.28	-13.00	-53.28	peak	
4		449.040	-67.12	2.55	-64.57	-13.00	-51.57	peak	
5		570.290	-66.91	4.21	-62.70	-13.00	-49.70	peak	
6	*	749.740	-65.80	5.96	-59.84	-13.00	-46.84	peak	

Test Mode: GSM850_TX CH190_GSM_with Accessory Devices_Second Antenna

Vertical

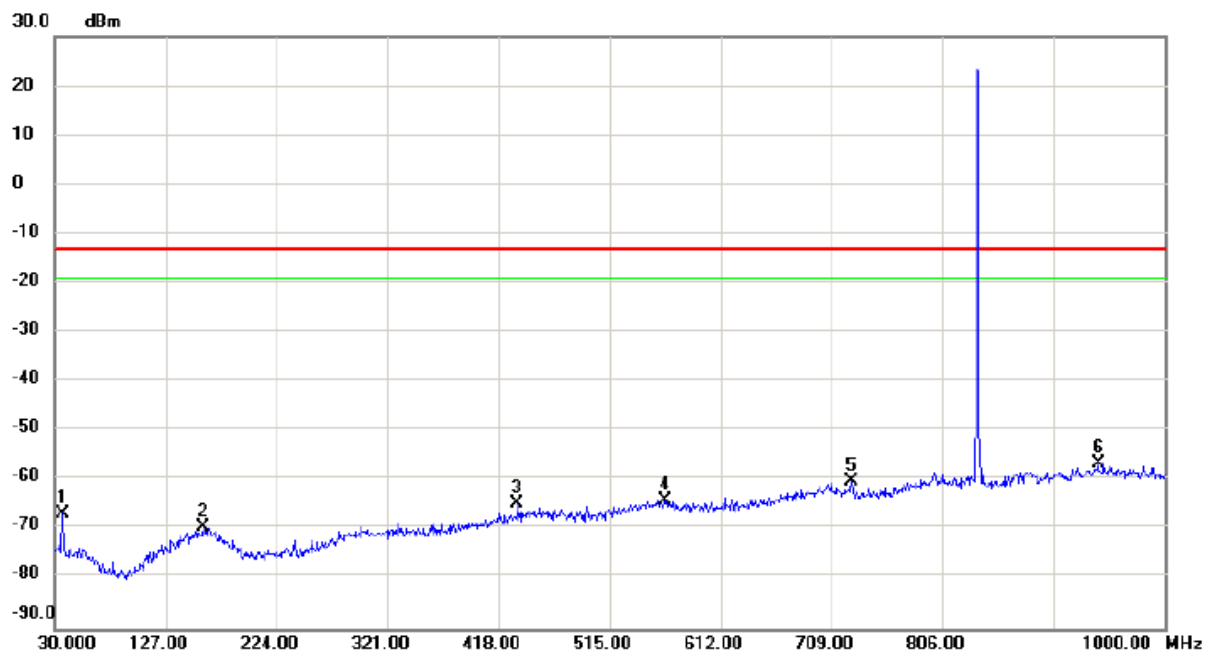


No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		59.100	-65.67	-5.55	-71.22	-13.00	-58.22	peak	
2		172.590	-68.37	-1.61	-69.98	-13.00	-56.98	peak	
3		435.460	-66.40	2.02	-64.38	-13.00	-51.38	peak	
4		583.870	-67.34	3.97	-63.37	-13.00	-50.37	peak	
5		703.180	-68.33	7.17	-61.16	-13.00	-48.16	peak	
6	*	944.710	-67.27	11.20	-56.07	-13.00	-43.07	peak	

Test Mode:

GSM850_TX CH190_GSM_with Accessory Devices_Second Antenna

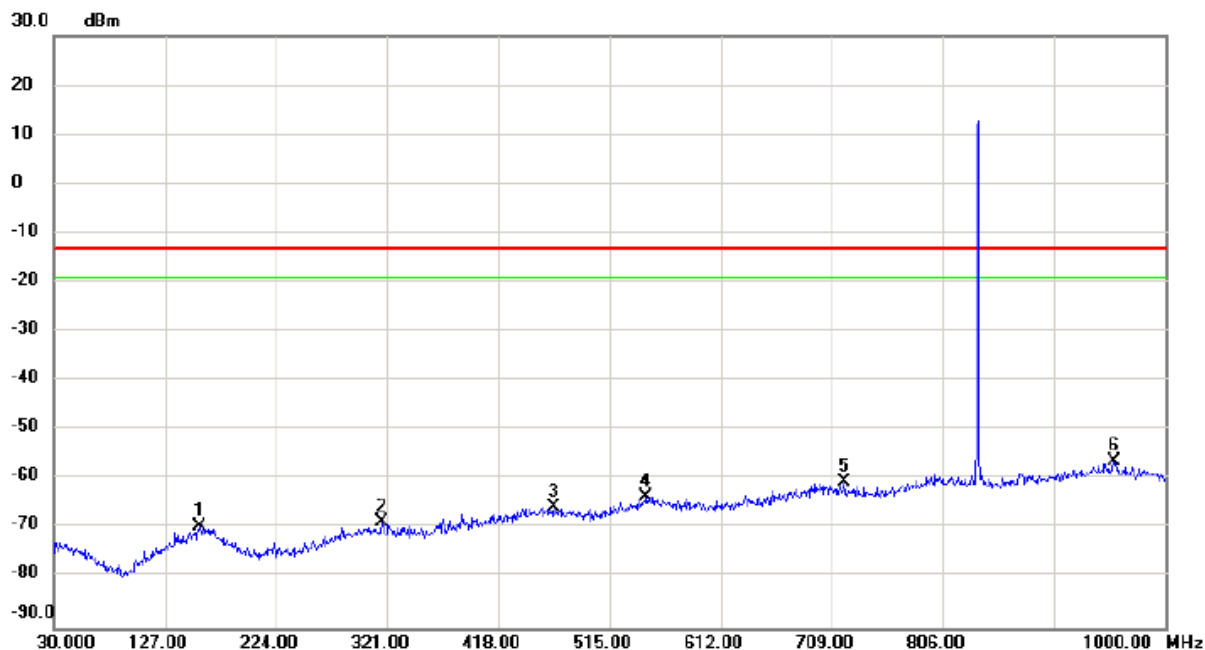
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		36.790	-61.79	-4.86	-66.65	-13.00	-53.65	peak	
2		159.980	-68.87	-0.60	-69.47	-13.00	-56.47	peak	
3		434.490	-66.51	1.99	-64.52	-13.00	-51.52	peak	
4		563.500	-68.27	4.31	-63.96	-13.00	-50.96	peak	
5		726.460	-66.67	6.57	-60.10	-13.00	-47.10	peak	
6	*	941.800	-67.69	11.07	-56.62	-13.00	-43.62	peak	

Test Mode: GSM850_TX CH190_EDGE_with Accessory Devices_Second Antenna

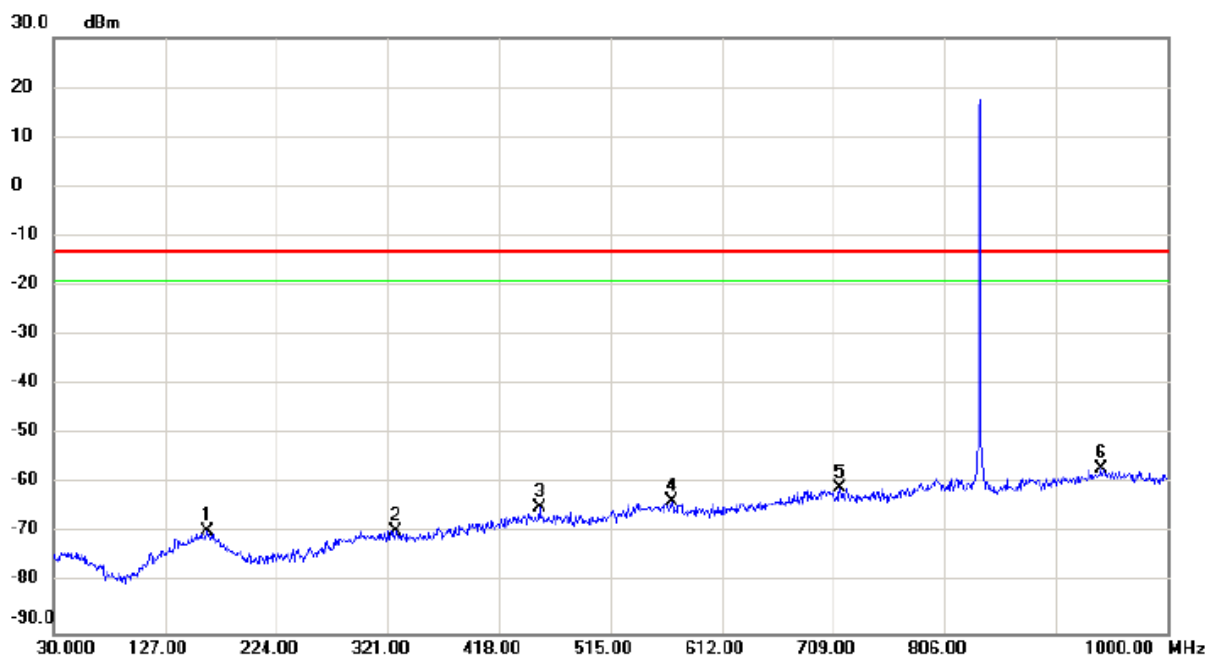
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		157.070	-78.32	8.73	-69.59	-13.00	-56.59	peak	
2		316.150	-77.43	8.99	-68.44	-13.00	-55.44	peak	
3		466.500	-77.34	11.82	-65.52	-13.00	-52.52	peak	
4		547.010	-77.42	13.94	-63.48	-13.00	-50.48	peak	
5		719.670	-76.85	16.33	-60.52	-13.00	-47.52	peak	
6	*	955.380	-77.00	20.87	-56.13	-13.00	-43.13	peak	

Test Mode: GSM850_TX CH190_EDGE_with Accessory Devices_Second Antenna

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		163.860	-78.27	8.76	-69.51	-13.00	-56.51	peak	
2		327.790	-78.27	8.82	-69.45	-13.00	-56.45	peak	
3		452.920	-76.87	12.13	-64.74	-13.00	-51.74	peak	
4		568.350	-77.41	13.83	-63.58	-13.00	-50.58	peak	
5		714.820	-77.22	16.46	-60.76	-13.00	-47.76	peak	
6 *		941.800	-77.38	20.66	-56.72	-13.00	-43.72	peak	

Test Mode: GSM850_TX CH190_GSM_without Accessory Devices_Second Antenna

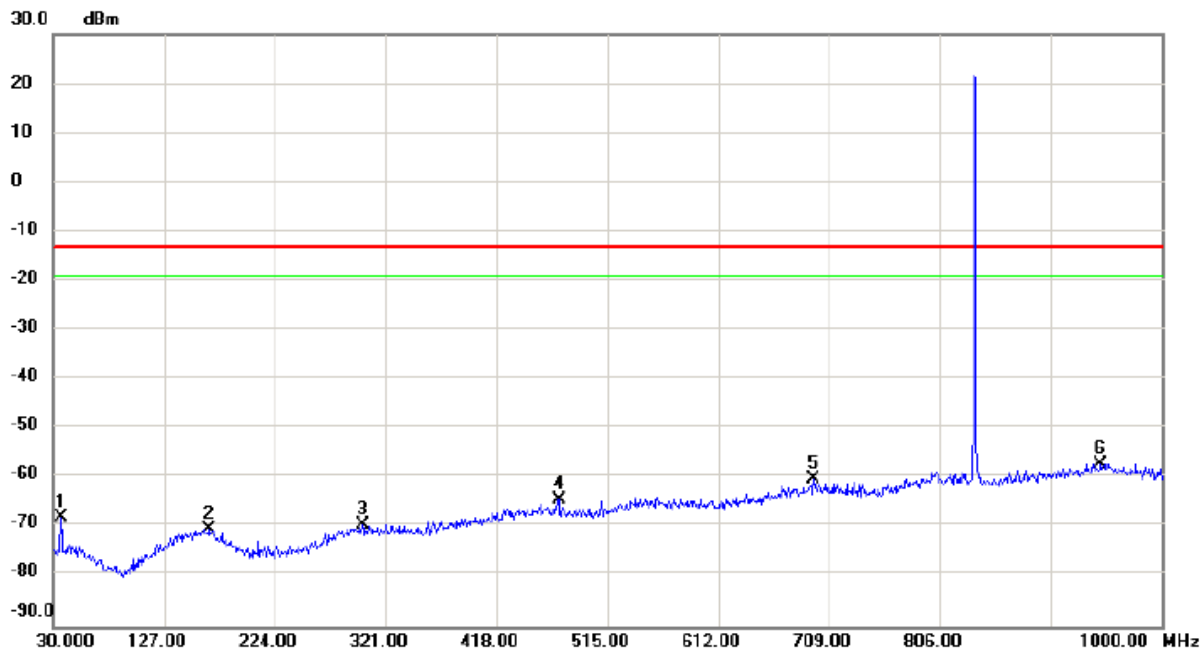
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		159.010	-68.22	-0.68	-68.90	-13.00	-55.90	peak	
2		462.620	-67.20	2.31	-64.89	-13.00	-51.89	peak	
3		549.920	-67.84	4.54	-63.30	-13.00	-50.30	peak	
4		699.300	-68.12	7.22	-60.90	-13.00	-47.90	peak	
5		812.790	-67.50	8.76	-58.74	-13.00	-45.74	peak	
6 *		953.440	-67.95	11.33	-56.62	-13.00	-43.62	peak	

Test Mode: GSM850_TX CH190_GSM_without Accessory Devices_Second Antenna

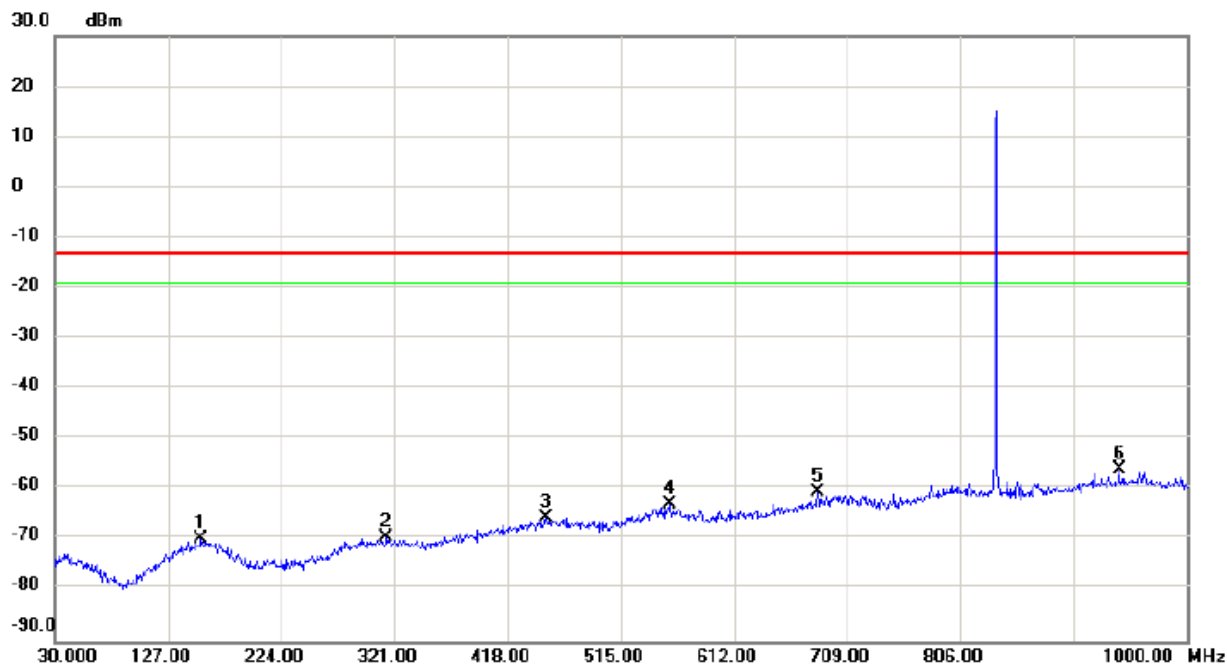
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		36.790	-63.12	-4.86	-67.98	-13.00	-54.98	peak	
2		166.770	-69.26	-1.00	-70.26	-13.00	-57.26	peak	
3		300.630	-68.98	-0.38	-69.36	-13.00	-56.36	peak	
4		472.320	-66.41	2.10	-64.31	-13.00	-51.31	peak	
5		695.420	-67.15	7.03	-60.12	-13.00	-47.12	peak	
6 *		946.650	-68.33	11.28	-57.05	-13.00	-44.05	peak	

Test Mode: GSM850_TX CH190_EDGE_without Accessory Devices_Second Antenna

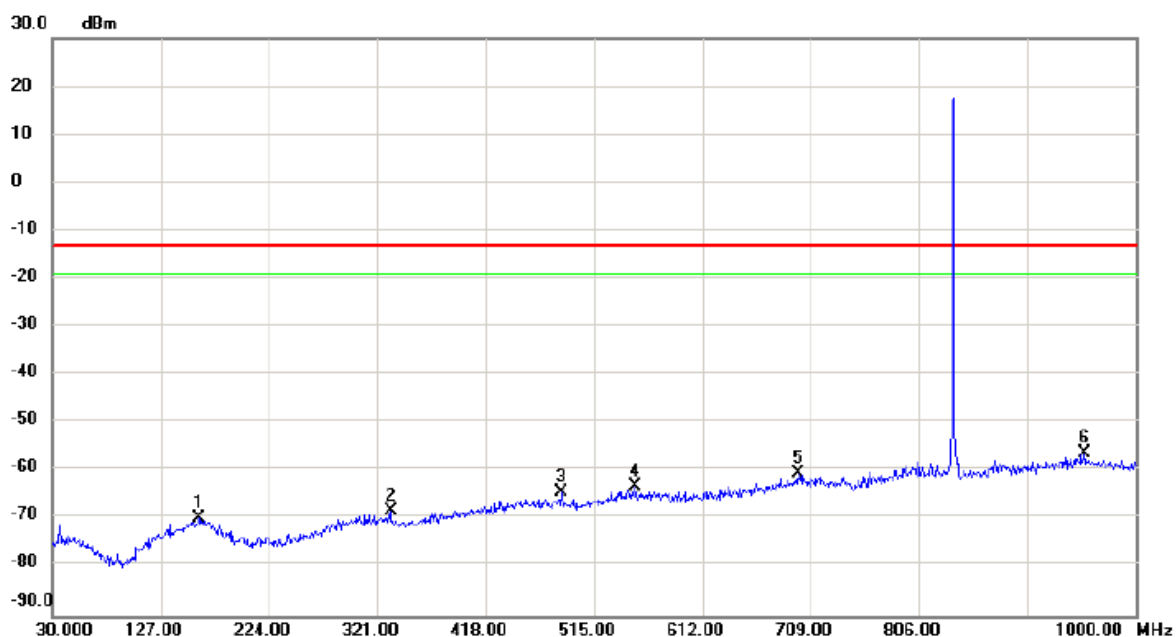
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		155.130	-68.66	-1.03	-69.69	-13.00	-56.69	peak	
2		314.210	-68.92	-0.57	-69.49	-13.00	-56.49	peak	
3		450.980	-68.16	2.58	-65.58	-13.00	-52.58	peak	
4		556.710	-67.29	4.42	-62.87	-13.00	-49.87	peak	
5		683.780	-66.98	6.47	-60.51	-13.00	-47.51	peak	
6 *		941.800	-67.15	11.07	-56.08	-13.00	-43.08	peak	

Test Mode: GSM850_TX CH190_EDGE_without Accessory Devices_Second Antenna

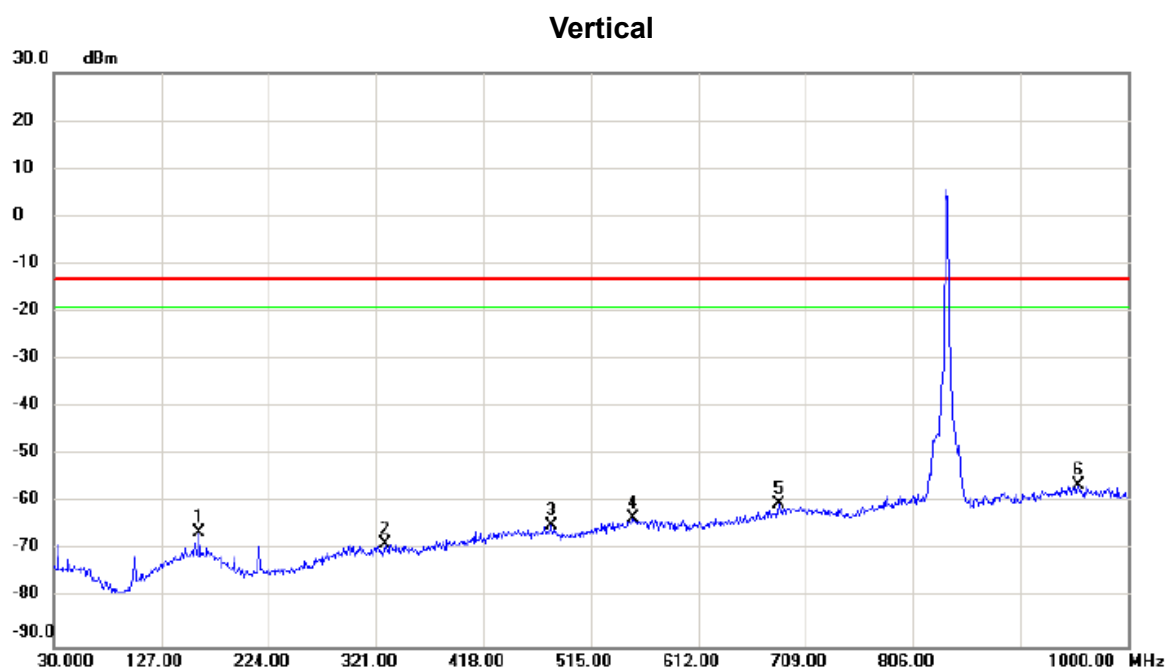
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		160.950	-69.11	-0.66	-69.77	-13.00	-56.77	peak	
2		332.640	-67.47	-0.83	-68.30	-13.00	-55.30	peak	
3		485.900	-66.25	1.79	-64.46	-13.00	-51.46	peak	
4		551.860	-67.55	4.51	-63.04	-13.00	-50.04	peak	
5		697.360	-67.58	7.12	-60.46	-13.00	-47.46	peak	
6	*	954.410	-67.42	11.31	-56.11	-13.00	-43.11	peak	

Test Mode:

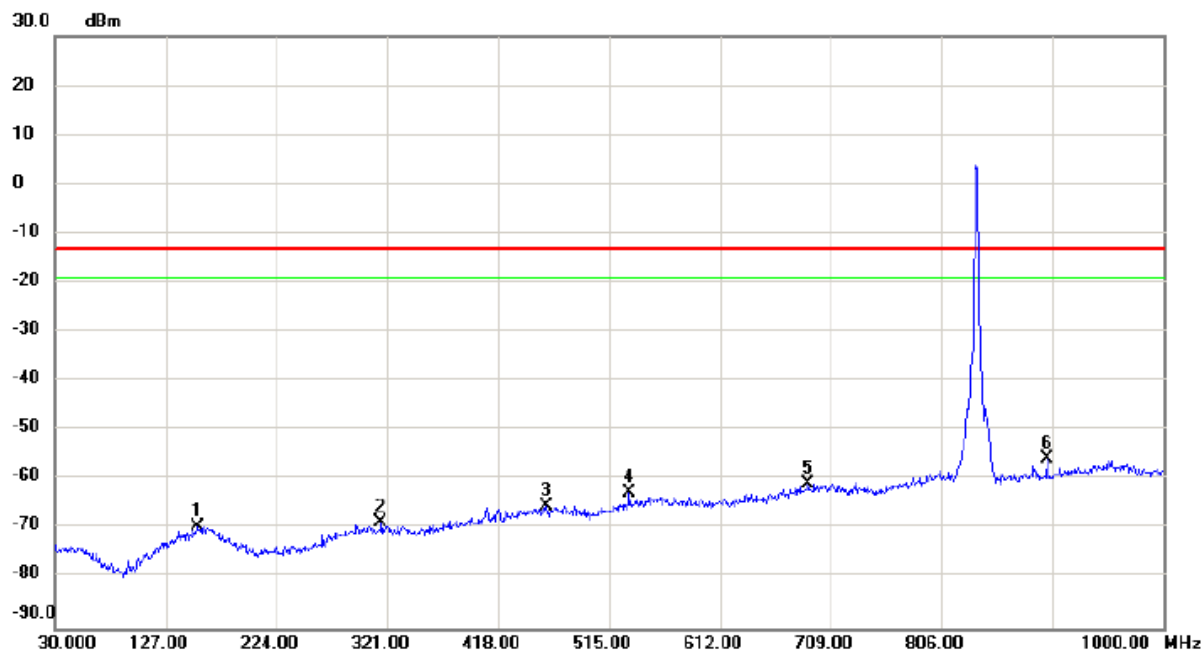
WCDMA Band V_TX CH4182_Second Antenna



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		160.950	-65.41	-0.66	-66.07	-13.00	-53.07	peak	
2		329.245	-67.75	-0.78	-68.53	-13.00	-55.53	peak	
3		479.595	-66.60	1.93	-64.67	-13.00	-51.67	peak	
4		553.800	-67.74	4.48	-63.26	-13.00	-50.26	peak	
5		684.750	-66.59	6.52	-60.07	-13.00	-47.07	peak	
6	*	955.380	-67.61	11.28	-56.33	-13.00	-43.33	peak	

Test Mode: WCDMA Band V_TX CH4182_Second Antenna

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		155.130	-68.43	-1.03	-69.46	-13.00	-56.46	peak	
2		315.180	-68.05	-0.58	-68.63	-13.00	-55.63	peak	
3		459.710	-67.65	2.38	-65.27	-13.00	-52.27	peak	
4		532.460	-66.01	3.46	-62.55	-13.00	-49.55	peak	
5		688.630	-67.44	6.70	-60.74	-13.00	-47.74	peak	
6	*	898.150	-64.95	9.36	-55.59	-13.00	-42.59	peak	

Test Mode: LTE Band 5_TX CH20525_1.4M_Second Antenna

Vertical

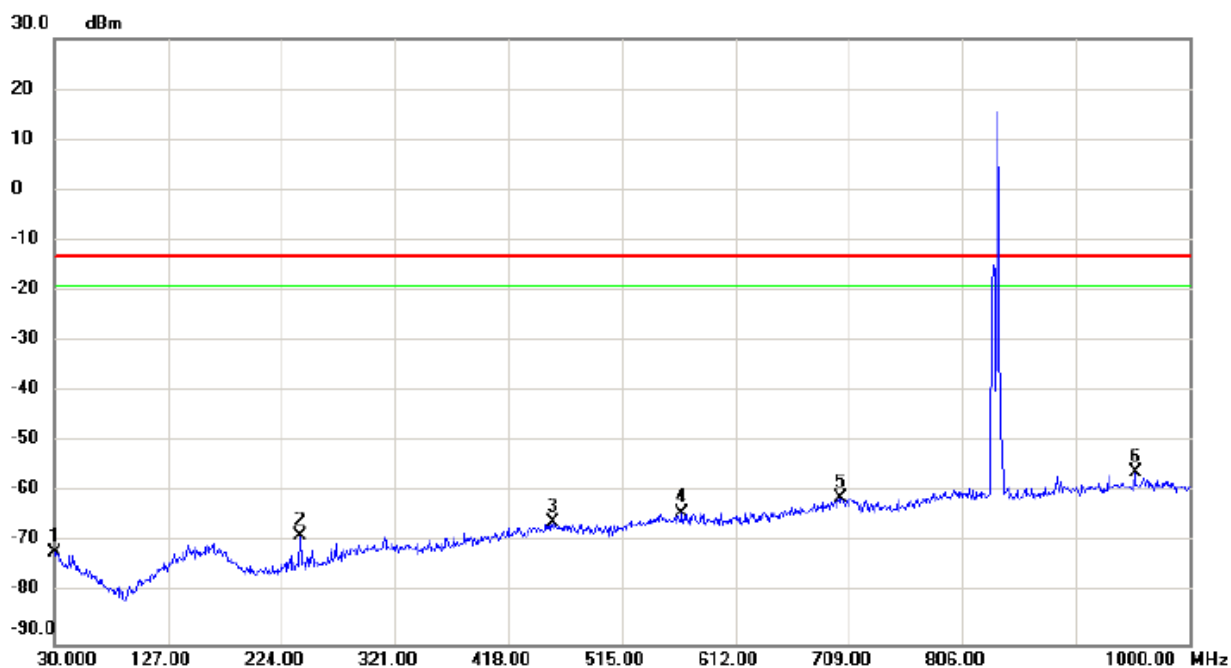


No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		240.490	-63.09	-4.66	-67.75	-13.00	-54.75	peak	
2		472.320	-68.05	2.10	-65.95	-13.00	-52.95	peak	
3		557.680	-68.14	4.41	-63.73	-13.00	-50.73	peak	
4		698.330	-67.39	7.17	-60.22	-13.00	-47.22	peak	
5		809.880	-67.68	8.80	-58.88	-13.00	-45.88	peak	
6 *		932.100	-66.37	10.69	-55.68	-13.00	-42.68	peak	

Test Mode:

LTE Band 5_TX CH20525_1.4M_Second Antenna

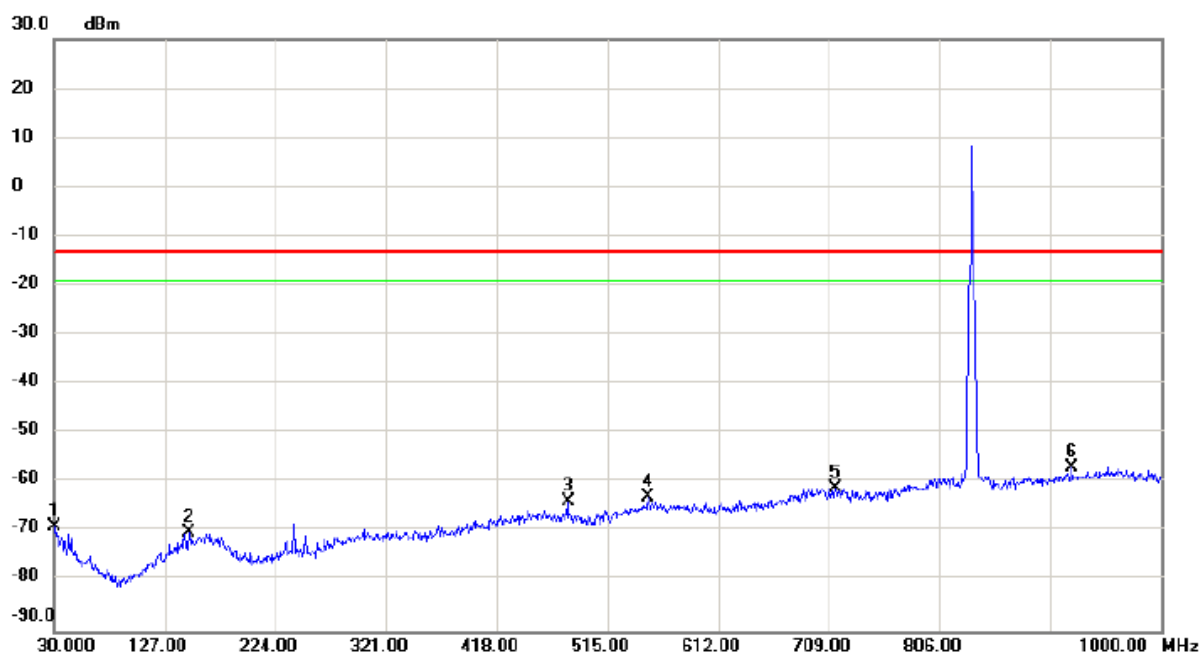
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		30.970	-66.91	-5.01	-71.92	-13.00	-58.92	peak	
2		240.490	-63.88	-4.66	-68.54	-13.00	-55.54	peak	
3		455.830	-68.28	2.46	-65.82	-13.00	-52.82	peak	
4		566.410	-68.28	4.27	-64.01	-13.00	-51.01	peak	
5		702.210	-68.17	7.20	-60.97	-13.00	-47.97	peak	
6	*	953.440	-67.24	11.33	-55.91	-13.00	-42.91	peak	

Test Mode: LTE Band 5_TX CH20525_5M_Second Antenna

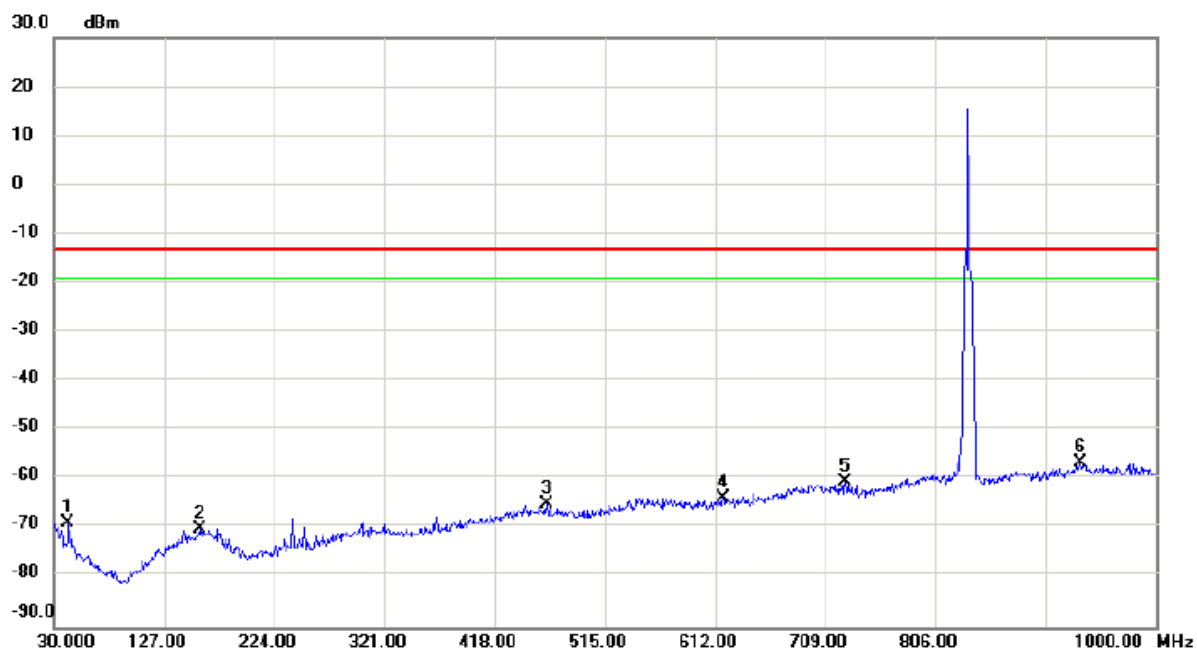
Vertical



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		30.970	-63.96	-5.01	-68.97	-13.00	-55.97	peak	
2		148.340	-68.31	-1.59	-69.90	-13.00	-56.90	peak	
3		480.080	-65.67	1.92	-63.75	-13.00	-50.75	peak	
4		550.890	-67.42	4.52	-62.90	-13.00	-49.90	peak	
5		714.820	-67.85	6.87	-60.98	-13.00	-47.98	peak	
6 *		921.430	-67.11	10.26	-56.85	-13.00	-43.85	peak	

Test Mode: LTE Band 5_TX CH20525_5M_Second Antenna

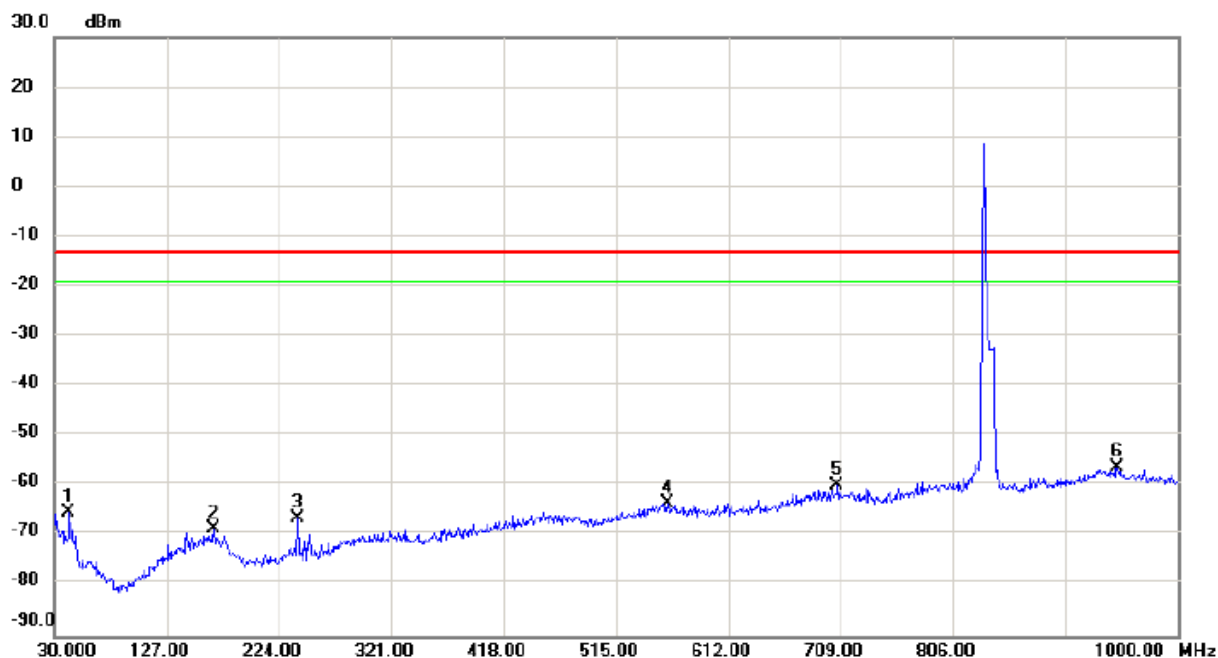
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		42.610	-64.10	-4.70	-68.80	-13.00	-55.80	peak	
2		158.040	-69.20	-0.78	-69.98	-13.00	-56.98	peak	
3		463.590	-67.36	2.29	-65.07	-13.00	-52.07	peak	
4		618.790	-67.73	4.13	-63.60	-13.00	-50.60	peak	
5		726.460	-67.14	6.57	-60.57	-13.00	-47.57	peak	
6 *		933.070	-67.29	10.72	-56.57	-13.00	-43.57	peak	

Test Mode: LTE Band 5_TX CH20525_10M_Second Antenna

Vertical

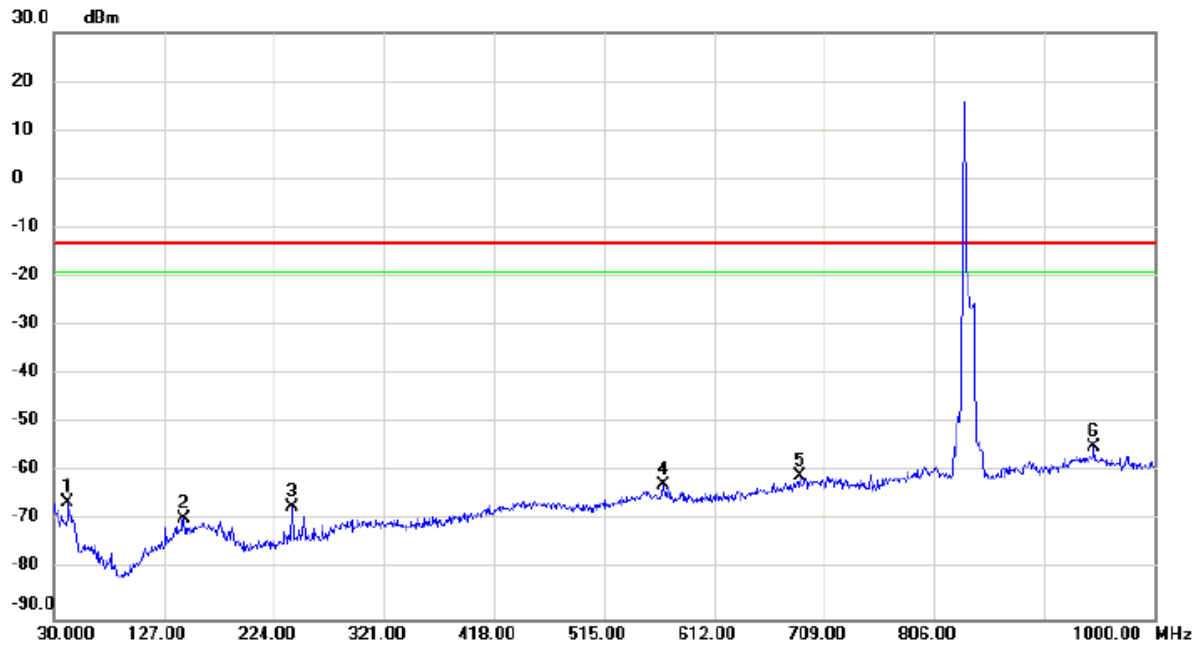


No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		42.610	-60.60	-4.70	-65.30	-13.00	-52.30	peak	
2		167.740	-67.42	-1.07	-68.49	-13.00	-55.49	peak	
3		240.490	-61.71	-4.66	-66.37	-13.00	-53.37	peak	
4		559.620	-67.78	4.38	-63.40	-13.00	-50.40	peak	
5		706.090	-67.05	7.10	-59.95	-13.00	-46.95	peak	
6 *		947.620	-67.51	11.32	-56.19	-13.00	-43.19	peak	

Test Mode:

LTE Band 5_TX CH20525_10M_Second Antenna

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Margin dB	Detector	Comment
1		42.610	-61.47	-4.70	-66.17	-13.00	-53.17	peak	
2		144.460	-67.61	-1.83	-69.44	-13.00	-56.44	peak	
3		240.490	-62.39	-4.66	-67.05	-13.00	-54.05	peak	
4		567.380	-66.70	4.24	-62.46	-13.00	-49.46	peak	
5		687.660	-67.33	6.66	-60.67	-13.00	-47.67	peak	
6 *		946.650	-65.96	11.28	-54.68	-13.00	-41.68	peak	