



# FCC Radio Test Report FCC ID: QISB315S-22VERB

This report concerns (check one): ⊠Original Grant □Class II Change

Project No. : 1802C116 Equipment : LTE CPE Model Name : B315s-22

**Applicant**: Huawei Technologies Co.,Ltd.

Address : Administration Building, Headquarters of Huawei

Technologies Co., Ltd., Bantian, Longgang District,

Shenzhen, 518129, P.R.C

Date of Receipt : Feb. 24, 2018

**Date of Test**: Feb. 24, 2018 ~ Mar. 24, 2018

Issued Date : Mar. 27, 2018 Tested by : BTL Inc.

Technical Engineer : Shown Xio

(Shawn Xiao)

Authorized Signatory : See ...

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TESTING
NVLAP LAB CODE 200788-0

Report No.: BTL-FCCP-3-1802C116 Page 1 of 141





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#### 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.

Report No.: BTL-FCCP-3-1802C116 Page 2 of 141





Table of Contents	Page
REPORT ISSUED HISTORY	5
1. CERTIFICATION	6
2 . SUMMARY OF TEST RESULTS	7
2.1 TEST FACILITY	8
2.2 MEASUREMENT UNCERTAINTY	8
3 . GENERAL INFORMATION	9
3.1 GENERAL DESCRIPTION OF EUT	9
3.2 DESCRIPTION OF TEST MODES AND TEST CONDITION	11
3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TEST	
3.4 DESCRIPTION OF SUPPORT UNITS	12
4 . TEST RESULT	13
4.1 OUTPUT POWER MEASUREMENT	13
4.1.1 LIMIT	13
4.1.2 TEST PROCEDURE	13
4.1.3 TESTSETUP LAYOUT 4.1.4 TEST DEVIATION	13 13
4.1.5 TEST RESULTS	13
4.2 OCCUPIED BANDWIDTH MEASUREMENT	14
4.2.1 TEST PROCEDURE	14
4.2.2 TEST SETUP LAYOUT	14
4.2.3 TEST DEVIATION	14
4.2.4 TEST RESULTS	14
4.3 CONDUCTED EMISSIONS MEASUREMENT 4.3.1 LIMIT	15 15
4.3.2 TEST PROCEDURES	15
4.3.3 TESTSETUP LAYOUT	15
4.3.4 TESTDEVIATION	15
4.3.5 TEST RESULTS	15
4.4 RADIATED EMISSIONS MEASUREMENT	16
4.4.1 LIMIT	16
4.4.2 TEST PROCEDURES 4.4.3 TESTSETUP LAYOUT	16 16
4.4.4 TESTDEVIATION	17
4.4.5 TEST RESULTS (9KHZ TO 30MHZ)	17
4.4.6 TEST RESULTS (30MHZ TO 1000MHZ)	17
4.4.7 TEST RESULTS (ABOVE 1000MHZ)	17
4.5 BAND EDGE MEASUREMENT	18

Report No.: BTL-FCCP-3-1802C116





Table of Contents	Page
4.5.1 LIMIT 4.5.2 TEST PROCEDURES 4.5.3 TESTSETUP LAYOUT 4.5.4 TESTDEVIATION 4.5.5 TEST RESULTS	18 18 18 18 18
4.6 PEAK TO AVERAGE RATIO MEASUREMENT 4.6.1 LIMIT 4.6.2 TEST PROCEDURES 4.6.3 TESTSETUP LAYOUT 4.6.4 TESTDEVIATION 4.6.5 TEST RESULTS	19 19 19 19 19
4.7 FREQUENCY STABILITY MEASUREMENT 4.7.1 LIMIT 4.7.2 TEST PROCEDURES 4.7.3 TESTSETUP LAYOUT 4.7.4 TESTDEVIATION 4.7.5 TEST RESULTS	20 20 20 20 20 20 20
5. LIST OF MEASUREMENT EQUIPMENTS	21
APPENDIX A - OUTPUT POWER  APPENDIX B - OCCUPIED BANDWIDTH	23 28
APPENDIX C - CONDUCTED EMISSIONS	37
APPENDIX D - RADIATED EMISSION (9KHZ TO 30MHZ)  APPENDIX E - RADIATED EMISSION (30MHZ TO 1GHZ)	40 77
APPENDIX F - RADIATED EMISSION (ABOVE 1GHZ)	90
APPENDIX G - BAND EDGE	127
APPENDIX H - PEAK TO AVERAGE RATIO	132
APPENDIX I - FREQUENCY STABILITY	137

Report No.: BTL-FCCP-3-1802C116 Page 4 of 141





# **REPORT ISSUED HISTORY**

Issued No.	Description	Issued Date
BTL-FCCP-3-1802C116	Original Issue.	Mar. 27, 2018

Report No.: BTL-FCCP-3-1802C116 Page 5 of 141





# 1. CERTIFICATION

Equipment : LTE CPE Brand Name : HUAWEI Model Name : B315s-22

Applicant : Huawei Technologies Co.,Ltd. Manufacturer : Huawei Technologies Co.,Ltd.

Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,

Bantian, Longgang District, Shenzhen, 518129, P.R.C

Factory : Huawei Technologies Co.,Ltd.

Address : Administration Building, Headquarters of Huawei Technologies Co., Ltd.,

Bantian, Longgang District, Shenzhen, 518129, P.R.C

Date of Test : Feb, 24, 2018 ~ Mar, 24, 2018

Test Sample: Engineering Sample Standard(s): 47 CFR FCC Part 27

47 CFR FCC Part 2 & ANSI/TIA-603-D-2010

KDB 971168 D01 Power Meas License Digital Systems v03

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-3-1802C116) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP according to the ISO-17025 quality assessment standard and technical standard(s).

Test results included in this report is only for the LTE Band 38 part.

Report No.: BTL-FCCP-3-1802C116 Page 6 of 141





# 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 27 & Part 2					
Standard(s) Section	Test Item	Judgment	Tested By		
2.1046 27.50(d)(4)	Radiated power	PASS	Paul Li		
2.1046 27.50(d)(4)	Conducted Output Power	PASS	Paul Li		
2.1049 27.53(h)	Occupied Bandwidth	PASS	Paul Li		
2.1051 27.53(h)	Conducted Spurious Emissions	PASS	Paul Li		
2.1053 27.53(h)	Radiated Spurious Emissions	PASS	Paul Li		
27.53(h)	Band Edge Measurements	PASS	Paul Li		
27.50	Peak To Average Ratio	PASS	Paul Li		
2.1055 27.54	Frequency Stability	PASS	Paul Li		

#### NOTE:

Report No.: BTL-FCCP-3-1802C116 Page 7 of 141

<sup>(1)&</sup>quot; N/A" denotes test is not applicable to this device.





#### 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 number for FCC: 854385 BTL's designation number for FCC: CN5020

#### 2.2 MEASUREMENT UNCERTAINTY

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

The BTL measurement uncertainty as below table:

#### A. Radiated Measurement:

Test Site	Method	Measurement Frequency Range		U,(dB)	
DG-CB03 (3m)		9KHz ~ 30MHz	V	3.79	
	CISPR	9KHz ~ 30MHz		Н	3.57
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	Н	3.78	
		200MHz ~ 1,000MHz		V	4.10
		200MHz ~ 1,000MHz	Н	4.06	

Test Site	Method	Measurement Frequency Range		U,(dB)
DG-CB03	CISPR	1GHz ~ 18GHz	V	3.12
(3m)	CISPR	1GHz ~ 18GHz	Н	3.68

Test Site	Method	Measurement Frequency Range		U,(dB)
DG-CB03	CISPR	18GHz ~ 40GHz	V	4.15
(1m)	CISPR	18GHz ~ 40GHz	Н	4.14

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

Report No.: BTL-FCCP-3-1802C116 Page 8 of 141





# 3. GENERAL INFORMATION

# 3.1 GENERAL DESCRIPTION OF EUT

Equipment	LTE CPE			
Brand Name	HUAWEI			
Model Name	B315s-22			
Model Difference	N/A			
Modulation Type	LTE		K,16QAM K,16QAM	
	LTE 38 (Channel Bandwidth: 5MHz)		2617.5 MH	Z
Operation Frequency	LTE 38 (Channel Bandwidth: 10MHz)	2575 ~ 2	615 MHz	
Operation Frequency	LTE 38 (Channel Bandwidth: 15MHz)	2577.5 ~	2612.5 MH	Z
	LTE 38 (Channel Bandwidth: 20MHz)	2580 ~ 2	610 MHz	
	LTE 20 (Channel Bandwidth, SML)	QPSK	26.88	dBm
	LTE 38 (Channel Bandwidth: 5MHz)	16QAM	25.85	dBm
	LTE 38 (Channel Bandwidth: 10MHz)	QPSK	27.33	dBm
Max. EIRP Power		16QAM	26.26	dBm
Max. LINF FOWE	LTE 38 (Channel Bandwidth: 15MHz)	QPSK	26.75	dBm
	212 de (enamer Banawatii: 16tti 12)	16QAM	25.73	dBm
	LTE 38 (Channel Bandwidth: 20MHz)	QPSK	26.58	dBm
	ETE 00 (Onamici Banawatii. 2011112)	16QAM	25.91	dBm
Antenna Type	Internal Antenna and External Antenna			
Antenna Gain	4dBi for Internal Antenna, 1 dBi and 3 c	Bi for Exte	rnal Antenr	na
Hardware Version	WL1B310I			
Softwarre Version	21.328.03.DM2.00			
IMEI No.	867962031001418			
Power Source	Supplied from AC/DC adapter.			
Power Rating	Input: 100V~240V 50/60 Hz,0.5A Output: 12V1A			

Report No.: BTL-FCCP-3-1802C116 Page 9 of 141





#### 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	Mfr/Brand	Model.
LAN Cable	N/A	N/A
TEL Cable	N/A	N/A
		HW-120100E01
	Huawei Technologies Co.,Ltd.	HW-120100B01
Adoutes		HW-120100U01
Adapter		HW-120100A6W
		HW-120100BW
		HW-120100EW

Report No.: BTL-FCCP-3-1802C116 Page 10 of 141





#### 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:

	LTE BAND 38				
	T	LI L BAND			T
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
	37775 to 38225	37775, 38000, 38225	5MHz	QPSK, 16QAM	1RB/12RB/25RB
EIRP	37800 to 38200	37800, 38000, 38200	10MHz	QPSK, 16QAM	1RB/25RB/50RB
LIN	37825 to 38175	37825, 38000, 38175	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	37850 to 38150	37850, 38000, 38150	20MHz	QPSK, 16QAM	1RB/50RB/100RB
	37775 to 38225	38000	5MHz	QPSK	1 RB
Frequency	37800 to 38200	38000	10MHz	QPSK	1 RB
Stability	37825 to 38175	38000	15MHz	QPSK	1 RB
	37850 to 38150	38000	20MHz	QPSK	1 RB
	37775 to 38225	37775, 38000, 38225	5MHz	QPSK, 16QAM	25RB
Occupied	37800 to 38200	37800, 38000, 38200	10MHz	QPSK, 16QAM	50RB
Bandwidth	37825 to 38175	37825, 38000, 38175	15MHz	QPSK, 16QAM	75 RB
	37850 to 38150	37850, 38000, 38150	20MHz	QPSK, 16QAM	100RB
	37775 to 38225	37775, 38000, 38225	5MHz	QPSK, 16QAM	1 RB
Peak to	37800 to 38200	37800, 38000, 38200	10MHz	QPSK, 16QAM	1 RB
Average Ratio	37825 to 38175	37825, 38000, 38175	15MHz	QPSK, 16QAM	1 RB
	37850 to 38150	37850, 38000, 38150	20MHz	QPSK, 16QAM	1 RB
	37775 to 38225	37775, 38225	5MHz	QPSK, 16QAM	1RB/25RB
Band Edge	37800 to 38200	37800, 38200	10MHz	QPSK, 16QAM	1RB/50RB
Dana Lage	37825 to 38175	37825, 38175	15MHz	QPSK, 16QAM	1RB/75RB
	37850 to 38150	37850, 38150	20MHz	QPSK, 16QAM	1RB/100RB
Conducted	37775 to 38225	38000	5MHz	QPSK	1 RB
Emission	37850 to 38150	38000	20MHz	QPSK	1 RB
Radiated	37775 to 38225	38000	5MHz	QPSK	1 RB
Emission	37850 to 38150	38000	20MHz	QPSK	1 RB

Report No.: BTL-FCCP-3-1802C116 Page 11 of 141

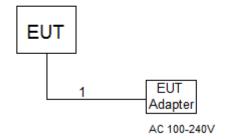




#### **EUT TEST CONDITIONS:**

Test Item	Environmental Conditions	Test Voltage
EIRP	24°C, 63%RH	DC 12.00V
Conducted Output Power	25°C, 65%RH	DC 12.00V
Occupied Bandwidth	25°C, 65%RH	DC 12.00V
Conducted Emission	25°C, 65%RH	DC 12.00V
Radiated Emission	25°C, 60%RH	AC 120V/60Hz
Band Edge	25°C, 65%RH	DC 12.00V
Peak to Average Ratio	25°C, 65%RH	DC 12.00V
Frequency Stability	25°C, 65%RH	DC 12.00V, DC 10.80V, DC 13.20V

#### 3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



#### 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.	FCC ID	Series No.
-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.2m	DC cable

Report No.: BTL-FCCP-3-1802C116 Page 12 of 141





#### 4. TEST RESULT

#### **4.1 OUTPUT POWER MEASUREMENT**

#### 4.1.1 LIMIT

Mobile / Portable station are limited to 2 watts e.i.r.p. (LTE 38)

#### **4.1.2 TEST PROCEDURE**

#### EIRP/ERP:

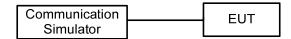
EIRP= Conducted Power +Antenan gain ERP power=EIPR power-2.15dBi.

#### **Conducted Power:**

The EUT was set up for the maximum power with 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 TESTSETUP LAYOUT**

**Conducted Power Measurement** 



#### 4.1.4 TEST DEVIATION

No deviation

#### 4.1.5 TEST RESULTS

Please refer to the Appendix A.

Report No.: BTL-FCCP-3-1802C116 Page 13 of 141



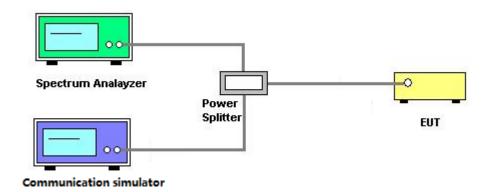


#### 4.2 OCCUPIED BANDWIDTH MEASUREMENT

#### **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.

Report No.: BTL-FCCP-3-1802C116





Page 15 of 141

#### 4.3 CONDUCTED EMISSIONS MEASUREMENT

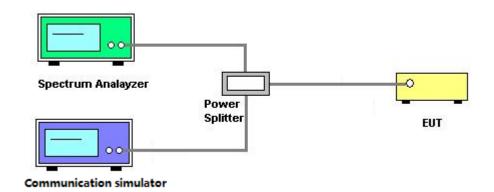
#### 4.3.1 LIMIT

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 v03 Section 6.0.
- 2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
- 3. The band edges of low and high channels for the highest RF powers were measured. Set RBW>=1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
- 4. Set spectrum analyzer with RMS detector.
- 5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- 6. The limit line is derived from 43+10log(P)dB below the transmitter power P(Watts)
  - =P(W)-[43+10log(P)](dB)
  - =[30+10log(P)](dBm)-[43+10log(P)](dB)
  - =-13dBm

#### 4.3.3 TESTSETUP LAYOUT



#### 4.3.4 TESTDEVIATION

No deviation

#### 4.3.5 TEST RESULTS

Please refer to the Appendix C.

Report No.: BTL-FCCP-3-1802C116





#### 4.4 RADIATED EMISSIONS MEASUREMENT

#### 4.4.1 LIMIT

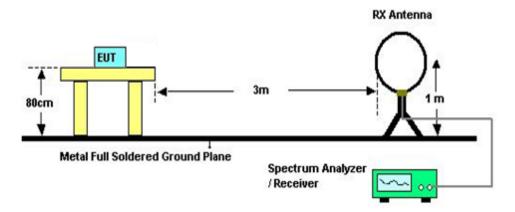
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13dBm.

#### **4.4.2 TEST PROCEDURES**

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

#### 4.4.3 TESTSETUP LAYOUT

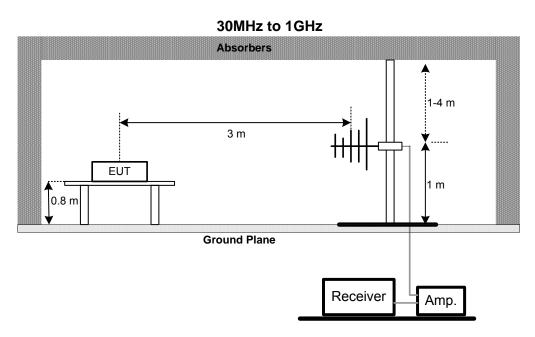
#### **Below 30MHz**



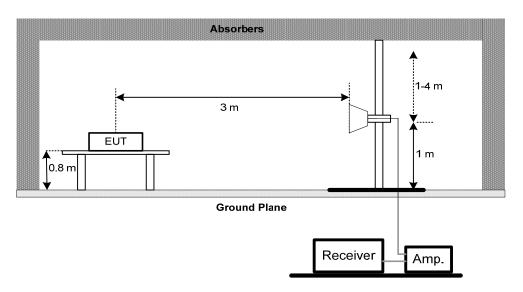
Report No.: BTL-FCCP-3-1802C116 Page 16 of 141







#### **Above 1GHz**



#### 4.4.4 TESTDEVIATION

No deviation

# 4.4.5 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix D.

# 4.4.6 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Appendix E.

#### 4.4.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix F.

Report No.: BTL-FCCP-3-1802C116 Page 17 of 141





#### 4.5 BAND EDGE MEASUREMENT

#### 4.5.1 LIMIT

For operations in the 704-716 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

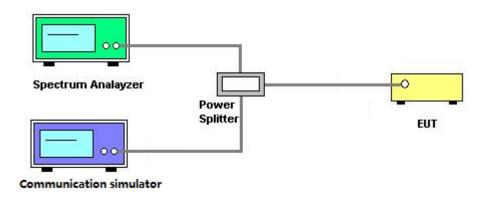
However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 1710–1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

#### **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 1MHz. RB of the spectrum is 13kHz and VB of the spectrum is 51kHz (LTE Bandwidth 1.4MHz).
- 3. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Bandwidth 3MHz).
- 4. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 5MHz/10MHz).
- 5. Record the max trace plot into the test report.

#### 4.5.3 TESTSETUP LAYOUT



#### 4.5.4 TESTDEVIATION

No deviation

#### 4.5.5 TEST RESULTS

Please refer to the Appendix G.

Report No.: BTL-FCCP-3-1802C116 Page 18 of 141





#### 4.6 PEAK TO AVERAGE RATIO MEASUREMENT

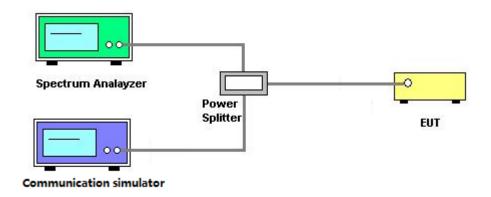
#### 4.6.1 LIMIT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

#### **4.6.2 TEST PROCEDURES**

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

#### 4.6.3 TESTSETUP LAYOUT



#### 4.6.4 TESTDEVIATION

No deviation

### 4.6.5 TEST RESULTS

Please refer to the Appendix H.

Report No.: BTL-FCCP-3-1802C116





#### 4.7 FREQUENCY STABILITY MEASUREMENT

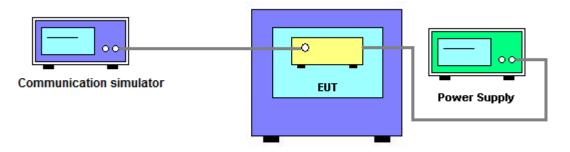
#### 4.7.1 LIMIT

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

#### **4.7.2 TEST PROCEDURES**

- 1. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- 2. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- 3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5°C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
- 4. The frequency error was recorded frequency error from the communication simulator.

#### 4.7.3 TESTSETUP LAYOUT



#### 4.7.4 TESTDEVIATION

No deviation

#### 4.7.5 TEST RESULTS

Please refer to the Appendix I.

Report No.: BTL-FCCP-3-1802C116





# **5. LIST OF MEASUREMENT EQUIPMENTS**

	Radiated Emission & ERP or EIRP Measurement										
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until						
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 11, 2019						
2	Amplifier	Agilent	8449B	3008A02274	Mar. 11, 2019						
3	Amplifier	HP	8447D	2944A09673	Oct. 19, 2018						
4	HighPass Filter	Wairrwright Instruments Gmbh	WHK 1.5/15G-10ST	11	Mar. 11, 2019						
5	Band Reject Filter	Wairrwright Instruments Gmbh	WRCG 1710/1785-1690/180 5-60/12SS	38	Mar. 11, 2019						
6	Band Reject Filter	Wairrwright Instruments Gmbh	WRCG 824/849-810/863-60/ 9SS	7	Mar. 11, 2019						
7	Band Reject Filter	Wairrwright Instruments Gmbh	WRCG 880/915-860/935-60/ 9SS	14	Mar. 11, 2019						
8	Band Reject Filter	Wairrwright Instruments Gmbh	WRCG 1850/1910-1830/193 0-60/10SS	17	Mar. 11, 2019						
9	HighPass Filter	Wairrwright Instruments Gmbh	WHK3.1/18G-10SS	24	Mar. 11, 2019						
10	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 11, 2019						
11	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 11, 2019						
12	Receiver	Agilent	N9038A	MY52130039	Aug. 20, 2018						
13	wideband radio communication tester	R&S	CMW500	152372	Mar. 11, 2019						
14	Cable	emci	LMR-400(30MHz-1G Hz)(8m+5m)	N/A	Jun. 26, 2018						
15	Cable	emci	EMC104-SM-SM-12 000(12m)	N/A	Jun. 26, 2018						
16	Controller	ETS-Lindgren	2090	N/A	N/A						
17	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A						
18	Antenna	EM	EM-6876-1	230	Feb. 07, 2019						
19	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 11, 2019						
20	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 08, 2018						

Report No.: BTL-FCCP-3-1802C116 Page 21 of 141





	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. 11, 2019							
2	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Mar. 11, 2019							
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S +	331000910-1	Mar. 11, 2019							
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 11, 2019							
5	Cable	N/A	RG316(0.3m)	N/A	Jul. 05, 2018							
6	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018							

	Frequency Stability Measurement											
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until							
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 11, 2019							
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. 11, 2019							
4	wideband radio communication tester	R&S	CMW500	152372	Mar. 11, 2019							
5	Const Temp,& Humidity Chamber	Bell	BTH-50C	20170306001	Mar. 26, 2018							
6	Cable	N/A	RG316(0.3m)	N/A	Jul. 05, 2018							

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

Report No.: BTL-FCCP-3-1802C116 Page 22 of 141





APPENDIX A - OUTPUT POWER									

Report No.: BTL-FCCP-3-1802C116 Page 23 of 141





# **Conducted Power:**

				Low CH	Mid CH	High CH
LTE Band / BW	Modulation	RB	RB	37775 CH	38000 CH	38225 CH
LIE Ballu / BW	Modulation	Sizet	Offset			
		0,200	011000	2572.5 MHz	2595 MHz	2617.5 MHz
		1	0	21.74	22.02	22.08
		1	12	22.60	22.88	22.87
		1	24	21.95	22.15	22.16
	QPSK	12	0	21.30	21.44	21.52
		12	6	21.53	21.75	21.66
		12	13	21.44	21.61	21.61
38 / 5M		25	0	21.26	21.49	21.40
30 / 3101		1	0	20.68	21.10	21.04
		1	12	21.43	21.85	21.85
		1	24	20.84	21.14	21.14
	16QAM	12	0	21.22	21.34	21.40
		12	6	21.47	21.63	21.55
		12	13	21.40	21.52	21.52
		25	0	21.25	21.39	21.36

					14:1011	11: 1 011
		RB	RB	Low CH	Mid CH	High CH
LTE Band / BW	Modulation	Sizet	Offset	37800 CH	38000 CH	38200 CH
		Oizet	Oliset	2575 MHz	2595 MHz	2615 MHz
		1	0	22.16	22.29	22.16
		1	24	23.25	23.29	23.33
		1	49	21.60	21.82	21.83
	QPSK	25	0	21.51	21.61	21.53
		25	12	21.85	21.91	21.92
		25	25	21.57	21.62	21.56
38 / 10M		50	0	21.48	21.47	21.59
30 / 10101		1	0	21.01	21.03	20.98
		1	24	22.04	21.93	22.26
	16QAM	1	49	20.50	20.46	20.66
		25	0	21.36	21.39	21.40
		25	12	21.72	21.68	21.64
		25	25	21.43	21.48	21.11
		50	0	21.33	21.30	21.05

Report No.: BTL-FCCP-3-1802C116 Page 24 of 141





LTE Band / BW		DD	DD	Low CH	Mid CH	High CH
	Modulation	RB Sizet	RB Offset	37825 CH	38000 CH	38175 CH
		Sizet	Oliset	2577.5 MHz	2595 MHz	2612.5 MHz
		1	0	22.28	22.36	22.31
		1	37	22.68	22.73	22.75
		1	74	21.72	22.16	22.10
	QPSK	36	0	21.26	21.37	21.22
		36	19	21.32	21.49	21.48
		36	39	21.04	21.39	21.26
38 / 15M		75	0	21.14	21.35	21.19
30 / 13101		1	0	21.32	20.99	21.58
		1	37	21.61	21.30	21.73
		1	74	20.78	21.19	21.02
	16QAM	36	0	21.32	21.38	21.21
		36	19	21.41	21.54	21.54
		36	39	21.13	21.40	21.28
		75	0	21.21	21.40	21.20

	1		1			
		RB	RB	Low CH	Mid CH	High CH
LTE Band / BW	Modulation	Sizet	Offset	37850 CH	38000 CH	38150 CH
		Sizet	Oliset	2580 MHz	2595 MHz	2610 MHz
		1	0	22.27	22.11	22.58
		1	50	22.12	22.42	22.04
		1	99	21.92	22.03	21.90
	QPSK	50	0	21.01	21.05	21.14
		50	25	21.02	20.99	20.87
		50	50	21.08	21.26	21.01
38 / 20M		100	0	21.10	21.21	21.01
30 / ZUIVI		1	0	21.73	21.16	21.91
		1	50	21.19	21.44	21.14
		1	99	21.34	21.19	21.01
	16QAM	50	0	21.02	21.07	21.18
		50	25	21.01	20.99	20.93
		50	50	21.11	21.27	21.09
		100	0	21.10	21.26	21.08

Report No.: BTL-FCCP-3-1802C116 Page 25 of 141





# **EIRP Power:**

		DD	DD	Low CH	Mid CH	High CH
LTE Band / BW	Modulation	RB Sizet	RB Offset	37775 CH	38000 CH	38225 CH
		Oizet	Oliset	2572.5 MHz	2595 MHz	2617.5 MHz
		1	0	25.74	26.02	26.08
		1	12	26.60	26.88	26.87
		1	24	25.95	26.15	26.16
	QPSK	12	0	25.30	25.44	25.52
		12	6	25.53	25.75	25.66
		12	13	25.44	25.61	25.61
38 / 5M		25	0	25.26	25.49	25.40
30 / SIVI		1	0	24.68	25.10	25.04
		1	12	25.43	25.85	25.85
		1	24	24.84	25.14	25.14
	16QAM	12	0	25.22	25.34	25.40
		12	6	25.47	25.63	25.55
		12	13	25.40	25.52	25.52
		25	0	25.25	25.39	25.36

		DD	DD.	Low CH	Mid CH	High CH
LTE Band / BW	Modulation	RB Sizet	RB Offset	37800 CH	38000 CH	38200 CH
		Sizet	Oliset	2575 MHz	2595 MHz	2615 MHz
		1	0	26.16	26.29	26.16
		1	24	27.25	27.29	27.33
		1	49	25.60	25.82	25.83
	QPSK	25	0	25.51	25.61	25.53
		25	12	25.85	25.91	25.92
		25	25	25.57	25.62	25.56
38 / 10M		50	0	25.48	25.47	25.59
36 / TOIVI		1	0	25.01	25.03	24.98
		1	24	26.04	25.93	26.26
		1	49	24.50	24.46	24.66
	16QAM	25	0	25.36	25.39	25.40
		25	12	25.72	25.68	25.64
		25	25	25.43	25.48	25.11
		50	0	25.33	25.30	25.05

Report No.: BTL-FCCP-3-1802C116 Page 26 of 141





		DD	DD	Low CH	Mid CH	High CH
LTE Band / BW	Modulation	RB Sizet	RB Offset	37825 CH	38000 CH	38175 CH
		Sizet	Oliset	2577.5 MHz	2595 MHz	2612.5 MHz
		1	0	26.28	26.36	26.31
		1	37	26.68	26.73	26.75
		1	74	25.72	26.16	26.10
	QPSK	36	0	25.26	25.37	25.22
		36	19	25.32	25.49	25.48
		36	39	25.04	25.39	25.26
38 / 15M		75	0	25.14	25.35	25.19
30 / T3W		1	0	25.32	24.99	25.58
		1	37	25.61	25.30	25.73
		1	74	24.78	25.19	25.02
	16QAM	36	0	25.32	25.38	25.21
		36	19	25.41	25.54	25.54
		36	39	25.13	25.40	25.28
		75	0	25.21	25.40	25.20

					14:1011	11: 1 011
LTE Band / BW	Modulation	RB Sizet	RB	Low CH	Mid CH	High CH
			Offset	37850 CH	38000 CH	38150 CH
				2580 MHz	2595 MHz	2610 MHz
		1	0	26.27	26.11	26.58
		1	50	26.12	26.42	26.04
		1	99	25.92	26.03	25.90
	QPSK	50	0	25.01	25.05	25.14
		50	25	25.02	24.99	24.87
		50	50	25.08	25.26	25.01
38 / 20M		100	0	25.10	25.21	25.01
30 / ZUIVI	16QAM	1	0	25.73	25.16	25.91
		1	50	25.19	25.44	25.14
		1	99	25.34	25.19	25.01
		50	0	25.02	25.07	25.18
		50	25	25.01	24.99	24.93
		50	50	25.11	25.27	25.09
		100	0	25.10	25.26	25.08

Report No.: BTL-FCCP-3-1802C116 Page 27 of 141





APPENDIX B - OCCUPIED BANDWIDTH						

Report No.: BTL-FCCP-3-1802C116 Page 28 of 141



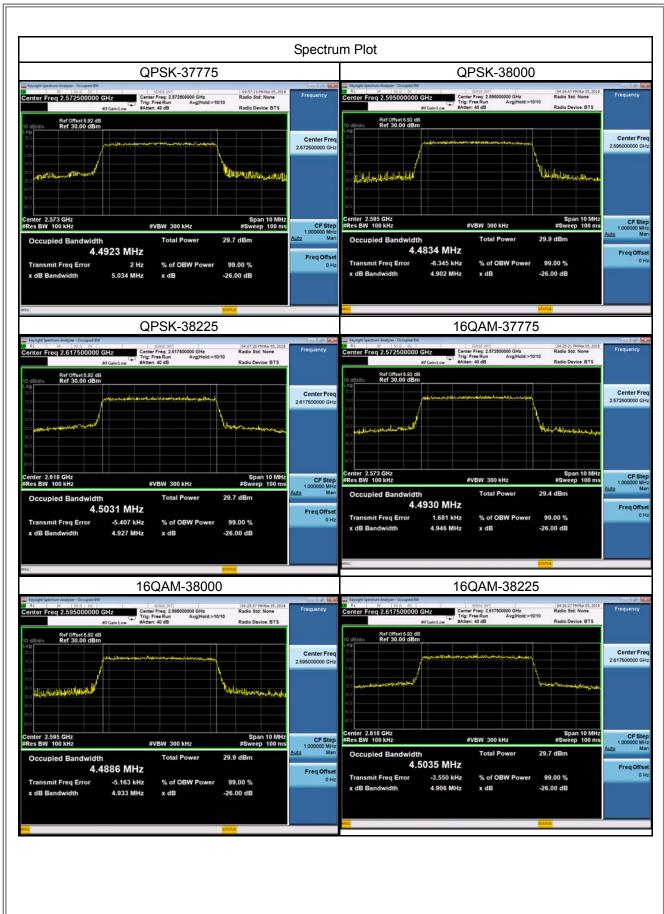


LTE Band 38_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
37775	2572.5	4.4923	37775	2572.5	4.4930
38000	2595	4.4834	38000	2595	4.4886
38225	2617.5	4.5031	38225	2617.5	4.5035
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37775	2572.5	5.034	37775	2572.5	4.946
38000	2595	4.902	38000	2595	4.933
38225	2617.5	4.927	38225	2617.5	4.906

Report No.: BTL-FCCP-3-1802C116 Page 29 of 141









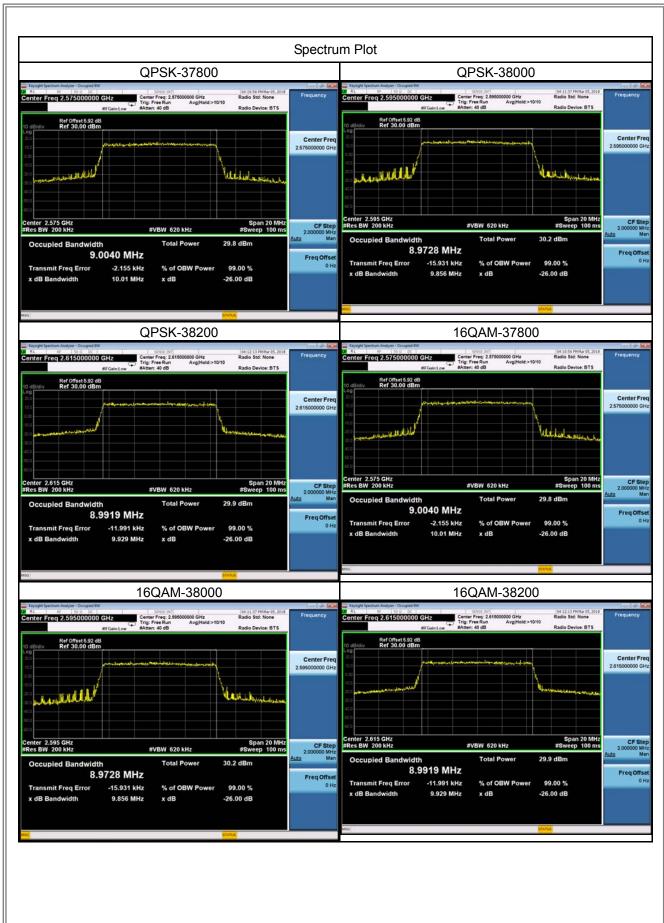


LTE Band 38_10M						
	QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
37800	2575	9.0040	37800	2575	9.0040	
38000	2595	8.9728	38000	2595	8.9728	
38200	2615	8.9919	38200	2615	8.9919	
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
37800	2575	10.010	37800	2575	10.010	
38000	2595	9.856	38000	2595	9.856	
38200	2615	9.929	38200	2615	9.929	

Report No.: BTL-FCCP-3-1802C116 Page 31 of 141









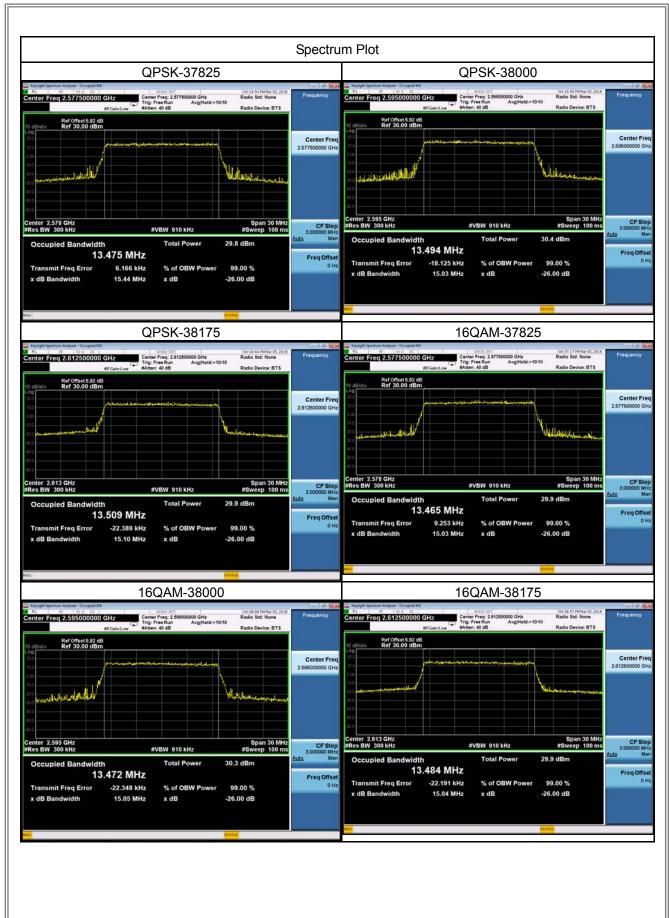


LTE Band 38_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
37825	2577.5	13.475	37825	2577.5	13.465
38000	2595	13.494	38000	2595	13.472
38175	2612.5	13.509	38175	2612.5	13.484
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37825	2577.5	15.44	37825	2577.5	15.03
38000	2595	15.03	38000	2595	15.05
38175	2612.5	15.10	38175	2612.5	15.04

Report No.: BTL-FCCP-3-1802C116 Page 33 of 141









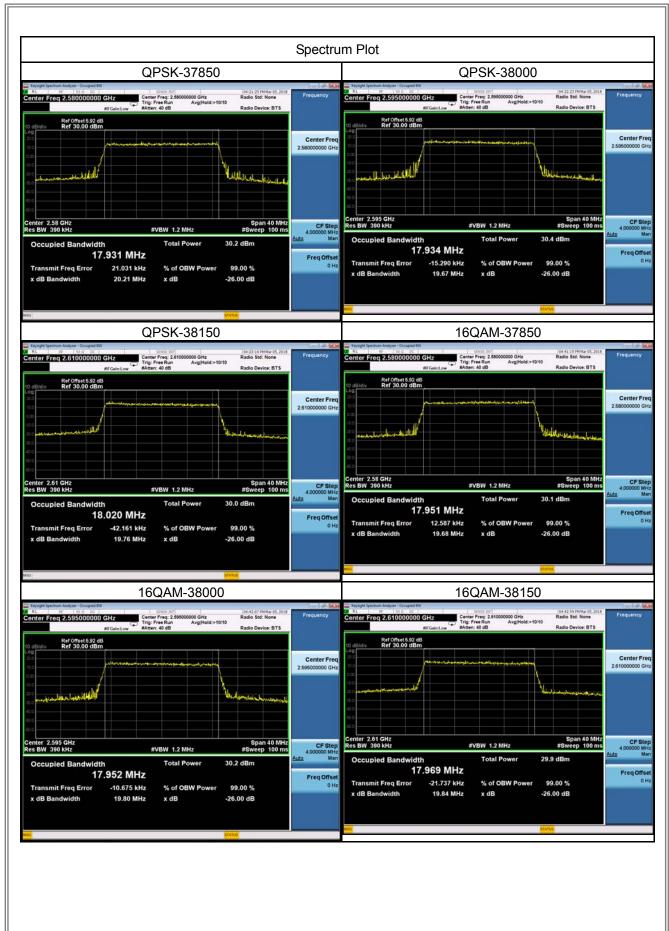


LTE Band 38_20M						
	QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
37850	2580	17.931	37850	2580	17.951	
38000	2595	17.934	38000	2595	17.952	
38150	2610	18.020	38150	2610	17.969	
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
37850	2580	20.21	37850	2580	19.68	
38000	2595	19.67	38000	2595	19.80	
38150	2610	19.76	38150	2610	19.84	

Report No.: BTL-FCCP-3-1802C116 Page 35 of 141









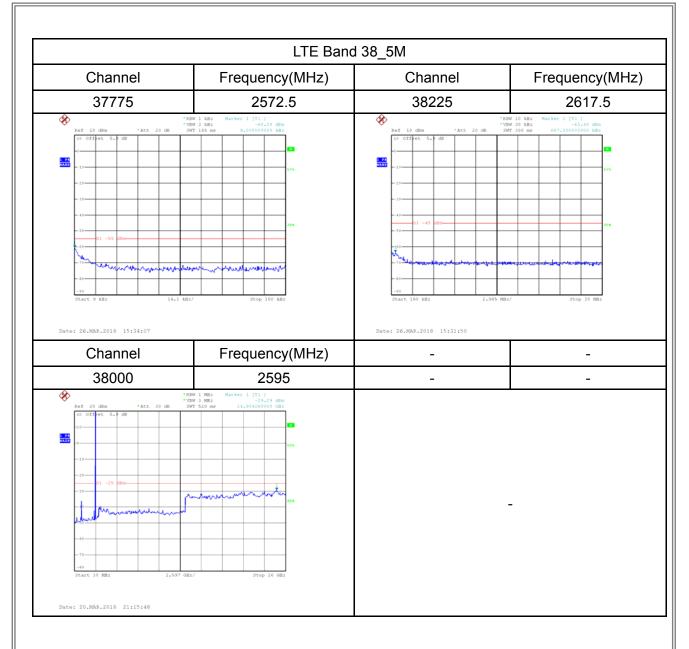


APPENDIX C - CONDUCTED EMISSIONS

Report No.: BTL-FCCP-3-1802C116 Page 37 of 141



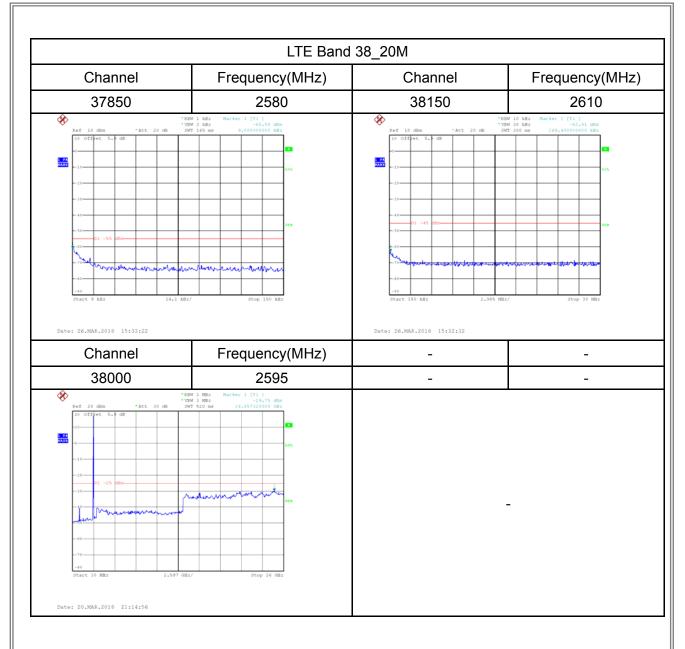




Report No.: BTL-FCCP-3-1802C116 Page 38 of 141







Report No.: BTL-FCCP-3-1802C116 Page 39 of 141





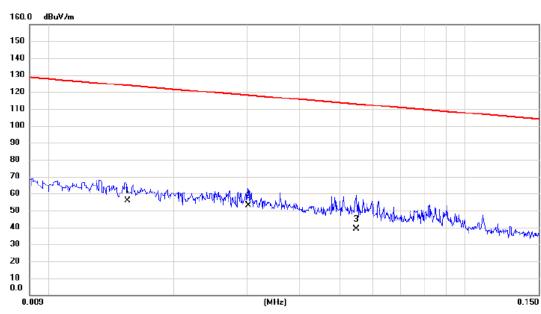
APPENDIX D - RADIATED EMISSION (9KHZ TO 30MHZ)

Report No.: BTL-FCCP-3-1802C116 Page 40 of 141





Ant 0°



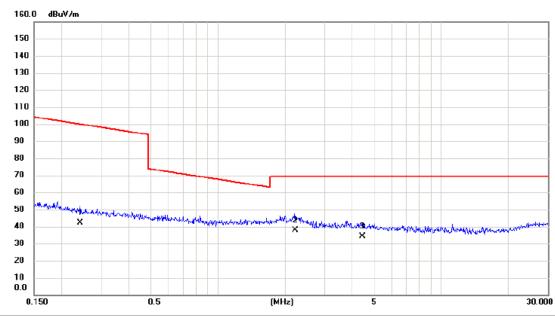
No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0155	35.54	20.20	55.74	123.80	-68.06	AVG	
2 *	0.0302	33.63	19.31	52.94	118.00	-65.06	AVG	
3	0.0548	20.34	18.63	38.97	112.83	-73.86	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 41 of 141





# Ant 0°



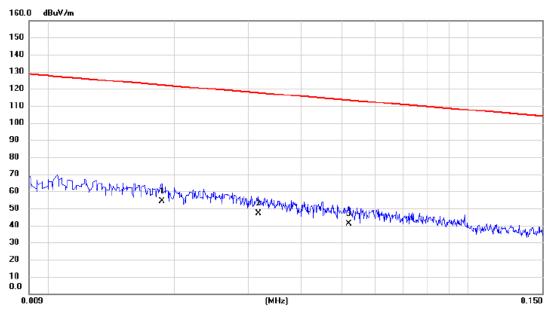
No. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.2416	25.55	16.69	42.24	99.94	-57.70	AVG	
2 *	2.2132	22.24	15.45	37.69	69.54	-31.85	QP	
3	4.4305	19.46	14.70	34.16	69.54	-35.38	QP	

Report No.: BTL-FCCP-3-1802C116 Page 42 of 141





## Ant 90°



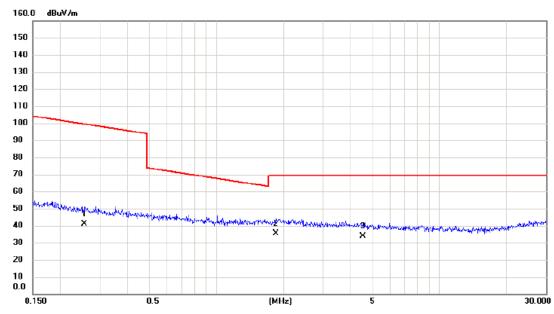
No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	0.0187	34.38	19.79	54.17	122.17	-68.00	AVG	
2	0.0317	27.69	19.27	46.96	117.58	-70.62	AVG	
3	0.0520	22.35	18.68	41.03	113.28	-72.25	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 43 of 141





# Ant 90°



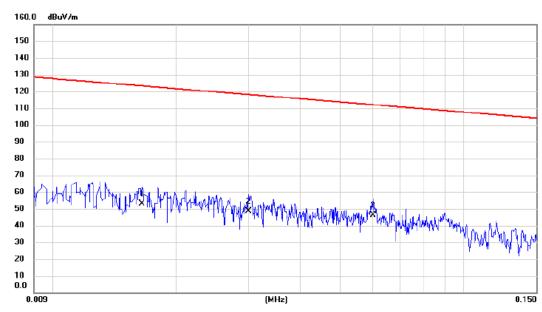
No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.2562	24.51	16.66	41.17	99.43	-58.26	AVG	
2 *	1.8483	19.76	15.57	35.33	69.54	-34.21	QP	
3	4.5254	18.98	14.64	33.62	69.54	-35.92	QP	

Report No.: BTL-FCCP-3-1802C116 Page 44 of 141





## Ant 0°



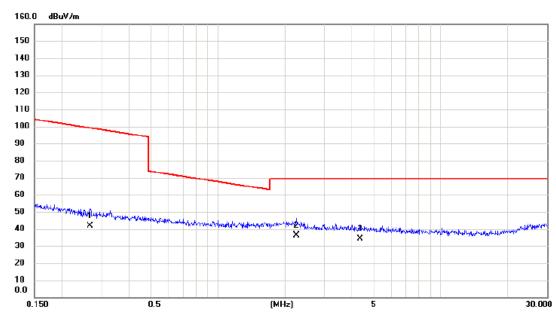
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0165	32.95	20.07	53.02	123.26	-70.24	AVG	
2	0.0300	29.39	19.32	48.71	118.06	-69.35	AVG	
3 *	0.0601	27.65	18.53	46.18	112.03	-65.85	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 45 of 141





# Ant 0°



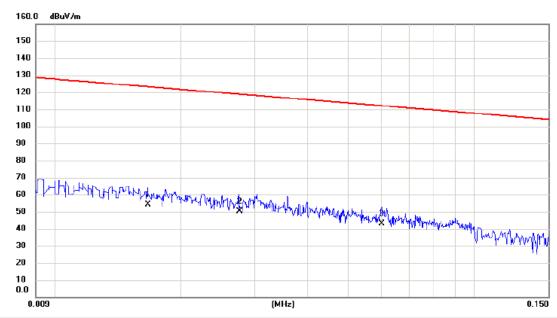
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.2672	25.06	16.65	41.71	99.07	-57.36	AVG	
2 *	2.2486	20.67	15.44	36.11	69.54	-33.43	QP	
3	4.3376	19.60	14.76	34.36	69.54	-35.18	QP	

Report No.: BTL-FCCP-3-1802C116 Page 46 of 141





## Ant 90°



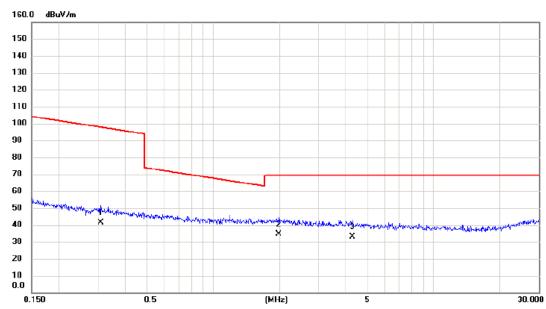
No. Mk.	Freq.			Measure ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.0167	34.07	20.05	54.12	123.15	-69.03	AVG	
2 *	0.0276	30.96	19.39	50.35	118.79	-68.44	AVG	
3	0.0601	24.49	18.53	43.02	112.03	-69.01	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 47 of 141





# Ant 90°



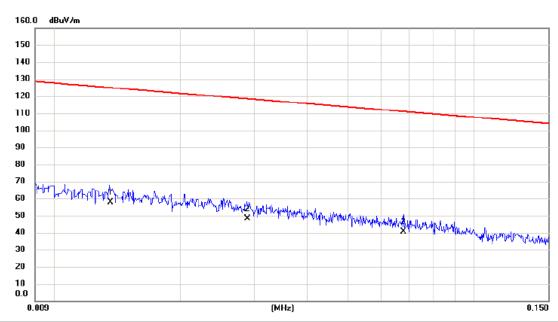
No. M	∕lk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.3100	24.73	16.61	41.34	97.78	-56.44	AVG	
2 *		1.9906	19.03	15.51	34.54	69.54	-35.00	QP	
3		4.2918	18.04	14.78	32.82	69.54	-36.72	QP	

Report No.: BTL-FCCP-3-1802C116 Page 48 of 141





## Ant 0°



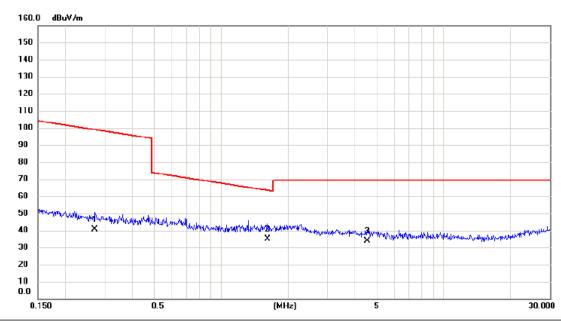
No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	0.0136	37.20	20.45	57.65	124.93	-67.28	AVG	
2	0.0288	29.00	19.36	48.36	118.42	-70.06	AVG	
3	0.0678	22.28	18.37	40.65	110.98	-70.33	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 49 of 141





# Ant 0°



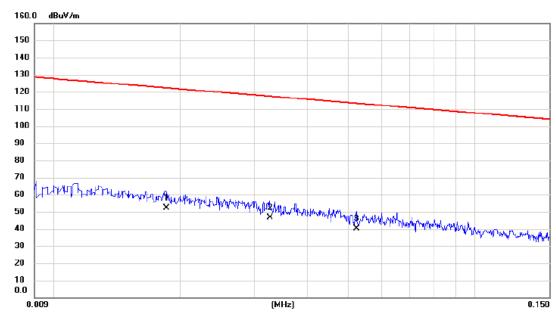
No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.2714	23.90	16.64	40.54	98.93	-58.39	AVG	
2 *	1.6105	19.39	15.66	35.05	63.47	-28.42	QP	
3	4.5254	18.99	14.64	33.63	69.54	-35.91	QP	

Report No.: BTL-FCCP-3-1802C116 Page 50 of 141





## Ant 90°



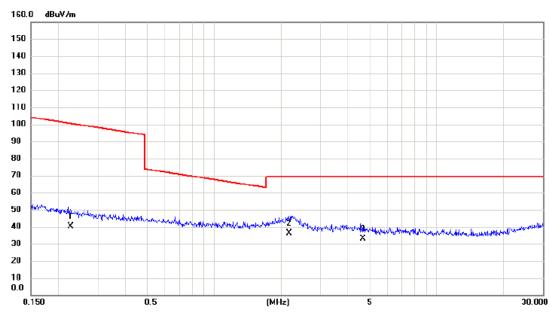
No. M	Λk.	Freq.	_	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	r	0.0185	32.35	19.82	52.17	122.26	-70.09	AVG	
2		0.0326	27.51	19.24	46.75	117.34	-70.59	AVG	
3		0.0524	21.47	18.67	40.14	113.22	-73.08	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 51 of 141





# Ant 90°



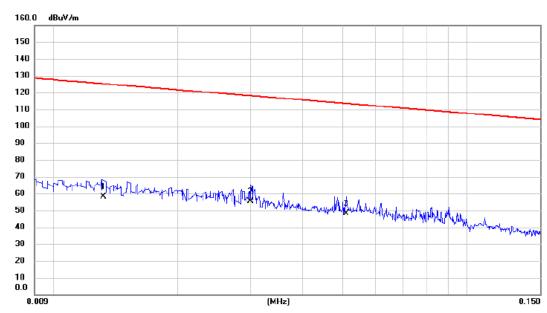
No. Mk.	Freq.	_	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.2268	23.61	16.72	40.33	100.49	-60.16	AVG	
2 *	2.1783	20.82	15.46	36.28	69.54	-33.26	QP	
3	4.6715	18.29	14.56	32.85	69.54	-36.69	QP	

Report No.: BTL-FCCP-3-1802C116 Page 52 of 141





## Ant 0°



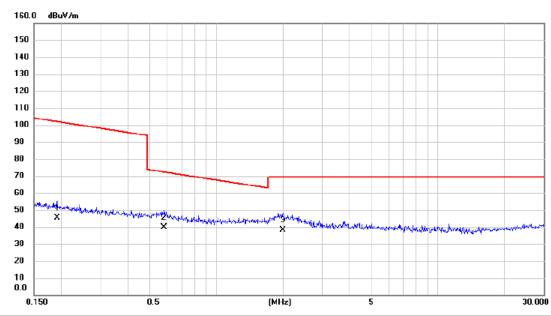
No. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.013	37.85	20.50	58.35	125.19	-66.84	AVG	
2 *	0.030	36.25	19.32	55.57	118.06	-62.49	AVG	
3	0.051	29.58	18.70	48.28	113.45	-65.17	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 53 of 141





# Ant 0°



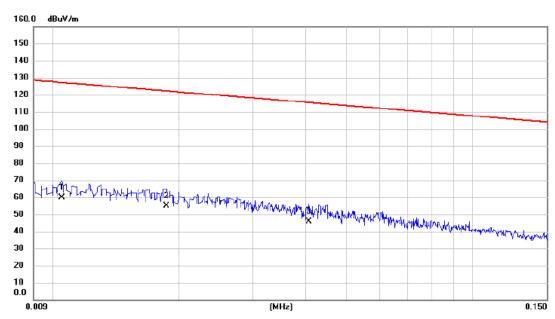
No. Mk.	Freq.			Measure ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.191	28.38	16.83	45.21	101.98	-56.77	AVG	
2	0.582	23.24	16.37	39.61	72.30	-32.69	QP	
3 *	2.001	22.70	15.51	38.21	69.54	-31.33	QP	

Report No.: BTL-FCCP-3-1802C116 Page 54 of 141





## Ant 90°



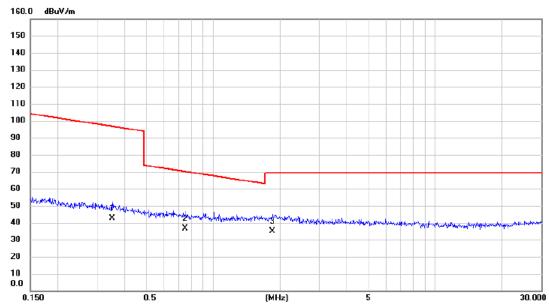
No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.011	38.86	20.85	59.71	127.18	-67.47	AVG	
2 *	0.019	35.38	19.79	55.17	122.17	-67.00	AVG	
3	0.041	26.67	19.00	45.67	115.39	-69.72	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 55 of 141





# Ant 90°



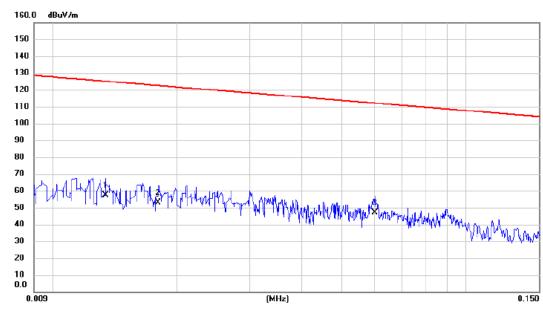
No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.352	26.04	16.58	42.62	96.67	-54.05	AVG	
2 *	0.747	20.47	16.18	36.65	70.14	-33.49	QP	
3	1.848	19.26	15.57	34.83	69.54	-34.71	QP	

Report No.: BTL-FCCP-3-1802C116 Page 56 of 141





## Ant 0°



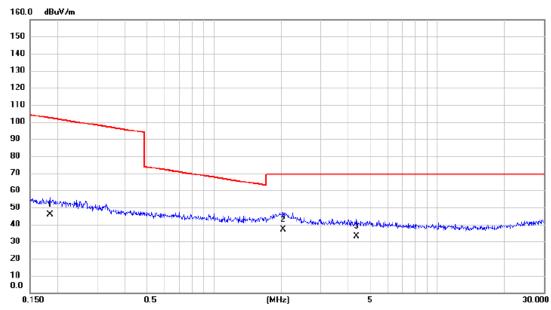
No. Mk.	Freq.		Correct Factor	Measure ment	- Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.013	37.01	20.48	57.49	125.06	-67.57	AVG	
2	0.018	33.16	19.88	53.04	122.50	-69.46	AVG	
3 *	0.060	28.65	18.53	47.18	112.03	-64.85	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 57 of 141





# Ant 0°



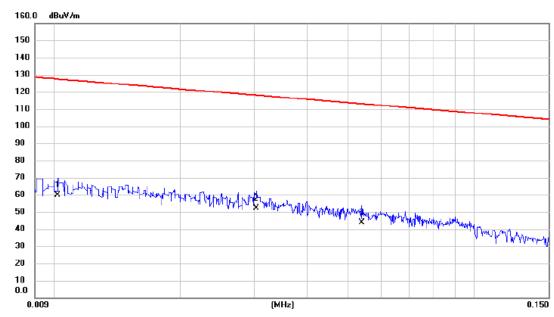
No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.184	28.98	16.85	45.83	102.29	-56.46	AVG	
2 *	2.044	21.51	15.50	37.01	69.54	-32.53	QP	
3	4.338	18.10	14.76	32.86	69.54	-36.68	QP	

Report No.: BTL-FCCP-3-1802C116 Page 58 of 141





## Ant 90°



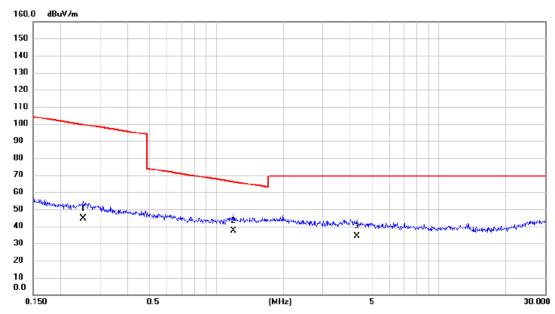
No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.010	38.72	20.89	59.61	127.43	-67.82	AVG	
2 *	0.030	32.95	19.31	52.26	117.98	-65.72	AVG	
3	0.054	25.27	18.64	43.91	112.96	-69.05	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 59 of 141





# Ant 90°



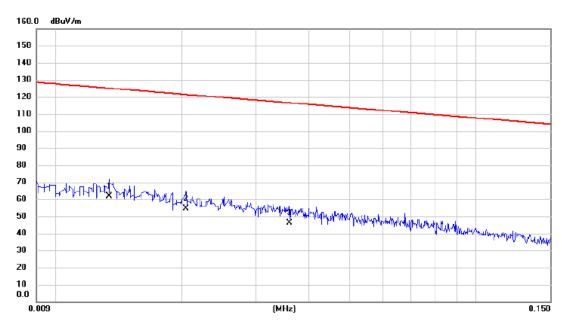
No. Mk.	Freq.			Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.252	27.76	16.66	44.42	99.58	-55.16	AVG	
2 *	1.191	21.56	15.81	37.37	66.09	-28.72	QP	
3	4.292	19.54	14.78	34.32	69.54	-35.22	QP	

Report No.: BTL-FCCP-3-1802C116 Page 60 of 141





## Ant 0°



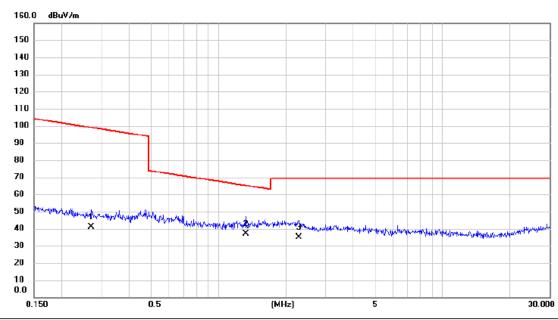
No. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	0.013	41.17	20.48	61.65	125.06	-63.41	AVG	
2	0.020	35.06	19.61	54.67	121.41	-66.74	AVG	
3	0.036	27.24	19.14	46.38	116.48	-70.10	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 61 of 141





# Ant 0°



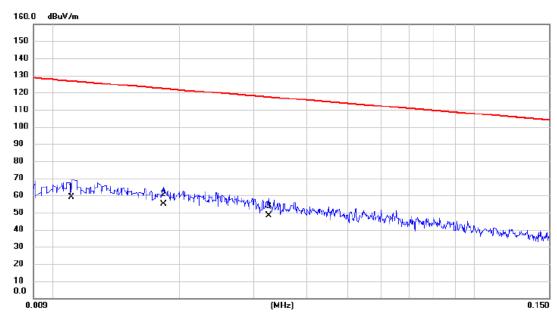
No. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.271	24.40	16.64	41.04	98.93	-57.89	AVG	
2 *	1.324	21.18	15.77	36.95	65.17	-28.22	QP	
3	2.284	19.54	15.43	34.97	69.54	-34.57	QP	

Report No.: BTL-FCCP-3-1802C116 Page 62 of 141





### Ant 90°



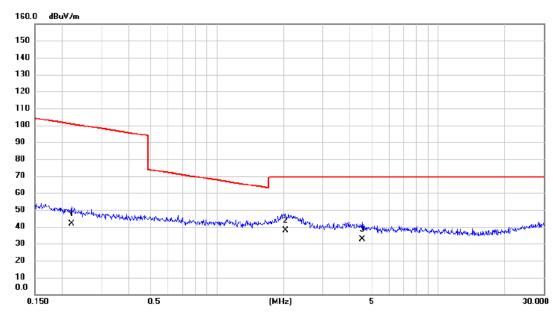
No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.011	38.18	20.78	58.96	126.70	-67.74	AVG	
2 *	0.018	35.33	19.84	55.17	122.36	-67.19	AVG	
3	0.033	29.00	19.25	48.25	117.37	-69.12	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 63 of 141





# Ant 90°



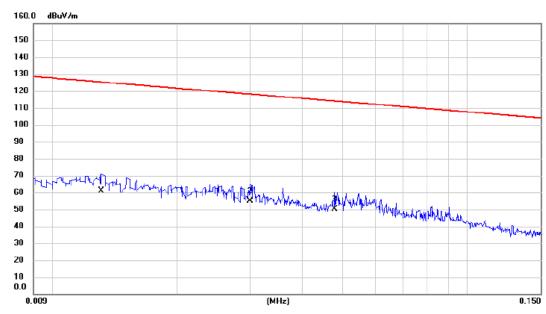
No. Mk.	Freq.	_		Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.220	25.22	16.74	41.96	100.77	-58.81	AVG	
2 *	2.044	22.42	15.50	37.92	69.54	-31.62	QP	
3	4.549	18.16	14.63	32.79	69.54	-36.75	QP	

Report No.: BTL-FCCP-3-1802C116 Page 64 of 141





## Ant 0°



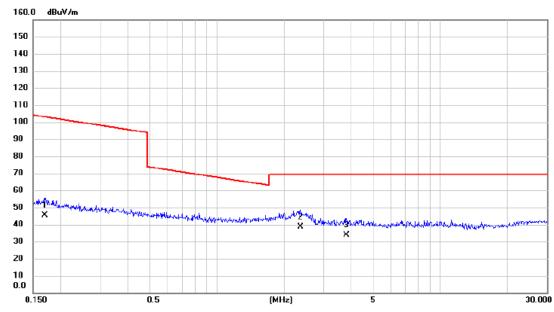
No. Mk.	Freq.			Measure- ment		Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.013	40.33	20.52	60.85	125.26	-64.41	AVG	
2 *	0.030	35.62	19.32	54.94	118.06	-63.12	AVG	
3	0.048	31.30	18.79	50.09	114.02	-63.93	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 65 of 141





# Ant 0°



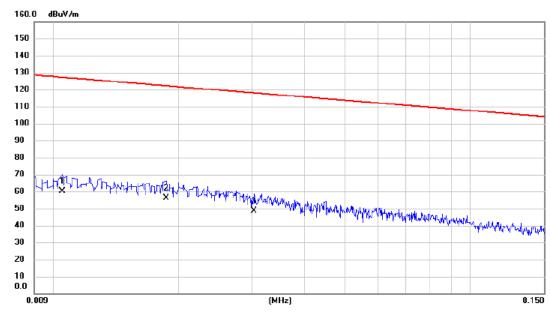
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.170	28.41	16.89	45.30	102.98	-57.68	AVG	
2 *	2.371	23.14	15.41	38.55	69.54	-30.99	QP	
3	3.799	18.86	15.01	33.87	69.54	-35.67	QP	

Report No.: BTL-FCCP-3-1802C116 Page 66 of 141





## Ant 90°



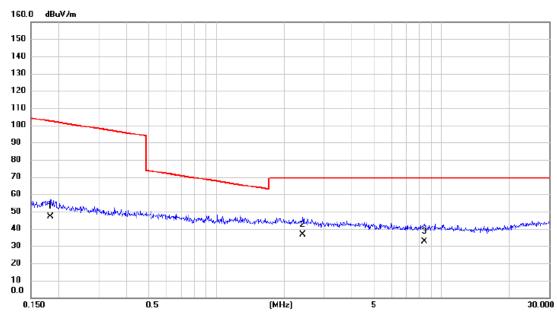
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.011	39.36	20.85	60.21	127.18	-66.97	AVG	
2 *	0.019	36.38	19.79	56.17	122.17	-66.00	AVG	
3	0.030	29.48	19.31	48.79	117.98	-69.19	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 67 of 141





# Ant 90°



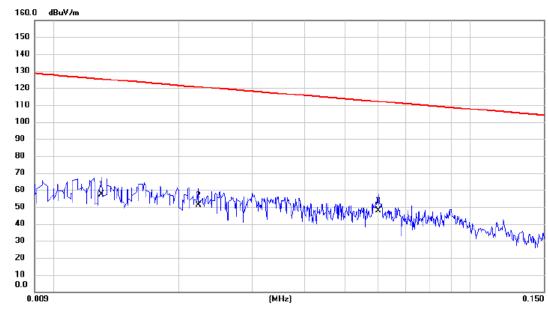
No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.183	30.31	16.85	47.16	102.34	-55.18	AVG	
2 *	2.422	21.10	15.39	36.49	69.54	-33.05	QP	
3	8.412	18.53	13.94	32.47	69.54	-37.07	QP	

Report No.: BTL-FCCP-3-1802C116 Page 68 of 141





## Ant 0°



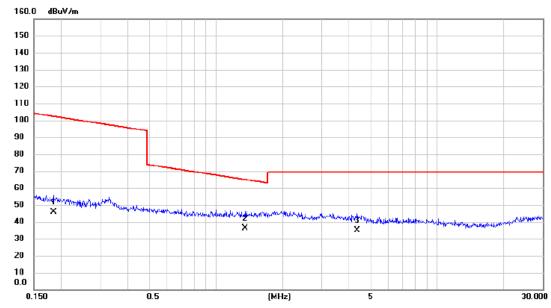
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.013	36.68	20.53	57.21	125.33	-68.12	AVG	
2	0.022	31.45	19.55	51.00	120.64	-69.64	AVG	
3 *	0.060	29.15	18.53	47.68	112.03	-64.35	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 69 of 141





# Ant 0°



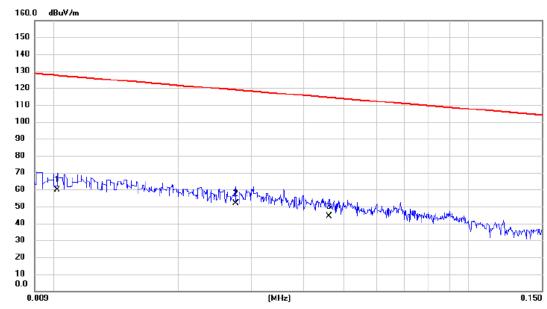
No. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.184	28.98	16.85	45.83	102.29	-56.46	AVG	
2 *	1.352	20.56	15.76	36.32	64.98	-28.66	QP	
3	4.338	20.10	14.76	34.86	69.54	-34.68	QP	

Report No.: BTL-FCCP-3-1802C116 Page 70 of 141





## Ant 90°



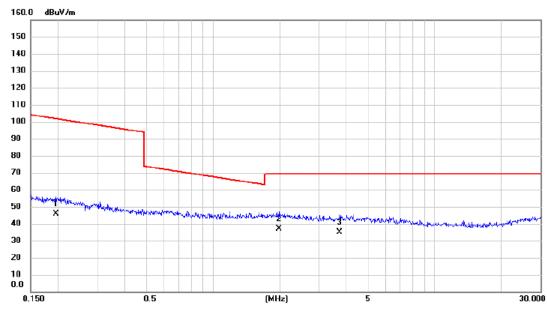
No. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.010	38.72	20.89	59.61	127.43	-67.82	AVG	
2 *	0.028	32.45	19.40	51.85	118.82	-66.97	AVG	
3	0.046	25.49	18.84	44.33	114.33	-70.00	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 71 of 141





# Ant 90°



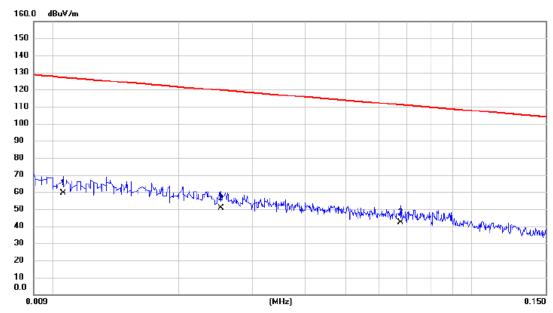
No. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.195	28.87	16.81	45.68	101.80	-56.12	AVG	
2 *	1.990	21.53	15.51	37.04	69.54	-32.50	QP	
3	3.720	20.18	15.02	35.20	69.54	-34.34	QP	

Report No.: BTL-FCCP-3-1802C116 Page 72 of 141





Ant 0°



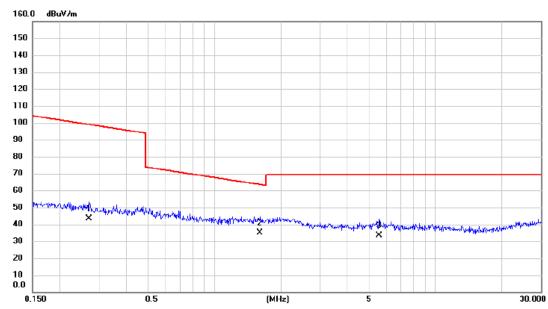
No. Mk.	Freq.	Reading Level		Measure ment	- Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	0.011	38.41	20.84	59.25	127.10	-67.85	AVG	
2	0.025	31.24	19.46	50.70	119.58	-68.88	AVG	
3	0.068	23.77	18.38	42.15	111.01	-68.86	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 73 of 141





## Ant 0°



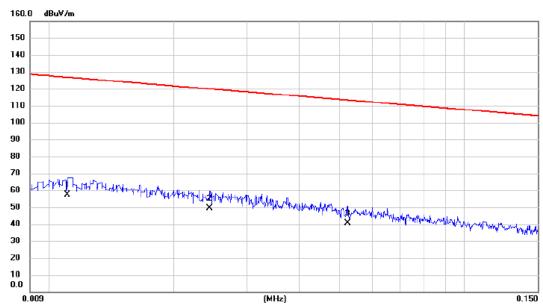
No. Mk.	Freq.			Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.271	26.90	16.64	43.54	98.93	-55.39	AVG	
2 *	1.610	19.39	15.66	35.05	63.47	-28.42	QP	
3	5.564	19.25	14.30	33.55	69.54	-35.99	QP	

Report No.: BTL-FCCP-3-1802C116 Page 74 of 141





### Ant 90°



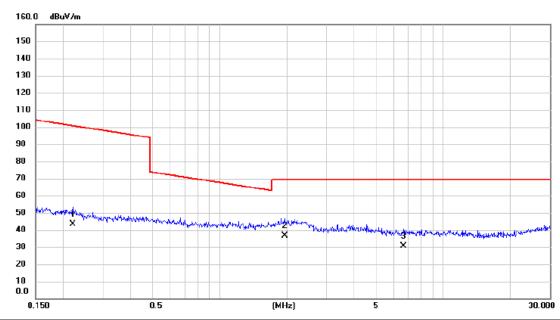
No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	0.011	36.68	20.78	57.46	126.70	-69.24	AVG	
2	0.024	29.73	19.49	49.22	119.86	-70.64	AVG	
3	0.052	21.97	18.67	40.64	113.22	-72.58	AVG	

Report No.: BTL-FCCP-3-1802C116 Page 75 of 141





## Ant 90°



No. Mk.	Freq.		Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	0.220	26.72	16.74	43.46	100.77	-57.31	AVG	
2 *	1.949	21.19	15.53	36.72	69.54	-32.82	QP	
3	6.662	16.60	14.17	30.77	69.54	-38.77	QP	

Report No.: BTL-FCCP-3-1802C116 Page 76 of 141





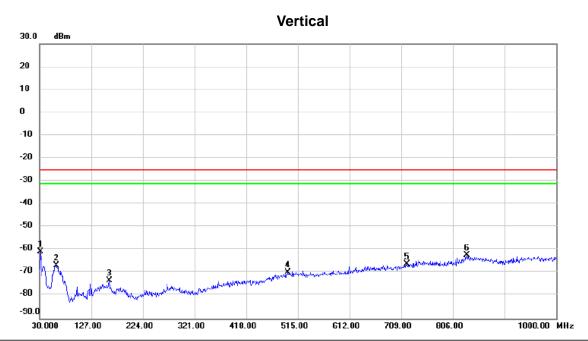
APPENDIX E - RADIATED EMISSION (30MHZ TO 1GHZ)

Report No.: BTL-FCCP-3-1802C116 Page 77 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_Internal Antenna



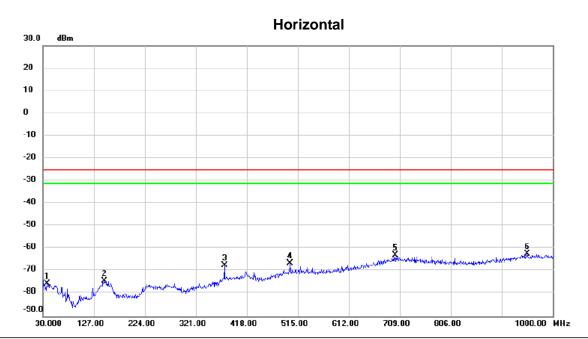
No. Mk.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	31.940	-60.09	-0.73	-60.82	-25.00	-35.82	peak	
2	62.010	-67.51	0.73	-66.78	-25.00	-41.78	peak	
3	160.950	-76.15	2.87	-73.28	-25.00	-48.28	peak	
4	496.570	-77.24	7.35	-69.89	-25.00	-44.89	peak	
5	719.670	-77.40	11.27	-66.13	-25.00	-41.13	peak	
6	832.190	-75.93	13.55	-62.38	-25.00	-37.38	peak	

Report No.: BTL-FCCP-3-1802C116 Page 78 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_Internal Antenna



No. M	k. Freq.	Reading Level	Correct Factor	Measure ment	- Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	37.760	-76.61	1.28	-75.33	-25.00	-50.33	peak	
2	146.400	-78.13	3.84	-74.29	-25.00	-49.29	peak	
3	375.320	-72.88	5.54	-67.34	-25.00	-42.34	peak	
4	500.450	-74.54	8.06	-66.48	-25.00	-41.48	peak	
5	700.270	-76.75	13.97	-62.78	-25.00	-37.78	peak	
6 *	951.500	-77.19	14.95	-62.24	-25.00	-37.24	peak	

Report No.: BTL-FCCP-3-1802C116 Page 79 of 141



127.00



Test Mode: LTE Band 38\_TX CH38150\_20M\_Internal Antenna

### Vertical 30.0 dBm 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90.0 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 MHz

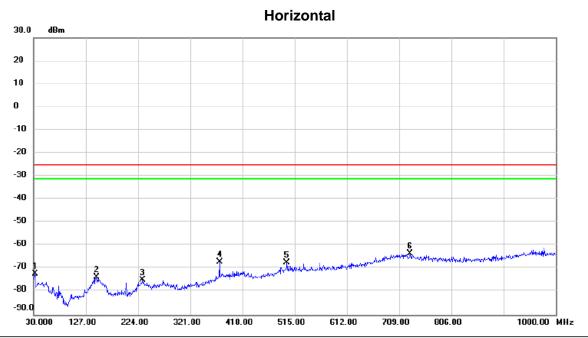
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	32.910	-58.47	-0.96	-59.43	-25.00	-34.43	peak	
2	61.040	-67.29	0.60	-66.69	-25.00	-41.69	peak	
3	151.250	-78.10	3.15	-74.95	-25.00	-49.95	peak	
4	281.230	-78.34	2.60	-75.74	-25.00	-50.74	peak	
5	530.520	-76.70	7.49	-69.21	-25.00	-44.21	peak	
6	757.500	-76.92	12.39	-64.53	-25.00	-39.53	peak	

Report No.: BTL-FCCP-3-1802C116 Page 80 of 141





Test Mode: LTE Band 38\_TX CH38150\_20M\_Internal Antenna



No. N	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		32.910	-73.13	0.96	-72.17	-25.00	-47.17	peak	
2		147.370	-77.74	3.95	-73.79	-25.00	-48.79	peak	
3		232.730	-77.82	3.02	-74.80	-25.00	-49.80	peak	
4		375.320	-72.72	5.54	-67.18	-25.00	-42.18	peak	
5		500.450	-75.54	8.06	-67.48	-25.00	-42.48	peak	
6 *		729.370	-76.59	13.27	-63.32	-25.00	-38.32	peak	

Report No.: BTL-FCCP-3-1802C116 Page 81 of 141



127.00

224.00

321.00

418.00



1000.00 MHz

Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_1dBi

# 

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	31.940	-60.47	-0.73	-61.20	-25.00	-36.20	peak	
2	125.060	-71.90	-1.55	-73.45	-25.00	-48.45	peak	
3	279.290	-78.35	2.62	-75.73	-25.00	-50.73	peak	
4	500.450	-76.16	7.55	-68.61	-25.00	-43.61	peak	
5	744.890	-76.22	12.28	-63.94	-25.00	-38.94	peak	
6	844.800	-77.40	14.21	-63.19	-25.00	-38.19	peak	

515.00

612.00

709.00

806.00

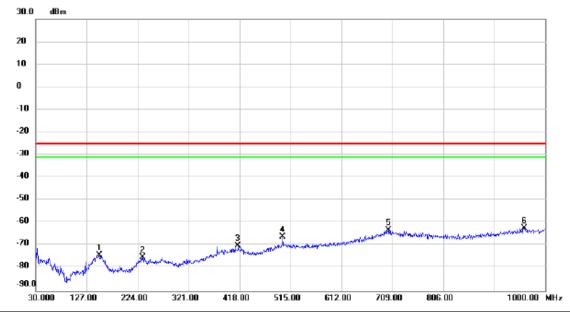
Report No.: BTL-FCCP-3-1802C116 Page 82 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_1dBi

# Horizontal



. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
	150.280	-78.39	4.20	-74.19	-25.00	-49.19	peak	
	233.700	-78.15	2.94	-75.21	-25.00	-50.21	peak	
	415.090	-76.67	6.63	-70.04	-25.00	-45.04	peak	
	500.450	-74.33	8.06	-66.27	-25.00	-41.27	peak	
	701.240	-77.25	13.95	-63.30	-25.00	-38.30	peak	
*	960.230	-77.14	14.94	-62.20	-25.00	-37.20	peak	
	. Mk.	MHz 150.280 233.700 415.090 500.450 701.240	Mk. Freq. Level  MHz dBm  150.280 -78.39  233.700 -78.15  415.090 -76.67  500.450 -74.33  701.240 -77.25	Mk.         Freq.         Level         Factor           MHz         dBm         dB           150.280         -78.39         4.20           233.700         -78.15         2.94           415.090         -76.67         6.63           500.450         -74.33         8.06           701.240         -77.25         13.95	Mk.         Freq.         Level         Factor         ment           MHz         dBm         dB         dBm           150.280         -78.39         4.20         -74.19           233.700         -78.15         2.94         -75.21           415.090         -76.67         6.63         -70.04           500.450         -74.33         8.06         -66.27           701.240         -77.25         13.95         -63.30	Mk.         Freq.         Level         Factor         ment         Limit           MHz         dBm         dB         dBm         dBm           150.280         -78.39         4.20         -74.19         -25.00           233.700         -78.15         2.94         -75.21         -25.00           415.090         -76.67         6.63         -70.04         -25.00           500.450         -74.33         8.06         -66.27         -25.00           701.240         -77.25         13.95         -63.30         -25.00	Mk.         Freq.         Level         Factor         ment         Limit         Margin           MHz         dBm         dB         dBm         dBm         dB         dB           150.280         -78.39         4.20         -74.19         -25.00         -49.19           233.700         -78.15         2.94         -75.21         -25.00         -50.21           415.090         -76.67         6.63         -70.04         -25.00         -45.04           500.450         -74.33         8.06         -66.27         -25.00         -41.27           701.240         -77.25         13.95         -63.30         -25.00         -38.30	Mk.         Freq.         Level         Factor         ment         Limit         Margin           MHz         dBm         dB         dBm         dBm         dB         Detector           150.280         -78.39         4.20         -74.19         -25.00         -49.19         peak           233.700         -78.15         2.94         -75.21         -25.00         -50.21         peak           415.090         -76.67         6.63         -70.04         -25.00         -45.04         peak           500.450         -74.33         8.06         -66.27         -25.00         -41.27         peak           701.240         -77.25         13.95         -63.30         -25.00         -38.30         peak

Report No.: BTL-FCCP-3-1802C116 Page 83 of 141



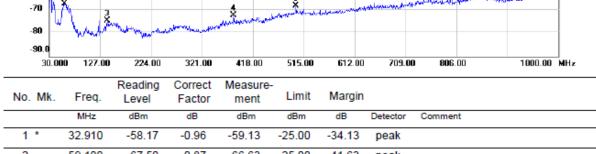
30.0

20 10 0 -10 -20 -30 -40 -50 dBm



Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_3dBi

# Vertical



	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	32.910	-58.17	-0.96	-59.13	-25.00	-34.13	peak	
2	59.100	-67.50	0.87	-66.63	-25.00	-41.63	peak	
3	140.580	-76.35	2.21	-74.14	-25.00	-49.14	peak	
4	381.140	-75.76	3.85	-71.91	-25.00	-46.91	peak	
5	500.450	-75.09	7.55	-67.54	-25.00	-42.54	peak	
6	847.710	-76.67	14.36	-62.31	-25.00	-37.31	peak	

Report No.: BTL-FCCP-3-1802C116 Page 84 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_3dBi

# Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		32.910	-74.38	0.96	-73.42	-25.00	-48.42	peak	
2		146.400	-77.45	3.84	-73.61	-25.00	-48.61	peak	
3		250.190	-74.82	1.87	-72.95	-25.00	-47.95	peak	
4		375.320	-74.10	5.54	-68.56	-25.00	-43.56	peak	
5		500.450	-74.00	8.06	-65.94	-25.00	-40.94	peak	
6	*	711.910	-76.56	13.69	-62.87	-25.00	-37.87	peak	

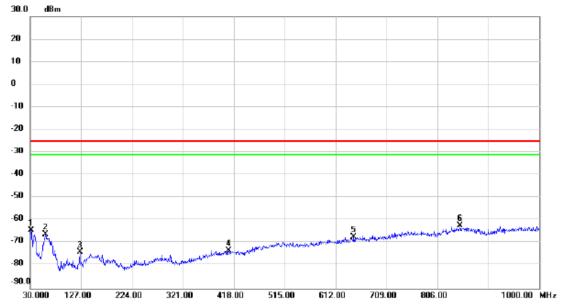
Report No.: BTL-FCCP-3-1802C116 Page 85 of 141





Test Mode: LTE Band 38\_TX CH38150\_20M\_External Antenna\_1dBi

# Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		31.940	-63.47	-0.73	-64.20	-25.00	-39.20	peak	
2		59.100	-67.15	0.87	-66.28	-25.00	-41.28	peak	
3		125.060	-72.26	-1.55	-73.81	-25.00	-48.81	peak	
4		408.300	-77.56	4.33	-73.23	-25.00	-48.23	peak	
5		646.920	-77.28	10.03	-67.25	-25.00	-42.25	peak	
6	*	849.650	-76.80	14.46	-62.34	-25.00	-37.34	peak	

Report No.: BTL-FCCP-3-1802C116 Page 86 of 141





Test Mode: LTE Band 38\_TX CH38150\_20M\_External Antenna\_1dBi

### Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		30.000	-76.03	1.88	-74.15	-25.00	-49.15	peak	
2		144.460	-76.75	3.63	-73.12	-25.00	-48.12	peak	
3		229.820	-77.73	3.20	-74.53	-25.00	-49.53	peak	
4		378.230	-76.53	5.89	-70.64	-25.00	-45.64	peak	
5		500.450	-74.33	8.06	-66.27	-25.00	-41.27	peak	
6	*	679.900	-76.31	12.61	-63.70	-25.00	-38.70	peak	

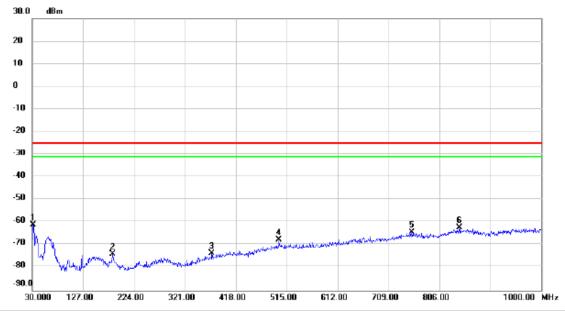
Report No.: BTL-FCCP-3-1802C116 Page 87 of 141





Test Mode: LTE Band 38\_TX CH38150\_20M\_External Antenna\_3dBi

# Vertical



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	31.940	-60.44	-0.73	-61.17	-25.00	-36.17	peak	
2	183.260	-73.74	-0.07	-73.81	-25.00	-48.81	peak	
3	372.410	-77.01	3.45	-73.56	-25.00	-48.56	peak	
4	500.450	-75.31	7.55	-67.76	-25.00	-42.76	peak	
5	753.620	-76.88	12.44	-64.44	-25.00	-39.44	peak	
6	843.830	-76.43	14.16	-62.27	-25.00	-37.27	peak	

Report No.: BTL-FCCP-3-1802C116 Page 88 of 141





Test Mode: LTE Band 38\_TX CH38150\_20M\_External Antenna\_3dBi

# Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1		31.940	-71.27	1.27	-70.00	-25.00	-45.00	peak	
2		148.340	-78.17	4.06	-74.11	-25.00	-49.11	peak	
3		230.790	-76.21	3.18	-73.03	-25.00	-48.03	peak	
4		375.320	-73.82	5.54	-68.28	-25.00	-43.28	peak	
5		500.450	-74.75	8.06	-66.69	-25.00	-41.69	peak	
6	*	708.030	-76.45	13.79	-62.66	-25.00	-37.66	peak	

Report No.: BTL-FCCP-3-1802C116 Page 89 of 141



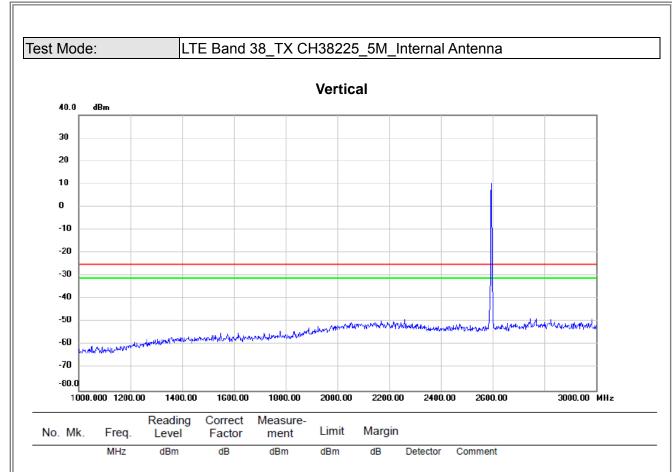


# APPENDIX F - RADIATED EMISSION (ABOVE 1GHZ)

Report No.: BTL-FCCP-3-1802C116 Page 90 of 141







Report No.: BTL-FCCP-3-1802C116 Page 91 of 141



1000.000 1200.00

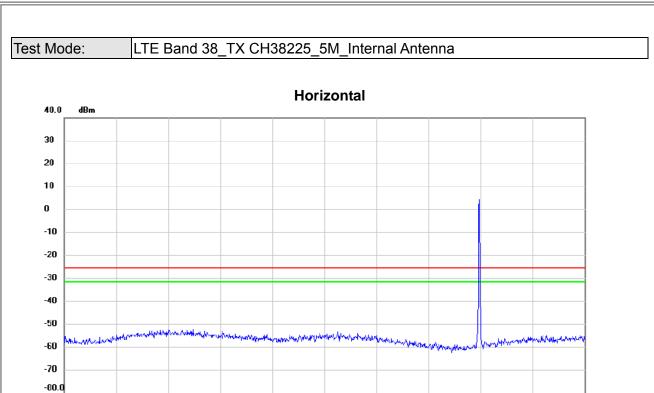
1400.00

1600.00

1800.00



3000.00 MHz



No. Mk.	Freq.		Correct Factor	Measure- ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

2000.00

2200.00

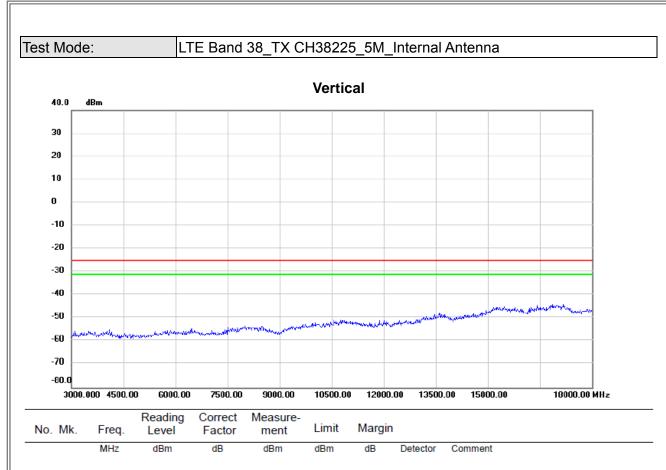
2400.00

2600.00

Report No.: BTL-FCCP-3-1802C116 Page 92 of 141





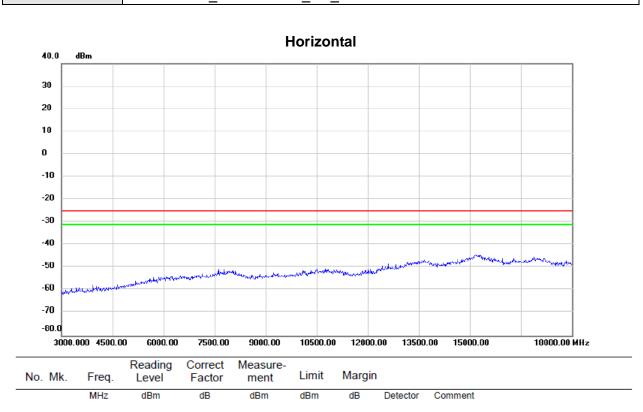


Report No.: BTL-FCCP-3-1802C116 Page 93 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_Internal Antenna



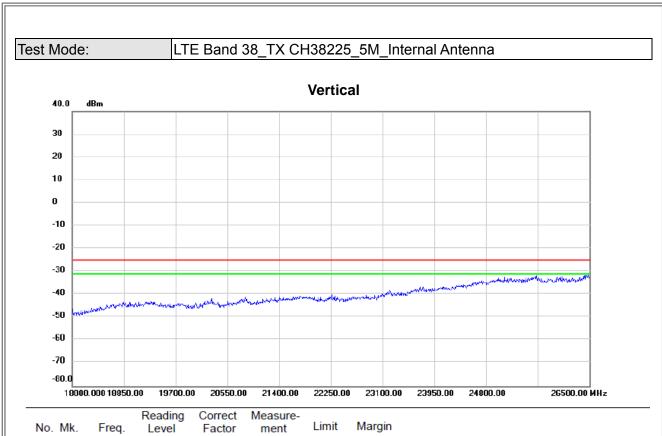
Report No.: BTL-FCCP-3-1802C116 Page 94 of 141



MHz

dBm





dBm

dBm

dB

Detector

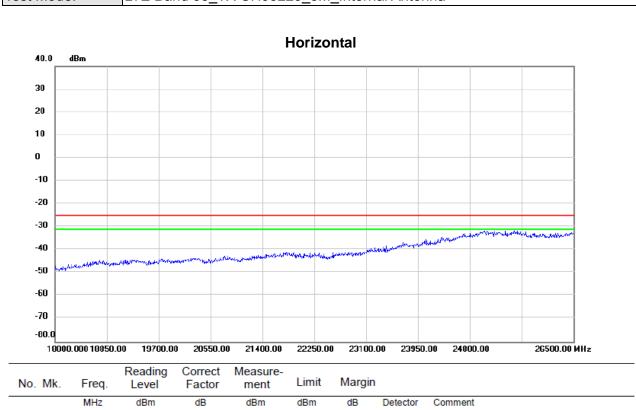
Comment

Report No.: BTL-FCCP-3-1802C116 Page 95 of 141





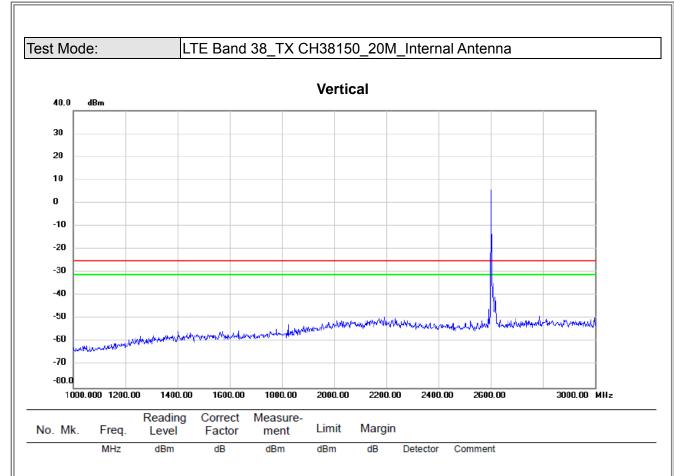
Test Mode: LTE Band 38\_TX CH38225\_5M\_Internal Antenna



Report No.: BTL-FCCP-3-1802C116 Page 96 of 141





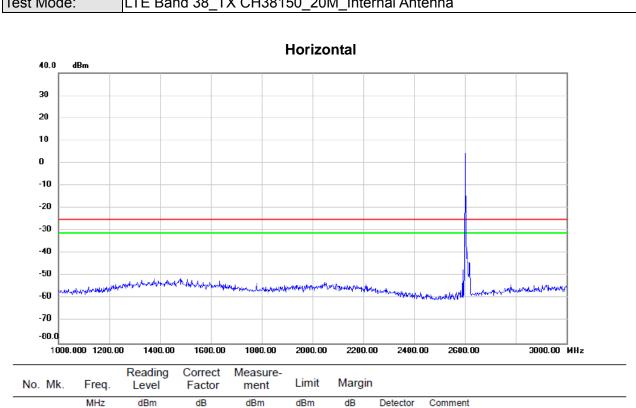


Report No.: BTL-FCCP-3-1802C116 Page 97 of 141





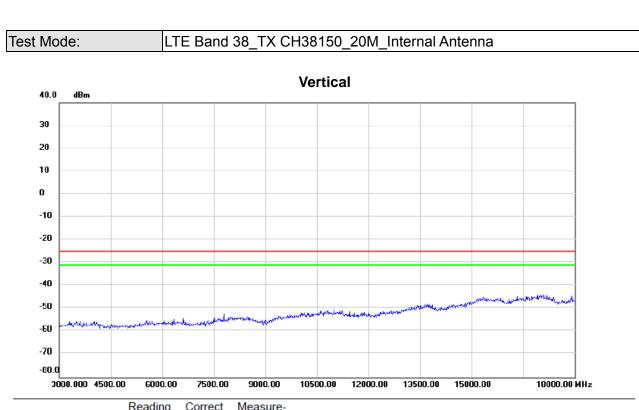
Test Mode: LTE Band 38\_TX CH38150\_20M\_Internal Antenna



Report No.: BTL-FCCP-3-1802C116 Page 98 of 141







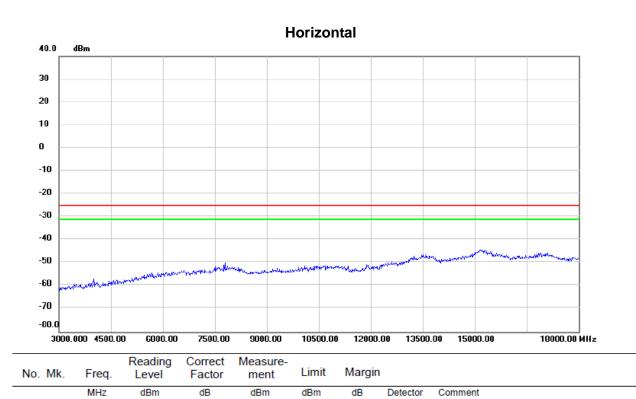
-	No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin				
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment		

Report No.: BTL-FCCP-3-1802C116 Page 99 of 141





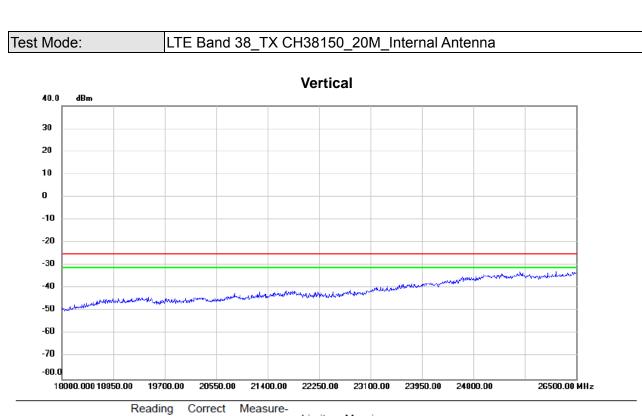
Test Mode: LTE Band 38\_TX CH38150\_20M\_Internal Antenna



Report No.: BTL-FCCP-3-1802C116 Page 100 of 141







No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Report No.: BTL-FCCP-3-1802C116 Page 101 of 141



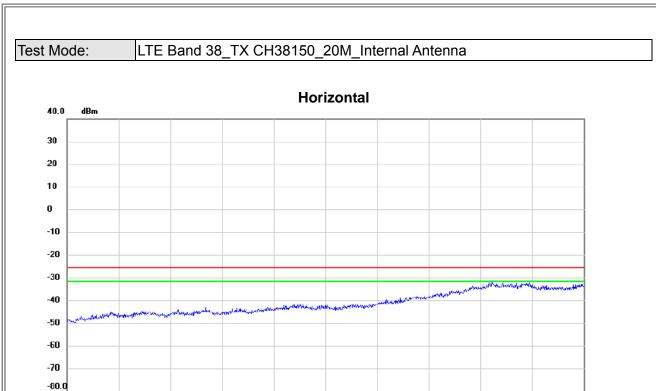
18000.000 18850.00

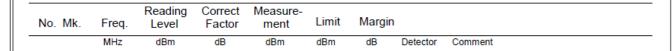
19700.00

20550.00

21400.00







22250.00

23100.00

23950.00

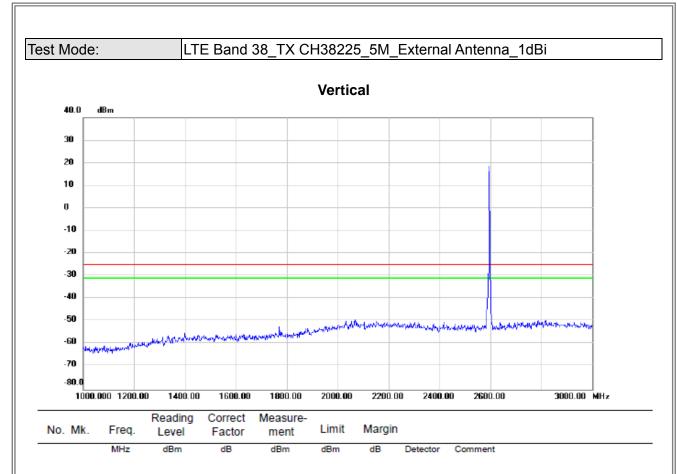
24800.00

26500.00 MHz

Report No.: BTL-FCCP-3-1802C116 Page 102 of 141







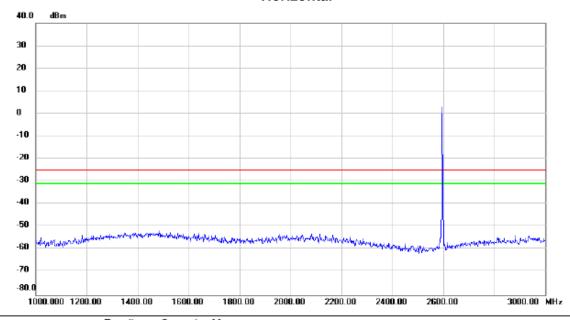
Report No.: BTL-FCCP-3-1802C116 Page 103 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_1dBi

Horizontal

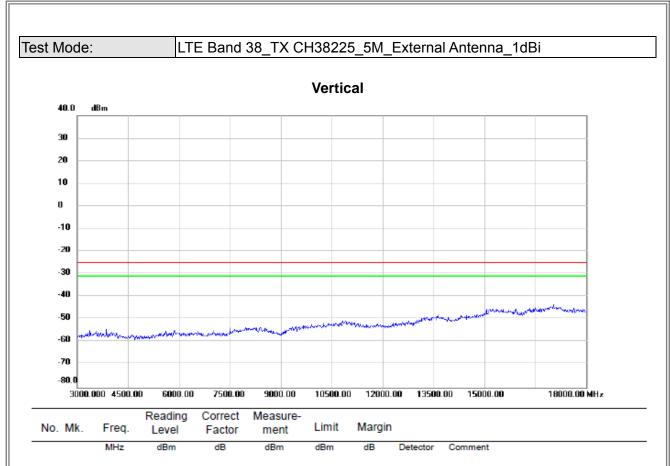


	1000.000	1200. <b>0</b> 0	1400.00	1600.00	<b>180</b> 0.0 <b>0</b>	2000.00	2200.00	2400.0	0 2600.00	3000.00 MHz
No. N	Иk. F	req.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
	N	ИHz	dBm	dB	dBm	dBm	dB	Detector	Comment	

Report No.: BTL-FCCP-3-1802C116 Page 104 of 141





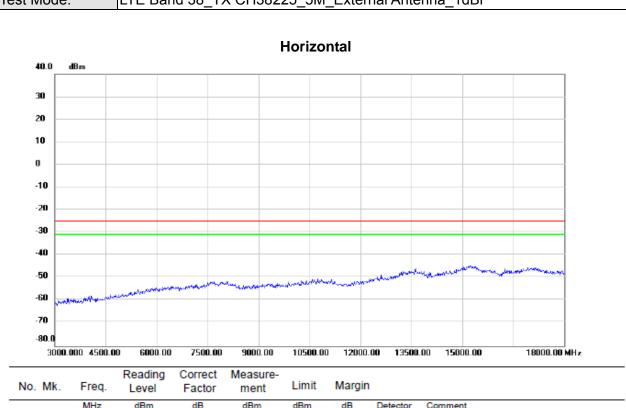


Report No.: BTL-FCCP-3-1802C116 Page 105 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_1dBi

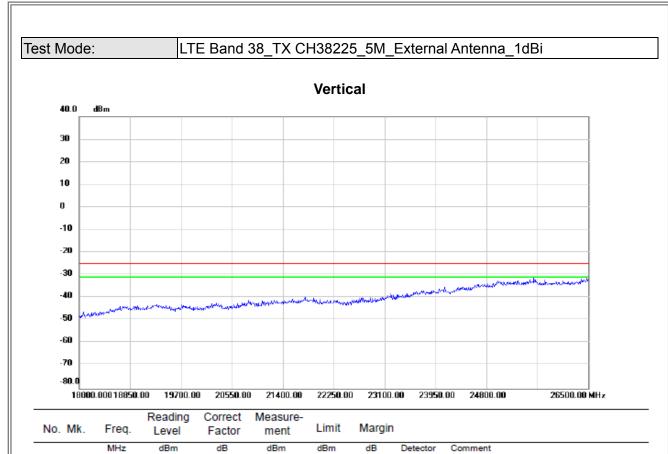


	30 <b>00.0</b> 00	4500.00	6 <b>0</b> 00.00	7500.00	3000.00	10500.00	12000.0	IU 1.350U	.00 15000.00	18000.00 MH 2
No.	Mk. F	req.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment	

Report No.: BTL-FCCP-3-1802C116 Page 106 of 141





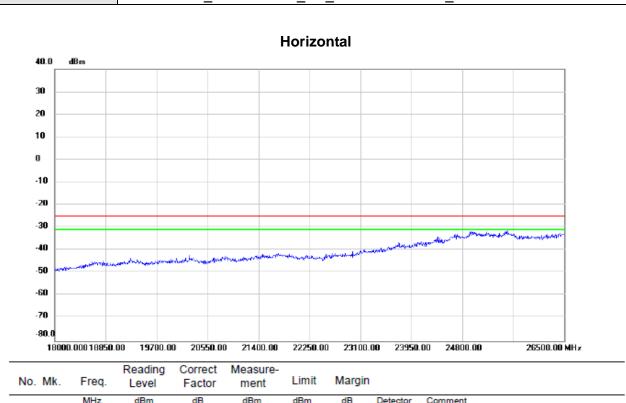


Report No.: BTL-FCCP-3-1802C116 Page 107 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_1dBi

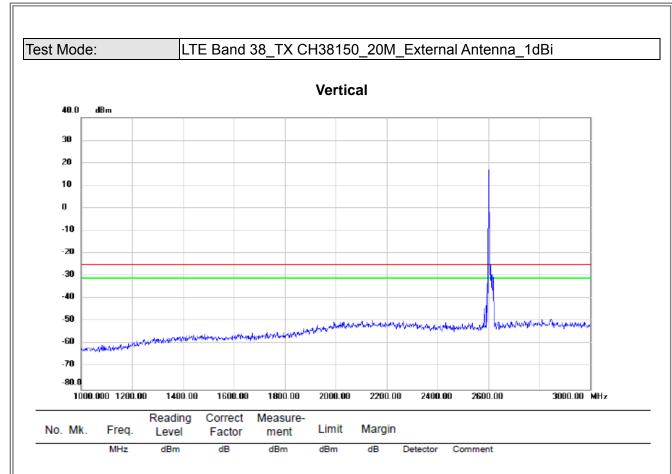


No. Mk.	Freq.	_		Measure- ment	Limit	Margin	ı	
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Page 108 of 141 Report No.: BTL-FCCP-3-1802C116



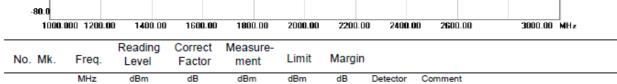




Report No.: BTL-FCCP-3-1802C116 Page 109 of 141



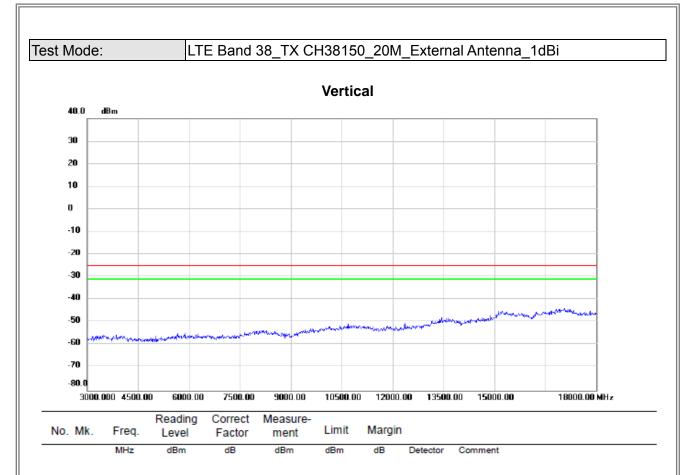




Report No.: BTL-FCCP-3-1802C116





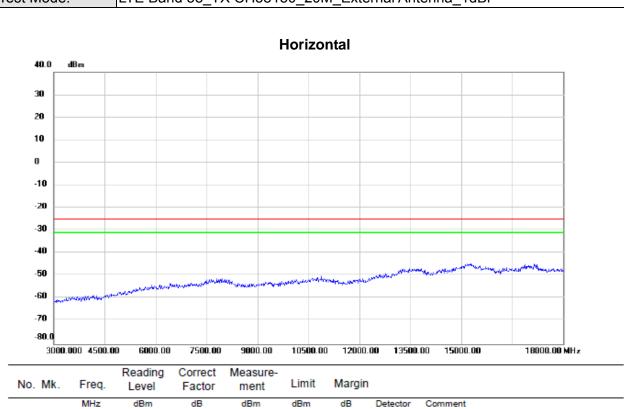


Report No.: BTL-FCCP-3-1802C116 Page 111 of 141





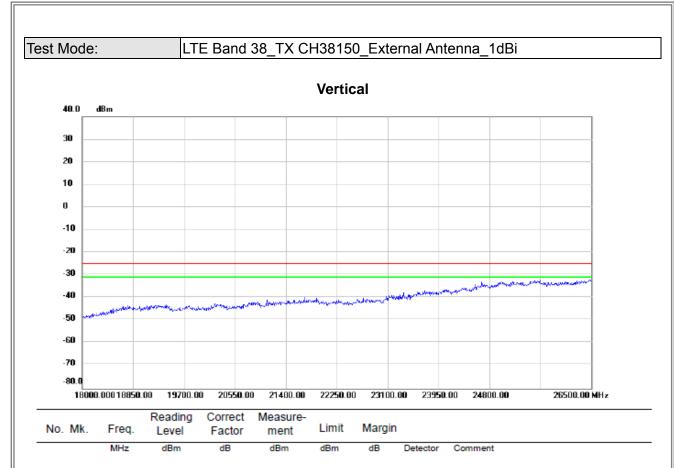
Test Mode: LTE Band 38\_TX CH38150\_20M\_External Antenna\_1dBi



Report No.: BTL-FCCP-3-1802C116





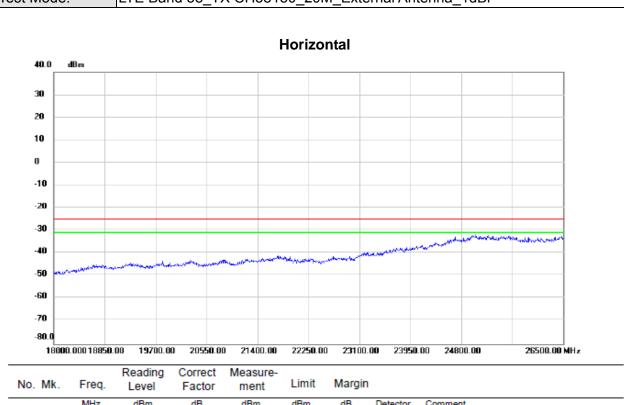


Report No.: BTL-FCCP-3-1802C116 Page 113 of 141





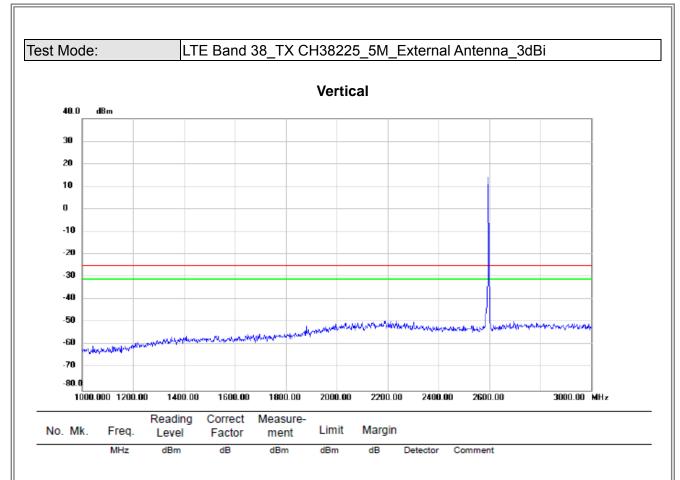
Test Mode: LTE Band 38\_TX CH38150\_20M\_External Antenna\_1dBi



Report No.: BTL-FCCP-3-1802C116 Page 114 of 141







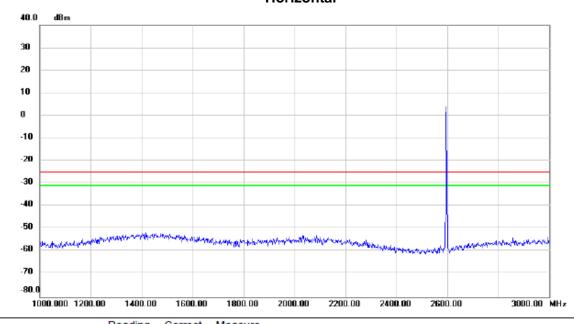
Report No.: BTL-FCCP-3-1802C116 Page 115 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_3dBi

Horizontal

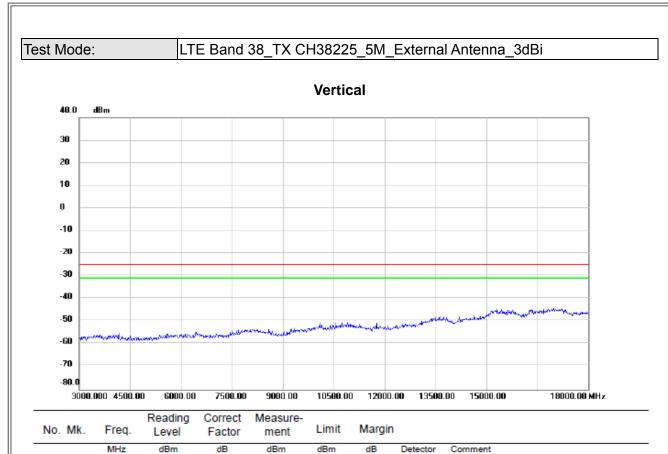


	1000.000	1200.00	<b>140</b> 0.00	1600.00	<b>180</b> 0.0 <b>0</b>	2000.00	<b>220</b> 0.00	2400.0	0 <b>26</b> 00.00	3000.00 MI	Hz
No.	Mk. F	req.	Reading Level	Correct Factor	Measure- ment	Limit	Margin				
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment		

Report No.: BTL-FCCP-3-1802C116 Page 116 of 141







Report No.: BTL-FCCP-3-1802C116 Page 117 of 141





Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_3dBi

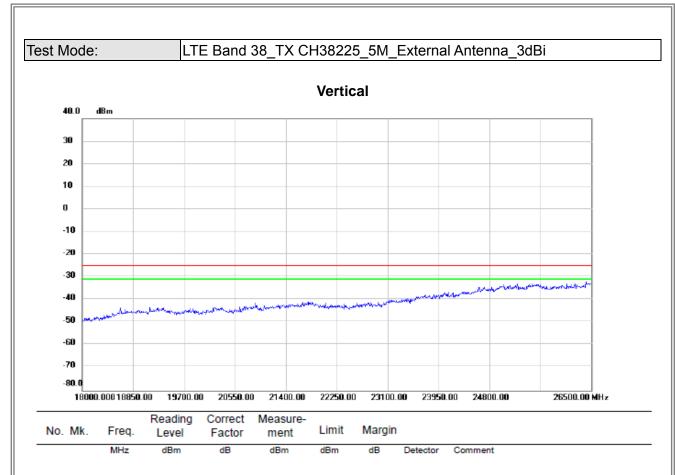
# Horizontal 40.0 dBm 20 10 -10 -30 -40 -50 -60 -70 -80.d

	3000.000	4300.00	6000.00	7300.00	3000.00	10300.00	12000.0	10 13300	.00 13000.00	TODUU.UU MITZ
No.	Mk. F	req.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment	

Page 118 of 141 Report No.: BTL-FCCP-3-1802C116





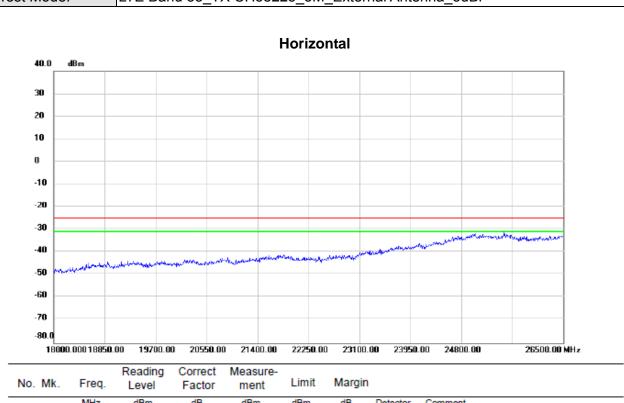


Report No.: BTL-FCCP-3-1802C116 Page 119 of 141





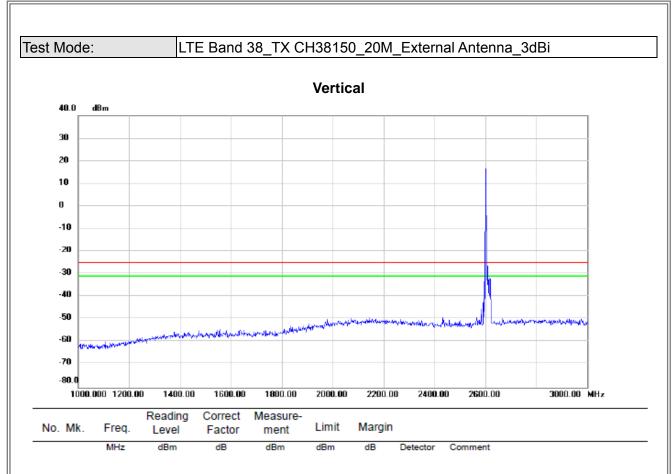
Test Mode: LTE Band 38\_TX CH38225\_5M\_External Antenna\_3dBi



Report No.: BTL-FCCP-3-1802C116 Page 120 of 141



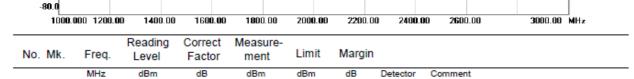




Report No.: BTL-FCCP-3-1802C116 Page 121 of 141



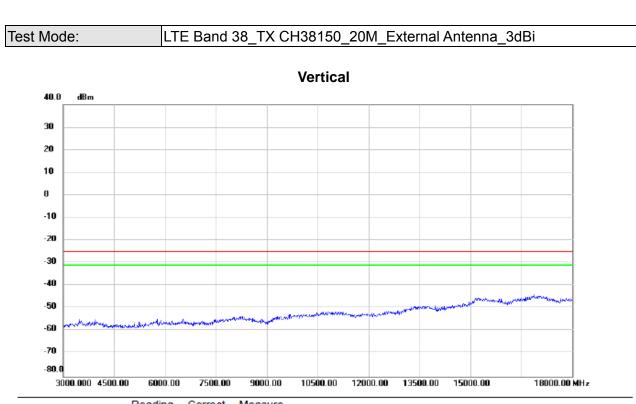




Report No.: BTL-FCCP-3-1802C116







	3000.000	4300.00	and a	1 300.00	AAAA	ro.ma.uu	12.000.0		12000.00	Table de la lacte
No.	Mk. F	req.	Reading Level	Correct Factor	Measure- ment	Limit	Margin			
		MHz	dBm	dB	dBm	dBm	dB	Detector	Comment	

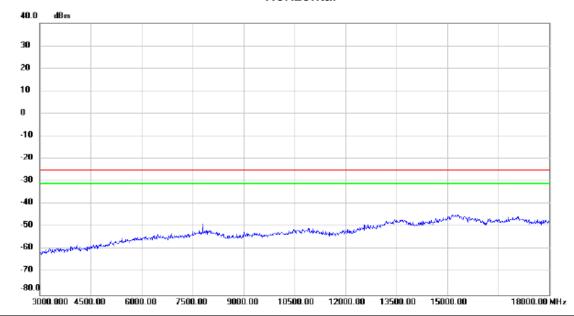
Report No.: BTL-FCCP-3-1802C116 Page 123 of 141





Test Mode: LTE Band 38\_TX CH38150\_20M\_External Antenna\_3dBi

Horizontal

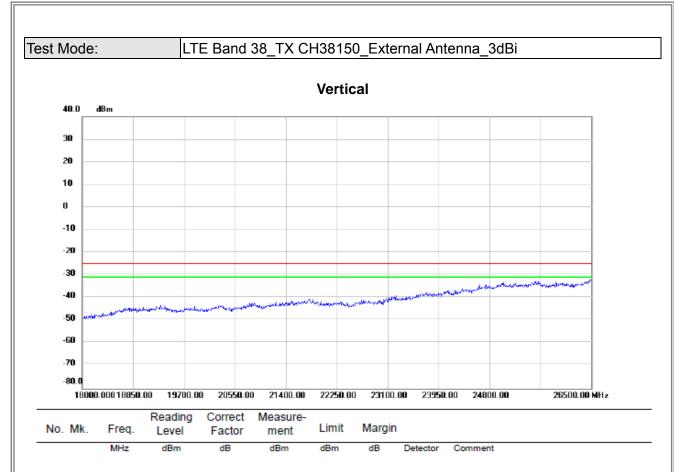


No. Mk.	Freq.	Reading Level		Measure- ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment

Report No.: BTL-FCCP-3-1802C116 Page 124 of 141





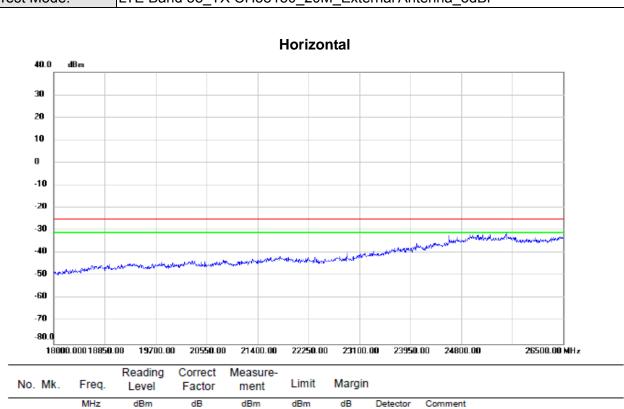


Report No.: BTL-FCCP-3-1802C116 Page 125 of 141





Test Mode: LTE Band 38\_TX CH38150\_20M\_External Antenna\_3dBi



Report No.: BTL-FCCP-3-1802C116 Page 126 of 141



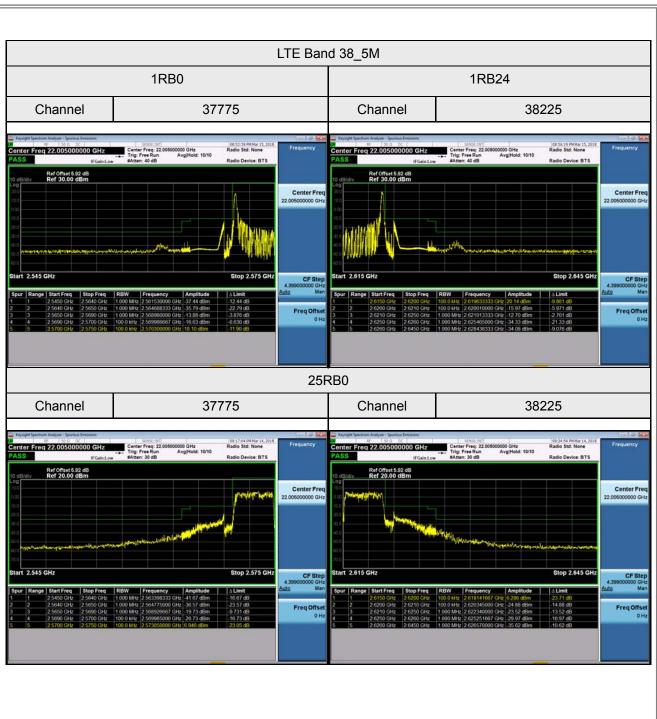


APPENDIX G - BAND EDGE

Report No.: BTL-FCCP-3-1802C116 Page 127 of 141

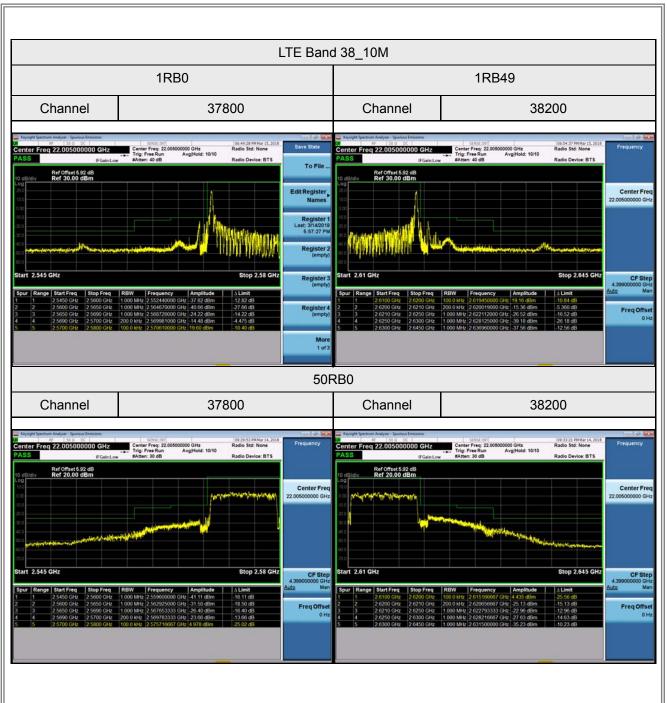






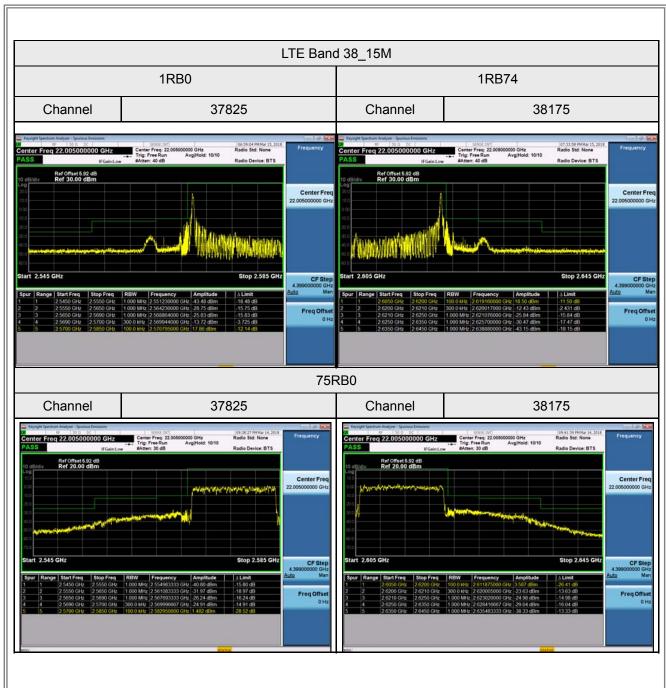






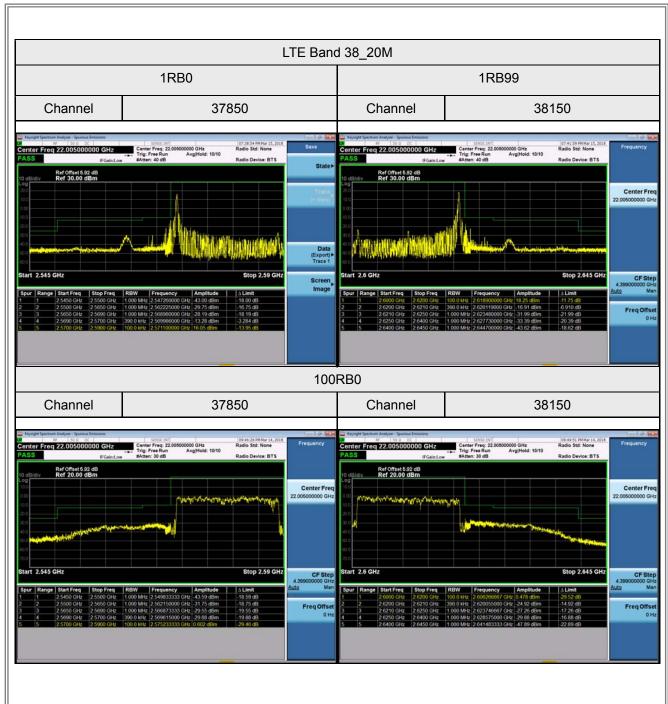














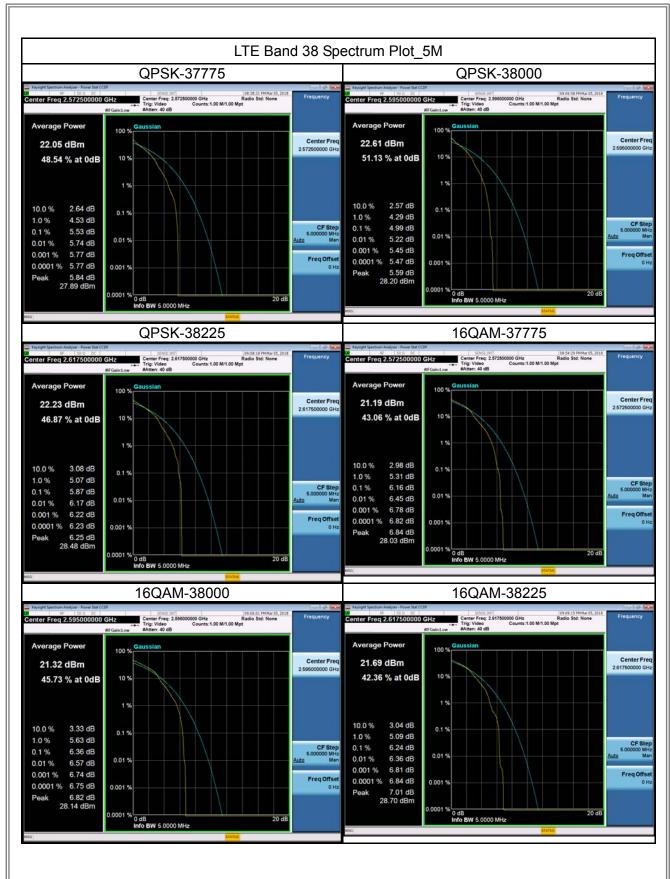


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APPENDIX H - PEAK TO AVERAGE RATIO	

Report No.: BTL-FCCP-3-1802C116 Page 132 of 141

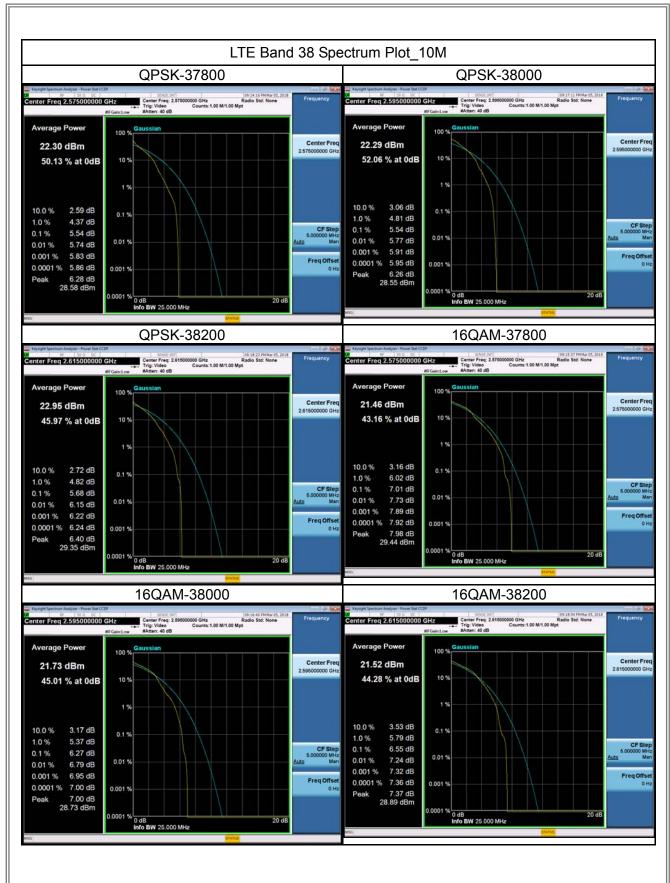












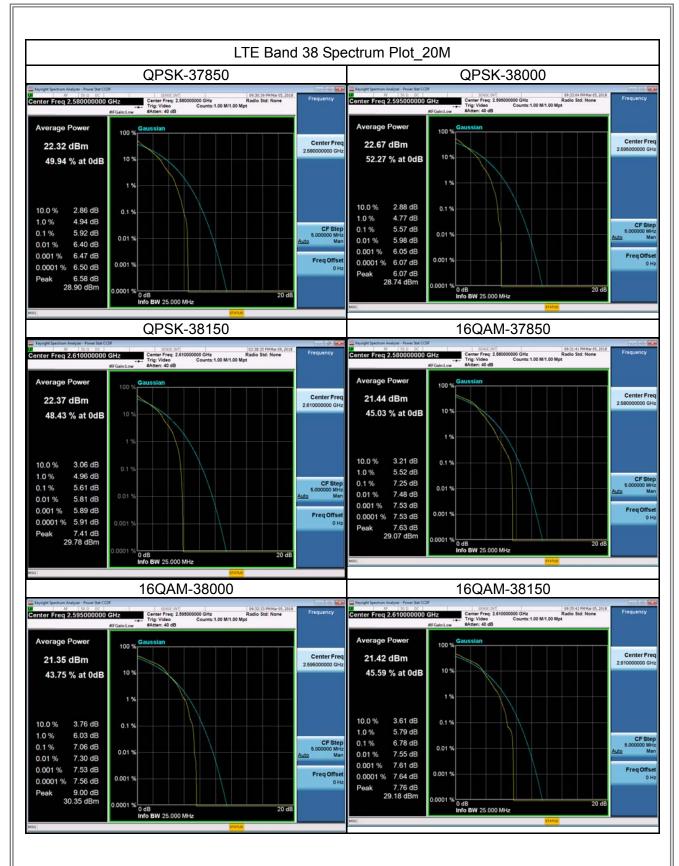
















APPENDIX I - FREQUENCY STABILITY

Report No.: BTL-FCCP-3-1802C116 Page 137 of 141





Test Mode:	LTE Band 38 CH40690 5M
1000 111000.	212 Bana 00_01110000_0W

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-30	6.58	0.002535645	2.5
-20	-4.08	0.001572254	2.5
-10	-2.55	0.000982659	2.5
0	7.28	0.002805395	2.5
10	9.92	0.003822736	2.5
20	5.64	0.00217341	2.5
30	-8.98	0.003460501	2.5
40	3.34	0.001287091	2.5
50	-5.87	0.002262042	2.5
Max. Deviation (ppm)	9.92	0.003822736	2.5

### Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
10.80V	3.91	0.001506744	2.5
12.00V	-2.54	0.000978805	2.5
13.20V	6.09	0.002346821	2.5
Max. Deviation (ppm)	6.09	0.002346821	2.5

Report No.: BTL-FCCP-3-1802C116 Page 138 of 141





Test Mode:	LTE Band 38 CH40690 10M

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-30	6.45	0.002485549	2.5
-20	7.82	0.003013487	2.5
-10	-5.65	0.002177264	2.5
0	6.87	0.002647399	2.5
10	-6.24	0.002404624	2.5
20	8.98	0.003460501	2.5
30	-3.74	0.001441233	2.5
40	3.63	0.001398844	2.5
50	-3.86	0.001487476	2.5
Max. Deviation (ppm)	8.98	0.003460501	2.5

### Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
10.80V	3.88	0.001495183	2.5
12.00V	-7.31	0.002816956	2.5
13.20V	-5.79	0.002231214	2.5
Max. Deviation (ppm)	7.31	0.002816956	2.5

Report No.: BTL-FCCP-3-1802C116 Page 139 of 141





Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-30	3.82	0.001472	2.5
-20	-6.58	0.002536	2.5
-10	8.45	0.003256	2.5
0	-5.74	0.002212	2.5
10	7.54	0.002906	2.5
20	-6.24	0.002405	2.5
30	6.47	0.002493	2.5
40	3.84	0.00148	2.5
50	5.14	0.001981	2.5
Max. Deviation (ppm)	8.45	0.003256	2.5

## Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
10.80V	-3.68	0.001418	2.5
12.00V	8.26	0.003183	2.5
13.20V	-4.75	0.00183	2.5
Max. Deviation (ppm)	8.26	0.003183	2.5

Report No.: BTL-FCCP-3-1802C116 Page 140 of 141





Toot Modo:	LTE Band 38 CH40690 20M
Test Mode:	ILTE BANG 38 CH40090 ZUM

Temperature(°C)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
-30	-6.78	0.002613	2.5
-20	7.58	0.002921	2.5
-10	-4.42	0.001703	2.5
0	6.72	0.00259	2.5
10	-4.47	0.001723	2.5
20	6.28	0.00242	2.5
30	4.52	0.001742	2.5
40	6.52	0.002513	2.5
50	-5.79	0.002231	2.5
Max. Deviation (ppm)	7.58	0.002921	2.5

### Voltage vs. Frequency Stability

Voltage(Volts)	Frequency Error (Hz)	Frequency Error (ppm)	Limit(ppm)
10.80V	5.66	0.002181	2.5
12.00V	-7.35	0.002832	2.5
13.20V	6.18	0.002382	2.5
Max. Deviation (ppm)	7.35	0.002832	2.5

Report No.: BTL-FCCP-3-1802C116 Page 141 of 141