FCC Test Report

(PART 27)

Report No.:	RF160112E05C
FCC ID:	2AD8UFW2IADPM01
Test Model:	FW2IADPM01
Received Date:	July 17, 2018
Test Date:	July 23 to Aug. 06, 2018
Issued Date:	Aug. 28, 2018
Applicant:	Nokia Solutions and Networks
Address:	2000 W. Lucent Lane, Naperville, IL 60563, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF160112E05C	Original release.	Aug. 28, 2018

1 Certificate of Conformity

Product:	Nokia FW2IA LTE Module
Brand:	Nokia
Test Model:	FW2IADPM01
Sample Status:	MASS-PRODUCTION
Applicant:	Nokia Solutions and Networks
Test Date:	July 23 to Aug. 06, 2018
Standards:	FCC Part 27 FCC Part 2

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Aug. 28, 2018

Claire Kuan / Specialist

Approved by : _____ , **Date:** Aug. 28, 2018

May Chen / Manager

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(4)	Equivalent Isotropically radiated power	PASS	Meet the requirement of limit.
2.1047	Modulation characteristics	PASS	Meet the requirement
2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	PASS	Meet the requirement of limit.
2.1049 27.53(h)	Occupied Bandwidth	PASS	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	PASS	Meet the requirement of limit.
27.50(d)(5)	Peak To Average Ratio	PASS	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -33.06dB at 8650MHz & 8660MHz.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Test Site and Instruments

For radiated spurious emissions test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-2	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier Mini-Circuits	ZVA-183-S+	AMP-ZVA-03	May 10, 2018	May 09, 2019
RF Cable	EMC104-SM-SM-1200	160923	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150318	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: July 23 to Aug. 06, 2018

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Spectrum Analyzer Agilent	E4446A	MY48250254	Nov. 21, 2017	Nov. 20, 2018
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
AC Power Source Extech Electronics	6205	1440452	NA	NA
DC Power Supply Topward	6603D	795558	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
True RMS Clamp Meter FLUKE	325	31130711WS	May 22, 2018	May 21, 2019
ESG Vector signal generator Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	Nov. 26, 2017	Nov. 25, 2018
ESG Vector signal generator Agilent	E4438C	MY47271330 506 602 UNJ	Oct. 11, 2017	Oct. 10, 2018
Mech Switch Absorptive Mini-Circuits	MSP4TA-18+	0140	Feb. 12, 2018	Feb. 11, 2019
FXD ATTEN Mini-Circuits	BW-S3W2+	MN71981	Feb. 12, 2018	Feb. 11, 2019
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: July 31, 2018

3 General Information

3.1 General Description of EUT

Product	Nokia FW2IA LTE Module	
Brand	Nokia	
Test Model	FW2IADPM01	
Test Sample S/N	EB181010957	
Hardware Version	X23	
Status of EUT	MASS-PRODUCTION	
Power Supply Rating	12Vdc	
Modulation Type	QPSK, 16QAM, 64QAM, 256QAM	
Modulation Technology	FDD	
Transfer Rate	Uplink ：75Mbps , Downlink ：300Mbps	
Operating Frequency	Channel Bandwidth: 5MHz	2112.5MHz ~2177.5MHz
	Channel Bandwidth: 10MHz	2115MHz ~2175MHz
	Channel Bandwidth: 15MHz	2117.5MHz ~2172.5MHz
	Channel Bandwidth: 20MHz	2120MHz ~2170MHz
Number of Channel	Channel Bandwidth: 5MHz	651
	Channel Bandwidth: 10MHz	601
	Channel Bandwidth: 15MHz	551
	Channel Bandwidth: 20MHz	501
Max. EIRP Power	Channel Bandwidth: 10MHz+15MHz GAP 15MHz	774.46mW (QPSK)
	Channel Bandwidth: 10MHz+15MHz GAP 20MHz	785.24mW (QPSK)
	Channel Bandwidth: 20MHz+20MHz GAP 20MHz	831.76mW (QPSK)
	Channel Bandwidth: 20MHz+20MHz Contiguous	853.10mW (QPSK)
Emission Designator	Channel Bandwidth: 10MHz+15MHz GAP 15MHz	QPSK: 22M6G7D
		16QAM: 22M7D7W
		64QAM: 22M5D7W
		256QAM: 22M5D7W
	Channel Bandwidth: 10MHz+15MHz GAP 20MHz	QPSK: 22M6G7D
		16QAM: 22M6D7W
		64QAM: 22M5D7W
		256QAM: 22M6D7W
	Channel Bandwidth: 20MHz+20MHz GAP 20MHz	QPSK: 36M0G7D
		16QAM: 36M1D7W
		64QAM: 36M0D7W
		256QAM: 36M1D7W
	Channel Bandwidth: 20MHz+20MHz Contiguous	QPSK: 37M8G7D
		16QAM: 37M8D7W
		64QAM: 37M8D7W
		256QAM: 37M8D7W
Antenna Type	Refer to note as below	
Antenna Connector	Refer to user's manual	

Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC Class II change. The difference compared with the Report No.: RF160112E05A design is as the following:

   ◆ Added MC mode as following table:

Bandwidth (MHz)	Available Channels (MHz)	Tested Frequency (MHz)	
10+15 with a 15MHz GAP	66686 + 66961	Low	2135MHz(BW:10MHz) + 2162.5MHz(BW:15MHz)
		Middle	
		High	
10+15 with a 20MHz GAP	66636 + 66961	Low	2130MHz(BW:10MHz) + 2162.5MHz(BW:15MHz)
		Middle	
		High	
20+20 Contiguous	66536 + 66736 66686 + 66886 66836 + 67036	Low	2120MHz(BW:20MHz) + 2140MHz(BW:20MHz)
		Middle	2135MHz(BW:20MHz) + 2155MHz(BW:20MHz)
		High	2150MHz(BW:20MHz) + 2170MHz(BW:20MHz)
20+20 with a 20MHz GAP	66536 + 66936 66586 + 66986 66636 + 67036	Low	2120MHz(BW:20MHz) + 2160MHz(BW:20MHz)
		Middle	2125MHz(BW:20MHz) + 2165MHz(BW:20MHz)
		High	2130MHz(BW:20MHz) + 2170MHz(BW:20MHz)

2. According to above conditions, all test items need to be performed. And all data was verified to meet the requirements.
3. There is LTE technology used for the EUT, which supports 2110~2180MHz frequency band.
4. The EUT incorporates a MIMO function for LTE mode

Channel Bandwidth	Modulation	TX & RX configuration	
5MHz	QPSK, 16QAM, 64QAM, 256QAM	2TX	2RX
10MHz	QPSK, 16QAM, 64QAM, 256QAM	2TX	2RX
15MHz	QPSK, 16QAM, 64QAM, 256QAM	2TX	2RX
20MHz	QPSK, 16QAM, 64QAM, 256QAM	2TX	2RX

5. The EUT's spec. as below table:

Model name	LTE				
	Freq.(MHz)		Freq.(MHz)		Band
FW2IADPM01	UL	BW 5MHz : 1712.5~1777.5	DL	BW 5MHz : 2112.5~2177.5	AWS
		BW 10MHz : 1715~1775		BW 10MHz : 2115~2175	
		BW 15MHz : 1717.5~1772.5		BW 15MHz : 2117.5~2172.5	
		BW 20MHz : 1720~1770		BW 20MHz : 2120~2170	

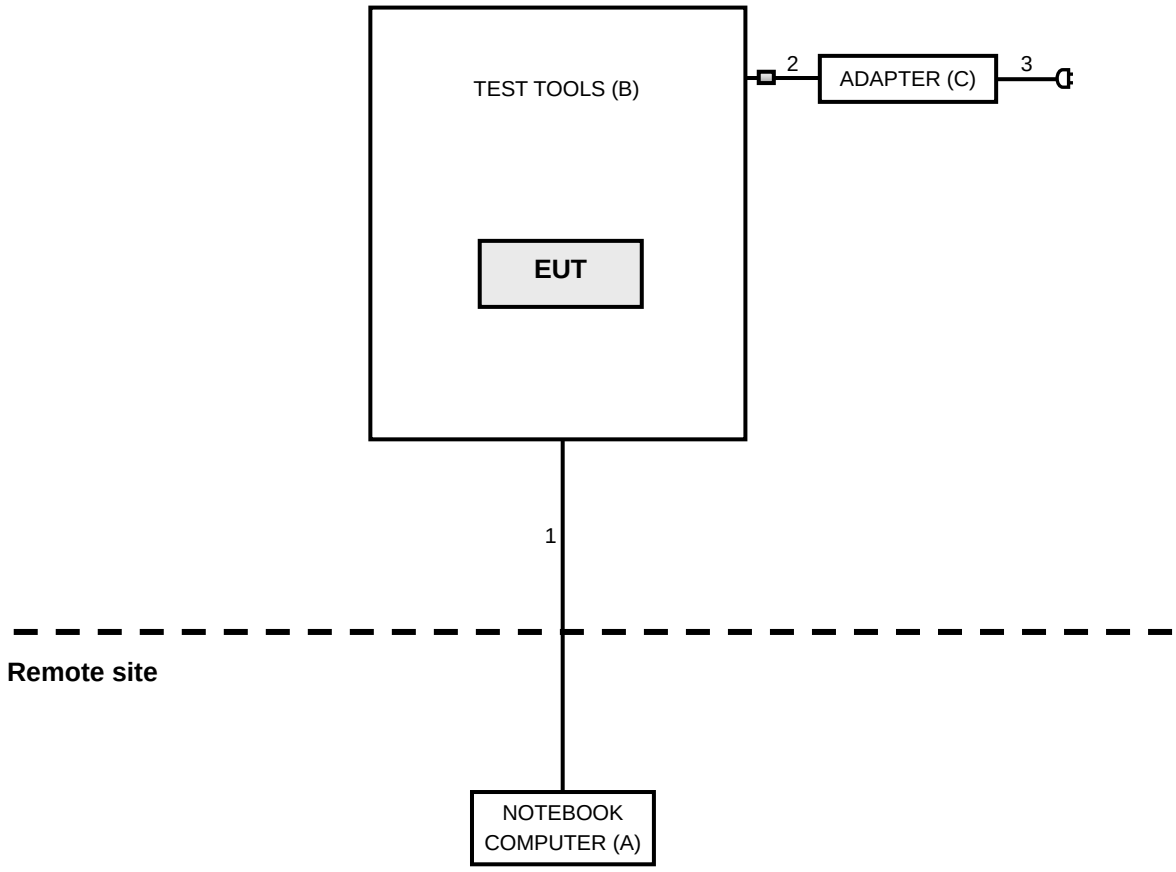
6. The antennas provided to the EUT, please refer to the following table:

Antenna Spec.					
Antenna No	Brand	Model	Antenna Type	Gain(dBi)	Frequency (GHz)
LTE Ant1(Main)	Nokia	FW2IADPM01	Slot Antenna	6.03	1.7~2.7
Antenna No	Brand	Model	Antenna Type	Gain(dBi)	Frequency (GHz)
LTE Ant2(Aux)	Nokia	FW2IADPM01	Slot Antenna	4.64	1.7~2.7

Cable Spec.				
Brand	Model	Connector Type	Cable Loss(dB)	Cable Length (mm)
NA	NA	Right angle MMCX Plug	peak gain included	287

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	D531	CN-0XM006-48643-86L-4472	QDS-BRCM1019	Provided by Lab
B	TEST TOOLS	NA	NA	NA	NA	Supplied by Client
C	ADAPTER	DVE	DSA-60PFE-12	NA	NA	Supplied by Client

NOTE:

1. All power cords of the above support units are non-shielded (1.8 m).

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	RJ-45	1	10	No	0	Provided by Lab
2	DC	1	1.2	No	1	Supplied by Client
3	AC	1	1.8	No	0	Supplied by Client

NOTE:

1. The core(s) is(are) originally attached to the cable(s).

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports
The worst case was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

Test Item	Available Frequency (MHz)	Tested Frequency (MHz)	Channel Bandwidth	GAP	Modulation
Output Power	2110 to 2180	2135 + 2162.5	10MHz+15MHz Non- Contiguous	15MHz	QPSK, 16QAM, 64QAM, , 256QAM
		2130 + 2162.5	10MHz+15MHz Non- Contiguous	20MHz	QPSK, 16QAM, 64QAM, , 256QAM
		2120 + 2160, 2125 + 2165, 2130 + 2170	20MHz+20MHz Non- Contiguous	20MHz	QPSK, 16QAM, 64QAM, , 256QAM
		2120 + 2140, 2135 + 2155, 2150 + 2170	20MHz+20MHz Contiguous	-	QPSK, 16QAM, 64QAM, , 256QAM
Frequency Stability	2110 to 2180	2135 + 2162.5	10MHz+15MHz Non- Contiguous	15MHz	QPSK
		2130 + 2162.5	10MHz+15MHz Non- Contiguous	20MHz	QPSK
		2120 + 2160, 2130 + 2170	20MHz+20MHz Non- Contiguous	20MHz	QPSK
		2120 + 2140 , 2150 + 2170	20MHz+20MHz Contiguous	-	QPSK
Emission Bandwidth	2110 to 2180	2135 + 2162.5	10MHz+15MHz Non- Contiguous	15MHz	QPSK, 16QAM, 64QAM, , 256QAM
		2130 + 2162.5	10MHz+15MHz Non- Contiguous	20MHz	QPSK, 16QAM, 64QAM, , 256QAM
		2120 + 2160, 2125 + 2165, 2130 + 2170	20MHz+20MHz Non- Contiguous	20MHz	QPSK, 16QAM, 64QAM, , 256QAM
		2120 + 2140, 2135 + 2155, 2150 + 2170	20MHz+20MHz Contiguous	-	QPSK, 16QAM, 64QAM, , 256QAM
Channel Edge	2110 to 2180	2135 + 2162.5	10MHz+15MHz Non- Contiguous	15MHz	QPSK
		2130 + 2162.5	10MHz+15MHz Non- Contiguous	20MHz	QPSK
		2120 + 2160, 2130 + 2170	20MHz+20MHz Non- Contiguous	20MHz	QPSK
		2120 + 2140, 2150 + 2170	20MHz+20MHz Contiguous	-	QPSK
Peak To Average Ratio	2110 to 2180	2135 + 2162.5	10MHz+15MHz Non- Contiguous	15MHz	QPSK, 16QAM, 64QAM, , 256QAM
		2130 + 2162.5	10MHz+15MHz Non- Contiguous	20MHz	QPSK, 16QAM, 64QAM, , 256QAM
		2120 + 2160, 2125 + 2165, 2130 + 2170	20MHz+20MHz Non- Contiguous	20MHz	QPSK, 16QAM, 64QAM, , 256QAM
		2120 + 2140, 2135 + 2155, 2150 + 2170	20MHz+20MHz Contiguous	-	QPSK, 16QAM, 64QAM, , 256QAM
Conducted Emission	2110 to 2180	2135 + 2162.5	10MHz+15MHz Non- Contiguous	15MHz	QPSK
		2130 + 2162.5	10MHz+15MHz Non- Contiguous	20MHz	QPSK
		2120 + 2160, 2125 + 2165, 2130 + 2170	20MHz+20MHz Non- Contiguous	20MHz	QPSK
		2120 + 2140, 2135 + 2155, 2150 + 2170	20MHz+20MHz Contiguous	-	QPSK

Test Item	Available Frequency (MHz)	Tested Frequency (MHz)	Channel Bandwidth	GAP	Modulation
Radiated Emission Below 1GHz	2110 to 2180	2135 + 2162.5	10MHz+15MHz Non- Contiguous	15MHz	QPSK
		2130 + 2162.5	10MHz+15MHz Non- Contiguous	20MHz	QPSK
		2120 + 2160, 2125 + 2165, 2130 + 2170	20MHz+20MHz Non- Contiguous	20MHz	QPSK
		2120 + 2140, 2135 + 2155, 2150 + 2170	20MHz+20MHz Contiguous	-	QPSK
Radiated Emission Above 1GHz	2110 to 2180	2135 + 2162.5	10MHz+15MHz Non- Contiguous	15MHz	QPSK
		2130 + 2162.5	10MHz+15MHz Non- Contiguous	20MHz	QPSK
		2120 + 2160, 2125 + 2165, 2130 + 2170	20MHz+20MHz Non- Contiguous	20MHz	QPSK
		2120 + 2140, 2135 + 2155, 2150 + 2170	20MHz+20MHz Contiguous	-	QPSK

*****This module is based on FW2XXXX host assembly provide base band data during testing.

NOTE:

1. The conducted output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, the Frequency Stability and Radiated Emission were performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power (System)	Tested By
Output Power	24deg. C, 62%RH	120Vac, 60Hz	Robert Cheng
Modulation characteristics	24deg. C, 62%RH	120Vac, 60Hz	Robert Cheng
Frequency Stability	24deg. C, 62%RH	120Vac, 60Hz	Robert Cheng
Emission Bandwidth	24deg. C, 62%RH	120Vac, 60Hz	Robert Cheng
Band Edge	24deg. C, 62%RH	120Vac, 60Hz	Robert Cheng
Peak To Average Ratio	24deg. C, 62%RH	120Vac, 60Hz	Robert Cheng
Conducted Emission	24deg. C, 62%RH	120Vac, 60Hz	Robert Cheng
Radiated Emission	22deg. C, 63%RH	120Vac, 60Hz	Robert Cheng

Note: Above input power with the AC/DC PSU used during testing.

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

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

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

NOTE: All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

The radiated peak output power shall be according to the specific rule Part 27.50(d)(4) that are limited to EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10MHz for LTE mode.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) 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.

c. 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 b. Record the power level of S.G

d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.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.

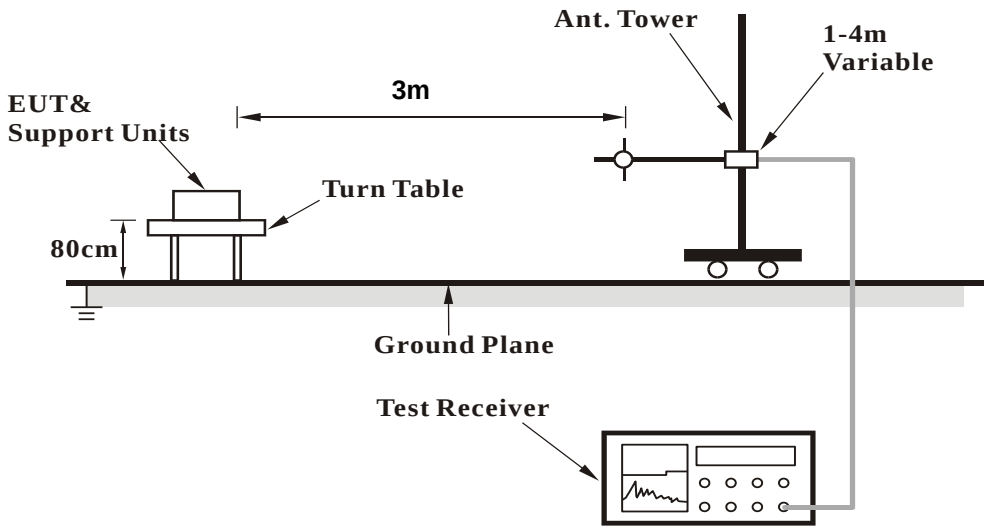
Conducted Power Measurement:

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

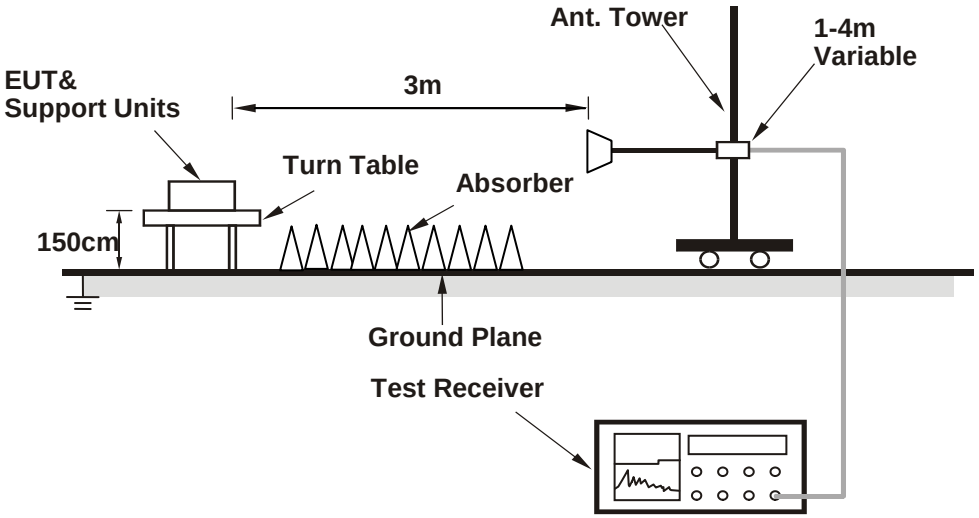
4.1.3 Test Setup

EIRP / ERP MEASUREMENT:

For Radiated Emission below or equal 1GHz



For Radiated Emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

CONDUCTED POWER MEASUREMENT:

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.4 Test Results (Conducted Output Power)

10MHz+15MHz Non-Contiguous GAP 15MHz

Channel Number	Freq. (MHz)	QPSK				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66686+66961	2135+2162.5	24.46	24.45	27.47	558.47	22
Channel Number	Freq. (MHz)	16QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66686+66961	2135+2162.5	24.48	24.42	27.46	557.19	22
Channel Number	Freq. (MHz)	64QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66686+66961	2135+2162.5	24.45	24.49	27.48	559.76	22
Channel Number	Freq. (MHz)	256QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66686+66961	2135+2162.5	24.46	24.39	27.44	554.63	22

10MHz+15MHz Non-Contiguous GAP 20MHz

Channel Number	Freq. (MHz)	QPSK				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66636+66961	2130+2162.5	24.48	24.55	27.53	566.24	22
Channel Number	Freq. (MHz)	16QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66636+66961	2130+2162.5	24.51	24.47	27.50	562.34	22
Channel Number	Freq. (MHz)	64QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66636+66961	2130+2162.5	24.40	24.56	27.49	561.05	22
Channel Number	Freq. (MHz)	256QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66636+66961	2130+2162.5	24.56	24.51	27.55	568.85	22

20MHz+20MHz Non-Contiguous GAP 20MHz

Channel Number	Freq. (MHz)	QPSK				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66536+66936	2120+2160	24.52	24.67	27.61	576.77	20
66586+66986	2125+2165	24.45	24.51	27.49	561.05	20
66636+67036	2130+2170	24.34	24.31	27.34	542.00	20
Channel Number	Freq. (MHz)	16QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66536+66936	2120+2160	24.40	24.79	27.61	576.77	20
66586+66986	2125+2165	24.46	24.61	27.55	568.85	20
66636+67036	2130+2170	24.41	24.52	27.48	559.76	20
Channel Number	Freq. (MHz)	64QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66536+66936	2120+2160	24.52	24.68	27.61	576.77	20
66586+66986	2125+2165	24.56	24.61	27.60	575.44	20
66636+67036	2130+2170	24.53	24.31	27.43	553.35	20
Channel Number	Freq. (MHz)	256QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66536+66936	2120+2160	24.33	24.66	27.51	563.64	20
66586+66986	2125+2165	24.51	24.56	27.55	568.85	20
66636+67036	2130+2170	24.47	24.36	27.43	553.35	20

20MHz+20MHz Contiguous

Channel Number	Freq. (MHz)	QPSK				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66536+66736	2120+2140	23.87	23.89	26.89	488.65	20
66686+66886	2135+2155	24.15	24.16	27.17	521.19	20
66836+67036	2150+2170	23.95	24.03	27.00	501.19	20
Channel Number	Freq. (MHz)	16QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66536+66736	2120+2140	23.86	23.95	26.92	492.04	20
66686+66886	2135+2155	24.15	24.28	27.23	528.45	20
66836+67036	2150+2170	24.15	24.23	27.20	524.81	20
Channel Number	Freq. (MHz)	64QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66536+66736	2120+2140	23.73	23.86	26.81	479.73	20
66686+66886	2135+2155	24.19	24.27	27.24	529.66	20
66836+67036	2150+2170	24.05	24.17	27.12	515.23	20
Channel Number	Freq. (MHz)	256QAM				Setting
		Conducted Average Power (dBm)		Total Power (dBm)	Total Power (mW)	
		Chain0	Chain1			
66536+66736	2120+2140	23.89	23.95	26.93	493.17	20
66686+66886	2135+2155	24.19	24.28	27.25	530.88	20
66836+67036	2150+2170	24.06	24.15	27.12	515.23	20

4.1.5 Test Results (EIRP Power)

10MHz+15MHz Non-Contiguous GAP 15MHz

EIRP POWER (QPSK)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66686+66961	2135+2162.5	22.47	6.42	28.89	774.46	62.14
EIRP POWER (16QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66686+66961	2135+2162.5	22.37	6.42	28.79	756.83	62.14
EIRP POWER (64QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66686+66961	2135+2162.5	22.24	6.42	28.66	734.51	62.14
EIRP POWER (256QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66686+66961	2135+2162.5	22.10	6.42	28.52	711.21	62.14

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

10MHz+15MHz Non-Contiguous GAP 20MHz

EIRP POWER (QPSK)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66636+66961	2130+2162.5	22.53	6.42	28.95	785.24	62.14
EIRP POWER (16QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66636+66961	2130+2162.5	22.35	6.42	28.77	753.36	62.14
EIRP POWER (64QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66636+66961	2130+2162.5	22.32	6.42	28.74	748.17	62.14
EIRP POWER (256QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66636+66961	2130+2162.5	22.22	6.42	28.64	731.14	62.14

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

20MHz+20MHz Non-Contiguous GAP 20MHz

EIRP POWER (QPSK)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66536+66936	2120+2160	22.57	6.42	28.99	792.50	62.14
66586+66986	2125+2165	22.78	6.42	29.20	831.76	62.14
66636+67036	2130+2170	22.57	6.42	28.99	792.50	62.14
EIRP POWER (16QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66536+66936	2120+2160	22.46	6.42	28.88	772.68	62.14
66586+66986	2125+2165	22.45	6.42	28.87	770.90	62.14
66636+67036	2130+2170	22.55	6.42	28.97	788.86	62.14
EIRP POWER (64QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66536+66936	2120+2160	22.28	6.42	28.70	741.31	62.14
66586+66986	2125+2165	22.13	6.42	28.55	716.14	62.14
66636+67036	2130+2170	22.09	6.42	28.51	709.58	62.14
EIRP POWER (256QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66536+66936	2120+2160	22.17	6.42	28.59	722.77	62.14
66586+66986	2125+2165	22.07	6.42	28.49	706.32	62.14
66636+67036	2130+2170	22.03	6.42	28.45	699.84	62.14

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

20MHz+20MHz Contiguous

EIRP POWER (QPSK)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66536+66736	2120+2140	22.89	6.42	29.31	853.10	62.14
66686+66886	2135+2155	22.70	6.42	29.12	816.58	62.14
66836+67036	2150+2170	22.77	6.42	29.19	829.85	62.14
EIRP POWER (16QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66536+66736	2120+2140	22.67	6.42	29.09	810.96	62.14
66686+66886	2135+2155	22.46	6.42	28.88	772.68	62.14
66836+67036	2150+2170	22.47	6.42	28.89	774.46	62.14
EIRP POWER (64QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66536+66736	2120+2140	22.47	6.42	28.89	774.46	62.14
66686+66886	2135+2155	22.22	6.42	28.64	731.14	62.14
66836+67036	2150+2170	22.18	6.42	28.60	724.44	62.14
EIRP POWER (256QAM)						
Channel No.	Frequency (MHz)	S.G Power Value(dBm)	Correction Factor (dB)	Peak Output Power		Limit (dBm)
				dBm	mW	
66536+66736	2120+2140	22.32	6.42	28.74	748.17	62.14
66686+66886	2135+2155	22.11	6.42	28.53	712.85	62.14
66836+67036	2150+2170	22.08	6.42	28.50	707.95	62.14

NOTE: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Modulation characteristics Measurement

4.2.1 Limits of Modulation characteristics

N/A

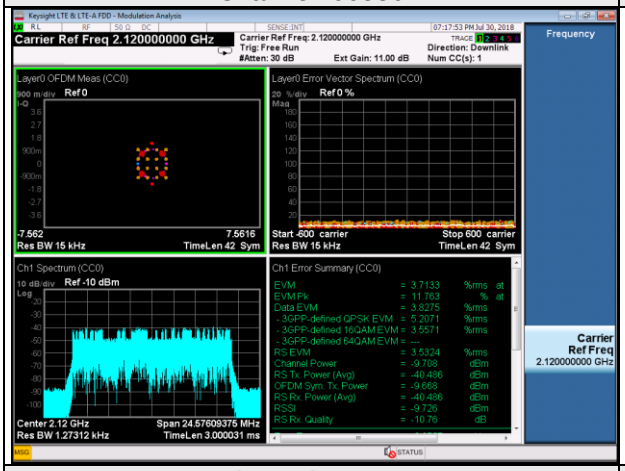
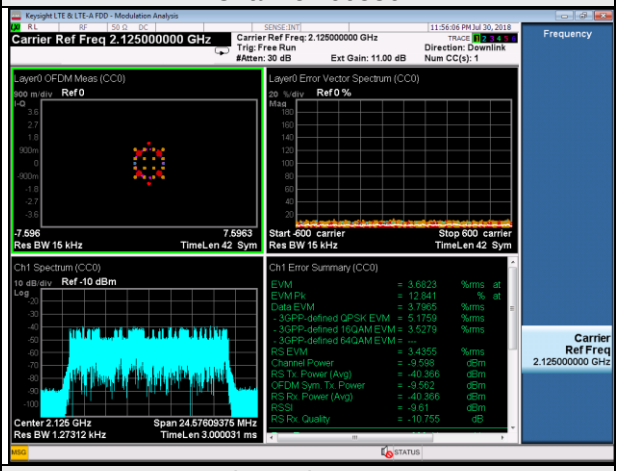
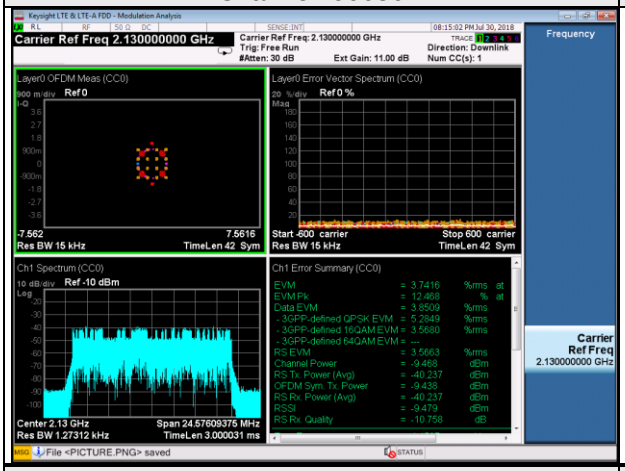
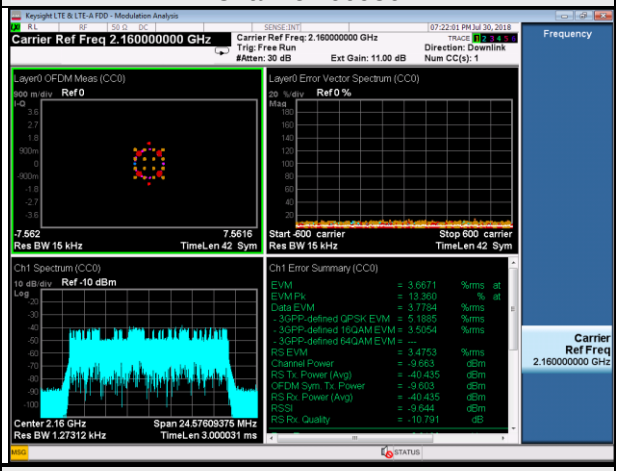
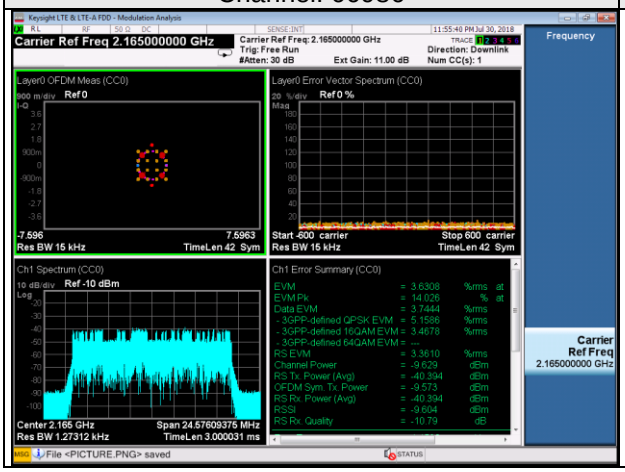
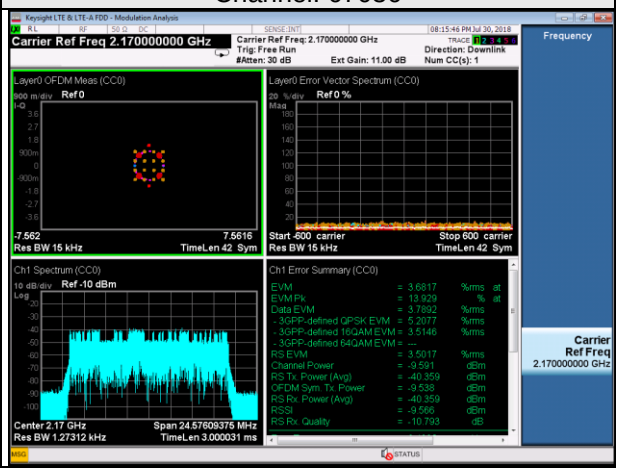
4.2.2 Test Procedure

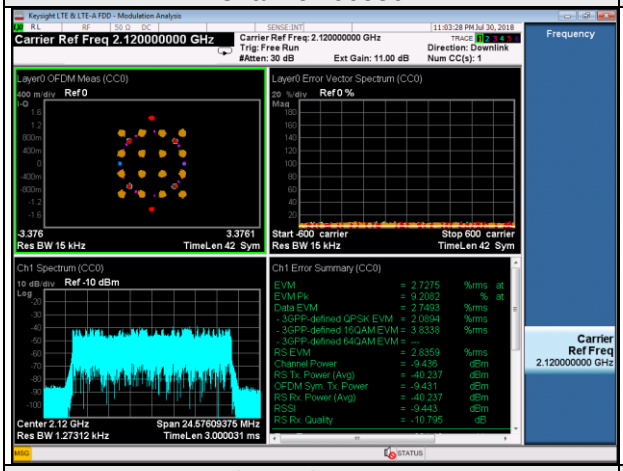
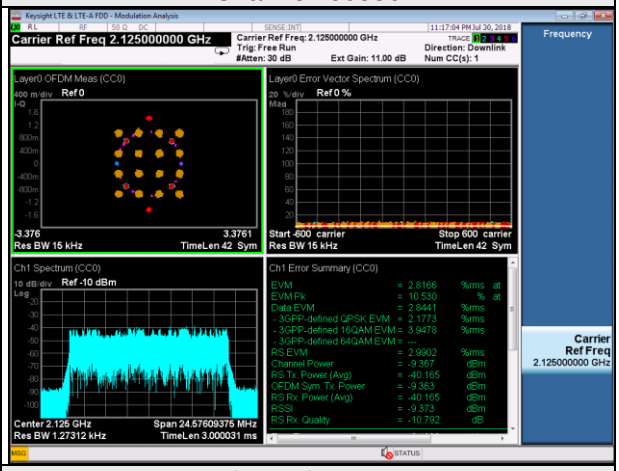
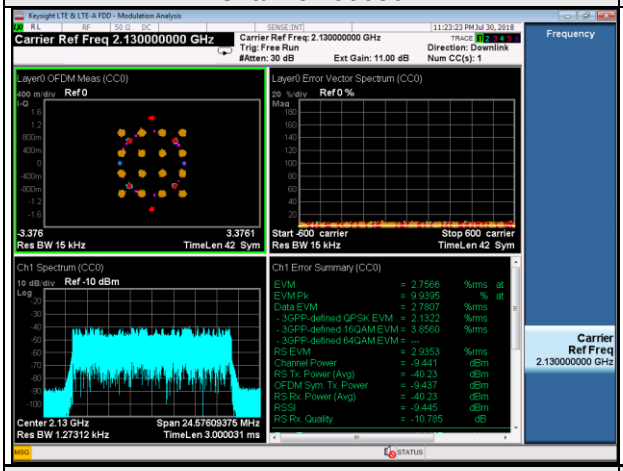
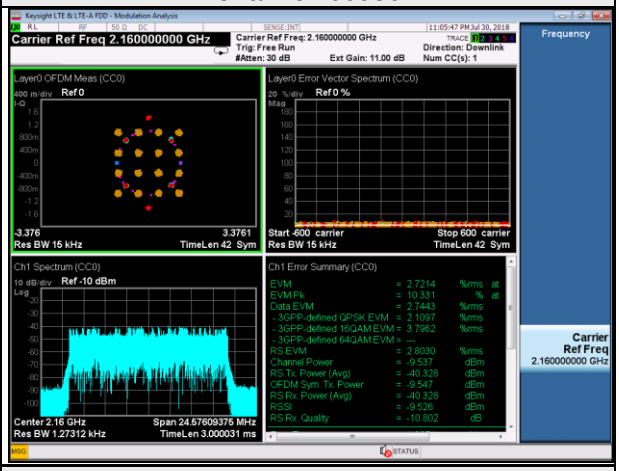
Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.3 Test Setup

4.2.4 Test Results

20MHz+20MHz Non-Contiguous GAP 20MHz Chain 0

Spectrum Plot of Measurement Value	
QPSK	
Channel: 66536	Channel: 66586
	
Channel: 66636	Channel: 66936
	
Channel: 66986	Channel: 67036
	

16QAM	
Channel: 66536	Channel: 66586
	
Channel: 66636	Channel: 66936
	
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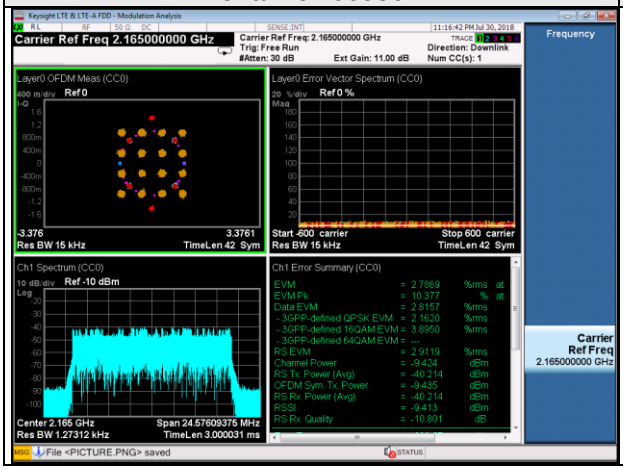
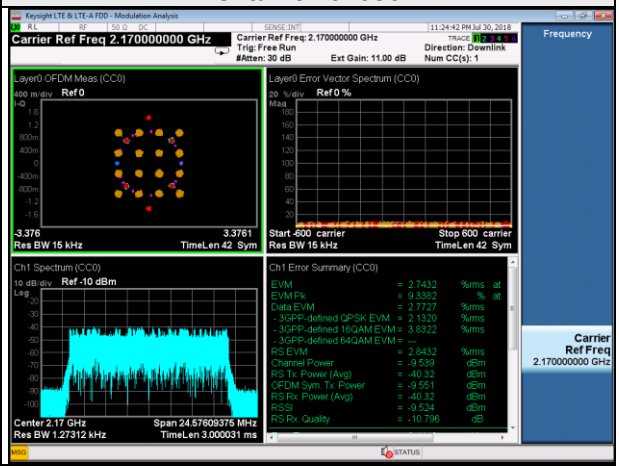
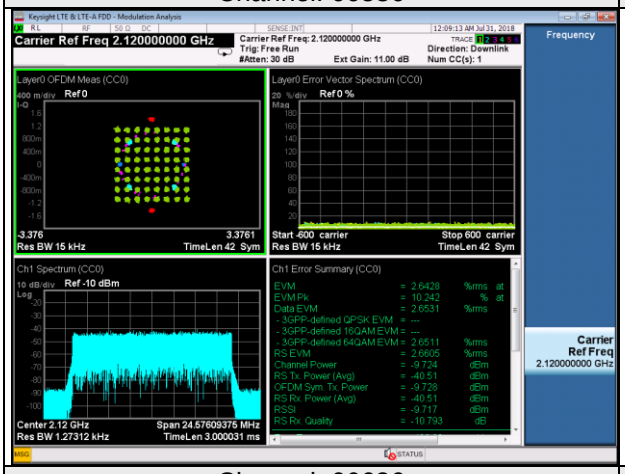
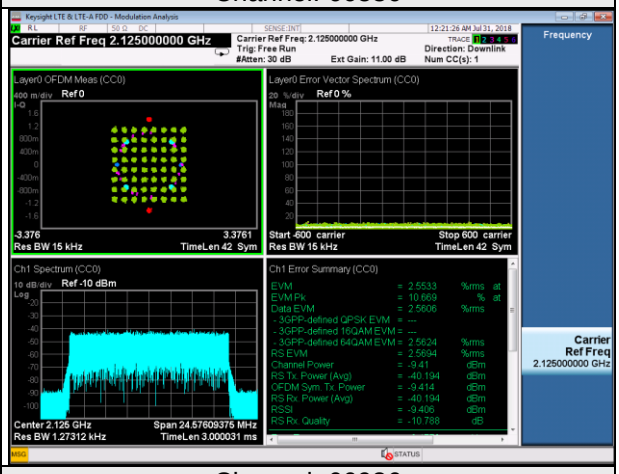
	

64QAM	
Channel: 66536	Channel: 66586
	
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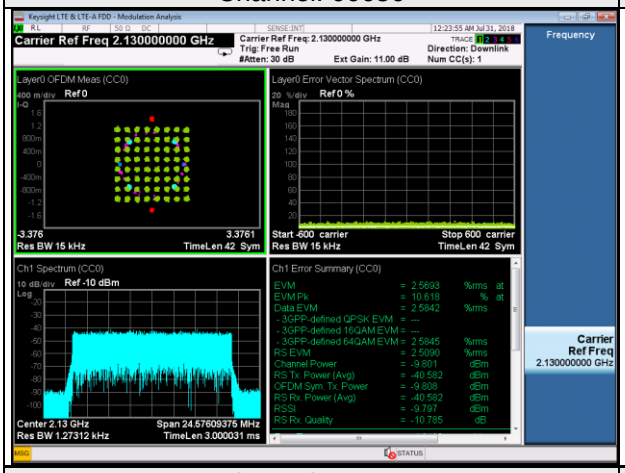
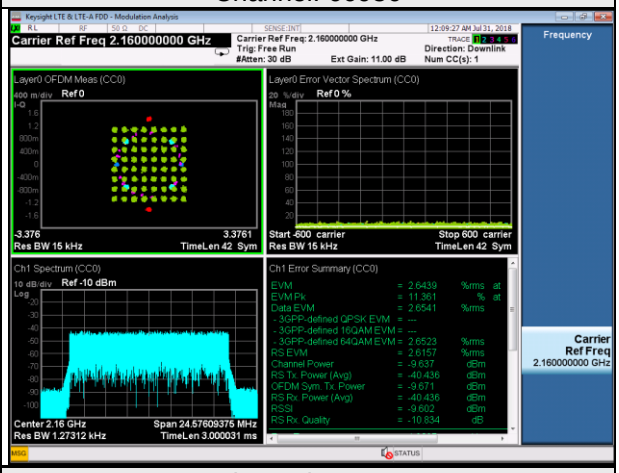
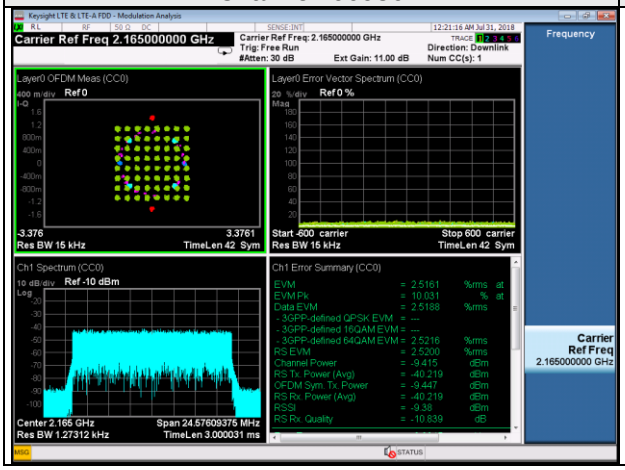
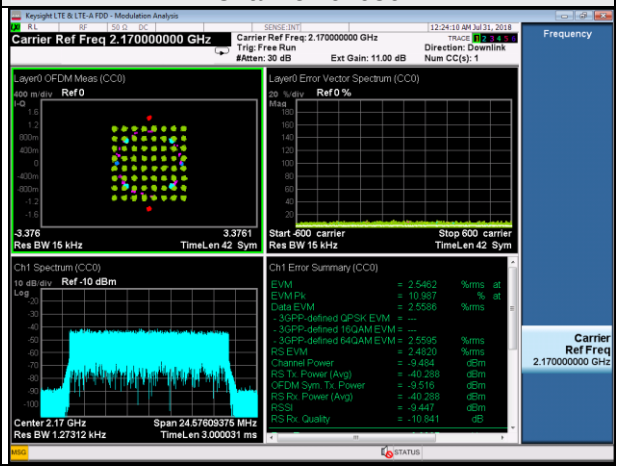
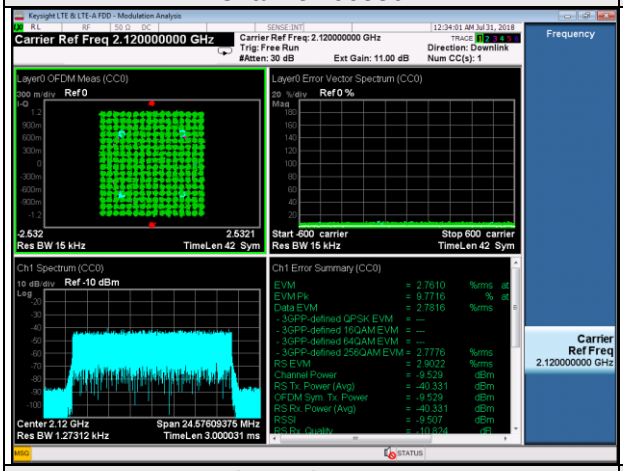
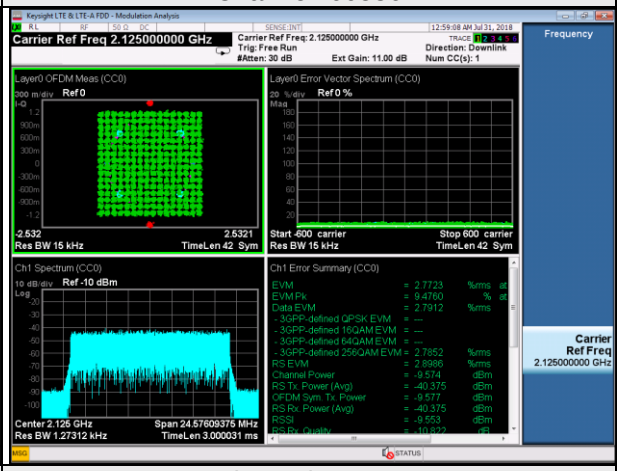
	
Channel: 66986	Channel: 67036
	

256QAM

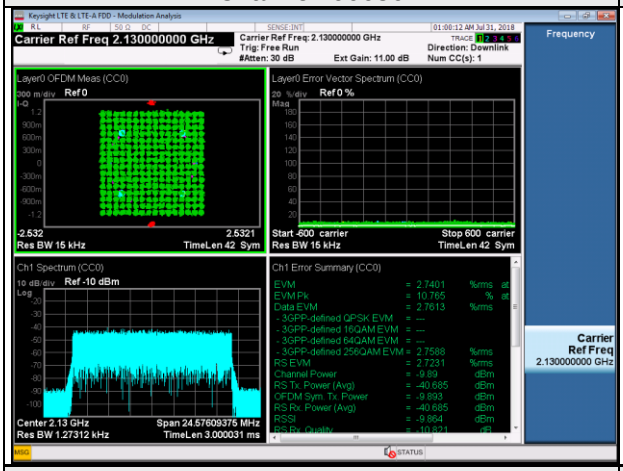
Channel: 66536



Channel: 66586



Channel: 66636



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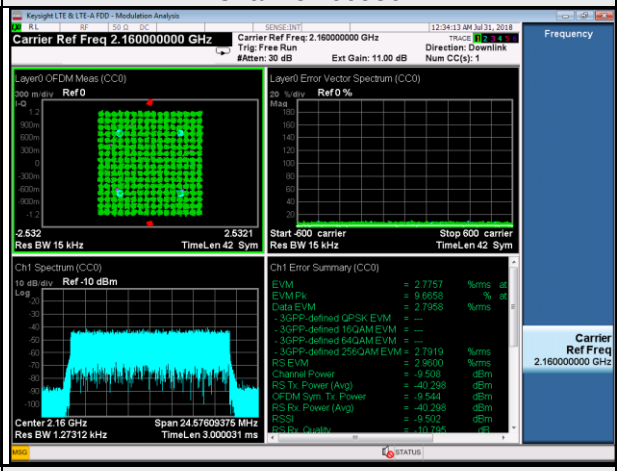

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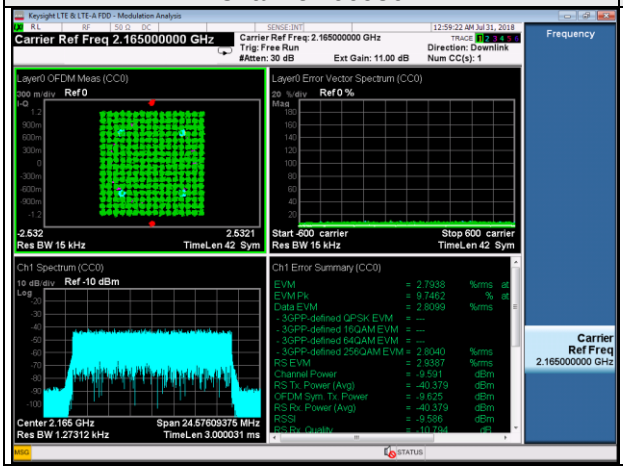
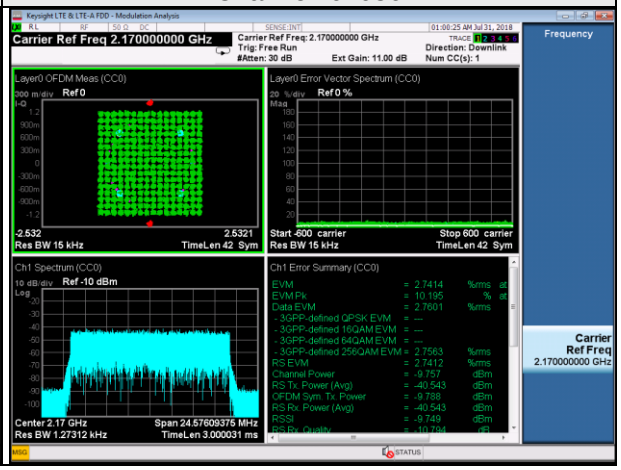
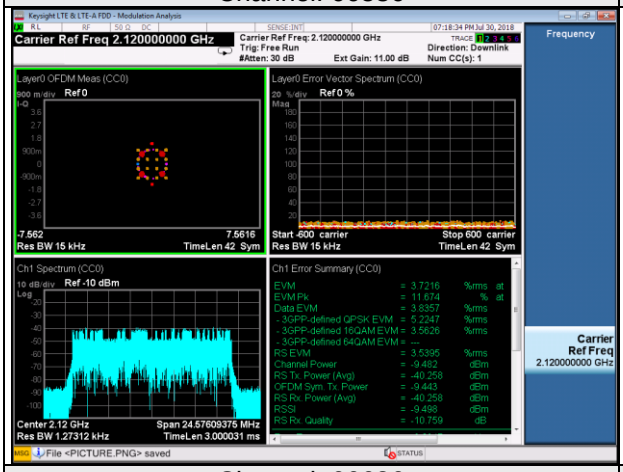
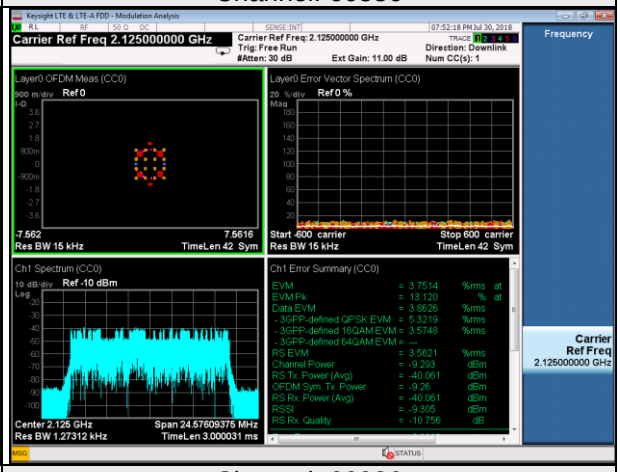
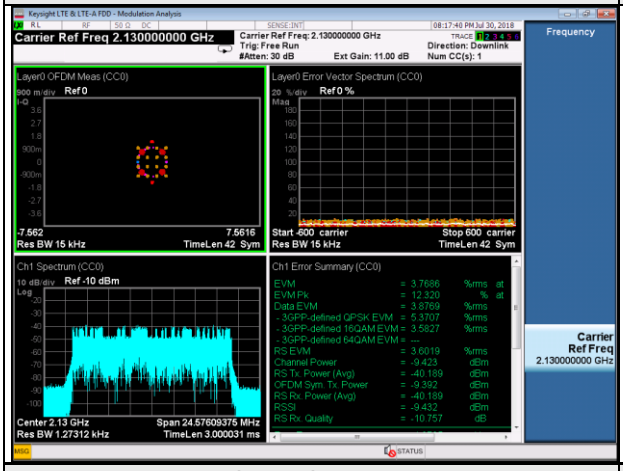
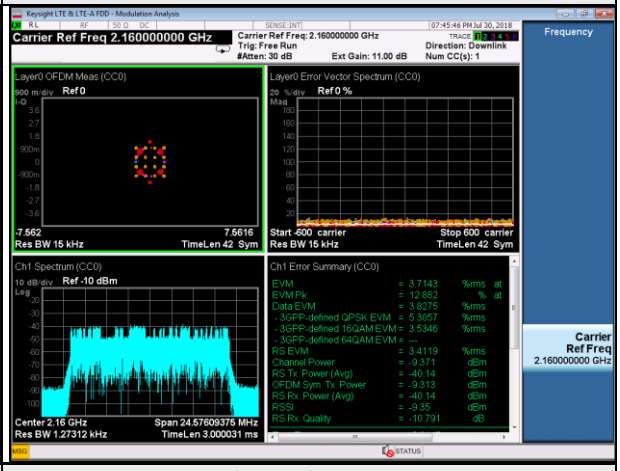
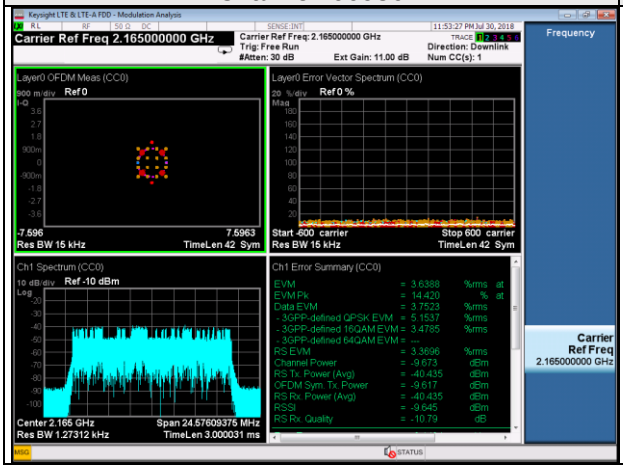
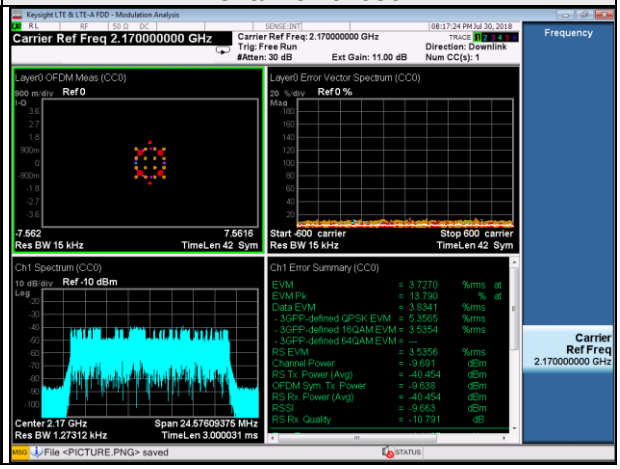


Channel: 67036

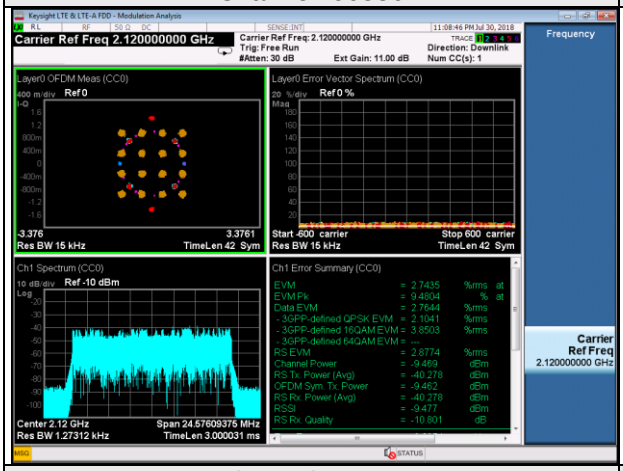


20MHz+20MHz Non-Contiguous GAP 20MHz Chain 1

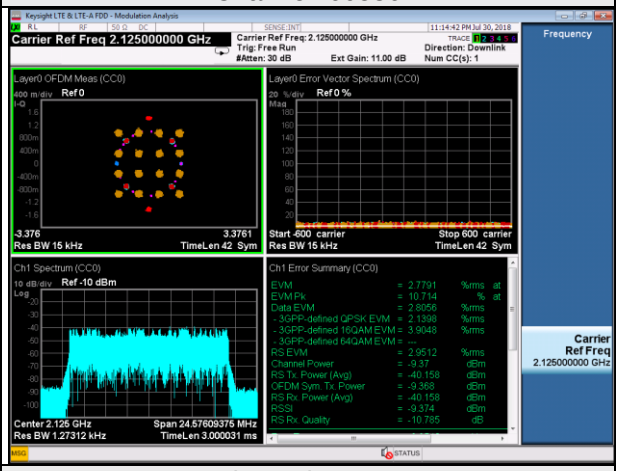
Spectrum Plot of Measurement Value	
QPSK	
Channel: 66536	Channel: 66586
	
Channel: 66636	Channel: 66936
	
Channel: 66986	Channel: 67036
	

16QAM

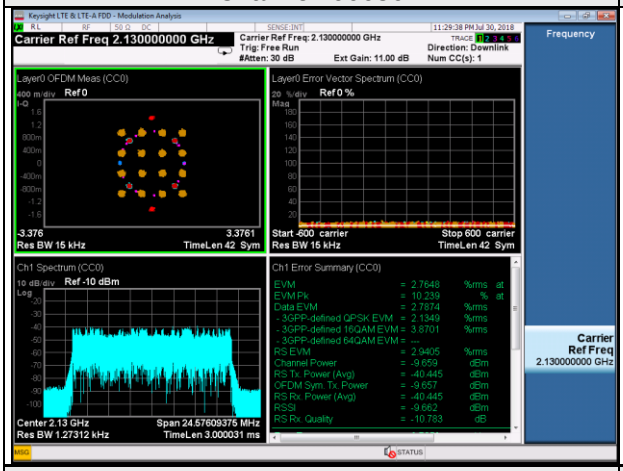
Channel: 66536



Channel: 66586



Channel: 66636



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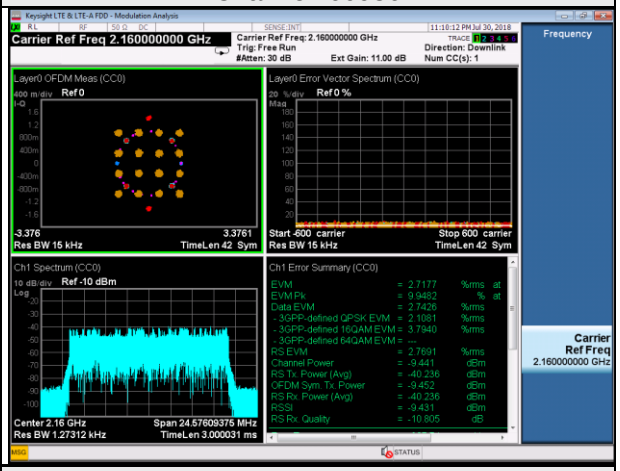

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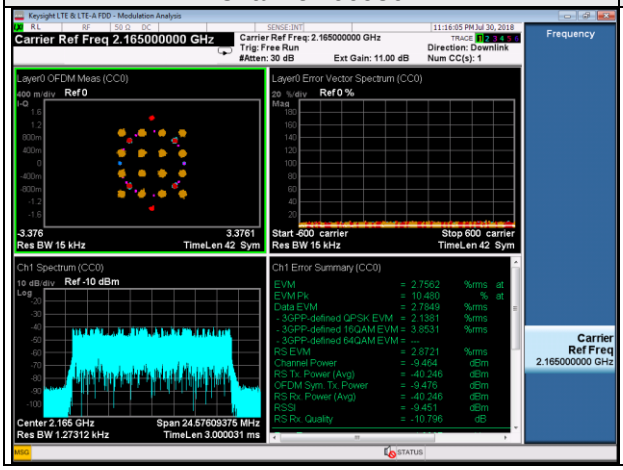

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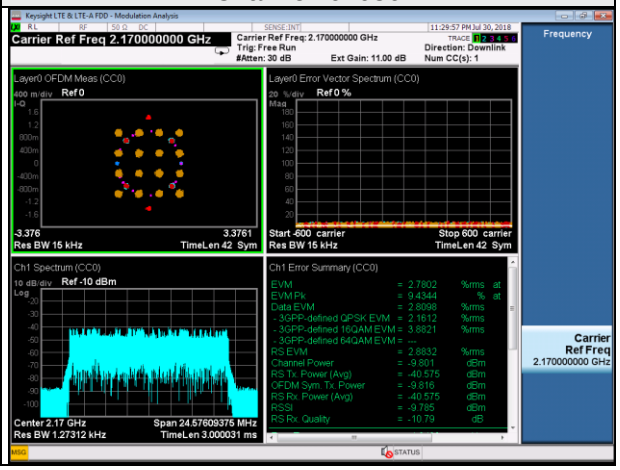

64QAM	
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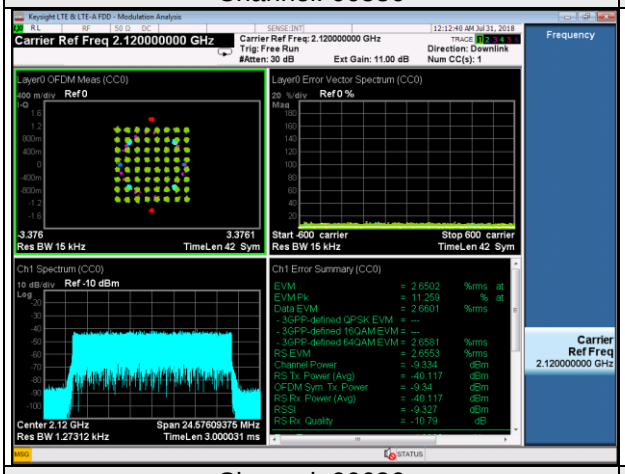	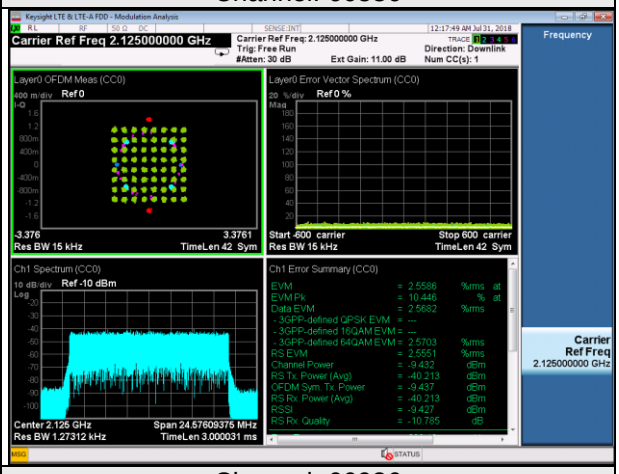
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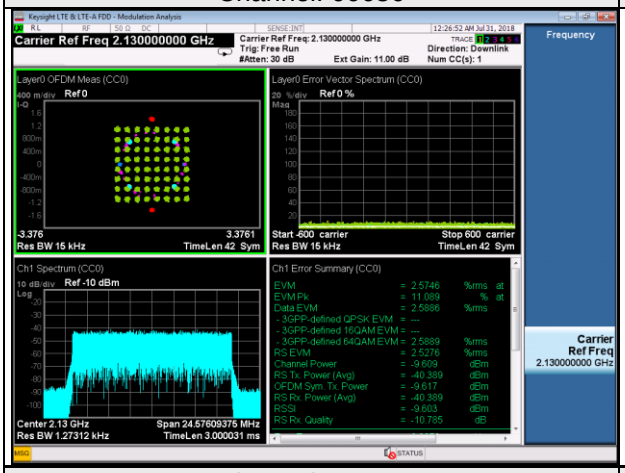	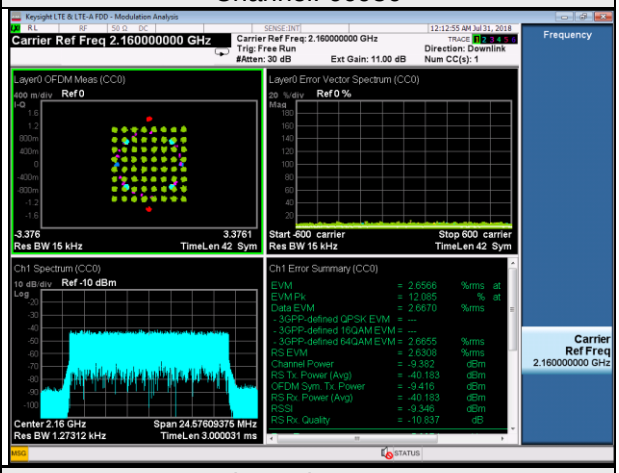
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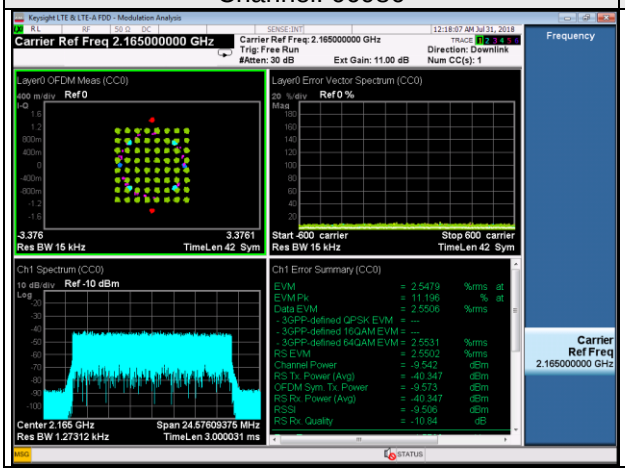	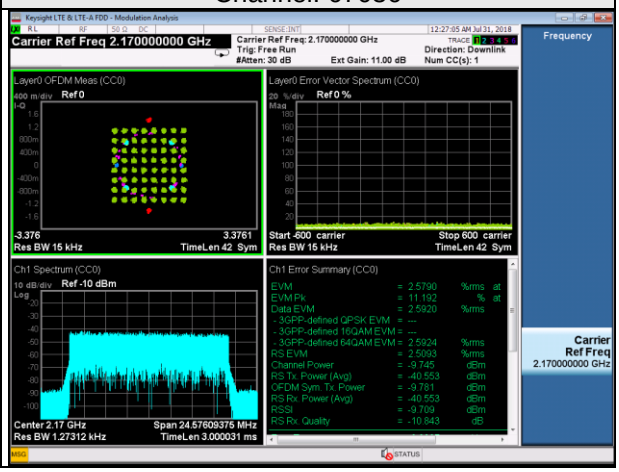

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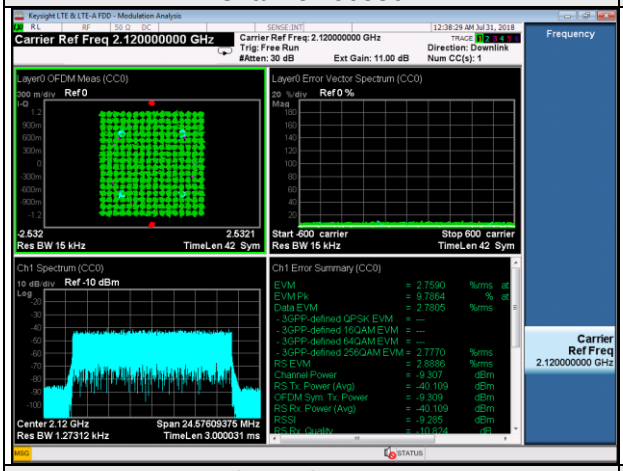

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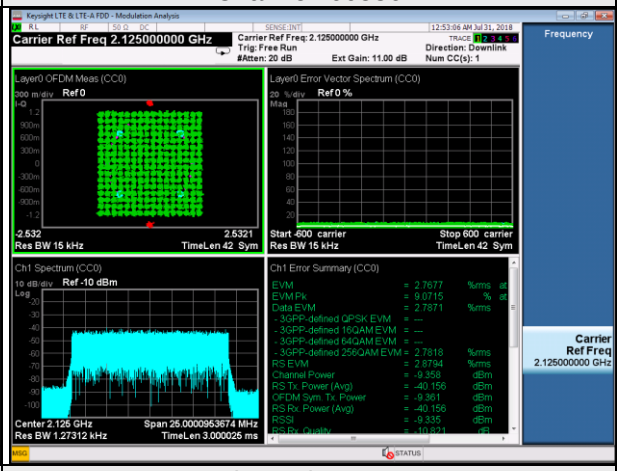

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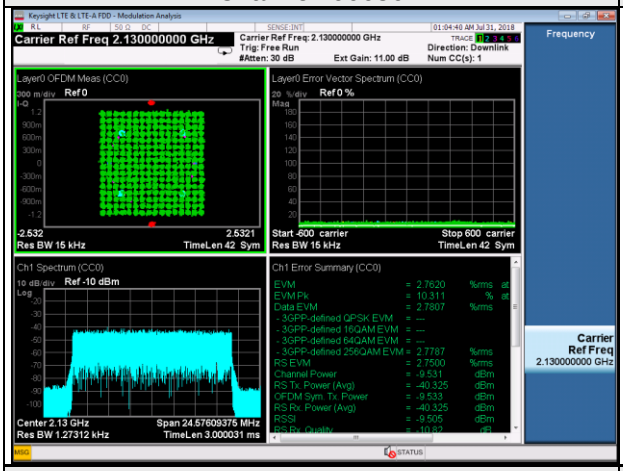

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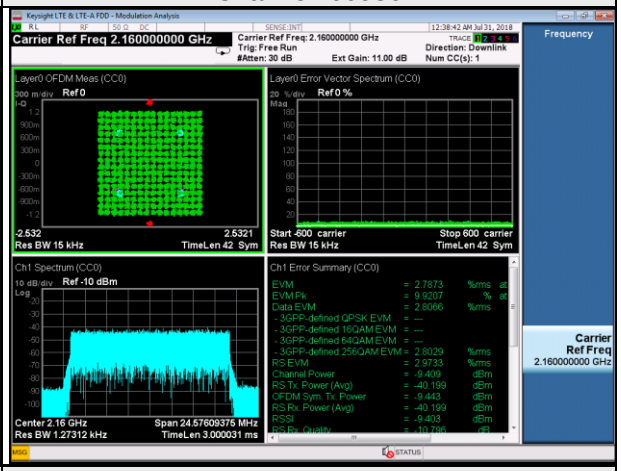

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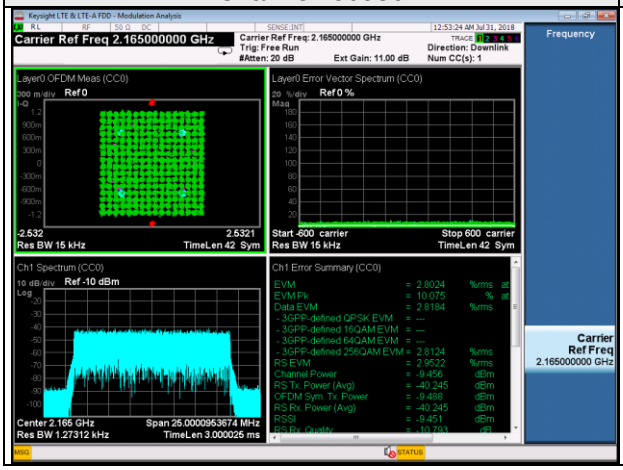

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