

FCC TEST REPORT

(PART 27)

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Address:	4F-2#,Lianjian Science&Industry Park, Huarong Road, Dalang,Longhua District, Shenzhen City, Guangdong Province, P.R.China

Manufacturer or Supplier:	Shenzhen Neoway Technology Co.,Ltd.
Address:	4F-2#,Lianjian Science&Industry Park, Huarong Road, Dalang,Longhua District, Shenzhen City, Guangdong Province, P.R.China
Product:	Cat.M1 Module
Brand Name:	neoway
Model Name:	N27-W3
FCC ID:	PJ7-N27-W3
Date of tests:	Nov. 23, 2019 ~ Jan. 09, 2020

The tests have been carried out according to the requirements of the following standard:

☒ FCC Part 27, Subpart C, L ☒ ANSI/TIA/EIA-603- D
☒ FCC Part 2 ☒ ANSI/TIA/EIA-603-E ☒ ANSI C63.26-2015

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
	
Date: Jan. 14, 2020	Date: Jan. 14, 2020

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF191122W002-3	Original release	Jan. 14, 2020

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 27 & Part 2		
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT
2.1046 27.50(d)(4)	Maximum Peak Output Power	Compliance
2.1055 27.54	Frequency Stability	Compliance
2.1049 27.53(h)	Occupied Bandwidth	Compliance
27.50(d)(5)	Peak to average ratio	Compliance
27.53(h)	Band Edge Measurements	Compliance
2.1051 27.53(h)	Conducted Spurious Emissions	Compliance
2.1053 27.53(h)	Radiated Spurious Emissions	Compliance

1.1 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	UNCERTAINTY
Frequency Stability	$\pm 76.97\text{Hz}$
Radiated emissions & Radiated Power (30MHz~1GMHz)	$\pm 4.98\text{dB}$
Radiated emissions & Radiated Power (1GMHz ~6GMHz)	$\pm 4.70\text{dB}$
Radiated emissions (6GMHz ~18GMHz)	$\pm 4.60\text{dB}$
Radiated emissions (18GMHz ~40GMHz)	$\pm 4.12\text{dB}$
Conducted emissions	$\pm 4.01\text{dB}$
Occupied Channel Bandwidth	$\pm 43.58\text{KHz}$
Conducted Output power	$\pm 2.06\text{dB}$
Band Edge Measurements	$\pm 4.70\text{dB}$
Peak to average ratio	$\pm 0.76\text{dB}$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,19	Feb. 25,20
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 26,19	Feb. 25,20
Bilog Antenna 1	ETS-LINDGREN	3143B	00161964	Feb. 26,19	Feb. 25,20
Bilog Antenna 2	ETS-LINDGREN	3143B	00161965	Feb. 26,19	Feb. 25,20
Horn Antenna 1	ETS-LINDGREN	3117	00168728	Feb. 26,19	Feb. 25,20
Horn Antenna 2	ETS-LINDGREN	3117	00168692	Nov. 24, 19	Nov. 23, 20
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40 -K-SG/QMS-00 361	15433	Nov. 24, 19	Nov. 23, 20
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 26,19	Feb. 25,20
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 24,19	Jun. 23,20
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 24,19	Jun. 23,20
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Jun. 24,19	Jun. 23,20
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn- CT0001143-1216	Feb. 26,19	Feb. 25,20
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	ADT	ADT_Radiated V7.6.15.9.2	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SM A	1505	Jun. 24,19	Jun. 23,20
Power Meter	Anritsu	ML2495A	1506002	Feb. 26,19	Feb. 25,20
Power Sensor	Anritsu	MA2411B	1339352	Feb. 26,19	Feb. 25,20
Humid & Temp Programmable Tester	Juyi	ITH-120-45-CP -AR	IAA1504-001	Jun. 24,19	Jun. 23,20
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 26,19	Feb. 25,20

- NOTE:** 1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Cat.M1 Module	
BRAND NAME	neoway	
MODEL NAME	N27-W3	
POWER SUPPLY	$V_{\min}=3.1\text{Vdc}$, $V_{\text{nor}}=3.6\text{Vdc}$, $V_{\max}=4.3\text{Vdc}$	
MODULATION TECHNOLOGY	LTE CAT-M1	QPSK, 16QAM
FREQUENCY RANGE	LTE CAT-M1 Band 4 Channel Bandwidth: 1.4MHz	1710.7MHz ~ 1754.3MHz
	LTE CAT-M1 Band 4 Channel Bandwidth: 3MHz	1711.5MHz ~ 1753.5MHz
	LTE CAT-M1 Band 4 Channel Bandwidth: 5MHz	1712.5MHz ~ 1752.5MHz
	LTE CAT-M1 Band 4 Channel Bandwidth: 10MHz	1715.0MHz ~ 1750.0MHz
	LTE CAT-M1 Band 4 Channel Bandwidth: 15MHz	1717.5MHz ~ 1747.5MHz
	LTE CAT-M1 Band 4 Channel Bandwidth: 20MHz	1720.0MHz ~ 1745.0MHz
	LTE CAT-M1 Band 66 Channel Bandwidth: 1.4MHz	1710.7MHz ~ 1779.3MHz
	LTE CAT-M1 Band 66 Channel Bandwidth: 3MHz	1711.5MHz ~ 1778.5MHz
	LTE CAT-M1 Band 66 Channel Bandwidth: 5MHz	1712.5MHz ~ 1777.5MHz
	LTE CAT-M1 Band 66 Channel Bandwidth: 10MHz	1715MHz ~ 1775MHz
	LTE CAT-M1 Band 66 Channel Bandwidth: 15MHz	1717.5MHz ~ 1772.5MHz
	LTE CAT-M1 Band 66 Channel Bandwidth: 20MHz	1720MHz ~ 1770MHz
EMISSION DESIGNATOR	LTE CAT-M1 Band 4 Channel Bandwidth: 1.4MHz	QPSK: 1M11G7D
		16QAM: 1M10W7D
	LTE CAT-M1 Band 4 Channel Bandwidth: 3MHz	QPSK: 1M27G7D
		16QAM: 1M14W7D
	LTE CAT-M1 Band 4 Channel Bandwidth: 5MHz	QPSK: 1M09G7D
		16QAM: 911KW7D
	LTE CAT-M1 Band 4 Channel Bandwidth: 10MHz	QPSK: 1M08G7D
		16QAM: 911KW7D
	LTE CAT-M1 Band 4 Channel Bandwidth: 15MHz	QPSK: 1M09G7D
		16QAM: 913KW7D



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VERITAS**

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	LTE CAT-M1 Band 4 Channel Bandwidth: 20MHz	QPSK: 1M08G7D 16QAM: 912KW7D
	LTE CAT-M1 Band 66 Channel Bandwidth: 1.4MHz	QPSK: 1M26G7D 16QAM: 1M10W7D
	LTE CAT-M1 Band 66 Channel Bandwidth: 3MHz	QPSK: 1M26G7D 16QAM: 1M09W7D
	LTE CAT-M1 Band 66 Channel Bandwidth: 5MHz	QPSK: 1M08G7D 16QAM: 910KW7D
	LTE CAT-M1 Band 66 Channel Bandwidth: 10MHz	QPSK: 1M08G7D 16QAM: 907KW7D
	LTE CAT-M1 Band 66 Channel Bandwidth: 15MHz	QPSK: 1M09G7D 16QAM: 914KW7D
	LTE CAT-M1 Band 66 Channel Bandwidth: 20MHz	QPSK: 1M08G7D 16QAM: 908KW7D
MAX. ERP/EIRP POWER	LTE CAT-M1 Band 4 Channel Bandwidth: 1.4MHz	333mW
	LTE CAT-M1 Band 4 Channel Bandwidth: 3MHz	334mW
	LTE CAT-M1 Band 4 Channel Bandwidth: 5MHz	337mW
	LTE CAT-M1 Band 4 Channel Bandwidth: 10MHz	340mW
	LTE CAT-M1 Band 4 Channel Bandwidth: 15MHz	344mW
	LTE CAT-M1 Band 4 Channel Bandwidth: 20MHz	347mW
	LTE CAT-M1 Band 66 Channel Bandwidth: 1.4MHz	337mW
	LTE CAT-M1 Band 66 Channel Bandwidth: 3MHz	338mW
	LTE CAT-M1 Band 66 Channel Bandwidth: 5MHz	335mW
	LTE CAT-M1 Band 66 Channel Bandwidth: 10MHz	330mW
	LTE CAT-M1 Band 66 Channel Bandwidth: 15MHz	337mW
	LTE CAT-M1 Band 66 Channel Bandwidth: 20MHz	339mW
ANTENNA TYPE	Monopole Antenna with 2dBi gain for LTE CAT-M1 Band 4/LTE CAT-M1 Band 66	
HW VERSION	V1.1	
SW VERSION	N27-Q01-STDBZ-01B	
DATA CABLE	Refer to user's manual	



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VERITAS**

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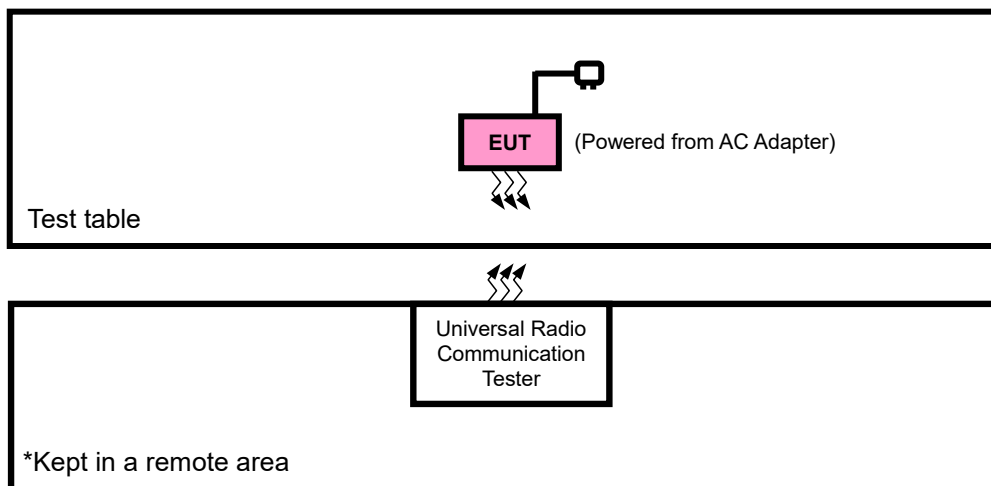
NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
LTE CAT-M1	1TX/1RX

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



2.3 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
1	Adapter	JINGSAI	CLS-050200	N/A	N/A
2	DC source	LONG WEI	PS-6403D	010934269	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	Unshielded, Detachable 1.8m
2	DC Line: Unshielded, Detachable 1.0m

2.4 DESCRIPTION OF TEST MODES

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 in radiated emission was found when positioned on X-plane for LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
-	EUT + Adapter with LTE link

LTE CAT-M1 BAND 4

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
FREQUENCY STABILITY	19957 to 20393	19957, 20393	1.4MHz	QPSK	2 RB / 0 RB Offset
	19965 to 20385	19965, 20385	3MHz	QPSK	2 RB / 0 RB Offset
	19975 to 20375	19975, 20375	5MHz	QPSK	2 RB / 0 RB Offset
	20000 to 20350	20000, 20350	10MHz	QPSK	2 RB / 0 RB Offset
	20025 to 20325	20025, 20325	15MHz	QPSK	2 RB / 0 RB Offset
	20050 to 20300	20050, 20300	20MHz	QPSK	2 RB / 0 RB Offset
OCCUPIED BANDWIDTH	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
PEAK TO AVERAGE RATIO	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
BAND EDGE	19957 to 20393	19957	1.4MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 6 RB / 0 RB Offset
		20393	1.4MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 5 RB / 0 RB Offset
	19965 to 20385	19965	3MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 6 RB / 0 RB Offset
		20385	3MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 5 RB / 0 RB Offset
	19975 to 20375	19975	5MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 6 RB / 0 RB Offset
		20375	5MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 5 RB / 0 RB Offset
	20000 to 20350	20000	10MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 6 RB / 0 RB Offset
		20350	10MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 5 RB / 0 RB Offset

BAND EDGE	20025 to 20325	20025	15MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
					6 RB / 0 RB Offset
	20050 to 20300	20325	15MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
					5 RB / 0 RB Offset
		20050	20MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
					6 RB / 0 RB Offset
CONDCUDED EMISSION	20025 to 20325	20300	20MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
					5 RB / 0 RB Offset
	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK	2 RB / 0 RB Offset
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK	2 RB / 0 RB Offset
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK	2 RB / 0 RB Offset
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK	2 RB / 0 RB Offset
RADIATED EMISSION	20025 to 20325	20025, 20175, 20325	15MHz	QPSK	2 RB / 0 RB Offset
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK	2 RB / 0 RB Offset
	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK	2 RB / 0 RB Offset
	19965 to 20385	20175	3MHz	QPSK	2 RB / 0 RB Offset
	19975 to 20375	20175	5MHz	QPSK	2 RB / 0 RB Offset
	20000 to 20350	20175	10MHz	QPSK	2 RB / 0 RB Offset
	20025 to 20325	20175	15MHz	QPSK	2 RB / 0 RB Offset
	20050 to 20300	20175	20MHz	QPSK	2 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE CAT-M1 BAND 66

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	131979 to 132665	131979, 132322, 132665	1.4MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	131987 to 132657	131987, 132322, 132657	3MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	131997 to 132647	131997, 132322, 132647	5MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	132022 to 132622	132022, 132322, 132622	10MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	132047 to 132597	132047, 132322, 132597	15MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
FREQUENCY STABILITY	131979 to 132665	131979, 132665	1.4MHz	QPSK	2 RB / 0 RB Offset
	131987 to 132657	131987, 132657	3MHz	QPSK	2 RB / 0 RB Offset
	131997 to 132647	131997, 132647	5MHz	QPSK	2 RB / 0 RB Offset
	132022 to 132622	132022, 132622	10MHz	QPSK	2 RB / 0 RB Offset
	132047 to 132597	132047, 132597	15MHz	QPSK	2 RB / 0 RB Offset
	132072 to 132572	132072, 132572	20MHz	QPSK	2 RB / 0 RB Offset
OCCUPIED BANDWIDTH	131979 to 132665	131979, 132322, 132665	1.4MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
	131987 to 132657	131987, 132322, 132657	3MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 1 RB Offset
	131997 to 132647	131997, 132322, 132647	5MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
	132022 to 132622	132022, 132322, 132622	10MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
	132047 to 132597	132047, 132322, 132597	15MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK, 16QAM,	6 RB / 0 RB Offset 5 RB / 0 RB Offset
PEAK TO AVERAGE RATIO	131979 to 132665	131979, 132322, 132665	1.4MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	131987 to 132657	131987, 132322, 132657	3MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	131997 to 132647	131997, 132322, 132647	5MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	132022 to 132622	132022, 132322, 132622	10MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	132047 to 132597	132047, 132322, 132597	15MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
BAND EDGE	131979 to 132665	131979	1.4MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 6 RB / 0 RB Offset
		132665	1.4MHz	QPSK, 16QAM,	2 RB / 0 RB Offset 5 RB / 0 RB Offset

	131987 to 132657	131987	3MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
		132657	3MHz	QPSK, 16QAM,	6 RB / 0 RB Offset
	131997 to 132647	131997	5MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
		132647	5MHz	QPSK, 16QAM,	6 RB / 0 RB Offset
	132022 to 132622	132022	10MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
		132622	10MHz	QPSK, 16QAM,	6 RB / 0 RB Offset
	132047 to 132597	132047	15MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
		132597	15MHz	QPSK, 16QAM,	6 RB / 0 RB Offset
	132072 to 132572	132072	20MHz	QPSK, 16QAM,	2 RB / 0 RB Offset
		132572	20MHz	QPSK, 16QAM,	6 RB / 0 RB Offset
	CONDCUDED EMISSION	131979 to 132665	131979, 132322, 132665	1.4MHz	QPSK
		131987 to 132657	131987, 132322, 132657	3MHz	QPSK
		131997 to 132647	131997, 132322, 132647	5MHz	QPSK
		132022 to 132622	132022, 132322, 132622	10MHz	QPSK
		132047 to 132597	132047, 132322, 132597	15MHz	QPSK
		132072 to 132572	132072, 132322, 132572	20MHz	QPSK
RADIATED EMISSION	131979 to 132665	132322	1.4MHz	QPSK	2 RB / 0 RB Offset
	131987 to 132657	132322	3MHz	QPSK	2 RB / 0 RB Offset
	131997 to 132647	132322	5MHz	QPSK	2 RB / 0 RB Offset
	132022 to 132622	132322	10MHz	QPSK	2 RB / 0 RB Offset
	132047 to 132597	132322	15MHz	QPSK	2 RB / 0 RB Offset
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK	2 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	23deg. C, 70%RH	5Vdc from adapter	Tony Xiong
FREQUENCY STABILITY	23deg. C, 70%RH	DC 3.1V/3.6V/4.3V	Kevin Zhang
OCCUPIED BANDWIDTH	23deg. C, 70%RH	5Vdc from adapter	Kevin Zhang
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	5Vdc from adapter	Kevin Zhang
BAND EDGE	23deg. C, 70%RH	5Vdc from adapter	Kevin Zhang
CONDUCTED EMISSION	23deg. C, 70%RH	5Vdc from adapter	Kevin Zhang
RADIATED EMISSION	23deg. C, 70%RH	5Vdc from adapter	Tony Xiong



Test Report No.: RF191122W002-3

2.5 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-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

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

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_{\text{T}} - L_{\text{C}}$$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively

(expressed in the same units as P_{Meas} , typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_{T} = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

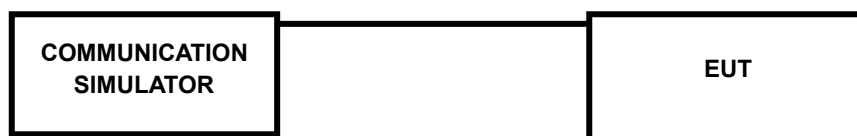
L_{C} = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

CONDUCTED POWER MEASUREMENT:

- 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.

3.1.3 TEST SETUP

CONDUCTED POWER MEASUREMENT:



3.1.4 TEST RESULTS

AVERAGE CONDUCTED OUTPUT POWER (dBm)

LTE CAT-M1 Band 4						
BW	Modulation	RB Size	RB Offset	Low CH 19957	Mid CH 20175	High CH 20393
				Frequency 1710.7 MHz	Frequency 1732.5 MHz	Frequency 1754.3 MHz
1.4MHz	QPSK	2	0	23.18	23.20	23.11
		2	4	23.17	23.19	23.10
		5	0	23.11	23.10	23.05
		5	1	23.14	23.20	23.09
		6	0	22.56	22.62	22.51
	16QAM	2	0	23.18	23.23	23.10
		2	4	23.24	23.29	23.18
		5	0	23.16	23.21	23.12
		5	1	23.12	23.17	23.05

LTE CAT-M1 Band 4						
BW	Modulation	RB Size	RB Offset	Low CH 19965	Mid CH 20175	High CH 20385
				Frequency 1711.5 MHz	Frequency 1732.5 MHz	Frequency 1753.5 MHz
3MHz	QPSK	2	0	23.15	23.17	23.12
		2	4	23.13	23.19	23.10
		5	0	23.11	23.14	23.00
		5	1	23.15	23.14	23.06
		6	0	22.59	22.62	22.51
	16QAM	2	0	23.17	23.24	23.16
		2	4	23.26	23.24	23.19
		5	0	23.19	23.23	23.14
		5	1	23.13	23.17	23.08

LTE CAT-M1 Band 4						
BW	Modulation	RB Size	RB Offset	Low CH19975	Mid CH20175	High CH20375
				Frequency 1712.5 MHz	Frequency 1732.5 MHz	Frequency 1752.5 MHz
5MHz	QPSK	2	0	23.16	23.17	23.12
		2	4	23.16	23.19	23.07
		5	0	23.12	23.14	23.01
		5	1	23.12	23.17	23.11
		6	0	22.61	22.63	22.55
	16QAM	2	0	23.16	23.19	23.14
		2	4	23.25	23.28	23.19
		5	0	23.20	23.24	23.08
		5	1	23.13	23.19	23.07

LTE CAT-M1 Band 4						
BW	Modulation	RB Size	RB Offset	Low CH 20000	Mid CH 20175	High CH 20350
				Frequency 1715 MHz	Frequency 1732.5 MHz	Frequency 1750 MHz
10MHz	QPSK	2	0	23.15	23.18	23.12
		2	4	23.19	23.19	23.08
		5	0	23.10	23.15	23.04
		5	1	23.10	23.18	23.06
		6	0	22.62	22.60	22.50
	16QAM	2	0	23.15	23.24	23.14
		2	4	23.24	23.28	23.17
		5	0	23.14	23.20	23.11
		5	1	23.11	23.20	23.05

LTE CAT-M1 Band 4						
BW	Modulation	RB Size	RB Offset	Low CH 20025	Mid CH 20175	High CH 20325
				Frequency 1717.5 MHz	Frequency 1732.5 MHz	Frequency 1747.5 MHz
15MHz	QPSK	2	0	23.14	23.22	23.11
		2	4	23.14	23.23	23.09
		5	0	23.09	23.10	23.05
		5	1	23.16	23.21	23.10
		6	0	22.58	22.62	22.50
	16QAM	2	0	23.15	23.22	23.10
		2	4	23.25	23.29	23.18
		5	0	23.14	23.17	23.10
		5	1	23.14	23.19	23.05

LTE CAT-M1 Band 4						
BW	Modulation	RB Size	RB Offset	Low CH 20050	Mid CH 20175	High CH 20300
				Frequency 1720 MHz	Frequency 1732.5 MHz	Frequency 1745 MHz
20MHz	QPSK	2	0	23.20	23.24	23.14
		2	4	23.21	23.25	23.15
		5	0	23.13	23.17	23.07
		5	1	23.18	23.22	23.12
		6	0	22.63	22.67	22.57
	16QAM	2	0	23.23	23.27	23.17
		2	4	23.28	23.32	23.22
		5	0	23.21	23.25	23.15
		5	1	23.18	23.22	23.12

LTE CAT-M1 Band 66						
BW	Modulation	RB Size	RB Offset	Low CH 131979	Mid CH 132422	High CH 132665
				Frequency 1710.7 MHz	Frequency 1755 MHz	Frequency 1779.3 MHz
1.4MHz	QPSK	1	0	23.19	22.88	22.70
		1	5	23.14	22.86	22.69
		3	0	23.17	22.89	22.67
		3	3	23.18	22.83	22.66
		6	0	22.99	22.68	22.45
	16QAM	1	0	23.24	22.93	22.71
		1	5	23.27	22.93	22.72
		3	0	23.27	22.91	22.74
		3	3	23.17	22.90	22.68

LTE CAT-M1 Band 66						
BW	Modulation	RB Size	RB Offset	Low CH 131987	Mid CH 132422	High CH 132657
				Frequency 1711.5 MHz	Frequency 1755 MHz	Frequency 1778.5 MHz
3MHz	QPSK	1	0	23.22	22.92	22.70
		1	5	23.16	22.85	22.64
		3	0	23.15	22.85	22.70
		3	3	23.19	22.86	22.63
		6	0	22.96	22.65	22.45
	16QAM	1	0	23.21	22.87	22.72
		1	5	23.23	22.96	22.73
		3	0	23.29	22.97	22.76
		3	3	23.17	22.84	22.64

LTE CAT-M1 Band 66						
BW	Modulation	RB Size	RB Offset	Low CH 131997	Mid CH 132422	High CH 132647
				Frequency 1712.5 MHz	Frequency 1755 MHz	Frequency 1777.5 MHz
5MHz	QPSK	2	0	23.23	22.86	22.72
		2	4	23.19	22.87	22.68
		5	0	23.15	22.88	22.69
		5	1	23.13	22.87	22.67
		6	0	22.98	22.67	22.46
	16QAM	2	0	23.22	22.93	22.70
		2	4	23.25	22.94	22.74
		5	0	23.22	22.97	22.76
		5	1	23.19	22.84	22.67

LTE CAT-M1 Band 66						
BW	Modulation	RB Size	RB Offset	Low CH 132022	Mid CH 132422	High CH 132622
				Frequency 1715 MHz	Frequency 1755 MHz	Frequency 1775 MHz
10MHz	QPSK	2	0	23.18	22.89	22.68
		2	4	23.15	22.84	22.69
		5	0	23.17	22.88	22.66
		5	1	23.16	22.85	22.66
		6	0	22.96	22.70	22.46
	16QAM	2	0	23.19	22.88	22.73
		2	4	23.24	22.95	22.69
		5	0	23.23	22.96	22.73
		5	1	23.16	22.89	22.65

LTE CAT-M1 Band 66						
BW	Modulation	RB Size	RB Offset	Low CH 132047	Mid CH 132422	High CH 132597
				Frequency 1717.5 MHz	Frequency 1755 MHz	Frequency 1772.5 MHz
15MHz	QPSK	2	0	23.22	22.90	22.69
		2	4	23.14	22.84	22.64
		5	0	23.18	22.89	22.67
		5	1	23.18	22.84	22.62
		6	0	22.97	22.66	22.45
	16QAM	2	0	23.24	22.93	22.66
		2	4	23.27	22.91	22.69
		5	0	23.27	22.97	22.77
		5	1	23.17	22.85	22.67

LTE CAT-M1 Band 66						
BW	Modulation	RB Size	RB Offset	Low CH 132072	Mid CH 132422	High CH 132572
				Frequency 1720 MHz	Frequency 1755 MHz	Frequency 1770 MHz
20 MHz	QPSK	2	0	23.25	22.94	22.73
		2	4	23.22	22.91	22.70
		5	0	23.23	22.92	22.71
		5	1	23.21	22.90	22.69
		6	0	23.02	22.71	22.50
	16QAM	2	0	23.26	22.95	22.74
		2	4	23.28	22.97	22.76
		5	0	23.30	22.99	22.78
		5	1	23.22	22.91	22.70

EIRP

LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19957	1710.7	22.72	2.00	24.72	296.48	1
20175	1732.5	22.80	2.00	24.80	302.00	1
20393	1754.3	23.02	2.00	25.02	317.69	1

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19957	1710.7	22.93	2.00	24.93	311.17	1
20175	1732.5	23.01	2.00	25.01	316.96	1
20393	1754.3	23.23	2.00	25.23	333.43	1

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19965	1711.5	22.73	2.00	24.73	297.17	1
20175	1732.5	22.81	2.00	24.81	302.69	1
20385	1753.5	23.03	2.00	25.03	318.42	1

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19965	1711.5	22.94	2.00	24.94	311.89	1
20175	1732.5	23.02	2.00	25.02	317.69	1
20385	1753.5	23.24	2.00	25.24	334.20	1

LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19975	1712.5	22.76	2.00	24.76	299.23	1
20175	1732.5	22.84	2.00	24.84	304.79	1
20375	1752.5	23.06	2.00	25.06	320.63	1

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19975	1712.5	22.97	2.00	24.97	314.05	1
20175	1732.5	23.05	2.00	25.05	319.89	1
20375	1752.5	23.27	2.00	25.27	336.51	1

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18650	1715.0	22.80	2.00	24.80	302.00	1
18900	1732.5	22.88	2.00	24.88	307.61	1
19150	1750.0	23.10	2.00	25.10	323.59	1

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20000	1715.0	23.01	2.00	25.01	316.96	1
20175	1732.5	23.09	2.00	25.09	322.85	1
20350	1750.0	23.31	2.00	25.31	339.63	1

LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20025	1717.5	22.86	2.00	24.86	306.20	1
20175	1732.5	22.94	2.00	24.94	311.89	1
20325	1747.5	23.16	2.00	25.16	328.10	1

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20025	1717.5	23.07	2.00	25.07	321.37	1
20175	1732.5	23.15	2.00	25.15	327.34	1
20325	1747.5	23.37	2.00	25.37	344.35	1

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20050	1720.0	22.89	2.00	24.89	308.32	1
20175	1732.5	22.97	2.00	24.97	314.05	1
20300	1745.0	23.19	2.00	25.19	330.37	1

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20050	1720.0	23.10	2.00	25.10	323.59	1
20175	1732.5	23.18	2.00	25.18	329.61	1
20300	1745.0	23.40	2.00	25.40	346.74	1

LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
131979	1710.7	23.19	2.00	25.19	330.37	1
132322	1745.0	22.89	2.00	24.89	308.32	1
132665	1779.3	22.70	2.00	24.70	295.12	1

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
131979	1710.7	23.27	2.00	25.27	336.51	1
132322	1745.0	22.93	2.00	24.93	311.17	1
132665	1779.3	22.74	2.00	24.74	297.85	1

LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
131987	1711.5	23.22	2.00	25.22	332.66	1
132322	1745.0	22.92	2.00	24.92	310.46	1
132657	1778.5	22.70	2.00	24.70	295.12	1

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
131987	1711.5	23.29	2.00	25.29	338.06	1
132322	1745.0	22.97	2.00	24.97	314.05	1
132657	1778.5	22.76	2.00	24.76	299.23	1

LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
131997	1712.5	23.23	2.00	25.23	333.43	1
132322	1745.0	22.88	2.00	24.88	307.61	1
132647	1777.5	22.76	2.00	24.76	299.23	1

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
131997	1712.5	23.25	2.00	25.25	334.97	1
132322	1745.0	22.97	2.00	24.97	314.05	1
132647	1777.5	22.76	2.00	24.76	299.23	1

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
132022	1715.0	23.18	2.00	25.18	329.61	1
132322	1745.0	22.89	2.00	24.89	308.32	1
132622	1775.0	22.68	2.00	24.68	293.76	1

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
132022	1715.0	22.66	2.00	24.66	292.42	1
132322	1745.0	22.73	2.00	24.73	297.17	1
132622	1775.0	22.68	2.00	24.68	293.76	1

LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
132047	1717.5	23.22	2.00	25.22	332.66	1
132322	1745.0	22.90	2.00	24.90	309.03	1
132597	1772.5	22.69	2.00	24.69	294.44	1

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
132047	1717.5	23.27	2.00	25.27	336.51	1
132322	1745.0	22.97	2.00	24.97	314.05	1
132597	1772.5	22.77	2.00	24.77	299.92	1

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
132072	1720.0	23.25	2.00	25.25	334.97	1
132322	1745.0	22.94	2.00	24.94	311.89	1
132572	1770.0	22.73	2.00	24.73	297.17	1

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
132072	1720.0	23.30	2.00	25.30	338.84	1
132322	1745.0	22.99	2.00	24.99	315.50	1
132572	1770.0	22.78	2.00	24.78	300.61	1

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

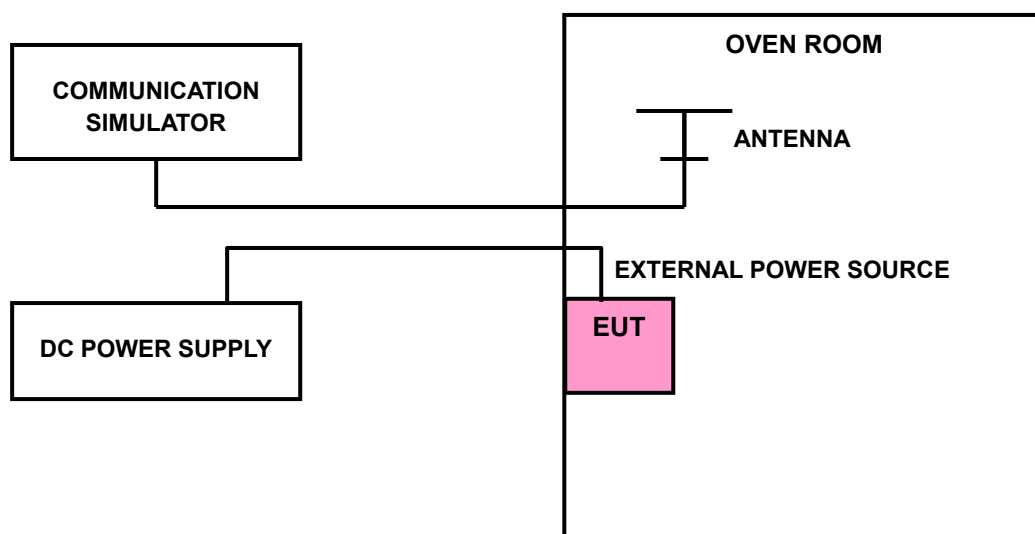
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.2.2 TEST PROCEDURE

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

LTE CAT-M1 BAND 4

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0019	0.0025	2.5
V _{min}	-0.0031	-0.0031	2.5
V _{max}	0.0021	0.0020	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0114	-0.0115	2.5
-20	-0.0103	-0.0099	2.5
-10	-0.0083	-0.0080	2.5
0	-0.0076	-0.0073	2.5
10	-0.0053	-0.0047	2.5
20	-0.0043	-0.0040	2.5
30	-0.0027	-0.0034	2.5
40	-0.0021	-0.0019	2.5
50	-0.0002	-0.0003	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0021	0.0021	2.5
V _{min}	-0.0021	-0.0025	2.5
V _{max}	0.0018	0.0018	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0116	-0.0111	2.5
-20	-0.0113	-0.0100	2.5
-10	-0.0083	-0.0082	2.5
0	-0.0075	-0.0073	2.5
10	-0.0047	-0.0053	2.5
20	-0.0039	-0.0042	2.5
30	-0.0038	-0.0039	2.5
40	-0.0018	-0.0022	2.5
50	-0.0004	-0.0006	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0021	0.0024	2.5
V _{min}	-0.0024	-0.0030	2.5
V _{max}	0.0021	0.0021	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0120	-0.0116	2.5
-20	-0.0111	-0.0103	2.5
-10	-0.0084	-0.0083	2.5
0	-0.0077	-0.0072	2.5
10	-0.0048	-0.0052	2.5
20	-0.0043	-0.0043	2.5
30	-0.0042	-0.0037	2.5
40	-0.0016	-0.0022	2.5
50	-0.0004	-0.0004	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0024	0.0026	2.5
V _{min}	-0.0031	-0.0030	2.5
V _{max}	0.0026	0.0026	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0118	-0.0112	2.5
-20	-0.0111	-0.0109	2.5
-10	-0.0084	-0.0080	2.5
0	-0.0075	-0.0072	2.5
10	-0.0050	-0.0046	2.5
20	-0.0043	-0.0039	2.5
30	-0.0031	-0.0029	2.5
40	-0.0015	-0.0018	2.5
50	-0.0004	-0.0002	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0025	0.0024	2.5
V _{min}	-0.0031	-0.0030	2.5
V _{max}	0.0024	0.0024	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0115	-0.0113	2.5
-20	-0.0110	-0.0110	2.5
-10	-0.0082	-0.0080	2.5
0	-0.0078	-0.0076	2.5
10	-0.0055	-0.0045	2.5
20	-0.0043	-0.0043	2.5
30	-0.0038	-0.0025	2.5
40	-0.0022	-0.0022	2.5
50	-0.0004	-0.0005	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0025	0.0026	2.5
V _{min}	-0.0031	-0.0030	2.5
V _{max}	0.0024	0.0025	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0116	-0.0112	2.5
-20	-0.0112	-0.0099	2.5
-10	-0.0083	-0.0080	2.5
0	-0.0076	-0.0074	2.5
10	-0.0052	-0.0050	2.5
20	-0.0041	-0.0042	2.5
30	-0.0031	-0.0041	2.5
40	-0.0021	-0.0016	2.5
50	-0.0003	-0.0003	2.5

LTE CAT-M1 BAND 66

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0022	0.0025	2.5
V _{min}	-0.0031	-0.0030	2.5
V _{max}	0.0021	0.0021	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0116	-0.0110	2.5
-20	-0.0108	-0.0106	2.5
-10	-0.0086	-0.0079	2.5
0	-0.0078	-0.0074	2.5
10	-0.0051	-0.0048	2.5
20	-0.0038	-0.0043	2.5
30	-0.0028	-0.0026	2.5
40	-0.0021	-0.0014	2.5
50	-0.0002	-0.0005	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0021	0.0021	2.5
V _{min}	-0.0021	-0.0025	2.5
V _{max}	0.0018	0.0018	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0121	-0.0116	2.5
-20	-0.0108	-0.0104	2.5
-10	-0.0084	-0.0081	2.5
0	-0.0076	-0.0073	2.5
10	-0.0051	-0.0048	2.5
20	-0.0044	-0.0041	2.5
30	-0.0029	-0.0029	2.5
40	-0.0017	-0.0016	2.5
50	-0.0002	-0.0002	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0021	0.0026	2.5
V _{min}	-0.0023	-0.0030	2.5
V _{max}	0.0021	0.0021	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0122	-0.0119	2.5
-20	-0.0112	-0.0106	2.5
-10	-0.0084	-0.0082	2.5
0	-0.0074	-0.0076	2.5
10	-0.0055	-0.0044	2.5
20	-0.0042	-0.0040	2.5
30	-0.0030	-0.0034	2.5
40	-0.0019	-0.0017	2.5
50	-0.0004	-0.0003	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0025	0.0025	2.5
V _{min}	-0.0031	-0.0030	2.5
V _{max}	0.0024	0.0025	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0118	-0.0117	2.5
-20	-0.0098	-0.0103	2.5
-10	-0.0082	-0.0084	2.5
0	-0.0078	-0.0073	2.5
10	-0.0051	-0.0048	2.5
20	-0.0041	-0.0044	2.5
30	-0.0034	-0.0039	2.5
40	-0.0018	-0.0022	2.5
50	-0.0006	-0.0006	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0025	0.0023	2.5
V _{min}	-0.0031	-0.0030	2.5
V _{max}	0.0024	0.0023	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0123	-0.0110	2.5
-20	-0.0102	-0.0098	2.5
-10	-0.0081	-0.0080	2.5
0	-0.0078	-0.0074	2.5
10	-0.0052	-0.0046	2.5
20	-0.0043	-0.0038	2.5
30	-0.0038	-0.0042	2.5
40	-0.0016	-0.0017	2.5
50	-0.0004	-0.0002	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V _{nor}	0.0025	0.0026	2.5
V _{min}	-0.0031	-0.0030	2.5
V _{max}	0.0024	0.0025	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max} .

FREQUENCY ERROR vs. TEMPERATURE.

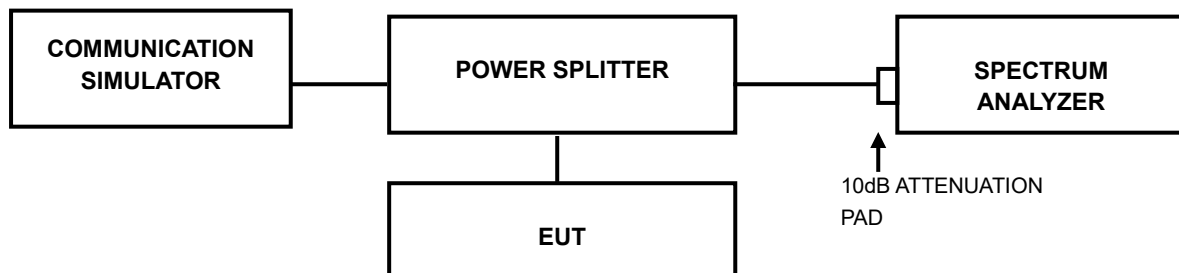
TEMP. (°C)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0121	-0.0118	2.5
-20	-0.0100	-0.0110	2.5
-10	-0.0086	-0.0080	2.5
0	-0.0074	-0.0074	2.5
10	-0.0048	-0.0051	2.5
20	-0.0040	-0.0043	2.5
30	-0.0027	-0.0042	2.5
40	-0.0018	-0.0020	2.5
50	-0.0004	-0.0004	2.5

3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

3.3.2 TEST SETUP



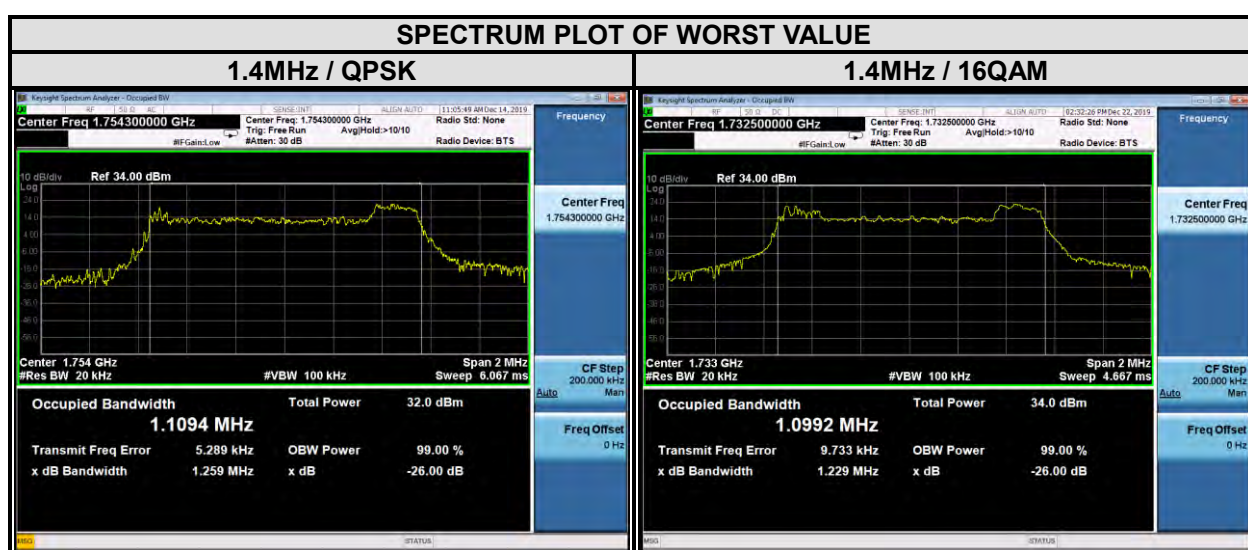
3.3.3 TEST PROCEDURES

- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.3.4 TEST RESULTS

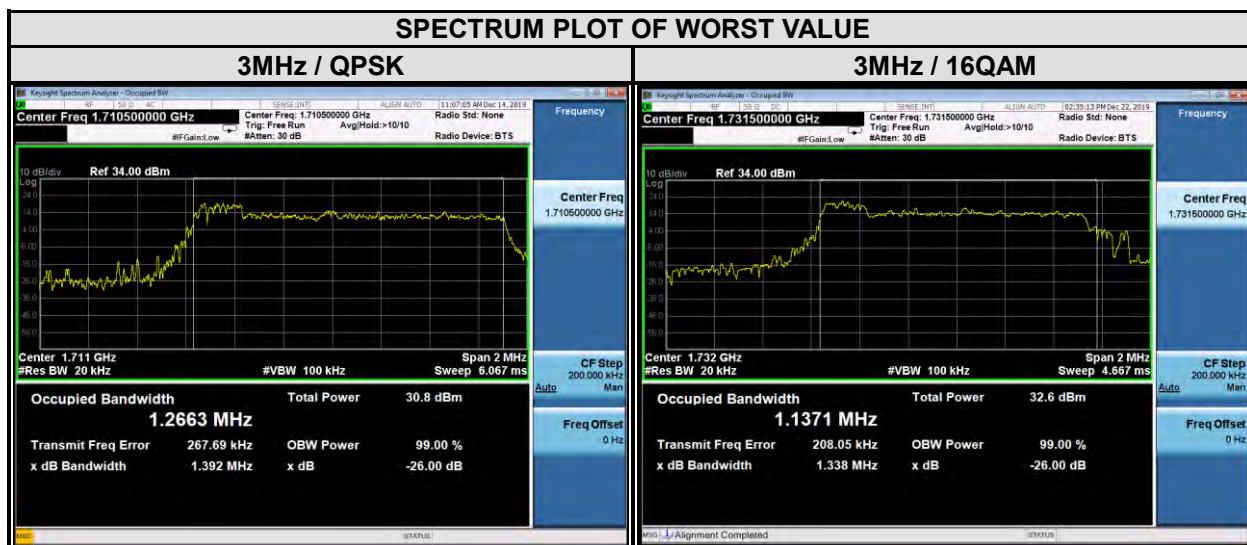
LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 1.4MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
19957	1710.7	1.09	1.10	1.23	1.22
20175	1732.5	1.10	1.10	1.22	1.23
20393	1754.3	1.11	1.10	1.26	1.22



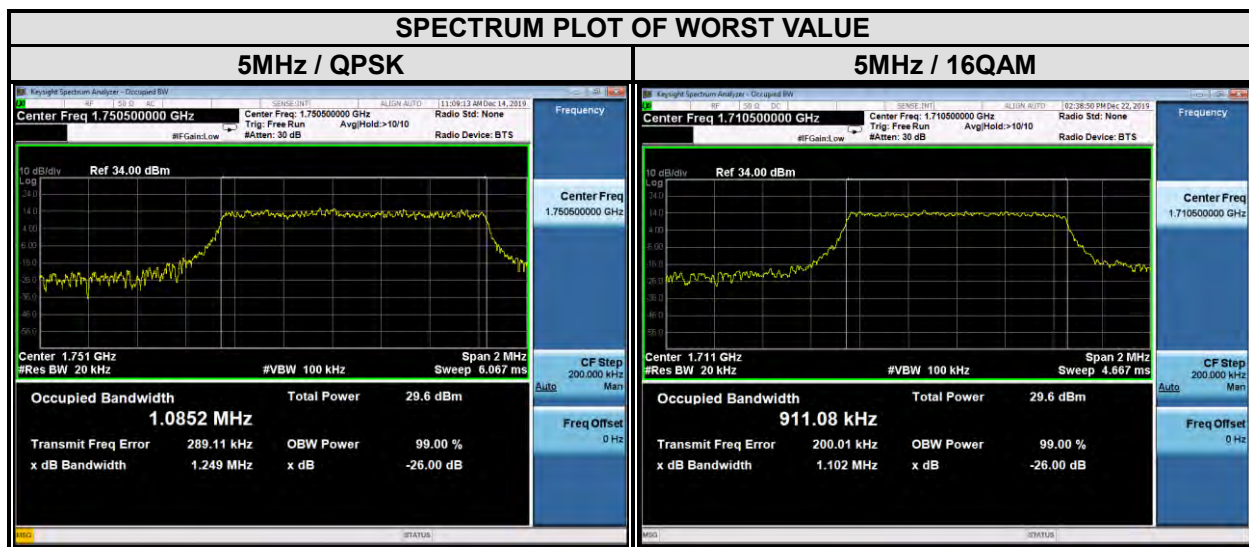
LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 3MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
19965	1711.5	1.27	1.10	1.39	1.23
20175	1732.5	1.26	1.14	1.38	1.34
20385	1753.5	1.26	1.09	1.38	1.25



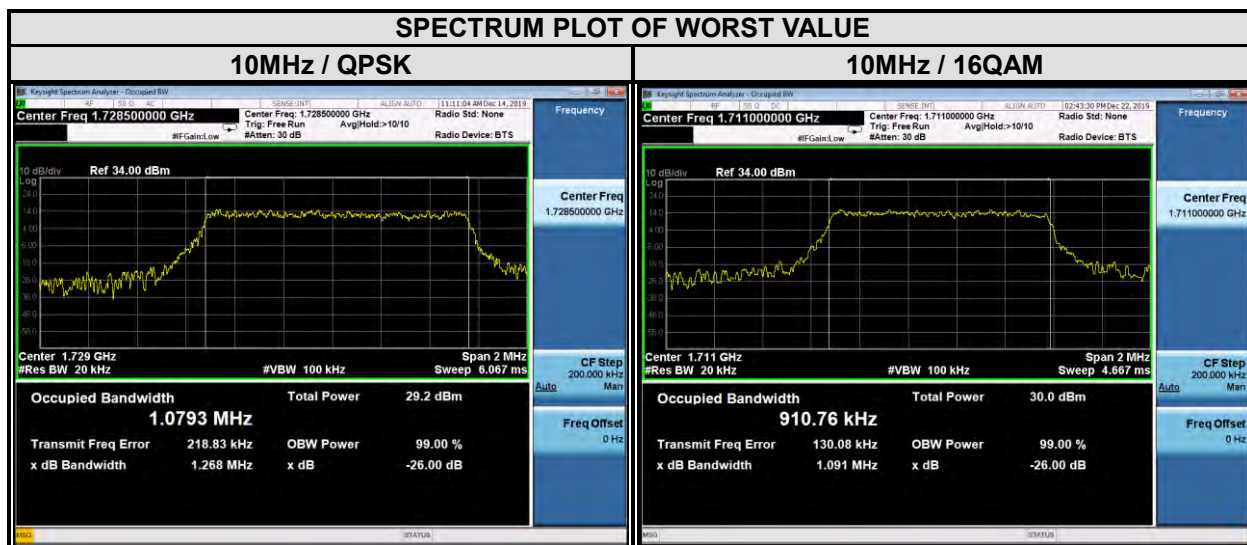
LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 5MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
19975	1712.5	1.08	0.911	1.27	1.10
20175	1732.5	1.08	0.908	1.27	1.10
20375	1752.5	1.09	0.910	1.25	1.06



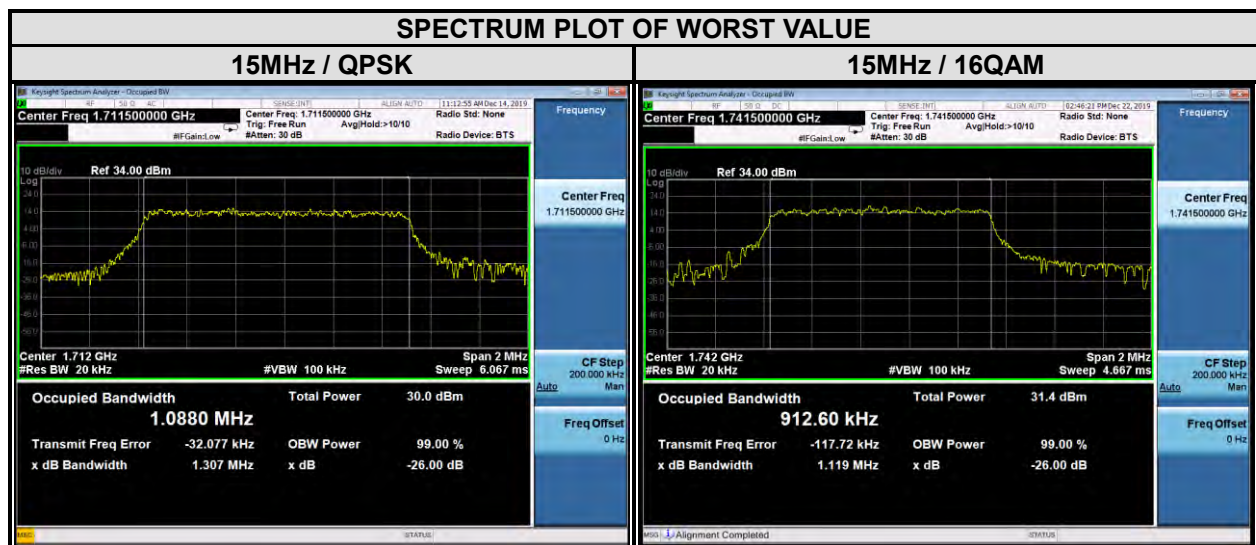
LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 10MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20000	1715	1.08	0.911	1.29	1.09
20175	1732.5	1.08	0.909	1.27	1.08
20350	1750	1.08	0.908	1.25	1.16



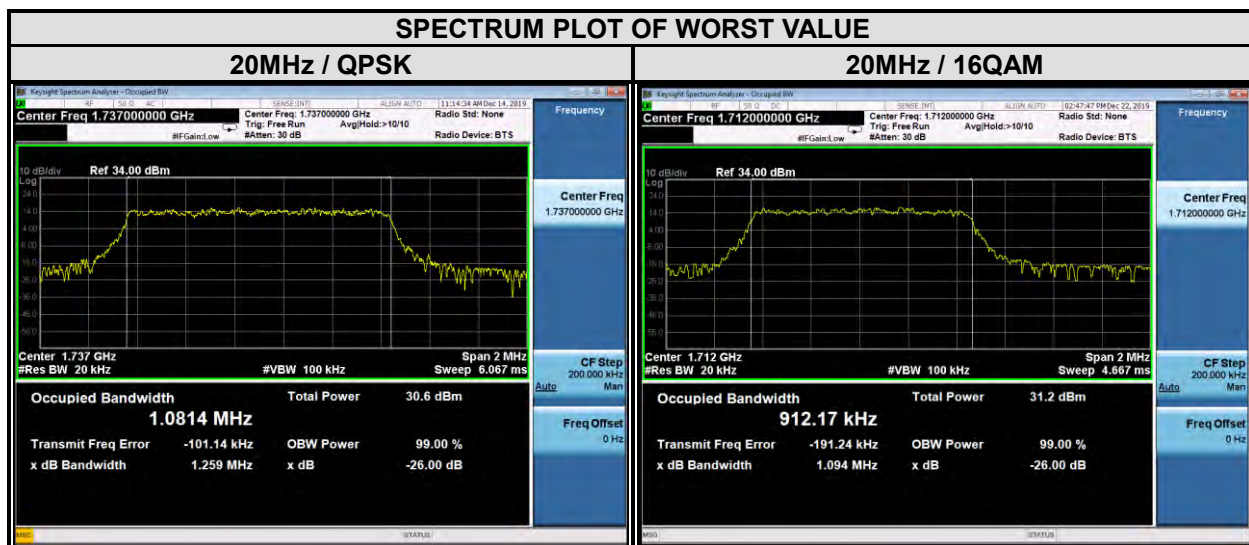
LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 15MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20025	1717.5	1.09	0.908	1.31	1.06
20175	1732.5	1.08	0.905	1.28	1.07
20325	1747.5	1.08	0.913	1.26	1.12



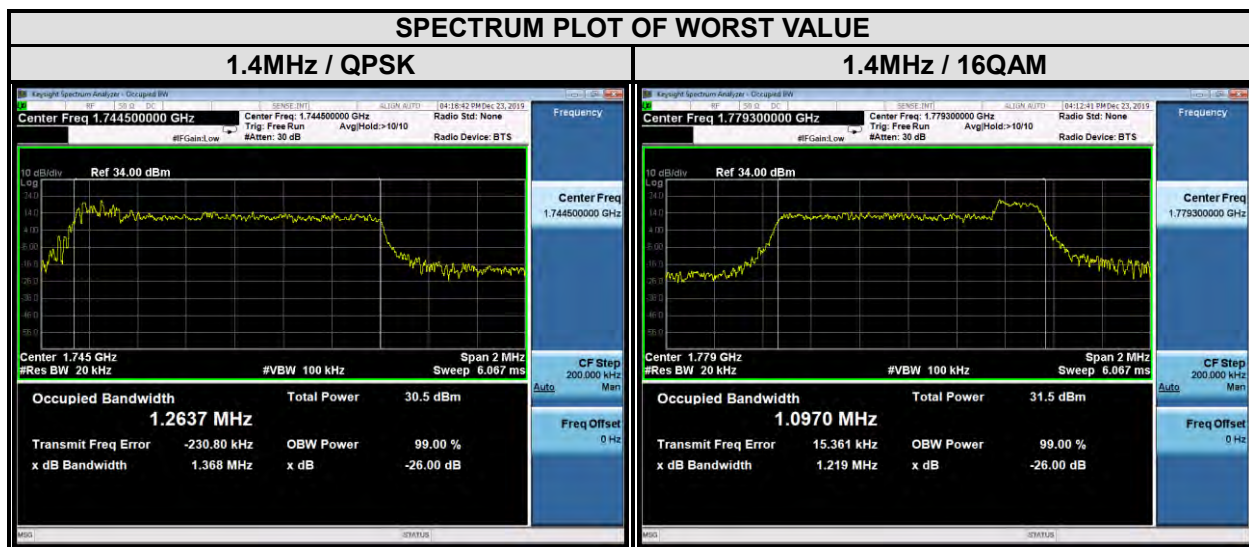
LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 20MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20050	1720	1.08	0.910	1.23	1.10
20175	1732.5	1.08	0.912	1.27	1.09
20300	1745	1.08	0.908	1.26	1.19



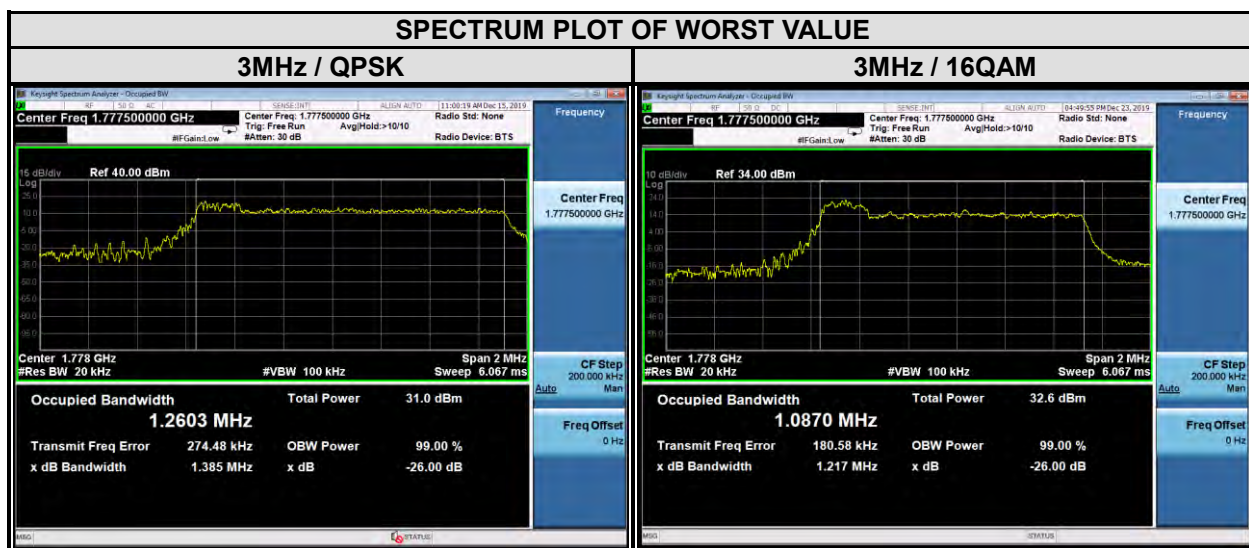
LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 1.4MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
131979	1710.7	1.10	1.10	1.22	1.22
132322	1745	1.26	1.09	1.37	1.20
132665	1779.3	1.10	1.10	1.24	1.22



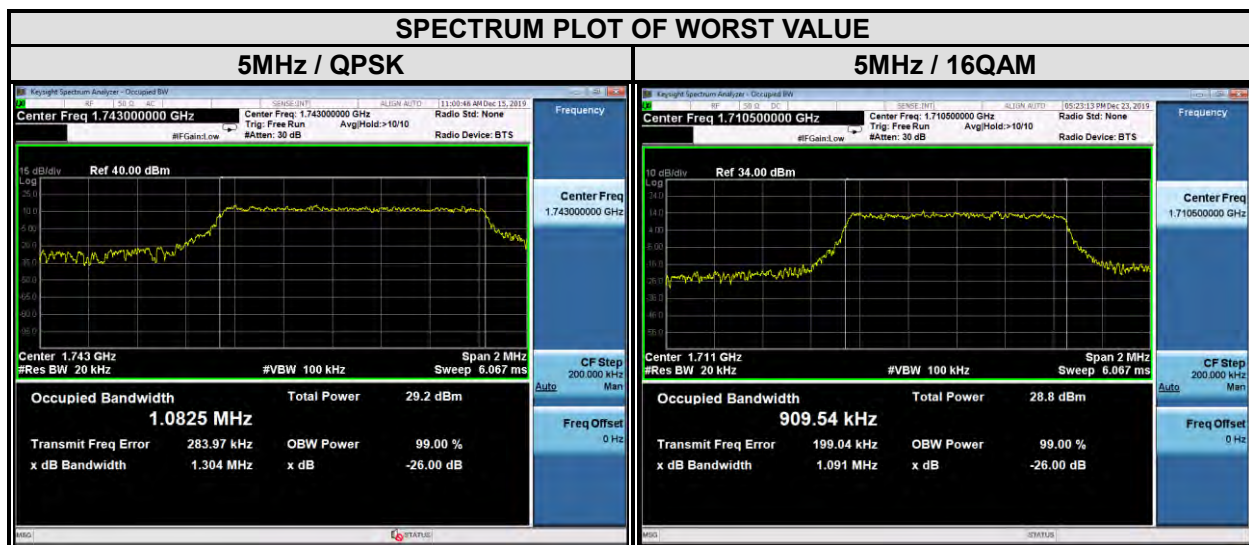
LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 3MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
131987	1711.5	1.25	1.09	1.33	1.24
132322	1745	1.25	1.09	1.34	1.22
132657	1778.5	1.26	1.09	1.39	1.22



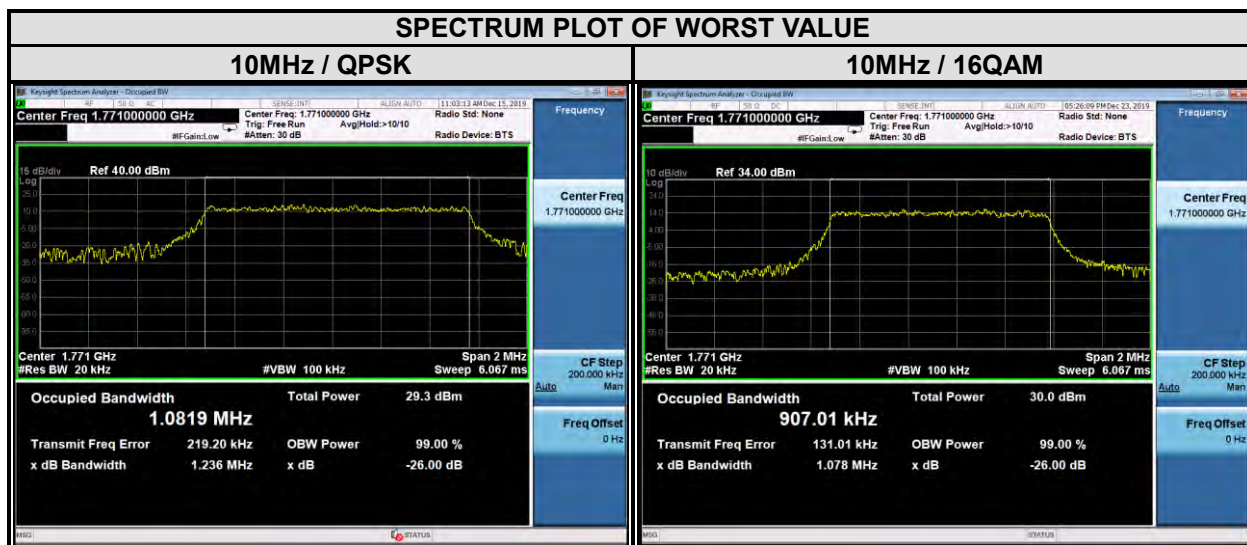
LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 5MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
131997	1712.5	1.08	0.910	1.29	1.09
132322	1745	1.08	0.906	1.30	1.09
132647	1777.5	1.08	0.907	1.26	1.11



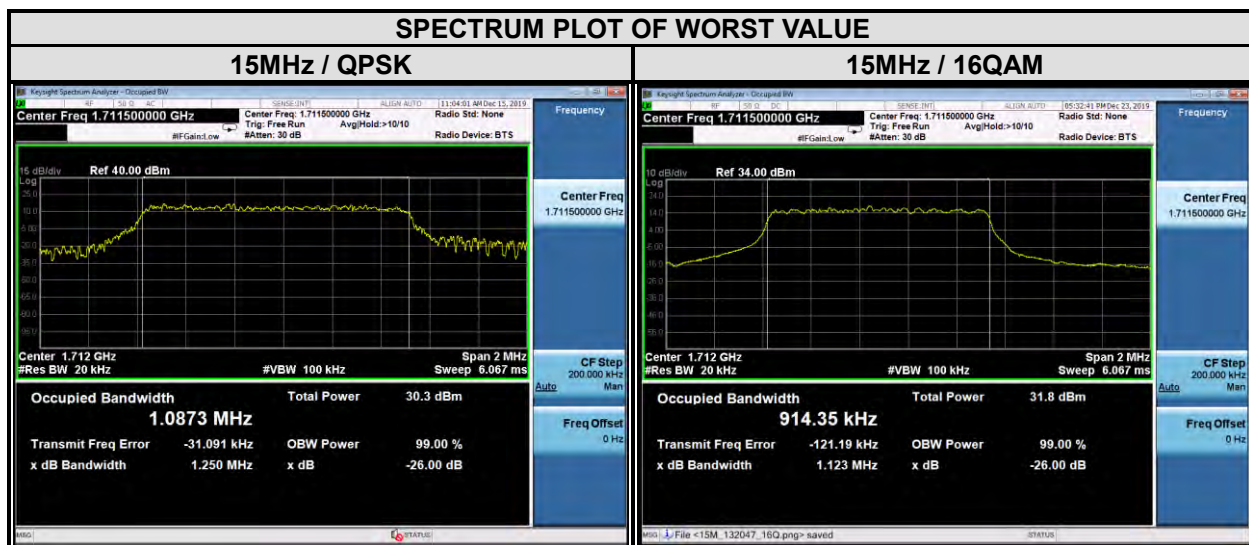
LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 10MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
132022	1715	1.08	0.905	1.26	1.06
132322	1745	1.07	0.905	1.24	1.05
132622	1775	1.08	0.907	1.24	1.08



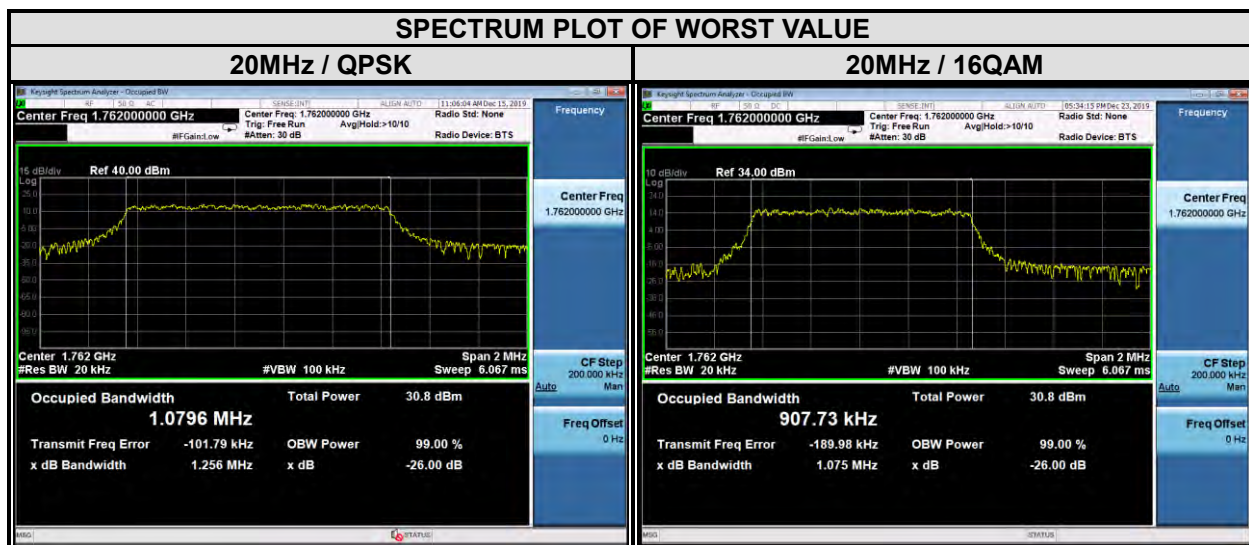
LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 15MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
132047	1717.5	1.09	0.914	1.25	1.12
132322	1745	1.08	0.904	1.25	1.06
132597	1772.5	1.09	0.903	1.25	1.06



LTE CAT-M1 BAND 66

CHANNEL BANDWIDTH: 20MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26dB OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
132072	1720	1.08	0.906	1.27	1.14
132322	1745	1.08	0.907	1.29	1.08
132572	1770	1.08	0.908	1.26	1.08

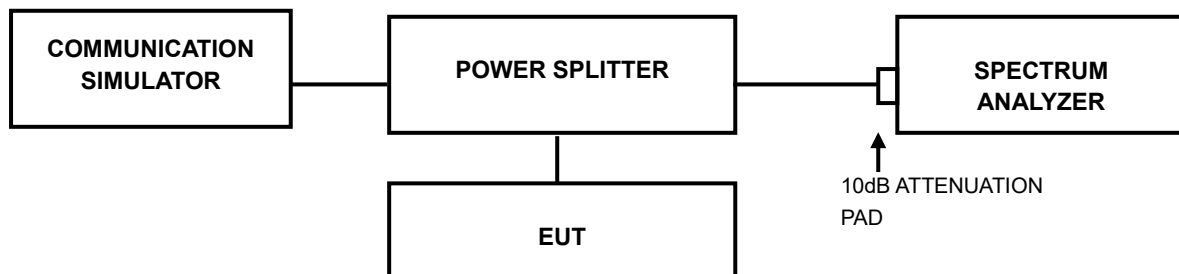


3.4 PEAK TO AVERAGE RATIO

3.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

3.4.2 TEST SETUP



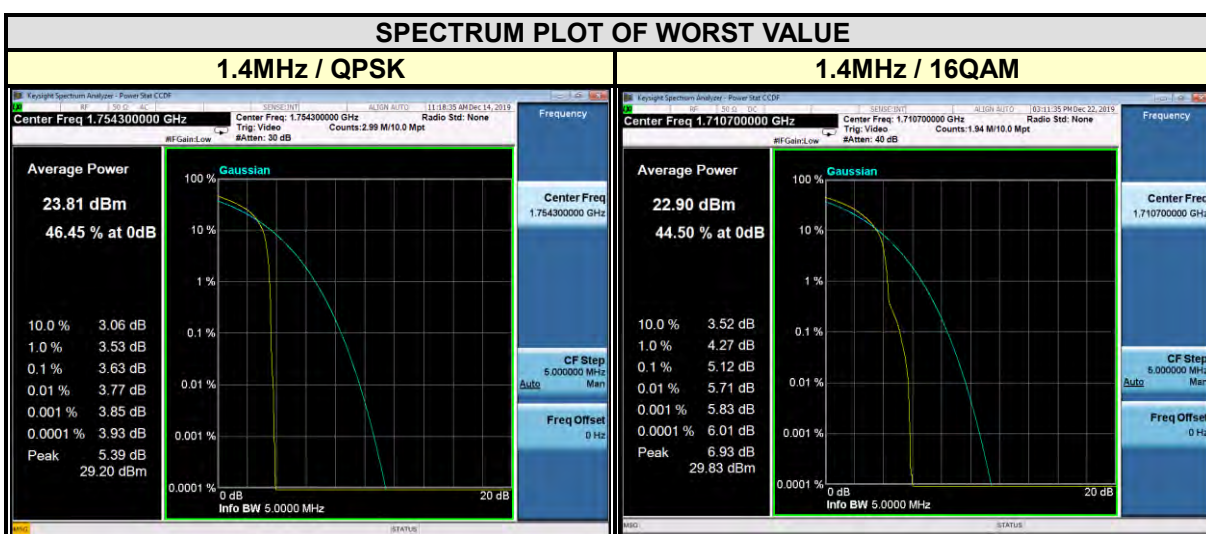
3.4.3 TEST PROCEDURES

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

3.4.4 TEST RESULTS

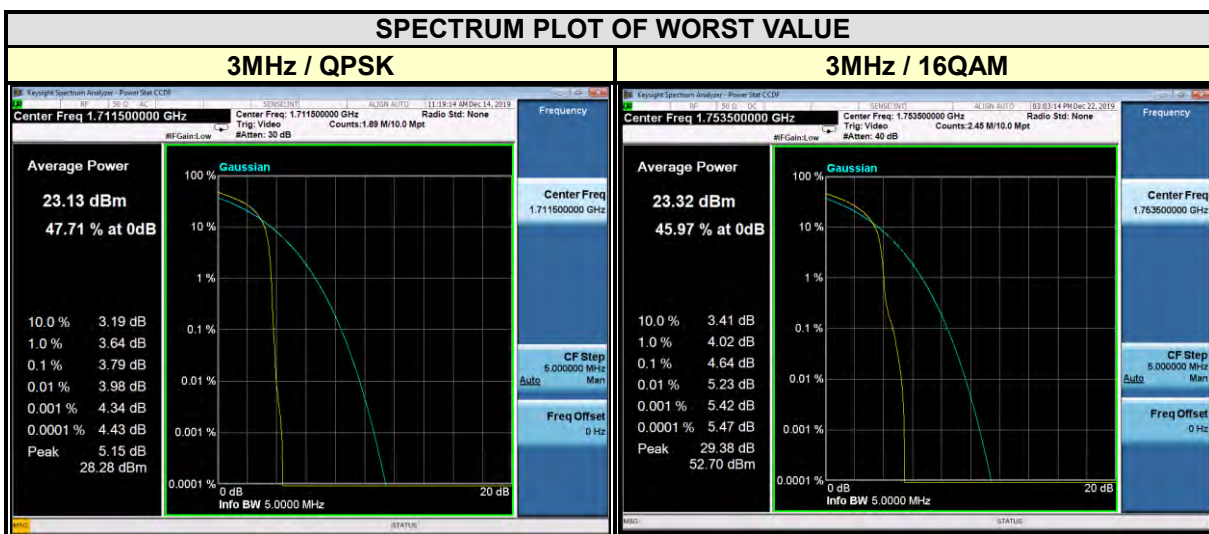
LTE CAT-M1 BAND 4

CHANNEL BANDWIDTH: 1.4MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
19957	1710.7	3.56	5.12
20175	1732.5	3.62	5.00
20393	1754.3	3.63	4.91

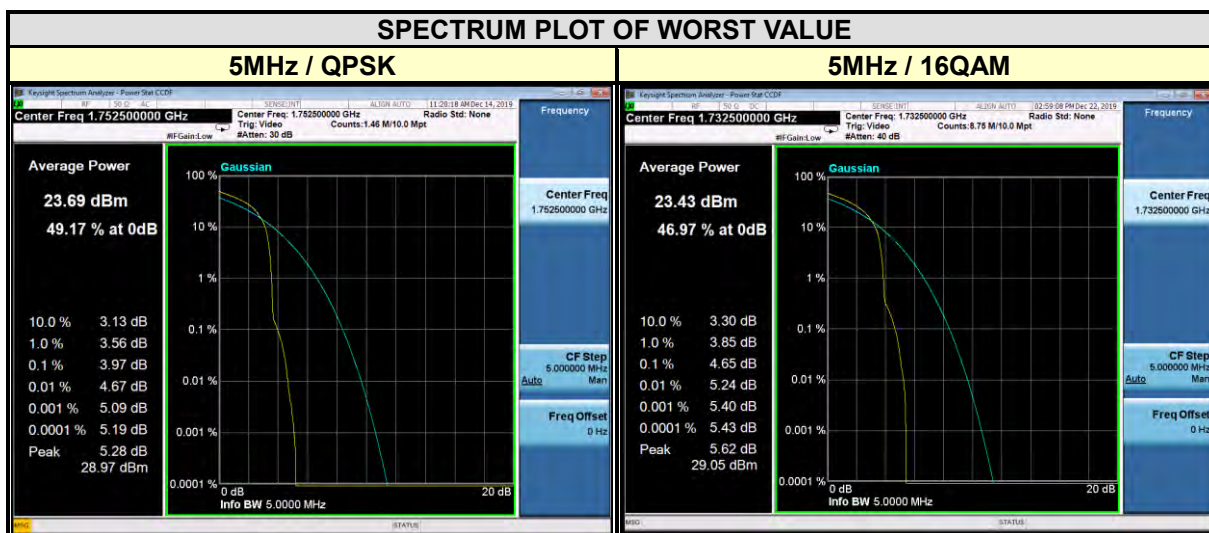


LTE CAT-M1 BAND 4

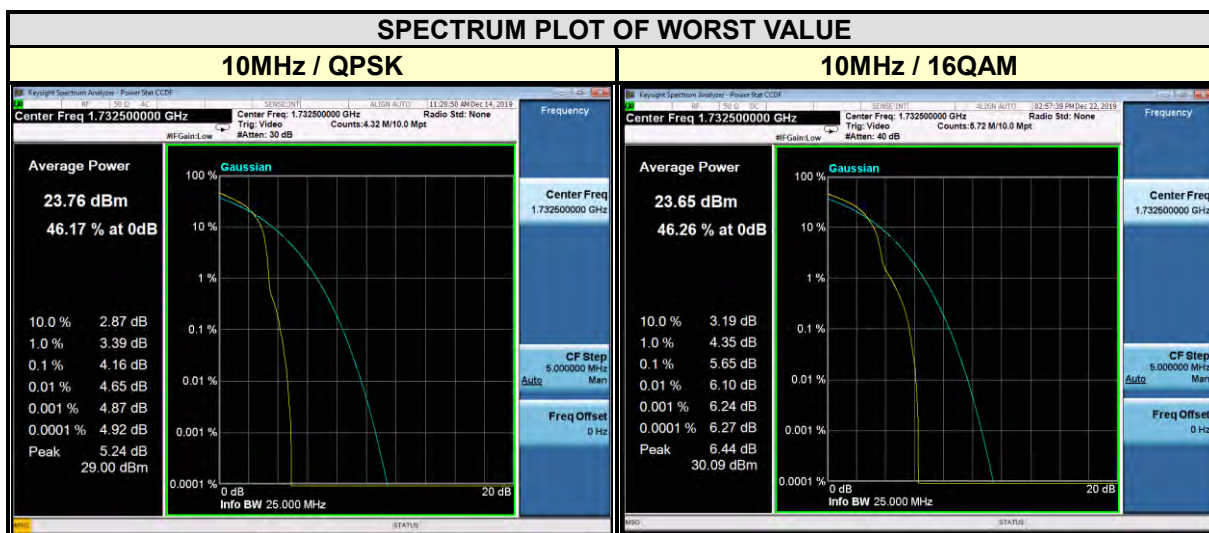
CHANNEL BANDWIDTH: 3MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
19965	1711.5	3.79	4.59
20175	1732.5	3.58	4.50
20385	1753.5	3.63	4.64



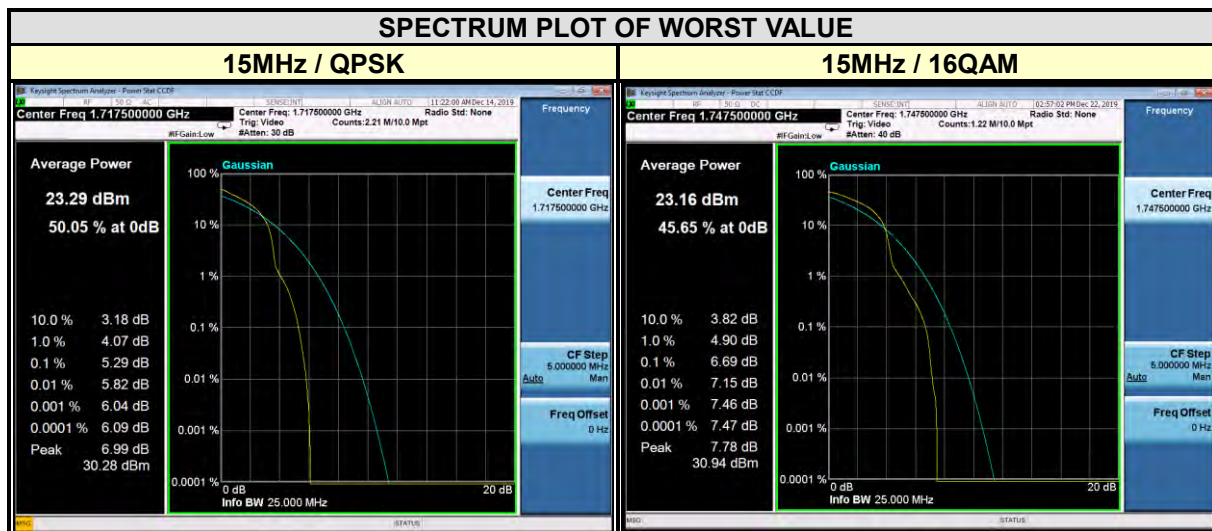
CHANNEL BANDWIDTH: 5MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
19975	1712.5	3.32	4.55
20175	1732.5	3.38	4.65
20375	1752.5	3.97	4.54



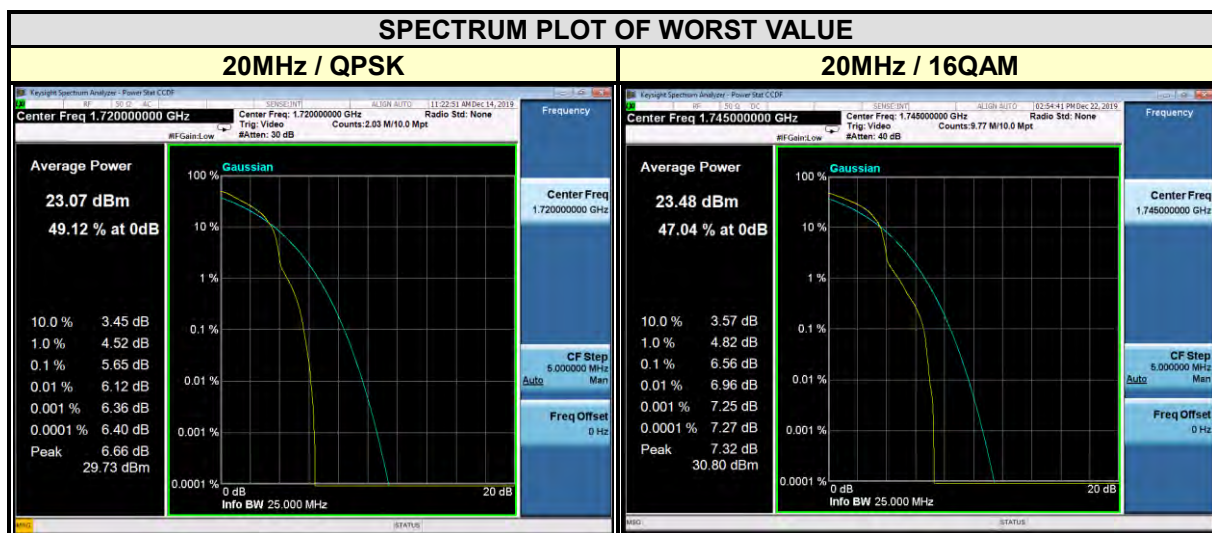
CHANNEL BANDWIDTH: 10MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20000	1715	4.14	5.61
20175	1732.5	4.16	5.65
20350	1750	4.12	5.50



CHANNEL BANDWIDTH: 15MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20025	1717.5	5.29	6.47
20175	1732.5	5.24	6.53
20325	1747.5	5.19	6.69



CHANNEL BANDWIDTH: 20MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20050	1720	5.65	6.39
20175	1732.5	5.11	6.52
20300	1745	4.99	6.56



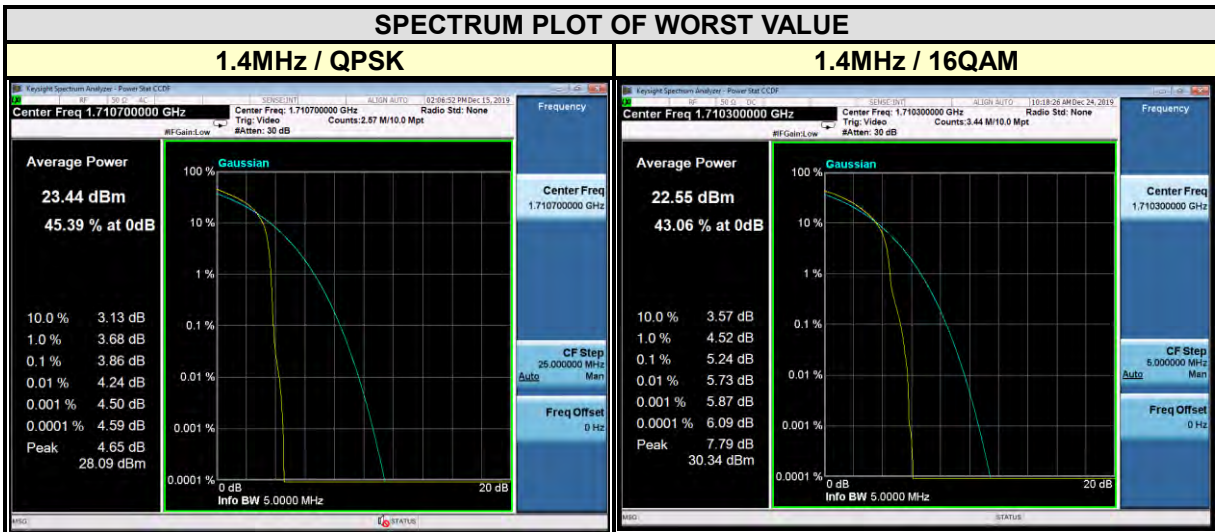


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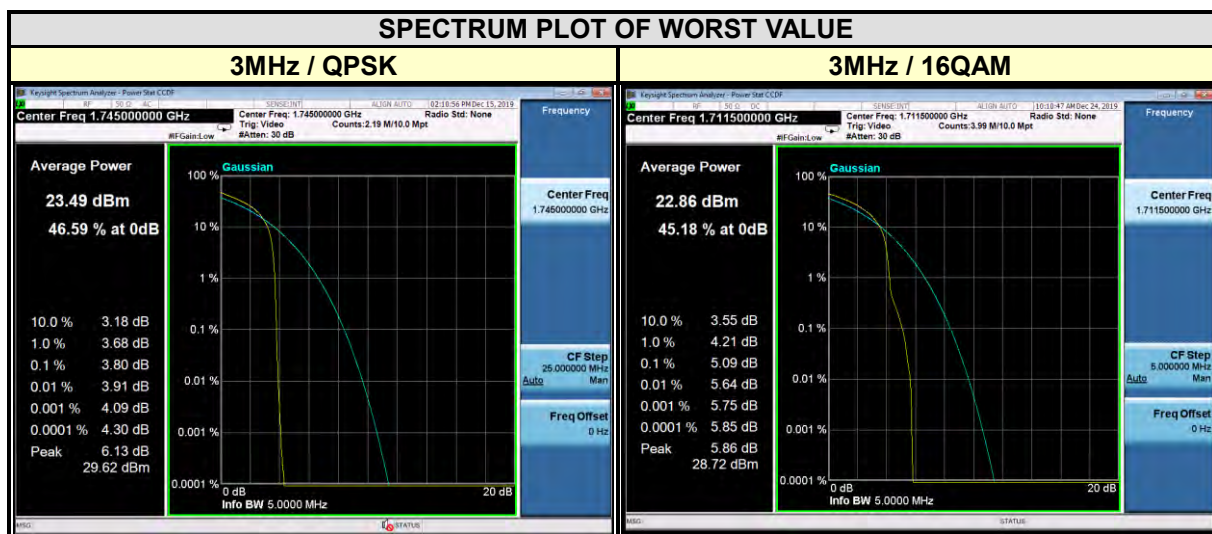
Test Report No.: RF191122W002-3

LTE CAT-M1 BAND 66

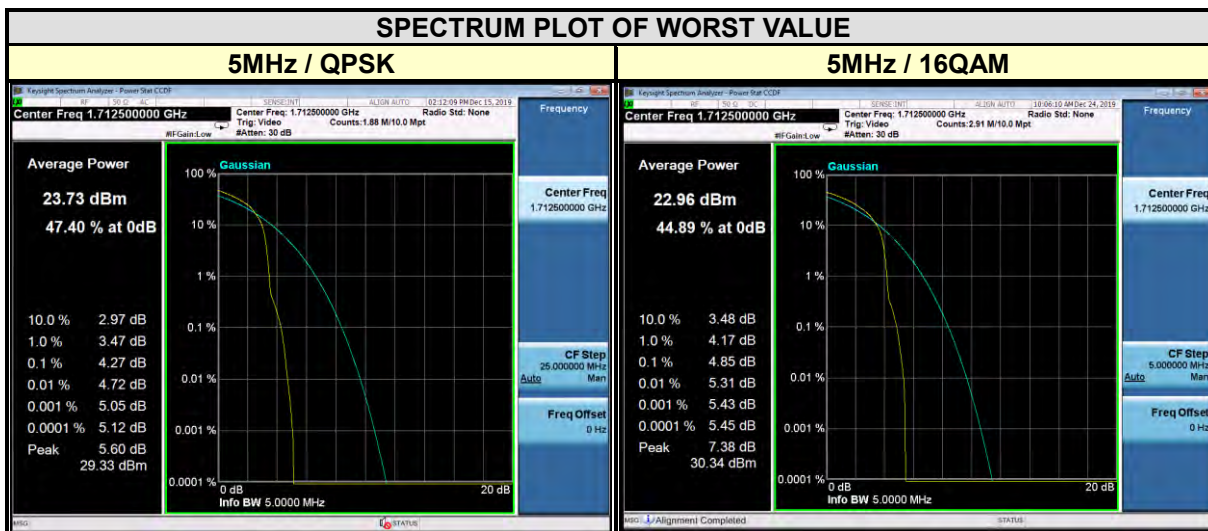
CHANNEL BANDWIDTH: 1.4MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
131979	1710.7	3.86	5.24
132322	1745	3.72	4.93
132665	1779.3	3.85	5.07



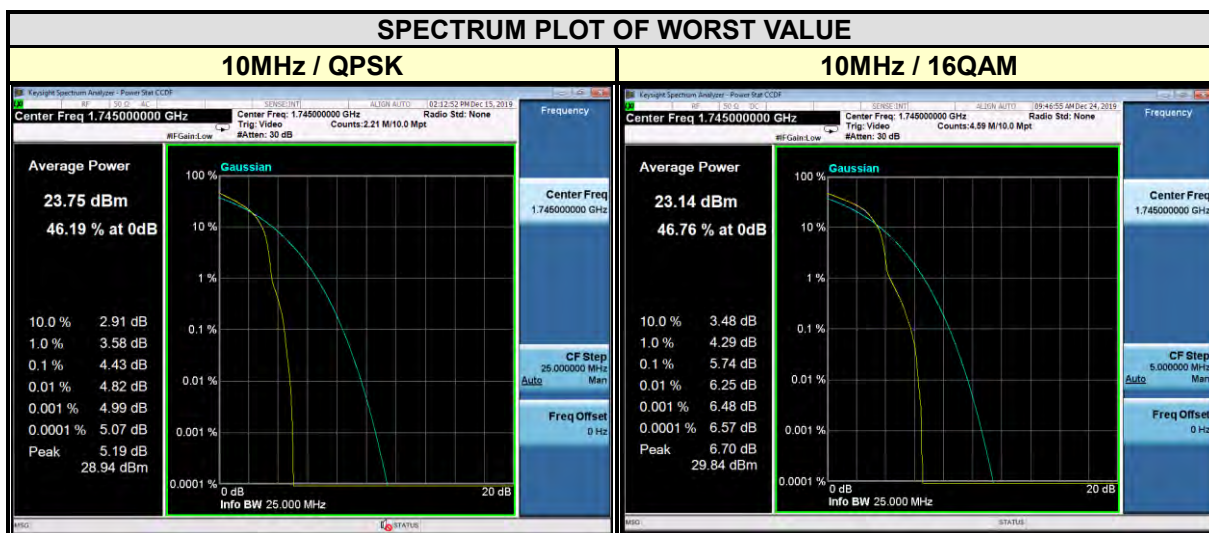
CHANNEL BANDWIDTH: 3MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
131987	1711.5	3.78	5.09
132322	1745	3.80	4.85
132657	1778.5	3.64	4.83



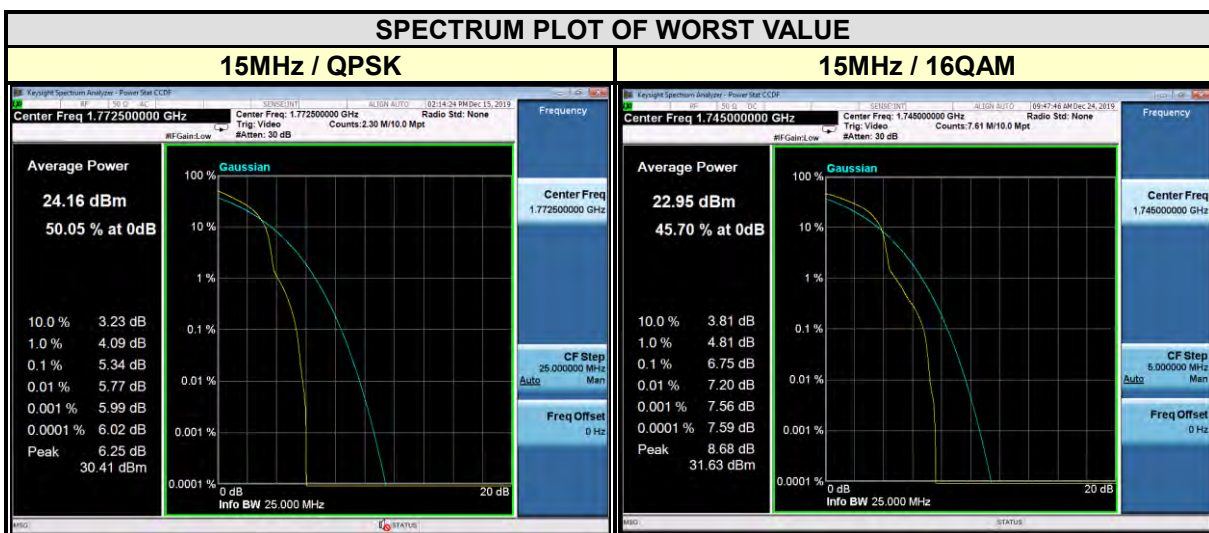
CHANNEL BANDWIDTH: 5MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
131997	1712.5	4.27	4.85
132322	1745	4.09	4.73
132647	1777.5	3.70	4.65



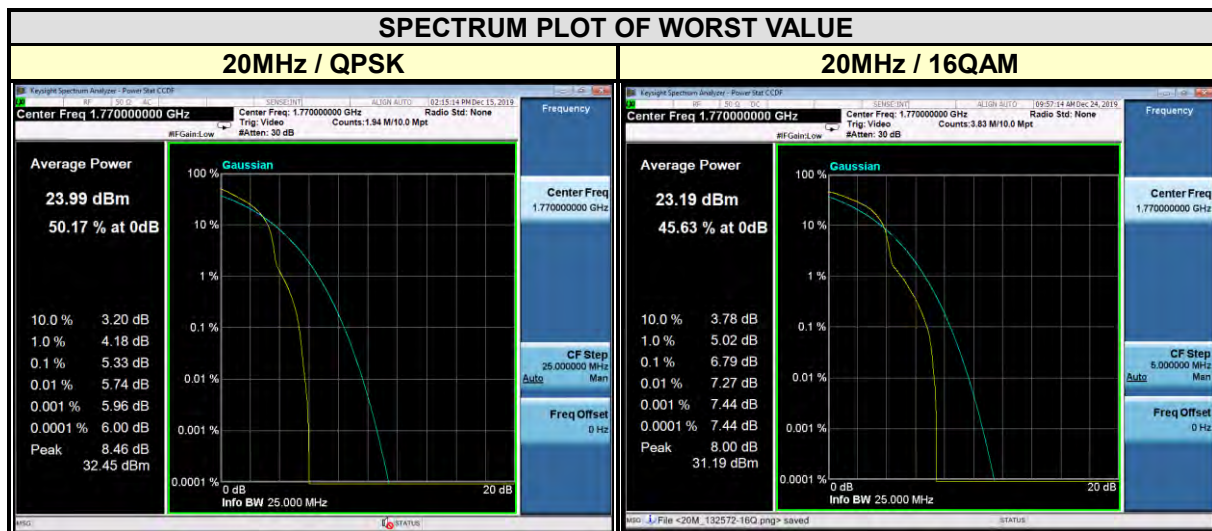
CHANNEL BANDWIDTH: 10MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
132022	1715	4.40	5.35
132322	1745	4.43	5.74
132622	1775	4.31	5.61



CHANNEL BANDWIDTH: 15MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
132047	1717.5	5.12	6.58
132322	1745	5.18	6.75
132597	1772.5	5.34	6.73



CHANNEL BANDWIDTH: 20MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
132072	1720	5.13	6.77
132322	1745	5.24	6.72
132572	1770	5.33	6.79



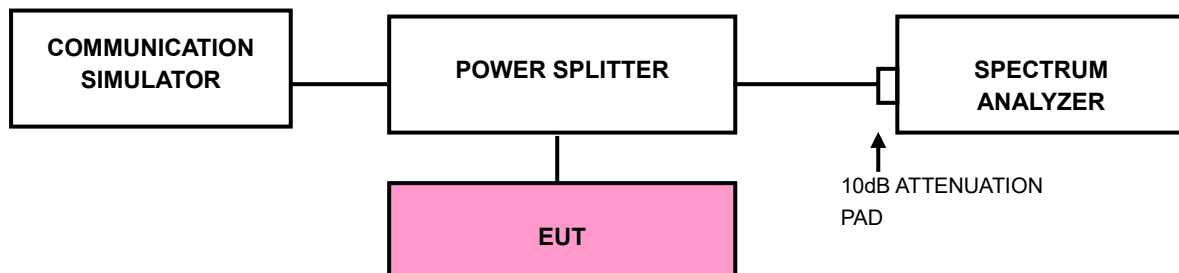
3.5 BAND EDGE MEASUREMENT

3.5.1 LIMITS OF BAND EDGE MEASUREMENT

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.

3.5.2 TEST SETUP



3.5.3 TEST PROCEDURES

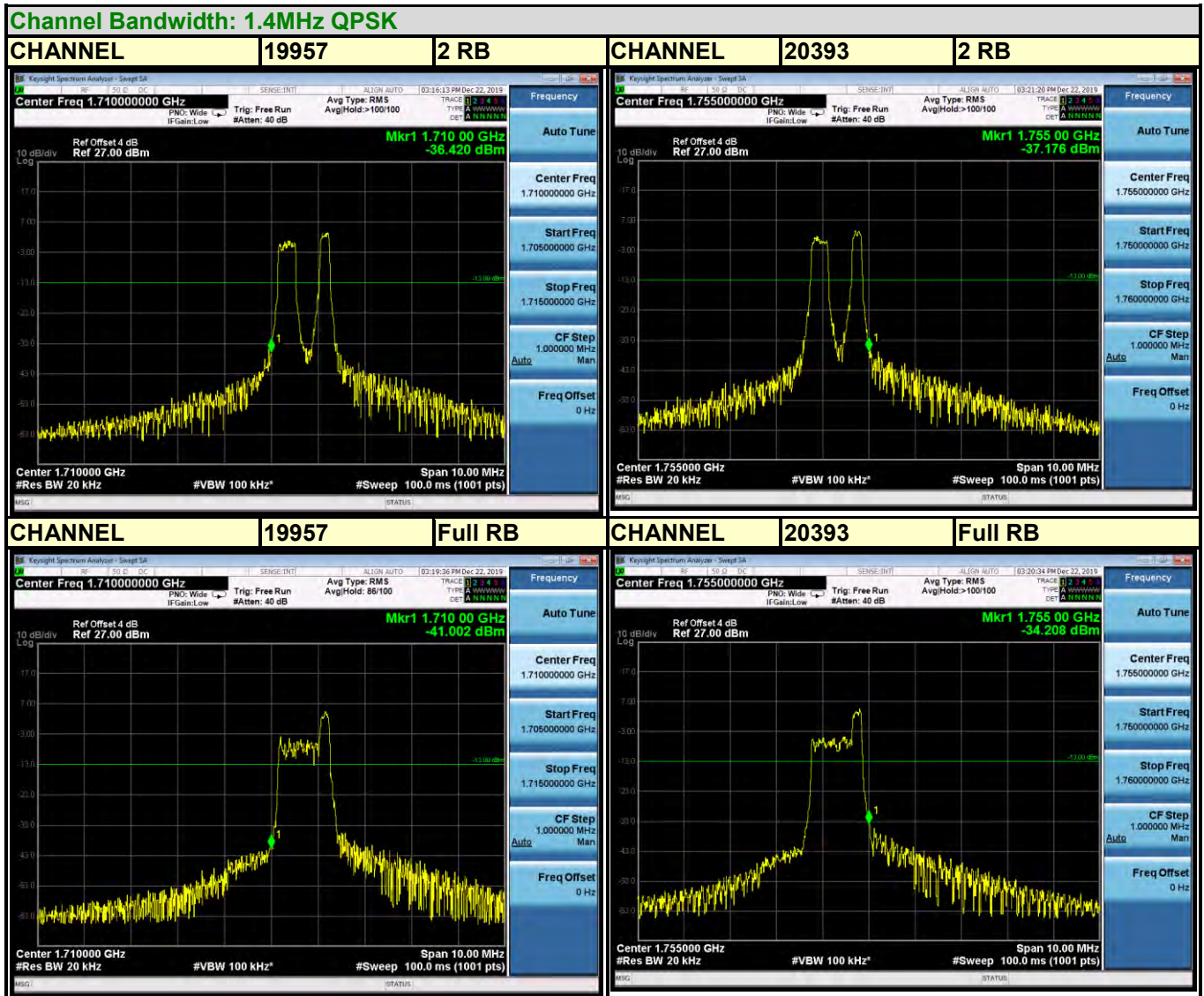
- a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 20kHz and VBW of the spectrum is 100 kHz. (LTE CAT-M1 Bandwidth 1.4MHz)
- d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100kHz. (LTE bandwidth 3MHz)
- e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 50kHz and VBW of the spectrum is 200kHz. (LTE bandwidth 5MHz)
- f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz. (LTE bandwidth 10MHz)
- g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 15MHz)
- h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 20MHz)
- i. Record the max trace plot into the test report.



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3.5.4 TEST RESULTS

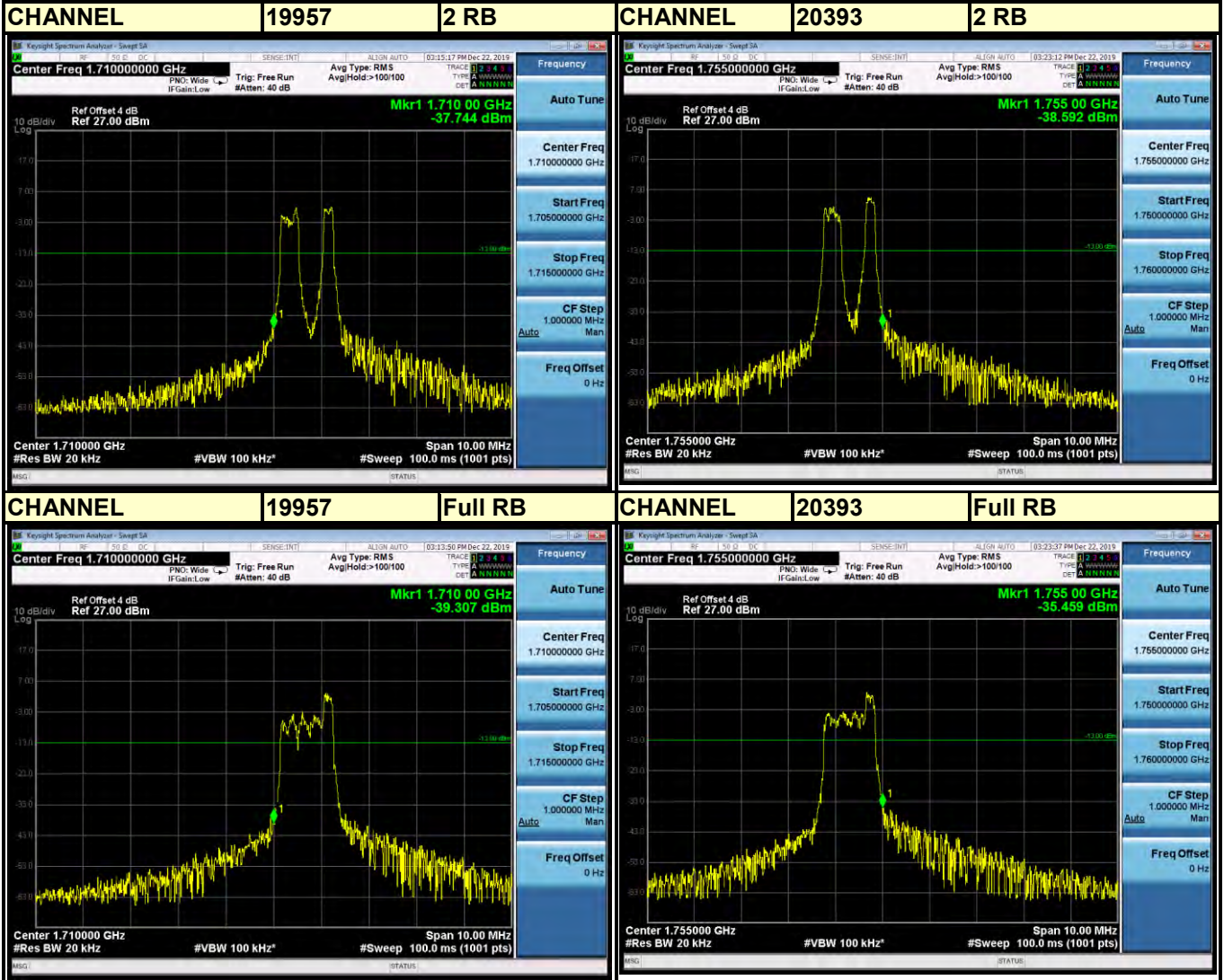
LTE CAT-M1 BAND 4



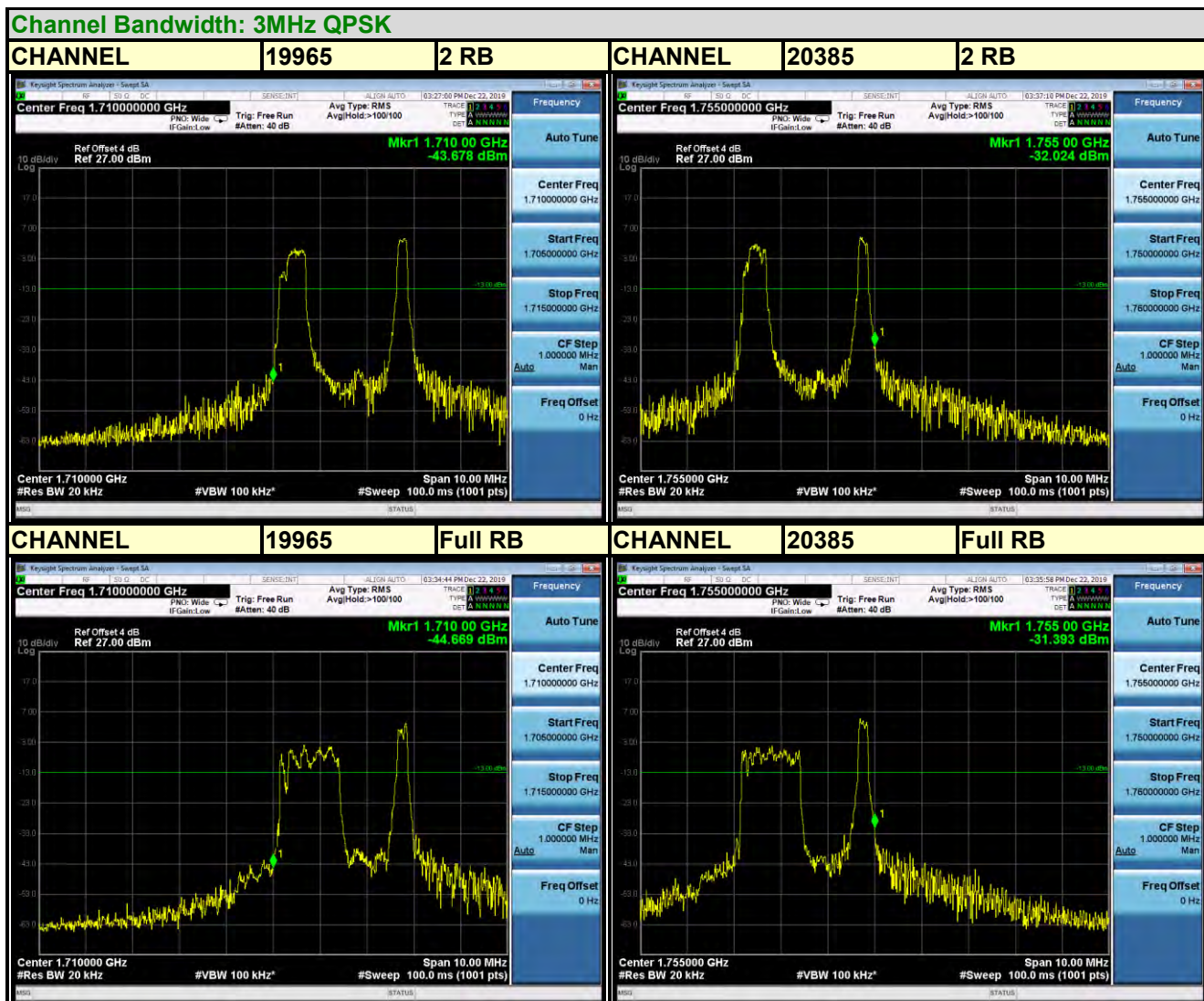


Test Report No.: RF191122W002-3

Channel Bandwidth: 1.4MHz 16QAM



LTE CAT-M1 BAND 4

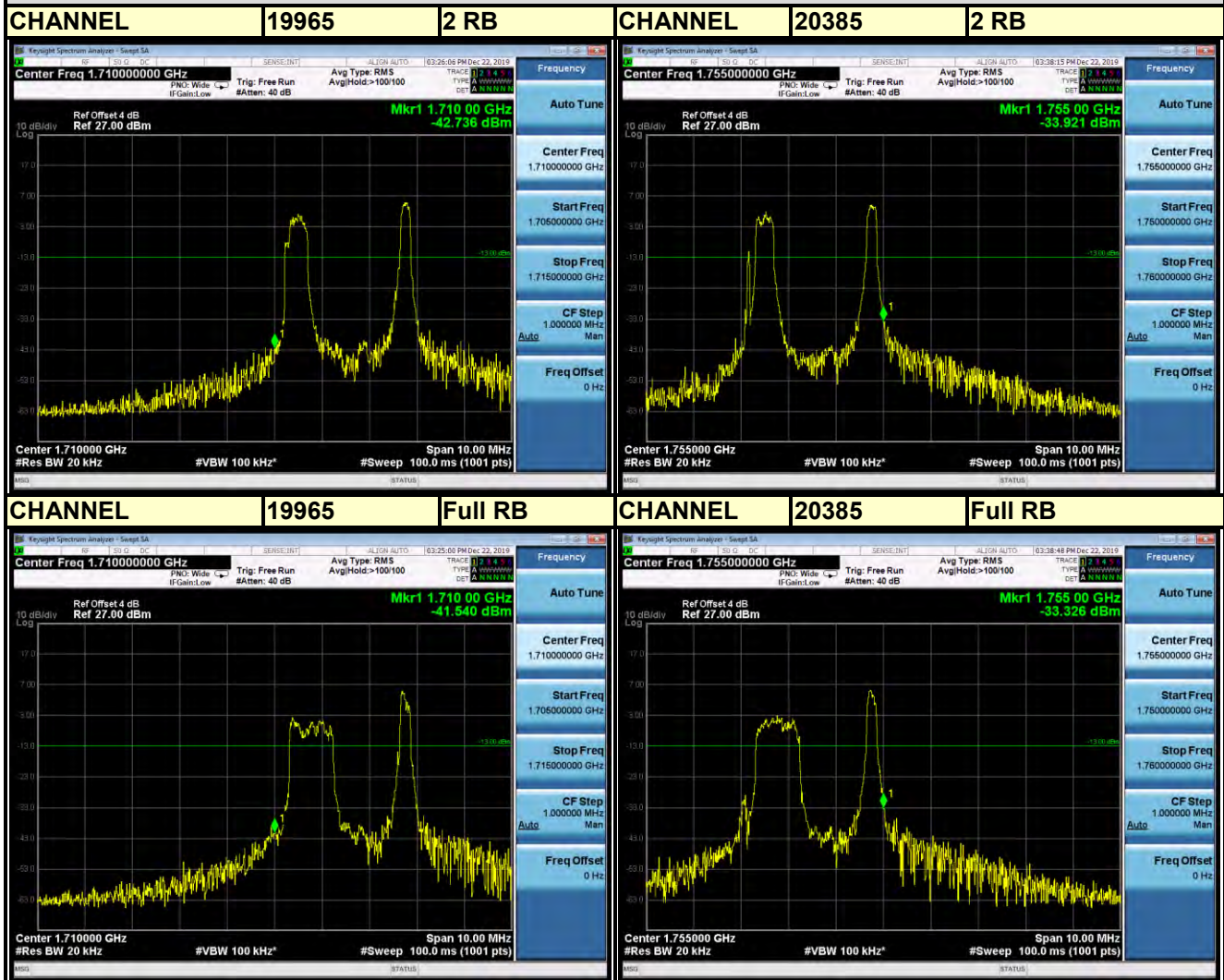




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Test Report No.: RF191122W002-3

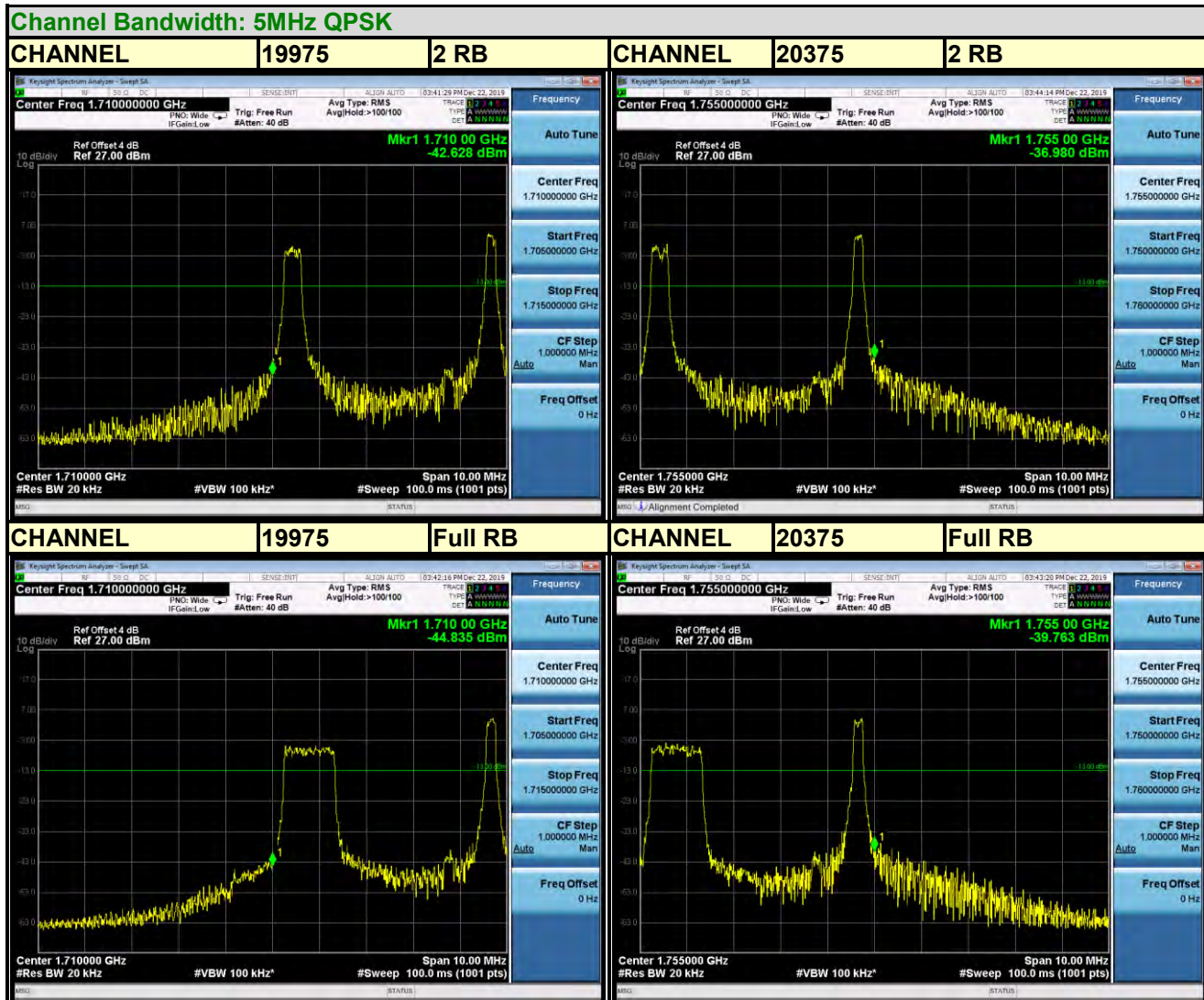
Channel Bandwidth: 3MHz 16QAM





Test Report No.: RF191122W002-3

LTE CAT-M1 BAND 4

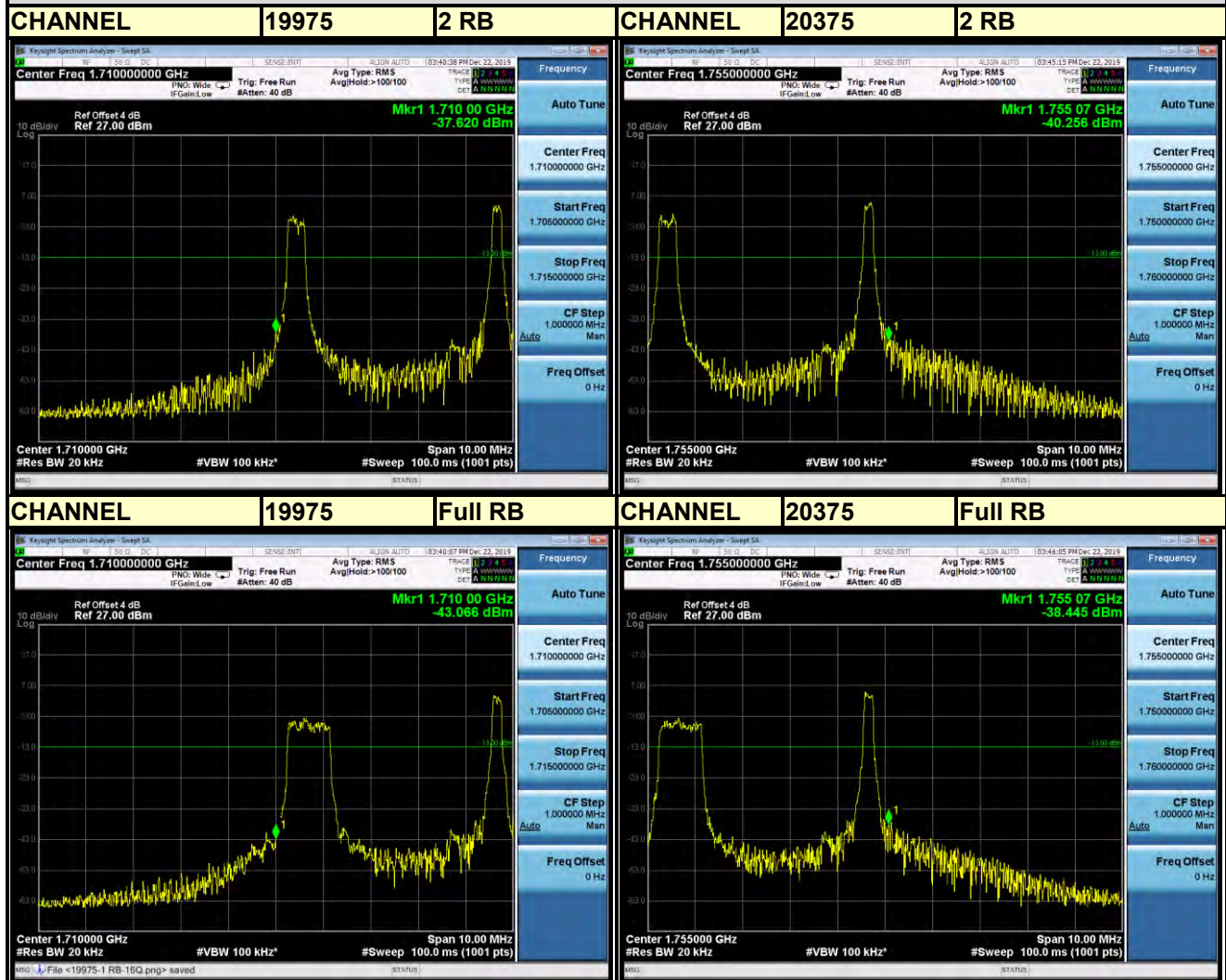




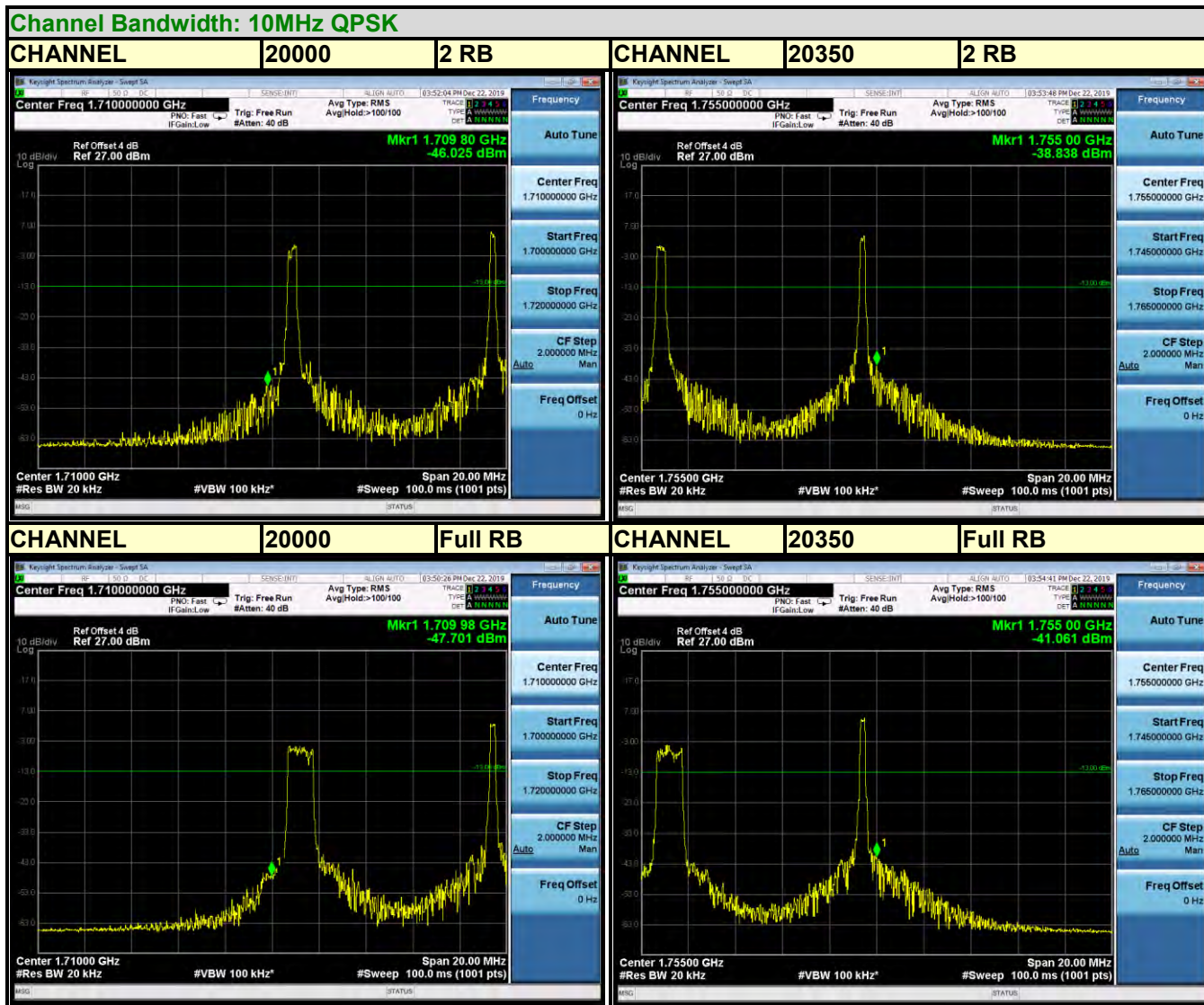
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Test Report No.: RF191122W002-3

Channel Bandwidth: 5MHz 16QAM



LTE CAT-M1 BAND 4

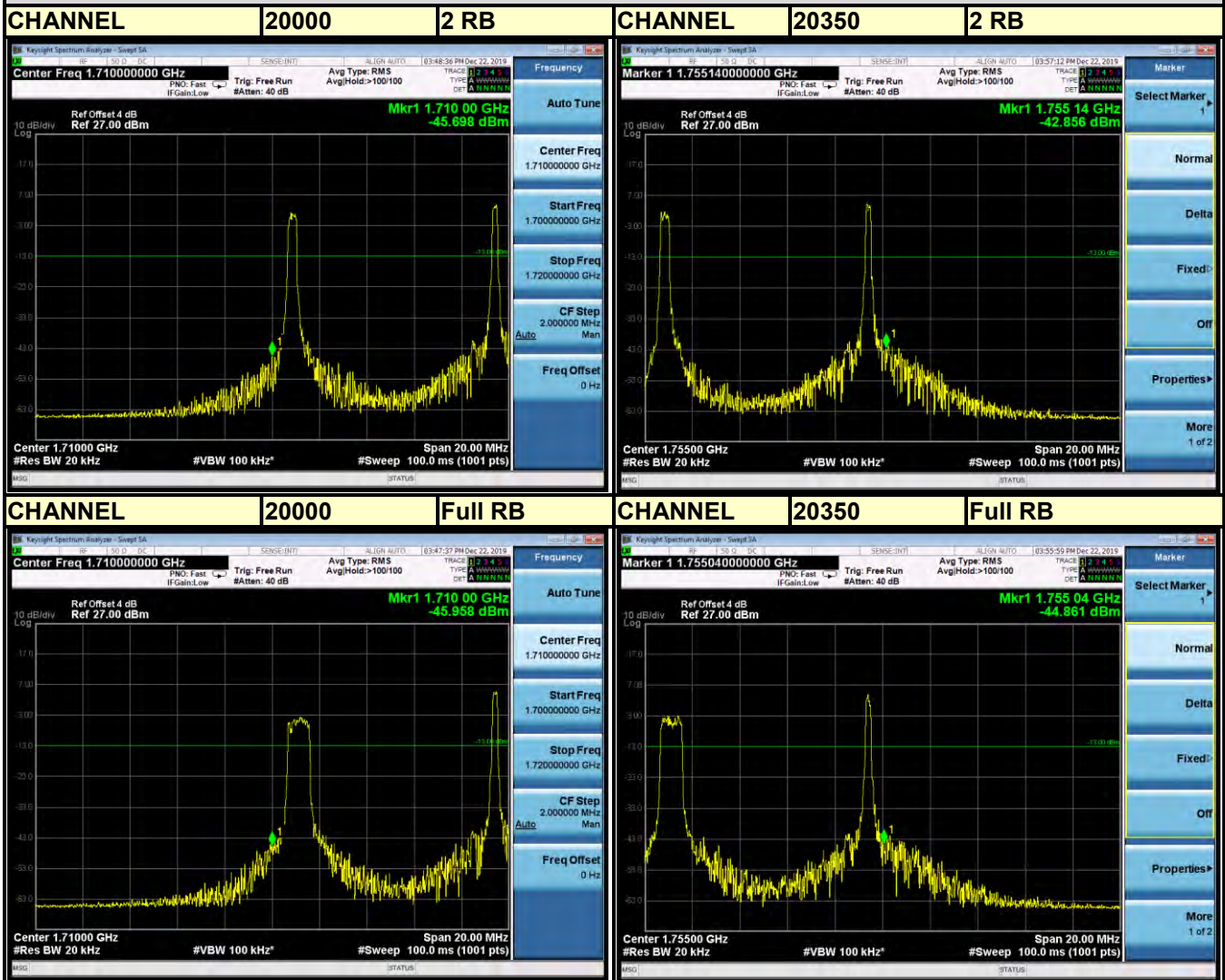




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Test Report No.: RF191122W002-3

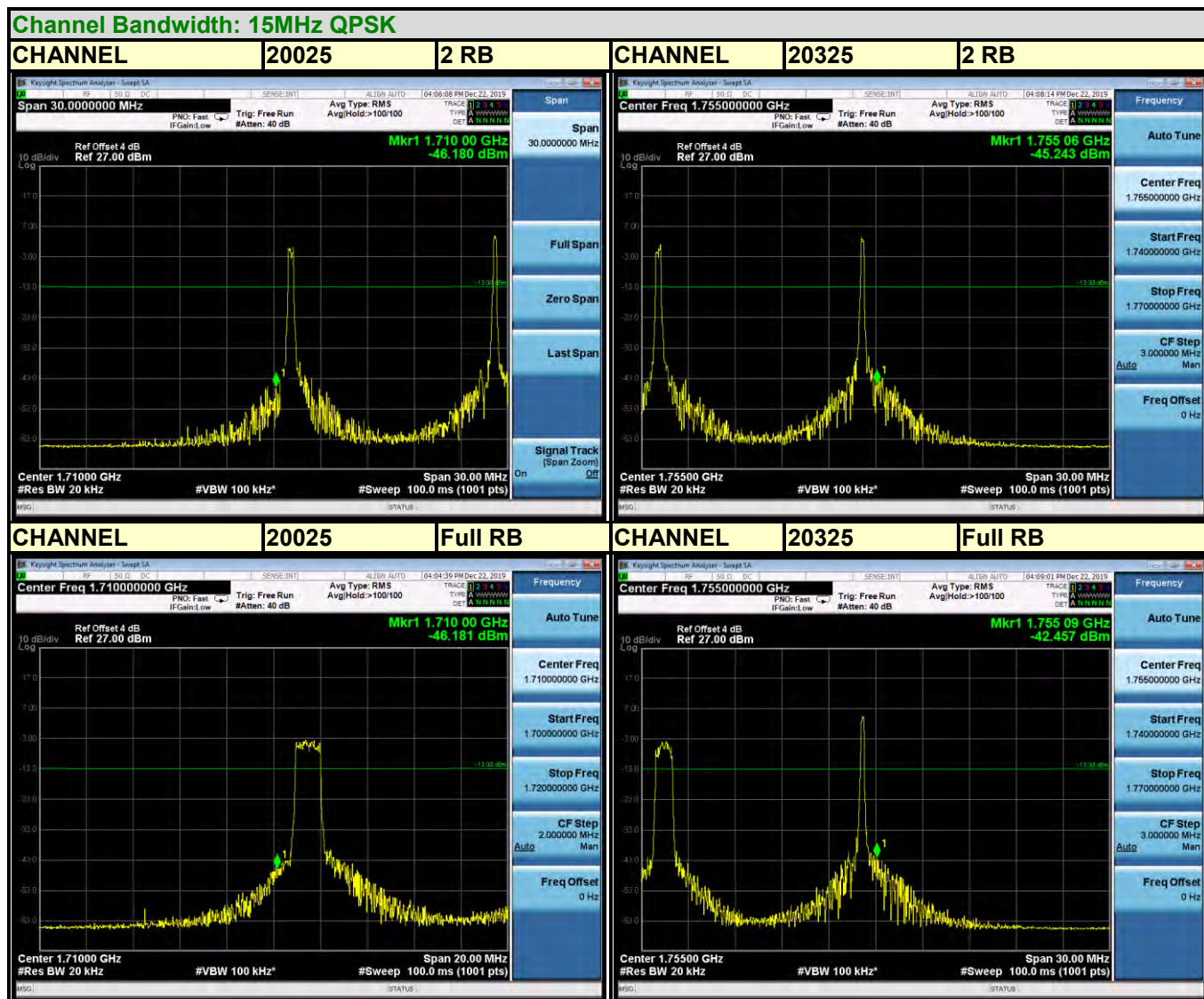
Channel Bandwidth: 10MHz 16QAM



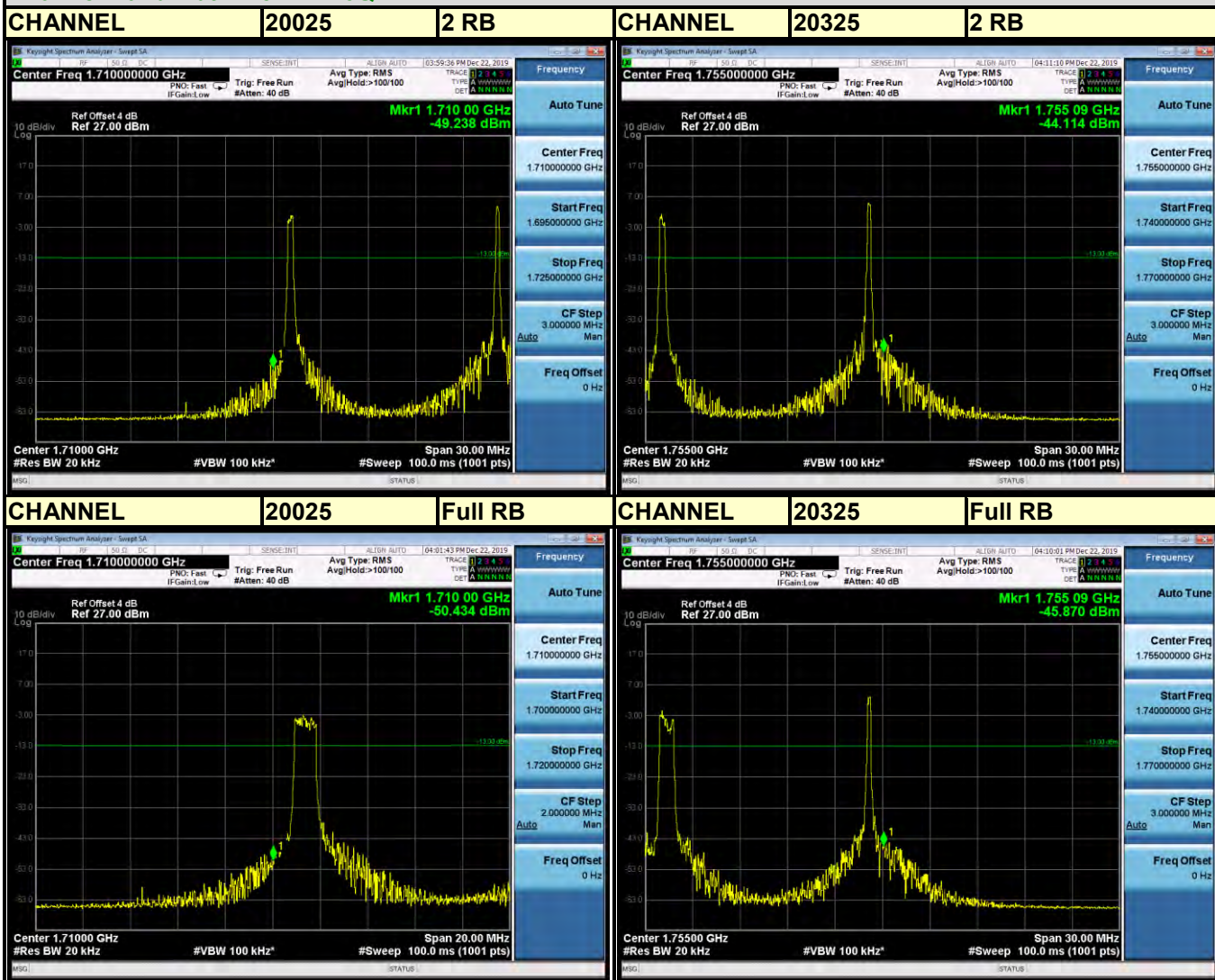


Test Report No.: RF191122W002-3

LTE CAT-M1 BAND 4

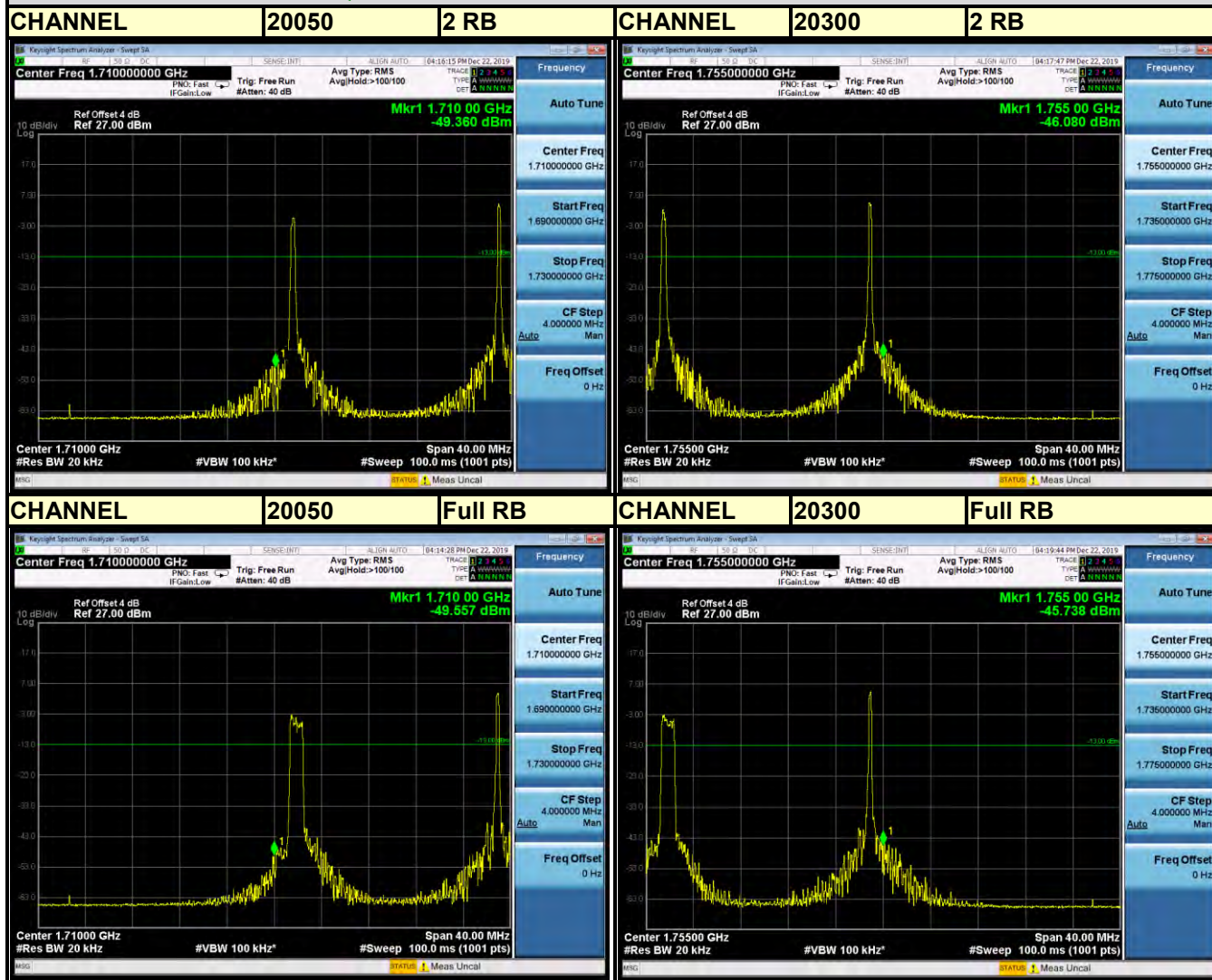


Channel Bandwidth: 15MHz 16QAM



LTE CAT-M1 BAND 4

Channel Bandwidth: 20MHz QPSK

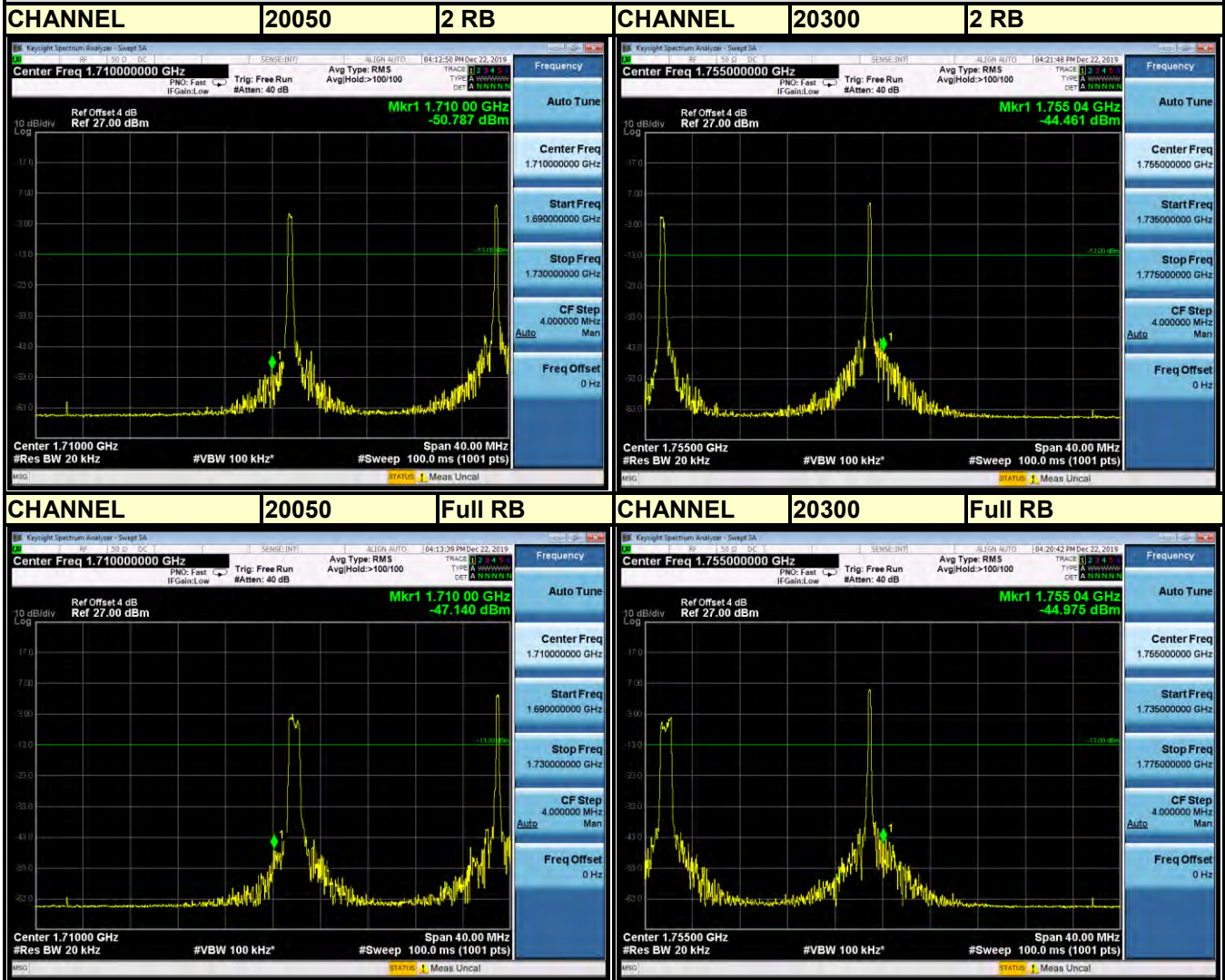




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Test Report No.: RF191122W002-3

Channel Bandwidth: 20MHz 16QAM



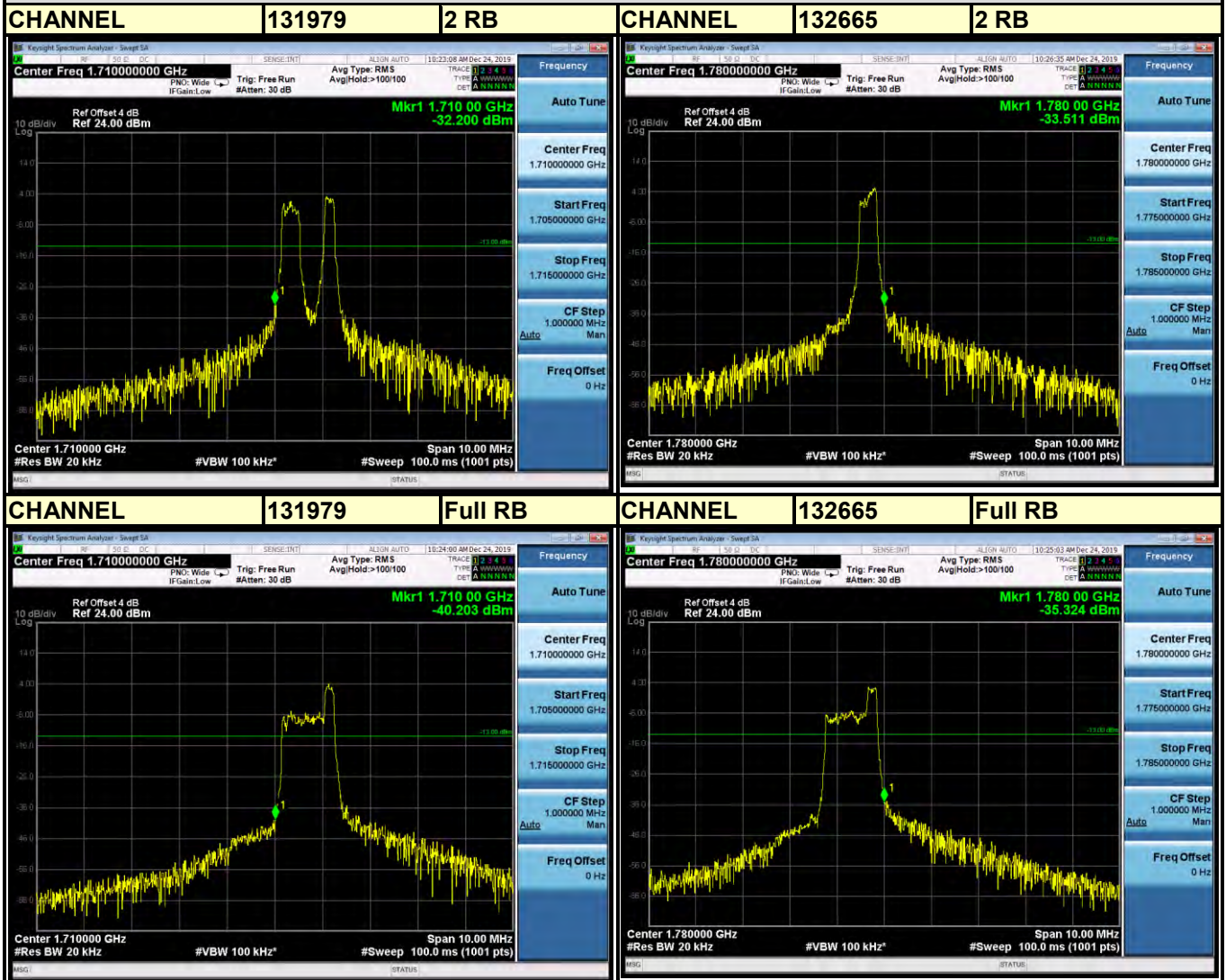


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LTE CAT-M1 BAND 66

Test Report No.: RF191122W002-3

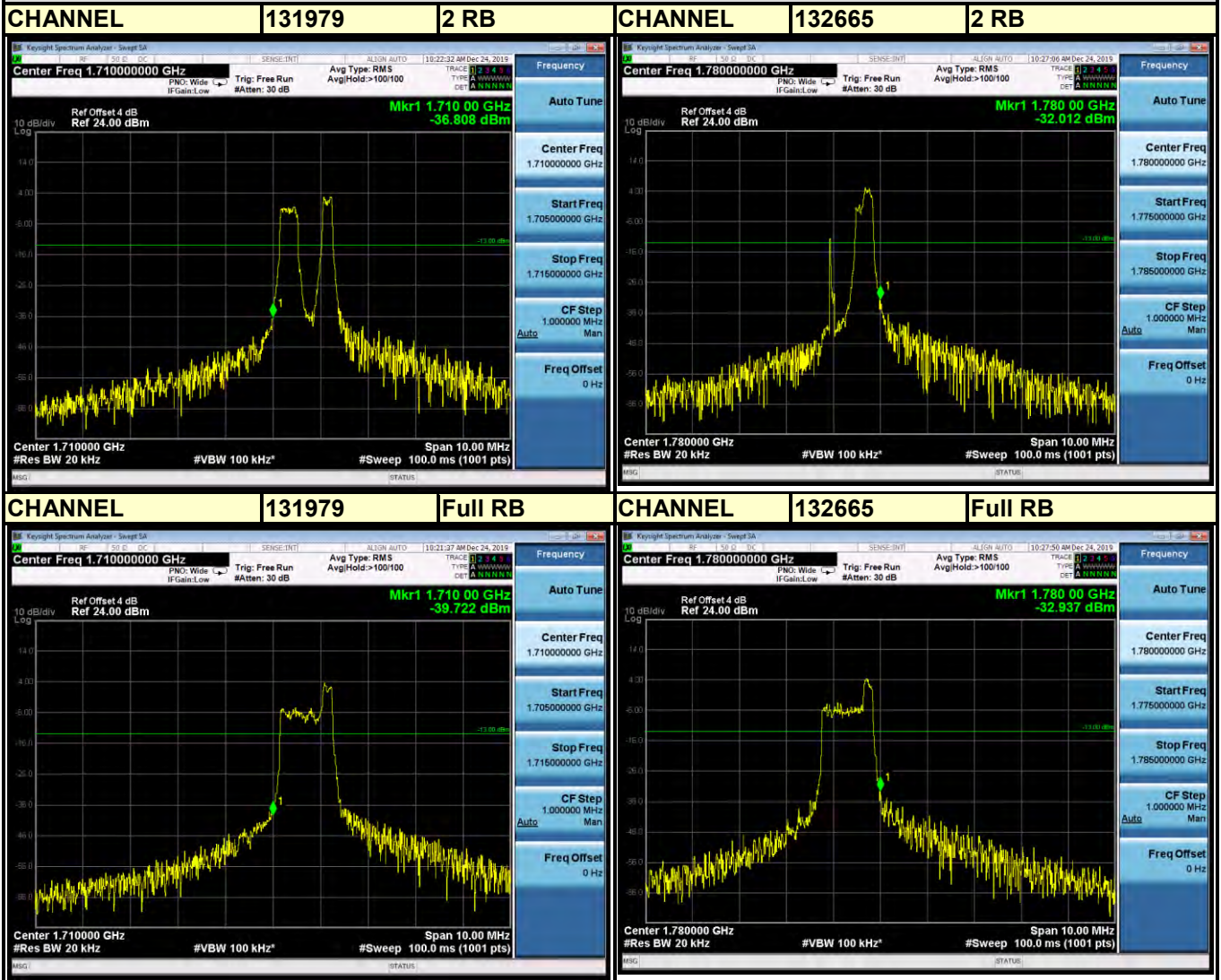
Channel Bandwidth: 1.4MHz QPSK



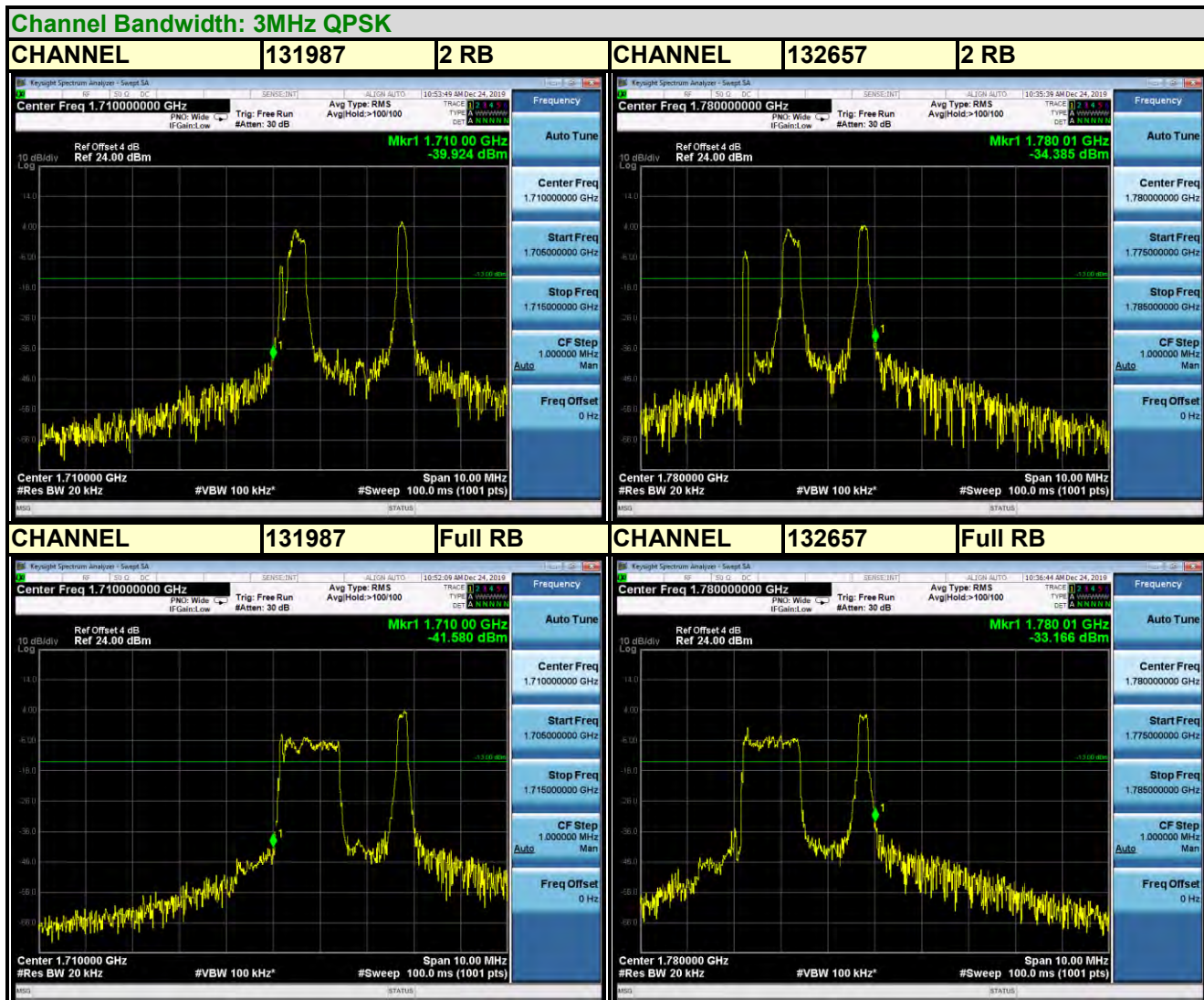


Test Report No.: RF191122W002-3

Channel Bandwidth: 1.4MHz 16QAM



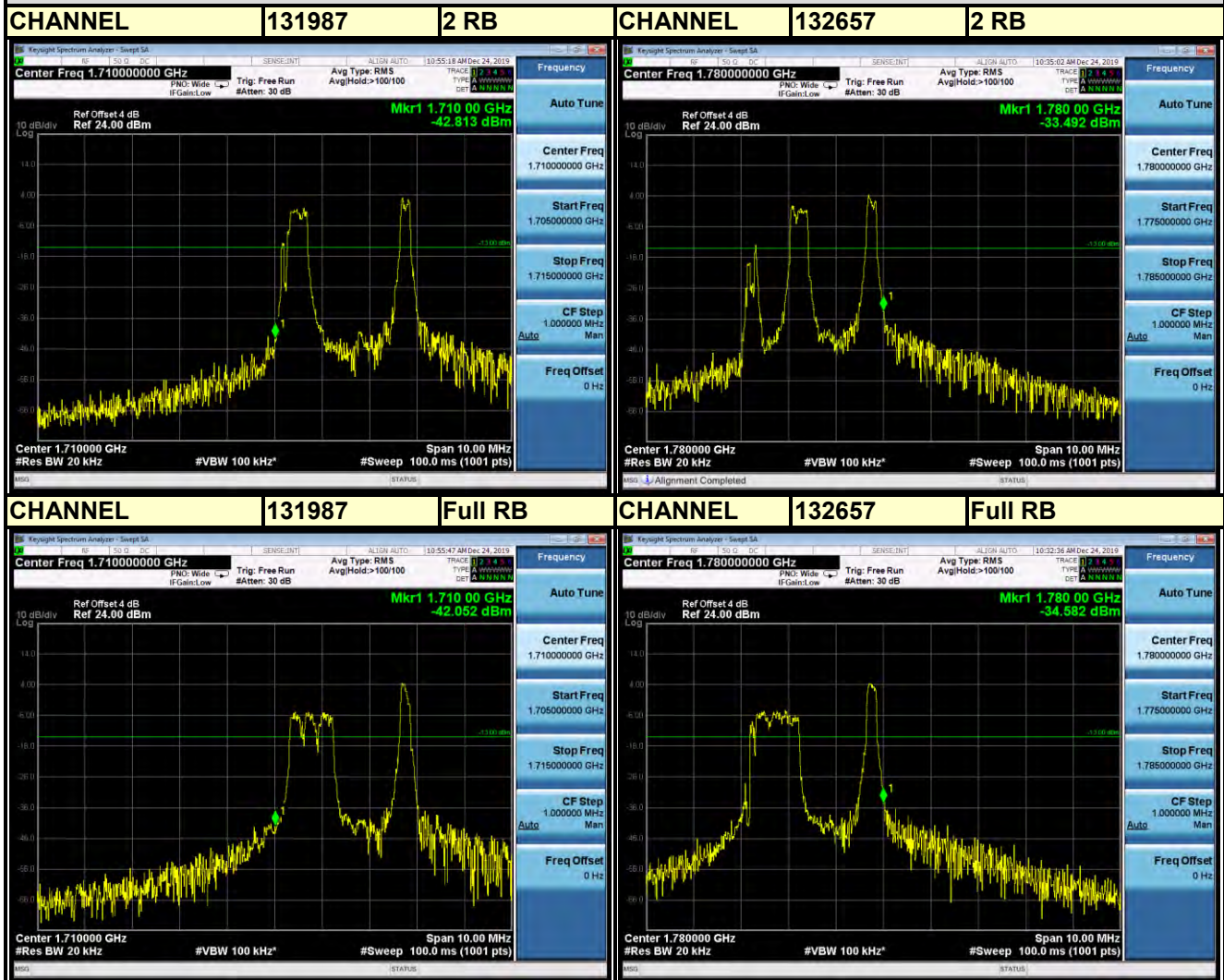
LTE CAT-M1 BAND 66



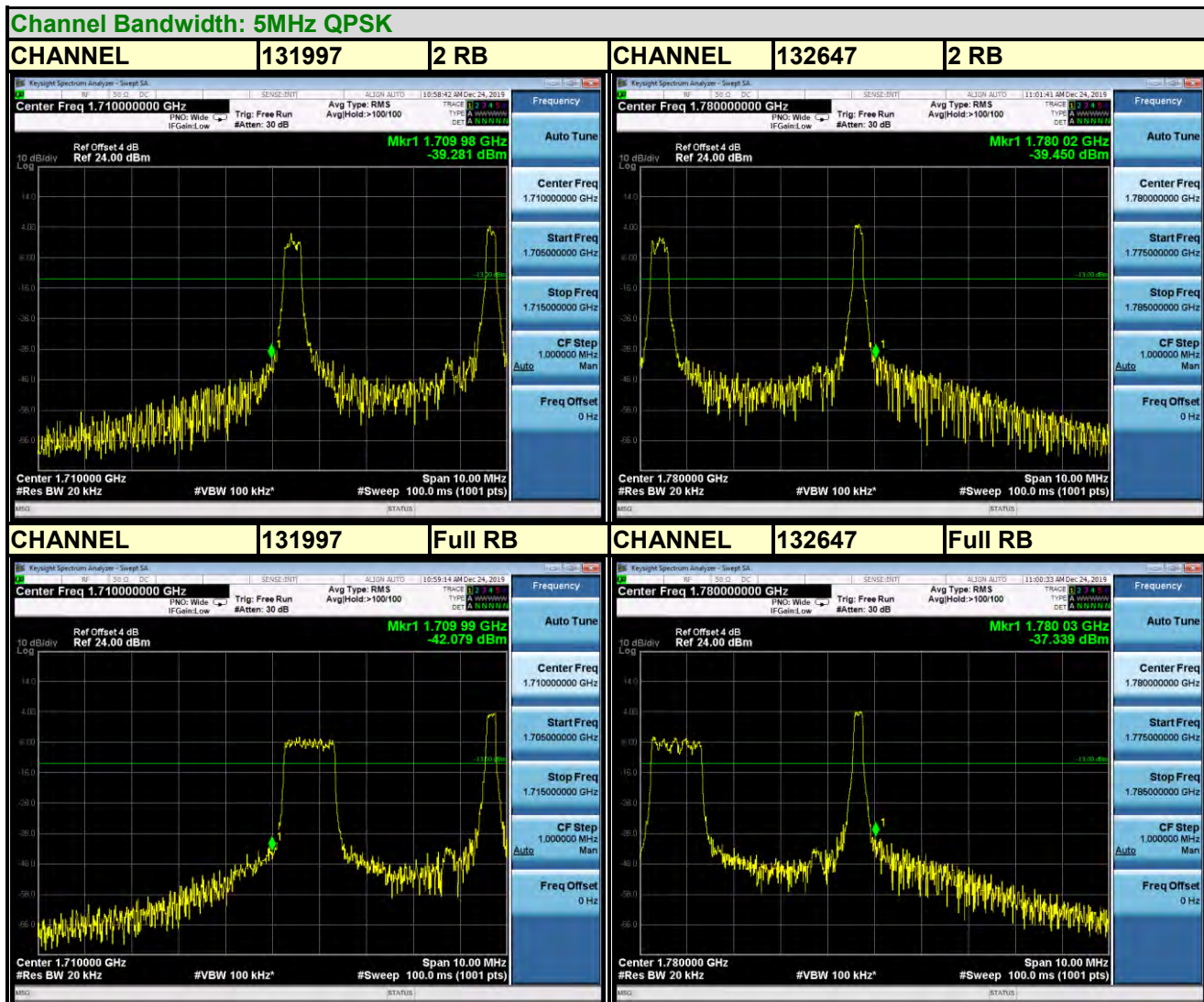


Test Report No.: RF191122W002-3

Channel Bandwidth: 3MHz 16QAM



LTE CAT-M1 BAND 66

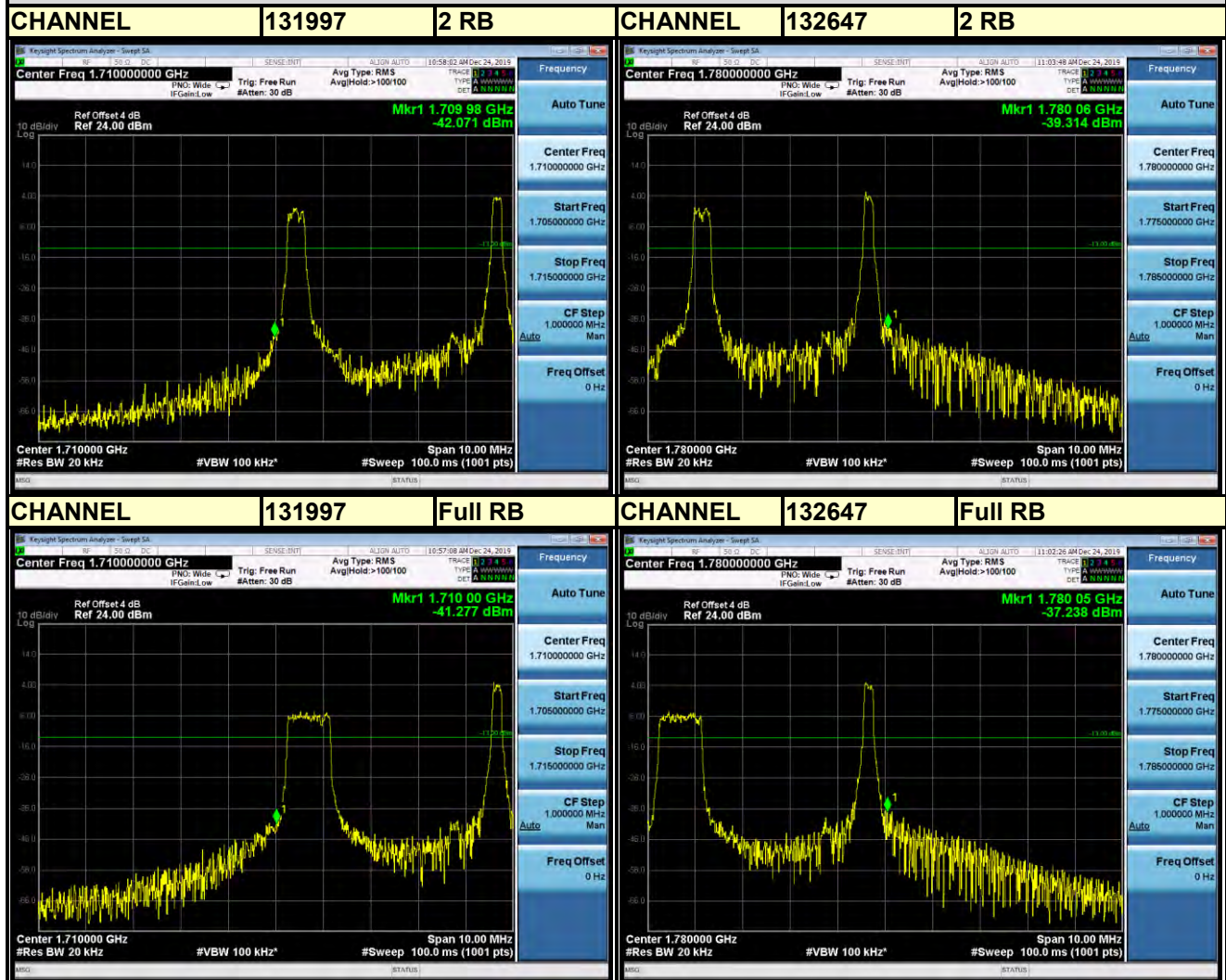




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VERITAS

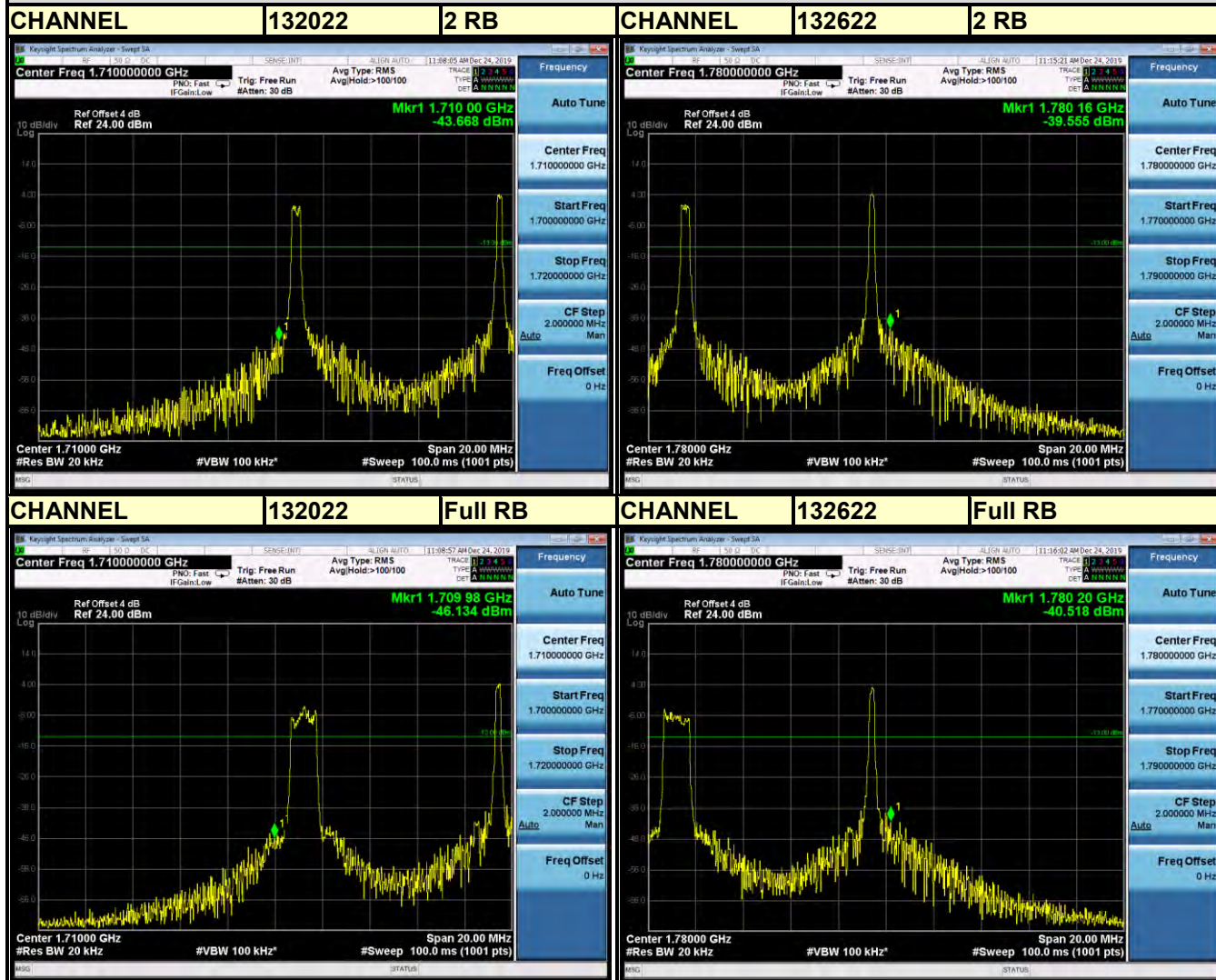
Test Report No.: RF191122W002-3

Channel Bandwidth: 5MHz 16QAM



LTE CAT-M1 BAND 66

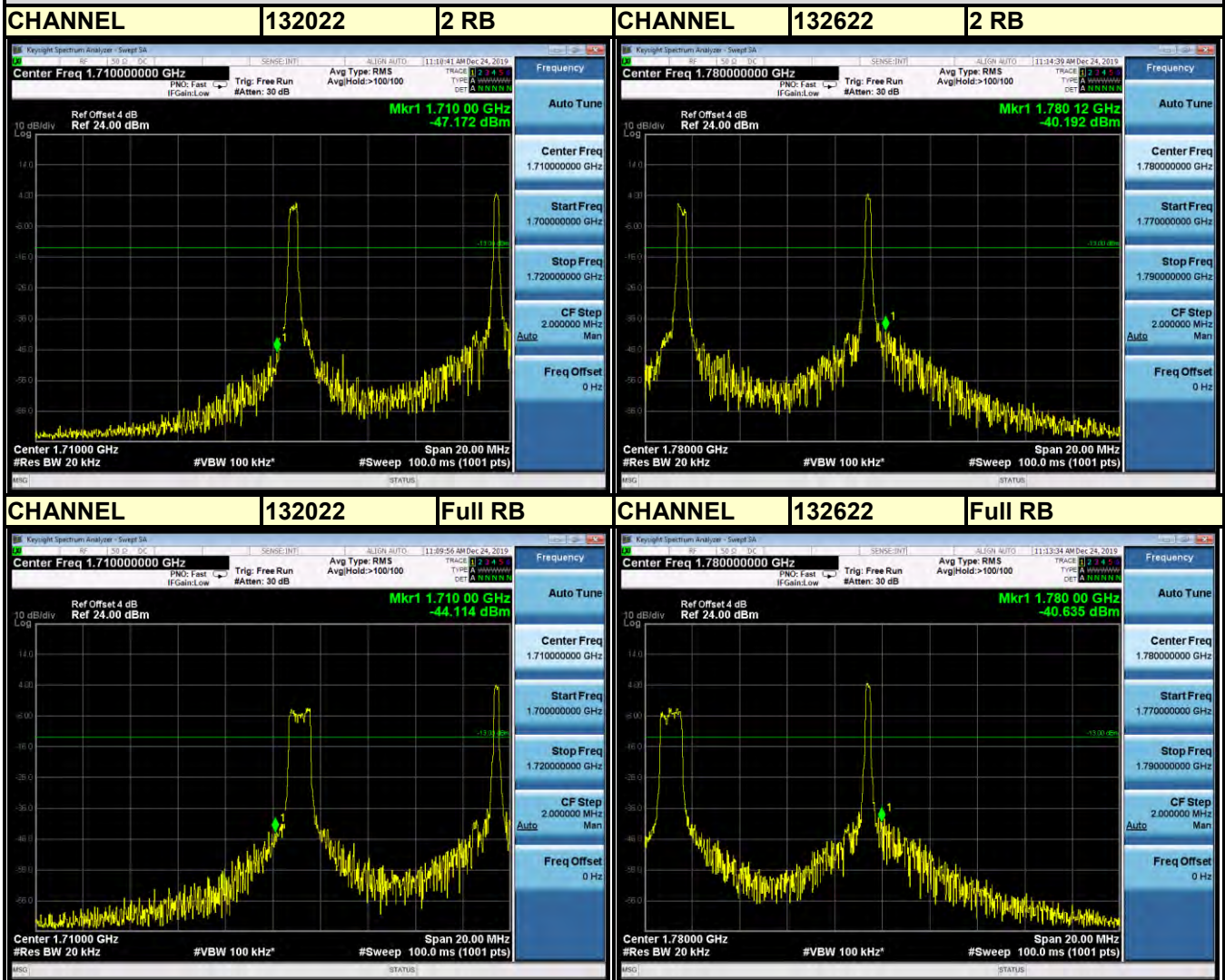
Channel Bandwidth: 10MHz QPSK



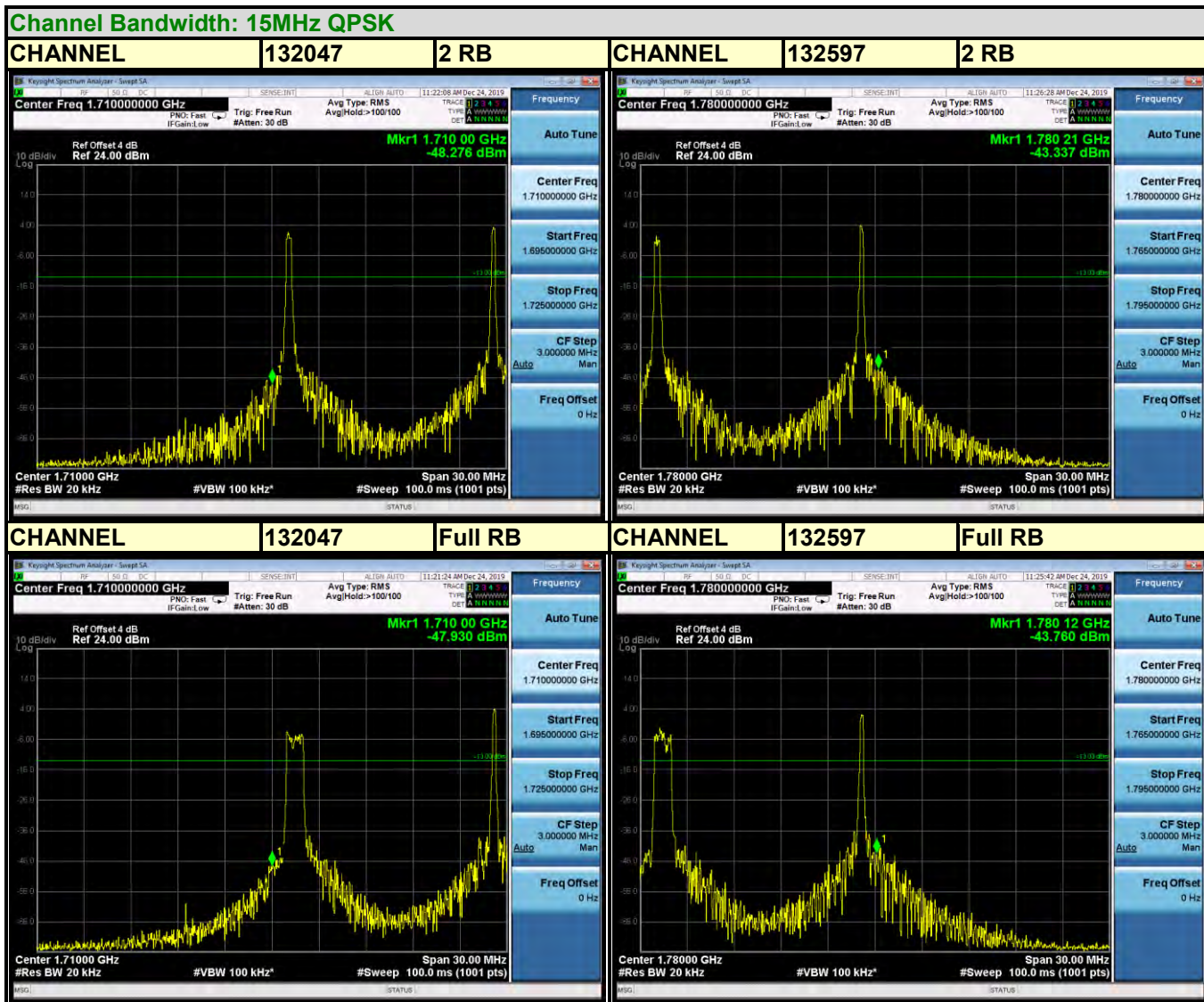


Test Report No.: RF191122W002-3

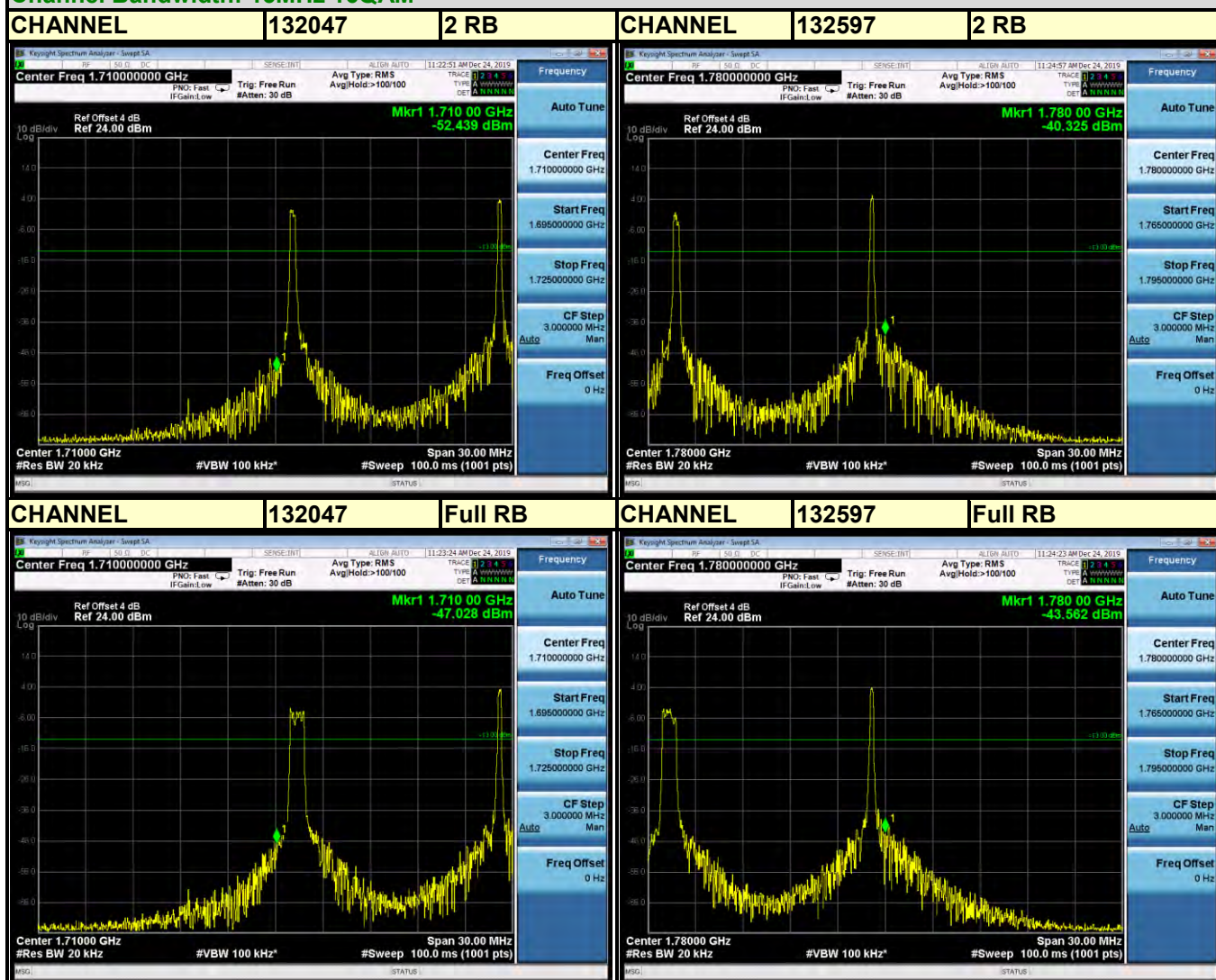
Channel Bandwidth: 10MHz 16QAM



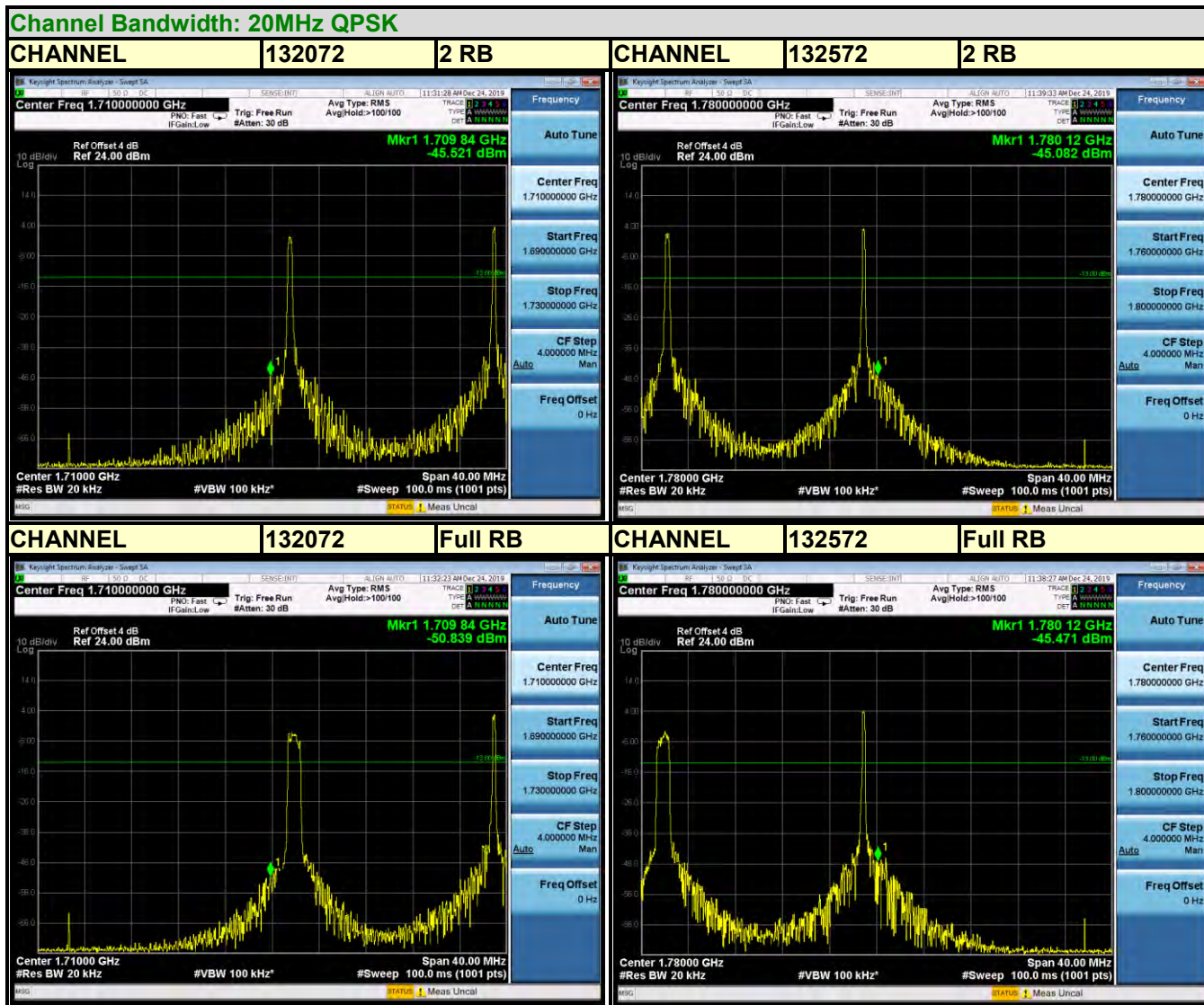
LTE CAT-M1 BAND 66



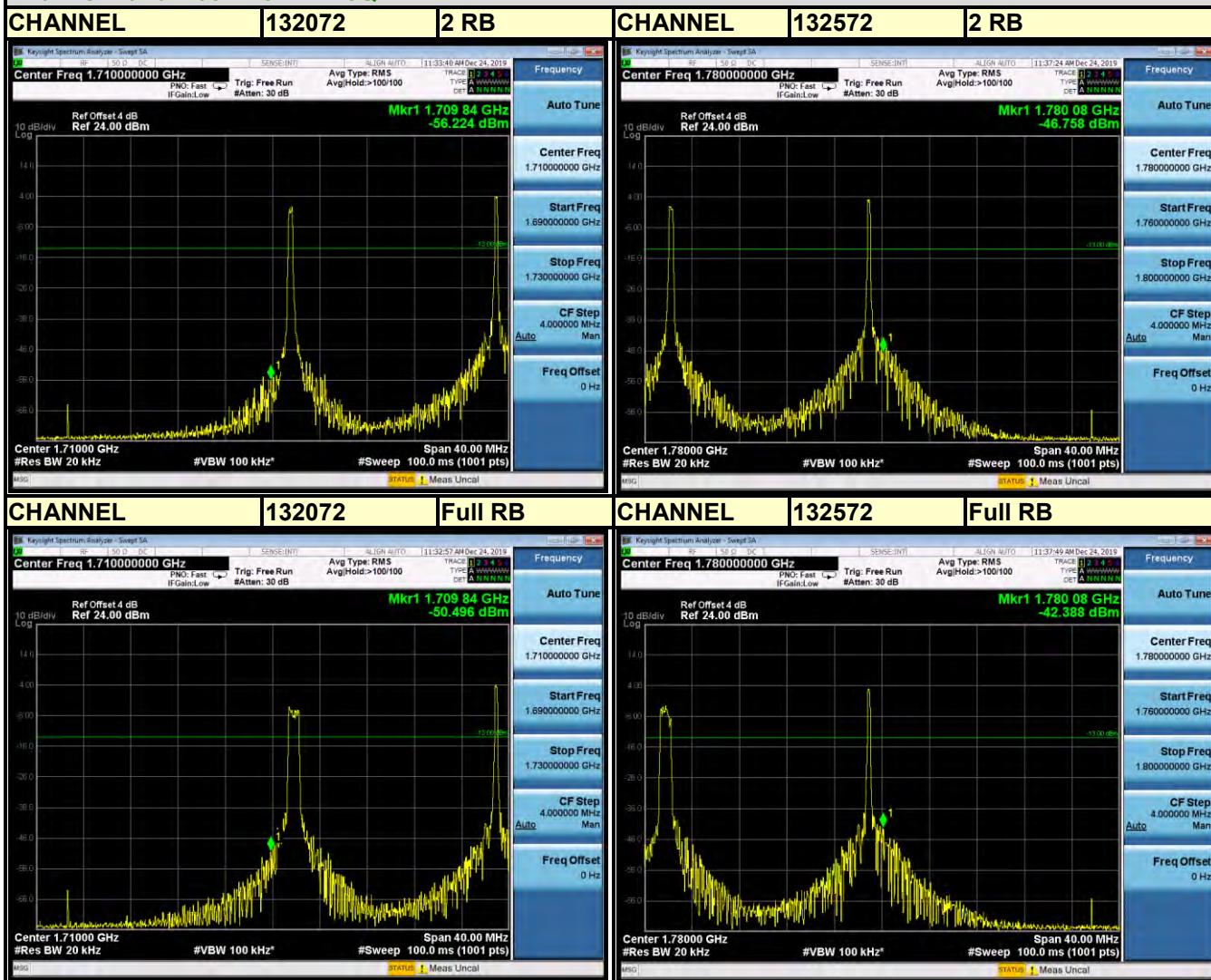
Channel Bandwidth: 15MHz 16QAM



LTE CAT-M1 BAND 66



Channel Bandwidth: 20MHz 16QAM



3.6 CONDUCTED SPURIOUS EMISSIONS

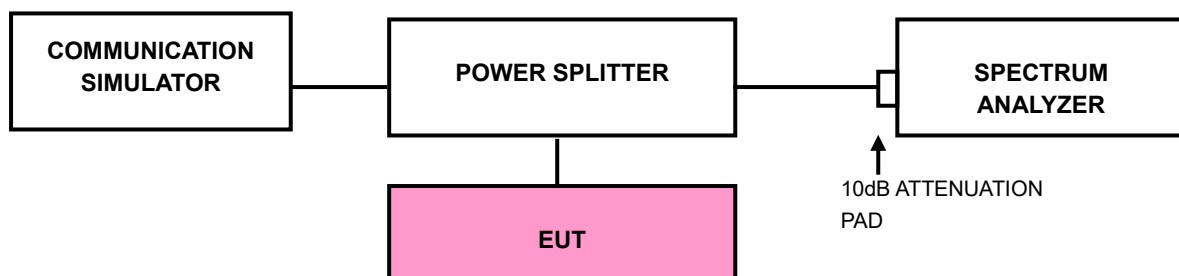
3.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

3.6.2 TEST PROCEDURE

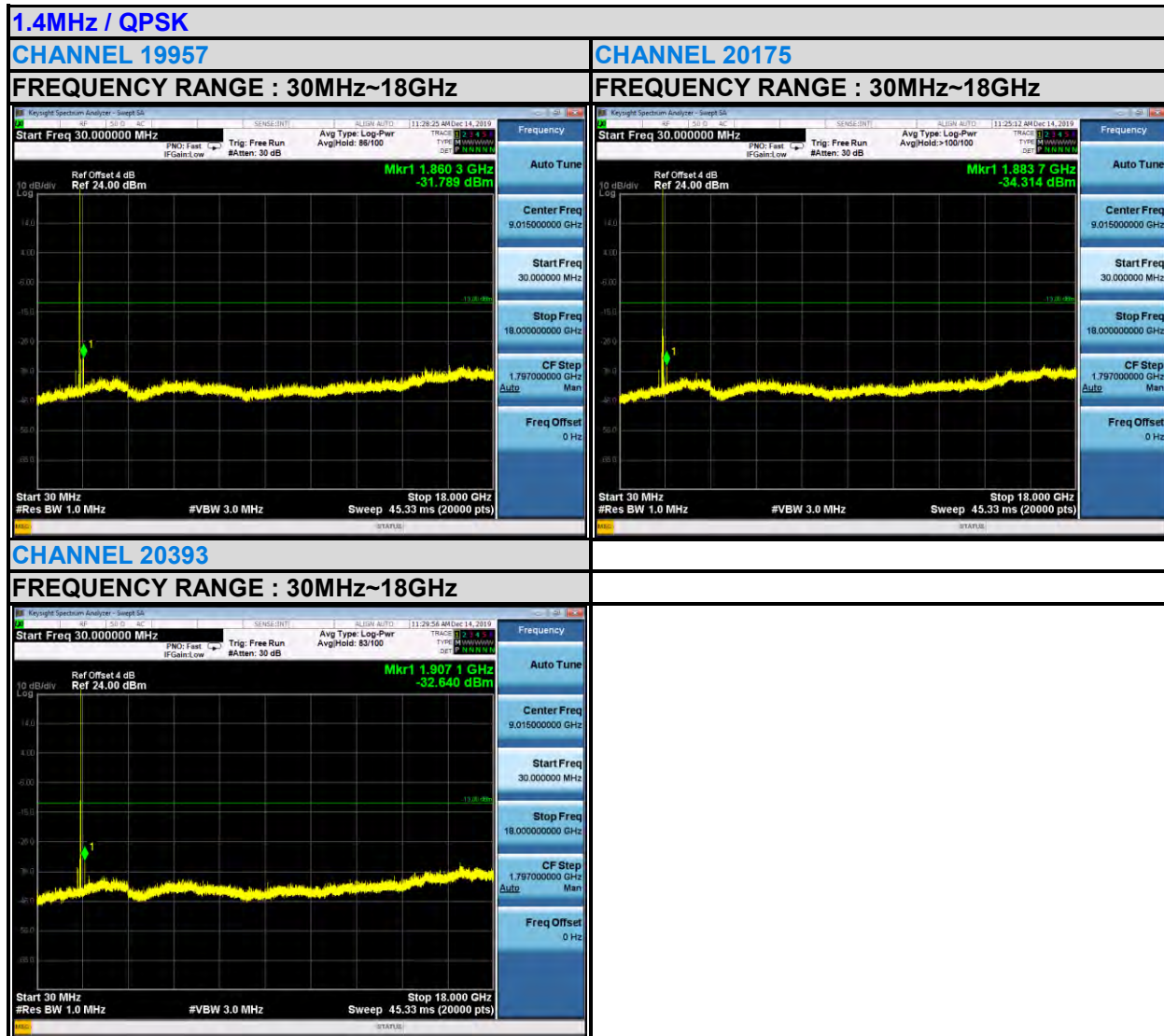
- a. The EUT makes a phone call to the communication simulator. All measurements were done at middle operational frequency range.
- b. Measuring frequency range is from 30 MHz to 19.1GHz for WCDMA Band 4 & LTE Band 4. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

3.6.3 TEST SETUP



3.6.4 TEST RESULTS

LTE CAT-M1 BAND 4



3MHz / QPSK

CHANNEL 19965

FREQUENCY RANGE : 30MHz~18GHz



CHANNEL 20175

FREQUENCY RANGE : 30MHz~18GHz



CHANNEL 20385

FREQUENCY RANGE : 30MHz~18GHz

