

Shenzhen HUAK Testing Technology Co., Ltd. Report No.: HK2402210730-6E

# FCC Test Report FCC Part 27

Report Reference No FCC ID	
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Date of issue	Mar. 07, 2024
Testing Laboratory Name	Shenzhen HUAK Testing Technology Co., Ltd.
Address:	1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Applicant's name:	Streamax Technology Co., Ltd.
Address:	21-23/F, Building B1, Zhiyuan, No. 1001, Xueyuan Avenue, Nanshan District, Shenzhen, Guangdong 518055, China
Test specification:	
Standard	FCC CFR Title 47 Part 2, Part 27
TRF Originator	Shenzhen HUAK Testing Technology Co., Ltd.
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Test item description	: MDVR
Trade Mark	: N/A
Manufacturer	: Streamax Technology Co., Ltd.
Model/Type reference	: M1N 2.0
Series Models	: N/A
Modulation Type	: QPSK, 16QAM
Rating	: DC 12V from DC Power
Hardware version	: V1.0
Software version	: V1.0
Result	PASS

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# TEST REPORT

HK2402210730-6E –	Mar. 07, 2024
	Date of issue
: MDVR	
: M1N 2.0	
: N/A	
: Streamax Technology Co	., Ltd.
21-23/F, Building B1, Zhiyu Avenue, Nanshan District, 518055, China	
: Streamax Technology Co	., Ltd. why restrice
21-23/F, Building B1, Zhiyu Avenue, Nanshan District, 518055, China	
	<ul> <li>MDVR</li> <li>M1N 2.0</li> <li>N/A</li> <li>Streamax Technology Co</li> <li>21-23/F, Building B1, Zhiyu Avenue, Nanshan District, 518055, China</li> <li>Streamax Technology Co</li> <li>21-23/F, Building B1, Zhiyu Avenue, Nanshan District,</li> </ul>

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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Т 691

# \*\* Modified History \*\*

Revision		Description Is		Issued Data	
Revision 1.0	lr	nitial Test Report Release	Mar. (	07, 2024	Jason Zhou
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~S'*	~S\"	~SIT	~S'	~S\"	~S'

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# 1 <u>Summary</u>

# 1.1 Test Standards

The tests were performed according to following standards:

FCC Part 27: Miscellaneous Wireless Communications Services.

TIA/EIA 603 D June 2010:Land Mobile FM or PM Communications Equipment Measurement and Performance Standards 47 CFR FCC Part 15 Subpart B: - Unintentional Radiators.

FCC Part 2: Frequency Alloca-Tions And Radio Treaty Mat-Ters; General Rules And Reg-Ulations.

KDB971168 D01: v02r02 Measurement Guidance For Certification Of Licensed Digital Transmitters.

# 1.2 Test Description

Section in CFR 47	Result
Part 2.1046 Part 27.50(d)(4)	Pass
Part 27.50(d)(4)	Pass
Part 2.1049 Part 27.53(h)	Pass
Part 2.1051 Part 27.53(h)	Pass
Part 2.1053 Part 27.53(h)	Pass
Part 2.1051 Part 27.53(h)	Pass
Part 2.1055 Part 27.54	Pass
	Part 2.1046         Part 27.50(d)(4)         Part 27.50(d)(4)         Part 27.50(d)(4)         Part 2.1049         Part 27.53(h)         Part 27.53(h)

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ICATION



# 1.3 Information of The Test Laboratory

Shenzhen HUAK Testing Technology Co., Ltd. Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01. FCC Designation Number is CN1229. Canada IC CAB identifier is CN0045. CNAS Registration Number is L9589.

# 1.4 Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4:Uncertainty in EMC Measurements" and is documented in the Shenzhen HUAK Testing Technology Co., Ltd.quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen HUAK Testing Technology Co., Ltd.is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)
(1) This uncertainty represe	nts an expanded uncertainty	expressed at approxima	tely the 95%

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

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# 2 <u>General Information</u>

# 2.1 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C		
Relative Humidity:	55 %	K TESTING	W TESTING
Air Pressure:	101 kPa	O HUM	O HUM

# 2.2 Description of Test Modes

The EUT has been tested under typical operating condition. The CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report. Note:

- 1. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst resulton this report.
- 2. Test method and refer to 3GPP TS136521.

# 2.3 Test frequency list

The	ulpo - ulpo	- ullpo
0	0.	
TX Channel Bandwidth	Frequency (MHz)	channel
1.4 MHz	1710.7	19957
	1732.5	20175
	1754.3	20393
	1711.5	19965
3 MHz	1732.5	20175
)	1753.5	20385
	1712.5	19975
5 MHz	1732.5	20175
and	1752.5	20375
	1715.0	20000
10 MHz 🌑	1732.5	20175
Die	1750.0	20350
2/11	1717.5	20025
15 MHz	1732.5	20175
O HOM	1747.5	20325
	1720.0	20050
20 MHz	1732.5	20175
	1745.0	20300

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# 2.4 Equipments Used During The Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	ENV216	R&S	HKE-059	2024/02/20	2025/02/19
LISN	R&S	ENV216	HKE-002	2024/02/20	2025/02/19
Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	2024/02/21	2026/02/20
Receiver	R&S	ESR-7	HKE-010	2024/02/20	2025/02/19
Spectrum analyzer	Agilent	N9020A	HKE-048	2024/02/20	2025/02/19
RF automatic control unit	Tonscend	JS0806-2	HKE-060	2024/02/20	2025/02/19
Horn antenna	Schwarzbeck	9120D	HKE-013	2024/02/21	2026/02/20
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	2024/02/21	2026/02/20
Preamplifier	EMCI 🔜 😡	EMC051845SE	HKE-015	2024/02/20	2025/02/19
Preamplifier	Agilent	83051A	HKE-016	2024/02/20	2025/02/19
Temperature and humidity meter	Boyang	HTC-1	HKE-075	2024/02/20	2025/02/19
High pass filter unit	Tonscend	JS0806-F	HKE-055	2024/02/20	2025/02/19
RF cable	Times	1-40G	HKE-034	2024/02/20	2025/02/19
Power meter	Agilent	E4419B	HKE-085	2024/02/20	2025/02/19
Power Sensor	Agilent	E9300A	HKE-086	2024/02/20	2025/02/19
Wireless Communication Test Set	R&S	CMU200	HKE-026	2024/02/20	2025/02/19
High gain antenna	Schwarzbeck	LB-180400KF	HKE-054	2024/02/21	2026/02/20
Horn antenna	Schwarzbeck	9120D	HKE-135	2024/02/21	2026/02/20
High gain antenna	Schwarzbeck	LB-180400KF	HKE-128	2024/02/21	2026/02/20
Broadband antenna	Schwarzbeck	VULB 9163	HKE-087	2024/02/21	2026/02/20
Signal generator	Agilent	E4433B	HKE-120	2024/02/20	2025/02/19
Signal generator	Agilent	E4421B	HKE-121	2024/02/20	2025/02/19

# 2.5 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AM6L-M1N2 filing to comply with of the FCC Part 27 Rules.

# 2.6 Modifications

No modifications were implemented to meet testing criteria.

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# 3 Test Conditions and Results

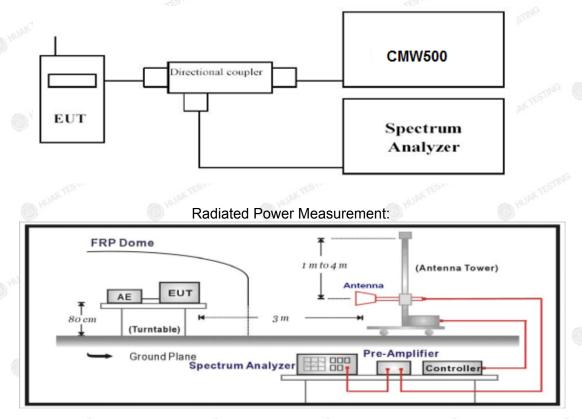
# 3.1 Output Power

# LIMIT

According to §27.50 (d) (4): Fixed, mobile, and portable (hand- held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

# TEST CONFIGURATION

**Conducted Power Measurement** 



# TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D.

### **Conducted Power Measurement:**

- a) Place the EUT on a bench and set it in transmitting mode.
- b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- c) EUT Communicate with CMW500, then select a channel for testing.
- d) Add a correction factor to the display of spectrum, and then test.

# **Radiated Power Measurement:**

- a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.
- c. The output of the test antenna shall be connected to the measuring receiver.
- d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e. The test antenna shall be raised and lowered through the specified range of height until a maximum signal

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# **HUAK TESTING**

level is detected by the measuring receiver.

- f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h. The maximum signal level detected by the measuring receiver shall be noted.
- i. The transmitter shall be replaced by a substitution antenna.
- j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k. The substitution antenna shall be connected to a calibrated signal generator.
- I. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- q. Test site anechoic chamber refer to ANSI C63.4.

# TEST RESULTS

### **Conducted Measurement:**

TX Channel	Frequency	LTE FDD Band 4	Average	Power [dBm]
Bandwidth	(MHz)	RB Size/Offset	QPSK	16QAM
HUAK		1 RB low	23.14	22.22
0		1 RB high	23.28	21.99
	1710.7	50% RB mid	23.10	21.98
		100% RB	23.16	22.20
TESTING	m. @	1 RB low	23.16	21.94
1.4 MHz	1700 E - MARTE	1 RB high	23.29	22.09
	1732.5	50% RB mid	22.23	21.26
		100% RB	23.38	22.42
		1 RB low	23.52	22.56
TING	1754.3	1 RB high	23.38	22.30
TES	1754.5	50% RB mid	23.51	22.42
(D) +1		100% RB	23.56	22.47
		1 RB low	23.07	21.84
16	1711.5	1 RB high	22.93	22.04
SING	1711.5	50% RB mid	23.24	22.14
ILAK TED		100% RB	22.23	21.25
0 10		1 RB low	22.32	21.14
3 MHz	1732.5	1 RB high	22.18	21.31
3 IVITZ	1732.5	50% RB mid	22.15	21.02
TING		100% RB	23.61	22.53
AKTES	IAN TES	1 RB low	23.52	22.39
	1753.5	1 RB high	23.53	22.67
	1755.5	50% RB mid	22.61	21.74
		100% RB	22.69	21.51
all G	D/G D/G	1 RB low	23.04	22.17
5 MHz	1712.	1 RB high	23.18	22.30
	1/12.	50% RB mid	23.22	21.86
	<b></b>	100% RB	22.10	20.95
,G	1722 5	1 RB low	22.00	21.13
	1732.5	1 RB high	22.26	21.24

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	White Tes	50% RB mid	22.07	21.15
olG	TING HU	100% RB	23.45	22.39
L TESTIN	A TEST	1 RB low	23.59	22.34
HUAT OH	tree - Hudan	1 RB high	23.47	22.60
	1752.5	50% RB mid	22.48	21.68
		100% RB	22.56	21.67
		1 RB low	23.14	22.22
resting		1 RB high	23.25	22.83
HUAK IL	1715.0	50% RB mid	23.46	22.43
		100% RB	22.24	21.39
		1 RB low	22.33	21.40
TISTING	TESTING	1 RB high	22.45	21.53
10 MHz	1732.5	50% RB mid	22.29	21.35
HUAK		100% RB	23.07	22.14
	.6	1 RB low	23.19	22.37
	The second second	1 RB high	23.51	22.52
	1750.0	50% RB mid	22.25	21.40
CSTING	TESTING C	100% RB	22.30	21.40
HUAN	JA HUAR JA	1 RB low	23.24	22.48
(). · · · ·		1 RB high	23.44	23.13
	1717.5	50% RB mid	23.45	22.81
		100% RB	22.43	22.39
TING	TING	1 RB low	22.37	22.36
AK TEST	all TEST	1 RB high	22.46	22.45
15 MHz	1732.5	50% RB mid	22.45	21.33
		100% RB	23.46	22.57
STING	~STINC	1 RB low	23.15	22.22
110	CING A MUNKTLE	1 RB high	22.93	22.03
I LAK T	1747.5	50% RB mid	22.32	22.31
0		100% RB	22.30	22.34
3	-csTING	1 RB low	23.14	22.00
	1700.0	1 RB high	23.62	22.68
STING	1720.0	50% RB mid	23.63	22.66
HAK TES	JAX TES	100% RB	22.14	21.20
0 ··· 0 ··		1 RB low	22.20	21.16
00 MU	1700 5	1 RB high	22.49	21.56
20 MHz	1732.5	50% RB mid	22.41	21.48
mG	and and	100% RB	23.30	22.90
AK TESTIN	AKTES	1 RB low	23.58	23.33
HURL	4745 0 40	1 RB high	23.37	22.84
	1745.0	50% RB mid	22.41	21.51
BIG	GING	100% RB	22.47	21.59

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Radiated Measurement *Remark:* 

- We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.
- 2.  $EIRP=P_{Mea}(dBm)-P_{cl}(dB)+P_{Ag}(dB)+G_{a}(dBi)$

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization				
1710.7	-16.52	3.06	9.68	34.80	24.90	30.00	5.10	V				
1732.5	-16.8	3.17	9.68	34.80	24.51	30.00	5.49	TING V				
1754.3	-15.81	3.22	9.75	34.80	25.52	30.00	4.48	V				

### LTE FDD Band 4\_Channel Bandwidth 1.4MHz\_QPSK

# LTE FDD Band 4\_Channel Bandwidth 3MHz\_QPSK

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1711.5	-15.24	3.06	9.68	34.80	26.18	30.00	3.82	V
1732.5	-14.95	3.17	9.68	34.80	26.36	30.00	3.64	V
1753.5	-15.8	3.22	9.75	34.80	25.53	30.00	4.47	V

# LTE FDD Band 4\_Channel Bandwidth 5MHz\_QPSK

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1712.5	-16.3	3.06	9.68	34.80	25.12	30.00	4.88	V
1732.5	-16.14	3.17	9.68	34.80	25.17	30.00	4.83	V
1752.5	-15.73	3.22	9.75	34.80	25.60	30.00	4.40	V

# LTE FDD Band 4\_Channel Bandwidth 10MHz\_QPSK

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1715.0	-15.29	3.06	9.68	34.80	26.13	30.00	3.87	V
1732.5	-15.55	3.17	9.68	34.80	25.76	30.00	4.24	V
1750.0	-16.09	3.22	9.75	34.80	25.24	30.00	4.76	V

# LTE FDD Band 4\_Channel Bandwidth 15MHz\_QPSK

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1717.5	-16.93	3.06	9.68	34.80	24.49	30.00	5.51	V North
1732.5	-15.62	3.17	9.68	34.80	25.69	30.00	4.31	V
1747.5	-16.11	3.22	9.75	34.80	25.22	30.00	4.78	V

### LTE FDD Band 4\_Channel Bandwidth 20MHz\_QPSK

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1720.0	-14.07	3.06	9.68	34.80	27.35	30.00	2.65	V
1732.5	-15.31	3.17	9.68	34.80	26.00	30.00	4.00	V
1745.0	-15.28	3.22	9.75	34.80	26.05	30.00	3.95	V

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# **HUAK TESTING**

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LTE FDD Band 4\_Channel Bandwidth 1.4MHz\_16QAM

1	Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
87	1710.7	-16.85	3.06	9.68	34.80	24.57	30.00	5.43	V
	1732.5	-16.11	3.17	9.68	34.80	25.20	30.00	4.80	V
	1754.3	-15.39	3.22	9.75	34.80	25.94	30.00	4.06	V

### LTE FDD Band 4\_Channel Bandwidth 3MHz\_16QAM

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1711.5	-15.49	3.06	9.68	34.80	25.93	30.00	4.07	STANS V
1732.5	-14.7	3.17	9.68	34.80	26.61	30.00	3.39	V
1753.5	-16.17	3.22	9.75	34.80	25.16	30.00	4.84	V

### LTE FDD Band 4\_Channel Bandwidth 5MHz\_16QAM

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1712.5	-16.47	3.06	9.68	34.80	24.95	30.00	5.05	V
1732.5	-16.71	3.17	9.68	34.80	24.60	30.00	5.40	V
1752.5	-15.33	o 3.22	9.75	34.80	26.00	30.00	4.00	V

# LTE FDD Band 4\_Channel Bandwidth 10MHz\_16QAM

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1715.0	-14.91	3.06	9.68	34.80	26.51	30.00	3.49	N V
1732.5	-14.74	3.17	9.68	34.80	26.57	30.00	3.43	V
1750.0	-16.46	3.22	9.75 🔊	34.80	24.87	30.00	5.13	V

## LTE FDD Band 4\_Channel Bandwidth 15MHz\_16QAM

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1717.5	-16.66	3.06	9.68	34.80	24.76	30.00	5.24	V
1732.5	-16.24	3.17	9.68	34.80	25.07	30.00	4.93	V
1747.5	-16.14	3.22	9.75	34.80	25.19	30.00	4.81	V

LTE FDD Band 4\_Channel Bandwidth 20MHz\_16QAM

Frequency (MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	P <sub>Ag</sub> (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1720.0	-15.75	3.06	9.68	34.80	25.67	30.00	4.33	V
1732.5	-14.19	3.17	9.68	34.80	27.12	30.00	2.88	V
1745.0	-15.52	3.22	9.75	34.80	25.81	30.00	4.19	V

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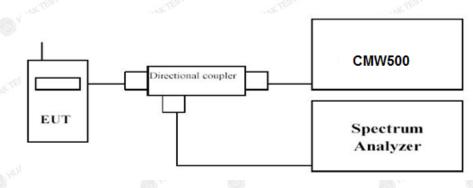
# **HUAK TESTING**

# 3.2 Peak-to-Average Ratio (PAR)

# LIMIT

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

# **TEST CONFIGURATION**



# TEST PROCEDURE

- 1. Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- 2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
- 3. Set the number of counts to a value that stabilizes the measured CCDF curve;
- 4. Set the measurement interval as follows:
  - 1). for continuous transmissions, set to 1 ms;

2). for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.

5. Record the maximum PAPR level associated with a probability of 0.1%.

# TEST RESULTS

### Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.

Olan	Olm	Olan Olan	GIAN	aniG	
K TEST	TEST	LTE FDD Band 4	AK TESTA	AK TESTIN	
TX Channel	Frequency	RB Size/Offset	PAPR (dB)		
Bandwidth	(MHz)	RD Size/Oliset	- QPSK	16QAM	
1.4 MHz	1710.7	1 <i>RB</i> #0	4.00	5.10	
	1732.5		4.61	8.45	
	1754.3	AKTEST	12.22	5.31	
3 MHz	1711.5	HO.	4.06	4.92	
	1732.5	1RB#0	4.50	5.48	
	1753.5		4.36	5.09	
5 MHz	1712.5	1RB#0	8.48	4.98	
	1732.5		4.45	5.35	
	1752.5		4.24	5.16	
10 MHz	1715.0		3.87	4.67	
	1732.5	1RB#0	4.34	8.47	
	1750.0	_	8.48	5.46	
15 MHz	1717.5	1RB#0	3.96	4.76	
	1732.5		4.34	5.13	
	1747.5		4.54	5.46	
20 MHz	1720.0	ر 1RB#0	3.94	4.69	
	1732.5		8.49	4.98	
	1745.0	TESTING	4.51	5.31	

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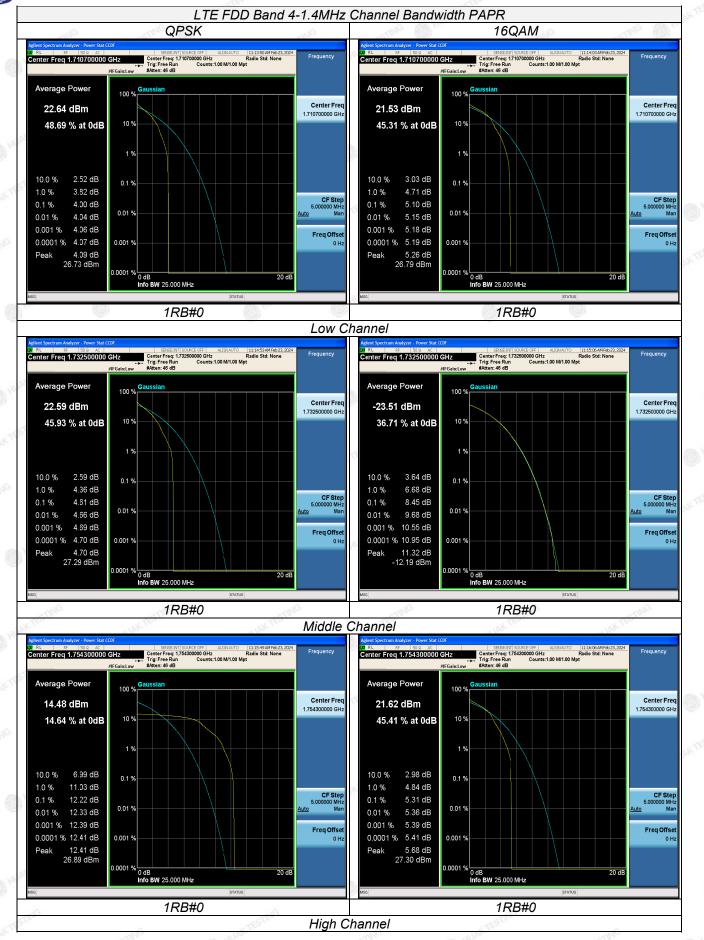
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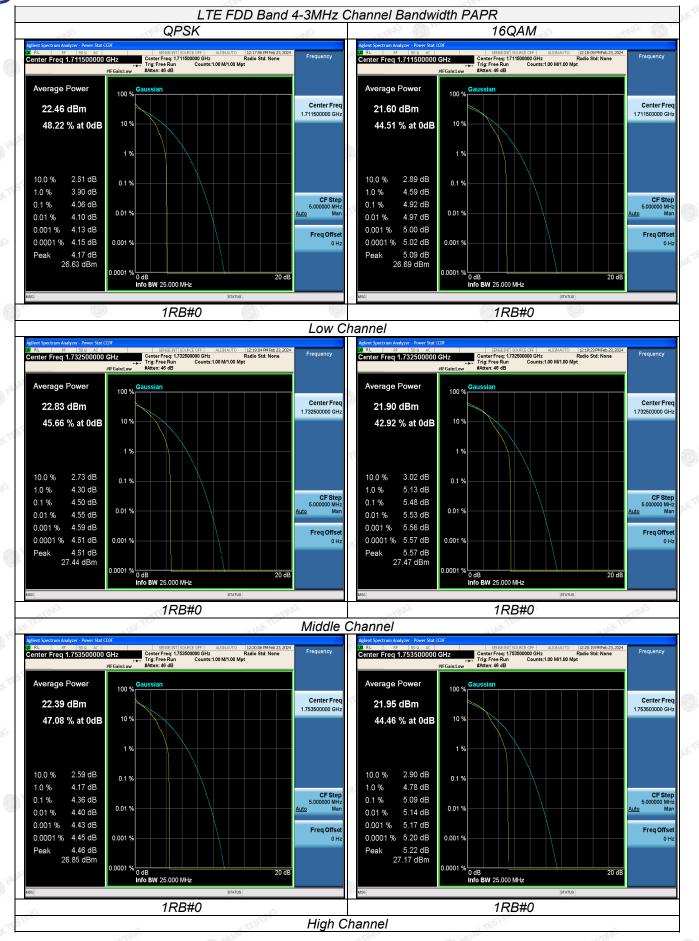
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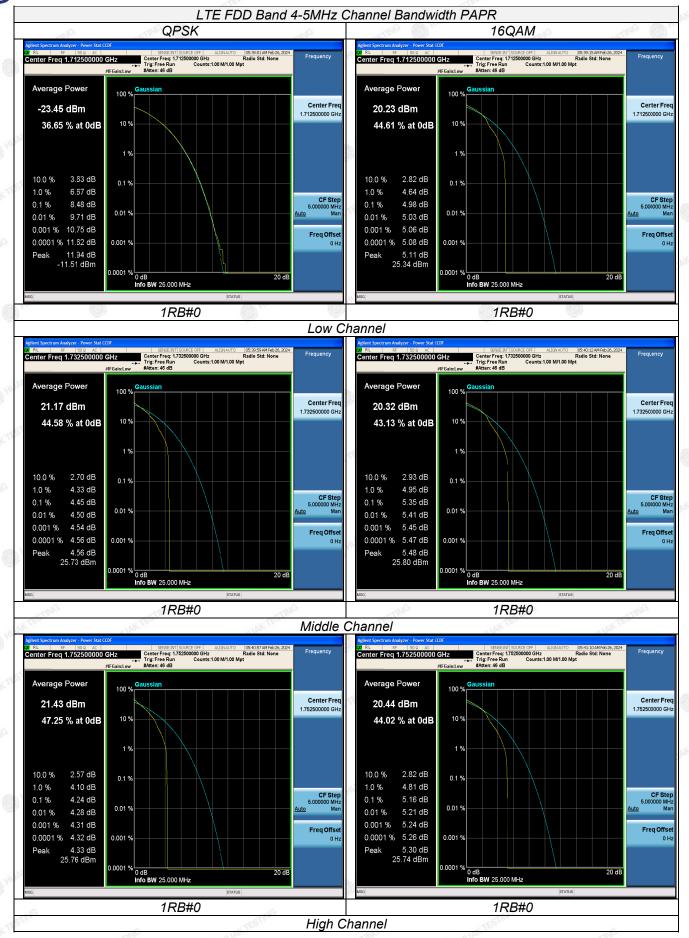
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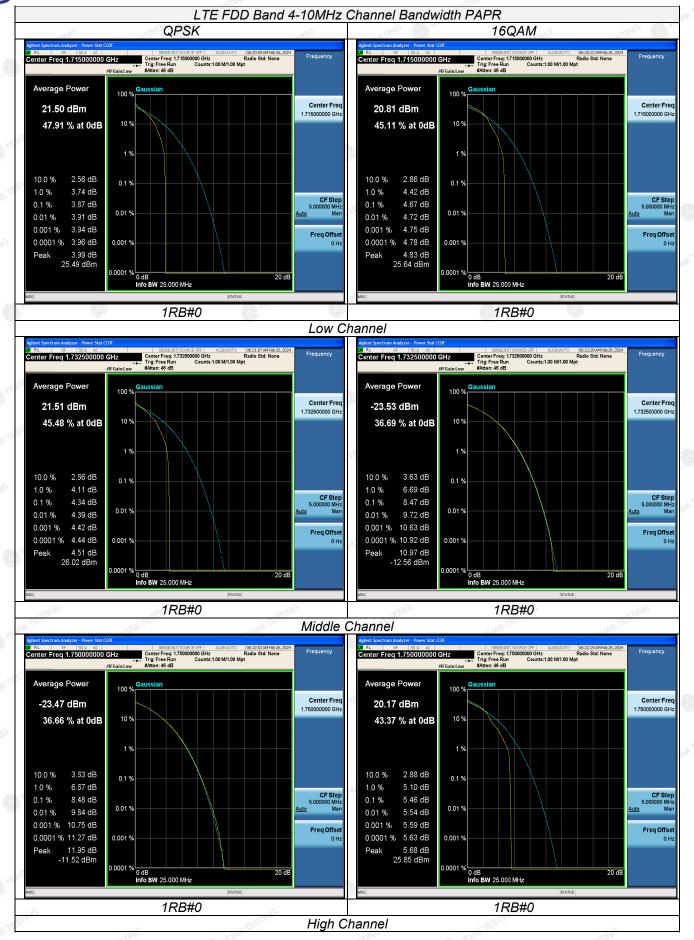
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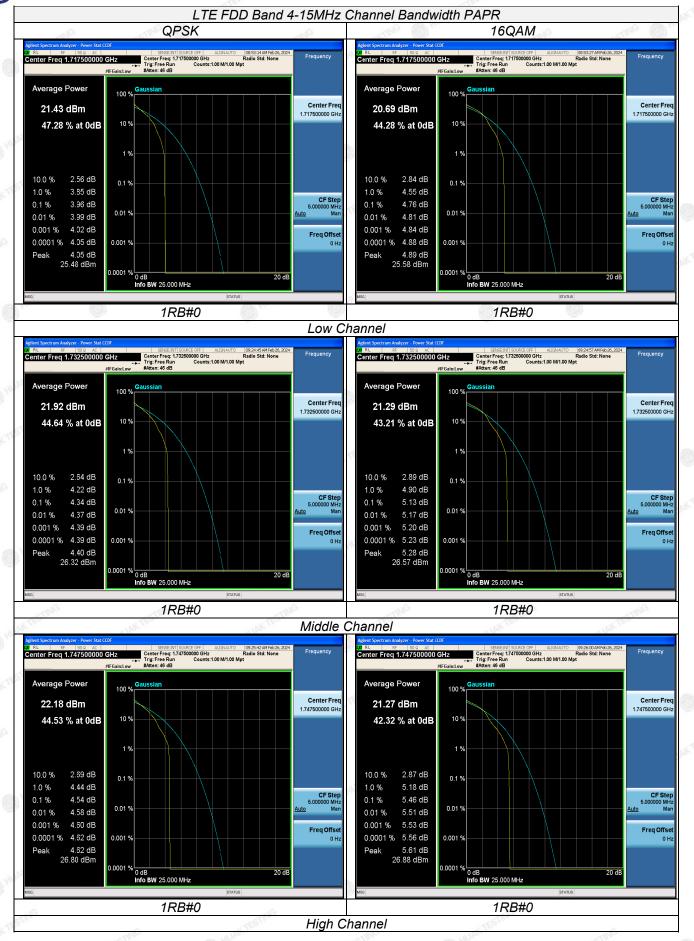
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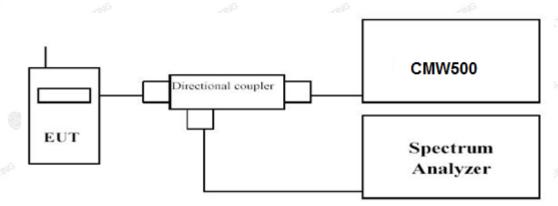
# **HUAK TESTING**

# 3.3 Occupied Bandwidth and Emission Bandwidth

LIMIT

N/A

# **TEST CONFIGURATION**



# TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded. Set RBW was set to about 1% of emission BW, VBW≥3 times RBW.

-26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

# TEST RESULTS

1.

Remark:

We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.

		LTE FDD	) Band 4			
TX Channel	RB Size/Offset	Frequency (MHz)	-26dBc Emission bandwidth (MHz)		99% Occupied bandwidth (MHz)	
Bandwidth			QPSK	16QAM	QPSK	16QAM
1.4 MHz	A HOM	1710.7	1.300	1.299	1.0926	1.0969
	6RB#0	1732.5	1.296	1.307	1.0938	1.0992
		1754.3	1.295	1.287	1.0944	1.0957
3 MHz	ING I LAK TES	1711.5	2.967	2.970	2.7062	2.6954
	15RB#0	1732.5	2.974	2.942	2.7049	2.6951
CO HI		1753.5	2.959	2.968	2.7009	2.6917
5 MHz 25RB#0	TING	1712.5	5.023	4.996	4.5058	4.5063
	25RB#0	1732.5	5.032	5.049	4.5134	4.5130
	TING A HO	1752.5	5.015	5.000	4.5067	4.5047
10 MHz	MAKTES	1715.0	9.929	9.826	8.9477	8.9594
	50RB#0	1732.5	9.941	9.841	8.9945	8.9662
		1750.0	9.819	9.862	8.9771	8.9539
15 MHz		1717.5	14.67	14.65	13.430	13.430
	75RB#0	1732.5	14.78	14.69	13.468	13.481
	TESTING	1747.5	14.66	14.68	13.380	13.415
20 MHz	HUAN	1720.0	19.40	19.47	17.863	17.860
	100RB#0	1732.5	19.56	19.41	17.929	17.995
		1745.0	19.43	19.42	17.847	17.903

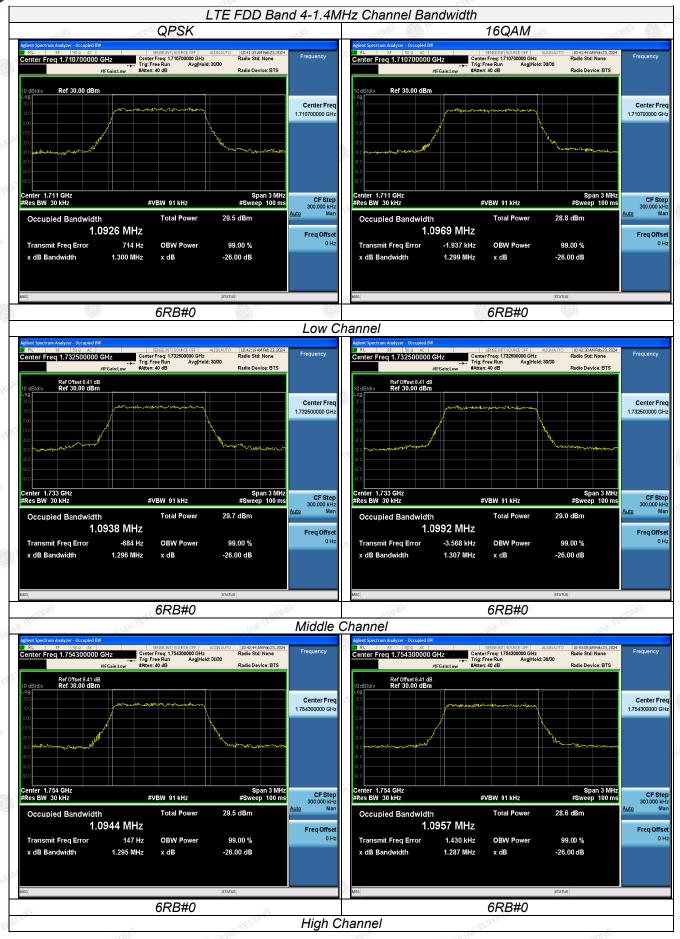
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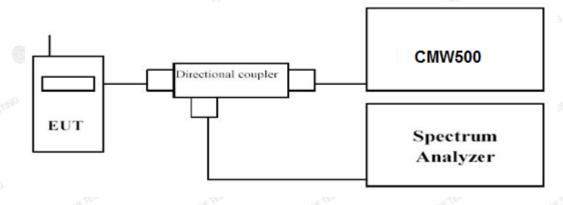


# 3.4 Band Edge Compliance

## LIMIT

According to 27.53 (h): For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

# TEST CONFIGURATION



### TEST PROCEDURE

- 1. The transmitter output port was connected to base station.
- 2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
- 3. Set EUT at maximum power through base station.
- 4. Select lowest and highest channels for each band and different modulation.
- 5. Measure Band edge using RMS (Average) detector by spectrum.

# TEST RESULTS

### Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.

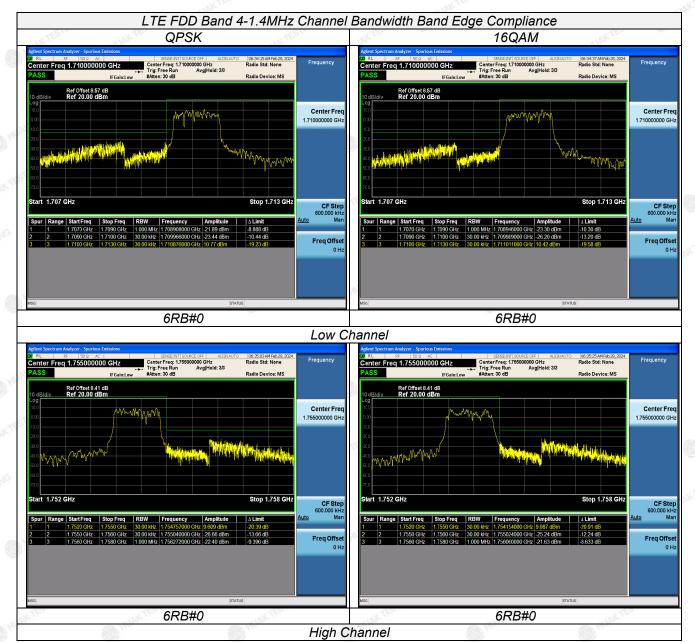
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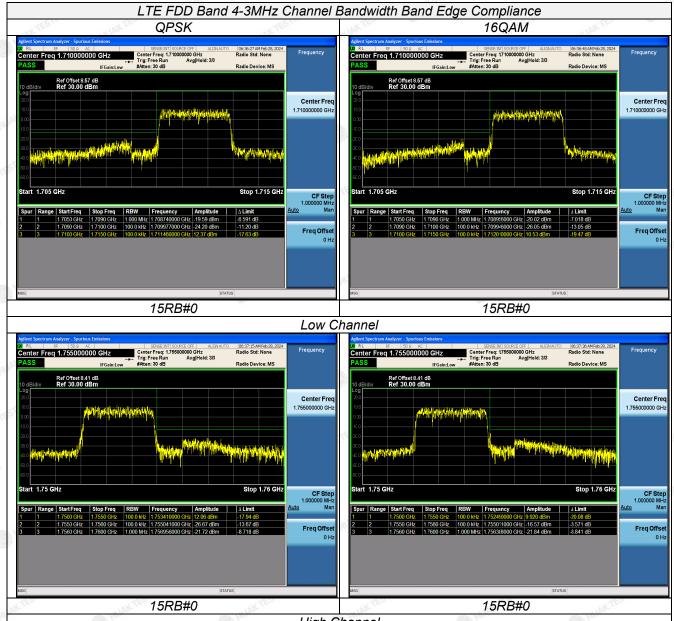
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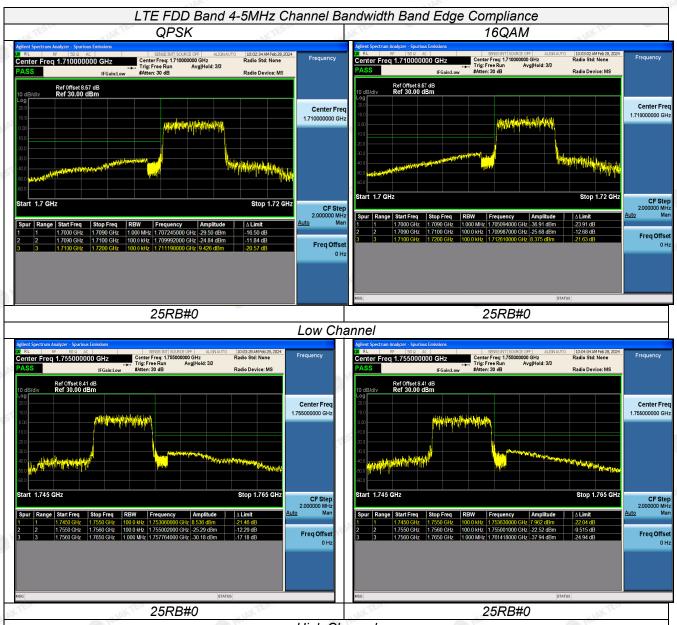
High Channel

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High Channel

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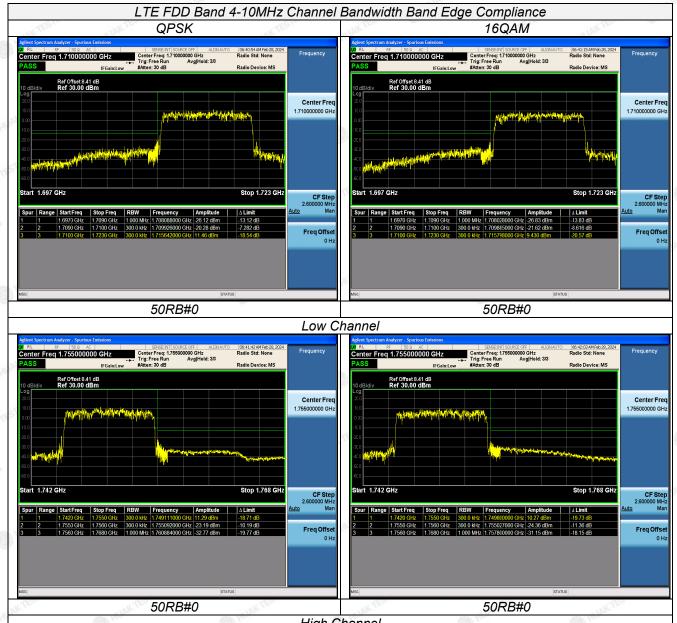
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High Channel

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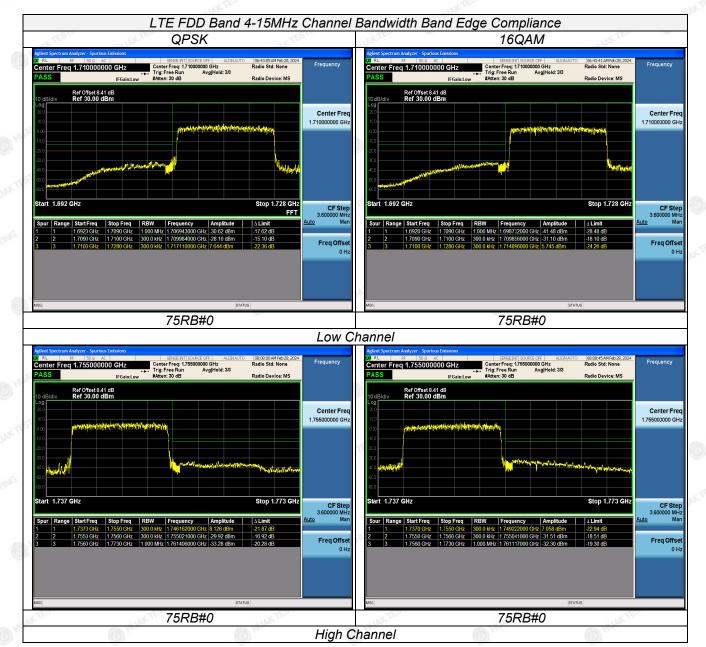


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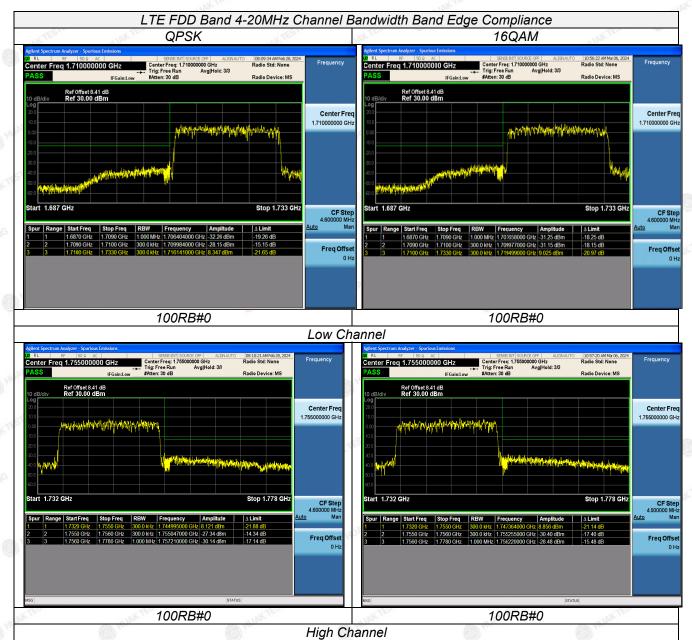
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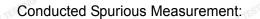


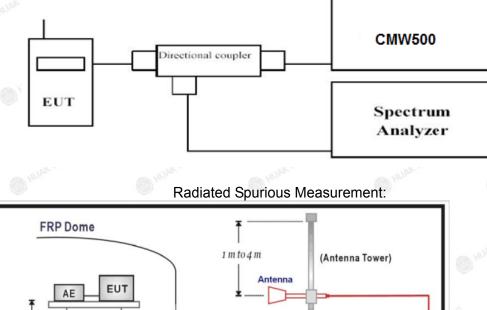
# 3.5 Spurious Emission

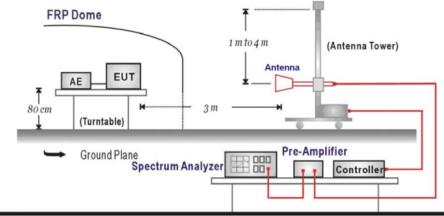
# LIMIT

According to 27.53 (h): For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

# TEST CONFIGURATION







# TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D.

### **Conducted Spurious Measurement:**

- a. Place the EUT on a bench and set it in transmitting mode.
- b. Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- c. EUT Communicate with CMW500, then select a channel for testing.
- d. Add a correction factor to the display of spectrum, and then test.
- e. The resolution bandwidth of the spectrum analyzer was set sufficient scans were taken to show the out of band Emission if any up to10<sup>th</sup> harmonic.
- f. Please refer to following tables for test antenna conducted emissions.

Working Frequency	Sub range (GHz)	RBW	VBW	Sweep time (s)
w.	0.000009~0.000015	1KHz	3KHz	Auto
LTE FDD Band 4	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26.5	1 MHz	3 MHz	Auto

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**HUAK TESTING** 

- a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.
- c. The output of the test antenna shall be connected to the measuring receiver.
- d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h. The maximum signal level detected by the measuring receiver shall be noted.
- i. The transmitter shall be replaced by a substitution antenna.
- j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k. The substitution antenna shall be connected to a calibrated signal generator.
- I. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- q. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for Part 22 and 1MHz for Part 24. The frequency range was checked up to 10th harmonic.
- r. Test site anechoic chamber refer to ANSI C63.

# TEST RESULTS

### Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.

### **Conducted Measurement:**

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