

Shenzhen HUAK Testing Technology Co., Ltd. Report No.: HK2203211049-10E

TEST REPORT

FCC Part 90

Report Reference No.: HK2203211049-10E

FCC ID: **2A6DD-WRS225**

Compiled by

(position+printed name+signature) .: File administrators Gary Qian

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(position+printed name+signature) .: Manager Jason Zhou

Date of issue: Apr. 13, 2022

Testing Laboratory Name.....: Shenzhen HUAK Testing Technology Co., Ltd.

Applicant's name: Wicrypt Labs Limited

Address Vistra Corporate Services Centre, Wickhams Cay II, Road Town,

Tortola, VG1110, British Virgin Islands, United Kingdom

Test specification:

Standard...... FCC Part 90

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Test item description: Wicrypt Spider Duo

Trade Mark.....: N/A

Manufacturer: Wicrypt Tech Limited

Model/Type reference: WRS225

Series Models: N/A

Ratings: DC 12V from adapter

Modulation: QPSK, 16QAM

Hardware version: V2.0

Software version: V2.0

Frequency LTE Band 26

Result: PASS



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TEST REPORT

Equipment under Test : Wicrypt Spider Duo

Model /Type : WRS225

Series Models : N/A

Applicant : Wicrypt Labs Limited

Address : Vistra Corporate Services Centre, Wickhams

Cay II, Road Town, Tortola, VG1110, British

Virgin Islands, United Kingdom

Manufacturer : Wicrypt Tech Limited

Address : No. 36 Garden Avenue, Bethel Plaza, Enugu,

Nigeria

-CG7111	457	-5111	-c5111	-cG/I	28/11
W. I.C.	Test result		HUAKTE	Pass	
			40000		

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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1. SUMMARY

1.1 Test Standards

The tests were performed according to following standards: FCC Part 90: PRIVATE LAND MOBILE RADIO 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 v03r01: MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

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1.2 Test Description

Requirement	CFR 47 Section	Result
Conducted Output Power	§2.1046; §90.635;	PASS
Peak-to-Average	§2.1046;	PASS
Effective Radiated Power	§2.1046; §90.635;	PASS
Occupied Bandwidth	§2.1049;	PASS
Band Edge	§2.1051; §90.691	PASS
Conducted Spurious Emission	§2.1051; §90.691	PASS
Field Strength of Spurious Radiation	§2.1053; §90.691	PASS
Frequency Stability for Temperature & Voltage	§2.1055; §90.231	PASS

Note:

- 1. PASS: Test item meets the requirement.
- 2. Fail: Test item does not meet the requirement.
- 3. N/A: Test case does not apply to the test object.
- 4. The test result judgment is decided by the limit of test standard.

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2. EUT DESCRIPTION

V 12.	1887 L. 1833
Product Name:	Wicrypt Spider Duo
Model :	WRS225
Additional Model:	N/A
Trade Mark:	N/A
Tx Frequency:	LTE Band 26: 814 MHz ~ 824 MHz
Rx Frequency:	LTE Band 26: 859MHz ~ 869 MHz
Bandwidth:	LTE Band 26: 1.4MHz /3MHz /5MHz /10MHz
Type of Modulation:	QPSK/16QAM
Antenna Type:	External Antenna
Antenna Gain:	LTE Band 26: 2.5dBi
Power Supply:	DC 12V from adapter

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3. GENERAL INFORMATION

3.1. Test environment and mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation

The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

Description Operation Frequency

LTE Band 2	26(1.4MHz)	LTE Band 26(3MHz)		
Channel	Frequency (MHz)	Channel	Frequency (MHz)	
26697	814.7	26705	815.5	
26740	819.0	26740	819.0	
26783	823.3	26775	822.5	
LTE Band	26(5MHz)	LTE Band 26(10MHz)		
Channel	Frequency (MHz)	Channel	Frequency (MHz)	
26715	816.5	26740	819.0	
26740	819.0	<u> </u>		
26765	821.5	-	TE TING	

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3.2. Test Mode

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test Mode					
Band	Band Radiated TCs Conducted TCs				
LTE Band 26	QPSK Link (1.4MHz / 3MHz / 5MHz / 10MHz)	16QAM Link (1.4MHz / 3MHz / 5MHz / 10MHz)			

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas License Digital Systems v03 with maximum output power. Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

3.3. 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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
1	LAK TESTING	1	JAK TESTING	1

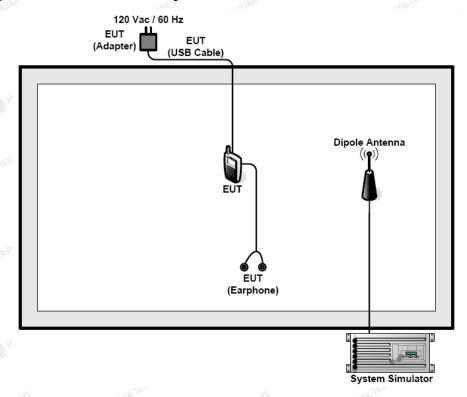
Note:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



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3.4. Configuration of Tested System



3.5. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level. The spectrum analyzer offset is derived from RF cable loss and attenuator factor. $Offset = RF \ cable \ loss + attenuator \ factor.$

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3.6. Equipments Used during the Test

THE HOLE		THE HOUSE		AD HO	All In
Test Equipment	Manufacture r	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	HKE-059	2022/02/18	2023/02/17
LISN	R&S	ENV216	HKE-002	2022/02/18	2023/02/17
Receiver	R&S	ESCI 7	HKE-010	2022/02/18	2023/02/17
Spectrum analyzer	R&S	FSP40	HKE-025	2022/02/18	2023/02/17
Spectrum analyzer	Agilent	N9020A	HKE-048	2022/02/18	2023/02/17
RF automatic control unit	Tonscend	JS0806-1	HKE-060	2022/02/18	2023/02/17
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	2022/02/18	2023/02/17
Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	2022/02/18	2023/02/17
Horn antenna	Schwarzbeck	9120D	HKE-013	2022/02/18	2023/02/17
High gain antenna	Schwarzbeck	LB-180400KF	HKE-054	2022/02/18	2023/02/17
Preamplifier	EMCI	EMC051845SE	HKE-015	2022/02/18	2023/02/17
Preamplifier	Agilent	83051A	HKE-016	2022/02/18	2023/02/17
Preamplifier	Schwarzbeck	BBV 9743	HKE-006	2022/02/18	2023/02/17
Temperature and humidity meter	Boyang	HTC-1	HKE-075	2022/02/18	2023/02/17
High-low temperature chamber	Guangke	HT-80L	HKE-118	2022/02/18	2023/02/17
High pass filter unit	Tonscend	JS0806-F	HKE-055	2022/02/18	2023/02/17
RF Cable(below1GHz)	Times	9kHz-1GHz	HKE-117	2022/02/18	2023/02/17
RF Cable(above 1GHz)	Times	1-40G	HKE-034	2022/02/18	2023/02/17
Power meter	Agilent	E4419B	HKE-085	2022/02/18	2023/02/17
Power Sensor	Agilent	E9300A	HKE-086	2022/02/18	2023/02/17
Conducted test software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A	N/A
Radiated test software	Tonscend	TS+ Rev 2.5.0.0	HKE-082	N/A	N/A
RF test software	Tonscend	JS1120-B Version 2.6	HKE-083	N/A	N/A
RF test software	Tonscend	JS1120-4	HKE-113	N/A	N/A
RF test software	Tonscend	JS1120-3	HKE-114	N/A	N/A
RF test software	Tonscend	JS1120-1	HKE-115	N/A	N/A
Wireless Communication Test Set	R&S	CMW500	HKE-026	2022/02/18	2023/02/17
Wireless Communication Test Set	R&S	CMU200	HKE-029	2022/02/18	2023/02/17



4. FACILITIES AND ACCREDITATIONS

4.1. 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.

4.2. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

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	AKTESTINE (1)

⁽¹⁾ This uncertainty represents an expanded uncertainty expressed at approximately the 95%

confidence level using a coverage factor of k=2.



5. TEST RESULTS AND MEASUREMENT DATA

5.1. Conducted Output Power Measurement

5.1.1. Test Specification

4 100	"IA" "IA" "IA"
Test Requirement:	FCC part 90.635
Test Method:	FCC part 2.1046
Limits:	LTE Band 26: 100W
Test Setup:	System Simulator
Test Procedure:	 The transmitter output port was connected to the system simulator. Set EUT at maximum power through system simulator. Select lowest, middle, highest channels for each band and different modulation.
	4. Measure and record the power level from the system simulator.
Test Result:	PASS THE THE PASS

TEST RESULTS

AFICATION.

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Conducted Measurement:

TX Channel	LIEFD	D Band 26	Average D	ower [dDm]
Bandwidth	RB Size/Offset	Frequency (MHz)	Average Po	16QAM
Dandwidth	DAX TE	814.7	23.83	22.98
(i)	1 DP low	819.0	23.56	10000
TING	1 RB low		23.50	22.71
,	TINE	823.3	. 15.5-	22.55
MAKTES	4 DD himb	814.7	23.69	22.22
(1) M	1 RB high	819.0	23.55	22.21
1.4 MHz	V TESTING	823.3	23.57	22.16
16	FOOV DD	814.7	22.47	21.55
V TESTINE	50% RB mid	819.0	23.47	22.48
HUPA DE	HUAT	823.3	23.65	22.26
		814.7	23.47	22.44
	100% RB	819.0	23.64	22.46
Digg	. Or .	823.3	23.39	22.47
KTEST		815.5	23.32	22.08
	1 RB low	819.0	22.43	21.53
n)G	- 19	822.5	23.54	22.17
Man		815.5	23.39	22.40
O NALE HUNGSTON	1 RB high	819.0	23.62	22.42
		822.5	22.55	21.35
3 MHz	STNG	815.5	22.56	21.35
	50% RB mid	819.0	22.61	21.41
ESTING		822.5	22.57	21.56
HUAK IL	HUAR S	815.5	23.51	22.53
	100% RB	819.0	23.63	22.49
		822.5	23.40	22.47
auG	Dia Dia	816.5	22.47	21.47
KTESTI	1 RB low	819.0	22.38	21.55
O H		821.5	22.43	21.43
6	-163	816.5	22.42	21.43
Ulla	1 RB high	819.0	23.44	22.48
= NALL - 14 75	Mary Hilliam	821.5	23.31	22.56
5 MHz		816.5	23.44	22.62
	50% RB mid	819.0	22.58	21.51
	THUAK TELL	821.5	22.51	21.60
ESTING	TESTING TESTING	816.5	22.44	21.44
HUAKIL	100% RB	819.0	22.37	21.39
	100,0110	821.5	23.52	22.68



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10 MHz	1 RB low	819.0	23.89	22.55
	1 RB high	819.0	23.53	22.60
	50% RB mid	819.0	22.47	21.63
	100% RB	819.0	22.47	21.50



5.2. Peak to Average Ratio

5.2.1. Test Specification

Test Method:	FCC KDB 971168 D01v03		
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.		
Test Setup:	System Simulator EUT Spectrum Analyzer		
Test Procedure:	 Spectrum Analyzer The testing follows FCC KDB 971168 D01v03 Section 5.7.1. The EUT was connected to spectrum analyzer and system simulator via a power divider. Set EUT to transmit at maximum output power. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%. 		
Test Result:	PASS 2010 DECEMBER 100 DECEMBER		

TEST RESULTS

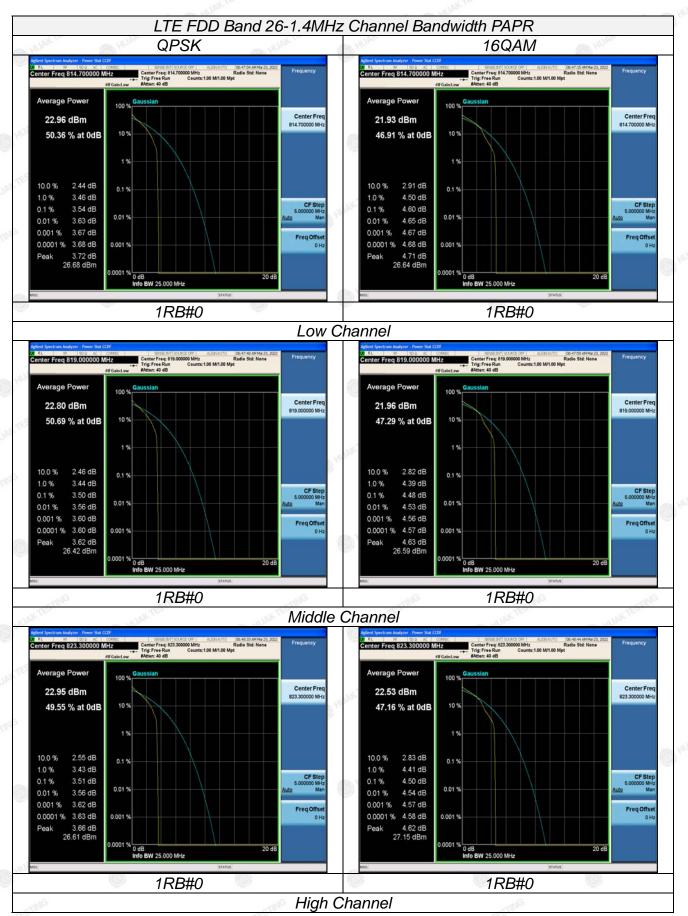
Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 26; recorded worst case for each Channel Bandwidth of LTE FDD Band 26.

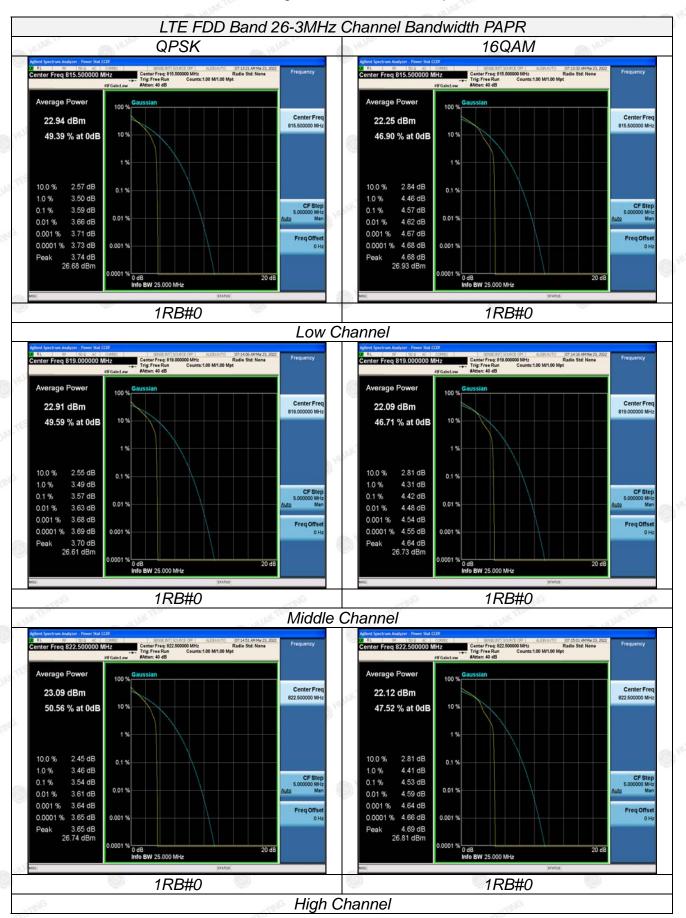
Ho.	(1)	LTE FDD Band 26	(I) HOW	O HO.	
TX Channel	Frequency	RB Size/Offset	PAPR (dB)		
Bandwidth	(MHz)	RB Size/Oliset	QPSK	16QAM	
N TEST	814.7	N TESTING	3.54	4.60	
1.4 MHz	819.0	1RB#0	3.50	4.48	
	823.3		3.51	4.50	
20.0	815.5		3.59	4.57	
3 MHz	819.0	1RB#0	3.57	4.42	
HUAK I	822.5	HUAR I	3.54	4.53	
	816.5		3.50	4.32	
5 MHz	819.0	1RB#0	3.53	4.37	
	821.5	THE THE	3.45	3.49	
10 MHz	819.0	1RB#0	4.42	4.53	

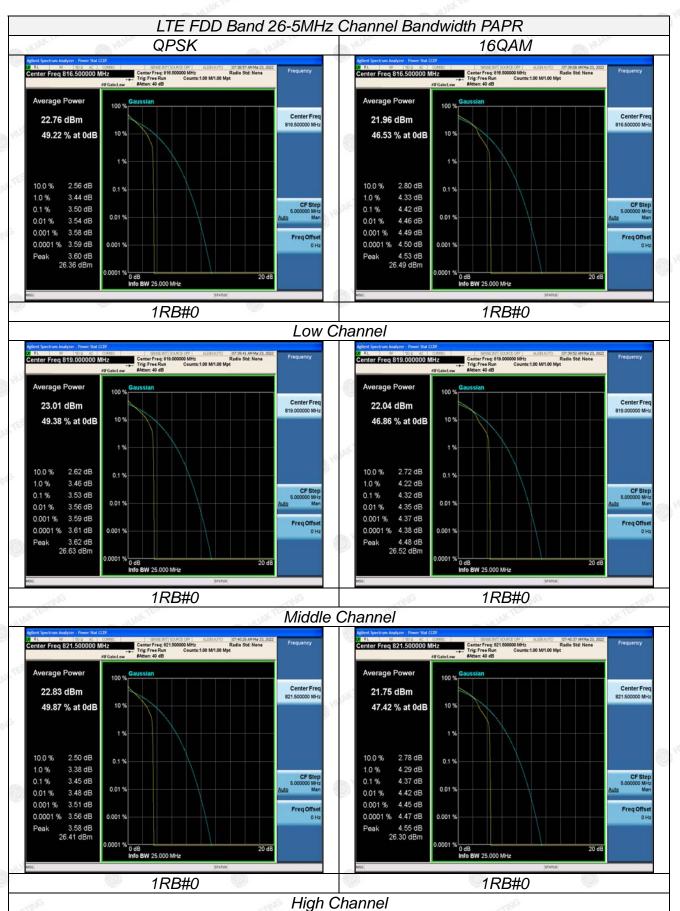
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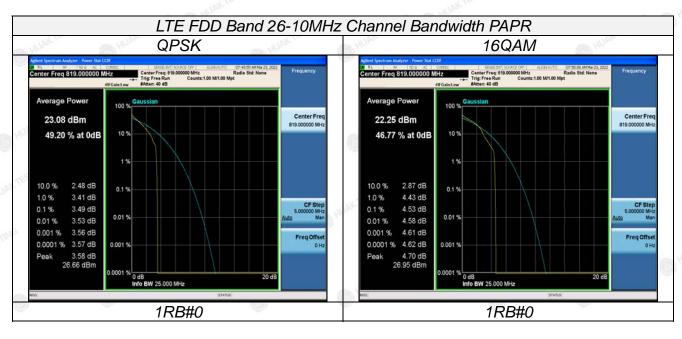


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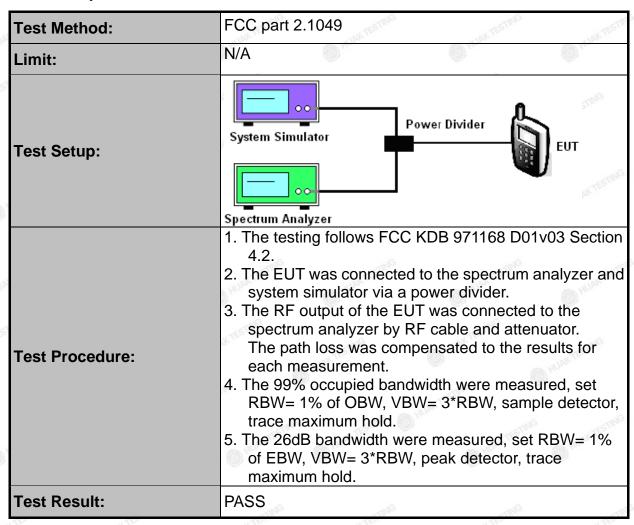
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5.3. 99% Occupied Bandwidth and 26dB Bandwidth Measurement

5.3.1. Test Specification



TEST RESULTS

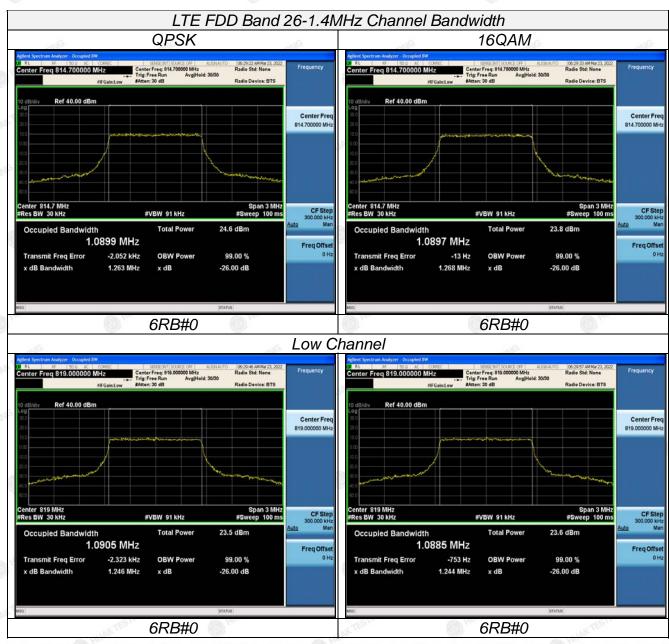
Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 26; recorded worst case for each Channel Bandwidth of LTE FDD Band 26.

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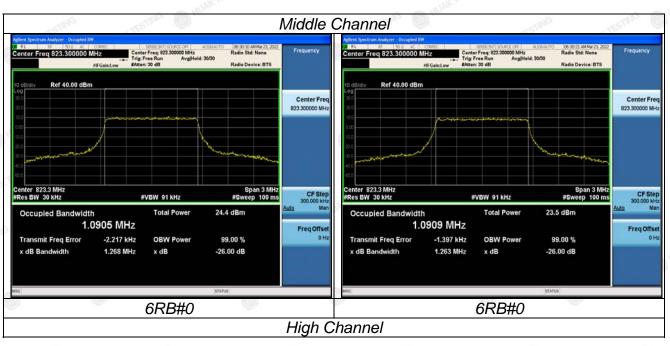
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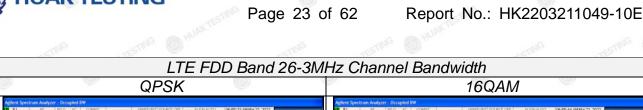
LTE FDD Band 26						
	Fraguency	-26dBc Emission		99% Occupied		
Channel RB Size/Offset		bandwidth (MHz)		bandwidth (MHz)		
	(IVIIIZ)	QPSK	16QAM	QPSK	16QAM	
6RB#0	814.7	1.263	1.268	1.0899	1.0897	
	819.0	1.246	1.244	1.0905	1.0885	
	823.3	1.268	1.263	1.0905	1.0909	
	815.5	2.901	2.904	2.6969	2.6878	
15RB#0	819.0	2.919	2.911	2.6965	2.6937	
Jan	822.5	2.916	2.912	2.6932	2.6970	
CTING	816.5	4.898	4.899	4.4965	4.4981	
25RB#0	819.0	4.877	4.857	4.5055	4.5050	
TESTING ON	821.5	4.886	4.866	4.5024	4.5013	
50RB#0	819.0	9.545	9.504	8.9582	8.9578	
	6RB#0 15RB#0 25RB#0	RB Size/Offset Frequency (MHz) 814.7 819.0 823.3 815.5 819.0 822.5 816.5 819.0 821.5	RB Size/Offset Frequency (MHz)	RB Size/Offset Frequency (MHz) -26dBc Emission bandwidth (MHz) QPSK 16QAM 814.7 1.263 1.268 819.0 1.246 1.244 823.3 1.268 1.263 815.5 2.901 2.904 819.0 2.919 2.911 822.5 2.916 2.912 816.5 4.898 4.899 25RB#0 819.0 4.877 4.857 821.5 4.886 4.866	RB Size/Offset Frequency (MHz)	

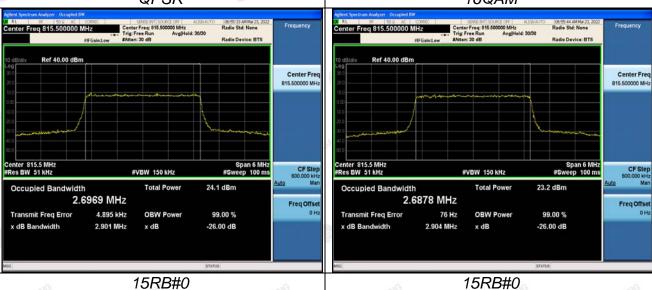




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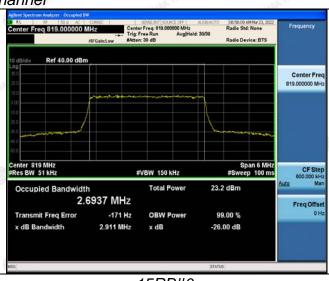




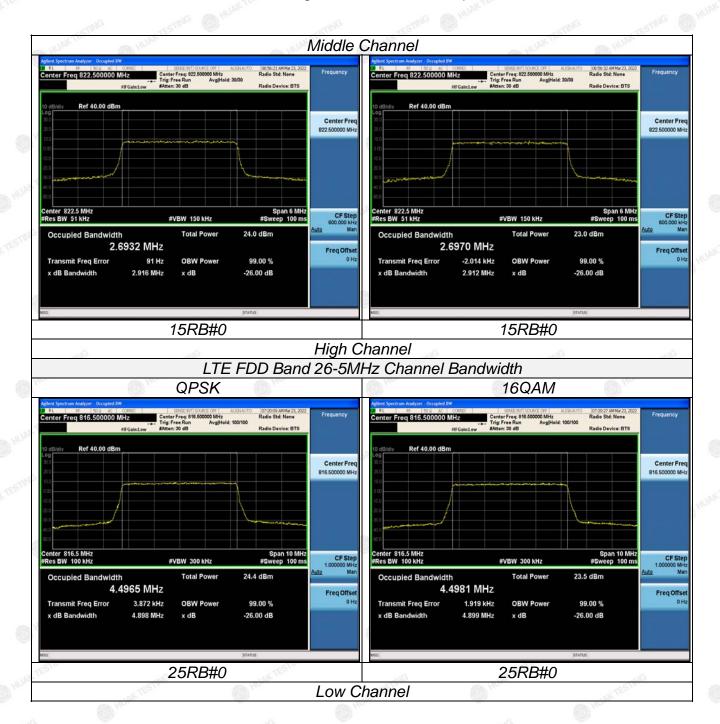


Low Channel

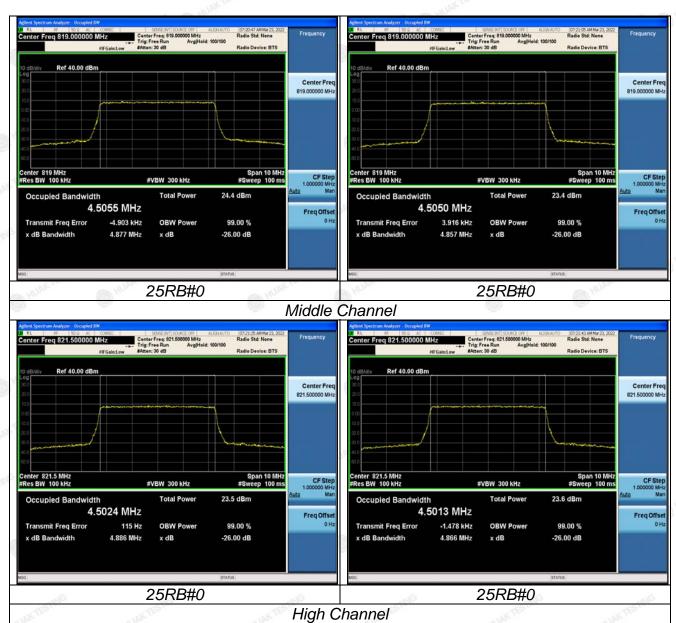




15RB#0 15RB#0

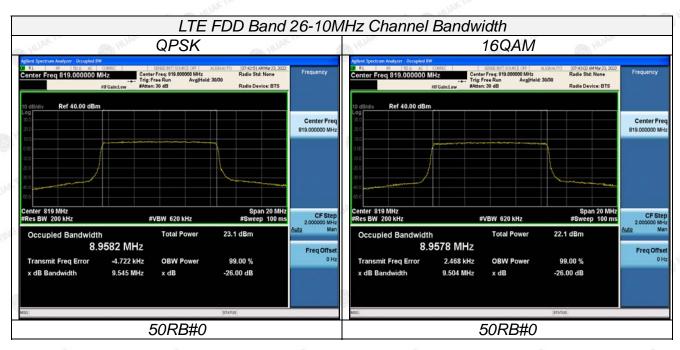


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5.4. Band Edge and Conducted Spurious Emission Measurement

5.4.1. Test Specification

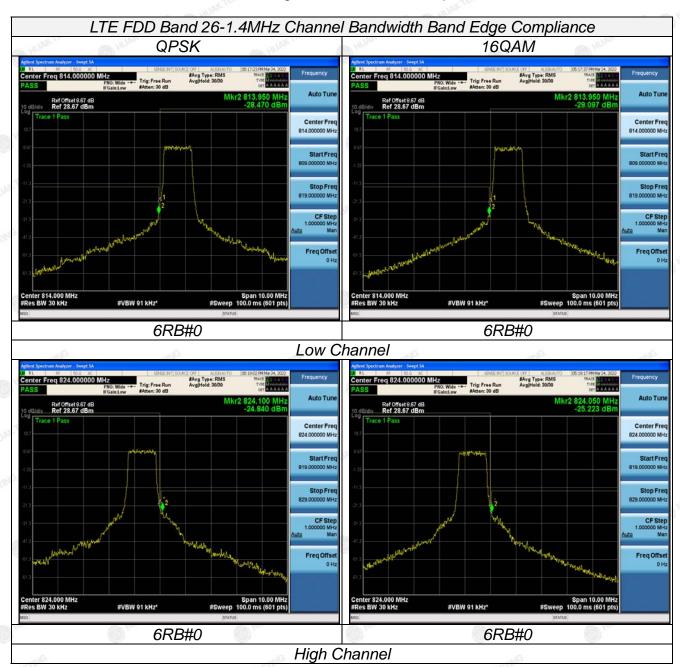
Test Requirement:	FCC part 90.691	WAX TESTIVE	- HUAK TESTIN		
Test Method:	FCC part2.1051	•			
Limit:	For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log ₁₀ (f/6.1) decibels or 50 + 10 Log ₁₀ (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.				
Test Setup:	System Simulator Spectrum Analyzer	rider EUT	MANY TESTING		
Test Procedure:	 The testing follows FCC KDB 971168 D01v03 Section 6.0. The EUT was connected to the spectrum analyzer and system simulator via a power divider. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement. The band edges of low and high channels for the highest RF powers were measured. The conducted spurious emission for the whole frequency range was taken. The RF fundamental frequency should be excluded against the limit line in the operating frequency band. 				
Test Result:	PASS	CP or a mining module	ziroy sariar		

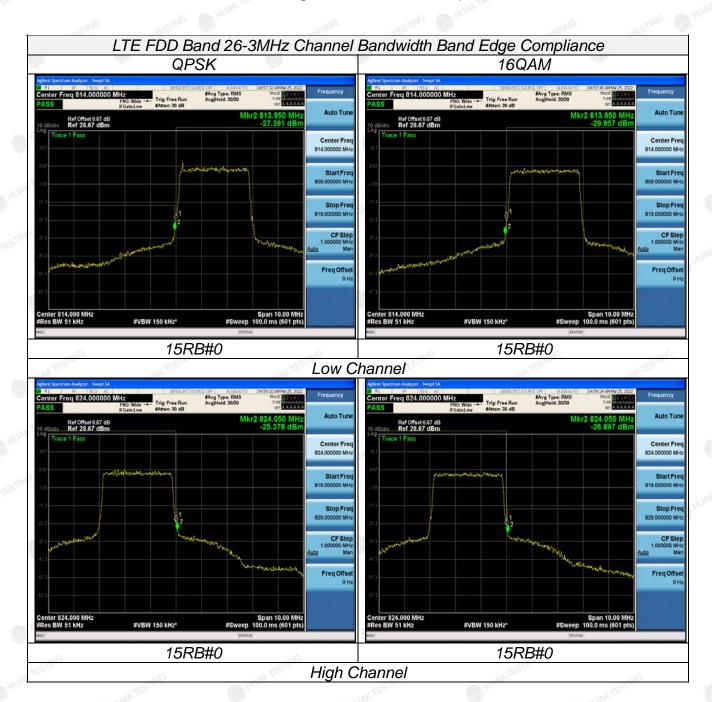
TEST RESULTS

Remark:

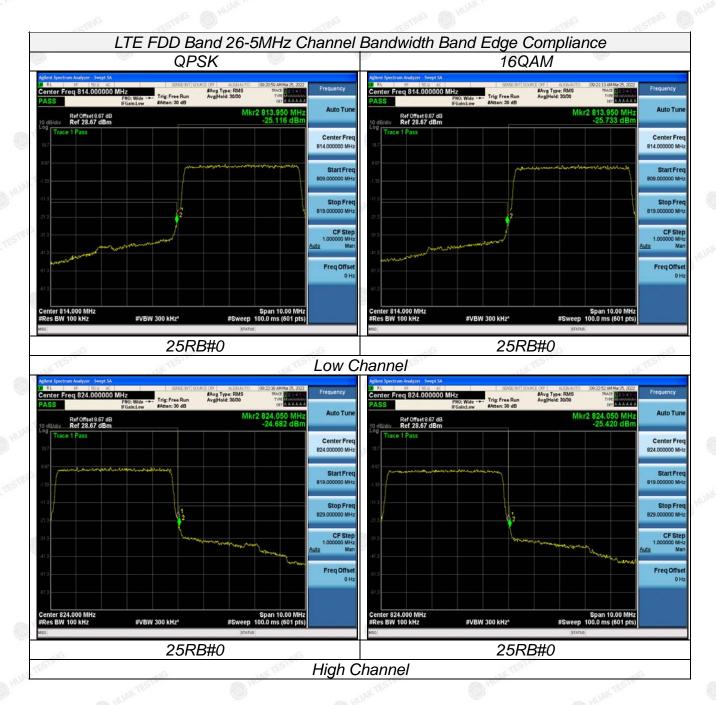
1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 26; recorded worst case for each Channel Bandwidth of LTE FDD Band 26.

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