

FCC Test Report

(Part 24)

Product Name : Gigabit LTE Multi-Service Router / LTE Dual-SIM Dual-Band Wireless VoIP VPN Router

Model No : BEC 6600VAL, BEC 6600AEL, BEC 6600X, BiPAC 4520VAOZ R3, BiPAC 4520VAPZ R3, BiPAC 4500VAOZ R3, BiPAC 4500VAPZ R3, BiPAC 4520AZ R3, BiPAC 4520AZL R3, BiPAC 4500AZ R3, BiPAC 4500AZL R3, BiPAC 4520VNOZ R3, BiPAC 4520VNPZ R3, BiPAC 4500VNOZ R3, BiPAC 4500VNPZ R3, BiPAC 4520NZ R3, BiPAC 4520NZL R3, BiPAC 4500NZ R3, BiPAC 4500NZL R3, BiPAC 4520Z R3, BiPAC 4520ZL R3, BiPAC 4500Z R3, BiPAC 4500ZL R3

FCC ID : QI3BEC-6600AEL

Applicant : Billion Electric Co., Ltd.

Address : 8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)

Date of Receipt : 2020/08/28

Issued Date : 2020/09/14

Report No. : 2080882R-E3042110004

Report Version : V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

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Product Name : Gigabit LTE Multi-Service Router / LTE Dual-SIM Dual-Band Wireless VoIP VPN Router

Applicant : Billion Electric Co., Ltd.

Address : 8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)

Manufacturer : Billion Electric Co., Ltd.

Trade Name : BEC, Billion

Model No. : BEC 6600VAL, BEC 6600AEL, BEC 6600X, BiPAC 4520VAOZ R3, BiPAC 4520VAPZ R3, BiPAC 4500VAOZ R3, BiPAC 4500VAPZ R3, BiPAC 4520AZ R3, BiPAC 4520AZL R3, BiPAC 4500AZ R3, BiPAC 4500AZL R3, BiPAC 4520VNOZ R3, BiPAC 4520VNPZ R3, BiPAC 4500VNOZ R3, BiPAC 4500VNPZ R3, BiPAC 4520NZ R3, BiPAC 4520NZL R3, BiPAC 4500NZ R3, BiPAC 4500NZL R3, BiPAC 4520Z R3, BiPAC 4520ZL R3, BiPAC 4500Z R3, BiPAC 4500ZL R3

EUT Rated Voltage : DC 15V 2A

EUT Test Voltage : DC 15V 2A(Power by adapter AC 120V/60Hz)

Measurement Standard : FCC CFR Title 47 Part 24

Measurement Reference : FCC CFR Title 47 Part 2
TIA/EIA 603-E 2016
KDB 971168 D01V03R01
ANSI C63.26 2015

Test Result : Complied

Documented By : Genie Chang
(Senior Adm. Specialist / Genie Chang)

Tested By : Vorana Chen
(Senior Engineer / Vorana Chen)

Approved By : Vincent Lin
(Director / Vincent Lin)

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Revision History

Report No.	Version	Description	Issued Date
2080882R-E3042110004	V1.0	Initial issue of report.	2020-09-14

1. GENERAL INFORMATION

1.1 EUT Description

Product Name	Gigabit LTE Multi-Service Router / LTE Dual-SIM Dual-Band Wireless VoIP VPN Router
Model No.	BEC 6600VAL, BEC 6600AEL, BEC 6600X, BiPAC 4520VAOZ R3, BiPAC 4520VAPZ R3, BiPAC 4500VAOZ R3, BiPAC 4500VAPZ R3, BiPAC 4520AZ R3, BiPAC 4520AZL R3, BiPAC 4500AZ R3, BiPAC 4500AZL R3, BiPAC 4520VNOZ R3, BiPAC 4520VNPZ R3, BiPAC 4500VNOZ R3, BiPAC 4500VNPZ R3, BiPAC 4520NZ R3, BiPAC 4520NZL R3, BiPAC 4500NZ R3, BiPAC 4500NZL R3, BiPAC 4520Z R3, BiPAC 4520ZL R3, BiPAC 4500Z R3, BiPAC 4500ZL R3
Test Sample	BiPAC 4520VAOZ R3
Trade Name	BEC, Billion
IMEI No.	867897040204415
FCC ID	QI3BEC-6600AEL
TX Frequency	LTE Band 2: 1850MHz ~1910MHz
Rx Frequency	LTE Band 2: 1930MHz ~1990MHz
Bandwidth	LTE Band 2: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz
Modulation	QPSK/16-QAM/64QAM
HW Version	V1.0
SW Version	1.00.1.23
Antenna Type	Dipole Antenna
All models are electrically identical, different model names are for marketing purpose.	

Note: The different of the each model is shown as below:

Model Name: BEC 6600AEL

Gigabit LTE Multi-Service Router

Model Name: BiPAC 4520VAOZ R3

LTE Dual-SIM Dual-Band Wireless VoIP VPN Router

	Trade Name	External LTE Antenna	Wi-Fi Antenna	VPN	VoIP	WiFi 5GHz/2.4GHz	SIM Slot	USB Host	Power Adapter
BEC 6600VAL	BEC	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	X	O	5GHz+2.4GHz	1	O	DC 15V/ 2.0A
BEC 6600AEL	BEC	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	O	X	5GHz+2.4GHz	1	O	DC 15V/ 2.0A
BEC 6600X	BEC	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	O	O	5GHz+2.4GHz	1	O	DC 15V/ 2.0A
BiPAC 4520VAOZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	O	O	5GHz+2.4GHz	2	O	DC 15V/ 2.0A
BiPAC 4520VAPZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	X	O	5GHz+2.4GHz	2	O	DC 15V/ 2.0A
BiPAC 4500VAOZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	O	O	5GHz+2.4GHz	1	O	DC 15V/ 2.0A
BiPAC 4500VAPZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	X	O	5GHz+2.4GHz	1	O	DC 15V/ 2.0A
BiPAC 4520AZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	O	X	5GHz+2.4GHz	2	O	DC 15V/ 2.0A
BiPAC 4520AZL R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	X	X	5GHz+2.4GHz	2	O	DC 15V/ 2.0A
BiPAC 4500AZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	O	X	5GHz+2.4GHz	1	O	DC 15V/ 2.0A
BiPAC 4500AZL R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *2pcs	X	X	5GHz+2.4GHz	1	O	DC 15V/ 2.0A
BiPAC 4520VNOZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *1pcs	O	O	2.4GHz	2	O	DC 15V/ 2.0A
BiPAC 4520VNPZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *1pcs	X	O	2.4GHz	2	O	DC 15V/ 2.0A
BiPAC 4500VNOZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *1pcs	O	O	2.4GHz	1	O	DC 15V/ 2.0A
BiPAC 4500VNPZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *1pcs	X	O	2.4GHz	1	O	DC 15V/ 2.0A
BiPAC 4520NZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *1pcs	O	X	2.4GHz	2	O	DC 15V/ 2.0A
BiPAC 4520NZL R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *1pcs	X	X	2.4GHz	2	O	DC 15V/ 2.0A
BiPAC 4500NZ R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *1pcs	O	X	2.4GHz	1	O	DC 15V/ 2.0A
BiPAC 4500NZL R3	Billion	LTE Wide-band Antenna *4pcs	5/ 2.4GHz External WiFi Antenna *2pcs 5/ 2.4GHz Embedded WiFi Antenna *1pcs	X	X	2.4GHz	1	O	DC 15V/ 2.0A
BiPAC 4520Z R3	Billion	LTE Wide-band Antenna *4pcs	X	O	X	X	2	O	DC 15V/ 2.0A
BiPAC 4520ZL R3	Billion	LTE Wide-band Antenna *4pcs	X	X	X	X	2	O	DC 15V/ 2.0A
BiPAC 4500Z R3	Billion	LTE Wide-band Antenna *4pcs	X	O	X	X	1	O	DC 15V/ 2.0A
BiPAC 4500ZL R3	Billion	LTE Wide-band Antenna *4pcs	X	X	X	X	1	O	DC 15V/ 2.0A

Note: "O" means YES, and "X" means NO support in hardware and firmware

1.2 Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	GRAND-TEK	AAZANDXSX0AL711200	3.5 dBi for LTE Band 2
2	GRAND-TEK	AAZANDXSX0AL711200 (RX)	3.5 dBi for LTE Band 2

1.3 Operational Description

The EUT provide all functions described as above. The EUT is tested with maximum rated TX power via the Base Station simulator.

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined

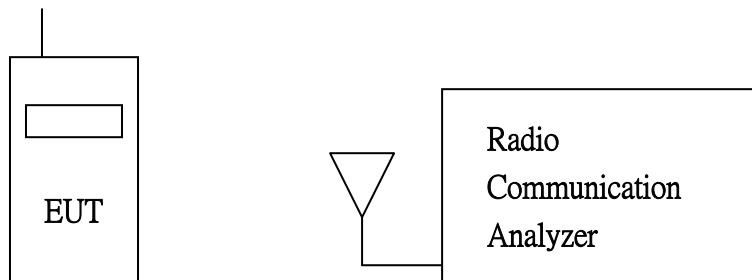
as:

Test Mode:	LTE Band 2 (1.4M)-QPSK/16QAM/64QAM
	LTE Band 2 (3M)-QPSK/16QAM/64QAM
	LTE Band 2 (5M)-QPSK/16QAM/64QAM
	LTE Band 2 (10M)-QPSK/16QAM/64QAM
	LTE Band 2 (15M)-QPSK/16QAM/64QAM
	LTE Band 2 (20M)-QPSK/16QAM/64QAM

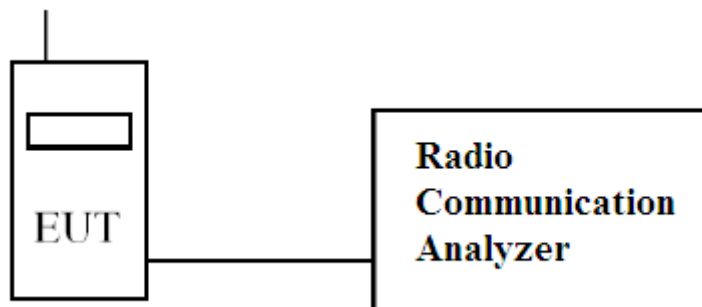
Note : All operation modes has been verified and the report shows the worst case mode.

1.4 Configuration of tested System

(a) Configuration of Radiated measurement



(b) Configuration of Conducted measurement



1.5 EUT Setup Procedures

- (1) Setup the EUT and simulators as shown on 1.3
- (2) Turn on the power of all equipments.
- (3) The EUT link with base station and it will continue receive the signal.
- (4) Repeat the above procedure (3).

1.6 Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	22 ~ 24
Humidity (%RH)	25-75	53 ~ 58

USA : FCC Registration Number: TW3023

Canada : IC Registration Number: 4075A

Site Description: Accredited by TAF
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,
Taiwan, R.O.C.
Phone number: 886-2-8601-3788
Fax number: 886-2-8601-3789
Email address: info.tw@dekra.com
Website: <http://www.dekra.com.tw>

2. Technical Test

2.1. Summary of test result

Test Item	FCC Reference section	FCC Limit	Result
RF Output Power	§2.1046	<2 Watts	Pass
	§24.232(c)		
Occupied Bandwidth	§2.1049	Within the frequency range	Pass
	§24.238(b)		
Spurious Emission at Antenna Terminals	§2.1051	<-13dBm	Pass
	§24.238(a)		
Conducted Emission	§2.1051	<-13dBm	Pass
	§24.238(a)		
Field Strength of Spurious Radiation	§2.1053	<-13dBm	Pass
	§24.238(a)		
Frequency Stability for Temperature & Voltage	§2.1055	Within the frequency range	Pass
	§24.235		
Peak to Average Ratio	§24.232 (d)	<13dB	Pass

2.2. List of test Equipment

Conducted /CTR

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY54510357	2020/05/14
Directional coupler	Agilent	87300C	MY44300353	2019/12/05
Directional coupler	Agilent	778D-012	50550	2019/12/05
Standard Temperature & Humidity Chamber	WIT	TH-1S-B	EQ-201-00146	2020/04/06
DC power supply	Agilent	E3610A	MY40009845	2020/06/30
Communication Tester	R&S	CMW500	157304	2019/11/13

Radiated / Site3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2707	2020/01/20
Horn Antenna	R&S	9120D	867	2020/04/21
Pre-Amplifier	SGH	PRAMP118	20200202	2020/03/17
Spectrum Analyzer	Agilent	N9010A	MY54510357	2020/05/14
DC power supply	Agilent	E3646A	MY53020023	2019/10/14
Communication Tester	R&S	CMW500	157304	2019/11/13

2.3. Measurement Uncertainty

Conducted Emission

The measurement uncertainty of confidence of 95% is evaluated as ± 1.52 dB

Radiated Emission (Below 1GHz)

The measurement uncertainty of confidence of 95% is evaluated as ± 4.22 dB

Radiated Emission (Above 1GHz)

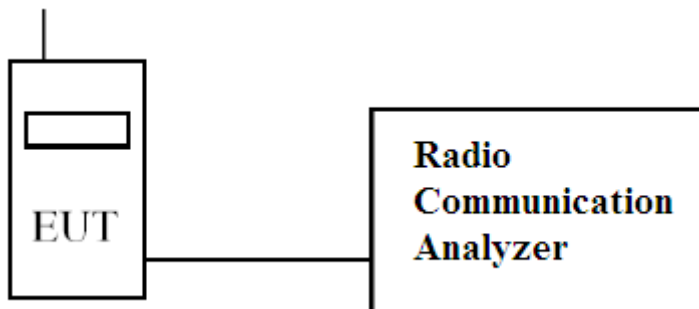
The measurement uncertainty of confidence of 95% is evaluated as ± 4.08 dB

3. Conducted Output Power Measurement

3.1. Test Specification

According to FCC Part 2.1046, 24.232

3.2. Test Setup



3.3. Limits

Band	Limit
LTE Band 2/1900	EIRP <2W

3.4. Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the output power was measured at the antenna terminals of the EUT.

3.5. Test Result of Maximum Power Output

Channel	Modulation	LTE Band 2 (1900MHz)							
		RB	RB	Maximum Conducted Output Power					
		No.	Offset	1.4M	3M	5M	10M	15M	20M
Low	QPSK	1	#0	22.61	22.72	22.72	22.81	22.86	22.86
		1	#Mid	22.74	22.81	22.70	22.73	22.65	22.63
		1	#Max	22.60	22.67	22.62	22.64	22.56	22.49
		50%	#0	22.58	21.70	21.73	21.76	21.77	21.78
		50%	#Mid	22.71	21.76	21.71	21.74	21.73	21.71
		50%	#Max	22.67	21.69	21.69	21.66	21.62	21.64
		100%	--	21.63	21.71	21.67	21.71	21.69	21.71
	16QAM	1	#0	21.95	22.18	22.15	22.16	22.00	22.04
		1	#Mid	22.10	22.22	22.13	22.10	21.80	21.75
		1	#Max	22.05	22.07	22.10	22.02	21.69	21.56
		50%	#0	21.73	20.84	20.82	20.79	20.90	20.89
		50%	#Mid	21.73	20.87	20.81	20.76	20.78	20.78
		50%	#Max	21.72	20.85	20.76	20.73	20.72	20.68
		100%	--	20.74	20.77	20.84	20.76	20.80	20.83
	64QAM	1	#0	20.97	21.05	21.09	21.09	21.23	21.17
		1	#Mid	20.98	21.14	21.06	20.94	21.02	20.87
		1	#Max	20.92	21.02	21.00	20.87	20.89	20.65
		50%	#0	20.82	19.81	19.84	19.85	19.88	19.92
		50%	#Mid	20.80	19.79	19.80	19.85	19.83	19.83
		50%	#Max	20.77	19.75	19.80	19.76	19.67	19.75
		100%	--	19.74	19.76	19.75	19.84	19.81	19.81
Mid	QPSK	1	#0	22.41	22.55	22.57	22.62	22.70	22.81
		1	#Mid	22.51	22.68	22.55	22.52	22.50	22.56
		1	#Max	22.47	22.52	22.53	22.45	22.49	22.42
		50%	#0	22.47	21.53	21.55	21.57	21.67	21.67
		50%	#Mid	22.51	21.56	21.57	21.56	21.61	21.58
		50%	#Max	22.47	21.51	21.51	21.51	21.54	21.52
		100%	--	21.45	21.52	21.53	21.53	21.62	21.60
	16QAM	1	#0	21.68	21.74	22.09	22.08	21.86	21.94
		1	#Mid	21.84	21.87	22.05	21.97	21.74	21.77
		1	#Max	21.80	21.68	22.05	21.90	21.77	21.68
		50%	#0	21.52	20.73	20.67	20.63	20.70	20.72

		50%	#Mid	21.68	20.79	20.65	20.65	20.66	20.63
		50%	#Max	21.48	20.70	20.60	20.60	20.58	20.57
		100%	--	20.60	20.74	20.65	20.65	20.68	20.63
	64QAM	1	#0	20.62	20.61	20.95	20.52	20.80	20.71
		1	#Mid	20.67	20.73	20.94	20.51	20.69	20.52
		1	#Max	20.55	20.55	20.86	20.45	20.61	20.38
		50%	#0	20.61	19.68	19.65	19.69	19.69	19.80
		50%	#Mid	20.65	19.68	19.66	19.69	19.71	19.70
		50%	#Max	20.59	19.64	19.62	19.62	19.62	19.69
		100%	--	19.52	19.59	19.60	19.69	19.71	19.68
High	QPSK	1	#0	22.47	22.58	22.53	22.65	22.65	22.79
		1	#Mid	22.53	22.67	22.46	22.60	22.48	22.56
		1	#Max	22.45	22.53	22.45	22.55	22.50	22.56
		50%	#0	22.42	21.52	21.58	21.58	21.64	21.77
		50%	#Mid	22.47	21.54	21.55	21.57	21.57	21.70
		50%	#Max	22.46	21.52	21.55	21.56	21.54	21.61
		100%	--	21.47	21.54	21.52	21.56	21.60	21.74
	16QAM	1	#0	21.60	21.60	21.85	21.74	22.12	22.02
		1	#Mid	21.73	21.67	21.87	21.76	22.03	21.78
		1	#Max	21.61	21.57	21.79	21.75	22.08	21.85
		50%	#0	21.50	20.71	20.66	20.70	20.69	20.84
		50%	#Mid	21.67	20.71	20.66	20.67	20.65	20.75
		50%	#Max	21.63	20.67	20.63	20.66	20.64	20.76
		100%	--	20.59	20.66	20.64	20.63	20.66	20.79
	64QAM	1	#0	20.65	20.75	21.04	20.67	20.88	20.82
		1	#Mid	20.78	20.86	21.04	20.60	20.77	20.61
		1	#Max	20.71	20.72	20.90	20.63	20.76	20.63
		50%	#0	20.74	19.76	19.77	19.77	19.82	19.85
		50%	#Mid	20.78	19.80	19.77	19.76	19.79	19.79
		50%	#Max	20.77	19.74	19.74	19.73	19.74	19.72
		100%	--	19.79	19.70	19.72	19.76	19.80	19.77

3.6. Maximum Conducted Power and ERP/EIRP Power

According to KDB 412172 D01 Section 1.2 Power Approach

$$\text{EIRP} = P_T + G_T - L_C = \text{ERP} + 2.15 \text{ dB}, \text{ERP} = \text{EIRP} - 2.15 \text{ dB}$$

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

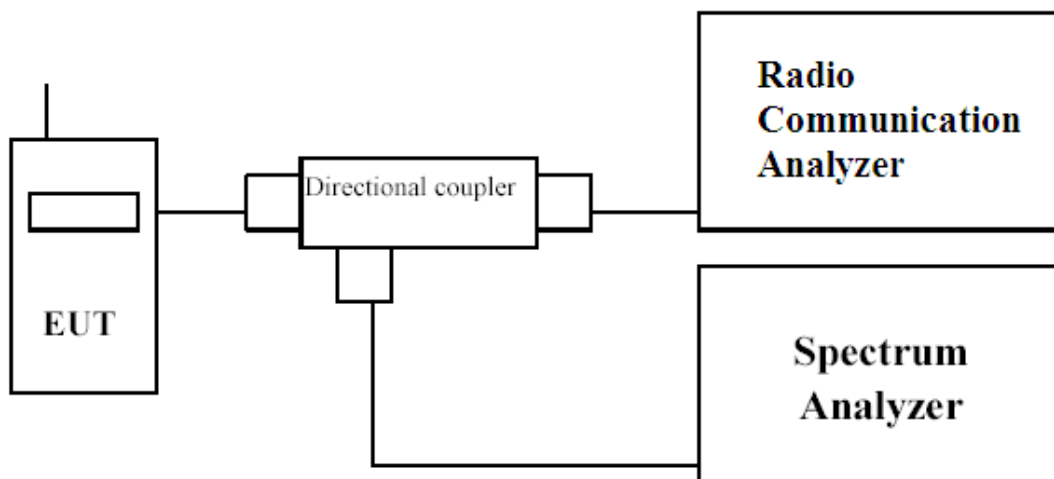
LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum EIRP (W)	Maximum EIRP Limit (W)
2	1.4M	QPSK	22.74	0.188	3.5	0.421	2
		16QAM	22.10	0.162	3.5	0.363	2
		64QAM	20.98	0.125	3.5	0.281	2
	3M	QPSK	22.81	0.191	3.5	0.428	2
		16QAM	22.22	0.167	3.5	0.373	2
		64QAM	21.14	0.130	3.5	0.291	2
	5M	QPSK	22.72	0.187	3.5	0.419	2
		16QAM	22.15	0.164	3.5	0.367	2
		64QAM	21.09	0.129	3.5	0.288	2
	10M	QPSK	22.81	0.191	3.5	0.428	2
		16QAM	22.16	0.164	3.5	0.368	2
		64QAM	21.09	0.129	3.5	0.288	2
	15M	QPSK	22.86	0.193	3.5	0.433	2
		16QAM	22.12	0.163	3.5	0.365	2
		64QAM	21.23	0.133	3.5	0.297	2
	20M	QPSK	22.86	0.193	3.5	0.433	2
		16QAM	22.04	0.160	3.5	0.358	2
			64QAM	21.17	0.131	3.5	0.293

4. Occupied Bandwidth

4.1. Test Secification

According to FCC Part 2.1049, 24.238

4.2. Test Setup



4.3. Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the occupied bandwidth was measured at the antenna terminals of the EUT. The Resolution BW of the analyzer is set to 1 %~5% of the emission bandwidth. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

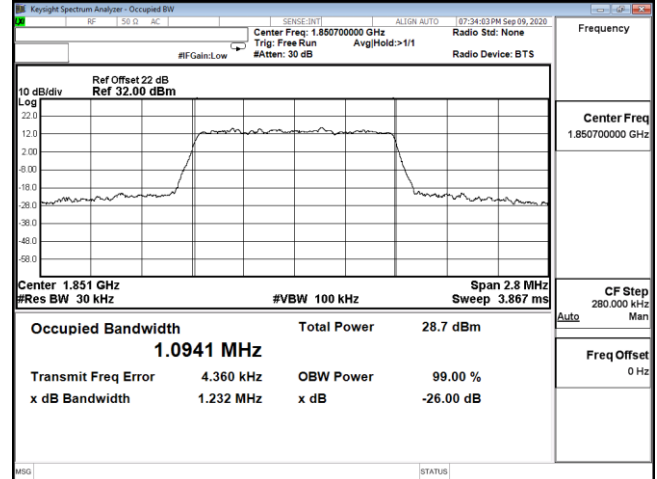
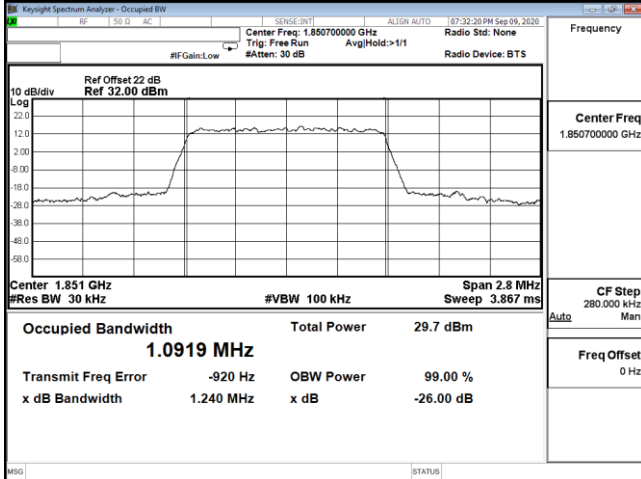
The plots below show the resultant display from the Spectrum Analyser.

4.4. Test Result of Occupied Bandwidth

Product	Gigabit LTE Multi-Service Router / LTE Dual-SIM Dual-Band Wireless VoIP VPN Router
Test Mode	Occupied Bandwidth
Test Site	CTR

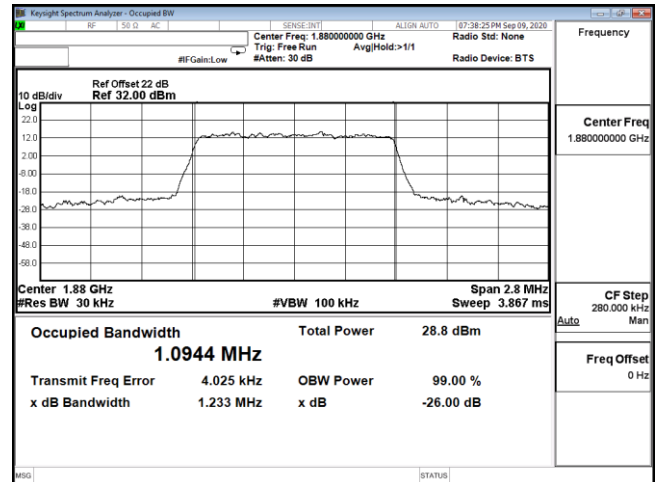
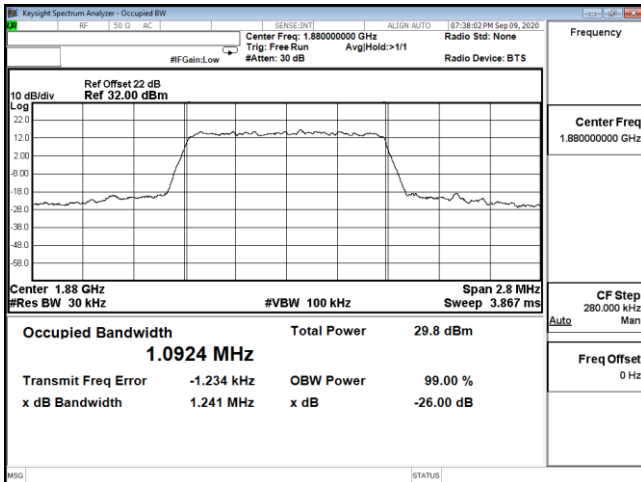
LTE Band 2								
BW	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26 dB bandwidth (MHz)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4M	18607	1850.7	1.0919	1.0941	1.0927	1.240	1.232	1.231
1.4M	18900	1880	1.0924	1.0944	1.0930	1.241	1.233	1.233
1.4M	19193	1909.3	1.0916	1.0931	1.0917	1.241	1.233	1.232
3M	18615	1851.5	2.7270	2.7262	2.7239	3.079	3.094	3.060
3M	18900	1880	2.7315	2.7283	2.7231	3.087	3.090	3.061
3M	19185	1908.5	2.7280	2.7288	2.7256	3.086	3.077	3.056
5M	18625	1852.5	4.4911	4.4949	4.5027	4.997	4.964	4.960
5M	18900	1880	4.4923	4.4930	4.5060	5.016	4.981	4.962
5M	19175	1907.5	4.4933	4.4960	4.5049	5.009	4.973	4.979
10M	18650	1855	9.0780	9.0082	9.0437	9.985	9.901	9.973
10M	18900	1880	9.0937	9.0192	9.0597	9.992	9.940	9.981
10M	19150	1905	9.0903	9.0190	9.0611	10.03	9.933	9.990
15M	18675	1857.5	13.453	13.436	13.417	14.68	14.74	14.72
15M	18900	1880	13.485	13.471	13.462	14.71	14.87	14.76
15M	19125	1902.5	13.491	13.465	13.455	14.69	14.79	14.68
20M	18700	1860	18.402	18.405	18.357	20.45	20.40	20.53
20M	18900	1880	18.537	18.543	18.503	20.51	20.60	20.59
20M	19100	1900	18.463	18.468	18.425	20.38	20.49	20.51

Product	Gigabit LTE Multi-Service Router / LTE Dual-SIM Dual-Band Wireless VoIP VPN Router		
Test Mode	Occupied Bandwidth		
Date of Test	2020/09/09	Test Site	CTR
Test Condition	Band 2 QPSK/16QAM/64QAM		



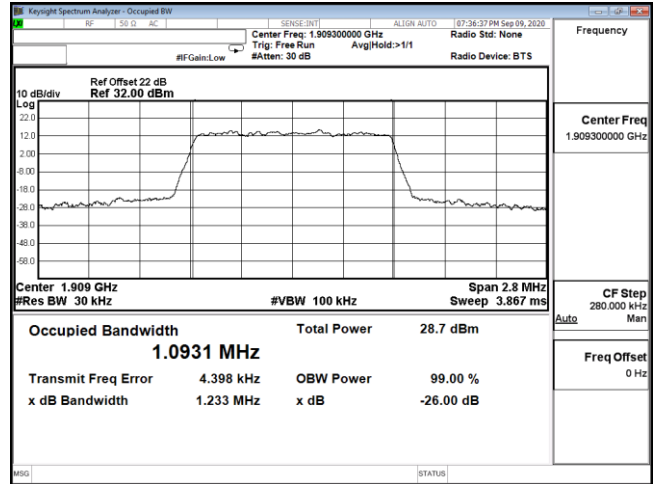
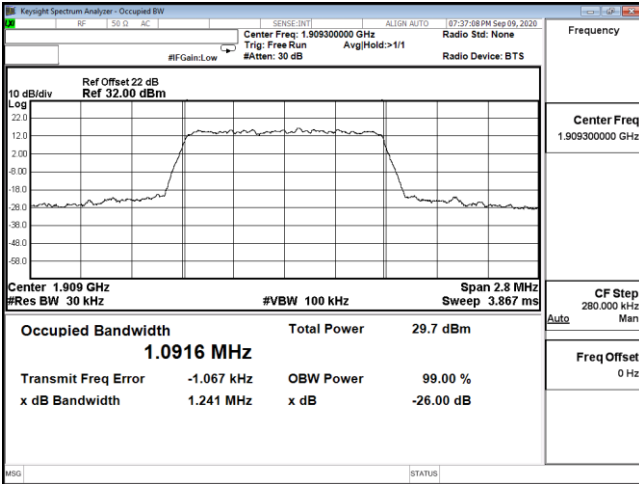
OCC B2 1.4M CH18607 QPSK

OCC B2 1.4M CH18607 16QAM



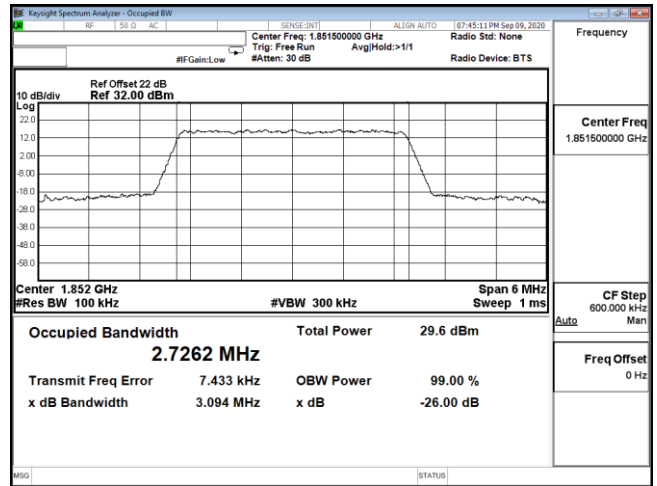
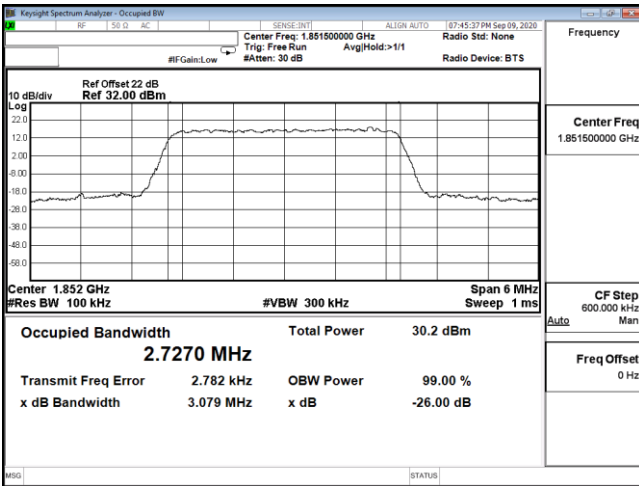
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OCC B2 1.4M CH18900 16QAM



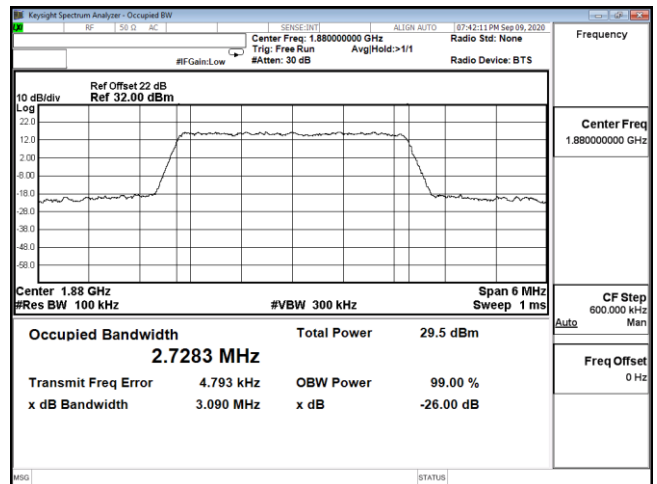
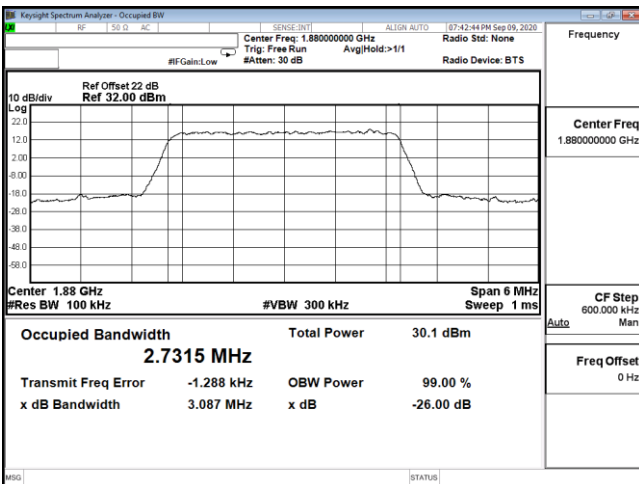
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OCC B2 1.4M CH19193 16QAM



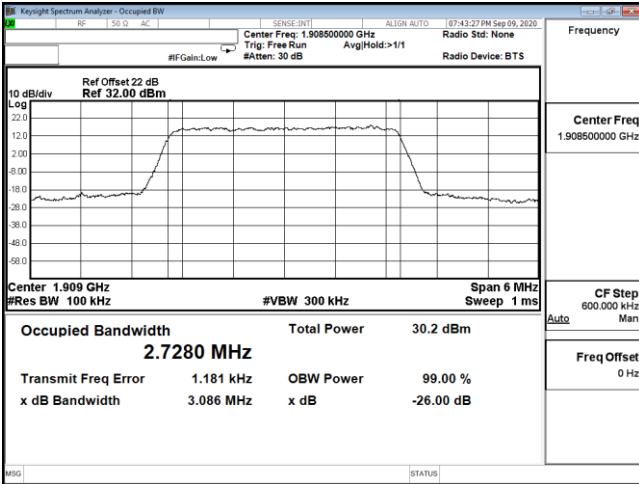
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OCC B2 3M CH18615 16QAM

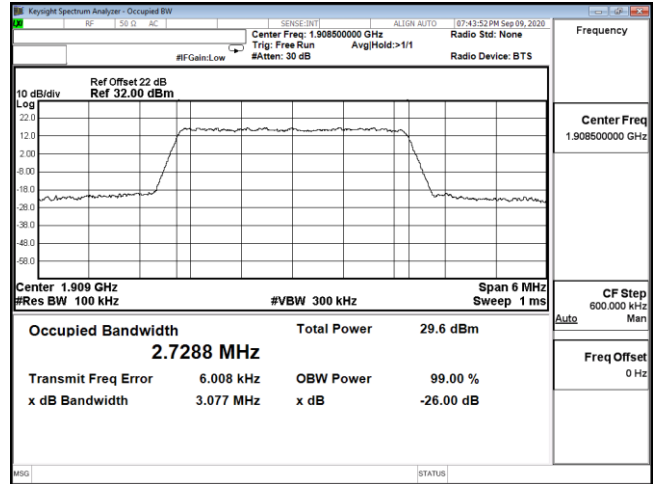


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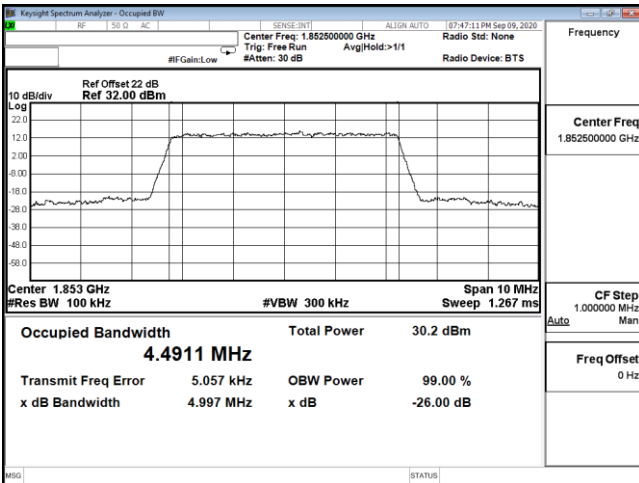
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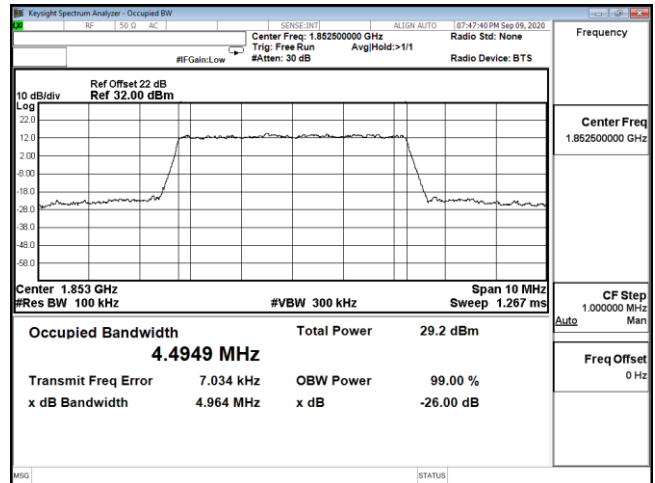
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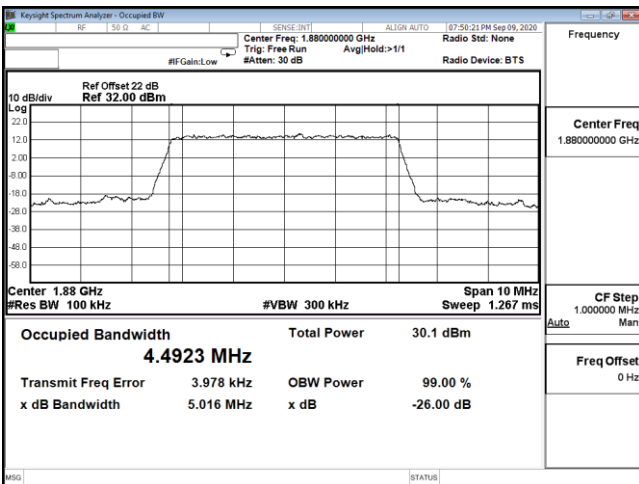
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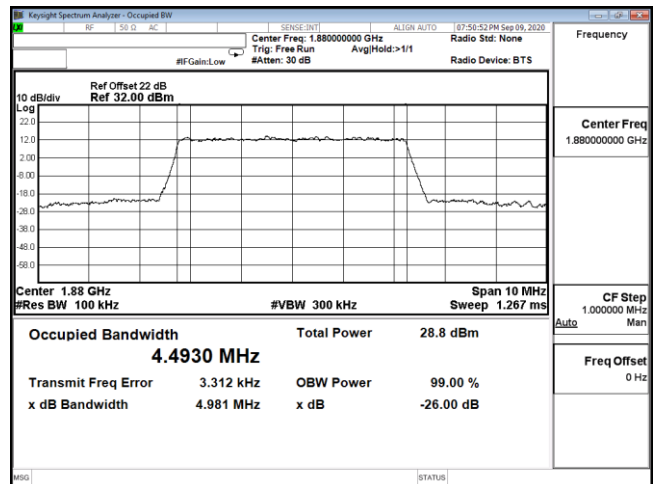
OCC B2 5M CH18625 QPSK



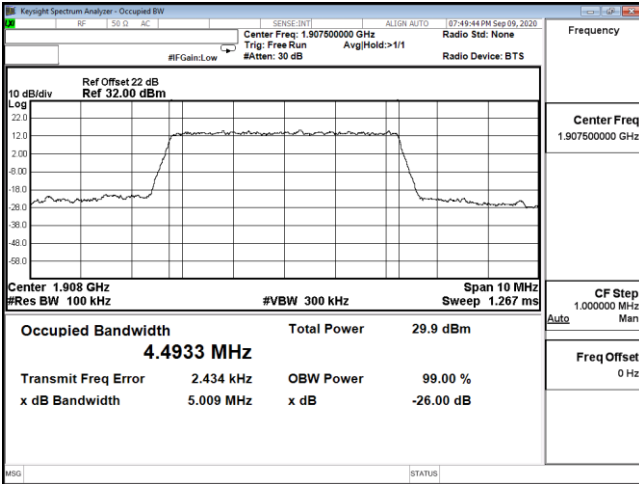
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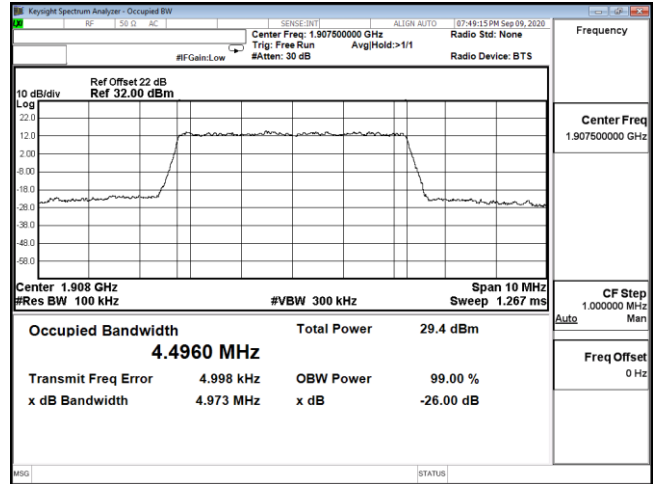
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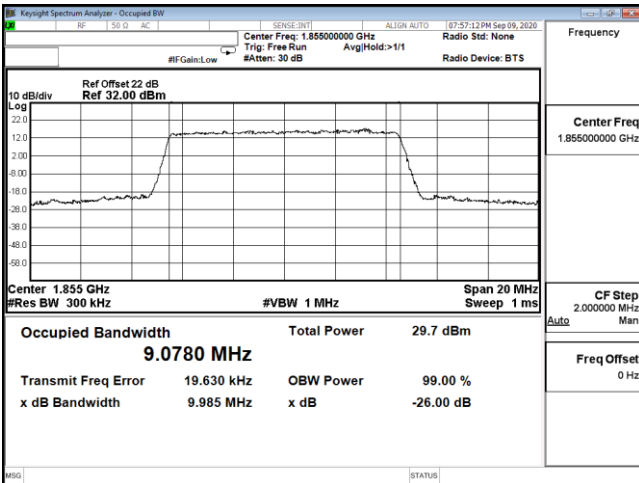
OCC B2 5M CH18900 16QAM



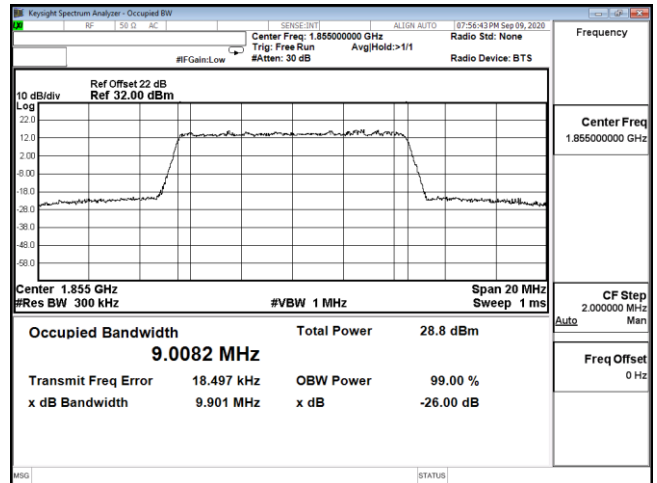
OCC B2 5M CH19175 QPSK



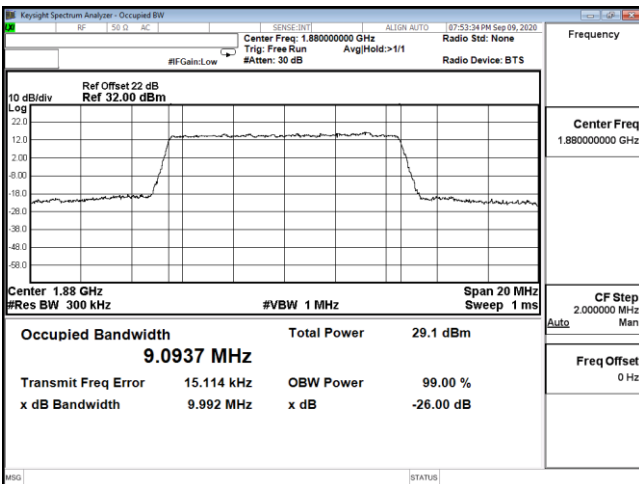
OCC B2 5M CH19175 16QAM



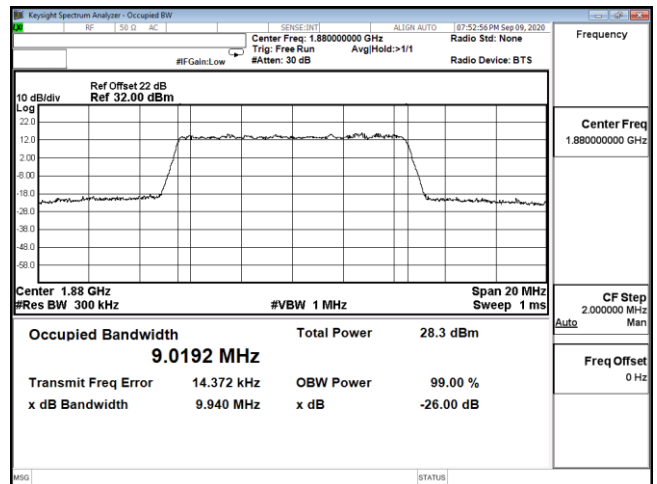
OCC B2 10M CH18650 QPSK



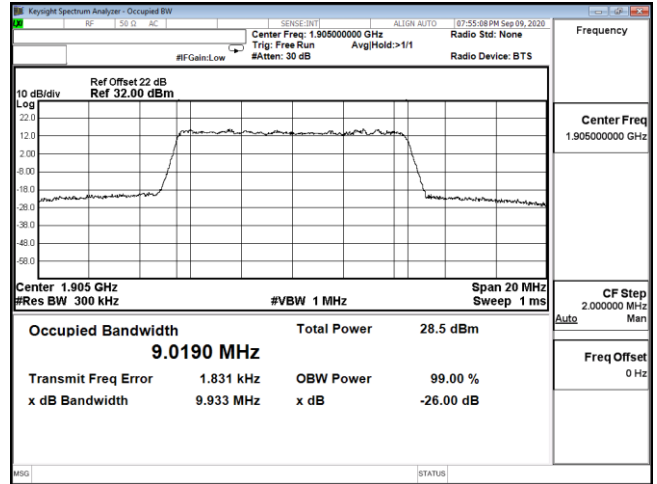
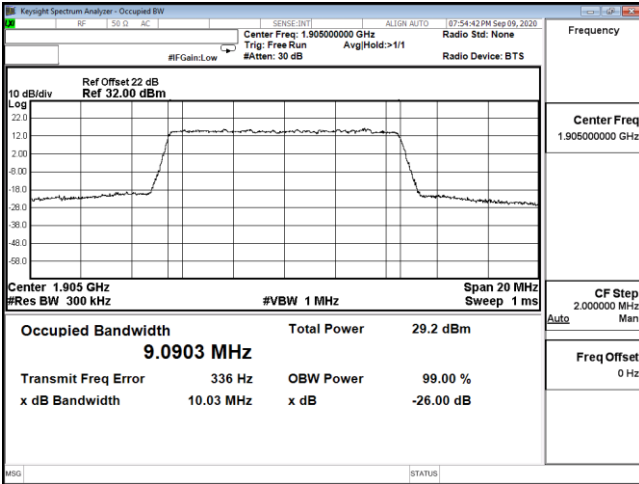
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OCC B2 10M CH18900 QPSK

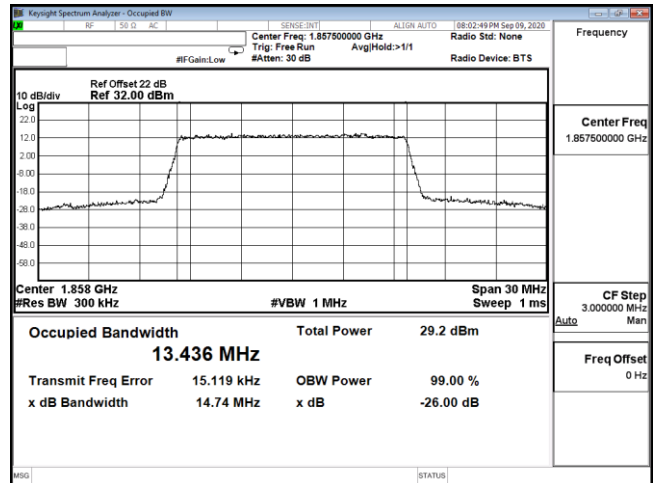
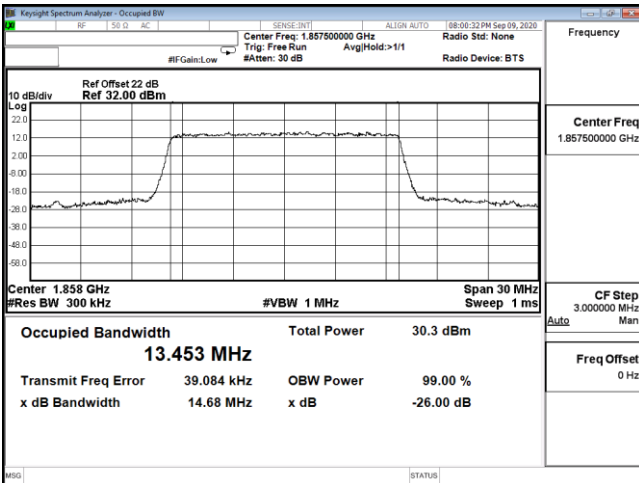


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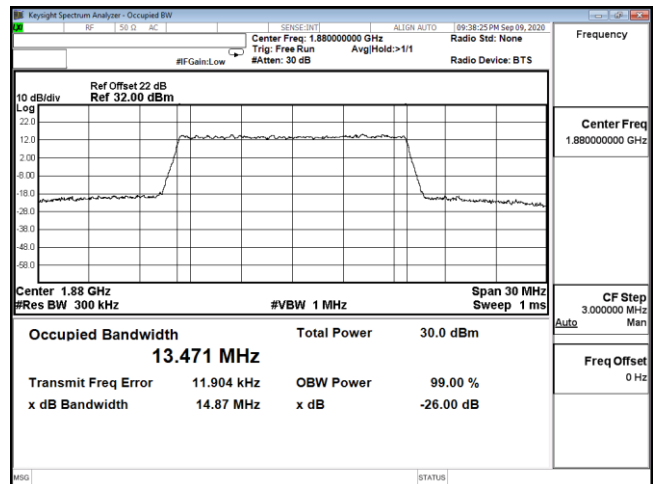
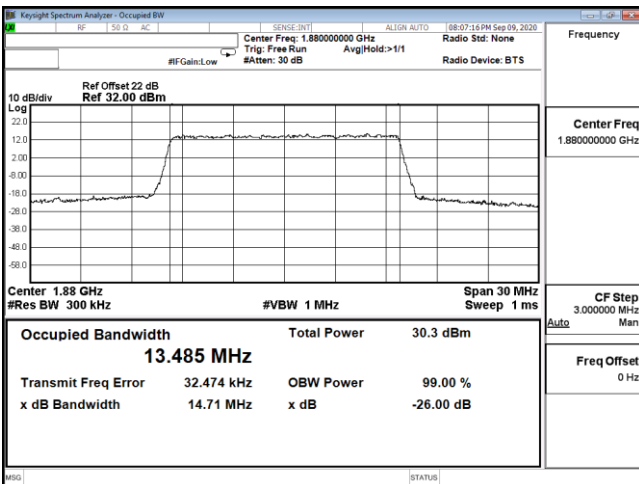
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OCC B2 10M CH19150 16QAM



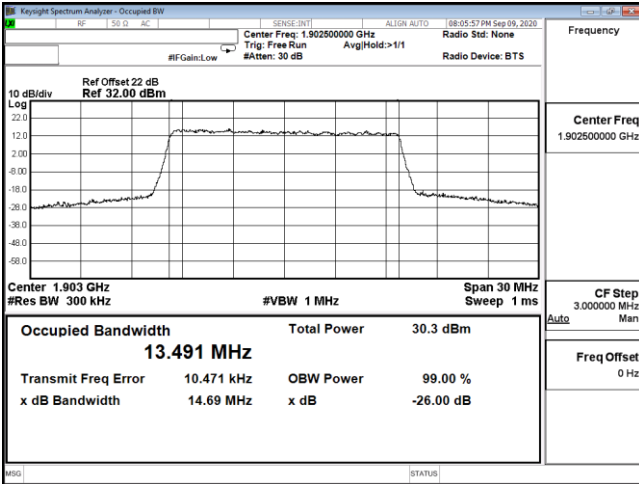
OCC B2 15M CH18675 QPSK

OCC B2 15M CH18675 16QAM

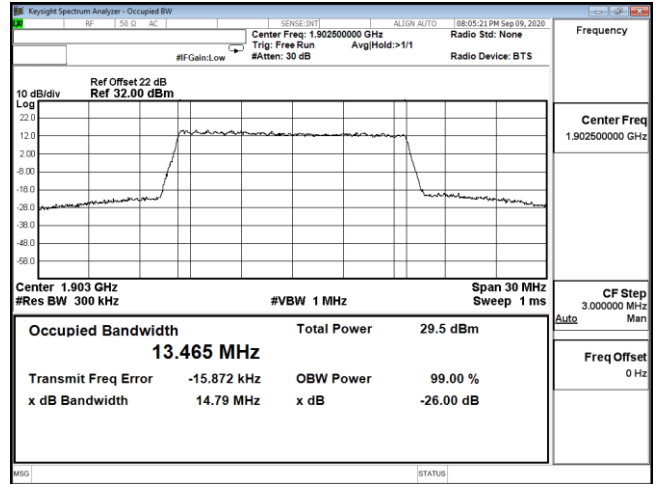


OCC B2 15M CH18900 QPSK

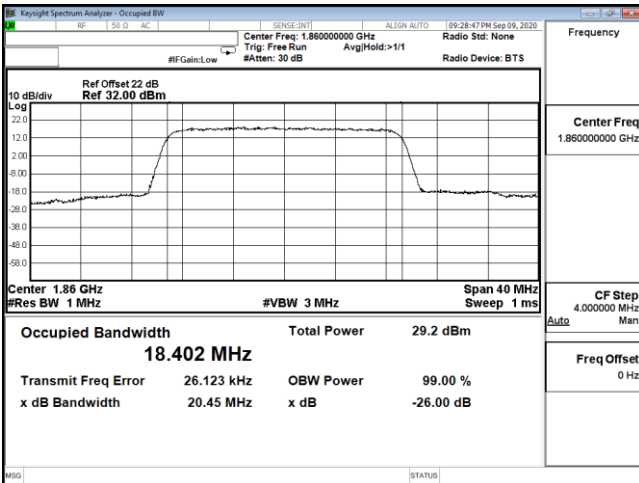
OCC B2 15M CH18900 16QAM



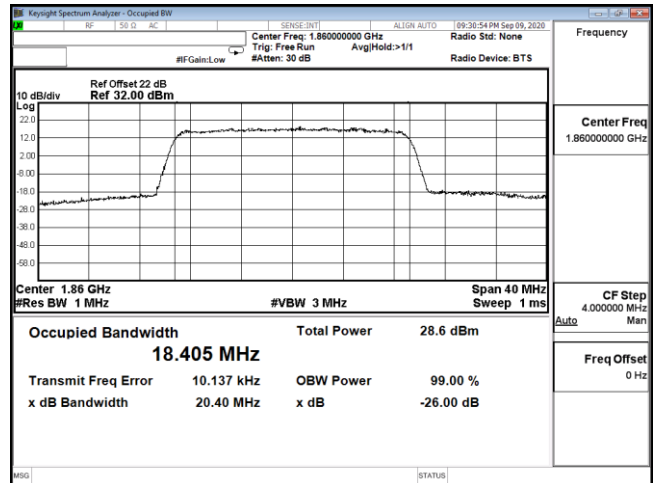
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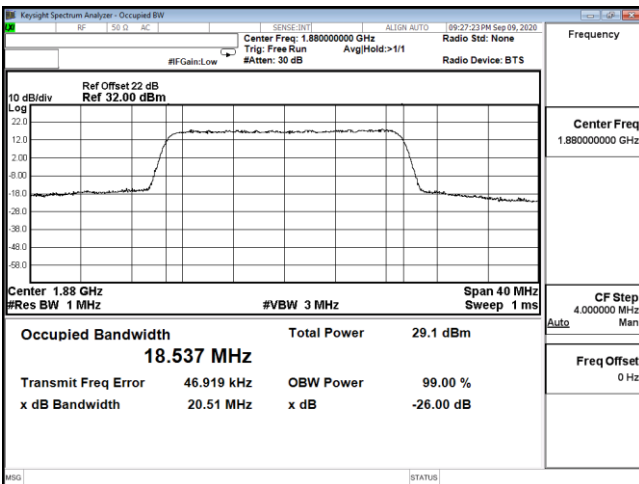
OCC B2 15M CH19125 16QAM



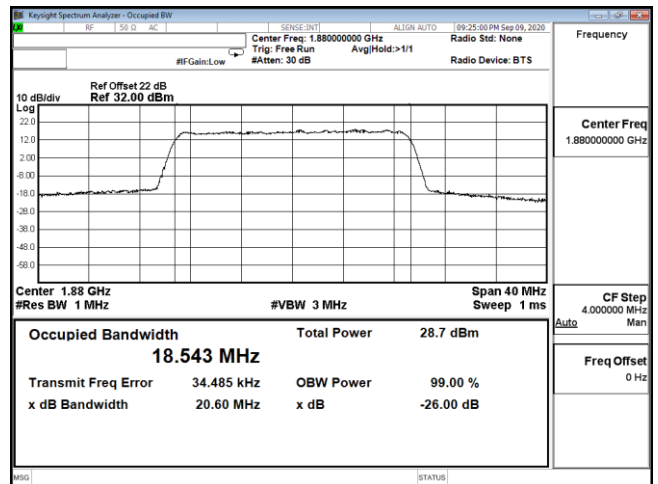
OCC B2 20M CH18700 QPSK



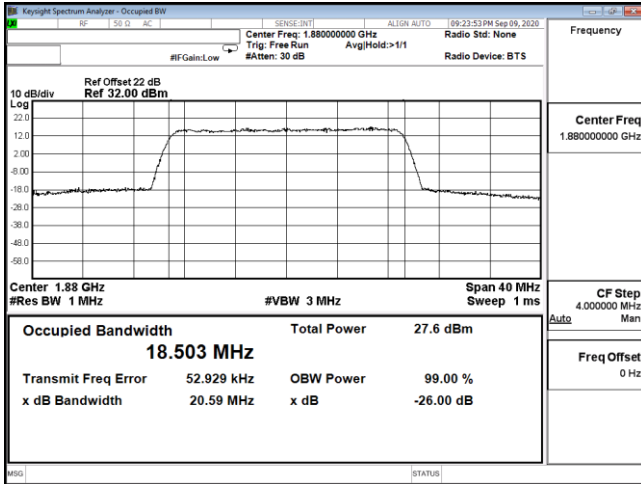
OCC B2 20M CH18700 16QAM



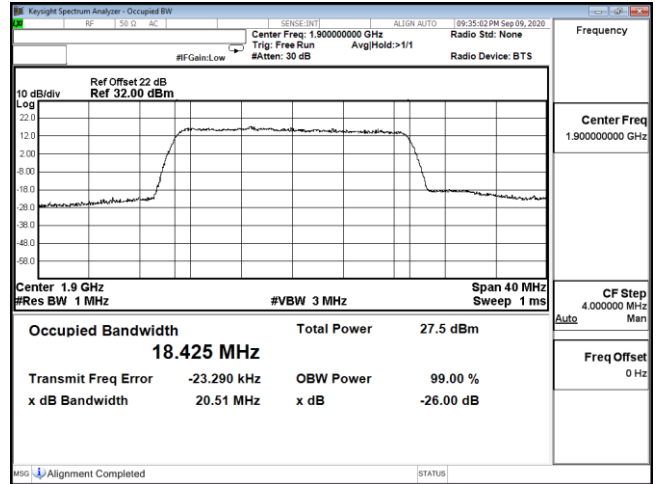
OCC B2 20M CH18900 QPSK



OCC B2 20M CH18900 16QAM



OCC B2 20M CH18900 64QAM



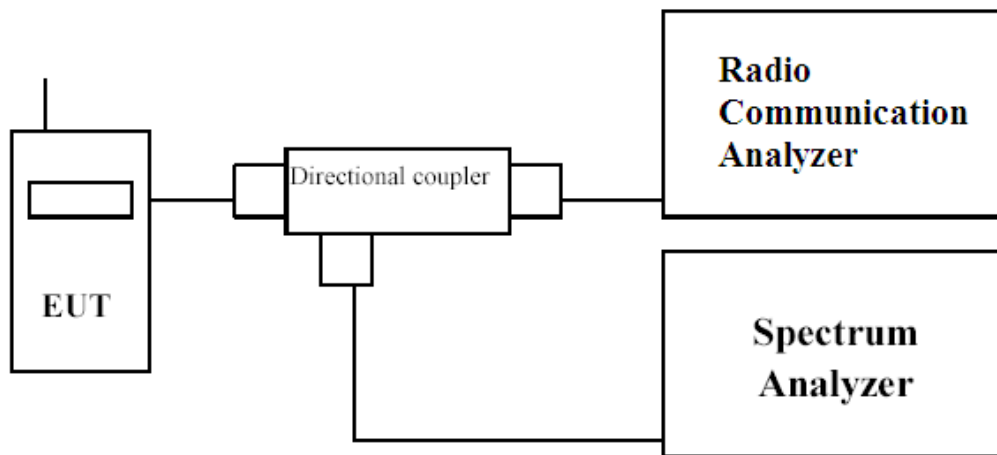
OCC B2 20M CH19100 64QAM

5. Spurious Emission At Antenna Terminals (+/-1MHz)

5.1. Test Specification

According to Part 2.1051, 24.238

5.2. Setup



5.3. Limits

The spurious (unwanted) emission limits specified in the individual FCC rule parts applicable to licensed digital transmitters (typically referred to under the heading 'emission limits') normally apply to any and all emissions that are present outside of the authorized frequency band/block and apply to emissions in both the out-of-band and spurious domains. unwanted emissions are required by the licensed rule parts to be attenuated below the transmitter power by a factor of at least $43 + 10\log(P)$ dB, where P represents the transmitter power expressed in watts

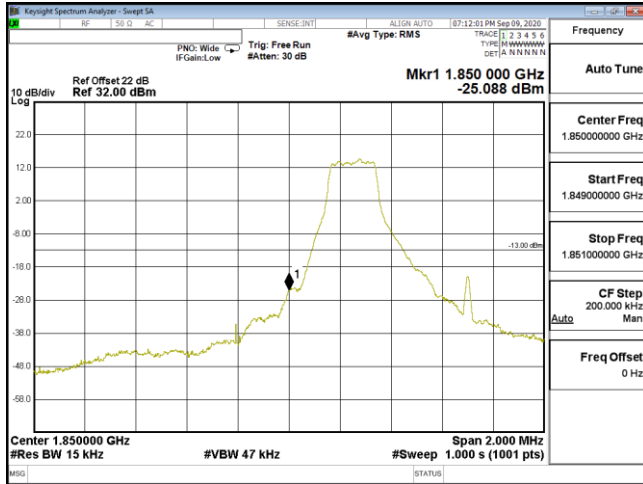
5.4. Test Procedure

In accordance with Part 24.238 at least 1% of the emission bandwidth was used for the resolution and video bandwidths up to 1MHz away from the Block Edge. At greater than 1MHz, the resolution and video bandwidth were increased to 1MHz/3MHz.

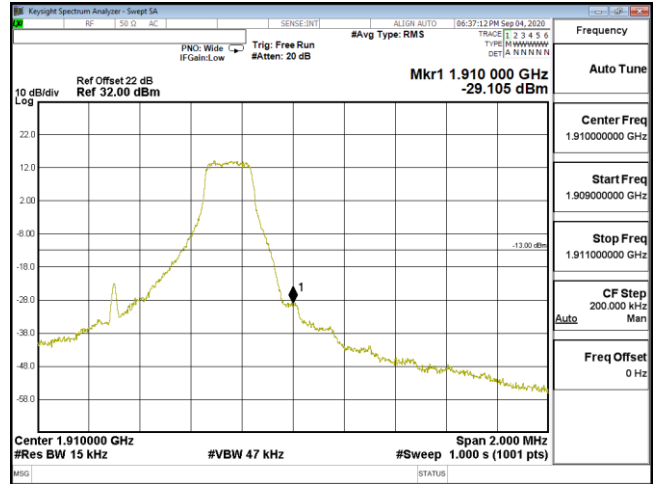
The reference power and path losses of all channels used for testing in each frequency block were measured.

5.5. Test Result of Spurious Emission At Antenna Terminals (+/-1MHz)

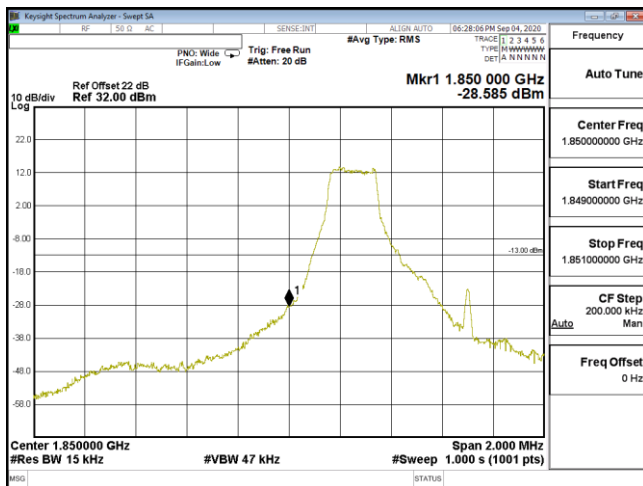
Product	Gigabit LTE Multi-Service Router / LTE Dual-SIM Dual-Band Wireless VoIP VPN Router		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2020/09/09	Test Site	CTR
Test Condition	Block Edge Test (LTE Band 2)		



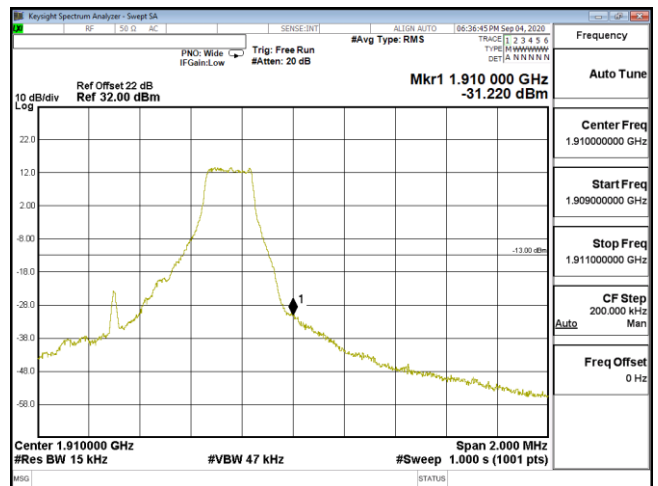
EDGE B2 1.4M CH18607 QPSK(1,0)



EDGE B2 1.4M CH19193 QPSK(1,5)



EDGE B2 1.4M CH18607 16QAM(1,0)



EDGE B2 1.4M CH19193 16QAM(1,5)

