

FCC Test Report

(Part 24&27)

Product Name : Triple-SIM 4G/LTE Router with WWAN Failover

Model No : MX-221P , MX-221

FCC ID : QI3BIL-MX221P

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 : 2019/03/22

Issued Date : 2019/04/26

Report No. : 1930373R-HPUSP37V00

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 of the equipment and evaluated measurement uncertainty herein.

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Test Report

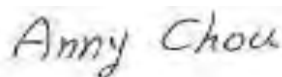
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Applicant : Billion Electric Co., Ltd.
Address : 8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei
City 231, Taiwan (R.O.C.)
Manufacturer : Billion Electric Co., Ltd.
Trade Name : BEC, Billion
Model No. : MX-221P , MX-221
EUT Rated Voltage : AC 100-240V/50-60Hz
EUT Test Voltage : AC 120V/60Hz
Measurement Standard : FCC CFR Title 47 Part 2 24 27
Measurement Reference : TIA/EIA 603-E 2016
KDB 971168 D01V03
ANSI C63.26 2015
Test Result : Complied

Documented By :



(Senior Adm. Specialist / Anny Chou)

Tested By :



(Senior Engineer / Vorana Chen)

Approved By :



(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Triple-SIM 4G/LTE Router with WWAN Failover
Model No.	MX-221P , MX-221
Trade Name	BEC, Billion
IMEI No.	86683404
FCC ID	QI3BIL-MX221P
Modulation	LTE Band 2: QPSK/16-QAM
	LTE Band 4: QPSK/16-QAM
TX Frequency	LTE Band 2: 1850 MHz ~1910 MHz
	LTE Band 4: 1710 MHz ~1755 MHz
Rx Frequency	LTE Band 2: 1930 MHz ~1990 MHz
	LTE Band 4: 2110 MHz ~2155 MHz
Bandwidth	LTE Band 2: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz
	LTE Band 4: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz
HW Version	V1.010
SW Version	V1.04.1.303
Antenna Type	Dipole Antenna

1.2. Antenna List

No	Manufacturer	Part No	Antenna Type	Peak Gain
1	Grand-Tek Technology	OA-L71-12-05-C5-BL TX Mode	Dipole Antenna	3.5dBi for 1.71 GHz ~2.17 GHz
2	Grand-Tek Technology	OA-L71-12-05-C5-BL (Only RX Mode)	Dipole Antenna	3.5dBi for 1.71 GHz ~2.17 GHz

1.3. The different description of Model

The different description of Model		
Model	MX-221P	MX-221
Product Name	Triple-SIM 4G/LTE Router with WWAN Failover	
Trade Name	BEC, Billion	
LTE antennas(SMA)	Detachable LTE Antenna *2pcs	
SIM slot (2FF)	3	
Gigabit Ethernet port	2	
Power input from PoE PoE injector	PoE-PD (802.3at PD complaint (25.5W)	No
Power Input: Power adapter	12VDC 1.2A	
External color	Casing: ABS / Dark blue	
Software	without VPN	

1.4. Operational Description

The information contained within this report is intended to show verification of compliance of the 1700/1900MHz to the requirements of FCC 47 CFR Part 2, 24 and 27.

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:

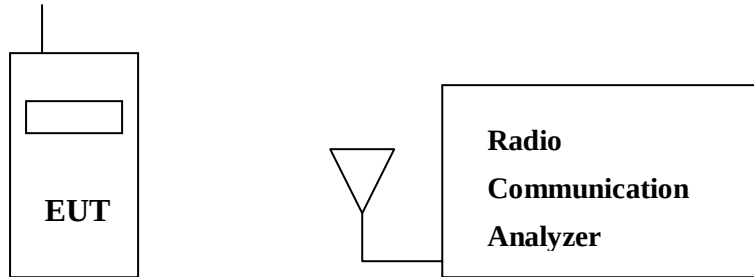
Test Mode:	LTE Band 2 (1.4M)-QPSK/16QAM
	LTE Band 2 (3M)-QPSK/16QAM
	LTE Band 2 (5M)-QPSK/16QAM
	LTE Band 2 (10M)-QPSK/16QAM
	LTE Band 2 (15M)-QPSK/16QAM
	LTE Band 2 (20M)-QPSK/16QAM
	LTE Band 4 (1.4M)-QPSK/16QAM
	LTE Band 4 (3M)-QPSK/16QAM
	LTE Band 4 (5M)-QPSK/16QAM
	LTE Band 4 (10M)-QPSK/16QAM
	LTE Band 4 (15M)-QPSK/16QAM
	LTE Band 4 (20M)-QPSK/16QAM

Note :

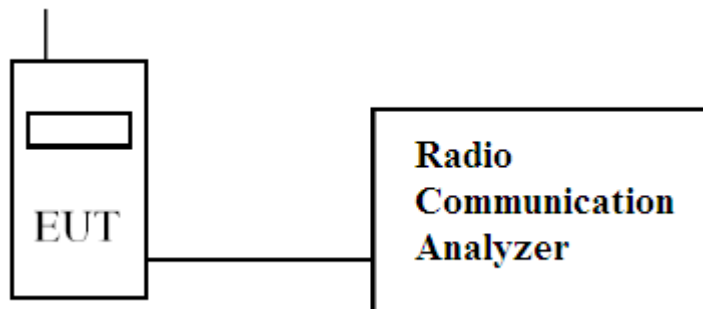
The maximum power levels are chosen in the LTE Band 2/4, only these modes were used for all tests.

1.5. Configuration of tested System

(a) Configuration of Radiated measurement



(b) Configuration of Conducted measurement



1.6. 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 was set to communicate with MT8820C.
- (4) Repeat the above procedure (3).

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	23
Humidity (%RH)	25-75	52
Barometric pressure (mbar)	860-1060	986

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en.aspx

Site Description: Accredited by TAF
Accredited Number: 3023

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FCC Accreditation Number: TW3023

1.8. Type of Emission

Band	Bandwidth (MHz)	Modulation	
		QPSK	16QAM
2	1.4	1M10G7D	1M09W7D
2	3	2M73G7D	2M72W7D
2	5	4M51G7D	4M48W7D
2	10	9M03G7D	9M03W7D
2	15	13M4G7D	13M4W7D
2	20	18M5G7D	18M4W7D
4	1.4	1M10G7D	1M09W7D
4	3	2M74G7D	2M72W7D
4	5	4M51G7D	4M48W7D
4	10	9M04G7D	9M03W7D
4	15	13M4G7D	13M4W7D
4	20	18M6G7D	18M4W7D

1.9. Voltages and AC currents

LTE Band 2 (1.4M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.090A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 2 (3M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.091A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 2 (5M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.091A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 2 (10M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.091A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 2 (15M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.096A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 2 (20M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.098A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 4 (1.4M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.095A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 4 (3M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.096A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 4 (5M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.096A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 4 (10M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.097A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 4 (15M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.101A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A
LTE Band 4 (20M)	EUT Transmitting (in maximum power) :	AC voltage : 120V , AC current : 0.102A
	EUT Standby :	AC voltage : 120V , AC current : 0.05A

2. Technical Test

2.1. Summary of test result

FCC Standard	Test Item	Result	Note
2.1046	Conducted Output Power	Pass	
24.232(c)			
27.50 (d)			
2.1049	Occupied Bandwidth	Pass	
24.238(b)			
27.53 (h)			
2.1051	Spurious Emission at Antenna Terminals	Pass	
24.238(a)			
27.53 (h)			
2.1051	Conducted Emission	Pass	
24.238(a)			
27.53 (h)			
2.1053	Field Strength of Spurious Radiation	Pass	
24.238(a)			
27.53 (h)			
2.1055	Frequency Stability for Temperature & Voltage	Pass	
24.235			
27.54			
24.232 (d)	Peak to Average Ratio	Pass	
27.50			

2.2. List of test Equipment

Conducted /CTR

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY54510357	2018/05/03
Directional coupler	Agilent	87300C	MY44300353	2018/12/04
Directional coupler	Agilent	778D-012	50550	2018/12/04
Standard Temperature & Humidity Chamber	WIT	TH-1S-B	EQ-201-00146	2019/02/27
Communication Tester	Agilent	MT8820C	6201465467	2018/07/20

Radiated / Site3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Loop Antenna	AMETEK	HLA6121	49611	2019/02/22
Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/06/24
Horn Antenna	R&S	9120D	556	2018/05/03
Pre-Amplifier	Agilent	87405C	MY55380068	2018/08/10
Spectrum Analyzer	Agilent	N9010A	MY54510357	2018/05/03
Communication Tester	Agilent	MT8820C	6201465467	2018/07/20

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)

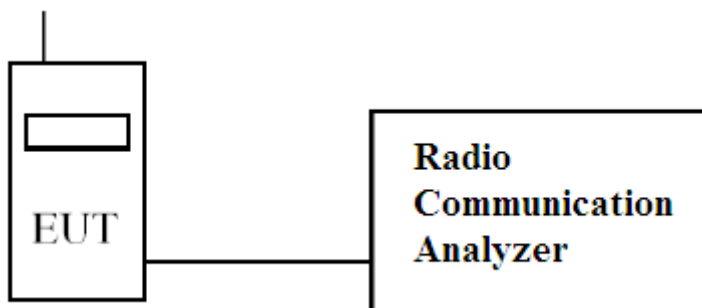
The measurement uncertainty of confidence of 95% is evaluated as ± 4.08 dB

3. Conducted Output Power Measurement

3.1. Test Specification

According to FCC Part 2.1046, 24.232, 27.50

3.2. Test Setup



3.3. Limits

Band	Limit
LTE Band 2/1900	<2W
LTE Band 4/1700	<1W

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

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 2 (1900MHz)/1.4MHz	18607 1850.7MHz	QPSK	1	#0	0	22.39	0.1734
			1	#Mid	0	22.56	0.1803
			1	#Max	0	22.42	0.1746
			50%	#0	1	22.49	0.1774
			50%	#Mid	1	22.55	0.1799
			50%	#Max	1	22.60	0.1820
			100%	--	1	21.58	0.1439
		16QAM	1	#0	1	21.62	0.1452
			1	#Mid	1	21.63	0.1455
			1	#Max	1	21.66	0.1466
			50%	#0	2	21.45	0.1396
			50%	#Mid	2	21.54	0.1426
			50%	#Max	2	21.50	0.1413
			100%	--	2	20.44	0.1107
	18900 1880MHz	QPSK	1	#0	0	22.44	0.1754
			1	#Mid	0	22.54	0.1795
			1	#Max	0	22.43	0.1750
			50%	#0	1	22.52	0.1786
			50%	#Mid	1	22.53	0.1791
			50%	#Max	1	22.56	0.1803
			100%	--	1	21.52	0.1419
		16QAM	1	#0	1	21.69	0.1476
			1	#Mid	1	21.27	0.1340
			1	#Max	1	21.55	0.1429
			50%	#0	2	21.43	0.1390
			50%	#Mid	2	21.78	0.1507
			50%	#Max	2	21.64	0.1459
			100%	--	2	20.68	0.1169
	19193 1909.3MHz	QPSK	1	#0	0	22.78	0.1897
			1	#Mid	0	22.70	0.1862
			1	#Max	0	22.53	0.1791
			50%	#0	1	22.76	0.1888
			50%	#Mid	1	22.70	0.1862
			50%	#Max	1	22.75	0.1884
			100%	--	1	21.64	0.1459
		16QAM	1	#0	1	21.54	0.1426
			1	#Mid	1	21.58	0.1439
			1	#Max	1	21.37	0.1371
			50%	#0	2	22.02	0.1592
			50%	#Mid	2	21.85	0.1531
			50%	#Max	2	21.61	0.1449
			100%	--	2	20.66	0.1164

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 2 (1900MHz)/3MHz	18615 1851.5MHz	QPSK	1	#0	0	22.40	0.1738
			1	#Mid	0	22.42	0.1746
			1	#Max	0	22.43	0.1750
			50%	#0	1	21.50	0.1413
			50%	#Mid	1	21.50	0.1413
			50%	#Max	1	21.51	0.1416
			100%	--	1	21.47	0.1403
		16QAM	1	#0	1	21.30	0.1349
			1	#Mid	1	21.87	0.1538
			1	#Max	1	21.23	0.1327
			50%	#0	2	20.25	0.1059
			50%	#Mid	2	20.60	0.1148
			50%	#Max	2	20.64	0.1159
			100%	--	2	20.45	0.1109
	18900 1880MHz	QPSK	1	#0	0	22.65	0.1841
			1	#Mid	0	22.66	0.1845
			1	#Max	0	22.61	0.1824
			50%	#0	1	21.55	0.1429
			50%	#Mid	1	21.40	0.1380
			50%	#Max	1	21.43	0.1390
			100%	--	1	21.48	0.1406
		16QAM	1	#0	1	21.27	0.1340
			1	#Mid	1	21.16	0.1306
			1	#Max	1	21.32	0.1355
			50%	#0	2	20.29	0.1069
			50%	#Mid	2	20.51	0.1125
			50%	#Max	2	20.55	0.1135
			100%	--	2	20.46	0.1112
	19185 1908.5MHz	QPSK	1	#0	0	22.90	0.1950
			1	#Mid	0	22.63	0.1832
			1	#Max	0	22.53	0.1791
			50%	#0	1	21.74	0.1493
			50%	#Mid	1	21.68	0.1472
			50%	#Max	1	21.66	0.1466
			100%	--	1	21.76	0.1500
		16QAM	1	#0	1	21.54	0.1426
			1	#Mid	1	21.55	0.1429
			1	#Max	1	21.58	0.1439
			50%	#0	2	20.80	0.1202
			50%	#Mid	2	20.89	0.1227
			50%	#Max	2	20.82	0.1208
			100%	--	2	20.59	0.1146

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 2 (1900MHz)/5MHz	18625 1852.5MHz	QPSK	1	#0	0	22.25	0.1679
			1	#Mid	0	22.39	0.1734
			1	#Max	0	22.49	0.1774
			50%	#0	1	21.48	0.1406
			50%	#Mid	1	21.43	0.1390
			50%	#Max	1	21.50	0.1413
			100%	--	1	21.43	0.1390
		16QAM	1	#0	1	21.23	0.1327
			1	#Mid	1	21.27	0.1340
			1	#Max	1	21.24	0.1330
			50%	#0	2	20.34	0.1081
			50%	#Mid	2	20.30	0.1072
			50%	#Max	2	20.34	0.1081
			100%	--	2	20.26	0.1062
	18900 1880MHz	QPSK	1	#0	0	22.34	0.1714
			1	#Mid	0	22.29	0.1694
			1	#Max	0	22.22	0.1667
			50%	#0	1	21.40	0.1380
			50%	#Mid	1	21.39	0.1377
			50%	#Max	1	21.40	0.1380
			100%	--	1	21.50	0.1413
		16QAM	1	#0	1	21.33	0.1358
			1	#Mid	1	21.15	0.1303
			1	#Max	1	21.24	0.1330
			50%	#0	2	20.67	0.1167
			50%	#Mid	2	20.44	0.1107
			50%	#Max	2	20.27	0.1064
			100%	--	2	20.46	0.1112
	19175 1907.5MHz	QPSK	1	#0	0	22.47	0.1766
			1	#Mid	0	22.62	0.1828
			1	#Max	0	22.14	0.1637
			50%	#0	1	21.60	0.1445
			50%	#Mid	1	21.58	0.1439
			50%	#Max	1	21.50	0.1413
			100%	--	1	21.52	0.1419
		16QAM	1	#0	1	21.32	0.1355
			1	#Mid	1	21.34	0.1361
			1	#Max	1	21.30	0.1349
			50%	#0	2	20.70	0.1175
			50%	#Mid	2	20.68	0.1169
			50%	#Max	2	20.61	0.1151
			100%	--	2	20.61	0.1151

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 2 (1900MHz)/10MHz	18650 1855MHz	QPSK	1	#0	0	22.22	0.1667
			1	#Mid	0	22.48	0.1770
			1	#Max	0	22.16	0.1644
			50%	#0	1	21.37	0.1371
			50%	#Mid	1	21.53	0.1422
			50%	#Max	1	21.49	0.1409
			100%	--	1	21.51	0.1416
		16QAM	1	#0	1	21.21	0.1321
			1	#Mid	1	21.29	0.1346
			1	#Max	1	21.28	0.1343
			50%	#0	2	20.52	0.1127
			50%	#Mid	2	20.45	0.1109
			50%	#Max	2	20.48	0.1117
			100%	--	2	20.46	0.1112
	18900 1880MHz	QPSK	1	#0	0	22.39	0.1734
			1	#Mid	0	22.26	0.1683
			1	#Max	0	22.17	0.1648
			50%	#0	1	21.48	0.1406
			50%	#Mid	1	21.39	0.1377
			50%	#Max	1	21.39	0.1377
			100%	--	1	21.38	0.1374
		16QAM	1	#0	1	21.45	0.1396
			1	#Mid	1	21.23	0.1327
			1	#Max	1	21.12	0.1294
			50%	#0	2	20.45	0.1109
			50%	#Mid	2	20.45	0.1109
			50%	#Max	2	20.55	0.1135
			100%	--	2	20.45	0.1109
	19150 1905MHz	QPSK	1	#0	0	22.23	0.1671
			1	#Mid	0	22.53	0.1791
			1	#Max	0	22.21	0.1663
			50%	#0	1	21.55	0.1429
			50%	#Mid	1	21.62	0.1452
			50%	#Max	1	21.58	0.1439
			100%	--	1	21.64	0.1459
		16QAM	1	#0	1	21.64	0.1459
			1	#Mid	1	21.92	0.1556
			1	#Max	1	21.39	0.1377
			50%	#0	2	20.55	0.1135
			50%	#Mid	2	20.70	0.1175
			50%	#Max	2	20.76	0.1191
			100%	--	2	20.73	0.1183

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 2 (1900MHz)/15MHz	18675 1857.5MHz	QPSK	1	#0	0	22.27	0.1687
			1	#Mid	0	22.37	0.1726
			1	#Max	0	22.39	0.1734
			50%	#0	1	21.25	0.1334
			50%	#Mid	1	21.39	0.1377
			50%	#Max	1	21.43	0.1390
			100%	--	1	21.44	0.1393
		16QAM	1	#0	1	21.14	0.1300
			1	#Mid	1	21.16	0.1306
			1	#Max	1	21.33	0.1358
			50%	#0	2	20.49	0.1119
			50%	#Mid	2	20.43	0.1104
			50%	#Max	2	20.50	0.1122
			100%	--	2	20.49	0.1119
	18900 1880MHz	QPSK	1	#0	0	22.53	0.1791
			1	#Mid	0	22.39	0.1734
			1	#Max	0	22.15	0.1641
			50%	#0	1	21.41	0.1384
			50%	#Mid	1	21.26	0.1337
			50%	#Max	1	21.31	0.1352
			100%	--	1	21.25	0.1334
		16QAM	1	#0	1	21.27	0.1340
			1	#Mid	1	21.10	0.1288
			1	#Max	1	21.02	0.1265
			50%	#0	2	20.48	0.1117
			50%	#Mid	2	20.42	0.1102
			50%	#Max	2	20.39	0.1094
			100%	--	2	20.31	0.1074
	19125 1902.5MHz	QPSK	1	#0	0	22.40	0.1738
			1	#Mid	0	22.50	0.1778
			1	#Max	0	22.17	0.1648
			50%	#0	1	21.50	0.1413
			50%	#Mid	1	21.40	0.1380
			50%	#Max	1	21.56	0.1432
			100%	--	1	21.50	0.1413
		16QAM	1	#0	1	21.64	0.1459
			1	#Mid	1	21.31	0.1352
			1	#Max	1	21.73	0.1489
			50%	#0	2	20.56	0.1138
			50%	#Mid	2	20.56	0.1138
			50%	#Max	2	20.64	0.1159
			100%	--	2	20.47	0.1114

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 2 (1900MHz)/20MHz	18700 1860MHz	QPSK	1	#0	0	21.99	0.1581
			1	#Mid	0	22.43	0.1750
			1	#Max	0	22.27	0.1687
			50%	#0	1	21.35	0.1365
			50%	#Mid	1	21.38	0.1374
			50%	#Max	1	21.51	0.1416
			100%	--	1	21.38	0.1374
		16QAM	1	#0	1	21.41	0.1384
			1	#Mid	1	21.38	0.1374
			1	#Max	1	21.12	0.1294
			50%	#0	2	20.52	0.1127
			50%	#Mid	2	20.44	0.1107
			50%	#Max	2	20.57	0.1140
			100%	--	2	20.35	0.1084
	18900 1880MHz	QPSK	1	#0	0	22.05	0.1603
			1	#Mid	0	22.14	0.1637
			1	#Max	0	21.92	0.1556
			50%	#0	1	21.45	0.1396
			50%	#Mid	1	21.26	0.1337
			50%	#Max	1	21.11	0.1291
			100%	--	1	21.33	0.1358
		16QAM	1	#0	1	21.22	0.1324
			1	#Mid	1	21.29	0.1346
			1	#Max	1	21.00	0.1259
			50%	#0	2	20.32	0.1076
			50%	#Mid	2	20.32	0.1076
			50%	#Max	2	20.35	0.1084
			100%	--	2	20.39	0.1094
	19100 1900MHz	QPSK	1	#0	0	22.17	0.1648
			1	#Mid	0	22.61	0.1824
			1	#Max	0	22.34	0.1714
			50%	#0	1	21.44	0.1393
			50%	#Mid	1	21.45	0.1396
			50%	#Max	1	21.54	0.1426
			100%	--	1	21.51	0.1416
		16QAM	1	#0	1	21.22	0.1324
			1	#Mid	1	21.41	0.1384
			1	#Max	1	21.29	0.1346
			50%	#0	2	20.51	0.1125
			50%	#Mid	2	20.66	0.1164
			50%	#Max	2	20.64	0.1159
			100%	--	2	20.45	0.1109

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (dBm)	Max Power (W)
Band 4 (1700MHz)/1.4MHz	CH19957 1710.7MHz	QPSK	1	#0	0	21.77	0.1503
			1	#Mid	0	21.84	0.1528
			1	#Max	0	21.52	0.1419
			50%	#0	1	21.79	0.1510
			50%	#Mid	1	21.75	0.1496
			50%	#Max	1	21.77	0.1503
			100%	--	1	20.71	0.1178
		16QAM	1	#0	1	20.72	0.1180
			1	#Mid	1	20.62	0.1153
			1	#Max	1	20.87	0.1222
			50%	#0	2	20.91	0.1233
			50%	#Mid	2	21.05	0.1274
			50%	#Max	2	20.96	0.1247
			100%	--	2	19.77	0.0948
	CH20175 1732.5MHz	QPSK	1	#0	0	21.95	0.1567
			1	#Mid	0	22.08	0.1614
			1	#Max	0	21.87	0.1538
			50%	#0	1	21.95	0.1567
			50%	#Mid	1	22.01	0.1589
			50%	#Max	1	21.97	0.1574
			100%	--	1	20.99	0.1256
		16QAM	1	#0	1	20.82	0.1208
			1	#Mid	1	20.75	0.1189
			1	#Max	1	20.72	0.1180
			50%	#0	2	20.92	0.1236
			50%	#Mid	2	20.87	0.1222
			50%	#Max	2	20.95	0.1245
			100%	--	2	19.88	0.0973
	CH20393 1754.3MHz	QPSK	1	#0	0	21.52	0.1419
			1	#Mid	0	21.81	0.1517
			1	#Max	0	21.51	0.1416
			50%	#0	1	21.67	0.1469
			50%	#Mid	1	21.78	0.1507
			50%	#Max	1	21.82	0.1521
			100%	--	1	20.80	0.1202
		16QAM	1	#0	1	20.59	0.1146
			1	#Mid	1	20.58	0.1143
			1	#Max	1	20.74	0.1186
			50%	#0	2	20.70	0.1175
			50%	#Mid	2	20.86	0.1219
			50%	#Max	2	20.73	0.1183
			100%	--	2	19.78	0.0951

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 4 (1700MHz)/3MHz	CH19965 1711.5MHz	QPSK	1	#0	0	21.78	0.1507
			1	#Mid	0	21.83	0.1524
			1	#Max	0	21.76	0.1500
			50%	#0	1	20.81	0.1205
			50%	#Mid	1	20.65	0.1161
			50%	#Max	1	20.70	0.1175
			100%	--	1	20.70	0.1175
		16QAM	1	#0	1	20.65	0.1161
			1	#Mid	1	20.39	0.1094
			1	#Max	1	20.59	0.1146
			50%	#0	2	19.70	0.0933
			50%	#Mid	2	19.50	0.0891
			50%	#Max	2	19.47	0.0885
			100%	--	2	19.71	0.0935
	CH20175 1732.5MHz	QPSK	1	#0	0	22.07	0.1611
			1	#Mid	0	22.13	0.1633
			1	#Max	0	21.86	0.1535
			50%	#0	1	20.93	0.1239
			50%	#Mid	1	21.07	0.1279
			50%	#Max	1	20.87	0.1222
			100%	--	1	21.03	0.1268
		16QAM	1	#0	1	20.79	0.1199
			1	#Mid	1	20.68	0.1169
			1	#Max	1	20.67	0.1167
			50%	#0	2	20.14	0.1033
			50%	#Mid	2	20.01	0.1002
			50%	#Max	2	20.19	0.1045
			100%	--	2	20.11	0.1026
	CH20385 1753.5MHz	QPSK	1	#0	0	21.65	0.1462
			1	#Mid	0	21.72	0.1486
			1	#Max	0	21.77	0.1503
			50%	#0	1	20.78	0.1197
			50%	#Mid	1	20.69	0.1172
			50%	#Max	1	20.62	0.1153
			100%	--	1	20.66	0.1164
		16QAM	1	#0	1	20.63	0.1156
			1	#Mid	1	20.66	0.1164
			1	#Max	1	20.76	0.1191
			50%	#0	2	19.75	0.0944
			50%	#Mid	2	19.71	0.0935
			50%	#Max	2	19.66	0.0925
			100%	--	2	19.87	0.0971

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 4 (1700MHz)/5MHz	CH19975 1712.5MHz	QPSK	1	#0	0	21.66	0.1466
			1	#Mid	0	21.77	0.1503
			1	#Max	0	21.63	0.1455
			50%	#0	1	20.73	0.1183
			50%	#Mid	1	20.63	0.1156
			50%	#Max	1	20.66	0.1164
			100%	--	1	20.78	0.1197
		16QAM	1	#0	1	20.51	0.1125
			1	#Mid	1	20.45	0.1109
			1	#Max	1	20.42	0.1102
			50%	#0	2	19.69	0.0931
			50%	#Mid	2	19.79	0.0953
			50%	#Max	2	19.74	0.0942
			100%	--	2	19.85	0.0966
	CH20175 1732.5MHz	QPSK	1	#0	0	21.81	0.1517
			1	#Mid	0	21.90	0.1549
			1	#Max	0	21.96	0.1570
			50%	#0	1	20.93	0.1239
			50%	#Mid	1	21.04	0.1271
			50%	#Max	1	20.95	0.1245
			100%	--	1	21.06	0.1276
		16QAM	1	#0	1	21.14	0.1300
			1	#Mid	1	20.72	0.1180
			1	#Max	1	20.58	0.1143
			50%	#0	2	19.91	0.0979
			50%	#Mid	2	20.23	0.1054
			50%	#Max	2	20.10	0.1023
			100%	--	2	20.14	0.1033
	CH20375 1752.5MHz	QPSK	1	#0	0	21.89	0.1545
			1	#Mid	0	21.81	0.1517
			1	#Max	0	21.73	0.1489
			50%	#0	1	20.78	0.1197
			50%	#Mid	1	20.73	0.1183
			50%	#Max	1	20.73	0.1183
			100%	--	1	20.88	0.1225
		16QAM	1	#0	1	20.68	0.1169
			1	#Mid	1	20.54	0.1132
			1	#Max	1	20.66	0.1164
			50%	#0	2	19.73	0.0940
			50%	#Mid	2	19.58	0.0908
			50%	#Max	2	19.75	0.0944
			100%	--	2	19.70	0.0933

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 4 (1700MHz)/10MHz	CH20000 1715MHz	QPSK	1	#0	0	21.71	0.1483
			1	#Mid	0	21.50	0.1413
			1	#Max	0	21.48	0.1406
			50%	#0	1	20.72	0.1180
			50%	#Mid	1	20.63	0.1156
			50%	#Max	1	20.71	0.1178
			100%	--	1	20.62	0.1153
		16QAM	1	#0	1	20.73	0.1183
			1	#Mid	1	20.71	0.1178
			1	#Max	1	20.41	0.1099
			50%	#0	2	19.80	0.0955
			50%	#Mid	2	19.71	0.0935
			50%	#Max	2	19.78	0.0951
			100%	--	2	19.68	0.0929
	CH20175 1732.5MHz	QPSK	1	#0	0	22.02	0.1592
			1	#Mid	0	22.09	0.1618
			1	#Max	0	21.80	0.1514
			50%	#0	1	21.00	0.1259
			50%	#Mid	1	21.05	0.1274
			50%	#Max	1	20.96	0.1247
			100%	--	1	21.07	0.1279
		16QAM	1	#0	1	21.14	0.1300
			1	#Mid	1	20.89	0.1227
			1	#Max	1	20.57	0.1140
			50%	#0	2	20.06	0.1014
			50%	#Mid	2	20.04	0.1009
			50%	#Max	2	19.89	0.0975
			100%	--	2	20.05	0.1012
	CH20350 1750MHz	QPSK	1	#0	0	22.05	0.1603
			1	#Mid	0	22.03	0.1596
			1	#Max	0	21.60	0.1445
			50%	#0	1	20.85	0.1216
			50%	#Mid	1	20.77	0.1194
			50%	#Max	1	20.73	0.1183
			100%	--	1	20.84	0.1213
		16QAM	1	#0	1	20.66	0.1164
			1	#Mid	1	20.86	0.1219
			1	#Max	1	20.59	0.1146
			50%	#0	2	20.02	0.1005
			50%	#Mid	2	19.94	0.0986
			50%	#Max	2	19.82	0.0959
			100%	--	2	19.94	0.0986

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 4 (1700MHz)/15MHz	CH20025 1717.5MHz	QPSK	1	#0	0	21.83	0.1524
			1	#Mid	0	21.63	0.1455
			1	#Max	0	21.75	0.1496
			50%	#0	1	20.72	0.1180
			50%	#Mid	1	20.69	0.1172
			50%	#Max	1	20.80	0.1202
			100%	--	1	20.79	0.1199
		16QAM	1	#0	1	20.61	0.1151
			1	#Mid	1	20.54	0.1132
			1	#Max	1	20.60	0.1148
			50%	#0	2	19.59	0.0910
			50%	#Mid	2	19.59	0.0910
			50%	#Max	2	19.70	0.0933
			100%	--	2	19.68	0.0929
	CH20175 1732.5MHz	QPSK	1	#0	0	21.83	0.1524
			1	#Mid	0	22.00	0.1585
			1	#Max	0	21.74	0.1493
			50%	#0	1	20.93	0.1239
			50%	#Mid	1	20.93	0.1239
			50%	#Max	1	20.80	0.1202
			100%	--	1	20.85	0.1216
		16QAM	1	#0	1	20.73	0.1183
			1	#Mid	1	20.61	0.1151
			1	#Max	1	20.42	0.1102
			50%	#0	2	19.91	0.0979
			50%	#Mid	2	20.00	0.1000
			50%	#Max	2	19.87	0.0971
			100%	--	2	20.01	0.1002
	CH20325 1747.5MHz	QPSK	1	#0	0	21.82	0.1521
			1	#Mid	0	21.77	0.1503
			1	#Max	0	21.68	0.1472
			50%	#0	1	20.87	0.1222
			50%	#Mid	1	20.82	0.1208
			50%	#Max	1	20.77	0.1194
			100%	--	1	20.85	0.1216
		16QAM	1	#0	1	20.81	0.1205
			1	#Mid	1	20.62	0.1153
			1	#Max	1	20.49	0.1119
			50%	#0	2	19.85	0.0966
			50%	#Mid	2	19.81	0.0957
			50%	#Max	2	19.76	0.0946
			100%	--	2	19.76	0.0946

Band	Channel	Modulation	RB No.	RB Offset	MPR	Max Power (Conducted)	Max Power (W)
Band 4 (1700MHz)/20MHz	CH20050 1720MHz	QPSK	1	#0	0	21.53	0.1422
			1	#Mid	0	21.66	0.1466
			1	#Max	0	21.93	0.1560
			50%	#0	1	20.67	0.1167
			50%	#Mid	1	20.66	0.1164
			50%	#Max	1	20.84	0.1213
			100%	--	1	20.75	0.1189
		16QAM	1	#0	1	20.91	0.1233
			1	#Mid	1	20.82	0.1208
			1	#Max	1	20.74	0.1186
			50%	#0	2	19.73	0.0940
			50%	#Mid	2	19.65	0.0923
			50%	#Max	2	19.92	0.0982
			100%	--	2	19.81	0.0957
	CH20175 1732.5MHz	QPSK	1	#0	0	21.48	0.1406
			1	#Mid	0	22.04	0.1600
			1	#Max	0	21.86	0.1535
			50%	#0	1	21.01	0.1262
			50%	#Mid	1	20.98	0.1253
			50%	#Max	1	20.75	0.1189
			100%	--	1	20.85	0.1216
		16QAM	1	#0	1	20.60	0.1148
			1	#Mid	1	20.70	0.1175
			1	#Max	1	20.53	0.1130
			50%	#0	2	20.09	0.1021
			50%	#Mid	2	20.06	0.1014
			50%	#Max	2	19.88	0.0973
			100%	--	2	19.92	0.0982
	CH20300 1745MHz	QPSK	1	#0	0	22.03	0.1596
			1	#Mid	0	21.96	0.1570
			1	#Max	0	21.42	0.1387
			50%	#0	1	20.94	0.1242
			50%	#Mid	1	20.79	0.1199
			50%	#Max	1	20.76	0.1191
			100%	--	1	20.76	0.1191
		16QAM	1	#0	1	20.79	0.1199
			1	#Mid	1	20.82	0.1208
			1	#Max	1	20.55	0.1135
			50%	#0	2	19.96	0.0991
			50%	#Mid	2	19.76	0.0946
			50%	#Max	2	19.76	0.0946
			100%	--	2	19.74	0.0942

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

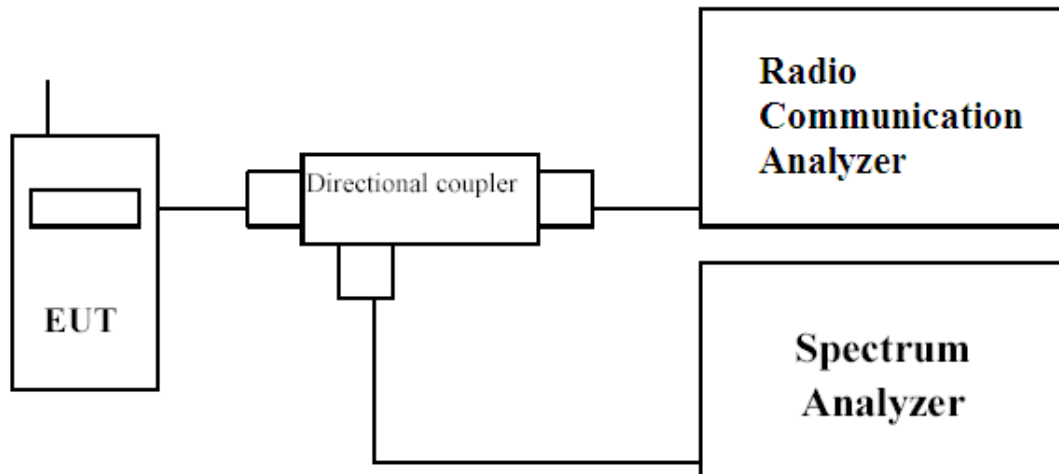
LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum ERP/EIRP (W)	Maximum ERP/EIRP Limit (W)
2	1.4M	QPSK	22.78	0.190	3.5	0.425	2
		16QAM	22.02	0.159	3.5	0.356	2
	3M	QPSK	22.90	0.195	3.5	0.437	2
		16QAM	21.87	0.154	3.5	0.344	2
	5M	QPSK	22.62	0.183	3.5	0.409	2
		16QAM	21.34	0.136	3.5	0.305	2
	10M	QPSK	22.53	0.179	3.5	0.401	2
		16QAM	21.92	0.156	3.5	0.348	2
	15M	QPSK	22.53	0.179	3.5	0.401	2
		16QAM	21.73	0.149	3.5	0.333	2
	20M	QPSK	22.61	0.182	3.5	0.408	2
		16QAM	21.41	0.138	3.5	0.310	2
4	1.4M	QPSK	22.08	0.161	3.5	0.361	1
		16QAM	21.05	0.127	3.5	0.285	1
	3M	QPSK	22.13	0.163	3.5	0.366	1
		16QAM	20.79	0.120	3.5	0.269	1
	5M	QPSK	21.96	0.157	3.5	0.352	1
		16QAM	21.14	0.130	3.5	0.291	1
	10M	QPSK	22.09	0.162	3.5	0.362	1
		16QAM	21.14	0.130	3.5	0.291	1
	15M	QPSK	22.00	0.158	3.5	0.355	1
		16QAM	20.81	0.121	3.5	0.270	1
	20M	QPSK	22.04	0.160	3.5	0.358	1
		16QAM	20.91	0.123	3.5	0.276	1

4. Occupied Bandwidth

4.1. Test Secification

According to FCC Part 2.1049, 24.238, 27.53

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.

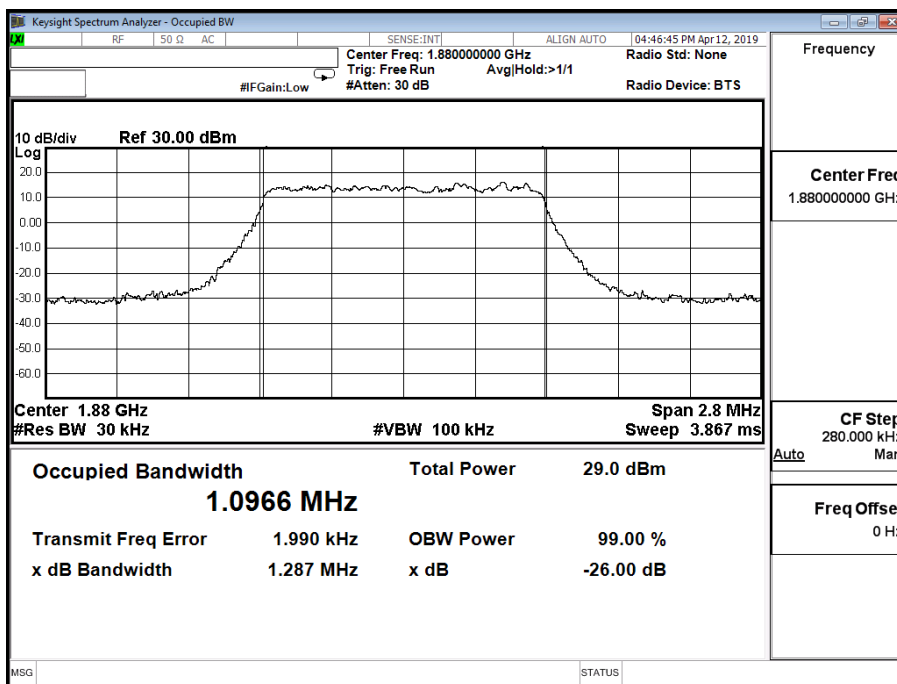
4.4. Test Result of Occupied Bandwidth

Product	Triple-SIM 4G/LTE Router with WWAN Failover
Test Mode	Occupied Bandwidth
Test Site	CTR

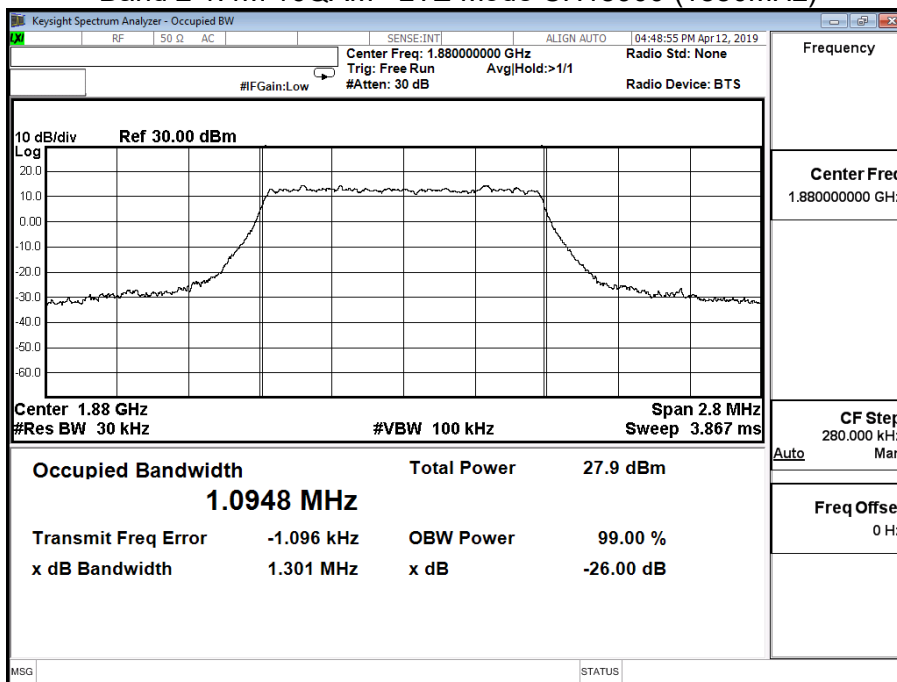
Test Mode	Channel	TX Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB bandwidth (MHz)	Result
Band 2 1.4M QPSK	18900	1880	1.0966	1.287	Pass
Band 2 1.4M 16QAM	18900	1880	1.0948	1.301	Pass
Band 2 3M QPSK	18900	1880	2.7326	3.067	Pass
Band 2 3M 16QAM	18900	1880	2.7186	3.046	Pass
Band 2 5M QPSK	18900	1880	4.5051	4.996	Pass
Band 2 5M 16QAM	18900	1880	4.4847	4.963	Pass
Band 2 10M QPSK	18900	1880	9.0309	10.05	Pass
Band 2 10M 16QAM	18900	1880	9.0329	10.04	Pass
Band 2 15M QPSK	18900	1880	13.441	14.73	Pass
Band 2 15M 16QAM	18900	1880	13.421	14.68	Pass
Band 2 20M QPSK	18900	1880	18.501	20.59	Pass
Band 2 20M 16QAM	18900	1880	18.441	20.28	Pass
Band 4 1.4M QPSK	20175	1732.5	1.0980	1.291	Pass
Band 4 1.4M 16QAM	20175	1732.5	1.0946	1.310	Pass
Band 4 3M QPSK	20175	1732.5	2.7354	3.080	Pass
Band 4 3M 16QAM	20175	1732.5	2.7195	3.041	Pass
Band 4 5M QPSK	20175	1732.5	4.5073	4.994	Pass
Band 4 5M 16QAM	20175	1732.5	4.4804	4.968	Pass
Band 4 10M QPSK	20175	1732.5	9.0410	10.08	Pass
Band 4 10M 16QAM	20175	1732.5	9.0254	10.01	Pass
Band 4 15M QPSK	20175	1732.5	13.445	14.69	Pass
Band 4 15M 16QAM	20175	1732.5	13.440	14.65	Pass
Band 4 20M QPSK	20175	1732.5	18.514	20.65	Pass
Band 4 20M 16QAM	20175	1732.5	18.437	20.34	Pass

Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 2 1.4M		

Band 2 1.4M QPSK - LTE Mode CH18900 (1880MHz)

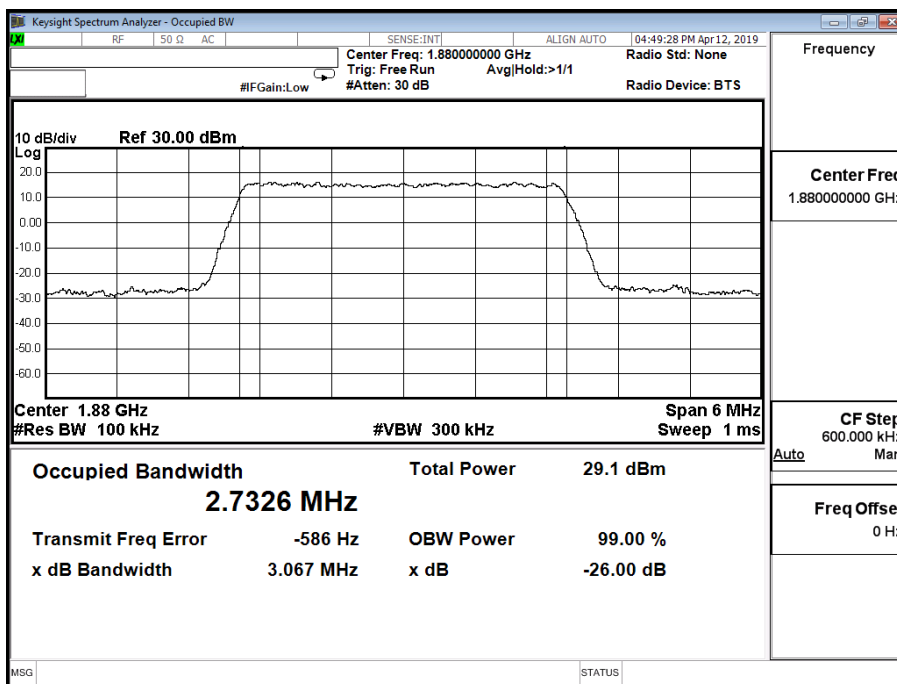


Band 2 1.4M 16QAM - LTE Mode CH18900 (1880MHz)

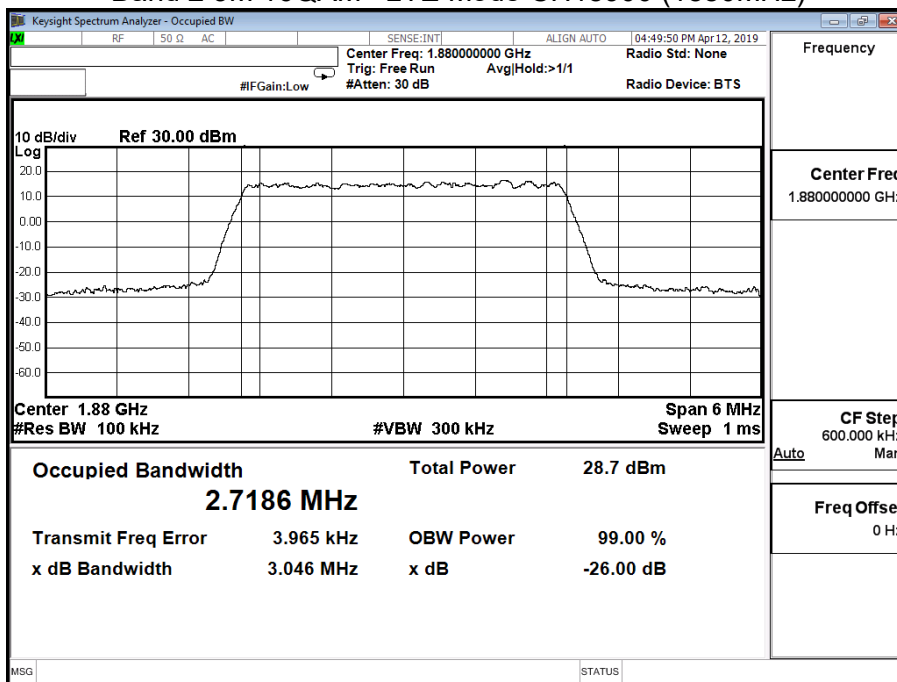


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 2 3M		

Band 2 3M QPSK - LTE Mode CH18900 (1880MHz)

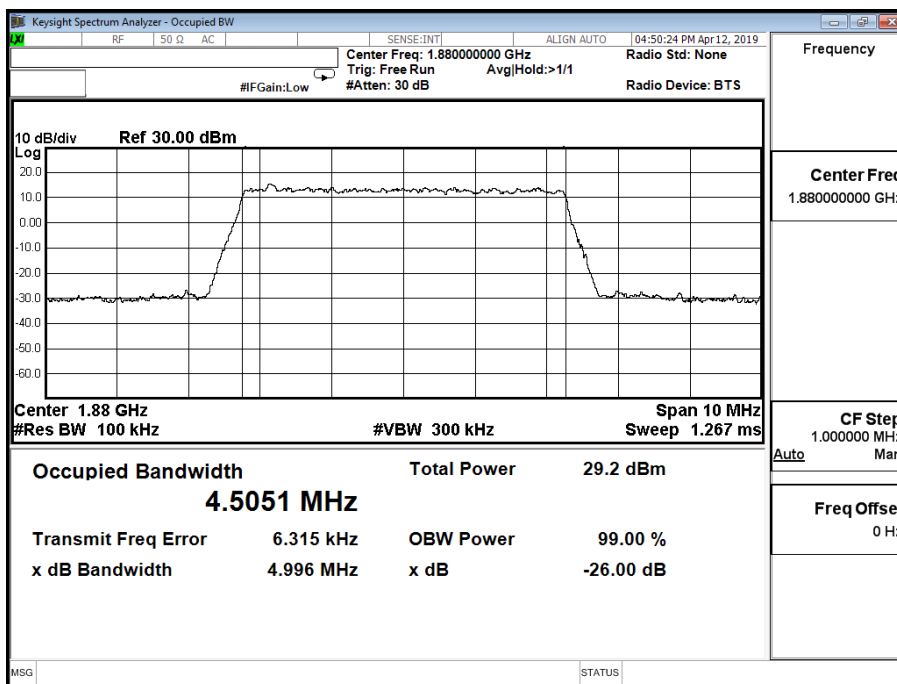


Band 2 3M 16QAM - LTE Mode CH18900 (1880MHz)

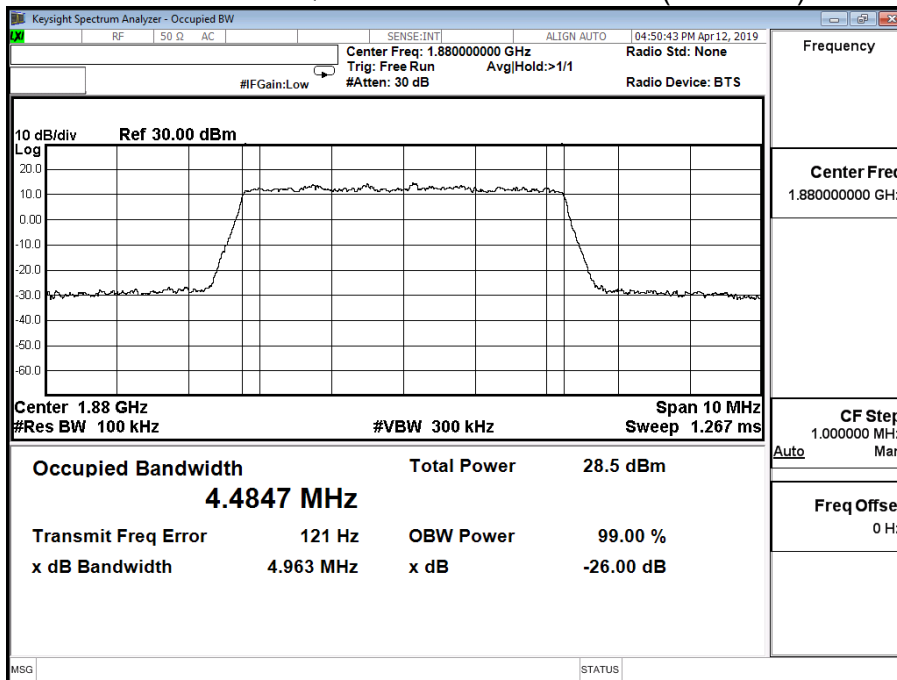


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 2 5M		

Band 2 5M QPSK - LTE Mode CH18900 (1880MHz)

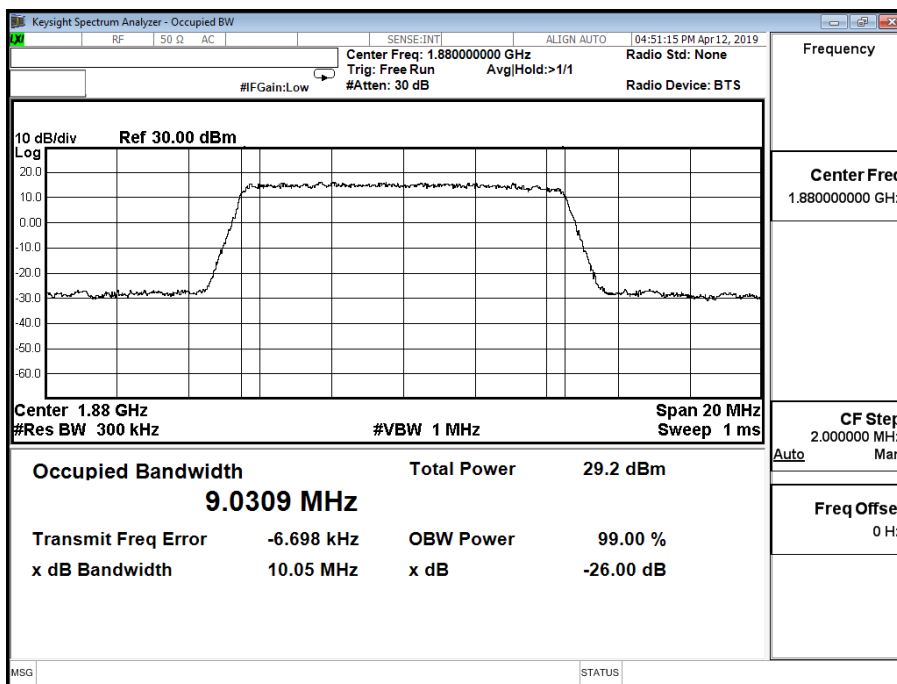


Band 2 5M 16QAM - LTE Mode CH18900 (1880MHz)

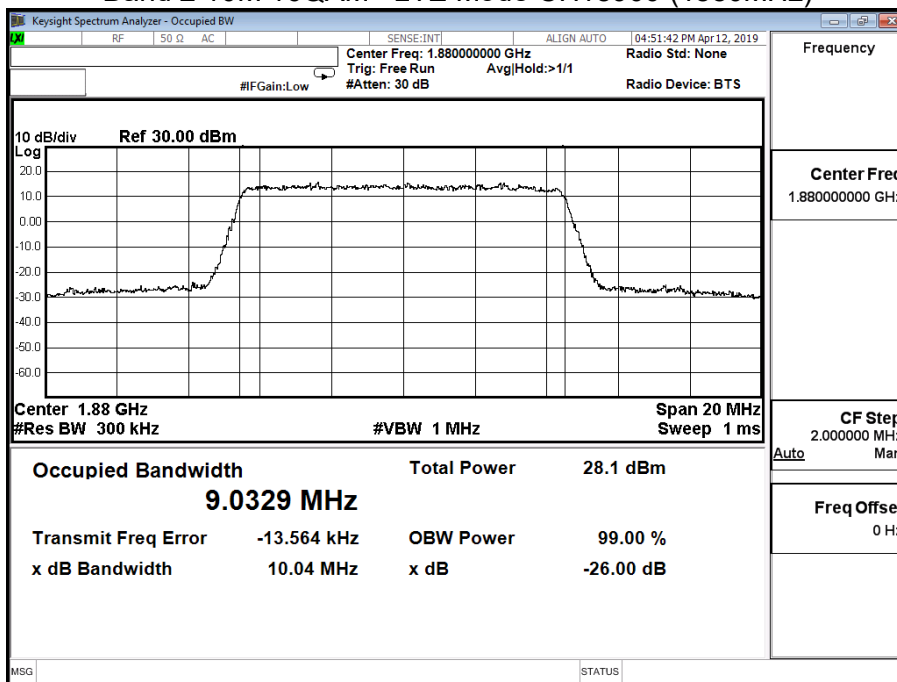


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 2 10M		

Band 2 10M QPSK - LTE Mode CH18900 (1880MHz)

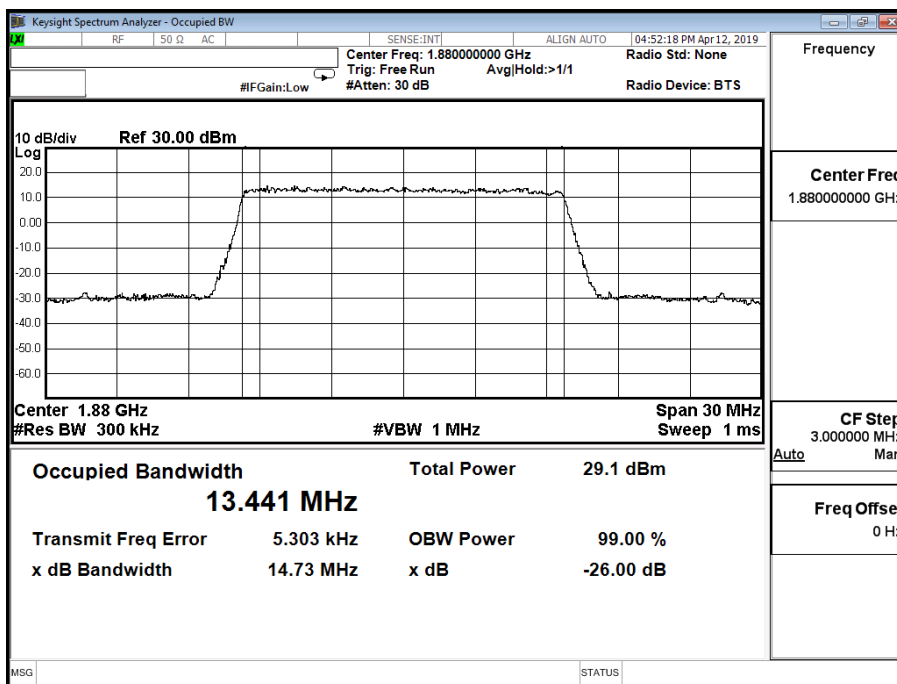


Band 2 10M 16QAM - LTE Mode CH18900 (1880MHz)

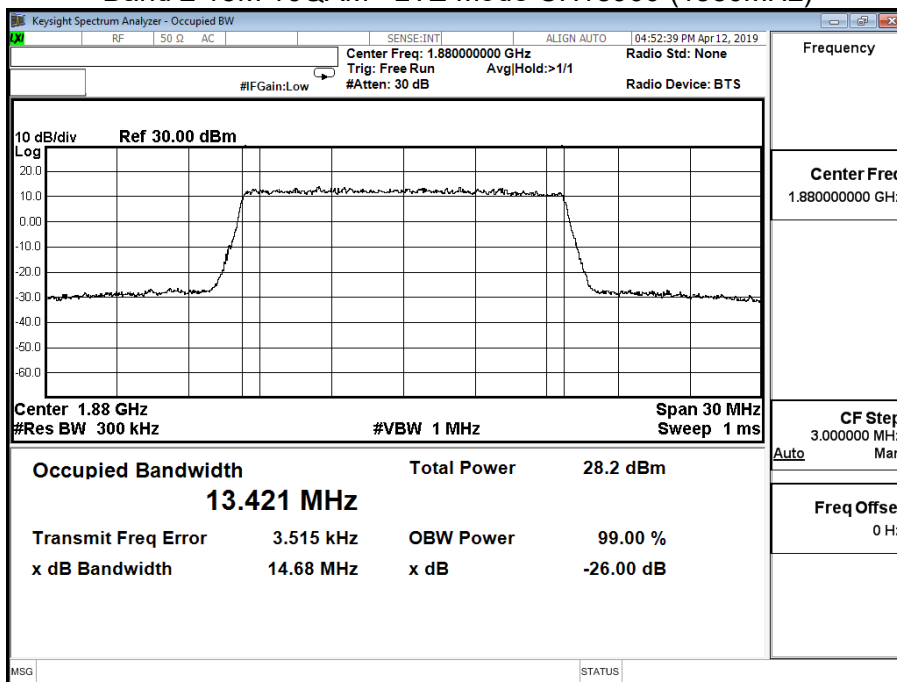


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 2 15M		

Band 2 15M QPSK - LTE Mode CH18900 (1880MHz)

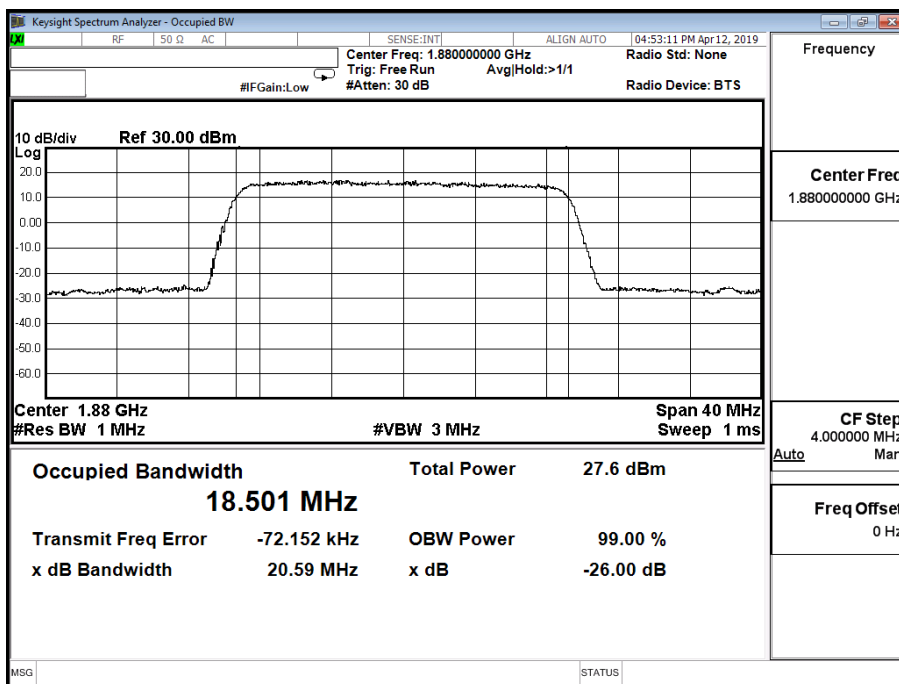


Band 2 15M 16QAM - LTE Mode CH18900 (1880MHz)

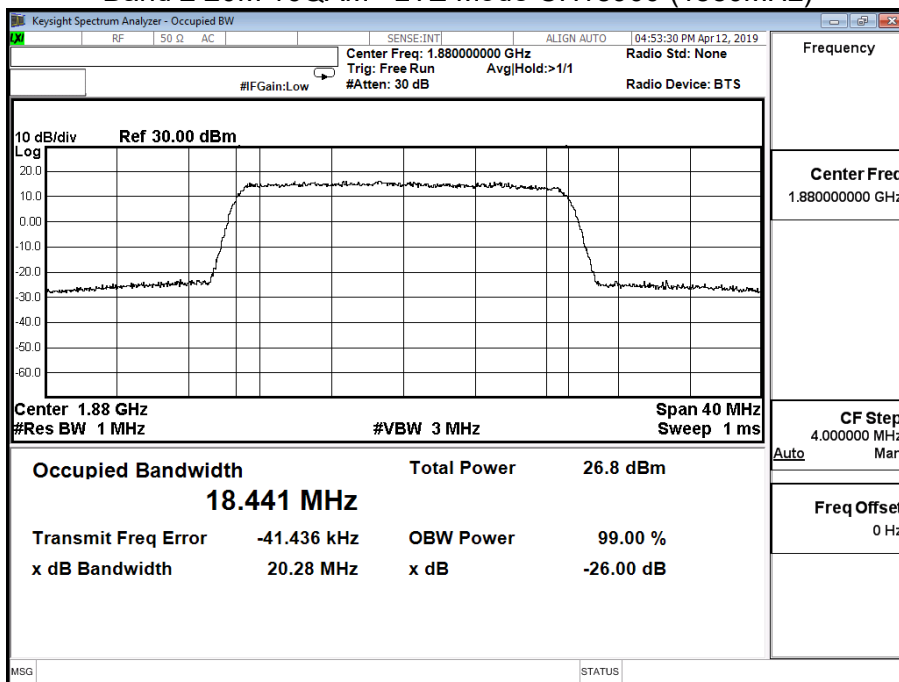


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 2 20M		

Band 2 20M QPSK - LTE Mode CH18900 (1880MHz)

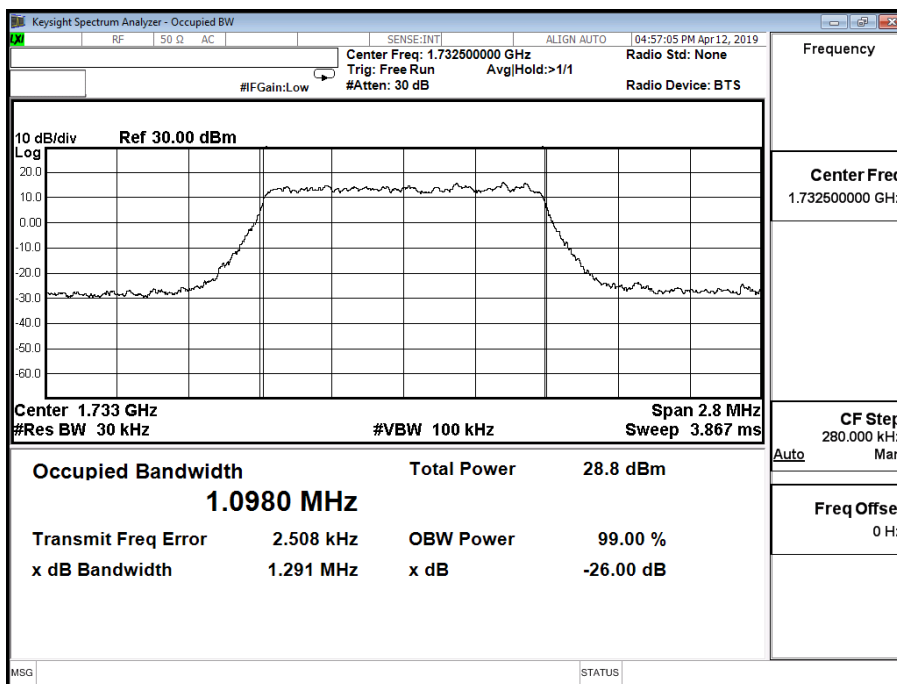


Band 2 20M 16QAM - LTE Mode CH18900 (1880MHz)

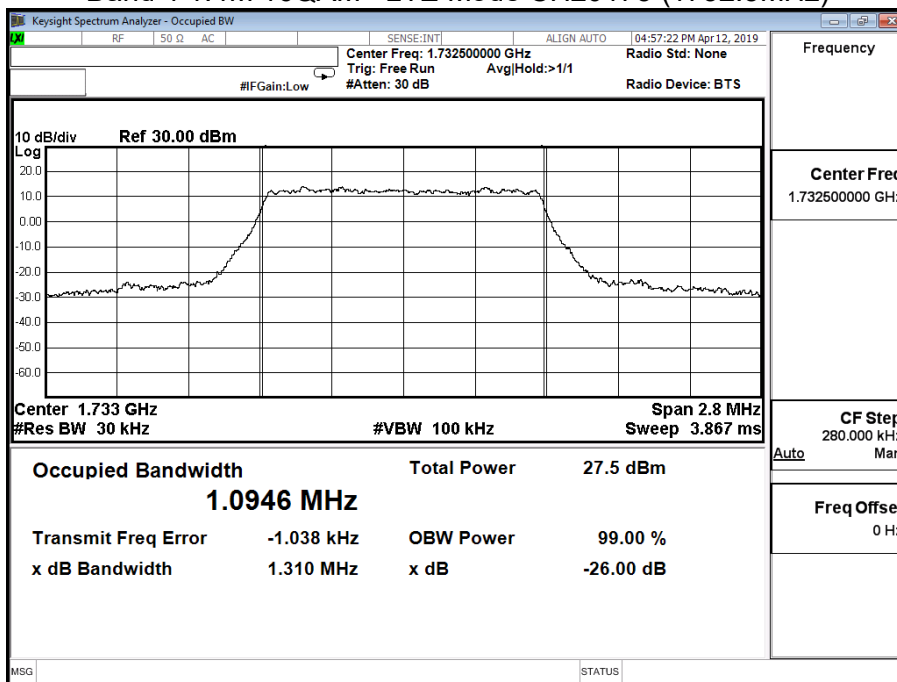


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 4 1.4M		

Band 4 1.4M QPSK - LTE Mode CH 20175 (1732.5MHz)

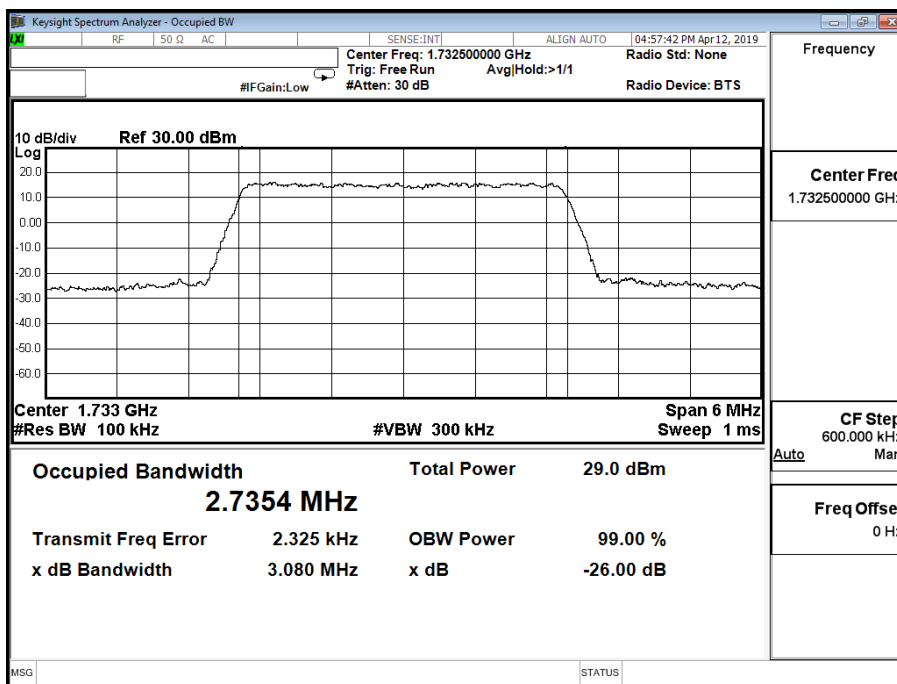


Band 4 1.4M 16QAM - LTE Mode CH20175 (1732.5MHz)

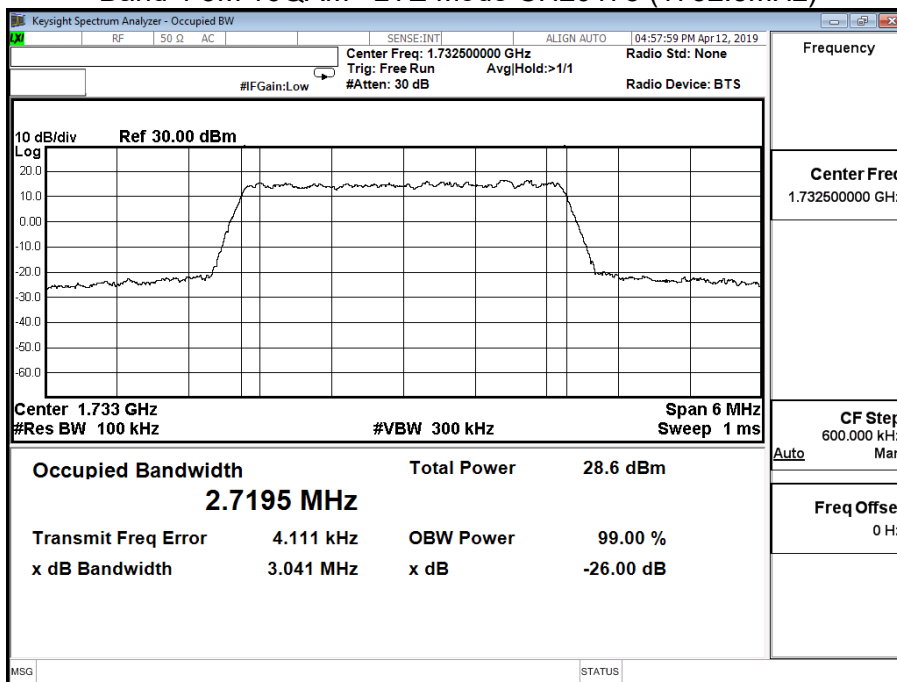


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 4 3M		

Band 4 3M QPSK - LTE Mode CH20175 (1732.5MHz)

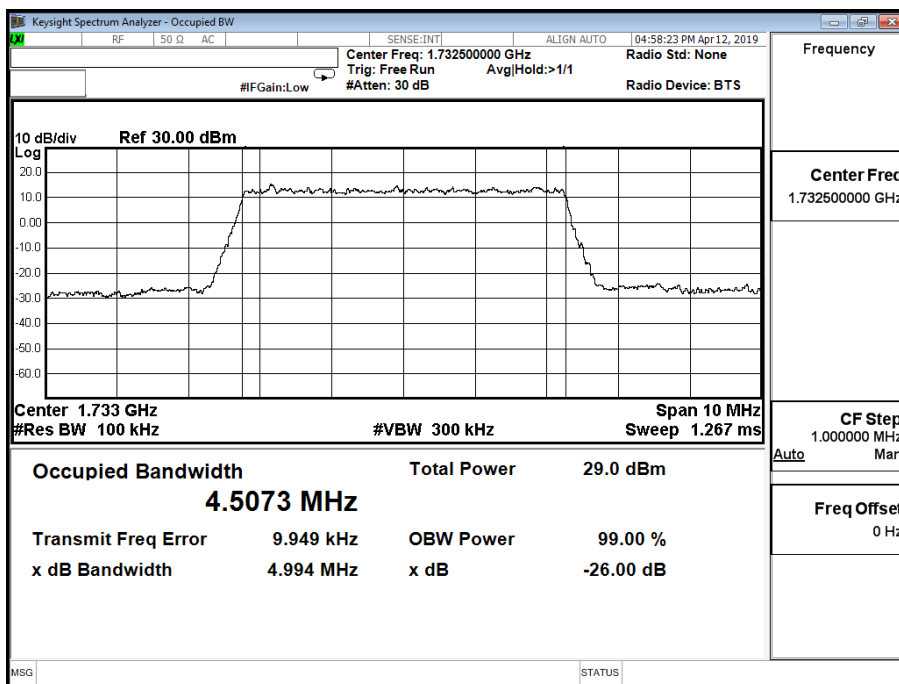


Band 4 3M 16QAM - LTE Mode CH20175 (1732.5MHz)

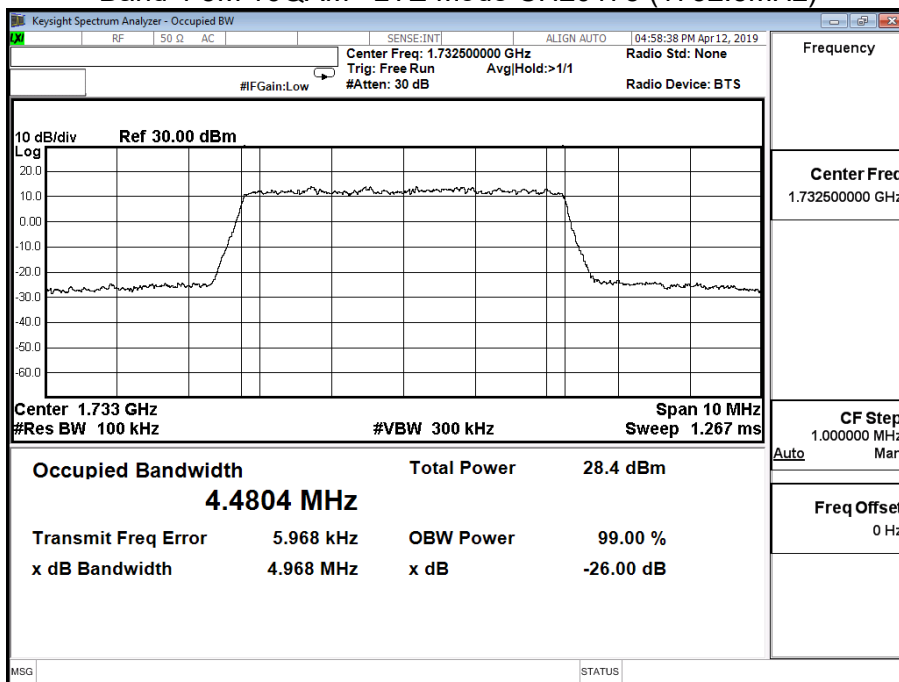


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 4 5M		

Band 4 5M QPSK - LTE Mode CH20175 (1732.5MHz)

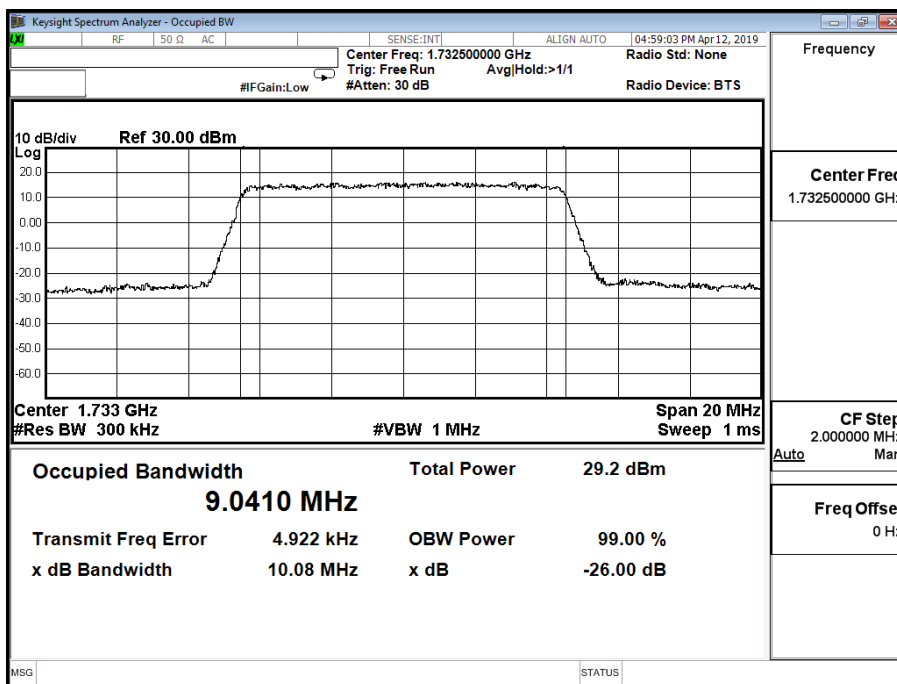


Band 4 5M 16QAM - LTE Mode CH20175 (1732.5MHz)

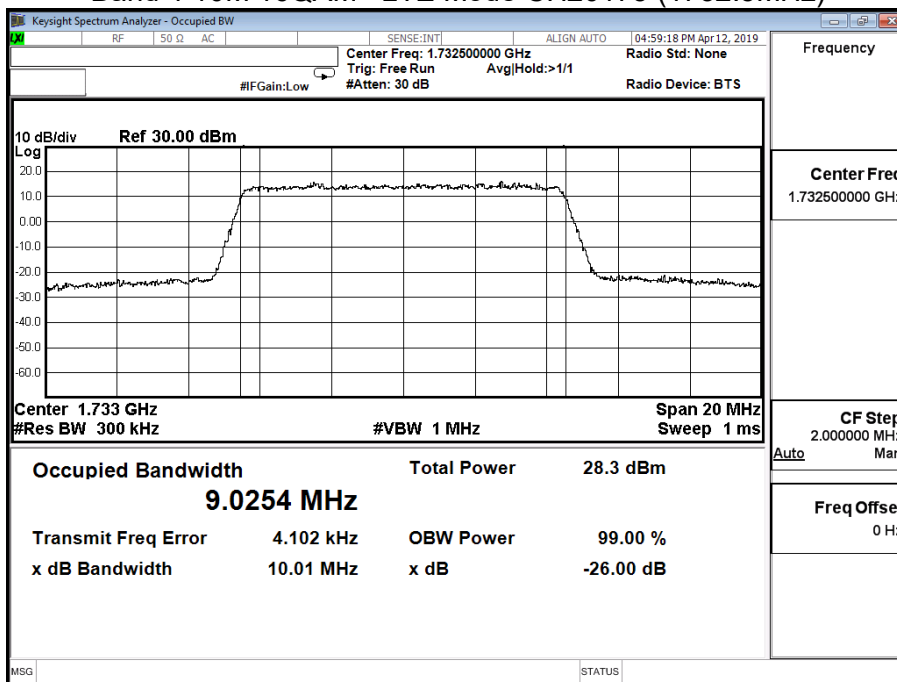


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 4 10M		

Band 4 10M QPSK - LTE Mode CH20175 (1732.5MHz)

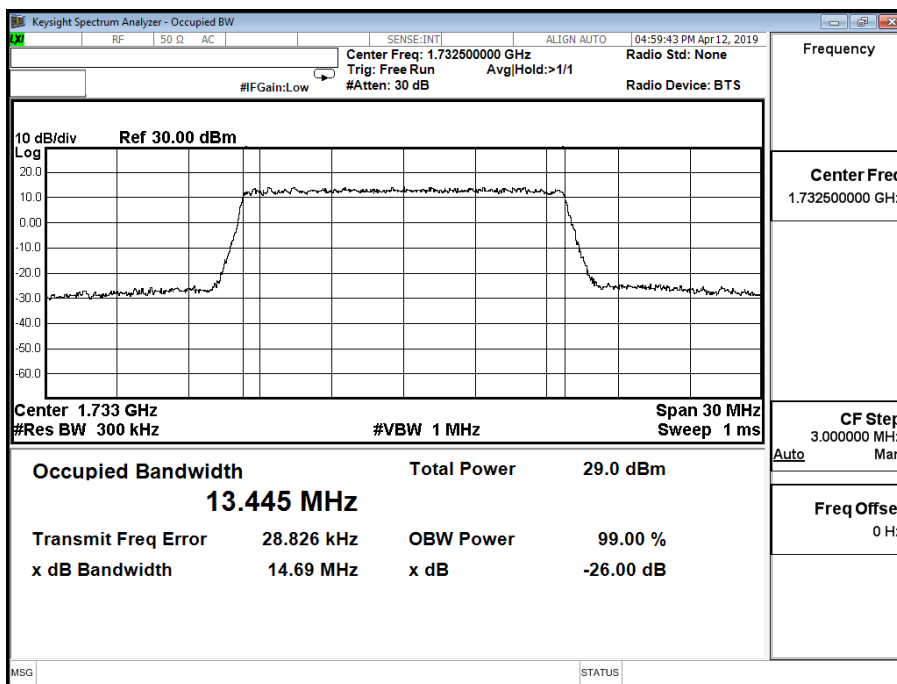


Band 4 10M 16QAM - LTE Mode CH20175 (1732.5MHz)

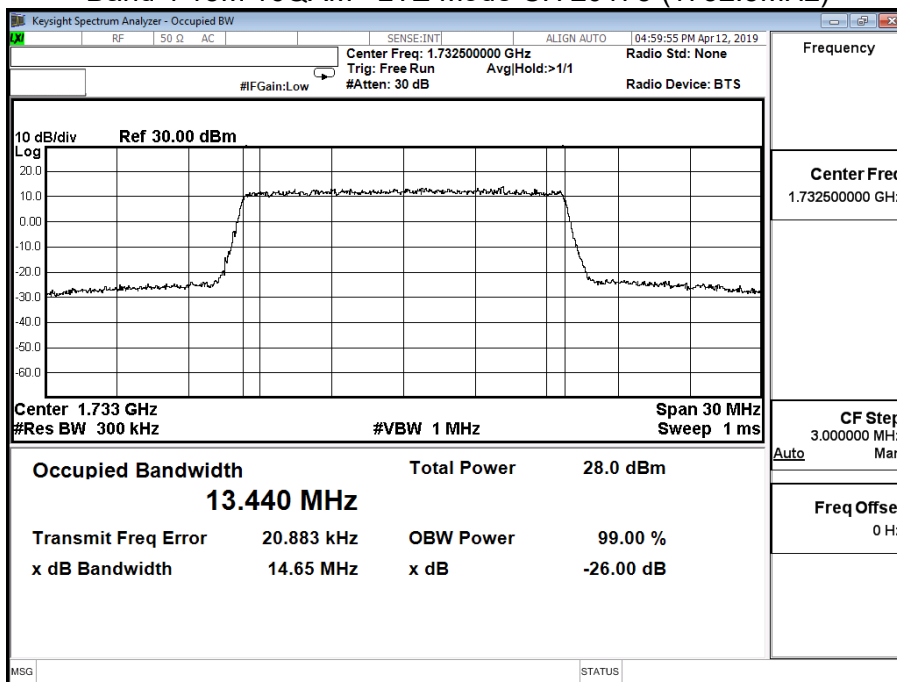


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 4 15M		

Band 4 15M QPSK - LTE Mode CH20175 (1732.5MHz)

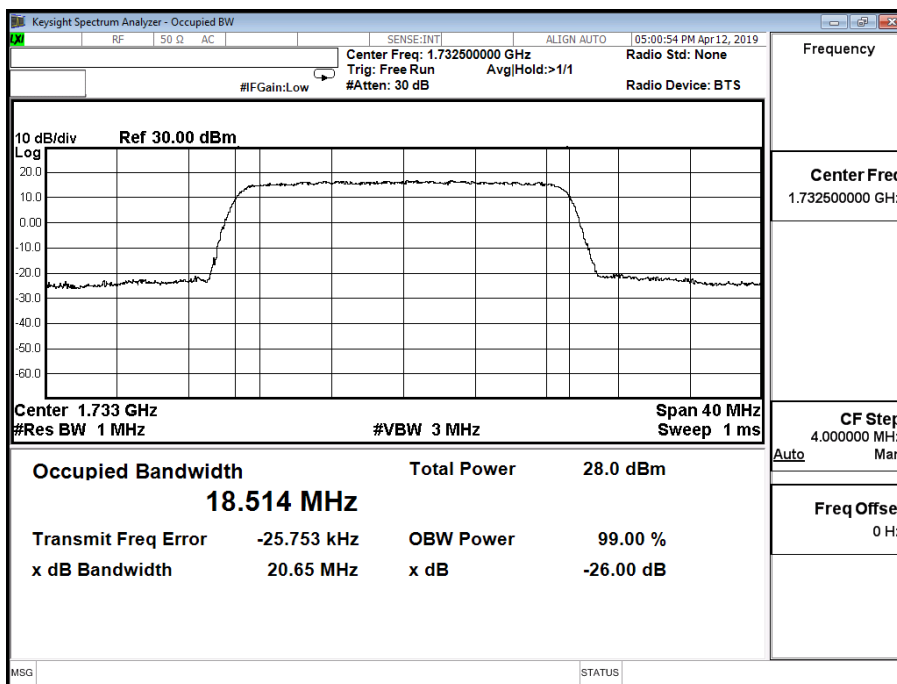


Band 4 15M 16QAM - LTE Mode CH 20175 (1732.5MHz)

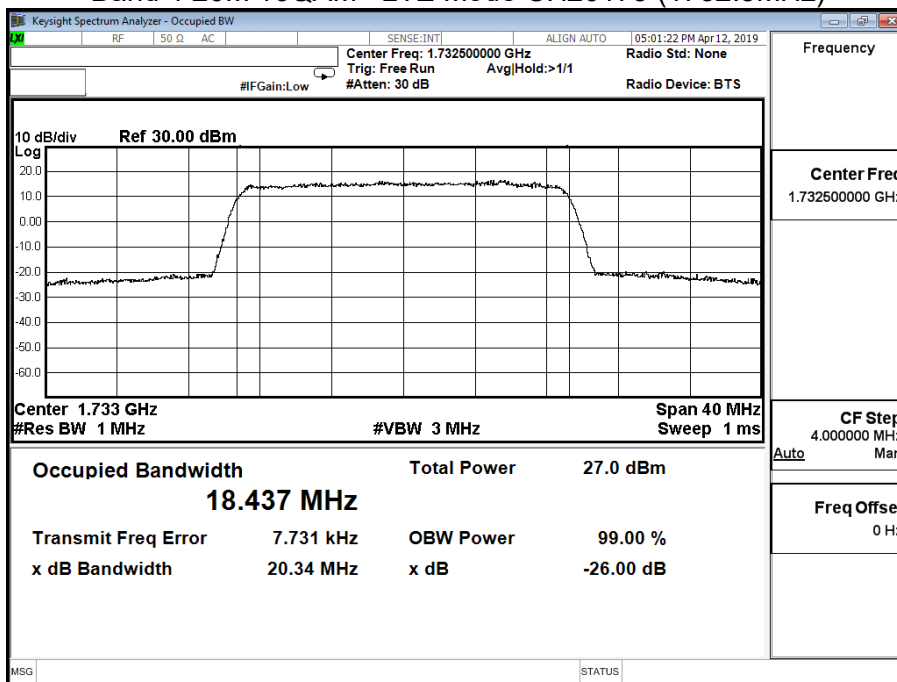


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Occupied Bandwidth		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Band 4 20M		

Band 4 20M QPSK - LTE Mode CH20175 (1732.5MHz)



Band 4 20M 16QAM - LTE Mode CH20175 (1732.5MHz)

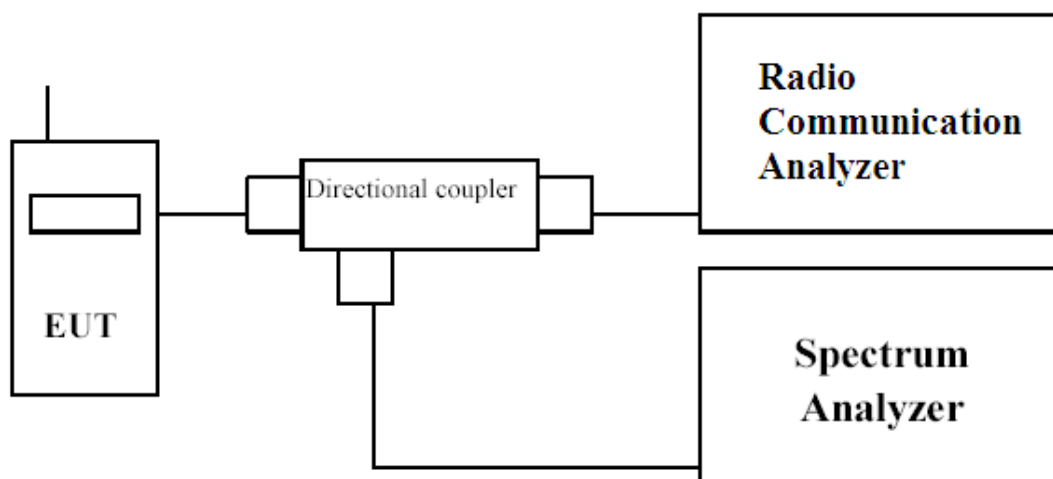


5. Spurious Emission At Antenna Terminals (+/-1MHz)

5.1. Test Specification

According to Part 2.1051, 24.238, 27.53

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

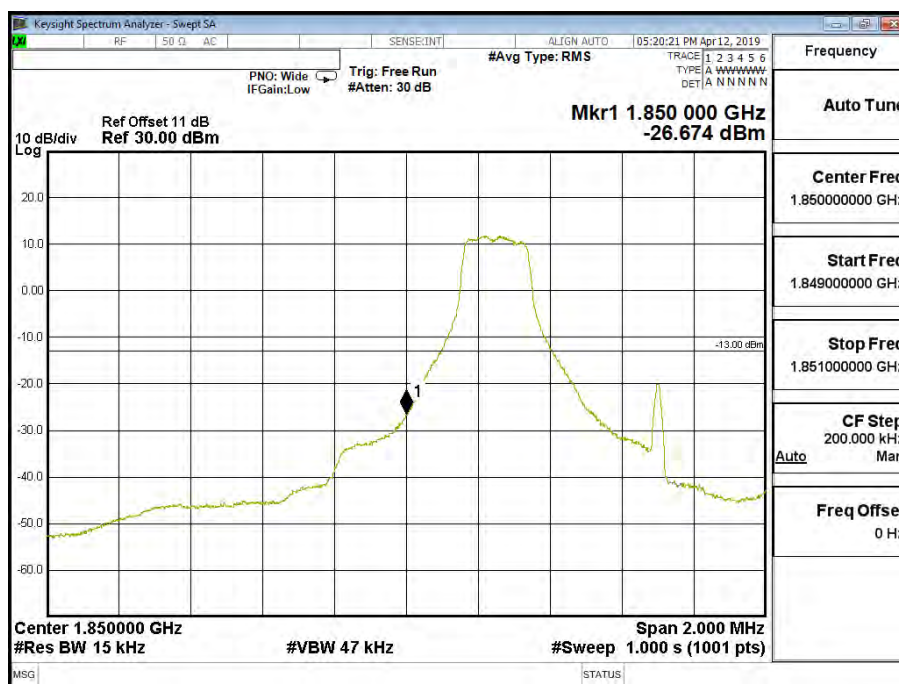
In accordance with Part 24.238, 27.53 at least 1% of the emission bandwidth was used for the resolution and video bandwidths up to 1MHz away from the Block Edge. At greater than 1MHz, the resolution and video bandwidth were increased to 1MHz/3MHz.

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

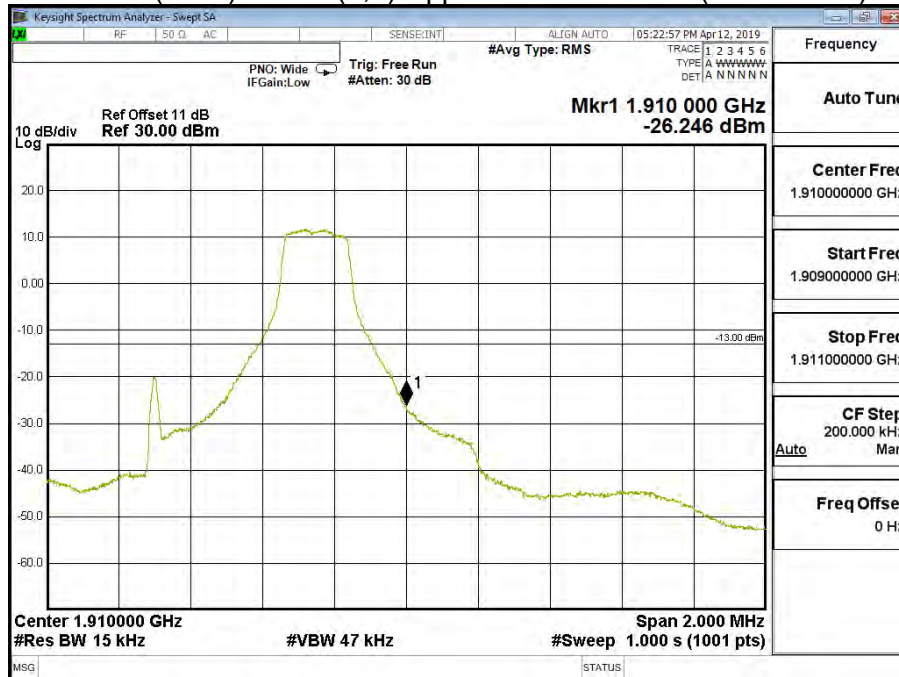
5.5. Test Result of Spurious Emission At Antenna Terminals (+/-1MHz)

Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 2 (1.4M))		

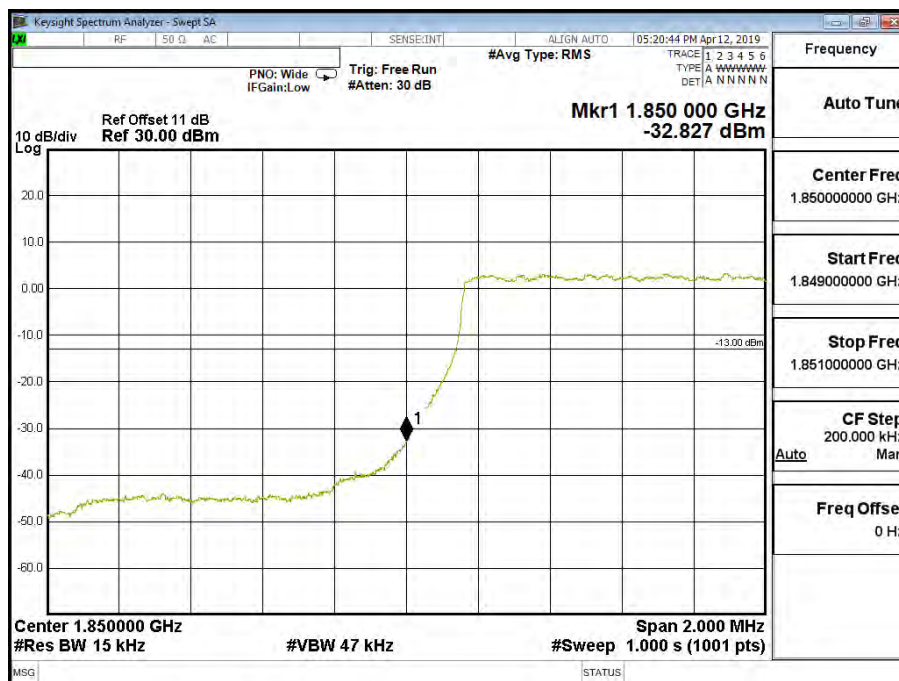
Band 2 (1.4M) QPSK (1,0) Lower Channel 18607 (1850.7MHz)



Band 2 (1.4M) QPSK (1,5) Upper Channel 19193 (1909.3MHz)



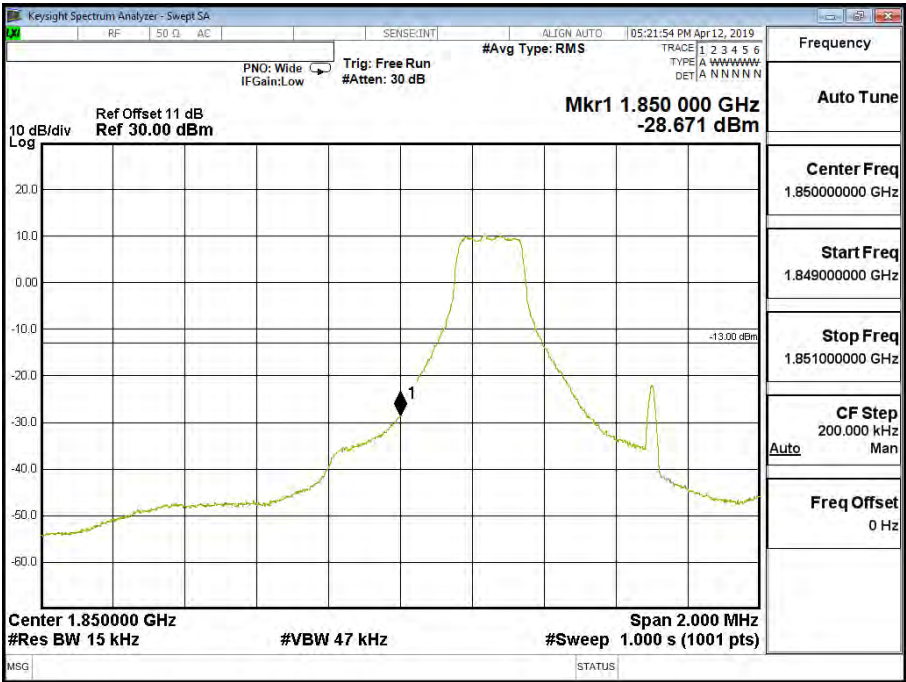
Band 2 (1.4M) QPSK (6,0) Lower Channel 18607 (1850.7MHz)



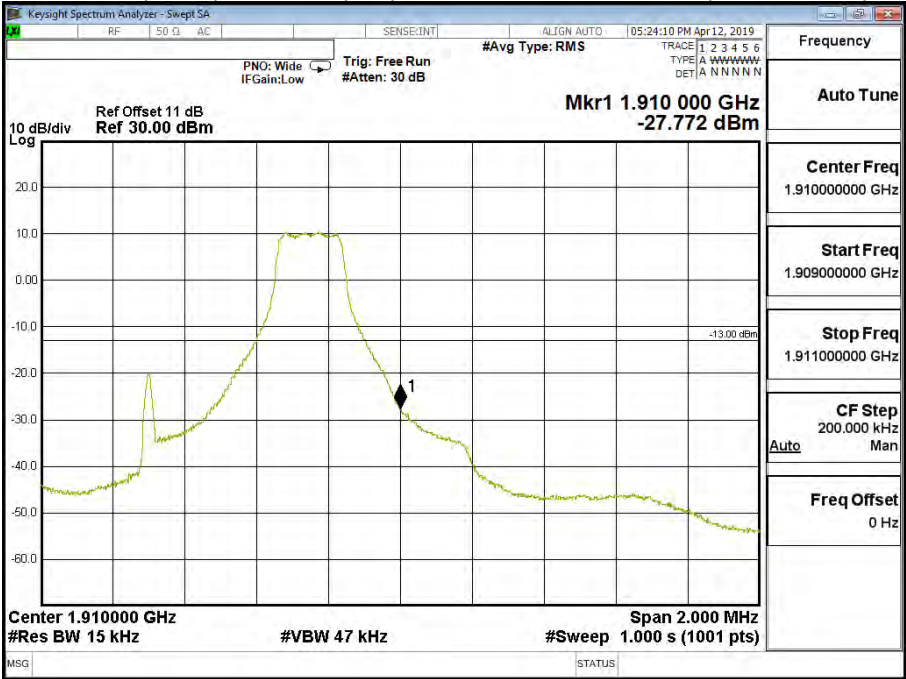
Band 2 (1.4M) QPSK (6,0) Upper Channel 19193 (1909.3MHz)



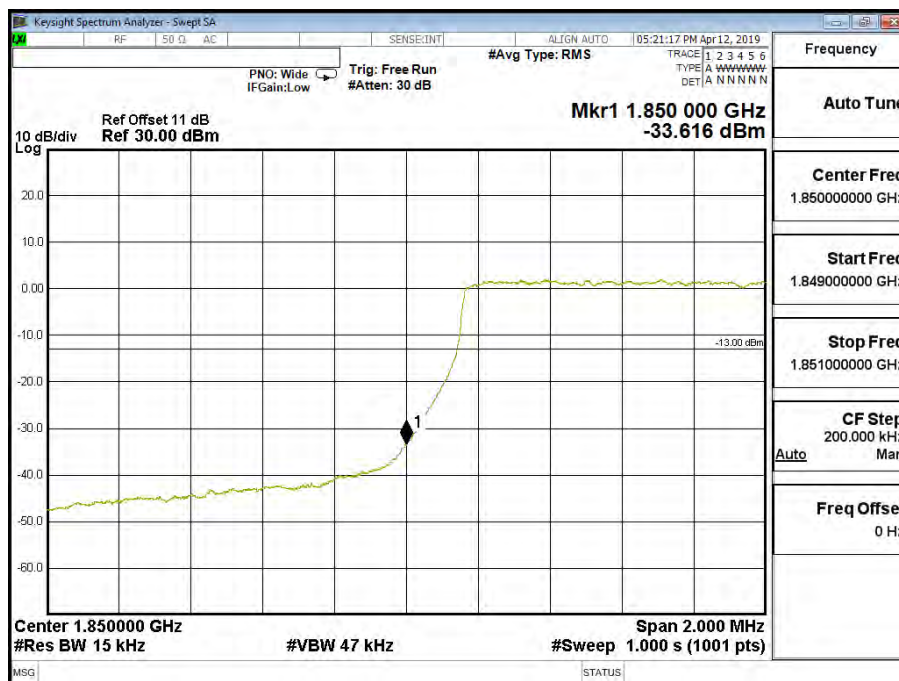
Band 2 (1.4M) 16QAM (1,0) Lower Channel 18607 (1850.7MHz)



Band 2 (1.4M) 16QAM (1,5) Upper Channel 19193 (1909.3MHz)



Band 2 (1.4M) 16QAM (6,0) Lower Channel 18607 (1850.7MHz)



Band 2 (1.4M) 16QAM (6,0) Upper Channel 19193 (1909.3MHz)

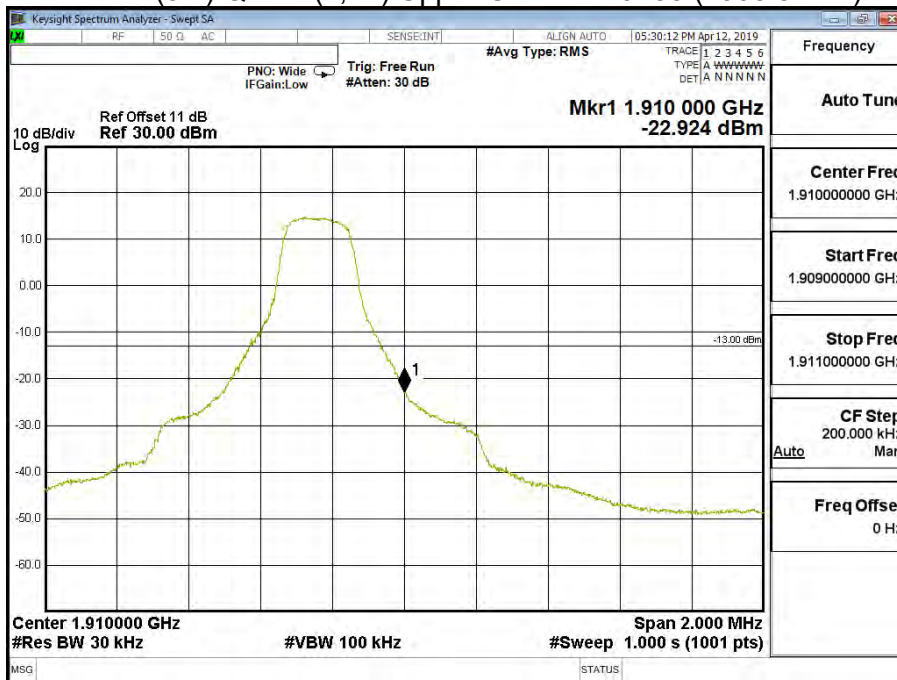


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 2 (3M))		

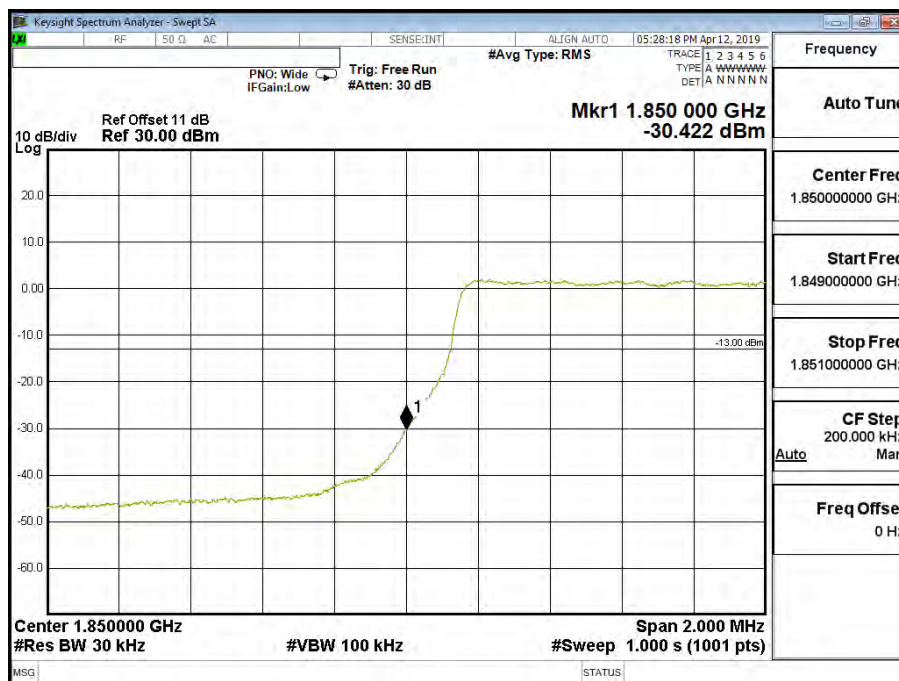
Band 2 (3M) QPSK (1,0) Lower Channel 18615 (1851.5MHz)



Band 2 (3M) QPSK (1,14) Upper Channel 19185 (1908.5MHz)



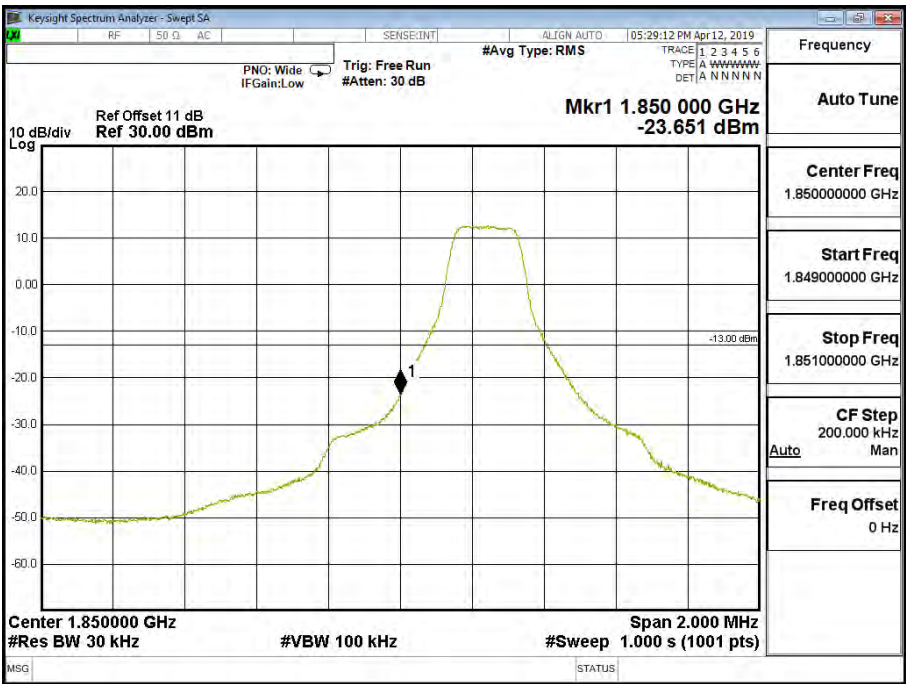
Band 2 (3M) QPSK (15,0) Lower Channel 18615 (1851.5MHz)



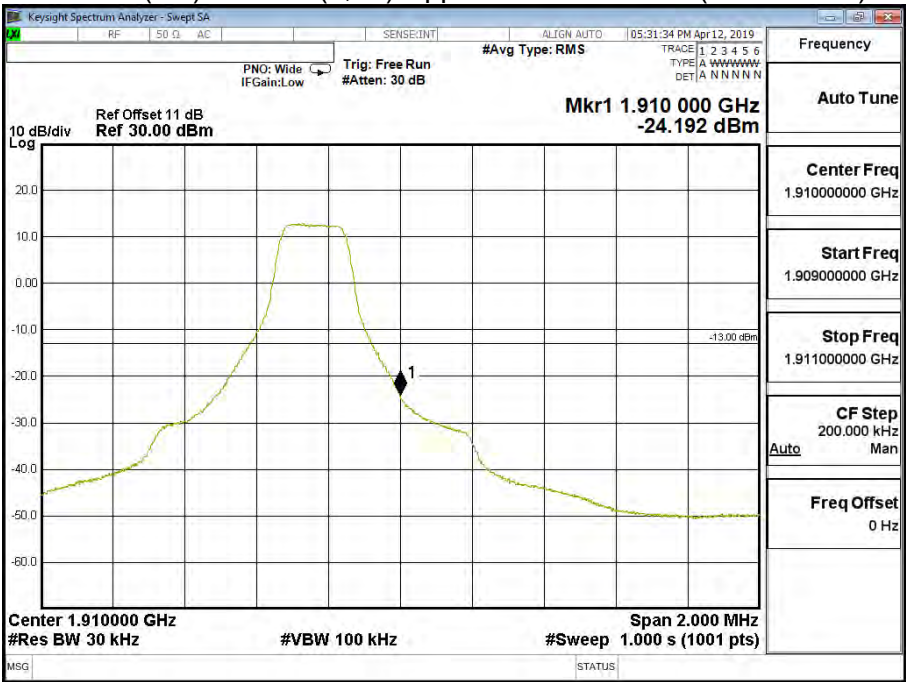
Band 2 (3M) QPSK (15,0) Upper Channel 19185 (1908.5MHz)



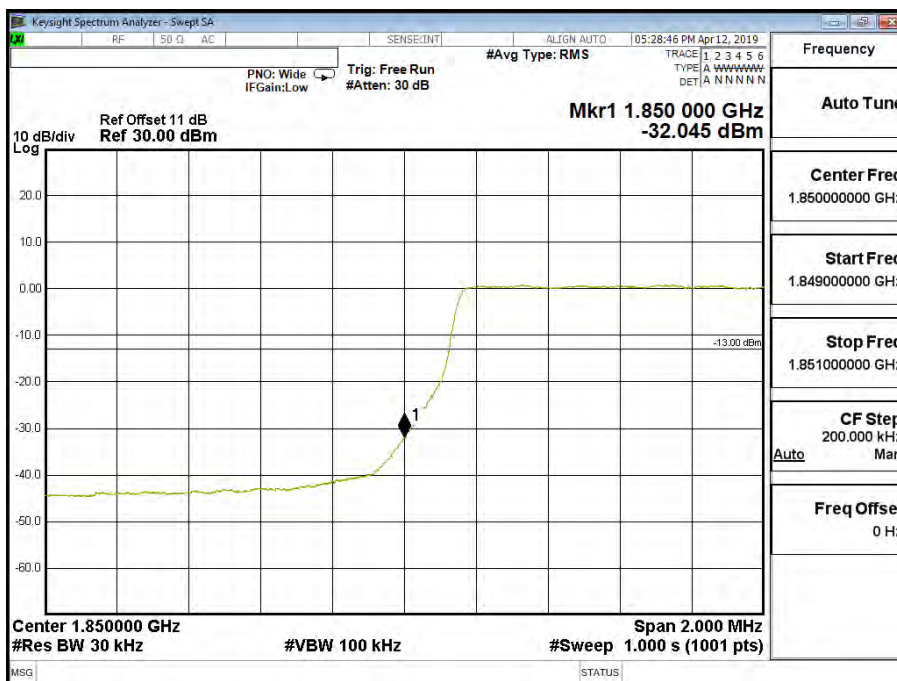
Band 2 (3M) 16QAM (1,0) Lower Channel 18615 (1851.5MHz)



Band 2 (3M) 16QAM (1,14) Upper Channel 19185 (1908.5MHz)



Band 2 (3M) 16QAM (15,0) Lower Channel 18615 (1851.5MHz)



Band 2 (3M) 16QAM (15,0) Upper Channel 19185 (1908.5MHz)

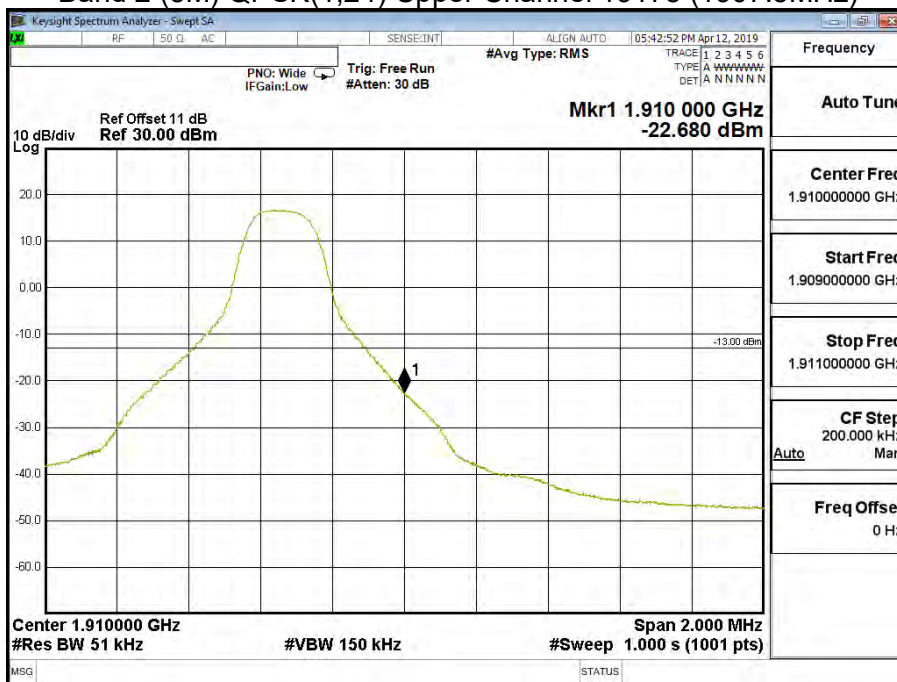


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 2 (5M))		

Band 2 (5M) QPSK(1,0) Lower Channel 18625 (1852.5MHz)



Band 2 (5M) QPSK(1,24) Upper Channel 19175 (1907.5MHz)



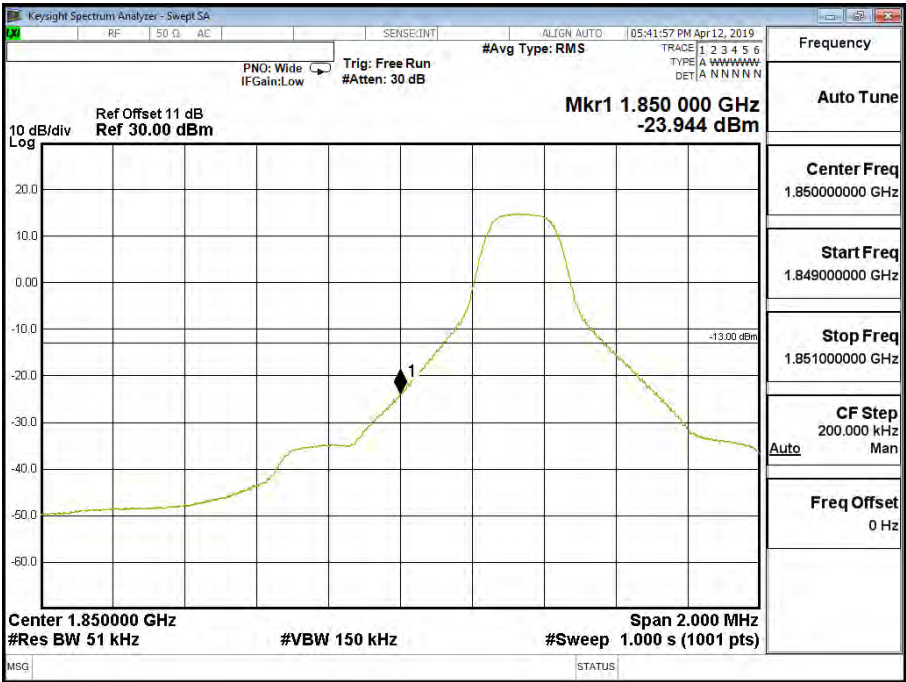
Band 2 (5M) QPSK(25,0) Lower Channel 18625 (1852.5MHz)



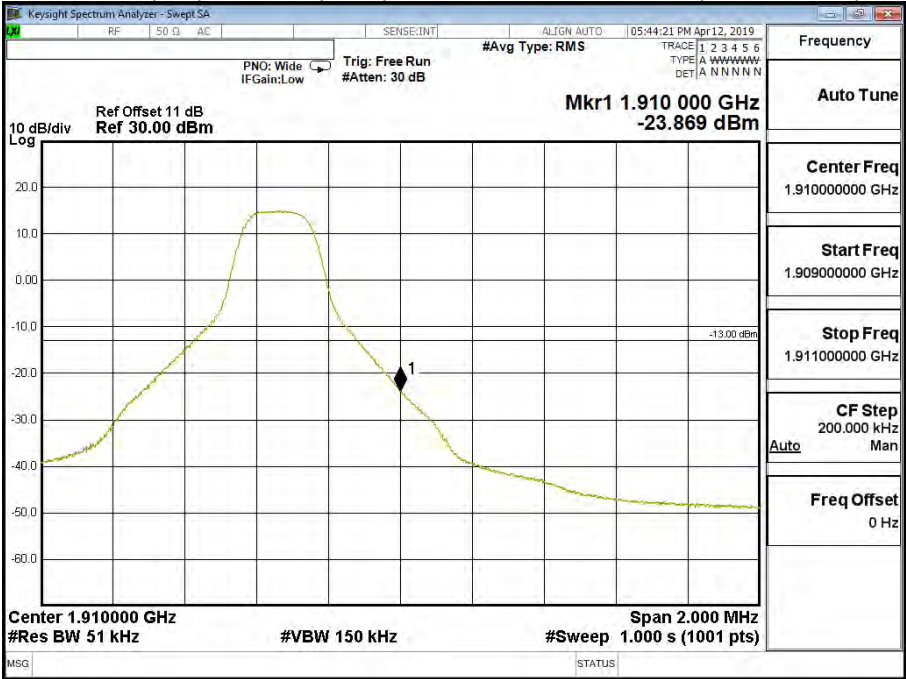
Band 2 (5M) QPSK(25,0) Upper Channel 19175 (1907.5MHz)



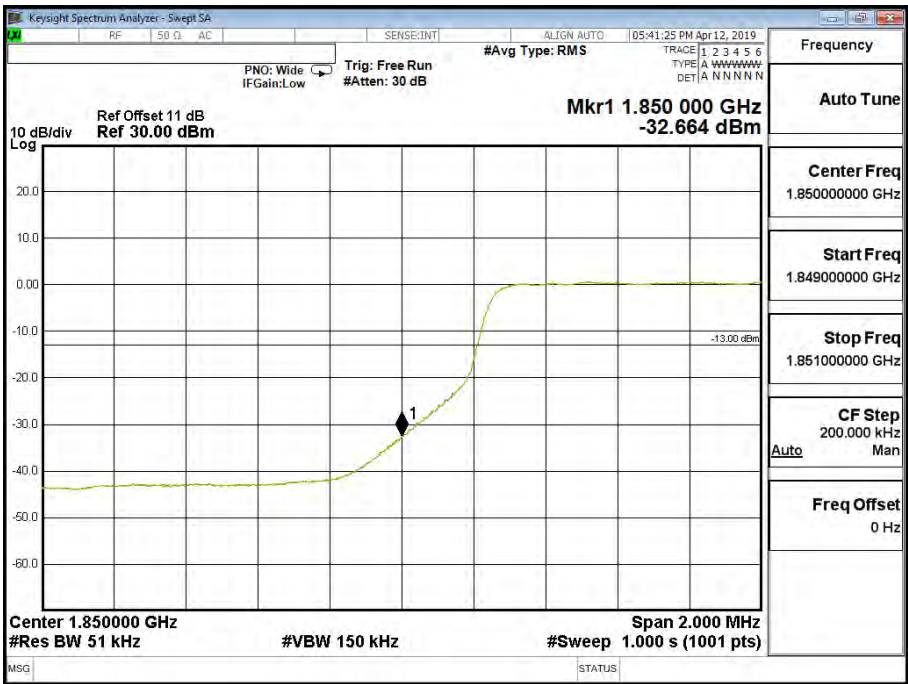
Band 2 (5M) 16QAM(1,0) Lower Channel 18625 (1852.5MHz)



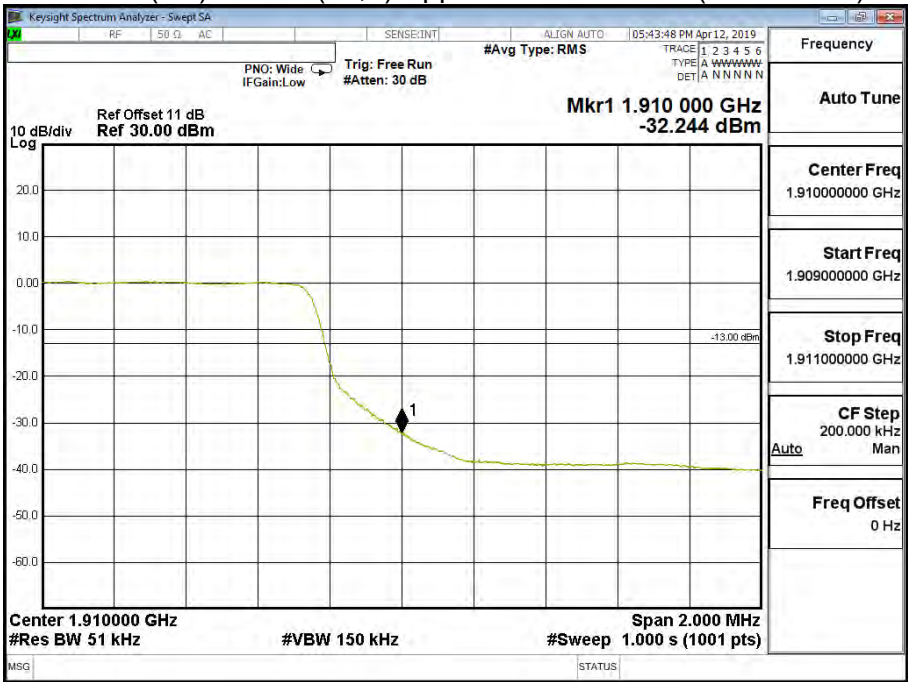
Band 2 (5M) 16QAM(1,24) Upper Channel 19175 (1907.5MHz)



Band 2 (5M) 16QAM(25,0) Lower Channel 18625 (1852.5MHz)



Band 2 (5M) 16QAM(25,0) Upper Channel 19175 (1907.5MHz)

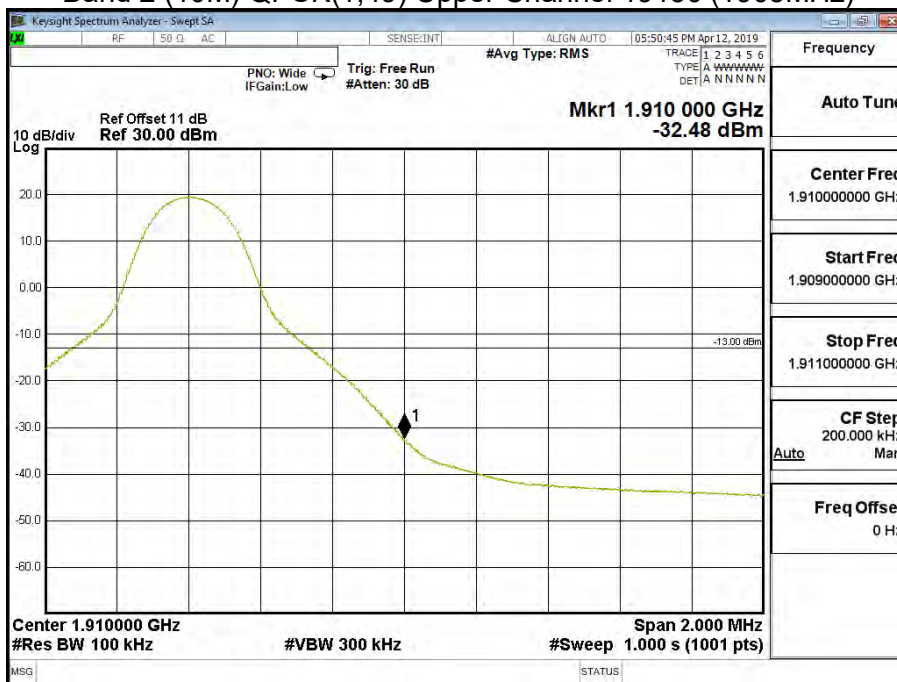


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 2 (10M))		

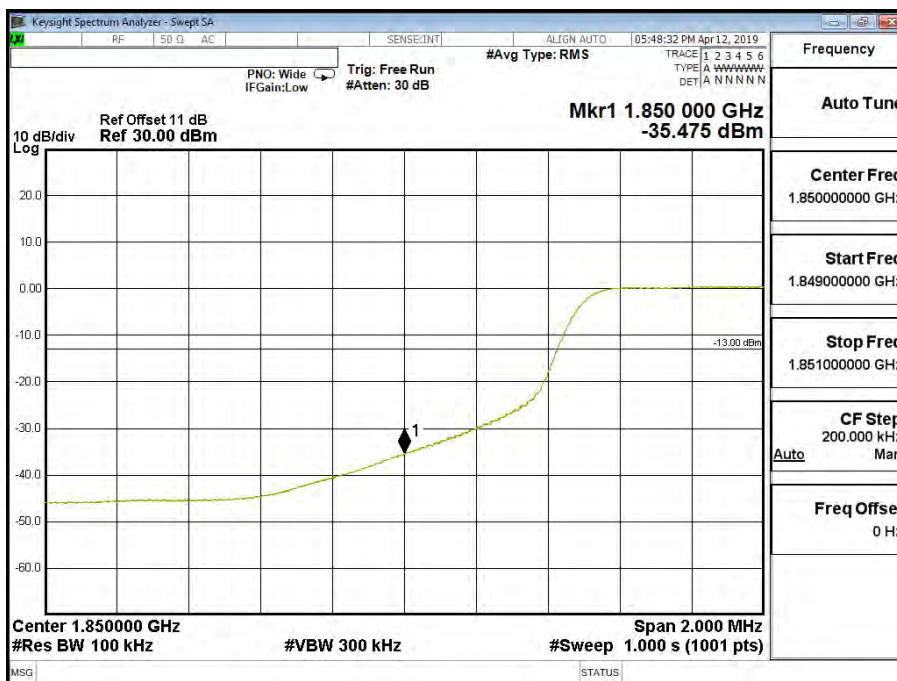
Band 2 (10M) QPSK(1,0) Lower Channel 18650 (1855MHz)



Band 2 (10M) QPSK(1,49) Upper Channel 19150 (1905MHz)



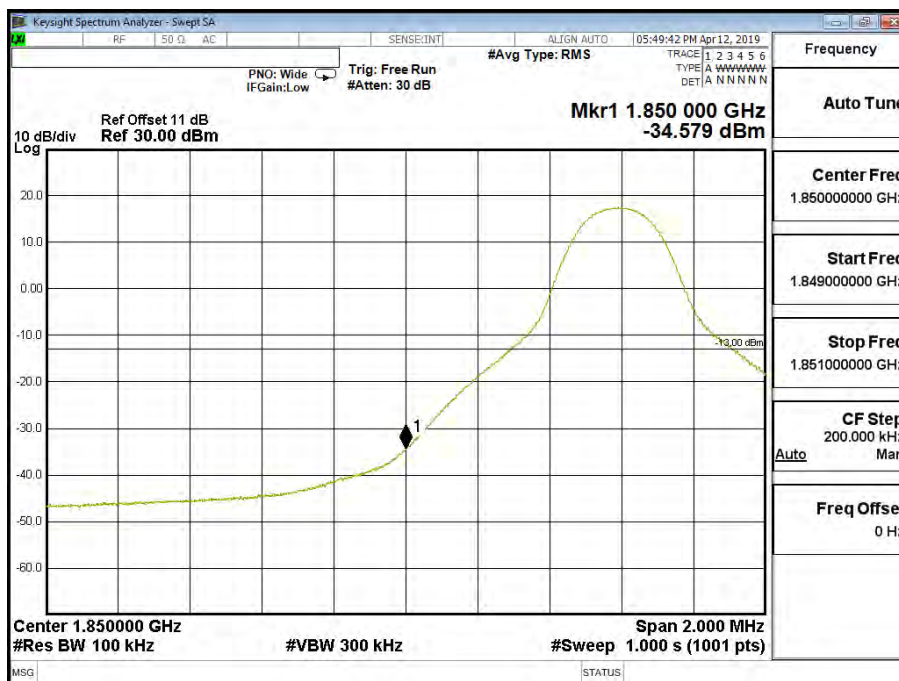
Band 2 (10M) QPSK(50,0) Lower Channel 18650 (1855MHz)



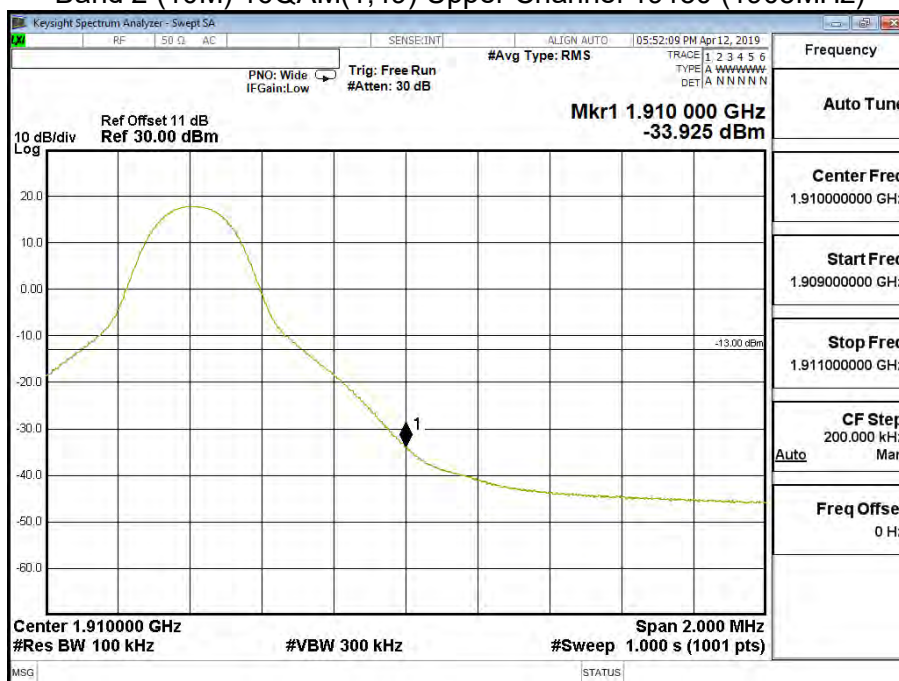
Band 2 (10M) QPSK(50,0) Upper Channel 19150 (1905MHz)



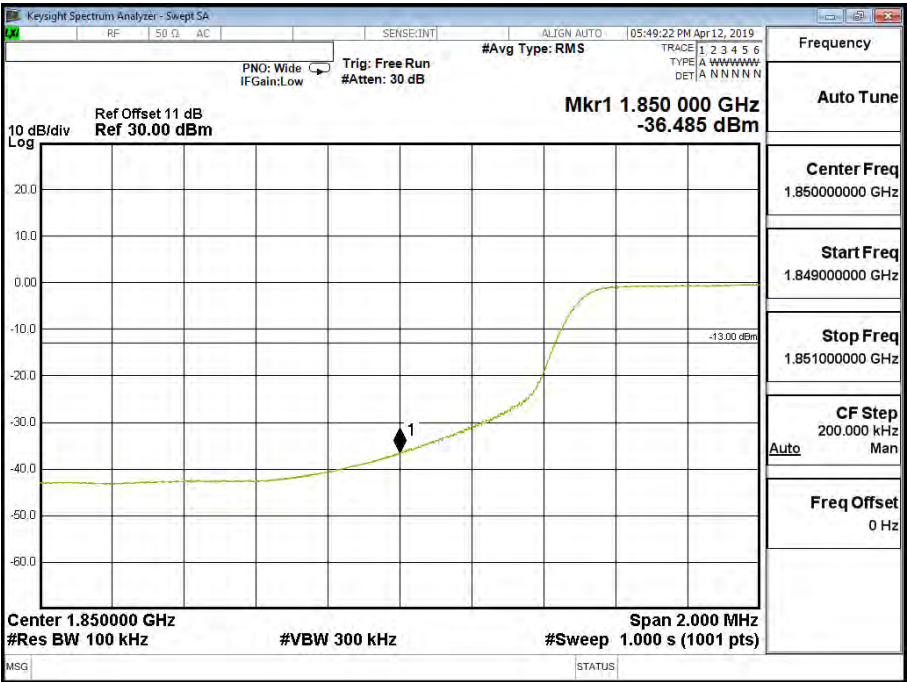
Band 2 (10M) 16QAM(1,0) Lower Channel 18650 (1855MHz)



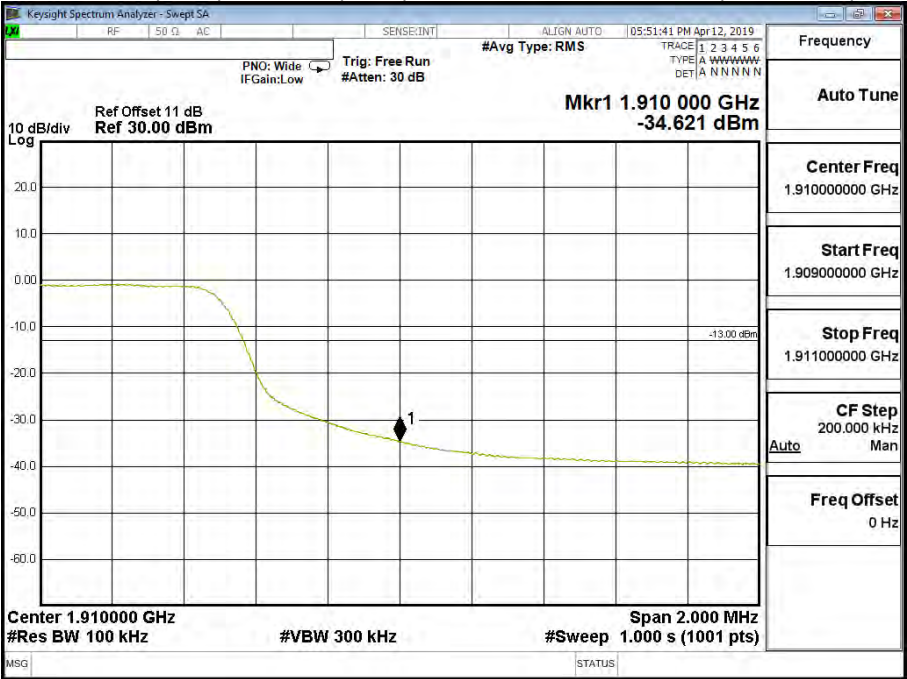
Band 2 (10M) 16QAM(1,49) Upper Channel 19150 (1905MHz)



Band 2 (10M) 16QAM(50,0) Lower Channel 18650 (1855MHz)



Band 2 (10M) 16QAM(50,0) Upper Channel 19150 (1905MHz)



Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 2 (15M))		

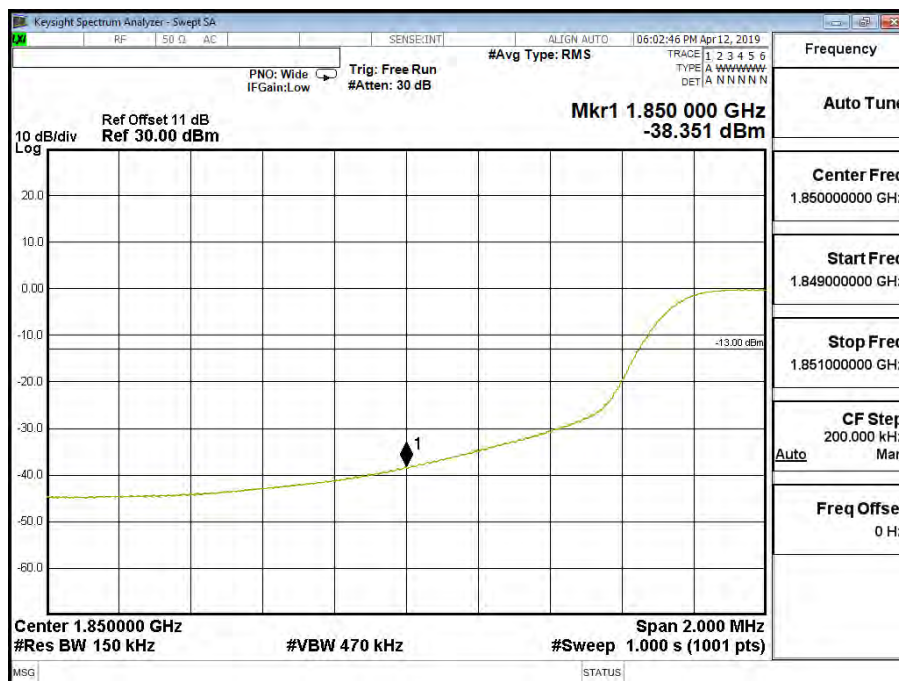
Band 2 (15M)QPSK(1,0) Lower Channel 18675 (1857.5MHz)



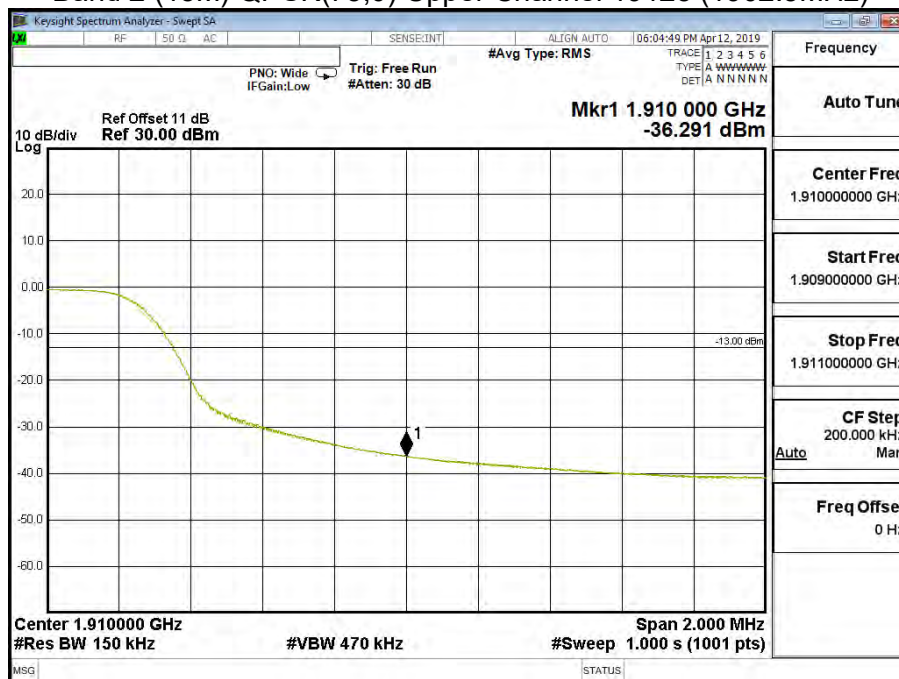
Band 2 (15M) QPSK(1,74) Upper Channel 19125 (1902.5MHz)



Band 2 (15M) QPSK(75,0) Lower Channel 18675 (1857.5MHz)



Band 2 (15M) QPSK(75,0) Upper Channel 19125 (1902.5MHz)



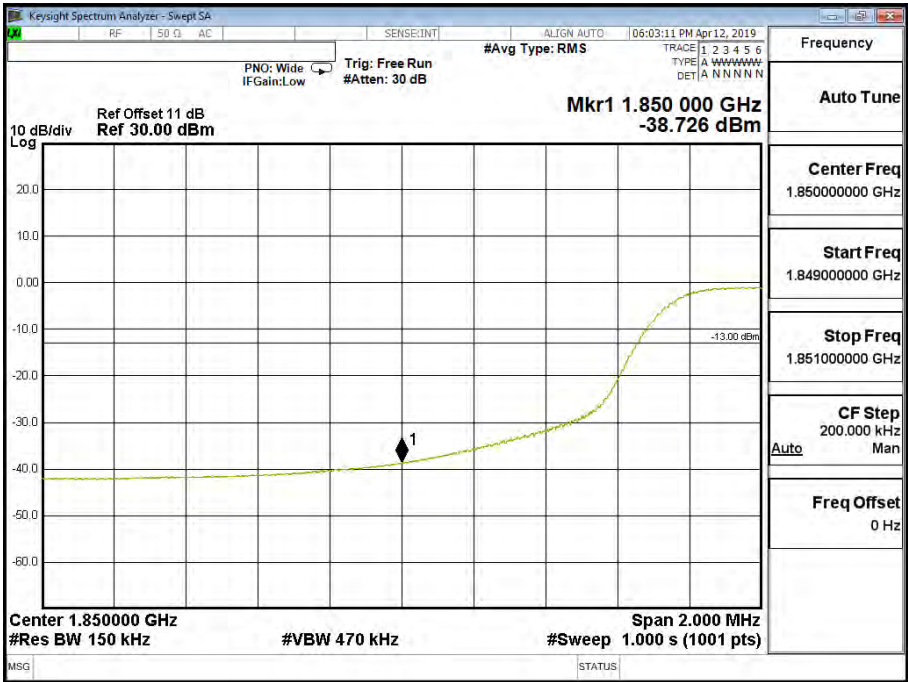
Band 2 (15M) 16QAM(1,0) Lower Channel 18675 (1857.5MHz)



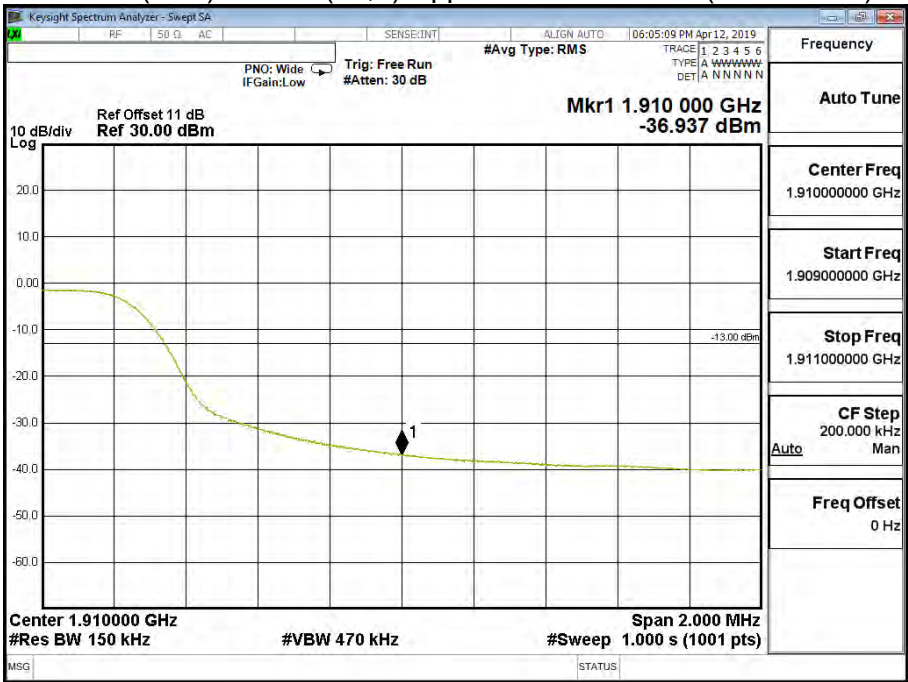
Band 2 (15M) 16QAM(1,74) Upper Channel 19125 (1902.5MHz)



Band 2 (15M) 16QAM(75,0) Lower Channel 18675 (1857.5MHz)

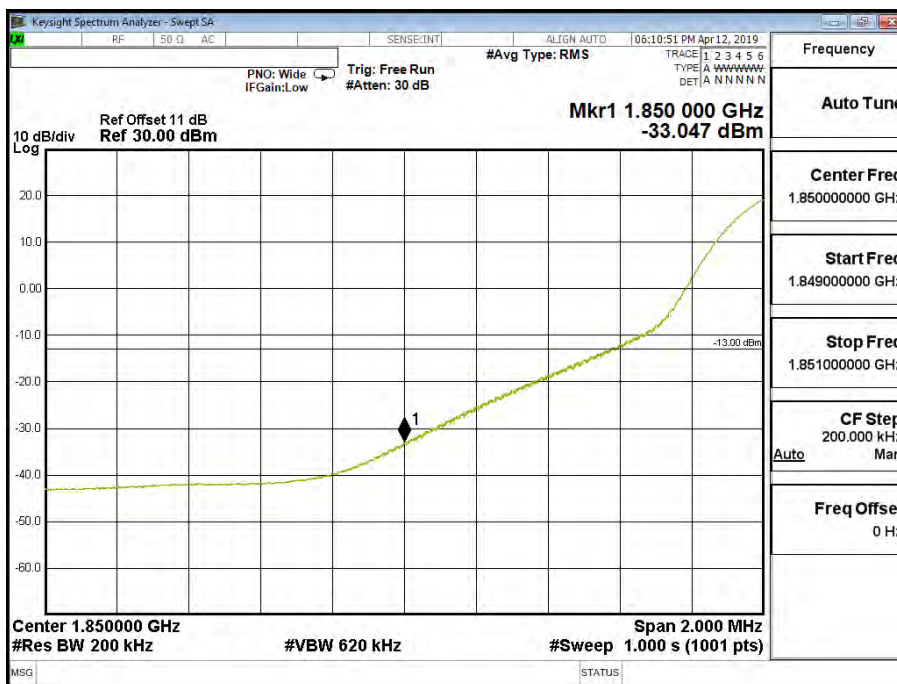


Band 2 (15M) 16QAM(75,0) Upper Channel 19125 (1902.5MHz)

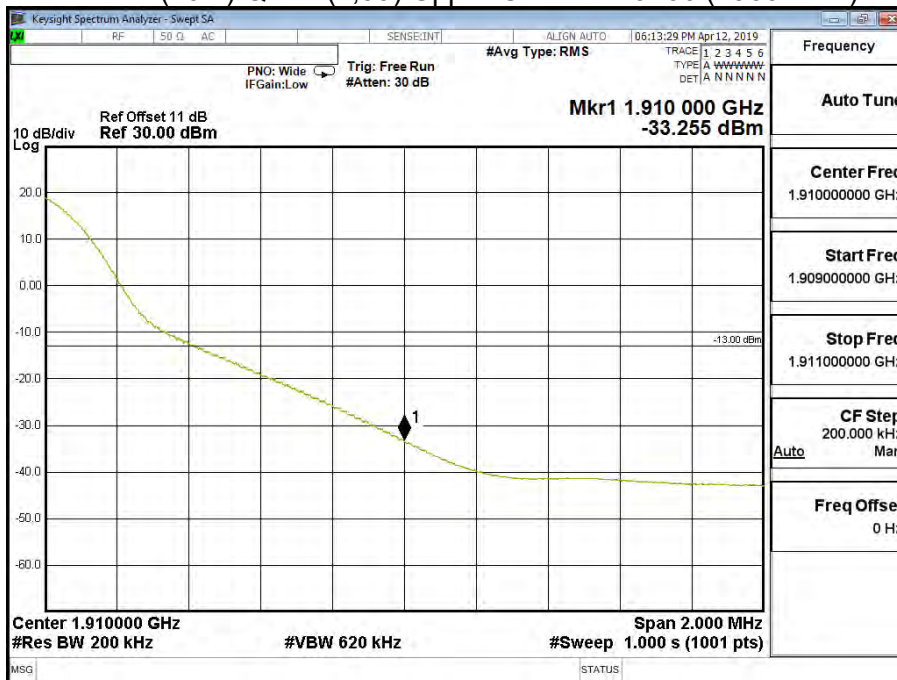


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 2 (20M))		

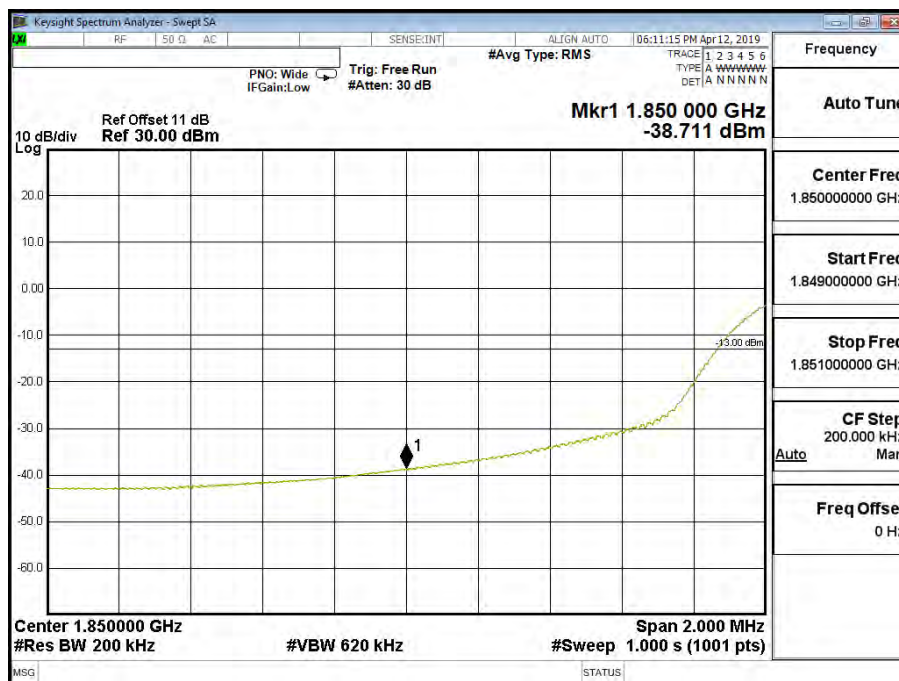
Band 2 (20M) QPSK(1,0) Lower Channel 18700 (1860MHz)



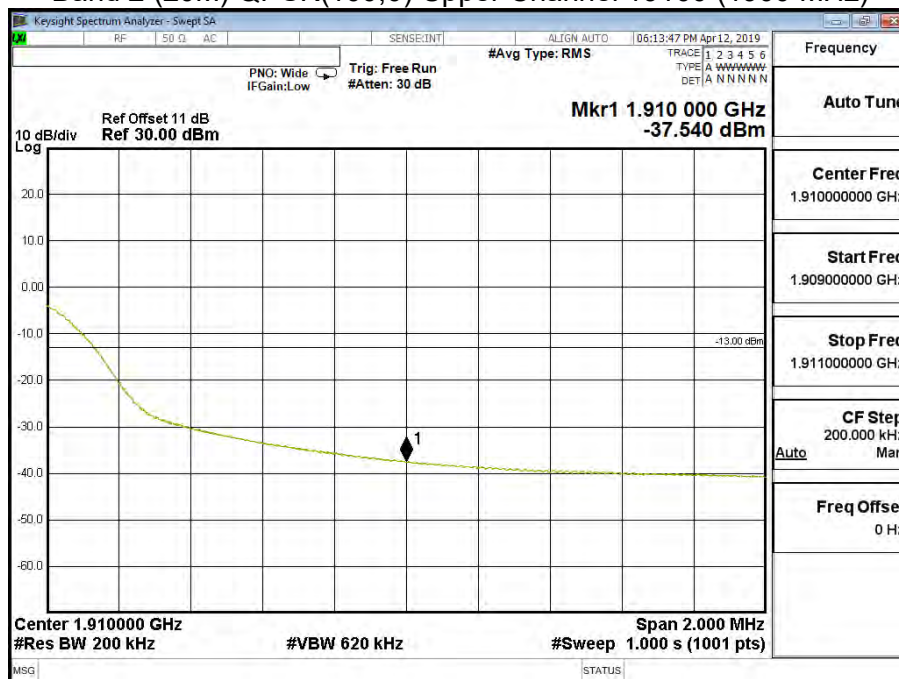
Band 2 (20M) QPSK(1,99) Upper Channel 19100 (1900 MHz)



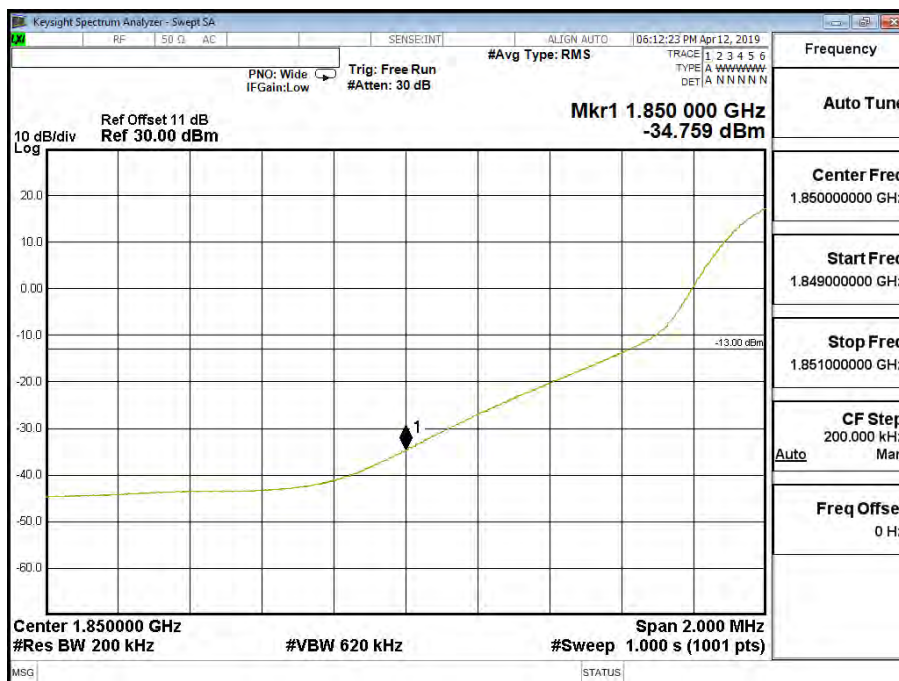
Band 2 (20M) QPSK(100,0) Lower Channel 18700 (1860MHz)



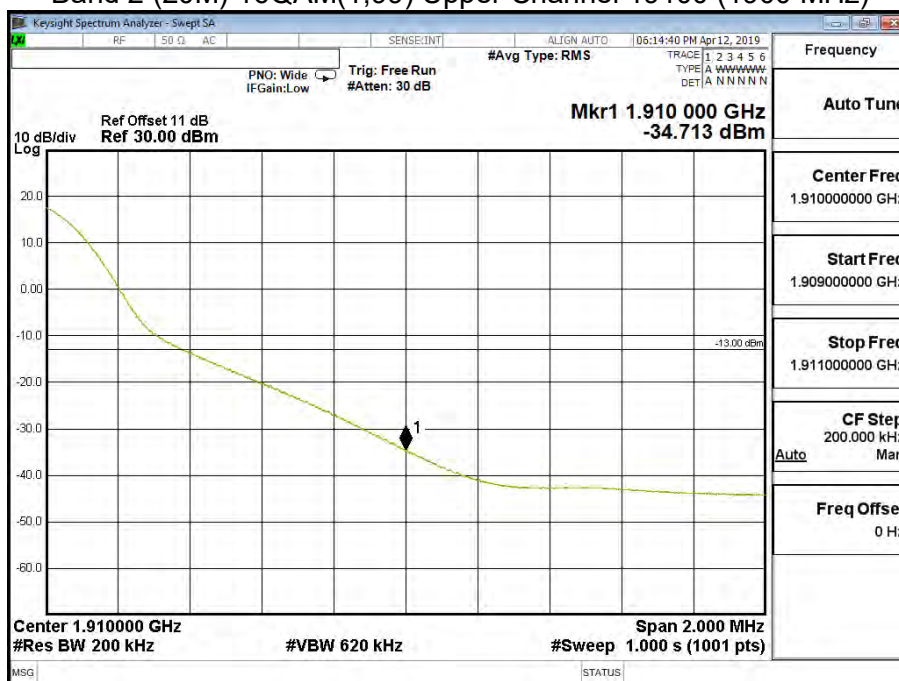
Band 2 (20M) QPSK(100,0) Upper Channel 19100 (1900 MHz)



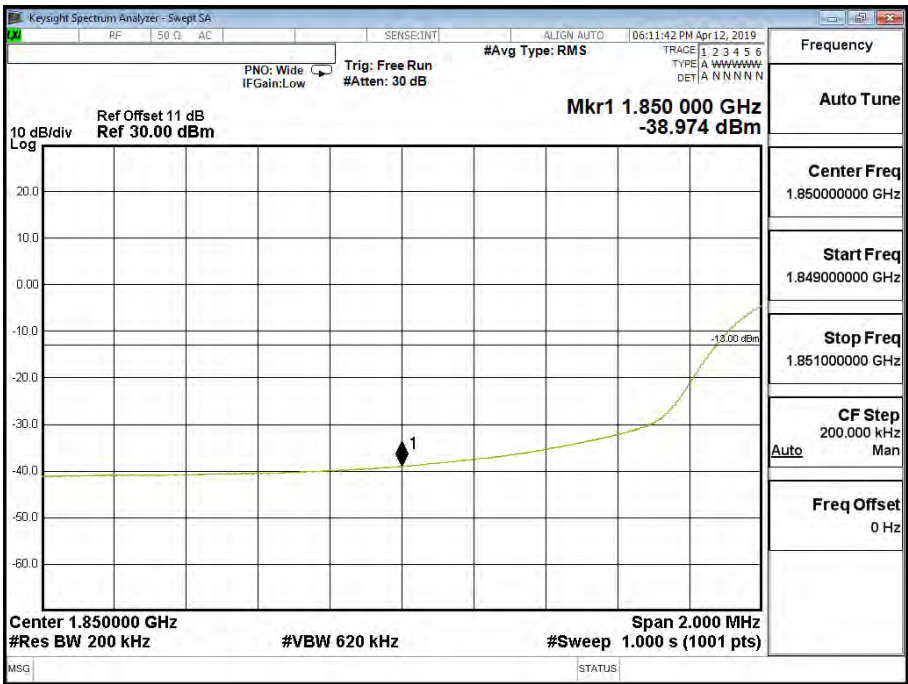
Band 2 (20M) 16QAM(1,0) Lower Channel 18700 (1860MHz)



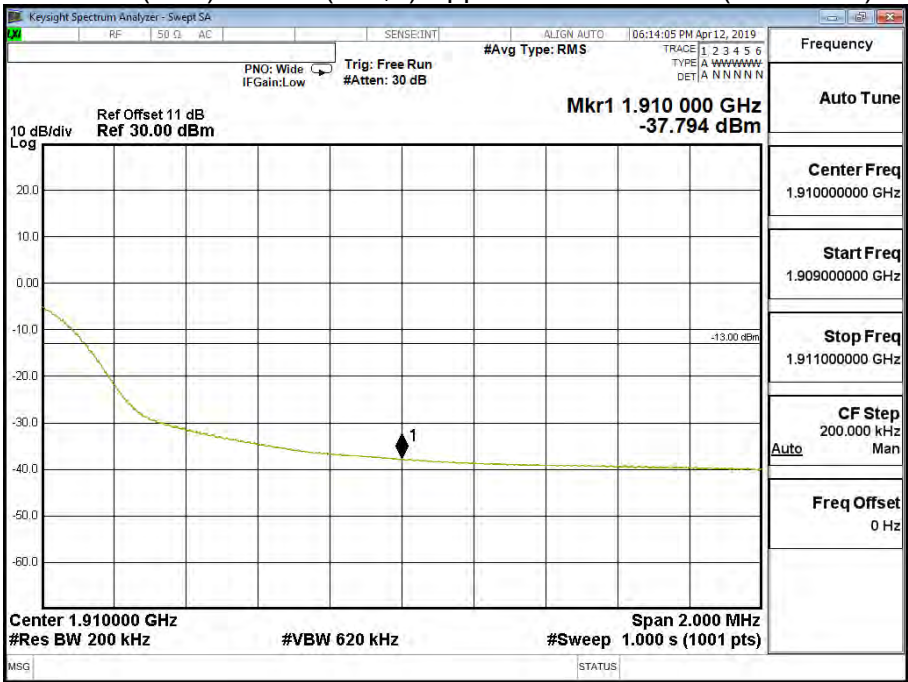
Band 2 (20M) 16QAM(1,99) Upper Channel 19100 (1900 MHz)



Band 2 (20M) 16QAM(100,0) Lower Channel 18700 (1860MHz)

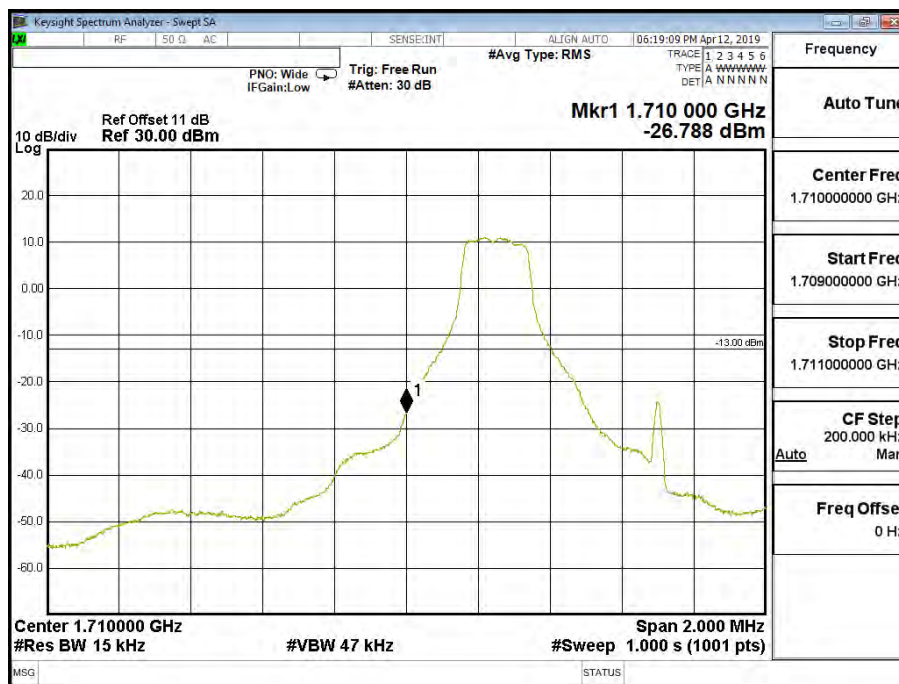


Band 2 (20M) 16QAM(100,0) Upper Channel 19100 (1900 MHz)

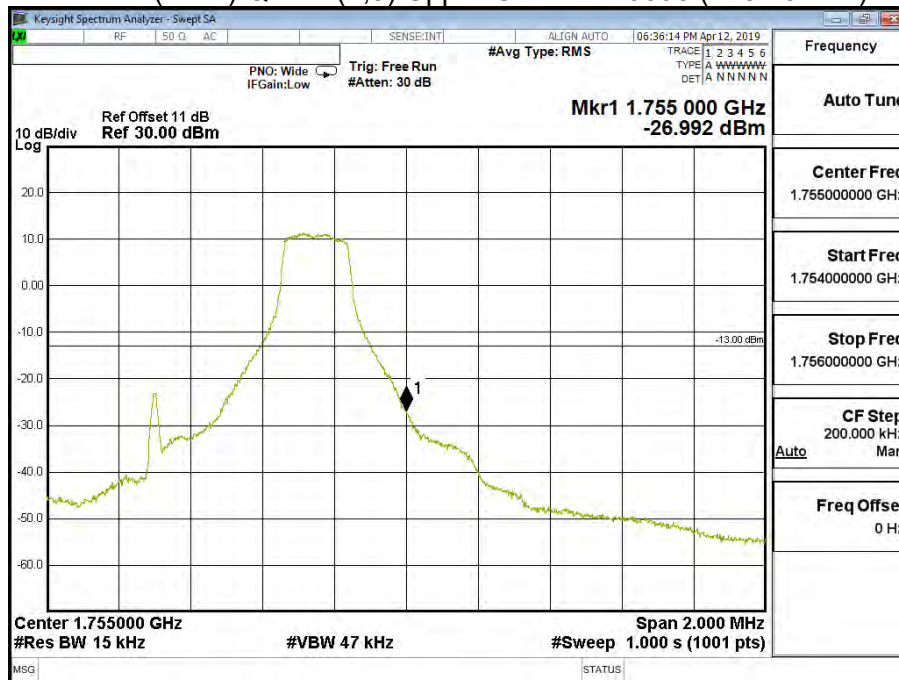


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 4 (1.4M))		

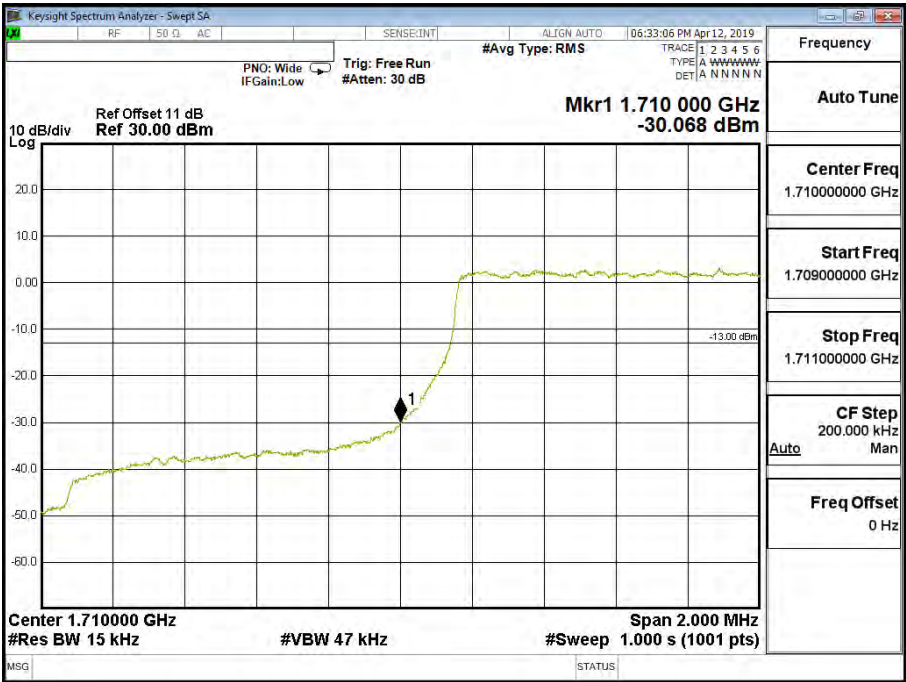
Band 4 (1.4M) QPSK (1,0) Lower Channel 19957 (1710.7MHz)



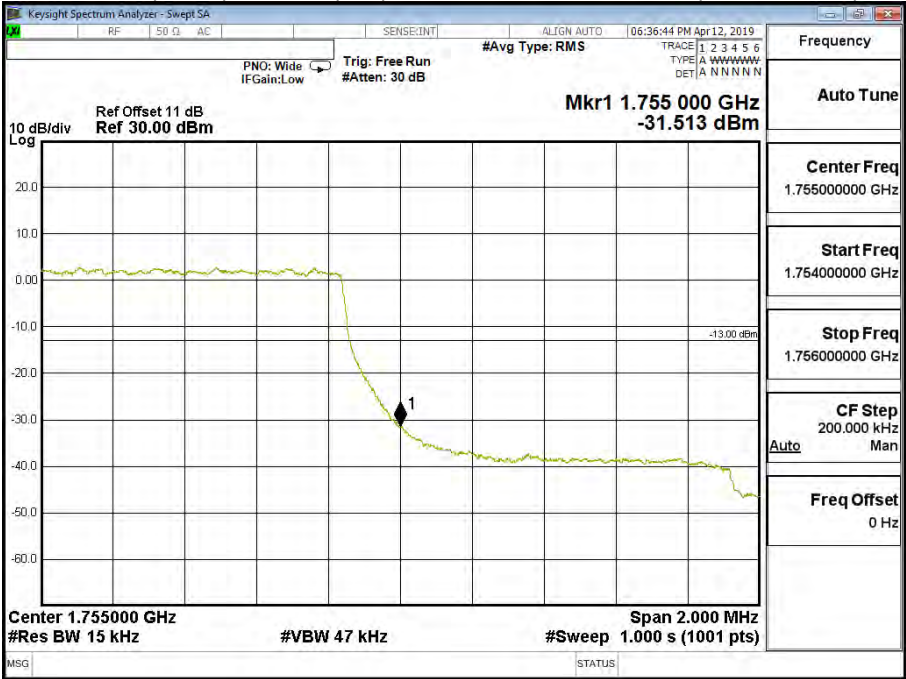
Band 4 (1.4M) QPSK (1,5) Upper Channel 20393 (1754.3MHz)



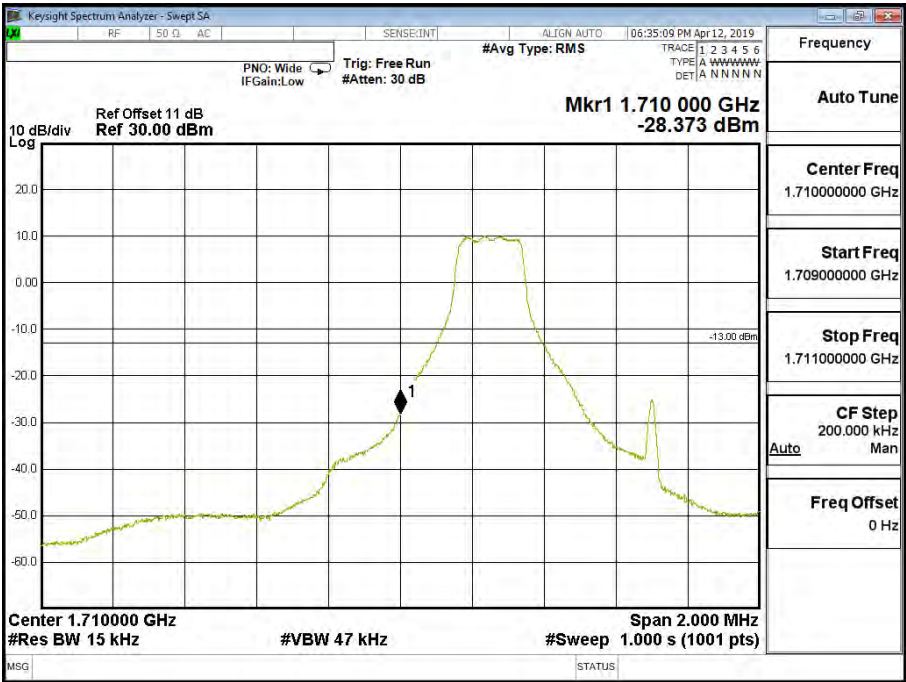
Band 4 (1.4M) QPSK (6,0) Lower Channel 19957 (1710.7MHz)



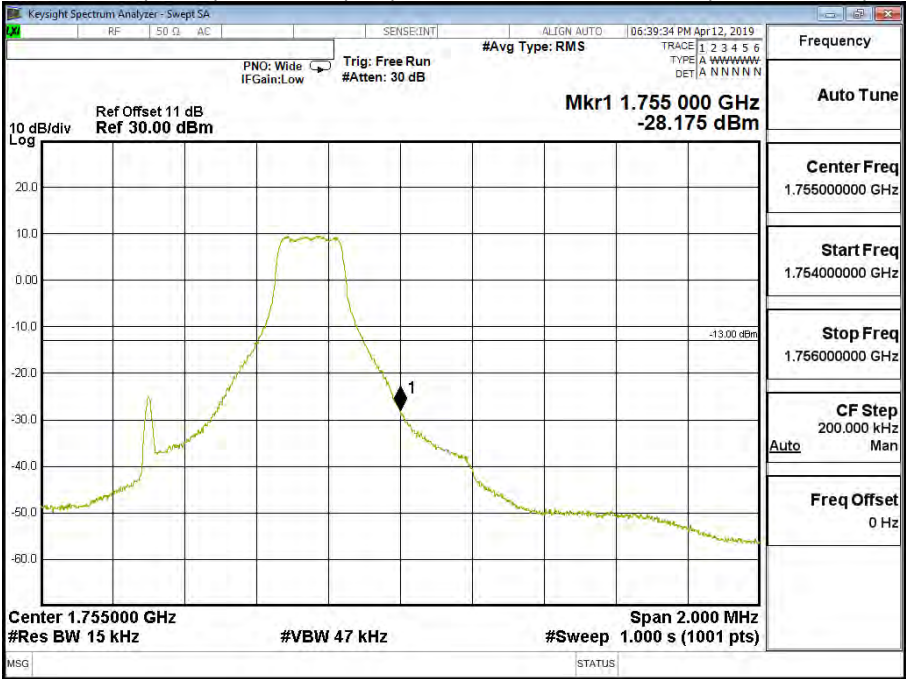
Band 4 (1.4M) QPSK (6,0) Upper Channel 20393 (1754.3MHz)



Band 4 (1.4M) 16QAM (1,0) Lower Channel 19957 (1710.7MHz)



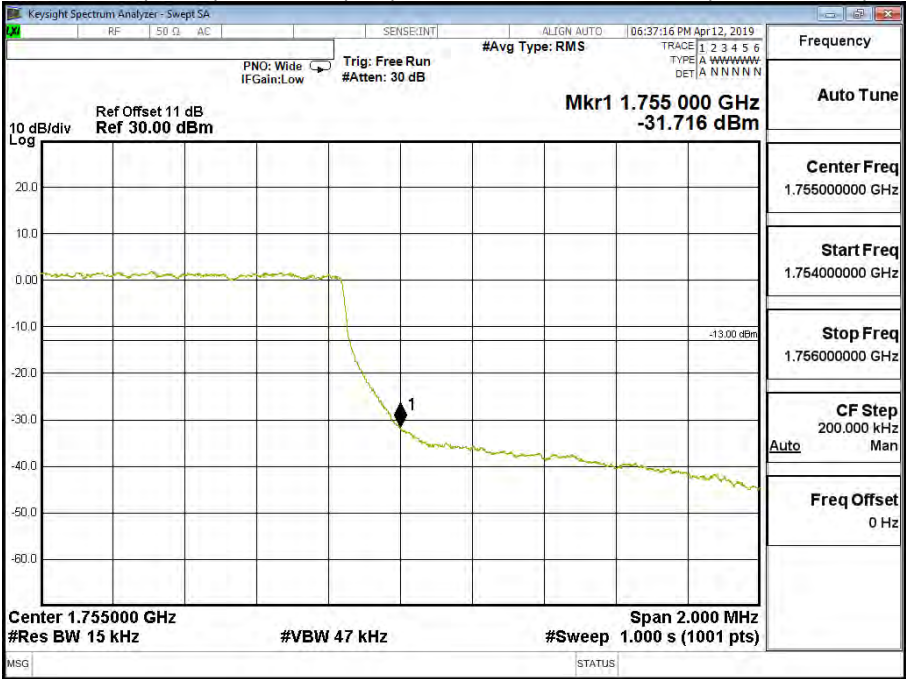
Band 4 (1.4M) 16QAM (1,5) Upper Channel 20393 (1754.3MHz)



Band 4 (1.4M) 16QAM (6,0) Lower Channel 19957 (1710.7MHz)

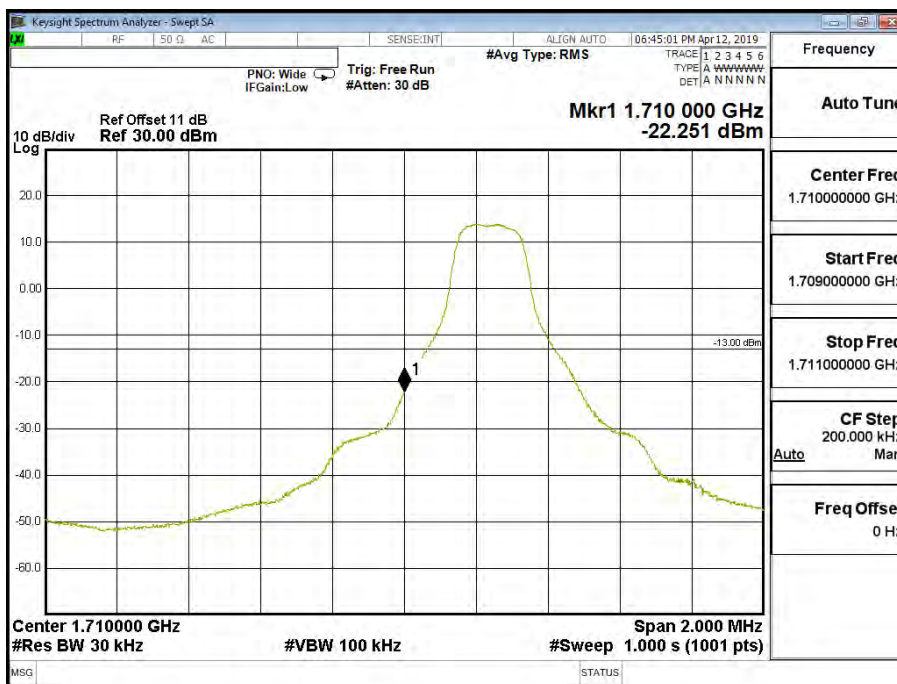


Band 4 (1.4M) 16QAM (6,0) Upper Channel 20393 (1754.3MHz)

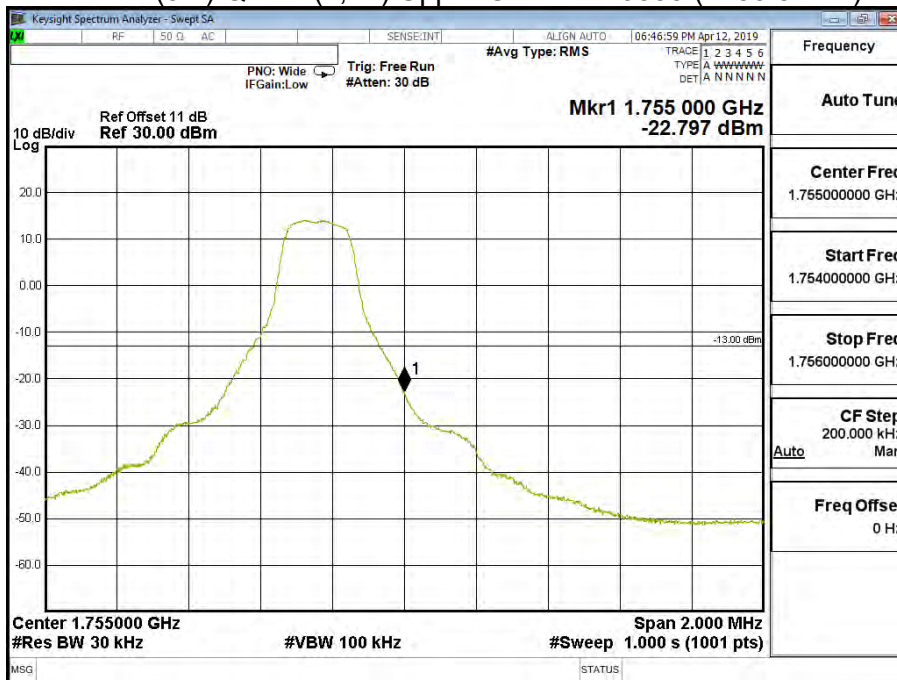


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 4 (3M))		

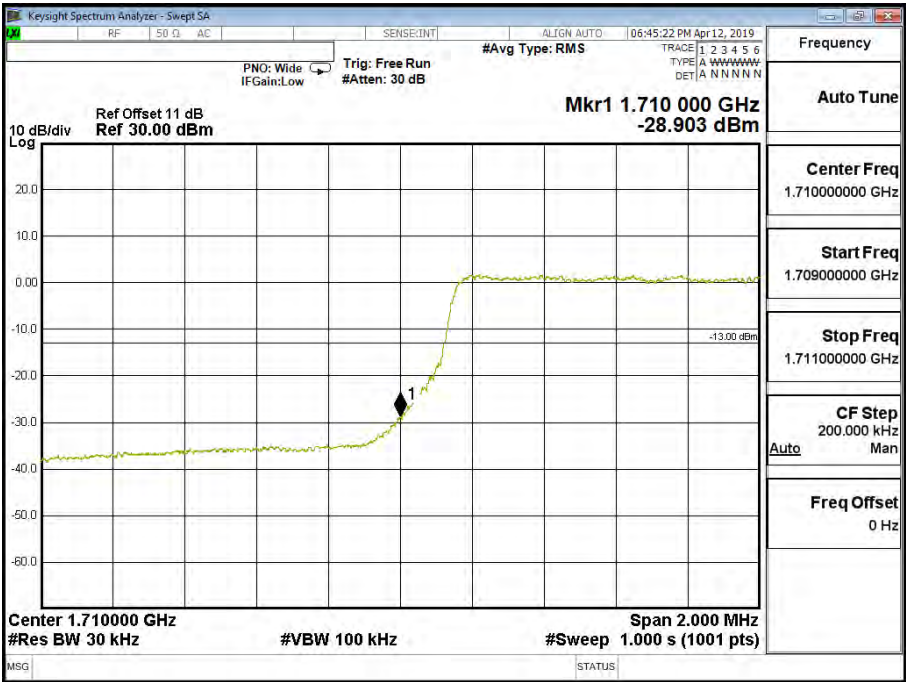
Band 4 (3M) QPSK (1,0) Lower Channel 19965 (1711.5MHz)



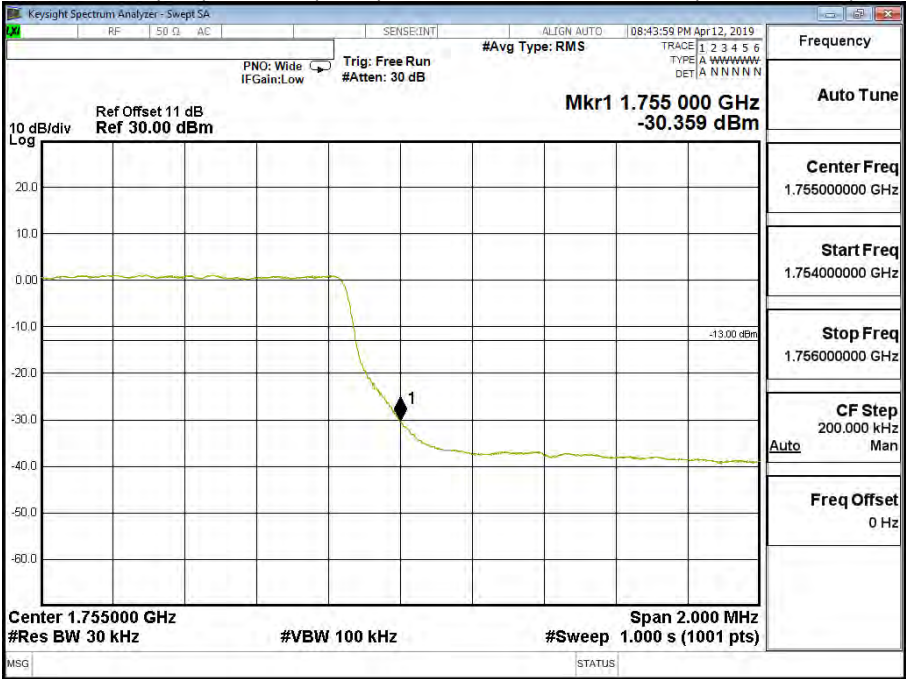
Band 4 (3M) QPSK (1,14) Upper Channel 20385 (1753.5MHz)



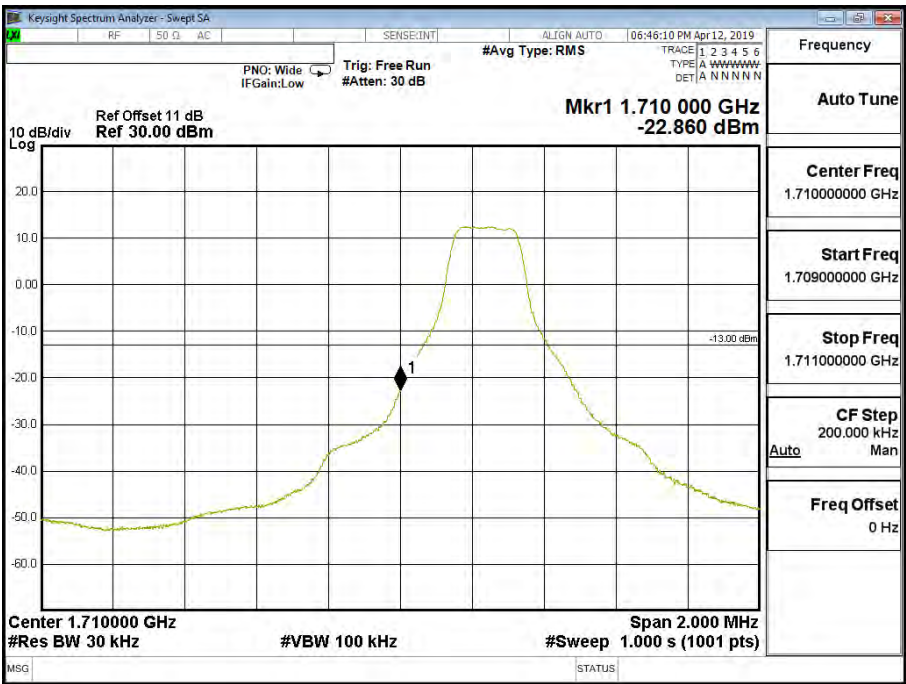
Band 4 (3M) QPSK (15,0) Lower Channel 19965 (1711.5MHz)



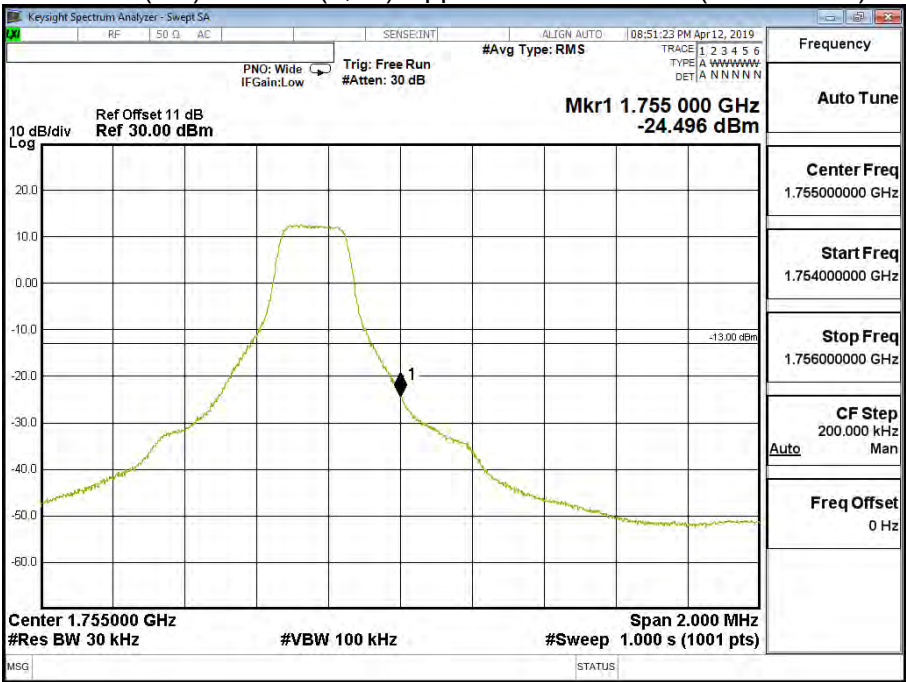
Band 4 (3M) QPSK (15,0) Upper Channel 20385 (1753.5MHz)



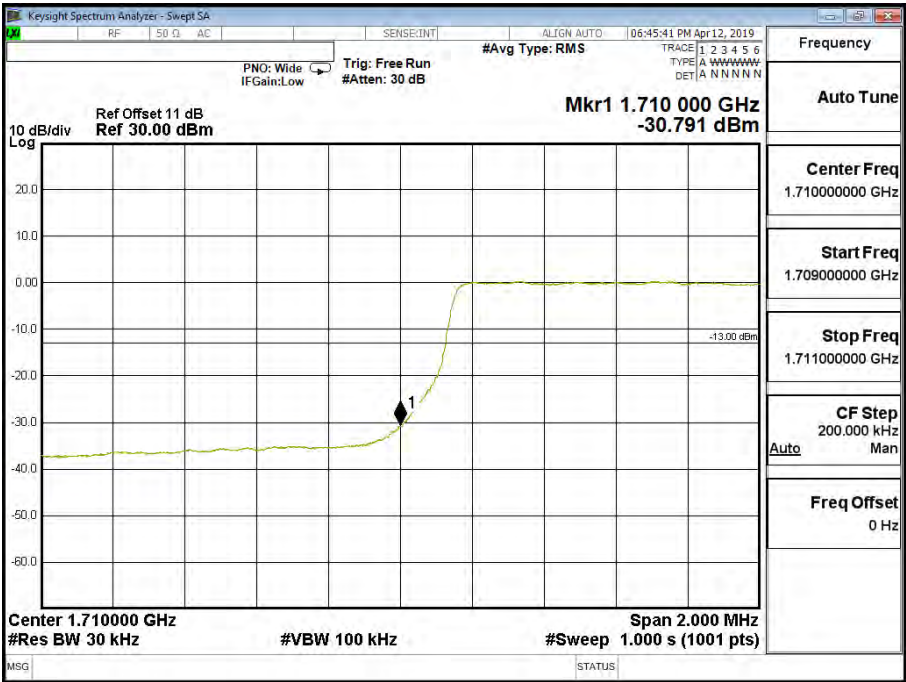
Band 4 (3M) 16QAM (1,0) Lower Channel 19965 (1711.5MHz)



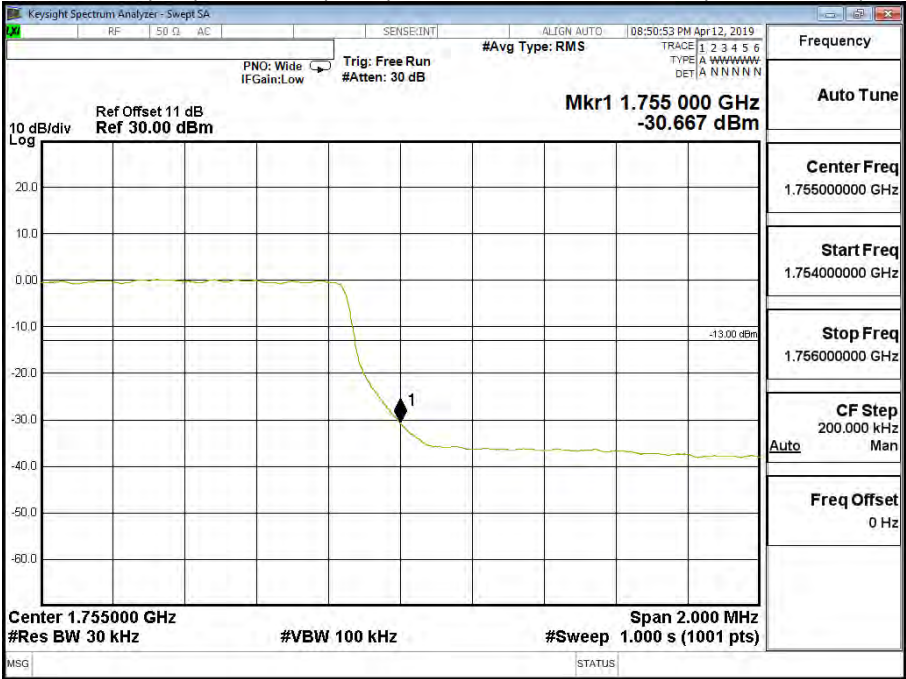
Band 4 (3M) 16QAM (1,14) Upper Channel 20385 (1753.5MHz)



Band 4 (3M) 16QAM (15,0) Lower Channel 19965 (1711.5MHz)



Band 4 (3M) 16QAM (15,0) Upper Channel 20385 (1753.5MHz)



Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 4 (5M))		

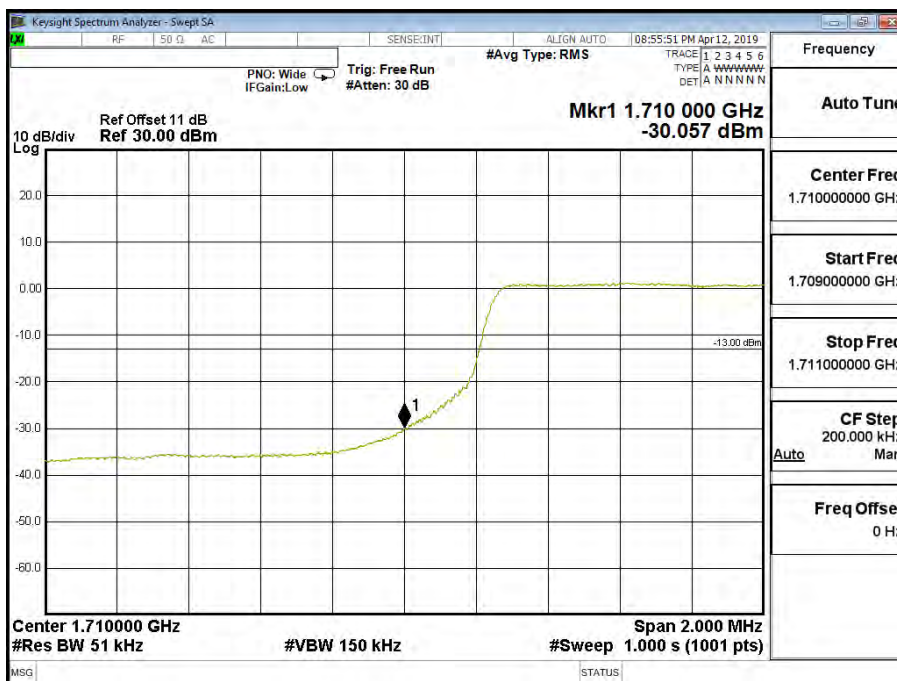
Band 4 (5M) QPSK(1,0) Lower Channel 19975 (1712.5MHz)



Band 4 (5M) QPSK(1,24) Upper Channel 20375 (1752.5MHz)



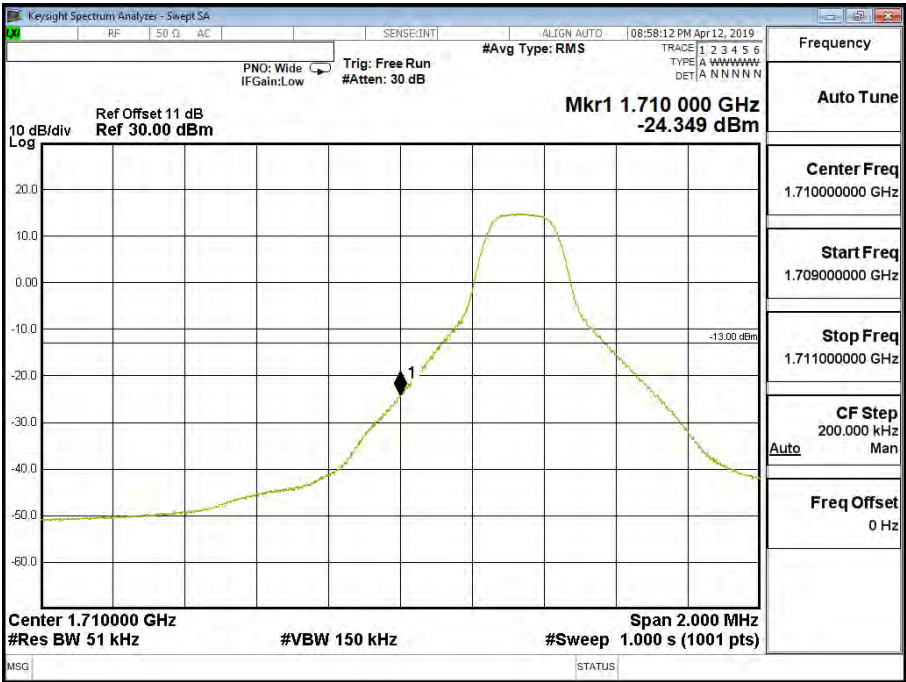
Band 4 (5M) QPSK(25,0) Lower Channel 19975 (1712.5MHz)



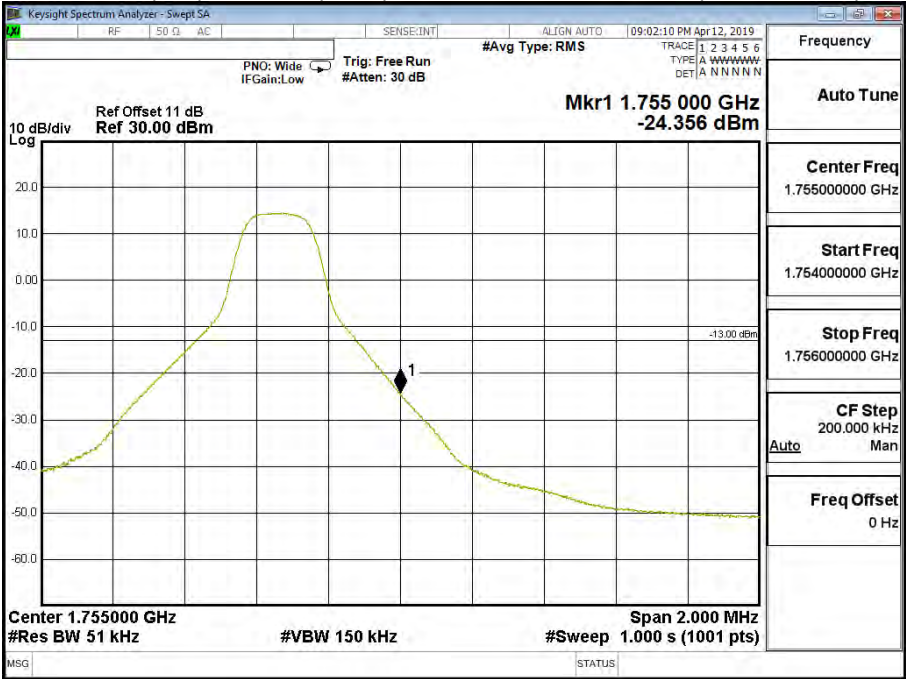
Band 4 (5M) QPSK(25,0) Upper Channel 20375 (1752.5MHz)



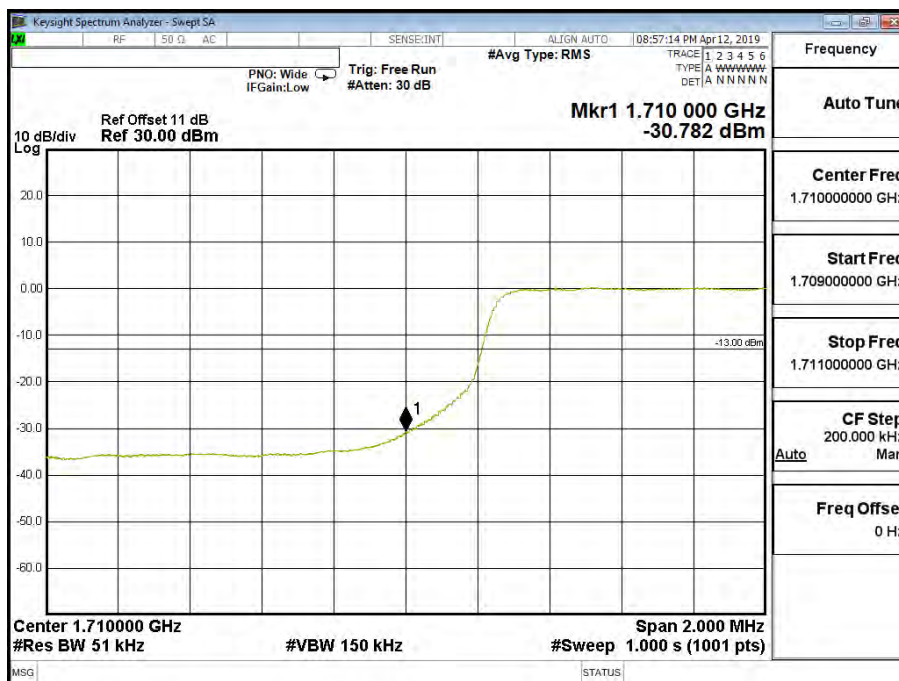
Band 4 (5M) 16QAM(1,0) Lower Channel 19975 (1712.5MHz)



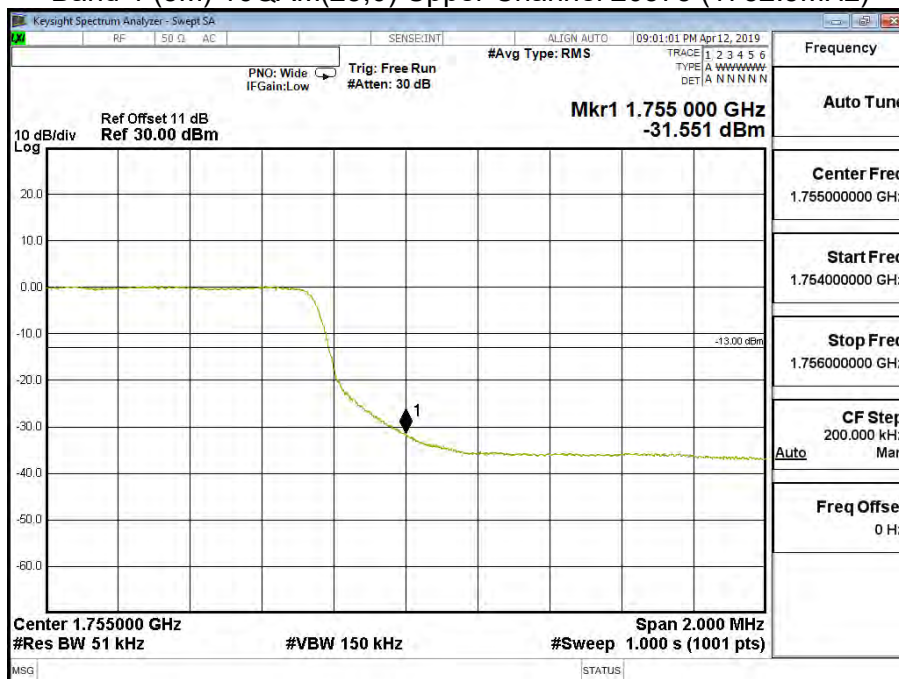
Band 4 (5M) 16QAM(1,24) Upper Channel 20375 (1752.5MHz)



Band 4 (5M) 16QAM(25,0) Lower Channel 19975 (1712.5MHz)



Band 4 (5M) 16QAM(25,0) Upper Channel 20375 (1752.5MHz)

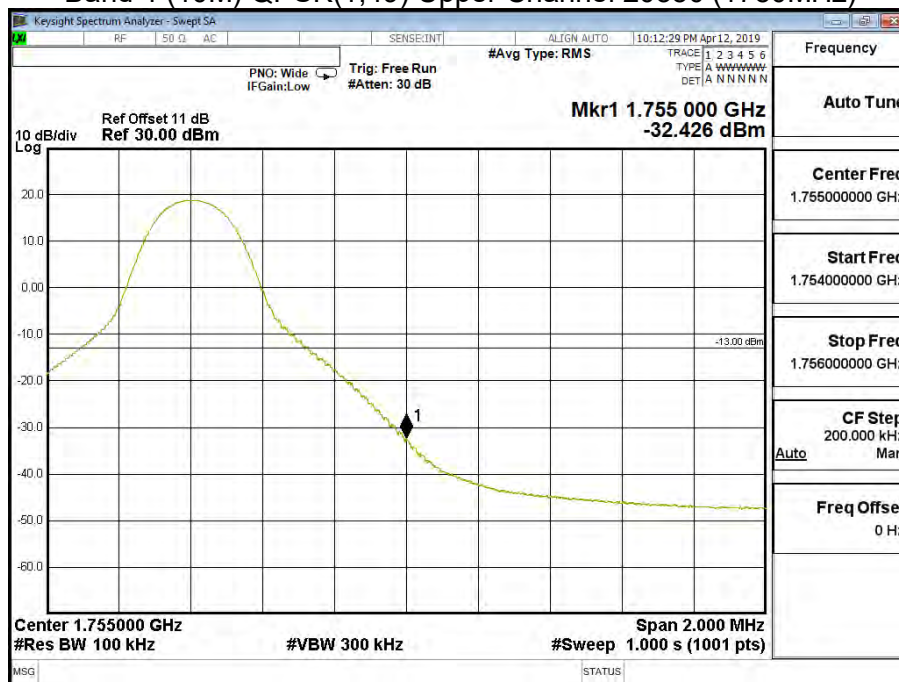


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 4 (10M))		

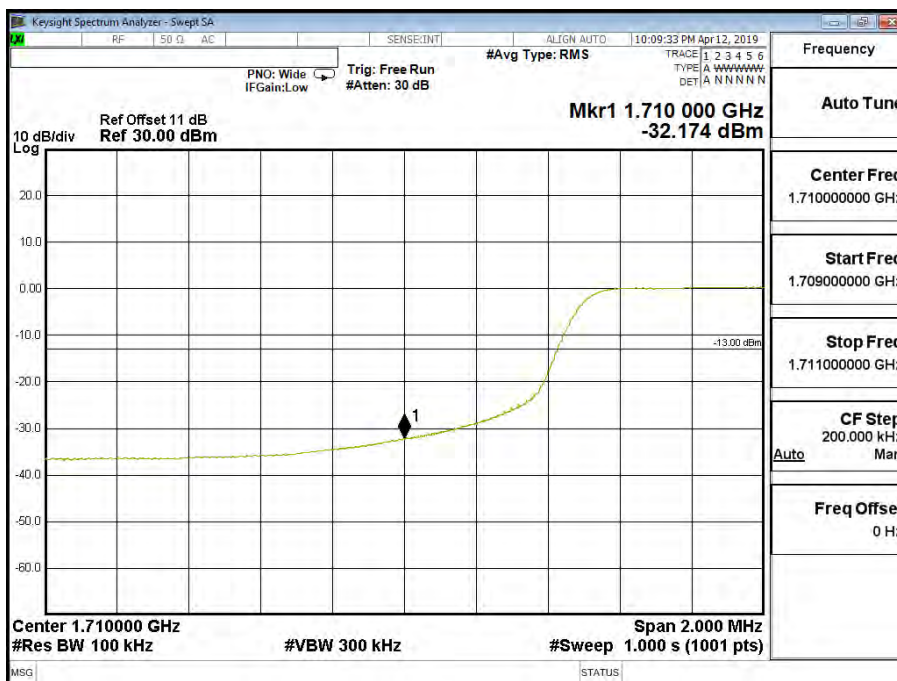
Band 4 (10M) QPSK(1,0) Lower Channel 20000 (1715MHz)



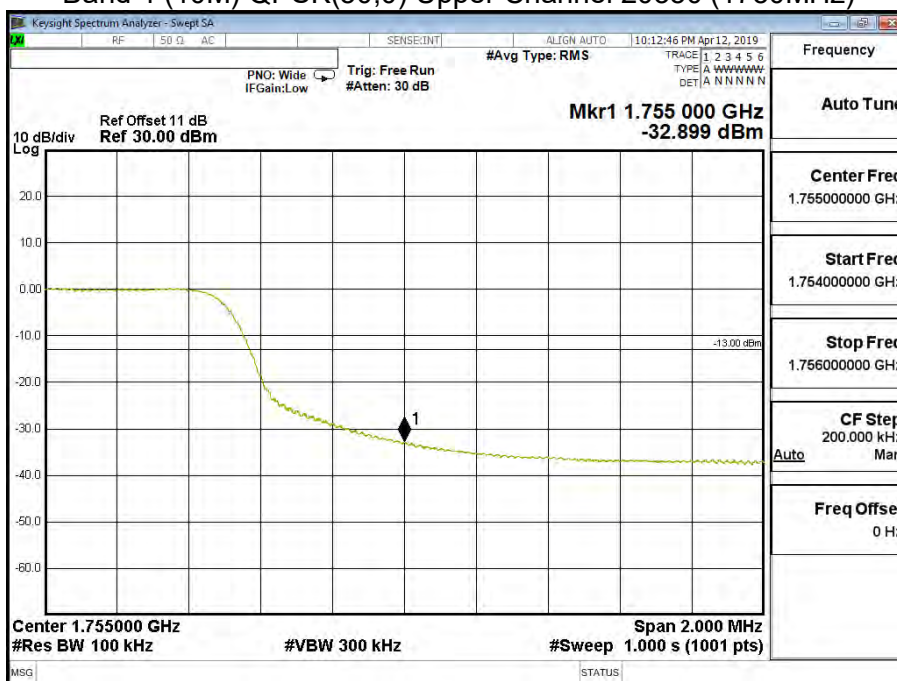
Band 4 (10M) QPSK(1,49) Upper Channel 20350 (1750MHz)



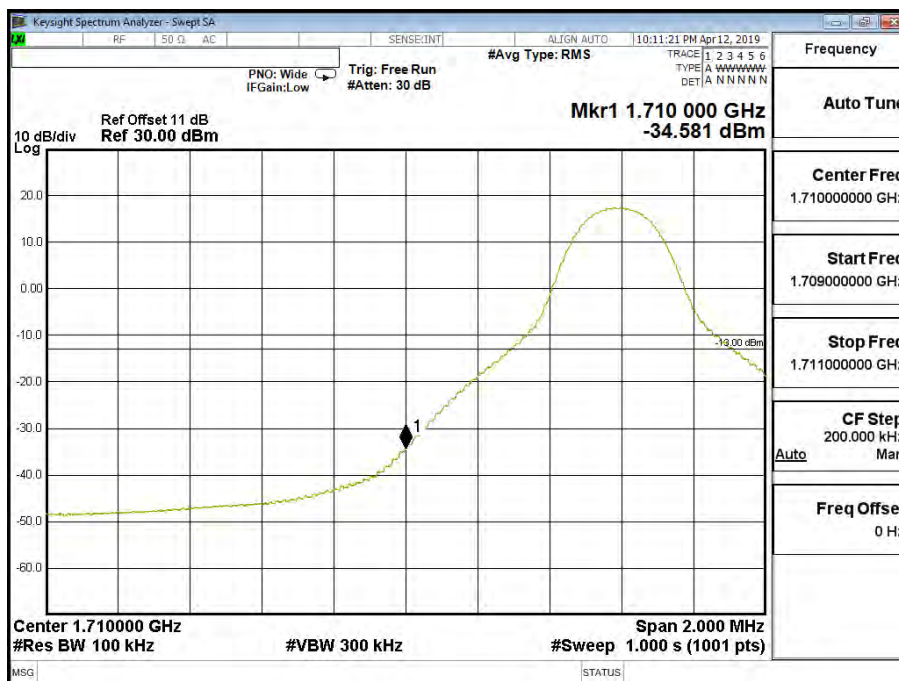
Band 4 (10M) QPSK(50,0) Lower Channel 20000 (1715MHz)



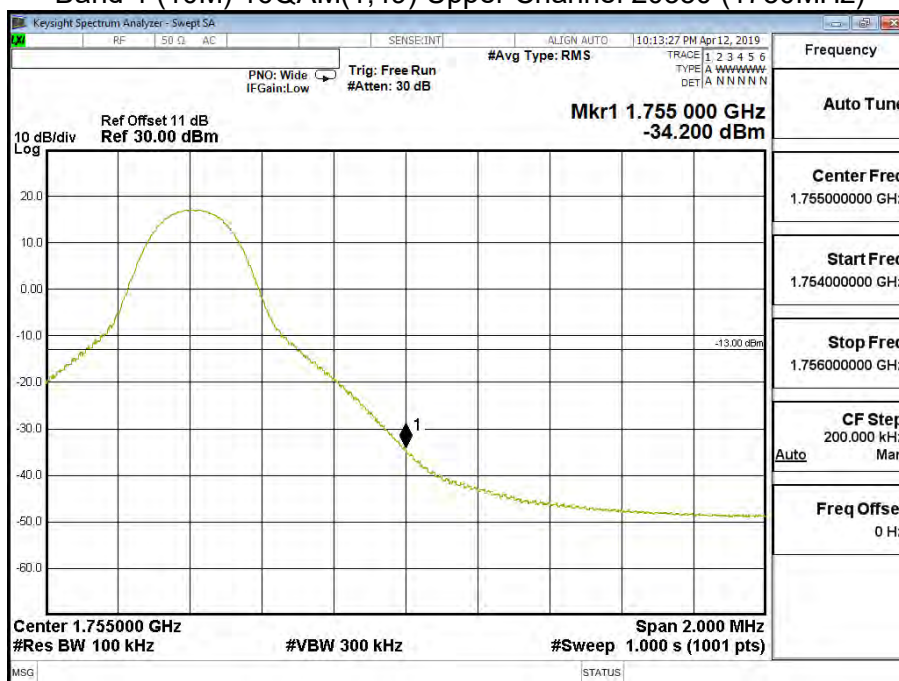
Band 4 (10M) QPSK(50,0) Upper Channel 20350 (1750MHz)



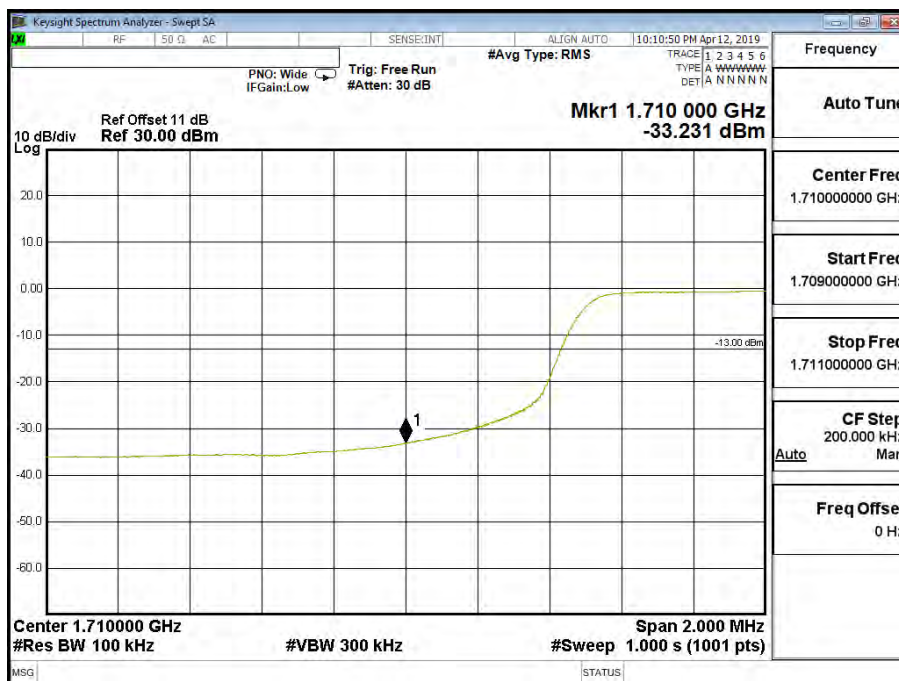
Band 4 (10M) 16QAM(1,0) Lower Channel 20000 (1715MHz)



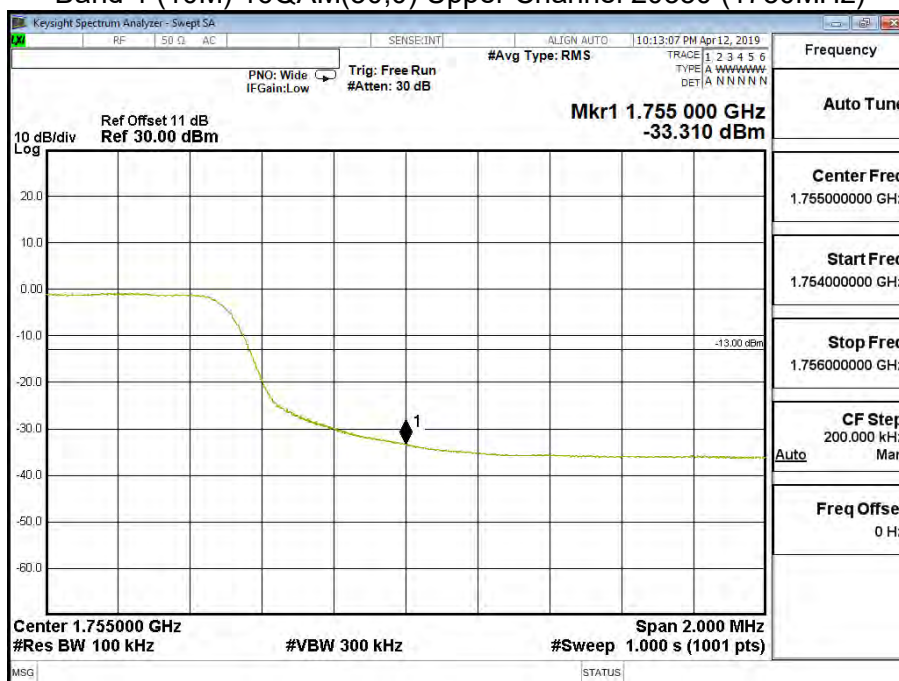
Band 4 (10M) 16QAM(1,49) Upper Channel 20350 (1750MHz)



Band 4 (10M) 16QAM(50,0) Lower Channel 20000 (1715MHz)

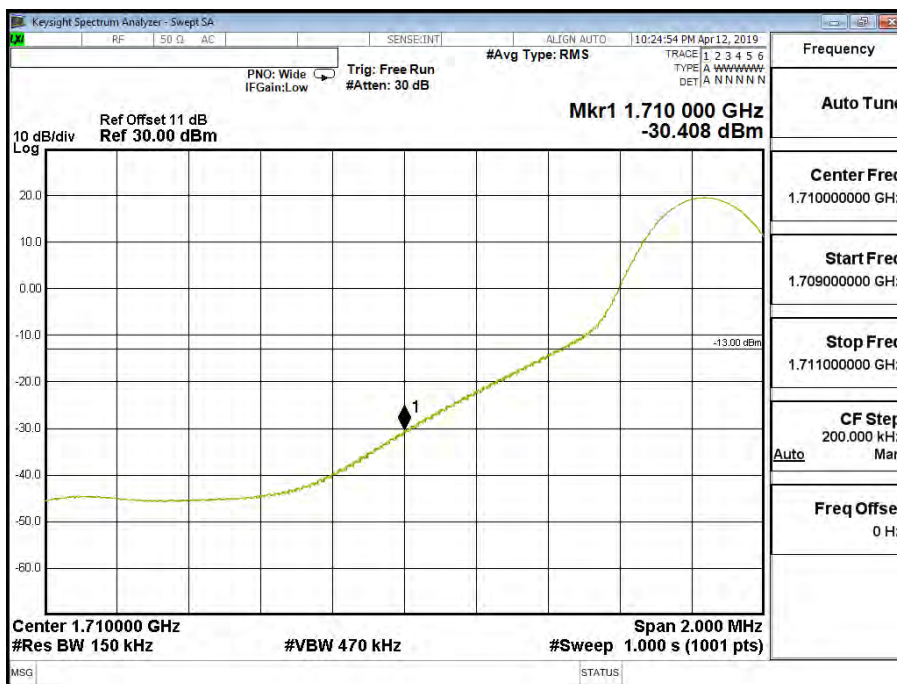


Band 4 (10M) 16QAM(50,0) Upper Channel 20350 (1750MHz)

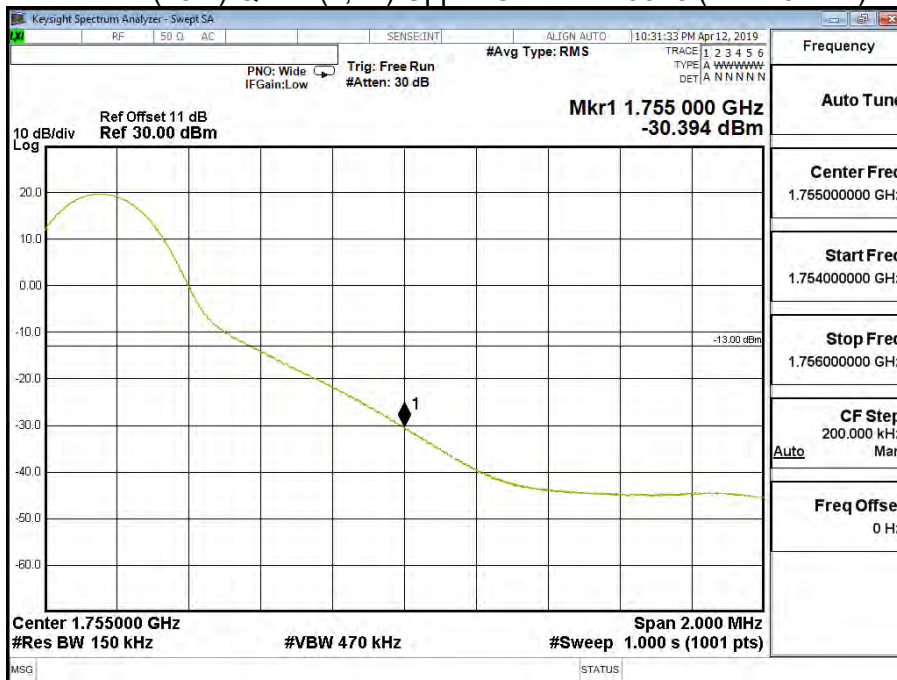


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 4 (15M))		

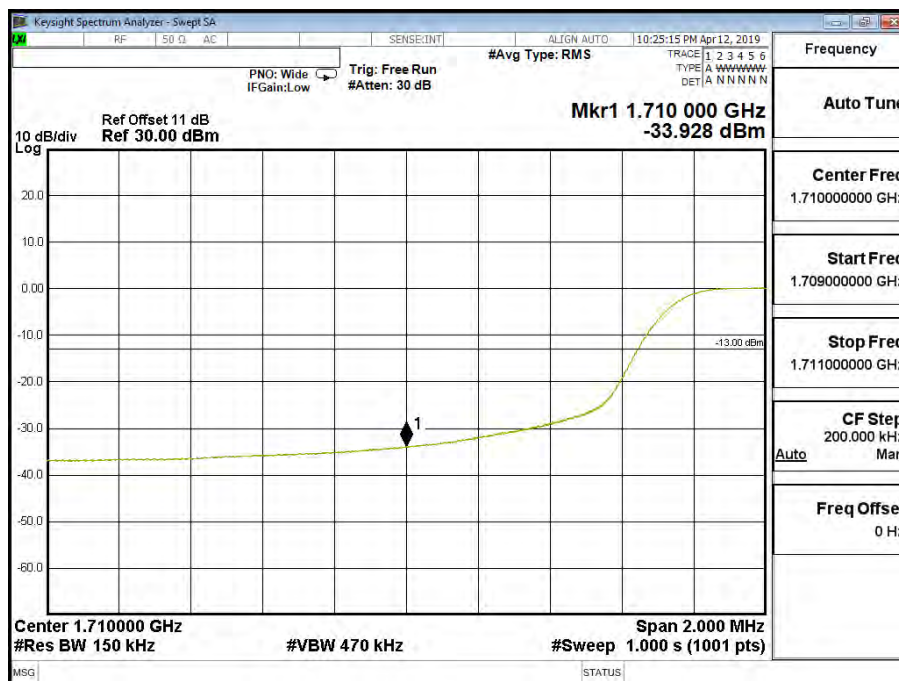
Band 4 (15M)QPSK(1,0) Lower Channel 20025 (1717.5MHz)



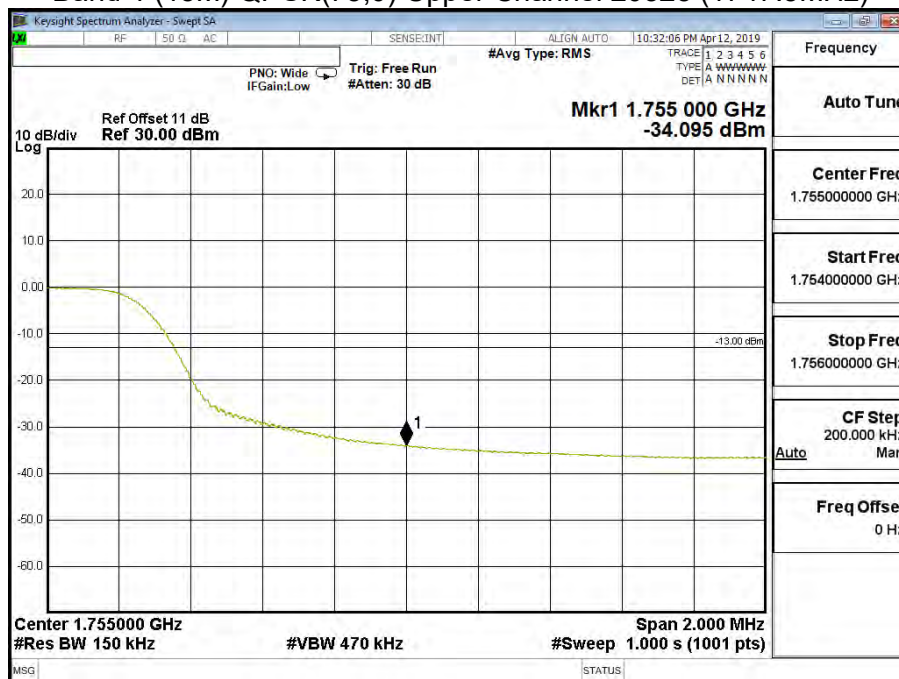
Band 4 (15M) QPSK(1,74) Upper Channel 20325 (1747.5MHz)



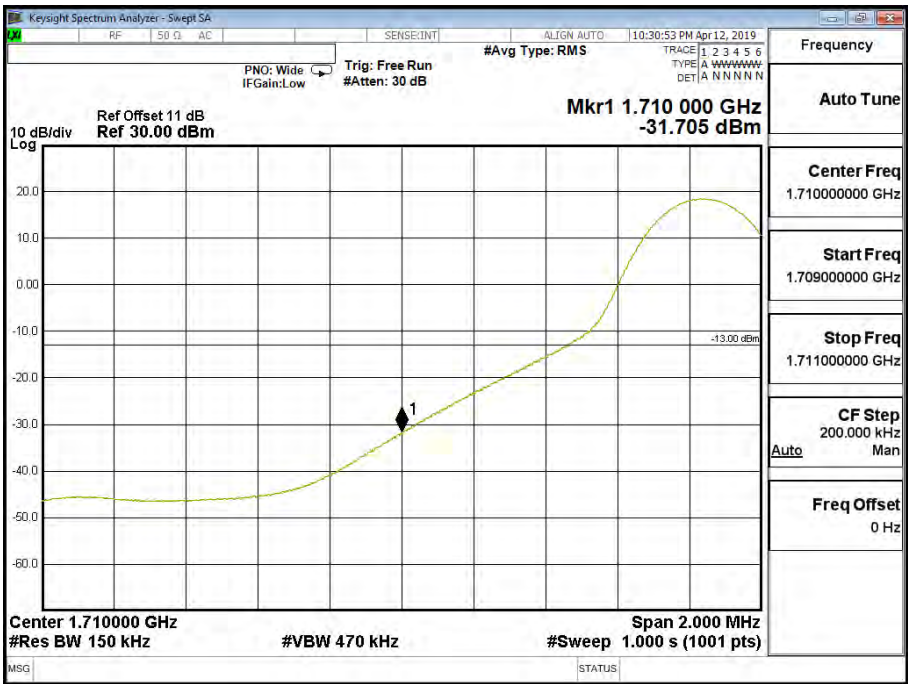
Band 4 (15M) QPSK(75,0) Lower Channel 20025 (1717.5MHz)



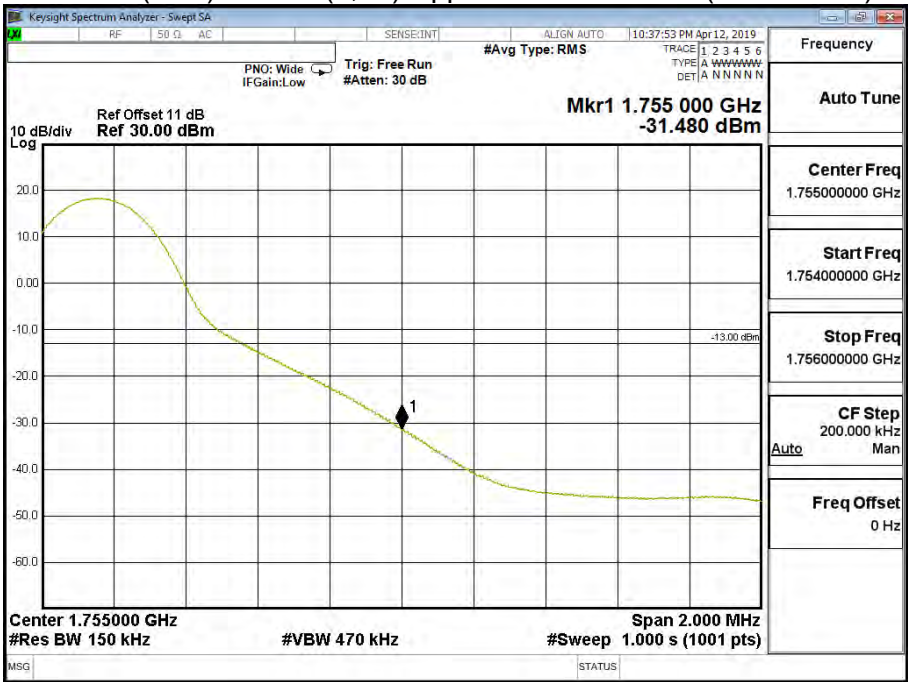
Band 4 (15M) QPSK(75,0) Upper Channel 20325 (1747.5MHz)



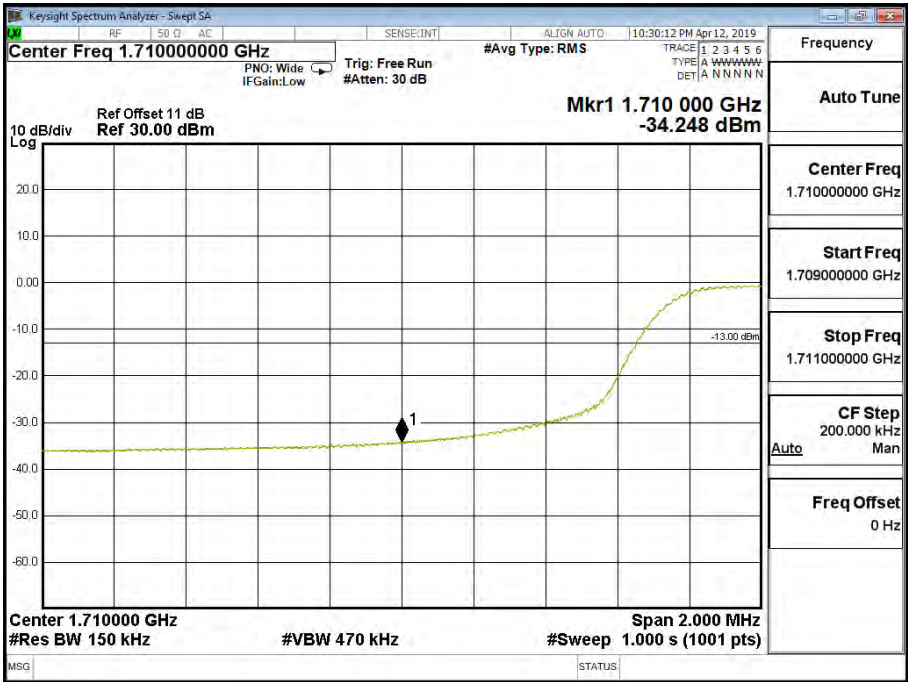
Band 4 (15M) 16QAM(1,0) Lower Channel 20025 (1717.5MHz)



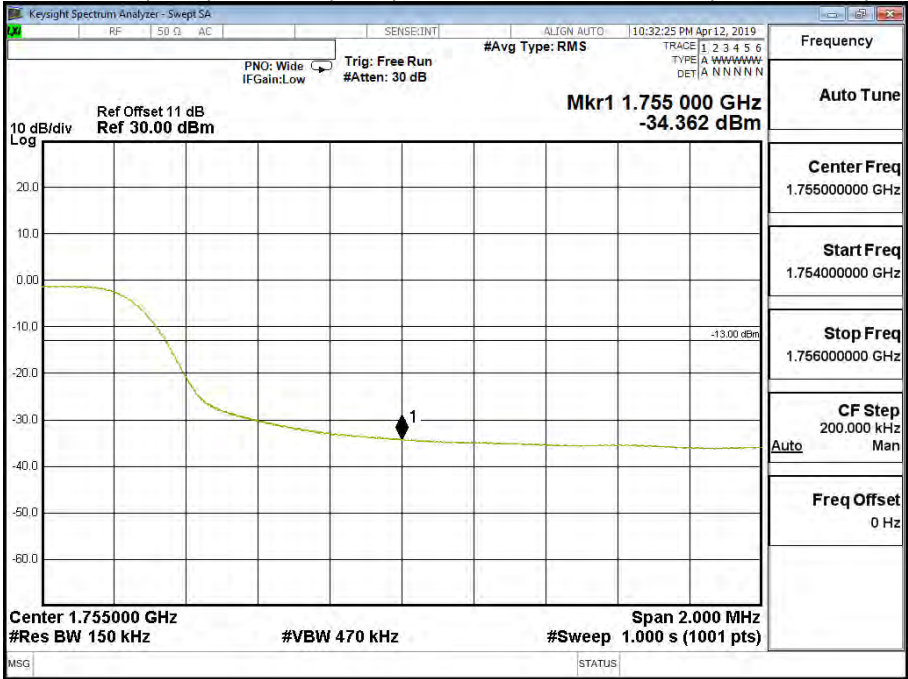
Band 4 (15M) 16QAM(1,74) Upper Channel 20325 (1747.5MHz)



Band 4 (15M) 16QAM(75,0) Lower Channel 20025 (1717.5MHz)



Band 4 (15M) 16QAM(75,0) Upper Channel 20325 (1747.5MHz)

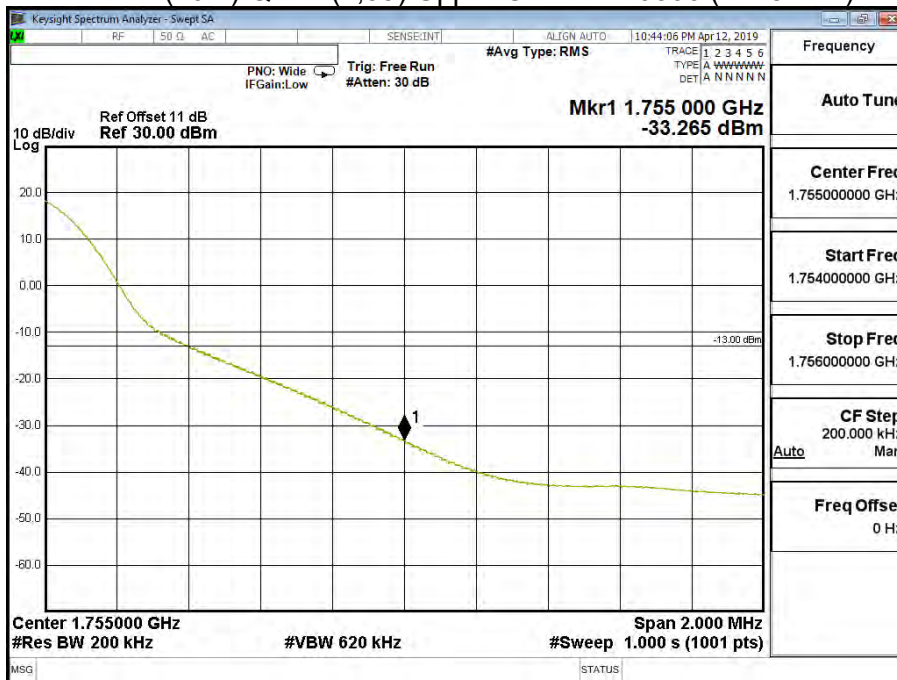


Product	Triple-SIM 4G/LTE Router with WWAN Failover		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2019/04/12	Test Site	CTR
Test Condition	Block Edge Test (Band 4 (20M))		

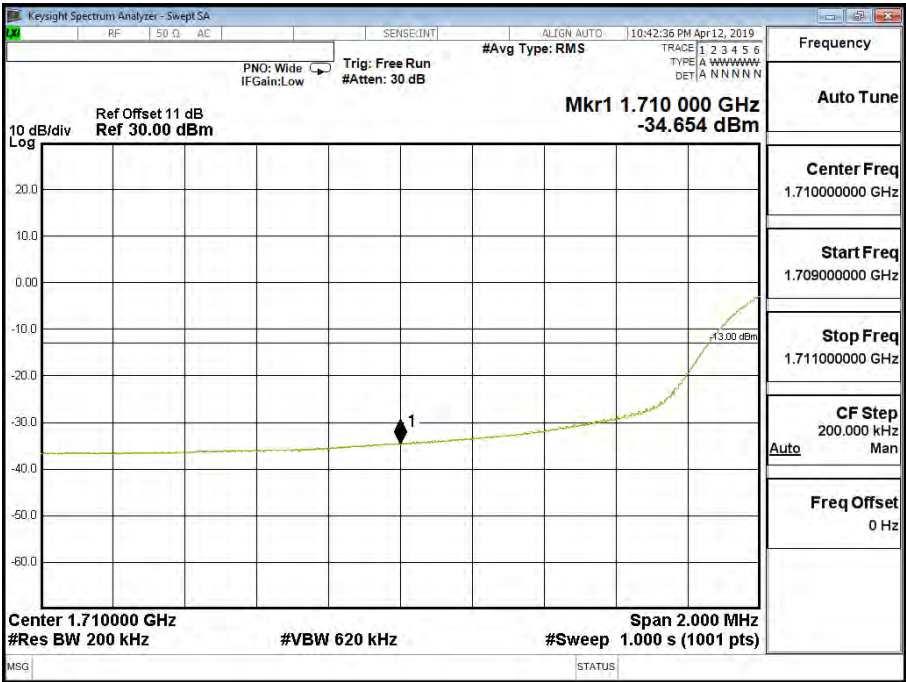
Band 4 (20M) QPSK(1,0) Lower Channel 20050 (1720MHz)



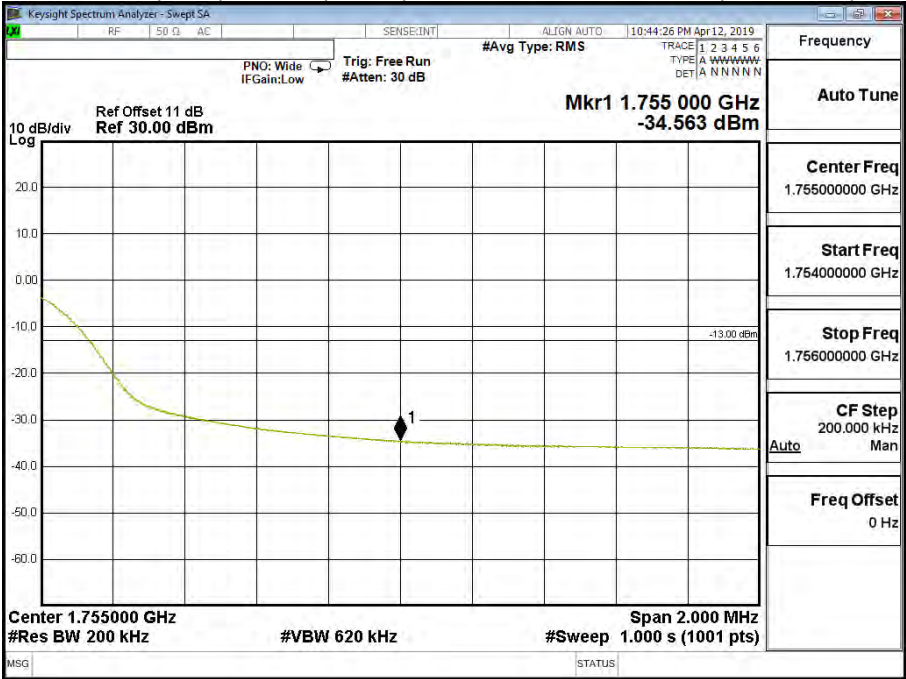
Band 4 (20M) QPSK(1,99) Upper Channel 20300 (1745MHz)



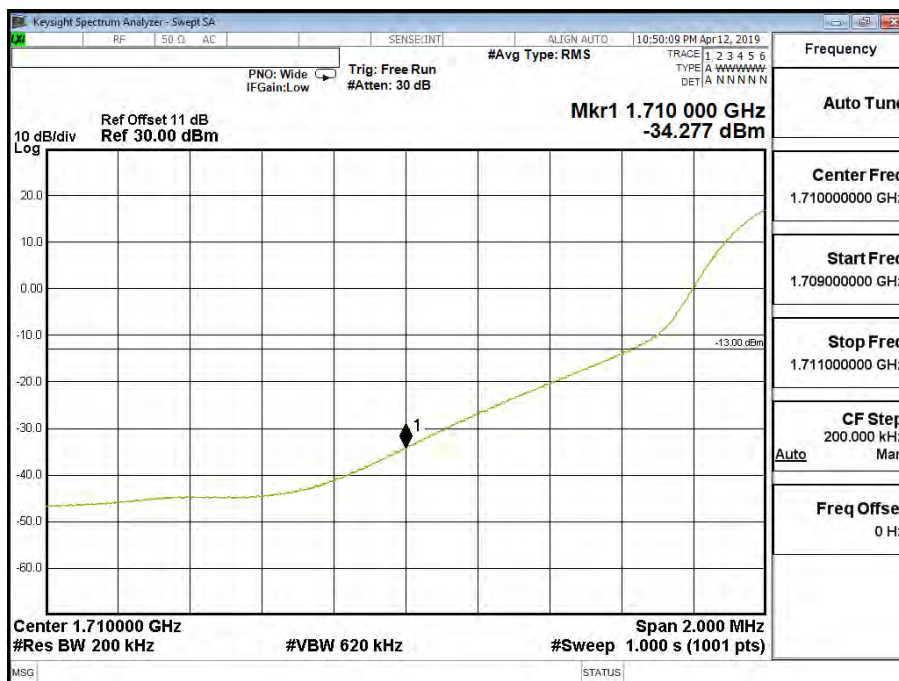
Band 4 (20M) QPSK(100,0) Lower Channel 20050 (1720MHz)



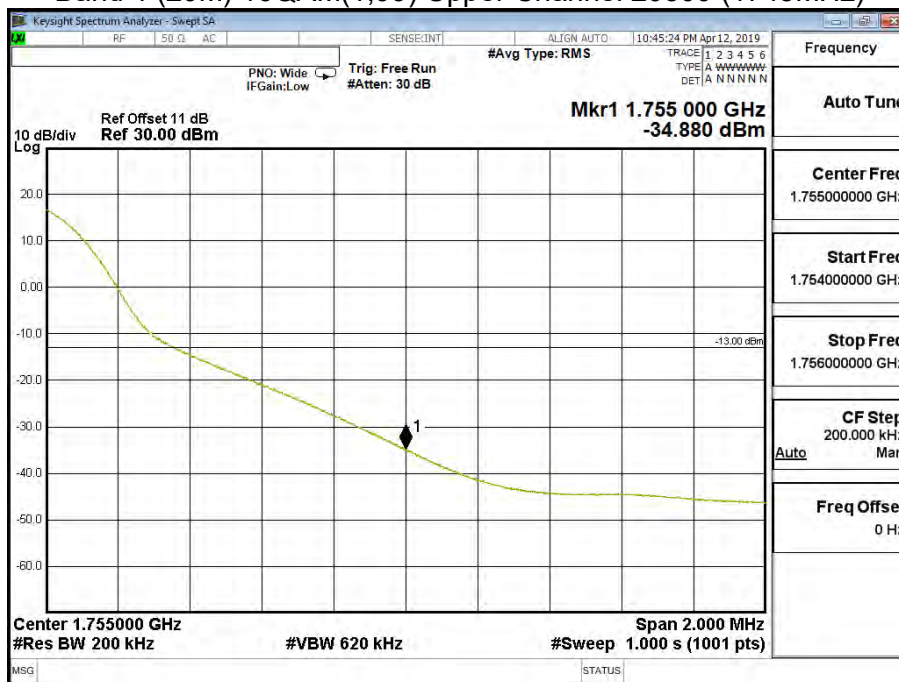
Band 4 (20M) QPSK(100,0) Upper Channel 20300 (1745MHz)



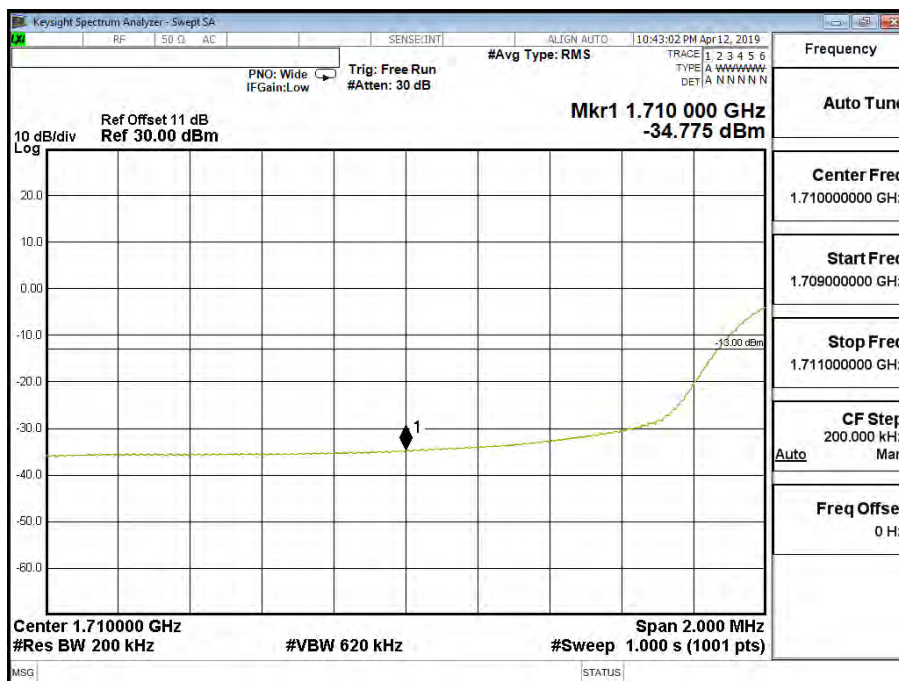
Band 4 (20M) 16QAM(1,0) Lower Channel 20050 (1720MHz)



Band 4 (20M) 16QAM(1,99) Upper Channel 20300 (1745MHz)



Band 4 (20M) 16QAM(100,0) Lower Channel 20050 (1720MHz)



Band 4 (20M) 16QAM(100,0) Upper Channel 20300 (1745MHz)

