



FCC TEST REPORT

FCC ID: SY4-B01011

On Behalf of

Shanghai Huace Navigation Technology LTD.

Handheld GNSS Data Collector

Model No.: LT50

Prepared for : Shanghai Huace Navigation Technology LTD.

Address : Building C, 599 Gaojing Road, Qingpu District,
Shanghai, China

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.

Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an
District, 518103, Shenzhen, Guangdong, China

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TEST REPORT DECLARATION

Applicant : Shanghai Huace Navigation Technology LTD.
 Address : Building C, 599 Gaojing Road, Qingpu District, Shanghai, China
 Manufacturer : Shanghai Huace Navigation Technology LTD.
 Address : Building C, 599 Gaojing Road, Qingpu District, Shanghai, China
 EUT Description : Handheld GNSS Data Collector
 (A) Model No. : LT50
 (B) Trademark : 

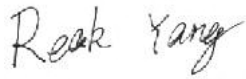
Measurement Standard Used:


- FCC CFR Title 47 Part 2
- FCC CFR Title 47 Part22 Subpart H
- FCC CFR Title 47 Part24 Subpart E
- FCC CFR Title 47 Part27

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Reak Yang
 Project Engineer 

Approved by (name + signature).....: Simple Guan
 Project Manager 

Date of issue..... : June 28, 2018

Revision History

Revision	Issue Date	Revisions	Revised By
00	June 28, 2018	Initial released Issue	Simple Guan

1 Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to SAR Report)
RF Output Power	Part 2.1046 part22.913(a) Part 24.232 (c) Part 27.50 (d)(4)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 part22.913(a) Part 24.238 Part 27.53(a)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 part22.913(a) Part 24.238 (a) Part 27.53 (h)	Pass
Field Strength of Spurious Radiation	Part 2.1053 part22.913(a) Part 24.238 (a) Part 27.53 (h)	Pass
Out of band emission, Band Edge	part22.913(a) Part 24.238 (a) Part 27.53(h)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Pass: The EUT complies with the essential requirements in the standard.

2 General Information

2.1 General Description of EUT

Product Name:	Handheld GNSS Data Collector
Model No.:	LT50
Support Networks:	LTE
Support Bands:	LTE Band 2, LTE Band 4, LTE Band 5, LTE Band 7, LTE Band 17
Channel Bandwidth:	LTE Band 2: 1.4MHz; 3MHz; 5MHz; 10MHz; 15MHz; 20MHz LTE Band 4: 1.4MHz; 3MHz; 5MHz; 10MHz; 15MHz; 20MHz LTE Band 5: 1.4MHz; 3MHz; 5MHz; 10MHz LTE Band 7: 5MHz; 10MHz; 15MHz; 20MHz LTE Band 17: 5MHz /10MHz
TX Frequency:	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.50MHz-2567.50MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz
Modulation type:	QPSK, 16QAM
Antenna type:	Internal antenna
Antenna gain:	0.17dBi(max.) For LTE Band 2; -1.19dBi(max.) For LTE Band 4; -1.23dBi(max.) For LTE Band 5; 1.11dBi(max.) For LTE Band 7; -1.75dBi(max.) For LTE Band 17;
Power supply:	DC 3.8V by battery or DC 5V from adapter input AC 120V, 60Hz

2.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22 subpart H and Part 24 subpart E of the FCC CFR 47 Rules.

2.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

2.4 Test Facility

Shenzhen Alpha Product Testing Co., Ltd

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen,
Guangdong, China

June 21, 2018 File on Federal Communication Commission

Registration Number: 293961

July 25, 2017 Certificated by IC

Registration Number: 12135A

3 Test Instruments list

Equipment	Manufacturer	Model No.	Serial No.	Last cal.	Cal. Due day
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2016.09.30	2018.09.29
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2016.09.30	2018.09.29
Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2016.09.29	2018.09.28
Filter	KANGMAI	ZLPF-LDC- 1000- 1959	1209002075	2017.09.22	2018.09.21
Filter	WAINWRIGHT	WHKX1.0G/15G - 10SS	SN40	2017.09.22	2018.09.21
Filter	WAINWRIGHT	WHKX2.80 /18G- 12SS	SN1	2017.09.22	2018.09.21
RF Cable	Resenberger	Cable 4	N/A	2017.09.22	2018.09.21
CMU200	ROHDE&SCHW ARZ	CMU200	116785	2017.09.22	2018.09.21
CMW500	ROHDE&SCHW ARZ	CMW500	1201.0002K50- 117239-sM	2017.09.22	2018.09.21
Signal Analyzer	Agilent	N9020A	MY499100060	2017.09.23	2018.09.22
vector Signal Generator	Agilent	N5182A	MY49060042	2017.09.22	2018.09.21
vector Signal Generator	Agilent	E4438C	US44271917	2017.09.28	2018.09.27
Amplifier	Agilent	8449B	3008A02664	2017.09.23	2018.09.22
Test Receiver	ROHDE&SCHW ARZ	ESR	1316.3003K03- 102082-Wa	2017.09.23	2018.09.22
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2016.09.30	2018.09.29
9*6*6 anechoic	CHENYU	9*6*6	N/A	2016.07.21	2020.07.20
RF Cable	Resenberger	Cable 1	N/A	2017.09.22	2018.09.21
RF Cable	Resenberger	Cable 2	N/A	2017.09.22	2018.09.21
RF Cable	Resenberger	Cable 3	N/A	2017.09.28	2018.09.27
Power Sensor	Power Radio	RPR3006W	15100041SNO91	2017.09.23	2018.09.22
20dB Attenuator	ICPROBING	IATS1	82347	2017.09.22	2018.09.21
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.09.22	2018.09.21
L.I.S.N.#2	ROHDE&SCHW ARZ	ENV216	101043	2017.09.22	2018.09.21
POWER DIVIDER	Mini-circuits	PD-2SF-0010	N/A	2017.09.22	2018.09.21
POWER DIVIDER	Mini-circuits	PD-2SF-0010	N/A	2017.09.22	2018.09.21
Temperature& Humidity test chamber	GZGONGWEN	GDS-250	080821	2017.10.22	2018.10.23

4 System test configuration

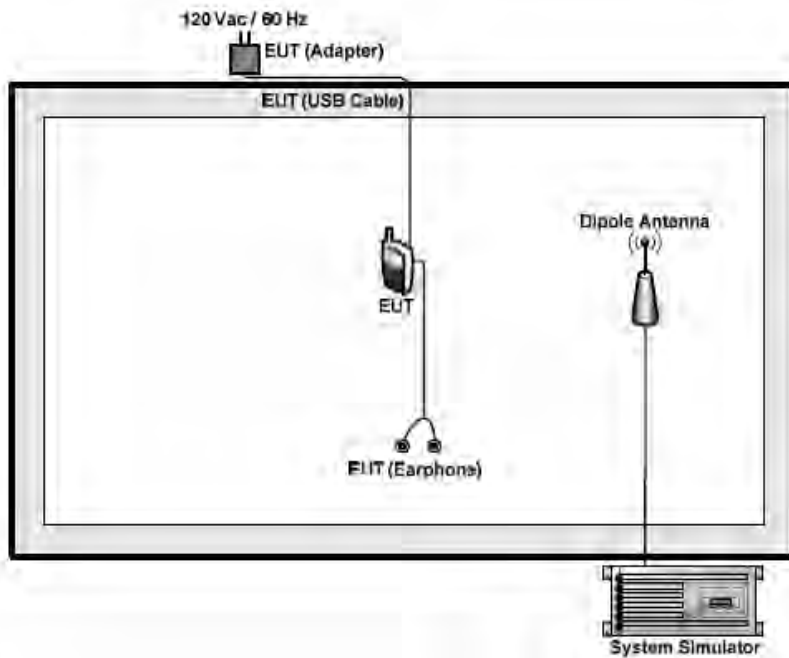
4.1 Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

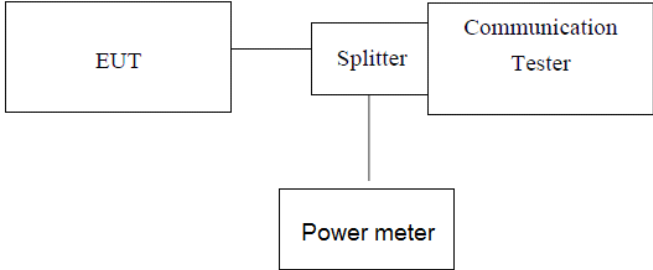
Test modes		
Band	Radiated	Conducted
LTE Band 2	■ QPSK link	■ QPSK link
LTE Band 4	■ QPSK link	■ QPSK link
LTE Band 5	■ QPSK link	■ QPSK link
LTE Band 7	■ QPSK link	■ QPSK link
LTE Band 17	■ QPSK link	■ QPSK link

Note: The maximum power levels are LTE mode for QPSK link. Only these modes were used for all tests.

4.2 Configuration of Tested System



4.3 Conducted Peak Output Power

Test Requirement:	FCC part22.913(a), FCC part24.232(b) and FCC part 27.50
Test Method:	FCC part2.1046
Limit:	LTE Band 2: 2W LTE Band 4: 1W LTE Band 5: 7W LTE Band 7: 2W LTE Band 17: 3W
Test setup:	 <pre> graph LR EUT[EUT] --- Splitter[Splitter] Splitter --- CT[Communication Tester] Splitter --- PM[Power meter] </pre> <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 7.1 for details
Test results:	Pass

Measurement Data

Band 2						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18607 1850.7MHz	Channel 18900 1880.0MHz	Channel 19193 1909.3MHz
1.4MHz	QPSK	1	0	21.71	22.20	22.54
		1	2	20.81	21.48	21.24
		1	5	20.72	23.62	20.08
		3	0	21.91	20.71	22.57
		3	1	20.82	22.47	22.31
		3	2	20.52	20.51	20.59
		6	0	21.00	19.99	22.63
	16QAM	1	0	21.04	23.45	22.99
		1	2	20.25	21.35	21.07
		1	5	22.22	23.07	23.31
		3	0	22.53	21.85	20.90
		3	1	21.67	22.25	23.25
		3	2	21.87	22.84	20.91
		6	0	20.80	20.55	20.13
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18615 1851.5MHz	Channel 18900 1880.0MHz	Channel 19185 1908.5MHz
3MHz	QPSK	1	0	21.72	22.12	22.03
		1	8	20.48	20.56	20.25
		1	14	22.43	21.41	22.35
		8	0	21.15	19.75	20.00
		8	4	22.59	22.36	21.39
		8	7	21.60	22.48	22.70
		15	0	22.75	21.81	19.43
	16QAM	1	0	22.73	22.89	22.08
		1	8	20.86	22.16	20.96
		1	15	22.16	22.14	19.29
		8	0	20.89	20.41	21.69
		8	4	20.79	20.12	22.01
		8	7	20.08	21.76	21.08
		15	0	22.44	22.14	20.79

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18625 1852.5MHz	Channel 18900 1880.0MHz	Channel 19175 1907.5MHz
5MHz	QPSK	1	0	22.39	21.96	22.55
		1	13	21.10	20.39	20.44
		1	24	20.90	21.74	22.30
		12	0	19.89	22.16	20.35
		12	6	21.27	21.10	21.31
		12	13	23.01	19.92	22.24
		25	0	22.43	22.06	20.78
	16QAM	1	0	21.04	22.14	21.31
		1	13	21.59	21.54	21.08
		1	24	20.44	19.85	22.51
		12	0	21.22	20.69	20.32
		12	6	20.58	21.25	20.57
		12	13	19.73	22.09	23.44
		25	0	21.82	21.72	20.34
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18650 1855.0MHz	Channel 18900 1880.0MHz	Channel 19150 1905.0MHz
10MHz	QPSK	1	0	21.43	22.19	20.33
		1	25	20.06	21.50	20.82
		1	49	23.34	21.90	22.66
		25	0	20.07	19.43	20.27
		25	13	22.23	20.04	20.84
		25	25	20.54	20.89	21.83
		50	0	20.39	22.80	20.92
	16QAM	1	0	21.90	20.74	22.31
		1	25	20.44	21.04	23.21
		1	49	20.95	19.84	20.43
		25	0	21.77	20.46	21.53
		25	13	20.12	22.95	22.00
		25	25	22.02	22.40	20.77
		50	0	21.84	22.14	20.64

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18675 1857.5MHz	Channel 18900 1880.0MHz	Channel 19125 1902.5MHz
15MHz	QPSK	1	0	22.75	22.28	21.75
		1	38	19.77	21.33	22.25
		1	74	20.38	20.05	21.01
		36	0	23.20	22.90	21.77
		36	18	23.22	22.15	22.48
		36	39	20.28	21.50	22.13
		75	0	21.36	22.71	21.53
	16QAM	1	0	21.36	21.63	22.75
		1	38	21.27	20.25	20.10
		1	74	23.38	20.38	22.55
		36	0	19.82	22.95	21.70
		36	18	22.00	21.39	20.13
		36	39	22.47	22.36	20.45
		75	0	20.57	23.14	22.28
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 18700 1860.0MHz	Channel 18900 1880.0MHz	Channel 19100 1900.0MHz
20MHz	QPSK	1	0	21.27	23.37	21.99
		1	50	23.34	23.14	20.74
		1	99	22.01	21.34	20.47
		50	0	22.25	20.17	22.50
		50	25	20.59	21.48	20.31
		50	50	21.41	20.93	21.41
		100	0	20.48	22.65	22.28
	16QAM	1	0	22.34	21.50	22.28
		1	50	20.89	19.48	22.07
		1	99	22.23	22.50	22.80
		50	0	21.20	21.99	23.13
		50	25	23.12	21.87	22.93
		50	50	20.70	20.63	21.91
		100	0	20.58	20.75	22.11

Band 4						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 19957 1710.7MHz	Channel 20175 1732.5MHz	Channel 20393 1754.3MHz
1.4MHz	QPSK	1	0	21.18	21.20	21.23
		1	2	21.46	21.47	21.44
		1	5	21.04	22.56	22.51
		3	0	21.40	22.72	22.19
		3	1	22.10	21.72	23.47
		3	2	22.10	21.98	22.37
		6	0	23.66	21.64	22.08
	16QAM	1	0	21.49	20.87	21.18
		1	2	22.19	21.84	22.65
		1	5	20.82	21.66	21.74
		3	0	21.84	21.09	23.21
		3	1	21.64	20.62	22.41
		3	2	22.73	22.41	23.49
		6	0	21.55	22.38	23.03
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 19965 1711.5MHz	Channel 20175 1732.5MHz	Channel 20385 1753.5MHz
3MHz	QPSK	1	0	21.66	22.19	21.84
		1	8	21.79	22.73	21.98
		1	14	21.72	21.21	21.40
		8	0	21.25	22.95	21.47
		8	4	21.75	22.03	22.78
		8	7	21.02	22.72	21.99
		15	0	23.05	21.79	22.94
	16QAM	1	0	22.27	22.51	21.36
		1	8	22.51	22.78	22.20
		1	15	21.03	22.10	21.99
		8	0	22.35	22.26	20.89
		8	4	20.99	21.46	20.90
		8	7	21.52	22.51	21.71
		15	0	22.56	23.28	21.66

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 19975 1712.5MHz	Channel 20175 1732.5MHz	Channel 20375 1752.5MHz
5MHz	QPSK	1	0	22.33	21.83	22.05
		1	13	22.66	22.28	21.88
		1	24	21.27	21.56	21.45
		12	0	22.90	22.03	21.51
		12	6	21.02	21.79	20.92
		12	13	21.99	22.06	21.42
		25	0	22.17	22.05	21.59
	16QAM	1	0	21.72	23.17	21.53
		1	13	22.04	21.87	21.96
		1	24	23.20	22.91	21.46
		12	0	22.43	23.42	22.05
		12	6	21.64	21.09	21.13
		12	13	21.40	21.67	22.45
		25	0	22.35	23.42	20.80
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20000 1715.0MHz	Channel 20175 1732.5MHz	Channel 20350 1750.0MHz
10MHz	QPSK	1	0	21.40	21.85	21.20
		1	25	20.84	22.77	22.45
		1	49	20.87	22.71	22.39
		25	0	22.67	21.56	22.53
		25	13	21.69	22.05	21.97
		25	25	22.24	23.51	21.09
		50	0	21.72	22.74	21.77
	16QAM	1	0	21.53	21.71	21.98
		1	25	22.23	20.79	22.08
		1	49	22.44	22.58	22.04
		25	0	23.04	22.12	23.06
		25	13	21.35	22.21	22.71
		25	25	22.31	22.18	20.41
		50	0	22.26	21.56	21.82

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20025 1717.5MHz	Channel 20175 1732.5MHz	Channel 20325 1747.5MHz
15MHz	QPSK	1	0	22.92	22.98	23.12
		1	38	21.64	22.78	21.43
		1	74	22.75	21.97	23.62
		36	0	22.31	22.46	22.03
		36	18	22.62	23.04	22.39
		36	39	22.00	21.25	21.26
		75	0	21.55	21.36	22.14
	16QAM	1	0	21.57	23.05	22.55
		1	38	22.28	22.45	21.53
		1	74	23.14	23.39	22.03
		36	0	21.71	23.02	22.06
		36	18	22.50	22.42	21.98
		36	39	20.87	21.65	20.65
		75	0	23.13	22.20	21.89
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20050 1720.0MHz	Channel 20175 1732.5MHz	Channel 20300 1745.0MHz
20MHz	QPSK	1	0	22.60	21.33	22.87
		1	50	21.45	21.67	22.09
		1	99	21.24	21.21	20.66
		50	0	21.20	20.89	21.75
		50	25	22.41	20.80	22.12
		50	50	22.34	22.93	22.36
		100	0	21.80	21.45	22.64
	16QAM	1	0	23.08	20.73	21.13
		1	50	22.16	21.15	22.72
		1	99	22.26	21.21	22.05
		50	0	22.28	22.56	22.31
		50	25	22.72	21.81	22.44
		50	50	22.56	21.45	21.63
		100	0	21.42	22.41	22.19

Band 5						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20407 824.7MHz	Channel 20525 836.5MHz	Channel 20643 848.3MHz
1.4MHz	QPSK	1	0	22.36	21.84	22.02
		1	2	21.04	20.69	20.93
		1	5	21.10	23.47	22.99
		3	0	21.19	22.84	21.20
		3	1	21.90	21.63	22.95
		3	2	21.99	22.62	22.05
		6	0	22.08	22.07	21.06
	16QAM	1	0	21.78	21.30	22.42
		1	2	21.32	22.44	22.11
		1	5	21.56	21.91	21.72
		3	0	22.21	21.11	22.75
		3	1	21.04	21.41	22.94
		3	2	22.93	22.11	23.93
		6	0	21.78	22.13	22.42
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20415 825.5MHz	Channel 20525 836.5MHz	Channel 20635 847.5MHz
3MHz	QPSK	1	0	21.80	22.50	21.11
		1	8	22.70	22.38	21.77
		1	14	22.99	21.39	21.14
		8	0	22.13	22.50	20.93
		8	4	21.23	21.69	23.24
		8	7	21.06	22.62	21.86
		15	0	22.68	19.67	21.90
	16QAM	1	0	21.93	22.09	22.28
		1	8	22.67	21.63	23.03
		1	15	22.36	20.92	23.09
		8	0	21.26	22.35	20.92
		8	4	21.41	22.07	21.49
		8	7	21.71	22.41	22.07
		15	0	21.82	23.68	20.96

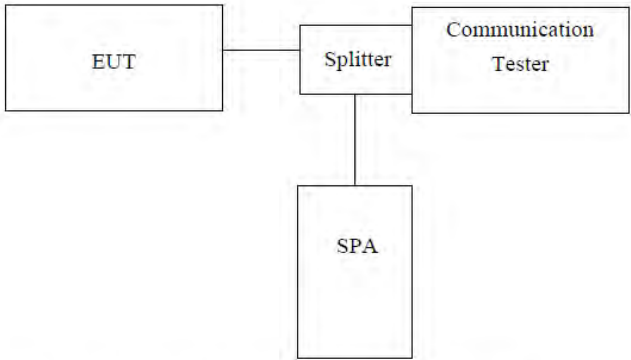
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20425 826.5MHz	Channel 20525 836.5MHz	Channel 20625 846.5MHz
5MHz	QPSK	1	0	22.11	21.01	22.20
		1	13	22.35	21.00	21.24
		1	24	21.91	23.47	22.20
		12	0	23.08	23.39	20.62
		12	6	21.15	21.84	19.77
		12	13	21.89	22.72	21.91
		25	0	21.39	21.54	22.93
	16QAM	1	0	22.74	23.90	21.20
		1	13	22.92	22.61	21.95
		1	24	23.34	22.82	21.43
		12	0	22.65	22.98	21.09
		12	6	20.32	21.83	21.59
		12	13	22.49	21.48	22.58
		25	0	22.57	22.51	21.48
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20450 829MHz	Channel 20525 836.5MHz	Channel 20600 844.0MHz
10MHz	QPSK	1	0	21.34	21.12	21.48
		1	25	21.99	23.06	22.02
		1	49	22.06	21.85	22.49
		25	0	22.43	21.44	22.24
		25	13	21.27	20.84	21.42
		25	25	21.76	23.18	21.50
		50	0	21.15	22.21	21.56
	16QAM	1	0	20.93	21.14	21.32
		1	25	21.31	21.71	21.07
		1	49	21.84	23.65	22.21
		25	0	22.04	21.07	22.06
		25	13	22.28	23.21	22.47
		25	25	20.80	21.24	20.36
		50	0	22.31	21.88	21.62

Band 7						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20775 2502.5MHz	Channel 21100 2535MHz	Channel 21425 2567.5MHz
5MHz	QPSK	1	0	21.46	22.25	22.50
		1	13	21.14	22.64	21.19
		1	24	20.98	22.00	21.99
		12	0	22.27	21.45	22.43
		12	6	21.99	23.48	21.67
		12	13	22.53	21.73	20.69
		25	0	23.07	21.62	22.65
	16QAM	1	0	22.03	22.56	22.13
		1	13	21.69	21.78	21.74
		1	24	21.31	22.54	21.93
		12	0	22.41	23.82	22.33
		12	6	21.07	20.99	22.76
		12	13	22.93	21.75	22.66
		25	0	22.98	22.83	21.60
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20800 2505MHz	Channel 21100 2535MHz	Channel 21400 2565MHz
10MHz	QPSK	1	0	20.68	20.82	23.40
		1	25	22.52	22.16	21.14
		1	49	22.84	22.90	22.98
		25	0	21.91	22.58	21.87
		25	13	20.97	21.76	22.07
		25	25	21.60	20.82	20.87
		50	0	22.26	22.11	21.48
	16QAM	1	0	22.13	20.95	21.95
		1	25	22.81	21.76	22.20
		1	49	20.95	21.78	22.84
		25	0	22.93	22.90	22.31
		25	13	22.36	21.14	22.23
		25	25	20.79	21.74	21.51
		50	0	23.07	22.39	22.33

Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20825 2507.5MHz	Channel 21100 2535MHz	Channel 21375 2562.5MHz
15MHz	QPSK	1	0	22.86	22.83	22.57
		1	38	22.46	22.07	22.86
		1	74	21.33	21.51	21.35
		36	0	21.75	22.90	20.86
		36	18	23.16	21.39	23.48
		36	39	22.25	20.67	20.52
		75	0	21.92	22.24	21.98
	16QAM	1	0	21.88	22.21	22.79
		1	38	22.55	21.55	22.44
		1	74	23.32	22.93	21.73
		36	0	21.72	23.12	21.19
		36	18	22.19	22.90	22.85
		36	39	22.61	21.36	21.96
		75	0	21.77	22.72	22.51
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 20850 2510MHz	Channel 21100 2535MHz	Channel 21350 2560MHz
20MHz	QPSK	1	0	21.96	21.24	22.44
		1	50	21.17	22.69	22.61
		1	99	21.94	21.41	22.57
		50	0	21.10	21.07	23.02
		50	25	23.08	20.90	21.95
		50	50	20.79	20.63	22.40
		100	0	22.28	20.80	21.81
	16QAM	1	0	22.25	22.22	21.65
		1	50	22.06	20.71	20.94
		1	99	22.53	22.27	22.10
		50	0	23.57	20.68	21.47
		50	25	20.99	23.09	21.89
		50	50	22.51	21.20	23.29
		100	0	21.64	22.41	21.59

Band 17						
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23755 706.5MHz	Channel 23790 710MHz	Channel 23825 713.5MHz
5MHz	QPSK	1	0	22.31	22.84	22.05
		1	13	20.77	21.86	21.42
		1	24	20.51	23.02	22.51
		12	0	22.24	22.01	21.96
		12	6	21.76	22.29	22.35
		12	13	22.12	21.77	21.26
		25	0	23.50	22.09	22.70
	16QAM	1	0	22.28	22.37	21.70
		1	13	21.34	20.94	21.99
		1	24	22.18	21.56	21.92
		12	0	22.34	22.09	22.68
		12	6	21.28	20.82	22.82
		12	13	22.53	21.55	23.17
		25	0	22.67	22.37	23.96
Bandwidth	Mode	RB Size	RB Offset	Actual output power(dBm)		
				Channel 23780 709MHz	Channel 23790 710MHz	Channel 23800 711MHz
10MHz	QPSK	1	0	21.38	22.43	22.47
		1	25	23.29	21.99	21.29
		1	49	23.20	21.49	23.14
		25	0	20.86	21.75	22.14
		25	13	21.19	22.60	22.04
		25	25	22.14	21.63	20.42
		50	0	22.30	22.42	21.35
	16QAM	1	0	21.79	21.39	21.41
		1	25	23.71	22.84	22.20
		1	49	20.79	21.57	22.55
		25	0	23.12	23.67	23.63
		25	13	23.62	21.92	21.41
		25	25	20.34	20.61	22.18
		50	0	22.63	22.63	22.70

4.4 Occupy Bandwidth

Test Requirement:	FCC part22.913(a), FCC part24.232(b) and FCC part27.53(a)
Test Method:	FCC part2.1049
Test setup:	 <pre> graph LR EUT[EUT] --- Splitter[Splitter] Splitter --- CT[Communication Tester] Splitter --- SPA[SPA] </pre> <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 7.1 for details
Test results:	Pass

Measurement Data

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 2	1.4MHz	Low range	6	0	1077.20	1227.00
		Mid range	6	0	1077.80	1220.00
		High range	6	0	1081.130	1240.00
	3MHz	Low range	15	0	2685.10	2942.00
		Mid range	15	0	2685.20	2911.00
		High range	15	0	2679.70	2917.00
	5MHz	Low range	25	0	4531.20	5011.00
		Mid range	25	0	4520.00	4970.00
		High range	25	0	4505.90	4993.00
	10MHz	Low range	50	0	8941.10	9777.00
		Mid range	50	0	8947.40	9633.00
		High range	50	0	8935.30	9567.00
	15MHz	Low range	75	0	13370.00	14380.00
		Mid range	75	0	13365.00	14360.00
		High range	75	0	13392.00	14450.00
	20MHz	Low range	100	0	17841.0	18850.00
		Mid range	100	0	17839.0	19170.00
		High range	100	0	17842.0	19220.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 4	1.4MHz	Low range	6	0	1075.80	1253.00
		Mid range	6	0	1076.20	1215.00
		High range	6	0	1076.60	1213.00
	3MHz	Low range	15	0	2684.00	2918.00
		Mid range	15	0	2678.50	2893.00
		High range	15	0	2682.30	2924.00
	5MHz	Low range	25	0	4525.00	5003.00
		Mid range	25	0	4520.10	4989.00
		High range	25	0	4508.50	5007.00
	10MHz	Low range	50	0	8927.60	9686.00
		Mid range	50	0	8927.50	9582.00
		High range	50	0	8930.40	9705.00
	15MHz	Low range	75	0	13401.00	14370.00
		Mid range	75	0	13337.00	14390.00
		High range	75	0	13376.00	14540.00
	20MHz	Low range	100	0	17846.0	19010.00
		Mid range	100	0	17823.0	19010.00
		High range	100	0	17861.0	19010.00

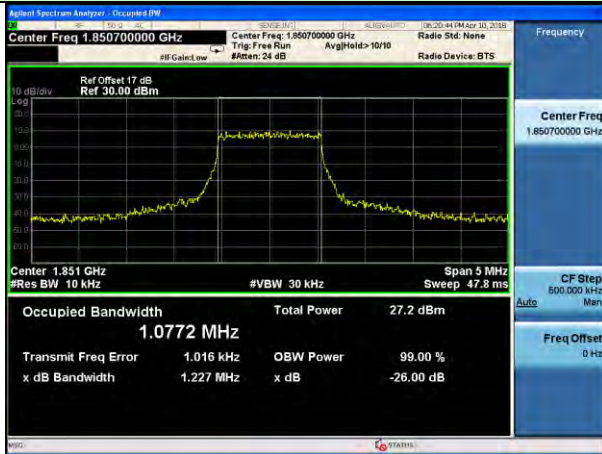
EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 5	1.4MHz	Low range	6	0	1075.70	1205.00
		Mid range	6	0	1076.10	1234.00
		High range	6	0	1076.90	1182.00
	3MHz	Low range	15	0	2684.80	2939.00
		Mid range	15	0	2681.30	2931.00
		High range	15	0	2689.90	2909.00
	5MHz	Low range	25	0	4502.60	4931.00
		Mid range	25	0	4513.90	4963.00
		High range	25	0	4500.00	4954.00
	10MHz	Low range	50	0	8926.50	9672.00
		Mid range	50	0	8946.90	9617.00
		High range	50	0	8905.20	9556.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 7	5MHz	Low range	25	0	4508.90	4936.00
		Mid range	25	0	4502.20	5004.00
		High range	25	0	4496.30	4918.00
	10MHz	Low range	50	0	8935.90	9737.00
		Mid range	50	0	8931.80	9559.00
		High range	50	0	8933.30	9617.00
	15MHz	Low range	75	0	13401.00	14420.00
		Mid range	75	0	13399.00	14400.00
		High range	75	0	13396.00	14390.00
	20MHz	Low range	100	0	17823.0	19050.00
		Mid range	100	0	17881.0	19090.00
		High range	100	0	17850.0	19210.00

EUT Mode	Channel Bandwidth	Channel	RB Configure		99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
			RB Size	RB Offset		
LTE Band 17	5MHz	Low range	25	0	4511.10	5005.00
		Mid range	25	0	4514.80	4935.00
		High range	25	0	4497.00	4963.00
	10MHz	Low range	50	0	8950.60	9704.00
		Mid range	50	0	8925.10	9644.00
		High range	50	0	8916.50	9524.00

Test plot as follows:

Test Mode: LTE Band 2 Channel Bandwidth: 1.4MHz	Test Mode: LTE Band 2 Channel Bandwidth: 3MHz
--	--



Lowest channel



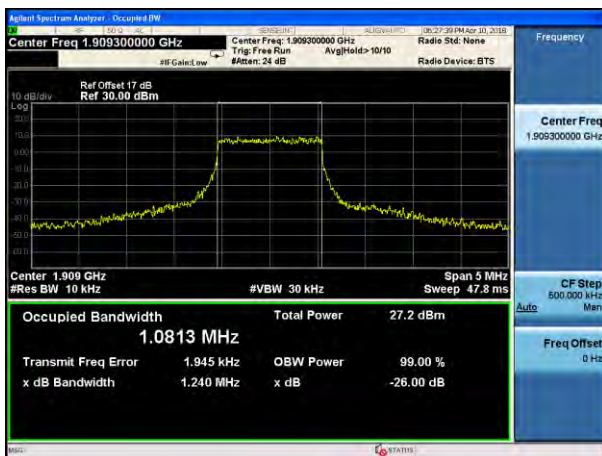
Lowest channel



Middle channel



Middle channel



Highest channel



Highest channel

Test Mode: LTE Band 2
Channel Bandwidth: 5MHz

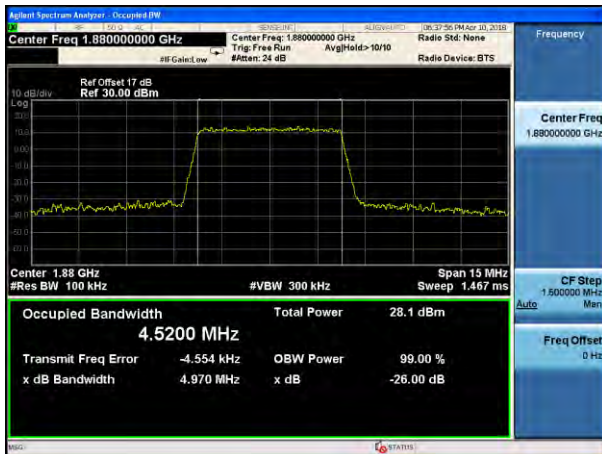


Lowest channel

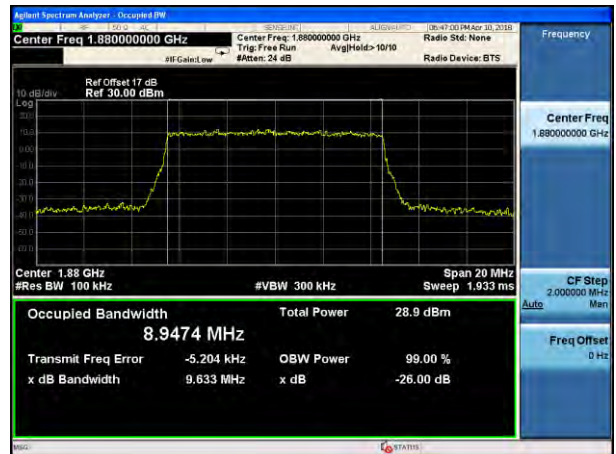
Test Mode: LTE Band 2
Channel Bandwidth: 10MHz



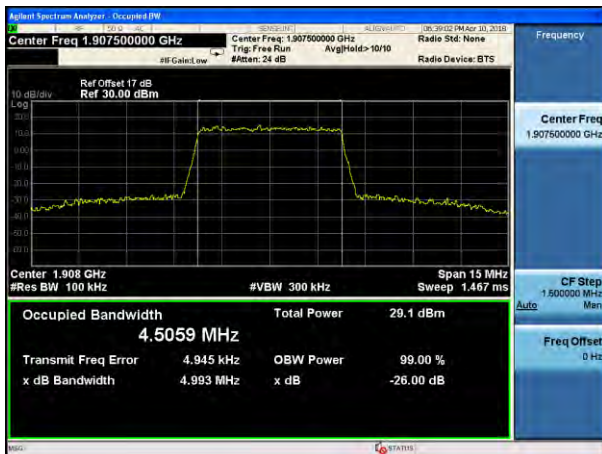
Lowest channel



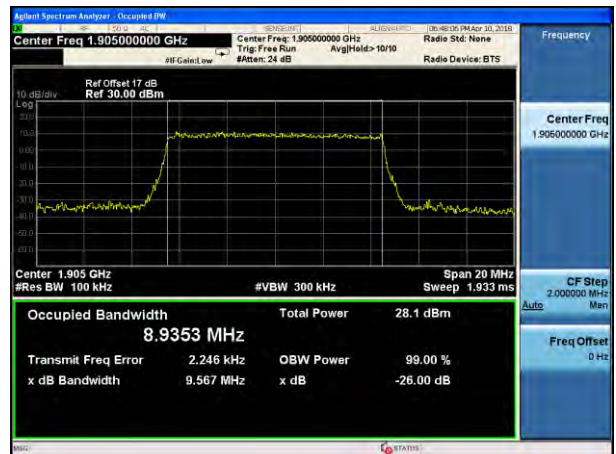
Middle channel



Middle channel

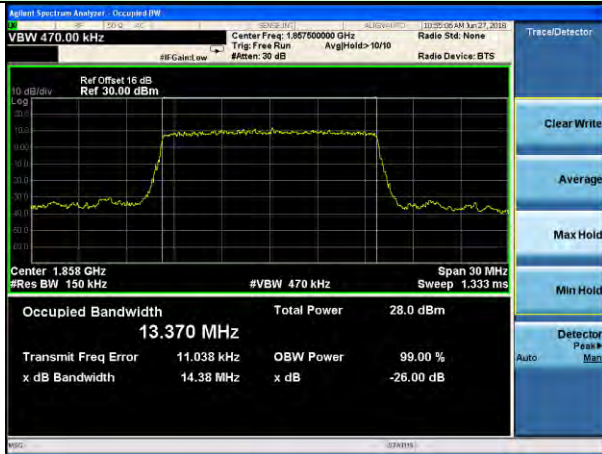


Highest channel

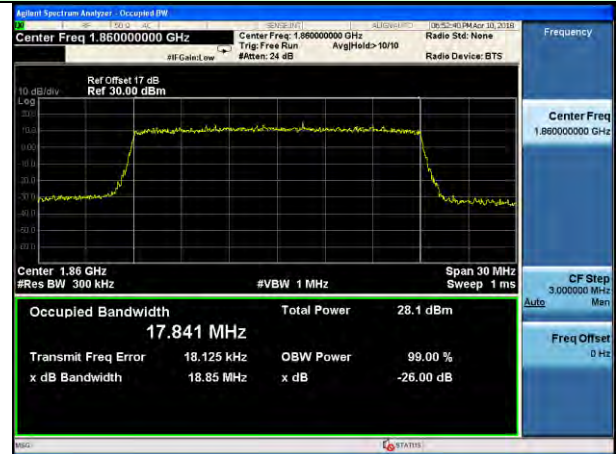


Highest channel

Test Mode: LTE Band 2 Channel Bandwidth: 15MHz	Test Mode: LTE Band 2 Channel Bandwidth: 20MHz
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Lowest channel



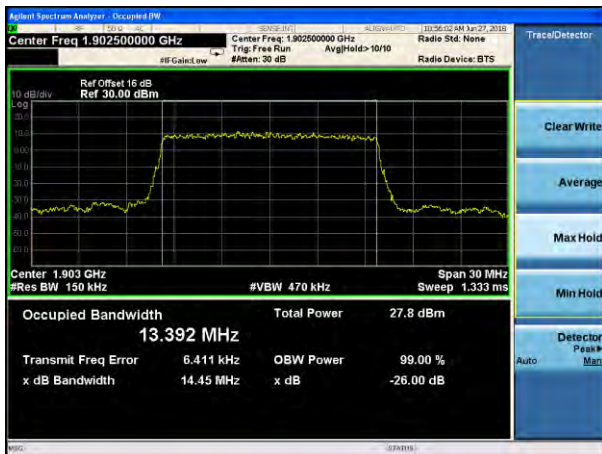
Lowest channel



Middle channel



Middle channel



Highest channel



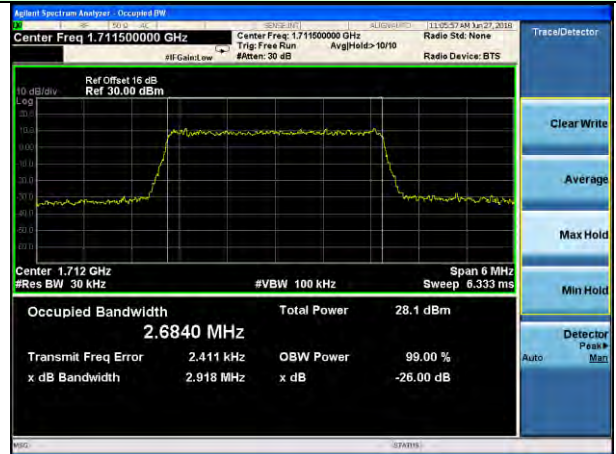
Highest channel

Test Mode: LTE Band 4
Channel Bandwidth: 1.4MHz

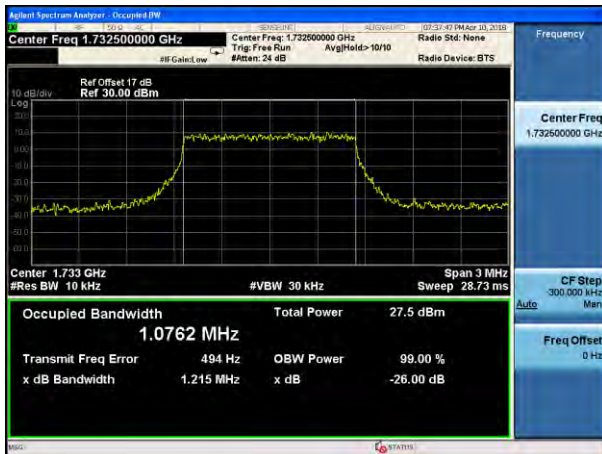


Lowest channel

Test Mode: LTE Band 4
Channel Bandwidth: 3MHz



Lowest channel



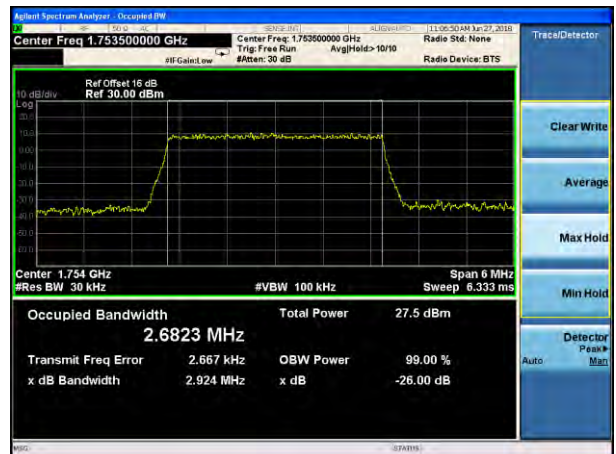
Middle channel



Middle channel



Highest channel



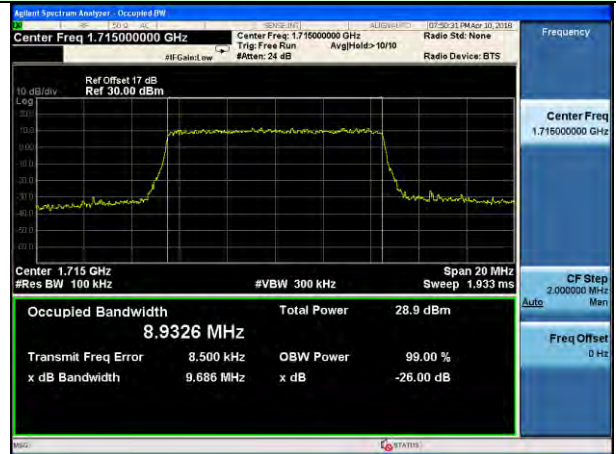
Highest channel

Test Mode: LTE Band 4
Channel Bandwidth: 5MHz



Lowest channel

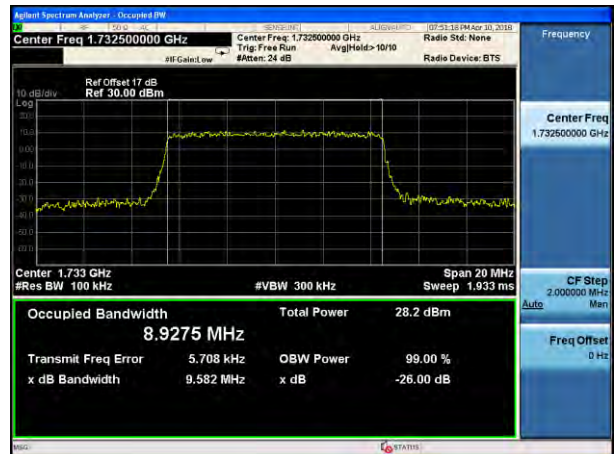
Test Mode: LTE Band 4
Channel Bandwidth: 10MHz



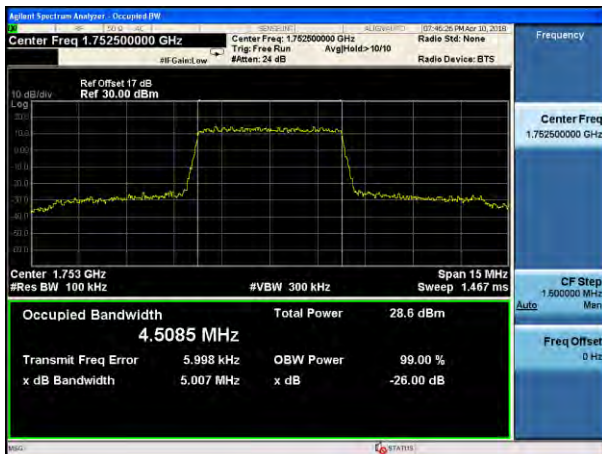
Lowest channel



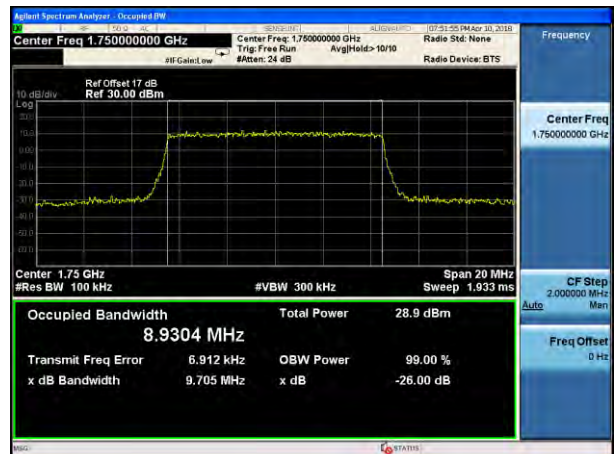
Middle channel



Middle channel



Highest channel

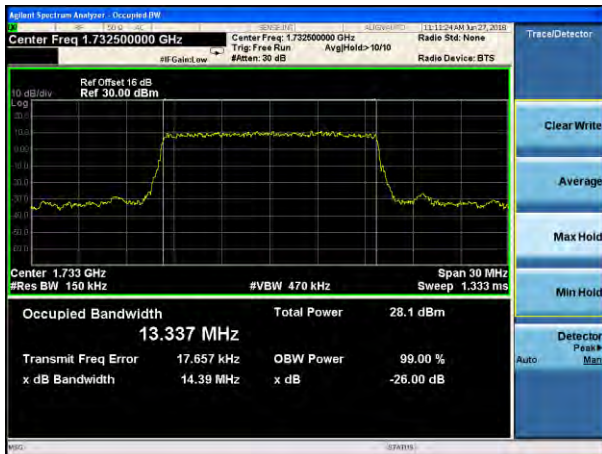


Highest channel

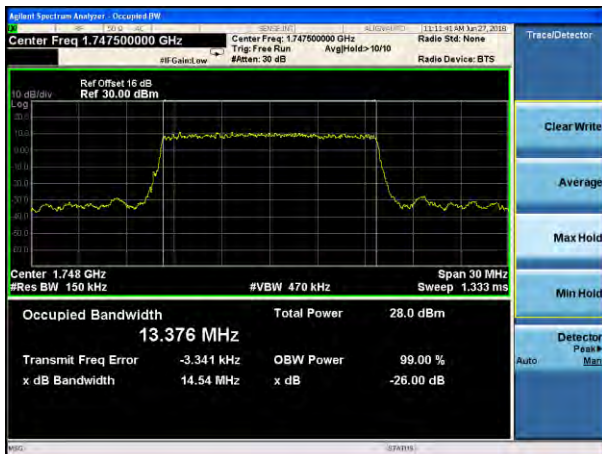
Test Mode: LTE Band 4
Channel Bandwidth: 15MHz



Lowest channel

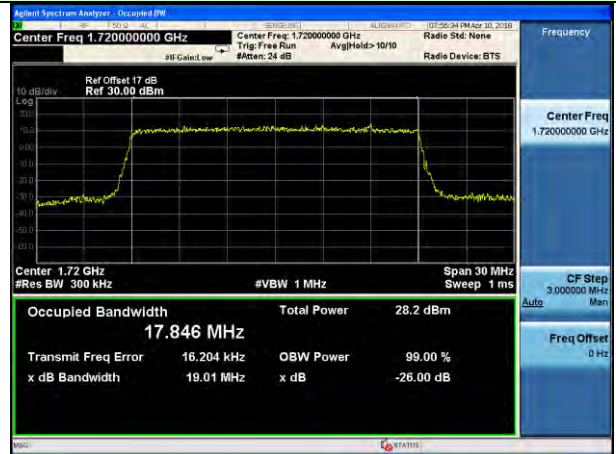


Middle channel

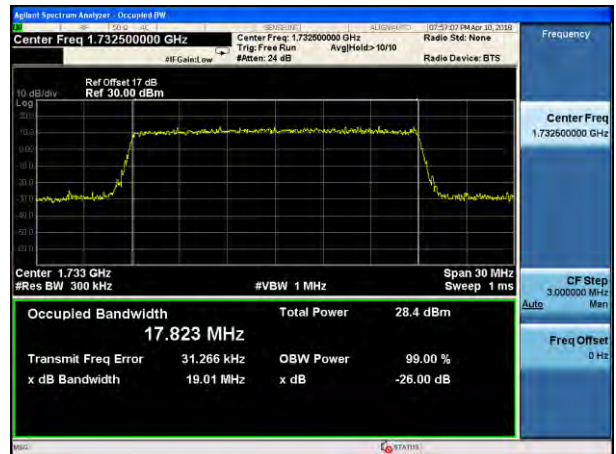


Highest channel

Test Mode: LTE Band 4
Channel Bandwidth: 20MHz



Lowest channel



Middle channel



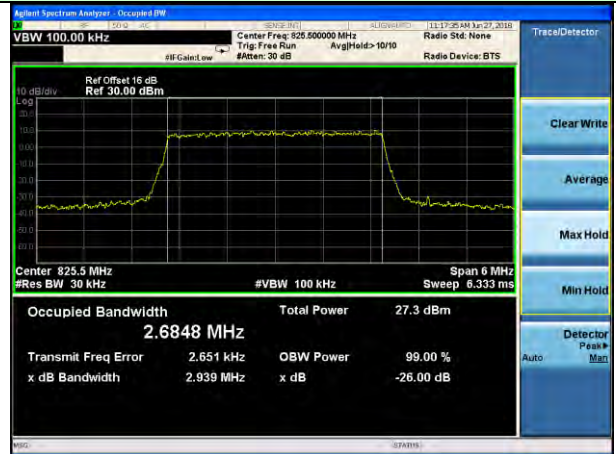
Highest channel

Test Mode: LTE Band 5
Channel Bandwidth: 1.4MHz



Lowest channel

Test Mode: LTE Band 5
Channel Bandwidth: 3MHz



Lowest channel



Middle channel



Middle channel



Highest channel



Highest channel

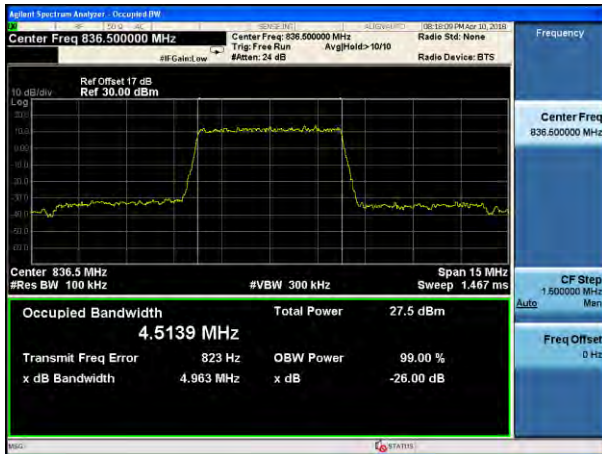
Test Mode: LTE Band 5
Channel Bandwidth: 5MHz



Test Mode: LTE Band 5
Channel Bandwidth: 10MHz



Lowest channel



Middle channel



Highest channel

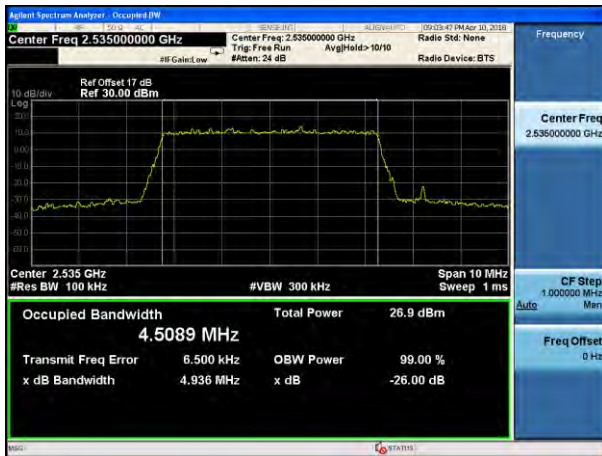
Test Mode: LTE Band 7 Channel Bandwidth: 5MHz	Test Mode: LTE Band 7 Channel Bandwidth: 10MHz
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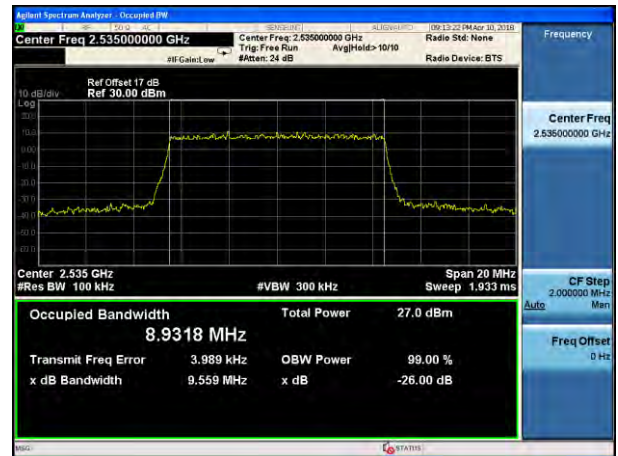
Lowest channel



Lowest channel



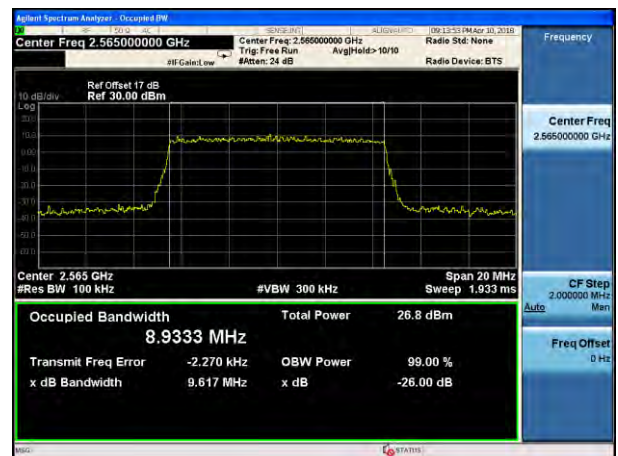
Middle channel



Middle channel



Highest channel



Highest channel

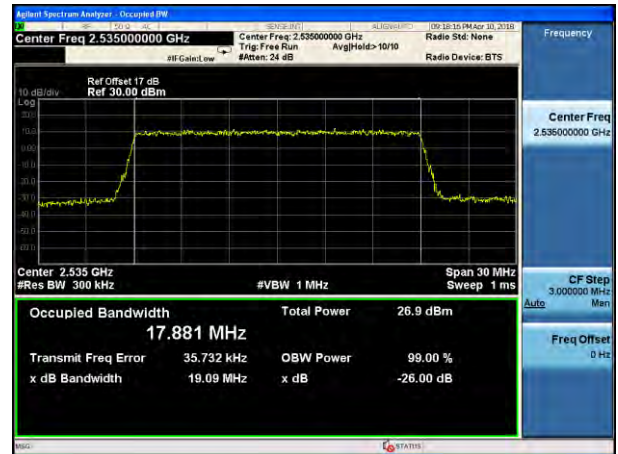
Test Mode: LTE Band 7
Channel Bandwidth: 15MHz



Test Mode: LTE Band 7
Channel Bandwidth: 20MHz



Lowest channel



Middle channel



Highest channel

Test Mode: LTE Band 17 Channel Bandwidth: 5MHz

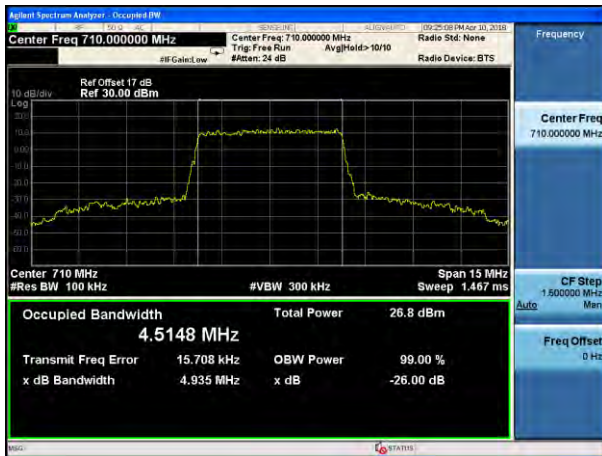


Lowest channel

Test Mode: LTE Band 17 Channel Bandwidth: 10MHz



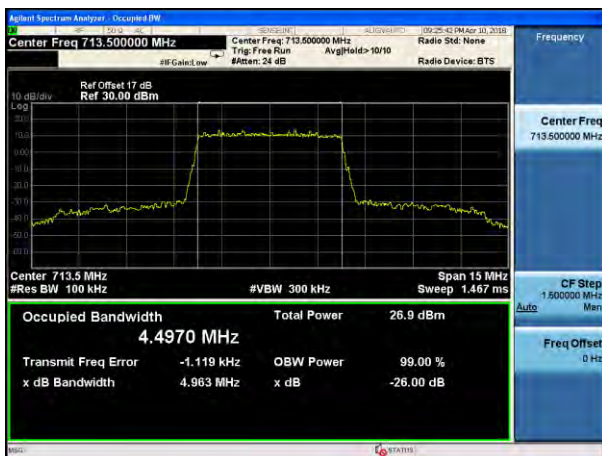
Lowest channel



Middle channel



Middle channel



Highest channel



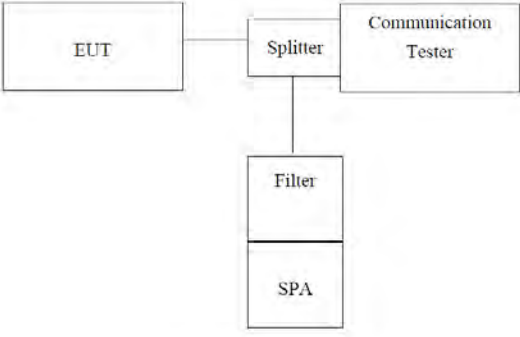
Highest channel

Note: All bandwidth and modulation are tested, only the worst result is reported.

4.5 MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 24E & Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

4.6 Out of band emission at antenna terminals

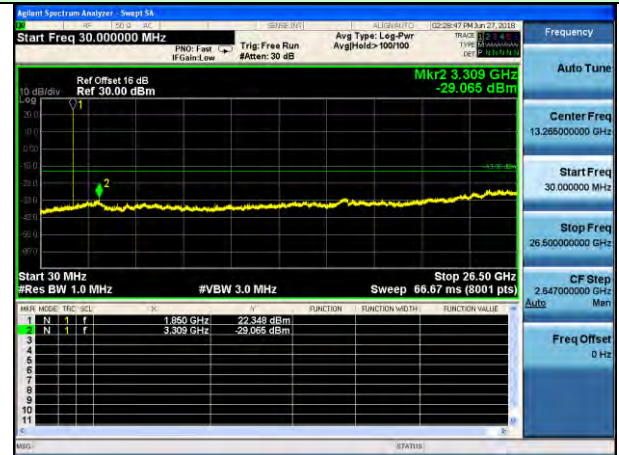
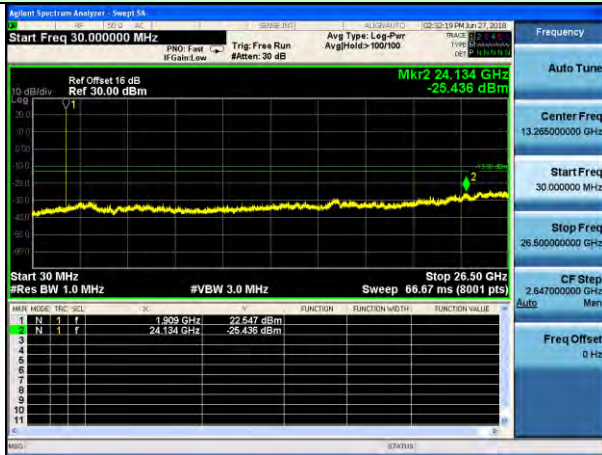
Test Requirement:	FCC part22.913(a), FCC part24.238(a) and FCC part27.53(h)
Test Method:	FCC part2.1051
Limit:	-13dBm
Test setup:	 <p style="text-align: center;"><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 7.1 for details
Test results:	Pass

Test plot as follows:

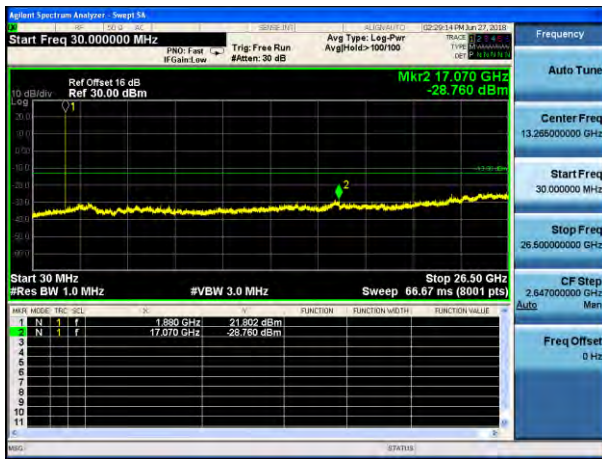
Conducted Spurious Emission:

Test Mode: LTE Band 2 / 1.4MHz /1RB

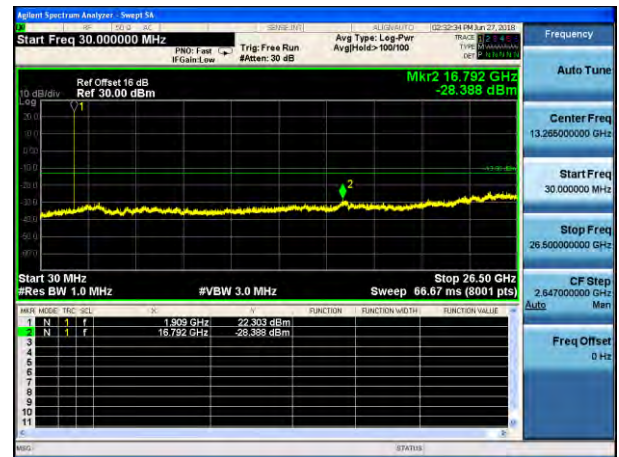
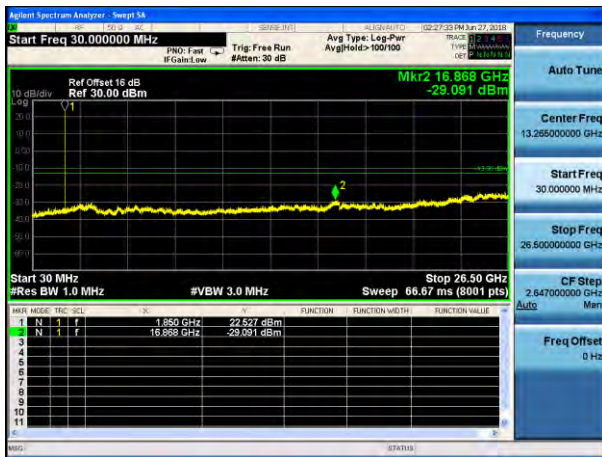
Test Mode: LTE Band 2 / 1.4MHz /6RB



Lowest channel



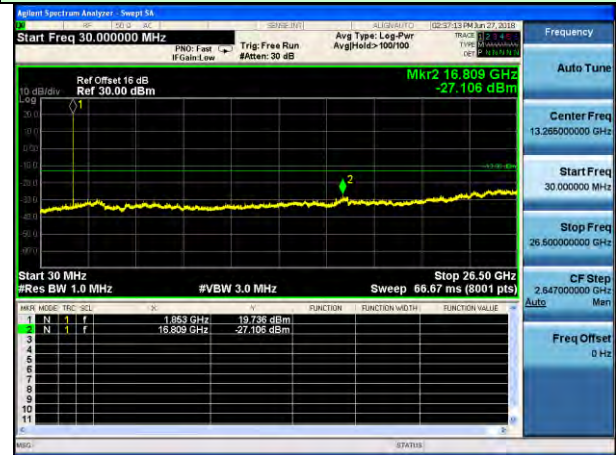
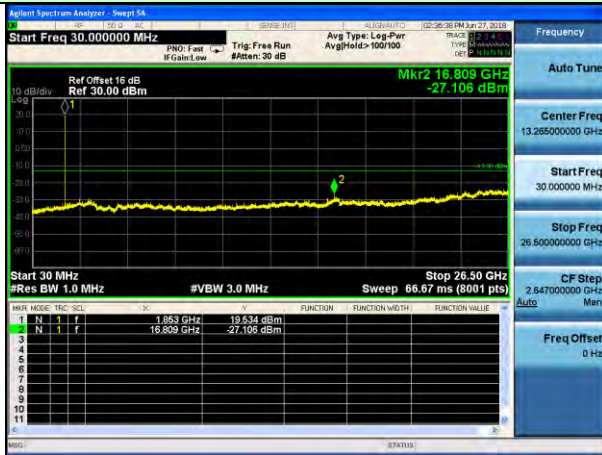
Middle channel



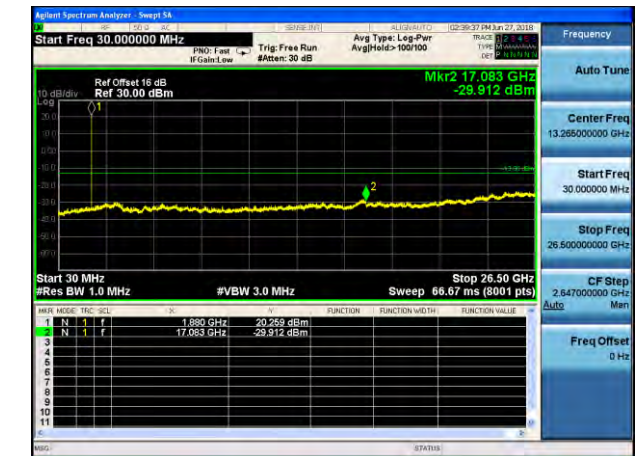
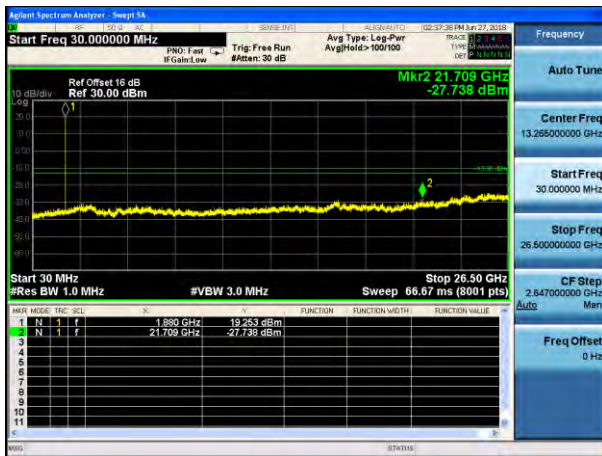
Highest channel

Test Mode: LTE Band 2 / 3MHz /1RB

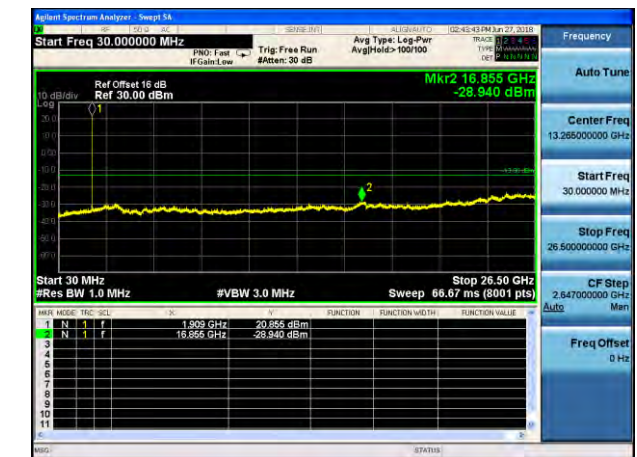
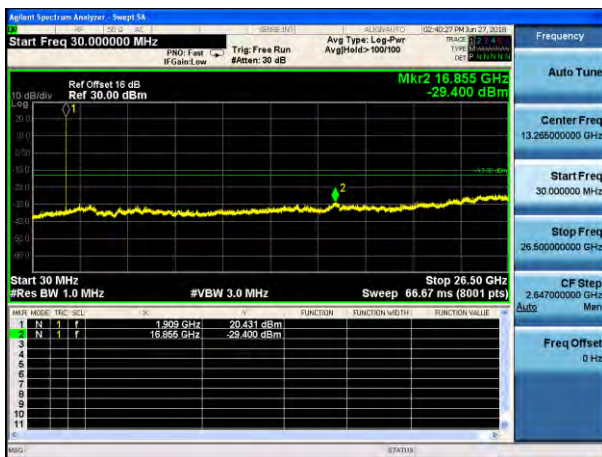
Test Mode: LTE Band 2 / 3MHz /15RB



Lowest channel

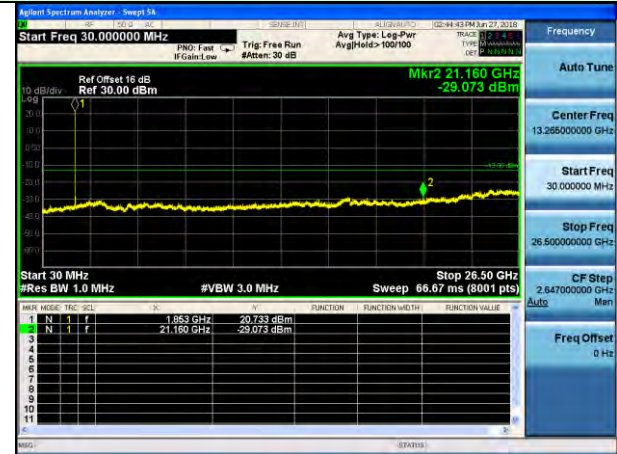


Middle channel

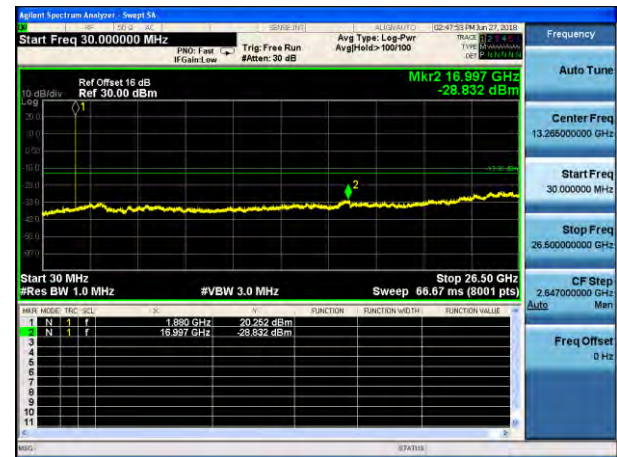
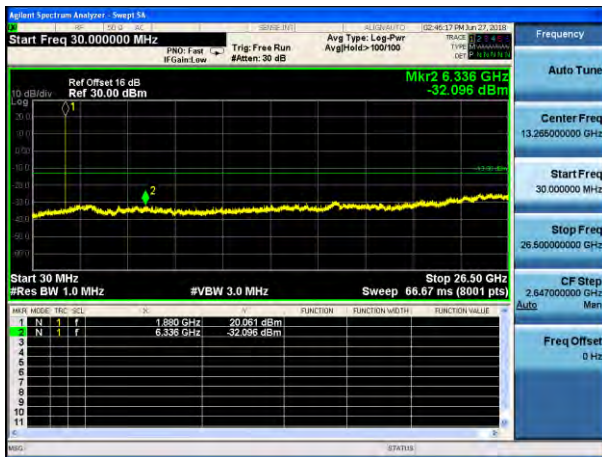


Highest channel

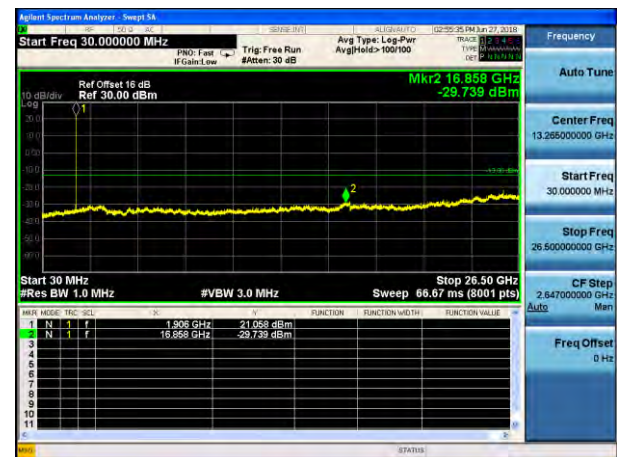
Test Mode: LTE Band 2 / 5MHz /1RB Test Mode: LTE Band 2 / 5MHz /25RB



Lowest channel



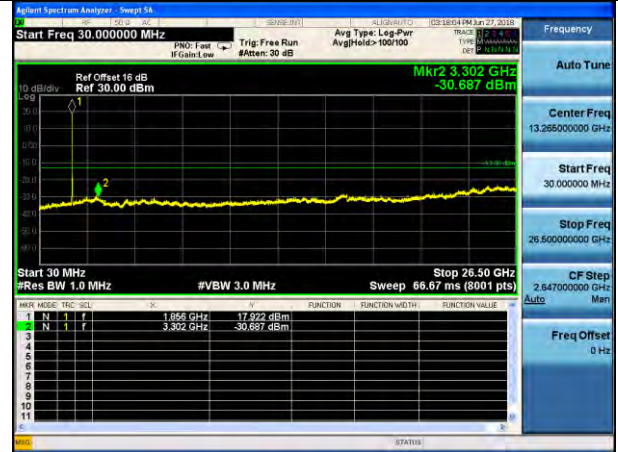
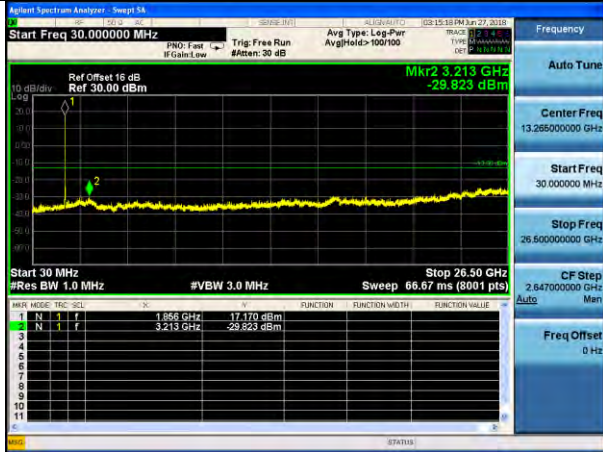
Middle channel



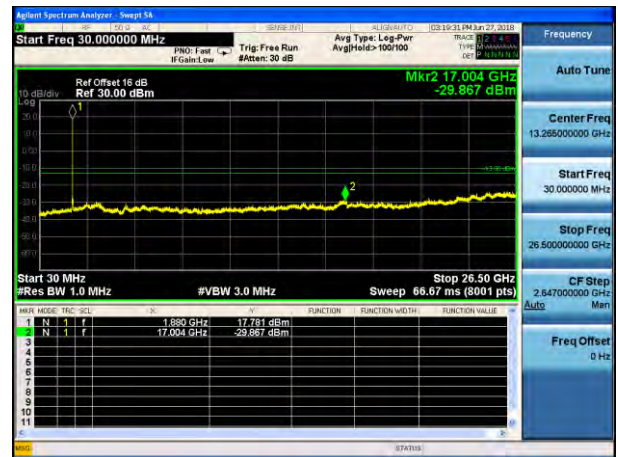
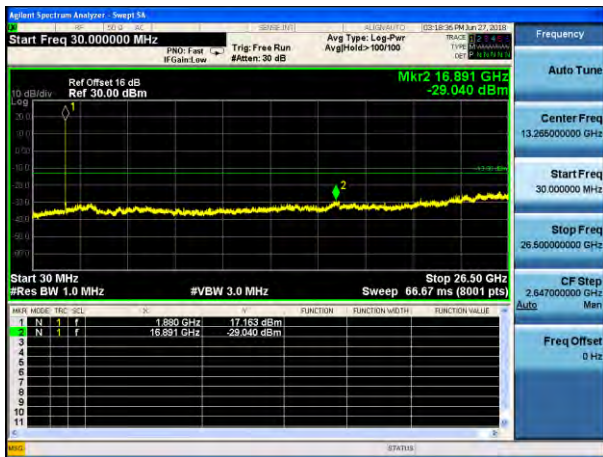
Highest channel

Test Mode: LTE Band 2 / 10MHz /1RB

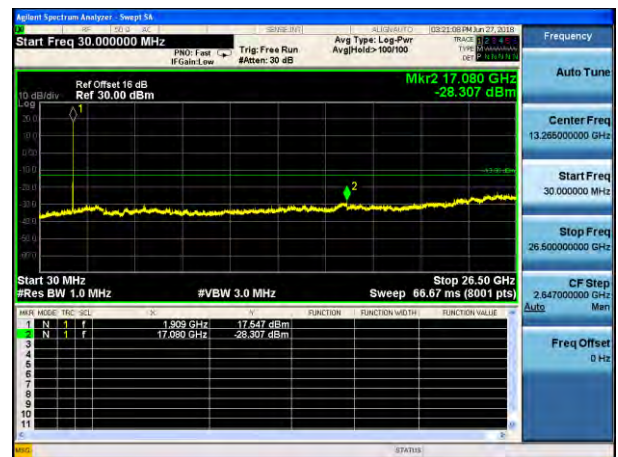
Test Mode: LTE Band 2 / 10MHz /50RB



Lowest channel



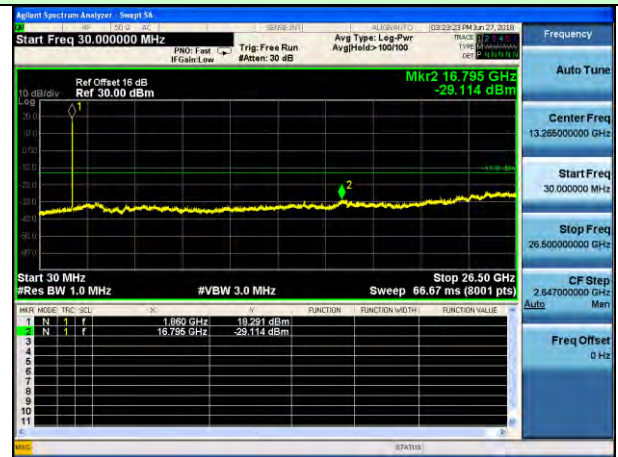
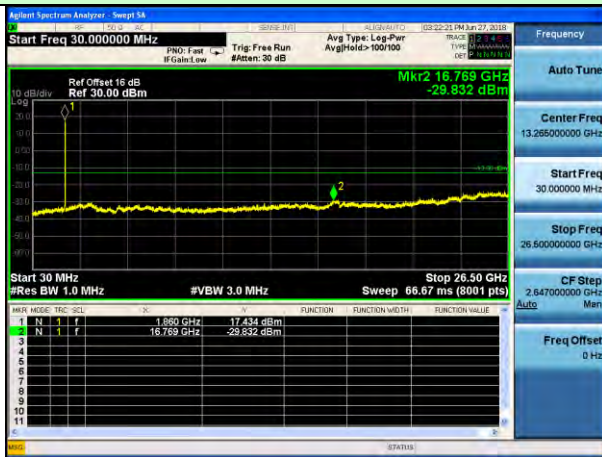
Middle channel



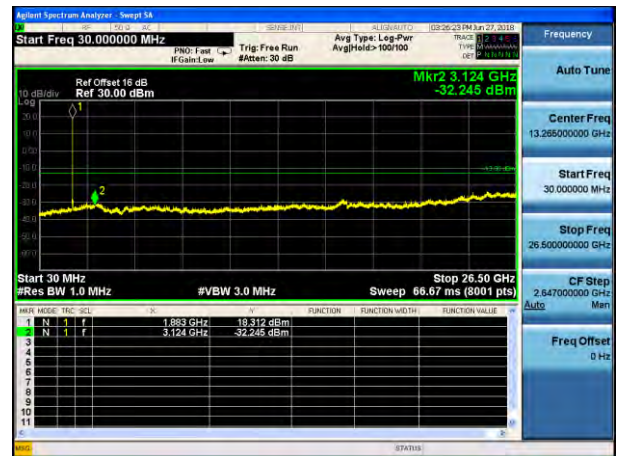
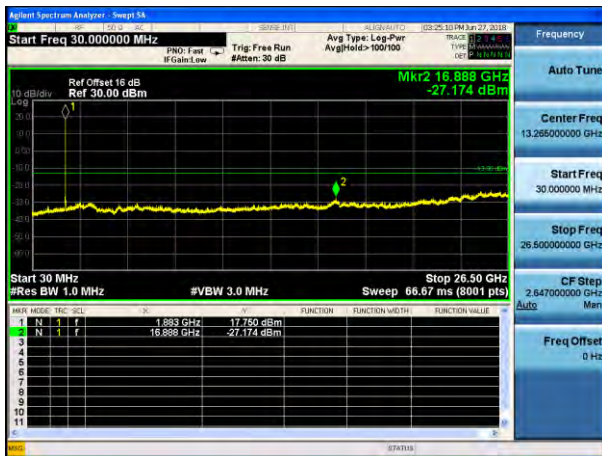
Highest channel

Test Mode: LTE Band 2 / 15MHz /1RB

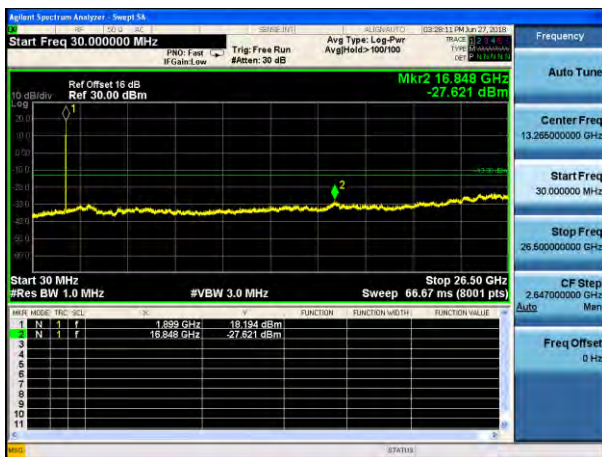
Test Mode: LTE Band 2 / 15MHz /75RB



Lowest channel



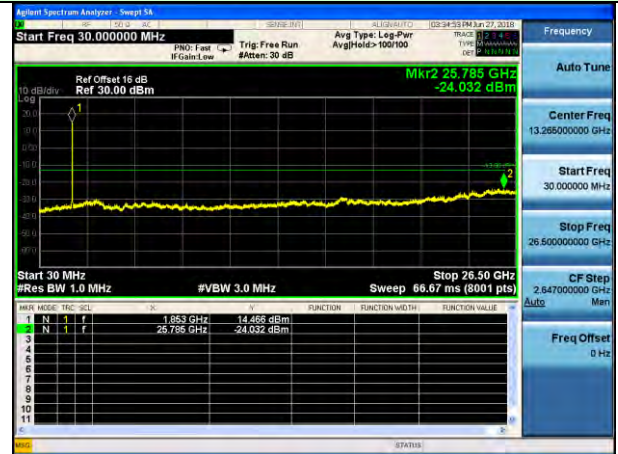
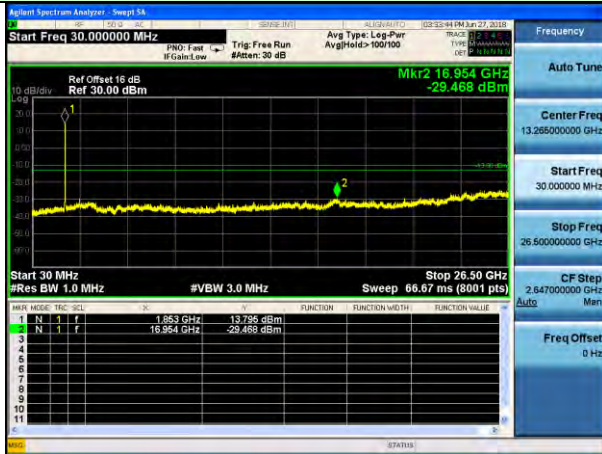
Middle channel



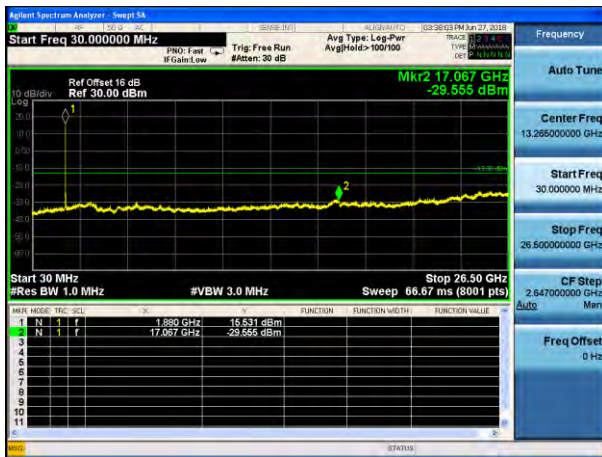
Highest channel

Test Mode: LTE Band 2 / 20MHz /1RB

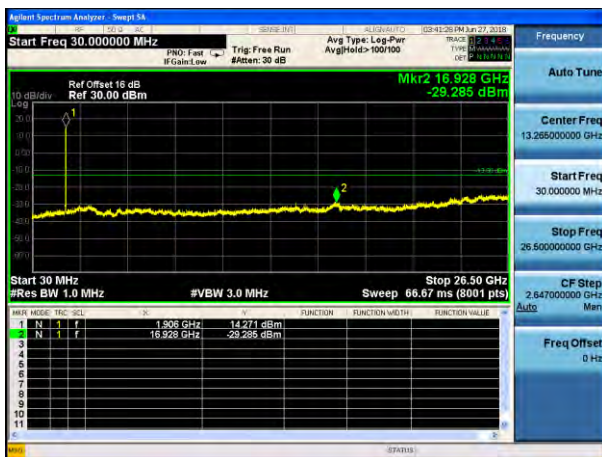
Test Mode: LTE Band 2 / 20MHz /100RB



Lowest channel



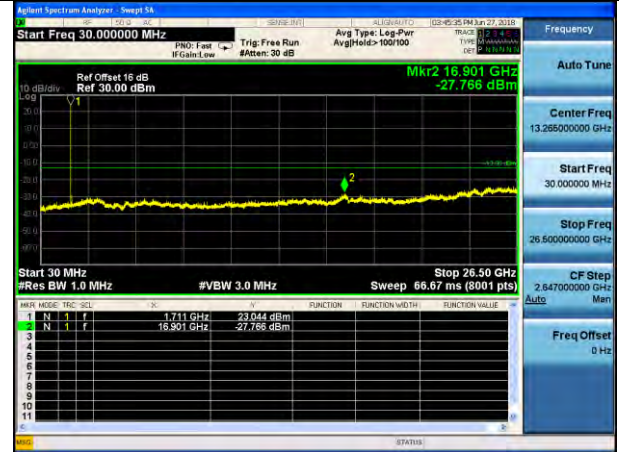
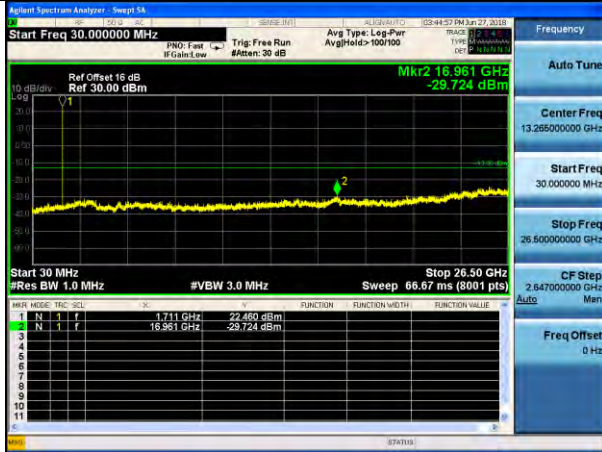
Middle channel



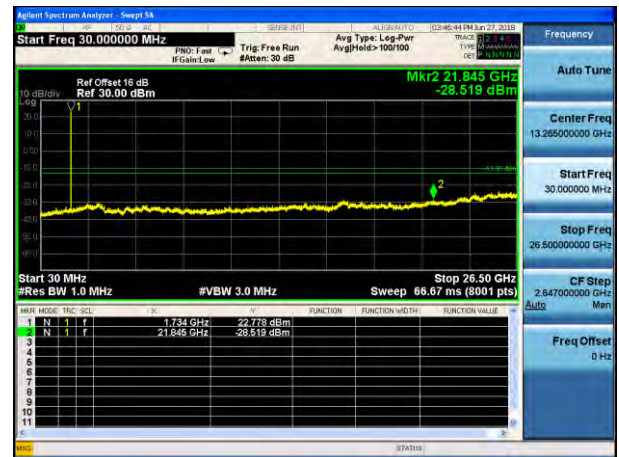
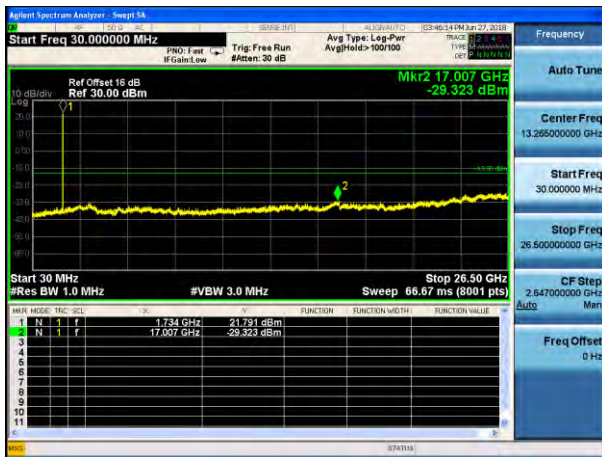
Highest channel

Test Mode: LTE Band 4 / 1.4MHz /1RB

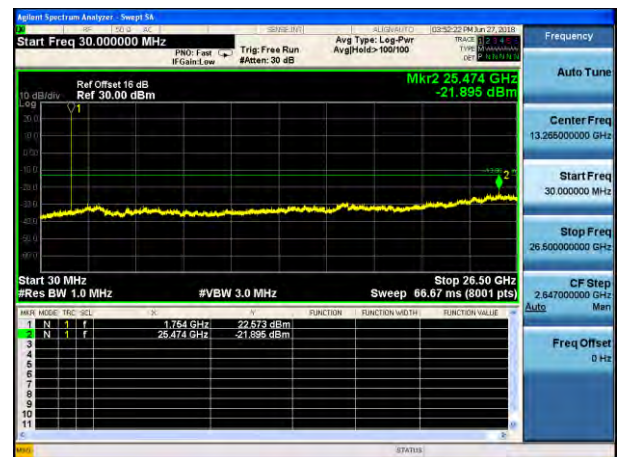
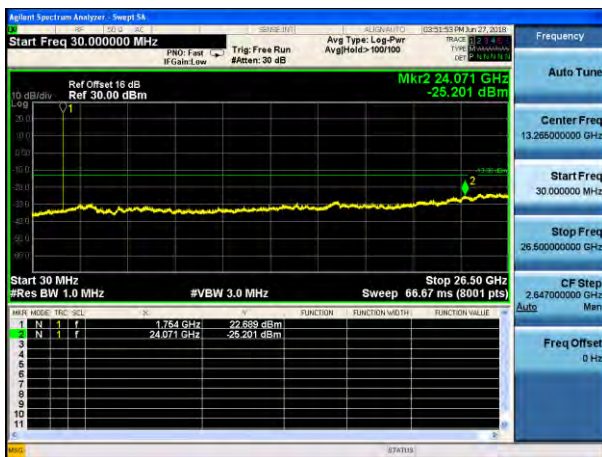
Test Mode: LTE Band 4 / 1.4MHz /6RB



Lowest channel

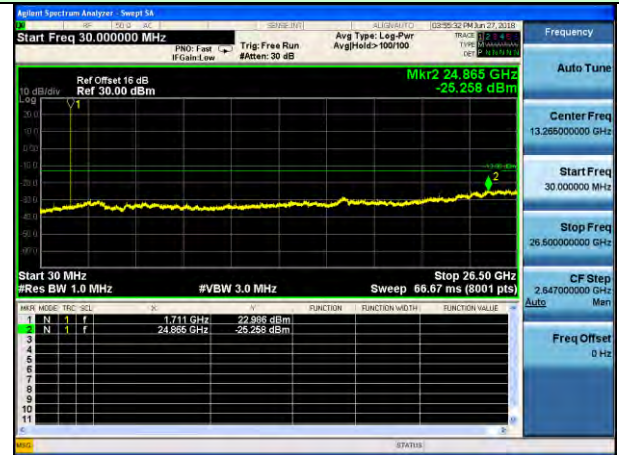
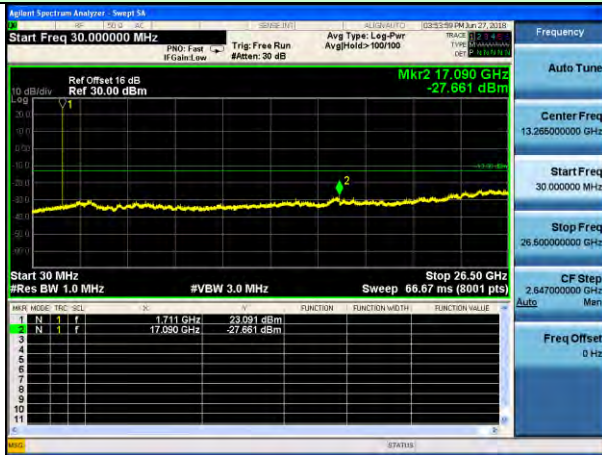


Middle channel

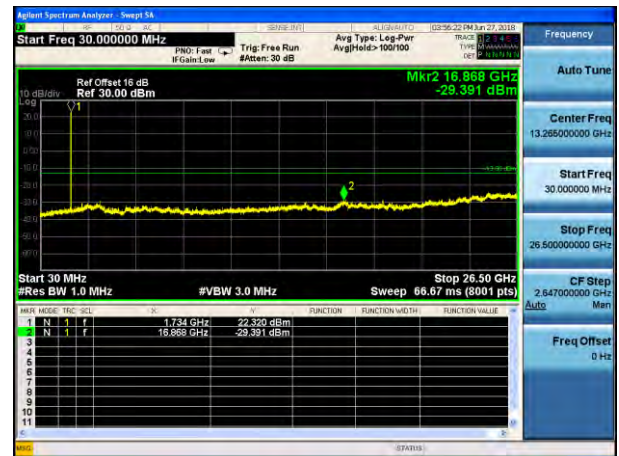
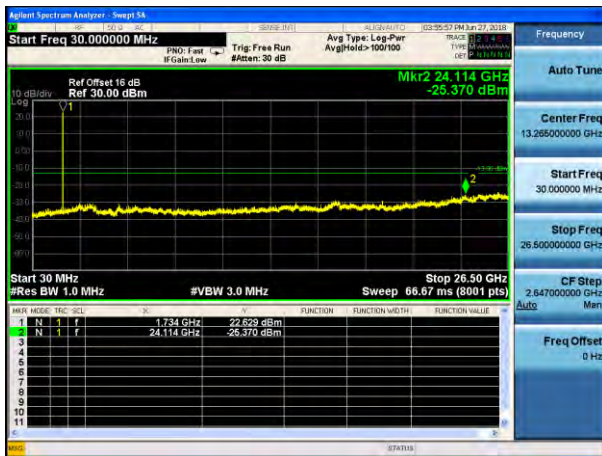


Highest channel

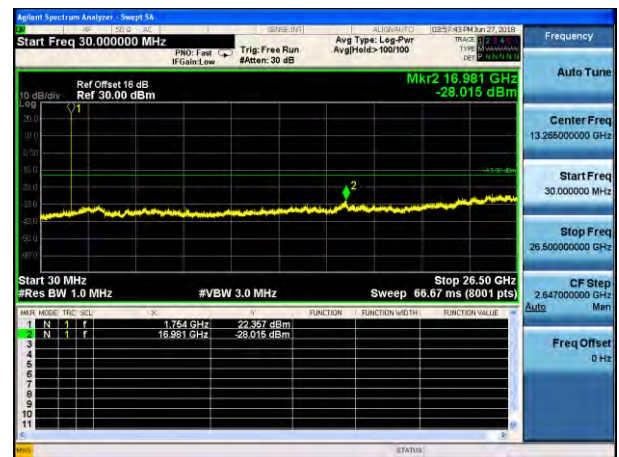
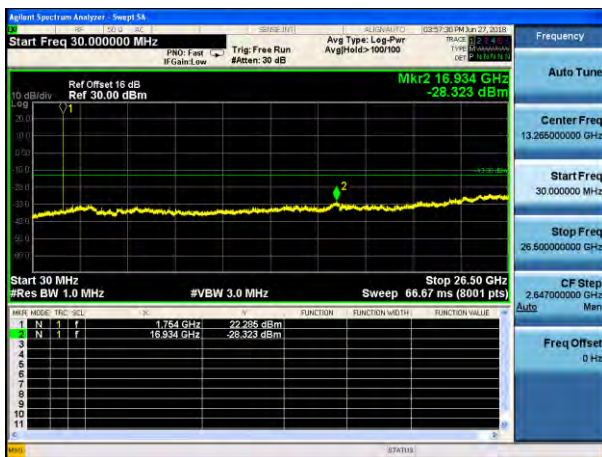
Test Mode: LTE Band 4 / 3MHz /1RB Test Mode: LTE Band 4 / 3MHz /15RB



Lowest channel



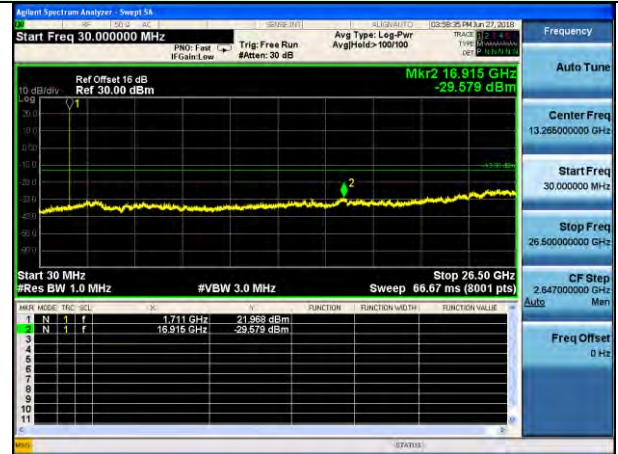
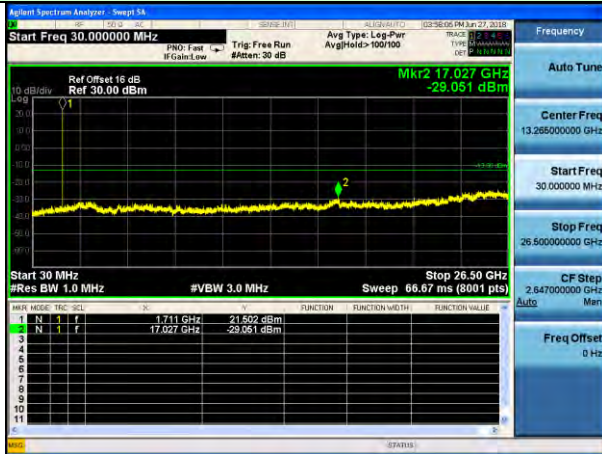
Middle channel



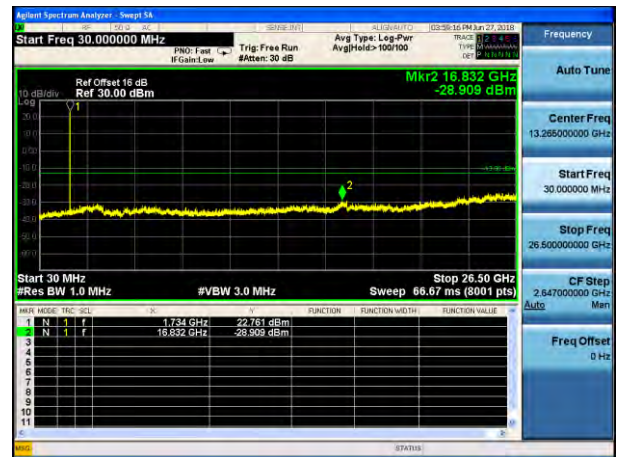
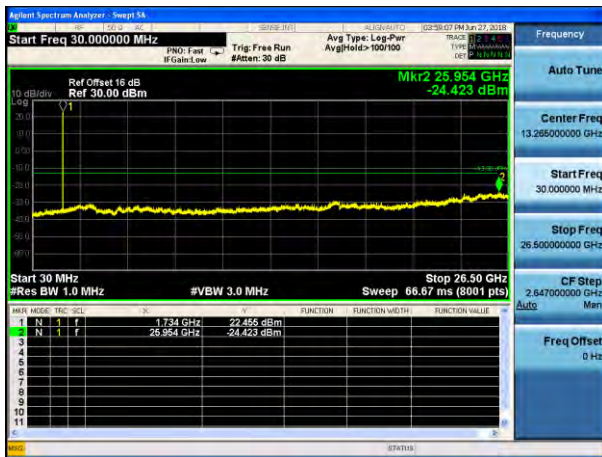
Highest channel

Test Mode: LTE Band 4 / 5MHz /1RB

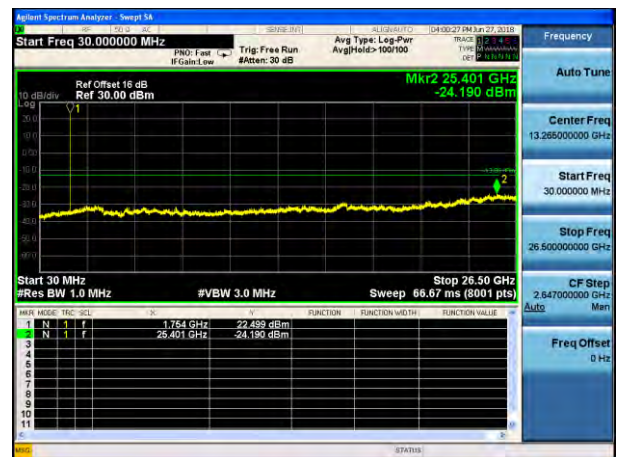
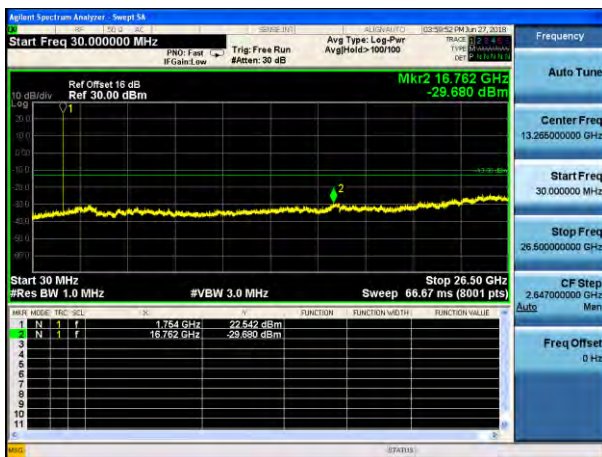
Test Mode: LTE Band 4 / 5MHz /25RB



Lowest channel



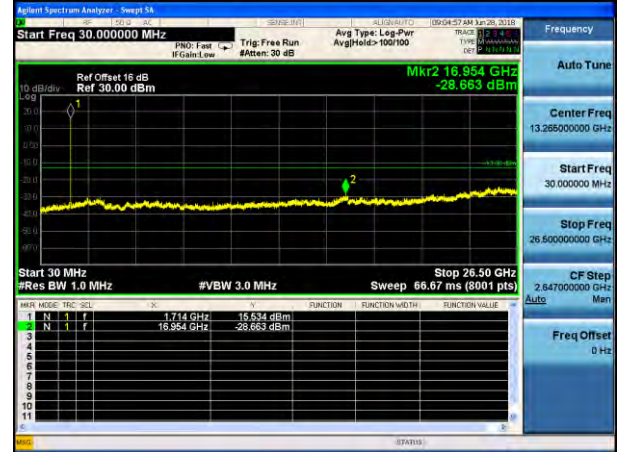
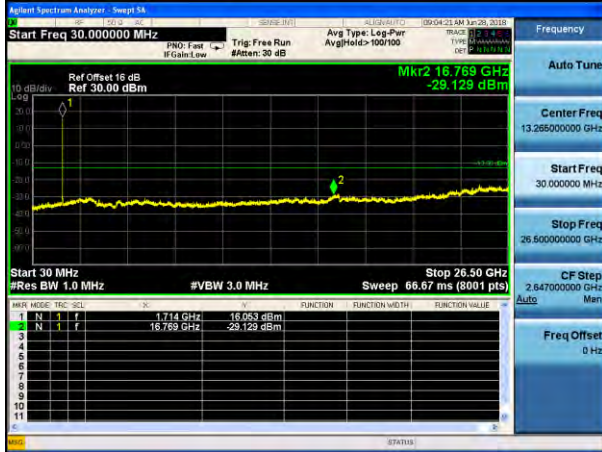
Middle channel



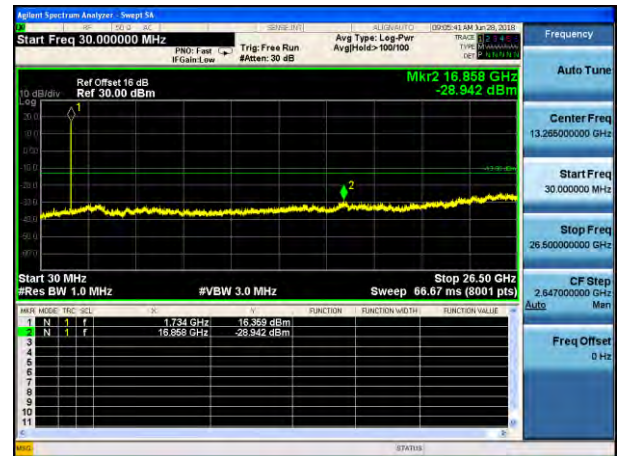
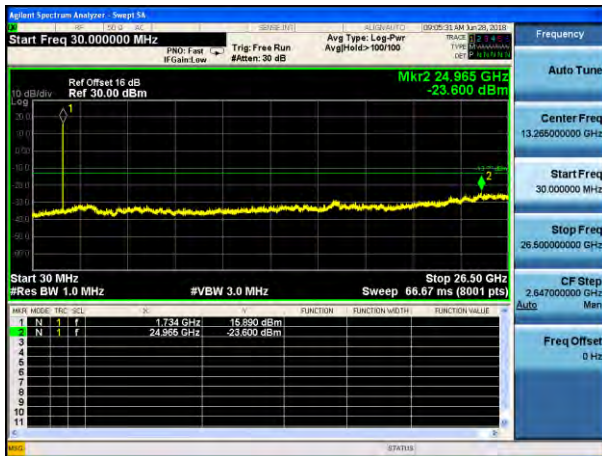
Highest channel

Test Mode: LTE Band 4 / 10MHz /1RB

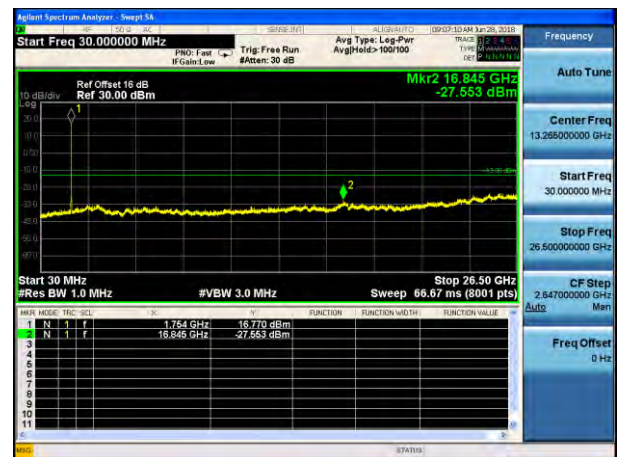
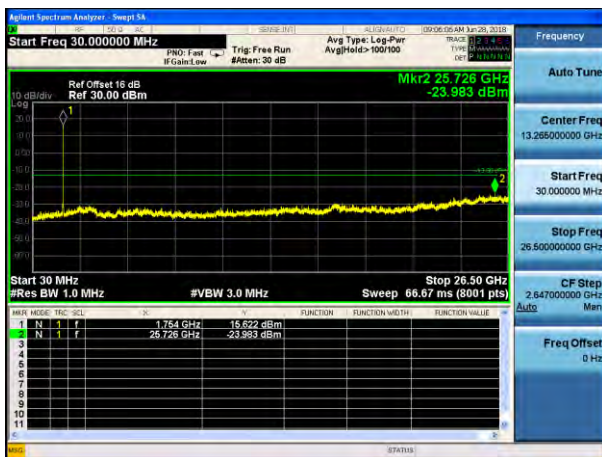
Test Mode: LTE Band 4 / 10MHz /50RB



Lowest channel

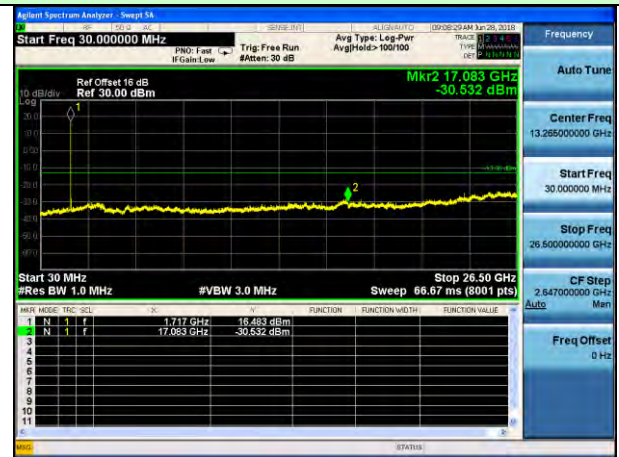
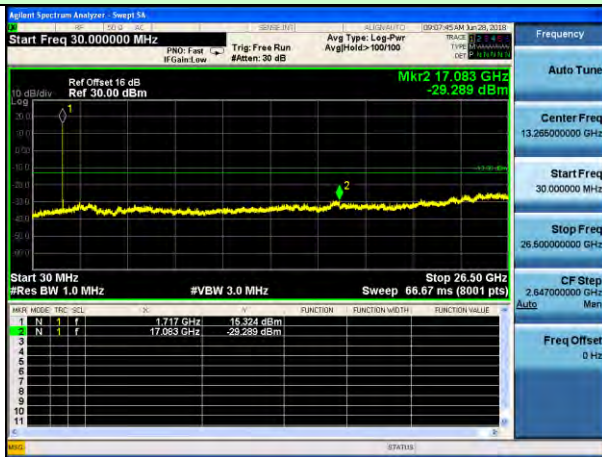


Middle channel

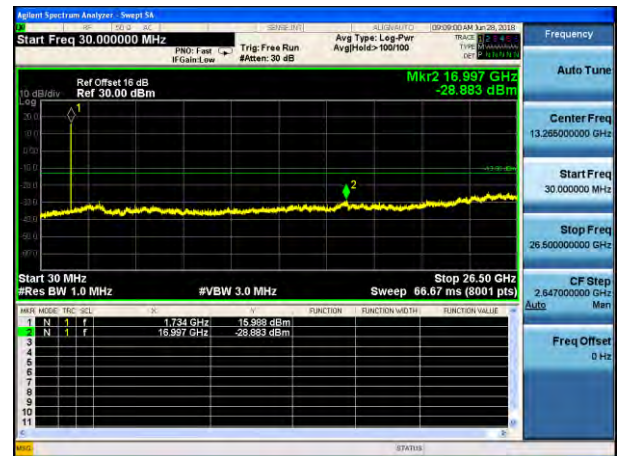
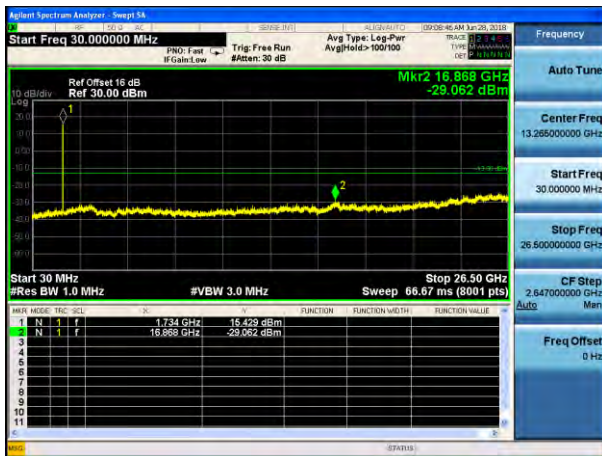


Highest channel

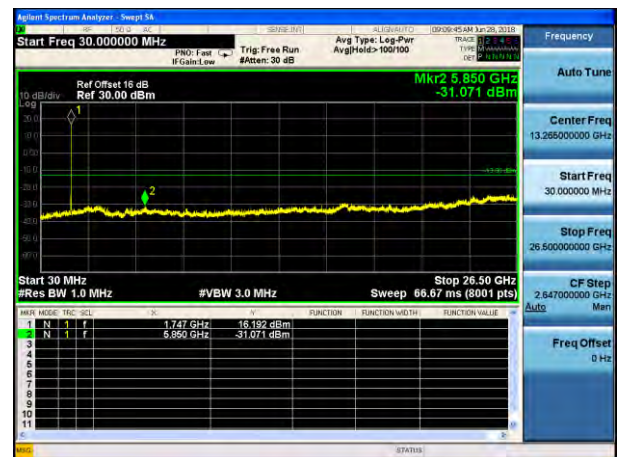
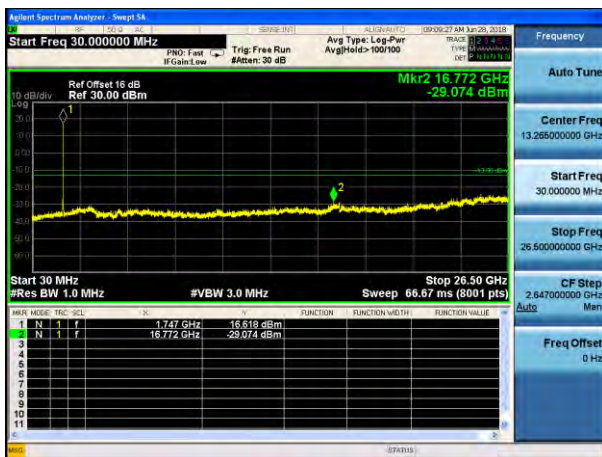
Test Mode: LTE Band 4 / 15MHz / 1RB Test Mode: LTE Band 4 / 15MHz / 75RB



Lowest channel

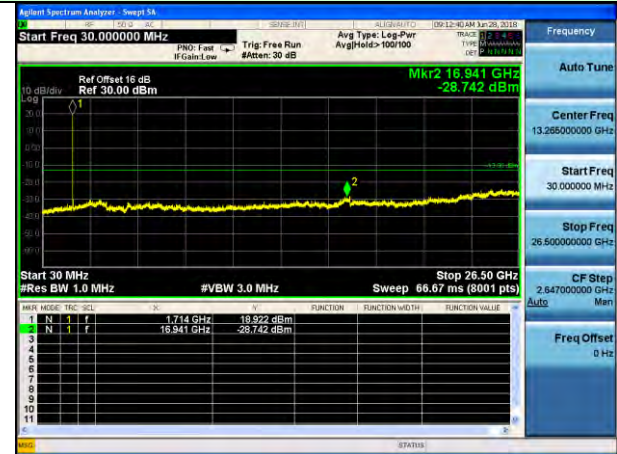


Middle channel

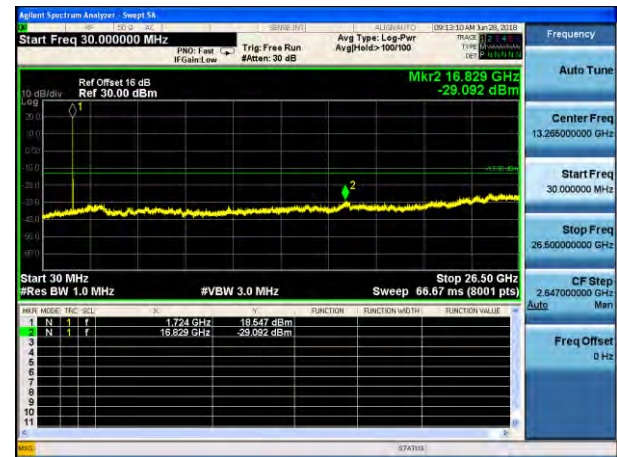
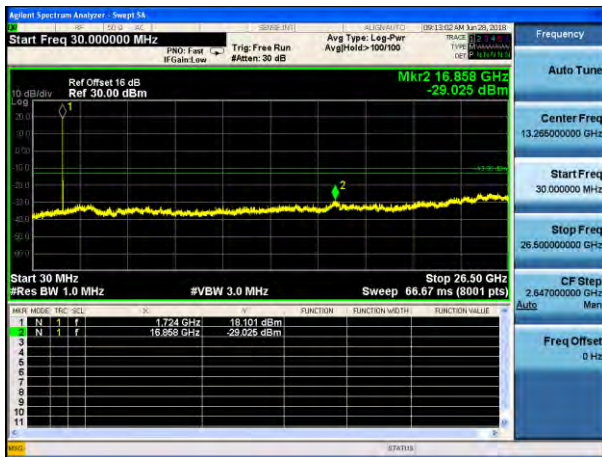


Highest channel

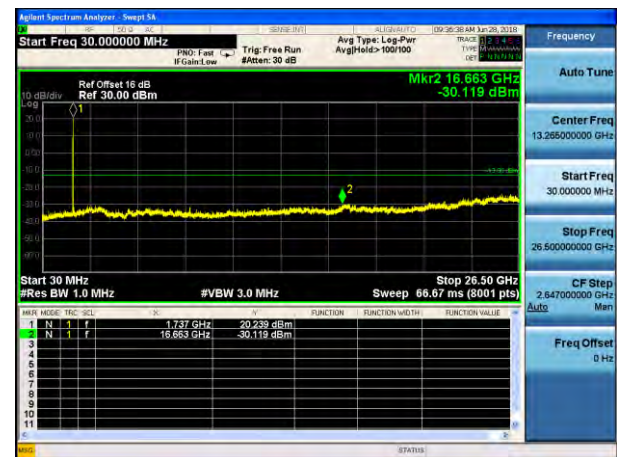
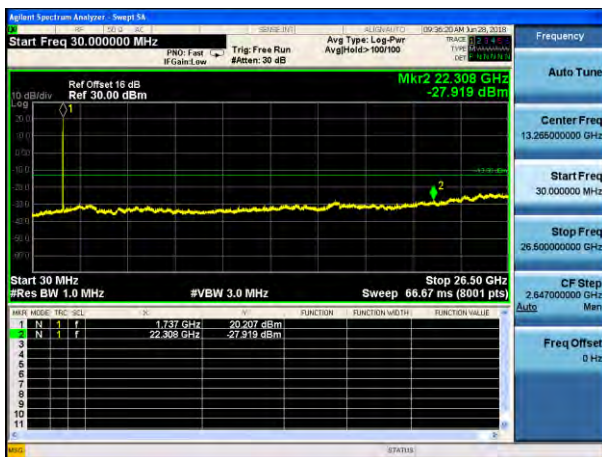
Test Mode: LTE Band 4 / 20MHz /1RB Test Mode: LTE Band 4 / 20MHz /100RB



Lowest channel

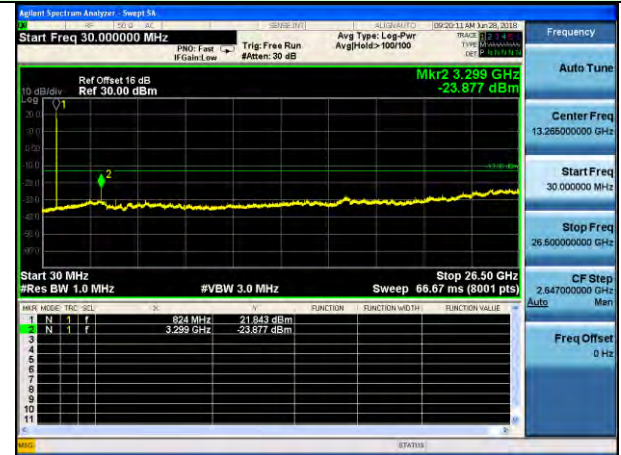
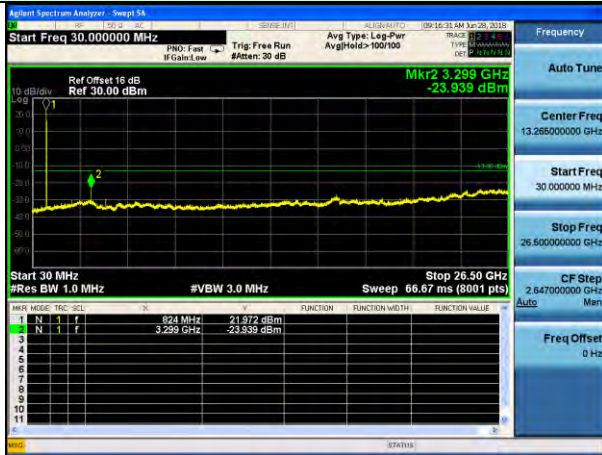


Middle channel

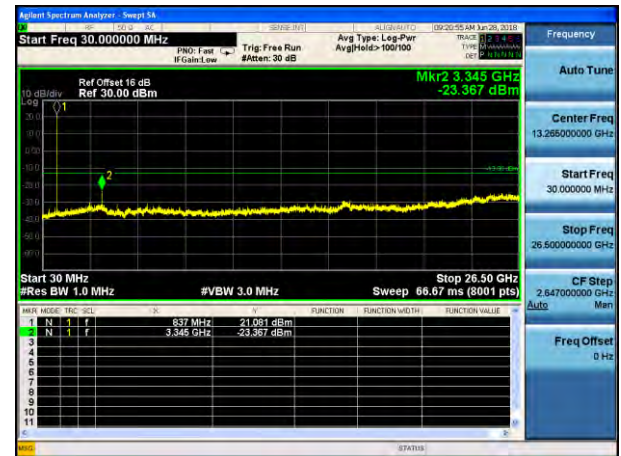
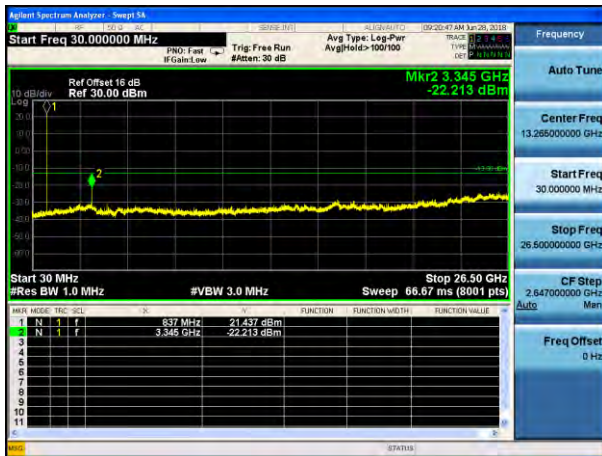


Highest channel

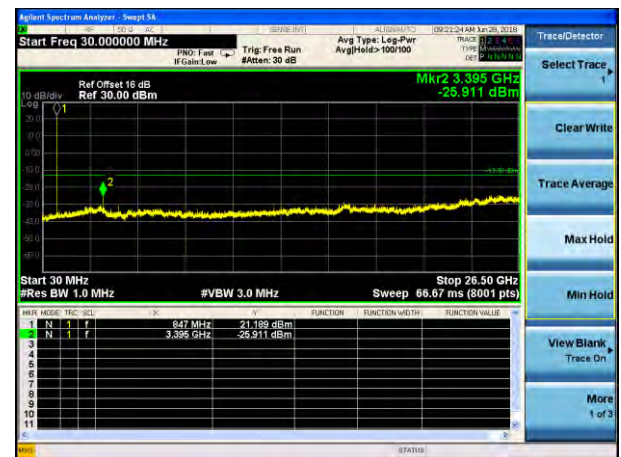
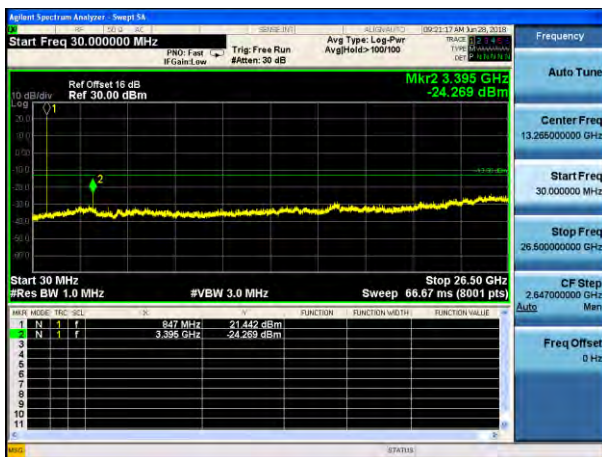
Test Mode: LTE Band 5 / 1.4MHz /1RB Test Mode: LTE Band 5 / 1.4MHz /6RB



Lowest channel



Middle channel



Highest channel