

EMC

TEST REPORT

Report No. : 150400345TWN-001

Model No. : UMC-I210C

Issued Date : May 21, 2015

Applicant: Wistron Neweb Corporation
Address: 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308,
Taiwan

Test Method/ Standard: 47 CFR FCC Part 27,
47 CFR FCC Part 2,
ANSI/TIA-603-C-2004
KDB 971168 D01 Power Meas License Digital Systems
v02r02

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1. Summary of Test Data

Test Requirement	Applicable Rule	Limit	Result
Conducted Output Power	2.1046	Reporting Only	Pass
Effective Radiated Power (Band 17)	27.50(c)(10)	ERP < 3 Watts	N/A
Effective Radiated Power (Band 13)	27.50(b)(10)	ERP < 3 Watts	Pass
Effective Isotropic Radiated Power (Band 4)	27.50(d)(4)	EIRP < 1 Watts	Pass
Frequency Stability	2.1055 27.54	< 2.5 ppm / Within frequency range	Pass
Occupied Bandwidth	2.1049 27.53(h)	Reporting Only	Pass
Peak to average ratio	27.50(d)(5)	< 13 dB	Pass
Band Edge Measurements	2.1049 27.53	< 43+10log10(P[Watts])	Pass
Conducted Spurious Emissions	2.1051 27.53	< 43+10log10(P[Watts])	Pass
Radiated Spurious Emissions	2.1053 27.53	< 43+10log10(P[Watts])	Pass

2. General Information

2.1 Identification of the EUT

Product:	Integrate with certified module-End product		
Model No:	UMC-I210C		
FCC ID:	NKR-CB1GI210C		
Manufacturer:	Wistron Neweb Corporation		
Address:	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan		
TX Frequency:	LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz		
RX Frequency:	LTE Band 4: 2110.7 MHz ~ 2154.3 MHz LTE Band 13: 748.5MHz ~ 753.5 MHz		
Bandwidth:	1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz (Band 4) 5MHz / 10MHz (Band 13)		
Maximum Output	LTE Band 4 : 24.5 dBm / 0.28 W		
Power to Antenna:			
Modulation:	LTE Band 4:	QPSK, 16QAM	
	LTE Band 13:	QPSK, 16QAM	
Rated Power:	DC 5 V from adapter		
Power Cord:	N/A		
Sample Received:	Apr. 20, 2015		
Sample condition:	Workable		
Test Date(s):	Apr. 27, 2015 ~ May 20, 2015		
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Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.		

2.2 Emission designator

FCC Rule	System	Type of Modulation	BW	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP (Watts)	Maximum EIRP (Watts)
Part 27	LTE Band 4	QPSK	1.4 MHz	1M11G7D	0.012	-	0.491 W
Part 27	LTE Band 4	16QAM	1.4 MHz	1M11D7W	0.012	-	0.412 W
Part 27	LTE Band 4	QPSK	3 MHz	2M69G7D	0.013	-	0.476 W
Part 27	LTE Band 4	16QAM	3 MHz	2M69D7W	0.012	-	0.374 W
Part 27	LTE Band 4	QPSK	5 MHz	4M47G7D	0.010	-	0.485 W
Part 27	LTE Band 4	16QAM	5 MHz	4M48D7W	0.012	-	0.469 W
Part 27	LTE Band 4	QPSK	10 MHz	8M95G7D	0.010	-	0.461 W
Part 27	LTE Band 4	16QAM	10 MHz	8M96D7W	0.010	-	0.384 W
Part 27	LTE Band 4	QPSK	15 MHz	13M4G7D	0.009	-	0.493 W
Part 27	LTE Band 4	16QAM	15 MHz	13M5D7W	0.009	-	0.402 W
Part 27	LTE Band 4	QPSK	20 MHz	17M9G7D	0.015	-	0.464 W
Part 27	LTE Band 4	16QAM	20 MHz	18M0D7W	0.014	-	0.421 W
Part 27	LTE Band 13	QPSK	5 MHz	4M47G7D	0.011	0.225 W	0.370 W
Part 27	LTE Band 13	16QAM	5 MHz	4M48D7W	0.010	0.188 W	0.308 W
Part 27	LTE Band 13	QPSK	10 MHz	8M95G7D	0.024	0.237 W	0.388 W
Part 27	LTE Band 13	16QAM	10 MHz	8M93D7W	0.028	0.174 W	0.285 W

2.3 Description of EUT

Product SW/HW version :	2.11.0-Beta2/ DGB
Radio SW/HW version :	N/A
Test SW Version :	N/A

2.4 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain	: 5.0 dBi max (Band 4), 2.5 dBi max (Band 13)
Antenna Type	: PCB antenna
Connector Type	: I-PEX

2.5 Adapter information

The EUT will be supplied with a power supply from below list:

No.	Brand	Model no.	Specification
Adapter	Ktec	KSAS0120500200HU	I/P: 100-240V~, 50-60Hz, 0.4A, O/P: 5.0Vdc, 2.0A

The above EUT information is declared by Wistron Neweb Corporation and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

2.6 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Data cable
Notebook PC	DELL	Latitude D610	6YWZK1S	USB Cable 1 meter

2.7 Applied test modes

Conducted	Test items	Band	Bandwidth	Modulation	RB #	Test Channel
	Max. Output Power	4	1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz	QPSK / 16QAM	1/Half/Full	L/M/H
		13	5MHz / 10MHz	QPSK / 16QAM	1/Half/Full	L/M/H
	Peak-to-Average Ratio	4	1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz	QPSK / 16QAM	1/Full	L/M/H
		13	5MHz / 10MHz	QPSK / 16QAM	1/Full	L/M/H
	26dB and 99% Bandwidth	4	1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz	QPSK / 16QAM	Full / 0 RB Offset	L/M/H
		13	5MHz / 10MHz	QPSK / 16QAM	Full / 0 RB Offset	L/M/H
	Conducted Band Edge	4	1.4MHz	QPSK / 16QAM	1RB/0RB Offset	L
					6RB/0RB Offset	
					1RB/5RB Offset	H
					6RB/0RB Offset	
			3MHz		1RB/0RB Offset	L
					15RB/0RB Offset	
					1RB/14RB Offset	H
					15RB/0RB Offset	
			5MHz		1RB/0RB Offset	L
					25RB/0RB Offset	
					1RB/24RB Offset	H

					25RB/0RB Offset	
			10MHz		1RB/0RB Offset	L
					50RB/0RB Offset	
					1RB/49RB Offset	H
					50RB/0RB Offset	
			15MHz		1RB/0RB Offset	L
					75RB/0RB Offset	
					1RB/74RB Offset	H
					75RB/0RB Offset	
			20MHz		1RB/0RB Offset	L
					100RB/0RB Offset	
					1RB/99RB Offset	H
		100RB/0RB Offset				
		13	5MHz	QPSK / 16QAM	1RB/0RB Offset	L
					25RB/0RB Offset	
					1RB/24RB Offset	H
					25RB/0RB Offset	
			10MHz		1RB/0RB Offset	L

					50RB/0RB Offset	H
					1RB/49RB Offset	
					50RB/0RB Offset	
	Conducted Spurious Emission	4	1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz	QPSK / 16QAM	1RB/0RB Offset	L/M/H
		13	5MHz / 10MHz	QPSK / 16QAM	1RB/0RB Offset	L/M/H
	Frequency Stability	4	20MHz	QPSK / 16QAM	Full / 0 RB Offset	L/H
		13	10MHz	QPSK / 16QAM	Full / 0 RB Offset	L/H
Radiated	E.I.R.P / E.R.P	4	1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz	QPSK / 16QAM	1RB/0RB Offset	L/M/H
		13	5MHz / 10MHz	QPSK / 16QAM	1RB/0RB Offset	L/M/H
	Radiated Spurious Emission	4	1.4MHz	QPSK / 16QAM	1RB/2RB Offset	L/M/H
			3MHz		1RB/7RB Offset	
			5MHz		1RB/12RB Offset	
			10MHz		1RB/49RB Offset	
			15MHz		1RB/37RB Offset	
			20MHz		1RB/0RB Offset	
		13	5MHz	QPSK / 16QAM	1RB/0RB Offset	L/M/H
			10MHz		1RB/49RB Offset	

2.8 Applied test axis

Pre-Scan has been executed only at X axis.

Radiated test item	Band	Axis
ERP/EIRP	LTE Band 4	X
	LTE Band 13	X
Radiated Spurious Emission	LTE Band 4	X
	LTE Band 13	X

2.9 Applied standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

ANSI/TIA-603-C-2004

FCC KDB 412172 D01 Determining ERP and EIRP v01

FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

3. Output Power Measurement

3.1 Test conditions

Temperature:	20	°C
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa

3.2 Limit for output power measurement

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

Portable stations (hand-held devices) operating in the 704-716 MHz band are limited to 3 watts ERP.

Portable stations (hand-held devices) operating in the 777-787MHz, 776-793 MHz band are limited to 3 watts ERP.

3.3 Test procedure

3.3.1 Conducted power measurement

1. The EUT was established communication with base station simulator and set up to transmit the maximum power.
2. Set the EUT to transmit at low, middle and high channel and record the power level on the base station simulator.
- 3,According to KDB 412172 D01 Power Approach

$ERP/EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$,
where;

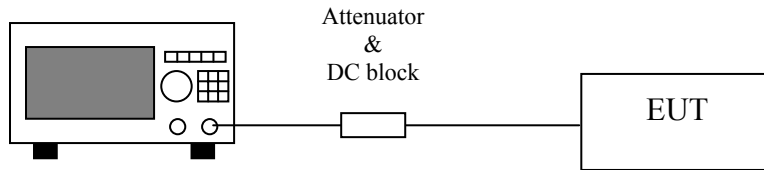
P_T =transmitter output power, in dBW, dBm

G_T = gain of the transmitting antenna, in dBi

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

3.4 Test diagram

3.4.1 Conducted test setup



Base station simulator

3.5 Test results

3.5.1 Conducted output power

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
1.4MHz	QPSK	19957	1710.7	1	0	27.00	22.09
		19957	1710.7	1	2	26.88	22.15
		19957	1710.7	1	5	27.18	22.38
		19957	1710.7	3	0	27.76	22.24
		19957	1710.7	3	1	27.71	22.33
		19957	1710.7	3	2	27.93	22.48
		19957	1710.7	6	0	28.61	21.34
		20175	1732.5	1	0	26.90	21.70
		20175	1732.5	1	2	26.51	21.63
		20175	1732.5	1	5	26.58	21.49
		20175	1732.5	3	0	26.47	21.52
		20175	1732.5	3	1	26.42	21.54
		20175	1732.5	3	2	26.34	21.48
		20175	1732.5	6	0	26.33	20.40
		20393	1754.3	1	0	26.72	22.77
		20393	1754.3	1	2	26.67	22.76
		20393	1754.3	1	5	26.69	22.67
		20393	1754.3	3	0	27.46	22.83
		20393	1754.3	3	1	27.80	22.81
		20393	1754.3	3	2	27.18	22.82
		20393	1754.3	6	0	27.48	21.75

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
1.4MHz	16QAM	19957	1710.7	1	0	26.78	21.31
		19957	1710.7	1	2	27.16	21.64
		19957	1710.7	1	5	27.02	21.66
		19957	1710.7	3	0	27.45	21.46
		19957	1710.7	3	1	27.30	21.47
		19957	1710.7	3	2	27.47	21.50
		19957	1710.7	6	0	27.70	21.58
		20175	1732.5	1	0	26.32	20.65
		20175	1732.5	1	2	26.22	20.77
		20175	1732.5	1	5	26.15	20.56
		20175	1732.5	3	0	26.74	20.43
		20175	1732.5	3	1	26.82	20.40
		20175	1732.5	3	2	26.50	20.44
		20175	1732.5	6	0	27.03	20.29
		20393	1754.3	1	0	26.81	21.75
		20393	1754.3	1	2	26.71	21.85
		20393	1754.3	1	5	26.70	21.87
		20393	1754.3	3	0	27.23	21.71
		20393	1754.3	3	1	27.11	22.07
		20393	1754.3	3	2	27.07	22.04
		20393	1754.3	6	0	27.53	21.85

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
3MHz	QPSK	19965	1711.5	1	0	26.78	22.08
		19965	1711.5	1	7	26.88	22.41
		19965	1711.5	1	14	26.96	22.63
		19965	1711.5	8	0	27.17	21.18
		19965	1711.5	8	4	27.15	21.36
		19965	1711.5	8	7	27.59	21.61
		19965	1711.5	15	0	27.37	21.36
		20175	1732.5	1	0	26.57	21.44
		20175	1732.5	1	7	26.40	21.41
		20175	1732.5	1	14	26.53	21.74
		20175	1732.5	8	0	26.10	20.13
		20175	1732.5	8	4	26.04	20.34
		20175	1732.5	8	7	26.15	20.28
		20175	1732.5	15	0	26.63	20.27
		20385	1753.5	1	0	26.39	22.70
		20385	1753.5	1	7	26.18	22.52
		20385	1753.5	1	14	26.29	22.18
		20385	1753.5	8	0	26.88	21.56
		20385	1753.5	8	4	26.67	21.54
		20385	1753.5	8	7	26.80	21.44
		20385	1753.5	15	0	27.04	21.59

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
3MHz	16QAM	19965	1711.5	1	0	27.47	21.07
		19965	1711.5	1	7	27.54	21.52
		19965	1711.5	1	14	27.51	21.76
		19965	1711.5	8	0	27.71	21.28
		19965	1711.5	8	4	27.47	21.47
		19965	1711.5	8	7	27.88	21.57
		19965	1711.5	15	0	27.98	21.31
		20175	1732.5	1	0	26.89	20.52
		20175	1732.5	1	7	26.69	20.51
		20175	1732.5	1	14	26.55	20.55
		20175	1732.5	8	0	27.10	20.40
		20175	1732.5	8	4	26.70	20.52
		20175	1732.5	8	7	26.77	20.40
		20175	1732.5	15	0	27.20	20.45
		20385	1753.5	1	0	26.57	21.64
		20385	1753.5	1	7	26.61	21.65
		20385	1753.5	1	14	26.75	21.25
		20385	1753.5	8	0	26.91	21.64
		20385	1753.5	8	4	26.81	21.63
		20385	1753.5	8	7	27.09	21.50
		20385	1753.5	15	0	27.97	21.52

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
5MHz	QPSK	19975	1712.5	1	0	26.69	21.77
		19975	1712.5	1	12	26.94	22.46
		19975	1712.5	1	24	26.89	22.44
		19975	1712.5	12	0	27.27	21.08
		19975	1712.5	12	6	27.20	21.49
		19975	1712.5	12	11	27.39	21.62
		19975	1712.5	25	0	27.80	21.33
		20175	1732.5	1	0	26.26	21.30
		20175	1732.5	1	12	26.04	21.30
		20175	1732.5	1	24	26.38	21.85
		20175	1732.5	12	0	26.12	20.24
		20175	1732.5	12	6	25.77	20.18
		20175	1732.5	12	11	25.88	20.17
		20175	1732.5	25	0	26.69	20.25
		20375	1752.5	1	0	26.52	22.77
		20375	1752.5	1	12	26.44	22.79
		20375	1752.5	1	24	26.56	22.34
		20375	1752.5	12	0	26.87	21.73
		20375	1752.5	12	6	26.59	21.85
		20375	1752.5	12	11	26.85	21.54
		20375	1752.5	25	0	27.35	21.63

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
5MHz	16QAM	19975	1712.5	1	0	26.59	20.97
		19975	1712.5	1	12	26.87	21.73
		19975	1712.5	1	24	26.85	21.59
		19975	1712.5	12	0	27.50	21.17
		19975	1712.5	12	6	27.25	21.60
		19975	1712.5	12	11	27.30	21.62
		19975	1712.5	25	0	28.00	21.55
		20175	1732.5	1	0	26.68	20.85
		20175	1732.5	1	12	26.20	20.91
		20175	1732.5	1	24	26.58	20.97
		20175	1732.5	12	0	26.79	20.26
		20175	1732.5	12	6	26.57	20.39
		20175	1732.5	12	11	26.44	20.37
		20175	1732.5	25	0	27.21	20.38
		20375	1752.5	1	0	26.41	22.52
		20375	1752.5	1	12	26.53	22.64
		20375	1752.5	1	24	26.30	22.05
		20375	1752.5	12	0	26.88	21.76
		20375	1752.5	12	6	26.51	21.77
		20375	1752.5	12	11	26.73	21.47
		20375	1752.5	25	0	27.72	21.60

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
10MHz	QPSK	20000	1715.0	1	0	27.09	22.29
		20000	1715.0	1	24	26.73	22.34
		20000	1715.0	1	49	27.14	22.56
		20000	1715.0	25	0	27.20	21.52
		20000	1715.0	25	12	26.92	21.38
		20000	1715.0	25	24	27.21	21.45
		20000	1715.0	50	0	27.56	21.47
		20175	1732.5	1	0	26.73	21.56
		20175	1732.5	1	24	26.15	21.14
		20175	1732.5	1	49	26.60	21.92
		20175	1732.5	25	0	26.71	20.35
		20175	1732.5	25	12	26.33	20.02
		20175	1732.5	25	24	26.49	20.42
		20175	1732.5	50	0	26.76	20.20
		20350	1750	1	0	26.60	22.58
		20350	1750	1	24	26.33	22.59
		20350	1750	1	49	26.32	22.41
		20350	1750	25	0	27.06	21.58
		20350	1750	25	12	26.79	21.64
		20350	1750	25	24	26.90	21.85
		20350	1750	50	0	27.66	21.63

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
10MHz	16QAM	20000	1715.0	1	0	27.55	21.21
		20000	1715.0	1	24	27.33	21.47
		20000	1715.0	1	49	27.44	21.45
		20000	1715.0	25	0	27.83	21.41
		20000	1715.0	25	12	27.38	21.42
		20000	1715.0	25	24	27.69	21.48
		20000	1715.0	50	0	28.18	21.68
		20175	1732.5	1	0	26.55	21.03
		20175	1732.5	1	24	26.04	20.65
		20175	1732.5	1	49	26.28	20.99
		20175	1732.5	25	0	26.95	20.40
		20175	1732.5	25	12	26.38	20.08
		20175	1732.5	25	24	26.82	20.47
		20175	1732.5	50	0	27.42	20.37
		20350	1750	1	0	26.79	21.73
		20350	1750	1	24	26.36	21.59
		20350	1750	1	49	26.34	21.41
		20350	1750	25	0	27.37	21.80
		20350	1750	25	12	26.72	21.53
		20350	1750	25	24	26.92	21.76
		20350	1750	50	0	27.67	21.47

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
15MHz	QPSK	20025	1717.5	1	0	27.60	22.35
		20025	1717.5	1	37	27.04	22.77
		20025	1717.5	1	74	27.99	22.15
		20025	1717.5	36	0	27.45	21.81
		20025	1717.5	36	16	27.28	21.77
		20025	1717.5	36	35	27.34	21.51
		20025	1717.5	75	0	28.06	21.68
		20175	1732.5	1	0	27.82	22.00
		20175	1732.5	1	37	26.22	21.65
		20175	1732.5	1	74	27.19	22.24
		20175	1732.5	36	0	26.81	20.64
		20175	1732.5	36	16	26.50	20.47
		20175	1732.5	36	35	26.60	20.75
		20175	1732.5	75	0	27.42	20.64
		20325	1747.5	1	0	27.15	21.92
		20325	1747.5	1	37	26.70	22.92
		20325	1747.5	1	74	27.18	22.69
		20325	1747.5	36	0	27.16	21.60
		20325	1747.5	36	16	27.02	22.00
		20325	1747.5	36	35	27.04	21.97
		20325	1747.5	75	0	28.10	21.69

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
	16QAM	20025	1717.5	1	0	28.30	21.51
		20025	1717.5	1	37	27.37	21.82
		20025	1717.5	1	74	28.23	22.04
		20025	1717.5	36	0	27.60	21.76
		20025	1717.5	36	16	27.60	21.80
		20025	1717.5	36	35	27.50	21.44
		20025	1717.5	75	0	28.04	21.64
		20175	1732.5	1	0	27.67	21.89
		20175	1732.5	1	37	26.55	21.09
		20175	1732.5	1	74	27.12	21.67
		20175	1732.5	36	0	27.37	20.60
		20175	1732.5	36	16	27.00	20.42
		20175	1732.5	36	35	26.97	20.69
		20175	1732.5	75	0	27.73	20.62
		20325	1747.5	1	0	28.29	21.21
		20325	1747.5	1	37	26.95	21.99
		20325	1747.5	1	74	26.381	21.81
		20325	1747.5	36	0	27.46	21.64
		20325	1747.5	36	16	27.43	22.04
		20325	1747.5	36	35	27.16	21.87
		20325	1747.5	75	0	27.95	21.69

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
20MHz	QPSK	20050	1720	1	0	27.35	22.23
		20050	1720	1	49	27.32	22.56
		20050	1720	1	99	26.91	21.52
		20050	1720	50	0	27.72	21.82
		20050	1720	50	24	27.37	21.61
		20050	1720	50	49	27.64	21.33
		20050	1720	100	0	27.62	21.57
		20175	1732.5	1	0	27.42	22.09
		20175	1732.5	1	49	26.80	21.59
		20175	1732.5	1	99	27.03	22.04
		20175	1732.5	50	0	27.57	20.99
		20175	1732.5	50	24	27.08	20.75
		20175	1732.5	50	49	27.34	21.03
		20175	1732.5	100	0	27.62	20.93
		20300	1745	1	0	26.99	21.69
		20300	1745	1	49	26.96	22.70
		20300	1745	1	99	26.84	22.65
		20300	1745	50	0	26.95	21.23
		20300	1745	50	24	27.05	21.58
		20300	1745	50	49	27.14	21.89
		20300	1745	100	0	27.63	21.48

LTE Band4							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
20MHz	16QAM	20050	1720	1	0	27.38	21.84
		20050	1720	1	49	26.50	21.98
		20050	1720	1	99	27.74	21.21
		20050	1720	50	0	27.69	21.82
		20050	1720	50	24	27.55	21.61
		20050	1720	50	49	27.86	21.23
		20050	1720	100	0	28.33	21.69
		20175	1732.5	1	0	27.37	21.71
		20175	1732.5	1	49	26.43	21.47
		20175	1732.5	1	99	27.19	21.66
		20175	1732.5	50	0	27.83	20.91
		20175	1732.5	50	24	27.24	20.81
		20175	1732.5	50	49	27.58	21.04
		20175	1732.5	100	0	28.27	20.94
		20300	1745	1	0	26.95	21.25
		20300	1745	1	49	27.09	22.28
		20300	1745	1	99	26.81	22.05
		20300	1745	50	0	27.49	21.27
		20300	1745	50	24	27.28	21.54
		20300	1745	50	49	27.43	21.83
		20300	1745	100	0	28.04	21.48

LTE Band13							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
5MHz	QPSK	23207	779.5	1	0	28.4	24.03
		23207	779.5	1	12	28.27	24.22
		23207	779.5	1	24	28.15	23.67
		23207	779.5	12	0	28.60	23.04
		23207	779.5	12	6	28.75	23.19
		23207	779.5	12	11	28.65	23.17
		23207	779.5	25	0	29.35	23.11
		23230	782.5	1	0	28.35	24.00
		23230	782.5	1	12	28.42	23.91
		23230	782.5	1	24	27.97	23.63
		23230	782.5	12	0	28.43	22.90
		23230	782.5	12	6	27.75	22.38
		23230	782.5	12	11	27.87	22.39
		23230	782.5	25	0	28.39	22.27
		23255	784.5	1	0	28.50	23.98
		23255	784.5	1	12	27.92	23.58
		23255	784.5	1	24	27.67	23.44
		23255	784.5	12	0	28.38	22.18
		23255	784.5	12	6	27.94	22.09
		23255	784.5	12	11	27.95	21.82
		23255	784.5	25	0	28.88	22.85

LTE Band13							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
5MHz	16QAM	23207	779.5	1	0	28.34	23.29
		23207	779.5	1	12	27.99	22.84
		23207	779.5	1	24	27.87	22.37
		23207	779.5	12	0	28.24	21.77
		23207	779.5	12	6	28.26	21.74
		23207	779.5	12	11	28.40	21.58
		23207	779.5	25	0	29.05	21.81
		23230	782.5	1	0	28.65	23.48
		23230	782.5	1	12	28.09	22.90
		23230	782.5	1	24	27.88	22.54
		23230	782.5	12	0	28.26	21.70
		23230	782.5	12	6	28.08	21.60
		23230	782.5	12	11	27.81	21.49
		23230	782.5	25	0	28.43	21.44
		23255	784.5	1	0	27.93	23.36
		23255	784.5	1	12	27.32	22.93
		23255	784.5	1	24	27.33	22.95
		23255	784.5	12	0	28.00	21.50
		23255	784.5	12	6	27.67	21.28
		23255	784.5	12	11	27.58	21.00
		23255	784.5	25	0	28.40	21.22

LTE Band13							
BW	Modulation	CH	Frequency (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average Power (dBm)
10MHz	QPSK	23230	782	1	0	28.92	24.46
		23230	782	1	24	28.20	23.53
		23230	782	1	49	27.64	23.20
		23230	782	25	0	28.65	22.80
		23230	782	25	12	28.62	22.57
		23230	782	25	24	28.51	22.54
		23230	782	50	0	28.60	22.53
	16QAM	23230	782	1	0	28.33	23.12
		23230	782	1	24	28.34	22.16
		23230	782	1	49	28.04	22.27
		23230	782	25	0	28.95	22.22
		23230	782	25	12	28.38	21.28
		23230	782	25	24	28.44	21.25
		23230	782	50	0	28.50	21.35

3.5.2 Radiated output power

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 1.4MHz

Modulation: QPSK

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
19957	1710.7	22.48	5	27.48
20175	1732.5	21.7	5	26.7
20393	1754.3	22.83	5	27.83

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 1.4MHz

Modulation: 16QAM

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
19957	1710.7	21.66	5	26.66
20175	1732.5	20.77	5	25.77
20393	1754.3	22.07	5	27.07

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 3MHz

Modulation: QPSK

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
19965	1711.5	22.63	5	27.63
20175	1732.5	21.74	5	26.74
20385	1753.5	22.7	5	27.7

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 3MHz

Modulation: 16QAM

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
19965	1711.5	21.76	5	26.76
20175	1732.5	20.55	5	25.55
20385	1753.5	21.65	5	26.65

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 5MHz

Modulation: QPSK

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
19975	1712.5	22.46	5	27.46
20175	1732.5	21.85	5	26.85
20375	1752.5	22.79	5	27.79

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 5MHz

Modulation: 16QAM

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
19975	1712.5	21.73	5	26.73
20175	1732.5	20.97	5	25.97
20375	1752.5	22.64	5	27.64

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 10MHz

Modulation: QPSK

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
20000	1715	22.56	5	27.56
20175	1732.5	21.92	5	26.92
20350	1750	22.59	5	27.59

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 10MHz

Modulation: 16QAM

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
20000	1715	21.68	5	26.68
20175	1732.5	21.03	5	26.03
20350	1750	21.8	5	26.8

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 15MHz

Modulation: QPSK

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
20025	1717.5	22.77	5	27.77
20175	1732.5	22.24	5	27.24
20325	1747.5	22.92	5	27.92

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 15MHz

Modulation: 16QAM

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
20025	1717.5	22.04	5	27.04
20175	1732.5	21.89	5	26.89
20325	1747.5	22.04	5	27.04

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 20MHz

Modulation: QPSK

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
20050	1720	22.56	5	27.56
20175	1732.5	22.09	5	27.09
20300	1745	22.7	5	27.7

Note: Conducted Power = P_T + L_C

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 20MHz

Modulation: 16QAM

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.I.R.P. (dBm)
20050	1720	21.98	5	26.98
20175	1732.5	21.71	5	26.71
20300	1745	22.28	5	27.28

Note: Conducted Power = P_T + L_C

Average E.R.P. for LTE Band 13

Channel Bandwidth: 5MHz

Modulation: QPSK

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.R.P. (dBm)
23207	779.5	24.22	2.5	24.57
23230	782.5	24	2.5	24.35
23255	784.5	23.98	2.5	24.33

Note: Conducted Power = P_T + L_C

Average E.R.P. for LTE Band 13

Channel Bandwidth: 5MHz

Modulation: 16QAM

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.R.P. (dBm)
23207	779.5	23.29	2.5	23.64
23230	782.5	23.48	2.5	23.83
23255	784.5	23.36	2.5	23.71

Note: Conducted Power = P_T + L_C

Average E.R.P. for LTE Band 13

Channel Bandwidth: 10MHz

Modulation: QPSK

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.R.P. (dBm)
23230	782	24.46	2.5	24.81

Note: Conducted Power = P_T + L_C

Average E.R.P. for LTE Band 13

Channel Bandwidth: 10MHz

Modulation: 16QAM

Channel	Frequency (MHz)	Conducted Power	G _T (dB)	E.R.P. (dBm)
23230	782	23.12	2.5	23.47

Note: Conducted Power = P_T + L_C

4. Frequency Stability

4.1 Test conditions

Temperature:	-30~60	°C
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa

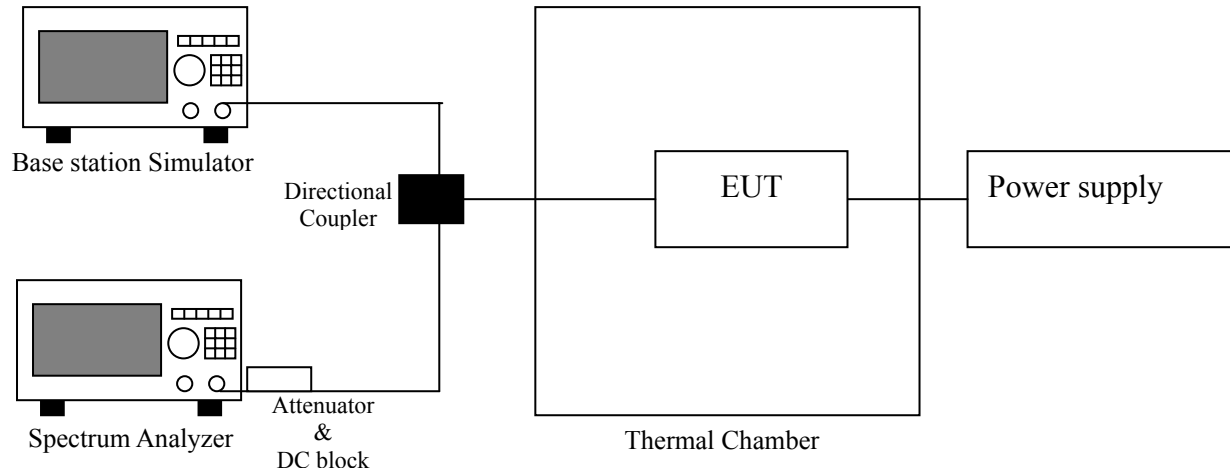
4.2 Limit for frequency stability

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.3 Test procedure

1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer and Base station Simulator.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency.
5. Repeat step 2 and 3 with the temperature chamber set to the specific temperature. The temperature is decreased by 10 degrees, allowed to stabilize, and then the measurement is repeated. This is repeated until -30°C is reached.
6. The test chamber was allowed to stabilize at +20degree C for minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record

4.4 Test diagram



4.5 Test results

Voltage V.S. Frequency Stability

LTE Band 4, 20MHz QPSK					
Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F _{Low}	F _{High}		
Temperature	Voltage	@-13dBm MHz	@-13dBm MHz		
Normal(25℃)	Normal	1710.84	1754.19		
Extreme(60℃)		1710.82	1754.21	25.78	0.015
Extreme(50℃)		1710.82	1754.21	-24.4	-0.014
Extreme(40℃)		1710.81	1754.19	25.29	0.015
Extreme(30℃)		1710.83	1754.20	-21.14	-0.012
Extreme(10℃)		1710.84	1754.21	20.31	0.012
Extreme(0℃)		1710.84	1754.20	20.43	0.012
Extreme(-10℃)		1710.84	1754.19	-22.93	-0.013
Extreme(-20℃)		1710.86	1754.21	23.62	0.014
Extreme(-30℃)		1710.86	1754.20	-22.20	-0.013
25℃	+15%	1710.83	1754.19	22.44	0.013
	-15%	1710.83	2854.21	21.01	0.012

LTE Band 4, 20MHz 16QAM					
Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		FLow	FHigh		
Temperature	Voltage	@-13dBm MHz	@-13dBm MHz		
Normal(25℃)	Normal	1710.82	1754.19		
Extreme(60℃)		1710.82	1754.19	20.77	0.012
Extreme(50℃)		1710.82	1754.20	-21.86	-0.013
Extreme(40℃)		1710.82	1754.19	-22.50	-0.013
Extreme(30℃)		1710.82	1754.19	-21.57	-0.013
Extreme(10℃)		1710.84	1754.19	-24.93	-0.014
Extreme(0℃)		1710.83	1754.20	-20.61	-0.012
Extreme(-10℃)		1710.84	1754.20	24.33	0.014
Extreme(-20℃)		1710.85	1754.20	21.01	0.012
Extreme(-30℃)		1710.85	1754.21	19.38	0.011
25℃	+15%	1710.83	1754.20	-17.77	-0.010
	-15%	1710.83	1754.20	-18.44	-0.011

LTE Band 13, 10MHz QPSK					
Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F _{Low}	F _{High}		
Temperature	Voltage	@-13dBm MHz	@-13dBm MHz		
Normal(25℃)	Normal	777.40	786.60		
Extreme(60℃)		777.40	786.59	15.39	0.020
Extreme(50℃)		777.39	786.60	17.67	0.023
Extreme(40℃)		777.40	786.61	16.06	0.021
Extreme(30℃)		777.40	786.61	-17.25	0.022
Extreme(10℃)		777.41	786.61	-14.86	0.019
Extreme(0℃)		777.41	786.60	17.15	0.022
Extreme(-10℃)		777.40	786.60	16.49	0.021
Extreme(-20℃)		777.39	786.60	-15.05	0.019
Extreme(-30℃)		777.40	786.60	18.71	0.024
25℃	+15%	777.41	786.60	16.37	0.021
	-15%	777.39	786.61	17.14	0.022

LTE Band 13, 10MHz 16QAM					
Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F _{Low}	F _{High}		
Temperature	Voltage	@-13dBm MHz	@-13dBm MHz		
Normal(25℃)	Normal	777.41	786.60		
Extreme(60℃)		777.40	786.61	17.85	0.023
Extreme(50℃)		777.41	786.60	21.97	0.028
Extreme(40℃)		777.41	786.60	-20.74	0.027
Extreme(30℃)		777.41	786.59	17.12	0.022
Extreme(10℃)		777.41	786.59	-14.91	0.019
Extreme(0℃)		777.41	786.61	18.37	0.023
Extreme(-10℃)		777.41	786.60	18.11	0.023
Extreme(-20℃)		777.41	786.59	16.79	0.021
Extreme(-30℃)		777.40	786.60	-15.61	0.020
25℃	+15%	777.41	786.60	17.55	0.022
	-15%	777.41	786.59	17.84	0.023

5. Occupied Bandwidth Measurement

5.1 Test conditions

Temperature:	20	°C
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa

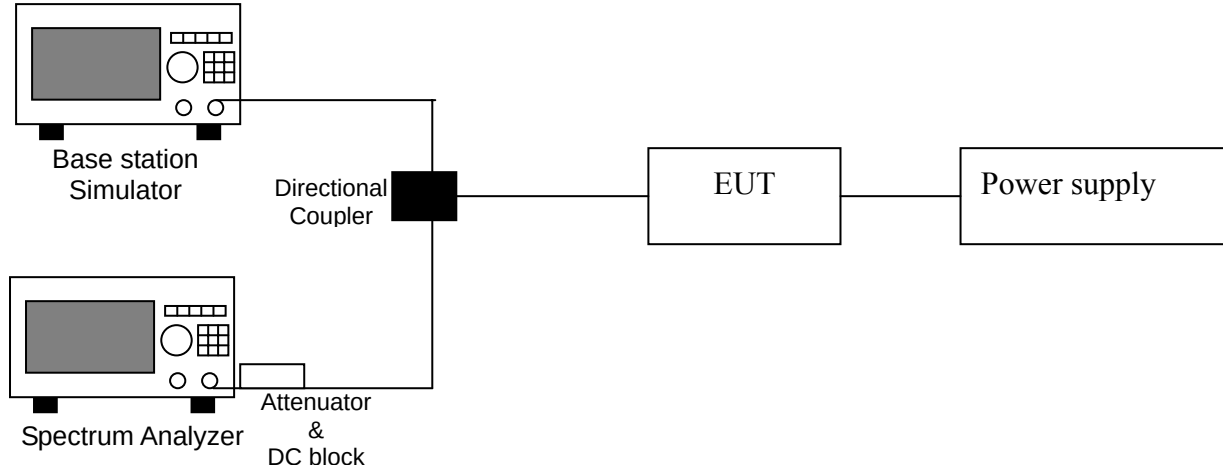
5.2 Limit for minimum occupied bandwidth

The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission,

5.4 Test procedure

1. The conducted occupied bandwidth test used the directional coupler via EUT RF power connector between Base station Simulator and spectrum analyzer.
2. Use OBW measurement function of Spectrum analyzer to measure 99 % Occupied bandwidth.

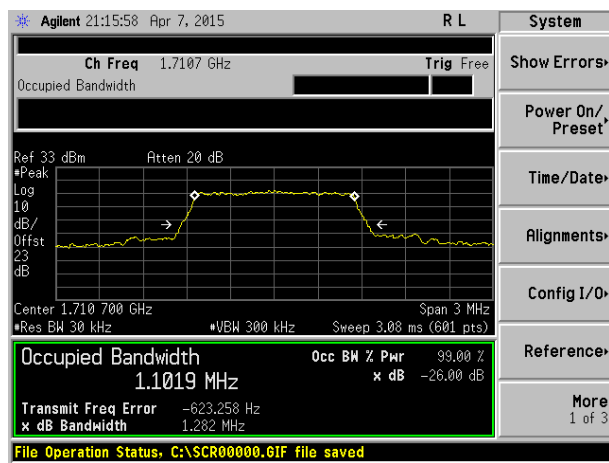
5.5 Test diagram



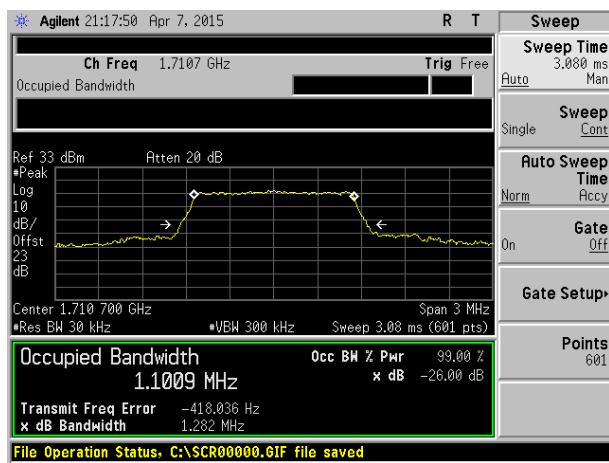
5.6 Test results

LTE Band 4									
Band Width	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Band Width	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM				QPSK	16QAM
1.4MHz	19957	1710.7	1.1019	1.1009	10MHz	20000	1715	8.9340	8.9563
	20175	1732.5	1.0998	1.1038		20175	1732.5	8.9487	8.9632
	20393	1754.3	1.1055	1.1058		20350	1750	8.9539	8.9339
3MHz	19965	1711.5	2.6800	2.6868	15MHz	20025	1717.5	13.3840	13.3625
	20175	1732.5	2.6864	2.6798		20175	1732.5	13.4460	13.4780
	20385	1753.5	2.6817	2.6832		20325	1747.5	13.4097	13.4093
5MHz	19975	1712.5	4.4717	4.4630	20MHz	20050	1720	17.8509	17.8384
	20175	1732.5	4.4725	4.4758		20175	1732.5	17.9253	17.9746
	20375	1752.5	4.4537	4.4648		20300	1745	17.8456	17.8417

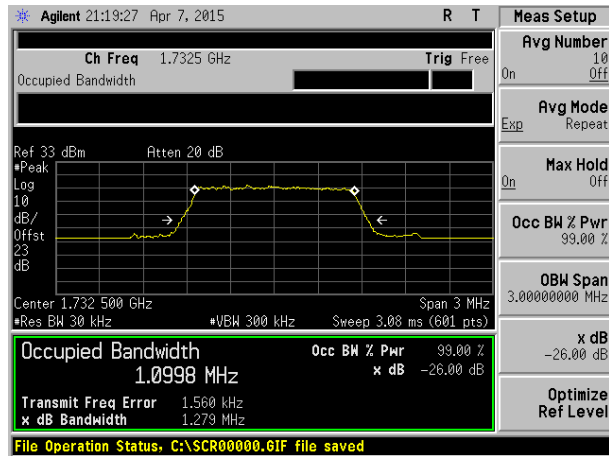
1.4 MHz / Low channel / QPSK



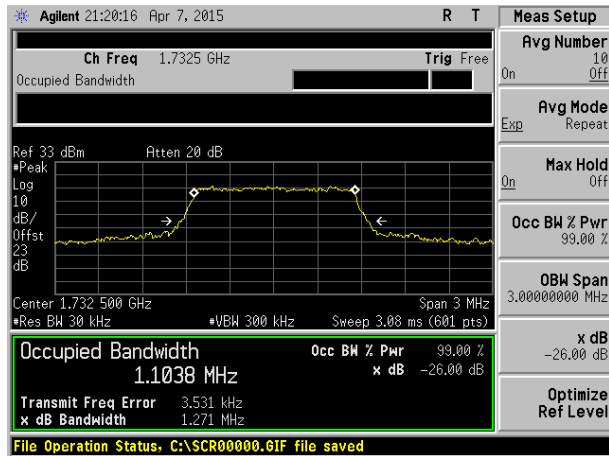
1.4 MHz / Low channel / 16QAM



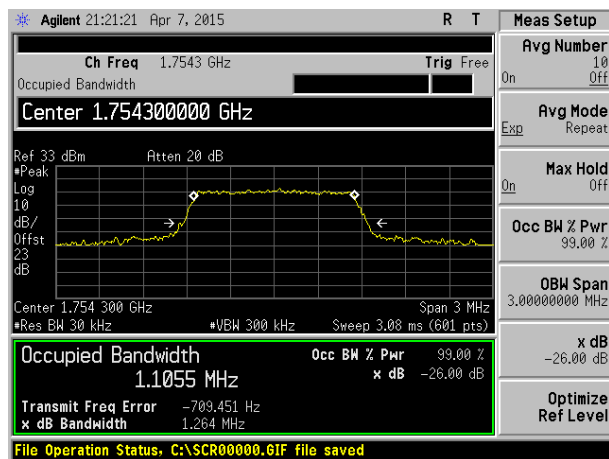
1.4 MHz / Middle channel / QPSK



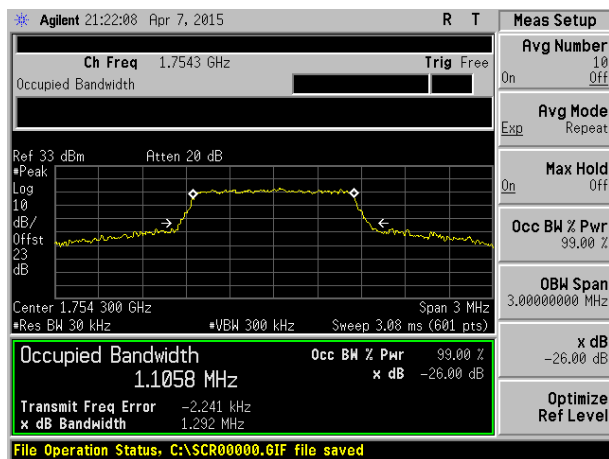
1.4 MHz / Middle channel / 16QAM



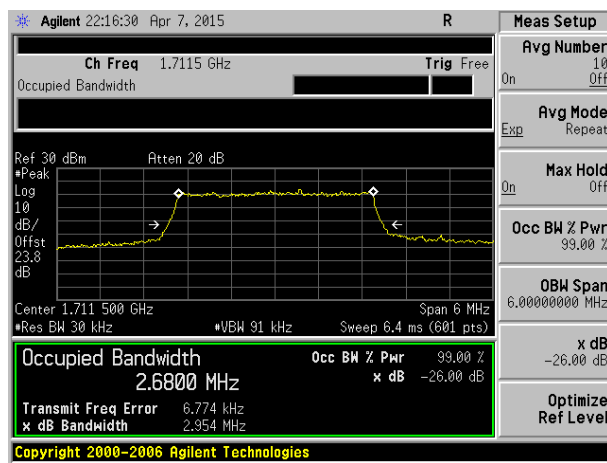
1.4 MHz / High channel / QPSK



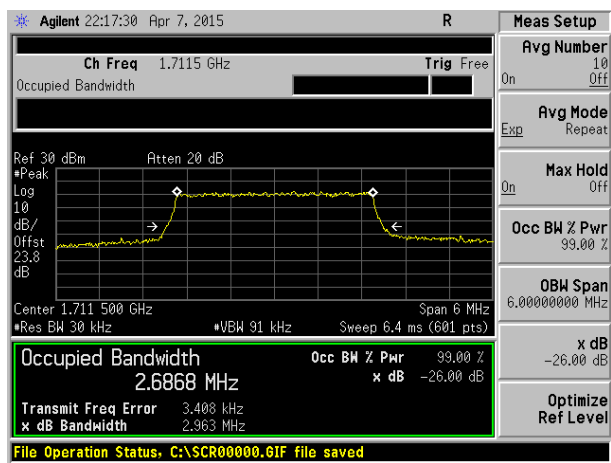
1.4 MHz / High channel / 16QAM



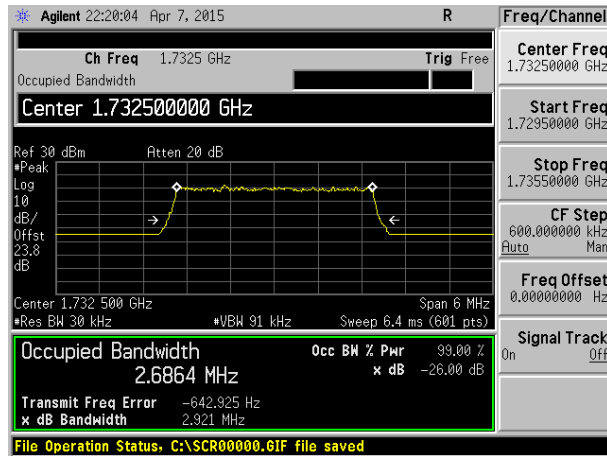
3 MHz / Low channel / QPSK



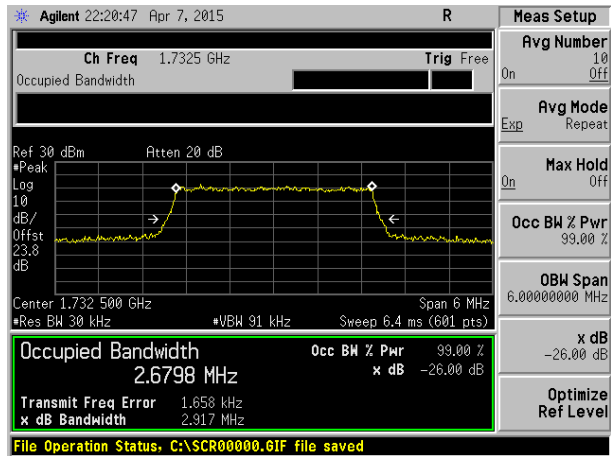
3 MHz / Low channel / 16QAM



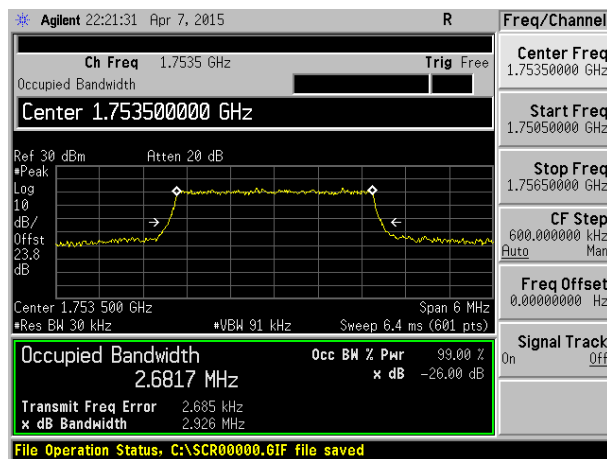
3 MHz / Middle channel / QPSK



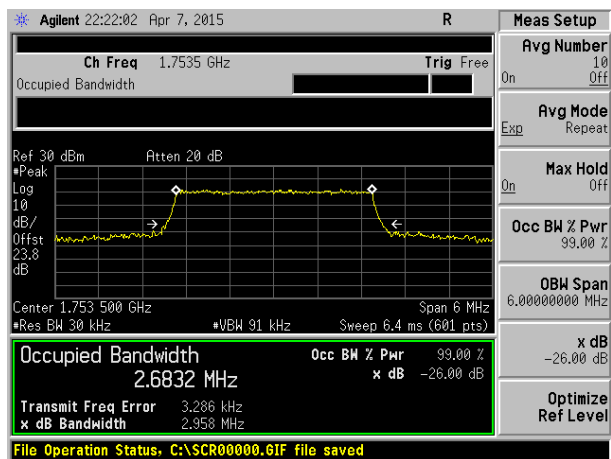
3 MHz / Middle channel / 16QAM



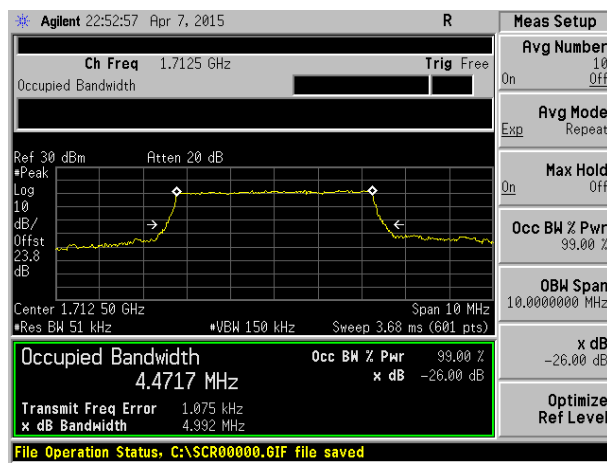
3 MHz / High channel / QPSK



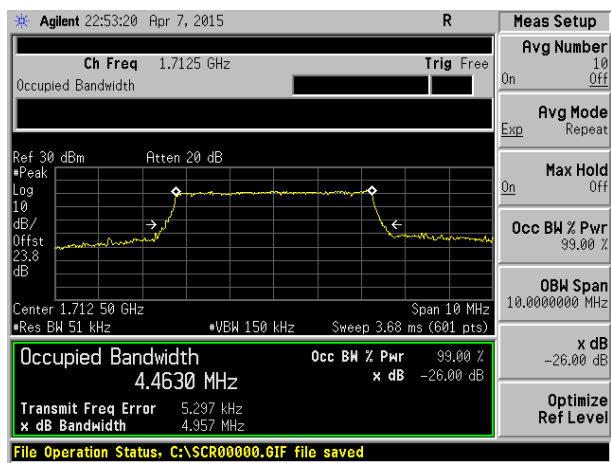
3 MHz / High channel / 16QAM



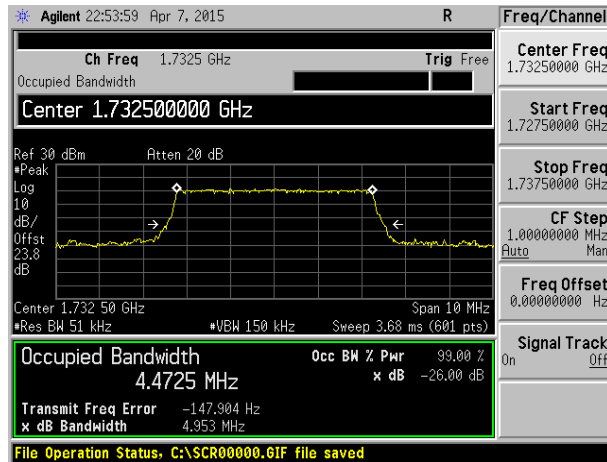
5 MHz / Low channel / QPSK



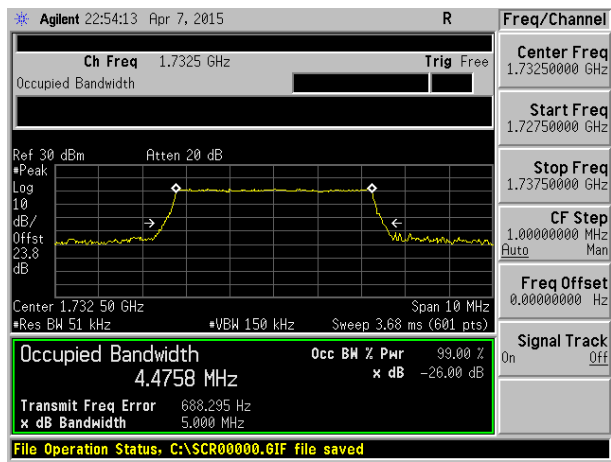
5 MHz / Low channel / 16QAM



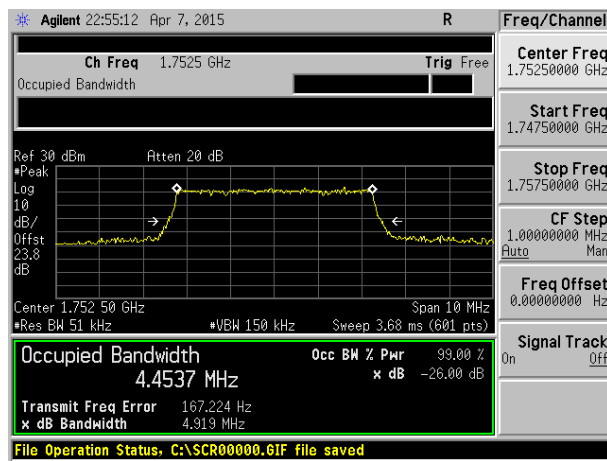
5 MHz / Middle channel / QPSK



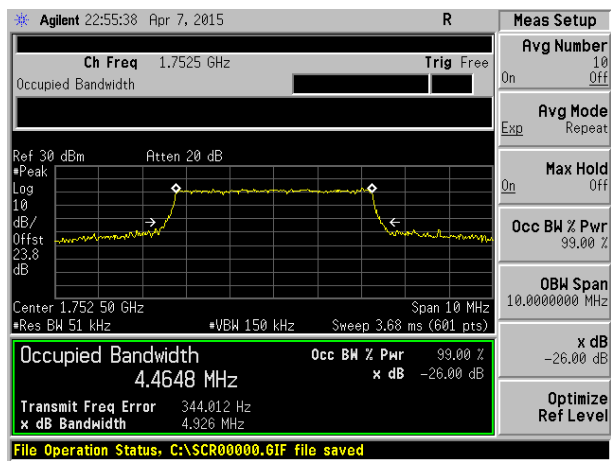
5 MHz / Middle channel / 16QAM



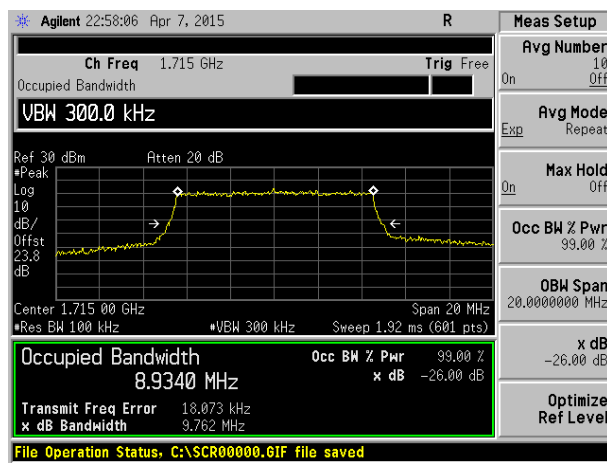
5 MHz / High channel / QPSK



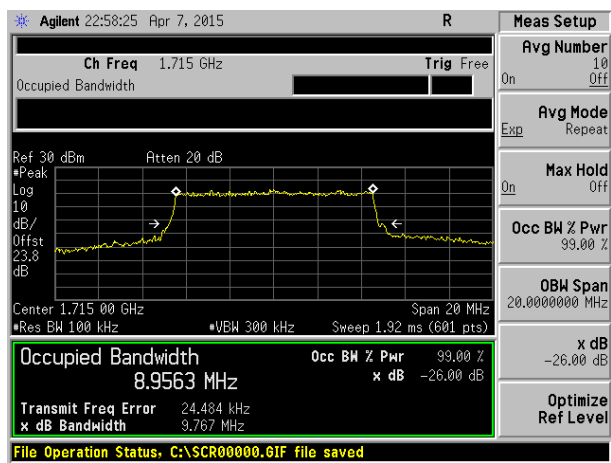
5 MHz / High channel / 16QAM



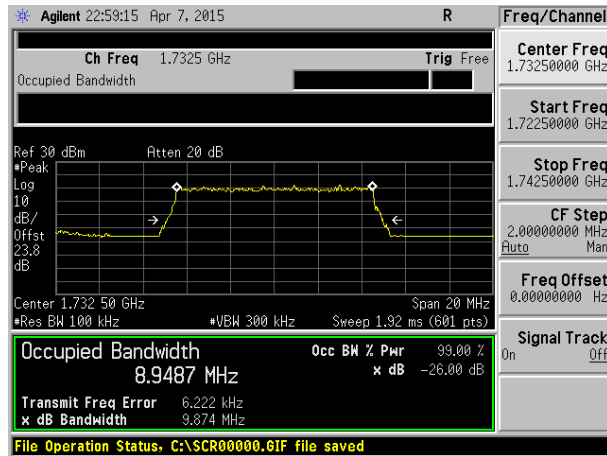
10 MHz / Low channel / QPSK



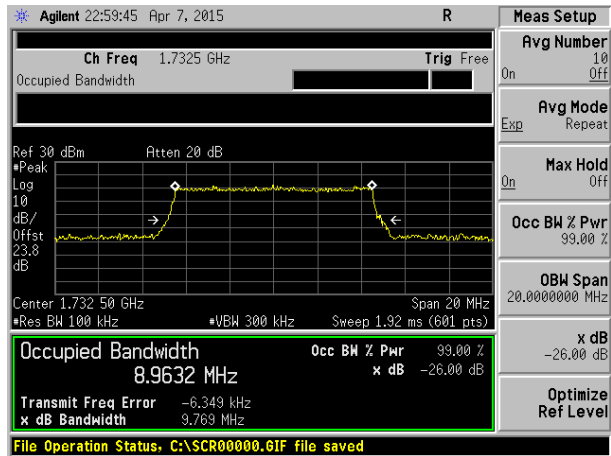
10 MHz / Low channel / 16QAM



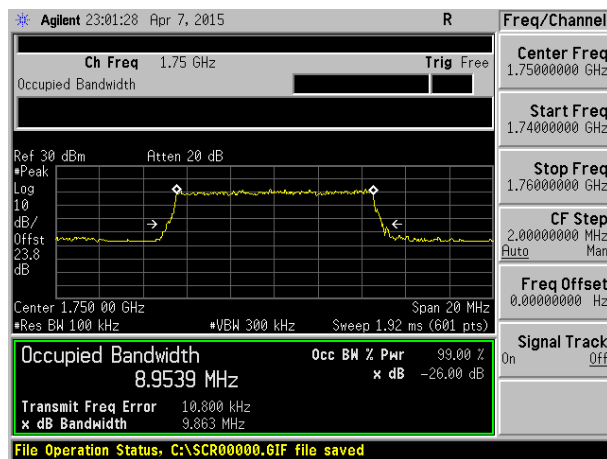
10 MHz / Middle channel / QPSK



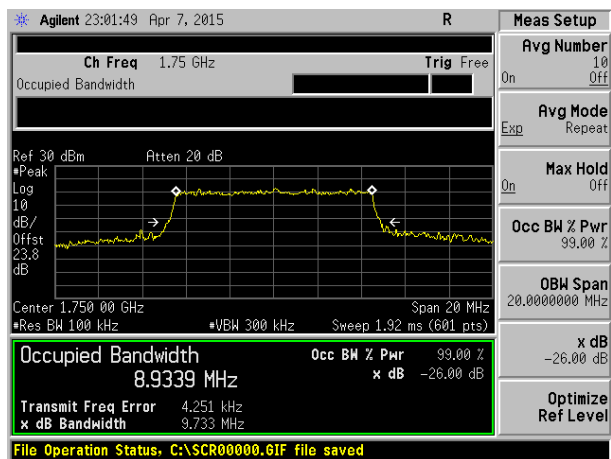
10 MHz / Middle channel / 16QAM



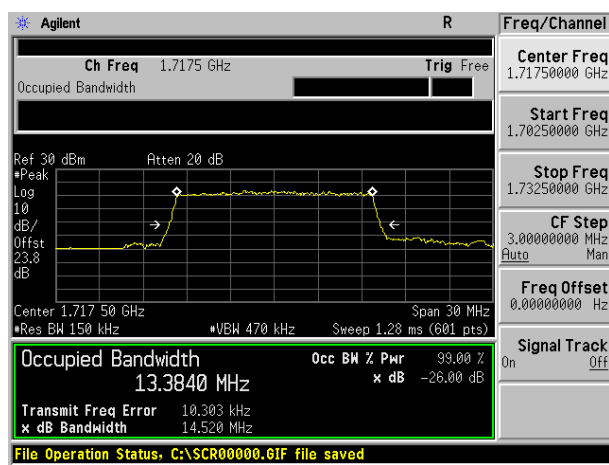
10 MHz / High channel / QPSK



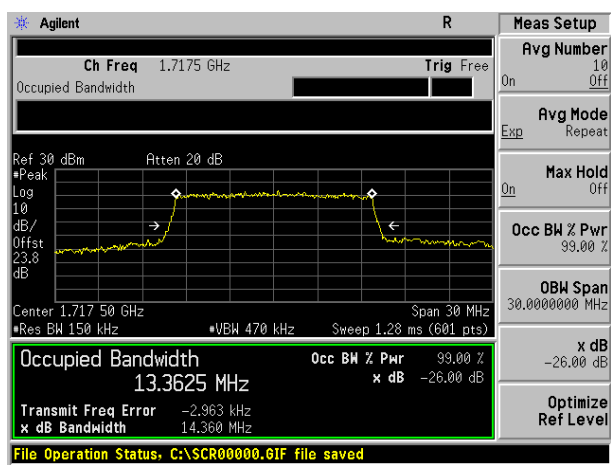
10 MHz / High channel / 16QAM



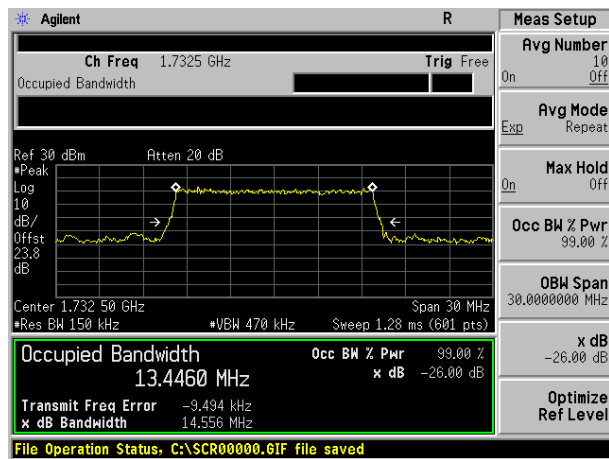
15 MHz / Low channel / QPSK



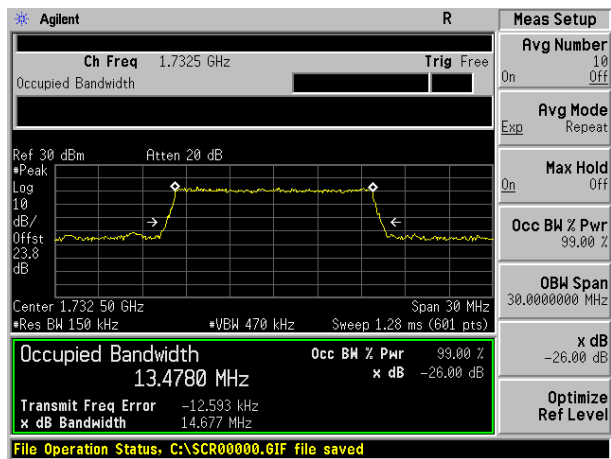
15 MHz / Low channel / 16QAM



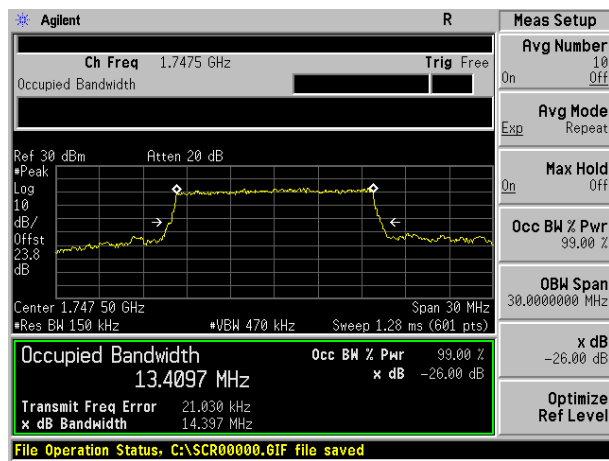
15 MHz / Middle channel / QPSK



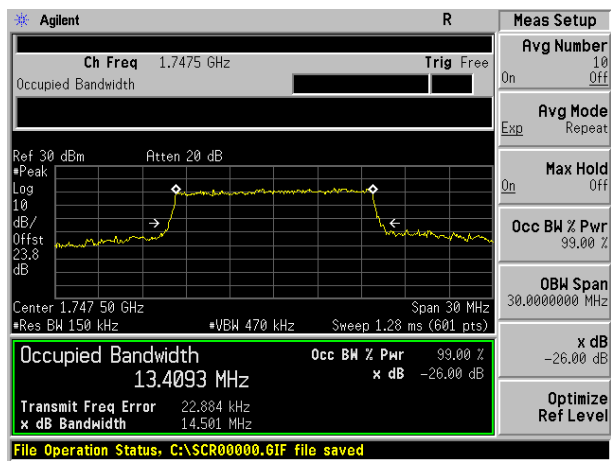
15 MHz / Middle channel / 16QAM



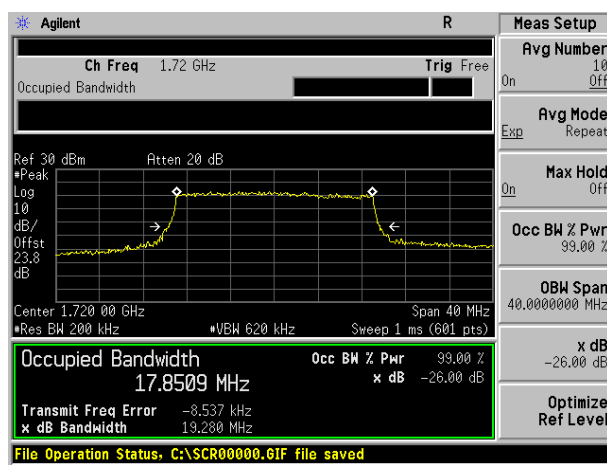
15 MHz / High channel / QPSK



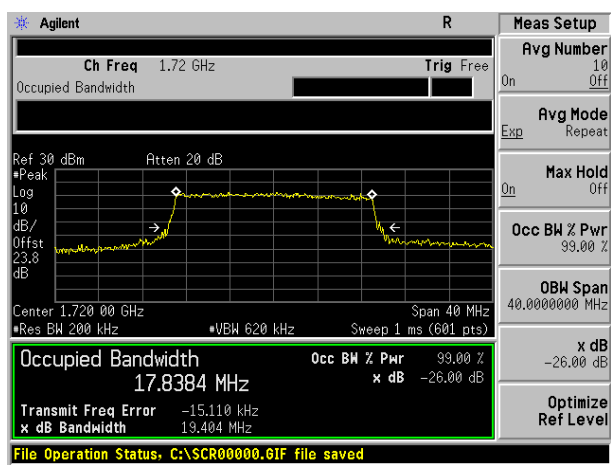
15 MHz / High channel / 16QAM



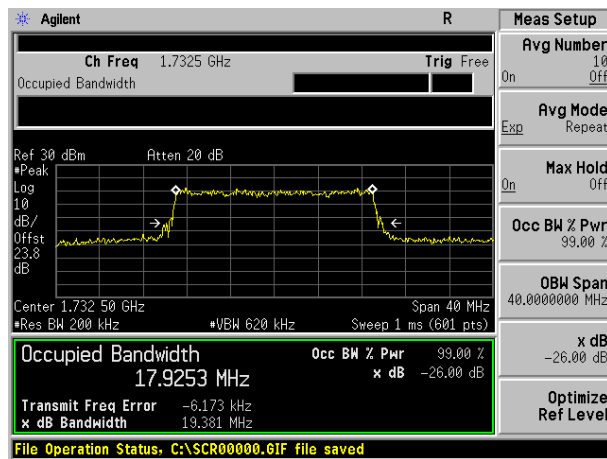
20 MHz / Low channel / QPSK



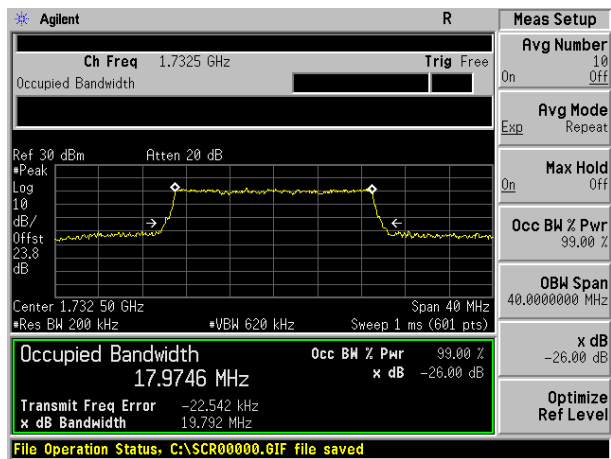
20 MHz / Low channel / 16QAM



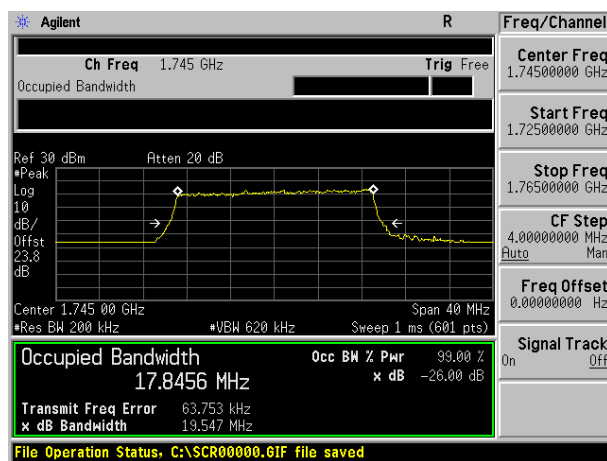
20 MHz / Middle channel / QPSK



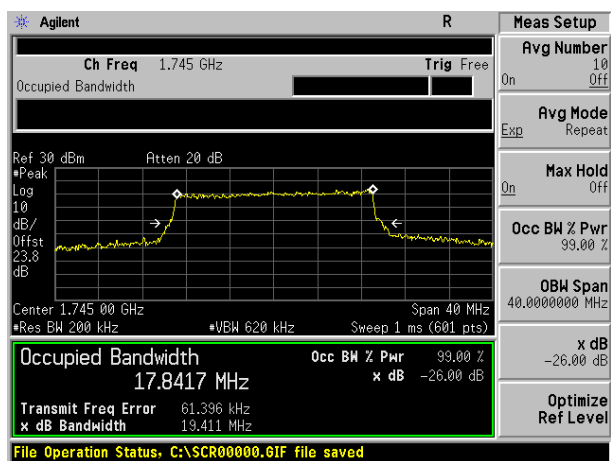
20 MHz / Middle channel / 16QAM



20 MHz / High channel / QPSK

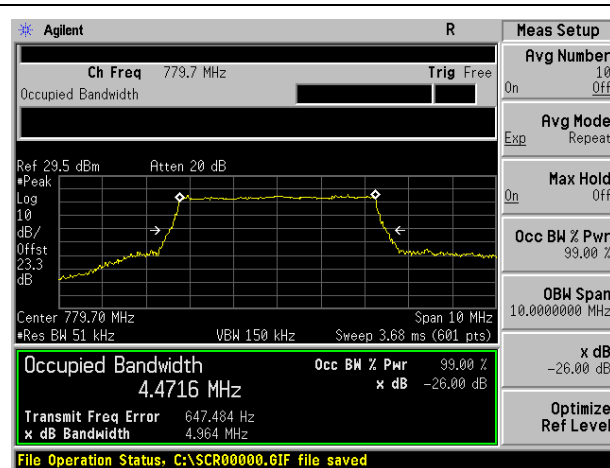


20 MHz / High channel / 16QAM

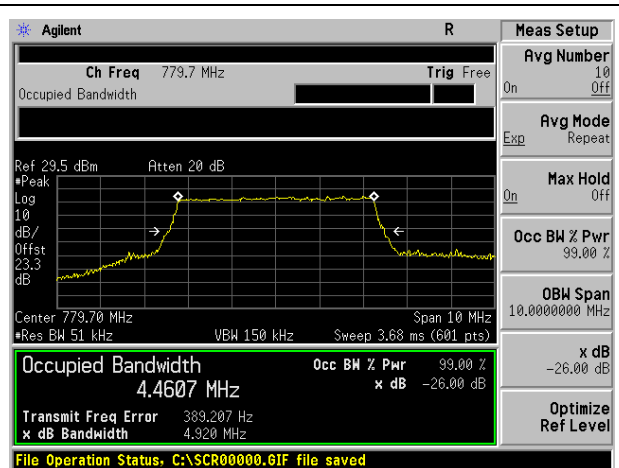


LTE Band 13									
Band Width	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Band Width	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM				QPSK	16QAM
5MHz	23207	779.7	4.4716	4.4607	10MHz	23230	782	8.9545	8.9268
	23230	782	4.4589	4.4780					
	23255	784.5	4.4665	4.4721					

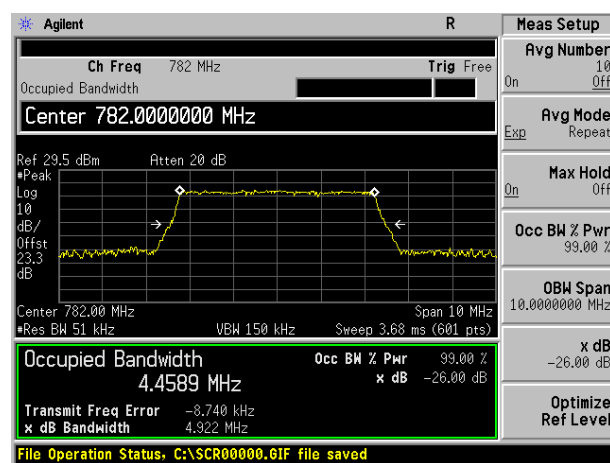
5 MHz / Low channel / QPSK



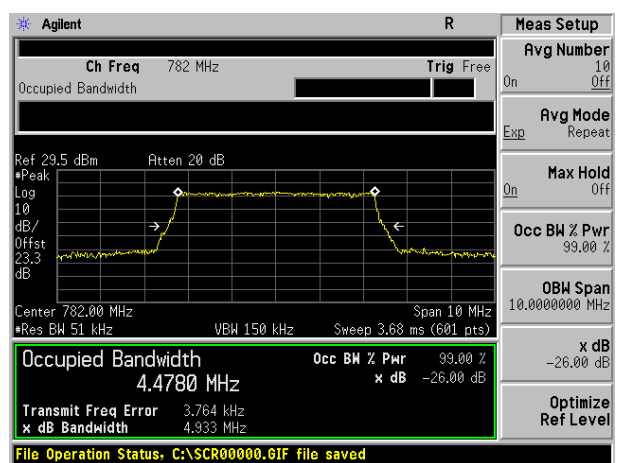
5 MHz / Low channel / 16QAM



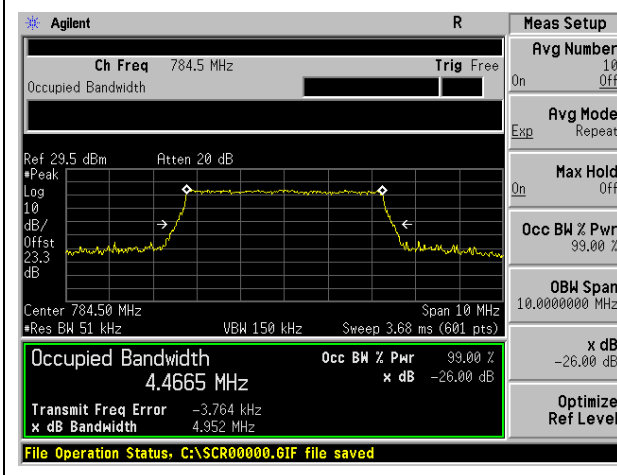
5 MHz / Middle channel / QPSK



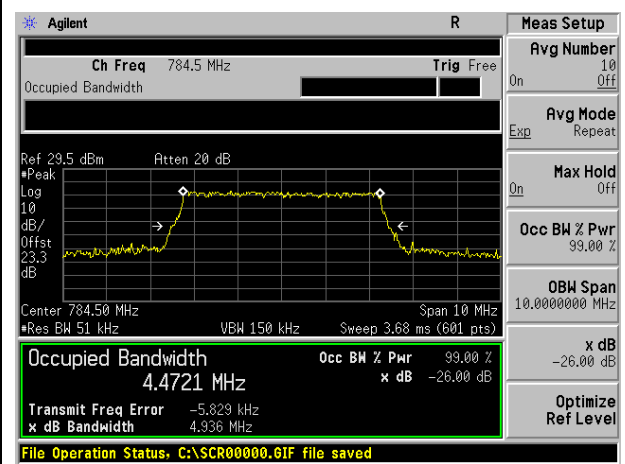
5 MHz / Middle channel / 16QAM



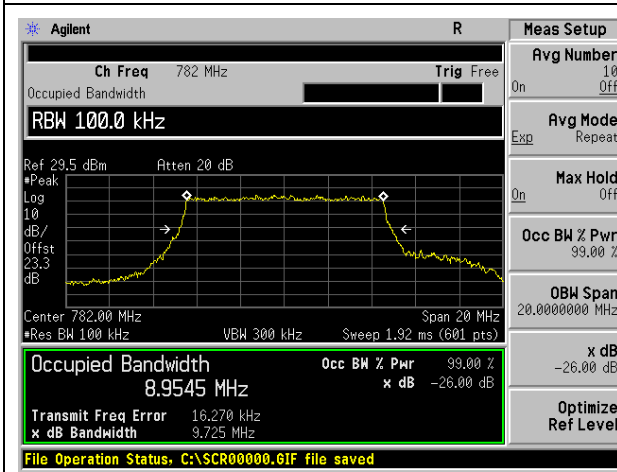
5 MHz / High channel / QPSK



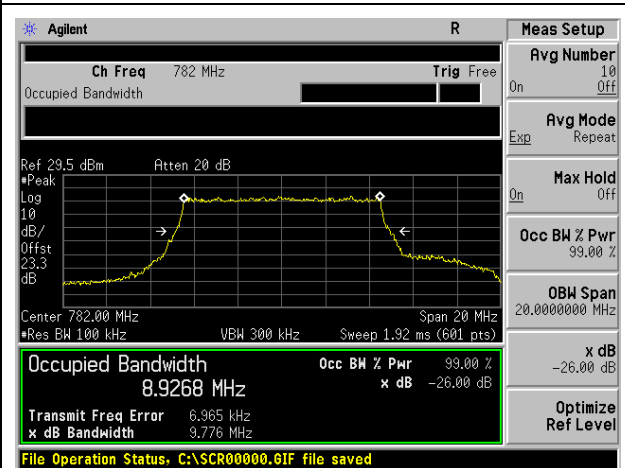
5 MHz / High channel / 16QAM



10 MHz / QPSK



10 MHz / 16QAM



6. Peak Excursion to Average Ratio

6.1 Test conditions

Temperature:	20	°C
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa

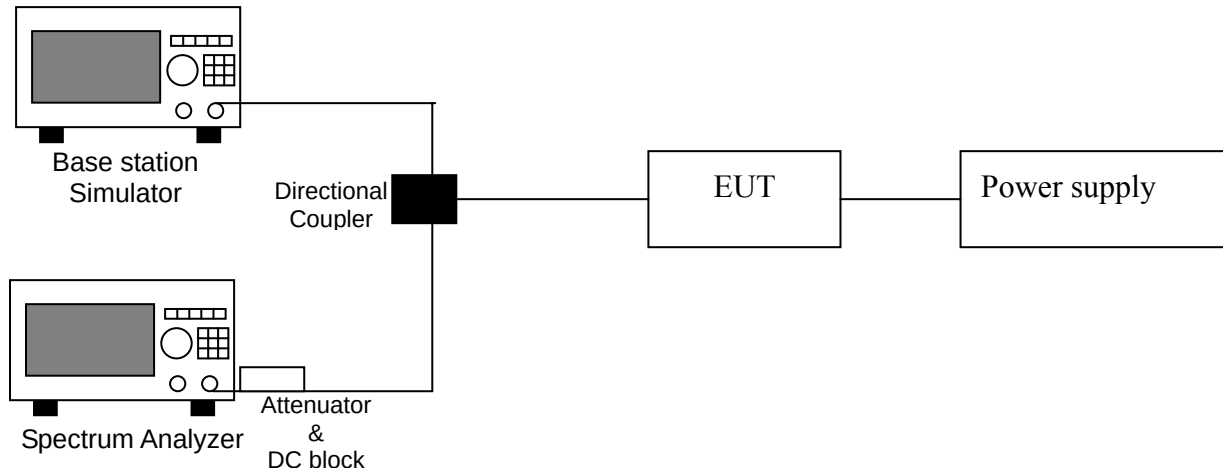
6.2 Limit for peak excursion to average ratio

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

6.3 Test procedure

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

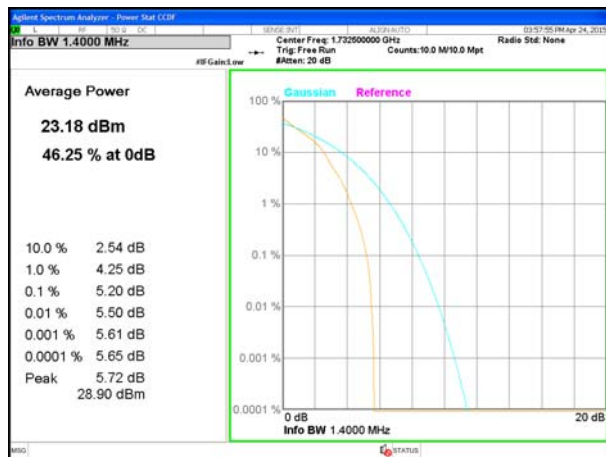
6.4 Test diagram



6.5 Test results

Band 4							
BW	Channel	Frequency (MHz)	Peak to Average Ratio (dB)				Pass/Fail
			QPSK		16QAM		
			1 RB	Full RB	1 RB	Full RB	
1.4MHz	20175	1732.5	5.72	7.16	6.36	7.26	Pass
3 MHz	20175	1732.5	5.61	7.14	6.37	7.82	Pass
5 MHz	20175	1732.5	5.48	6.96	6.40	7.42	Pass
10 MHz	20175	1732.5	5.94	7.75	6.47	7.72	Pass
15 MHz	20175	1732.5	5.90	7.44	6.95	7.53	Pass
20MHz	20175	1732.5	5.40	7.74	7.49	7.81	Pass

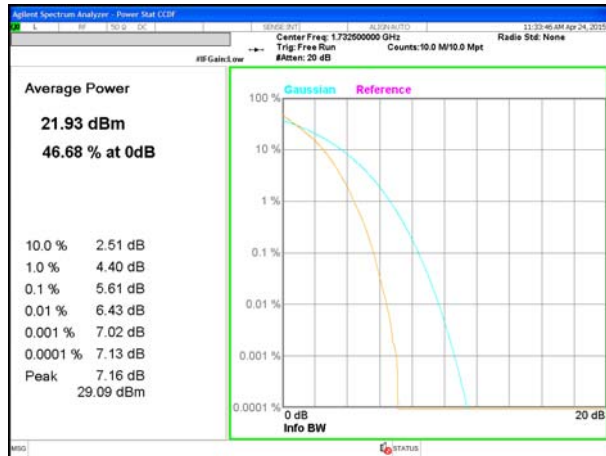
1.4 MHz / 1 RB / QPSK



1.4 MHz / 1 RB / 16QAM



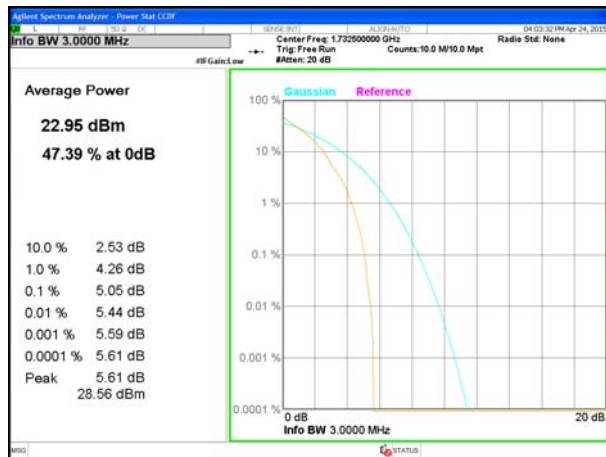
1.4 MHz / Full RB / QPSK



1.4 MHz / Full RB / 16QAM



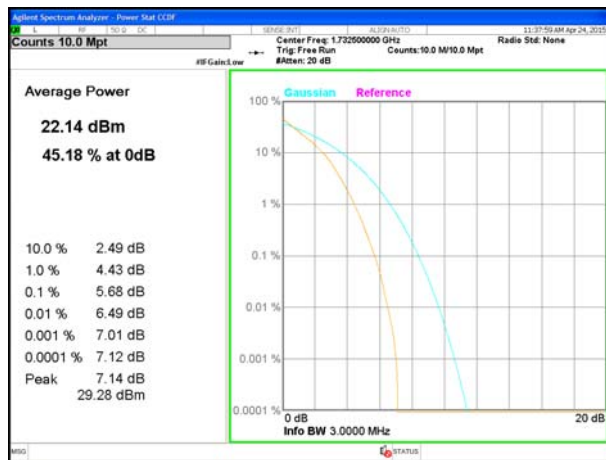
3 MHz / 1 RB / QPSK



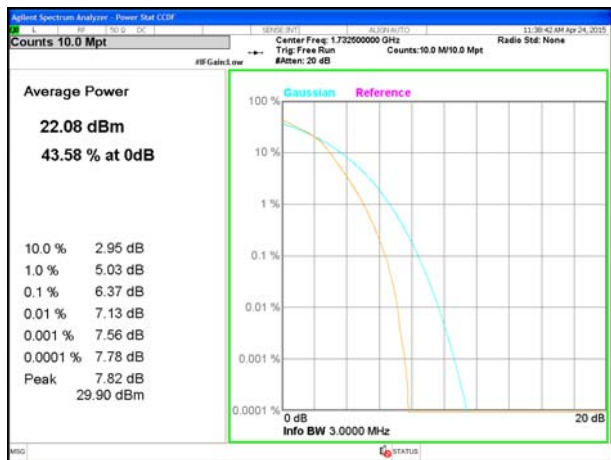
3 MHz / 1 RB / 16QAM



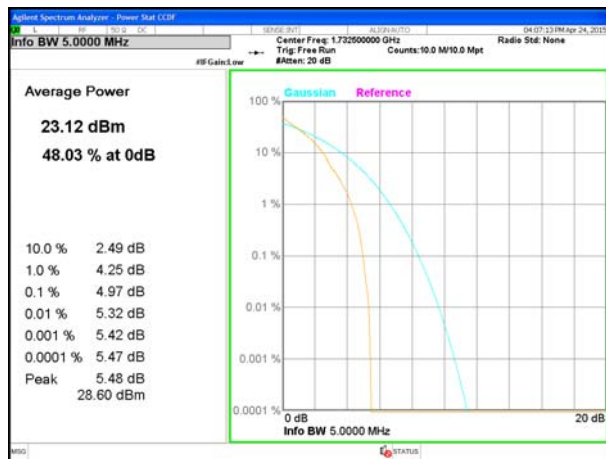
3 MHz / Full RB / QPSK



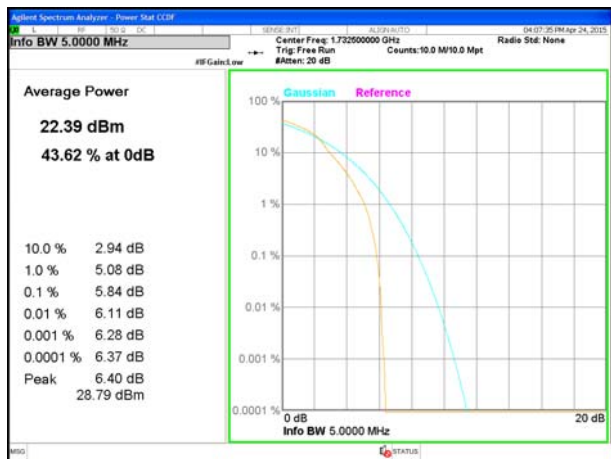
3 MHz / Full RB / 16QAM



5 MHz / 1 RB / QPSK



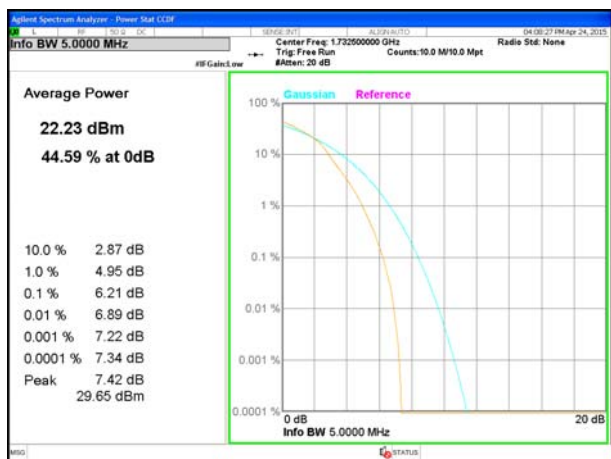
5 MHz / 1 RB / 16QAM



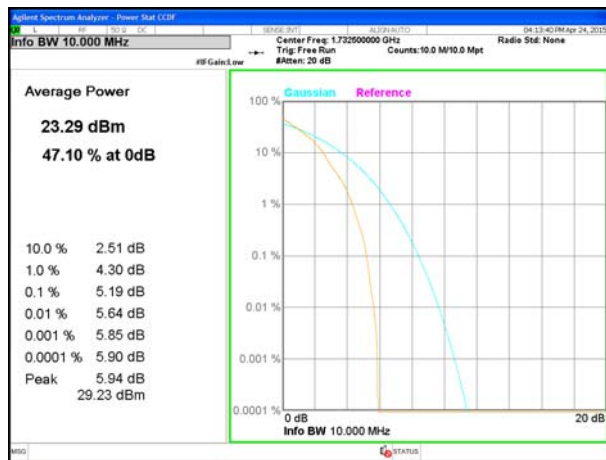
5 MHz / Full RB / QPSK



5 MHz / Full RB / 16QAM



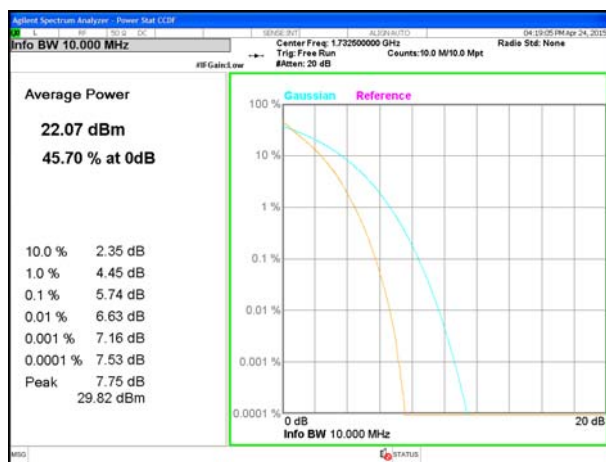
10 MHz / 1 RB / QPSK



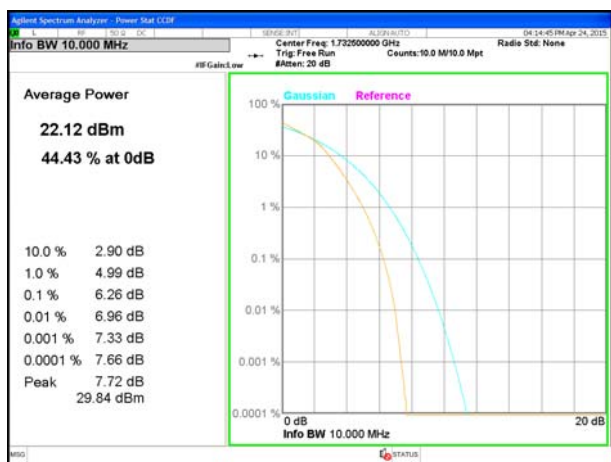
10 MHz / 1 RB / 16QAM



10 MHz / Full RB / QPSK



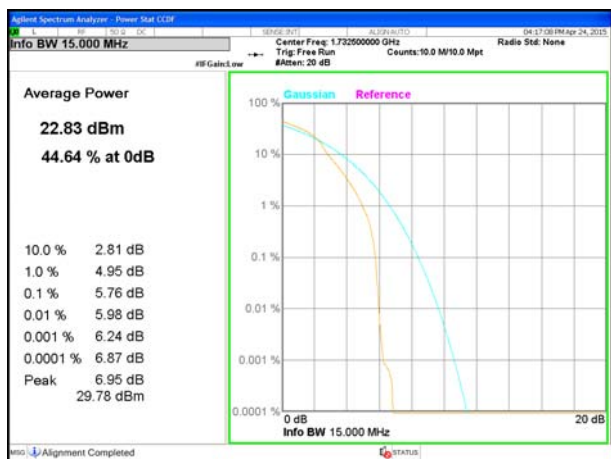
10 MHz / Full RB / 16QAM



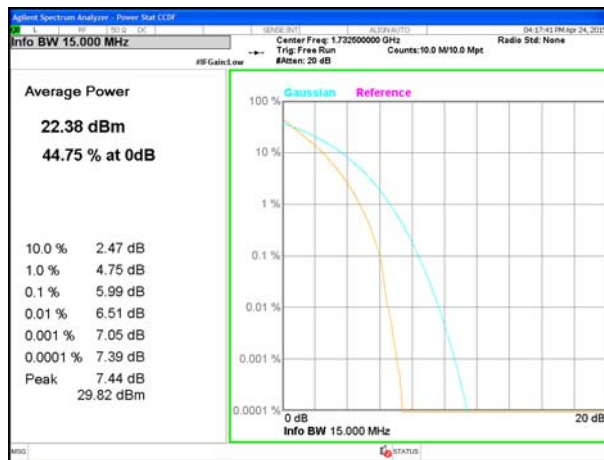
15 MHz / 1 RB / QPSK



15 MHz / 1 RB / 16QAM



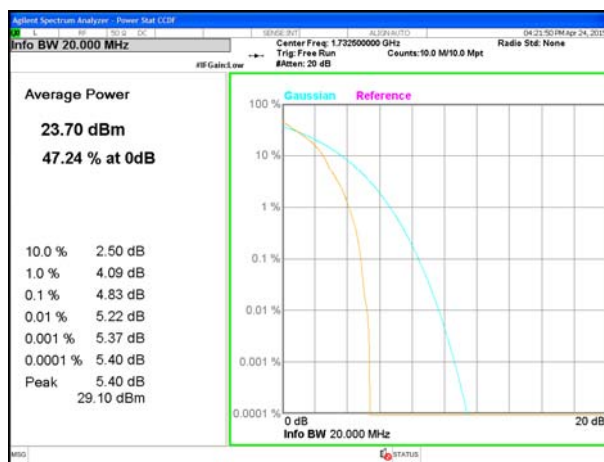
15 MHz / Full RB / QPSK



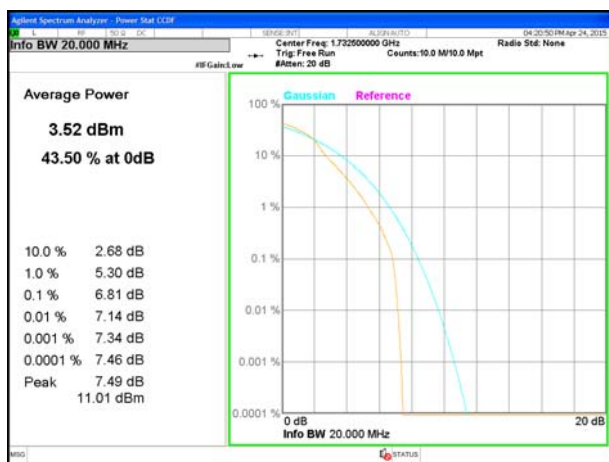
15 MHz / Full RB / 16QAM



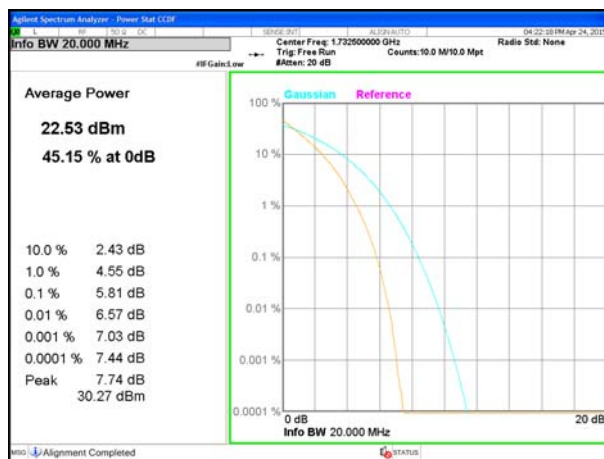
20 MHz / 1 RB / QPSK



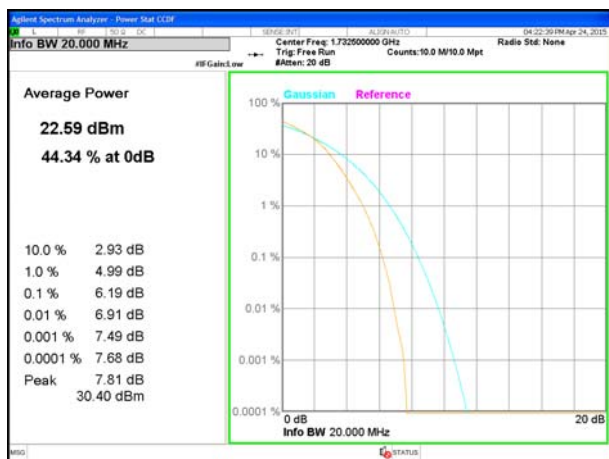
20 MHz / 1 RB / 16QAM



20 MHz / Full RB / QPSK

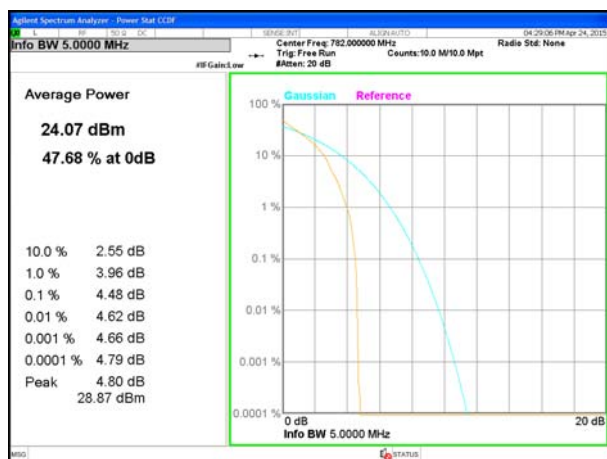


20 MHz / Full RB / 16QAM

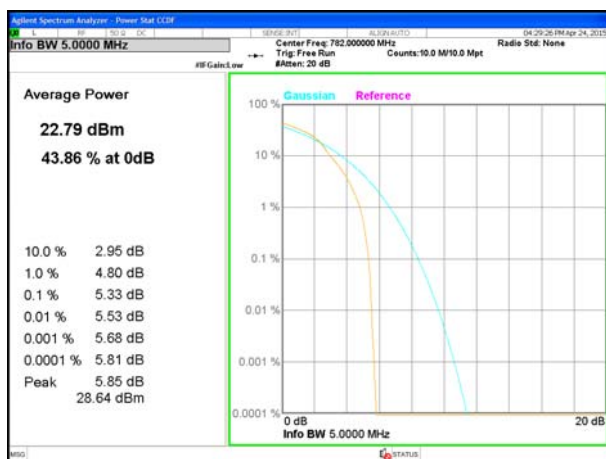


Band 13							
BW	Channel	Frequency (MHz)	Peak to Average Ratio (dB)				Pass/Fail
			QPSK		16QAM		
			1 RB	Full RB	1 RB	Full RB	
5 MHz	23230	782	4.80	6.81	5.85	7.65	Pass
10 MHz	23230	782	5.04	6.43	5.77	7.32	Pass

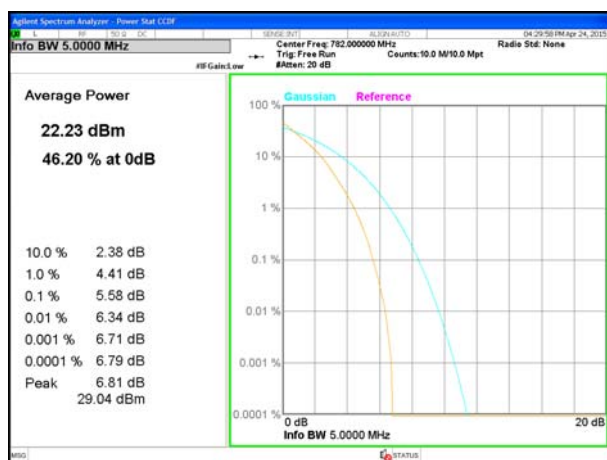
5 MHz / 1 RB / QPSK



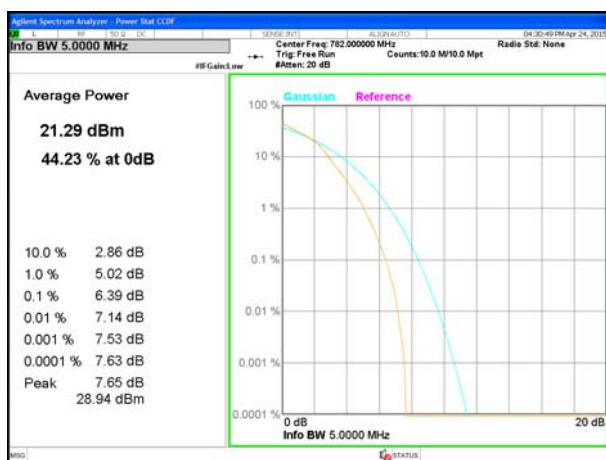
5 MHz / 1 RB / 16QAM



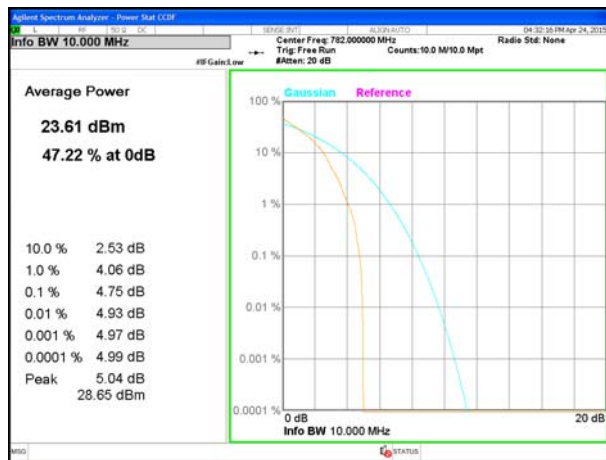
5 MHz / Full RB / QPSK



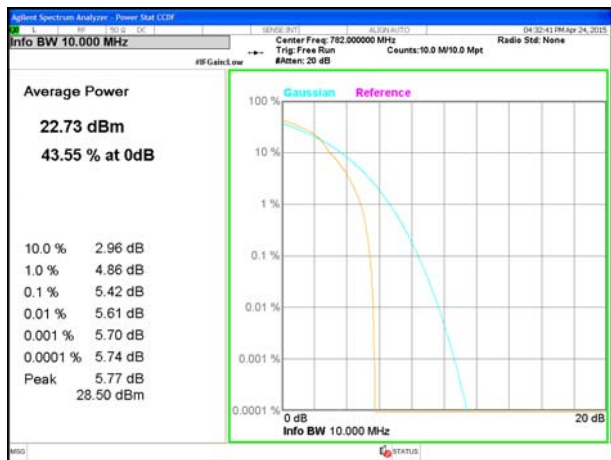
5 MHz / Full RB / 16QAM



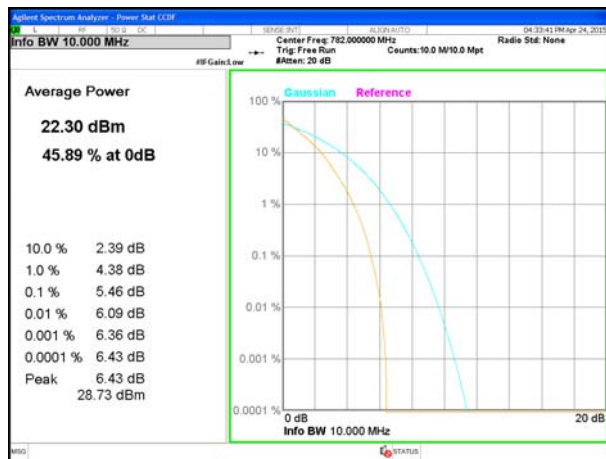
10 MHz / 1 RB / QPSK



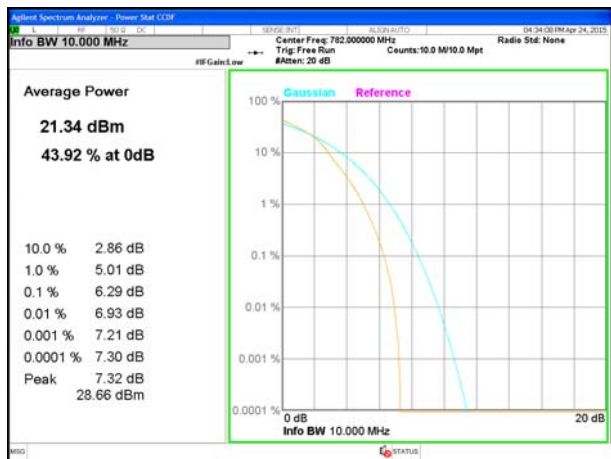
10 MHz / 1 RB / 16QAM



10 MHz / Full RB / QPSK



10 MHz / Full RB / 16QAM



7. Emission on the Band Edge

7.1 Test conditions

Temperature:	20	°C
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa

7.2 Limit for emission on the band edge

For operations in the 776 - 788 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 100 kHz bandwidth. However, in the 100 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

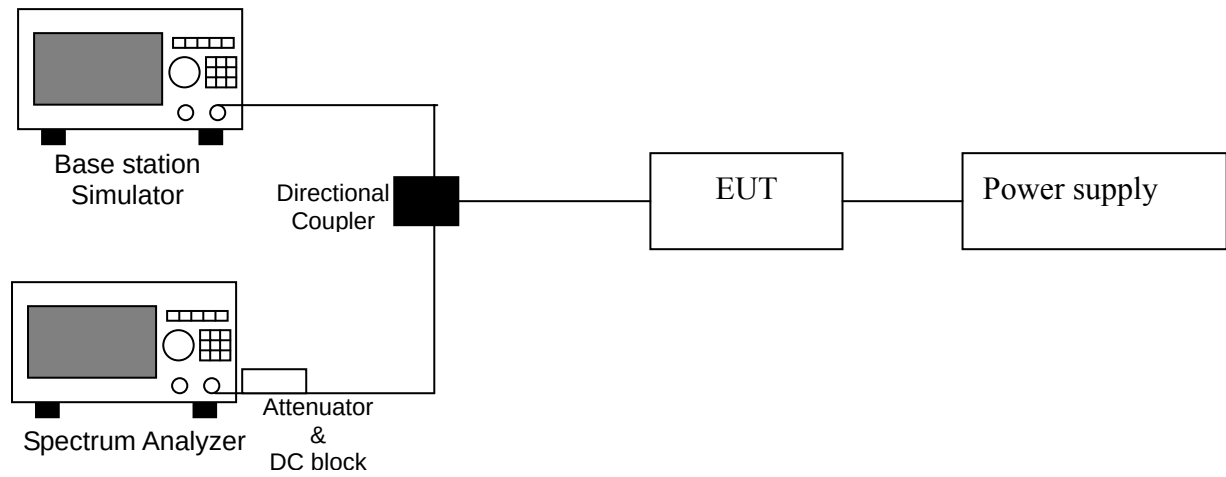
For operations in the 763 - 775 and 793 - 805 MHz band, the FCC limit is $65 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 6.25 kHz bandwidth. However, in the 100 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 1710 – 1755 MHz band, the limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

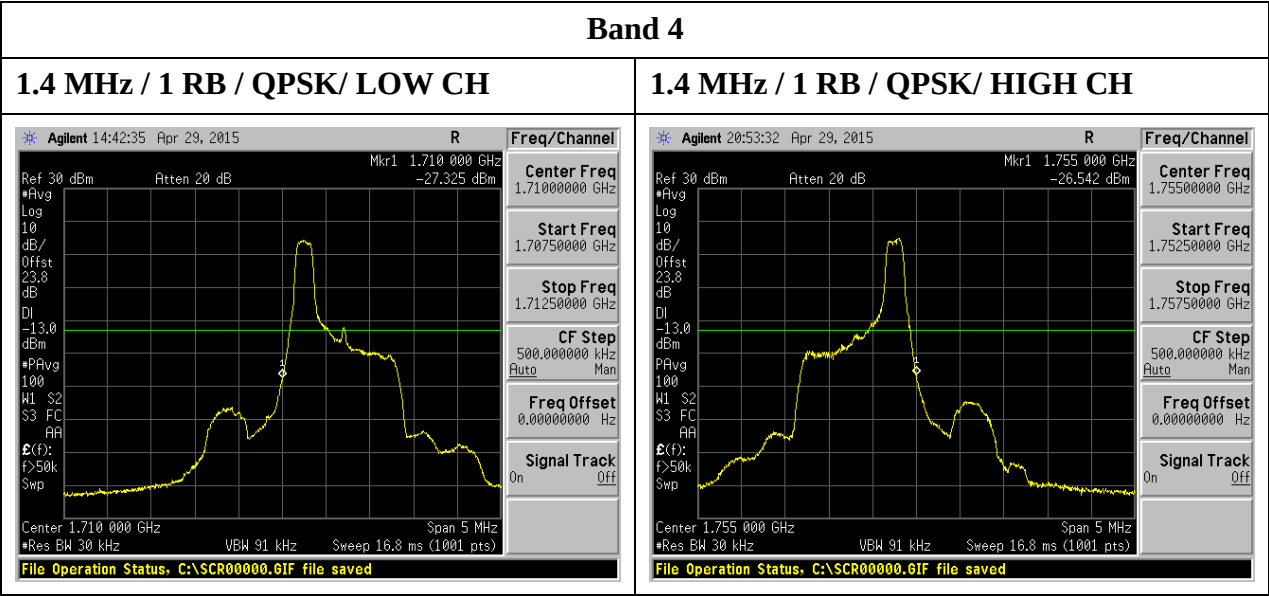
7.3 Test procedure

1. The EUT was set up for the maximum peak power with LTE link data modulation.
The power was measured with Spectrum Analyzer. All measurements were done at 2 channels (lowest and highest operating channel for each band.).
2. The band edge measurement used the directional coupler via EUT RF power connector between Base station Simulator and spectrum analyzer.
3. Set the spectrum analyzer span to include the block edge frequency.
4. Set a marker to point the corresponding band edge frequency in each band.
5. Record the max trace plot into the test report.

7.4 Test diagram

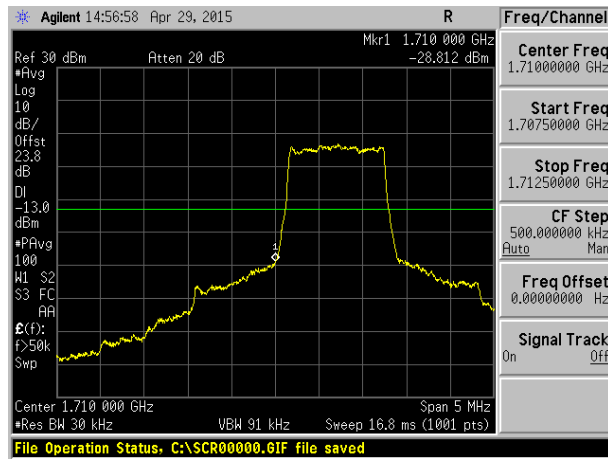


7.4 Test results

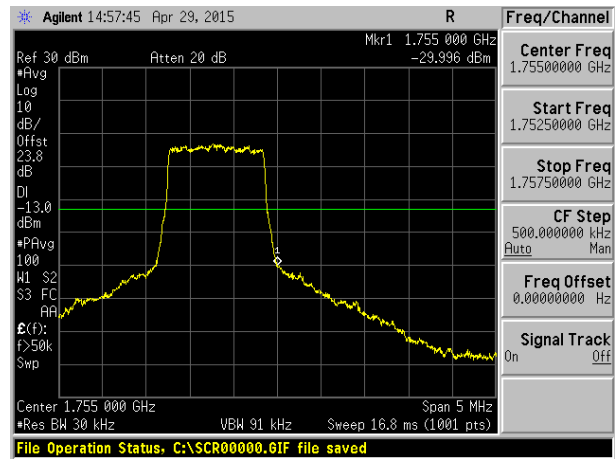


Band 4

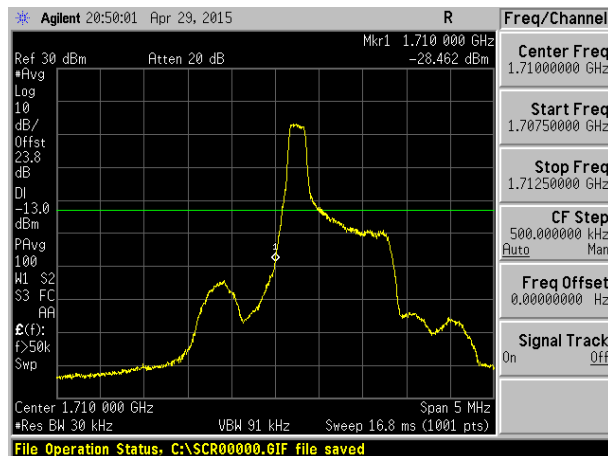
1.4 MHz / Full RB / QPSK/ LOW CH



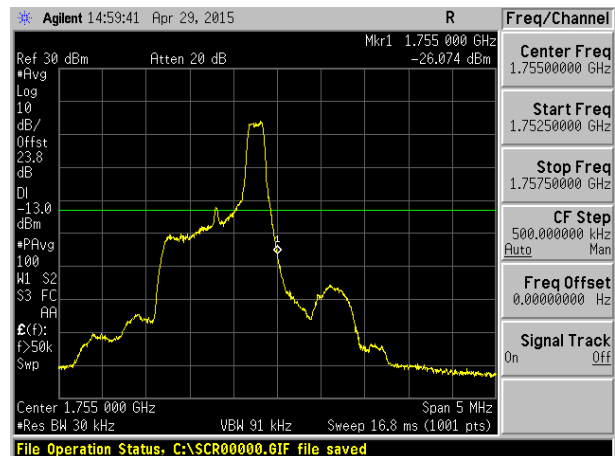
1.4 MHz / Full RB / QPSK/ HIGH CH



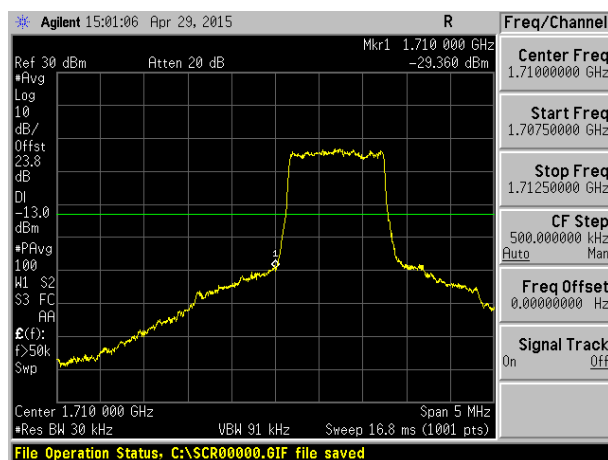
1.4 MHz / 1 RB / 16QAM / LOW CH



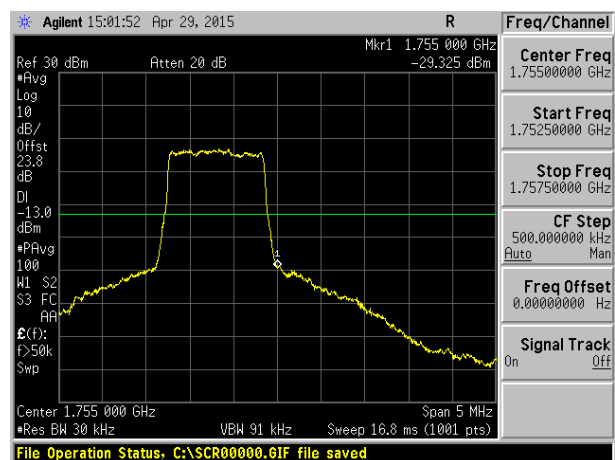
1.4 MHz / 1 RB / 16QAM / HIGH CH



1.4 MHz / Full RB / 16QAM / LOW CH

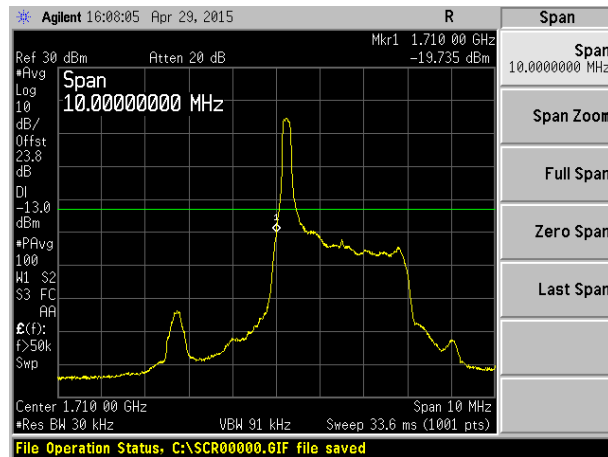


1.4 MHz / Full RB / 16QAM / HIGH CH

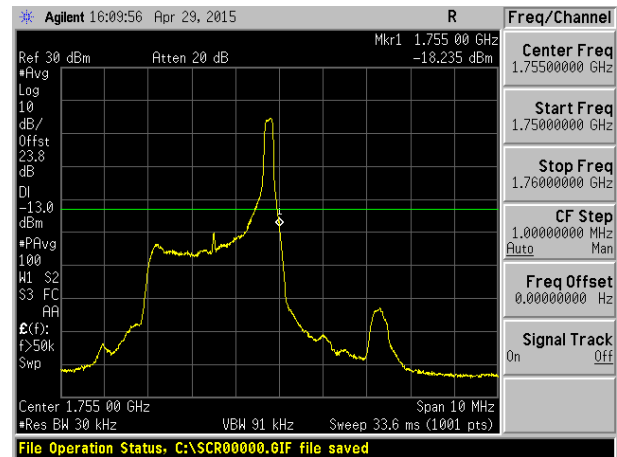


Band 4

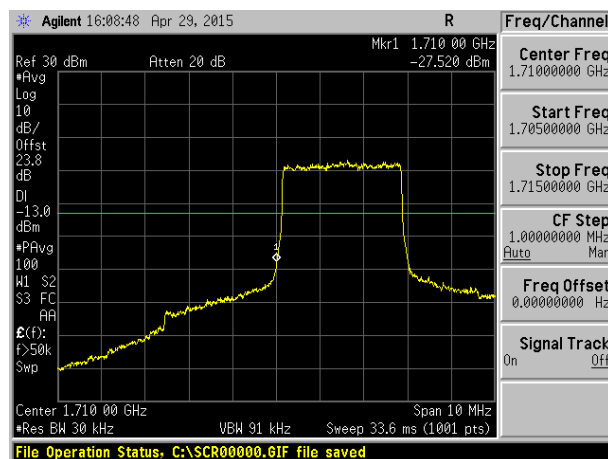
3 MHz / 1 RB / QPSK/ LOW CH



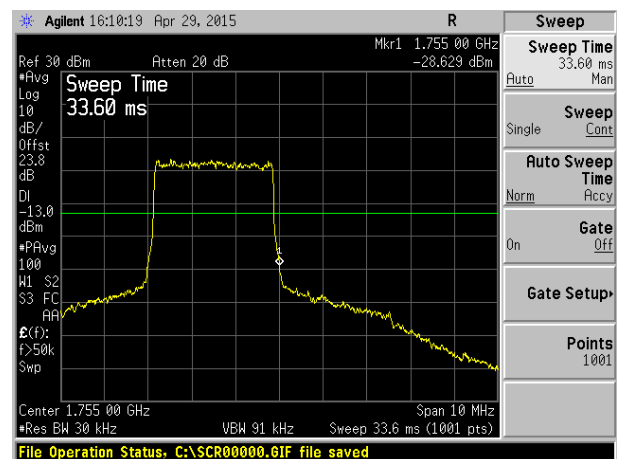
3 MHz / 1 RB / QPSK/ HIGH CH



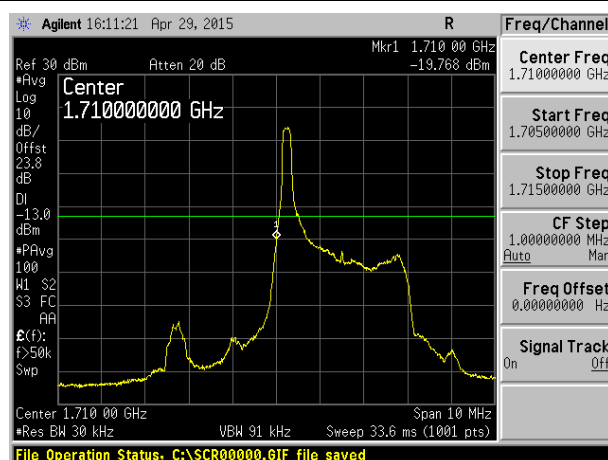
3 MHz / Full RB / QPSK/ LOW CH



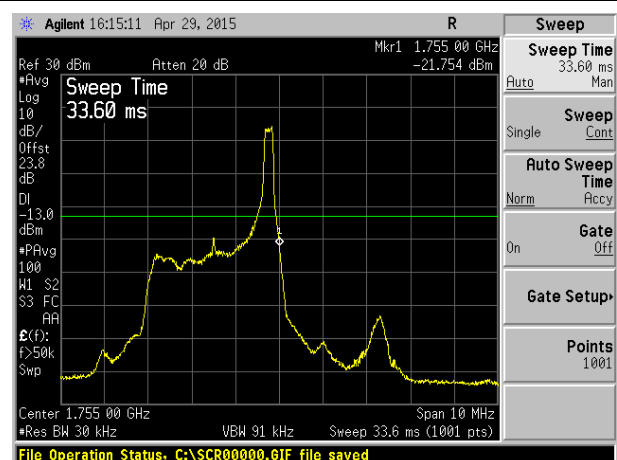
3 MHz / Full RB / QPSK/ HIGH CH



3 MHz / 1 RB / 16QAM / LOW CH

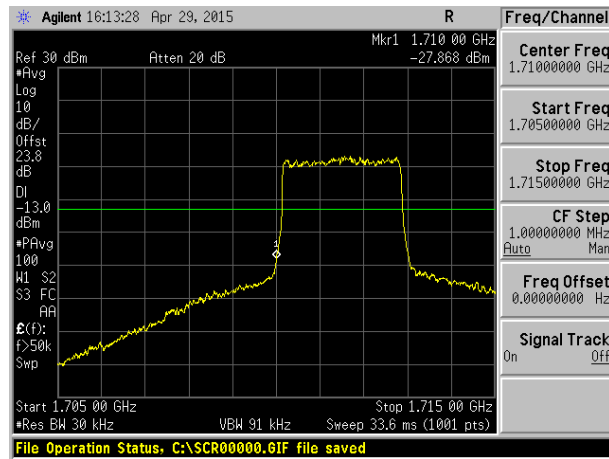


3 MHz / 1 RB / 16QAM / HIGH CH

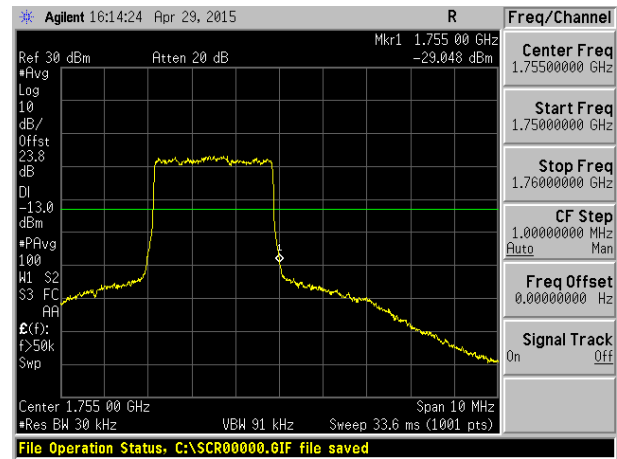


Band 4

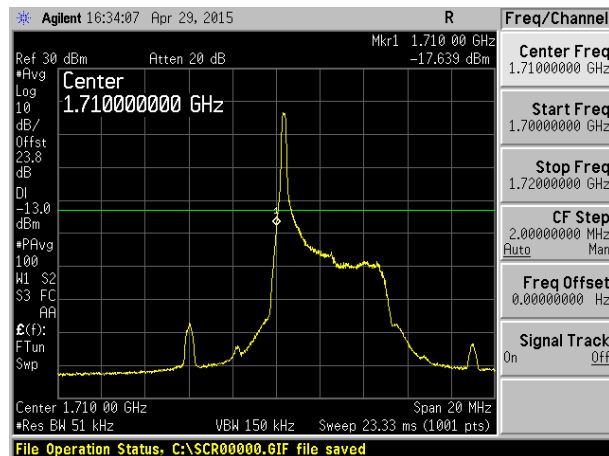
3 MHz / Full RB / 16QAM / LOW CH



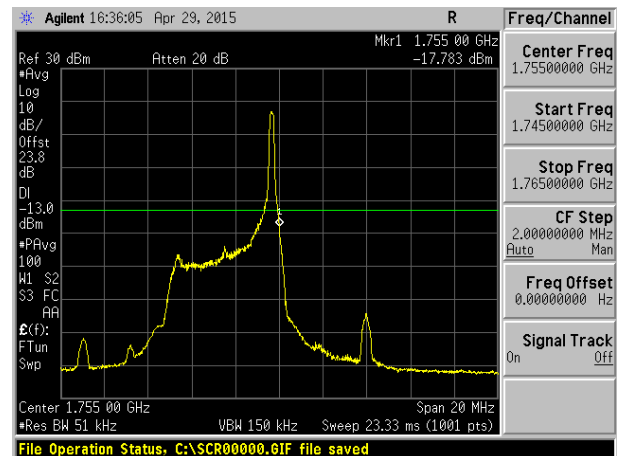
3 MHz / Full RB / 16QAM / HIGH CH



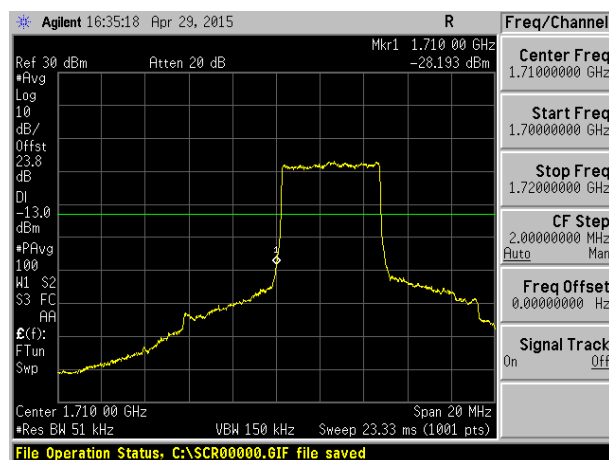
5 MHz / 1 RB / QPSK/ LOW CH



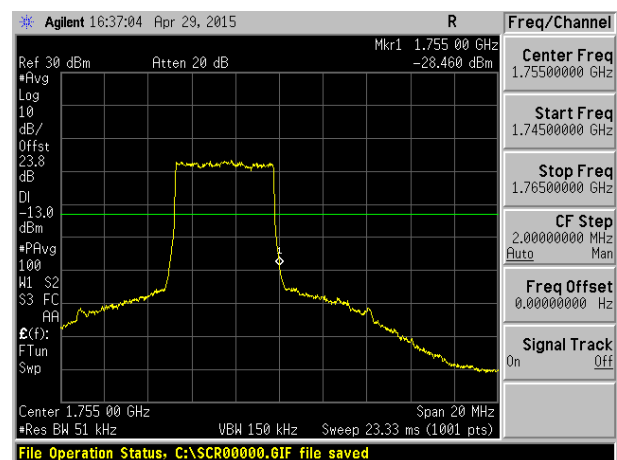
5 MHz / 1 RB / QPSK/ HIGH CH



5 MHz / Full RB / QPSK/ LOW CH

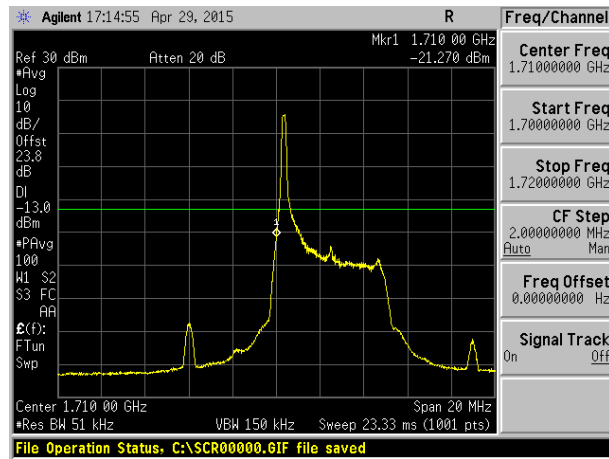


5 MHz / Full RB / QPSK/ HIGH CH

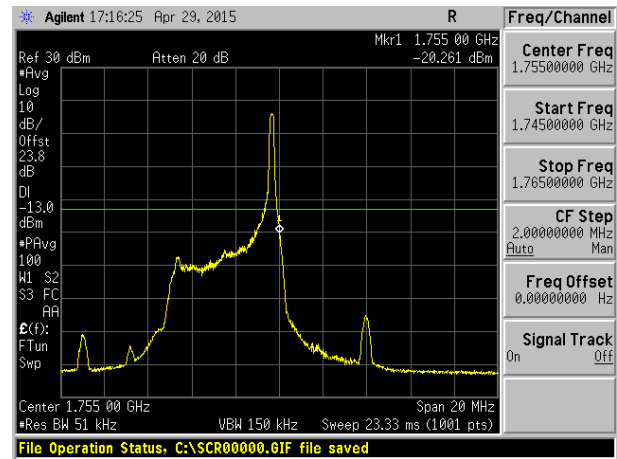


Band 4

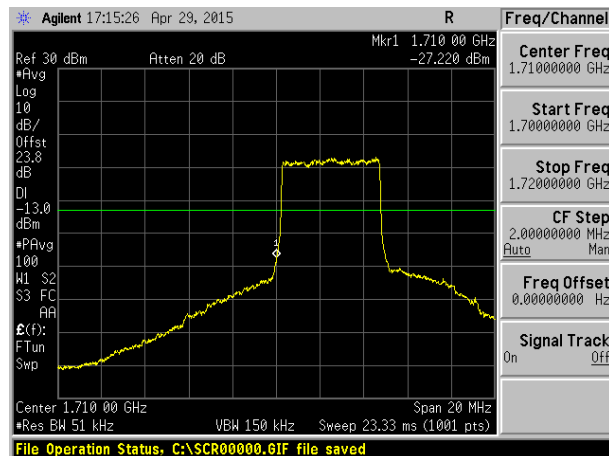
5 MHz / 1 RB / 16QAM / LOW CH



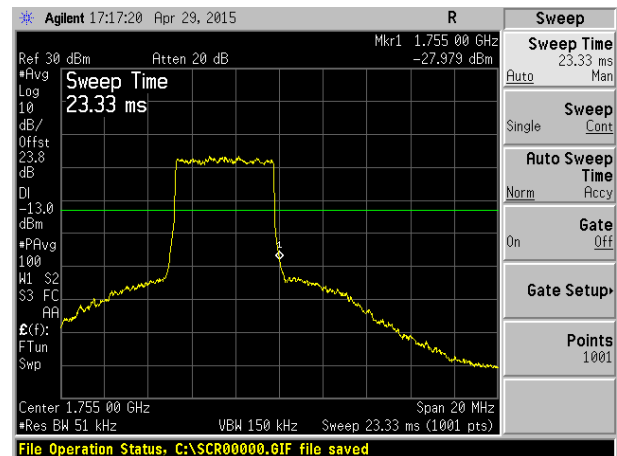
5 MHz / 1 RB / 16QAM / HIGH CH



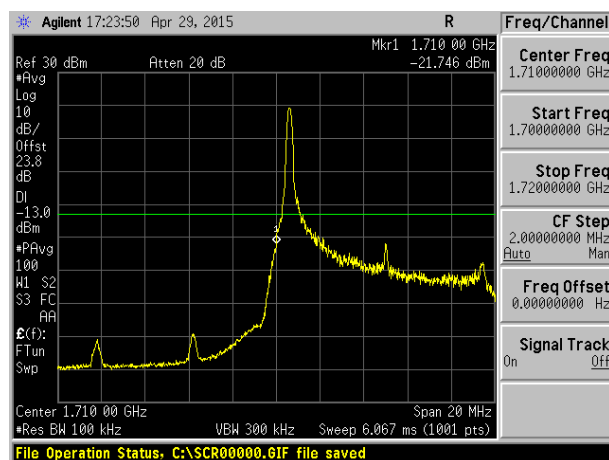
5 MHz / Full RB / 16QAM / LOW CH



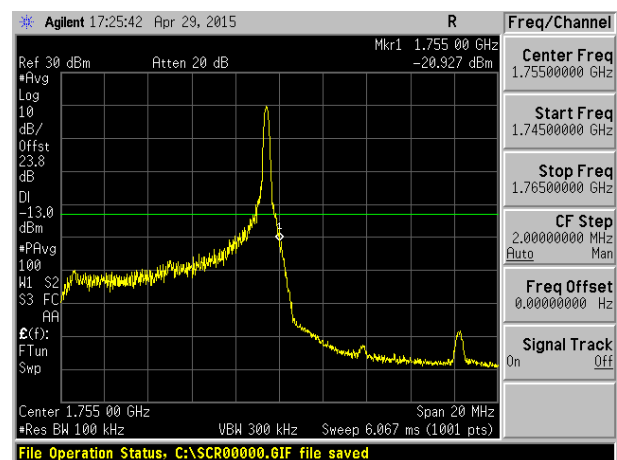
5 MHz / Full RB / 16QAM / HIGH CH



10 MHz / 1 RB / QPSK/ LOW CH

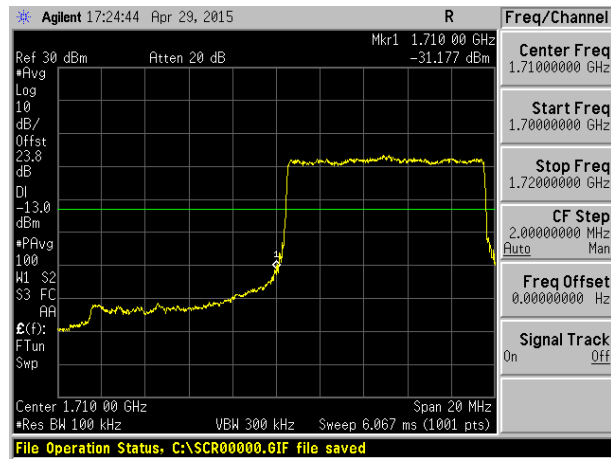


10 MHz / 1 RB / QPSK/ HIGH CH

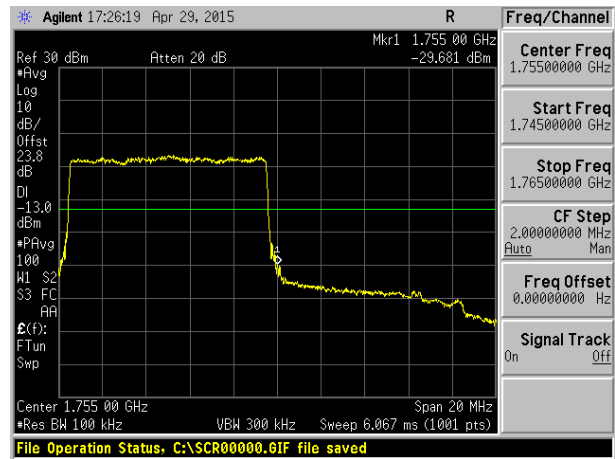


Band 4

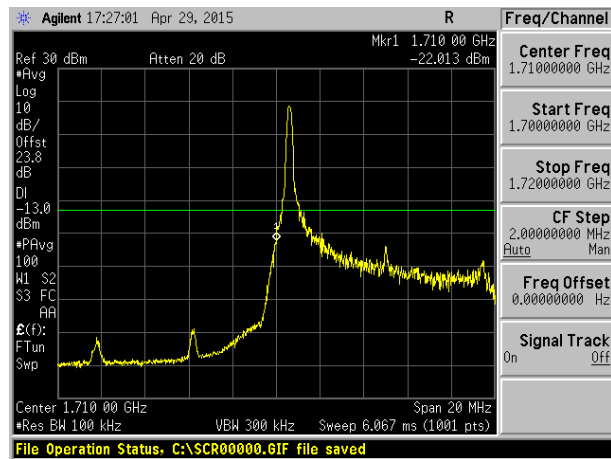
10 MHz / Full RB / QPSK/ LOW CH



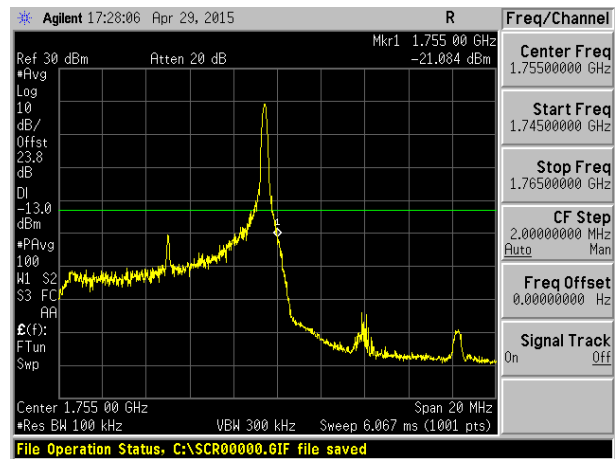
10 MHz / Full RB / QPSK/ HIGH CH



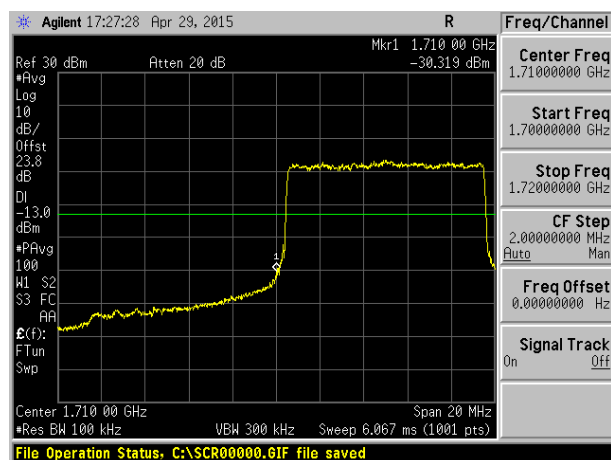
10 MHz / 1 RB / 16QAM / LOW CH



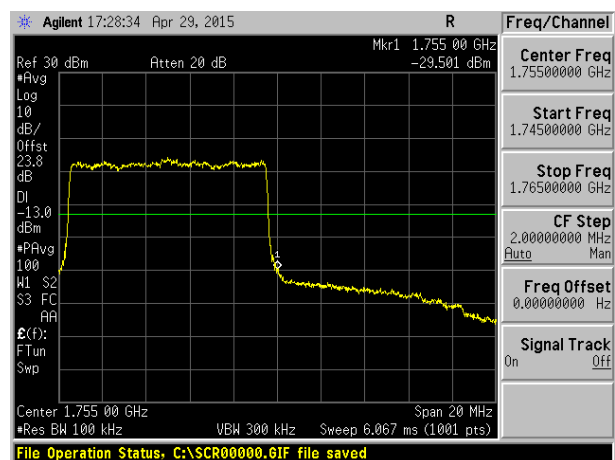
10 MHz / 1 RB / 16QAM / HIGH CH



10 MHz / Full RB / 16QAM / LOW CH

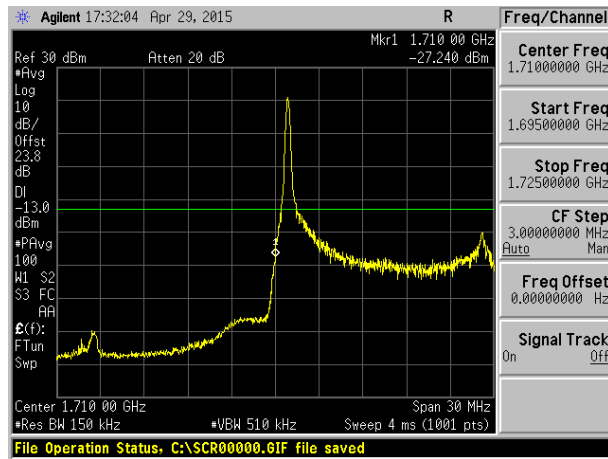


10 MHz / Full RB / 16QAM / HIGH CH

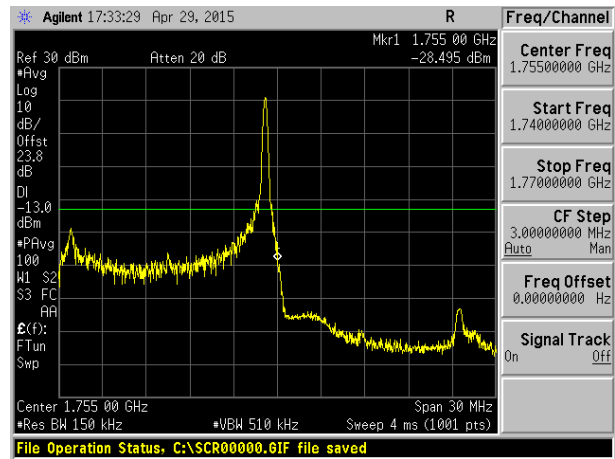


Band 4

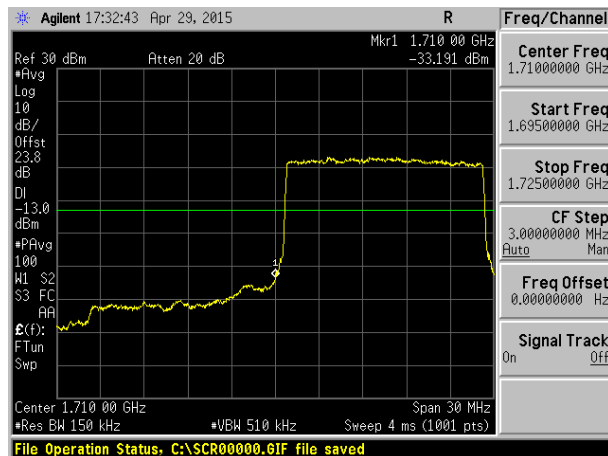
15 MHz / 1 RB / QPSK/ LOW CH



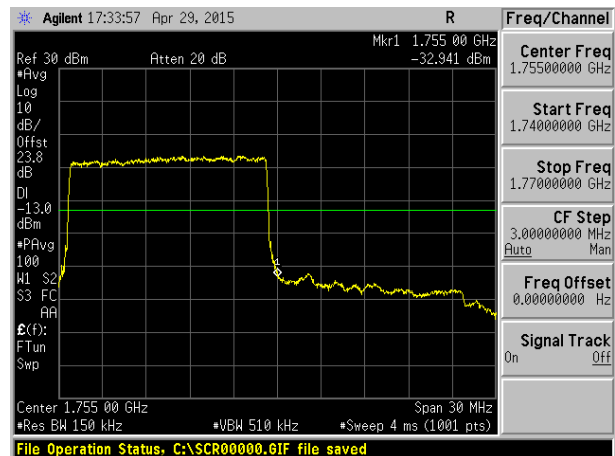
15 MHz / 1 RB / QPSK/ HIGH CH



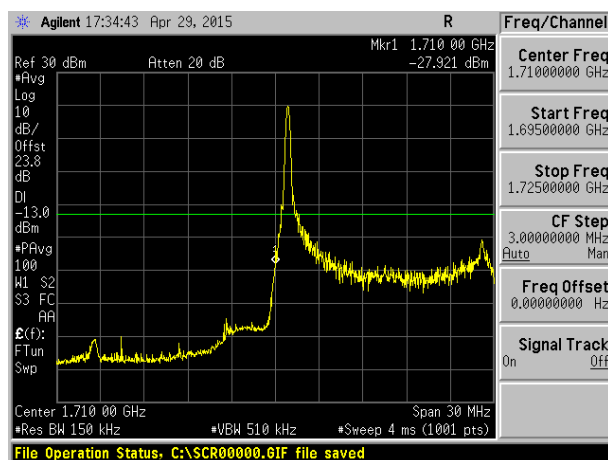
15 MHz / Full RB / QPSK/ LOW CH



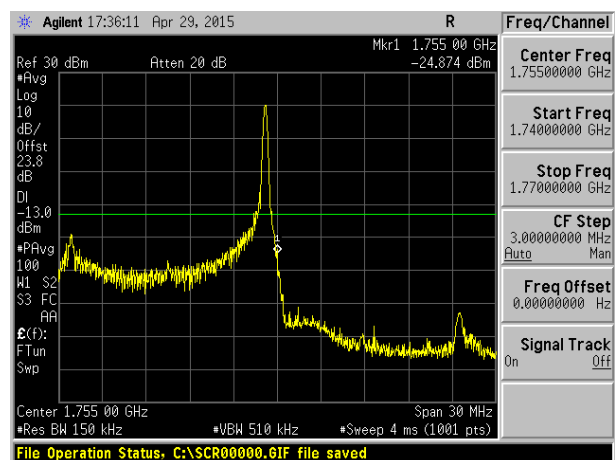
15 MHz / Full RB / QPSK/ HIGH CH



15 MHz / 1 RB / 16QAM / LOW CH

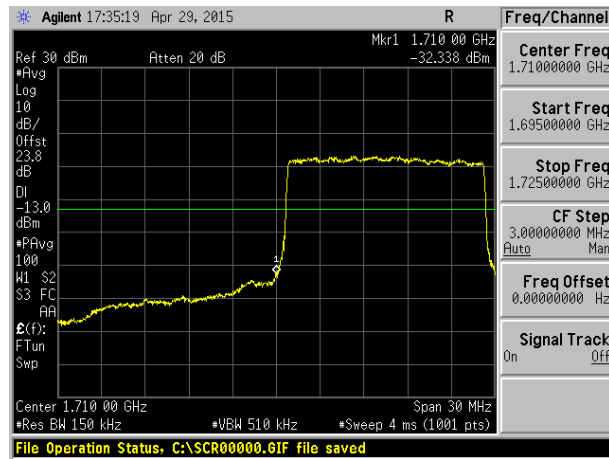


15 MHz / 1 RB / 16QAM / HIGH CH

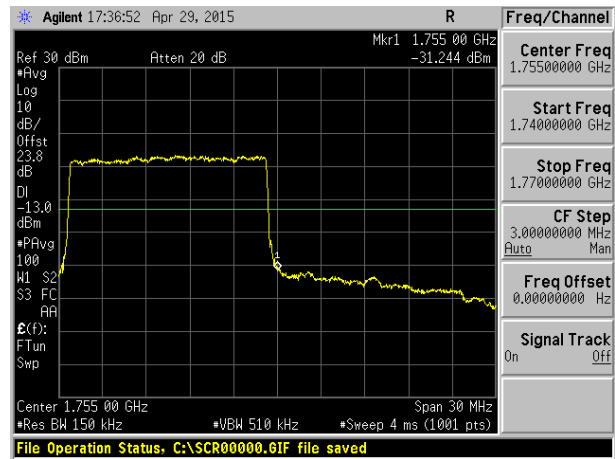


Band 4

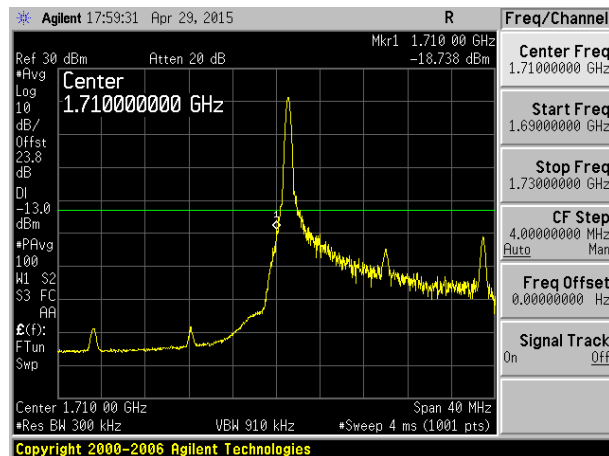
15 MHz / Full RB / 16QAM / LOW CH



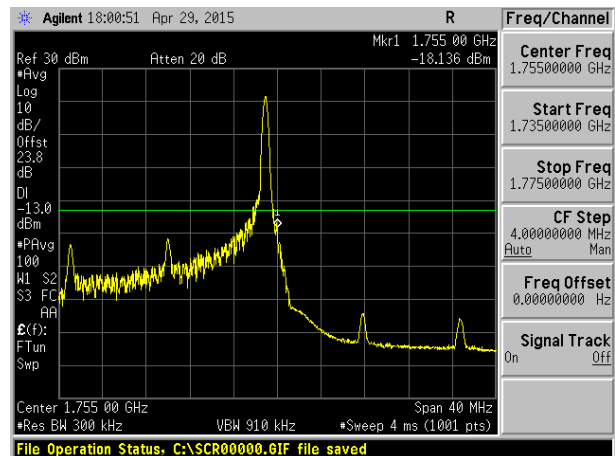
15 MHz / Full RB / 16QAM / HIGH CH



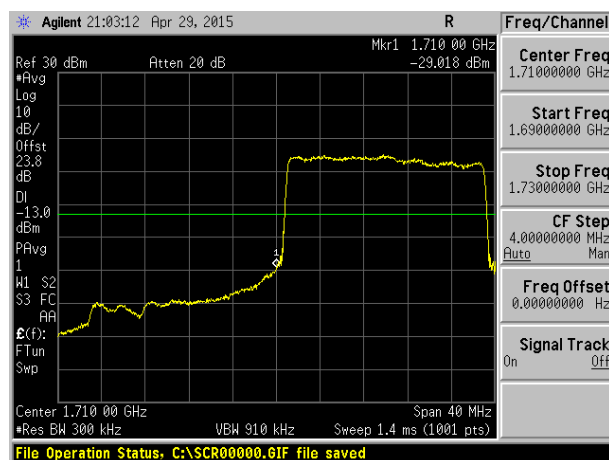
20 MHz / 1 RB / QPSK/ LOW CH



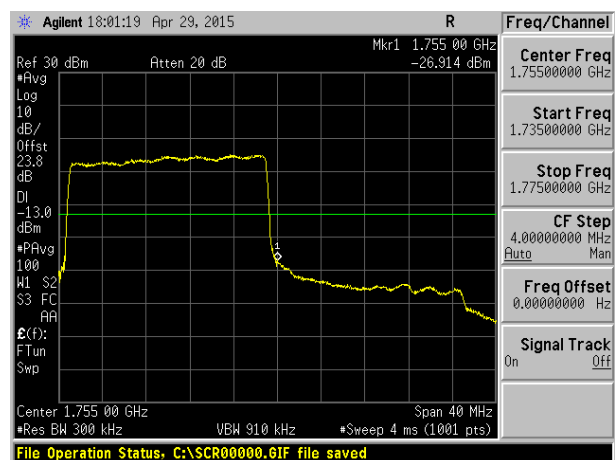
20 MHz / 1 RB / QPSK/ HIGH CH



20 MHz / Full RB / QPSK/ LOW CH

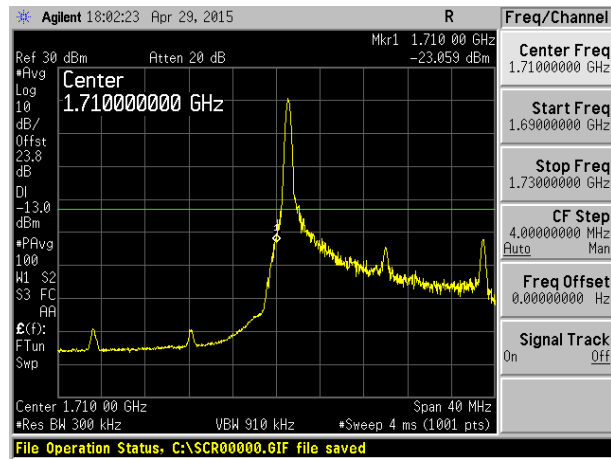


20 MHz / Full RB / QPSK/ HIGH CH

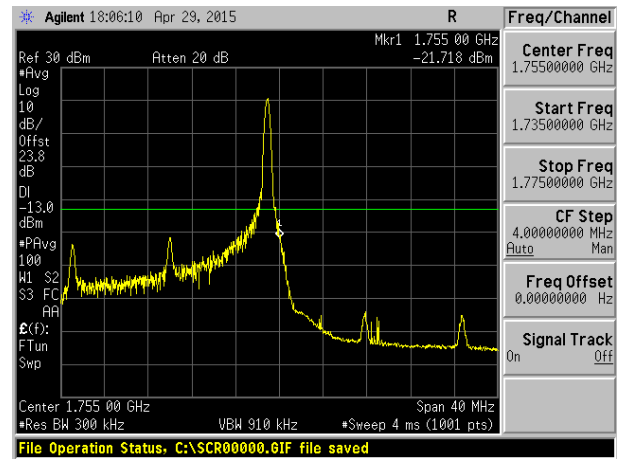


Band 4

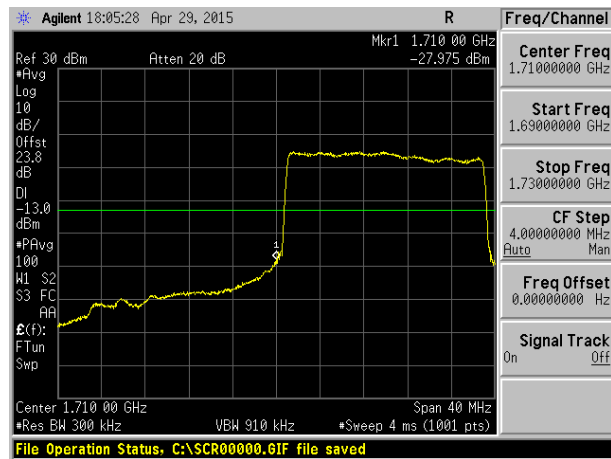
20 MHz / 1 RB / 16QAM / LOW CH



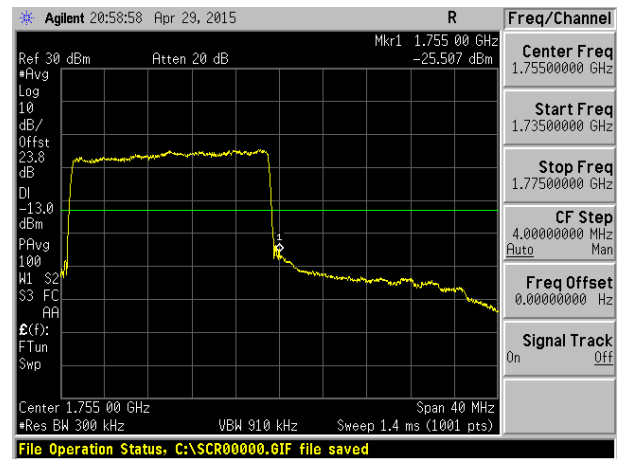
20 MHz / 1 RB / 16QAM / HIGH CH



20 MHz / Full RB / 16QAM / LOW CH

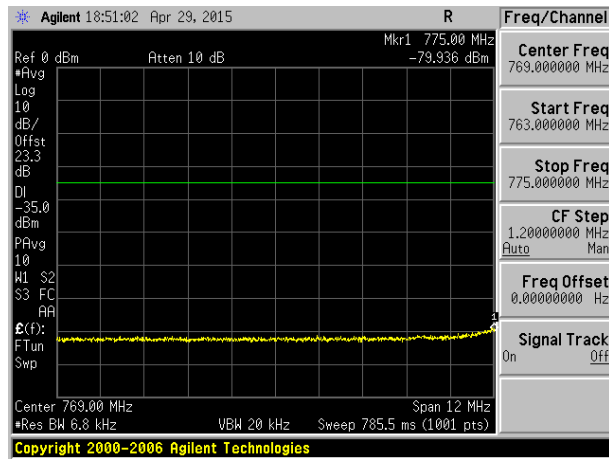


20 MHz / Full RB / 16QAM / HIGH CH

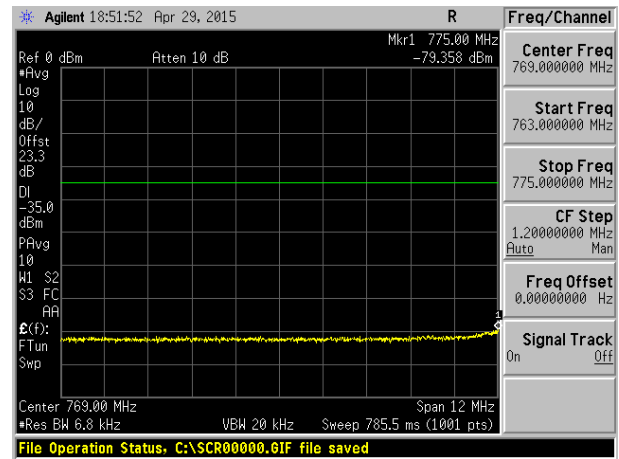


Band 13 /763MHz – 775MHz

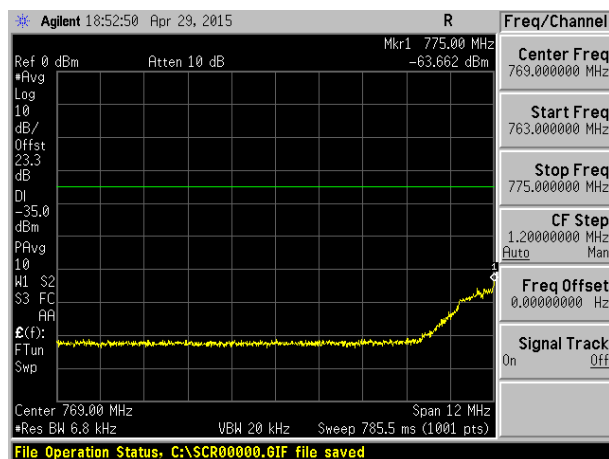
5 MHz / 1 RB / QPSK/ LOW CH



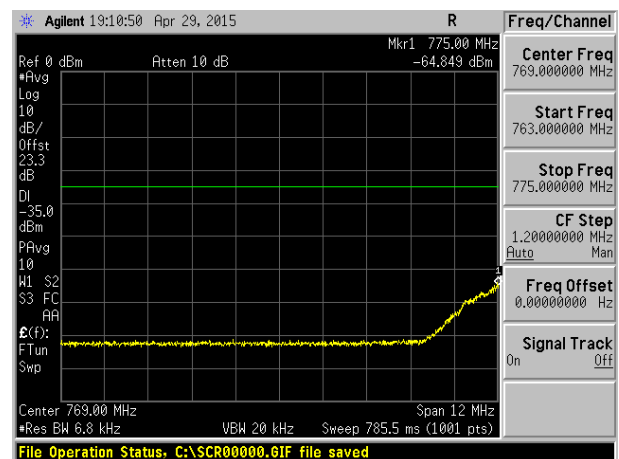
5 MHz / 1 RB / 16 QAM/ LOW CH



5 MHz / Full RB / QPSK/ LOW CH

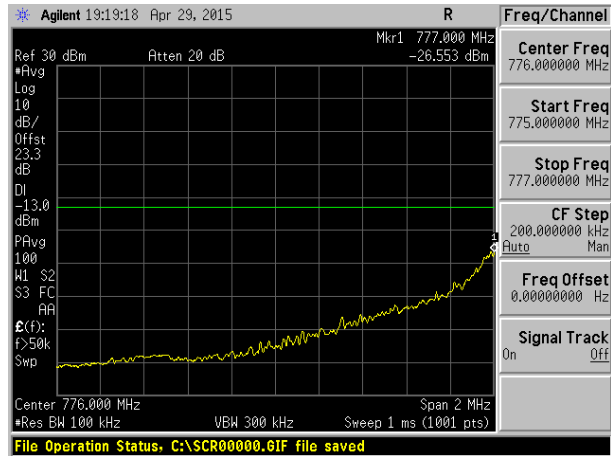


5 MHz / Full RB / 16 QAM/ LOW CH

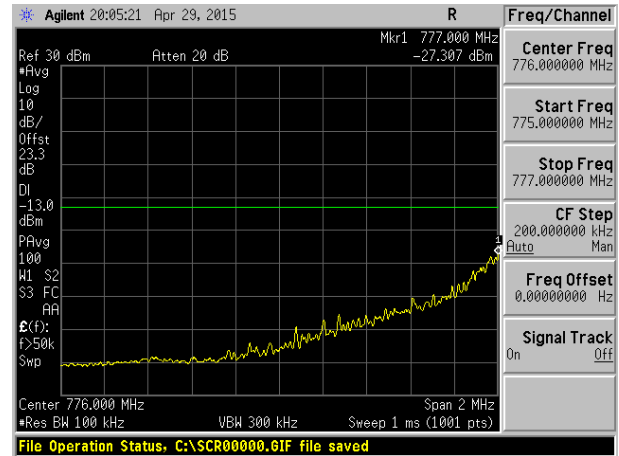


Band 13 /775MHz – 777MHz

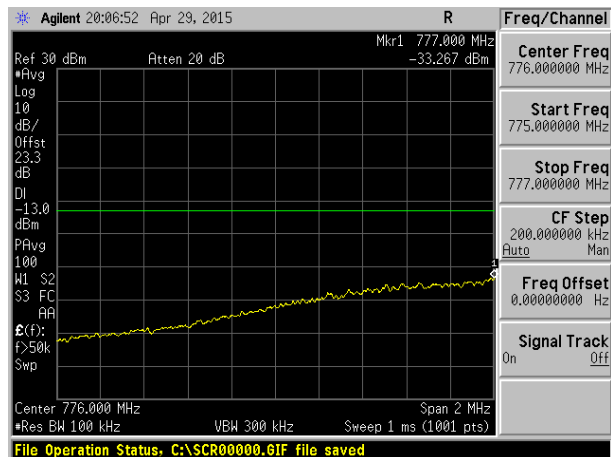
5 MHz / 1 RB / QPSK/ LOW CH



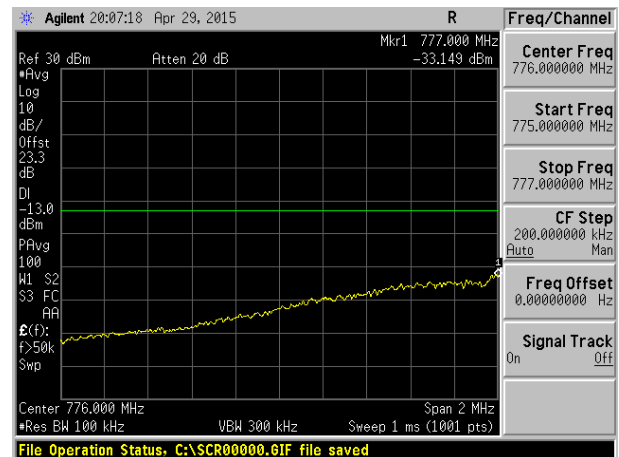
5 MHz / 1 RB / 16 QAM/ LOW CH



5 MHz / Full RB / QPSK/ LOW CH



5 MHz / Full RB / 16 QAM/ LOW CH

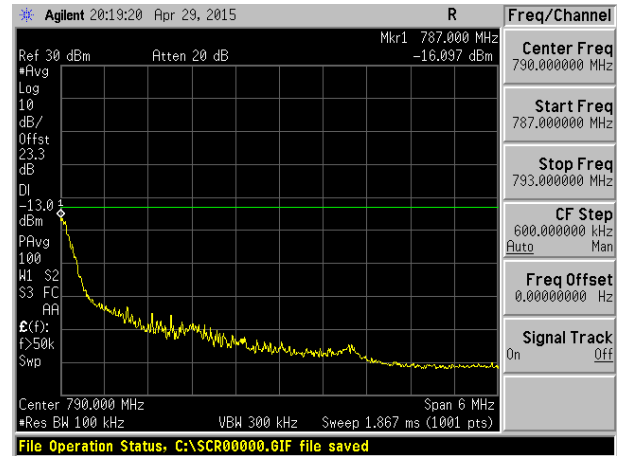


Band 13 /787MHz – 793MHz

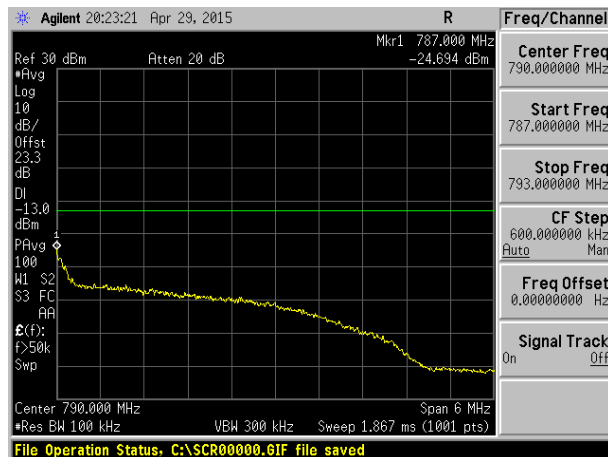
5 MHz / 1 RB / QPSK/ HIGH CH



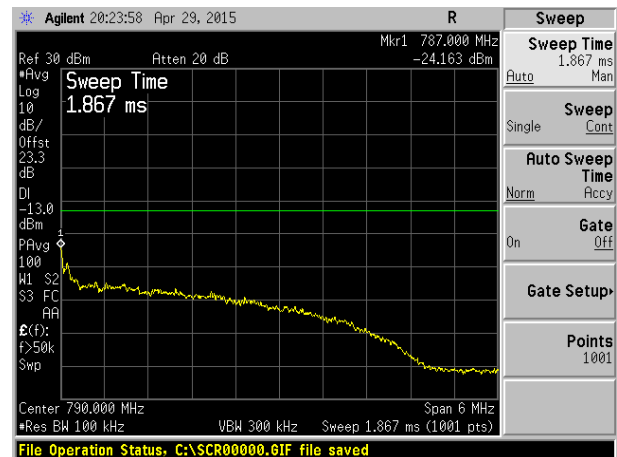
5 MHz / 1 RB / 16 QAM/ HIGH CH



5 MHz / Full RB / QPSK/ HIGH CH

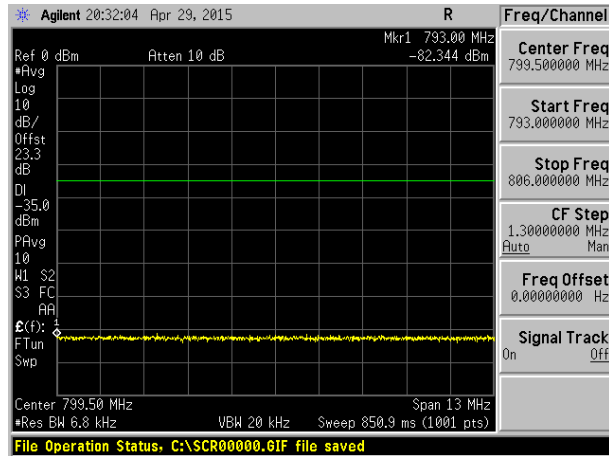


5 MHz / Full RB / 16 QAM/ HIGH CH

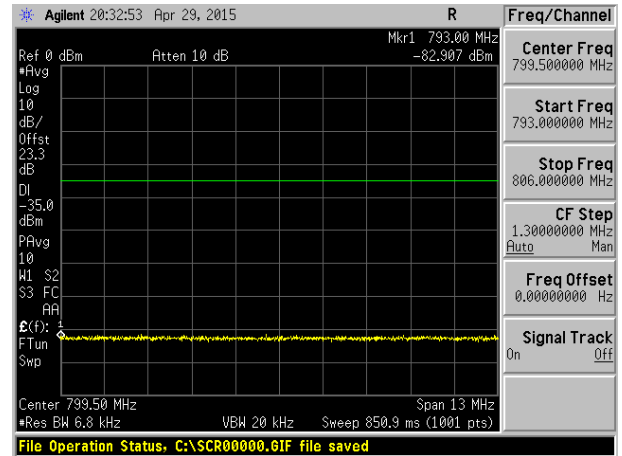


Band 13 /787MHz – 793MHz

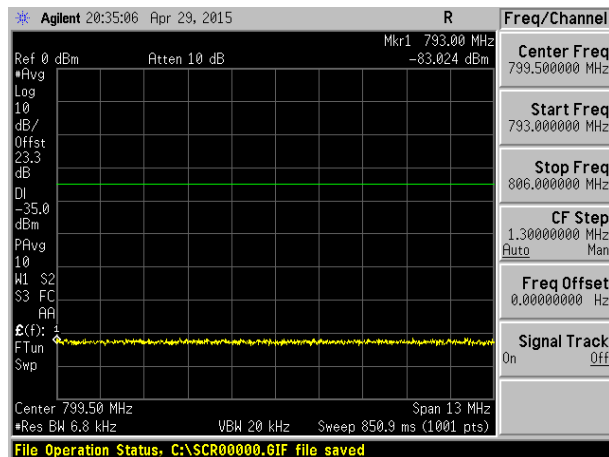
5 MHz / 1 RB / QPSK/ HIGH CH



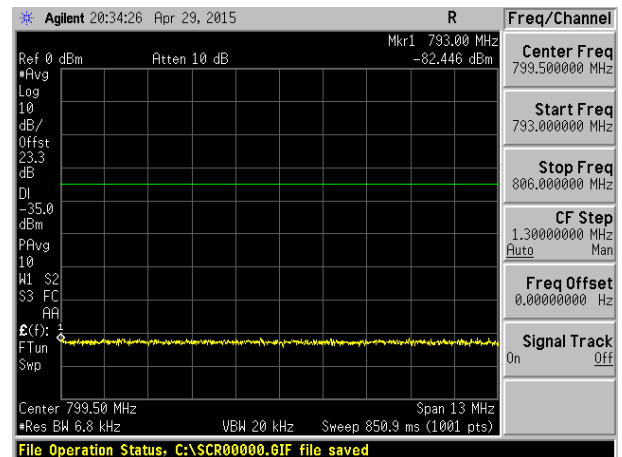
5 MHz / 1 RB / 16 QAM/ HIGH CH



5 MHz / Full RB / QPSK/ HIGH CH

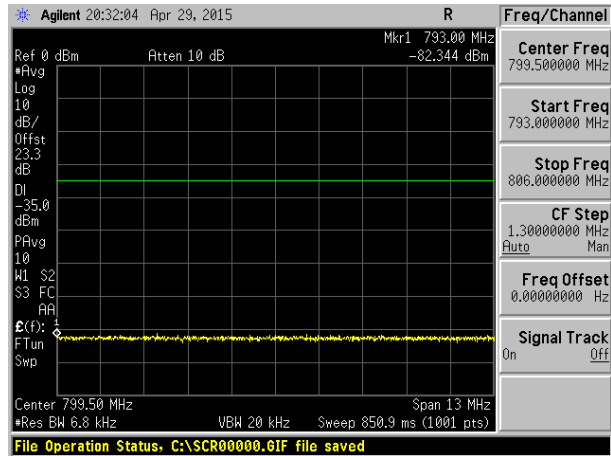


5 MHz / Full RB / 16 QAM/ HIGH CH

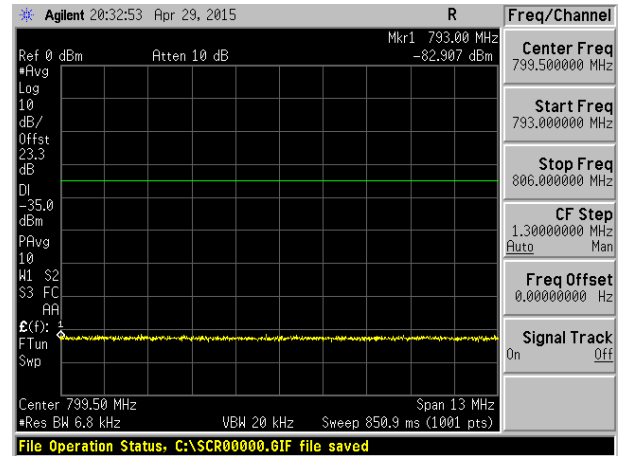


Band 13 /793MHz – 806MHz

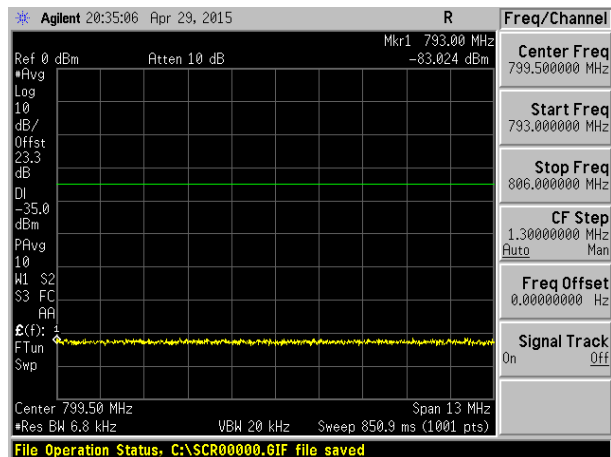
5 MHz / 1 RB / QPSK/ HIGH CH



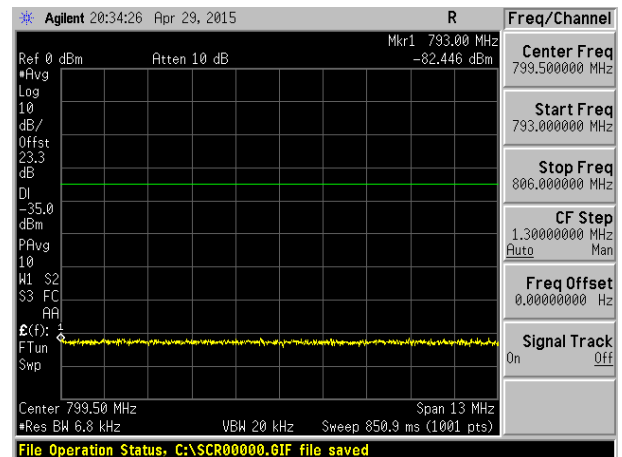
5 MHz / 1 RB / 16 QAM/ HIGH CH



5 MHz / Full RB / QPSK/ HIGH CH

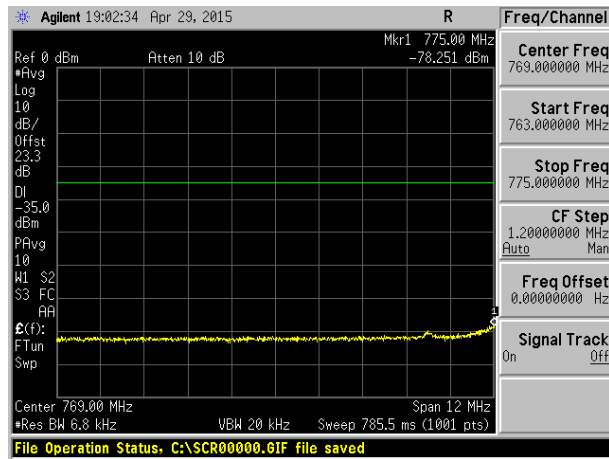


5 MHz / Full RB / 16 QAM/ HIGH CH

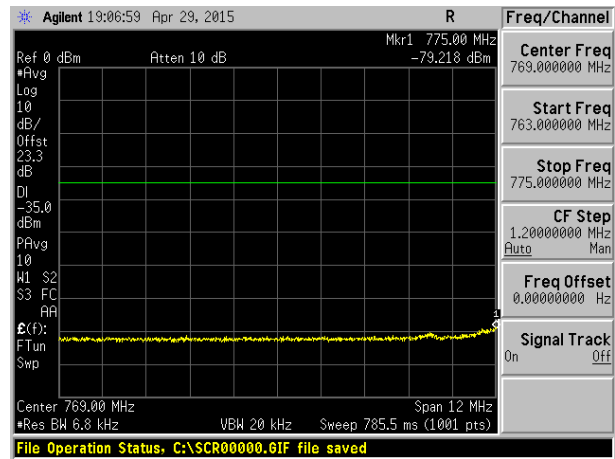


Band 13 /763MHz – 775MHz

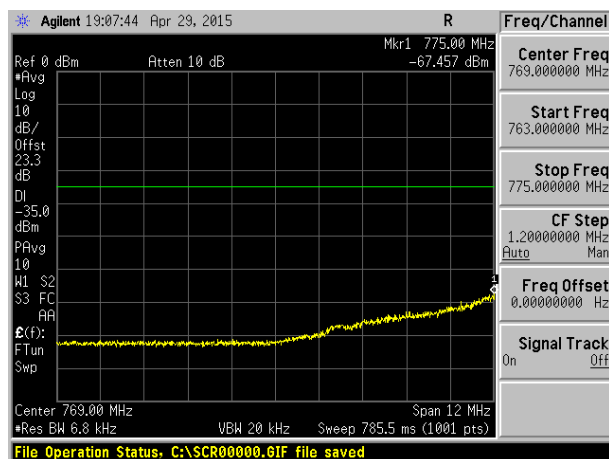
10 MHz / 1 RB / QPSK/ LOW Edge



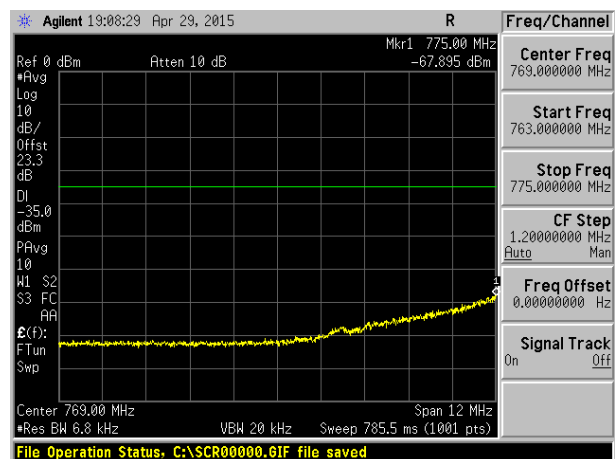
10 MHz / 1 RB / 16 QAM/ LOW Edge



5 MHz / Full RB / QPSK/ LOW Edge



5 MHz / Full RB / 16 QAM/ LOW Edge

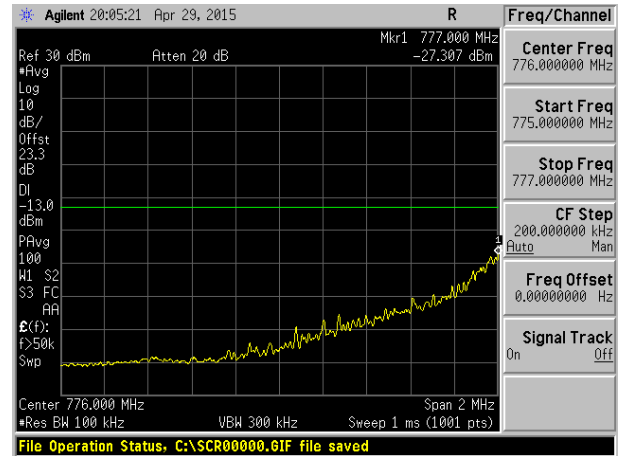


Band 13 /775MHz – 777MHz

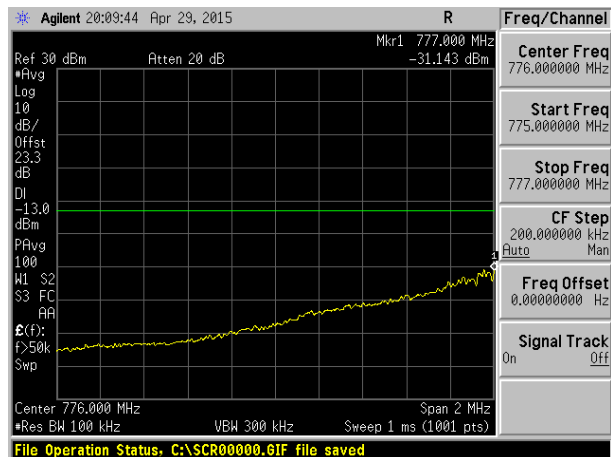
5 MHz / 1 RB / QPSK/ LOW Edge



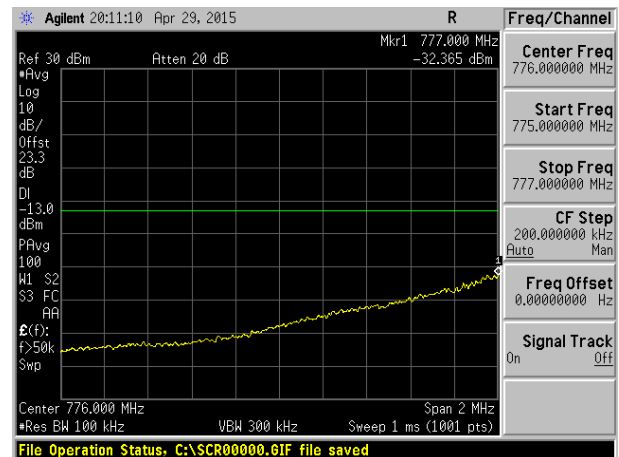
5 MHz / 1 RB / 16 QAM/ LOW Edge



5 MHz / Full RB / QPSK/ LOW Edge

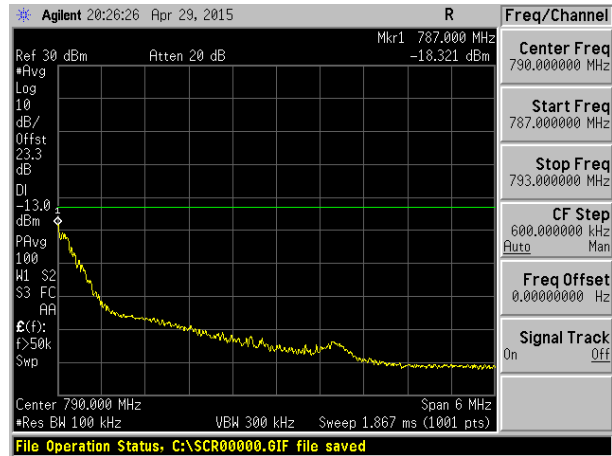


5 MHz / Full RB / 16 QAM/ LOW Edge

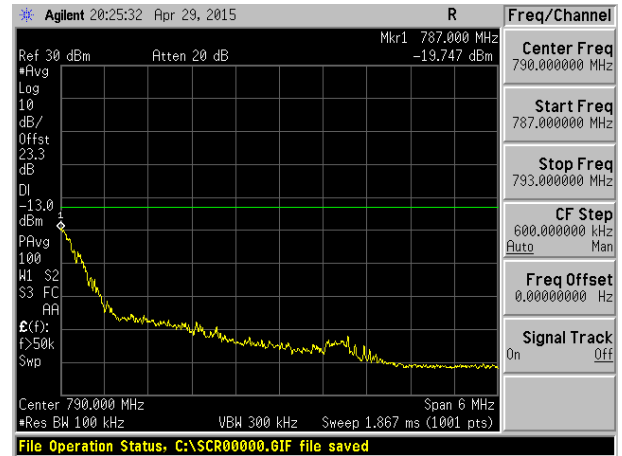


Band 13 /787MHz – 793MHz

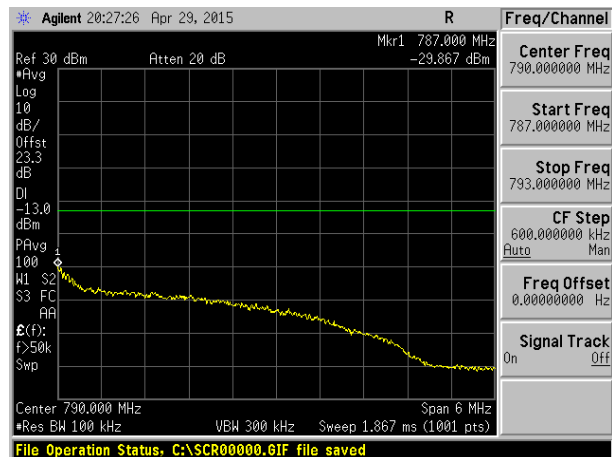
5 MHz / 1 RB / QPSK/ HIGH Edge



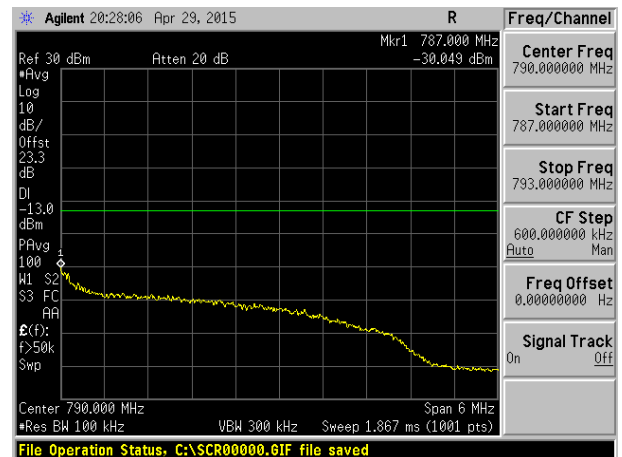
5 MHz / 1 RB / 16 QAM/ HIGH Edge



5 MHz / Full RB / QPSK/ HIGH Edge

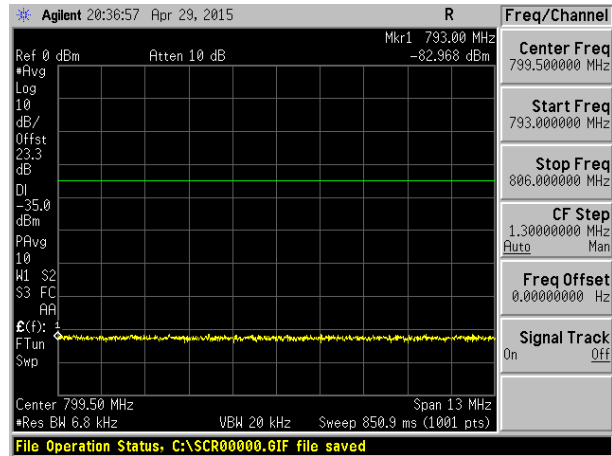


5 MHz / Full RB / 16 QAM/ HIGH Edge

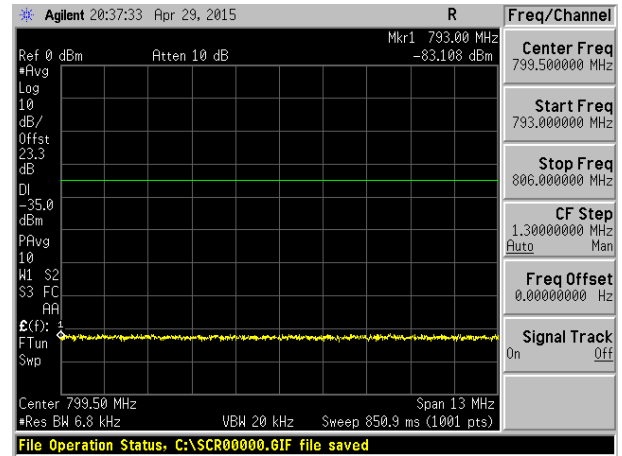


Band 13 /793MHz – 806MHz

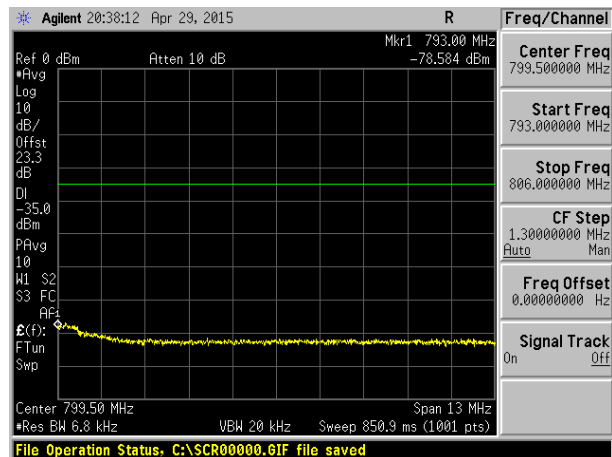
5 MHz / 1 RB / QPSK/ HIGH Edge



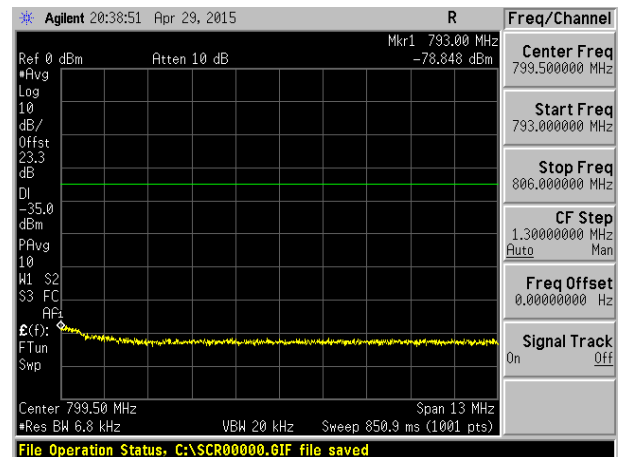
5 MHz / 1 RB / 16 QAM/ HIGH Edge



5 MHz / Full RB / QPSK/ HIGH Edge



5 MHz / Full RB / 16 QAM/ HIGH Edge



8. Conducted Spurious Emissions

8.1 Test conditions

Temperature:	20	°C
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa

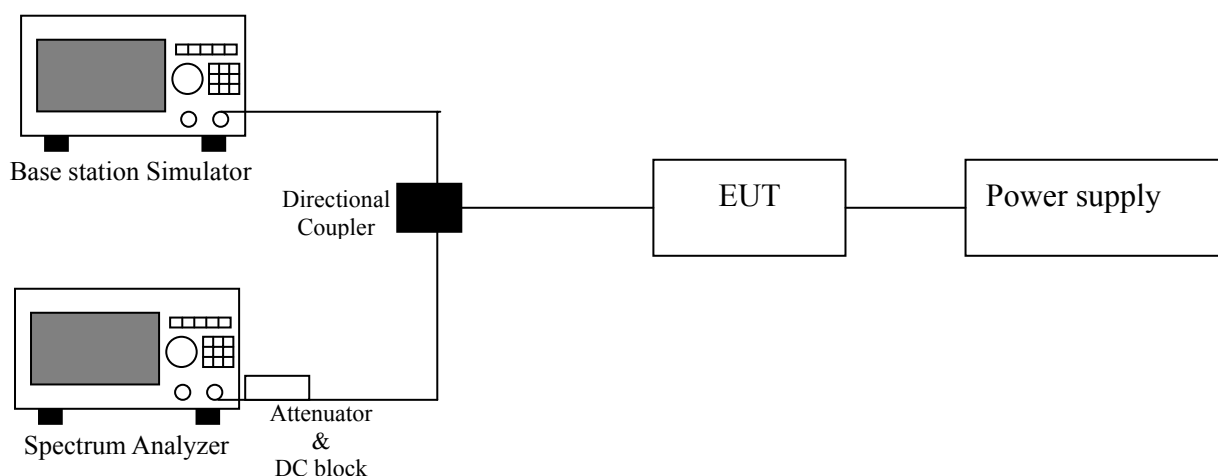
8.2 Limit for conducted spurious emissions

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13 dBm

8.3 Test procedure

1. The EUT connected to the Base station simulator. All measurements were done at low, middle and high operational frequency range.
2. Measuring frequency range is from 30 MHz to 8GHz for LTE Band 13 and from 30MHz to 18GHz for LTE Band 4. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

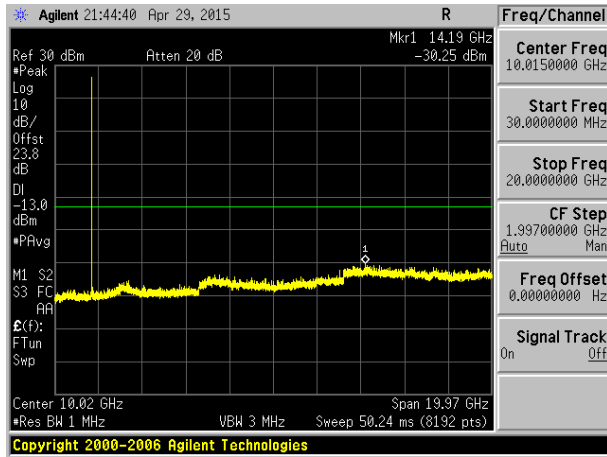
8.4 Test diagram



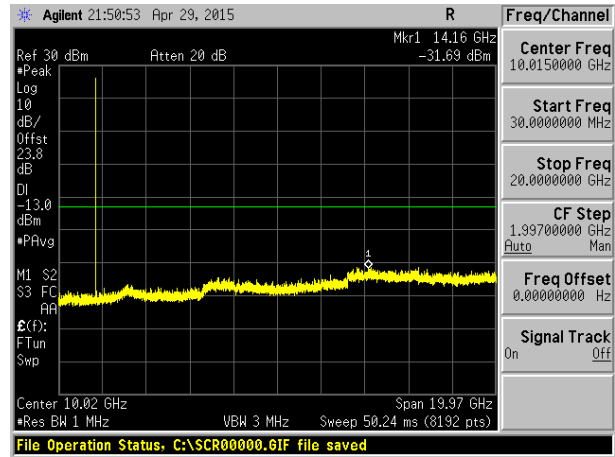
8.5 Test results

Band 4

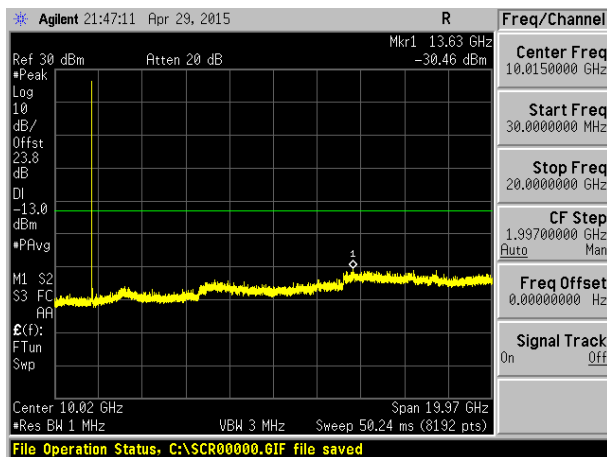
1.4 MHz / 1 RB / QPSK/ LOW CH



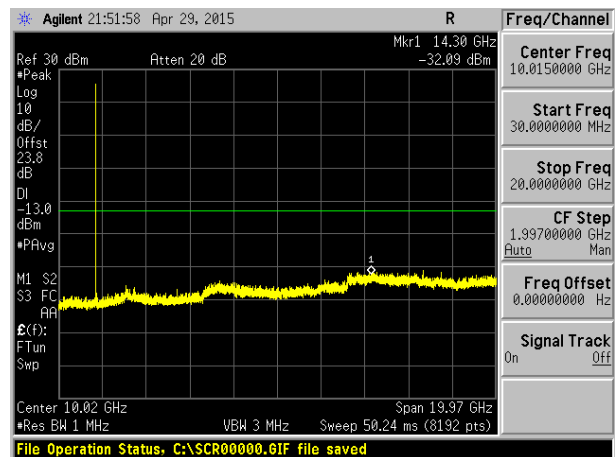
1.4 MHz / 1 RB / 16QAM / LOW CH



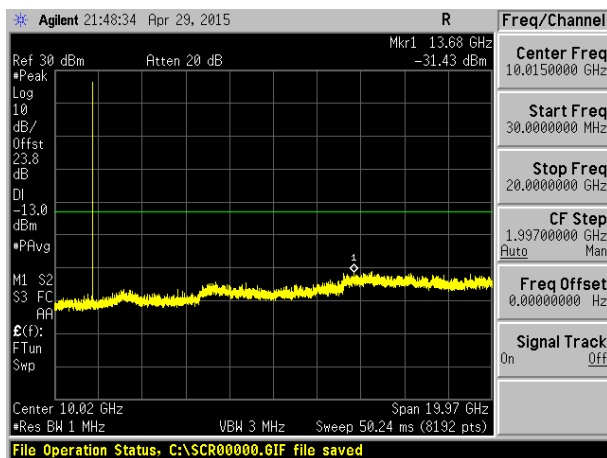
1.4 MHz / 1 RB / QPSK/ MIDDLE CH



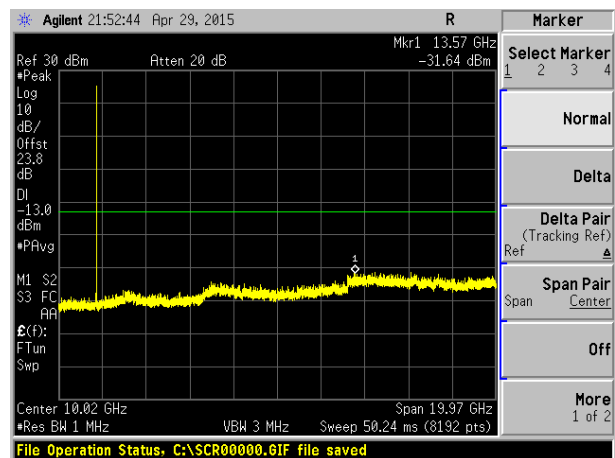
1.4 MHz / 1 RB / 16QAM / MIDDLE CH



1.4 MHz / 1 RB / QPSK / HIGH CH

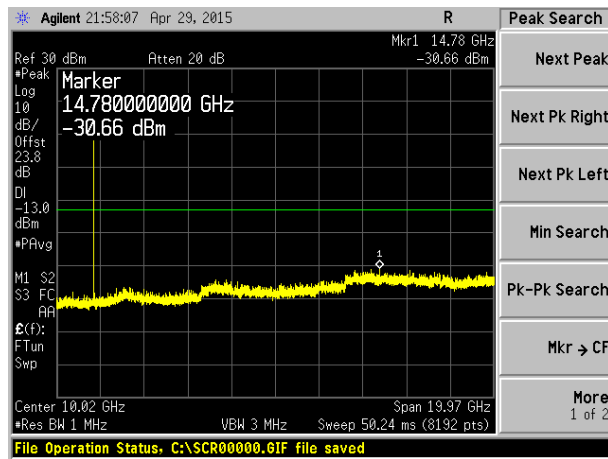


1.4 MHz / 1 RB / 16QAM / HIGH CH

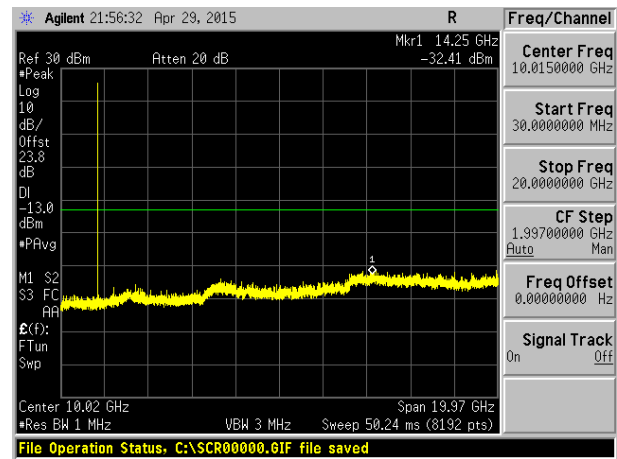


Band 4

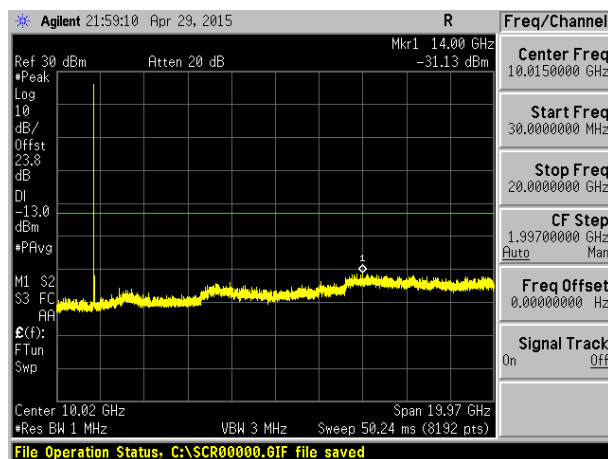
3 MHz / 1 RB / QPSK/ LOW CH



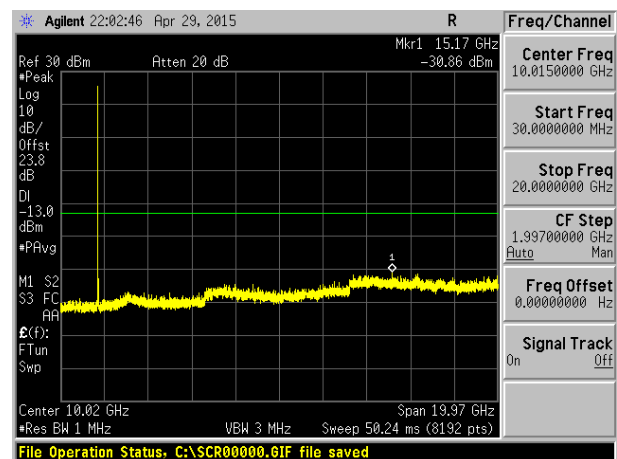
3 MHz / 1 RB / 16QAM / LOW CH



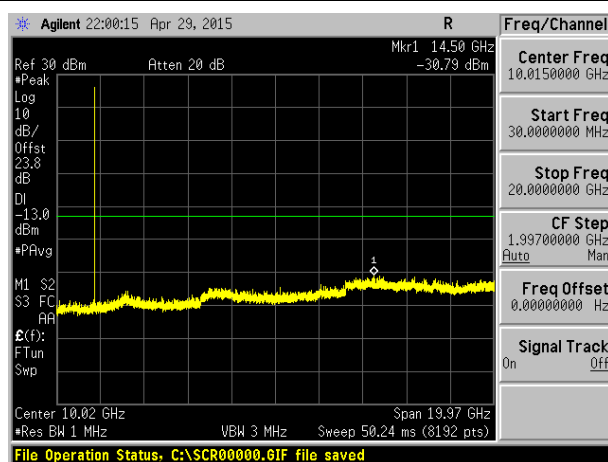
3 MHz / 1 RB / QPSK/ MIDDLE CH



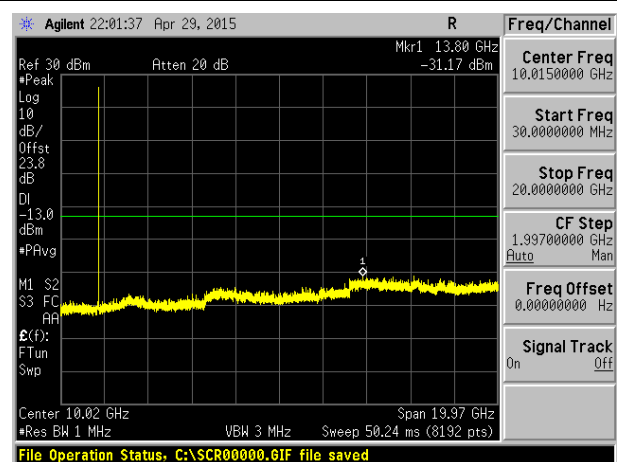
3 MHz / 1 RB / 16QAM / MIDDLE CH



3 MHz / 1 RB / QPSK / HIGH CH

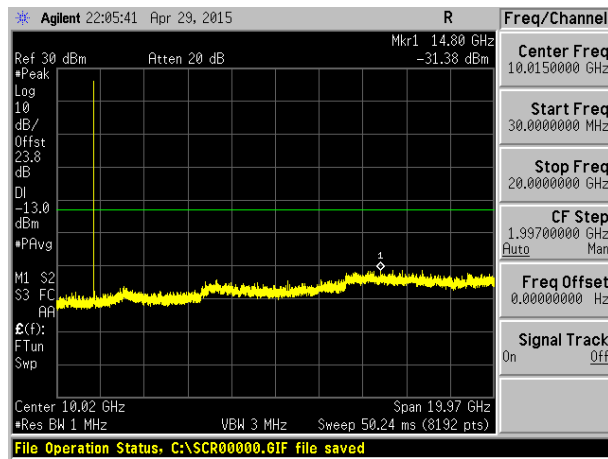


3 MHz / 1 RB / 16QAM / HIGH CH

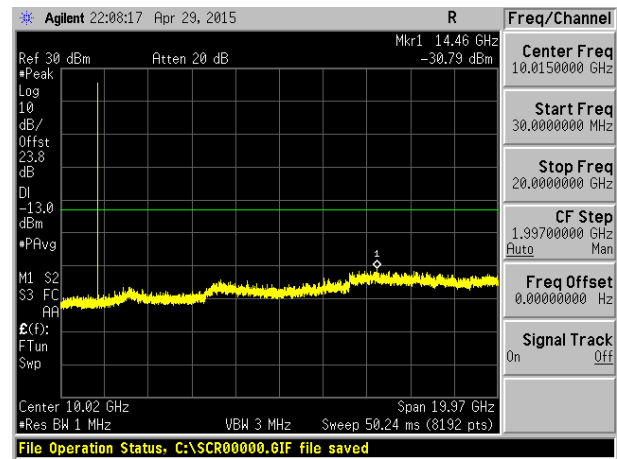


Band 4

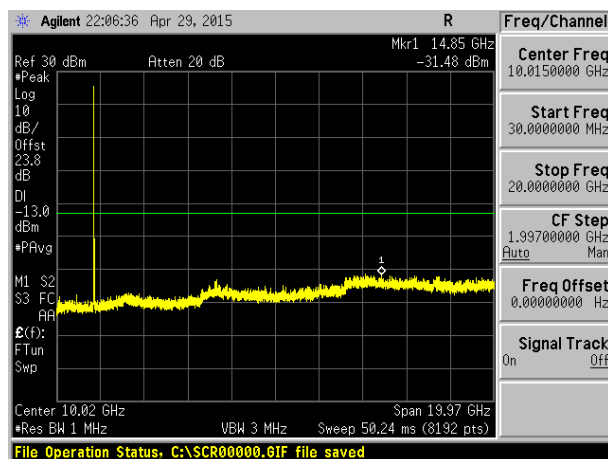
5 MHz / 1 RB / QPSK/ LOW CH



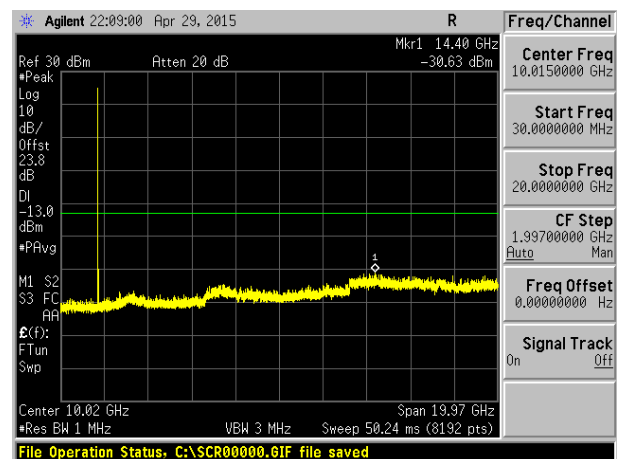
5 MHz / 1 RB / 16QAM / LOW CH



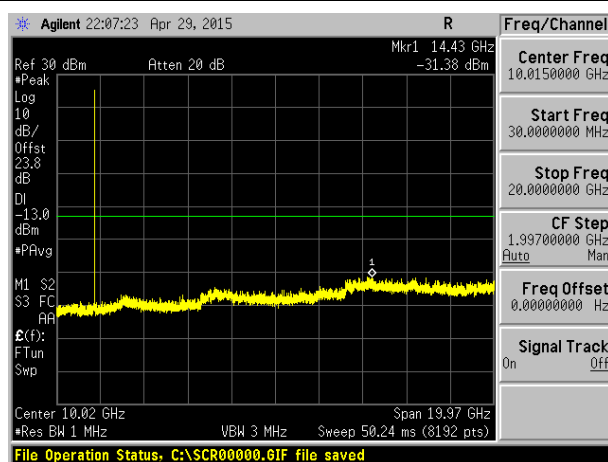
5 MHz / 1 RB / QPSK/ MIDDLE CH



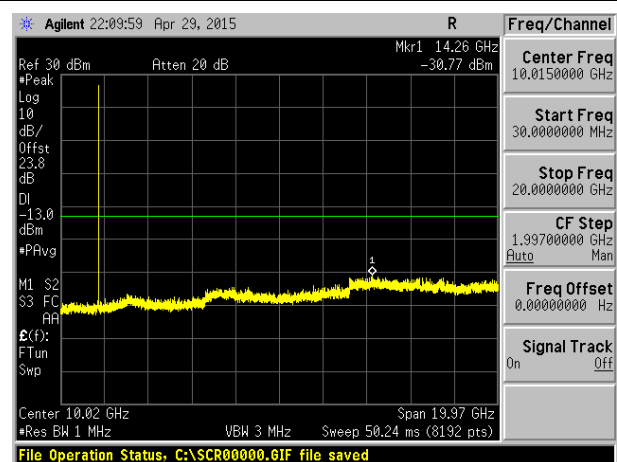
5 MHz / 1 RB / 16QAM / MIDDLE CH



5 MHz / 1 RB / QPSK / HIGH CH

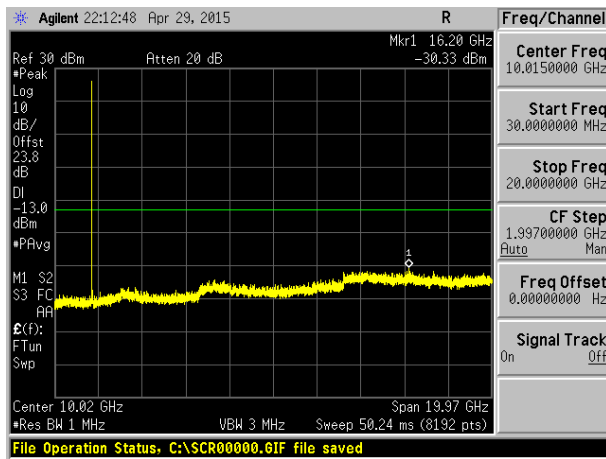


5 MHz / 1 RB / 16QAM / HIGH CH

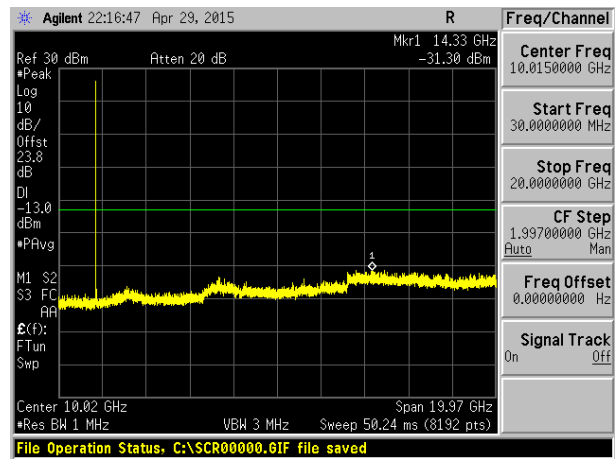


Band 4

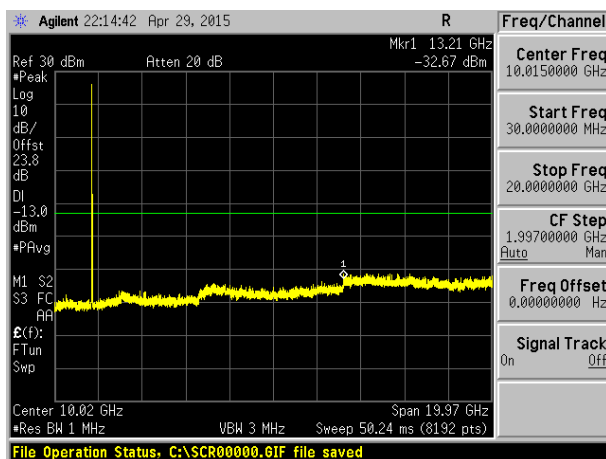
10 MHz / 1 RB / QPSK/ LOW CH



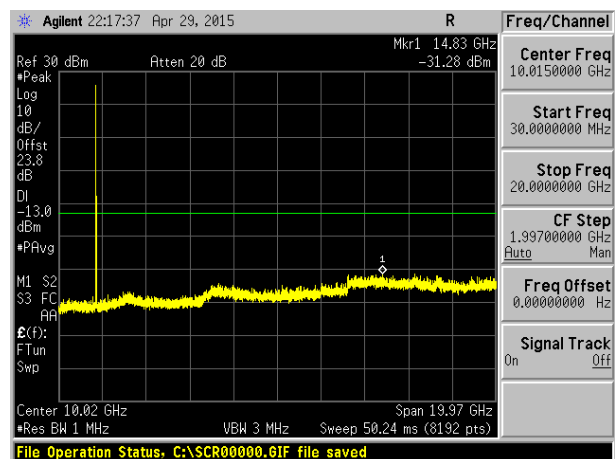
10 MHz / 1 RB / 16QAM / LOW CH



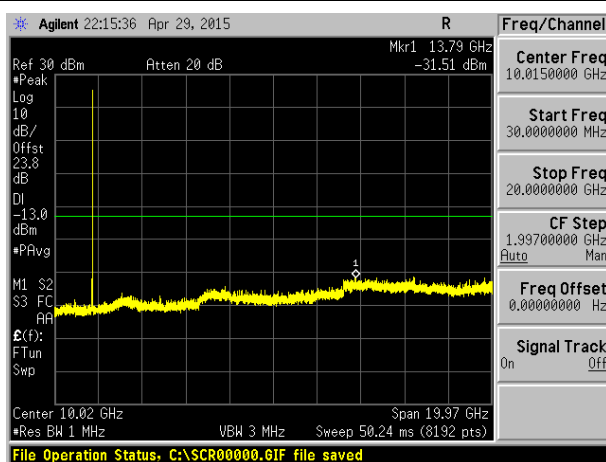
10 MHz / 1 RB / QPSK/ MIDDLE CH



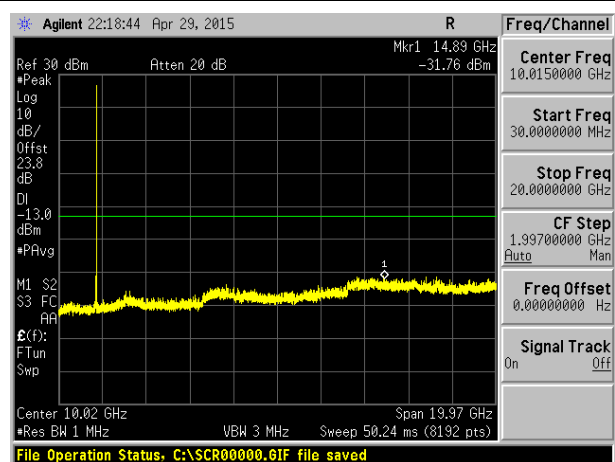
10 MHz / 1 RB / 16QAM / MIDDLE CH



10 MHz / 1 RB / QPSK / HIGH CH

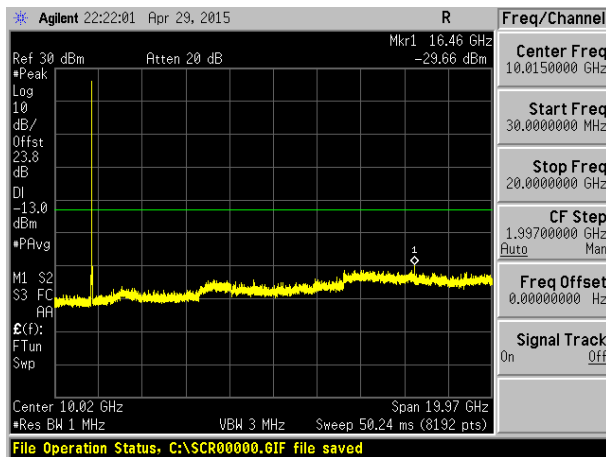


10 MHz / 1 RB / 16QAM / HIGH CH

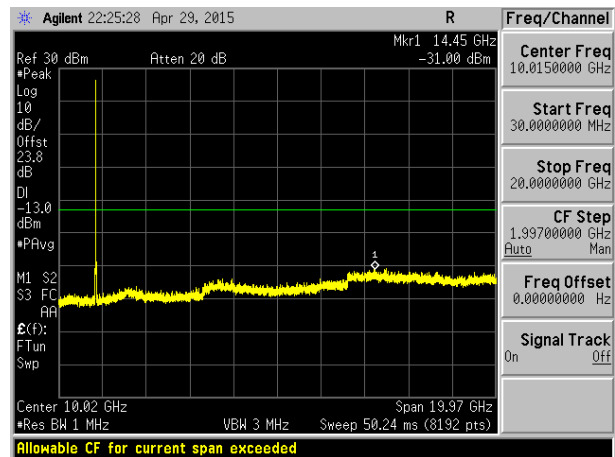


Band 4

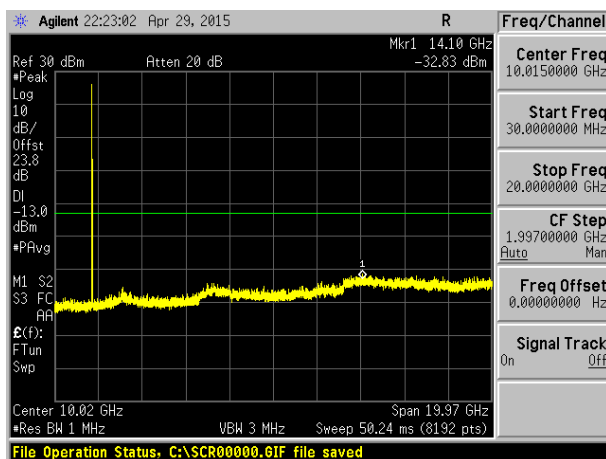
15 MHz / 1 RB / QPSK/ LOW CH



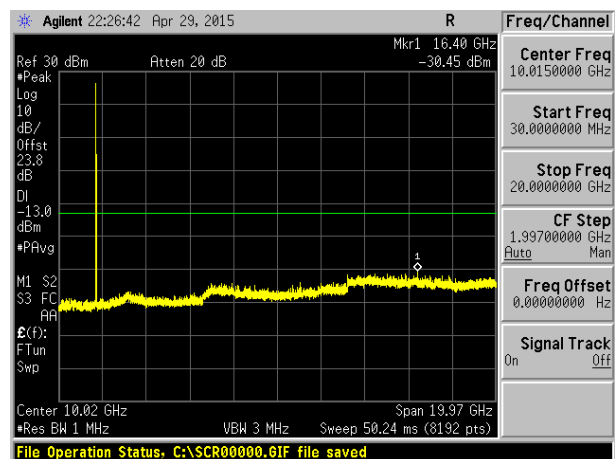
15 MHz / 1 RB / 16QAM / LOW CH



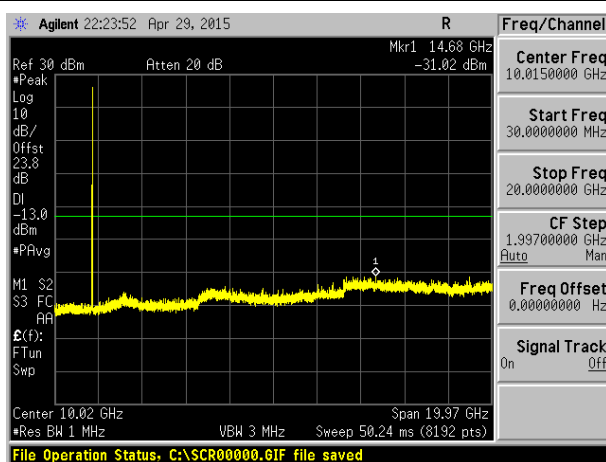
15 MHz / 1 RB / QPSK/ MIDDLE CH



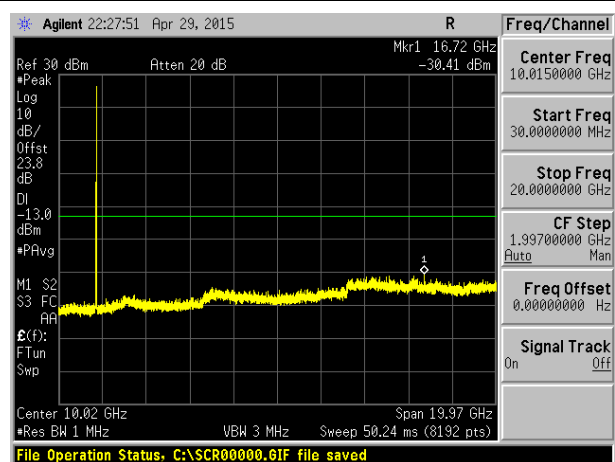
15 MHz / 1 RB / 16QAM / MIDDLE CH



15 MHz / 1 RB / QPSK / HIGH CH

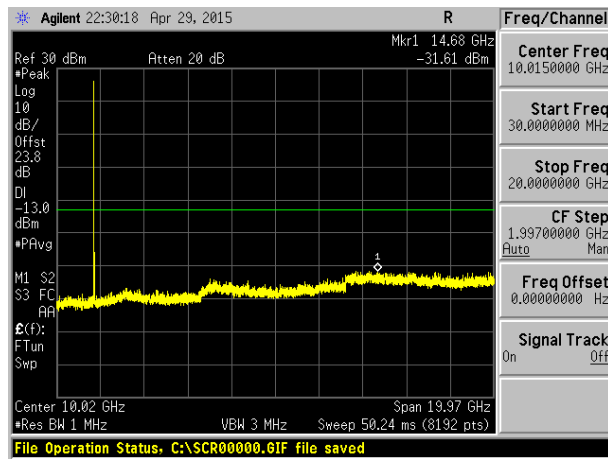


15 MHz / 1 RB / 16QAM / HIGH CH

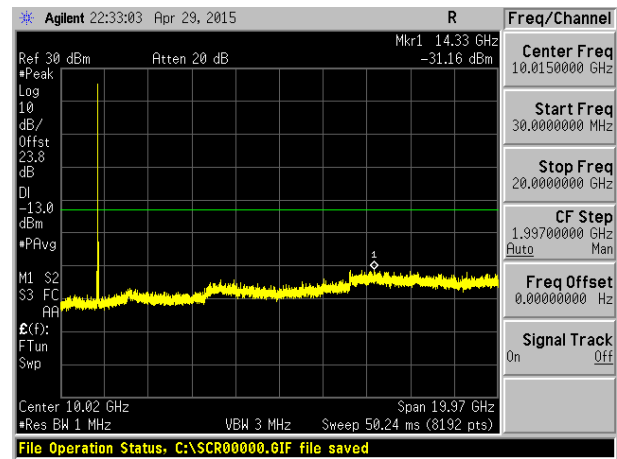


Band 4

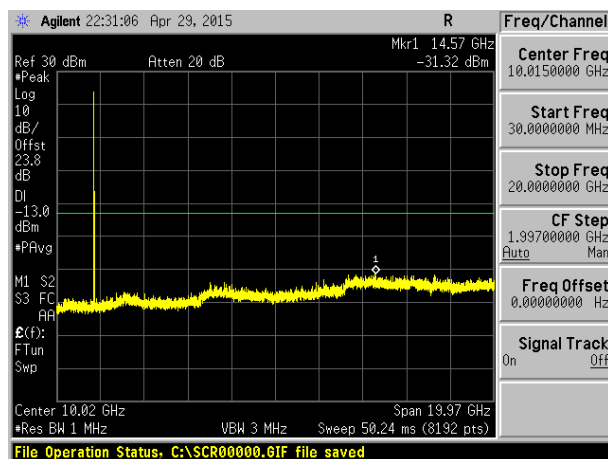
20 MHz / 1 RB / QPSK/ LOW CH



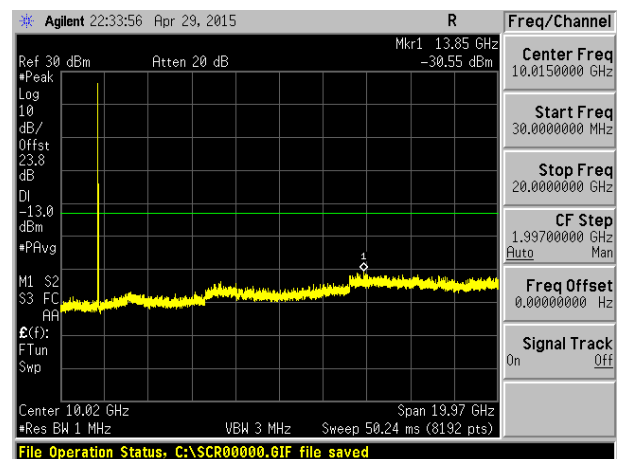
20 MHz / 1 RB / 16QAM / LOW CH



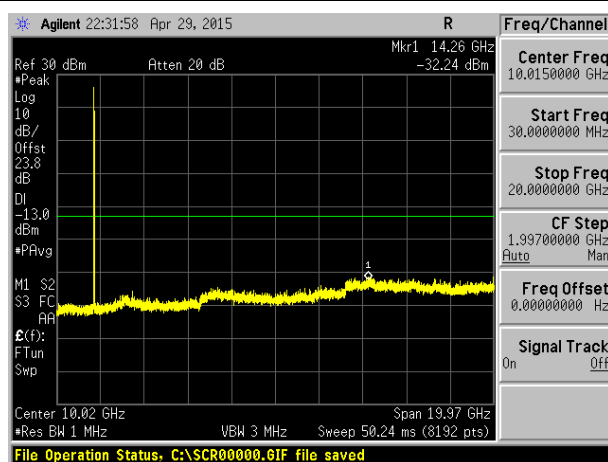
20 MHz / 1 RB / QPSK/ MIDDLE CH



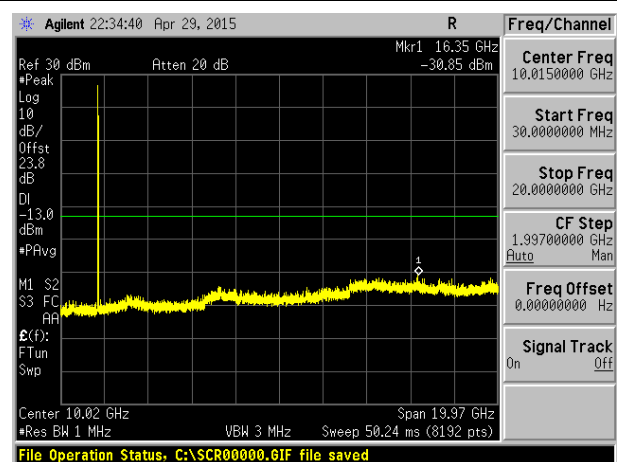
20 MHz / 1 RB / 16QAM / MIDDLE CH



20 MHz / 1 RB / QPSK / HIGH CH

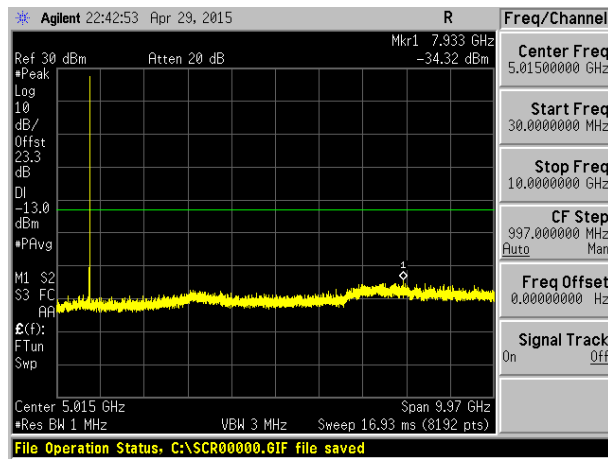


20 MHz / 1 RB / 16QAM / HIGH CH

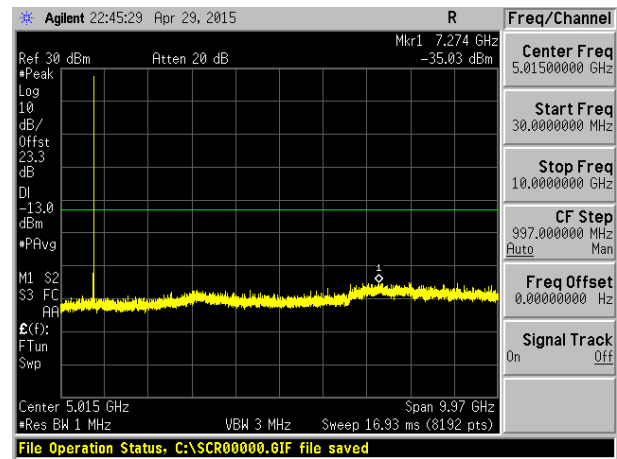


Band 4

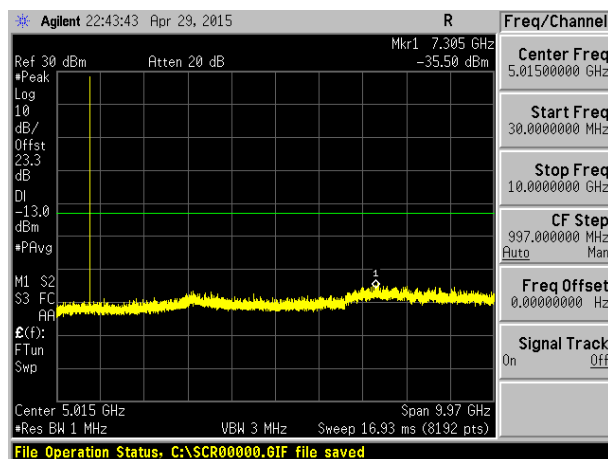
5 MHz / 1 RB / QPSK/ LOW CH



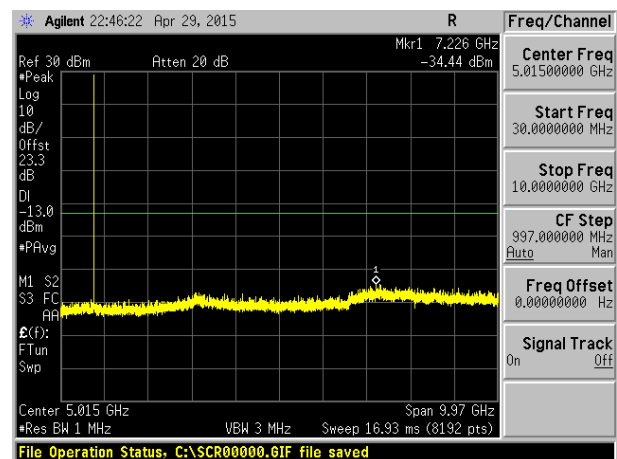
5 MHz / 1 RB / 16QAM / LOW CH



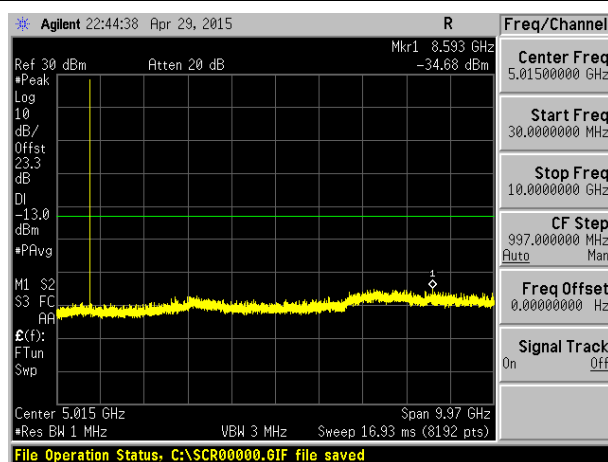
5 MHz / 1 RB / QPSK/ MIDDLE CH



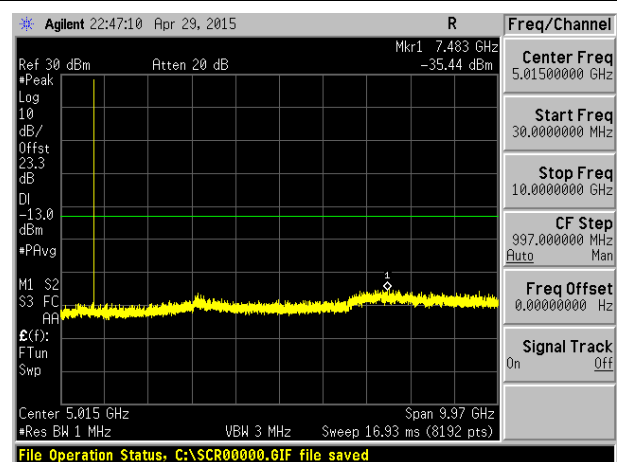
5 MHz / 1 RB / 16QAM / MIDDLE CH



5 MHz / 1 RB / QPSK / HIGH CH

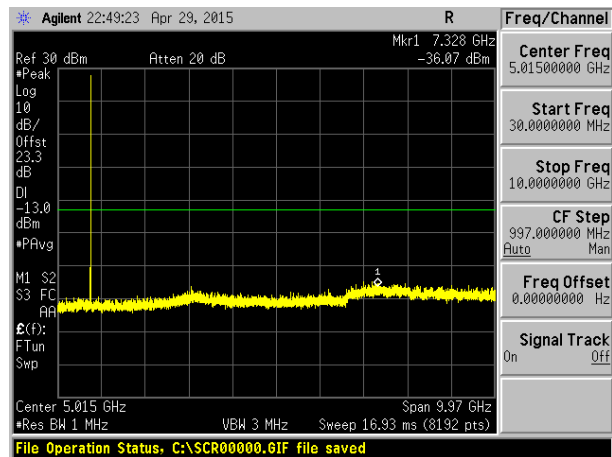


5 MHz / 1 RB / 16QAM / HIGH CH

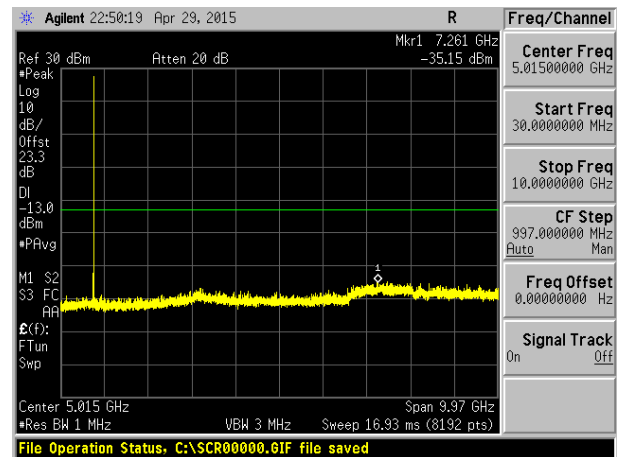


Band 4

10 MHz / 1 RB / QPSK



10 MHz / 1 RB / 16QAM



9. Radiated Emission Measurement

9.1 Test conditions

Temperature:	20	°C
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa

9.2 Limit for radiated emission measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13 dBm

For operations in the 746–763 MHz, 775–793 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

9.3 Test procedure

1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the turn table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G

3. EIRP = Output power level of S.G –TX cable loss + Antenna gain of substitution horn.

4.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

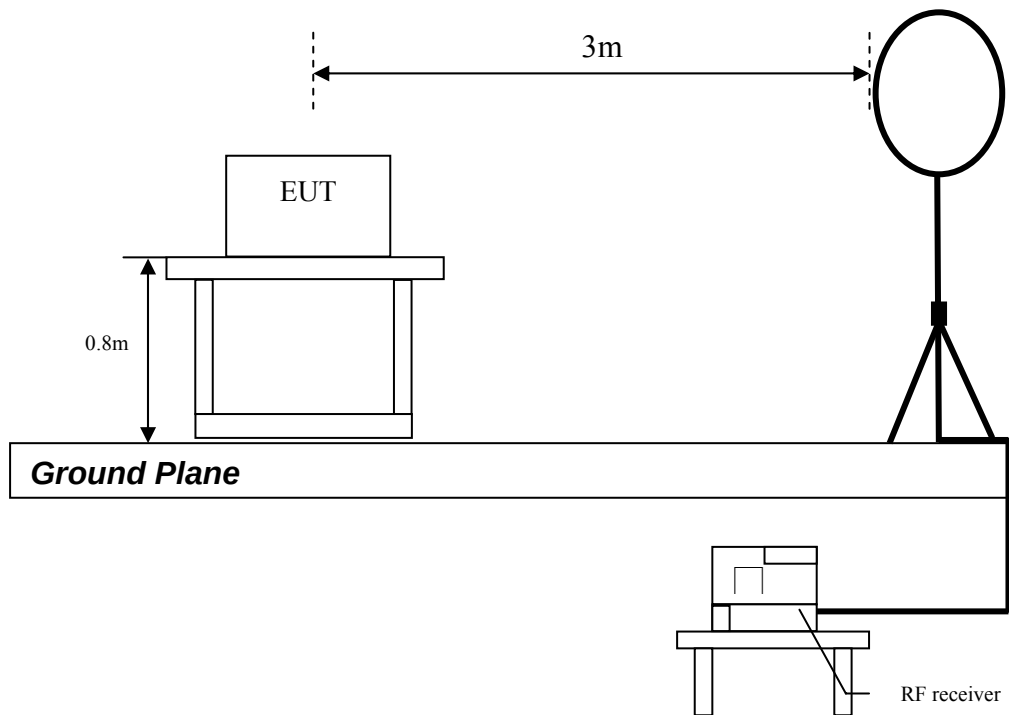
9.4 Test diagram

The EUT can only placement in one orthogonal axes.

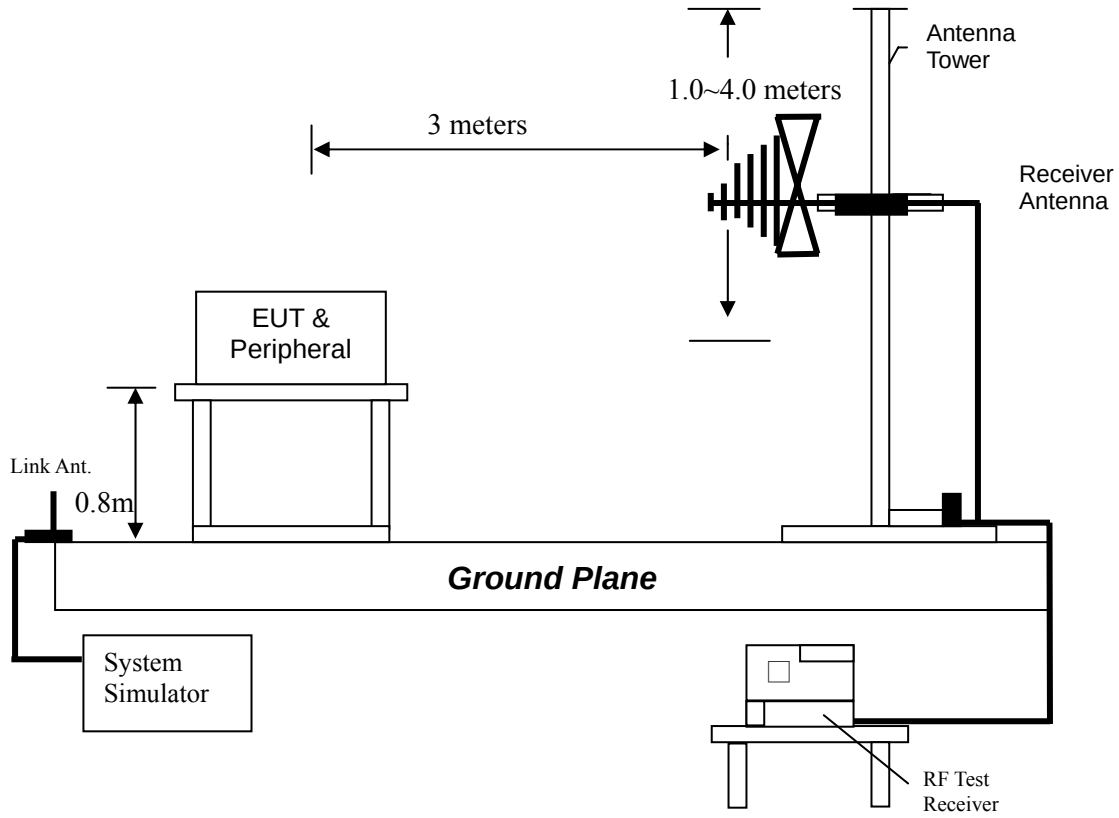
The final test data was executed under this configuration.

9.5 Test configuration

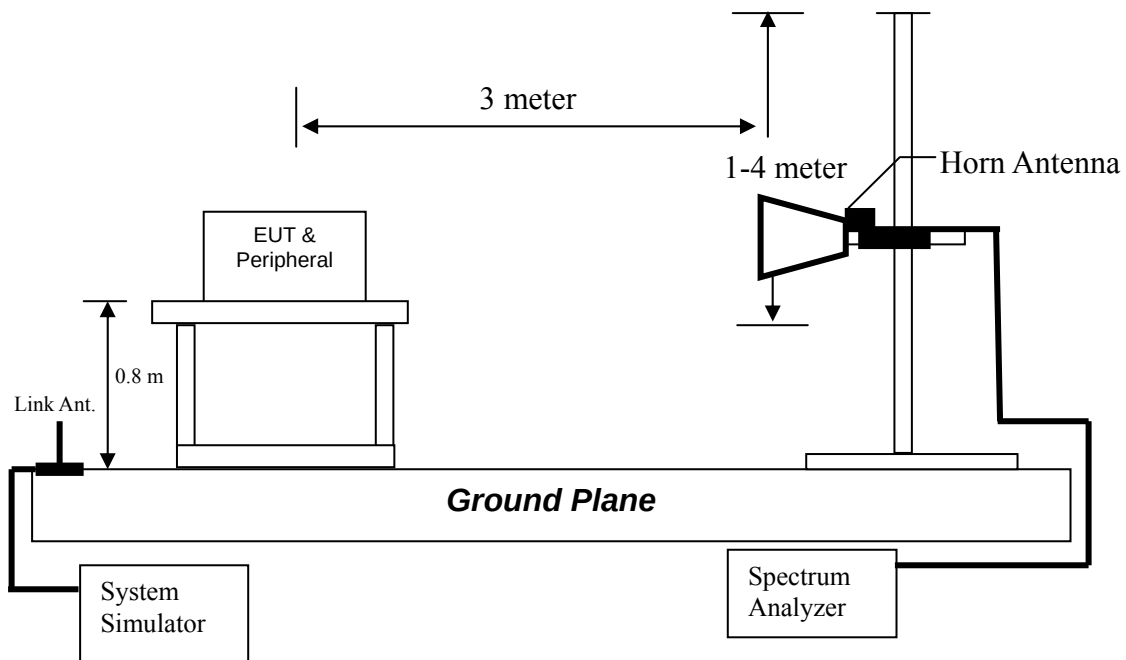
9.5.1 Radiated emission from 9 kHz to 30MHz using Loop Antenna



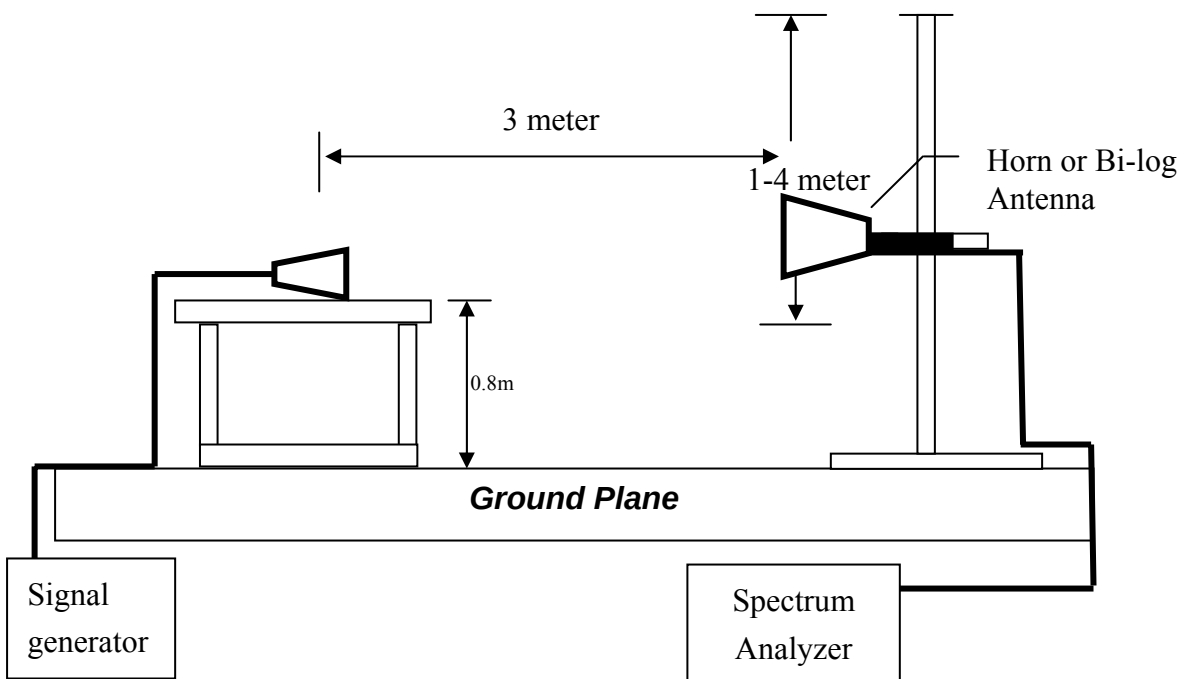
9.5.2 Radiated emission below 1GHz using Bilog Antenna



9.5.3 Radiated emission above 1GHz using Horn Antenna



9.5.4 Radiated emission with Substitution Antenna



9.5 Test results

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 1.4MHz

RB	Mode	Channel	Vertical		Horizontal		Ant	Cable	Result		Margin		Limit
			Frequency	S.G. Value	Frequency	S.G. Value	Gain	Loss	Ver	Hor	Ver	Hor	
			(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dB)					
1-2	QPSK	Low	3420	-43.26	3420	-55.26	9.77	3.76	-37.25	-49.25	-24.25	-36.25	-13
			5131	-53.59	5131	-54.62	10.93	6.62	-49.29	-50.32	-36.29	-37.32	-13
			6843	-50.20	6843	-59.33	11.93	5.85	-44.13	-53.26	-31.13	-40.26	-13
		Middle	3462	-43.87	3462	-52.64	9.78	3.70	-37.79	-46.56	-24.79	-33.56	-13
			5198	-43.20	5198	-48.23	10.94	7.02	-39.28	-44.31	-26.28	-31.31	-13
			6934	-52.88	6934	-54.76	11.85	5.30	-46.33	-48.21	-33.33	-35.21	-13
		High	3504	-47.79	3504	-54.38	9.80	3.72	-41.71	-48.30	-28.71	-35.30	-13
			5261	-50.66	5261	-53.41	10.95	6.63	-46.34	-49.09	-33.34	-36.09	-13
			6920	-58.22	6920	-61.52	11.86	5.43	-51.79	-55.09	-38.79	-42.09	-13
	16QAM	Low	3420	-42.77	3420	-55.26	9.77	3.76	-36.76	-49.25	-23.76	-36.25	-13
			5128	-52.52	5128	-55.91	10.93	6.63	-48.23	-51.62	-35.23	-38.62	-13
			6843	-48.70	6843	-59.41	11.93	5.85	-42.63	-53.34	-29.63	-40.34	-13
		Middle	3462	-43.55	3462	-54.71	9.78	3.70	-37.47	-48.63	-24.47	-35.63	-13
			5198	-44.32	5198	-48.78	10.94	7.02	-40.40	-44.86	-27.40	-31.86	-13
			6934	-47.24	6934	-54.96	11.85	5.30	-40.69	-48.41	-27.69	-35.41	-13
		High	3504	-47.40	3504	-57.20	9.80	3.72	-41.32	-51.12	-28.32	-38.12	-13
			5261	-46.94	5261	-54.50	10.95	6.63	-42.62	-50.18	-29.62	-37.18	-13
			7158	-57.21	7158	-55.40	11.64	6.17	-51.74	-49.93	-38.74	-36.93	-13

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 3MHz

RB	Mode	Channel	Vertical		Horizontal		Ant	Cable	Result		Margin		Limit
			Frequency	S.G. Value	Frequency	S.G. Value	Gain	Loss	Ver	Hor	Ver	Hor	
			(MHz)	(dBm)	(MHz)	(dBm)	(dBi)	(dB)					
1-7	QPSK	Low	3420	-43.85	3420	-55.13	9.77	3.76	-37.84	-49.12	-24.84	-36.12	-13
			5135	-53.36	5135	-54.81	10.93	6.61	-49.04	-50.49	-36.04	-37.49	-13
			6850	-47.88	6850	-60.64	11.92	5.95	-41.91	-54.67	-28.91	-41.67	-13
		Middle	3462	-43.14	3462	-52.05	9.78	3.70	-37.06	-45.97	-24.06	-32.97	-13
			5198	-44.51	5198	-49.13	10.94	7.02	-40.59	-45.21	-27.59	-32.21	-13
			6934	-48.10	6934	-55.54	11.85	5.30	-41.55	-48.99	-28.55	-35.99	-13
		High	3504	-45.96	3504	-53.36	9.80	3.72	-39.88	-47.28	-26.88	-34.28	-13
			5261	-49.55	5261	-55.63	10.95	6.63	-45.23	-51.31	-32.23	-38.31	-13
			6969	-59.18	6969	-56.24	11.82	5.54	-52.90	-49.96	-39.90	-36.96	-13
	16QAM	Low	3420	-44.06	3420	-52.91	9.77	3.76	-38.05	-46.90	-25.05	-33.90	-13
			5135	-53.05	5135	-54.23	10.93	6.61	-48.73	-49.91	-35.73	-36.91	-13
			6850	-53.45	6850	-55.76	11.92	5.95	-47.48	-49.79	-34.48	-36.79	-13
		Middle	3462	-44.97	3462	-53.46	9.78	3.70	-38.89	-47.38	-25.89	-34.38	-13
			5198	-47.49	5198	-46.20	10.94	7.02	-43.57	-42.28	-30.57	-29.28	-13
			6934	-50.20	6934	-56.47	11.85	5.30	-43.65	-49.92	-30.65	-36.92	-13
		High	3504	-47.44	3504	-53.32	9.80	3.72	-41.36	-47.24	-28.36	-34.24	-13
			5261	-48.27	5261	-52.59	10.95	6.63	-43.95	-48.27	-30.95	-35.27	-13
			7018	-59.67	7018	-61.76	11.78	6.32	-54.21	-56.30	-41.21	-43.30	-13

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 5MHz

RB	Mode	Channel	Vertical		Horizontal		Ant Gain (dBi)	Cable Loss (dB)	Result		Margin		Limit
			Frequency (MHz)	S.G. Value (dBm)	Frequency (MHz)	S.G. Value (dBm)			Ver	Hor	Ver	Hor	
1-12	QPSK	Low	3420	-44.43	3420	-54.65	9.77	3.76	-38.42	-48.64	-25.42	-35.64	-13
			5135	-52.88	5135	-54.74	10.93	6.61	-48.56	-50.42	-35.56	-37.42	-13
			6850	-52.47	6850	-55.43	11.92	5.95	-46.50	-49.46	-33.50	-36.46	-13
		Middle	3462	-42.64	3462	-52.38	9.78	3.70	-36.56	-46.30	-23.56	-33.30	-13
			5198	-46.42	5198	-47.50	10.94	7.02	-42.50	-43.58	-29.50	-30.58	-13
			6934	-51.56	6934	-52.44	11.85	5.30	-45.01	-45.89	-32.01	-32.89	-13
		High	3504	-46.37	3504	-51.14	9.80	3.72	-40.29	-45.06	-27.29	-32.06	-13
			5254	-49.17	5254	-57.67	10.95	6.73	-44.95	-53.45	-31.95	-40.45	-13
			7018	-59.42	7018	-61.80	11.78	6.32	-53.96	-56.34	-40.96	-43.34	-13
	16QAM	Low	3420	-43.07	3420	-52.59	9.77	3.76	-37.06	-46.58	-24.06	-33.58	-13
			5135	-52.80	5135	-53.92	10.93	6.61	-48.48	-49.60	-35.48	-36.60	-13
			6850	-53.74	6850	-55.59	11.92	5.95	-47.77	-49.62	-34.77	-36.62	-13
		Middle	3462	-44.18	3462	-49.78	9.78	3.70	-38.10	-43.70	-25.10	-30.70	-13
			5198	-48.59	5198	-48.38	10.94	7.02	-44.67	-44.46	-31.67	-31.46	-13
			6934	-49.13	6934	-55.85	11.85	5.30	-42.58	-49.30	-29.58	-36.30	-13
		High	3504	-48.74	3504	-52.81	9.80	3.72	-42.66	-46.73	-29.66	-33.73	-13
			5254	-49.61	5254	-56.06	10.95	6.73	-45.39	-51.84	-32.39	-38.84	-13
			7011	-59.21	7011	-61.04	11.79	6.26	-53.68	-55.51	-40.68	-42.51	-13

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 10MHz

RB	Mode	Channel	Vertical		Horizontal		Ant Gain (dBi)	Cable Loss (dB)	Result		Margin		Limit
			Frequency (MHz)	S.G. Value (dBm)	Frequency (MHz)	S.G. Value (dBm)			Ver	Hor	Ver	Hor	
1-49	QPSK	Low	3434	-43.37	3434	-51.50	9.77	3.73	-37.33	-45.46	-24.33	-32.46	-13
			5156	-47.94	5156	-50.92	10.93	6.62	-43.63	-46.61	-30.63	-33.61	-13
			6878	-53.86	6878	-55.92	11.90	5.76	-47.72	-49.78	-34.72	-36.78	-13
		Middle	3469	-46.19	3469	-53.37	9.79	3.70	-40.11	-47.29	-27.11	-34.29	-13
			5212	-42.58	5212	-48.70	10.94	6.98	-38.62	-44.74	-25.62	-31.74	-13
			6948	-59.10	6948	-56.17	11.84	5.17	-52.43	-49.50	-39.43	-36.50	-13
		High	3511	-48.85	3511	-54.81	9.80	3.75	-42.81	-48.77	-29.81	-35.77	-13
			5261	-47.68	5261	-52.69	10.95	6.63	-43.36	-48.37	-30.36	-35.37	-13
			7018	-59.53	7018	-61.42	11.78	6.32	-54.07	-55.96	-41.07	-42.96	-13
	16QAM	Low	3441	-44.41	3441	-51.67	9.78	3.72	-38.35	-45.61	-25.35	-32.61	-13
			5156	-47.67	5156	-48.99	10.93	6.62	-43.36	-44.68	-30.36	-31.68	-13
			6878	-50.66	6878	-55.08	11.90	5.76	-44.52	-48.94	-31.52	-35.94	-13
		Middle	3469	-47.98	3469	-53.27	9.79	3.70	-41.90	-47.19	-28.90	-34.19	-13
			5212	-45.93	5212	-50.51	10.94	6.98	-41.97	-46.55	-28.97	-33.55	-13
			6948	-59.64	6948	-53.54	11.84	5.17	-52.97	-46.87	-39.97	-33.87	-13
		High	3504	-46.83	3504	-51.16	9.80	3.72	-40.75	-45.08	-27.75	-32.08	-13
			5261	-49.07	5261	-53.99	10.95	6.63	-44.75	-49.67	-31.75	-36.67	-13
			7018	-59.32	7018	-61.79	11.78	6.32	-53.86	-56.33	-40.86	-43.33	-13

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 15MHz

RB	Mode	Channel	Vertical		Horizontal		Ant Gain (dBi)	Cable Loss (dB)	Result		Margin		Limit
			Frequency (MHz)	S.G. Value (dBm)	Frequency (MHz)	S.G. Value (dBm)			Ver	Hor	Ver	Hor	
1-37	QPSK	Low	3434	-43.97	3434	-52.53	9.77	3.73	-37.93	-46.49	-24.93	-33.49	-13
			5149	-46.44	5149	-56.63	10.93	6.57	-42.08	-52.27	-29.08	-39.27	-13
			6871	-48.70	6871	-52.75	11.90	5.81	-42.61	-46.66	-29.61	-33.66	-13
		Middle	3462	-43.52	3462	-52.83	9.78	3.70	-37.44	-46.75	-24.44	-33.75	-13
			5198	-46.68	5198	-48.68	10.94	7.02	-42.76	-44.76	-29.76	-31.76	-13
			6934	-50.45	6934	-54.76	11.85	5.30	-43.90	-48.21	-30.90	-35.21	-13
		High	3490	-47.63	3490	-54.25	9.80	3.70	-41.53	-48.15	-28.53	-35.15	-13
			5240	-54.67	5240	-60.53	10.95	6.84	-50.56	-56.42	-37.56	-43.42	-13
			6990	-59.51	6990	-62.00	11.81	5.97	-53.67	-56.16	-40.67	-43.16	-13
	16QAM	Low	3434	-44.47	3434	-54.99	9.77	3.73	-38.43	-48.95	-25.43	-35.95	-13
			5156	-48.30	5156	-47.92	10.93	6.62	-43.99	-43.61	-30.99	-30.61	-13
			6871	-47.84	6871	-55.35	11.90	5.81	-41.75	-49.26	-28.75	-36.26	-13
		Middle	3462	-44.75	3462	-54.72	9.78	3.70	-38.67	-48.64	-25.67	-35.64	-13
			5198	-44.95	5198	-48.41	10.94	7.02	-41.03	-44.49	-28.03	-31.49	-13
			6934	-50.83	6934	-56.59	11.85	5.30	-44.28	-50.04	-31.28	-37.04	-13
		High	3490	-48.77	3490	-48.16	9.80	3.70	-42.67	-42.06	-29.67	-29.06	-13
			5240	-54.92	5240	-41.24	10.95	6.84	-50.81	-37.13	-37.81	-24.13	-13
			6990	-59.79	6990	-43.96	11.81	5.97	-53.95	-38.12	-40.95	-25.12	-13

Average E.I.R.P. for LTE Band 4

Channel Bandwidth: 20MHz

RB	Mode	Channel	Vertical		Horizontal		Ant Gain (dBi)	Cable Loss (dB)	Result		Margin		Limit
			Frequency (MHz)	S.G. Value (dBm)	Frequency (MHz)	S.G. Value (dBm)			Ver	Hor	Ver	Hor	
1-0	QPSK	Low	3420	-45.57	3420	-56.09	9.77	3.76	-39.56	-50.08	-26.56	-37.08	-13
			5135	-51.76	5135	-57.15	10.93	6.61	-47.44	-52.83	-34.44	-39.83	-13
			6843	-51.95	6843	-60.01	11.93	5.85	-45.88	-53.94	-32.88	-40.94	-13
		Middle	3448	-44.63	3448	-53.49	9.78	3.71	-38.56	-47.42	-25.56	-34.42	-13
			5170	-45.91	5170	-48.31	10.93	6.75	-41.73	-44.13	-28.73	-31.13	-13
			6892	-51.07	6892	-55.91	11.89	5.67	-44.85	-49.69	-31.85	-36.69	-13
		High	3469	-44.04	3469	-53.33	9.79	3.70	-37.96	-47.25	-24.96	-34.25	-13
			5205	-45.51	5205	-47.33	10.94	7.01	-41.58	-43.40	-28.58	-30.40	-13
			6948	-52.43	6948	-55.81	11.84	5.17	-45.76	-49.14	-32.76	-36.14	-13
	16QAM	Low	3420	-46.73	3420	-57.03	9.77	3.76	-40.72	-51.02	-27.72	-38.02	-13
			5135	-51.39	5135	-57.13	10.93	6.61	-47.07	-52.81	-34.07	-39.81	-13
			6843	-51.52	6843	-60.03	11.93	5.85	-45.45	-53.96	-32.45	-40.96	-13
		Middle	3448	-45.61	3448	-54.54	9.78	3.71	-39.54	-48.47	-26.54	-35.47	-13
			5170	-45.02	5170	-50.03	10.93	6.75	-40.84	-45.85	-27.84	-32.85	-13
			6892	-49.91	6892	-55.53	11.89	5.67	-43.69	-49.31	-30.69	-36.31	-13
		High	3469	-44.52	3469	-52.18	9.79	3.70	-38.44	-46.10	-25.44	-33.10	-13
			5205	-45.89	5205	-47.59	10.94	7.01	-41.96	-43.66	-28.96	-30.66	-13
			6948	-52.63	6948	-55.65	11.84	5.17	-45.96	-48.98	-32.96	-35.98	-13

Average E.R.P. for LTE Band 13

Channel Bandwidth: 5MHz

RB	Mode	Channel	Vertical		Horizontal		Ant Gain (dBi)	Cable Loss (dB)	Result		Margin		Limit
			Frequency (MHz)	S.G. Value (dBm)	Frequency (MHz)	S.G. Value (dBm)			Ver	Hor	Ver	Hor	
1-0	QPSK	Low	1553	-68.72	1553	-63.82	8.64	2.56	-62.64	-57.74	-22.64	-17.74	-40
			2330	-59.97	2330	-62.49	9.53	3.66	-54.10	-56.62	-41.10	-43.62	-13
			3016	-62.60	3016	-64.70	9.61	3.85	-56.84	-58.94	-43.84	-45.94	-13
		Middle	1518	-70.87	1518	-67.09	8.61	2.51	-64.77	-60.99	-24.77	-20.99	-40
			2337	-62.00	2337	-62.79	9.54	3.67	-56.13	-56.92	-43.13	-43.92	-13
			3121	-64.93	3121	-67.46	9.65	3.89	-59.17	-61.70	-46.17	-48.70	-13
		High	1560	-69.20	1560	-66.09	8.65	2.56	-63.11	-60.00	-23.11	-20.00	-40
			2344	-62.64	2344	-64.81	9.55	3.68	-56.77	-58.94	-43.77	-45.94	-13
			3162	-63.63	3162	-67.39	9.66	3.90	-57.87	-61.63	-44.87	-48.63	-13
	16QAM	Low	1553	-68.20	1553	-64.43	8.64	2.56	-62.12	-58.35	-22.12	-18.35	-40
			2330	-59.24	2330	-62.78	9.53	3.66	-53.37	-56.91	-40.37	-43.91	-13
			3016	-62.66	3016	-64.97	9.61	3.85	-56.90	-59.21	-43.90	-46.21	-13
		Middle	1518	-69.94	1518	-66.77	8.61	2.51	-63.84	-60.67	-23.84	-20.67	-40
			2337	-60.49	2337	-64.73	9.54	3.67	-54.62	-58.86	-41.62	-45.86	-13
			3121	-64.96	3121	-67.50	9.65	3.89	-59.20	-61.74	-46.20	-48.74	-13
		High	1560	-69.15	1560	-68.49	8.65	2.56	-63.06	-62.40	-23.06	-22.40	-40
			2344	-62.80	2344	-63.75	9.55	3.68	-56.93	-57.88	-43.93	-44.88	-13
			3128	-64.17	3128	-67.93	9.65	3.89	-58.41	-62.17	-45.41	-49.17	-13

Average E.R.P. for LTE Band 13

Channel Bandwidth: 10MHz

RB	Mode	Channel	Vertical		Horizontal		Ant	Cable	Result		Margin		Limit
			Frequency (MHz)	S.G. Value (dBm)	Frequency (MHz)	S.G. Value (dBm)	Gain (dBi)	Loss (dB)	Ver	Hor	Ver	Hor	
1-49	QPSK	Middle	1567	-69.10	1567	-66.71	8.65	2.56	-63.00	-60.61	-23.00	-20.61	-40
			2358	-61.83	2358	-64.00	9.57	2.91	-55.17	-57.34	-42.17	-44.34	-13
			3128	-64.65	3128	-67.53	9.65	3.89	-58.89	-61.77	-45.89	-48.77	-13
	16QAM	Middle	1567	-69.45	1567	-66.74	8.65	2.56	-63.35	-60.64	-23.35	-20.64	-40
			2358	-60.79	2358	-63.04	9.57	2.91	-54.13	-56.38	-41.13	-43.38	-13
			3128	-64.76	3128	-67.51	9.65	3.89	-59.00	-61.75	-46.00	-48.75	-13

Appendix A: Test equipments list

Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
ESCI EMI Test Receiver	Rohde & Schwarz	ESCI	100018	2014/12/02	2015/12/01
Spectrum Analyzer	Rohde & Schwarz	FSP30	100137	2014/06/16	2015/06/15
Spectrum Analyzer	Rohde & Schwarz	FSEK30	100186	2015/01/14	2016/01/13
Horn Antenna (1-18G)	Schwarzbeck	BBHA 9120 D	9120D-456	2014/08/29	2017/08/27
Horn Antenna (14-42G)	SHWARZBECK	BBHA 9170	BBHA9170159	2014/09/16	2017/09/14
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-172	2013/08/08	2015/08/07
Loop Antenna	RolfHeine	LA-285	02/10033	2014/03/18	2017/03/16
Pre-Amplifier	MITEQ	AFS44-00102650--42-10P-44	1495287	2013/10/27	2015/10/26
Pre-Amplifier	MITEQ	JS4-26004000--27-8A	828825	2014/09/15	2015/09/14
Power Meter	Anritsu	ML2495A	0844001	2014/11/12	2015/11/11
Power Sensor	Anritsu	MA2411B	0738452	2014/11/12	2015/11/11
Two-Line -V-Network	Rohde & Schwarz	ESH3-Z5	825562/003	2014/10/15	2015/10/14
Two-Line V-Network	Rohde & Schwarz	ESH3-Z5	838979/014	2014/10/05	2015/10/4
Simulator	Rohde & Schwarz	CMW 500	124781	2014/10/03	2015/10/02
Spectrum Analyzer	Agilent	N9030A	MY51380492	2014/09/19	2015/09/18
Brand		Software		Version	
ADT		Radiated test system		7.5.14	

Appendix B: Measurement Uncertainty

Measurement uncertainty was calculated in accordance with TR 100 028-1.

Parameter	Uncertainty		
Radiated Emission	Below 1 GHz	Vertical	3.90 dB
		Horizontal	3.86 dB
	1G~18GHz	Vertical	4.19 dB
		Horizontal	4.30 dB
	18GHz~40GHz	Vertical	2.92 dB
		Horizontal	2.90 dB
Conducted Output power	0.86 dB		
Conducted Spurious Emission	0.84 dB		

This uncertainty represents an expanded uncertainty expressed at approximately the 95 %