International Certification Corp.
No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.
Tel: 886-3-271-8666 Fax: 886-3-318-0155

FCC Test Report

FCC ID	:	**2AAGMVZ20Q**
Equipment	:	**VZ20Q module**
Model No.	:	**VZ20Q**
Brand Name	:	**EZLinkLTE**
Applicant	:	**Sequans Communications**
Address	:	**19 LE PARVIS DE LA DEFENSE, PARIS-LA DEFENSE CEDEX, France, 92073**
Manufacturer	:	**AcSiP**
Address	:	**3F.-1, No. 207, Fuxing Rd., Taoyuan City, Taoyuan County 33066, Taiwan (R.O.C)**
Standard	:	**47 CFR FCC Part 27 Subpart B**
Received Date	:	**Jun. 14, 2013**
Tested Date	:	**Jun. 14 ~ Jul. 12, 2013**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:

Gary Chang / Manager

Testing Laboratory
2732

Table of Contents

Release Record

Report No.	Version	Description	Issued Date
FG370901B13	Rev. 01	Initial issue	Jul. 15, 2013
FG370901B13	Rev. 02	Adding ERP of 16QAM	Aug 7, 2013

Summary of Test Results

FCC Rules	Test Items	Measured	Result
2.1046 / 27.50(c)(10)	Effective Radiated Power	Power[dBm]: 22.74	Pass
2.1053 / 27.53(g)	Radiated Emissions	Meet the requirement of limit	Pass
2.1053 / 27.53(f)	Radiated Spurious Emission in the 1559-1610MHz band	Meet the requirement of limit	Pass
2.1051 / 27.53(g)	Conducted Emissions	Meet the requirement of limit	Pass
27.53(g)	Band Edge Measurement	Meet the requirement of limit	Pass
2.1049 / 27.53(g)	Occupied Bandwidth	Meet the requirement of limit	Pass
2.1055 / 27.54	Frequency Stability	Meet the requirement of limit	Pass
27.50(d)(5)	Peak to Average Ratio	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

Operating band (MHz)	Channel Bandwidth: 5MHz: 779.5-784.5 Channel Bandwidth: 10MHz: 782
Modulation	Uplink: QPSK, 16QAM Downlink: QPSK, 16QAM, 64QAM
Category	4
H/W Version	REV02
S/W Version	MFW3.2.0 / ASW2.2.0

1.1.2 Maximum EIRP, Frequency Tolerance and Emission Designator

Channel Bandwidth (MHz)	Modulation	Maximum ERP (dBm)	Frequency Tolerance (ppm)	Emission Designator
5	QPSK	22.74	0.023	4M56G7D
10	QPSK	22.48	0.023	9M00G7D

1.1.3 Antenna Details

Ant. No.	Type	Gain (dBi)	Connector	Remark
1	Isotropic	2	SMA	---

1.1.4 EUT Operational Condition

Supply Voltage	☐ AC mains	☒ DC	
Type of DC Source	☐ Internal DC supply	☐ External DC adapter	☒ From host
Operational Voltage	☒ Vnom (120 V)	☒ Vmax (126.5 V)	☒ Vmin (93.5 V)
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (70°C)	☒ Tmin (-30°C)

1.1.5 Accessories

N/A

1.1.6 Operating Channel List

Channel Bandwidth: 5 MHz	Channel	Frequency (MHz)
Low	23205	779.5
Middle	23230	782.0
High	23255	784.5

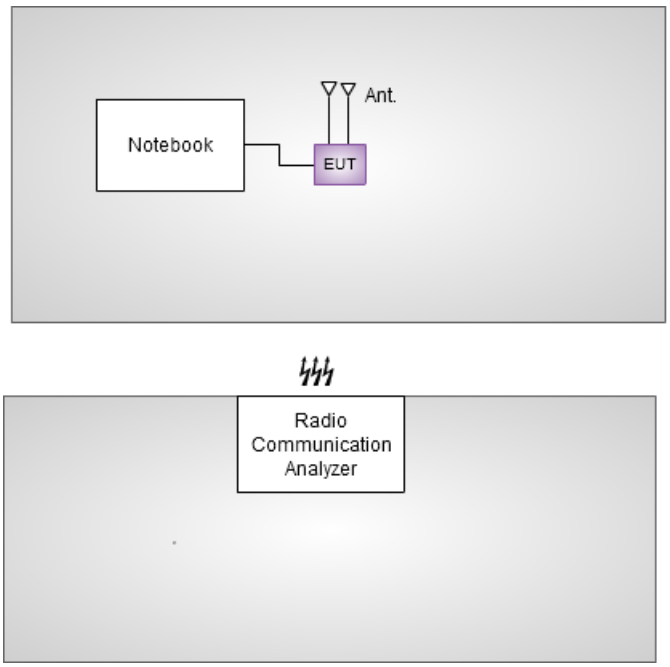
Channel Bandwidth: 10 MHz	Channel	Frequency (MHz)
---	23230	782.0

1.2 Test Setup Chart

Support Equipment List						
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	E6430	---	DoC	USB, 1m non-shielded w/o core
2	Radio Communication Analyzer	Anritsu	MT8820C	6201240341	---	---

1.3 Test Setup Chart

Test Setup Diagram



1.4 The Equipment List

Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
3m semi-anechoic chamber	CHAMPRO	SAC-03	03CH01-WS	Jan. 04, 2013	Jan. 03, 2014
Spectrum Analyzer	R&S	FSV40	101498	Jan. 24, 2013	Jan. 23, 2014
Receiver	ROHDE&SCHWARZ	ESR3	101658	Jan. 28, 2013	Jan. 27, 2014
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jan. 11, 2013	Jan. 10, 2014
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Feb. 18, 2013	Feb. 17, 2014
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014
Amplifier	Burgeon	BPA-530	100219	Nov. 28, 2012	Nov. 27, 2013
Amplifier	Agilent	83017A	MY39501308	Dec. 18, 2012	Dec. 17, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-001	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-002	Dec. 25, 2012	Dec. 24, 2013
control	EM Electronics	EM1000	60612	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014
Amplifier	MITEQ	AMF-6F-260400	9121372	Apr. 19, 2013	Apr. 18, 2015
Note: Calibration Interval of instruments listed above is two year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV 40	101063	Feb. 18, 2013	Feb. 17, 2014
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 29, 2012	Nov. 28, 2013
Power Meter	Anritsu	ML2495A	1241002	Oct. 15, 2012	Oct. 14, 2013
Power Sensor	Anritsu	MA2411B	1027366	Oct. 24, 2012	Oct. 23, 2013
Signal Generator	R&S	SMB100A	175727	Jan. 14, 2013	Jan. 13, 2014
Radio Communication Analyzer	Anritsu	MT8820C	6201240341	Mar. 13, 2013	Mar. 12, 2014
Bluetooth Tester	R&S	CBT	100959	Jan. 09, 2013	Jan. 08, 2014
MXG-B RF Vector Signal Generator	Agilent	N5182B	MY53050081	Apr. 19, 2013	Apr. 18, 2014
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards.

47 CFR FCC Part 27 Subpart B
ANSI C63.43-2003
ANSI / TIA / EIA-603-C -2004
971168 D01 Power Meas License Digital Systems v02r01

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±35.101 Hz
Conducted power	±0.536 dB
Frequency error	±35.101 Hz
Temperature	±0.3 °C
Conducted emission	±2.946 dB
AC conducted emission	±2.43 dB
Radiated emission	±2.49 dB

2 Test Configuration

2.1 Testing Condition and Location Information

Test Item	Test Site	Ambient Condition	Tested By
RF conducted	TH01-WS	24°C / 63%	Brad Wu
Radiated Emissions	03CH01-WS	25°C / 65%	Aska Huang

- FCC site registration No.: 657002
- IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Channel Bandwidth	Test Channel	Modulation	Size / Offset
Effective Radiated Power	5 MHz 10 MHz	23205 / 23230 / 23255 23230	QPSK / 16QAM QPSK / 16QAM	1 / 0 1 / 49
Radiated Emissions (below 1GHz)	5 MHz 10 MHz	23255 23230	QPSK QPSK	1 / 0 1 / 49
Radiated Emissions (above 1GHz)	5 MHz 10 MHz	23205 / 23230 / 23255 23230	QPSK QPSK	1 / 0 1 / 49
Radiated Spurious Emission in the 1559-1610MHz band	5 MHz 10 MHz	23205 / 23230 / 23255 23230	QPSK QPSK	1 / 0 1 / 49
Conducted Emissions	5 MHz 10 MHz	23205 / 23230 / 23255 23230	QPSK / 16QAM QPSK / 16QAM	1 / 0 1 / 49
Band Edge	5 MHz 10 MHz	23205 / 23230 / 23255 23230	QPSK / 16QAM QPSK / 16QAM	Note 2
Occupied Bandwidth Peak to Average Ratio	5 MHz 10 MHz	23205 / 23230 / 23255 23230	QPSK / 16QAM QPSK / 16QAM	25 / 0 50 / 0
Frequency Stability	5 MHz 10 MHz	23255 23230	QPSK QPSK	25 / 0 50 / 0

NOTE:
1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.
2. 1 RB allocated at the lower / upper edge of a channel , 100% RB allocation
   Please refer to band edge test result section for detail test condition

3 Test Results

3.1 Effective Radiated Power

3.1.1 Limit of Effective Radiated Power

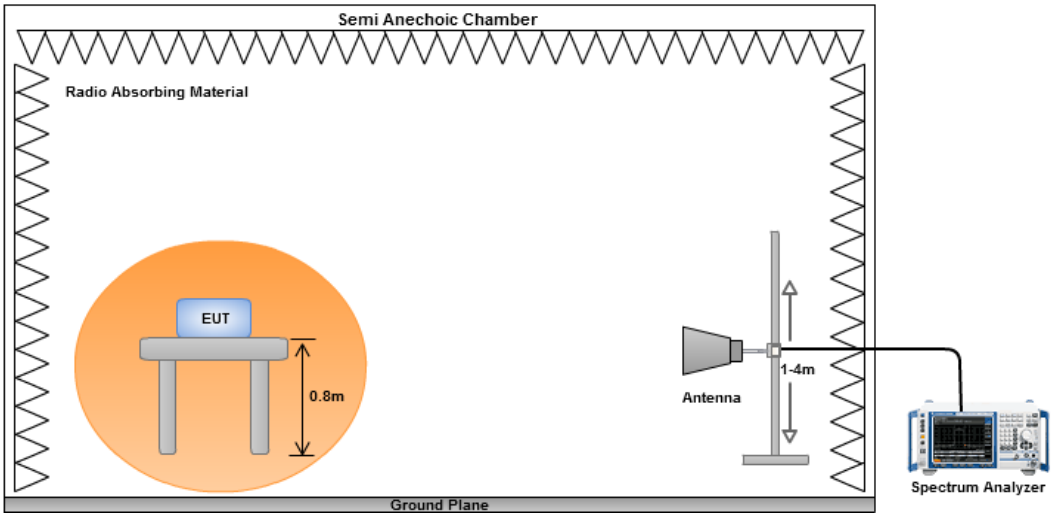
Portable stations (hand-held devices) transmitting in the 746~757 MHz, 758~763 MHz, 776~793MHz, and 805~806 MHz bands are limited to 3 watts ERP.

3.1.2 Test Procedures

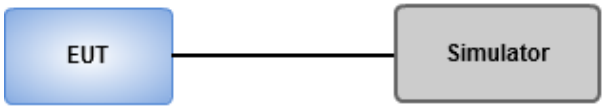
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.
4. After finding the max radiated emission, substitution method will be used for getting effective radiated power. EUT will be removed and substitution antenna will be placed at same position. Signal generator will output CW signal to substitution antenna through a RF cable. Rotate turntable and move antenna to find maximum radiated emission. Adjust output power of signal generator to let the maximum radiated emission is same as step 3. Record the output power level.
5. E.I.R.P = output power of step 4 + gain of substitution antenna – cable loss of RF cable. ERP can be calculated by below formula:
   E.R.P= E.I.R.P –2.15dB

3.1.3 Test Setup

Effective Radiated Power Measurement



Conducted Power Measurement



3.1.4 Test Result of Effective Radiated Power

Conducted Output Power (dBm)

Band			LTE Band 13		
BW: 5 MHz	Channel		23205	23230	23255
Modulation	Frequency (MHz)		779.5	782.0	784.5
	RB	RB Offset	Conducted Output Power (dBm)		
QPSK	1	0	22.93	22.90	22.94
	1	24	22.80	22.73	22.71
	12	6	21.73	21.73	21.69
	25	0	21.75	21.81	21.76
16QAM	1	0	21.95	21.69	21.68
	1	24	21.87	21.81	21.78
	12	6	20.71	20.73	20.72
	25	0	20.75	20.83	20.84

Band			LTE Band 13		
BW: 10 MHz	Channel		23230	---	---
Modulation	Frequency (MHz)		782.0	---	---
	RB	RB Offset	Conducted Output Power (dBm)		
QPSK	1	0	22.80	---	---
	1	49	22.90	---	---
	25	12	21.73	---	---
	50	0	21.72	---	---
16QAM	1	0	21.90	---	---
	1	49	22.00	---	---
	25	12	20.74	---	---
	50	0	20.69	---	---

ERP (dBm)

Mode	BW: 5 MHz / QPSK						
Channel	Frequency (MHz)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
23205	779.5	-8.41	20.51	3.73	22.09	34.77	-12.68
23230	782.0	-7.77	21.15	3.74	22.74	34.77	-12.03
23255	784.5	-7.95	20.98	3.75	22.58	34.77	-12.19

Mode	BW: 5 MHz / 16QAM						
Channel	Frequency (MHz)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
23205	779.5	-9.66	19.26	3.73	20.84	34.77	-13.93
23230	782.0	-9.12	19.80	3.74	21.39	34.77	-13.38
23255	784.5	-9.34	19.59	3.75	21.19	34.77	-13.58

Mode	BW: 10 MHz / QPSK						
Channel	Frequency (MHz)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
23230	782.0	-8.03	20.89	3.74	22.48	34.77	-12.29

Mode	BW: 10 MHz / 16QAM						
Channel	Frequency (MHz)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
23230	782.0	-9.18	19.74	3.74	21.33	34.77	-13.44

ERP = S.G power value + correction factor -2.15

3.2 Radiated Emissions

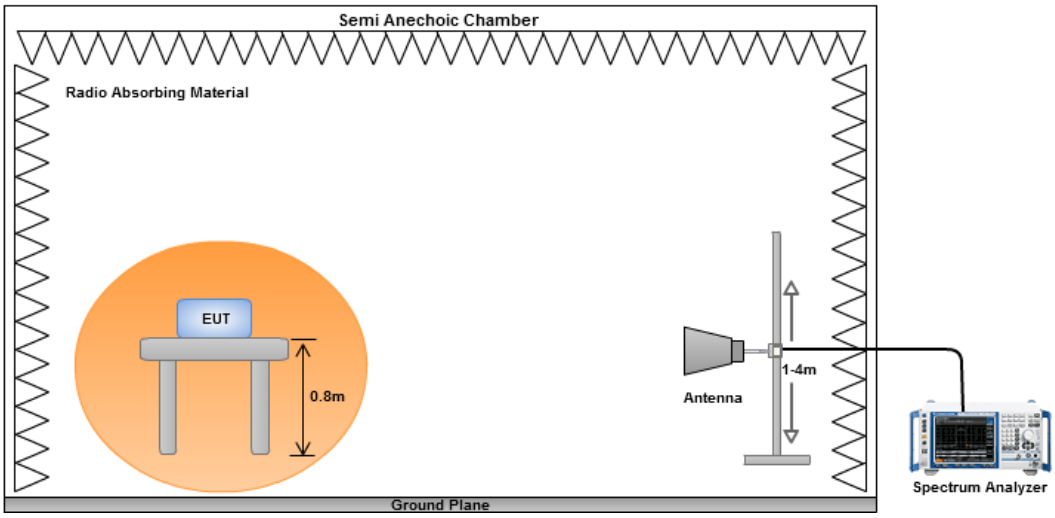
3.2.1 Limit of Radiated Emissions

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB equal to -13dBm.

3.2.2 Test Procedures

1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.
4. After finding the max radiated emission, substitution method will be used for getting effective radiated power. EUT will be removed and substitution antenna will be placed at same position. Signal generator will output CW signal to substitution antenna through a RF cable. Rotate turntable and move antenna to find maximum radiated emission. Adjust output power of signal generator to let the maximum radiated emission is same as step 3. Record the output power level.
5. E.I.R.P = output power of step 4 + gain of substitution antenna – cable loss of RF cable. ERP can be calculated by below formula:
   E.R.P= E.I.R.P –2.15dB

3.2.3 Test Setup



3.2.4 Test Result of Radiated Emissions below 1GHz

Mode	BW: 5 MHz				Channel	23225		
Frequency (MHz)	Antenna Polarity	E.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	E.I.R.P. (dBm)
64.92	H	-57.40	-13	-44.40	-46.09	-49.91	-5.34	-55.25
224.00	H	-56.30	-13	-43.30	-43.77	-59.93	5.78	-54.15
232.73	H	-54.12	-13	-41.12	-41.99	-57.69	5.72	-51.97
362.71	H	-52.64	-13	-39.64	-43.59	-56.03	5.54	-50.49
527.61	H	-59.16	-13	-46.16	-53.61	-62.06	5.05	-57.01
700.27	H	-56.57	-13	-43.57	-53.03	-58.69	4.27	-54.42
98.87	V	-56.88	-13	-43.88	-45.46	-55.24	0.51	-54.73
230.79	V	-57.42	-13	-44.42	-48	-61.00	5.73	-55.27
362.71	V	-53.34	-13	-40.34	-46.21	-56.73	5.54	-51.19
428.67	V	-56.07	-13	-43.07	-51.06	-59.14	5.22	-53.92
494.63	V	-57.77	-13	-44.77	-53.47	-60.78	5.16	-55.62
700.27	V	-53.24	-13	-40.24	-51.54	-55.36	4.27	-51.09

Mode	BW: 10 MHz				Channel	23230		
Frequency (MHz)	Antenna Polarity	E.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	E.I.R.P. (dBm)
64.92	H	-57.53	-13	-44.53	-496.22	-50.04	-5.34	-55.38
224.00	H	-58.42	-13	-45.42	-45.89	-62.05	5.78	-56.27
232.73	H	-52.41	-13	-39.41	-40.28	-55.98	5.72	-50.26
362.71	H	-51.82	-13	-38.82	-42.77	-55.21	5.54	-49.67
527.61	H	-59.53	-13	-46.53	-53.98	-62.43	5.05	-57.38
700.27	H	-56.84	-13	-43.84	-53.3	-58.96	4.27	-54.69
98.87	V	-55.72	-13	-42.72	-44.3	-54.08	0.51	-53.57
230.79	V	-57.84	-13	-44.84	-48.42	-61.42	5.73	-55.69
362.71	V	-53.54	-13	-40.54	-46.41	-56.93	5.54	-51.39
428.67	V	-58.04	-13	-45.04	-53.03	-61.11	5.22	-55.89
494.63	V	-57.62	-13	-44.62	-53.32	-60.63	5.16	-55.47
700.27	V	-52.41	-13	-39.41	-50.71	-54.53	4.27	-50.26

3.2.5 Test Result of Radiated Emissions above 1GHz

Mode	BW: 5 MHz				Channel	23205		
Frequency (MHz)	Antenna Polarity	E.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	E.I.R.P. (dBm)
1554.69	H	-48.98	-13	-35.98	-49.01	-52.06	5.23	-46.83
3109.38	H	-43.00	-13	-30.00	-51.08	-46.77	5.92	-40.85
4664.07	H	-43.85	-13	-30.85	-56.84	-47.03	5.33	-41.7
6218.76	H	-33.37	-13	-20.37	-51.37	-34.75	3.53	-31.22
1554.69	V	-51.32	-13	-38.32	-50.51	-54.40	5.23	-49.17
3109.38	V	-44.42	-13	-31.42	-52.87	-48.19	5.92	-42.27
4664.07	V	-44.01	-13	-31.01	-55.5	-47.19	5.33	-41.86
6218.76	V	-35.63	-13	-22.63	-51.64	-37.01	3.53	-33.48

Mode	BW: 5 MHz				Channel	23230		
Frequency (MHz)	Antenna Polarity	E.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	E.I.R.P. (dBm)
2339.54	H	-47.16	-13	-34.16	-51.33	-50.77	5.76	-45.01
3119.38	H	-48.16	-13	-35.16	-56.31	-51.92	5.91	-46.01
3899.23	H	-43.93	-13	-30.93	-54.72	-46.87	5.09	-41.78
2339.54	V	-47.70	-13	-34.70	-53.54	-51.31	5.76	-45.55
3119.38	V	-46.80	-13	-33.80	-55.31	-50.56	5.91	-44.65
3899.23	V	-41.45	-13	-28.45	-52.21	-44.39	5.09	-39.3

Mode	BW: 5 MHz				Channel	23255		
Frequency (MHz)	Antenna Polarity	E.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	E.I.R.P. (dBm)
3129.38	H	-42.50	-13	-29.50	-50.78	-46.25	5.90	-40.35
4694.07	H	-42.61	-13	-29.61	-40.46	-45.77	5.31	-40.46
6258.76	H	-35.32	-13	-22.32	-33.17	-36.67	3.50	-33.17
3129.38	V	-43.88	-13	-30.88	-52.46	-47.63	5.90	-41.73
4694.07	V	-42.76	-13	-29.76	-54.27	-45.92	5.31	-40.61
6258.76	V	-36.49	-13	-23.49	-52.49	-37.84	3.50	-34.34

Mode	BW: 10 MHz				Channel	23230		
Frequency (MHz)	Antenna Polarity	E.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)	E.I.R.P. (dBm)
3145.7	H	-45.63	-13	-32.63	-53.87	-49.36	5.88	-43.48
4718.7	H	-43.95	-13	-30.95	-57.15	-47.08	5.28	-41.8
6219.8	H	-38.23	-13	-25.23	-56.31	-39.61	3.53	-36.08
3145.7	V	-46.27	-13	-33.27	-54.85	-50.00	5.88	-44.12
4718.7	V	-44.90	-13	-31.90	-56.41	-48.03	5.28	-42.75
6219.8	V	-37.60	-13	-24.60	-53.61	-38.98	3.53	-35.45

3.2.6 Test Result of Radiated Emissions in the 1559-1610MHz band

Mode	BW: 5 MHz			Channel	23205		
Frequency (MHz)	Antenna Polarity	E.I.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
1563.20	H	-49.52	-40	-9.52	-50.86	-54.75	5.23
1563.20	V	-47.03	-40	-7.03	-49.21	-52.26	5.23

Mode	BW: 5 MHz			Channel	23230		
Frequency (MHz)	Antenna Polarity	E.I.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
1559.69	H	-47.76	-40	-7.76	-49.94	-52.99	5.23
1559.69	V	-49.89	-40	-9.89	-51.23	-55.12	5.23

Mode	BW: 5 MHz			Channel	23255		
Frequency (MHz)	Antenna Polarity	E.I.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
1564.69	H	-46.53	-40	-6.53	-48.71	-51.76	5.23
1564.69	V	-49.34	-40	-9.34	-50.68	-54.57	5.23

Mode	BW: 10 MHz			Channel	23230		
Frequency (MHz)	Antenna Polarity	E.I.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
1572.90	H	-48.18	-40	-8.18	-50.36	-53.41	5.23
1572.90	V	-51.03	-40	-11.03	-52.37	-56.26	5.23

3.3 Conducted Emissions

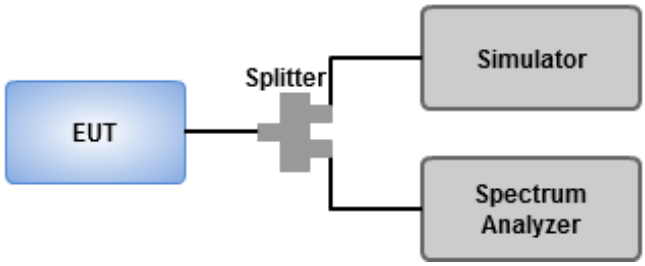
3.3.1 Limit of Conducted Emissions

On any frequency outside the 776~788 MHz band, the power of any emission shall be attenuatedoutside the band below the transmitter power (P) by at least 43 + 10 log (P) dB equal to -13dBm.

3.3.2 Test Procedures

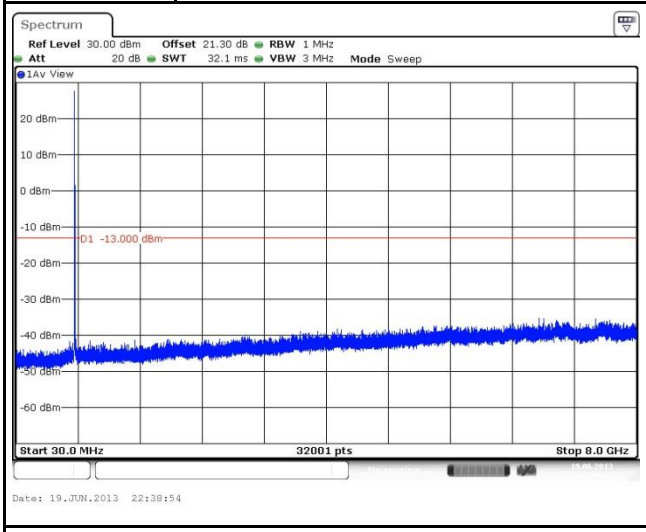
1. Lowestand highest operating channelsare tested for thisitem.
2. Scan frequency range isfrom 30MHz~8GHz.
3. Set RBW = 1MHz, VBW = 3MHz, detector = RMS, sweep time = auto.
4. Record the max trace value and capture the test plotof each sub frequency band.

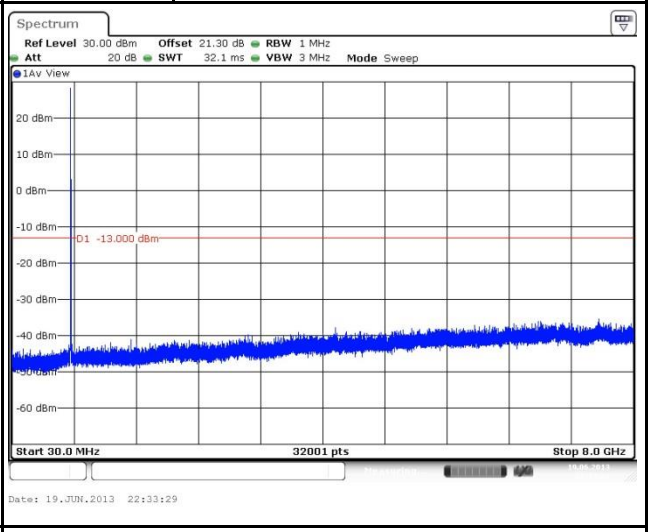
3.3.3 Test Setup

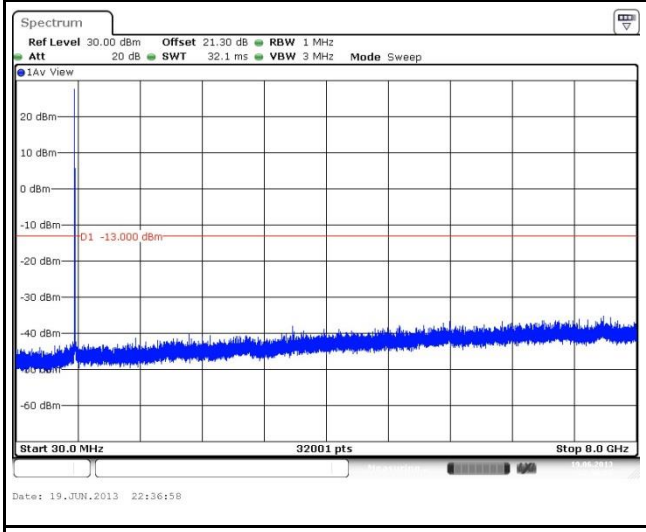


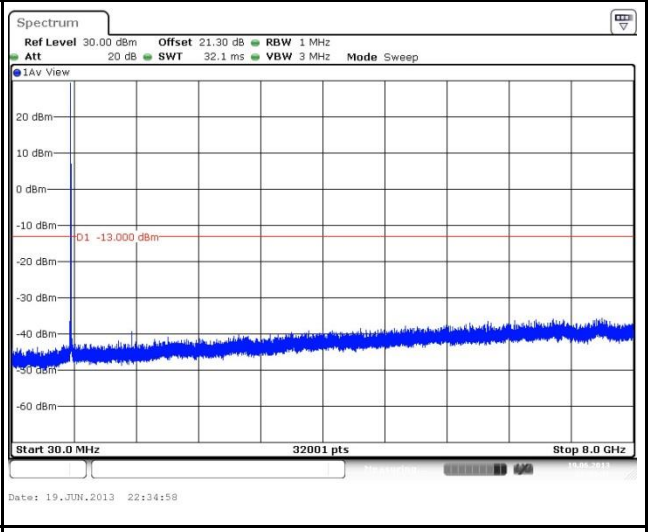
3.3.4 Test Result of Conducted Emissions

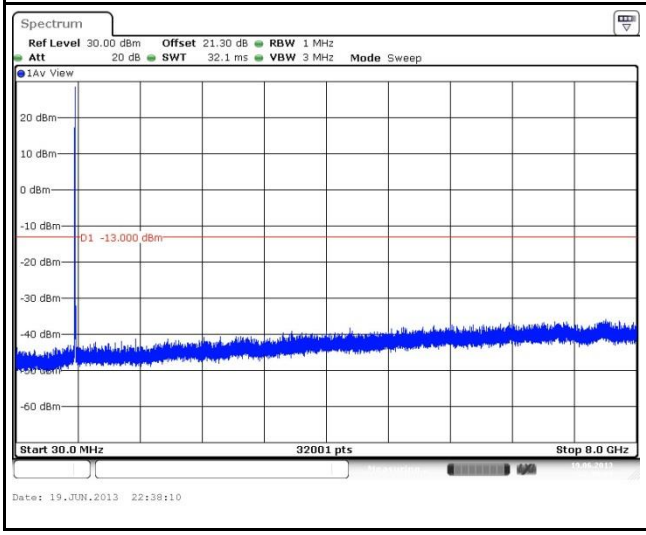
Mode	BW: 5 MHz / QPSK	Mode	BW: 5 MHz / 16QAM
Channel	23205 / 23230 / 23255	Channel	23205 / 23230 / 23255

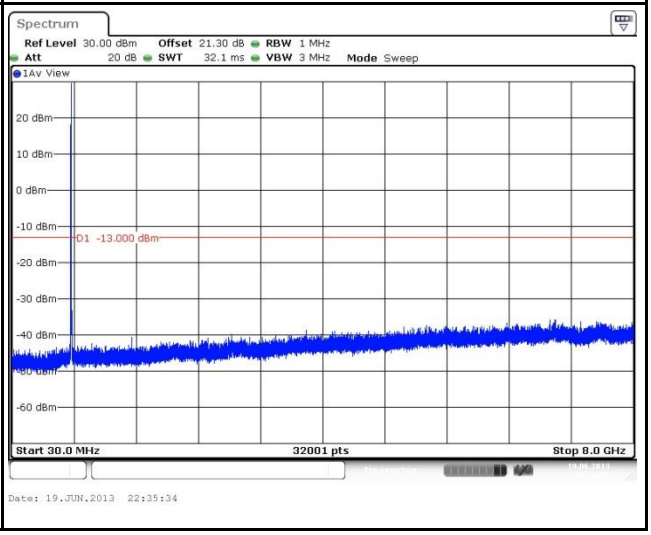




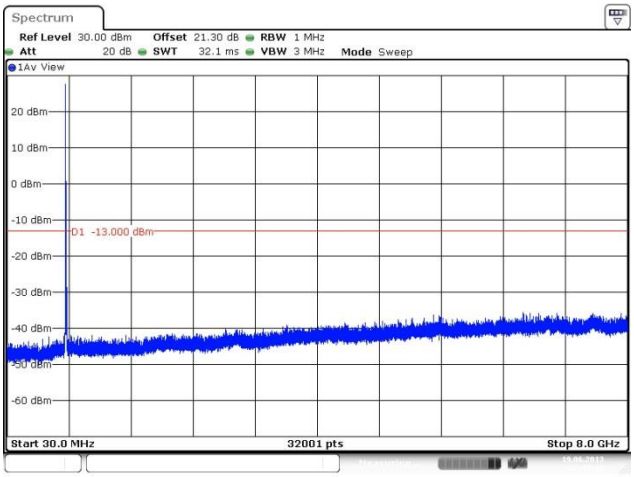


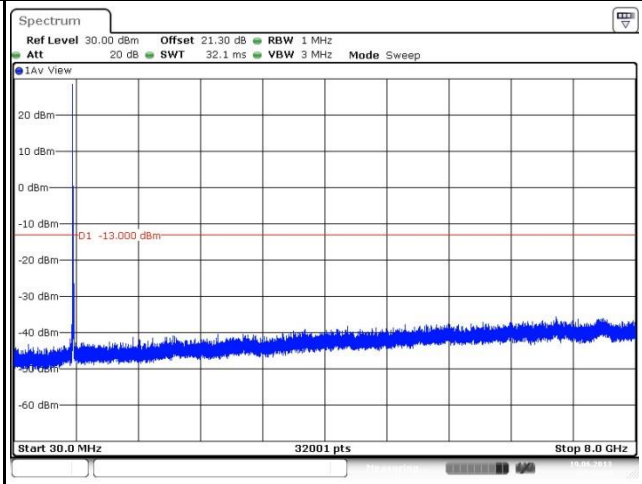






Mode	BW: 10 MHz / QPSK	Mode	BW: 10 MHz / 16QAM
Channel	23230	Channel	23230





3.4 Band Edge

3.4.1 Limit of Band Edge

On any frequency outside the 776~788 MHz band, the power of any emission shall be attenuatedoutside the band below the transmitter power (P) by at least 43 + 10 log (P) dB equal to -13dBm.

On all frequencies between 763~775 MHz and 793~805 MHz, by a factor not less than 65 + 10 log(P) dB in a 6.25 kHz band segment, for mobile and portable stations.

3.4.2 Test Procedures

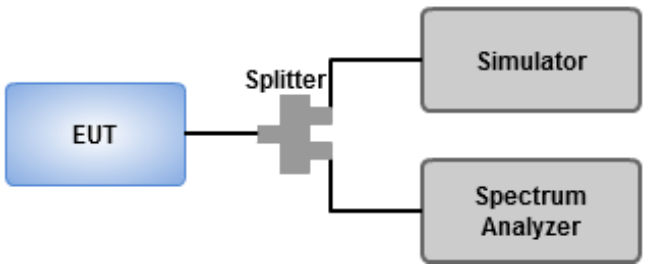
For frequency range 775~789 MHz

1. Set RBW = 100kHz, VBW = 300kHz, detector = RMS, sweep time = auto.
2. Record the max trace value and capture the test plot.

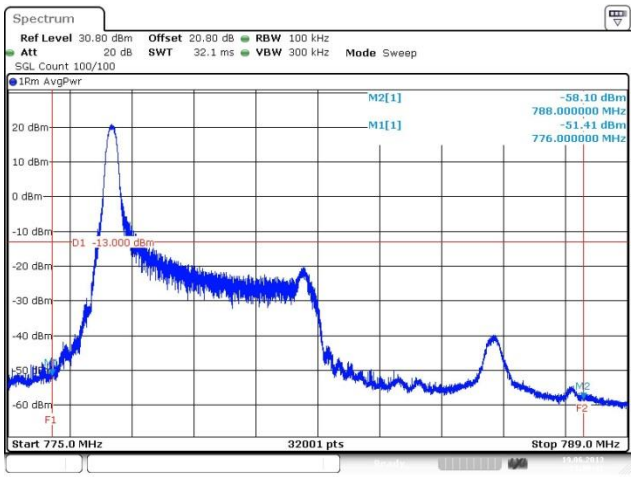
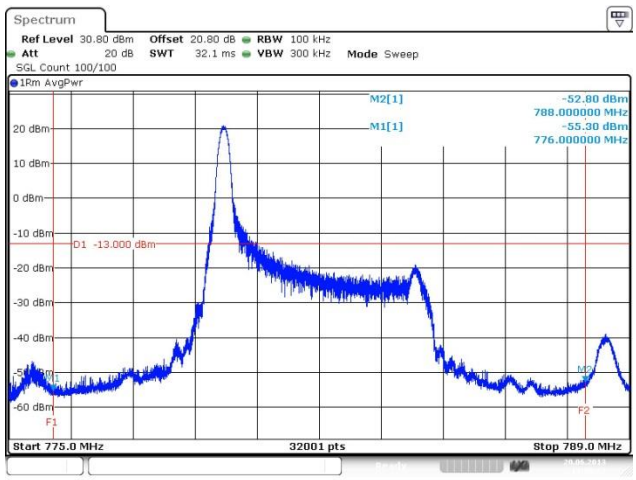
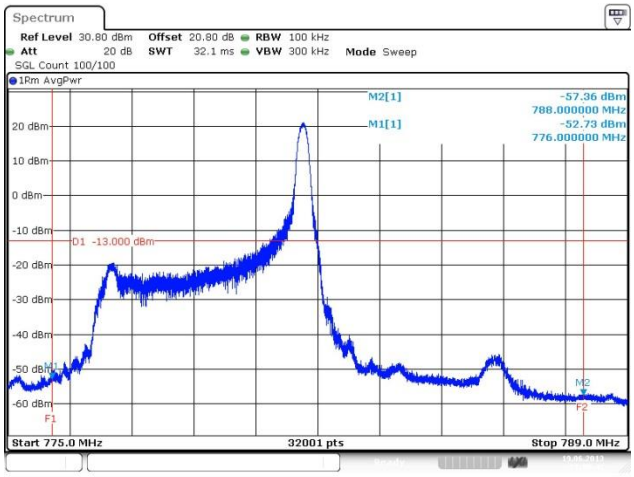
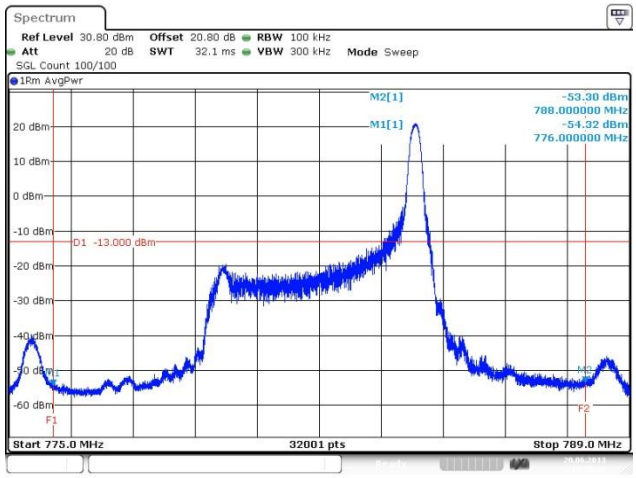
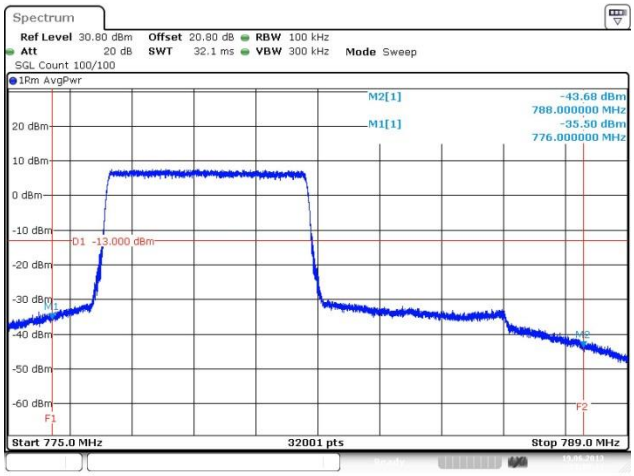
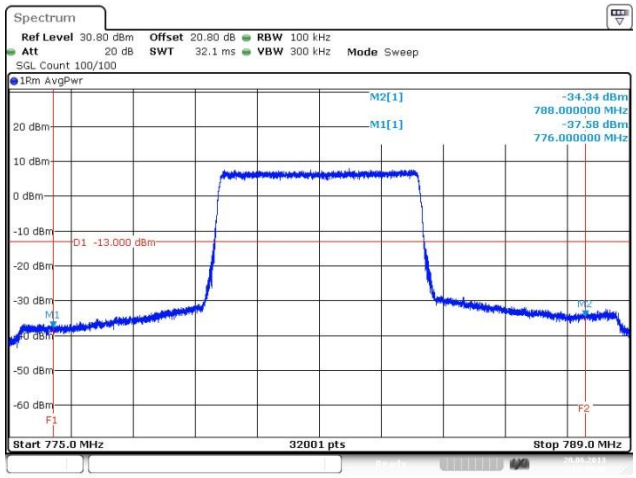
For frequency range 763~775 and 793~805 MHz

1. Set RBW = 10kHz, VBW = 30kHz, detector = RMS, sweep time = auto.
2. Record the max trace value and capture the test plot.

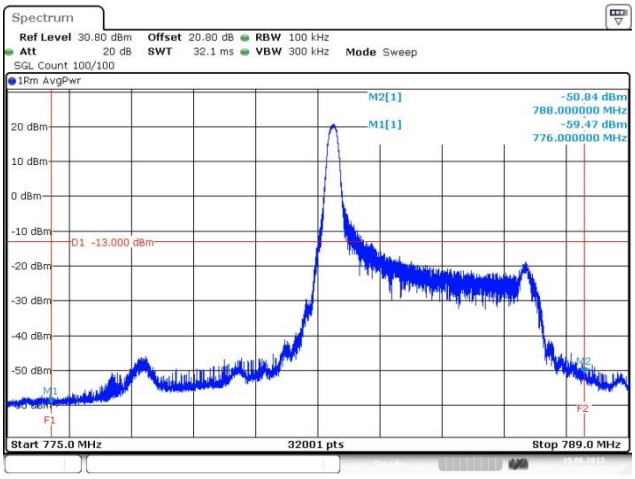
3.4.3 Test Setup

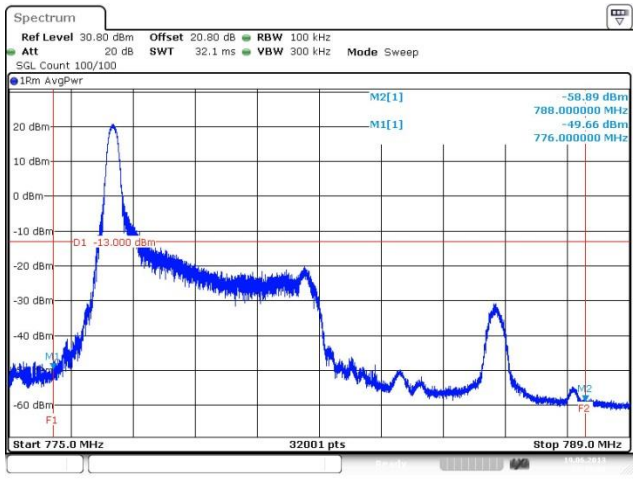


3.4.4 Test Result of 775~789 MHz

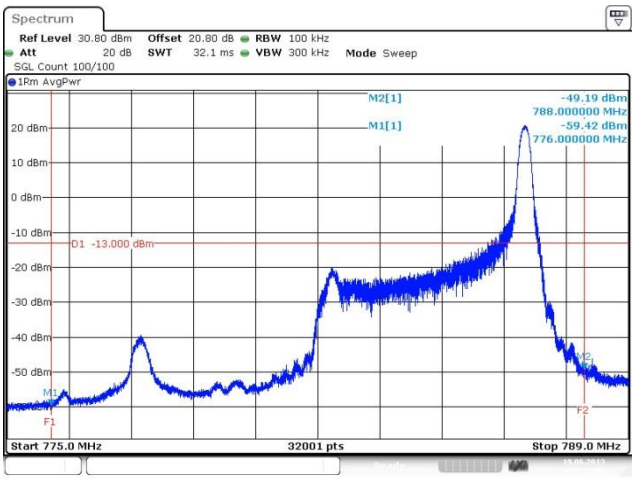
Mode	BW: 5 MHz / QPSK		Mode	BW: 5 MHz / QPSK	
Channel	23205	1 RB / Offset 0	Channel	23230	1 RB / Offset 0
					
Channel	23205	1 RB / Offset 24	Channel	23230	1 RB / Offset 24
					
Channel	23205	25 RB / Offset 0	Channel	23230	25 RB / Offset 0
					

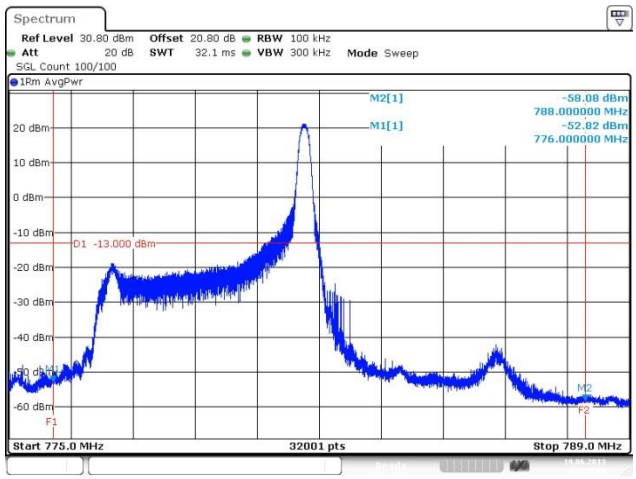
Mode	BW: 5 MHz / QPSK		Mode	BW: 5 MHz / 16QAM	
Channel	23255	1 RB / Offset 0	Channel	23205	1 RB / Offset 0



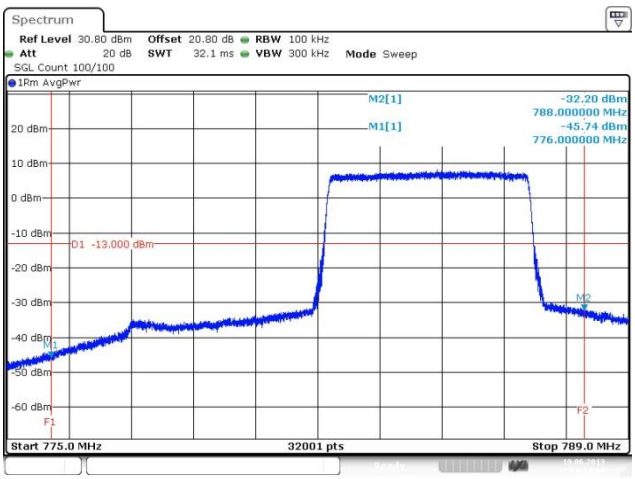


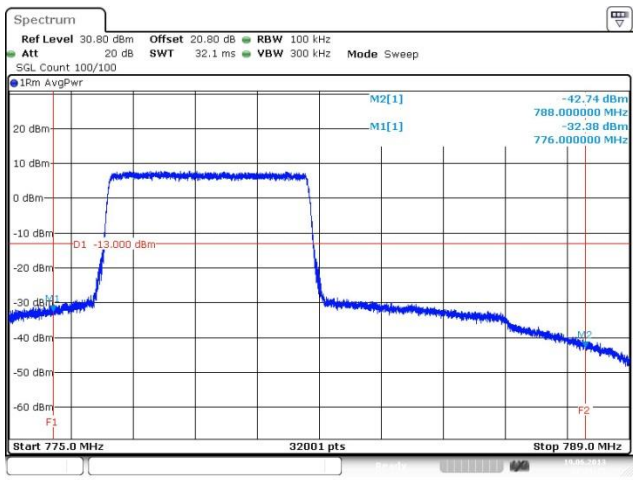
Channel	23255	1 RB / Offset 24	Channel	23205	1 RB / Offset 24



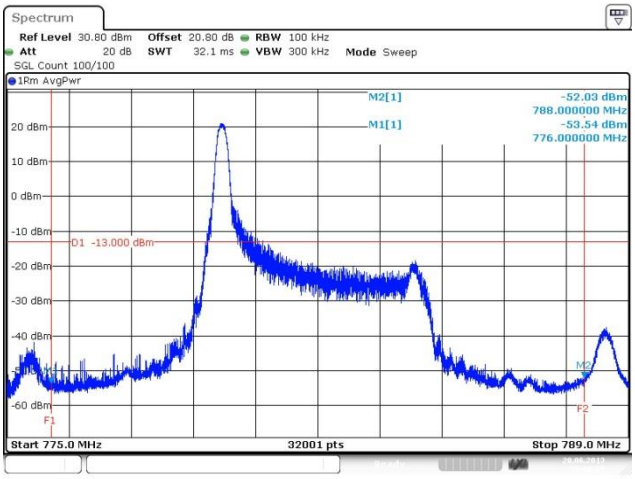


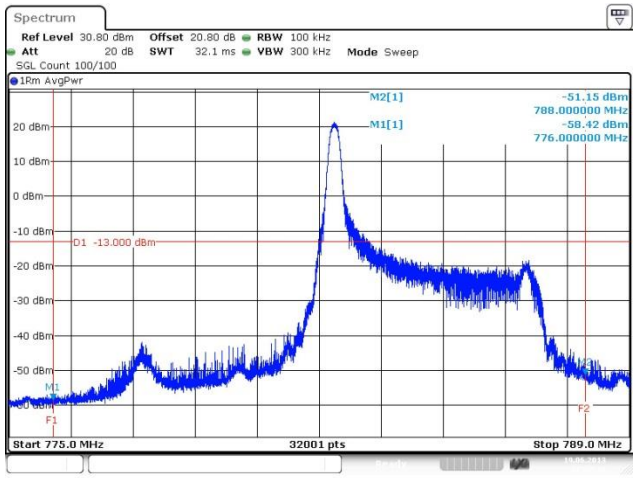
Channel	23255	25 RB / Offset 0	Channel	23205	25 RB / Offset 0



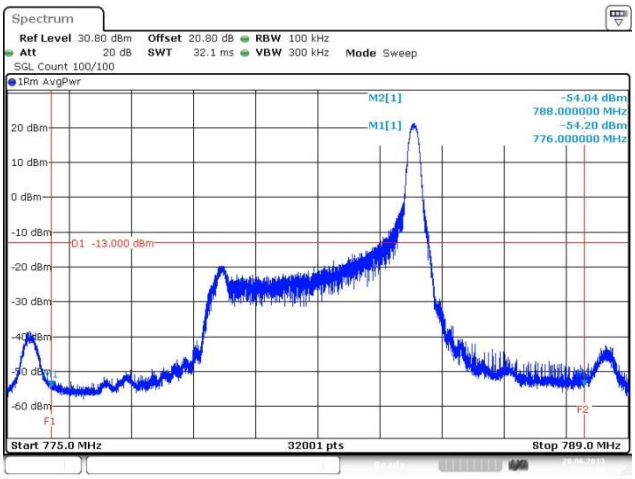


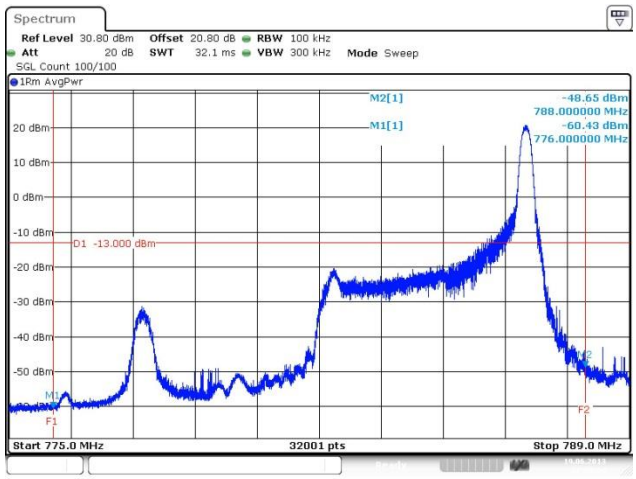
Mode	BW: 5 MHz / 16QAM		Mode	BW: 5 MHz / 16QAM	
Channel	23230	1 RB / Offset 0	Channel	23255	1 RB / Offset 0



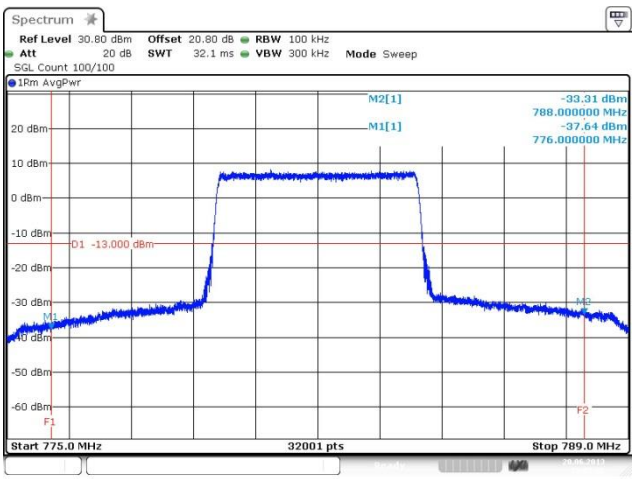


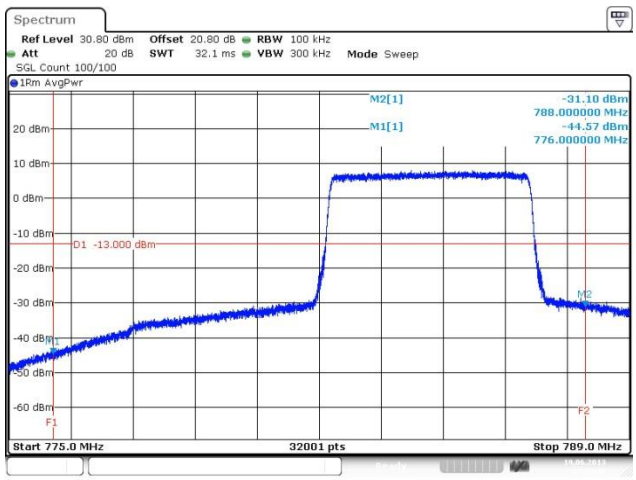
Channel	23230	1 RB / Offset 24	Channel	23255	1 RB / Offset 24



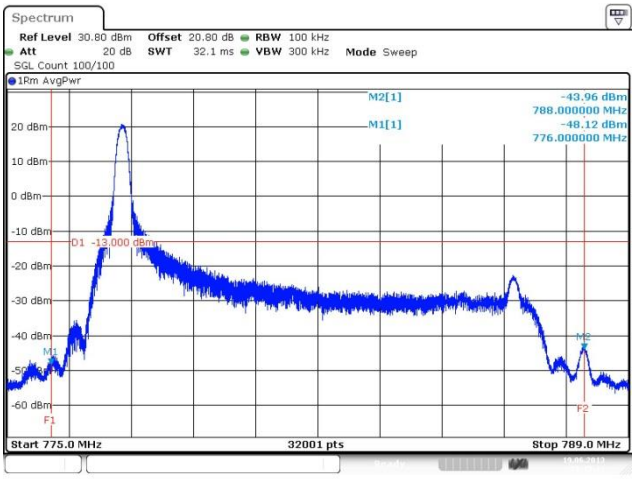


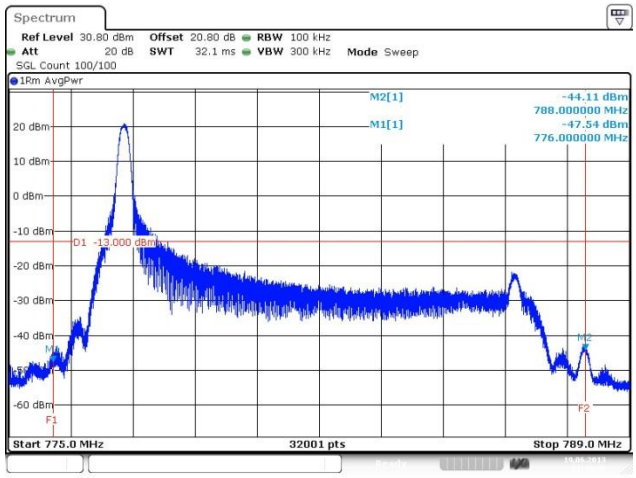
Channel	23230	25 RB / Offset 0	Channel	23255	25 RB / Offset 0



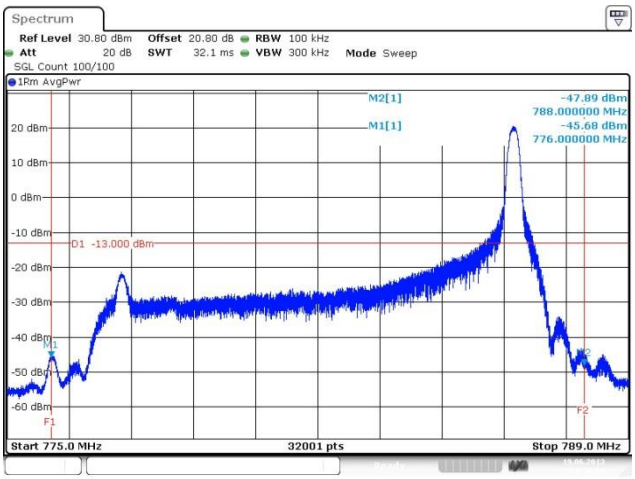


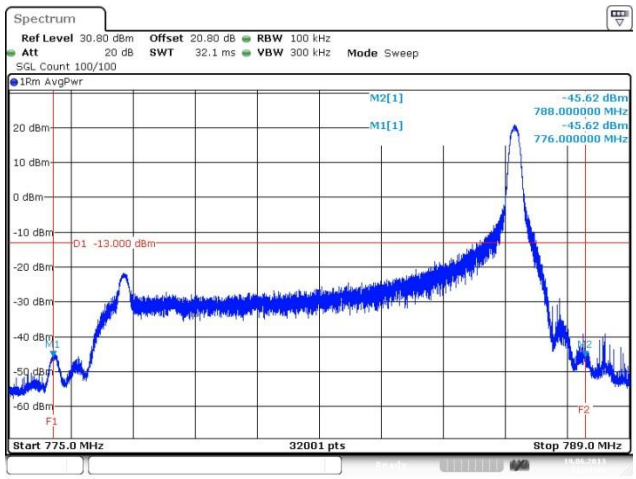
Mode	BW: 10 MHz / QPSK		Mode	BW: 10 MHz / 16QAM	
Channel	23230	1 RB / Offset 0	Channel	23230	1 RB / Offset 0



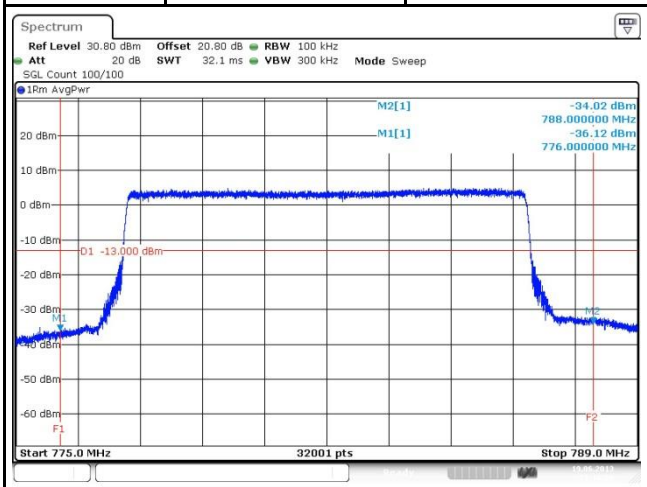


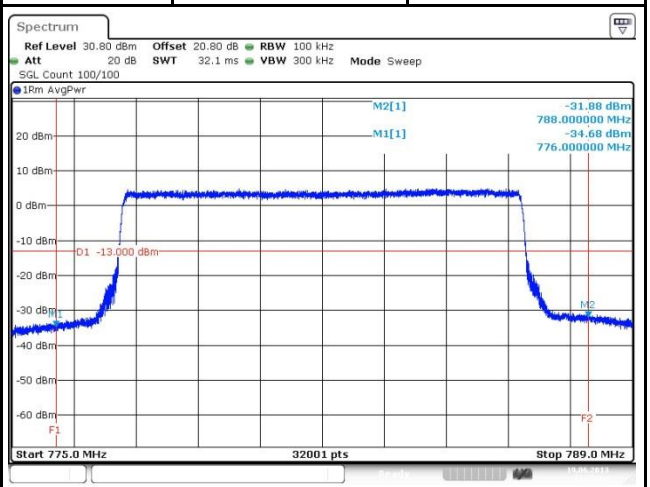
Channel	23230	1 RB / Offset 49	Channel	23230	1 RB / Offset 49



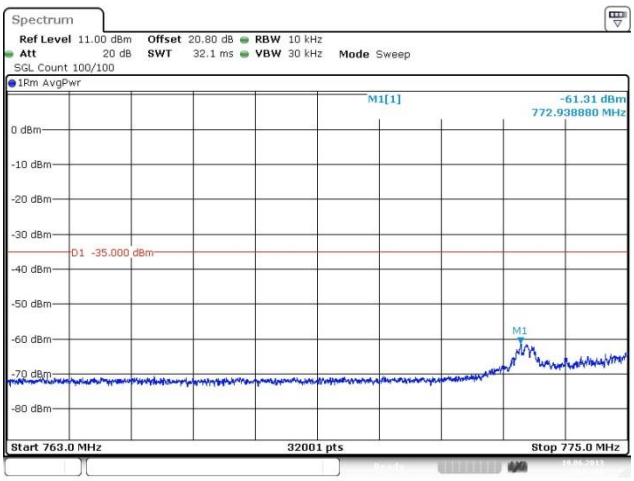
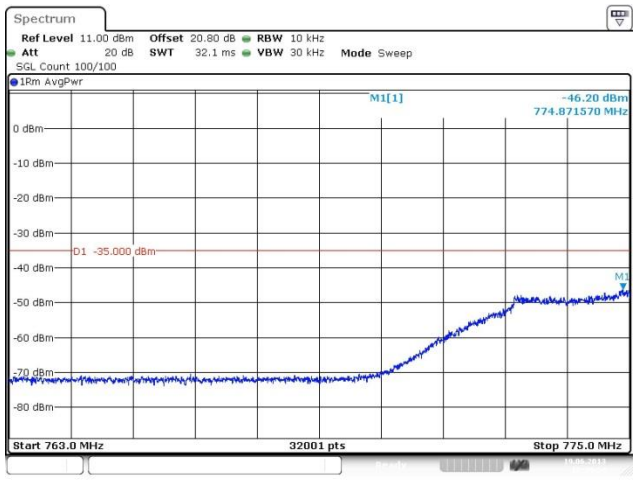
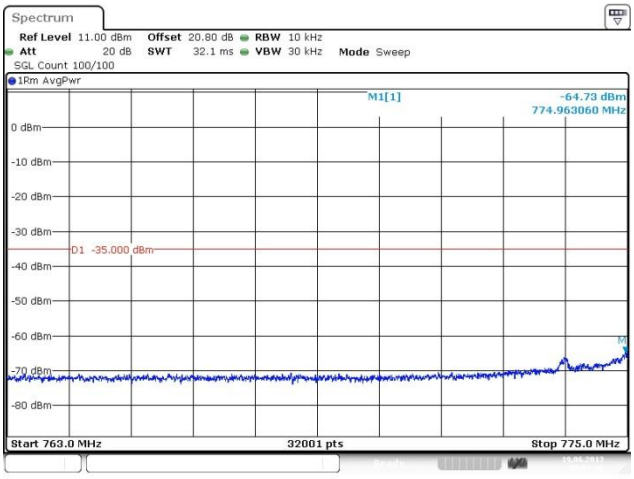
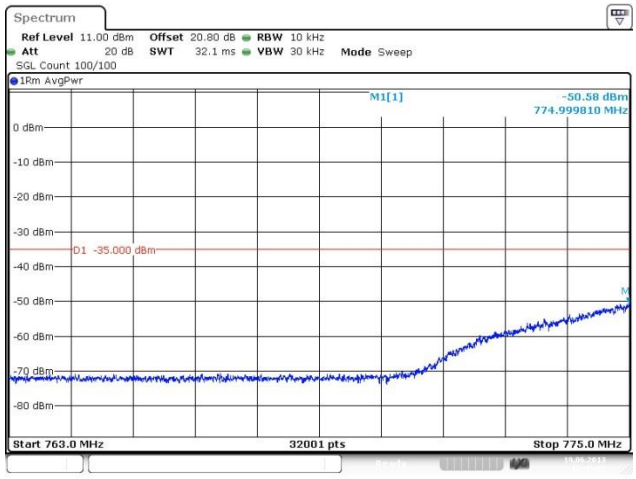
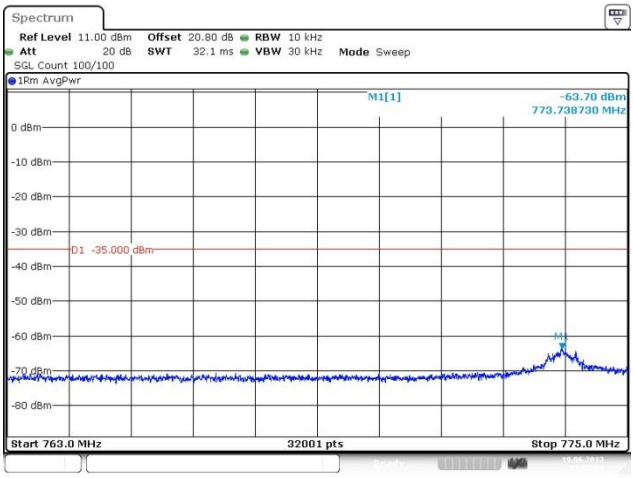
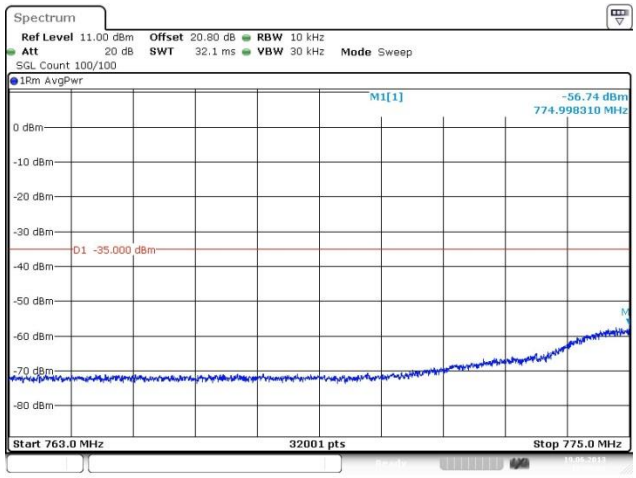


Channel	23230	50 RB / Offset 0	Channel	23230	50 RB / Offset 0

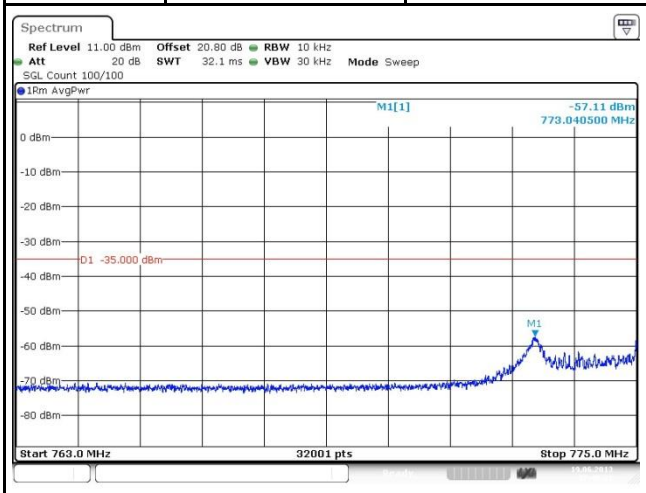




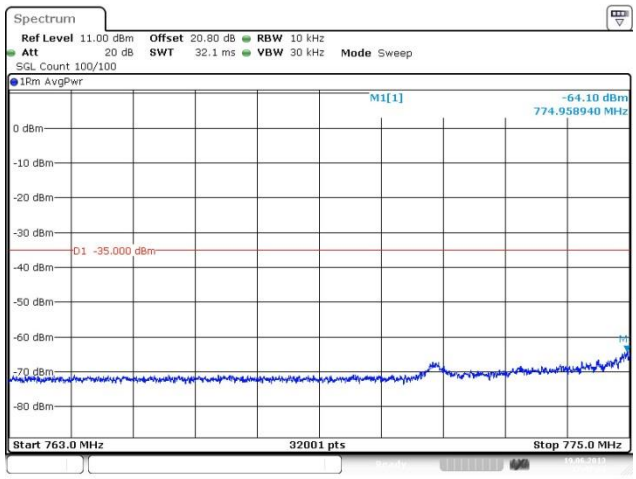
3.4.5 Test Result of 763~775 MHz

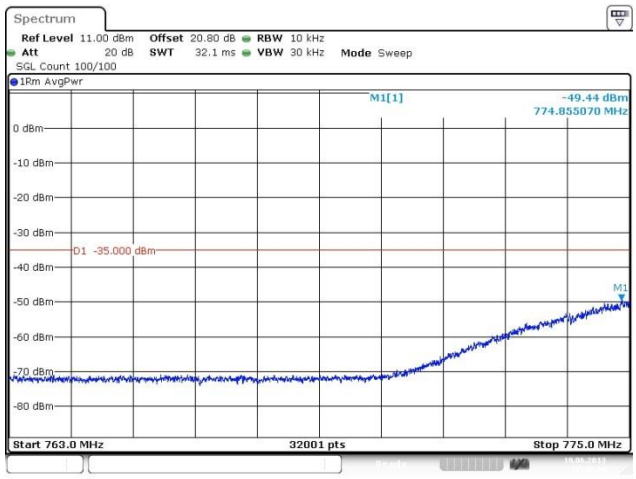
Mode	BW: 5 MHz / QPSK				
Channel	23205	1 RB / Offset 0	**Channel**	23205	25 RB / Offset 0
						
Channel	23230	1 RB / Offset 0	**Channel**	23230	25 RB / Offset 0
						
Channel	23255	1 RB / Offset 0	**Channel**	23255	25 RB / Offset 0
						

Mode	BW: 5 MHz / 16QAM				
Channel	23205	1 RB / Offset 0	Channel	23205	25 RB / Offset 0

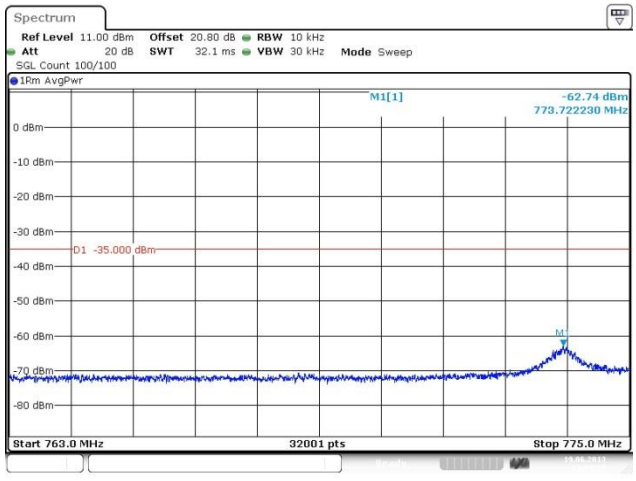


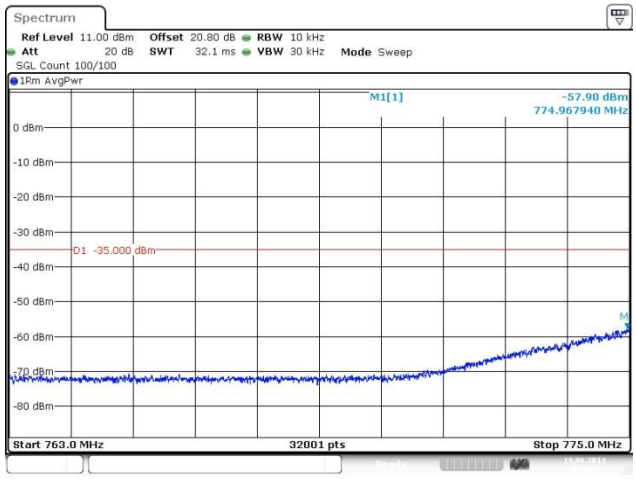
Channel	23230	1 RB / Offset 0	Channel	23230	25 RB / Offset 0



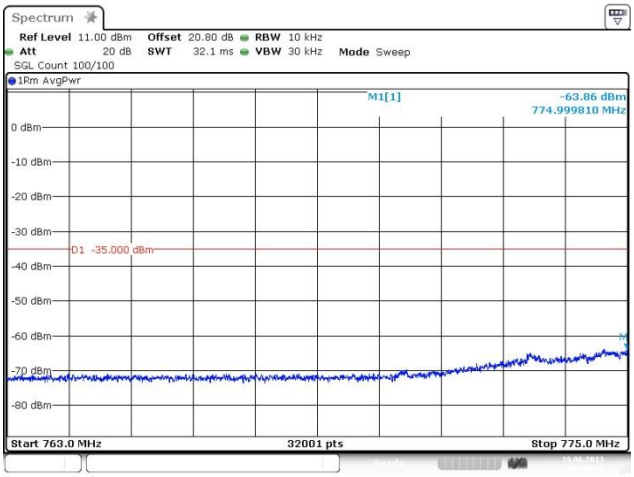


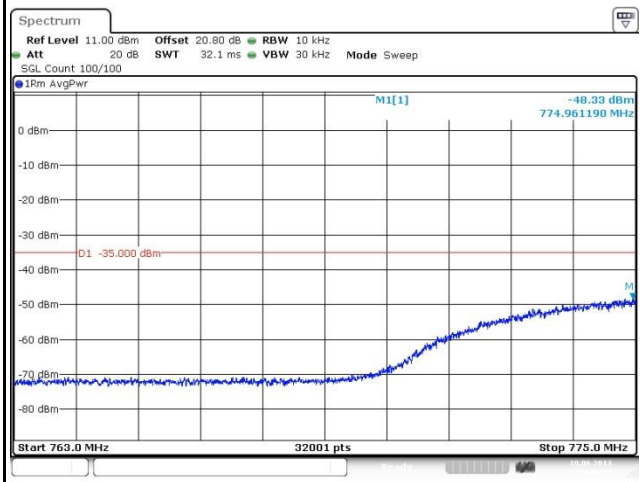
Channel	23255	1 RB / Offset 0	Channel	23255	25 RB / Offset 0



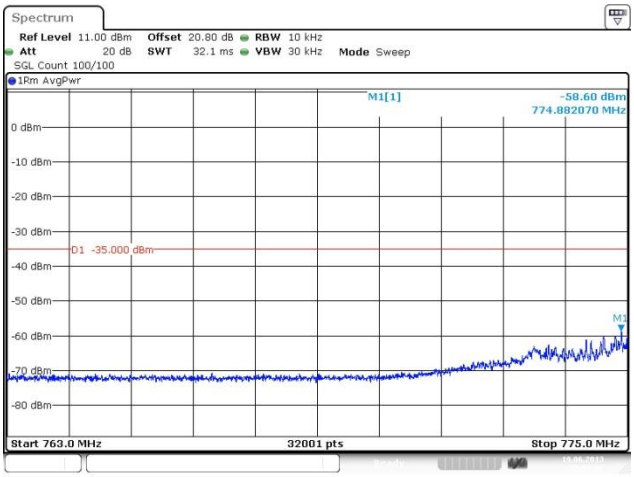


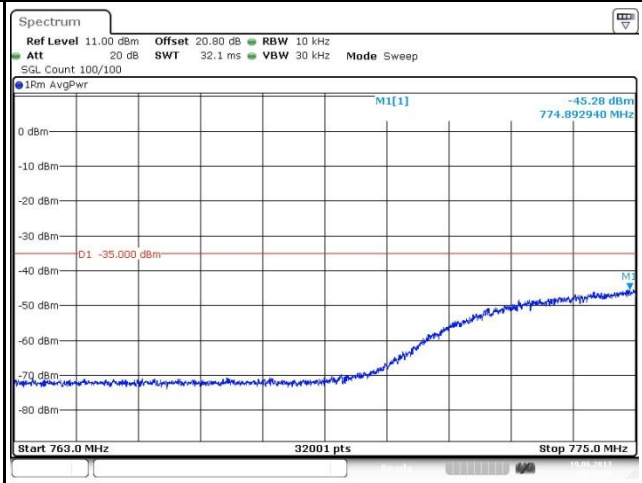
Mode	BW: 10 MHz / QPSK				
Channel	23230	1 RB / Offset 0	Channel	23230	50 RB / Offset 0



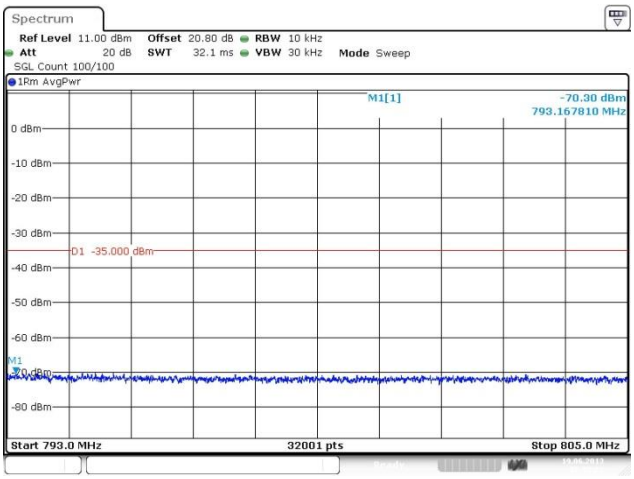
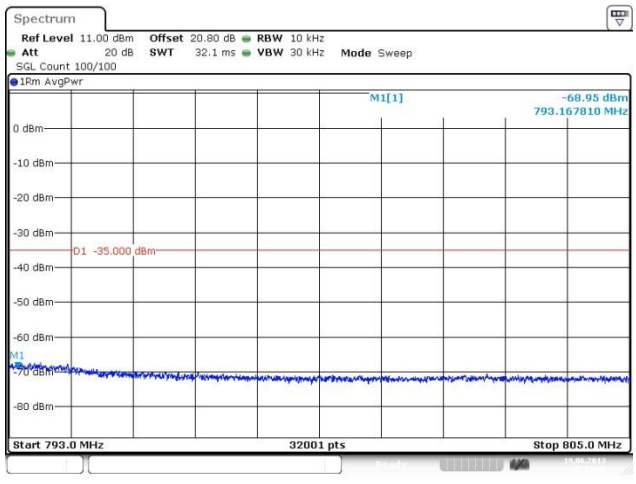
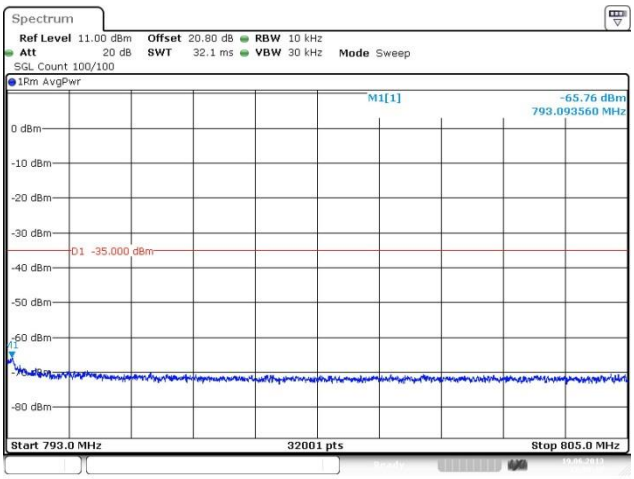
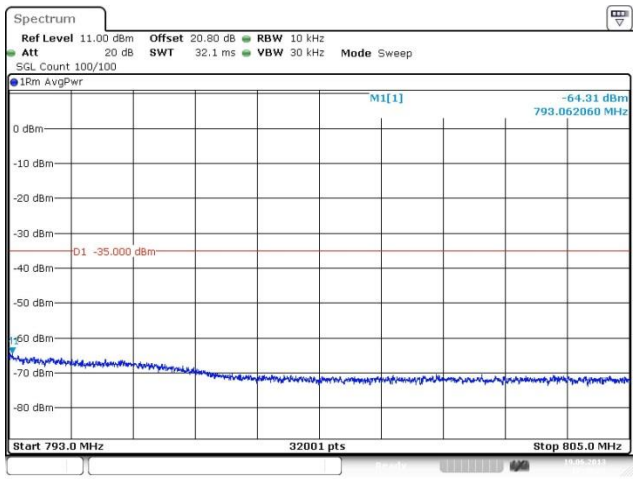
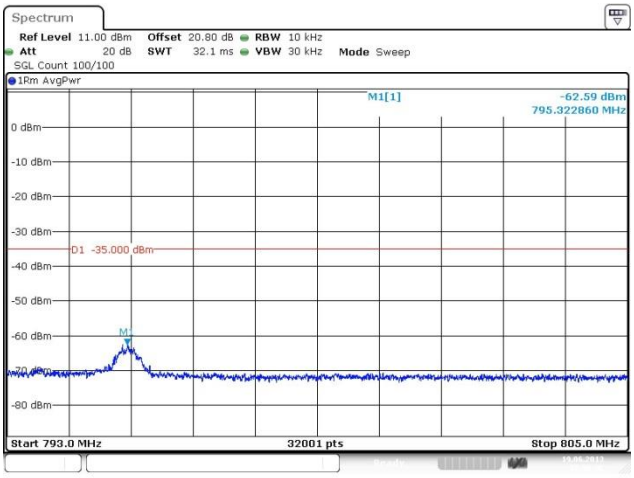
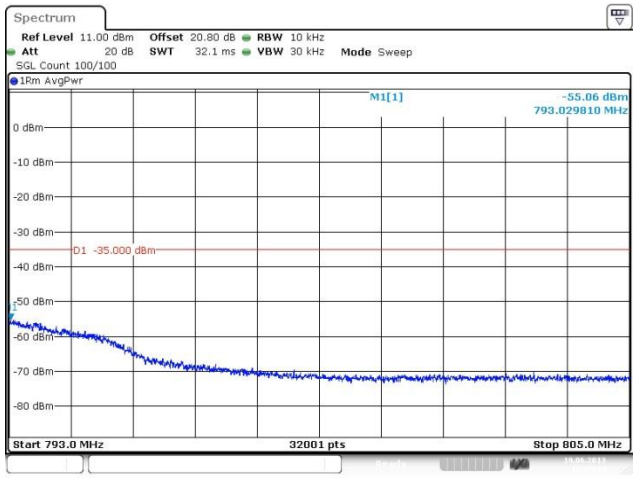


Mode	BW: 10 MHz / 16QAM				
Channel	23230	1 RB / Offset 0	Channel	23230	50 RB / Offset 0

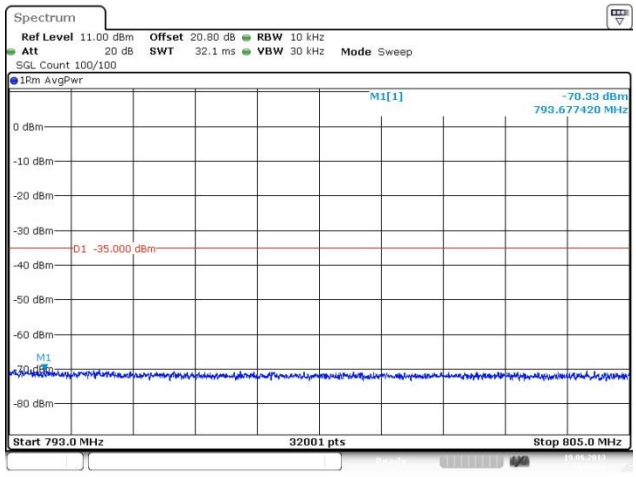


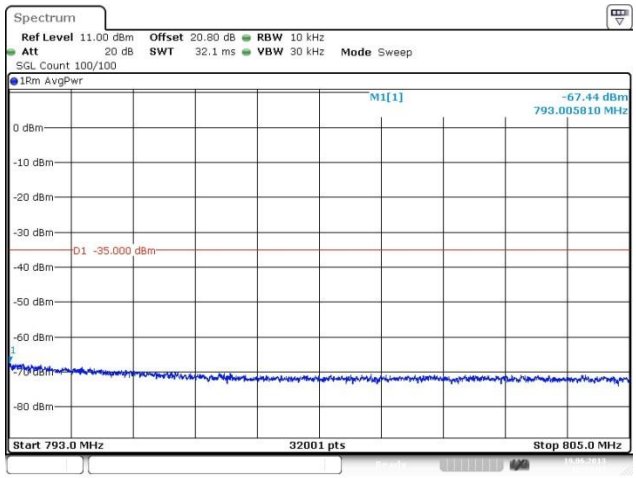


3.4.6 Test Result of 793~805 MHz

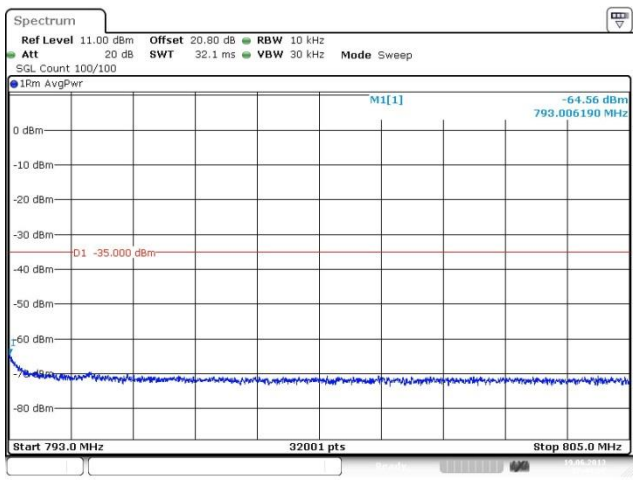
Mode	BW: 5 MHz / QPSK				
Channel	23205	1 RB / Offset 24	**Channel**	23205	25 RB / Offset 0
						
Channel	23230	1 RB / Offset 24	**Channel**	23230	25 RB / Offset 0
						
Channel	23255	1 RB / Offset 24	**Channel**	23255	25 RB / Offset 0
						

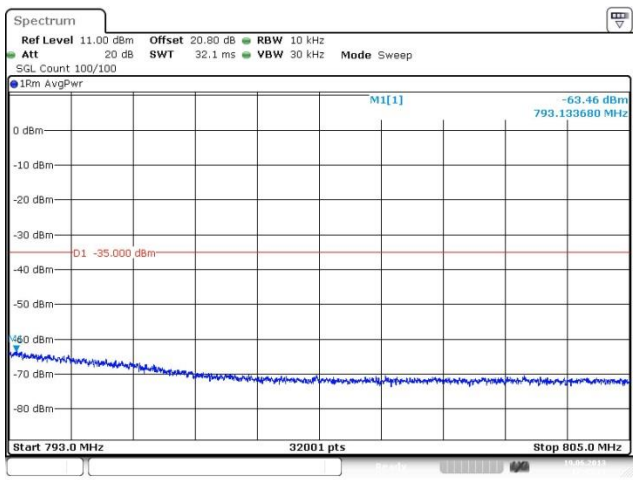
Mode	BW: 5 MHz / 16QAM				
Channel	23205	1 RB / Offset 24	**Channel**	23205	25 RB / Offset 0



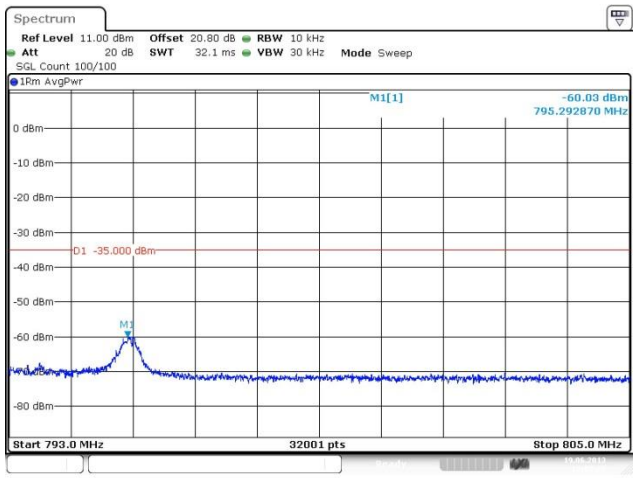


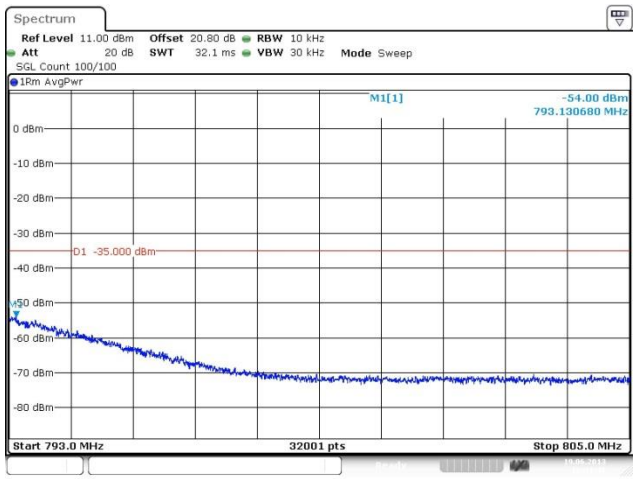
Channel	23230	1 RB / Offset 24	**Channel**	23230	25 RB / Offset 0



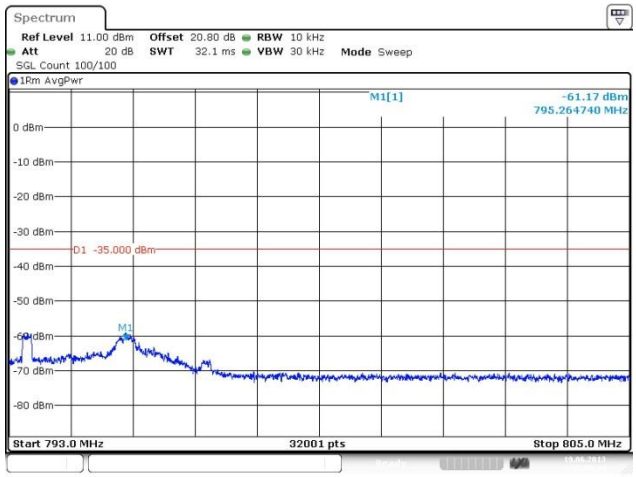


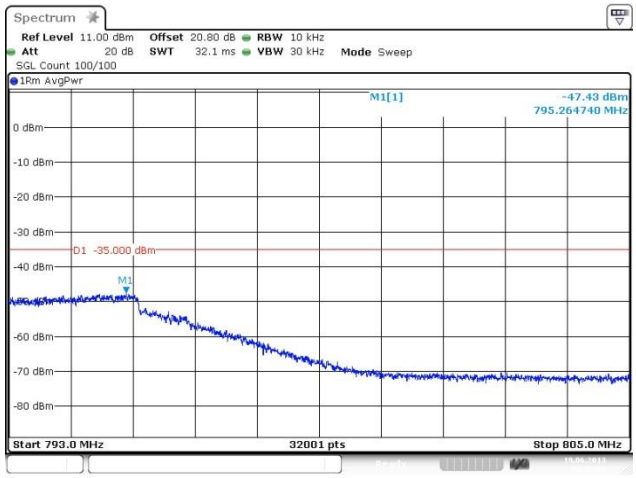
Channel	23255	1 RB / Offset 24	**Channel**	23255	25 RB / Offset 0



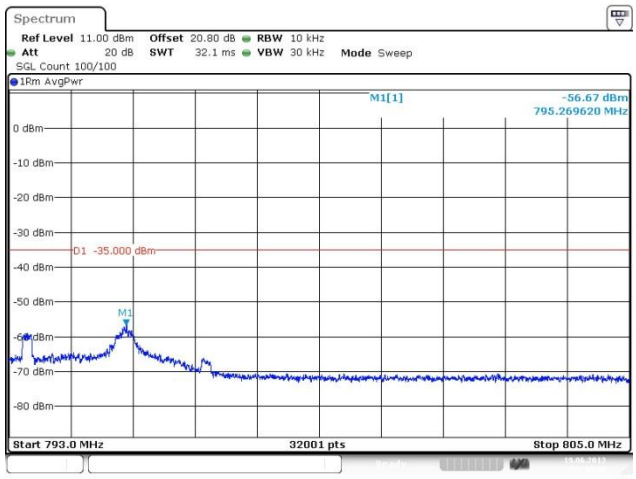


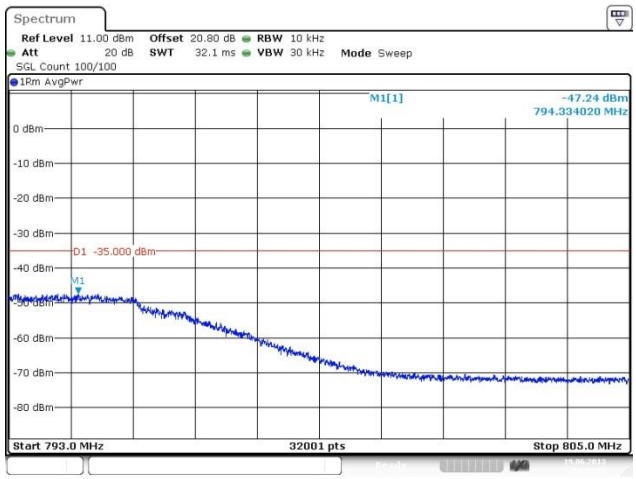
Mode	BW: 10 MHz / QPSK				
Channel	23230	1 RB / Offset 49	Channel	23230	50 RB / Offset 0





Mode	BW: 10 MHz / 16QAM				
Channel	23230	1 RB / Offset 49	Channel	23230	50 RB / Offset 0



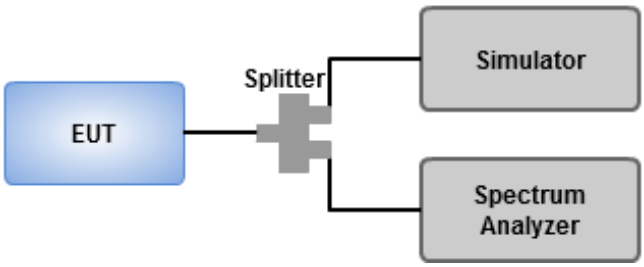


3.5 Occupied Bandwidth

3.5.1 Test Procedures

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth=300kHz for LTE BW = 5MHz
   Set resolution bandwidth (RBW) = 200 kHz, Video bandwidth=1000kHz for LTE BW = 10MHz
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Using occupied bandwidth measurement function of spectrum analyzer to measure occupied bandwidth.

3.5.2 Test Setup

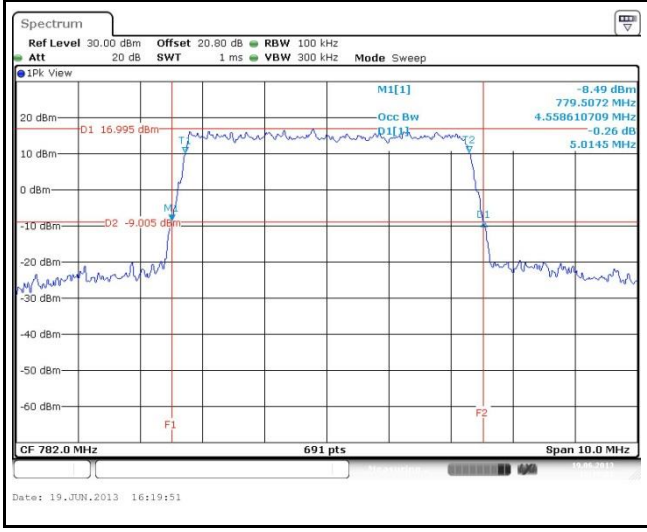


3.5.3 Test Result of Occupied Bandwidth

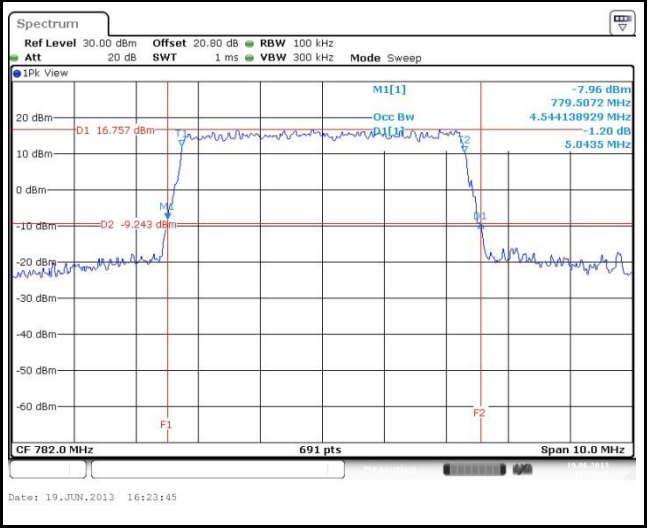
BW (MHz)	Modulation	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% OBW (MHz)
5	QPSK	23205	779.5	5.01	4.53
5	QPSK	23230	782.0	5.01	4.56
5	QPSK	23255	784.5	5.04	4.53
5	16QAM	23205	779.5	5.00	4.52
5	16QAM	23230	782.0	5.04	4.54
5	16QAM	23255	784.5	5.06	4.52

Worst plots

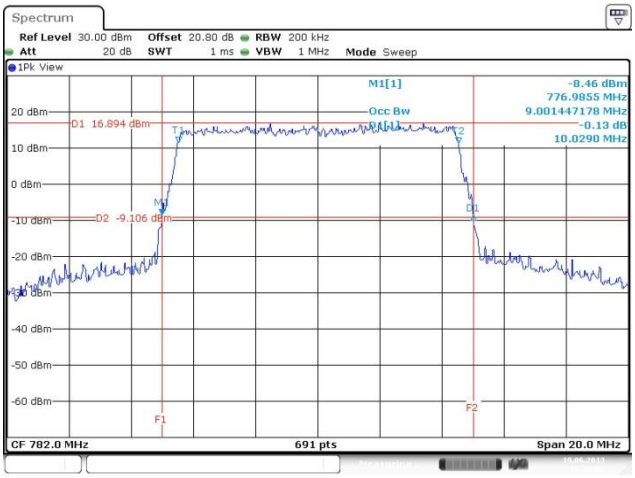
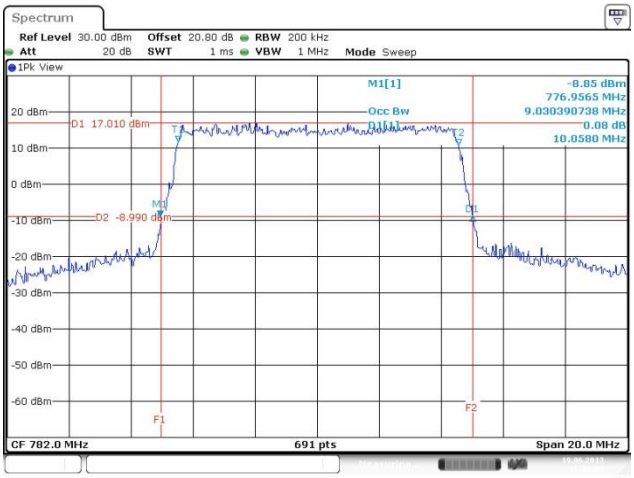
QPSK



16QAM



BW (MHz)	Modulation	Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% OBW (MHz)
10	QPSK	23230	782.0	10.03	9.00
10	16QAM	23230	782.0	10.06	9.03

Worst plots	
QPSK	16QAM
	

3.6 Frequency Stability

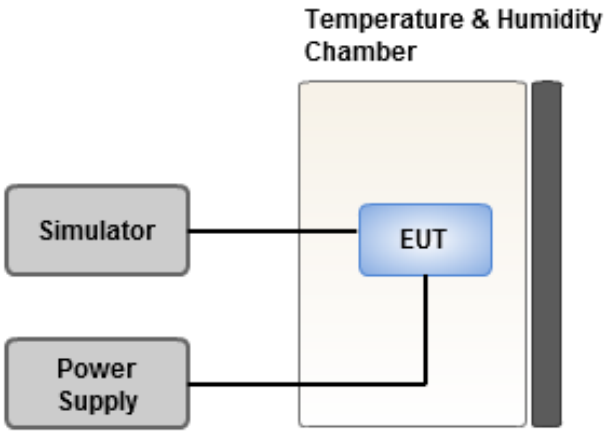
3.6.1 Limit of Frequency Stability

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

3.6.2 Test Procedures

1. EUT was placed at temperature chamber and connected to an external power supply.
2. Temperature and voltage condition shall be tested to confirm frequency stability.
3. Temperature range is from -30~70°C and voltage range is from lowest to highest working voltage.
4. Tem Linkup EUT and simulator. Confirm frequency drift value of simulator and record it.

3.6.3 Test Setup



3.6.4 Test Result of Frequency Stability

Mode	BW: 5 MHz	Channel	23230
Frequency Error vs. VOLTAGE			
Voltage (Volts)	Frequency error (Hz)	Frequency error (ppm)	Limit (ppm)
126.5	18	0.023	2.5
93.5	12	0.015	2.5
Frequency Error vs. Temperature			
Temperature (℃)	Frequency error (Hz)	Frequency error (ppm)	Limit (ppm)
70	15	0.019	2.5
60	13	0.017	2.5
50	14	0.018	2.5
40	11	0.014	2.5
30	13	0.017	2.5
20	9	0.012	2.5
10	6	0.008	2.5
0	12	0.015	2.5
-10	8	0.010	2.5
-20	6	0.008	2.5
-30	5	0.006	2.5

Mode	BW: 10 MHz	Channel	23230
Frequency Error vs. VOLTAGE			
Voltage (Volts)	Frequency error (Hz)	Frequency error (ppm)	Limit (ppm)
126.5	14	0.018	2.5
93.5	16	0.020	2.5
Frequency Error vs. Temperature			
Temperature (℃)	Frequency error (Hz)	Frequency error (ppm)	Limit (ppm)
70	17	0.022	2.5
60	15	0.019	2.5
50	16	0.020	2.5
40	18	0.023	2.5
30	14	0.018	2.5
20	13	0.017	2.5
10	11	0.014	2.5
0	13	0.017	2.5
-10	10	0.013	2.5
-20	9	0.012	2.5
-30	8	0.010	2.5

3.7 Peak to Average Ratio

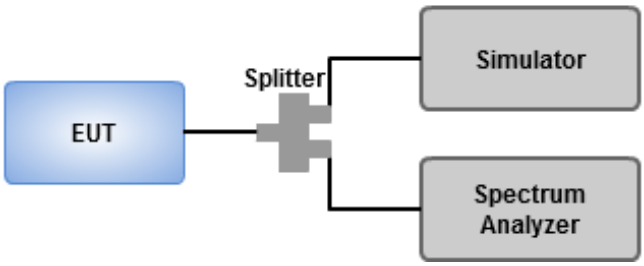
3.7.1 Limit of Peak to Average Ratio

The Peakto-average ratio (PAR) of the transmission may not exceed 13 dB.

3.7.2 Test Procedures

1. Set the number of counts to a value that stabilizes the measured CCDF curve.
2. Set the measurement interval to 1 ms.
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.7.3 Test Setup

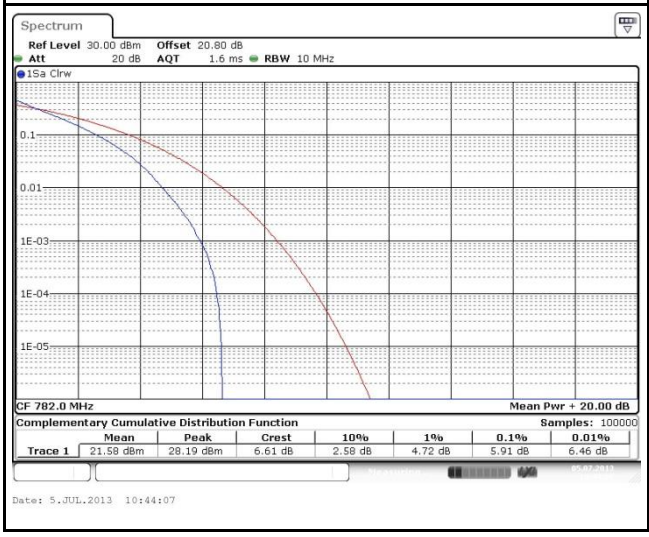


3.7.4 Test Result of Peak to Average Ratio

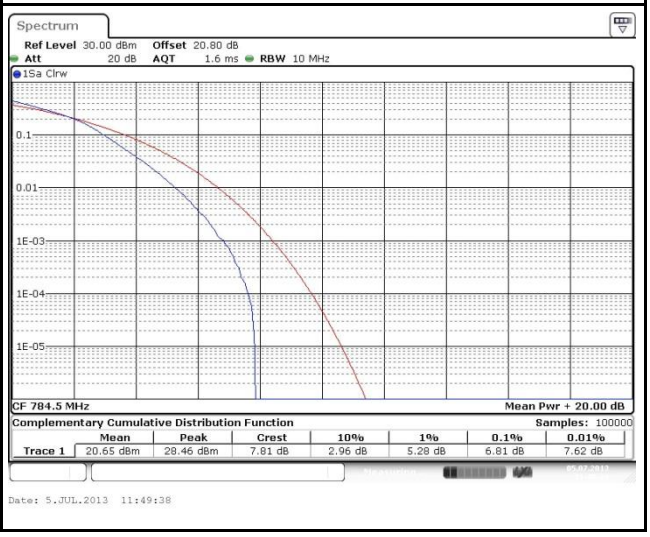
BW (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average Ratio (dB)
5	QPSK	23205	779.5	5.91
5	QPSK	23230	782.0	5.91
5	QPSK	23255	784.5	5.77
5	16QAM	23205	779.5	6.75
5	16QAM	23230	782.0	6.58
5	16QAM	23255	784.5	6.81

Worst plots

QPSK



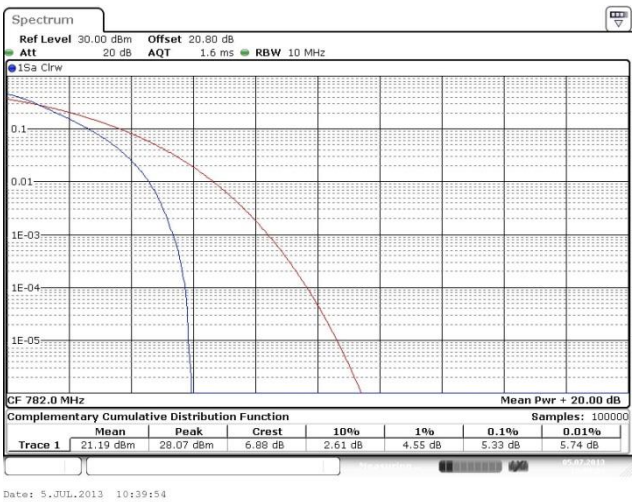
16QAM



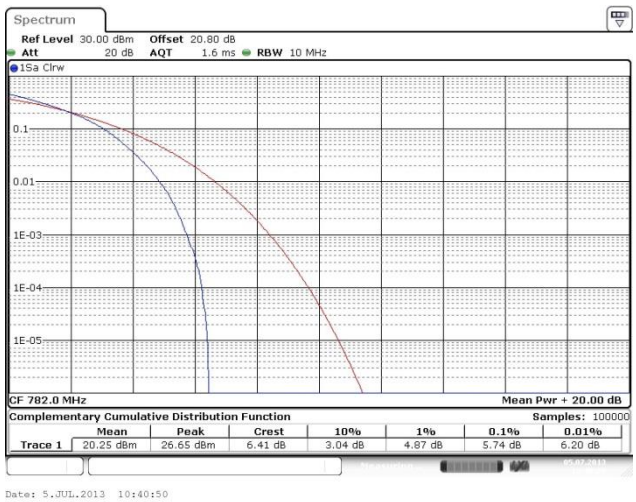
BW (MHz)	Modulation	Channel	Frequency (MHz)	Peak to Average Ratio (dB)
10	QPSK	23230	782.0	5.33
10	16QAM	23230	782.0	5.74

Worst plots

QPSK



16QAM



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