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TEST REPORT

Application No.:	SZEM1810009031CR
Applicant:	Hytera Communications Corporation Limited
Address of Applicant:	Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, 518057 China
Manufacturer:	Hytera Communications Corporation Limited
Address of Manufacturer:	Hytera Tower, Hi-Tech Industrial Park North, 9108# Beihuan Road, Nanshan District, Shenzhen, 518057 China
Factory:	Hytera Communications Corporation Limited Baolong Branch
Address of Factory:	Plant No.3, Hytera Hi-Tech Park, Baolong Industrial Area, Longgang District, Shenzhen, People's Republic of China
Equipment Under Test (EUT):	
EUT Name:	800MHz Radio Remote Unit
Model No.:	RRU3800F080
Trade mark:	Hytera
FCC ID:	YAM-RRU3800F080
Standard(s) :	47 CFR Part 2; 47 CFR Part 22 subpart H; 47 CFR Part 90 subpart S;
Date of Receipt:	2018-10-17
Date of Test:	2017-10-25 to 2018-11-13
Date of Issue:	2018-11-14
Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards specified above.



Keny Xu

EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Shenzhen Branch**

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-11-14		Original

Authorized for issue by:			
		 <hr/> Edison Li /Project Engineer	
		 <hr/> Eric Fu /Reviewer	



2 Test Summary

Test Item	FCC Rule No.	Requirements	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913, §90.635(b)	ERP≤500W for §22.913; ERP≤1000W for §90.635	PASS
Peak-Average Ratio	§2.1046, §22.913, §90.635(b)	≤13dB	PASS
Modulation Characteristics	§2.1047	Digital modulation	PASS
Occupied Bandwidth	§2.1049(h), §22.917, §90.209	OBW: No limit EBW: No limit	PASS
Band Edge Compliance	§2.1051, §22.917, §90.691	≤ -13dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block(for 869MHz-894MHz) ≤50+10*log10(P) at bandedge and for all out-of-band emissions within 37.5KHz of block edge(for 859MHz-869MHz) ≤43+10*log10(P) at bandedge and for all out-of-band emissions greater than 37.5KHz of block edge(for 859MHz-869MHz)	PASS
Spurious emissions at antenna terminals	§2.1051, §22.917, §90.691	≤ -13dBm	PASS
Field strength of spurious radiation	§2.1051, §22.917, §90.691	≤ -13dBm	PASS
Frequency stability	§2.1055, §22.355, §90.213	≤ ±1.5ppm	PASS

N/A: Not Applicable.

The EUT includes two TX/RX ports and it can be configured to transmit in MIMO mode, and MIMO mode was used for measurements as the worst configuration.

The maximum output power was tested on both TX/RX output connector Ant0 and Ant1, all other TX measurements were performed on the combined TX/RX output connector Ant0 of the EUT as the representative ports.

The complete testing was performed with the EUT transmitting at maximum RF output power Unless otherwise stated.



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4 General Information

4.1 Details of E.U.T.

Power supply:	-48 VDC
Sample Type:	Fixed Production
Operation Frequency Range:	TX: 859MHz-894MHz RX: 814MHz-849MHz
Modulation Type:	QPSK, 16QAM, 64QAM
Output Power:	2*40W per port
Antenna Type:	External Antenna
Max Antenna Gain:	17dBi
Extreme temp. Tolerance:	-40 °C to +55 °C

4.2 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	1015Pa	
Temperature:	TN	25 °C
Voltage:	VL	-43.2 V
	VN	-48 V
	VH	-52.8 V

NOTE: VL= lower extreme test voltage

VN= nominal voltage

VH= upper extreme test voltage

TN= normal temperature

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
DC power	ZHAOXIN	RXN-305D	REF. No.SEA2700
Coaxial Attenuator	Provided by client	SJ-SND-300-40-3	--
Coaxial Termination	Provided by client	TF300-6-B	--
BBU	Provided by client	BBU	00014016
Laptop	Lenovo	T430u	REF. No.SEA1800
Network Cable	SGS	N/A	150cm (unshielded)
Optical Fiber	Provided by client	--	180cm (unshielded)
DC Cable	Provided by client	--	150cm (unshielded)
RF Cable	Provided by client	--	3*120cm (unshielded)



4.4 Test Frequency

Test Mode	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
Band 26 (859-869MHz)	1.4	859.7	864.0	868.3
	3	860.5	864.0	867.5
	5	861.5	864.0	866.5
	10	/	864.0	/
	15	/	/	866.5
Test Mode	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
Band 26 (869-894MHz)	1.4	869.7	881.5	893.3
	3	870.5	881.5	892.5
	5	871.5	881.5	891.5
	10	874.0	881.5	889.0
	15	876.5	881.5	886.5

4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25×10^{-8}
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz) 4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (Below 1GHz) 4.8dB (Above 1GHz)
9	Temperature test	1 °C
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%



4.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC

Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None



5 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
DC Power Supply	ZhaoXin	PS-3005D	SEM011-05	2018-09-25	2019-09-24
Spectrum Analyzer (20Hz-43GHz)	Rohde & Schwarz	FSU43	SEM004-08	2018-04-13	2019-04-12
Signal Analyzer (10Hz-40GHz)	Rohde & Schwarz	FSV40	SEM008-04	2018-04-02	2019-04-01
Signal Generator (9kHz-40GHz)	KEYSIGHT	N5173B	SEM006-05	2018-09-27	2019-09-26
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.6	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2018-07-12	2019-07-11
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018-09-27	2019-09-26

Radiated Spurious Emissions					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
EXA Signal Analyzer (10Hz-26.5GHz)	Agilent Technologies Inc	N9010A	SEM004-09	2018-04-13	2019-04-12
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
Horn Antenna (800MHz-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2018-09-25	2019-09-24
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2018-09-27	2019-09-26
Band filter	N/A	N/A	N/A	N/A	N/A
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2018-07-12	2019-07-11



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RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2018-09-25	2019-09-24
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2018-04-02	2019-04-01
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2018-07-12	2019-07-11

General used equipment					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
Humidity/Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2018-09-27	2019-09-26
Humidity/Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2018-09-27	2019-09-26
Humidity/Temperature Indicator	Mingle	N/A	SEM002-08	2018-09-27	2019-09-26
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2018-04-08	2019-04-07

6 Radio Spectrum Matter Test Results

6.1 Effective (Isotropic) Radiated Power Output Data

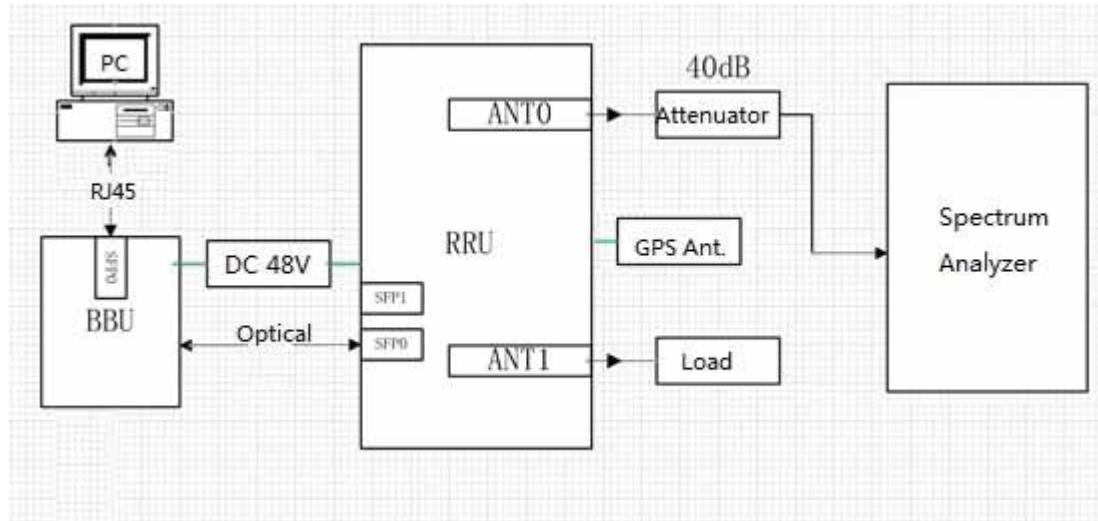
Test Requirement: §2.1046, §22.913, §90.635(d)
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: ERP≤500W for §22.913;
ERP≤1000W for §90.635(d);

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar
Test mode: b: Tx mode, Keep the EUT in transmitting mode.

6.1.2 Test Setup Diagram



6.1.3 Measurement Data



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Test data for 859MHz-869MHz:

Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	6	0	45.78	45.78	48.79	75.69
	MCH	6	0	45.66	45.66	48.67	73.63
	HCH	6	0	46.02	46.02	49.03	79.99
16QAM	LCH	6	0	45.62	45.62	48.63	72.95
	MCH	6	0	45.58	45.58	48.59	72.28
	HCH	6	0	45.79	45.79	48.80	75.86
64QAM	LCH	6	0	45.60	45.6	48.61	72.62
	MCH	6	0	45.55	45.55	48.56	71.78
	HCH	6	0	45.72	45.72	48.73	74.65

859MHz-869MHz, Nominal Bandwidth: 3MHz							
Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	15	0	45.75	45.75	48.76	75.17
	MCH	15	0	45.62	45.62	48.63	72.95
	HCH	15	0	45.81	45.81	48.82	76.21
16QAM	LCH	15	0	45.66	45.66	48.67	73.63
	MCH	15	0	45.54	45.54	48.55	71.62
	HCH	15	0	45.77	45.77	48.78	75.51
64QAM	LCH	15	0	45.63	45.63	48.64	73.12
	MCH	15	0	45.51	45.51	48.52	71.13
	HCH	15	0	45.72	45.72	48.73	74.65

859MHz-869MHz, Nominal Bandwidth: 5MHz							
Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	25	0	45.77	45.77	48.78	75.51
	MCH	25	0	45.63	45.63	48.64	73.12
	HCH	25	0	45.85	45.85	48.86	76.92
16QAM	LCH	25	0	45.56	45.56	48.57	71.95
	MCH	25	0	45.61	45.61	48.62	72.78
	HCH	25	0	45.82	45.82	48.83	76.39
64QAM	LCH	25	0	45.53	45.53	48.54	71.45
	MCH	25	0	45.60	45.60	48.61	72.62
	HCH	25	0	45.80	45.80	48.81	76.04



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859MHz-869MHz, Nominal Bandwidth: 10MHz							
Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	50	0	/	/	/	/
	MCH	50	0	45.60	45.60	48.61	72.62
	HCH	50	0	/	/	/	/
16QAM	LCH	50	0	/	/	/	/
	MCH	50	0	45.55	45.55	48.56	71.78
	HCH	50	0	/	/	/	/
64QAM	LCH	50	0	/	/	/	/
	MCH	50	0	45.52	45.52	48.53	71.29
	HCH	50	0	/	/	/	/

859MHz-869MHz, Nominal Bandwidth: 15MHz							
Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	75	0	/	/	/	/
	MCH	75	0	/	/	/	/
	HCH	75	0	45.75	45.75	48.76	75.17
16QAM	LCH	75	0	/	/	/	/
	MCH	75	0	/	/	/	/
	HCH	75	0	45.70	45.70	48.71	74.31
64QAM	LCH	75	0	/	/	/	/
	MCH	75	0	/	/	/	/
	HCH	75	0	45.59	45.59	48.60	72.45

Remark:

This device is tested without antenna. ERP/EIRP compliance is addressed at the time of licensing, as required by the responsible FCC/IC Bureau(s). Licensee's are required to take into account maximum antenna gain used in combination with above power setting to prevent the radiated output power to exceed the limits.



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Test data for 869MHz-894MHz:

Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	6	0	45.88	45.88	48.89	77.45
	MCH	6	0	45.65	45.65	48.66	73.46
	HCH	6	0	45.99	45.99	49.00	79.44
16QAM	LCH	6	0	45.77	45.77	48.78	75.51
	MCH	6	0	45.61	45.61	48.62	72.78
	HCH	6	0	45.74	45.74	48.75	74.99
64QAM	LCH	6	0	45.75	45.75	48.76	75.17
	MCH	6	0	45.60	45.60	48.61	72.62
	HCH	6	0	45.71	45.71	48.72	74.48

859MHz-869MHz, Nominal Bandwidth: 3MHz							
Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	15	0	45.89	45.89	48.90	77.63
	MCH	15	0	45.60	45.60	48.61	72.62
	HCH	15	0	45.85	45.85	48.86	76.92
16QAM	LCH	15	0	45.77	45.77	48.78	75.51
	MCH	15	0	45.52	45.52	48.53	71.29
	HCH	15	0	45.69	45.69	48.70	74.14
64QAM	LCH	15	0	45.75	45.75	48.76	75.17
	MCH	15	0	45.52	45.52	48.53	71.29
	HCH	15	0	45.63	45.63	48.64	73.12

859MHz-869MHz, Nominal Bandwidth: 5MHz							
Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	25	0	45.92	45.92	48.93	78.17
	MCH	25	0	45.63	45.63	48.64	73.12
	HCH	25	0	45.98	45.98	48.99	79.26
16QAM	LCH	25	0	45.88	45.88	48.89	77.45
	MCH	25	0	45.56	45.56	48.57	71.95
	HCH	25	0	45.83	45.83	48.84	76.56
64QAM	LCH	25	0	45.85	45.85	48.86	76.92
	MCH	25	0	45.53	45.53	48.54	71.45
	HCH	25	0	45.80	45.80	48.81	76.04



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859MHz-869MHz, Nominal Bandwidth: 10MHz							
Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	50	0	45.88	45.88	48.89	77.45
	MCH	50	0	45.61	45.61	48.62	72.78
	HCH	50	0	45.84	45.84	48.85	76.74
16QAM	LCH	50	0	45.75	45.75	48.76	75.17
	MCH	50	0	45.57	45.57	48.58	72.12
	HCH	50	0	45.79	45.79	48.80	75.86
64QAM	LCH	50	0	45.71	45.71	48.72	74.48
	MCH	50	0	45.54	45.54	48.55	71.62
	HCH	50	0	45.75	45.75	48.76	75.17

859MHz-869MHz, Nominal Bandwidth: 15MHz							
Modulation	Channel	RB Configuration		RF Output Power(dBm)		Total Conducted	
		Size	Offset	Ant1	Ant2	Total(dBm)	Total(W)
QPSK	LCH	75	0	45.60	45.60	48.61	72.62
	MCH	75	0	45.82	45.82	48.83	76.39
	HCH	75	0	45.79	45.79	48.80	75.86
16QAM	LCH	75	0	45.55	45.55	48.56	71.78
	MCH	75	0	45.77	45.77	48.78	75.51
	HCH	75	0	45.71	45.71	48.72	74.48
64QAM	LCH	75	0	45.54	45.54	48.55	71.62
	MCH	75	0	45.73	45.73	48.74	74.82
	HCH	75	0	45.70	45.70	48.71	74.31

Remark:

This device is tested without antenna. ERP/EIRP compliance is addressed at the time of licensing, as required by the responsible FCC/IC Bureau(s). Licensee's are required to take into account maximum antenna gain used in combination with above power setting to prevent the radiated output power to exceed the limits.

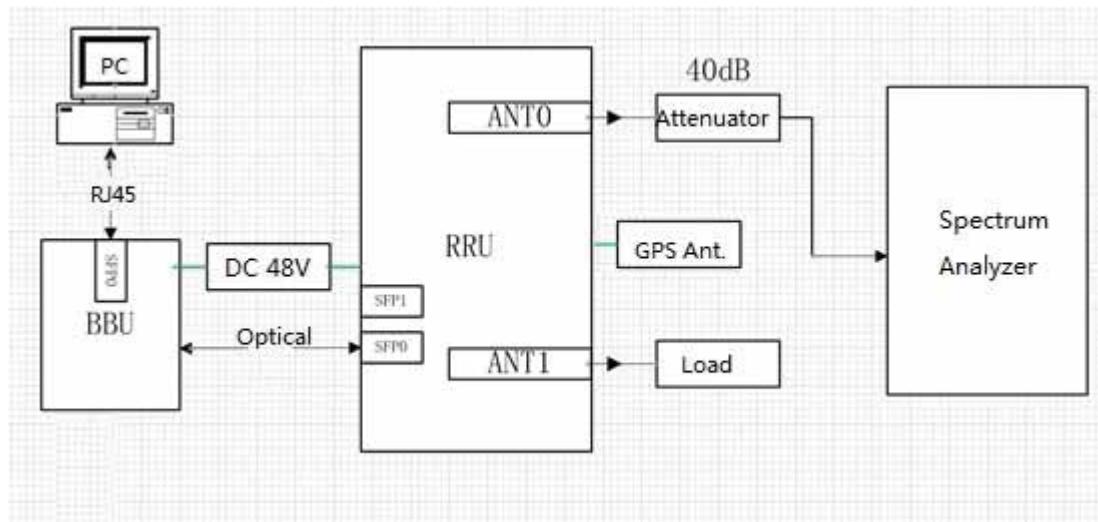
6.2 Peak-Average Ratio

Test Requirement: §2.1046, §22.913, §90.635(d)
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: ≤13dB

6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar
Test mode: b: Tx mode, Keep the EUT in transmitting mode.

6.2.2 Test Setup Diagram



6.2.3 Measurement Data



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Test data for 859MHz-869MHz:

Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	6	0	7.44	13	Pass
	MCH	6	0	7.44	13	Pass
	HCH	6	0	7.44	13	Pass
16QAM	LCH	6	0	7.40	13	Pass
	MCH	6	0	7.40	13	Pass
	HCH	6	0	7.44	13	Pass
64QAM	LCH	6	0	8.48	13	Pass
	MCH	6	0	8.52	13	Pass
	HCH	6	0	8.52	13	Pass

859MHz-869MHz, Nominal Bandwidth: 3MHz						
Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	15	0	8.36	13	Pass
	MCH	15	0	8.36	13	Pass
	HCH	15	0	8.28	13	Pass
16QAM	LCH	15	0	8.40	13	Pass
	MCH	15	0	8.52	13	Pass
	HCH	15	0	8.48	13	Pass
64QAM	LCH	15	0	8.52	13	Pass
	MCH	15	0	8.36	13	Pass
	HCH	15	0	8.40	13	Pass

859MHz-869MHz, Nominal Bandwidth: 5MHz						
Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	25	0	8.48	13	Pass
	MCH	25	0	8.44	13	Pass
	HCH	25	0	8.44	13	Pass
16QAM	LCH	25	0	8.36	13	Pass
	MCH	25	0	8.36	13	Pass
	HCH	25	0	8.36	13	Pass
64QAM	LCH	25	0	8.28	13	Pass
	MCH	25	0	8.40	13	Pass
	HCH	25	0	8.36	13	Pass



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859MHz-869MHz, Nominal Bandwidth: 10MHz						
Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	50	0	/	/	/
	MCH	50	0	8.36	13	Pass
	HCH	50	0	/	/	/
16QAM	LCH	50	0	/	/	/
	MCH	50	0	8.48	13	Pass
	HCH	50	0	/	/	/
64QAM	LCH	50	0	/	/	/
	MCH	50	0	8.48	13	Pass
	HCH	50	0	/	/	/

859MHz-869MHz, Nominal Bandwidth: 15MHz						
Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	75	0	/	/	/
	MCH	75	0	/	/	/
	HCH	75	0	8.44	13	Pass
16QAM	LCH	75	0	/	/	/
	MCH	75	0	/	/	/
	HCH	75	0	8.36	13	Pass
64QAM	LCH	75	0	/	/	/
	MCH	75	0	/	/	/
	HCH	75	0	8.48	13	Pass



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Test data for 869MHz-894MHz:

869MHz-894MHz, Nominal Bandwidth: 1.4MHz						
Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	6	0	7.40	13	Pass
	MCH	6	0	7.36	13	Pass
	HCH	6	0	7.36	13	Pass
16QAM	LCH	6	0	7.36	13	Pass
	MCH	6	0	7.44	13	Pass
	HCH	6	0	7.44	13	Pass
64QAM	LCH	6	0	8.36	13	Pass
	MCH	6	0	8.36	13	Pass
	HCH	6	0	8.48	13	Pass

869MHz-894MHz, Nominal Bandwidth: 3MHz						
Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	15	0	8.48	13	Pass
	MCH	15	0	8.32	13	Pass
	HCH	15	0	8.48	13	Pass
16QAM	LCH	15	0	8.40	13	Pass
	MCH	15	0	8.52	13	Pass
	HCH	15	0	8.48	13	Pass
64QAM	LCH	15	0	8.52	13	Pass
	MCH	15	0	8.36	13	Pass
	HCH	15	0	8.40	13	Pass

869MHz-894MHz, Nominal Bandwidth: 5MHz						
Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	25	0	8.20	13	Pass
	MCH	25	0	7.48	13	Pass
	HCH	25	0	7.52	13	Pass
16QAM	LCH	25	0	8.52	13	Pass
	MCH	25	0	8.44	13	Pass
	HCH	25	0	8.36	13	Pass
64QAM	LCH	25	0	8.40	13	Pass
	MCH	25	0	8.44	13	Pass
	HCH	25	0	8.40	13	Pass



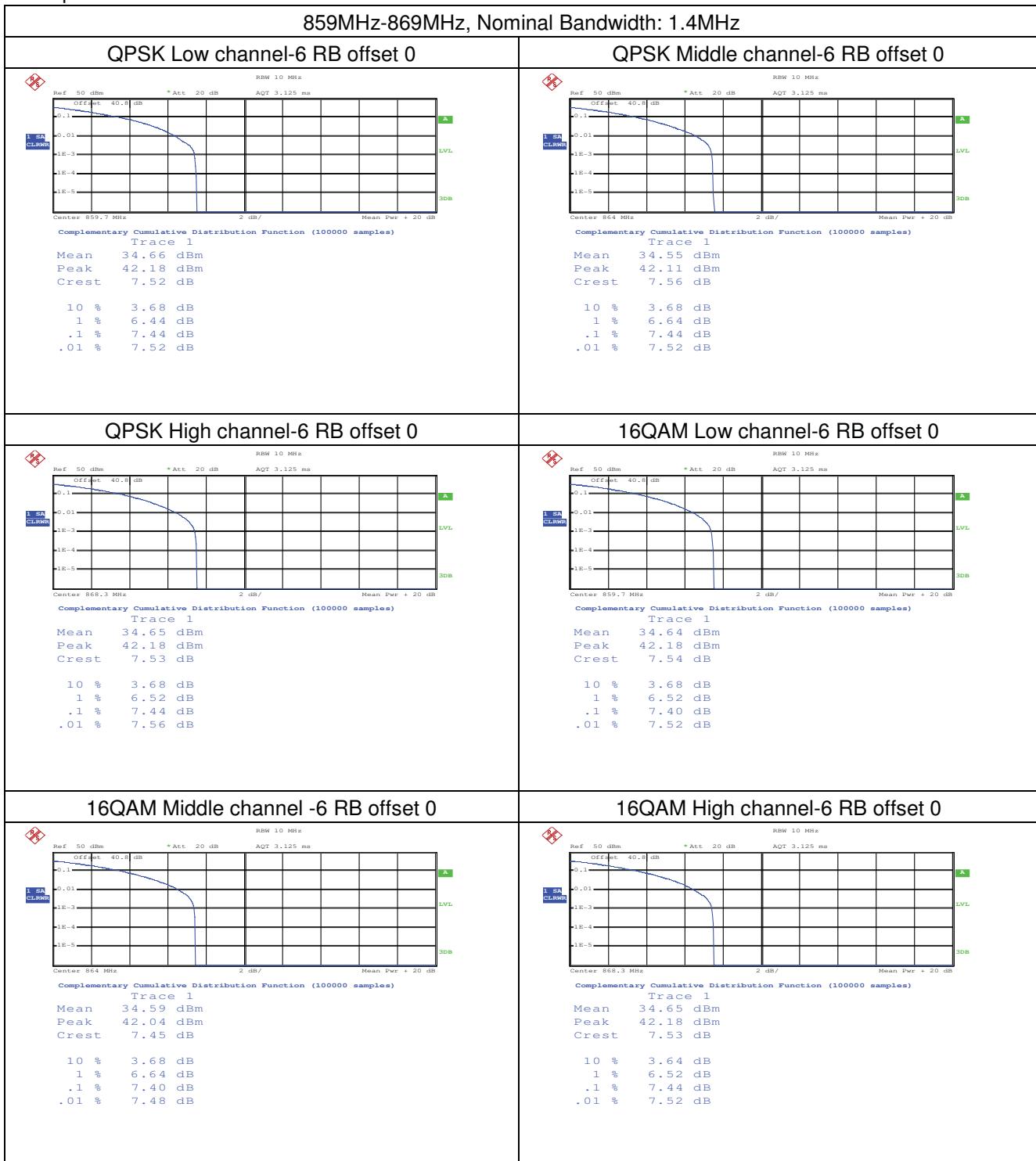
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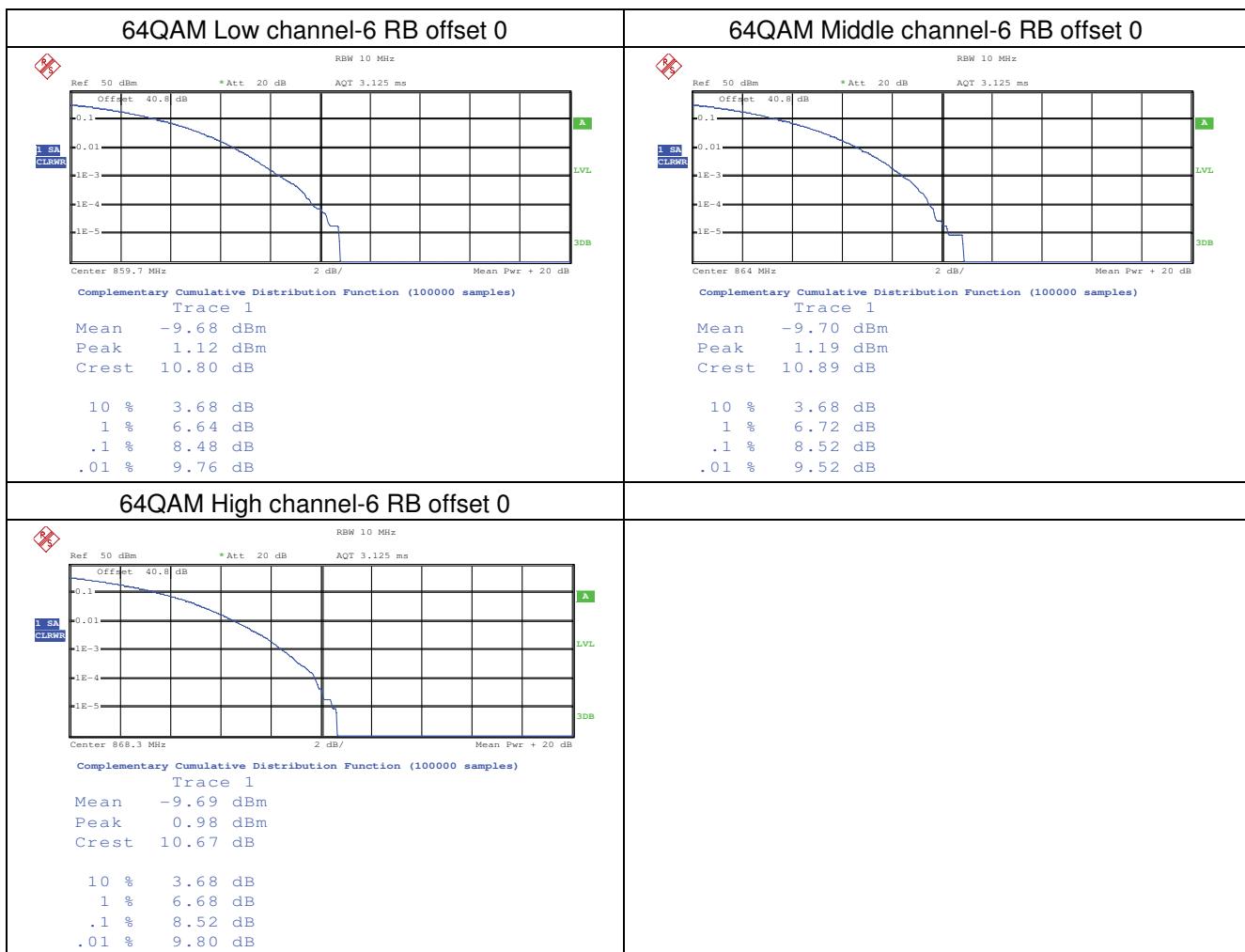
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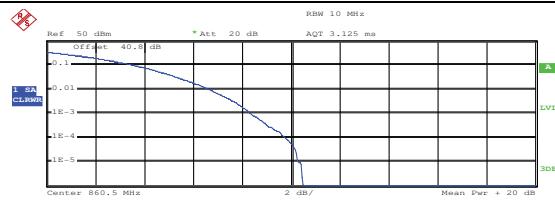
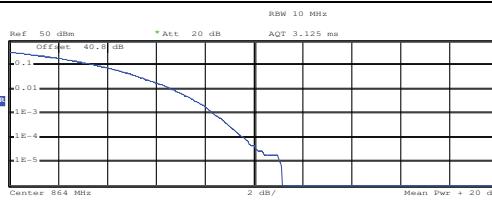
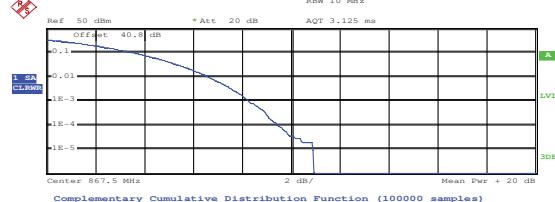
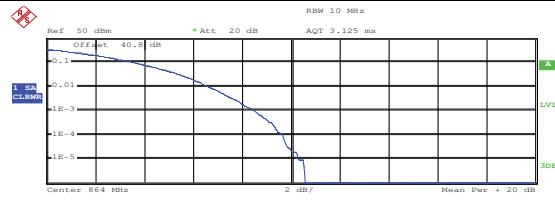
869MHz-894MHz, Nominal Bandwidth: 10MHz						
Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	50	0	7.72	13	Pass
	MCH	50	0	7.72	13	Pass
	HCH	50	0	8.08	13	Pass
16QAM	LCH	50	0	8.48	13	Pass
	MCH	50	0	8.48	13	Pass
	HCH	50	0	8.40	13	Pass
64QAM	LCH	50	0	8.32	13	Pass
	MCH	50	0	8.36	13	Pass
	HCH	50	0	8.44	13	Pass

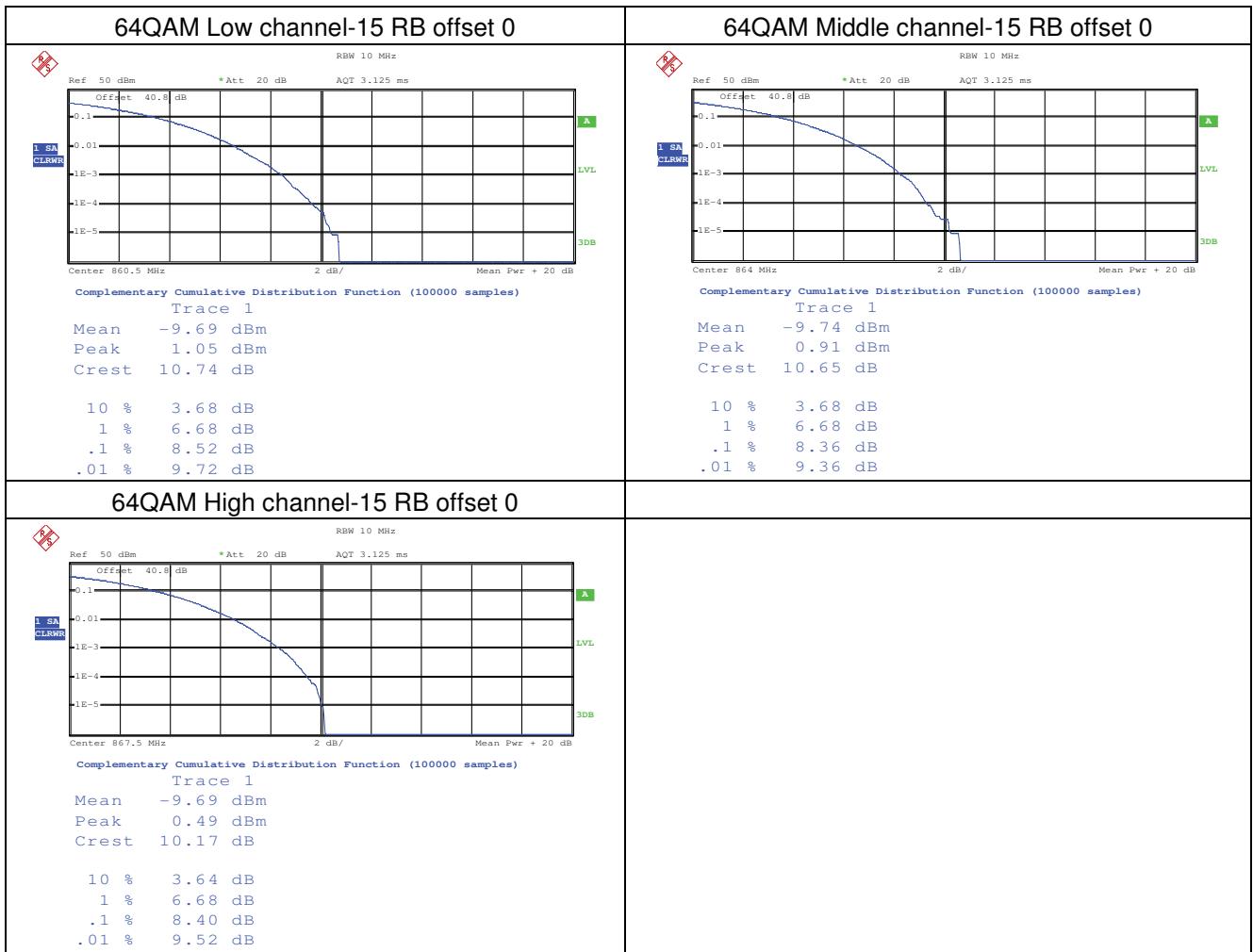
869MHz-894MHz, Nominal Bandwidth: 15MHz						
Modulation	Channel	RB Configuration		Test result (dB)	Limit (dB)	Verdict
		Size	Offset			
QPSK	LCH	75	0	8.52	13	Pass
	MCH	75	0	8.52	13	Pass
	HCH	75	0	8.52	13	Pass
16QAM	LCH	75	0	8.36	13	Pass
	MCH	75	0	8.40	13	Pass
	HCH	75	0	8.44	13	Pass
64QAM	LCH	75	0	8.40	13	Pass
	MCH	75	0	8.60	13	Pass
	HCH	75	0	8.44	13	Pass

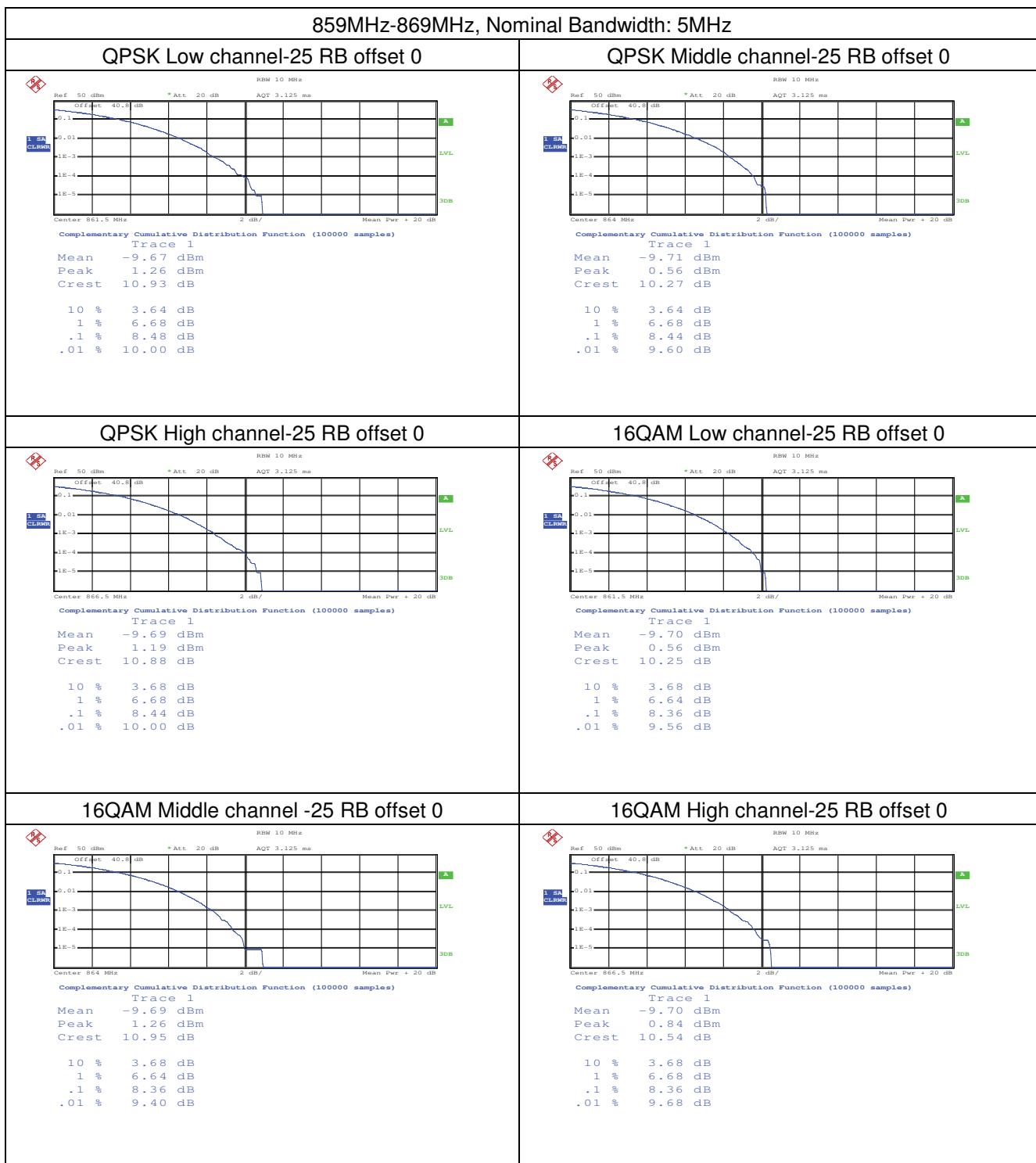
Test plot for 859MHz-869MHz:

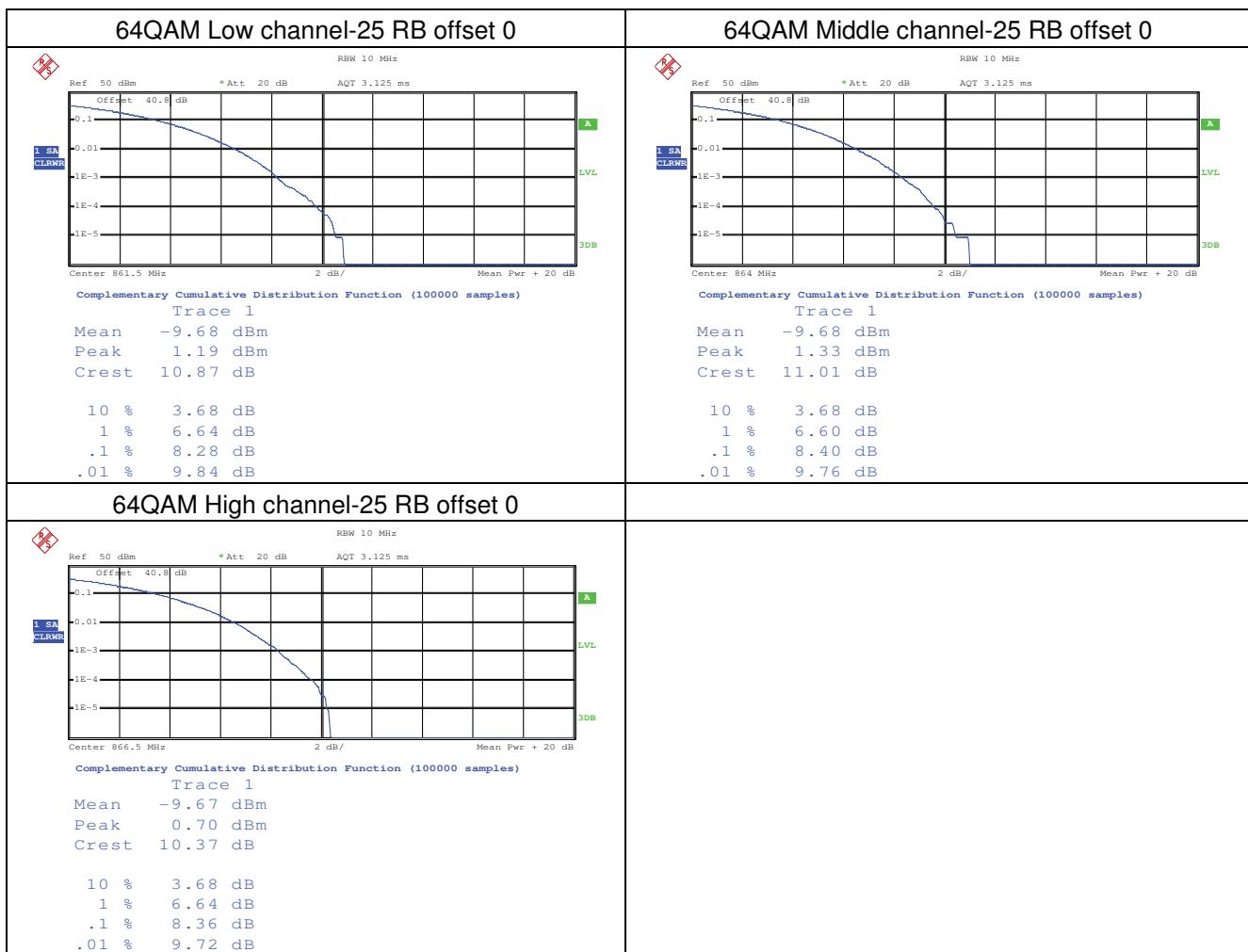


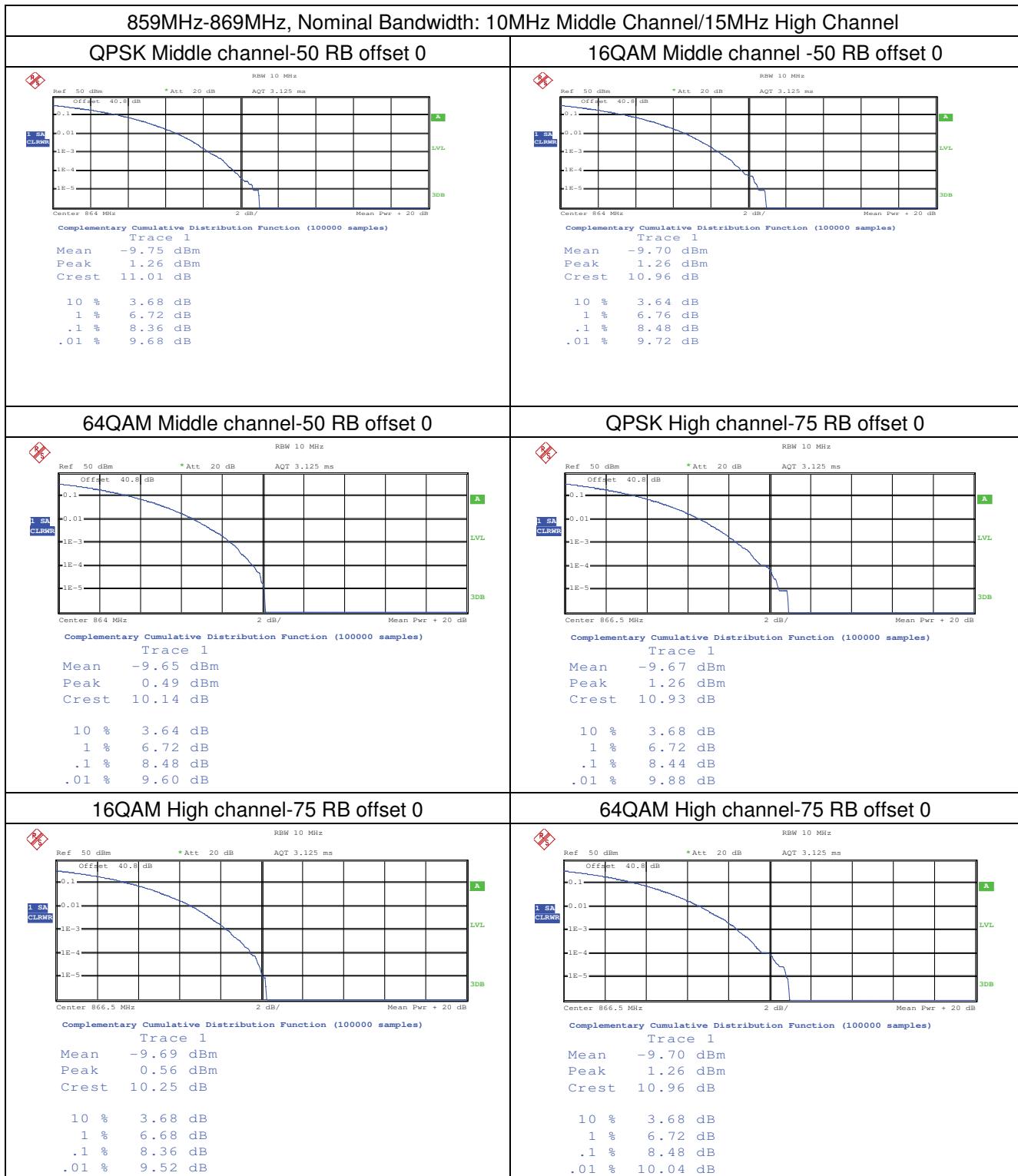


859MHz-869MHz, Nominal Bandwidth: 3MHz	
QPSK Low channel-15 RB offset 0	QPSK Middle channel-15 RB offset 0
 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean -9.64 dBm Peak 0.84 dBm Crest 10.48 dB 10 % 3.68 dB 1 % 6.68 dB .1 % 8.36 dB .01 % 9.80 dB	 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean -9.71 dBm Peak 1.47 dBm Crest 11.18 dB 10 % 3.68 dB 1 % 6.72 dB .1 % 8.36 dB .01 % 9.60 dB
QPSK High channel-15 RB offset 0	16QAM Low channel-15 RB offset 0
 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean -9.67 dBm Peak 1.26 dBm Crest 10.93 dB 10 % 3.68 dB 1 % 6.68 dB .1 % 8.28 dB .01 % 9.48 dB	 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean -9.67 dBm Peak 1.47 dBm Crest 11.14 dB 10 % 3.68 dB 1 % 6.64 dB .1 % 8.40 dB .01 % 9.80 dB
16QAM Middle channel -15 RB offset 0	16QAM High channel-15 RB offset 0
 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean -9.67 dBm Peak 0.91 dBm Crest 10.57 dB 10 % 3.68 dB 1 % 6.68 dB .1 % 8.52 dB .01 % 9.68 dB	 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean -9.68 dBm Peak 1.26 dBm Crest 10.94 dB 10 % 3.64 dB 1 % 6.72 dB .1 % 8.48 dB .01 % 9.56 dB

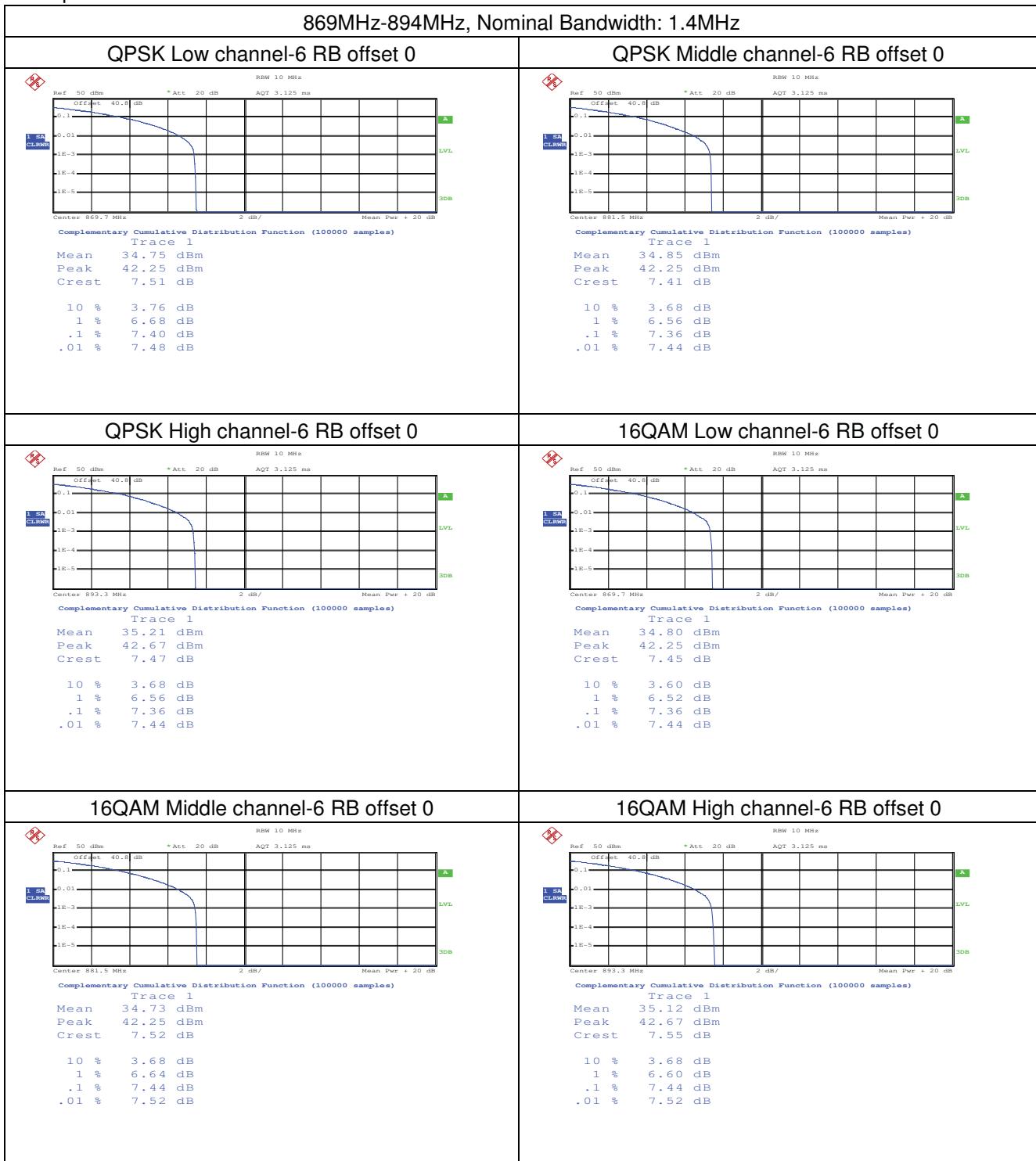


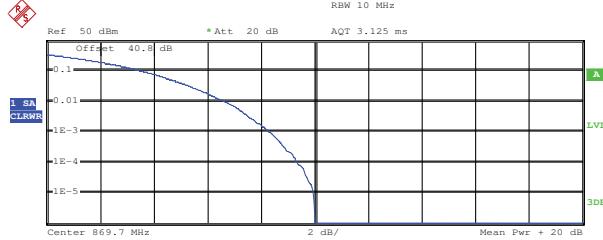
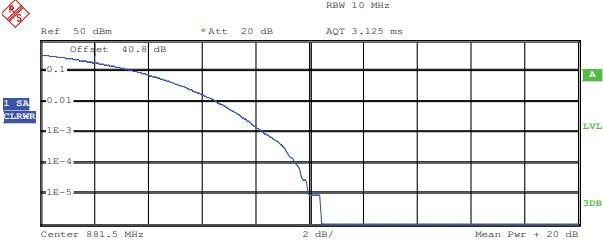
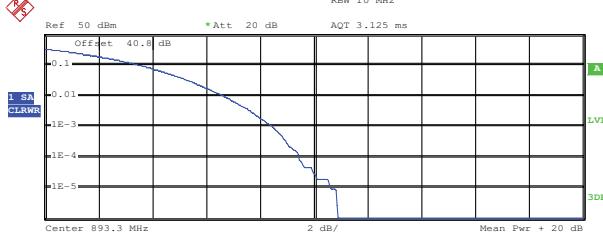


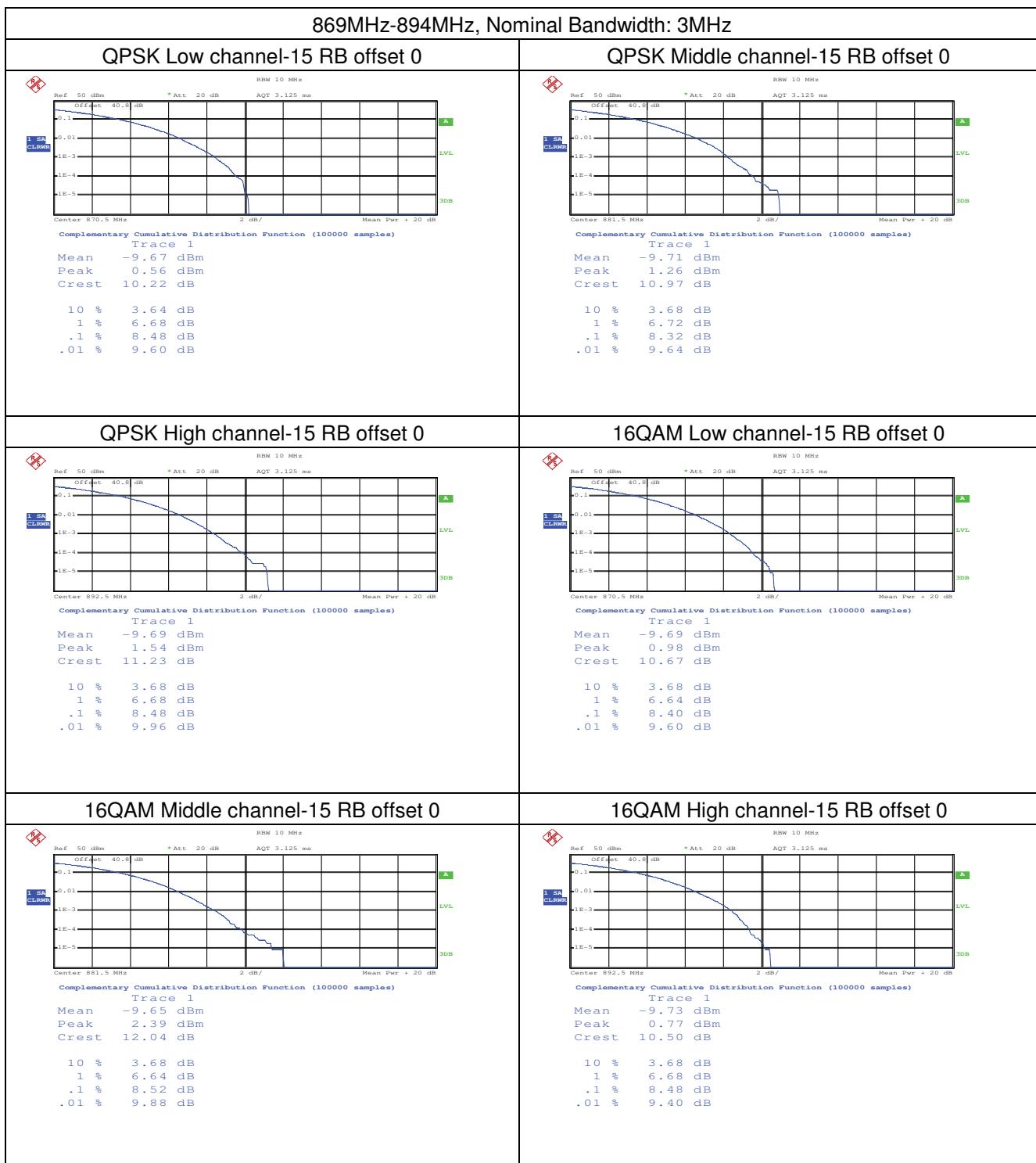


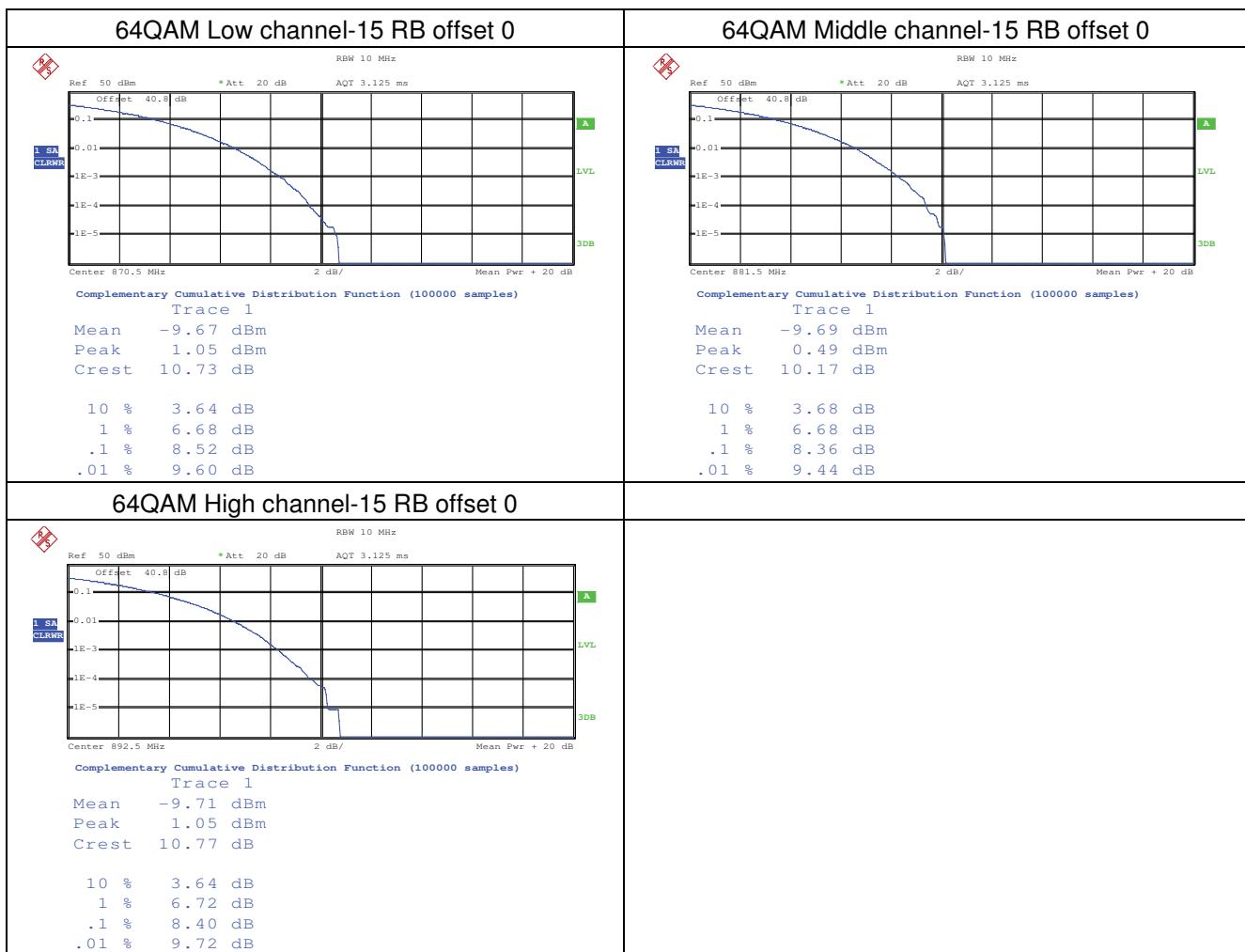


Test plot for 869MHz-894MHz:



64QAM Low channel-6 RB offset 0	64QAM Middle channel-6 RB offset 0																
 <p>Ref 50 dBm * Att 20 dB AQT 3.125 ms</p> <p>Offset 40.0 dB</p> <p>Center 869.7 MHz Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)</p> <p>Trace 1</p> <p>Mean -9.67 dBm Peak 0.35 dBm Crest 10.02 dB</p> <table border="1"> <tr><td>10 %</td><td>3.68 dB</td></tr> <tr><td>1 %</td><td>6.68 dB</td></tr> <tr><td>.1 %</td><td>8.36 dB</td></tr> <tr><td>.01 %</td><td>9.36 dB</td></tr> </table>	10 %	3.68 dB	1 %	6.68 dB	.1 %	8.36 dB	.01 %	9.36 dB	 <p>Ref 50 dBm * Att 20 dB AQT 3.125 ms</p> <p>Offset 40.0 dB</p> <p>Center 881.5 MHz Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)</p> <p>Trace 1</p> <p>Mean -9.67 dBm Peak 0.77 dBm Crest 10.44 dB</p> <table border="1"> <tr><td>10 %</td><td>3.64 dB</td></tr> <tr><td>1 %</td><td>6.64 dB</td></tr> <tr><td>.1 %</td><td>8.36 dB</td></tr> <tr><td>.01 %</td><td>9.52 dB</td></tr> </table>	10 %	3.64 dB	1 %	6.64 dB	.1 %	8.36 dB	.01 %	9.52 dB
10 %	3.68 dB																
1 %	6.68 dB																
.1 %	8.36 dB																
.01 %	9.36 dB																
10 %	3.64 dB																
1 %	6.64 dB																
.1 %	8.36 dB																
.01 %	9.52 dB																
64QAM High channel-6 RB offset 0																	
 <p>Ref 50 dBm * Att 20 dB AQT 3.125 ms</p> <p>Offset 40.0 dB</p> <p>Center 893.3 MHz Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)</p> <p>Trace 1</p> <p>Mean -9.69 dBm Peak 1.19 dBm Crest 10.88 dB</p> <table border="1"> <tr><td>10 %</td><td>3.68 dB</td></tr> <tr><td>1 %</td><td>6.68 dB</td></tr> <tr><td>.1 %</td><td>8.48 dB</td></tr> <tr><td>.01 %</td><td>9.48 dB</td></tr> </table>	10 %	3.68 dB	1 %	6.68 dB	.1 %	8.48 dB	.01 %	9.48 dB									
10 %	3.68 dB																
1 %	6.68 dB																
.1 %	8.48 dB																
.01 %	9.48 dB																

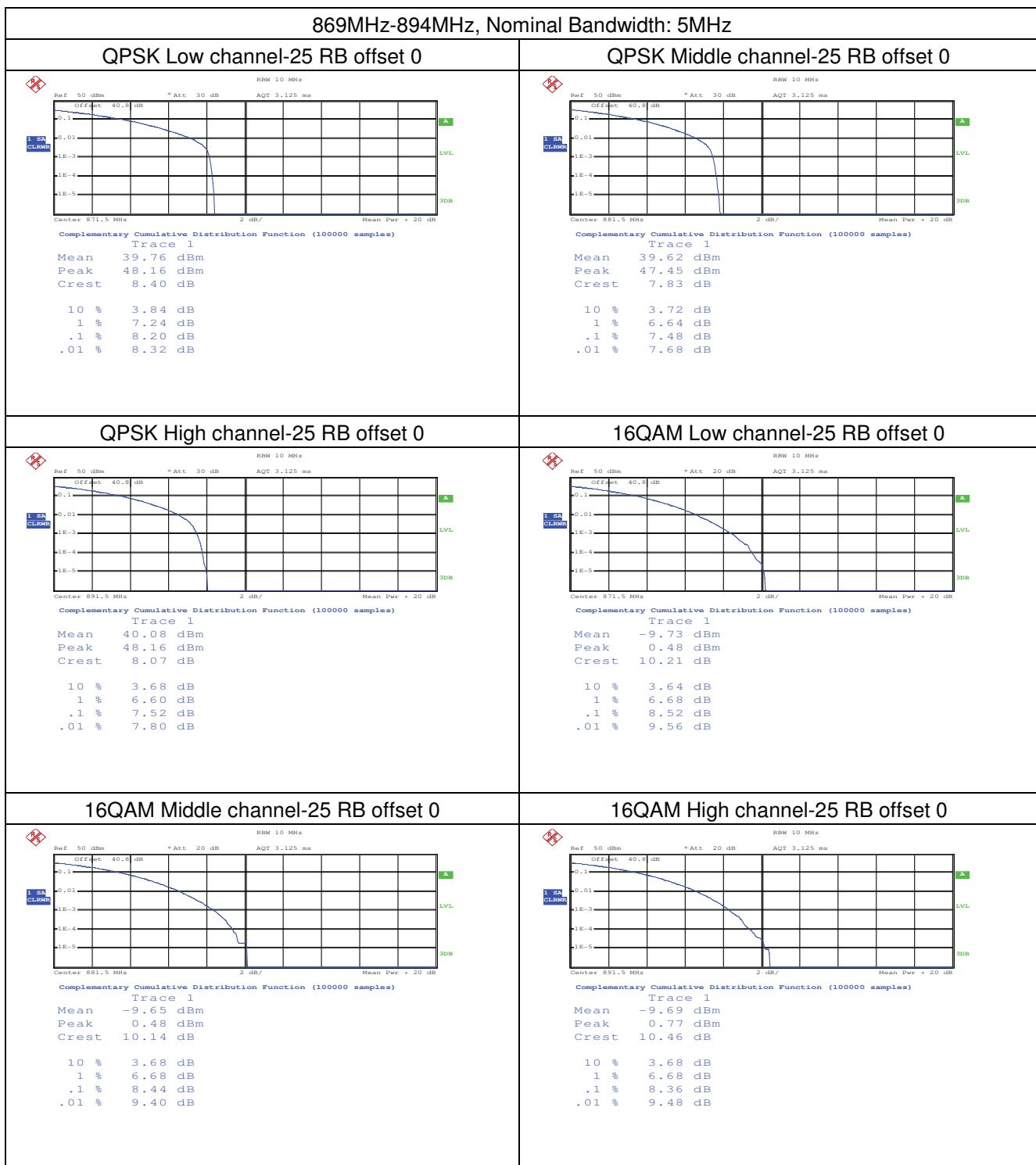


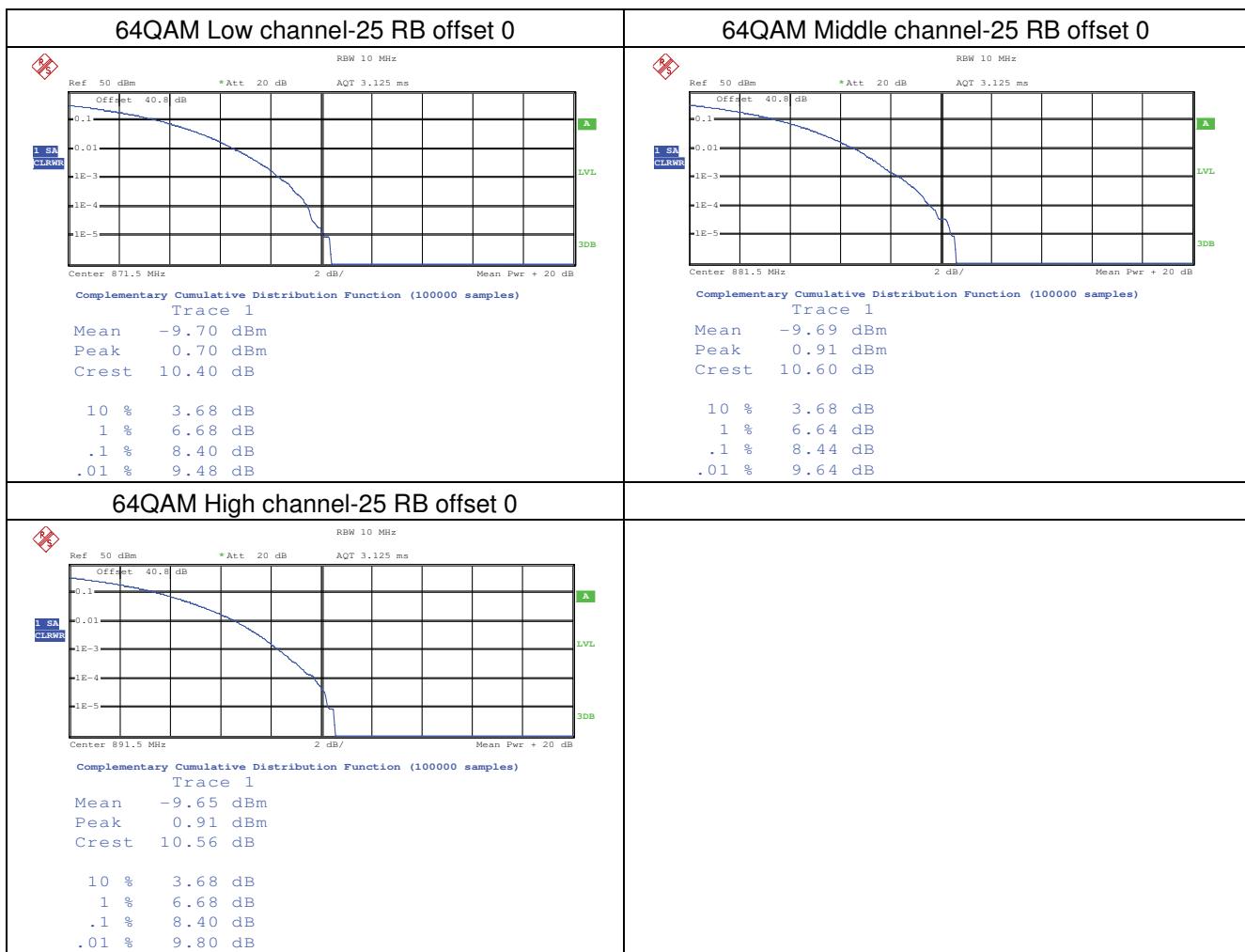


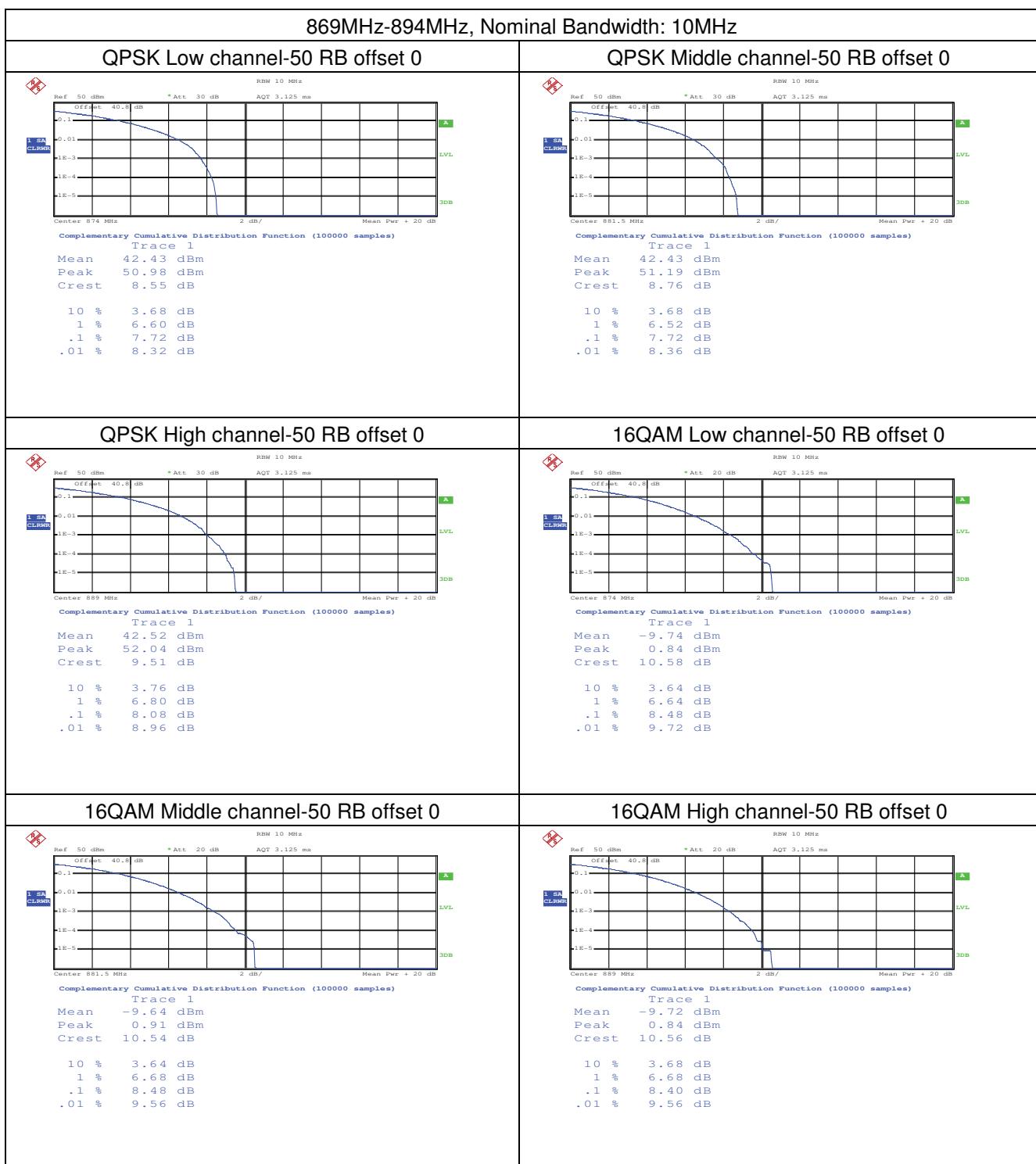


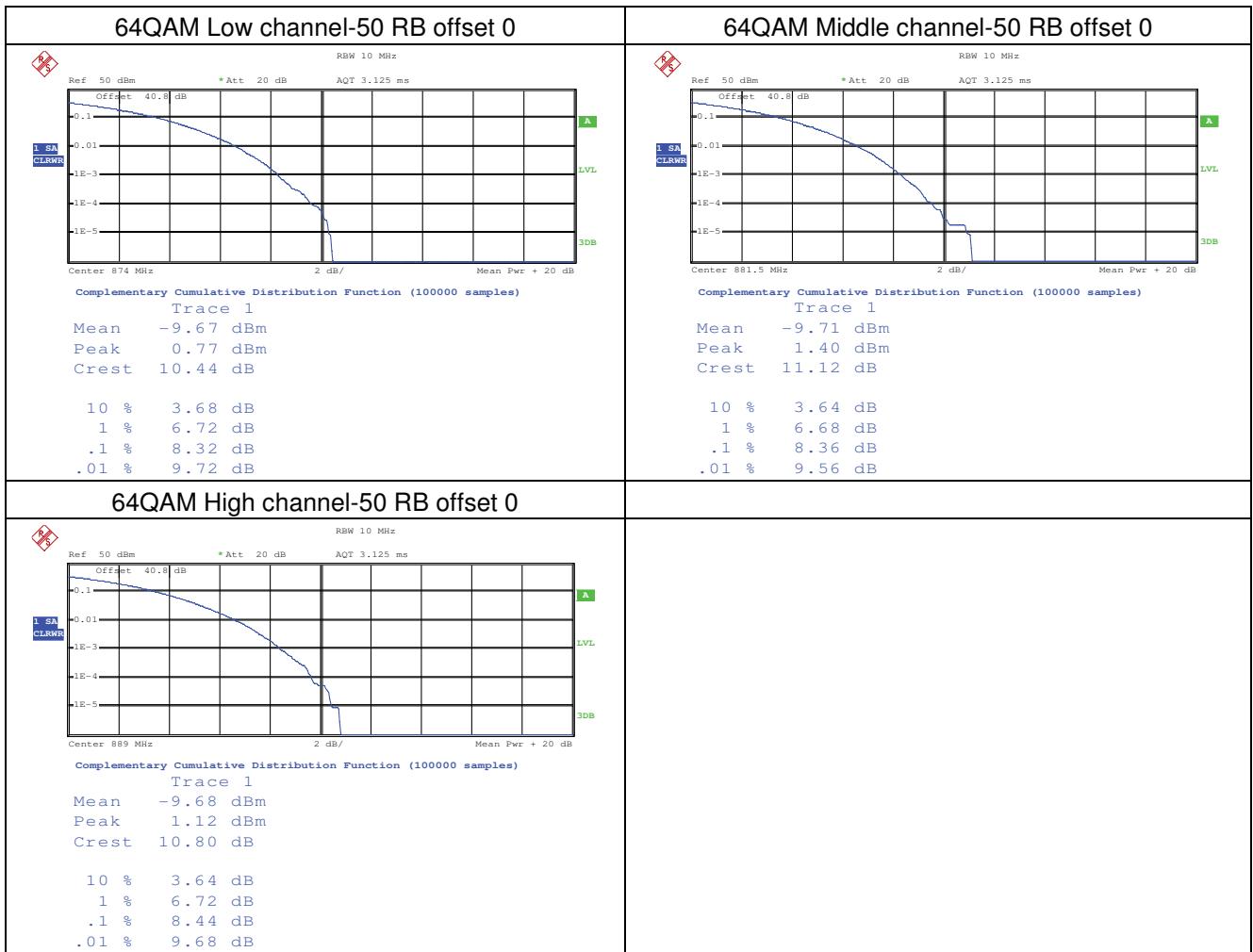
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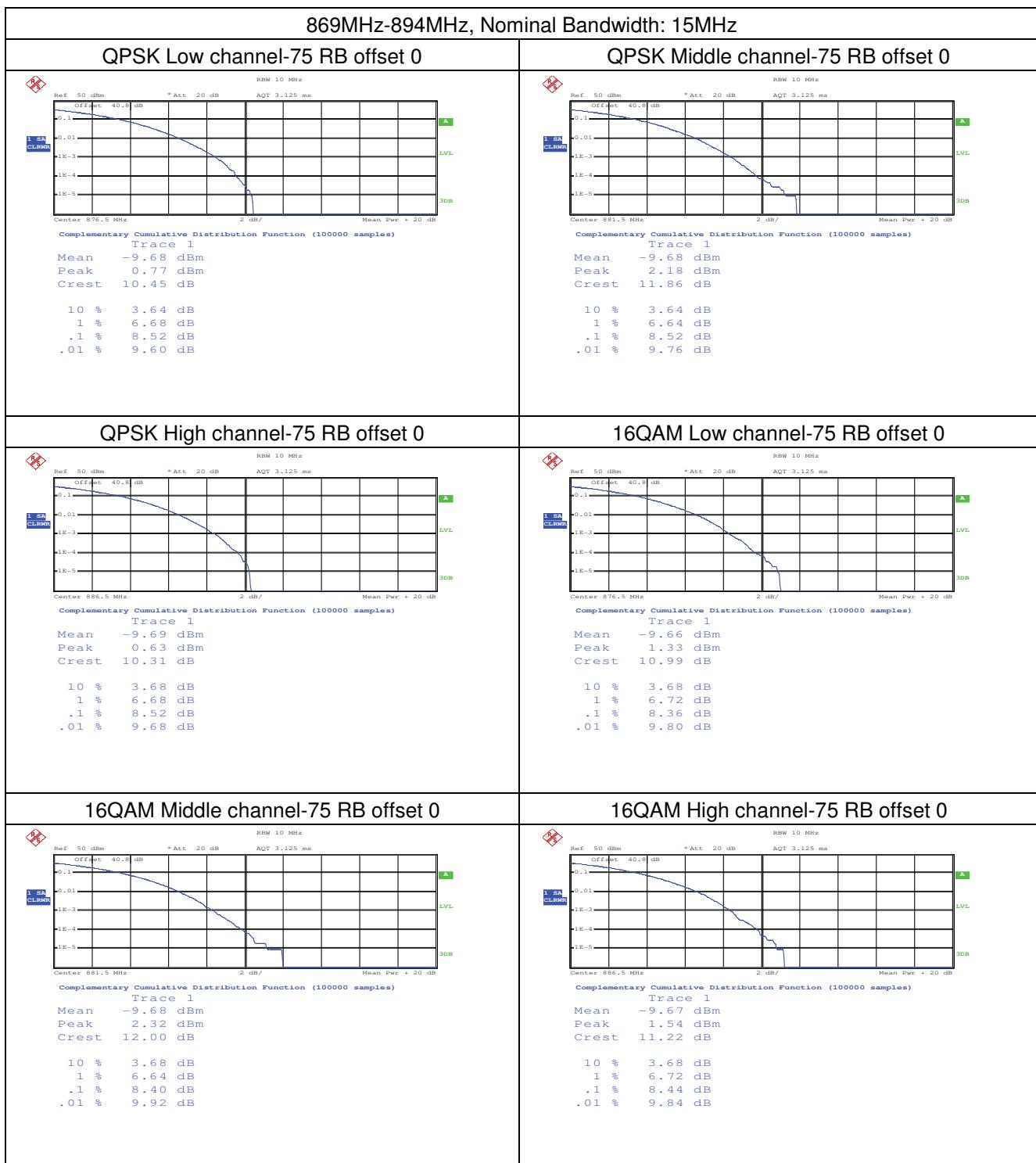
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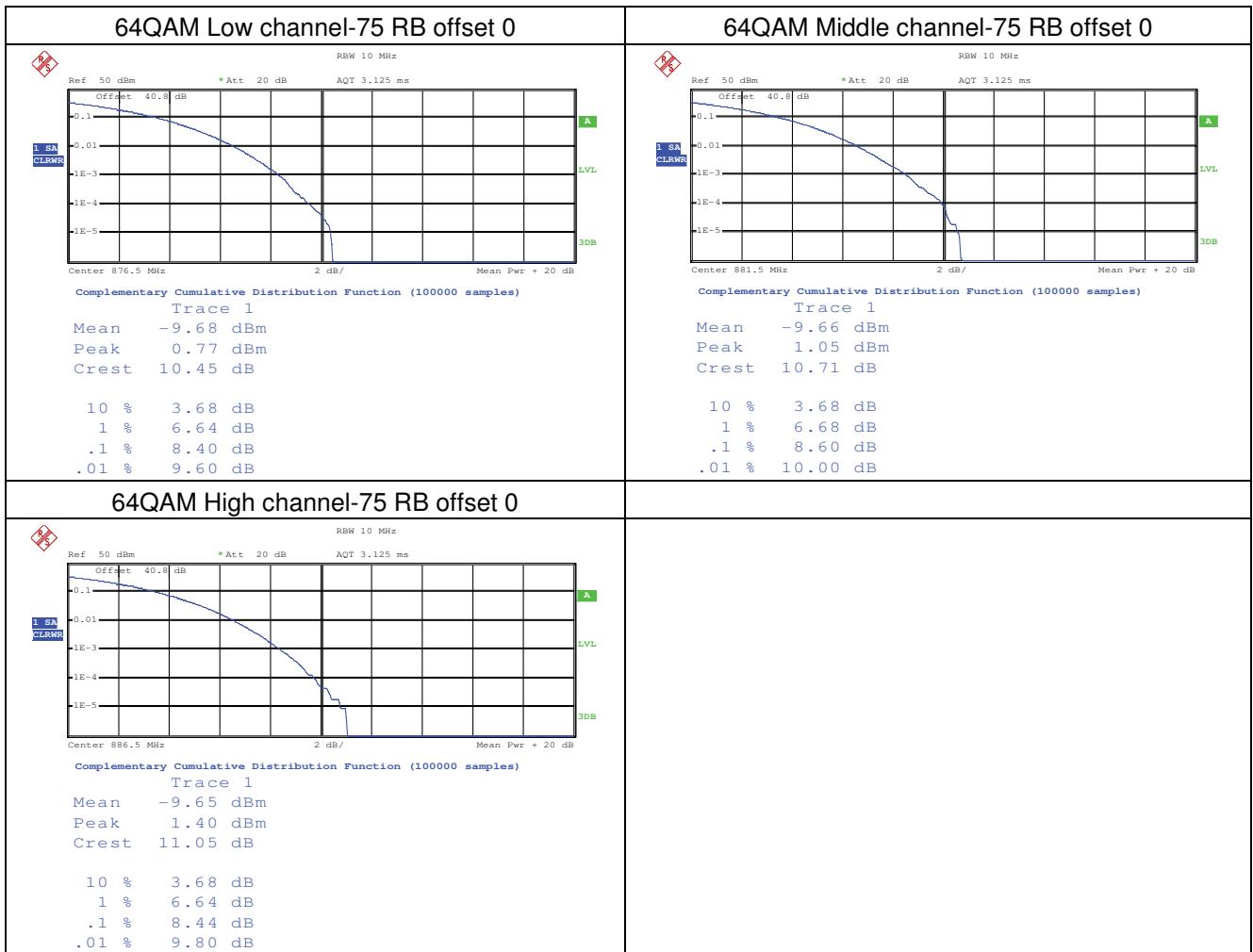












6.3 Occupied Bandwidth

Test Requirement: §2.1049(h), §22.917, §90.209

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit:
OBW: No limit
EBW: No limit

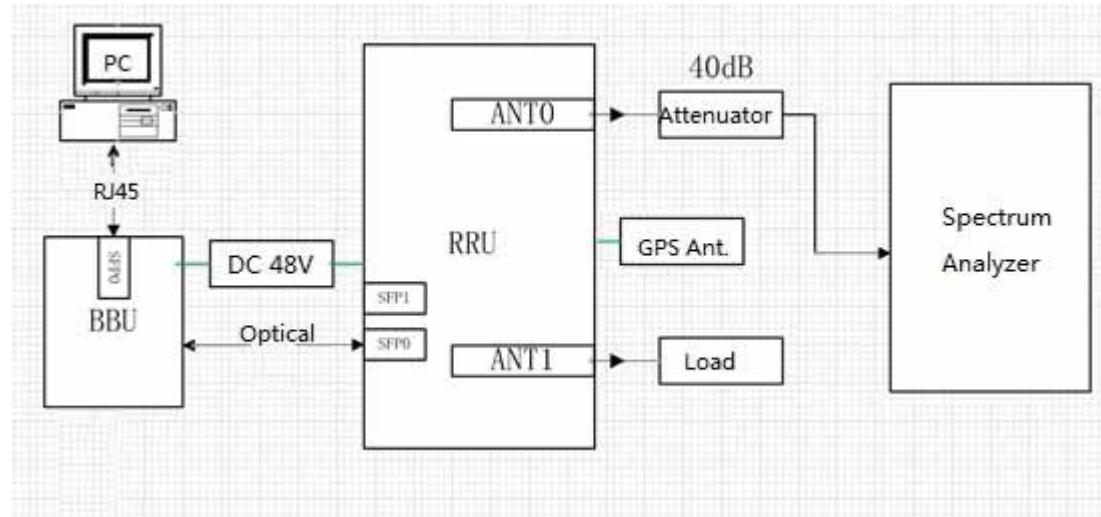
6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar

Test mode: b: Tx mode, Keep the EUT in transmitting mode.

6.3.2 Test Setup Diagram



6.3.3 Measurement Data



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Test data for 859MHz-869MHz:

Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
1.4 MHz	QPSK	OBW	1.128	1.125	1.128
		26dB bandwidth	1.293	1.290	1.302
	16QAM	OBW	1.125	1.134	1.125
		26dB bandwidth	1.290	1.293	1.293
	64QAM	OBW	1.107	1.116	1.113
		26dB bandwidth	1.281	1.293	1.290
Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
3.0 MHz	QPSK	OBW	2.694	2.700	2.688
		26dB bandwidth	2.826	2.832	2.820
	16QAM	OBW	2.688	2.694	2.688
		26dB bandwidth	2.826	2.832	2.832
	64QAM	OBW	2.700	2.700	2.700
		26dB bandwidth	2.814	2.820	2.814
Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
5.0 MHz	QPSK	OBW	4.500	4.490	4.500
		26dB bandwidth	4.800	4.800	4.810
	16QAM	OBW	4.490	4.490	4.490
		26dB bandwidth	4.800	4.810	4.810
	64QAM	OBW	4.500	4.490	4.490
		26dB bandwidth	4.740	4.720	4.740
Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
10.0 MHz	QPSK	OBW	/	8.960	/
		26dB bandwidth	/	9.420	/
	16QAM	OBW	/	8.940	/
		26dB bandwidth	/	9.480	/
	64QAM	OBW	/	8.960	/
		26dB bandwidth	/	9.280	/
Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
15.0 MHz	QPSK	OBW	/	/	13.53
		26dB bandwidth	/	/	14.61
	16QAM	OBW	/	/	13.50
		26dB bandwidth	/	/	14.58
	64QAM	OBW	/	/	13.44
		26dB bandwidth	/	/	14.43



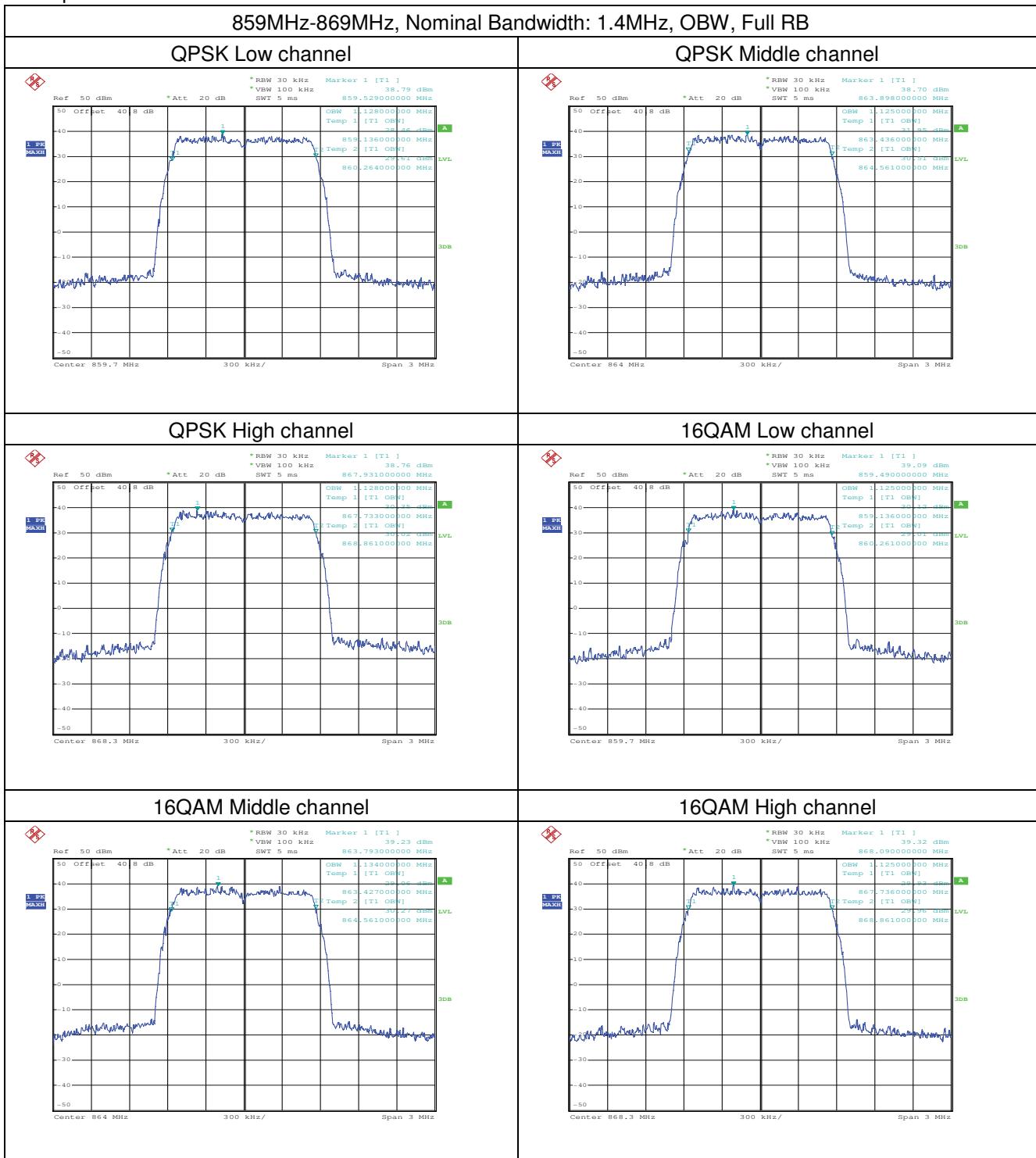
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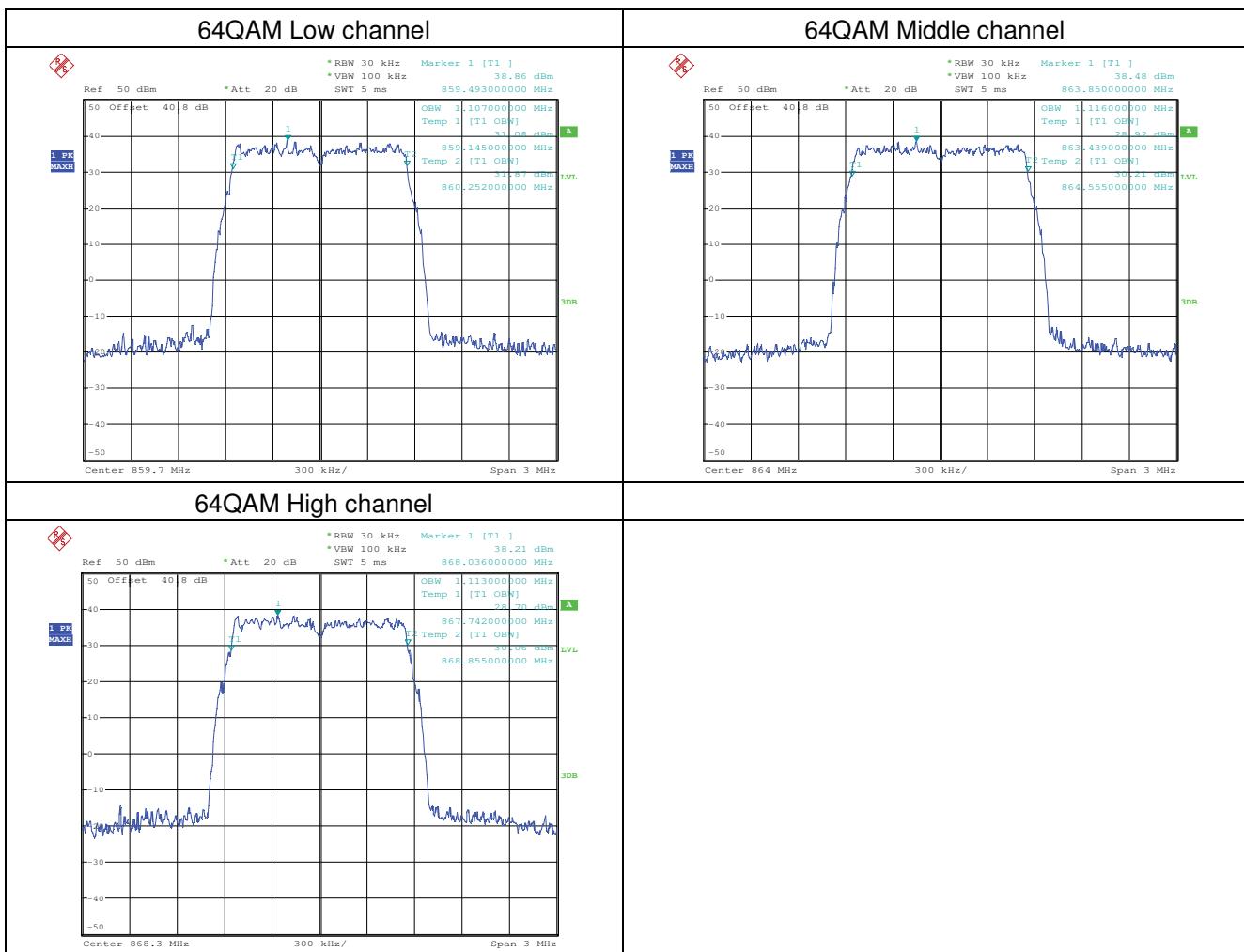
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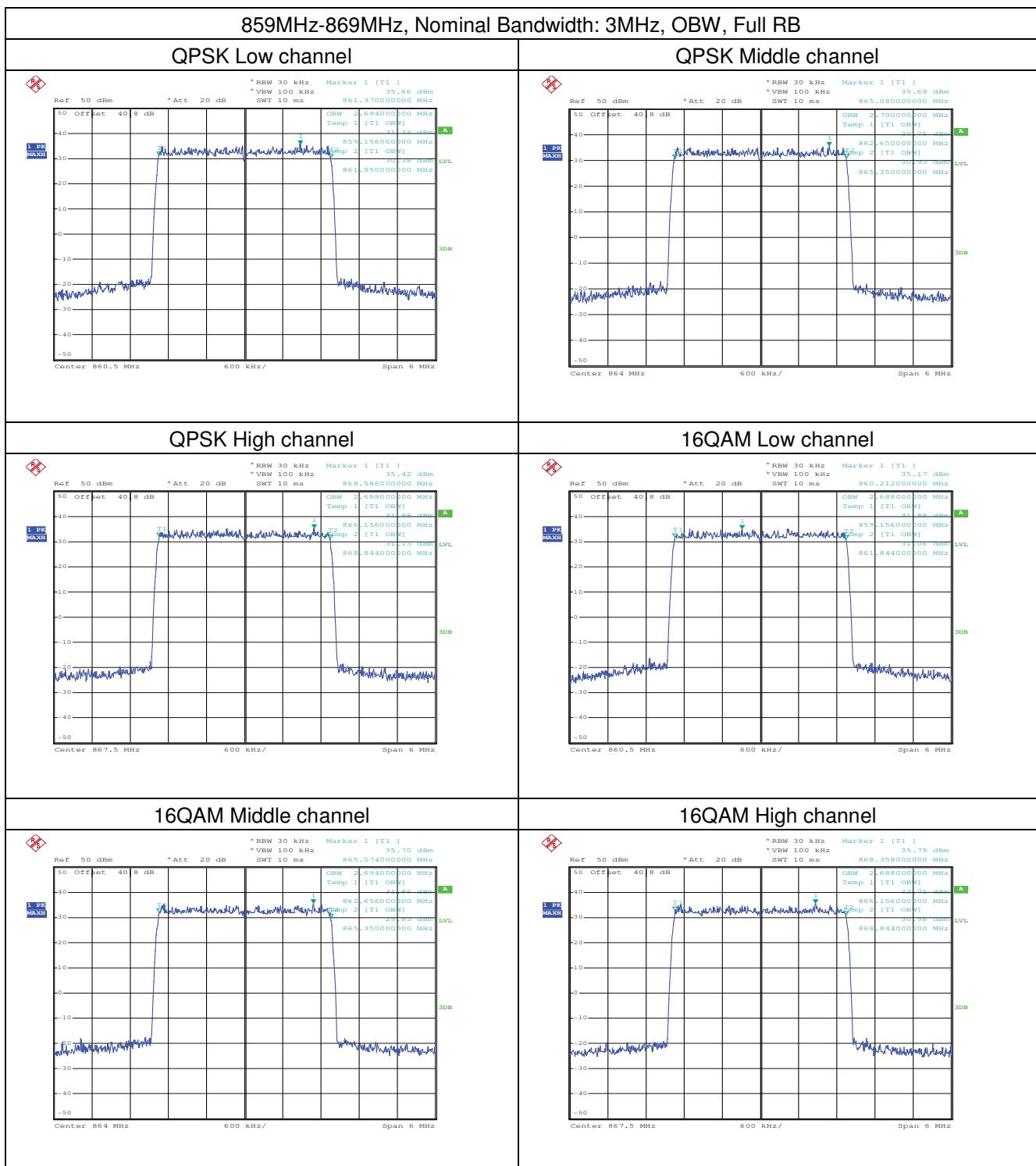
Test data for 869MHz-894MHz:

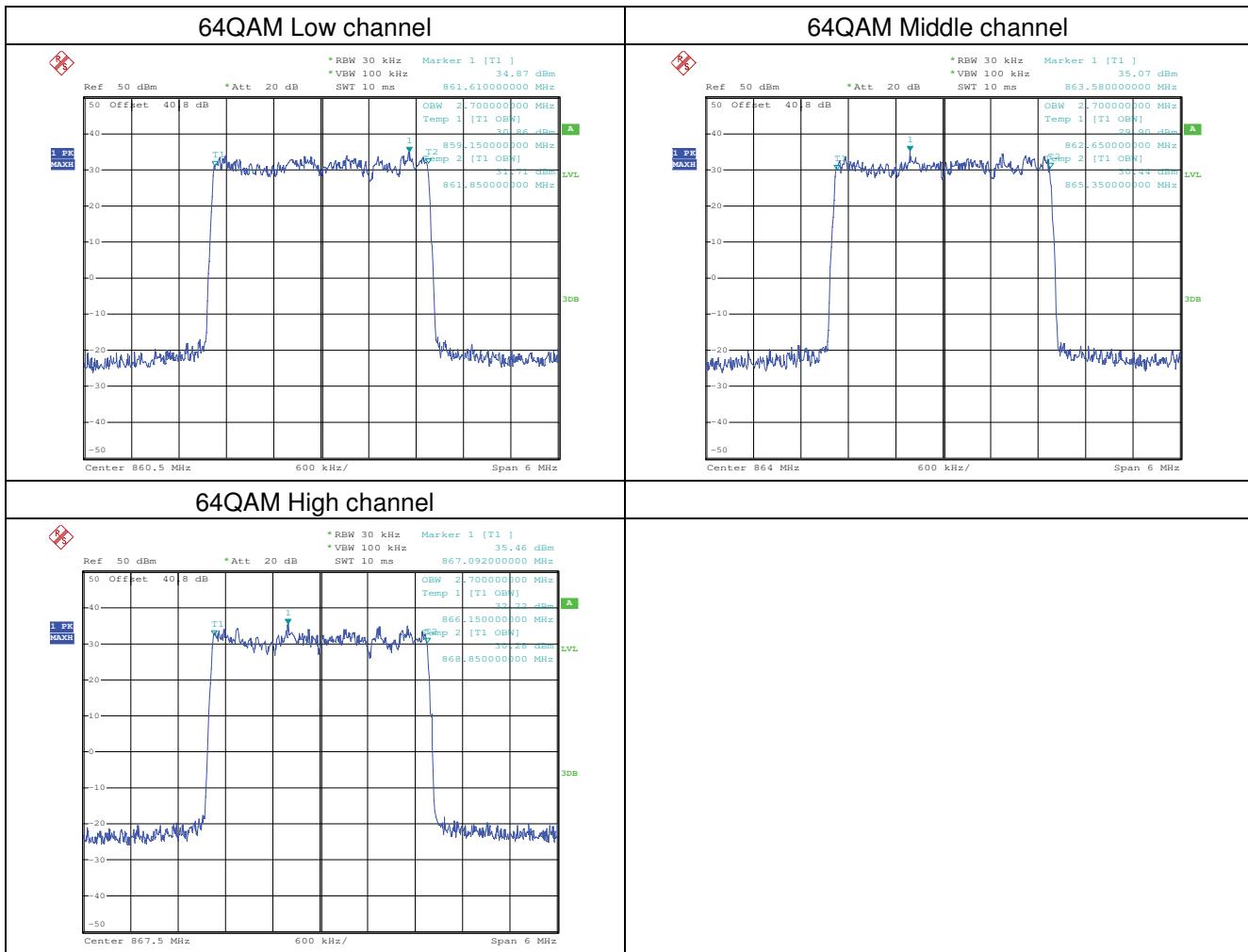
Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
1.4 MHz	QPSK	OBW	1.125	1.125	1.128
		26dB bandwidth	1.296	1.296	1.293
	16QAM	OBW	1.128	1.131	1.128
		26dB bandwidth	1.284	1.299	1.293
	64QAM	OBW	1.113	1.116	1.110
		26dB bandwidth	1.272	1.269	1.284
Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
3.0 MHz	QPSK	OBW	2.700	2.688	2.694
		26dB bandwidth	2.832	2.832	2.832
	16QAM	OBW	2.694	2.694	2.694
		26dB bandwidth	2.826	2.826	2.832
	64QAM	OBW	2.700	2.700	2.694
		26dB bandwidth	2.820	2.820	2.814
Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
5.0 MHz	QPSK	OBW	4.480	4.500	4.490
		26dB bandwidth	4.810	4.800	4.800
	16QAM	OBW	4.480	4.480	4.490
		26dB bandwidth	4.800	4.810	4.810
	64QAM	OBW	4.490	4.490	4.490
		26dB bandwidth	4.730	4.740	4.750
Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
10.0 MHz	QPSK	OBW	8.940	8.920	8.920
		26dB bandwidth	9.440	9.460	9.440
	16QAM	OBW	8.940	8.940	8.920
		26dB bandwidth	9.440	9.440	9.420
	64QAM	OBW	8.920	8.940	8.940
		26dB bandwidth	9.320	9.340	9.300
Nominal Bandwidth	Modulation	Test Item	Test result(MHz)		
			LCH	MCH	HCH
15.0 MHz	QPSK	OBW	13.500	13.500	13.500
		26dB bandwidth	14.700	14.580	14.520
	16QAM	OBW	13.500	13.500	13.500
		26dB bandwidth	14.640	14.580	14.490
	64QAM	OBW	13.410	13.410	13.500
		26dB bandwidth	14.460	14.400	14.460

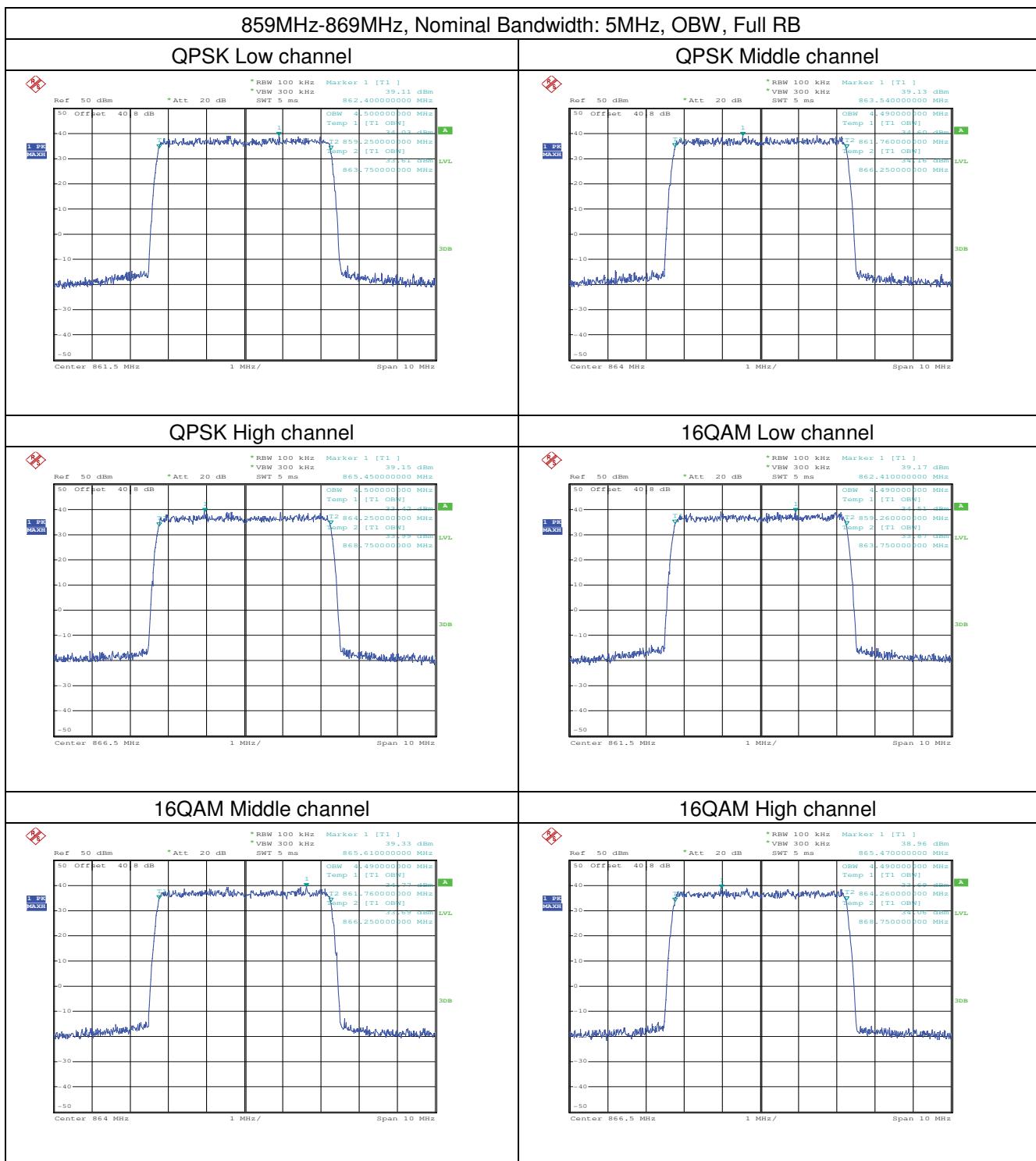
Test plot for 859MHz-869MHz/OBW:

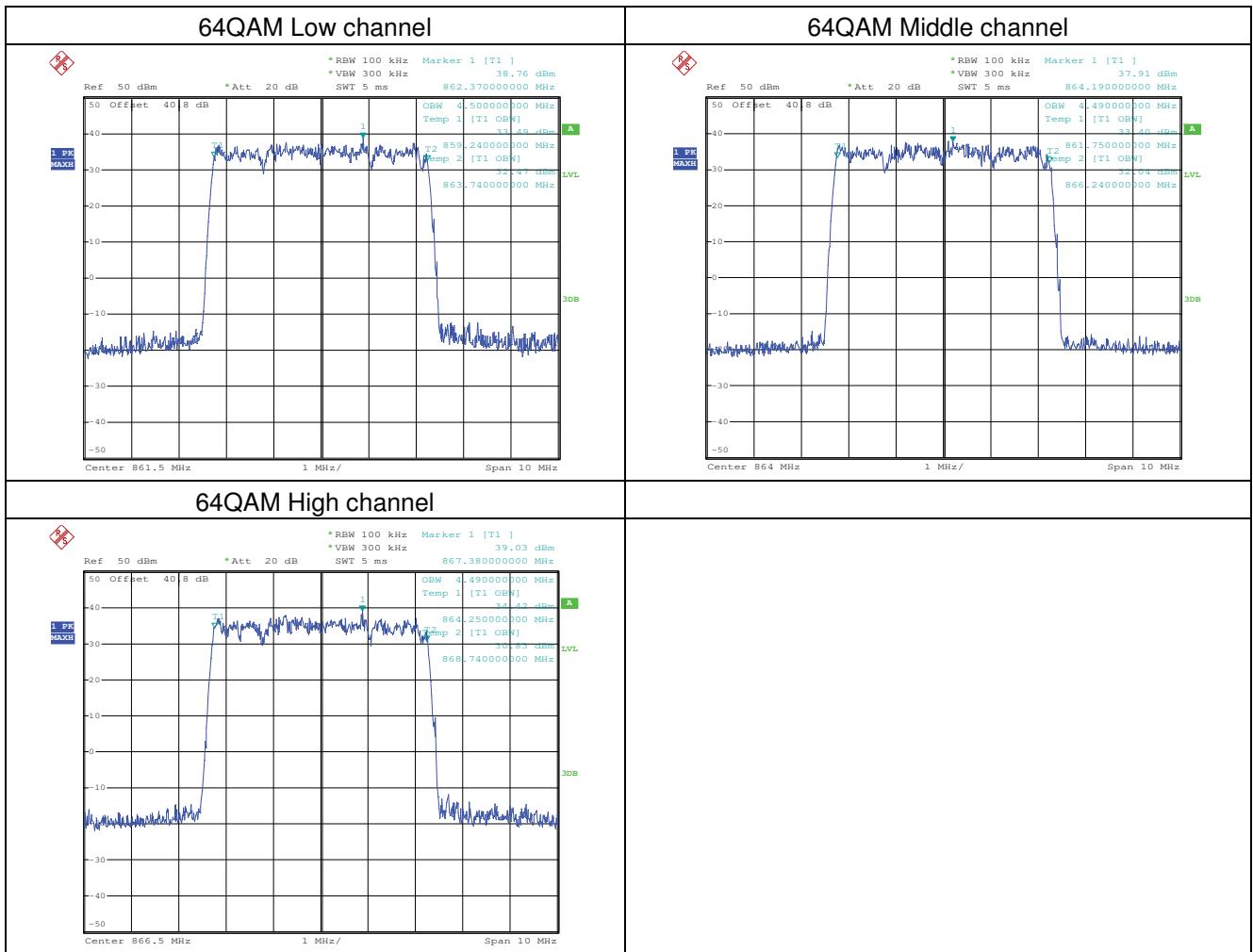


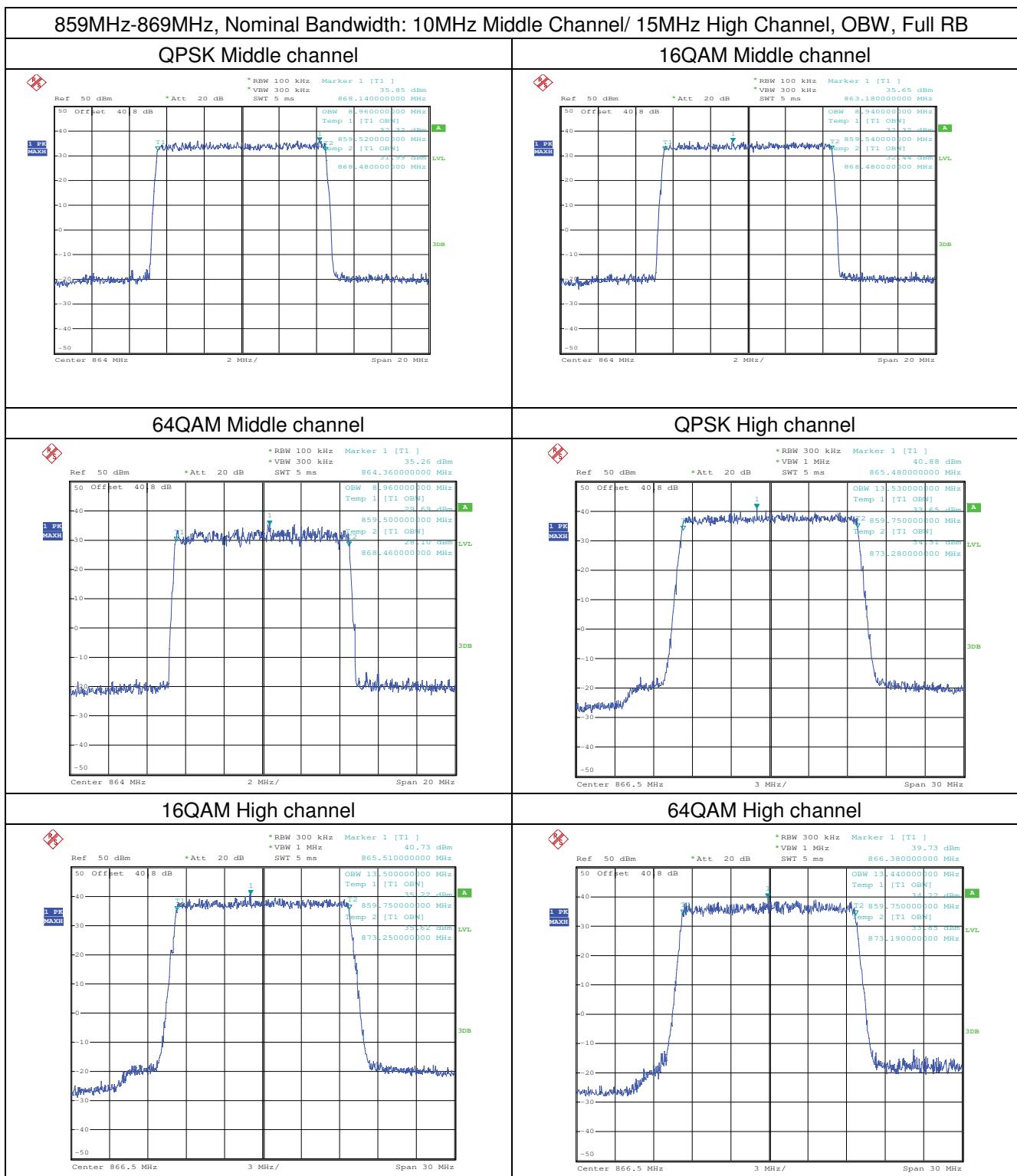




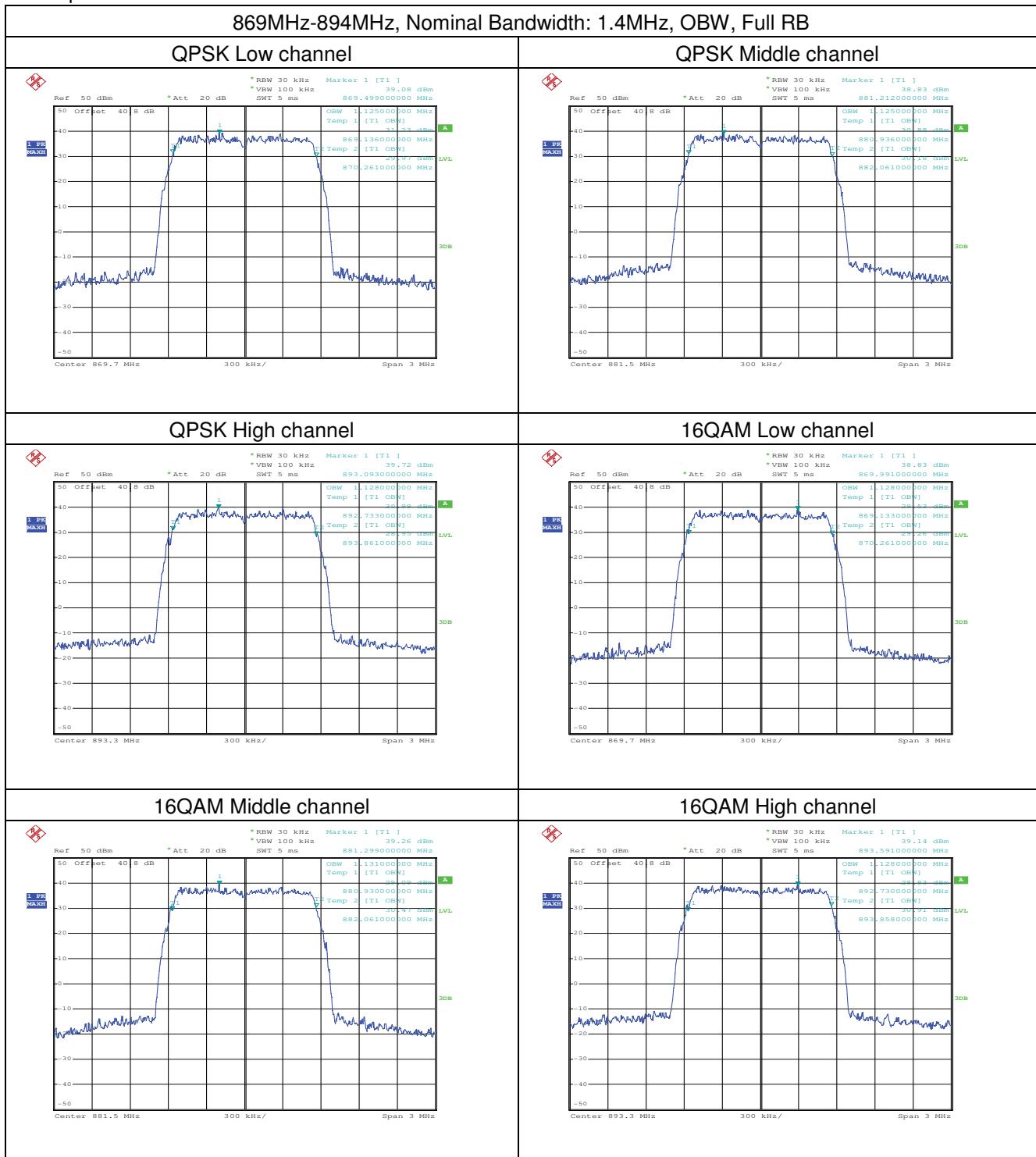


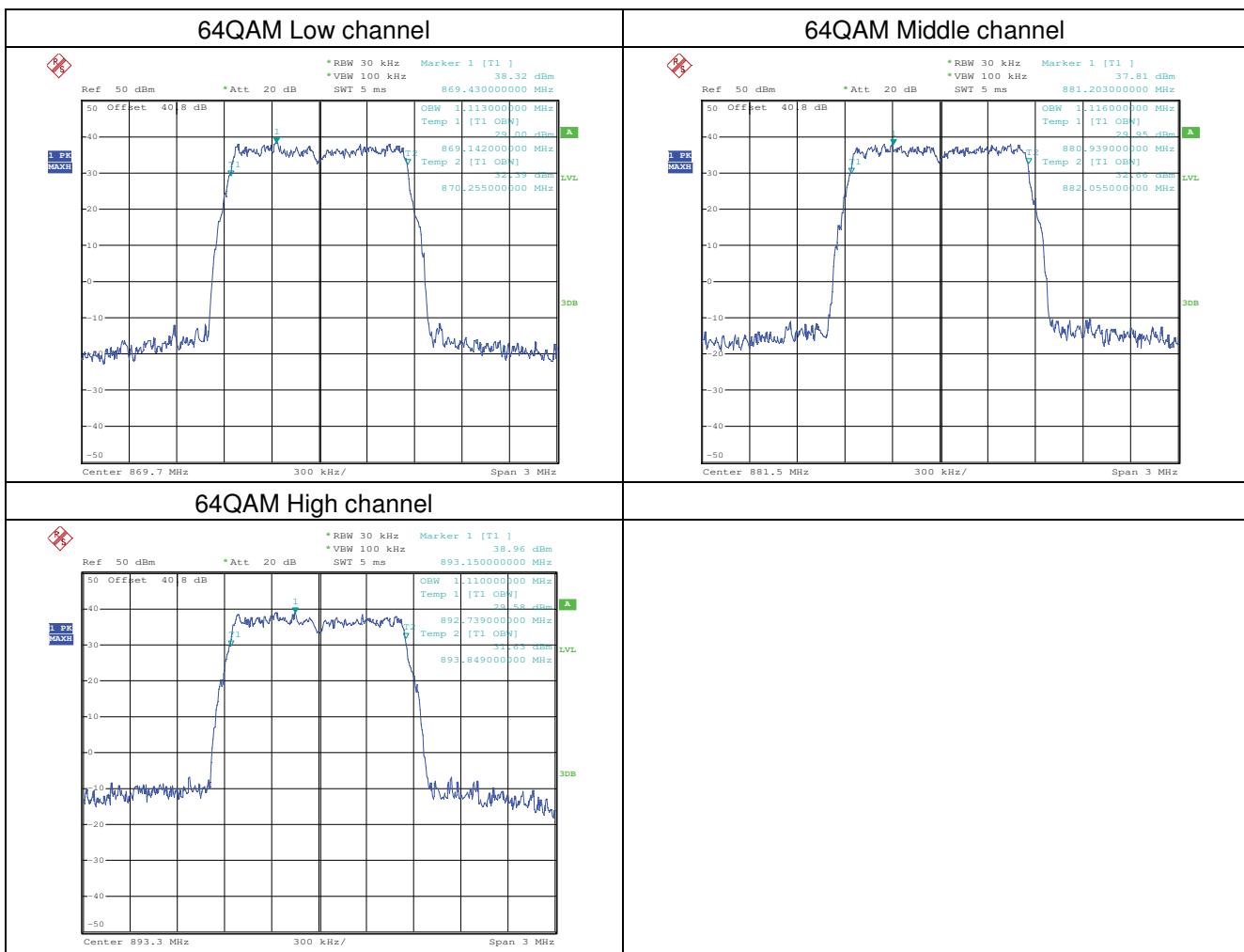


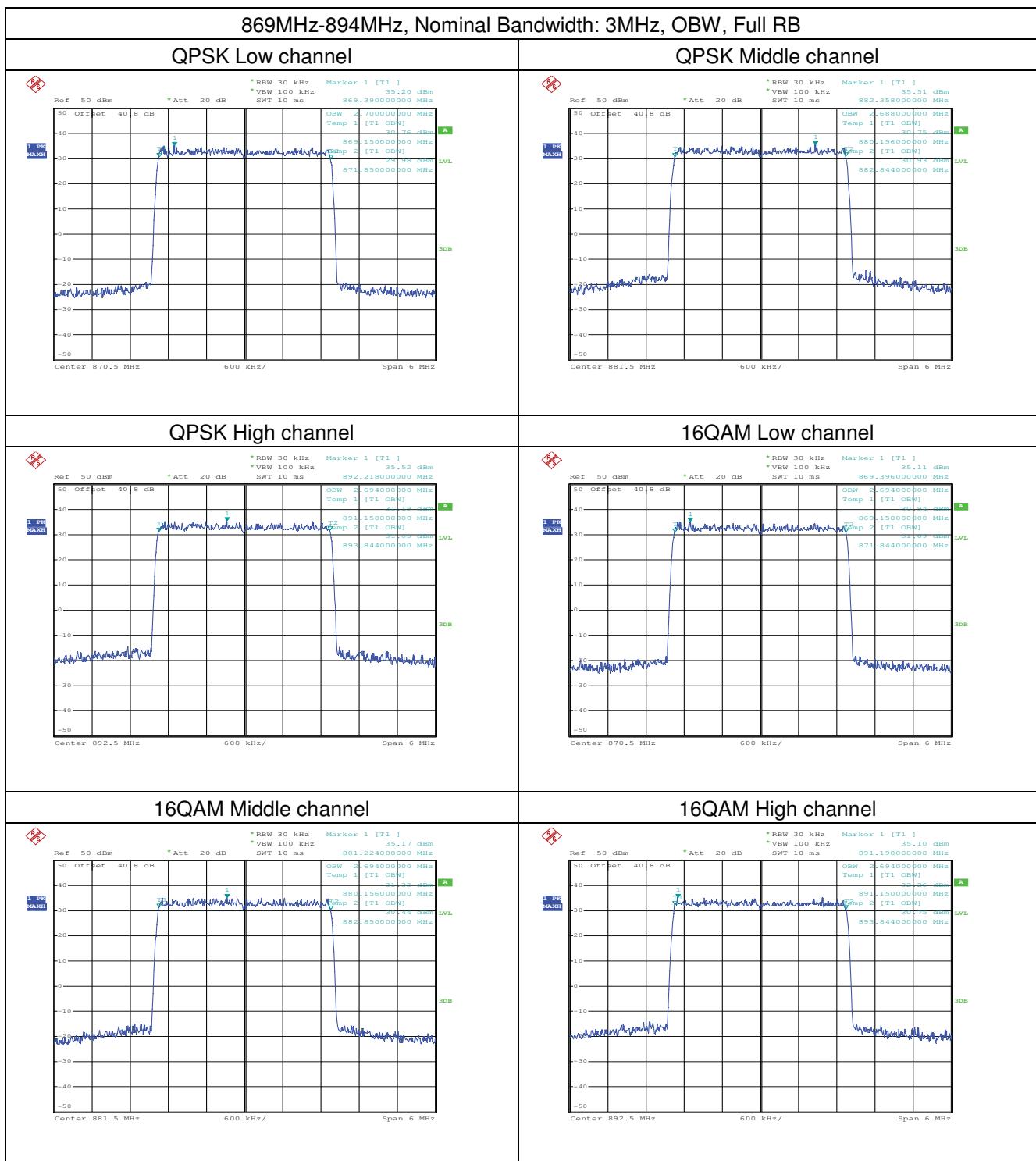


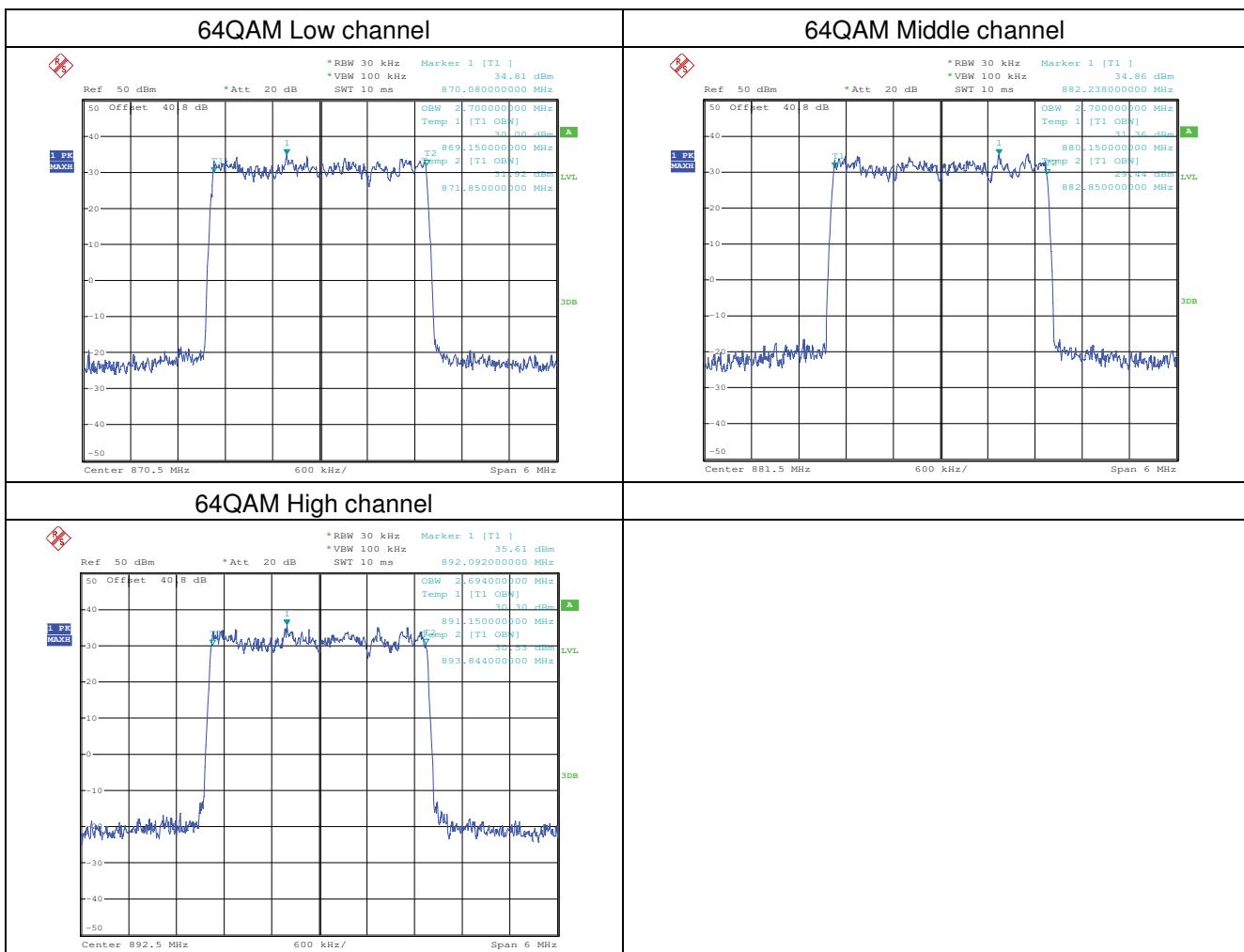


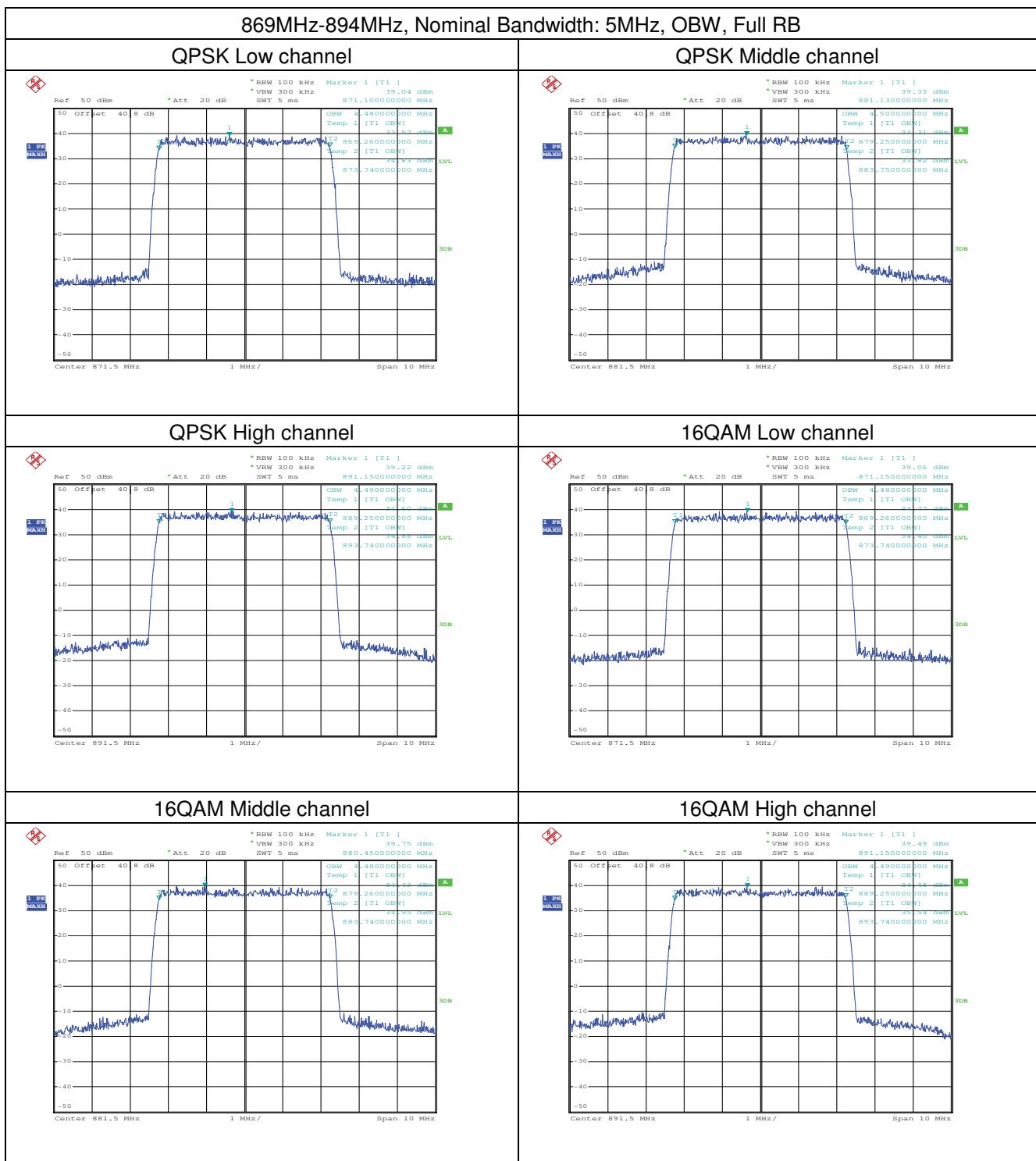
Test plot for 869MHz-894MHz/OBW:

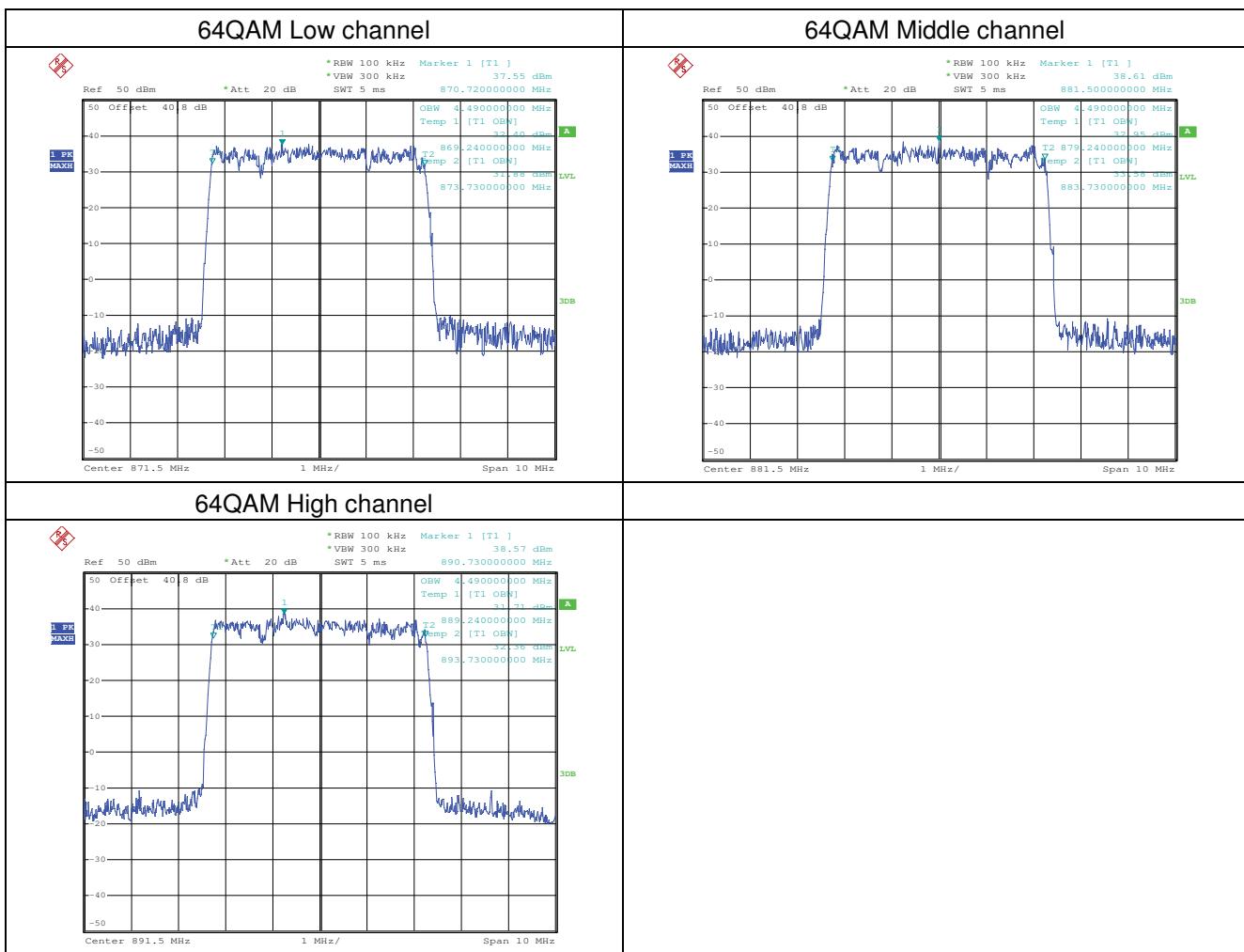


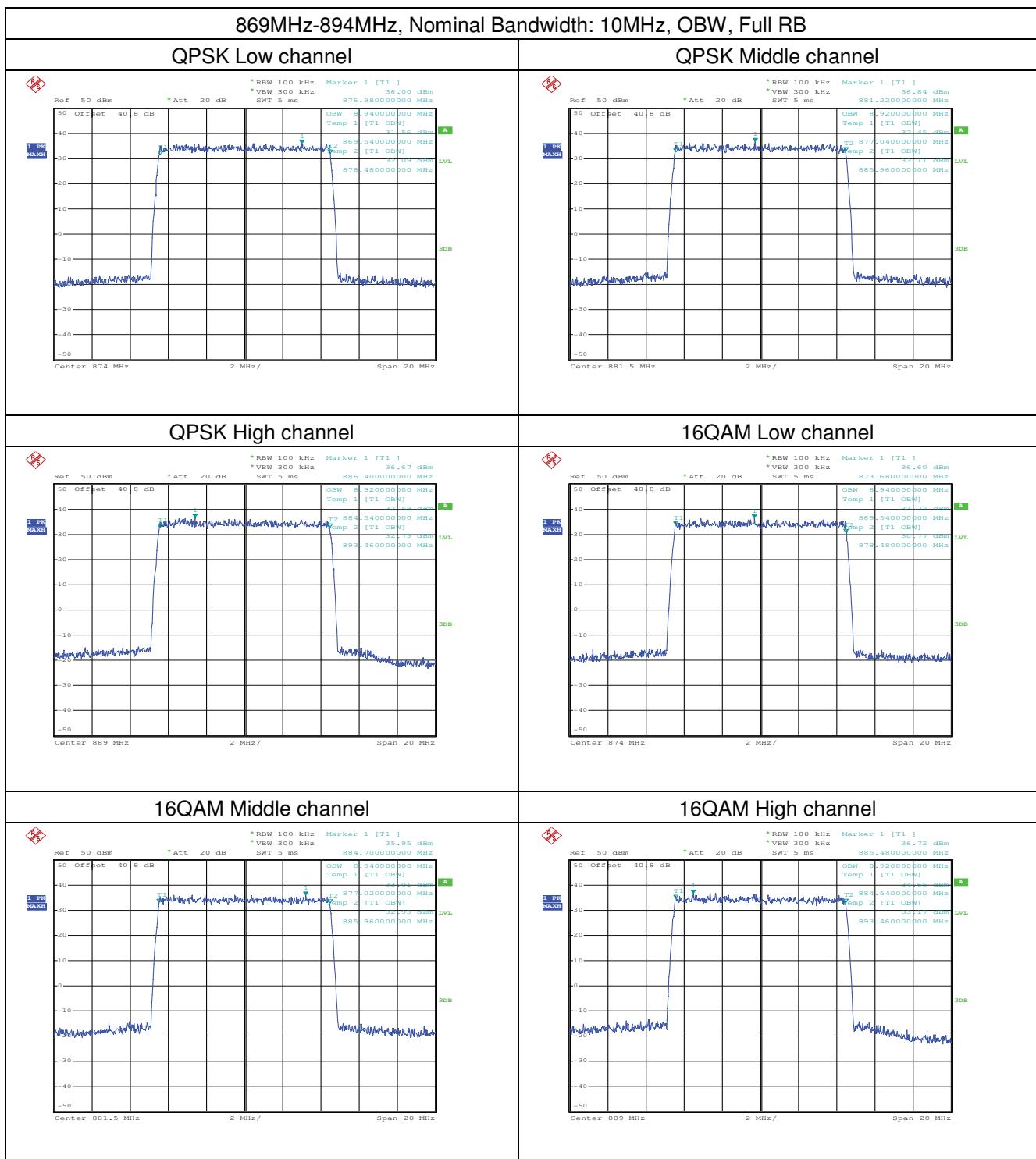


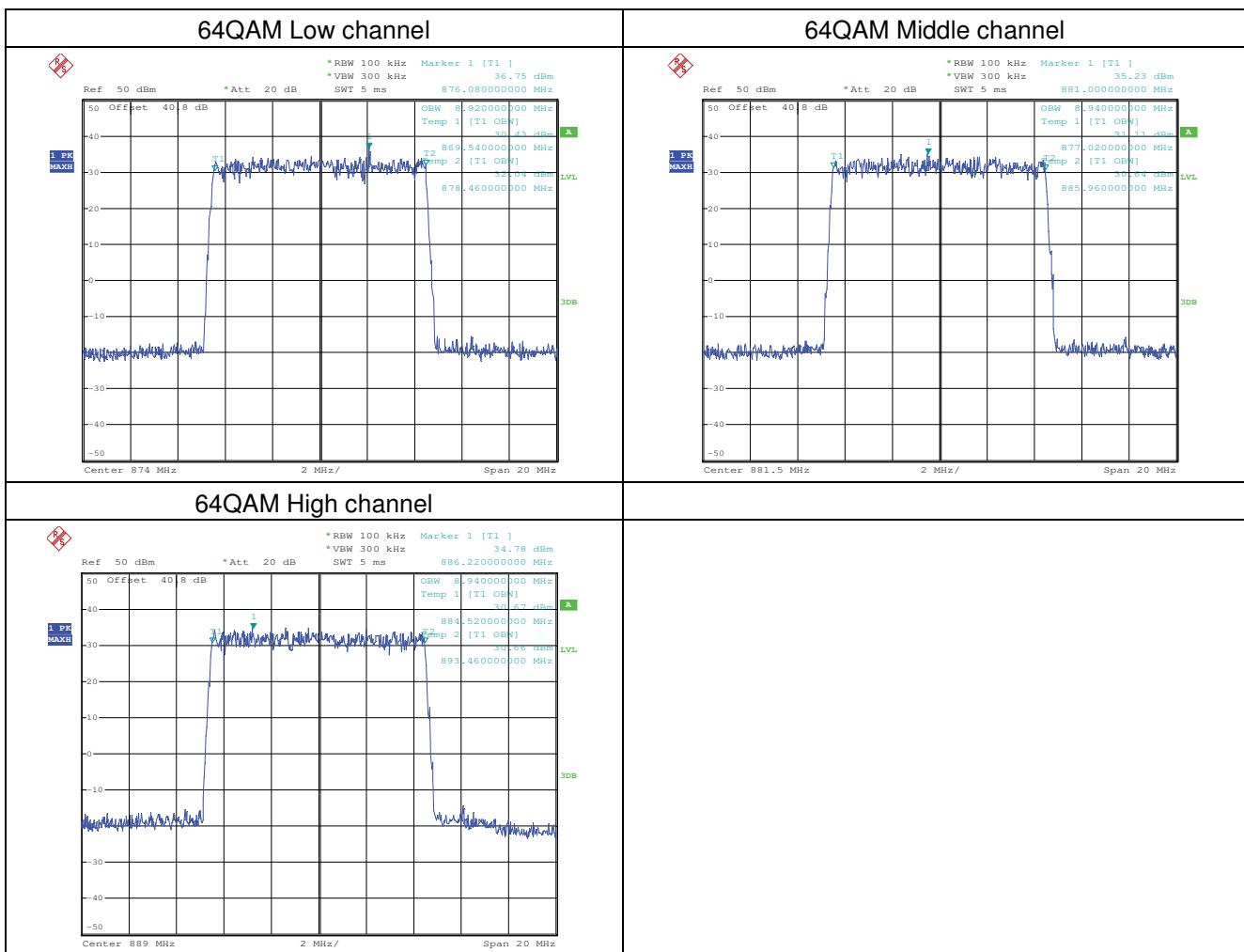


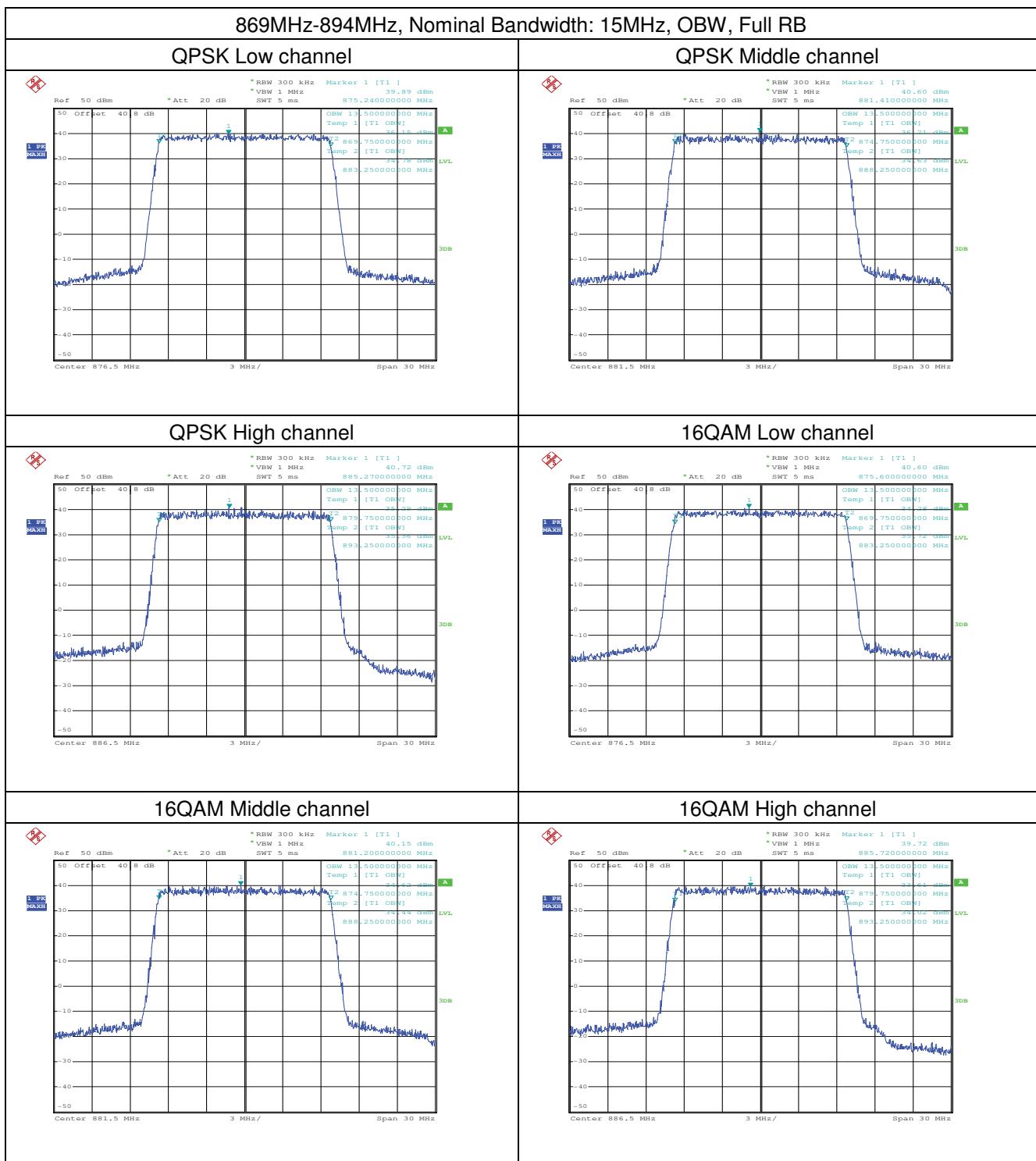


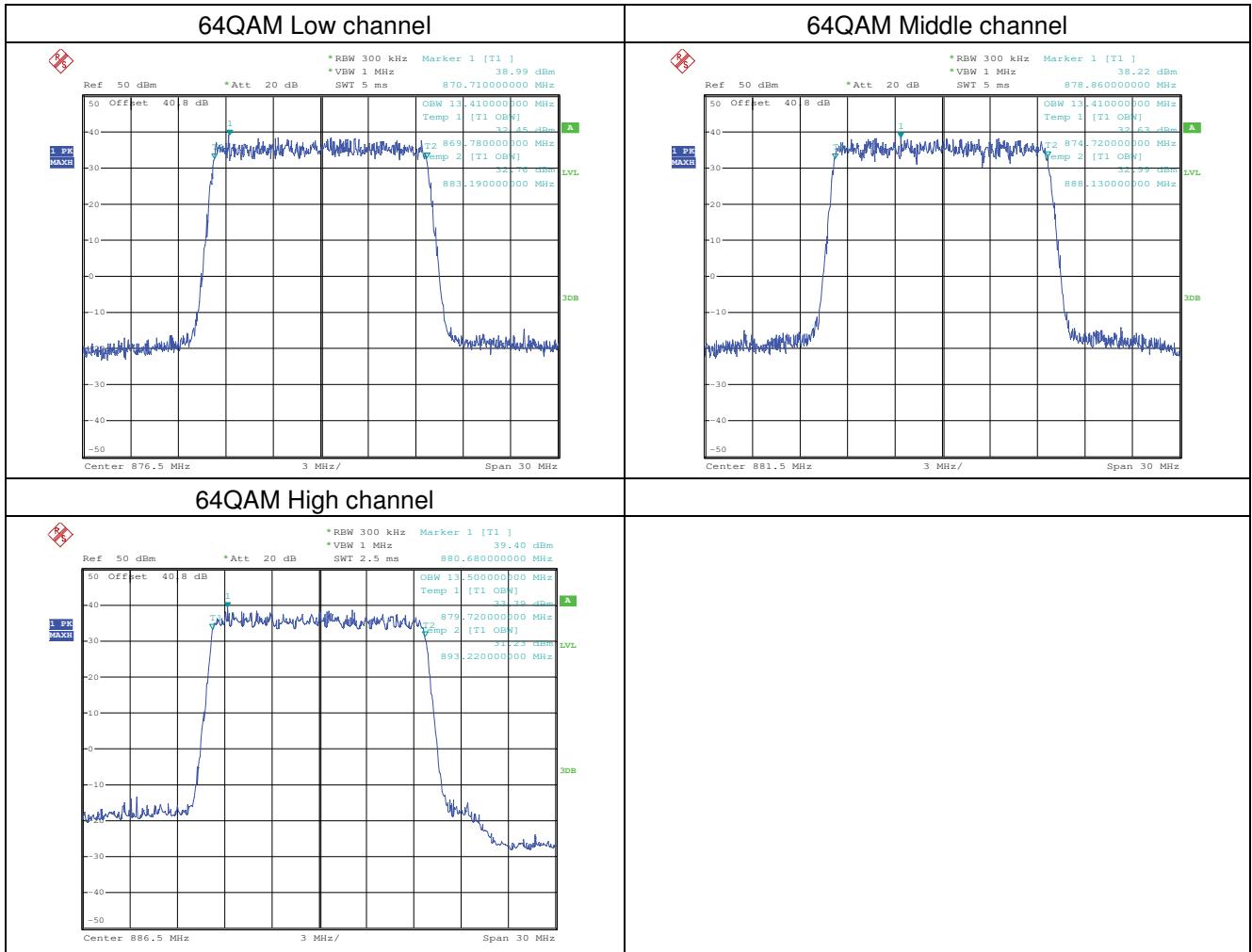




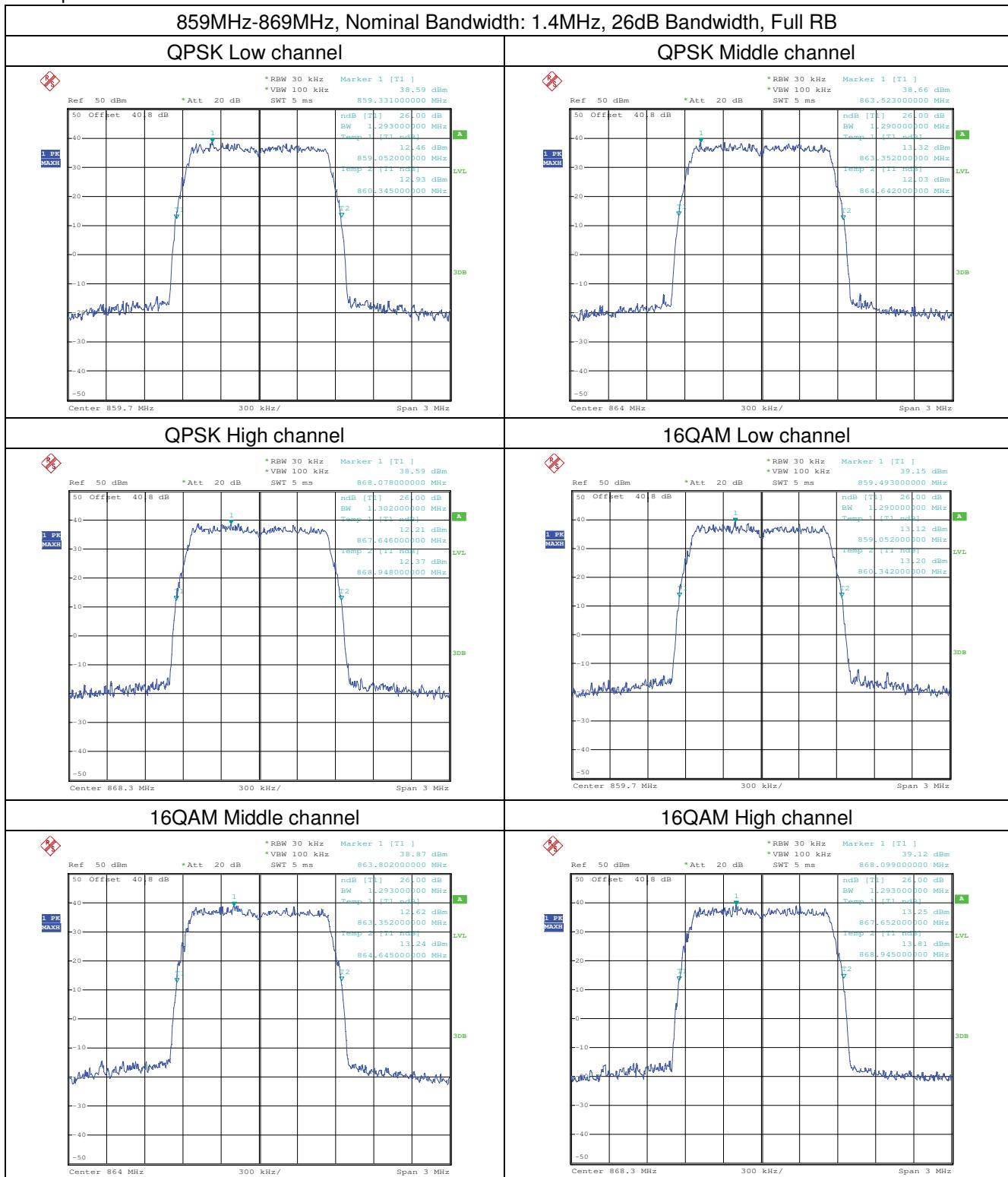


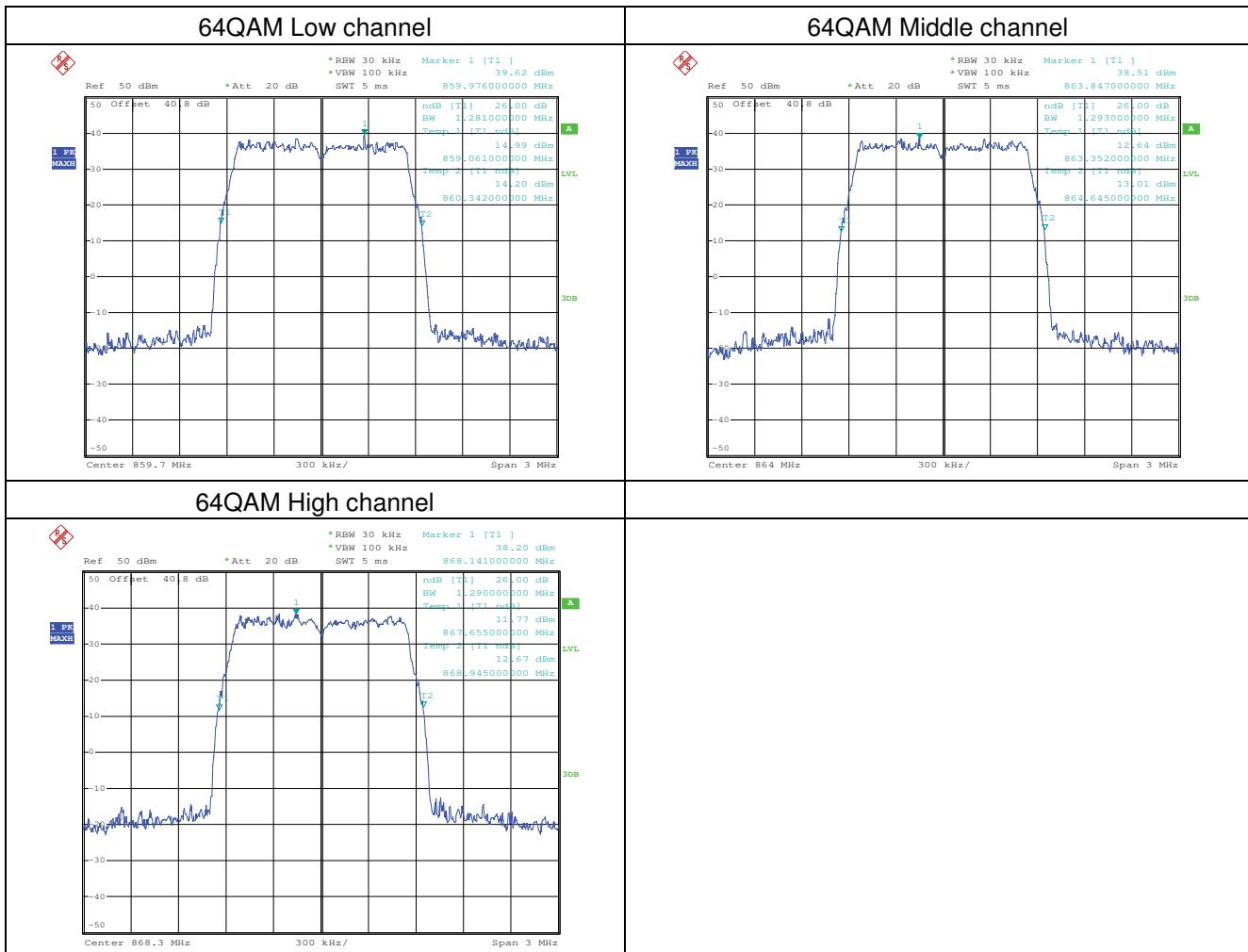


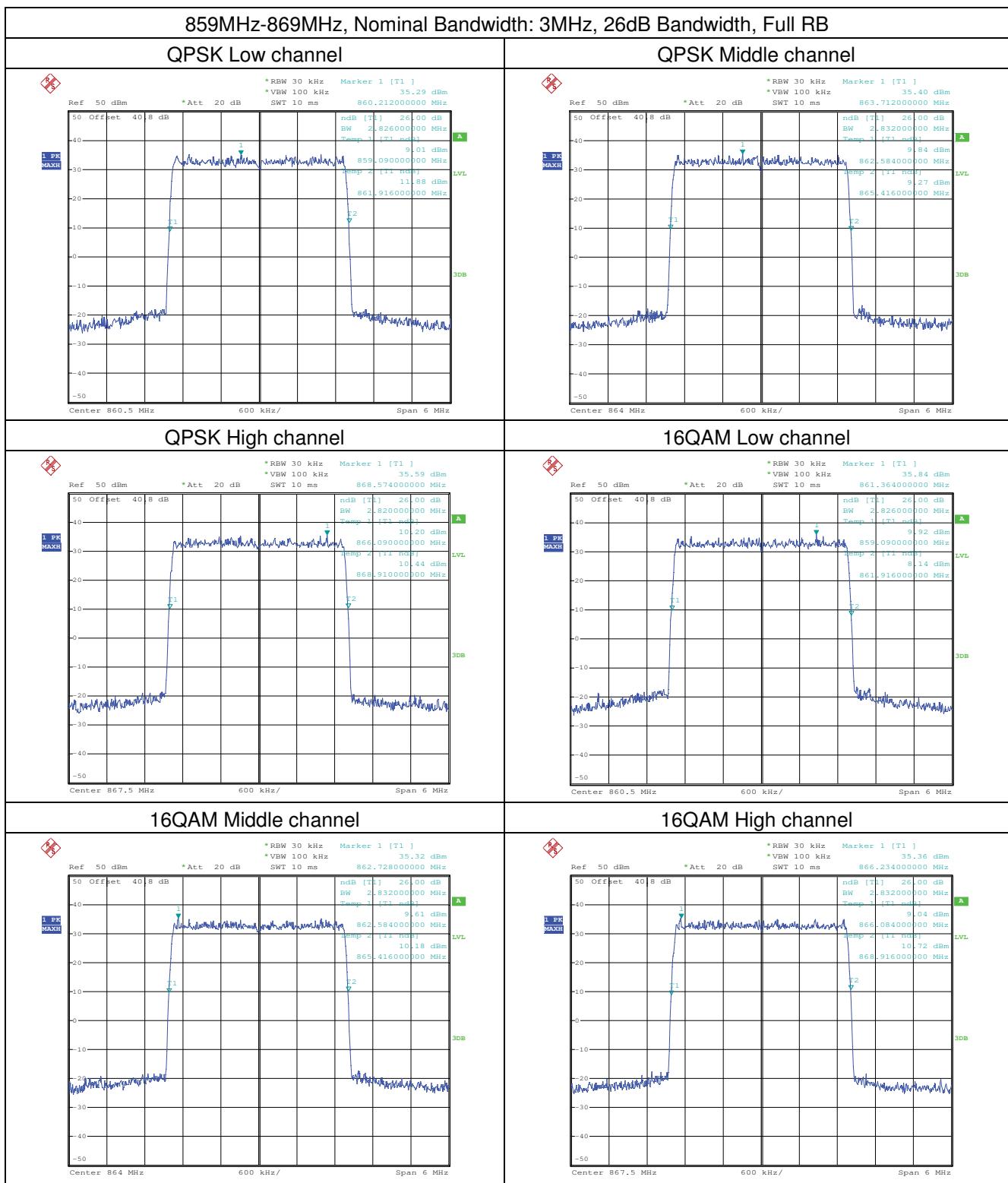


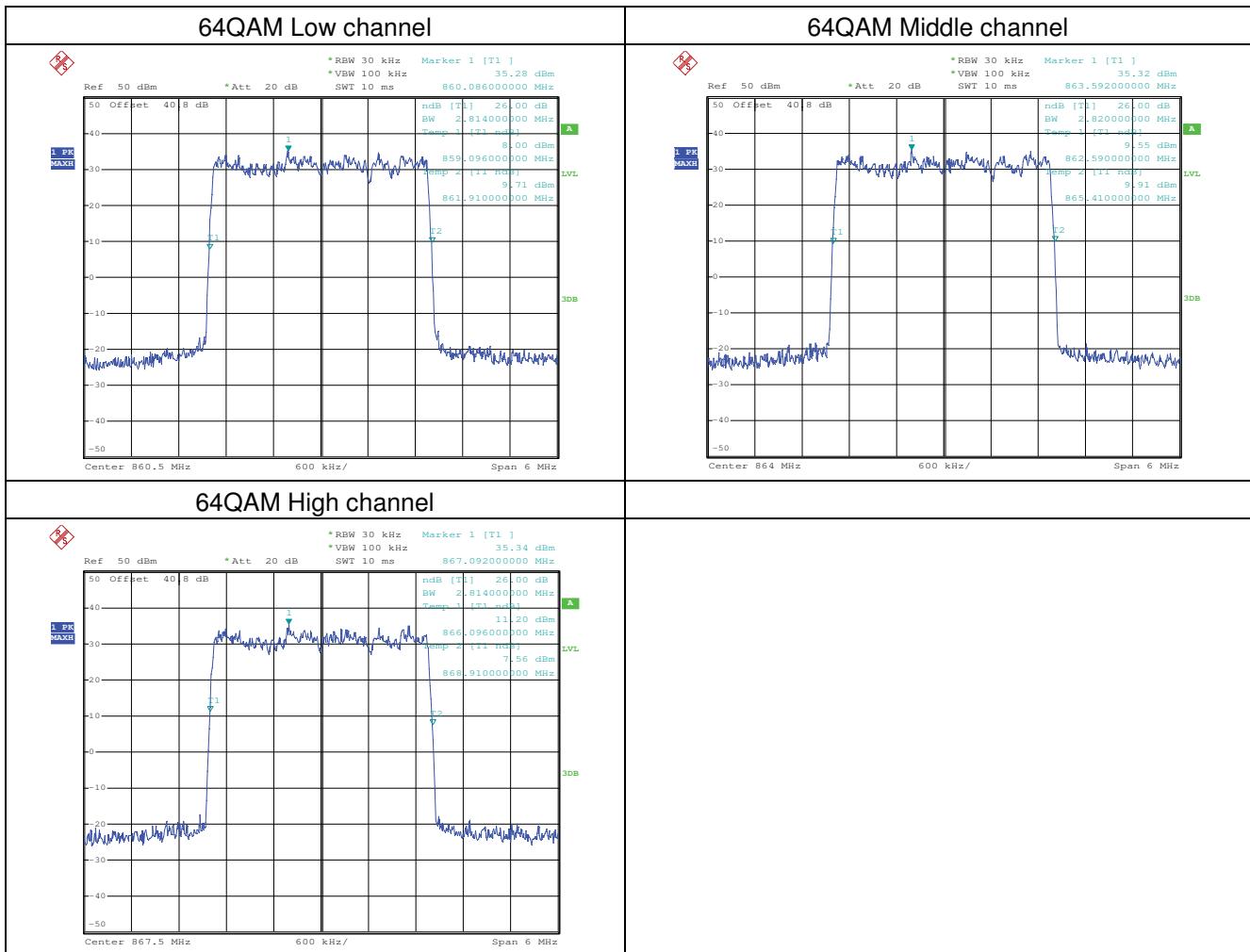


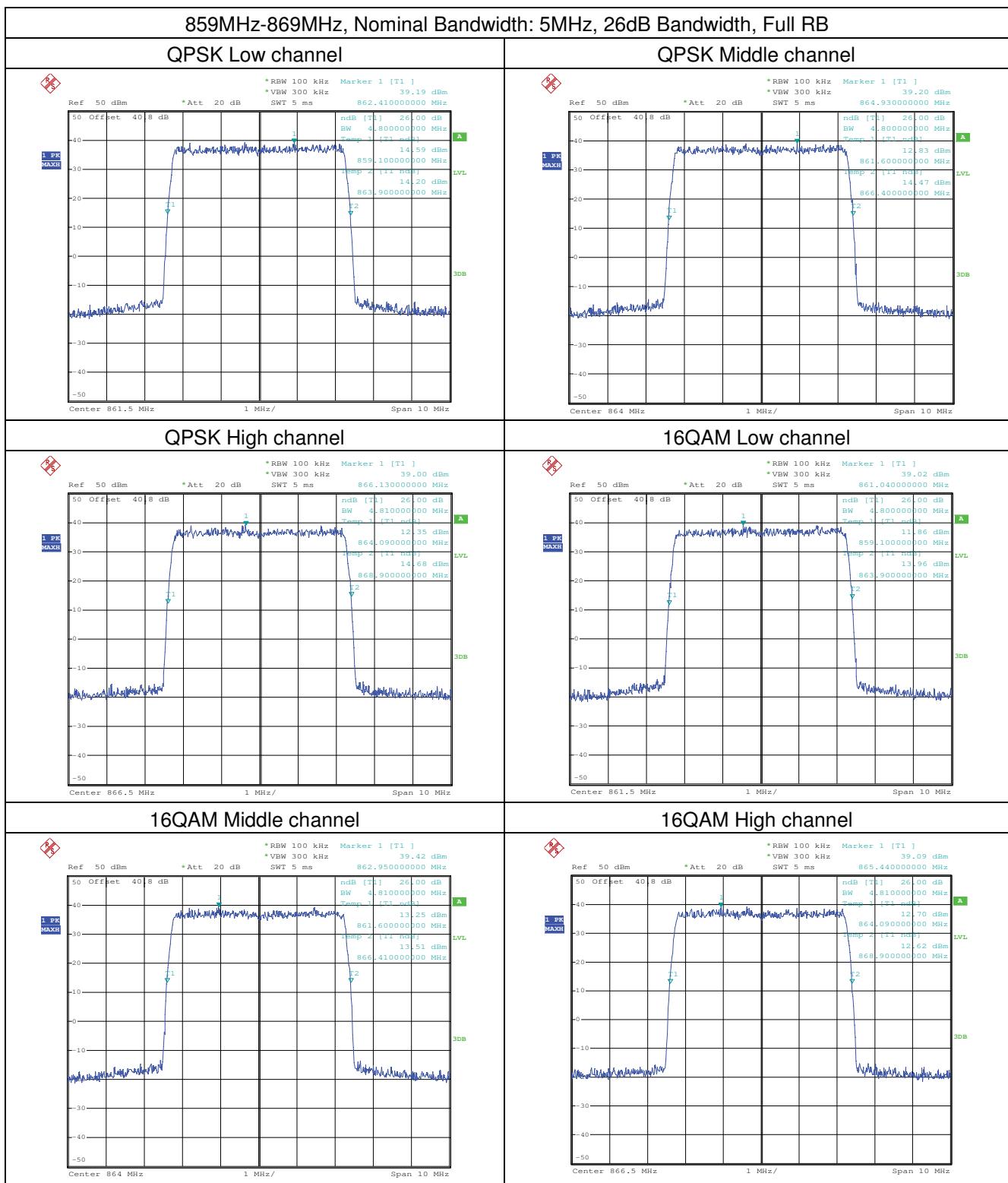
Test plot for 859MHz-869MHz/26dB Bandwidth:

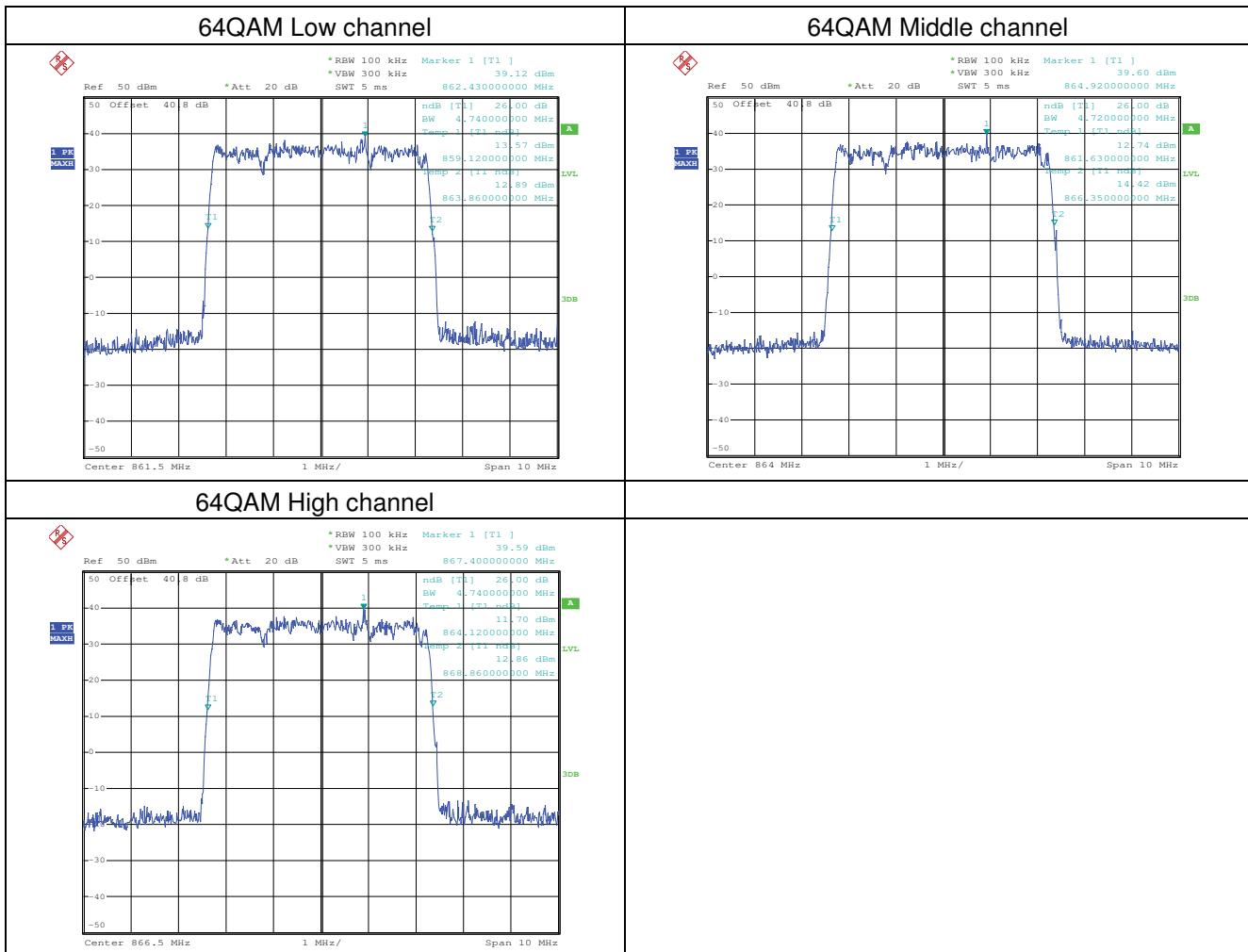


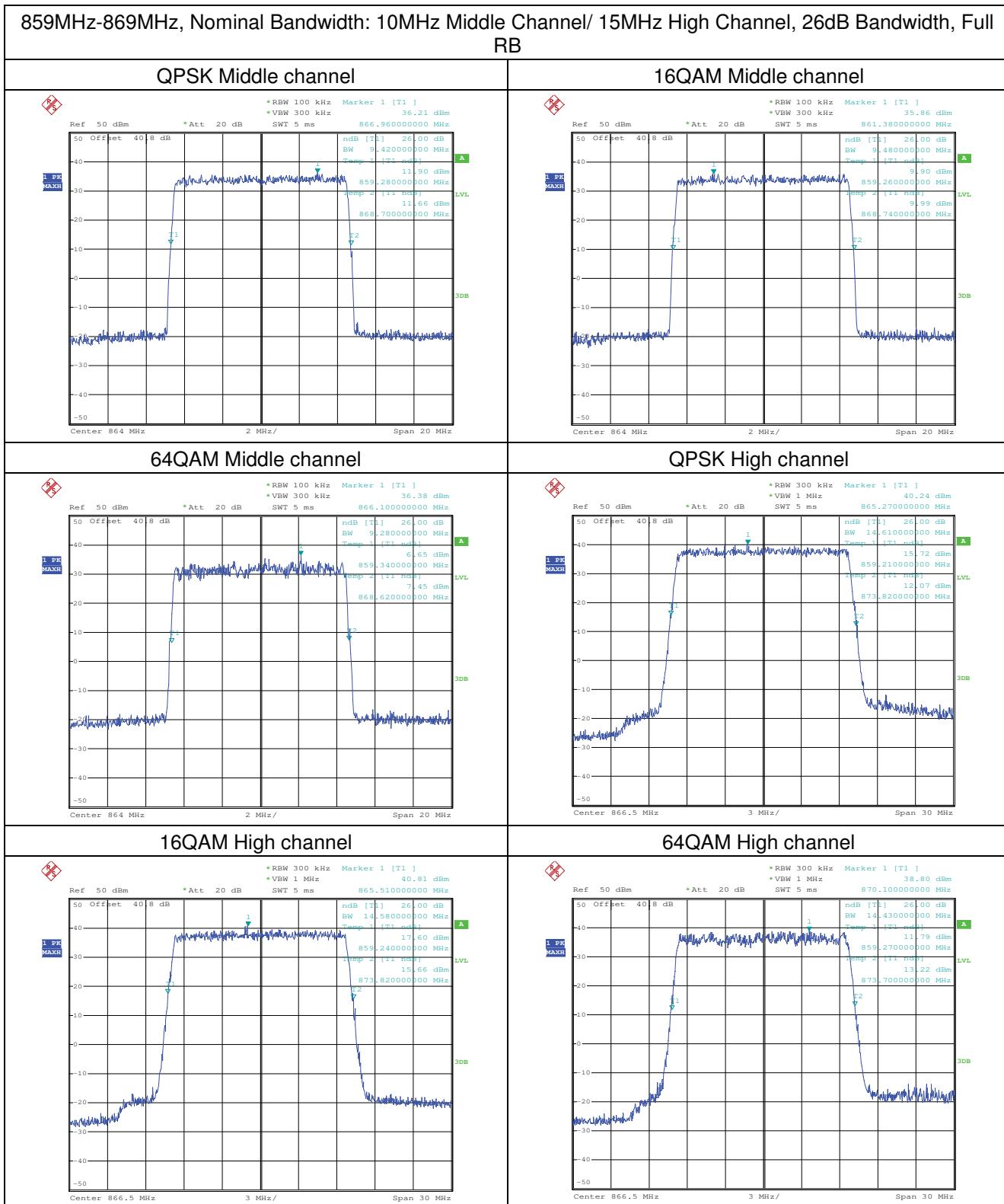




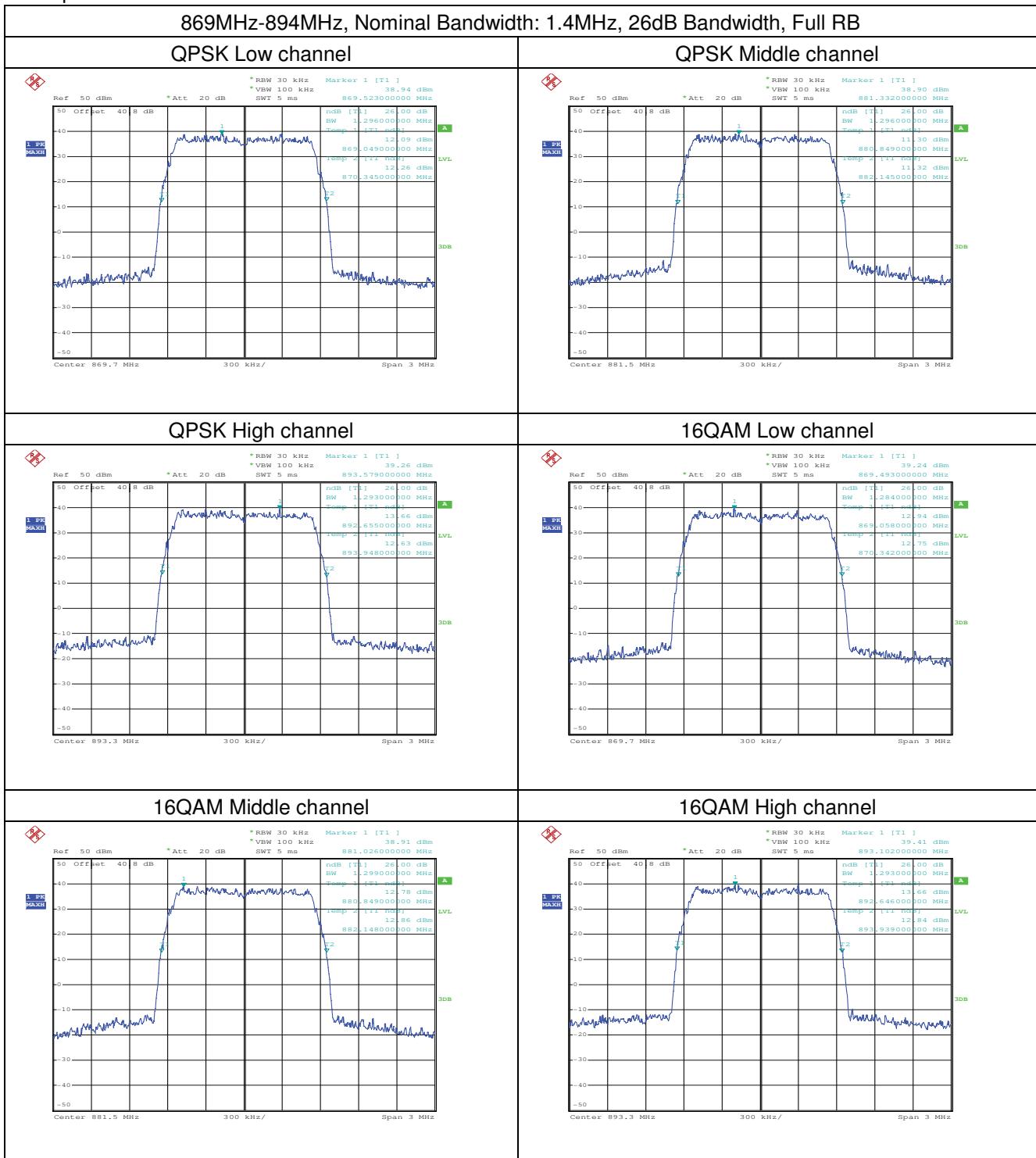


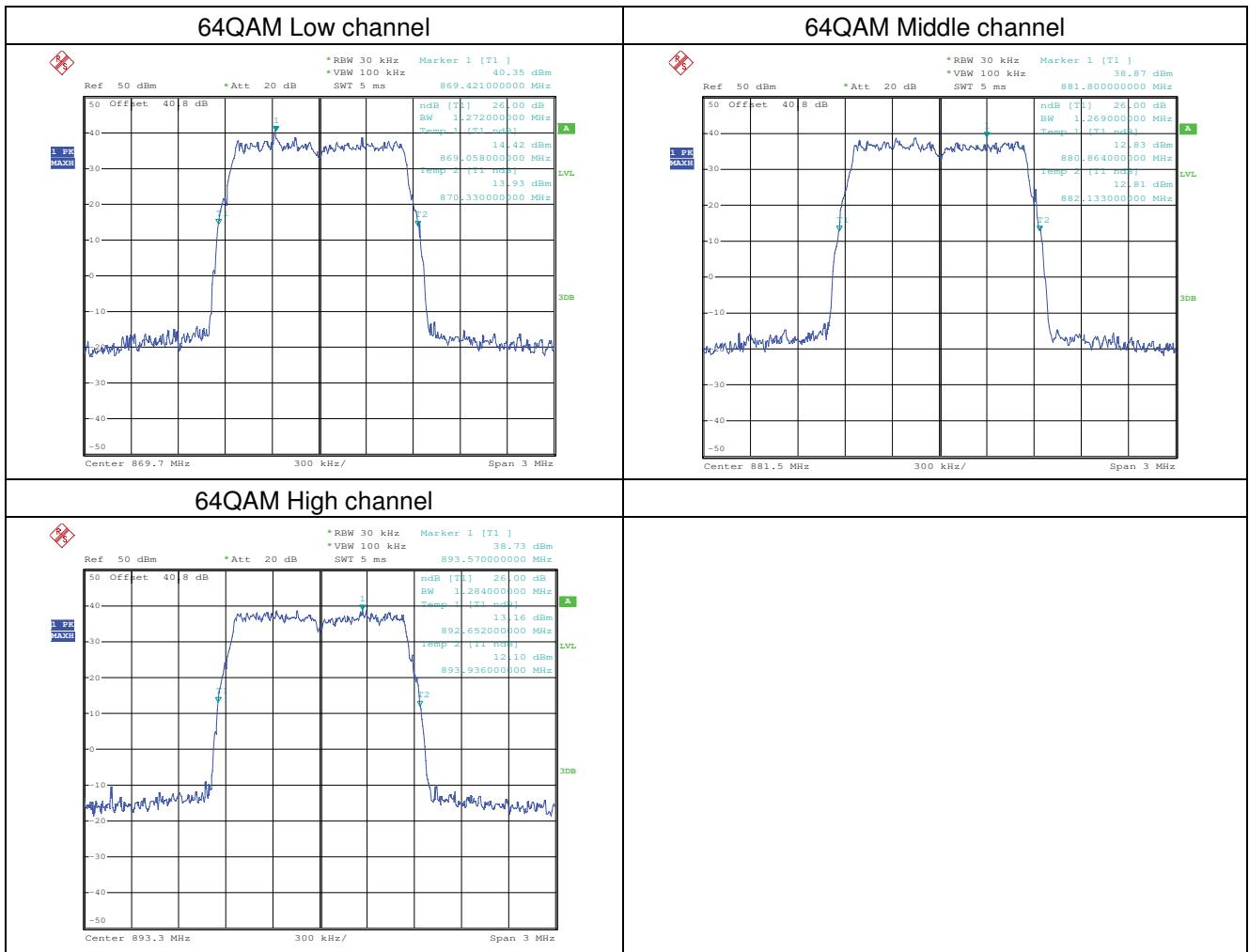


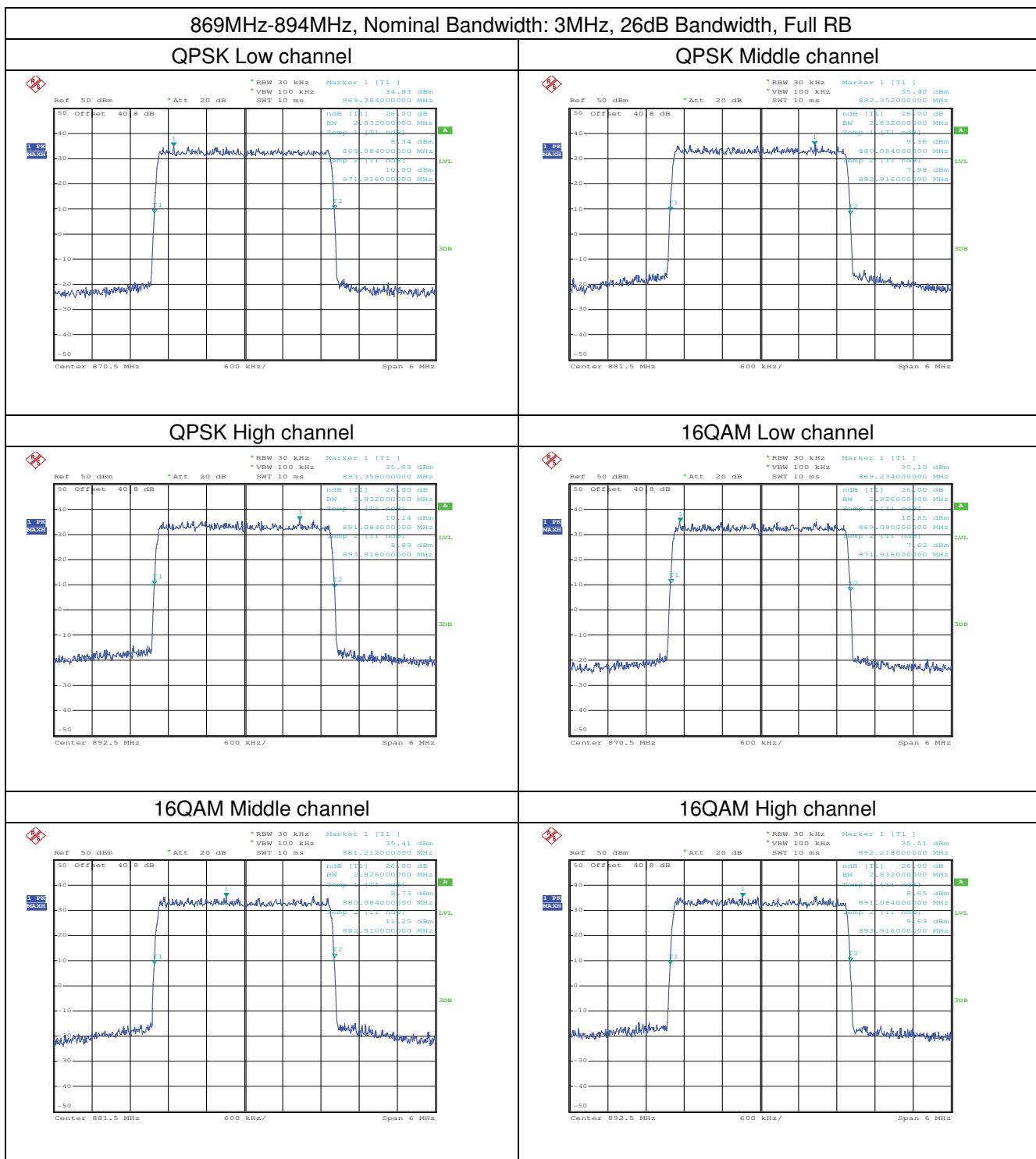


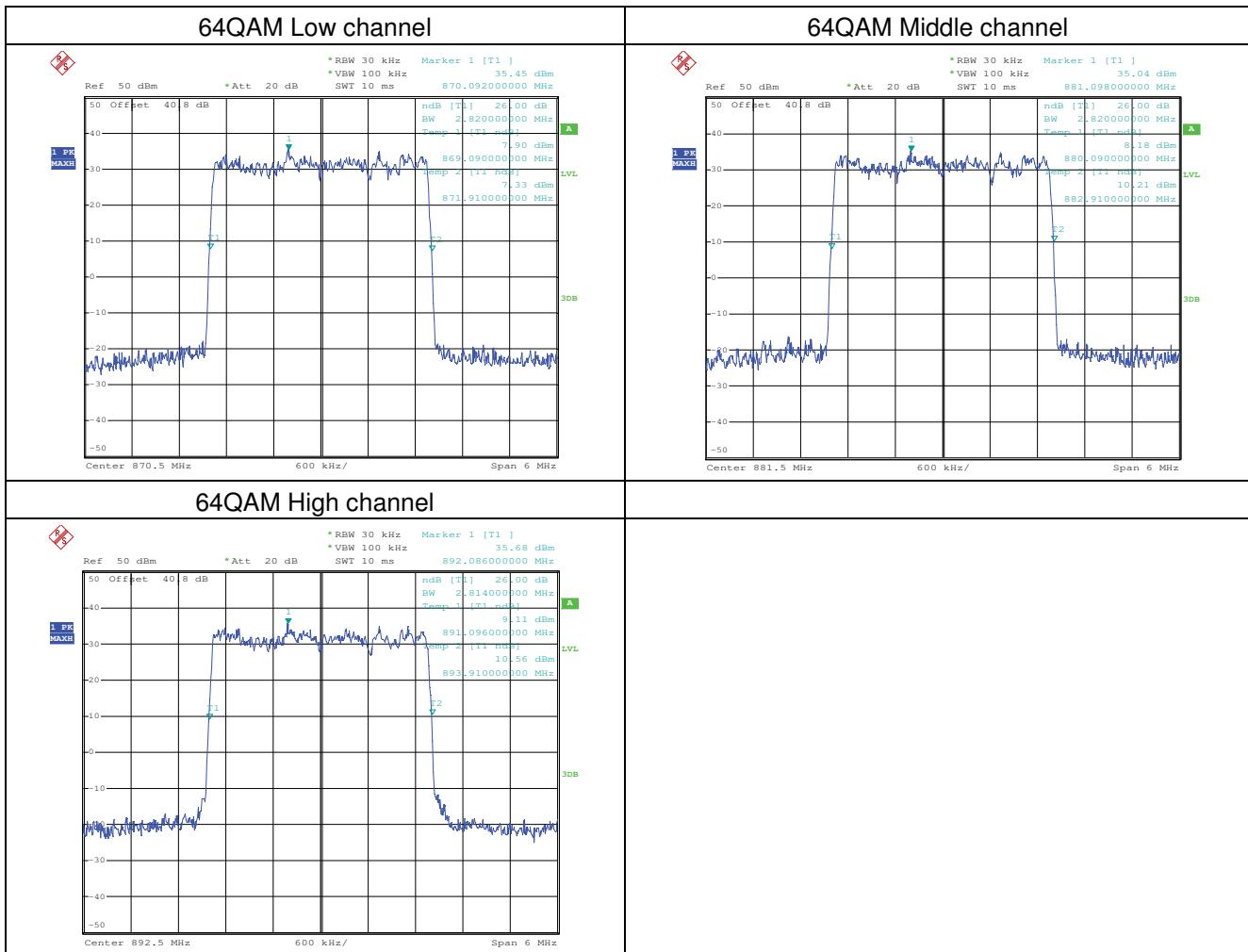


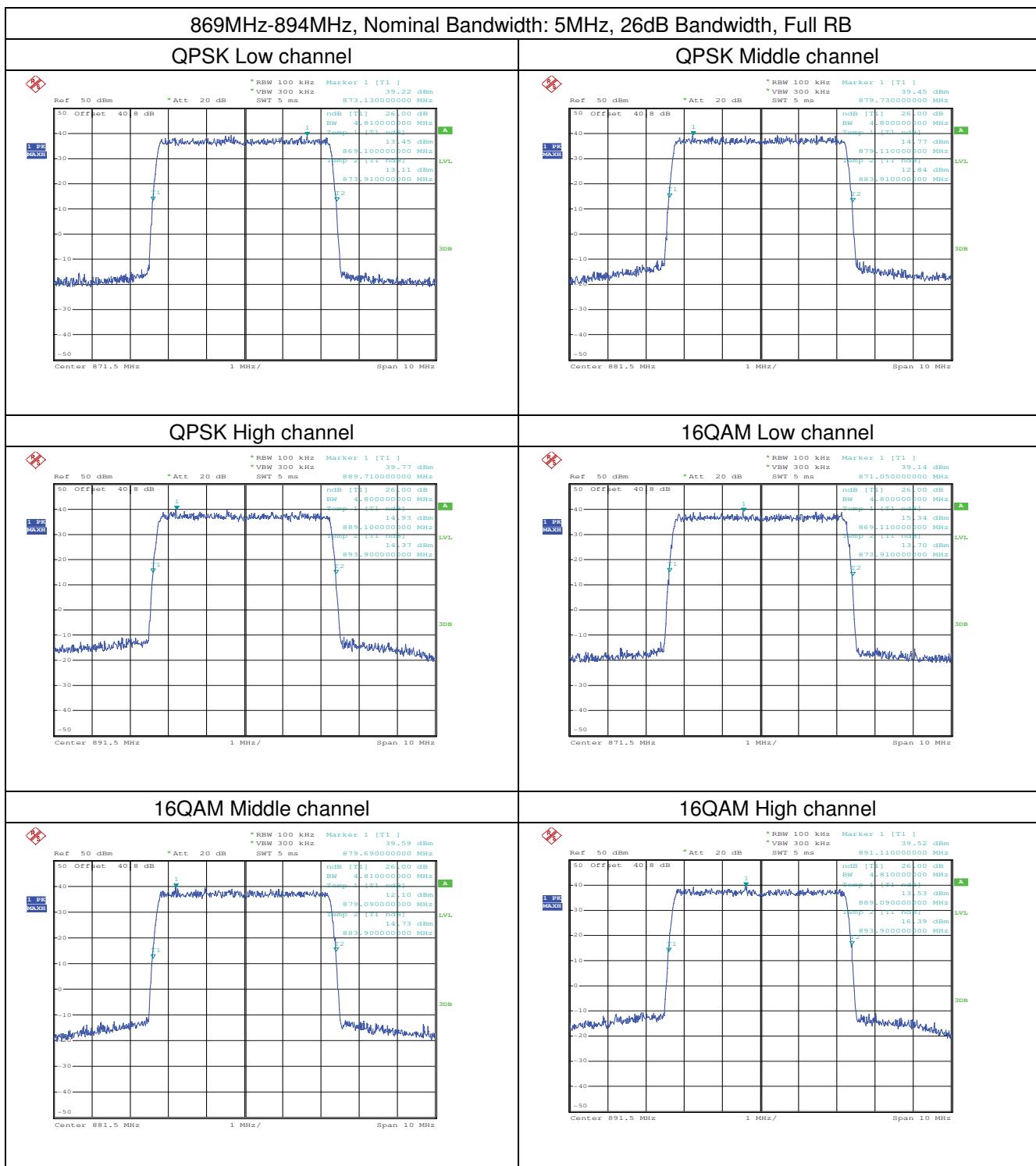
Test plot for 869MHz-894MHz/26dB Bandwidth:

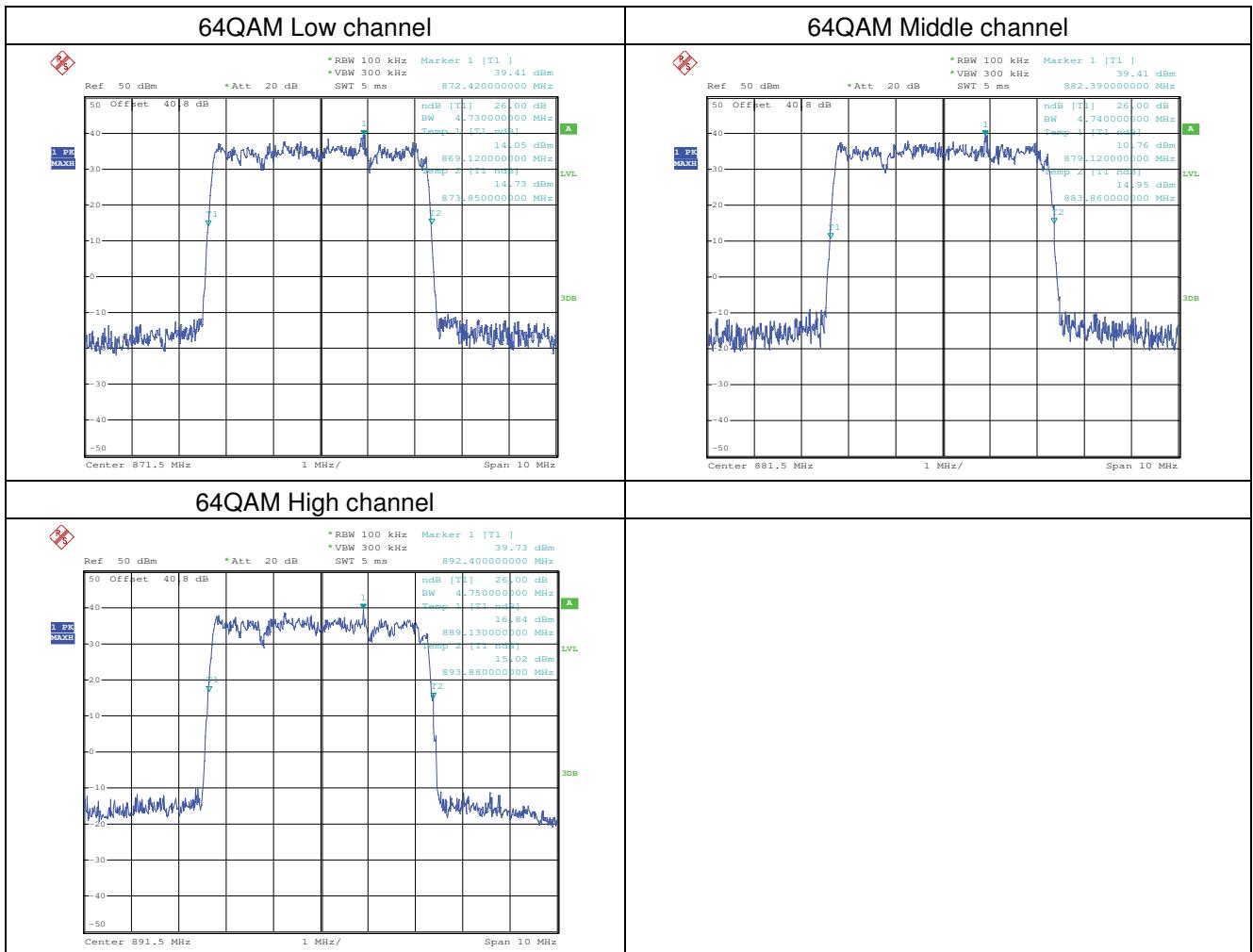


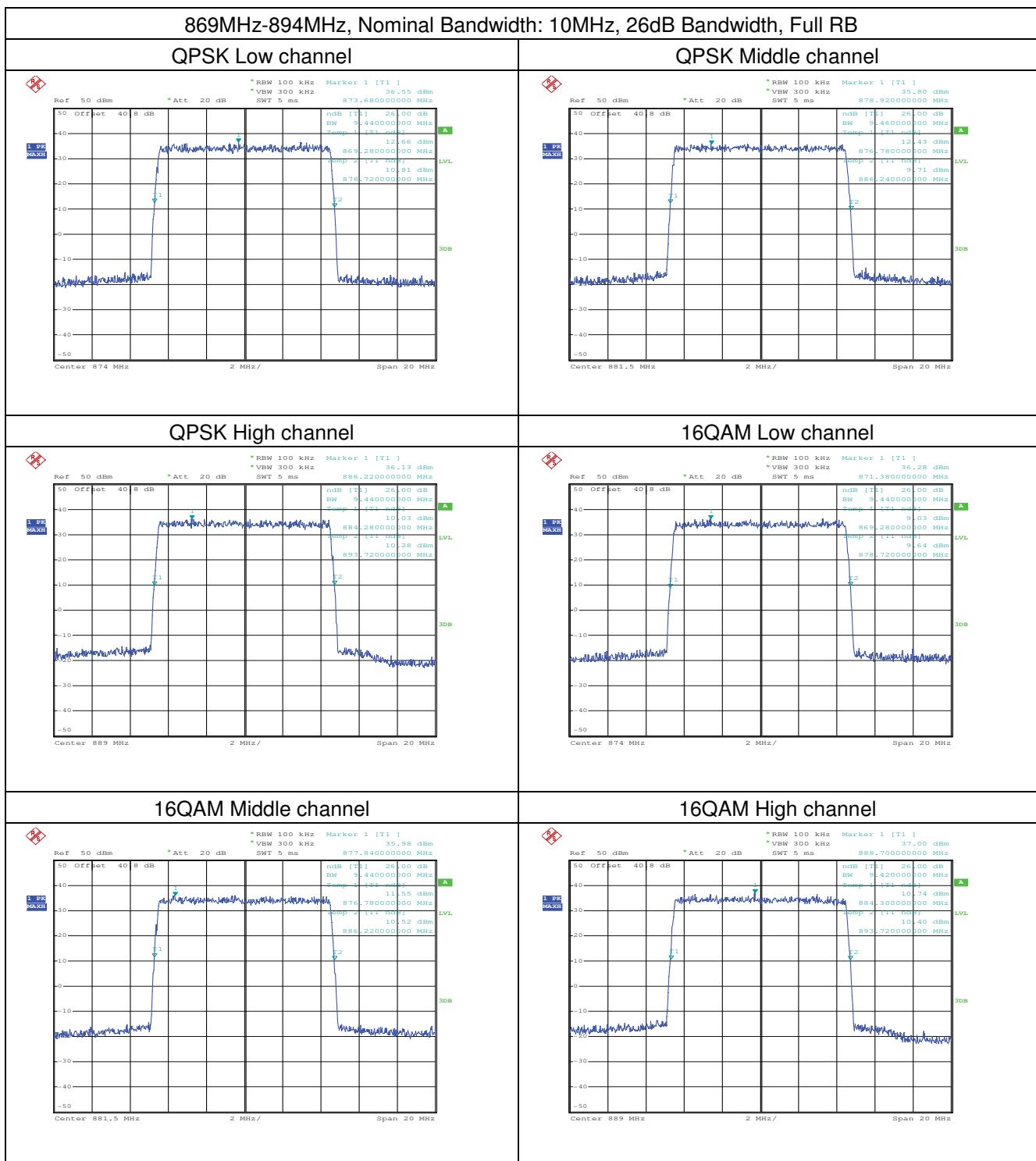


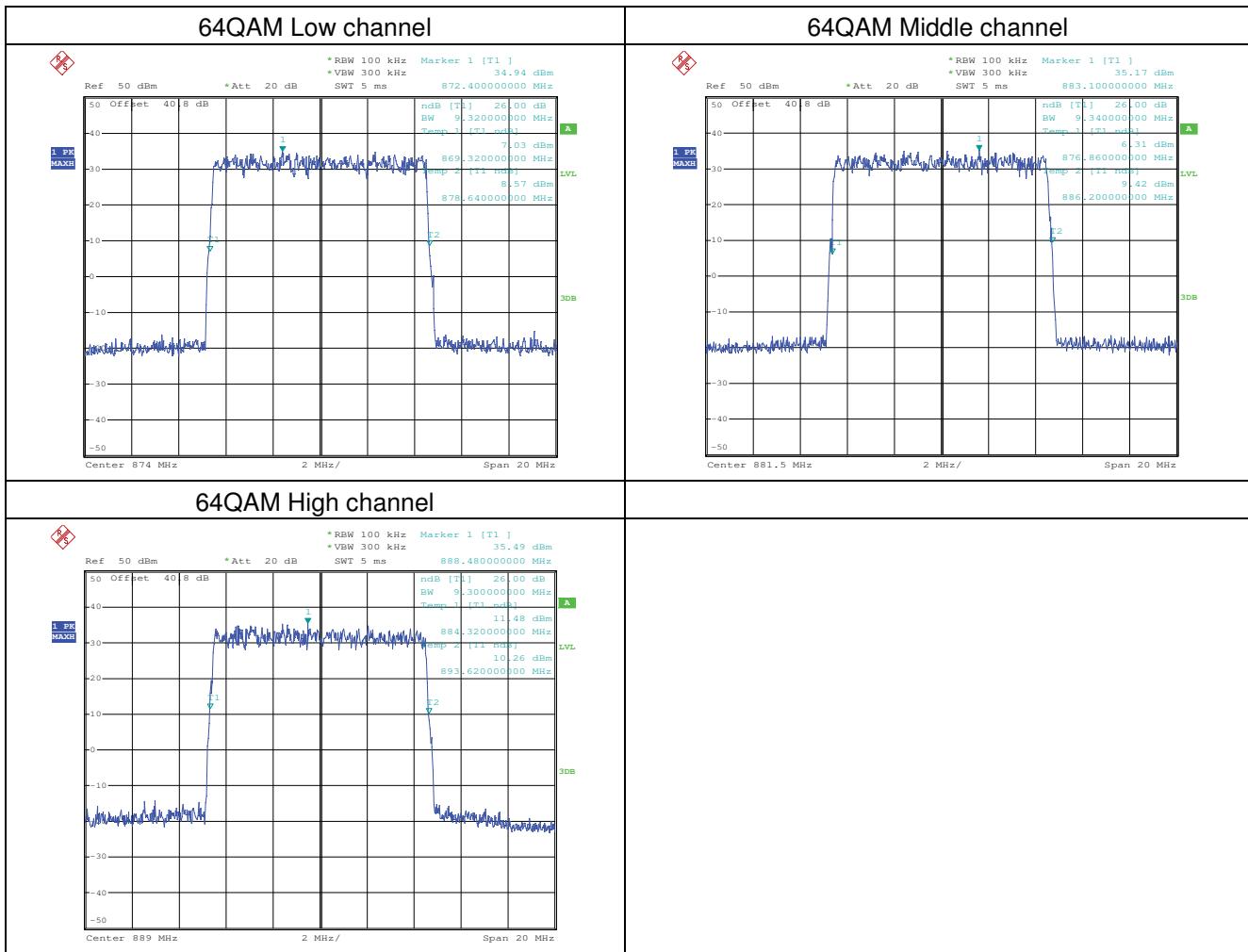


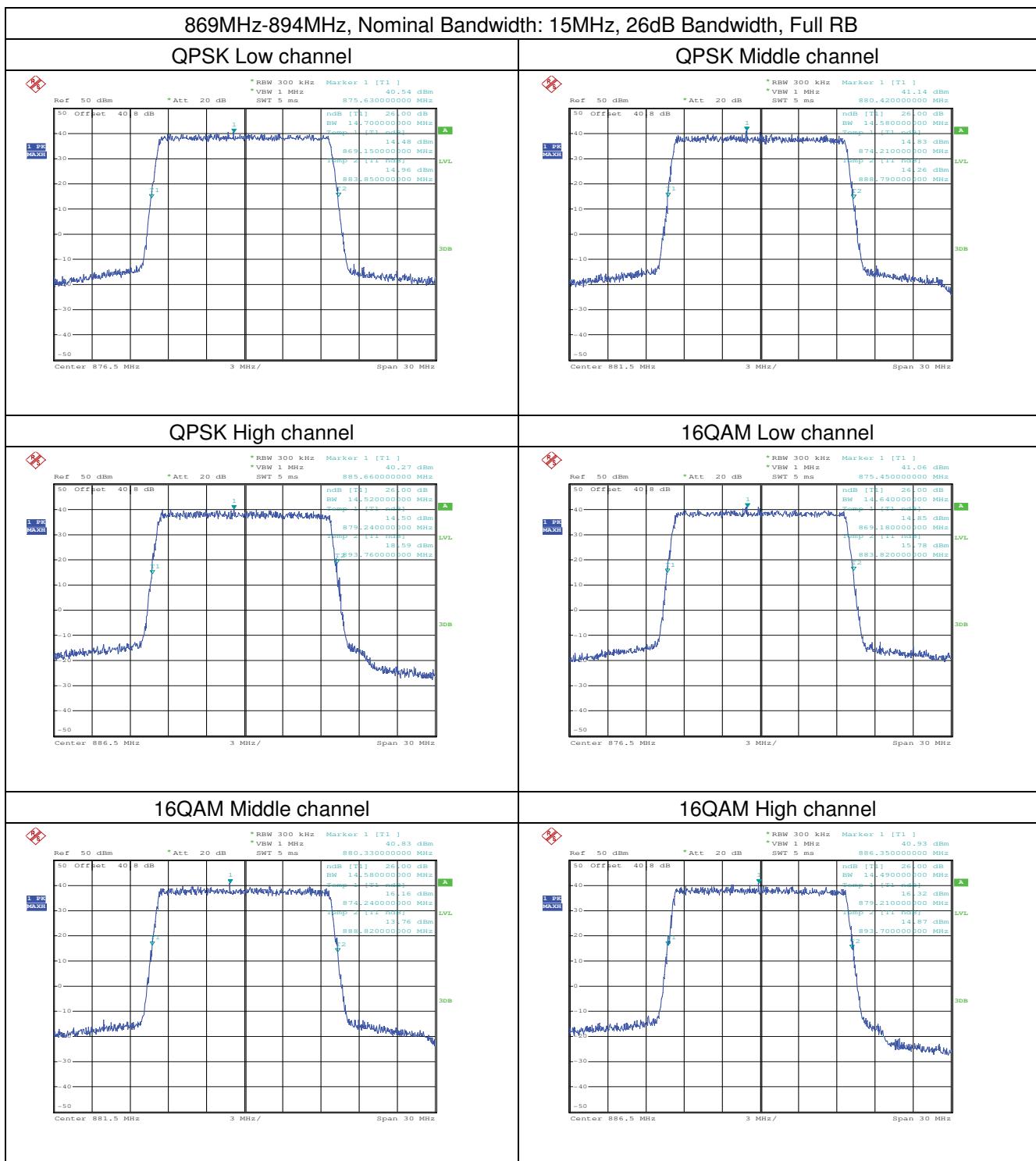


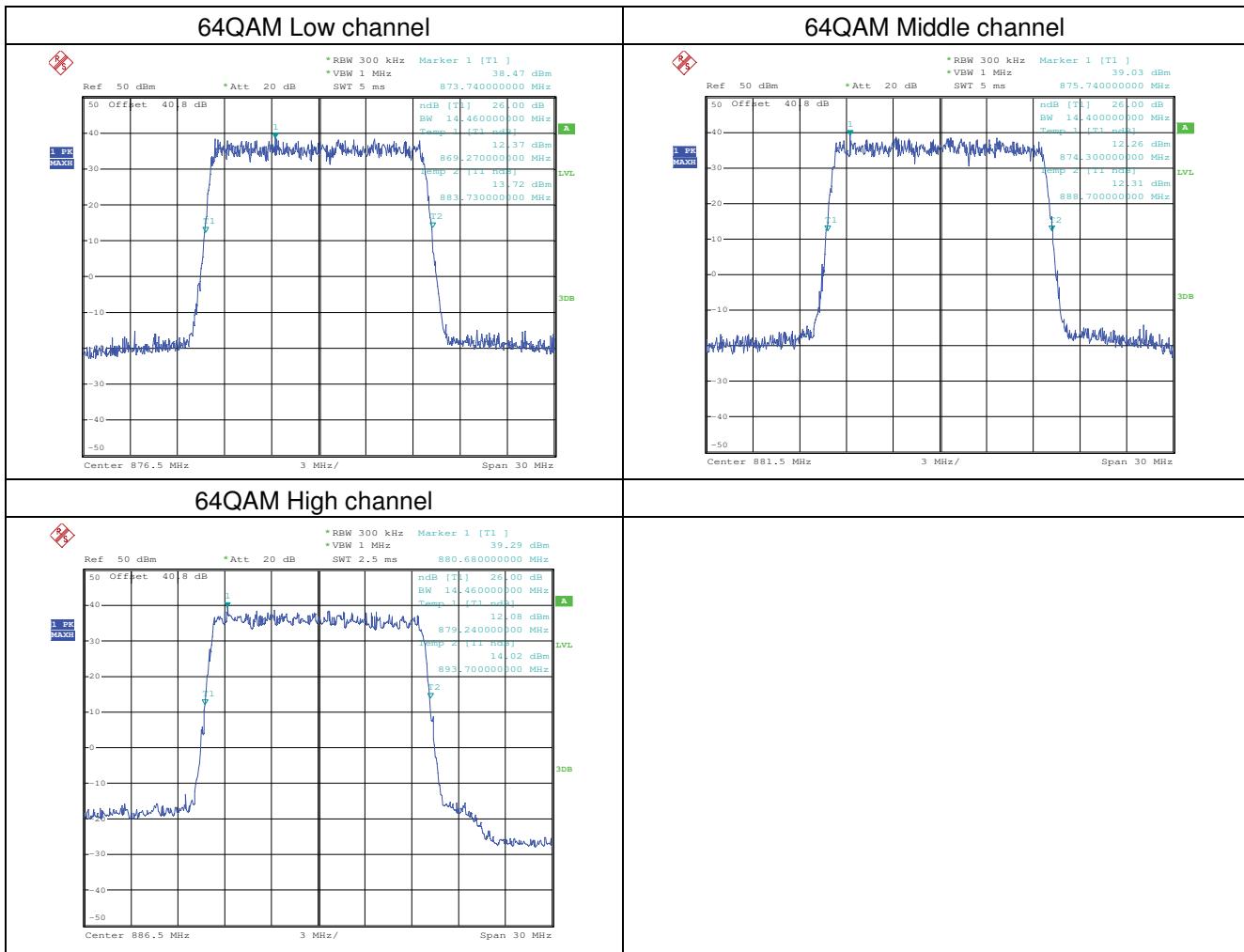












6.4 Band Edge Compliance

Test Requirement: §2.1051, §22.917, §90.691

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: $\leq -13\text{dBm}/1\% \times \text{EBW}$, in 1 MHz bands immediately outside and adjacent to the frequency block(for 869MHz-894MHz)

$\leq 50 + 10 \times \log_{10}(P)$ at bandedge and for all out-of-band emissions within 37.5KHz of block edge(for 859MHz-869MHz)

$\leq 43 + 10 \times \log_{10}(P)$ at bandedge and for all out-of-band emissions greater than 37.5KHz of block edge(for 859MHz-869MHz)

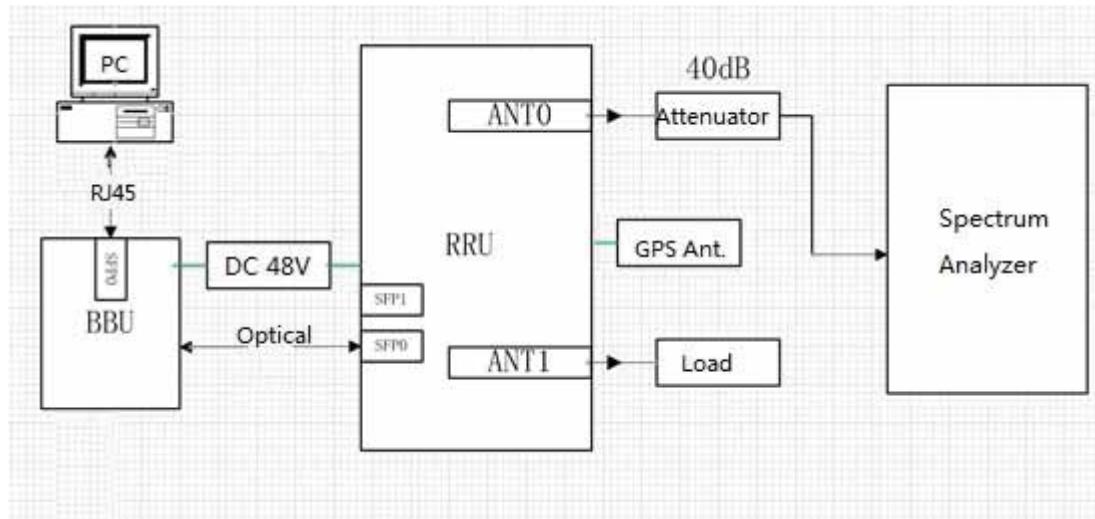
6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar

Test mode: b: Tx mode, Keep the EUT in transmitting mode.

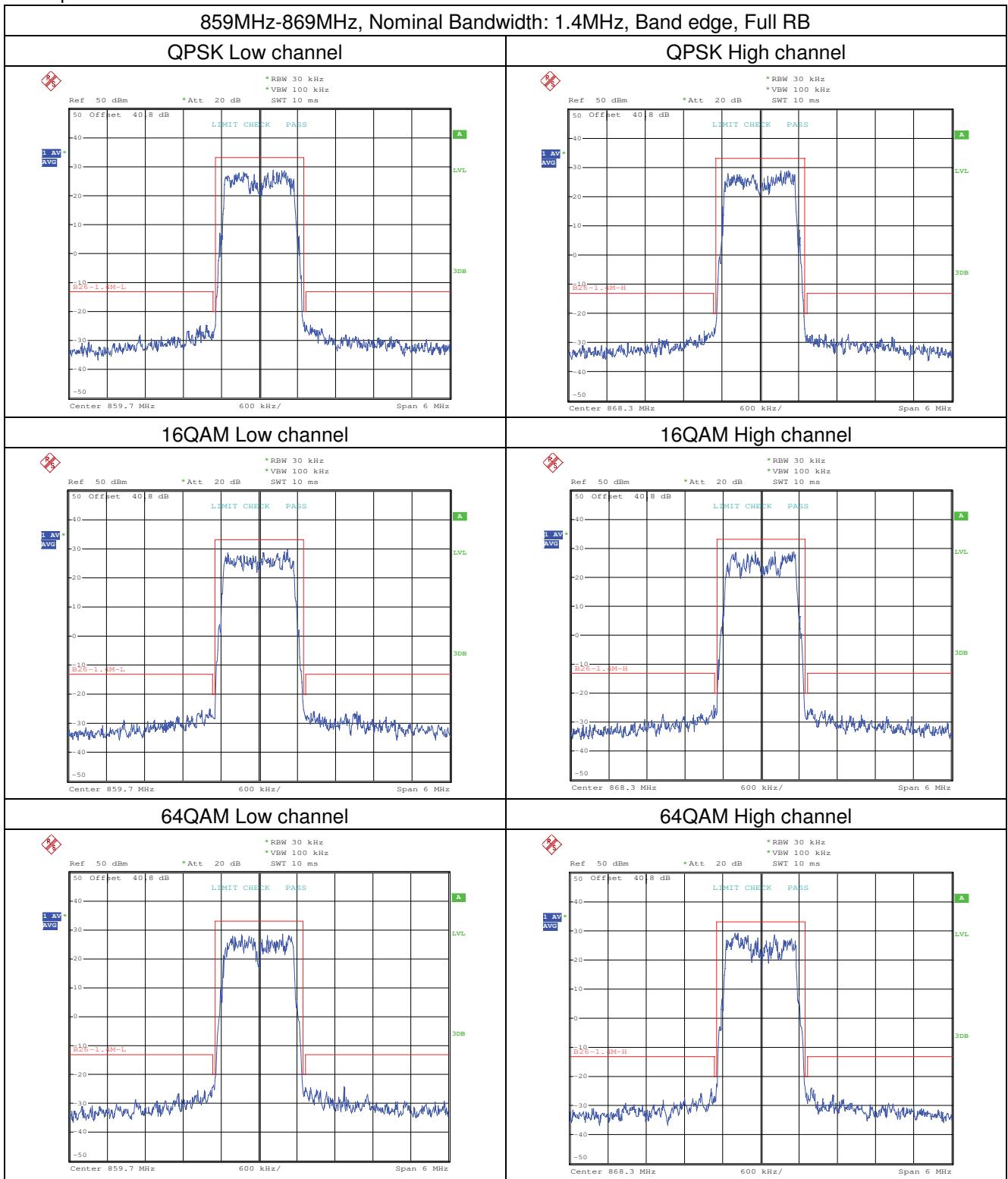
6.4.2 Test Setup Diagram

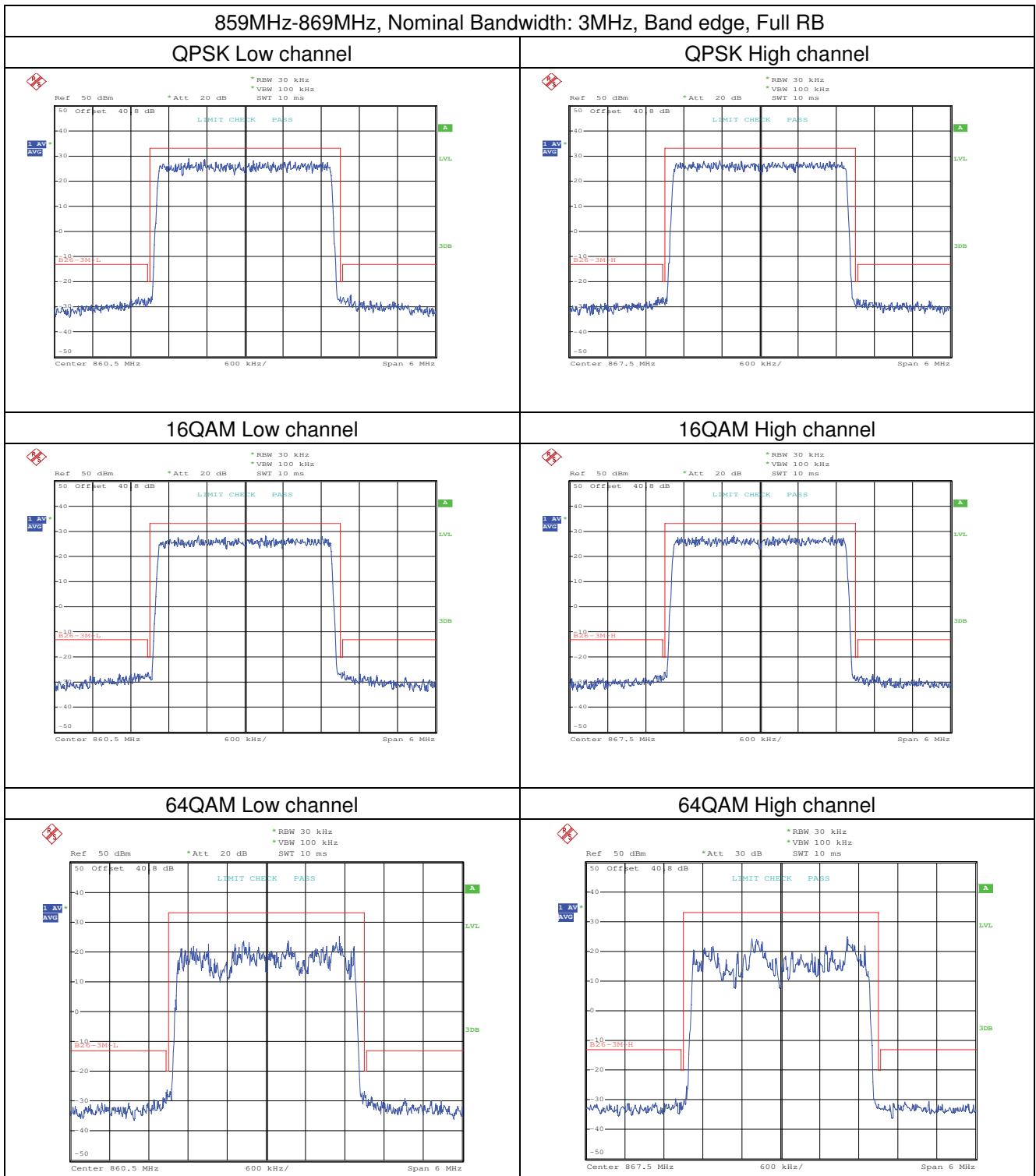


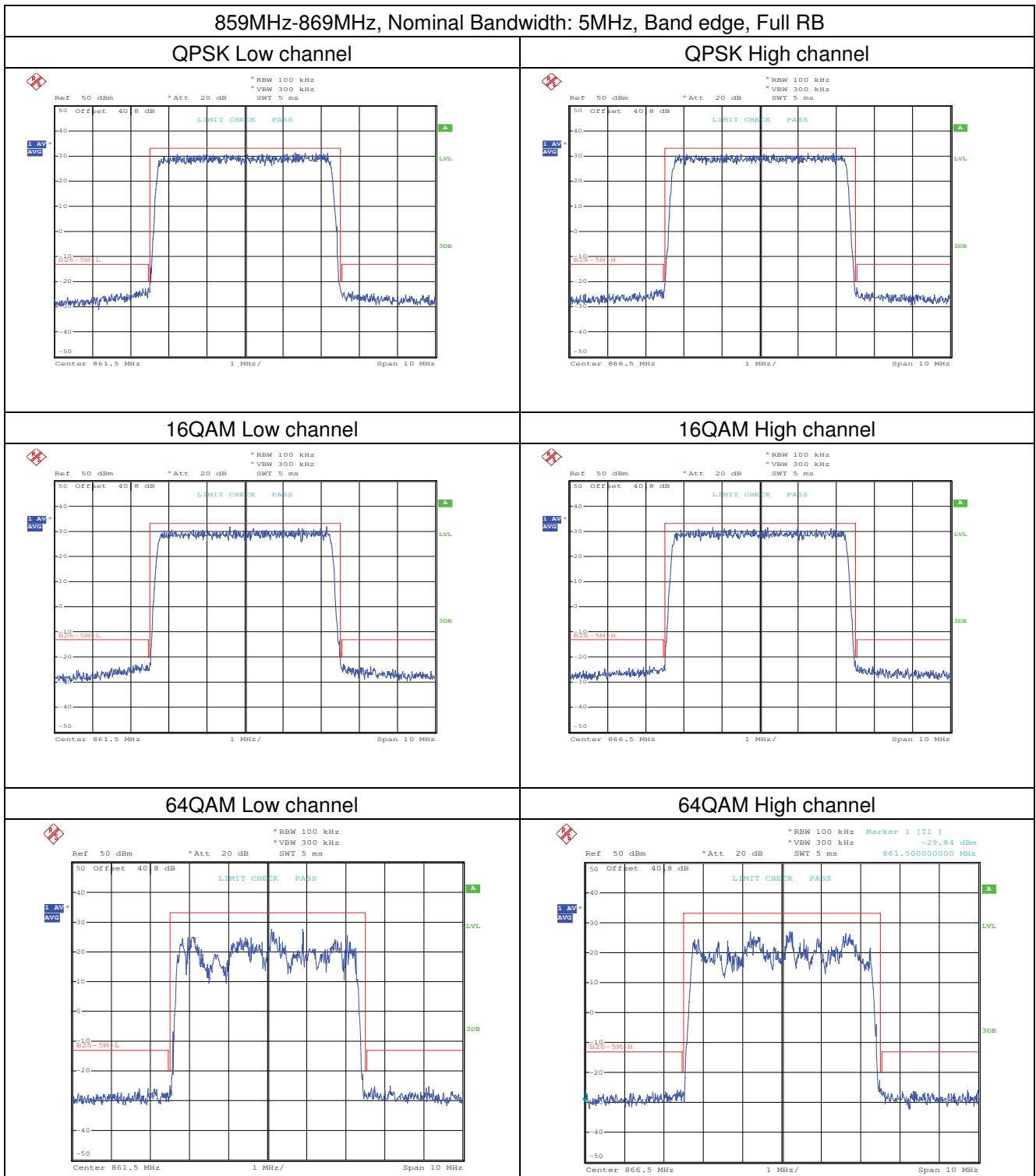
6.4.3 Measurement Data

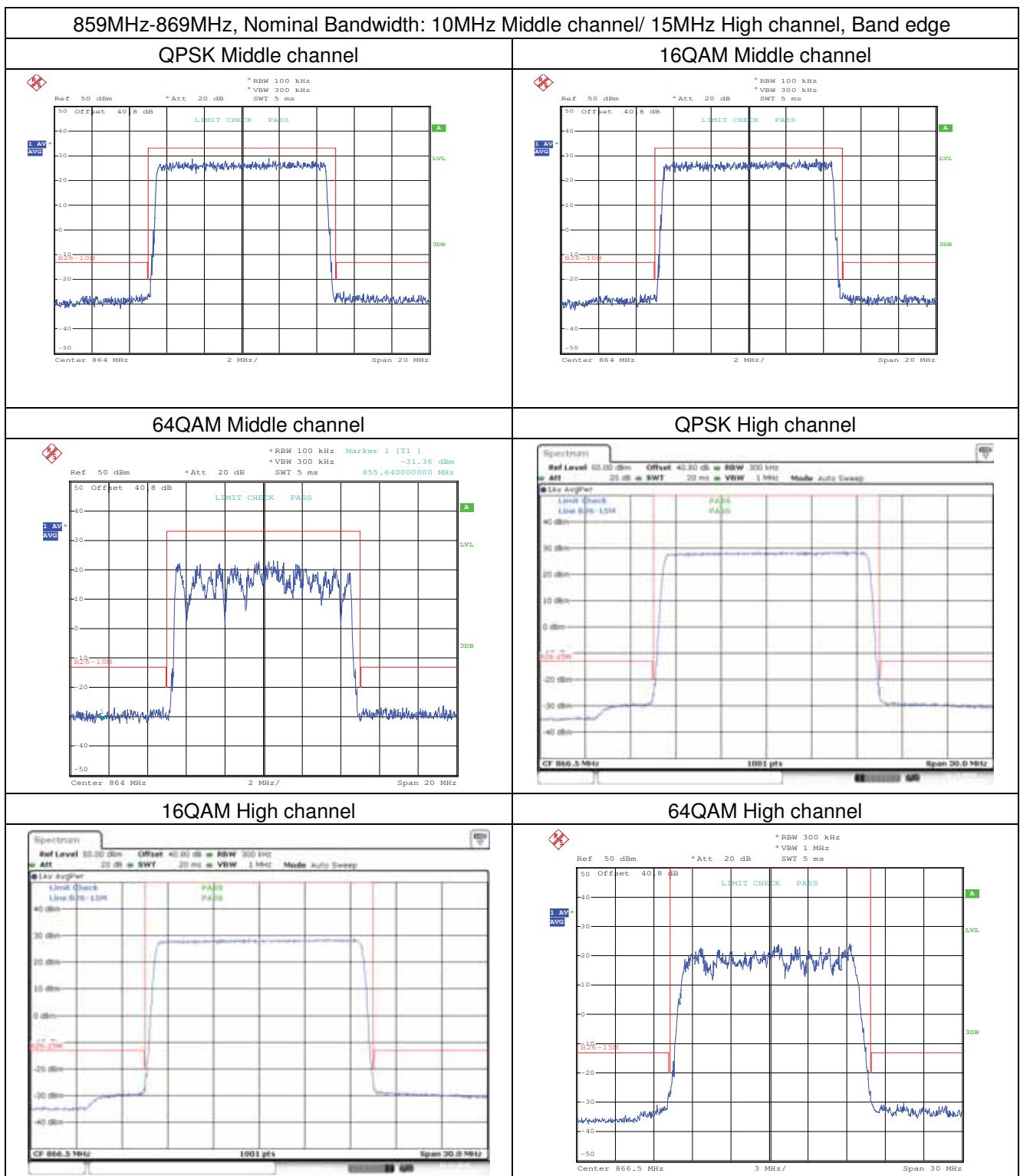
For the MIMO output from 2 TX-antenna connectors, each antenna port were measured individually and each individual limit was reduced by $10 \times \log(2)$. Limit line was calculated to show -16dB emission limit, according to FCC KDB 622911 D01.

Test plot for 859MHz-869MHz:

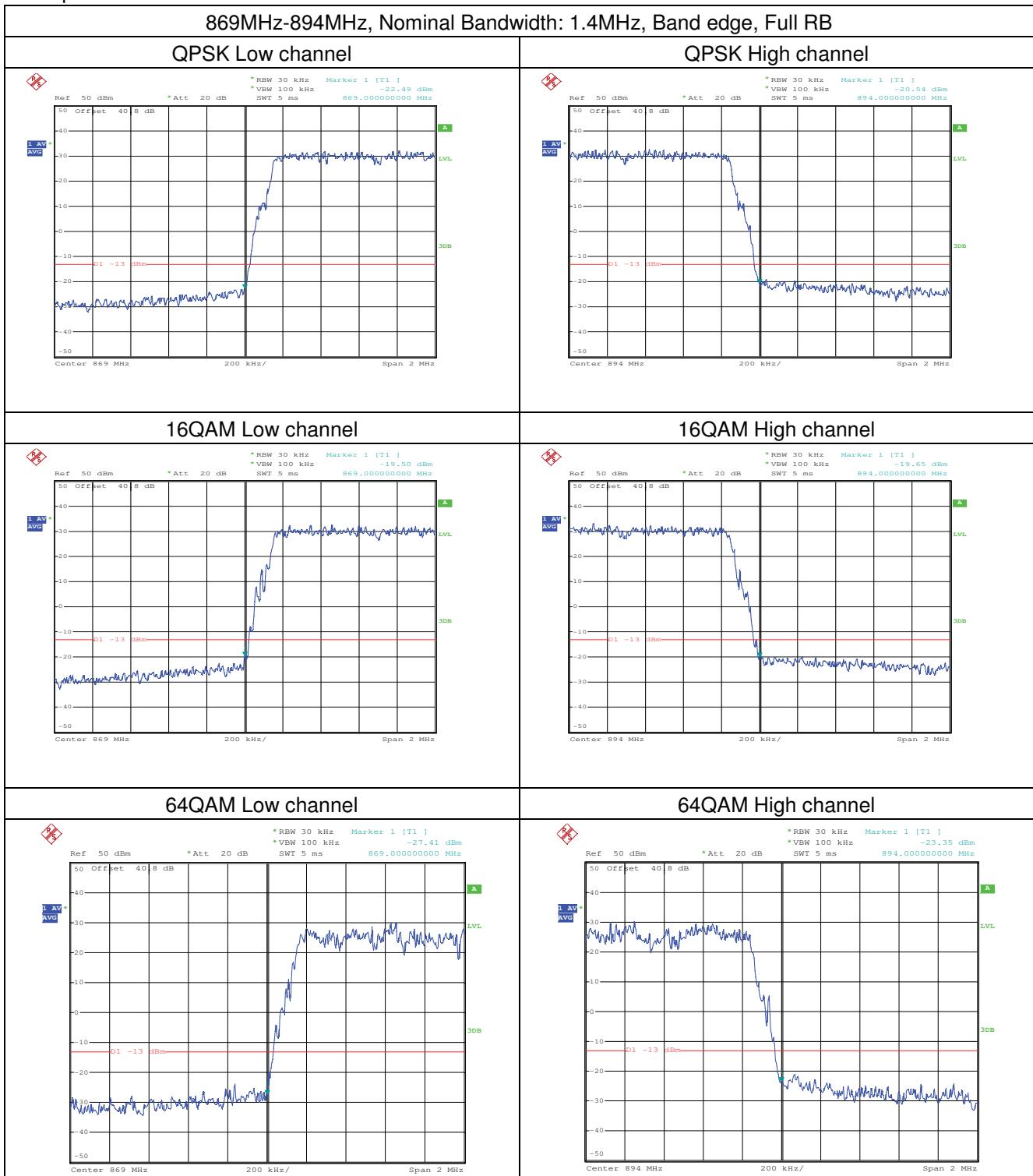


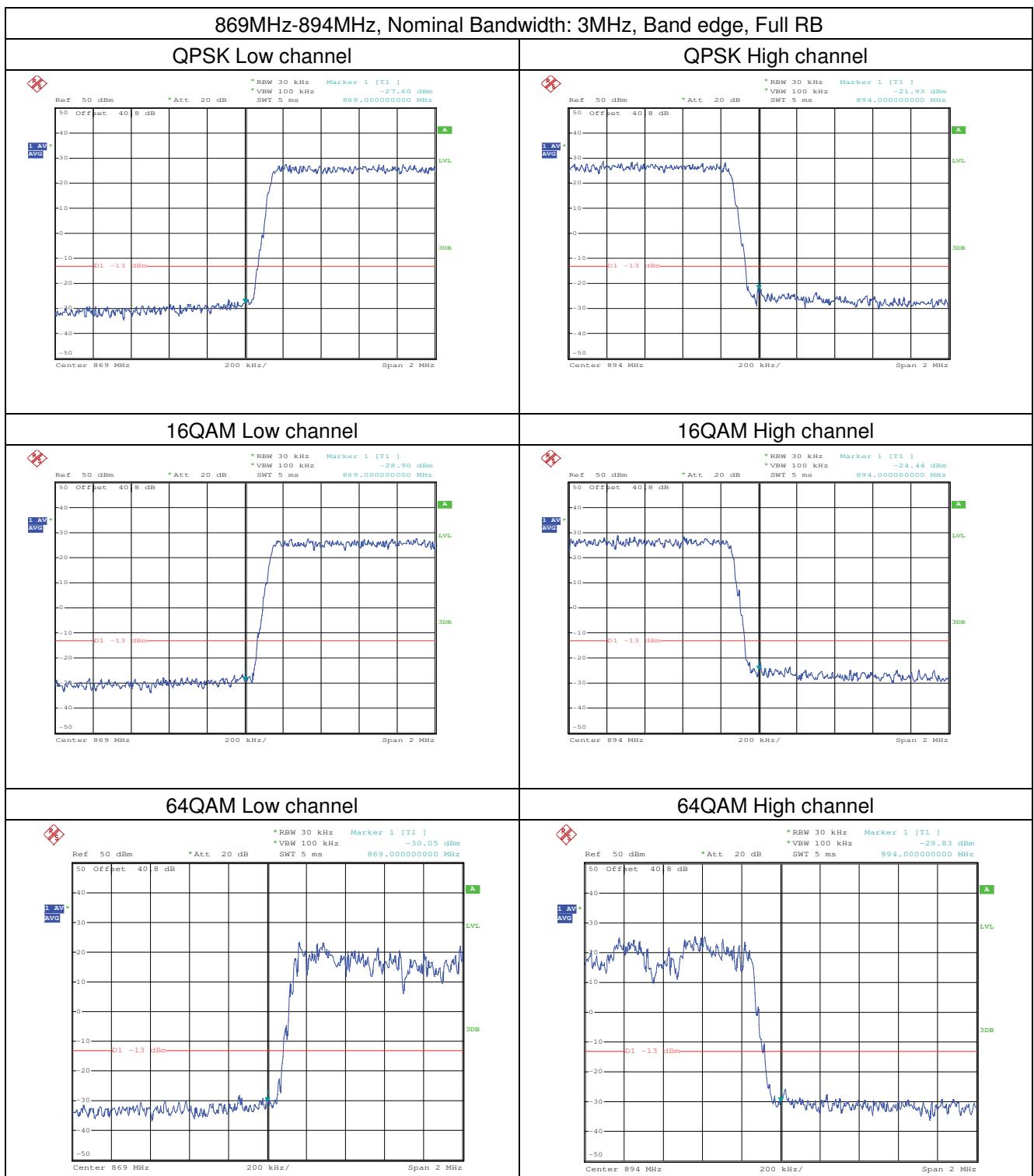


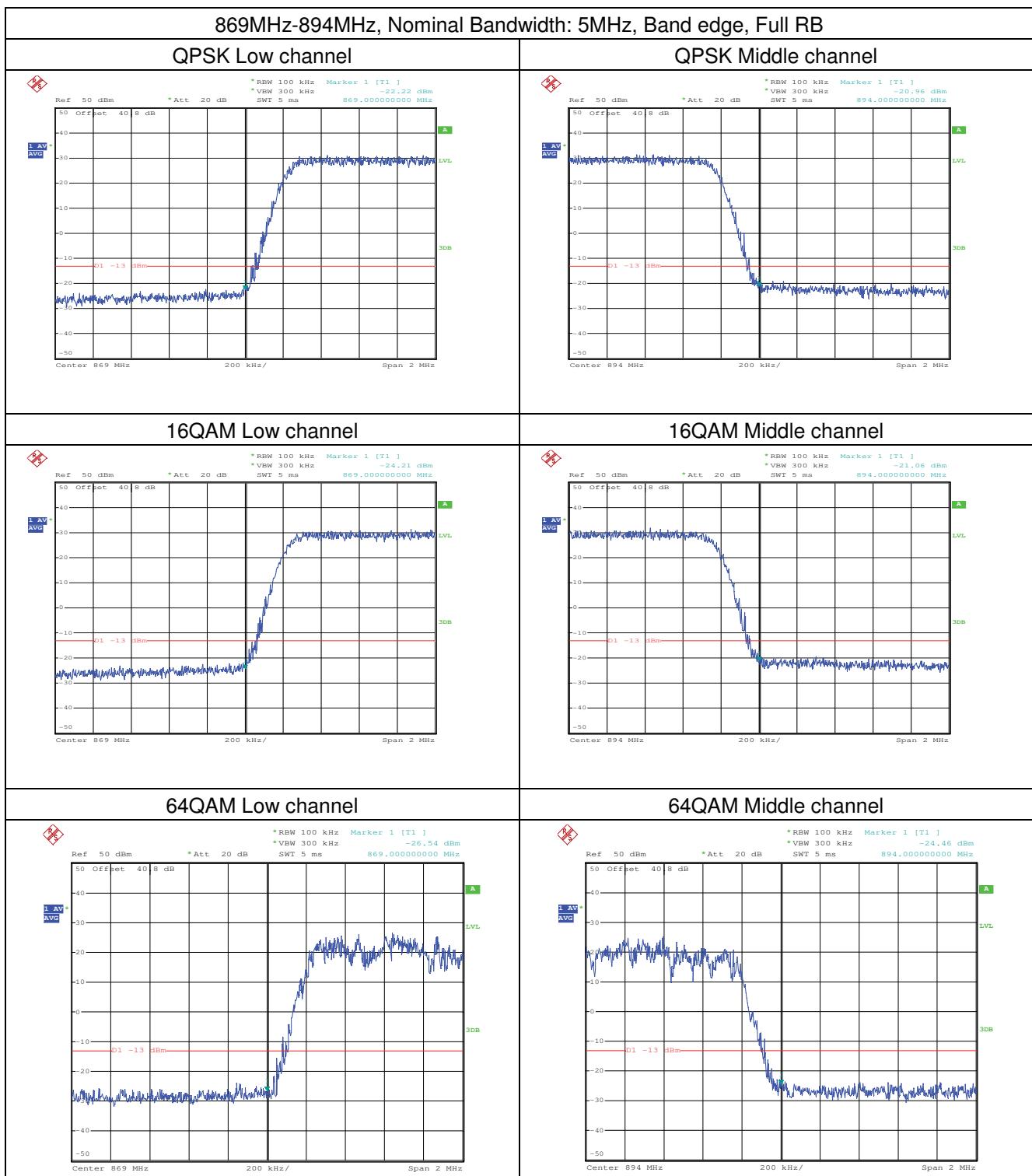


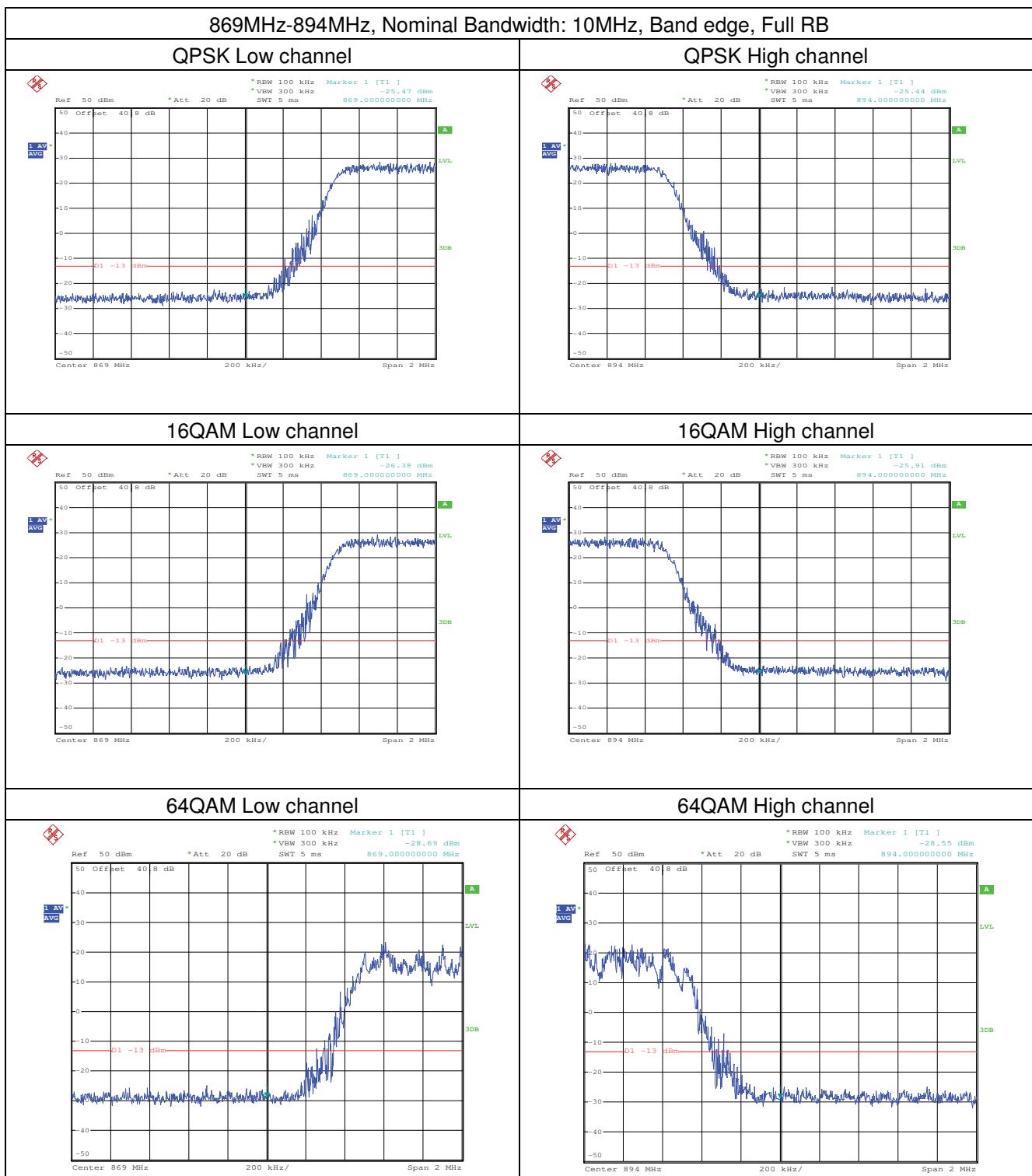


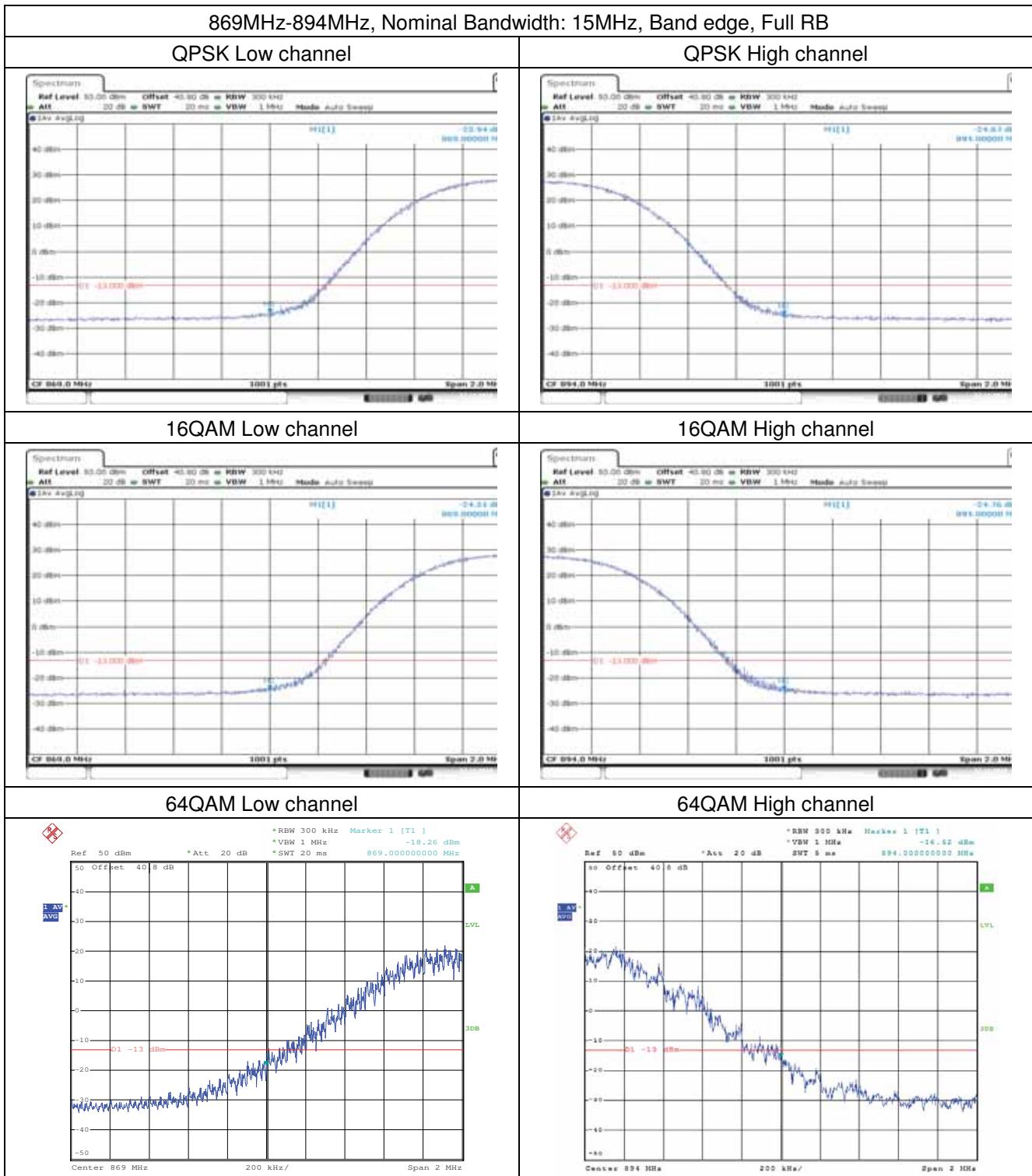
Test plot for 869MHz-894MHz:











6.5 Spurious emissions at antenna terminals

Test Requirement: §2.1051, §22.917, §90.691

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ≤ -13dBm

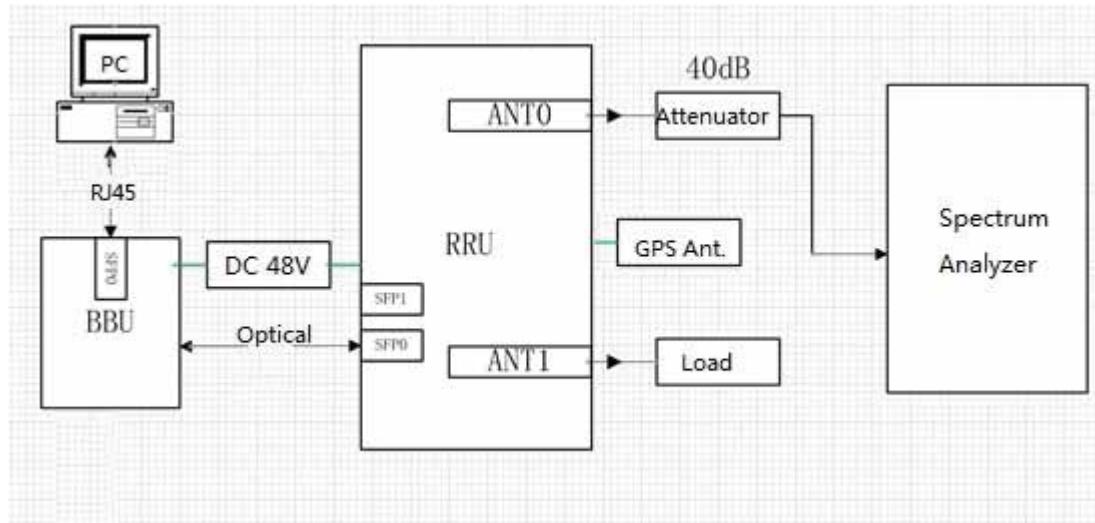
6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar

Test mode: b: Tx mode, Keep the EUT in transmitting mode.

6.5.2 Test Setup Diagram



6.5.3 Measurement Data

For the MIMO output from 2 TX-antenna connectors, each antenna port were measured individually and each individual limit was reduced by $10 \times \log(2)$. Limit line was calculated to show -16dB emission limit, according to FCC KDB 622911 D01.

Test plot for 859MHz-869MHz:

