ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22H, PART 24E, PART 27C and PART 90S ISED RSS-130, 132, 133, 139 REQUIREMENT

OF

FCC Applicant:	Keep Truckin, Inc. 55 Hawthorne St, San Francisco, CA 94105 USA
IC Applicant:	Keep Truckin, Inc. 55 Hawthorne St, San Francisco, CA 94105 USA
Product Name:	Asset Gateway
Brand Name:	KeepTruckin
Model No.:	AG-55
Model Difference:	N/A
FCC ID:	2AQM7-AG55
IC:	24516-AG55
Report Number:	ER/2019/80104
FCC Rule Part:	2 , 22H & 24E & 27C & L & 90S
ISED Rule:	RSS-130, 132, 133, 139,
Issue Date:	Sep. 27, 2019
Date of Test:	Aug. 19, 2019 ~ Sep. 09, 2019
Date of EUT Received:	Aug. 19, 2019

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26-2015 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Prepared By:

Gary Lee / Engineer

Approved By:

Blue Yang / Asst. Manager

Testing Laboratory
0513

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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
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1 GENERAL PRODUCT INFORMATION

1.1 Product Description

General:

Product Name:	Asset Gateway	
Brand Name:	KeepTruckin	
Model No.:	AG-55	
Model Difference:	N/A	
Hardware Version:	N/A	
Software Version:	N/A	
Power Supply:	3.6Vdc from Rechargeable Li-polymer Battery	
	Battery:	Model No.: BJ-X55XX-4KXKUQ, Supplier: Kunshan Million Gold Tian Yu Trading Co., Ltd.
IMEI:	356726104291370	

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1.2 Frequency Range

1.2.1 NB IoT

NB IoT Band	Subcarrier Spacing (kHz)	Operation Frequency (MHz)
2	3.75	1850.1 - 1909.9
	15	
4	3.75	1710.1 - 1754.9
	15	
5	3.75	824.1 - 848.9
	15	
12	3.75	699.1 - 715.9
	15	
13	3.75	777.1 - 786.9
	15	
	15	
26	3.75	824.1 - 848.9
	15	
26 Part 90	3.75	814.1 - 823.9

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1.2.2 Cat. M1

M1 Band	BW (MHz)	Operation Frequency (MHz)			M1 Band	BW (MHz)	Operation Frequency (MHz)		
2	1.4	1850.7	-	1909.3	26	1.4	824.7	-	848.3
	3	1851.5	-	1908.5		3	825.5	-	847.5
	5	1852.5	-	1907.5		5	826.5	-	846.5
	10	1855.0	-	1905.0		10	829.0	-	844.0
	15	1857.5	-	1902.5		15	831.5	-	841.5
	20	1860.0	-	1900.0	26 Part90	1.4	814.7	-	823.3
4	1.4	1710.7	-	1754.3		3	815.5	-	822.5
	3	1711.5	-	1753.5		5	816.5	-	821.5
	5	1712.5	-	1752.5		10	819.0		
	10	1715.0	-	1750.0					
	15	1717.5	-	1747.5					
	20	1720.0	-	1745.0					
5	1.4	824.7	-	848.3					
	3	825.5	-	847.5					
	5	826.5	-	846.5					
	10	829.0	-	844.0					
12	1.4	699.7	-	715.3					
	3	700.5	-	714.5					
	5	701.5	-	713.5					
	10	704.0	-	711.0					
13	5	779.5	-	784.5					
	10	782							

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Antenna Designation

Antenna Type	Supplier	Antenna Part No.	Main / Aux	Note
Monopole	INPAQ	WA-F-LTE8-03-005-B	Main	Ant 1

Operating Frequency (MHz)		Ant 1 Peak Antenna Gain (dBi)
LTE-Band 2	1850.1 ~ 1909.9	5.36
LTE-Band 4	1710.1 ~ 1754.9	4.30
LTE-Band 5	824.1 ~ 848.9	-1.63
LTE-Band 12	699.1 ~ 715.9	-0.36
LTE-Band 13	777.1 ~ 786.9	0.18
LTE-Band 26	824.1 ~ 848.9	-1.63
LTE-Band 26 Part 90	814.1 ~ 823.9	-1.68

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1.3 Type of Emission & Max ERP/EIRP Power Measurement Result:

1.3.1 NB IoT

NB IoT Band	Modulation	ERP / EIRP (dBm)		(W)	99% BW (kHz)	Type of Emission
2	BPSK	28.31	EIRP	0.678	229.00	229KG7D
2	QPSK	28.33	EIRP	0.681	222.32	222KG7D
NB IoT Band	Modulation	ERP / EIRP (dBm)		(W)	99% BW (kHz)	Type of Emission
4	BPSK	27.12	EIRP	0.515	230.08	230KG7D
4	QPSK	27.25	EIRP	0.531	222.91	223KG7D
NB IoT Band	Modulation	ERP / EIRP (dBm)		(W)	99% BW (kHz)	Type of Emission
5	BPSK	21.22	ERP	0.132	223.60	224KG7D
5	QPSK	21.01	ERP	0.126	221.84	222KG7D
NB IoT Band	Modulation	ERP / EIRP (dBm)		(W)	99% BW (kHz)	Type of Emission
12	BPSK	23.32	ERP	0.215	223.32	223KG7D
12	QPSK	23.30	ERP	0.214	225.64	226KG7D

NB IoT Band	Modulation	ERP / EIRP (dBm)		(W)	99% BW (kHz)	Type of Emission
13	BPSK	23.12	ERP	0.205	224.10	224KG7D
13	QPSK	23.05	ERP	0.202	221.54	222KG7D
NB IoT Band	Modulation	ERP / EIRP (dBm)		(W)	99% BW (kHz)	Type of Emission
26	BPSK	21.48	ERP	0.141	224.12	224KG7D
26	QPSK	21.45	ERP	0.140	221.00	221KG7D
NB IoT Band	Modulation	ERP / EIRP (dBm)		(W)	99% BW (kHz)	Type of Emission
26 Part90	BPSK	21.13	ERP	0.130	276.90	277KG7D
26 Part90	QPSK	21.11	ERP	0.129	276.20	276KG7D

1.3.2 Cat. M1

M1 Band	BW	Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
2	1.4	QPSK	27.98	EIRP	0.628	1.0926	1M09G7D
		16QAM	27.90	EIRP	0.617	1.1023	1M10D7W
2	3	QPSK	27.99	EIRP	0.630	1.2203	1M22G7D
		16QAM	27.73	EIRP	0.593	1.1997	1M20D7W
2	5	QPSK	27.99	EIRP	0.630	1.4435	1M44G7D
		16QAM	28.63	EIRP	0.729	1.2842	1M28D7W
2	10	QPSK	27.72	EIRP	0.592	1.9901	1M99G7D
		16QAM	28.62	EIRP	0.728	2.6042	2M60D7W
2	15	QPSK	27.99	EIRP	0.630	2.300	2M30G7D
		16QAM	28.72	EIRP	0.745	2.293	2M29D7W
2	20	QPSK	28.57	EIRP	0.719	3.325	3M33G7D
		16QAM	28.57	EIRP	0.719	2.763	2M76D7W

M1 Band	BW	Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
4	1.4	QPSK	26.89	EIRP	0.489	1.0986	1M10G7D
		16QAM	26.77	EIRP	0.475	1.1017	1M10D7W
4	3	QPSK	26.91	EIRP	0.491	1.2129	1M21G7D
		16QAM	26.65	EIRP	0.462	1.1868	1M19D7W
4	5	QPSK	26.98	EIRP	0.499	1.3107	1M31G7D
		16QAM	27.59	EIRP	0.574	1.2488	1M25D7W
4	10	QPSK	26.73	EIRP	0.471	2.0659	2M07G7D
		16QAM	27.44	EIRP	0.555	2.0817	2M08D7W
4	15	QPSK	26.96	EIRP	0.497	2.324	2M32G7D
		16QAM	26.92	EIRP	0.492	2.284	2M28D7W
4	20	QPSK	26.97	EIRP	0.498	2.716	2M72G7D
		16QAM	26.98	EIRP	0.499	2.357	2M36D7W

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M1 Band	BW	Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
5	1.4	QPSK	21.15	ERP	0.130	1.0964	1M10G7D
		16QAM	20.92	ERP	0.124	1.0985	1M10D7W
5	3	QPSK	21.08	ERP	0.128	1.2042	1M20G7D
		16QAM	20.90	ERP	0.123	1.1805	1M18D7W
5	5	QPSK	21.21	ERP	0.132	1.7009	1M70G7D
		16QAM	21.74	ERP	0.149	1.2383	1M24D7W
5	10	QPSK	21.08	ERP	0.128	2.2606	2M26G7D
		16QAM	21.73	ERP	0.149	2.5460	2M55D7W
M1 Band	BW	Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
12	1.4	QPSK	23.03	ERP	0.201	1.0975	1M10G7D
		16QAM	22.50	ERP	0.178	1.0978	1M10D7W
12	3	QPSK	23.01	ERP	0.200	1.2173	1M22G7D
		16QAM	22.67	ERP	0.185	1.1856	1M19D7W
12	5	QPSK	23.07	ERP	0.203	1.3468	1M35G7D
		16QAM	23.45	ERP	0.221	1.2886	1M29D7W
12	10	QPSK	23.01	ERP	0.200	2.3087	2M31G7D
		16QAM	23.52	ERP	0.225	2.5362	2M54D7W
M1 Band	BW	Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
13	5	QPSK	23.39	ERP	0.218	1.3430	1M34G7D
		16QAM	23.90	ERP	0.245	1.2718	1M27D7W
13	10	QPSK	23.45	ERP	0.221	1.9668	1M97G7D
		16QAM	23.93	ERP	0.247	2.0518	2M05D7W

M1 Band	BW	Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
26	1.4	QPSK	20.94	ERP	0.124	1.0962	1M10G7D
		16QAM	20.66	ERP	0.116	1.0994	1M10D7W
26	3	QPSK	20.92	ERP	0.124	1.2490	1M25G7D
		16QAM	20.53	ERP	0.113	1.1830	1M18D7W
26	5	QPSK	21.12	ERP	0.129	1.3587	1M36G7D
		16QAM	21.46	ERP	0.140	1.2934	1M29D7W
26	10	QPSK	20.86	ERP	0.122	2.5778	2M58G7D
		16QAM	21.55	ERP	0.143	2.5495	2M55D7W
26	15	QPSK	20.95	ERP	0.124	2.355	2M36G7D
		16QAM	21.50	ERP	0.141	2.377	2M38D7W
M1 Band	BW	Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
26 Part 90	1.4	QPSK	20.80	ERP	0.120	1.0974	1M10G7D
		16QAM	20.61	ERP	0.115	1.0980	1M10D7W
26 Part 90	3	QPSK	20.79	ERP	0.120	1.2675	1M27G7D
		16QAM	20.10	ERP	0.102	1.3861	1M39D7W
26 Part 90	5	QPSK	20.91	ERP	0.123	1.3541	1M35G7D
		16QAM	21.37	ERP	0.137	1.3285	1M33D7W
26 Part 90	10	QPSK	20.77	ERP	0.119	2.5316	2M53G7D
		16QAM	21.35	ERP	0.136	2.4742	2M47D7W

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1.4 Test Methodology of Applied Standards

FCC 47 CFR Part 2, 22H, 24E, 27C, Part 90.

ISED RSS-130 Issue 2 Feb. 2019, ISED RSS-132 Issue 3 Jan. 2013

ISED RSS-133 Issue 6, Amendment 1 Jan. 18, 2018, ISED RSS-139 Issue 3 July 16, 2015

ISED RSS-132 Issue 3 Dec. 2016

ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03r01

TS 151 010-1 is used to set, and measure the output power.

1.5 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 code 0513)

FCC Registration Numbers are: TW0001

Canada Registration number: 4620A-4

1.6 Special Accessories

No special accessories were used during testing.

1.7 Equipment Modifications

There were no modifications incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Measurement at Antenna Port

According to measurement procured ANSI C63.26-2015, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

According to measurement procured ANSI C63.26-2015, The EUT is a placed on as turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13.

2.4 Measurement Results Explanation Example

For all conducted test items:
The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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Note:
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Following shows an offset computation in physical test.

	RF cable loss (dB)	Attenuation factor(dB)	offset(dB)
Low Band (Below 1GHz)	1.2	13.8	15
High Band (Above 1 GHz)	1.7	13.3	15

2.5 Final Amplifier Voltage and Current Information:

NB IoT

Band 2

Test mode	DC voltage (V)	DC current (mA)
Band 2_3.75K	3.6	167.000
Band 2_15K	3.6	154.000

Band 4

Test mode	DC voltage (V)	DC current (mA)
Band 4_3.75K	3.6	174.000
Band 4_15K	3.6	162.000

Band 5

Test mode	DC voltage (V)	DC current (mA)
Band 5_3.75K	3.6	163.000
Band 5_15K	3.6	194.000

Band 12

Test mode	DC voltage (V)	DC current (mA)
Band 12_3.75K	3.6	192.000
Band 12_15K	3.6	207.000

Band 13

Test mode	DC voltage (V)	DC current (mA)
Band 13_3.75K	3.6	173.000
Band 13_15K	3.6	184.000

Band 26

Test mode	DC voltage (V)	DC current (mA)
Band 26_3.75K	3.6	183.000
Band 26_15K	3.6	192.000

Band 26_Part90

Test mode	DC voltage (V)	DC current (mA)
Band 26_Part90_3.75K	3.6	194.000
Band 26_Part90_15K	3.6	186.000

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Cat M1

M1 Band 2

Test mode	DC voltage (V)	DC current (mA)
M1 Band 2_1.4M QPSK	3.6	168.000
M1 Band 2_1.4M 16QAM	3.6	156.000
M1 Band 2_3M QPSK	3.6	165.000
M1 Band 2_3M 16QAM	3.6	201.000
M1 Band 2_5M QPSK	3.6	195.000
M1 Band 2_5M 16QAM	3.6	193.000
M1 Band 2_10M QPSK	3.6	203.000
M1 Band 2_10M 16QAM	3.6	184.000
M1 Band 2_15M QPSK	3.6	176.000
M1 Band 2_15M 16QAM	3.6	186.000
M1 Band 2_20M QPSK	3.6	169.000
M1 Band 2_20M 16QAM	3.6	187.000

M1 Band 4

Test mode	DC voltage (V)	DC current (mA)
M1 Band 4_1.4M QPSK	3.6	175.000
M1 Band 4_1.4M 16QAM	3.6	183.000
M1 Band 4_3M QPSK	3.6	162.000
M1 Band 4_3M 16QAM	3.6	195.000
M1 Band 4_5M QPSK	3.6	183.000
M1 Band 4_5M 16QAM	3.6	187.000
M1 Band 4_10M QPSK	3.6	179.000
M1 Band 4_10M 16QAM	3.6	166.000
M1 Band 4_15M QPSK	3.6	182.000
M1 Band 4_15M 16QAM	3.6	194.000
M1 Band 4_20M QPSK	3.6	198.000
M1 Band 4_20M 16QAM	3.6	178.000

M1 Band 5

Test mode	DC voltage (V)	DC current (mA)
M1 Band 5_1.4M QPSK	3.6	212.000
M1 Band 5_1.4M 16QAM	3.6	198.000
M1 Band 5_3M QPSK	3.6	189.000
M1 Band 5_3M 16QAM	3.6	185.000
M1 Band 5_5M QPSK	3.6	219.000
M1 Band 5_5M 16QAM	3.6	192.000
M1 Band 5_10M QPSK	3.6	185.000
M1 Band 5_10M 16QAM	3.6	174.000

M1 Band 12

Test mode	DC voltage (V)	DC current (mA)
M1 Band 5_1.4M QPSK	3.6	199.000
M1 Band 5_1.4M 16QAM	3.6	168.000
M1 Band 5_3M QPSK	3.6	185.000
M1 Band 5_3M 16QAM	3.6	184.000
M1 Band 5_5M QPSK	3.6	193.000
M1 Band 5_5M 16QAM	3.6	178.000
M1 Band 5_10M QPSK	3.6	162.000
M1 Band 5_10M 16QAM	3.6	181.000
M1 Band 5_10M 64QAM	3.6	197.000

M1 Band 13

Test mode	DC voltage (V)	DC current (mA)
M1 Band 13_5M QPSK	3.6	186.000
M1 Band 13_5M 16QAM	3.6	189.000
M1 Band 13_10M QPSK	3.6	175.000
M1 Band 13_10M 16QAM	3.6	192.000

M1 Band 26

Test mode	DC voltage (V)	DC current (mA)
M1 Band 26_1.4M QPSK	3.6	185.000
M1 Band 26_1.4M 16QAM	3.6	196.000
M1 Band 26_3M QPSK	3.6	168.000
M1 Band 26_3M 16QAM	3.6	178.000
M1 Band 26_5M QPSK	3.6	182.000
M1 Band 26_5M 16QAM	3.6	194.000
M1 Band 26_10M QPSK	3.6	173.000
M1 Band 26_10M 16QAM	3.6	169.000
M1 Band 26_15M QPSK	3.6	171.000
M1 Band 26_15M 16QAM	3.6	193.000

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M1 Band 26 for Part 90S

Test Mode	DC voltage (V)	DC current (mA)
M1 Band 26_1.4M QPSK	3.6	195.000
M1 Band 26_1.4M 16QAM	3.6	192.000
M1 Band 26_3M QPSK	3.6	186.000
M1 Band 26_3M 16QAM	3.6	187.000
M1 Band 26_5M QPSK	3.6	177.000
M1 Band 26_5M 16QAM	3.6	196.000
M1 Band 26_10M QPSK	3.6	183.000
M1 Band 26_10M 16QAM	3.6	181.000

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2.6 Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel-Conducted)

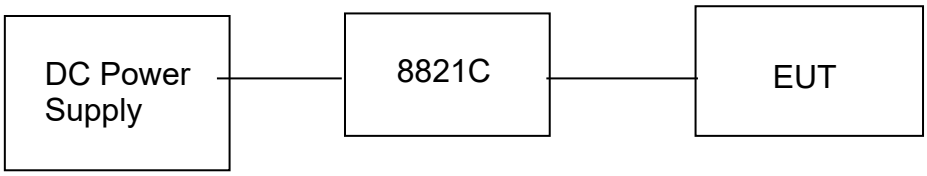
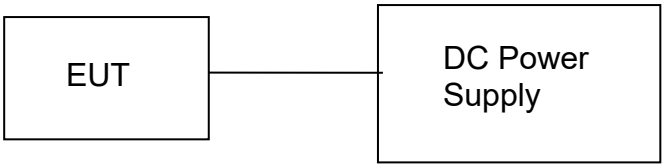


Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)



Remote Side

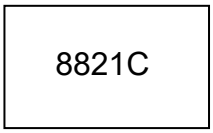


Table 2-1 Equipment Used in

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Radio Communication Analyer	Anritsu	MT8821C	6261786084	Shielded	Un-shielded
2.	DC Power Supply	Agilent	E3640A	MY52410006	N/A	N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	IC Rules	Description Of Test	Result
§2.1046(a)	RSS-GEN §6.12	RF Power Output	Compliant
§22.913(a)(5) §24.232(c) §27.50(c)(10) §27.50(d)(4) §27.50(b)(10) §90.635(b)	RSS-130 §4.6 RSS-132 §5.4 RSS-133 §6.4 RSS-139 §6.5	ERP/ EIRP measurement	Compliant
§2.1049(h)	RSS-GEN §6.7	99% & 26dB Occuupied Bandwidth	Compliant
§2.1051 §22.917(a)(b) §24.238(a) §27.53(g) §27.53(c) §27.53(h) §90.691(a)(1)	RSS-GEN §6.13 RSS-130 §4.7 RSS-132 §5.5 RSS-133 §6.5 RSS-139 §6.6	Out of Band Emissions at Antenna Terminals and Band Edge / Emission mask requirements	Compliant
§2.1053 §22.917(a) §24.238(a) §27.53(f) §27.53(g) §27.53(h) §90.691(a)(2)	RSS-GEN §6.13 RSS-130 §4.7 RSS-132 §5.5 RSS-133 §6.5 RSS-139 §6.6	Field Strength of Spurious Radiation	Compliant
§24.232(d) §27.50((B)	RSS-130 §4.6.1 RSS-132 §5.4 RSS-133 §6.4 RSS-139 §6.4	Peak to Average Ratio	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54	RSS-130 §4.5 RSS-132 §5.3 RSS-133 §6.3 RSS-139 §6.5	Frequency Stability	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 The Worst Test Modes and Configuration

1. The EUT has been tested under operating condition.
2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X(E1)Y(E2)Z(H) axis and antenna ports. The worst case was found as listed below. Following channel(s) was (were) selected for the final test as listed below:

4.2 NB IoT

NB IoT Modes	Radiated Emission		
	E1	E2	H
B2	-	V	-
B4	-	V	-
B5	-	V	-
B12	-	V	-
B13	-	V	-
B17	-	V	-
B25	-	V	-
B26	-	V	-
B26 Part 90	-	V	-
B30	-	V	-
B38	-	V	-
B41	-	V	-
B66	-	V	-
B85	-	V	-

NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B2	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V

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NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B4	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V
NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B5	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V
NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B12	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V
NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B13	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V

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NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B14	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V
NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B17	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V
NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B25	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V
NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B26	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V

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NB IoT Modes	Test Items	Subcarrier		Modulation		Test		
		3.75	15	BPSK	QPSK	L	M	H
B26 Part 90	EIRP	V	V	V	V	V	V	V
	Occupied Bandwidth	V	V	V	V	V	V	V
	Band Edge Compliance	V	V	V	V	V	-	V
	Peak-To-Average Ratio	V	V	V	V	V	V	V
	Frequency Stability	V	V	V	V	-	V	-
	Conducted Spurious Emission	V	V	V	V	V	V	V
	Radiated Spurious Emission	V	-	V	-	V	V	V

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4.3 Cat M1

M1 Band 2

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
FREQUENCY STA-BILITY	18650 to 19150	18900	10MHz	QPSK,	Full RB
OCCUPIED BAND-WIDTH	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	Full RB
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	Full RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	Full RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	Full RB
PEAK TO AVERAGE RATIO	18607 to 19193	18607, 18900, 19193	1.4MHz	16QAM	Full RB
	18615 to 19185	18615, 18900, 19185	3MHz	16QAM	Full RB
	18625 to 19175	18625, 18900, 19175	5MHz	16QAM	Full RB
	18650 to 19150	18650, 18900, 19150	10MHz	16QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	16QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	16QAM	Full RB
BAND EDGE	18607 to 19193	18607, 19193	1.4MHz	QPSK,	1 RB/ 0,5 RB Offes Full RB
	18615 to 19185	18615, 19185	3MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	18625 to 19175	18625, 19175	5MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	18650 to 19150	18650, 19150	10MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	18675 to 19125	18675, 19125	15MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	18700 to 19100	18700, 19100	20MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
CONDCUDETED EMISSION	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,	1 RB, 0 RB Offest
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK,	1 RB, 0 RB Offest
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK,	1 RB, 0 RB Offest
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK,	1 RB, 0 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK,	1 RB, 0 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMISSION	18675 to 19125	18675, 18900, 19125	15MHz	16QAM	1 RB, 0 RB Offest

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M1 Band 4

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
FREQUENCY STA-BILITY	20000 to 20350	20175	10MHz	QPSK,	Full RB
OCCUPIED BAND-WIDTH	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK, 16QAM	Full RB
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK, 16QAM	Full RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	Full RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	Full RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	Full RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	Full RB
PEAK TO AVERAGE RATIO	19957 to 19393	19957, 20175, 19393	1.4MHz	16QAM	Full RB
	19965 to 22385	19965, 20175, 22385	3MHz	16QAM	Full RB
	19975 to 20375	19975, 20175, 20375	5MHz	16QAM	Full RB
	20000 to 20350	20000, 20175, 20350	10MHz	16QAM	Full RB
	20025 to 20325	20025, 20175, 20325	15MHz	16QAM	Full RB
	20050 to 20300	20050, 20175, 20300	20MHz	16QAM	Full RB
BAND EDGE	19957 to 19393	19957, 19393	1.4MHz	QPSK,	1 RB/ 0,5 RB Offes Full RB
	19965 to 22385	19965, 22385	3MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	19975 to 20375	19975, 20375	5MHz	QPSK,	1 RB/ 0,4 RB Offest Full RB
	20000 to 20350	20000, 20350	10MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	20025 to 20325	20025, 20325	15MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	20050 to 20300	20050, 20300	20MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
CONDCUDETED EMISSION	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK,	1 RB, 0 RB Offest
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK,	1 RB, 0 RB Offest
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK,	1 RB, 0 RB Offest
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK,	1 RB, 0 RB Offest
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK,	1 RB, 0 RB Offest
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMIS-SION	19975 to 20375	19975, 20175, 20375	15MHz	16QAM	1 RB, 5 RB Offest

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M1 Band 5

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
FREQUENCY STA-BILITY	20450 to 20600	20525	10MHz	QPSK,	Full RB
OCCUPIED BAND-WIDTH	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK, 16QAM	Full RB
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM	Full RB
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	Full RB
PEAK TO AVERAGE RATIO	20470 to 20643	20470, 20525, 20643	1.4MHz	16QAM	Full RB
	20415 to 20635	20415, 20525, 20635	3MHz	16QAM	Full RB
	20425 to 20625	20425, 20525, 20625	5MHz	16QAM	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	16QAM	Full RB
BAND EDGE	20470 to 20643	20470, 20643	1.4MHz	QPSK,	1 RB/ 0,5 RB Offes Full RB
	20415 to 20635	20415, 20635	3MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	20425 to 20625	20425, 20625	5MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	20450 to 20600	20450, 20600	10MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
CONDCUDETED EMISSION	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK,	1 RB, 0 RB Offest
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK,	1 RB, 0 RB Offest
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK,	1 RB, 0 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMIS-SION	20425 to 20625	20425, 20525, 20625	5MHz	16QAM	1 RB, 0 RB Offest

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M1 Band 12

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAMM	1 RB/ 0,5 RB Offest
FREQUENCY STABILITY	23060 to 23130	23095	10MHz	QPSK,	Full RB
OCCUPIED BANDWIDTH	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	Full RB
PEAK TO AV-ERAGE RATIO	23017 to 23173	23017, 23095, 23173	1.4MHz	16QAM	Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	16QAM	Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	16QAM	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	16QAM	Full RB
BAND EDGE	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK,	1 RB/ 0,5 RB Offes Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
CONDCU-DETED EMIS-SION	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK,	1 RB, 0 RB Offest
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK,	1 RB, 0 RB Offest
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK,	1 RB, 0 RB Offest
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMISSION	23060 to 23130	23060, 23095, 23130	10MHz	16QAM	1 RB, 5 RB Offest

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M1 Band 13

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	23230	23230	10MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
FREQUENCY STA-BILITY	23230	23230	10MHz	QPSK,	Full RB
OCCUPIED BAND-WIDTH	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	Full RB
	23230	23230	10MHz	QPSK, 16QAM	Full RB
PEAK TO AVERAGE RATIO	23205 to 23255	23205, 23230, 23255	5MHz	16QAM	Full RB
	23230	23230	10MHz	16QAM	Full RB
BAND EDGE	23205 to 23255	23205, 23255	5MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	23230	23230	10MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
CONDCUDETED EMISSION	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,	1 RB, 0 RB Offest
	23230	23230	10MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMIS-SION	23230	23230	10MHz	16QAM	1 RB/ 0 RB Offest

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M1 Band 26 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK, 16QAM,	1 RB/ 0,5 RB Offest
	26805 to 27025	26805, 26915, 27025	3MHz	QPSK, 16QAM,	1 RB/ 0,5 RB Offest
	26815 to 27015	26815, 26915, 27015	5MHz	QPSK, 16QAM,	1 RB/ 0,5 RB Offest
	26840 to 26990	26840, 26915, 26990	10MHz	QPSK, 16QAM,	1 RB/ 0,5 RB Offest
	26865 to 26965	26865, 26915, 26965	15MHz	QPSK, 16QAM,	1 RB/ 0,5 RB Offest
FREQUENCY STABILITY	26865 to 26965	26915	15MHz	QPSK,	Full RB
OCCUPIED BANDWIDTH	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK, 16QAM,	Full RB
	26805 to 27025	26805, 26915, 27025	3MHz	QPSK, 16QAM,	Full RB
	26815 to 27015	26815, 26915, 27015	5MHz	QPSK, 16QAM,	Full RB
	26840 to 26990	26840, 26915, 26990	10MHz	QPSK, 16QAM,	Full RB
	26865 to 26965	26865, 26915, 26965	15MHz	QPSK, 16QAM,	Full RB
PEAK TO AV-ERAGE RATIO	26797 to 27033	26797, 26915, 27033	1.4MHz	16QAM	Full RB
	26805 to 27025	26805, 26915, 27025	3MHz	16QAM	Full RB
	26815 to 27015	26815, 26915, 27015	5MHz	16QAM	Full RB
	26840 to 26990	26840, 26915, 26990	10MHz	16QAM	Full RB
	26865 to 26965	26865, 26915, 26965	15MHz	16QAM	Full RB
BAND EDGE	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK,	1 RB/ 0,5 RB Offes Full RB
	26805 to 27025	26805, 26915, 27025	3MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	26815 to 27015	26815, 26915, 27015	5MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	26840 to 26990	26840, 26915, 26990	10MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	26865 to 26965	26865, 26915, 26965	15MHz	QPSK	1 RB/ 0,74 RB Offest
CONDCUDETED EMISSION	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK,	1 RB, 0 RB Offest
	26805 to 27025	26805, 26915, 27025	3MHz	QPSK,	1 RB, 0 RB Offest
	26815 to 27015	26815, 26915, 27015	5MHz	QPSK,	1 RB, 0 RB Offest
	26840 to 26990	26840, 26915, 26990	10MHz	QPSK,	1 RB, 0 RB Offest
	26865 to 26965	26865, 26915, 26965	15MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	26840 to 26990	26840, 26915, 26990	10MHz	16QAM	1 RB, 0 RB Offest

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M1 Band 26 for 90S MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
	26740	26740	10MHz	QPSK, 16QAM	1 RB/ 0,5 RB Offest
FREQUENCY STABIL-ITY	26697 to 26783	26740	1.4MHz	QPSK,	Full RB
OCCUPIED BAND-WIDTH	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM	Full RB
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM	Full RB
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM	Full RB
	26740	26740	10MHz	QPSK, 16QAM	Full RB
PEAK TO AVERAGE RATIO	26697 to 26783	26697, 26740, 26783	1.4MHz	16QAM	Full RB
	26705 to 26775	26705, 26740, 26775	3MHz	16QAM	Full RB
	26715 to 26765	26715, 26740, 26765	5MHz	16QAM	Full RB
	26740	26740	10MHz	16QAM	Full RB
EMISSION MASK	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK,	1 RB/ 0,5 RB Offes Full RB
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
	26740	26740	10MHz	QPSK,	1 RB/ 0,5 RB Offest Full RB
CONDCUDETED EMIS-SION	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK,	1 RB, 0 RB Offest
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK,	1 RB, 0 RB Offest
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK,	1 RB, 0 RB Offest
	26740	26740	10MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMISSION	26715 to 26765	26715, 26740, 26765	5MHz	16QAM	1 RB, 5 RB Offest

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Power Output	+/- 1.10 dB
ERP/ EIRP measurement	Vertical Polarization = +/- 4.74dB Horizontal Polarization =+/- 4.62dB
99% Occupied Bandwidth	+/- 5.19 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.70 dB
Peak to Average Ratio	+/- 0.70 dB
Frequency Stability vs. Temperature	+/- 5.19 Hz
Frequency Stability vs. Voltage	+/- 5.19 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : **Vertical**)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : **Horizontal**)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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6 MAXMUM OUTPUT POWER

6.1 Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

6.1.1 FCC ERP/EIRP LIMIT

According to FCC §2.1046

FCC 22.913(a)

(5) mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

FCC 24.232(c)

Mobile and portable stations are limited to 2 W EIRP.

FCC 27.50 (b)

(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

FCC 27.50(c)

(10) Portable stations (hand-held devices) are limited to 3 watts ERP.

FCC 27.50(d)

(4) Mobile, and portable (hand-held) stations operating in the 1710-1755 MHz, 1695-1710 MHz and 1755-1780 MHz bands are limited to 1W EIRP.

FCC 90.635(b)

Mobile station is limited to 100W ERP

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RSS-130 §4.6

The e.r.p. shall not exceed 3 watts for mobile equipment, fixed subscriber equipment and portable equipment operating in the Band 617-652 and 663-698MHz.

RSS-132 §5.4

The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment in operating in the Bands 824-849 and 869-894MHz shall not exceed 11.5 watts.

RSS-133 §6.4

The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510 which is 2 watts.

RSS-139 §6.5

The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters in the Bands 1710-1780MHz shall not exceed one watt.

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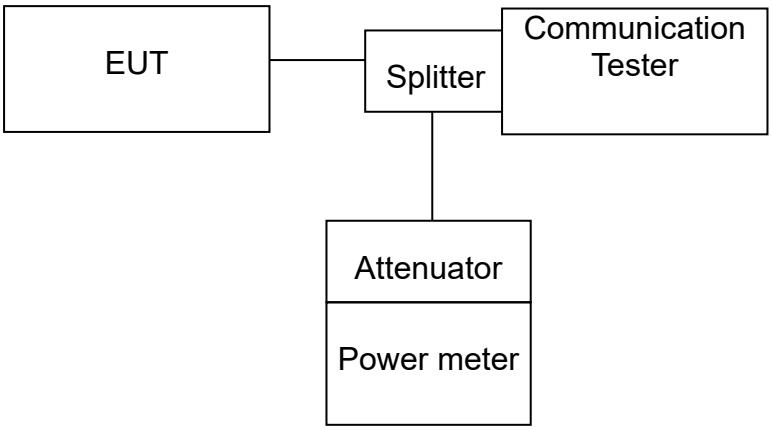
6.2 Test Set-up



Note: *Measurement setup for testing on Antenna connector*

6.3 Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. TS 151 010-1 is reference to conduct the test measurement of output power.
The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results
All bands conducted average power is obtained from the simulator telecommunication test set.
The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP.

TEST PROCEDURE:
ANSI C63.26:2015
KDB 971168 D01 Section 5.6

ERP/EIRP = PMeas + GT-LC

where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);
PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.2
For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

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6.4 Measurement Equipment Used

Conducted Emission (measured at antenna port) Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communication Analyer	Anritsu	MT8821C	6261786084	01/09/2019	01/08/2020
DC Power Supply	Agilent	E3640A	MY52410006	12/04/2018	12/03/2019
Attenuator	Mini-Circuit	BW-S10W2+	4	01/02/2019	01/01/2020
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2019	01/01/2020
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2019	01/01/2020

6.5 Measurement Result

NB IoT

Gain: 5.36

LTE NB-IoT Band 2						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result	
					Power(dBm)	EIRP(dBm)
18601	1850.1	BPSK	3.75	1@0	22.72	28.08
				1@47	22.68	28.04
		BPSK	15	1@11	22.95	28.31
		QPSK	15	1@0	22.97	28.33
				1@11	22.95	28.31
				12@0	21.27	26.63
18900	1880	BPSK	3.75	1@0	22.77	28.13
				1@47	22.66	28.02
		BPSK	15	1@11	22.94	28.3
		QPSK	15	1@0	22.88	28.24
				1@11	22.93	28.29
				12@0	21.3	26.66
19199	1909.9	BPSK	3.75	1@0	22.66	28.02
				1@47	22.64	28
		BPSK	15	1@11	22.59	27.95
		QPSK	15	1@0	22.6	27.96
				1@11	22.62	27.98
				12@0	21.04	26.4

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Gain: 4.3

LTE NB-IoT Band 4						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result	
					Power(dBm)	EIRP(dBm)
19951	1710.1	BPSK	3.75	1@0	22.49	26.79
				1@47	22.59	26.89
		BPSK	15	1@11	22.82	27.12
		QPSK	15	1@0	22.86	27.16
				1@11	22.95	27.25
				12@0	21.2	25.5
20175	1732.5	BPSK	3.75	1@0	22.53	26.83
				1@47	22.42	26.72
		BPSK	15	1@11	22.52	26.82
		QPSK	15	1@0	22.59	26.89
				1@11	22.54	26.84
				12@0	21.03	25.33
20399	1754.9	BPSK	3.75	1@0	22.41	26.71
				1@47	22.38	26.68
		BPSK	15	1@11	22.71	27.01
		QPSK	15	1@0	22.66	26.96
				1@11	22.67	26.97
				12@0	20.94	25.24

Gain: -1.63

LTE NB-IoT Band 5						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result	
					Power(dBm)	EIRP(dBm)
20401	824.1	BPSK	3.75	1@0	22.55	20.92
				1@47	22.43	20.8
		BPSK	15	1@11	22.38	20.75
		QPSK	15	1@0	22.39	20.76
				1@11	22.46	20.83
				12@0	20.88	19.25
20525	836.5	BPSK	3.75	1@0	22.55	20.92
				1@47	22.57	20.94
		BPSK	15	1@11	22.66	21.03
		QPSK	15	1@0	22.61	20.98
				1@11	22.54	20.91
				12@0	21.06	19.43
20649	848.9	BPSK	3.75	1@0	22.51	20.88
				1@47	22.61	20.98
		BPSK	15	1@11	22.85	21.22
		QPSK	15	1@0	22.64	21.01
				1@11	22.63	21
				12@0	21.03	19.4

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Gain: -0.36

LTE NB-IoT Band 12						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result	
					Power(dBm)	EIRP(dBm)
23011	699.1	BPSK	3.75	1@0	23.12	22.76
				1@47	23.19	22.83
		BPSK	15	1@11	23.68	23.32
		QPSK	15	1@0	23.56	23.2
				1@11	23.66	23.3
				12@0	21.88	21.52
23095	707.5	BPSK	3.75	1@0	23.07	22.71
				1@47	23.19	22.83
		BPSK	15	1@11	23.38	23.02
		QPSK	15	1@0	23.44	23.08
				1@11	23.51	23.15
				12@0	21.78	21.42
23179	715.9	BPSK	3.75	1@0	23.09	22.73
				1@47	23.33	22.97
		BPSK	15	1@11	23.26	22.9
		QPSK	15	1@0	23.31	22.95
				1@11	23.28	22.92
				12@0	21.55	21.19

Gain: 0.18

LTE NB-IoT Band 13						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result	
					Power(dBm)	EIRP(dBm)
23181	777.1	BPSK	3.75	1@0	22.94	23.12
				1@47	22.87	23.05
		BPSK	15	1@11	22.83	23.01
		QPSK	15	1@0	22.87	23.05
				1@11	22.85	23.03
				12@0	21.13	21.31
23230	782	BPSK	3.75	1@0	22.78	22.96
				1@47	22.71	22.89
		BPSK	15	1@11	22.76	22.94
		QPSK	15	1@0	22.79	22.97
				1@11	22.78	22.96
				12@0	21.05	21.23
23279	786.9	BPSK	3.75	1@0	22.59	22.77
				1@47	22.61	22.79
		BPSK	15	1@11	22.62	22.8
		QPSK	15	1@0	22.62	22.8
				1@11	22.61	22.79
				12@0	20.88	21.06

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Gain: -1.63

LTE NB-IoT Band 26						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result	
					Power(dBm)	EIRP(dBm)
26791	824.1	BPSK	3.75	1@0	22.41	20.78
				1@47	22.47	20.84
		BPSK	15	1@11	22.78	21.15
		QPSK	15	1@0	22.79	21.16
				1@11	22.81	21.18
				12@0	20.95	19.32
26915	836.5	BPSK	3.75	1@0	22.52	20.89
				1@47	22.58	20.95
		BPSK	15	1@11	22.86	21.23
		QPSK	15	1@0	22.84	21.21
				1@11	22.88	21.25
				12@0	21.09	19.46
27039	848.9	BPSK	3.75	1@0	22.67	21.04
				1@47	22.59	20.96
		BPSK	15	1@11	23.11	21.48
		QPSK	15	1@0	23.07	21.44
				1@11	23.08	21.45
				12@0	21.23	19.6

Gain: -1.68

LTE NB-IoT Band 26_Part90						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result	
					Power(dBm)	EIRP(dBm)
26691	814.1	BPSK	3.75	1@0	22.45	20.82
				1@47	22.38	20.75
		BPSK	15	1@11	22.76	21.13
		QPSK	15	1@0	22.68	21.05
				1@11	22.74	21.11
				12@0	20.91	19.28
26740	819	BPSK	3.75	1@0	22.53	20.9
				1@47	22.31	20.68
		BPSK	15	1@11	22.7	21.07
		QPSK	15	1@0	22.73	21.1
				1@11	22.71	21.08
				12@0	20.89	19.26
26789	823.9	BPSK	3.75	1@0	22.43	20.8
				1@47	22.45	20.82
		BPSK	15	1@11	22.61	20.98
		QPSK	15	1@0	22.63	21
				1@11	22.6	20.97
				12@0	20.75	19.12

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Cat M1

Antenna gain (dBi) 5.36

M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	18607	1850.7	QPSK	1	0	0	22.12	27.48	33	-5.52
				1	5	0	22.34	27.70	33	-5.3
				6	0	0	20.45	25.81	33	-7.19
	18900	1880	QPSK	1	0	0	22.53	27.89	33	-5.11
				1	5	0	22.62	27.98	33	-5.02
				6	0	0	20.48	25.84	33	-7.16
	19193	1909.3	QPSK	1	0	0	22.24	27.60	33	-5.4
				1	5	0	22.32	27.68	33	-5.32
				6	0	0	20.32	25.68	33	-7.32
	18607	1850.7	16QAM	1	0	0	22.31	27.67	33	-5.33
				1	5	0	22.54	27.90	33	-5.1
				6	0	0	20.59	25.95	33	-7.05
	18900	1880	16QAM	1	0	0	22.37	27.73	33	-5.27
				1	5	0	22.42	27.78	33	-5.22
				6	0	0	20.61	25.97	33	-7.03
	19193	1909.3	16QAM	1	0	0	22.32	27.68	33	-5.32
				1	5	0	22.48	27.84	33	-5.16
				6	0	0	20.46	25.82	33	-7.18

Antenna gain (dBi) 5.36

M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	18615	1851.5	QPSK	1	0	0	22.47	27.83	33	-5.17
				1	5	0	22.51	27.87	33	-5.13
				6	0	0	20.55	25.91	33	-7.09
	18900	1880	QPSK	1	0	0	22.52	27.88	33	-5.12
				1	5	0	22.63	27.99	33	-5.01
				6	0	0	20.64	26.00	33	-7
	19185	1908.5	QPSK	1	0	1	22.46	27.82	33	-5.18
				1	5	1	22.58	27.94	33	-5.06
				6	0	1	20.49	25.85	33	-7.15
	18615	1851.5	16QAM	1	0	0	21.78	27.14	33	-5.86
				1	5	0	21.86	27.22	33	-5.78
				6	0	0	20.64	26.00	33	-7
	18900	1880	16QAM	1	0	0	22.07	27.43	33	-5.57
				1	5	0	22.13	27.49	33	-5.51
				6	0	0	20.65	26.01	33	-6.99
	19185	1908.5	16QAM	1	0	1	22.24	27.60	33	-5.4
				1	5	1	22.37	27.73	33	-5.27
				6	0	1	20.55	25.91	33	-7.09

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Antenna gain (dBi) 5.36

M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	18625	1852.5	QPSK	1	0	0	22.43	27.79	33	-5.21
				1	5	0	22.52	27.88	33	-5.12
				6	0	0	21.49	26.85	33	-6.15
	18900	1880	QPSK	1	0	0	22.55	27.91	33	-5.09
				1	5	0	22.63	27.99	33	-5.01
				6	0	0	21.46	26.82	33	-6.18
	19175	1907.5	QPSK	1	0	3	22.59	27.95	33	-5.05
				1	5	3	22.62	27.98	33	-5.02
				6	0	3	21.52	26.88	33	-6.12
	18625	1852.5	16QAM	1	0	0	23.21	28.57	33	-4.43
				1	5	0	23.27	28.63	33	-4.37
				6	0	0	20.70	26.06	33	-6.94
	18900	1880	16QAM	1	0	0	23.13	28.49	33	-4.51
				1	5	0	23.22	28.58	33	-4.42
				6	0	0	20.78	26.14	33	-6.86
	19175	1907.5	16QAM	1	0	3	23.19	28.55	33	-4.45
				1	5	3	23.24	28.60	33	-4.4
				6	0	3	20.66	26.02	33	-6.98

Antenna gain (dBi) 5.36

M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	18650	1855	QPSK	1	0	0	22.22	27.58	33	-5.42
				1	5	0	22.35	27.71	33	-5.29
				6	0	0	21.54	26.90	33	-6.1
	18900	1880	QPSK	1	0	0	22.21	27.57	33	-5.43
				1	5	0	22.36	27.72	33	-5.28
				6	0	0	21.63	26.99	33	-6.01
	19150	1905	QPSK	1	0	7	22.28	27.64	33	-5.36
				1	5	7	22.19	27.55	33	-5.45
				6	0	7	21.45	26.81	33	-6.19
	18650	1855	16QAM	1	0	0	23.11	28.47	33	-4.53
				1	5	0	23.13	28.49	33	-4.51
				6	0	0	20.73	26.09	33	-6.91
	18900	1880	16QAM	1	0	0	23.23	28.59	33	-4.41
				1	5	0	23.26	28.62	33	-4.38
				6	0	0	20.64	26.00	33	-7
	19150	1905	16QAM	1	0	7	23.11	28.47	33	-4.53
				1	5	7	23.22	28.58	33	-4.42
				6	0	7	20.68	26.04	33	-6.96

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Antenna gain (dBi) 5.36

M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
15	18675	1857.5	QPSK	1	0	0	22.39	27.75	33	-5.25
				1	5	0	22.43	27.79	33	-5.21
				6	0	0	22.55	27.91	33	-5.09
	18900	1880	QPSK	1	0	0	22.36	27.72	33	-5.28
				1	5	0	22.63	27.99	33	-5.01
				6	0	0	22.51	27.87	33	-5.13
	19125	1902.5	QPSK	1	0	11	22.37	27.73	33	-5.27
				1	5	11	22.35	27.71	33	-5.29
				6	0	11	22.58	27.94	33	-5.06
	18675	1857.5	16QAM	1	0	0	23.05	28.41	33	-4.59
				1	5	0	23.14	28.50	33	-4.5
				6	0	0	22.77	28.13	33	-4.87
	18900	1880	16QAM	1	0	0	23.16	28.52	33	-4.48
				1	5	0	23.36	28.72	33	-4.28
				6	0	0	22.71	28.07	33	-4.93
	19125	1902.5	16QAM	1	0	11	23.19	28.55	33	-4.45
				1	5	11	23.09	28.45	33	-4.55
				6	0	11	22.67	28.03	33	-4.97

Antenna gain (dBi) 5.36

M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
20	18700	1860	QPSK	1	0	0	23.21	28.57	33	-4.43
				1	5	0	22.41	27.77	33	-5.23
				6	0	0	22.56	27.92	33	-5.08
	18900	1880	QPSK	1	0	0	22.34	27.70	33	-5.3
				1	5	0	22.41	27.77	33	-5.23
				6	0	0	22.57	27.93	33	-5.07
	19100	1900	QPSK	1	0	15	22.36	27.72	33	-5.28
				1	5	15	22.41	27.77	33	-5.23
				6	0	15	22.58	27.94	33	-5.06
	18700	1860	16QAM	1	0	0	23.08	28.44	33	-4.56
				1	5	0	23.15	28.51	33	-4.49
				6	0	0	22.79	28.15	33	-4.85
	18900	1880	16QAM	1	0	0	23.18	28.54	33	-4.46
				1	5	0	23.21	28.57	33	-4.43
				6	0	0	22.80	28.16	33	-4.84
	19100	1900	16QAM	1	0	15	23.13	28.49	33	-4.51
				1	5	15	23.12	28.48	33	-4.52
				6	0	15	22.57	27.93	33	-5.07

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Antenna gain (dBi) 4.3

M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	19957	1710.7	QPSK	1	0	0	22.08	26.38	30	-3.62
				1	5	0	22.29	26.59	30	-3.41
				6	0	0	20.41	24.71	30	-5.29
	20175	1732.5	QPSK	1	0	0	22.51	26.81	30	-3.19
				1	5	0	22.59	26.89	30	-3.11
				6	0	0	20.51	24.81	30	-5.19
	20393	1754.3	QPSK	1	0	0	22.23	26.53	30	-3.47
				1	5	0	22.38	26.68	30	-3.32
				6	0	0	20.41	24.71	30	-5.29
	19957	1710.7	16QAM	1	0	0	22.28	26.58	30	-3.42
				1	5	0	22.47	26.77	30	-3.23
				6	0	0	20.54	24.84	30	-5.16
	20175	1732.5	16QAM	1	0	0	22.34	26.64	30	-3.36
				1	5	0	22.47	26.77	30	-3.23
				6	0	0	20.68	24.98	30	-5.02
	20393	1754.3	16QAM	1	0	0	22.28	26.58	30	-3.42
				1	5	0	22.41	26.71	30	-3.29
				6	0	0	20.41	24.71	30	-5.29

Antenna gain (dBi) 4.3

M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	19965	1711.5	QPSK	1	0	0	22.45	26.75	30	-3.25
				1	5	0	22.57	26.87	30	-3.13
				6	0	0	20.51	24.81	30	-5.19
	20175	1732.5	QPSK	1	0	0	22.56	26.86	30	-3.14
				1	5	0	22.61	26.91	30	-3.09
				6	0	0	20.60	24.90	30	-5.1
	20385	1753.5	QPSK	1	0	1	22.41	26.71	30	-3.29
				1	5	1	22.55	26.85	30	-3.15
				6	0	1	20.41	24.71	30	-5.29
	19965	1711.5	16QAM	1	0	0	21.86	26.16	30	-3.84
				1	5	0	21.92	26.22	30	-3.78
				6	0	0	20.66	24.96	30	-5.04
	20175	1732.5	16QAM	1	0	0	22.10	26.40	30	-3.6
				1	5	0	22.19	26.49	30	-3.51
				6	0	0	20.71	25.01	30	-4.99
	20385	1753.5	16QAM	1	0	1	22.21	26.51	30	-3.49
				1	5	1	22.35	26.65	30	-3.35
				6	0	1	20.58	24.88	30	-5.12

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Antenna gain (dBi) 4.3

M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	19975	1712.5	QPSK	1	0	0	22.43	26.73	30	-3.27
				1	5	0	22.51	26.81	30	-3.19
				6	0	0	21.54	25.84	30	-4.16
	20175	1732.5	QPSK	1	0	0	22.51	26.81	30	-3.19
				1	5	0	22.68	26.98	30	-3.02
				6	0	0	21.42	25.72	30	-4.28
	20375	1752.5	QPSK	1	0	3	22.52	26.82	30	-3.18
				1	5	3	22.67	26.97	30	-3.03
				6	0	3	21.47	25.77	30	-4.23
	19975	1712.5	16QAM	1	0	0	23.18	27.48	30	-2.52
				1	5	0	23.21	27.51	30	-2.49
				6	0	0	20.68	24.98	30	-5.02
	20175	1732.5	16QAM	1	0	0	23.15	27.45	30	-2.55
				1	5	0	23.29	27.59	30	-2.41
				6	0	0	20.67	24.97	30	-5.03
	20375	1752.5	16QAM	1	0	3	23.14	27.44	30	-2.56
				1	5	3	23.22	27.52	30	-2.48
				6	0	3	20.69	24.99	30	-5.01

Antenna gain (dBi) 4.3

M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	20000	1715	QPSK	1	0	0	22.33	26.63	30	-3.37
				1	5	0	22.43	26.73	30	-3.27
				6	0	0	21.55	25.85	30	-4.15
	20175	1732.5	QPSK	1	0	0	22.24	26.54	30	-3.46
				1	5	0	22.35	26.65	30	-3.35
				6	0	0	21.57	25.87	30	-4.13
	20375	1750	QPSK	1	0	7	22.31	26.61	30	-3.39
				1	5	7	22.24	26.54	30	-3.46
				6	0	7	21.53	25.83	30	-4.17
	20000	1715	16QAM	1	0	0	23.05	27.35	30	-2.65
				1	5	0	23.14	27.44	30	-2.56
				6	0	0	20.68	24.98	30	-5.02
	20175	1732.5	16QAM	1	0	0	23.12	27.42	30	-2.58
				1	5	0	23.05	27.35	30	-2.65
				6	0	0	20.57	24.87	30	-5.13
	20375	1750	16QAM	1	0	7	22.99	27.29	30	-2.71
				1	5	7	23.03	27.33	30	-2.67
				6	0	7	20.57	24.87	30	-5.13

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Antenna gain (dBi) 4.3

M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
15	20025	1717.5	QPSK	1	0	0	22.21	26.51	30	-3.49
				1	5	0	22.43	26.73	30	-3.27
				6	0	0	22.66	26.96	30	-3.04
	20175	1732.5	QPSK	1	0	0	22.27	26.57	30	-3.43
				1	5	0	22.41	26.71	30	-3.29
				6	0	0	22.43	26.73	30	-3.27
	20325	1747.5	QPSK	1	0	11	22.41	26.71	30	-3.29
				1	5	11	22.55	26.85	30	-3.15
				6	0	11	22.47	26.77	30	-3.23
	20025	1717.5	16QAM	1	0	0	22.25	26.55	30	-3.45
				1	5	0	22.47	26.77	30	-3.23
				6	0	0	22.62	26.92	30	-3.08
	20175	1732.5	16QAM	1	0	0	22.31	26.61	30	-3.39
				1	5	0	22.47	26.77	30	-3.23
				6	0	0	22.45	26.75	30	-3.25
	20325	1747.5	16QAM	1	0	11	22.46	26.76	30	-3.24
				1	5	11	22.42	26.72	30	-3.28
				6	0	11	22.53	26.83	30	-3.17

Antenna gain (dBi) 4.3

M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
20	20050	1720	QPSK	1	0	0	22.44	26.74	30	-3.26
				1	5	0	22.53	26.83	30	-3.17
				6	0	0	22.61	26.91	30	-3.09
	20175	1732.5	QPSK	1	0	0	22.59	26.89	30	-3.11
				1	5	0	22.67	26.97	30	-3.03
				6	0	0	22.58	26.88	30	-3.12
	20300	1745	QPSK	1	0	15	22.55	26.85	30	-3.15
				1	5	15	22.43	26.73	30	-3.27
				6	0	15	22.45	26.75	30	-3.25
	20050	1720	16QAM	1	0	0	22.42	26.72	30	-3.28
				1	5	0	22.59	26.89	30	-3.11
				6	0	0	22.68	26.98	30	-3.02
	20175	1732.5	16QAM	1	0	0	22.54	26.84	30	-3.16
				1	5	0	22.63	26.93	30	-3.07
				6	0	0	22.61	26.91	30	-3.09
	20300	1745	16QAM	1	0	15	22.49	26.79	30	-3.21
				1	5	15	22.54	26.84	30	-3.16
				6	0	15	22.52	26.82	30	-3.18

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Antenna gain (dBi) -1.63

M1 Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	20407	824.7	QPSK	1	0	0	22.57	18.79	20.94	38.45	-17.51
				1	5	0	22.55	18.77	20.92	38.45	-17.53
				6	0	0	20.69	16.91	19.06	38.45	-19.39
	20525	836.5	QPSK	1	0	0	22.61	18.83	20.98	38.45	-17.47
				1	5	0	22.78	19.00	21.15	38.45	-17.3
				6	0	0	22.73	18.95	21.10	38.45	-17.35
	20643	848.3	QPSK	1	0	0	22.76	18.98	21.13	38.45	-17.32
				1	5	0	22.62	18.84	20.99	38.45	-17.46
				6	0	0	20.78	17.00	19.15	38.45	-19.3
	20407	824.7	16QAM	1	0	0	22.55	18.77	20.92	38.45	-17.53
				1	5	0	22.16	18.38	20.53	38.45	-17.92
				6	0	0	20.79	17.01	19.16	38.45	-19.29
	20525	836.5	16QAM	1	0	0	22.25	18.47	20.62	38.45	-17.83
				1	5	0	22.46	18.68	20.83	38.45	-17.62
				6	0	0	20.86	17.08	19.23	38.45	-19.22
	20643	848.3	16QAM	1	0	0	22.26	18.48	20.63	38.45	-17.82
				1	5	0	22.12	18.34	20.49	38.45	-17.96
				6	0	0	20.94	17.16	19.31	38.45	-19.14

Antenna gain (dBi) -1.63

M1 Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	20415	825.5	QPSK	1	0	0	22.57	18.79	20.94	38.45	-17.51
				1	5	0	22.61	18.83	20.98	38.45	-17.47
				6	0	0	20.69	16.91	19.06	38.45	-19.39
	20525	836.5	QPSK	1	0	0	22.69	18.91	21.06	38.45	-17.39
				1	5	0	22.65	18.87	21.02	38.45	-17.43
				6	0	0	20.76	16.98	19.13	38.45	-19.32
	20635	847.5	QPSK	1	0	1	22.65	18.87	21.02	38.45	-17.43
				1	5	1	22.71	18.93	21.08	38.45	-17.37
				6	0	1	20.78	17.00	19.15	38.45	-19.3
	20415	825.5	16QAM	1	0	0	22.14	18.36	20.51	38.45	-17.94
				1	5	0	22.27	18.49	20.64	38.45	-17.81
				6	0	0	20.77	16.99	19.14	38.45	-19.31
	20525	836.5	16QAM	1	0	0	22.13	18.35	20.50	38.45	-17.95
				1	5	0	22.24	18.46	20.61	38.45	-17.84
				6	0	0	20.84	17.06	19.21	38.45	-19.24
	20635	847.5	16QAM	1	0	1	22.49	18.71	20.86	38.45	-17.59
				1	5	1	22.53	18.75	20.90	38.45	-17.55
				6	0	1	20.94	17.16	19.31	38.45	-19.14

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Antenna gain (dBi) -1.63

M1 Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	20425	826.5	QPSK	1	0	0	22.65	18.87	21.02	38.45	-17.43
				1	5	0	22.81	19.03	21.18	38.45	-17.27
				6	0	0	21.71	17.93	20.08	38.45	-18.37
	20525	836.5	QPSK	1	0	0	22.84	19.06	21.21	38.45	-17.24
				1	5	0	22.67	18.89	21.04	38.45	-17.41
				6	0	0	21.75	17.97	20.12	38.45	-18.33
	20625	846.5	QPSK	1	0	3	22.72	18.94	21.09	38.45	-17.36
				1	5	3	22.78	19.00	21.15	38.45	-17.3
				6	0	3	21.65	17.87	20.02	38.45	-18.43
	20425	826.5	16QAM	1	0	0	23.28	19.50	21.65	38.45	-16.8
				1	5	0	23.16	19.38	21.53	38.45	-16.92
				6	0	0	20.83	17.05	19.20	38.45	-19.25
	20525	836.5	16QAM	1	0	0	23.24	19.46	21.61	38.45	-16.84
				1	5	0	23.32	19.54	21.69	38.45	-16.76
				6	0	0	20.81	17.03	19.18	38.45	-19.27
	20625	846.5	16QAM	1	0	3	23.37	19.59	21.74	38.45	-16.71
				1	5	3	23.21	19.43	21.58	38.45	-16.87
				6	0	3	21.01	17.23	19.38	38.45	-19.07

Antenna gain (dBi) -1.63

M1 Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	20450	829	QPSK	1	0	0	22.71	18.93	21.08	38.45	-17.37
				1	5	0	22.53	18.75	20.90	38.45	-17.55
				6	0	0	21.68	17.90	20.05	38.45	-18.4
	20525	836.5	QPSK	1	0	0	22.61	18.83	20.98	38.45	-17.47
				1	5	0	22.63	18.85	21.00	38.45	-17.45
				6	0	0	21.45	17.67	19.82	38.45	-18.63
	20600	844	QPSK	1	0	7	22.62	18.84	20.99	38.45	-17.46
				1	5	7	22.63	18.85	21.00	38.45	-17.45
				6	0	7	21.76	17.98	20.13	38.45	-18.32
	20450	829	16QAM	1	0	0	23.24	19.46	21.61	38.45	-16.84
				1	5	0	23.26	19.48	21.63	38.45	-16.82
				6	0	0	20.75	16.97	19.12	38.45	-19.33
	20525	836.5	16QAM	1	0	0	23.36	19.58	21.73	38.45	-16.72
				1	5	0	23.24	19.46	21.61	38.45	-16.84
				6	0	0	20.94	17.16	19.31	38.45	-19.14
	20600	844	16QAM	1	0	7	23.27	19.49	21.64	38.45	-16.81
				1	5	7	23.13	19.35	21.50	38.45	-16.95
				6	0	7	20.68	16.90	19.05	38.45	-19.4

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Antenna gain (dBi) -0.36

M1 Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	23017	699.7	QPSK	1	0	0	23.33	20.82	22.97	34.77	-11.8
				1	5	0	23.36	20.85	23.00	34.77	-11.77
				6	0	0	21.31	18.80	20.95	34.77	-13.82
	23095	707.5	QPSK	1	0	0	23.35	20.84	22.99	34.77	-11.78
				1	5	0	23.34	20.83	22.98	34.77	-11.79
				6	0	0	21.33	18.82	20.97	34.77	-13.8
	23173	715.5	QPSK	1	0	0	23.39	20.88	23.03	34.77	-11.74
				1	5	0	23.34	20.83	22.98	34.77	-11.79
				6	0	0	21.32	18.81	20.96	34.77	-13.81
	23017	699.7	16QAM	1	0	0	22.85	20.34	22.49	34.77	-12.28
				1	5	0	22.86	20.35	22.50	34.77	-12.27
				6	0	0	21.42	18.91	21.06	34.77	-13.71
	23095	707.5	16QAM	1	0	0	22.84	20.33	22.48	34.77	-12.29
				1	5	0	22.82	20.31	22.46	34.77	-12.31
				6	0	0	21.46	18.95	21.10	34.77	-13.67
	23173	715.5	16QAM	1	0	0	22.66	20.15	22.30	34.77	-12.47
				1	5	0	22.65	20.14	22.29	34.77	-12.48
				6	0	0	21.33	18.82	20.97	34.77	-13.8

Antenna gain (dBi) -0.36

M1 Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	23025	700.5	QPSK	1	0	0	23.28	20.77	22.92	34.77	-11.85
				1	5	0	23.30	20.79	22.94	34.77	-11.83
				6	0	0	21.31	18.80	20.95	34.77	-13.82
	23095	707.5	QPSK	1	0	0	23.37	20.86	23.01	34.77	-11.76
				1	5	0	23.28	20.77	22.92	34.77	-11.85
				6	0	0	21.35	18.84	20.99	34.77	-13.78
	23165	714.5	QPSK	1	0	1	23.12	20.61	22.76	34.77	-12.01
				1	5	1	23.21	20.70	22.85	34.77	-11.92
				6	0	1	21.21	18.70	20.85	34.77	-13.92
	23025	700.5	16QAM	1	0	0	23.01	20.50	22.65	34.77	-12.12
				1	5	0	23.03	20.52	22.67	34.77	-12.1
				6	0	0	21.45	18.94	21.09	34.77	-13.68
	23095	707.5	16QAM	1	0	0	22.72	20.21	22.36	34.77	-12.41
				1	5	0	22.69	20.18	22.33	34.77	-12.44
				6	0	0	21.49	18.98	21.13	34.77	-13.64
	23165	714.5	16QAM	1	0	1	22.61	20.10	22.25	34.77	-12.52
				1	5	1	22.52	20.01	22.16	34.77	-12.61
				6	0	1	21.35	18.84	20.99	34.77	-13.78

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Antenna gain (dBi) -0.36

M1 Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	23035	701.5	QPSK	1	0	0	23.36	20.85	23.00	34.77	-11.77
				1	5	0	23.22	20.71	22.86	34.77	-11.91
				6	0	0	22.24	19.73	21.88	34.77	-12.89
	23095	707.5	QPSK	1	0	0	23.12	20.61	22.76	34.77	-12.01
				1	5	0	23.43	20.92	23.07	34.77	-11.7
				6	0	0	22.36	19.85	22.00	34.77	-12.77
	23155	713.5	QPSK	1	0	3	23.27	20.76	22.91	34.77	-11.86
				1	5	3	23.24	20.73	22.88	34.77	-11.89
				6	0	3	22.32	19.81	21.96	34.77	-12.81
	23035	701.5	16QAM	1	0	0	23.81	21.30	23.45	34.77	-11.32
				1	5	0	23.76	21.25	23.40	34.77	-11.37
				6	0	0	21.35	18.84	20.99	34.77	-13.78
	23095	707.5	16QAM	1	0	0	23.65	21.14	23.29	34.77	-11.48
				1	5	0	23.77	21.26	23.41	34.77	-11.36
				6	0	0	21.37	18.86	21.01	34.77	-13.76
	23155	713.5	16QAM	1	0	3	23.63	21.12	23.27	34.77	-11.5
				1	5	3	23.56	21.05	23.20	34.77	-11.57
				6	0	3	21.26	18.75	20.90	34.77	-13.87

Antenna gain (dBi) -0.36

M1 Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	23060	704	QPSK	1	0	0	23.37	20.86	23.01	34.77	-11.76
				1	5	0	23.28	20.77	22.92	34.77	-11.85
				6	0	0	22.36	19.85	22.00	34.77	-12.77
	23095	707.5	QPSK	1	0	0	23.24	20.73	22.88	34.77	-11.89
				1	5	0	23.26	20.75	22.90	34.77	-11.87
				6	0	0	22.25	19.74	21.89	34.77	-12.88
	23130	711	QPSK	1	0	7	23.36	20.85	23.00	34.77	-11.77
				1	5	7	23.21	20.70	22.85	34.77	-11.92
				6	0	7	22.25	19.74	21.89	34.77	-12.88
	23060	704	16QAM	1	0	0	23.84	21.33	23.48	34.77	-11.29
				1	5	0	23.79	21.28	23.43	34.77	-11.34
				6	0	0	21.44	18.93	21.08	34.77	-13.69
	23095	707.5	16QAM	1	0	0	23.79	21.28	23.43	34.77	-11.34
				1	5	0	23.77	21.26	23.41	34.77	-11.36
				6	0	0	21.35	18.84	20.99	34.77	-13.78
	23130	711	16QAM	1	0	7	23.86	21.35	23.50	34.77	-11.27
				1	5	7	23.88	21.37	23.52	34.77	-11.25
				6	0	7	21.40	18.89	21.04	34.77	-13.73

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Antenna gain (dBi) 0.18

M1 Band 13_Uplink frequency band : 777 to 787 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	23205	779.5	QPSK	1	0	0	23.12	21.15	23.30	34.77	-11.47
				1	5	0	23.15	21.18	23.33	34.77	-11.44
				6	0	0	22.18	20.21	22.36	34.77	-12.41
	23230	782	QPSK	1	0	0	23.15	21.18	23.33	34.77	-11.44
				1	5	0	23.16	21.19	23.34	34.77	-11.43
				6	0	0	22.12	20.15	22.30	34.77	-12.47
	23255	784.5	QPSK	1	0	3	23.21	21.24	23.39	34.77	-11.38
				1	5	3	23.18	21.21	23.36	34.77	-11.41
				6	0	3	22.16	20.19	22.34	34.77	-12.43
	23205	779.5	16QAM	1	0	0	23.72	21.75	23.90	34.77	-10.87
				1	5	0	23.68	21.71	23.86	34.77	-10.91
				6	0	0	21.29	19.32	21.47	34.77	-13.3
	23230	782	16QAM	1	0	0	23.66	21.69	23.84	34.77	-10.93
				1	5	0	23.69	21.72	23.87	34.77	-10.9
				6	0	0	21.28	19.31	21.46	34.77	-13.31
	23255	784.5	16QAM	1	0	3	23.69	21.72	23.87	34.77	-10.9
				1	5	3	23.63	21.66	23.81	34.77	-10.96
				6	0	3	21.06	19.09	21.24	34.77	-13.53

Antenna gain (dBi) 0.18

M1 Band 13_Uplink frequency band : 777 to 787 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	23230	782	QPSK	1	0	0	23.22	21.25	23.40	34.77	-11.37
				1	5	0	23.27	21.30	23.45	34.77	-11.32
				6	0	0	22.17	20.20	22.35	34.77	-12.42
	23230	782	16QAM	1	0	0	23.75	21.78	23.93	34.77	-10.84
				1	5	0	23.71	21.74	23.89	34.77	-10.88
				6	0	0	21.34	19.37	21.52	34.77	-13.25

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Antenna gain (dBi) -1.63

M1 Band 26_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	26797	824.7	QPSK	1	0	0	22.52	18.74	20.89	38.45	-17.56
				1	5	0	22.48	18.70	20.85	38.45	-17.6
				6	0	0	20.61	16.83	18.98	38.45	-19.47
	26915	836.5	QPSK	1	0	0	22.51	18.73	20.88	38.45	-17.57
				1	5	0	22.53	18.75	20.90	38.45	-17.55
				6	0	0	20.58	16.80	18.95	38.45	-19.5
	27033	848.3	QPSK	1	0	0	22.55	18.77	20.92	38.45	-17.53
				1	5	0	22.57	18.79	20.94	38.45	-17.51
				6	0	0	20.61	16.83	18.98	38.45	-19.47
	26797	824.7	16QAM	1	0	0	22.28	18.50	20.65	38.45	-17.8
				1	5	0	22.22	18.44	20.59	38.45	-17.86
				6	0	0	20.79	17.01	19.16	38.45	-19.29
	26915	836.5	16QAM	1	0	0	22.25	18.47	20.62	38.45	-17.83
				1	5	0	22.26	18.48	20.63	38.45	-17.82
				6	0	0	20.74	16.96	19.11	38.45	-19.34
	27033	848.3	16QAM	1	0	0	22.24	18.46	20.61	38.45	-17.84
				1	5	0	22.29	18.51	20.66	38.45	-17.79
				6	0	0	20.78	17.00	19.15	38.45	-19.3

Antenna gain (dBi) -1.63

M1 Band 26_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	26805	825.5	QPSK	1	0	0	22.48	18.70	20.85	38.45	-17.6
				1	5	0	22.50	18.72	20.87	38.45	-17.58
				6	0	0	20.48	16.70	18.85	38.45	-19.6
	26915	836.5	QPSK	1	0	0	22.49	18.71	20.86	38.45	-17.59
				1	5	0	22.53	18.75	20.90	38.45	-17.55
				6	0	0	20.43	16.65	18.80	38.45	-19.65
	27025	847.5	QPSK	1	0	1	22.48	18.70	20.85	38.45	-17.6
				1	5	1	22.55	18.77	20.92	38.45	-17.53
				6	0	1	20.49	16.71	18.86	38.45	-19.59
	26805	825.5	16QAM	1	0	0	22.16	18.38	20.53	38.45	-17.92
				1	5	0	22.13	18.35	20.50	38.45	-17.95
				6	0	0	20.72	16.94	19.09	38.45	-19.36
	26915	836.5	16QAM	1	0	0	22.11	18.33	20.48	38.45	-17.97
				1	5	0	22.13	18.35	20.50	38.45	-17.95
				6	0	0	20.68	16.90	19.05	38.45	-19.4
	27025	847.5	16QAM	1	0	1	22.13	18.35	20.50	38.45	-17.95
				1	5	1	22.14	18.36	20.51	38.45	-17.94
				6	0	1	20.73	16.95	19.10	38.45	-19.35

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Antenna gain (dBi) -1.63

M1 Band 26_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	26815	826.5	QPSK	1	0	0	22.48	18.70	20.85	38.45	-17.6
				1	5	0	22.67	18.89	21.04	38.45	-17.41
				6	0	0	21.47	17.69	19.84	38.45	-18.61
	26915	836.5	QPSK	1	0	0	22.64	18.86	21.01	38.45	-17.44
				1	5	0	22.70	18.92	21.07	38.45	-17.38
				6	0	0	21.50	17.72	19.87	38.45	-18.58
	27015	846.5	QPSK	1	0	3	22.73	18.95	21.10	38.45	-17.35
				1	5	3	22.75	18.97	21.12	38.45	-17.33
				6	0	3	21.60	17.82	19.97	38.45	-18.48
	26815	826.5	16QAM	1	0	0	23.03	19.25	21.40	38.45	-17.05
				1	5	0	23.09	19.31	21.46	38.45	-16.99
				6	0	0	20.64	16.86	19.01	38.45	-19.44
	26915	836.5	16QAM	1	0	0	23.03	19.25	21.40	38.45	-17.05
				1	5	0	23.05	19.27	21.42	38.45	-17.03
				6	0	0	20.67	16.89	19.04	38.45	-19.41
	27015	846.5	16QAM	1	0	3	23.04	19.26	21.41	38.45	-17.04
				1	5	3	23.01	19.23	21.38	38.45	-17.07
				6	0	3	20.69	16.91	19.06	38.45	-19.39

Antenna gain (dBi) -1.63

M1 Band 26_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	26840	829	QPSK	1	0	0	22.46	18.68	20.83	38.45	-17.62
				1	5	0	22.40	18.62	20.77	38.45	-17.68
				6	0	0	21.39	17.61	19.76	38.45	-18.69
	26915	836.5	QPSK	1	0	0	22.47	18.69	20.84	38.45	-17.61
				1	5	0	22.49	18.71	20.86	38.45	-17.59
				6	0	0	21.56	17.78	19.93	38.45	-18.52
	26990	844	QPSK	1	0	7	22.47	18.69	20.84	38.45	-17.61
				1	5	7	22.43	18.65	20.80	38.45	-17.65
				6	0	7	21.56	17.78	19.93	38.45	-18.52
	26840	829	16QAM	1	0	0	23.18	19.40	21.55	38.45	-16.9
				1	5	0	23.15	19.37	21.52	38.45	-16.93
				6	0	0	20.83	17.05	19.20	38.45	-19.25
	26915	836.5	16QAM	1	0	0	23.11	19.33	21.48	38.45	-16.97
				1	5	0	23.17	19.39	21.54	38.45	-16.91
				6	0	0	20.89	17.11	19.26	38.45	-19.19
	26990	844	16QAM	1	0	7	23.08	19.30	21.45	38.45	-17
				1	5	7	23.15	19.37	21.52	38.45	-16.93
				6	0	7	20.82	17.04	19.19	38.45	-19.26

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Antenna gain (dBi) -1.63

M1 Band 26_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
15	26865	831.5	QPSK	1	0	0	22.49	18.71	20.86	38.45	-17.59
				1	5	0	22.46	18.68	20.83	38.45	-17.62
				6	0	0	22.53	18.75	20.90	38.45	-17.55
	26915	836.5	QPSK	1	0	0	22.48	18.70	20.85	38.45	-17.6
				1	5	0	22.44	18.66	20.81	38.45	-17.64
				6	0	0	22.56	18.78	20.93	38.45	-17.52
	26965	841.5	QPSK	1	0	11	22.41	18.63	20.78	38.45	-17.67
				1	5	11	22.47	18.69	20.84	38.45	-17.61
				6	0	11	22.58	18.80	20.95	38.45	-17.5
	26865	831.5	16QAM	1	0	0	23.05	19.27	21.42	38.45	-17.03
				1	5	0	23.02	19.24	21.39	38.45	-17.06
				6	0	0	22.75	18.97	21.12	38.45	-17.33
	26915	836.5	16QAM	1	0	0	23.01	19.23	21.38	38.45	-17.07
				1	5	0	23.02	19.24	21.39	38.45	-17.06
				6	0	0	22.85	19.07	21.22	38.45	-17.23
	26965	841.5	16QAM	1	0	11	23.13	19.35	21.50	38.45	-16.95
				1	5	11	23.10	19.32	21.47	38.45	-16.98
				6	0	11	22.67	18.89	21.04	38.45	-17.41

Antenna gain (dBi) -1.68

Part 90S_M1 Band 26_Uplink frequency band : 814 to 824 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	26697	814.7	QPSK	1	0	0	22.45	18.62	20.77	50	-29.23
				1	5	0	22.41	18.58	20.73	50	-29.27
				6	0	0	20.47	16.64	18.79	50	-31.21
	26740	819	QPSK	1	0	0	22.44	18.61	20.76	50	-29.24
				1	5	0	22.38	18.55	20.70	50	-29.3
				6	0	0	20.48	16.65	18.80	50	-31.2
	26783	823.3	QPSK	1	0	0	22.48	18.65	20.80	50	-29.2
				1	5	0	22.42	18.59	20.74	50	-29.26
				6	0	0	20.45	16.62	18.77	50	-31.23
	26697	814.7	16QAM	1	0	0	22.27	18.44	20.59	50	-29.41
				1	5	0	22.26	18.43	20.58	50	-29.42
				6	0	0	20.61	16.78	18.93	50	-31.07
	26740	819	16QAM	1	0	0	22.24	18.41	20.56	50	-29.44
				1	5	0	22.29	18.46	20.61	50	-29.39
				6	0	0	20.58	16.75	18.90	50	-31.1
	26783	823.3	16QAM	1	0	0	22.28	18.45	20.60	50	-29.4
				1	5	0	22.23	18.40	20.55	50	-29.45
				6	0	0	20.54	16.71	18.86	50	-31.14

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Antenna gain (dBi) -1.68

Part 90S_M1 Band 26_Uplink frequency band : 814 to 824 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	26705	815.5	QPSK	1	0	0	22.43	18.60	20.75	50	-29.25
				1	5	0	22.42	18.59	20.74	50	-29.26
				6	0	0	20.49	16.66	18.81	50	-31.19
	26740	819	QPSK	1	0	0	22.44	18.61	20.76	50	-29.24
				1	5	0	22.45	18.62	20.77	50	-29.23
				6	0	0	20.48	16.65	18.80	50	-31.2
	26775	822.5	QPSK	1	0	1	22.47	18.64	20.79	50	-29.21
				1	5	1	22.43	18.60	20.75	50	-29.25
				6	0	1	20.52	16.69	18.84	50	-31.16
	26705	815.5	16QAM	1	0	0	21.77	17.94	20.09	50	-29.91
				1	5	0	21.72	17.89	20.04	50	-29.96
				6	0	0	20.55	16.72	18.87	50	-31.13
	26740	819	16QAM	1	0	0	21.74	17.91	20.06	50	-29.94
				1	5	0	21.78	17.95	20.10	50	-29.9
				6	0	0	20.59	16.76	18.91	50	-31.09
	26775	822.5	16QAM	1	0	1	21.78	17.95	20.10	50	-29.9
				1	5	1	21.75	17.92	20.07	50	-29.93
				6	0	1	20.55	16.72	18.87	50	-31.13

Antenna gain (dBi) -1.68

Part 90S_M1 Band 26_Uplink frequency band : 814 to 824 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	26715	816.5	QPSK	1	0	0	22.55	18.72	20.87	50	-29.13
				1	5	0	22.43	18.60	20.75	50	-29.25
				6	0	0	21.35	17.52	19.67	50	-30.33
	26740	819	QPSK	1	0	0	22.53	18.70	20.85	50	-29.15
				1	5	0	22.42	18.59	20.74	50	-29.26
				6	0	0	21.36	17.53	19.68	50	-30.32
	26765	821.5	QPSK	1	0	3	22.59	18.76	20.91	50	-29.09
				1	5	3	22.45	18.62	20.77	50	-29.23
				6	0	3	21.38	17.55	19.70	50	-30.3
	26715	816.5	16QAM	1	0	0	23.02	19.19	21.34	50	-28.66
				1	5	0	23.04	19.21	21.36	50	-28.64
				6	0	0	20.67	16.84	18.99	50	-31.01
	26740	819	16QAM	1	0	0	23.01	19.18	21.33	50	-28.67
				1	5	0	23.00	19.17	21.32	50	-28.68
				6	0	0	20.63	16.80	18.95	50	-31.05
	26765	821.5	16QAM	1	0	3	23.00	19.17	21.32	50	-28.68
				1	5	3	23.05	19.22	21.37	50	-28.63
				6	0	3	20.69	16.86	19.01	50	-30.99

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Antenna gain (dBi) -1.68

Part 90S_M1 Band 26_Uplink frequency band : 814 to 824 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	26740	819	QPSK	1	0	0	22.43	18.60	20.75	50	-29.25
				1	5	0	22.45	18.62	20.77	50	-29.23
				6	0	0	21.39	17.56	19.71	50	-30.29
	26740	819	16QAM	1	0	0	23.01	19.18	21.33	50	-28.67
				1	5	0	23.03	19.20	21.35	50	-28.65
				6	0	0	20.84	17.01	19.16	50	-30.84

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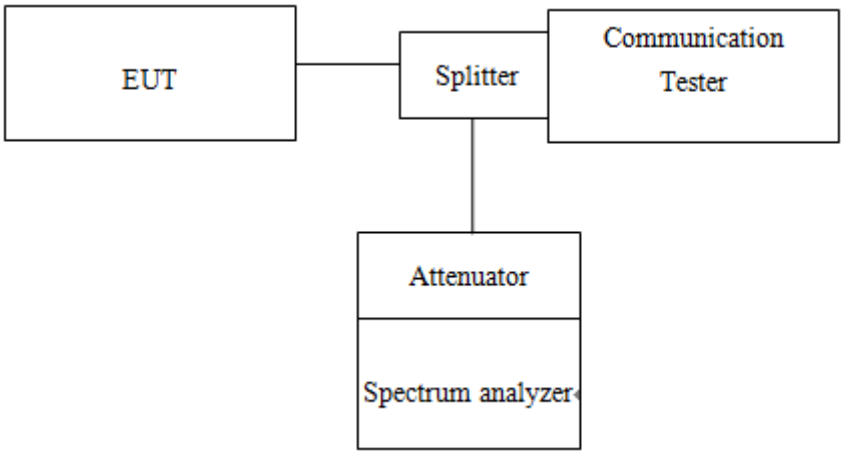
7 OCCUPIED BANDWIDTH MEASUREMENT

7.1 Standard Applicable

The occupied bandwidth 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.

7.2 Test Set-up



7.3 Measurement Procedure

99% &26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

99% Bandwidth with detector sample

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW, -20dBc display line was placed on the screen (or 20dB bandwidth). Set RBW to 99% bandwidth, RBW= 1% ~ 5%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

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7.4 Measurement Equipment Used

Conducted Emission (measured at antenna port) Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyz-er	Agilent	N9010A	MY50420195	05/02/2019	05/01/2020
Radio Communication Analyer	Anritsu	MT8821C	6261786084	01/09/2019	01/08/2020
DC Power Supply	Agilent	E3640A	MY52410006	12/04/2018	12/03/2019
Attenuator	Mini-Circuit	BW-S10W2+	4	01/02/2019	01/01/2020
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2019	05/16/2020
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2019	01/01/2020
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2019	01/01/2020

7.5 Measurement Result

NB IoT

LTE NB-IoT Band 2						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result (kHz)	
					26dB BW	99% BW
18601	1850.1	BPSK	3.75	1@0	307.400	229.00
		QPSK	15	1@0	256.000	210.38
		QPSK	15	12@0	268.300	222.04
18900	1880	BPSK	3.75	1@0	308.300	227.65
		QPSK	15	1@0	261.200	211.19
		QPSK	15	12@0	261.600	221.53
19199	1909.9	BPSK	3.75	1@0	279.400	224.62
		QPSK	15	1@0	257.600	208.13
		QPSK	15	12@0	271.700	222.32

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LTE NB-IoT Band 4						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result (kHz)	
					26dB BW	99% BW
19951	1710.1	BPSK	3.75	1@0	312.700	228.83
		QPSK	15	1@0	267.900	213.99
		QPSK	15	12@0	278.900	222.40
20175	1732.5	BPSK	3.75	1@0	322.100	229.27
		QPSK	15	1@0	260.500	212.39
		QPSK	15	12@0	266.400	222.91
20399	1754.9	BPSK	3.75	1@0	314.000	230.08
		QPSK	15	1@0	270.200	214.44
		QPSK	15	12@0	267.400	222.65

LTE NB-IoT Band 5						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result (kHz)	
					26dB BW	99% BW
20401	824.1	BPSK	3.75	1@0	273.900	221.73
		QPSK	15	1@0	245.600	200.10
		QPSK	15	12@0	273.000	220.77
20525	836.5	BPSK	3.75	1@0	272.300	223.21
		QPSK	15	1@0	254.000	198.88
		QPSK	15	12@0	274.000	221.84
20649	848.9	BPSK	3.75	1@0	268.300	223.60
		QPSK	15	1@0	255.500	200.62
		QPSK	15	12@0	271.500	218.98

LTE NB-IoT Band 12						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result (kHz)	
					26dB BW	99% BW
23011	699.1	BPSK	3.75	1@0	277.700	223.32
		QPSK	15	1@0	254.400	198.30
		QPSK	15	12@0	268.300	219.48
23095	707.5	BPSK	3.75	1@0	274.300	223.02
		QPSK	15	1@0	244.300	195.39
		QPSK	15	12@0	268.700	225.64
23719	715.9	BPSK	3.75	1@0	270.400	217.93
		QPSK	15	1@0	248.700	197.76
		QPSK	15	12@0	279.800	217.28

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LTE NB-IoT Band 13						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result (kHz)	
					26dB BW	99% BW
23181	777.1	BPSK	3.75	1@0	273.500	222.24
		QPSK	15	1@0	256.200	201.23
		QPSK	15	12@0	264.500	221.54
23230	782	BPSK	3.75	1@0	280.800	218.61
		QPSK	15	1@0	248.400	200.29
		QPSK	15	12@0	275.400	219.85
23279	786.9	BPSK	3.75	1@0	284.400	224.10
		QPSK	15	1@0	254.000	200.11
		QPSK	15	12@0	277.500	220.80

LTE NB-IoT Band 26						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result (kHz)	
					26dB BW	99% BW
26791	824.1	BPSK	3.75	1@0	273.300	223.86
		QPSK	15	1@0	251.900	199.12
		QPSK	15	12@0	269.400	217.08
26915	836.5	BPSK	3.75	1@0	273.900	223.61
		QPSK	15	1@0	248.600	202.24
		QPSK	15	12@0	268.400	221.00
27039	848.9	BPSK	3.75	1@0	273.400	224.12
		QPSK	15	1@0	255.500	201.88
		QPSK	15	12@0	275.500	219.03

LTE NB-IoT Band 26_Part90						
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Measure Result (kHz)	
					26dB BW	99% BW
26691	814.1	BPSK	3.75	1@0	224.290	275.10
		QPSK	15	1@0	201.950	257.40
		QPSK	15	12@0	219.280	272.30
26740	819	BPSK	3.75	1@0	211.660	252.80
		QPSK	15	1@0	199.620	250.60
		QPSK	15	12@0	223.650	262.80
26789	823.9	BPSK	3.75	1@0	224.160	276.90
		QPSK	15	1@0	201.880	249.10
		QPSK	15	12@0	222.780	276.20

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Cat M1

M1 BAND 2 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1850.7	18607	1.0919	1.0991	1.270	1.273
1880.0	18900	1.0926	1.0999	1.286	1.281
1909.3	19193	1.0916	1.1023	1.262	1.263

M1 BAND 2 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1851.5	18615	1.1829	1.1997	2.318	2.092
1880.0	18900	1.1785	1.1843	2.572	1.459
1908.5	19185	1.2203	1.1660	2.657	1.429

M1 BAND 2 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1852.5	18625	1.3331	1.2842	3.332	1.879
1880.0	18900	1.4435	1.2694	2.987	1.725
1907.5	19175	1.2742	1.2337	2.647	1.793

M1 BAND 2 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1855.0	18650	1.9901	2.6042	3.712	3.795
1880.0	18900	1.9204	1.9928	3.799	3.754
1905.0	19150	1.9864	1.9733	3.901	3.425

M1 BAND 2 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1857.5	18675	2.245	2.293	5.650	3.262
1880.0	18900	2.300	2.226	3.370	3.548
1902.5	19125	2.107	1.974	3.837	3.857

M1 BAND 2 Channel bandwidth: 20MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1860.0	18700	3.325	2.763	6.135	4.145
1880.0	18900	2.426	2.614	5.531	4.502
1900.0	19100	2.535	2.383	3.816	3.829

M1 BAND 4 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1710.7	19957	1.0919	1.1017	1.273	1.283
1732.5	20175	1.0986	1.0941	1.310	1.267
1754.3	20393	1.0911	1.1003	1.262	1.266

M1 BAND 4 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1711.5	19965	1.1946	1.1868	2.671	1.816
1732.5	20175	1.2129	1.1779	2.516	1.479
1753.5	20385	1.2002	1.1594	2.543	2.178

M1 BAND 4 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1712.5	19975	1.3107	1.2239	3.255	1.587
1732.5	20175	1.3003	1.2488	2.887	1.613
1752.5	20375	1.2944	1.2165	3.018	1.548

M1 BAND 4 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1715.0	20000	2.0659	2.0817	3.986	3.383
1732.5	20175	1.9888	1.9287	3.819	3.794
1750.0	20350	1.8569	1.9931	3.582	3.550

M1 BAND 4 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1717.5	20025	2.324	2.155	4.055	3.680
1732.5	20175	2.200	2.284	3.280	3.507
1747.5	20325	2.218	1.931	3.511	3.715

M1 BAND 4 Channel bandwidth: 20MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1720.0	20050	2.441	2.187	5.081	3.101
1732.5	20175	2.662	2.088	5.404	3.018
1745.0	20300	2.716	2.357	3.898	3.736

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M1 BAND 5 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
824.7	20407	1.0929	1.0959	1.277	1.295
836.5	20525	1.0961	1.0904	1.285	1.276
848.3	20643	1.0964	1.0985	1.286	1.269

M1 BAND 5 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
825.5	20415	1.1856	1.1805	2.236	1.470
836.5	20525	1.2042	1.1716	2.443	2.200
847.5	20635	1.1976	1.1719	2.633	1.453

M1 BAND 5 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
826.5	20425	1.3059	1.2282	2.844	1.561
836.5	20525	1.7009	1.2383	3.209	1.569
846.5	20625	1.3457	1.2377	2.896	1.456

M1 BAND 5 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
829.0	20450	2.1334	2.0515	4.117	3.536
836.5	20525	2.2606	2.5460	4.113	3.841
844.0	20600	1.8906	2.1794	4.171	3.577

M1 BAND 12 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
699.7	23017	1.0975	1.0978	1.293	1.302
707.5	23095	1.0890	1.0957	1.272	1.280
715.3	23173	1.0933	1.0919	1.305	1.272

M1 BAND 12 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
700.5	23025	1.2162	1.1856	2.181	1.465
707.5	23095	1.2173	1.1641	2.586	1.425
714.5	23165	1.1885	1.1657	2.548	1.437

M1 BAND 12 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
701.5	23035	1.3336	1.2720	2.810	1.601
707.5	23095	1.3468	1.2886	3.061	2.409
713.5	23155	1.3073	1.2570	3.018	1.593

M1 BAND 12 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
704.0	23060	2.3087	2.5362	3.980	3.715
707.5	23095	2.2743	2.0445	3.870	3.746
711.0	23130	1.8749	1.9477	4.200	3.584

M1 BAND 13 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
779.5	23205	1.3430	1.2718	3.142	1.578
782.0	23230	1.3158	1.2597	2.996	1.640
784.5	23255	1.3058	1.2527	2.515	1.556

M1 BAND 13 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
782.0	23230	1.967	2.052	3.608	3.819

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M1 BAND 26 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
824.7	26797	1.0944	1.0941	1.281	1.285
836.5	26915	1.0962	1.0994	1.287	1.295
848.3	27033	1.0962	1.0950	1.289	1.258

M1 BAND 26 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
825.5	26805	1.2263	1.1827	2.923	1.441
836.5	26915	1.2490	1.1830	2.930	1.514
847.5	27025	1.2413	1.1687	3.050	1.444

M1 BAND 26 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
826.5	26815	1.3587	1.2934	3.689	2.554
836.5	26915	1.3550	1.2877	3.135	1.589
846.5	27015	1.3375	1.2446	3.029	1.610

M1 BAND 26 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
829.0	26840	1.9523	2.0630	3.840	4.033
836.5	26915	2.5778	2.5495	4.366	3.932
844.0	26990	1.8117	2.4210	3.354	4.055

M1 BAND 26 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
831.5	26865	2.310	2.120	4.354	4.171
836.5	26915	2.355	2.294	4.441	4.541
841.5	26965	2.235	2.377	4.523	3.976

M1 BAND 26 for part 90S Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
814.7	26697	1.0964	1.0980	1.282	1.289
819.0	26740	1.0974	1.0964	1.279	1.286
823.3	26783	1.0961	1.0947	1.282	1.281

M1 BAND 26 for part 90S Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
815.5	26705	1.2093	1.2118	2.903	2.742
819.0	26740	1.2188	1.2308	2.646	2.933
822.5	26775	1.2675	1.3861	2.876	2.844

M1 BAND 26 for part 90S Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
816.5	26715	1.3541	1.2759	3.965	1.787
819.0	26740	1.3117	1.3285	3.005	2.900
821.5	26765	1.3302	1.2685	3.068	1.580

M1 BAND 26 for part 90S Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
819.0	26740	2.5316	2.4742	4.311	4.577

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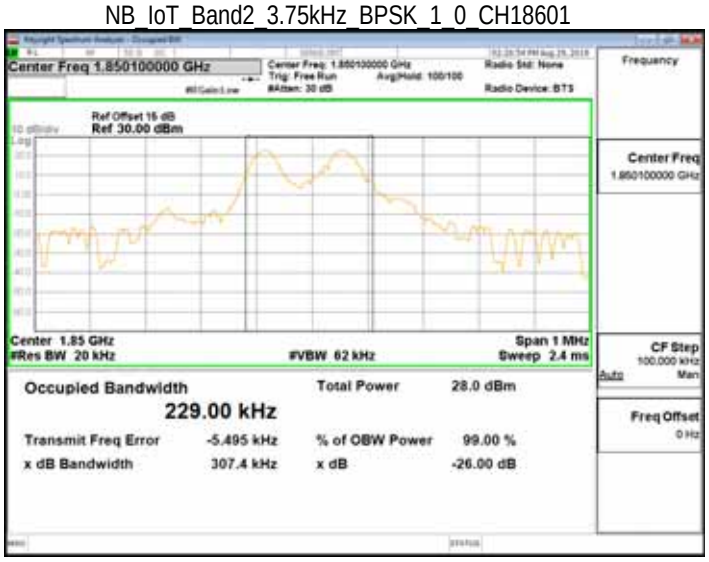
NB_IoT_Band2_3.75kHz_BPSK_1_0_CH18601



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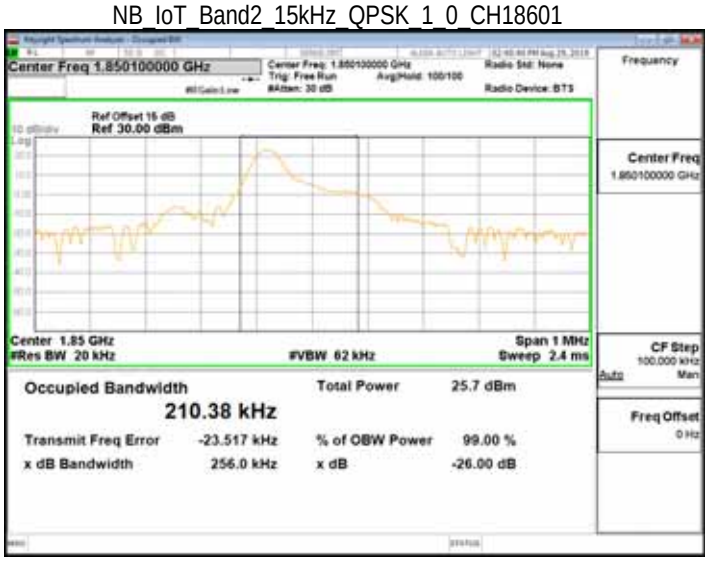

NB_IoT_Band2_3.75kHz_BPSK_1_0_CH18900

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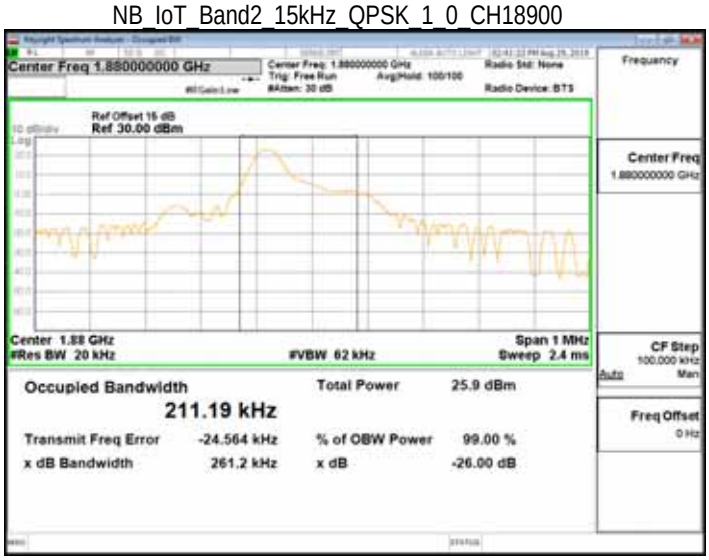

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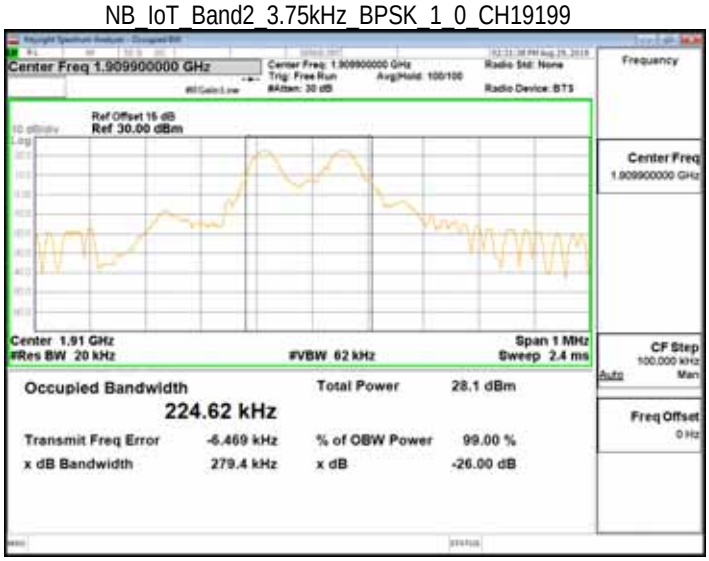

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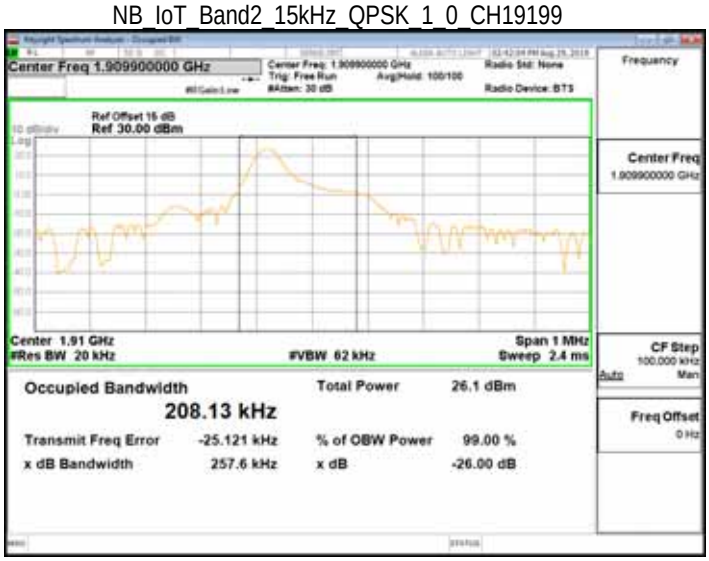

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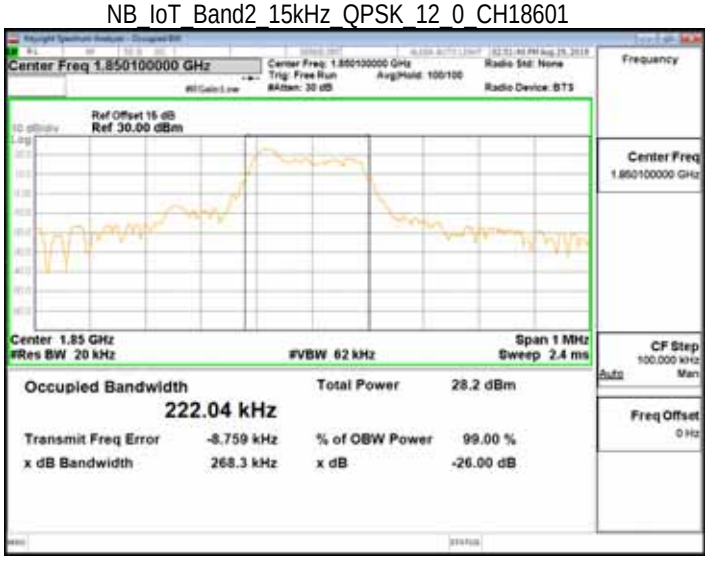
NB_IoT_Band2_15kHz_QPSK_12_0_CH18601



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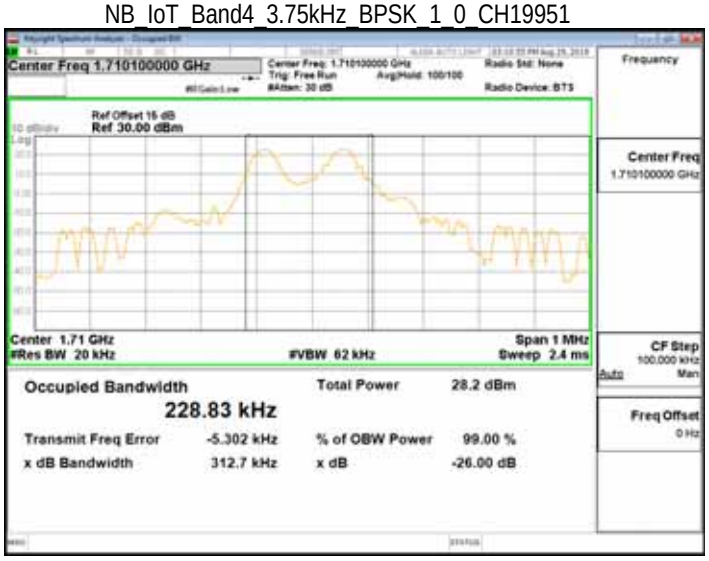

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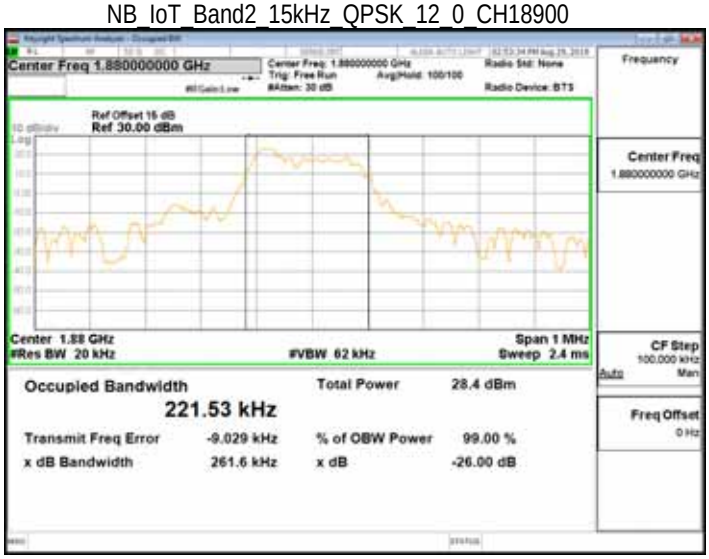

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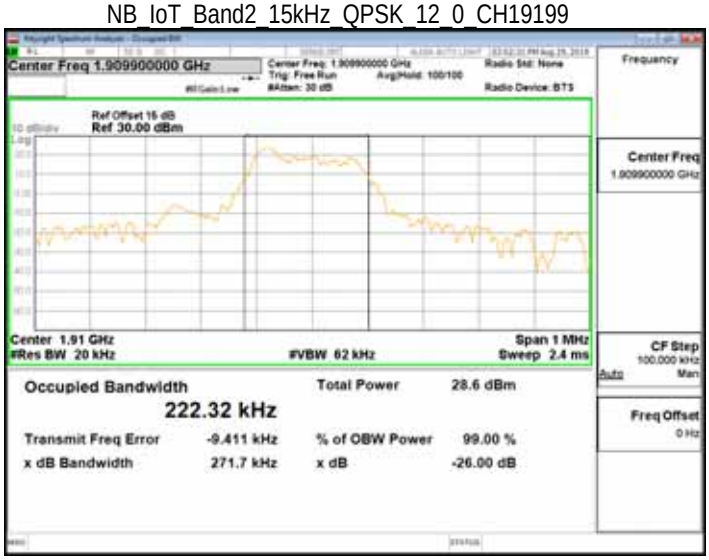

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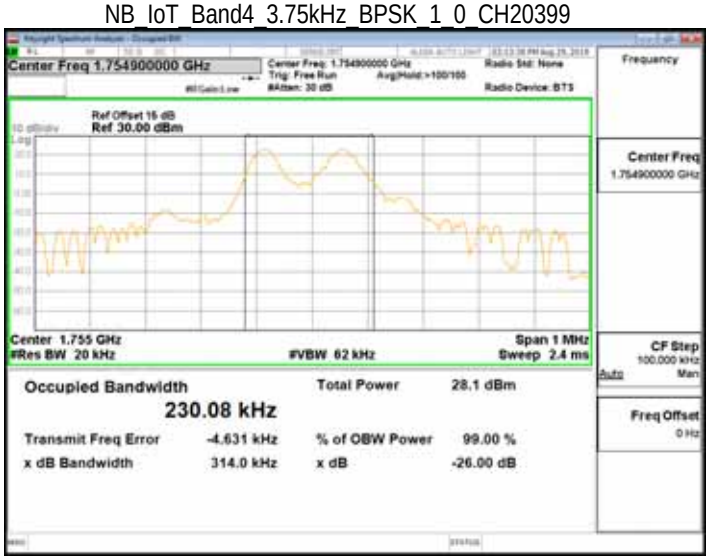

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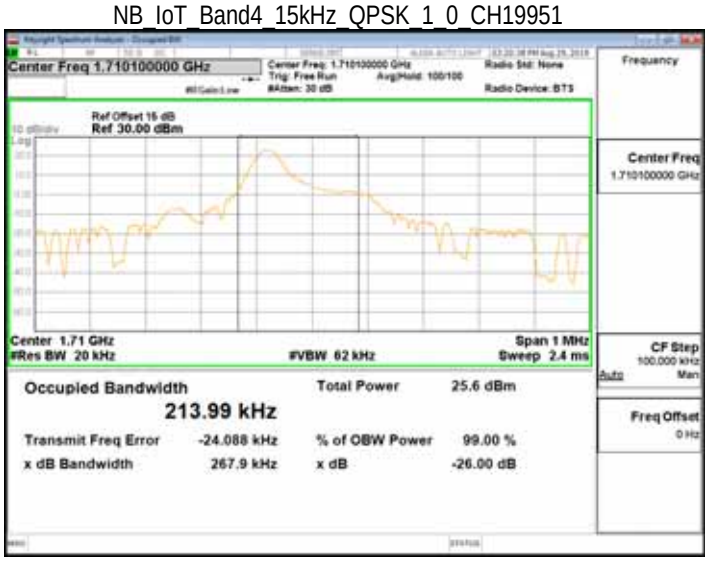
NB_IoT_Band4_15kHz_QPSK_1_0_CH19951



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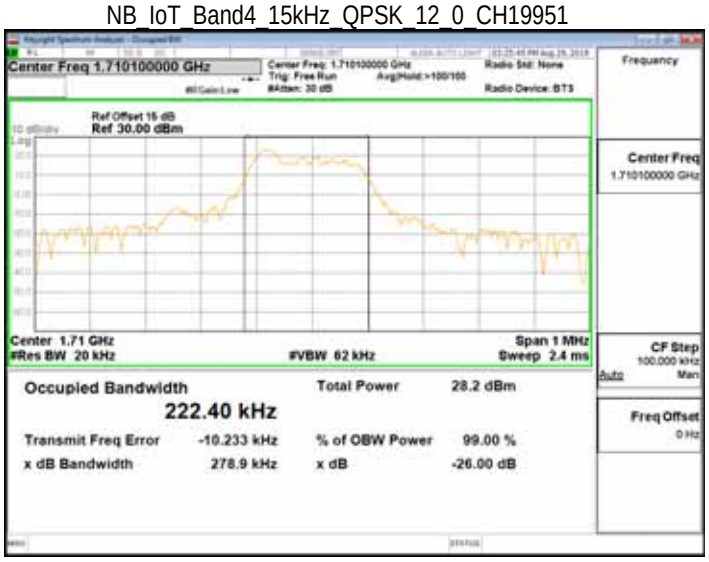

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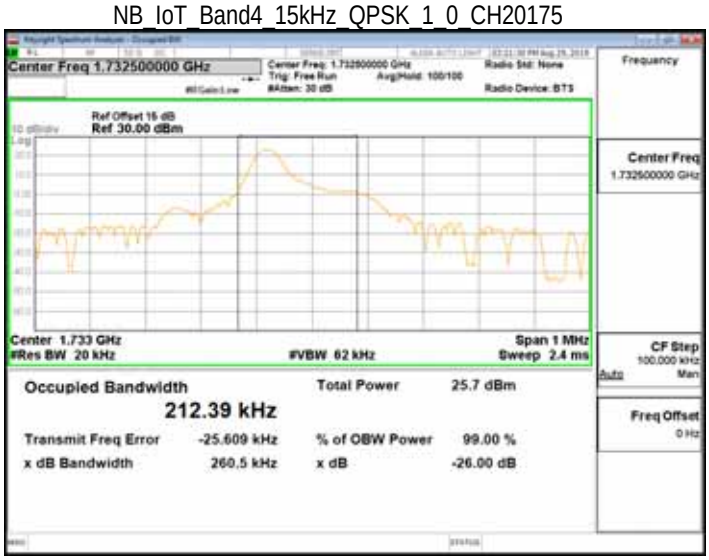

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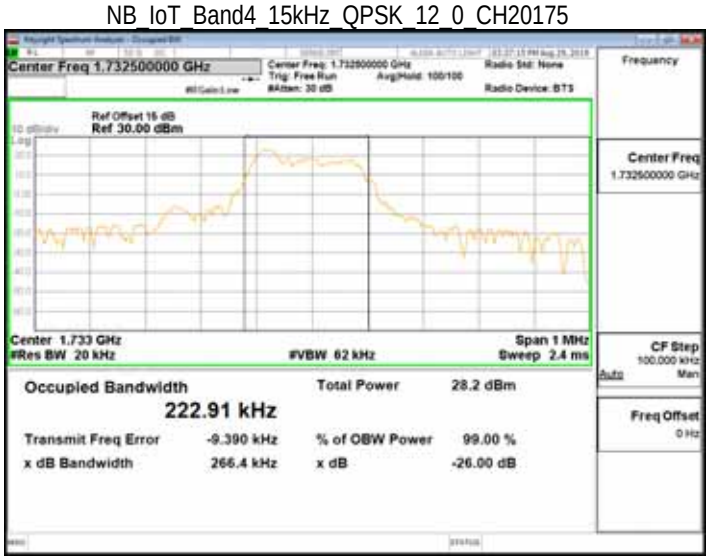

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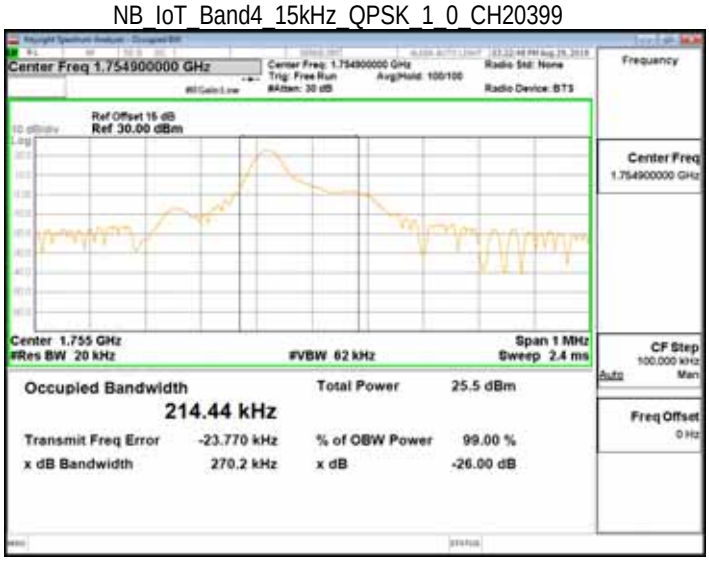

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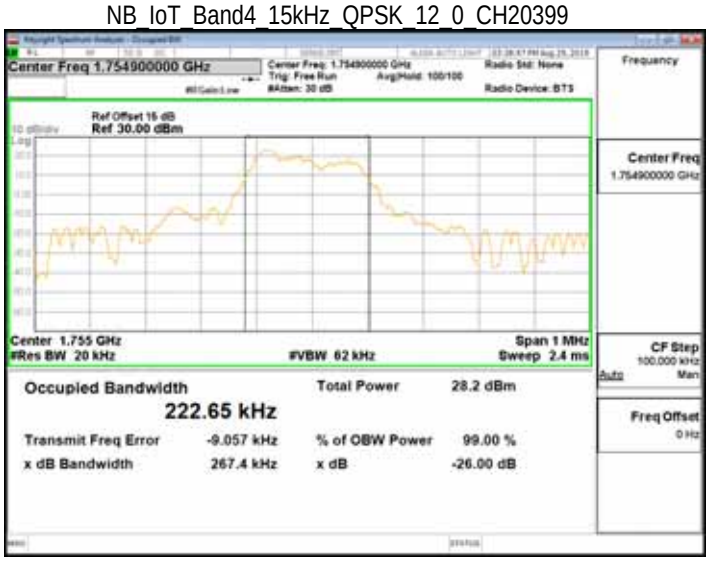

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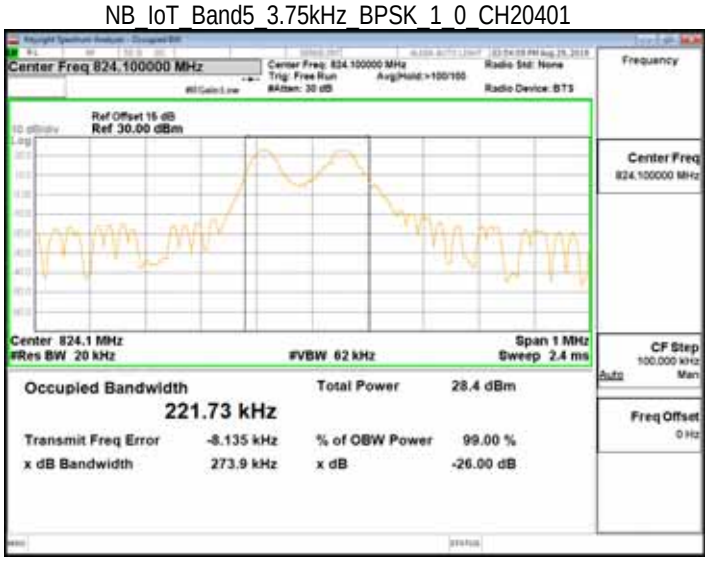
NB_IoT_Band5_3.75kHz_BPSK_1_0_CH20401



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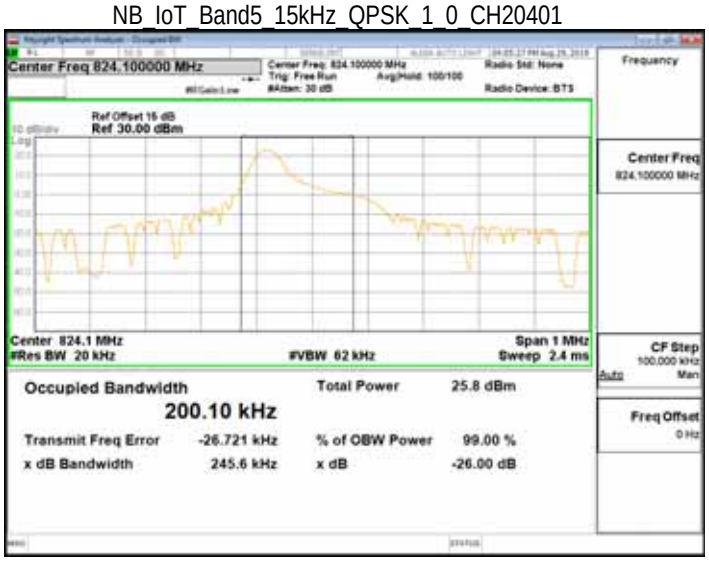

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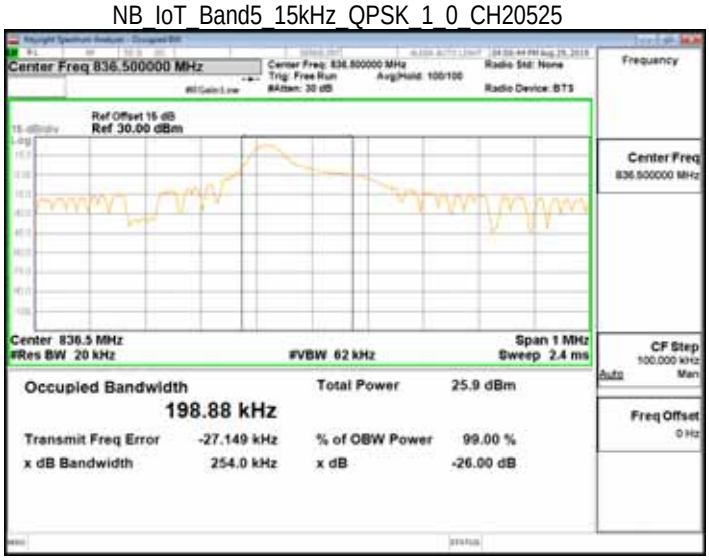

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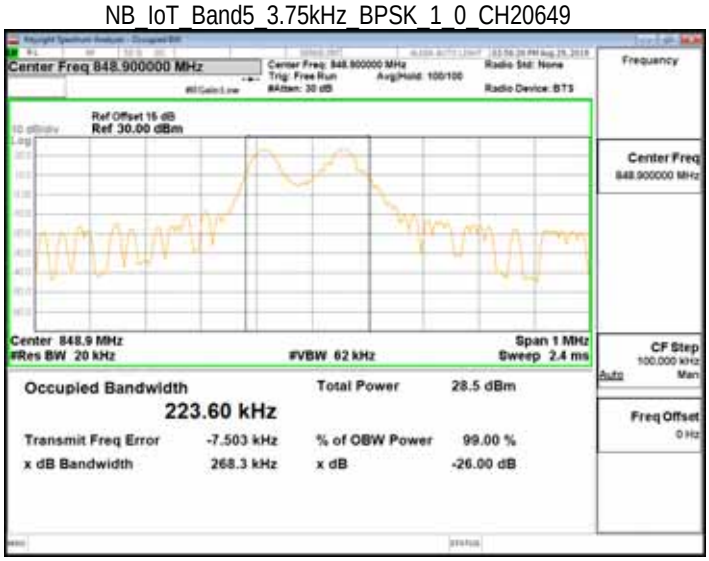

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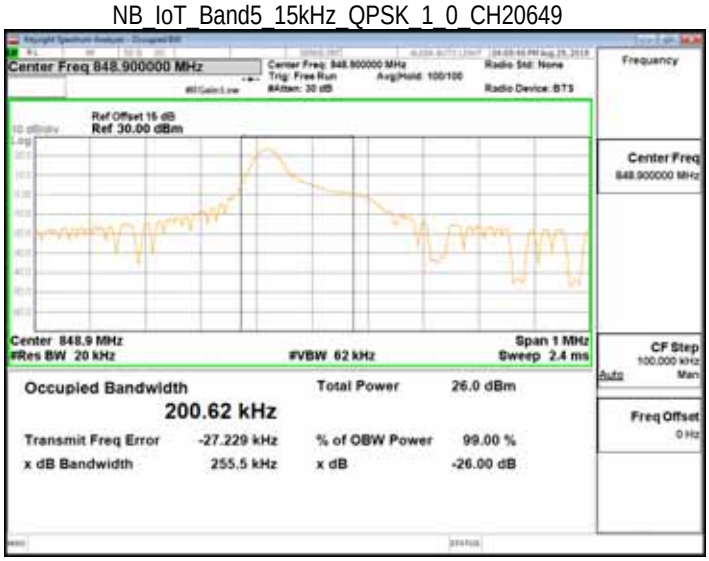

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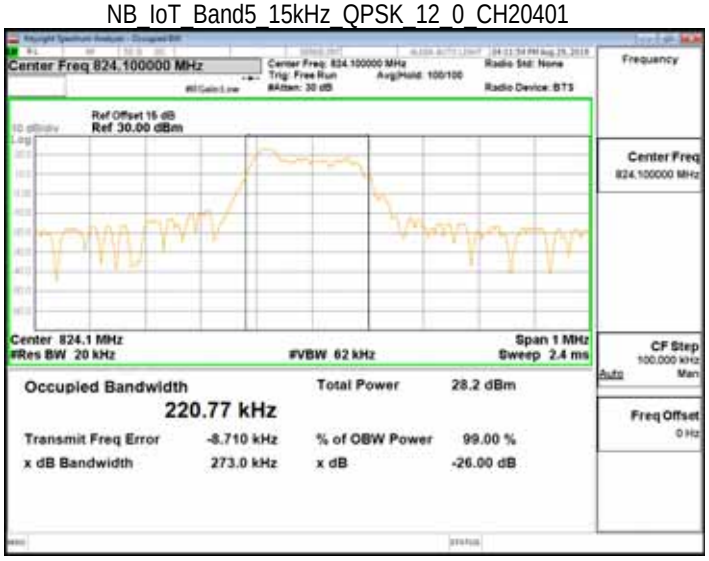
NB_IoT_Band5_15kHz_QPSK_12_0_CH20401



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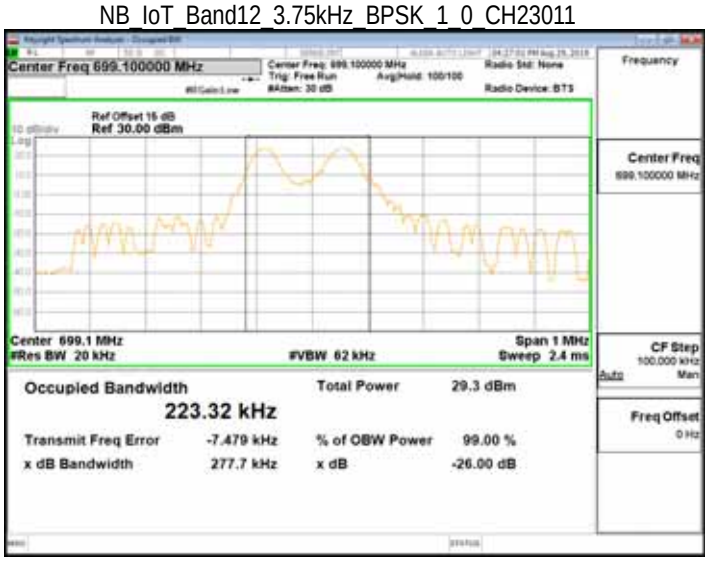

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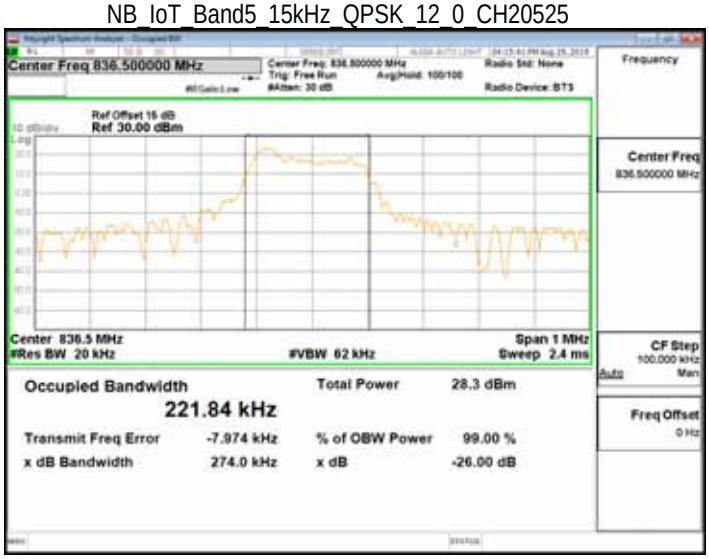

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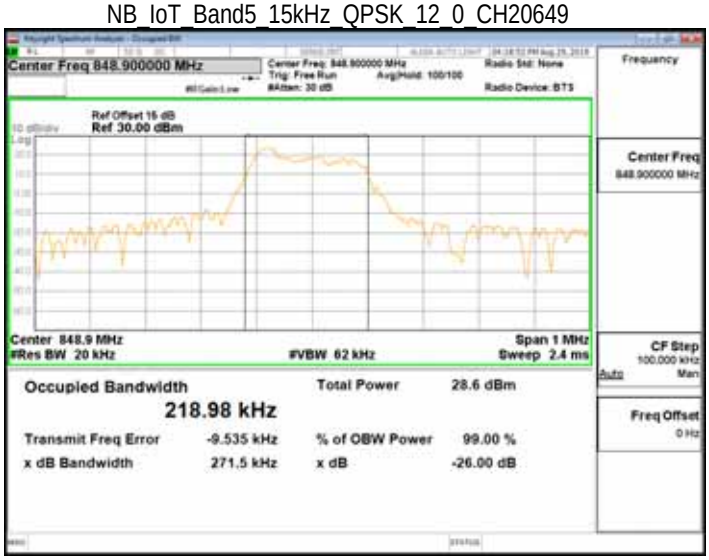
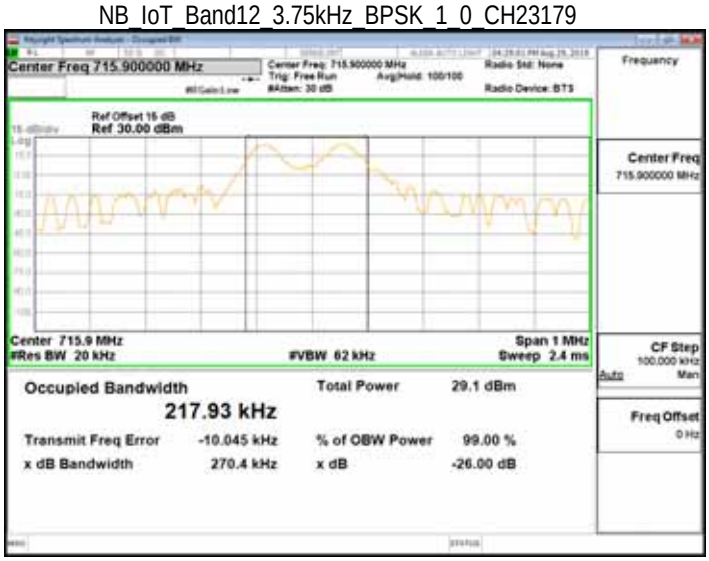
NB_IoT_Band5_15kHz_QPSK_12_0_CH20649



NB_IoT_Band12_3.75kHz_BPSK_1_0_CH23179



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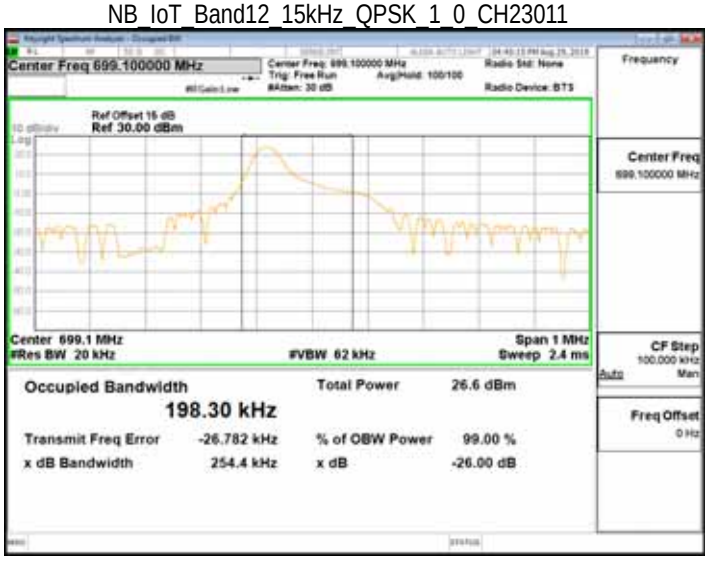
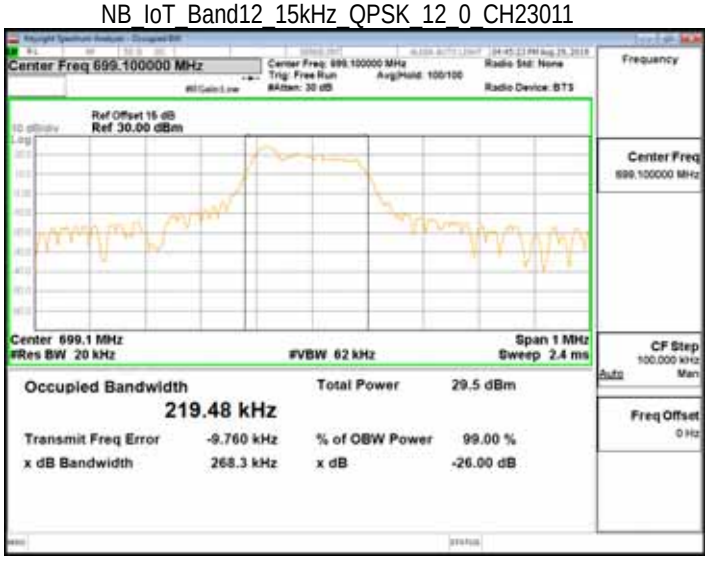
NB_IoT_Band12_15kHz_QPSK_1_0_CH23011



NB_IoT_Band12_15kHz_QPSK_12_0_CH23011



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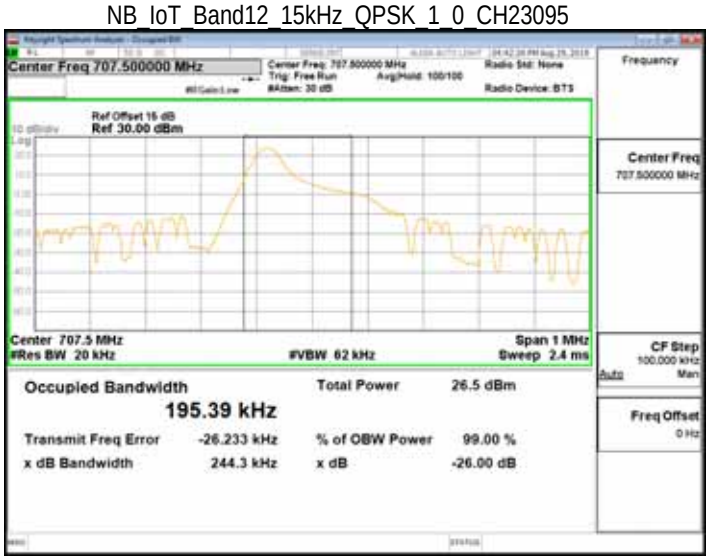

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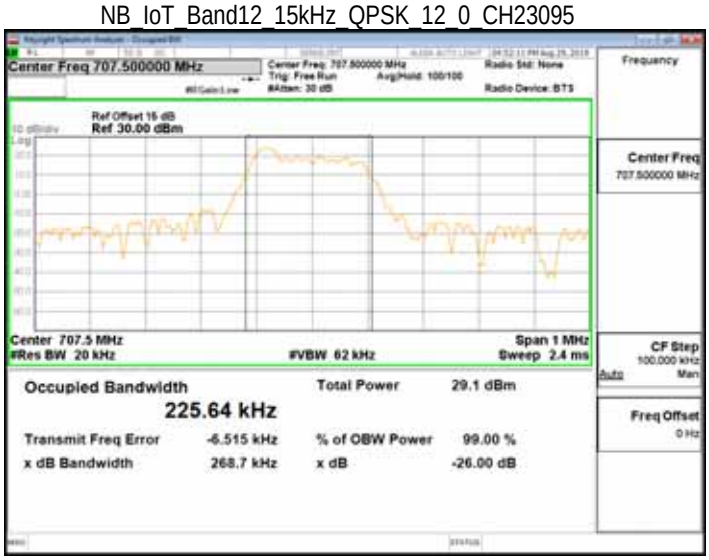
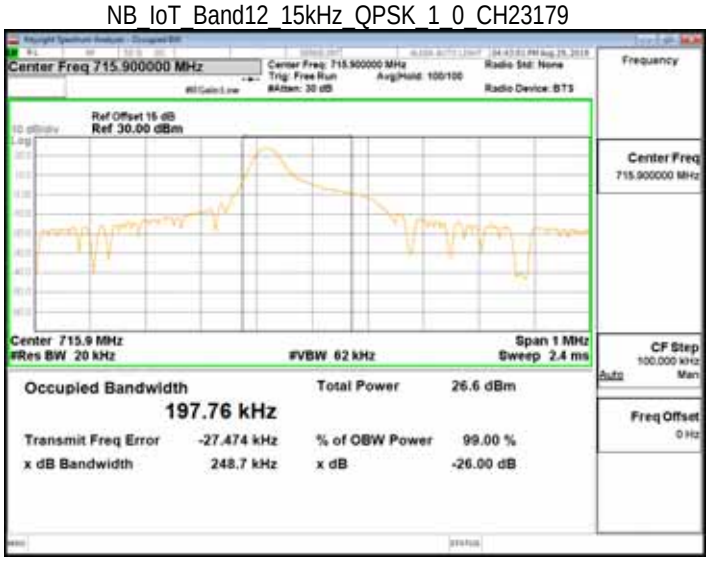
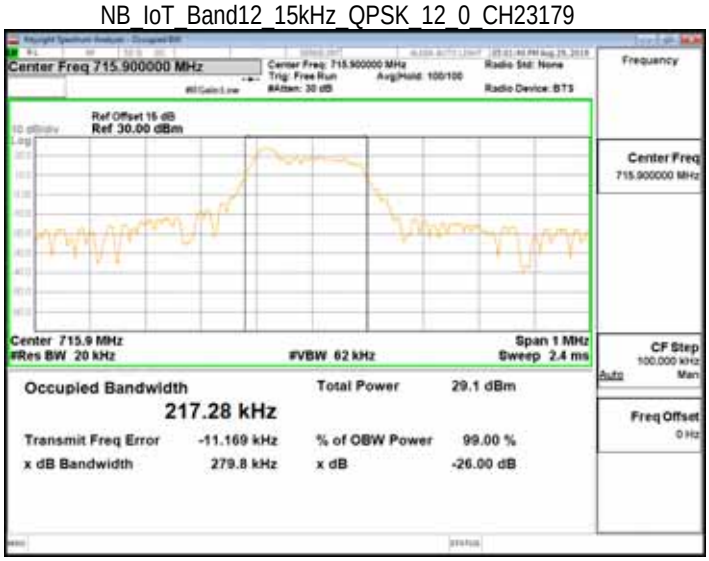


NB_IoT_Band12_15kHz_QPSK_1_0_CH23179



NB_IoT_Band12_15kHz_QPSK_12_0_CH23179



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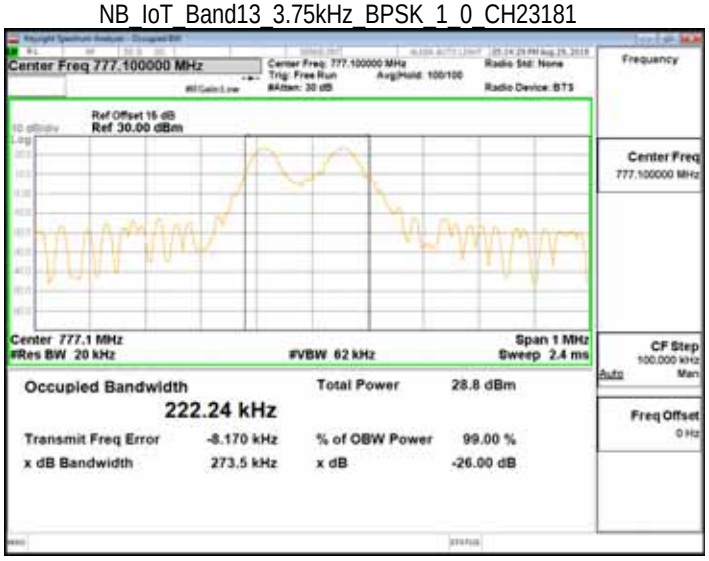
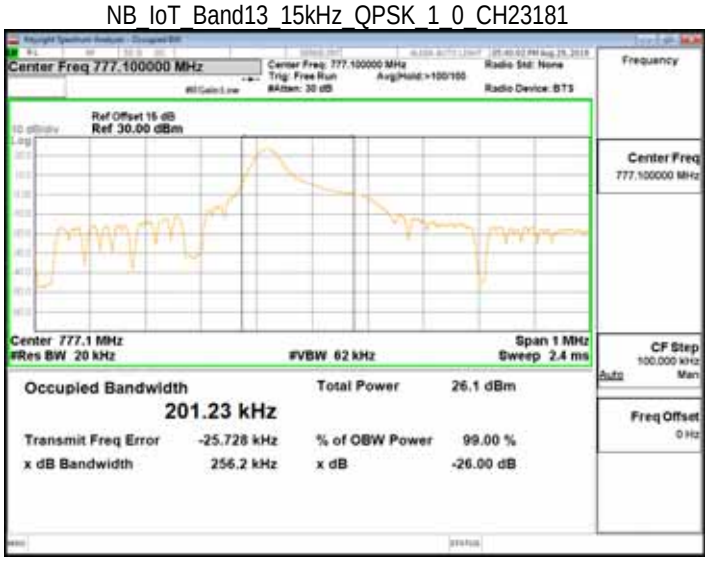
NB_IoT_Band13_3.75kHz_BPSK_1_0_CH23181

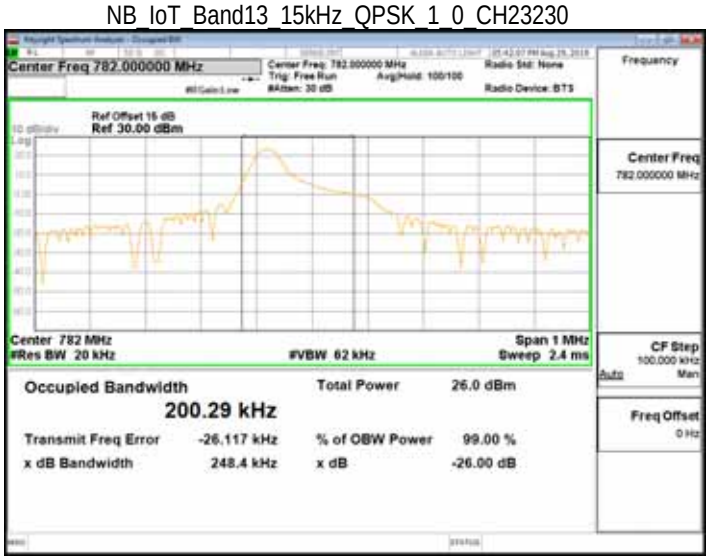


NB_IoT_Band13_15kHz_QPSK_1_0_CH23181

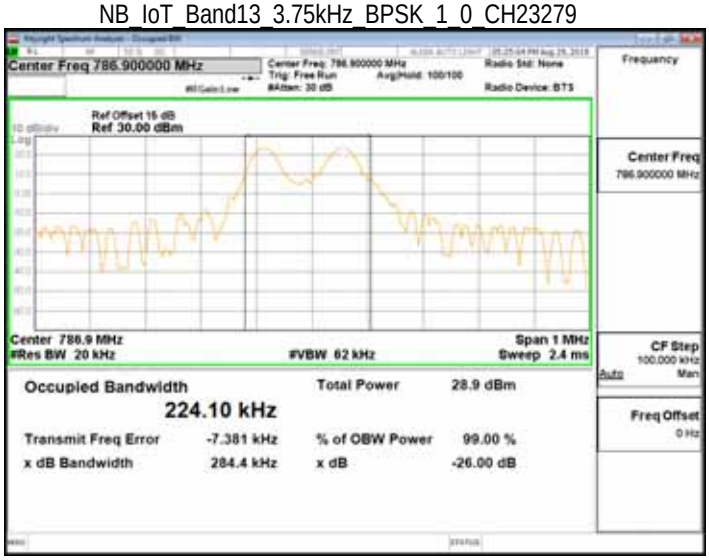


NB_IoT_Band13_3.75kHz_BPSK_1_0_CH23230

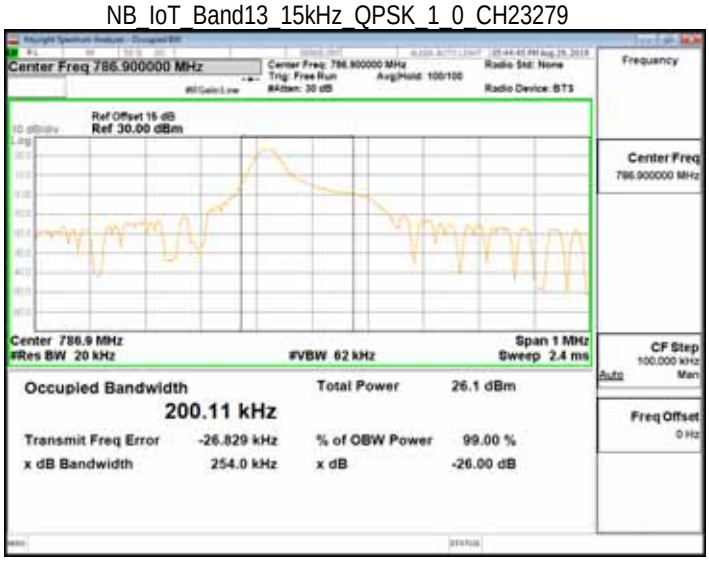
NB_IoT_Band13_15kHz_QPSK_1_0_CH23230



NB_IoT_Band13_3.75kHz_BPSK_1_0_CH23279



NB_IoT_Band13_15kHz_QPSK_1_0_CH23279



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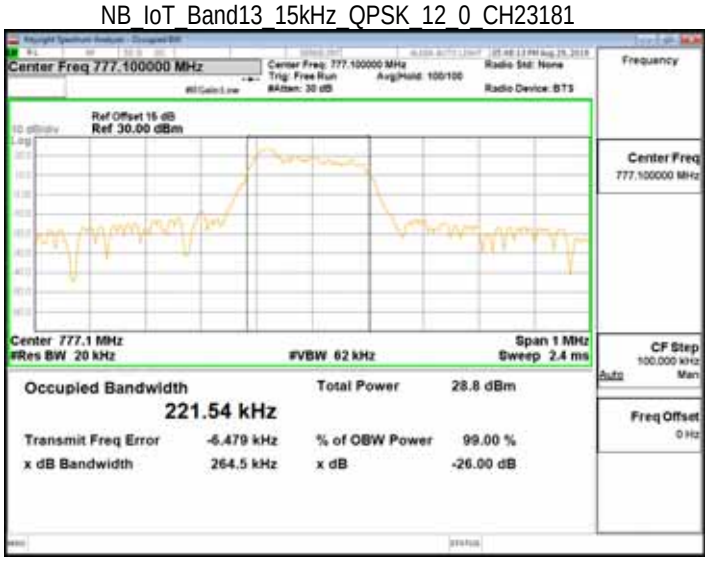
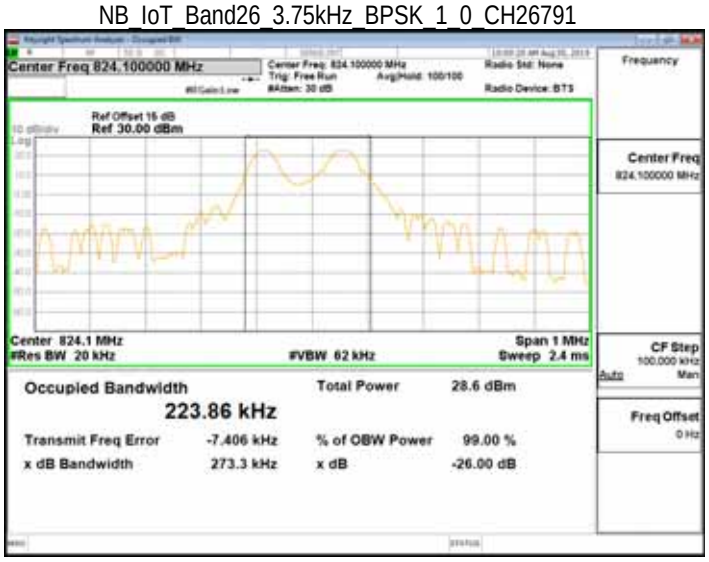
NB_IoT_Band13_15kHz_QPSK_12_0_CH23181



NB_IoT_Band26_3.75kHz_BPSK_1_0_CH26791



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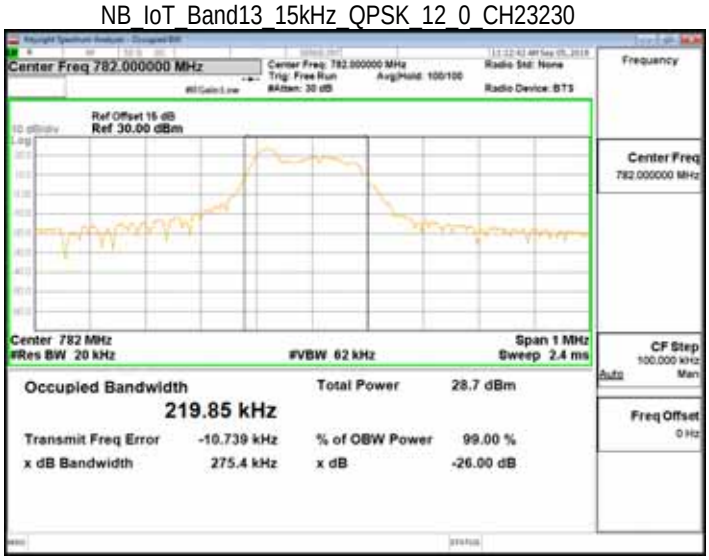
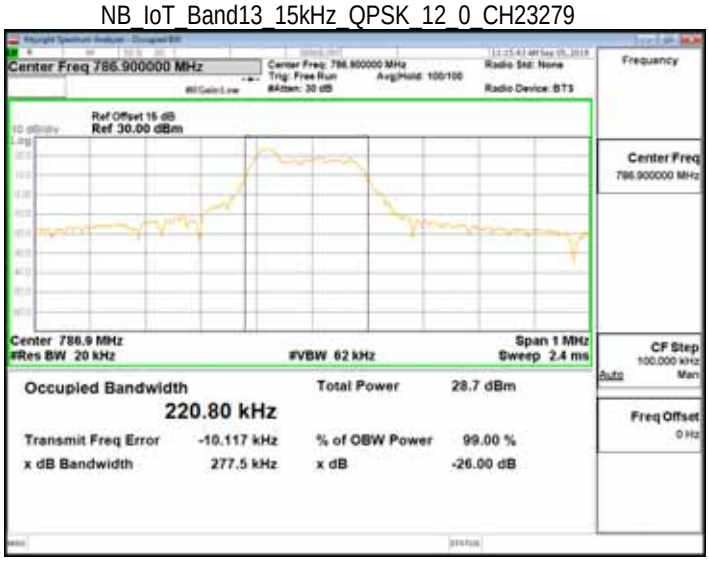
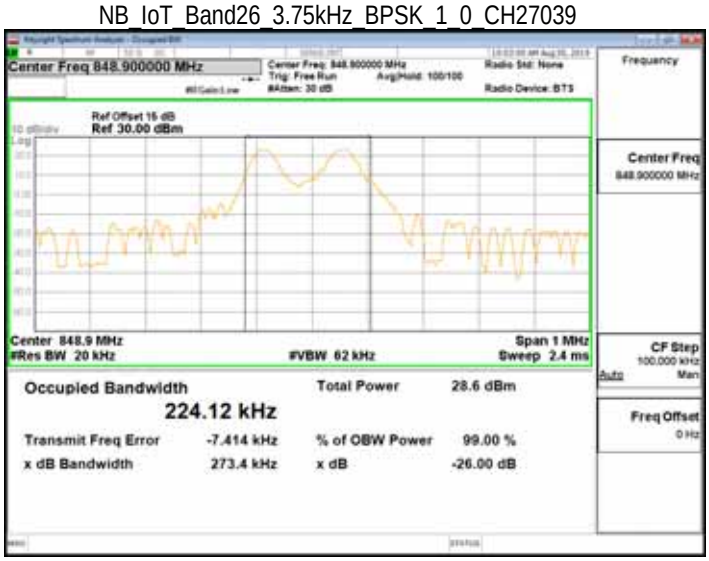


NB_IoT_Band26_3.75kHz_BPSK_1_0_CH26915

NB_IoT_Band13_15kHz_QPSK_12_0_CH23279



NB_IoT_Band26_3.75kHz_BPSK_1_0_CH27039



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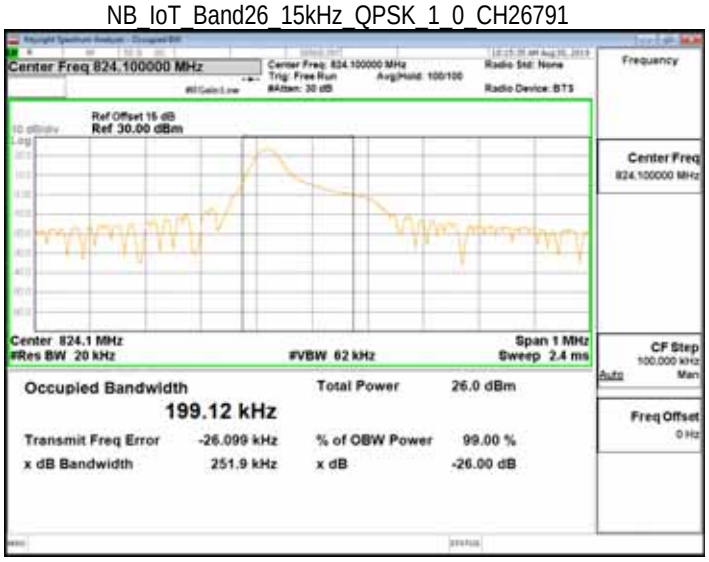
NB_IoT_Band26_15kHz_QPSK_1_0_CH26791



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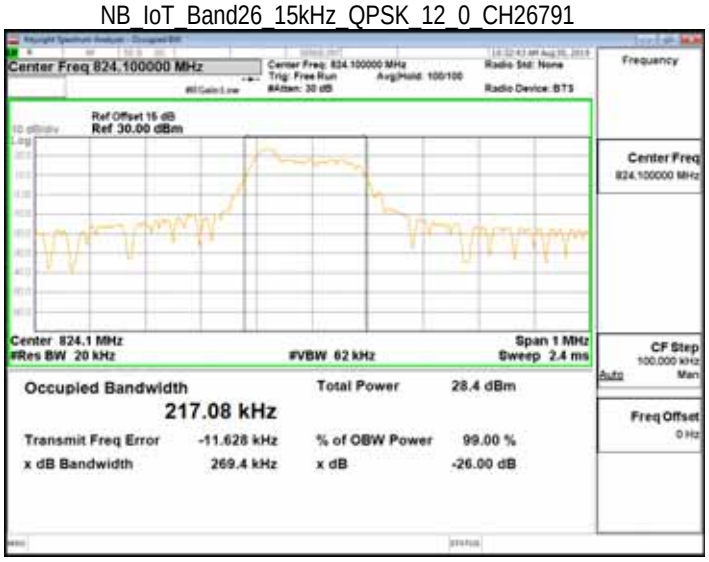

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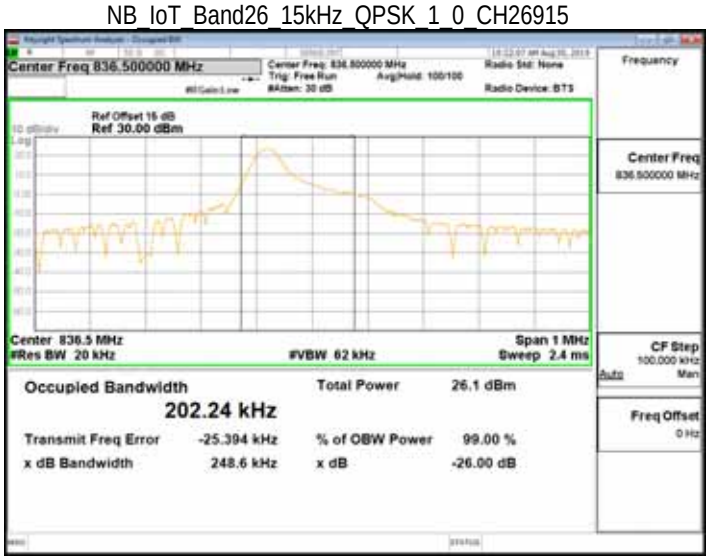
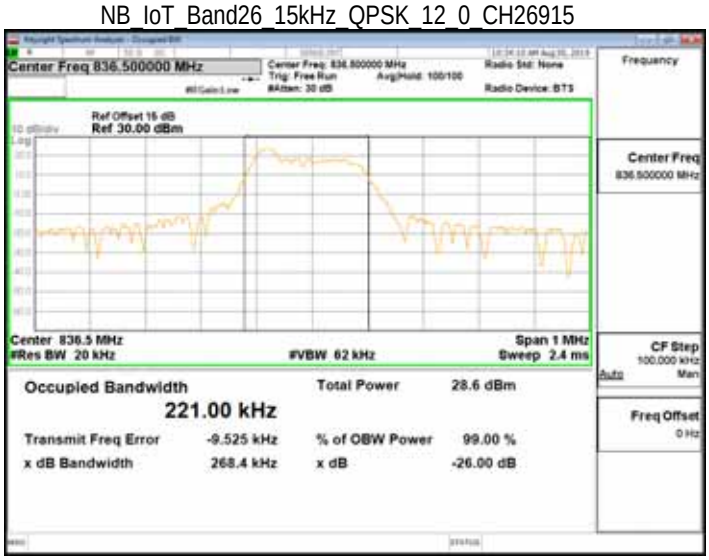


NB_IoT_Band26_15kHz_QPSK_12_0_CH26915



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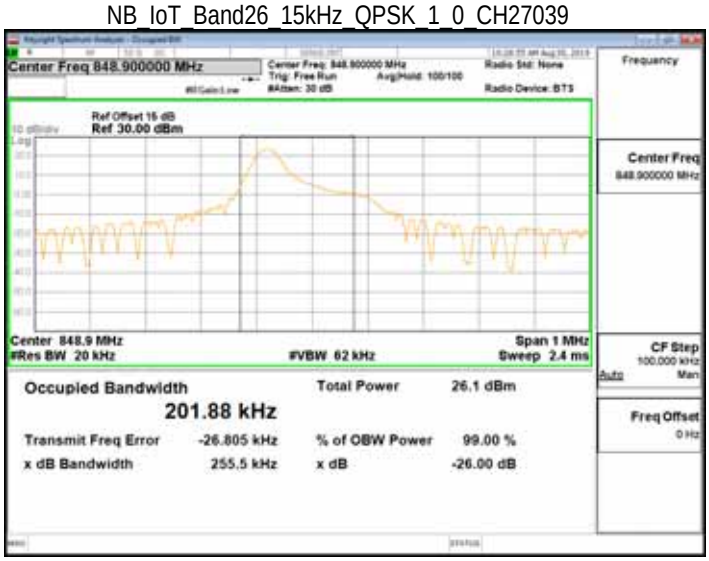
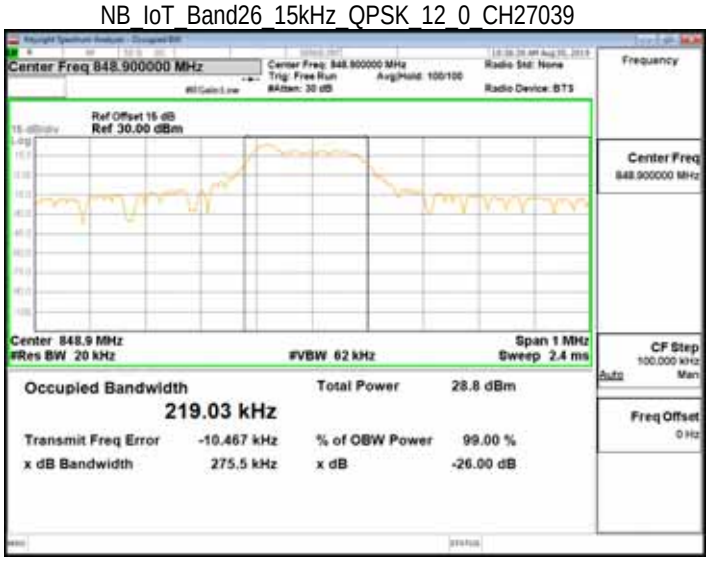


NB_IoT_Band26_15kHz_QPSK_12_0_CH27039



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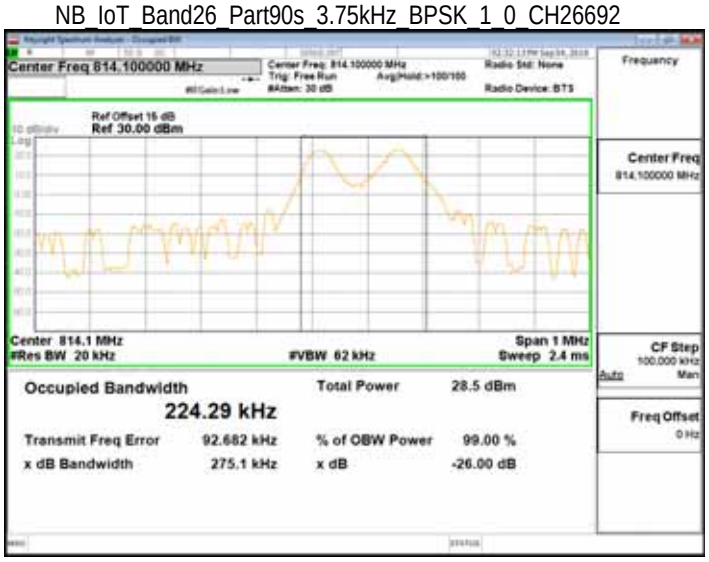
NB_IoT_Band26_Part90s_3.75kHz_BPSK_1_0_CH26692



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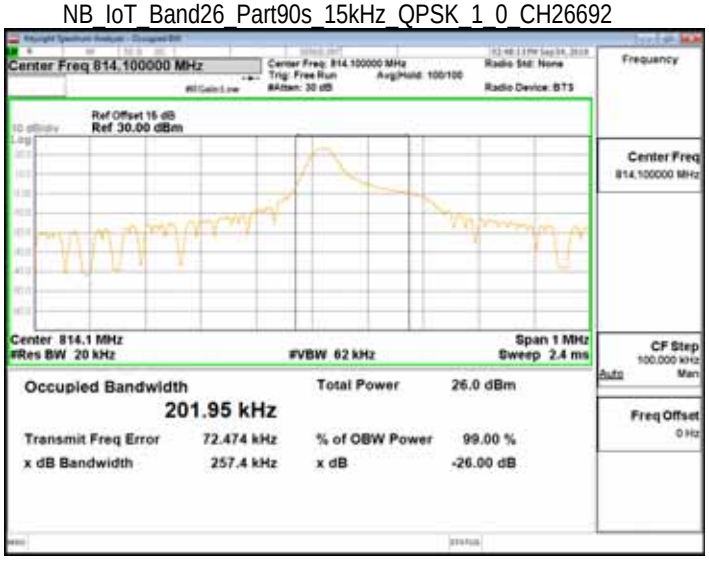

NB_IoT_Band26_Part90s_3.75kHz_BPSK_1_0_CH26740

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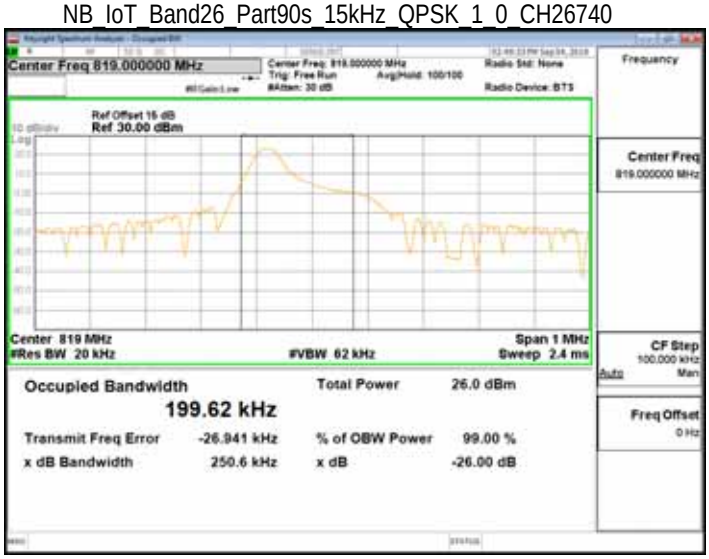
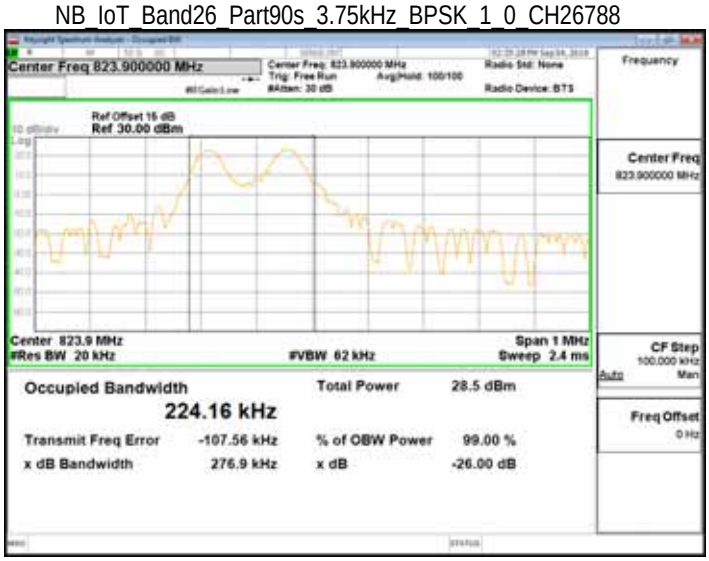
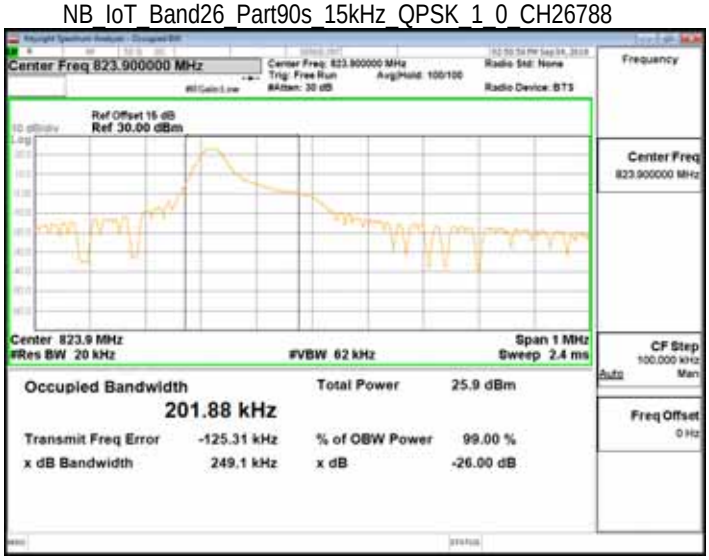


NB_IoT_Band26_Part90s_3.75kHz_BPSK_1_0_CH26788



NB_IoT_Band26_Part90s_15kHz_QPSK_1_0_CH26788



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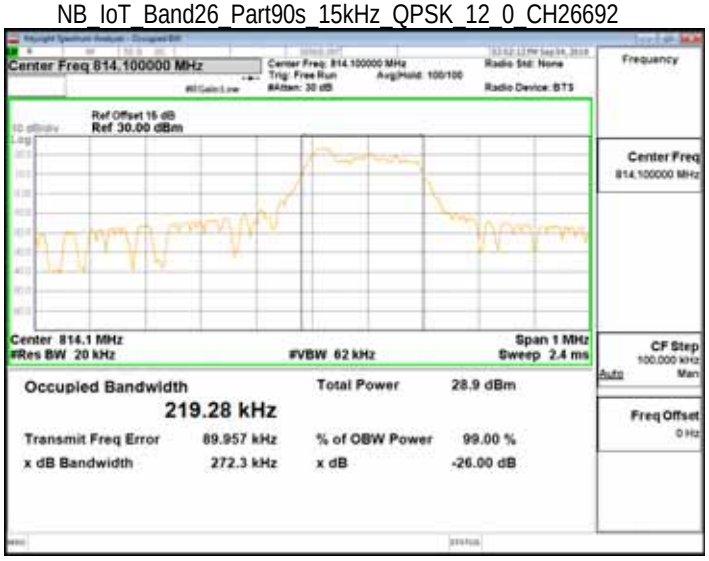
NB_IoT_Band26_Part90s_15kHz_QPSK_12_0_CH26692



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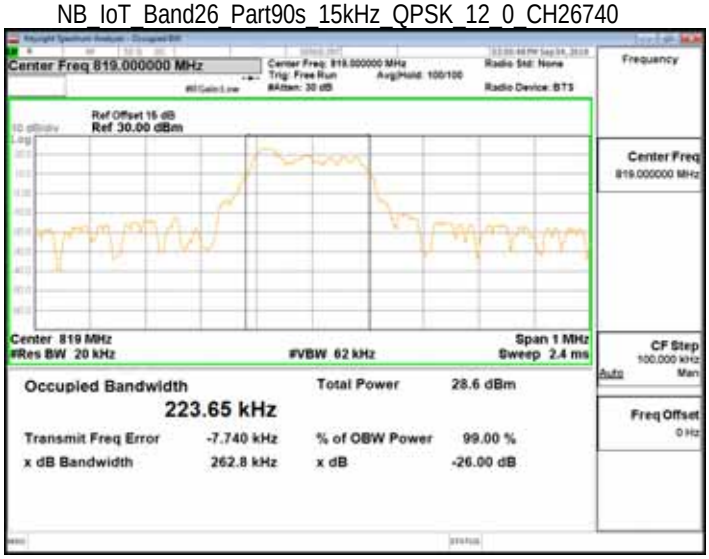

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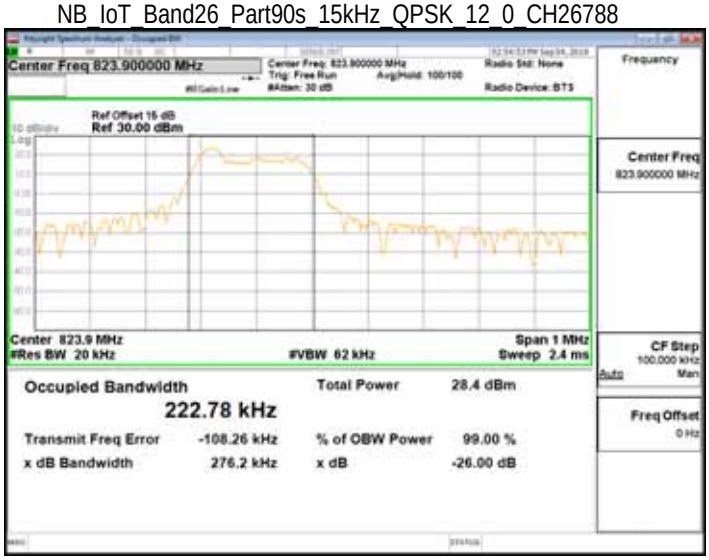

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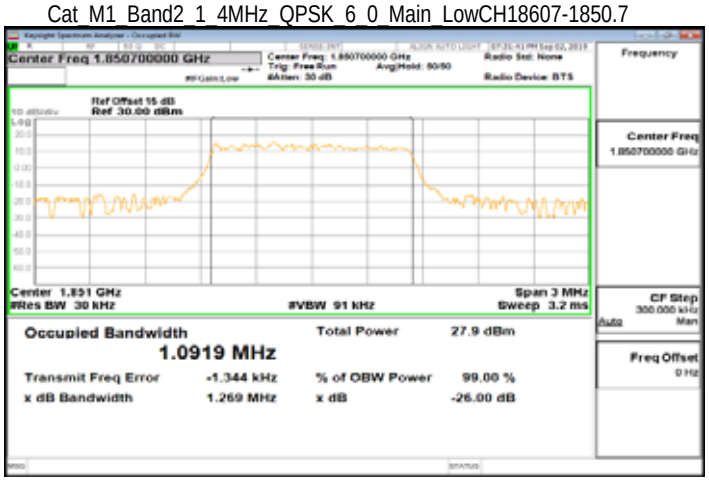
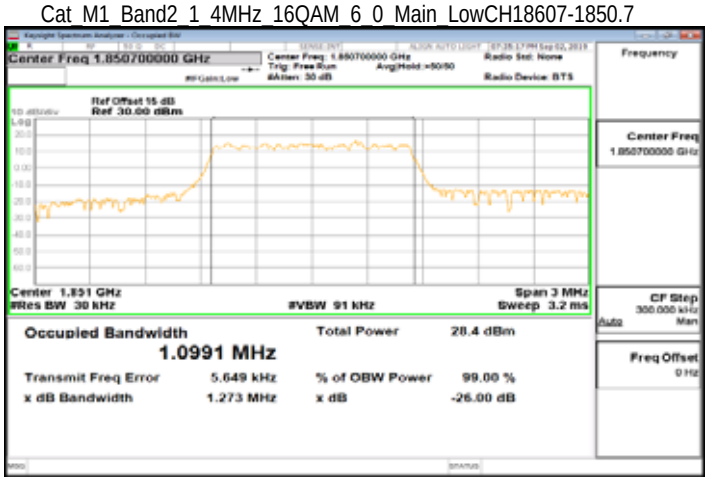
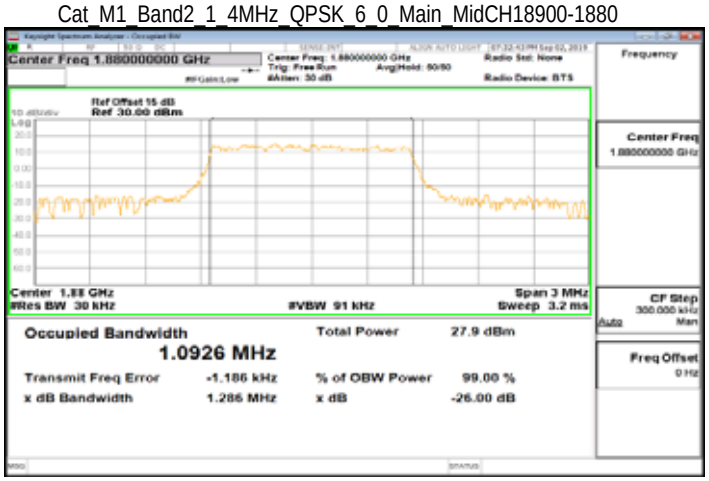
Cat_M1_Band2_1_4MHz_QPSK_6_0_Main_LowCH18607-1850.7



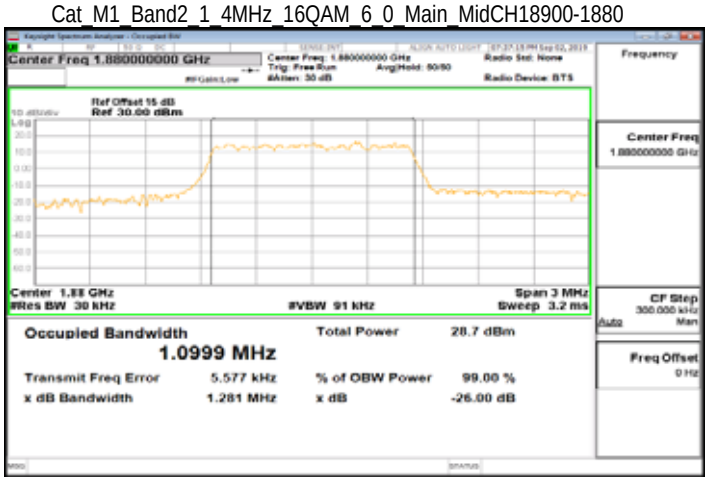
Cat_M1_Band2_1_4MHz_16QAM_6_0_Main_LowCH18607-1850.7



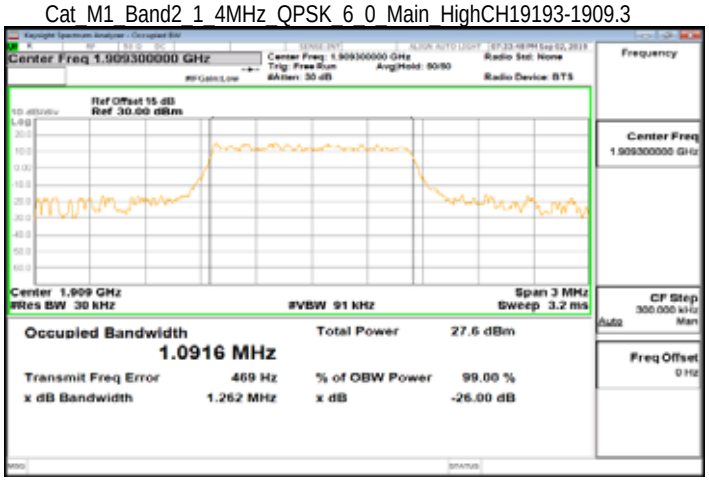
Cat_M1_Band2_1_4MHz_QPSK_6_0_Main_MidCH18900-1880



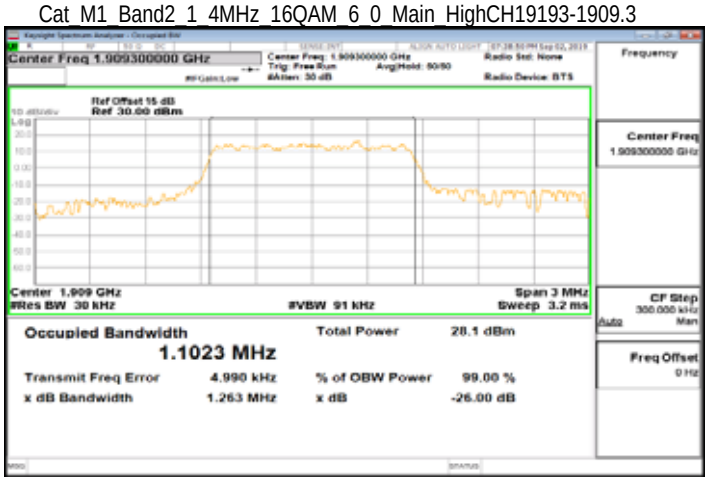
Cat_M1_Band2_1_4MHz_16QAM_6_0_Main_MidCH18900-1880



Cat_M1_Band2_1_4MHz_QPSK_6_0_Main_HighCH19193-1909.3



Cat_M1_Band2_1_4MHz_16QAM_6_0_Main_HighCH19193-1909.3



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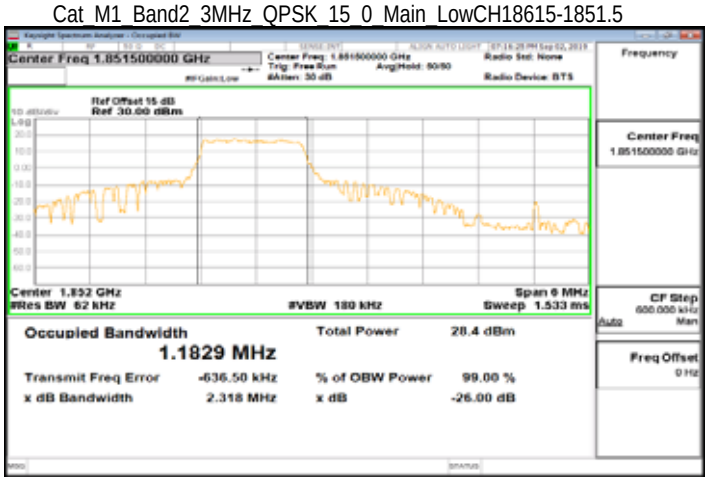
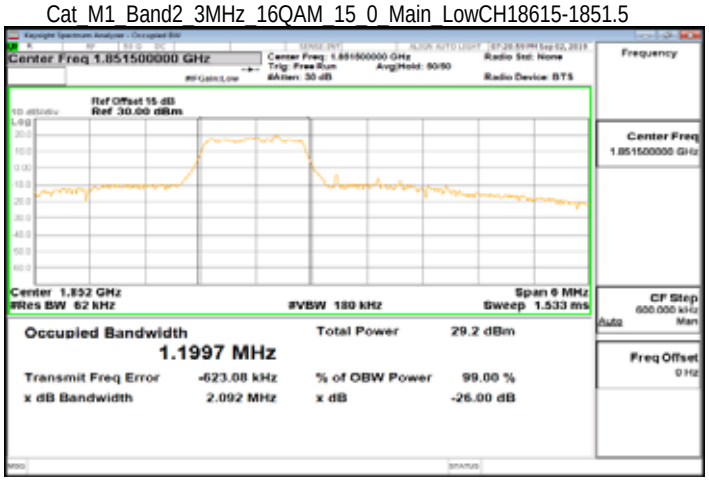
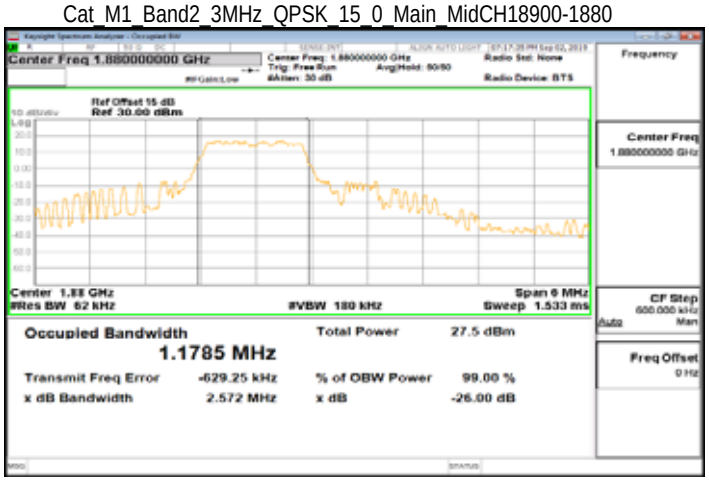
Cat_M1_Band2_3MHz_QPSK_15_0_Main_LowCH18615-1851.5



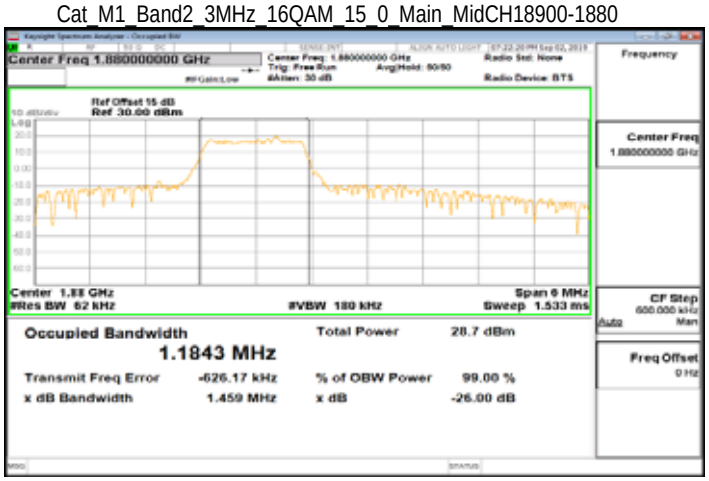
Cat_M1_Band2_3MHz_16QAM_15_0_Main_LowCH18615-1851.5



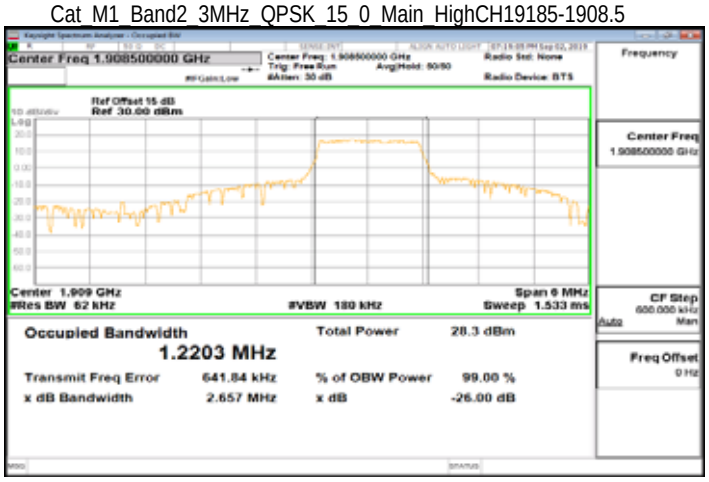
Cat_M1_Band2_3MHz_QPSK_15_0_Main_MidCH18900-1880



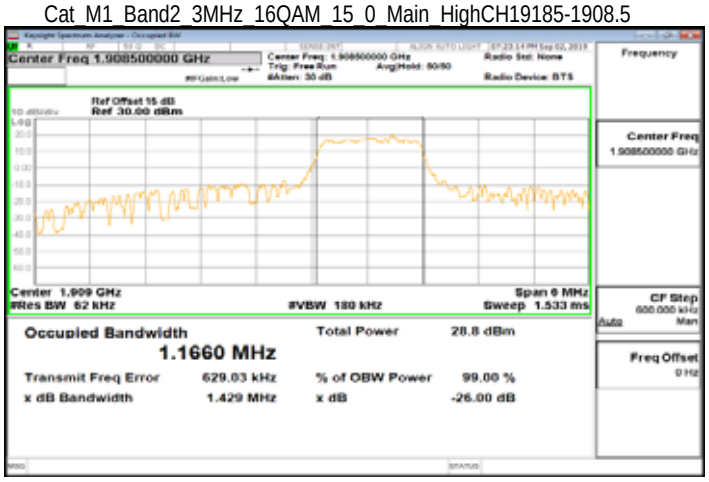
Cat_M1_Band2_3MHz_16QAM_15_0_Main_MidCH18900-1880



Cat_M1_Band2_3MHz_QPSK_15_0_Main_HighCH19185-1908.5



Cat_M1_Band2_3MHz_16QAM_15_0_Main_HighCH19185-1908.5



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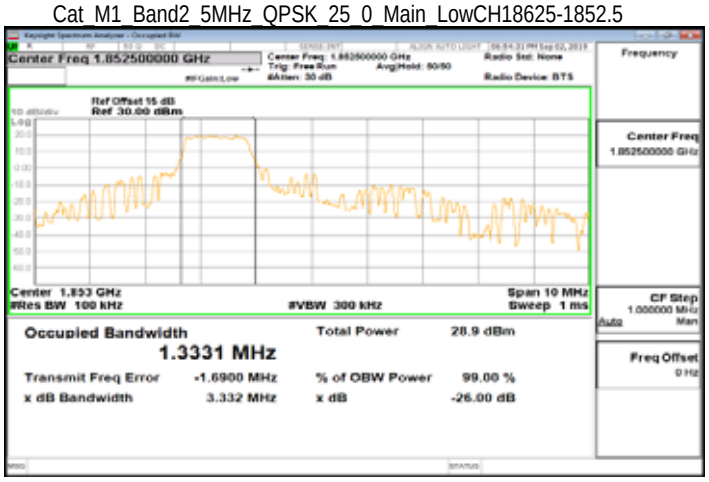
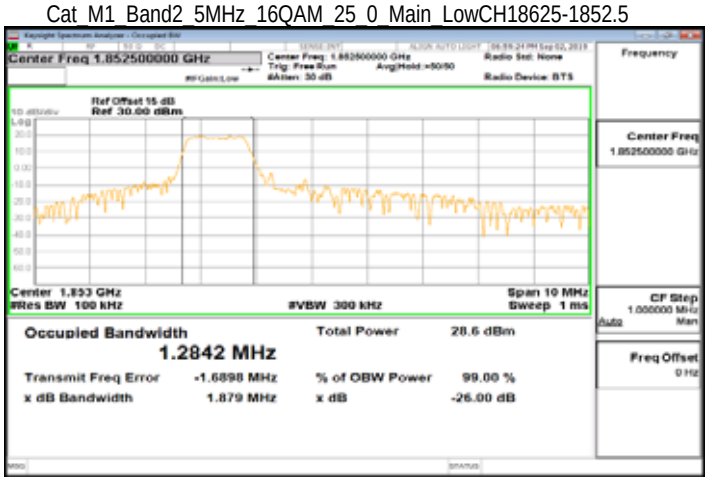
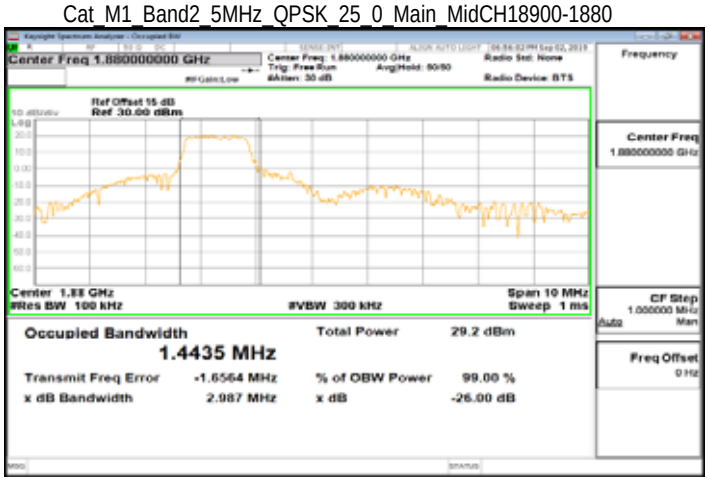
Cat_M1_Band2_5MHz_QPSK_25_0_Main_LowCH18625-1852.5



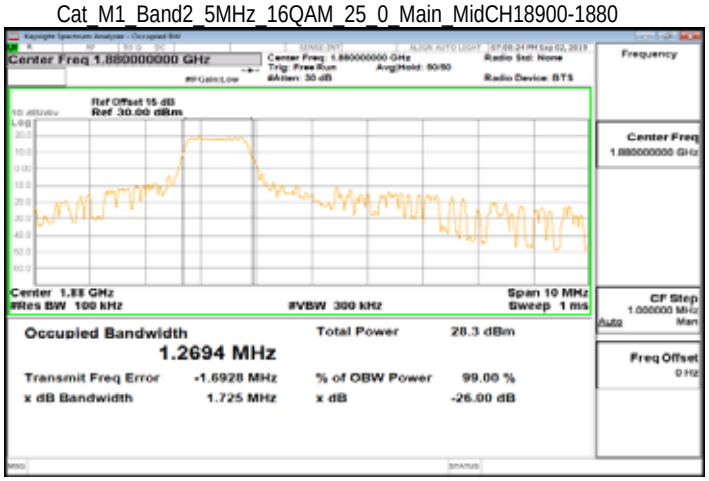
Cat_M1_Band2_5MHz_16QAM_25_0_Main_LowCH18625-1852.5



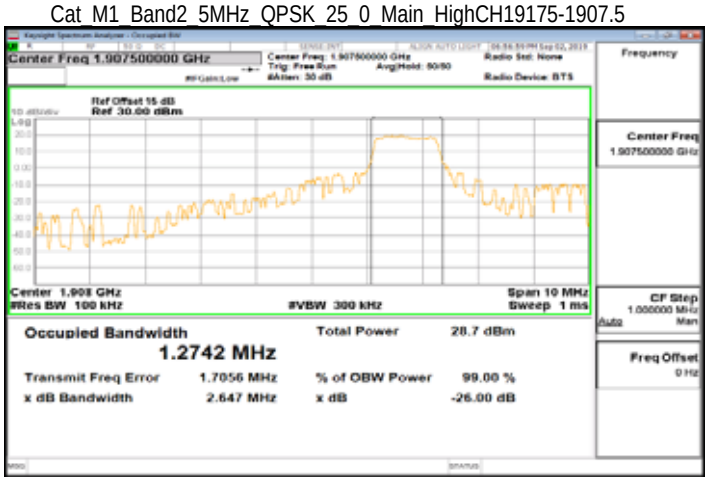
Cat_M1_Band2_5MHz_QPSK_25_0_Main_MidCH18900-1880



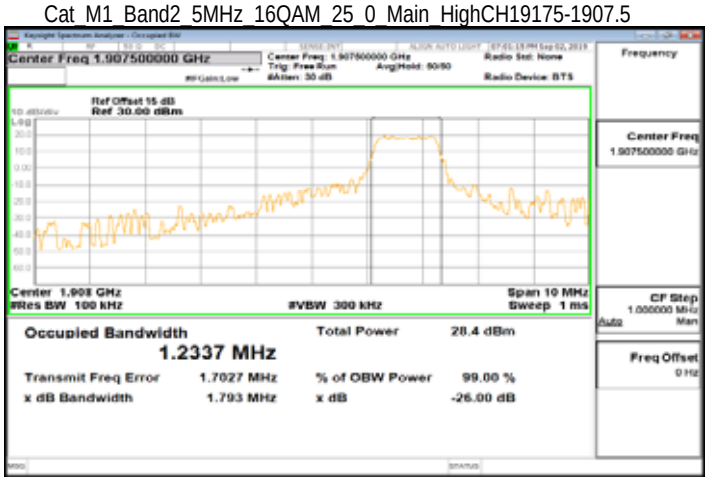
Cat_M1_Band2_5MHz_16QAM_25_0_Main_MidCH18900-1880



Cat_M1_Band2_5MHz_QPSK_25_0_Main_HighCH19175-1907.5



Cat_M1_Band2_5MHz_16QAM_25_0_Main_HighCH19175-1907.5



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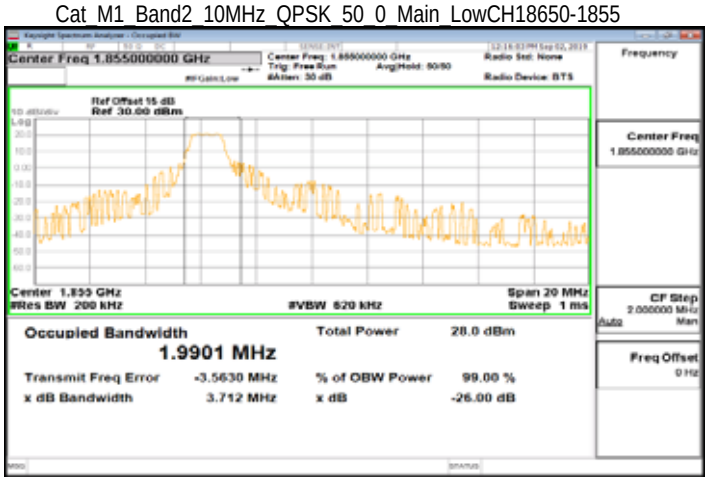
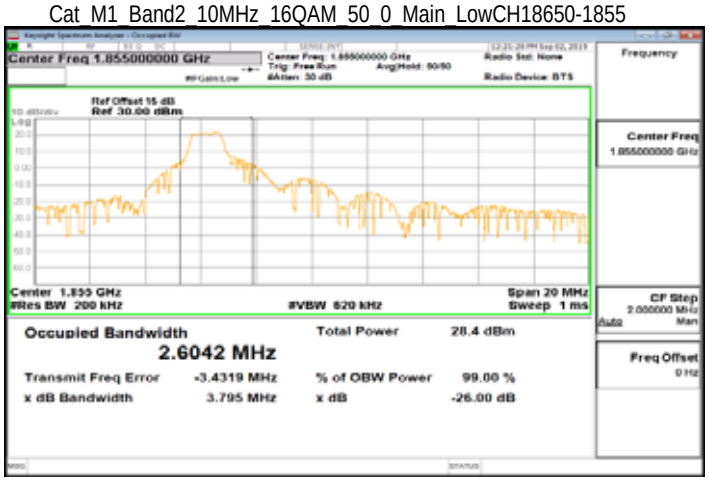
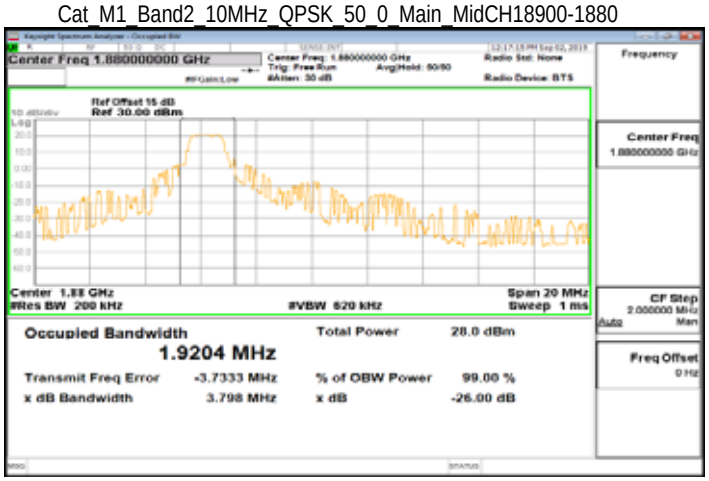
Cat_M1_Band2_10MHz_QPSK_50_0_Main_LowCH18650-1855



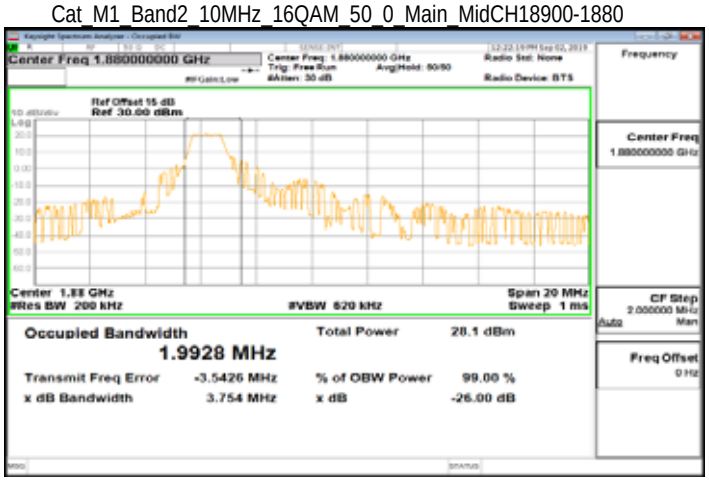
Cat_M1_Band2_10MHz_16QAM_50_0_Main_LowCH18650-1855



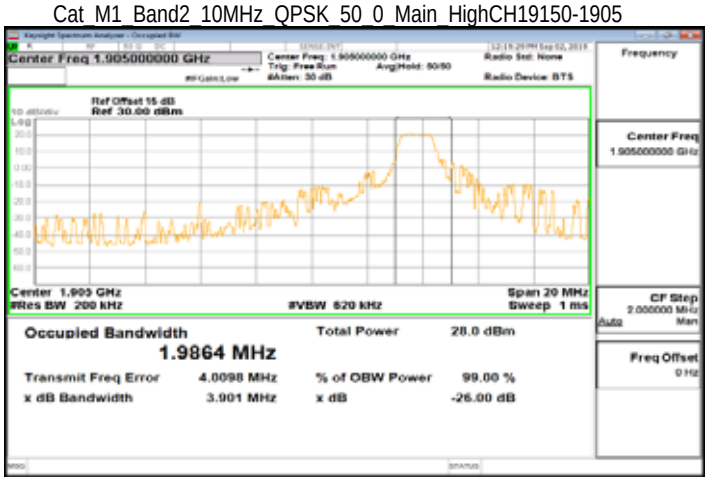
Cat_M1_Band2_10MHz_QPSK_50_0_Main_MidCH18900-1880



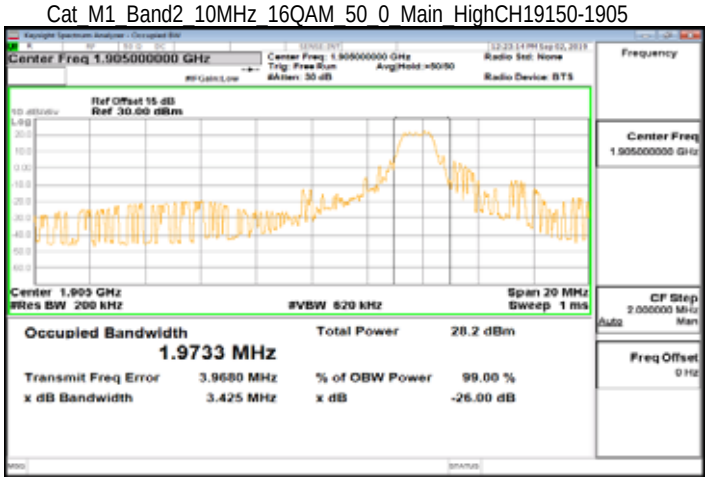
Cat_M1_Band2_10MHz_16QAM_50_0_Main_MidCH18900-1880



Cat_M1_Band2_10MHz_QPSK_50_0_Main_HighCH19150-1905



Cat_M1_Band2_10MHz_16QAM_50_0_Main_HighCH19150-1905



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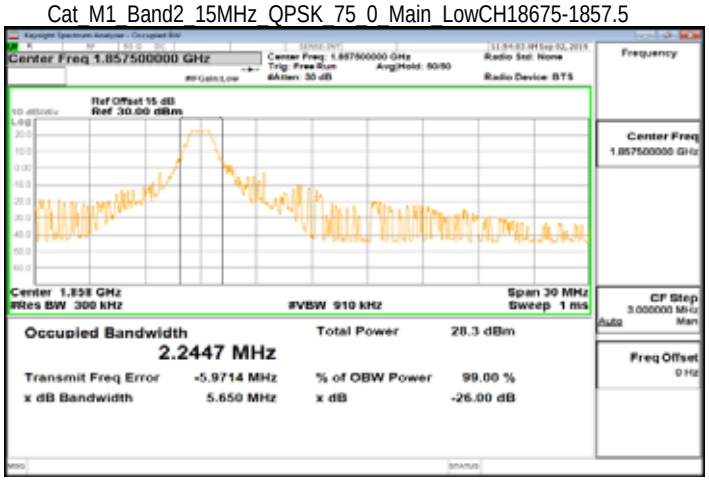
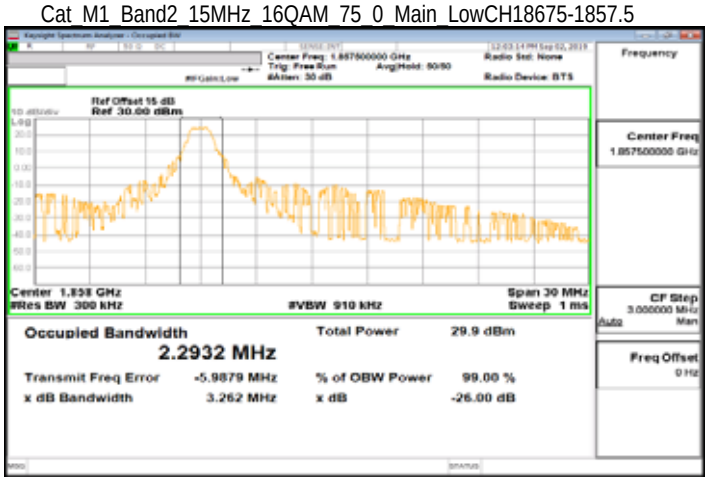
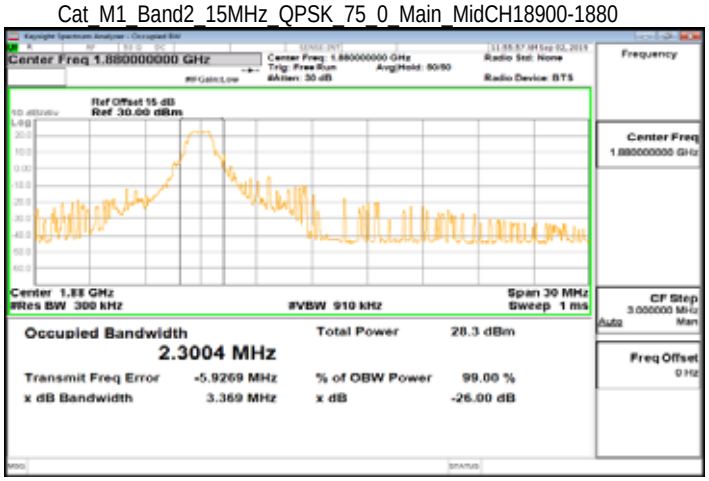
Cat_M1_Band2_15MHz_QPSK_75_0_Main_LowCH18675-1857.5



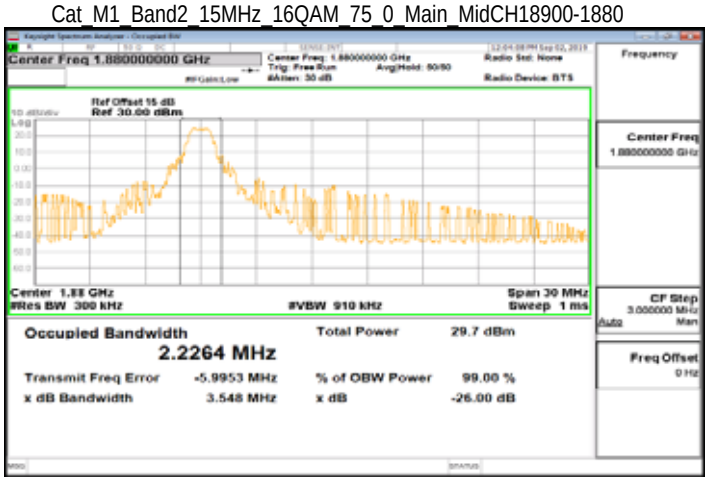
Cat_M1_Band2_15MHz_16QAM_75_0_Main_LowCH18675-1857.5



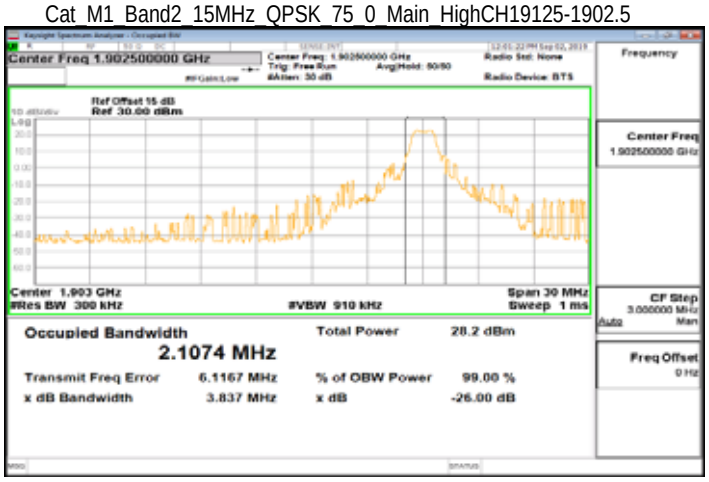
Cat_M1_Band2_15MHz_QPSK_75_0_Main_MidCH18900-1880



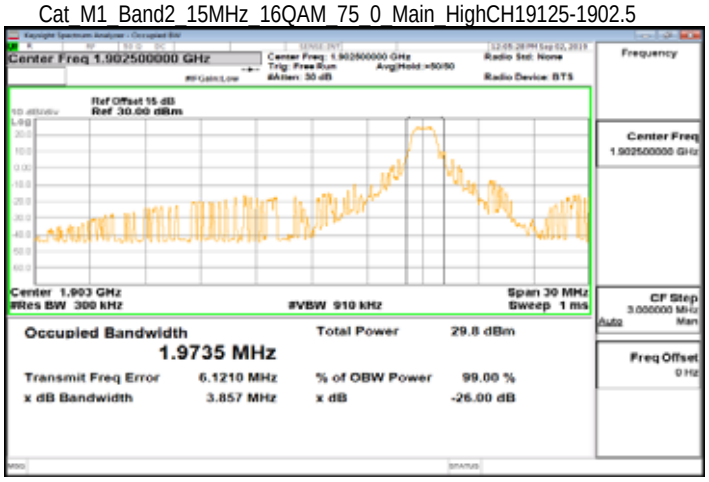
Cat_M1_Band2_15MHz_16QAM_75_0_Main_MidCH18900-1880



Cat_M1_Band2_15MHz_QPSK_75_0_Main_HighCH19125-1902.5



Cat_M1_Band2_15MHz_16QAM_75_0_Main_HighCH19125-1902.5



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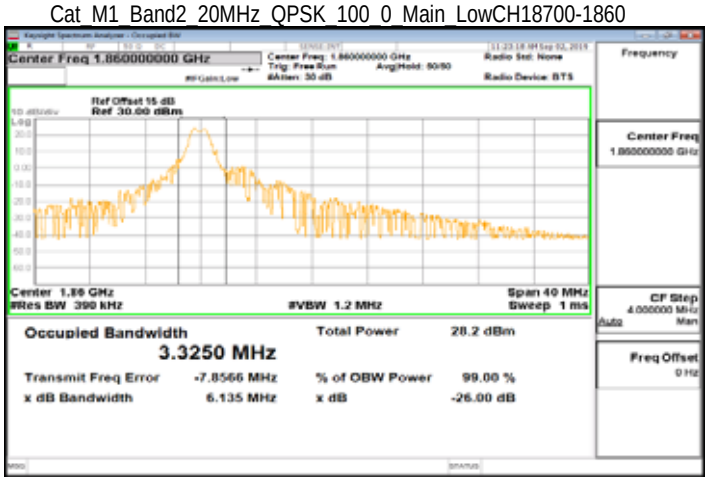
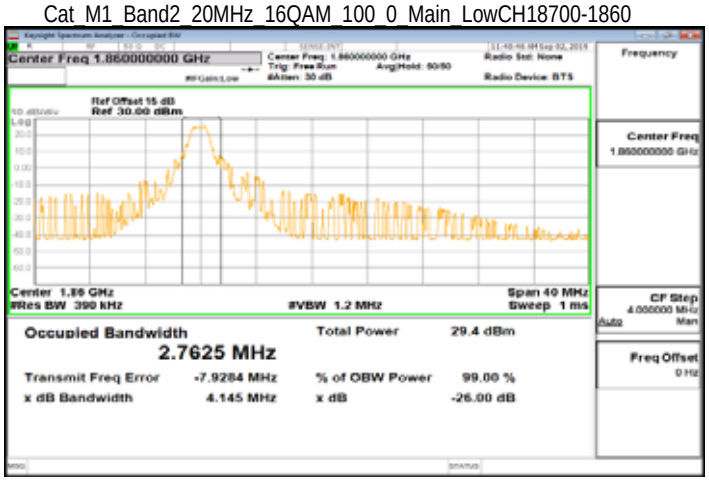
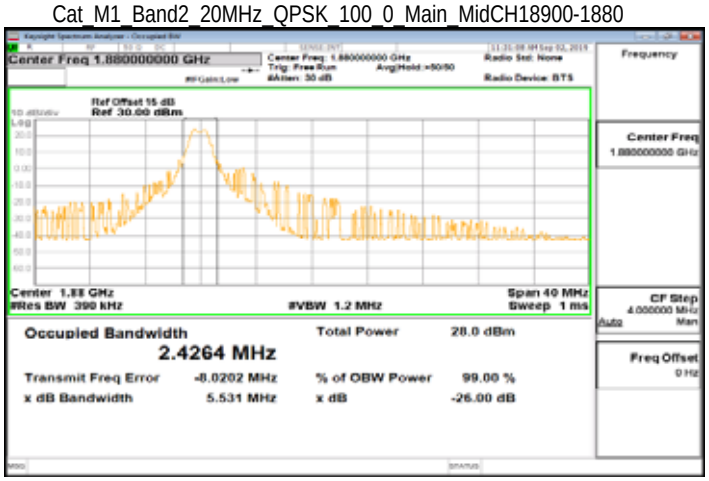
Cat_M1_Band2_20MHz_QPSK_100_0_Main_LowCH18700-1860



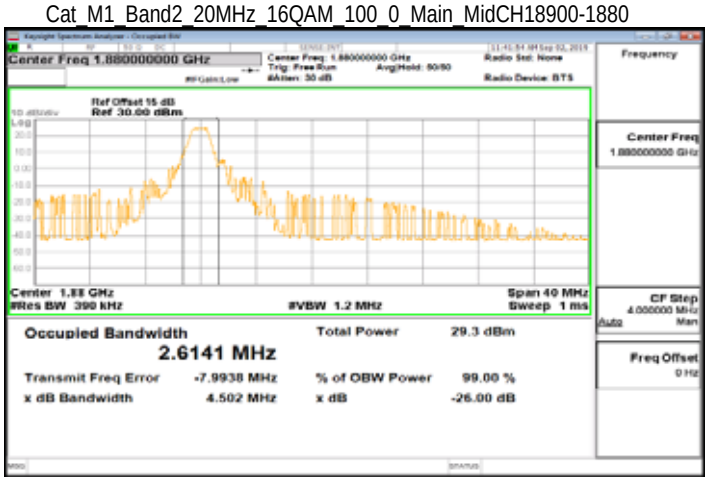
Cat_M1_Band2_20MHz_16QAM_100_0_Main_LowCH18700-1860



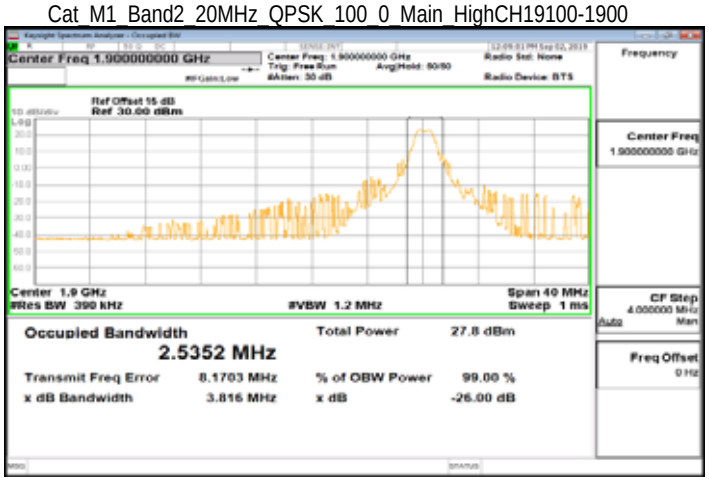
Cat_M1_Band2_20MHz_QPSK_100_0_Main_MidCH18900-1880



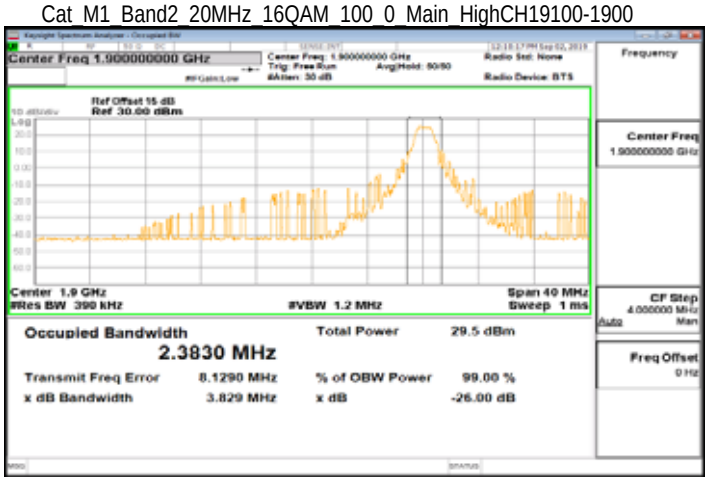
Cat_M1_Band2_20MHz_16QAM_100_0_Main_MidCH18900-1880



Cat_M1_Band2_20MHz_QPSK_100_0_Main_HighCH19100-1900



Cat_M1_Band2_20MHz_16QAM_100_0_Main_HighCH19100-1900



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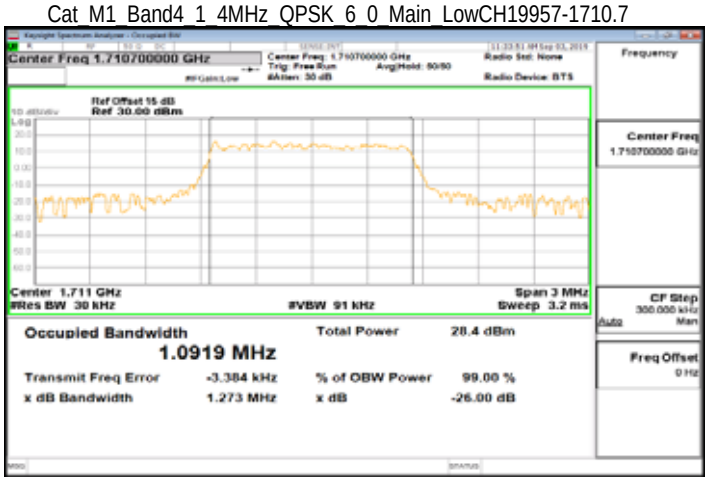
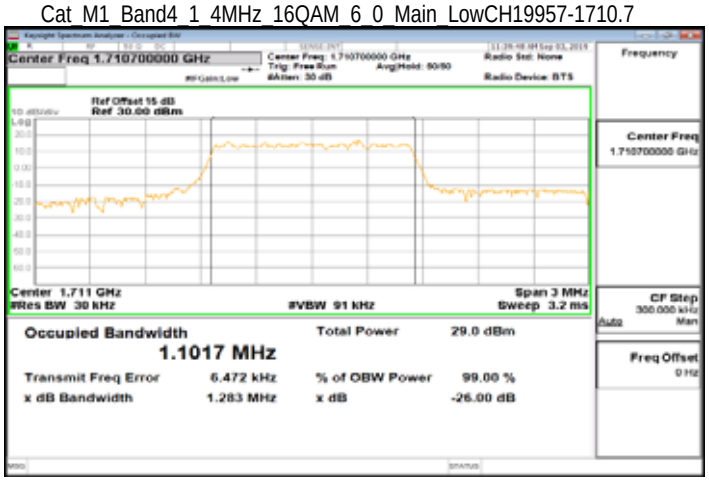
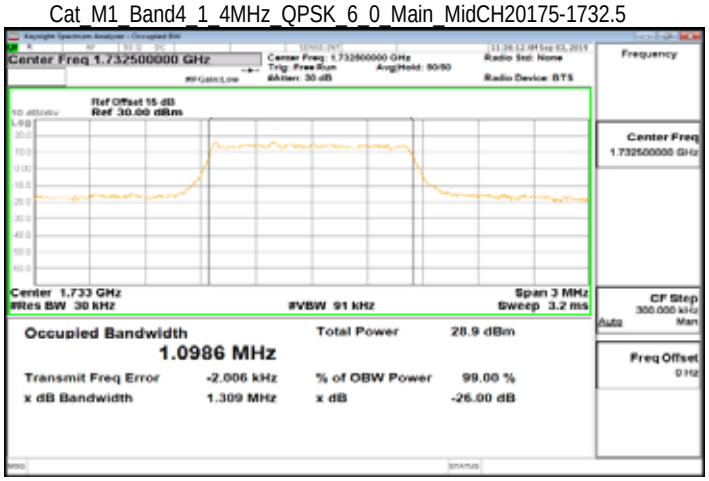
Cat_M1_Band4_1_4MHz_QPSK_6_0_Main_LowCH19957-1710.7



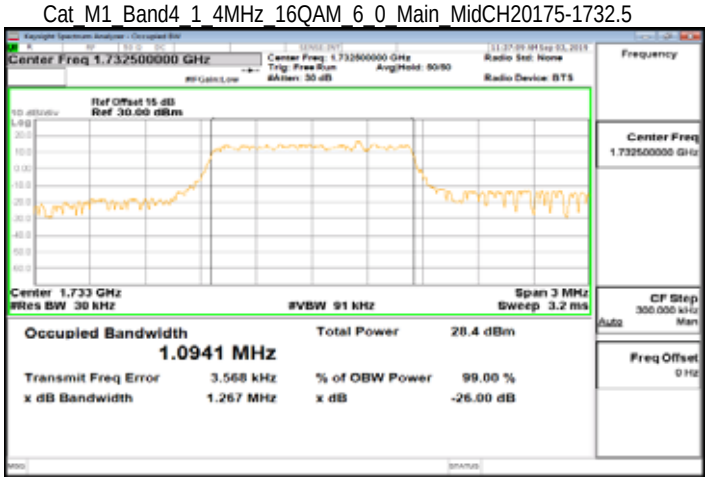
Cat_M1_Band4_1_4MHz_16QAM_6_0_Main_LowCH19957-1710.7



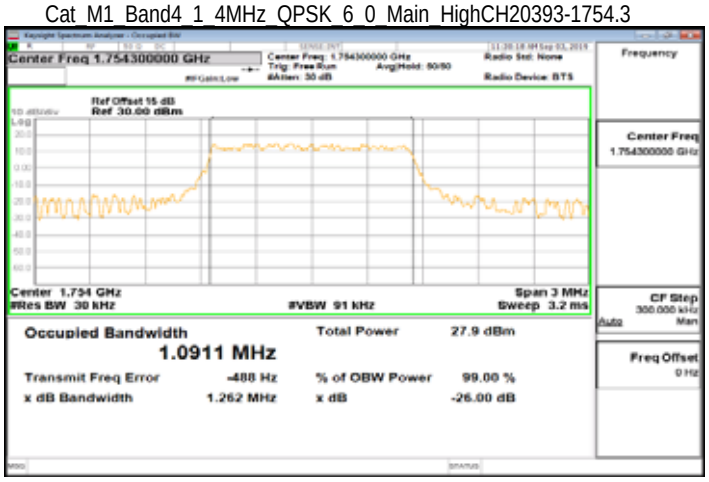
Cat_M1_Band4_1_4MHz_QPSK_6_0_Main_MidCH20175-1732.5



Cat_M1_Band4_1_4MHz_16QAM_6_0_Main_MidCH20175-1732.5



Cat_M1_Band4_1_4MHz_QPSK_6_0_Main_HighCH20393-1754.3



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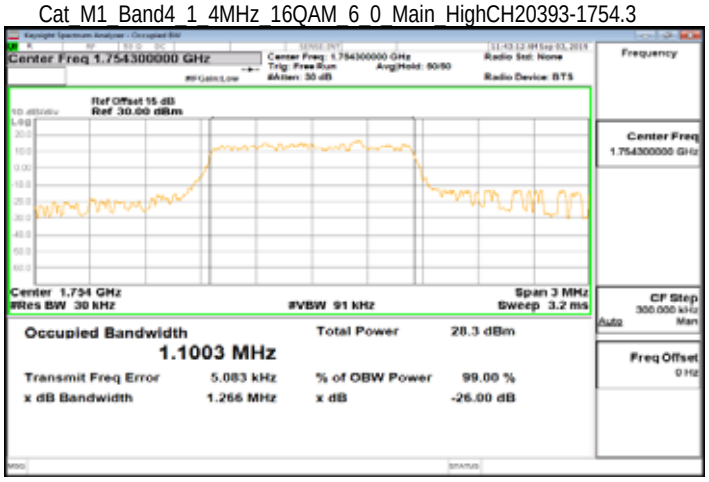

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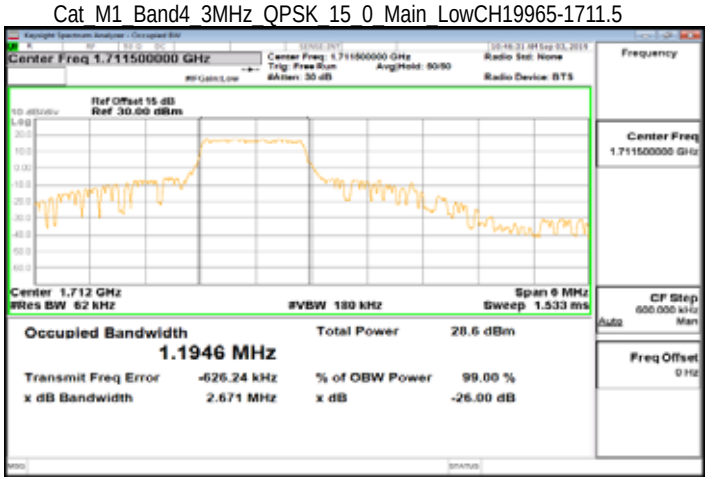
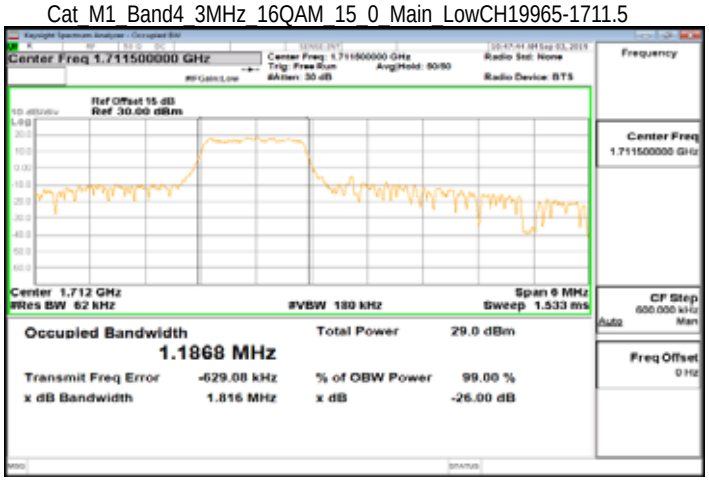
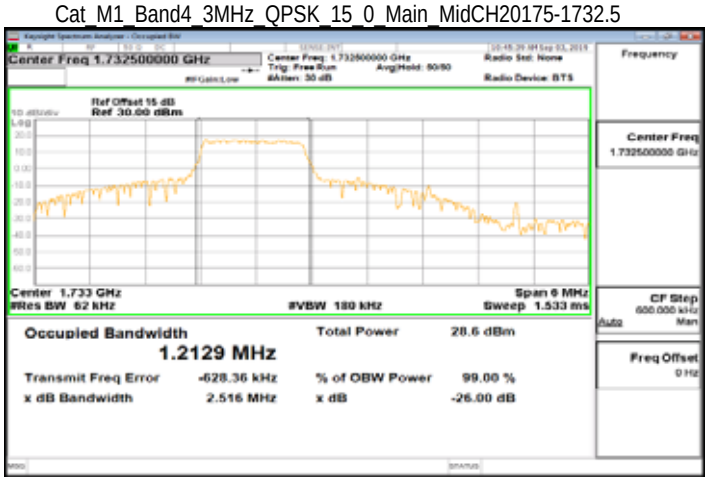
Cat_M1_Band4_3MHz_QPSK_15_0_Main_LowCH19965-1711.5



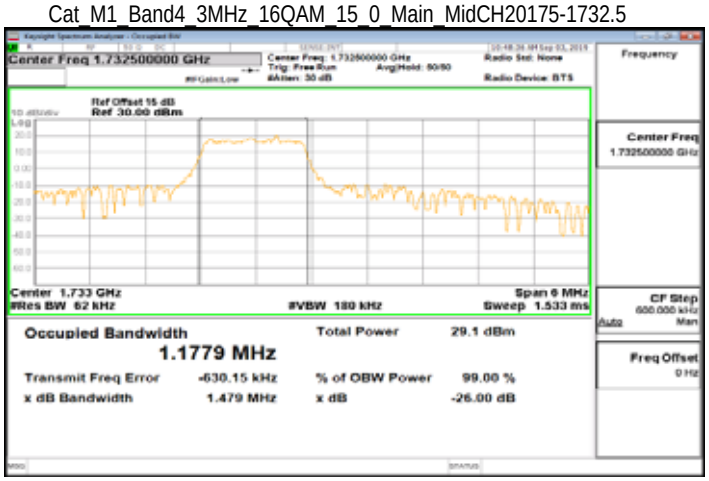
Cat_M1_Band4_3MHz_16QAM_15_0_Main_LowCH19965-1711.5



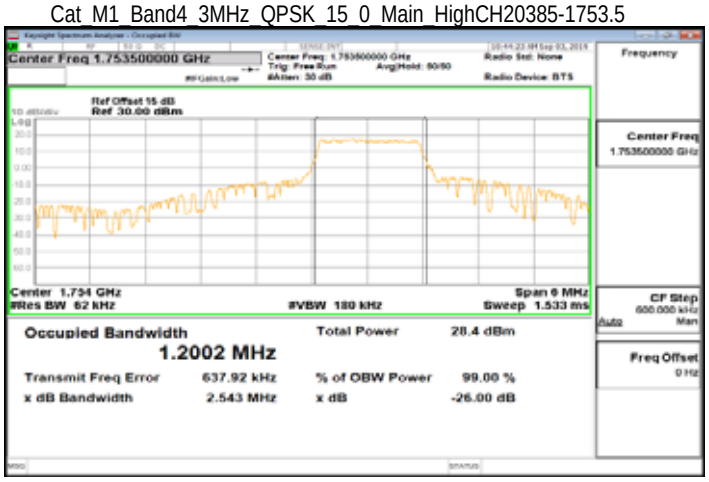
Cat_M1_Band4_3MHz_QPSK_15_0_Main_MidCH20175-1732.5



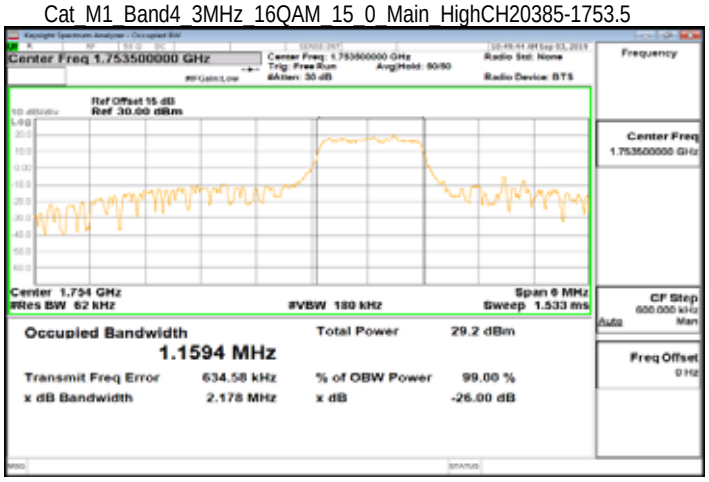
Cat_M1_Band4_3MHz_16QAM_15_0_Main_MidCH20175-1732.5



Cat_M1_Band4_3MHz_QPSK_15_0_Main_HighCH20385-1753.5



Cat_M1_Band4_3MHz_16QAM_15_0_Main_HighCH20385-1753.5



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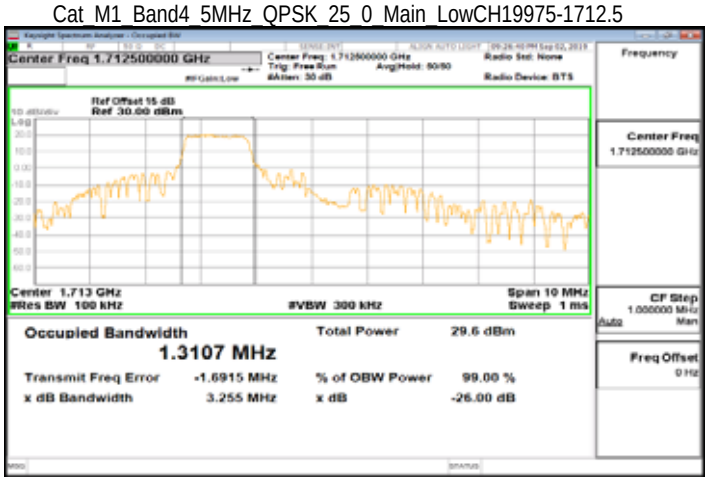
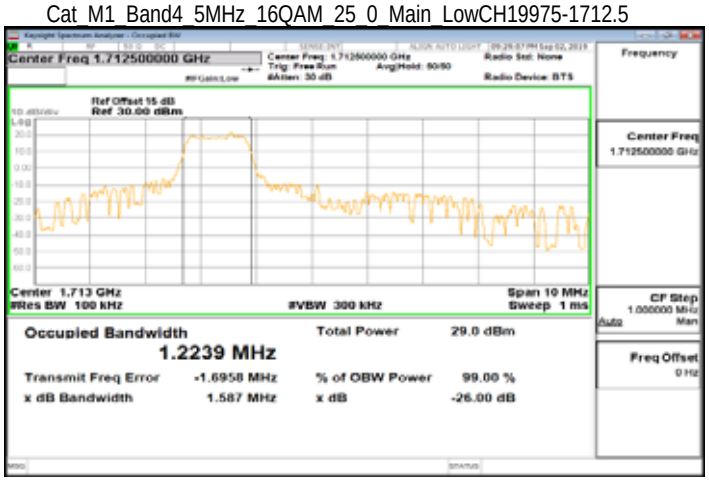
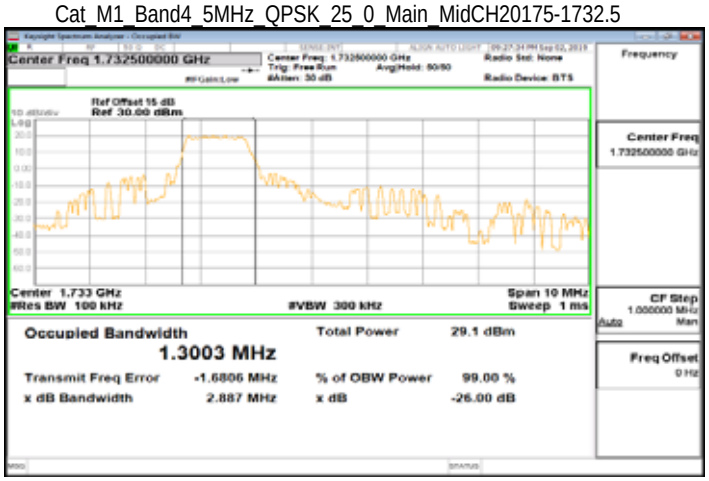
Cat_M1_Band4_5MHz_QPSK_25_0_Main_LowCH19975-1712.5



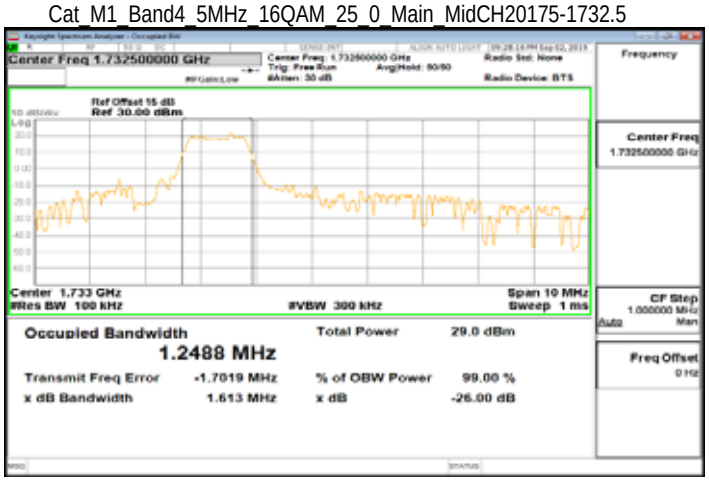
Cat_M1_Band4_5MHz_16QAM_25_0_Main_LowCH19975-1712.5



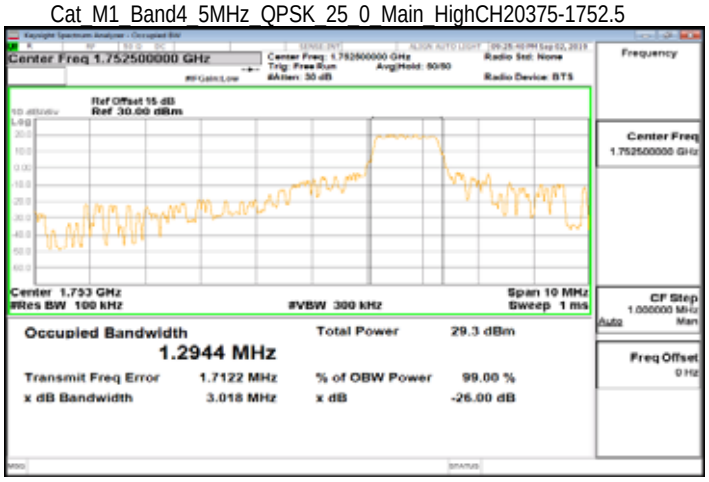
Cat_M1_Band4_5MHz_QPSK_25_0_Main_MidCH20175-1732.5



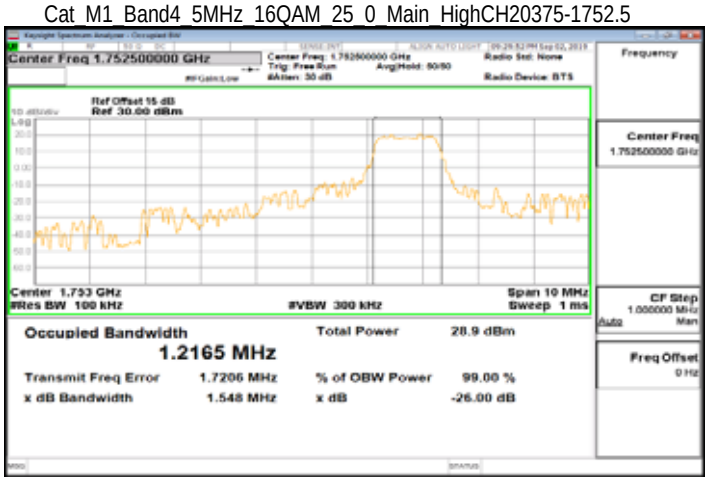
Cat_M1_Band4_5MHz_16QAM_25_0_Main_MidCH20175-1732.5



Cat_M1_Band4_5MHz_QPSK_25_0_Main_HighCH20375-1752.5



Cat_M1_Band4_5MHz_16QAM_25_0_Main_HighCH20375-1752.5



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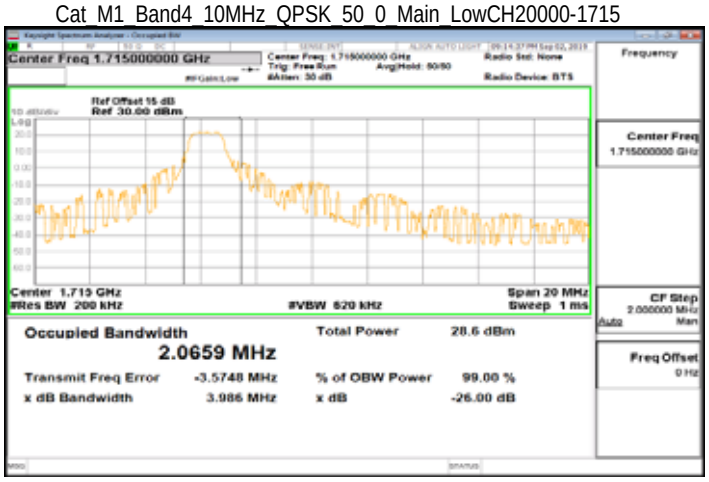
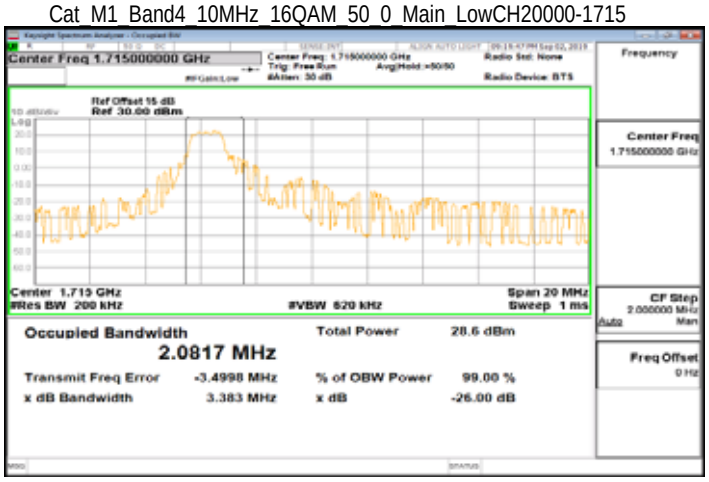
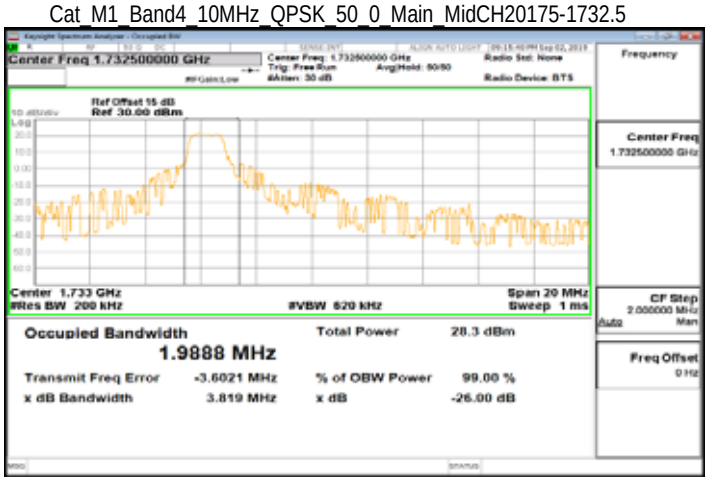
Cat_M1_Band4_10MHz_QPSK_50_0_Main_LowCH20000-1715



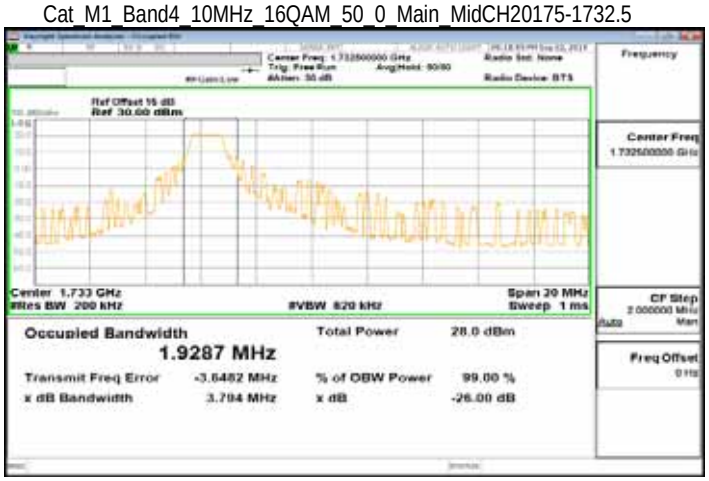
Cat_M1_Band4_10MHz_16QAM_50_0_Main_LowCH20000-1715



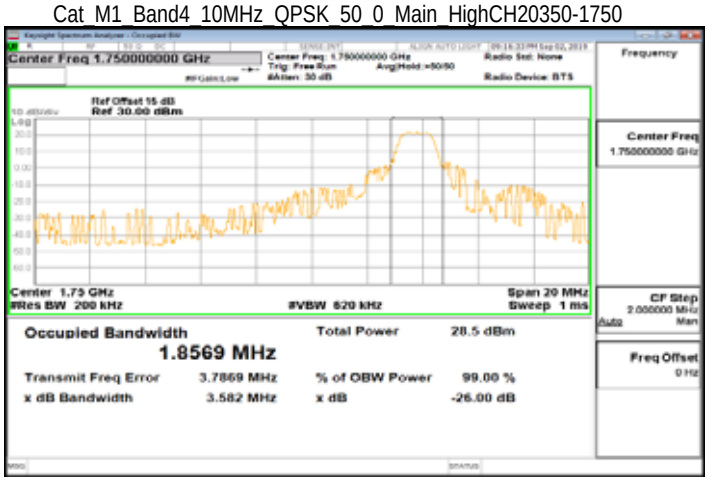
Cat_M1_Band4_10MHz_QPSK_50_0_Main_MidCH20175-1732.5



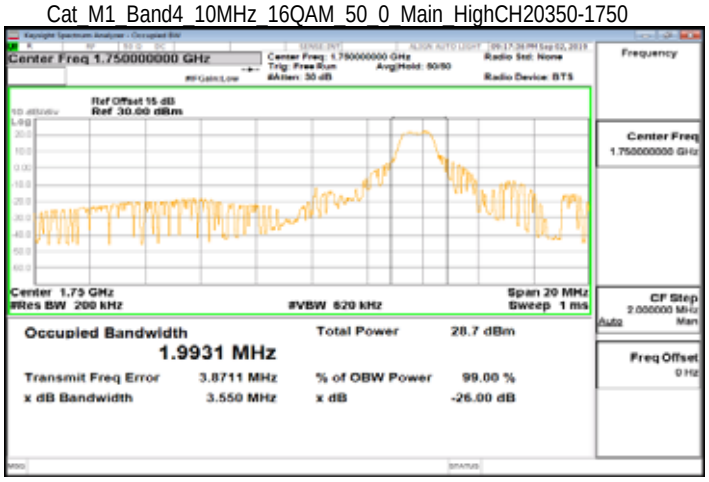
Cat_M1_Band4_10MHz_16QAM_50_0_Main_MidCH20175-1732.5



Cat_M1_Band4_10MHz_QPSK_50_0_Main_HighCH20350-1750



Cat_M1_Band4_10MHz_16QAM_50_0_Main_HighCH20350-1750



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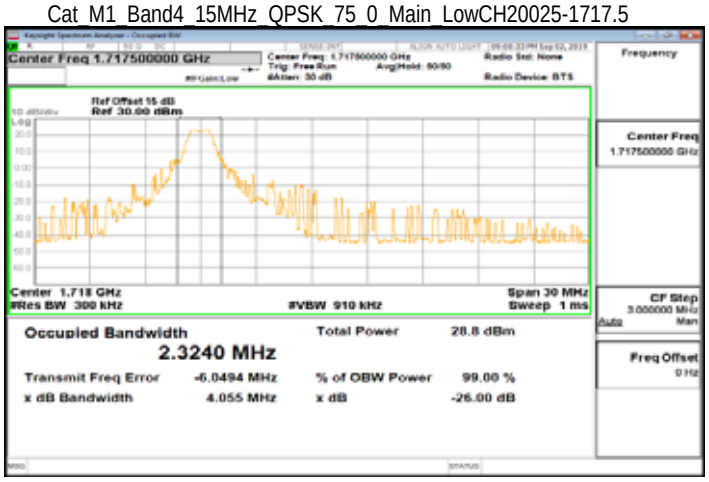
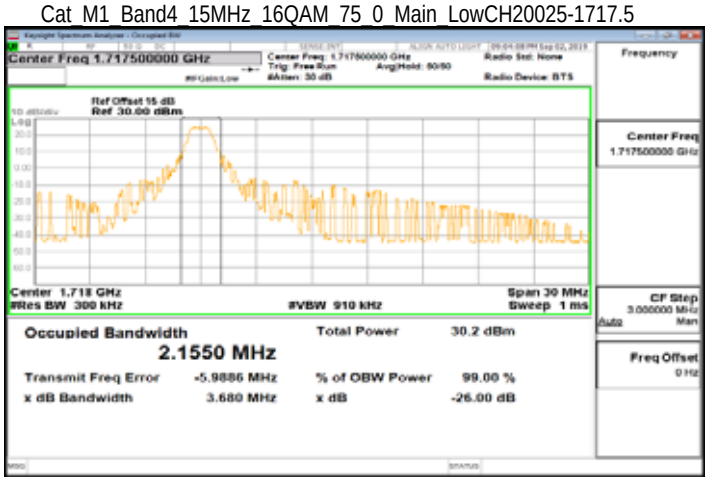
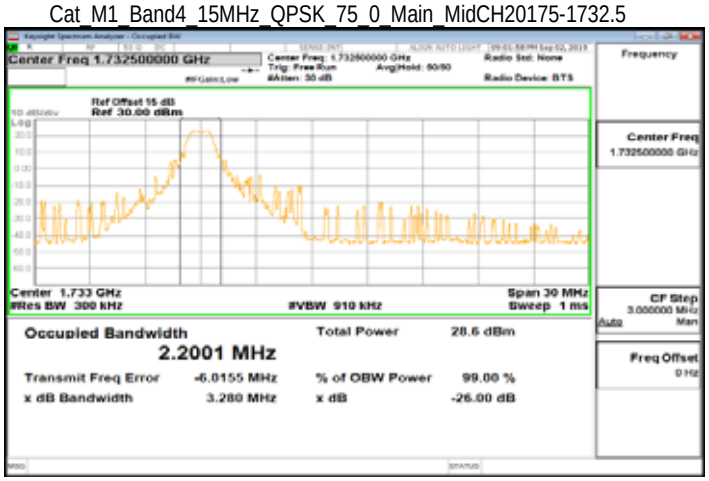
Cat_M1_Band4_15MHz_QPSK_75_0_Main_LowCH20025-1717.5



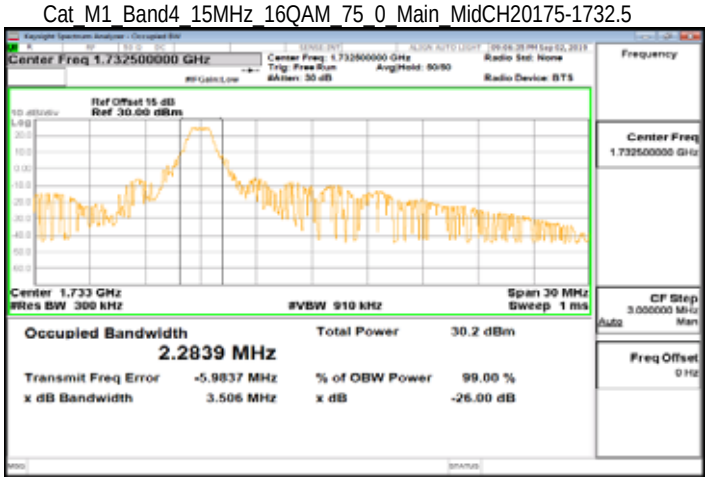
Cat_M1_Band4_15MHz_16QAM_75_0_Main_LowCH20025-1717.5



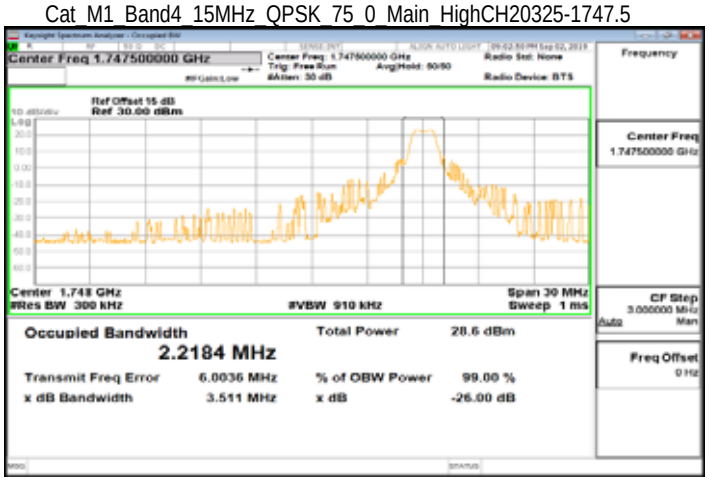
Cat_M1_Band4_15MHz_QPSK_75_0_Main_MidCH20175-1732.5



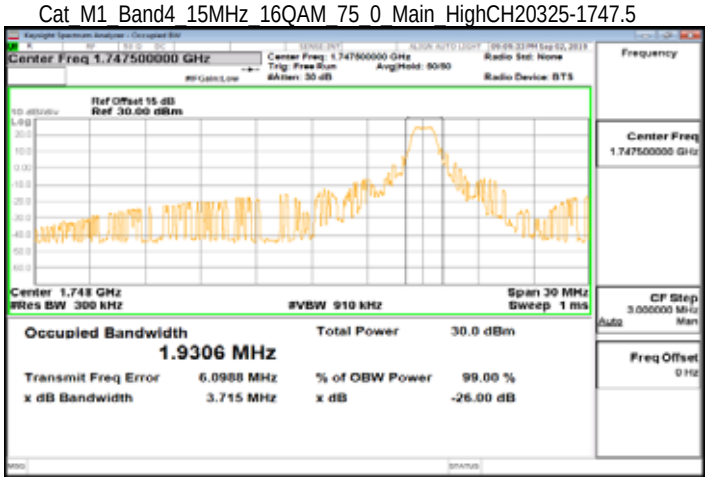
Cat_M1_Band4_15MHz_16QAM_75_0_Main_MidCH20175-1732.5



Cat_M1_Band4_15MHz_QPSK_75_0_Main_HighCH20325-1747.5



Cat_M1_Band4_15MHz_16QAM_75_0_Main_HighCH20325-1747.5



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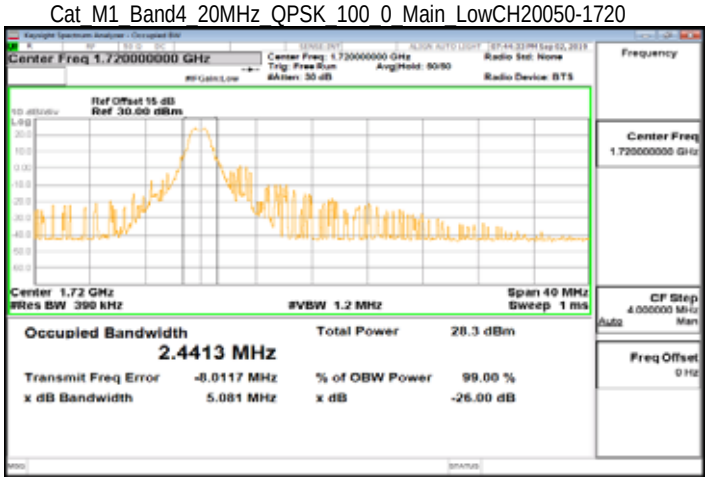
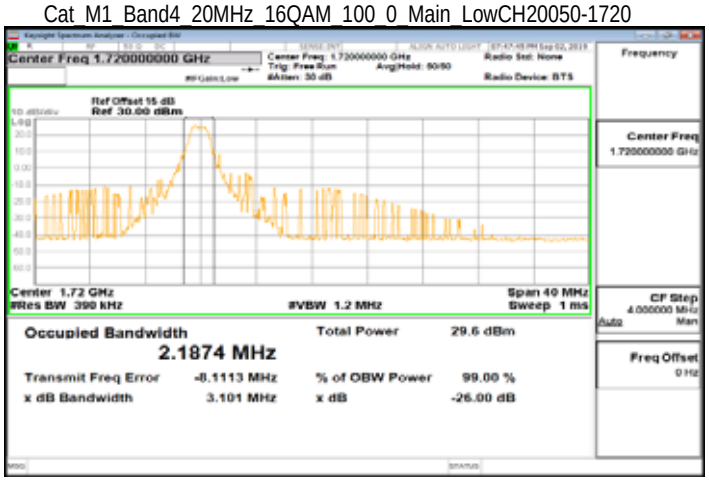
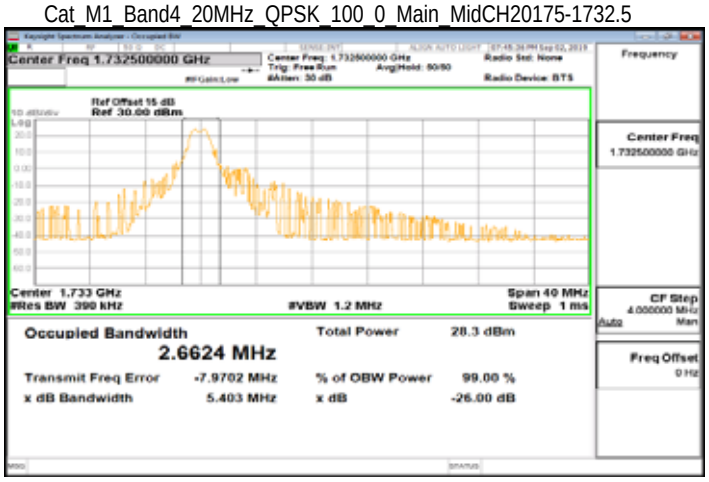
Cat_M1_Band4_20MHz_QPSK_100_0_Main_LowCH20050-1720



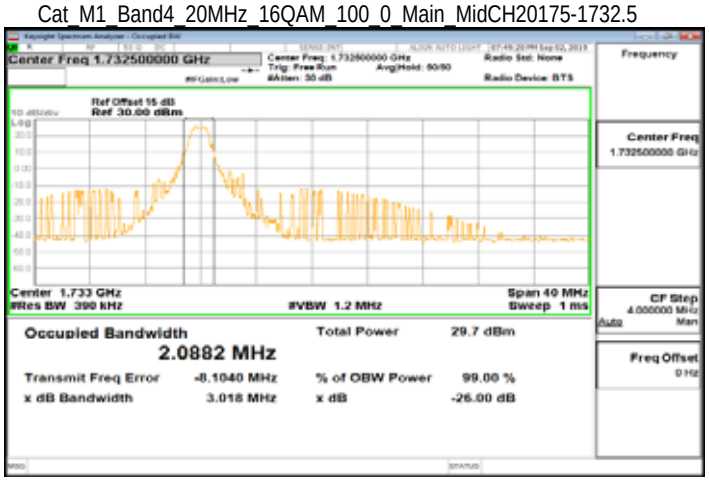
Cat_M1_Band4_20MHz_16QAM_100_0_Main_LowCH20050-1720



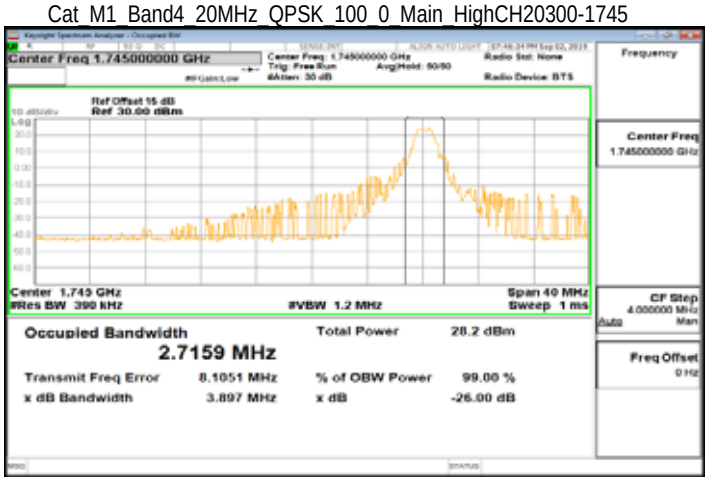
Cat_M1_Band4_20MHz_QPSK_100_0_Main_MidCH20175-1732.5



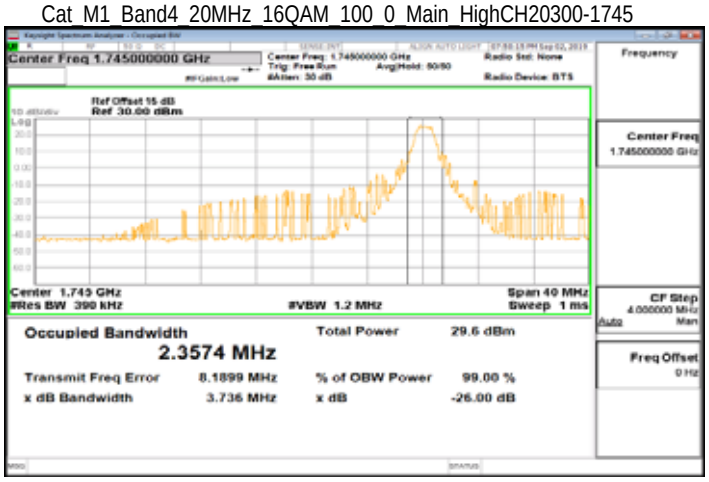
Cat_M1_Band4_20MHz_16QAM_100_0_Main_MidCH20175-1732.5



Cat_M1_Band4_20MHz_QPSK_100_0_Main_HighCH20300-1745



Cat_M1_Band4_20MHz_16QAM_100_0_Main_HighCH20300-1745



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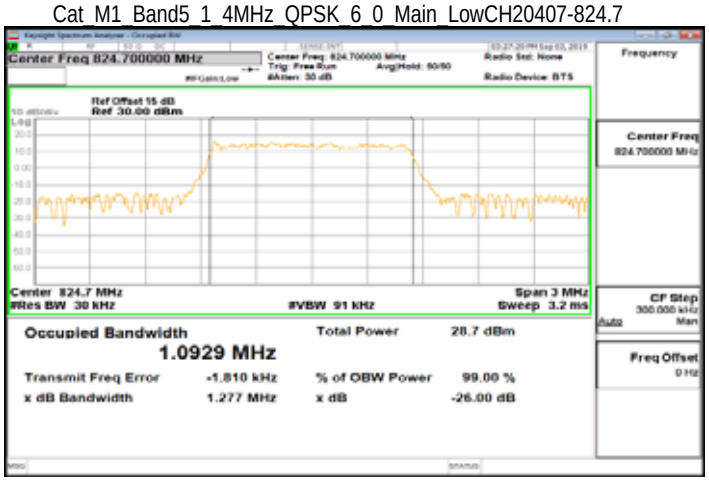
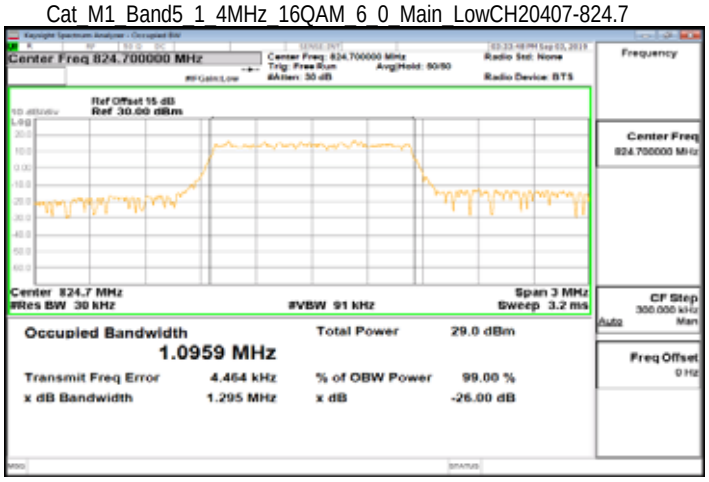
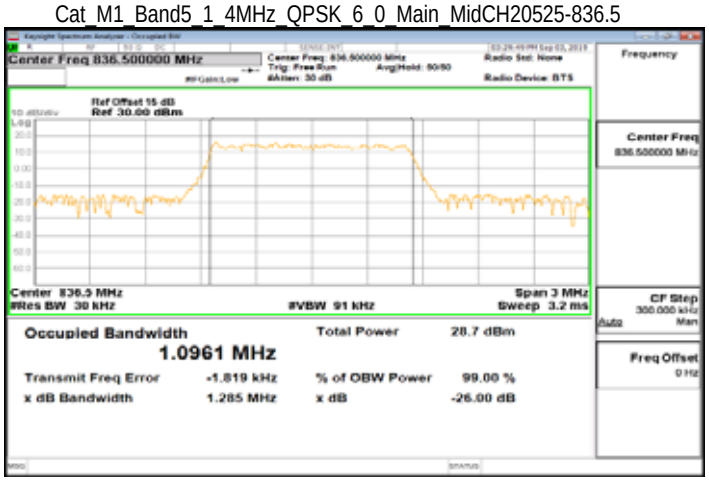
Cat_M1_Band5_1_4MHz_QPSK_6_0_Main_LowCH20407-824.7



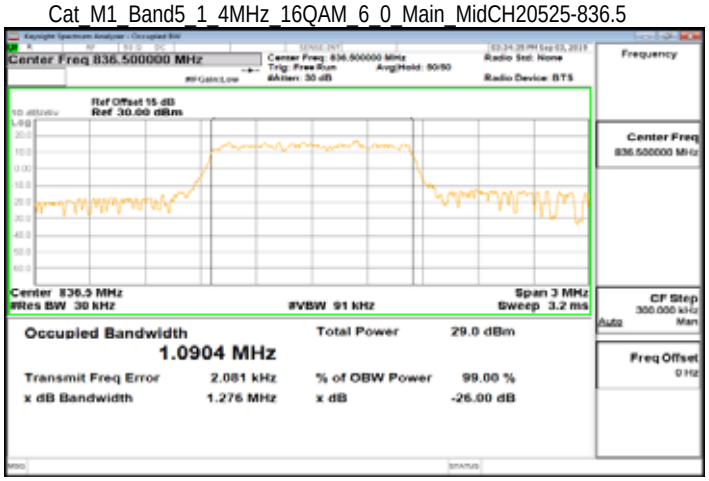
Cat_M1_Band5_1_4MHz_16QAM_6_0_Main_LowCH20407-824.7



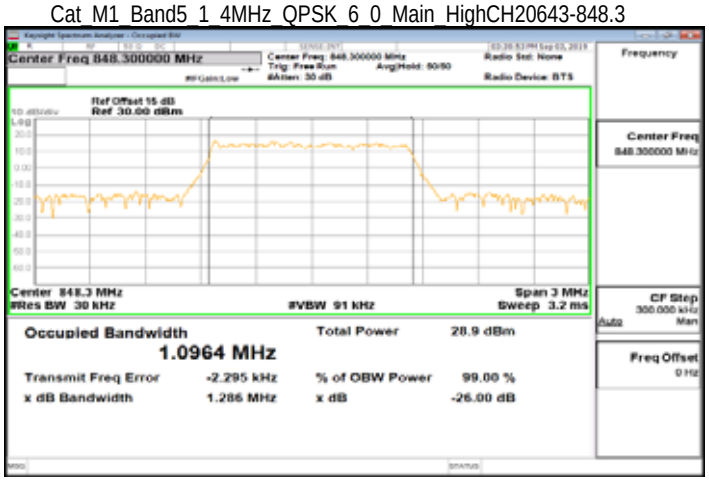
Cat_M1_Band5_1_4MHz_QPSK_6_0_Main_MidCH20525-836.5



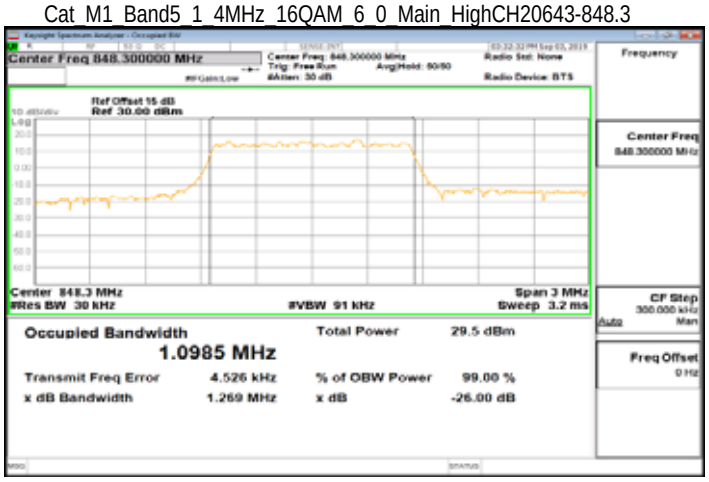
Cat_M1_Band5_1_4MHz_16QAM_6_0_Main_MidCH20525-836.5



Cat_M1_Band5_1_4MHz_QPSK_6_0_Main_HighCH20643-848.3



Cat_M1_Band5_1_4MHz_16QAM_6_0_Main_HighCH20643-848.3



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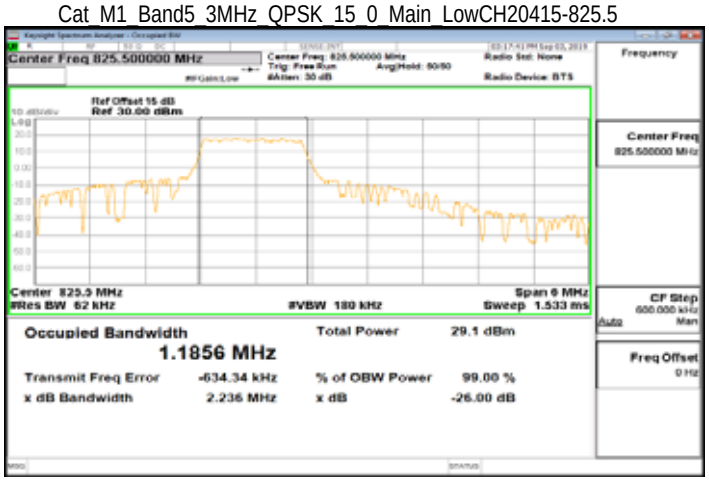
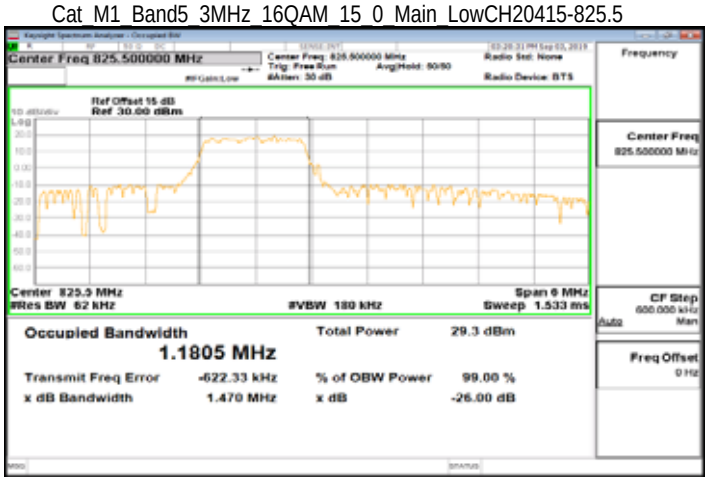
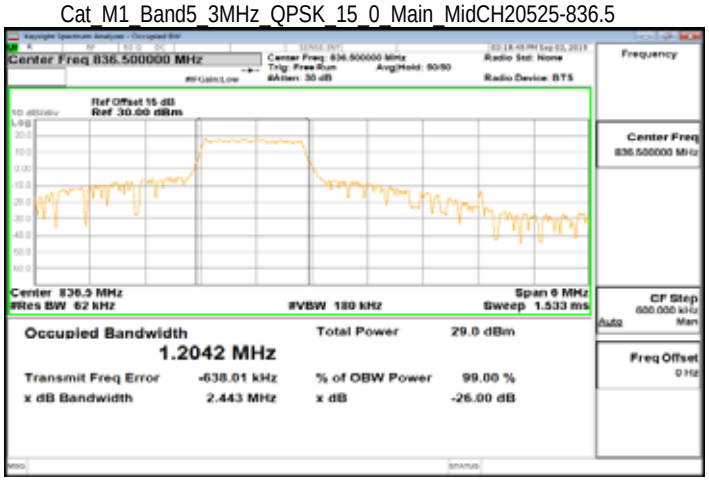
Cat_M1_Band5_3MHz_QPSK_15_0_Main_LowCH20415-825.5



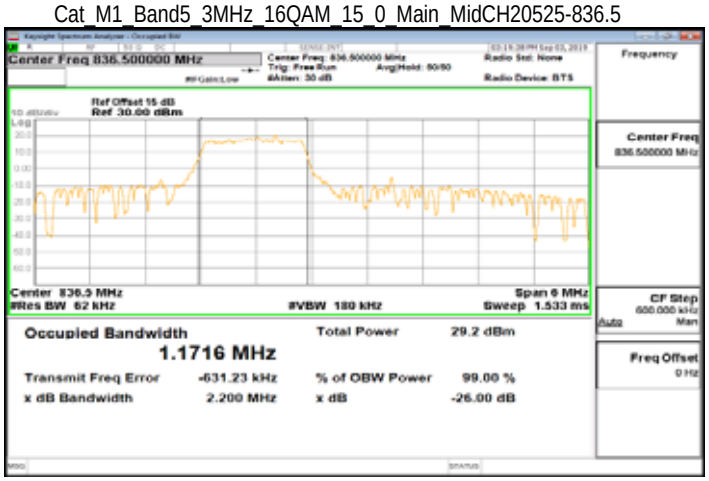
Cat_M1_Band5_3MHz_16QAM_15_0_Main_LowCH20415-825.5



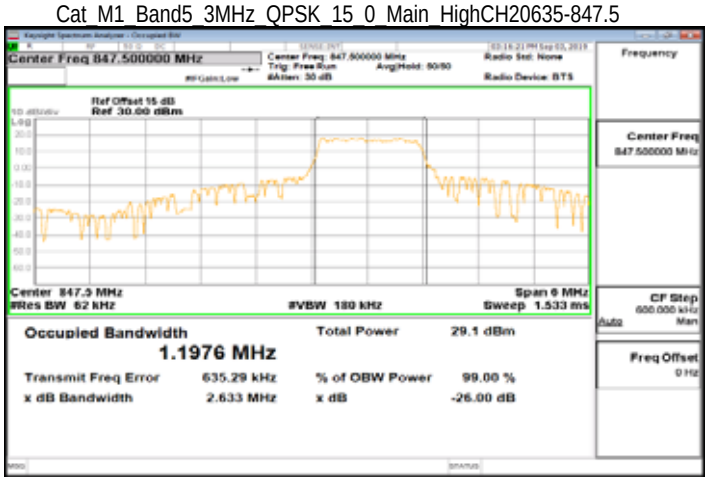
Cat_M1_Band5_3MHz_QPSK_15_0_Main_MidCH20525-836.5



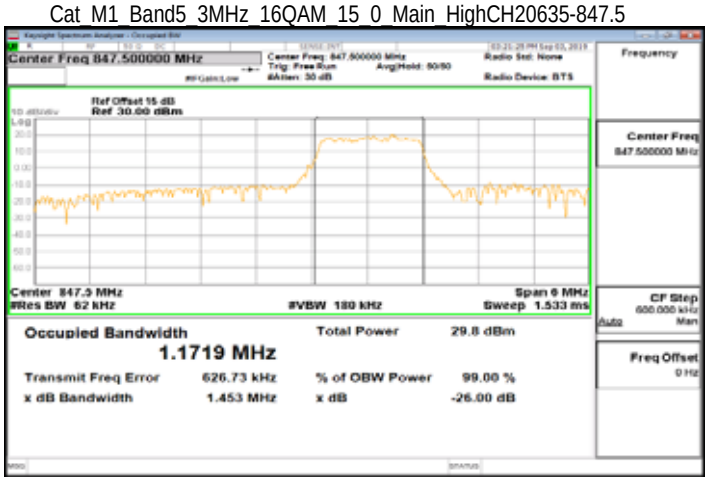
Cat_M1_Band5_3MHz_16QAM_15_0_Main_MidCH20525-836.5



Cat_M1_Band5_3MHz_QPSK_15_0_Main_HighCH20635-847.5



Cat_M1_Band5_3MHz_16QAM_15_0_Main_HighCH20635-847.5



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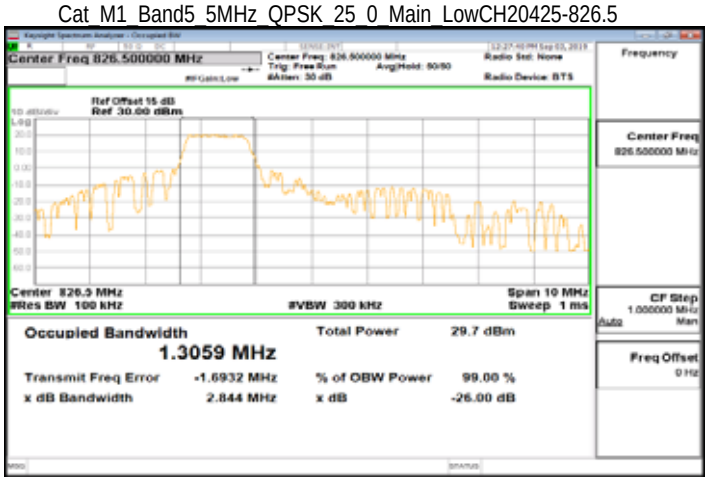
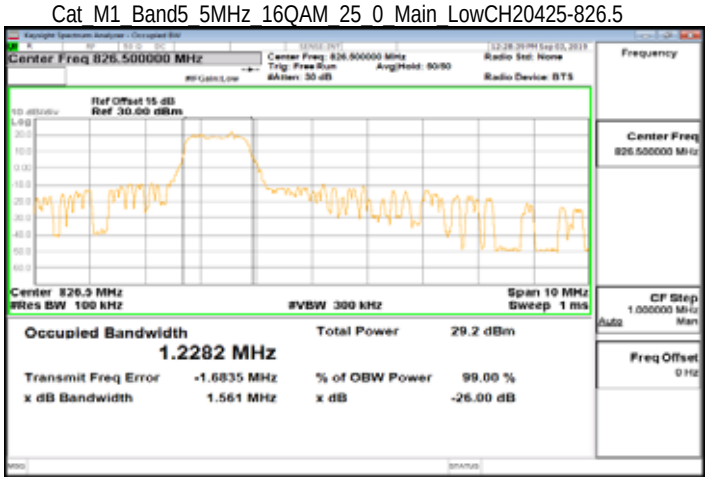
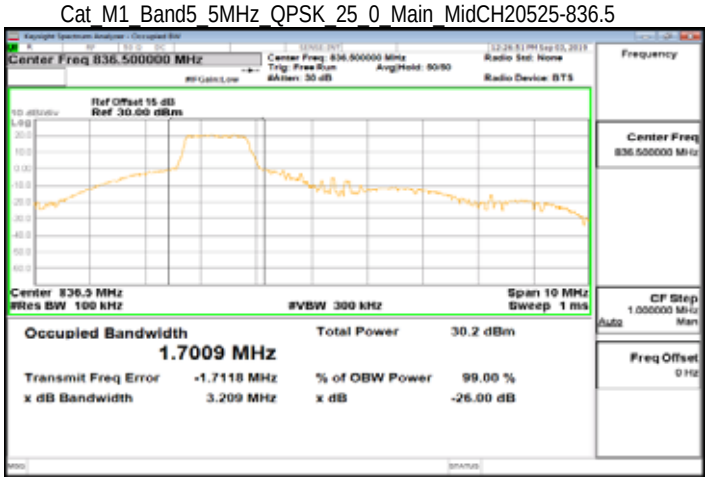
Cat_M1_Band5_5MHz_QPSK_25_0_Main_LowCH20425-826.5



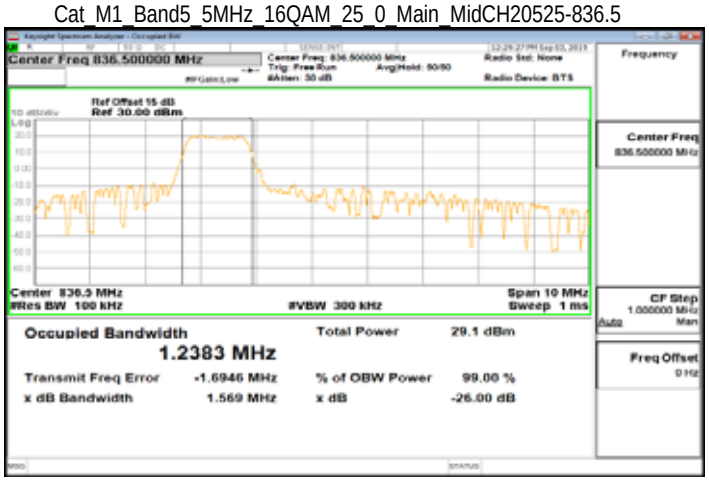
Cat_M1_Band5_5MHz_16QAM_25_0_Main_LowCH20425-826.5



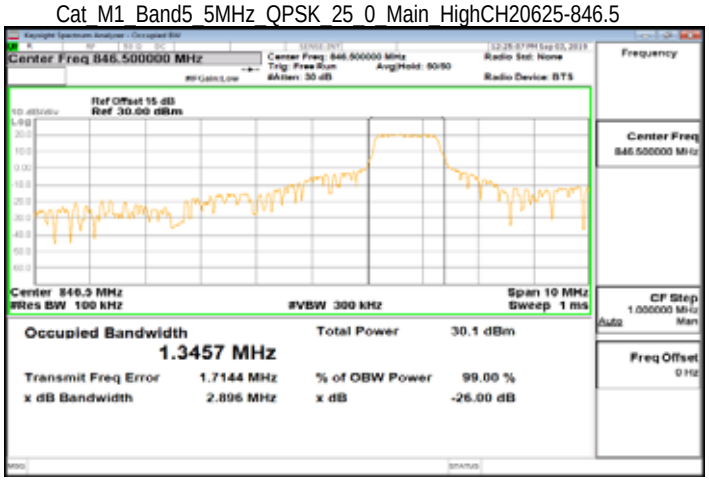
Cat_M1_Band5_5MHz_QPSK_25_0_Main_MidCH20525-836.5



Cat_M1_Band5_5MHz_16QAM_25_0_Main_MidCH20525-836.5



Cat_M1_Band5_5MHz_QPSK_25_0_Main_HighCH20625-846.5



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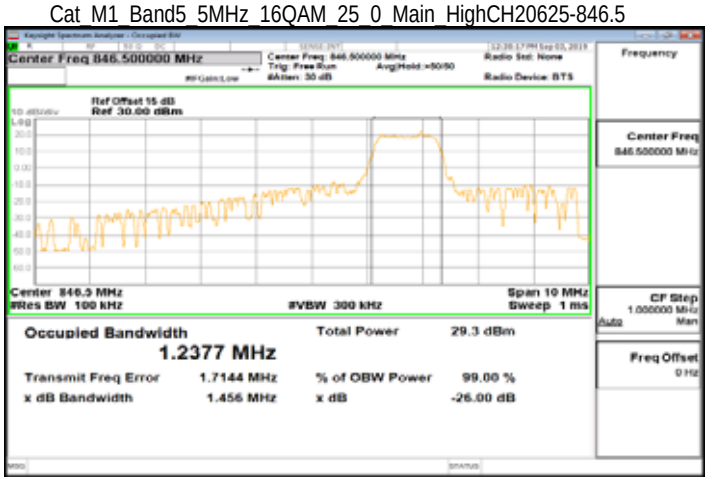

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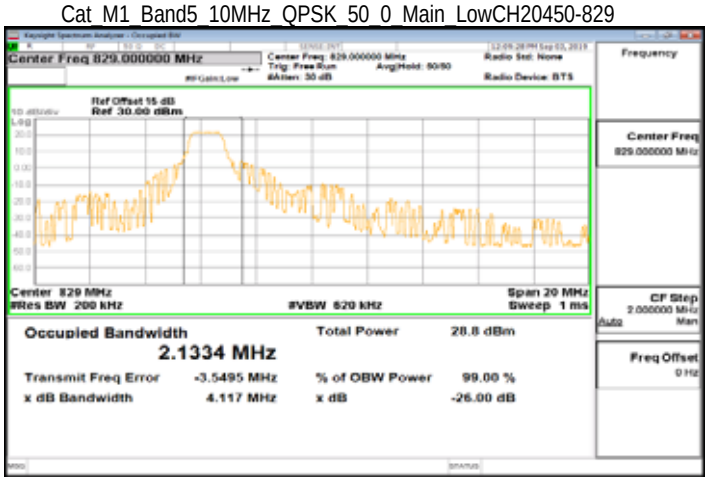
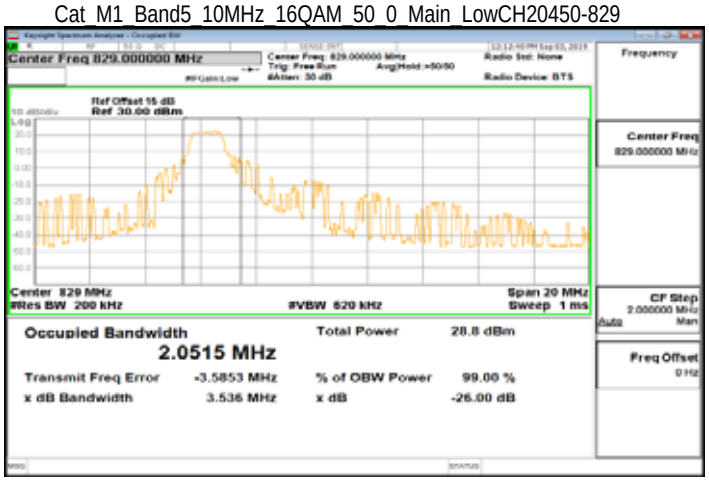
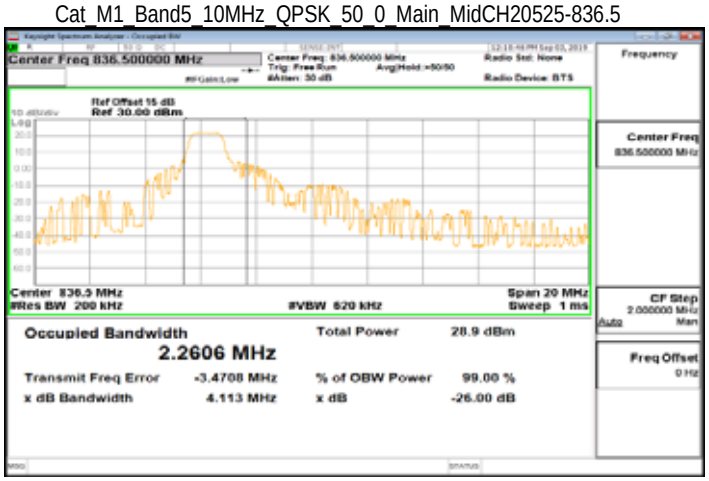
Cat_M1_Band5_10MHz_QPSK_50_0_Main_LowCH20450-829



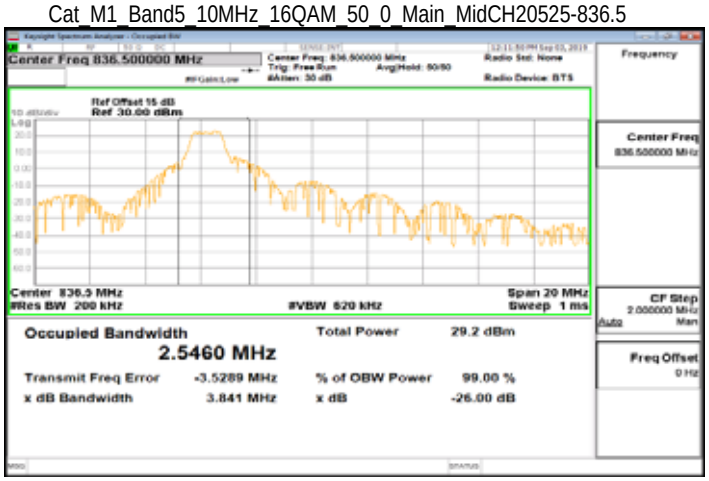
Cat_M1_Band5_10MHz_16QAM_50_0_Main_LowCH20450-829



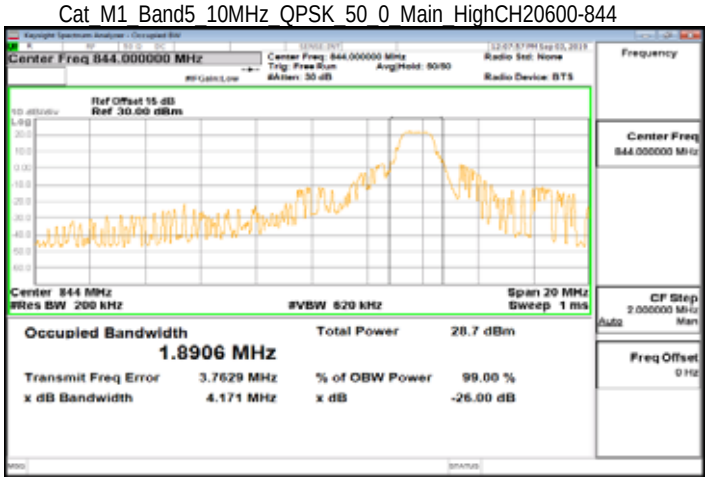
Cat_M1_Band5_10MHz_QPSK_50_0_Main_MidCH20525-836.5



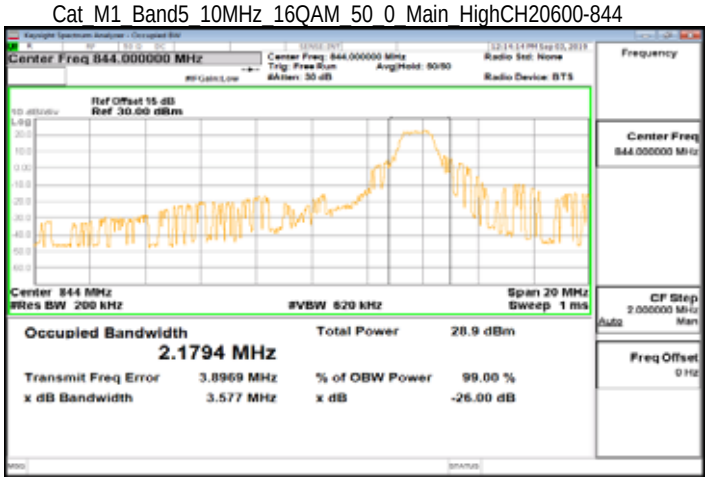
Cat_M1_Band5_10MHz_16QAM_50_0_Main_MidCH20525-836.5



Cat_M1_Band5_10MHz_QPSK_50_0_Main_HighCH20600-844



Cat_M1_Band5_10MHz_16QAM_50_0_Main_HighCH20600-844



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