ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

OF

Applicant:	Taiyo Yuden Co., Ltd. 8-1 Sakae-cyou Takasaki-shi Gunnma, Japan
Product Name:	CatM1 Module
Brand Name:	TAIYO YUDEN
Model No.:	CL5ADAH2Z
Model Difference:	N/A
Report Number:	ER/2020/70059
FCC ID:	RYYCL5AD
IC:	4389B-CL5AD
FCC Rule Part:	2 , 22H & 24E & 27C & 90S
ISED Rule:	RSS-130, 132, 133, 139
Issue Date:	Nov. 11, 2020
Date of Test:	Jul. 08, 2020 ~ Sep. 11, 2020
Date of EUT Received:	Jul. 08, 2020

We hereby certify that:
The above equipment was tested by SGS Taiwan Ltd. Central RF Lab 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.

Approved By: _____
Blue Yang / Asst. Manager

Testing Laboratory
3702

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Revision History				
Report Number	**Revision**	**Description**	**Issue Date**	**Remark**
ER/2020/70059	Rev.00	Original.	Nov. 11, 2020	Revised By: Tiffany Kao

Note:

1、Disclaimer

Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

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Contents

1 GENERAL PRODUCT INFORMATION 4
2 SYSTEM TEST CONFIGURATION 9
3 SUMMARY OF TEST RESULTS 12
4 DESCRIPTION OF TEST MODES 12
5 MEASUREMENT UNCERTAINTY 18
6 MAXMUM OUTPUT POWER 19
7 OCCUPIED BANDWIDTH MEASUREMENT 35
8 OUT OF BAND EMISSION AT ANTENNA TERMINALS 64
9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT 115
10 FREQUENCY STABILITY MEASUREMENT 149
11 PEAK TO AVERAGE RATIO 153

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1 GENERAL PRODUCT INFORMATION

1.1 Product Description

Product Name:	CatM1 Module
Brand Name:	TAIYO YUDEN
Model No.:	CL5ADAH2Z
Model difference:	N/A
Hardware Version:	V_2_0
Software Version:	RK_02_01_02_00_94.
Power Supply:	3.6Vdc

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1.2 Frequency Range

1.2.1 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					
12	1.4	699.7	-	715.3					
	3	700.5	-	714.5					
	5	701.5	-	713.5					
	10	704.0	-	711.0					

Note: Operation frequency 814~824MHz is diabled in Canada

1.3 Antenna Designation

Antenna Type	Antenna Model No.
Monopole	FMM800W-SMAP-L-A

Operating Frequency (MHz)		Peak Gain (dBi)
M1-Band 2	1850.7 ~ 1909.3	2.63
M1-Band 26	824.7 ~ 848.3	1.9
M1-Band 26 Part 90	814.7 ~ 823.3	1.83

Antenna Type	Antenna Model No.
Monopole	T17-058-1070

Operating Frequency (MHz)		Peak Gain (dBi)
M1-Band 4	1710.7 ~ 1754.3	3
M1-Band 12	699.7 ~ 715.5	3

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

1.4.1 Cat. M1

M1 Band	BW	Frequency		Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
2	1.4	1850.7	1909.3	QPSK	27.24	EIRP	0.530	1.1011	1M10G7D
				16QAM	25.42	EIRP	0.348	1.1051	1M11D7W
2	3	1851.5	1908.5	QPSK	27.26	EIRP	0.532	1.1512	1M15G7D
				16QAM	25.37	EIRP	0.344	1.1620	1M16D7W
2	5	1852.5	1907.5	QPSK	27.15	EIRP	0.519	1.2345	1M23G7D
				16QAM	26.73	EIRP	0.471	1.2303	1M23D7W
2	10	1855.0	1905.0	QPSK	27.11	EIRP	0.514	1.3891	1M39G7D
				16QAM	26.66	EIRP	0.463	1.3554	1M36D7W
2	15	1857.5	1902.5	QPSK	26.81	EIRP	0.480	1.614	1M61G7D
				16QAM	26.89	EIRP	0.489	1.686	1M69D7W
2	20	1860.0	1900.0	QPSK	26.84	EIRP	0.483	1.813	1M81G7D
				16QAM	26.81	EIRP	0.480	1.948	1M95D7W
4	1.4	1710.7	1754.3	QPSK	27.53	EIRP	0.566	1.1018	1M10G7D
				16QAM	26.16	EIRP	0.413	1.1045	1M10D7W
4	3	1711.5	1753.5	QPSK	27.22	EIRP	0.527	1.1553	1M16G7D
				16QAM	27.18	EIRP	0.522	1.1613	1M16D7W
4	5	1712.5	1752.5	QPSK	27.58	EIRP	0.573	1.2301	1M23G7D
				16QAM	27.25	EIRP	0.531	1.2302	1M23D7W
4	10	1715.0	1750.0	QPSK	27.44	EIRP	0.555	1.3972	1M40G7D
				16QAM	26.46	EIRP	0.443	1.3653	1M37D7W
4	15	1717.5	1747.5	QPSK	27.43	EIRP	0.553	1.580	1M58G7D
				16QAM	27.34	EIRP	0.542	1.611	1M61D7W
4	20	1720.0	1745.0	QPSK	27.51	EIRP	0.564	1.762	1M76G7D
				16QAM	26.90	EIRP	0.490	1.764	1M76D7W
12	1.4	699.7	715.3	QPSK	24.30	ERP	0.269	1.1006	1M10G7D
				16QAM	23.23	ERP	0.210	1.1102	1M11D7W
12	3	700.5	714.5	QPSK	24.33	ERP	0.271	1.1506	1M15G7D
				16QAM	23.23	ERP	0.210	1.1463	1M15D7W
12	5	701.5	713.5	QPSK	24.34	ERP	0.272	1.2187	1M22G7D
				16QAM	24.79	ERP	0.301	1.2164	1M22D7W
12	10	704.0	711.0	QPSK	24.67	ERP	0.293	1.3709	1M37G7D
				16QAM	24.82	ERP	0.303	1.3626	1M36D7W

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26	1.4	824.7	848.3	QPSK	23.70	ERP	0.234	1.1077	1M11G7D
				16QAM	22.03	ERP	0.160	1.1068	1M11D7W
26	3	825.5	847.5	QPSK	23.28	ERP	0.213	1.1494	1M15G7D
				16QAM	22.02	ERP	0.159	1.1590	1M16D7W
26	5	826.5	846.5	QPSK	23.36	ERP	0.217	1.2315	1M23G7D
				16QAM	23.51	ERP	0.224	1.2292	1M23D7W
26	10	829.0	844.0	QPSK	23.71	ERP	0.235	1.3822	1M38G7D
				16QAM	23.55	ERP	0.226	1.3731	1M37D7W
26	15	831.0	841.5	QPSK	23.36	ERP	0.217	2.088	2M09G7D
				16QAM	23.51	ERP	0.224	1.579	1M58D7W
26 (Part 90S)	1.4	814.7	823.3	QPSK	23.51	ERP	0.224	1.1008	1M10G7D
				16QAM	21.74	ERP	0.149	1.1088	1M11D7W
26 (Part 90S)	3	815.5	822.5	QPSK	23.23	ERP	0.210	1.1517	1M15G7D
				16QAM	21.84	ERP	0.153	1.1663	1M17D7W
26 (Part 90S)	5	816.5	822.5	QPSK	23.47	ERP	0.222	1.2323	1M23G7D
				16QAM	23.39	ERP	0.218	1.2311	1M23D7W
26 (Part 90S)	10	819.0	819.0	QPSK	23.31	ERP	0.214	1.3561	1M36G7D
				16QAM	23.42	ERP	0.220	1.3616	1M36D7W

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1.5 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
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.

1.6 Test Facility

SGS Taiwan Ltd. Central RF Lab (TAF code 3702)
No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

FCC Designation number: TW0027

ISED CAB identifier: TW3702

1.7 Special Accessories

No special accessories were used during testing.

1.8 Equipment Modifications

There was no modifications incorporated into the EUT.

1.9 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber,
the measurements correspond to those obtained at an open-field test site.
There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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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

The EUT is placed on a 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)

The EUT is placed on a 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.

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.
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)	3.5	10	13.5
High Band (Above 1 GHz)	3.6	10	13.6

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2.5 Final Amplifier Voltage and Current Information:

2.5.1 Cat M1

M1 Band 2

Test mode	DC voltage (V)	DC current (mA)
M1 Band 2_1.4M QPSK	3.6	196
M1 Band 2_1.4M 16QAM	3.6	216
M1 Band 2_3M QPSK	3.6	220
M1 Band 2_3M 16QAM	3.6	197
M1 Band 2_5M QPSK	3.6	204
M1 Band 2_5M 16QAM	3.6	217
M1 Band 2_10M QPSK	3.6	214
M1 Band 2_10M 16QAM	3.6	214
M1 Band 2_15M QPSK	3.6	218
M1 Band 2_15M 16QAM	3.6	195
M1 Band 2_20M QPSK	3.6	200
M1 Band 2_20M 16QAM	3.6	220

M1 Band 4

Test mode	DC voltage (V)	DC current (mA)
M1 Band 4_1.4M QPSK	3.6	211
M1 Band 4_1.4M 16QAM	3.6	202
M1 Band 4_3M QPSK	3.6	209
M1 Band 4_3M 16QAM	3.6	209
M1 Band 4_5M QPSK	3.6	202
M1 Band 4_5M 16QAM	3.6	197
M1 Band 4_10M QPSK	3.6	195
M1 Band 4_10M 16QAM	3.6	205
M1 Band 4_15M QPSK	3.6	195
M1 Band 4_15M 16QAM	3.6	213
M1 Band 4_20M QPSK	3.6	195
M1 Band 4_20M 16QAM	3.6	220

M1 Band 12

Test mode	DC voltage (V)	DC current (mA)
M1 Band 5_1.4M QPSK	3.6	217
M1 Band 5_1.4M 16QAM	3.6	192
M1 Band 5_3M QPSK	3.6	212
M1 Band 5_3M 16QAM	3.6	197
M1 Band 5_5M QPSK	3.6	215
M1 Band 5_5M 16QAM	3.6	217
M1 Band 5_10M QPSK	3.6	218
M1 Band 5_10M 16QAM	3.6	200
M1 Band 5_10M 64QAM	3.6	192

M1 Band 26

Test mode	DC voltage (V)	
M1 Band 26_1.4M QPSK	3.6	199
M1 Band 26_1.4M 16QAM	3.6	191
M1 Band 26_3M QPSK	3.6	200
M1 Band 26_3M 16QAM	3.6	205
M1 Band 26_5M QPSK	3.6	190
M1 Band 26_5M 16QAM	3.6	200
M1 Band 26_10M QPSK	3.6	193
M1 Band 26_10M 16QAM	3.6	201
M1 Band 26_15M QPSK	3.6	205
M1 Band 26_15M 16QAM	3.6	197

M1 Band 26 for Part 90S

Test Mode	DC voltage (V)	DC current (mA)
M1 Band 26_1.4M QPSK	3.6	190
M1 Band 26_1.4M 16QAM	3.6	208
M1 Band 26_3M QPSK	3.6	203
M1 Band 26_3M 16QAM	3.6	211
M1 Band 26_5M QPSK	3.6	211
M1 Band 26_5M 16QAM	3.6	198
M1 Band 26_10M QPSK	3.6	217
M1 Band 26_10M 16QAM	3.6	210

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2.6 Configuration of Tested System

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

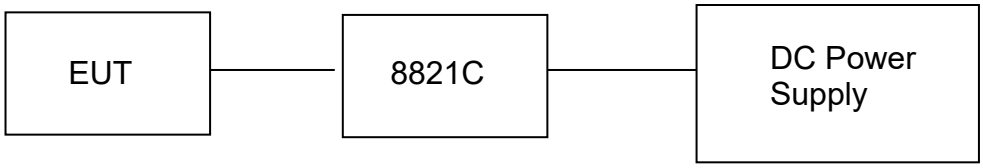
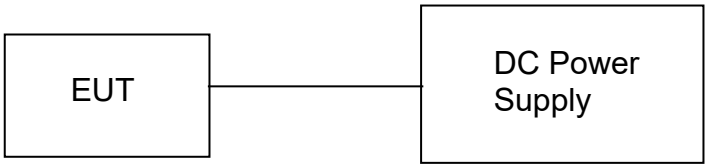


Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)



Remote Side

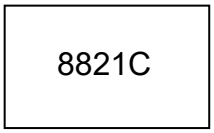


Table 2-1 Equipment Used in

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	MY40000811	shielded	Un-shielded

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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)(9) §27.50(d)(4) §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(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 §2.1057(a)(1) §22.917(a) §24.238(a) §27.53(g) §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	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 §6.5	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 §6.4	Frequency Stability	Compliant

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:

EUT	Serial Number	Note
CatM1 Module	355950100010914	N/A

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4.2 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/ 0,14 RB Offest
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1 RB/ 0,24 RB Offest
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1 RB/ 0,49 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1 RB/ 0,74 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1 RB/ 0,99 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/ 0,14 RB Offest Full RB
	18625 to 19175	18625, 19175	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB
	18650 to 19150	18650, 19150	10MHz	QPSK,	1 RB/ 0,49 RB Offest Full RB
	18675 to 19125	18675, 19125	15MHz	QPSK,	1 RB/ 0,74 RB Offest Full RB
	18700 to 19100	18700, 19100	20MHz	QPSK,	1 RB/ 0,99 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	18615 to 19185	18615, 18900, 19185	3MHz	QPSK	1 RB, 0 RB Offest

Remark: Maximum RB allocation is 6 RB, 0RB offset.

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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/ 0,14 RB Offest
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB/ 0,24 RB Offest
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB/ 0,49 RB Offest
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB/ 0,74 RB Offest
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB/ 0,99 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/ 0,14 RB Offest Full RB
	19975 to 20375	19975, 20375	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB
	20000 to 20350	20000, 20350	10MHz	QPSK,	1 RB/ 0,49 RB Offest Full RB
	20025 to 20325	20025, 20325	15MHz	QPSK,	1 RB/ 0,74 RB Offest Full RB
	20050 to 20300	20050, 20300	20MHz	QPSK,	1 RB/ 0,99 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	5MHz	QPSK,	1 RB, 0 RB Offest

Remark: Maximum RB allocation is 6 RB, 0RB offset.

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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/ 0,14 RB Offest
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	1 RB/ 0,24 RB Offest
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	1 RB/ 0,49 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/ 0,14 RB Offest Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK,	1 RB/ 0,49 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, 0 RB Offest

Remark: Maximum RB allocation is 6 RB, 0RB offset.

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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/ 0,14 RB Offest
	26815 to 27015	26815, 26915, 27015	5MHz	QPSK, 16QAM	1 RB/ 0,24 RB Offest
	26840 to 26990	26840, 26915, 26990	10MHz	QPSK, 16QAM	1 RB/ 0,49 RB Offest
	26865 to 26965	26865, 26915, 26965	15MHz	QPSK, 16QAM	1 RB/ 0,74 RB Offest
FREQUENCY STA-BILITY	26865 to 26965	26915	15MHz	QPSK,	Full RB
OCCUPIED BAND-WIDTH	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 AVERAGE 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/ 0,14 RB Offest Full RB
	26815 to 27015	26815, 26915, 27015	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB
	26840 to 26990	26840, 26915, 26990	10MHz	QPSK,	1 RB/ 0,49 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 EMIS-SION	26840 to 26990	26840, 26915, 26990	10MHz	QPSK,	1 RB, 0 RB Offest

Remark: Maximum RB allocation is 6 RB, 0RB offset.

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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/ 0,14 RB Offest
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM	1 RB/ 0,24 RB Offest
	26740	26740	10MHz	QPSK, 16QAM	1 RB/ 0,49 RB Offest
FREQUENCY STA-BILITY	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/ 0,14 RB Offest Full RB
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB
	26740	26740	10MHz	QPSK,	1 RB/ 0,49 RB Offest Full RB
CONDCUDETED EMISSION	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	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK,	1 RB, 0 RB Offest

Remark: Maximum RB allocation is 6 RB, 0RB offset.

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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

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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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.

6.2 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(c)

(9) Control and mobile stations in the 698-746 MHz band are limited to 30 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

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.

According to section 5.1.2 of SRSP-510, Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p. The equipment shall employ means to limit the power to the minimum necessary for successful communication.

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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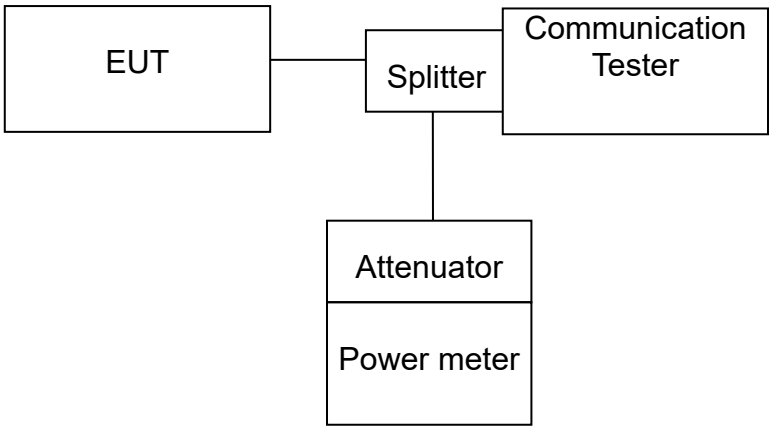
6.3 Test Set-up



Note: *Measurement setup for testing on Antenna connector*

6.4 Output Power Measurement Applicable Guideance

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 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.WAll bands conducted average power is obtained from the simulator telecommunication test set.

6.5 Determining ERP and/or EIRP from conducted RF output power measurements

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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6.6 Measurement Equipment Used

Conducted Emission (measured at antenna port) Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
DC Power Supply	Agilent	E3640A	MY40000811	12/23/2019	12/22/2020
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY57120290	02/20/2020	02/19/2021
Radio Communication Analyer	Anritsu	MT8821C	6261786084	01/18/2020	01/17/2021
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2020	01/01/2021

6.7 Measurement Result

6.7.1 Cat M1

Antenna gain (dBi) 2.63

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	24.61	27.24	33	-5.76
				1	5	0	24.58	27.21	33	-5.79
				6	0	0	20.78	23.41	33	-9.59
	18900	1880	QPSK	1	0	0	24.08	26.71	33	-6.29
				1	5	0	24.04	26.67	33	-6.33
				6	0	0	21.39	24.02	33	-8.98
	19193	1909.3	QPSK	1	0	0	24.41	27.04	33	-5.96
				1	5	0	24.40	27.03	33	-5.97
				6	0	0	21.75	24.38	33	-8.62
	18607	1850.7	16QAM	1	0	11	22.79	25.42	33	-7.58
				1	5	11	22.68	25.31	33	-7.69
				6	0	11	21.79	24.42	33	-8.58
	18900	1880	16QAM	1	0	11	22.46	25.09	33	-7.91
				1	5	11	22.38	25.01	33	-7.99
				6	0	11	21.46	24.09	33	-8.91
	19193	1909.3	16QAM	1	0	11	22.65	25.28	33	-7.72
				1	5	11	22.62	25.25	33	-7.75
				6	0	11	20.69	23.32	33	-9.68

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Antenna gain (dBi) 2.63

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	24.63	27.26	33	-5.74
				1	5	0	24.57	27.20	33	-5.8
				6	0	0	22.12	24.75	33	-8.25
	18900	1880	QPSK	1	0	0	23.99	26.62	33	-6.38
				1	5	0	23.97	26.60	33	-6.4
				6	0	0	21.58	24.21	33	-8.79
	19185	1908.5	QPSK	1	0	0	24.40	27.03	33	-5.97
				1	5	0	24.39	27.02	33	-5.98
				6	0	0	22.01	24.64	33	-8.36
	18615	1851.5	16QAM	1	0	11	22.74	25.37	33	-7.63
				1	5	11	22.71	25.34	33	-7.66
				6	0	11	21.98	24.61	33	-8.39
	18900	1880	16QAM	1	0	11	22.45	25.08	33	-7.92
				1	5	11	22.37	25.00	33	-8
				6	0	11	21.41	24.04	33	-8.96
	19185	1908.5	16QAM	1	0	11	22.67	25.30	33	-7.7
				1	5	11	22.57	25.20	33	-7.8
				6	0	11	21.56	24.19	33	-8.81

Antenna gain (dBi) 2.63

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	24.52	27.15	33	-5.85
				1	5	0	24.50	27.13	33	-5.87
				6	0	0	23.15	25.78	33	-7.22
	18900	1880	QPSK	1	0	0	24.09	26.72	33	-6.28
				1	5	0	24.06	26.69	33	-6.31
				6	0	0	22.66	25.29	33	-7.71
	19175	1907.5	QPSK	1	0	0	24.38	27.01	33	-5.99
				1	5	0	24.37	27.00	33	-6
				6	0	0	22.93	25.56	33	-7.44
	18625	1852.5	16QAM	1	0	11	23.56	26.19	33	-6.81
				1	5	11	23.57	26.20	33	-6.8
				6	0	11	21.80	24.43	33	-8.57
	18900	1880	16QAM	1	0	11	24.10	26.73	33	-6.27
				1	5	11	24.10	26.73	33	-6.27
				6	0	11	21.54	24.17	33	-8.83
	19175	1907.5	16QAM	1	0	11	23.32	25.95	33	-7.05
				1	5	11	24.08	26.71	33	-6.29
				6	0	11	21.51	24.14	33	-8.86

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Antenna gain (dBi) 2.63

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	24.48	27.11	33	-5.89
				1	5	0	24.45	27.08	33	-5.92
				6	0	0	23.10	25.73	33	-7.27
	18900	1880	QPSK	1	0	0	24.03	26.66	33	-6.34
				1	5	0	24.02	26.65	33	-6.35
				6	0	0	22.65	25.28	33	-7.72
	19150	1905	QPSK	1	0	0	24.35	26.98	33	-6.02
				1	5	0	24.35	26.98	33	-6.02
				6	0	0	22.79	25.42	33	-7.58
	18650	1855	16QAM	1	0	11	23.49	26.12	33	-6.88
				1	5	11	23.53	26.16	33	-6.84
				6	0	11	21.62	24.25	33	-8.75
	18900	1880	16QAM	1	0	11	24.03	26.66	33	-6.34
				1	5	11	23.08	25.71	33	-7.29
				6	0	11	21.36	23.99	33	-9.01
	19150	1905	16QAM	1	0	11	23.20	25.83	33	-7.17
				1	5	11	23.21	25.84	33	-7.16
				6	0	11	21.51	24.14	33	-8.86

Antenna gain (dBi) 2.63

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	24.18	26.81	33	-6.19
				1	5	0	24.16	26.79	33	-6.21
				6	0	0	23.97	26.60	33	-6.4
	18900	1880	QPSK	1	0	0	24.05	26.68	33	-6.32
				1	5	0	24.03	26.66	33	-6.34
				6	0	0	23.59	26.22	33	-6.78
	19125	1902.5	QPSK	1	0	0	23.94	26.57	33	-6.43
				1	5	0	23.92	26.55	33	-6.45
				6	0	0	23.74	26.37	33	-6.63
	18675	1857.5	16QAM	1	0	11	23.68	26.31	33	-6.69
				1	5	11	24.26	26.89	33	-6.11
				6	0	11	23.88	26.51	33	-6.49
	18900	1880	16QAM	1	0	11	24.11	26.74	33	-6.26
				1	5	11	24.15	26.78	33	-6.22
				6	0	11	23.42	26.05	33	-6.95
	19125	1902.5	16QAM	1	0	11	24.15	26.78	33	-6.22
				1	5	11	23.23	25.86	33	-7.14
				6	0	11	23.53	26.16	33	-6.84

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Antenna gain (dBi) 2.63

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	24.21	26.84	33	-6.16
				1	5	0	24.18	26.81	33	-6.19
				6	0	0	23.95	26.58	33	-6.42
	18900	1880	QPSK	1	0	0	23.96	26.59	33	-6.41
				1	5	0	23.94	26.57	33	-6.43
				6	0	0	23.57	26.20	33	-6.8
	19100	1900	QPSK	1	0	0	24.10	26.73	33	-6.27
				1	5	0	24.07	26.70	33	-6.3
				6	0	0	23.72	26.35	33	-6.65
	18700	1860	16QAM	1	0	11	23.47	26.10	33	-6.9
				1	5	11	23.48	26.11	33	-6.89
				6	0	11	23.81	26.44	33	-6.56
	18900	1880	16QAM	1	0	11	24.14	26.77	33	-6.23
				1	5	11	24.09	26.72	33	-6.28
				6	0	11	23.22	25.85	33	-7.15
	19100	1900	16QAM	1	0	11	23.02	25.65	33	-7.35
				1	5	11	24.18	26.81	33	-6.19
				6	0	11	23.34	25.97	33	-7.03

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Antenna gain (dBi) 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	24.34	27.34	30	-2.66
				1	5	0	24.31	27.31	30	-2.69
				6	0	0	21.93	24.93	30	-5.07
	20175	1732.5	QPSK	1	0	0	24.05	27.05	30	-2.95
				1	5	0	23.97	26.97	30	-3.03
				6	0	0	21.61	24.61	30	-5.39
	20393	1754.3	QPSK	1	0	0	24.53	27.53	30	-2.47
				1	5	0	24.44	27.44	30	-2.56
				6	0	0	22.06	25.06	30	-4.94
	19957	1710.7	16QAM	1	0	11	23.16	26.16	30	-3.84
				1	5	11	23.07	26.07	30	-3.93
				6	0	11	21.18	24.18	30	-5.82
	20175	1732.5	16QAM	1	0	11	22.94	25.94	30	-4.06
				1	5	11	22.87	25.87	30	-4.13
				6	0	11	21.95	24.95	30	-5.05
	20393	1754.3	16QAM	1	0	11	23.02	26.02	30	-3.98
				1	5	11	22.97	25.97	30	-4.03
				6	0	11	22.03	25.03	30	-4.97

Antenna gain (dBi) 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	24.22	27.22	30	-2.78
				1	5	0	24.14	27.14	30	-2.86
				6	0	0	22.23	25.23	30	-4.77
	20175	1732.5	QPSK	1	0	0	24.06	27.06	30	-2.94
				1	5	0	24.01	27.01	30	-2.99
				6	0	0	22.22	25.22	30	-4.78
	20385	1753.5	QPSK	1	0	0	24.21	27.21	30	-2.79
				1	5	0	24.16	27.16	30	-2.84
				6	0	0	21.97	24.97	30	-5.03
	19965	1711.5	16QAM	1	0	11	23.09	26.09	30	-3.91
				1	5	11	23.01	26.01	30	-3.99
				6	0	11	22.15	25.15	30	-4.85
	20175	1732.5	16QAM	1	0	11	22.92	25.92	30	-4.08
				1	5	11	22.88	25.88	30	-4.12
				6	0	11	21.99	24.99	30	-5.01
	20385	1753.5	16QAM	1	0	11	24.18	27.18	30	-2.82
				1	5	11	24.15	27.15	30	-2.85
				6	0	11	22.18	25.18	30	-4.82

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Antenna gain (dBi) 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	24.58	27.58	30	-2.42
				1	5	0	24.53	27.53	30	-2.47
				6	0	0	23.32	26.32	30	-3.68
	20175	1732.5	QPSK	1	0	0	24.27	27.27	30	-2.73
				1	5	0	24.20	27.20	30	-2.8
				6	0	0	23.12	26.12	30	-3.88
	20375	1752.5	QPSK	1	0	0	24.41	27.41	30	-2.59
				1	5	0	24.37	27.37	30	-2.63
				6	0	0	23.03	26.03	30	-3.97
	19975	1712.5	16QAM	1	0	11	23.57	26.57	30	-3.43
				1	5	11	23.59	26.59	30	-3.41
				6	0	11	21.82	24.82	30	-5.18
	20175	1732.5	16QAM	1	0	11	23.34	26.34	30	-3.66
				1	5	11	23.36	26.36	30	-3.64
				6	0	11	21.75	24.75	30	-5.25
	20375	1752.5	16QAM	1	0	11	23.34	26.34	30	-3.66
				1	5	11	24.25	27.25	30	-2.75
				6	0	11	21.57	24.57	30	-5.43

Antenna gain (dBi) 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	24.44	27.44	30	-2.56
				1	5	0	24.37	27.37	30	-2.63
				6	0	0	23.22	26.22	30	-3.78
	20175	1732.5	QPSK	1	0	0	24.28	27.28	30	-2.72
				1	5	0	24.23	27.23	30	-2.77
				6	0	0	23.12	26.12	30	-3.88
	20375	1750	QPSK	1	0	0	24.38	27.38	30	-2.62
				1	5	0	24.31	27.31	30	-2.69
				6	0	0	23.04	26.04	30	-3.96
	20000	1715	16QAM	1	0	11	23.44	26.44	30	-3.56
				1	5	11	23.46	26.46	30	-3.54
				6	0	11	21.80	24.80	30	-5.2
	20175	1732.5	16QAM	1	0	11	23.31	26.31	30	-3.69
				1	5	11	23.30	26.30	30	-3.7
				6	0	11	21.48	24.48	30	-5.52
	20375	1750	16QAM	1	0	11	23.34	26.34	30	-3.66
				1	5	11	23.31	26.31	30	-3.69
				6	0	11	21.47	24.47	30	-5.53

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Antenna gain (dBi) 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	24.43	27.43	30	-2.57
				1	5	0	24.36	27.36	30	-2.64
				6	0	0	24.14	27.14	30	-2.86
	20175	1732.5	QPSK	1	0	0	24.34	27.34	30	-2.66
				1	5	0	24.27	27.27	30	-2.73
				6	0	0	24.06	27.06	30	-2.94
	20325	1747.5	QPSK	1	0	0	24.36	27.36	30	-2.64
				1	5	0	24.27	27.27	30	-2.73
				6	0	0	24.08	27.08	30	-2.92
	20025	1717.5	16QAM	1	0	11	23.48	26.48	30	-3.52
				1	5	11	23.45	26.45	30	-3.55
				6	0	11	23.90	26.90	30	-3.1
	20175	1732.5	16QAM	1	0	11	23.44	26.44	30	-3.56
				1	5	11	23.38	26.38	30	-3.62
				6	0	11	23.80	26.80	30	-3.2
	20325	1747.5	16QAM	1	0	11	24.34	27.34	30	-2.66
				1	5	11	24.28	27.28	30	-2.72
				6	0	11	24.08	27.08	30	-2.92

Antenna gain (dBi) 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	24.51	27.51	30	-2.49
				1	5	0	24.46	27.46	30	-2.54
				6	0	0	24.25	27.25	30	-2.75
	20175	1732.5	QPSK	1	0	0	24.42	27.42	30	-2.58
				1	5	0	24.23	27.23	30	-2.77
				6	0	0	24.09	27.09	30	-2.91
	20300	1745	QPSK	1	0	0	24.43	27.43	30	-2.57
				1	5	0	24.37	27.37	30	-2.63
				6	0	0	24.10	27.10	30	-2.9
	20050	1720	16QAM	1	0	11	23.49	26.49	30	-3.51
				1	5	11	23.52	26.52	30	-3.48
				6	0	11	23.90	26.90	30	-3.1
	20175	1732.5	16QAM	1	0	11	23.40	26.40	30	-3.6
				1	5	11	23.41	26.41	30	-3.59
				6	0	11	23.78	26.78	30	-3.22
	20300	1745	16QAM	1	0	11	23.41	26.41	30	-3.59
				1	5	11	23.36	26.36	30	-3.64
				6	0	11	23.71	26.71	30	-3.29

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Antenna gain (dBi) 3

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	23.37	24.22	26.37	34.77	-8.4
				1	5	0	23.45	24.30	26.45	34.77	-8.32
				6	0	0	21.26	22.11	24.26	34.77	-10.51
	23095	707.5	QPSK	1	0	0	23.21	24.06	26.21	34.77	-8.56
				1	5	0	23.19	24.04	26.19	34.77	-8.58
				6	0	0	20.96	21.81	23.96	34.77	-10.81
	23173	715.5	QPSK	1	0	0	22.97	23.82	25.97	34.77	-8.8
				1	5	0	22.93	23.78	25.93	34.77	-8.84
				6	0	0	21.02	21.87	24.02	34.77	-10.75
	23017	699.7	16QAM	1	0	11	22.38	23.23	25.38	34.77	-9.39
				1	5	11	22.33	23.18	25.33	34.77	-9.44
				6	0	11	21.34	22.19	24.34	34.77	-10.43
	23095	707.5	16QAM	1	0	11	22.23	23.08	25.23	34.77	-9.54
				1	5	11	22.11	22.96	25.11	34.77	-9.66
				6	0	11	21.03	21.88	24.03	34.77	-10.74
	23173	715.5	16QAM	1	0	11	21.88	22.73	24.88	34.77	-9.89
				1	5	11	21.75	22.60	24.75	34.77	-10.02
				6	0	11	20.99	21.84	23.99	34.77	-10.78

Antenna gain (dBi) 3

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	23.44	24.29	26.44	34.77	-8.33
				1	5	0	23.48	24.33	26.48	34.77	-8.29
				6	0	0	21.44	22.29	24.44	34.77	-10.33
	23095	707.5	QPSK	1	0	0	23.06	23.91	26.06	34.77	-8.71
				1	5	0	23.02	23.87	26.02	34.77	-8.75
				6	0	0	21.51	22.36	24.51	34.77	-10.26
	23165	714.5	QPSK	1	0	0	22.87	23.72	25.87	34.77	-8.9
				1	5	0	22.84	23.69	25.84	34.77	-8.93
				6	0	0	21.57	22.42	24.57	34.77	-10.2
	23025	700.5	16QAM	1	0	11	22.38	23.23	25.38	34.77	-9.39
				1	5	11	22.38	23.23	25.38	34.77	-9.39
				6	0	11	21.46	22.31	24.46	34.77	-10.31
	23095	707.5	16QAM	1	0	11	22.33	23.18	25.33	34.77	-9.44
				1	5	11	22.11	22.96	25.11	34.77	-9.66
				6	0	11	21.64	22.49	24.64	34.77	-10.13
	23165	714.5	16QAM	1	0	11	22.13	22.98	25.13	34.77	-9.64
				1	5	11	22.14	22.99	25.14	34.77	-9.63
				6	0	11	21.23	22.08	24.23	34.77	-10.54

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Antenna gain (dBi) 3

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	23.47	24.32	26.47	34.77	-8.3
				1	5	0	23.49	24.34	26.49	34.77	-8.28
				6	0	0	22.62	23.47	25.62	34.77	-9.15
	23095	707.5	QPSK	1	0	0	23.22	24.07	26.22	34.77	-8.55
				1	5	0	23.15	24.00	26.15	34.77	-8.62
				6	0	0	22.76	23.61	25.76	34.77	-9.01
	23155	713.5	QPSK	1	0	0	22.86	23.71	25.86	34.77	-8.91
				1	5	0	22.80	23.65	25.80	34.77	-8.97
				6	0	0	22.32	23.17	25.32	34.77	-9.45
	23035	701.5	16QAM	1	0	11	23.92	24.77	26.92	34.77	-7.85
				1	5	11	23.94	24.79	26.94	34.77	-7.83
				6	0	11	21.17	22.02	24.17	34.77	-10.6
	23095	707.5	16QAM	1	0	11	23.65	24.50	26.65	34.77	-8.12
				1	5	11	23.66	24.51	26.66	34.77	-8.11
				6	0	11	21.46	22.31	24.46	34.77	-10.31
	23155	713.5	16QAM	1	0	11	23.22	24.07	26.22	34.77	-8.55
				1	5	11	23.35	24.20	26.35	34.77	-8.42
				6	0	11	21.20	22.05	24.20	34.77	-10.57

Antenna gain (dBi) 3

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	23.51	24.36	26.51	34.77	-8.26
				1	5	0	23.52	24.37	26.52	34.77	-8.25
				6	0	0	22.55	23.40	25.55	34.77	-9.22
	23095	707.5	QPSK	1	0	0	23.82	24.67	26.82	34.77	-7.95
				1	5	0	23.11	23.96	26.11	34.77	-8.66
				6	0	0	22.65	23.50	25.65	34.77	-9.12
	23130	711	QPSK	1	0	0	23.24	24.09	26.24	34.77	-8.53
				1	5	0	23.20	24.05	26.20	34.77	-8.57
				6	0	0	22.33	23.18	25.33	34.77	-9.44
	23060	704	16QAM	1	0	11	23.97	24.82	26.97	34.77	-7.8
				1	5	11	23.97	24.82	26.97	34.77	-7.8
				6	0	11	21.25	22.10	24.25	34.77	-10.52
	23095	707.5	16QAM	1	0	11	23.60	24.45	26.60	34.77	-8.17
				1	5	11	23.60	24.45	26.60	34.77	-8.17
				6	0	11	21.38	22.23	24.38	34.77	-10.39
	23130	711	16QAM	1	0	11	23.69	24.54	26.69	34.77	-8.08
				1	5	11	23.60	24.45	26.60	34.77	-8.17
				6	0	11	20.98	21.83	23.98	34.77	-10.79

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Antenna gain (dBi) 1.9

LTE 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)	ERP Limit (dBm)	Margin (dB)
1.4	26797	824.7	QPSK	1	0	0	23.74	23.49	25.64	38.45	-14.96
				1	5	0	23.66	23.41	25.56	38.45	-15.04
				6	0	0	21.18	20.93	23.08	38.45	-17.52
	26915	836.5	QPSK	1	0	0	23.63	23.38	25.53	38.45	-15.07
				1	5	0	23.65	23.40	25.55	38.45	-15.05
				6	0	0	21.23	20.98	23.13	38.45	-17.47
	27033	848.3	QPSK	1	0	0	23.94	23.69	25.84	38.45	-14.76
				1	5	0	23.95	23.70	25.85	38.45	-14.75
				6	0	0	21.19	20.94	23.09	38.45	-17.51
	26797	824.7	16QAM	1	0	11	22.18	21.93	24.08	38.45	-16.52
				1	5	11	22.05	21.80	23.95	38.45	-16.65
				6	0	11	21.17	20.92	23.07	38.45	-17.53
	26915	836.5	16QAM	1	0	11	22.24	21.99	24.14	38.45	-16.46
				1	5	11	22.10	21.85	24.00	38.45	-16.60
				6	0	11	21.34	21.09	23.24	38.45	-17.36
	27033	848.3	16QAM	1	0	11	22.28	22.03	24.18	38.45	-16.42
				1	5	11	22.23	21.98	24.13	38.45	-16.47
				6	0	11	21.17	20.92	23.07	38.45	-17.53

Antenna gain (dBi) 1.9

LTE 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)	ERP Limit (dBm)	Margin (dB)
3	26805	825.5	QPSK	1	0	0	23.46	23.21	25.36	38.45	-15.24
				1	5	0	23.41	23.16	25.31	38.45	-15.29
				6	0	0	21.25	21.00	23.15	38.45	-17.45
	26915	836.5	QPSK	1	0	0	23.50	23.25	25.40	38.45	-15.20
				1	5	0	23.48	23.23	25.38	38.45	-15.22
				6	0	0	21.27	21.02	23.17	38.45	-17.43
	27025	847.5	QPSK	1	0	0	23.53	23.28	25.43	38.45	-15.17
				1	5	0	23.53	23.28	25.43	38.45	-15.17
				6	0	0	21.57	21.32	23.47	38.45	-17.13
	26805	825.5	16QAM	1	0	11	22.19	21.94	24.09	38.45	-16.51
				1	5	11	22.07	21.82	23.97	38.45	-16.63
				6	0	11	21.28	21.03	23.18	38.45	-17.42
	26915	836.5	16QAM	1	0	11	22.18	21.93	24.08	38.45	-16.52
				1	5	11	22.10	21.85	24.00	38.45	-16.60
				6	0	11	21.36	21.11	23.26	38.45	-17.34
	27025	847.5	16QAM	1	0	11	22.27	22.02	24.17	38.45	-16.43
				1	5	11	22.24	21.99	24.14	38.45	-16.46
				6	0	11	21.53	21.28	23.43	38.45	-17.17

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Antenna gain (dBi) 1.9

LTE 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)	ERP Limit (dBm)	Margin (dB)
5	26815	826.5	QPSK	1	0	0	23.61	23.36	25.51	38.45	-15.09
				1	5	0	23.60	23.35	25.50	38.45	-15.10
				6	0	0	22.30	22.05	24.20	38.45	-16.40
	26915	836.5	QPSK	1	0	0	23.55	23.30	25.45	38.45	-15.15
				1	5	0	23.56	23.31	25.46	38.45	-15.14
				6	0	0	22.48	22.23	24.38	38.45	-16.22
	27015	846.5	QPSK	1	0	0	23.49	23.24	25.39	38.45	-15.21
				1	5	0	23.50	23.25	25.40	38.45	-15.20
				6	0	0	22.41	22.16	24.31	38.45	-16.29
	26815	826.5	16QAM	1	0	11	23.74	23.49	25.64	38.45	-14.96
				1	5	11	23.71	23.46	25.61	38.45	-14.99
				6	0	11	21.27	21.02	23.17	38.45	-17.43
	26915	836.5	16QAM	1	0	11	23.73	23.48	25.63	38.45	-14.97
				1	5	11	23.70	23.45	25.60	38.45	-15.00
				6	0	11	21.18	20.93	23.08	38.45	-17.52
	27015	846.5	16QAM	1	0	11	23.76	23.51	25.66	38.45	-14.94
				1	5	11	23.73	23.48	25.63	38.45	-14.97
				6	0	11	21.22	20.97	23.12	38.45	-17.48

Antenna gain (dBi) 1.9

LTE 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)	ERP Limit (dBm)	Margin (dB)
10	26840	829	QPSK	1	0	0	23.60	23.35	25.50	38.45	-15.10
				1	5	0	23.58	23.33	25.48	38.45	-15.12
				6	0	0	22.36	22.11	24.26	38.45	-16.34
	26915	836.5	QPSK	1	0	0	23.96	23.71	25.86	38.45	-14.74
				1	5	0	23.94	23.69	25.84	38.45	-14.76
				6	0	0	22.39	22.14	24.29	38.45	-16.31
	26990	844	QPSK	1	0	0	23.95	23.70	25.85	38.45	-14.75
				1	5	0	23.95	23.70	25.85	38.45	-14.75
				6	0	0	22.39	22.14	24.29	38.45	-16.31
	26840	829	16QAM	1	0	11	23.80	23.55	25.70	38.45	-14.90
				1	5	11	23.76	23.51	25.66	38.45	-14.94
				6	0	11	21.11	20.86	23.01	38.45	-17.59
	26915	836.5	16QAM	1	0	11	23.66	23.41	25.56	38.45	-15.04
				1	5	11	23.67	23.42	25.57	38.45	-15.03
				6	0	11	21.11	20.86	23.01	38.45	-17.59
	26990	844	16QAM	1	0	11	23.57	23.32	25.47	38.45	-15.13
				1	5	11	23.74	23.49	25.64	38.45	-14.96
				6	0	11	21.33	21.08	23.23	38.45	-17.37

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Antenna gain (dBi) 1.9

LTE 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)	ERP Limit (dBm)	Margin (dB)
15	26865	831.5	QPSK	1	0	0	23.61	23.36	25.51	38.45	-15.09
				1	5	0	23.59	23.34	25.49	38.45	-15.11
				6	0	0	23.30	23.05	25.20	38.45	-15.40
	26915	836.5	QPSK	1	0	0	23.49	23.24	25.39	38.45	-15.21
				1	5	0	23.48	23.23	25.38	38.45	-15.22
				6	0	0	23.23	22.98	25.13	38.45	-15.47
	26965	841.5	QPSK	1	0	0	23.54	23.29	25.44	38.45	-15.16
				1	5	0	23.54	23.29	25.44	38.45	-15.16
				6	0	0	23.38	23.13	25.28	38.45	-15.32
	26865	831.5	16QAM	1	0	11	23.76	23.51	25.66	38.45	-14.94
				1	5	11	23.52	23.27	25.42	38.45	-15.18
				6	0	11	23.30	23.05	25.20	38.45	-15.40
	26915	836.5	16QAM	1	0	11	23.71	23.46	25.61	38.45	-14.99
				1	5	11	23.66	23.41	25.56	38.45	-15.04
				6	0	11	21.15	20.90	23.05	38.45	-17.55
	26965	841.5	16QAM	1	0	11	23.69	23.44	25.59	38.45	-15.01
				1	5	11	23.64	23.39	25.54	38.45	-15.06
				6	0	11	23.20	22.95	25.10	38.45	-15.50

Antenna gain (dBi) 1.83

Part 90S_LTE 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)	ERP Limit (dBm)	Margin (dB)
1.4	26697	814.7	QPSK	1	0	0	23.83	23.51	25.66	50	-26.49
				1	5	0	23.46	23.14	25.29	50	-26.86
				6	0	0	21.24	20.92	23.07	50	-29.08
	26740	819	QPSK	1	0	0	23.47	23.15	25.30	50	-26.85
				1	5	0	23.43	23.11	25.26	50	-26.89
				6	0	0	21.06	20.74	22.89	50	-29.26
	26783	823.3	QPSK	1	0	0	23.50	23.18	25.33	50	-26.82
				1	5	0	23.45	23.13	25.28	50	-26.87
				6	0	0	21.20	20.88	23.03	50	-29.12
	26697	814.7	16QAM	1	0	11	22.03	21.71	23.86	50	-28.29
				1	5	11	21.88	21.56	23.71	50	-28.44
				6	0	11	20.96	20.64	22.79	50	-29.36
	26740	819	16QAM	1	0	11	22.06	21.74	23.89	50	-28.26
				1	5	11	21.94	21.62	23.77	50	-28.38
				6	0	11	21.06	20.74	22.89	50	-29.26
	26783	823.3	16QAM	1	0	11	22.05	21.73	23.88	50	-28.27
				1	5	11	21.96	21.64	23.79	50	-28.36
				6	0	11	21.04	20.72	22.87	50	-29.28

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Antenna gain (dBi) 1.83

Part 90S_LTE 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)	ERP Limit (dBm)	Margin (dB)
3	26705	815.5	QPSK	1	0	0	23.32	23.00	25.15	50	-27.00
				1	5	0	23.28	22.96	25.11	50	-27.04
				6	0	0	21.20	20.88	23.03	50	-29.12
	26740	819	QPSK	1	0	0	23.43	23.11	25.26	50	-26.89
				1	5	0	23.38	23.06	25.21	50	-26.94
				6	0	0	21.21	20.89	23.04	50	-29.11
	26775	822.5	QPSK	1	0	0	23.55	23.23	25.38	50	-26.77
				1	5	0	23.47	23.15	25.30	50	-26.85
				6	0	0	21.29	20.97	23.12	50	-29.03
	26705	815.5	16QAM	1	0	11	22.07	21.75	23.90	50	-28.25
				1	5	11	21.95	21.63	23.78	50	-28.37
				6	0	11	21.17	20.85	23.00	50	-29.15
	26740	819	16QAM	1	0	11	22.16	21.84	23.99	50	-28.16
				1	5	11	22.03	21.71	23.86	50	-28.29
				6	0	11	21.18	20.86	23.01	50	-29.14
	26775	822.5	16QAM	1	0	11	22.01	21.69	23.84	50	-28.31
				1	5	11	21.93	21.61	23.76	50	-28.39
				6	0	11	21.20	20.88	23.03	50	-29.12

Antenna gain (dBi) 1.83

Part 90S_LTE 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)	ERP Limit (dBm)	Margin (dB)
5	26715	816.5	QPSK	1	0	0	23.79	23.47	25.62	50	-26.53
				1	5	0	23.74	23.42	25.57	50	-26.58
				6	0	0	22.27	21.95	24.10	50	-28.05
	26740	819	QPSK	1	0	0	23.55	23.23	25.38	50	-26.77
				1	5	0	23.52	23.20	25.35	50	-26.80
				6	0	0	22.27	21.95	24.10	50	-28.05
	26765	821.5	QPSK	1	0	0	23.53	23.21	25.36	50	-26.79
				1	5	0	23.53	23.21	25.36	50	-26.79
				6	0	0	22.30	21.98	24.13	50	-28.02
	26715	816.5	16QAM	1	0	11	23.59	23.27	25.42	50	-26.73
				1	5	11	22.55	22.23	24.38	50	-27.77
				6	0	11	21.18	20.86	23.01	50	-29.14
	26740	819	16QAM	1	0	11	23.67	23.35	25.50	50	-26.65
				1	5	11	23.63	23.31	25.46	50	-26.69
				6	0	11	21.34	21.02	23.17	50	-28.98
	26765	821.5	16QAM	1	0	11	23.71	23.39	25.54	50	-26.61
				1	5	11	23.61	23.29	25.44	50	-26.71
				6	0	11	21.06	20.74	22.89	50	-29.26

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Antenna gain (dBi) 1.83

Part 90S_LTE 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)	ERP Limit (dBm)	Margin (dB)
10	26740	819	QPSK	1	0	0	23.63	23.31	25.46	50	-26.69
				1	5	0	23.59	23.27	25.42	50	-26.73
				6	0	0	23.38	23.06	25.21	50	-26.94
	26740	819	16QAM	1	0	11	23.74	23.42	25.57	50	-26.58
				1	5	11	23.67	23.35	25.50	50	-26.65
				6	0	11	21.03	20.71	22.86	50	-29.29

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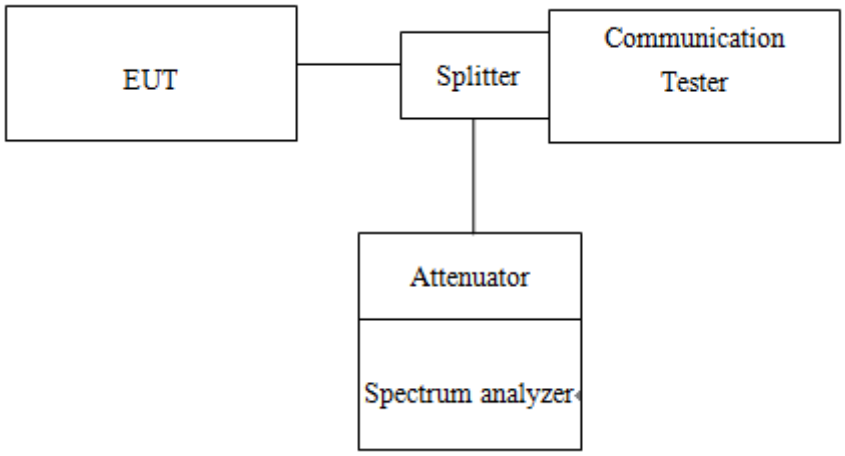
7 OCCUPIED BANDWIDTH MEASUREMENT

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.
DC Power Supply	Agilent	E3640A	MY40000811	12/23/2019	12/22/2020
Radio Communication Analyer	Anritsu	MT8821C	6261786084	01/18/2020	01/17/2021
Temperature Chamber	TERCHY	MHG-120LF	911009	05/20/2020	05/19/2021
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY57120290	02/20/2020	02/19/2021
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2020	01/01/2021

7.5 Measurement Result

7.5.1 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	1.1011	1.1051	1.288	1.323
1880.0	18900	1.0904	1.0937	1.308	1.314
1909.3	19193	1.0957	1.1040	1.296	1.308

M1 BAND 2 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1851.5	18615	1.1461	1.1598	1.370	1.405
1880.0	18900	1.1498	1.1519	1.374	1.398
1908.5	19185	1.1512	1.1620	1.363	1.379

M1 BAND 2 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1852.5	18625	1.2260	1.2303	1.603	1.472
1880.0	18900	1.2345	1.2223	1.526	1.461
1907.5	19175	1.2325	1.2235	1.470	1.443

M1 BAND 2 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1855.0	18650	1.3672	1.3539	2.215	2.063
1880.0	18900	1.3594	1.3476	1.976	2.115
1905.0	19150	1.3891	1.3554	2.156	2.290

M1 BAND 2 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1857.5	18675	1.614	1.686	2.855	2.945
1880.0	18900	1.597	1.637	2.680	3.020
1902.5	19125	1.565	1.613	2.561	3.044

M1 BAND 2 Channel bandwidth: 20MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1860.0	18700	1.803	1.948	2.919	3.081
1880.0	18900	1.775	1.738	2.853	2.875
1900.0	19100	1.813	1.812	2.886	2.928

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M1 BAND 4 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1710.7	19957	1.1015	1.1038	1.314	1.328
1732.5	20175	1.1018	1.1045	1.295	1.348
1754.3	20393	1.1009	1.0979	1.317	1.332

M1 BAND 4 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1711.5	19965	1.1503	1.1524	1.364	1.435
1732.5	20175	1.1553	1.1512	1.371	1.396
1753.5	20385	1.1378	1.1613	1.369	1.387

M1 BAND 4 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1712.5	19975	1.2301	1.2269	1.560	1.427
1732.5	20175	1.2250	1.2195	1.545	1.438
1752.5	20375	1.2298	1.2302	1.613	1.439

M1 BAND 4 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1715.0	20000	1.3551	1.3434	1.908	1.692
1732.5	20175	1.3398	1.3537	2.057	1.701
1750.0	20350	1.3972	1.3653	1.994	1.706

M1 BAND 4 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1717.5	20025	1.580	1.545	2.426	2.444
1732.5	20175	1.574	1.526	2.460	2.255
1747.5	20325	1.565	1.611	2.586	2.687

M1 BAND 4 Channel bandwidth: 20MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1720.0	20050	1.762	1.729	2.729	2.623
1732.5	20175	1.740	1.764	2.586	2.814
1745.0	20300	1.744	1.745	2.632	2.775

M1 BAND 12 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
699.7	23017	1.1006	1.1102	1.297	1.323
707.5	23095	1.1002	1.1017	1.303	1.319
715.3	23173	1.0991	1.1020	1.303	1.325

M1 BAND 12 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
700.5	23025	1.1506	1.1434	1.367	1.371
707.5	23095	1.1499	1.1463	1.375	1.364
714.5	23165	1.1448	1.1424	1.366	1.362

M1 BAND 12 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
701.5	23035	1.2062	1.1998	1.497	1.503
707.5	23095	1.2062	1.2164	1.497	1.480
713.5	23155	1.2187	1.2066	1.552	1.416

M1 BAND 12 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
704.0	23060	1.3325	1.3626	1.668	1.644
707.5	23095	1.3408	1.3568	1.715	1.722
711.0	23130	1.3709	1.3412	1.857	1.634

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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	1.1077	1.1048	1.279	1.319
836.5	26915	1.1029	1.1068	1.316	1.314
848.3	27033	1.0937	1.1005	1.304	1.323

M1 BAND 26 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
825.5	26805	1.1449	1.1578	1.371	1.391
836.5	26915	1.1494	1.1471	1.363	1.374
847.5	27025	1.1436	1.1590	1.366	1.383

M1 BAND 26 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
826.5	26815	1.2081	1.2281	1.522	1.434
836.5	26915	1.2315	1.2292	1.544	1.436
846.5	27015	1.2189	1.2105	1.676	1.450

M1 BAND 26 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
829.0	26840	1.3460	1.3731	1.896	1.863
836.5	26915	1.3527	1.3394	1.941	1.761
844.0	26990	1.3822	1.3231	1.897	1.774

M1 BAND 26 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
831.5	26865	1.578	1.569	2.702	2.570
836.5	26915	2.088	1.553	3.298	2.661
841.5	26965	1.553	1.579	2.459	2.667

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	1.0971	1.1088	1.310	1.322
819.0	26740	1.0992	1.1032	1.311	1.318
823.3	26783	1.1008	1.0999	1.310	1.312

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	1.1457	1.1439	1.369	1.396
819.0	26740	1.1466	1.1543	1.363	1.438
822.5	26775	1.1517	1.1663	1.365	1.427

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	1.2320	1.2311	1.559	1.451
819.0	26740	1.2170	1.2237	1.514	1.595
821.5	26765	1.2323	1.1850	1.575	1.327

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	1.3561	1.3616	1.760	1.934

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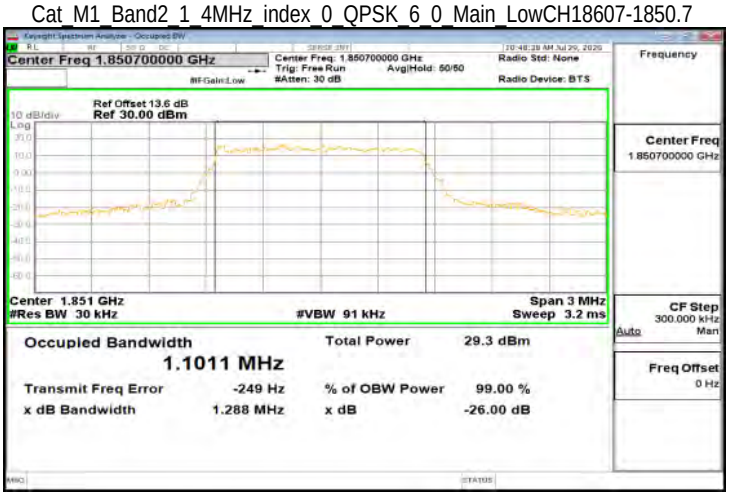
Cat_M1_Band2_1_4MHz_index_0_QPSK_6_0_Main_LowCH18607-1850.7



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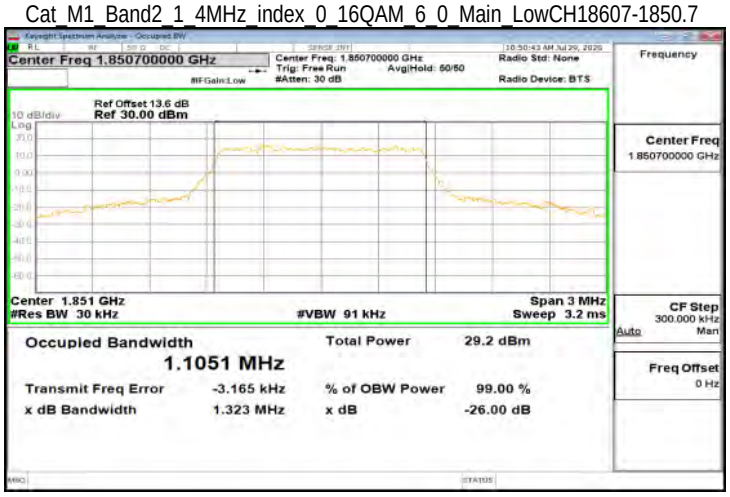

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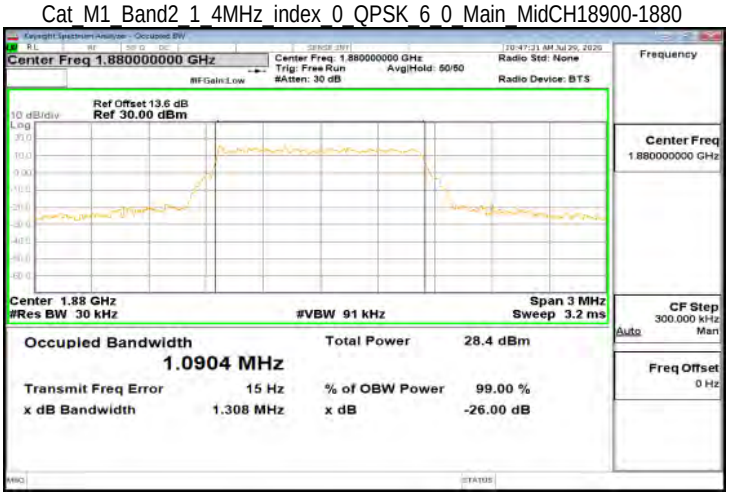

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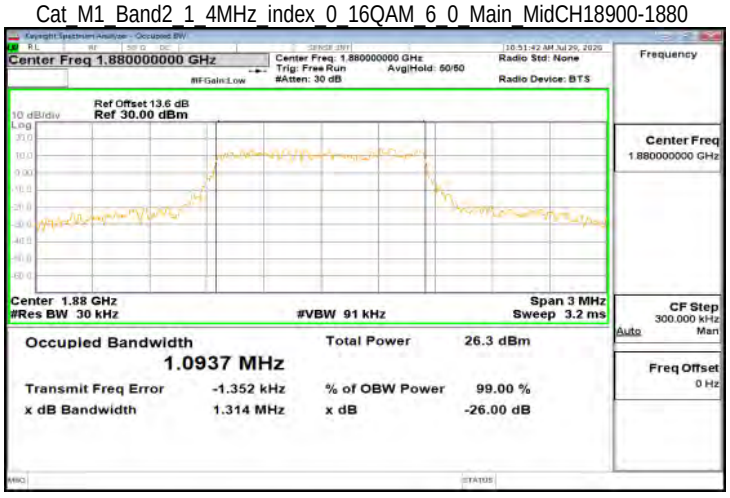

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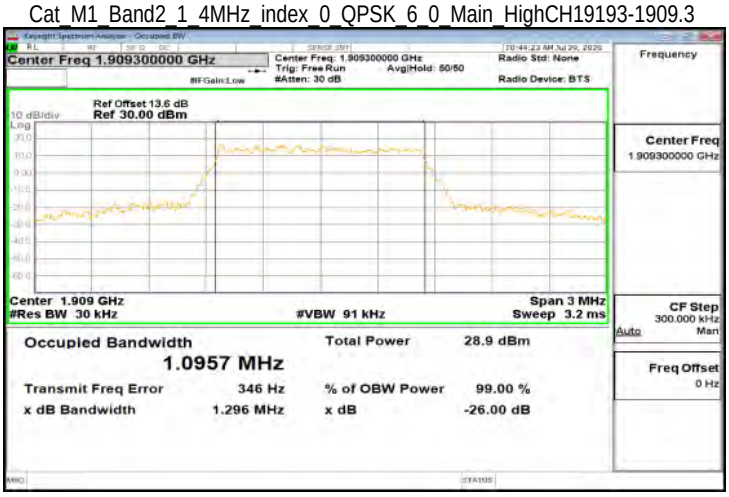

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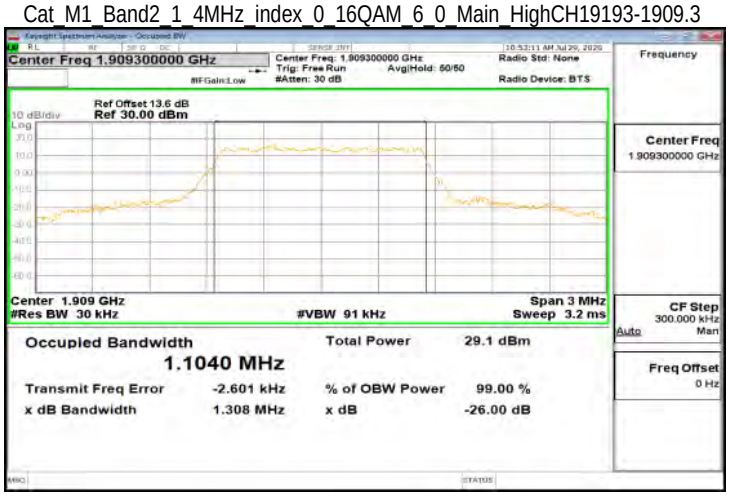

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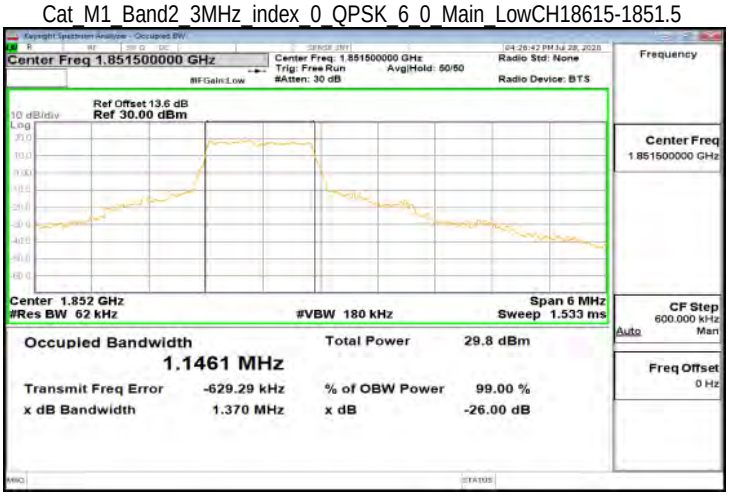
Cat_M1_Band2_3MHz_index_0_QPSK_6_0_Main_LowCH18615-1851.5



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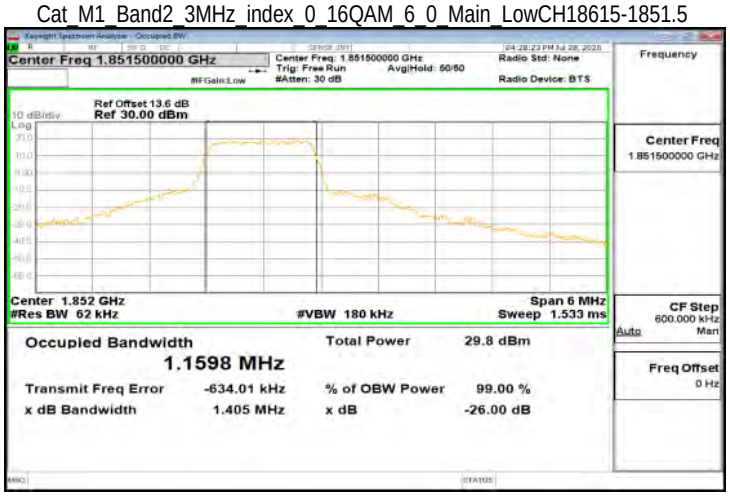

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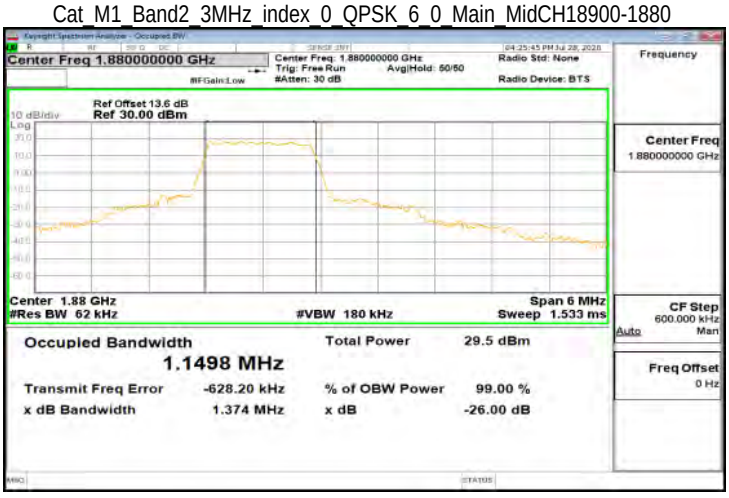
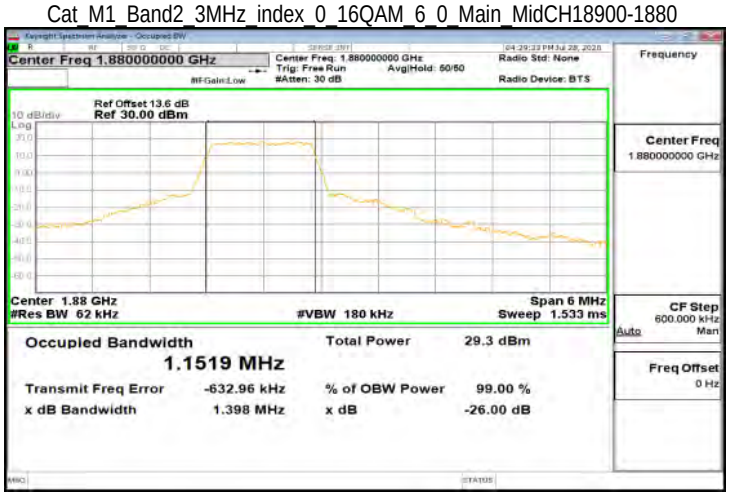
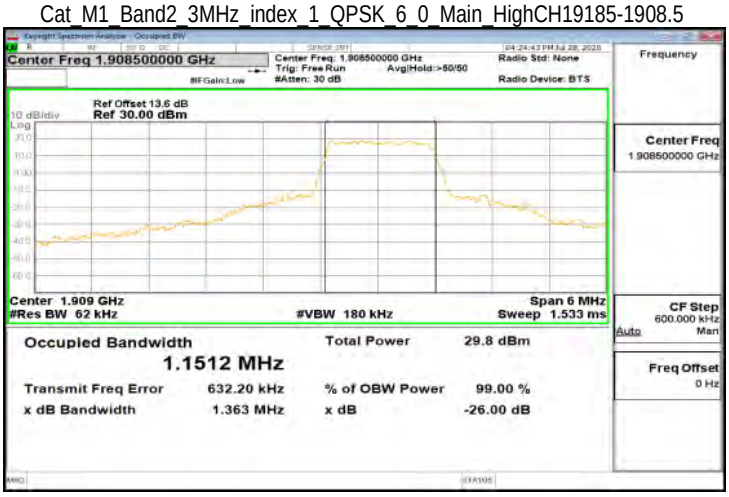


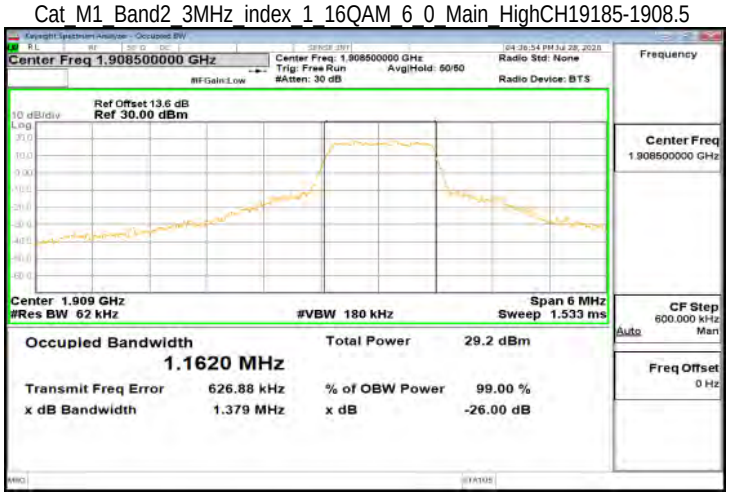
Cat_M1_Band2_3MHz_index_0_16QAM_6_0_Main_MidCH18900-1880



Cat_M1_Band2_3MHz_index_1_QPSK_6_0_Main_HighCH19185-1908.5



Cat_M1_Band2_3MHz_index_1_16QAM_6_0_Main_HighCH19185-1908.5



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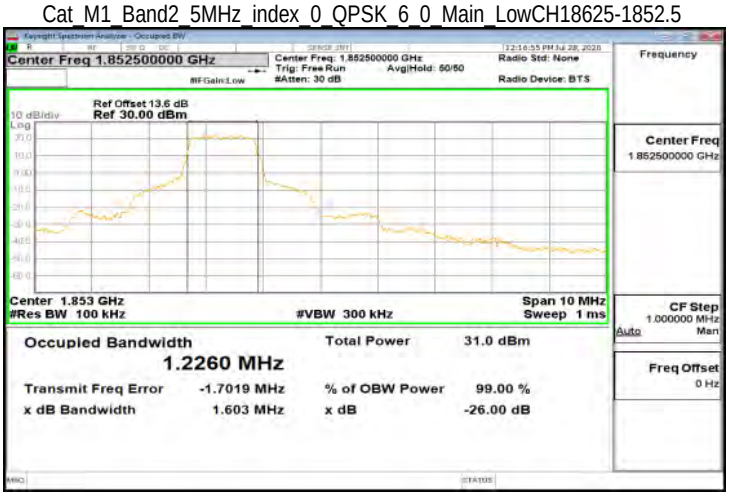
Cat_M1_Band2_5MHz_index_0_QPSK_6_0_Main_LowCH18625-1852.5



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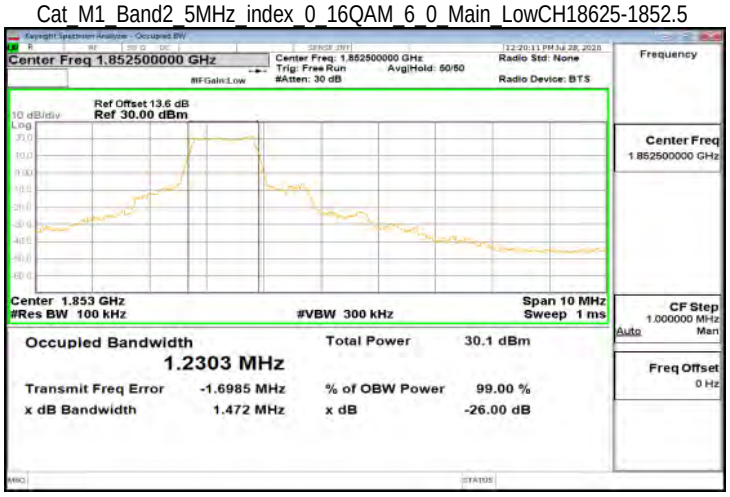
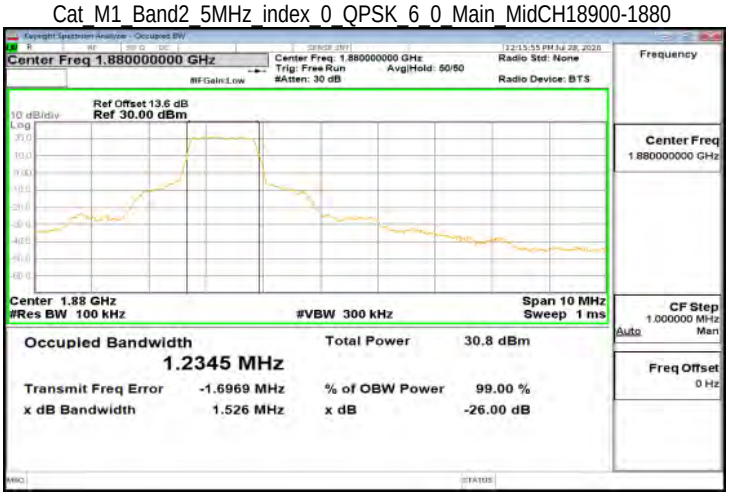
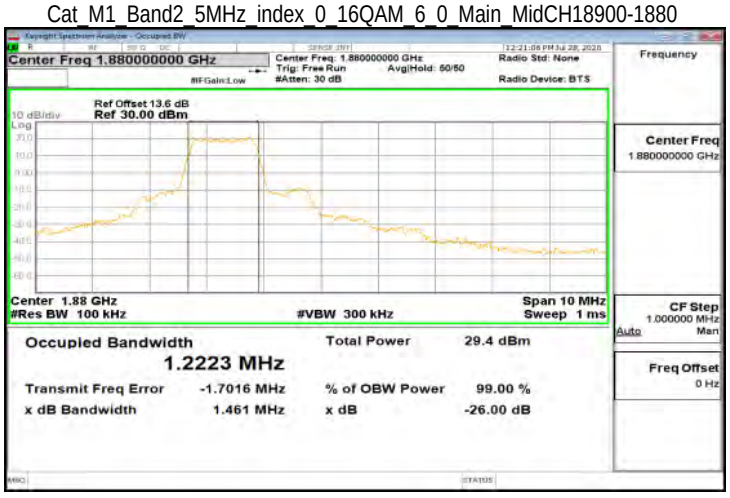


Cat_M1_Band2_5MHz_index_0_QPSK_6_0_Main_MidCH18900-1880



Cat_M1_Band2_5MHz_index_0_16QAM_6_0_Main_MidCH18900-1880



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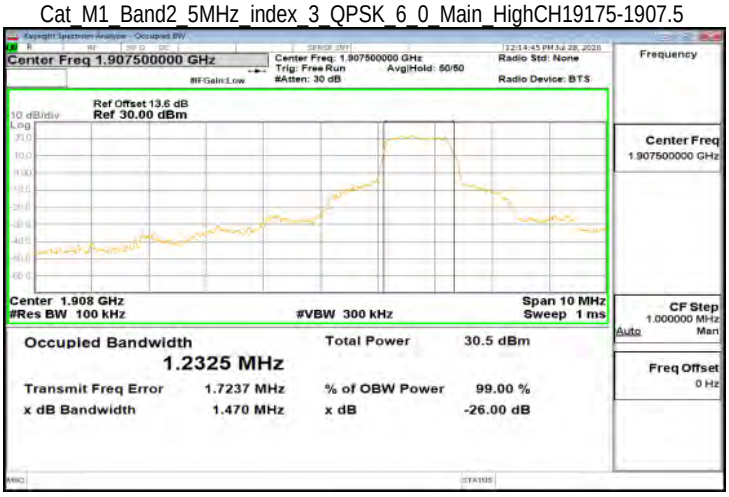

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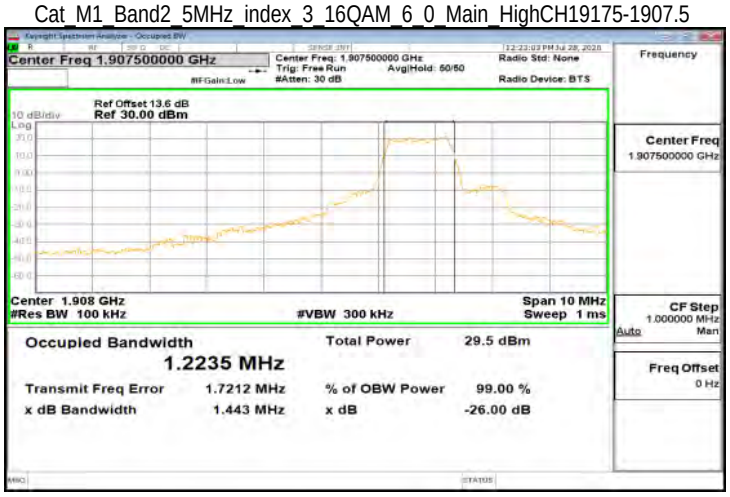

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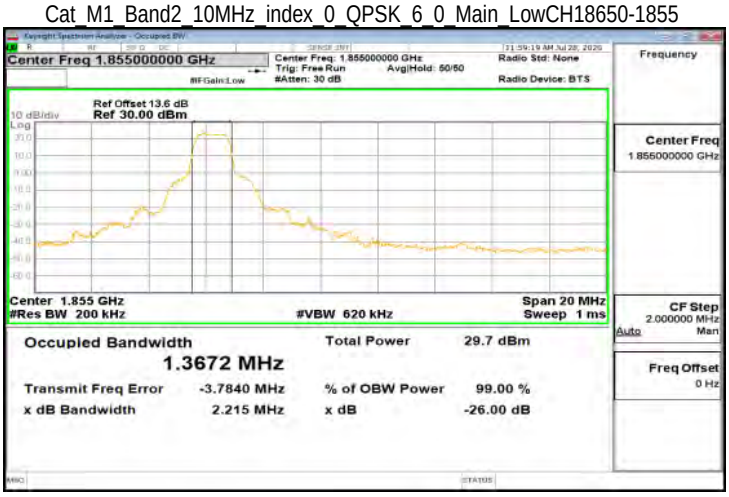
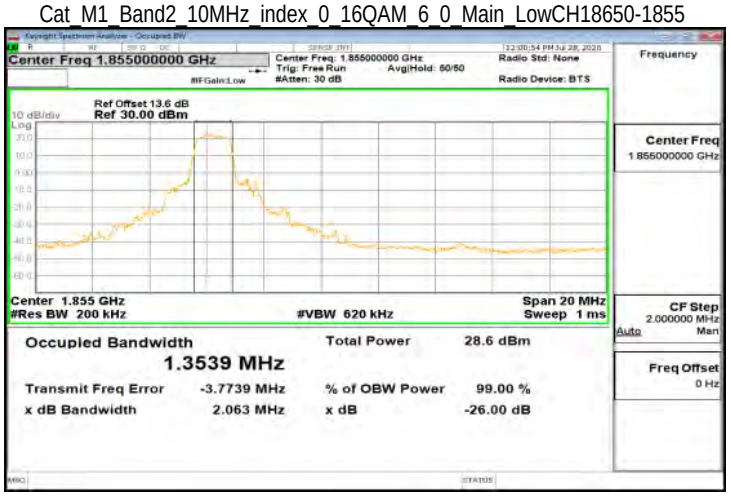
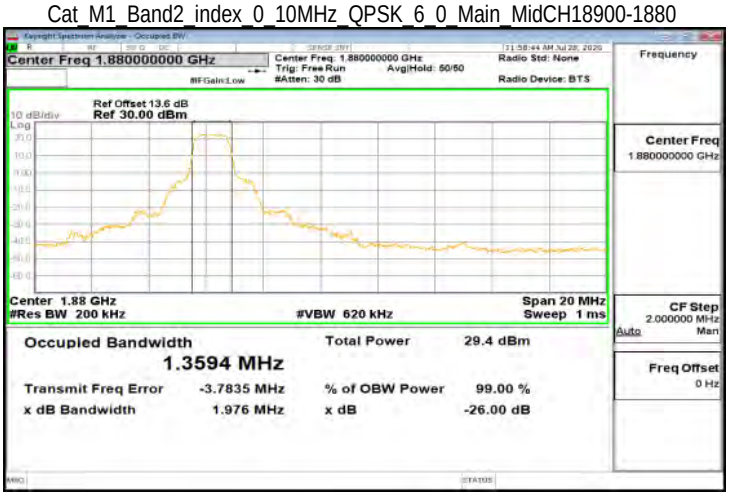
Cat_M1_Band2_10MHz_index_0_QPSK_6_0_Main_LowCH18650-1855



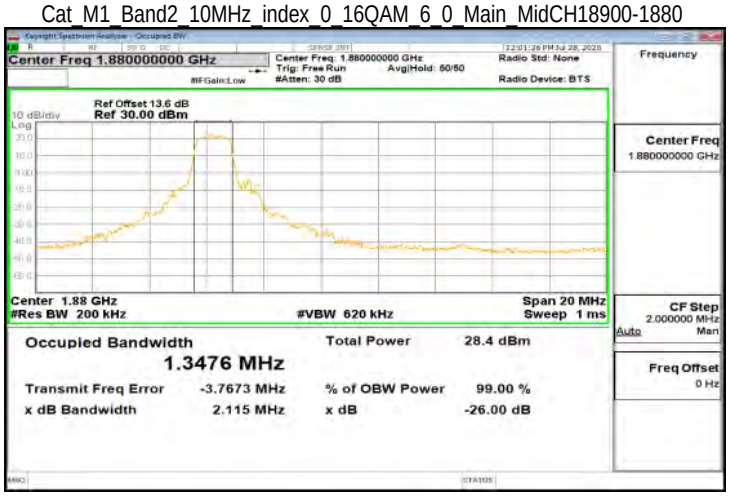
Cat_M1_Band2_10MHz_index_0_16QAM_6_0_Main_LowCH18650-1855



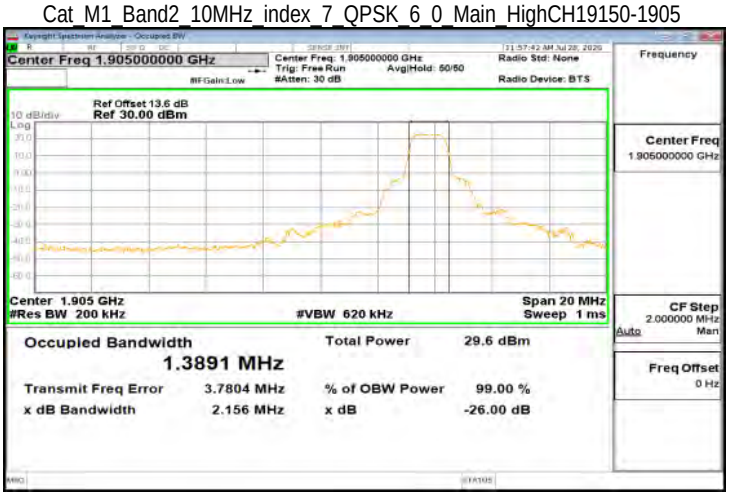
Cat_M1_Band2_index_0_10MHz_QPSK_6_0_Main_MidCH18900-1880



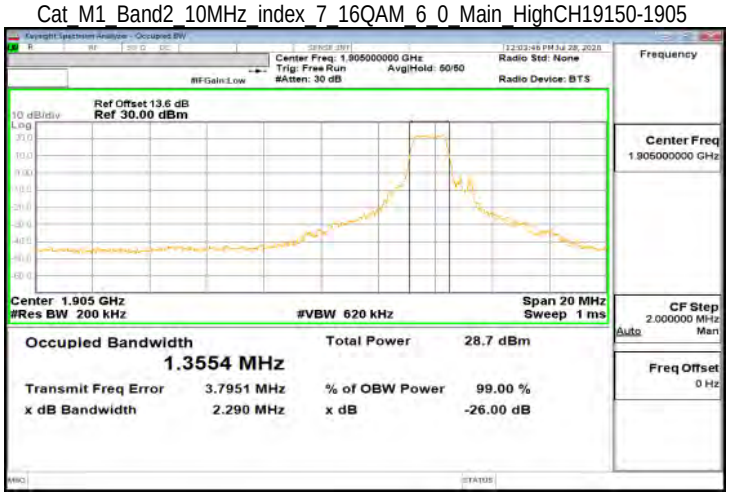
Cat_M1_Band2_10MHz_index_0_16QAM_6_0_Main_MidCH18900-1880



Cat_M1_Band2_10MHz_index_7_QPSK_6_0_Main_HighCH19150-1905



Cat_M1_Band2_10MHz_index_7_16QAM_6_0_Main_HighCH19150-1905



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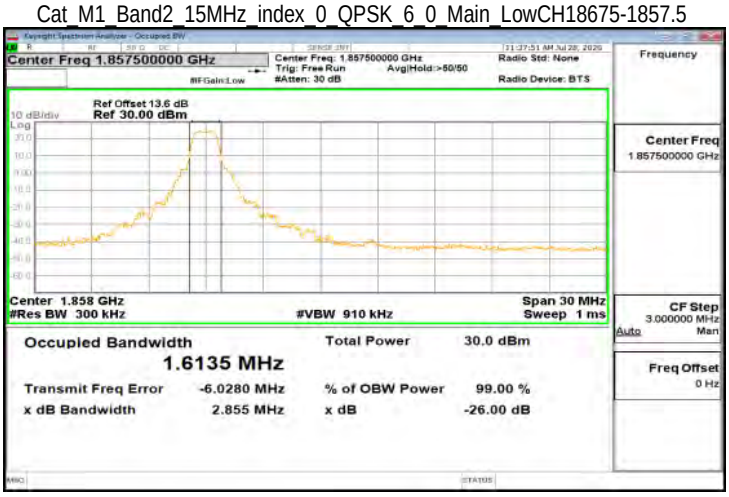
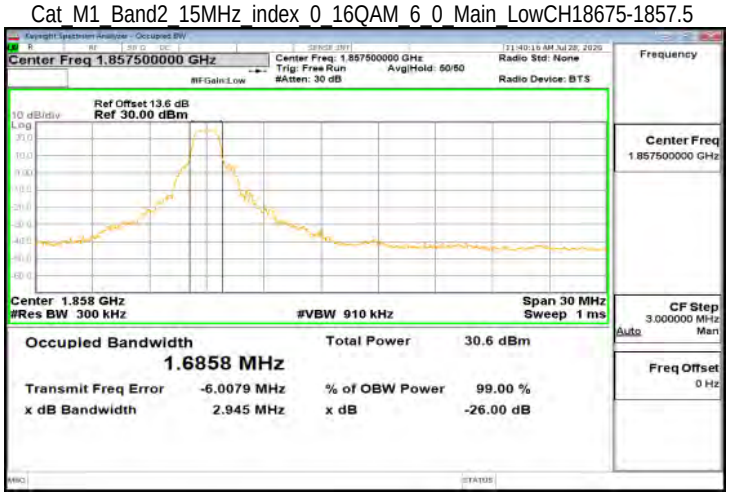
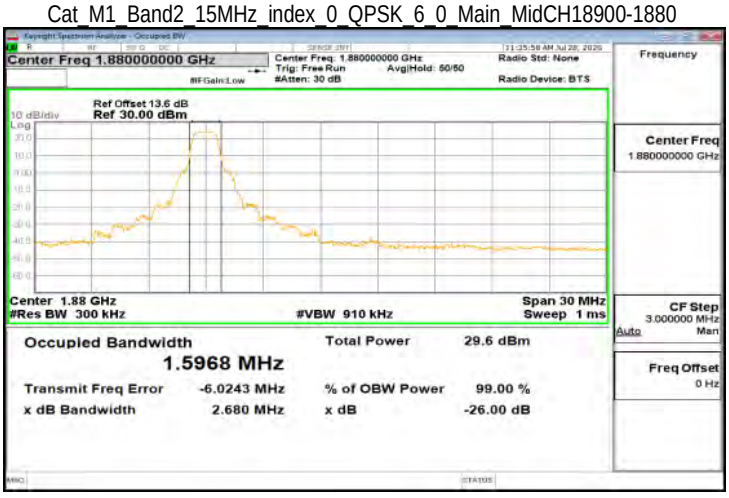
Cat_M1_Band2_15MHz_index_0_QPSK_6_0_Main_LowCH18675-1857.5



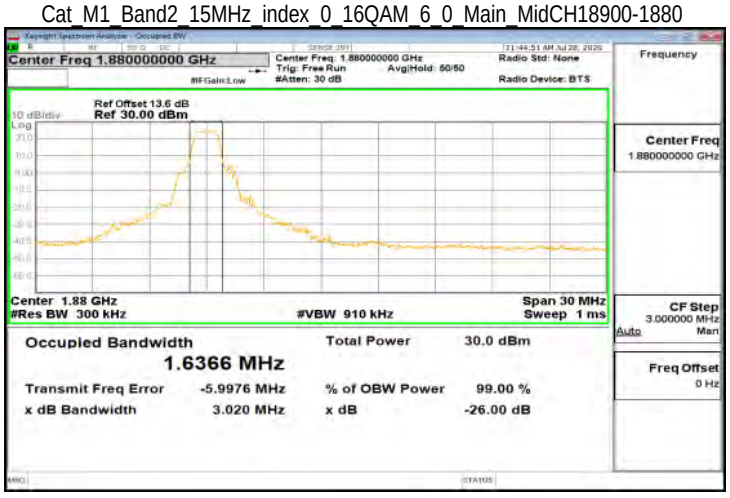
Cat_M1_Band2_15MHz_index_0_16QAM_6_0_Main_LowCH18675-1857.5



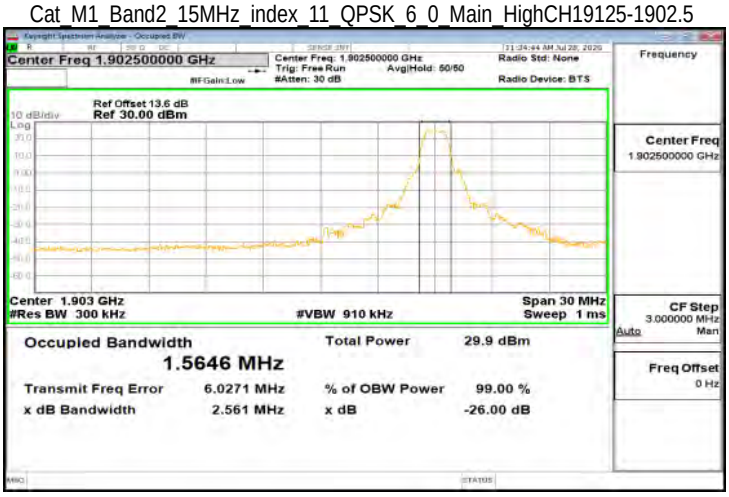
Cat_M1_Band2_15MHz_index_0_QPSK_6_0_Main_MidCH18900-1880



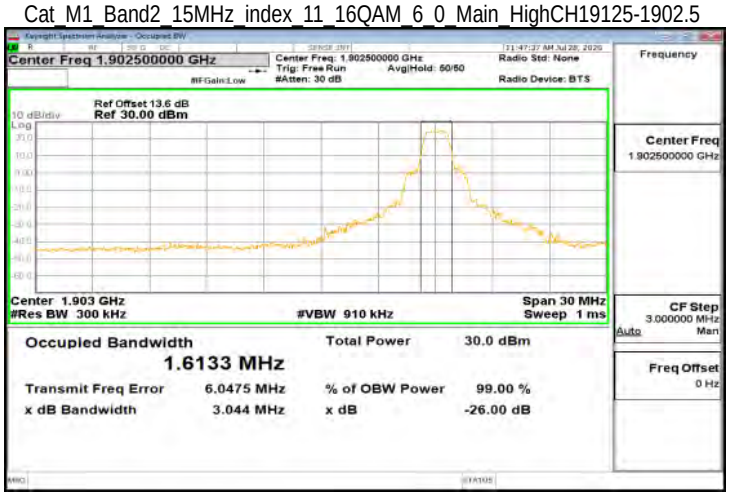
Cat_M1_Band2_15MHz_index_0_16QAM_6_0_Main_MidCH18900-1880



Cat_M1_Band2_15MHz_index_11_QPSK_6_0_Main_HighCH19125-1902.5



Cat_M1_Band2_15MHz_index_11_16QAM_6_0_Main_HighCH19125-1902.5



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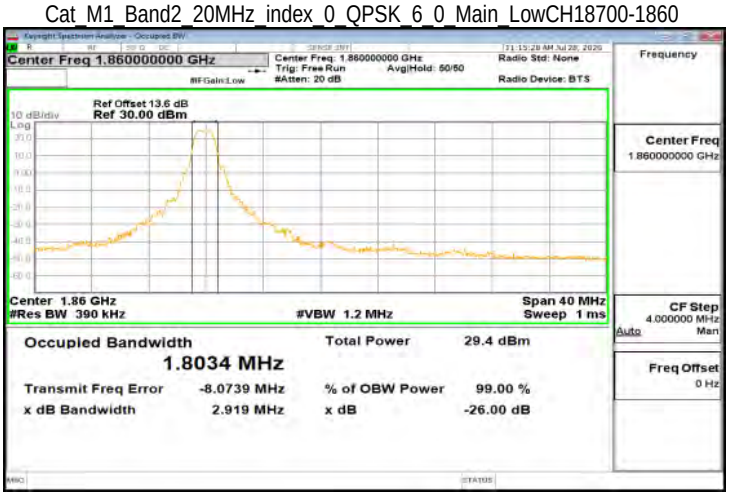
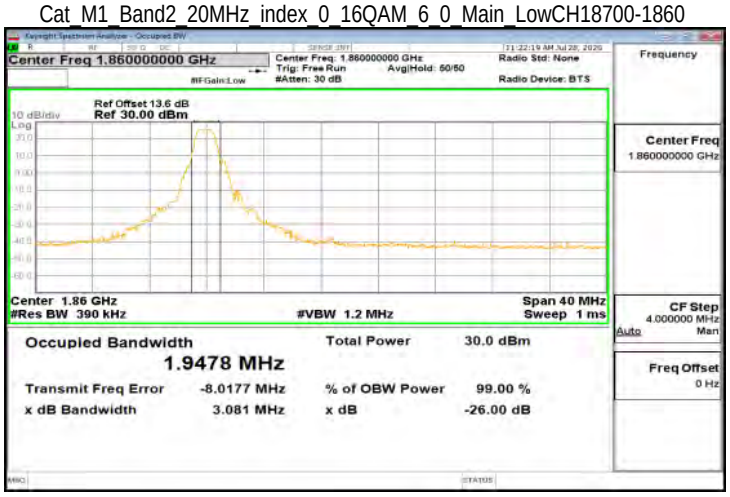
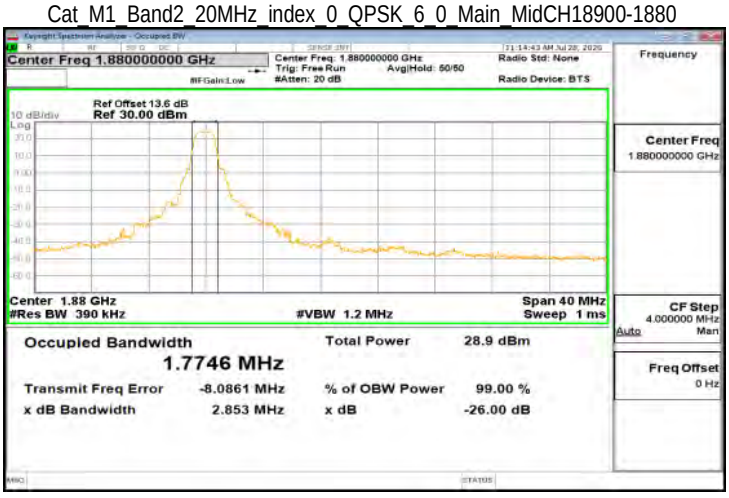
Cat_M1_Band2_20MHz_index_0_QPSK_6_0_Main_LowCH18700-1860



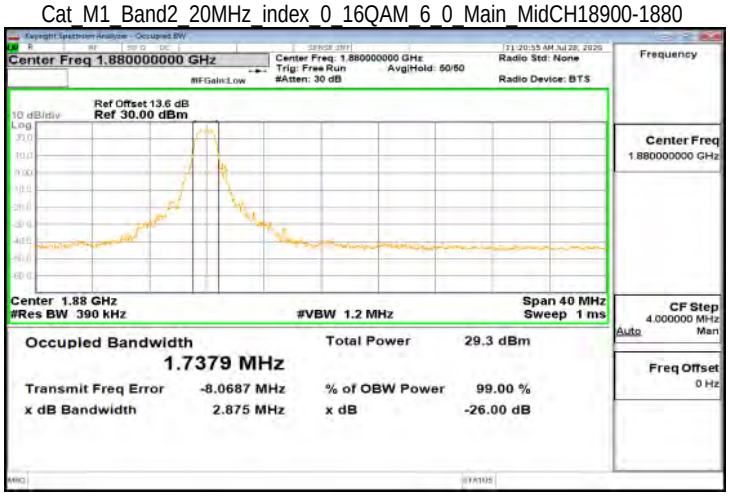
Cat_M1_Band2_20MHz_index_0_16QAM_6_0_Main_LowCH18700-1860



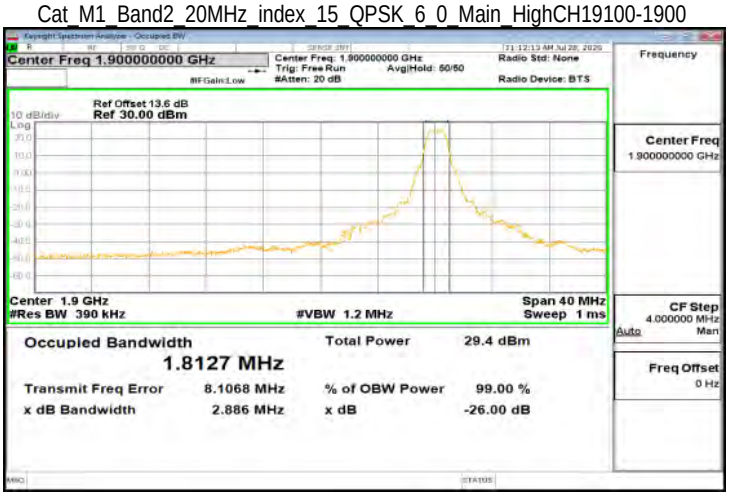
Cat_M1_Band2_20MHz_index_0_QPSK_6_0_Main_MidCH18900-1880



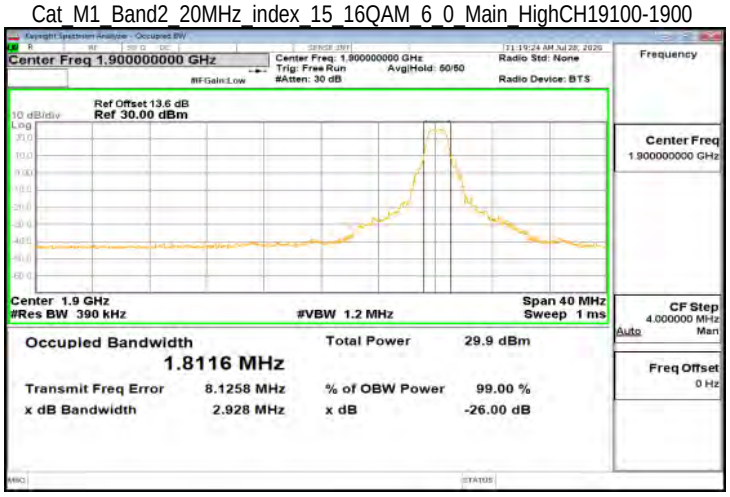
Cat_M1_Band2_20MHz_index_0_16QAM_6_0_Main_MidCH18900-1880



Cat_M1_Band2_20MHz_index_15_QPSK_6_0_Main_HighCH19100-1900



Cat_M1_Band2_20MHz_index_15_16QAM_6_0_Main_HighCH19100-1900



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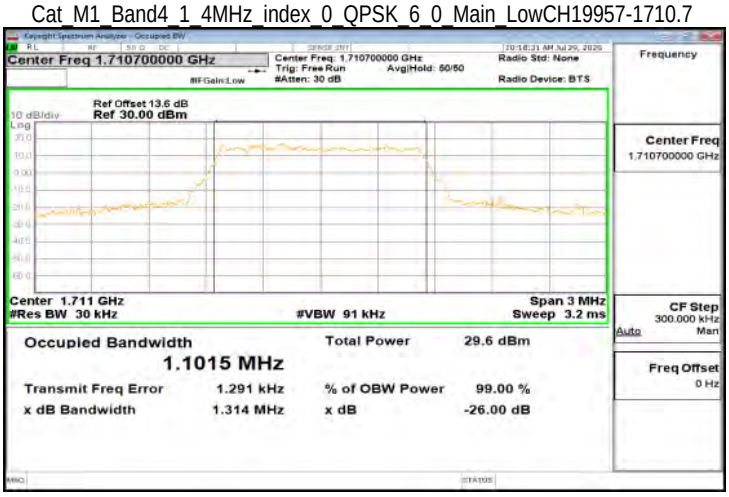
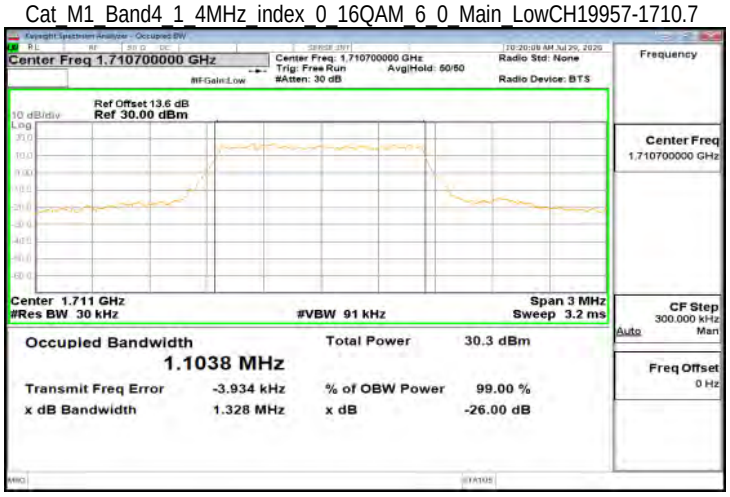
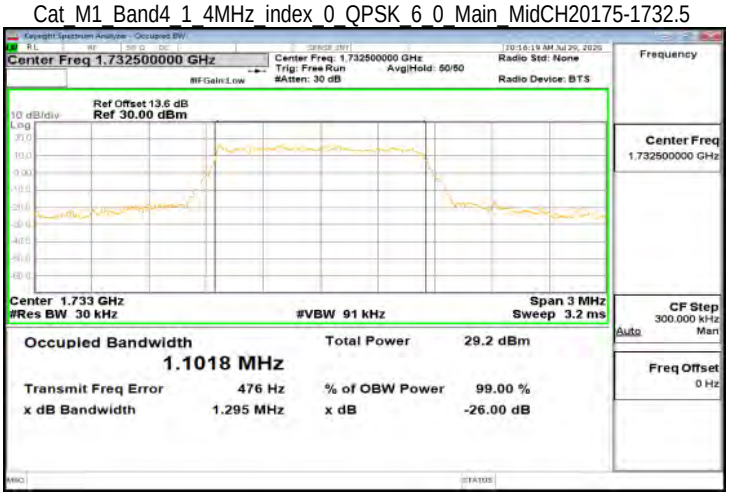
Cat_M1_Band4_1_4MHz_index_0_QPSK_6_0_Main_LowCH19957-1710.7



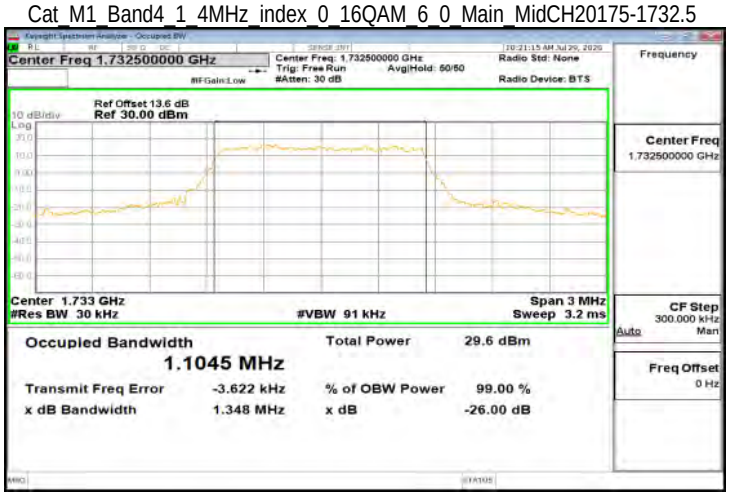
Cat_M1_Band4_1_4MHz_index_0_16QAM_6_0_Main_LowCH19957-1710.7



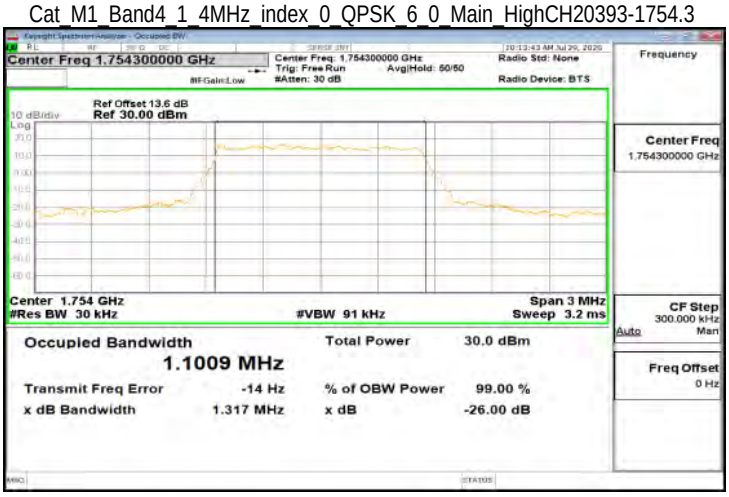
Cat_M1_Band4_1_4MHz_index_0_QPSK_6_0_Main_MidCH20175-1732.5



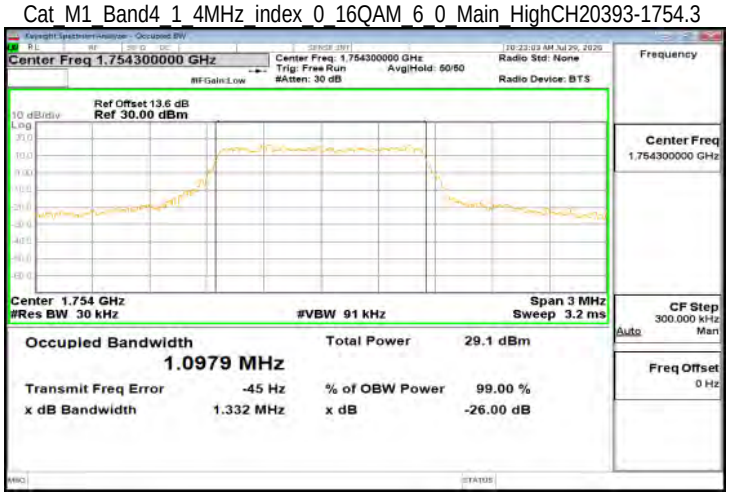
Cat_M1_Band4_1_4MHz_index_0_16QAM_6_0_Main_MidCH20175-1732.5



Cat_M1_Band4_1_4MHz_index_0_QPSK_6_0_Main_HighCH20393-1754.3



Cat_M1_Band4_1_4MHz_index_0_16QAM_6_0_Main_HighCH20393-1754.3



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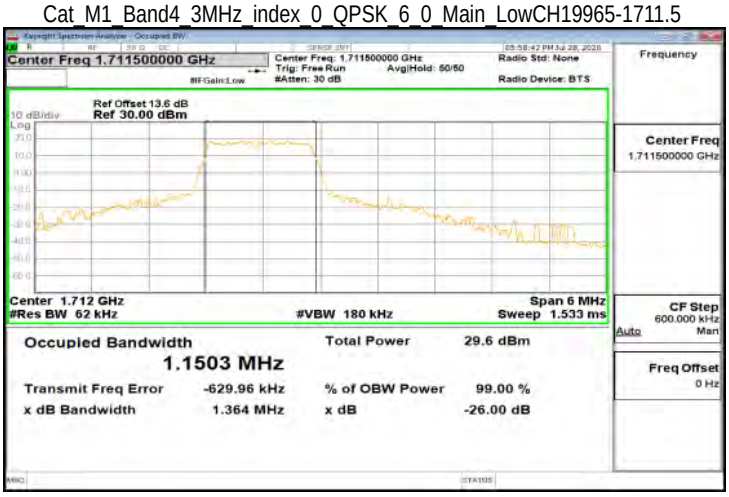
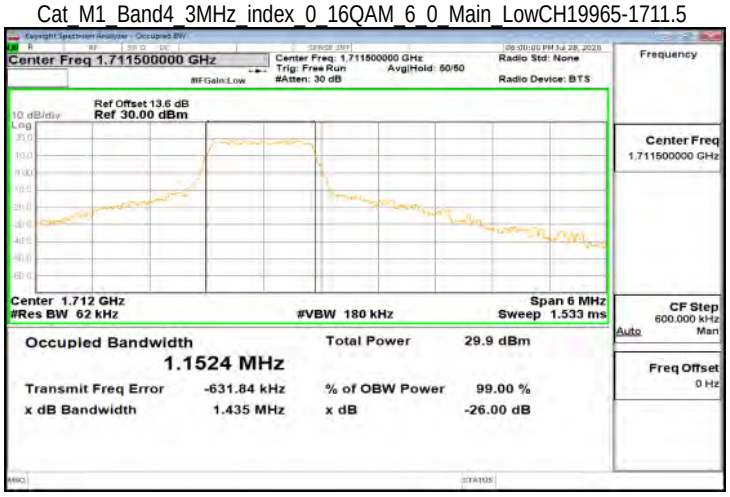
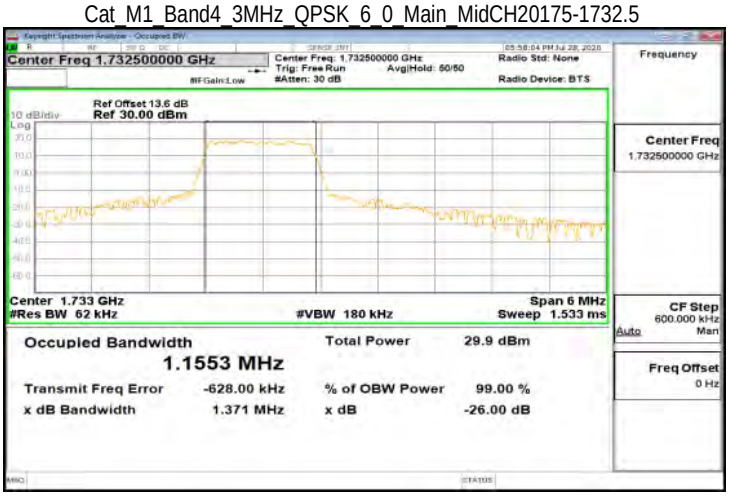
Cat_M1_Band4_3MHz_index_0_QPSK_6_0_Main_LowCH19965-1711.5



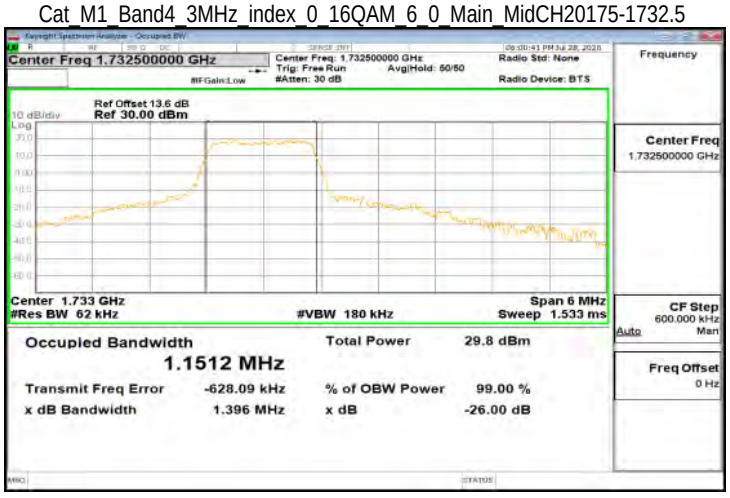
Cat_M1_Band4_3MHz_index_0_16QAM_6_0_Main_LowCH19965-1711.5



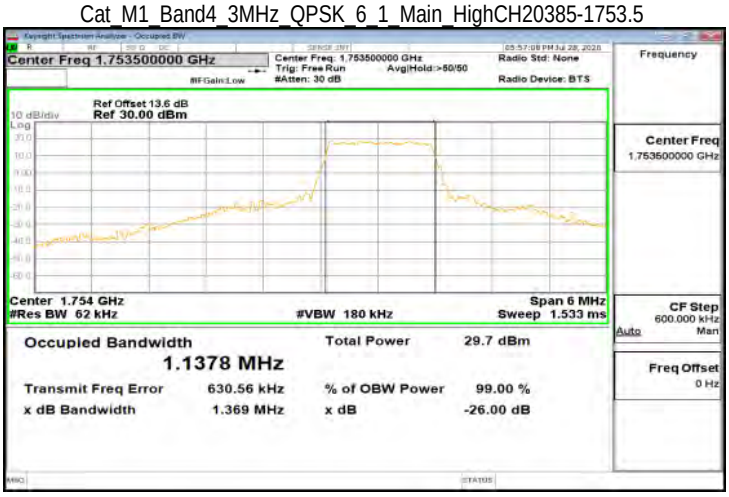
Cat_M1_Band4_3MHz_QPSK_6_0_Main_MidCH20175-1732.5



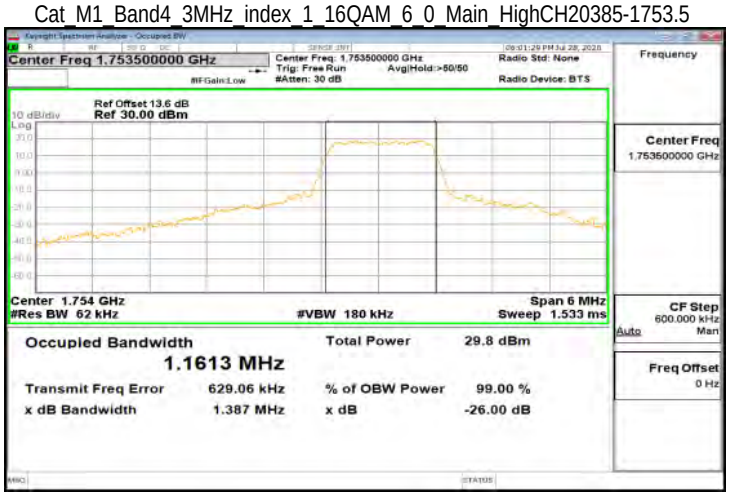
Cat_M1_Band4_3MHz_index_0_16QAM_6_0_Main_MidCH20175-1732.5



Cat_M1_Band4_3MHz_QPSK_6_1_Main_HighCH20385-1753.5



Cat_M1_Band4_3MHz_index_1_16QAM_6_0_Main_HighCH20385-1753.5



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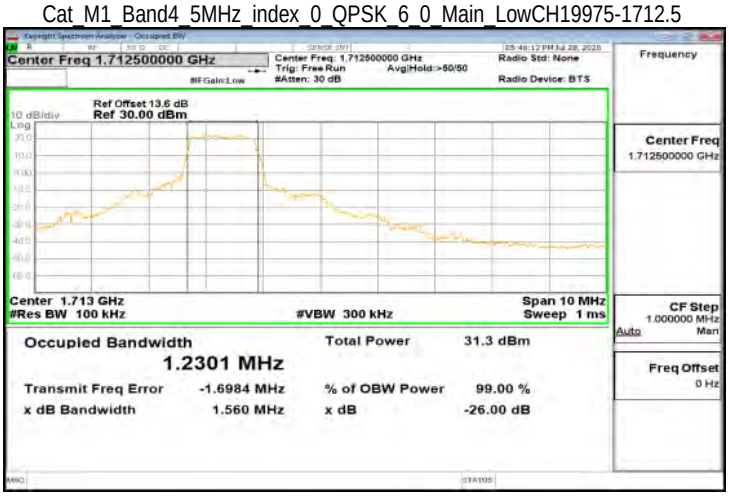
Cat_M1_Band4_5MHz_index_0_QPSK_6_0_Main_LowCH19975-1712.5



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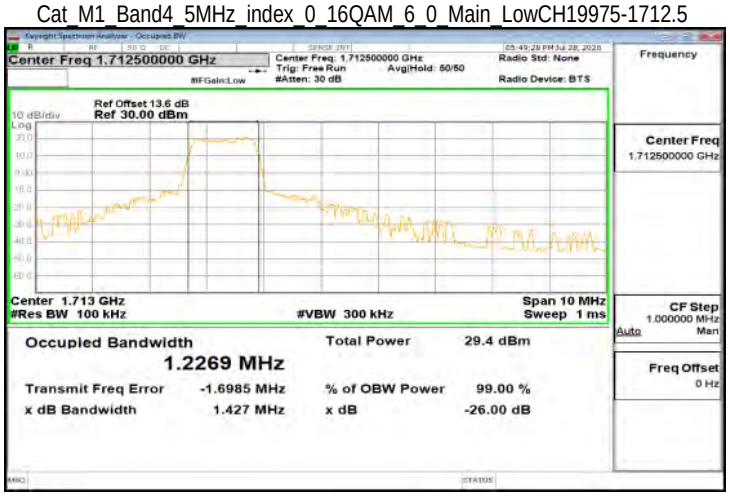
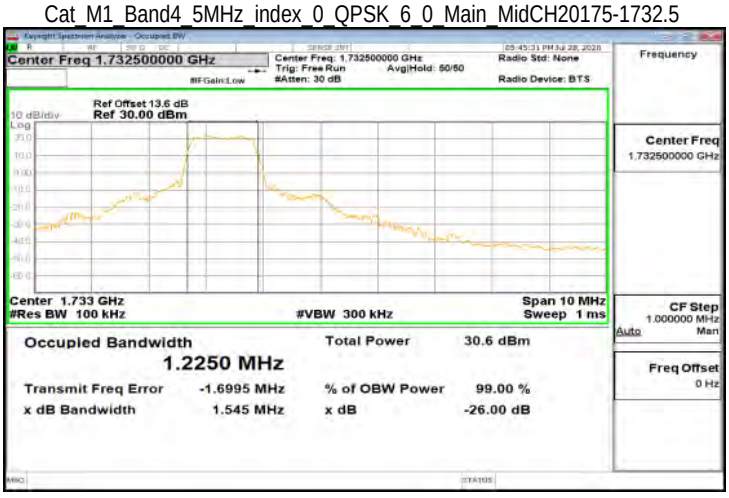
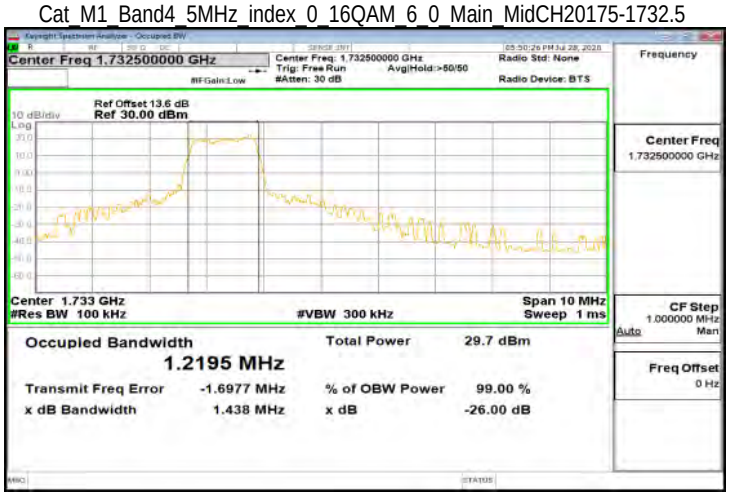


Cat_M1_Band4_5MHz_index_0_QPSK_6_0_Main_MidCH20175-1732.5



Cat_M1_Band4_5MHz_index_0_16QAM_6_0_Main_MidCH20175-1732.5



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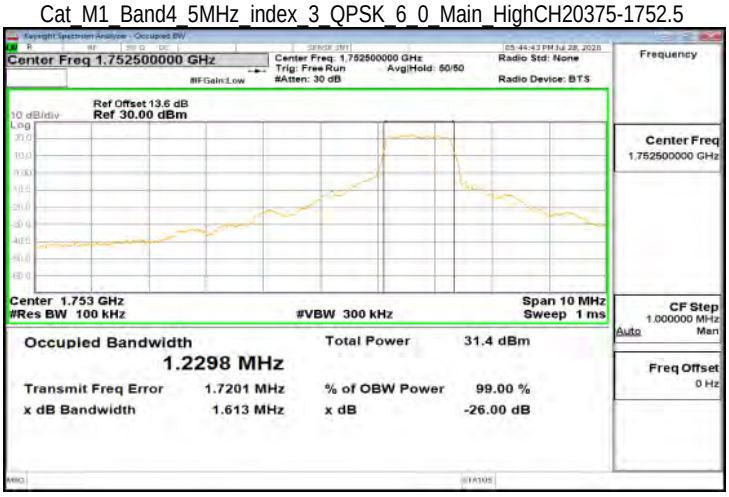

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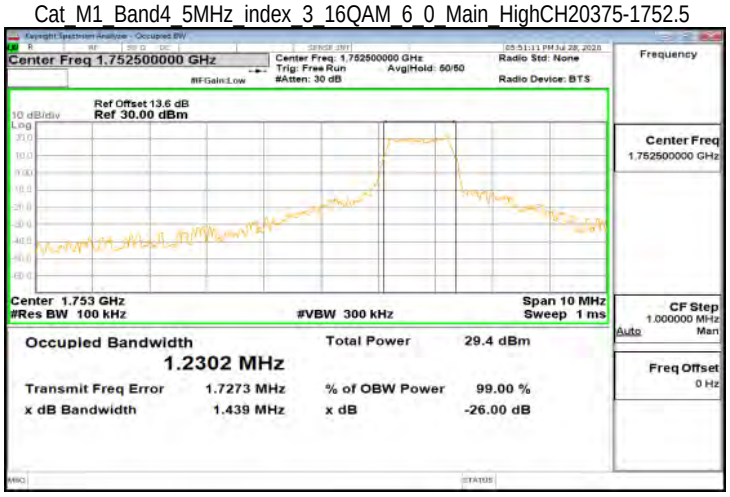

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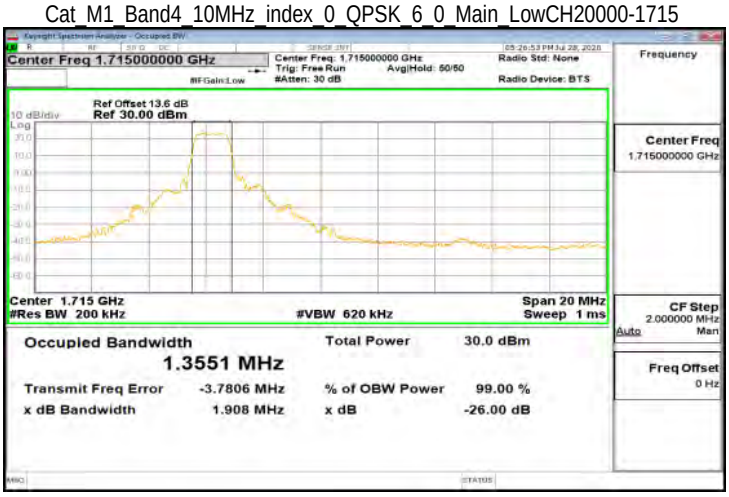
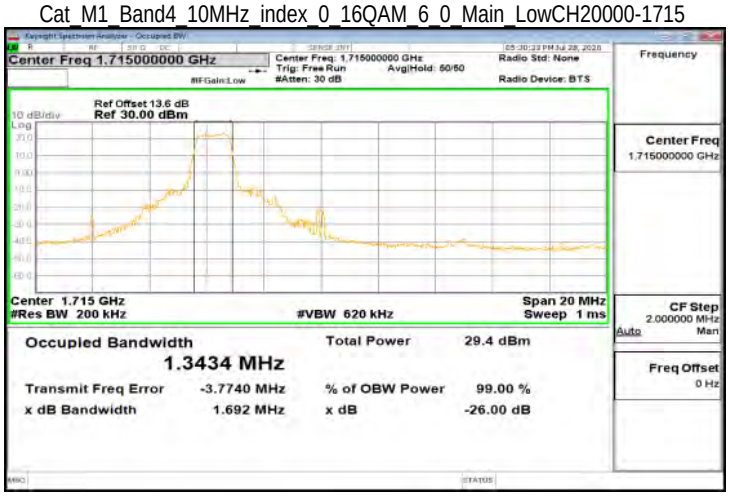
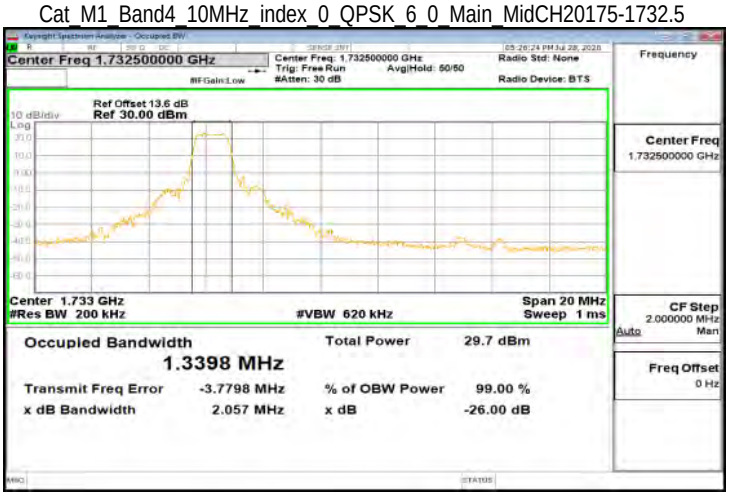
Cat_M1_Band4_10MHz_index_0_QPSK_6_0_Main_LowCH20000-1715



Cat_M1_Band4_10MHz_index_0_16QAM_6_0_Main_LowCH20000-1715



Cat_M1_Band4_10MHz_index_0_QPSK_6_0_Main_MidCH20175-1732.5



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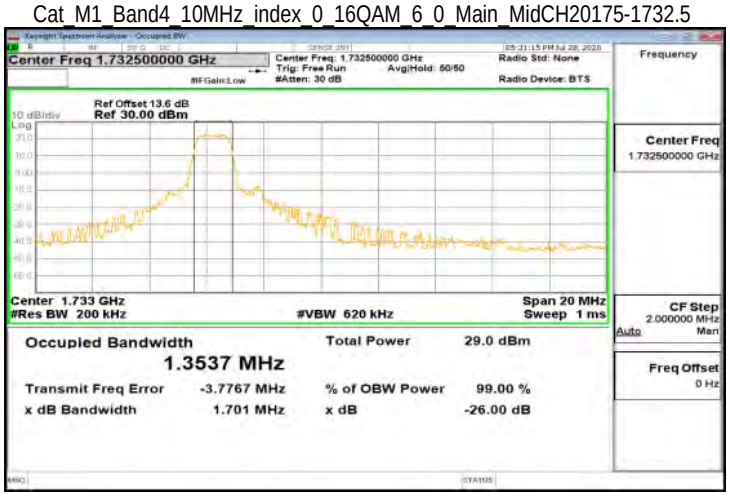
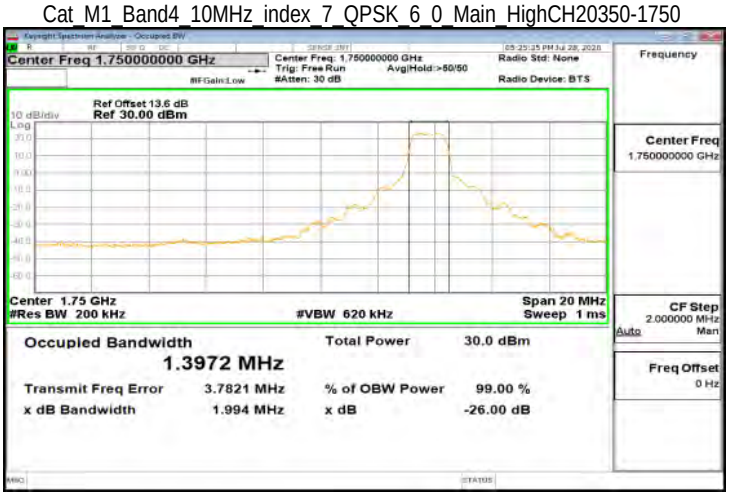
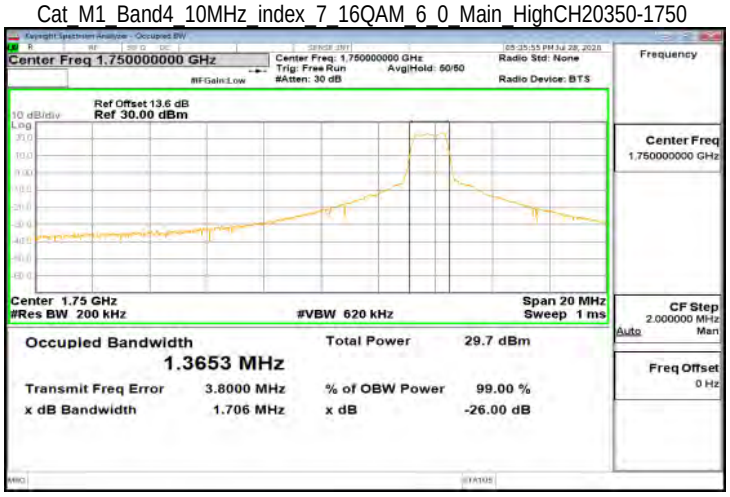


Cat_M1_Band4_10MHz_index_7_QPSK_6_0_Main_HighCH20350-1750



Cat_M1_Band4_10MHz_index_7_16QAM_6_0_Main_HighCH20350-1750



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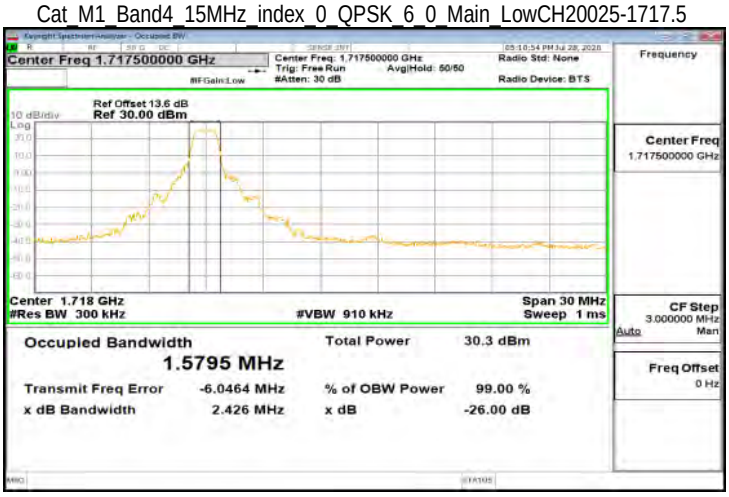
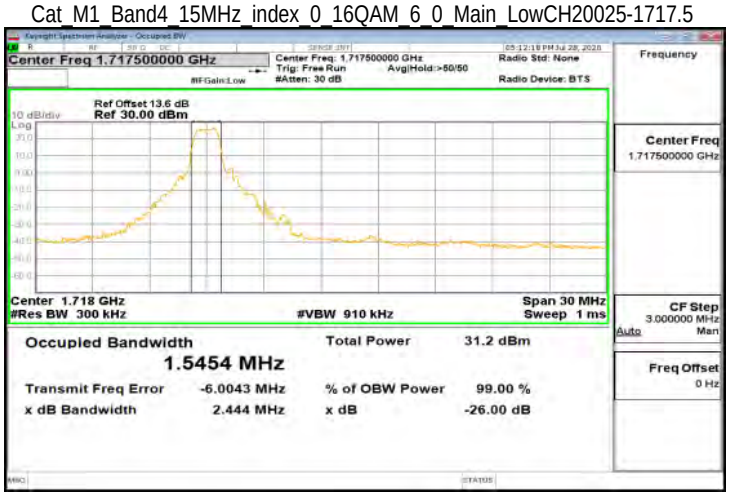
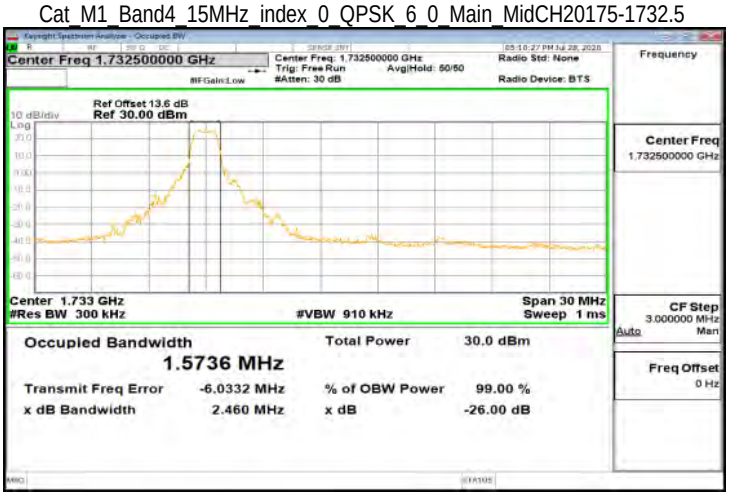
Cat_M1_Band4_15MHz_index_0_QPSK_6_0_Main_LowCH20025-1717.5



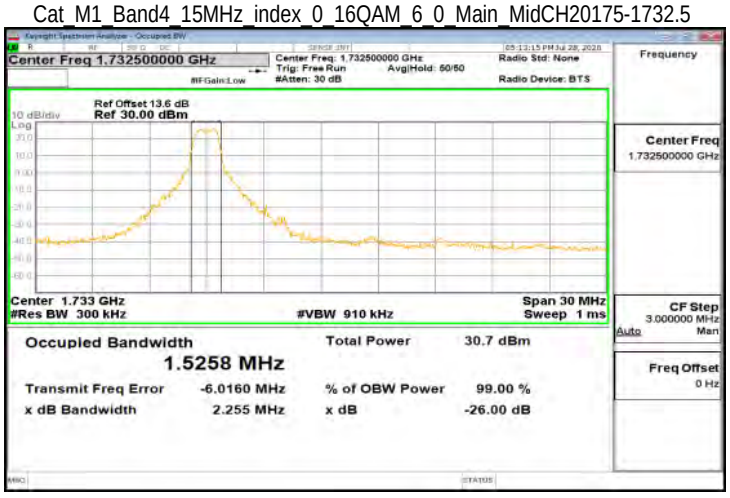
Cat_M1_Band4_15MHz_index_0_16QAM_6_0_Main_LowCH20025-1717.5



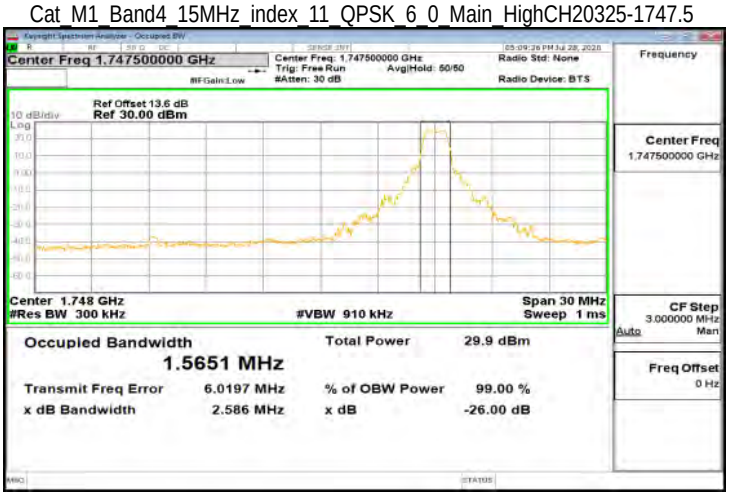
Cat_M1_Band4_15MHz_index_0_QPSK_6_0_Main_MidCH20175-1732.5



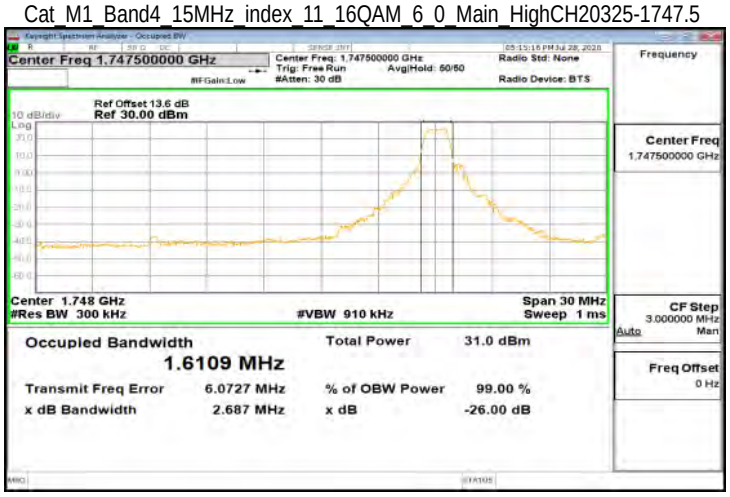
Cat_M1_Band4_15MHz_index_0_16QAM_6_0_Main_MidCH20175-1732.5



Cat_M1_Band4_15MHz_index_11_QPSK_6_0_Main_HighCH20325-1747.5



Cat_M1_Band4_15MHz_index_11_16QAM_6_0_Main_HighCH20325-1747.5



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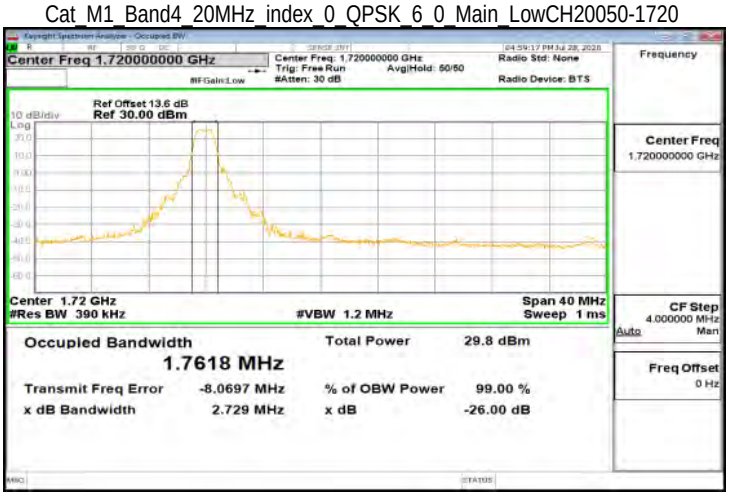
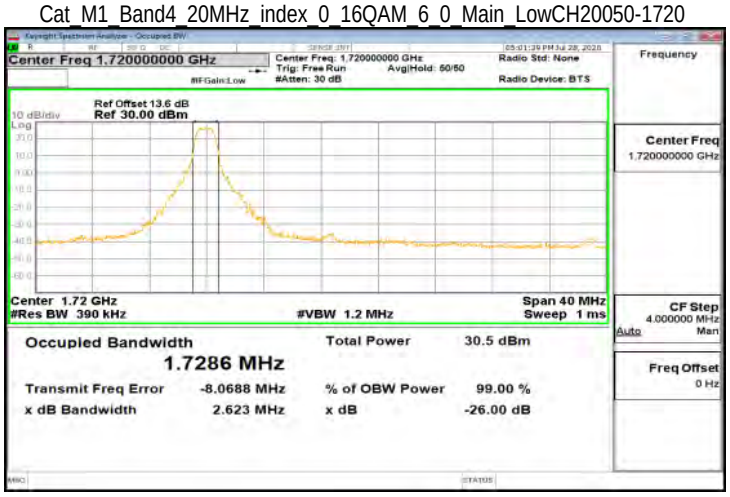
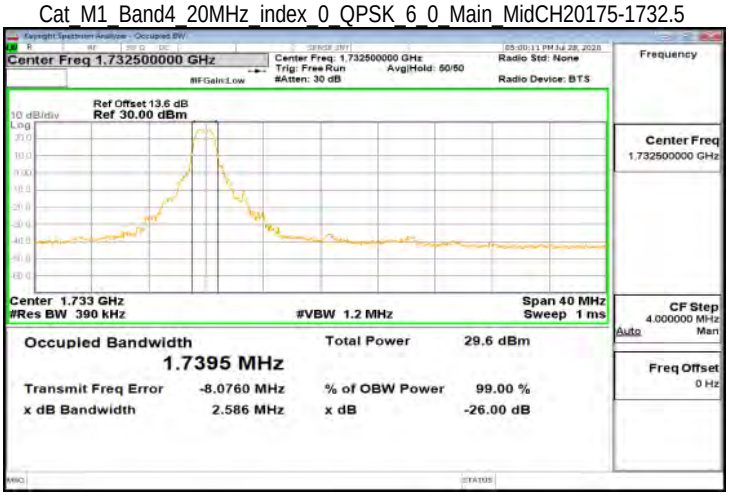
Cat_M1_Band4_20MHz_index_0_QPSK_6_0_Main_LowCH20050-1720



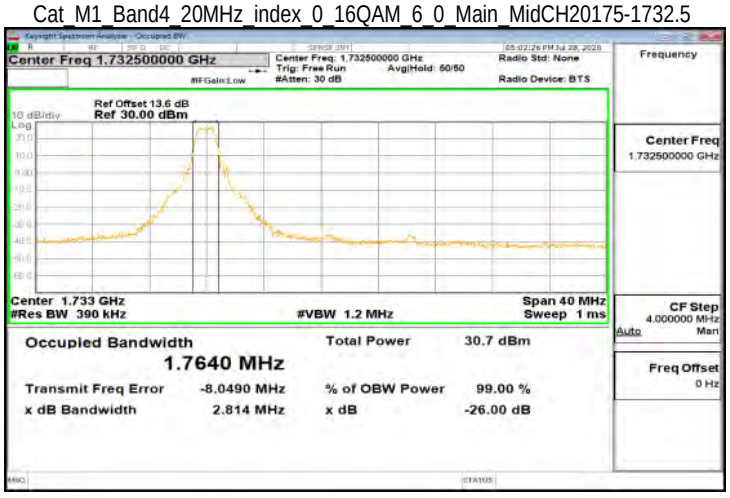
Cat_M1_Band4_20MHz_index_0_16QAM_6_0_Main_LowCH20050-1720



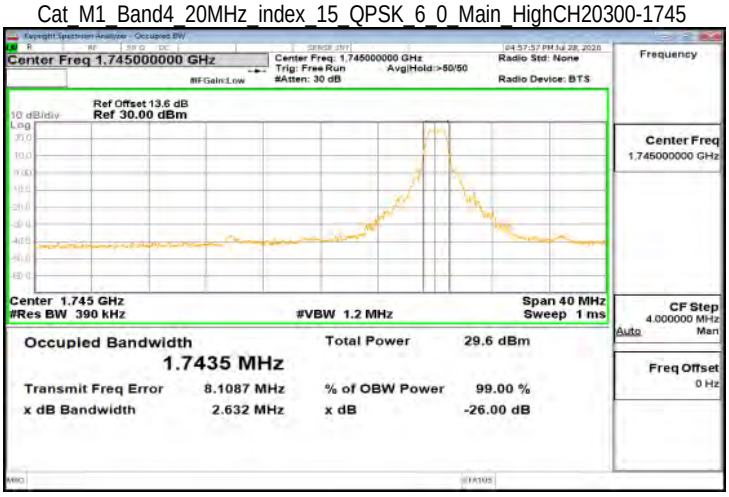
Cat_M1_Band4_20MHz_index_0_QPSK_6_0_Main_MidCH20175-1732.5



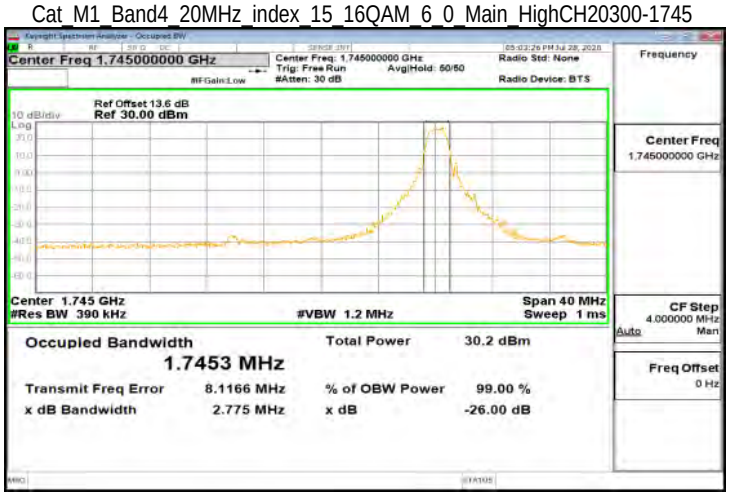
Cat_M1_Band4_20MHz_index_0_16QAM_6_0_Main_MidCH20175-1732.5



Cat_M1_Band4_20MHz_index_15_QPSK_6_0_Main_HighCH20300-1745



Cat_M1_Band4_20MHz_index_15_16QAM_6_0_Main_HighCH20300-1745



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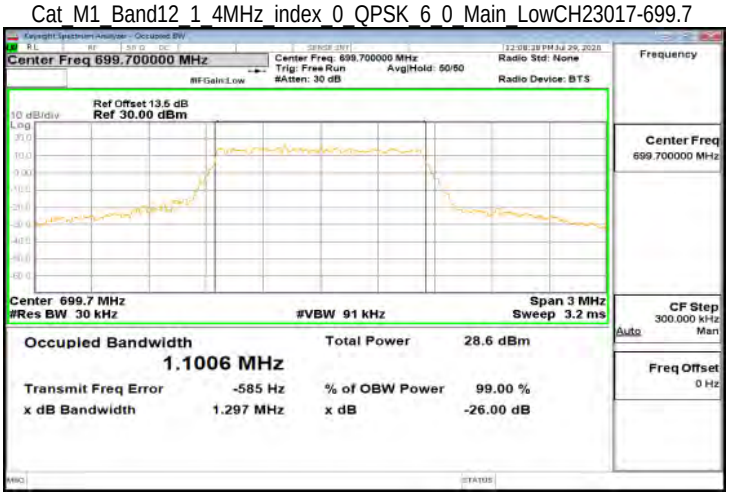
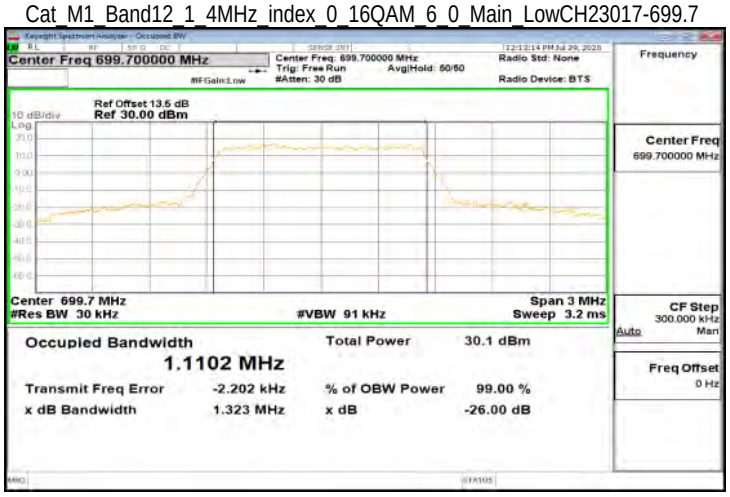
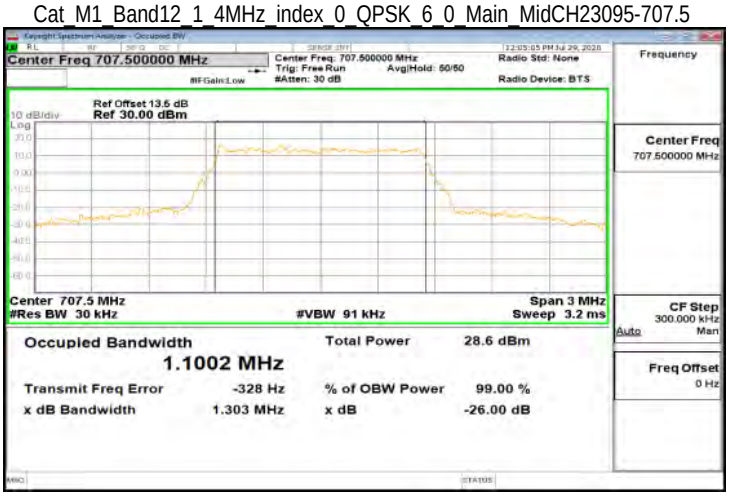
Cat_M1_Band12_1_4MHz_index_0_QPSK_6_0_Main_LowCH23017-699.7



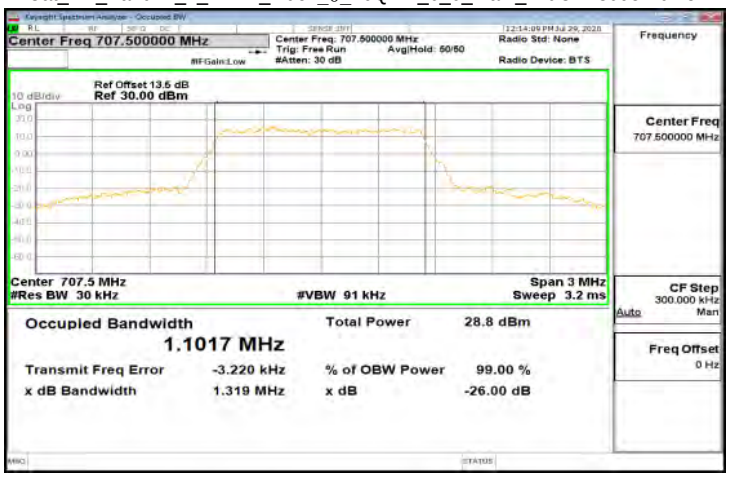
Cat_M1_Band12_1_4MHz_index_0_16QAM_6_0_Main_LowCH23017-699.7



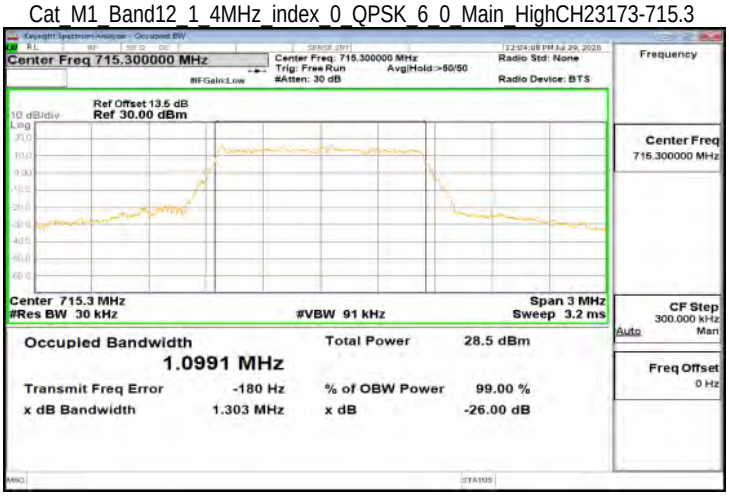
Cat_M1_Band12_1_4MHz_index_0_QPSK_6_0_Main_MidCH23095-707.5



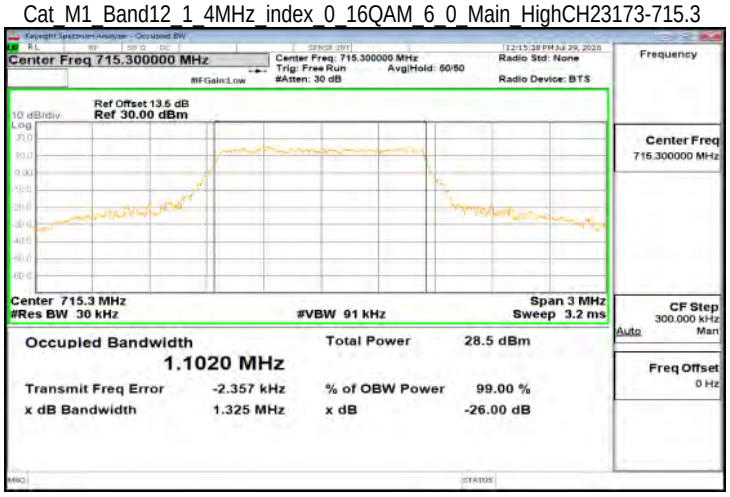
Cat_M1_Band12_1_4MHz_index_0_16QAM_6_0_Main_MidCH23095-707.5



Cat_M1_Band12_1_4MHz_index_0_QPSK_6_0_Main_HighCH23173-715.3



Cat_M1_Band12_1_4MHz_index_0_16QAM_6_0_Main_HighCH23173-715.3



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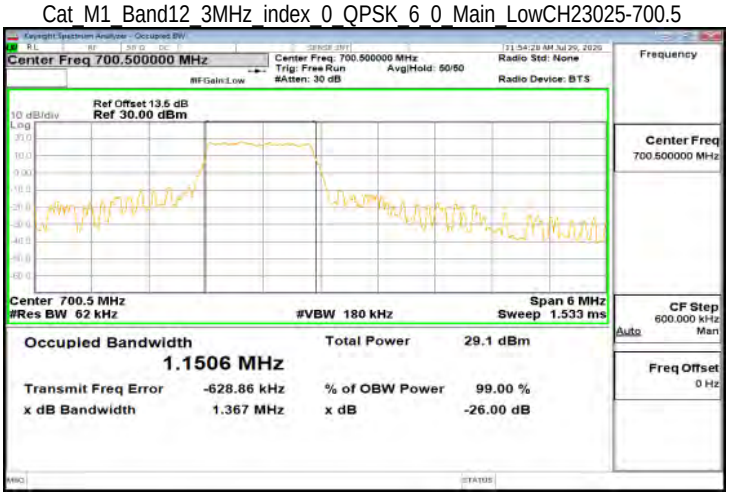
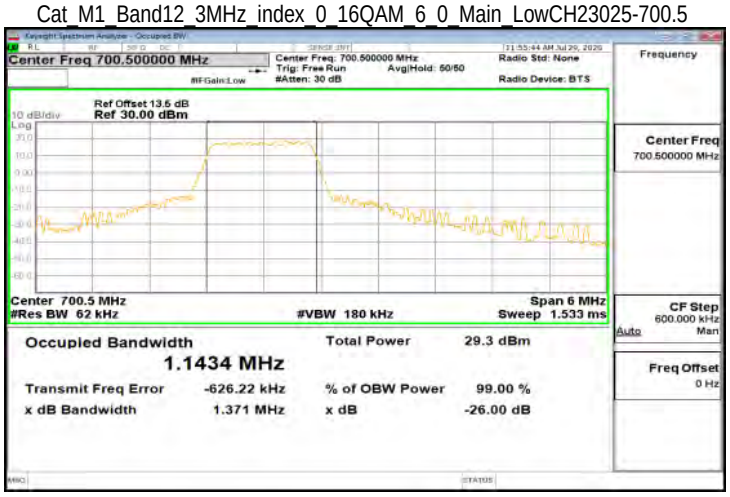
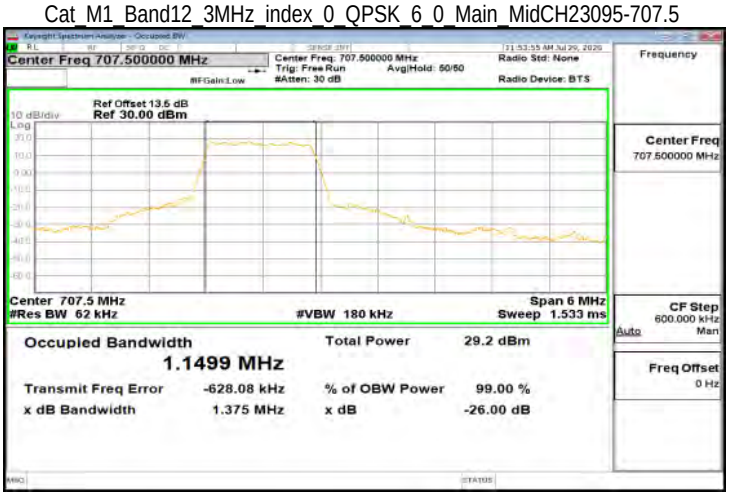
Cat_M1_Band12_3MHz_index_0_QPSK_6_0_Main_LowCH23025-700.5



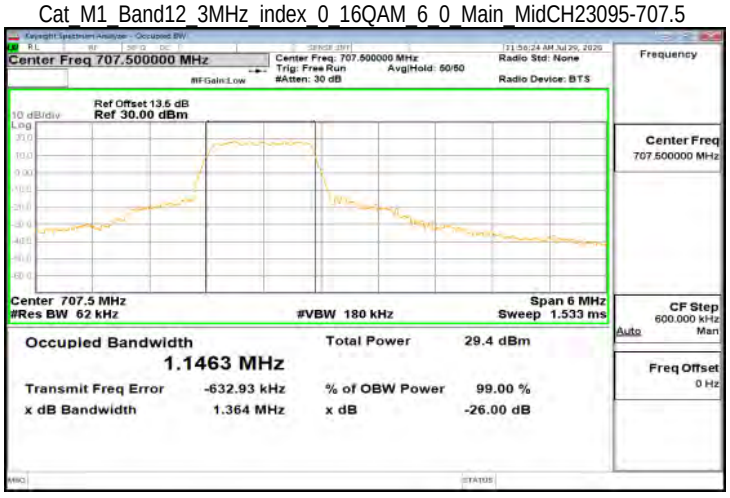
Cat_M1_Band12_3MHz_index_0_16QAM_6_0_Main_LowCH23025-700.5



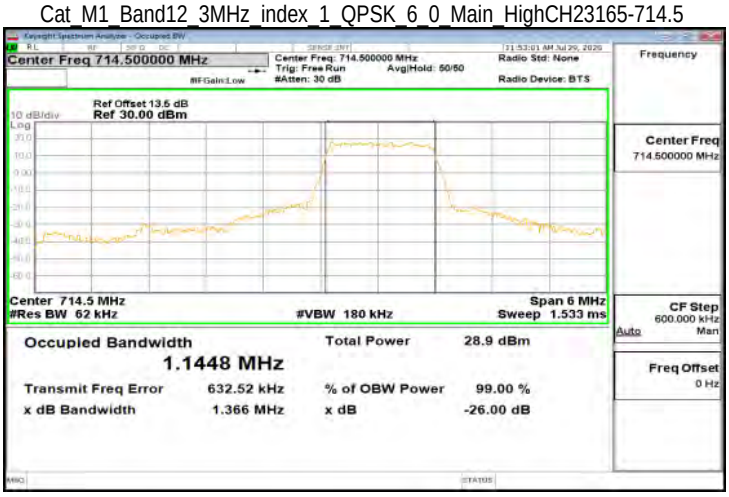
Cat_M1_Band12_3MHz_index_0_QPSK_6_0_Main_MidCH23095-707.5



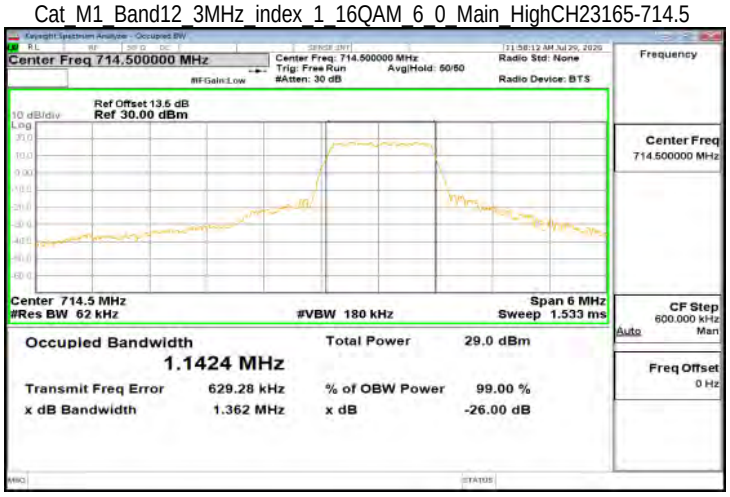
Cat_M1_Band12_3MHz_index_0_16QAM_6_0_Main_MidCH23095-707.5



Cat_M1_Band12_3MHz_index_1_QPSK_6_0_Main_HighCH23165-714.5



Cat_M1_Band12_3MHz_index_1_16QAM_6_0_Main_HighCH23165-714.5



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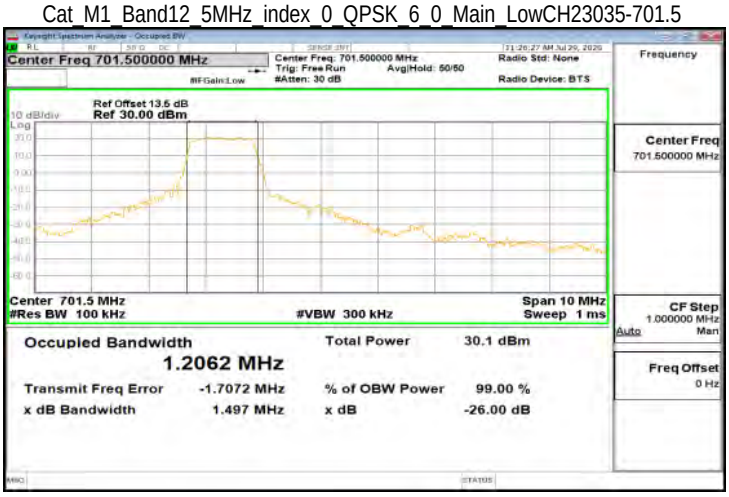
Cat_M1_Band12_5MHz_index_0_QPSK_6_0_Main_LowCH23035-701.5



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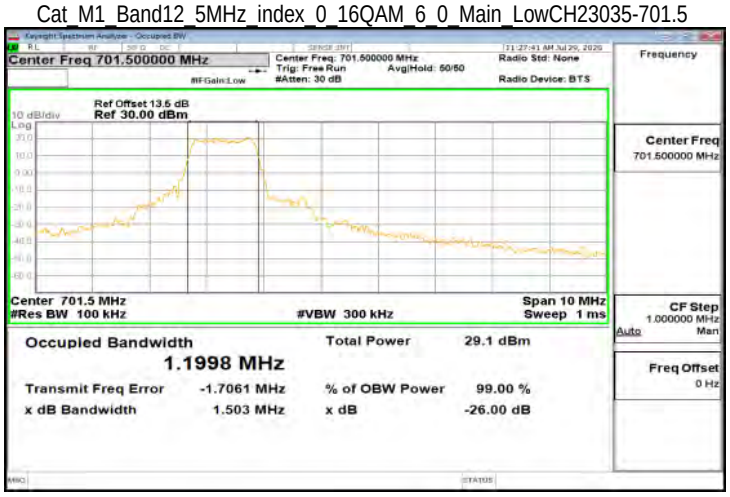
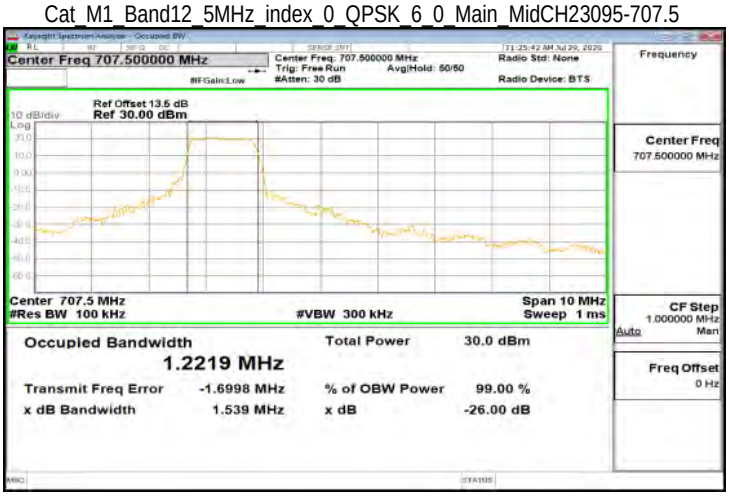


Cat_M1_Band12_5MHz_index_0_QPSK_6_0_Main_MidCH23095-707.5



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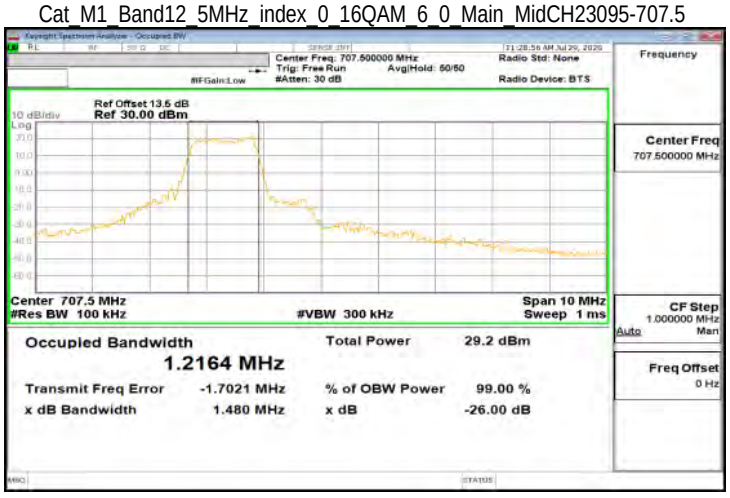

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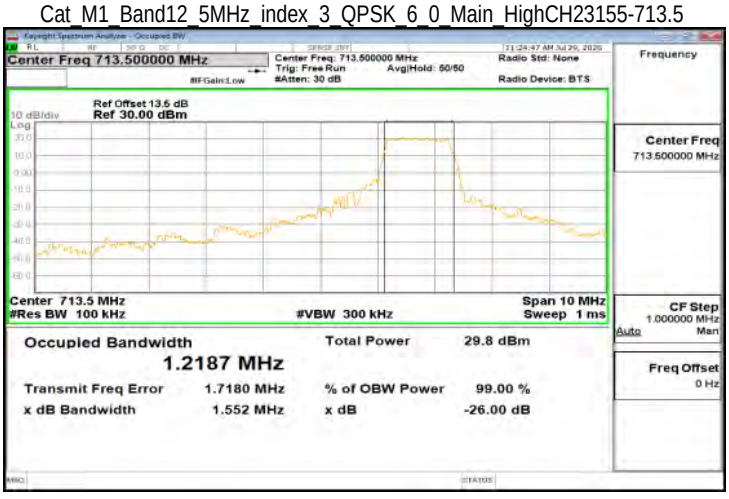

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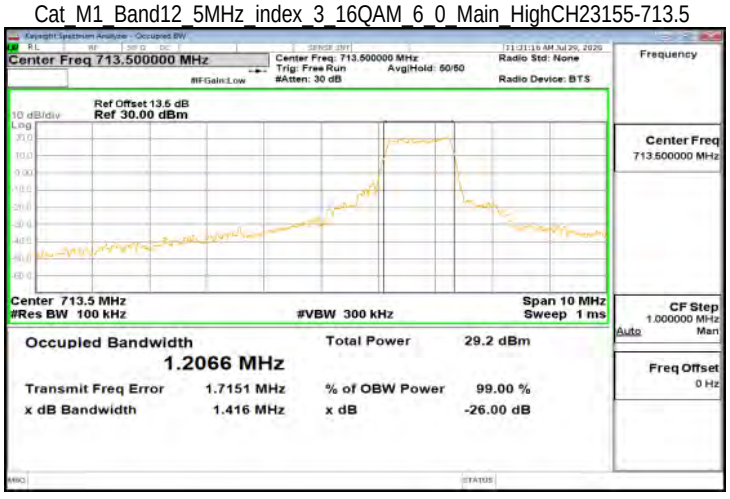

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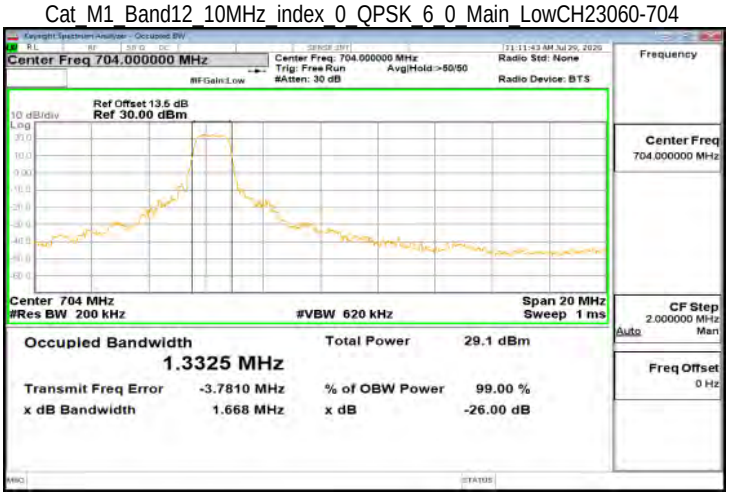
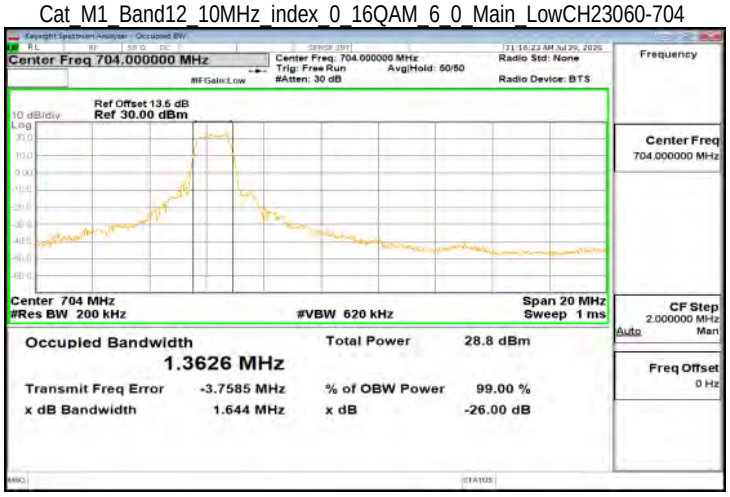
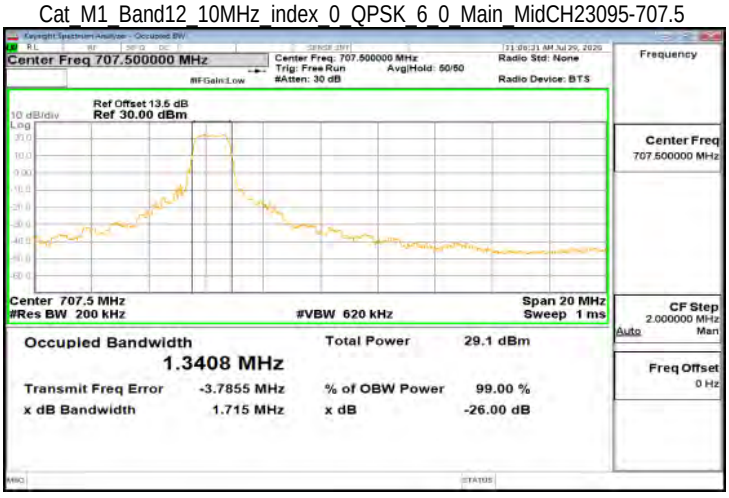
Cat_M1_Band12_10MHz_index_0_QPSK_6_0_Main_LowCH23060-704



Cat_M1_Band12_10MHz_index_0_16QAM_6_0_Main_LowCH23060-704



Cat_M1_Band12_10MHz_index_0_QPSK_6_0_Main_MidCH23095-707.5



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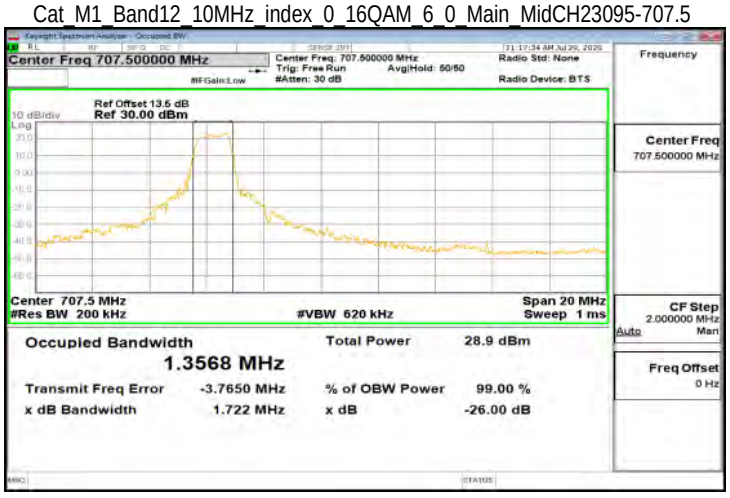
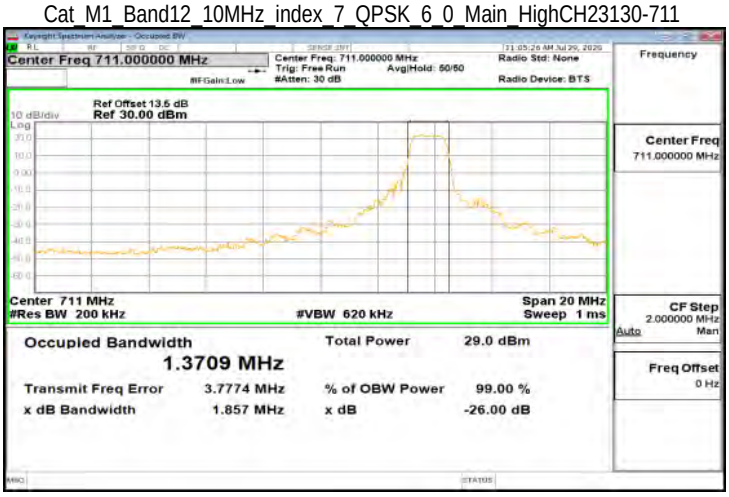


Cat_M1_Band12_10MHz_index_7_QPSK_6_0_Main_HighCH23130-711



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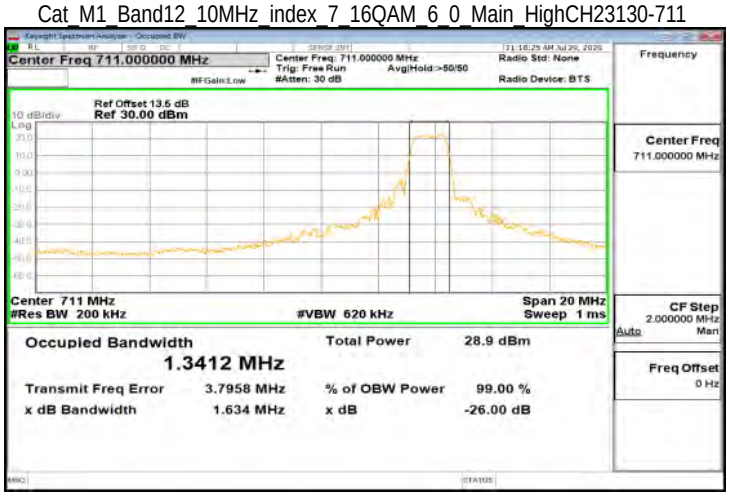

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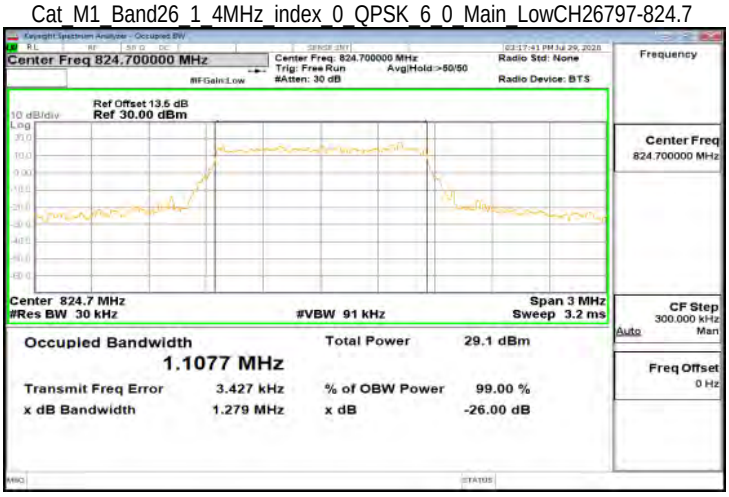
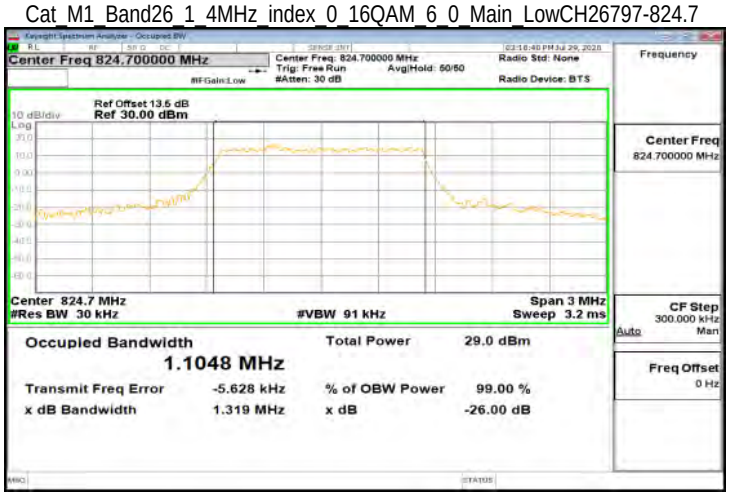
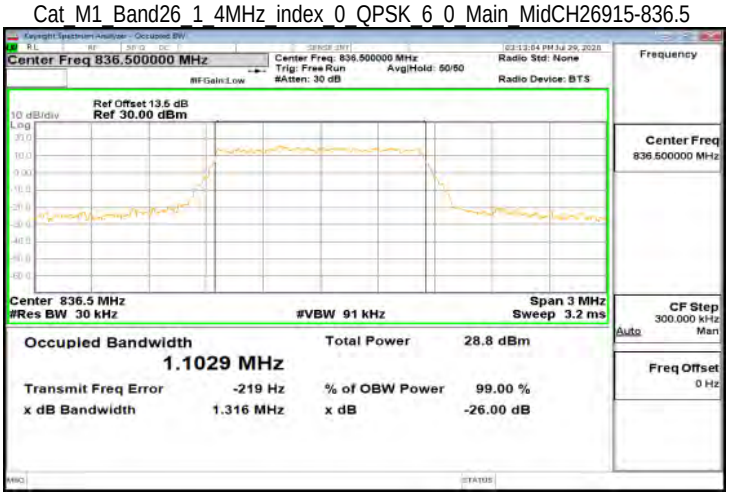
Cat_M1_Band26_1_4MHz_index_0_QPSK_6_0_Main_LowCH26797-824.7



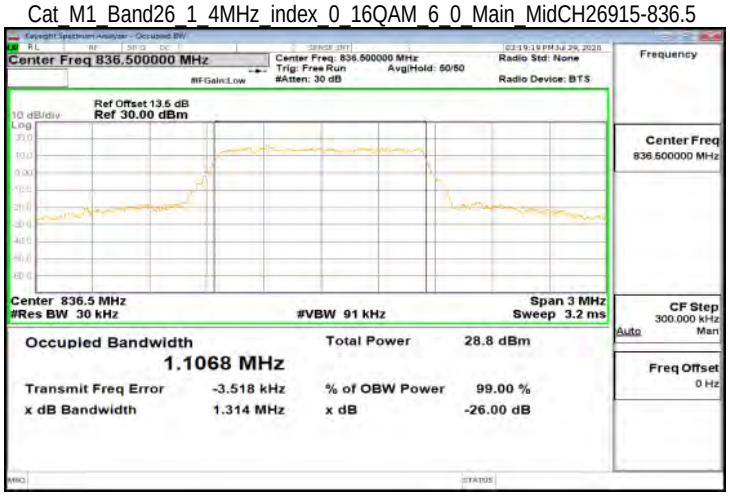
Cat_M1_Band26_1_4MHz_index_0_16QAM_6_0_Main_LowCH26797-824.7



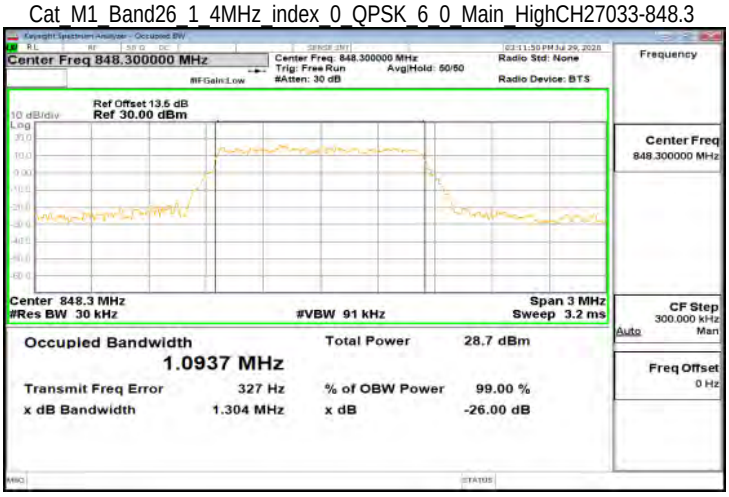
Cat_M1_Band26_1_4MHz_index_0_QPSK_6_0_Main_MidCH26915-836.5



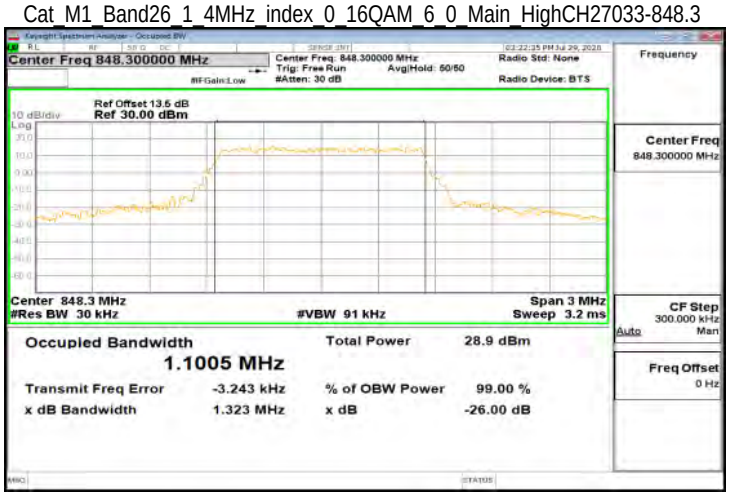
Cat_M1_Band26_1_4MHz_index_0_16QAM_6_0_Main_MidCH26915-836.5



Cat_M1_Band26_1_4MHz_index_0_QPSK_6_0_Main_HighCH27033-848.3



Cat_M1_Band26_1_4MHz_index_0_16QAM_6_0_Main_HighCH27033-848.3



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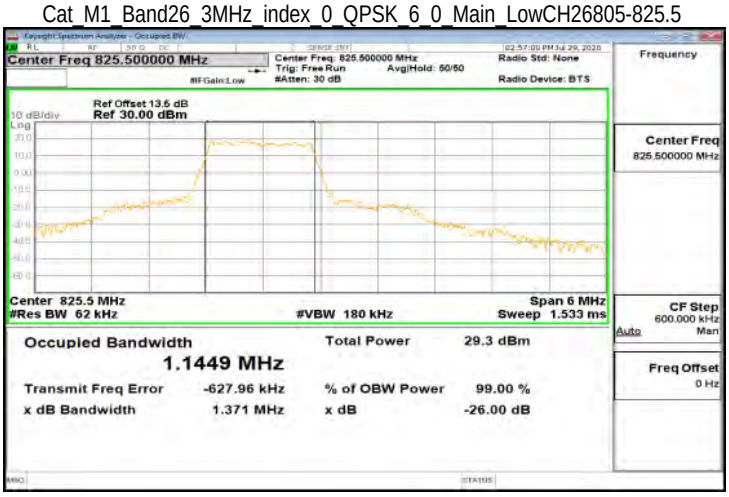
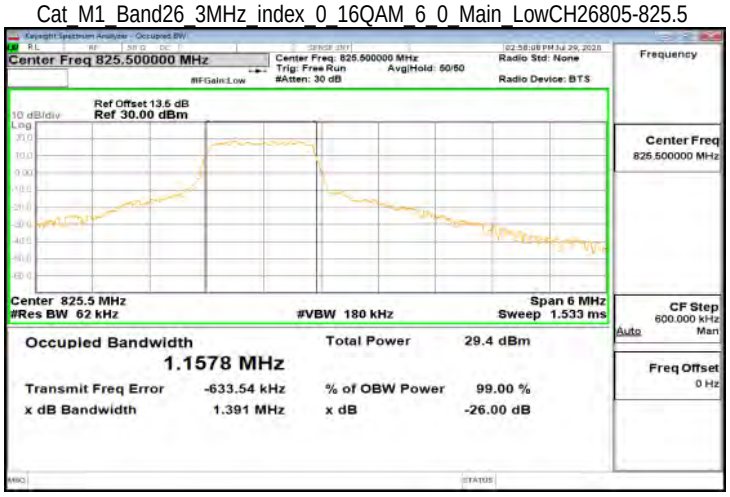
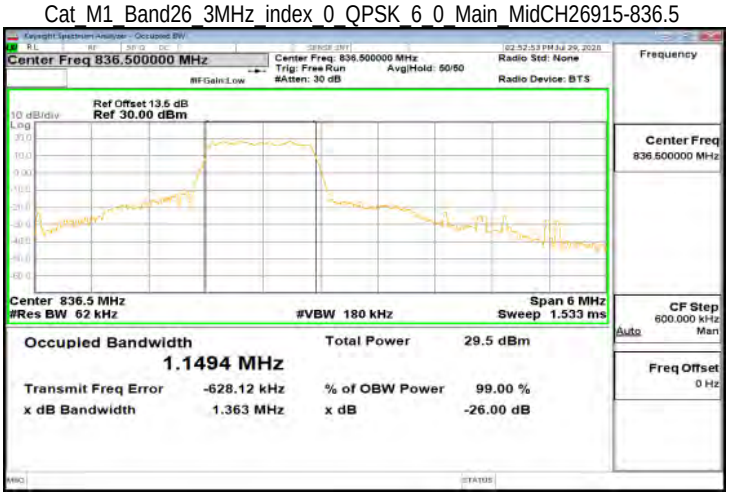
Cat_M1_Band26_3MHz_index_0_QPSK_6_0_Main_LowCH26805-825.5



Cat_M1_Band26_3MHz_index_0_16QAM_6_0_Main_LowCH26805-825.5



Cat_M1_Band26_3MHz_index_0_QPSK_6_0_Main_MidCH26915-836.5



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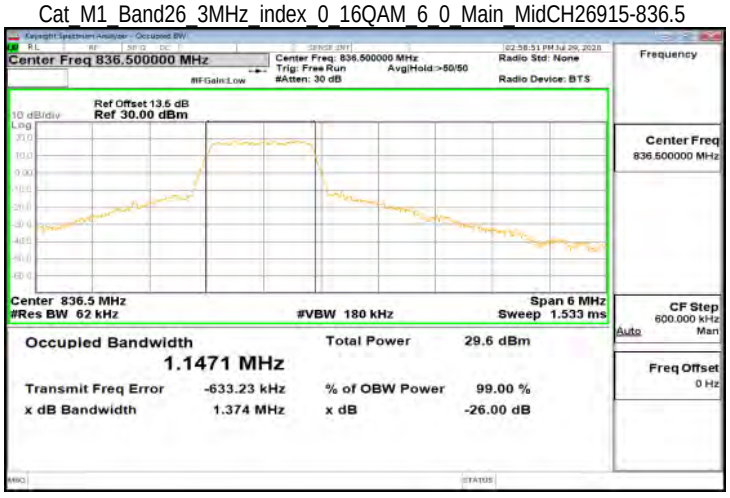
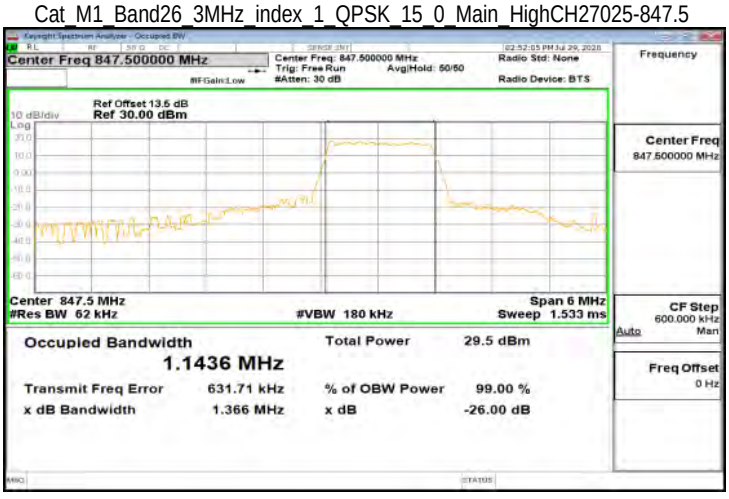
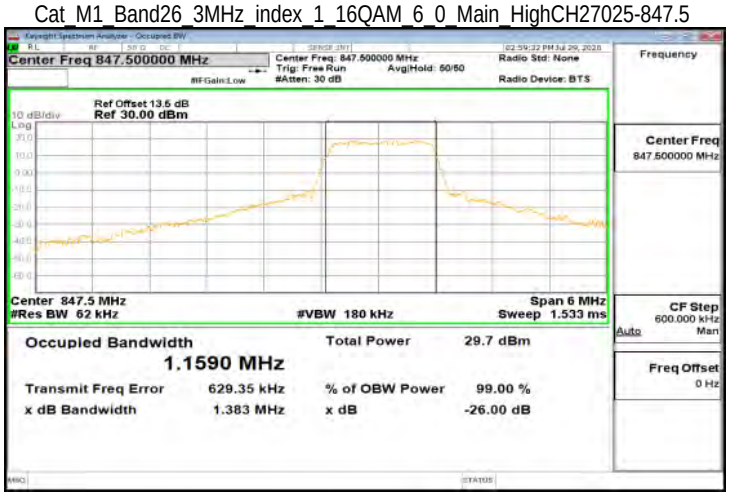


Cat_M1_Band26_3MHz_index_1_QPSK_15_0_Main_HighCH27025-847.5



Cat_M1_Band26_3MHz_index_1_16QAM_6_0_Main_HighCH27025-847.5



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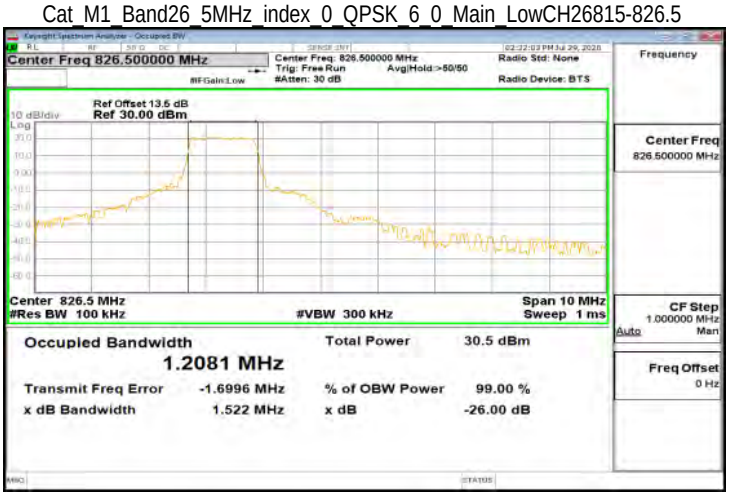
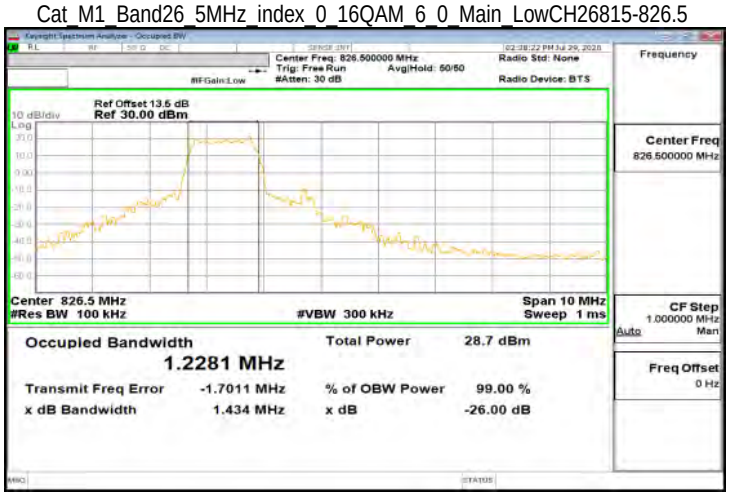
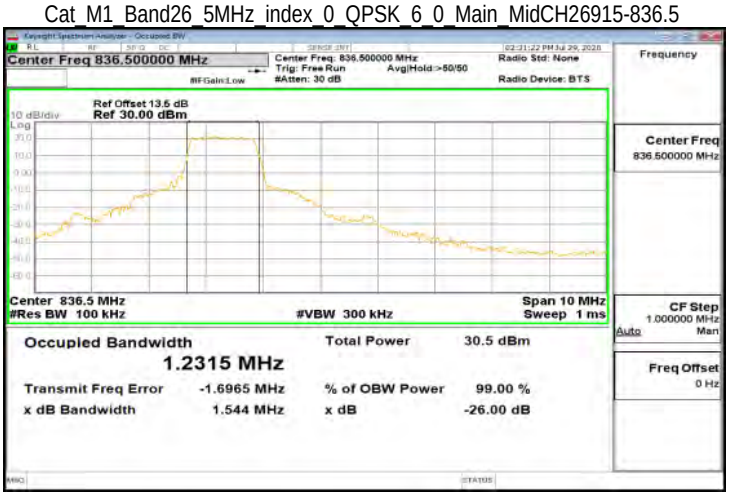
Cat_M1_Band26_5MHz_index_0_QPSK_6_0_Main_LowCH26815-826.5



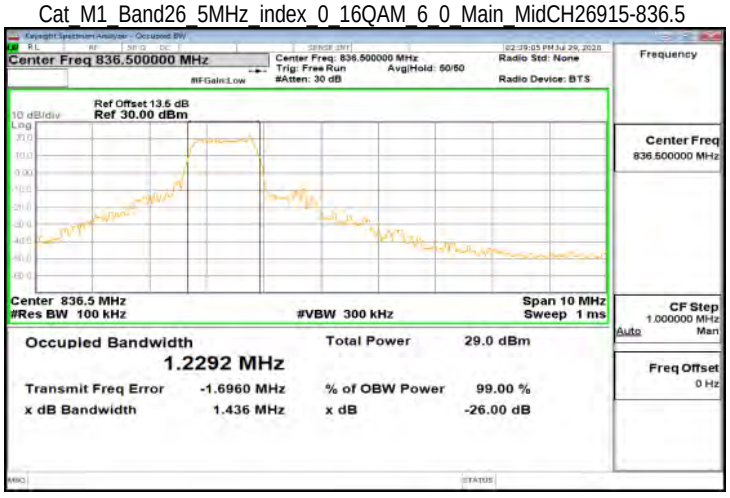
Cat_M1_Band26_5MHz_index_0_16QAM_6_0_Main_LowCH26815-826.5



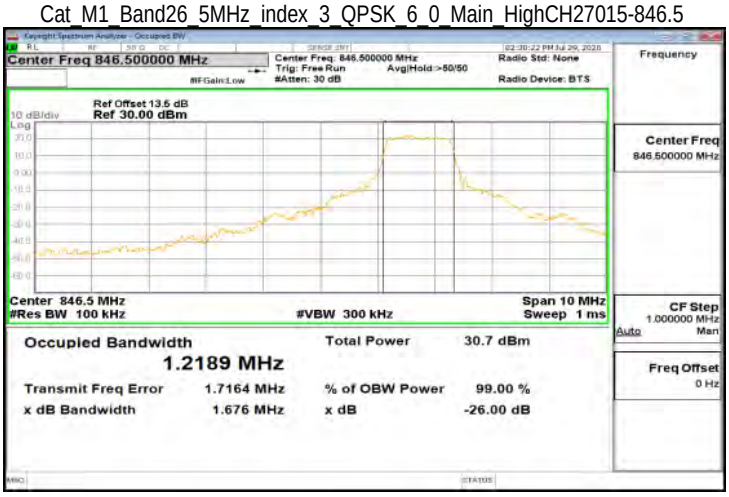
Cat_M1_Band26_5MHz_index_0_QPSK_6_0_Main_MidCH26915-836.5



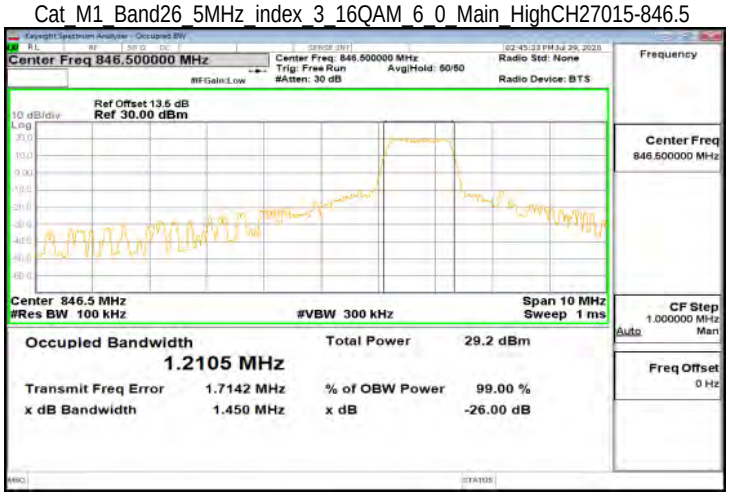
Cat_M1_Band26_5MHz_index_0_16QAM_6_0_Main_MidCH26915-836.5



Cat_M1_Band26_5MHz_index_3_QPSK_6_0_Main_HighCH27015-846.5



Cat_M1_Band26_5MHz_index_3_16QAM_6_0_Main_HighCH27015-846.5



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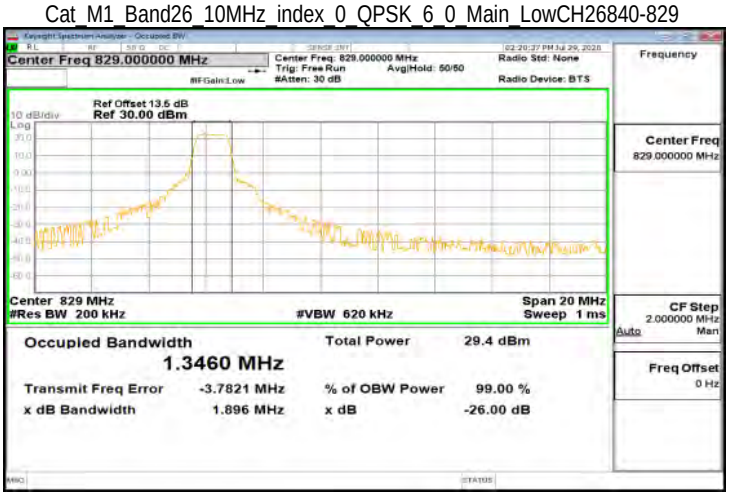
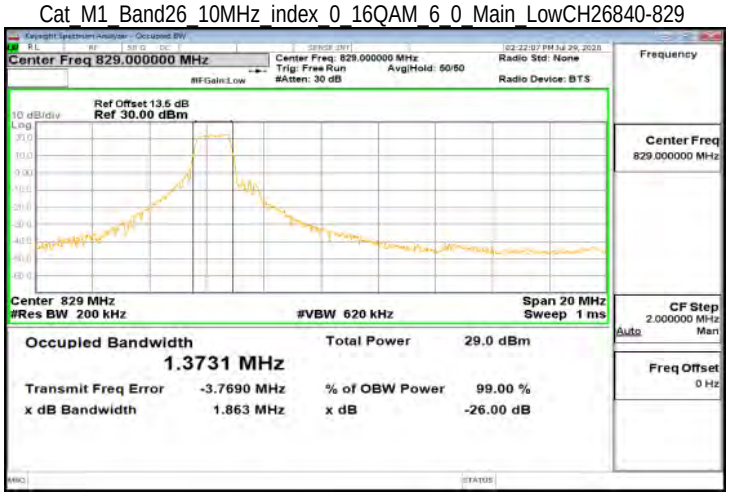
Cat_M1_Band26_10MHz_index_0_QPSK_6_0_Main_LowCH26840-829



Cat_M1_Band26_10MHz_index_0_16QAM_6_0_Main_LowCH26840-829



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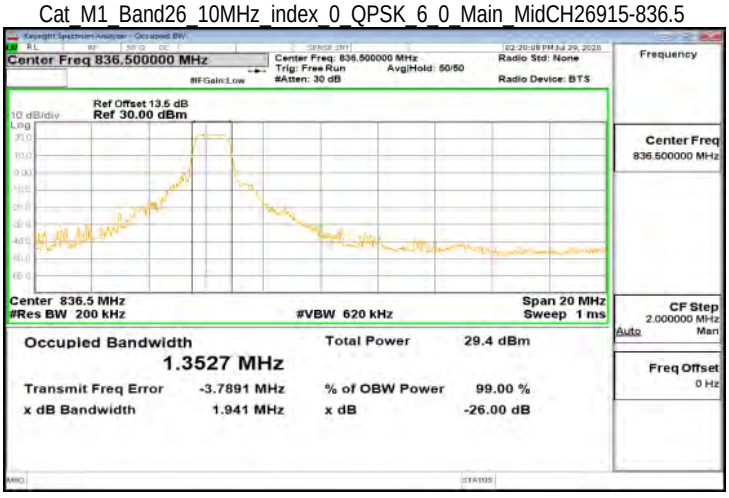
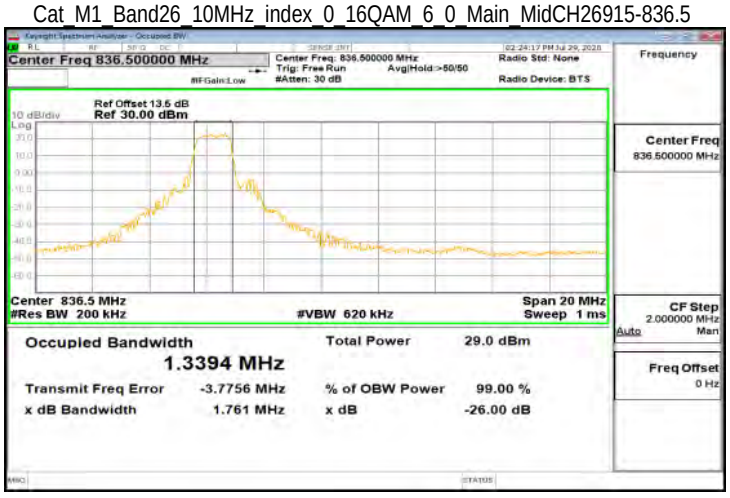


Cat_M1_Band26_10MHz_index_0_16QAM_6_0_Main_MidCH26915-836.5



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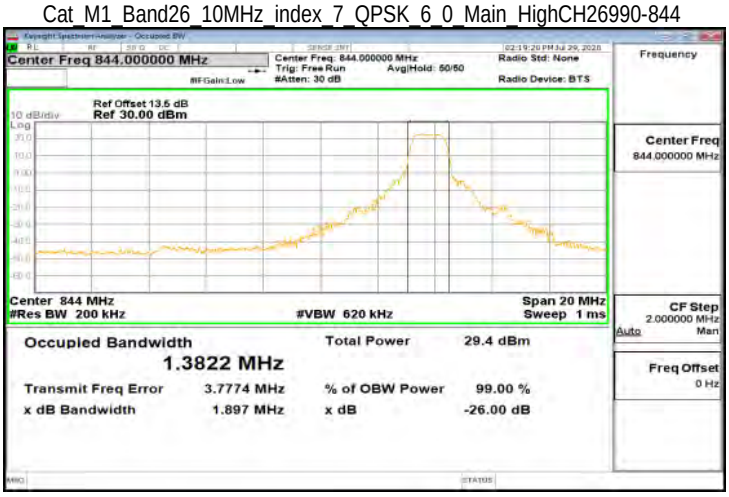

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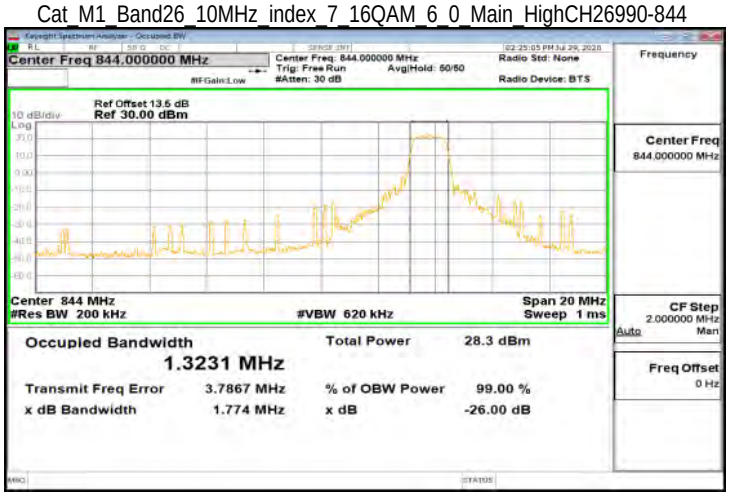

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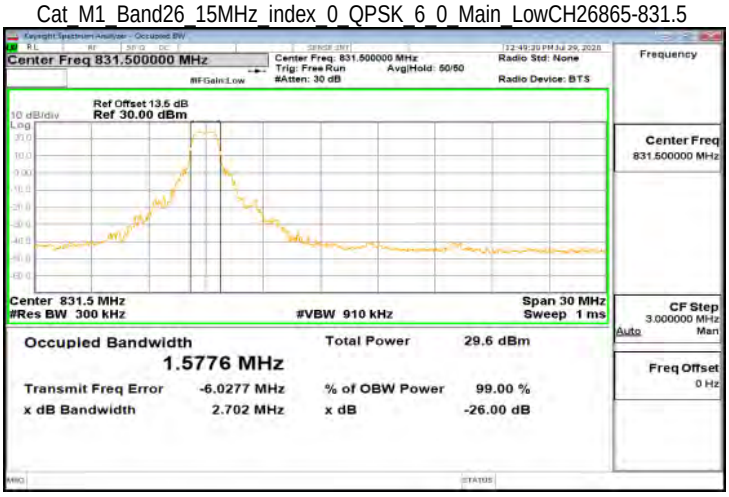
Cat_M1_Band26_15MHz_index_0_QPSK_6_0_Main_LowCH26865-831.5



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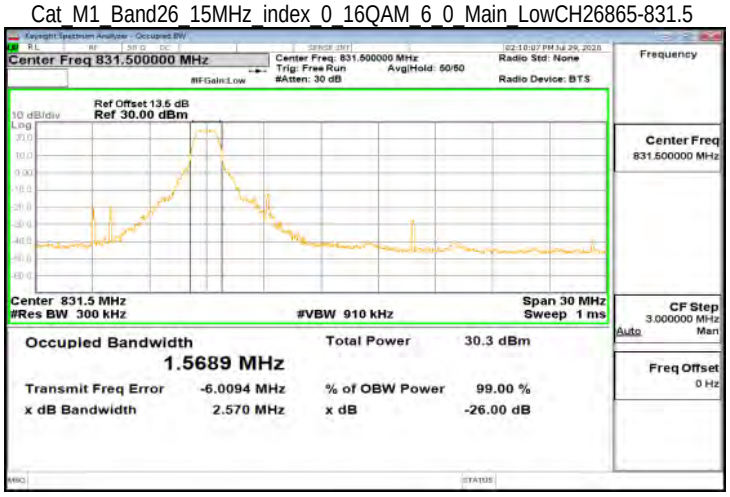

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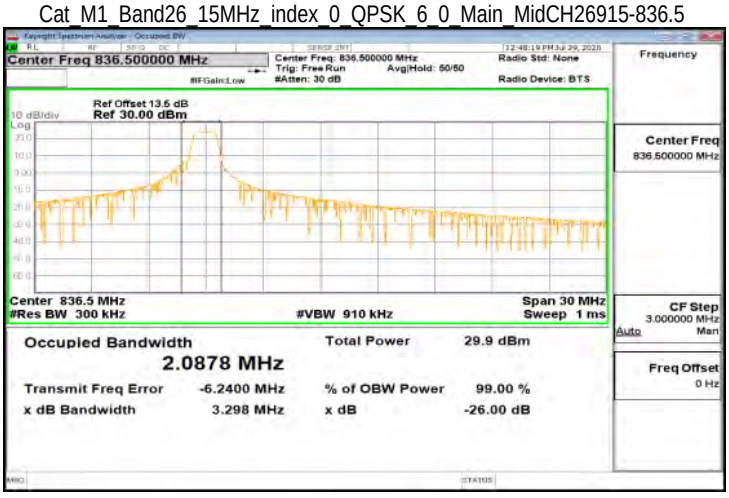

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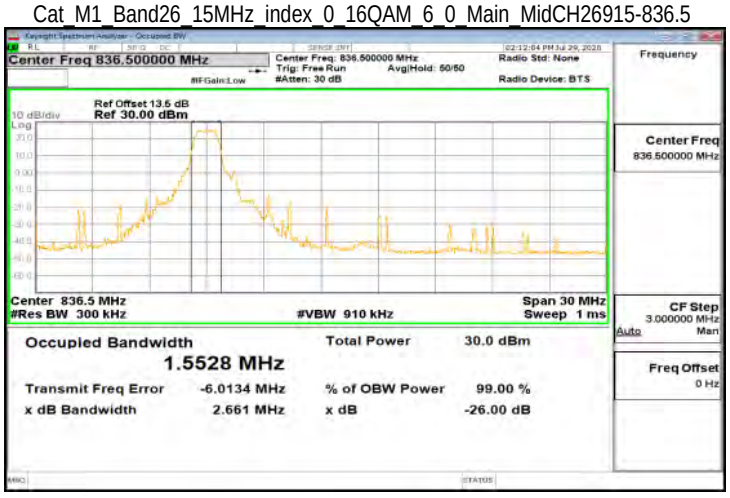

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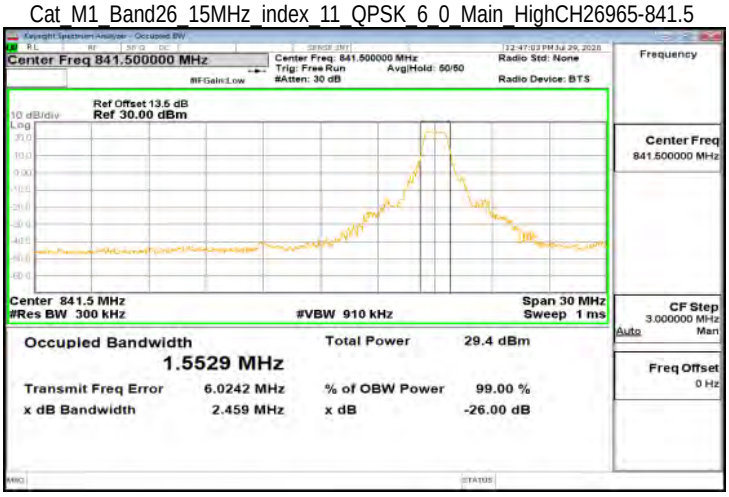

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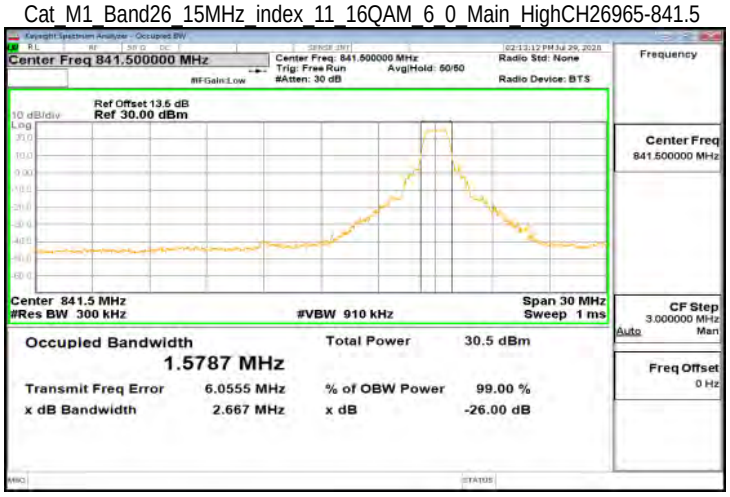

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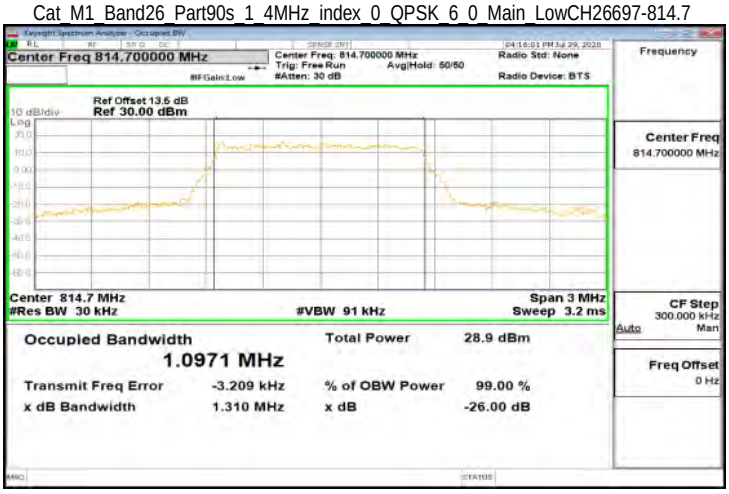
Cat_M1_Band26_Part90s_1_4MHz_index_0_QPSK_6_0_Main_LowCH26697-814.7



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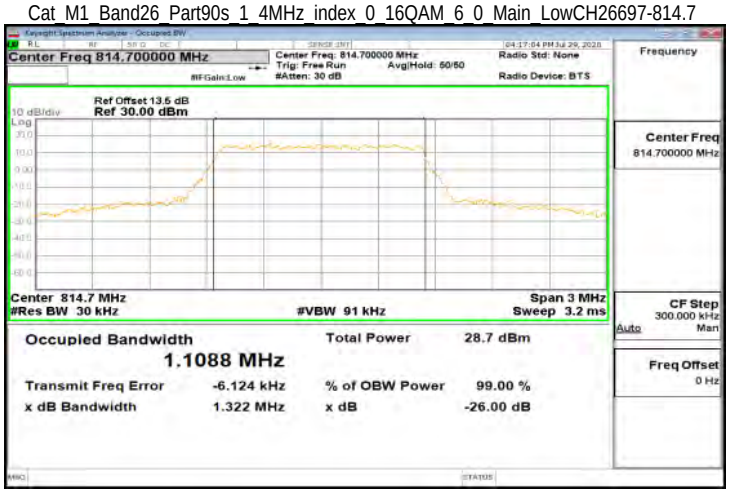

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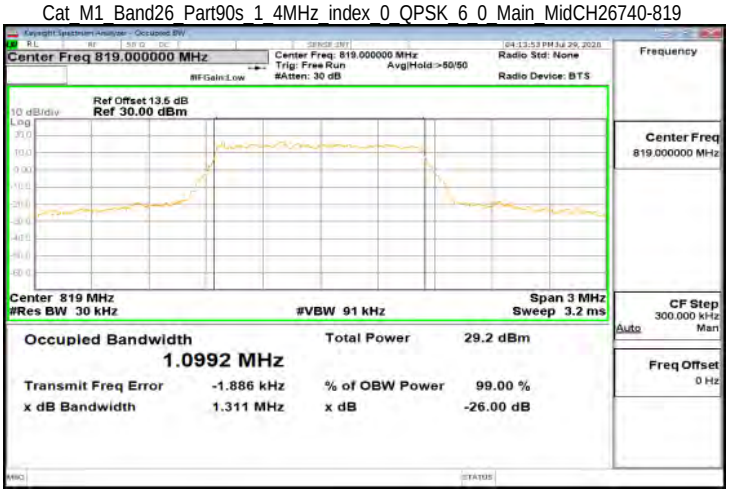

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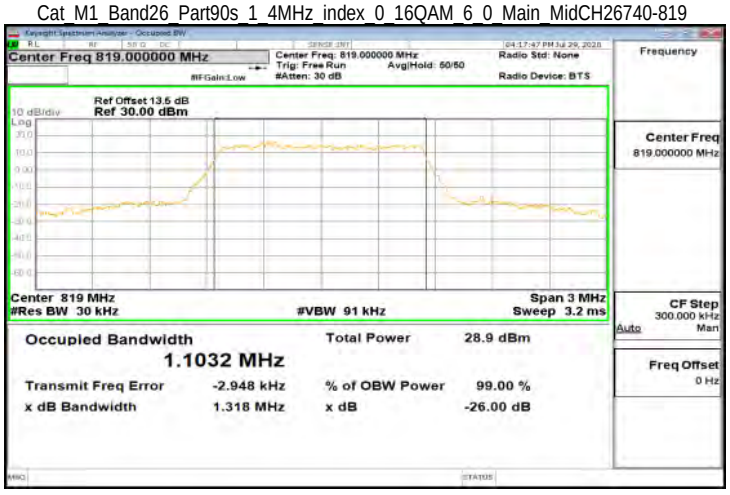
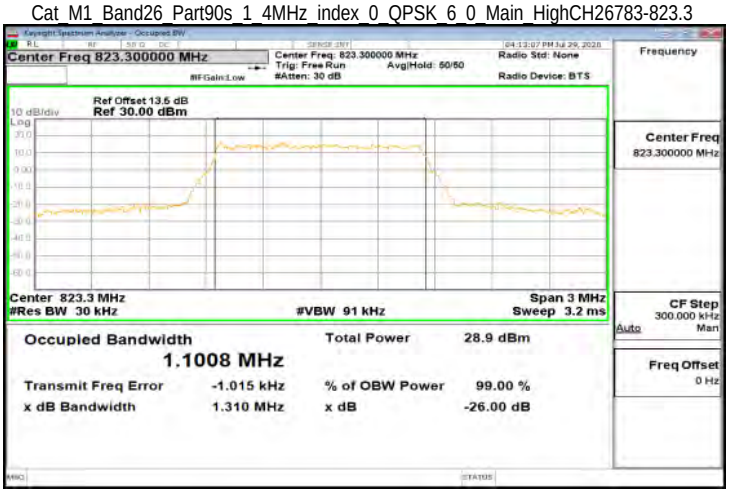


Cat_M1_Band26_Part90s_1_4MHz_index_0_QPSK_6_0_Main_HighCH26783-823.3



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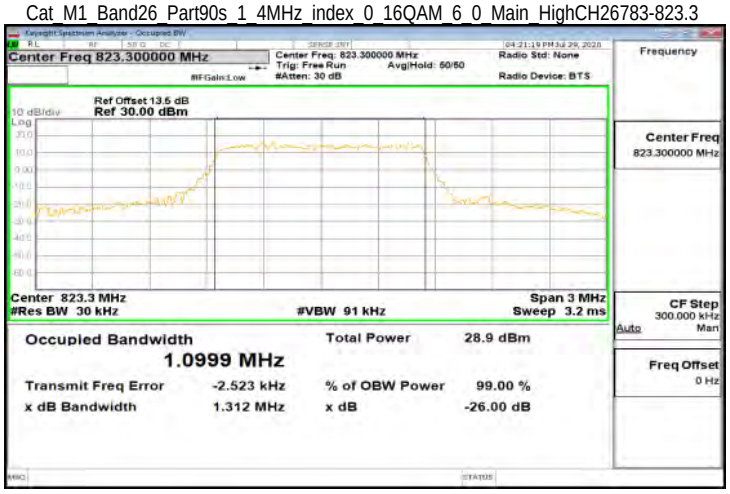

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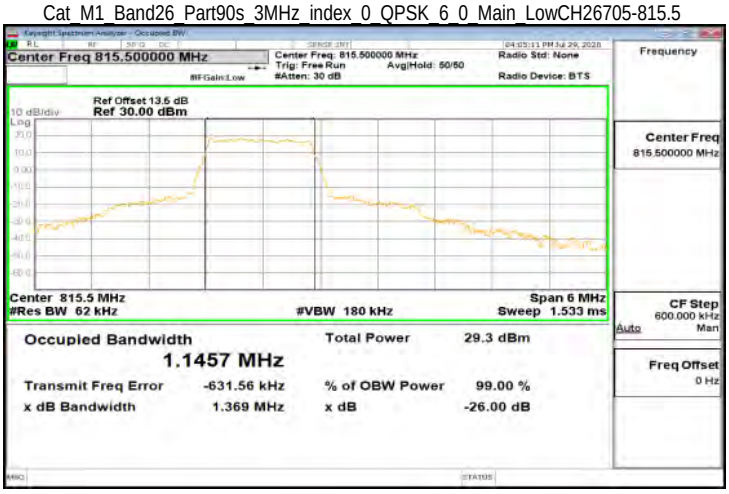
Cat_M1_Band26_Part90s_3MHz_index_0_QPSK_6_0_Main_LowCH26705-815.5



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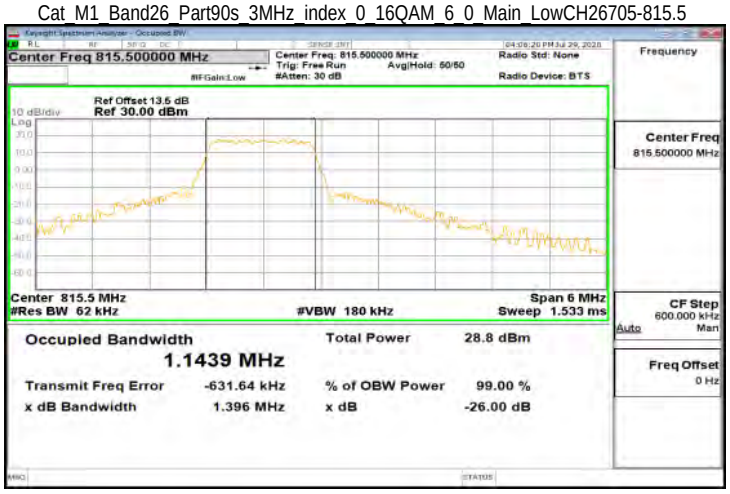

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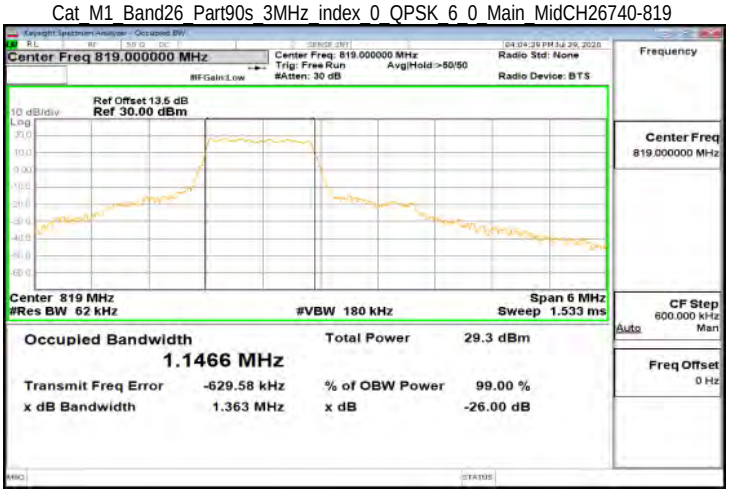

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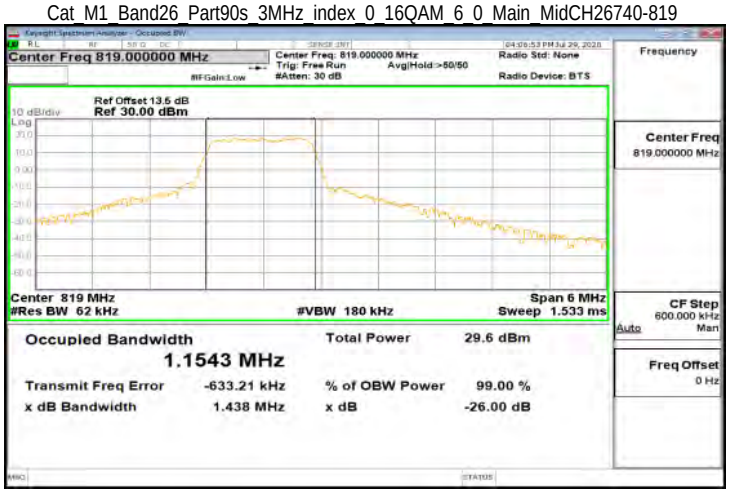

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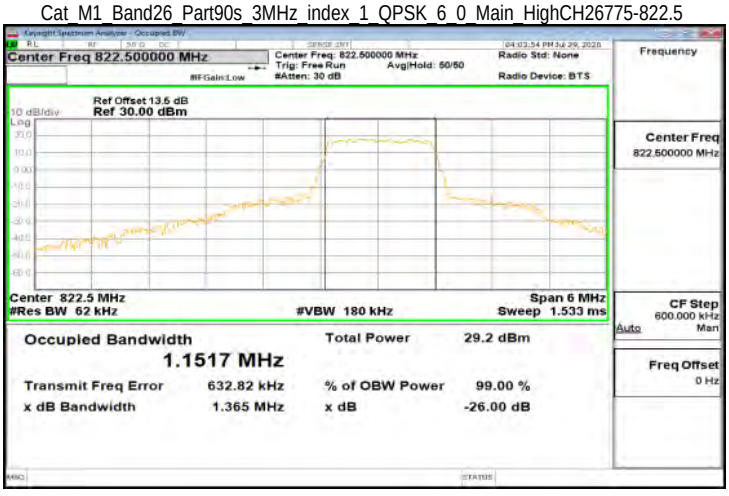

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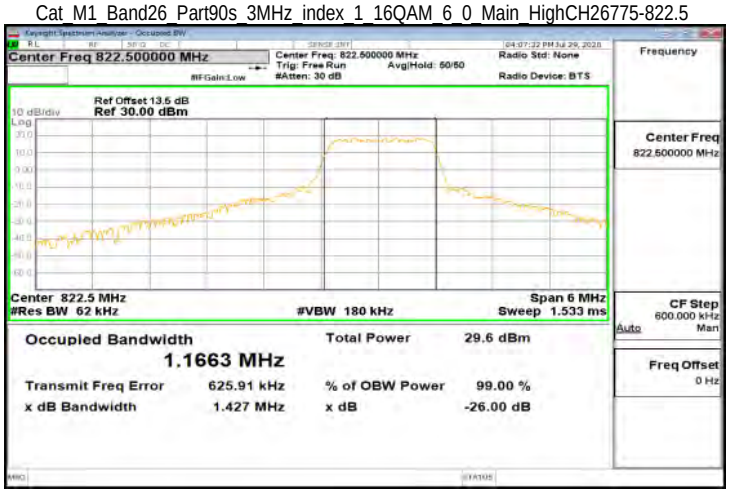

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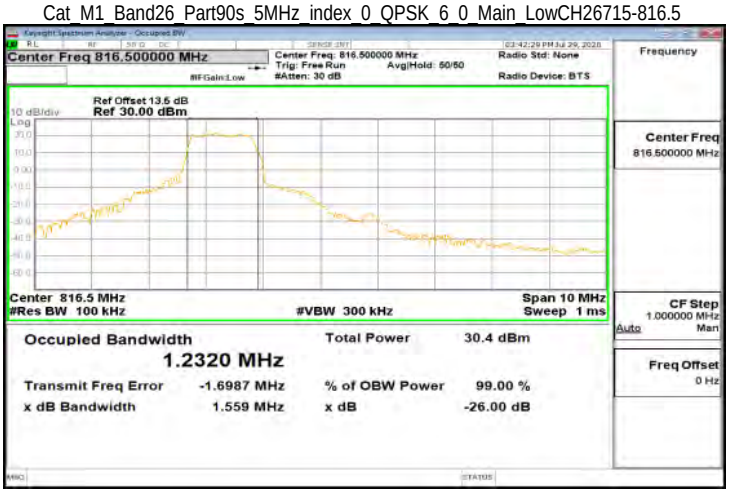
Cat_M1_Band26_Part90s_5MHz_index_0_QPSK_6_0_Main_LowCH26715-816.5



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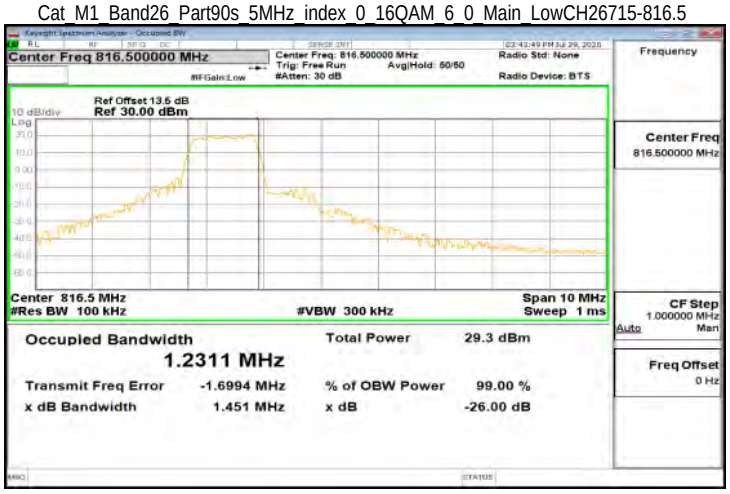

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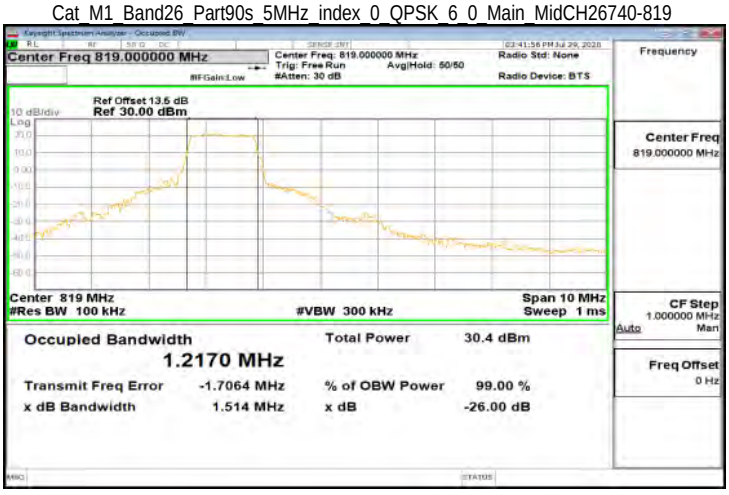

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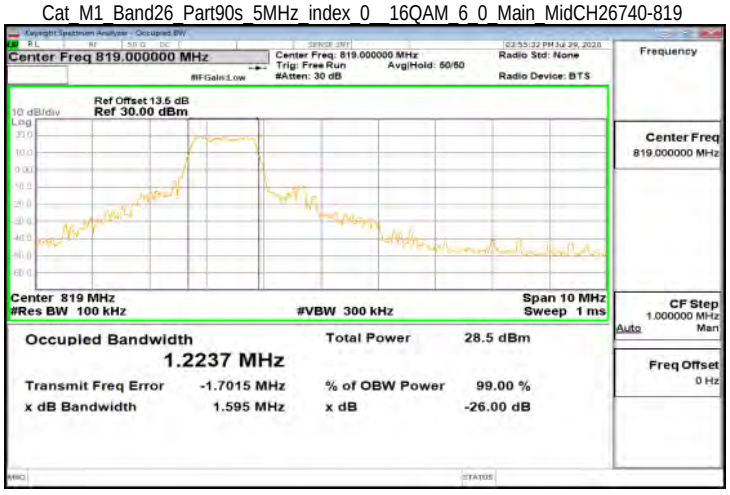

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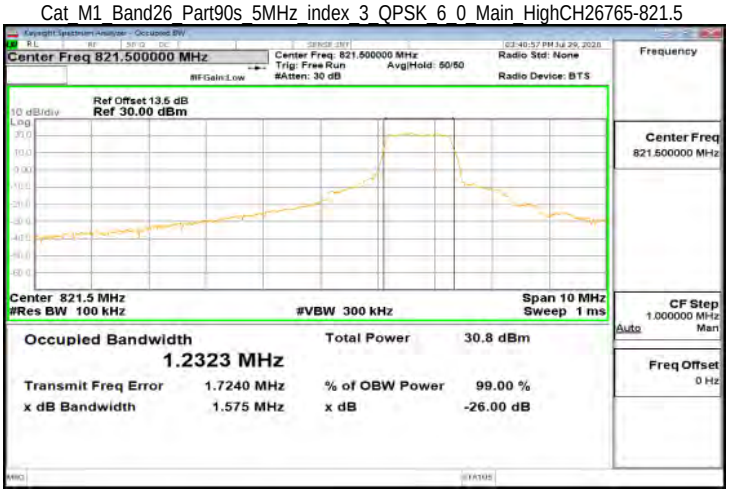

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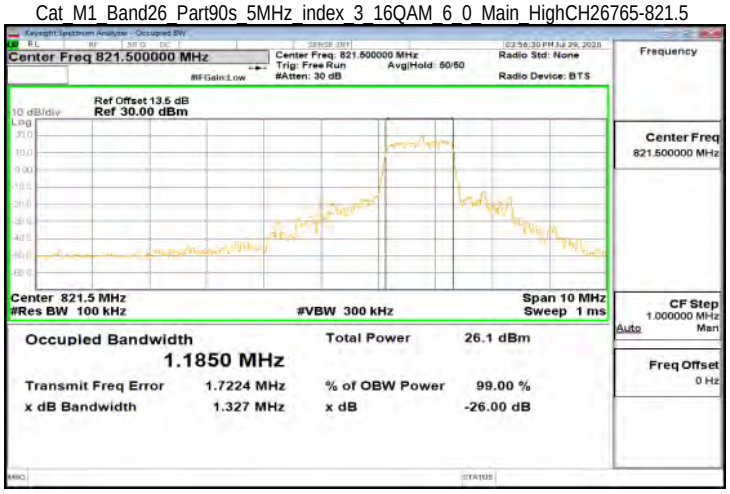

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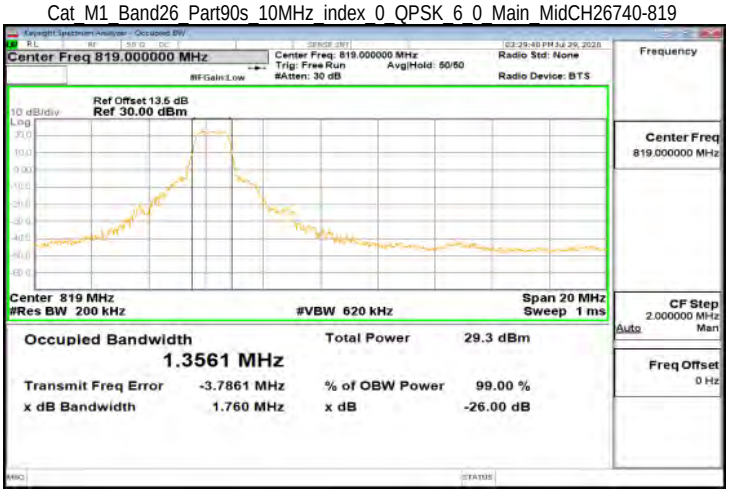
Cat_M1_Band26_Part90s_10MHz_index_0_QPSK_6_0_Main_MidCH26740-819



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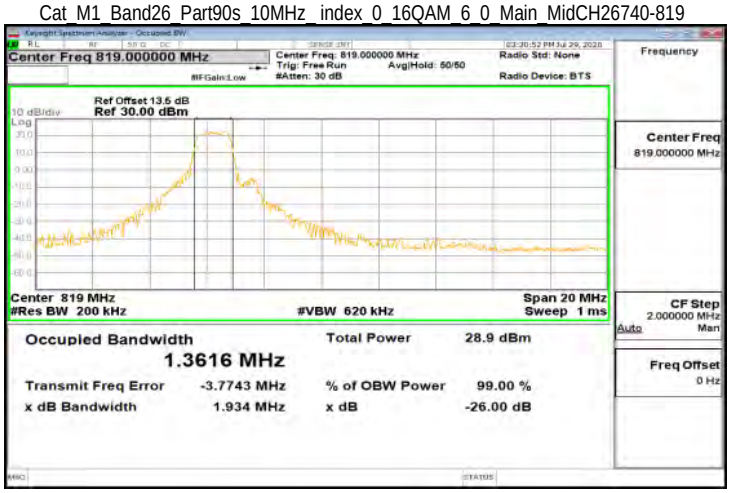

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8 OUT OF BAND EMISSION AT ANTENNA TERMINALS

8.1 Standard Applicable

FCC §22.917(a), §24.238(a), §27.53(h), §90.543(a)(1)
RSS-130 §4.7, RSS-132 §5.5, RSS-133 §6.5.1, RSS-139 §6.5, RSS-139 §6.6

Out of band emissions.The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC §27.53(g) for B12

Compliance for operations in the 600 MHz, 698-746 MHz, 746-758 MHz and the 776-788 MHz band with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

ISED RSS-130 §4.7.1 for B12

Compliance for operations in the 617-652 MHz, 663-698 MHz, 698-756 MHz and the 777-787 MHz band, the unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

FCC §27.53(h)(3) for B4

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

RSS-139 §6.6 for B4

In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block,Footnote 2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

FCC §90.691 Emission mask requirements for EA-based systems for B26

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

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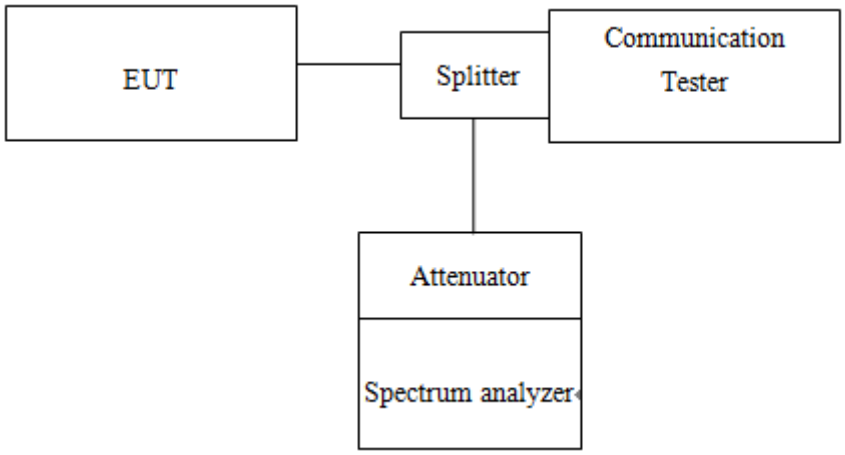
8.2 Test SET-UP



8.3 Measurement Procedure

8.3.1 Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

8.3.2 Band Edge

1. To connect Antenna Port of EUT to Spectrum.
2. The band edge of low and high channels for the highest RF powers was measured. Setting RBW ≥ 1% EBW.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

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8.4 Measurement Equipment Used

Conducted Emission (measured at antenna port) Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
DC Power Supply	Agilent	E3640A	MY40000811	12/23/2019	12/22/2020
Radio Communication Analyer	Anritsu	MT8821C	6261786084	01/18/2020	01/17/2021
Temperature Chamber	TERCHY	MHG-120LF	911009	05/20/2020	05/19/2021
EXA Spectrum Analyz-er	KEYSIGHT	N9010A	MY57120290	02/20/2020	02/19/2021
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	01/02/2020	01/01/2021

8.5 Measurement Result:

Refer to next pages.

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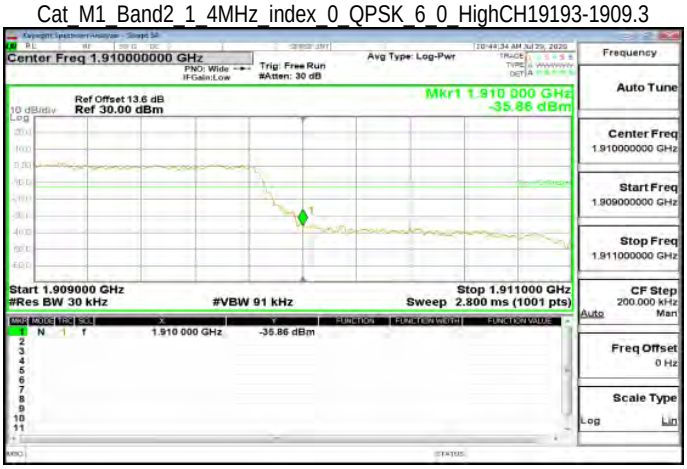
8.5.1 Bandedge

Cat_M1_Band2_1_4MHz_index_0_QPSK_1_0_LowCH18607-1850.7

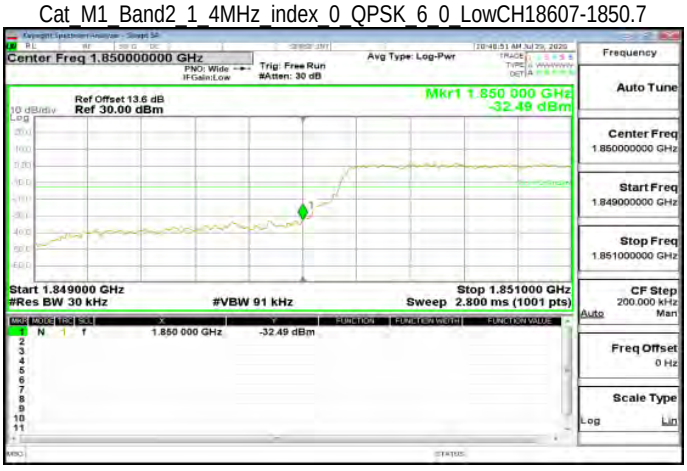
Cat_M1_Band2_1_4MHz_index_0_QPSK_6_0_HighCH19193-1909.3



Cat_M1_Band2_1_4MHz_index_0_QPSK_1_5_HighCH19193-1909.3

Cat_M1_Band2_3MHz_index_0_QPSK_1_0_LowCH18615-1851.5

Cat_M1_Band2_1_4MHz_index_0_QPSK_6_0_LowCH18607-1850.7



Cat_M1_Band2_3MHz_index_1_QPSK_1_5_HighCH19185-1908.5

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Cat_M1_Band2_3MHz_QPSK_index_0_6_0_LowCH18615-1851.5

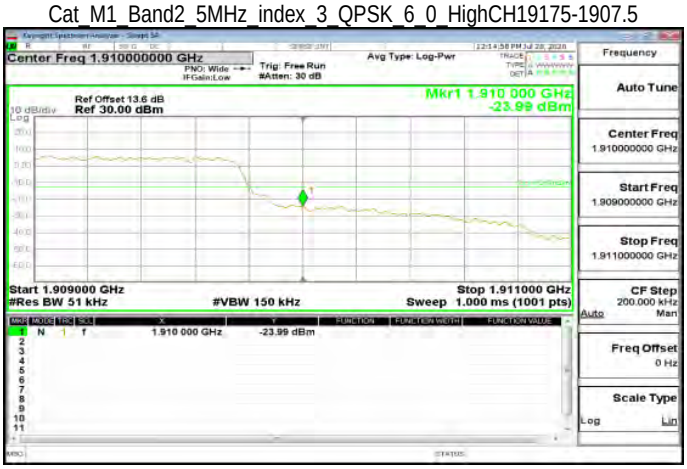
Cat_M1_Band2_5MHz_index_3_QPSK_1_5_HighCH19175-1907.5

Cat_M1_Band2_3MHz_index_1_QPSK_6_0_HighCH19185-1908.5

Cat_M1_Band2_5MHz_index_0_QPSK_6_0_LowCH18625-1852.5

Cat_M1_Band2_5MHz_index_0_QPSK_1_0_LowCH18625-1852.5

Cat_M1_Band2_5MHz_index_3_QPSK_6_0_HighCH19175-1907.5



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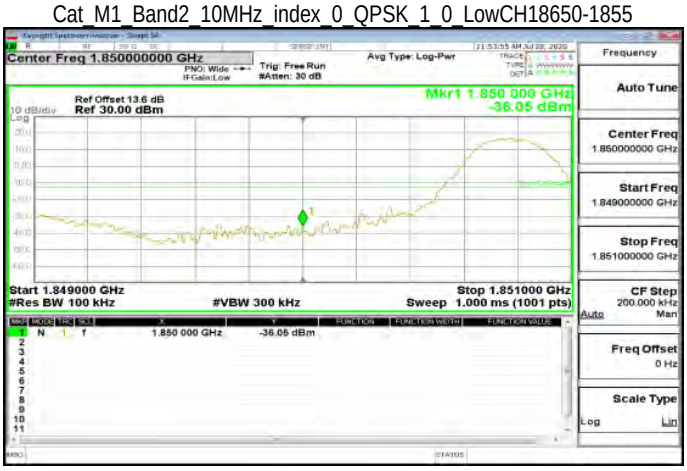
Cat_M1_Band2_10MHz_index_0_QPSK_1_0_LowCH18650-1855

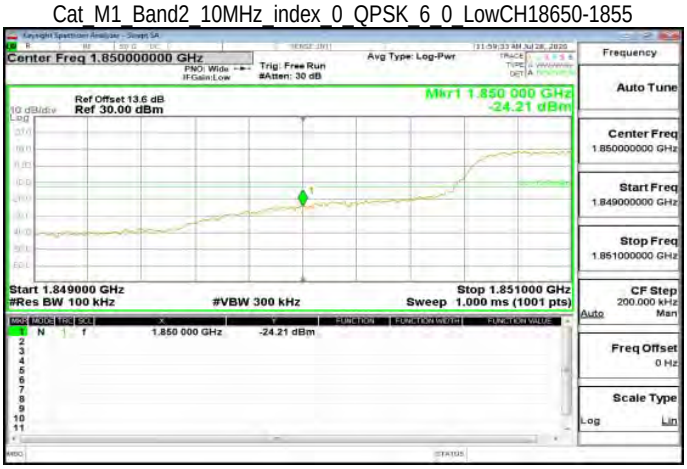


Cat_M1_Band2_10MHz_index_7_QPSK_6_0_HighCH19150-1905

Cat_M1_Band2_10MHz_index_7_QPSK_1_5_HighCH19150-1905

Cat_M1_Band2_15MHz_index_0_QPSK_1_0_LowCH18675-1857.5

Cat_M1_Band2_10MHz_index_0_QPSK_6_0_LowCH18650-1855



Cat_M1_Band2_15MHz_index_11_QPSK_1_5_HighCH19125-1902.5

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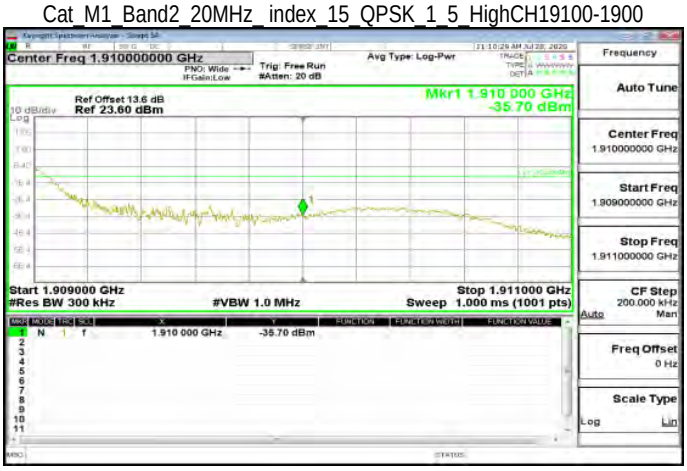
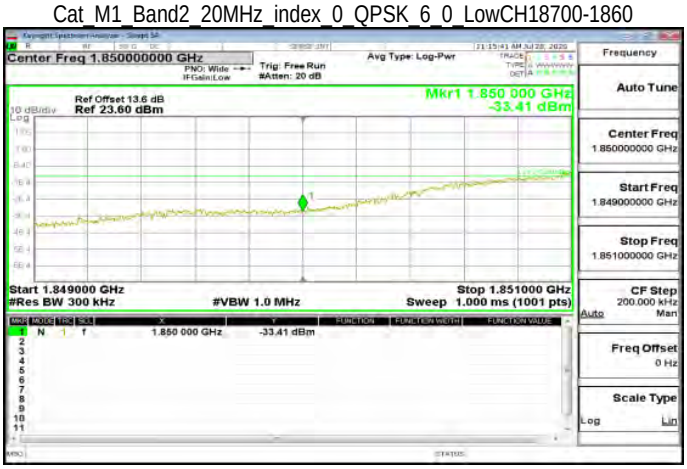
Cat_M1_Band2_15MHz_index_0_QPSK_6_0_LowCH18675-1857.5

Cat_M1_Band2_20MHz_ index_15_QPSK_1_5_HighCH19100-1900

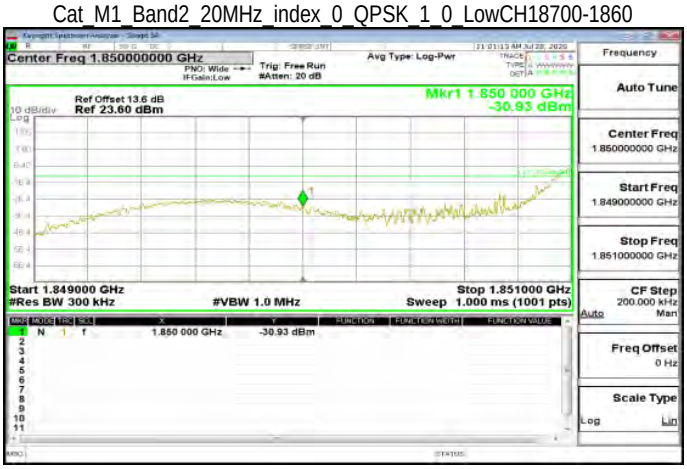


Cat_M1_Band2_15MHz_index_11_QPSK_6_0_HighCH19125-1902.5

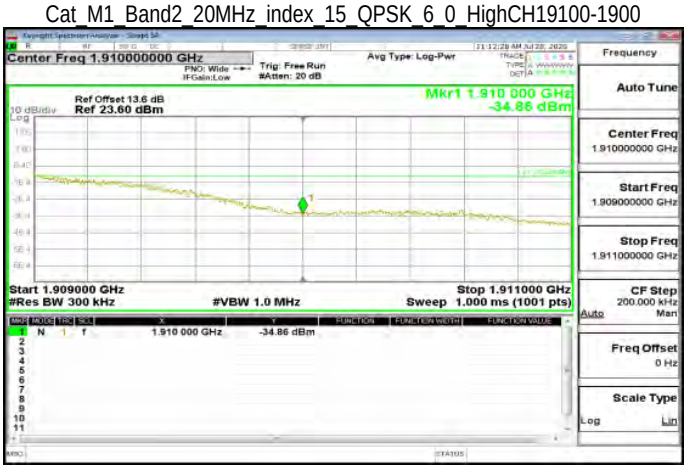
Cat_M1_Band2_20MHz_index_0_QPSK_6_0_LowCH18700-1860



Cat_M1_Band2_20MHz_index_0_QPSK_1_0_LowCH18700-1860



Cat_M1_Band2_20MHz_index_15_QPSK_6_0_HighCH19100-1900



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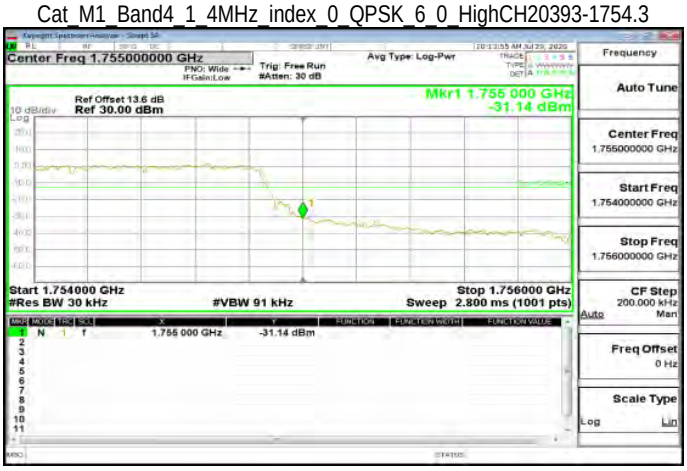
Cat_M1_Band4_1_4MHz_index_0_QPSK_1_0_LowCH19957-1710.7

Cat_M1_Band4_1_4MHz_index_0_QPSK_6_0_HighCH20393-1754.3



Cat_M1_Band4_1_4MHz_index_0_QPSK_1_5_HighCH20393-1754.3

Cat_M1_Band4_3MHz_index_0QPSK_1_0_LowCH19965-1711.5

Cat_M1_Band4_1_4MHz_index_0_QPSK_6_0_LowCH19957-1710.7

Cat_M1_Band4_3MHz_index_1_QPSK_1_5_HighCH20385-1753.5

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Cat_M1_Band4_3MHz_index_0_QPSK_6_0_LowCH19965-1711.5

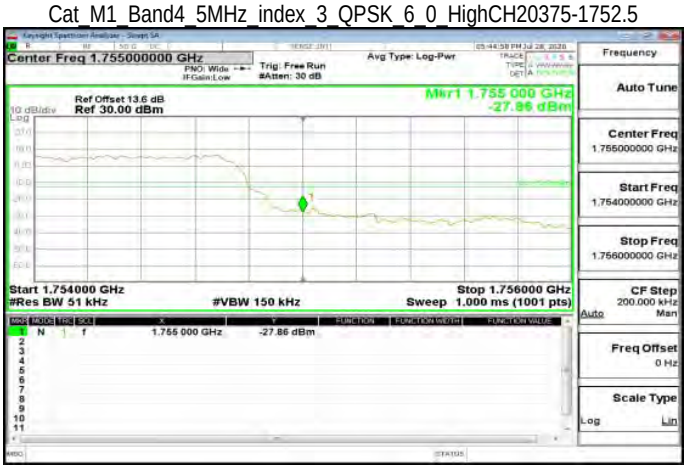
Cat_M1_Band4_5MHz_index_3_QPSK_1_5_HighCH20375-1752.5

Cat_M1_Band4_3MHz_index_1_QPSK_6_0_HighCH20385-1753.5

Cat_M1_Band4_5MHz_index_0_QPSK_6_0_LowCH19975-1712.5

Cat_M1_Band4_5MHz_index_0_QPSK_1_0_LowCH19975-1712.5

Cat_M1_Band4_5MHz_index_3_QPSK_6_0_HighCH20375-1752.5



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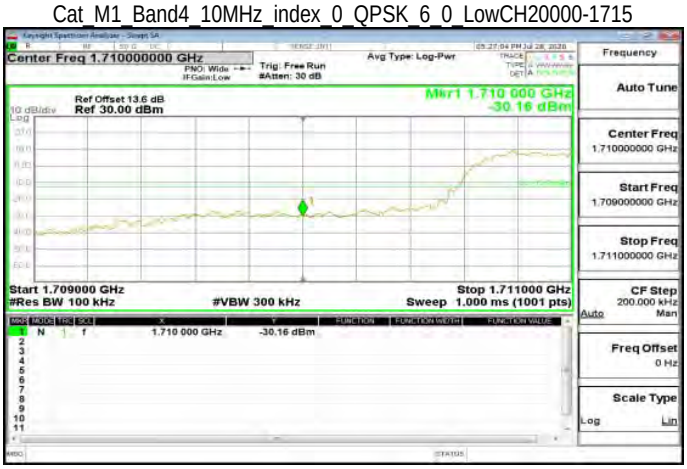
Cat_M1_Band4_10MHz_index_0_QPSK_1_0_LowCH20000-1715

Cat_M1_Band4_10MHz_index_7_QPSK_6_0_HighCH20350-1750

Cat_M1_Band4_10MHz_index_7_QPSK_1_5_HighCH20350-1750

Cat_M1_Band4_15MHz_index_0_QPSK_1_0_LowCH20025-1717.5

Cat_M1_Band4_10MHz_index_0_QPSK_6_0_LowCH20000-1715



Cat_M1_Band4_15MHz_index_11_QPSK_1_5_HighCH20325-1747.5

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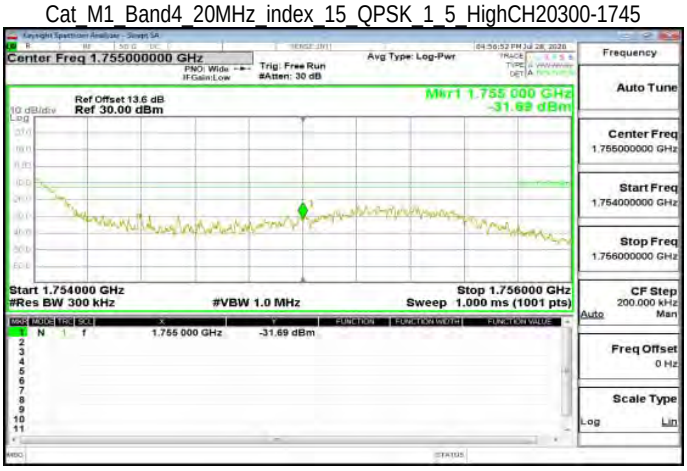
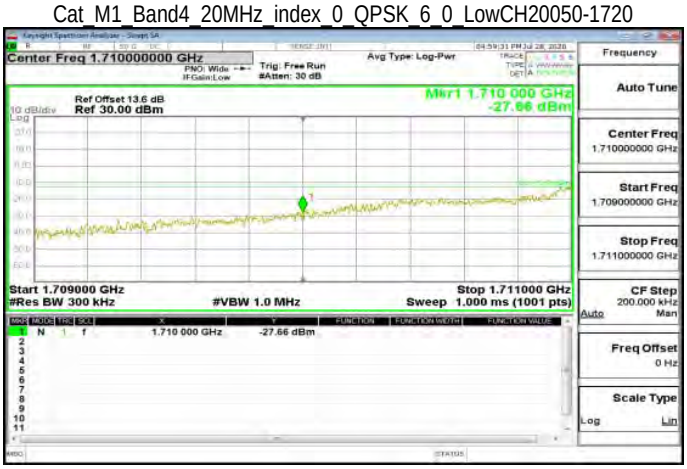
Cat_M1_Band4_15MHz_index_0_QPSK_6_0_LowCH20025-1717.5

Cat_M1_Band4_20MHz_index_15_QPSK_1_5_HighCH20300-1745



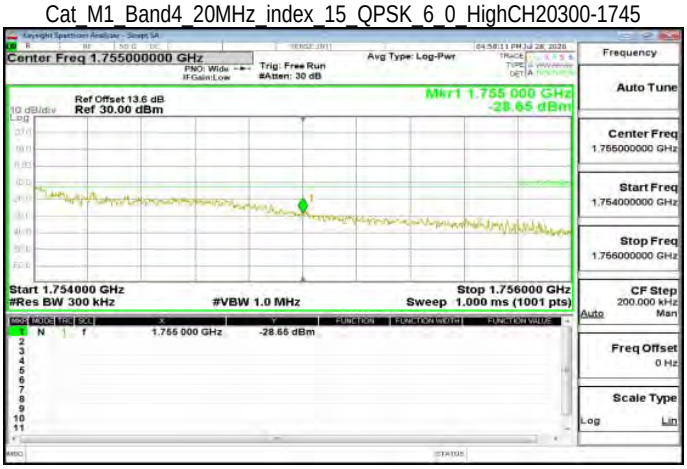
Cat_M1_Band4_15MHz_index_11_QPSK_6_0_HighCH20325-1747.5

Cat_M1_Band4_20MHz_index_0_QPSK_6_0_LowCH20050-1720



Cat_M1_Band4_20MHz_index_0_QPSK_1_0_LowCH20050-1720

Cat_M1_Band4_20MHz_index_15_QPSK_6_0_HighCH20300-1745



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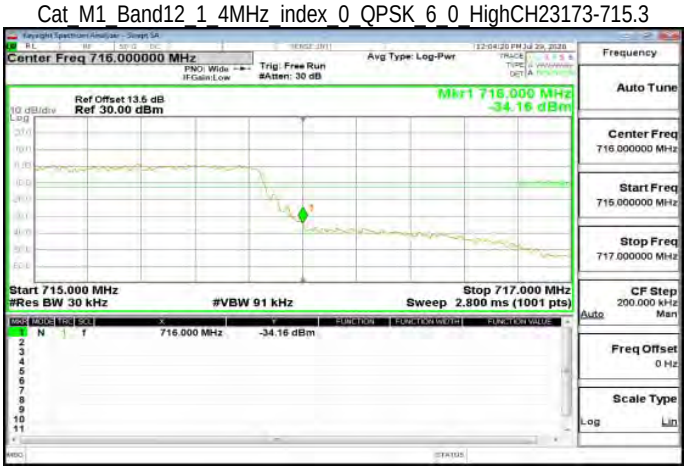
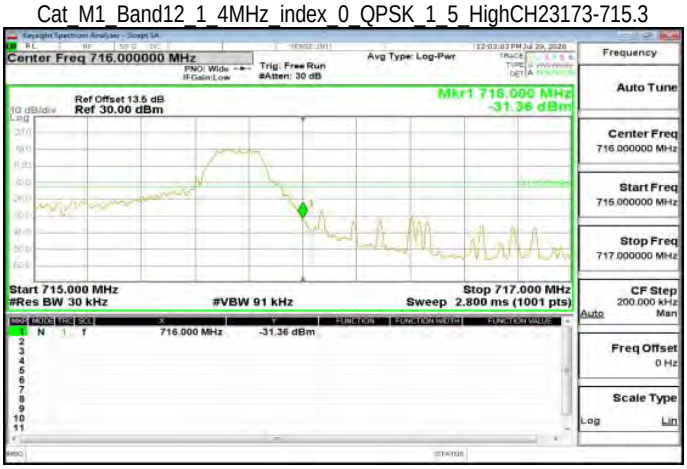
Cat_M1_Band12_1_4MHz_index_0_QPSK_1_0_LowCH23017-699.7

Cat_M1_Band12_1_4MHz_index_0_QPSK_6_0_HighCH23173-715.3



Cat_M1_Band12_1_4MHz_index_0_QPSK_1_5_HighCH23173-715.3



Cat_M1_Band12_3MHz_index_0_QPSK_1_0_LowCH23025-700.5

Cat_M1_Band12_1_4MHz_index_0_QPSK_6_0_LowCH23017-699.7

Cat_M1_Band12_3MHz_index_1_QPSK_1_5_HighCH23165-714.5

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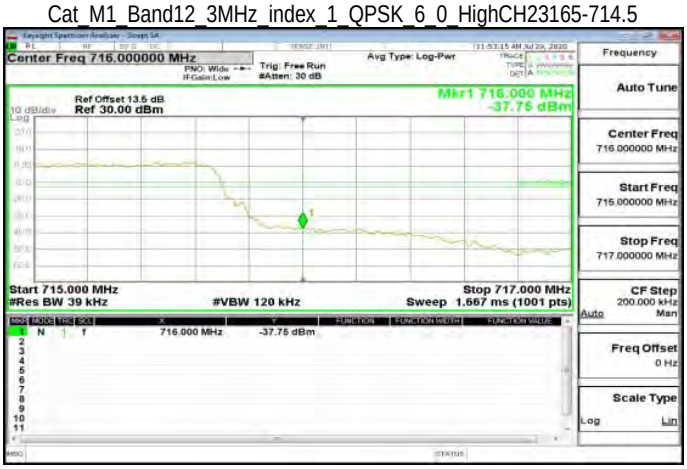
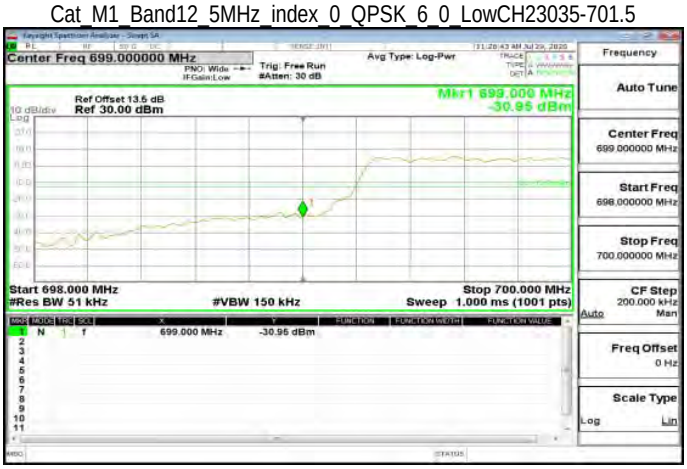
Cat_M1_Band12_3MHz_index_0_QPSK_6_0_LowCH23025-700.5

Cat_M1_Band12_5MHz_index_3_QPSK_1_5_HighCH23155-713.5

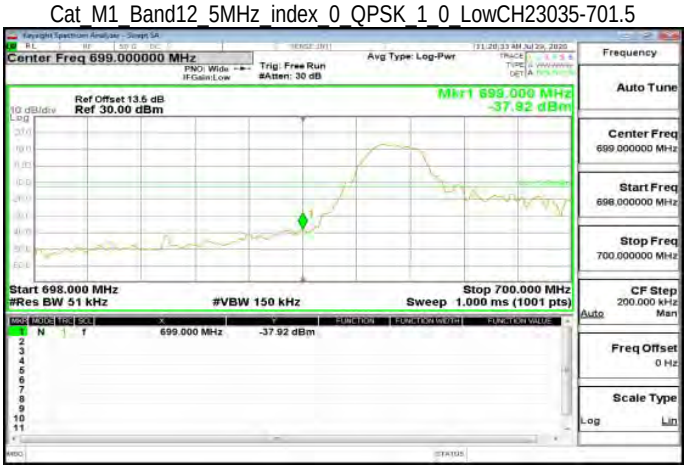
Cat_M1_Band12_3MHz_index_1_QPSK_6_0_HighCH23165-714.5



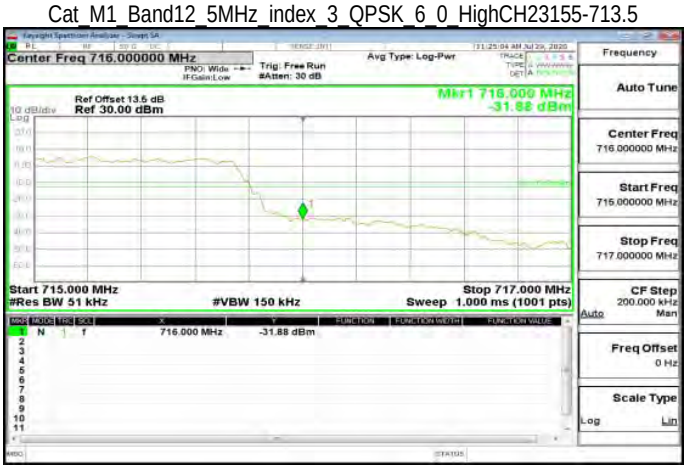
Cat_M1_Band12_5MHz_index_0_QPSK_6_0_LowCH23035-701.5



Cat_M1_Band12_5MHz_index_0_QPSK_1_0_LowCH23035-701.5



Cat_M1_Band12_5MHz_index_3_QPSK_6_0_HighCH23155-713.5



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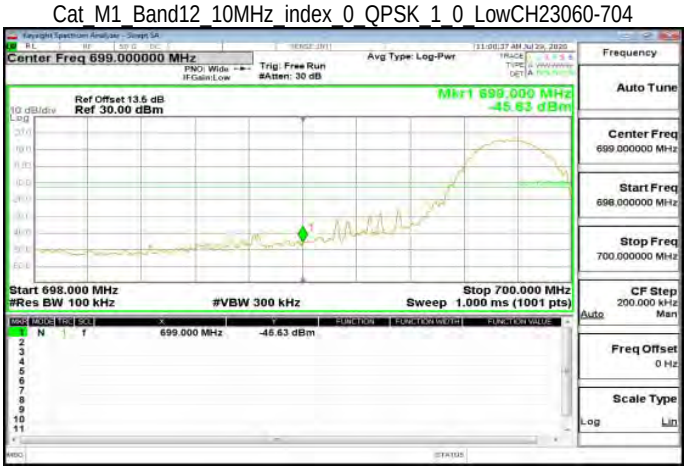
Cat_M1_Band12_10MHz_index_0_QPSK_1_0_LowCH23060-704



Cat_M1_Band12_10MHz_index_7_QPSK_6_0_HighCH23130-711

Cat_M1_Band12_10MHz_index_7_QPSK_1_5_HighCH23130-711

Cat_M1_Band26_1_4MHz_index_0_QPSK_1_0_LowCH26797-824.7

Cat_M1_Band12_10MHz_index_0_QPSK_6_0_LowCH23060-704

Cat_M1_Band26_1_4MHz_index_0_QPSK_1_5_HighCH27033-848.3

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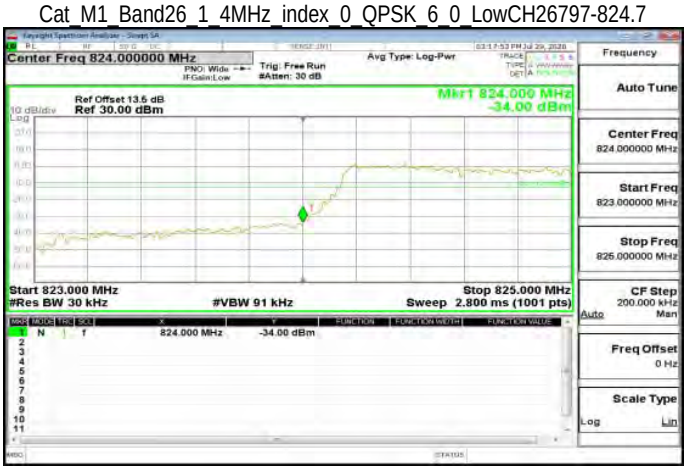
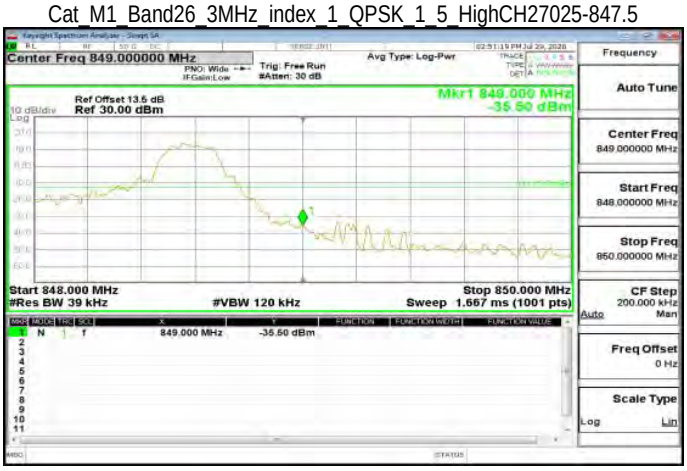
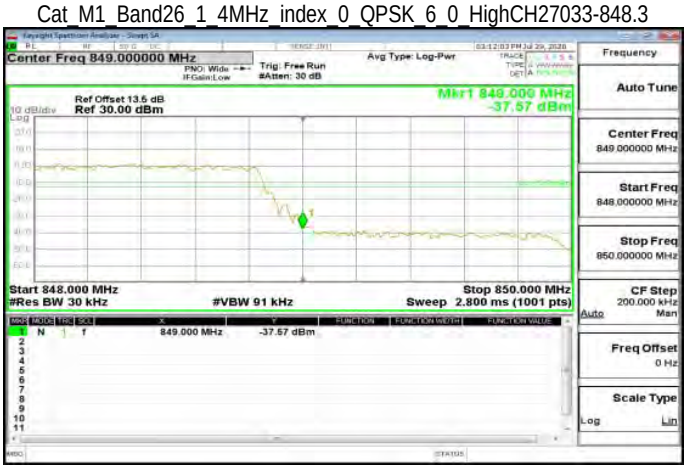
Cat_M1_Band26_1_4MHz_index_0_QPSK_6_0_LowCH26797-824.7



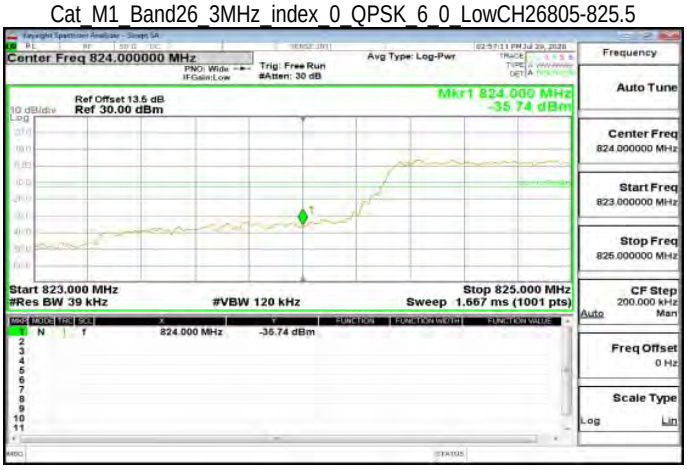
Cat_M1_Band26_3MHz_index_1_QPSK_1_5_HighCH27025-847.5



Cat_M1_Band26_1_4MHz_index_0_QPSK_6_0_HighCH27033-848.3

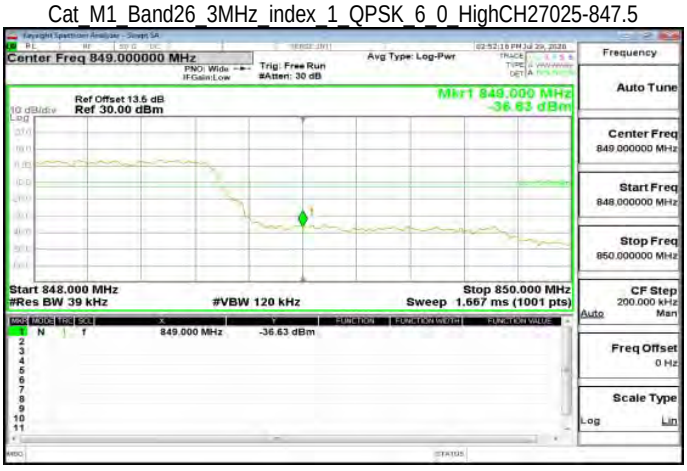


Cat_M1_Band26_3MHz_index_0_QPSK_6_0_LowCH26805-825.5



Cat_M1_Band26_3MHz_index_0_QPSK_1_0_LowCH26805-825.5

Cat_M1_Band26_3MHz_index_1_QPSK_6_0_HighCH27025-847.5



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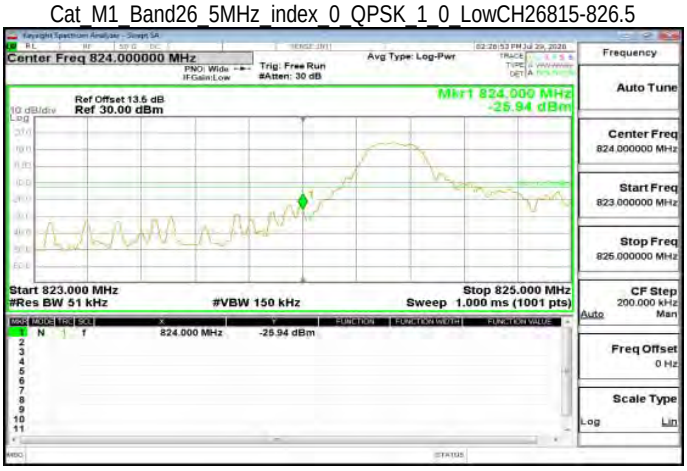
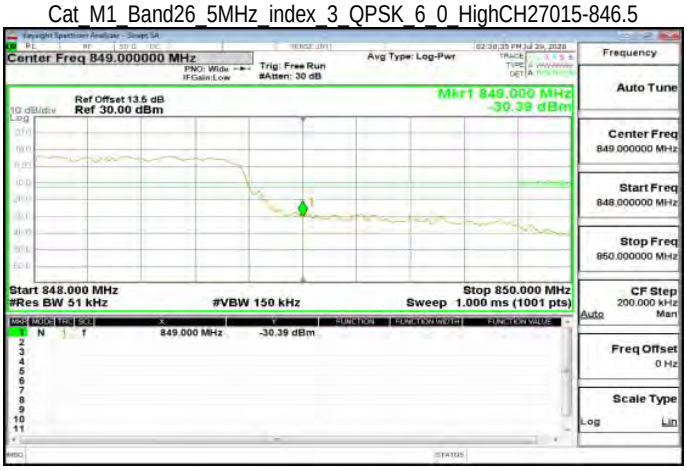
Cat_M1_Band26_5MHz_index_0_QPSK_1_0_LowCH26815-826.5



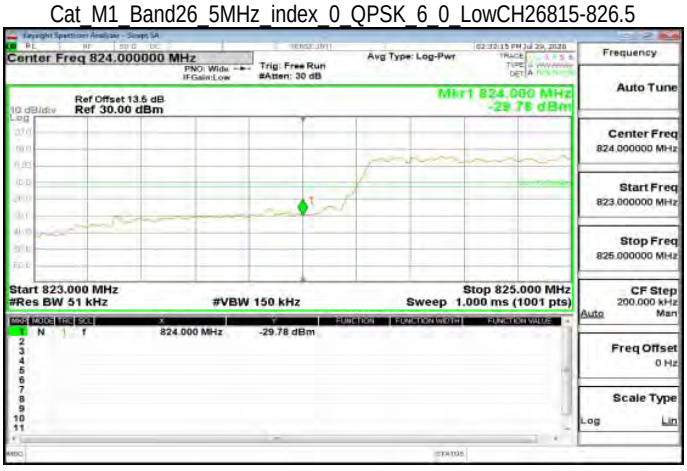
Cat_M1_Band26_5MHz_index_3_QPSK_6_0_HighCH27015-846.5



Cat_M1_Band26_5MHz_index_3_QPSK_1_5_HighCH27015-846.5

Cat_M1_Band26_10MHz_index_0_QPSK_1_0_LowCH26840-829

Cat_M1_Band26_5MHz_index_0_QPSK_6_0_LowCH26815-826.5



Cat_M1_Band26_10MHz_index_7_QPSK_1_5_HighCH26990-844

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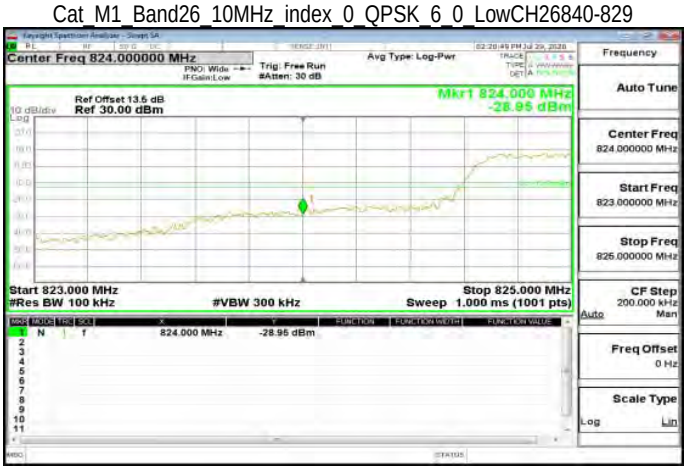
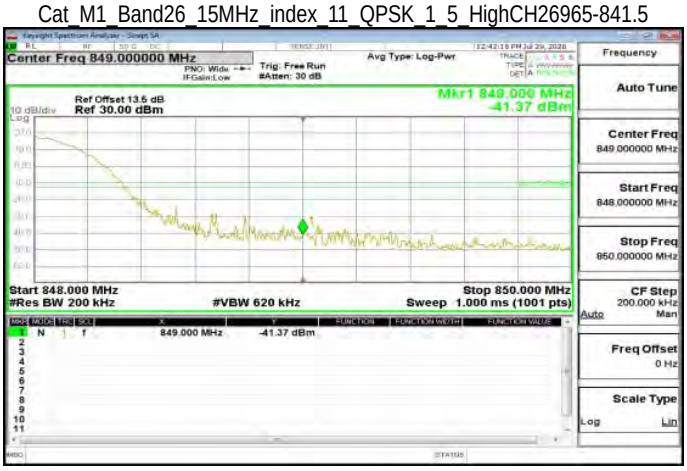
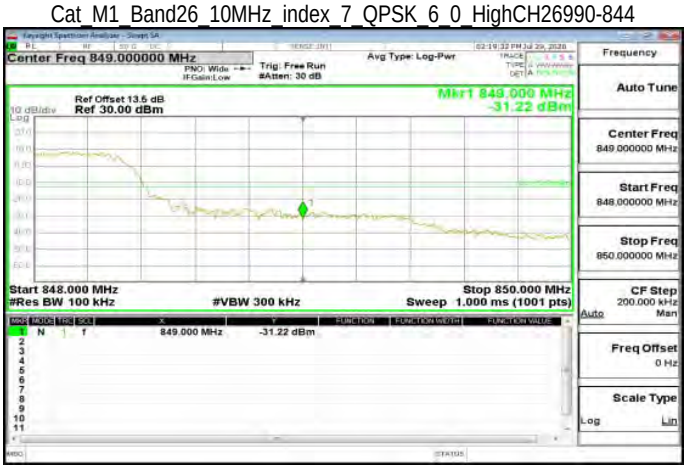
Cat_M1_Band26_10MHz_index_0_QPSK_6_0_LowCH26840-829



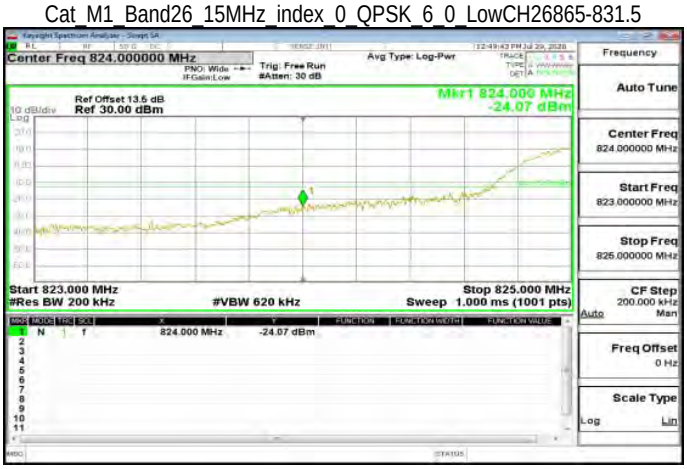
Cat_M1_Band26_15MHz_index_11_QPSK_1_5_HighCH26965-841.5



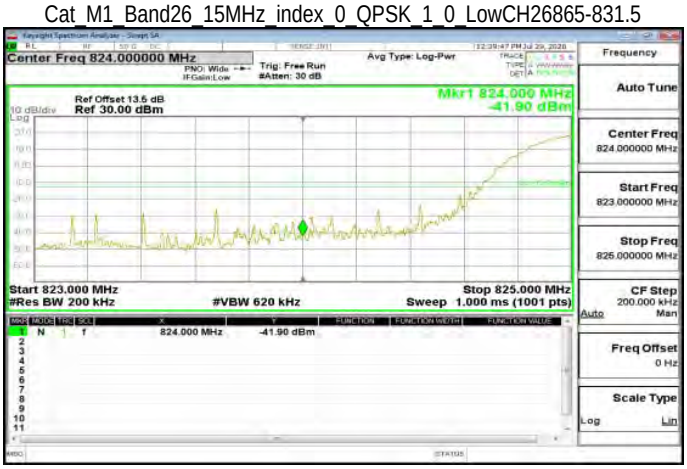
Cat_M1_Band26_10MHz_index_7_QPSK_6_0_HighCH26990-844



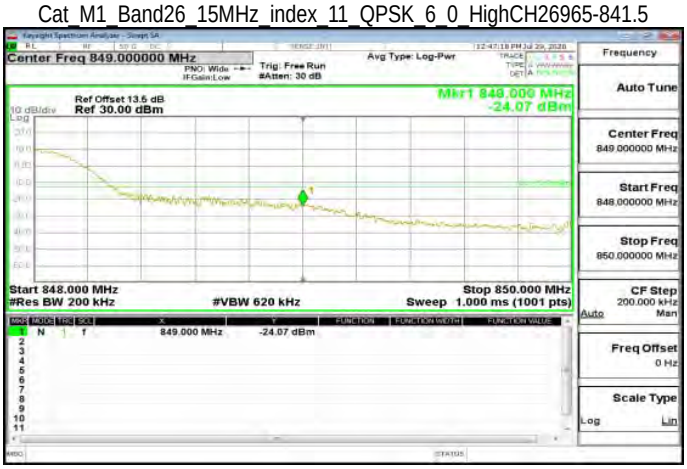
Cat_M1_Band26_15MHz_index_0_QPSK_6_0_LowCH26865-831.5



Cat_M1_Band26_15MHz_index_0_QPSK_1_0_LowCH26865-831.5



Cat_M1_Band26_15MHz_index_11_QPSK_6_0_HighCH26965-841.5



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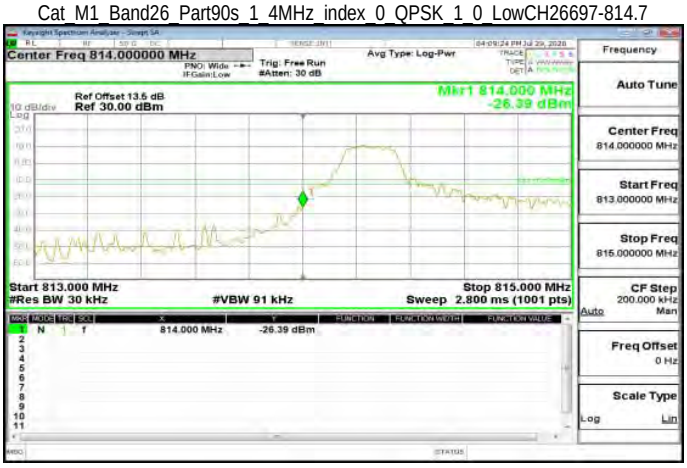
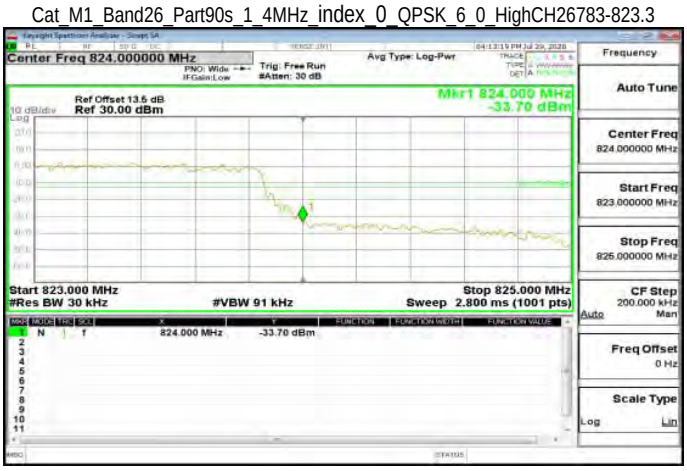
Cat_M1_Band26_Part90s_1_4MHz_index_0_QPSK_1_0_LowCH26697-814.7



Cat_M1_Band26_Part90s_1_4MHz_index_0_QPSK_6_0_HighCH26783-823.3



Cat_M1_Band26_Part90s_1_4MHz_index_0_QPSK_1_5_HighCH26783-823.3

Cat_M1_Band26_Part90s_3MHz_index_0_QPSK_1_0_LowCH26705-815.5

Cat_M1_Band26_Part90s_1_4MHz_index_0_QPSK_6_0_LowCH26697-814.7

Cat_M1_Band26_Part90s_3MHz_index_1_QPSK_1_5_HighCH26775-822.5

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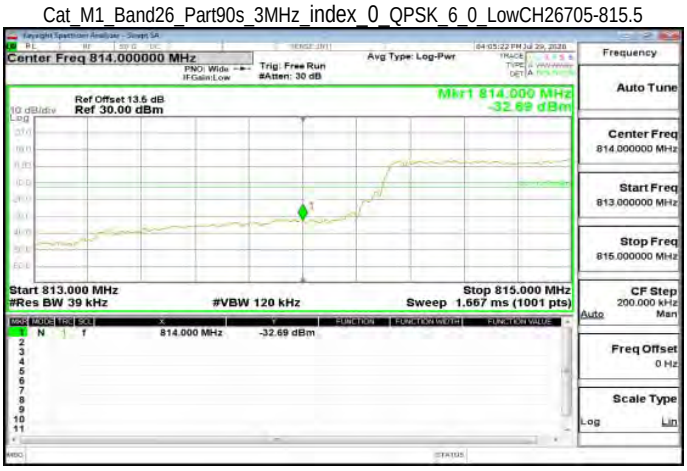
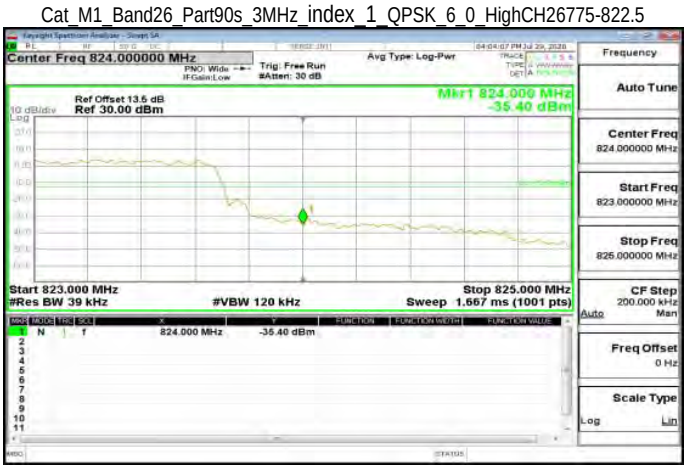
Cat_M1_Band26_Part90s_3MHz_index_0_QPSK_6_0_LowCH26705-815.5

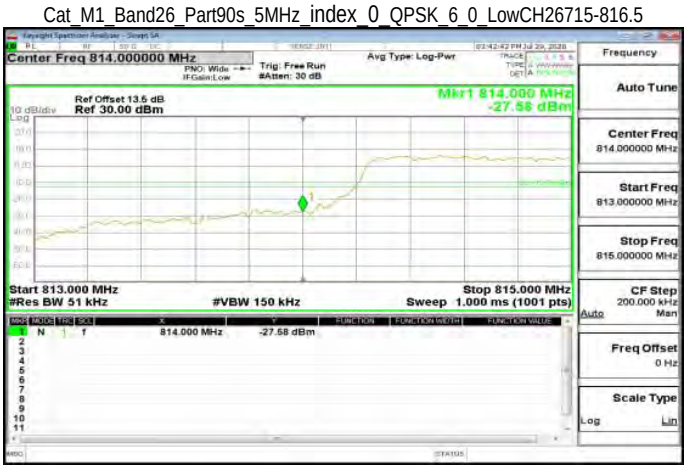


Cat_M1_Band26_Part90s_5MHz_index_3_QPSK_1_5_HighCH26765-821.5

Cat_M1_Band26_Part90s_3MHz_index_1_QPSK_6_0_HighCH26775-822.5

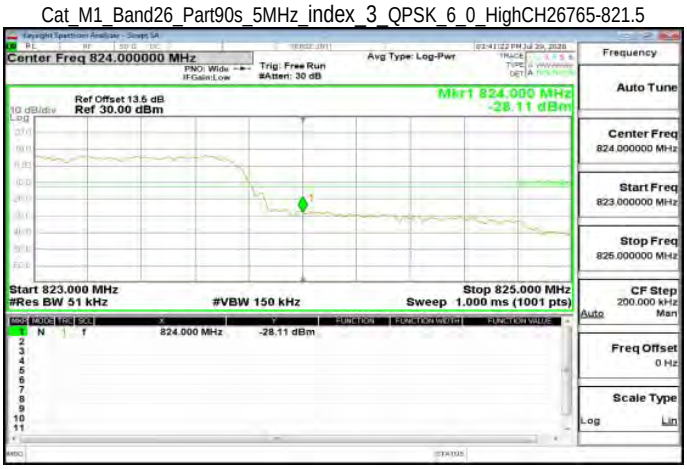


Cat_M1_Band26_Part90s_5MHz_index_0_QPSK_6_0_LowCH26715-816.5



Cat_M1_Band26_Part90s_5MHz_index_0_QPSK_1_0_LowCH26715-816.5

Cat_M1_Band26_Part90s_5MHz_index_3_QPSK_6_0_HighCH26765-821.5



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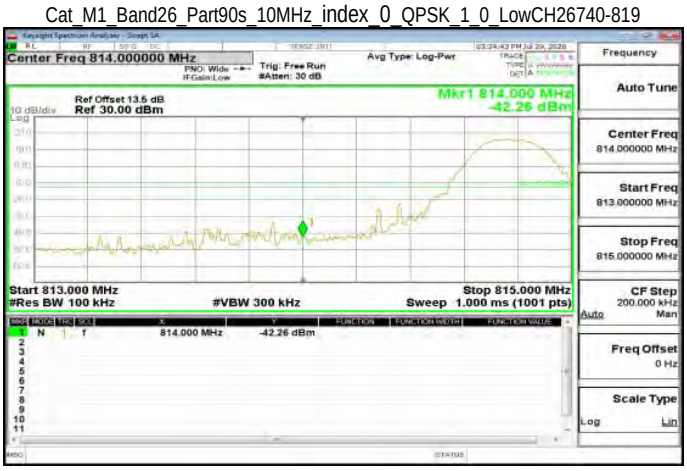
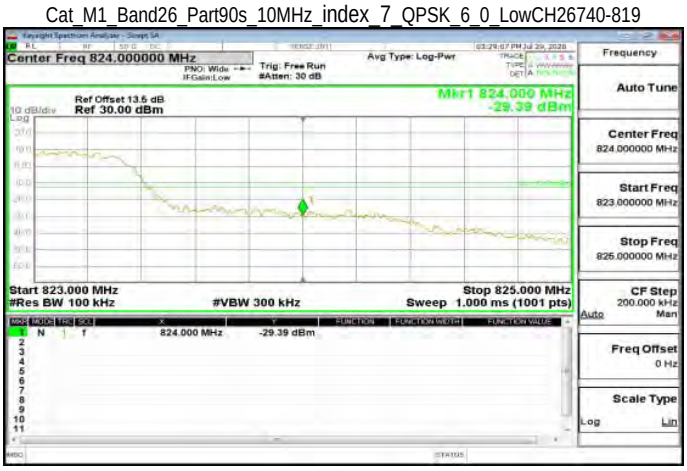
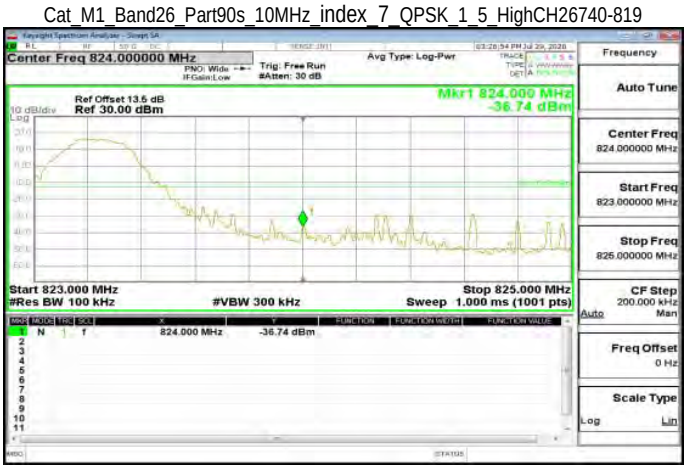
Cat_M1_Band26_Part90s_10MHz_index_0_QPSK_1_0_LowCH26740-819



Cat_M1_Band26_Part90s_10MHz_index_7_QPSK_6_0_LowCH26740-819



Cat_M1_Band26_Part90s_10MHz_index_7_QPSK_1_5_HighCH26740-819



Cat_M1_Band26_Part90s_10MHz_index_0_QPSK_6_0_HighCH26740-819

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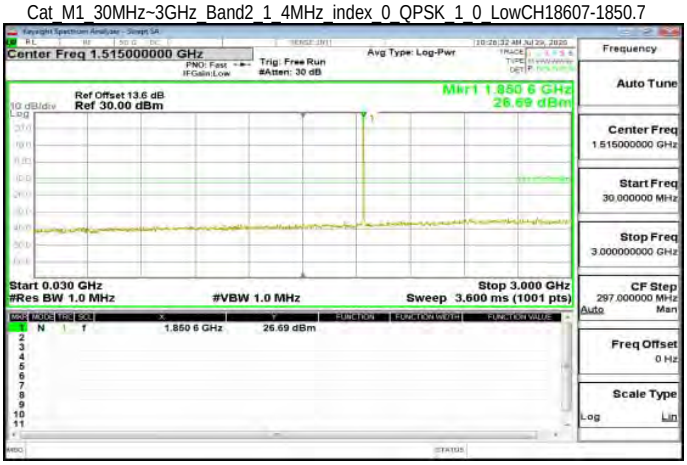
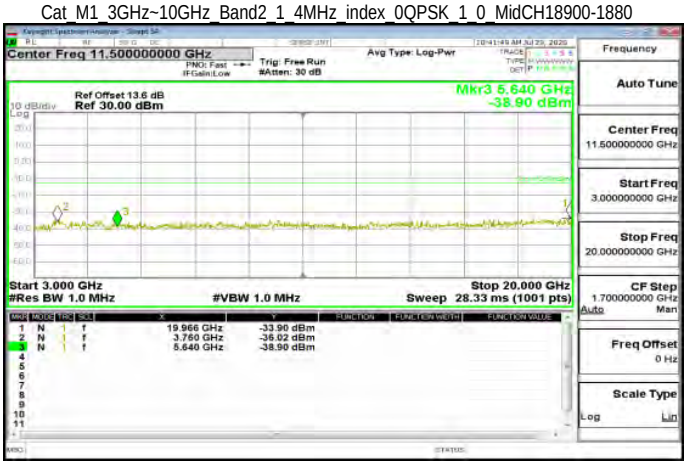
8.5.2 Spurious Emission

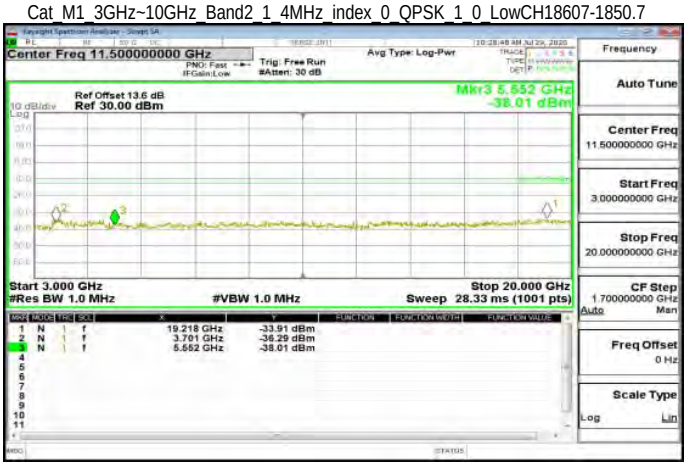
Cat_M1_30MHz~3GHz_Band2_1_4MHz_index_0_QPSK_1_0_LowCH18607-1850.7



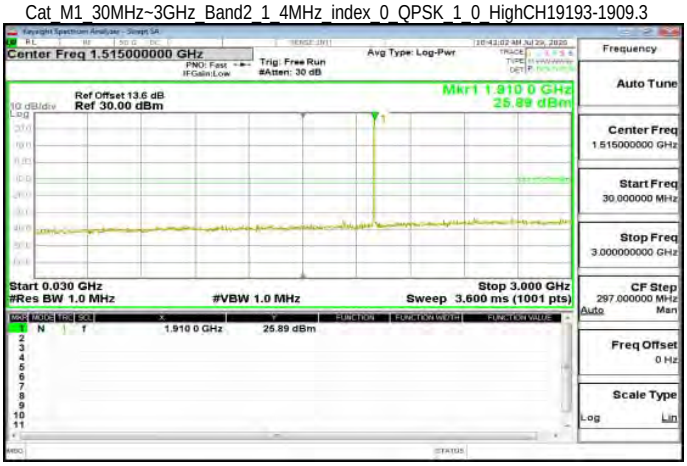
Cat_M1_3GHz~10GHz_Band2_1_4MHz_index_0QPSK_1_0_MidCH18900-1880



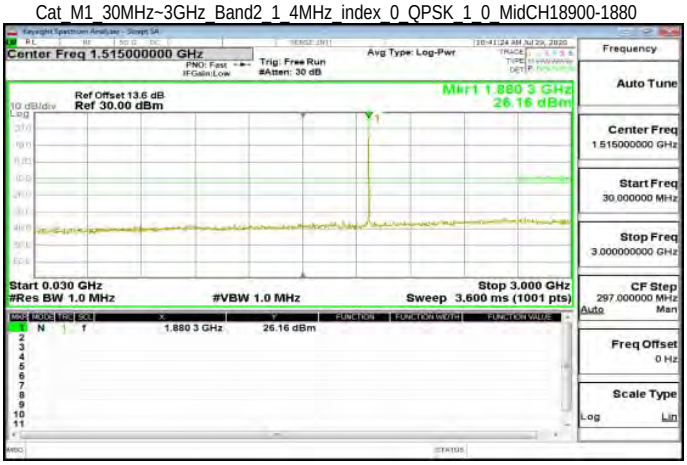
Cat_M1_3GHz~10GHz_Band2_1_4MHz_index_0_QPSK_1_0_LowCH18607-1850.7



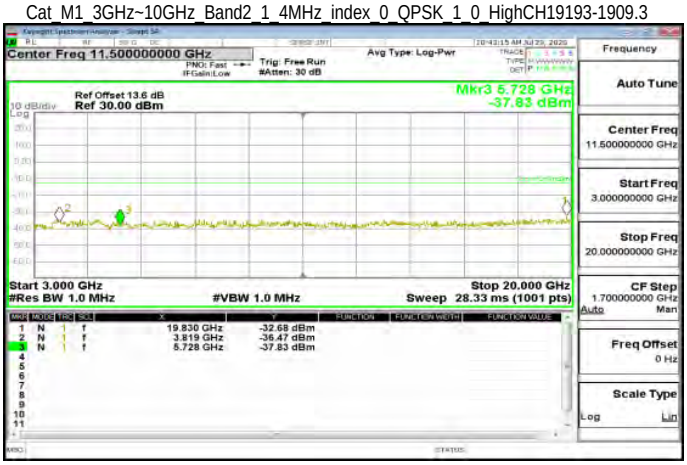
Cat_M1_30MHz~3GHz_Band2_1_4MHz_index_0_QPSK_1_0_HighCH19193-1909.3



Cat_M1_30MHz~3GHz_Band2_1_4MHz_index_0_QPSK_1_0_MidCH18900-1880



Cat_M1_3GHz~10GHz_Band2_1_4MHz_index_0_QPSK_1_0_HighCH19193-1909.3



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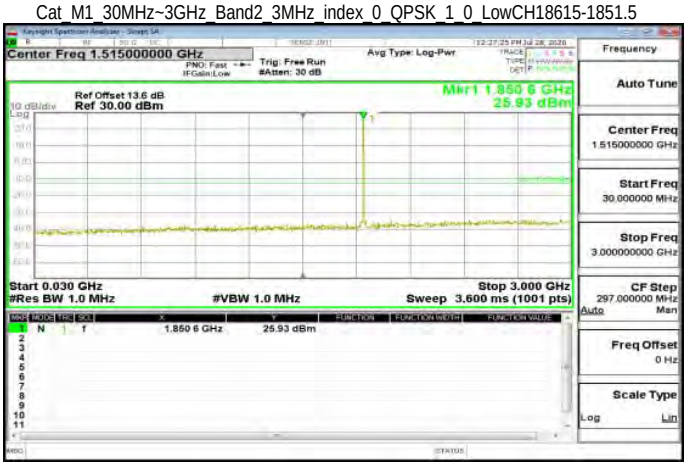
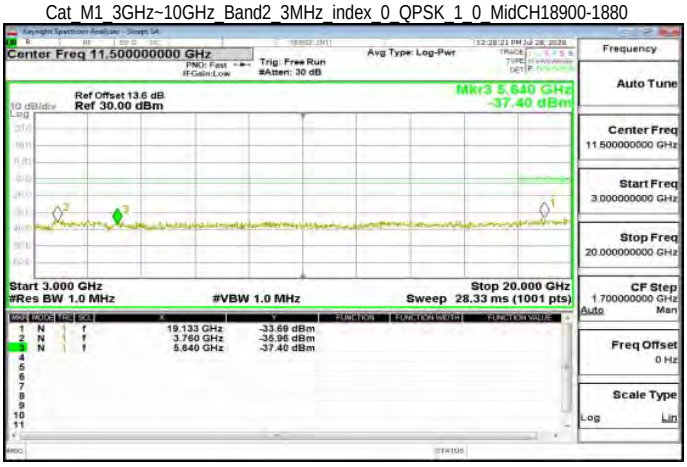
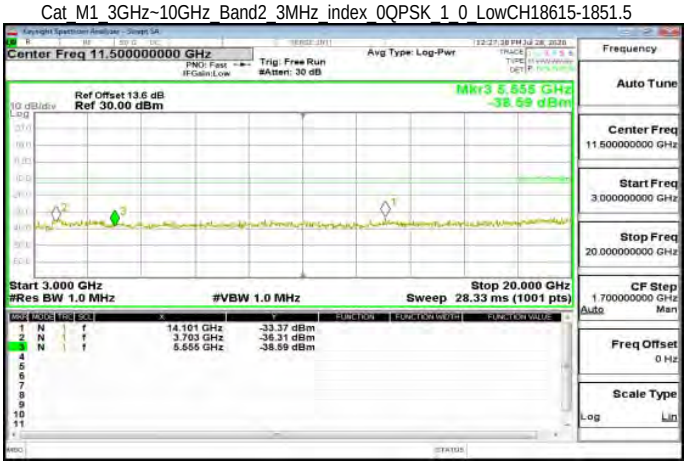
Cat_M1_30MHz~3GHz_Band2_3MHz_index_0_QPSK_1_0_LowCH18615-1851.5



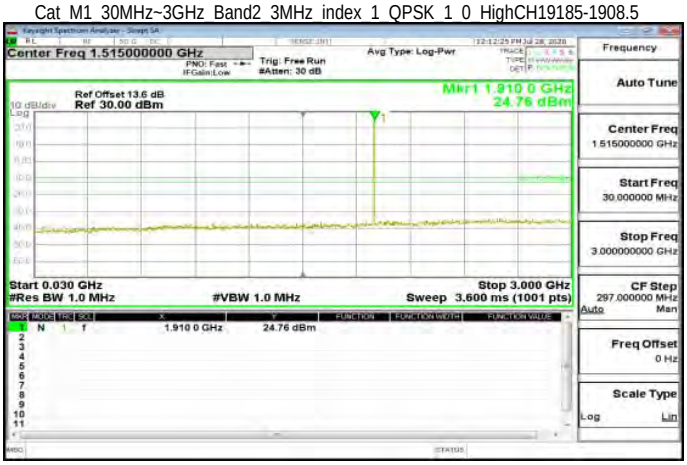
Cat_M1_3GHz~10GHz_Band2_3MHz_index_0_QPSK_1_0_MidCH18900-1880



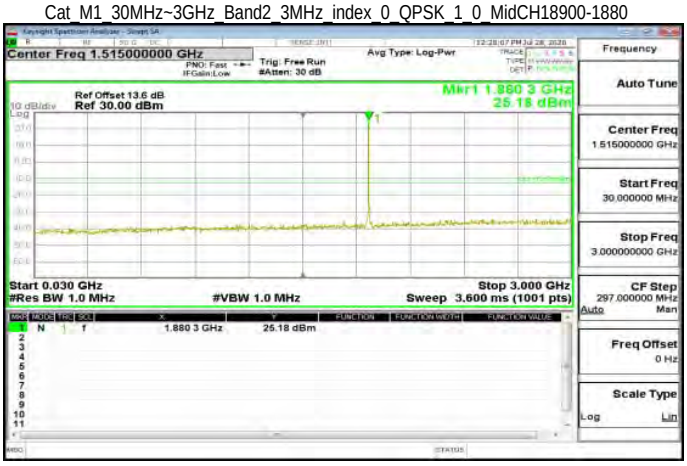
Cat_M1_3GHz~10GHz_Band2_3MHz_index_0QPSK_1_0_LowCH18615-1851.5



Cat_M1_30MHz~3GHz_Band2_3MHz_index_1_QPSK_1_0_HighCH19185-1908.5



Cat_M1_30MHz~3GHz_Band2_3MHz_index_0_QPSK_1_0_MidCH18900-1880



Cat_M1_3GHz~10GHz_Band2_3MHz_index_1_QPSK_1_0_HighCH19185-1908.5

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