CERTIFICATION TEST REPORT

Report Number. : 4789899747-E3V2

Applicant	:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	:	SM-H111U
FCC ID	:	A3LSMH111U
EUT Description	:	Communication Module
Test Standard(s)	:	FCC CFR47 PART 96

Date Of Issue:
2021-06-25

Prepared by:
UL Korea, Ltd.
26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
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IAS ACCREDITED
Testing Laboratory
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2021-06-18	Initial issue	SunGeun Lee
V2	2021-06-25	Updated to address TCB's question	SunGeun Lee

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_96 (04)
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218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: Communicaion Module

MODEL NUMBER: SM-H111U

SERIAL NUMBER: R3AR400JQHB, R3AR400JQ3D (CONDUTED, RADIATED)

DATE TESTED: 2021-04-13 – 2021-06-18;

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 96	Complies

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:

Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

Sungeun Lee
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 96.
3. ANSI TIA-603-E, 2016
4. ANSI C63.26, 2015
5. KDB 971168 D01 Power Meas License Digital Systems v03r01
6. KDB 412172 D01 Determining ERP and EIRP v01r01

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do,16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Chamber 1
☒ Chamber 2
☐ Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

EIRP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss(between the SG and substitution antenna) + Substitution Antenna Factor (dBi)

ERP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss(between the SG and substitution antenna)

(Path loss = Signal generator output – PSA reading with substitution antenna)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.01 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.26 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.90 dB
Radiated Disturbance, Above 18 GHz	5.49 dB

Uncertainty figures are valid to a confidence level of 95%.

4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2007.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Communication Module.
This test report addresses the WWAN operational mode.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average conducted output powers as follows:

LTE Band 48

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				55340	55990	56640		
				3560 MHz	3625 MHz	3690 MHz		
20 MHz	QPSK	1	0	21.86	21.98	21.87	0.0	23.0
		1	49	22.08	22.15	22.16	0.0	23.0
		1	99	22.10	22.00	22.04	0.0	23.0
		50	0	20.89	21.01	20.99	1.0	22.0
		50	24	20.98	21.06	21.14	1.0	22.0
		50	50	20.99	21.01	20.91	1.0	22.0
		100	0	20.96	20.96	20.89	1.0	22.0
	16QAM	1	0	20.96	20.98	20.72	1.0	22.0
		1	49	21.09	21.05	20.91	1.0	22.0
		1	99	21.14	20.93	20.85	1.0	22.0
		50	0	20.08	20.18	20.18	2.0	21.0
		50	24	20.13	20.16	20.11	2.0	21.0
		50	50	20.14	20.14	20.05	2.0	21.0
		100	0	20.09	20.12	20.03	2.0	21.0
	64QAM	1	0	19.78	20.10	20.35	2.0	21.0
		1	49	20.01	20.18	20.55	2.0	21.0
		1	99	20.03	20.06	20.37	2.0	21.0
		50	0	19.02	19.16	19.15	3.0	20.0
		50	24	19.09	19.16	19.25	3.0	20.0
		50	50	19.16	19.14	19.16	3.0	20.0
		100	0	19.08	19.14	19.00	3.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				55315	55990	56665		
				3557.5 MHz	3625 MHz	3692.5 MHz		
15 MHz	QPSK	1	0	21.77	22.01	21.88	0.0	23.0
		1	37	21.92	22.06	22.11	0.0	23.0
		1	74	21.88	22.00	22.07	0.0	23.0
		36	0	20.90	20.99	20.94	1.0	22.0
		36	20	20.87	21.09	21.00	1.0	22.0
		36	39	20.96	21.00	21.04	1.0	22.0
		75	0	20.91	21.02	21.11	1.0	22.0
	16QAM	1	0	20.87	20.96	20.90	1.0	22.0
		1	37	20.97	21.06	20.95	1.0	22.0
		1	74	20.99	21.00	21.06	1.0	22.0
		36	0	20.08	20.15	20.34	2.0	21.0
		36	20	20.05	20.20	20.27	2.0	21.0
		36	39	20.11	20.20	20.21	2.0	21.0
		75	0	20.07	20.16	20.25	2.0	21.0
	64QAM	1	0	20.19	19.94	19.74	2.0	21.0
		1	37	20.29	20.04	19.71	2.0	21.0
		1	74	20.27	20.01	19.72	2.0	21.0
		36	0	19.03	19.07	19.23	3.0	20.0
		36	20	19.07	19.10	19.14	3.0	20.0
		36	39	19.16	19.08	19.24	3.0	20.0
		75	0	19.00	19.14	19.11	3.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				55290	55990	56690		
				3555 MHz	3625 MHz	3695 MHz		
10 MHz	QPSK	1	0	21.87	22.02	22.19	0.0	23.0
		1	25	21.98	22.10	22.18	0.0	23.0
		1	49	21.94	22.08	22.21	0.0	23.0
		25	0	20.91	21.08	21.07	1.0	22.0
		25	12	20.92	21.04	21.06	1.0	22.0
		25	25	20.95	21.03	21.15	1.0	22.0
		50	0	20.93	21.08	21.21	1.0	22.0
	16QAM	1	0	20.81	20.97	21.04	1.0	22.0
		1	25	20.89	21.05	21.24	1.0	22.0
		1	49	20.91	21.04	21.16	1.0	22.0
		25	0	20.06	20.25	20.27	2.0	21.0
		25	12	20.06	20.22	20.25	2.0	21.0
		25	25	20.09	20.20	20.37	2.0	21.0
		50	0	20.06	20.25	20.40	2.0	21.0
	64QAM	1	0	20.21	20.16	19.87	2.0	21.0
		1	25	20.27	20.20	19.96	2.0	21.0
		1	49	20.28	20.19	19.92	2.0	21.0
		25	0	19.03	19.06	19.09	3.0	20.0
		25	12	19.03	19.06	19.34	3.0	20.0
		25	25	19.02	19.08	19.28	3.0	20.0
		50	0	19.02	19.16	19.25	3.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				55265	55990	56715		
				3552.5 MHz	3625 MHz	3697.5 MHz		
5 MHz	QPSK	1	0	21.81	22.02	22.17	0.0	23.0
		1	12	21.88	22.09	22.26	0.0	23.0
		1	24	21.87	22.08	22.06	0.0	23.0
		12	0	20.83	21.07	21.10	1.0	22.0
		12	7	20.83	21.08	21.18	1.0	22.0
		12	13	20.83	21.03	21.09	1.0	22.0
		25	0	20.86	21.06	21.07	1.0	22.0
	16QAM	1	0	20.72	21.02	21.23	1.0	22.0
		1	12	20.78	21.15	21.15	1.0	22.0
		1	24	20.80	21.04	21.15	1.0	22.0
		12	0	20.01	20.16	20.36	2.0	21.0
		12	7	20.02	20.18	20.39	2.0	21.0
		12	13	20.01	20.20	20.34	2.0	21.0
		25	0	20.00	20.25	20.22	2.0	21.0
	64QAM	1	0	19.63	20.54	20.32	2.0	21.0
		1	12	19.71	20.57	20.48	2.0	21.0
		1	24	19.65	20.51	20.22	2.0	21.0
		12	0	18.94	19.22	19.15	3.0	20.0
		12	7	18.94	19.24	19.08	3.0	20.0
		12	13	18.90	19.18	19.01	3.0	20.0
		25	0	19.02	19.12	19.20	3.0	20.0

LTE Band 48

FCC Part 96					
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted	
				Avg [dBm]	Avg [mW]
Band 48	3560~3690	20	QPSK	22.16	164.27
			16QAM	21.14	129.95
			64QAM	20.55	113.49
	3557.5~3692.5	15	QPSK	22.11	162.38
			16QAM	21.06	127.53
			64QAM	20.29	106.81
	3555~3695	10	QPSK	22.21	166.17
			16QAM	21.24	133.06
			64QAM	20.28	106.71
	3552.5~3697.5	5	QPSK	**22.26**	**168.43**
			16QAM	21.23	132.68
			64QAM	20.57	114.13

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5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a internal antenna for the [List the bands supported] with a maximum peak gain as follow:

Frequency (MHz)	Peak Gain (dBi)
LTE Band 48 3550 ~ 3700 MHz	0.0

5.4. WORST-CASE ORIENTATION

Following modes should be considered as worst-case scenario for all other measurements.

For LTE Band 48, the worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM, and 64QAM modulations. It was found that QPSK and 16QAM results were worst case. All testing was performed using QPSK and 16QAM modulations to represent the worst case. However, the out of band emissions and spurious radiation were only performed on bandwidth and RB offset(with RB size 1) with the highest conducted power in QPSK.

Highest power setting for each bands				
LTE Band	**Frequency (MHz)**	**Bandwidth (MHz)**	**RB size**	**RB offset**
48	3552.5	5	1	12
	3625.0		1	12
	3697.5		1	12

The fundamental and radiated spurious emission were investigated in three orthogonal orientations X, Y and Z, it was determined that below orientation was worst-case orientation for each band.

Band	**RSE**		
	X	**Y**	**Z**
LTE B48	-	O	-

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
JIG Board	SAMSUNG	N/A	N/A	N/A
External antenna x 4ea	SAMSUNG	LMH ant	N/A	N/A

I/O CABLE

Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	DC IN	Shielded	1.0 m	N/A
2	ANT#0	2	MHF Type	Shielded	95.5 mm	N/A
3	ANT#1	3	MHF Type	Shielded	95.5 mm	N/A
4	ANT#2	4	MHF Type	Shielded	95.5 mm	N/A
5	ANT#3	5	MHF Type	Shielded	95.5 mm	N/A

TEST SETUP

The EUT is continuously communicated with the call box during the tests.

For radiated spurious emissions, while ANSI C63.26 allows the antenna port to be terminated in a load an antenna was connected to the RF port to allow connection to the call box.

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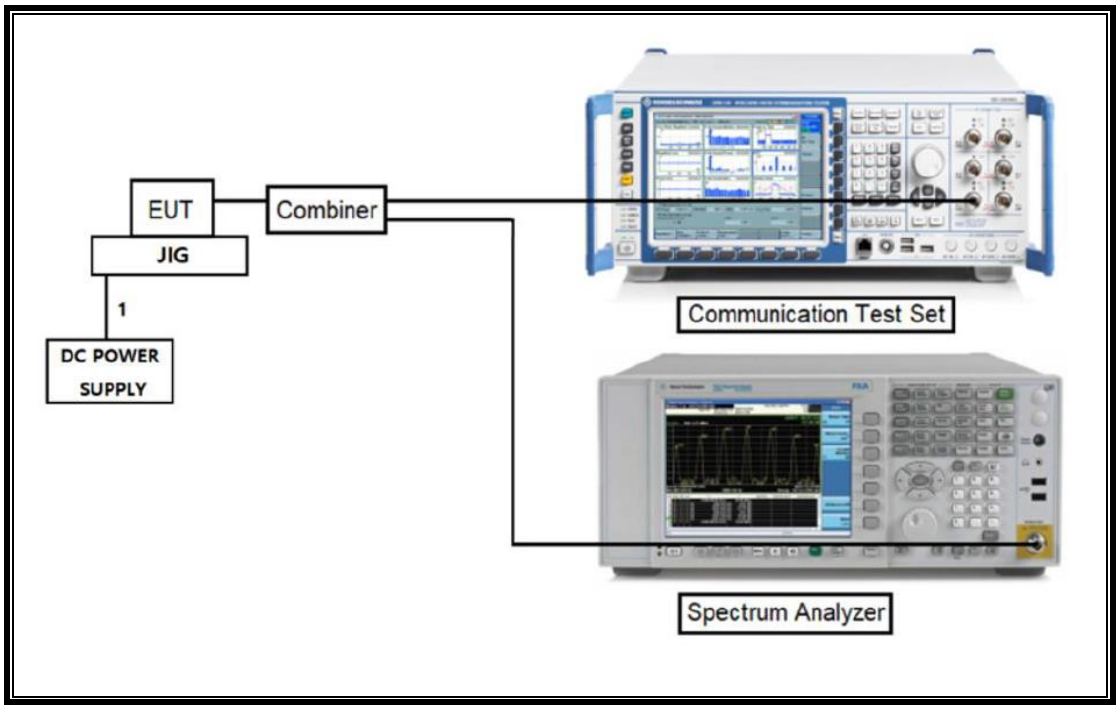
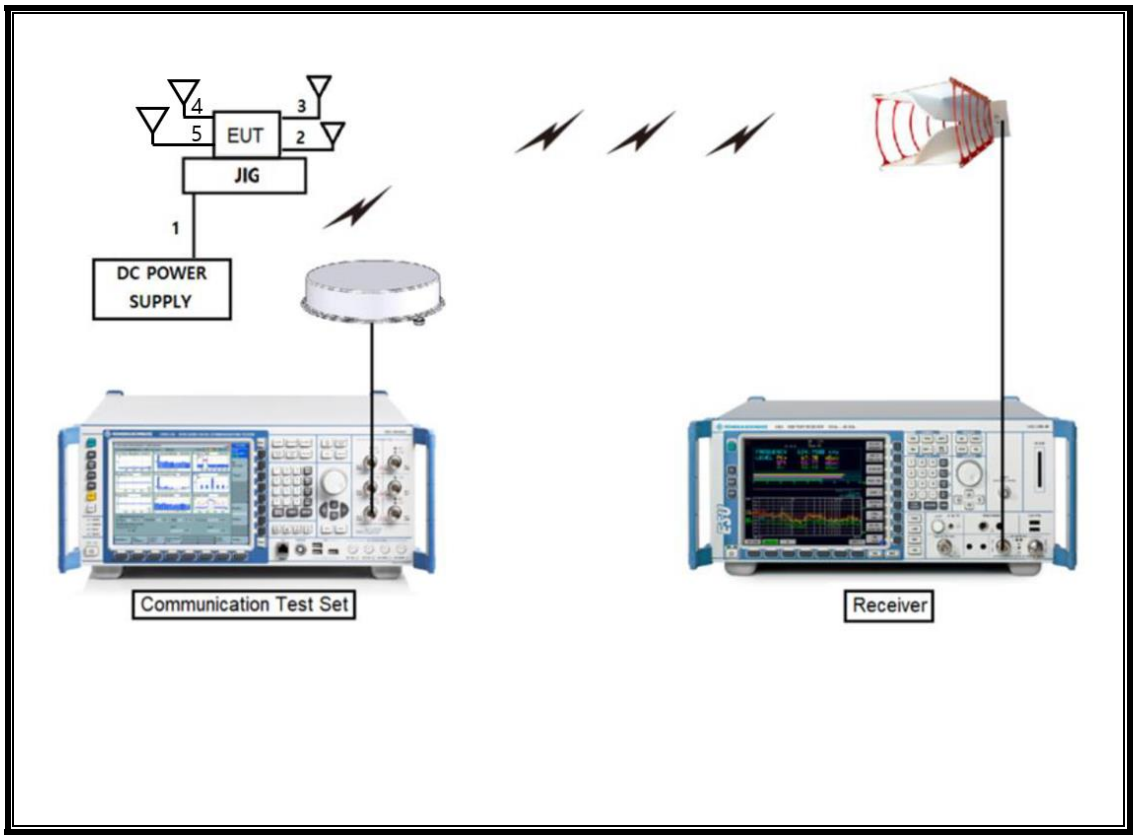
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	2023-02-08
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	110367-0003	N/A
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	80108-0004	N/A
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2022-08-04
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2021-10-02
Preamplifier	ETS	3116C-PA	00168841	2021-08-06
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2022-08-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2022-08-13
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2022-08-13
Antenna, Horn, 18 GHz	ETS	3115	00167211	2022-07-27
Antenna, Horn, 18 GHz	ETS	3115	00161451	2022-08-15
Antenna, Horn, 18 GHz	ETS	3117	00168724	2022-07-27
Antenna, Horn, 18 GHz	ETS	3117	00168717	2022-08-15
Communications Test Set	R&S	CMW500	150314	2021-08-04
DC Power Supply	Agilent / HP	E3640A	MY54226395	2021-08-05
Preamplifier, 1000 MHz	Sonoma	310N	341282	2021-08-03
Preamplifier, 1000 MHz	Sonoma	310N	370599	2021-08-06
Preamplifier, 1000 MHz	Sonoma	310N	351741	2021-08-03
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2021-08-03
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2021-08-04
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2021-08-03
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2021-08-05
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2021-08-05
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2021-08-03
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2021-08-03
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2021-08-05
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2021-08-05
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	2021-08-05
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	2021-08-05
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	2021-08-05
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	2021-08-05
Attenuator	PASTERNACK	PE7087-10	A009	2021-08-05
Attenuator	PASTERNACK	PE7087-10	A001	2021-08-03
Attenuator	PASTERNACK	PE7087-10	A008	2021-08-03
Attenuator	PASTERNACK	PE7004-10	2	2021-08-04
Attenuator	PASTERNACK	PE7395-10	A011	2021-08-05
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2021-10-02
Temperature Chamber	ESPEC	SH-642	93001109	2021-08-04
Power Splitter	MINI-CIRCUITS	WA1534	UL001	2022-01-27
Power Splitter	MINI-CIRCUITS	WA1534	UL002	2022-01-27

UL Software			
Description	**Manufacturer**	**Model**	**Version**
Antenna port test software	UL	CLT	Ver 2.5
Radiated software	UL	UL EMC	Ver 9.5

7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
2.1049	Occupied Bandwidth(99%)	N/A	Conducted	Pass
2.1046	Conducted output power	N/A		Pass
2.1051 96.41(e)(ii)	Out of band emissions	Section 9.2 & 9.3		Pass
2.1055	Frequency Stability	Fundamental emissions stay within authorized frequency block		Pass
96.47	End user device additional requirements (CBSD Protocol)	Section 9.5		Not performed[Note]
96.41(b)	Equivalent Isotropic Radiated Power	23 dBm/10 MHz	Radiated	Pass
2.1053 96.41(e)	Radiated Spurious Emission	-40 dBm/MHz		Pass

Note. Please refer to CBSD Protocol test report(Report number: 4789899747-E10)

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8. PEAK TO AVERAGE RATIO

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The PAR were measured on the Spectrum Analyzer.

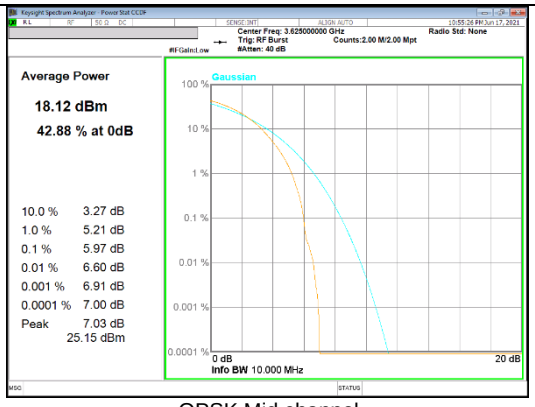
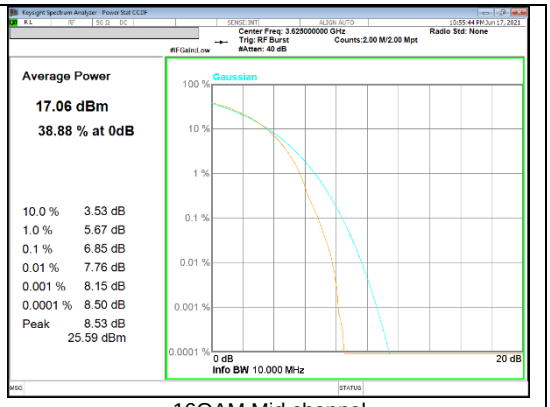
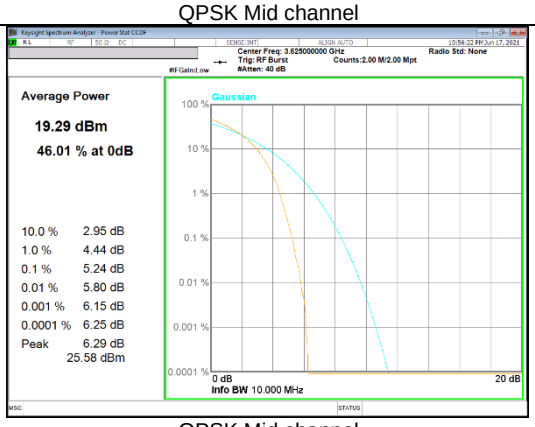
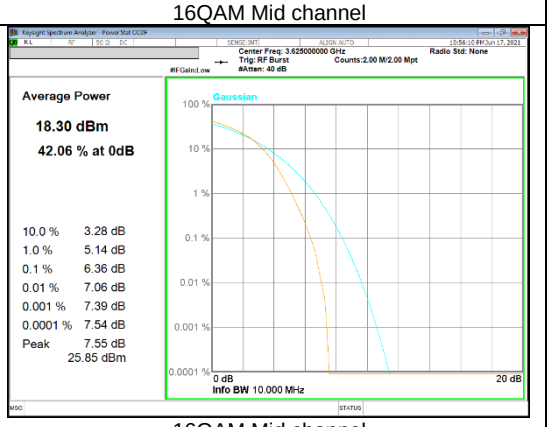
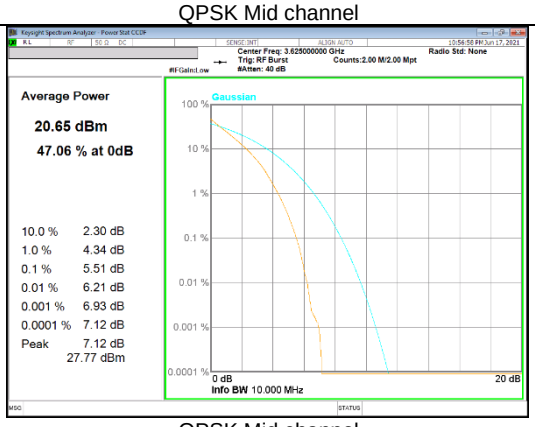
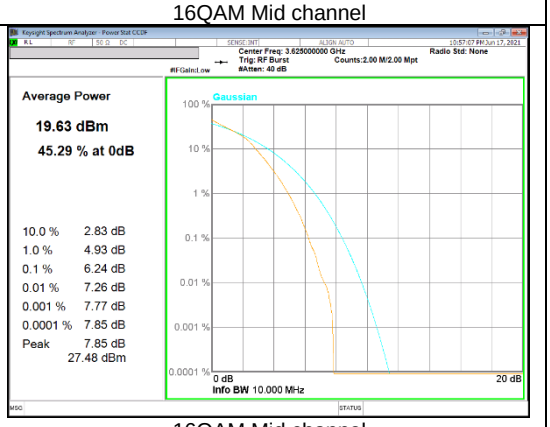
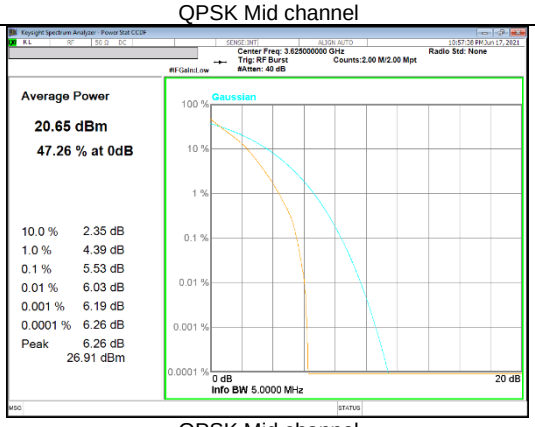
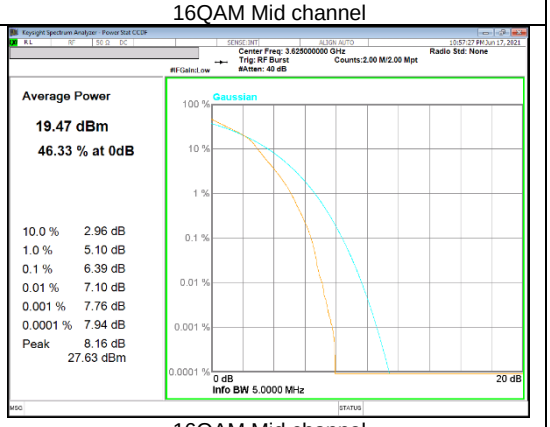
Test Spec

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

RESULTS

8.1. CONDUCTED PEAK TO AVERAGE RESULT

LTE Band 48

20 MHz	 QPSK Mid channel	 16QAM Mid channel
15 MHz	 QPSK Mid channel	 16QAM Mid channel
10 MHz	 QPSK Mid channel	 16QAM Mid channel
5 MHz	 QPSK Mid channel	 16QAM Mid channel

9. LIMITS AND CONDUCTED RESULTS

9.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

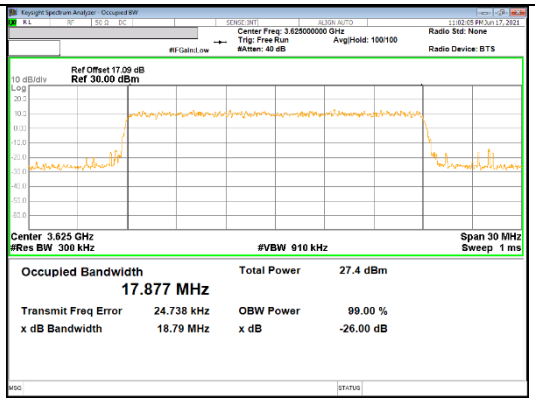
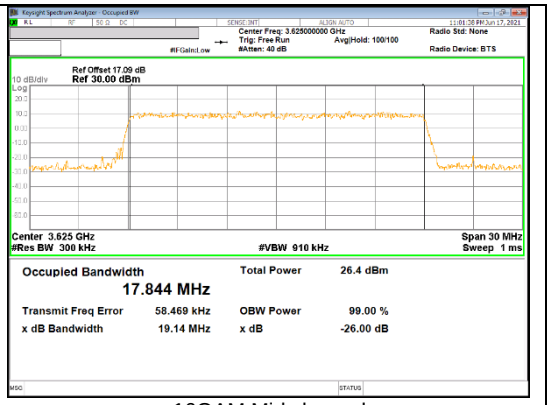
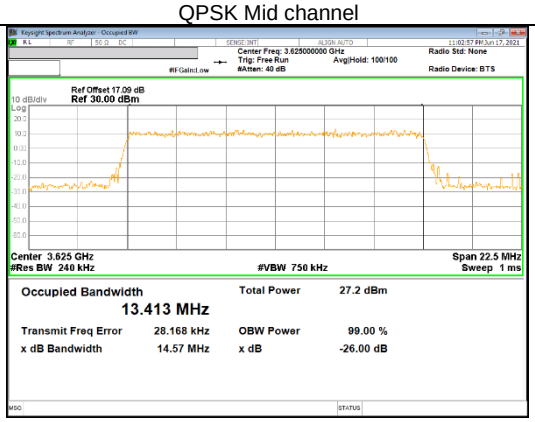
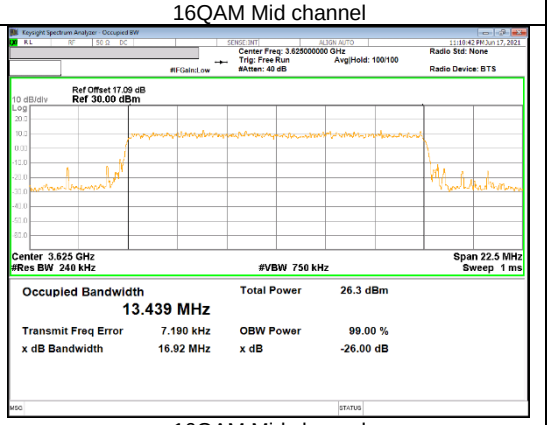
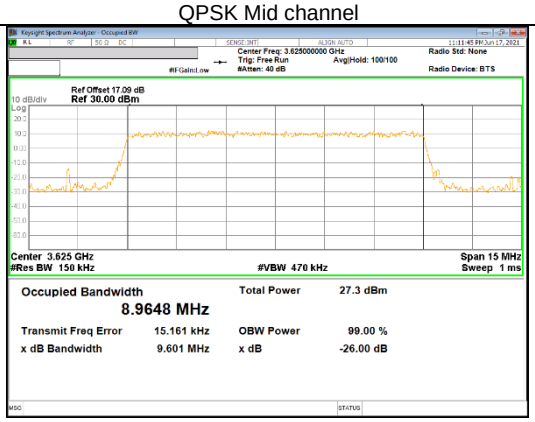
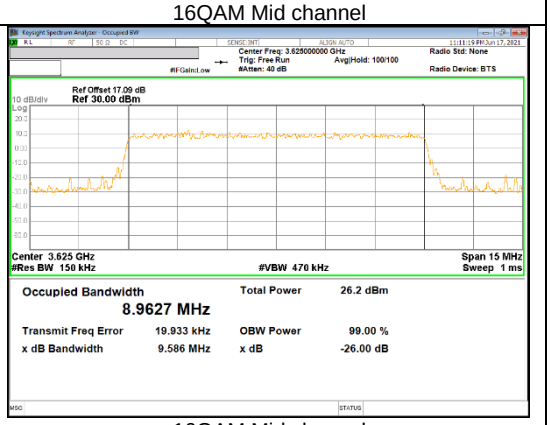
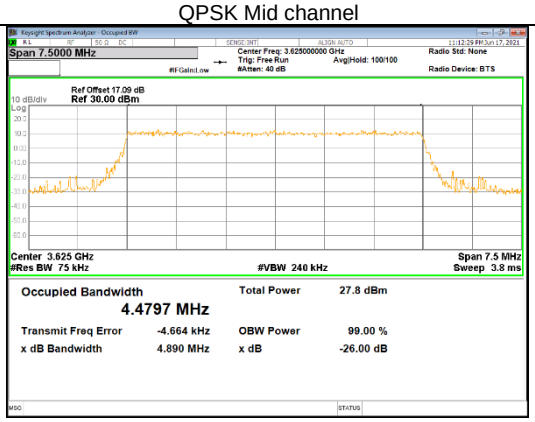
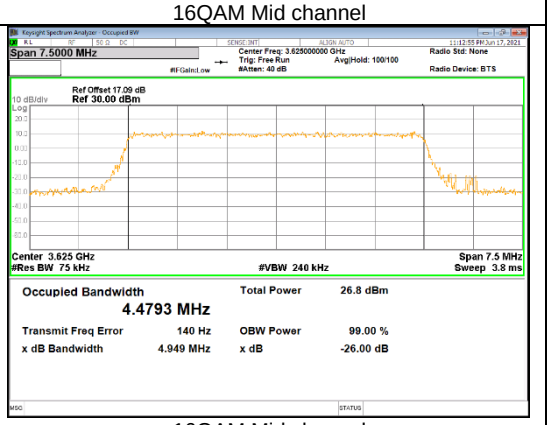
OCCUPIED BANDWIDTH RESULTS

See the following pages.

- LTE Band 48

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE 48	20M	QPSK	3625.0	17.877	18.790
		16QAM		17.844	19.140
	15M	QPSK	3625.0	13.413	14.570
		16QAM		13.439	16.920
	10M	QPSK	3625.0	8.965	9.601
		16QAM		8.963	9.586
	5M	QPSK	3625.0	4.480	4.890
		16QAM		4.479	4.949

LTE Band 48

20 MHz	 QPSK Mid channel	 16QAM Mid channel
15 MHz	 QPSK Mid channel	 16QAM Mid channel
10 MHz	 QPSK Mid channel	 16QAM Mid channel
5 MHz	 QPSK Mid channel	 16QAM Mid channel

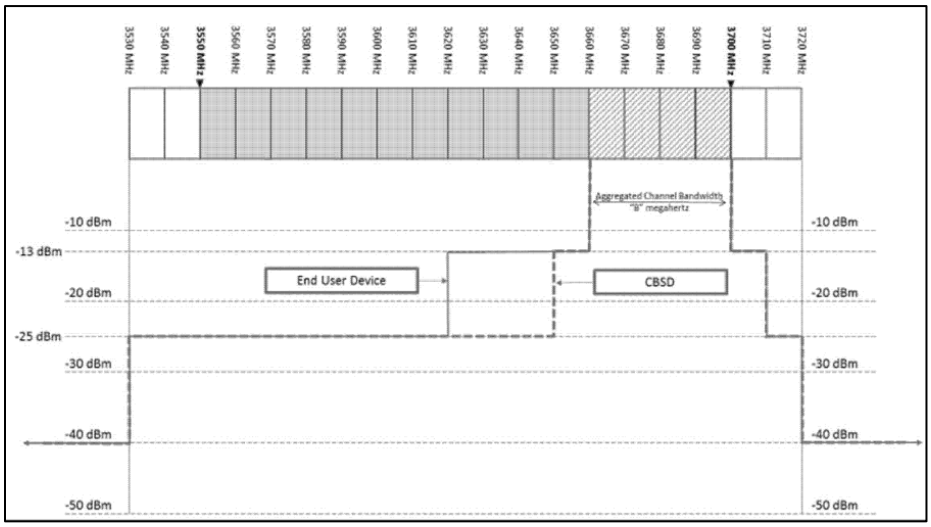
9.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §2.1051 and §96.41(e)(ii)

LIMITS

For channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed −25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.
The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.



TEST PROCEDURE

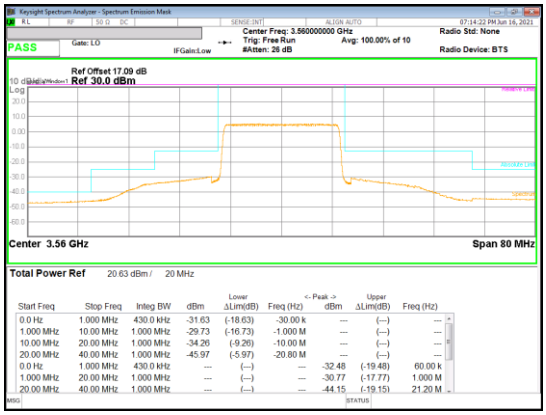
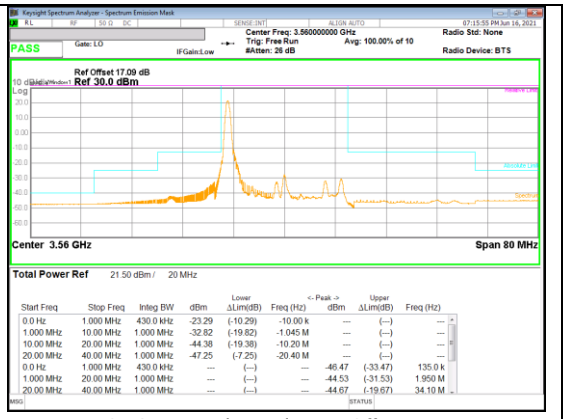
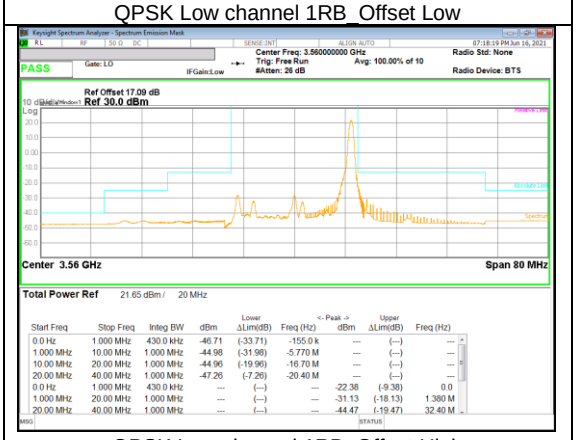
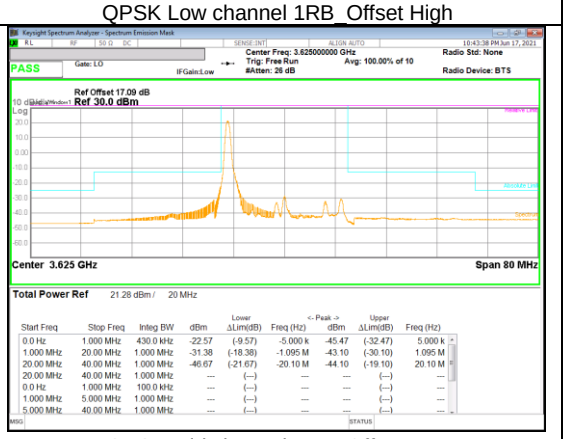
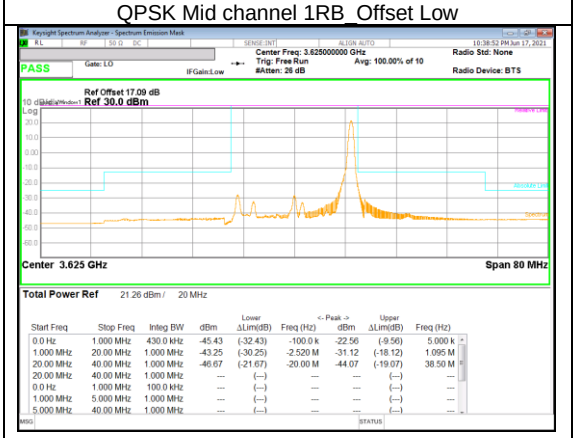
Per KDB 971168 D01 Power Meas License Digital Systems v03r01
The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

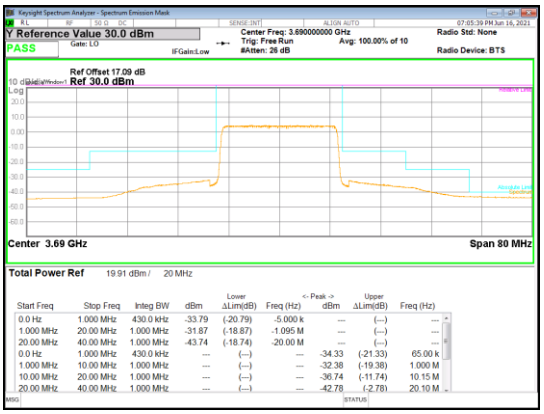
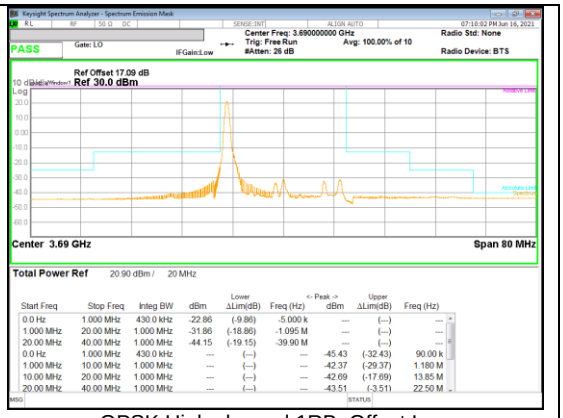
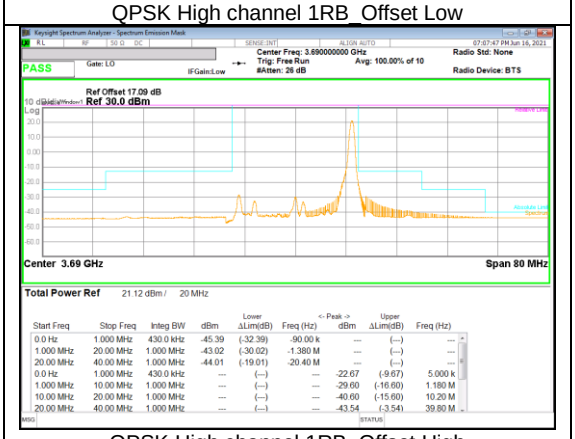
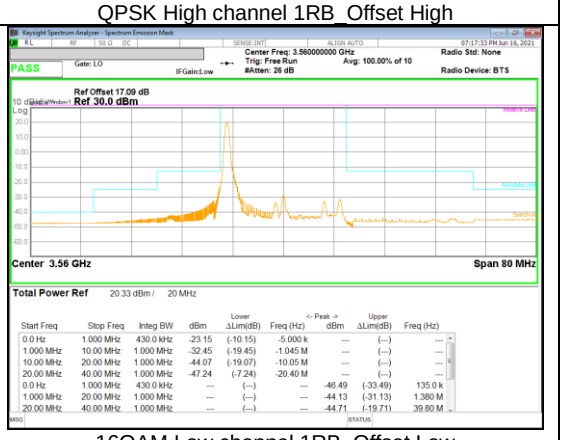
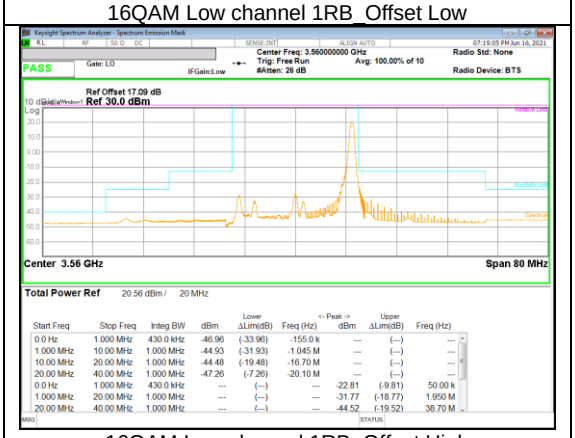
a) Set the RBW = 1 ~ 1.5 % of OBW(Typically limited to a minimum RBW of 1% of the OBW)
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = Auto;
e) Detector = RMS;
f) Ensure that the number of measurement points ≥ 2*Span/RBW;
g) Trace mode = Average (100);

BAND EDGE RESULTS

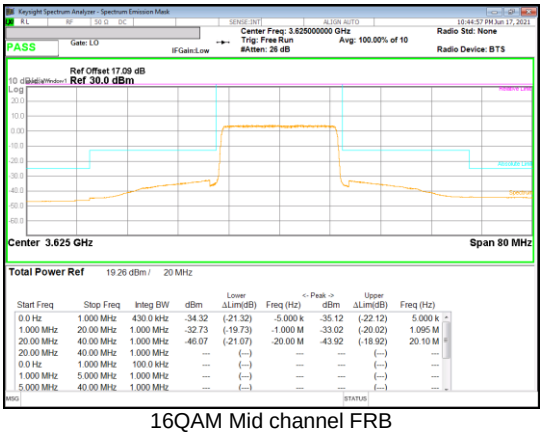
See the following pages.

LTE Band 48

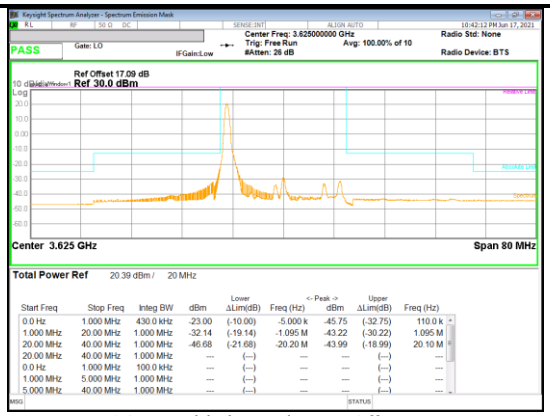
20MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB_Offset Low  QPSK Low channel 1RB_Offset High
	 QPSK Mid channel FRB	 QPSK Mid channel 1RB_Offset Low  QPSK Mid channel 1RB_Offset High

20MHz	 QPSK High channel FRB	 QPSK High channel 1RB_Offset Low  QPSK High channel 1RB_Offset High
20MHz	 16QAM Low channel FRB	 16QAM Low channel 1RB_Offset Low  16QAM Low channel 1RB_Offset High

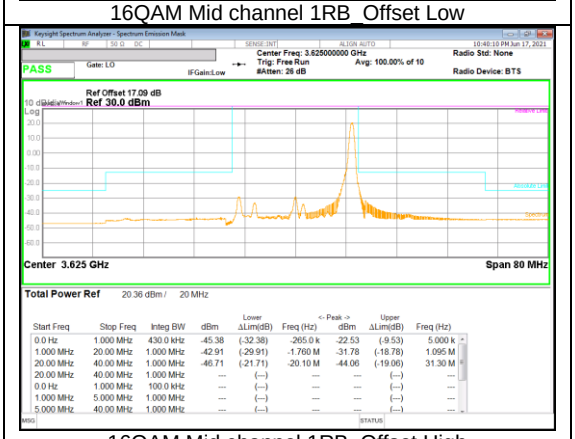
20MHz



16QAM Mid channel FRB

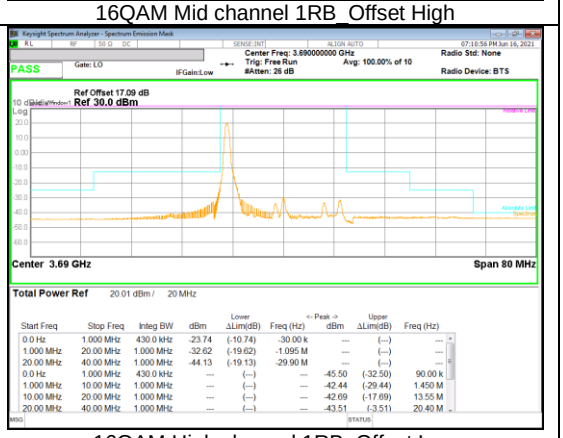


16QAM Mid channel 1RB_Offset Low

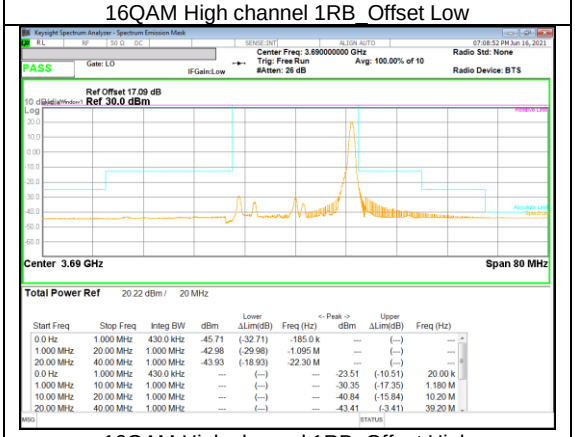


16QAM Mid channel 1RB_Offset High

16QAM High channel FRB

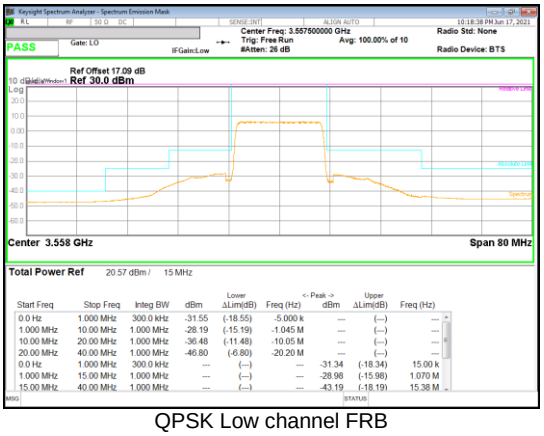


16QAM High channel 1RB_Offset Low



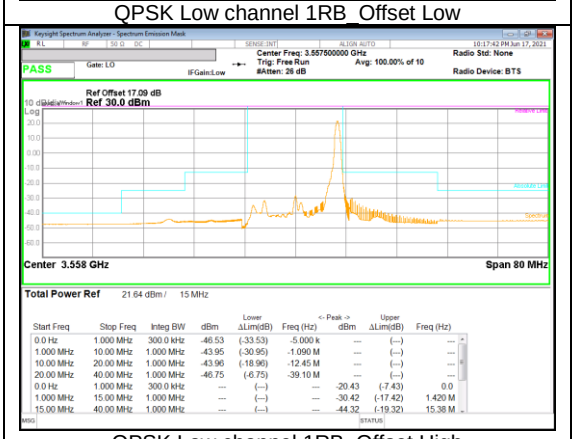
16QAM High channel 1RB_Offset High

15MHz



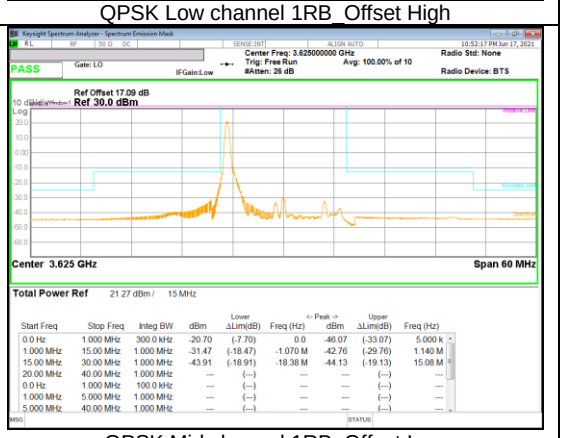
QPSK Low channel FRB

QPSK Low channel 1RB_Offset Low

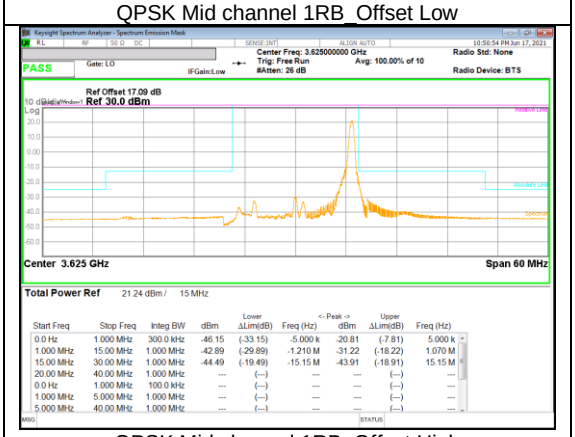


QPSK Low channel 1RB_Offset High

QPSK Mid channel FRB

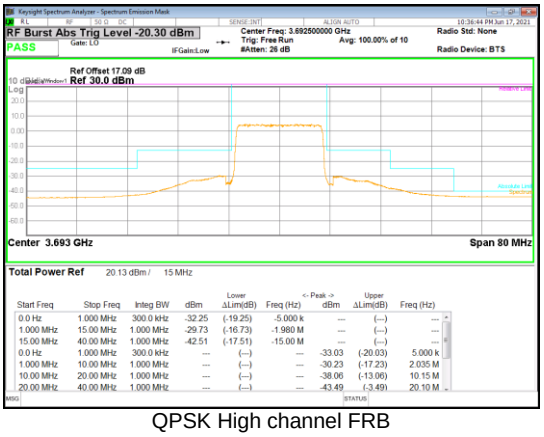


QPSK Mid channel 1RB_Offset Low

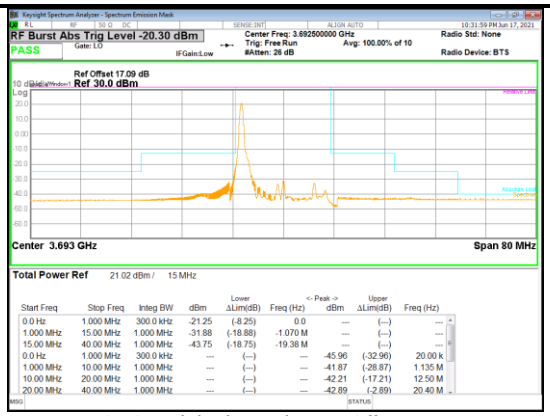


QPSK Mid channel 1RB_Offset High

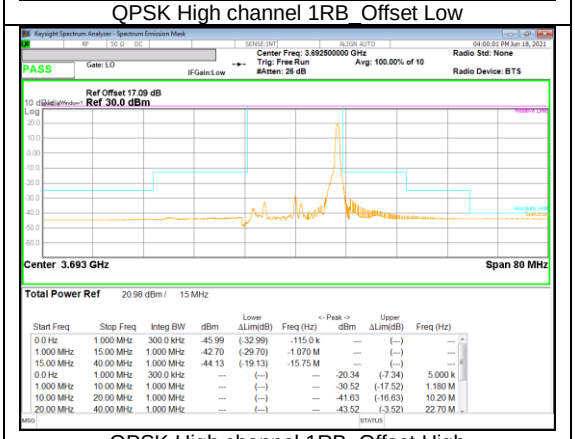
15MHz



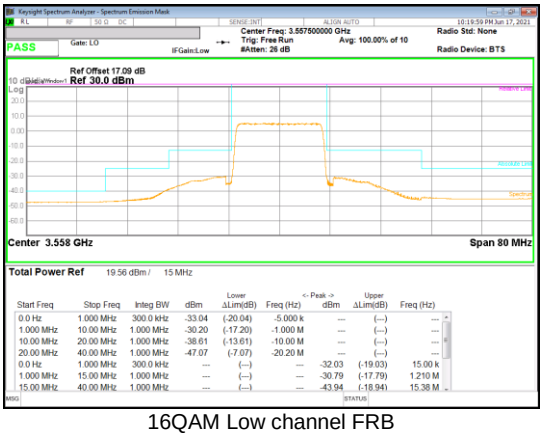
QPSK High channel FRB



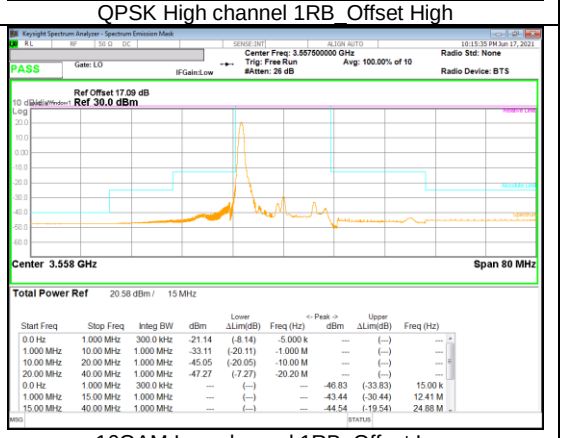
QPSK High channel 1RB_Offset Low



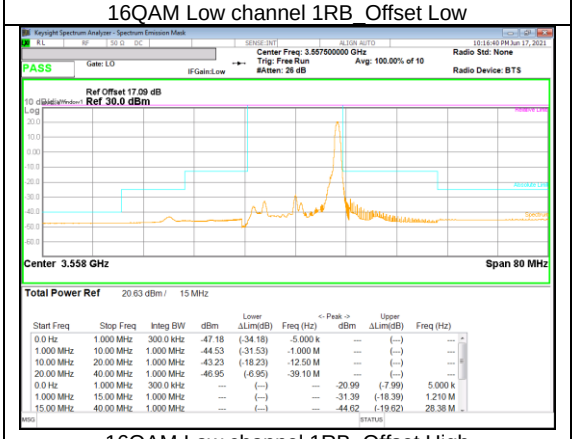
QPSK High channel 1RB_Offset High



16QAM Low channel FRB

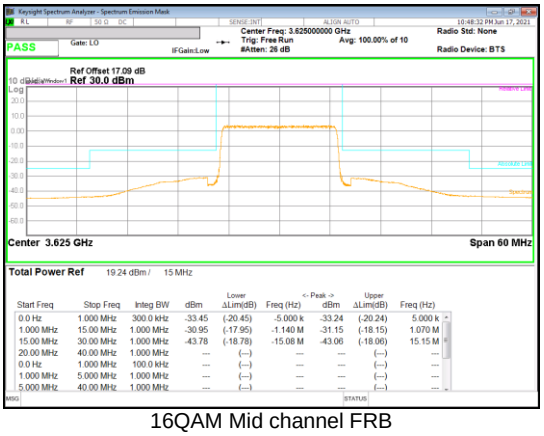


16QAM Low channel 1RB_Offset Low



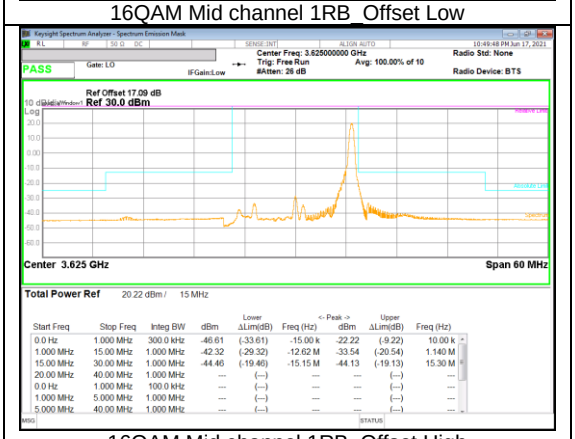
16QAM Low channel 1RB_Offset High

15MHz

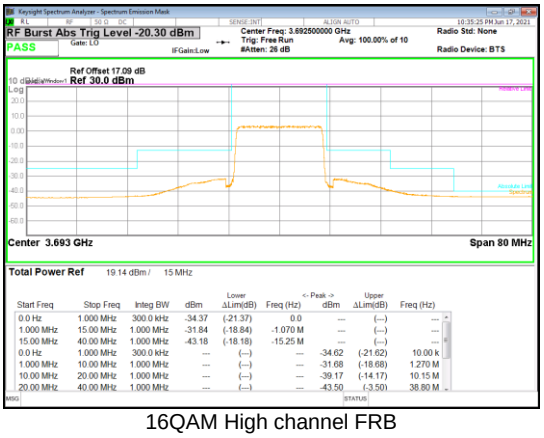


16QAM Mid channel FRB

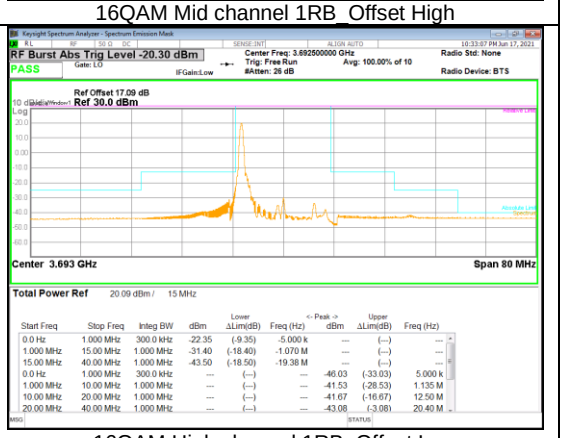
16QAM Mid channel 1RB_Offset Low



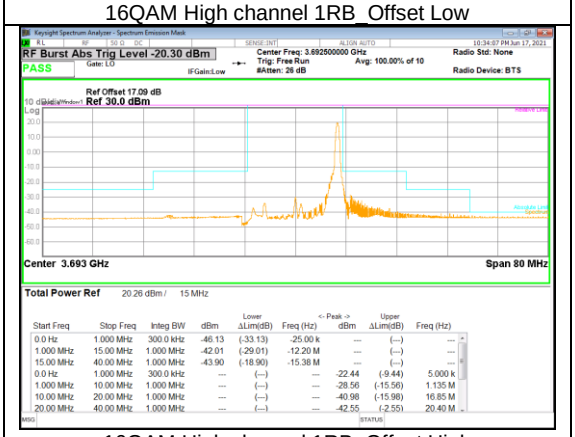
16QAM Mid channel 1RB_Offset High



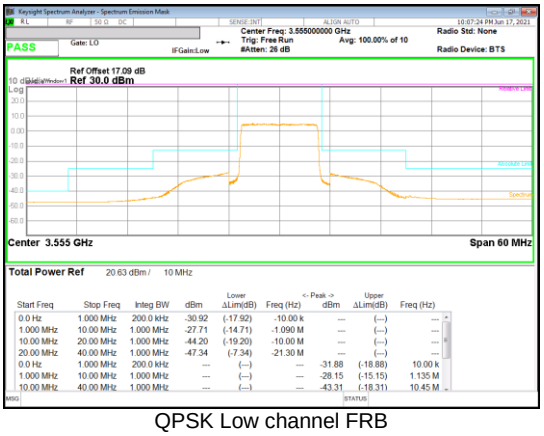
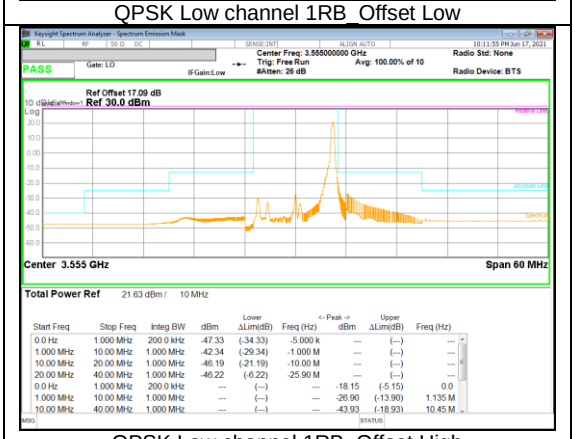
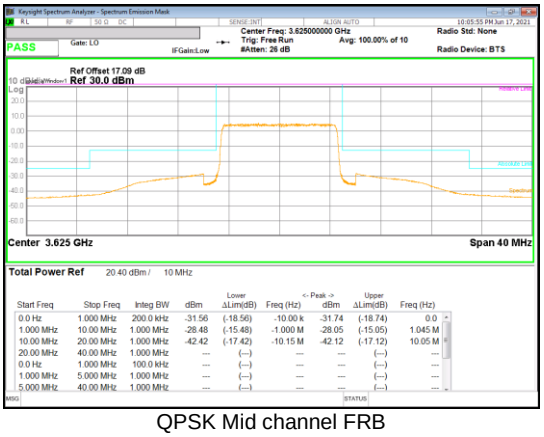
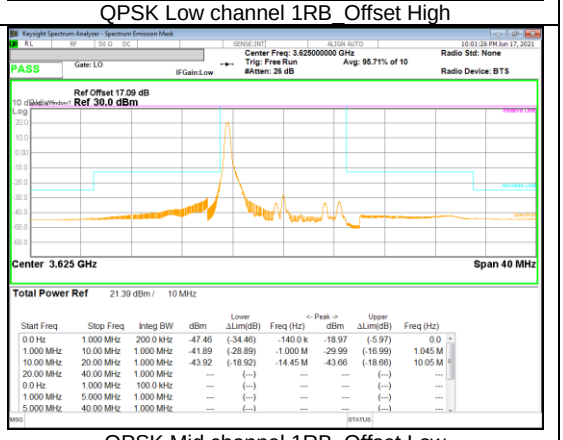
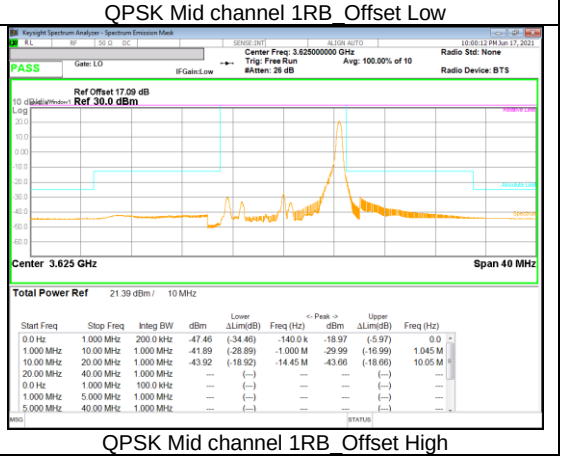
16QAM High channel FRB

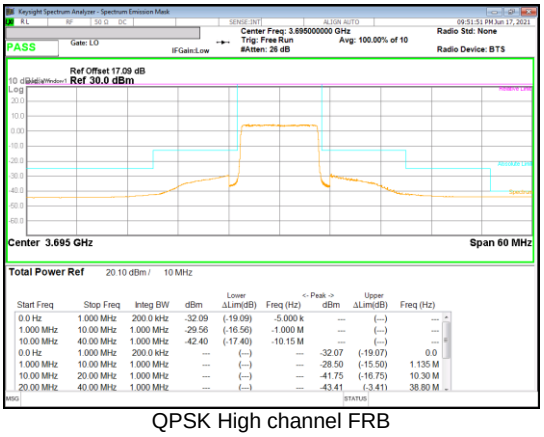
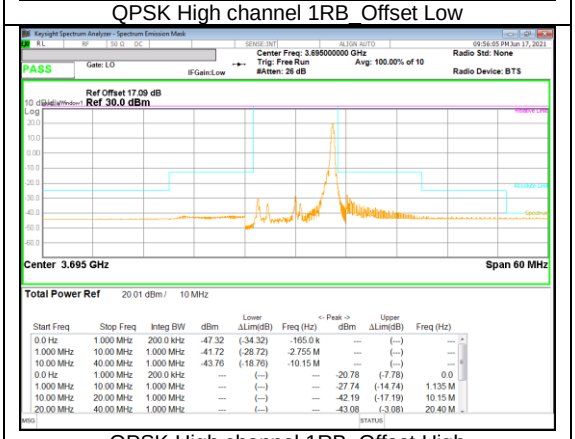
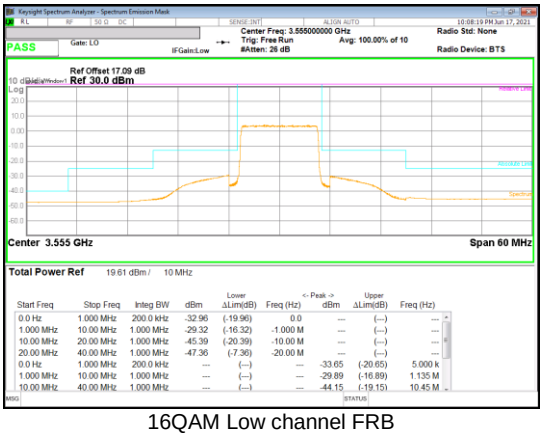
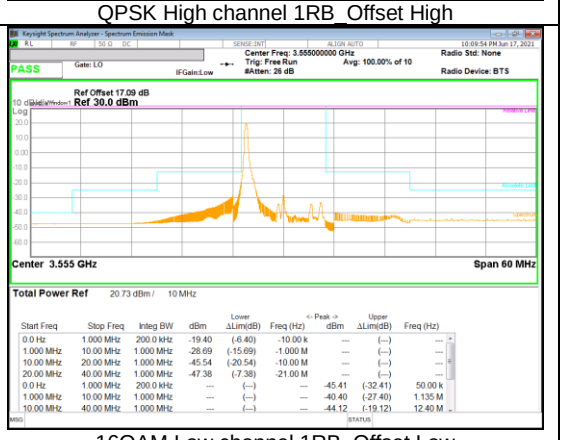
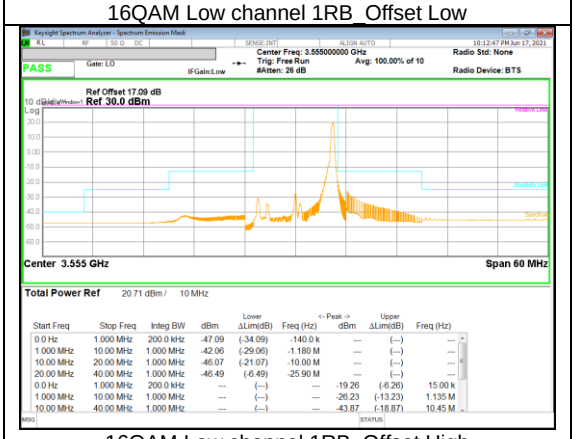


16QAM High channel 1RB_Offset Low

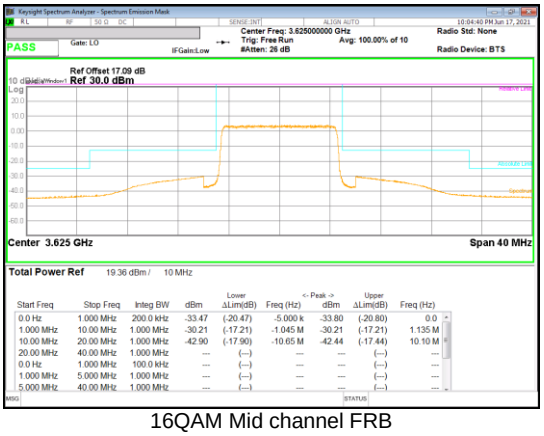


16QAM High channel 1RB_Offset High

10MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB_Offset Low
		 QPSK Low channel 1RB_Offset High
	 QPSK Mid channel FRB	 QPSK Mid channel 1RB_Offset Low
		 QPSK Mid channel 1RB_Offset High

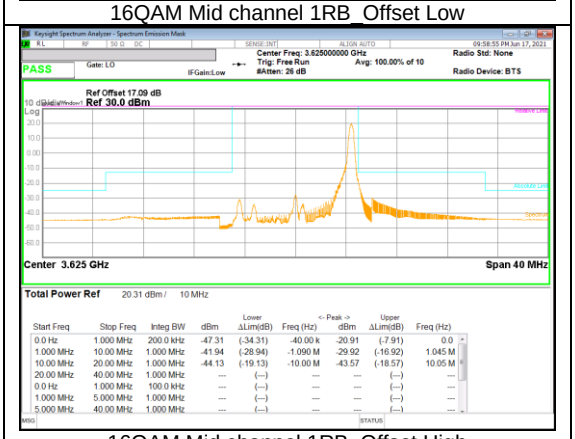
10MHz	 QPSK High channel FRB	 QPSK High channel 1RB_Offset Low  QPSK High channel 1RB_Offset High
10MHz	 16QAM Low channel FRB	 16QAM Low channel 1RB_Offset Low  16QAM Low channel 1RB_Offset High

10MHz



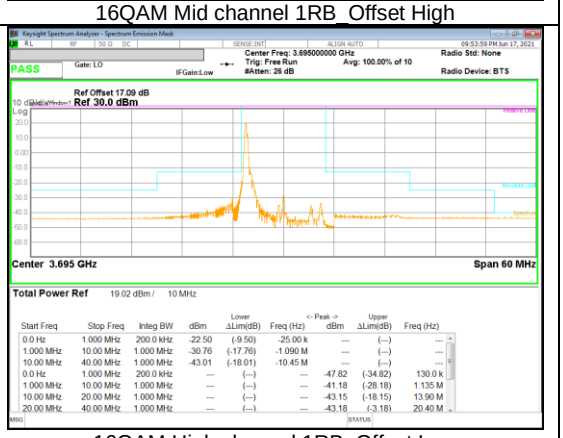
16QAM Mid channel FRB

16QAM Mid channel 1RB_Offset Low

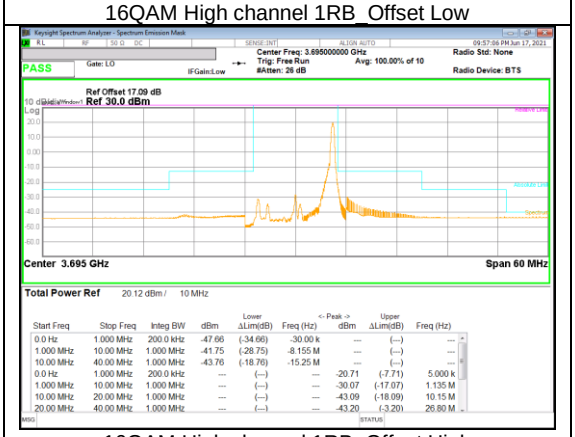


16QAM Mid channel 1RB_Offset High

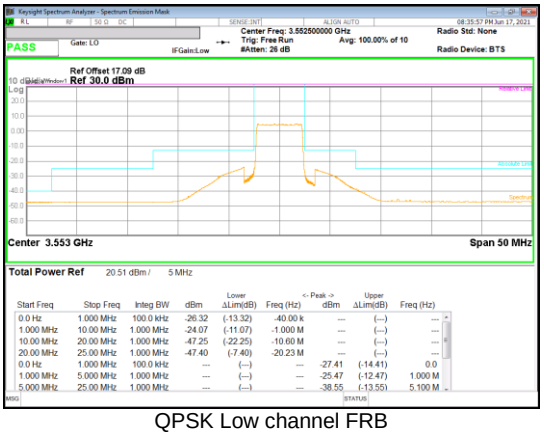
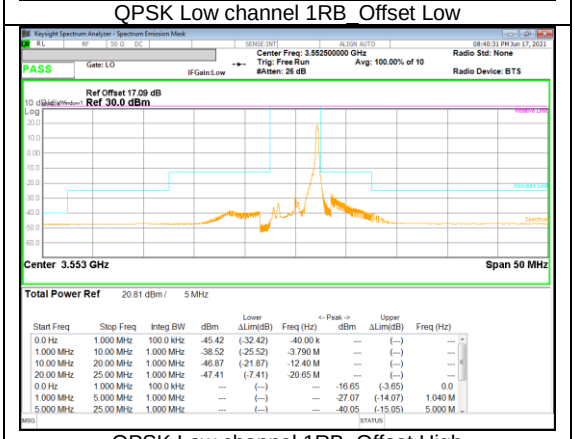
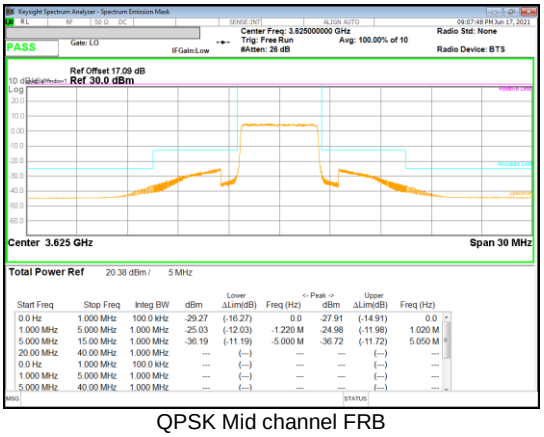
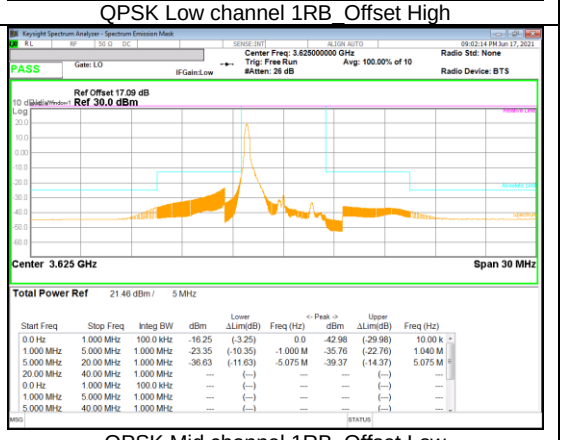
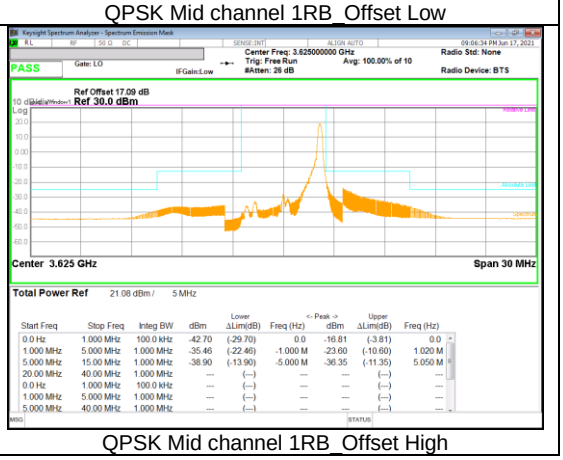
16QAM High channel FRB

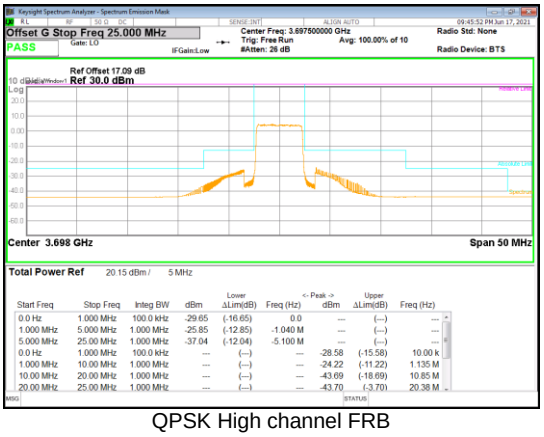
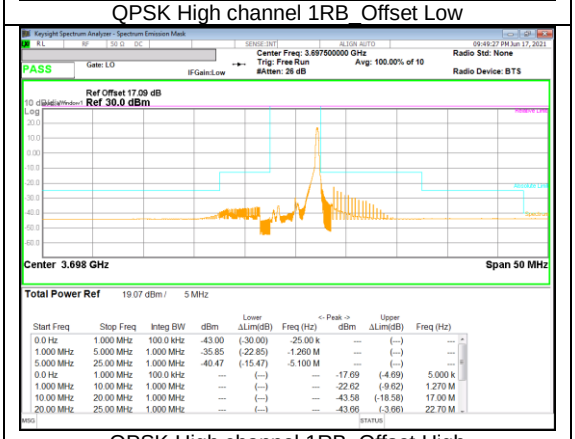
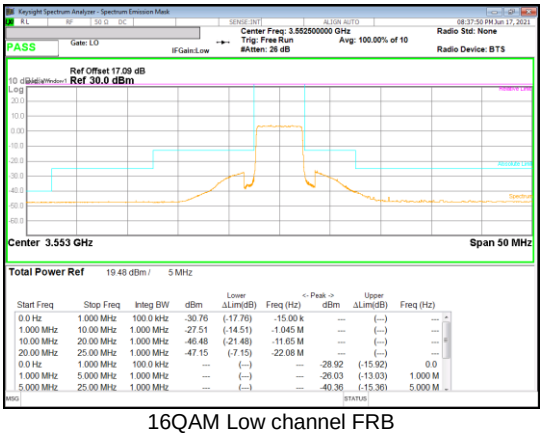
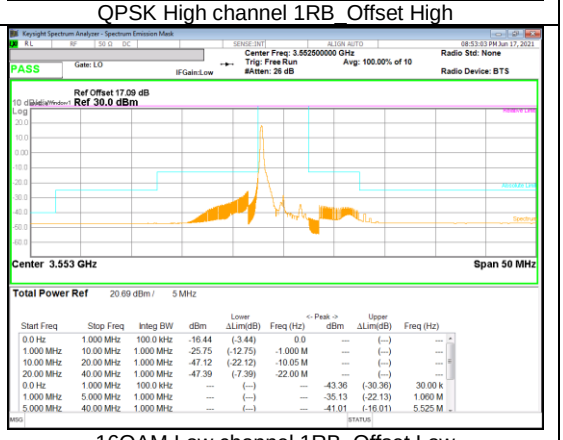
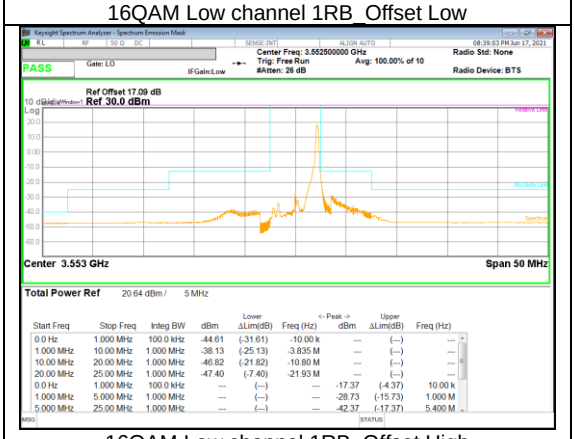


16QAM High channel 1RB_Offset Low



16QAM High channel 1RB_Offset High

5MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB_Offset Low
		 QPSK Low channel 1RB_Offset High
	 QPSK Mid channel FRB	 QPSK Mid channel 1RB_Offset Low
		 QPSK Mid channel 1RB_Offset High

5MHz	 QPSK High channel FRB	 QPSK High channel 1RB_Offset Low  QPSK High channel 1RB_Offset High
5MHz	 16QAM Low channel FRB	 16QAM Low channel 1RB_Offset Low  16QAM Low channel 1RB_Offset High