

**ELECTROMAGNETIC EMISSIONS
COMPLIANCE REPORT**

Applicant: Sercomm Corporation
8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan,
R.O.C.

Manufacturer: Sercomm Corporation
8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan,
R.O.C.

Product Name: CATM1 Module

Brand Name: Sercomm

Model No. TPM530M

Report Number: TERF2508002675ER

FCC ID P27-TPM530

Date of EUT Received: August 22, 2025

Date of Test: August 25, 2025 ~ September 16, 2025

Issue Date: September 24, 2025

Approved By

Marcus Tseng

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 comply With FCC Part2, 24E, 27C.
The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2508002675ER	00	Original	September 24, 2025	Yuri Tsai	

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.

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1 GENERAL PRODUCT INFORMATION

1.1 Product Description

Product Name:	CATM1 Module
Brand Name:	Sercomm
Model No.:	TPM530M
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	2443DZK00040
Power Supply:	3.8 Vdc
Test Software (Name/Version)	Connected with Callbox

1.2 Antenna Designation

Antenna Type	Part No.	Antenna No.
Dipole	617202CPWY	Ant1
Note: Transmission frequencies in this test report are only available by the above antenna(s).		

LTE Band	Frequency Range (MHz)	Antenna Gain (dBi)
LTE Band 2	1850~1910	1.7
LTE Band 4	1710~1755	1.7
LTE Band 12	699~716	1.2
LTE Band 13	777~787	1.2

Note: The antenna information is provided by the applicant, and the laboratory shall not be held liable for the accuracy, completeness, or reliability of any applicant-supplied data.

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1.3 Operating Frequencies

CAT-M1 Band 2			
BW (MHz)	Operation Frequency (MHz)		
1.4	1850.7	-	1909.3
3	1851.5	-	1908.5
5	1852.5	-	1907.5
10	1855.0	-	1905.0
15	1857.5	-	1902.5
20	1860.0	-	1900.0
CAT-M1 Band 4			
BW (MHz)	Operation Frequency (MHz)		
1.4	1710.7	-	1754.3
3	1711.5	-	1753.5
5	1712.5	-	1752.5
10	1715.0	-	1750.0
15	1717.5	-	1747.5
20	1720.0	-	1745.0
CAT-M1 Band 12			
BW (MHz)	Operation Frequency (MHz)		
1.4	699.7	-	715.3
3	700.5	-	714.5
5	701.5	-	713.5
10	704.0	-	711.0
CAT-M1 Band 13			
BW (MHz)	Operation Frequency (MHz)		
5	779.5	-	784.5
10	782.0		

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

CAT-M1 Band	BW	Frequency		Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
2	1.4	1850.7	1909.3	QPSK	24.04	EIRP	0.254	1.0891	1M09G7D
				16QAM	22.92	EIRP	0.196	0.9552	955KD7W
2	3	1851.5	1908.5	QPSK	24.14	EIRP	0.259	1.0874	1M09G7D
				16QAM	22.91	EIRP	0.195	0.9548	955KD7W
2	5	1852.5	1907.5	QPSK	24.05	EIRP	0.254	1.1064	1M11G7D
				16QAM	24.07	EIRP	0.255	0.9812	981KD7W
2	10	1855.0	1905.0	QPSK	24.00	EIRP	0.251	1.1034	1M10G7D
				16QAM	24.06	EIRP	0.255	0.9614	961KD7W
2	15	1857.5	1902.5	QPSK	24.19	EIRP	0.262	1.109	1M11G7D
				16QAM	24.27	EIRP	0.267	0.974	974KD7W
2	20	1860.0	1900.0	QPSK	24.11	EIRP	0.258	1.116	1M12G7D
				16QAM	24.15	EIRP	0.260	0.974	974KD7W
CAT-M1 Band	BW	Frequency		Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
4	1.4	1710.7	1754.3	QPSK	23.99	EIRP	0.251	1.0898	1M09G7D
				16QAM	22.85	EIRP	0.193	0.9587	959KD7W
4	3	1711.5	1753.5	QPSK	24.02	EIRP	0.252	1.0915	1M09G7D
				16QAM	22.89	EIRP	0.195	0.9607	961KD7W
4	5	1712.5	1752.5	QPSK	23.95	EIRP	0.248	1.1065	1M11G7D
				16QAM	24.00	EIRP	0.251	0.9634	963KD7W
4	10	1715.0	1750.0	QPSK	24.04	EIRP	0.254	1.1030	1M10G7D
				16QAM	24.00	EIRP	0.251	0.9517	952KD7W
4	15	1717.5	1747.5	QPSK	24.20	EIRP	0.263	1.1072	1M11G7D
				16QAM	24.18	EIRP	0.262	0.9639	964KD7W
4	20	1720.0	1745.0	QPSK	24.08	EIRP	0.256	1.1081	1M11G7D
				16QAM	24.16	EIRP	0.261	0.9629	963KD7W
CAT-M1 Band	BW	Frequency		Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
12	1.4	699.7	715.3	QPSK	21.50	ERP	0.141	1.0897	1M09G7D
				16QAM	20.27	ERP	0.106	0.9588	959KD7W
12	3	700.5	714.5	QPSK	21.59	ERP	0.144	1.0878	1M09G7D
				16QAM	20.40	ERP	0.110	0.9541	954KD7W
12	5	701.5	713.5	QPSK	21.62	ERP	0.145	1.1022	1M10G7D
				16QAM	21.56	ERP	0.143	0.9622	962KD7W
12	10	704.0	711.0	QPSK	21.54	ERP	0.143	1.1044	1M10G7D
				16QAM	21.53	ERP	0.142	0.9422	942KD7W

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CAT-M1 Band	BW	Frequency		Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
13	5	779.5	784.5	QPSK	21.57	ERP	0.144	1.1066	1M11G7D
				16QAM	21.54	ERP	0.143	0.9640	964KD7W
13	10	782.0	782.0	QPSK	21.55	ERP	0.143	1.0879	1M09G7D
				16QAM	21.59	ERP	0.144	0.9385	939KD7W

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1.5 Final Amplifier Voltage and Current Information

CAT-M1 Band 2

Test mode	DC voltage (V)	DC current (mA)
CAT-M1 Band 2_20M QPSK	3.8	120

CAT-M1 Band 4

Test mode	DC voltage (V)	DC current (mA)
CAT-M1 Band 4_20M QPSK	3.8	110

CAT-M1 Band 12

Test mode	DC voltage (V)	DC current (mA)
CAT-M1 Band 12_10M	3.8	120

CAT-M1 Band 13

Test mode	DC voltage (V)	DC current (mA)
CAT-M1 Band 13_10M	3.8	120

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1.6 EUT Availability and The Worst Test Modes

1. Pre-Scan has been conducted to determine the worst-case scenario from all possible combinations among available modulations, data rates and antenna ports, the worst case configurations listed below for the final test.
2. The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

Test Items				Max. Output Power									
Band	Test Channel			Bandwidth (MHz)						Modulation		RB #	
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Full
2	V	V	V	V	V	V	V	V	V	V	V	V	V
4	V	V	V	V	V	V	V	V	V	V	V	V	V
12	V	V	V	V	V	V	V	-	-	V	V	V	V
13	V	V	V	-	-	V	V	-	-	V	V	V	V
Test Items				Frequency Stability									
2	-	V	-	-	-	-	V	-	-	V	-	-	V
4	-	V	-	-	-	-	V	-	-	V	-	-	V
12	-	V	-	-	-	-	V	-	-	V	-	-	V
13	-	V	-	-	-	-	V	-	-	V	-	-	V
Test Items				26dB and 99% Bandwidth									
Band	Test Channel			Bandwidth (MHz)						Modulation		RB #	
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Full
2	V	V	V	V	V	V	V	V	V	V	V	-	V
4	V	V	V	V	V	V	V	V	V	V	V	-	V
12	V	V	V	V	V	V	V	-	-	V	V	-	V
13	V	V	V	-	-	V	V	-	-	V	V	-	V
Test Items				Peak-to-Average Ratio									
2	V	V	V	V	V	V	V	V	V	V	V	-	V
4	V	V	V	V	V	V	V	V	V	V	V	-	V
12	V	V	V	V	V	V	V	-	-	V	V	-	V
13	V	V	V	-	-	V	V	-	-	V	V	-	V
Test Items				Band Edge									
Band	Test Channel			Bandwidth (MHz)						Modulation		RB #	
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Full
2	V	-	V	V	V	V	V	V	V	V	-	V	V
4	V	-	V	V	V	V	V	V	V	V	-	V	V
12	V	-	V	V	V	V	V	-	-	V	-	V	V
13	V	-	V	-	-	V	V	-	-	V	-	V	V
Test Items				Conducted Emission									
2	V	V	V	-	-	-	-	V	-	-	V	V	-
4	V	V	V	-	-	-	-	V	-	V	-	V	-
12	V	V	V	-	-	V	-	-	-	V	-	V	-
13	-	V	-	-	-	-	V	-	-	-	V	V	-

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Test Items				Radiated Emission									
Band	Test Channel			Bandwidth (MHz)						Modulation		RB #	
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Full
2	V	V	V	-	-	-	-	V	-	-	V	V	-
4	V	V	V	-	-	-	-	V	-	V	-	V	-
12	V	V	V	-	-	V	-	-	-	V	-	V	-
13	-	V	-	-	-	-	V	-	-	-	V	V	-

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2 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§24.232(c) §27.1507(a)(4) §27.50(a)(3)(i) §27.50(b)(10) §27.50(c)(10) §27.50(d)(4) §27.50(h)(2) §27.50(j)(3) §27.50(k)(3)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occupied Bandwidth	Compliant
§24.238(a) §27.1509 §27.53(a)(4) §27.53(c)(2) §27.53(g) §27.53(h)(1) §27.53(l)(2) §27.53(m)(4) §27.53(n)(2)	Out of Band Emissions at Antenna Terminals and Band Edge / Emission mask requirements	Compliant
§24.238(a) §27.1509 §27.53(a)(4) §27.53(c)(2) §27.53(g) §27.53(h)(1) §27.53(l)(2) §27.53(m)(4) §27.53(n)(2)	Field Strength of Spurious Radiation	Compliant
§24.232(d) §27.1507(a)(4) §27.50 (k)(4) §27.50(a)(1)(B) §27.50(d)(5) §27.50(j)(4)	Peak to Average Ratio	Compliant
§2.1055(a)(1) §24.235 §27.54	Frequency Stability	Compliant

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2.1 Test Methodology of Applied Standards

1. FCC 47 CFR Part 2, 24E
2. FCC 47 CFR Part 2, 27C
3. ANSI C63.26:2015
4. FCC KDB 971168 D01 Power Meas License Digital System v03r01
5. FCC KDB 412172 D01 Determining ERP and EIRP v01r01

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2.2 Measurement Uncertainty

Test Items	Uncertainty
Output Power measurement	+/- 0.97 dB
ERP/ EIRP measurement	+/- 2.16 dB
Emission Bandwidth	+/- 1.38 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.77 dB
Peak to Average Ratio	+/- 0.97 dB
Frequency Stability vs. Temperature	+/- 1.48 Hz
Frequency Stability vs. Voltage	+/- 1.48 Hz
Temperature	+/- 0.60 °C
Humidity	+/- 3.00 %
DC / AC Power Source	+/- 1.00 %

Radiated Spurious Emission Measurement Uncertainty		
Polarization: Vertical	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.37 dB	1GHz - 18GHz
	+/- 3.83 dB	18GHz - 40GHz
Polarization: Horizontal	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.37 dB	1GHz - 18GHz
	+/- 3.83 dB	18GHz - 40GHz
Radiated Spurious Emission	+/- 2.00 dB	33GHz - 50GHz
	+/- 1.59 dB	50GHz - 60GHz
	+/- 1.71 dB	60GHz - 90GHz
	+/- 1.64 dB	90GHz - 140GHz
	+/- 3.84 dB	140GHz - 220GHz

Note

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

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2.3 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number / Registration Number	IC CAB identifier
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	SAC 1 / SAC 2 / SAC 3 Conduction 1 / Conducted 1 Conducted 2 / Conducted 3 Conducted 4 / Conducted 5 Conducted 6	TW0027 / 891563	TW3702
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.2, Keji 1st Rd, Guishan District, Taoyuan City, Taiwan 333	SAC C / SAC D / SAC G Conduction C/ Conducted A Conducted B / Conducted C Conducted D / Conducted E Conducted F / Conducted G	TW0028 / 200037	TW3702

Test Condition	Test Site name	Test Engineer	Test Environment (T&H)	Test Date
Conducted	Conducted 3	Brian Wang	21~27°C / 57~66%	2025/08/25 ~ 2025/08/29

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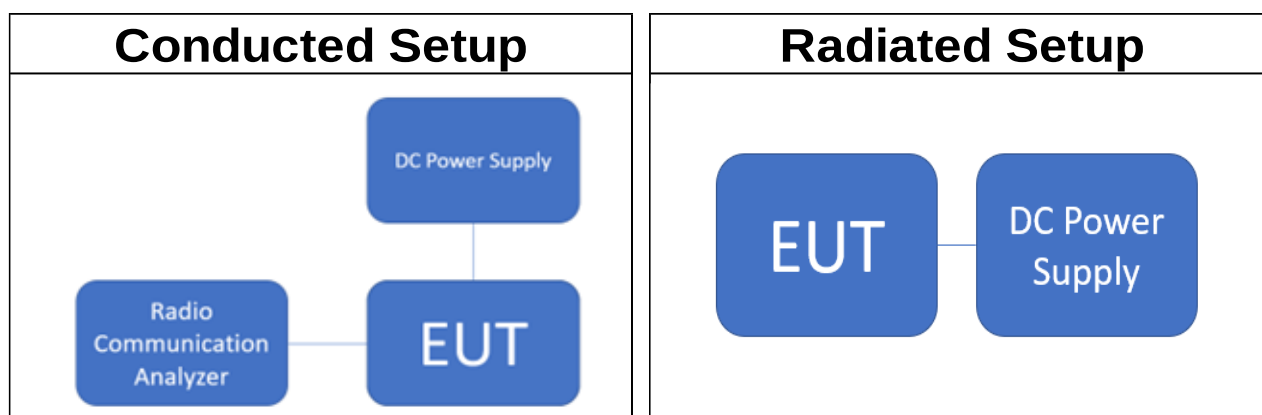
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3 CONTROL UNIT(S) AND PERIPHERAL(S)

3.1 EUT Exercise

1. 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. 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. The spectrum analyzer offset is derived from RF cable loss and at-tenuator factor.

3.2 Diagrams



3.3 List

3.3.1 Conducted Setup

N/A

3.3.2 Radiated Setup

N/A

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4 MEASUREMENT EQUIPMENT USED

4.1 Conducted Measurement

Conducted Emission Test Site: Conducted 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Attenuator	Mini-Circuits	BW-S10W2+	16	12/11/2024	12/10/2025
DC Block	Mini-Circuits	BLK-18-S+	12	12/11/2024	12/10/2025
DC Power Supply	Chroma	41901	777188	07/08/2025	07/07/2026
PXA Spectrum Analyzer	Keysight	N9030B	MY61330494	04/16/2025	04/15/2026
Radio Communication Analyzer	Anritsu	MT8821C	6262044751	11/04/2024	11/03/2025
Splitter	RF-Lambda	RFLT2W1G18G	11-JSPF412-017	12/11/2024	12/10/2025
Temperature Chamber	Giant Force	GTH-150-40-CP-AR	MAA0512-018	06/04/2025	06/03/2026
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R

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4.2 Radiated Measurement

Radiated Emission Test Site: SAC 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
1.3G High Pass Filter	Woken	WHKX10-1066	20	12/11/2024	12/10/2025
3G High Pass Filter	Titan	T04H30001800070S01	23040703-34	12/11/2024	12/10/2025
Band Reject Filter 1700-2000	Titan	T04N800100050S01	23040703-7	12/11/2024	12/10/2025
Band Reject Filter 635-920	Titan	T04N63592050S01	23040703-4	12/11/2024	12/10/2025
Bi-log Antenna	SCHWARZBECK	VULB9168	1208	07/22/2025	07/21/2026
Bi-log Antenna	TESEO	CBL 6112D	35242 & AT-N0555	12/09/2024	12/08/2025
Coaxial Cable	EMCI	EMC104-SM-SM-8000+EMC106-SM-SM-7600	RX Cable 9K-18G(160125+150817)	07/14/2025	07/13/2026
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062/2	07/14/2025	07/13/2026
Coaxial Cables	Huber Suhner	SUCOFLEX 102	TX Cable 25M-40G 805068/2	07/14/2025	07/13/2026
DC Power Supply	HILA	DP-3003N	11233K1019035	03/24/2025	03/23/2026
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60242081	10/23/2024	10/22/2025
Horn Antenna	ETS.LINDGREN	3117	143271	01/09/2025	01/08/2026
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	08/07/2025	08/06/2026
Horn Antenna	SCHWARZBECK	BBHA9120D	D803	01/09/2025	01/08/2026
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/20/2024	12/19/2025
Network Analyzer	Anritsu	MS4644A	1216312	12/25/2024	12/24/2025
Pre-Amplifier	EMCI	EMC118A45SEE	980933	07/14/2025	07/13/2026
Pre-Amplifier	EMCI	EMC184045SEE	980939	07/14/2025	07/13/2026
Pre-Amplifier	HP	8447D	2944A09469	07/14/2025	07/13/2026
Radio Communication Analyzer	Anritsu	MT8821C	6261786084	12/31/2024	12/30/2025
Site Cal	SGS	SAC 1	N/A	07/14/2025	07/13/2026
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

NOTE: N.C.R refers to Not Calibrated Required.

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5 REGULATORY REQUIREMENTS

5.1 Maximum Output Power

§24.232(c)

(c) Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

§27.1507(a)(4)

(4) Portable stations. Portable stations must not exceed 3 watts ERP.

§27.50(a)(3)(i)

(i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

§27.50(b)(10)

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

§27.50(c)(10)

(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

§27.50(d)(4)

(4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

§27.50(h)(2)

(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

§27.50(j)(3)

(3) Mobile and portable stations are limited to 1 Watt EIRP. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

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§27.50(k)(3)

(3) Mobile devices are limited to 1Watt (30 dBm) EIRP. Mobile devices operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

5.2 Occupied Bandwidth

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.

5.3 Out Of Band Emission At Antenna Terminals

§24.238(a)

(a) 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.

§27.1509

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) in watts by at least the following amounts:

(a) For 900 MHz broadband operations in 897.5-900.5 MHz band by at least $43 + 10 \log(P)$ dB.

(b) For 900 MHz broadband operations in the 936.5-939.5 MHz band, by at least $50 + 10 \log(P)$ dB.

(c) Compliance with the provisions of paragraphs (a) and (b) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the licensee's band, a resolution bandwidth of at least 1 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.

(d) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

(e) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

§27.53(a)(4)

(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: $43 + 10 \log(P)$ dB on all frequencies between

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2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log(P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log(P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log(P)$ dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log(P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log(P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log(P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log(P)$ dB below 2288 MHz;

(iii) By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log(P)$ dB above 2365 MHz.

§27.53(c)(2)

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;

§27.53(g)

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance 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.

§27.53(h)(1)

(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

§27.53(l)(2)

(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (l)(2) 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, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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

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all emissions are attenuated at least 26 dB below the transmitter power.

§27.53(m)(4)

(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

§27.53(n)(2)

(2) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (n)(2) 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, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

5.4 Field Strength Of Spurious Radiation

§24.238(a)

(a) 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.

§27.1509

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) in watts by at least the following amounts:

(a) For 900 MHz broadband operations in 897.5-900.5 MHz band by at least $43 + 10 \log (P)$ dB.

(b) For 900 MHz broadband operations in the 936.5-939.5 MHz band, by at least $50 + 10 \log (P)$ dB.

(c) Compliance with the provisions of paragraphs (a) and (b) of this section is based on the use of measurement instrumentation employing a resolution

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bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the licensee's band, a resolution bandwidth of at least 1 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.

(d) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

(e) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

§27.53(a)(4)

(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz;

(iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 MHz.

§27.53(c)(2)

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

§27.53(g)

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance 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.

§27.53(h)(1)

(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920

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MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

§27.53(l)(2)

(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (l)(2) 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, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

§27.53(m)(4)

(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

§27.53(n)(2)

(2) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (n)(2) 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, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

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5.5 Frequency Stability

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

5.6 Peak to Average Ratio

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

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6 TEST CONFIGURATION

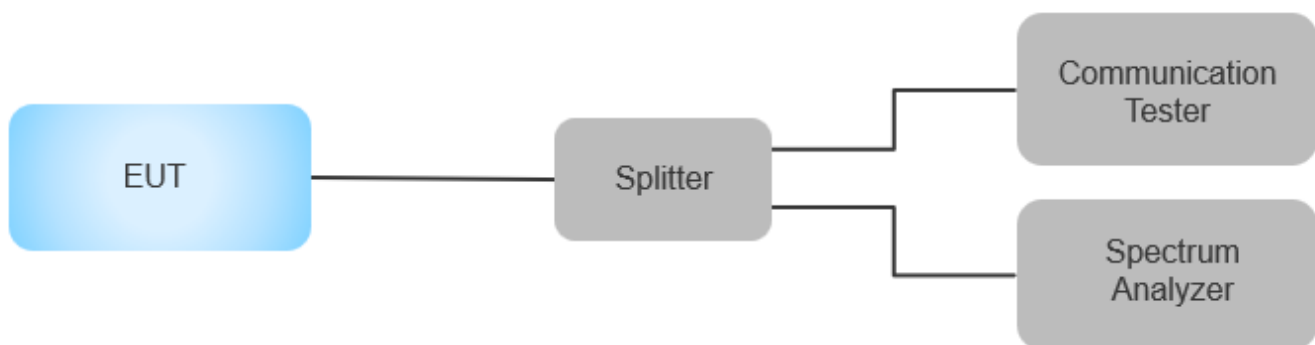
6.1 Maximum Output Power



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.

KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results.

6.2 Occupied Bandwidth



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% ~ 5%, VBW $\geq 3 * RBW$, with span $> 2 * \text{Signal BW}$, set % Power = 99%.

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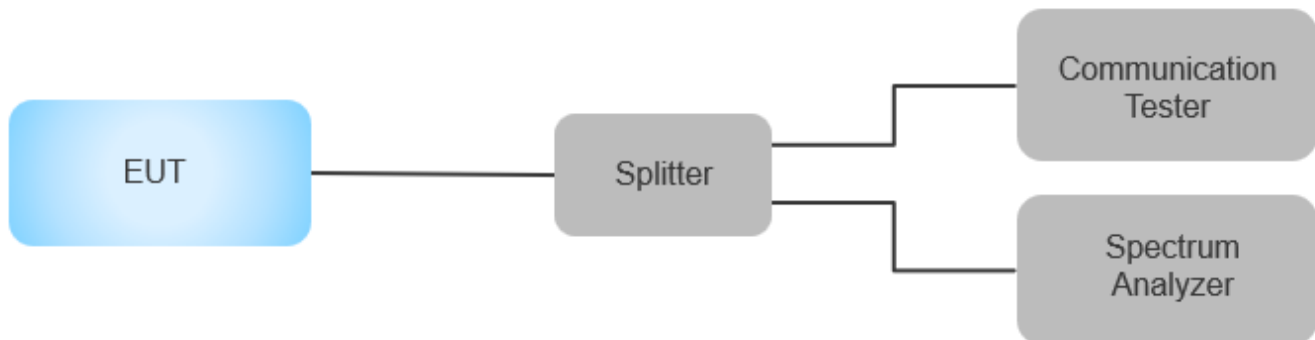
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6.3 Out Of Band Emission At Antenna Terminals



6.3.1 Out Of Band 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.

To connect Antenna Port of EUT to Spectrum.

Set RBW = 1MHz & VBW = 1MHz on Spectrum.

Allow trace to fully stabilize

Repeat above procedures until all default test channel measured were complete.

6.3.2 Band Edge

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.

To connect Antenna Port of EUT to Spectrum.

Set RBW = 1MHz & VBW = 1MHz on Spectrum.

Allow trace to fully stabilize

Repeat above procedures until all default test channel measured were complete.

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 $RBW \geq 1\% \text{ EBW}$.
3. Detector = Average
4. Allow trace to fully stabilize
5. Repeat above procedures until all default test channel measured were complete.

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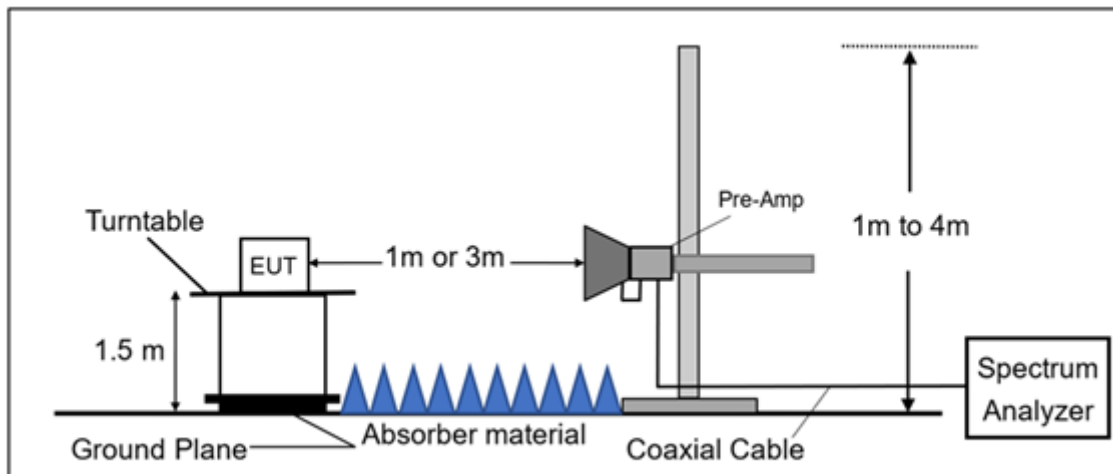
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6.4 Field Strength Of Spurious Radiation

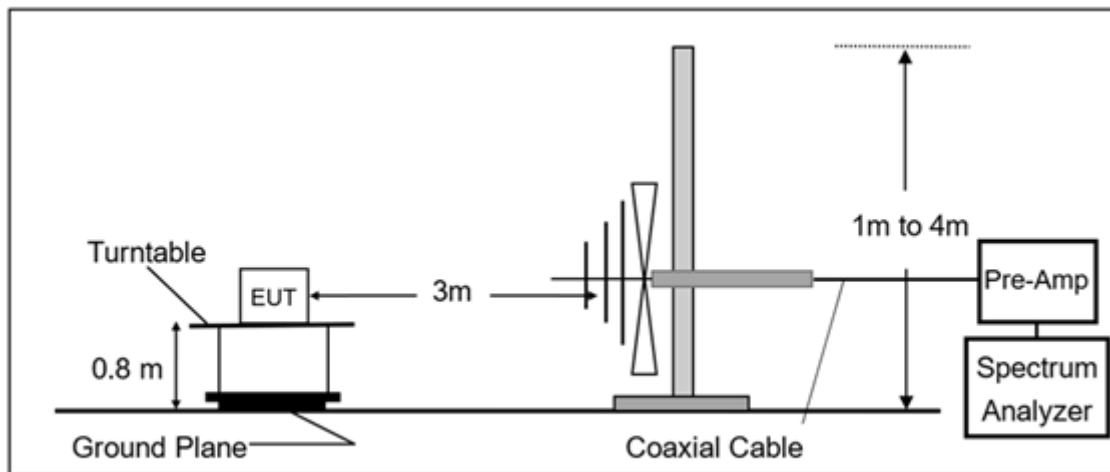
For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*6m*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.



Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



Radiated Emission Test Set-Up, Frequency Above 1GHz.

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The Equipment Under Test (EUT) was positioned on a non-conductive turntable that rotates 360 degrees. The receiving antenna was placed 3 meters from the EUT, with height varied between 1-4 meters to maximize emission detection.

To identify maximum emission levels, the following parameters were optimized:

EUT azimuth angle through 360-degree rotation

EUT orientation in three orthogonal axes

Antenna height (1-4 meters)

Antenna polarization (horizontal and vertical)

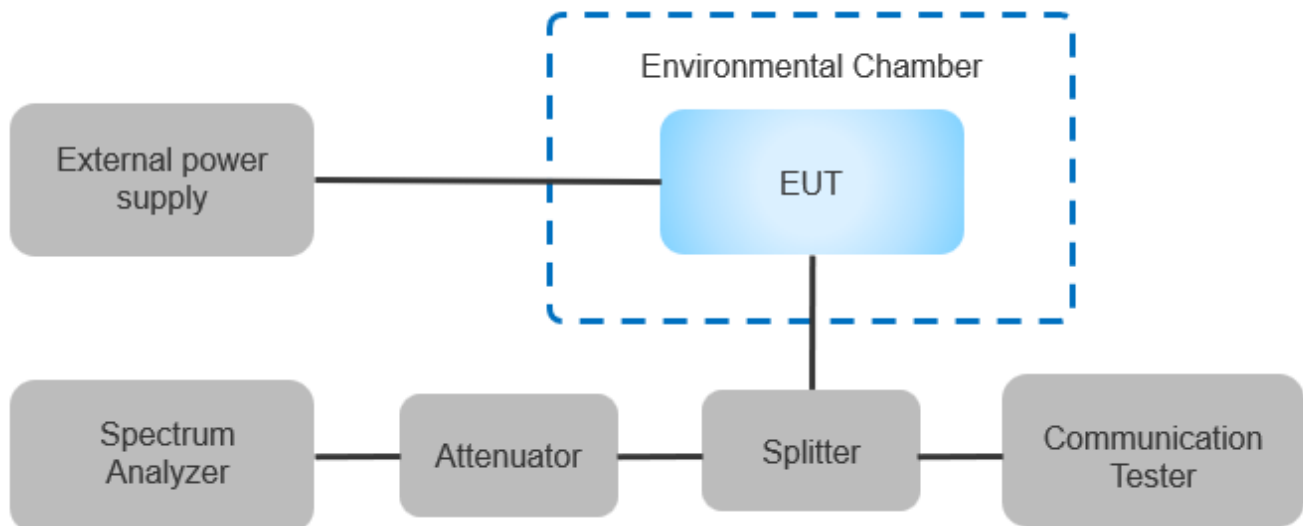
For frequencies above 1 GHz, measurements were conducted with the antenna maintained within the 3dB illumination bandwidth and pointed toward the EUT in both azimuth and elevation angles.

The frequency range extending to the tenth harmonic was investigated for three fundamental frequencies (low, middle, and high channels). Spurious emissions were identified and their power levels determined using the substitution method. The spurious emission attenuation was calculated as the difference between the radiated power at the fundamental frequency and the spurious emission frequency.

$ERP \text{ (dBm)} = SG \text{ Level (dBm)} + \text{Antenna Gain (dBd)} + \text{Cable Loss (dB)}$

$EIRP \text{ (dBm)} = SG \text{ Level (dBm)} + \text{Antenna Gain (dBi)} + \text{Cable Loss (dB)}$

6.5 Frequency Stability



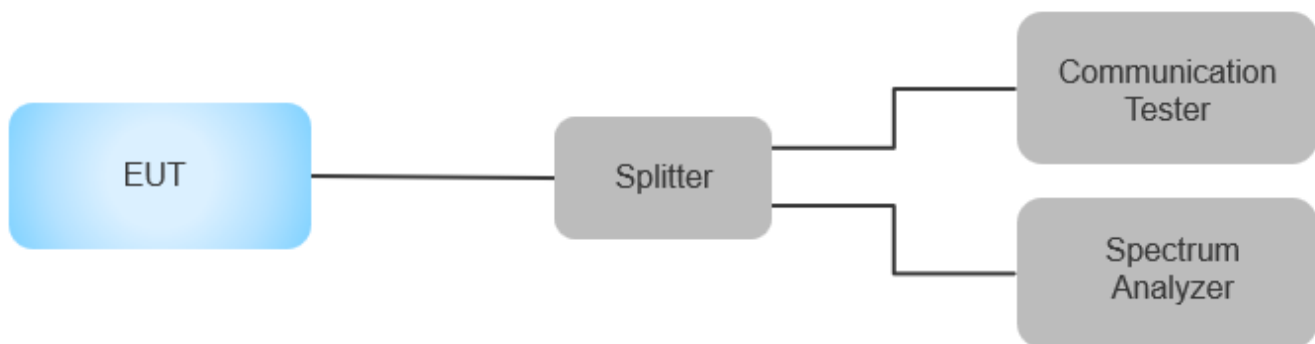
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The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint as declared by the manufacturer, record the maximum frequency change.

6.6 Peak To Average Ratio



1. KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:
2. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth; & internal = 1ms
3. As an alternative, the highest power level measured in a narrower RBW (relative to the specified reference bandwidth) can be scaled by applying a correction factor determined from: $10 \log [(reference\ bandwidth) / (resolution\ or\ measurement\ band-width)]$.
4. Set the number of counts to a value that stabilizes the measured CCDF curve.

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7 TEST RESULTS

7.1 Maximum Output Power

Antenna gain (dBi) 1.7

CAT-M1 Band 2 Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	18607	1850.7	QPSK	1	0	0	22.29	23.99	33	-9.01
				6	0	0	20.44	22.14	33	-10.86
	18900	1880	QPSK	1	0	0	22.34	24.04	33	-8.96
				6	0	0	20.39	22.09	33	-10.91
	19193	1909.3	QPSK	1	5	0	22.25	23.95	33	-9.05
				6	0	0	20.36	22.06	33	-10.94
	18607	1850.7	16QAM	1	0	0	21.18	22.88	33	-10.12
				5	0	0	20.52	22.22	33	-10.78
	18900	1880	16QAM	1	0	0	21.22	22.92	33	-10.08
				5	0	0	20.45	22.15	33	-10.85
	19193	1909.3	16QAM	1	5	0	21.03	22.73	33	-10.27
				5	0	0	20.29	21.99	33	-11.01

Antenna gain (dBi) 1.7

CAT-M1 Band 2 Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	18615	1851.5	QPSK	1	0	0	22.44	24.14	33	-8.86
				6	0	0	20.52	22.22	33	-10.78
	18900	1880	QPSK	1	0	0	22.31	24.01	33	-8.99
				6	0	0	20.46	22.16	33	-10.84
	19185	1908.5	QPSK	1	5	1	22.20	23.90	33	-9.10
				6	0	1	20.42	22.12	33	-10.88
	18615	1851.5	16QAM	1	0	0	21.21	22.91	33	-10.09
				5	0	0	20.49	22.19	33	-10.81
	18900	1880	16QAM	1	0	0	21.19	22.89	33	-10.11
				5	0	0	20.43	22.13	33	-10.87
	19185	1908.5	16QAM	1	5	1	20.96	22.66	33	-10.34
				5	0	1	20.36	22.06	33	-10.94

Antenna gain (dBi) 1.7

CAT-M1 Band 2 Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	18625	1852.5	QPSK	1	0	0	22.35	24.05	33	-8.95
				6	0	0	21.44	23.14	33	-9.86
	18900	1880	QPSK	1	0	0	22.30	24.00	33	-9.00
				6	0	0	21.47	23.17	33	-9.83
	19175	1907.5	QPSK	1	5	3	22.10	23.80	33	-9.20
				6	0	3	21.26	22.96	33	-10.04
	18625	1852.5	16QAM	1	0	0	22.37	24.07	33	-8.93
				5	0	0	20.63	22.33	33	-10.67
	18900	1880	16QAM	1	0	0	22.35	24.05	33	-8.95
				5	0	0	20.58	22.28	33	-10.72
	19175	1907.5	16QAM	1	5	3	22.17	23.87	33	-9.13
				5	0	3	20.40	22.10	33	-10.90

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Antenna gain (dBi) 1.7

CAT-M1 Band 2 Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	18650	1855	QPSK	1	0	0	22.30	24.00	33	-9.00
				6	0	0	21.49	23.19	33	-9.81
	18900	1880	QPSK	1	0	0	22.22	23.92	33	-9.08
				6	0	0	21.35	23.05	33	-9.95
	19150	1905	QPSK	1	5	7	22.18	23.88	33	-9.12
				6	0	7	21.26	22.96	33	-10.04
	18650	1855	16QAM	1	0	0	22.36	24.06	33	-8.94
				5	0	0	21.57	23.27	33	-9.73
	18900	1880	16QAM	1	0	0	22.27	23.97	33	-9.03
				5	0	0	21.43	23.13	33	-9.87
	19150	1905	16QAM	1	5	7	22.14	23.84	33	-9.16
				5	0	7	21.27	22.97	33	-10.03

Antenna gain (dBi) 1.7

CAT-M1 Band 2 Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
15	18675	1857.5	QPSK	1	0	0	22.49	24.19	33	-8.81
				6	0	0	22.40	24.10	33	-8.90
	18900	1880	QPSK	1	0	0	22.27	23.97	33	-9.03
				6	0	0	22.38	24.08	33	-8.92
	19125	1902.5	QPSK	1	5	11	22.13	23.83	33	-9.17
				6	0	11	22.30	24.00	33	-9.00
	18675	1857.5	16QAM	1	0	0	22.57	24.27	33	-8.73
				5	0	0	22.42	24.12	33	-8.88
	18900	1880	16QAM	1	0	0	22.32	24.02	33	-8.98
				5	0	0	22.46	24.16	33	-8.84
	19125	1902.5	16QAM	1	5	11	22.19	23.89	33	-9.11
				5	0	11	22.42	24.12	33	-8.88

Antenna gain (dBi) 1.7

CAT-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	22.35	24.05	33	-8.95
				6	0	0	22.35	24.05	33	-8.95
	18900	1880	QPSK	1	0	0	22.41	24.11	33	-8.89
				6	0	0	22.31	24.01	33	-8.99
	19100	1900	QPSK	1	5	15	22.19	23.89	33	-9.11
				6	0	15	22.36	24.06	33	-8.94
	18700	1860	16QAM	1	0	0	22.25	23.95	33	-9.05
				5	0	0	22.35	24.05	33	-8.95
	18900	1880	16QAM	1	0	0	22.45	24.15	33	-8.85
				5	0	0	22.27	23.97	33	-9.03
	19100	1900	16QAM	1	5	15	22.27	23.97	33	-9.03
				5	0	15	22.22	23.92	33	-9.08

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Antenna gain (dBi) 1.7

CAT-M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	19957	1710.7	QPSK	1	0	0	22.28	23.98	30	-6.02
				6	0	0	20.42	22.12	30	-7.88
	20175	1732.5	QPSK	1	0	0	22.29	23.99	30	-6.01
				6	0	0	20.34	22.04	30	-7.96
	20393	1754.3	QPSK	1	5	0	22.20	23.90	30	-6.10
				6	0	0	20.48	22.18	30	-7.82
	19957	1710.7	16QAM	1	0	0	21.13	22.83	30	-7.17
				5	0	0	20.27	21.97	30	-8.03
	20175	1732.5	16QAM	1	0	0	21.15	22.85	30	-7.15
				5	0	0	20.32	22.02	30	-7.98
	20393	1754.3	16QAM	1	5	0	21.14	22.84	30	-7.16
				5	0	0	20.32	22.02	30	-7.98

Antenna gain (dBi) 1.7

CAT-M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	19965	1711.5	QPSK	1	0	0	22.30	24.00	30	-6.00
				6	0	0	20.43	22.13	30	-7.87
	20175	1732.5	QPSK	1	0	0	22.32	24.02	30	-5.98
				6	0	0	20.37	22.07	30	-7.93
	20385	1753.5	QPSK	1	5	1	22.28	23.98	30	-6.02
				6	0	1	20.34	22.04	30	-7.96
	19965	1711.5	16QAM	1	0	0	21.19	22.89	30	-7.11
				5	0	0	20.38	22.08	30	-7.92
	20175	1732.5	16QAM	1	0	0	21.17	22.87	30	-7.13
				5	0	0	20.28	21.98	30	-8.02
	20385	1753.5	16QAM	1	5	1	21.14	22.84	30	-7.16
				5	0	1	20.42	22.12	30	-7.88

Antenna gain (dBi) 1.7

CAT-M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	19975	1712.5	QPSK	1	0	0	22.20	23.90	30	-6.10
				6	0	0	21.22	22.92	30	-7.08
	20175	1732.5	QPSK	1	0	0	22.25	23.95	30	-6.05
				6	0	0	21.21	22.91	30	-7.09
	20375	1752.5	QPSK	1	5	3	22.24	23.94	30	-6.06
				6	0	3	21.34	23.04	30	-6.96
	19975	1712.5	16QAM	1	0	0	22.30	24.00	30	-6.00
				5	0	0	20.37	22.07	30	-7.93
	20175	1732.5	16QAM	1	0	0	22.28	23.98	30	-6.02
				5	0	0	20.43	22.13	30	-7.87
	20375	1752.5	16QAM	1	5	3	22.29	23.99	30	-6.01
				5	0	3	20.41	22.11	30	-7.89

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Antenna gain (dBi) 1.7

CAT-M1 Band 4 Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	20000	1715	QPSK	1	0	0	22.27	23.97	30	-6.03
				6	0	0	21.40	23.10	30	-6.90
	20175	1732.5	QPSK	1	0	0	22.34	24.04	30	-5.96
				6	0	0	21.33	23.03	30	-6.97
	20350	1750	QPSK	1	5	7	22.22	23.92	30	-6.08
				6	0	7	21.28	22.98	30	-7.02
	20000	1715	16QAM	1	0	0	22.30	24.00	30	-6.00
				5	0	0	21.29	22.99	30	-7.01
	20175	1732.5	16QAM	1	0	0	22.21	23.91	30	-6.09
				5	0	0	21.31	23.01	30	-6.99
	20350	1750	16QAM	1	5	7	22.29	23.99	30	-6.01
				5	0	7	21.43	23.13	30	-6.87

Antenna gain (dBi) 1.7

CAT-M1 Band 4 Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
15	20025	1717.5	QPSK	1	0	0	22.50	24.20	30	-5.80
				6	0	0	22.31	24.01	30	-5.99
	20175	1732.5	QPSK	1	0	0	22.22	23.92	30	-6.08
				6	0	0	22.35	24.05	30	-5.95
	20325	1747.5	QPSK	1	5	11	22.25	23.95	30	-6.05
				6	0	11	22.22	23.92	30	-6.08
	20025	1717.5	16QAM	1	0	0	22.23	23.93	30	-6.07
				5	0	0	22.18	23.88	30	-6.12
	20175	1732.5	16QAM	1	0	0	22.48	24.18	30	-5.82
				5	0	0	22.34	24.04	30	-5.96
	20325	1747.5	16QAM	1	5	11	22.33	24.03	30	-5.97
				5	0	11	22.37	24.07	30	-5.93

Antenna gain (dBi) 1.7

CAT-M1 Band 4 Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
20	20050	1720	QPSK	1	0	0	22.35	24.05	30	-5.95
				6	0	0	22.24	23.94	30	-6.06
	20175	1732.5	QPSK	1	0	0	22.14	23.84	30	-6.16
				6	0	0	22.32	24.02	30	-5.98
	20300	1745	QPSK	1	5	15	22.31	24.01	30	-5.99
				6	0	15	22.38	24.08	30	-5.92
	20050	1720	16QAM	1	0	0	22.45	24.15	30	-5.85
				5	0	0	22.26	23.96	30	-6.04
	20175	1732.5	16QAM	1	0	0	22.10	23.80	30	-6.20
				5	0	0	22.28	23.98	30	-6.02
	20300	1745	16QAM	1	5	15	22.46	24.16	30	-5.84
				5	0	15	22.32	24.02	30	-5.98

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Antenna gain (dBi) 1.2

CAT-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)	ERP Limit (dBm)	Margin (dB)
1.4	23017	699.7	QPSK	1	0	0	22.44	21.49	23.64	34.77	-13.28
				6	0	0	20.56	19.61	21.76	34.77	-15.16
	23095	707.5	QPSK	1	0	0	22.45	21.50	23.65	34.77	-13.27
				6	0	0	20.58	19.63	21.78	34.77	-15.14
	23173	715.3	QPSK	1	5	0	22.35	21.40	23.55	34.77	-13.37
				6	0	0	20.55	19.60	21.75	34.77	-15.17
	23017	699.7	16QAM	1	0	0	21.15	20.20	22.35	34.77	-14.57
				5	0	0	20.49	19.54	21.69	34.77	-15.23
	23095	707.5	16QAM	1	0	0	21.22	20.27	22.42	34.77	-14.50
				5	0	0	20.54	19.59	21.74	34.77	-15.18
	23173	715.5	16QAM	1	5	0	21.03	20.08	22.23	34.77	-14.69
				5	0	0	20.53	19.58	21.73	34.77	-15.19

Antenna gain (dBi) 1.2

CAT-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)	ERP Limit (dBm)	Margin (dB)
3	23025	700.5	QPSK	1	0	0	22.43	21.48	23.63	34.77	-13.29
				6	0	0	20.55	19.60	21.75	34.77	-15.17
	23095	707.5	QPSK	1	0	0	22.54	21.59	23.74	34.77	-13.18
				6	0	0	20.65	19.70	21.85	34.77	-15.07
	23165	714.5	QPSK	1	5	1	22.46	21.51	23.66	34.77	-13.26
				6	0	1	20.58	19.63	21.78	34.77	-15.14
	23025	700.5	16QAM	1	0	0	21.33	20.38	22.53	34.77	-14.39
				5	0	0	20.53	19.58	21.73	34.77	-15.19
	23095	707.5	16QAM	1	0	0	21.35	20.40	22.55	34.77	-14.37
				5	0	0	20.51	19.56	21.71	34.77	-15.21
	23165	714.5	16QAM	1	5	1	21.27	20.32	22.47	34.77	-14.45
				5	0	1	20.56	19.61	21.76	34.77	-15.16

Antenna gain (dBi) 1.2

CAT-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)	ERP Limit (dBm)	Margin (dB)
5	23035	701.5	QPSK	1	0	0	22.41	21.46	23.61	34.77	-13.31
				6	0	0	21.49	20.54	22.69	34.77	-14.23
	23095	707.5	QPSK	1	0	0	22.57	21.62	23.77	34.77	-13.15
				6	0	0	21.64	20.69	22.84	34.77	-14.08
	23155	713.5	QPSK	1	5	3	22.41	21.46	23.61	34.77	-13.31
				6	0	3	21.50	20.55	22.70	34.77	-14.22
	23035	701.5	16QAM	1	0	0	22.51	21.56	23.71	34.77	-13.21
				5	0	0	20.69	19.74	21.89	34.77	-15.03
	23095	707.5	16QAM	1	0	0	22.38	21.43	23.58	34.77	-13.34
				5	0	0	20.68	19.73	21.88	34.77	-15.04
	23155	713.5	16QAM	1	5	3	22.44	21.49	23.64	34.77	-13.28
				5	0	3	20.62	19.67	21.82	34.77	-15.10

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Antenna gain (dBi) 1.2

CAT-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)	ERP Limit (dBm)	Margin (dB)
10	23060	704	QPSK	1	0	0	22.47	21.52	23.67	34.77	-13.25
				6	0	0	21.57	20.62	22.77	34.77	-14.15
	23095	707.5	QPSK	1	0	0	22.49	21.54	23.69	34.77	-13.23
				6	0	0	21.59	20.64	22.79	34.77	-14.13
	23130	711	QPSK	1	5	7	22.41	21.46	23.61	34.77	-13.31
				6	0	7	21.50	20.55	22.70	34.77	-14.22
	23060	704	16QAM	1	0	0	22.47	21.52	23.67	34.77	-13.25
				5	0	0	21.70	20.75	22.90	34.77	-14.02
	23095	707.5	16QAM	1	0	0	22.48	21.53	23.68	34.77	-13.24
				5	0	0	21.62	20.67	22.82	34.77	-14.10
	23130	711	16QAM	1	5	7	22.45	21.50	23.65	34.77	-13.27
				5	0	7	21.52	20.57	22.72	34.77	-14.20

Antenna gain (dBi) 1.2

CAT-M1 Band 13_Uplink frequency band : 777 to 787 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	ERP Limit (dBm)	Margin (dB)
5	23205	779.5	QPSK	1	0	0	22.52	21.57	23.72	34.77	-13.20
				6	0	0	21.63	20.68	22.83	34.77	-14.09
	23230	782	QPSK	1	0	0	22.47	21.52	23.67	34.77	-13.25
				6	0	0	21.52	20.57	22.72	34.77	-14.20
	23255	784.5	QPSK	1	5	3	22.36	21.41	23.56	34.77	-13.36
				6	0	3	21.59	20.64	22.79	34.77	-14.13
	23205	779.5	16QAM	1	0	0	22.49	21.54	23.69	34.77	-13.23
				5	0	0	20.72	19.77	21.92	34.77	-15.00
	23230	782	16QAM	1	0	0	22.42	21.47	23.62	34.77	-13.30
				5	0	0	20.57	19.62	21.77	34.77	-15.15
	23255	784.5	16QAM	1	5	3	22.44	21.49	23.64	34.77	-13.28
				5	0	3	20.68	19.73	21.88	34.77	-15.04

Antenna gain (dBi) 1.2

CAT-M1 Band 13_Uplink frequency band : 777 to 787 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB allocation	RB Start	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	ERP Limit (dBm)	Margin (dB)
10	23230	782	QPSK	1	0	0	22.50	21.55	23.70	34.77	-13.22
				6	0	0	21.65	20.70	22.85	34.77	-14.07
	23230	782	16QAM	1	0	0	22.54	21.59	23.74	34.77	-13.18
				5	0	0	21.55	20.60	22.75	34.77	-14.17
	/	/	/	/	/	/	/	/	/	/	/
				/	/	/	/	/	/	/	/

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7.2 Occupied Bandwidth

CAT-M1 BAND 2 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1850.7	18607	1.0887	0.9450	1.336	1.290
1880.0	18900	1.0863	0.9552	1.333	1.309
1909.3	19193	1.0891	0.9506	1.344	1.307

CAT-M1 BAND 2 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1851.5	18615	1.0856	0.9504	1.342	1.304
1880.0	18900	1.0874	0.9519	1.335	1.307
1908.5	19185	1.0874	0.9548	1.320	1.316

CAT-M1 BAND 2 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1852.5	18625	1.1043	0.9679	1.380	1.309
1880.0	18900	1.1064	0.9812	1.343	1.323
1907.5	19175	1.0975	0.9700	1.350	1.318

CAT-M1 BAND 2 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1855.0	18650	1.0925	0.9614	1.357	1.308
1880.0	18900	1.0914	0.9404	1.316	1.311
1905.0	19150	1.1034	0.9349	1.356	1.281

CAT-M1 BAND 2 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1857.5	18675	1.1061	0.9350	1.390	1.324
1880.0	18900	1.1086	0.9737	1.363	1.313
1902.5	19125	1.0939	0.9502	1.381	1.326

CAT-M1 BAND 2 Channel bandwidth: 20MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1860.0	18700	1.1016	0.9727	1.387	1.317
1880.0	18900	1.0904	0.9409	1.338	1.334
1900.0	19100	1.1160	0.9740	1.362	1.321

CAT-M1 BAND 4 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1710.7	19957	1.0864	0.9587	1.333	1.308
1732.5	20175	1.0896	0.9482	1.323	1.318
1754.3	20393	1.0898	0.9564	1.332	1.306

CAT-M1 BAND 4 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1711.5	19965	1.0906	0.9573	1.326	1.315
1732.5	20175	1.0879	0.9607	1.328	1.297
1753.5	20385	1.0915	0.9576	1.330	1.307

CAT-M1 BAND 4 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1712.5	19975	1.1065	0.9572	1.341	1.305
1732.5	20175	1.1017	0.9603	1.338	1.297
1752.5	20375	1.0969	0.9634	1.341	1.310

CAT-M1 BAND 4 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1715.0	20000	1.0864	0.9517	1.302	1.306
1732.5	20175	1.0906	0.9418	1.329	1.286
1750.0	20350	1.1030	0.9374	1.342	1.296

CAT-M1 BAND 4 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1717.5	20025	1.1072	0.9353	1.346	1.285
1732.5	20175	1.1067	0.9639	1.386	1.312
1747.5	20325	1.0935	0.9526	1.351	1.310

CAT-M1 BAND 4 Channel bandwidth: 20MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1720.0	20050	1.1056	0.9541	1.370	1.326
1732.5	20175	1.0904	0.9377	1.341	1.311
1745.0	20300	1.1081	0.9629	1.380	1.323

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CAT-M1 BAND 12 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
699.7	23017	1.0871	0.9521	1.307	1.292
707.5	23095	1.0885	0.9542	1.315	1.300
715.3	23173	1.0897	0.9588	1.325	1.307

CAT-M1 BAND 12 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
700.5	23025	1.0878	0.9470	1.313	1.312
707.5	23095	1.0862	0.9541	1.331	1.302
714.5	23165	1.0859	0.9506	1.326	1.299

CAT-M1 BAND 12 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
701.5	23035	1.1021	0.9575	1.337	1.305
707.5	23095	1.0935	0.9622	1.338	1.308
713.5	23155	1.1022	0.9567	1.330	1.298

CAT-M1 BAND 12 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
704.0	23060	1.0890	0.9404	1.310	1.324
707.5	23095	1.0874	0.9422	1.299	1.295
711.0	23130	1.1044	0.9318	1.347	1.267

CAT-M1 BAND 13 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
779.5	23205	1.1061	0.9640	1.338	1.306
782.0	23230	1.1052	0.9594	1.339	1.297
784.5	23255	1.1066	0.9618	1.360	1.305

CAT-M1 BAND 13 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
782.0	23230	1.0879	0.9385	1.308	1.305

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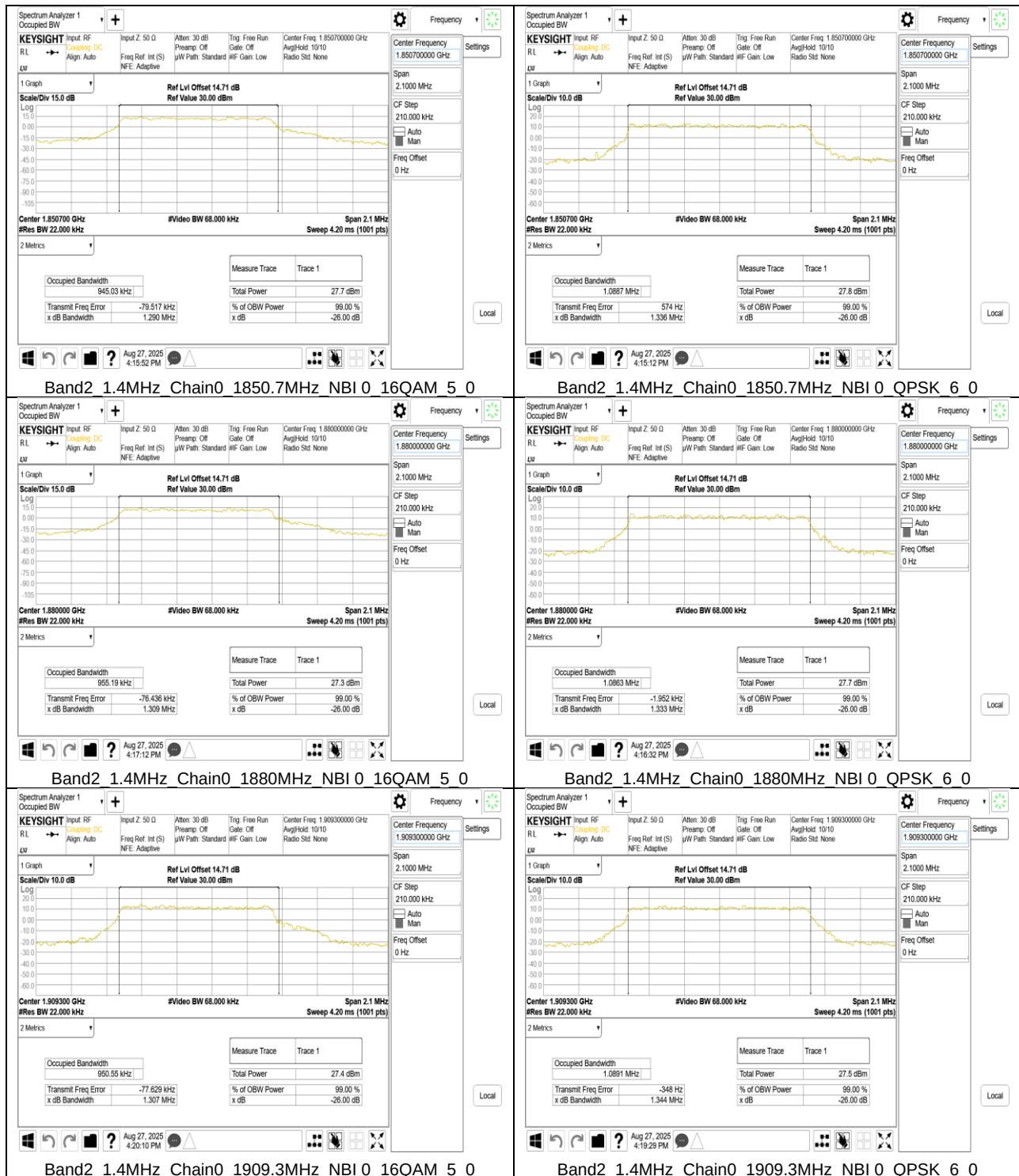
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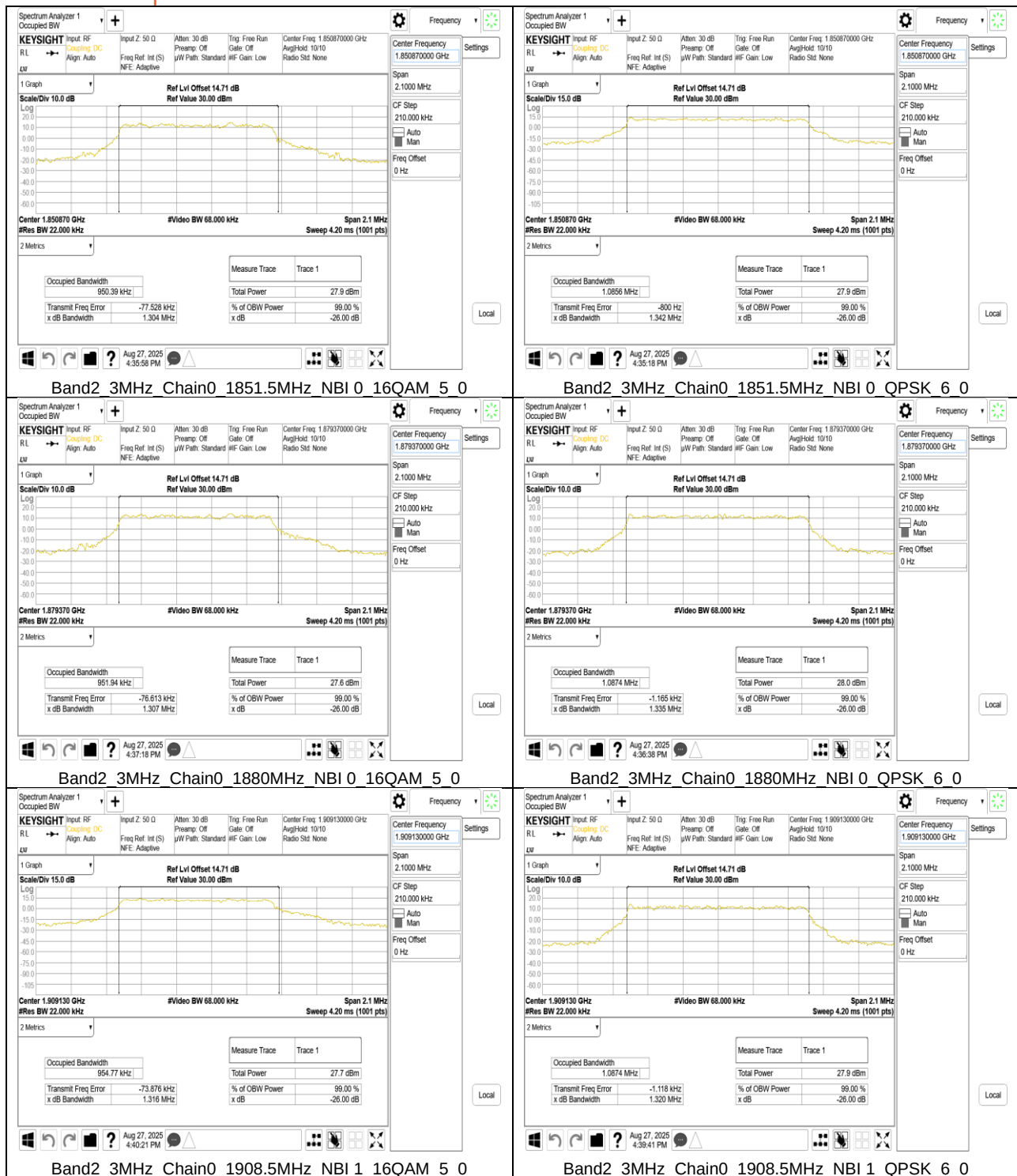
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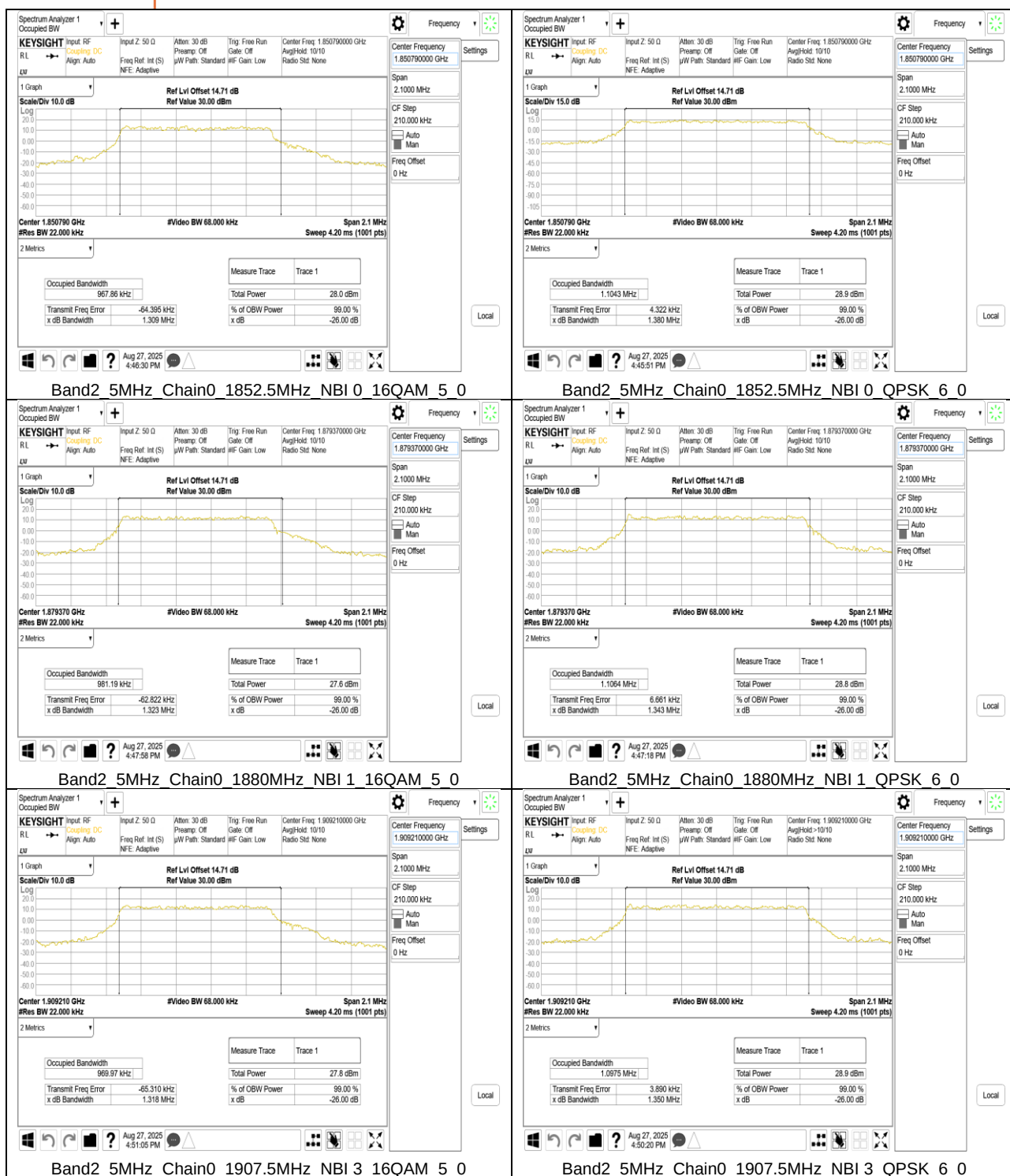
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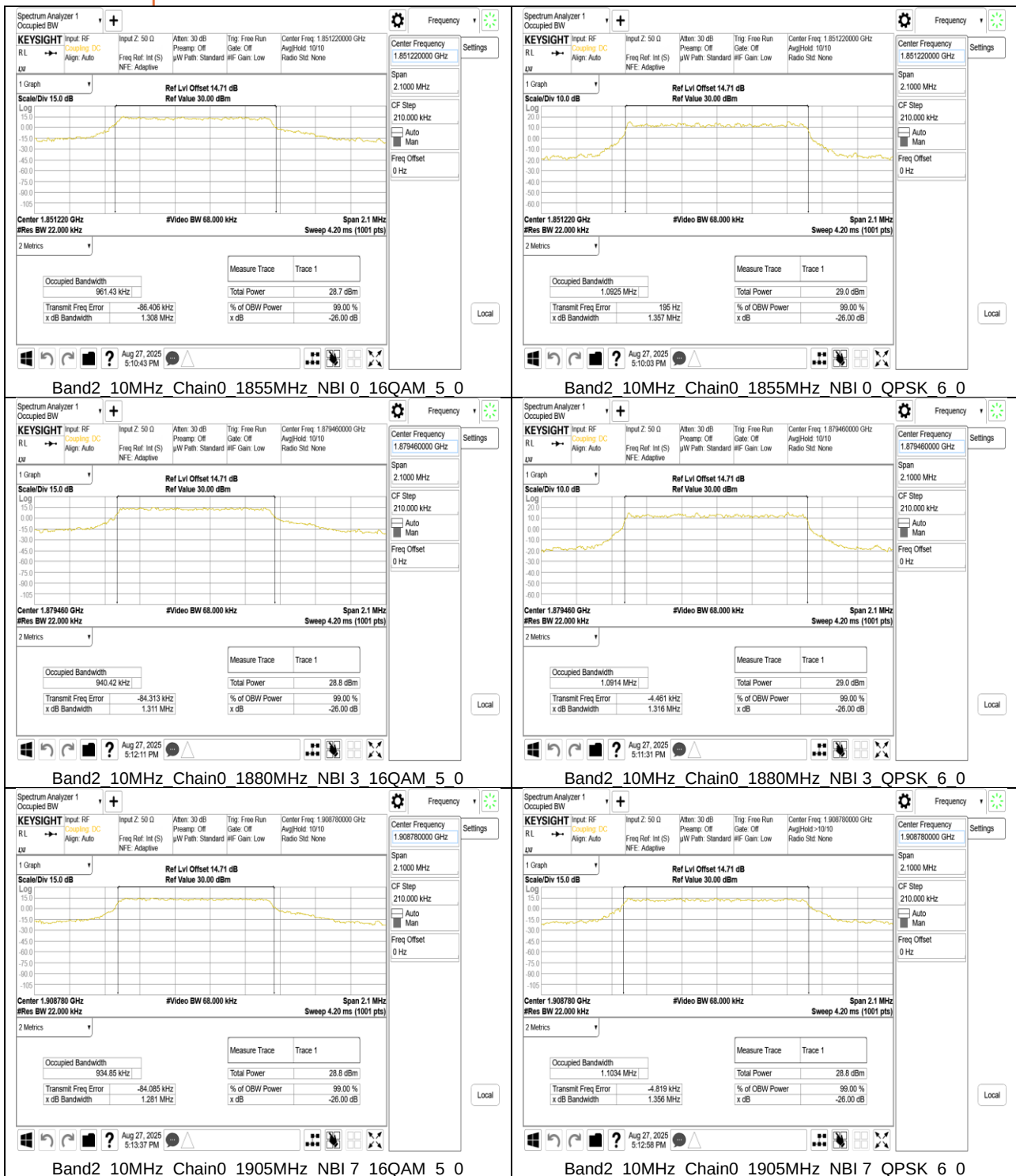
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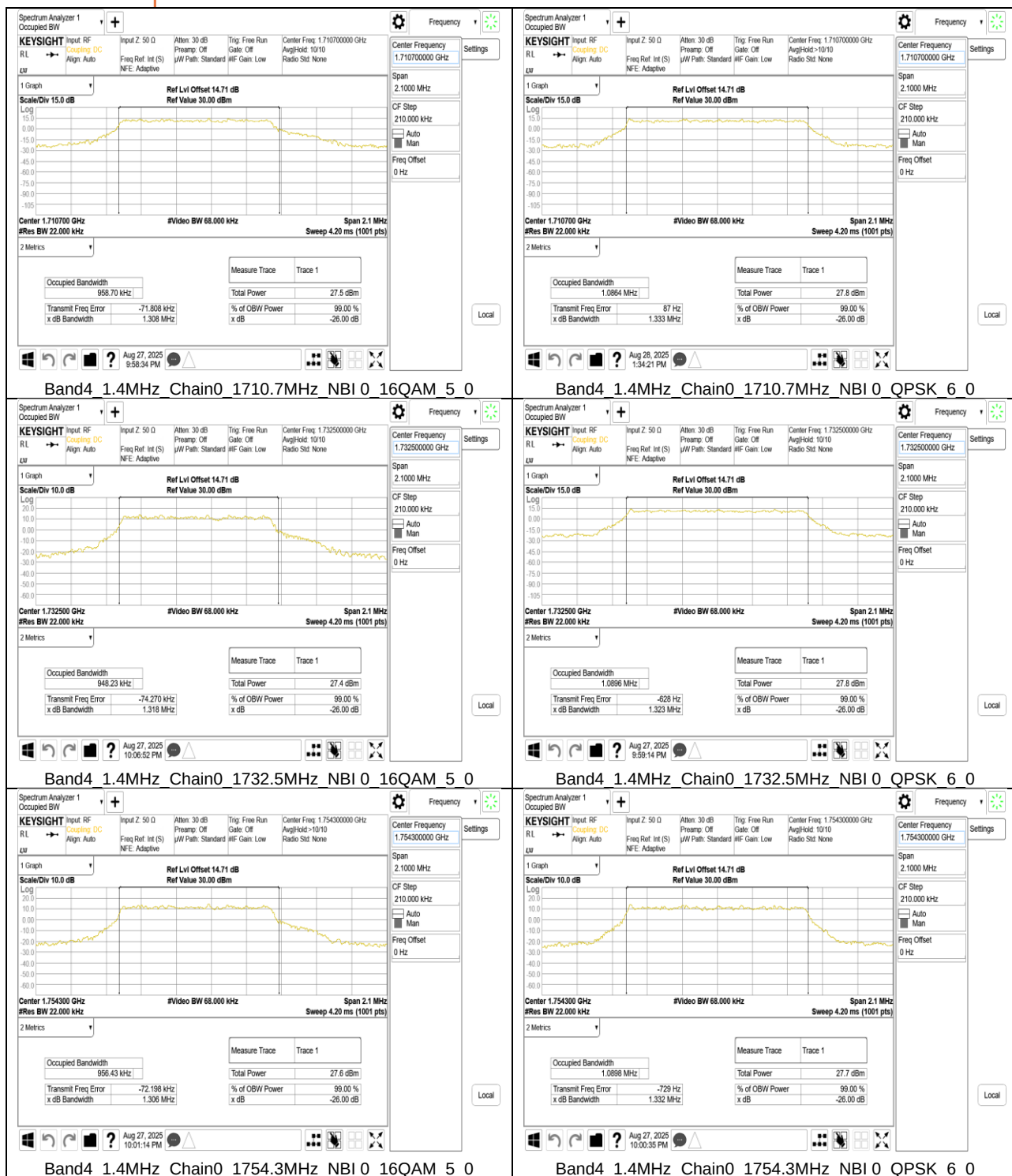
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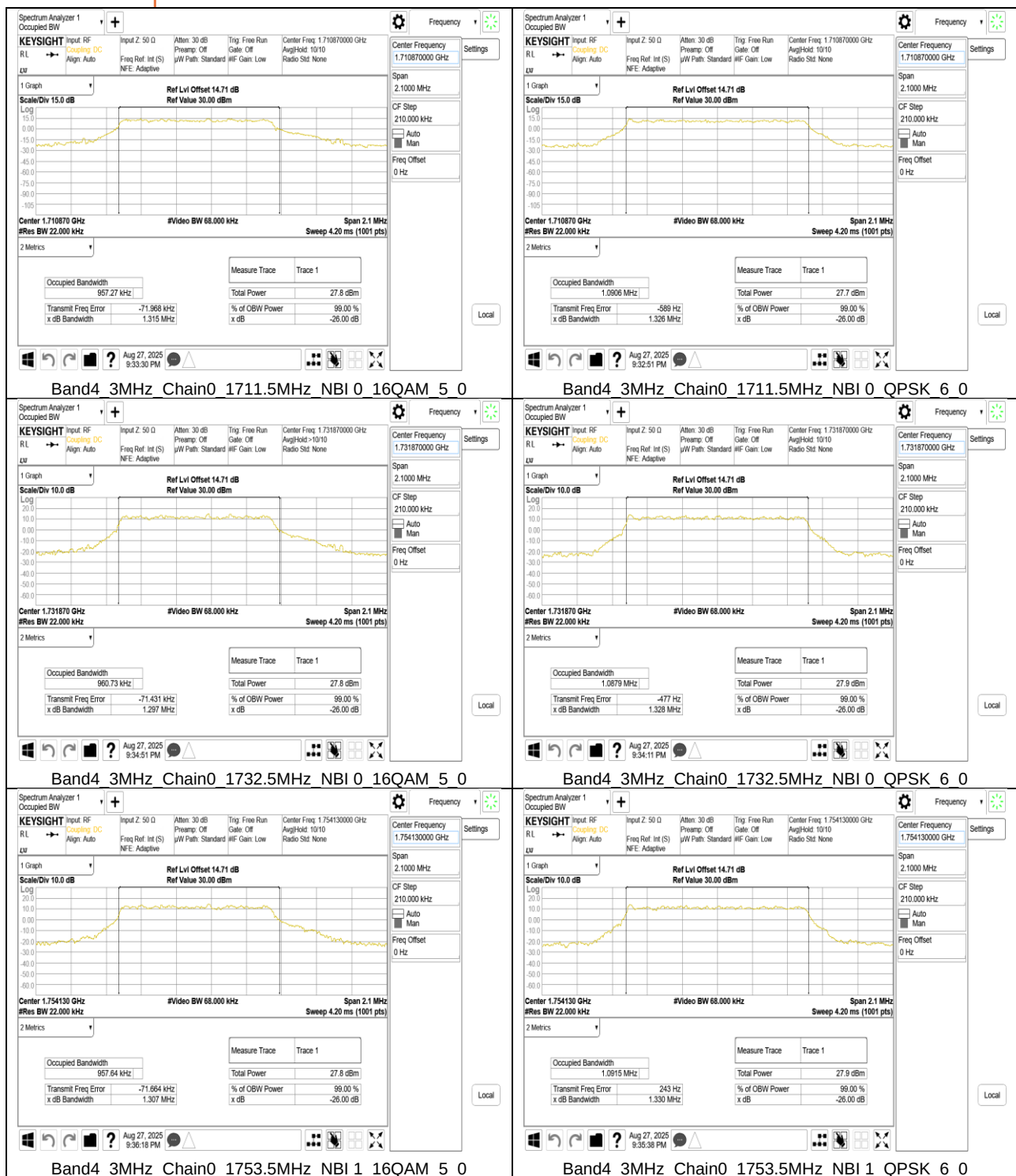
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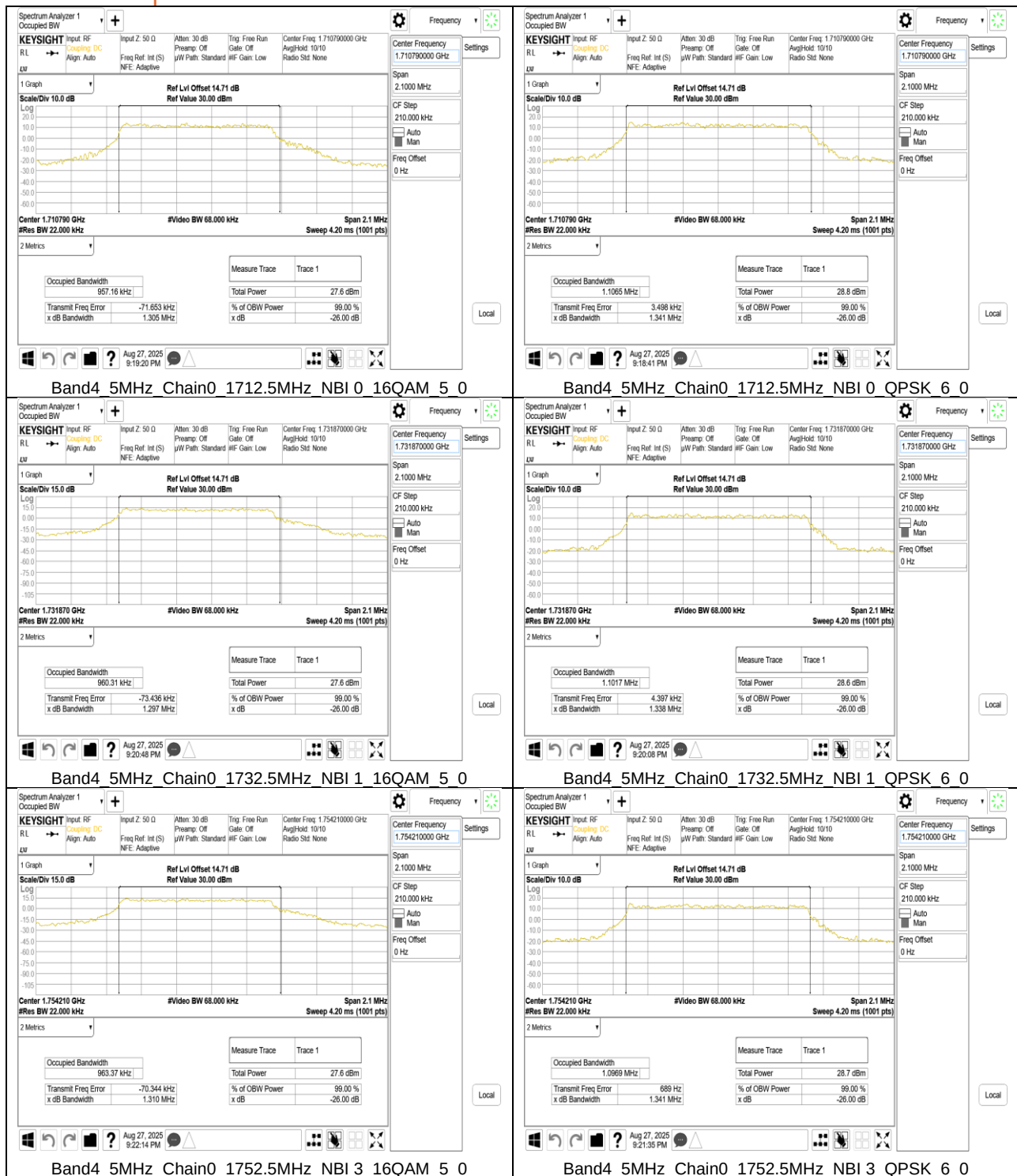
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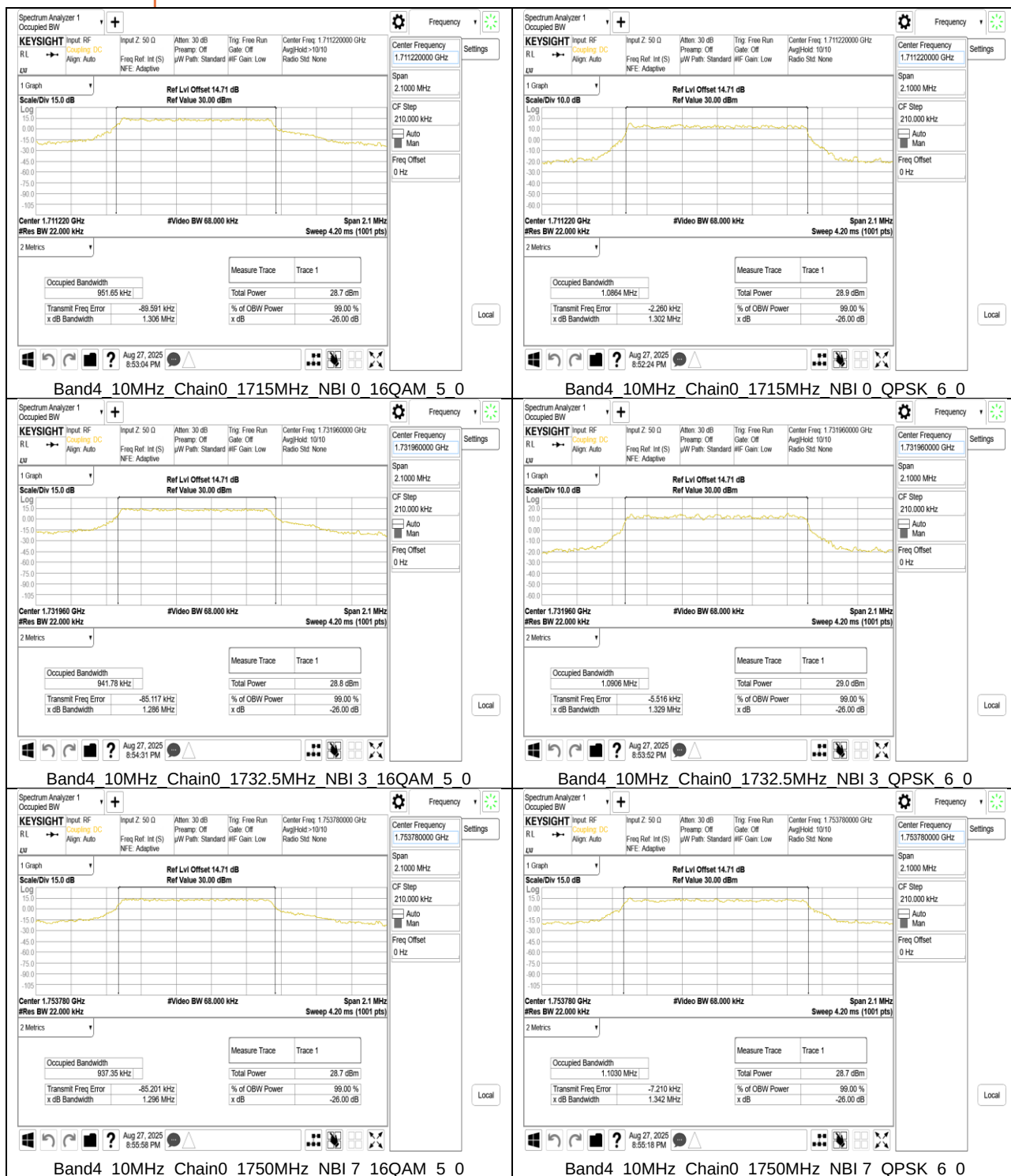
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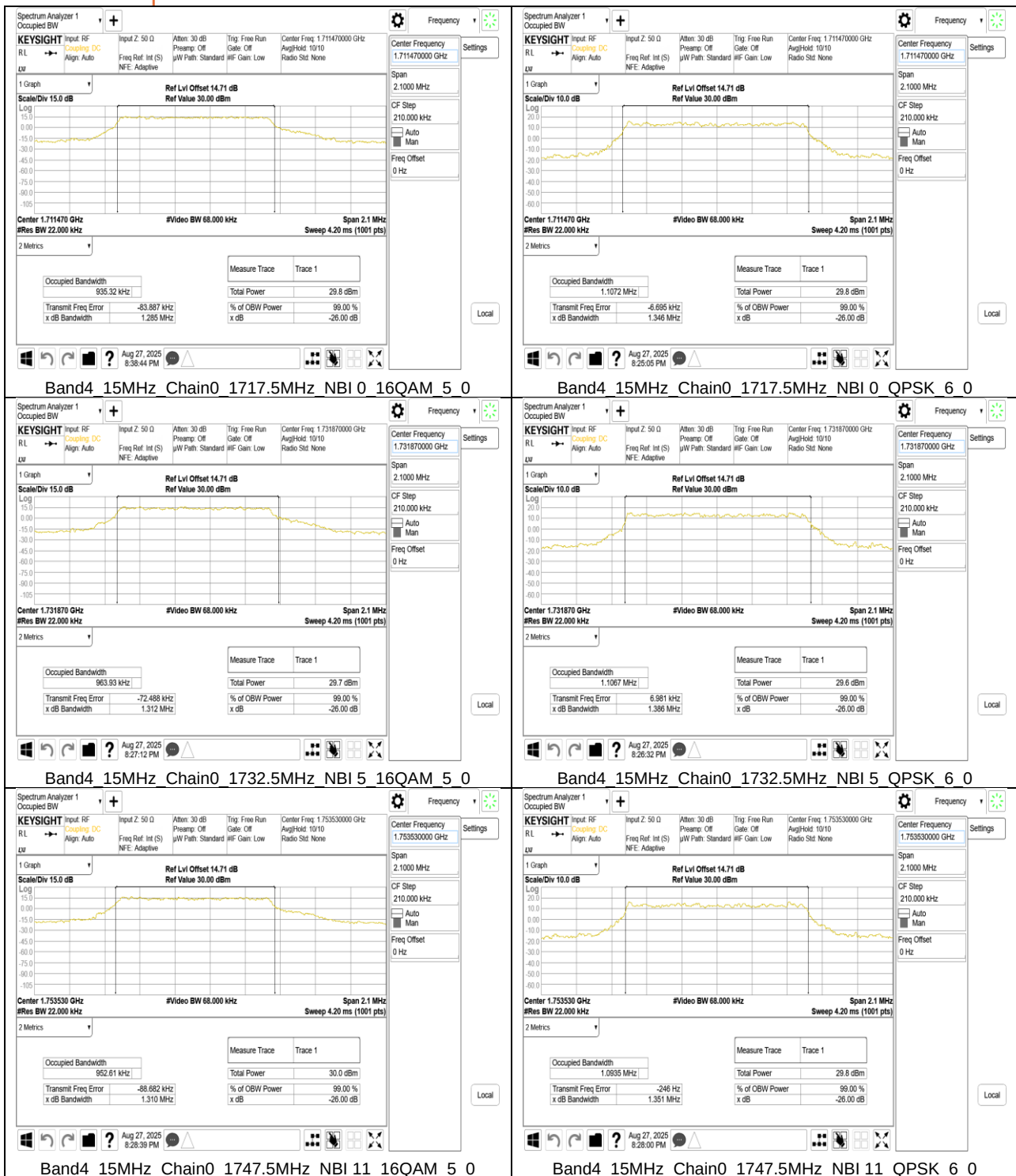
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