

TEST REPORT

Product Name : Cell Phone Signal Booster
Brand Name : N/A
Model : American-5band
Series Model : N/A
FCC ID : 2BWMS-L5-5B-2006
Applicant : **Light Folding Science and Technology Co., Limited**
Address : Room D07, 8/F, Block 2, Kai Tak Factory Building, 99 King Fuk Street, San Po Kong, Hong Kong
Manufacturer : **Light Folding Science and Technology Co., Limited**
Address : Room D07, 8/F, Block 2, Kai Tak Factory Building, 99 King Fuk Street, San Po Kong, Hong Kong
Standard(s) : FCC CFR Title 47 Part 20.21
Date of Receipt : June 05, 2026
Date of Test : June 05, 2026~ July 07, 2026
Issued Date : July 08, 2026

Issued By: **Dongguan Yaxu (AiT) Technology Limited**
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Note: This device has been tested and found to comply with the standard(s) listed, this test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory. This report shall not be reproduced except in full, without the written approval of Dongguan Yaxu (AiT) Technology Limited. If there is a need to alter or revise this document, the right belongs to Dongguan Yaxu (AiT) Technology Limited, and it should give a prior written notice of the revision document. This test report must not be used by the client to claim product endorsement.

**Report Revise Record**

Report Version	Issued Date	Notes
M0	July 08, 2026	Initial Release

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1 TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

[FCC Part 2:](#) FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS

[FCC CFR Title 47 Part 20.21:](#) COMMERCIAL MOBILE SERVICES, Signal boosters

[ANSI C63.26:2015:](#) American National Standard of procedures for compliance testing of transmitters used in licensed radio services.

[KDB 935210 D03 Signal Booster Measurements v04r04:](#) PROVIDER-SPECIFIC CONSUMER SIGNAL BOOSTERS COMPLIANCE MEASUREMENTS GUIDANCE

1.2 Test Summary

Test Item	Section in CFR 47	Result
Authorized frequency band verification test	20.21(e)(3)	Pass
Maximum power	20.21(e)(8)(i)(D), 20.21(e)(8)(i)(B),	Pass
Maximum booster gain computation	20.21(e)(8)(i)(C)(2), 20.21(e)(8)(i)(B)	Pass
Inter-modulation	20.21(e)(8)(i)(F)	Pass
Out-of-band emissions	20.21(e)(8)(i)(E)	Pass
Conducted spurious emissions	2.1051	Pass
Noise limits	20.21(e)(8)(i)(A), 20.21(e)(8)(i)(H)	Pass
Uplink inactivity	20.21(e)(8)(i)(I)	Pass
Variable booster gain	20.21(e)(8)(i)(C)(1), 20.21(e)(8)(i)(H)	Pass
Oscillation Detection	20.21(e)(8)(ii)(A) 20.21(e)(5)	Pass
Radiated Spurious Emission	2.1053	Pass
Occupied bandwidth	2.1049	Pass
Spectrum Block Filtering (This only applies to devices utilizing spectrum block filtering)	20.21(e)(8)(i)(B)	NA

1.3 Test Facility

Test Laboratory: Dongguan Yaxu (AiT) Technology Limited

No.22, Jinqianling 3rd Street, Jitigang, Huangjiang, Dongguan, Guangdong, China

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

CNAS-Registration No: L6177

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2017 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on April 18, 2022

FCC-Registration No.: 703111 Designation Number: CN1313

Dongguan Yaxu (AiT) Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC-Registration No.: 6819A CAB identifier: CN0122

The 3m Semi-anechoic chamber of Dongguan Yaxu (AiT) Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 6819A

A2LA-Lab Cert. No.: 6317.01

Dongguan Yaxu (AiT) Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.4 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 - 4"Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Dongguan Yaxu (AiT) Technology Limited's quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Yaxu (AiT) laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	9KHz~30MHz ± 1.20 dB	(1)
Radiated Emission	9KHz~30MHz ± 3.10 dB	(1)
Radiated Emission	30MHz~1GHz ± 3.75 dB	(1)
Radiated Emission	1GHz~18GHz ± 3.88 dB	(1)
Radiated Emission	18GHz-40GHz ± 3.88 dB	(1)
RF power, conducted	30MHz~6GHz ± 0.16 dB	(1)
RF power density, conducted	± 0.24 dB	(1)
Spurious emissions, conducted	± 0.21 dB	(1)
Temperature	$\pm 1^{\circ}\text{C}$	(1)
Humidity	$\pm 3\%$	(1)
DC and low frequency voltages	$\pm 1.5\%$	(1)
Time	$\pm 2\%$	(1)
Duty cycle	$\pm 2\%$	(1)
Bandwidth	$\pm 1.5 \times 10^{-6}$	(1)

The report uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

2 GENERAL INFORMATION

2.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2 General Description of EUT

Product Name:	Cell Phone Signal Booster		
Model/Type reference:	American-5band		
Power ratings:	DC 5V from adapter		
Adapter information:	Model: SZXYUT60A-0500500 Input:AC100-240V1.2A 50/60Hz Output:DC5V---5A		
Hardware Version:	V1		
Software Version:	V1		
Sample(s) Status:	AiTDG-260730002-1(Normal sample) AiTDG-260730002-2(Engineer sample)		
Operation Frequency Band:	Frequency Band	Uplink (MHz)	Downlink (MHz)
	Broadband PCS	1850-1915	1930-1995
	AWS-1	1710-1755	2110-2155
	Cellular	824-849	869-894
	Lower 700 MHz	699-716	729-746
	Upper 700 MHz	777-787	746-756
Device Type:	Fixed booster		

Mode	Antenna Type	Frequency(MHz)	Antenna Gain(dBi)	Cable loss(dB)
Uplink	Log Periodic Antenna	1850-1915	9.0	4.70
		1710-1755	9.0	4.60
		824-849	7.5	3.00
		699-716	7.5	2.80
		777-787	7.5	2.85
Downlink	Ceiling Antenna	1930-1995	4.0	4.80
		2110-2155	5.0	5.00
		869-894	3.0	3.00
		729-746	2.0	2.80
		746-756	2.0	2.87
	Built-in Antenna	1930-1995	4.0	0.5
		2110-2155	5.0	0.5
		869-894	3.0	0.5
		729-746	2.0	0.5
		746-756	2.0	0.5

2.3 Equipment List for the Test

RF Conducted measurement						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
☒ 1	Spectrum Analyzer	Agilent	N9020A	MY53421570	2025.09.23	2026.09.22
☐ 2	Power Sensor	Agilent	U2021XA	MY54110007	2025.09.23	2026.09.22
☒ 3	Signal Generator	Agilent	N5182A	MY50143009	2025.09.26	2026.09.25
☒ 4	Analog signal generator	Agilent	E8257	MY51554256	2025.09.23	2026.09.22
☒ 5	Power divider	xingbo	HXGF-G2A03	210730-1-3	2025.09.23	2026.09.22
☒ 6	Directional Coupler	MCLI/USA	CB11-20	0D2L51502	2025.09.23	2026.09.22
☒ 7	Band Reject Filter Group	COM-MW	ZBFS6-700-3000	547	2025.09.23	2026.09.22
☐ 8	Pro.Temp&Humi.chamber	MENTEK	MHP-150-1C	MAA08112501	2025.09.25	2026.09.24
☐ 9	Wideband Radio communication tester	R&S	CMW500	135866	2025.09.23	2026.09.22
☒ 10	DC power supply	ZHAOXIN	RXN-305D-2	28070002559	N/A	N/A
☐ 11	RF Test box	TST	TSTPASS	21033016	2025.09.23	2026.09.22
☐ 12	RF Software	TST	TSTPASS	Version 2.0	N/A	N/A

Radiation Emission measurement						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
☒ 1	Spectrum Analyzer	R&S	FSV40	101470	2025.09.26	2026.09.25
☒ 2	EMI Measuring Receiver	R&S	ESPI	100773	2025.09.25	2026.09.24
☒ 3	Low Noise Pre Amplifier	HP	HP8447E	1937A01855	2025.09.25	2026.09.24
☒ 4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2025.09.25	2026.09.24
☒ 5	TRILOG Super Broadband test Antenna	SCHWARZBEC K	VULB-9160	9160-3206	2024.08.29	2026.08.28
☒ 6	TRILOG Super Broadband test Antenna	SCHWARZBEC K	VULB-9160	9160-3207	2024.08.29	2026.08.28
☒ 7	Broadband Horn Antenna	SCHWARZBEC K	BBHA 9120D	452	2024.08.29	2026.08.28
☒ 8	Broadband Horn Antenna	SCHWARZBEC K	BBHA 9120D	453	2024.08.29	2026.08.28
☒ 9	SHF-EHF Horn Antenna 15-40GHz	SCHWARZBEC K	BBHA9170	BBHA9170367	2023.09.12	2026.09.11
☒ 10	SHF-EHF Horn Antenna 15-40GHz	SCHWARZBEC K	BBHA9170	BBHA9170368	2023.09.12	2026.09.11
☒ 11	Signal Generator	Agilent	N5182A	MY50143009	2025.09.26	2026.09.25
☒ 12	Analog signal generator	Agilent	E8257	MY51554256	2025.09.23	2026.09.22
☒ 13	6dB Attenuator	JFW	50FPE-006	4360846-949-1	2025.09.23	2026.09.22
☒ 14	Band Reject Filter Group	COM-MW	ZBFS6-700-3000	547	2025.09.23	2026.09.22
☒ 15	RE Software	EZ	EZ-EMC_RE	Ver.AIT-03A	N/A	N/A

Note: ☐ is not applicable in this Test Report. ☒ is applicable in this Test Report.

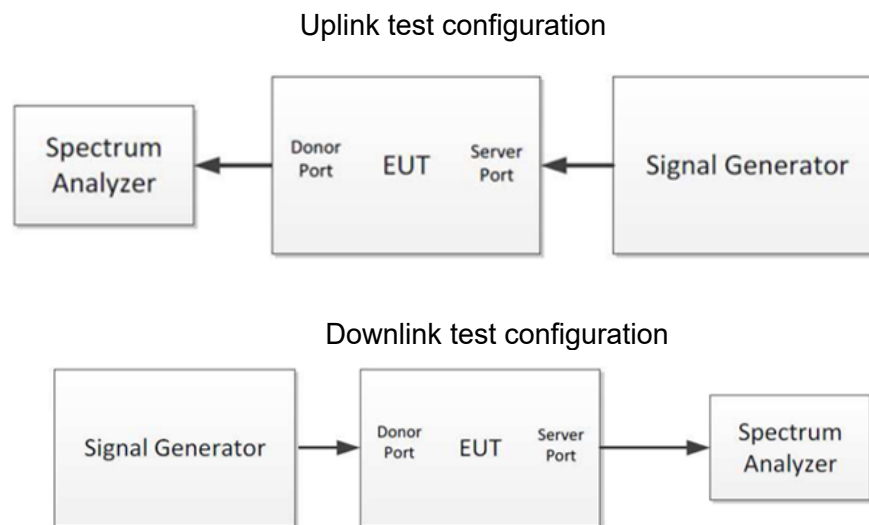
3 TEST CONDITIONS AND RESULTS

3.1 Authorized frequency band verification

LIMIT

Consumer Signal Boosters must be designed and manufactured such that they only operate on the frequencies used for the provision of subscriber-based services under parts 22 (Cellular), 24 (Broadband PCS), 27 (AWS-1, 700 MHz Lower A-E Blocks, and 700 MHz Upper C Block), and 90 (Specialized Mobile Radio) of this chapter. The Commission will not certificate any Consumer Signal Boosters for operation on part 90 of this chapter (Specialized Mobile Radio) frequencies until the Commission releases a public notice announcing the date Consumer Signal Boosters may be used in the band.

TEST CONFIGURATION

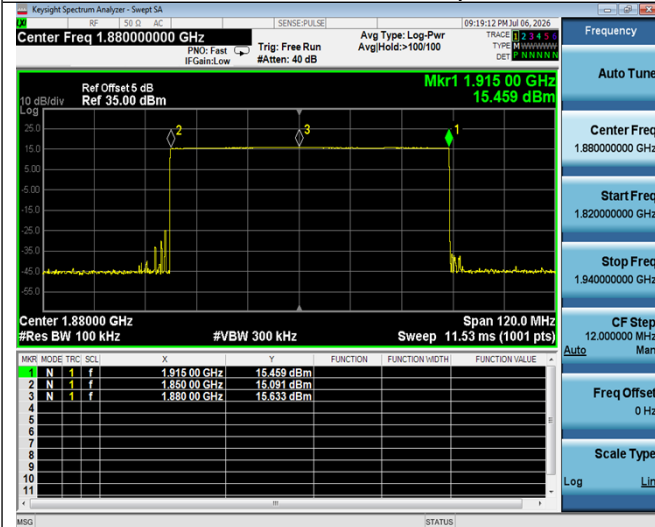


TEST PROCEDURE

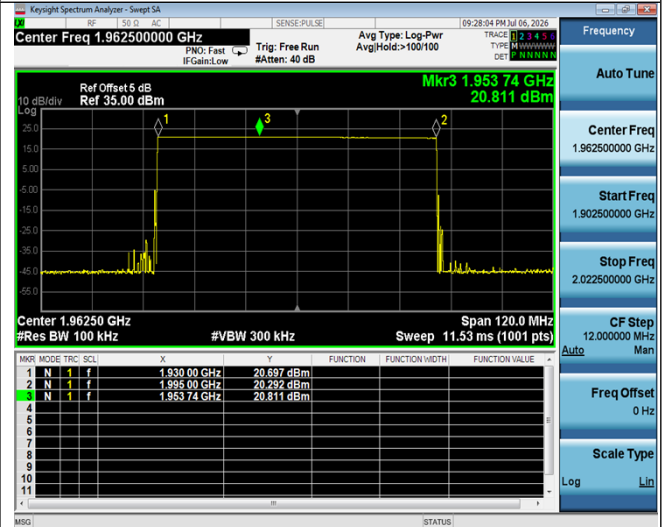
- Connect the EUT to the test equipment either in test mode or normal mode and set the passband of the EUT to the lowest passband frequency of the booster in the CMRS band.
- Set the spectrum analyzer resolution bandwidth (RBW) for 100 kHz with the video bandwidth (VBW) $\geq 3 \times$ RBW, using a PEAK detector with the MAX HOLD function.
- Set the center frequency of the spectrum analyzer to the center of the operational band under test with a span of 1 MHz.
- Set the signal generator for CW mode and tune to the center frequency of the operational band under test.
- Set the initial signal generator power to a level that is at least 6 dB below the AGC level specified by the manufacturer.
- Slowly increase the signal generator power level until the output signal reaches the AGC operational level.
- Reduce the signal generator power to a level that is 3 dB below the level noted above, then manually reset the EUT (e.g., cycle ac/dc power).
- Reset the spectrum analyzer span to $2 \times$ the width of the CMRS band under test. Adjust the tuned frequency of the signal generator to sweep $2 \times$ the width of the CMRS band using the sweep function. The AGC must be deactivated throughout the entire sweep.
- Using three markers, identify the CMRS band edges and the frequency with the highest power. Affirm that the values of all markers are visible on the display of the spectrum analyzer (e.g., marker table set to on).
- Capture the spectrum analyzer trace for inclusion in the test report.
- Repeat c) to j) for all operational uplink and downlink bands.

Test Result

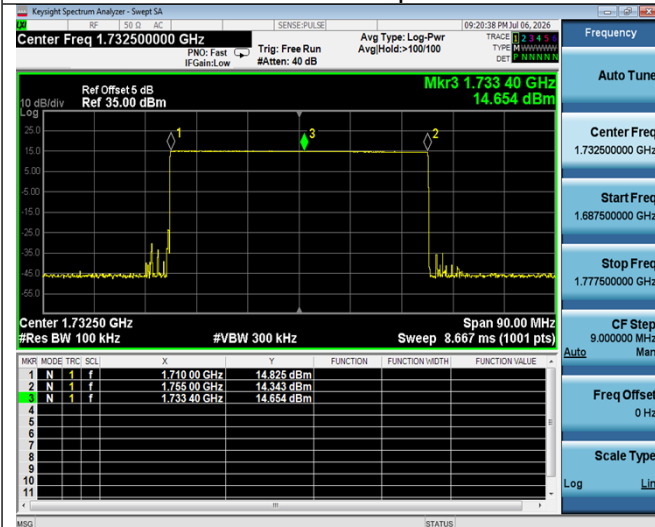
Broadband PCS band uplink



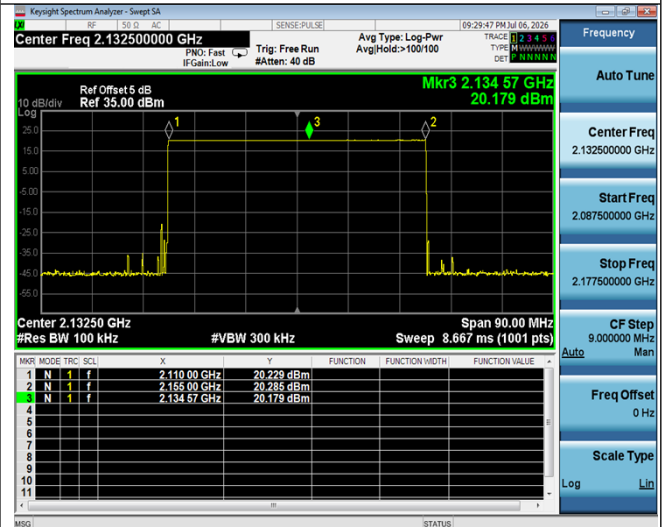
Broadband PCS band downlink



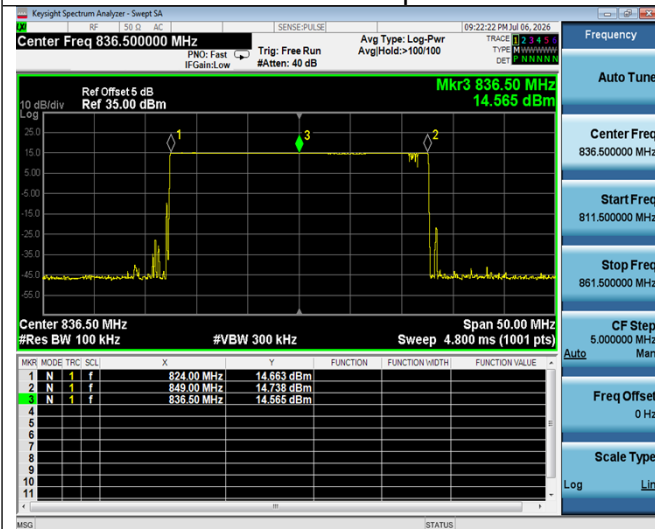
AWS-1 band uplink



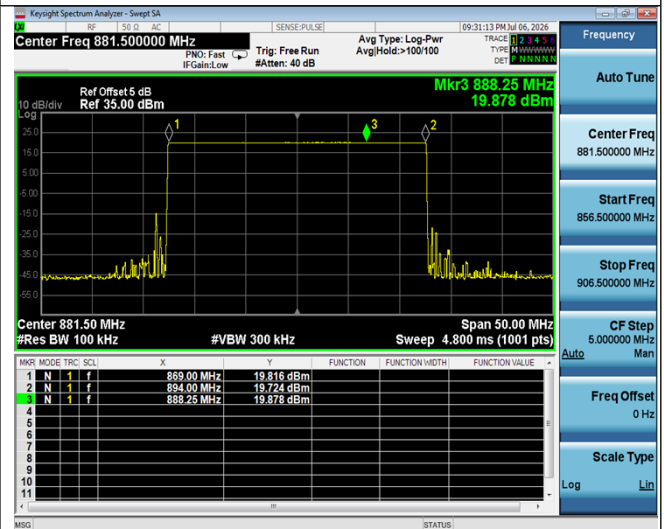
AWS-1 band downlink



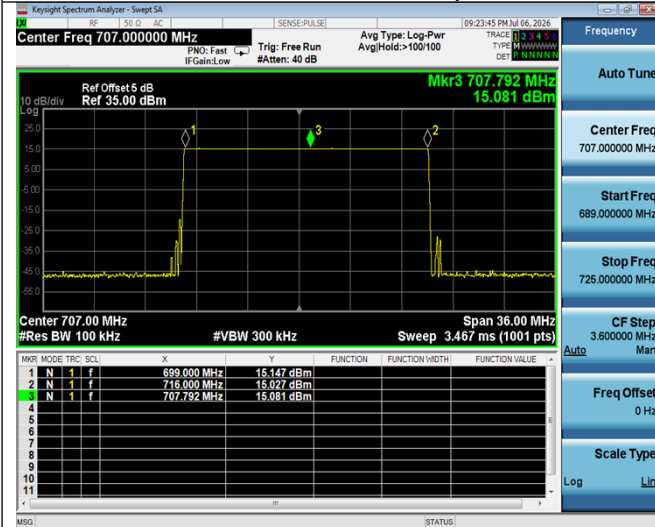
Cellular Band uplink



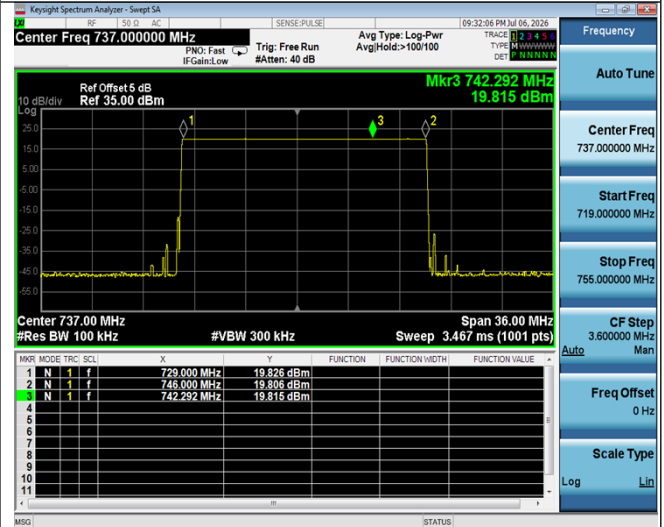
Cellular Band downlink



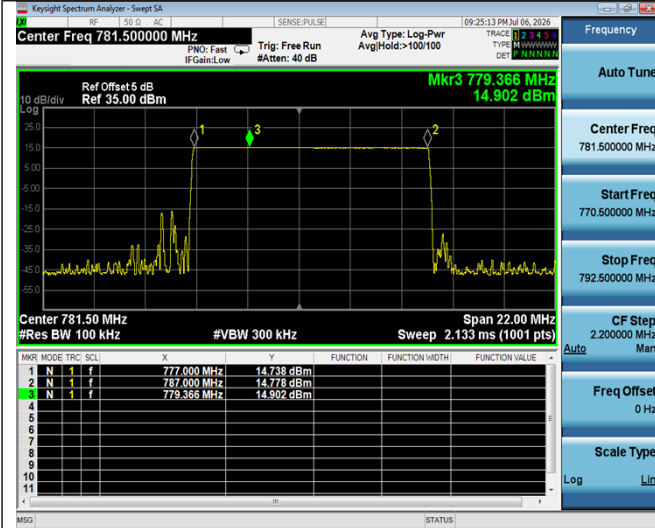
Lower 700 MHz band uplink



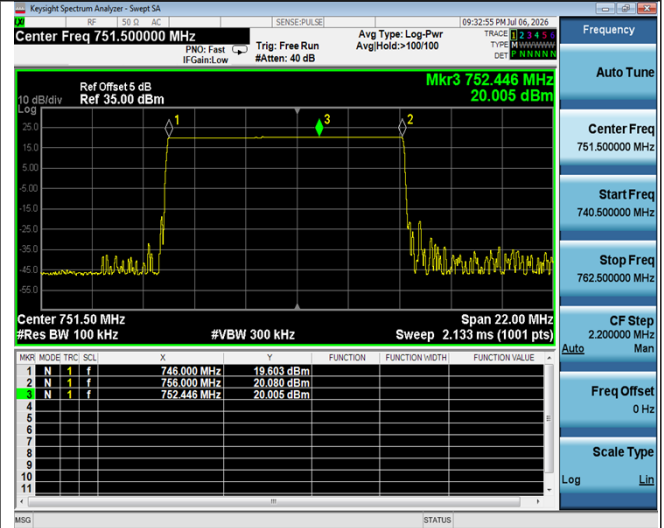
Lower 700 MHz band downlink



Upper 700 MHz band uplink



Upper 700 MHz band downlink



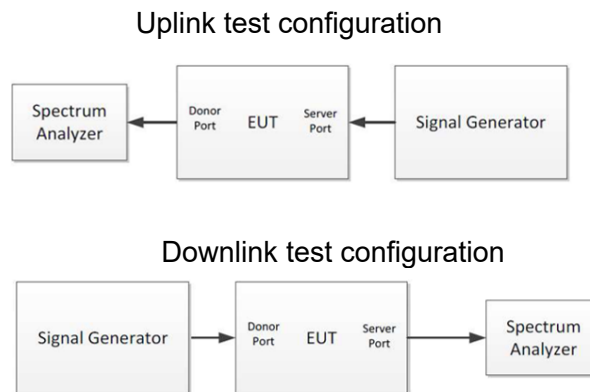
3.2 Maximum power

LIMIT

Uplink: Conducted output: 17dBm-30dBm; EIRP $\leq$ 30dBm

Downlink: EIRP $\leq$ 17dBm

TEST CONFIGURATION



TEST PROCEDURE

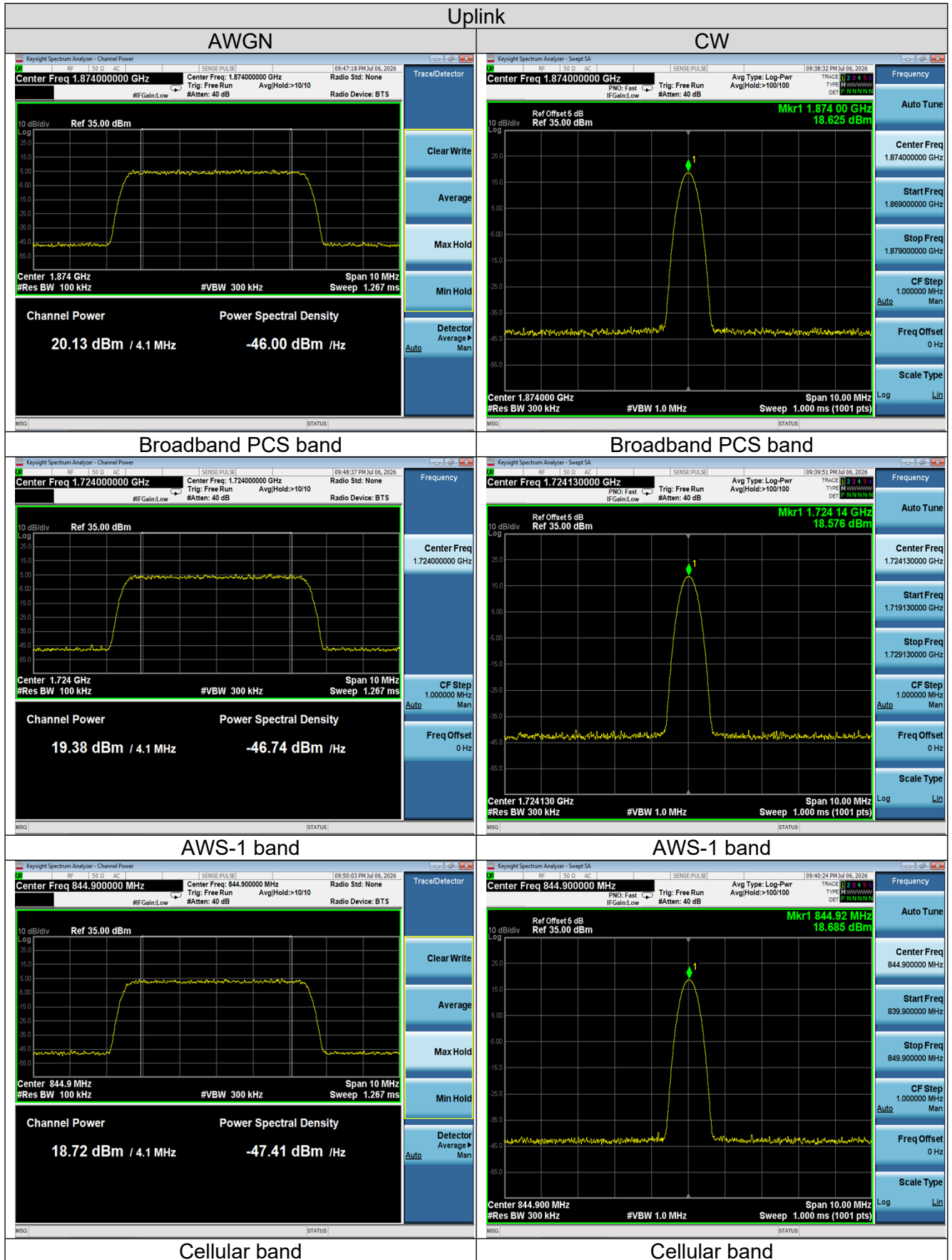
- a) Connect the EUT in test as TEST CONFIGURATION Begin with the uplink output (donor) port connected to the spectrum analyzer.
- b) Configure the signal generator and spectrum analyzer for operation on the frequency determined in 7.1 with the highest power level, but with the center frequency of the signal no closer than 2.5 MHz from the band edge. The spectrum analyzer span shall be set to at least 10 MHz
- c) Set the initial signal generator power to a level well below that which causes AGC activation.
- d) Slowly increase the signal generator power level until the output signal reaches the AGC operational limit (from observation of signal behavior on the spectrum analyzer; i.e., no further increase in output power as input power is increased).
- e) Reduce power sufficiently on the signal generator to ensure that the AGC is not controlling the power output.
- f) Slowly increase the signal generator power to a level just below (and within 0.5 dB of) the AGC limit without triggering the AGC. Note the signal generator power level as P_{in} .
- g) Measure the output power (P_{out}) with the spectrum analyzer as follows.
 - 1) Set RBW = 100 kHz for AWGN signal type, or 300 kHz for CW or GSM signal type.
 - 2) Set VBW $\geq$ 3*RBW.
 - 3) Select either the BURST POWER or CHANNEL POWER measurement mode, as required for each signal type. For AWGN, the channel power integration bandwidth shall be the 99% OBW of the 4.1 MHz signal.
 - 4) Select the power averaging (rms) detector.
 - 5) Affirm that the number of measurement points per sweep $\geq$ (2*span)/RBW.
NOTE—This requirement does not apply for BURST power measurement mode.
 - 6) Set sweep time = auto couple, or as necessary (but no less than auto couple value).
 - 7) Trace average at least 100 traces in power averaging (i.e., rms) mode.
 - 8) Record the measured power level P_{out} , with one set of results for the GSM or CW input stimulus, and another set of results for the AWGN input stimulus.
- h) Repeat step g) while increasing the signal generator amplitude in 2 dB steps until the maximum input level indicated in 5.5 is reached. If the booster has shut down at any point during the input power steps, it should be noted and step g) shall be repeated at an input level 1 dB less than that found to cause the shutdown. The test report shall include either a statement describing that the device complies at 10 dB above AGC or at the 5.5 power levels, or a table showing compliance at the additional input power(s) required.
- i) Repeat the entire procedure for each operational uplink and downlink frequency band supported by the booster.
- j) Provide tabulated results in the test report.

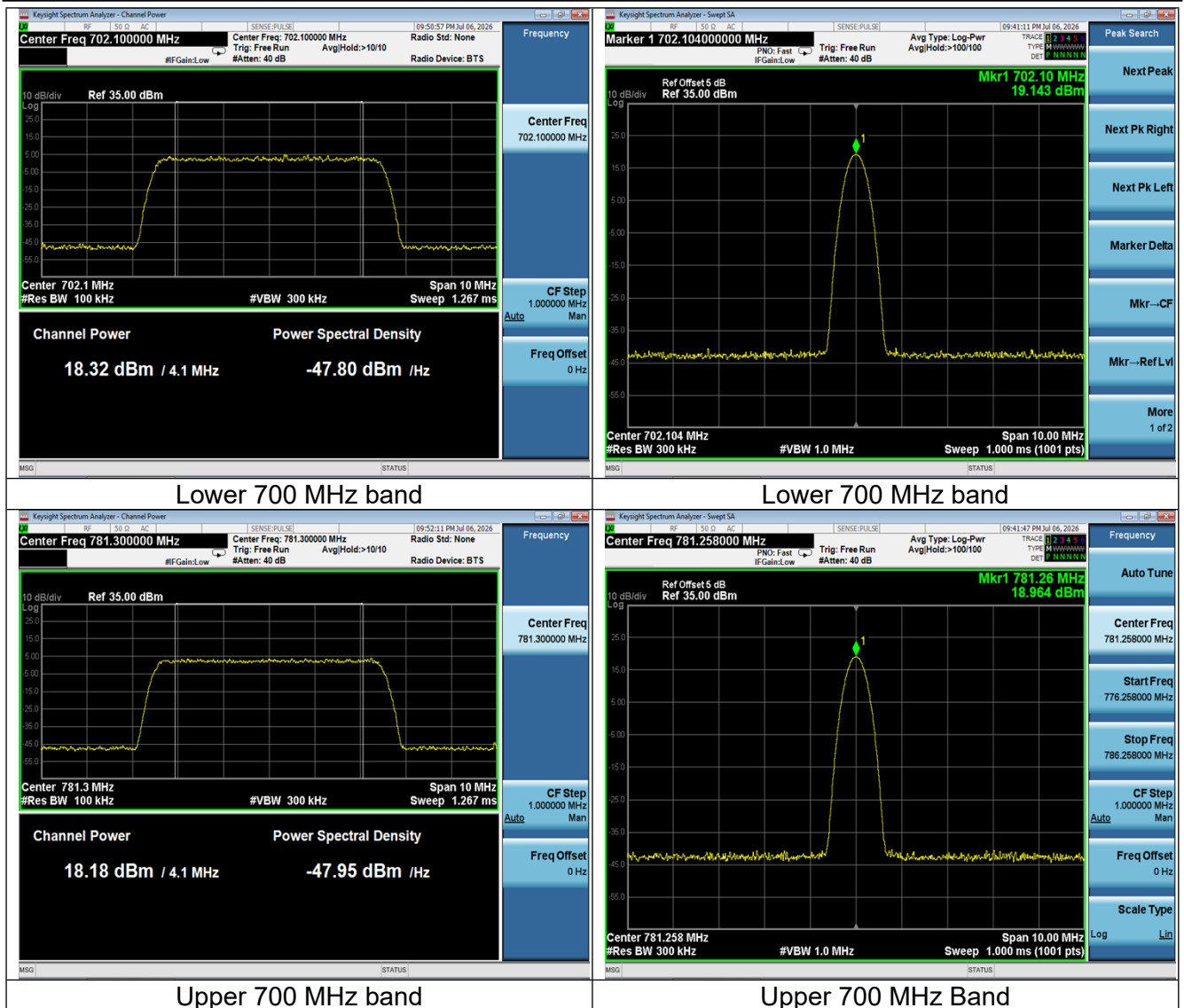
Test Result

Mode	Band (MHz)	Signal type	Pre AGC Input level (dBm)	Output level (dBm)	Cable loss(dB)	Ant Gain (dBi)	EIRP (dBm)	Limit (dBm)
Uplink	Broadband PCS	AWGN	-44.03	20.13	4.70	9.0	24.43	Conduct power: 17-30 and EIRP: ≤30
		CW	-46.06	18.63	4.70	9.0	22.93	
	AWS-1	AWGN	-43.60	19.38	4.60	9.0	23.78	
		CW	-43.60	18.58	4.60	9.0	22.98	
	Cellular	AWGN	-44.02	18.72	3.00	7.5	23.22	
		CW	-44.49	18.69	3.00	7.5	23.19	
	Lower 700 MHz	AWGN	-44.57	18.32	2.80	7.5	23.02	
		CW	-43.16	19.14	2.80	7.5	23.84	
	Upper 700 MHz	AWGN	-44.27	18.18	2.85	7.5	22.83	
		CW	-43.24	18.96	2.85	7.5	23.61	
Downlink	Broadband PCS	AWGN	-53.30	10.34	4.80	4.0	9.54	EIRP: ≤17
		CW	-54.60	9.08	4.80	4.0	8.28	
	AWS-1	AWGN	-55.08	8.80	5.00	5.0	8.80	
		CW	-53.98	8.87	5.00	5.0	8.87	
	Cellular	AWGN	-54.93	8.72	3.00	3.0	8.72	
		CW	-54.58	9.39	3.00	3.0	9.39	
	Lower 700 MHz	AWGN	-53.18	9.77	2.80	2.0	8.97	
		CW	-51.73	9.54	2.80	2.0	8.74	
	Upper 700 MHz	AWGN	-54.63	9.60	2.87	2.0	8.73	
		CW	-54.46	9.50	2.87	2.0	8.63	

Note:

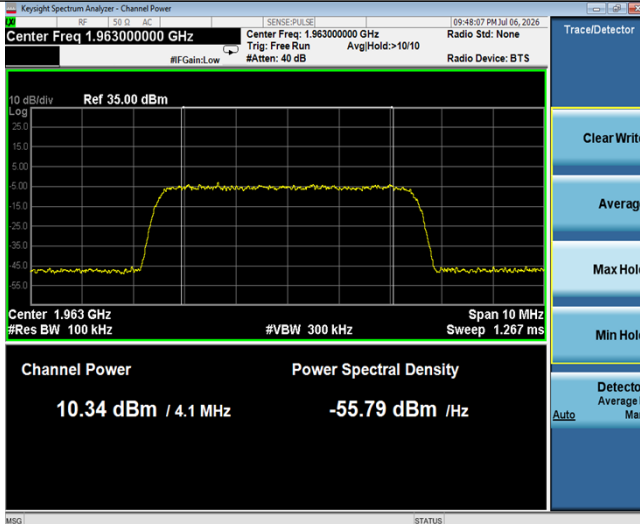
1. EIRP= Conducted Output Level+ Max Antenna Gain- Cable Loss.
2. The device also compliance when input signal at 10 dB above AGC.



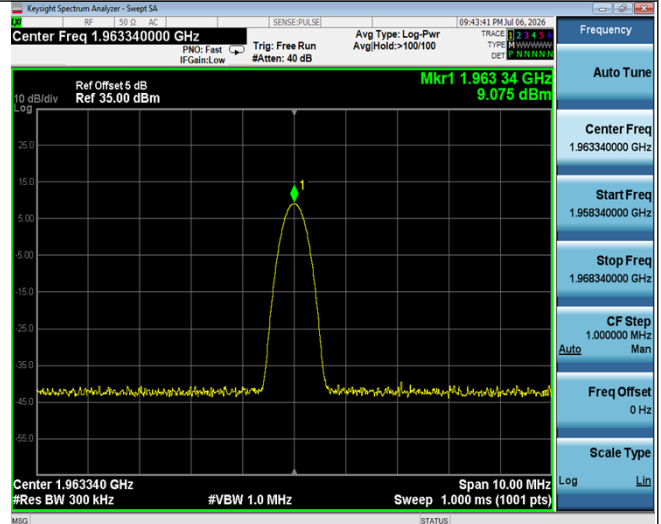


Downlink

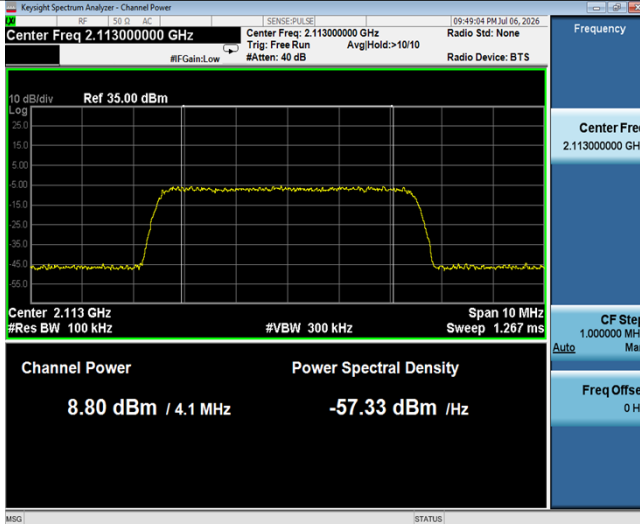
AWGN



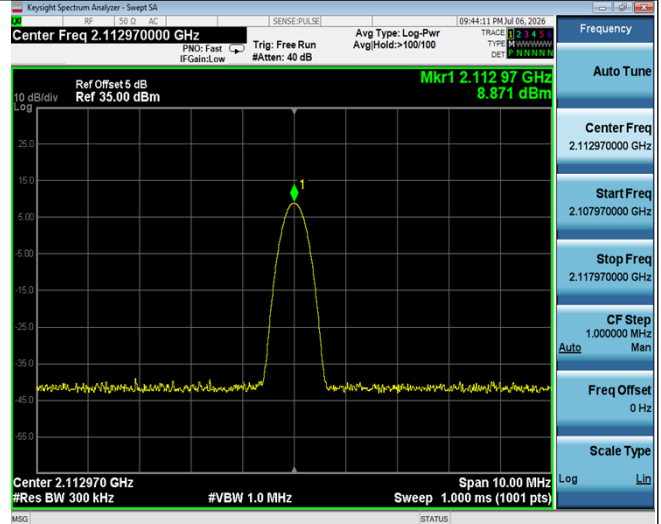
CW



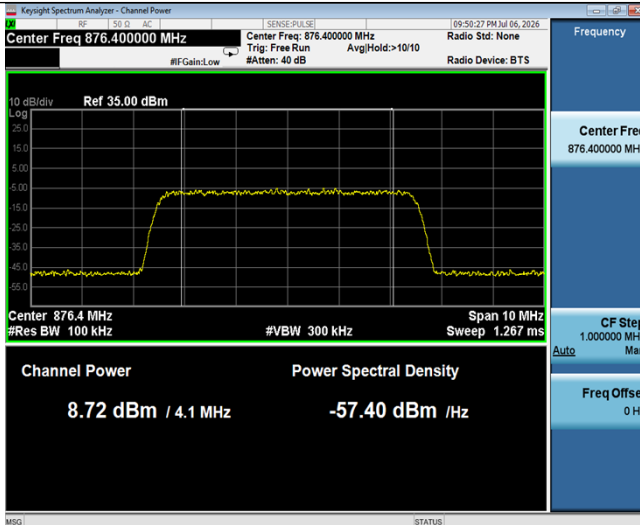
Broadband PCS band



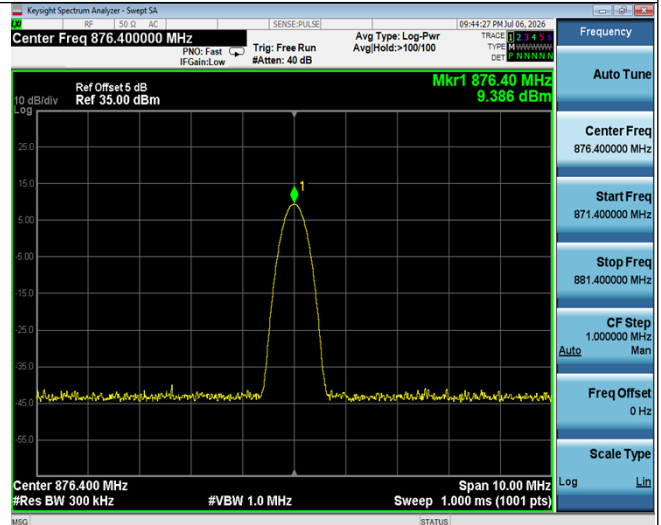
Broadband PCS band



AWS-1 band

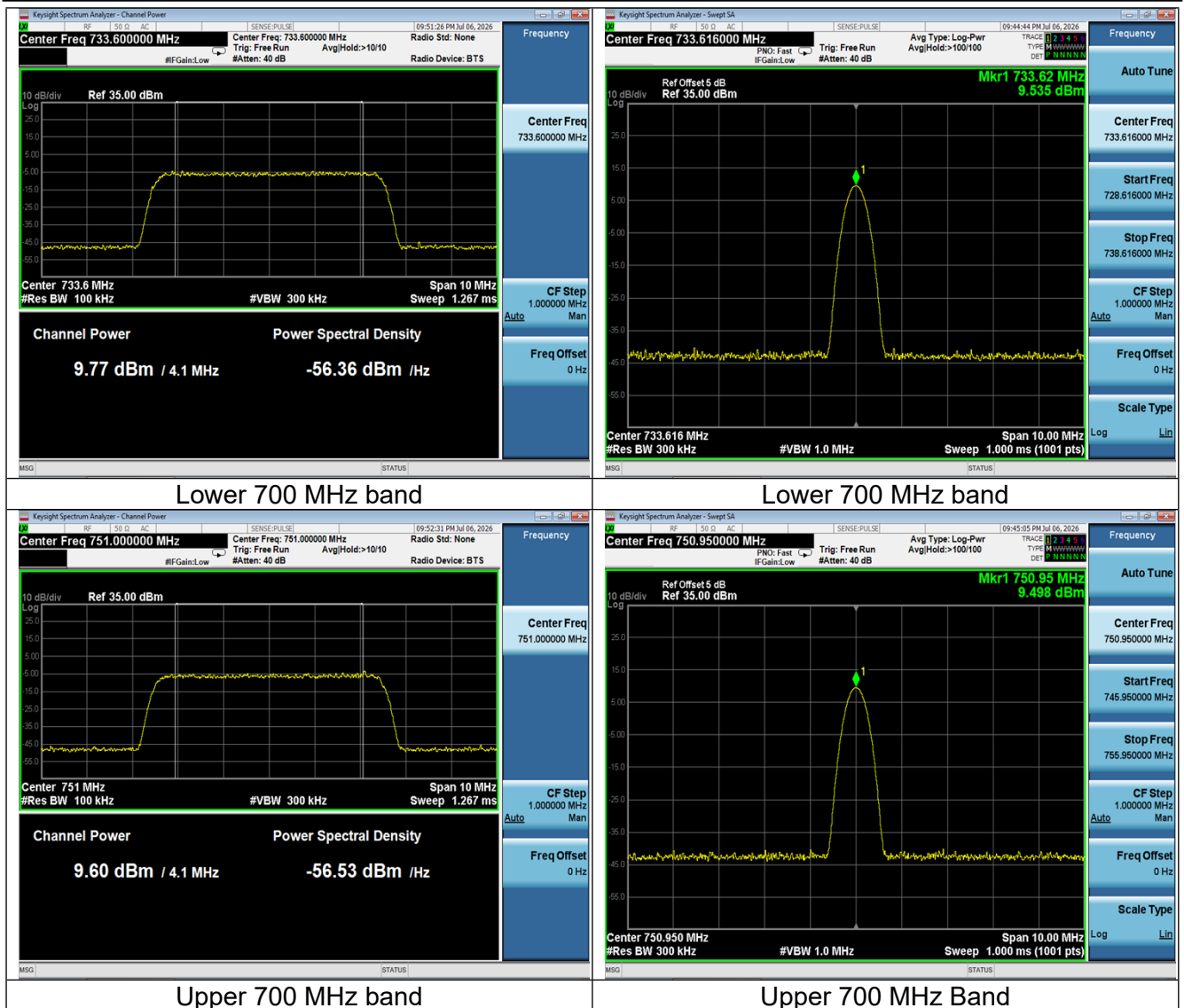


AWS-1 band



Cellular band

Cellular band



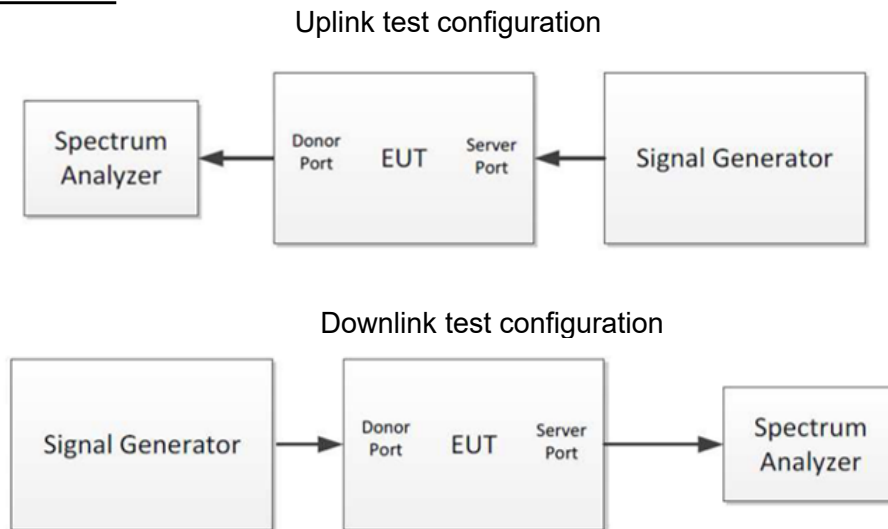
3.3 Maximum booster gain computation

LIMIT

Gain Limit (dB) = 6.5 dB + 20Log(F_{MHz}) while F_{MHz} is the uplink mid-band frequency with the downlink gain limit being equivalent to the paired Uplink band gain limit.

Section 20.21(e)(8)(i)(B) Consumer Boosters must be able to provide equivalent uplink and downlink gain and conducted uplink power output that is at least 0.05 watts.

TEST CONFIGURATION



TEST PROCEDURE

- a) Connect the EUT in test mode.
- b) Configure the signal generator and spectrum analyzer for operation on the frequency with the highest power level as determined.
- c) Set the initial signal generator power to a level far below the AGC threshold level.
- d) Slowly increase the signal generator power level until the output signal reaches the AGC threshold level as determined from observation of the signal behavior on the spectrum analyzer (i.e., no further increase in output power as input power is increased).
- e) Reduce power sufficiently on the signal generator to ensure that the AGC is not limiting the output power.
- f) Slowly increase the signal generator power to a level just below (and within 0.5 dB of) the AGC threshold without triggering the AGC. Note the signal generator power level as (P_{in}).
- g) Measure the output power (P_{out}) with the spectrum analyzer as follows.
 - 1) Set RBW = 100 kHz for AWGN signal type, or 300 kHz for CW or GSM signal type.
 - 2) Set VBW $\geq 3 \times$ RBW.
 - 3) Select either the BURST POWER or CHANNEL POWER measurement mode, as appropriate for each signal type. For AWGN, the channel power integration bandwidth shall be the 99% OBW of the 4.1 MHz signal.
 - 4) Select the power averaging (rms) detector.
 - 5) Affirm that the number of measurement points per sweep $\geq (2 \times \text{span}) / \text{RBW}$. NOTE—This requirement does not apply for BURST power measurement mode.
 - 6) Set sweep time = auto couple, or as necessary (but no less than auto couple value).
 - 7) Trace average at least 100 traces in power averaging (i.e., rms) mode.
 - 8) Record the measured power level P_{out} , with one set of results for the GSM or CW input stimulus, and another set of results for the AWGN input stimulus.
- h) Repeat step g) while increasing the signal generator amplitude in 2 dB steps until the maximum input level is reached. Ensure that the EUT maintains compliance with applicable power limits.
- i) Repeat the procedure for each operational uplink and downlink frequency band supported by the booster.
- j) Provide tabulated results in the test report.

Test result

Mode	Band (MHz)	Signal type	Pre AGC Input level (dBm)	Output level (dBm)	Gain (dB)	Gain limit (dB)
Uplink	Broadband PCS	AWGN	-44.03	20.13	64.16	72.00
		CW	-46.06	18.63	64.69	
	AWS-1	AWGN	-43.60	19.38	62.98	71.27
		CW	-43.60	18.58	62.18	
	Cellular	AWGN	-44.02	18.72	62.74	64.95
		CW	-44.49	18.69	63.18	
	Lower 700 MHz	AWGN	-44.57	18.32	62.89	63.49
		CW	-43.16	19.14	62.30	
	Upper 700 MHz	AWGN	-44.27	18.18	62.45	64.36
		CW	-43.24	18.96	62.20	
Downlink	Broadband PCS	AWGN	-53.30	10.34	63.64	72.00
		CW	-54.60	9.08	63.68	
	AWS-1	AWGN	-55.08	8.80	63.88	71.27
		CW	-53.98	8.87	62.85	
	Cellular	AWGN	-54.93	8.72	63.65	64.95
		CW	-54.58	9.39	63.97	
	Lower 700 MHz	AWGN	-53.18	9.77	62.95	63.49
		CW	-51.73	9.54	61.27	
	Upper 700 MHz	AWGN	-54.63	9.60	64.23	64.36
		CW	-54.46	9.50	63.96	

Note: Gain Limit (dB) = 6.5 + 20Log(Central frequency of uplink band (MHz))

Difference between uplink and downlink gain

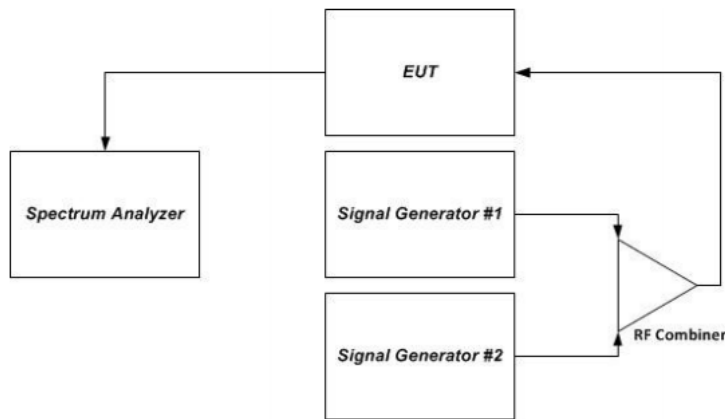
Band (MHz)	Signal type	Gain uplink (dB)	Gain Down link (dB)	D-value	Limit (dBm)
Broadband PCS	AWGN	64.16	63.64	0.52	N/A
	CW	64.69	63.68	1.01	
AWS-1	AWGN	62.98	63.88	0.90	
	CW	62.18	62.85	0.67	
Cellular	AWGN	62.74	63.65	0.91	
	CW	63.18	63.97	0.79	
Lower 700 MHz	AWGN	62.89	62.95	0.06	
	CW	62.30	61.27	1.03	
Upper 700 MHz	AWGN	62.45	64.23	1.78	
	CW	62.20	63.96	1.76	

3.4 Inter-modulation

LIMIT

Inter-modulation Level $\leq$ -19dBm

TEST CONFIGURATION

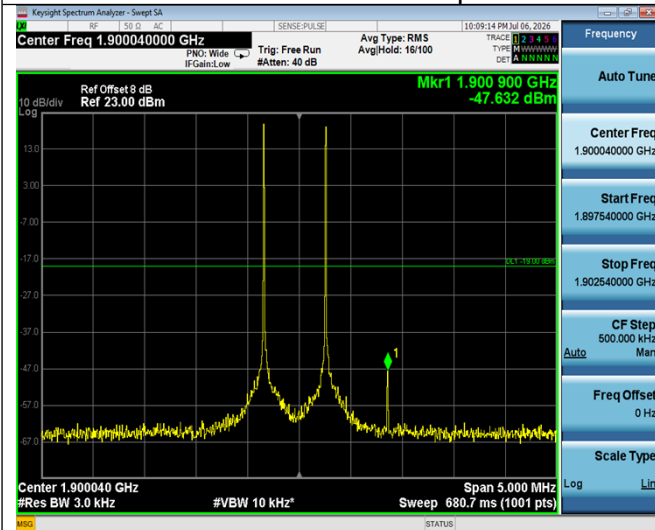


TEST PROCEDURE

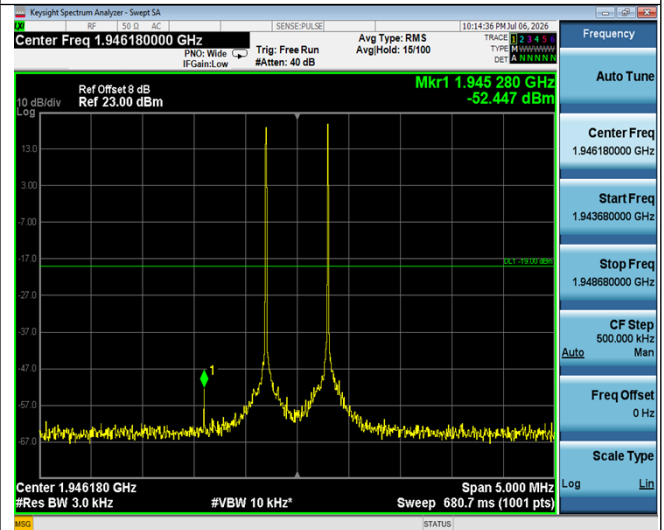
- Begin with the uplink output (donor) port connected to the spectrum analyzer.
- Set the spectrum analyzer RBW = 3kHz.
- Set the VBW $\geq$ 3* RBW.
- Select the rms detector.
- Set the spectrum analyzer center frequency to the center of the supported operational band under test.
- Set the span to 5 MHz. Affirm that the number of measurement points per sweep $\geq$ (2 $\times$ span)/RBW.
- Configure the two signal generators for CW operation with generator #1 tuned 300 kHz below the operational band center frequency and generator #2 tuned 300 kHz above the operational band center frequency.
- Set the signal generator amplitudes so that the power from each into the EUT is equivalent, then turn on the RF output.
- Simultaneously increase each signal generators' amplitude equally until just before the EUT begins AGC, then affirm that all intermodulation-product emissions (if any occur) are below the specified limit of -19 dBm.
- Use the trace averaging function of the spectrum analyzer, and wait for the trace to stabilize. Place a marker at the highest amplitude intermodulation-product emission.
- Record the maximum intermodulation product amplitude level that is observed.
- Capture the spectrum analyzer trace for inclusion in the test report.
- Repeat 7.4e) to 7.4l) for all uplink and downlink operational bands.
NOTE—If using a single signal generator with dual outputs, affirm that intermodulation products are not the result of the generator.
- Increase the signal generator amplitude in 2 dB steps to 10 dB above the AGC threshold but not exceeding the maximum input level of 5.5, to affirm that the EUT maintains compliance with the intermodulation limit. The test report shall include either a statement describing that the device complies at 10 dB above AGC or at the 5.5 power levels, or a table showing compliance at the additional input power(s) required.

TEST RESULT

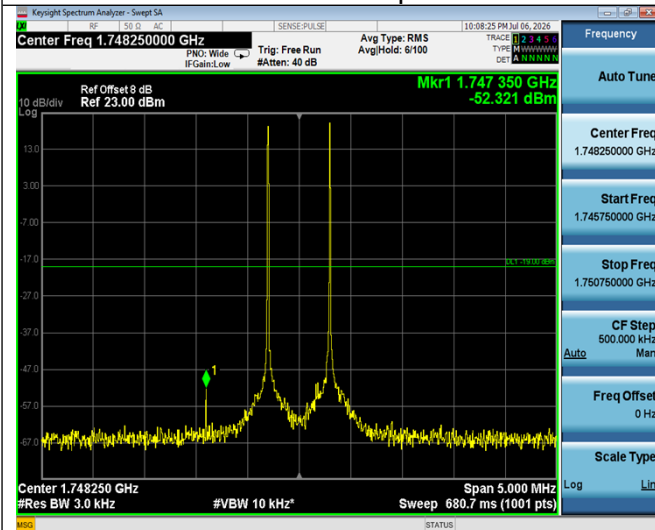
Broadband PCS band uplink



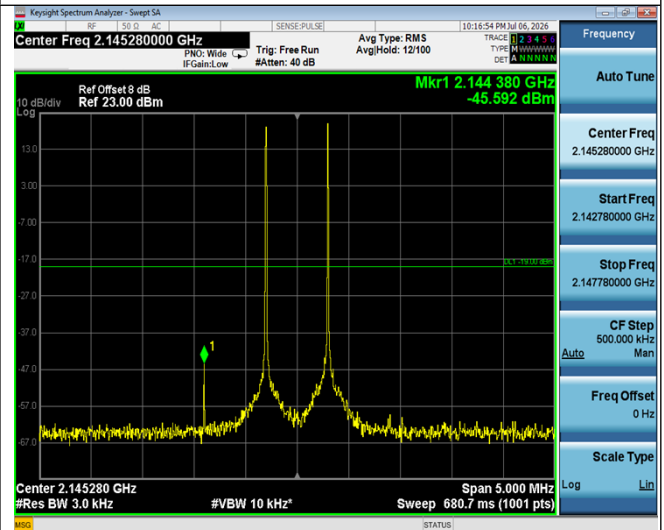
Broadband PCS band downlink



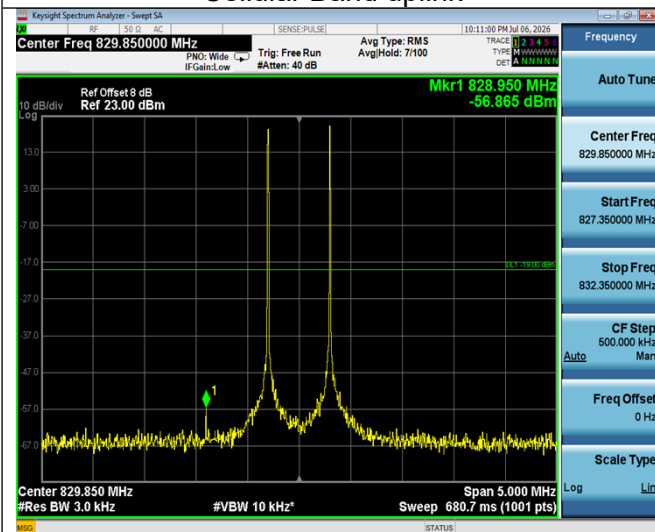
AWS-1 band uplink



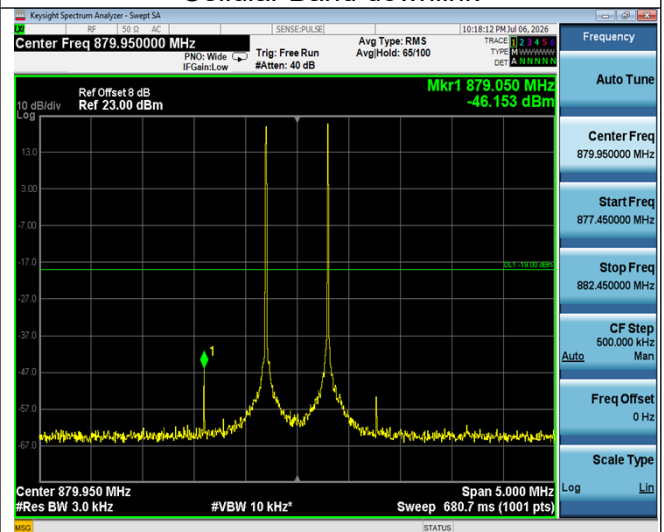
AWS-1 band downlink

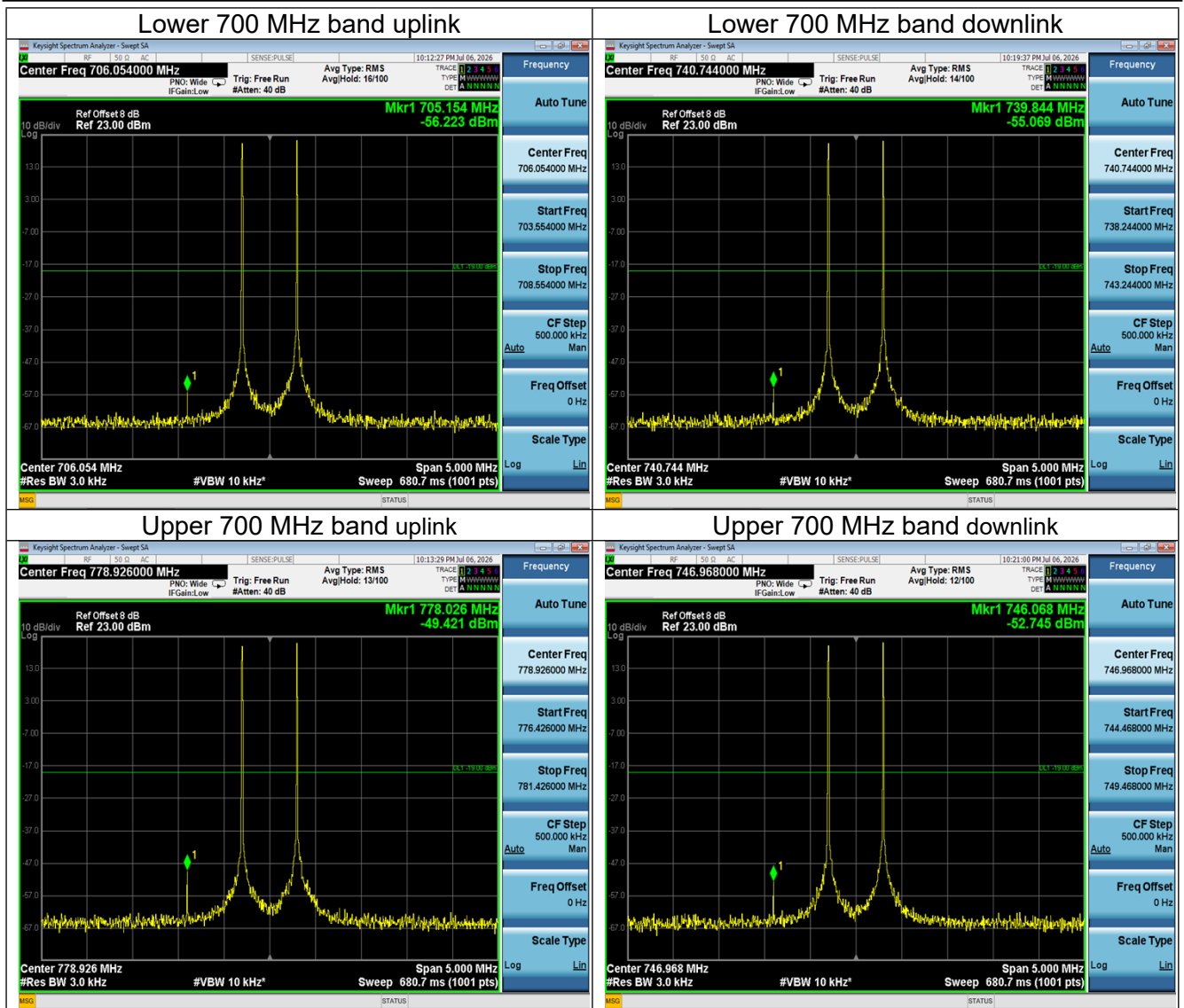


Cellular Band uplink



Cellular Band downlink





Note. The device also compliance when input signal at 10 dB above AGC.

3.5 Out-of-band emissions

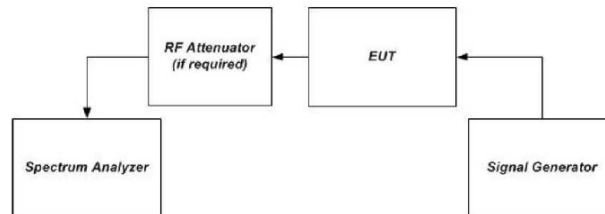
LIMIT

Out-of-band Emissions Limit = $P1 - 6 - (43 + 10\log(P2)) = -19\text{dBm}$

P1 = power in dBm

P2 = power in Watts

TEST CONFIGURATION



TEST PROCEDURE

- a) Begin with the uplink output (donor) port connected to the spectrum analyzer.
- b) Configure the signal generator for the appropriate operation for all uplink and downlink bands:
 - 1) GSM: 0.2 MHz from upper and lower band edges.
 - 2) LTE (5 MHz): 2.5 MHz from upper and lower band edges.
 - 3) CDMA: 1.25 MHz from upper and lower band edges, except for cellular band as follows (only the upper and lower frequencies need to be tested):
824.88 MHz, 845.73 MHz, 836.52 MHz, 848.10 MHz,
869.88 MHz, 890.73 MHz, 881.52 MHz, 893.10 MHz.

NOTE 1 – Alternative test modulation types:

CDMA (alternative 1.25 MHz AWGN)

LTE 5 MHz (alternative W-CDMA or 4.1 MHz AWGN)

NOTE 2 – For LTE, the signal generator should use the uplink and downlink signal types for these modulations in uplink and downlink tests, respectively. LTE shall use 5 MHz signal, 25 resource blocks transmitting.

NOTE 3–When using an AWGN test signal, the bandwidth shall be the measured 99% OBW.

- c) Set the signal generator amplitude to the maximum power level prior to AGC similar to the power measurement procedures for the appropriate modulations.
- d) Set RBW = measurement bandwidth specified in the applicable rule section for the supported frequency band.
NOTE 3–Within 300 kHz and 3 MHz away from band edge, if smaller RBW is used (i.e., $RBW < 100\text{ kHz}$ or 1 MHz , for above and below 1 GHz , respectively), per Parts 24 and 27 the smaller RBW is applicable only for frequencies within 100 kHz or 1 MHz (for above and below 1 GHz , respectively) away from the band edge.
- e) Set VBW = $3 * RBW$.
- f) Select the power averaging (rms) detector.
- g) Sweep time = auto-couple.
- h) Set the analyzer start frequency to the upper band/block edge frequency and the stop frequency to the upper band/block edge frequency plus: 300 kHz (when operational frequency is $< 1\text{ GHz}$), or 3 MHz (when operational frequency is $\geq 1\text{ GHz}$).
- i) Trace average at least 100 traces in power averaging (i.e., rms) mode.
- j) Use peak marker function to find the maximum power level.
- k) Capture the spectrum analyzer trace of the power level for inclusion in the test report.
- l) Increase the signal generator amplitude in 2 dB steps until the maximum input level per 5.5 is reached. Affirm that the EUT maintains compliance with the OOB limits. The test report shall include either a statement describing that the device complies at 10 dB above AGC or at the 5.5 power levels, or a table showing compliance at the additional input power(s) required.
- m) Reset the analyzer start frequency to the lower band/block edge frequency minus: 300 kHz (when operational frequency is $< 1\text{ GHz}$), or 3 MHz (when operational frequency is $\geq 1\text{ GHz}$), and the stop frequency to the lower band/block edge frequency, then repeat i) to l).
- n) Repeat b) through m) for each uplink and downlink operational band.

TEST RESULT

Signal Type:GSM

