Cellphone-Mate, Inc.

ADDENDUM TO EMC TEST REPORT 97222-10

Mobile Wideband Consumer Booster
Model: Fusion2go

Tested To The Following Standards:

FCC Part 22H

Report No.: 97222-10A

Date of issue: August 5, 2015

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Cellphone-Mate, Inc.
48346 Milmont Drive
Fremont, CA 94538

Representative: Dennis Findley
Customer Reference Number: SC20150623

REPORT PREPARED BY:

Morgan Tramontin
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 97222

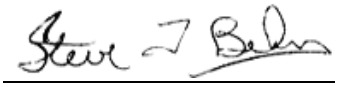
DATE OF EQUIPMENT RECEIPT: June 26, 2015
DATE(S) OF TESTING: June 26, 29, & July 20, 2015

Revision History

Original: Testing of the Mobile Wideband Consumer Booster, Fusion2go to FCC Part 22H.
Addendum A: To add a statement that clarifies the lowest frequency of measurement to section 2.1051 Spurious Emissions at Antenna Terminals.

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
1120 Fulton Place
Fremont, CA 94539

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.02.00
EMITest Immunity	5.02.00

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Fremont	US0082	SL2-IN-E-1148R	3082B-1	958979	A-0149

SUMMARY OF RESULTS

Standard / Specification: FCC Part(s) 2 / 22H

Test Procedure	Description	Modifications*	Results
2.1046	RF Power Output	NA	NA[1]
2.1047	Modulation Characteristics	NA	NA[1]
2.1049	Occupied Bandwidth	NA	Pass
2.1051	Spurious Emissions at Antenna Terminals	NA	Pass
2.1053 / 22.917(a)	Field Strength of Spurious Radiation	NA	Pass
2.1055	Frequency Stability	NA	NA[2]

NA = Not Applicable
NA[1] = A different standard applies; see applicable test report.
NA[2] = Not applicable. See the section in the report for the reason.

Modifications* During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

***Modifications listed above must be incorporated into all production units.**

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

During testing numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
Mobile Wideband Consumer Booster	Cellphone-Mate, Inc.	Fusion2go	1

Support Equipment:

Device	Manufacturer	Model #	S/N
Switching Power Adapter	SureCall	GFP451DA-1238-1	1406-0000611
Signal Generator	Agilent	E4438C	MY42082260
Signal Generator	Agilent	E4433B	US40052164

FCC PART(S) 2 / 22H

2.1049 Occupied Bandwidth

Test Equipment					
Asset #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
ANP05713	Attenuator	PE7015-20	Pasternack	03/24/2015	03/24/2017
ANP06710	Cable	32026-29094K-29094K-72TC	AstroLab	09/18/2014	09/18/2016
AN02869	Spectrum Analyzer	E4440A	Agilent	07/10/2014	07/10/2015

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer: Cellphone-Mate, Inc.
Specification: **Occupied Band Width**
Work Order #: **97222** Date: 6/26/2015
Test Type: **Conducted Emissions** Time: 16:34:39
Tested By: Daniel Bertran Sequence#: 1
Software: EMITest 5.02.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Configuration 1
The equipment under test (EUT) is a Mobile Wideband Consumer Booster.
The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.

Part 22
UL: 824-849MHz
DL: 869-894MHz

All adjustable settings on the test sample are set at max gain.

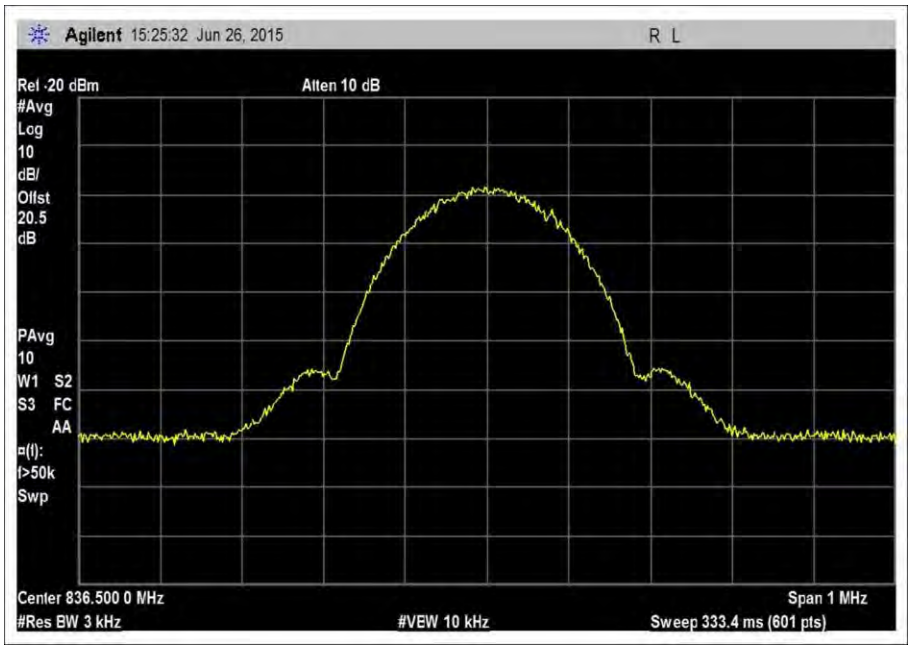
Test environment conditions: Temperature: 20.8°C, Relative Humidity: 42%, Atmospheric Pressure: 101.5kPa

Test procedure: The test was performed in accordance with section 7.10 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015.

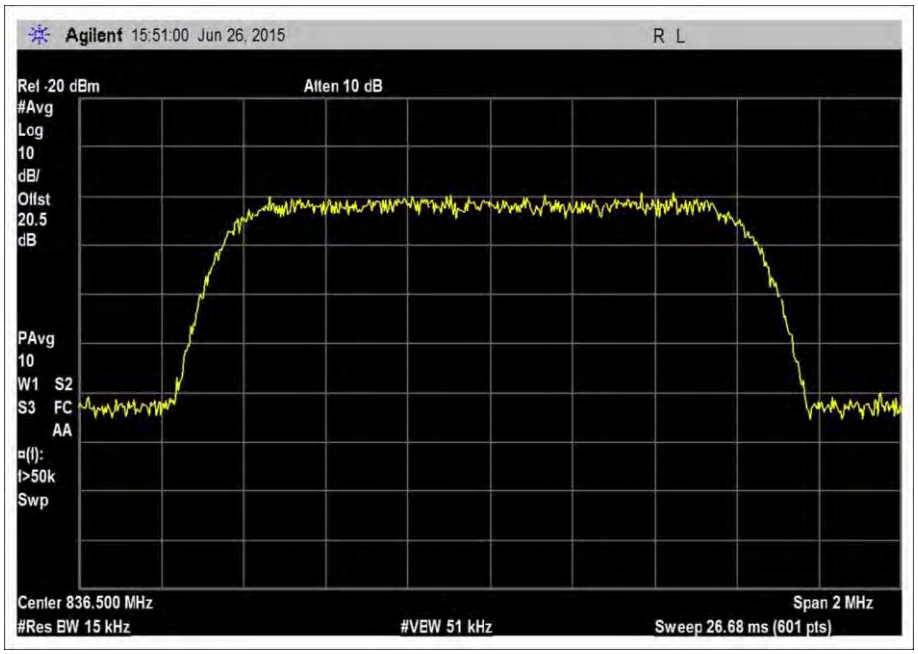
Firmware: V1.0

Test Data

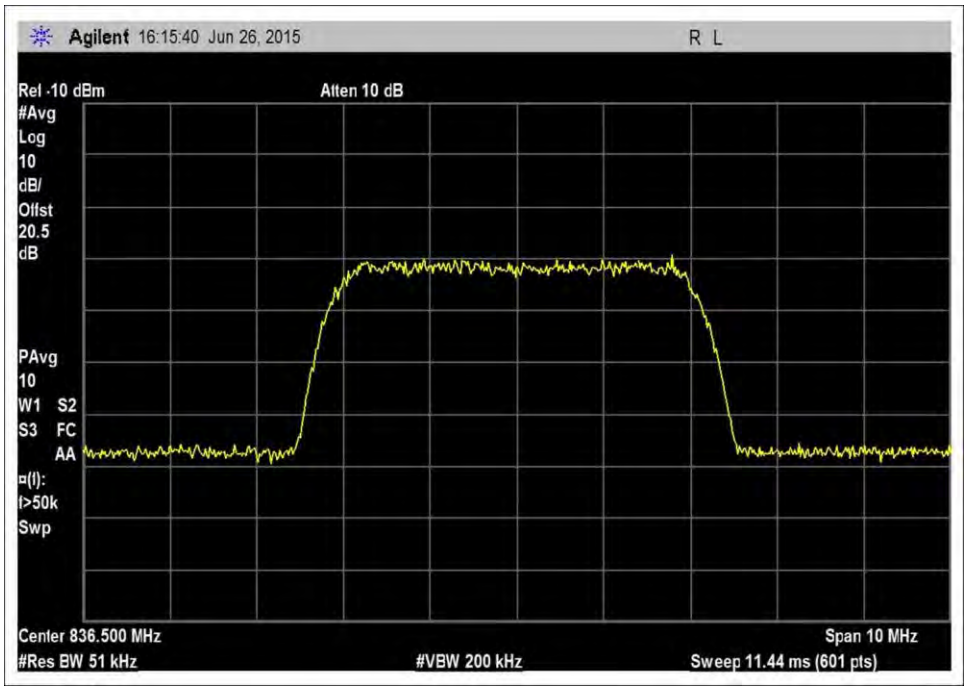
Input-UL



UL_824-849MHz_GSM

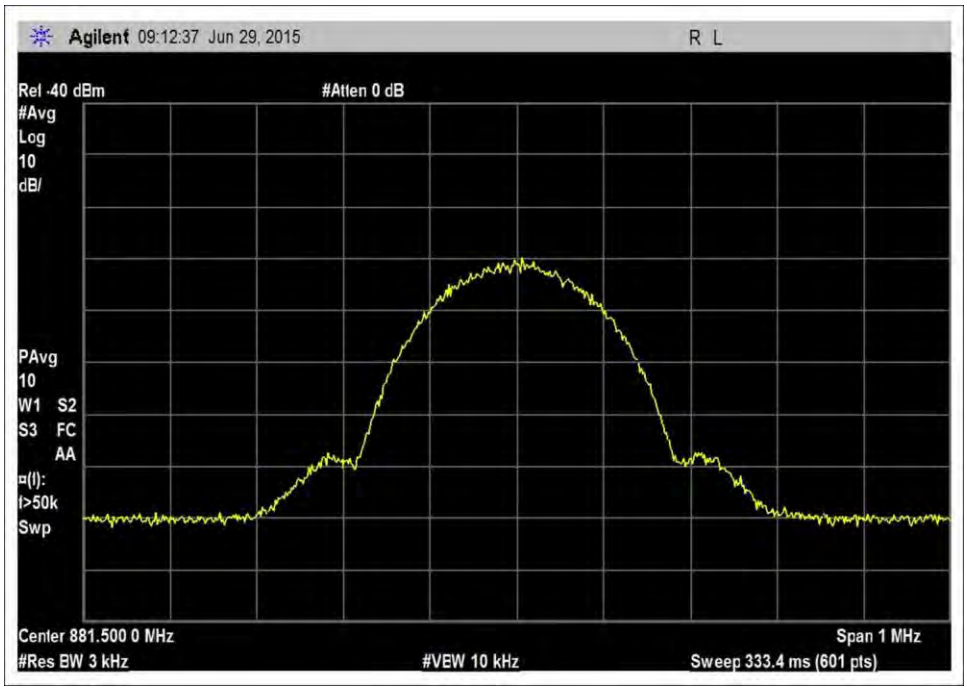


UL_824-849MHz_CDMA



UL_824-849MHz_WCDMA

Input-DL



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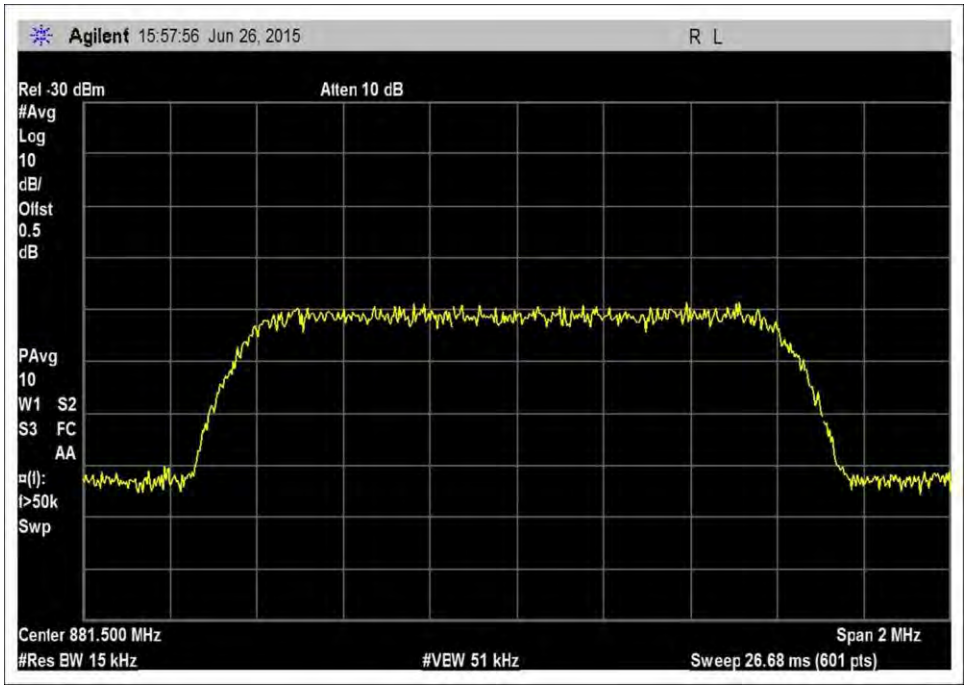
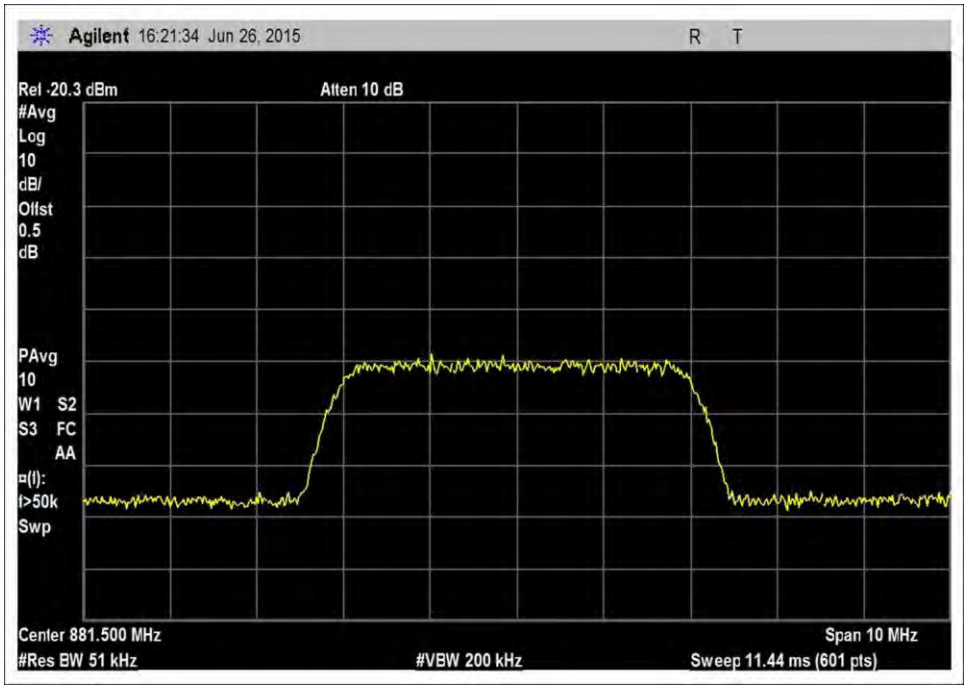
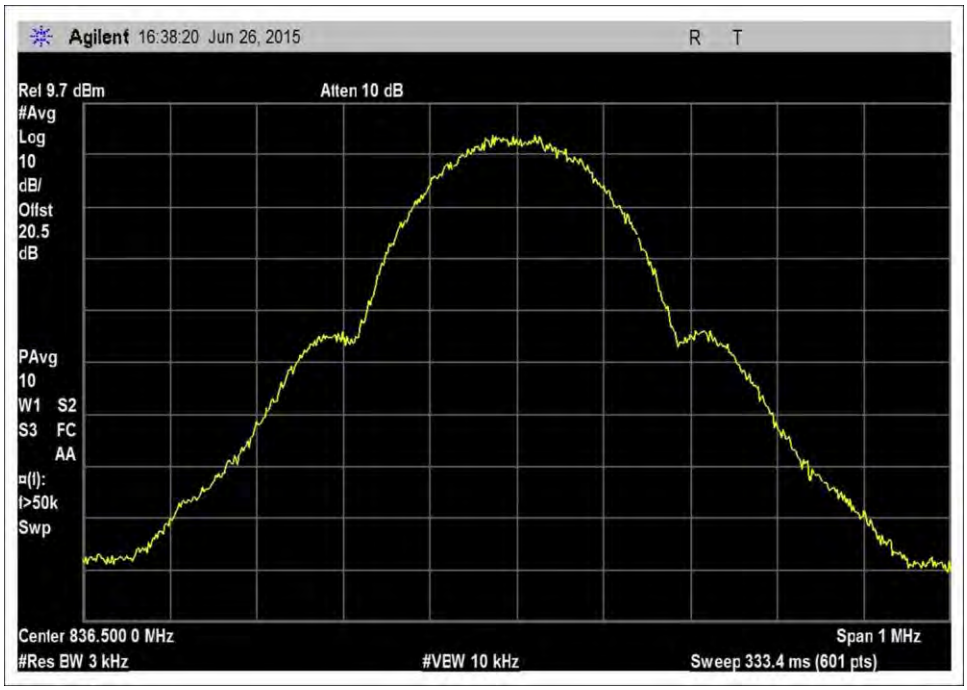


DL_869-894MHz_CDMA

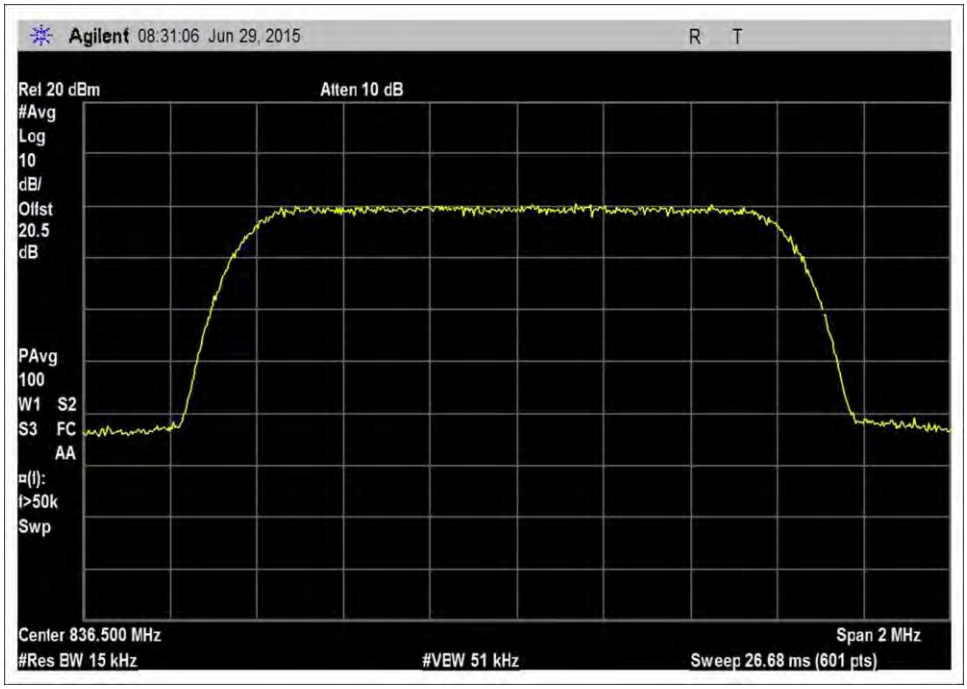


DL_869-894MHz_WCDMA

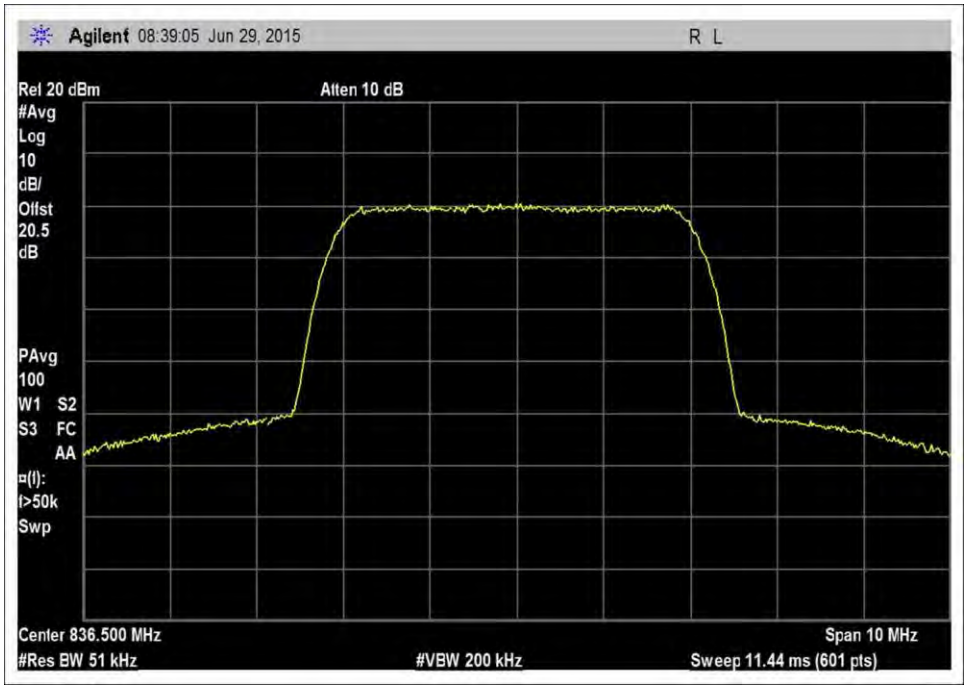
Output-UL



UL_824-849MHz_GSM

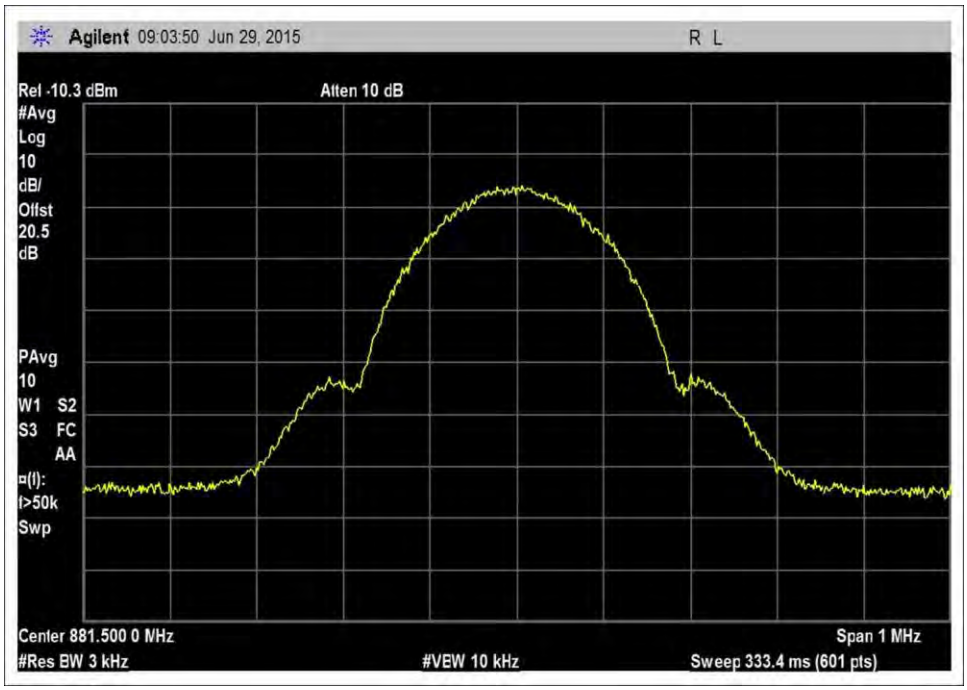


UL_824-849MHz_CDMA

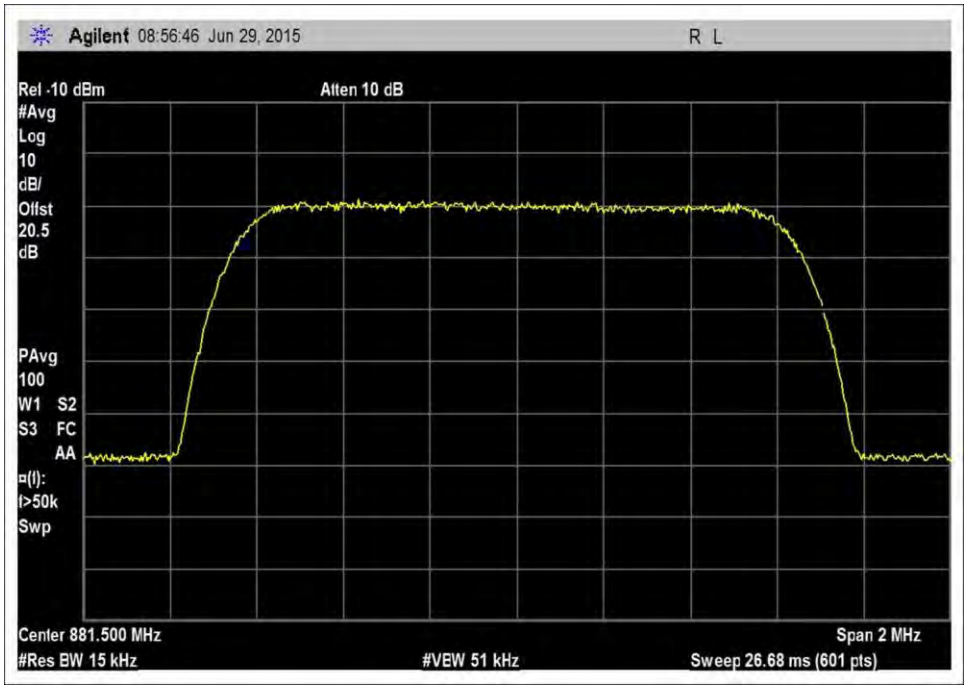


UL_824-849MHz_WCDMA

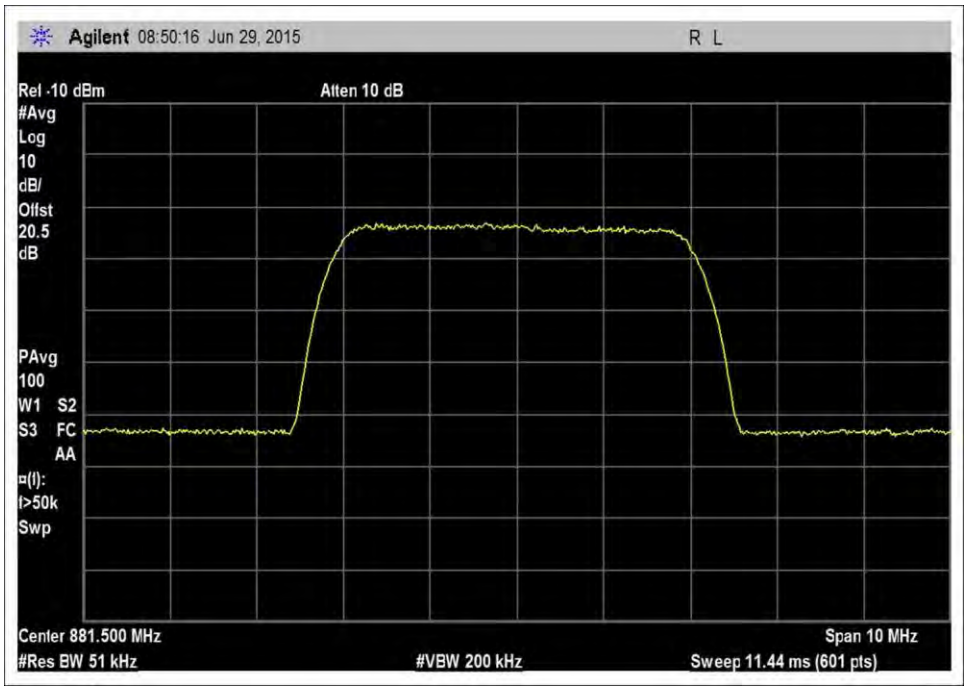
Output-DL



DL_869-894MHz_GSM

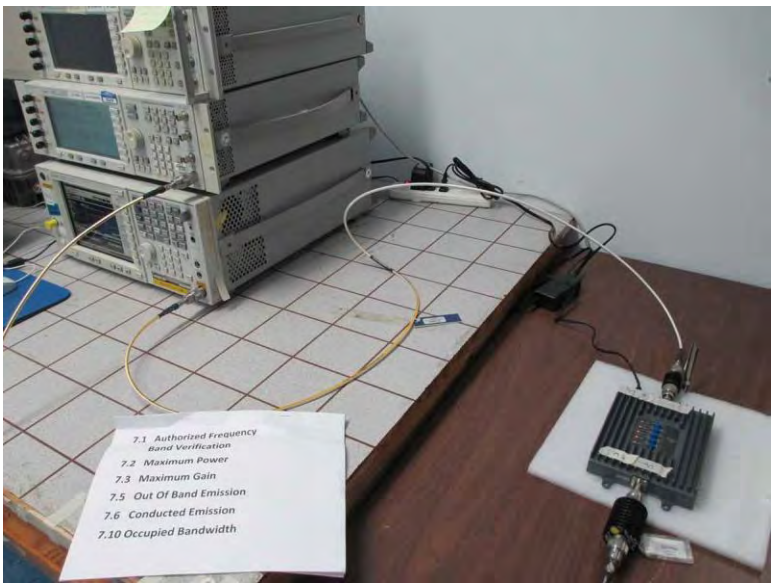


DL_869-894MHz_CDMA



DL_869-894MHz_WCDMA

Test Setup Photo



2.1051 Spurious Emissions at Antenna Terminals

Test Equipment

Asset #	Description	Model	Manufacturer	Cal Date	Cal Due
ANP05389	Attenuator	766-10	Narda	02/27/2014	02/27/2016
ANP05713	Attenuator	PE7015-20	Pasternack	03/24/2015	03/24/2017
ANP06709	Cable	32026-29094K-29094K-72TC	AstroLab	09/18/2014	09/18/2016
ANP06710	Cable	32026-29094K-29094K-72TC	AstroLab	09/18/2014	09/18/2016
AN02869	Spectrum Analyzer	E4440A	Agilent	07/10/2014	07/10/2015

Test Conditions / Setup

Test Location: CKC Laboratories, Inc • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
Customer: Cellphone-Mate, Inc
Specification: **2.1051 Spurious Emissions at Antenna Terminals / 7.6 Conducted Spurious Emissions**
Work Order #: **97222** Date: 6/29/2015
Test Type: **Conducted Emissions** Time: 12:50:18
Tested By: Daniel Bertran Sequence#: 1
Software: EMITest 5.02.00

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Configuration 1
The equipment under test (EUT) is a Mobile Wideband Consumer Booster.
The EUT is placed on the test bench. Evaluation performed at the Outside (Donor) and Inside (Server) antenna port.

Part 24
UL: 1850-1915MHz
DL: 1930-1995MHz

Frequency range of measurement = 9 kHz- 22GHz.

9 kHz	-	150 kHz ->	RBW= 200Hz VBW= 200Hz
150 kHz	-	30 MHz ->	RBW= 9kHz VBW= 9kHz
30 MHz	-	1000MHz ->	RBW*= 1MHz VBW= 3MHz
1000 MHz	-	22000MHz ->	RBW= 1MHz VBW= 3MHz

*Note: As specified on 7.6 Conducted spurious emissions test procedure of 935210 D03 Signal Booster Measurements v03, for frequencies below 1 GHz, an RBW of 1 MHz may be used in a preliminary measurement. If non-compliant emissions are detected, a final measurement shall be made with a 100 kHz RBW. Additionally, a peak detector may also be used for the preliminary measurement. If non-compliant emissions are detected then a final measurement of these emissions shall be made with the power averaging (RMS) detector.

All adjustable settings on the test sample are set at max gain.

Test environment conditions: Temperature: 20.8°C, Relative Humidity: 42%, Atmospheric Pressure: 101.5kPa

Test procedure: The test was performed in accordance with section 7.6 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015.

Firmware: V1.0

Summary of Results

Pass: As summarized in plots below, the conducted spurious emissions are within limits.

9 KHz-30 MHz

No Conducted Spurious Emissions were found within 20dB of the limit.

Test Data

Limit line for Spurious Conducted Emission

Required Attenuation = 43+10 Log P dB

Limit line (dBuV) = V_{dBuv} - Attenuation

V_{dBuV} = $20 \text{ Log } \frac{V}{1 \times 10^{-6}}$

= $20\left(\text{Log } V - \text{Log } 1 \times 10^{-6}\right)$

= $20 \text{ Log } V - 20 \text{ Log} 1 \times 10^{-6}$

= $20 \text{ Log } V - 20(-6)$

= $20 \text{ Log } V + 120$

Attenuation = $43 + 10 \text{ Log } P$

= $43 + 10 \text{ Log } \frac{V^2}{R}$

= $43 + 10\left(\text{Log } V^2 - \text{Log } R\right)$

= $43 + 10(2 \text{ Log } V - \text{Log } R)$

= $43 + 20 \text{ Log } V - 10 \text{ Log } R$

Limit line = V_{dBuv} - Attenuation

= 20 Log V + 120 – (43 + 20 Log V – 10Log R)

= 20 Log V + 120 – 43 – 20 Log V + 10Log R

= 20 Log V + 120 – 43 – 20 Log V + 10Log R

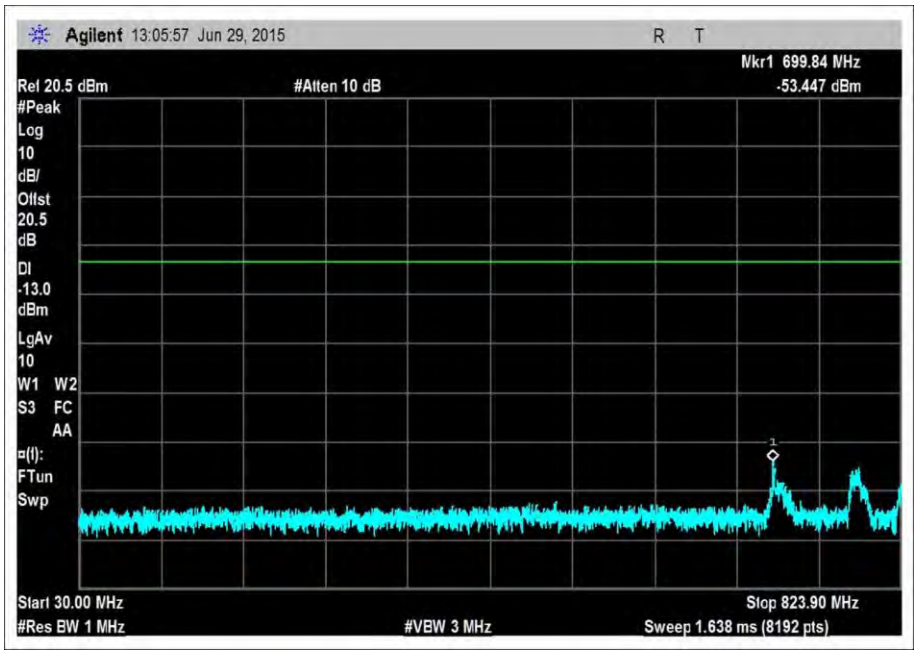
= 120 – 43 + 10 Log 50 Note : R = 50 Ω

= 120 –43 + 16.897

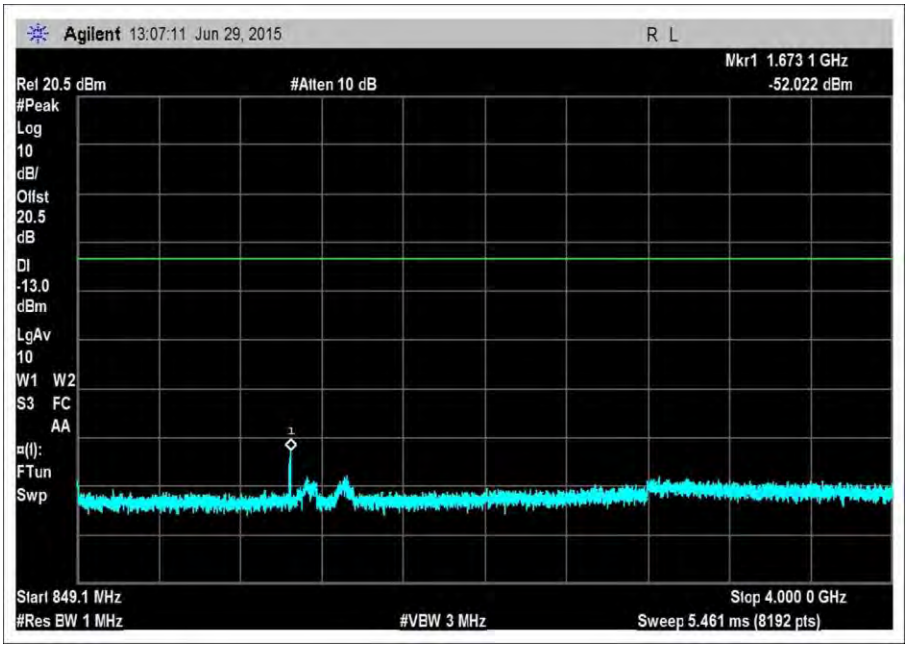
= 94 dBuV at any power level

Test Plot(s)

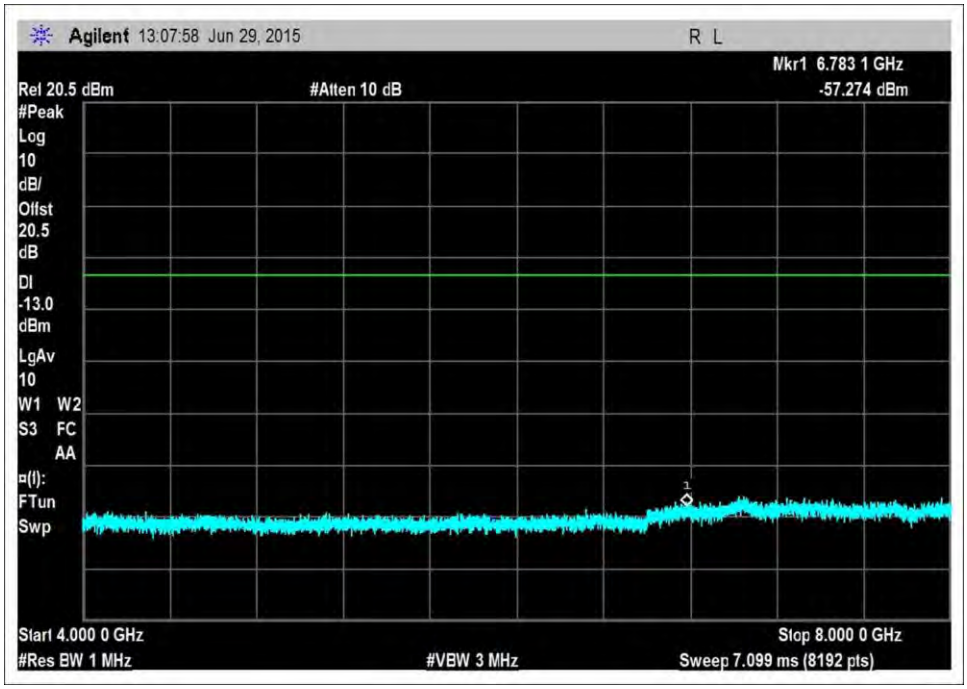
UL



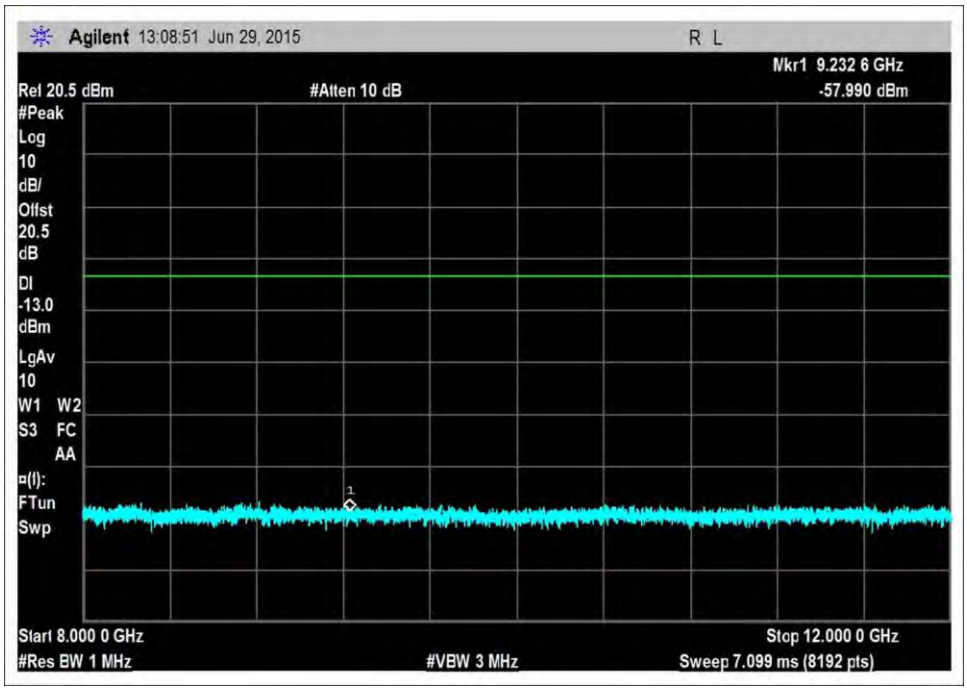
UL_824-849L



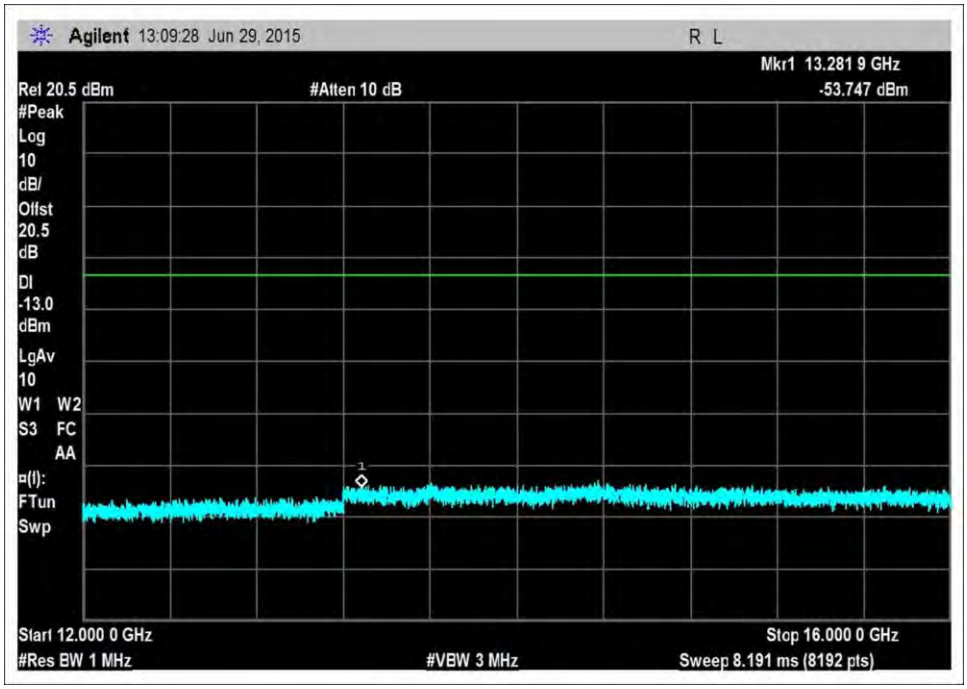
UL_824-849R1



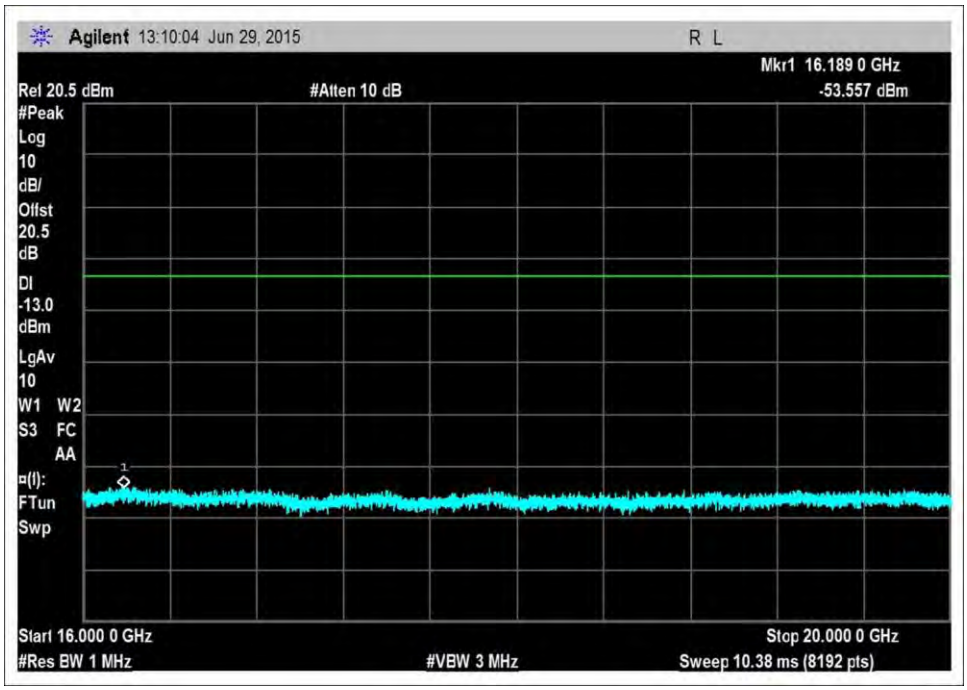
UL_824-849R2



UL_824-849R3

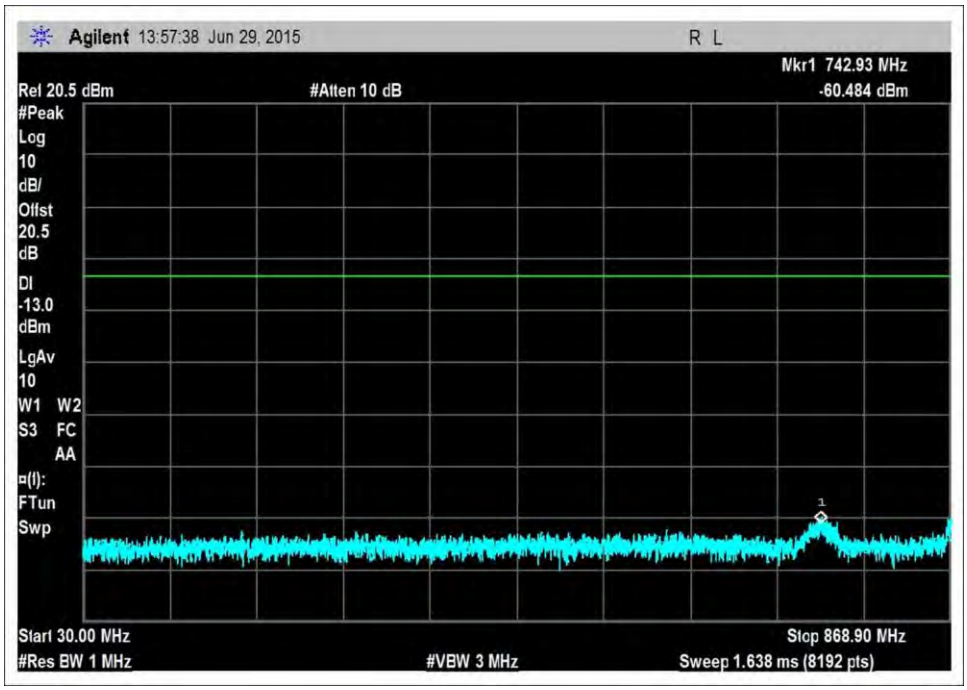


UL_824-849R4

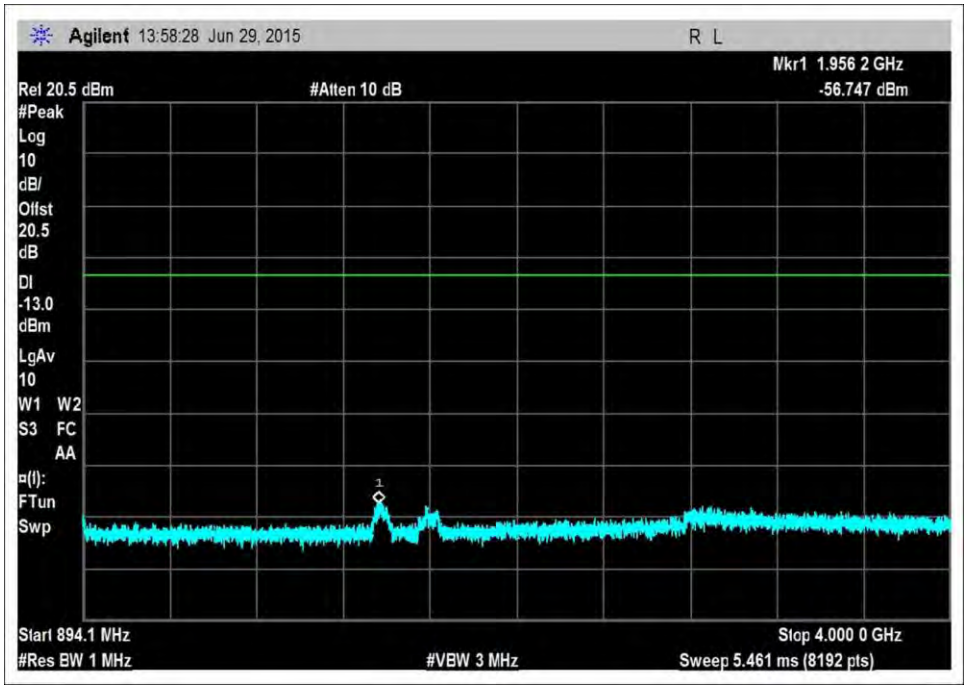


UL_824-849R5

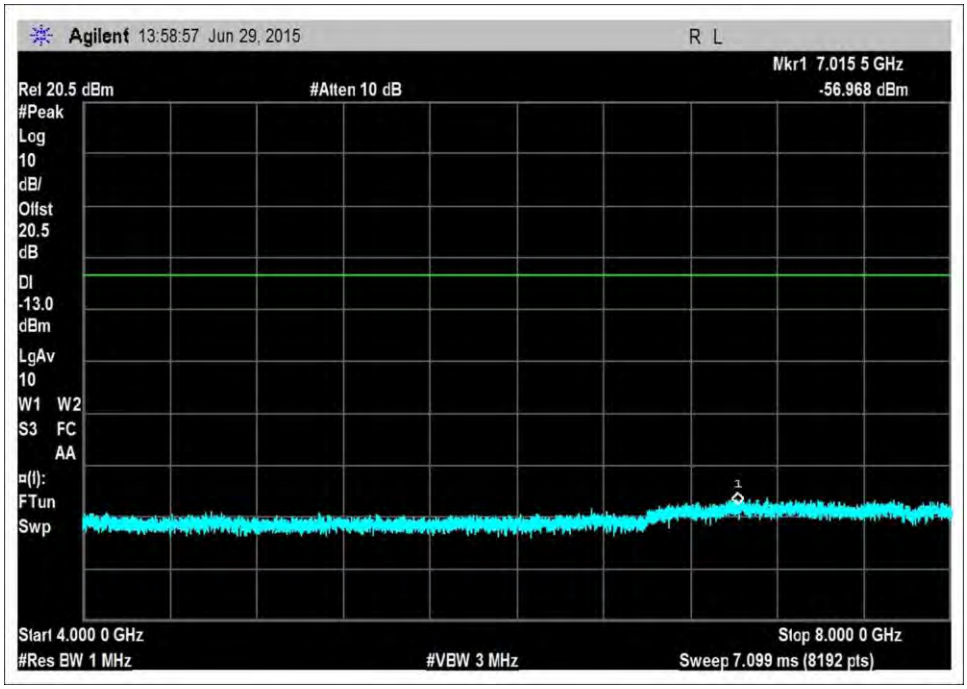
DL



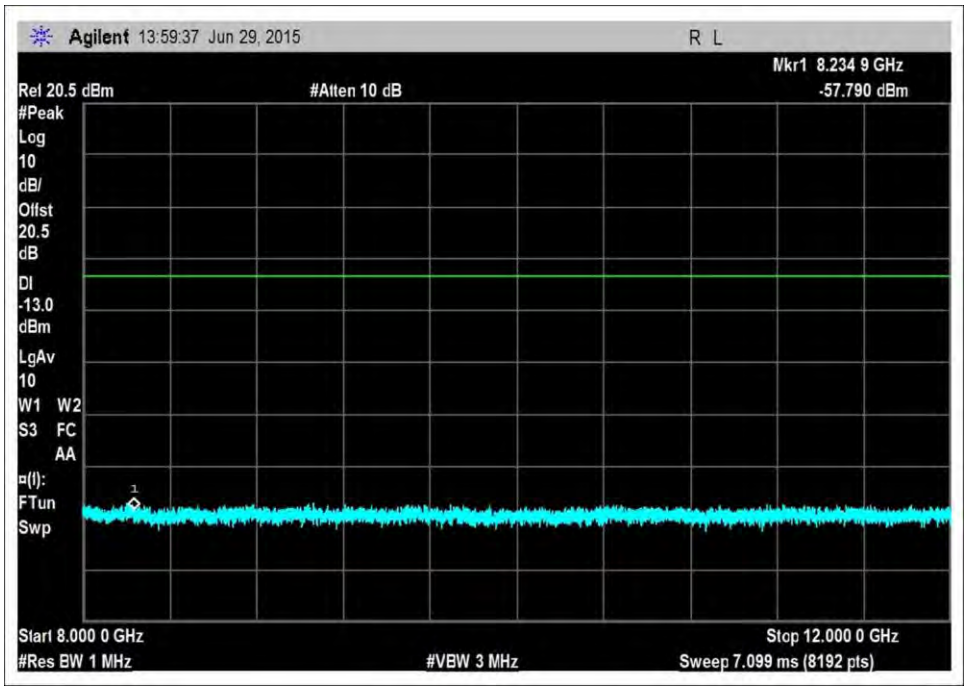
DL-869-894L



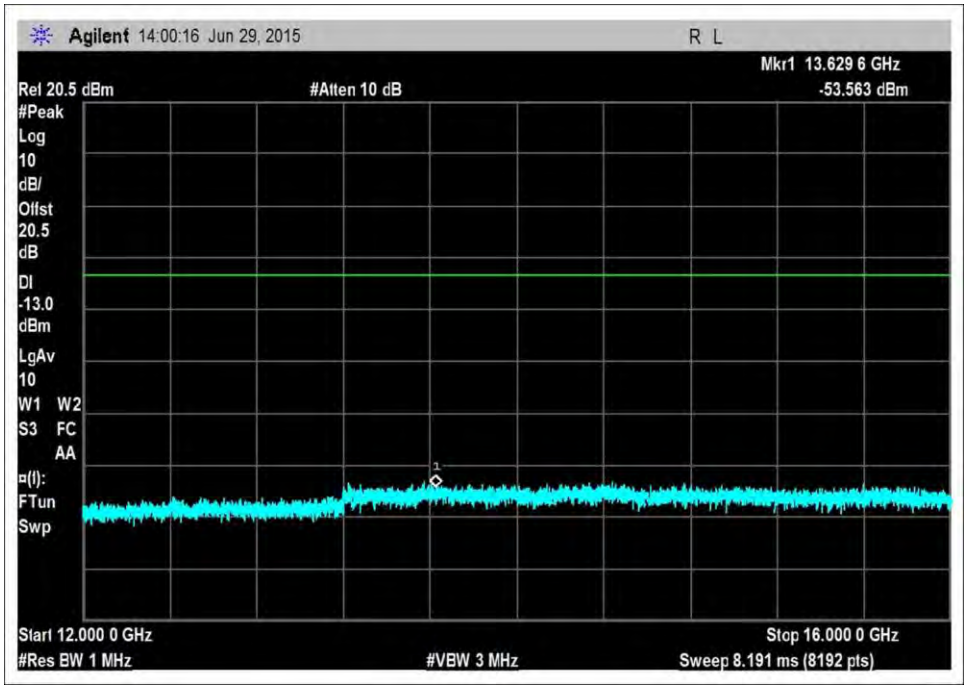
DL_869-894R1



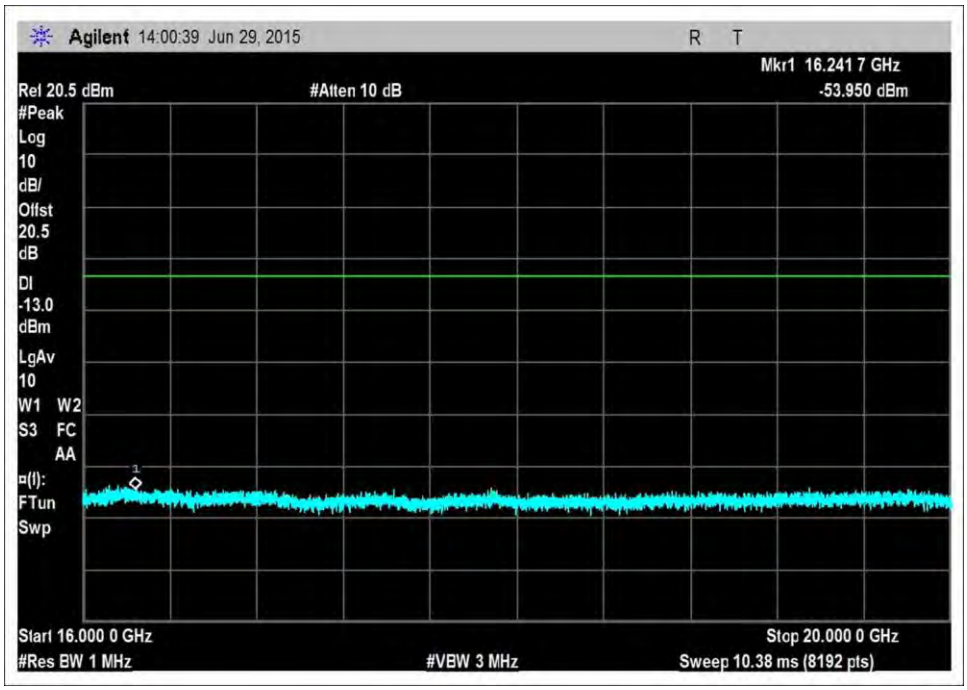
DL_869-894R2



DL_869-894R3

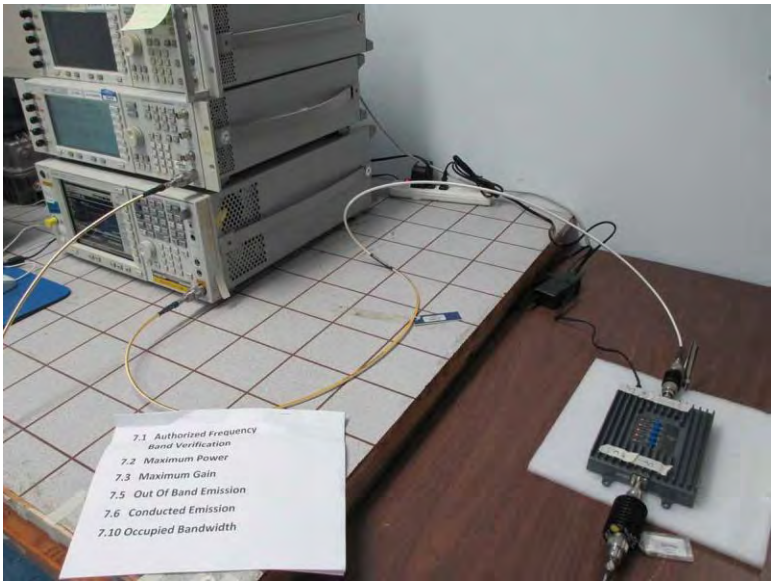


DL_869-894R4



DL_869-894R5

Test Setup Photo(s)



2.1053 / 22.917(a) Field Strength of Spurious Radiation

Test Equipment					
Asset #	**Description**	**Model**	**Manufacturer**	**Cal Date**	**Cal Due**
AN02157	Horn Antenna-ANSI C63.5 Calibration	3115	EMCO	12/02/2014	12/02/2016
ANP06710	Cable	32026-29094K-29094K-72TC	AstroLab	09/18/2014	09/18/2016
AN03114	Preamp	AMF-7D-00101800-30-10P	Miteq	04/22/2015	04/22/2017
ANP06126	Cable	32022-29094K-29094K-168TC	Astrolab	03/18/2015	03/18/2017
AN03302	Cable	32026-29094K-29094K-72TC	Astrolab	03/24/2014	03/24/2016
AN03471	RF Characteristics Analyzer	E4440A	Agilent	12/19/2013	12/19/2015
ANP00880	Cable	RG214U	Pasternack	06/13/2014	06/13/2016
ANP06691	Cable	PE3062-180	Pasternack	08/08/2014	08/08/2016
ANP01183	Cable	CNT-195	Andrews	09/03/2013	09/03/2015
AN00686	Preamp	8447D Opt 010	HP	05/27/2014	05/27/2016
AN00852	Biconilog Antenna	CBL 6111C	Schaffner	11/24/2014	11/24/2016
ANP00929	Cable	various	various	01/23/2014	01/23/2016
AN00432	Loop Antenna	6502	EMCO	05/08/2015	05/08/2017
AN02694	Active Horn Antenna	AMFW-5F-18002650-20-10P	Miteq	05/07/2015	05/07/2017
ANP05389	Attenuator	766-10	Narda	02/27/2014	02/27/2016

Test Conditions / Setup

Test Location:	CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170		
Customer:	Cellphone-Mate, Inc.		
Specification:	**47 CFR §22.917(a) Spurious Emissions**		
Work Order #:	**97222**	Date:	7/20/2015
Test Type:	**Radiated Emissions**	Time:	08:24:38
Tested By:	Daniel Bertran	Sequence#:	1
Software:	EMITest 5.02.00		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

Configuration 1
The equipment under test (EUT) is a Mobile Wideband Consumer Booster.
During testing, the (EUT) is placed on the Styrofoam table top.
A remotely located signal generator is connected to input port of EUT.
All adjustable settings on the test sample are set at max gain.
Firmware: V1.0

Evaluation of DL path was performed with signal fed into the Outside antenna port while Inside antenna port was terminated with 50 Ohm Weinschel load (MN:1424-4 and SN:21874).
Evaluation of UL path was performed with signal fed into the Inside antenna port while Outside antenna port was terminated with the same above 50 Ohm load.

Part 22
UL: 824-849MHz
DL: 869-894MHz

TX Freq = > Center frequency of above listed bands.
Modulation=> CW

Frequency range of measurement = 9 kHz- 22GHz.

9 kHz - 150 kHz ->	RBW=200 Hz	VBW=200 Hz
150 kHz - 30 MHz ->	RBW=9 kHz	VBW=9 kHz
30 MHz - 1000MHz ->	RBW=120 kHz	VBW=120 kHz
1000 MHz-22000MHz ->	RBW=1 MHz	VBW=1 MHz

Test environment conditions: Temperature: 21.1°C, Relative Humidity: 45%, Atmospheric Pressure: 101.5kPa

Test procedure: The test was performed in accordance with section 7.1 of the FCC document: 935210 D03 Wideband Consumer Signal Booster Measurement Guidance v03 Dated June 5, 2015.

Note: No emissions were found within 20dB of the limit line.

Test Data

Limit line for Spurious Radiated Emission

Required Attenuation = 43+10 Log P (dB)

For radiated spurious emission measured at 3 meter test distance,

Required attenuation = 43+10 Log $P_{t\ at\ 3\ meter}$ dB
Limit line (dBuV) = E_{dBuv} - Attenuation

E_{dBuv} = Measured field strength at 3 meter in dBuV/m

Power Density (Isotropic)

$$P_D = \frac{P_t}{4\pi r^2}$$

P_D = Power Density in Watts /m^2
Pt = Average Transmit Power
r = Test distance

Field Intensity E (V/m)

$$E = \sqrt{P_D \times 377}$$

$$E = \frac{\sqrt{P_t \times 377}}{4\pi r^2}$$

$$E = \sqrt{\frac{P_t \times 30}{r^2}}$$

$$P_t = \left(\frac{E^2 \times r^2}{30} \right)$$

10 Log P_t = 10 Log E^2 (V/m)+ 10 Log r^2 – 10 Log 30

10 Log P_t = 20 Log E (V/m) + 20 Log r – 10 Log 30

At 3 meter, r = 3 m

$10 \text{ Log } P_t = 20 \text{ Log } E \text{ (V/m)} + 20 \text{ Log } 3 - 10 \text{ Log } 30$

$10 \text{ Log } P_t = 20 \text{ Log } E \text{ (V/m)} + 9.54 - 14.77$

$10 \text{ Log } P_t = 20 \text{ Log } E \text{ (V/m)} - 5.23$

*Since 20 Log E (V/m) = 20 Log E (**u**V/m) –120*

$10 \text{ Log } P_t = 20 \text{ Log } E \text{ (uV/m)} - 120 - 5.23$

$10 \text{ Log } P_t = 20 \text{ Log } E \text{ (uV/m)} - 125.23$

Limit line (dBuV) at 3 meter = E_{dBuv} – Attenuation

= $E_{dBuv} - (43+10 \text{ Log } P_{t \text{ at 3 meter}})$

= $E_{dBuv} - 43 - 10 \text{ Log } P_{t \text{ at 3 meter}}$

= $E_{dBuv} - 43 - (20 \text{ Log } E \text{ (uV/m)} - 125.23)$

= $E_{dBuv} - 43 - 20 \text{ Log } E \text{ (uV/m)} + 125.23$

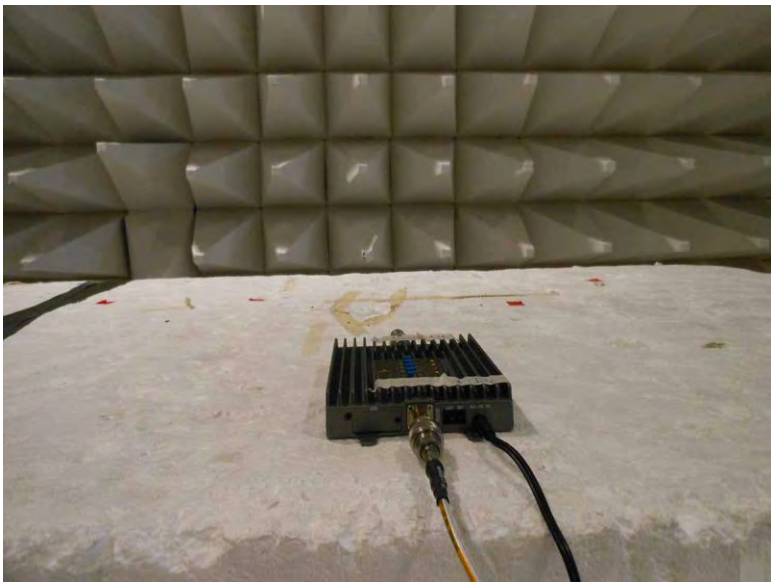
= $E_{dBuv} - 20 \text{ Log } E \text{ (uV/m)} + 82.23$

Since 20 Log E (uV/m) = E in dBuV/m

= $\cancel{E_{dBuv}} - \cancel{E_{dBuv}} + 82.23$

Radiated Emission limit 3 meter = 82.23 dBuV at any power level measured in dBuV

Test Setup Photo(s)



2.1055 Frequency Stability

Note: This test is not applicable because the EUT does not alter the input signal.