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TEST REPORT

FOR FCC PART 90 CLASS B INDUSTRIAL BOOSTER
for
FCC ID: 2AHVPSB800M2A

APPLICANT	**RADIO SOLUTIONS, INC.**
	70 ACCORD PARK DRIVE NORWELL, MA. 02061 USA
MODEL NUMBER	**SB800M2A**
PRODUCT DESCRIPTION	**800 MHz CLASS B SIGNAL BOOSTER/BDA**
DATE SAMPLE RECEIVED	11/15/2016
FINAL TEST DATE	12/05/2016
TESTED BY	Cory Leverett
APPROVED BY	Tim Royer
TEST RESULTS	☒ PASS ☐ FAIL

A2LA ACCREDITED
Testing Certificate # 0955-01

Report Number	Version Number	Description	Issue Date
2299AUT16TestReport_	Rev1	Initial Issue	12/05/2016
	Rev2	Admin updates, added emission mask B	12/13/2016
	Rev3	Admin Update	12/15/2016

TABLE OF CONTENTS

GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

Summary

The device under test does:
☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.
☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669
Tested by:

Name & Title, Cory Leverett, Project Manager/Testing Technician

Date: 12/15/2016

Reviewed by:

Name & Title, Tim Royer, Project Manager/Testing Engineer

Date: 12/15/2016

Testing Certificate # 0955-01

GENERAL INFORMATION

EUT Specification

EUT Description	800 MHz CLASS B SIGNAL BOOSTER/BDA
FCC ID	2AHVPSB800M2A
Model Number	SB800M2A
Operating Frequency	Uplink 806-815 ; Downlink 851-860MHz
Test Frequencies	806.25, 810.50, 814.75, 851.25, 855.50 & 859.75 MHz
Type of Emission	F7E, F1D, F1E, F3E
Modulation	FM
EUT Power Source	☒ 110–120Vac/50– 60Hz
	☐ DC Power 12V
	☐ Battery Operated Exclusively
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☒ Fixed
	☐ Mobile
	☐ Portable
Test Conditions	Temperature: 24-26ºC Relative Humidity: 50 - 65%. Barometer 1023.2mb
Modification to the EUT	None
Test Exercise	The EUT was operated per KDB 935210 D05 v01r01.
Applicable Standards	FCC CFR 47 Part 90.219, FCC Part 2, KDB 935210 D02 v03 02, D05 v01r01, ANSI/TIA 603-D:2010,
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA.

RF EXPOSURE INFORMATION: 47CFR 2.1091

The requirements for this equipment are covered in the included MPE report.

TEST RESULTS SUMMARY

FCC RULE PART	Limit	TEST DESCRIPTION	RESULT PASS/FAIL
90.219(e)(1)	5.0Watts ERP	4.5.4 RF Gain & Power Output	Pass
KDB 935210-D05 § 4.2	Reporting Only	4.2 AGC Threshold	Pass
KDB 935210-D05 § 4.3	Reporting Only	4.3 Out-Of-band rejection	Pass
90.219(e)(4) 90.210	per rule part	4.4 Input-versus-output signal comparison	Pass
90.219(e)(2)	≤ 9 dB	4.6 Noise Figure	Pass
90.219(e)(3)	-13 dBm	4.7.2 Out-of-band/out-of-block Intermodulation	Pass
2.1051(a), 90.219(e)(3)	-13 dBm	4.7.3 Spurious Emissions Conducted	Pass
2.1055	NA	4.8 Frequency Stability	NA
2.1053, 90.219(e)(3)	-13 dBm	4.9 Spurious emissions radiated	Pass

RF POWER OUTPUT and AMPLIFIER GAIN. §4.5

Rule Part No.: Part 2.1046(a), Part 90.219 (e) (1)

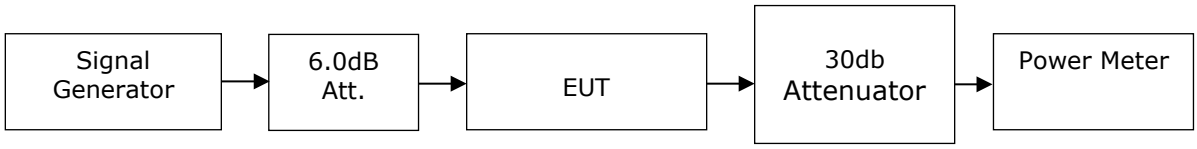
Requirements: 5.0Watts ERP

Procedure: KDB935210 Measurement Guidance for Industrial Boosters
§ 4.5.1 General
§ 4.5.2 Determining Amplifier/Booster Gain
§ 4.5.4 Power Measurement Method 2: Using a power meter

The Input and Output power levels were recorded and the gain calculated using the following formula:

$$\text{Gain}_{dB} = \text{Output Power}_{dBm} - \text{Input Power}_{dBm}$$

Setup Diagram:



Test Data: Uplink Measurement Table

Mode	Input Freq (MHz)	Input Power (dBm)	Output Power (dBm)	Limit (dBm)	Margin (dB)	Gain (dB)
CW	806.25	-61.31	29.82	36.99	7.17	91.13
CW	806.25	-59.05	29.93	36.99	7.06	88.98
CW	810.50	-59.81	30.39	36.99	6.6	90.2
CW	810.50	-57.61	30.55	36.99	6.44	88.16
CW	814.75	-60.07	30.11	36.99	6.88	90.18
CW	814.75	-58.04	30.25	36.99	6.74	88.29

Test Data: Downlink Measurement Table

Mode	Input Freq (MHz)	Input Power (dBm)	Output Power (dBm)	Limit (dBm)	Margin (dB)	Gain (dB)
CW	851.25	-58.70	29.07	36.99	7.92	87.77
CW	851.25	-56.13	29.21	36.99	7.78	85.34
CW	855.50	-60.48	28.75	36.99	8.24	89.23
CW	855.50	-58.20	28.92	36.99	8.07	87.12
CW	859.75	-58.23	26.84	36.99	10.15	85.07
CW	859.75	-55.62	27.07	36.99	9.92	82.69

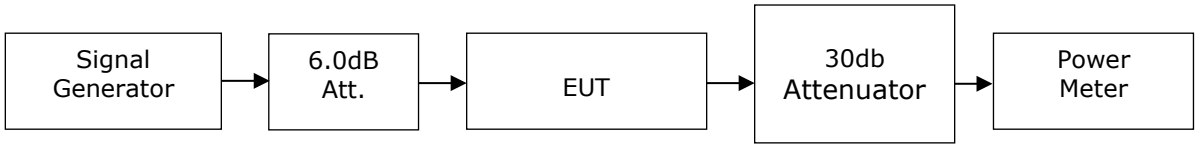
AGC THRESHOLD §4.2

Rule Part No.: KDB935210 § 4.2

Requirements: Reporting only, used to determine test input levels

Procedure: KDB935210 Measurement Guidance for Industrial Boosters
§ 4.2 Measuring AGC threshold

Setup Diagram:



Test Data: Uplink Measurement Table

Gen Freq (MHz)	Gen Output (dBm)	Insertion Loss (dB)	Booster Input (dBm)	Booster Output (dBm)
810.5	-57.9	6.16	64.06	29.39
810.5	-56.9	6.16	63.06	30.37
810.5	-55.9	6.16	62.06	30.41

Test Data: Downlink Measurement Table

Gen Freq (MHz)	Gen Output (dBm)	Insertion Loss (dB)	Booster Input (dBm)	Booster Output (dBm)
855.5	-58.5	6.26	64.76	27.84
855.5	-57.5	6.26	63.76	28.86
855.5	-56.5	6.26	62.76	28.96

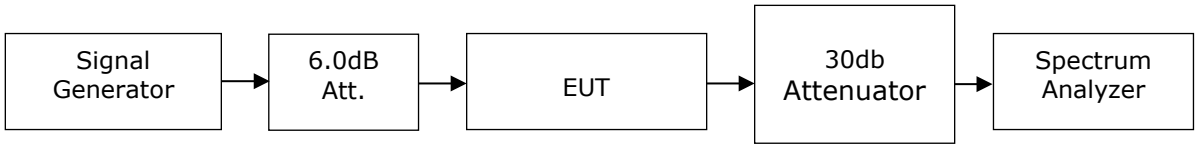
OUT-OF-BAND REJECTION § 4.3

Rule Part No.: KDB935210 § 4.3

Requirements: Reporting of the 20 dB Bandwidth Only

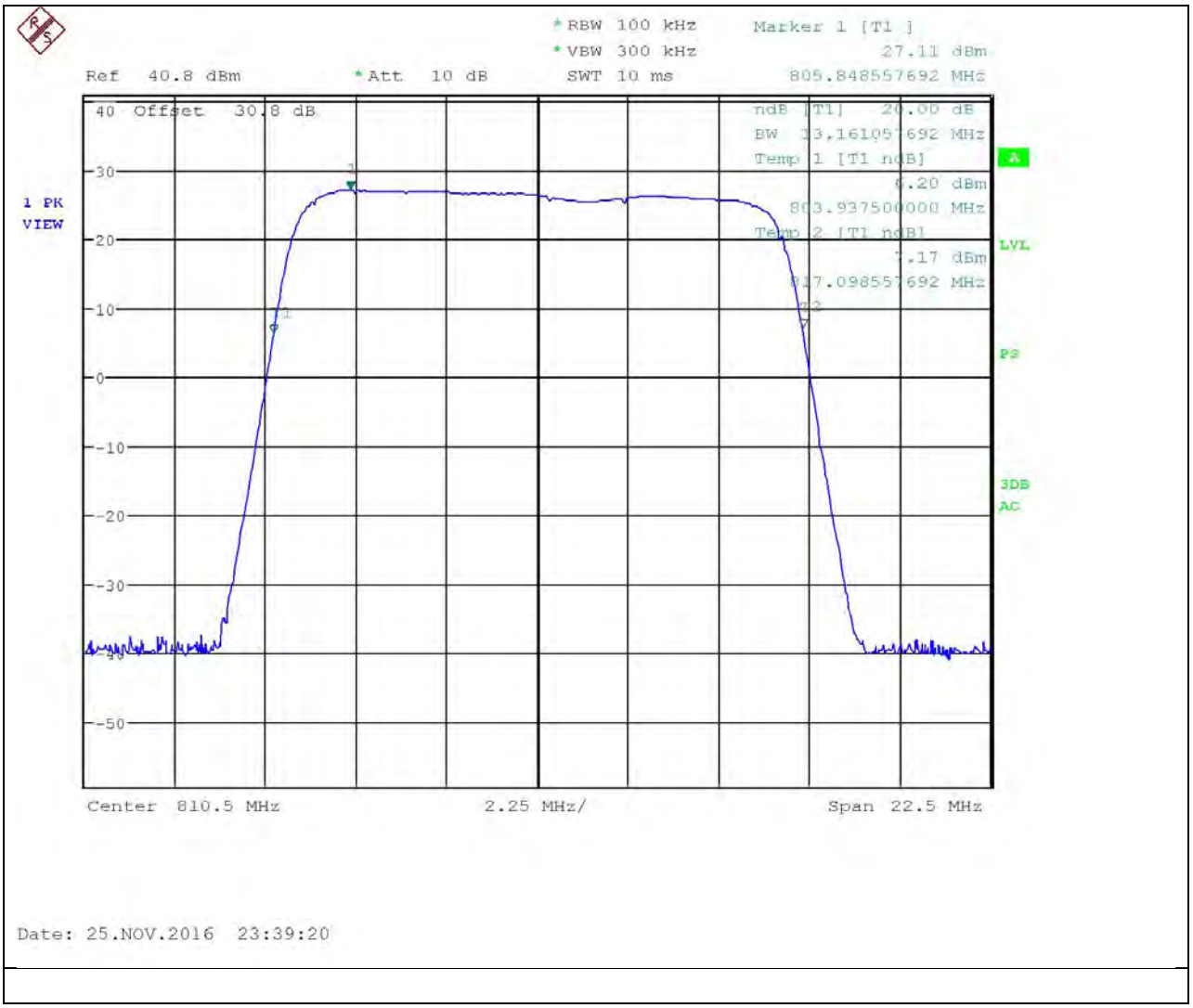
Procedure: KDB935210 § 4.3 Out of band rejection

Setup Diagram:



Out-of-Band Rejection §4.3

Test Data: Uplink Plot



Out-of-Band Rejection §4.3

Test Data: Downlink Plot

INPUT-VERSUS-OUTPUT SIGNAL COMPARISON §4.4

Rule Part No.: FCC Part 90.219(e) (4), 90.210 (b) (d) (e)

Requirements: A signal booster must be designed such that all signals that it retransmits meet the following requirements:

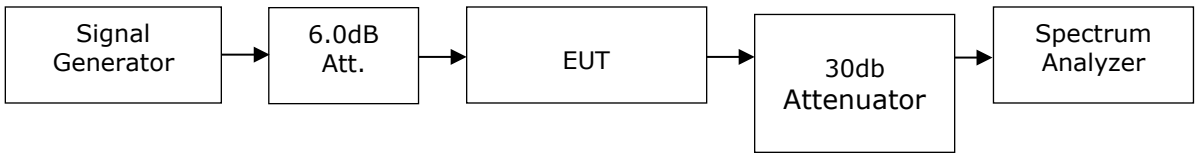
The signals are retransmitted on the same channels as received. Minor departures from the exact provider or reference frequencies of the input signals are allowed, provided that the retransmitted signals meet the requirements of §90.213.

There is no change in the occupied bandwidth of the retransmitted signals.

The retransmitted signals continue to meet the unwanted emissions limits of §90.210 applicable to the corresponding received signals (assuming that these received signals meet the applicable unwanted emissions limits by a reasonable margin).

Procedure: KDB935210 § 4.4 Input versus output signal comparison

Setup Diagram:

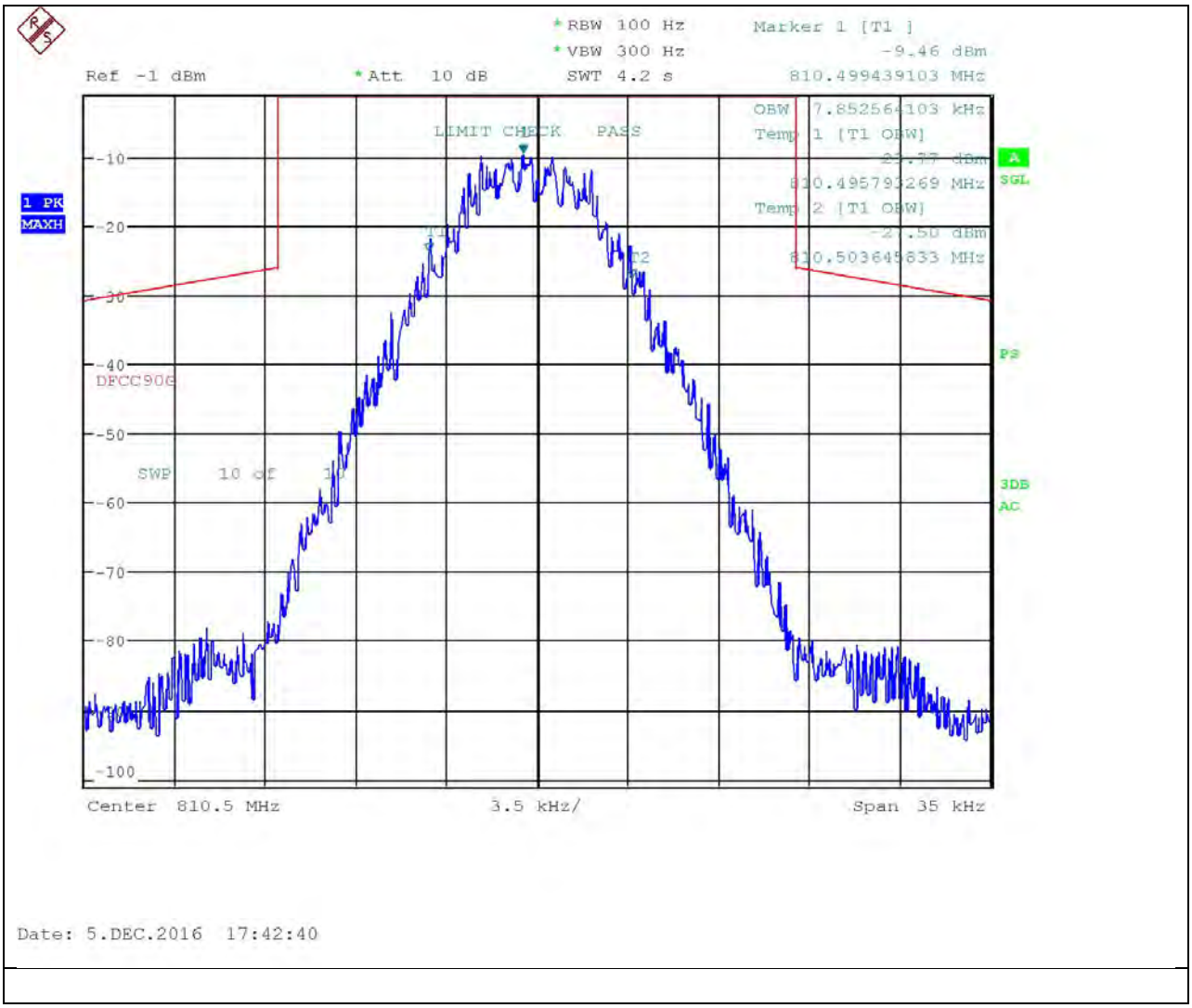


Notes:

1. Input plot 1 shows the input signal at 0 dBm compared to emission mask
2. Input plot 2 shows input power level for measurement 1, below AGC threshold
3. Input Plot 3 shows input power level for measurement 2, 3 dB above AGC threshold
4. Output Plot 1 shows the output signal for measurement step 1, with input below AGC threshold compared to emissions mask
5. Output Plot 2 shows the output signal for measurement step 2, with input 3 dB above AGC threshold compared to emissions mask

INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 8k10F7E Input Plot 1



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

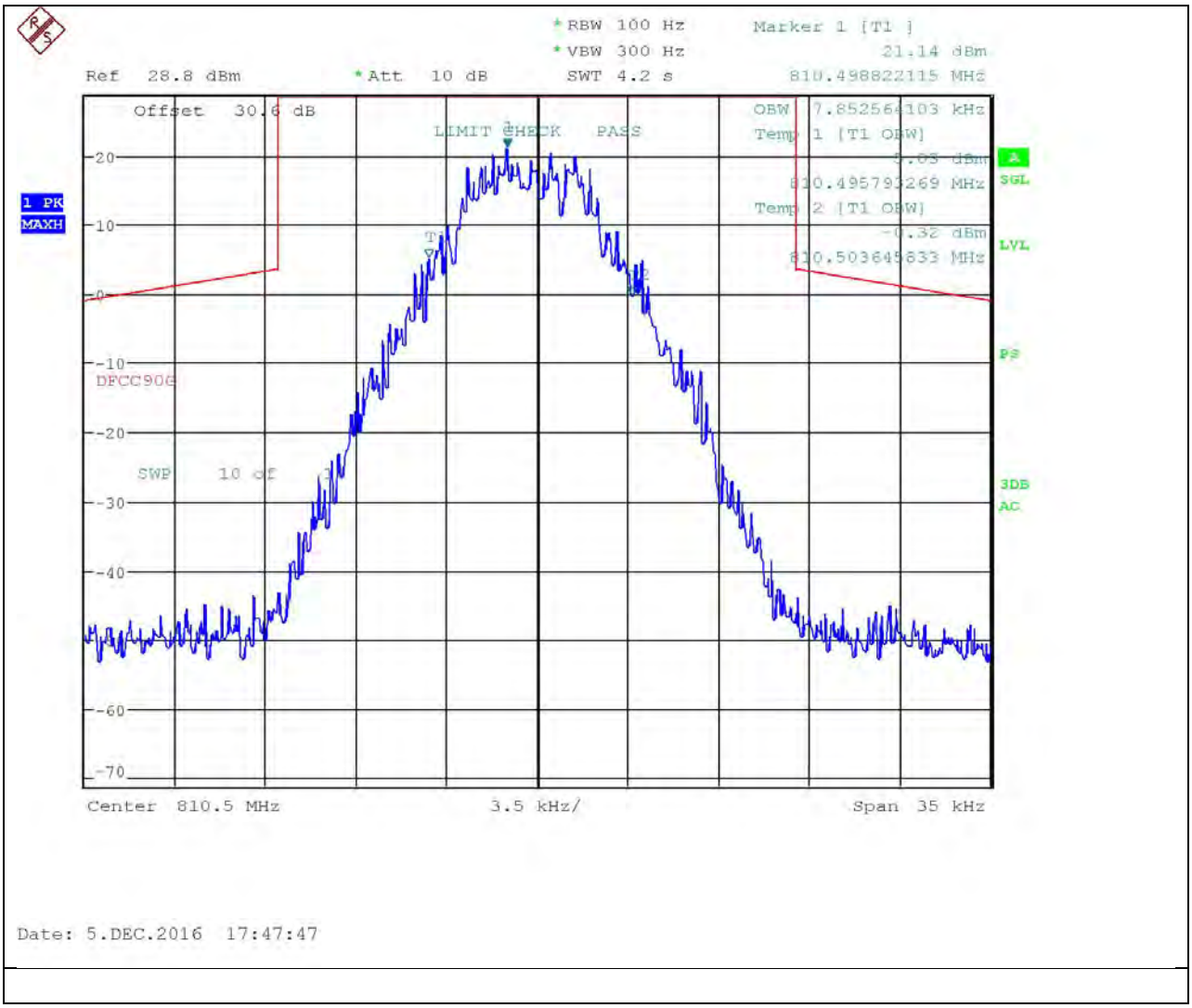
Test Data: Uplink 8k10F7E Input Plot 2

INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 8k10F7E Input Plot 3

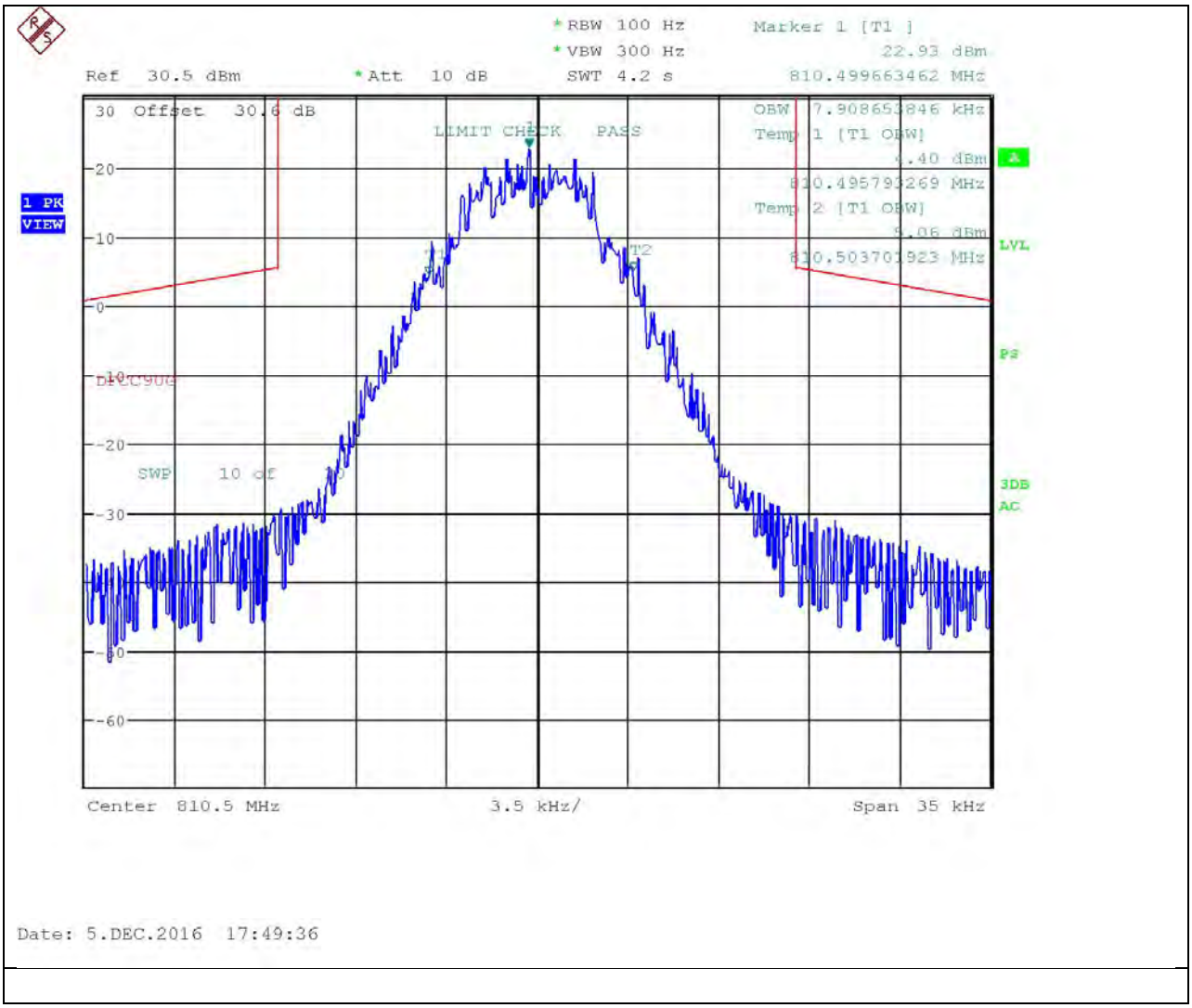
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 8k10F7E Output Plot 1



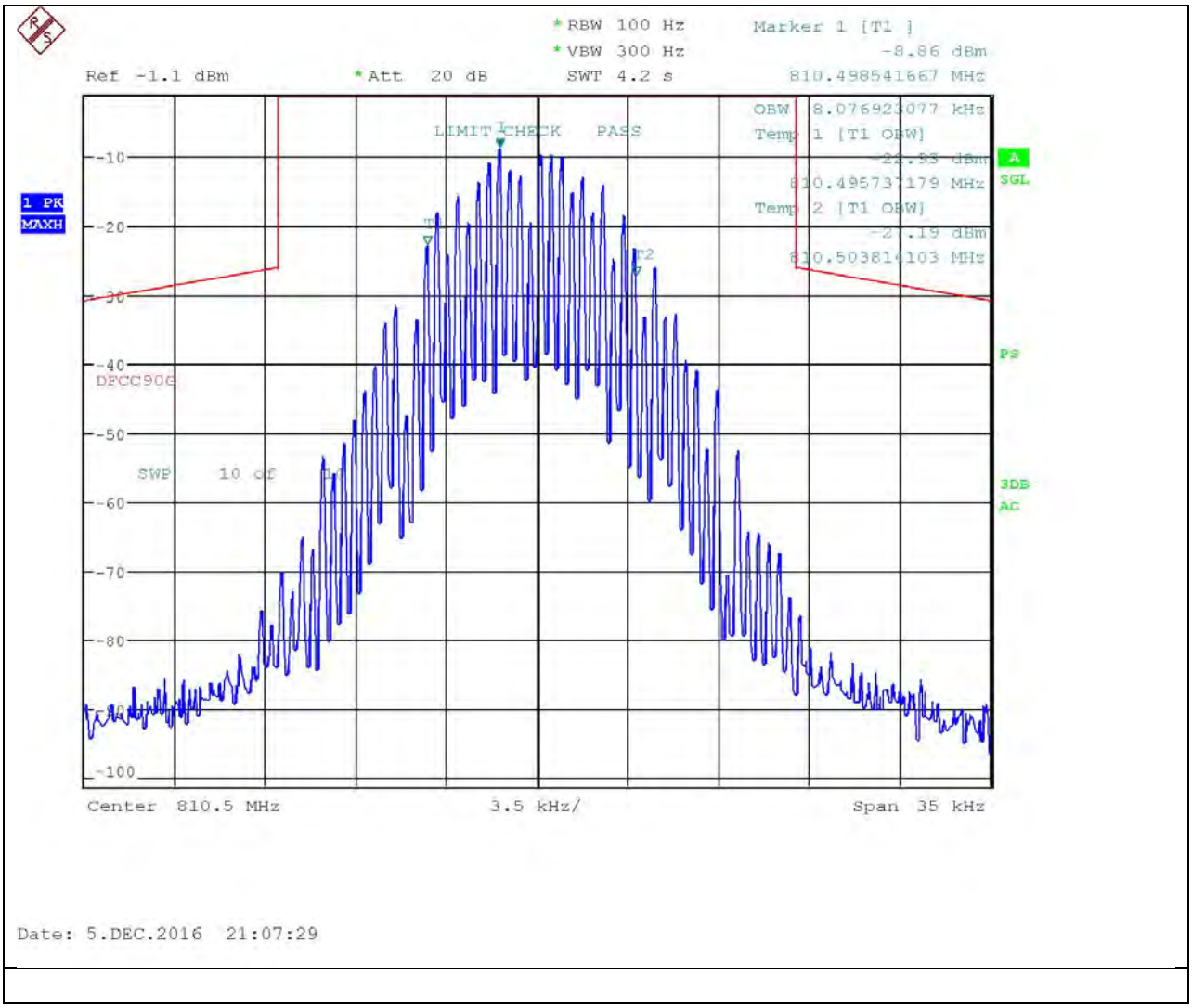
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 8k10F7E Output Plot 2



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 8k10F1E/F1D Input Plot 1



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

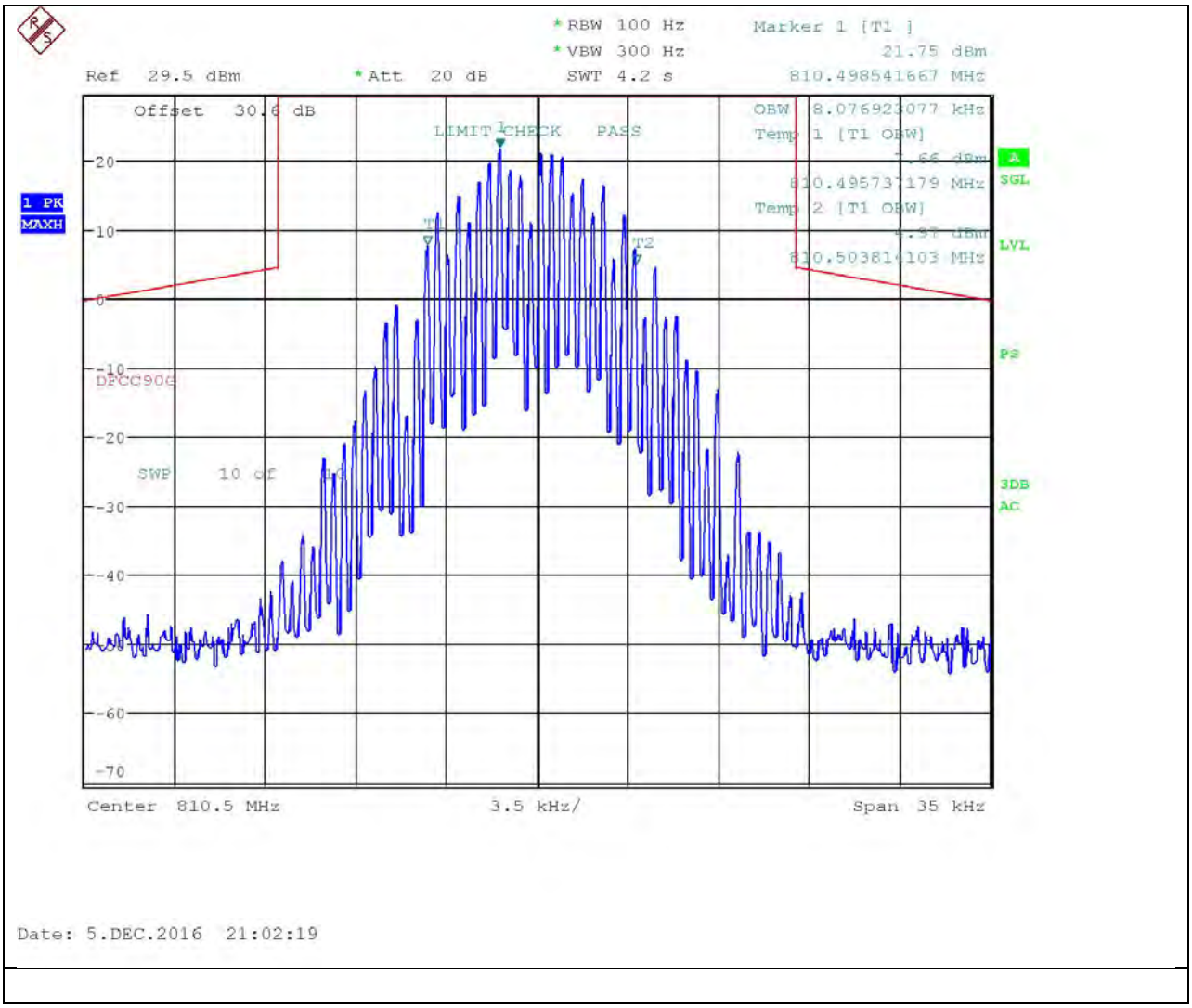
Test Data: Uplink 8K10F1E/F1D Input Plot 2

INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 8K10F1E/F1D Input Plot 3

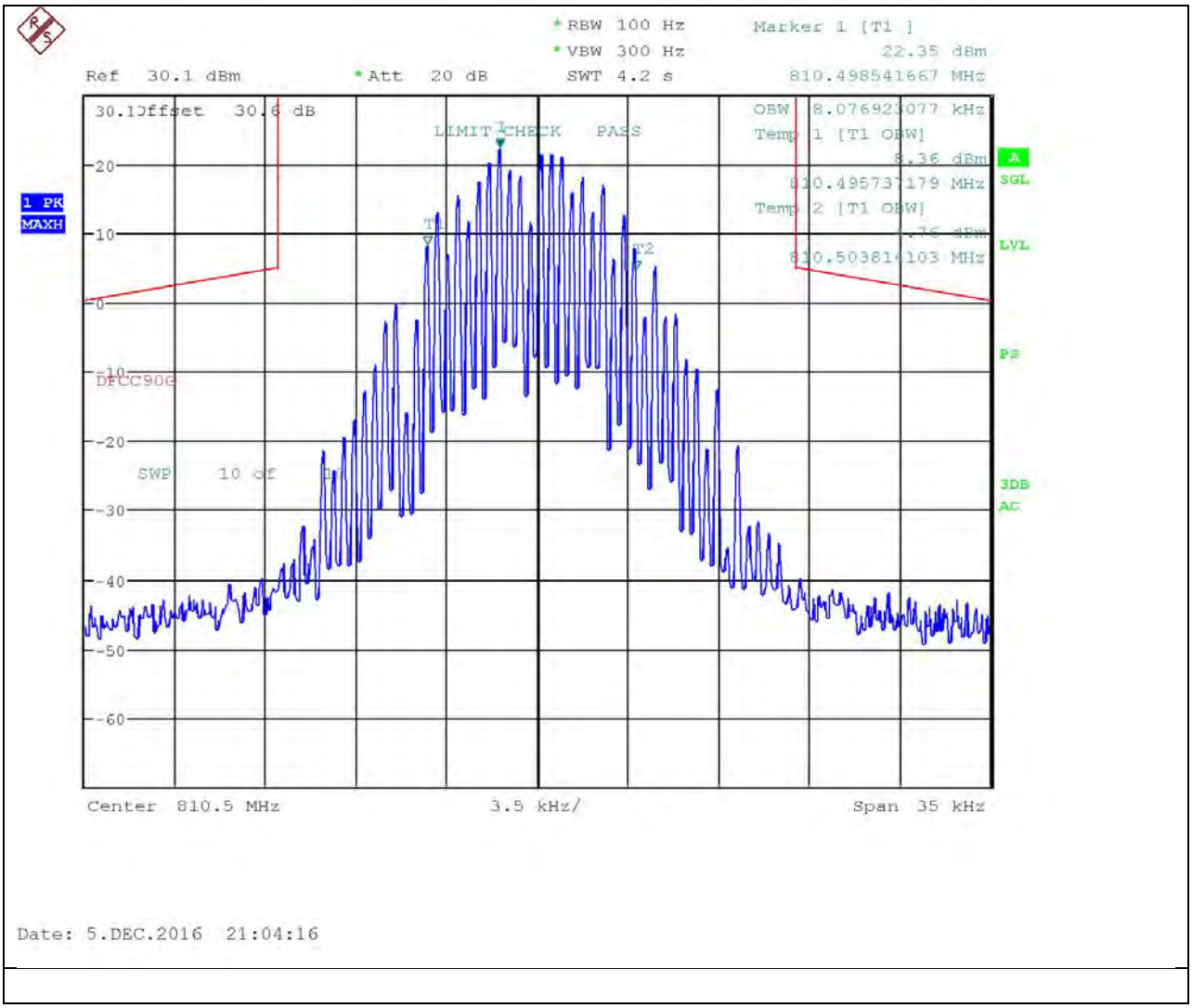
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 8K10F1E/F1D Output Plot 1



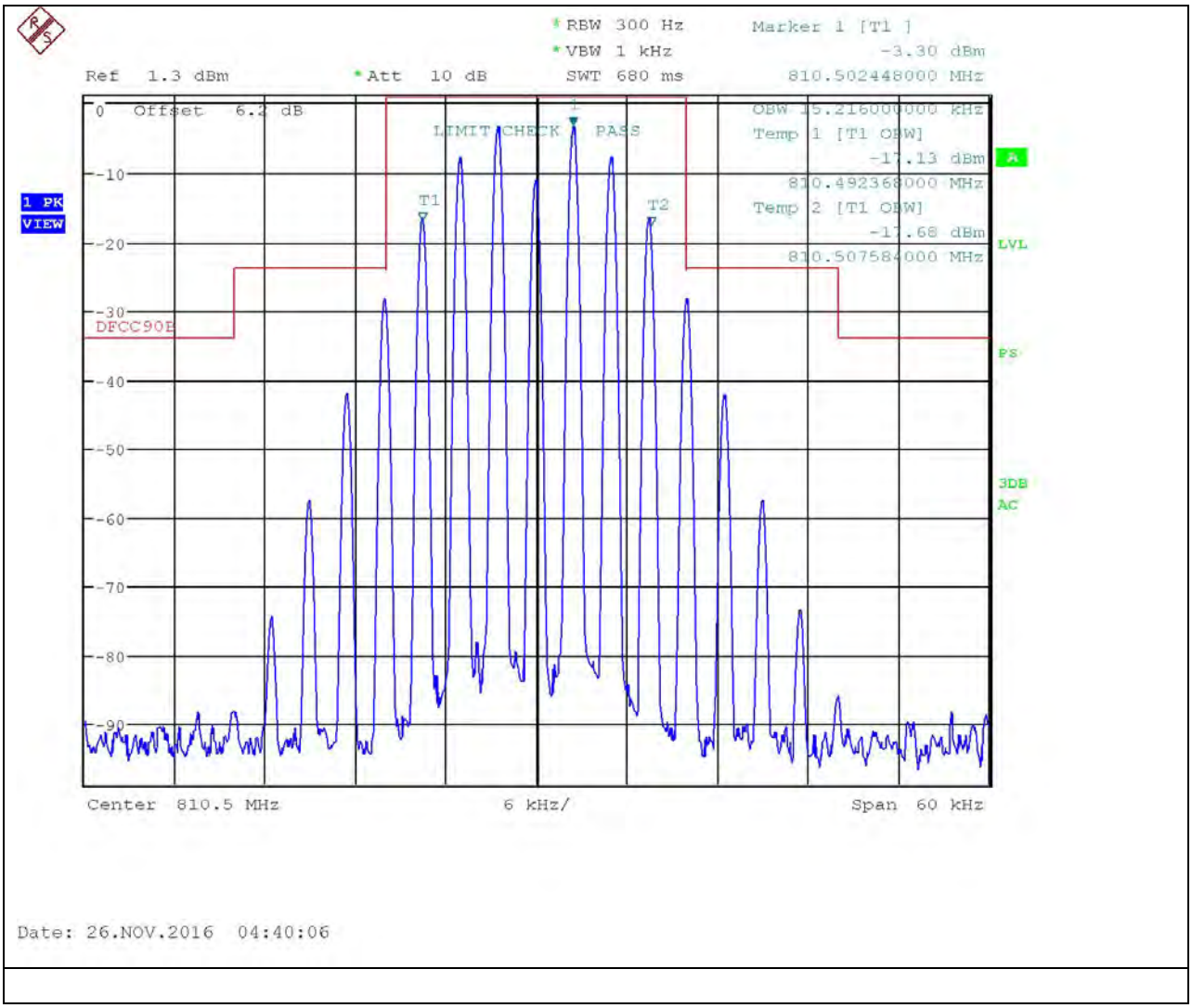
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 8K10F1E/F1D Output Plot 2



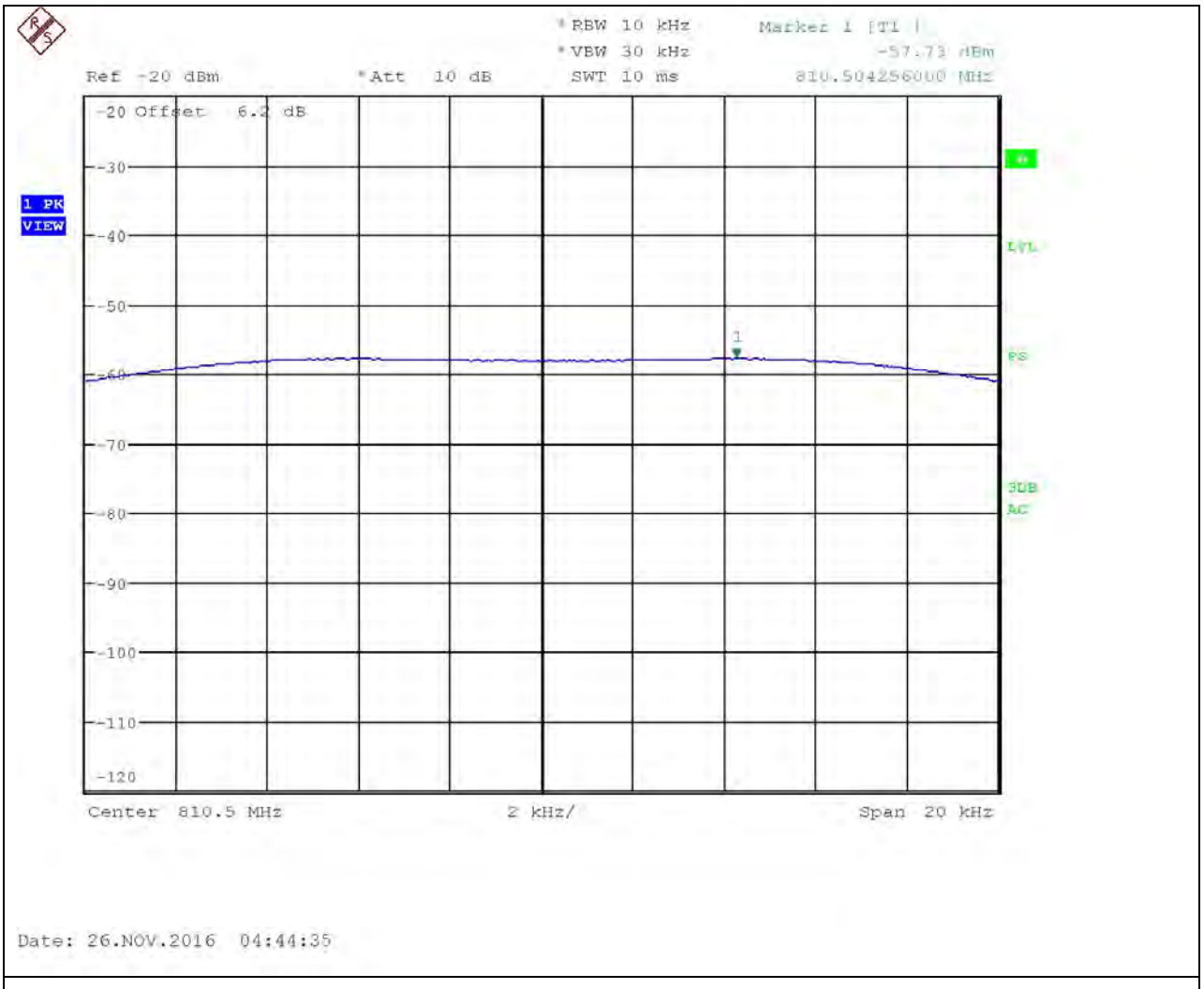
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 16K0F3E Input Plot 1



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 16K0F3E Input Plot 2

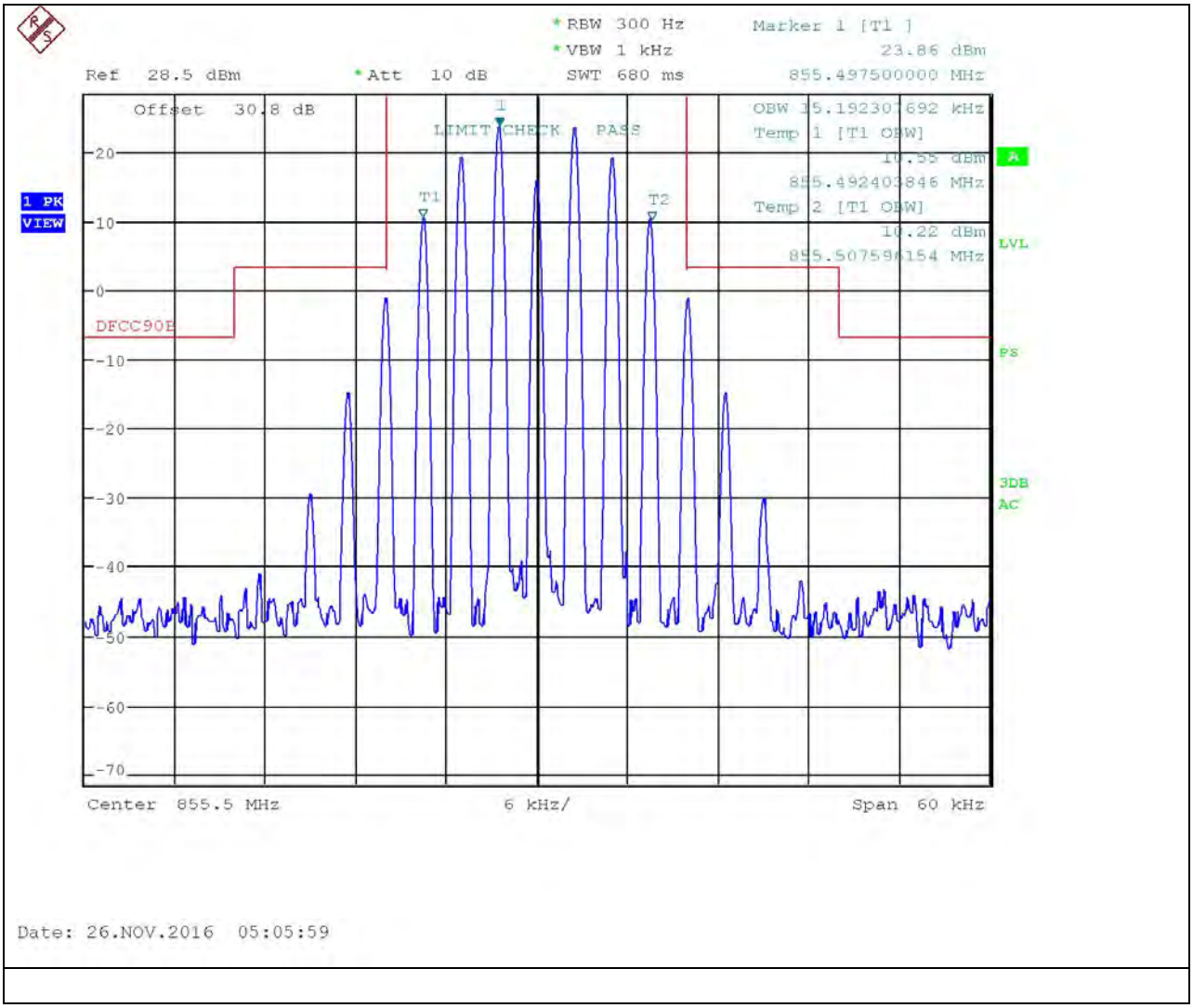


INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 16K0F3E Input Plot 3

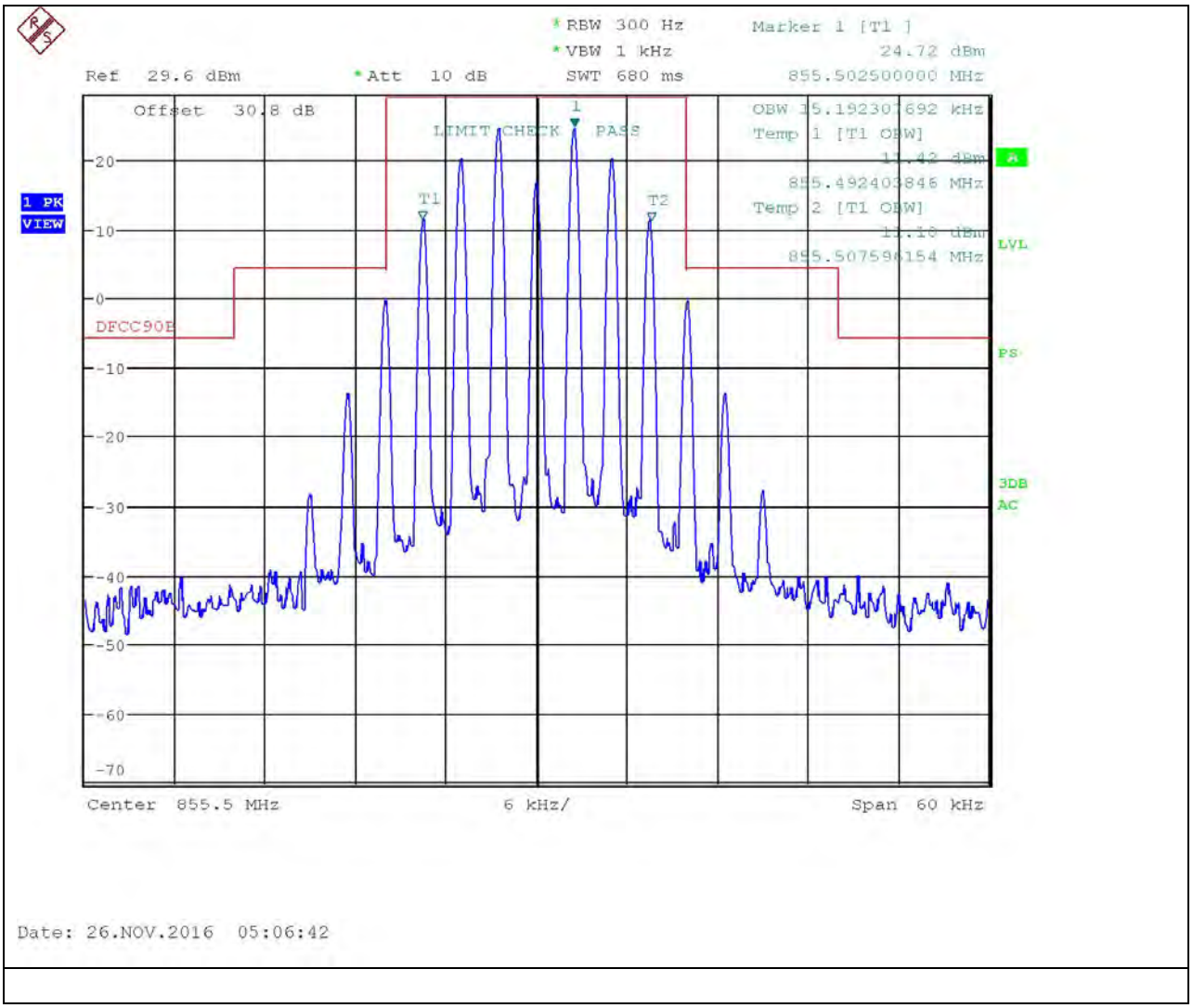
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 16k0F3E Output Plot 1



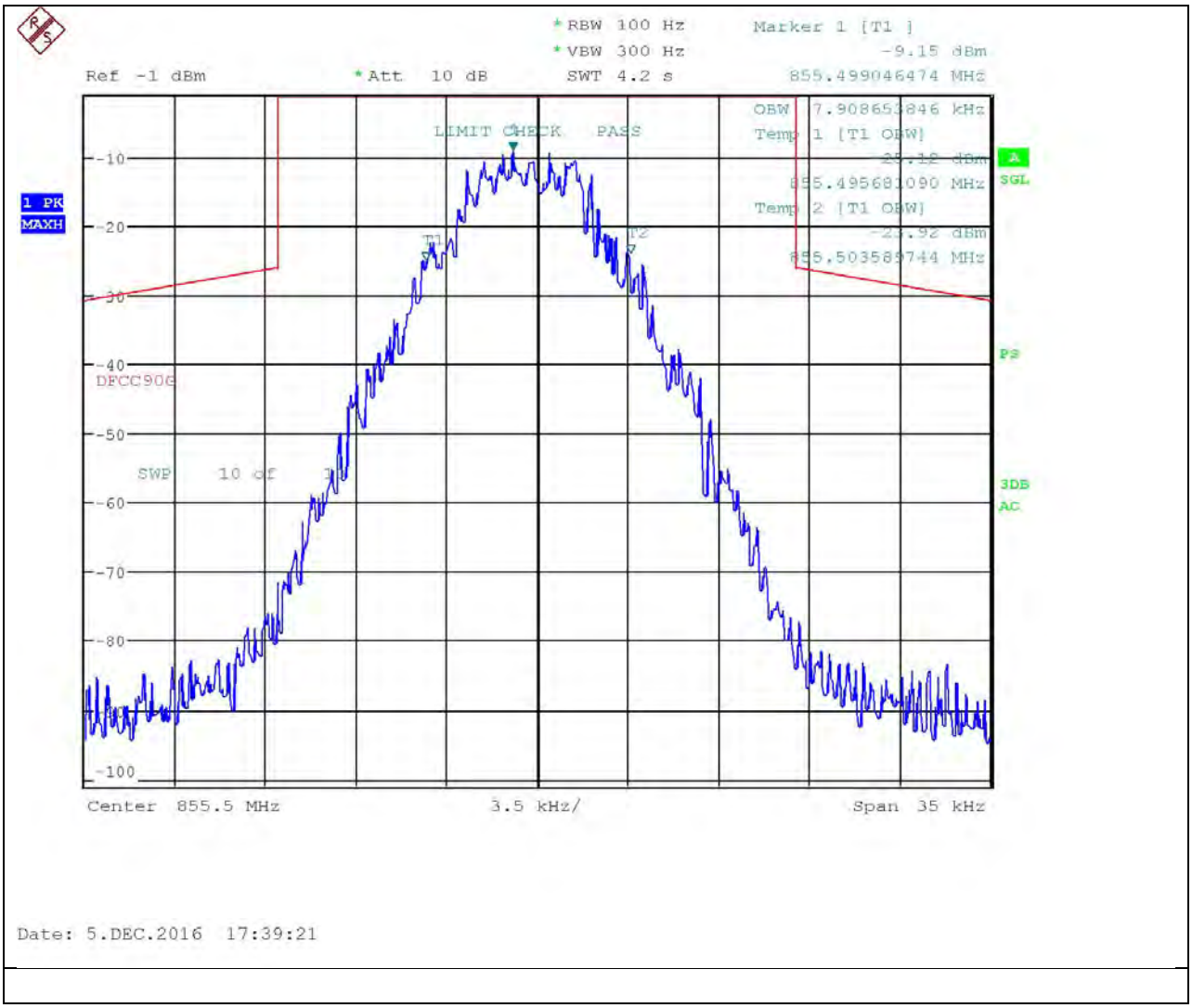
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Uplink 16k0F3E Output Plot 2



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 8k10F7E Input Plot 1



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

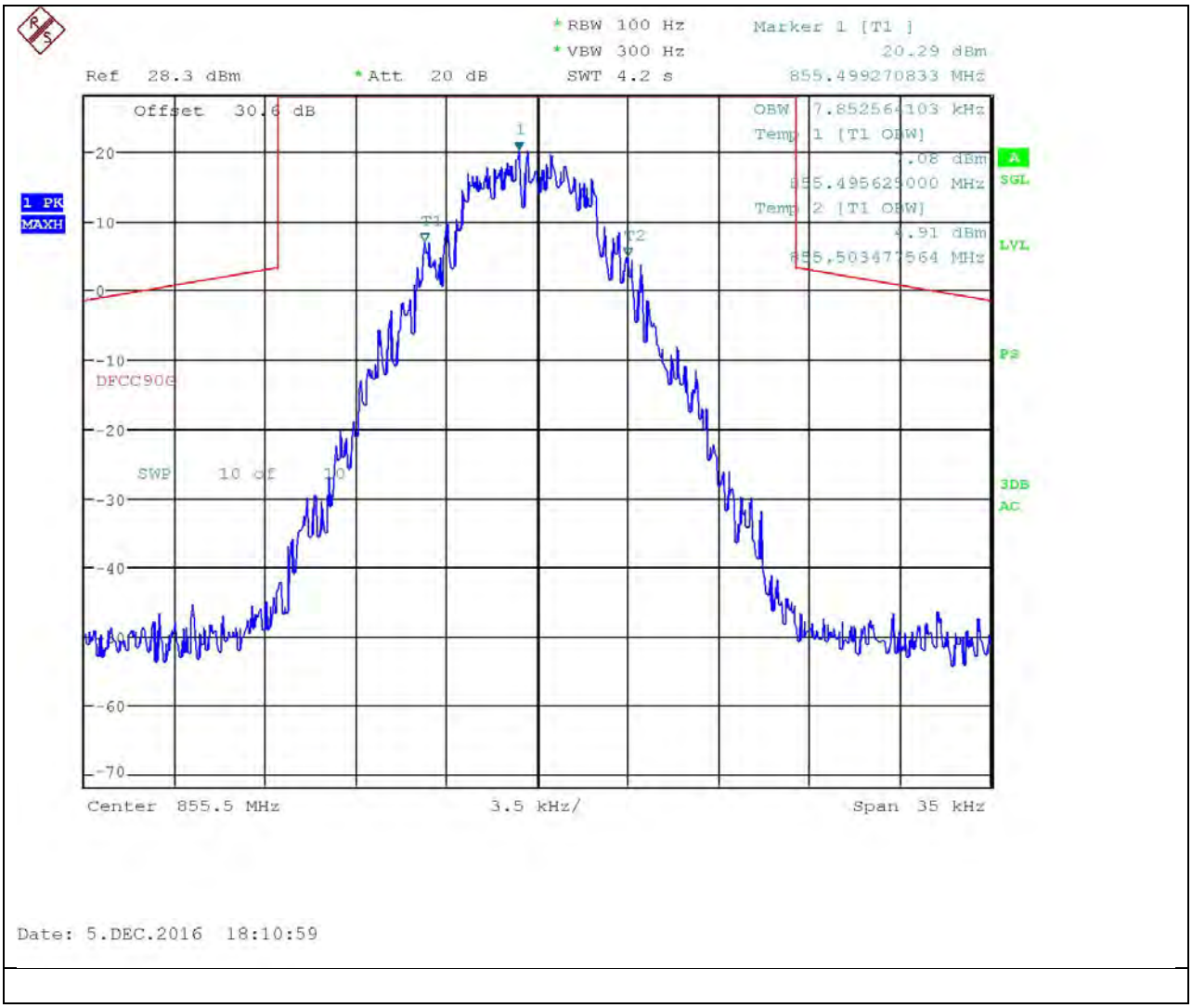
Test Data: Downlink 8k10F7E Input Plot 2

INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 8k10F7E Input Plot 3

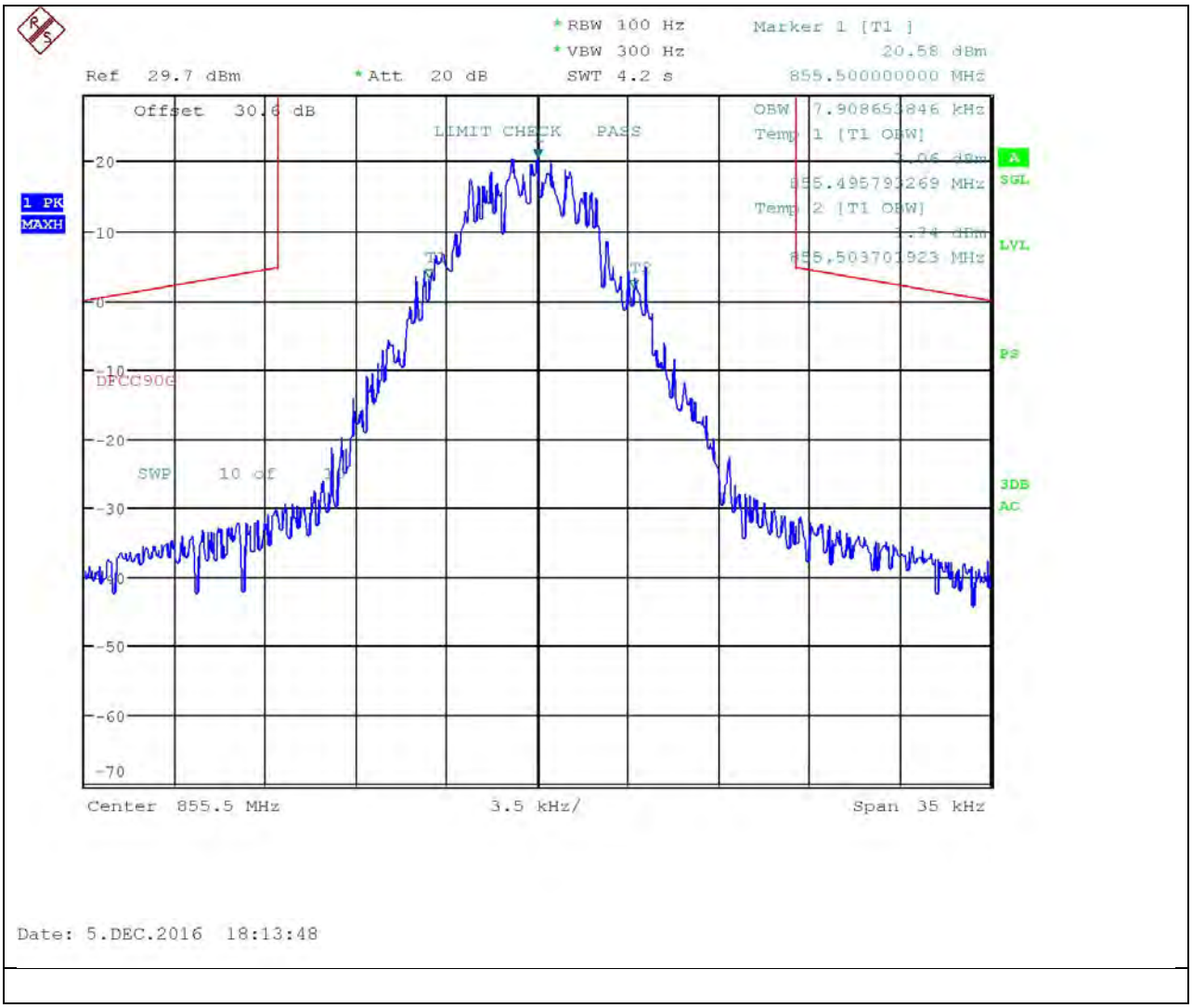
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 8k10F7E Output Plot 1



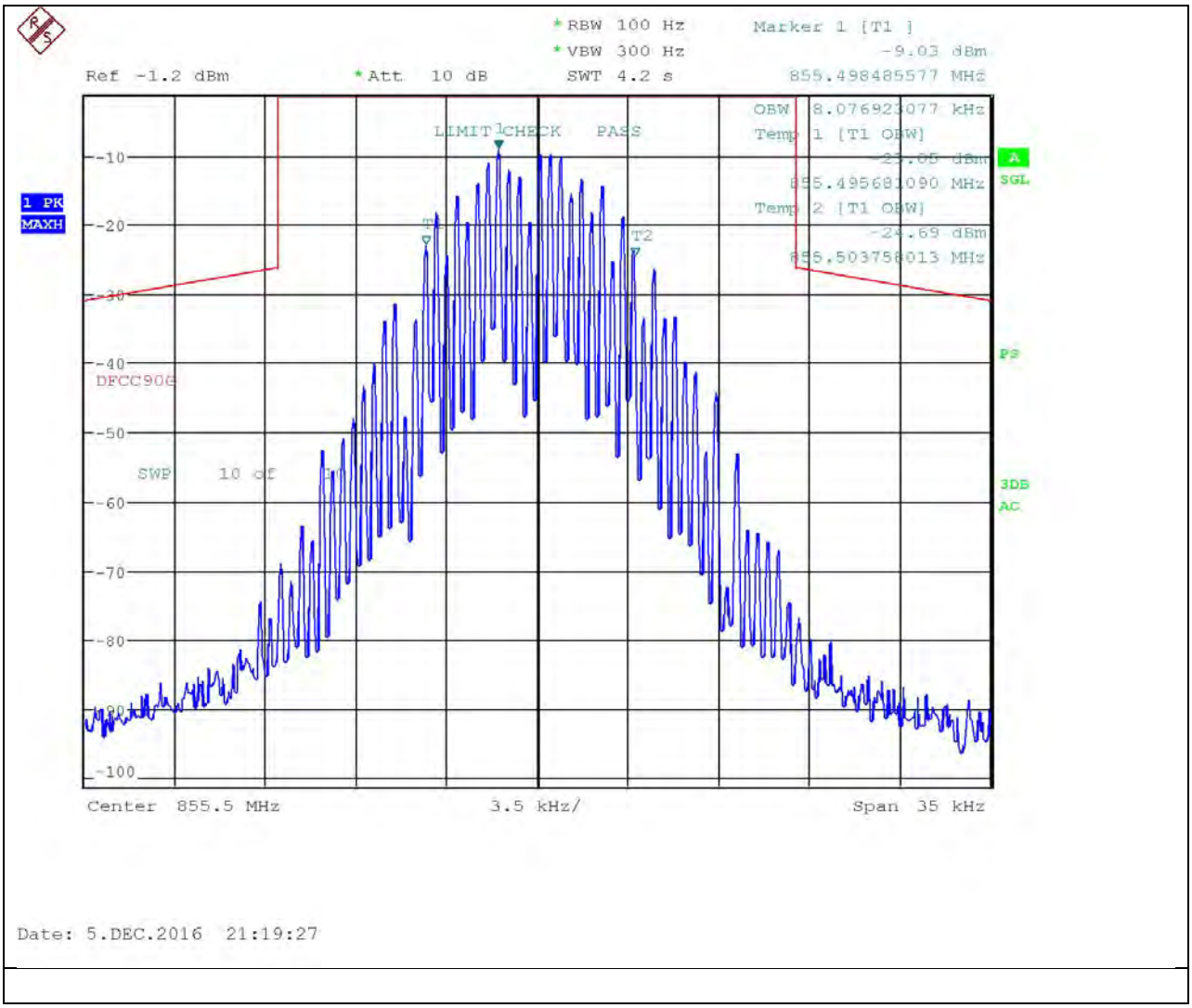
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 8k10F7E Output Plot 2



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 8k10F1E/F1D Input Plot 1



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

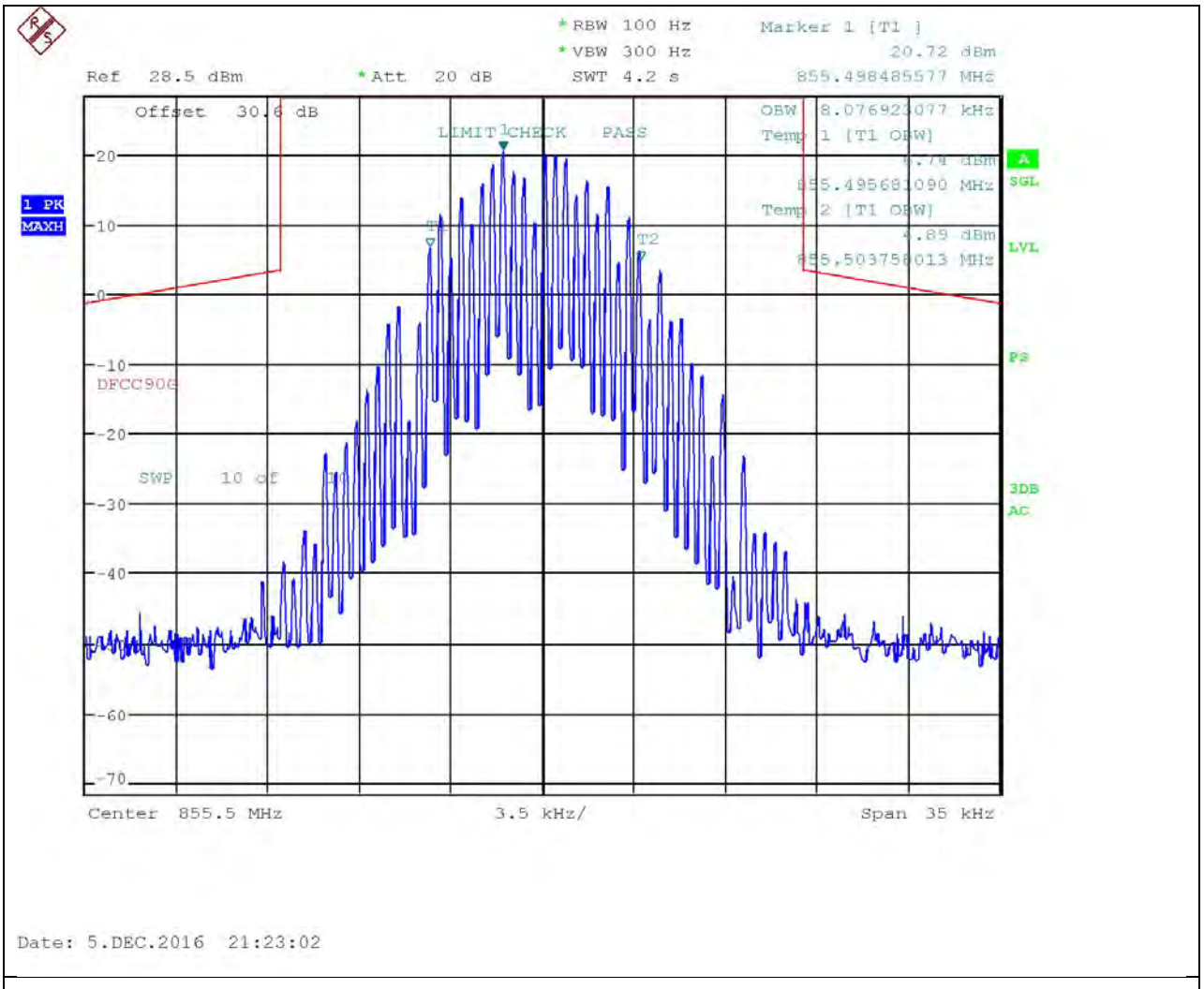
Test Data: Downlink 8K10F1E/F1D Input Plot 2

INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 8K10F1E/F1D Input Plot 3

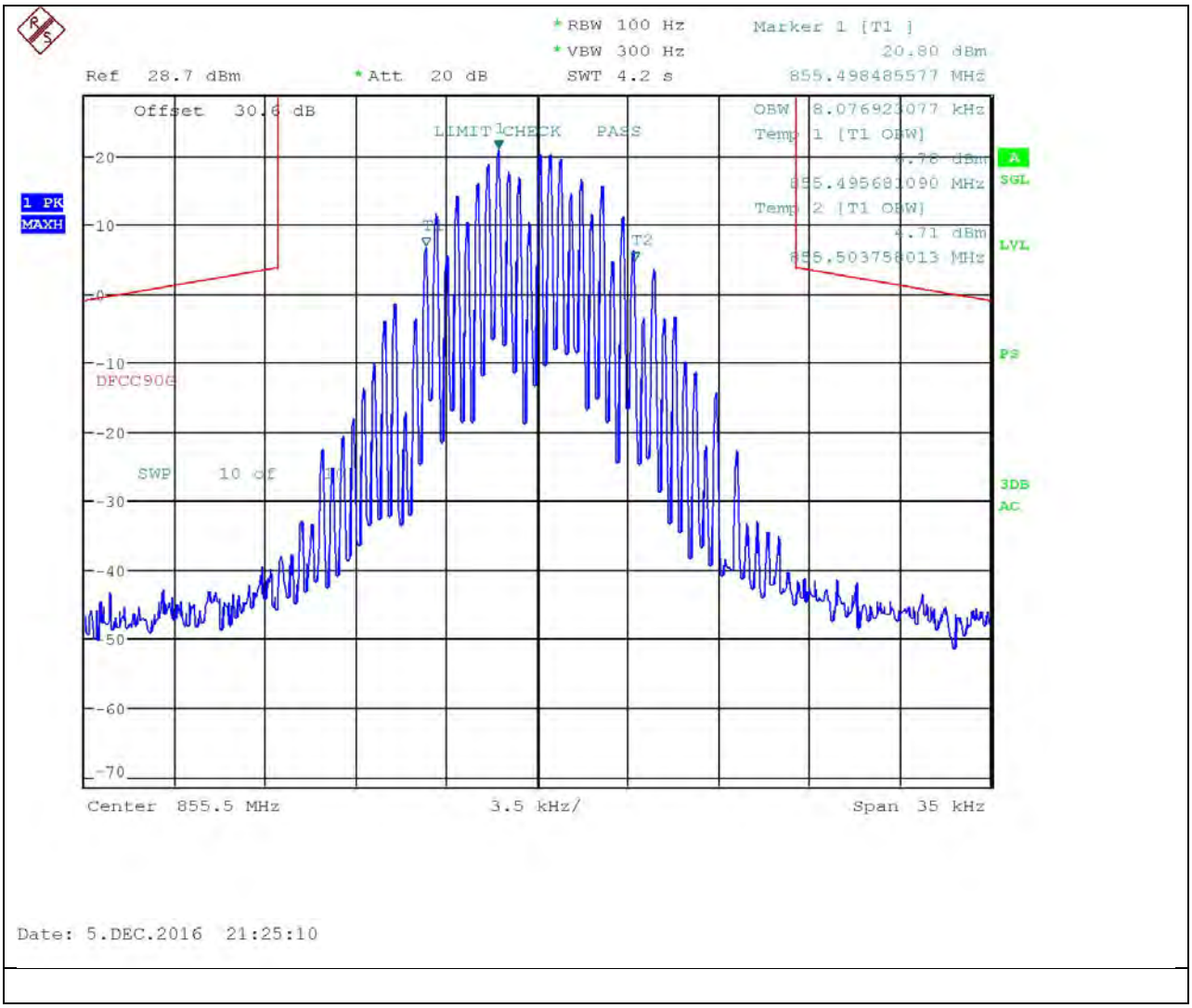
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 8K10F1E/F1D Output Plot 1



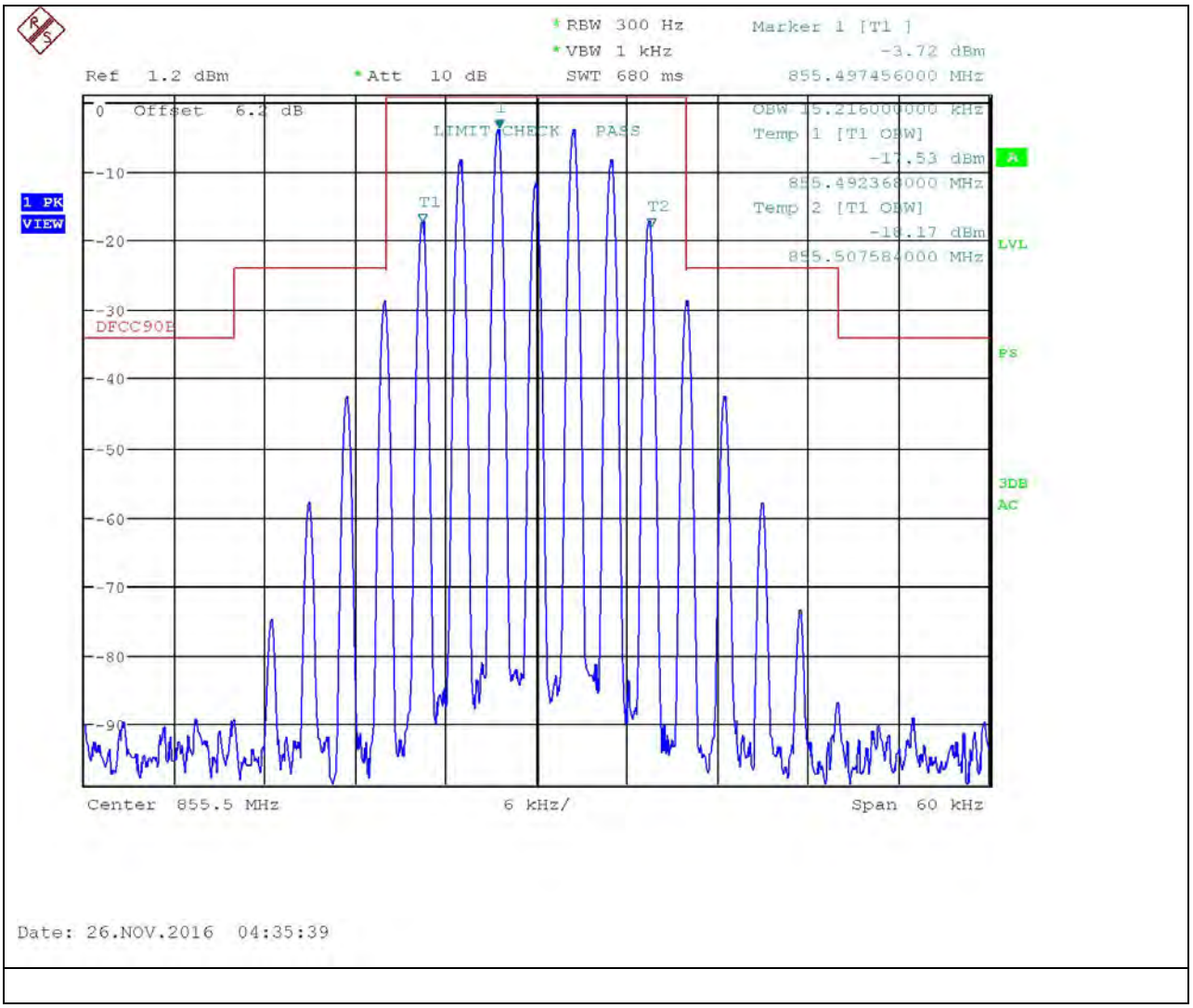
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 8K10F1E/F1D Output Plot 2



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 16K0F3E Input Plot 1



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

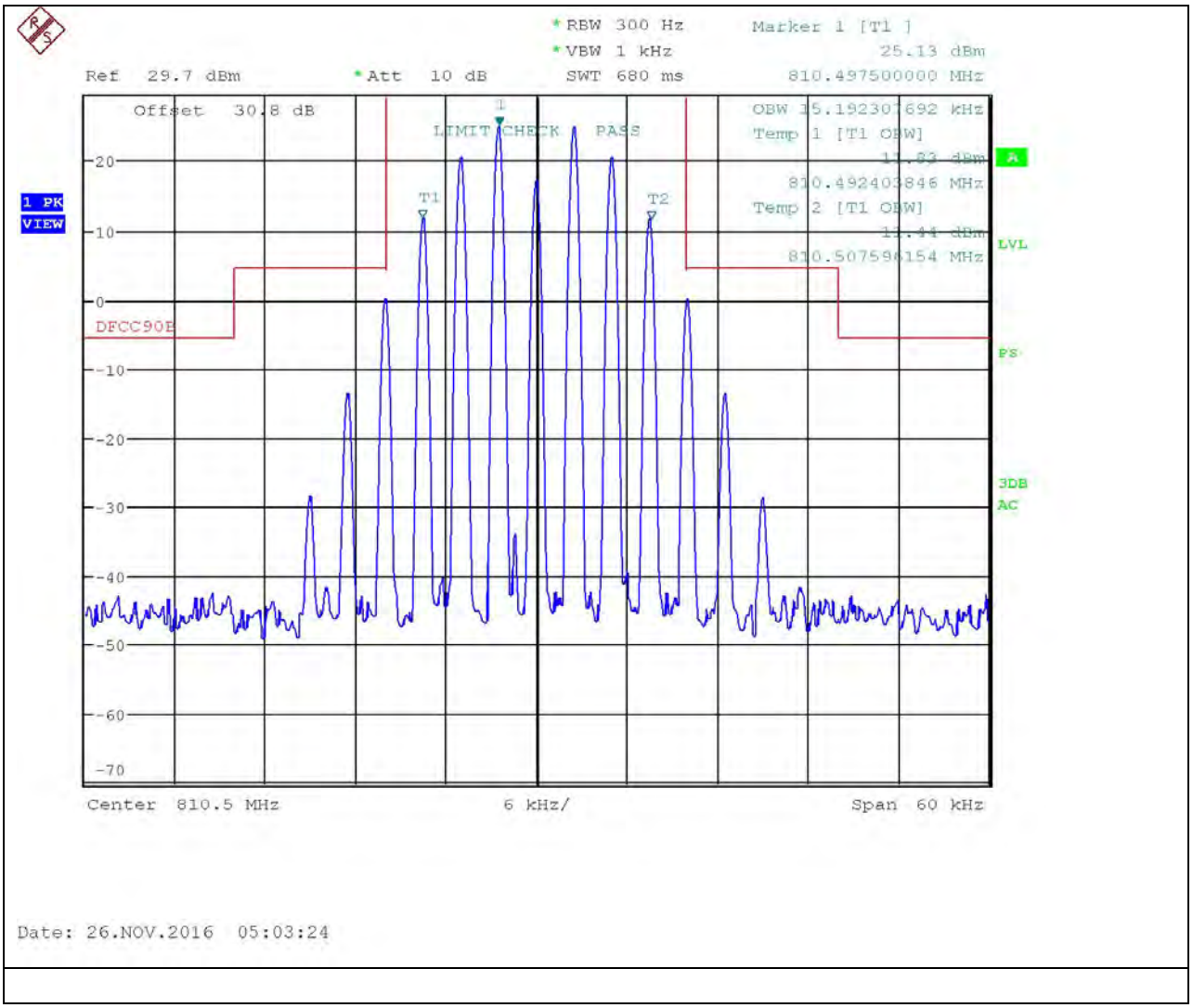
Test Data: Downlink 16K0F3E Input Plot 2

INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 16K0F3E Input Plot 3

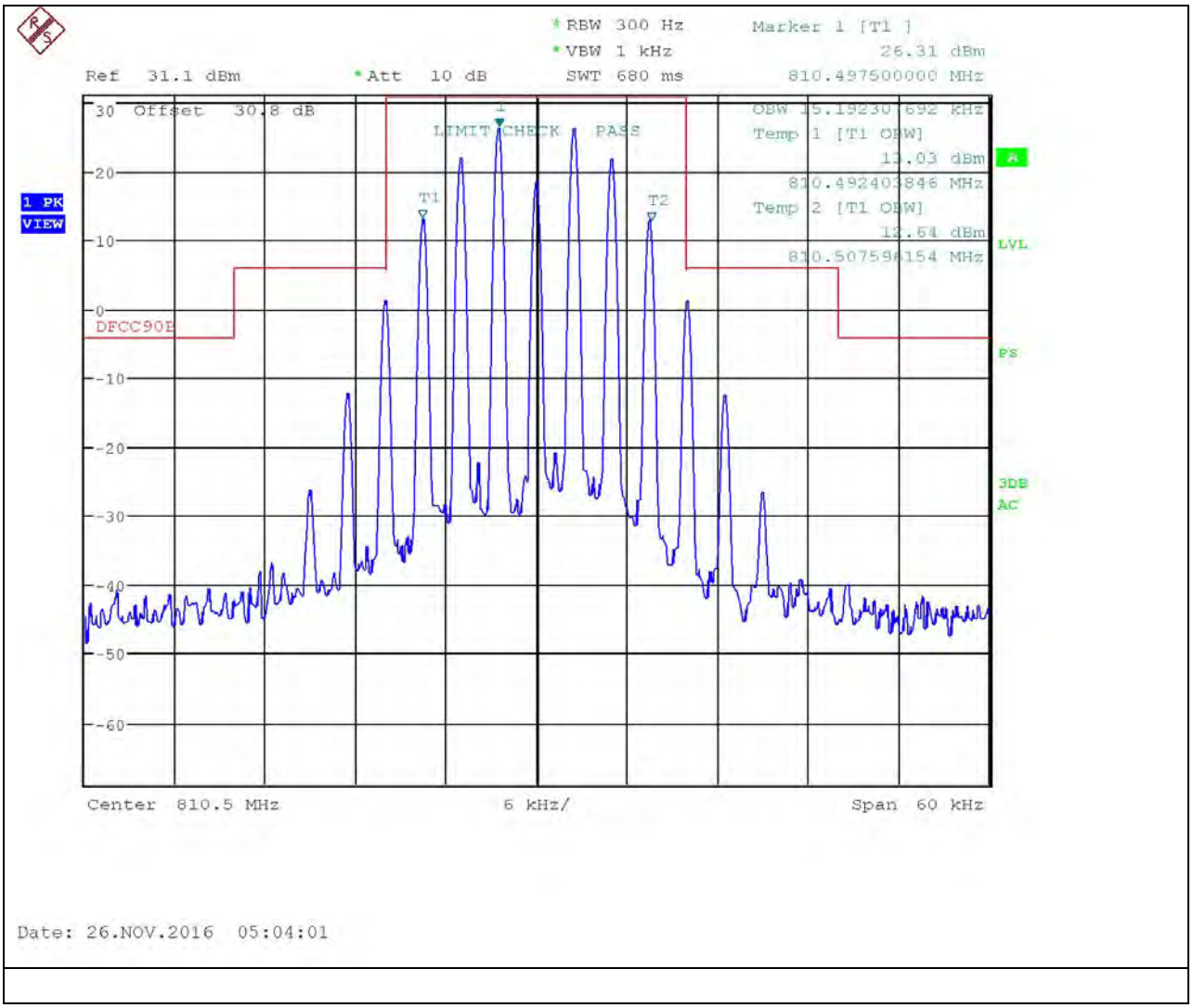
INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 16k0F3E Output Plot 1



INPUT-VERSUS-OUTPUT SIGNAL COMPARISON

Test Data: Downlink 16k0F3E Output Plot 2



NOISE FIGURE §4.6

Rule Part No.: Part 90.219 (e) (2)

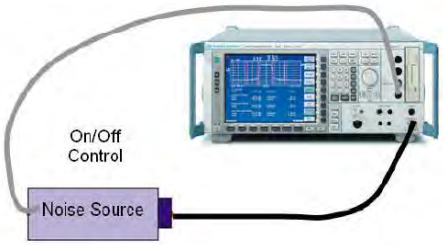
Requirements: The noise figure of a signal booster must not exceed 9 dB in either direction.

Procedure: KDB935210 Measurement Guidance for Industrial Boosters
§ 4.6 Noise Figure Measurements

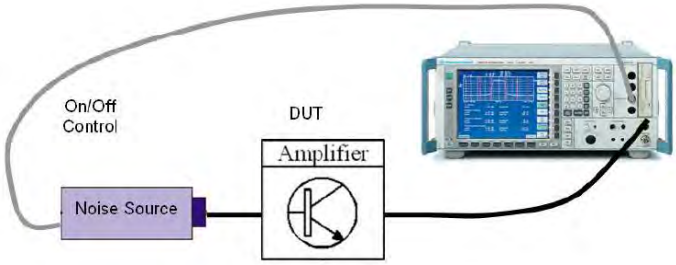
1MA178_2e R&S Application Note the Y Factor Technique Noise Figure
§ 2 Background Theory and Equations
§ 3 Detailed Measurement Steps

Setup Diagram:

Calibration



Measurement



NOISE FIGURE §4.6

Test Data: Uplink Measurement Table

$T^{ON\ source}$ (K)	$T^{OFF\ source}$ (K)	Source ENR (dB)
9674.216051	290	15.1

Step 1 Calibration of Noise Source with ESU 40							
F_c	$N^{SA\ off}$		$N^{SA\ on}$		Y^{SA}	T^{SA}	NF^{SA}
MHz	dBm	fW	dBm	fW	Linear	Analyzer	dB
Up	-92.81	523.60	-85.89	2576.32	4.92	2103.69	9.17

Step 2 Noise Measurement with EUT							
F_c	$N^{EUT\ \&\ SA\ off}$		$N^{EUT\ \&\ SA\ on}$		$Y^{EUT\ \&\ SA}$	$T^{EUT\ \&\ SA}$	NF
MHz	dBm	fW	dBm	fW	Linear	Cascade	dB
Up	-7.07	196336027683.61	4.08	2558585886905.65	13.03	489.96	4.30

Step 3 Noise Figure Calcualtion for EUT						
F_c	Gain	Gain	T^{EUT}	NF	Limit	Margin
MHz	Num	dB	EUT	dB	≤dB	dB
Up	1150789699	90.61	489.96	4.30	9.00	4.70

Test Data: Downlink Measurement Table

$T^{ON\ source}$ (K)	$T^{OFF\ source}$ (K)	Source ENR (dB)
9674.216051	290	15.1

Step 1 Calibration of Noise Source with ESU 40							
F_c	$N^{SA\ off}$		$N^{SA\ on}$		Y^{SA}	T^{SA}	NF^{SA}
MHz	dBm	fW	dBm	fW	Linear	Analyzer	dB
Down	-93.28	469.89	-86.38	2301.44	4.90	2117.57	9.19

Step 2 Noise Measurement with EUT							
F_c	$N^{EUT\ \&\ SA\ off}$		$N^{EUT\ \&\ SA\ on}$		$Y^{EUT\ \&\ SA}$	$T^{EUT\ \&\ SA}$	NF
MHz	dBm	fW	dBm	fW	Linear	Cascade	dB
Down	-6.25	237137370566.17	4.87	3069021988391.16	12.94	495.82	4.33

Step 3 Noise Figure Calcualtion for EUT						
F_c	Gain	Gain	T^{EUT}	NF	Limit	Margin
MHz	Num	dB	EUT	dB	≤dB	dB
Down	1546170271	91.89	495.82	4.33	9.00	4.67

Results Meet Requirements

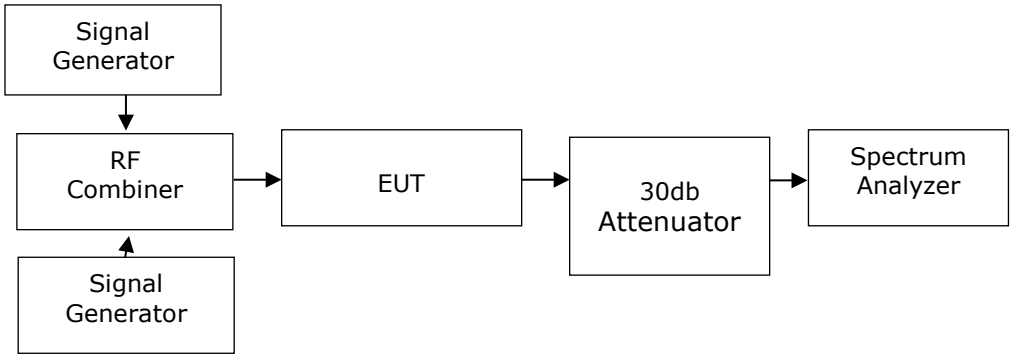
OUT OF BAND / OUT OF BLOCK EMISSIONS (intermodulation) §4.7

Rule Part No.: 90.219 (e) (3)

Requirements: -13 dBm

Procedure: KDB935210 Measurement Guidance for Industrial Boosters
§ 4.7.1 General
§ 4.7.2 Out of Band/ Out of block emissions conducted measurements

Setup Diagram:



Notes:

1. Input plot 1 shows the 2 input signal power levels for measurement step b, below AGC threshold
2. Input plot 2 shows the 2 input signal power levels for measurement step i, 3 dB above AGC threshold
3. Output Plot 1 shows the 2 output signals intermodulation compared to limit for measurement step h, with input below AGC threshold
4. Output Plot 2 shows the 2 output signals intermodulation compared to limit for measurement step h, with input 3 dB above AGC threshold

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

Test Data: Uplink Measurement Table

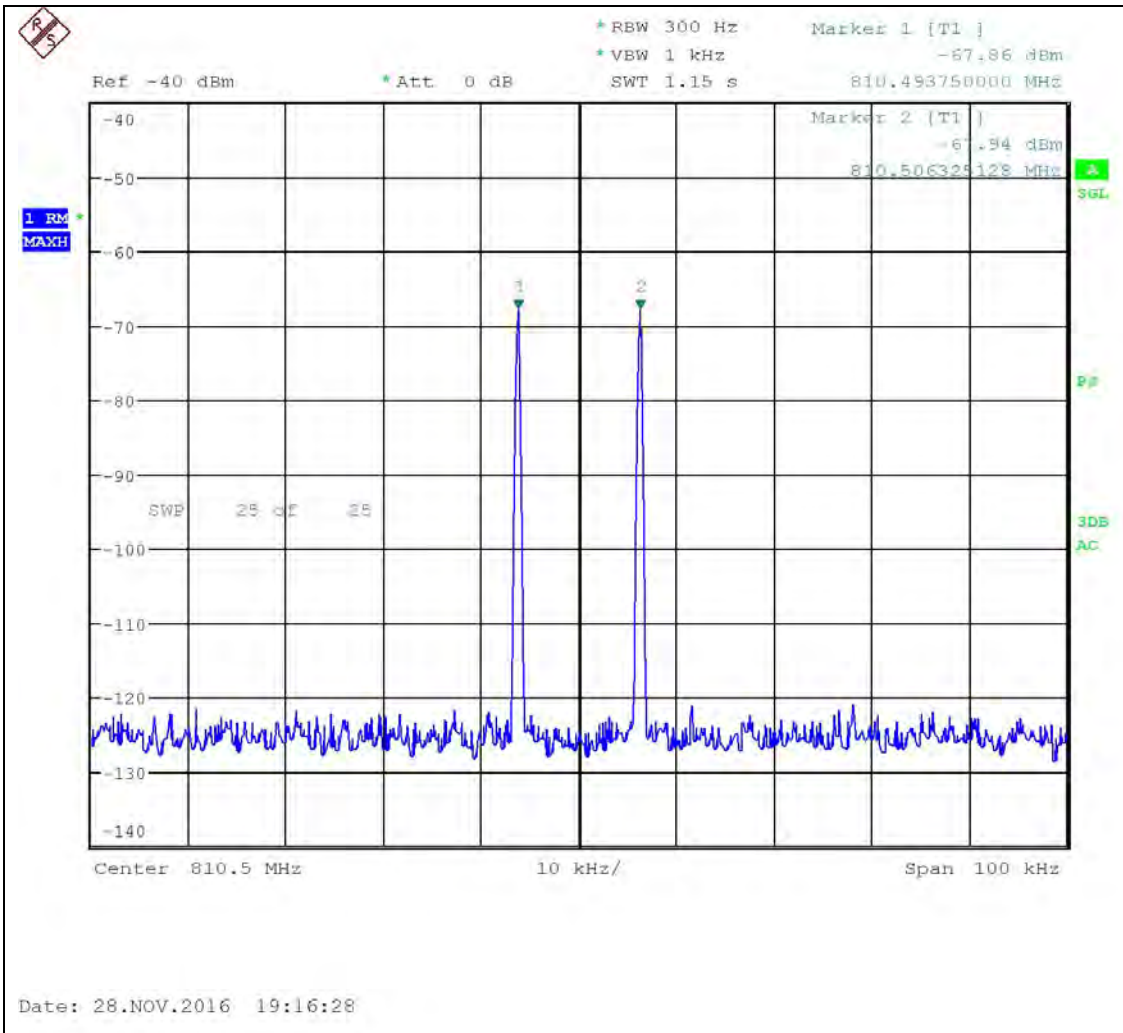
CH Spacing (KHz)	f0 (MHz)	Input Level (dBm)	Low Freq (MHz)	High Freq (MHz)	Read Level (dBm)	Limit (dBm)	Margin (dB)
12.50	810.50	-67.8	810.493750	810.506250	-27.46	-13	14.46
12.50	810.50	-64.8	810.493750	810.506250	-23.51	-13	10.51
25.00	810.50	-67.9	810.487500	810.512500	-25.37	-13	12.37
25.00	810.50	-64.8	810.487500	810.512500	-16.41	-13	3.41

Test Data: Downlink Measurement Table

CH Spacing (KHz)	f0 (MHz)	Input Level (dBm)	Low Freq (MHz)	High Freq (MHz)	Read Level (dBm)	Limit (dBm)	Margin (dB)
12.50	855.50	-64.9	855.493750	855.506250	-26.31	-13	13.31
12.50	855.50	-67.9	855.493750	855.506250	-26.34	-13	13.34
25.00	855.50	-64.9	855.487500	855.512500	-21.49	-13	8.49
25.00	855.50	-67.9	855.487500	855.512500	-26.49	-13	13.49

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

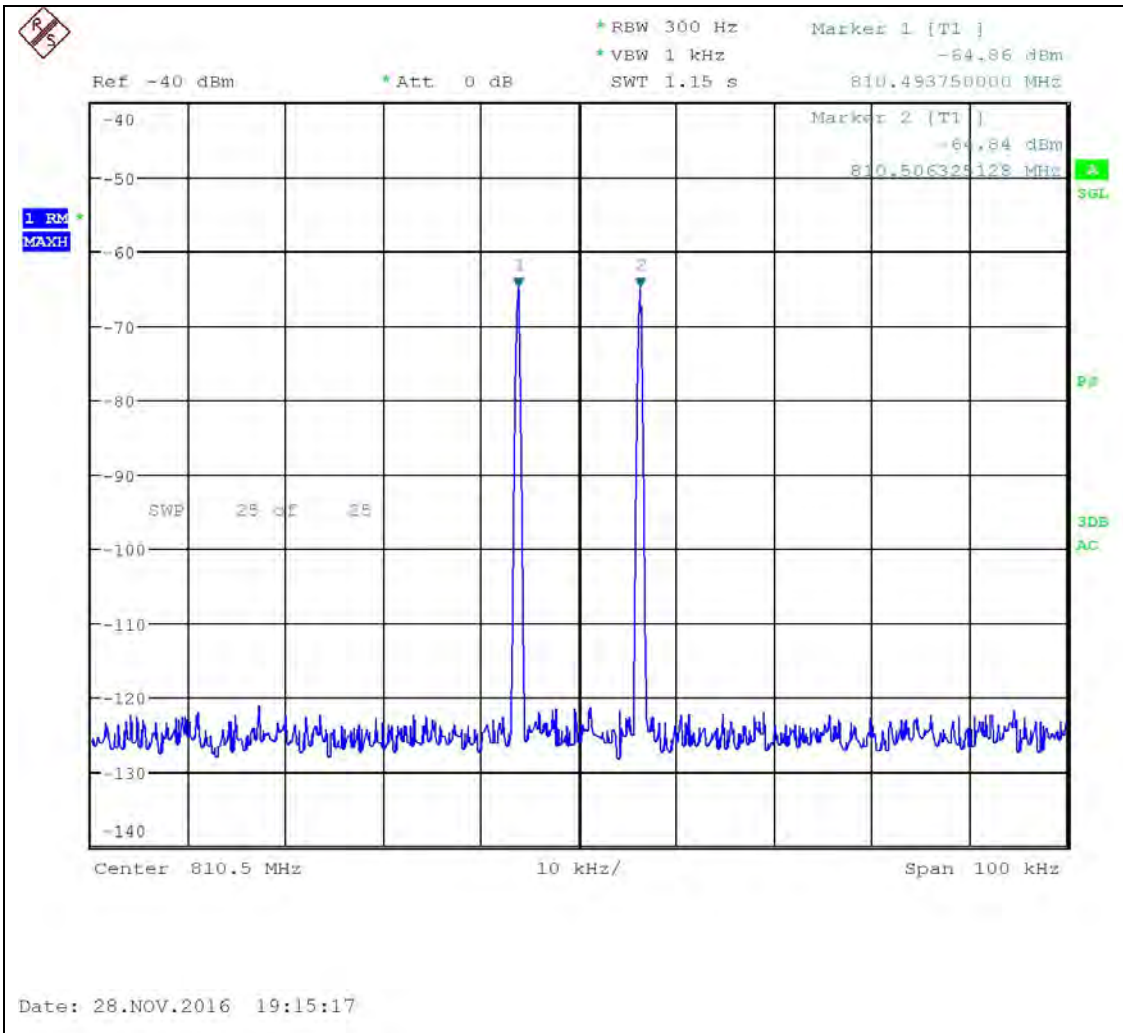
Test Data: Uplink 12.5 KHz Ch. Spacing Input Plot 1



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

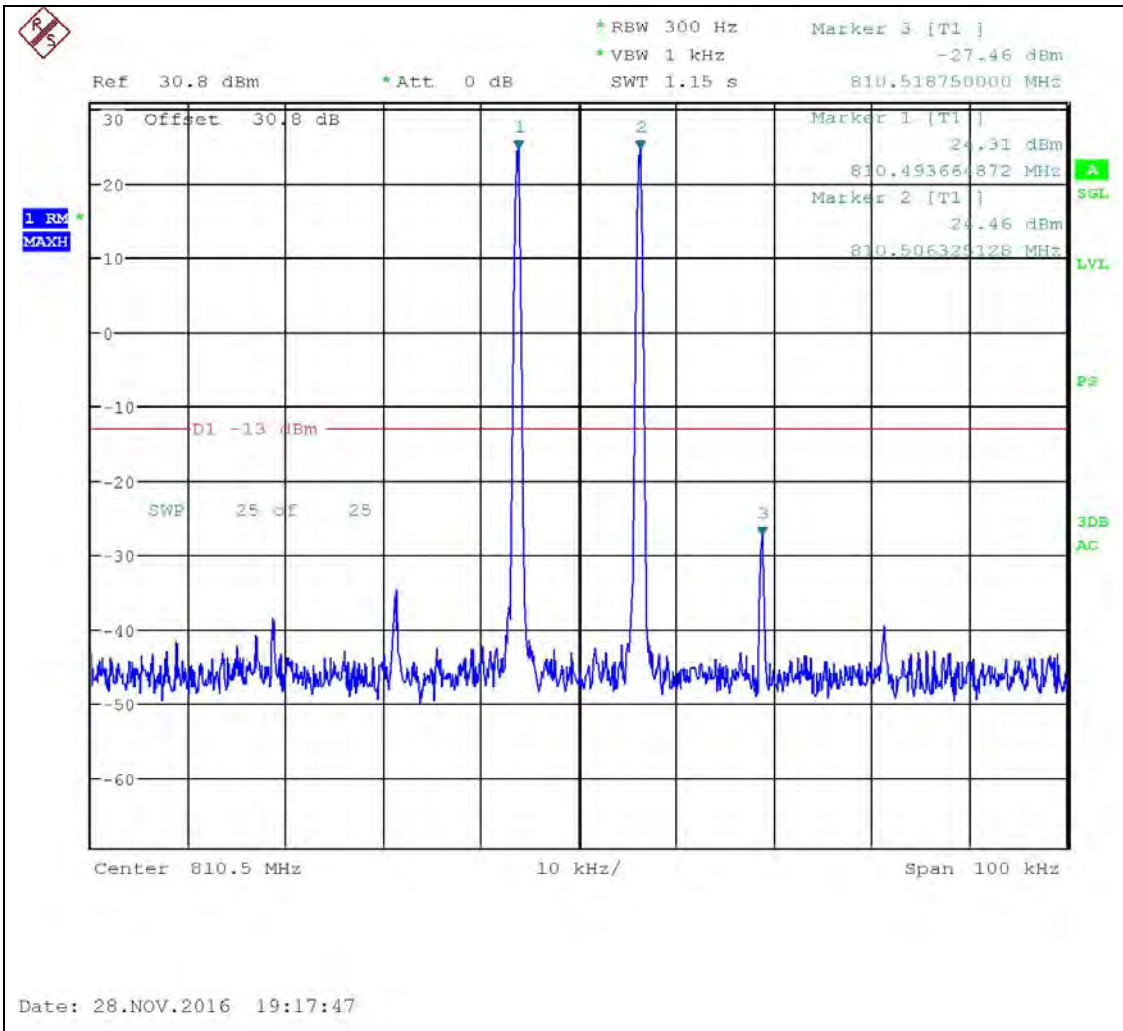
Test Data: Uplink 12.5 KHz Ch. Spacing Input Plot 2



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

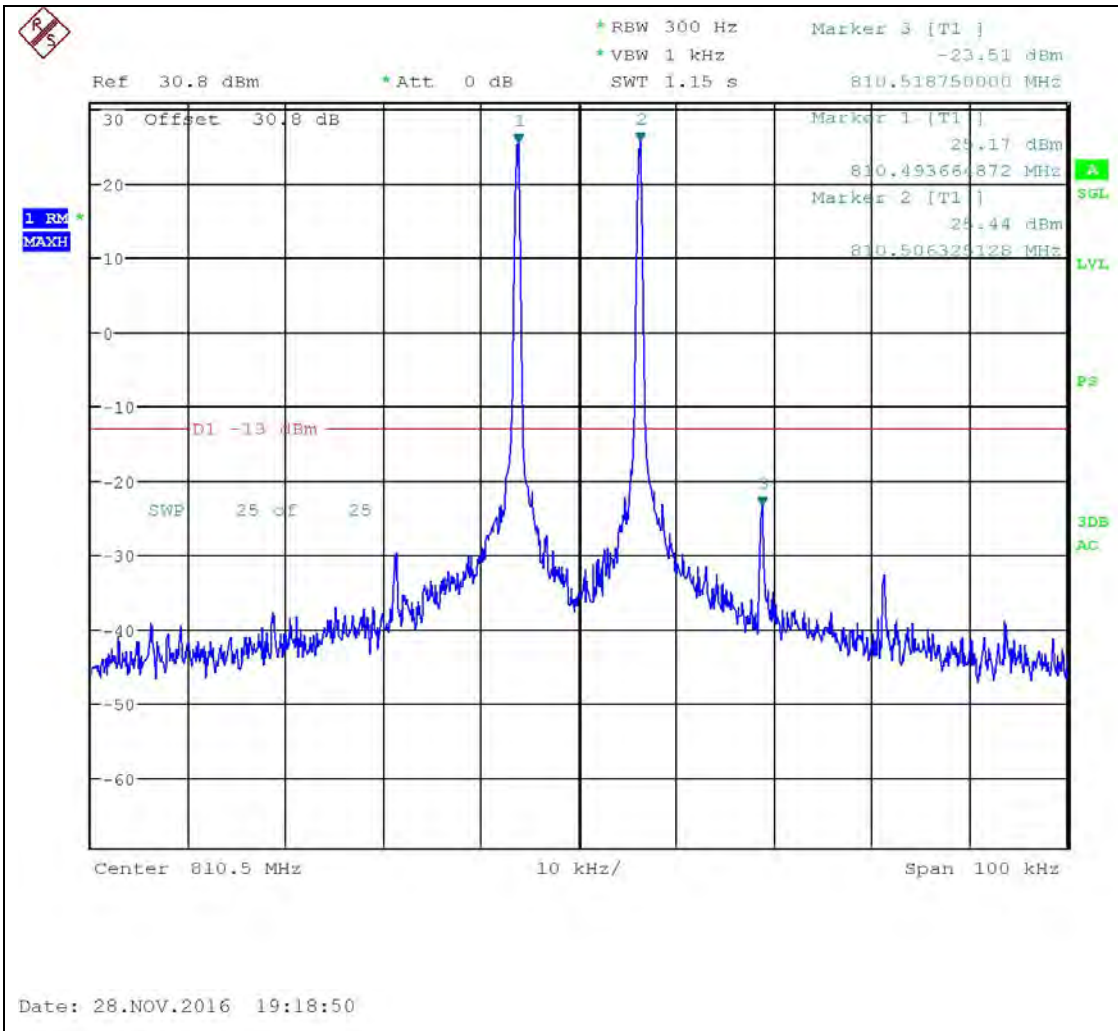
Test Data: Uplink 12.5 KHz Ch. Spacing Output Plot 1



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

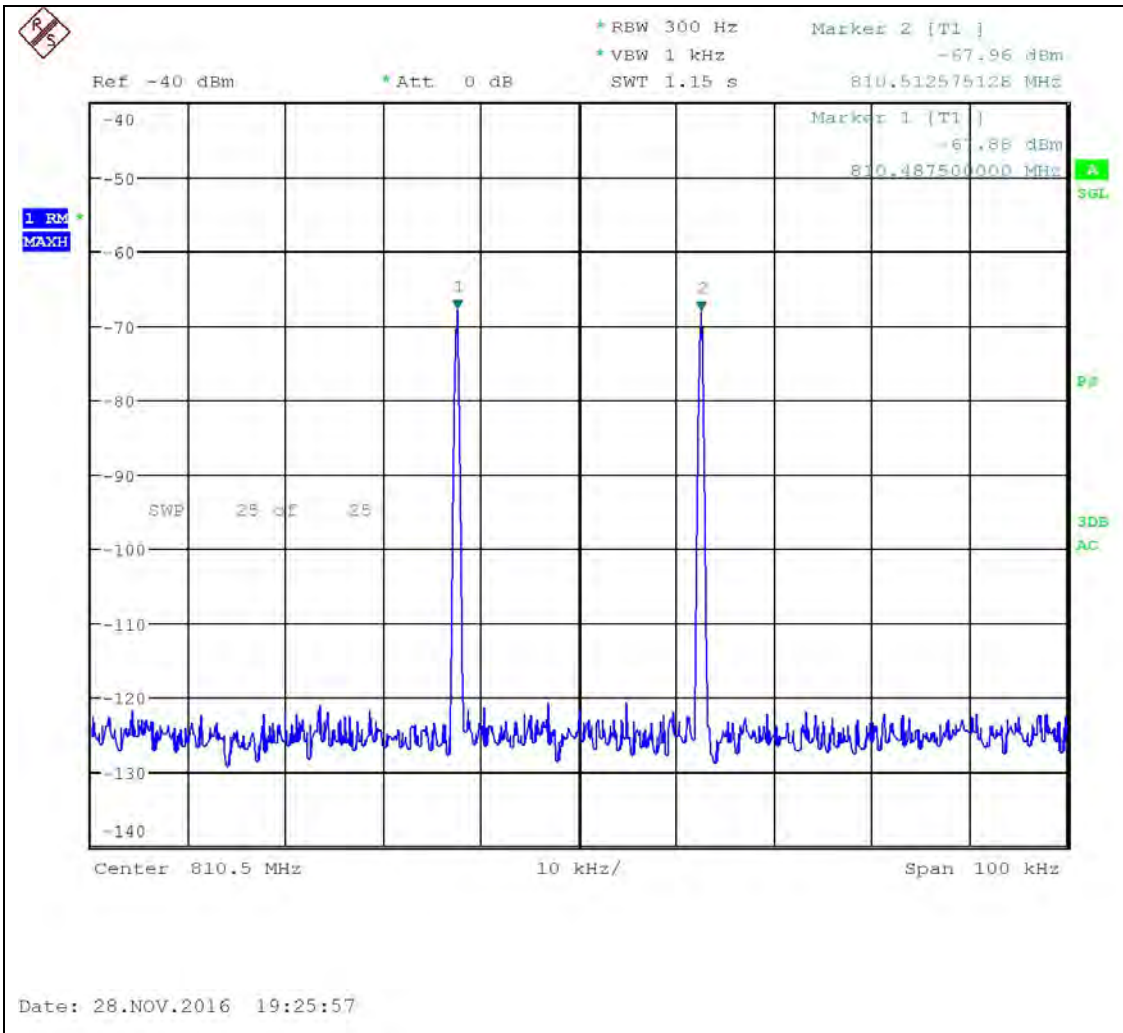
Test Data: Uplink 12.5 KHz Ch. Spacing Output Plot 2



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

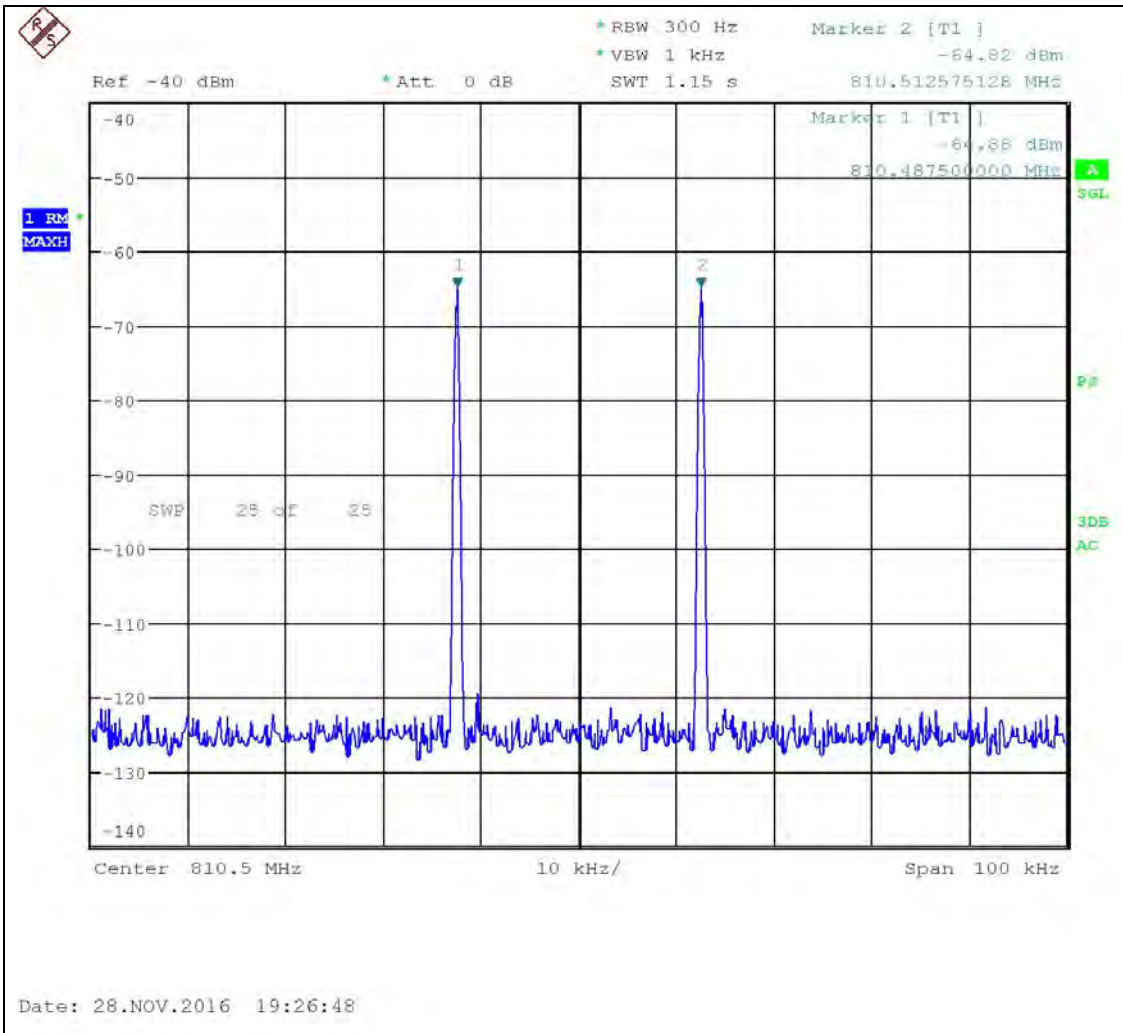
Test Data: Uplink 25 KHz Ch. Spacing Input Plot 1



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

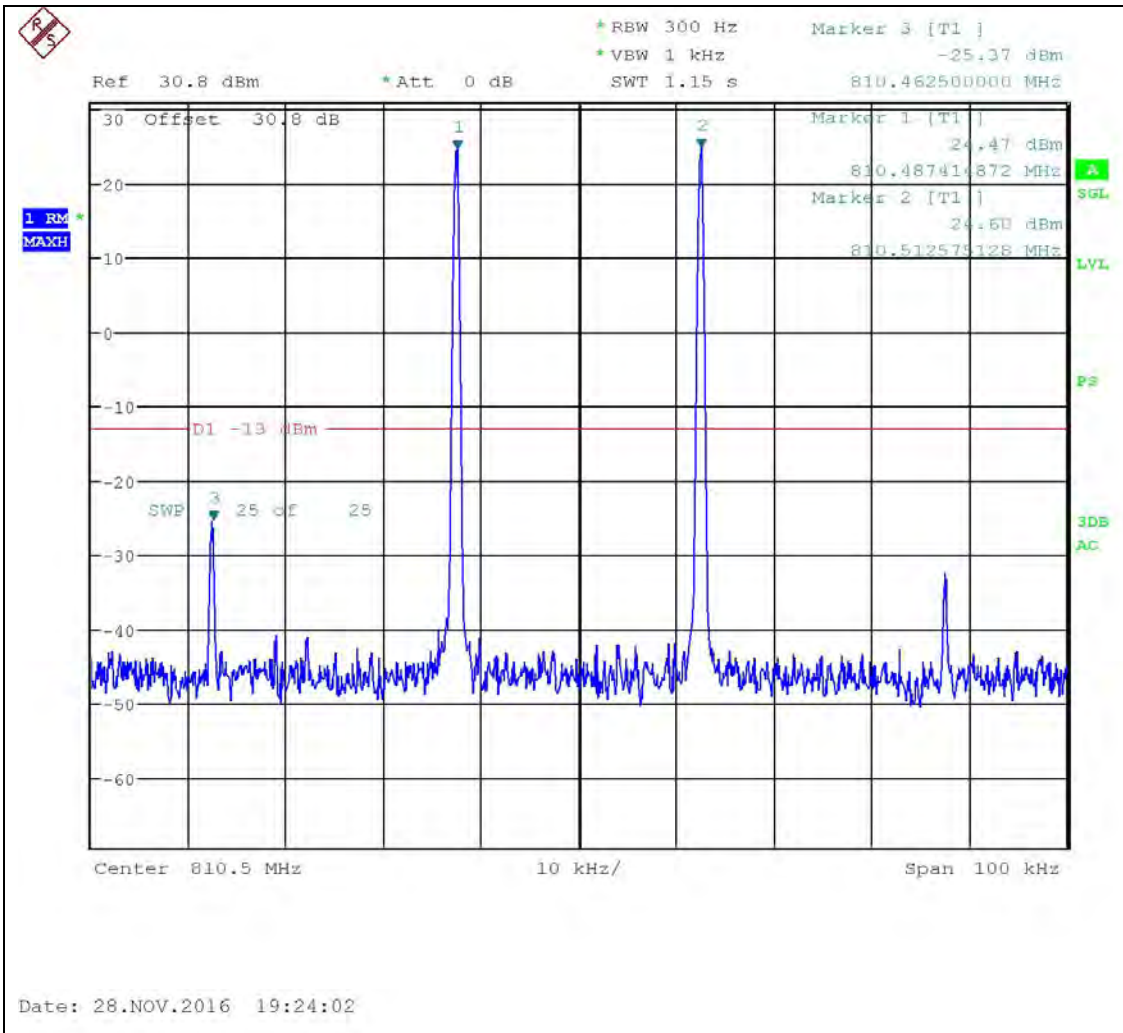
Test Data: Uplink 25 KHz Ch. Spacing Input Plot 2



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

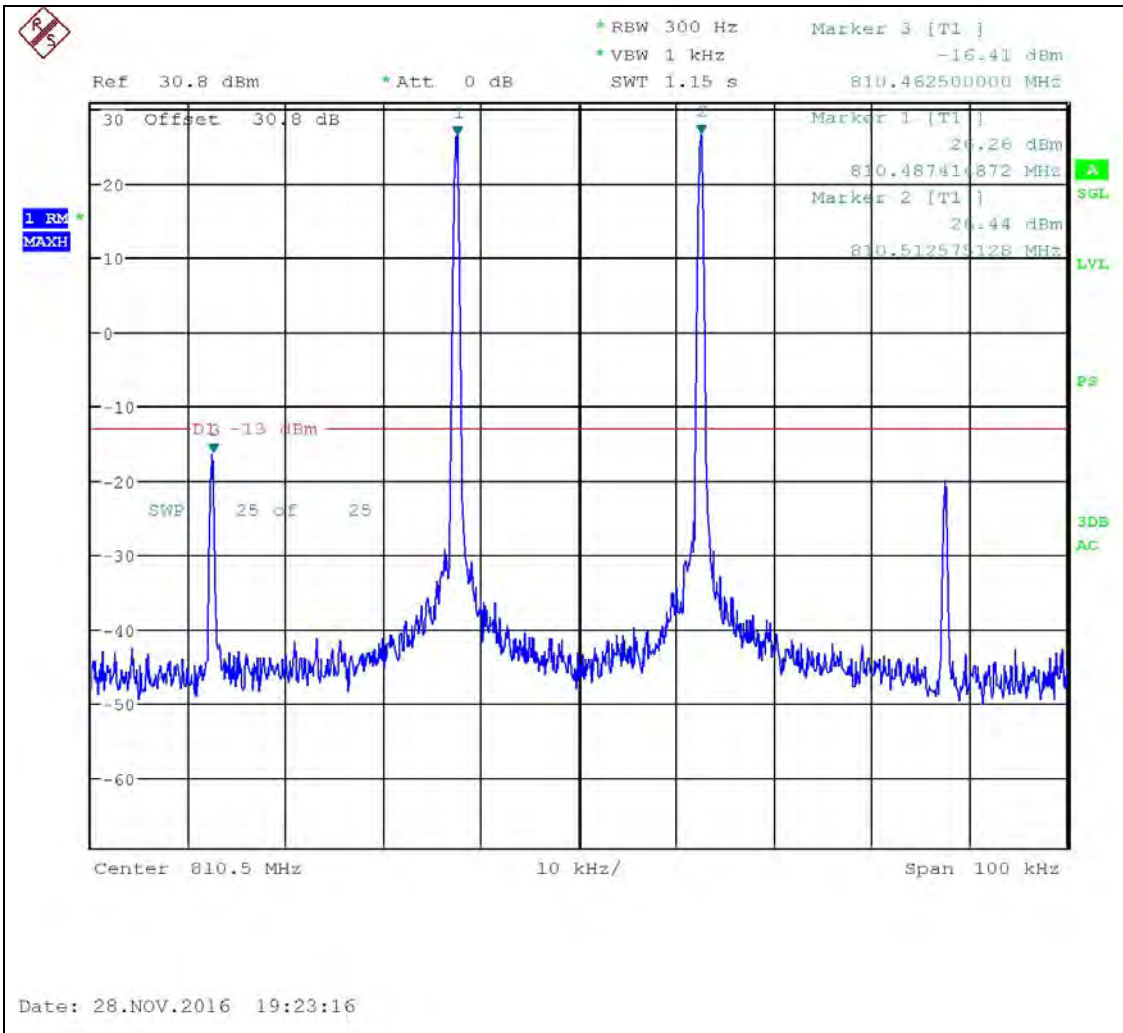
Test Data: Uplink 25 KHz Ch. Spacing Output Plot 1



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

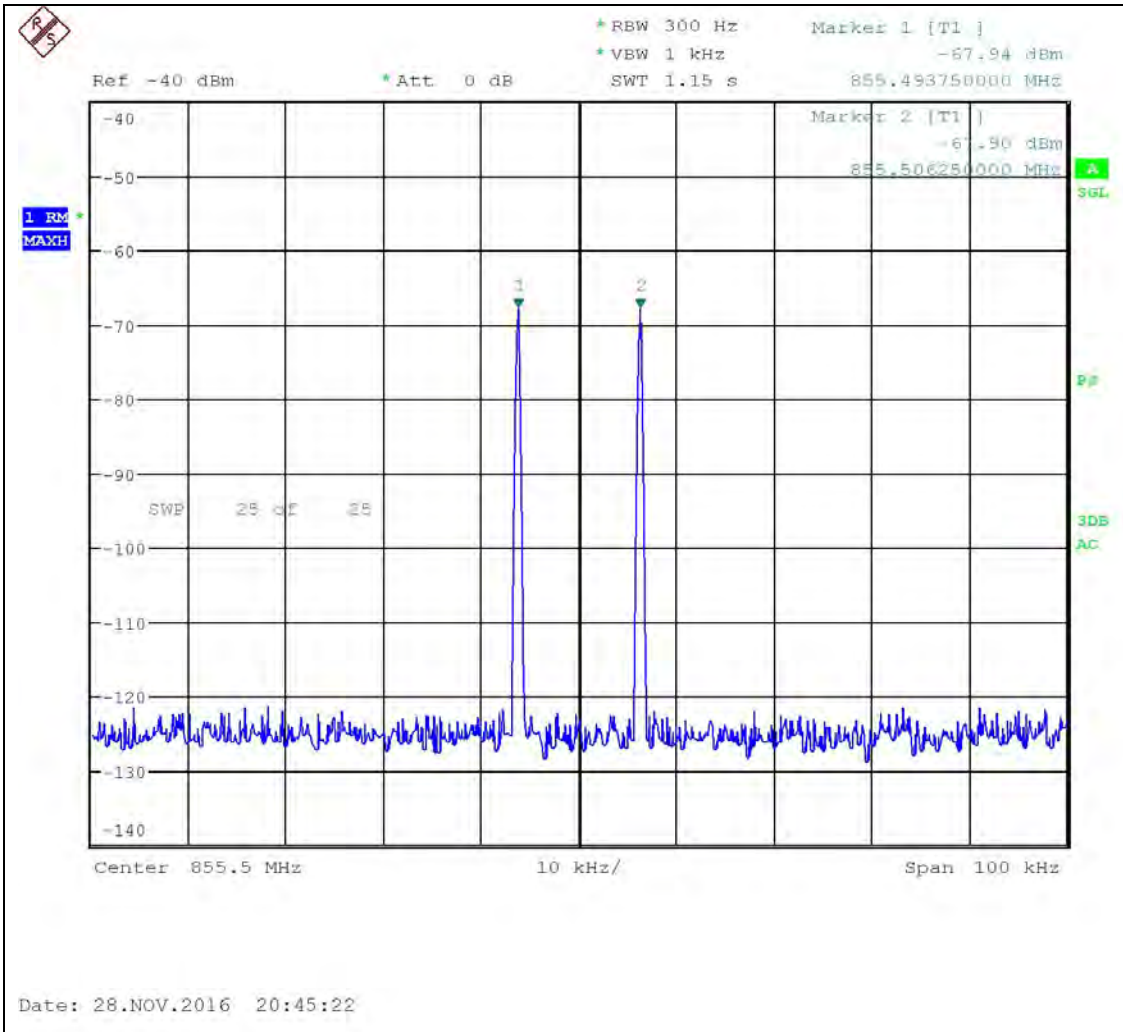
Test Data: Uplink 25 KHz Ch. Spacing Output Plot 2



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

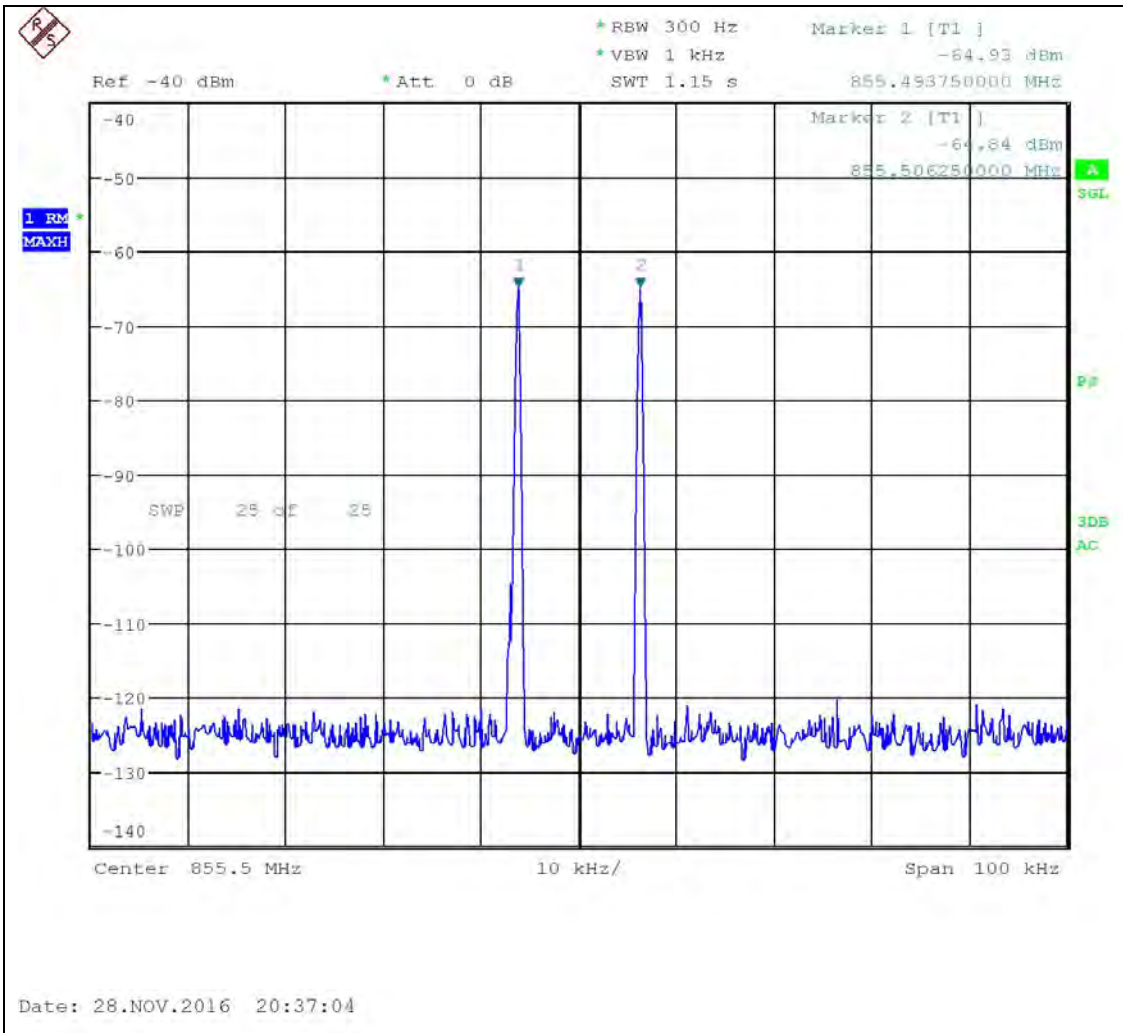
Test Data: Downlink 12.5 KHz Ch. Spacing Input Plot 1



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

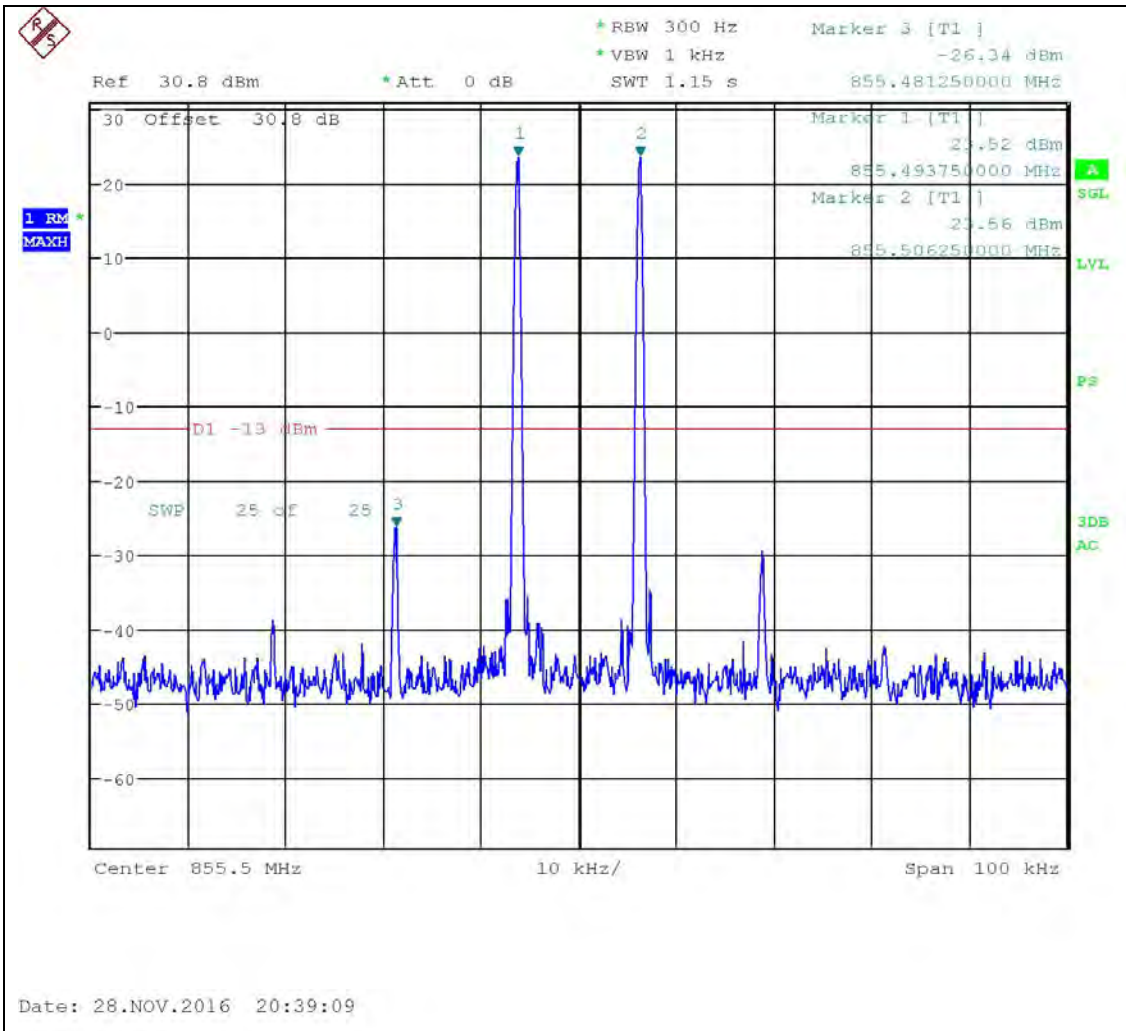
Test Data: Downlink 12.5 KHz Ch. Spacing Input Plot 2



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

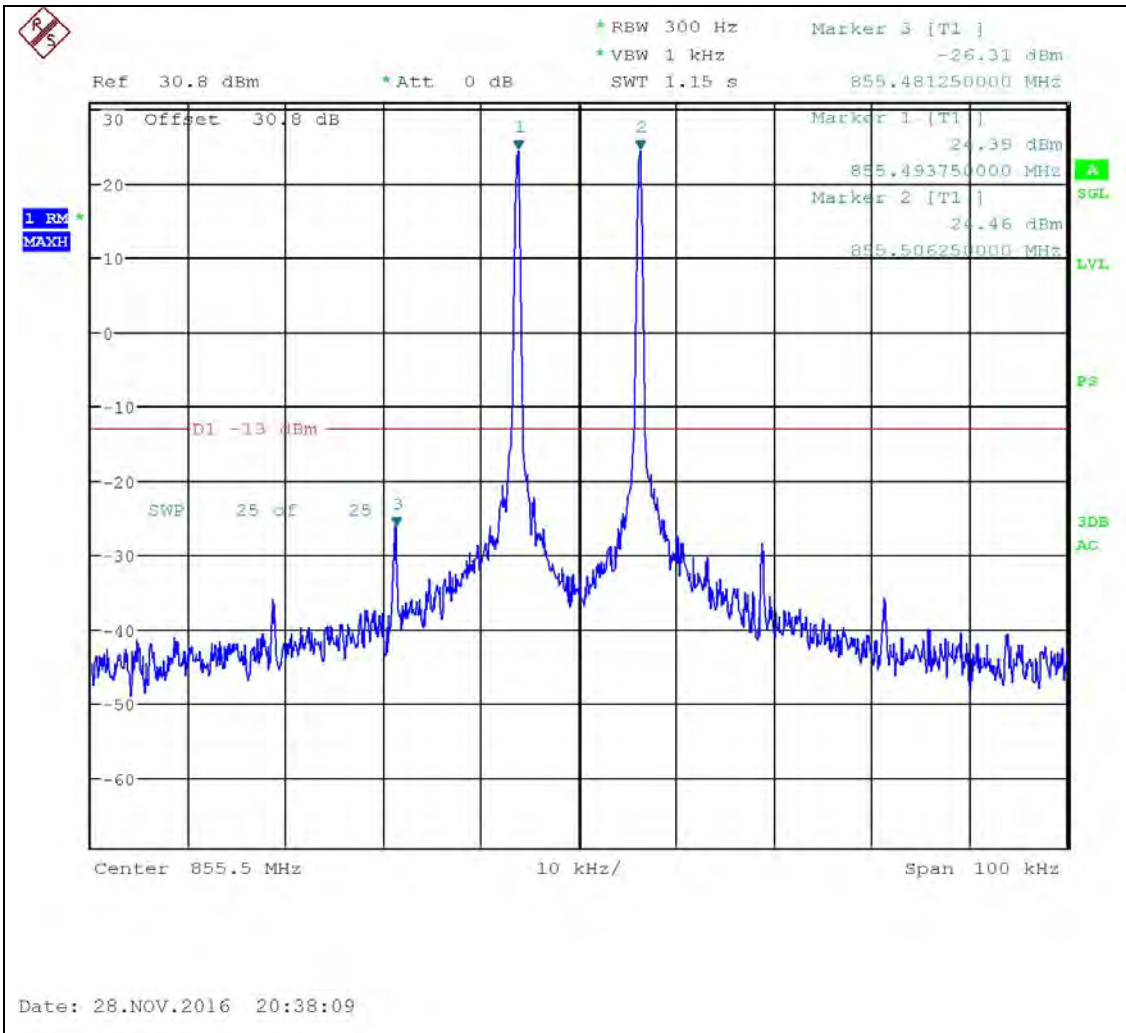
Test Data: Downlink 12.5 KHz Ch. Spacing Output Plot 1



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

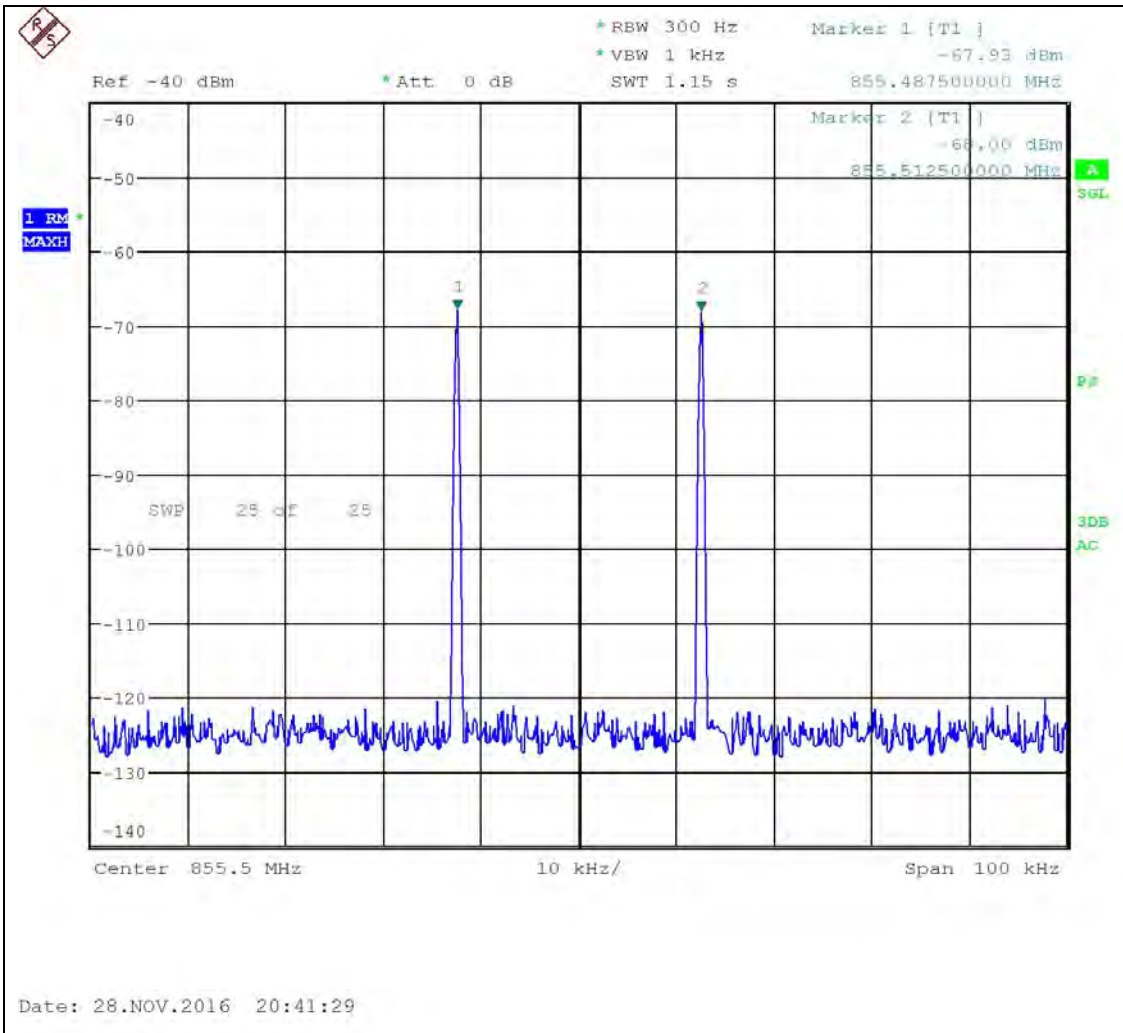
Test Data: Downlink 12.5 KHz Ch. Spacing Output Plot 2



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

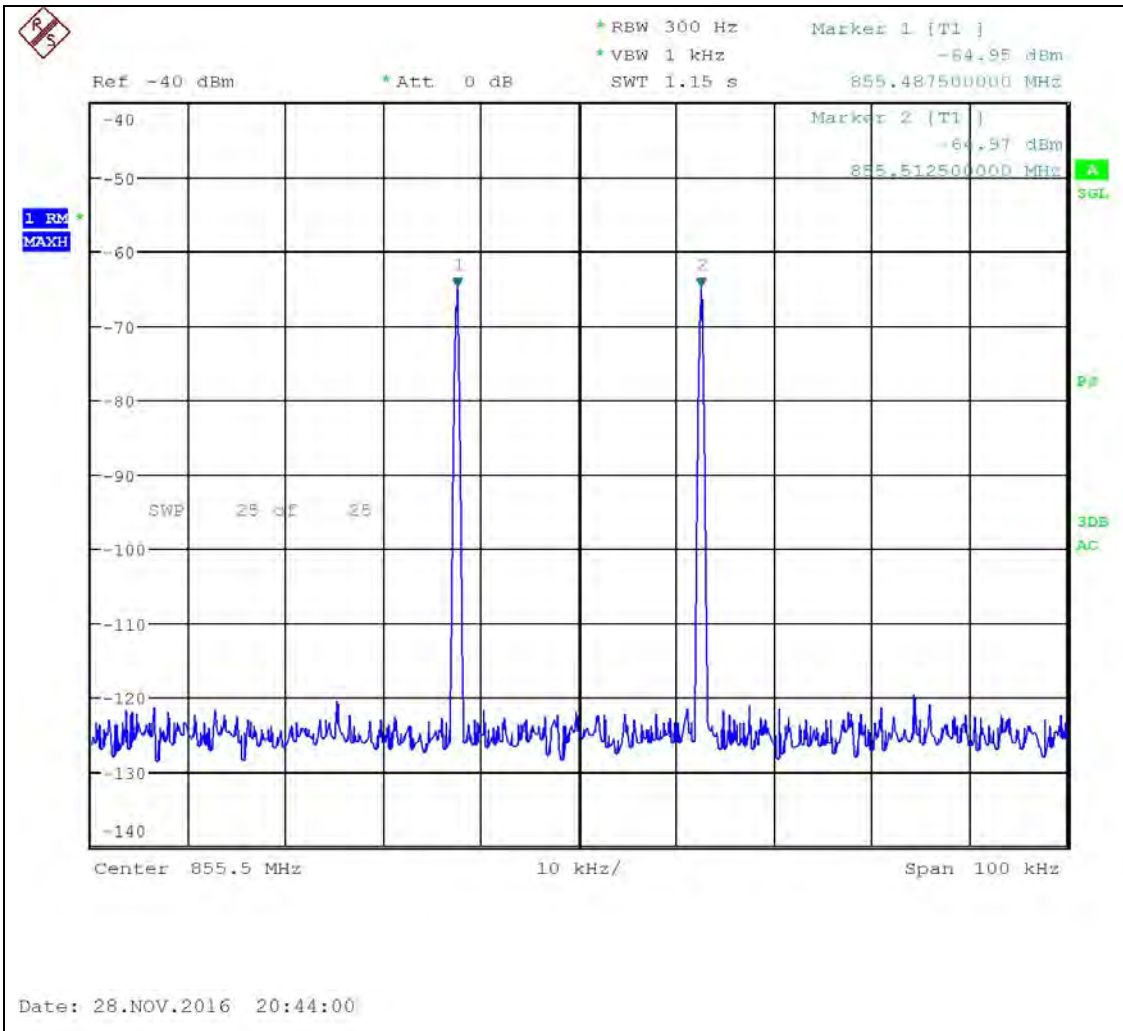
Test Data: Downlink 25 KHz Ch. Spacing Input Plot 1



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

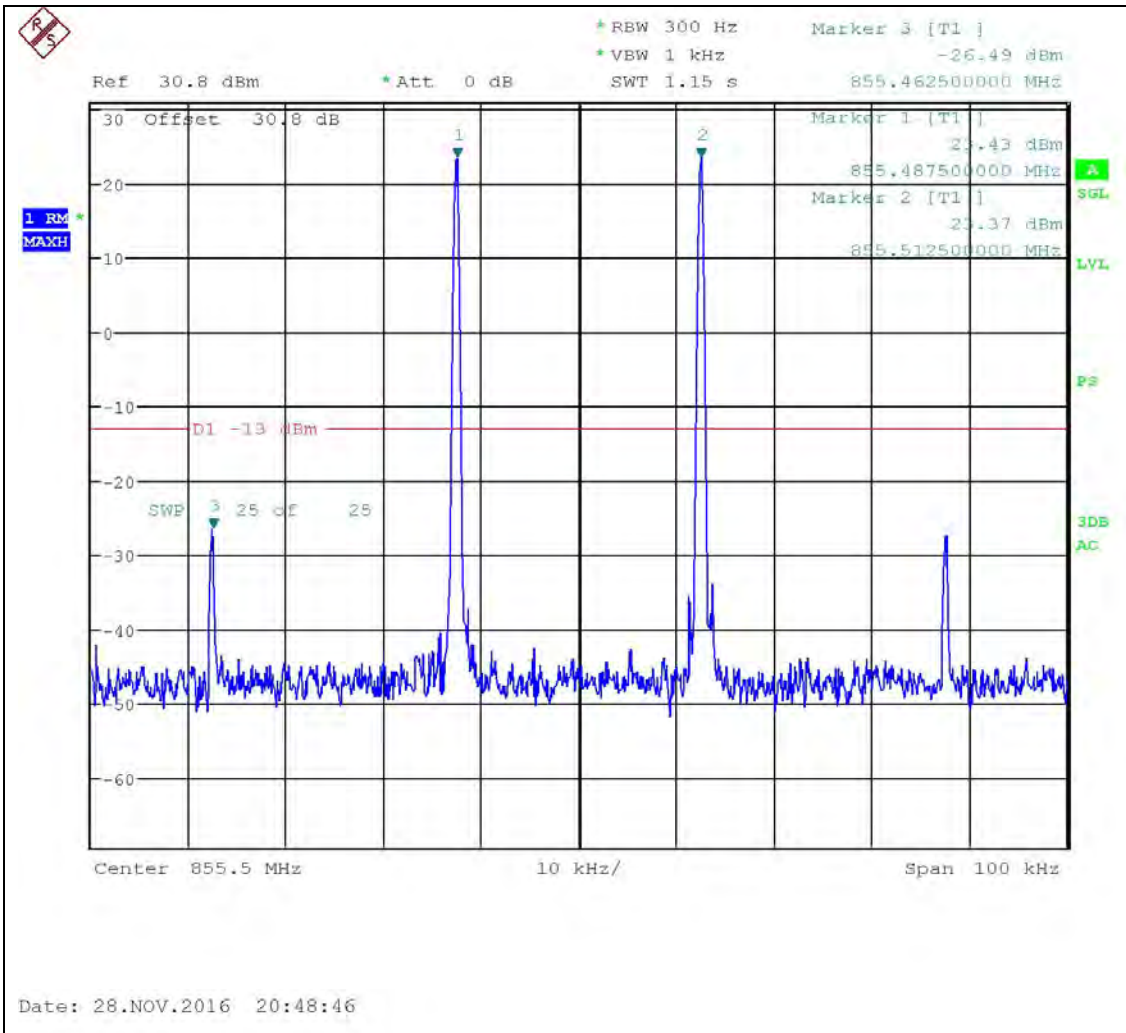
Test Data: Downlink 25 KHz Ch. Spacing Input Plot 2



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

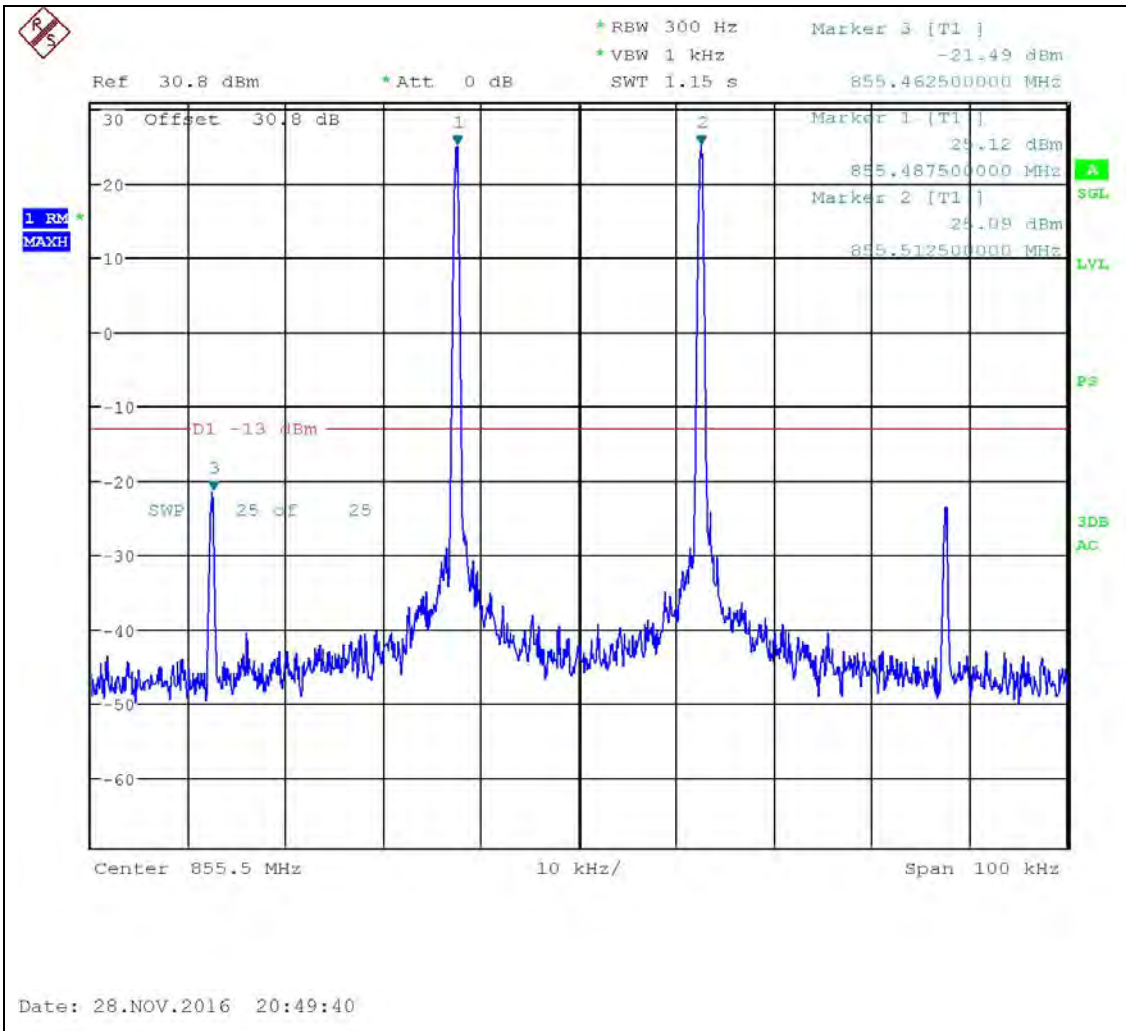
Test Data: Downlink 25 KHz Ch. Spacing Output Plot 1



Results Meet Requirements

Out-of-band / out-of-block Emissions (including intermodulation) §4.7.2

Test Data: Downlink 25 KHz Ch. Spacing Output Plot 2



Results Meet Requirements

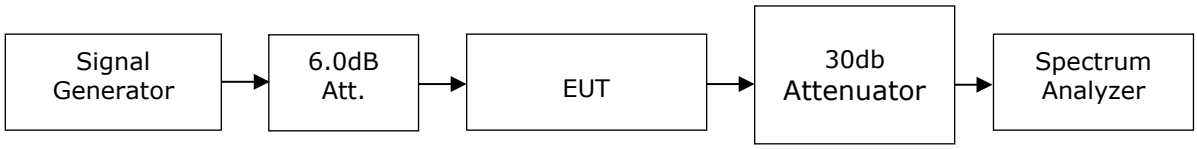
ANTENNA CONDUCTED EMISSIONS §4.7

Rule Parts. No.: Part 2.1053, 90.219 (e) (3)

Requirements: - 13 dBm in any 100 KHz Bandwidth

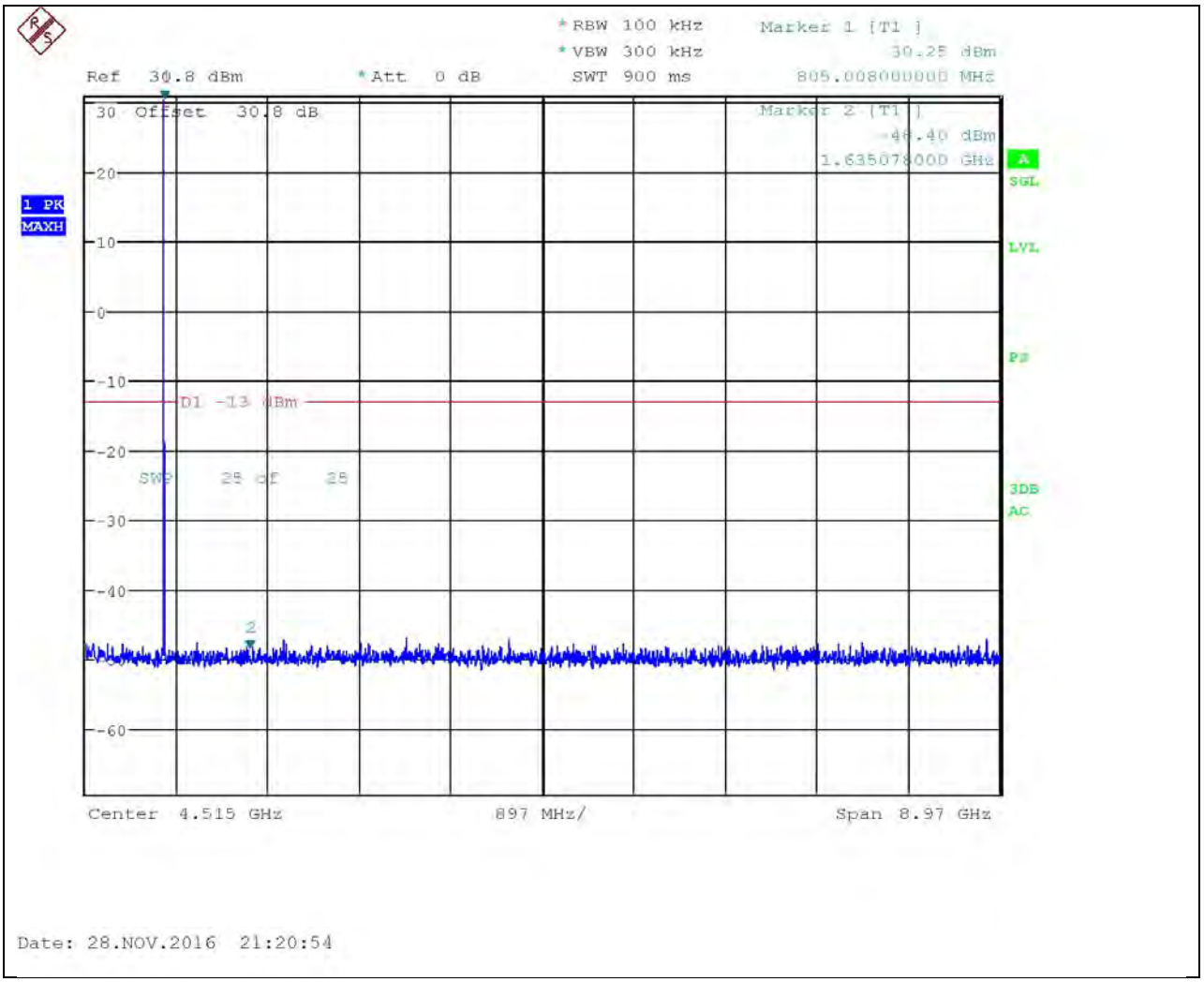
Procedure: KDB935210 Measurement Guidance for Industrial Boosters
§ 4.7.1 General
§ 4.7.3 EUT Spurious emissions conducted measurements

Test Setup Diagram:



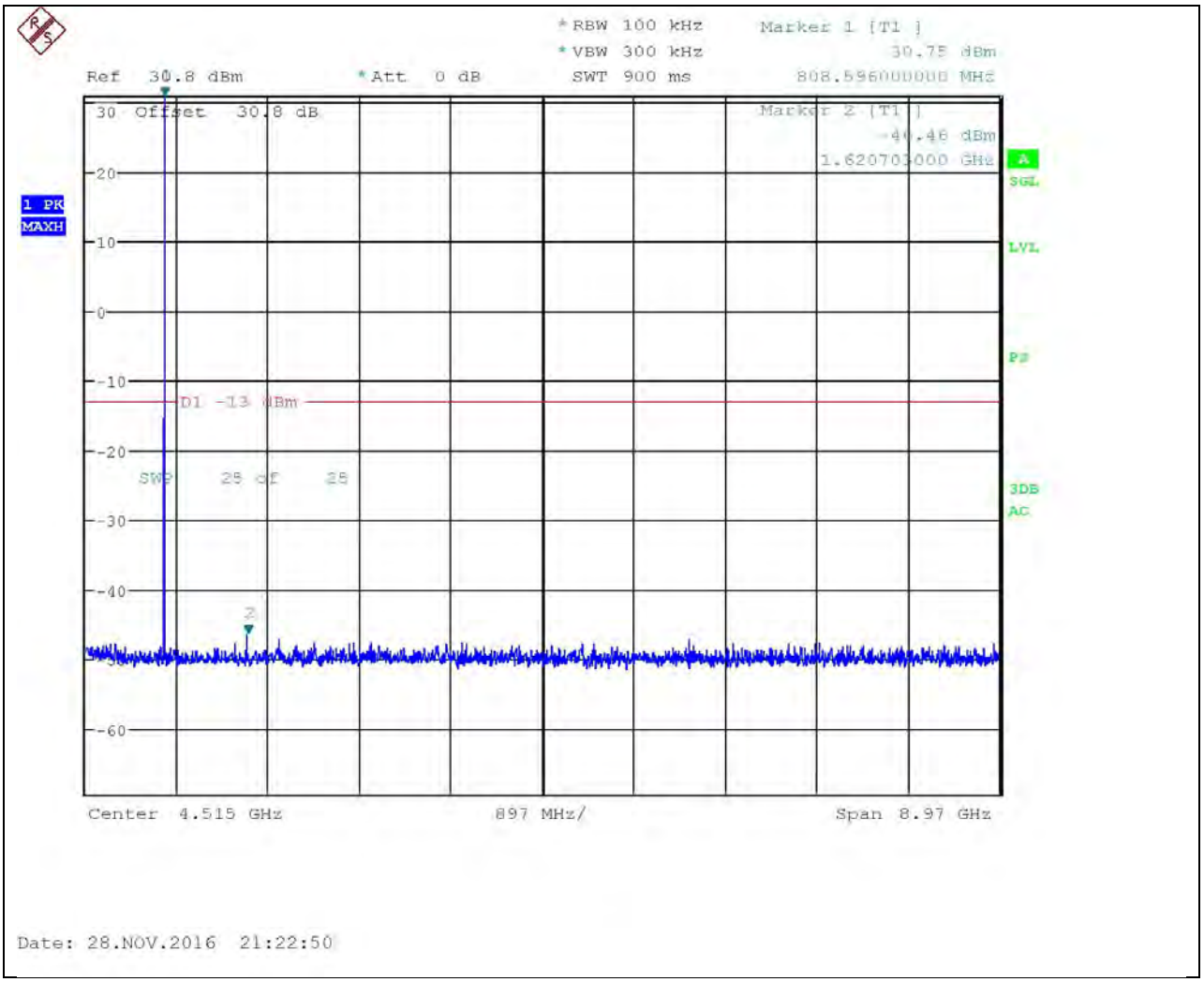
ANTENNA CONDUCTED EMISSIONS §4.7

Test Data: Uplink low end of band 30 MHz to 9 GHz Plot



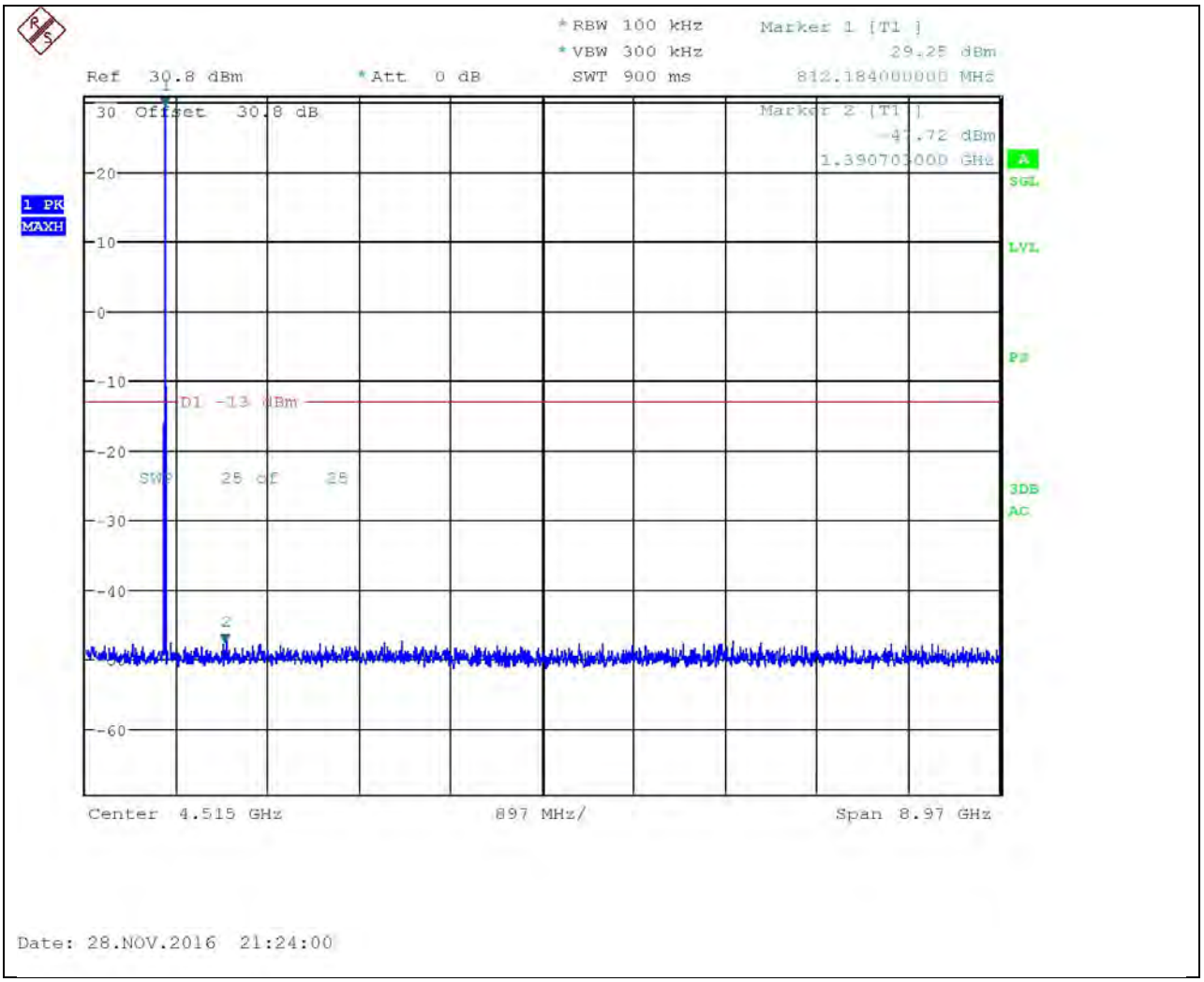
ANTENNA CONDUCTED EMISSIONS §4.7

Test Data: Uplink middle of band 30 MHz to 9 GHz Plot



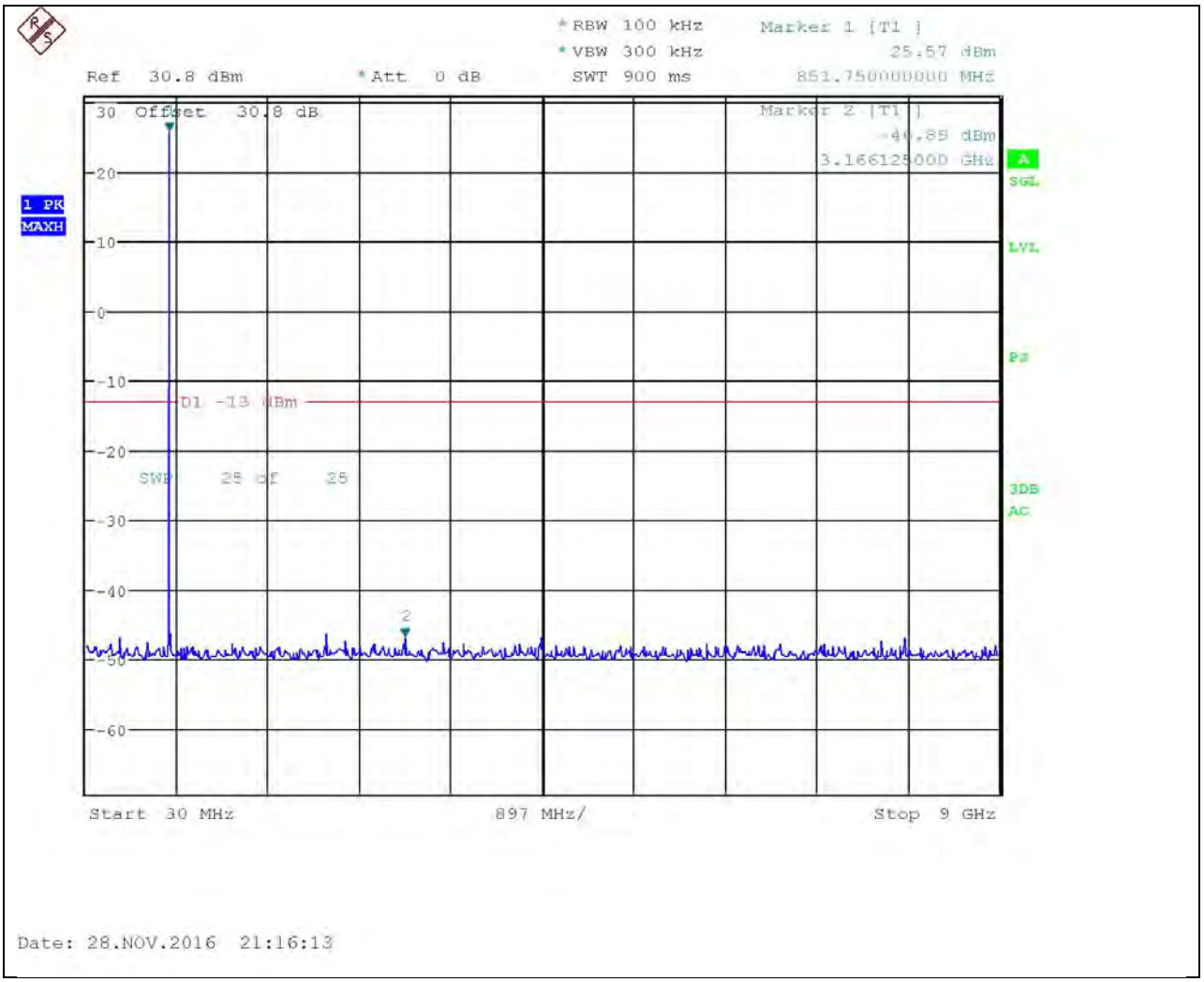
ANTENNA CONDUCTED EMISSIONS §4.7

Test Data: Uplink high end of band 30 MHz to 9 GHz Plot



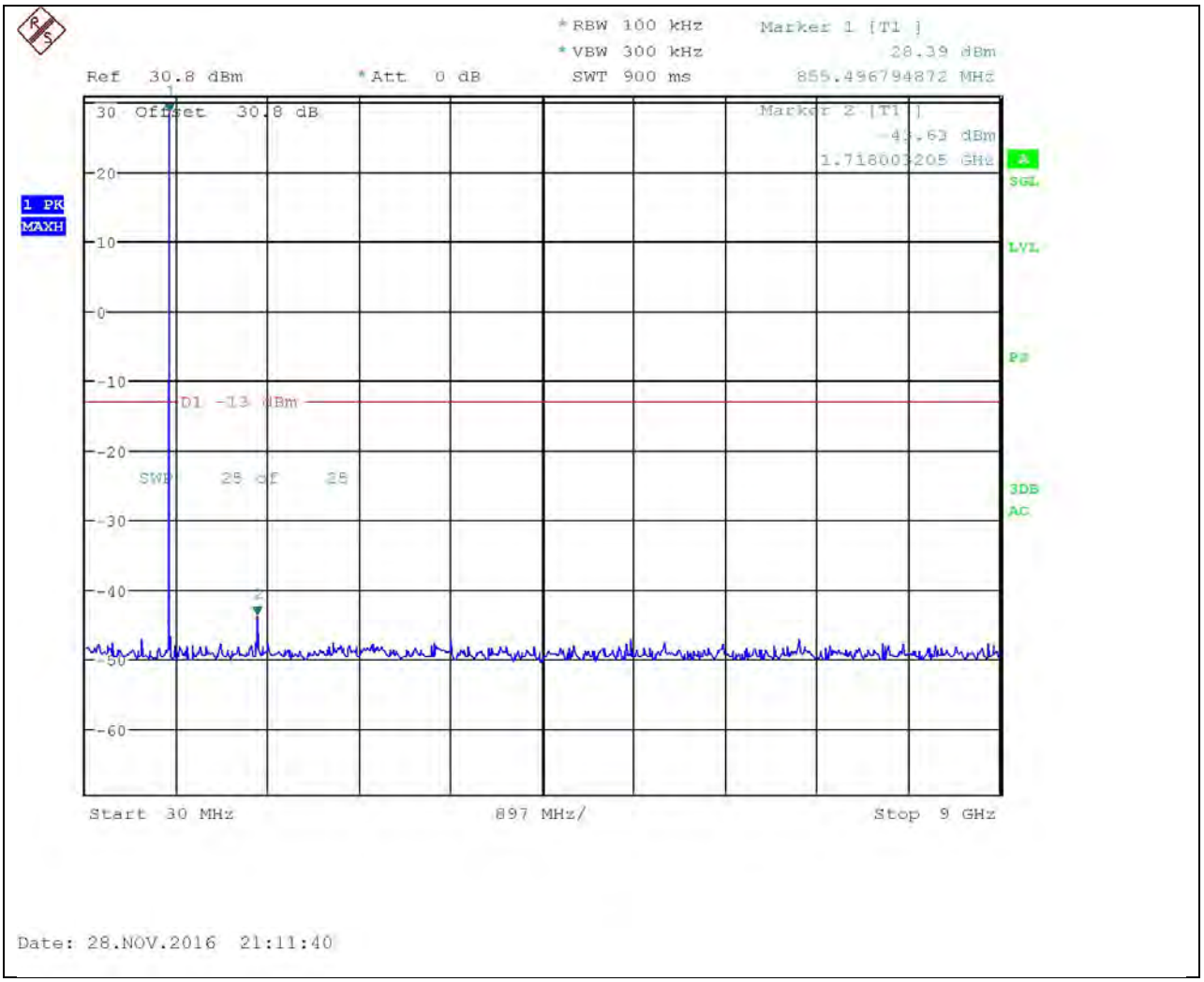
ANTENNA CONDUCTED EMISSIONS §4.7

Test Data: Downlink low end of band 30 MHz to 9 GHz Plot



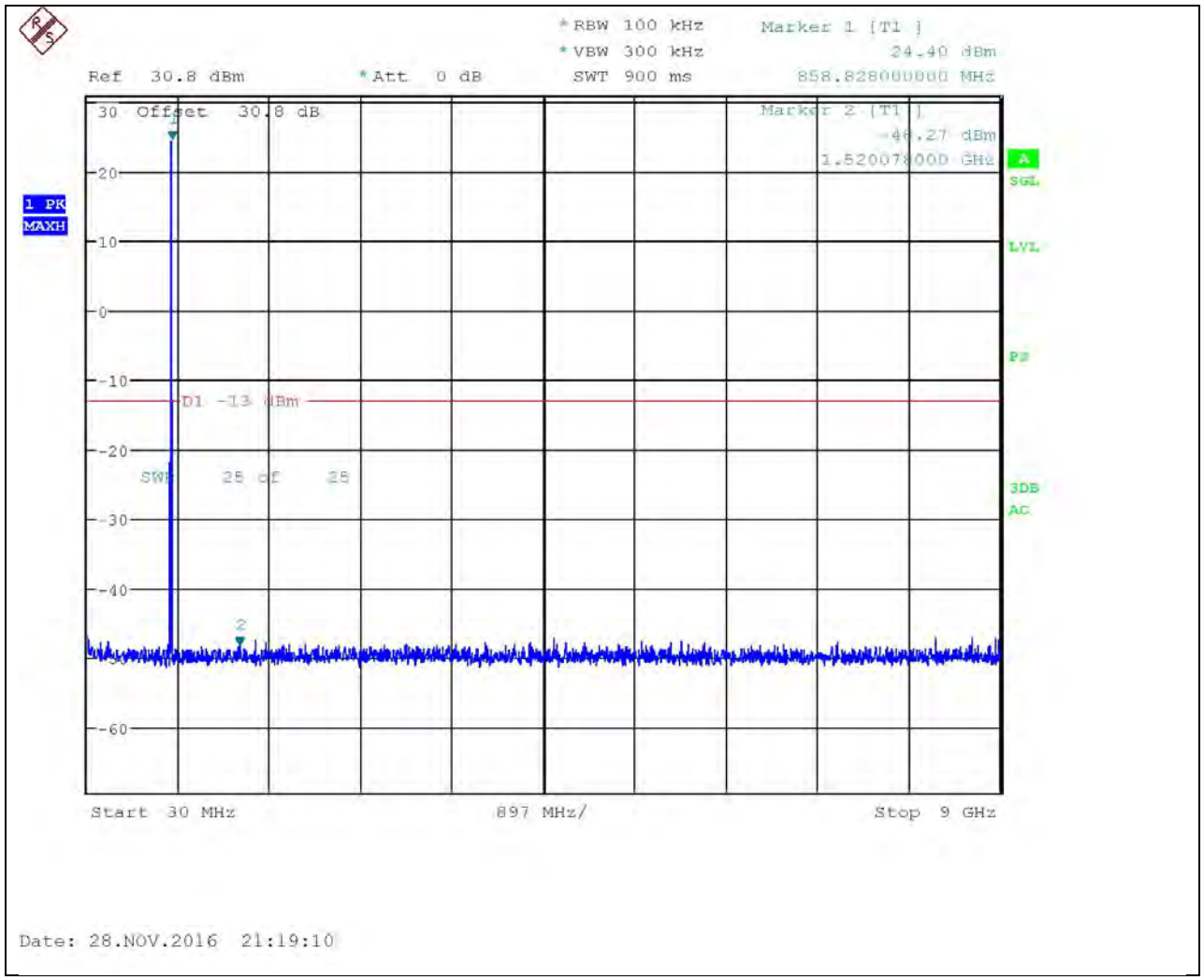
ANTENNA CONDUCTED EMISSIONS §4.7

Test Data: Downlink middle of band 30 MHz to 9 GHz Plot



ANTENNA CONDUCTED EMISSIONS §4.7

Test Data: Downlink high end of band 30 MHz to 9 GHz Plot



FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS §4.9

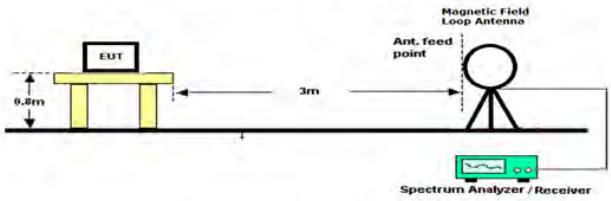
Rule Parts. No.: Part 2.1053, 90.219 (e) (3)

Requirements: - 13 dBm in any 100 KHz Bandwidth

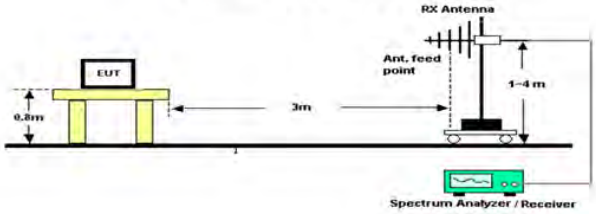
Procedure: KDB935210 Measurement Guidance for Industrial Boosters
§ 4.7.1 General
§ 4.9 Spurious emissions radiated measurements

Test Setup Diagram:

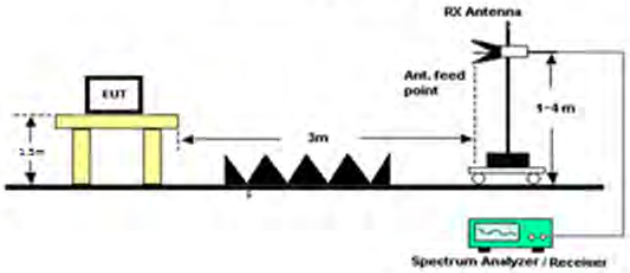
Emissions below 30 MHz



Emissions 30 – 1000 MHz



Emissions above 1 GHz



Notes:

The tabulated data shows the worst case results of emissions within 20 dB of the limit for the radiated field strength emissions test. Three places in the band were measured using a CW input signal at a level 3 dB above the AGC threshold. The spectrum was scanned from 9 KHz to at least the tenth harmonic of the fundamental. Measurements were made at the test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

FIELD STRENGTH OF SPURIOUS RADIATION EMISSIONS

Test Data: Uplink middle of band Measurement Table

Emission Freq (MHz)	Polarity (H/V)	d (meters)	P_{meas} (dBm)	G_R (dBi)	L_C (dB)	P_R (dBm)	L_P (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
31.10	V	3	-82.6	-13.2	0.6	-68.8	11.9	-56.9	-13	43.9
779.48	H	3	-101.52	5.3	10.5	-96.32	39.9	-56.4	-13	43.4
1621.00	H	3	-65.7	6.1	4.6	-67.21	46.2	-21.0	-13	8.0
2431.50	H	3	-68.5	5.4	5.8	-68.14	49.8	-18.4	-13	5.4
3242.00	H	3	-70.0	7.4	6.7	-70.74	52.3	-18.5	-13	5.5
4052.50	H	3	-71.3	8.8	7.8	-72.32	54.2	-18.1	-13	5.1

Results meet requirements

MEASURMENT UNCERTAINTY

State of the measurement uncertainty – TIA 603-D June 2010
The data and results referenced in this document are true and accurate. The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16–4 or ENTR 100-028 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: "Uncertainty in EMC Measurements" and is documented in the Timco Engineering, Inc. 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 Timco Engineering, Inc. is reported:

Test Items	Measurement Uncertainty	EN 300 Limits	Notes
RF Frequency	± 69.5 Hz	±1X10^{-7}	(1)
RF Conducted Power	±0.93dB	±0.750dB	(1)
Conducted spurious emission of transmitter valid up to 40GHz	±2.36dB	±4.0dB	
Radiated RF Power	±1.4dB	±6.0dB	
Maximum frequency deviation: Within 300 Hz and 6kHz of audio freq. Within 6kHz and 25kHz of audio Freq.	 ±1.88% ±2.04%	 ±5.0% ±3.0dB	
Deviation Limitation	±1.29%	±5.0%	
Adjacent channel power	±1.47dB	±5.0dB	(1)
Radiated emission of transmitter valid up to 18GHz	±3.96dB	±6.0dB	
Temperature	±1.0°C	±1.0°C	(1)
Humidity	±5.0%	±10.0%	
Valid up to 1 GHz for the RF parameters unless otherwise stated			

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Non Radiating 50 OHM Load	Sierra Elec	160B-600X	1038	09/13/16	09/13/18
Antenna: Biconical 1096 Chamber	Eaton	94455-1	1096	07/14/15	07/14/17
Antenna: Log-Periodic 1122	Electro-Metrics	LPA-25	1122	07/14/15	07/14/17
Attenuator N 6dB 20W DC-11G	Narda	768-6	8802	05/22/15	05/22/17
CHAMBER	Panashield	3M	N/A	04/25/16	12/31/17
Sweep/Signal Generator	Anritsu	68369B	985112	10/28/15	10/28/17
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren Chamber	3117	00041534	02/25/15	02/25/17
Software: Field Strength Program	Timco	N/A	Version 4.0	Na	na
Antenna: Active Loop	ETS-Lindgren	6502	00062529	11/18/15	11/18/17
Coaxial Cable - NMNM-0300-00 Yellow	Insulated Wire Inc.		NMNM-0300-00	08/05/15	08/05/17
Hygro-Thermometer	Extech	445703	0602	06/30/15	06/30/17
Signal Generator R & S SMIQ 02	Rohde & Schwarz	SMIQ02	DE24678	01/09/16	01/09/18
Coaxial Cable - BMBM-0130-00 Black	Alpha Wire		BMBM-0130-00	05/24/16	05/24/18
Coaxial Cable - Chamber 3 cable set (Primary)	Micro-Coax	Chamber 3 cable set (Primary)	KMKM-0244-01; KMKM-0670-00; KFKF-0198-01	08/08/16	08/08/18
Coaxial Cable - BMBM-0155-01 Black	BELDEN		BMBM-0155-01	06/01/16	06/01/18
Coaxial Cable - BMBM-0065-00 Black	Belden		BMBM-0065-00	06/08/16	06/08/18
Coaxial Cable - BMBM-0155-00 Black	MIYAZAKI		BMBM-0155-00	05/24/16	05/24/18
Signal Generator R & S SMU 200A	Rohde & Schwarz	SMU200A	103195	02/29/16	02/28/18
Coaxial Cable - NMNM-0317-00 Black DC-4G	Unknown		NMNM-0317-00	07/13/16	07/13/18
EMI Test Receiver R & S ESU 40	Rohde & Schwarz	ESU 40	100460	01/05/16	01/05/17
Attenuator K 6dB 2W DC-40G	Narda	4768-6	1044-2	06/25/15	06/25/17
Bore-sight Antenna Positioning Tower	Sunol Sciences	TLT2	N/A	Na	na
Attenuator N 30dB 10W DC-18G	Pasternack	PE7015-30	#24	06/22/15	06/22/17
Pre-amp	RF-LAMBDA	RLNA00M45GA	NA	01/04/16	01/04/18
Noise Source 10MHz - 18GHz	Agilent	346B	MY44421884	05/04/16	05/04/18

*EMI RECEIVER SOFTWARE VERSION
The receiver firmware used was version 4.43 Service Pack 3

END OF REPORT