ENGINEERING TEST REPORT

P25 Vehicular Radio Extender
Model: VRX1000 700/800 MHz
FCC ID: LO6-VRX1000700800

Applicant:

Futurecom Systems Group, ULC
3277 Langstaff Road
Concord, ON
Canada L4K 5P8

Tested in Accordance With

Federal Communications Commission (FCC)
47 CFR, Parts 2 and 90

UltraTech's File No.: FSG-142Q_FCC90

This Test report is Issued under the Authority of
Tri M. Luu
Vice President of Engineering
UltraTech Group of Labs

Date: October 30, 2014

Report Prepared by: Dharmajit Solanki Issued Date: October 30, 2014	Tested by: Hung Trinh Test Dates: October 01 - 23, 2014

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4
Tel.: (905) 829-1570 Fax.: (905) 829-8050
Website: www.ultratech-labs.com, Email: vic@ultratech-labs.com, Email: tri@ultratech-labs.com

91038	1309	46390-2049	NVLAP LAB CODE 200093-0	SL2-IN-E-1119R	CA2049	TL363_B	TPTDP DA1300

TABLE OF CONTENTS

EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Parts 2 and 90
Title:	Code of Federal Regulations (CFR), Title 47 –Telecommunication, Part 90 Private land mobile radio services
Purpose of Test:	To gain FCC Equipment Authorization for Radio operating in Part 90.
Test Procedures:	Both conducted and radiated emissions measurements were conducted in accordance with TIA/EIA Standard TIA-603-D – Land Mobile FM or PM Communications Equipment Measurement and performance Standards.

1.2. RELATED SUBMITTAL(S)/GRANT(S)

None

1.3. NORMATIVE REFERENCES

Publication	Year	Title
FCC CFR Parts 0-19, 80-End	2013	Code of Federal Regulations, Title 47 – Telecommunication
ANSI C63.4	2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
TIA/EIA 603, Edition D	2010	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
CISPR 22 & EN 55022	2008-09, Edition 6.0 2006	Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement
CISPR 16-1-1 +A1 +A2	2006 2006 2007	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-1-2 +A1 +A2	2003 2004 2006	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-2: Conducted disturbances

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

APPLICANT	
Name:	Futurecom Systems Group, ULC
Address:	3277 Langstaff Road Concord, ON Canada L4K 5P8
Contact Person:	Mr. Tony Bombera Phone #: 905 660 5548 X225 Fax #: 905 660 6858 Email Address: tonyb@futurecom.com

MANUFACTURER	
Name:	Futurecom Systems Group, ULC
Address:	3277 Langstaff Road Concord, ON Canada L4K 5P8
Contact Person:	Mr. Tony Bombera Phone #: 905 660 5548 X225 Fax #: 905 660 6858 Email Address: tonyb@futurecom.com

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	Futurecom Systems Group, ULC
Product Name:	P25 VEHICULAR RADIO EXTENDER
Model Name or Number:	VRX1000 700/800 MHz
Serial Number:	00000043
Type of Equipment:	Licensed Non-Broadcast Station Transmitter
Power Supply Requirement:	13.8V DC Nominal
Transmitting/Receiving Antenna Type:	Non-integral
Primary User Functions of EUT:	Radio coverage extender for portable radios

2.3. EUT'S TECHNICAL SPECIFICATIONS

Transmitter	
Equipment Type:	Fixed Base & Mobile Stations
Intended Operating Environment:	Commercial, industrial or business environment
Power Supply Requirement:	13.8V DC 3A Nominal
RF Output Power Rating:	Programmable 0.5W – 3.0W
Operating Frequency Range:	764-776 MHz and 851-869 MHz
RF Output Impedance:	50 Ω
Channel Spacing:	25 kHz & 12.5 kHz
Modulation Employed:	Analog FM, P25 C4FM
Data Rate:	9600 bps
Emission Designation*:	16K0F3E, 11K0F3E, 8K10F1E and 8K10F1D
Oscillator Frequency(ies):	14.4MHz, 107.85MHz, 109.65MHz
Antenna Connector Type:	Mini UHF

*Necessary bandwidth determined using the Carson's formula: B_n = 2M+2DK

where: B_n = Necessary bandwidth in hertz
M = Maximum modulation frequency in hertz
D = Peak frequency deviation
K = An overall numerical factor which varies according to the emission and which depends upon the allowable signal distortion.

Standard Audio Modulation (12.5 kHz Channelization, Analog Voice):
M = 3 kHz; D = 2.5 kHz; K = 1
B_n = 2M+2DK = 2(3 kHz) + 2(2.5 kHz)(1) = 11 kHz
Emission Designator: 11K0F3E.

Standard Audio Modulation (25 kHz Channelization, Analog Voice):
M = 3 kHz; D = 5 kHz
B_n = 2M+2DK = 2(3 kHz) + 2(5 kHz)(1) = 16 kHz
Emission Designator: 16K0F3E

For Digital Modulation the measured 99% occupied bandwidth was used instead of Carson's rule.

Digital (12.5 kHz Channelization, Digital Voice):
Emission Designator: 8K10F1E

Digital (12.5 kHz Channelization, Digital Data):
Emission Designator: 8K10F1D

2.4. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	DC Power Input	1	M12	1m, unshielded
2	Programming Connector	1	Mini USB	0.6m, Shielded
3	RF Connector	1	Mini UHF	0.6m, Shielded
4	Auxiliary/Options/Mobile Connector	1	DB-25	0.9m, Shielded

EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21° C to 24° C
Humidity:	45 to 51%
Pressure:	102 kPa
Power input source:	13.8V DC nominal

3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TEST SIGNALS

Operating Modes:	The transmitter was operated in a continuous transmission mode with the carrier modulated as specified in the Test Data.
Special Test Software:	N/A
Special Hardware Used:	Test Jig
Transmitter Test Antenna:	The EUT is tested with the transmitter antenna port terminated to a 50 Ω Load.

Transmitter Test Signals	
Frequency Band(s):	764-775 MHz and 851-854 & 854-869 MHz
Test Frequency(ies):	764.025 MHz, 770.0 MHz and 774.975 MHz 851.025 MHz and 853.975 MHz 854.025 MHz, 861.5 MHz and 868.975 MHz
Transmitter Wanted Output Test Signals:	
• Transmitter Power (measured maximum output power):	764-775 MHz bands: 34.94 dBm 851-869 MHz bands: 34.93 dBm
• Normal Test Modulation:	F3E, F1E and F1D
• Modulating signal source:	External for analog mode/Internal for digital mode

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).

- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 91038) and Industry Canada office (Industry Canada File No.: 2049A-3). Expiry Date: 2017-04-02.

4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Applicability (Yes/No)
2.1046 & 90.205	RF Power Output	Yes
2.1047(a)	Modulation Characteristics - Audio Frequency Response	Yes
2.1047(b)	Modulation Characteristics - Modulation Limiting	Yes
2.1049, 90.209 & 90.210	Occupied Bandwidth and Emission Limitations/Masks	Yes
2.1051, 2.1057, 90.210 & 90.543(b)	Spurious Emissions at Antenna Terminal	Yes
2.1053, 2.1057, 90.210 & 90.543(b)	Field Strength of Spurious Emissions	Yes
2.1055, 90.213 & 90.539	Frequency Stability	Yes
90.214	Transient Frequency Behavior	Yes
90.543(a)	Adjacent Channel Power	Yes
1.1307, 1.1310 & 2.1091	RF Exposure Limit	Yes
15.207	AC Power Line Conducted Emissions	Yes

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None

4.4. DEVIATION OF STANDARD TEST PROCEDURES

None

EXHIBIT 5. TEST DATA

5.1. RF POWER OUTPUT [§§ 2.1046 & 90.205]

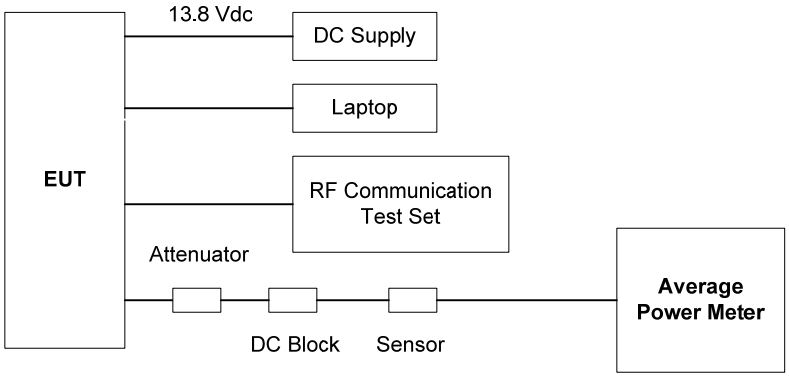
5.1.1. Limits

Please refer to FCC 47 CFR § 90.205 for specification details.

5.1.2. Method of Measurements

Refer to Section 8.1 of this report for measurement details.

5.1.3. Test Arrangement



5.1.4. Test Data

Power Setting	Frequency (MHz)	Measured Conducted Power Output		Power Output Rating	
		(dBm)	(W)	(dBm)	(W)
764 - 775 MHz Band					
High	764.025	34.74	2.98	34.77	3
	770.000	34.77	3.00	34.77	3
	774.975	34.94	3.12	34.77	3
Low	764.025	26.95	0.50	26.99	0.5
	770.000	26.98	0.50	26.99	0.5
	774.975	27.13	0.52	26.99	0.5
851 - 854 MHz Band					
High	851.025	34.93	3.11	34.77	3
	853.975	34.89	3.08	34.77	3
Low	851.025	27.15	0.52	26.99	0.5
	853.975	27.13	0.52	26.99	0.5
854 - 869 MHz Band					
High	854.025	34.89	3.08	34.77	3
	861.500	34.80	3.02	34.77	3
	868.975	34.64	2.91	34.77	3
Low	854.025	27.13	0.52	26.99	0.5
	861.500	27.01	0.50	26.99	0.5
	868.975	26.94	0.49	26.99	0.5

5.2. MODULATION CHARACTERISTICS - AUDIO FREQUENCY RESPONSE [§ 2.1047(a)]

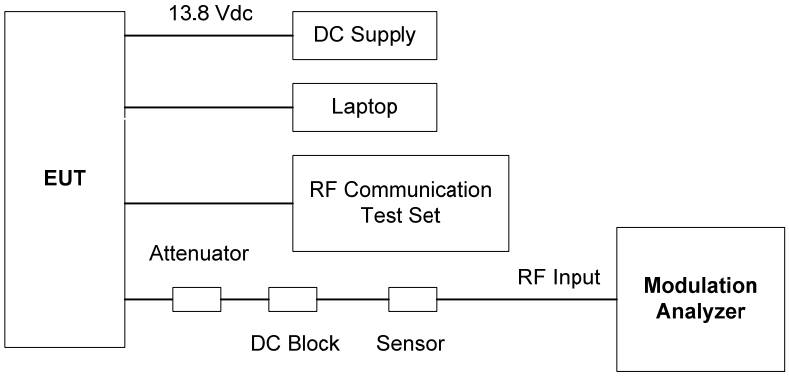
5.2.1. Limits

§ **2.1047(a):** Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

5.2.2. Method of Measurements

The rated audio input signal was applied to the input of the audio low-pass filter (or of all modulation stages) using an audio oscillator, this input signal level and its corresponding output signal were then measured and recorded using the FFT Digital Spectrum Analyzer. Tests were repeated at different audio signal frequencies from 0 to 50 KHz.

5.2.3. Test Arrangement

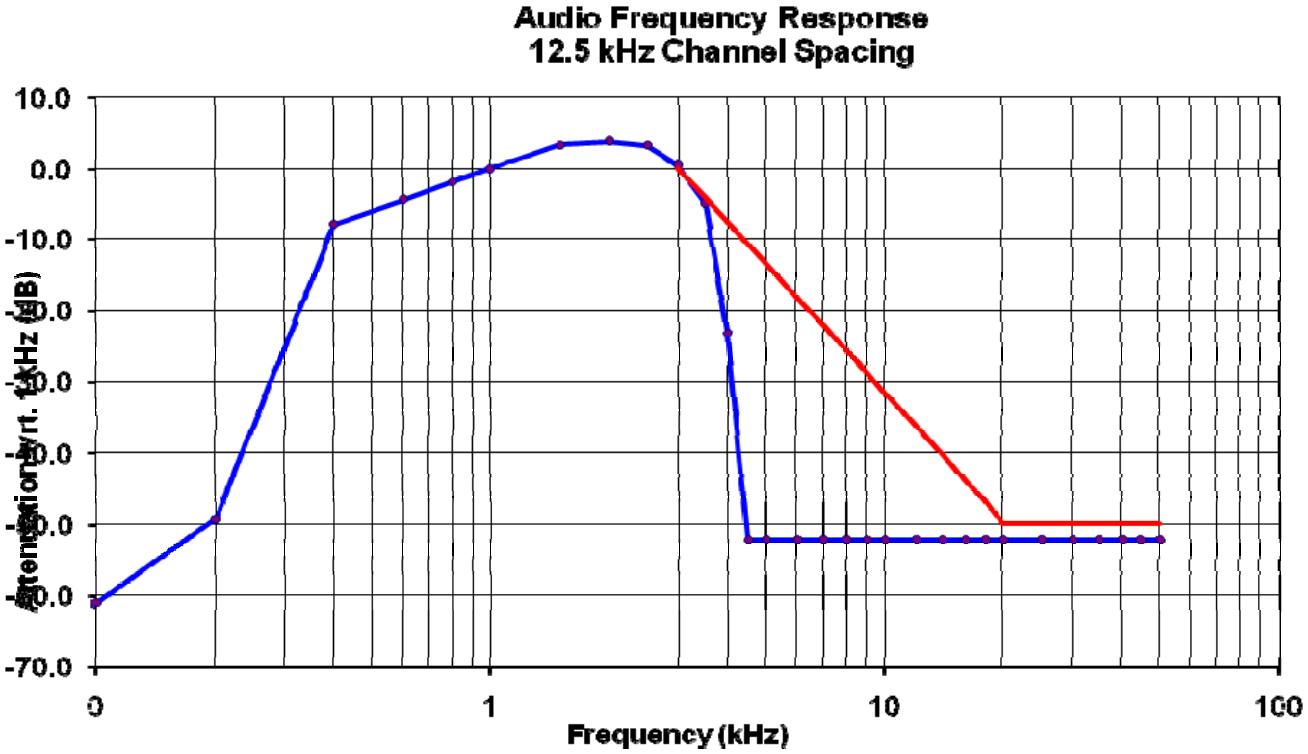


5.2.4. Test Data

5.2.4.1. 12.5 kHz Channel Spacing, 764.025 MHz, F3E, Frequency of All Modulation States

Remark: Due to the difficulty of measuring the Frequency Response of the internal low-pass filter, the Frequency Response of All Modulation States is performed to show the roll-off at 3 kHz in comparison with the recommended audio filter attenuation.

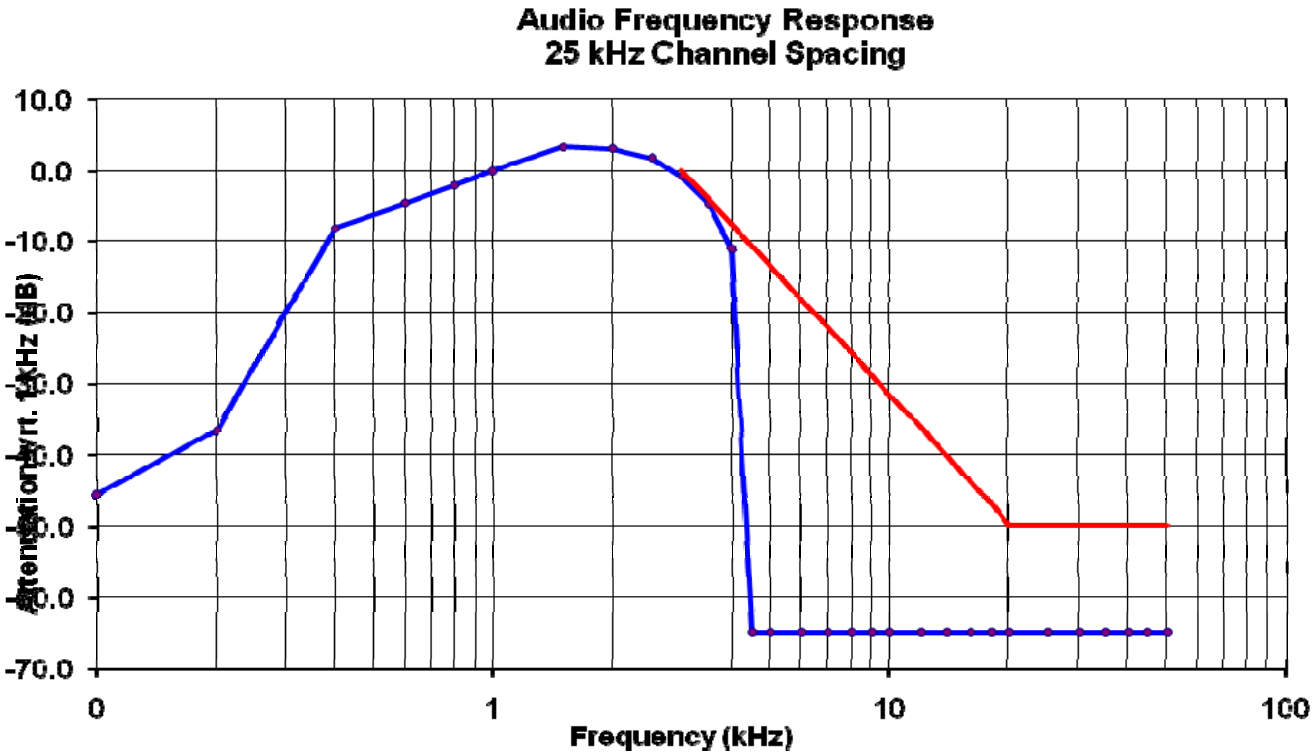
Frequency (kHz)	Audio In (dBV)	Audio Out (dBV)	Attenuation (Out - In) (dB)	Attenuation Rel. to 1 KHz (dB)	Recommended Attenuation (dB)
0.1	-9.25	-60.78	-51.5	-61.0	--
0.2	-9.25	-49.05	-39.8	-49.3	--
0.4	-9.25	-7.55	1.7	-7.8	--
0.6	-9.25	-4.18	5.1	-4.4	--
0.8	-9.25	-1.57	7.7	-1.8	--
1.0	-9.25	0.23	9.5	0.0	--
1.5	-9.25	3.62	12.9	3.4	--
2.0	-9.25	4.07	13.3	3.8	--
2.5	-9.25	3.58	12.8	3.4	--
3.0	-9.25	0.68	9.9	0.4	0
3.5	-9.25	-4.72	4.5	-5.0	-4
4.0	-9.25	-22.75	-13.5	-23.0	-7
4.5	-9.25	-52.0	-42.8	-52.2	-11
5.0	-9.25	-52.0	-42.8	-52.2	-13
6.0	-9.25	-52.0	-42.8	-52.2	-18
7.0	-9.25	-52.0	-42.8	-52.2	-22
8.0	-9.25	-52.0	-42.8	-52.2	-26
9.0	-9.25	-52.0	-42.8	-52.2	-29
10.0	-9.25	-52.0	-42.8	-52.2	-31
12.0	-9.25	-52.0	-42.8	-52.2	-36
14.0	-9.25	-52.0	-42.8	-52.2	-40
16.0	-9.25	-52.0	-42.8	-52.2	-44
18.0	-9.25	-52.0	-42.8	-52.2	-47
20.0	-9.25	-52.0	-42.8	-52.2	-50
25.0	-9.25	-52.0	-42.8	-52.2	-50
30.0	-9.25	-52.0	-42.8	-52.2	-50
35.0	-9.25	-52.0	-42.8	-52.2	-50
40.0	-9.25	-52.0	-42.8	-52.2	-50
45.0	-9.25	-52.0	-42.8	-52.2	-50
50.0	-9.25	-52.0	-42.8	-52.2	-50



5.2.4.2. 25 kHz Channel Spacing, 764.025 MHz, F3E, Frequency of All Modulation States

Remark: Due to the difficulty of measuring the Frequency Response of the internal low-pass filter, the Frequency Response of All Modulation States is performed to show the roll-off at 3 kHz in comparison with the recommended audio filter attenuation.

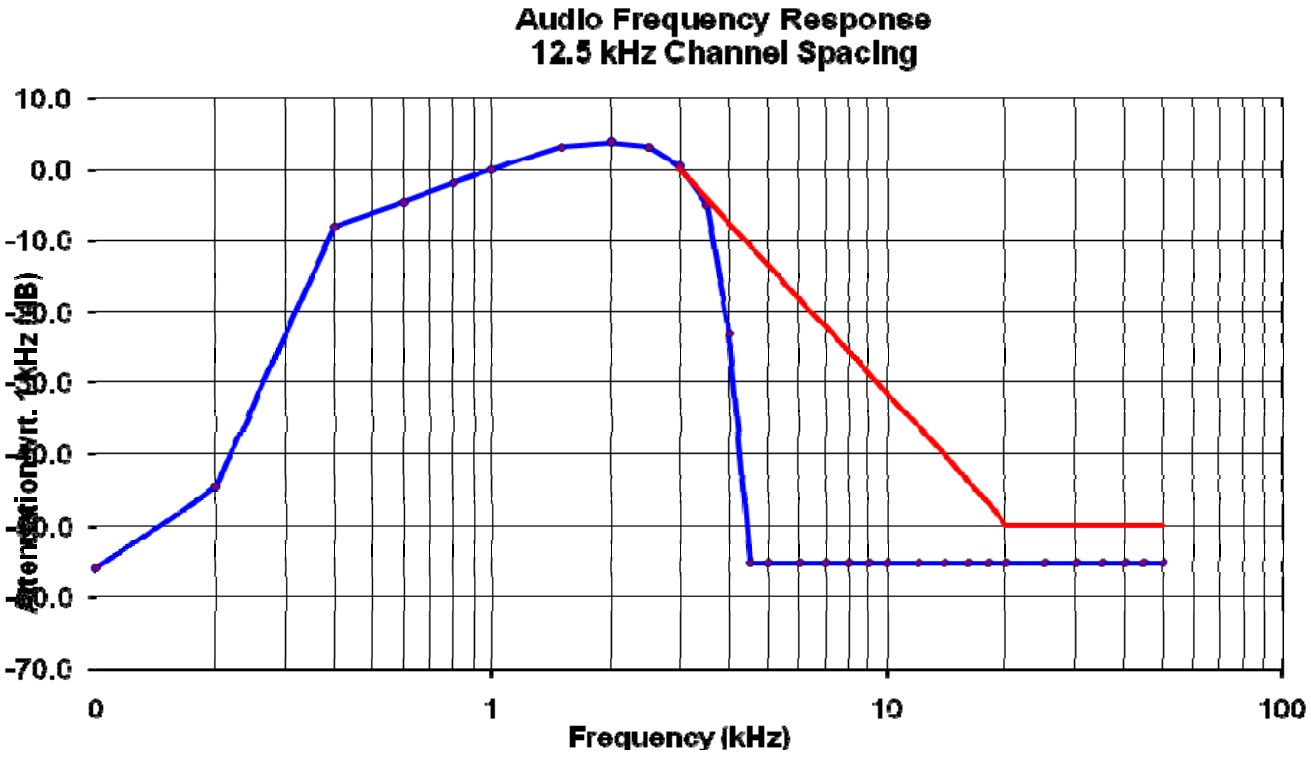
Frequency (kHz)	Audio In (dBV)	Audio Out (dBV)	Attenuation (Out - In) (dB)	Attenuation Rel. to 1 KHz (dB)	Recommended Attenuation (dB)
0.1	-20.93	-50.70	-29.8	-45.5	--
0.2	-20.93	-41.70	-20.8	-36.5	--
0.4	-20.93	-13.30	7.6	-8.1	--
0.6	-20.93	-9.75	11.2	-4.6	--
0.8	-20.93	-7.13	13.8	-1.9	--
1.0	-20.93	-5.20	15.7	0.0	--
1.5	-20.93	-1.75	19.2	3.5	--
2.0	-20.93	-2.00	18.9	3.2	--
2.5	-20.93	-3.50	17.4	1.7	--
3.0	-20.93	-6.00	14.9	-0.8	0
3.5	-20.93	-10.00	10.9	-4.8	-4
4.0	-20.93	-16.15	4.8	-11.0	-7
4.5	-20.93	-70.00	-49.1	-64.8	-11
5.0	-20.93	-70.00	-49.1	-64.8	-13
6.0	-20.93	-70.00	-49.1	-64.8	-18
7.0	-20.93	-70.00	-49.1	-64.8	-22
8.0	-20.93	-70.00	-49.1	-64.8	-26
9.0	-20.93	-70.00	-49.1	-64.8	-29
10.0	-20.93	-70.00	-49.1	-64.8	-31
12.0	-20.93	-70.00	-49.1	-64.8	-36
14.0	-20.93	-70.00	-49.1	-64.8	-40
16.0	-20.93	-70.00	-49.1	-64.8	-44
18.0	-20.93	-70.00	-49.1	-64.8	-47
20.0	-20.93	-70.00	-49.1	-64.8	-50
25.0	-20.93	-70.00	-49.1	-64.8	-50
30.0	-20.93	-70.00	-49.1	-64.8	-50
35.0	-20.93	-70.00	-49.1	-64.8	-50
40.0	-20.93	-70.00	-49.1	-64.8	-50
45.0	-20.93	-70.00	-49.1	-64.8	-50
50.0	-20.93	-70.00	-49.1	-64.8	-50



5.2.4.3. 12.5 kHz Channel Spacing, 851.025 MHz, F3E, Frequency of All Modulation States

Remark: Due to the difficulty of measuring the Frequency Response of the internal low-pass filter, the Frequency Response of All Modulation States is performed to show the roll-off at 3 kHz in comparison with the recommended audio filter attenuation.

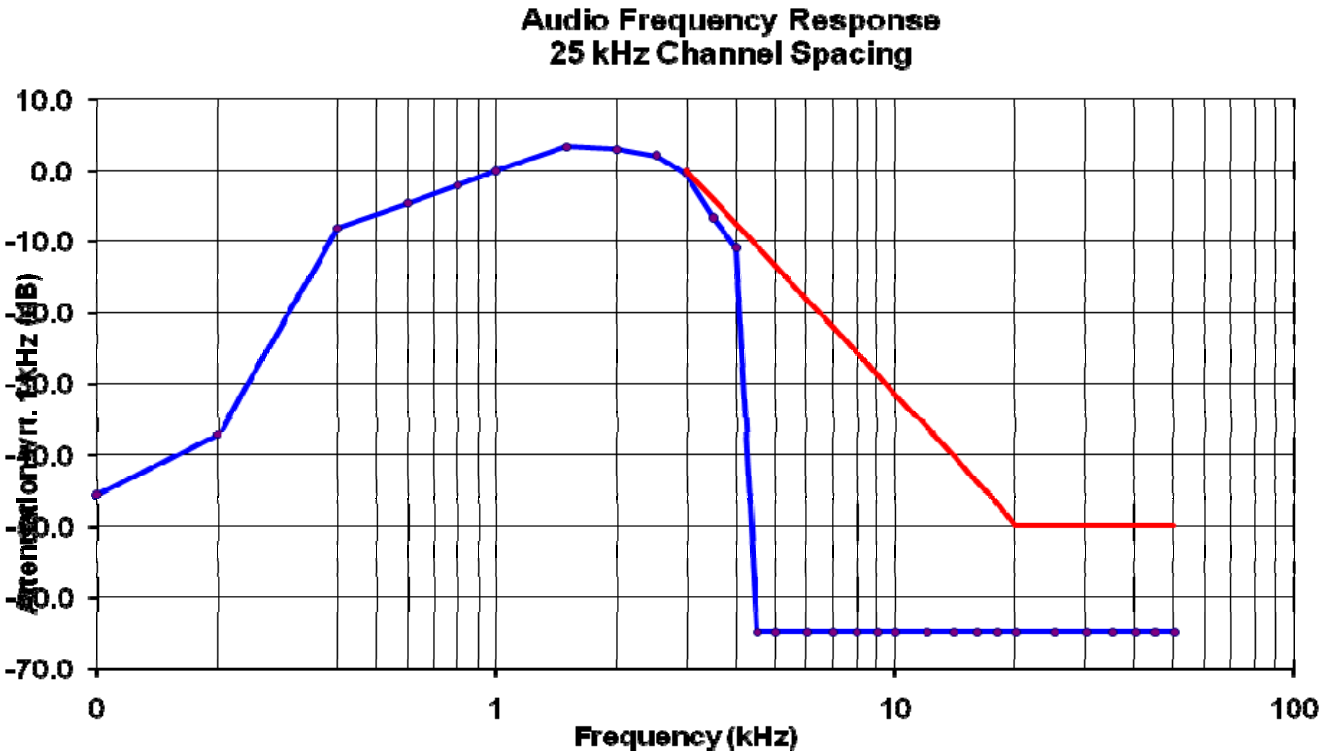
Frequency (kHz)	Audio In (dBV)	Audio Out (dBV)	Attenuation (Out - In) (dB)	Attenuation Rel. to 1 KHz (dB)	Recommended Attenuation (dB)
0.1	-25.92	-55.00	-29.1	-37.4	--
0.2	-25.92	-42.00	-16.1	-24.4	--
0.4	-25.92	-24.31	1.6	-6.7	--
0.6	-25.92	-20.87	5.1	-3.3	--
0.8	-25.92	-18.56	7.4	-1.0	--
1.0	-25.92	-17.58	8.3	0.0	--
1.5	-25.92	-16.87	9.1	0.7	--
2.0	-25.92	-16.82	9.1	0.8	--
2.5	-25.92	-16.95	9.0	0.6	--
3.0	-25.92	-18.20	7.7	-0.6	0
3.5	-25.92	-22.50	3.4	-4.9	-4
4.0	-25.92	-37.23	-11.3	-19.7	-7
4.5	-25.92	-70.00	-44.1	-52.4	-11
5.0	-25.92	-70.00	-44.1	-52.4	-13
6.0	-25.92	-70.00	-44.1	-52.4	-18
7.0	-25.92	-70.00	-44.1	-52.4	-22
8.0	-25.92	-70.00	-44.1	-52.4	-26
9.0	-25.92	-70.00	-44.1	-52.4	-29
10.0	-25.92	-70.00	-44.1	-52.4	-31
12.0	-25.92	-70.00	-44.1	-52.4	-36
14.0	-25.92	-70.00	-44.1	-52.4	-40
16.0	-25.92	-70.00	-44.1	-52.4	-44
18.0	-25.92	-70.00	-44.1	-52.4	-47
20.0	-25.92	-70.00	-44.1	-52.4	-50
25.0	-25.92	-70.00	-44.1	-52.4	-50
30.0	-25.92	-70.00	-44.1	-52.4	-50
35.0	-25.92	-70.00	-44.1	-52.4	-50
40.0	-25.92	-70.00	-44.1	-52.4	-50
45.0	-25.92	-70.00	-44.1	-52.4	-50
50.0	-25.92	-70.00	-44.1	-52.4	-50



5.2.4.4. 25 kHz Channel Spacing, 851.025 MHz, F3E, Frequency of All Modulation States

Remark: Due to the difficulty of measuring the Frequency Response of the internal low-pass filter, the Frequency Response of All Modulation States is performed to show the roll-off at 3 kHz in comparison with the recommended audio filter attenuation.

Frequency (kHz)	Audio In (dBV)	Audio Out (dBV)	Attenuation (Out - In) (dB)	Attenuation Rel. to 1 KHz (dB)	Recommended Attenuation (dB)
0.1	-20.93	-50.70	-29.8	-45.5	--
0.2	-20.93	-42.36	-21.4	-37.1	--
0.4	-20.93	-13.34	7.6	-8.1	--
0.6	-20.93	-9.78	11.2	-4.5	--
0.8	-20.93	-7.19	13.7	-2.0	--
1.0	-20.93	-5.24	15.7	0.0	--
1.5	-20.93	-1.77	19.2	3.5	--
2.0	-20.93	-2.20	18.7	3.0	--
2.5	-20.93	-3.20	17.7	2.0	--
3.0	-20.93	-5.70	15.2	-0.5	0
3.5	-20.93	-12.00	8.9	-6.8	-4
4.0	-20.93	-16.08	4.9	-10.8	-7
4.5	-20.93	-70.00	-49.1	-64.8	-11
5.0	-20.93	-70.00	-49.1	-64.8	-13
6.0	-20.93	-70.00	-49.1	-64.8	-18
7.0	-20.93	-70.00	-49.1	-64.8	-22
8.0	-20.93	-70.00	-49.1	-64.8	-26
9.0	-20.93	-70.00	-49.1	-64.8	-29
10.0	-20.93	-70.00	-49.1	-64.8	-31
12.0	-20.93	-70.00	-49.1	-64.8	-36
14.0	-20.93	-70.00	-49.1	-64.8	-40
16.0	-20.93	-70.00	-49.1	-64.8	-44
18.0	-20.93	-70.00	-49.1	-64.8	-47
20.0	-20.93	-70.00	-49.1	-64.8	-50
25.0	-20.93	-70.00	-49.1	-64.8	-50
30.0	-20.93	-70.00	-49.1	-64.8	-50
35.0	-20.93	-70.00	-49.1	-64.8	-50
40.0	-20.93	-70.00	-49.1	-64.8	-50
45.0	-20.93	-70.00	-49.1	-64.8	-50
50.0	-20.93	-70.00	-49.1	-64.8	-50



5.3. MODULATION CHARACTERISTICS - MODULATION LIMITING [§ 2.1047 (b)]

5.3.1. Limits

§ **2.1047(b):** Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.

Recommended frequency deviation characteristics are given below:

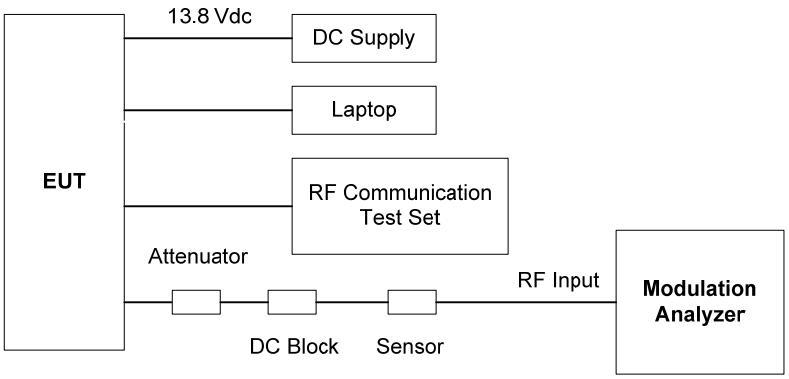
- 1.25 kHz for 6.25 kHz Channel Spacing System
- 2.5 kKHz for 12.5 kHz Channel Spacing System
- 5 kHz for 25 kHz Channel Spacing System

5.3.2. Method of Measurements

For Audio Transmitter: The carrier frequency deviation was measured with the tone input signal level varied from 0 Vp to audio input rating level plus 16 dB at frequencies 0.1, 0.5, 1.0, 3.0 and 5.0 kHz. The maximum deviation was recorded at each test condition.

For Data Transmitter with Maximum Frequency Deviation set by Factory: The EUT was set at maximum frequency deviation, and its peak frequency deviation was then measured using EUT's internal random data source.

5.3.3. Test Arrangement



5.3.4. Test Data

5.3.4.1. Voice Modulation Limiting for 12.5 kHz Channel Spacing Operation, 764.025 MHz

Modulating Signal Level	Peak Frequency Deviation (kHz) at the following modulating frequency:					Maximum Limit
(mVrms)	0.1 kHz	0.5 kHz	1.0 kHz	3.0 kHz	5.0 kHz	(kHz)
100	0.1	0.2	0.4	0.9	0.1	2.5
500	0.1	1.1	2.2	1.8	0.1	2.5
600	0.1	1.3	2.3	1.9	0.1	2.5
700	0.1	1.5	2.3	2.0	0.1	2.5
800	0.1	1.7	2.3	2.0	0.1	2.5
900	0.1	1.9	2.3	2.1	0.1	2.5
1000	0.1	2.1	2.3	2.2	0.1	2.5
1100	0.1	2.1	2.3	2.2	0.1	2.5
1200	0.1	2.1	2.3	2.2	0.1	2.5
1300	0.1	2.1	2.3	2.2	0.1	2.5
1400	0.1	2.1	2.3	2.2	0.1	2.5
1500	0.2	2.1	2.3	2.2	0.1	2.5
2000	0.4	2.1	2.3	2.2	0.1	2.5
2500	0.6	2.1	2.3	2.2	0.1	2.5
3000	0.7	2.2	2.3	2.2	0.1	2.5
3500	0.8	2.2	2.3	2.2	0.1	2.5

Voice Signal Input Level	= STD MOD Level + 16 dB = 50.63 dB(mVrms) + 16 dB = 66.63 dB(mVrms) = 2145 mVrms	
Modulation Frequency (kHz)	**Peak Deviation (kHz)**	**Maximum Limit (kHz)**
0.1	0.5	2.5
0.2	1.1	2.5
0.4	2.2	2.5
0.6	2.3	2.5
0.8	2.3	2.5
1.0	2.3	2.5
1.2	2.4	2.5
1.4	2.4	2.5
1.6	2.4	2.5
1.8	2.4	2.5
2.0	2.4	2.5
2.5	2.2	2.5
3.0	2.2	2.5
3.5	1.3	2.5
4.0	0.9	2.5
4.5	0.1	2.5
5.0	0.0	2.5
6.0	0.2	2.5
7.0	0.4	2.5
8.0	1.0	2.5
9.0	0.0	2.5
10.0	0.0	2.5

5.3.4.2. Voice Modulation Limiting for 25 kHz Channel Spacing Operation, 764.025 MHz

Modulating Signal Level	Peak Frequency Deviation (kHz) at the following modulating frequency:					Maximum Limit
(mVrms)	0.1 kHz	0.5 kHz	1.0 kHz	3.0 kHz	5.0 kHz	(kHz)
100	0.1	2.1	0.9	1.8	0.1	5
500	0.1	2.1	4.4	3.7	0.1	5
600	0.1	2.5	4.5	3.8	0.1	5
700	0.1	2.9	4.6	3.9	0.1	5
800	0.1	3.5	4.7	4.0	0.1	5
900	0.1	3.8	4.7	4.0	0.1	5
1000	0.1	4.2	4.7	4.0	0.1	5
1100	0.1	4.3	4.7	4.0	0.1	5
1200	0.1	4.3	4.7	4.4	0.1	5
1300	0.1	4.3	4.7	4.4	0.1	5
1400	0.3	4.3	4.6	4.4	0.1	5
1500	0.4	4.3	4.6	4.4	0.1	5
2000	0.8	4.3	4.6	4.4	0.1	5
2500	0.8	4.3	4.6	4.4	0.1	5
3000	1.4	4.3	4.6	4.4	0.1	5
3500	1.6	4.3	4.7	4.4	0.1	5

Voice Signal Input Level	= STD MOD Level + 16 dB = 50.88 dB(mVrms) + 16 dB = 66.88 dB(mVrms) =2208 mVrms	
Modulation Frequency (kHz)	**Peak Deviation (kHz)**	**Maximum Limit (kHz)**
0.1	1.0	5
0.2	2.2	5
0.4	4.4	5
0.6	4.5	5
0.8	4.5	5
1.0	4.7	5
1.2	4.8	5
1.4	4.8	5
1.6	4.8	5
1.8	4.9	5
2.0	4.9	5
2.5	4.4	5
3.0	4.4	5
3.5	2.8	5
4.0	1.8	5
4.5	0.2	5
5.0	0.1	5
6.0	0.4	5
7.0	0.9	5
8.0	2.2	5
9.0	2.9	5
10.0	0.1	5

5.3.4.3. Voice Modulation Limiting for 12.5 kHz Channel Spacing Operation, 806.1 MHz

Modulating Signal Level	Peak Frequency Deviation (kHz) at the following modulating frequency:					Maximum Limit
(mVrms)	0.1 kHz	0.5 kHz	1.0 kHz	3.0 kHz	5.0 kHz	(kHz)
100	0.1	0.3	0.5	0.9	0.1	2.5
500	0.1	1.1	2.2	1.9	0.1	2.5
600	0.1	1.3	2.3	1.9	0.1	2.5
700	0.1	1.5	2.3	1.9	0.1	2.5
800	0.1	1.8	2.3	2.0	0.1	2.5
900	0.1	1.9	2.3	2.0	0.1	2.5
1000	0.1	2.1	2.3	2.0	0.1	2.5
1100	0.1	2.1	2.3	2.2	0.1	2.5
1200	0.1	2.1	2.3	2.2	0.1	2.5
1300	0.1	2.1	2.3	2.2	0.1	2.5
1400	0.2	2.1	2.3	2.2	0.1	2.5
1500	0.2	2.1	2.3	2.2	0.1	2.5
2000	0.4	2.1	2.3	2.2	0.1	2.5
2500	0.6	2.1	2.3	2.2	0.1	2.5
3000	0.7	2.2	2.3	2.2	0.1	2.5
3500	0.8	2.2	2.3	2.2	0.1	2.5

Voice Signal Input Level	= STD MOD Level + 16 dB = 50.50 dB(mVrms) + 16 dB = 66.50 dB(mVrms) = 2113 mVrms	
Modulation Frequency (kHz)	**Peak Deviation (kHz)**	**Maximum Limit (kHz)**
0.1	0.5	2.5
0.2	1.1	2.5
0.4	2.2	2.5
0.6	2.3	2.5
0.8	2.3	2.5
1.0	2.3	2.5
1.2	2.4	2.5
1.4	2.4	2.5
1.6	2.4	2.5
1.8	2.5	2.5
2.0	2.4	2.5
2.5	2.2	2.5
3.0	2.2	2.5
3.5	1.4	2.5
4.0	0.9	2.5
4.5	0.2	2.5
5.0	0.1	2.5
6.0	0.2	2.5
7.0	0.4	2.5
8.0	1.1	2.5
9.0	1.3	2.5
10.0	0.1	2.5

5.3.4.4. Voice Modulation Limiting for 25 kHz Channel Spacing Operation, 806.1 MHz

Modulating Signal Level	Peak Frequency Deviation (kHz) at the following modulating frequency:					Maximum Limit
(mVrms)	0.1 kHz	0.5 kHz	1.0 kHz	3.0 kHz	5.0 kHz	(kHz)
100	0.1	2.1	0.9	1.8	0.1	5
500	0.1	2.2	4.3	3.7	0.1	5
600	0.1	2.6	4.5	3.9	0.1	5
700	0.1	3.0	4.5	4.0	0.1	5
800	0.1	3.5	4.5	4.1	0.1	5
900	0.1	3.8	4.6	4.1	0.1	5
1000	0.1	4.2	4.6	4.2	0.1	5
1100	0.1	4.3	4.6	4.3	0.1	5
1200	0.1	4.3	4.6	4.4	0.1	5
1300	0.1	4.3	4.7	4.4	0.1	5
1400	0.3	4.3	4.7	4.4	0.1	5
1500	0.4	4.3	4.7	4.4	0.1	5
2000	0.8	4.2	4.7	4.5	0.1	5
2500	1.3	4.2	4.7	4.5	0.1	5
3000	1.5	4.2	4.7	4.5	0.1	5
3500	1.5	4.2	4.7	4.5	0.1	5

Voice Signal Input Level	= STD MOD Level + 16 dB = 50.88 dB(mVrms) + 16 dB = 66.88 dB(mVrms) = 2208 mVrms	
Modulation Frequency (kHz)	**Peak Deviation (kHz)**	**Maximum Limit (kHz)**
0.1	1.1	5
0.2	2.3	5
0.4	4.4	5
0.6	4.5	5
0.8	4.6	5
1.0	4.7	5
1.2	4.8	5
1.4	4.8	5
1.6	4.8	5
1.8	4.9	5
2.0	4.9	5
2.5	4.5	5
3.0	4.5	5
3.5	2.8	5
4.0	1.8	5
4.5	0.2	5
5.0	0.1	5
6.0	0.4	5
7.0	0.9	5
8.0	2.1	5
9.0	2.9	5
10.0	0.1	5

5.3.4.5. Data Modulation Limiting for 12.5 kHz Channel Spacing Operation (Factory Setting)

Operating Mode	Data Rate	Peak Frequency Deviation (kHz)
764.025 MHz, Digital C4FM, 12.5 kHz channel spacing	Factory default setting	3.1
851.025 MHz, Digital C4FM, 12.5 kHz channel spacing	Factory default setting	3.1

5.4. OCCUPIED BANDWIDTH & EMISSION MASK [§§ 2.1049, 90.209 & 90.210]

5.4.1. Limits

Emissions shall be attenuated below the mean output power of the transmitter as follows:

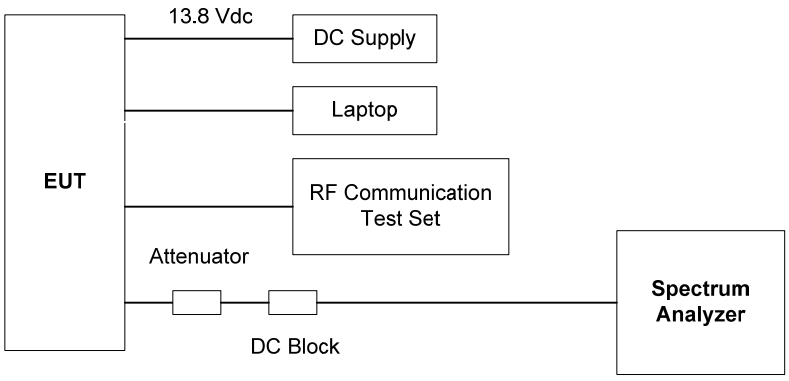
Frequency band (MHz)	Channel spacing (kHz)	Authorized bandwidth (kHz)	Applicable Emission Masks	
			Mask for equipment with Audio low pass filter	Mask for equipment without audio low pass filter
806-809/ 851-854	12.5	20	B	H
809-824/ 854-869 [5]	25	20	B	G

[5] Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of § 90.691.

5.4.2. Method of Measurements

Refer to Section 8.4 of this report for measurement details.

5.4.3. Test Arrangement



5.4.4. Test Data

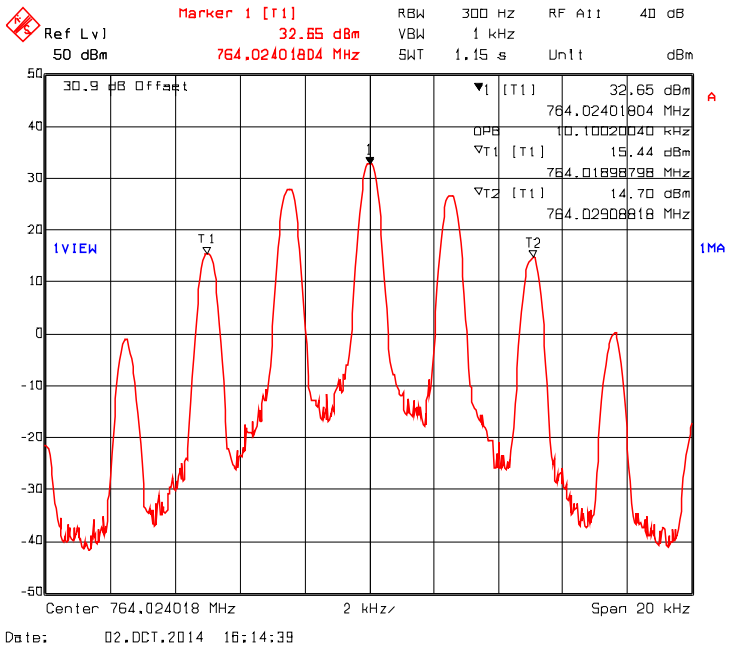
5.4.4.1. 99% Occupied Bandwidth

Frequency (MHz)	Channel Spacing (KHz)	Modulation	*Measured 99% OBW at Maximum Freq. Deviation (kHz)	Maximum Authorized Bandwidth (kHz)
764.025	25	16K0F3E	15.15	20.0
770.000	25	16K0F3E	15.15	20.0
774.975	25	16K0F3E	15.03	20.0
851.025	25	16K0F3E	15.09	20.0
853.975	25	16K0F3E	15.09	20.0
854.025	25	16K0F3E	15.03	20.0
861.500	25	16K0F3E	15.09	20.0
868.975	25	16K0F3E	15.03	20.0
764.025	12.5	11K0F3E	10.10	11.25
770.000	12.5	11K0F3E	10.06	11.25
774.975	12.5	11K0F3E	10.06	11.25
851.025	12.5	11K0F3E	10.06	11.25
853.975	12.5	11K0F3E	10.02	11.25
854.025	12.5	11K0F3E	10.02	11.25
861.500	12.5	11K0F3E	10.02	11.25
868.975	12.5	11K0F3E	10.02	11.25
764.025	12.5	8K10F1E, 8K10F1D	8.22	11.25
770.000	12.5	8K10F1E, 8K10F1D	8.46	11.25
774.975	12.5	8K10F1E, 8K10F1D	8.46	11.25
851.025	12.5	8K10F1E, 8K10F1D	8.14	11.25
853.975	12.5	8K10F1E, 8K10F1D	8.34	11.25
854.025	12.5	8K10F1E, 8K10F1D	8.46	11.25
861.500	12.5	8K10F1E, 8K10F1D	8.38	11.25
868.975	12.5	8K10F1E, 8K10F1D	8.34	11.25

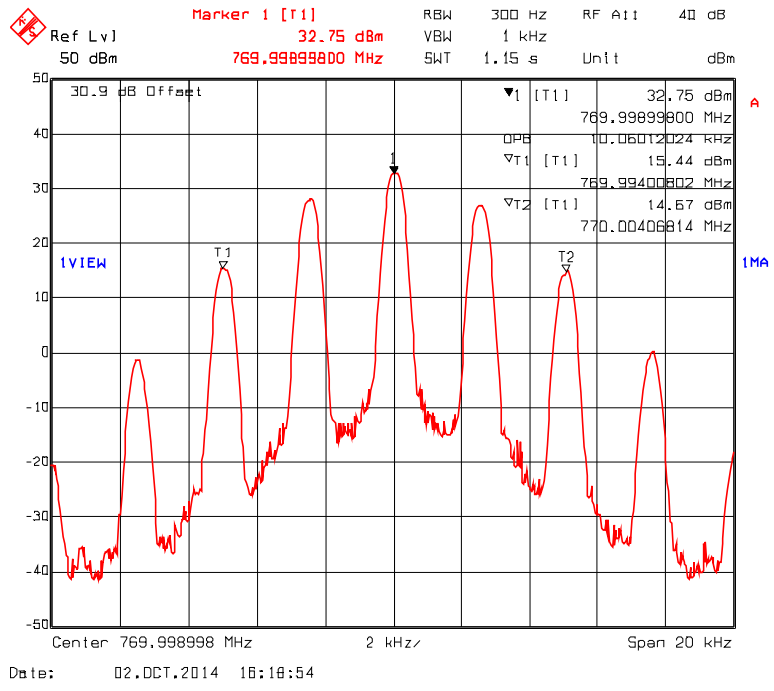
Note: 99% Occupied Bandwidth measurements were done using the built-in auto function of the analyzer.

See the following plots for detailed measurements.

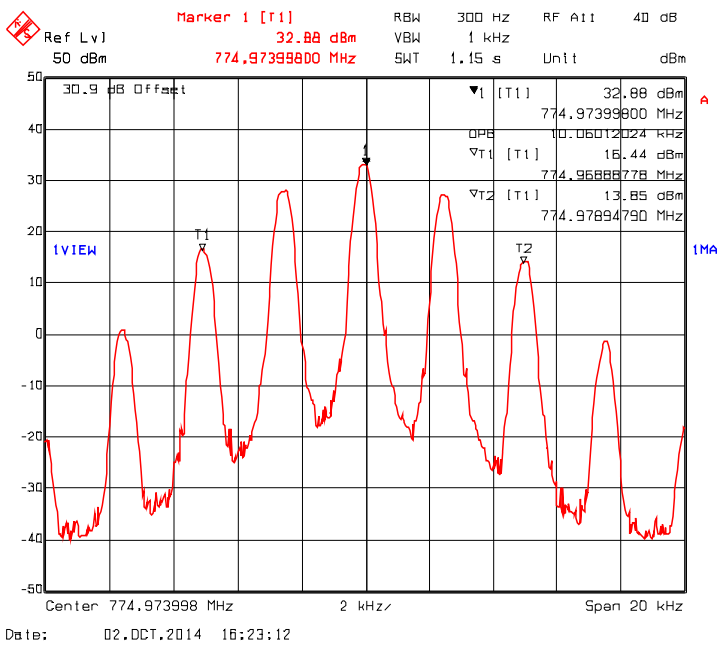
Plot 5.4.4.1.1. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F3E, 764.025 MHz



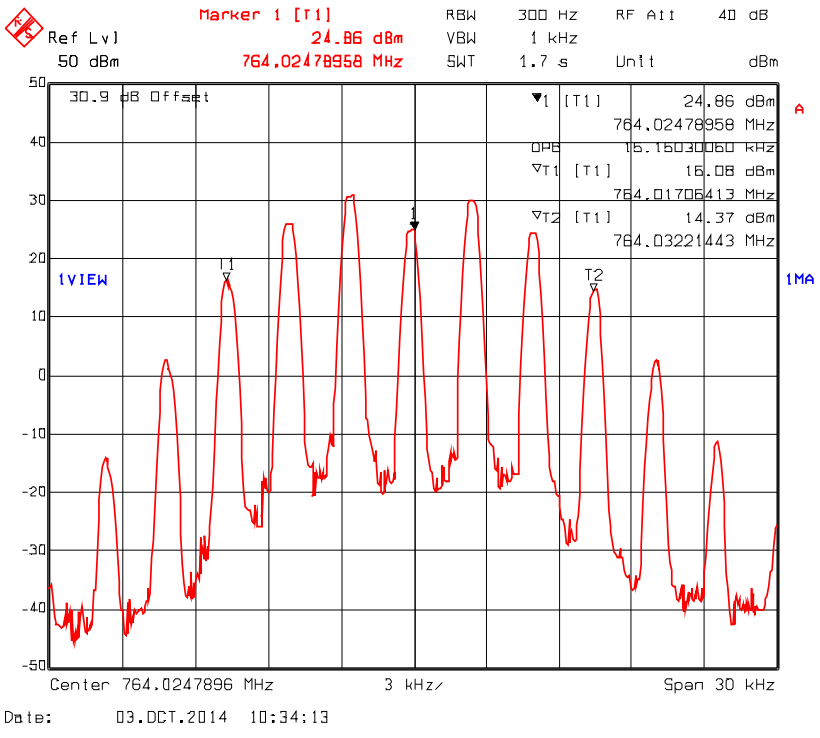
Plot 5.4.4.1.2. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F3E, 770.0 MHz



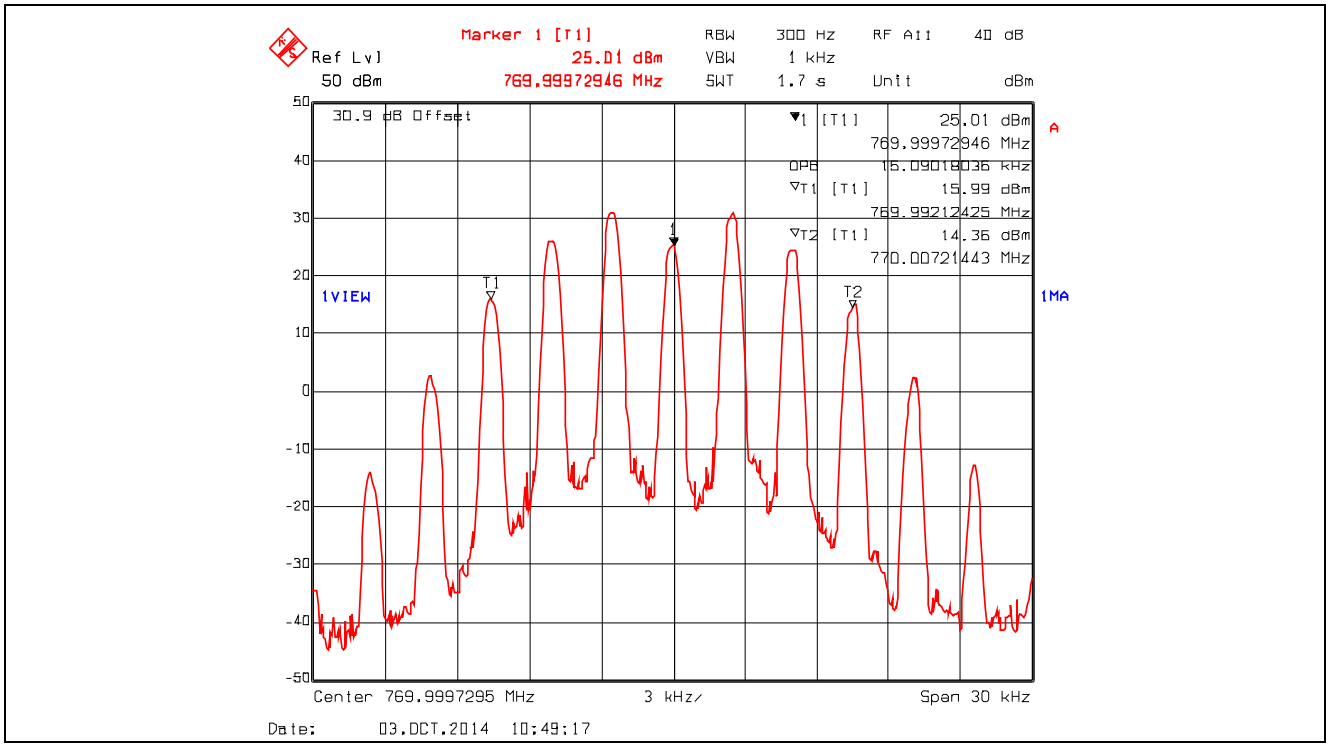
Plot 5.4.4.1.3. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F3E, 774.975 MHz



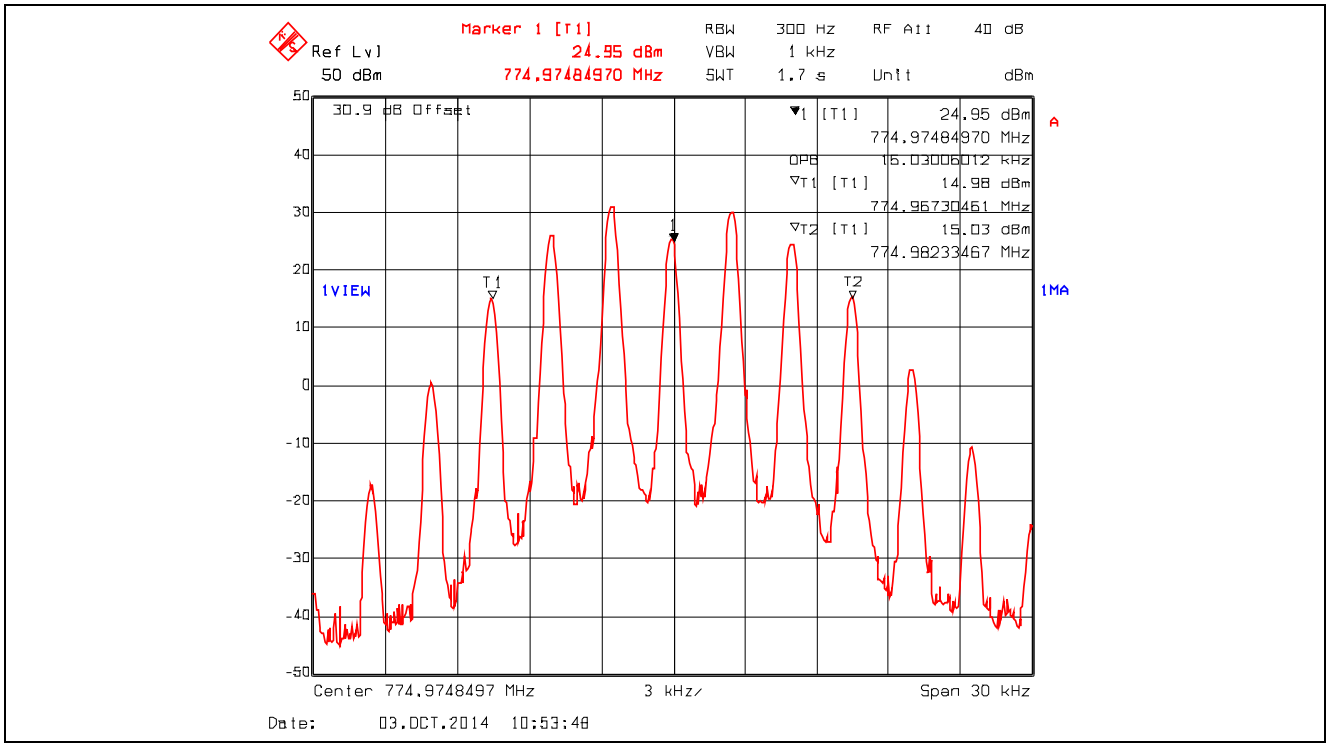
Plot 5.4.4.1.4. 99% Occupied Bandwidth, 25 kHz Channel Spacing, F3E, 764.025 MHz



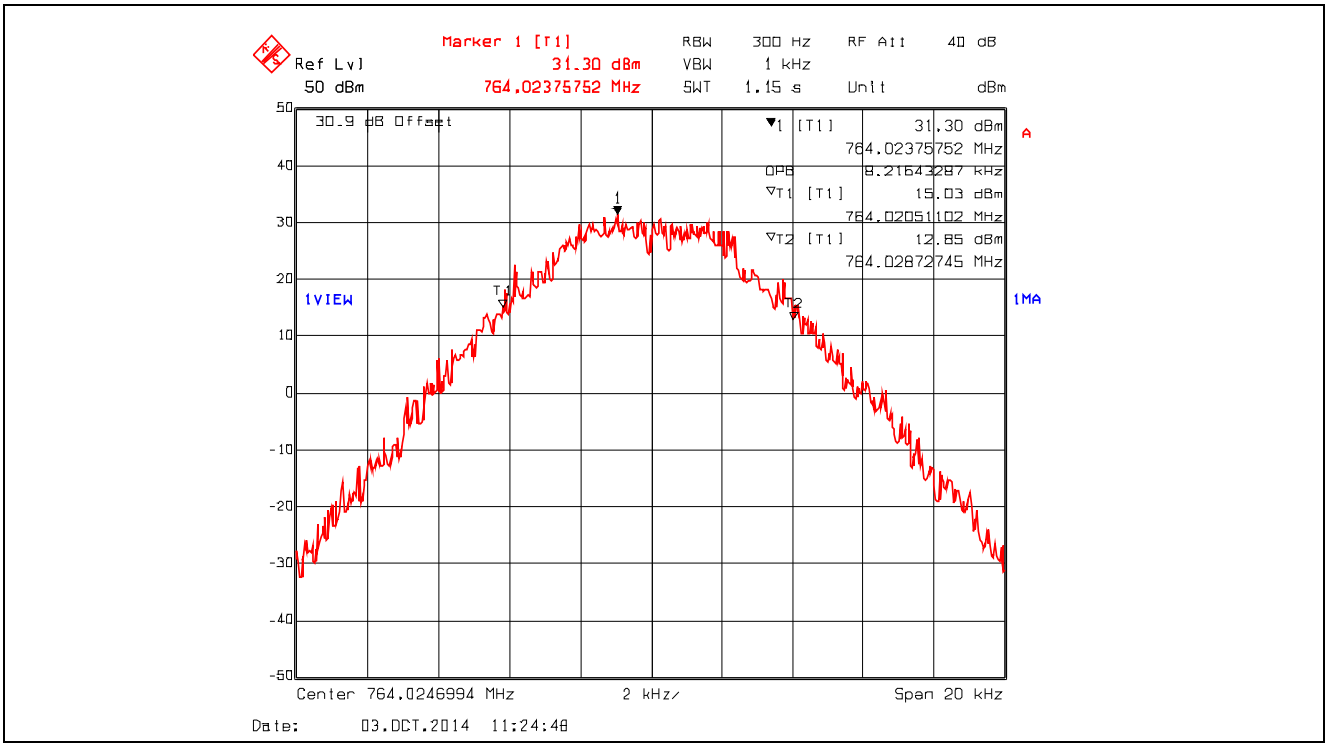
Plot 5.4.4.1.5. 99% Occupied Bandwidth, 25 kHz Channel Spacing, F3E, 770.0MHz



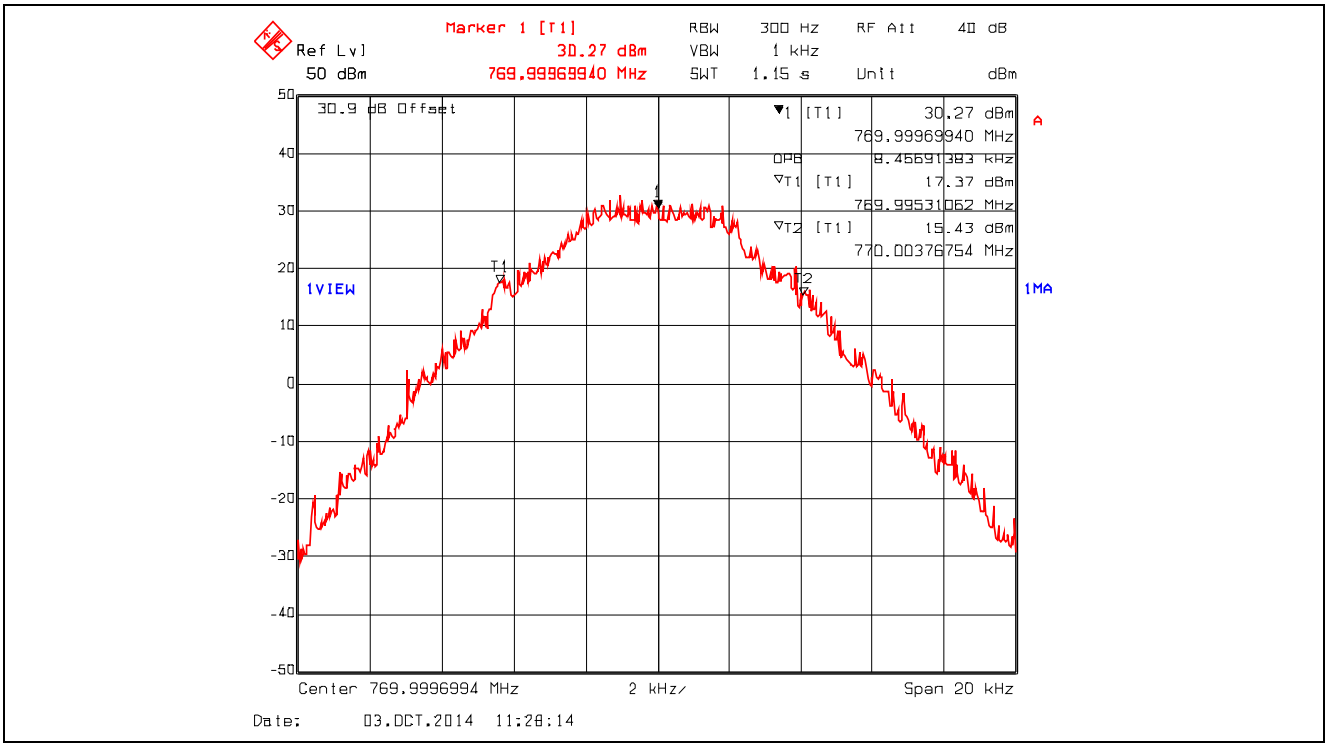
Plot 5.4.4.1.6. 99% Occupied Bandwidth, 25 kHz Channel Spacing, F3E, 774.975MHz



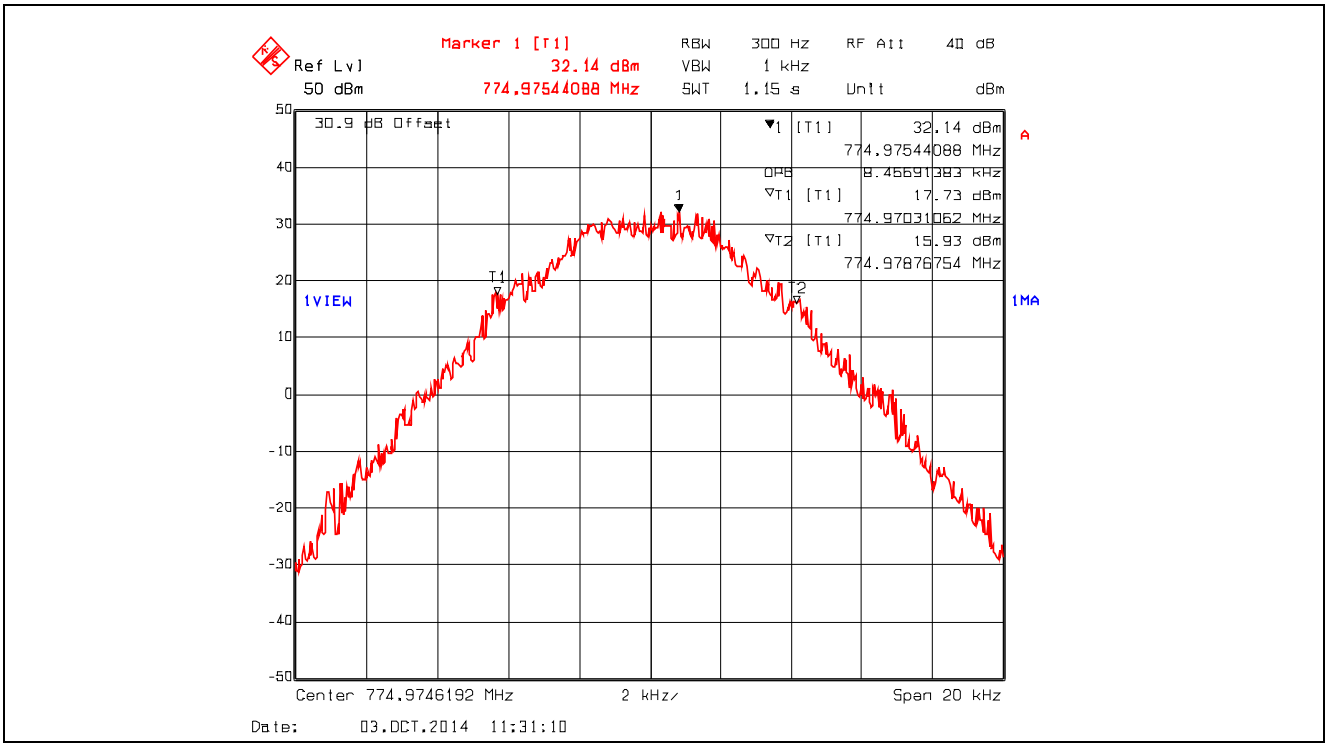
Plot 5.4.4.1.7. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F1E/F1D, 764.025 MHz



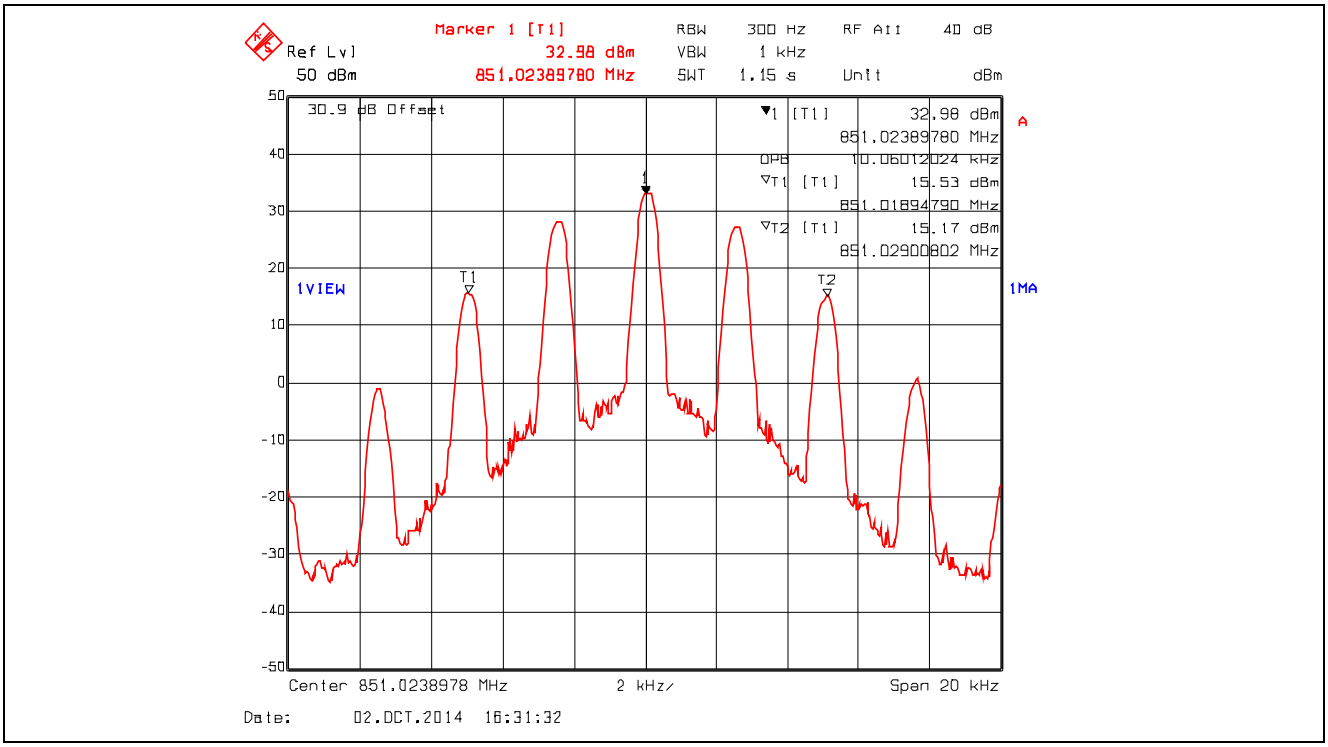
Plot 5.4.4.1.8. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F1E/F1D, 770.0 MHz



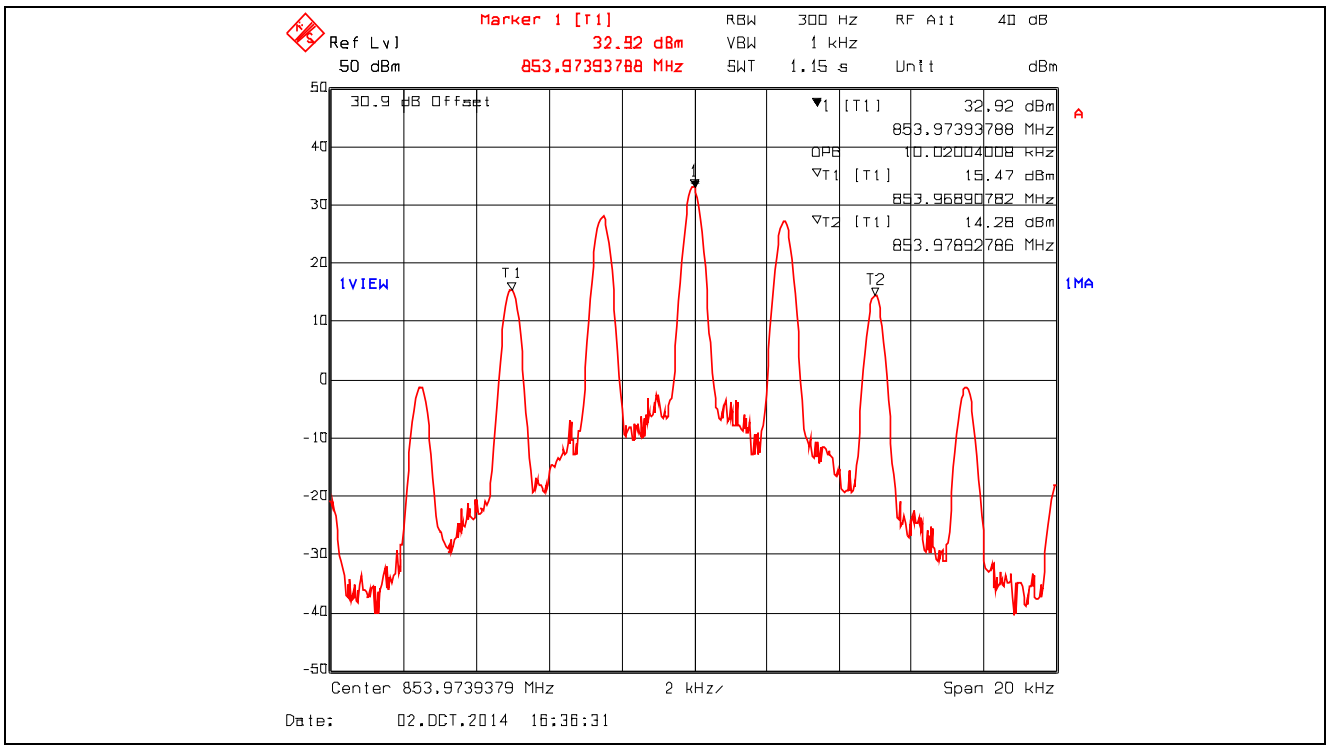
Plot 5.4.4.1.9. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F1E/F1D, 774.975 MHz



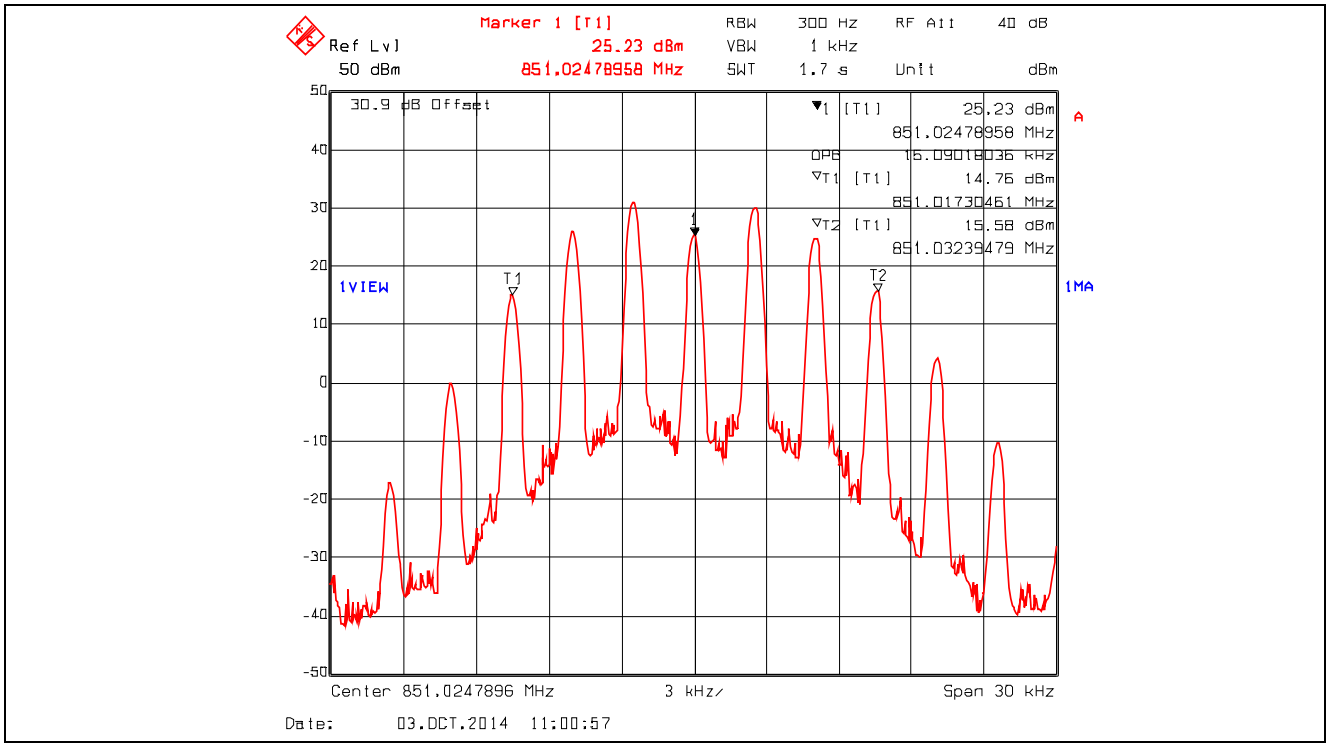
Plot 5.4.4.1.10. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F3E, 851.025 MHz



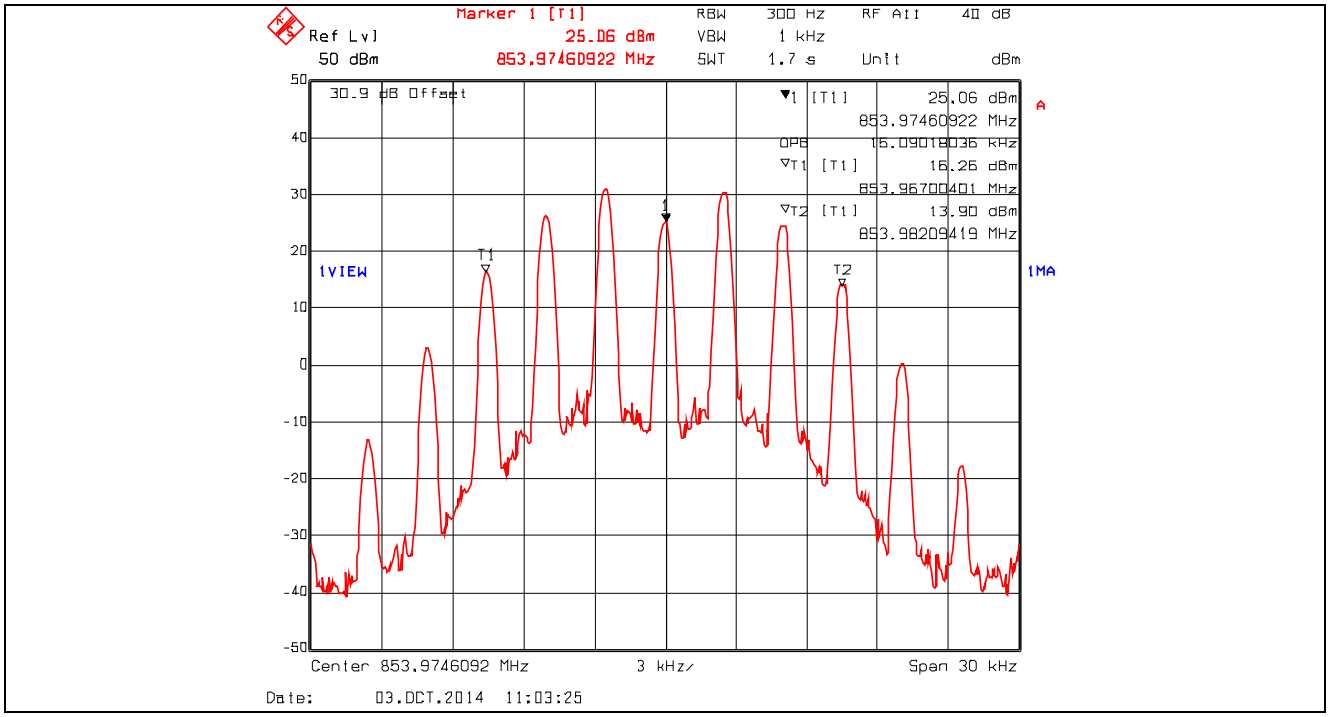
Plot 5.4.4.1.11. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F3E, 853.975 MHz



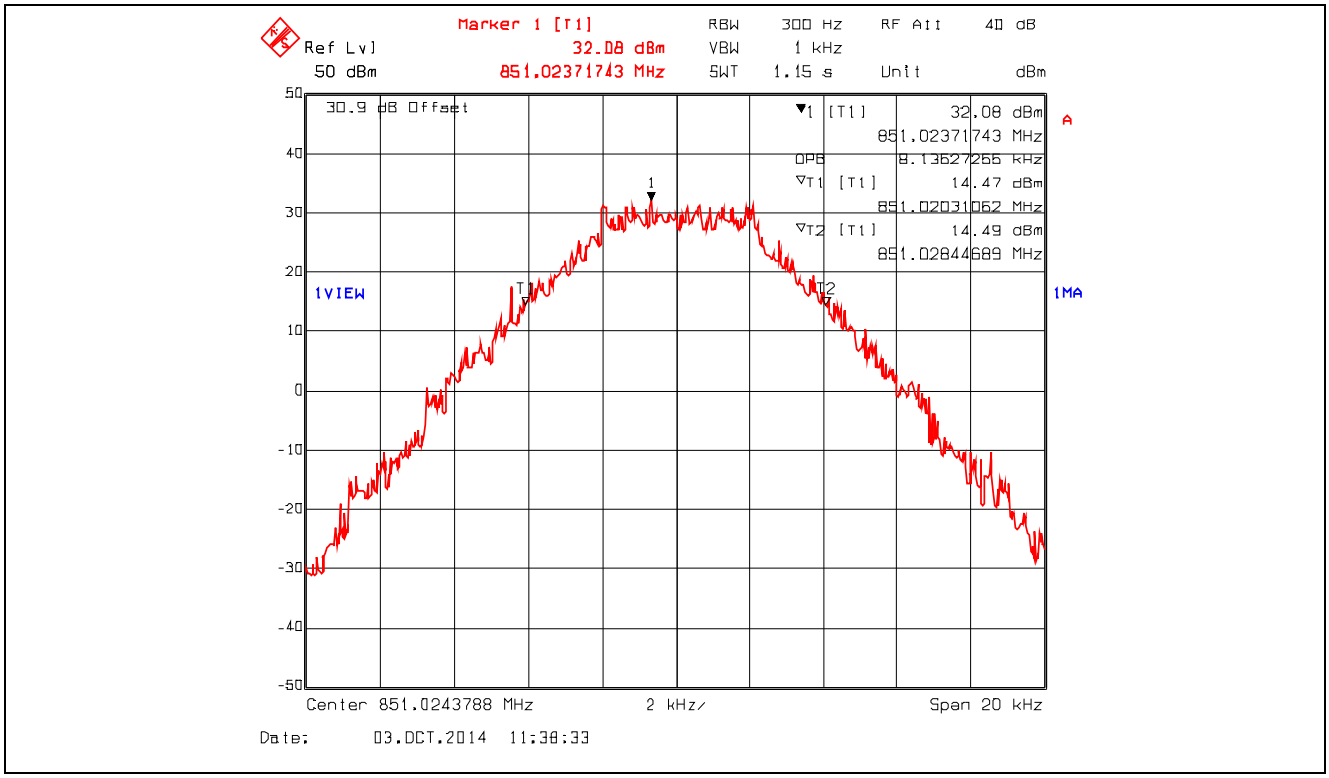
Plot 5.4.4.1.12. 99% Occupied Bandwidth, 25 kHz Channel Spacing, F3E, 851.025 MHz



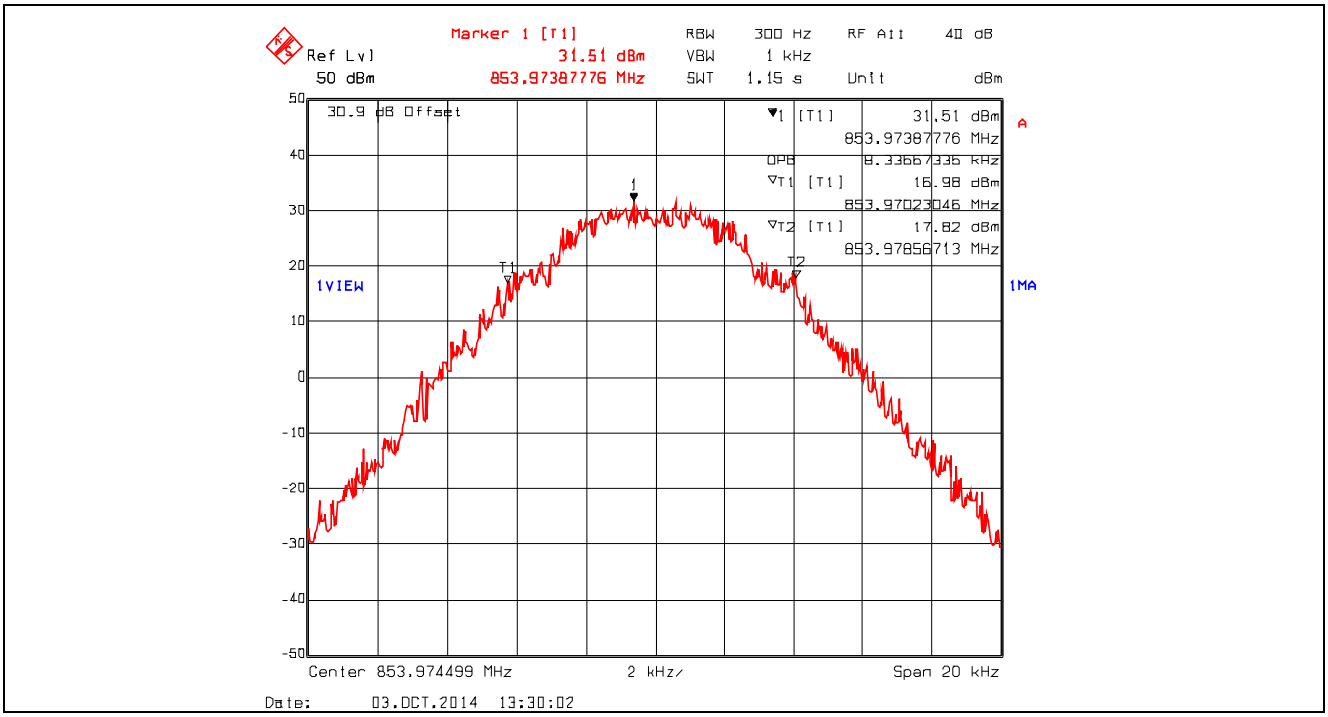
Plot 5.4.4.1.13. 99% Occupied Bandwidth, 25 kHz Channel Spacing, F3E, 853.975 MHz



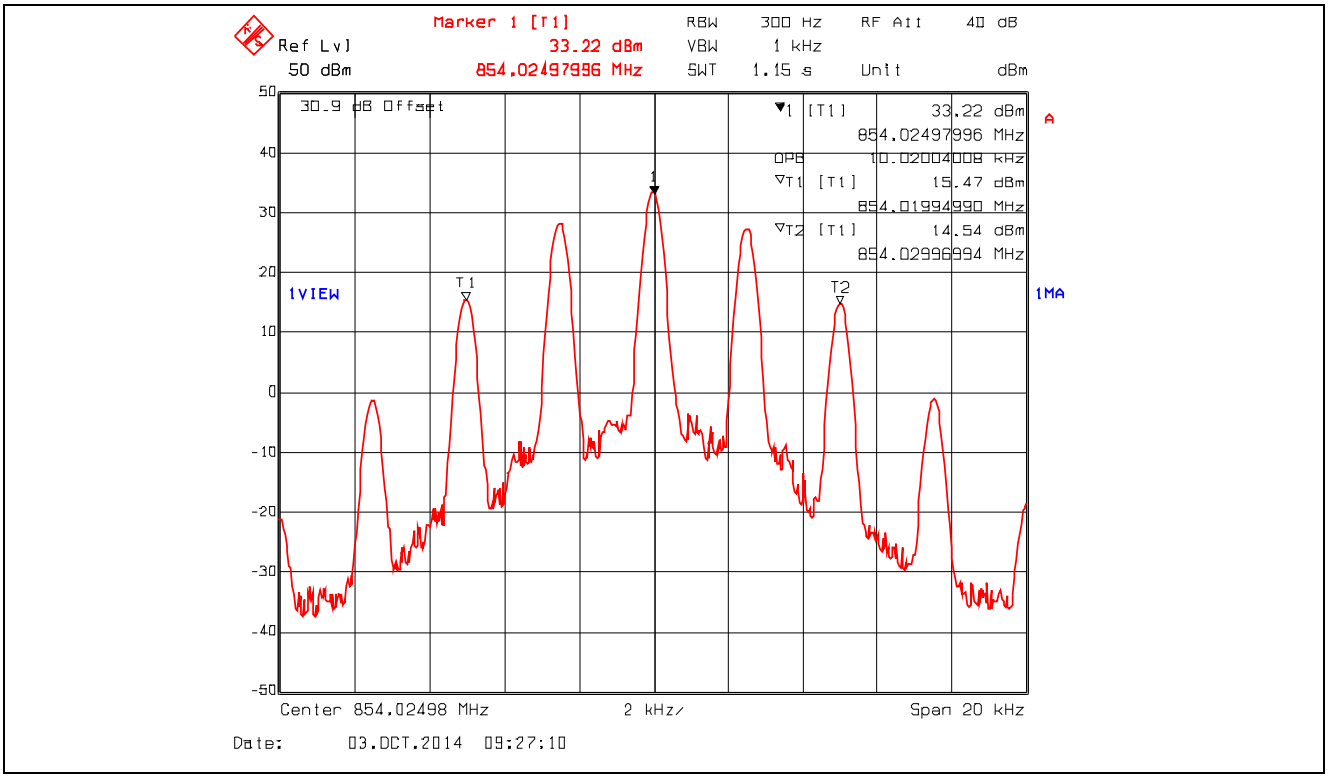
Plot 5.4.4.1.14. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F1E/F1D, 851.025 MHz



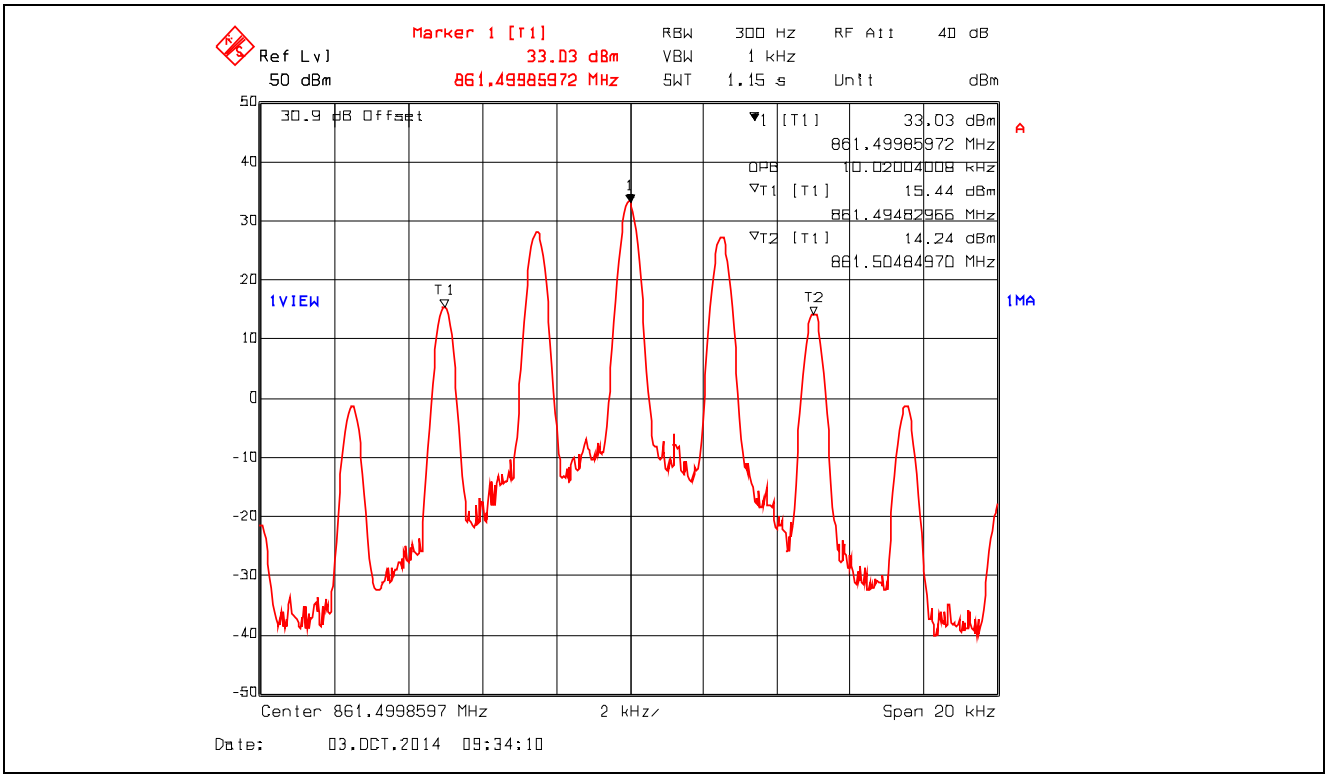
Plot 5.4.4.1.15. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F1E/F1D, 853.975 MHz



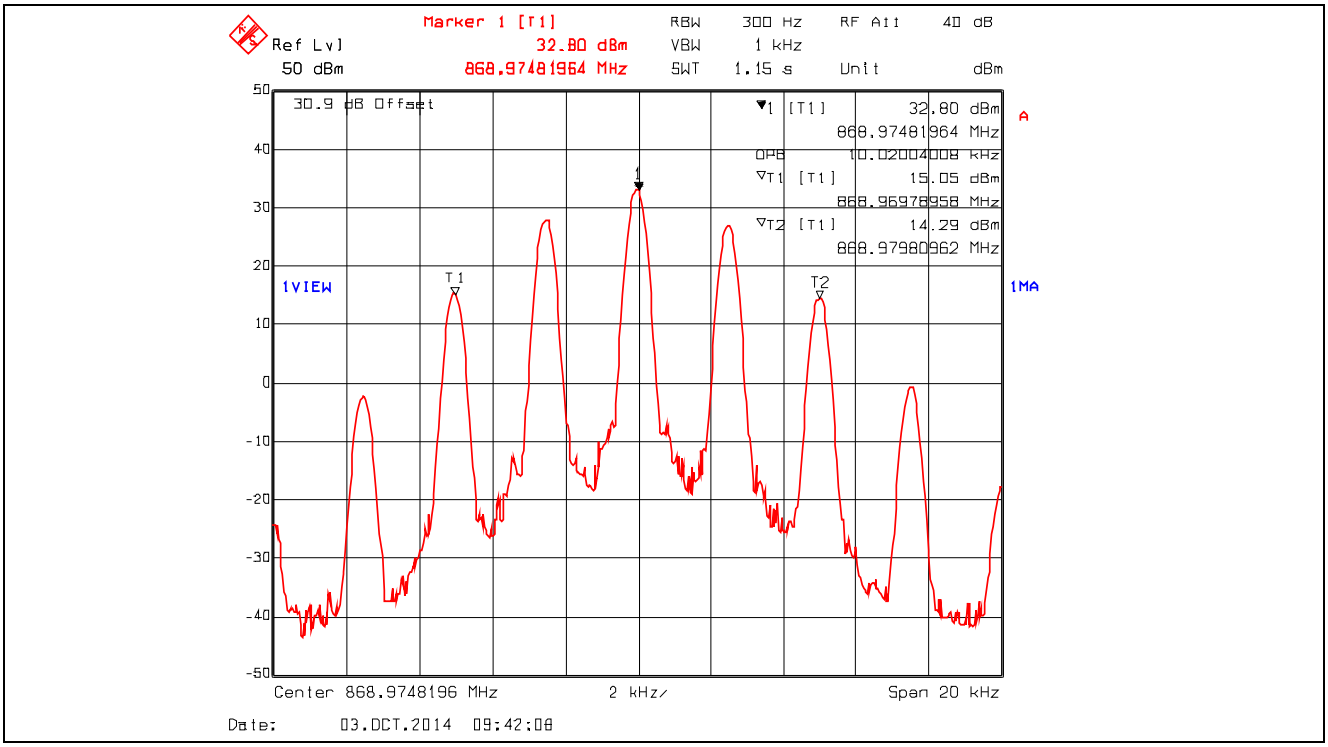
Plot 5.4.4.1.16. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F3E, 854.025 MHz



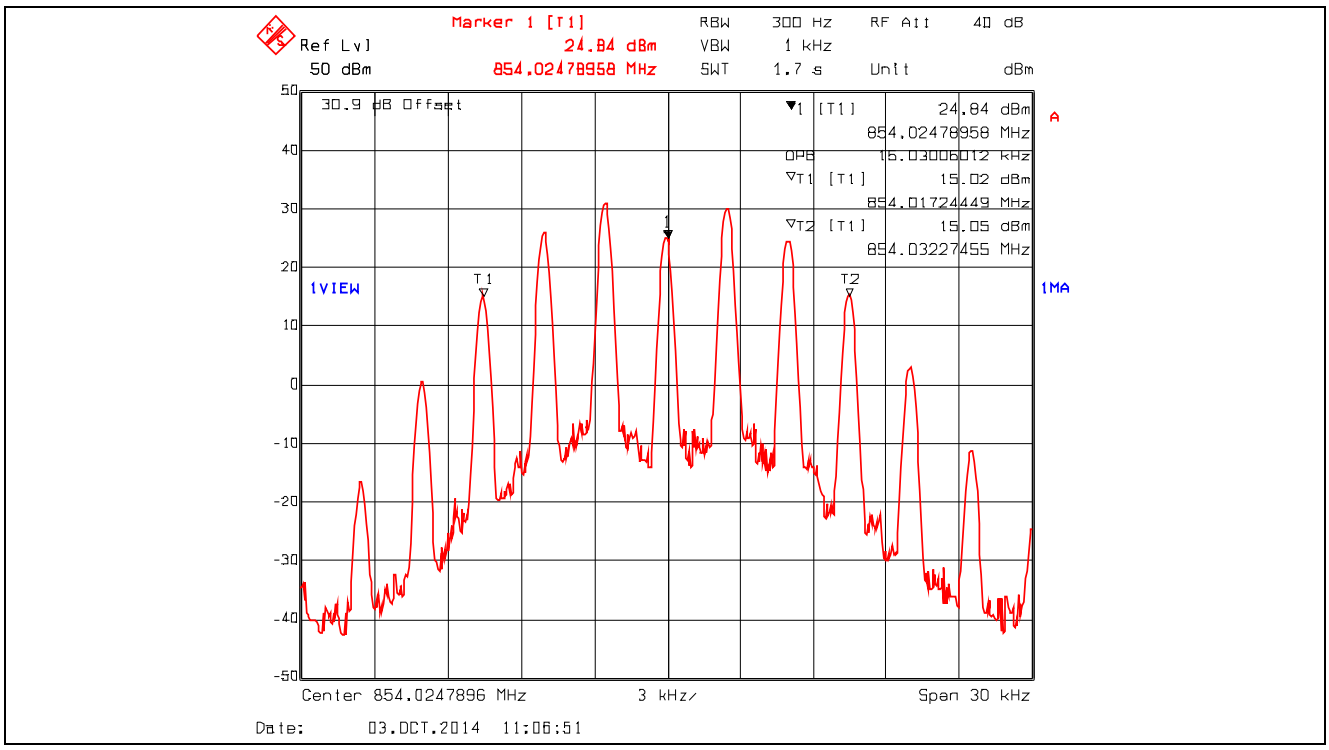
Plot 5.4.4.1.17. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F3E, 861.5 MHz



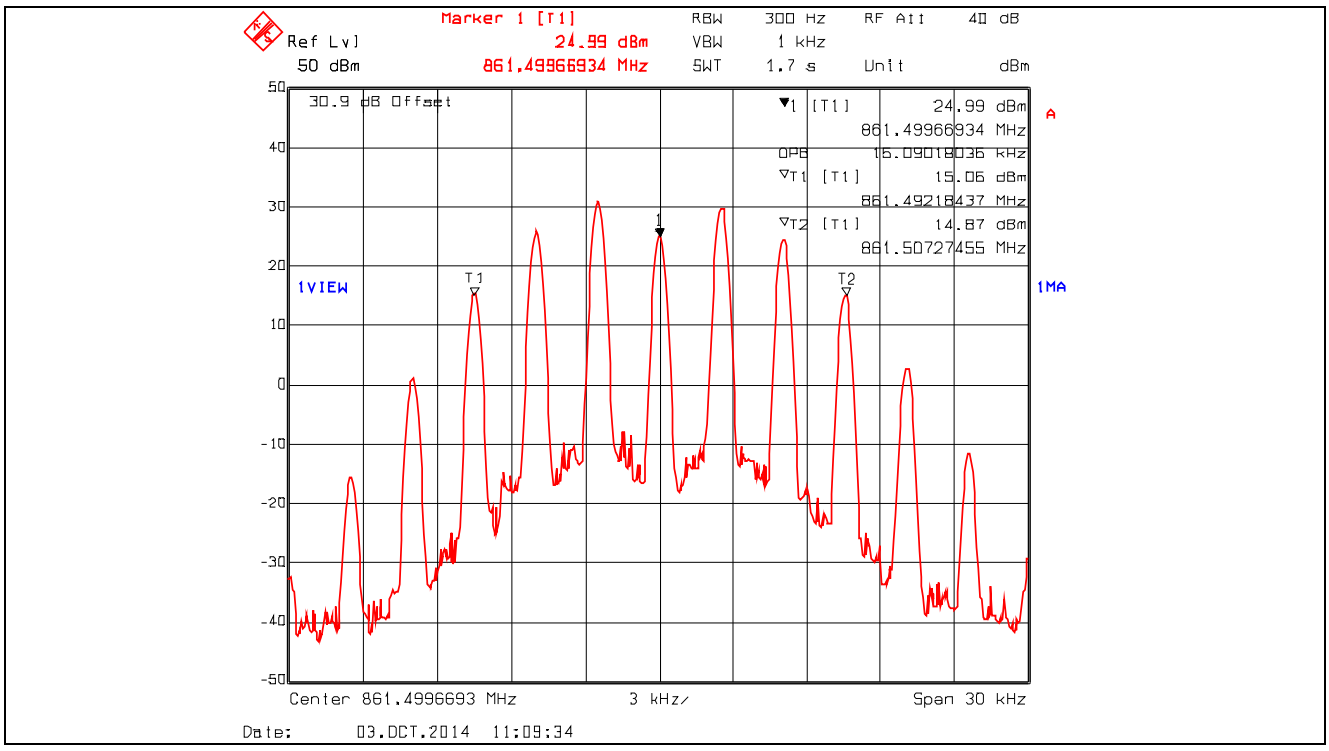
Plot 5.4.4.1.18. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F3E, 868.975 MHz



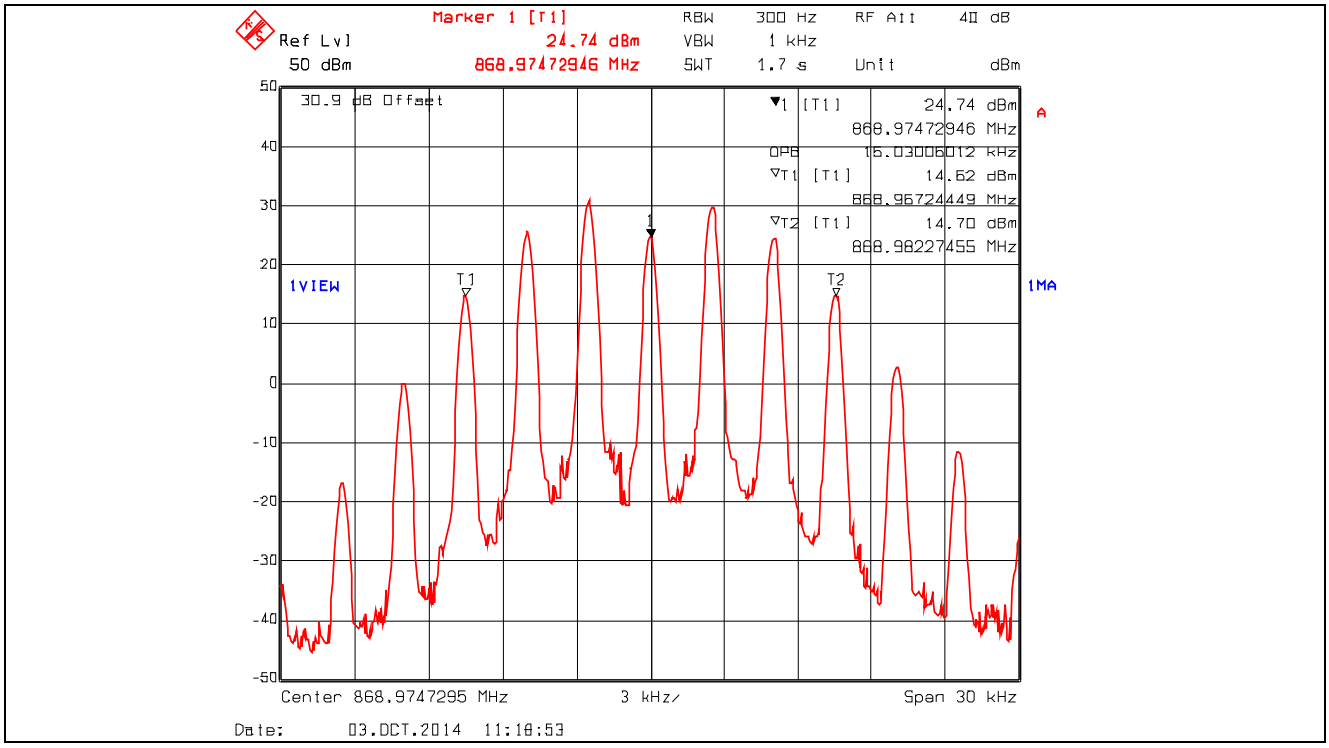
Plot 5.4.4.1.19. 99% Occupied Bandwidth, 25 kHz Channel Spacing, F3E, 854.025 MHz



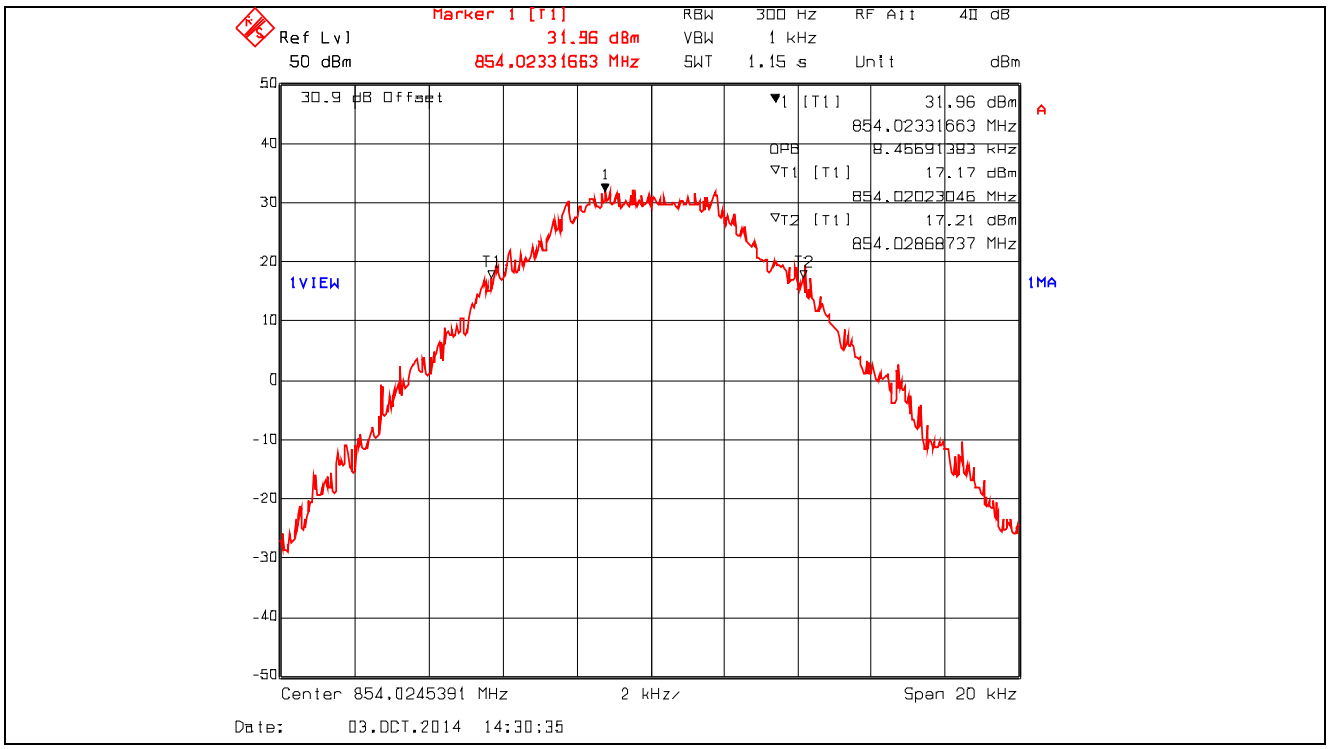
Plot 5.4.4.1.20. 99% Occupied Bandwidth, 25 kHz Channel Spacing, F3E, 861.5 MHz



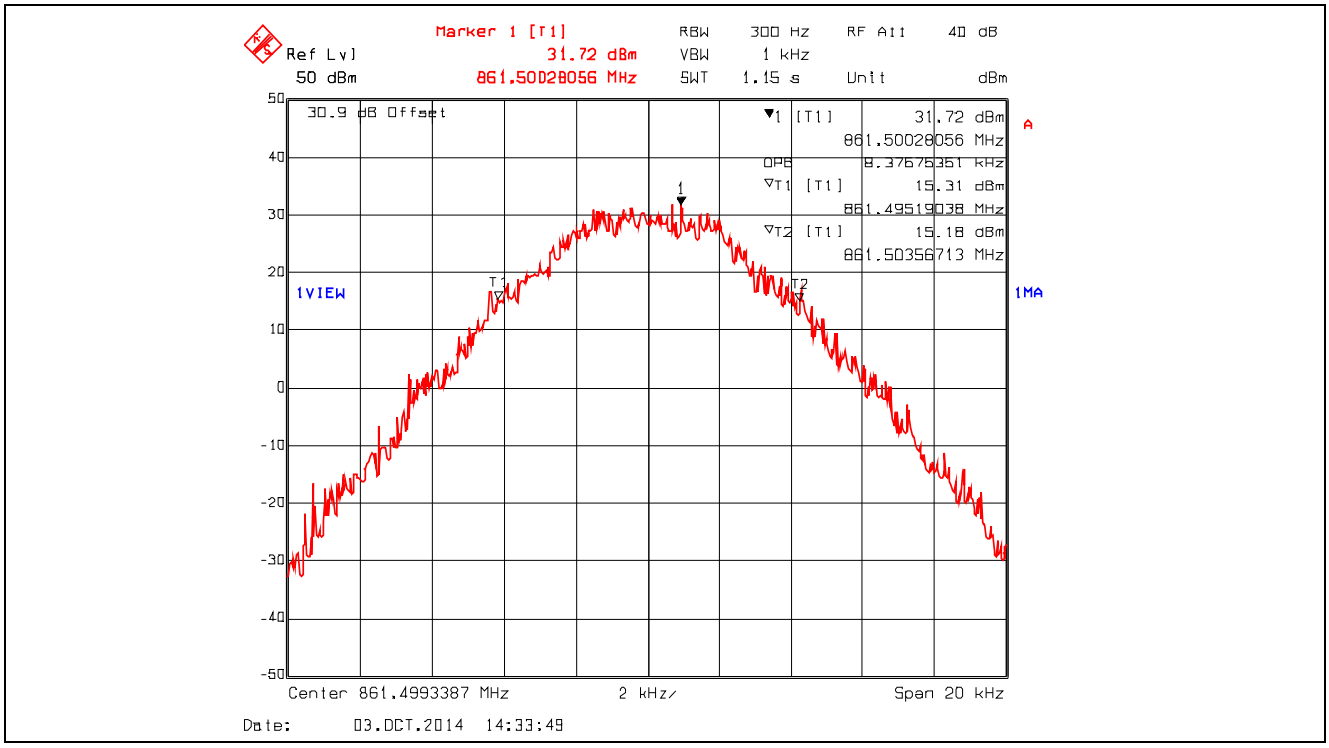
Plot 5.4.4.1.21. 99% Occupied Bandwidth, 25 kHz Channel Spacing, F3E, 868.975 MHz



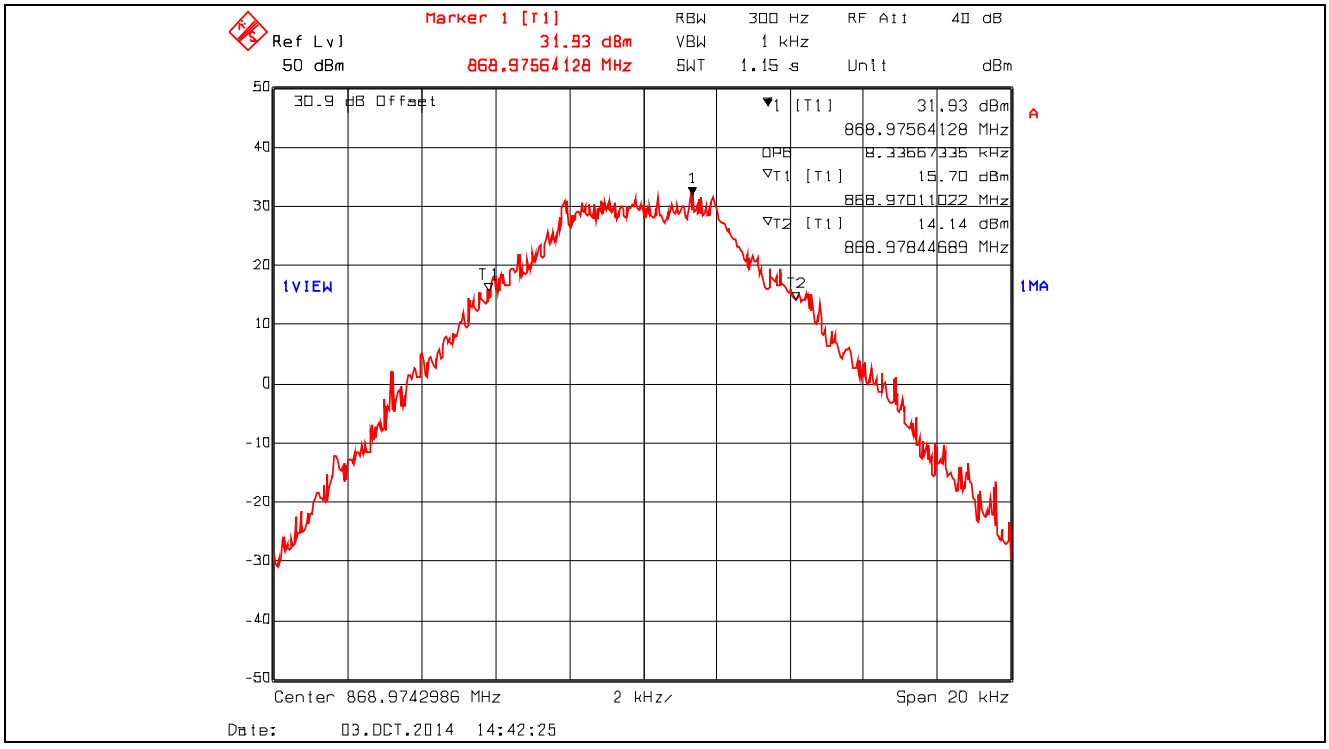
Plot 5.4.4.1.22. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F1E/F1D, 854.025 MHz



Plot 5.4.4.1.23. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F1E/F1D, 861.5 MHz

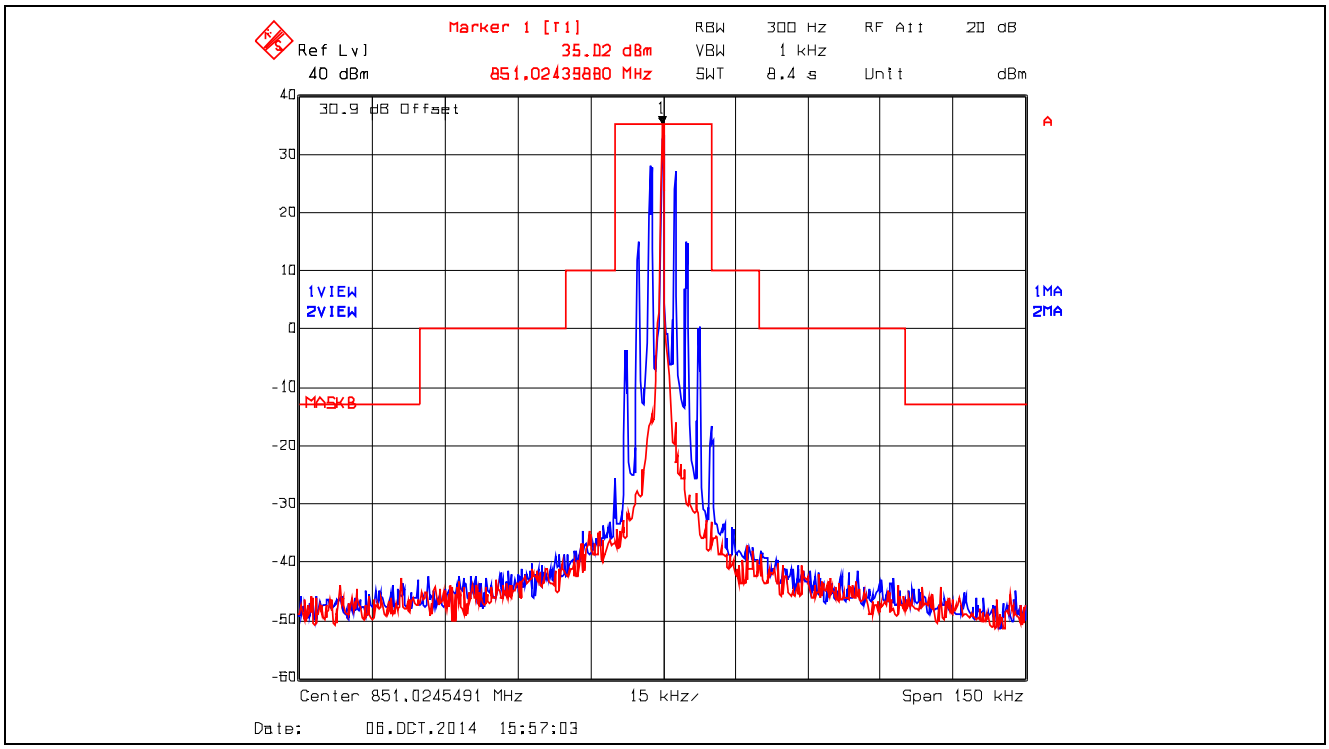


Plot 5.4.4.1.24. 99% Occupied Bandwidth, 12.5 kHz Channel Spacing, F1E/F1D, 868.975 MHz

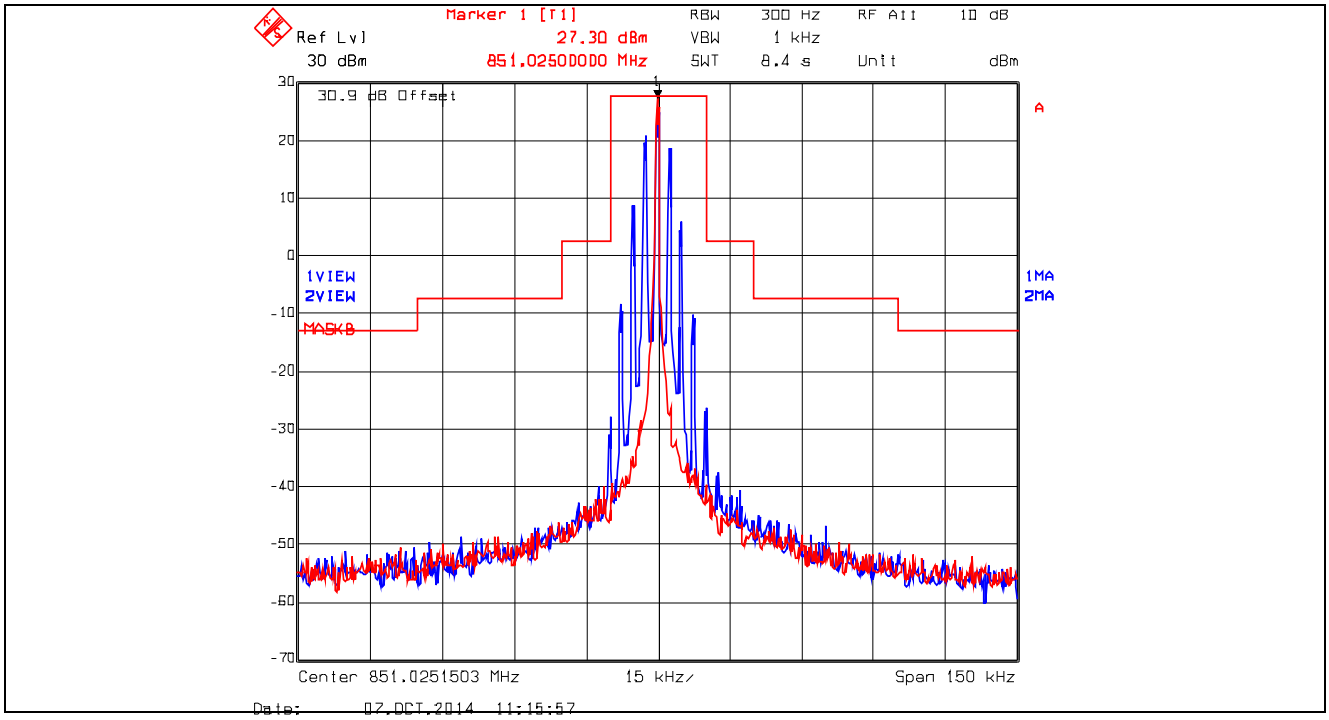


5.4.4.2. Emission Masks

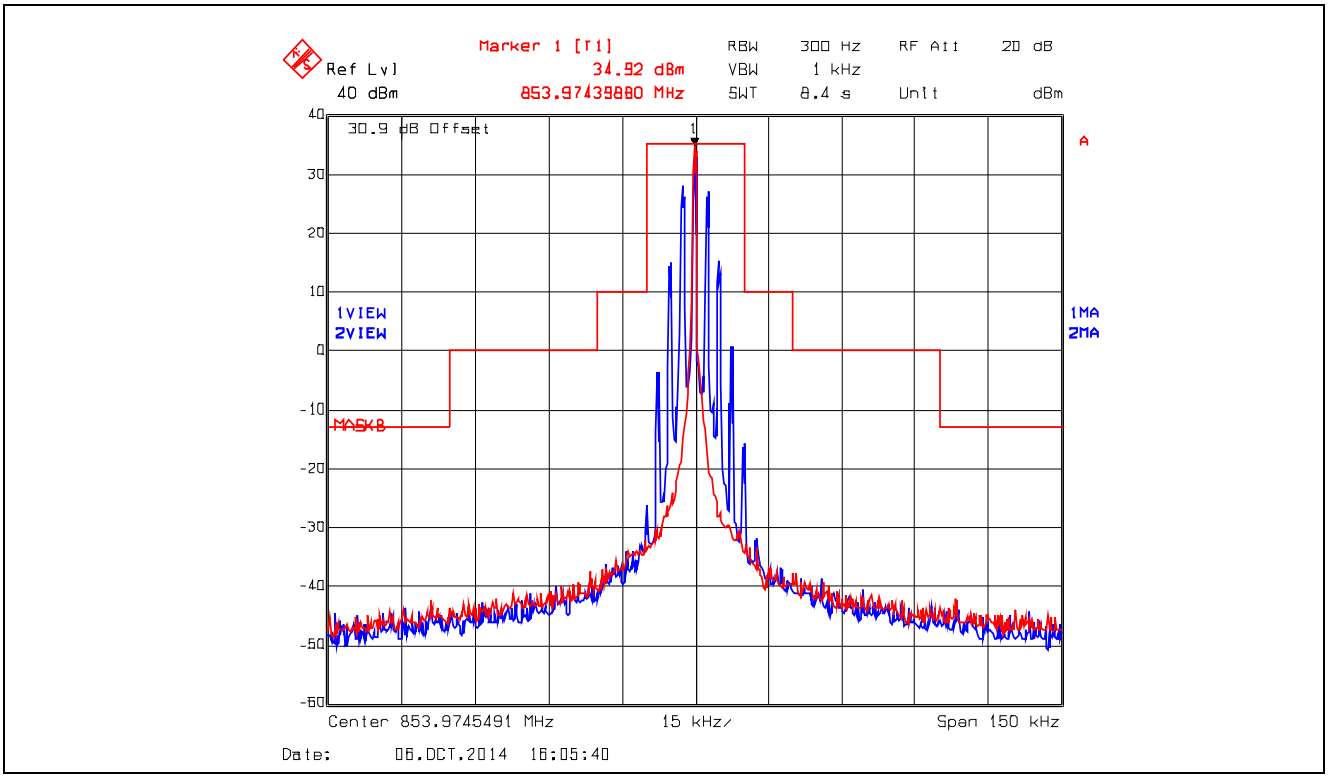
Plot 5.4.4.2.1. Emission Mask B, 12.5 kHz Channel Spacing, F3E, High Power, 851.025 MHz



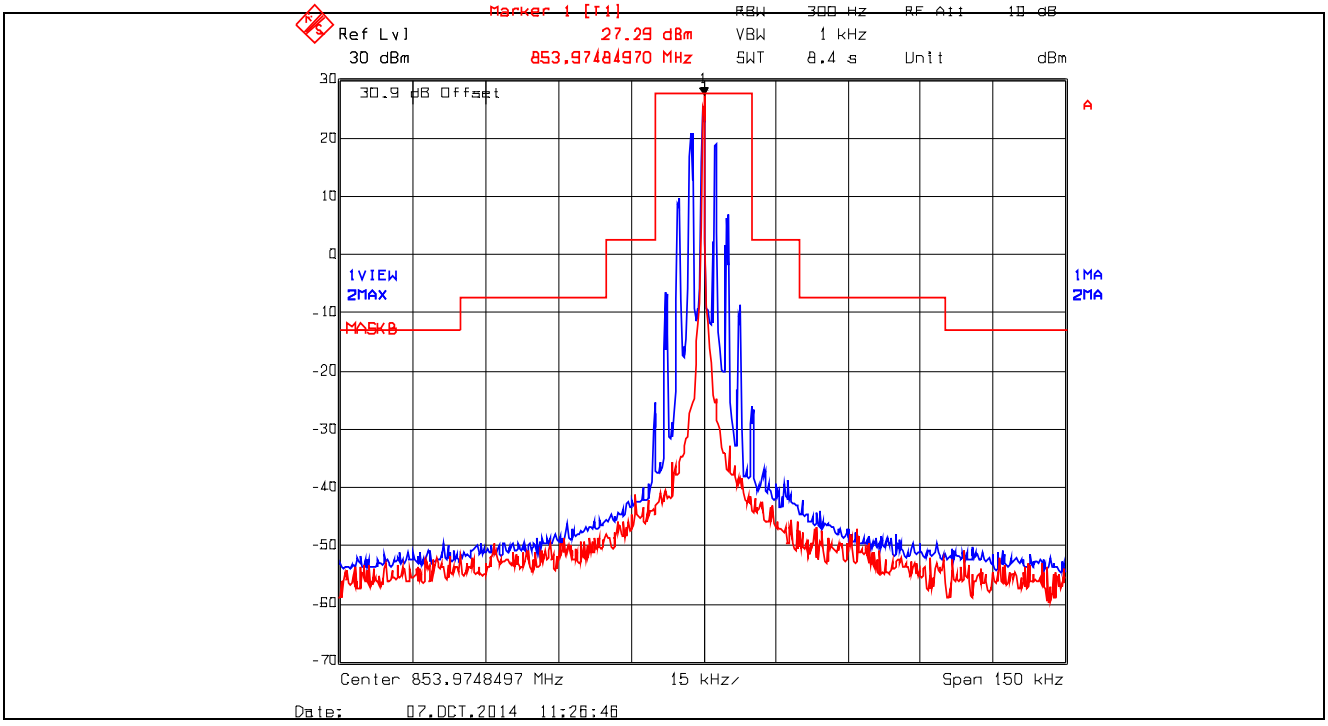
Plot 5.4.4.2.2. Emission Mask B, 12.5 kHz Channel Spacing, F3E, Low Power, 851.025 MHz



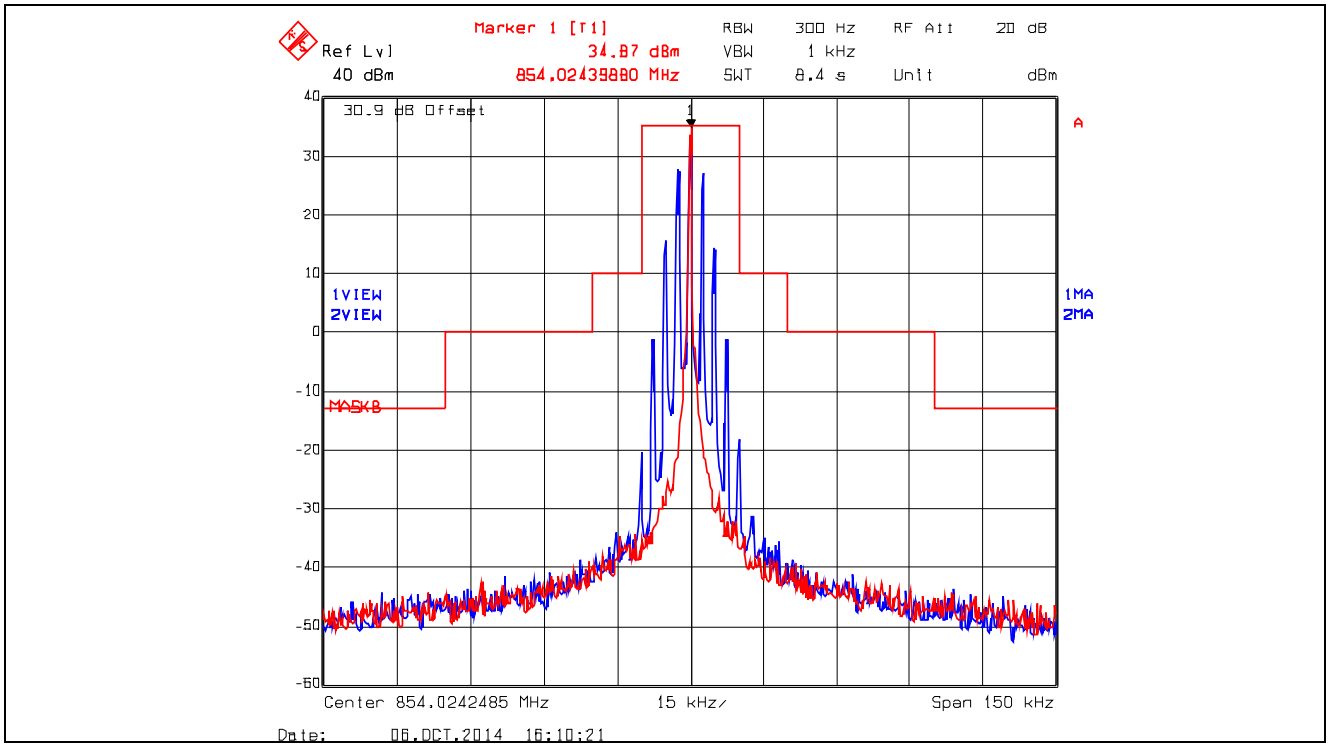
Plot 5.4.4.2.3. Emission Mask B, 12.5 kHz Channel Spacing, F3E, High Power, 853.975 MHz



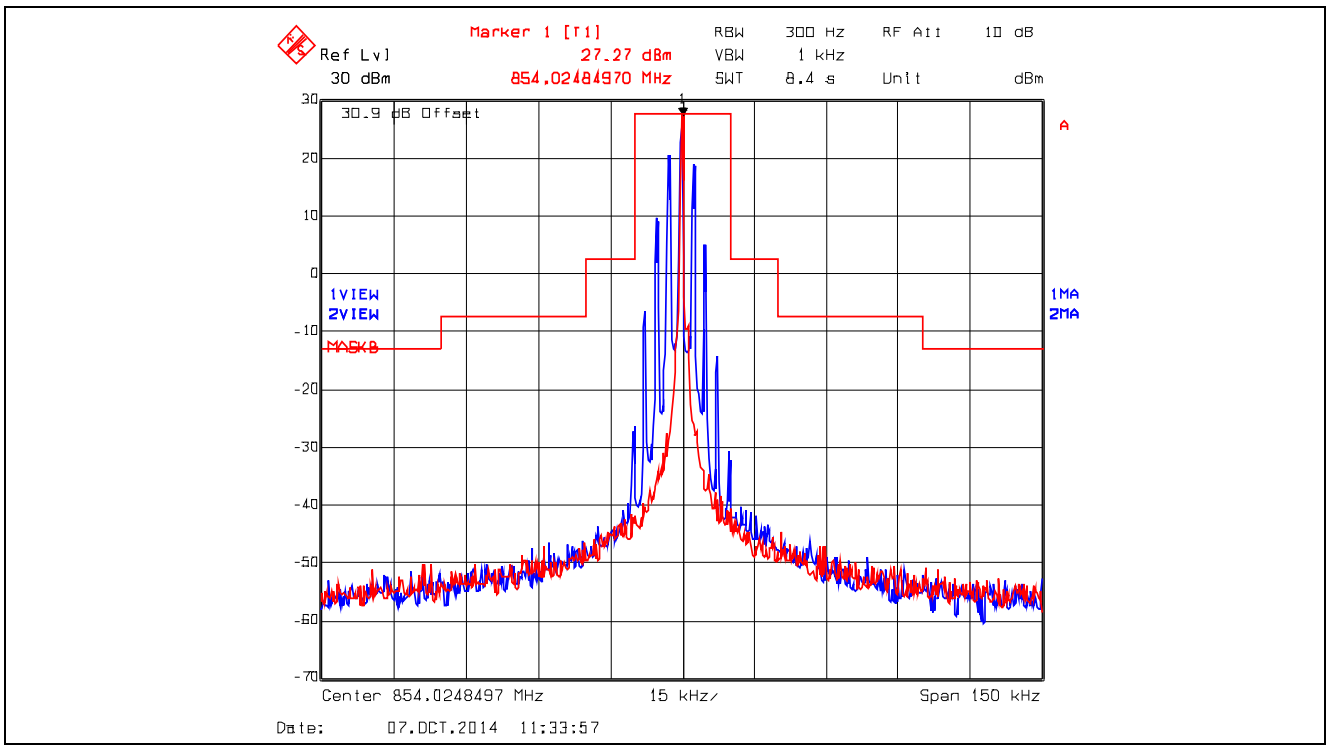
Plot 5.4.4.2.4. Emission Mask B, 12.5 kHz Channel Spacing, F3E, Low Power, 853.975 MHz



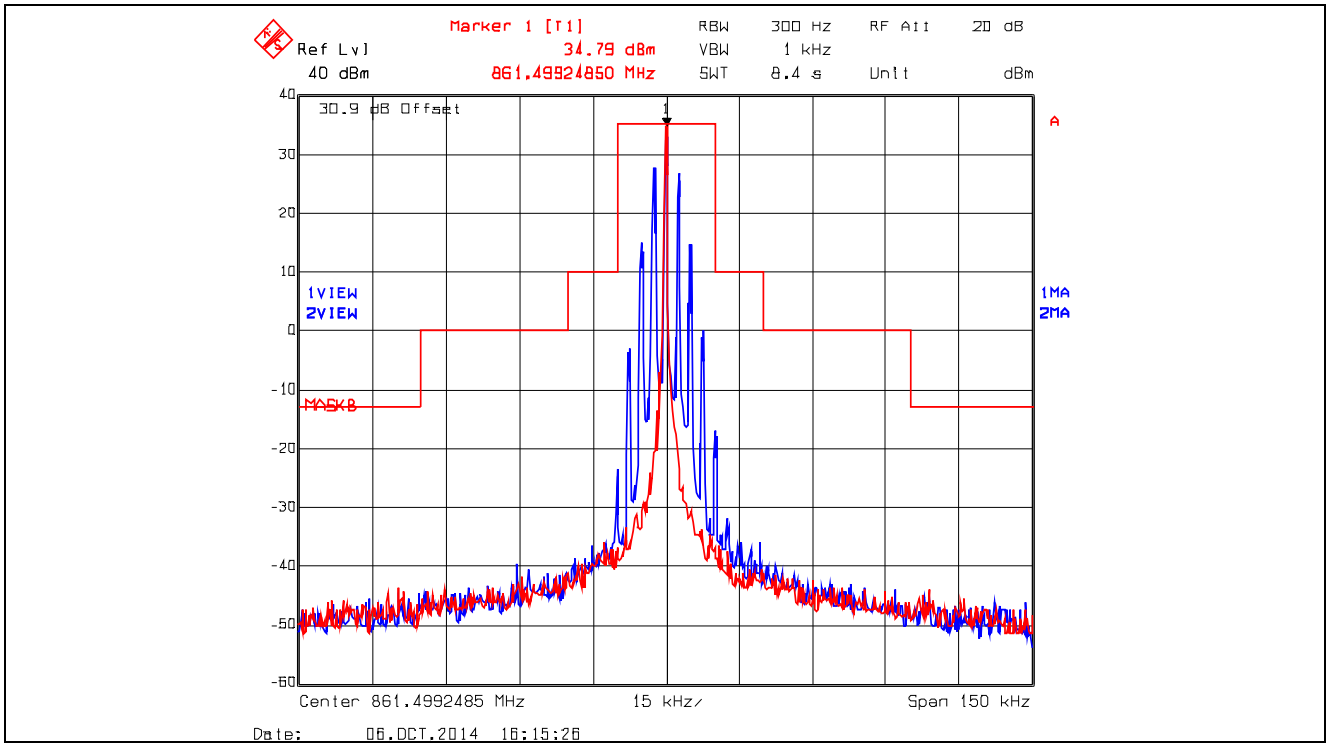
Plot 5.4.4.2.5. Emission Mask B, 12.5 kHz Channel Spacing, F3E, High Power, 854.025 MHz



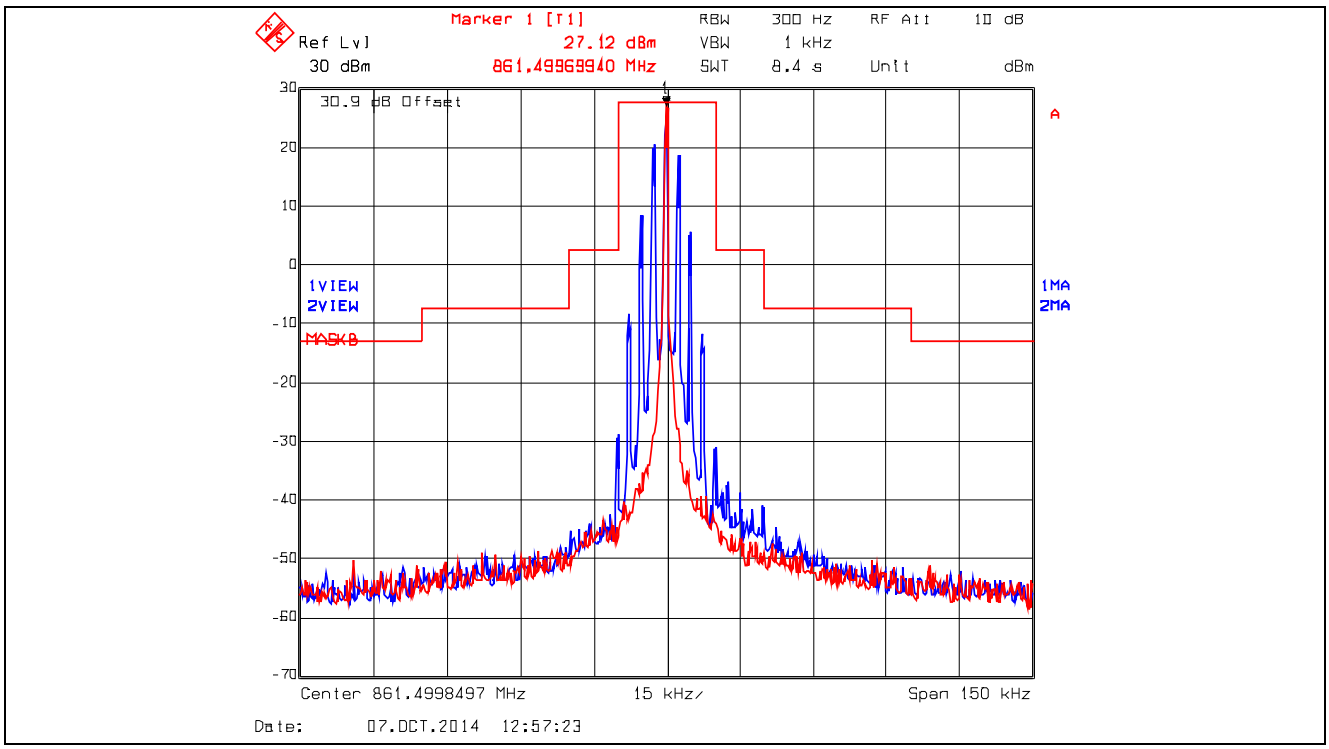
Plot 5.4.4.2.6. Emission Mask B, 12.5 kHz Channel Spacing, F3E, Low Power, 854.025 MHz



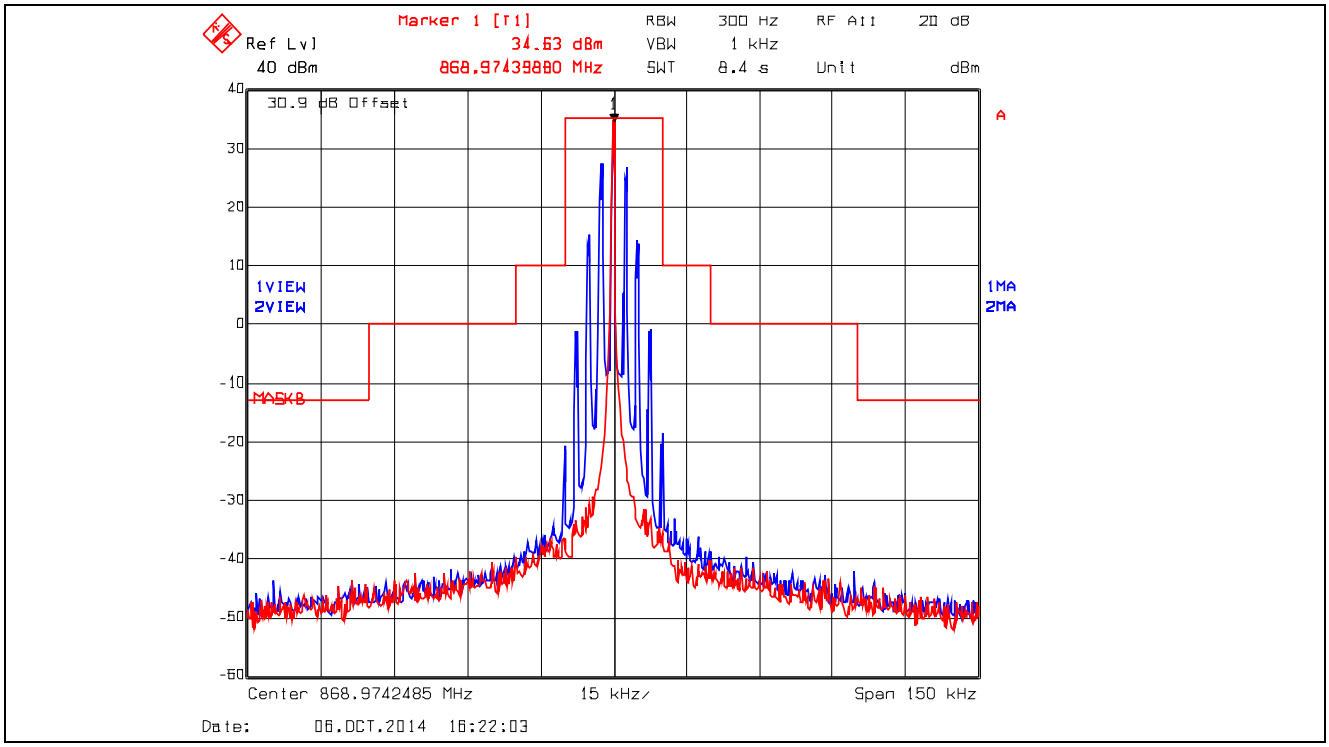
Plot 5.4.4.2.7. Emission Mask B, 12.5 kHz Channel Spacing, F3E, High Power, 861.5 MHz



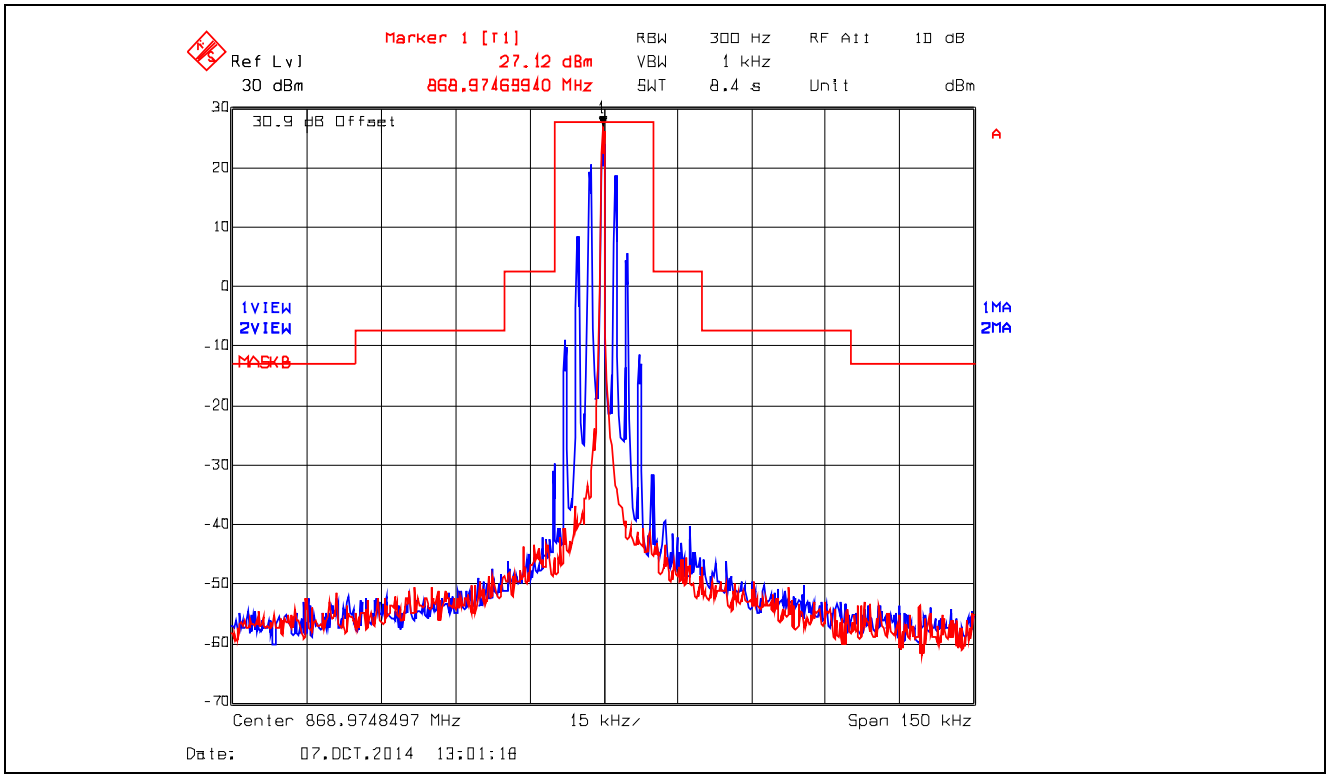
Plot 5.4.4.2.8. Emission Mask B, 12.5 kHz Channel Spacing, F3E, Low Power, 861.5 MHz



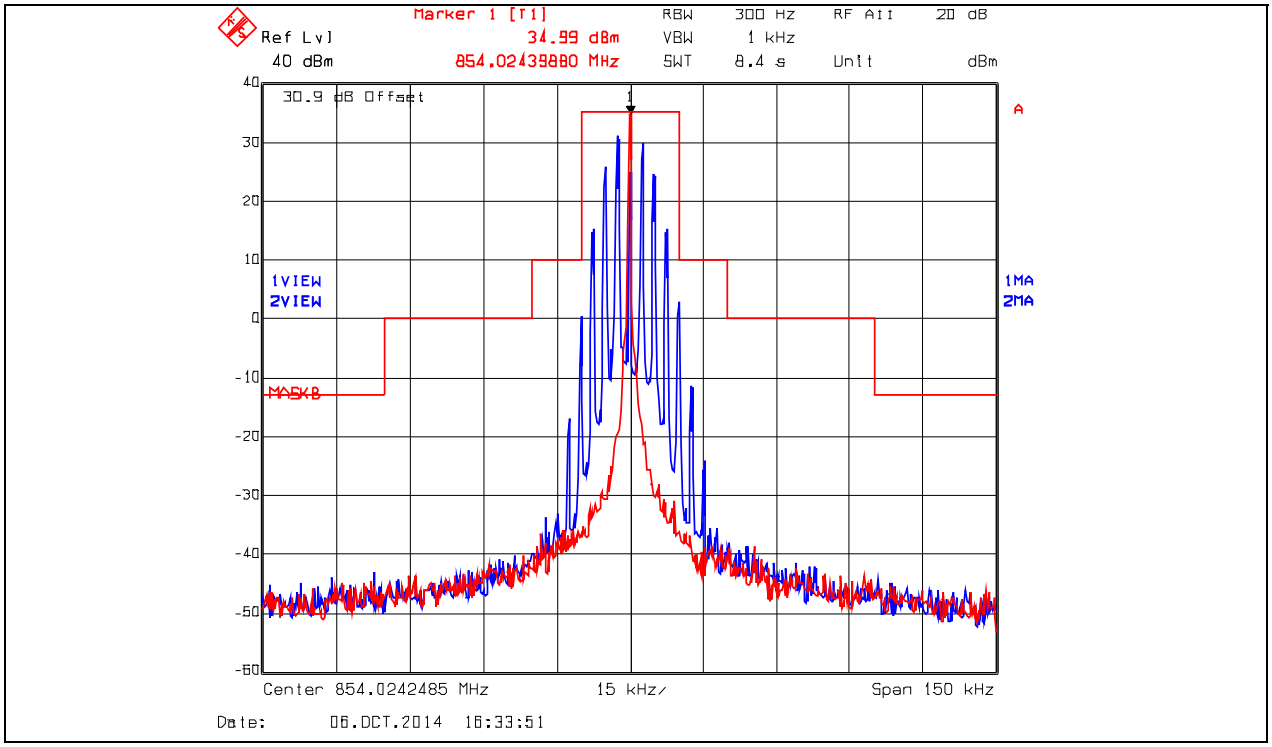
Plot 5.4.4.2.9. Emission Mask B, 12.5 kHz Channel Spacing, F3E, High Power, 868.975 MHz



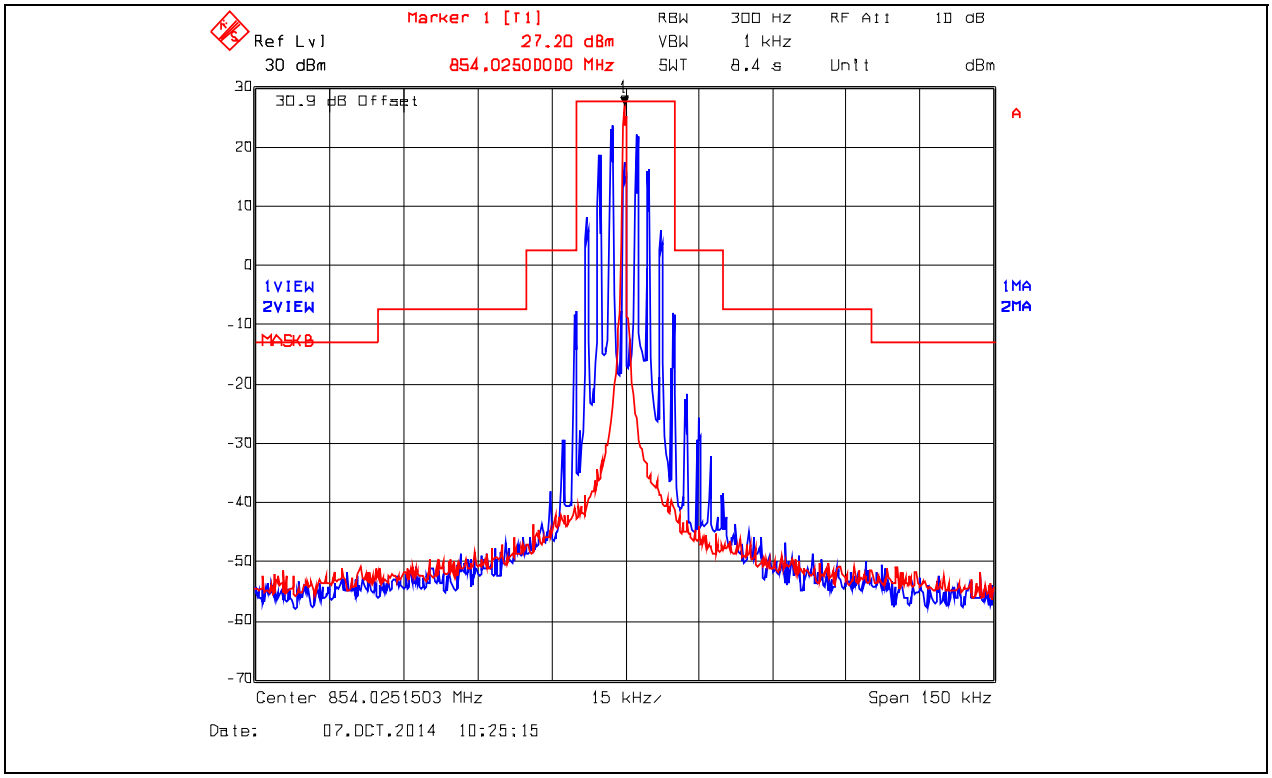
Plot 5.4.4.2.10. Emission Mask B, 12.5 kHz Channel Spacing, F3E, Low Power, 868.975 MHz



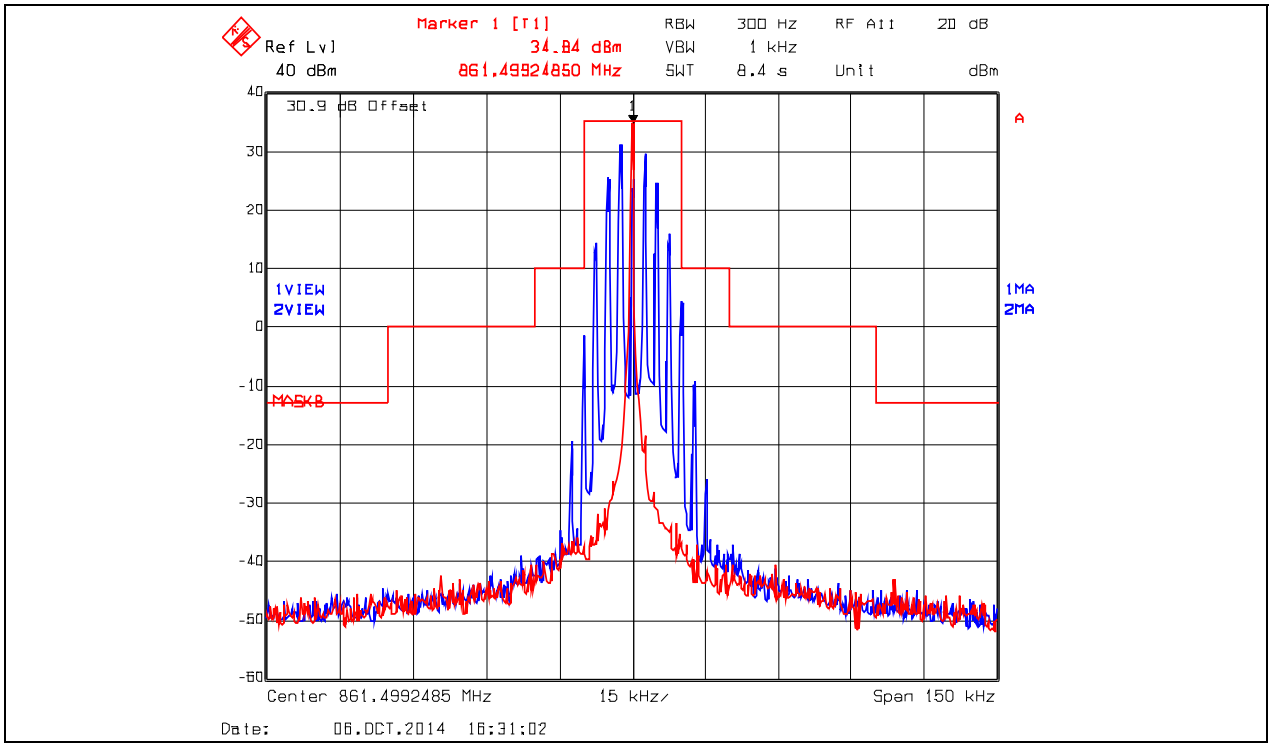
Plot 5.4.4.2.11. Emission Mask B, 25 kHz Channel Spacing, F3E, High Power, 854.025 MHz



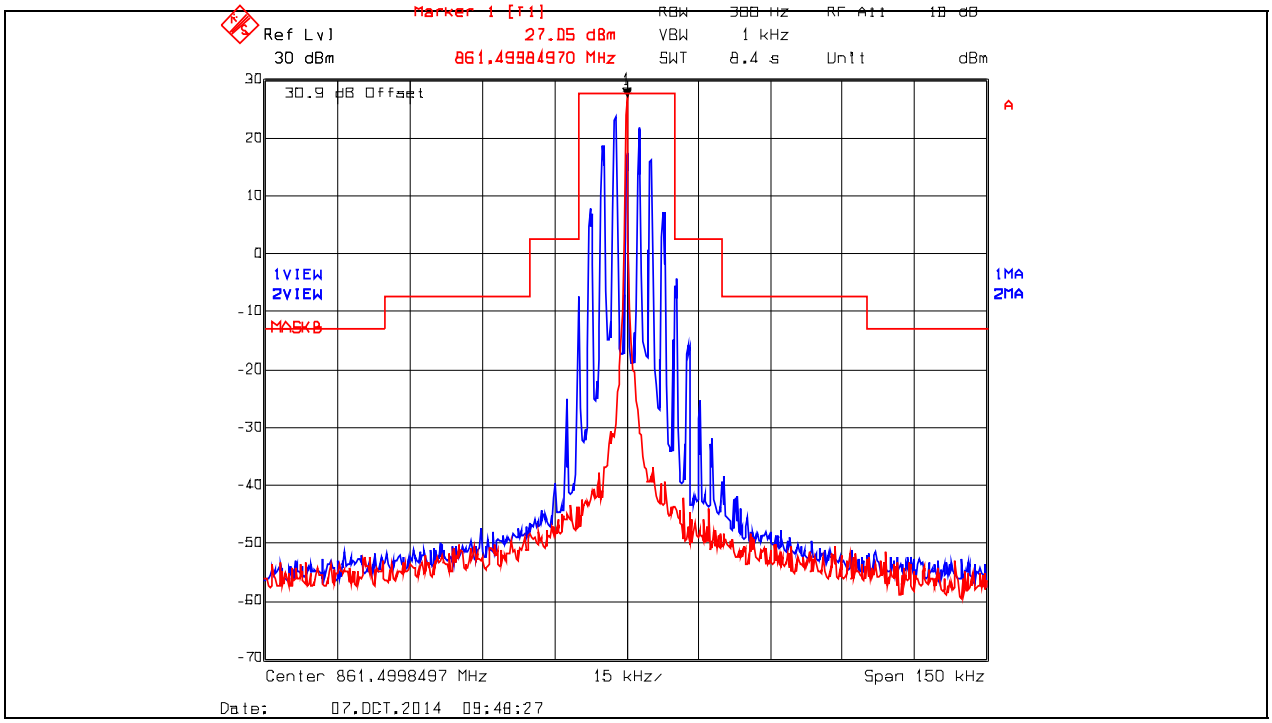
Plot 5.4.4.2.12. Emission Mask B, 25 kHz Channel Spacing, F3E, Low Power, 854.025 MHz



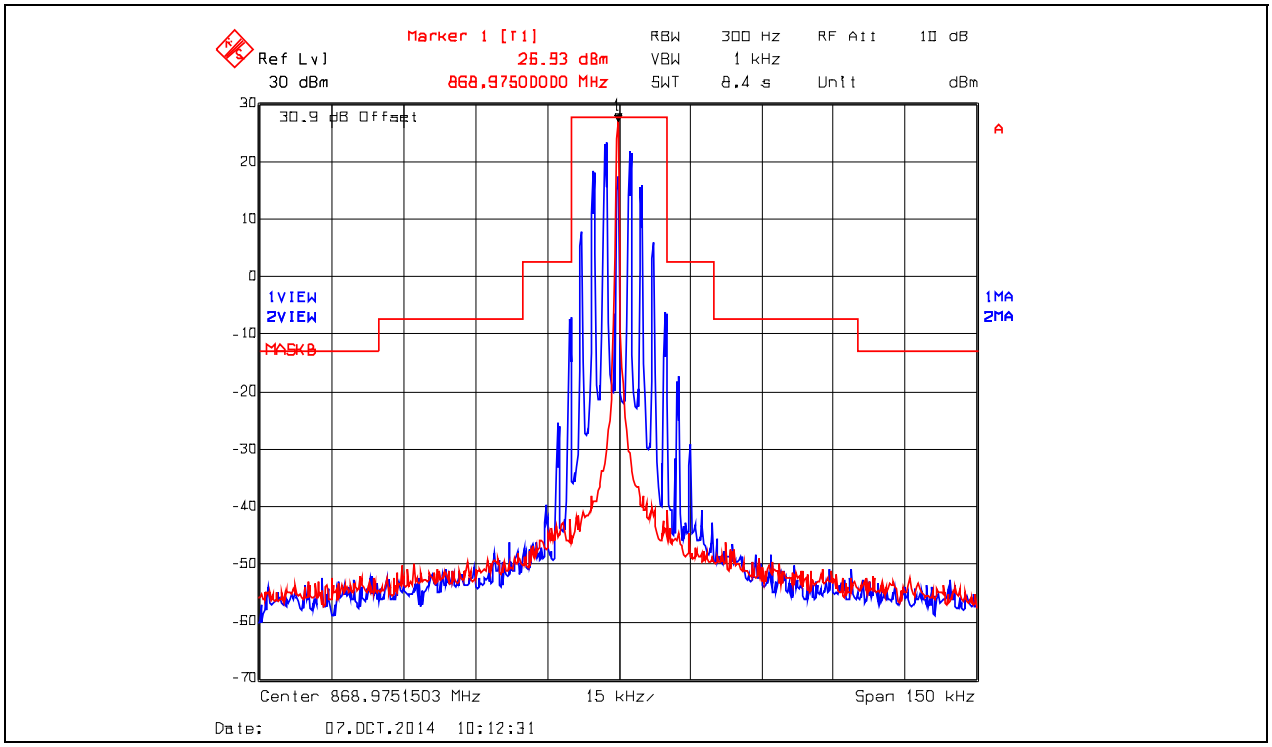
Plot 5.4.4.2.13. Emission Mask B, 25 kHz Channel Spacing, F3E, High Power, 861.5 MHz



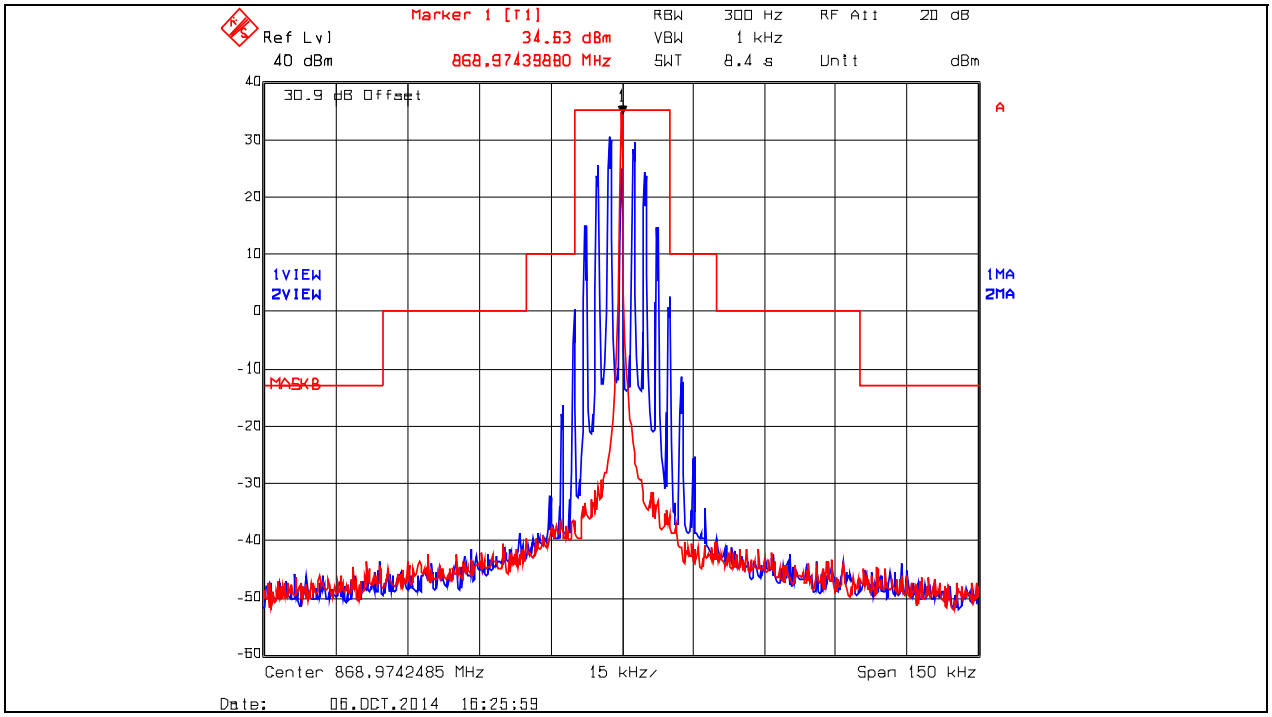
Plot 5.4.4.2.14. Emission Mask B, 25 kHz Channel Spacing, F3E, Low Power, 861.5 MHz



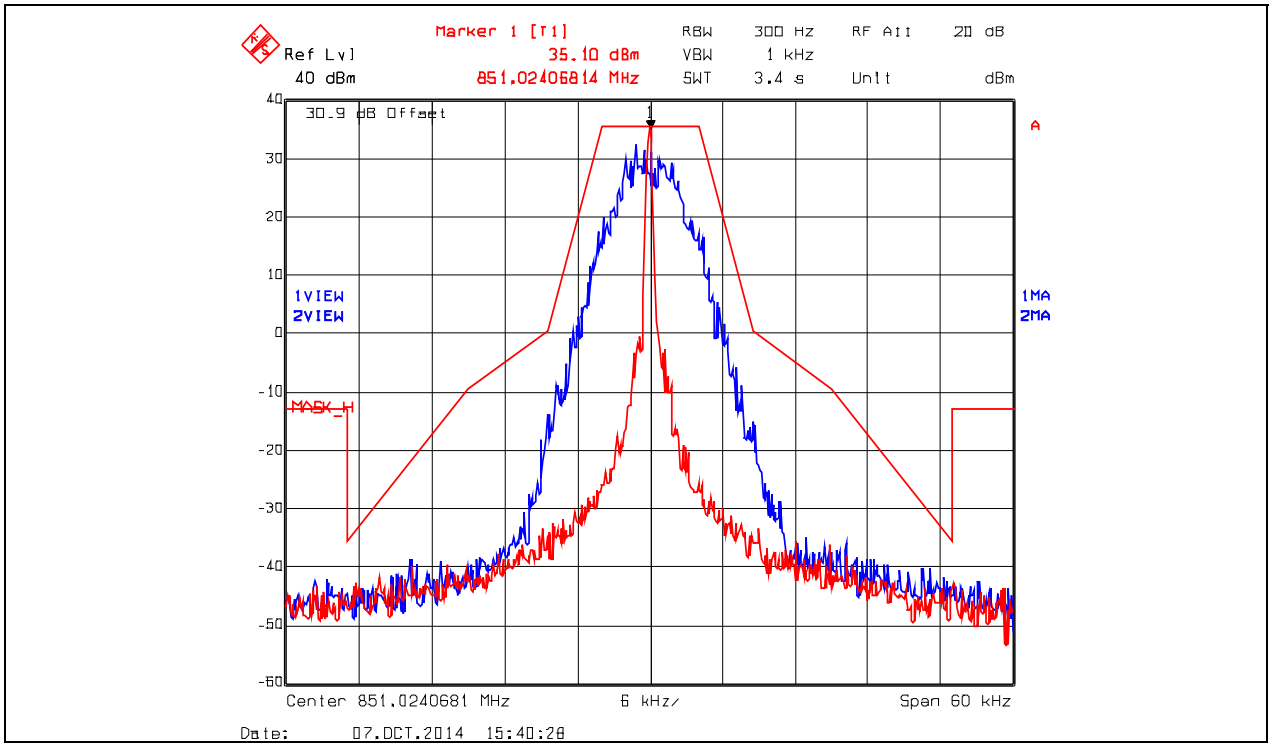
Plot 5.4.4.2.15. Emission Mask B, 25 kHz Channel Spacing, F3E, High Power, 868.975 MHz



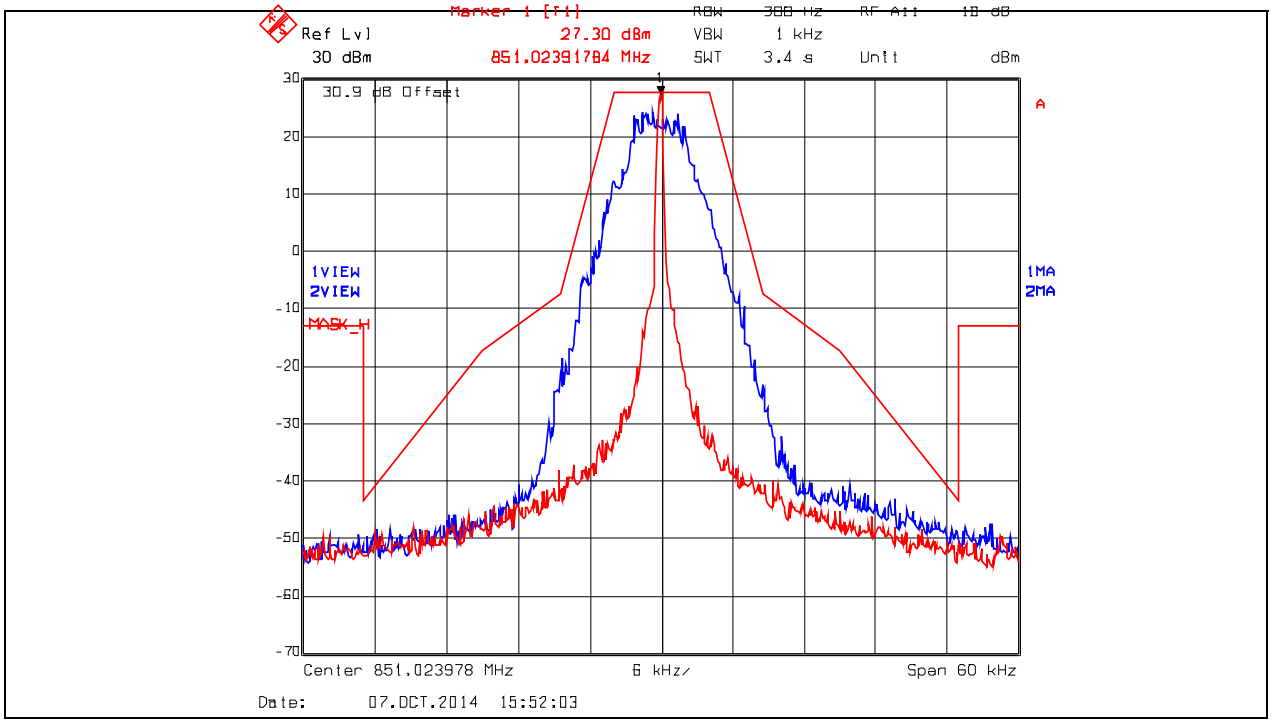
Plot 5.4.4.2.16. Emission Mask B, 25 kHz Channel Spacing, F3E, Low Power, 868.975 MHz



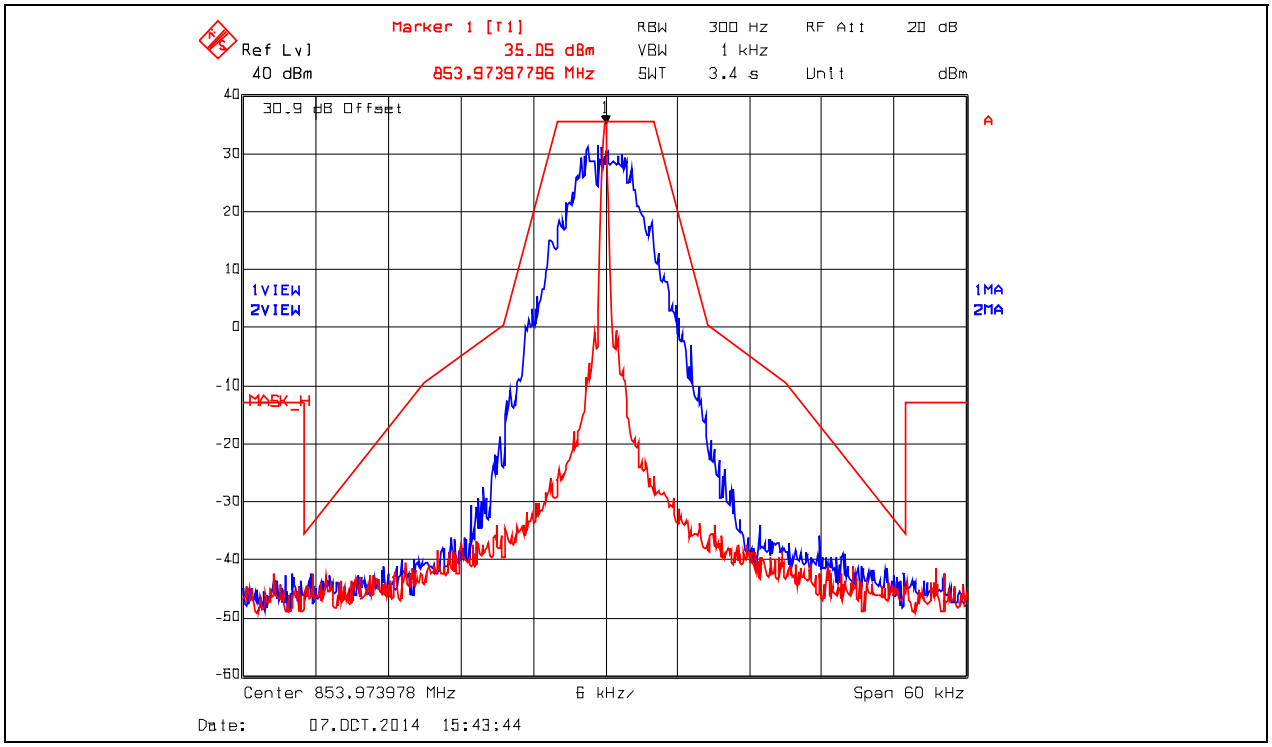
Plot 5.4.4.2.17. Emission Mask H, 12.5 kHz Channel Spacing, F1E/F1D, High Power, 851.025 MHz



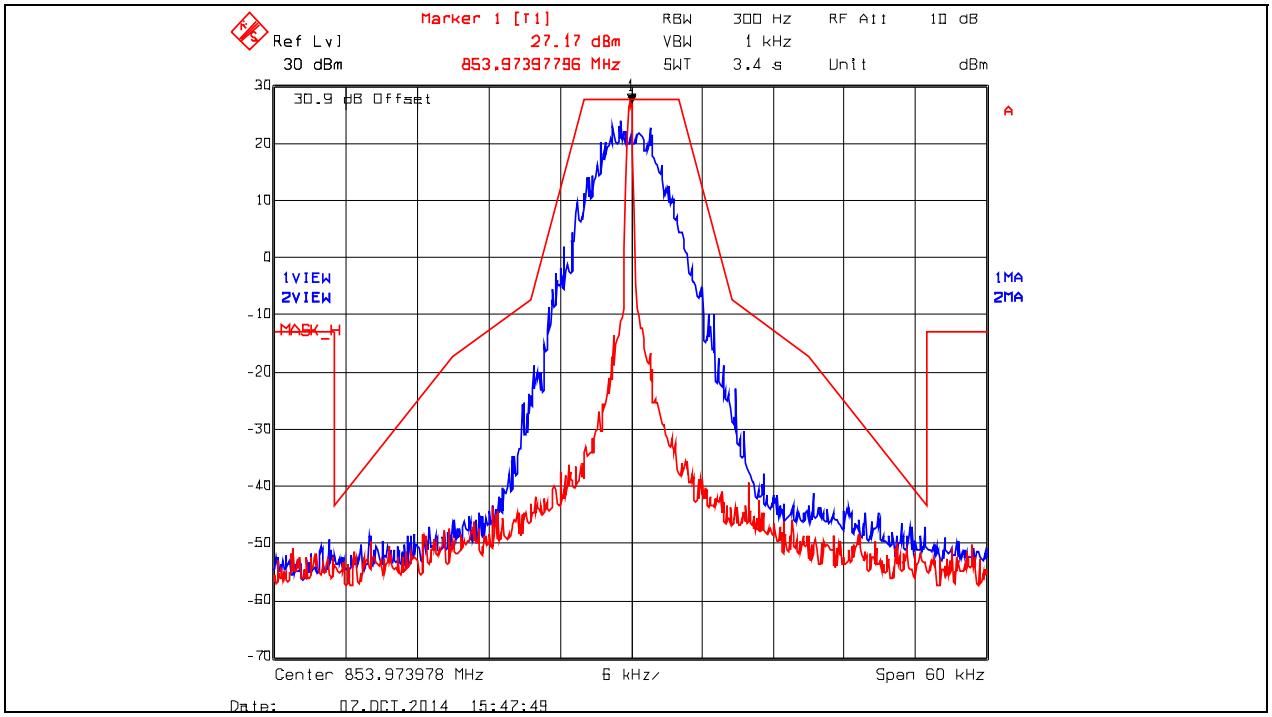
Plot 5.4.4.2.18. Emission Mask H, 12.5 kHz Channel Spacing, F1E/F1D, Low Power, 851.025 MHz



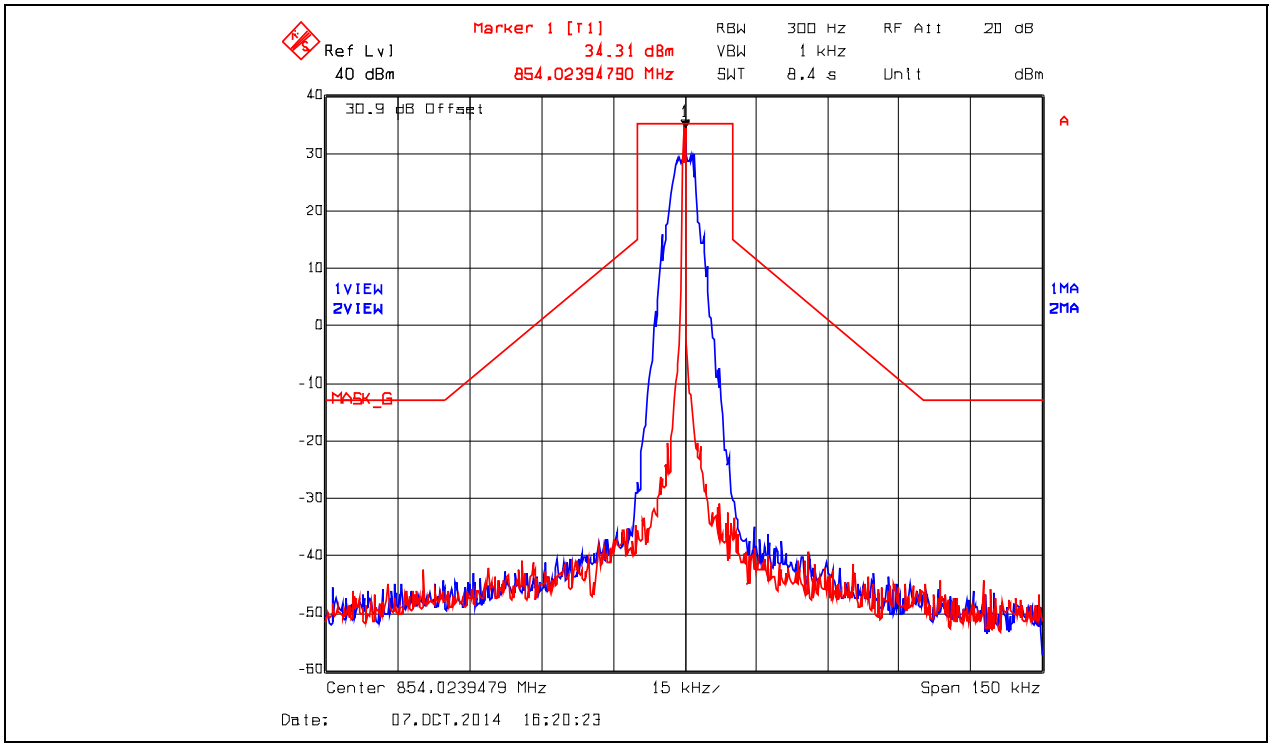
Plot 5.4.4.2.19. Emission Mask H, 12.5 kHz Channel Spacing, F1E/F1D, High Power, 853.975 MHz



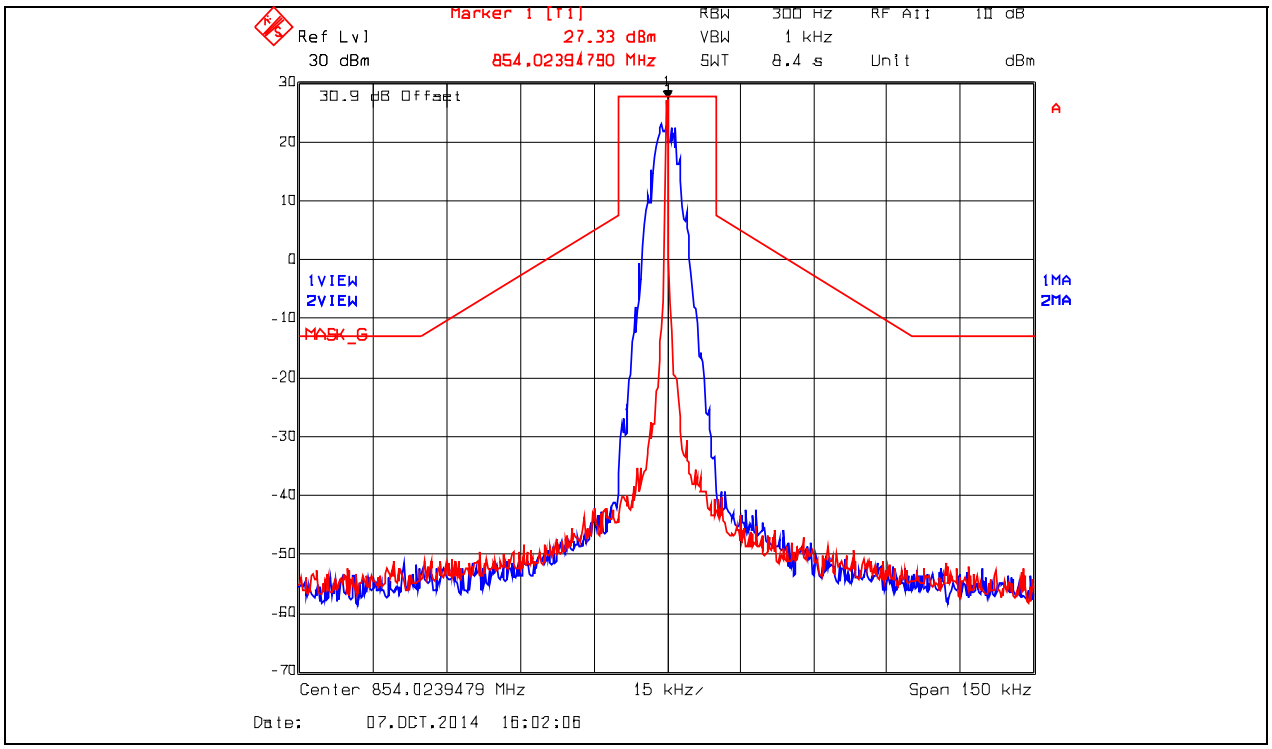
Plot 5.4.4.2.20. Emission Mask H, 12.5 kHz Channel Spacing, F1E/F1D, Low Power, 853.975 MHz



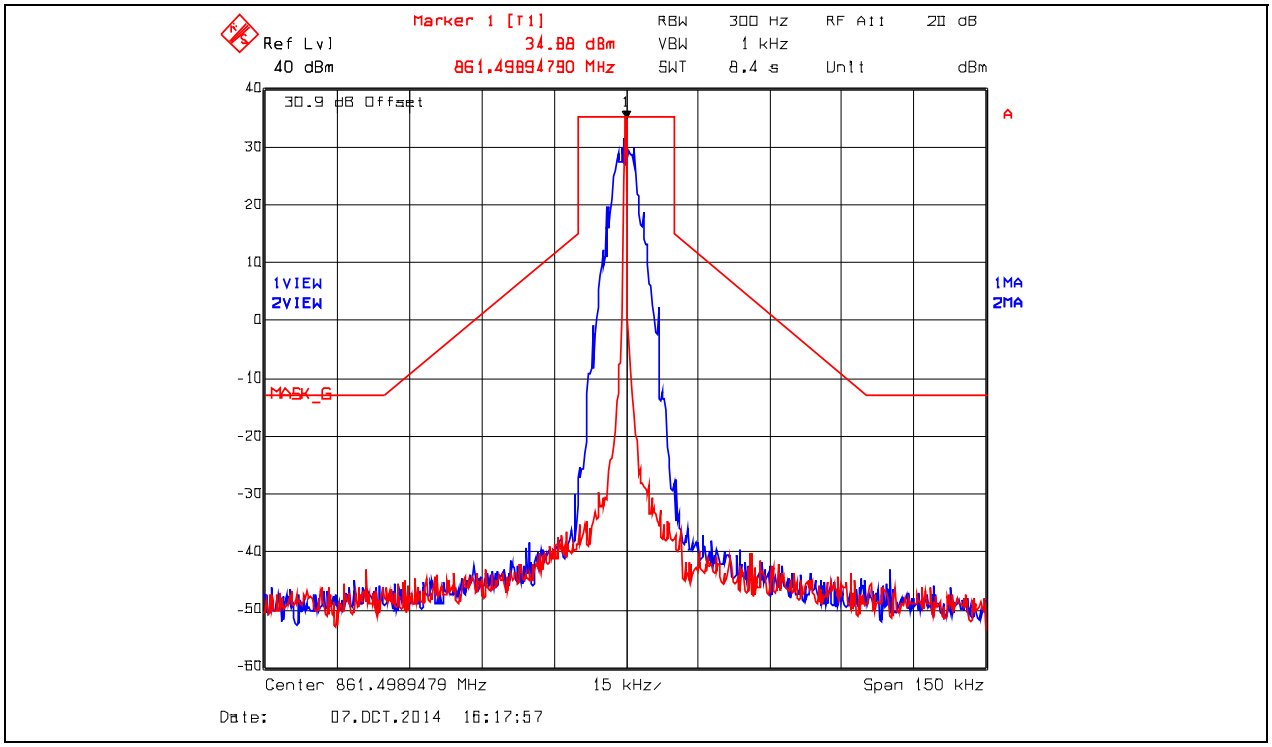
Plot 5.4.4.2.21. Emission Mask G, 12.5 kHz Channel Spacing, F1E/F1D, High Power, 854.025 MHz



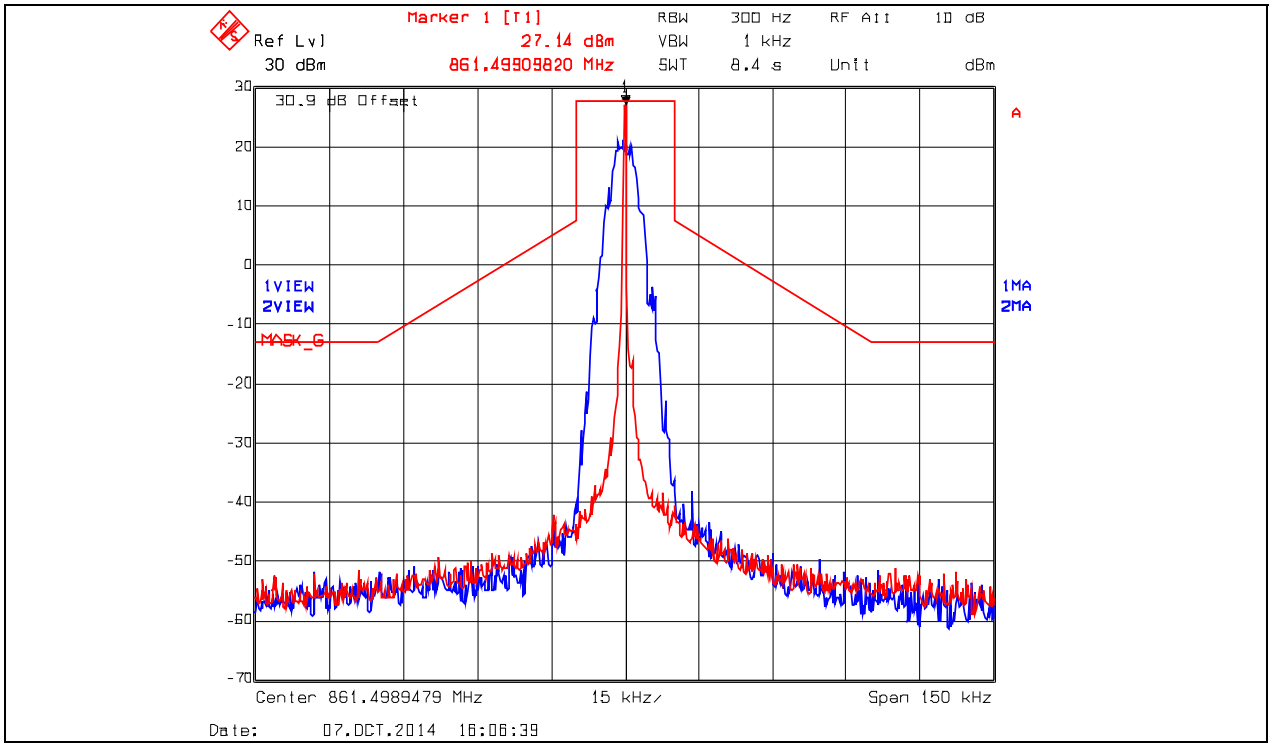
Plot 5.4.4.2.22. Emission Mask G, 12.5 kHz Channel Spacing, F1E/F1D, Low Power, 854.025 MHz



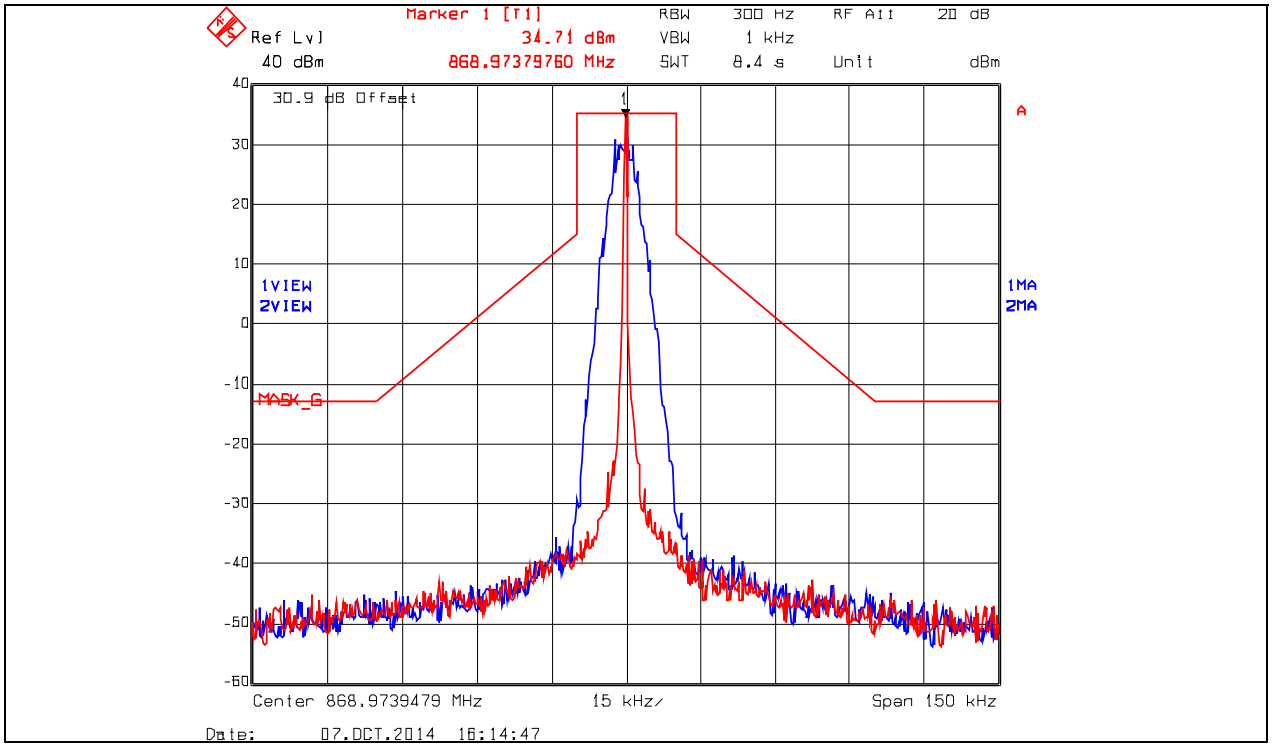
Plot 5.4.4.2.23. Emission Mask G, 12.5 kHz Channel Spacing, F1E/F1D, High Power, 861.5 MHz



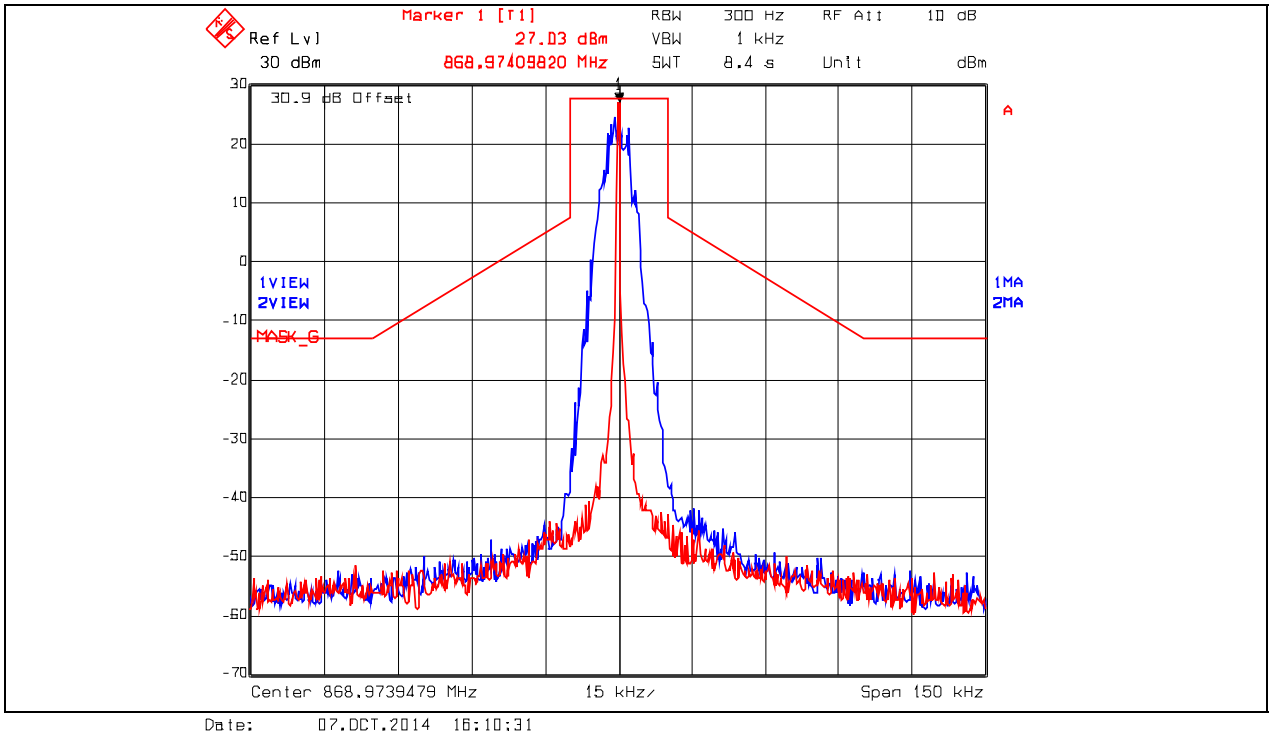
Plot 5.4.4.2.24. Emission Mask G, 12.5 kHz Channel Spacing, F1E/F1D, Low Power, 861.5 MHz



Plot 5.4.4.2.25. Emission Mask G, 12.5 kHz Channel Spacing, F1E/F1D, High Power, 868.975 MHz



Plot 5.4.4.2.26. Emission Mask G, 12.5 kHz Channel Spacing, F1E/F1D, Low Power, 868.975 MHz



5.5. TRANSMITTER ANTENNA POWER SPURIOUS/HARMONIC CONDUCTED EMISSIONS [§§ 2.1051, 2.1057, 90.210 & 90.543]

5.5.1. Limits

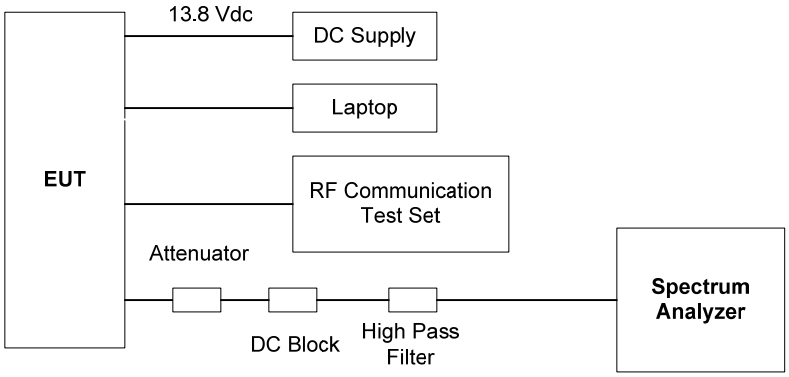
Emissions shall be attenuated below the mean output power of the transmitter as follows:

FCC Rules	Attenuation Limit (dBc)
§ 90.210(b)	At least 43 + 10 log (P) dB.
§ 90.210(d)	At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation.
§ 90.543(b)	At least 43 + 10 log (P) dB

5.5.2. Method of Measurements

Refer to Section 8.5 of this report for measurement details

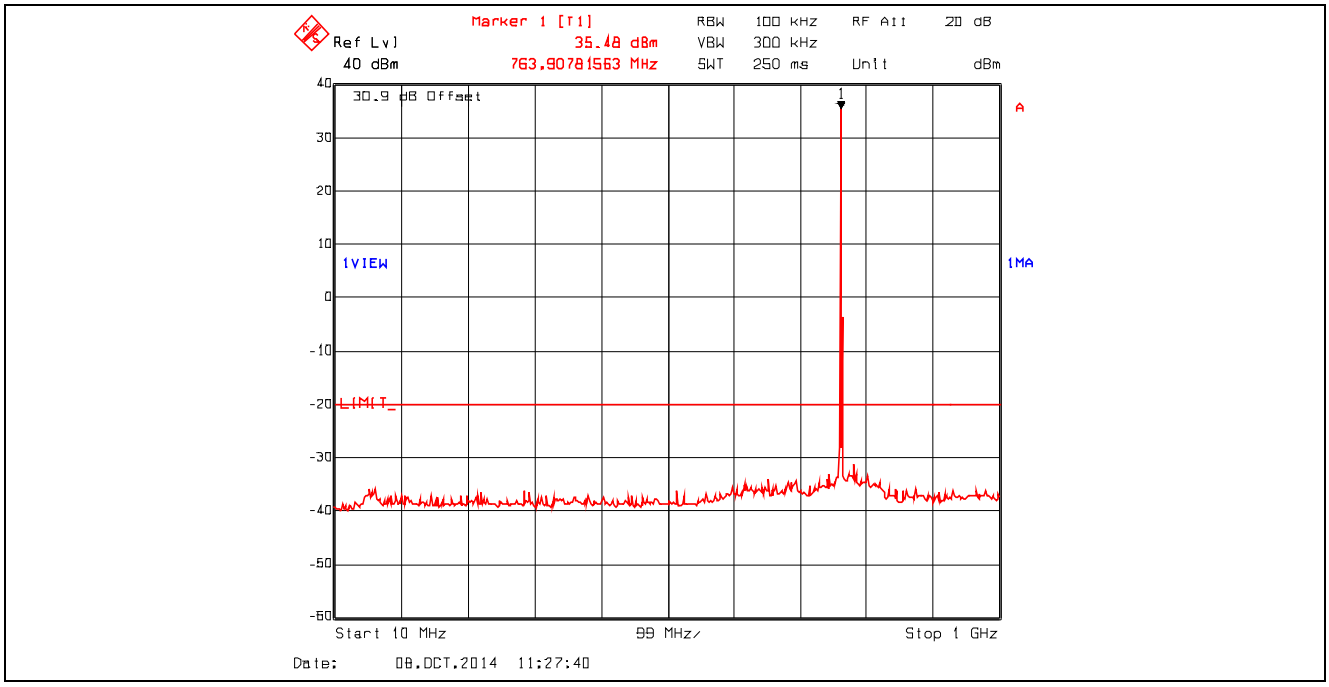
5.5.3. Test Arrangement



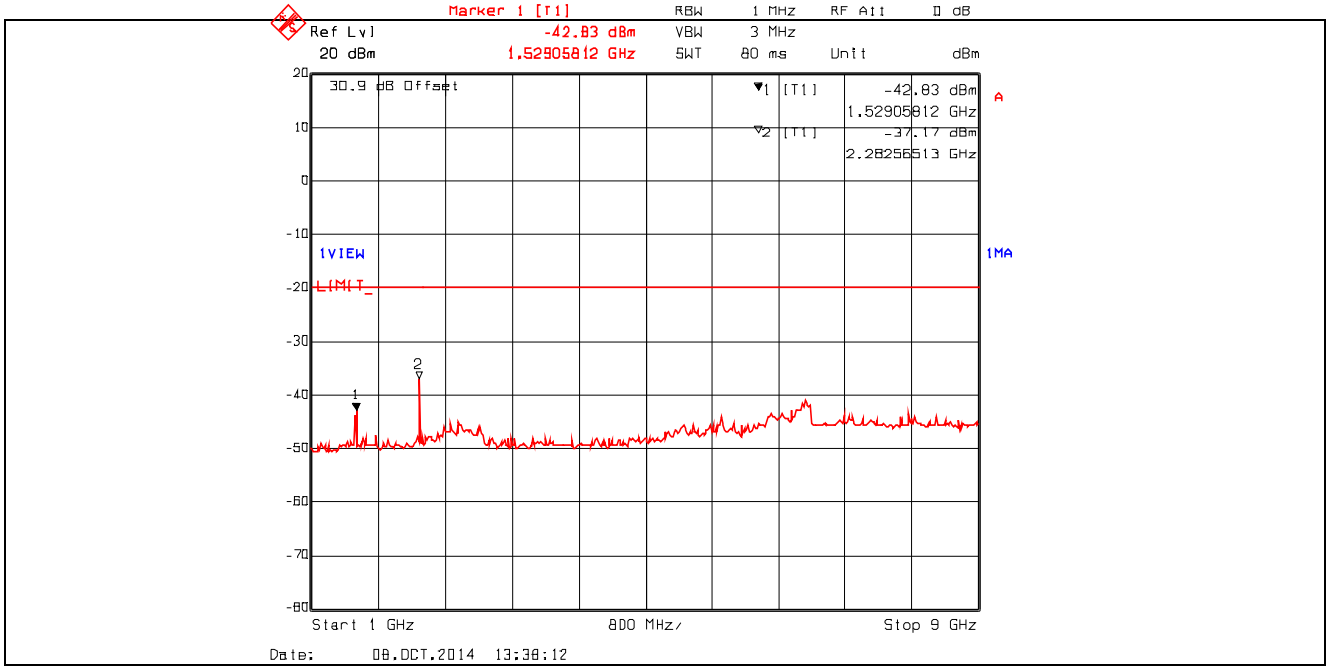
5.5.4. Test Data

Remark: Preliminary testing performed to determine the worst case test configuration. The worst case final test results at 12.5 kHz channelization; modulated with 2.5 kHz audio signal were compared with the more stringent limit to demonstrate compliance.

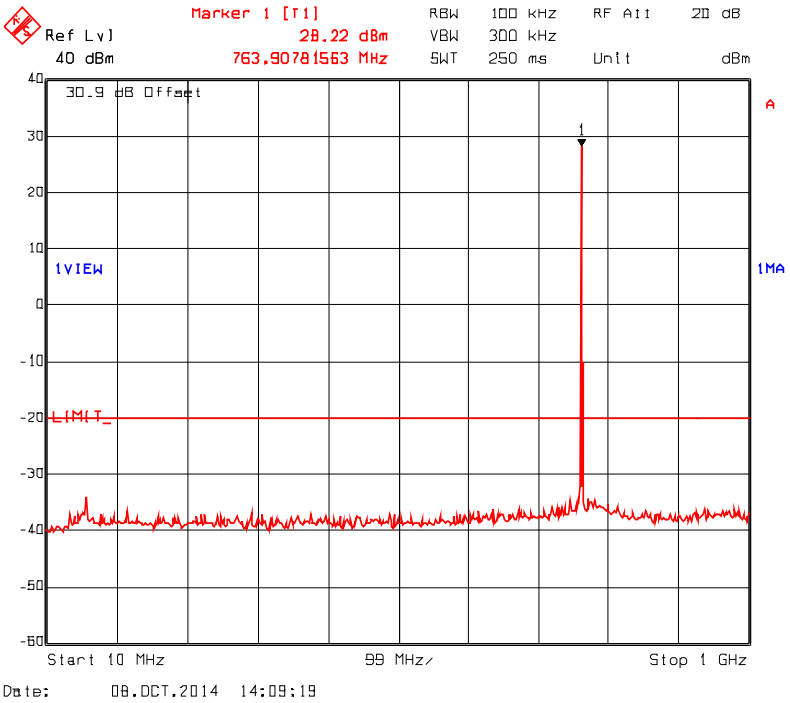
Plot 5.5.4.1. Conducted Transmitter Spurious Emissions, High Power, 764.025 MHz, 10 MHz - 1 GHz



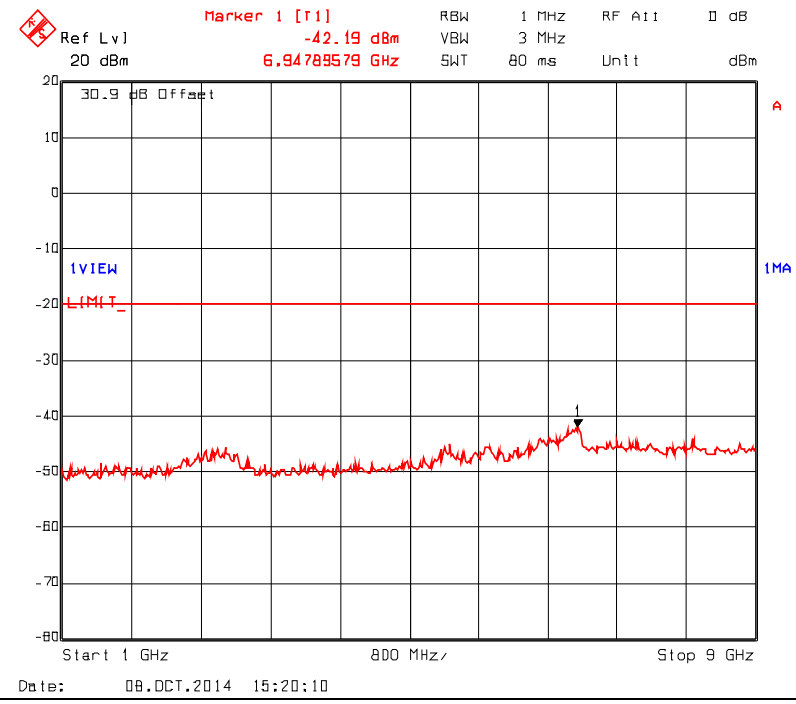
Plot 5.5.4.2. Conducted Transmitter Spurious Emissions, High Power, 764.025 MHz, 1 GHz - 9 GHz



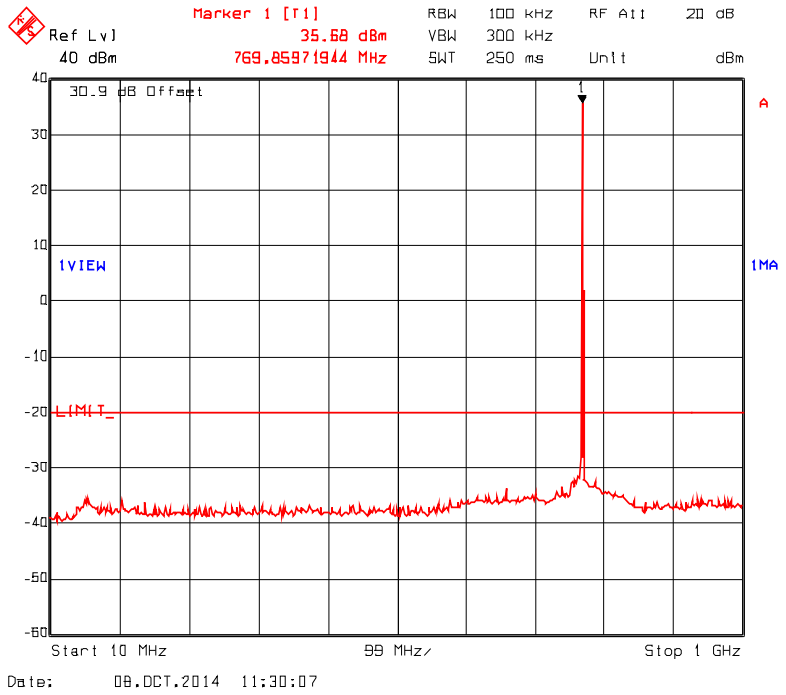
Plot 5.5.4.3. Conducted Transmitter Spurious Emissions, Low Power, 764.025 MHz, 10 MHz - 1 GHz



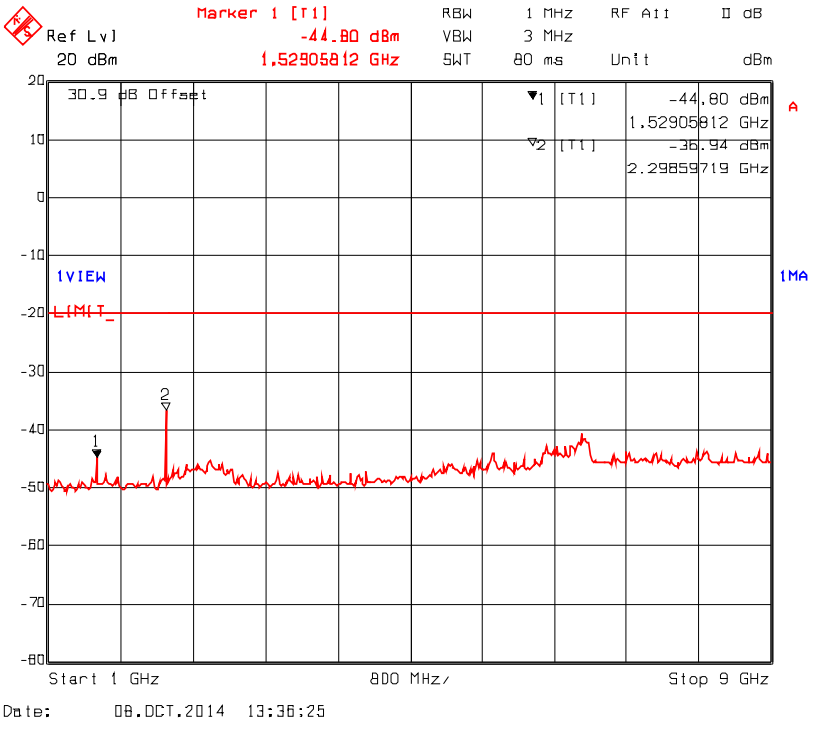
Plot 5.5.4.4. Conducted Transmitter Spurious Emissions, Low Power, 764.025 MHz, 1 GHz - 9 GHz



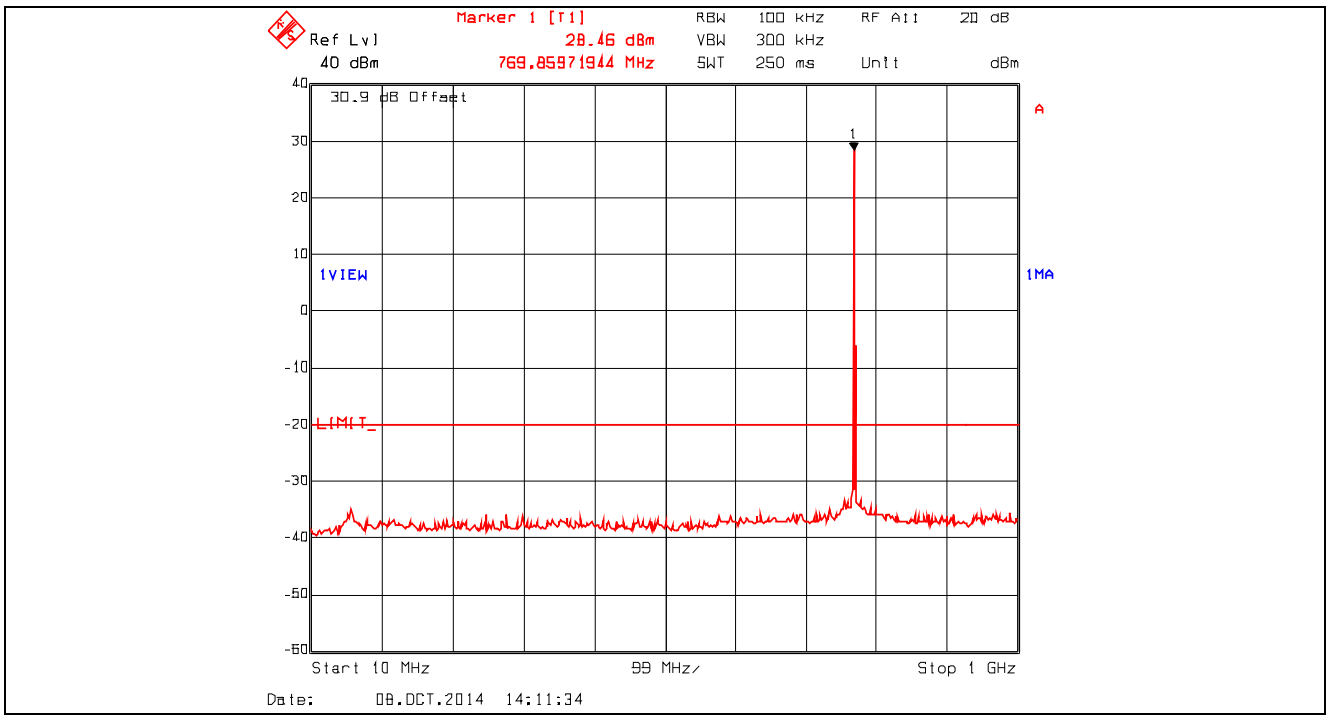
Plot 5.5.4.5. Conducted Transmitter Spurious Emissions, High Power, 770.0 MHz, 10 MHz - 1 GHz



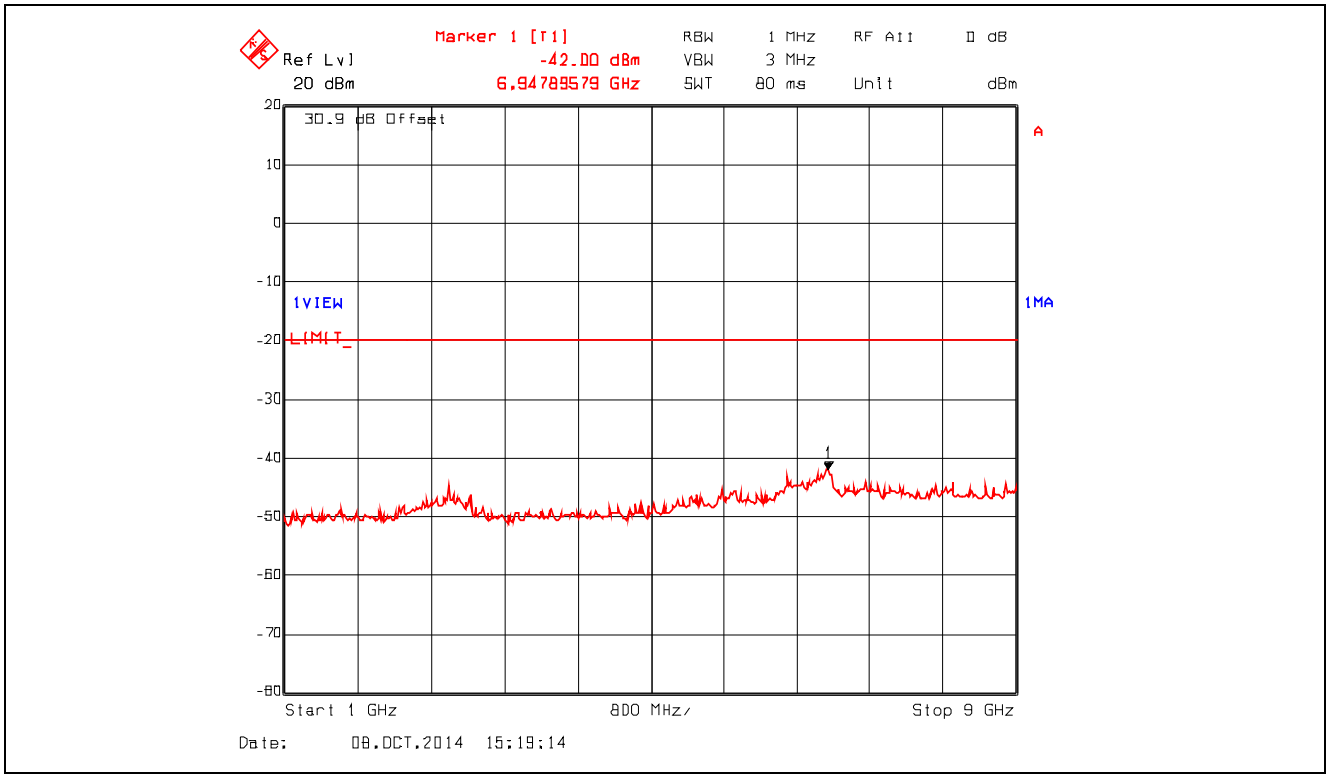
Plot 5.5.4.6. Conducted Transmitter Spurious Emissions, High Power, 770.0 MHz, 1 GHz - 9 GHz



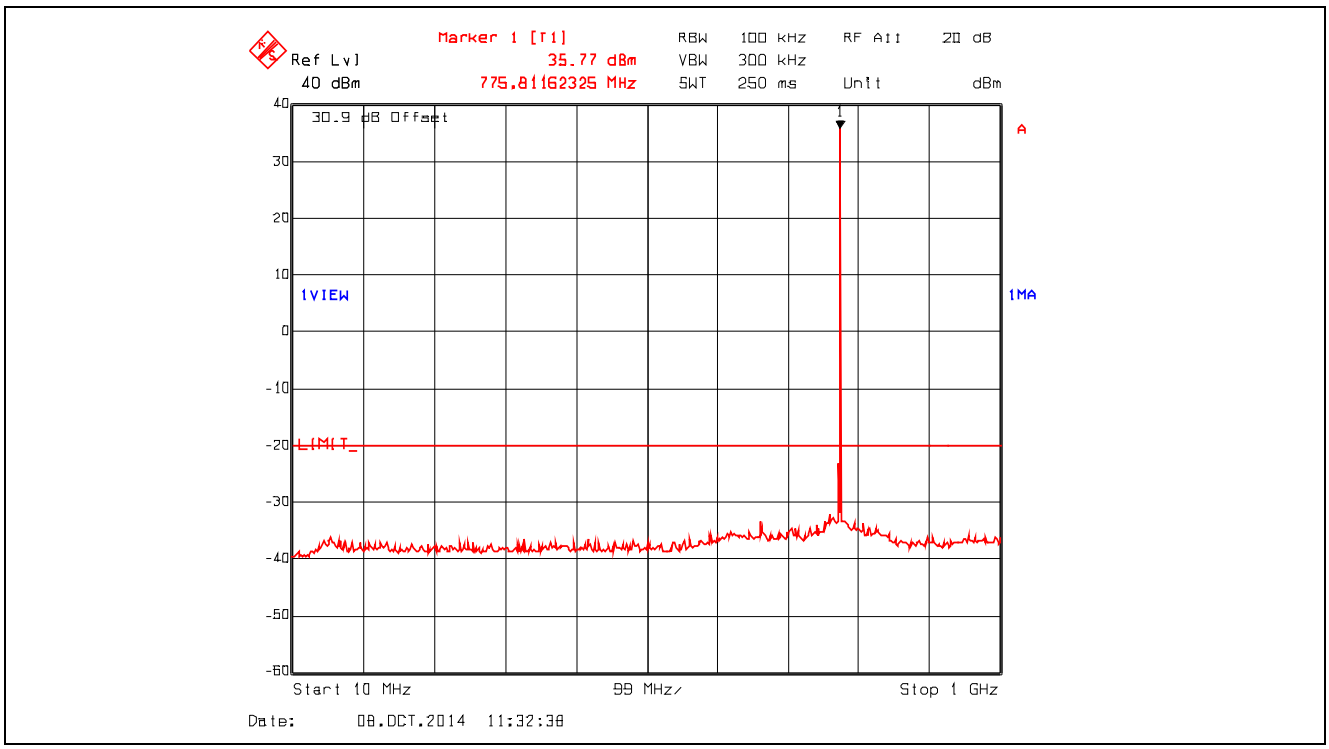
Plot 5.5.4.7. Conducted Transmitter Spurious Emissions, Low Power, 770.0 MHz, 10 MHz - 1 GHz



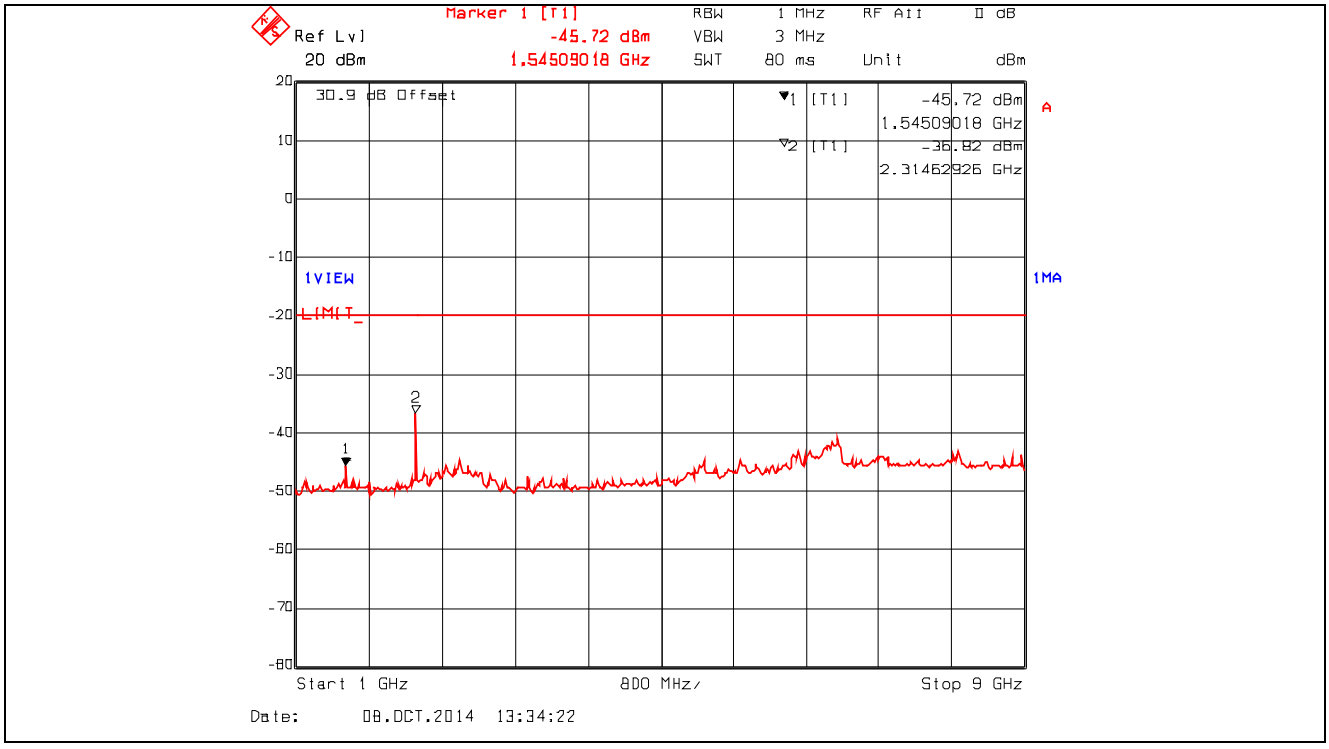
Plot 5.5.4.8. Conducted Transmitter Spurious Emissions, Low Power, 770.0 MHz, 1 GHz - 9 GHz



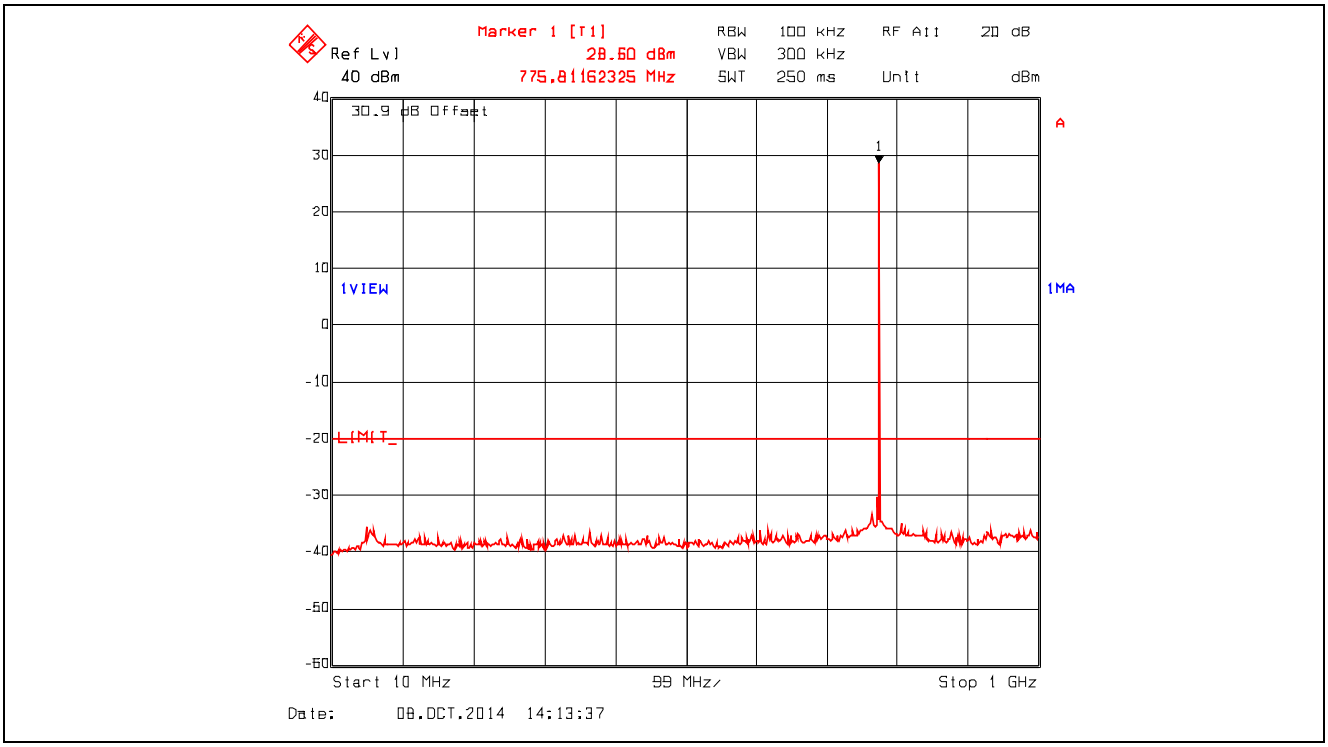
Plot 5.5.4.9. Conducted Transmitter Spurious Emissions, High Power, 774.975 MHz, 10 MHz - 1 GHz



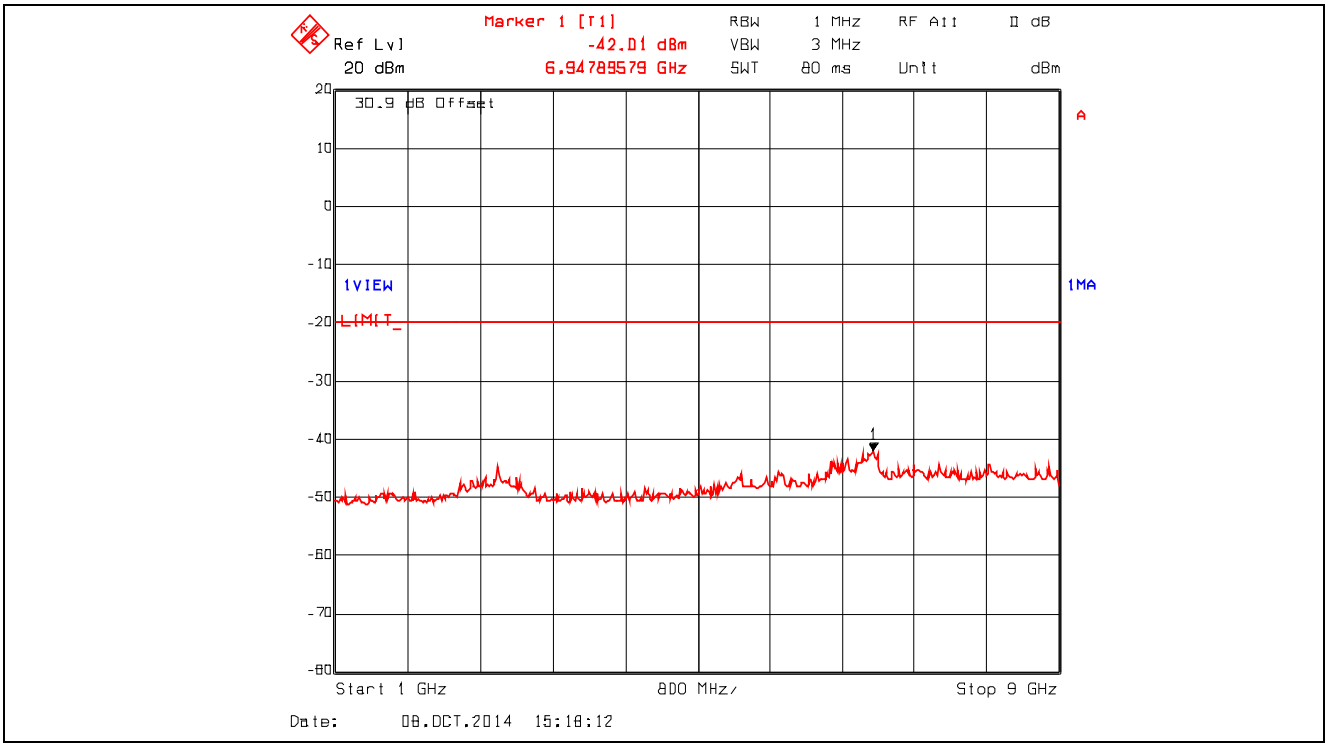
Plot 5.5.4.10. Conducted Transmitter Spurious Emissions, High Power, 774.975 MHz, 1 GHz - 9 GHz



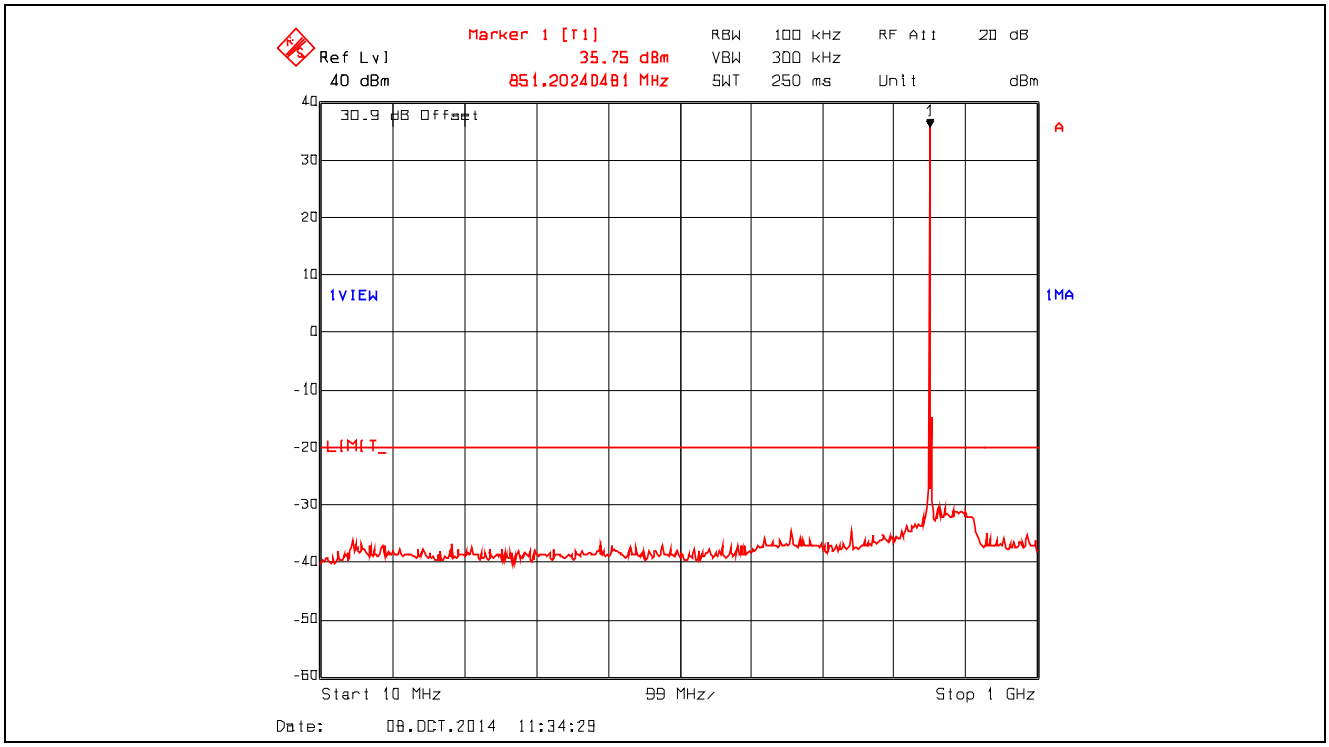
Plot 5.5.4.11. Conducted Transmitter Spurious Emissions, Low Power, 774.975 MHz, 10 MHz - 1 GHz



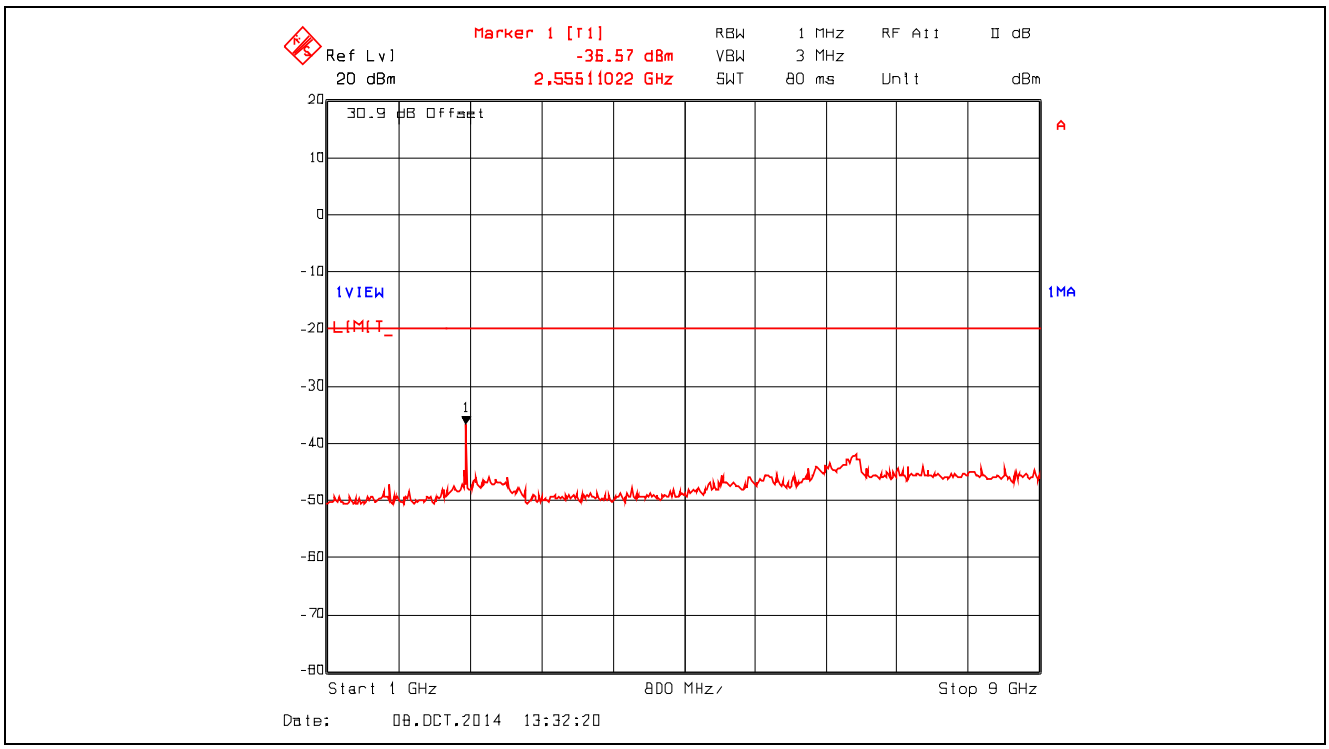
Plot 5.5.4.12. Conducted Transmitter Spurious Emissions, Low Power, 774.975 MHz, 1 GHz - 9 GHz



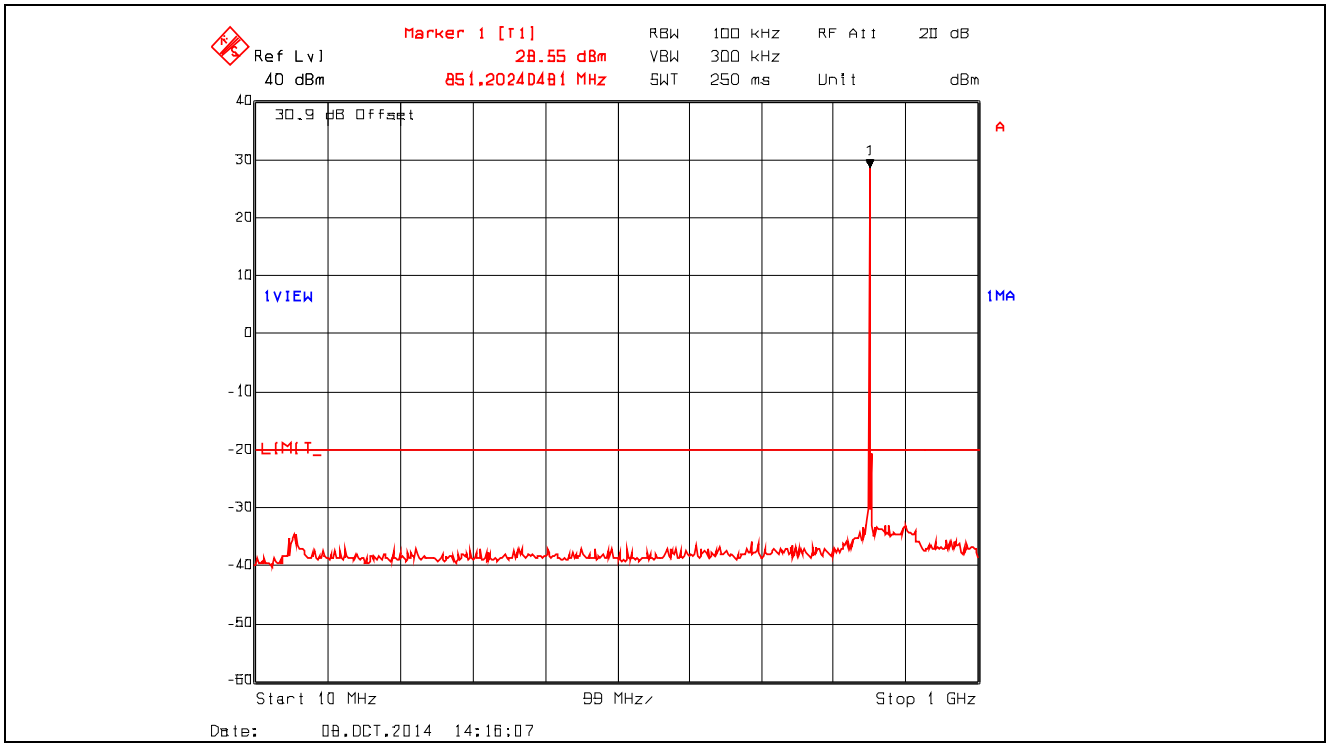
Plot 5.5.4.13. Conducted Transmitter Spurious Emissions, High Power, 851.025 MHz, 10 MHz - 1 GHz



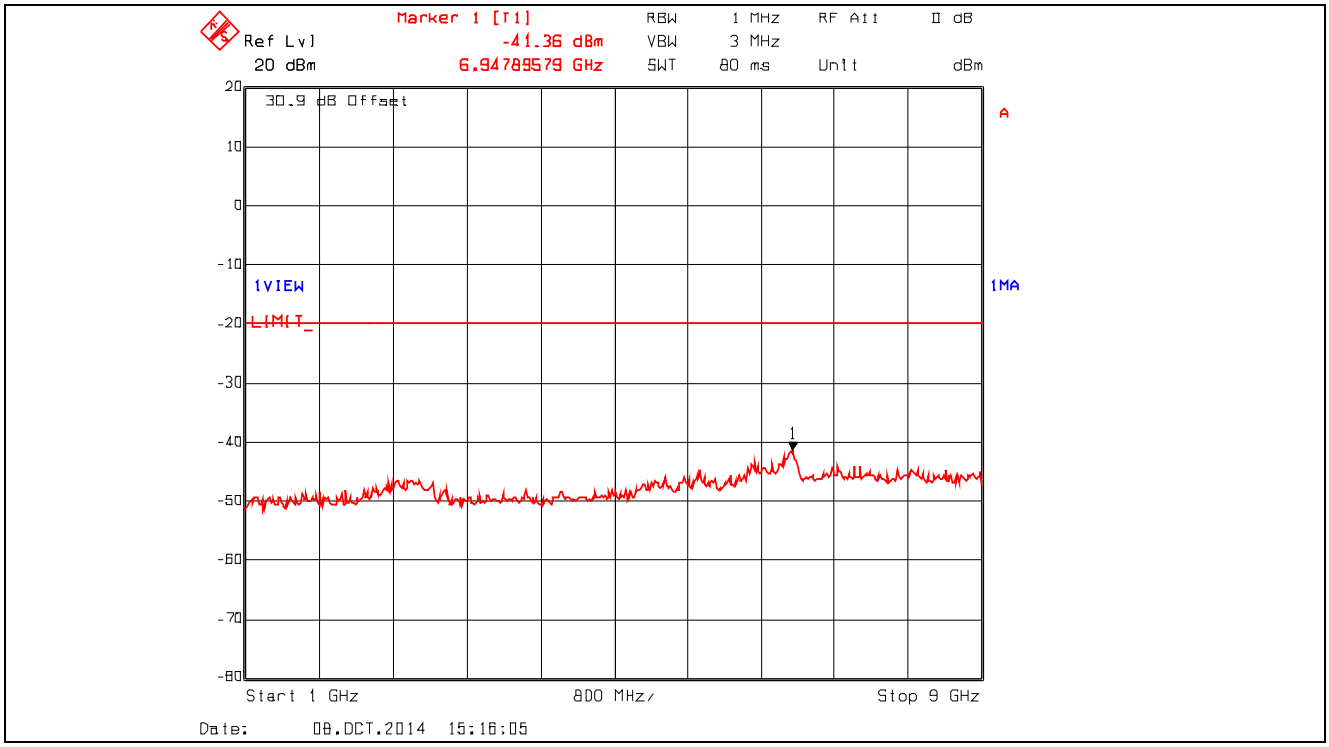
Plot 5.5.4.14. Conducted Transmitter Spurious Emissions, High Power, 851.025 MHz, 1 GHz - 9 GHz



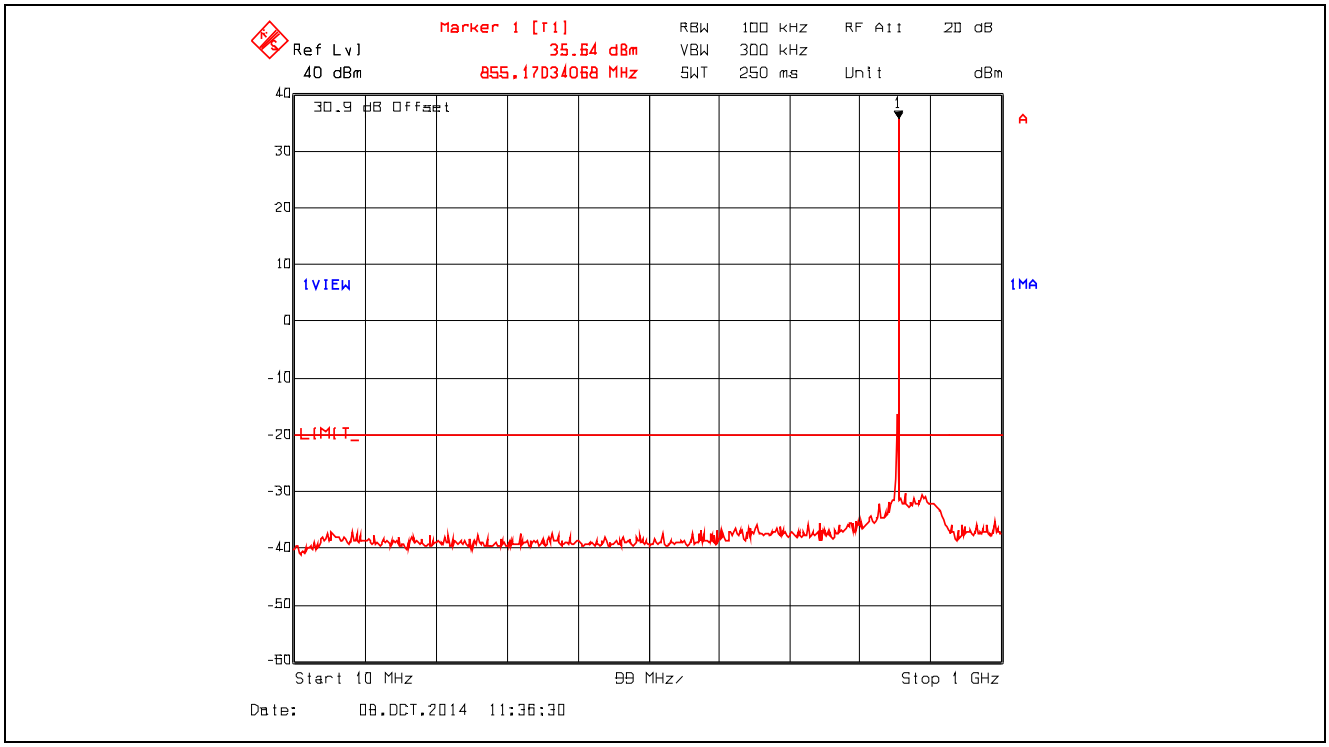
Plot 5.5.4.15. Conducted Transmitter Spurious Emissions, Low Power, 851.025 MHz, 10 MHz - 1 GHz



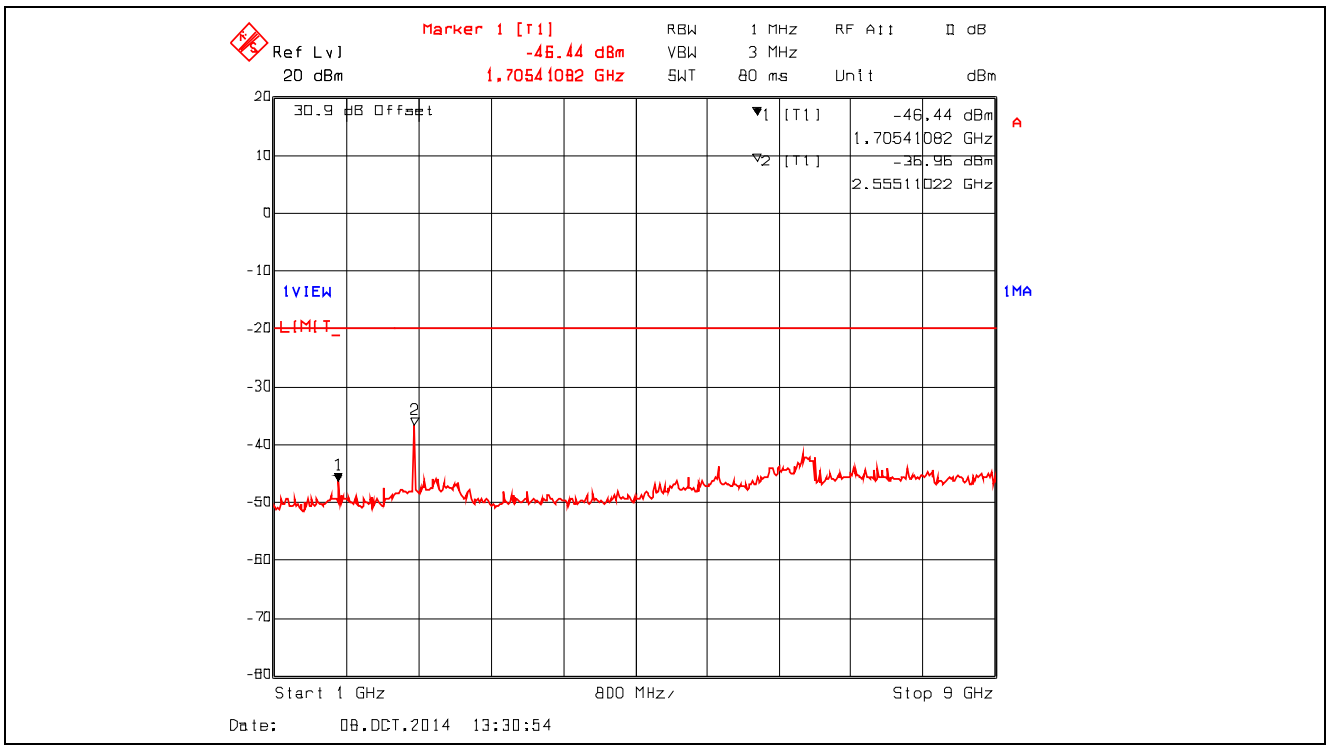
Plot 5.5.4.16. Conducted Transmitter Spurious Emissions, Low Power, 851.025 MHz, 1 GHz - 9 GHz



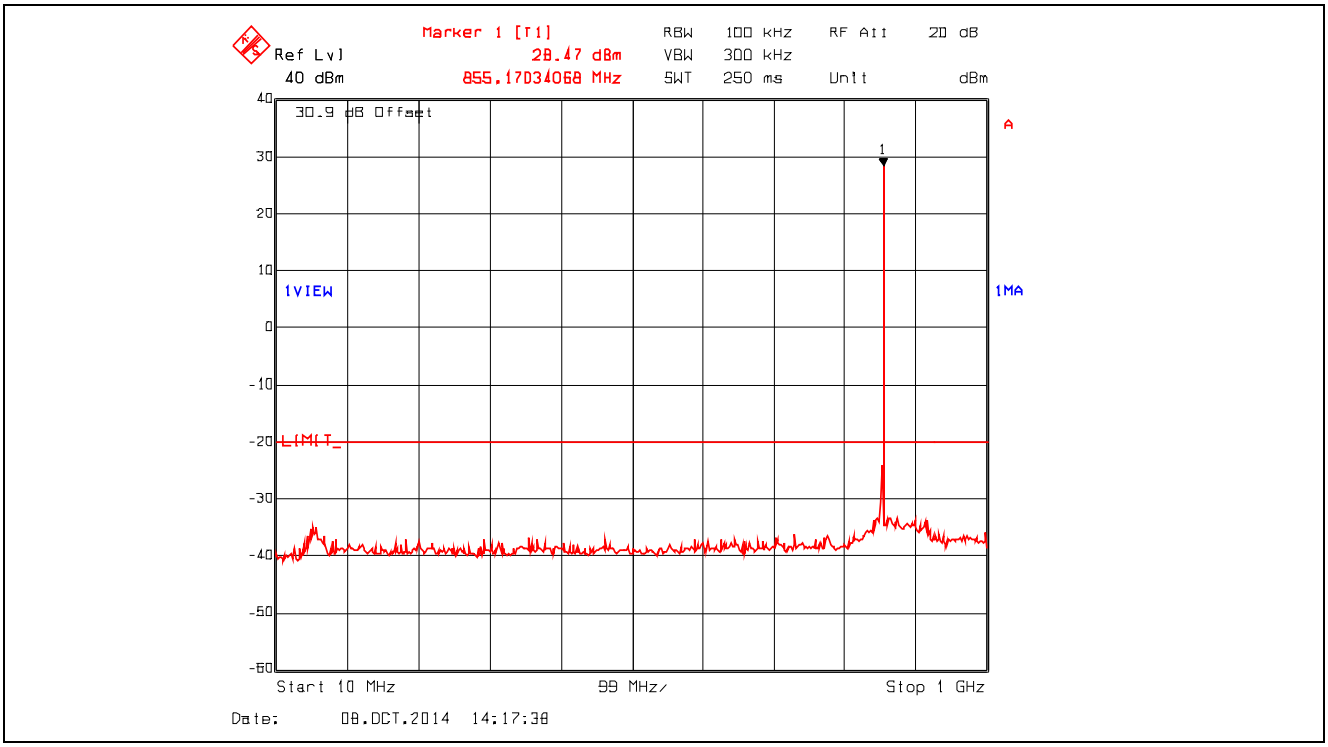
Plot 5.5.4.17. Conducted Transmitter Spurious Emissions, High Power, 853.975 MHz, 10 MHz - 1 GHz



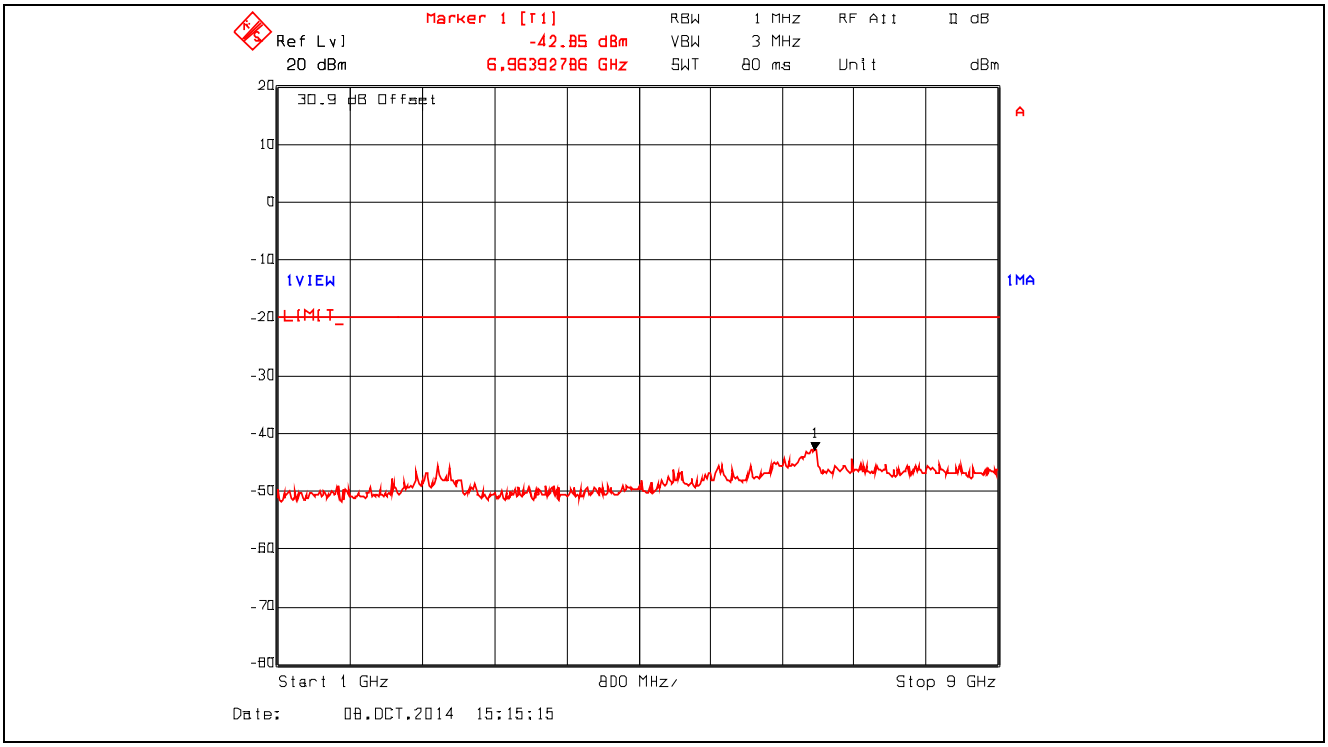
Plot 5.5.4.18. Conducted Transmitter Spurious Emissions, High Power, 853.975 MHz, 1 GHz - 9 GHz



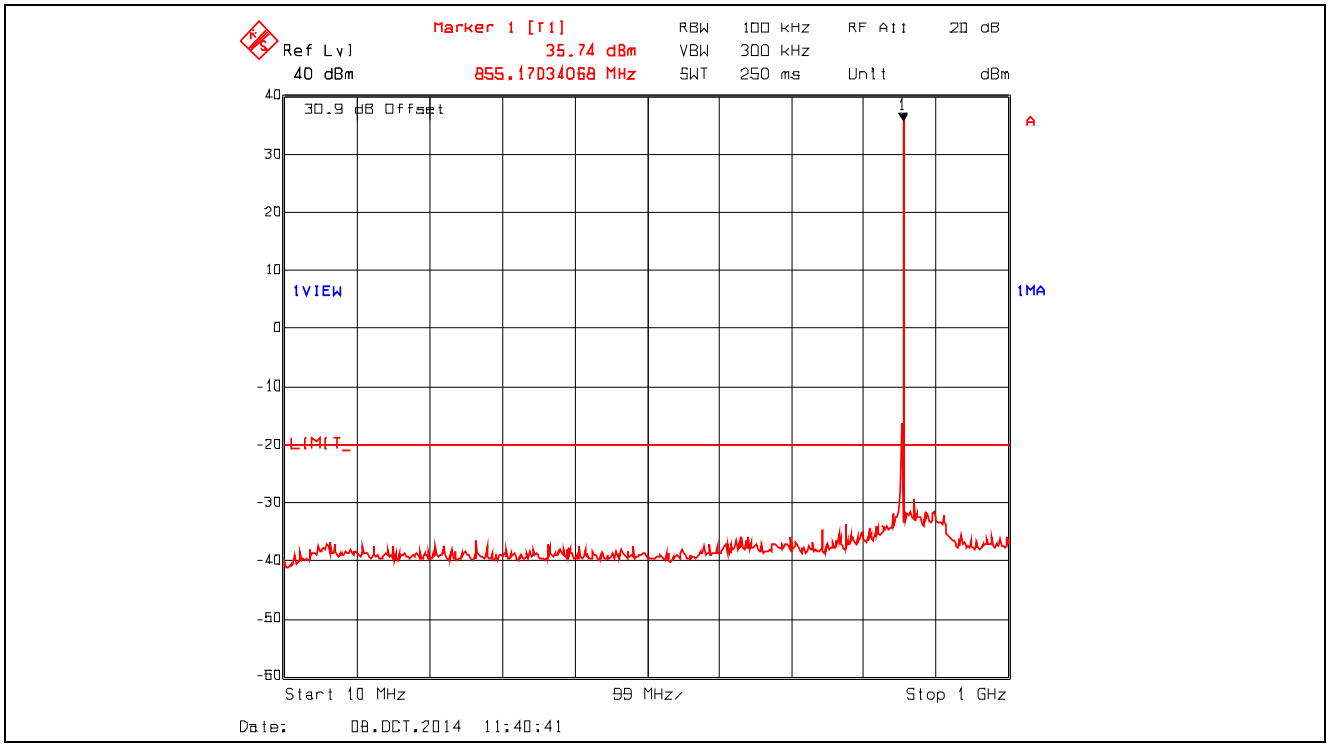
Plot 5.5.4.19. Conducted Transmitter Spurious Emissions, Low Power, 853.975 MHz, 10 MHz - 1 GHz



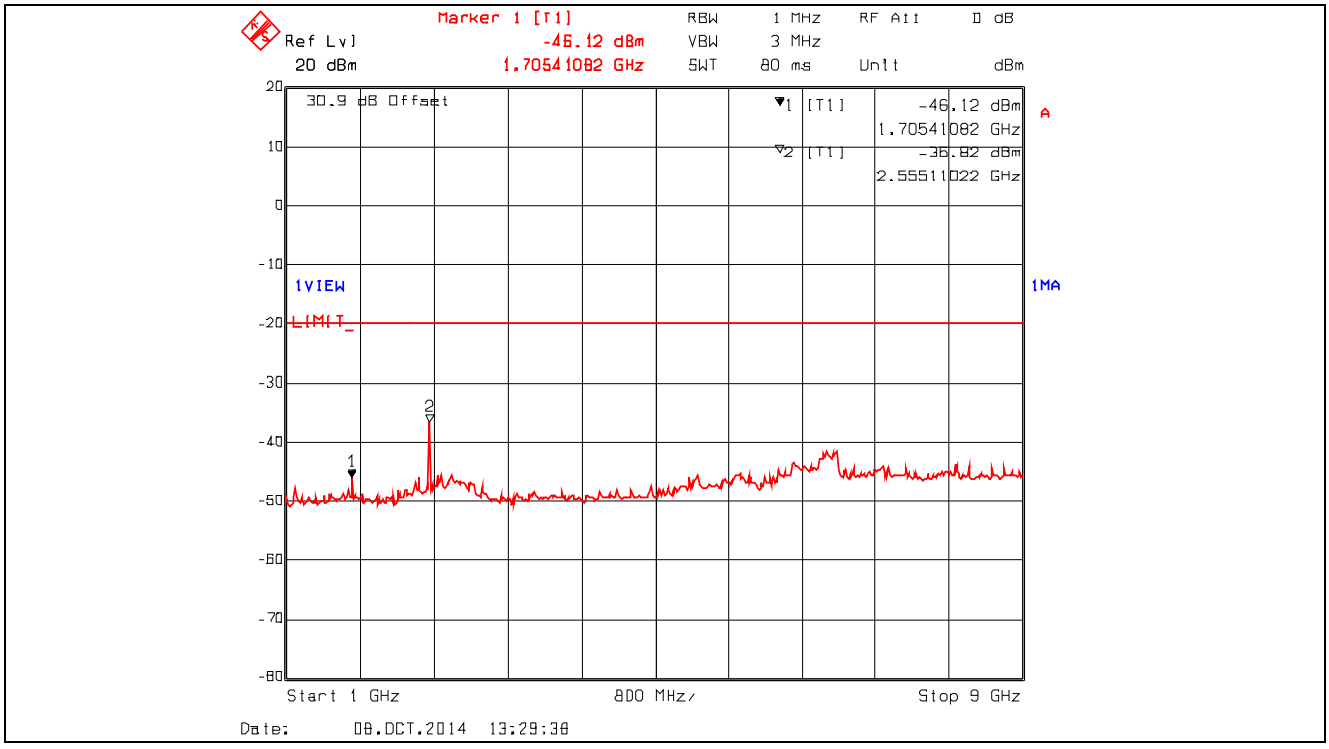
Plot 5.5.4.20. Conducted Transmitter Spurious Emissions, Low Power, 853.975 MHz, 1 GHz - 9 GHz



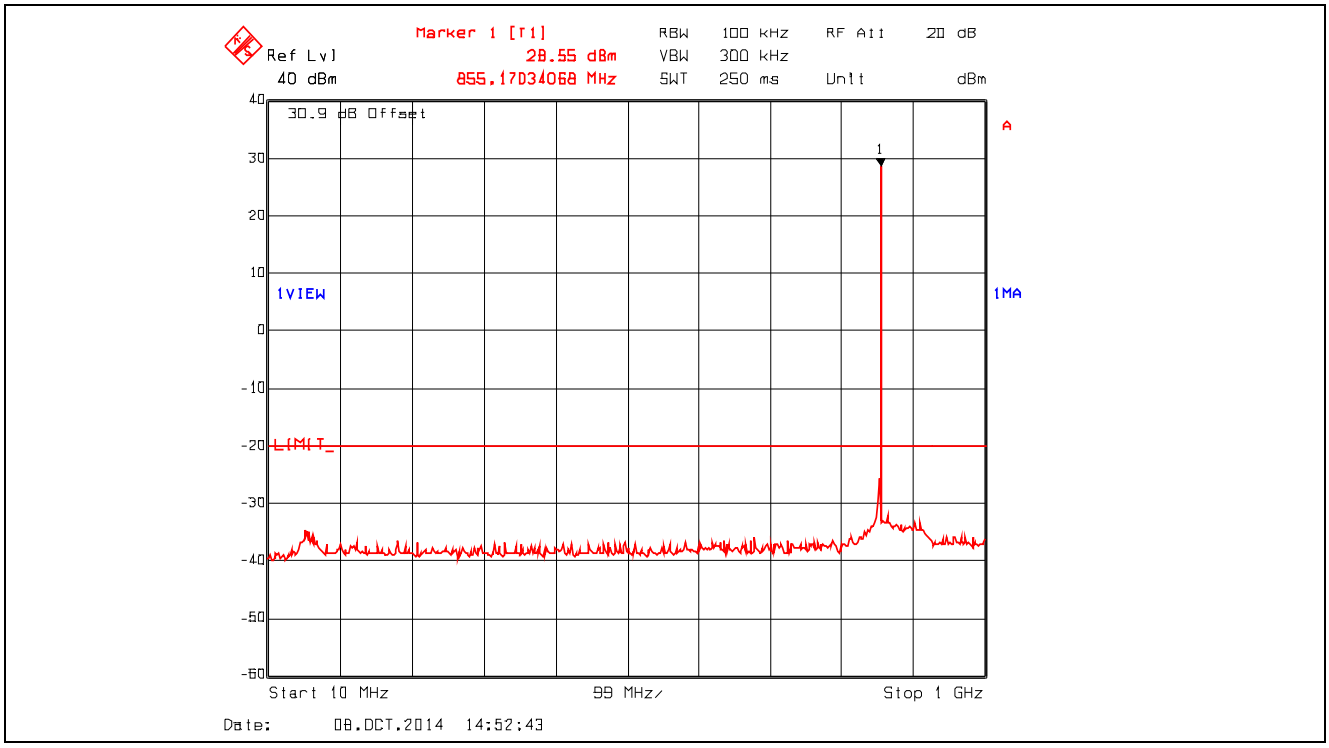
Plot 5.5.4.21. Conducted Transmitter Spurious Emissions, High Power, 854.025 MHz, 10 MHz - 1 GHz



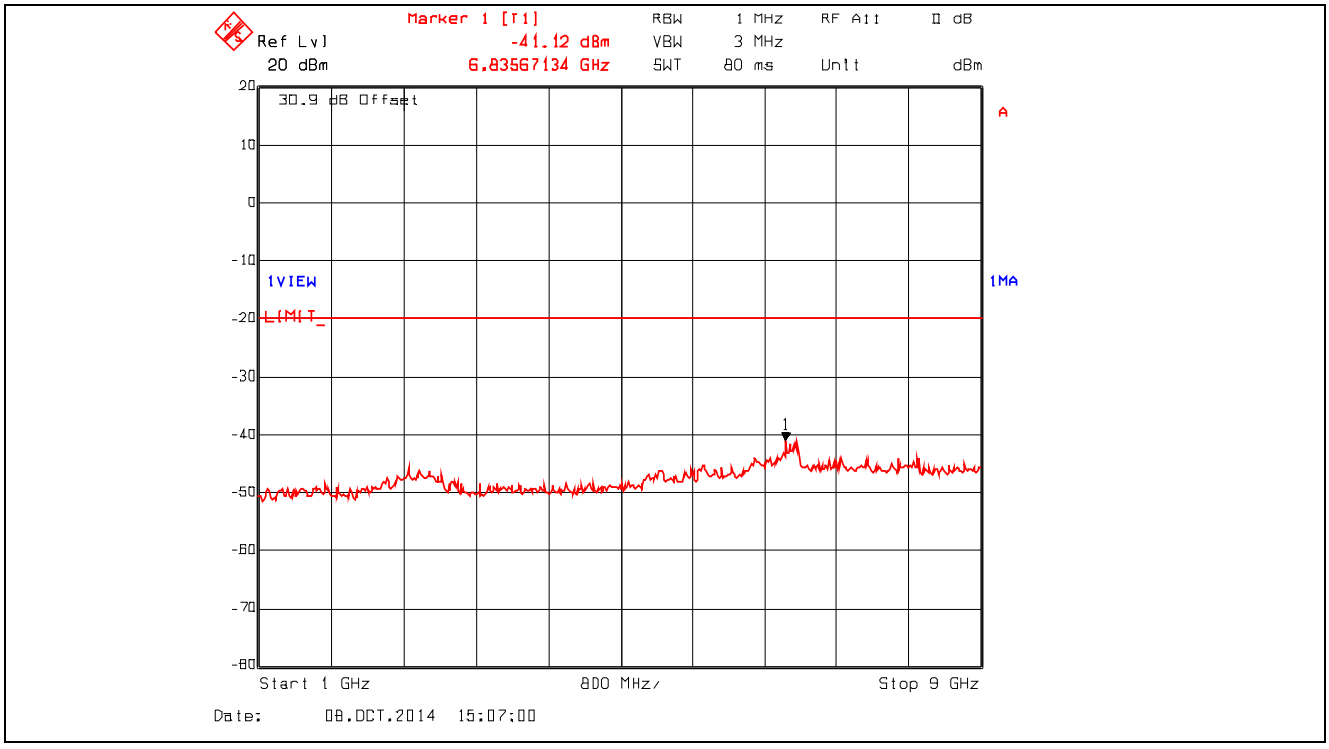
Plot 5.5.4.22. Conducted Transmitter Spurious Emissions, High Power, 854.025 MHz, 1 GHz - 9 GHz



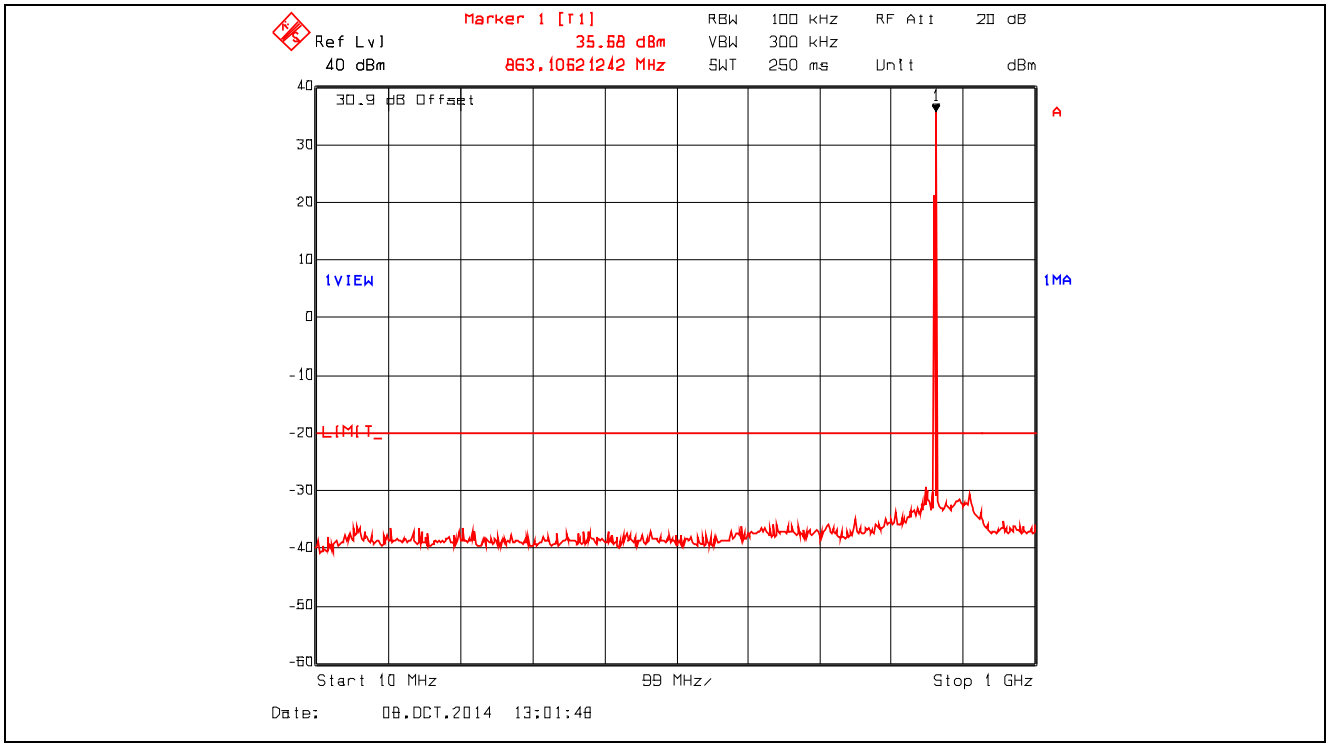
Plot 5.5.4.23. Conducted Transmitter Spurious Emissions, Low Power, 854.025 MHz, 10 MHz - 1 GHz



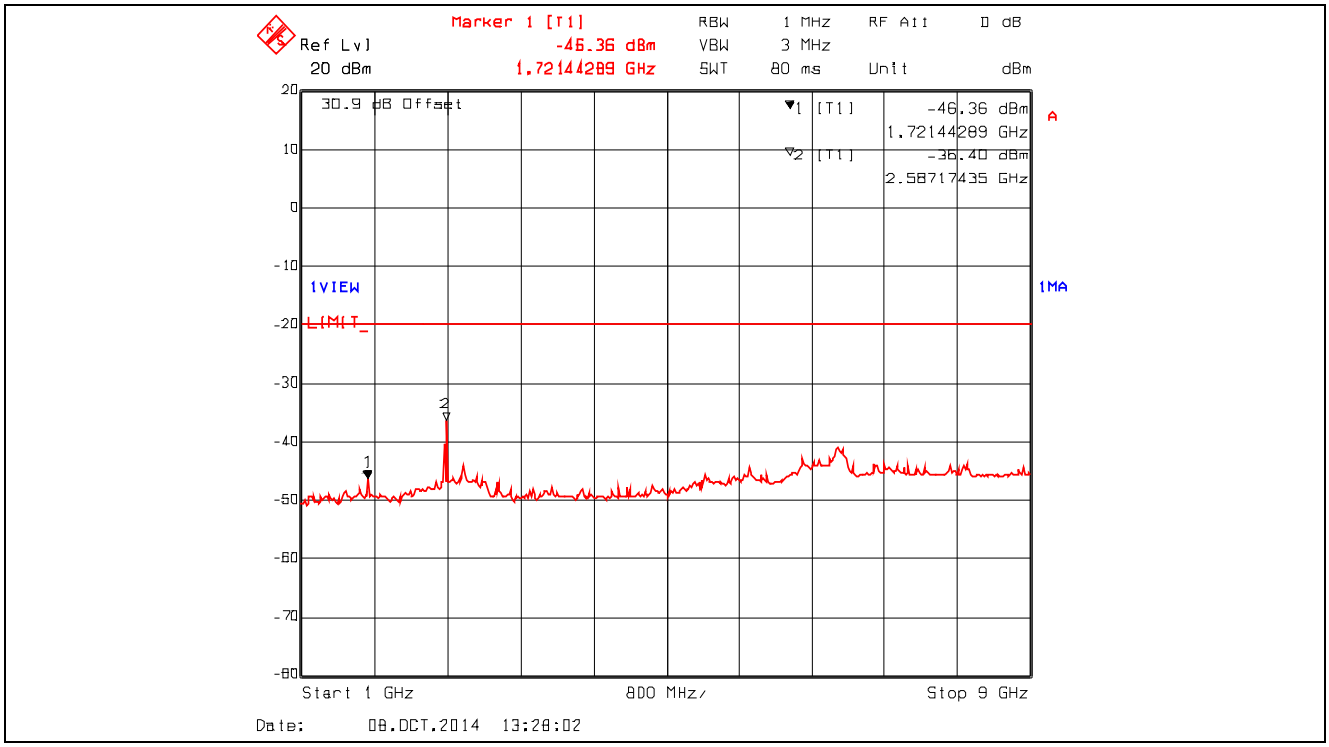
Plot 5.5.4.24. Conducted Transmitter Spurious Emissions, Low Power, 854.025 MHz, 1 GHz - 9 GHz



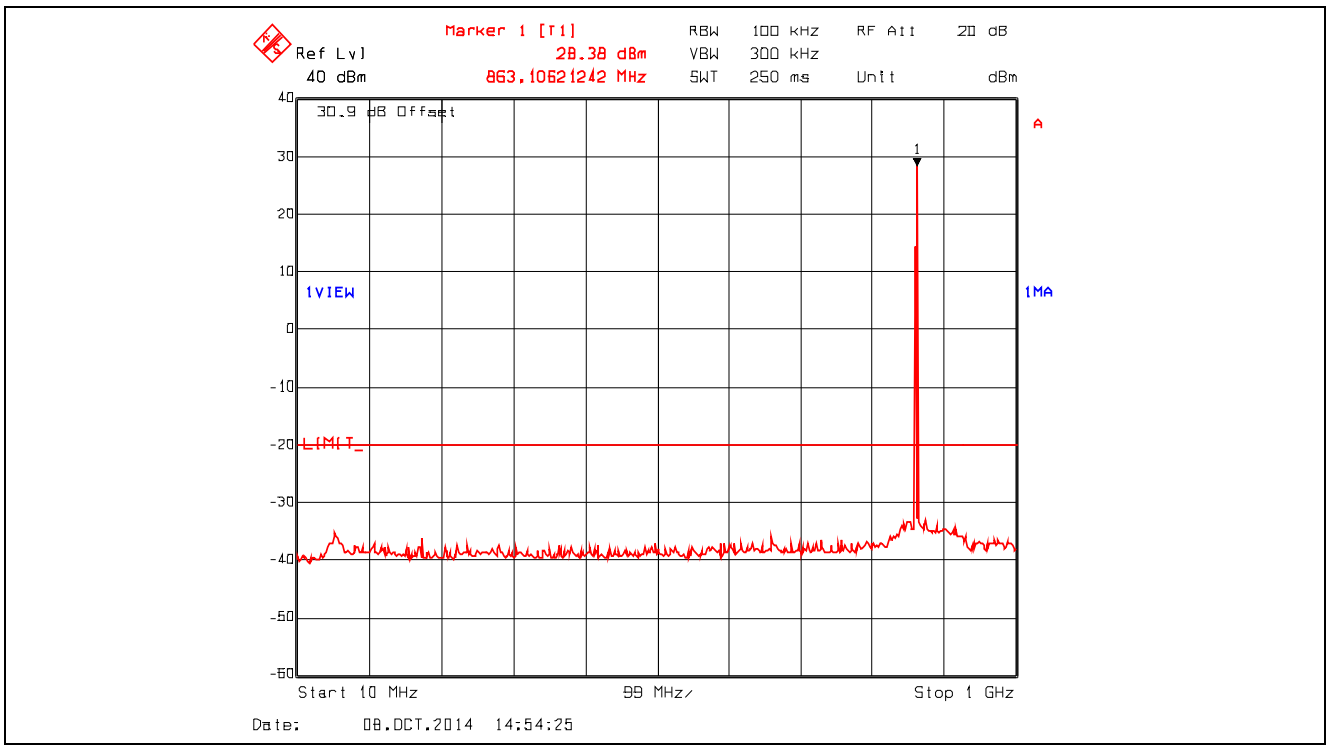
Plot 5.5.4.25. Conducted Transmitter Spurious Emissions, High Power, 861.5 MHz, 10 MHz - 1 GHz



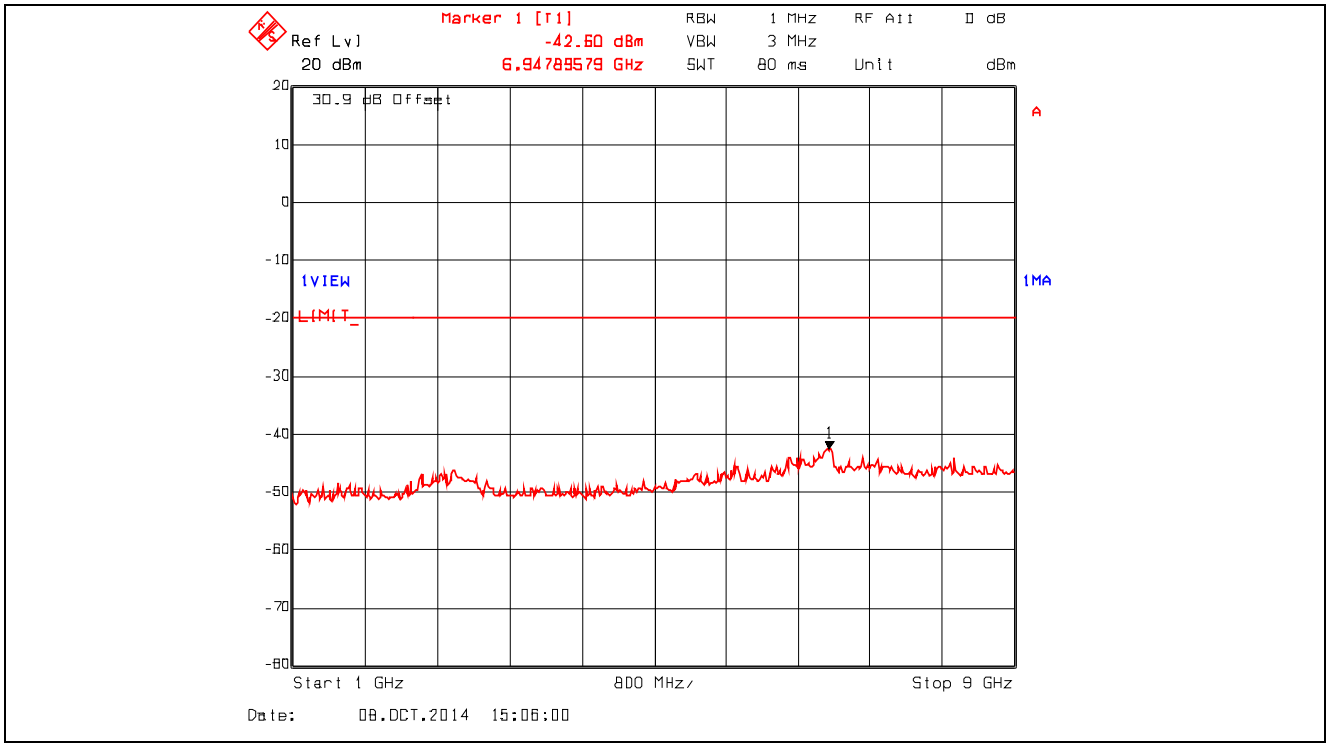
Plot 5.5.4.26. Conducted Transmitter Spurious Emissions, High Power, 861.5 MHz, 1 GHz - 9 GHz



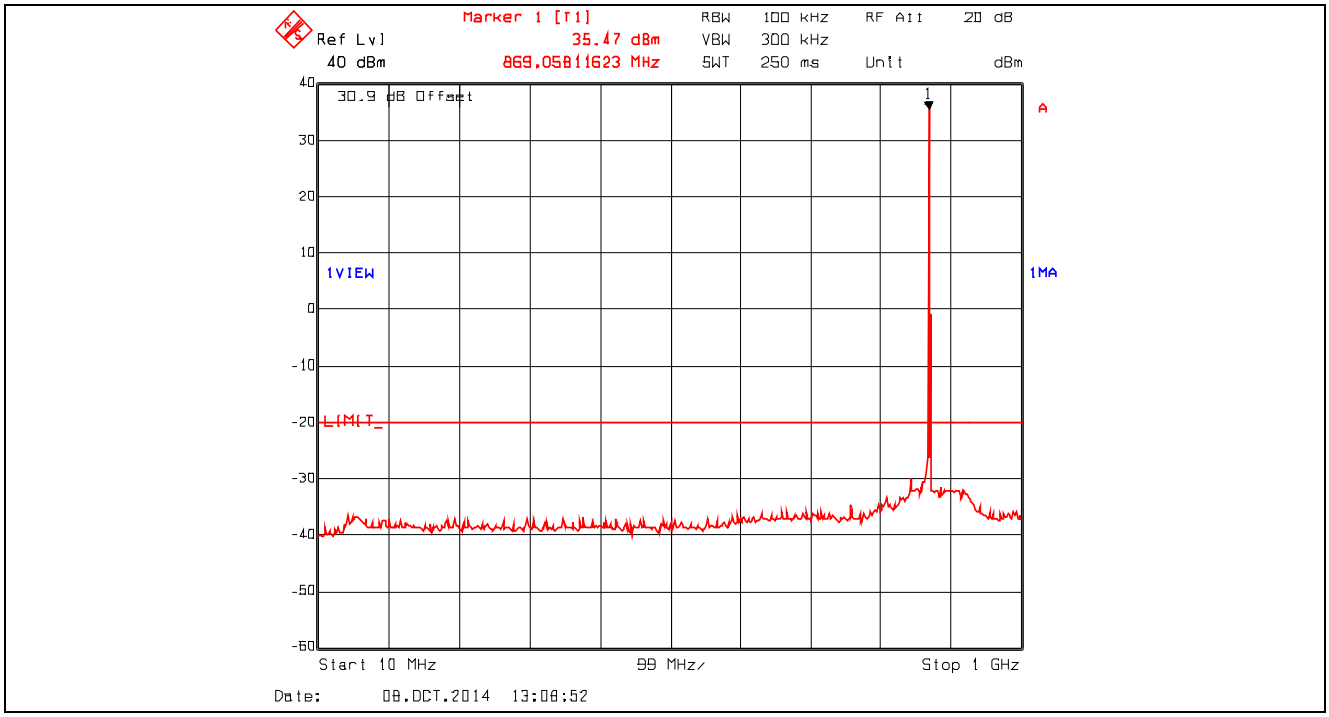
Plot 5.5.4.27. Conducted Transmitter Spurious Emissions, Low Power, 861.5 MHz, 10 MHz - 1 GHz



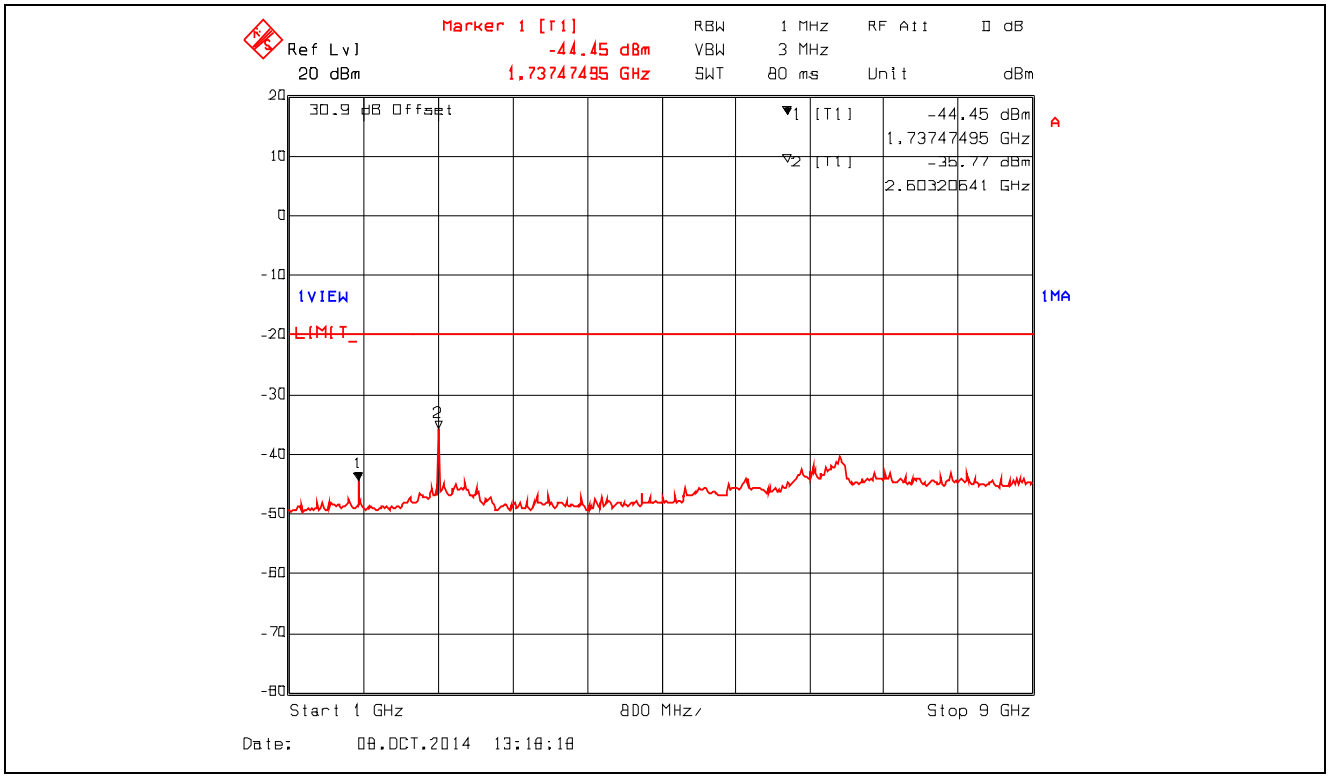
Plot 5.5.4.28. Conducted Transmitter Spurious Emissions, Low Power, 861.5 MHz, 1 GHz - 9 GHz



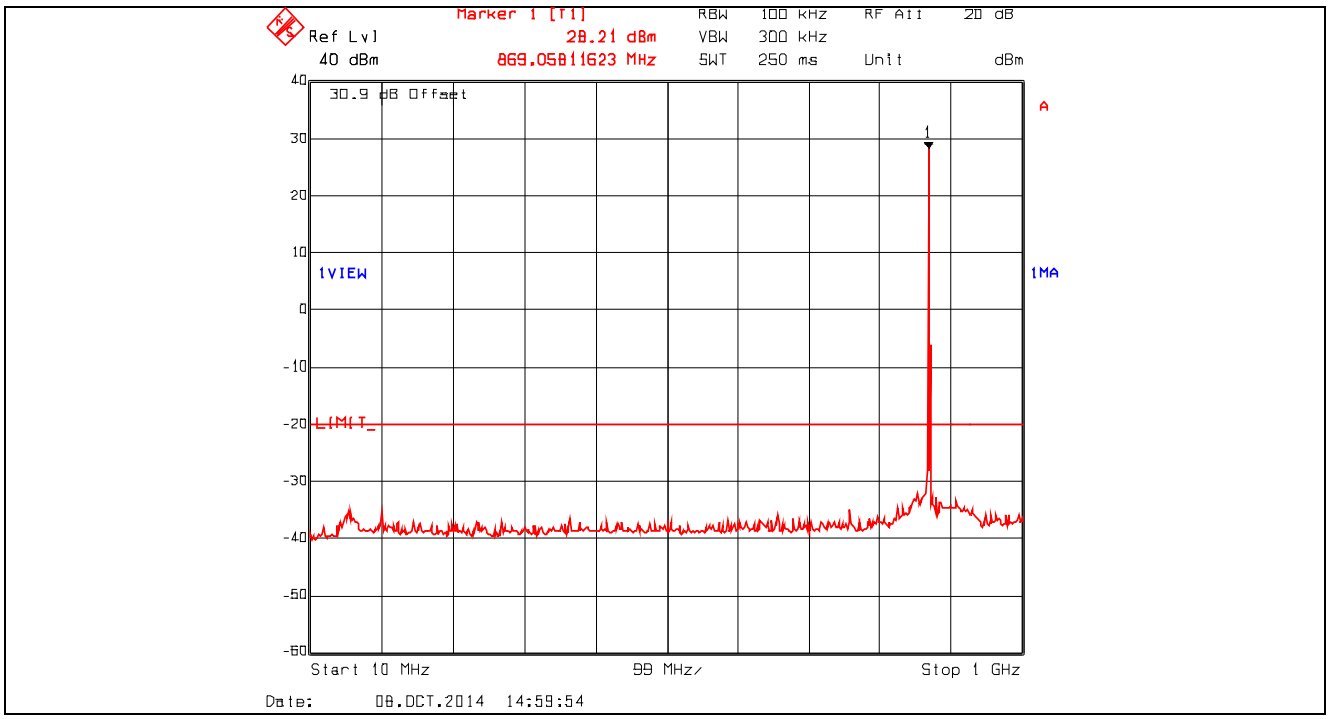
Plot 5.5.4.29. Conducted Transmitter Spurious Emissions, High Power, 868.975 MHz, 10 MHz - 1 GHz



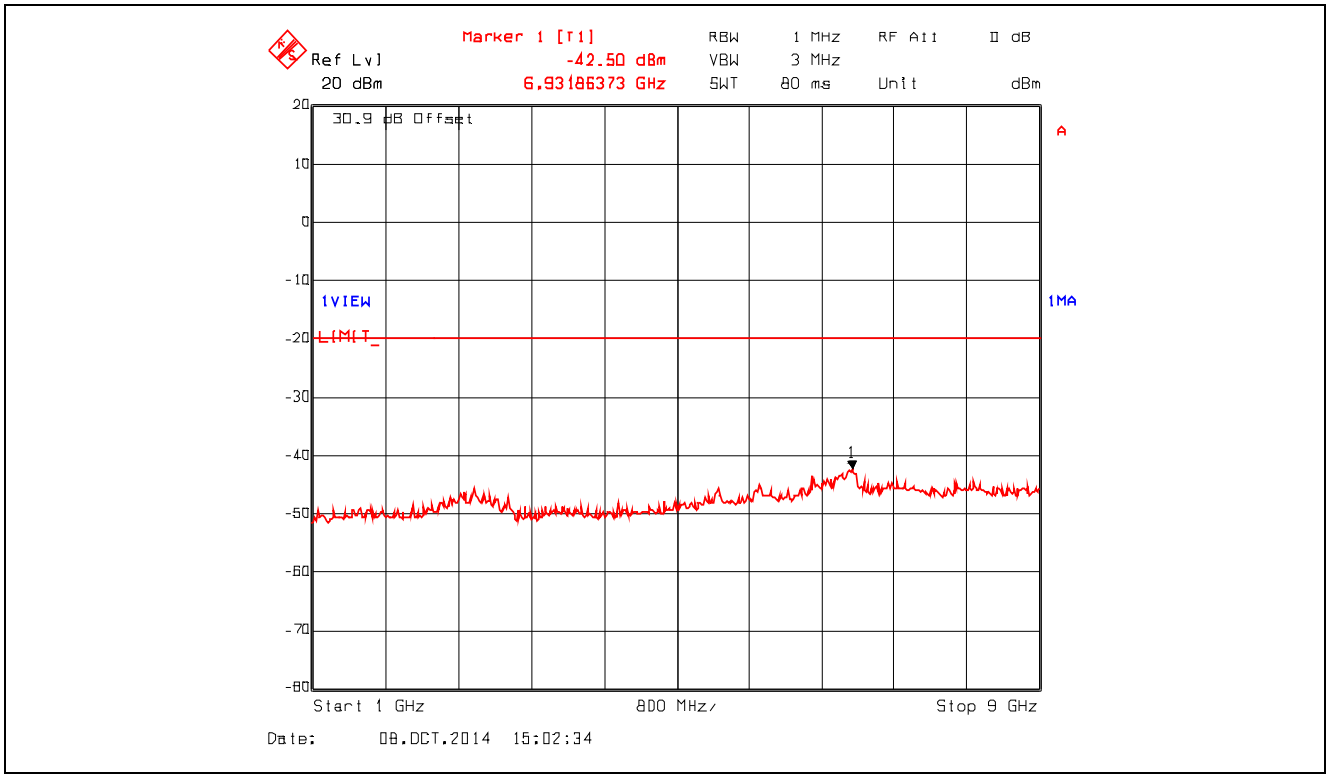
Plot 5.5.4.30. Conducted Transmitter Spurious Emissions, High Power, 868.975 MHz, 1 GHz - 9 GHz



Plot 5.5.4.31. Conducted Transmitter Spurious Emissions, Low Power, 868.975 MHz, 10 MHz - 1 GHz



Plot 5.5.4.32. Conducted Transmitter Spurious Emissions, Low Power, 868.975 MHz, 1 GHz - 9 GHz



5.6. TRANSMITTER SPURIOUS/HARMONIC RADIATED EMISSIONS [§§ 2.1053, 2.1057, 90.210 & 90.543]

5.6.1. Limits

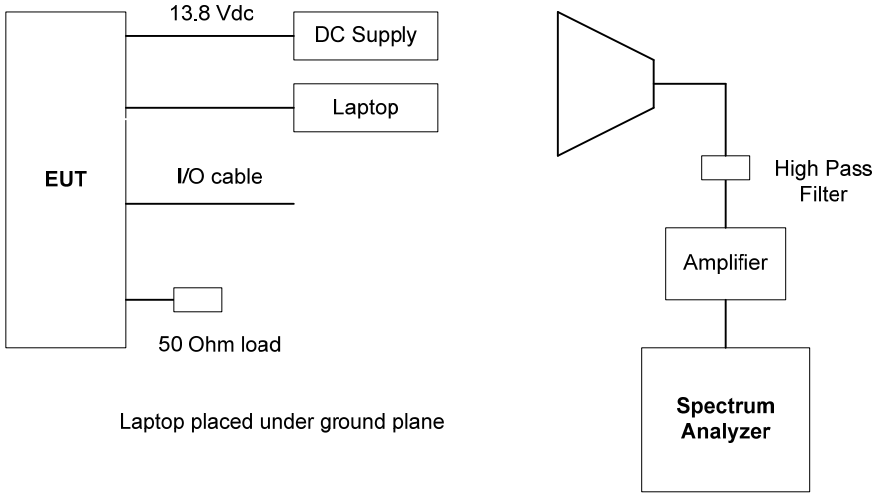
Emissions shall be attenuated below the mean output power of the transmitter as follows:

FCC Rules	Attenuation Limit (dBc)
§ 90.210(b)	At least 43 + 10 log (P) dB
§ 90.210(d)	At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation.
§ 90.543(b)	At least 43 + 10 log (P) dB

5.6.2. Method of Measurements

See substitution test method specified in Section 8.2 of this report

5.6.3. Test Arrangement



5.6.4. Test Data

Remarks:

- The emissions were scanned from 30 MHz to 10th harmonics; all spurious emissions that are in excess of 20dB below the specified limit shall be recorded.
- Exploratory tests were conducted with modulations in the range of typical modes of operation to identify the worst-case modulation. There were no discernable differences detected. The high power setting was used to represents the worst-case test configuration for the final measurement.
- The more stringent limit will be applied for compliance.

(a) 764-775 MHz

Test Frequency (MHz):	764.025					
Limit (dBm):	-20					
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP (dBm)**	**Limit (dBm)**	**Margin (dB)**
30 - 9000	*	Peak	H/V	*	-20	*

* All harmonics and spurious emissions are more than 20 dB below the specified attenuation limit.

Test Frequency (MHz):	770.0					
Limit (dBm):	-20					
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP (dBm)**	**Limit (dBm)**	**Margin (dB)**
30 - 9000	*	Peak	H/V	*	-20	*

* All harmonics and spurious emissions are more than 20 dB below the specified attenuation limit.

Test Frequency (MHz):	774.975					
Limit (dBm):	-20					
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP (dBm)**	**Limit (dBm)**	**Margin (dB)**
30 - 9000	*	Peak	H/V	*	-20	*

* All harmonics and spurious emissions are more than 20 dB below the specified attenuation limit.

(b) 851-854 & 854-869 MHz

Test Frequency (MHz):	851.025					
Limit (dBm):	-20					
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP (dBm)**	**Limit (dBm)**	**Margin (dB)**
30 - 9000	*	Peak	H/V	*	-20	*

* All harmonics and spurious emissions are more than 20 dB below the specified attenuation limit.

Test Frequency (MHz):	853.975					
Limit (dBm):	-20					
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP (dBm)**	**Limit (dBm)**	**Margin (dB)**
30 - 9000	*	Peak	H/V	*	-20	*

* All harmonics and spurious emissions are more than 20 dB below the specified attenuation limit.

Test Frequency (MHz):	854.025					
Limit (dBm):	-20					
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP (dBm)**	**Limit (dBm)**	**Margin (dB)**
30 - 9000	*	Peak	H/V	*	-20	*

* All harmonics and spurious emissions are more than 20 dB below the specified attenuation limit.

Test Frequency (MHz):	861.5					
Limit (dBm):	-20					
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP (dBm)**	**Limit (dBm)**	**Margin (dB)**
30 - 9000	*	Peak	H/V	*	-20	*

* All harmonics and spurious emissions are more than 20 dB below the specified attenuation limit.

Test Frequency (MHz):	868.975					
Limit (dBm):	-20					
Frequency (MHz)	**E-Field (dBµV/m)**	**EMI Detector (Peak/QP)**	**Antenna Polarization (H/V)**	**ERP (dBm)**	**Limit (dBm)**	**Margin (dB)**
30 - 9000	*	Peak	H/V	*	-20	*

* All harmonics and spurious emissions are more than 20 dB below the specified attenuation limit.

5.7. FREQUECNY STABILITY [§§ 2.1055, 90.213 & 90.539]

5.7.1. Limits

See § 90.213 - Minimum Frequency Stability

Frequency range (MHz)	Minimum Frequency Stability (ppm)		
	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
806-809	[4] 1.0	1.5	1.5
809-824	[4] 1.5	2.5	2.5
851-854	1.0	1.5	1.5
854-869	1.5	2.5	2.5

[4] Control stations may operate with the frequency tolerance specified for associated mobile frequencies.

§ 90.539 Transmitters designed to operate in 769-775 MHz and 799-805 MHz frequency bands must meet the frequency stability requirements in this section.

(a) Mobile, portable and control transmitters must normally use automatic frequency control (AFC) to lock on to the base station signal.

(b) The frequency stability of base transmitters operating in the narrowband segment must be 100 parts per billion or better.

(c) The frequency stability of mobile, portable, and control transmitters operating in the narrowband segment must be 400 parts per billion or better when AFC is locked to the base station. When AFC is not locked to the base station, the frequency stability must be at least 1.0 ppm for 6.25 kHz, 1.5 ppm for 12.5 kHz (2 channel aggregate), and 2.5 ppm for 25 kHz (4 channel aggregate).

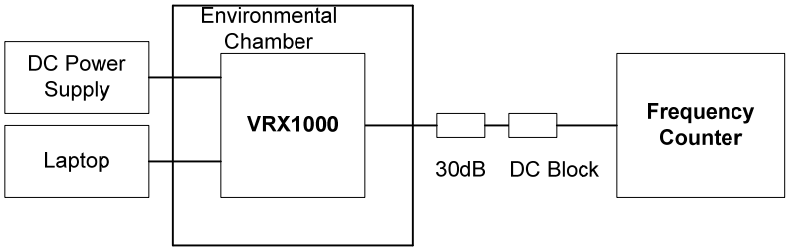
(d) The frequency stability of base transmitters operating in the wideband segment must be 1 part per million or better.

(e) The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked.

5.7.2. Method of Measurements

Refer to Section 8.3 of this report for measurement details.

5.7.3. Test Arrangement



5.7.4. Test Data

Center Frequency:	764.025 MHz
Full Power Level:	34.70 dBm
Frequency Tolerance Limit (Worst Case):	±1.0 ppm or 764 Hz
Max. Frequency Tolerance Measured:	-424 Hz or -0.55 ppm
Input Voltage Rating:	13.8V DC

Ambient Temperature (°C)	**Frequency Drift (Hz)**		
	Supply Voltage 13.8V DC (Nominal)	**Supply Voltage 11.73 VDC (85% of Nominal)**	**Supply Voltage 15.87 VDC (115% of Nominal)**
-30	76	--	--
-20	45	--	--
-10	15	--	--
0	48	--	--
10	25	--	--
20	0	1	0
30	-76	--	--
40	-296	--	--
50	-424	--	--
60	-388	--	--

5.8. ADJACENT CHANNEL POWER [§ 90.543]

5.8.1. Limits

§ 90.543 (a) The adjacent channel power (ACP) requirements for transmitters designed for various channel sizes are shown in the following tables. Mobile station requirements apply to handheld, car mounted and control station units. The tables specify a value for the ACP as a function of the displacement from the channel center frequency and measurement bandwidth. In the following tables, "(s)" indicates a swept measurement may be used.

12.5 kHz Mobile Transmitter ACP Requirements

Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP relative (dBc)
9.375	6.25	−40
15.625	6.25	−60
21.875	6.25	−60
37.50	25.00	−60
62.50	25.00	−65
87.50	25.00	−65
150.00	100	−65
250.00	100	−65
350.00	100	−65
>400 to 12 MHz	30 (s)	−75
12 MHz to paired receive band	30 (s)	−75
In the paired receive band	30 (s)	−100

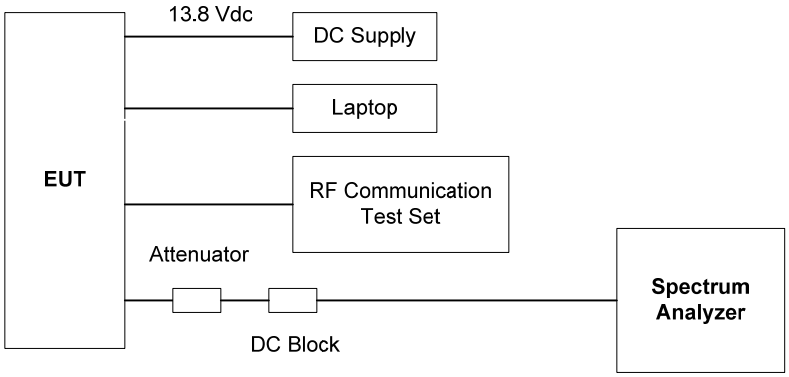
25 kHz Mobile Transmitter ACP Requirements

Offset from center frequency (kHz)	Measurement bandwidth (kHz)	Maximum ACP relative (dBc)
15.625	6.25	−40
21.875	6.25	−60
37.50	25	−60
62.50	25	−65
87.50	25	−65
150.00	100	−65
250.00	100	−65
350.00	100	−65
>400 kHz to 12 MHz	30 (s)	−75
12 MHz to paired receive band	30 (s)	−75
In the paired receive band	30 (s)	−100

5.8.2. Method of Measurements

TIA-603-D 2.2.14 and § 90.543

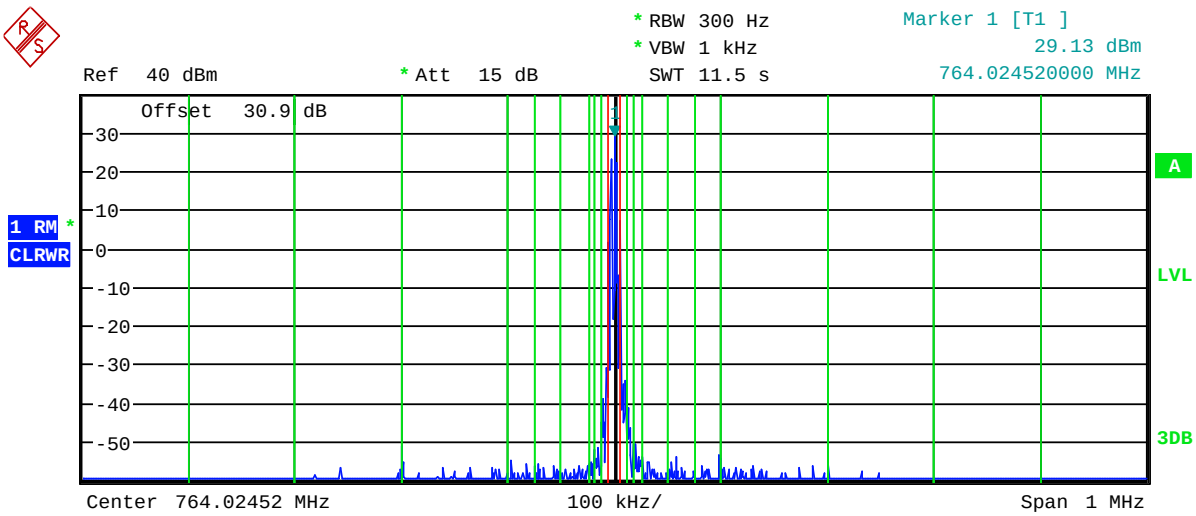
5.8.3. Test Arrangement



5.8.4. Test Data

Analog Voice, 12.5 kHz Channel Spacing, 764.025 MHz Ref. Power Level = 34.74 dBm				
Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Measured Maximum ACP (dBc)		Maximum ACP (dBc)
		Lower	Upper	
9.375	6.25	-46.86	-53.54	-40
15.625	6.25	-74.14	-70.02	-60
21.875	6.25	-78.26	-76.85	-60
37.500	25.00	-75.39	-74.22	-60
62.500	25.00	-75.34	-75.14	-65
87.500	25.00	-75.69	-75.37	-65
150.000	100.00	-70.55	-70.26	-65
250.000	100.00	-72.07	-72.33	-65
350.000	100.00	-73.26	-73.54	-65
>400 kHz to 12 MHz	30 (Swept)	<-75	<-75	-75
12 MHz to paired receive band	30 (Swept)	<-75	<-75	-75
In the paired receive band	30 (Swept)	<-100	<-100	-100

Plot 5.8.4.1. Adjacent Channel Power, Analog Voice, 12.5 kHz Channel Spacing, 764.025 MHz



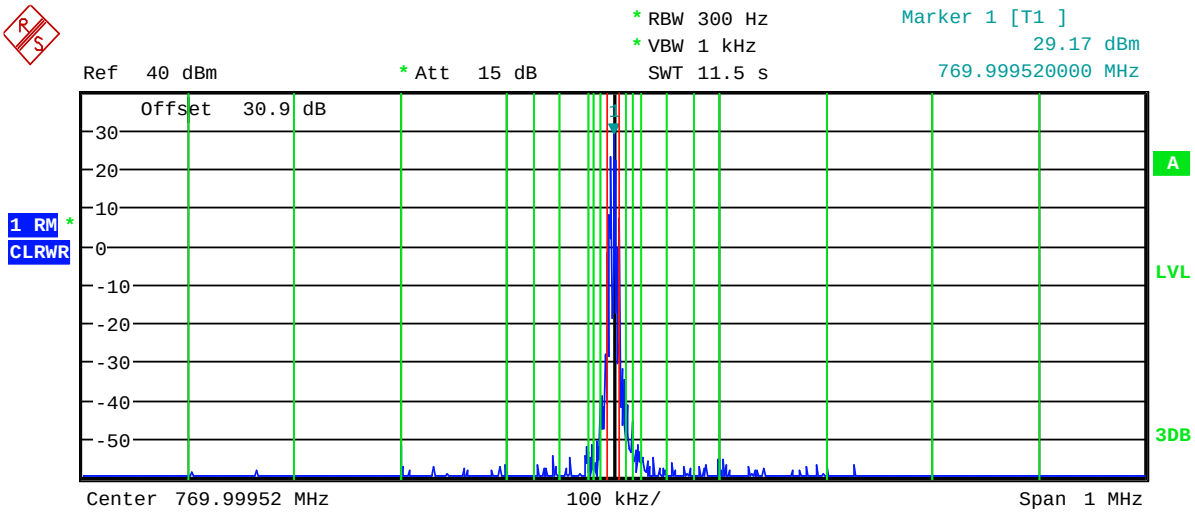
Channel	Bandwidth	Spacing	Lower	Upper
Tx Channel	12.500 kHz		34.71 dBm	
Adjacent	6.250 kHz	9.375 kHz	-46.86 dB	-53.54 dB
Alternate	6.250 kHz	15.625 kHz	-74.14 dB	-70.02 dB
2nd Alt	6.250 kHz	21.875 kHz	-78.26 dB	-76.85 dB
3rd Alt	25.000 kHz	37.500 kHz	-75.39 dB	-74.22 dB
4th Alt	25.000 kHz	62.500 kHz	-75.34 dB	-75.14 dB
5th Alt	25.000 kHz	87.500 kHz	-75.69 dB	-75.37 dB
6th Alt	100.000 kHz	150.000 kHz	-70.55 dB	-70.26 dB
7th Alt	100.000 kHz	250.000 kHz	-72.07 dB	-72.33 dB
8th Alt	100.000 kHz	350.000 kHz	-73.26 dB	-73.54 dB

Ultratech Labs

Date: 16.OCT.2014 15:56:03

Analog Voice, 12.5 kHz Channel Spacing, 770.0 MHz Ref. Power Level = 34.77 dBm				
Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Measured Maximum ACP (dBc)		Maximum ACP (dBc)
		Lower	Upper	
9.375	6.25	-49.72	-51.96	-40
15.625	6.25	-70.93	-69.60	-60
21.875	6.25	-77.51	-76.33	-60
37.500	25.00	-74.96	-74.39	-60
62.500	25.00	-76.22	-76.26	-65
87.500	25.00	-78.00	-75.74	-65
150.000	100.00	-70.94	-70.57	-65
250.000	100.00	-72.73	-72.67	-65
350.000	100.00	-73.29	-73.45	-65
>400 kHz to 12 MHz	30 (Swept)	<-75	<-75	-75
12 MHz to paired receive band	30 (Swept)	<-75	<-75	-75
In the paired receive band	30 (Swept)	<-100	<-100	-100

Plot 5.8.4.2. Adjacent Channel Power, Analog Voice, 12.5 kHz Channel Spacing, 770.0 MHz



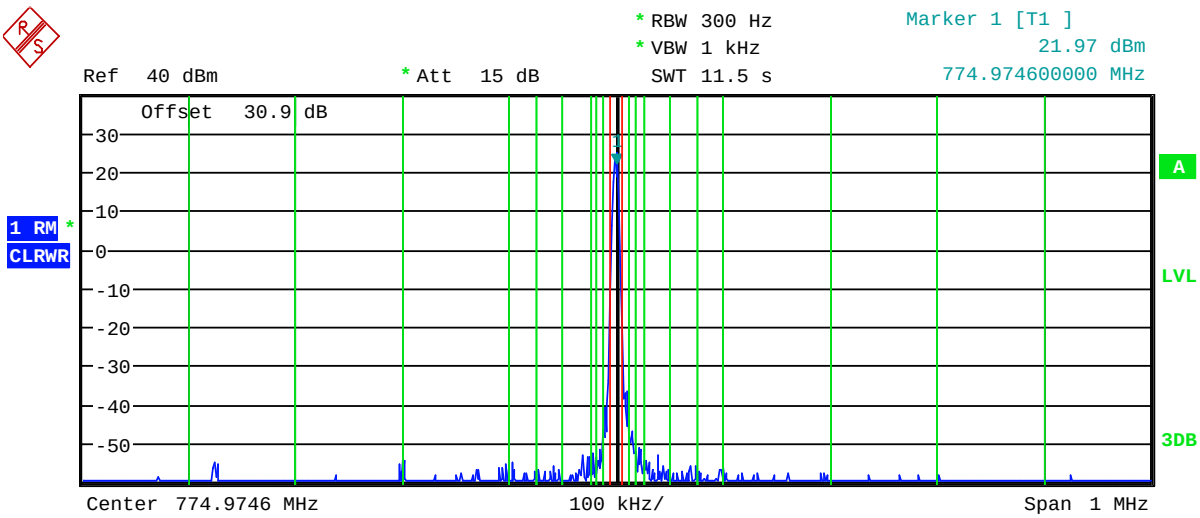
Channel	Bandwidth	Spacing	Lower	Upper
Tx Channel	**12.500 kHz**		**34.73 dBm**	
Adjacent	6.250 kHz	9.375 kHz	-49.72 dB	-51.96 dB
Alternate	6.250 kHz	15.625 kHz	-70.93 dB	-69.60 dB
2nd Alt	6.250 kHz	21.875 kHz	-77.51 dB	-76.33 dB
3rd Alt	25.000 kHz	37.500 kHz	-74.96 dB	-74.39 dB
4th Alt	25.000 kHz	62.500 kHz	-76.22 dB	-76.26 dB
5th Alt	25.000 kHz	87.500 kHz	-78.00 dB	-75.74 dB
6th Alt	100.000 kHz	150.000 kHz	-70.94 dB	-70.57 dB
7th Alt	100.000 kHz	250.000 kHz	-72.73 dB	-72.67 dB
8th Alt	100.000 kHz	350.000 kHz	-73.29 dB	-73.45 dB

Ultratech Labs

Date: 16.OCT.2014 15:52:58

Analog Voice, 12.5 kHz Channel Spacing, 774.975 MHz, Ref. Power Level = 34.94 dBm				
Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Measured Maximum ACP (dBc)		Maximum ACP (dBc)
		Lower	Upper	
9.375	6.25	-50.87	-49.93	-40
15.625	6.25	-74.38	-70.65	-60
21.875	6.25	-76.94	-75.12	-60
37.500	25.00	-73.53	-72.60	-60
62.500	25.00	-75.16	-74.58	-65
87.500	25.00	-75.19	-74.61	-65
150.000	100.00	-69.98	-70.06	-65
250.000	100.00	-71.13	-71.93	-65
350.000	100.00	-71.27	-72.78	-65
>400 kHz to 12 MHz	30 (Swept)	<-75	<-75	-75
12 MHz to paired receive band	30 (Swept)	<-75	<-75	-75
In the paired receive band	30 (Swept)	<-100	<-100	-100

Plot 5.8.4.3. Adjacent Channel Power, Analog Voice, 12.5 kHz Channel Spacing, 774.975 MHz



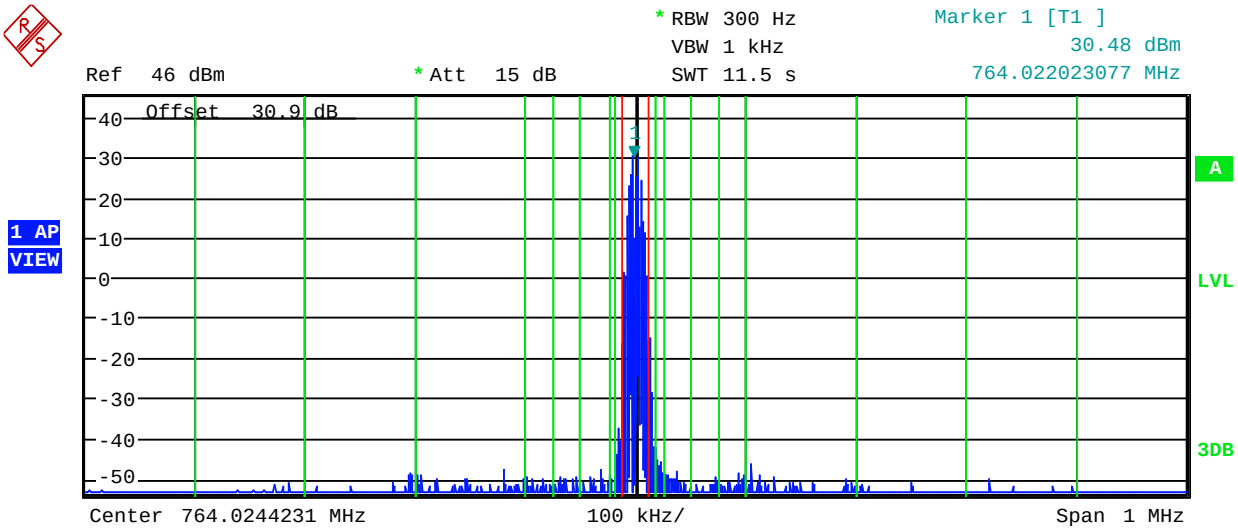
Channel	Bandwidth	Spacing	Lower	Upper
Tx Channel	12.500 kHz		34.07 dBm	
Adjacent	6.250 kHz	9.375 kHz	-50.87 dB	-49.93 dB
Alternate	6.250 kHz	15.625 kHz	-74.38 dB	-70.65 dB
2nd Alt	6.250 kHz	21.875 kHz	-76.94 dB	-75.12 dB
3rd Alt	25.000 kHz	37.500 kHz	-73.53 dB	-72.60 dB
4th Alt	25.000 kHz	62.500 kHz	-75.16 dB	-74.58 dB
5th Alt	25.000 kHz	87.500 kHz	-75.19 dB	-74.61 dB
6th Alt	100.000 kHz	150.000 kHz	-69.98 dB	-70.06 dB
7th Alt	100.000 kHz	250.000 kHz	-71.13 dB	-71.93 dB
8th Alt	100.000 kHz	350.000 kHz	-71.27 dB	-72.78 dB

Ultratech Labs

Date: 16.OCT.2014 15:48:20

Analog Voice, 25 kHz Channel Spacing, 764.025 MHz Ref. Power Level = 34.74 dBm				
Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Measured Maximum ACP (dBc)		Maximum ACP (dBc)
		Lower	Upper	
15.625	6.25	-52.71	-50.82	-40
21.875	6.25	-77.82	-74.40	-60
37.500	25.00	-73.10	-71.96	-60
62.500	25.00	-73.52	-73.90	-65
87.500	25.00	-73.10	-72.96	-65
150.000	100.00	-68.13	-68.18	-65
250.000	100.00	-69.03	-69.79	-65
350.000	100.00	-70.47	-70.61	-65
>400 kHz to 12 MHz	30 (Swept)	<-75	<-75	-75
12 MHz to paired receive band	30 (Swept)	<-75	<-75	-75
In the paired receive band	30 (Swept)	<-100	<-100	-100

Plot 5.8.4.4. Adjacent Channel Power, Analog Voice, 25 kHz Channel Spacing, 764.025 MHz



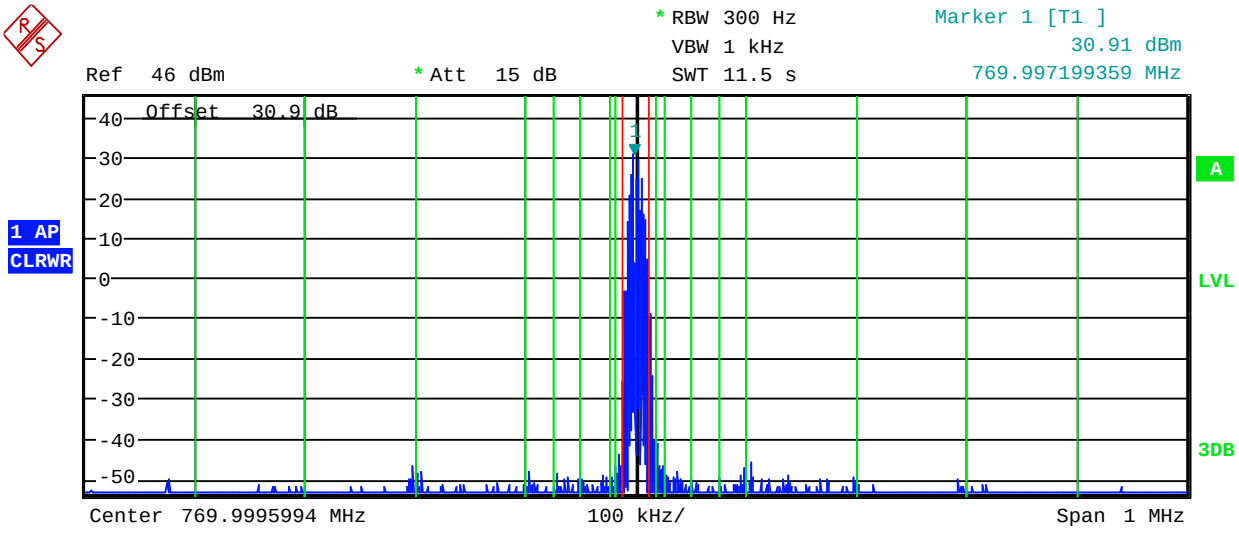
Channel	Bandwidth	Spacing	Lower	Upper
Tx Channel	25.000 kHz		36.44 dBm	
Adjacent	6.250 kHz	15.625 kHz	-52.71 dB	-50.82 dB
Alternate	6.250 kHz	21.875 kHz	-77.82 dB	-74.40 dB
2nd Alt	25.000 kHz	37.500 kHz	-73.10 dB	-71.96 dB
3rd Alt	25.000 kHz	62.500 kHz	-73.52 dB	-73.90 dB
4th Alt	25.000 kHz	87.500 kHz	-73.10 dB	-72.96 dB
5th Alt	100.000 kHz	150.000 kHz	-68.13 dB	-68.18 dB
6th Alt	100.000 kHz	250.000 kHz	-69.03 dB	-69.79 dB
7th Alt	100.000 kHz	350.000 kHz	-70.47 dB	-70.61 dB

Ultratech Labs

Date: 6.OCT.2014 14:10:01

Analog Voice, 25 kHz Channel Spacing, 770.0 MHz Ref. Power Level = 34.77 dBm				
Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Measured Maximum ACP (dBc)		Maximum ACP (dBc)
		Lower	Upper	
15.625	6.25	-61.91	-45.11	-40
21.875	6.25	-77.23	-72.27	-60
37.500	25.00	-73.33	-71.92	-60
62.500	25.00	-73.41	-74.36	-65
87.500	25.00	-74.04	-72.92	-65
150.000	100.00	-68.46	-67.73	-65
250.000	100.00	-69.56	-69.61	-65
350.000	100.00	-70.40	-70.53	-65
>400 kHz to 12 MHz	30 (Swept)	<-75	<-75	-75
12 MHz to paired receive band	30 (Swept)	<-75	<-75	-75
In the paired receive band	30 (Swept)	<-100	<-100	-100

Plot 5.8.4.5. Adjacent Channel Power, Analog Voice, 25 kHz Channel Spacing, 770.0 MHz



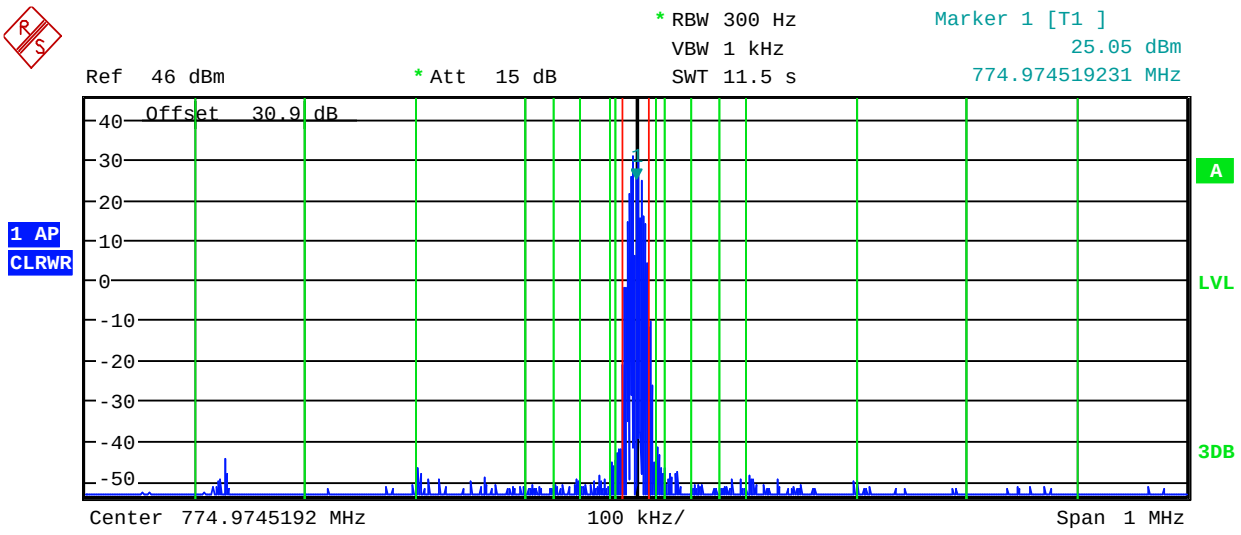
Channel	Bandwidth	Spacing	Lower	Upper
Tx Channel	25.000 kHz		36.34 dBm	
Adjacent	6.250 kHz	15.625 kHz	-61.91 dB	-45.11 dB
Alternate	6.250 kHz	21.875 kHz	-77.23 dB	-72.27 dB
2nd Alt	25.000 kHz	37.500 kHz	-73.33 dB	-71.92 dB
3rd Alt	25.000 kHz	62.500 kHz	-73.41 dB	-74.36 dB
4th Alt	25.000 kHz	87.500 kHz	-74.04 dB	-72.92 dB
5th Alt	100.000 kHz	150.000 kHz	-68.46 dB	-67.73 dB
6th Alt	100.000 kHz	250.000 kHz	-69.56 dB	-69.61 dB
7th Alt	100.000 kHz	350.000 kHz	-70.40 dB	-70.53 dB

Ultratech Labs

Date: 6.OCT.2014 14:23:35

Analog Voice, 25 kHz Channel Spacing, 774.975 MHz Ref. Power Level = 34.94 dBm				
Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Measured Maximum ACP (dBc)		Maximum ACP (dBc)
		Lower	Upper	
15.625	6.25	-57.37	-46.54	-40
21.875	6.25	-74.65	-71.90	-60
37.500	25.00	-72.52	-71.92	-60
62.500	25.00	-73.29	-73.73	-65
87.500	25.00	-73.99	-74.29	-65
150.000	100.00	-68.30	-68.58	-65
250.000	100.00	-70.27	-69.47	-65
350.000	100.00	-69.57	-70.56	-65
>400 kHz to 12 MHz	30 (Swept)	<-75	<-75	-75
12 MHz to paired receive band	30 (Swept)	<-75	<-75	-75
In the paired receive band	30 (Swept)	<-100	<-100	-100

Plot 5.8.4.6. Adjacent Channel Power, Analog Voice, 12.5 kHz Channel Spacing, 774.975 MHz



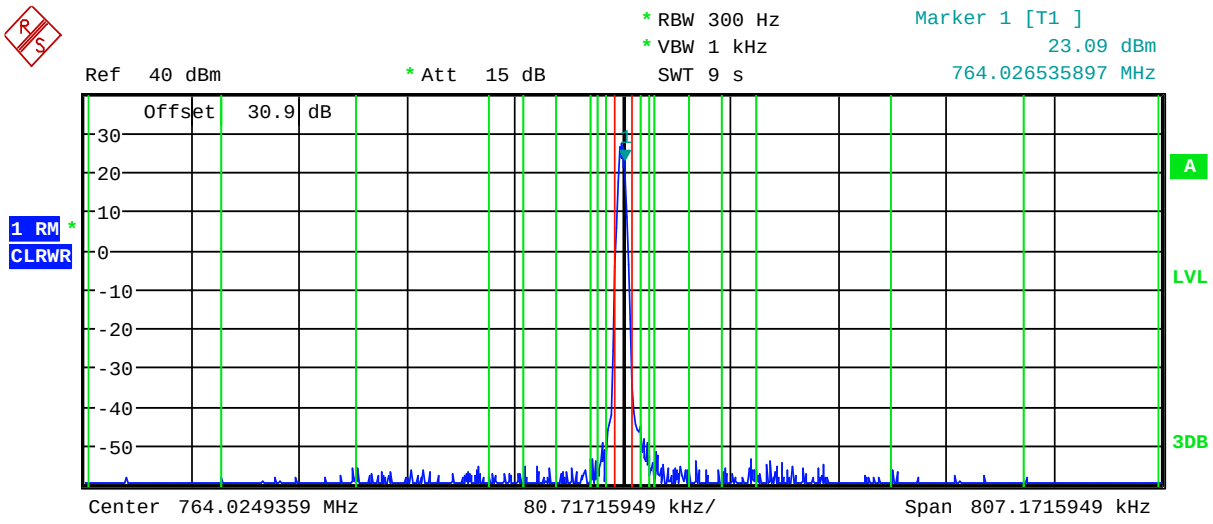
Channel	Bandwidth	Spacing	Lower	Upper
Tx Channel	**25.000 kHz**		**36.47 dBm**	
Adjacent	6.250 kHz	15.625 kHz	-57.37 dB	-46.54 dB
Alternate	6.250 kHz	21.875 kHz	-74.65 dB	-71.90 dB
2nd Alt	25.000 kHz	37.500 kHz	-72.52 dB	-71.92 dB
3rd Alt	25.000 kHz	62.500 kHz	-73.29 dB	-73.73 dB
4th Alt	25.000 kHz	87.500 kHz	-73.99 dB	-74.29 dB
5th Alt	100.000 kHz	150.000 kHz	-68.30 dB	-68.58 dB
6th Alt	100.000 kHz	250.000 kHz	-70.27 dB	-69.47 dB
7th Alt	100.000 kHz	350.000 kHz	-69.57 dB	-70.56 dB

Ultratech Labs

Date: 6.OCT.2014 14:27:45

Digital C4FM, 12.5 kHz Channel Spacing, 764.025 MHz Ref. Power Level = 34.72 dBm				
Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Measured Maximum ACP (dBc)		Maximum ACP (dBc)
		Lower	Upper	
9.375	6.25	-49.32	-51.62	-40
15.625	6.25	-77.56	-72.58	-60
21.875	6.25	-79.65	-79.63	-60
37.500	25.00	-77.50	-75.26	-60
62.500	25.00	-77.72	-77.58	-65
87.500	25.00	-77.53	-77.00	-65
150.000	100.00	-72.18	-72.10	-65
250.000	100.00	-73.94	-74.26	-65
350.000	100.00	-75.12	-75.18	-65
>400 kHz to 12 MHz	30 (Swept)	<-75	<-75	-75
12 MHz to paired receive band	30 (Swept)	<-75	<-75	-75
In the paired receive band	30 (Swept)	<-100	<-100	-100

Plot 5.8.4.7. Adjacent Channel Power, Digital Mode, 12.5 kHz Channel Spacing, 764.025 MHz



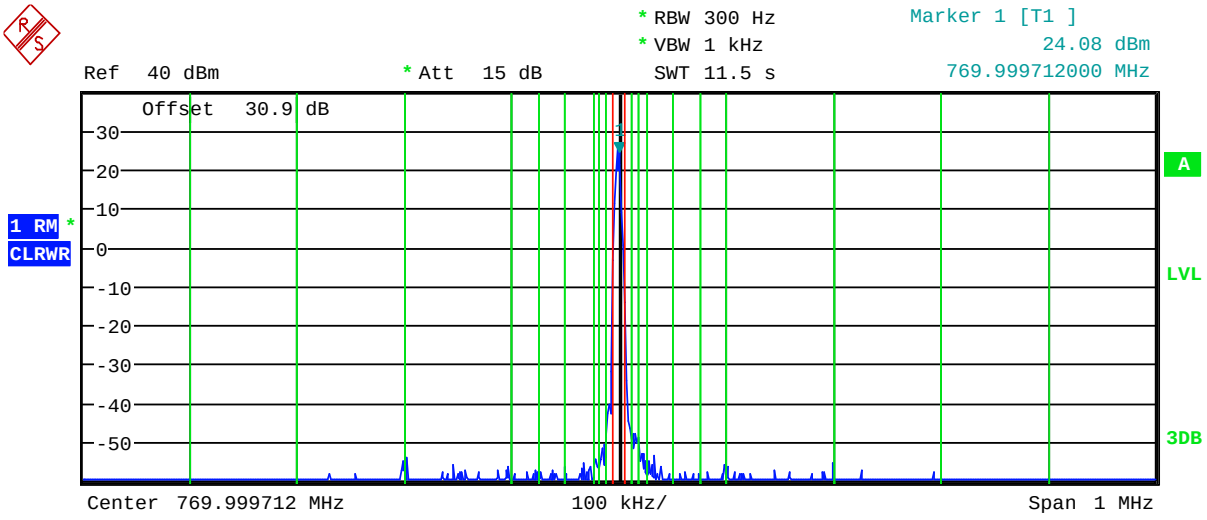
Channel	Bandwidth	Spacing	Lower	Upper
Tx Channel	12.500 kHz		36.82 dBm	
Adjacent	6.250 kHz	9.375 kHz	-49.32 dB	-51.62 dB
Alternate	6.250 kHz	15.625 kHz	-77.56 dB	-72.58 dB
2nd Alt	6.250 kHz	21.875 kHz	-79.65 dB	-79.63 dB
3rd Alt	25.000 kHz	37.500 kHz	-77.50 dB	-75.26 dB
4th Alt	25.000 kHz	62.500 kHz	-77.72 dB	-77.58 dB
5th Alt	25.000 kHz	87.500 kHz	-77.53 dB	-77.00 dB
6th Alt	100.000 kHz	150.000 kHz	-72.18 dB	-72.10 dB
7th Alt	100.000 kHz	250.000 kHz	-73.94 dB	-74.26 dB
8th Alt	100.000 kHz	350.000 kHz	-75.12 dB	-75.18 dB

Ultratech Labs

Date: 16.OCT.2014 15:29:59

Digital C4FM, 12.5 kHz Channel Spacing, 770.0 MHz Ref. Power Level = 34.77 dBm				
Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Measured Maximum ACP (dBc)		Maximum ACP (dBc)
		Lower	Upper	
9.375	6.25	-49.64	-47.05	-40
15.625	6.25	-76.26	-71.83	-60
21.875	6.25	-78.87	-75.93	-60
37.500	25.00	-76.53	-75.46	-60
62.500	25.00	-76.81	-77.33	-65
87.500	25.00	-76.87	-77.66	-65
150.000	100.00	-71.16	-71.72	-65
250.000	100.00	-72.99	-73.31	-65
350.000	100.00	-74.47	-74.23	-65
>400 kHz to 12 MHz	30 (Swept)	<-75	<-75	-75
12 MHz to paired receive band	30 (Swept)	<-75	<-75	-75
In the paired receive band	30 (Swept)	<-100	<-100	-100

Plot 5.8.4.8. Adjacent Channel Power, Digital Mode, 12.5 kHz Channel Spacing, 770.0 MHz



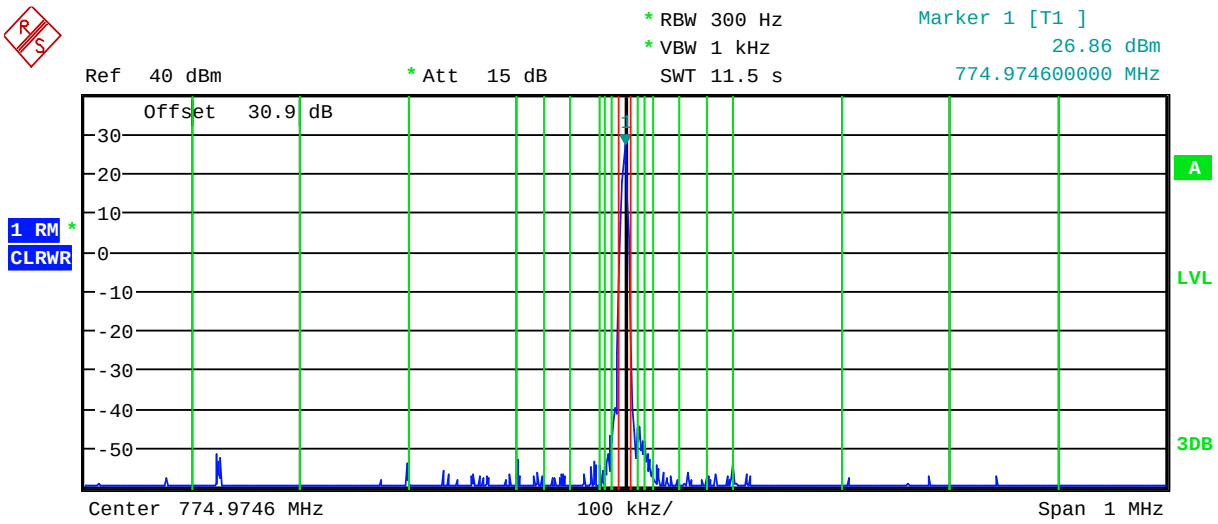
Channel	Bandwidth	Spacing	Lower	Upper
Tx Channel	**12.500 kHz**		**35.49 dBm**	
Adjacent	6.250 kHz	9.375 kHz	-49.64 dB	-47.05 dB
Alternate	6.250 kHz	15.625 kHz	-76.26 dB	-71.83 dB
2nd Alt	6.250 kHz	21.875 kHz	-78.87 dB	-75.93 dB
3rd Alt	25.000 kHz	37.500 kHz	-76.53 dB	-75.46 dB
4th Alt	25.000 kHz	62.500 kHz	-76.81 dB	-77.33 dB
5th Alt	25.000 kHz	87.500 kHz	-76.87 dB	-77.66 dB
6th Alt	100.000 kHz	150.000 kHz	-71.16 dB	-71.72 dB
7th Alt	100.000 kHz	250.000 kHz	-72.99 dB	-73.31 dB
8th Alt	100.000 kHz	350.000 kHz	-74.47 dB	-74.23 dB

Ultratech Labs

Date: 16.OCT.2014 15:38:18

Digital C4FM, 12.5 kHz Channel Spacing, 774.975 MHz Ref. Power Level = 34.94 dBm				
Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Measured Maximum ACP (dBc)		Maximum ACP (dBc)
		Lower	Upper	
9.375	6.25	-49.70	-52.04	-40
15.625	6.25	-74.06	-70.46	-60
21.875	6.25	-80.41	-75.71	-60
37.500	25.00	-75.89	-75.15	-60
62.500	25.00	-76.88	-76.70	-65
87.500	25.00	-76.37	-76.12	-65
150.000	100.00	-71.56	-72.06	-65
250.000	100.00	-72.46	-72.91	-65
350.000	100.00	-72.33	-73.95	-65
>400 kHz to 12 MHz	30 (Swept)	<-75	<-75	-75
12 MHz to paired receive band	30 (Swept)	<-75	<-75	-75
In the paired receive band	30 (Swept)	<-100	<-100	-100

Plot 5.8.4.9. Adjacent Channel Power, Digital Mode, 12.5 kHz Channel Spacing, 774.975 MHz



Channel	Bandwidth	Spacing	Lower	Upper
Tx Channel	**12.500 kHz**		**35.46 dBm**	
Adjacent	6.250 kHz	9.375 kHz	-49.70 dB	-52.04 dB
Alternate	6.250 kHz	15.625 kHz	-74.06 dB	-70.46 dB
2nd Alt	6.250 kHz	21.875 kHz	-80.41 dB	-75.71 dB
3rd Alt	25.000 kHz	37.500 kHz	-75.89 dB	-75.15 dB
4th Alt	25.000 kHz	62.500 kHz	-76.88 dB	-76.70 dB
5th Alt	25.000 kHz	87.500 kHz	-76.37 dB	-76.12 dB
6th Alt	100.000 kHz	150.000 kHz	-71.56 dB	-72.06 dB
7th Alt	100.000 kHz	250.000 kHz	-72.46 dB	-72.91 dB
8th Alt	100.000 kHz	350.000 kHz	-72.33 dB	-73.95 dB

Ultratech Labs

Date: 16.OCT.2014 15:42:11

5.9. EXPOSURE OF HUMANS TO RF FIELD [[§§ 1.1310 & 2.1091]

§ **1.1310:** The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*($900/f^2$)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Note 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Note 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

5.9.1. Method of Measurements

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi \cdot r^2} = \frac{EIRP}{4\pi \cdot r^2}$$

Where, P: power input to the antenna in mW
EIRP: Equivalent (effective) isotropic radiated power.
S: power density mW/cm^2
G: numeric gain of antenna relative to isotropic radiator
r: distance to centre of radiation in cm

$$r = \sqrt{\frac{PG}{4\pi \cdot S}} = \sqrt{\frac{EIRP}{4\pi \cdot S}}$$

5.9.2. Evaluation of RF Exposure Compliance Requirements

(a) 764-775 MHz

Maximum RF Power conducted, **$P_{conducted}$[dBm]:**	34.94
Maximum Antenna Gain, **G[dBi]**:	2.15
Maximum EIRP, **P_{EIRP}[dBm]**:	37.09
Power Density, S mW/cm^2 = f/300 = 7640/300	2.55
Calculated RF Safety Distance for Occupational/Uncontrolled Exposure, $r_{safety\_controlled}$[cm]:	12.6
Power Density, S mW/cm^2 = f/1500 = 764/1500	0.509
Calculated RF Safety Distance for General Population/Uncontrolled Exposure, $r_{safety\_controlled}$[cm]:	28.3

(b) 851-869 MHz

Maximum RF Power conducted, **$P_{conducted}$[dBm]:**	34.93
Maximum Antenna Gain, **G[dBi]**:	2.15
Maximum EIRP, **P_{EIRP}[dBm]**:	37.08
Power Density, S mW/cm^2 = f/300 = 851/300	2.84
Calculated RF Safety Distance for Occupational/Uncontrolled Exposure, $r_{safety\_controlled}$[cm]:	12.0
Power Density, S mW/cm^2 = f/1500 = 851/1500	0.567
Calculated RF Safety Distance for General Population/Uncontrolled Exposure, $r_{safety\_controlled}$[cm]:	26.8

5.10. POWER LINE CONDUCTED EMISSIONS [§ 15.207]

5.10.1. Limits

The equipment shall meet the limits of the following table:

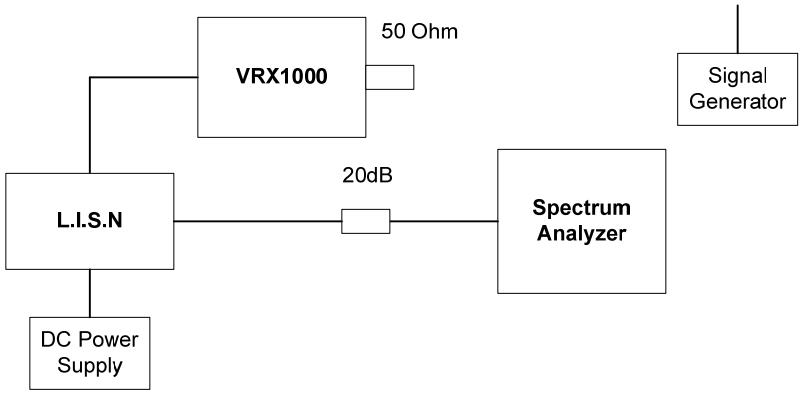
Frequency of emission (MHz)	Conducted Limits (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

5.10.1.1. Method of Measurements

Refer to Ultratech Test Procedures ULTR-P001-2004 & ANSI C63.4-2009 for method of measurements.

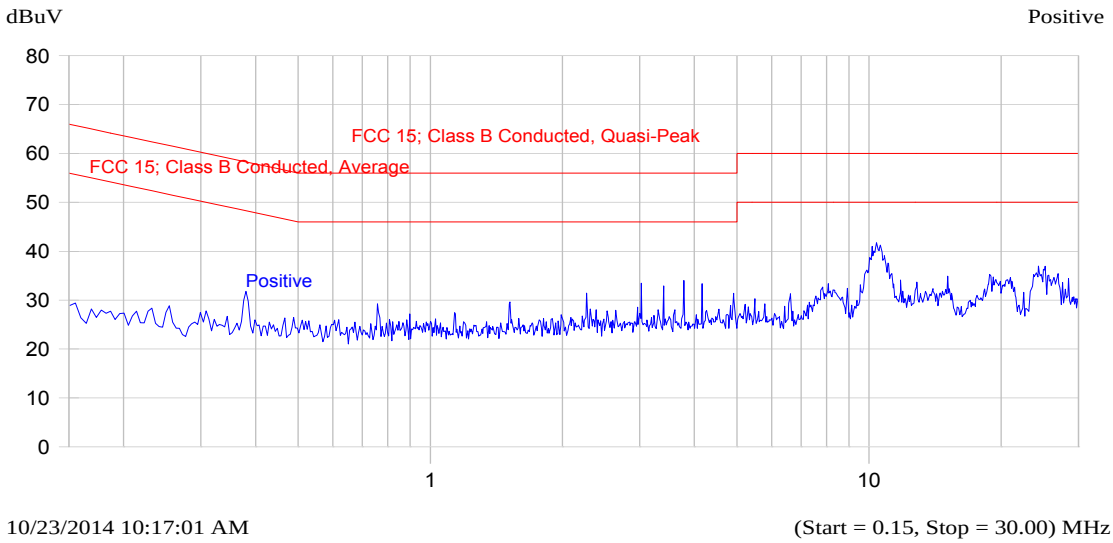
5.10.2. Test Arrangement



5.10.3. Test Data

Plot 5.10.3.1. Power Line Conducted Emissions (Tx Mode)
Line Voltage: 13.8V DC ; Line Tested: Positive

Current Graph

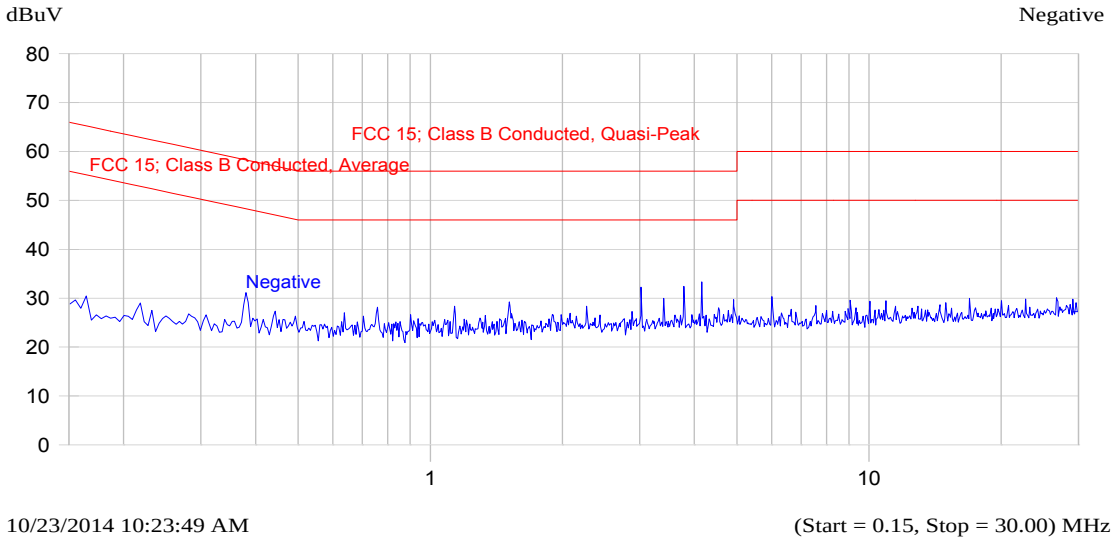


Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.372	31.5	24.0	-35.6	19.5	-30.0	Positive
10.336	41.6	36.5	-23.5	30.3	-19.7	Positive
24.948	36.5	29.2	-30.8	23.3	-26.7	Positive

Plot 5.10.3.2. Power Line Conducted Emissions (Tx Mode)
Line Voltage: 13.8V DC ; Line Tested: Negative

Current Graph

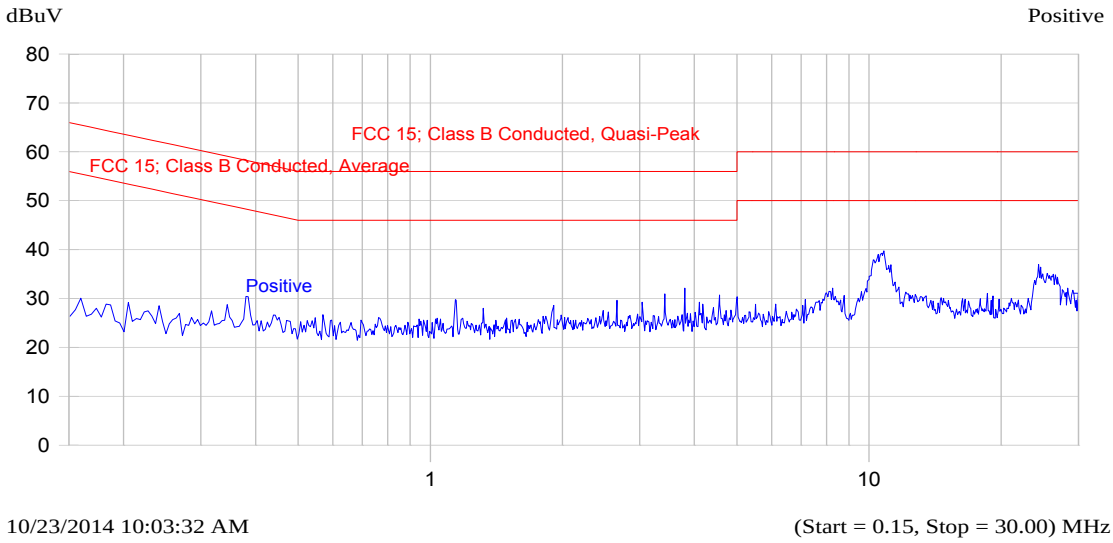


Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.376	32.2	29.2	-30.3	27.3	-22.2	Negative
4.159	31.0	27.9	-28.1	25.8	-20.2	Negative

Plot 5.10.3.3. Power Line Conducted Emissions (Rx Mode)
Line Voltage: 13.8V DC ; Line Tested: Positive

Current Graph

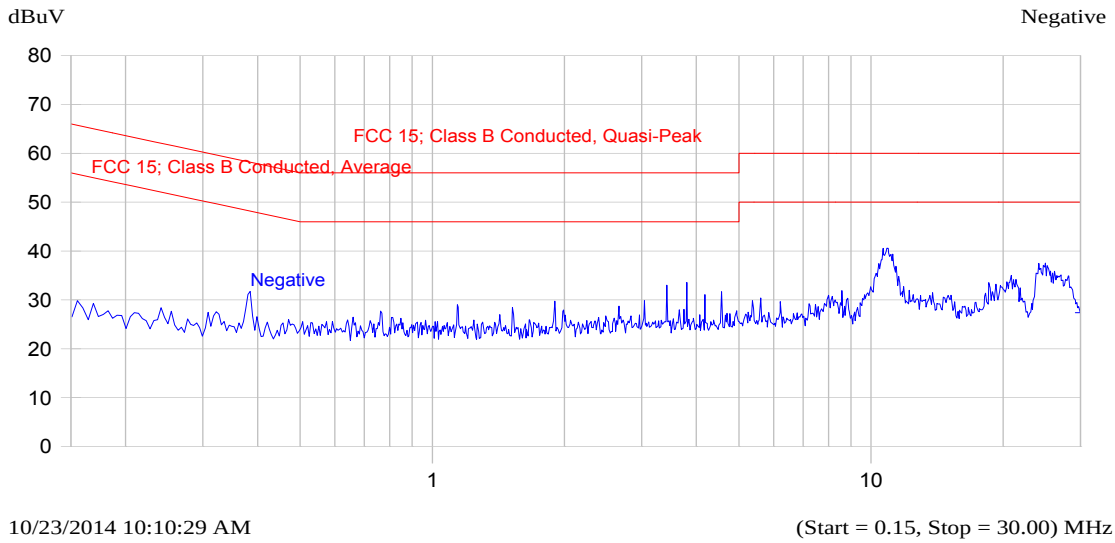


Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.372	27.1	21.5	-38.1	15.6	-34.0	Positive
10.802	40.3	35.3	-24.7	29.1	-20.9	Positive
24.337	32.6	29.0	-31.0	22.2	-27.8	Positive

Plot 5.10.3.4. Power Line Conducted Emissions (Rx Mode)
Line Voltage: 13.8V DC ; Line Tested: Negative

Current Graph



Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.376	29.3	25.2	-34.3	22.0	-27.4	Negative
10.863	41.5	36.4	-23.6	30.0	-20.0	Negative
25.211	35.2	29.0	-31.0	22.9	-27.1	Negative

EXHIBIT 6. TEST EQUIPMENT LIST

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Cal. Due Date
Spectrum Analyzer	Rohde & Schwarz	FSEK30	100077	20 Hz - 40 GHz	Nov 08, 2015
Attenuator (30dB)	Aeroflex/Weinschel	46-30-34	BR9127	DC - 18 GHz	Cal. on use
High Pass Filter	Mini Circuit	SHP 250		Cut off 250 MHz	Cal. on use
Power Sensor	Hewlett Packard	8481A	US37295684	0.01 - 18 GHz	Apr 28, 2015
Modulation Analyzer	Hewlett Packard	8901B	3226A04606	150 kHz – 1300 MHz	Feb 25, 2015
Frequency Counter	EIP	545A	2683	10 Hz - 18 GHz	07 Apr 2015
Combiner	Mini Circuit	ZFSC-3-4	15542	1 MHz – 1 GHz	Cal. on use
RF Detector	Pasternack	PE8000-50	--	10 MHz - 1 GHz	Cal. on use
DC Block	Hewlett Packard	11742A	12460	0.045 – 26.5 GHz	Cal on use
Environmental Chamber	Envirotronics	SSH32C	11994847-S-11059	-60 to 177 °C	01 May 2015
RF Communication Test Set	Hewlett Packard	8920B	US39064699	30 MHz – 1 GHz	17 Jan 2015
High Pass Filter	K & L	11SH10-1500/T8000	2	Cut off 900 MHz	Cal. on use
Power supply	Tenma	72-7295	490300297	1 – 40 Vdc	Cal on use
High Pass Filter	Mini Circuit	SHP 800	--	Cut off 750 MHz	Cal. on use
Attenuator	MCE / Weinschel	48-30-34	BM5 354	DC – 18 GHz	Cal on use
Biconi-Log Antenna	ETS Lindgren	3142C	26873	26 – 3000 MHz	14 Apr 2015
Horn Antenna	ETS Lindgren	3115	5955	1 -18 GHz	26 Mar 2015
EMI Receiver	Rohde & Schwarz	ESU40	100037	20 Hz – 40 GHz	5 Apr 2015
RF Amplifier	AH System	PAM-0118	225	20 MHz – 18 GHz	7 Apr 2015
Power Meter	Hewlett Packard	436A	2709A27515	0.0001 - 50 GHz	Apr 25, 2015
Spectrum Analyzer	Agilent	E7401A	US40240432	9 kHz–1.5 GHz	14 Mar 2015
Attenuator	Pasternack	PE7010-20	-	DC–2 GHz	02 Jan 2015
L.I.S.N	EMCO	3825/2R	1165	0.01 -30 MHz	05 Nov 2014
Signal Generator	Hewlett Packard	8648C	3443U00391	0.1 – 3.2 GHz	11 Feb 2015

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

	Line Conducted Emission Measurement Uncertainty (9 kHz – 30 MHz):	**Measured**	**Limit**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 1.44**	**± 1.8**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 2.89**	**± 3.6**

7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

	Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 2.39**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.79**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 2.39**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.78**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz):	**Measured (dB)**	**Limit (dB)**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 1.87**	**Under consideration**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 3.75**	**Under consideration**

EXHIBIT 8. MEASUREMENT METHODS

8.1. CONDUCTED POWER MEASUREMENTS

- The following shall be applied to the combination(s) of the radio device and its intended antenna(e).
- I f the RF level is user adjustable, all measurements shall be made with the highest power level available to the user for that combination.
- The following method of measurement shall apply to both conducted and radiated measurements.
- The radiated measurements are performed at the Ultratech Calibrated Open Field Test Site.
- The measurement shall be performed using normal operation of the equipment with modulation.

Test procedure shall be as follows:

Step 1: Duty Cycle measurements if the transmitter's transmission is transient

- Using a EMI Receiver with the frequency span set to 0 Hz and the sweep time set at a suitable value to capture the envelope peaks and the duty cycle of the transmitter output signal;
- The duty cycle of the transmitter, x = Tx on / (Tx on + Tx off) with 0<x<1, is measure and recorded in the test report. For the purpose of testing, the equipment shall be operated with a duty cycle that is equal or more than 0.1.

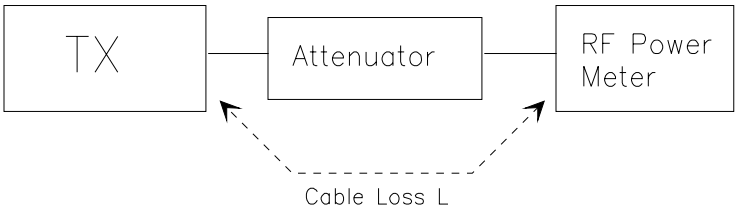
Step 2: Calculation of Average EIRP. See Figure 1

- The average output power of the transmitter shall be determined using a wideband, calibrated RF average power meter with the power sensor with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be recorded as "A" (in dBm);
- The e.i.r.p. shall be calculated from the above measured power output "A", the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:

EIRP = A + G + 10log(1/x)

{X = 1 for continuous transmission => 10log(1/x) = 0 dB}

Figure 1.



8.2. RADIATED POWER MEASUREMENTS (ERP & EIRP) USING SUBSTITUTION METHOD

8.2.1. MAXIMIZING RF EMISSION LEVEL (E-FIELD)

(a) The measurements were performed with full rf output power and modulation.
(b) Test was performed at listed 3m open area test site (listed with FCC, IC, ITI, NVLAP, ACA & VCCI).
(c) The transmitter under test was placed at the specified height on a non-conducting turntable (80 cm height)
(d) The BICONILOG antenna (20 MHz to 1 GHz) or HORN antenna (1 GHz to 18 GHz) was used for measuring.
(e) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
E (dBμV/m) = Reading (dBμV) + Total Correction Factor (dB/m)

(f) Set the EMI Receiver and #2 as follows:

Center Frequency:	test frequency
Resolution BW:	100 KHz
Video BW:	same
Detector Mode:	positive
Average:	off
Span:	3 x the signal bandwidth

(g) The test antenna was lowered or raised from 1 to 4 meters until the maximum signal level was detected.
(h) The transmitter was rotated through 360^{o} about a vertical axis until a higher maximum signal was received.
(i) The test antenna was lowered or raised again from 1 to 4 meters until a maximum was obtained. This level was recorded.
(j) The recorded reading was corrected to the true field strength level by adding the antenna factor, cable loss and subtracting the pre-amplifier gain.
(k) The above steps were repeated with both transmitters' antenna and test receiving antenna placed in vertical and horizontal polarization. Both readings with the antennas placed in vertical and horizontal polarization shall be recorded.
(l) Repeat for all different test signal frequencies.

8.2.2. Measuring the EIRP of Spurious/Harmonic Emissions using Substitution Method

(a) Set the EMI Receiver (for measuring E-Field) and Receiver #2 (for measuring EIRP) as follows:

Center Frequency:	equal to the signal source
Resolution BW:	100 KHz
Video BW:	VBW > RBW
Detector Mode:	positive
Average:	off
Span:	3 x the signal bandwidth

(b) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
E (dBuV/m) = Reading (dBuV) + Total Correction Factor (dB/m)

(c) Select the frequency and E-field levels obtained in the Section 8.2.1 for ERP/EIRP measurements.
(d) Substitute the EUT by a signal generator and one of the following transmitting antenna (substitution antenna):
- ♦ DIPOLE antenna for frequency from 30-1000 MHz or
- ♦ HORN antenna for frequency above 1 GHz }.

(e) Mount the transmitting antenna at 1.5 meter high from the ground plane.
(f) Use one of the following antenna as a receiving antenna:
- ♦ DIPOLE antenna for frequency from 30-1000 MHz or
- ♦ HORN antenna for frequency above 1 GHz }.

(g) If the DIPOLE antenna is used, tune it's elements to the frequency as specified in the calibration manual.
(h) Adjust both transmitting and receiving antenna in a VERTICAL polarization.
(i) Tune the EMI Receivers to the test frequency.
(j) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
(k) The transmitter was rotated through 360° about a vertical axis until a higher maximum signal was received.
(l) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
(m) Adjust input signal to the substitution antenna until an equal or a known related level to that detected from the transmitter was obtained in the test receiver.
(n) Record the power level read from the Average Power Meter and calculate the ERP/EIRP as follows:

P = P1 - L1 = (P2 + L2) – L1 = P3 + A + L2 - L1
EIRP = P + G1 = P3 + L2 - L1 + A + G1
ERP = EIRP – 2.15 dB
Total Correction factor in EMI Receiver # 2 = L2 – L1 + G1

Where:	P:	Actual RF Power fed into the substitution antenna port after corrected.
	P1:	Power output from the signal generator
	P2:	Power measured at attenuator A input
	P3:	Power reading on the Average Power Meter
	EIRP:	EIRP after correction
	ERP:	ERP after correction

(o) Adjust both transmitting and receiving antenna in a HORIZONTAL polarization, then repeat step (k) to (o)
(p) Repeat step (d) to (o) for different test frequency
(q) Repeat steps (c) to (j) with the substitution antenna oriented in horizontal polarization.
(r) Actual gain of the EUT's antenna is the difference of the measured EIRP and measured RF power at the RF port. Correct the antenna gain if necessary.

Figure 2

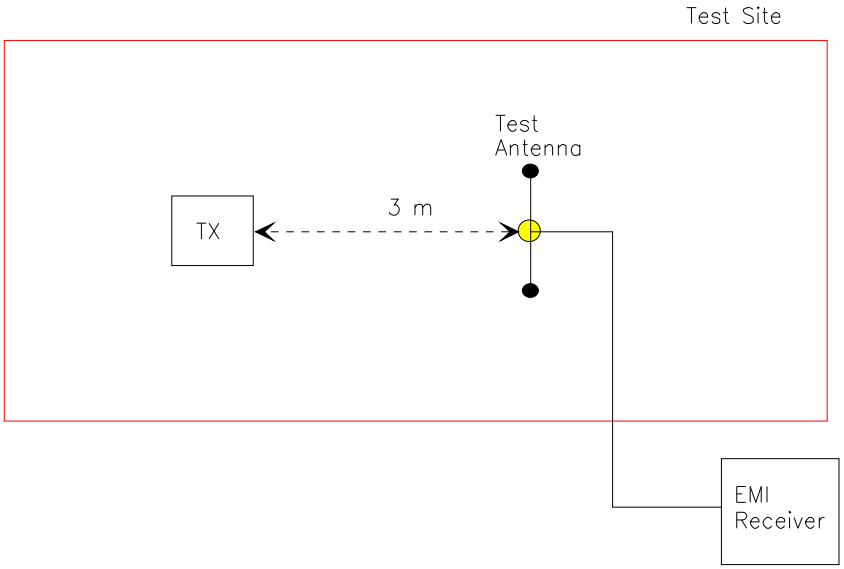
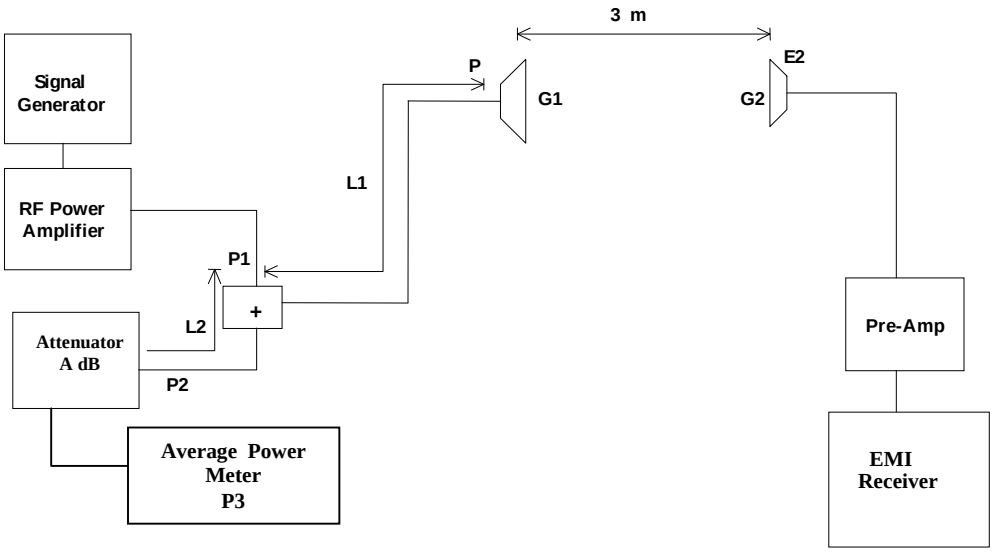


Figure 3



All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

8.3. FREQUENCY STABILITY

Refer to FCC @ 2.1055.

(a) The frequency stability shall be measured with variation of ambient temperature as follows: From -30 to +50 centigrade except that specified in subparagraph (2) & (3) of this paragraph.

(b) Frequency measurements shall be made at extremes of the specified temperature range and at intervals of not more than 10 centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short-term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stability circuitry need be subjected to the temperature variation test.

(d) The frequency stability supply shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

(3) The supply voltage shall be measured at the input to the cable normally provide with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

(e) When deemed necessary, the Commission may require tests of frequency stability under conditions in addition to those specifically set out in paragraphs (a), (b), (c) and (d) of this section. (For example, measurements showing the effect of proximity to large metal objects, or of various types of antennas, may be required for portable equipment).

8.4. EMISSION MASK

Voice or Digital Modulation Through a Voice Input Port @ 2.1049(c)(i):- The transmitter was modulated by a 2.5 KHz tone signal at an input level 16 dB greater than that required to produce 50% modulation (e.g.: ±2.5 KHz peak deviation at 1 KHz modulating frequency). The input level was established at the frequency of maximum response of the audio modulating circuit.

Digital Modulation Through a Data Input Port @ 2.1049(h):- Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the Emission Masks shall be shown for operation with any devices used for modifying the spectrum when such devices are operational at the discretion of the user.

The following EMI Receiver bandwidth shall be used for measurement of Emission Mask/Out-of-Band Emission Measurements:

(1) For 25 KHz Channel Spacing: RBW = 300 Hz
(2) For 12.5 KHz or 6.25 KHz Channel Spacings: RBW = 100 Hz

The all cases the Video Bandwidth shall be equal or greater than the measuring bandwidth.

8.5. SPURIOUS EMISSIONS (CONDUCTED)

With transmitter modulation characteristics described in Out-of-Band Emissions measurements @ 2.1049, the transmitter spurious and harmonic emissions were scanned. The spurious and harmonic emissions were measured with the EMI Receiver controls set as RBW = 30 KHz minimum , VBW ≥ RBW and SWEEP TIME = AUTO). The transmitter was operated at a full rated power output, and modulated as follows:

FCC 47 CFR 2.1057 - Frequency spectrum to be investigated: The spectrum was investigated from the lowest radio generated in the equipment up to at least the 10^{th} harmonic of the carrier frequency or to the highest frequency practicable in the present state of the art of measuring techniques, whichever is lower. Particular attention should be paid to harmonics and subharmonics of the carrier frequency. Radiation at the frequencies of multiplier stages should be checked. The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

FCC 47 CFR 2.1051 - Spurious Emissions at Antenna Terminal: The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of the harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in 2.1049 as appropriate. The magnitude of spurious emissions, which are attenuated more than 20 dB below the permissible value, need not be specified.