



Nemko Test Report: 2015 281848 FCC PT90

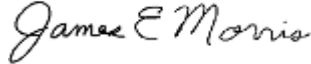
Applicant: Fujitsu Network Communications, Inc.
Two Blue Hill Plaza
2nd Floor
Pearl River, NY 10965

**Equipment Under Test:
(E.U.T.)** LS103-Z2

In Accordance With: **CFR 47, Part 90, Subpart R**
Regulations Governing the Licensing and Use of
Frequencies in the 763-775 AND 793-805 MHz Bands

Tested By: Nemko USA, Inc.
2210 Faraday Ave, Suite 150
Carlsbad, CA 92008

TESTED BY:  **DATE:** 30 April 2015
David Light, Wireless Engineer

APPROVED BY:  **DATE:** 6 May 2015

Number of Pages: 31

Table of Contents

Section 1. Summary of Test Results	3
Section 2. General Equipment Specification	5
Section 3. RF Power Output.....	6
Section 4. Occupied Bandwidth.....	7
Section 5. Spurious Emissions at Antenna Terminals	10
Section 6. Field Strength of Spurious	23
Section 7. Frequency Stability	24
Section 8. Test Equipment List.....	26
Section 9 – Test Setup Photo.....	27
ANNEX A - TEST DIAGRAMS	28

EQUIPMENT: **LS103-Z2**

Section 1. Summary of Test Results

Manufacturer: Fujitsu Network Communications, Inc.

Model No.: LS112-Z3

Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 90, Subpart R.



New Submission



Production Unit



Class II Permissive Change



Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".



NVLAP LAB CODE 200116-0

Nemko USA, Inc. authorizes the above named company to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko USA, Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This report applies only to the items tested.

Summary of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	90.542	1000W/MHz	Complies
Occupied Bandwidth	90.543(d)	Not defined	Complies
Spurious Emissions at Antenna Terminals	90.543(c) and (e)	-13 dBm \ -46 dBm	Complies
Field Strength of Spurious Emissions	90.543(c) and (e)	-13 dBm \ -46 dBm	Complies
Frequency Stability	90.539(d)	1 ppm	Complies*

Note – Manufacturer has included a temperature cutoff function to ensure EUT ceases operation at any temperature between -3°C to -10C.

Section 2. General Equipment Specification

Supply Voltage Input:	120 Vac		
Frequency Bands:	758 to 768 MHz		
Type of Modulation and Designator:	LTE (5M00G7W)	LTE 10M0G7W	
Maximum No. of Carriers:	1		
Output Impedance:	50 ohms		
RF Output (Rated):	Per channel:	0.05	W
	Total:	0.05	W

System Description

LTE, band selectable, 2x2 MIMO, low-power cellular base station, typically designed for use in a home or small business.

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 21 April 2015

Test Results: Complies.**Measurement Data:**

Emission Bandwidth (MHz)	Antenna Port	Frequency (MHz)	Measured Output Power (dBm)	Measured Output Power (W)
5	1	763.0	16.4	0.044
10	1	763.0	16.6	0.046
5	2	763.0	16.5	0.045
10	2	763.0	16.4	0.044

Composite power: 5 MHz Carrier 19.5 dBm 0.089 Watts
10 MHz Carrier 19.5 dBm 0.090 Watts

Note: These measurements were made using FCC Measurement Guidance document 662911

Equipment Used: E1061**Measurement Uncertainty:** +/- 1.7 dB**Temperature:** 22 °C**Relative Humidity:** 45 %

Section 4. Occupied Bandwidth

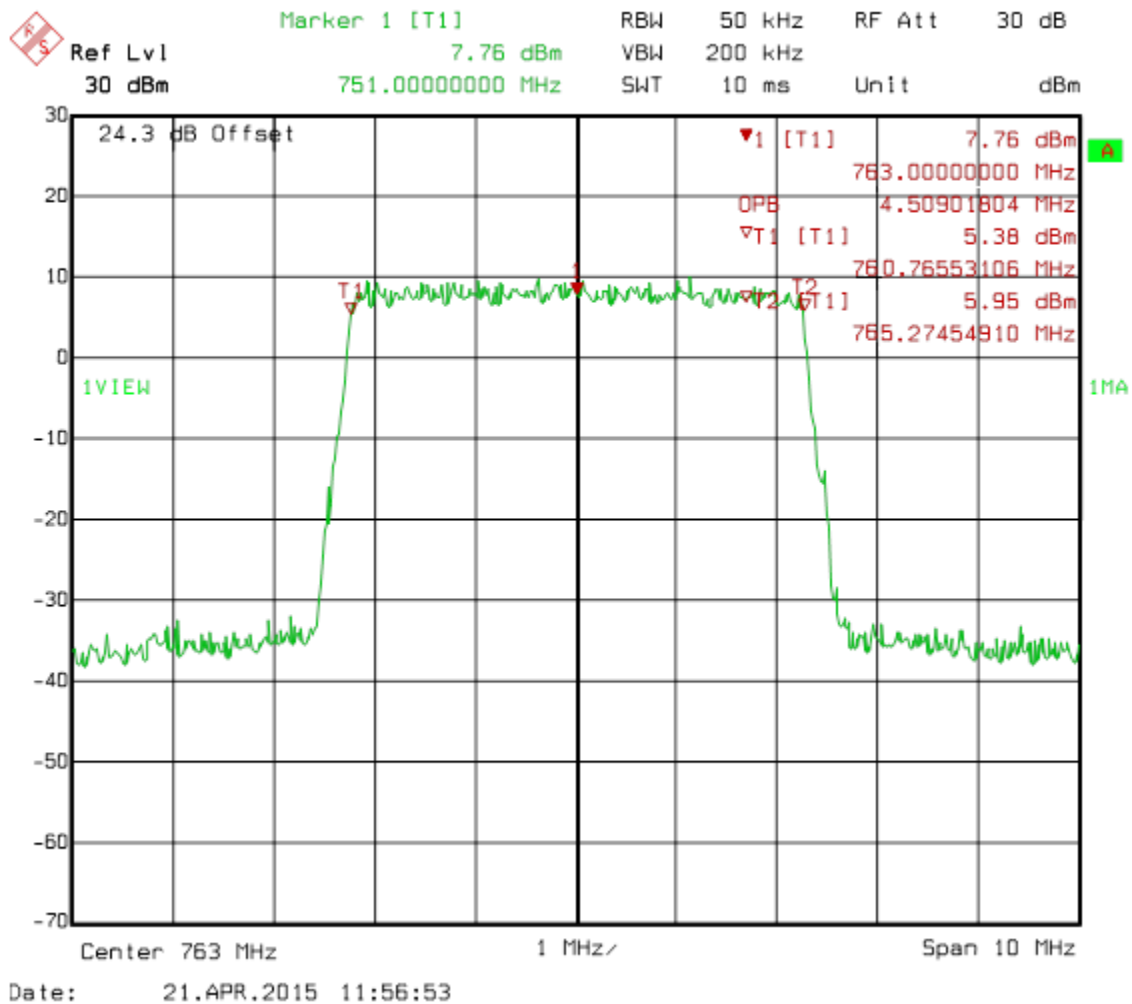
NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 21 April 2015

Test Results: Complies.**Test Data:** See attached plot(s).**Equipment Used:** 1036**Measurement Uncertainty:** +/- 1.6 dB**Temperature:** 22 °C**Relative Humidity:** 45 %

Note: All measurements presented were made with the EUT in QPSK mode. These measurements are consistent with all modulations and data rates.

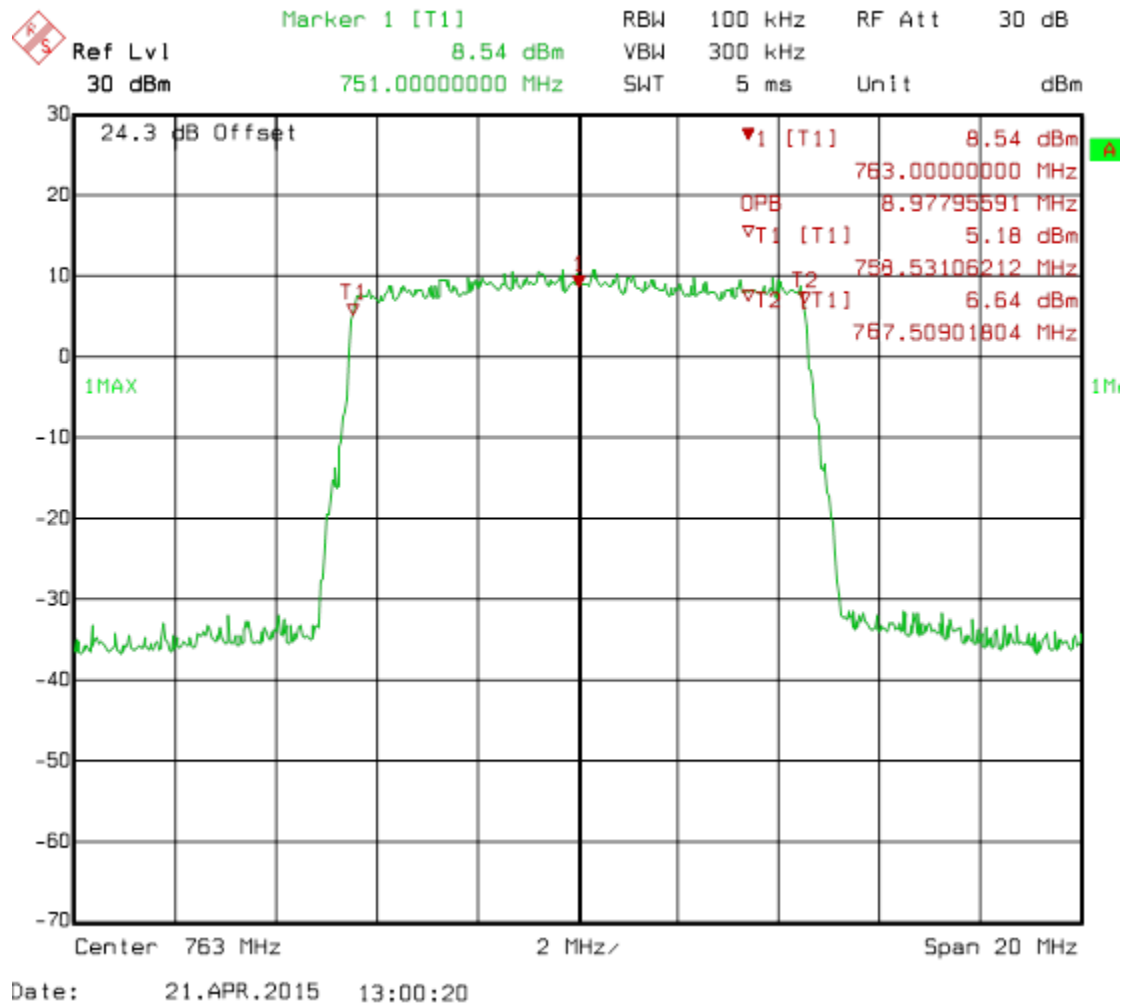
Test Data – Occupied Bandwidth

QPSK
5 MHz



Test Data – Occupied Bandwidth

QPSK
10 MHz



Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 21 April 2015

Test Results: Complies.

Test Data: Refer to plots below.

Equipment Used: 1036

Measurement Uncertainty: +/- 1.7 dB

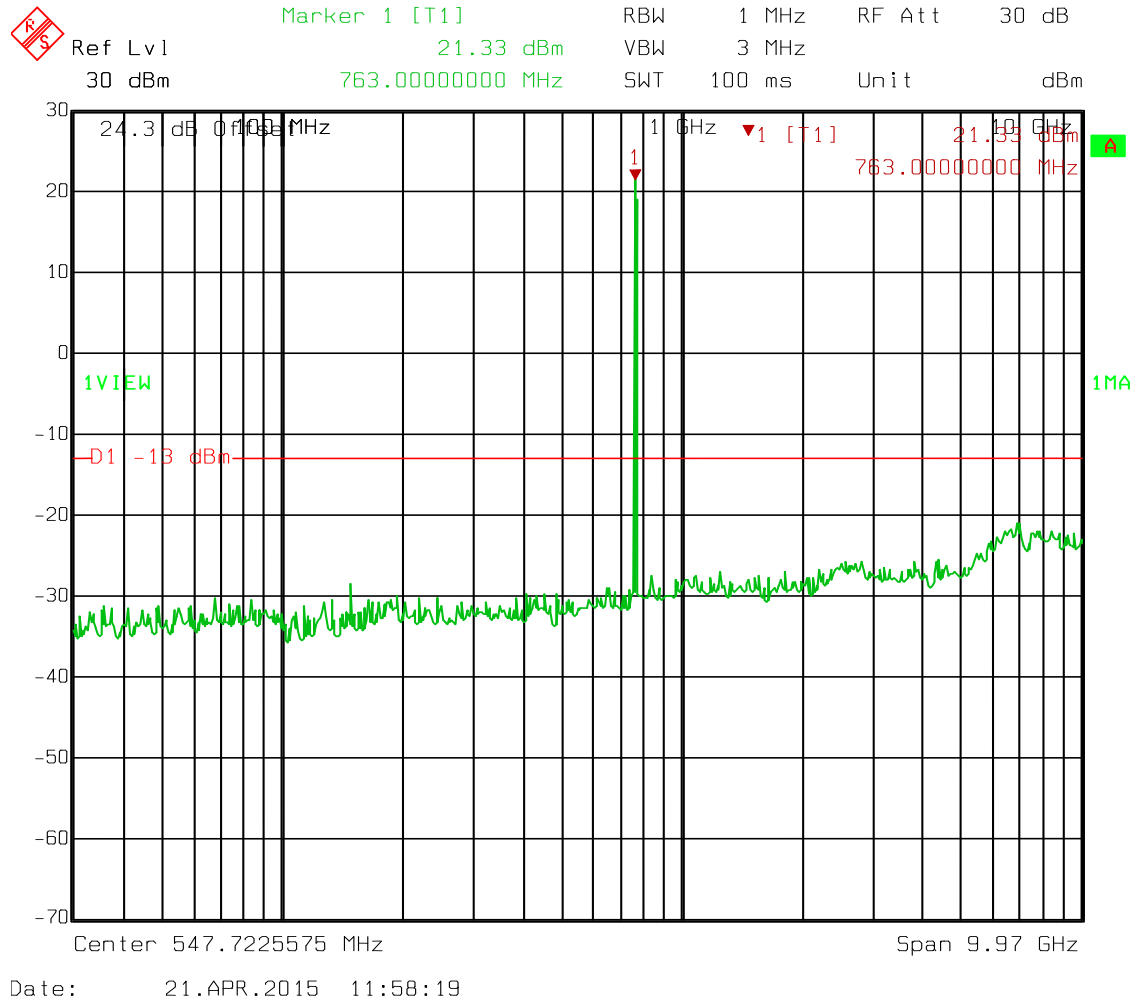
Temperature: 22 °C

Relative Humidity: 45 %

Note: These measurements were made using FCC Measurement Guidance document 662911. All measurements include 3 dB offset for 2x2 MIMO.
 $10 \log (N_{ANT}) = 3$

Test Data – Spurious Emissions at Antenna Terminals

QPSK
5 MHz

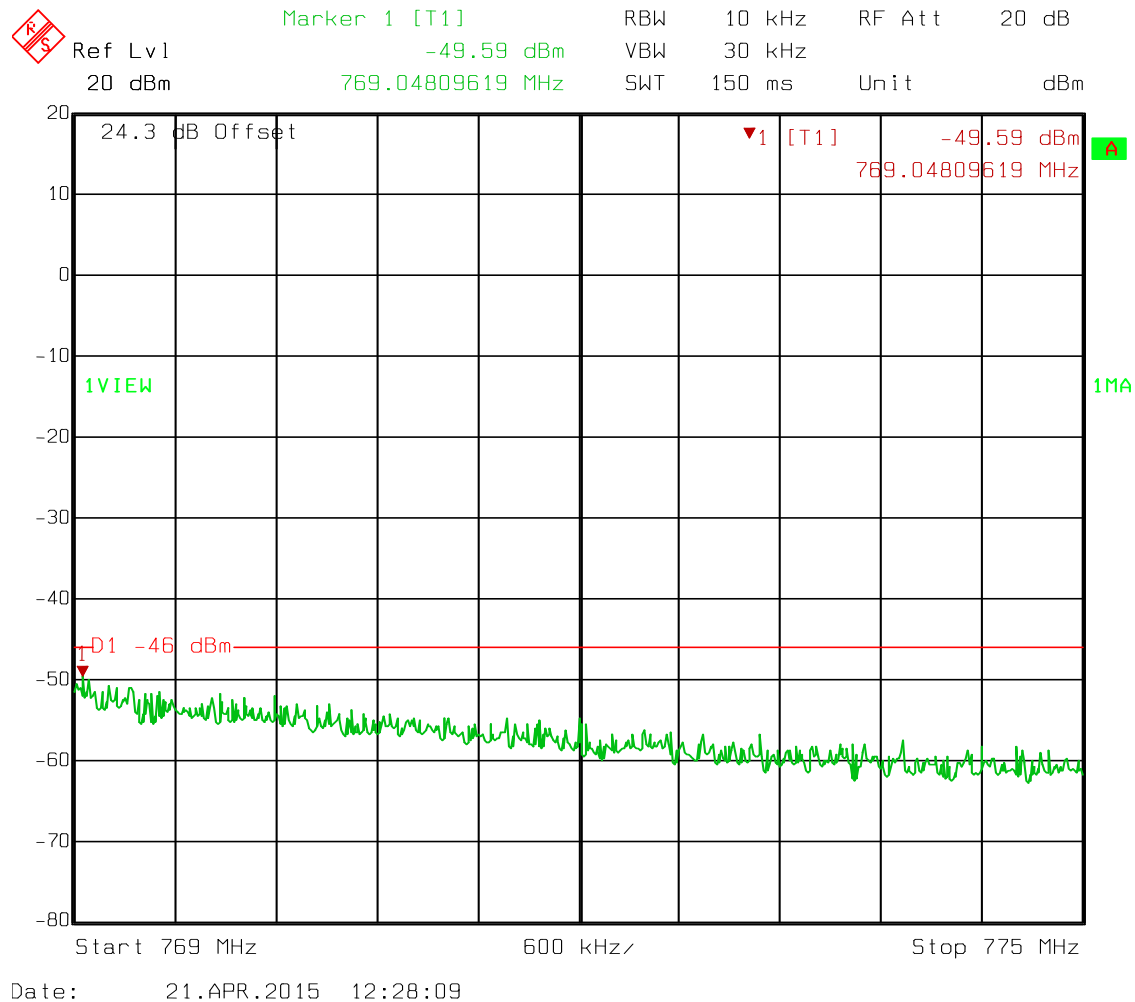


Test Data – Spurious Emissions at Antenna Terminals

90.543(e)(1)

5 MHz

QPSK

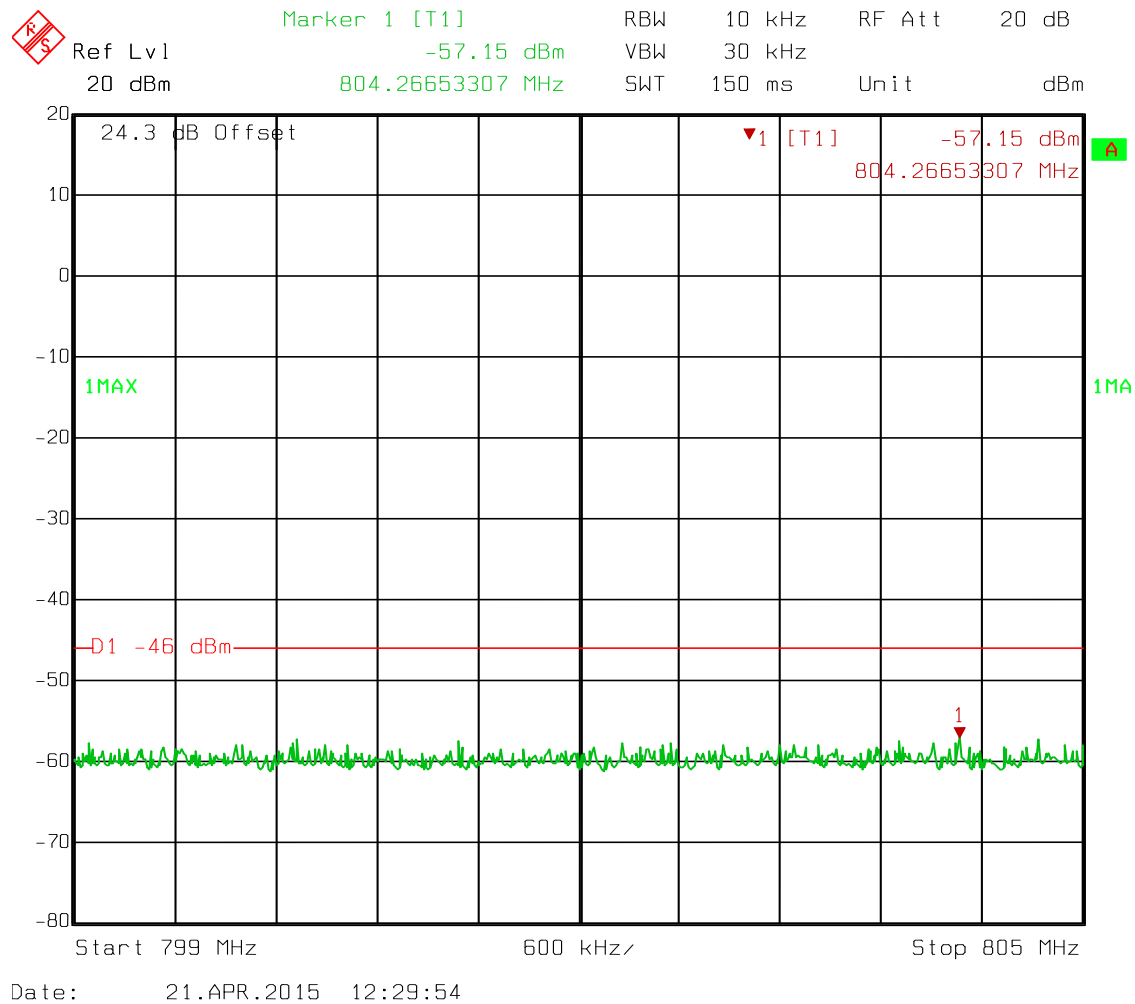


Test Data – Spurious Emissions at Antenna Terminals

90.543(e)(1)

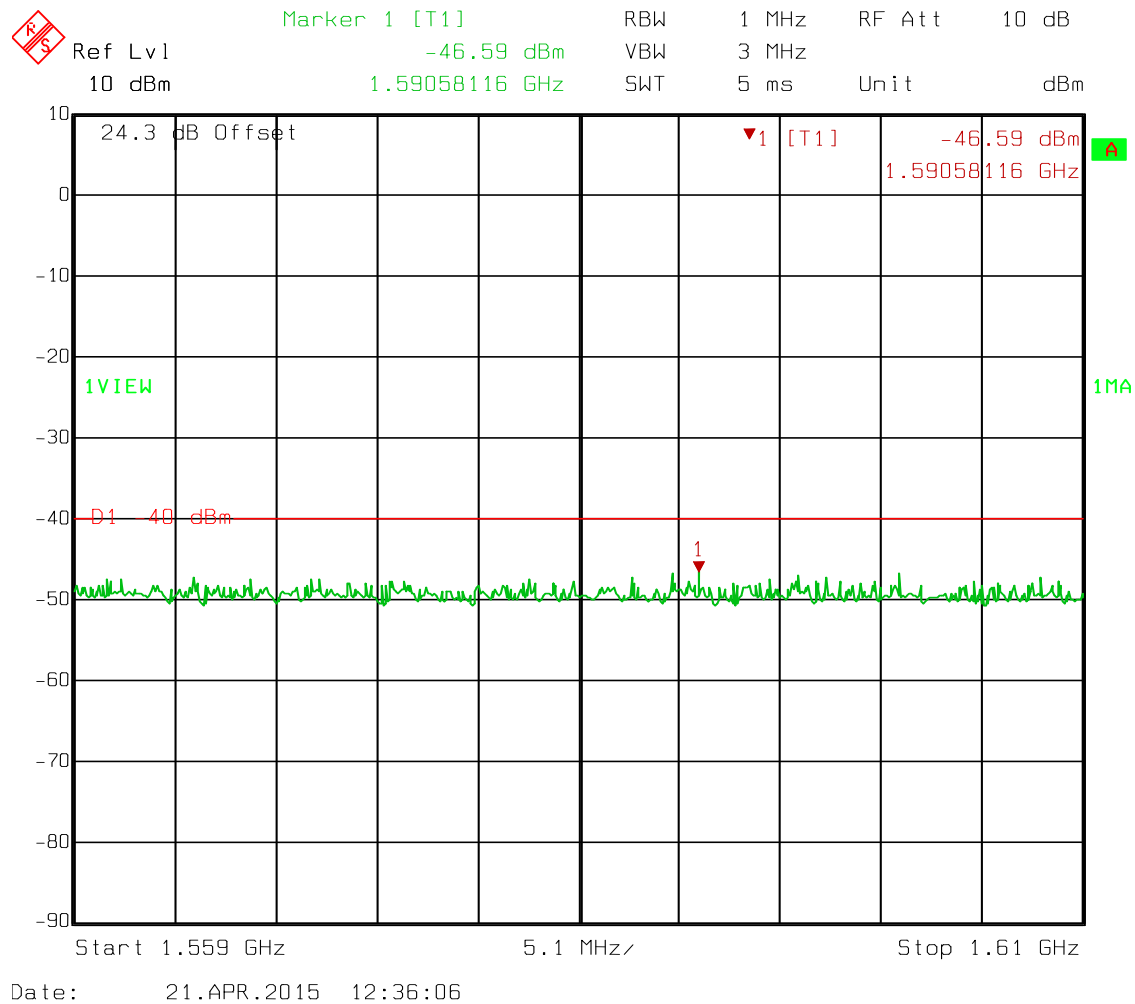
5 MHz

QPSK



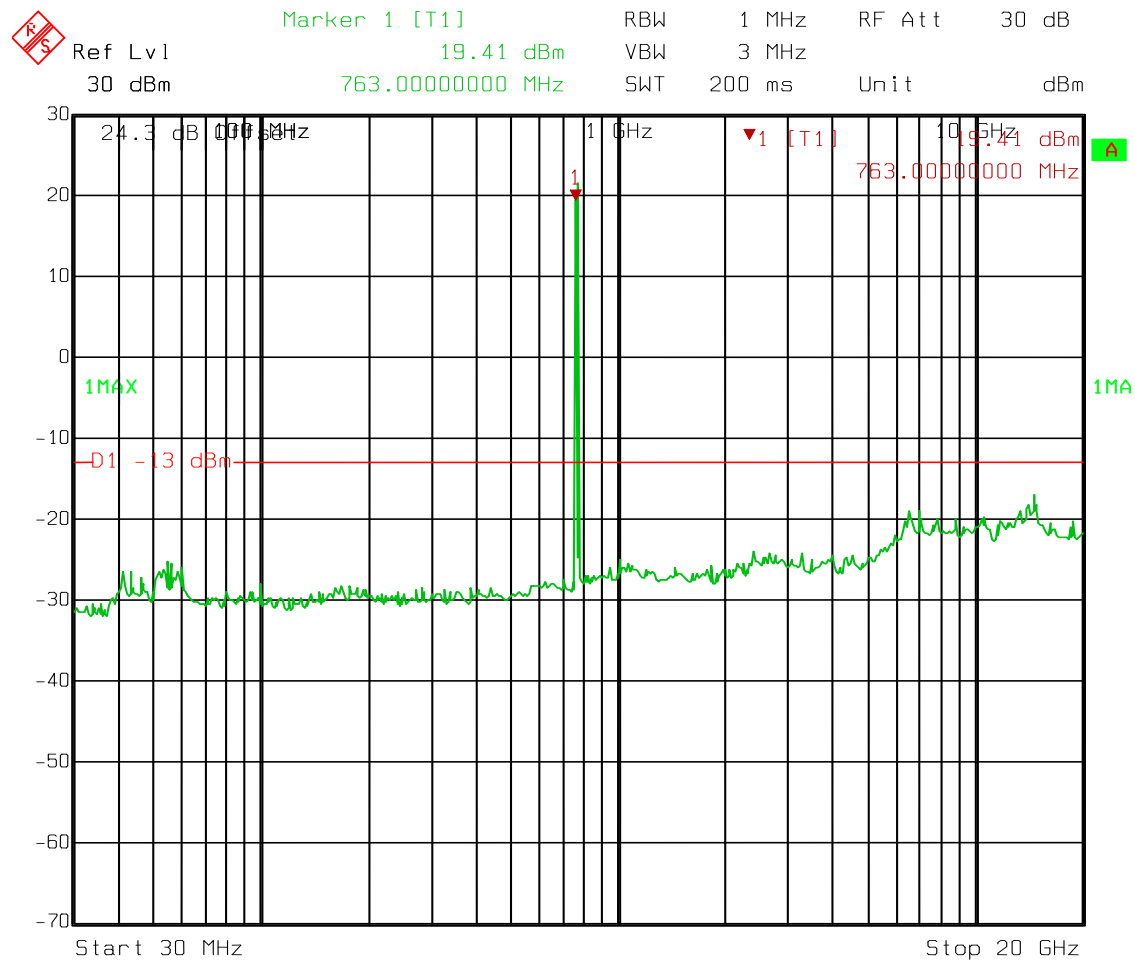
Test Data – Spurious Emissions at Antenna Terminals

90.543(f)
5 MHz
QPSK



Test Data – Spurious Emissions at Antenna Terminals

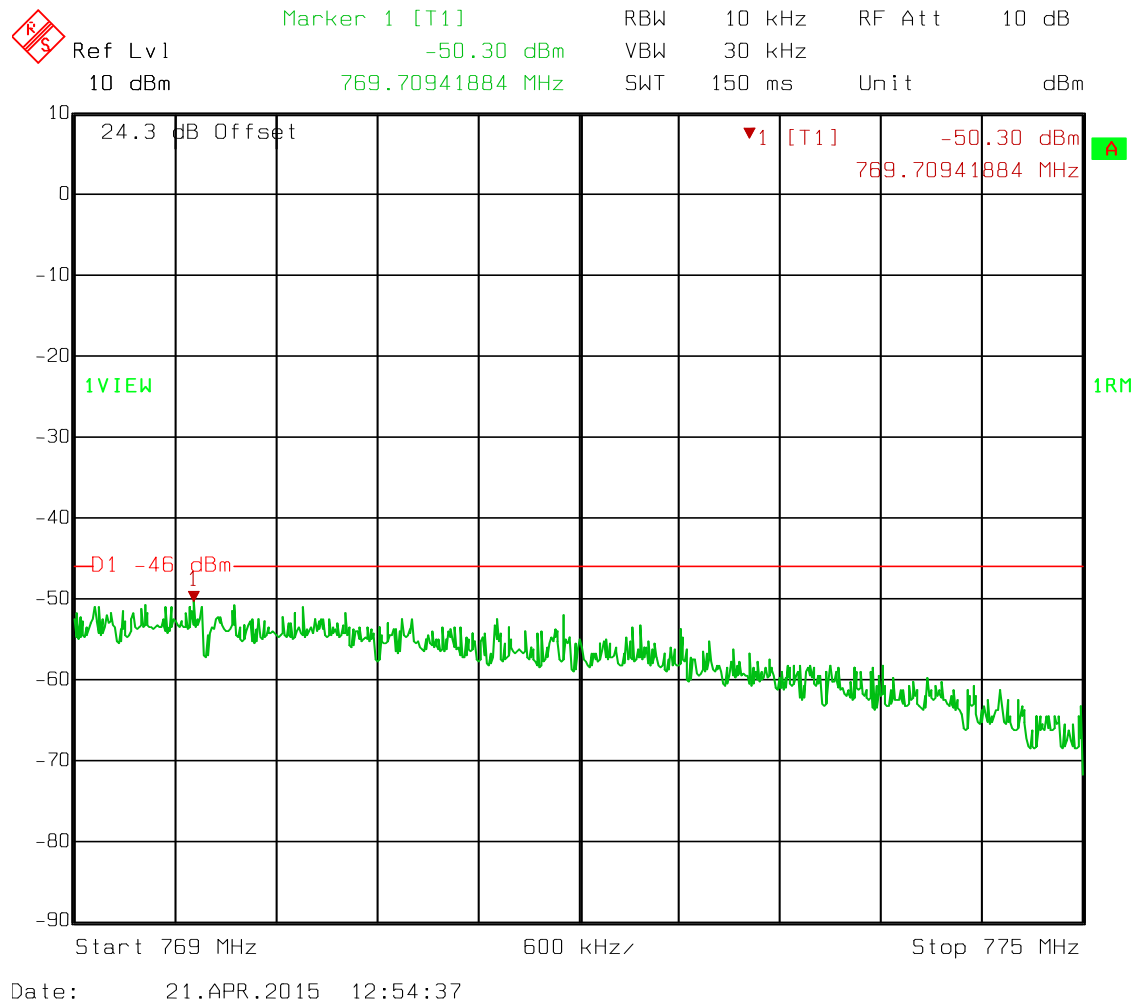
10 MHz
QPSK



Date: 21.APR.2015 12:57:40

EQUIPMENT: LS103-Z2

Test Data – Spurious Emissions at Antenna Terminals

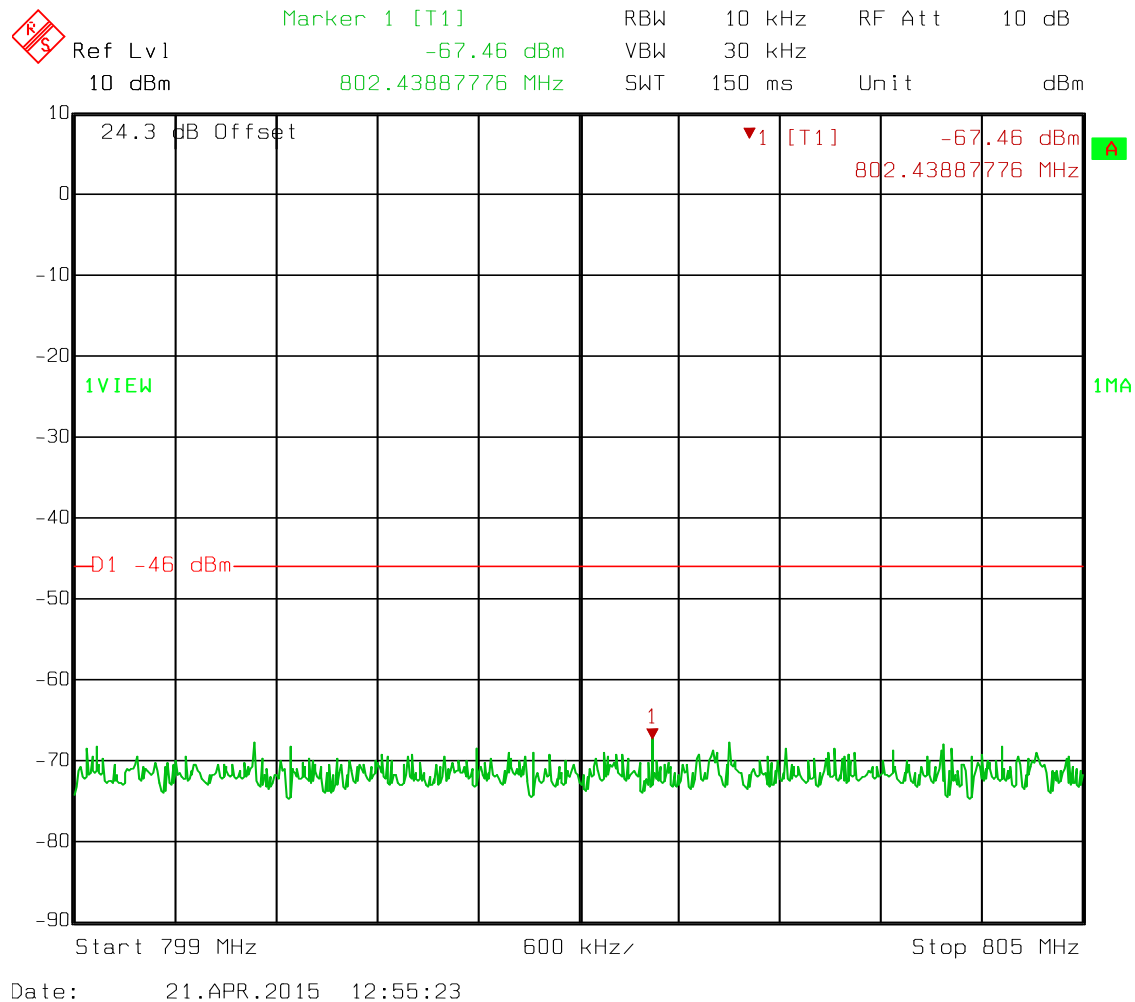
90.543(e)(1)
10 MHz
QPSK

Test Data – Spurious Emissions at Antenna Terminals

90.543(e)(1)

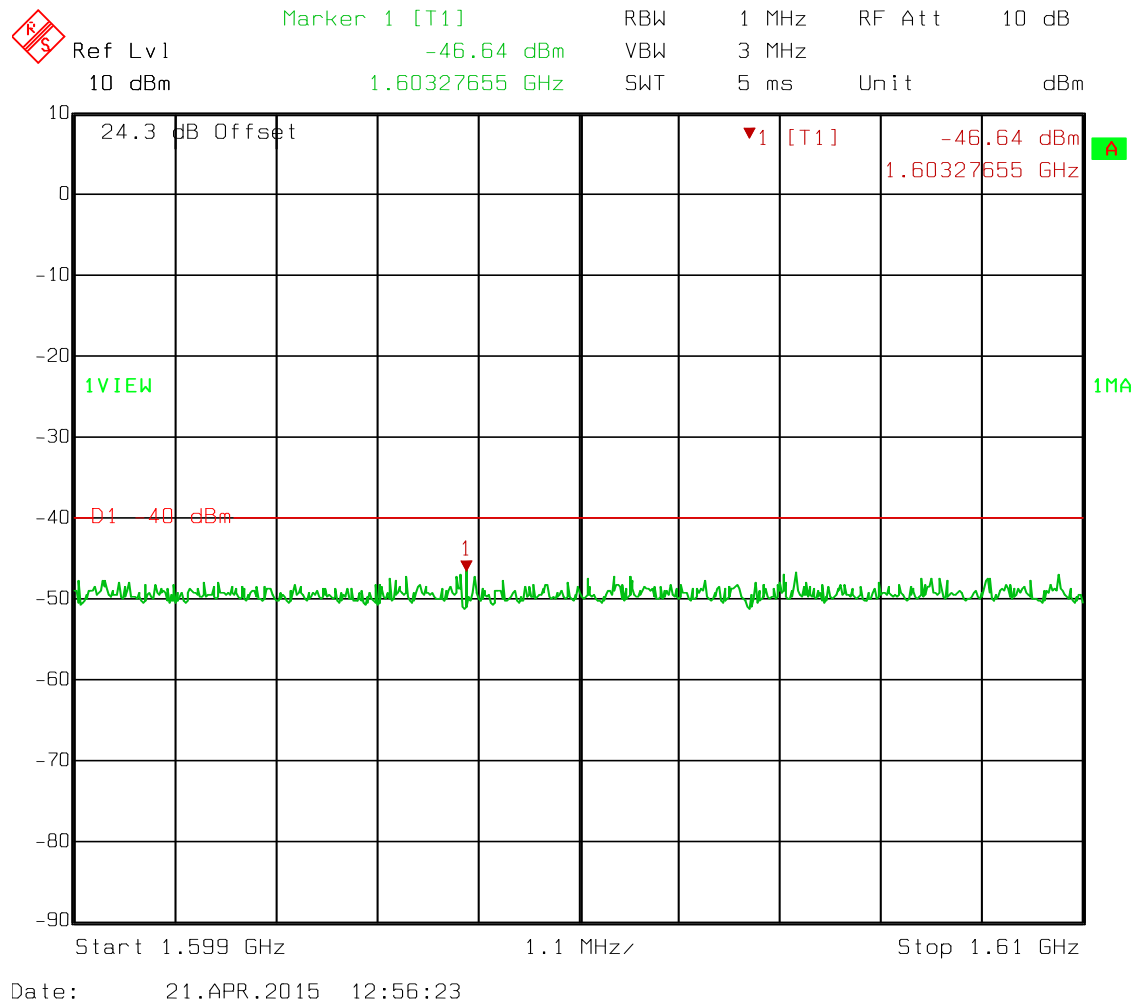
10 MHz

QPSK



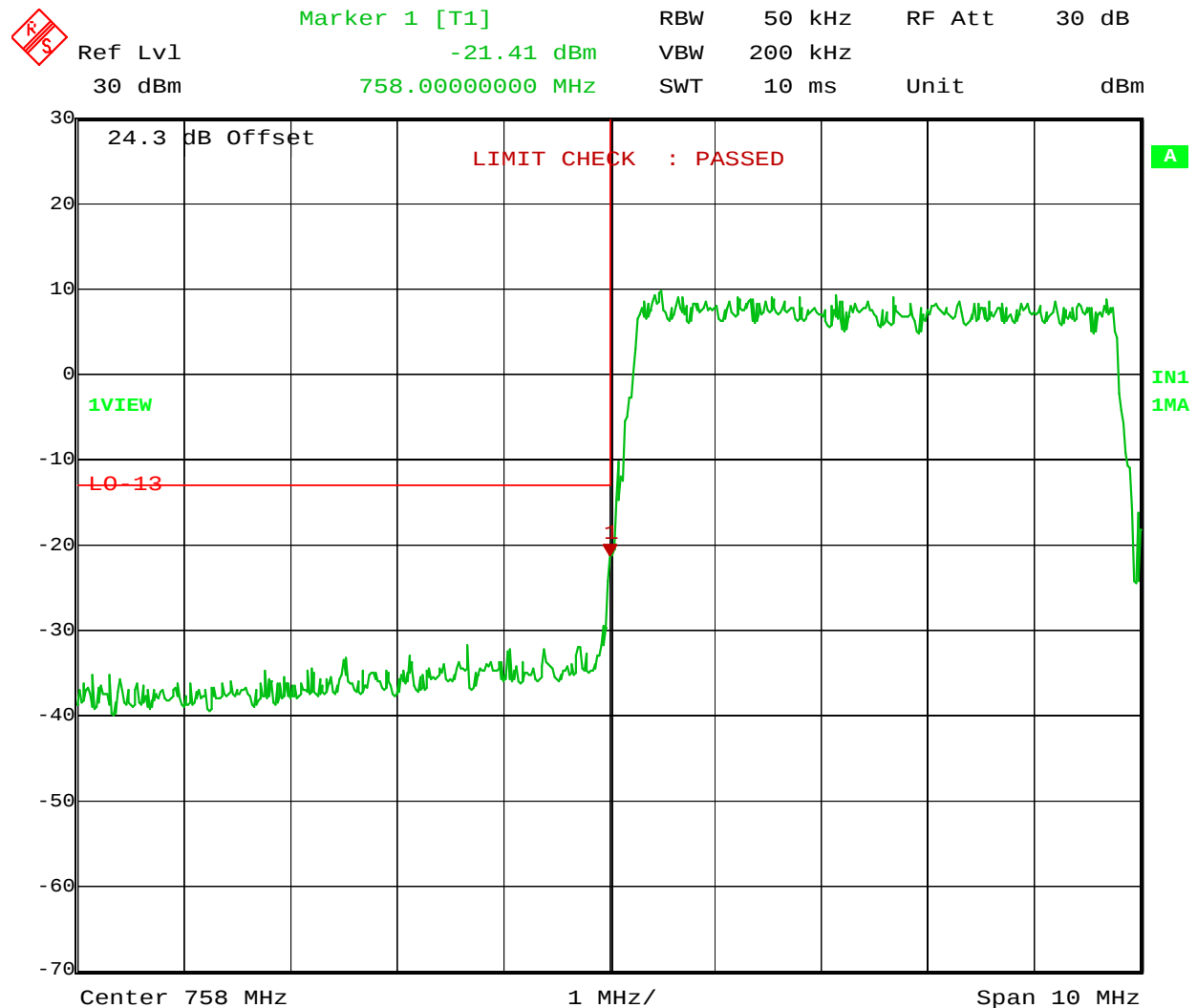
EQUIPMENT: LS103-Z2

Test Data – Spurious Emissions at Antenna Terminals

90.543(f)
10 MHz
QPSK

Test Data – Spurious Emissions at Antenna Terminals

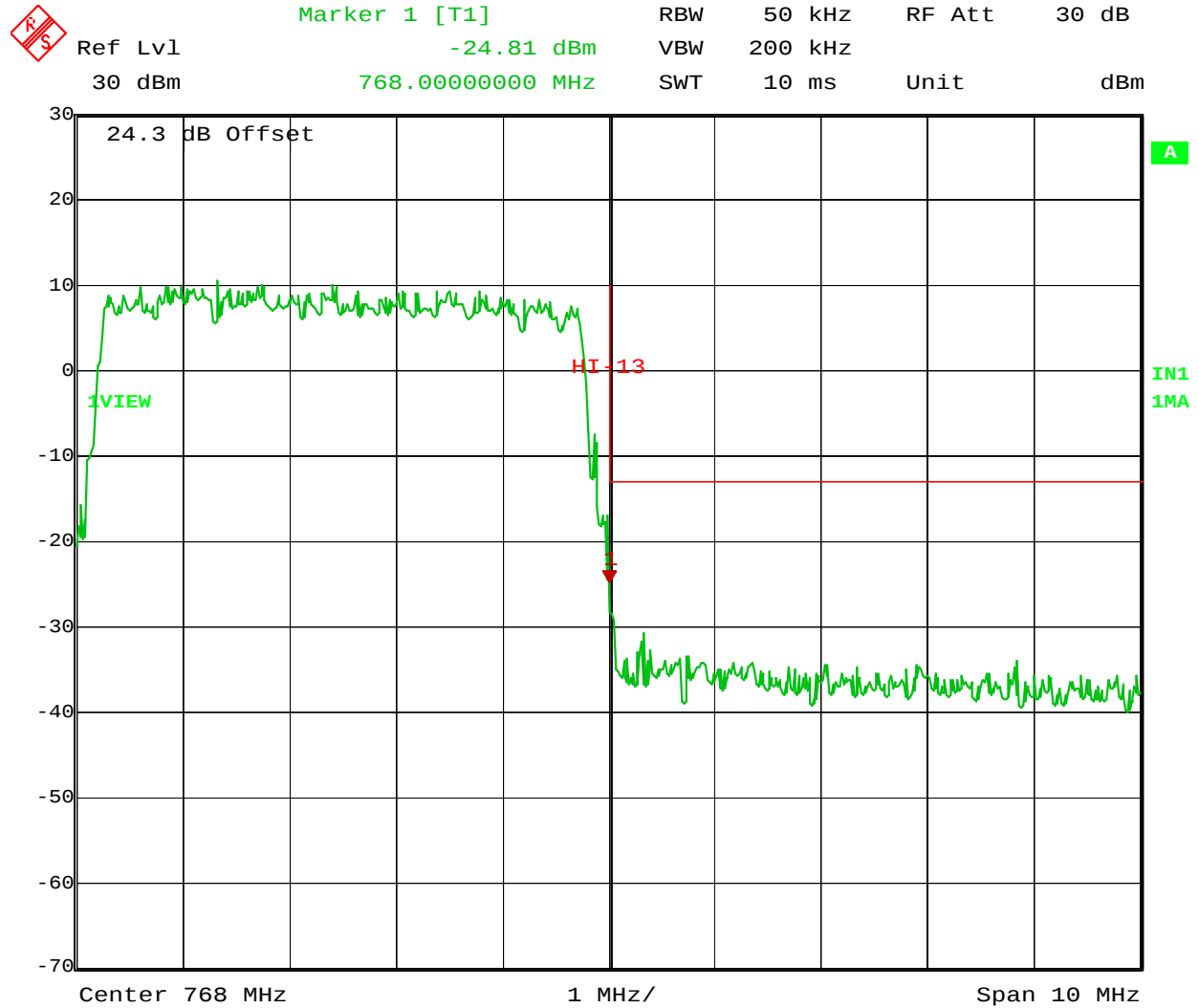
Lower Edge
5 MHz



Date: 23.APR.2015 10:22:29

Test Data – Spurious Emissions at Antenna Terminals

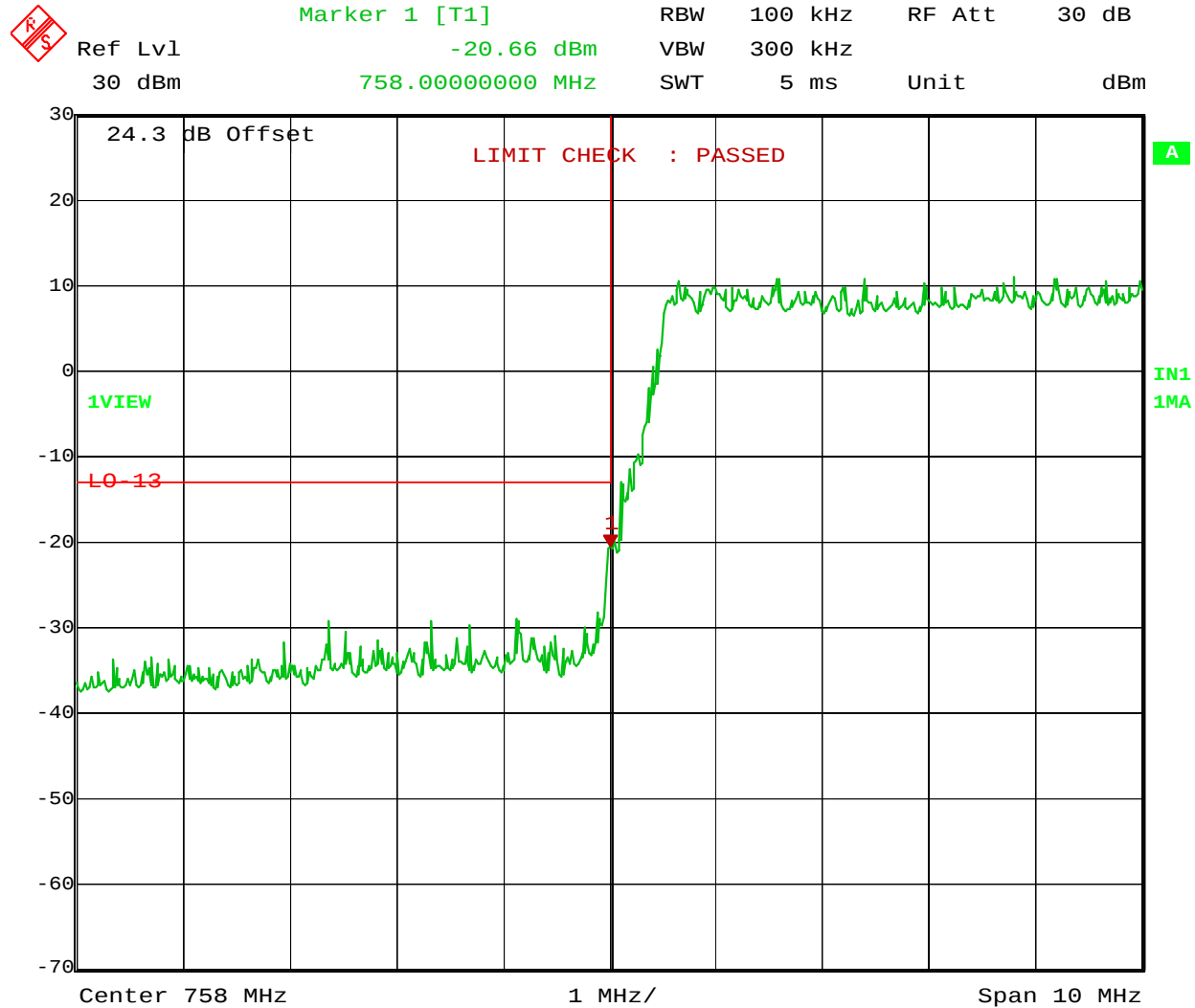
Upper Edge
5 MHz



Date: 23.APR.2015 10:23:11

Test Data – Spurious Emissions at Antenna Terminals

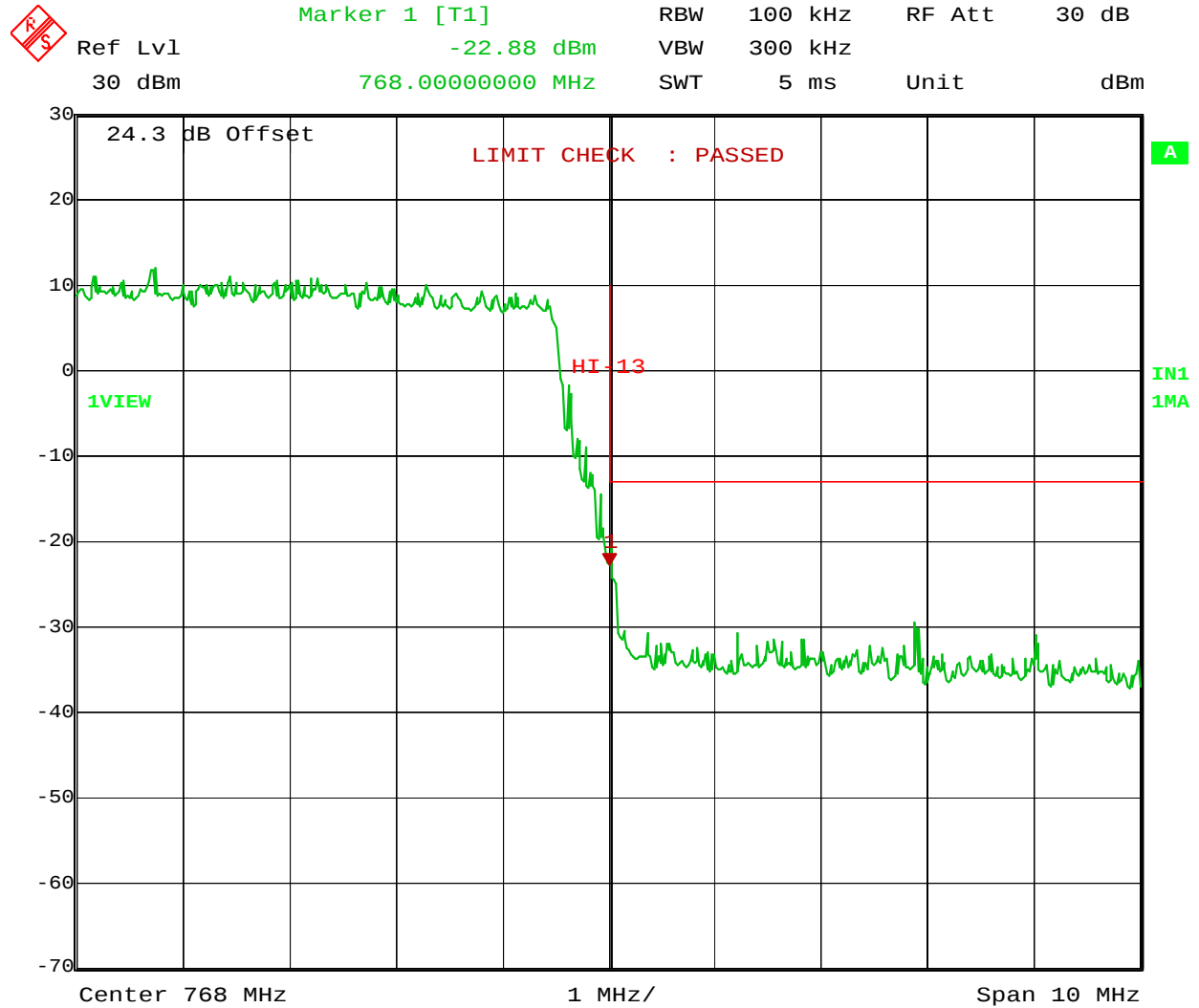
Lower Edge
10 MHz



Date: 23.APR.2015 10:28:59

Test Data – Spurious Emissions at Antenna Terminals

Upper Edge
10 MHz



Date: 23.APR.2015 10:28:24

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 21 April 2015

Test Results: Complies.

Test Data: There were no emissions detected above the noise floor which was at least 20 dB below the specification. The spectrum was searched from 30 MHz to 10 GHz in each mode and modulation.

EUT was tested in MIMO configuration.

Equipment Used: 1036-1480-E1029-993

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 45 %

Note: These measurements were made using FCC Measurement Guidance document 662911

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1055
TESTED BY: David Light	DATE: 22 April 2015

Test Results: Complies

Measurement Data: Refer to chart below

Equipment Used: 1036

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 45 %

Test Data – Frequency Stability

			Standard Test Frequency		763.000120	MHz	
Temp (°C)	Measured Frequency (MHz)		Test Voltage	Frequency Error (Hz)	Limit (+/-Hz)	Error (ppm)	Comment
20	763.000120		120 Vac	0	763.0	0	
20	763.000120		102 Vac	0	763.0	0.0	
20	763.000120		132 Vac	0	763.0	0.0	
50	762.999988		120 Vac	-132	763.0	-0.2	
40	762.999935		120 Vac	-185	763.0	-0.2	
30	762.999932		120 Vac	-188	763.0	-0.2	
10	763.000058		120 Vac	-62	763.0	-0.1	
0	763.000011		120 Vac	-109	763.0	-0.1	
-10	763.000238		120 Vac	118	763.0	0.2	
Notes:							

Note – Manufacturer has included temperature cutoff function to ensure that EUT ceases operation below -10°C.

Section 8. Test Equipment List

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
E1029	Preamplifier	A.H. Systems,	PAM-0118	343	12-Aug-2014	12-Aug-2015
993	Antenna, Horn	A.H. Systems	SAS-200/571	162	23-Dec-2014	23-Dec-2016
1036	Spectrum Analyzer	Rohde & Schwartz	FSEK30	830844/006	15-Jul-2013	15-Jul-2015
1763	Antenna, Bilog	Schaffner	CBL 6111D	22926	13-May-2014	13-May-2015
E1061	Power Sensor	ETS-Lindgren	7002-006	00160096	21-Oct-2014	21-Oct-2015

Section 9 – Test Setup Photo



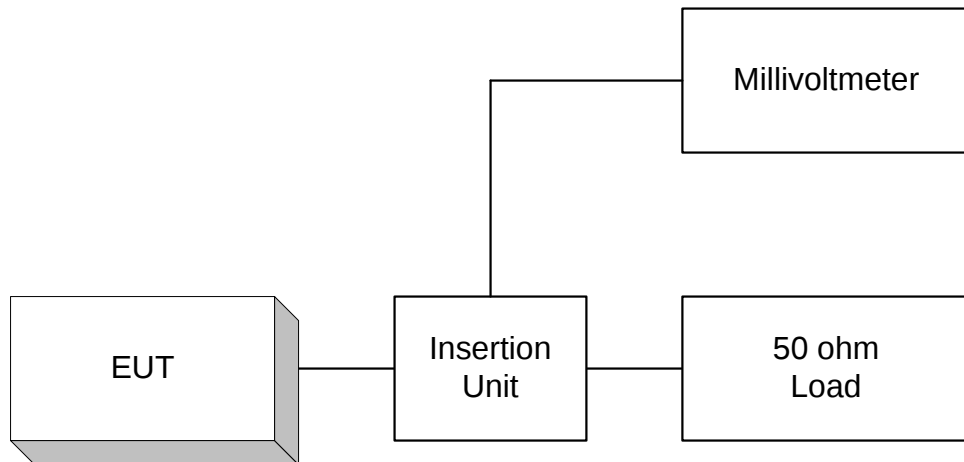
Nemko USA, Inc.

CFR 47, PART 90, SUBPART R
Regulations Governing the Licensing and Use of
Frequencies in the 763-775 AND 793-805 MHz Bands
PROJECT NO.: 2015 281848 FCC PT90

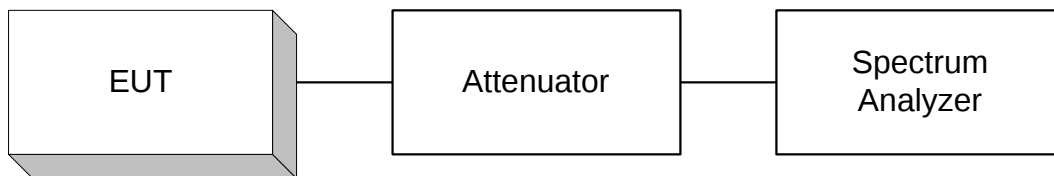
***EQUIPMENT:* LS103-Z2**

ANNEX A - TEST DIAGRAMS

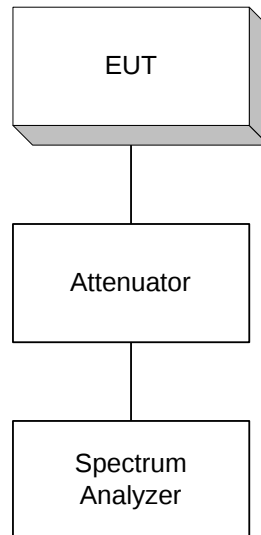
Para. No. 2.985 - R.F. Power Output



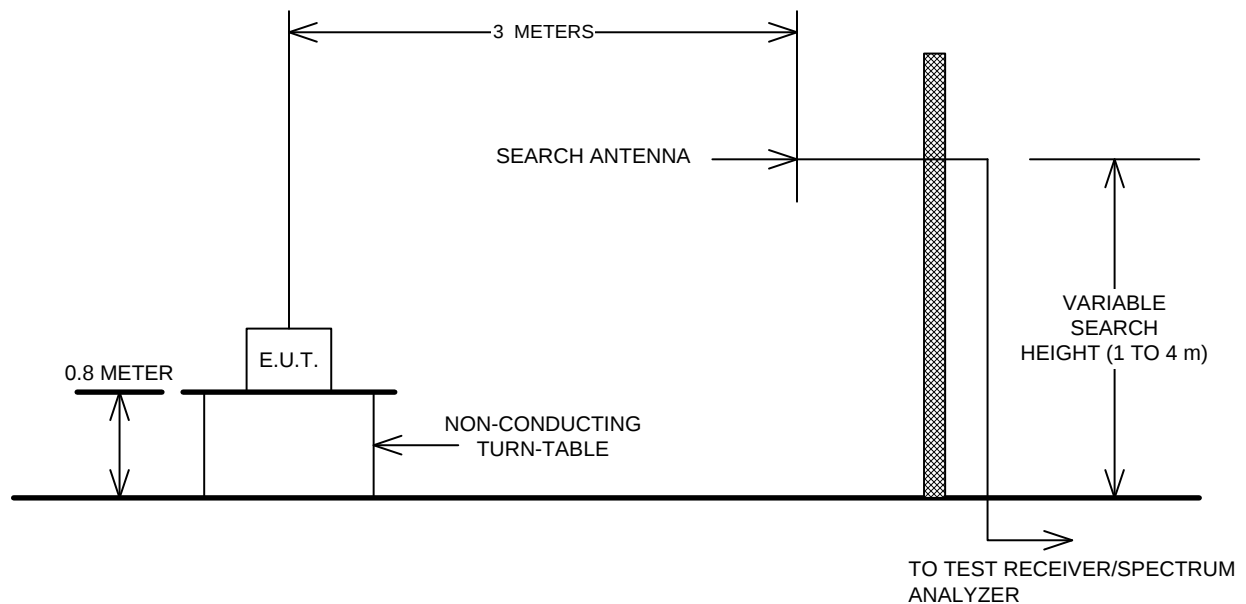
Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals



Para. No. 2.993 - Field Strength of Spurious Radiation



Para. No. 2.995 - Frequency Stability

