Nemko Test Report:	2014 258431 FCC PT22_rev1
Applicant:	Communication Components, Inc. 89 Leuning St. – 2nd Floor South Hackensack, NJ 07606
Equipment Under Test: (E.U.T.)	SCB-850-1W-ALU-OD-1
FCC ID:	NT3SCB8501WA
In Accordance With:	**CFR 47, Part 22, Subpart H** Cellular Band Repeaters
Tested By:	Nemko USA Inc. 2210 Faraday Ave. Suite 150 Carlsbad, CA 92008

TESTED BY:  **DATE:** 16 June 2014

David Light, Wireless Engineer

APPROVED BY:  **DATE:** 16 June 2014

Bruce Ketterling, EMC Manager

Number of Pages: 25

Table of Contents

Section 1. Summary of Test Results

Manufacturer:	Communication Components, Inc
Model No.:	SCB-850-1W-ALU-OD-1
Serial No.:	Not available

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 CFR 47, Part 22, Subpart H.

☒	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".

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. Nemko USA, Inc. is a NVLAP accredited laboratory.

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	22.913(a)	500W ERP	Complies
Occupied Bandwidth	Not defined	Input/Output	Complies
Spurious Emissions at Antenna Terminals	22.917	-13 dBm	Complies
Field Strength of Spurious Emissions	22.917	-13 dBm E.I.R.P.	Complies
Frequency Stability	22.355	1.5 ppm	NA

Footnotes:

Frequency stability was not performed since the equipment does not perform frequency translation.

Only Downlink direction was tested since the device is an amplifier that connects direct to the BTS..

Revisions:

1) Added statement on pages 10 and 14.

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Section 2. General Equipment Specification

Supply Voltage Input:		120 Vac				
Frequency Range:	**Downlink:**	869 to 894 MHz				
Frequency Range:	**Uplink:**	NA				
Type of Modulation and Designator:		**CDMA (F9W)** ☐	**GSM (GXW)** ☐	**TDMA (DXW)** ☐	**EDGE (G7W)** ☐	**UMTS (F9W)** ☒
Output Impedance:		50 ohms				
RF Output (Rated):	**Downlink:**	1.0 W 30.0 dBm				
	Uplink:	NA W NA dBm				
Frequency Translation:		**F1-F1** ☒	**F1-F2** ☐	**N/A** ☐		
Band Selection:		**Software** ☐	**Duplexer Change** ☐	**Fullband Coverage** ☒		

Description of EUT

This MetroCell Amplifier is designed with a very simple interface specifically designed to work with the ALU 9364 MetroCell without the need for retrofitting the original equipment. It mounts directly to the MetroCell without any additional cables or connectors. The MetroCell Amplifier is designed for compatibility with the latest UMTS and HSPA+ standard and is guaranteed to maintain the integrity of the UMTS signal upon amplification.

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 22.913
TESTED BY: David Light	DATE: 01 May 2014

Test Results: Complies.

Test Data:

Direction	Modulation	Output per Channel (dBm)	Composite Power (dBm)	Composite Power (W)
Uplink	UMTS	NA	NA	NA
Downlink	UMTS	27.0	30	1.0

Equipment Used: 1036

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 35 %

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 01 May 2014

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036

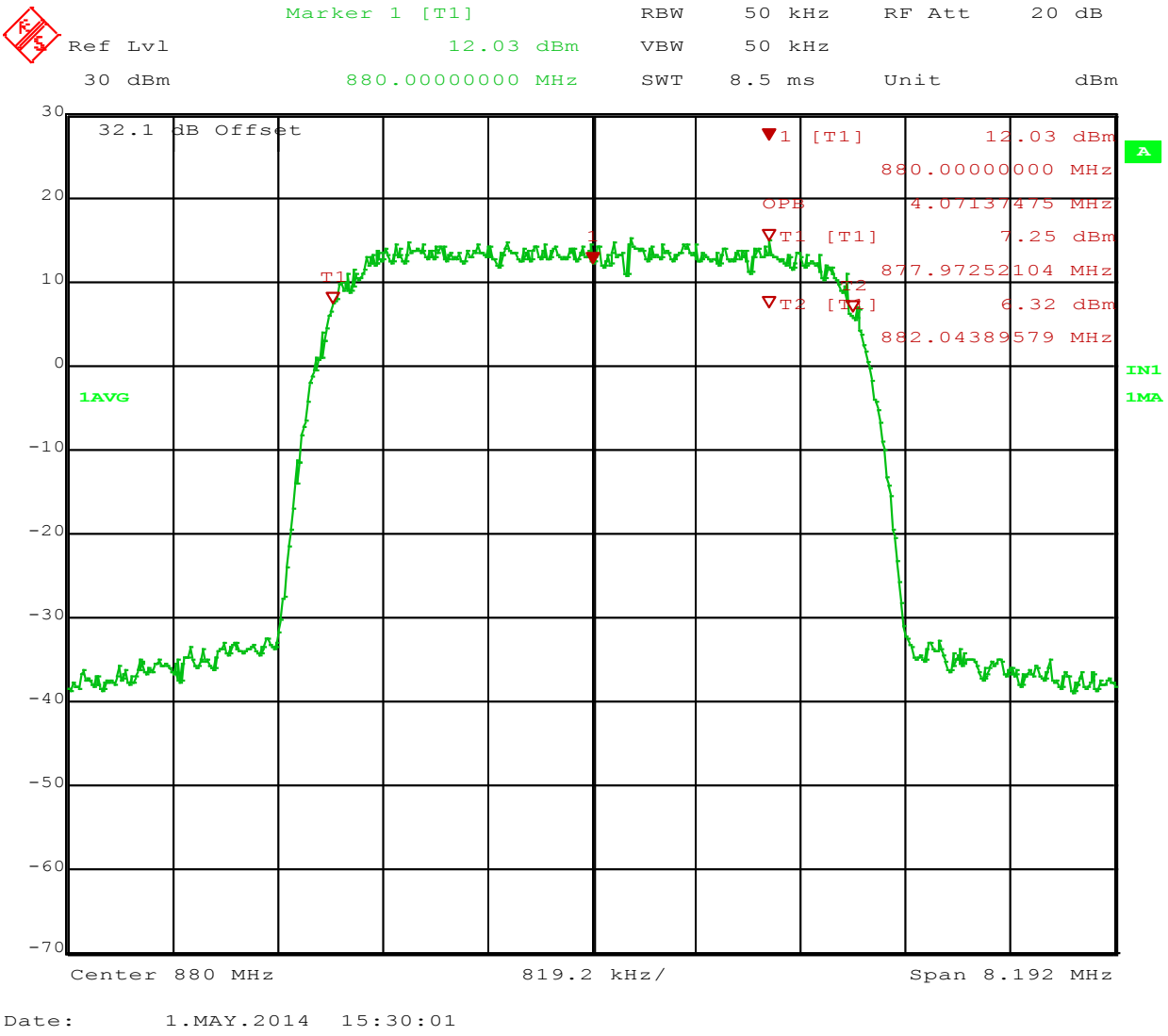
Measurement Uncertainty: $1X10^{-7}$ ppm

Temperature: 22 °C

Relative Humidity: 35 %

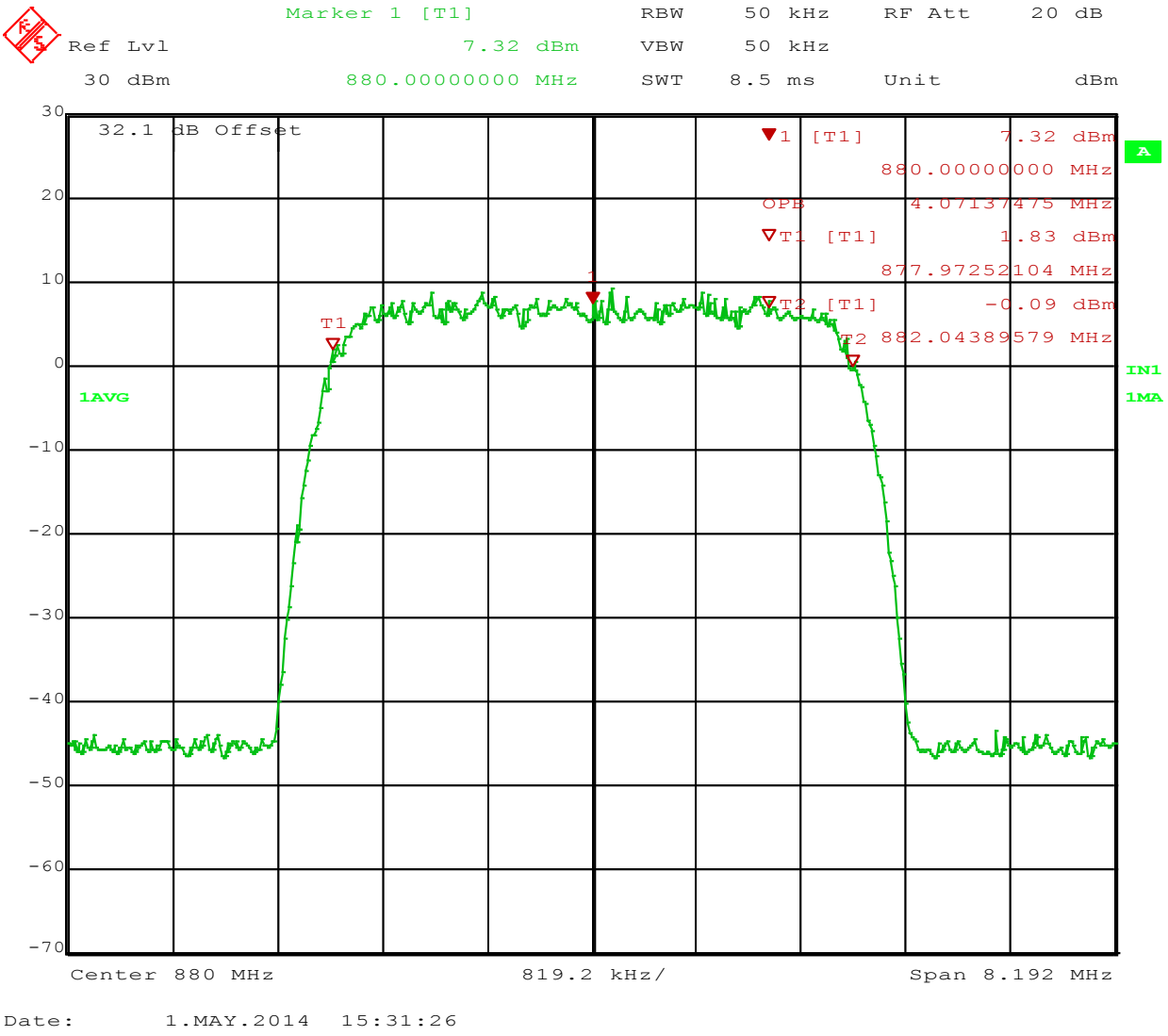
Test Data – Occupied Bandwidth

UMTS – Output



Test Data – Occupied Bandwidth

UMTS – Input



Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 22.917
TESTED BY: David Light	DATE: 01 May 2014

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036

Measurement Uncertainty: +/- 1.7 dB

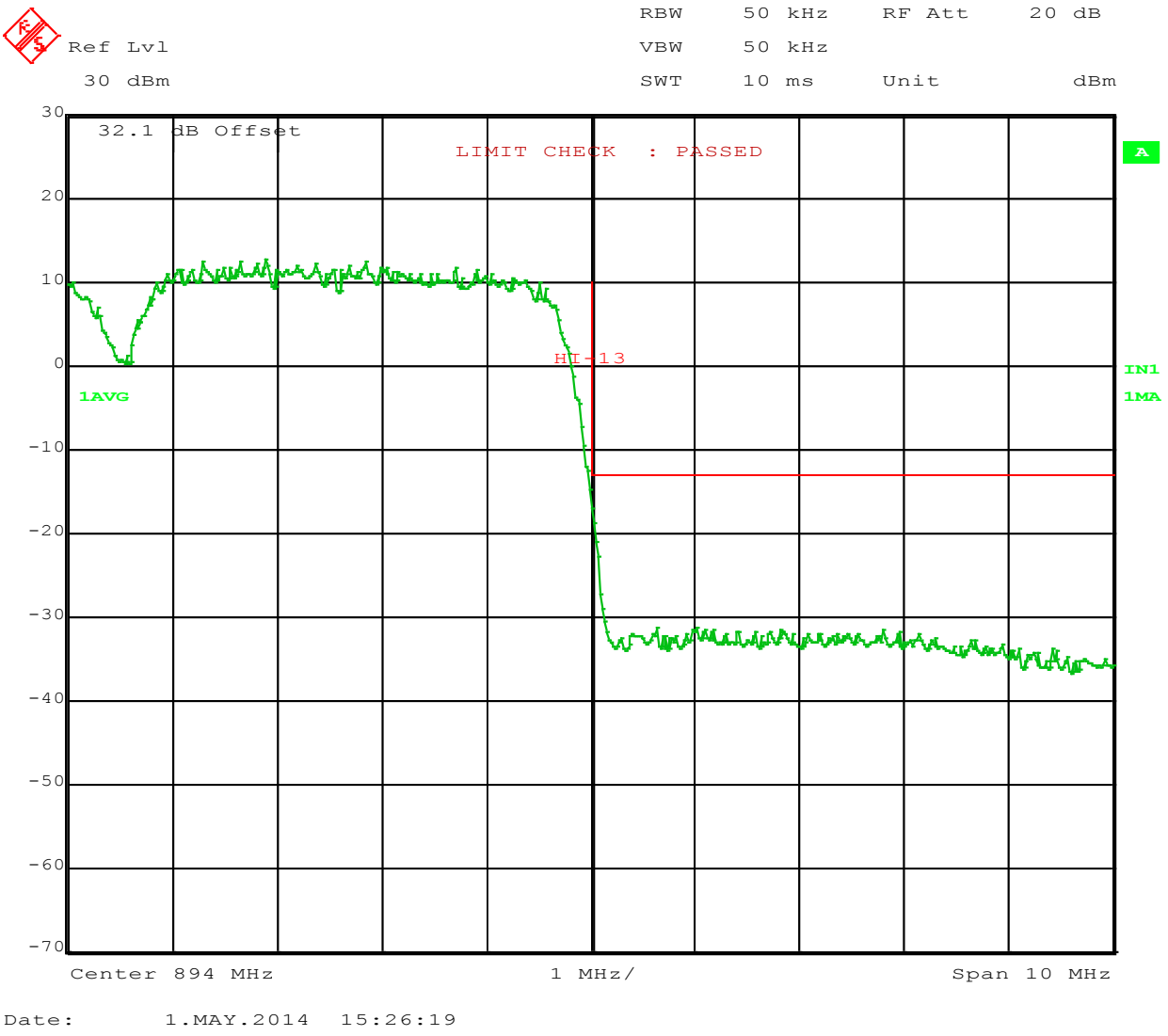
Temperature: 22 °C

Relative Humidity: 35 %

Note: The EUT was tested on three channels as well as intermodulation characteristics at the band edges. The noise floor measurements presented for the center channel are representative of all channels and conditions.

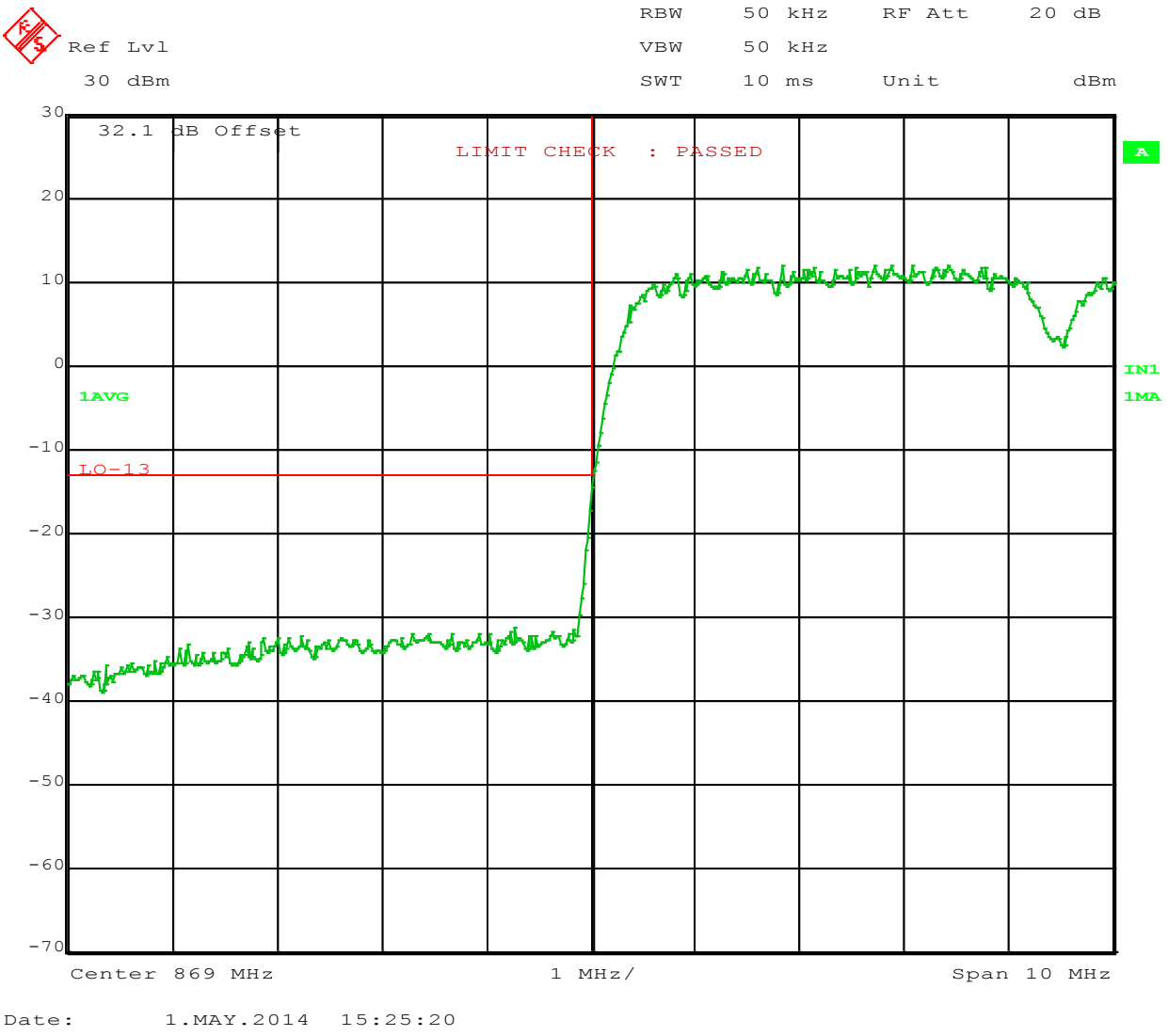
Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation
UMTS
Downlink



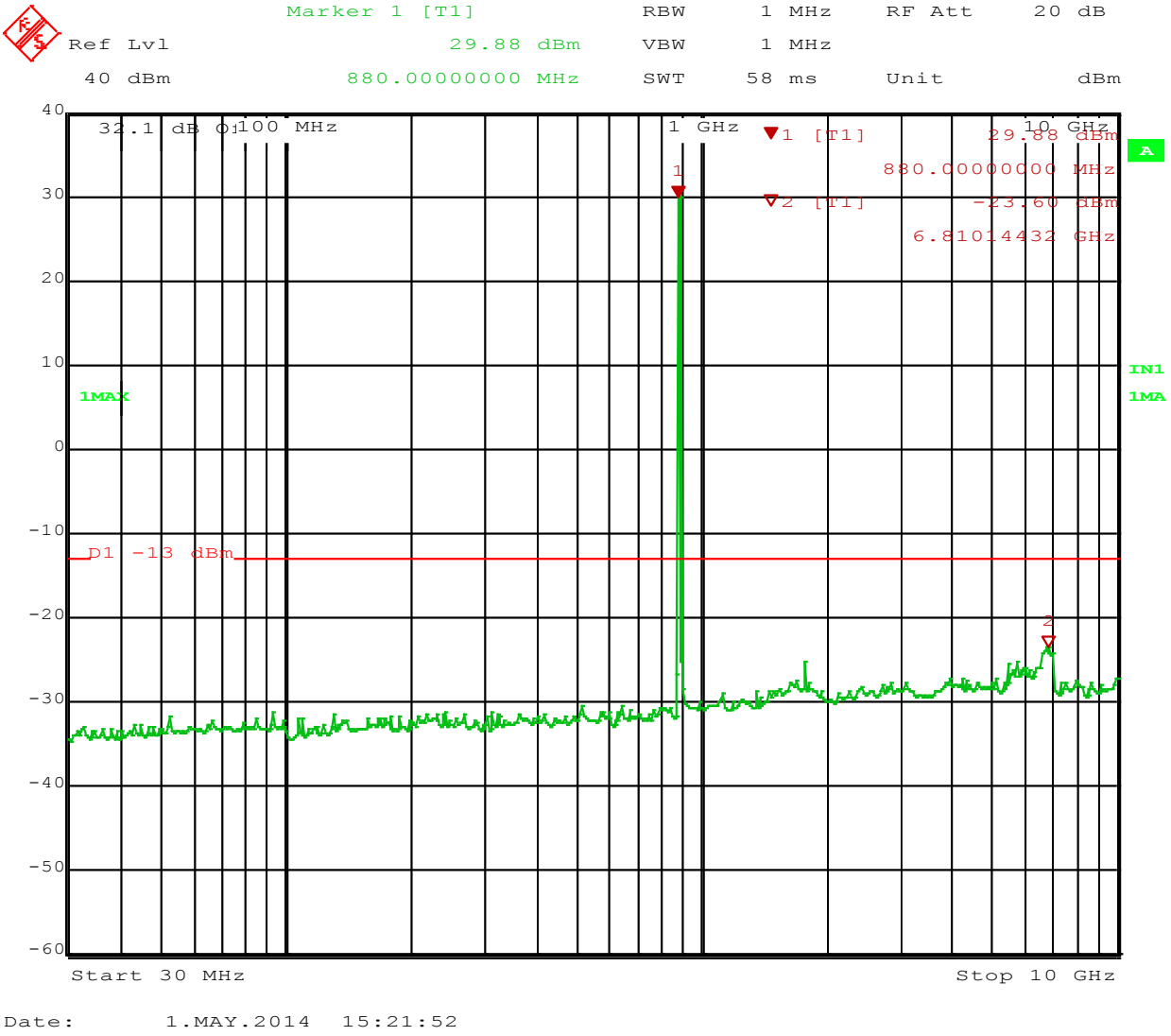
Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation
UMTS
Uplink



Test Data – Spurious Emissions at Antenna Terminals

Spurs – UMTS - Downlink



Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious	PARA. NO.: 22.917
TESTED BY: David Light	DATE: 02 May 2014

Test Results: Complies.

Test Data: There were no emissions detected within 20 dB of the specification limit of -13 dBm ERP [43 + 10 log(P) dB]

Equipment Used: 911-901-1016-1480-529

Measurement Uncertainty: +/-1.7 dB

Temperature: 21 °C

Relative Humidity: 30 %

Note: The EUT was tested on three channels. The noise floor measurements presented for the center channel are representative of all channels and conditions.

Section 7. Test Equipment List

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
529	Antenna, DRWG	EMCO	3115	2505	31-Oct-2012	31-Oct-2014
901	Preamplifier	Sonoma	310 N	130607	21-Nov-2013	21-Nov-2014
911	Spectrum Analyzer	Agilent	E4440A	US41421266	21-Jan-2014	21-Jan-2015
1016	Preamplifier	Hewlett Packard	8449A	2749A00159	20-Aug-2013	20-Aug-2014
1036	Spectrum Analyzer	Rohde & Schwartz	FSEK30	830844/006	15-Jul-2013	15-Jul-2015
1480	Antenna, Bilog	Schaffner-Chase	CBL6111C	2572	02-Apr-2014	02-Apr-2015

ANNEX A - TEST DETAILS

NAME OF TEST: RF Power Output	**PARA. NO.: 2.1046**

Minimum Standard: Para. No. 22.913(a). The maximum effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 watts.

Method Of Measurement:

Detachable Antenna:
The peak power at antenna terminals is measured using an in-line peak power meter. Power output is measured with the maximum rated input level.

Integral Antenna:
The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

NAME OF TEST: Occupied Bandwidth **PARA. NO.: 2.1049**

Minimum Standard: Not defined (Input/Output)

Method Of Measurement:

CDMA

Spectrum analyzer settings:
RBW=VBW=30 kHz
Span: 5 MHz
Sweep: Auto

GSM / EDGE

RBW=VBW= 3 kHz
Span: 1 MHz
Sweep: Auto

TDMA

RBW=VBW= 1 kHz
Span: 1 MHz
Sweep: Auto

W-CDMA

RBW=VBW= 100 kHz
Span: 10 MHz
Sweep: Auto

NAME OF TEST: Spurious Emission at Antenna Terminals **PARA. NO.: 2.1051**

Minimum Standard: Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least 43 + 10 log P. This is equivalent to -13 dBm absolute power.

Method Of Measurement:

Spectrum analyzer settings:

CDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 30 kHz (< 1MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: 6 Sweeps

GSM / EDGE

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: Disabled

TDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: Disabled

W-CDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 100 kHz (< 1MHz from Band Edge)
VBW: ≥ RBW
Sweep: Auto
Video Avg: 6 Sweeps

NAME OF TEST: Field Strength of Spurious Radiation PARA. NO.: 2.1053

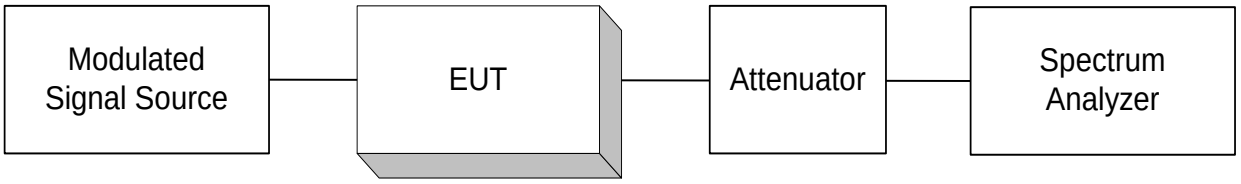
Minimum Standard: Para. No. 22.917(e). The mean power of emissions must be attenuated below the mean power of the unmodulated carrier on any frequency twice or more than twice the fundamental emission by at least 43 + 10 log P. This is equivalent to -13 dBm absolute power.

Method of Measurement TIA/EIA-603-1992

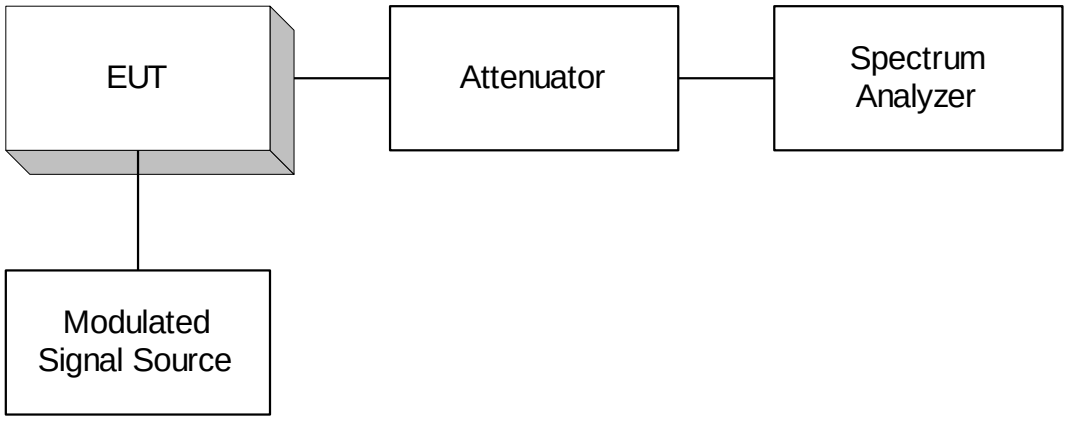
The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

ANNEX B - TEST DIAGRAMS

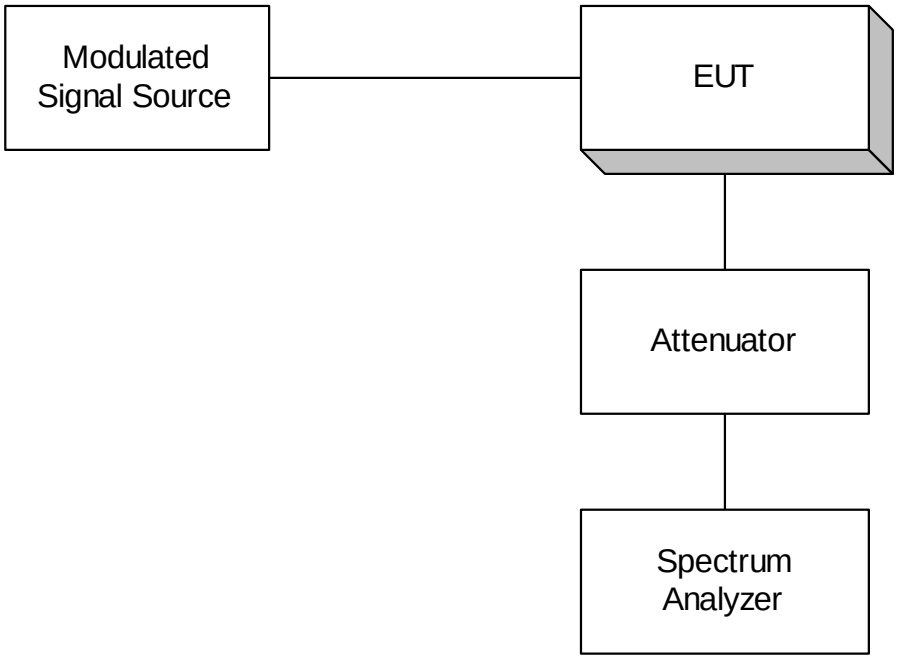
Para. No. 2.1046 - R.F. Power Output



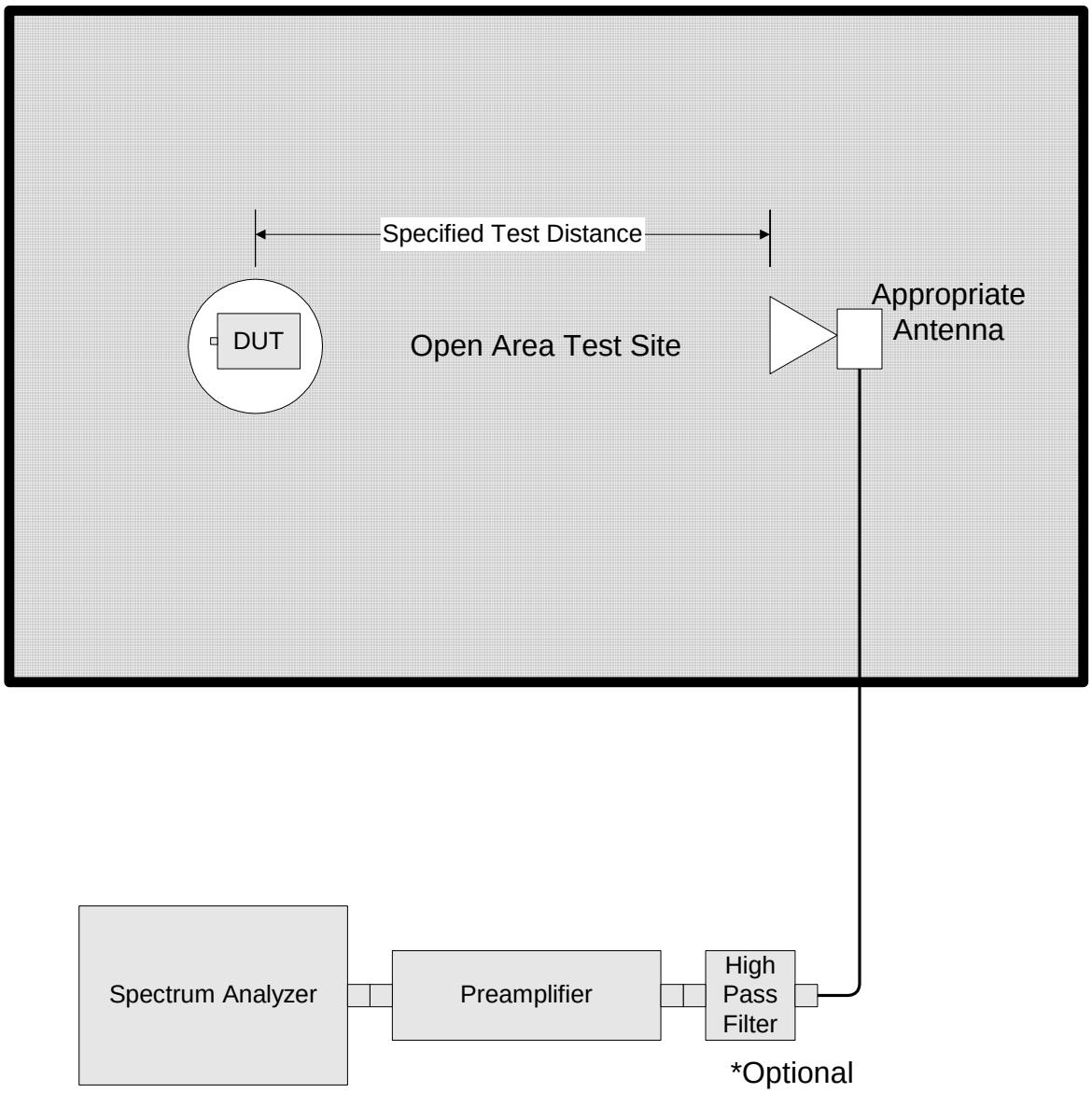
Para. No. 2.1049 - Occupied Bandwidth

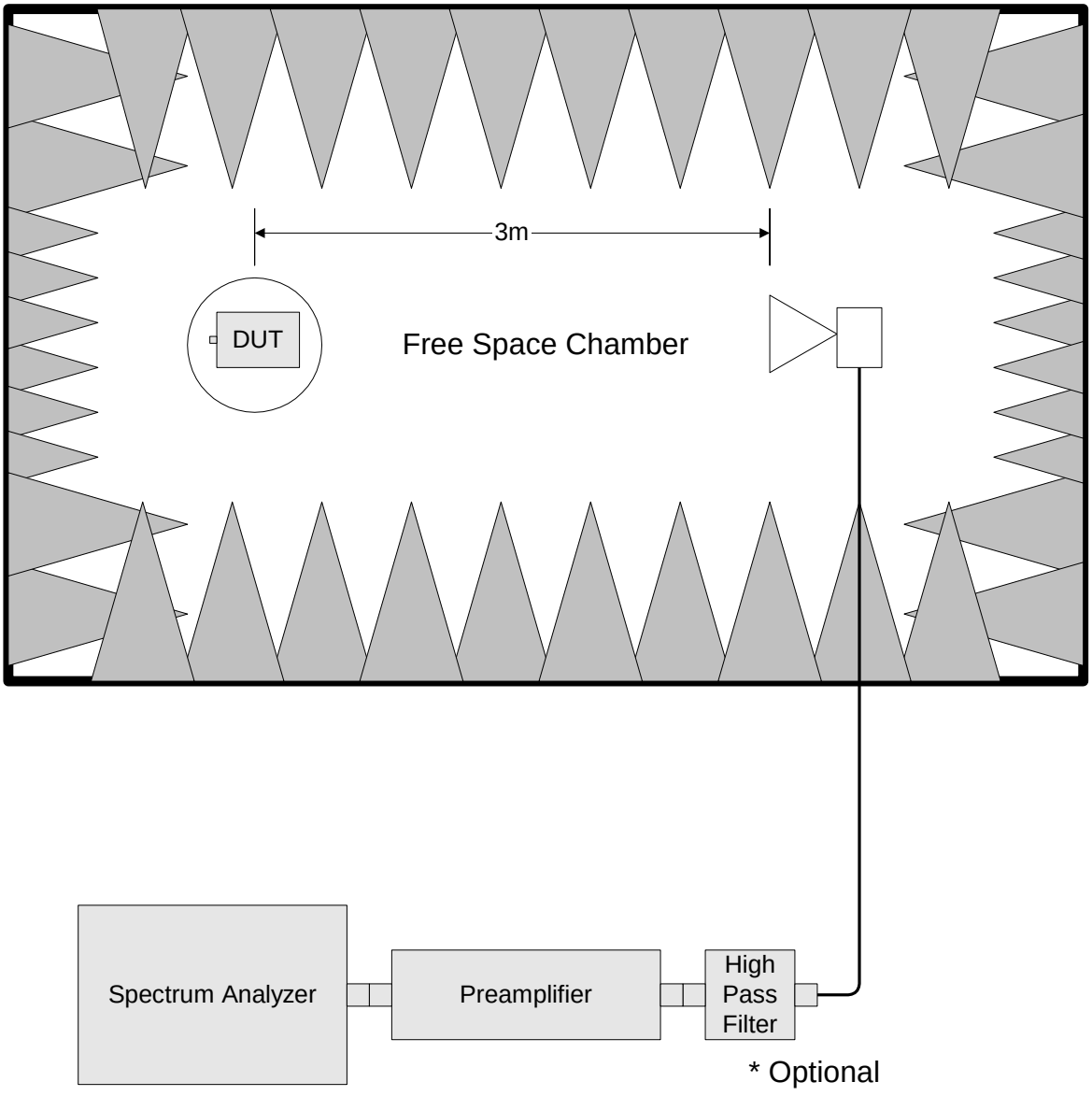


Para. No. 2.1051 Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Spurious Radiation




3m
DUT
Free Space Chamber
Spectrum Analyzer
Preamplifier
High
Pass
Filter
* Optional