

Electromagnetic Compatibility Test Report

Prepared in accordance with

FCC Part 15C, ANSI C63.10:2009

On

Commercial Series Detectors

ISC-CDL1-W15G AND ISC-CDL1-WA15G

Bosch Security Systems




130 Perinton Parkway

Fairport, NY 14450

Prepared by:

TUV Rheinland of North America, Inc.

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

Client:	Bosch Security Systems 130 Perinton Parkway Fairport, NY 14450		Peter Namisnak 585-223-4060 / 585-289-4263 peter.namisnak@us.bosch.com	
Identification:	Commercial Series Detectors	Serial No.:	0004/8	
Test item:	ISC-CDL1-W15G AND ISC-CDL1-WA15G		Date tested:	5/10/2015
Testing location:	TUV Rheinland of North America 710 Resende Drive Webster, NY 14580 U.S.A.		Tel: (585) 645-0125	
Test specification:	Emissions: FCC Part 15 subpart C, RSS-210 Issue 8 FCC Part 15.209(a) FCC Part 15.205(a) FCC Part 15.245(a), ANSI C63.10:2009 Section 6.9 ANSI C63.10:2009 section 6.9 , FCC Part 2.1093,			
Test Result:	The above product was found to be Compliant to the above test standard(s)			
tested by: Randall Masline			reviewed by: Cecil Gittens	
<u>5 June 2015</u> Date Name Signature			<u>5 June 2015</u> Date Name Signature	
Other Aspects:	None			
Abbreviations: OK, Pass, Compliant, Complies = passed Fail, Not Compliant, Does Not Comply = failed N/A = not applicable				
	 		Industry Canada	VCCI
US5253	Testing Cert.# 3331.08		482B-1	SL2-IN-E-050R

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

TABLE OF CONTENTS

1	GENERAL INFORMATION	4
1.1	SCOPE	4
1.2	PURPOSE	4
1.3	SUMMARY OF TEST RESULTS	5
	LABORATORY INFORMATION	7
1.1	ACCREDITATIONS & ENDORSEMENTS	7
1.2	MEASUREMENT UNCERTAINTY EMISSIONS	8
1.3	CALIBRATION TRACEABILITY	9
1.4	MEASUREMENT EQUIPMENT USED	10
2	PRODUCT INFORMATION	11
2.1	PRODUCT DESCRIPTION	11
2.2	EQUIPMENT MODIFICATIONS	11
2.3	TEST PLAN	11
2.4	MODEL IDENTIFICATION	11
3	EMISSIONS.....	13
3.1	RADIATED EMISSIONS	13
3.2	FIELD STRENGTH OF FUNDAMENTAL AND HARMONIC EMISSIONS	17
3.3	BAND EDGE MEASUREMENT	26
3.4	OCCUPIED BANDWIDTH -20 dB AND 99%	28
3.5	FREQUENCY STABILITY	31
3.6	RF EXPOSURE MEASUREMENT (MOBILE DEVICE).....	36
	APPENDIX A	37
4	TEST PLAN.....	37
4.1	GENERAL INFORMATION	37
4.2	MODEL(S) NAME	37
4.3	TYPE OF PRODUCT.....	37
4.4	EQUIPMENT UNDER TEST (EUT) DESCRIPTION	38
4.5	MODIFICATIONS	38
4.6	PRODUCT ENVIRONMENT	38
4.7	COUNTRIES	38
4.8	GENERAL PRODUCT INFORMATION.....	39
4.9	EUT ELECTRICAL POWERED INFORMATION	39
4.10	EUT MODES OF OPERATION	39
4.11	ELECTRICAL SUPPORT EQUIPMENT.....	40
4.12	NON - ELECTRICAL SUPPORT EQUIPMENT	40
4.13	EUT EQUIPMENT/CABLING INFORMATION	40
4.14	EUT TEST PROGRAM.....	40

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

1 General Information

1.1 Scope

This report is intended to document the status of conformance with the requirements of the FCC Part 15C, ANSI C63.10:2009 based on the results of testing performed on 5/10/2015 on the Commercial Series Detectors, Model No. ISC-CDL1-W15G AND ISC-CDL1-WA15G, manufactured by Bosch Security Systems. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

1.2 Purpose

Testing was performed to evaluate the performance of the EUT (Equipment Under Test) in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

1.3 Summary of Test Results

Applicant	Bosch Security Systems 130 Perinton Parkway Fairport, NY 14450	Tel	585-223-4060	Contact	Peter Namisnak
		Fax	585-289-4263	e-mail	peter.namisnak@us.bosch.com
Description	Commercial Series Detectors	Model Number	ISC-CDL1-W15G AND ISC-CDL1-WA15G		
Serial Number	0004/8	Test Voltage/Freq.	12VDC		
Test Date Completed:	5/10/2015	Test Engineer	Randall Masline		
Standards	Description	Severity Level or Limit		Criteria	Test Result
FCC Part 15 subpart C Standard	Radio Frequency Devices - Subpart C: Intentional Radiators	See called out parts below		See Below	Complies
RSS-210 Issue 8 Standard	Licence-exempt Radio Apparatus (All Frequency Bands): Category 1 Equipment	See called out parts below		See Below	Complies
FCC Part 15.209(a) FCC Part 15.205(a)	Radiated Emissions Restricted Bands	Class B, 30 - 1000 MHz		Limit	Complies
FCC Part 15.245(a)	Operation within the bands 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10500 - 10550MHz and 24075-24175 MHz	2500mv/m Fundamental = 127.9 dBuV 25.0mv/m Harmonics = 87.95 dBuV		Limit	Complies
ANSI C63.10:2009 Section 6.9	Band Edge Requirements	Per ANSI C63.10:2009		Limit	Complies
ANSI C63.10:2009 section 6.9	Occupied Bandwidth	-20 dB and 99% Occupied bandwidth			Complies
FCC 15.215(c) and ANSI C63.10: 2009 6.8.2	Frequency Stability				Complies
FCC Part 2.1093	RF Exposure	MPE or SAR Requirements (Mobile)			Complies

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

Manufacturer's statement - attestation

The manufacturer; **Bosch Security Systems Inc.**, as the responsible party for the equipment tested, hereby affirms:

- a) That he has reviewed and concurs that the test shown in this report are reflective of the operational characteristics of the device for which certification is sought;
- b) That the device in this test report will be representative of production units;
- c) That all changes (in hardware and software/firmware) to the subject device will be reviewed.
- d) That any changes impacting the attributes, functionality or operational characteristics documented in this report will be communicated to the body responsible for approving (certifying) the subject equipment.

Peter Namisnak

Printed name of official



Signature of official

**130 Perinton Parkway
Fairport, NY 14450**

Address

07-May-2015

Date

(585)678-3462

Telephone number

Peter.namisnak@us.bosch.com

Email address of official

Laboratory Information

1.1 Accreditations & Endorsements

1.1.1 US Federal Communications Commission

TUV Rheinland of North America located at, 710 Resende Road, Building 199, Webster, NY 14580 is accredited by the commission for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Registration No 90575). The laboratory scope of accreditation includes: Title 47 CFR Part 15, and 18. The accreditation is updated every 3 years.

1.1.2 ILAC/A2LA

This is a program which is administered under the auspices of A2LA. The laboratory has been assessed and accredited in accordance with ISO Standard 17025:2005 (Certificate Number: 3331.08). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

1.1.3 VCCI

VCCI Accredited test lab. Registration numbers A-0203

1.1.4 Industry Canada

(Registration No.: 482B-1) The 10m Semi-Anechoic Chamber has been accepted by Industry Canada to perform testing to 3 and to 10m, based on the test procedures described in ANSI C63.4-2009.

1.1.5 BSMI

Registration No.: SL2-IN-E-050R. The BSMI accreditation was obtained by NIST MRA with the BSMI.

1.1.6 Korea

Recognized by Radio Research Agency as an accredited Conformity Assessment Body (CAB) under the terms of Phase I of the APEC TEL.

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

1.1.7 Sample Calculation – radiated & conducted emissions

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

$$\text{Field Strength (dB}\mu\text{V/m)} = \text{RAW} - \text{AMP} + \text{CBL} + \text{ACF}$$

Where: RAW = Measured level before correction (dB μ V)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu\text{V/m} = 10^{\frac{\text{dB}\mu\text{V} / \text{m}}{20}}$$

Sample radiated emissions calculation @ 30 MHz

Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dB μ V/m)

$$25 \text{ dB}\mu\text{V/m} + 17.5 \text{ dB} - 20 \text{ dB} + 1.0 \text{ dB} = 23.5 \text{ dB}\mu\text{V/m}$$

1.2 Measurement Uncertainty Emissions

Measurement	<i>U_{lab}</i>	<i>U_{cispr}</i>
Radiated Disturbance @ 10m		
30 MHz – 1000 MHz	4.57 dB	5.2 dB
Conducted Disturbance @ Mains Terminals		
150 kHz – 30 MHz	2.62 dB	3.6 dB
Disturbance Power		
30 MHz – 300 MHz	3.88 dB	4.5 dB

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

Measurement Uncertainty Immunity

The estimated combined standard uncertainty for radiated emissions measurements is ± 1.6 dB.
The estimated combined standard uncertainty for conducted emissions measurements is ± 1.2 dB.

The expanded uncertainty at a level of 95% confidence is obtained by multiplying the combined standard uncertainty by a coverage factor of 2. Compliance criteria are not based on measurement uncertainty.

1.3 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2005. Equipment calibration records are kept on file at the test facility.

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

1.4 Measurement Equipment Used

Equipment	Manufacturer	Model #	Ref.	Serial #	Last Cal dd/mm/yy	Next Cal dd/mm/yy	Test
Radiated Emissions							
Analyzer w RF Filter Section 85460A	HP	8546A		3325A00134	12-Aug-14	12-Aug-15	RE
Multimeter	Fluke	83	C437	48162892	12-Aug-14	12-Aug-15	RE
BiLog	Chase	CBL6111	C017	1169	22 Aug 13	22 Aug 15	RE
Receiver (20Hz-40GHz)	Rohde & Schwarz	ESI(B) 40		100274	15-Aug-14	15-Aug-15	RE
Horn (1-18 GHz)	ETS	3117		040361	16-Jan-14	16-Jan-16	RE
Horn(18-26.5 GHz)	ETS	3117		6707	3-Jan-14	3-Jan-16	RE
Horn(26.5-40 GHz)	ETS	3117		1180	8-Jan-14	8-Jan-16	RE
Environmental Chamber	Tenny			1662	18-Jul-14	18-Jul-15	RE
Environmental Chamber	Thermotron			20891	8-Jul-14	8-Jul-15	
General Laboratory Equipment							
Multimeter	Fluke	87	C405	49050672	12-Aug-14	12-Aug-15	
Multimeter	Fluke	8062A	C452	4715199	12-Aug-14	12-Aug-15	
Pressure/Temperature/RH	Extech	SD700	C480	Q668876	12-Aug-14	12-Aug-15	

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

2 Product Information

2.1 Product Description

See Appendix A

2.2 Equipment Modifications

No modifications were needed to bring product into compliance.

2.3 Test Plan

The EUT product information, test configuration, mode of operation, test types, test procedures, test levels, pass/failure criteria, in this report were carried out per the product test plan located in appendix A of this report

2.4 Model Identification

ISC-CDL1-WA15G

Bosch Commercial Series TriTech+ detector with Anti-mask

Uses PIR & MW detection technologies.

Has Anti-mask feature

Range 15m

Model ISC-CDL1-W15G

Bosch Commercial Series TriTech detector

Uses PIR & MW detection technologies.

Range 15m

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Figure 1 – External Photo of EUT

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3 Emissions

3.1 Radiated Emissions

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

3.1.1 Over View of Test

Results	Complies (as tested per this report)					Date	3/27/2015	
Standard	FCC Part 15.209(a) FCC Part 15.205(a)							
Product Model	ISC-CDL1-W15G AND ISC-CDL1-WA15G				Serial#	0004/8		
Configuration	See test plan for details							
Test Set-up	Tested in 10m Semi-Anechoic Chamber at 3 meters, placed on turn-table, see test plans for details							
EUT Powered By	12VDC	Temp	22°C	Humidity	18%	Pressure	987mbar	
Frequency Range	30 - 1000 MHz @ 10m							
Perf. Criteria	Class B. (Below Limit)			Perf. Verification		Readings Under Limit		
Mod. to EUT	None			Test Performed By		Randall Masline		

3.1.2 Test Procedure

Radiated and FCC emissions tests were performed using the procedures of ANSI C63.10 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 30 - 1000 MHz was investigated for radiated emissions.

Radiated emission testing was first performed at a distance of 3 meters in the semi-anechoic chamber in order to identify the specific frequencies for which these measurements will be made on the 10m Semi-Anechoic Chamber.

3.1.3 Deviations

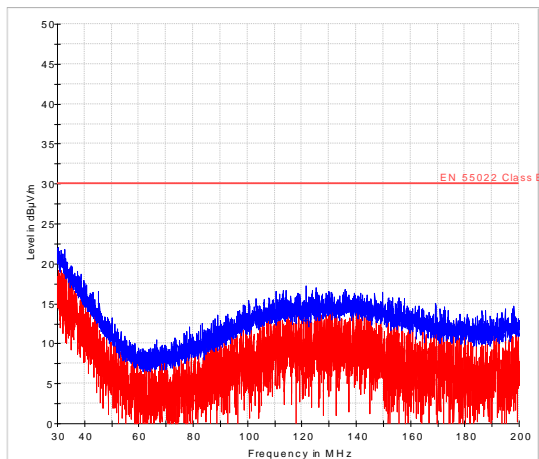
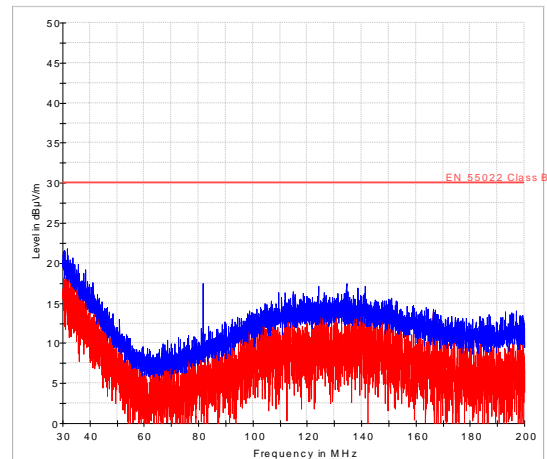
There were no deviations from the test methodology listed in the test plan for the radiated emission test.

3.1.4 Final Test

All final radiated emissions measurements were below (in compliance) the limits.

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3.1.1 Final Graphs

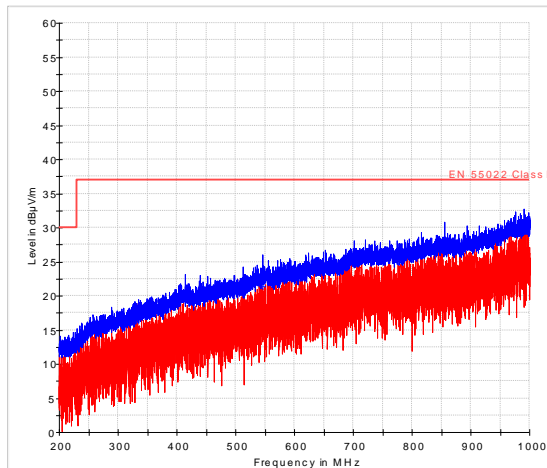
NOTES:
Radiated Emissions ISC-CDL-WA15G
Vertical / Horizontal

30-200MHz Vertical Polarization

30-200MHz Horizontal Polarization

Frequency MHz	QuasiPeak dBµV/m	Meas. Time ms	Bandwidth kHz	Height cm	Polarization	Azimuth deg	Corr. dB
121.480000	12.9	100.0	120.000	100.0	V	201.0	-5.2
169.280000	11.9	100.0	120.000	100.0	V	181.0	-5.5
198.120000	11.7	100.0	120.000	100.0	V	100.0	-5.5

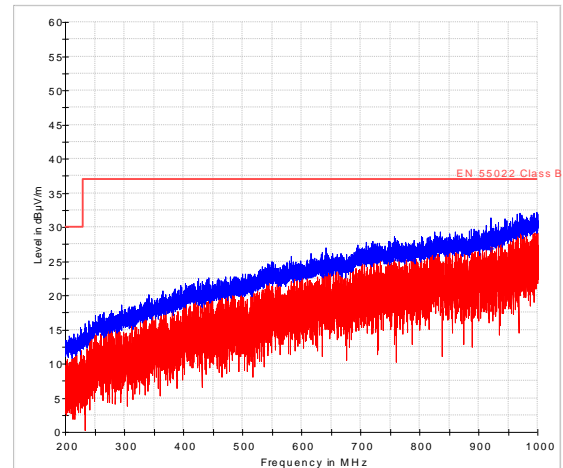
Frequency MHz	QuasiPeak dBµV/m	Meas. Time ms	Bandwidth kHz	Height cm	Polarization	Azimuth deg	Corr. dB
81.680000	8.7	100.0	120.000	400.0	H	180.0	-10.1

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

NOTES:

Radiated Emissions ISC-CDL-WA15G
Vertical / Horizontal


200-1000MHz Vertical Polarization



200-1000MHz Horizontal Polarization

Frequency MHz	QuasiPeak dBµV/m	Meas. Time ms	Bandwidth kHz	Height cm	Polarization	Azimuth deg	Corr. dB
546.400000	21.4	100.0	120.000	100.0	V	201.0	7.0
855.120000	25.8	100.0	120.000	100.0	V	352.0	13.9

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3.1.2 Final Tabulated Data

Radiated Emissions ISC-CDL-WA15G

Frequency [MHz]	Antenna Height [Meters]	Antenna Polarity	EUT Angle [Degrees]	Corrected Reading* [dB(μV/m)]	Margin	CFR 47 Part 15**, EN55022 Class B, 10 Meter Limit [dB(μV/m)]
81.68	400.0	H	180.0	8.7	-21.3	30
121.48	100.0	V	201.0	12.9	-17.1	30
169.28	100.0	V	181.0	11.9	-18.1	30
198.12	100.0	V	100.0	11.7	-18.3	30
546.40	100.0	V	201.0	21.4	-15.6	37
855.12	100.0	V	352.0	25.8	-11.2	37

Radiated Emission Measurements for 30-1000 MHz

*All measurements made using quasi-peak detector unless otherwise noted

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3.2 Field Strength of Fundamental and Harmonic Emissions

This test measures the electromagnetic levels of fundamental and spurious signals generated by the EUT that radiated from the EUT.

3.2.1 Test Over View

Results	Complies (as tested per this report)					Date	5/10/2015	
Standard	FCC Part 15.245(a)							
Product Model	ISC-CDL1-W15G AND ISC-CDL1-WA15G				Serial#	0004/8		
Configuration	See test plan for details							
Test Set-up	10m Semi-Anechoic Chamber EUT placed on table See test plan for details							
EUT Powered By	12VDC	Temp	22° C	Humidity	47%	Pressure	1026mbar	
Perf. Criteria	2500mv/m (Below Limit)		Perf. Verification		Readings under Limit			
Mod to EUT	None		Test Performed By		Randall Masline			

3.2.2 Test Procedure

Field Strength and FCC emissions tests were performed using the procedures of ANSI C63.10 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

Radiated emission testing measurements will be made on the 10m Semi-Anechoic Chamber, at a 3m distance.

3.2.3 Deviations

There were no deviations from the test methodology listed in the test plan for the radiated emission test.

3.2.4 Final Test

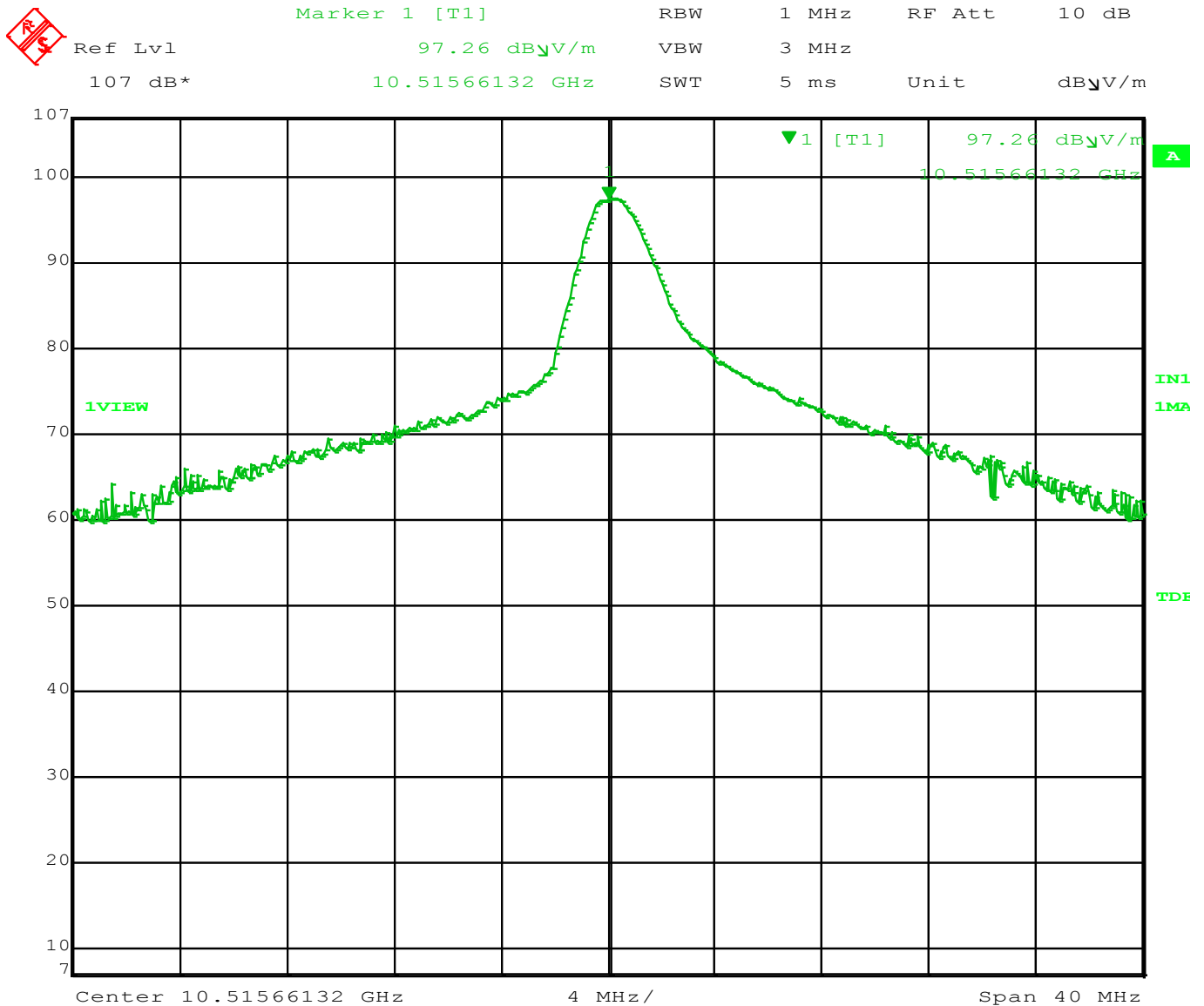
All final radiated emissions measurements were below (in compliance) the limits.

2500mv/m Fundamental = 127.9 dBuV

25.0mv/m Harmonics = 87.95 dBuV

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3.2.5 Final Data



Date: 10.MAY.2015 04:38:25

Figure 2 – Horizontal, 97.26 dBuV/m

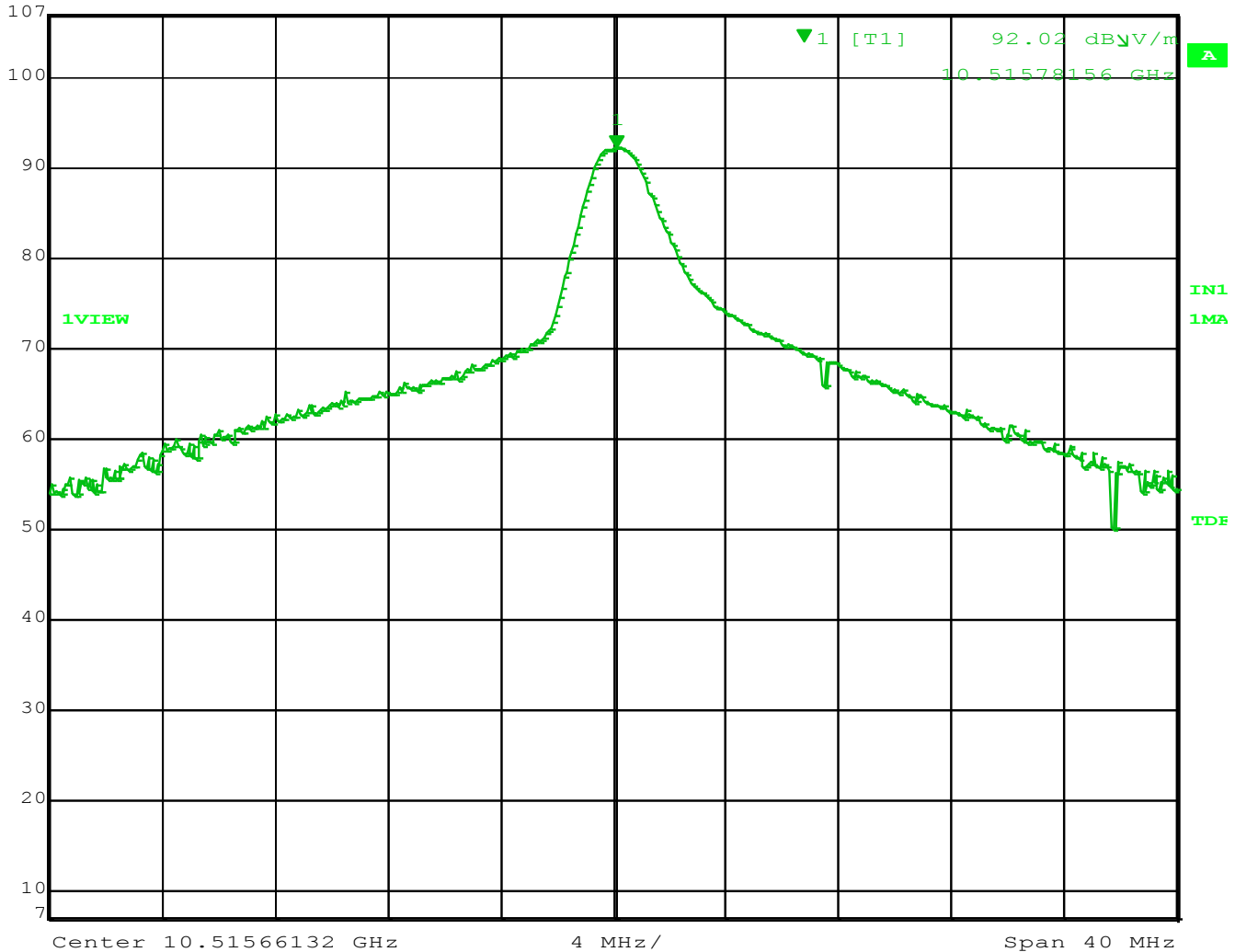
Limit: 2500mv/m Fundamental = 127.9 dBuV/m

Limit: 25.0mv/m Harmonics = 87.95 dBuV/m

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
 Ref Lvl 92.02 dBV/m VBW 3 MHz
 107 dB* 10.51578156 GHz SWT 5 ms Unit dBV/m



Date: 10.MAY.2015 04:39:19

Figure 3 – Vertical, 92.02 dBV/m

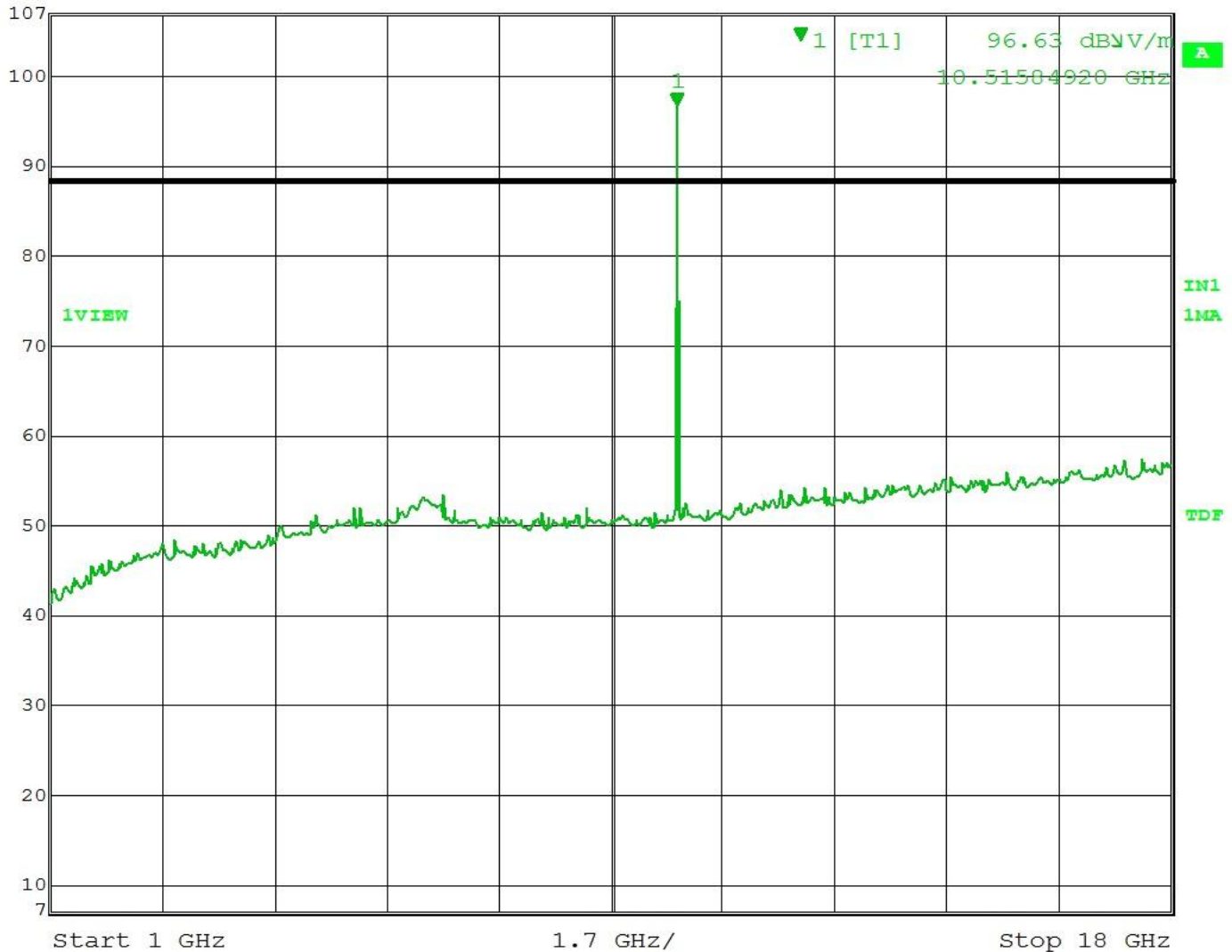
Limit: 2500mv/m Fundamental = 127.9 dBuV/m

Limit: 25.0mv/m Harmonics = 87.95 dBuV/m

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
107 dB*	96.63 dB μ V/m	VBW	3 MHz		
	10.51584920 GHz	SWT	170 ms	Unit	dB μ V/m



Date: 10.MAY.2015 04:48:15

Figure 4 – Field strength of Harmonic Emissions 1-18 GHz, Horizontal

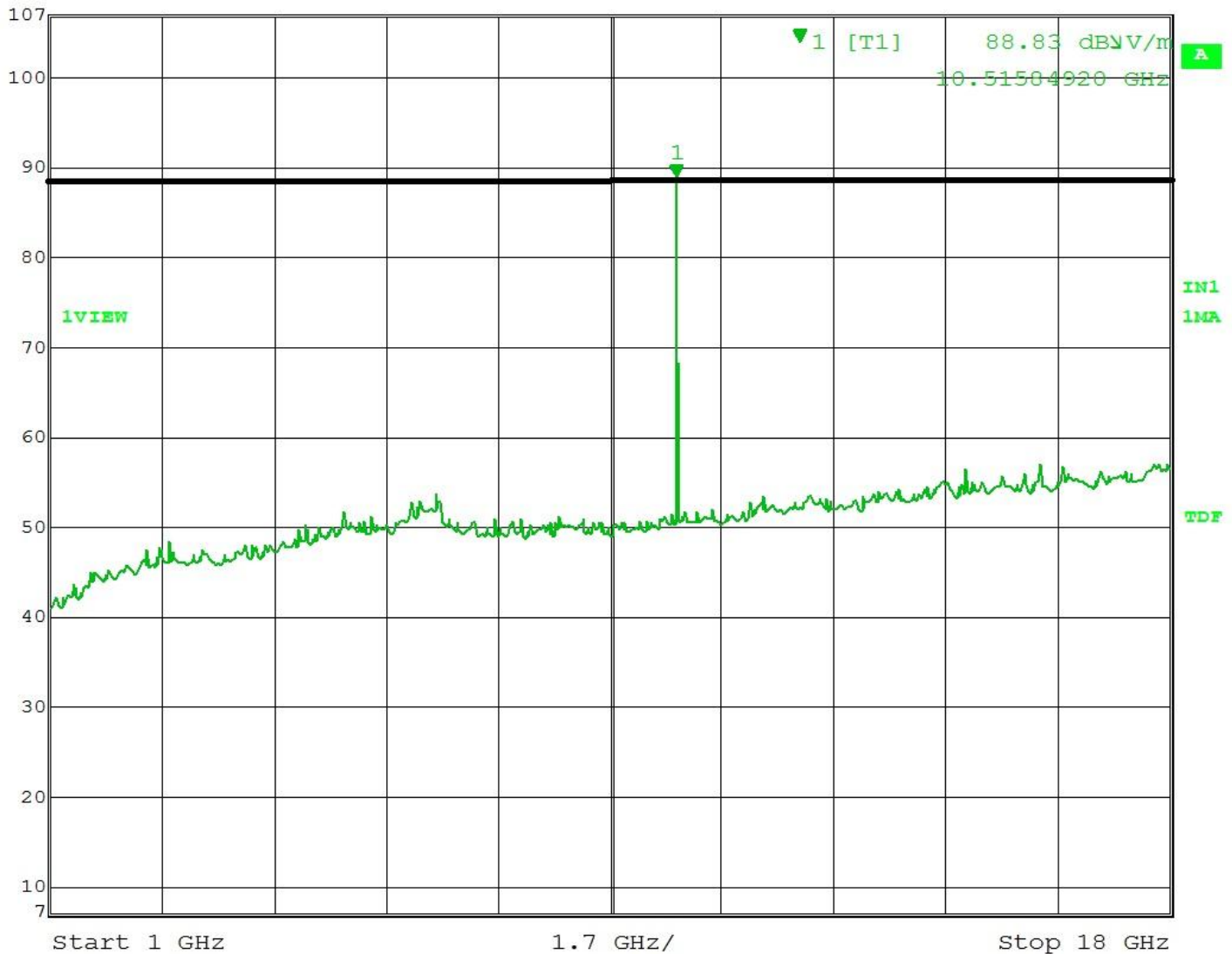
NOTE: 1 is fundamental frequency

Limit: 2500mv/m Fundamental = 127.9 dB μ V/mLimit: 25.0mv/m Harmonics = 87.95 dB μ V/m

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
 Ref Lvl 88.83 dB μ V/m VBW 3 MHz
 107 dB* 10.51584920 GHz SWT 170 ms Unit dB μ V/m



Date: 10.MAY.2015 04:49:17

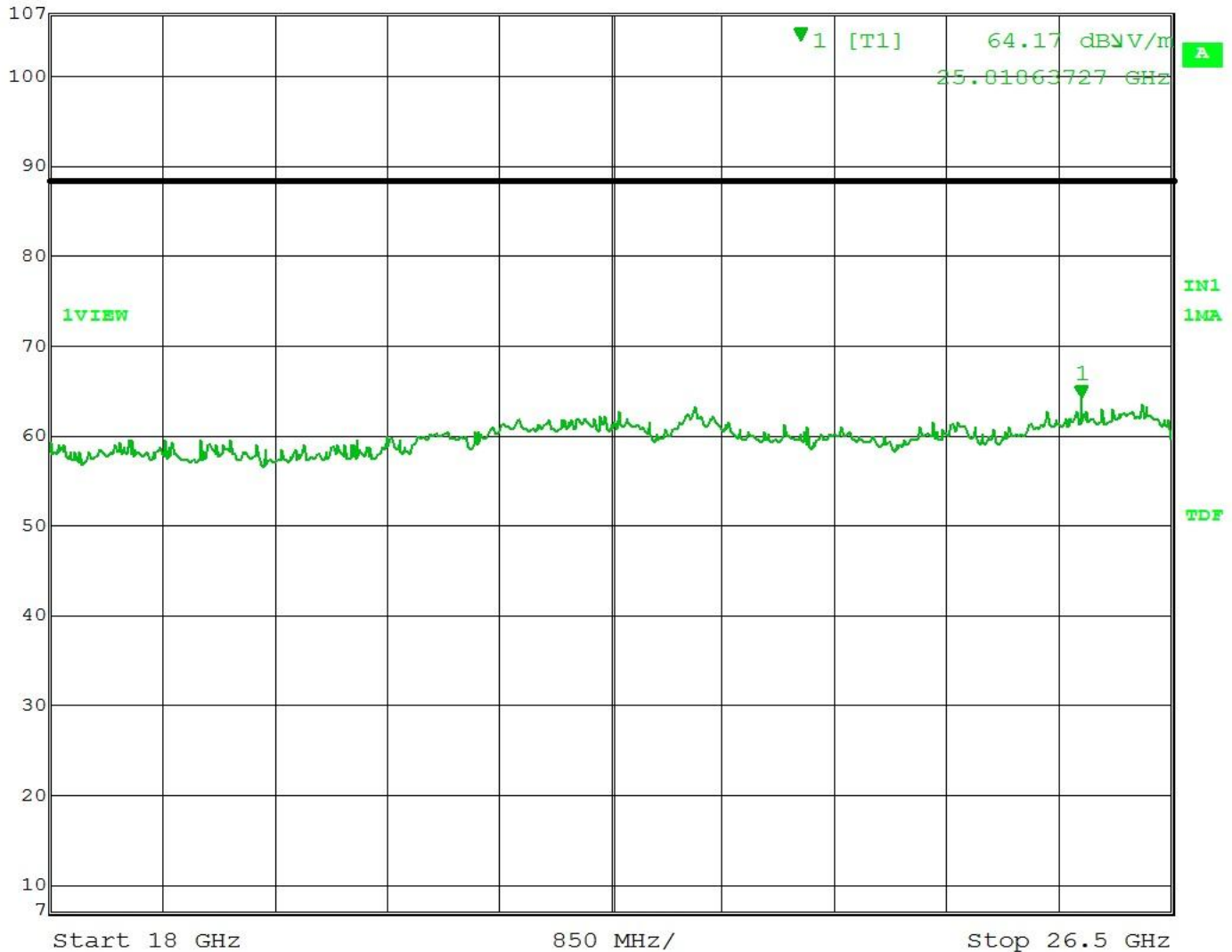
Figure 5 – Field strength of Harmonic Emissions 10 - 18 GHz, Vertical

NOTE: 1 is fundamental frequency

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
107 dB*	64.17 dB μ V/m	VBW	3 MHz		
	25.81863727 GHz	SWT	86 ms	Unit	dB μ V/m



Date: 10.MAY.2015 04:51:40

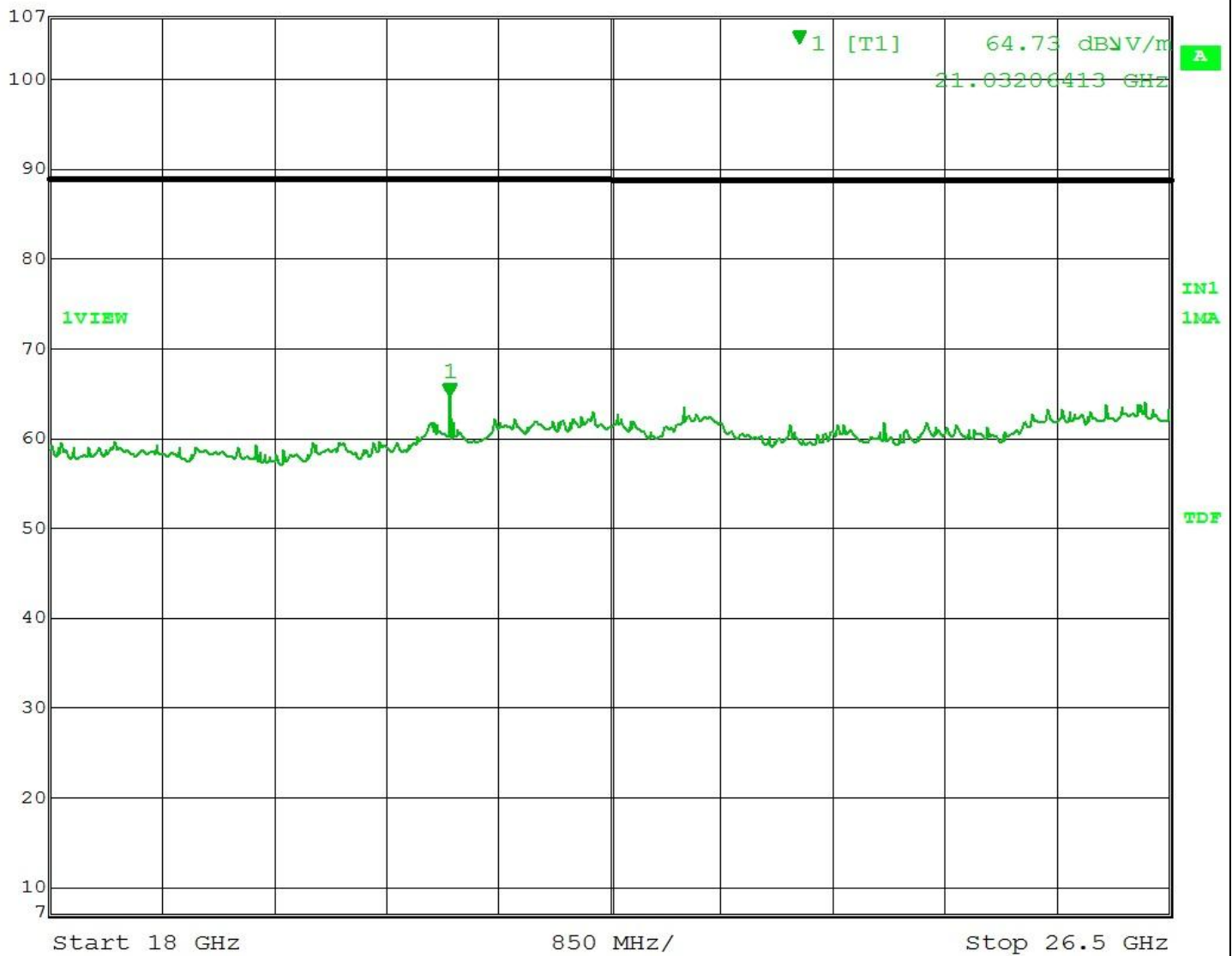
Figure 6 – Field strength of Harmonic Emissions 18 - 26.5 GHz, Horizontal

NOTE: The marked frequency is not a spurious emission of the Fundamental

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl 64.73 dB μ V/m VBW 3 MHz
107 dB* 21.03206413 GHz SWT 86 ms Unit dB μ V/m



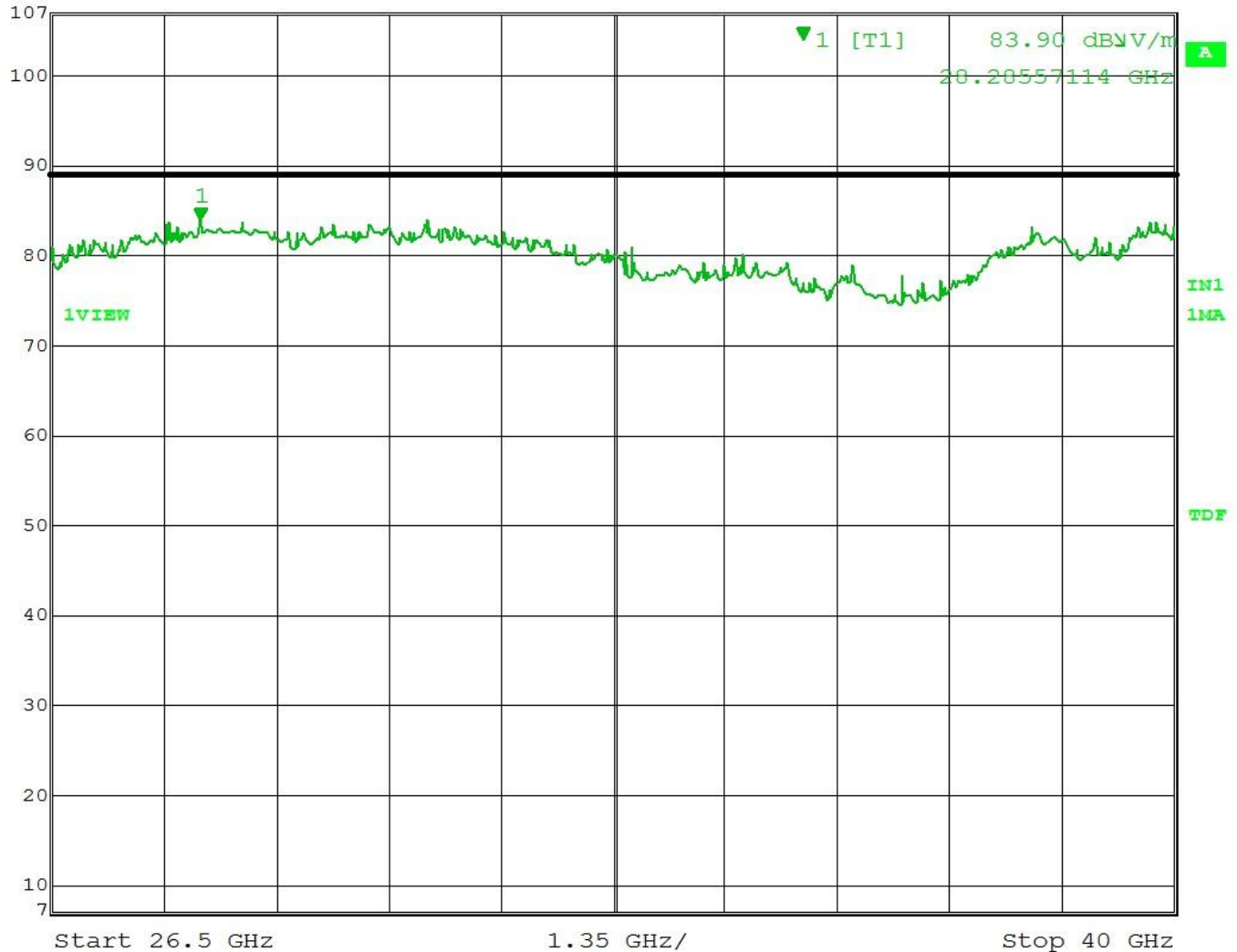
Date: 10.MAY.2015 04:50:52

Figure 7 – Field strength of Harmonic Emissions 18 - 26.5 GHz, Vertical

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
 Ref Lvl 83.90 dB μ V/m VBW 3 MHz
 107 dB* 28.28557114 GHz SWT 205 ms Unit dB μ V/m



Date: 10.MAY.2015 04:52:42

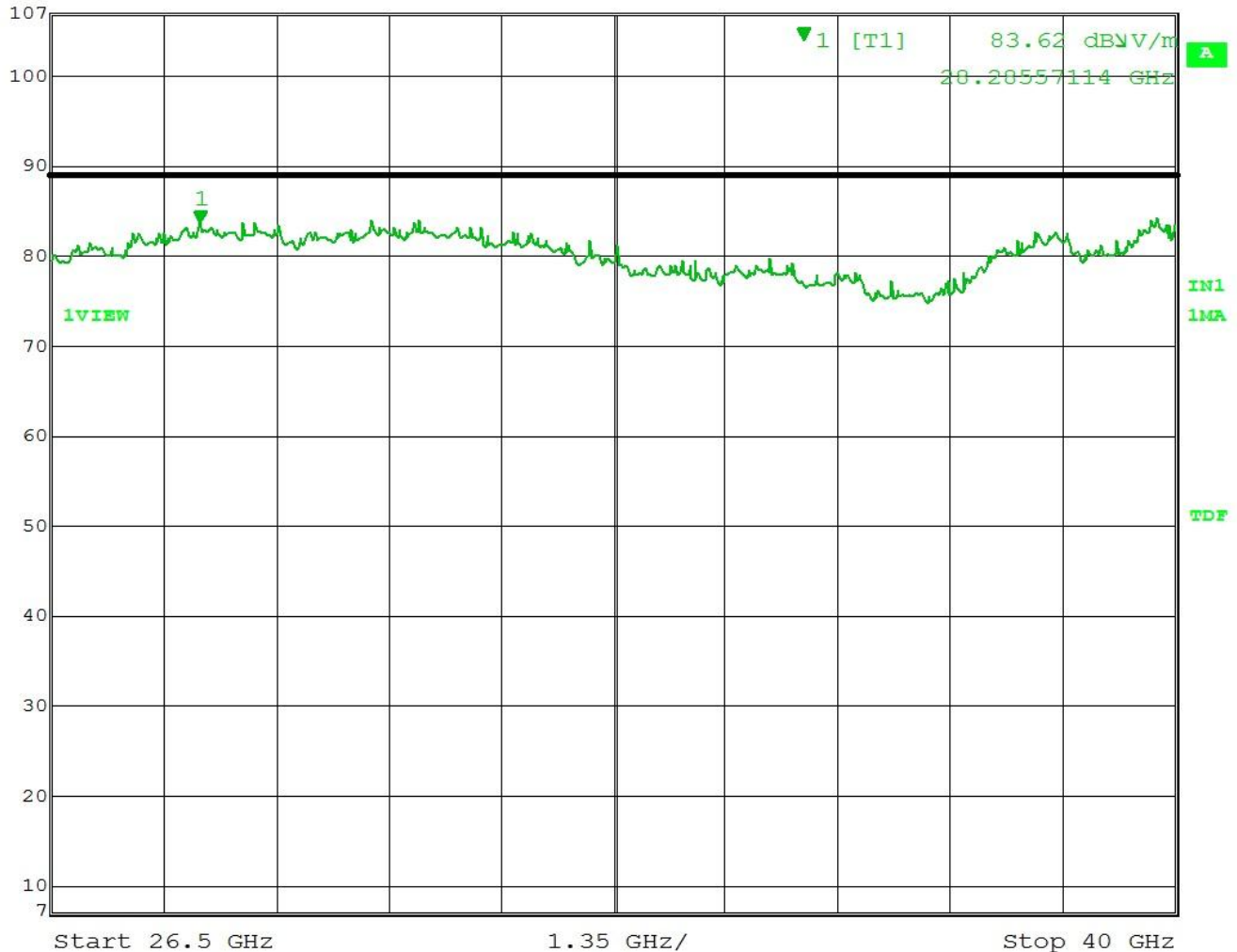
Figure 8 – Field strength of Harmonic Emissions 26.5 - 40 GHz, Horizontal

NOTE: The marked frequency is not a spurious emission of the Fundamental

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
 Ref Lvl 83.62 dBV/m VBW 3 MHz
 107 dB* 28.28557114 GHz SWT 205 ms Unit dBV/m



Date: 10.MAY.2015 04:57:37

Figure 9 – Field strength of Harmonic Emissions 26.5 - 40 GHz, Vertical

NOTE: The marked frequency is not a spurious emission of the Fundamental

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3.3 Band Edge Measurement

The measured results at the band edges must be in compliance with restricted frequency bands of operation called out in ANSI C63.10:2009 section 5.9 and FCC 15.205

3.3.1 Test Over View

Results	Complies (as tested per this report)					Date	5/10/2015	
Standard	ANSI C63.10:2009 Section 6.9							
Product Model	ISC-CDL1-W15G AND ISC-CDL1-WA15G				Serial#	0004/8		
Configuration	See test plan for details							
Test Set-up	10m Semi-Anechoic Chamber EUT placed on table See test plan for details							
EUT Powered By	12VDC	Temp	22° C	Humidity	47%	Pressure	1026mbar	
Perf. Criteria	15.205 Restricted Band frequencies			Perf. Verification		Readings within the permitted band		
Mod to EUT	None			Test Performed By		Randall Masline		

3.3.2 Test Procedure

The measurement will be made using guidance from ANSI C63.10

3.3.3 Deviations

There were no deviations from the test methodology.

3.3.4 Final Test

The band edge requirements of the EUT were within the limits specified in the standard.

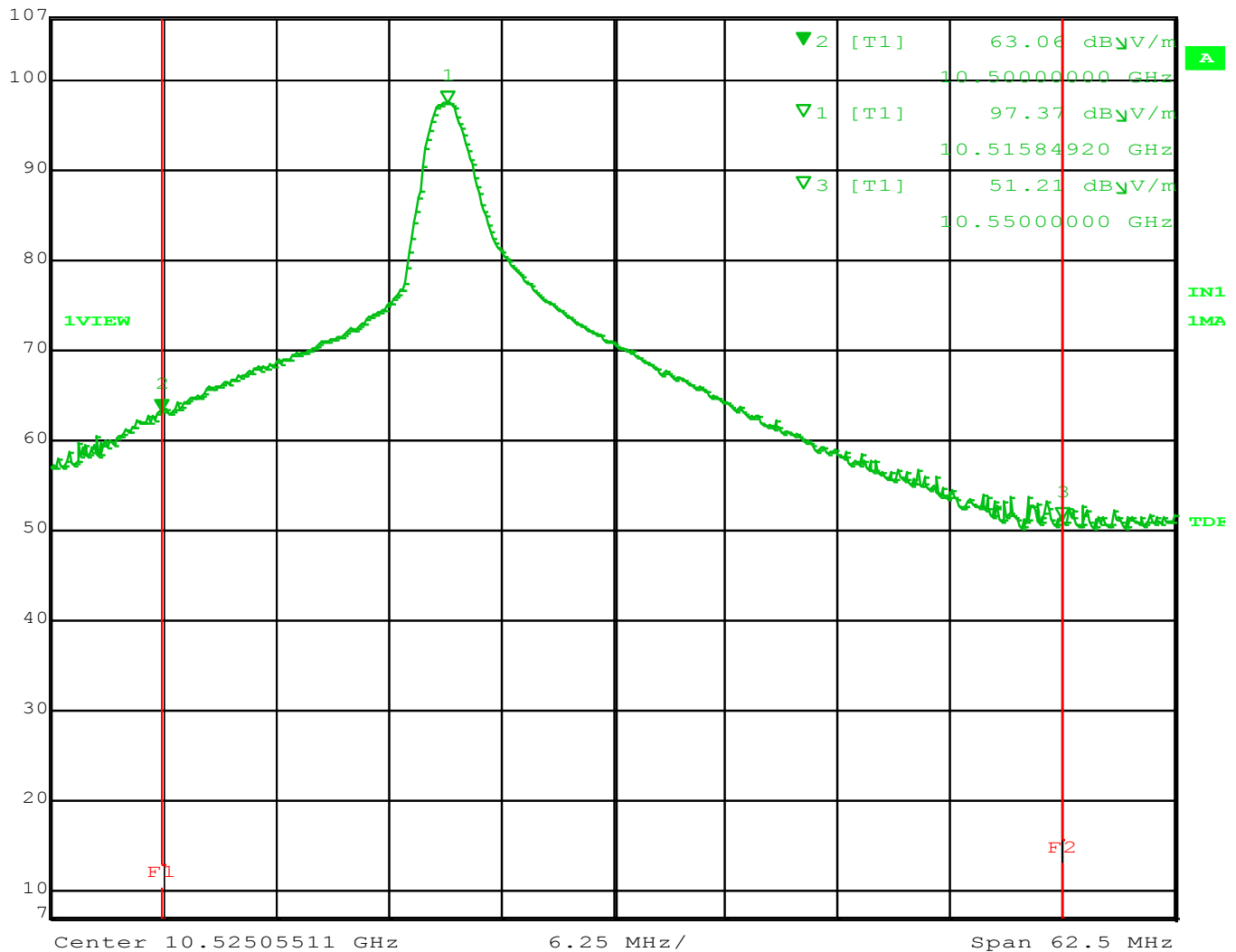
The Band edges do not fall into any restricted bands.

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3.3.5 Band Edge Requirement Data



Marker 2 [T1] RBW 1 MHz RF Att 10 dB
 Ref Lvl 63.06 dB μ V/m VBW 3 MHz
 107 dB* 10.50000000 GHz SWT 5 ms Unit dB μ V/m



Date: 10.MAY.2015 04:42:07

Figure 10 – Band Edge

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3.4 Occupied Bandwidth -20 dB and 99%

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

3.4.1 Test Over View

Results	Complies (as tested per this report)					Date	5/10/2015	
Standard	ANSI C63.10:2009 section 6.9							
Product Model	ISC-CDL1-W15G AND ISC-CDL1-WA15G				Serial#	0004/8		
Configuration	See test plan for details							
Test Set-up	10m Semi-Anechoic Chamber EUT placed on table See test plan for details							
EUT Powered By	12VDC	Temp	22° C	Humidity	47%	Pressure	1026mbar	
Mod to EUT	None		Test Performed By			Randall Masline		

3.4.2 Test Procedure

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.

3.4.3 Deviations

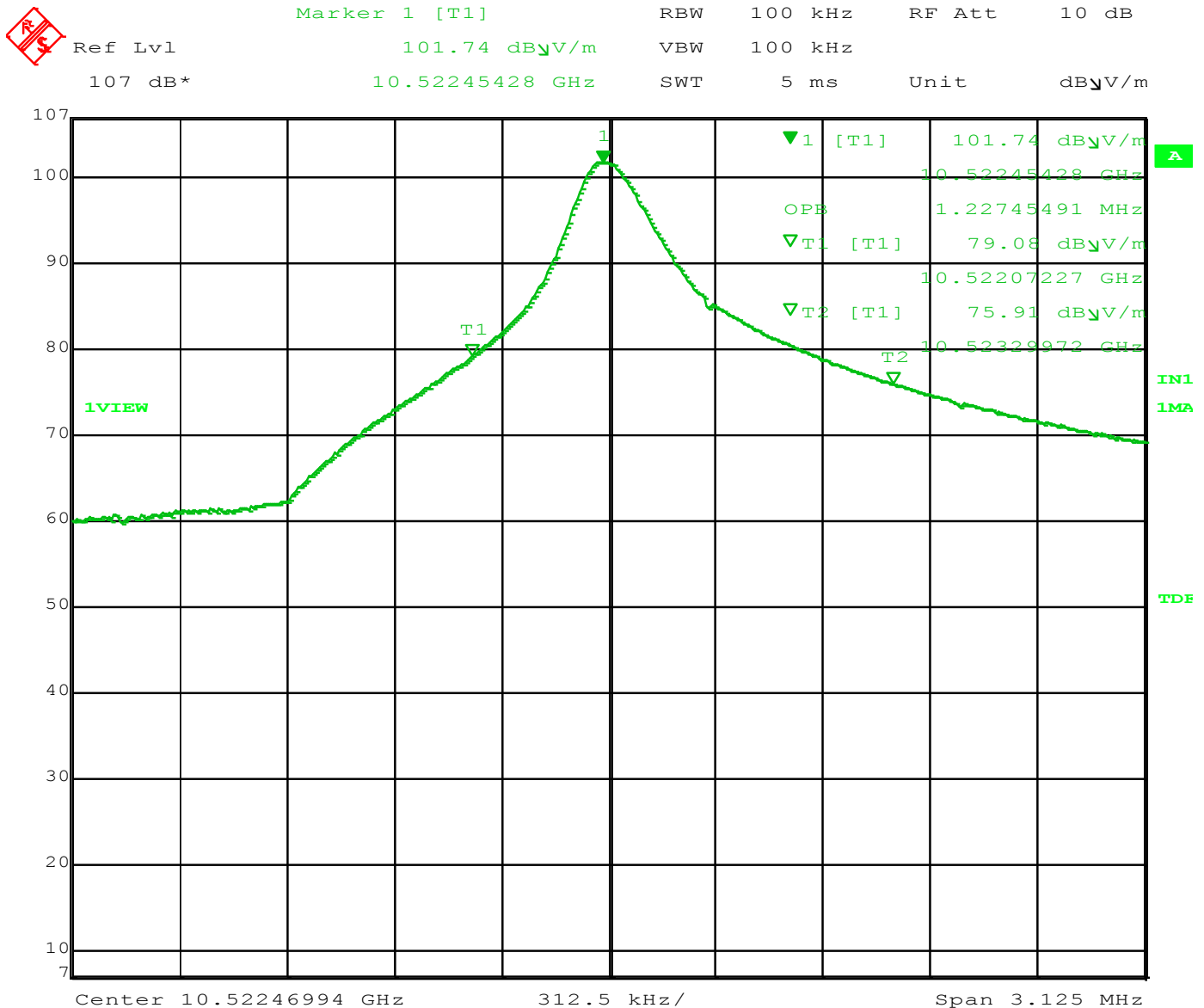
There were no deviations from the test methodology listed in the test plan.

3.4.4 Final Test

The EUT met the performance criteria requirement as specified in the test plan of this report.

3.4.5 Final Data

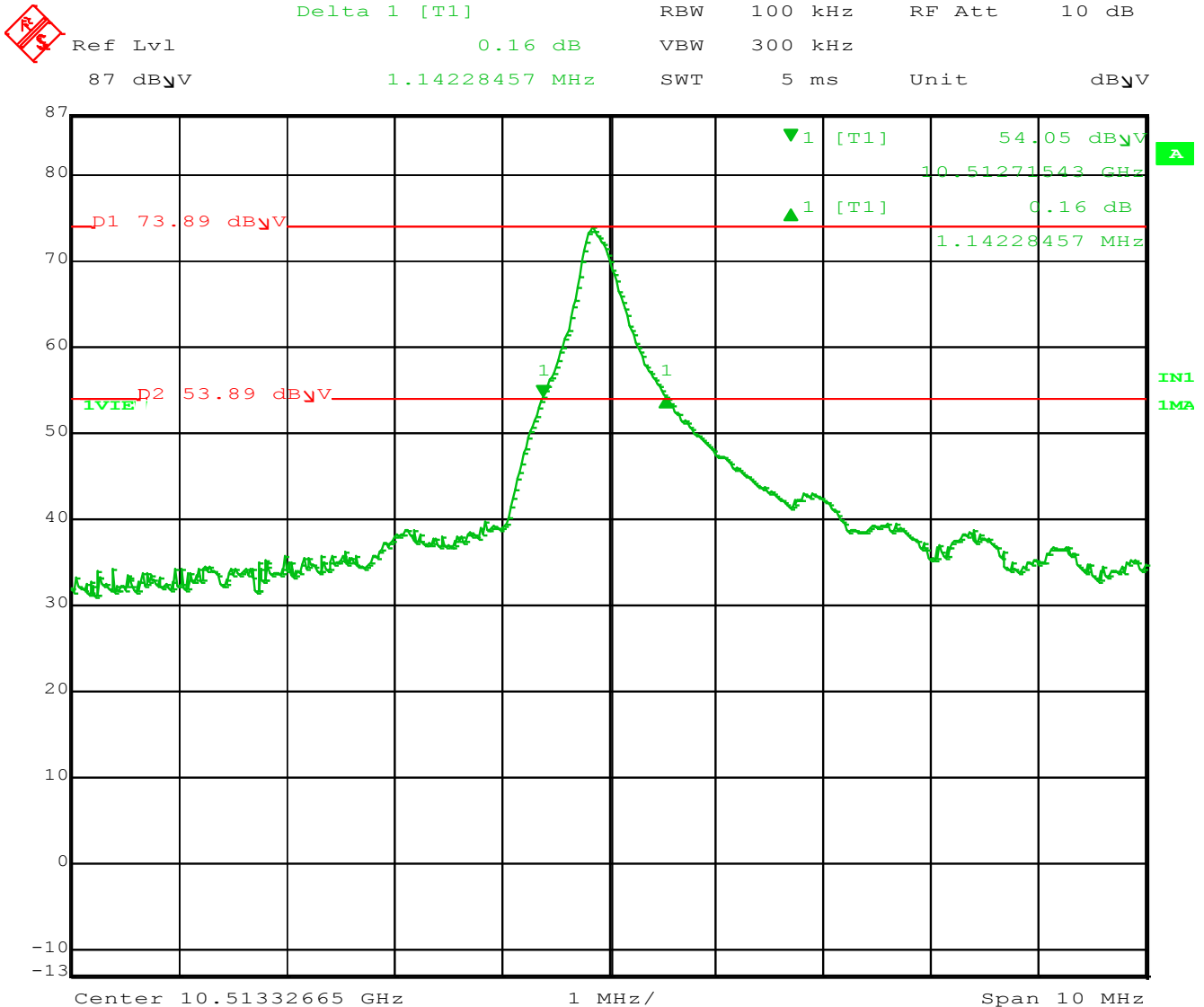
The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Date: 28.JAN.2015 14:00:15

Figure 11 – 99% Occupied Bandwidth = 1.227 MHz

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Date: 20.MAY.2015 10:35:23

Figure 12 – Occupied Bandwidth -20dB = 1.14 MHz

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3.5 Frequency Stability

. Tests shall be made at ambient room temperature (+15°C to +25°C)

(a) Install a new or fully charged Battery

Temperature	Frequency (GHz)	Measurement (dBuV) Actual	Measurement (dBuV) Calculated	Measurement (dBm)
Nominal 22° C in Semi-Anechoic Chamber	10.51566132	97.26	-	-9.74
Nominal 22° C in Temperature Chamber	10.51437876	75.46	97.26*	-9.74*
-20° C	10.52490982	76.08	97.88*	-9.12*
+55° C	10.49841683	65.65	87.45*	-19.54*

Table 1 – Frequency Stability

NOTE: Temp testing was performed at higher extremes. A new battery was used for testing

*NOTE: For temperature measurements, the distance is at 30cm without using an amplifier, cable or antenna factors inside the Temperature chamber

This measurement is used as a baseline from the e.i.r.p. measurement taken in the 10m Semi-Anechoic chamber which is 97.26 dBuV/m

97.26 dBuV/m in Semi-Anechoic chamber = 75.46 dBuV/m in temp chamber

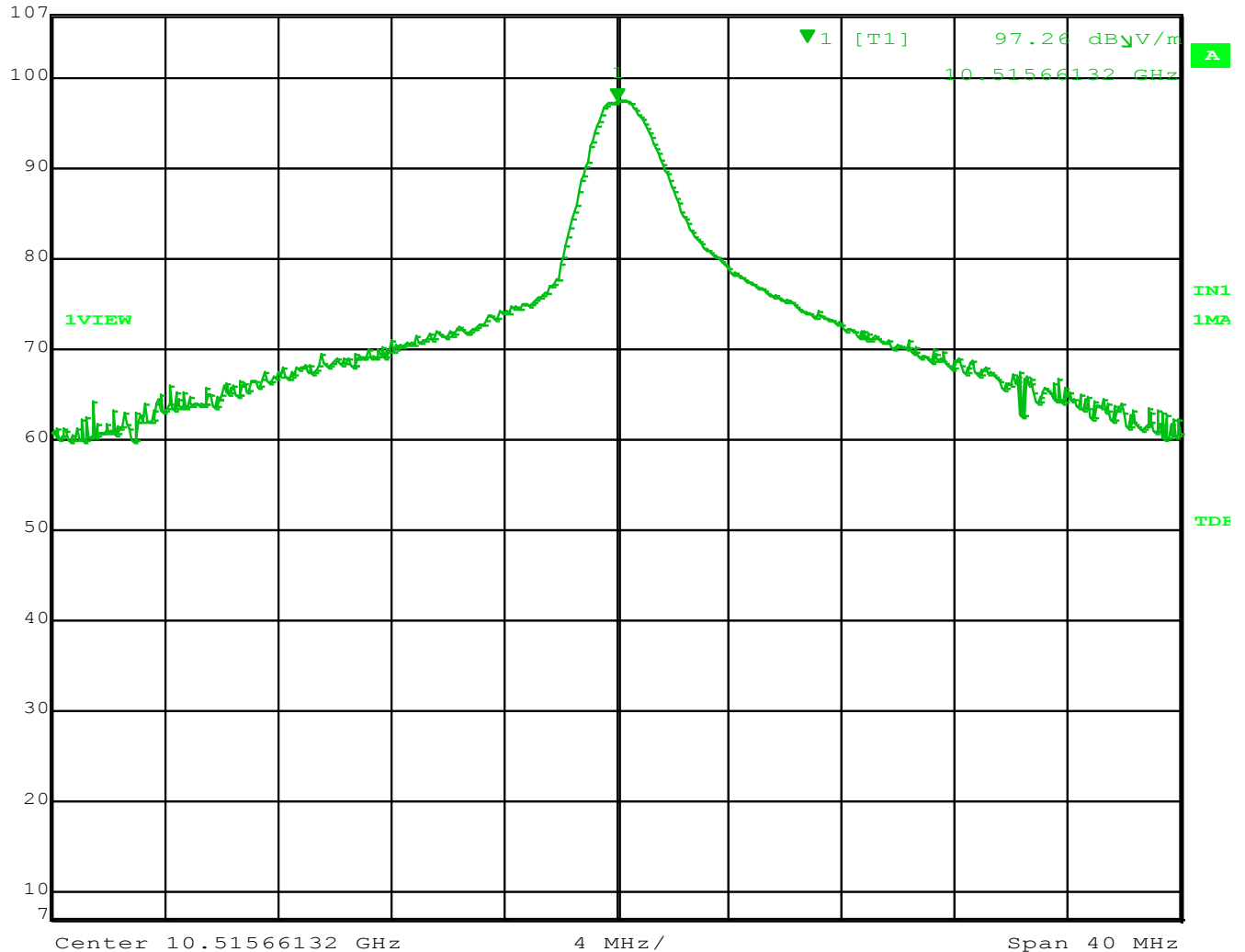
$97.26 - 75.46 = 21.8 \text{ dB}$

21.8 dB will be added to the remaining temperature plots

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
107 dB*	97.26 dBV/m	VBW	3 MHz		
	10.51566132 GHz	SWT	5 ms	Unit	dBV/m



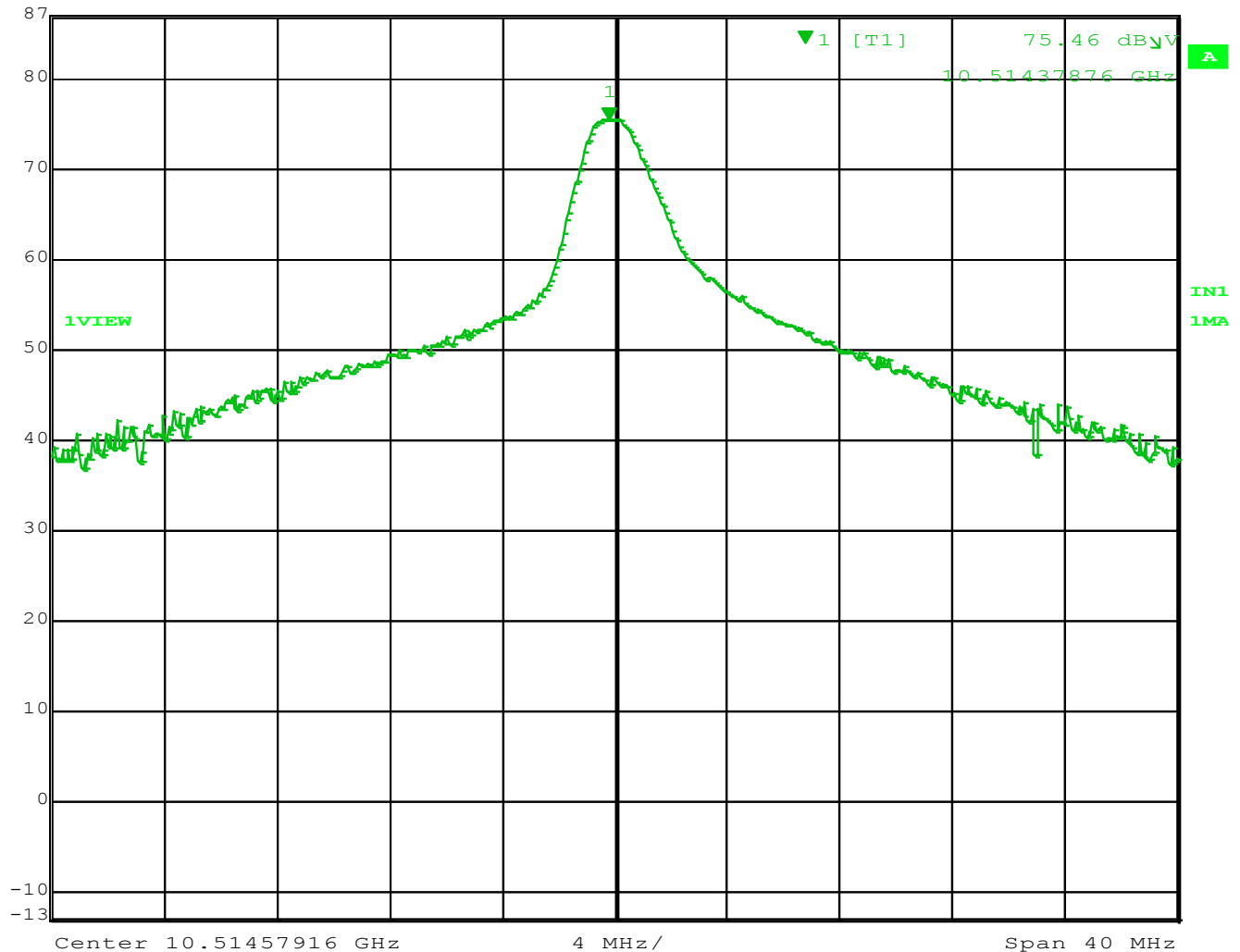
Date: 10.MAY.2015 04:38:25

Figure 13 – 22°C Ambient Temperature Measured in Semi-Anechoic Chamber

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl 75.46 dBμV VBW 3 MHz
87 dBμV 10.51437876 GHz SWT 5 ms Unit dBμV



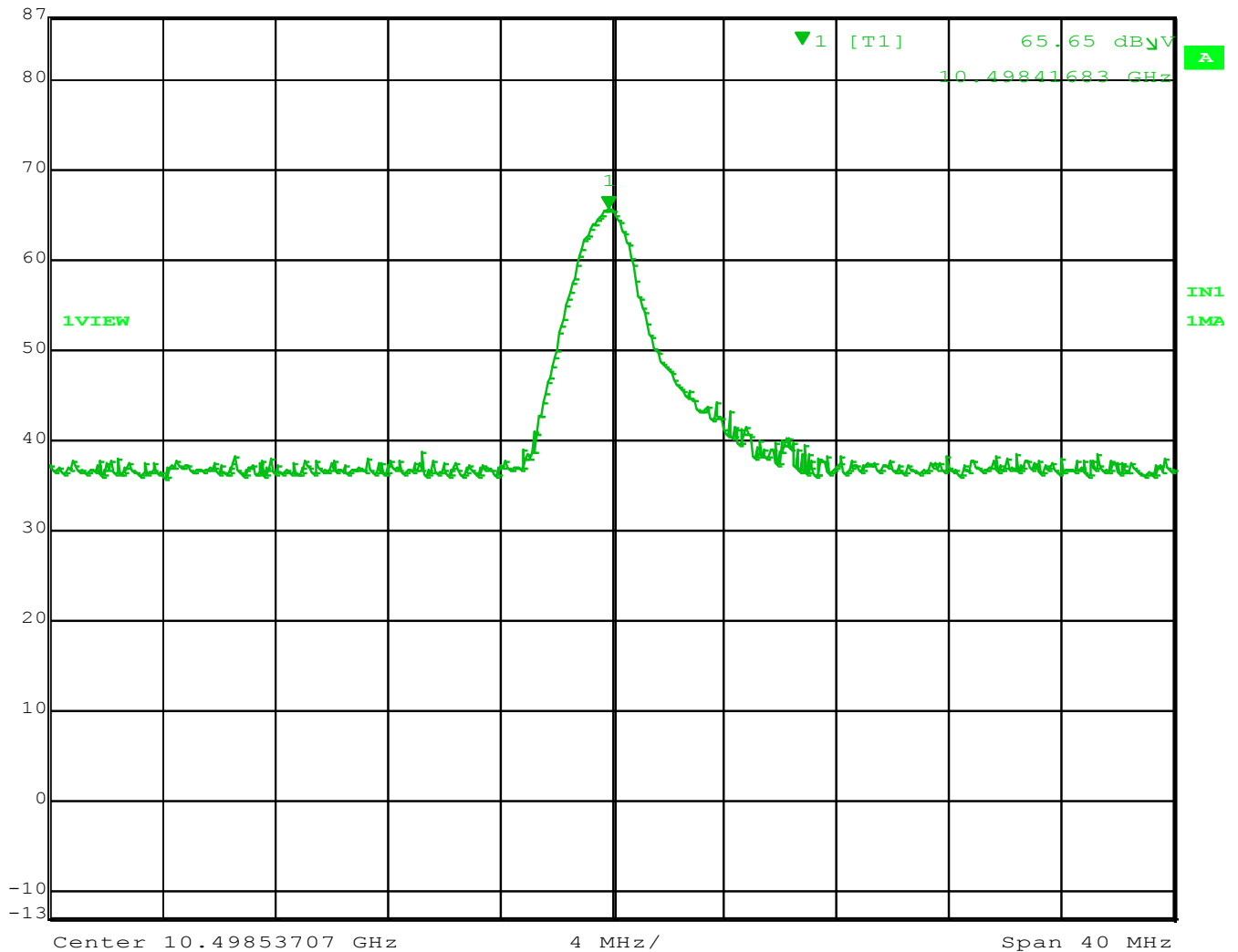
Date: 20.MAY.2015 10:17:55

Figure 14 – 22°C Ambient Temperature Measured in Temperature Chamber

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl 65.65 dBμV VBW 3 MHz
87 dBμV 10.49841683 GHz SWT 5 ms Unit dBμV



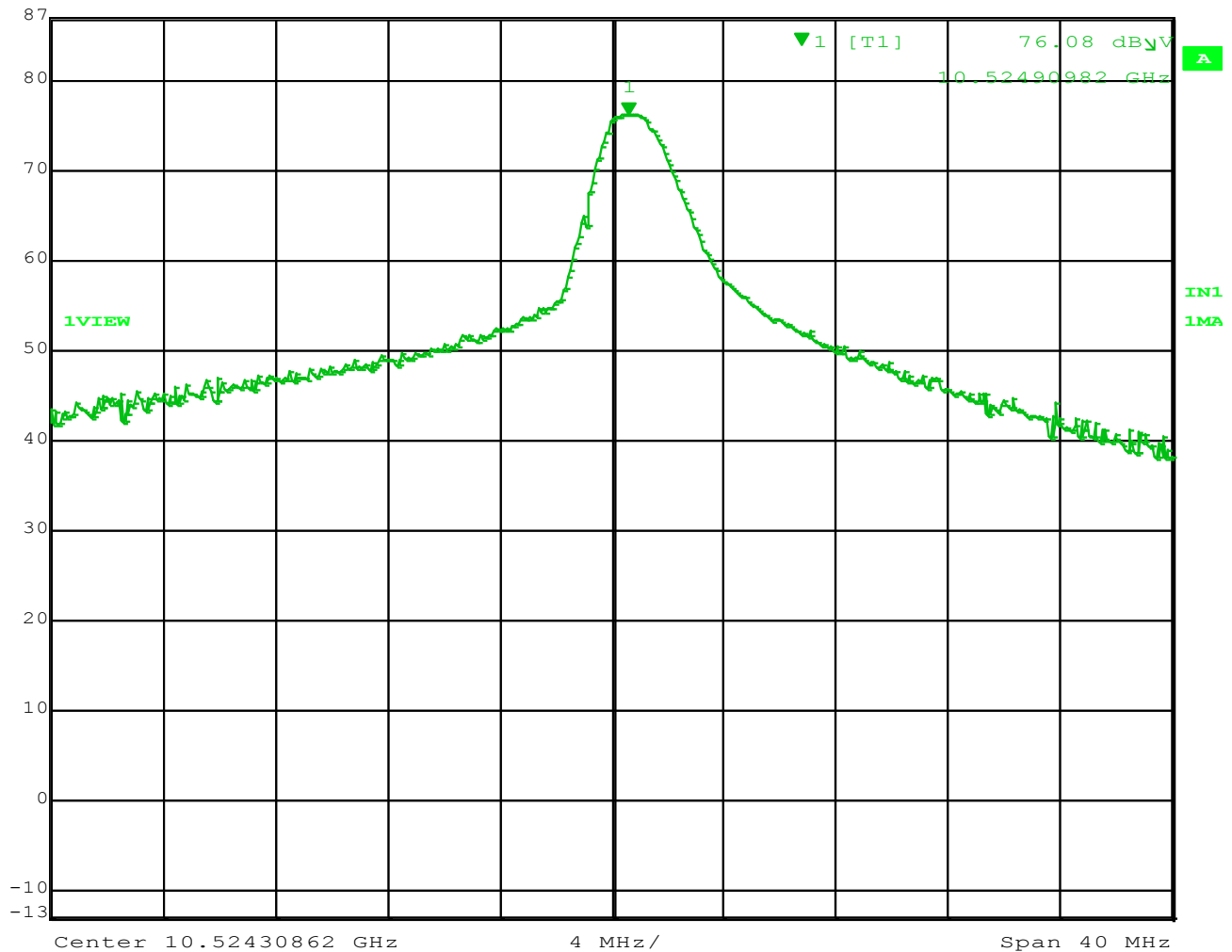
Date: 20.MAY.2015 11:28:38

Figure 15 – +55°C Measurement 65.65 dBuV + 21.8db = 87.45 dBuV (Calculated)

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



Marker 1 [T1] RBW 1 MHz RF Att 10 dB
Ref Lvl 76.08 dBμV VBW 3 MHz
87 dBμV 10.52490982 GHz SWT 5 ms Unit dBμV



Date: 20.MAY.2015 12:16:53

Figure 16 – -20°C Measurement 76.08 dBuV +21.8 dB = 97.88 dBuV

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

3.6 RF Exposure Measurement (Mobile Device)

FCC:

Controlled Exposures - Limit =	5	mW/cm ²
Uncontrolled Exposures - Limit =	1	mW/cm ²
Pd =	0.0003176	mW/cm ²
Controlled Margin to Limit =	4.9997	mW/cm ²
Uncontrolled Margin to Limit =	0.9997	mW/cm ²

Note: * = Plane-wave equivalent power density

Limit for 1.5-100 GHz: 5 mW/cm²

Limit for 1.5-100 GHz: 1.0 mW/cm²

$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

IC:

Controlled Exposures to Limit =	50	W/m ²
Uncontrolled Exposures Limit =	10	W/m ²
Pd =	0.003176	W/m ²
Controlled Margin to Limit =	49.9968	W/m ²
Uncontrolled Margin to Limit =	9.9968	W/m ²

Note: Refer to section 4 of RSS-102 for limits and time averaging for frequencies below 10 MHz and above 150 GHz.

Limit for 6-150 GHz: 50 W/m²

Limit for 6-150 GHz: 10 W/m²

$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

Appendix A

4 Test Plan

This test report is intended to follow this test plan outlined here in unless other wise stated in this here report. The following test plan will give details on product information, standards to be used, test set ups and refer to TUV test procedures. The test procedures will give the steps to be taken when performing the stated test. The product information below came via client, product manual, product itself and or the internet.

4.1 General Information

Client	Bosch Security Systems
Address 1	130 Perinton Parkway
Address 2	Fairport, NY 14450
Contact Person	Peter Namisnak
Telephone	585-223-4060
Fax	585-289-4263
e-mail	peter.namisnak@us.bosch.com

4.2 Model(s) Name

ISC-CDL1-W15G AND ISC-CDL1-WA15G

4.3 Type of Product

Commercial Series Detectors

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TUV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

4.4 Equipment Under Test (EUT) Description

The EUT is a Combination Microwave/PIR Passive Infra –Red and Microwave Commercial Series Detectors operating at 10525 MHz.

4.5 Modifications

No modifications were necessary to meet compliance limits.

4.6 Product Environment

<input type="checkbox"/>	Residential	<input type="checkbox"/>	Hospital
<input checked="" type="checkbox"/>	Light Industrial	<input type="checkbox"/>	Small Clinic
<input type="checkbox"/>	Industrial	<input type="checkbox"/>	Doctor's office
<input type="checkbox"/>	Other		

*Check all that apply

4.7 Countries

<input checked="" type="checkbox"/>	USA
<input checked="" type="checkbox"/>	Canada

*Check all that apply

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

4.8 General Product Information

Size		H	11cm	W	6cm	L	6.5cm
Weight		≤1kg		Fork-Lift Needed		No	
Notes							

4.9 EUT Electrical Powered Information

4.9.1 Electrical Power Type

<input type="checkbox"/>	AC	<input checked="" type="checkbox"/>	DC	<input type="checkbox"/>	Batteries	<input type="checkbox"/>	Host -
--------------------------	----	-------------------------------------	----	--------------------------	-----------	--------------------------	--------

4.9.2 Electrical Power Information

Name	Type	Voltage		Frequency	Current	Notes
		min	max			
Main	DC	9	15			
Notes						

4.10 EUT Modes of Operation

The EUT is powered by a 12VDC Battery and goes into continues operation scanning for motion.

4.11 Electrical Support Equipment

Type	Manufacture	Model	Connected To
Battery			EUT Power

4.12 Non - Electrical Support Equipment

Item	Notes
Gas	
Water	

4.13 EUT Equipment/Cabling Information

EUT Port	Connected To	Location	Cable Type		
			Length	Shielded	Bead
Power	Battery	top	3m	No	No

4.14 EUT Test Program

No test Program, EUT was operational and Scanning.

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the Federal Government.