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FCC Part 15, Subpart C, Section 15.247 &
ISED Canada, RSS-247 and RSS-GEN

Test Report

On

CRD 3000 Control Router
FCC ID: IZP76530R
IC: 8093A-76530R

Customer Name:	Echelon
Customer P.O:	50901
Date of Report Revision:	July 18, 2017
Test Report No:	R-6201N-1, Rev. A
Test Start Date:	May 16, 2017
Test Finish Date:	May 17, 2017
Test Technician:	M. Seamans
Report Revision Approved By:	T. Hannemann
Report Revision Prepared By:	J. Ramsey

Technical Information

Report Number:	R-6201N-1, Rev. A
Customer:	Echelon
Address:	2901 Patrick Henry Drive
	Santa Clara, CA 95054
Manufacturer:	Echelon
Manufacturer Address:	2901 Patrick Henry Drive
	Santa Clara, CA 95054
Test Sample:	CRD 3000 Control Router
Part Number:	CRD 3000
Model Number:	76530R
Serial Numbers:	0503F3C3DB00, 0503F3C14500
FCC ID:	IZP76530R
IC:	8093A-76530R
Type:	Digital Transmission – Direct Sequence Spread Spectrum Transmitter
Power Requirements:	120 VAC, 60 Hz
Frequency of Operation:	2405.0 to 2475.0 MHz
Equipment Class:	DTS
Antenna Type:	Flexible Planer Inverted F Antenna, 2 dBi Flexible Polymer Patch Antenna, 4 dBi
Equipment Use:	Wireless Communications Bridge

Test Specifications:
FCC Rules and Regulations Part 15, Subpart C, Section 15.247
Radio Standards Specification, RSS-247, Issue 2, February 2017
RSS-GEN, Issue 4, November 2014

Test Procedures:
ANSI C63.4: 2014
ANSI C63.10: 2013

FCC 558074 D01 DTS Meas Guidance V04, April 5, 2017

Test Facility:
Retlif Testing Laboratories
101 New Boston Road
Goffstown, NH 03045

FCC Registered Test Site Number: 90899
IC Registered Test Site Number: 2047C-1

Table 1 –Tests Performed

FCC Part 15, Subpart C	Industry Canada RSS-GEN	Industry Canada RSS-247	Test Method
15.247(a)(2)	N/A	5.2(1)	Occupied Bandwidth (6dB Bandwidth)
15.247(b)(3)	N/A	5.4	Power Output
15.247(d)	N/A	5.5	Antenna Port, Conducted Emissions
15.247(e)	N/A	5.2(2)	Antenna Port, Power Density
15.247(d)	N/A	5.5	Spurious Radiated Emissions, 30 MHz to 25 GHz
15.109	7.1	N/A	Receiver Spurious Emissions
15.207(a)	8.8	N/A	AC Conducted Emissions

Table 2 – Support Equipment

Description	Manufacturer	Part Number	Model Number	Serial Number
Laptop PC	Lenovo	N/A	Type 1951-C2U	L3-M3375 06/07
V20 Powerline Network Interface	Echelon	75021R	U20	N/A

EUT Operation:
The EUT was operating in two modes. In the first mode, the EUT was transmitting a modulating signal at 2.405 GHz (low channel), 2.440 GHz (mid channel) and 2.475 GHz (high channel). In the second mode, the EUT was in standby.

EUT Description:
The EUT is a bridge between powerline communications and 2.4 GHz radio communications.

Certification and Signatures

We certify that this report is a true representation of the results obtained from the tests of the equipment stated. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.

Scott Wentworth
Branch Manager
NVLAP Approved Signatory

Todd Hannemann
EMC Test Engineer
iNARTE Certified Technician ATL-0255-T

Non-Warranty Provision
The testing services have been performed, findings obtained and reports prepared in accordance with generally accepted laboratory principles and practices. This warranty is in lieu of all others, either expressed or implied.

Non-Endorsement
This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement or certification of the product or material tested. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

Revision History

Revisions to this document are listed below; the latest revised document supersedes all previous issues of this document:

Revision	Date	Pages Affected
-	July 14, 2017	Original Release
A	July 18, 2017	Global changes: • Document changed from R-6201N-1 to R-6201N-1, Rev. A 2: • Revised end point value of Frequency of Operation 6: • Revised maximum conducted output power in test results 20-22: • Corrected title and note of all Conducted Output Power test data 26-31: • Added note to all Out of Band Conducted Emissions data 53: • Added Duty Cycle data

Requirements and Test Results

FCC Section 15.247 (a)(2) and ISED RSS-247, 5.2(1) - Bandwidth
For systems using digital modulation techniques operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725 – 5850 MHz bands the minimum 6 dB bandwidth shall be at least 500 kHz.

- **Results**:
  The minimum 6dB bandwidth measured while transmitting was 1.633 MHz. The device was found to meet the requirement of 15.247 (a)(2) and RSS-247, 5.2(1).

FCC Section 15.247 (b)(3) and ISED RSS-247, 5.4(4) - Power Output
For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g.: alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

- **Results**:
  The maximum conducted output power when transmitting was 151.71 mW. The maximum antenna gain of the antenna is 4.0 dBi. The device was found to meet the power output requirements of 15.247 (b)(3) and RSS-247, 5.4 including de facto EIRP.

Requirements and Test Results (con't)

FCC Section 15.247(d) and ISED RSS- 247, 5.5 – Unwanted Emissions

Antenna Terminal Out of Band/Band Edge Conducted Emissions
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Paragraph (b)(3) of Section 15.247 and RSS-247, 5.4(4) the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) and RSS-GEN is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) and RSS-GEN must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

- **Results**:
  All measured out of band/band edge conducted emissions were below the specified limits and the device was found to meet the requirements of 15.247 (d).

FCC Section 15.247(d) and ISED RSS-GEN, 8.9 – Unwanted Emissions

Radiated Spurious Emissions/Restricted Bands/Band Edge
Emissions which fall into restricted bands, as defined in 15.205(a) and RSS-GEN must comply with the radiated emissions limits specified in 15.209(a), RSS-GEN and shown below in Table 3, Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. When conducted measurements are performed in the restricted frequency bands the conducted output power (in dBm) plus the maximum transmit antenna gain (in dBi) must be converted to equivalent electric field strength to be compared to the limits. Emissions emanating from the EUT cabinet and cables must also comply with the radiated emissions limits. Radiated emissions measurements were also performed at the band edges to ensure band edge compliance.

Table 3 - Radiated Emission Limits

Frequency of Emission (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 to 88	100	3
88 to 216	150	3
216 to 960	200	3
Above 960	500	3

Requirements and Test Results (con't)

- **Results**:
  All spurious emissions were measured and found to be in compliance with the limits specified in 15.209(a) and RSS-GEN. Band edge emissions were also found to be in compliance with the limits specified in 15.209(a).

Conducted Restricted Bands Field Strength Conversion:

The Conducted Restricted Band Emissions were converted to field strength of the emission as follows:

EIRP = CO + AG

Where:
CO = Conducted Output Power in dBm
AG = Maximum Transmit Antenna Gain in dBi

E = EIRP – 20log D + 104.8

Where:
E = electric field strength in dBµV/m,
EIRP = equivalent isotropic radiated power in dBm
D = specified measurement distance in meters.

dBµV/M is converted to uV/M for comparison to the specified limit using the formula:

invLog dBµV/M/20

FCC Section 15.247(e) and ISED RSS-247, 5.2(2) – Power Spectral Density
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

- **Results**:
  The power spectral density conducted from the intentional radiator to the antenna was not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density was determined in accordance with Section 15.247(b)(3) and RSS-247, 5.2(2).

FCC 15.109 and ISED RSS-Gen, Par. 7.1 - Receiver Radiated Spurious Emissions
Spurious emissions from receivers must comply with the radiated emissions limits specified in RSS-Gen, Para. 7.1 and as shown above in Table 1.

- **Results**:
  No EUT receiver spurious emissions were observed within 10dB of the specified limit.

FCC 15.207(a) and RSS-GEN, Par. 8.8 – AC Conducted Emissions
For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits shown in Table 4, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of the paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Table 4 - Conducted Emission Limits

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50
*Decreases due to logarithm of the frequency		

- **Results**:
  The conducted emissions observed did not exceed the limits specified in Table 4.

Field Strength Calculation/Conversion:

The maximized field strength of the emission was obtained as follows:

CR = MR + CF

Where:
CR = Corrected Reading in dBµV/m
MR = Uncorrected Meter Reading in dBµV
CF = Correction Factor in dB (Antenna Factor, Pre-amp + Cable Loss)

Example:

MR = 15.35 dBµV
CF = 16.85 dB
CR = 15.35 dBuV + 16.85 = 32.2 dBµV/m

dBµV/M is converted to uV/M for comparison to the specified limit using the formula:

invLog dBµV/M/20

32.2 dBuV/m = 40.74 uV/m

RF Power Conversion:

Power readings in dBm may be converted to mW using the formula:

InvLog dBm/10

Example: 20dBm = 100mW

FCC Section 15.247 (i) and ISED RSS-102
RF Exposure Limits

Spread Spectrum Transmitters operating under 15.247 and RSS-247 must be operated in a manner that ensures the public is not exposed to RF energy levels in access of the commission's guidelines. Based on the transmitter power and maximum antenna gain (see calculation below) the minimum separation distance was calculated to determine the distance for acceptable MPE power density levels to meet both the Occupational/Controlled Exposure and the General Population/Uncontrolled Exposure requirements of FCC Part 1.1310 and RSS-102. The calculation below uses the more stringent General Population MPE Limits.

$$S = \frac{PG}{4\prod Dsq}$$

D = Minimum Separation Distance in cm

S = Max allowed Power Density in mW/cmsq

Per 1.1310 For the Frequency of 2400 MHz S = 1 mW/cmsq

Power = Max Power Input to Antenna = 151.71 mW

Gain = Max Power Gain of Antenna = 4.0 dBi = 2.51 numeric

$$1.0 \text{ mW/cmsq} = \frac{151.71x2.51}{4x(3.14)xD\text{^}2} = \frac{381.07}{12.56xD\text{^}2}$$

$$D\text{^}2 = \frac{381.07}{12.56x1.0}$$

$$D = \sqrt{30.33} = 5.51\text{cm}$$

Equipment List

FCC Section 15.247(a)(2) / RSS-5.2(1)
Occupied Bandwidth

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/21/2016	10/31/2017
5135	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 12.4 GHz	757C-10	11/23/2016	11/30/2017

FCC Section 15.247(b)(3) / RSS-247 5.4
Power Output

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/21/2016	10/31/2017
5135	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 12.4 GHz	757C-10	11/23/2016	11/30/2017

FCC Section 15.247 (d) / RSS-247, 5.5
Antenna Terminal Out of Band/ Band Edge Conducted Emissions, 30 MHz to 25 GHz

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/21/2016	10/31/2017
5135	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 12.4 GHz	757C-10	11/23/2016	11/30/2017

FCC Section 15.247(e) / RSS- 247, 5.2(2)
Power Density

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/21/2016	10/31/2017
5135	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 12.4 GHz	757C-10	11/23/2016	11/30/2017

FCC Section 15.247 (d) / RSS-GEN, 8.9
Spurious Radiated Emissions/Restricted Bands, 30 MHz to 25 GHz

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1232	AGILENT / HP	PRE-AMPLIFIER	1 - 26.5 GHz	8449B	6/16/2016	6/30/2017
3258	ETS / EMCO	ANTENNA, DOUBLE RIDGED GUIDE	1 - 18 GHz	3115	10/13/2016	4/30/2018
3427B	ETS / EMCO	ANTENNA, BICONICAL	20 - 200 MHz	3104	2/5/2016	8/31/2017
3430	MCS	ANTENNA, HORN	18 - 26.5 GHz	K-5039	No Calibration Required	
4029B	RETLIF	OPEN AREA TEST SITE, ATTENUATION	3 / 10 Meters	RNH	4/13/2016	4/30/2018
443	ELECTRO-METRICS	ANTENNA, LOG PERIODIC	200 MHz - 1000 MHz	LPA-25	10/6/2016	4/30/2018
R469	AGILENT / HP	ANALYZER, SPECTRUM	100 Hz - 26.5 GHz	E7405A;A	12/1/2016	12/31/2017

FCC Section 15.109 / RSS-GEN, 7.1
Receiver Radiated Spurious

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1232	AGILENT / HP	PRE-AMPLIFIER	1 - 26.5 GHz	8449B	6/16/2016	6/30/2017
3258	ETS / EMCO	ANTENNA, DOUBLE RIDGED GUIDE	1 - 18 GHz	3115	10/13/2016	4/30/2018
3427B	ETS / EMCO	ANTENNA, BICONICAL	20 - 200 MHz	3104	2/5/2016	8/31/2017
3430	MCS	ANTENNA, HORN	18 - 26.5 GHz	K-5039	No Calibration Required	
4029B	RETLIF	OPEN AREA TEST SITE, ATTENUATION	3 / 10 Meters	RNH	4/13/2016	4/30/2018
443	ELECTRO-METRICS	ANTENNA, LOG PERIODIC	200 MHz - 1000 MHz	LPA-25	10/6/2016	4/30/2018
R469	AGILENT / HP	ANALYZER, SPECTRUM	100 Hz - 26.5 GHz	E7405A;A	12/1/2016	12/31/2017

FCC Section 15.207(a) / RSS-GEN, 8.8
AC Conducted Emissions

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1704	SOLAR ELECTRONICS	LISN	50 uH, 150 kHz - 30 MHz	21106-50-BP-25-BNC	11/18/2016	11/30/2017
1705	SOLAR ELECTRONICS	LISN	50 uH, 150 kHz - 30 MHz	21106-50-BP-25-BNC	11/18/2016	11/30/2017
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/21/2016	10/31/2017
5135	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 12.4 GHz	757C-10	11/23/2016	11/30/2017
5188	Cybertron	COMPUTER, CONTROL	N/A	TSVQJA2221	No Calibration Required	

FCC Section Part 15.247(a)(2)
Occupied Bandwidth (6dB Bandwidth)

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/21/2016	10/31/2017
5135	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 12.4 GHz	757C-10	11/23/2016	11/30/2017

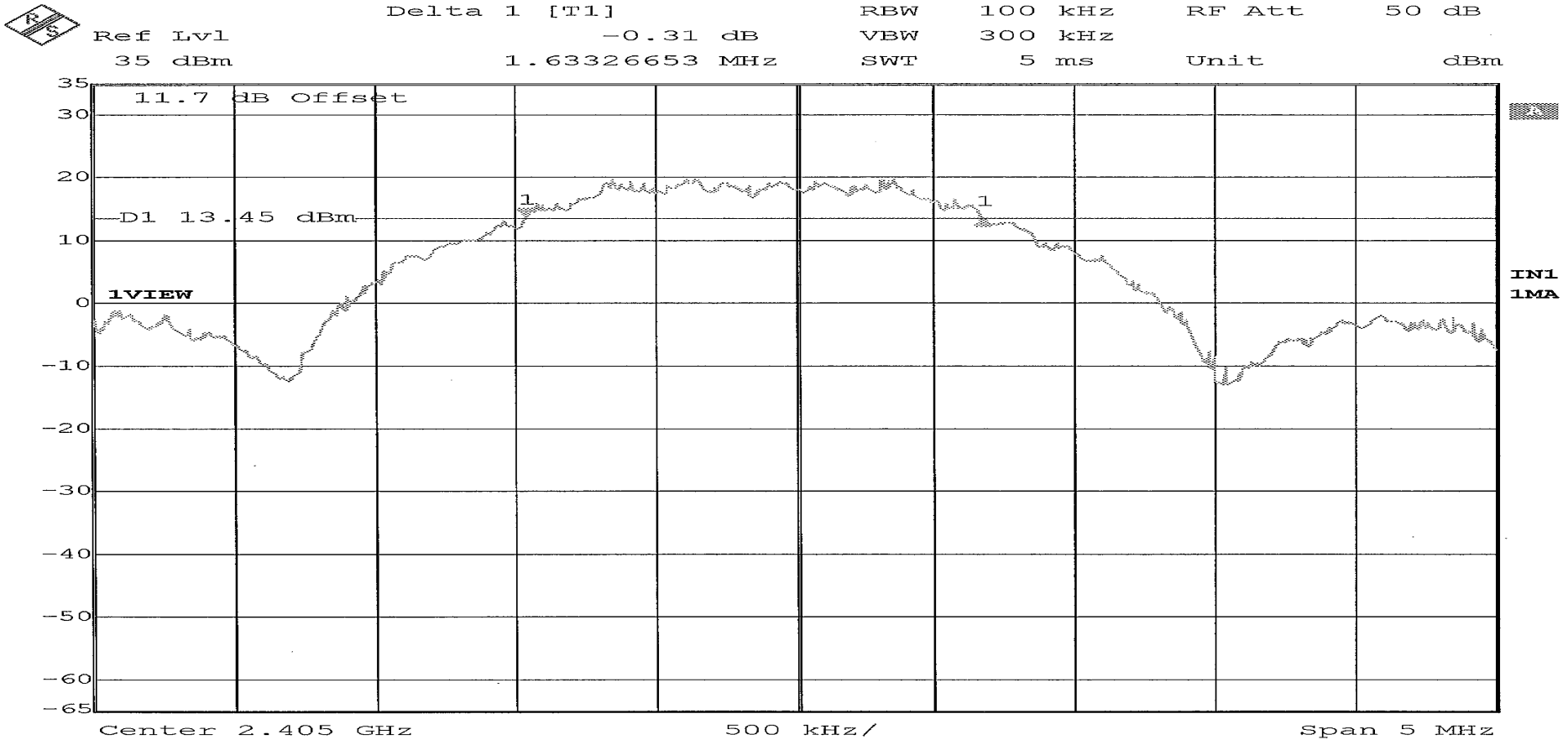
FCC Section 15.247(d) / RSS-GEN, 8.9
Antenna Conducted Restricted Bands

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/21/2016	10/31/2017
5135	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 12.4 GHz	757C-10	11/23/2016	11/30/2017

FCC Section 15.247(9)(2)/ RSS-247, 5.2(1)
Occupied Bandwidth (6 dB Bandwidth)
Test Data

RETLIF TESTING LABORATORIES

Test Method:	6dB Bandwidth		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.405 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (a)(2)		
Technician	M. Seamans	**Date**	May 16th, 2017
Climatic Conditions	Temp: 21.6 °C Relative Humidity: 42.1 %		
Notes	Occupied Bandwidth: 1.633266 MHz		



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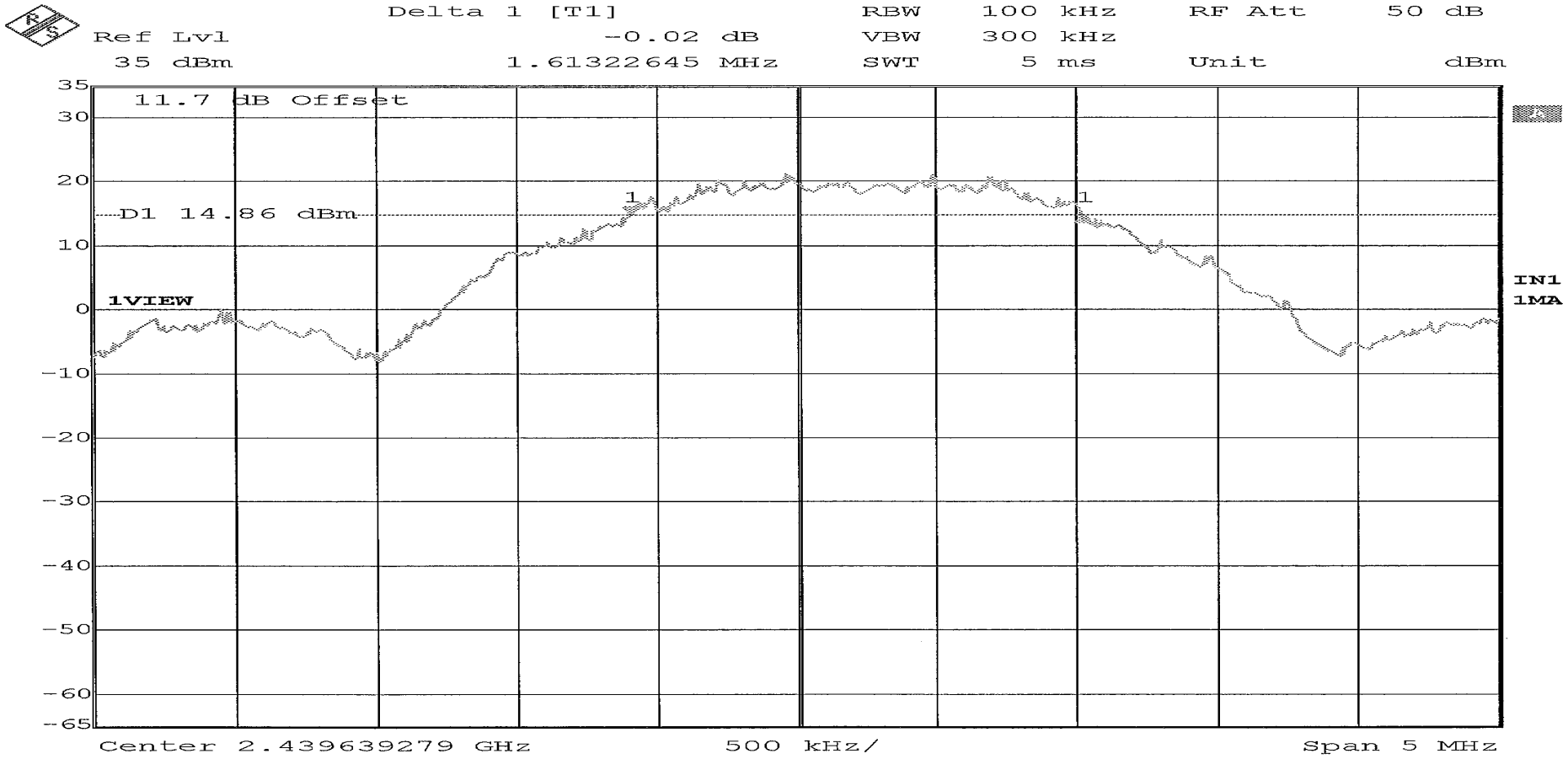
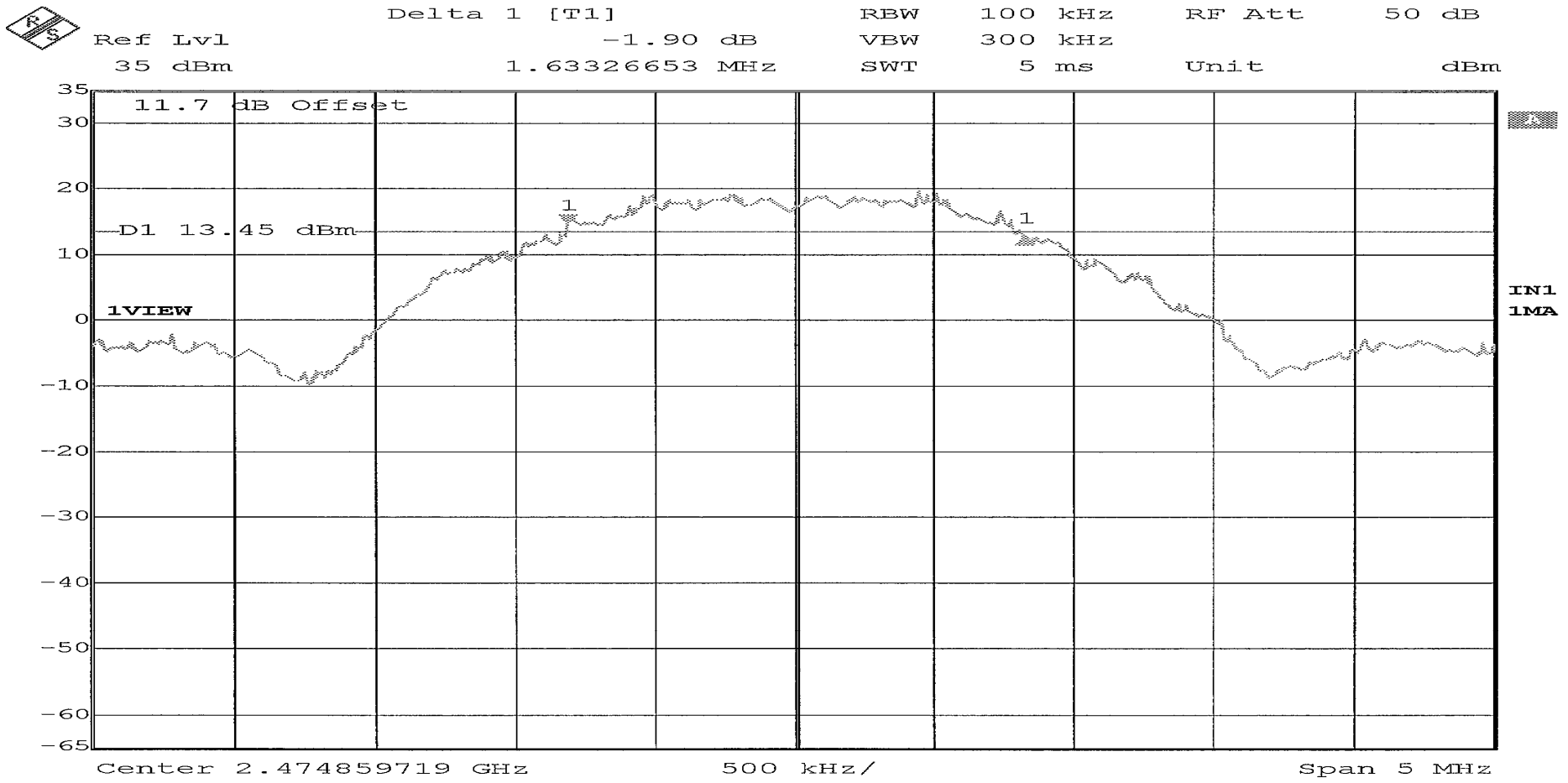
RETLIF TESTING LABORATORIES

Test Method:	6dB Bandwidth		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.440 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (a)(2)		
Technician	M. Seamans	**Date**	May 16th, 2017
Climatic Conditions	Temp: 21.6 °C Relative Humidity: 42.1 %		
Notes	Occupied Bandwidth: 1.613226 MHz		



RETLIF TESTING LABORATORIES

Test Method:	6dB Bandwidth		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.475 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (a)(2)		
Technician	M. Seamans	**Date**	May 16th, 2017
Climatic Conditions	Temp: 21.6 °C Relative Humidity: 42.1 %		
Notes	Occupied Bandwidth: 1.633266 MHz		



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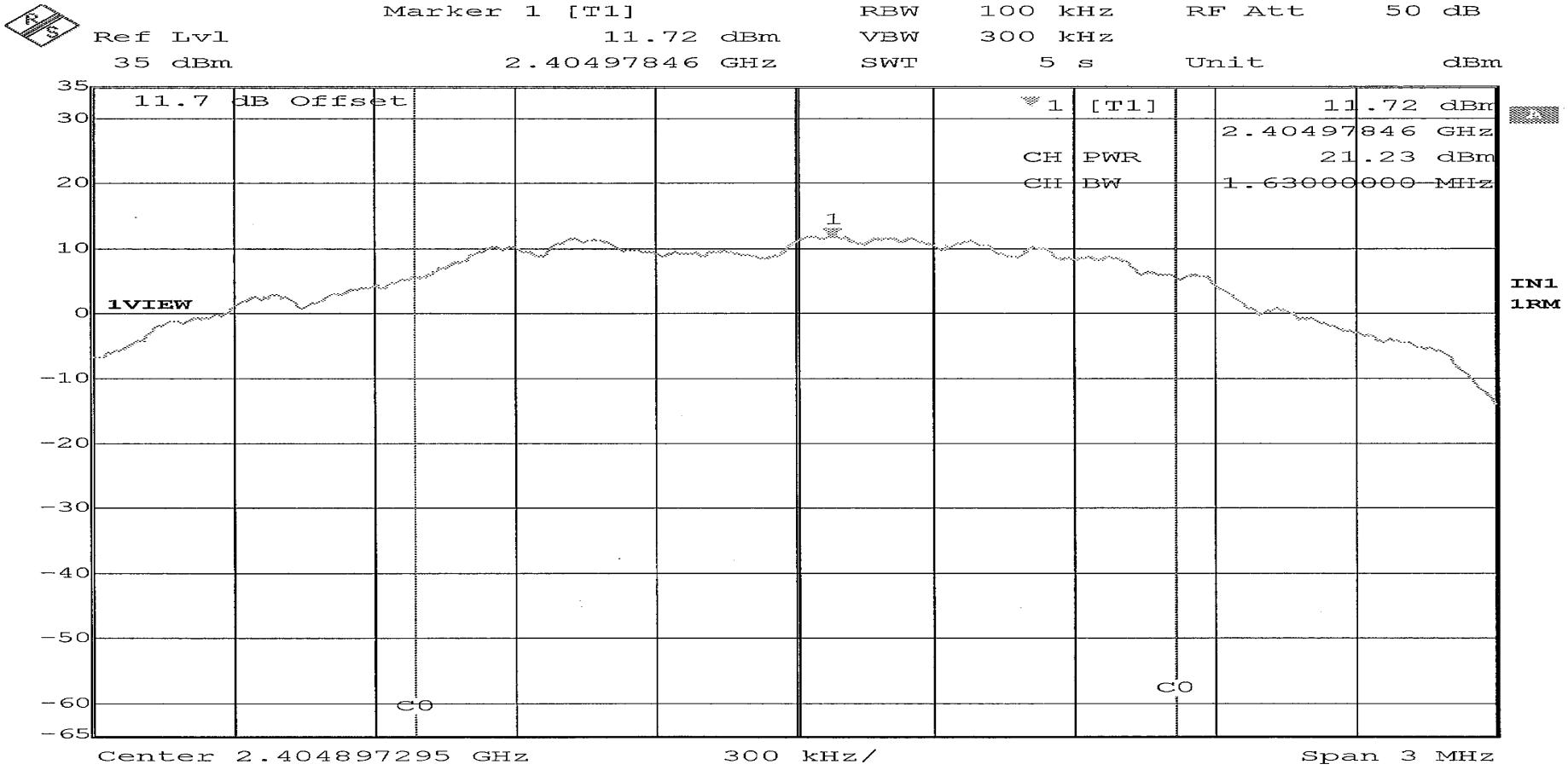
Test Photographs
Power Output

Test Setup

FCC Section 15.247 (b)(3) / RSS-247, 5.4
Power Output
Test Data

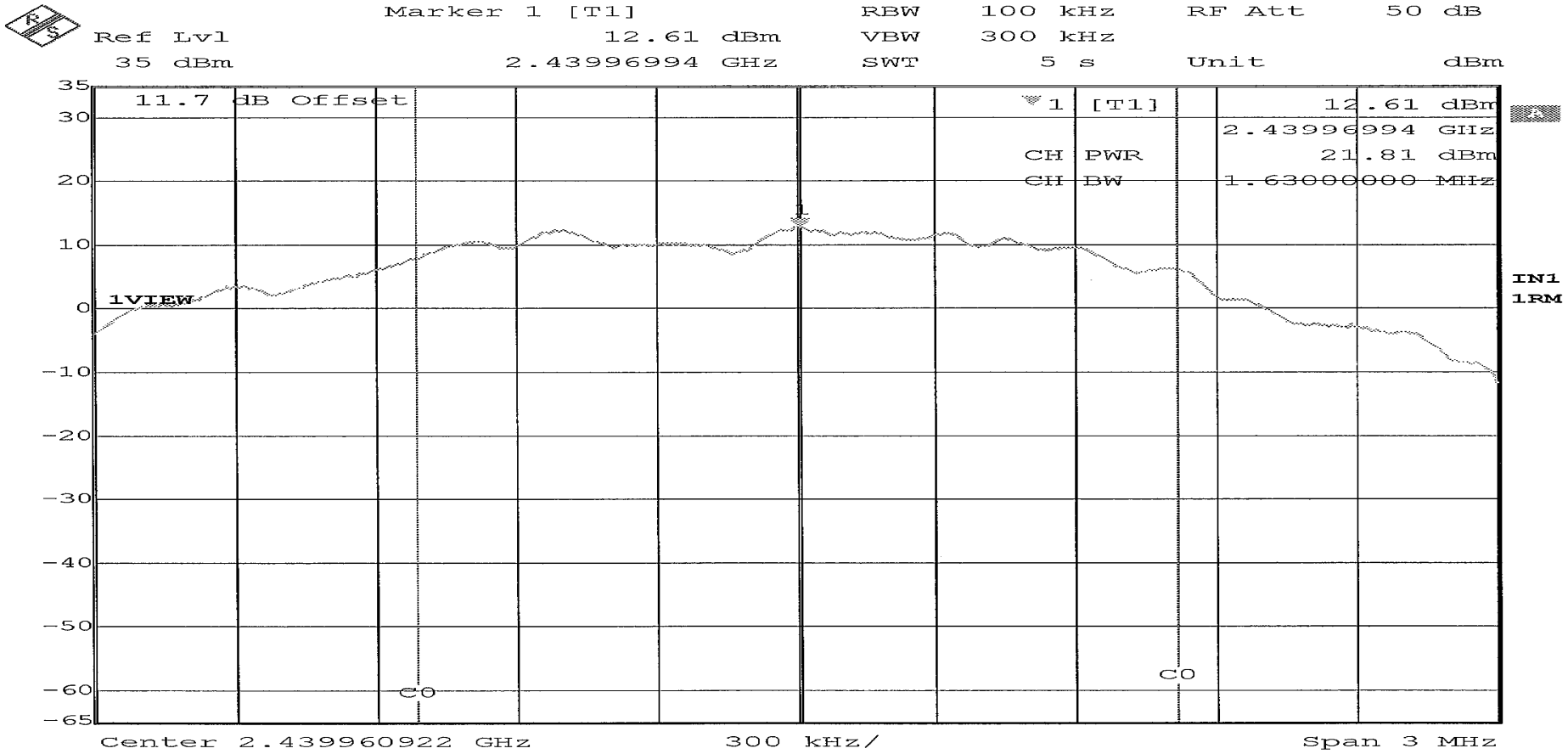
RETLIF TESTING LABORATORIES

Test Method:	Conducted Output Power		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.405 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (b)(3)		
Technician	M. Seamans	**Date**	May 16th, 2017
Climatic Conditions	Temp: 21.4 °C Relative Humidity: 43.6 %		
Notes	KDB AVGSA-3, Output Power: 21.23 dBm		



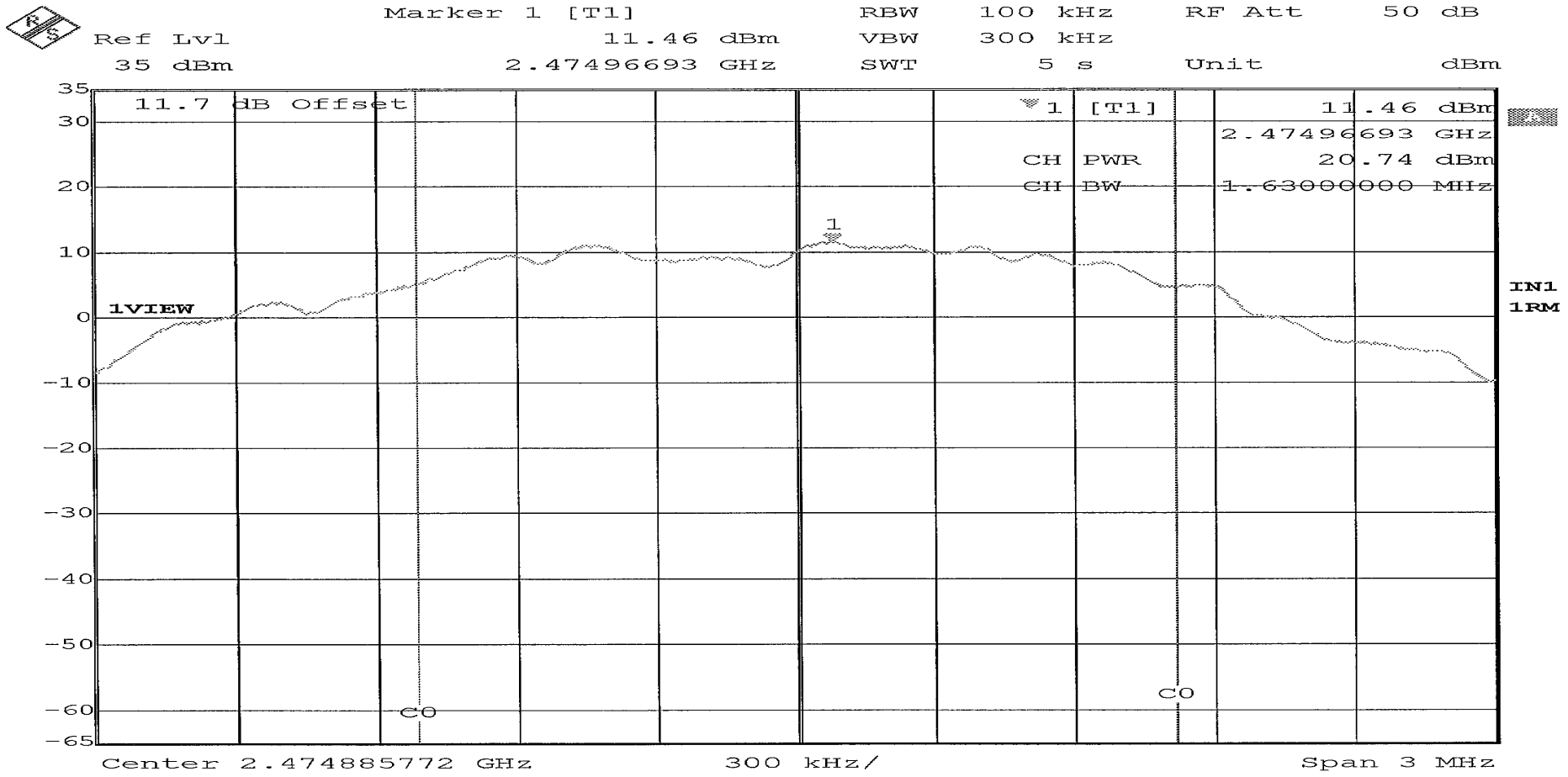
RETLIF TESTING LABORATORIES

Test Method:	Conducted Output Power		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.440 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (b)(3)		
Technician	M. Seamans	**Date**	May 16th, 2017
Climatic Conditions	Temp: 21.4 °C Relative Humidity: 43.6 %		
Notes	KDB AVGSA-3, Output Power: 21.81dBm		



RETLIF TESTING LABORATORIES

Test Method:	Conducted Output Power		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.475 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (b)(3)		
Technician	M. Seamans	**Date**	May 16th, 2017
Climatic Conditions	Temp: 21.4 °C Relative Humidity: 43.6 %		
Notes	KDB AVGSA-3, Output Power: 20.74 dBm		



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Test Photographs
Antenna Terminal Out of Band/Band Edge Conducted Emissions (30 MHz to 25 GHz)

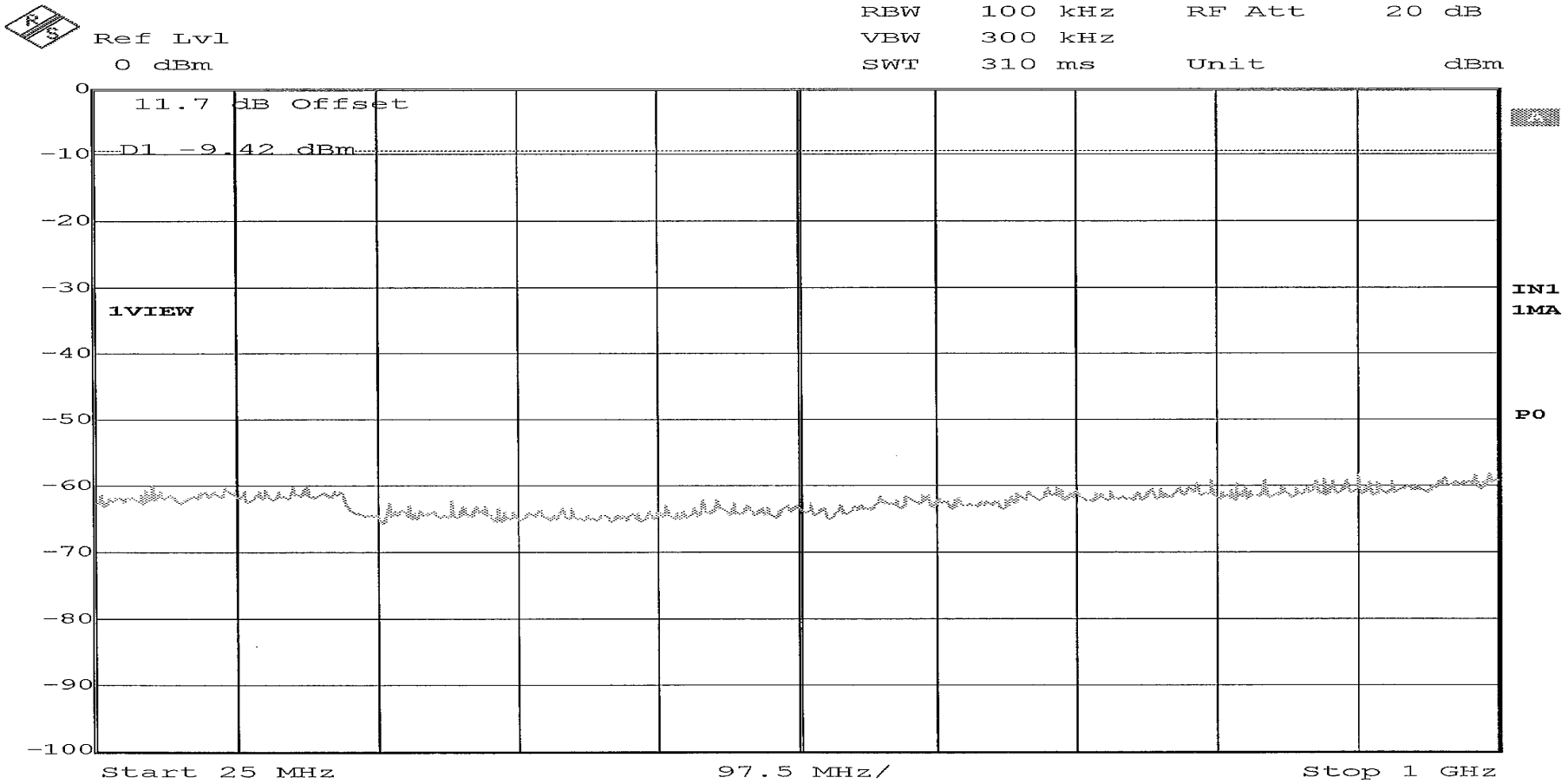
Test Setup

FCC Section 15.247 (d) / RSS-247, 5.5
Antenna Terminal Out of Band/Band Edge Conducted Emissions (30 MHz to 25 GHz)
Test Data

Out of Band Conducted Emissions
Test Data

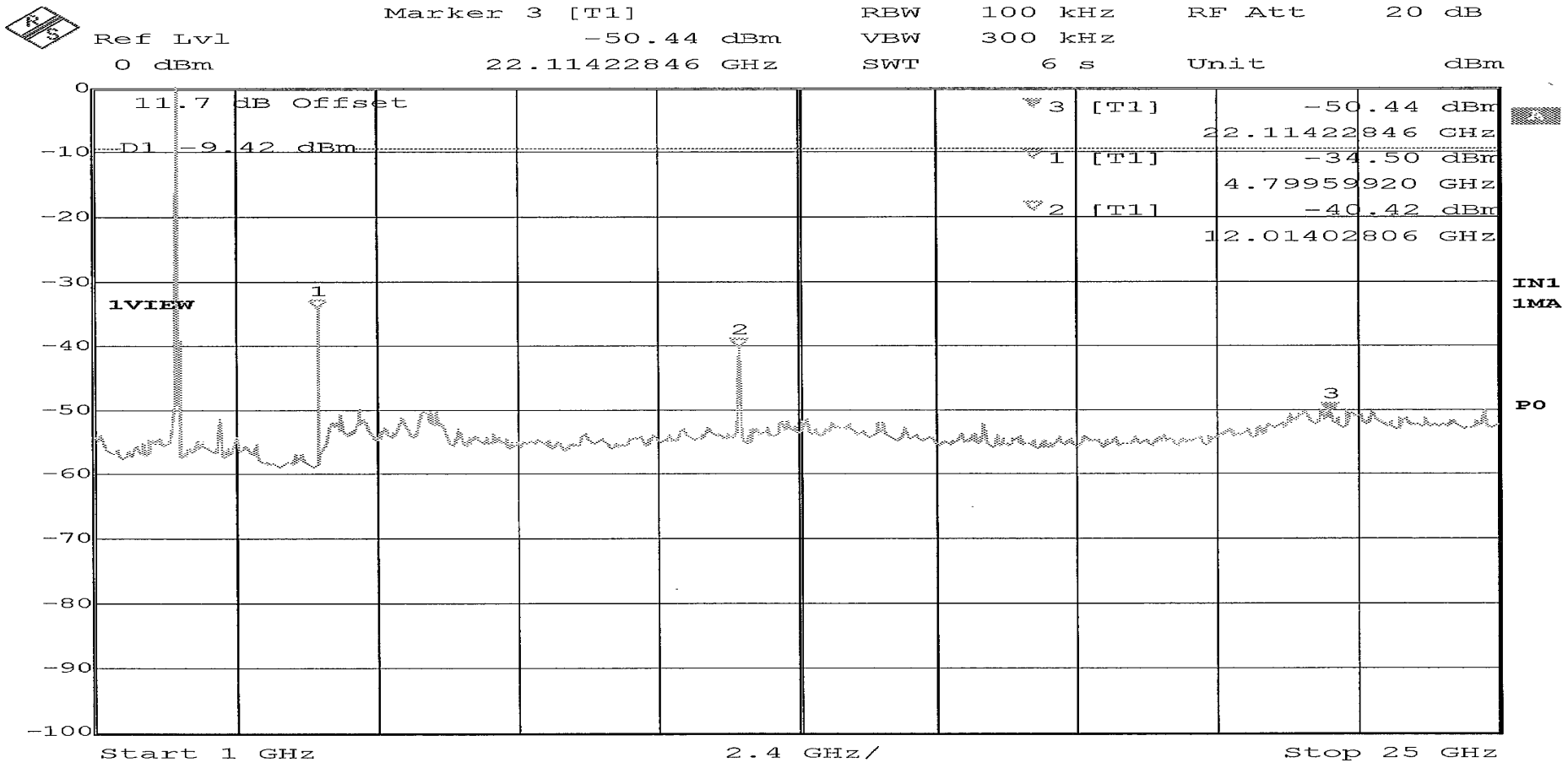
RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 25 MHz to 25 GHz		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.405 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 21.0 °C Relative Humidity: 45.8 %		
Notes	Limit: -9.42 dBm (30 dB below the maximum in-band PSD level)		



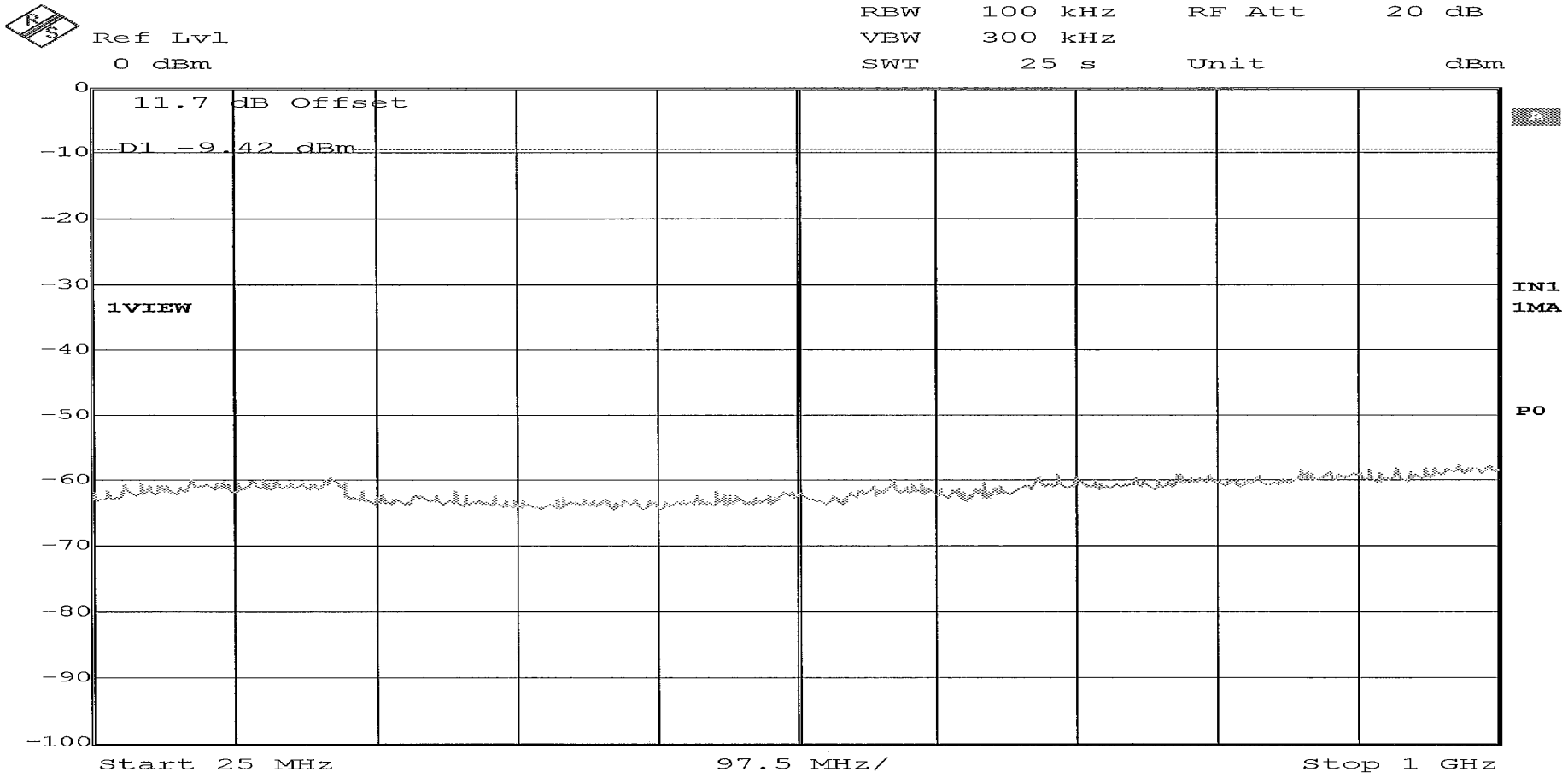
RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 25 MHz to 25 GHz		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.405 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 21.0 °C Relative Humidity: 45.8 %		
Notes	Limit: -9.42 dBm (30 dB below the maximum in-band PSD level)		



RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 25 MHz to 25 GHz		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.440 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 21.0 °C Relative Humidity: 45.8 %		
Notes	Limit: -9.42 dBm (30 dB below the maximum in-band PSD level)		



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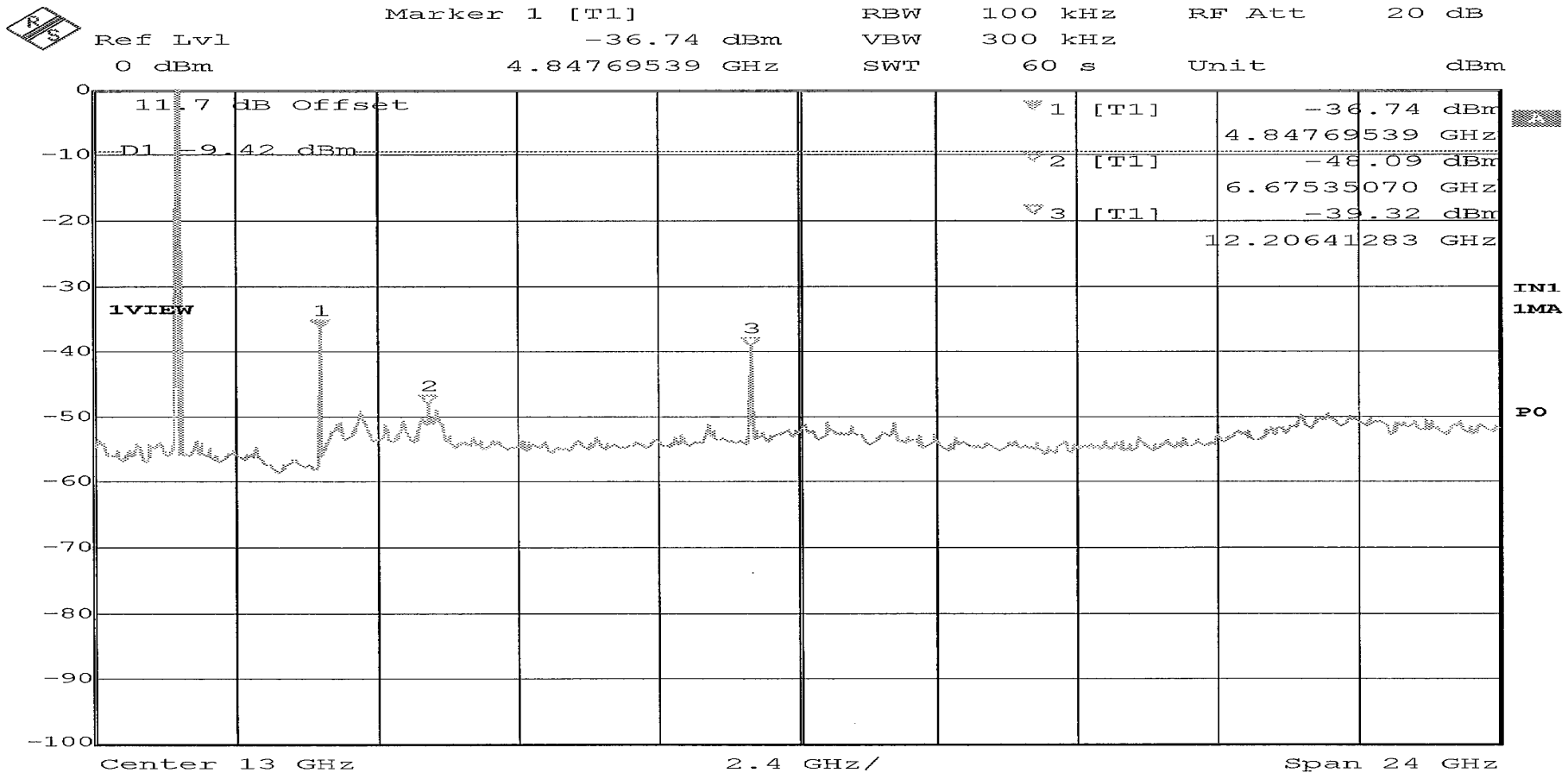
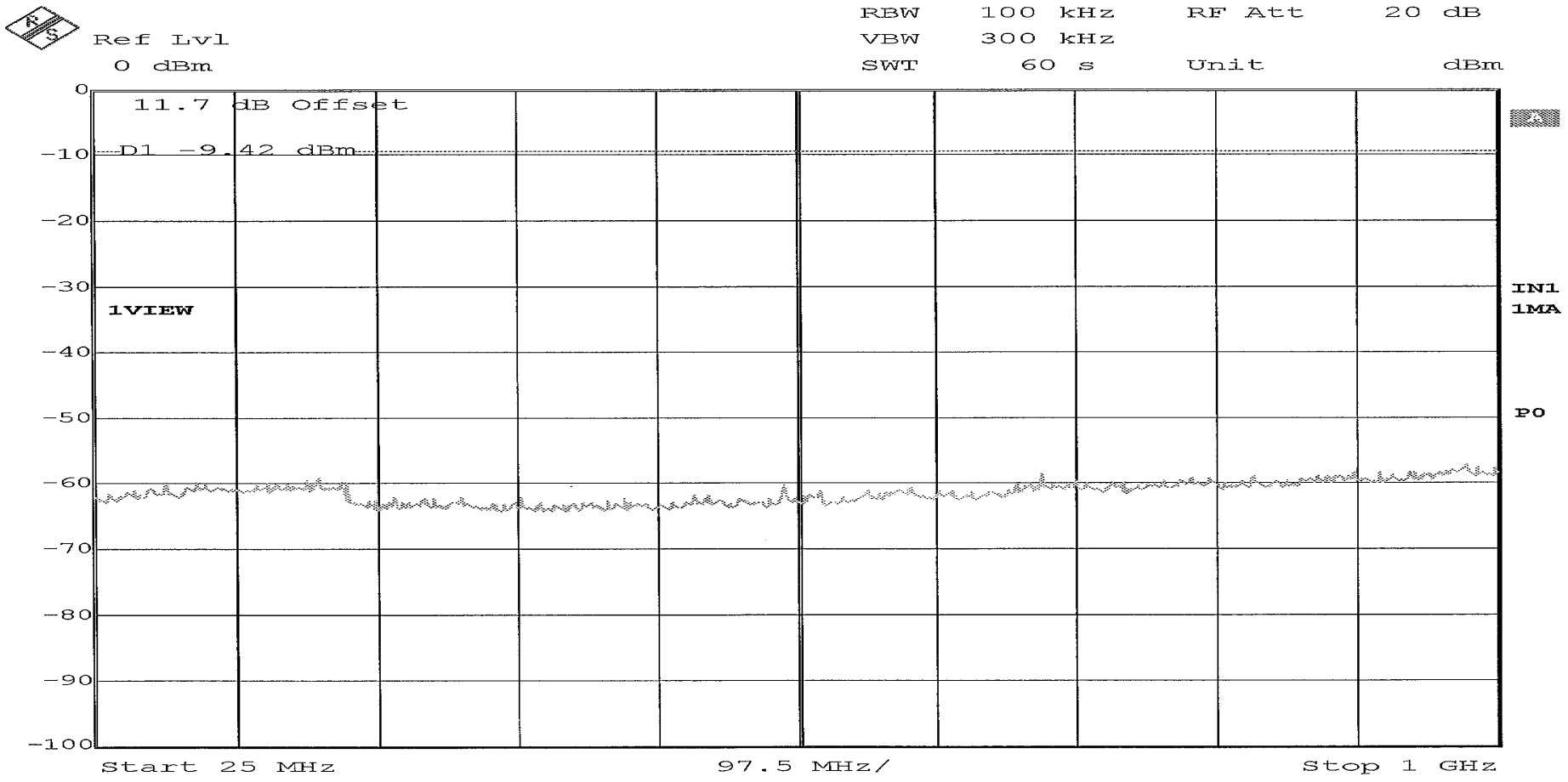
RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 25 MHz to 25 GHz		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.440 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 21.0 °C Relative Humidity: 45.8 %		
Notes	Limit: -9.42 dBm (30 dB below the maximum in-band PSD level)		



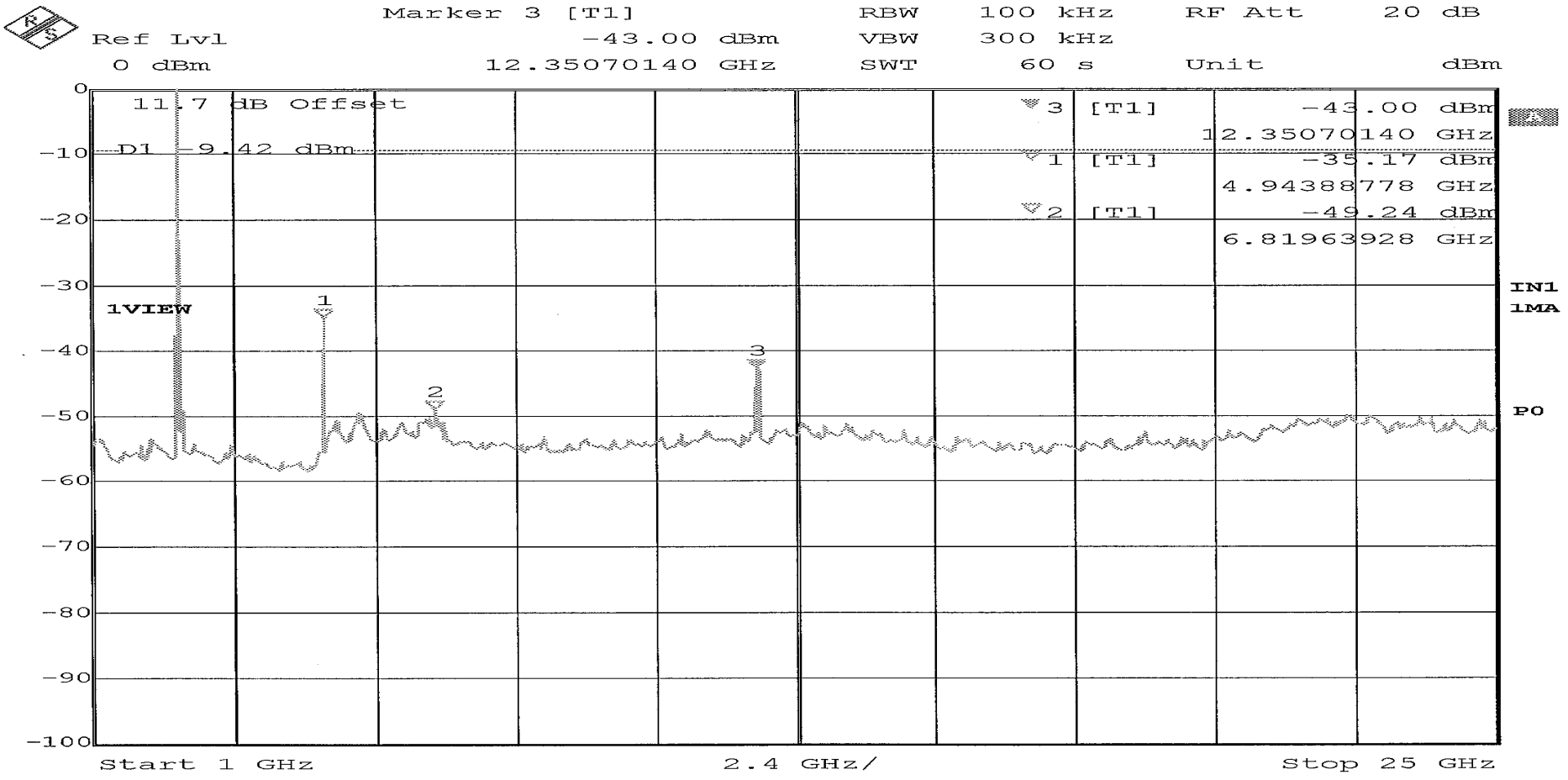
RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 25 MHz to 25 GHz		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.475 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 21.0 °C Relative Humidity: 45.8 %		
Notes	Limit: -9.42 dBm (30 dB below the maximum in-band PSD level)		



RETLIF TESTING LABORATORIES

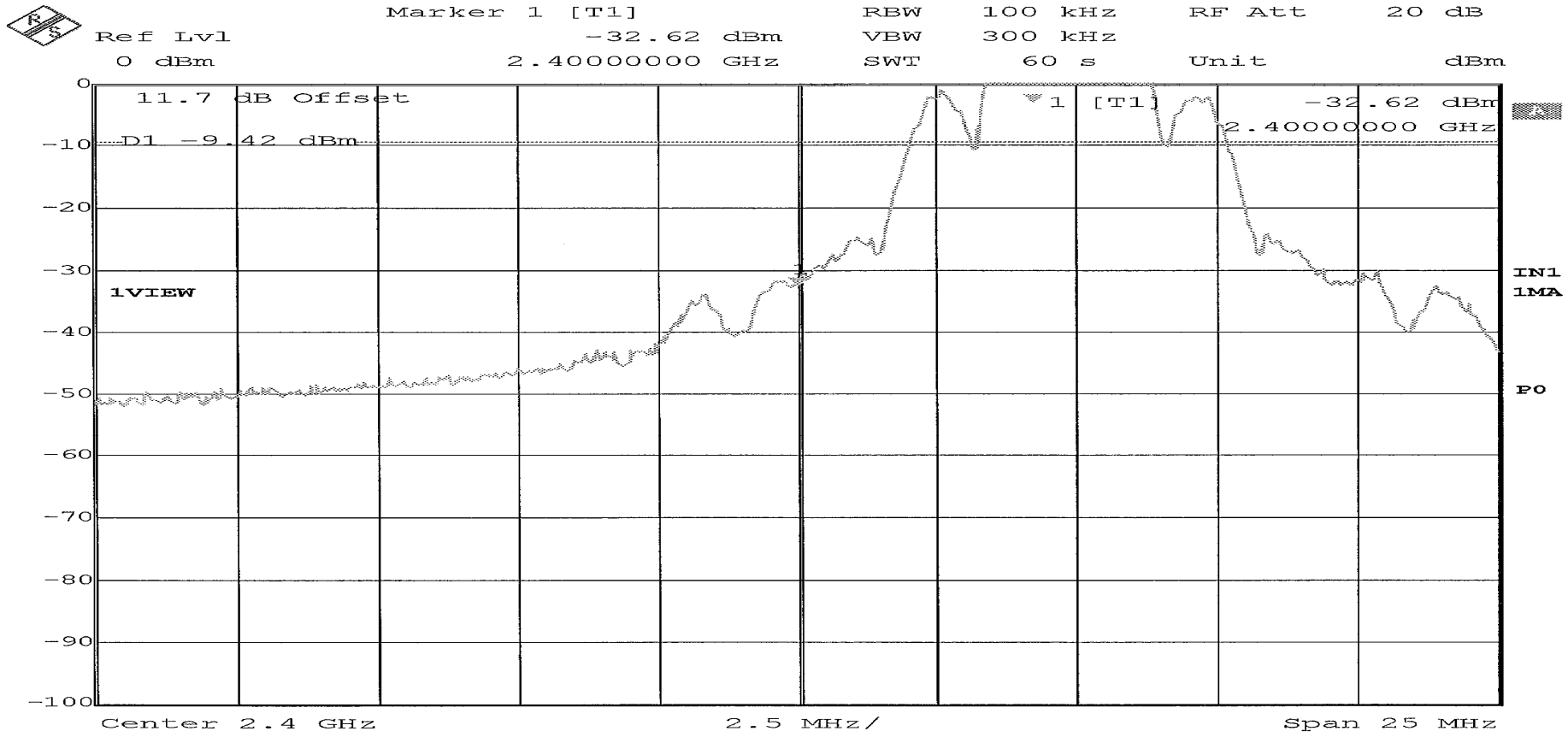
Test Method:	Out of Band Conducted Emissions 25 MHz to 25 GHz		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.475 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 21.0 °C Relative Humidity: 45.8 %		
Notes	Limit: -9.42 dBm (30 dB below the maximum in-band PSD level)		



Band Edge Conducted
Test Data

RETLIF TESTING LABORATORIES

Test Method:	Band Edge Conducted		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.405 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 21.0 °C Relative Humidity: 45.8 %		
Notes	Limit: -9.42 dBm		



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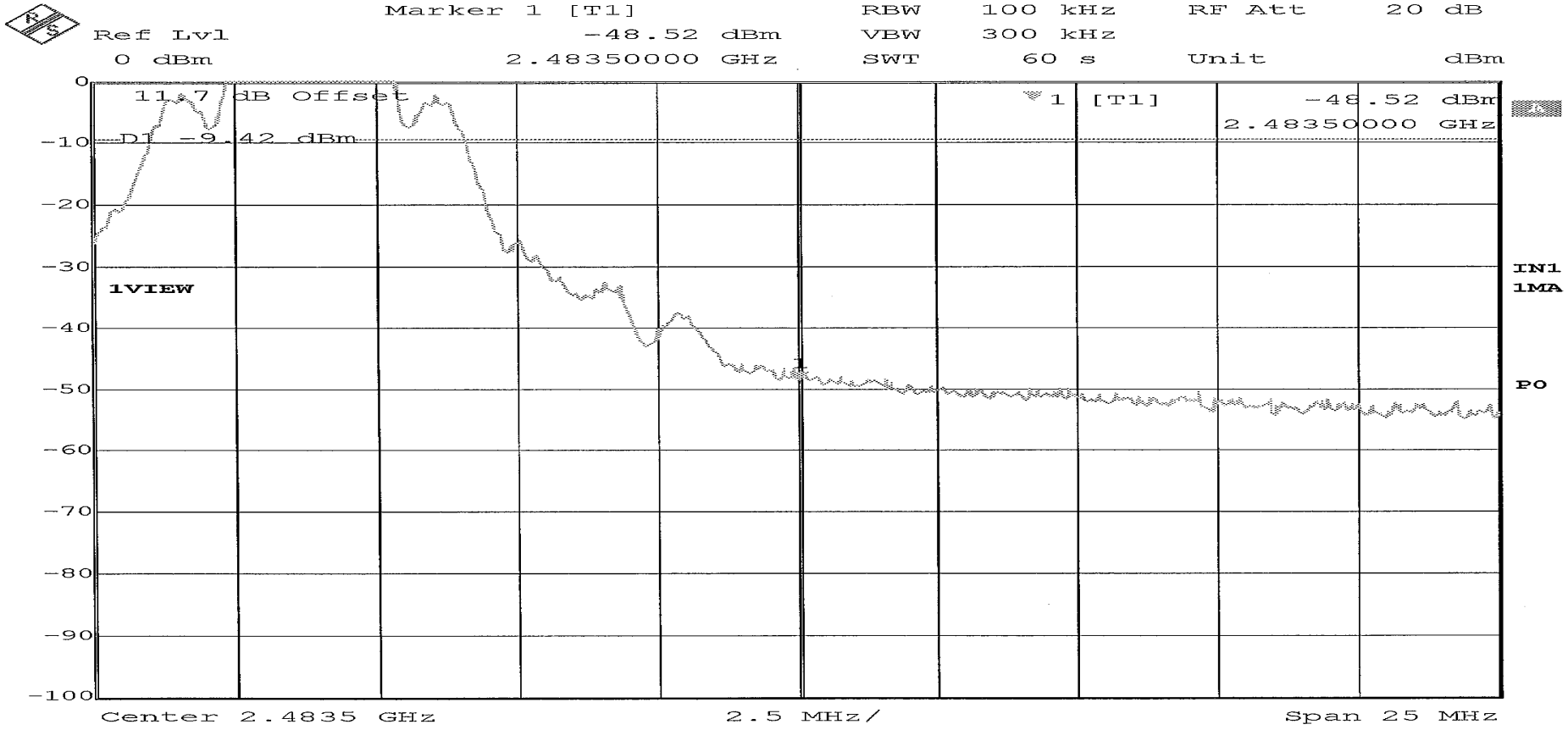
RETLIF TESTING LABORATORIES

Test Method:	Band Edge Conducted		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.475 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 21.0 °C Relative Humidity: 45.8 %		
Notes	Limit: -9.42 dBm		



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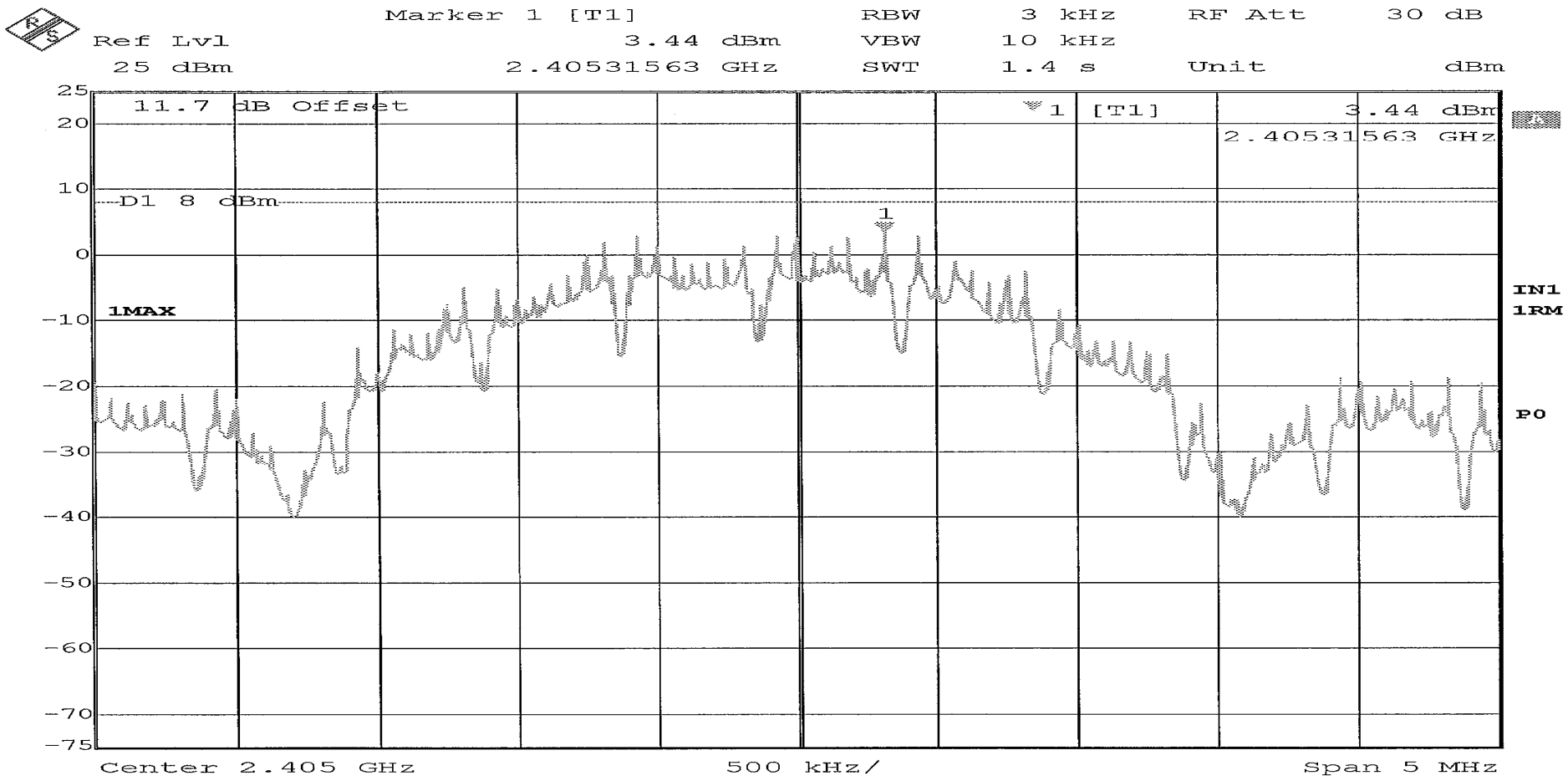
Test Photographs
Power Density

Test Configuration

FCC Section 15.247(e) / RSS-247, 5.2(2)
Power Density
Test Data

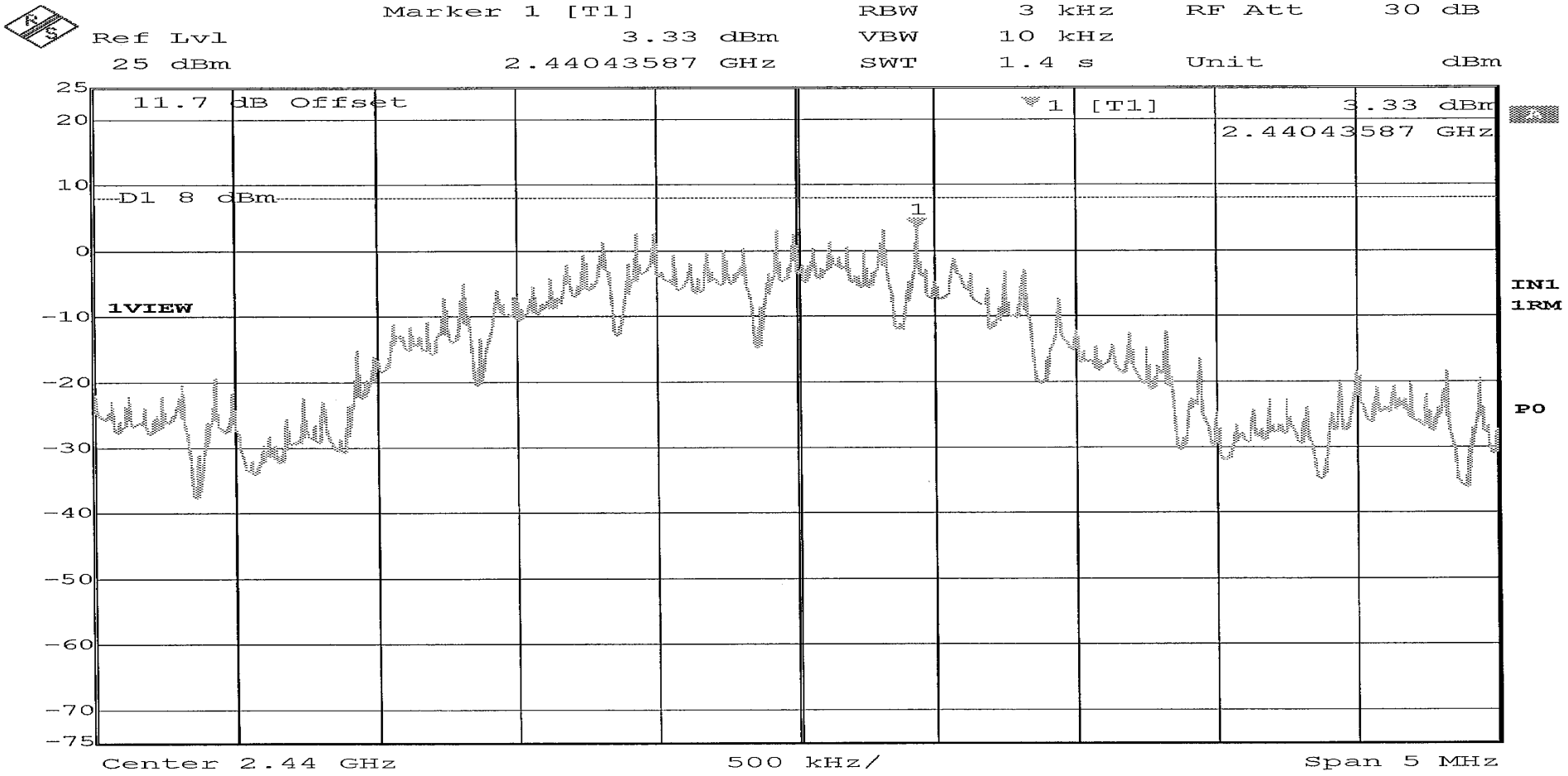
RETLIF TESTING LABORATORIES

Test Method:	Power Spectral Density		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.405 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (e)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 22.3 °C Relative Humidity: 44.3 %		
Notes	KDB 10.7 AVGPSD-3, Power Spectral Density: 3.44 dBm Limit: 8 dBm		



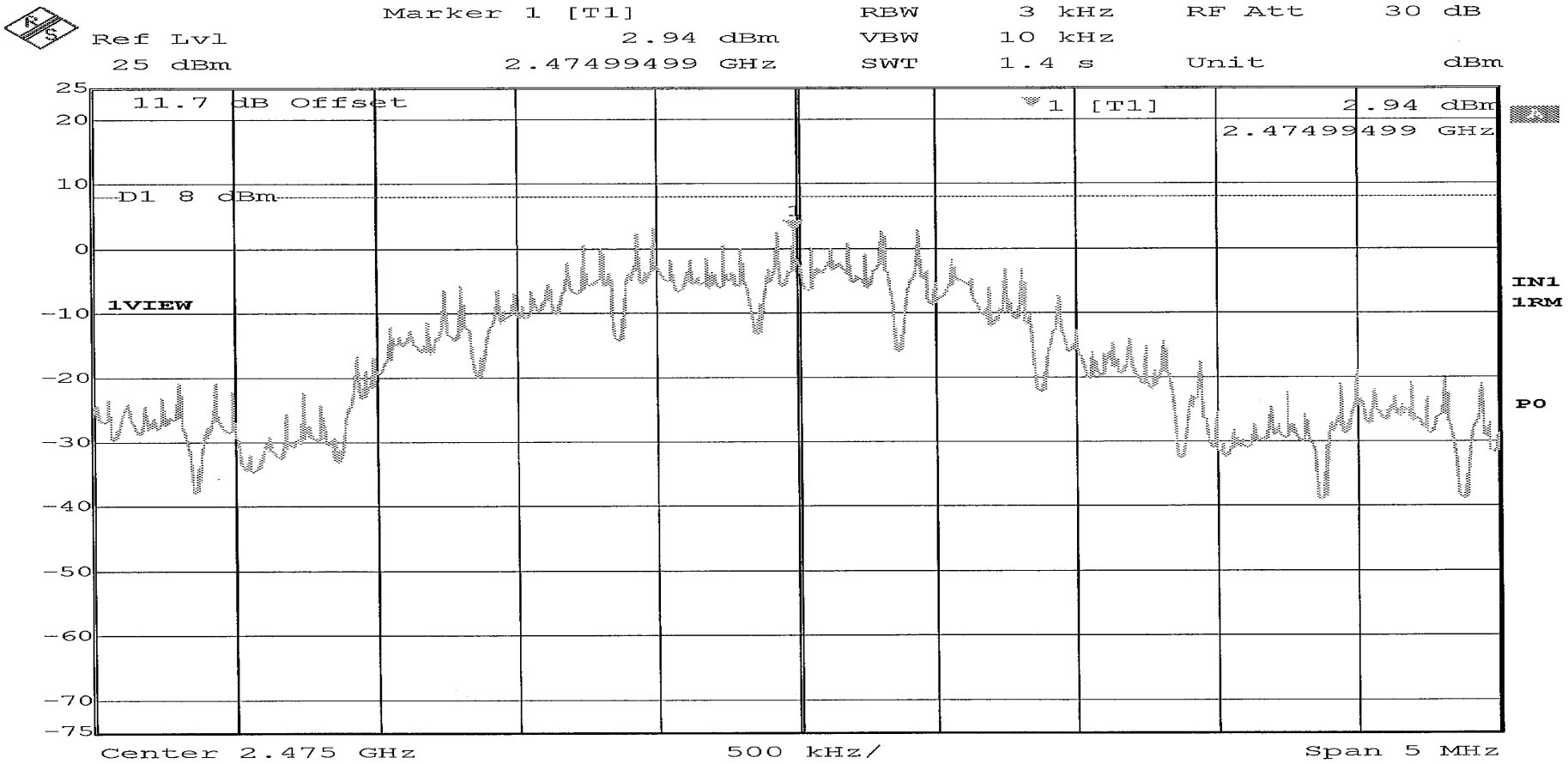
RETLIF TESTING LABORATORIES

Test Method:	Power Spectral Density		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.44 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (e)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 22.3 °C Relative Humidity: 44.3 %		
Notes	KDB 10.7 AVGPSD-3, Power Spectral Density: 3.33 dBm Limit: 8 dBm		



RETLIF TESTING LABORATORIES

Test Method:	Power Spectral Density		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.475 GHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (e)		
Technician	M. Seamans	**Date**	May 17th, 2017
Climatic Conditions	Temp: 22.3 °C Relative Humidity: 44.3 %		
Notes	KDB 10.7 AVGPSD-3, Power Spectral Density: 2.94 dBm Limit: 8 dBm		



Test Photographs
Antenna Conducted Restricted Bands

Test Setup

FCC Section 15.247(d) / RSS-GEN, 8.9
Antenna Conducted Restricted Bands
Test Data

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	

Notes: Detector: Quasi-Peak <1GHz, Average >1GHz X=0.5158

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
37.50	-	-	-	-	-	-	-	-	100.00
|	38.00*	-78.61	-	-	-	-78.61	16.647	6.797	I
38.25	-	-	-	-	-	-	-	-	100.00
73.00	-	-	-	-	-	-	-	-	100.00
|	74.00*	-77.47	-	-	-	-77.47	17.787	7.751	I
74.60	-	-	-	-	-	-	-	-	100.00
74.80	-	-	-	-	-	-	-	-	100.00
|	75.00*	--77.47	-	-	-	--77.47	17.787	7.751	|
75.20	-	-	-	-	-	-	-	-	100.00
108.00	-	-	-	-	-	-	-	-	100.00
|	115.00*	-77.22	-	-	-	-77.22	18.037	7.977	|
121.94	-	-	-	-	-	-	-	-	100.00
123.00	-	-	-	-	-	-	-	-	100.00
|	130.00*	-77.06	-	-	-	-77.06	18.197	8.126	|
138.00	-	-	-	-	-	-	-	-	100.00

No EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	

Notes: Detector: Quasi-Peak <1GHz, Average >1GHz X=0.5158

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
149.90	-	-	-	-	-	-	-	-	100.00
|	150.00*	-74.84	-	-	-	-74.84	20.417	10.492	I
150.05	-	-	-	-	-	-	-	-	100.00
156.52	-	-	-	-	-	-	-	-	100.00
|	156.52*	-76.72	-	-	-	-76.72	18.537	8.450	I
156.52	-	-	-	-	-	-	-	-	100.00
156.70	-	-	-	-	-	-	-	-	100.00
|	156.80*	-76.72	-	-	-	-76.72	18.537	8.450	|
156.90	-	-	-	-	-	-	-	-	100.00
162.01	-	-	-	-	-	-	-	-	150.00
|	165.00*	-76.84	-	-	-	-76.84	18.417	8.334	|
167.17	-	-	-	-	-	-	-	-	150.00
167.72	-	-	-	-	-	-	-	-	150.00
|	170.00*	-76.72	-	-	-	-76.72	18.537	8.450	|
173.20	-	-	-	-	-	-	-	-	150.00

No EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	
Notes: Detector: Quasi-Peak <1GHz, Average >1GHz X=0.5158		

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
240.00	-	-	-	-	-	-	-	-	200.00
|	260.00*	-79.38	-	-	-	-79.38	15.877	6.221	|
285.00	-	-	-	-	-	-	-	-	200.00
322.80	-	-	-	-	-	-	-	-	200.00
|	330.00*	-80.06	-	-	-	-80.06	15.197	5.752	|
335.40	-	-	-	-	-	-	-	-	200.00
399.90	-	-	-	-	-	-	-	-	200.00
|	405.00*	-79.71	-	-	-	-79.71	15.547	5.989	|
410.00	-	-	-	-	-	-	-	-	200.00
608.00	-	-	-	-	-	-	-	-	200.00
|	611.00*	-77.61	-	-	-	-77.61	17.647	7.627	|
614.00	-	-	-	-	-	-	-	-	200.00
960.00	-	-	-	-	-	-	-	-	500.00
|	975.00*	-74.31	-	-	-	-74.31	20.947	11.152	|
1240.00	-	-	-	-	-	-	-	-	500.00
1300.00	-	-	-	-	-	-	-	-	500.00
|	1350.00*	-78.13	-	-	-	-78.13	17.127	7.184	|
1427.00	-	-	-	-	-	-	-	-	500.00

No EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	
Notes: Detector: Quasi-Peak <1GHz, Average >1GHz X=0.5158		

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
1435.00	-	-	-	-	-	-	-	-	500.00
|	1500.00*	-76.35	-	-	-	-76.35	18.907	8.818	|
1646.50	-	-	-	-	-	-	-	-	500.00
1660.00	-	-	-	-	-	-	-	-	500.00
|	1680.00*	-76.76	-	-	-	-76.76	18.497	8.411	|
1710.00	-	-	-	-	-	-	-	-	500.00
1718.80	-	-	-	-	-	-	-	-	500.00
|	1720.00*	-76.44	-	-	-	-76.44	18.817	8.727	|
1722.20	-	-	-	-	-	-	-	-	500.00
2200.00	-	-	-	-	-	-	-	-	500.00
|	2250.00*	-76.52	-	-	-	-76.52	18.737	8.647	|
2300.00	-	-	-	-	-	-	-	-	500.00
2310.00	-	-	-	-	-	-	-	-	500.00
|	2389.96	-61.39	4.00	2.875	-	-54.51	40.747	108.988	|
2390.00	-	-	-	-	-	-	-	-	500.00
2483.50	-	-	-	-	-	-	-	-	500.00
|	2483.57	-54.74	4.00	2.875	-5.749	-53.61	41.643	120.829	|
2500.00	-	-	-	-	-	-	-	-	500.00

EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	
Notes: Detector: Quasi-Peak <1GHz, Average >1GHz X=0.5158		

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
2690.00	-	-	-	-	-	-	-	-	500.00
|	2750.00*	-74.25	-	-	-	-74.25	21.007	11.229	|
2900.00	-	-	-	-	-	-	-	-	500.00
3260.00	-	-	-	-	-	-	-	-	500.00
|	3263.00*	-76.98	-	-	-	-76.98	18.277	8.201	|
3267.00	-	-	-	-	-	-	-	-	500.00
3332.00	-	-	-	-	-	-	-	-	500.00
|	3336.00*	-76.90	-	-	-	-76.90	18.357	8.277	|
3339.00	-	-	-	-	-	-	-	-	500.00
3345.00	-	-	-	-	-	-	-	-	500.00
|	3350.00*	-76.91	-	-	-	-76.91	18.347	8.267	|
3358.00	-	-	-	-	-	-	-	-	500.00
3600.00	-	-	-	-	-	-	-	-	500.00
|	3700.00*	-77.97	-	-	-	-77.97	17.287	7.317	|
4400.00	-	-	-	-	-	-	-	-	500.00
4500.00	-	-	-	-	-	-	-	-	500.00
|	4880.07	-50.06	4.00	2.875	-	-43.19	52.072	401.442	|
5150.00	-	-	-	-	-	-	-	-	500.00

EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	
Notes: Detector: Quasi-Peak <1GHz, Average >1GHz X=0.5158		

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
5350.00	-	-	-	-	-	-	-	-	500.00
|	5400.00*	-73.41	-	-	-	-73.41	21.847	12.370	|
5460.00	-	-	-	-	-	-	-	-	500.00
7250.00	-	-	-	-	-	-	-	-	500.00
|	7416.33	-61.95	4.00	2.875	-	-55.07	40.182	102.123	|
7750.00	-	-	-	-	-	-	-	-	500.00
8025.00	-	-	-	-	-	-	-	-	500.00
|	8300.00*	-75.49	-	-	-	-75.49	19.767	9.735	|
8500.00	-	-	-	-	-	-	-	-	500.00
9000.00	-	-	-	-	-	-	-	-	500.00
|	9100.00*	-75.90	-	-	-	-75.90	19.357	9.287	|
9200.00	-	-	-	-	-	-	-	-	500.00
9300.00	-	-	-	-	-	-	-	-	500.00
|	9400.00*	-75.87	-	-	-	-75.87	19.387	9.319	|
9500.00	-	-	-	-	-	-	-	-	500.00
10600.00	-	-	-	-	-	-	-	-	500.00
|	12201.81	-52.13	4.00	2.875	-	-45.25	50.002	316.317	|
12700.00	-	-	-	-	-	-	-	-	500.00

EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	
Notes: Detector: Quasi-Peak <1GHz, Average >1GHz X=0.5158		

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
13250.00	-	-	-	-	-	-	-	-	500.00
|	15800.00*	-73.90	-	-	-	-73.90	21.357	11.691	|
16200.00	-	-	-	-	-	-	-	-	500.00
17700.00	-	-	-	-	-	-	-	-	500.00
|	19240.00*	-73.95	-	-	-	-73.95	21.307	11.624	|
21400.00	-	-	-	-	-	-	-	-	500.00
22010.00	-	-	-	-	-	-	-	-	500.00
|	22320.00*	-72.65	-	-	-	-72.65	22.607	13.501	|
23120.00	-	-	-	-	-	-	-	-	500.00
23000.00	-	-	-	-	-	-	-	-	500.00
|	23800.00*	-72.71	-	-	-	-72.71	22.547	13.408	|
24000.00	-	-	-	-	-	-	-	-	500.00

No EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	
Notes: Detector: Peak X=0.5158		

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
1300.00	-	-	-	-	-	-	-	-	5000.00
|	1350.00*	-65.18	-	-	-	-65.18	30.077	31.906	|
1427.00	-	-	-	-	-	-	-	-	5000.00
1435.00	-	-	-	-	-	-	-	-	5000.00
|	1500.00*	-66.29	-	-	-	-66.29	28.967	28.078	|
1646.50	-	-	-	-	-	-	-	-	5000.00
1660.00	-	-	-	-	-	-	-	-	5000.00
|	1680.00*	-65.30	-	-	-	-65.30	29.957	31.468	|
1710.00	-	-	-	-	-	-	-	-	5000.00
1718.80	-	-	-	-	-	-	-	-	5000.00
|	1720.00*	-68.33	-	-	-	-68.33	26.927	22.201	|
1722.20	-	-	-	-	-	-	-	-	5000.00
2200.00	-	-	-	-	-	-	-	-	5000.00
|	2250.00*	-65.04	-	-	-	-65.04	30.217	32.424	|
2300.00	-	-	-	-	-	-	-	-	5000.00
2310.00	-	-	-	-	-	-	-	-	5000.00
|	2389.96	-32.25	4.00	2.875	-	-25.38	69.882	3119.778	|
2390.00	-	-	-	-	-	-	-	-	5000.00

EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	
Notes: Detector: Peak X=0.5158		

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
2483.50	-	-	-	-	-	-	-	-	5000.00
|	2483.57	-29.17	4.00	2.875	-5.749	-28.04	67.213	2294.424	|
2500.00	-	-	-	-	-	-	-	-	5000.00
2690.00	-	-	-	-	-	-	-	-	5000.00
|	2750.00*	-64.02	-	-	-	-64.02	31.237	36.465	|
2900.00	-	-	-	-	-	-	-	-	5000.00
3260.00	-	-	-	-	-	-	-	-	5000.00
|	3263.00*	-64.86	-	-	-	-64.86	30.397	33.103	|
3267.00	-	-	-	-	-	-	-	-	5000.00
3332.00	-	-	-	-	-	-	-	-	5000.00
|	3336.00*	-65.70	-	-	-	-65.70	29.557	30.052	|
3339.00	-	-	-	-	-	-	-	-	5000.00
3345.00	-	-	-	-	-	-	-	-	5000.00
|	3350.00*	-64.95	-	-	-	-64.95	30.307	32.762	|
3358.00	-	-	-	-	-	-	-	-	5000.00
3600.00	-	-	-	-	-	-	-	-	5000.00
|	3700.00*	-66.02	-	-	-	-66.02	29.257	28.965	|
4400.00	-	-	-	-	-	-	-	-	5000.00

EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	
Notes: Detector: Peak X=0.5158		

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
4500.00	-	-	-	-	-	-	-	-	5000.00
|	4880.07	-30.50	4.00	2.875	-	-23.62	71.632	3816.135	|
5150.00	-	-	-	-	-	-	-	-	5000.00
5350.00	-	-	-	-	-	-	-	-	5000.00
|	5400.00*	-61.72	-	-	-	-61.72	33.537	47.520	|
5460.00	-	-	-	-	-	-	-	-	5000.00
7250.00	-	-	-	-	-	-	-	-	5000.00
|	7416.33	-53.29	4.00	2.875	-	-46.415	48.842	276.773	|
7750.00	-	-	-	-	-	-	-	-	5000.00
8025.00	-	-	-	-	-	-	-	-	5000.00
|	8300.00*	-64.96	-	-	-	-64.96	30.297	32.724	|
8500.00	-	-	-	-	-	-	-	-	5000.00
9000.00	-	-	-	-	-	-	-	-	5000.00
|	9100.00*	-65.01	-	-	-	-65.01	30.247	32.537	|
9200.00	-	-	-	-	-	-	-	-	5000.00
9300.00	-	-	-	-	-	-	-	-	5000.00
|	9400.00*	-64.76	-	-	-	-64.76	30.497	33.487	|
9500.00	-	-	-	-	-	-	-	-	5000.00

EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	Unwanted Emissions into Restricted Frequency Bands	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated signal at 2405 MHz, 2440 MHz and 2475 MHz consecutively.	
Technician	M. Seamans	
Date	May 16th, 2017	
Notes: Detector: Peak X=0.5158		

TEST PARAMETERS

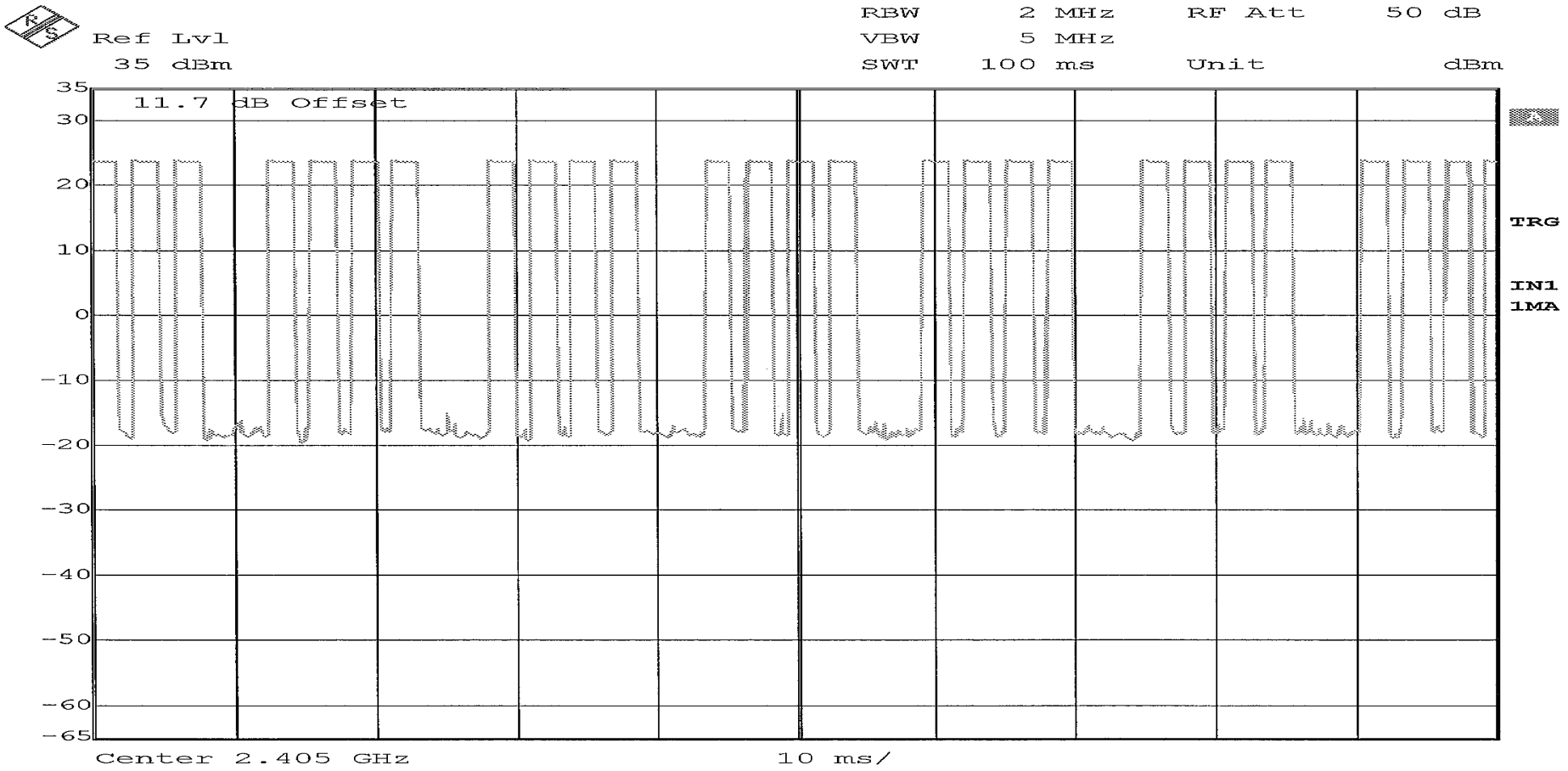
Restricted Band	Measured Frequency	Meter Reading	Antenna Gain	Duty Cycle Factor 10log(1/x)	Duty Cycle Factor 20log(x)	Corrected Reading	Converted Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dB	dBm	dBm	dBuV/m	uV/m	uV/m
10600.00	-	-	-	-	-	-	-	-	5000.00
|	12201.81	-31.59	4.00	2.875	-	-24.715	70.542	3366.075	|
12700.00	-	-	-	-	-	-	-	-	5000.00
13250.00	-	-	-	-	-	-	-	-	5000.00
|	15800.00*	-63.47	-	-	-	-63.47	31.787	38.848	|
16200.00	-	-	-	-	-	-	-	-	5000.00
17700.00	-	-	-	-	-	-	-	-	5000.00
|	19240.00*	-63.27	-	-	-	-63.27	31.987	39.753	|
21400.00	-	-	-	-	-	-	-	-	5000.00
22010.00	-	-	-	-	-	-	-	-	5000.00
|	22320.00*	-61.72	-	-	-	-61.72	33.537	47.520	|
23120.00	-	-	-	-	-	-	-	-	5000.00
23000.00	-	-	-	-	-	-	-	-	5000.00
|	23800.00*	-61.72	-	-	-	-61.72	33.537	47.520	|
24000.00	-	-	-	-	-	-	-	-	5000.00

EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

Duty Cycle Determination
Test Data

RETLIF TESTING LABORATORIES

Test Method:	Duty Cycle Determination		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.405 GHz		
Test Specification	FCC part 15.35 / RSS-GEN		
Technician	M. Seamans	**Date**	May 16th, 2017
Climatic Conditions	Temp: 21.6 °C Relative Humidity: 42.1 %		
Notes	Number of Pulses: 26		



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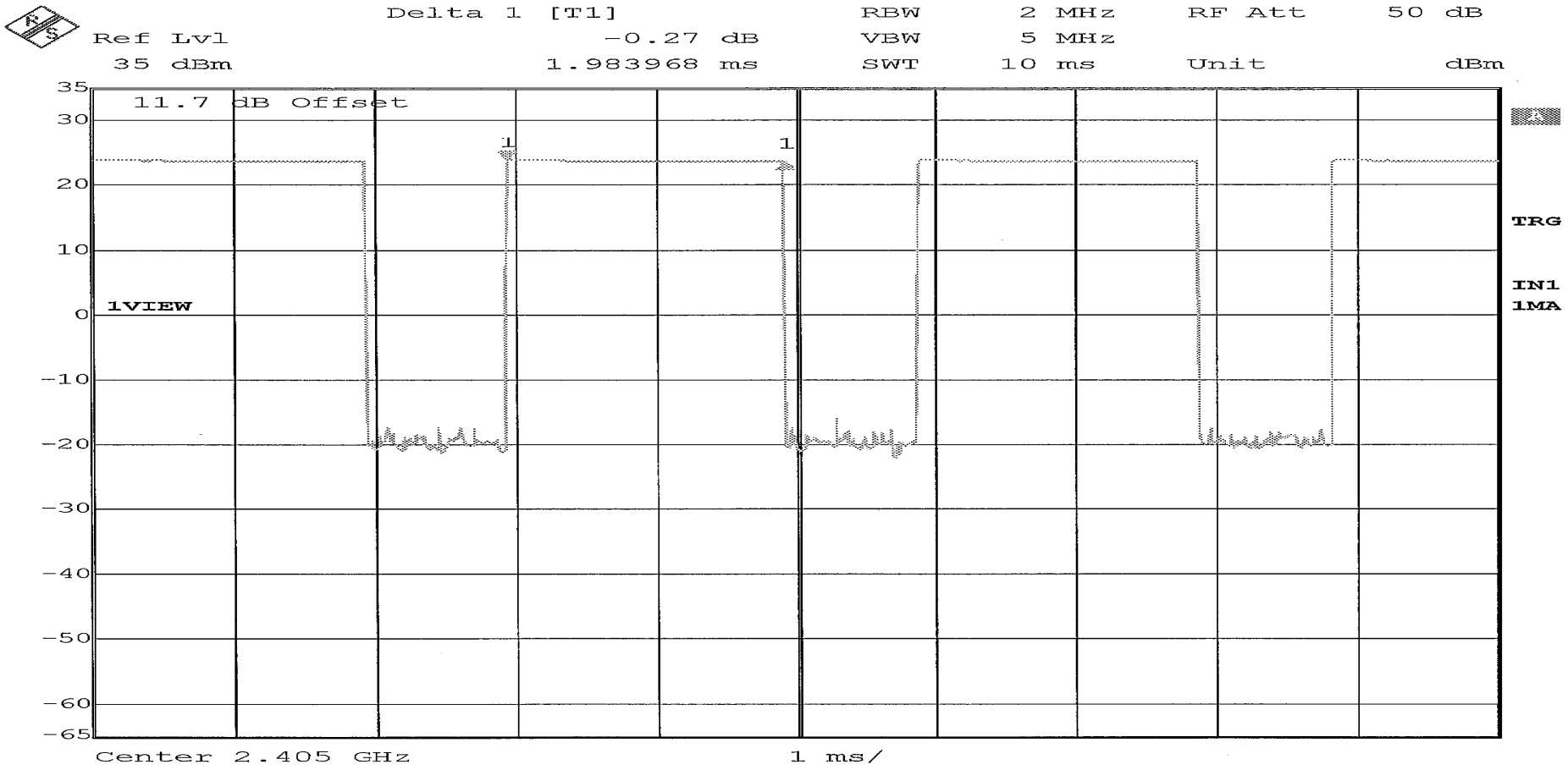
RETLIF TESTING LABORATORIES

Test Method:	Duty Cycle Determination		
Customer	Echelon	**Job No.**	R-6201N-1
Test Sample	Control Router Device		
Model Number	76530R	**Serial No.**	0503F3C3DB00, 0503F3C14500
Operating Mode	Transmitting modulated signal at 2.405 GHz		
Test Specification	FCC part 15.35 / RSS-GEN		
Technician	M. Seamans	**Date**	May 16th, 2017
Climatic Conditions	Temp: 21.6 °C Relative Humidity: 42.1 %		
Notes	Pulse width: 1.983968 ms		



RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET	
Test Method	**Duty Cycle Determination**
Customer	Echelon
Job Number	R-6201N-1
Test Sample	Control Router Device
Model Number	76530R
Serial Number	0503F3C3DB00, 0503F3C14500
Test Specification	FCC part 15.35 / RSS-GEN
Operating Mode	Transmitting modulated signal at 2.405 GHz
Technician	M. Seamans
Date	May 16th, 2017
Notes:	

TEST PARAMETERS				
Measured on time	**Measured time interval**	**Duty Cycle Factor Calculation**	**Result**	**Duty Cycle Factor**
msec	**msec**		**dB**	**dB**
51.583168	100	= $20*\text{Log}_{10}$(51.583168 ms/ 100 ms)	-5.74984	-5.749
				Data Sheet 3 of 3

Test Photographs
Spurious Radiated Emissions (30 MHz to 25 GHz)

Test Setup

Test Photographs
Spurious Radiated Emissions (30 MHz to 25 GHz)

Horizontal Antenna Polarization, 30 MHz to 200 MHz, Biconical Antenna

Vertical Antenna Polarization, 30 MHz to 200 MHz, Biconical Antenna

Test Photographs
Spurious Radiated Emissions (30 MHz to 25 GHz)

Horizontal Antenna Polarization, 200 MHz to 1 GHz, Log Periodic

Vertical Antenna Polarization, 200 MHz to 1 GHz, Log Periodic

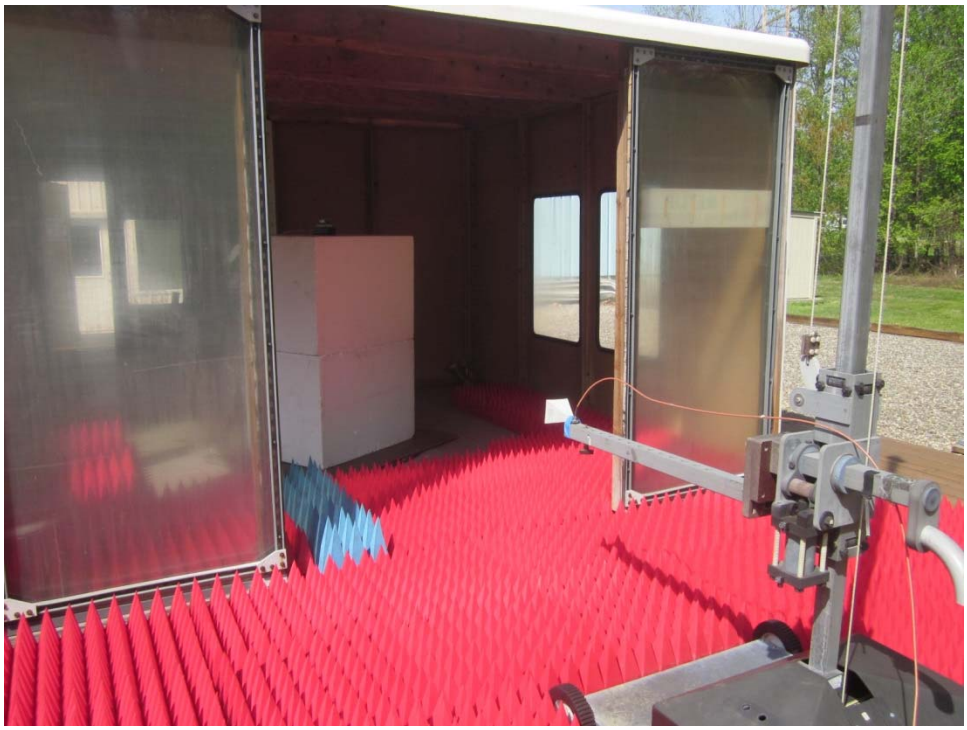
Test Photographs
Spurious Radiated Emissions (30 MHz to 25 GHz)

Horizontal Antenna Polarization, 1 GHz to 18 GHz, Double Ridge Guide

Vertical Antenna Polarization, 1 GHz to 18 GHz, Double Ridge Guide

Test Photographs
Spurious Radiated Emissions (30 MHz to 25 GHz)

Horizontal Antenna Polarization, 18 GHz to 25 GHz, Horn



Vertical Antenna Polarization, 18 GHz to 25 GHz, Horn

FCC Section 15.247 (d) / RSS-GEN, 8.9
Spurious Radiated Emissions, 30 MHz to 25 GHz
Test Data

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET	
Test Method	**Spurious Emissions 30 MHz to 25 GHz**
Customer	Echelon
Job Number	R-6201N-1
Test Sample	Control Router Device
Model Number	76530R
Serial Number	0503F3C3DB00, 0503F3C14500
Test Specification	FCC Part. 15.209(a)
Operating Mode	Standby
Technician	M. Seamans
Date	May 17th, 2017

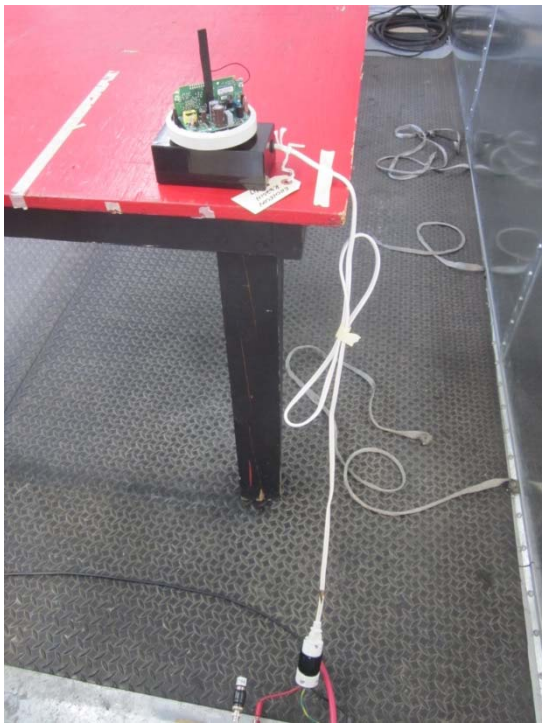
Notes: EUT Antenna replaced with Dummy Load
Test Antenna Distance: 3 meters Detector: Quasi-Peak < 1GHz; Average > 1GHz

TEST PARAMETERS

Frequency	Antenna Position	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading			Limit at 3M
MHz	(H/V) / Height	Degrees	dBuV	dB	dBuV/m			dBuV/m
30.00	-	-	-	-	-			40.0
|	-	-	-	-	-			|
35.00	V-1m	0.0	7.63	15.72	23.35	*		|
|	-	-	-	-	-			|
88.00	-	-	-	-	-			40.0
88.00	-	-	-	-	-			43.5
|	-	-	-	-	-			|
110.00	V-1m	0.0	11.75	10.12	21.87	*		|
160.00	V-1m	0.0	6.96	12.56	19.52	*		|
|	-	-	-	-	-			|
216.00	-	-	-	-	-			43.5
216.00	-	-	-	-	-			46.0
|	-	-	-	-	-			|
241.60	H-1.75m	270.0	14.43	15.77	30.20			|
|	-	-	-	-	-			|
960.00	-	-	-	-	-			46.0
960.00	-	-	-	-	-			54.0
|	-	-	-	-	-			|
4950.80	V-2m	0.0	46.90	0.41	47.31			|
12000.00	V-1m	0.0	41.82	7.90	49.72	*		|
22000.00	V-1m	0.0	41.70	-5.71	35.99	*		|
|	-	-	-	-	-			|
25000.00	-	-	-	-	-			54.0

EUT emissions within 10 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum. * This emission is not from the EUT. It is a measurement of minimum measurement system sensitivity (Noise Floor).

Test Photographs
AC Conducted Emissions



Configuration

Test Setup

FCC Section 15.207(a)/ RSS-GEN, 8.8
AC Conducted Emissions
Test Data

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	**Conducted Emissions, Class B 150 kHz to 30 MHz**	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart B Class B	Paragraph: 15.207 (a)
Operating Mode	Transmitting modulated signal	
Technician	M. Seamans	
Date	May 17th, 2017	
Port Tested	120 VAC 60 Hz	

Notes: Lead Tested: 120 VAC 60 Hz Hot Detector: Quasi-Peak and Average

TEST PARAMETERS

Test Frequency	Lead Tested	Quasi-Peak Reading	Quasi-Peak Limit	Quasi-Peak Margin		Average Reading	Average Limit	Average Margin
MHz		dBuV	dBuV	dB		dBuV	dBuV	dB
0.150	-	-	66.0	-		-	56.0	-
|	-	-	|	-		-	|	-
0.160	Hot	56.60	65.5	8.89		44.4	55.5	11.1
0.181	Hot	52.80	64.4	11.64		30.6	54.4	23.8
0.205	Hot	51.40	63.4	12.01		34.7	53.4	18.7
0.236	Hot	50.00	62.2	12.24		29.3	52.2	22.9
0.258	Hot	48.70	61.5	12.80		38.8	51.5	12.7
0.278	Hot	51.80	60.9	9.08		40.7	50.9	10.2
|	-	-	|	-		-	|	-
0.500	-	-	56.0	-		-	46.0	-
|	-	-	|	-		-	|	-
0.572	Hot	39.50	|	16.50		21.0	|	25.0
1.247	Hot	35.00	|	21.00		20.7	|	25.3
|	-	-	|	-		-	|	-
5.000	-	-	56.0	-		-	46.0	-
5.000	-	-	60.0	-		-	50.0	-
|	-	-	|	-		-	|	-
30.000	-	-	60.0	-		-	50.0	-

EUT emissions observed throughout the given frequency spectrum were recorded and evaluated. Emission levels closest to the limit are listed on this data sheet.

Data Sheet 1 of 2

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET		
Test Method	**Conducted Emissions, Class B 150 kHz to 30 MHz**	
Customer	Echelon	
Job Number	R-6201N-1	
Test Sample	Control Router Device	
Model Number	76530R	
Serial Number	0503F3C3DB00, 0503F3C14500	
Test Specification	FCC Part 15 Subpart B Class B	Paragraph: 15.207 (a)
Operating Mode	Transmitting modulated signal	
Technician	M. Seamans	
Date	May 17th, 2017	
Port Tested	120 VAC 60 Hz	

Notes: Lead Tested: 120 VAC 60 Hz Neutral Detector: Quasi-Peak and Average

TEST PARAMETERS

Test Frequency	Lead Tested	Quasi-Peak Reading	Quasi-Peak Limit	Quasi-Peak Margin		Average Reading	Average Limit	Average Margin
MHz		dBuV	dBuV	dB		dBuV	dBuV	dB
0.150	-	-	66.0	-		-	56.0	-
|	-	-	|	-		-	|	-
0.161	Neutral	57.30	65.4	8.14		48.5	55.4	6.9
0.220	Neutral	52.60	62.8	10.22		42.5	52.8	10.3
0.244	Neutral	48.40	62.0	13.58		27.4	52.0	24.6
0.271	Neutral	53.70	61.1	7.39		45.9	51.1	5.2
0.276	Neutral	54.00	60.9	6.94		44.4	50.9	6.5
0.308	Neutral	48.60	60.0	11.42		32.0	50.0	18.0
0.336	Neutral	47.00	59.3	12.30		32.7	49.3	16.6
0.436	Neutral	37.80	57.1	19.34		27.8	47.1	19.3
|	-	-	|	-		-	|	-
0.500	-	-	56.0	-		-	46.0	-
|	-	-	|	-		-	|	-
5.000	-	-	56.0	-		-	46.0	-
5.000	-	-	60.0	-		-	50.0	-
|	-	-	|	-		-	|	-
30.000	-	-	60.0	-		-	50.0	-

EUT emissions observed throughout the given frequency spectrum were recorded and evaluated. Emission levels closest to the limit are listed on this data sheet.

Data Sheet 2 of 2