RETLIF TESTING LABORATORIES | Put Us To The Test℠
101 New Boston Road
Goffstown, NH 03045 USA
Tel: (603) 497-4600 • Fax: (603) 497-5281 • www.retlif.com

FCC Part 15, Subpart C, Section 15.247
Test Report

On

Senet Lora Base Station

Customer Name: Senet, Inc.

Customer P.O: 670

Date of Report Revision: May 12, 2015

Test Report No.: R-5934N-2, Rev. A

Test Start Date: March 30, 2015

Test Finish Date: May 6, 2015

Test Technician: M. Seamans

Revision Approved By: S. Wentworth

Report Revision Prepared By: J. Ramsey

Our letters, procedures and reports are for the exclusive use of the customer to whom they are addressed and their communication or the use of the name of Retlif Testing Laboratories must receive our prior written approval. Our letters, procedures and reports apply only to the sample tested and are not necessarily indicative of the qualities of apparently identical or similar products. The letters, procedures and reports and the name of Retlif Testing Laboratories or insignia are not to be used under any circumstances in advertising to the general public. This test report shall not be reproduced, except in full, without the written approval of Retlif Testing Laboratories.

Technical Information

Report Number:	R-5934N-2, Rev. A
Customer:	Senet, Inc.
Address:	46 River Road Hudson, NH 03051
Manufacturer:	Senet, Inc.
Manufacturer Address:	46 River Road Hudson, NH 03051
Test Sample:	LoRa Base Station
Model Number:	5863
Serial Number:	000012
FCC ID:	X94-0005845
Antenna Types:	LCOM HG908U-PRO 8 dBi Omnidirectional Antenna L-COM DHGV-906U 6 dBi Omnidirectional Antenna
Power Requirements:	DC Powered via the Bottom Tower Box
Frequency Band of Operation:	902.6 MHz to 927.5 MHz
Frequencies Tested:	902.6 MHz, 914.9 MHz, 927.5 MHz
Equipment Use:	Base Station used with Senet Oil & Propane eSensor Transmitters

Test Specification:
FCC Rules and Regulations Part 15, Subpart C, Section 15.247

Test Procedure:
ANSI C63.4:2003

558074 D01, FCC Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247, June 5, 2014

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

FCC Registered Test Site Number: 90899

Tests Performed

The test methods performed on the LoRa Base Station are shown below:

Table 1 – Tests Performed

FCC Part 15, Subpart C	Test Method
15.247(a)(2)	Occupied Bandwidth (6 dB Bandwidth)
15.247(b)(3)	Output Power
15.247(d)	Antenna Port Out of Band /Band Edge/Non-Restricted Band Conducted Emissions (30 MHz to 10 GHz)
15.247 (d)	Restricted Band Emissions
15.247(d)	Radiated Spurious Emissions, 30 MHz to 10 GHz
15.247(e)	Power Density
15.207(b)	*Conducted Emissions, Power Leads, 150 kHz to 30 MHz

***NOTE**: The EUT receives DC Power from the Bottom Tower Box which is powered by 120VAC, 60Hz. Conducted emissions testing was performed at the system level on the AC input power leads of the bottom tower box.

General Test Requirements

1. The measurement procedures of ANSI C63.4:2003 and ANSI C63.10: 2013 were utilized as specified in FCC Part 15, Subpart C, Section 15.31(a)(3) and FCC Guidance for Performing Compliance Measurements on Digital Transmission Systems, June 5, 2014.
2. All radiated emissions measurements were performed on an Open Area Test Site (OATS), listed with the FCC, in accordance with FCC Section 15.31(d).
3. All measurements were performed at the specified 3 meter test distance as required by FCC Section 15.31(f).
4. The EUT was rotated throughout 360 degrees for all radiated emissions measurements as specified in FCC Section 15.31(f)(5).
5. All readily accessible EUT controls were adjusted in such a manner as to maximize the level of emissions in accordance with FCC Section 15.31(g).
6. Appropriate accessories were attached to all EUT ports during the performance of radiated emissions measurements as required by FCC Section 15.31(i).
7. The EUT operated over the frequency range of 902.6 MHz to 927.5 MHz. Testing was performed with the device operating at 3 frequencies, 1 at the top, 1 in the middle and 1 at the bottom of the range of operation in accordance with FCC Section 15.31(m).
8. The frequency spectrum was investigated from the lowest frequency generated in the device up to the 10th harmonic of the highest fundamental frequency in accordance with FCC Section 15.33(a)(1).
9. The EUT has a Type N antenna port for connection to an omni antenna. The EUT will be installed on top of towers or tall buildings, will always be professionally installed and therefore is not required to have a unique antenna connector.

Power Leads and Interconnecting Cables:
All power and interconnecting cables, including cable length, routing and type were as specified in Table 2:

Table 2 - EUT Interconnecting Cable Configurations

System Component	EUT Port	Cable Length (Meters)	Signal Description	Cable Description	Routed To
Tower Box (Top)	Ethernet	15.24	Ethernet	Shielded Ethernet	Tower Box (Bottom)
Tower Box (Top)	RF	1.0	RF	Shielded RF Coaxial	Antenna or Test Equipment/Load

Support Equipment:
All equipment that was utilized to achieve the EUT operating state specified is listed in Table 3:

Table 3 - Support Equipment

Description	Manufacturer	Model Number	Serial Number
Tower Box (Bottom)	Senet Inc.	5875	000010
Laptop PC	Toshiba	C55-A5300	9D030876Q
Wireless Router	Netgear	WNR1000	Z8P2OB7K09CZ8

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
Laboratory Supervisor
iNARTE Certified 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
-	April 21, 2015	Original Release
A	May 12, 2015	Global Changes: • Document changed from R-5934N-2 to R-5934N-2, Rev. A 7-8: • Added last paragraph and updated results to Output Power section 8: • Revised title of Unwanted Emissions paragraph 9: • Added Restricted Band Emissions & Unwanted Emissions sections 11: • Revised RF Exposure section 12: • Updated Antenna Port Conducted Emissions list to include Restricted Band Emissions method 20: • Updated Conducted Output Power (Integrated) data 34: • Added Restricted Band Emissions Section (photo and data) 50: • Replaced Radiated Spurious Emissions data

Requirements and Test Results

Requirement: 6dB Bandwidth
FCC Section 15.247(a)(2)
Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz
Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz bands. The minimum 6 dB bandwidths shall be at least 500 kHz.

- Results:
  The minimum 6 dB bandwidth measured 641.28 kHz which complies with the minimum bandwidth requirement of 500 kHz.

Requirement: Output Power
FCC Sections 15.247(b)(3)
Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz

The maximum conducted output power of the intentional radiator shall not exceed the following:

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 antenna 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 antenna 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.

If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Output Power testing was performed utilizing the test procedure specified in FCC DTS Measurement Guideline 558074 D01, Paragraph 9.2.2.2 AVGSA-1 (trace averaging with the EUT transmitting at full power throughout each sweep). The output power was determined by integrating the spectrum across the OBW of the signal using the channel/band power measurement function.

Requirements and Test Results (con't)

- Results:
  The device operates in the 902 - 928 MHz band. The maximum peak output power was measured and was found to be 27.65 dBm (582 mW). The antenna with the highest gain used with this device is the 8 dBi gain omni antenna which means that the conducted power to the antenna must be limited to 28 dBm. The device was found to meet the power output requirements of 15.247 (b)(3) including de facto EIRP.

Requirement: Unwanted Emissions
FCC Section 15.247(d)
Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz

Antenna Port Out of Band/Band Edge/Non-Restricted Band 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 this section, 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) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) must also comply with the radiated emissions limits specified in Section 15.209(a) (see Section 15.205(c)).

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

Requirements and Test Results (con't)

Restricted Band Emissions

Emissions which fall into restricted bands must comply with the general radiated emissions limits as specified in Table 4. The Antenna Port conducted emissions test method described in FCC DTS Measurement Guideline 558074 D01, Paragraph 12.2.2 was utilized to show compliance. The maximum transmit antenna gain was added to the conducted power level of the observed emissions to determine the EIRP level. The appropriate ground reflection factor was added to the EIRP level and then the final EIRP level was converted to the equivalent electric field strength.

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

Requirement: Unwanted Emissions
FCC Section 15.247(d)
Radiated Spurious Emissions

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. For these measurements the EUT transmit antenna was removed and replaced with a termination matching the nominal impedance (50 ohms) of the antenna.

Table 4 - Radiated Spurious/Restricted Band/Band Edge Emissions 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

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

Requirements and Test Results (con't)

Requirement: Power Spectral Density
FCC Section 15.247(e):
Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz

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 maximum measured power spectral density was 7.57 dBm which complied with the specified power density limit and the device was found to meet the requirements of 15.247(e).

Requirement: AC Line Conducted Emissions
FCC Section 15.207(a) - Conducted Limits

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 5, 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.

The conducted emissions shall be measured with a 50 ohm/50 microhenry line impedance stabilization network.

Table 5 - 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 5.

Requirements and Test Results (con't)

FCC Section 15.247(i) – RF Exposure

Transmitters operating under 15.247 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 the separation distance for acceptable MPE power density levels to meet both the Occupational/Controlled Exposure and the General Population/Uncontrolled Exposure requirements of 1.1310 was calculated.

The calculation below uses the more stringent General Population MPE Limits and the highest gain antenna that will be used (8dBi Omni Antenna).

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

D = Minimum Separation Distance in cm

S = Max allowed Power Density in mW/cmsq

Per 1.1310 For Frequency of 900 MHz = 0.6mW/cmsq

Power = Max Power Input to Antenna = 582 mW

Gain = Max Power Gain of Antenna = 8.0 dBi = 6.31 numeric

$$0.6\text{mW/cmsq} = \frac{582 \times 6.31}{4\,(3.14) \times Dsq} = \frac{3672.42}{12.56 \times Dsq}$$

$$Dsq = \frac{3672.42}{12.56 \times 0.6} = 487.32$$

D = sq. root 487.32 = 22 cm

The installation manual will contain a RF Exposure Statement and specify that a 22 cm separation distance from the antenna will be maintained.

Equipment List

FCC Section 15.247(a)(2)
Occupied Bandwidth

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5039	FLUKE	ATTENUATOR, COAXIAL	20 dB, DC - 12.4 GHz	Y9305	12/17/2014	12/31/2015
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/29/2014	10/31/2016

FCC Section 15.247(b)(3)
Power Output

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5039	FLUKE	ATTENUATOR, COAXIAL	20 dB, DC - 12.4 GHz	Y9305	12/17/2014	12/31/2015
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/29/2014	10/31/2016

FCC Section 15.247(d)
Antenna Port Conducted Emissions/Restricted Band Emissions

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5039	FLUKE	ATTENUATOR, COAXIAL	20 dB, DC - 12.4 GHz	Y9305	12/17/2014	12/31/2015
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/29/2014	10/31/2016

FCC Section 15.247(e)
Power Density

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
5039	FLUKE	ATTENUATOR, COAXIAL	20 dB, DC - 12.4 GHz	Y9305	12/17/2014	12/31/2015
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/29/2014	10/31/2016

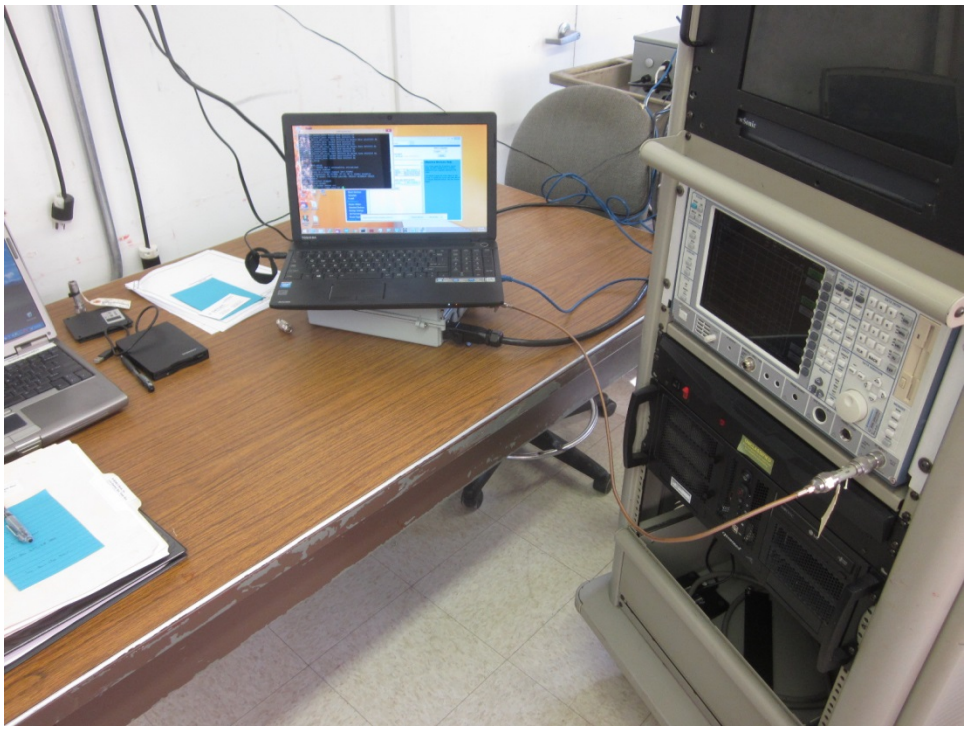
FCC Section 15.247(d)
Radiated Spurious Emissions, 30 MHz to 10 GHz

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
1232	AGILENT / HP	PRE-AMPLIFIER	1 - 26.5 GHz	8449B	6/24/2014	6/30/2015
3258	ETS / EMCO	ANTENNA, DOUBLE RIDGED GUIDE	1 - 18 GHz	3115	9/4/2013	3/31/2015
5195	ETS / EMCO	ANTENNA, DOUBLE RIDGED GUIDE	1 - 18 GHz	3117	6/12/2014	12/31/2015
8165	ETS / EMCO	ANTENNA, BICONILOG	26 - 2000 MHz	3142	5/20/2013	5/31/2015
R462	AGILENT / HP	ANALYZER, SPECTRUM	9 kHz - 26.5 GHz	E7405A	1/8/2015	1/31/2016

FCC Section 15.207(a)
Conducted Emissions, Power Leads, 150 kHz to 30 MHz

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
4027	SOLAR ELECTRONICS	LISN	50 uH, 10 KHz - 50 MHz	9252-50-R-24BNC	2/23/2015	2/29/2016
4028	ACME	TRANSFORMER, ISOLATION		120X240	No Calibration Required	
5070	ROHDE & SCHWARZ	RECEIVER, EMI	20 Hz - 40 GHz	ESIB40	10/29/2014	10/31/2016
5133	NARDA MICROWAVE	ATTENUATOR, COAXIAL	10 dB, DC - 12.4 GHz	757C-10	10/28/2014	10/31/2015
5188	Cybertron	COMPUTER, CONTROL	N/A	TSVQJA2221	No Calibration Required	

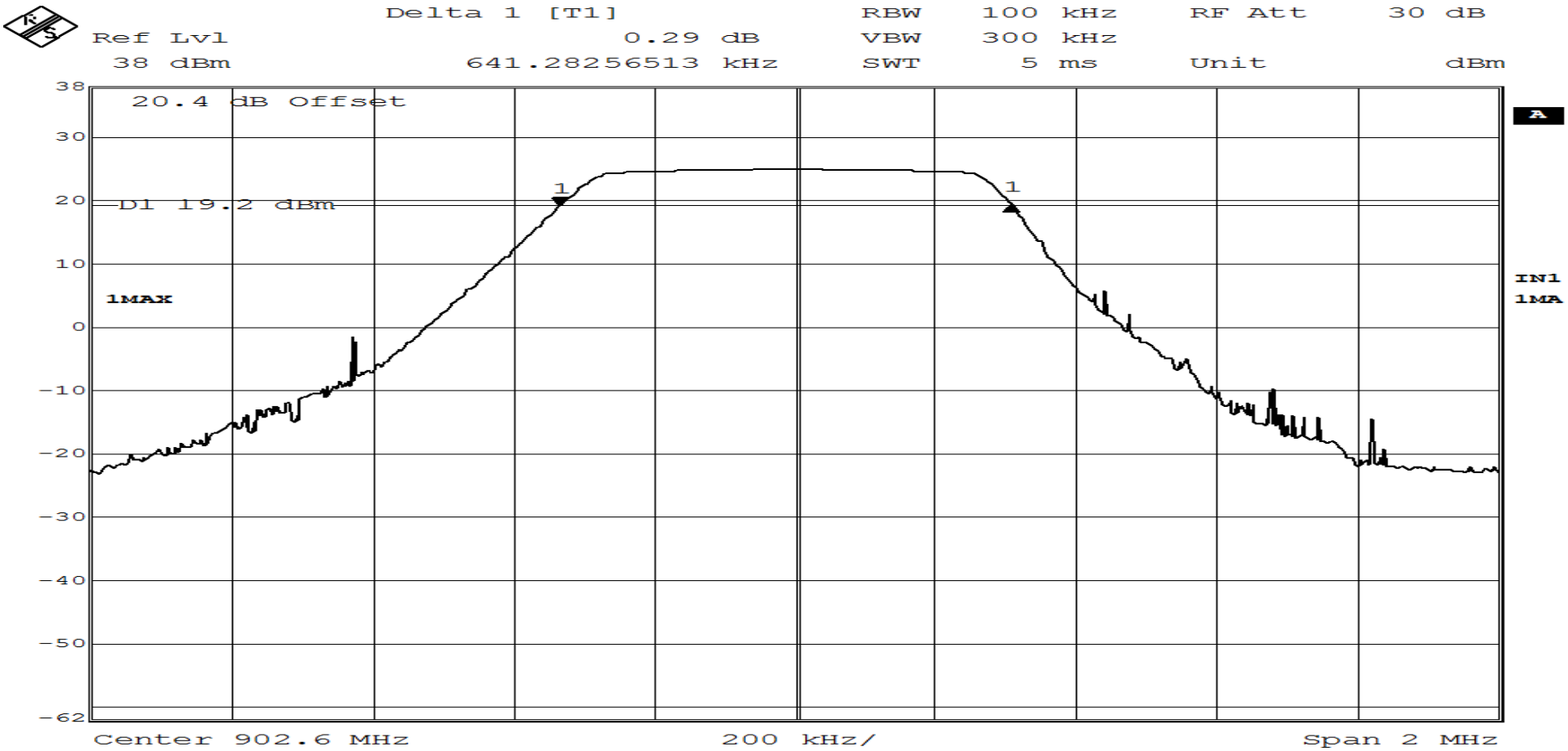
Test Photograph
6dB Bandwidth



FCC Part 15, Subpart C, Section 15.247(a)(2)
6dB Bandwidth
Test Data

RETLIF TESTING LABORATORIES

Test Method:	6dB Bandwidth		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 902.6 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (a)(2)		
Technician	M. Seamans	**Date**	April 21st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 23.0 %		
Notes	Occupied Bandwidth: 641.28 kHz		

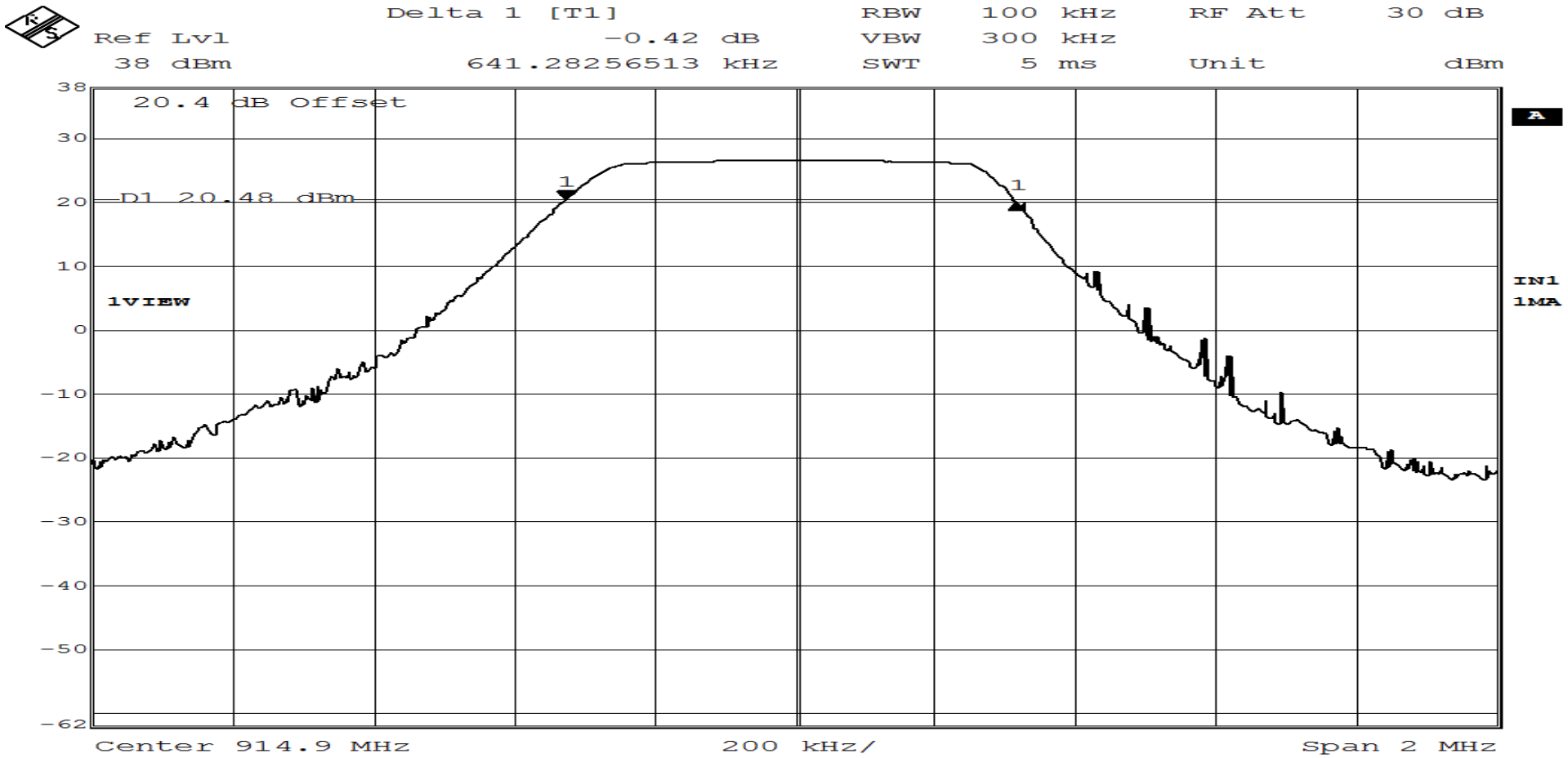


Date: 21.APR.2015 08:51:43

Page 1 of 3

RETLIF TESTING LABORATORIES

Test Method:	6dB Bandwidth		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 914.9 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (a)(2)		
Technician	M. Seamans	**Date**	March 30th, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Occupied Bandwidth: 641.28 kHz		

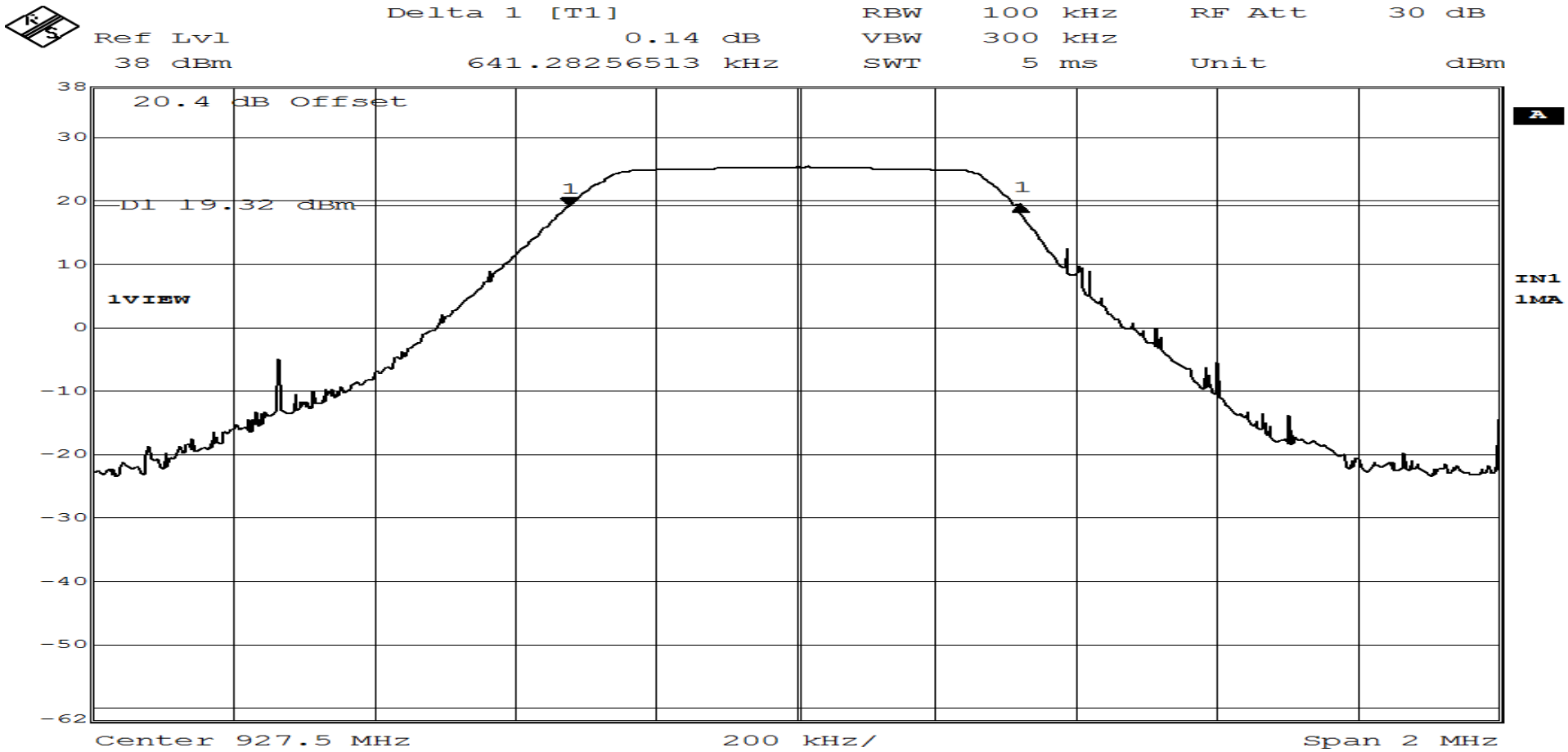


Date: 30.MAR.2015 14:17:45

Page 2 of 3

RETLIF TESTING LABORATORIES

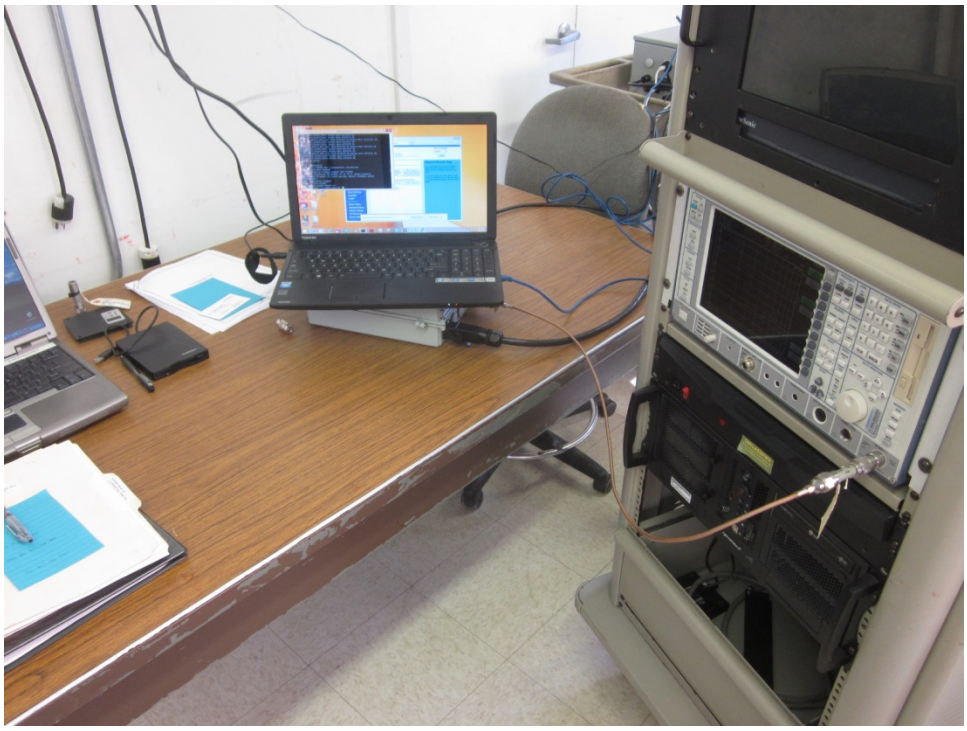
Test Method:	6dB Bandwidth		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 927.5 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (a)(2)		
Technician	M. Seamans	**Date**	March 30th, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Occupied Bandwidth: 641.28 kHz		



Date: 30.MAR.2015 14:21:13

Page 3 of 3

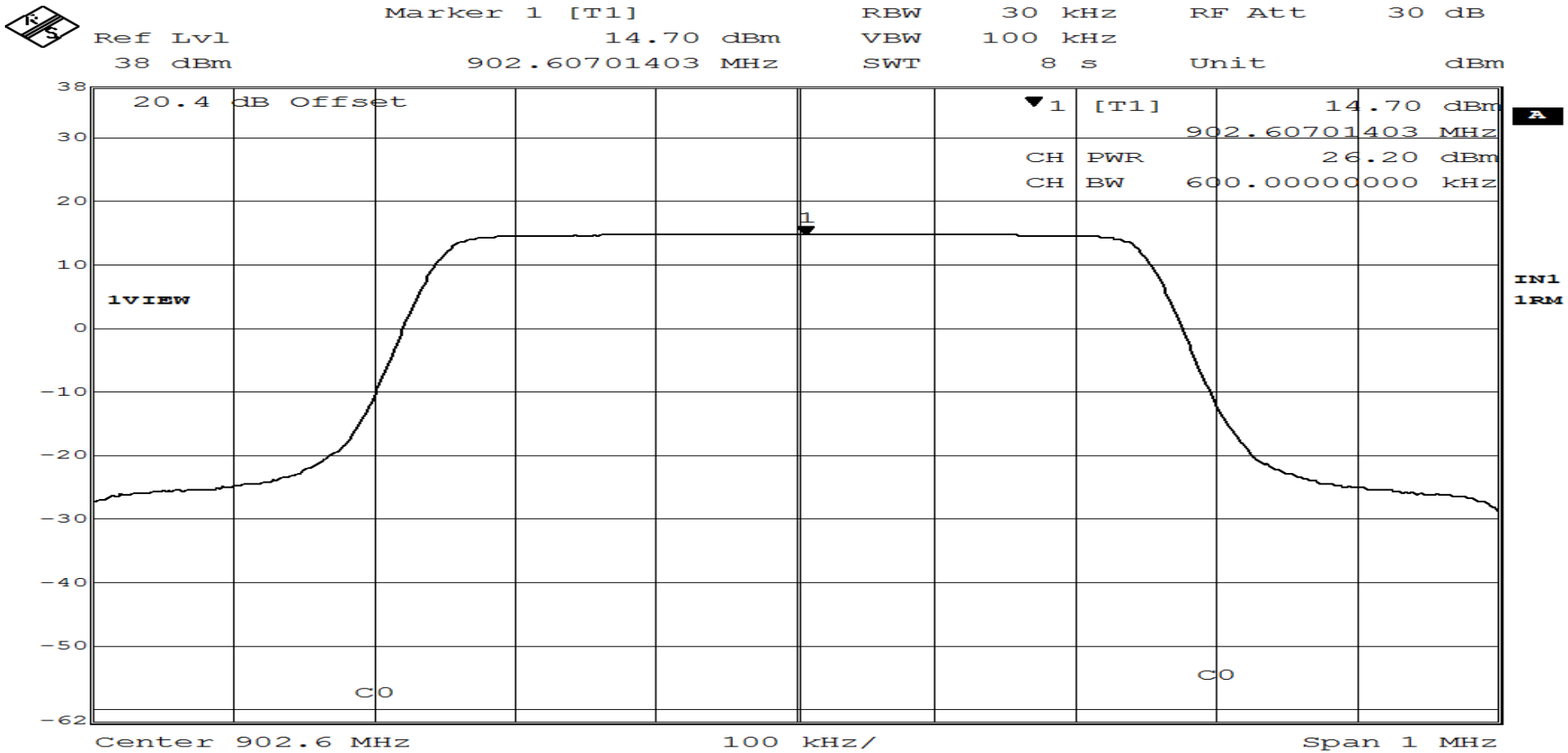
Test Photograph
Power Output



FCC Part 15, Subpart C, Section 15.247(b)(3)
Power Output
Test Data

RETLIF TESTING LABORATORIES

Test Method:	Conducted Power Output		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 902.60 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (b)(3) FCC DTS Guidance Document: KDB 558074 D01 DTS, Method 9.2.2.2		
Technician	M. Seamans	**Date**	May 6th, 2015
Climatic Conditions	Temp: 20.5 °C Relative Humidity: 34.0 %		
Notes	Power Output: 26.20 dBm		

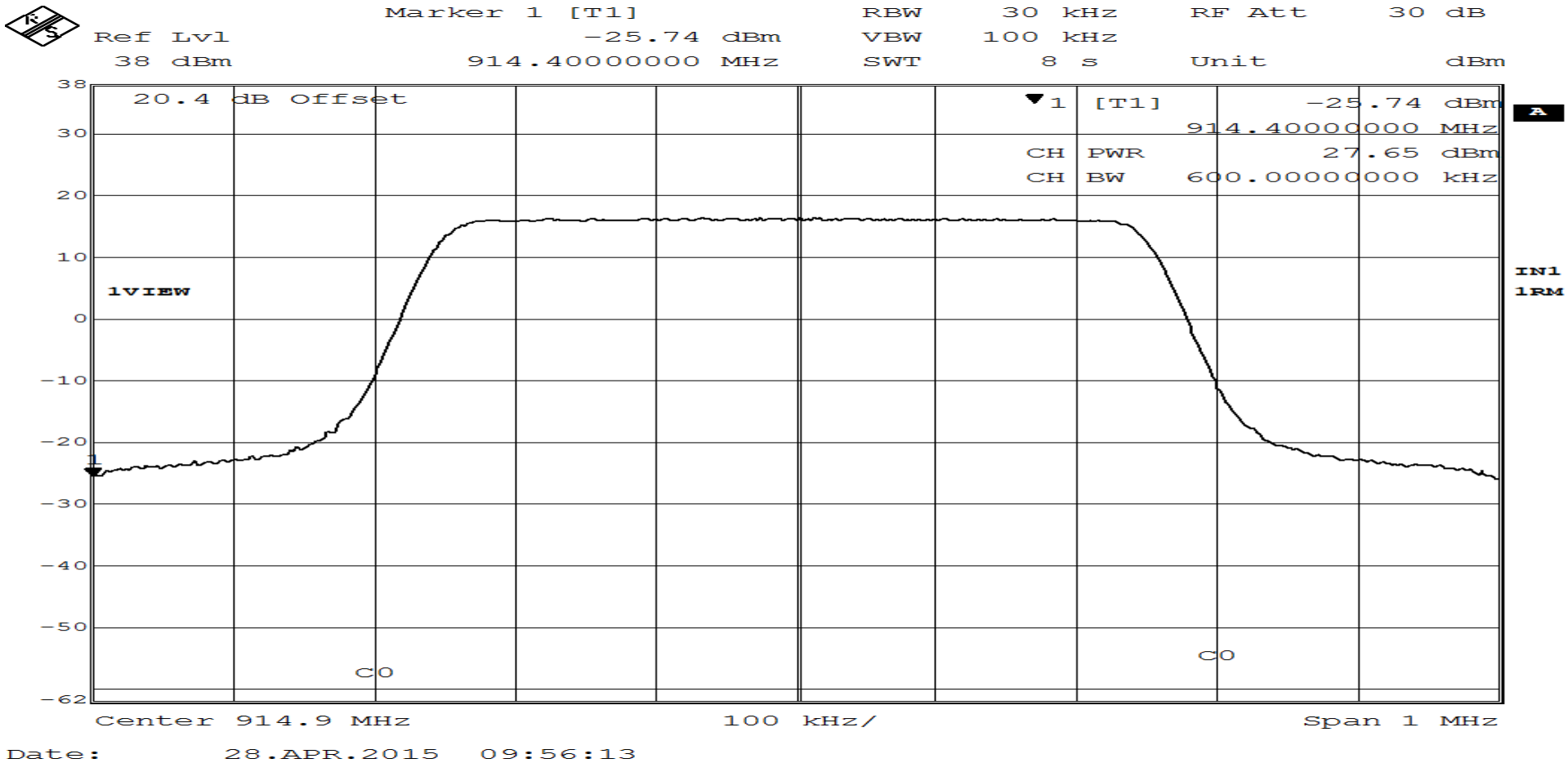


Date: 28.APR.2015 09:39:35

Page 1 of 3

RETLIF TESTING LABORATORIES

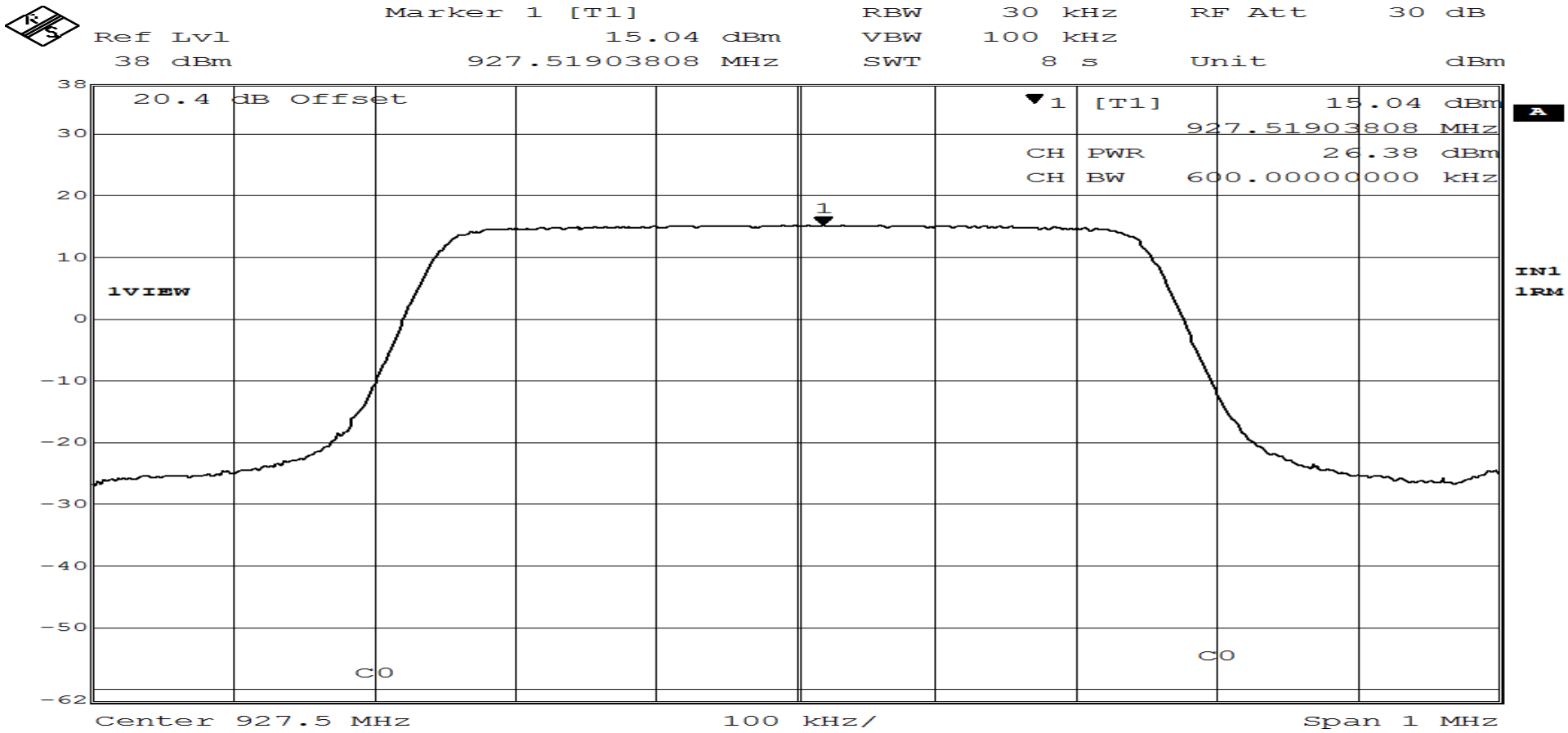
Test Method:	Conducted Power Output		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 914.9 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (b)(3) FCC DTS Guidance Document: KDB 558074 D01 DTS, Method 9.2.2.2		
Technician	M. Seamans	**Date**	May 6th, 2015
Climatic Conditions	Temp: 20.5 °C Relative Humidity: 34.0 %		
Notes	Power Output: 27.65 dBm		



Page 2 of 3

RETLIF TESTING LABORATORIES

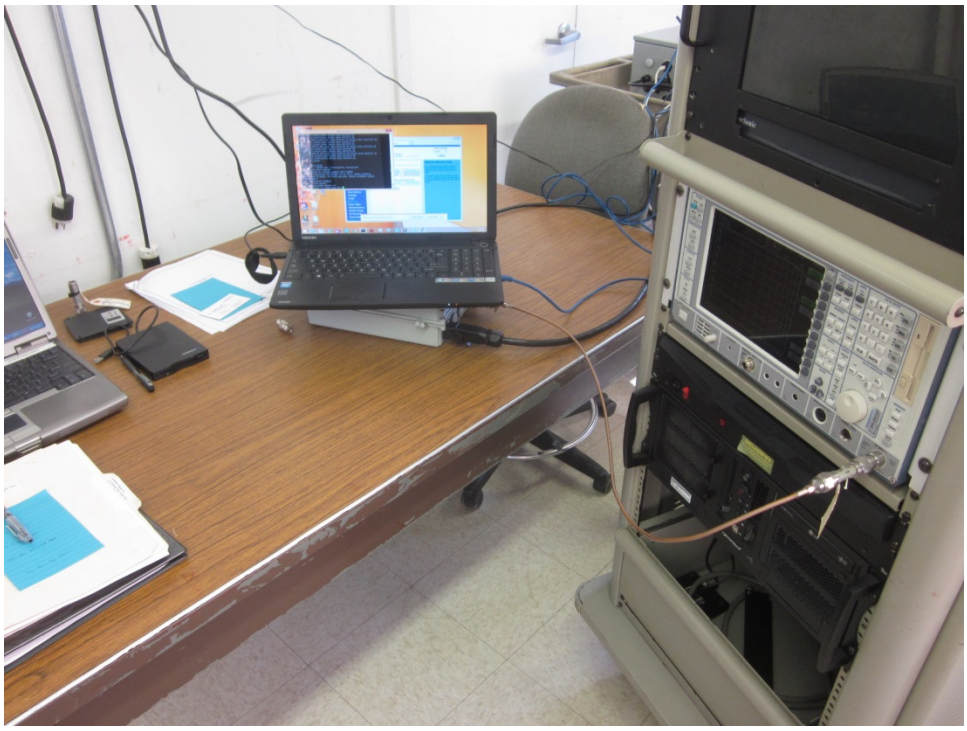
Test Method:	Conducted Power Output		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 927.5 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (b)(3) FCC DTS Guidance Document: KDB 558074 D01 DTS, Method 9.2.2.2		
Technician	M. Seamans	**Date**	May 6th, 2015
Climatic Conditions	Temp: 20.5 °C Relative Humidity: 34.0 %		
Notes	Power Output: 26.38 dBm		



Date: 28.APR.2015 10:12:22

Page 3 of 3

Test Photograph
Antenna Port, Conducted Emissions

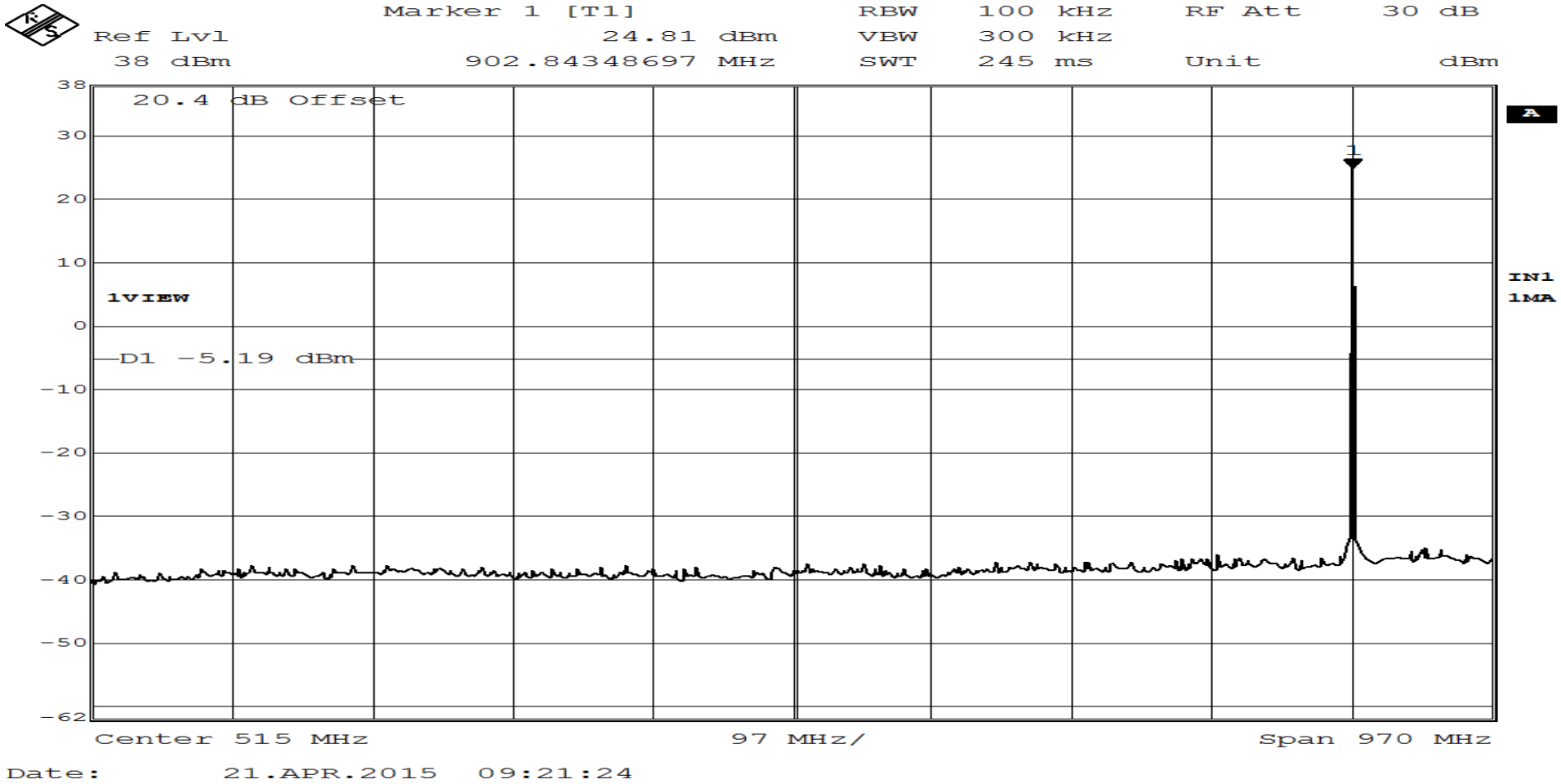


Test Setup

FCC Part 15, Subpart C, Section 15.247(d)
Antenna Port, Conducted Emissions
Test Data

RETLIF TESTING LABORATORIES

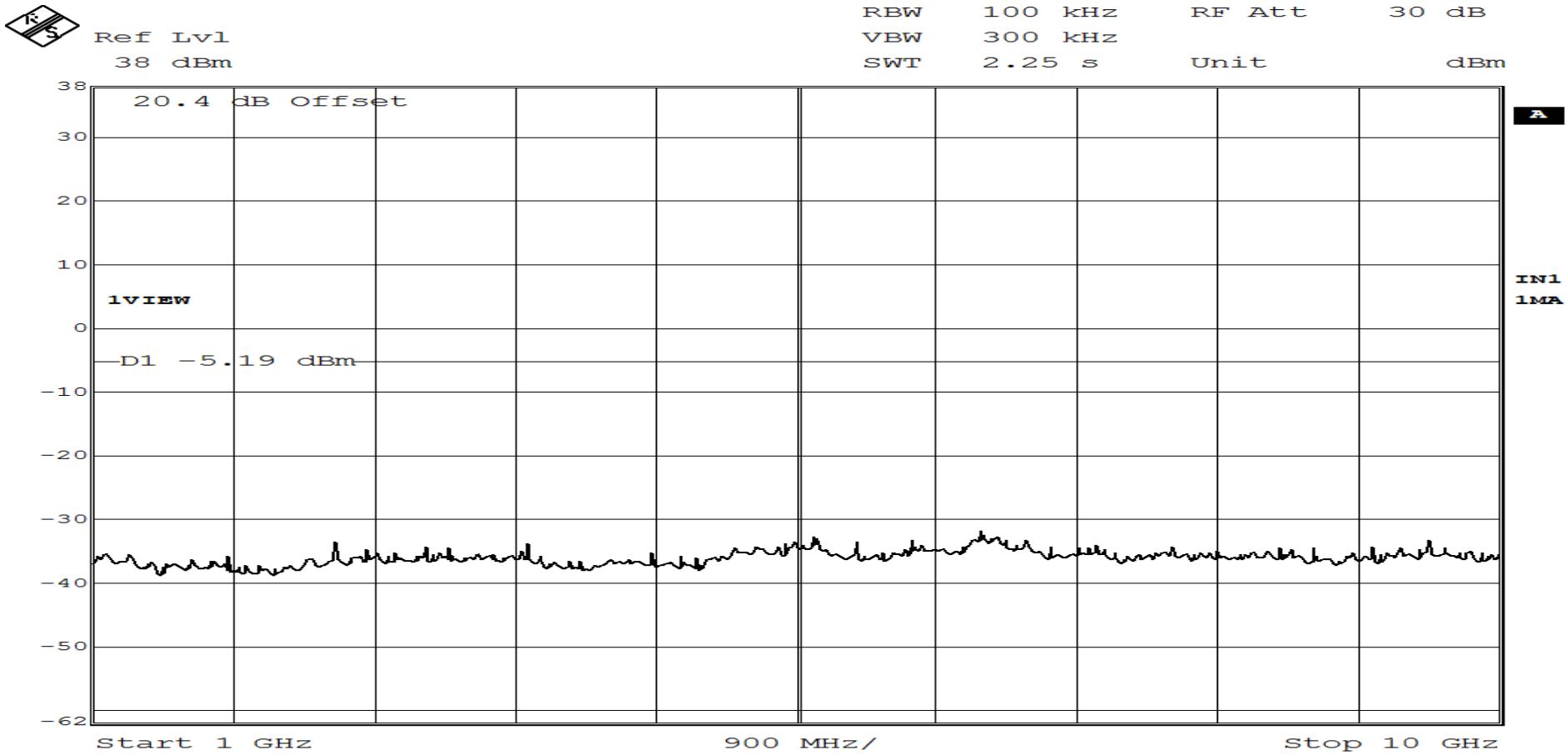
Test Method:	Out of Band Conducted Emissions 30 MHz to 10 GHz		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 902.6 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	April 21st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 26.0 %		
Notes	Limit: - 5.19 dBm (30dB down from Output Power)		



RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 30 MHz to 10 GHz		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 902.6 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	April 21st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 23.0 %		
Notes	Limit: - 5.19 dBm (30dB down from Output Power)		

Page 1 of 6

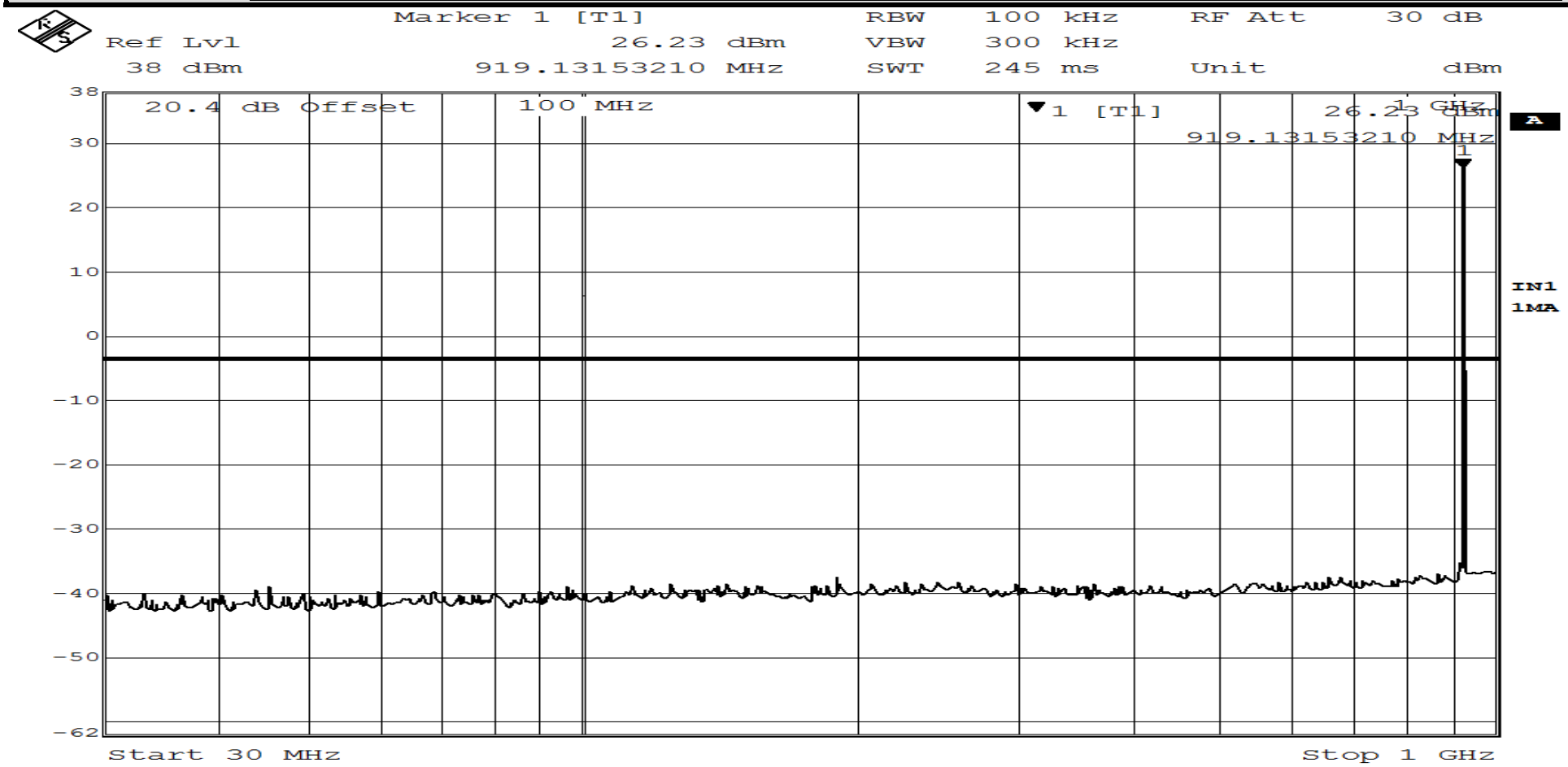


Date: 21.APR.2015 09:22:22

Page 2 of 6

RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 30 MHz to 10 GHz		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 914.9 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	March 31st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Limit: - 3.77 dBm (30dB down from Output Power)		

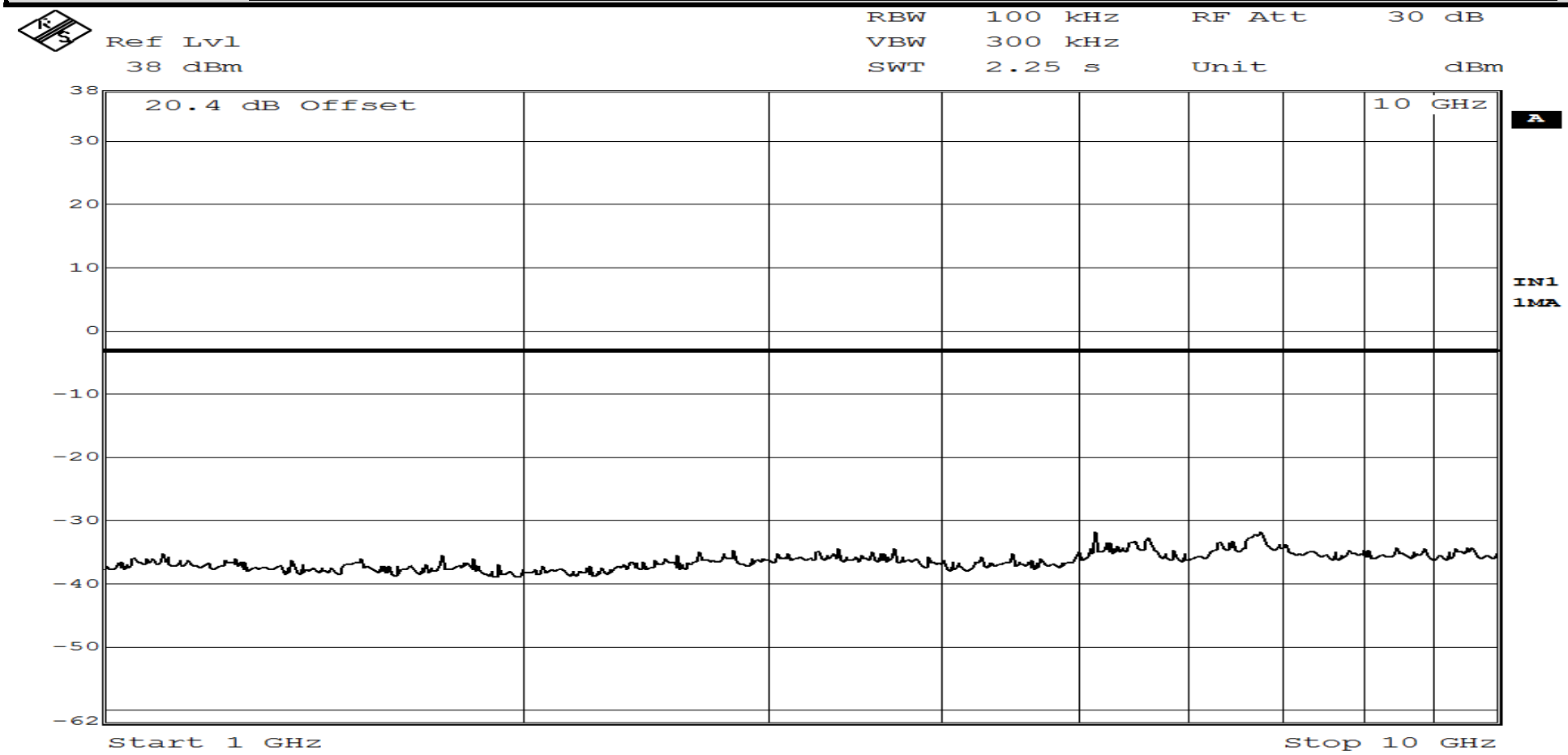


Date: 31.MAR.2015 07:40:33

Page 3 of 6

RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 30 MHz to 10 GHz		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 914.9 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	March 31st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Limit: - 3.77 dBm (30dB down from Output Power)		

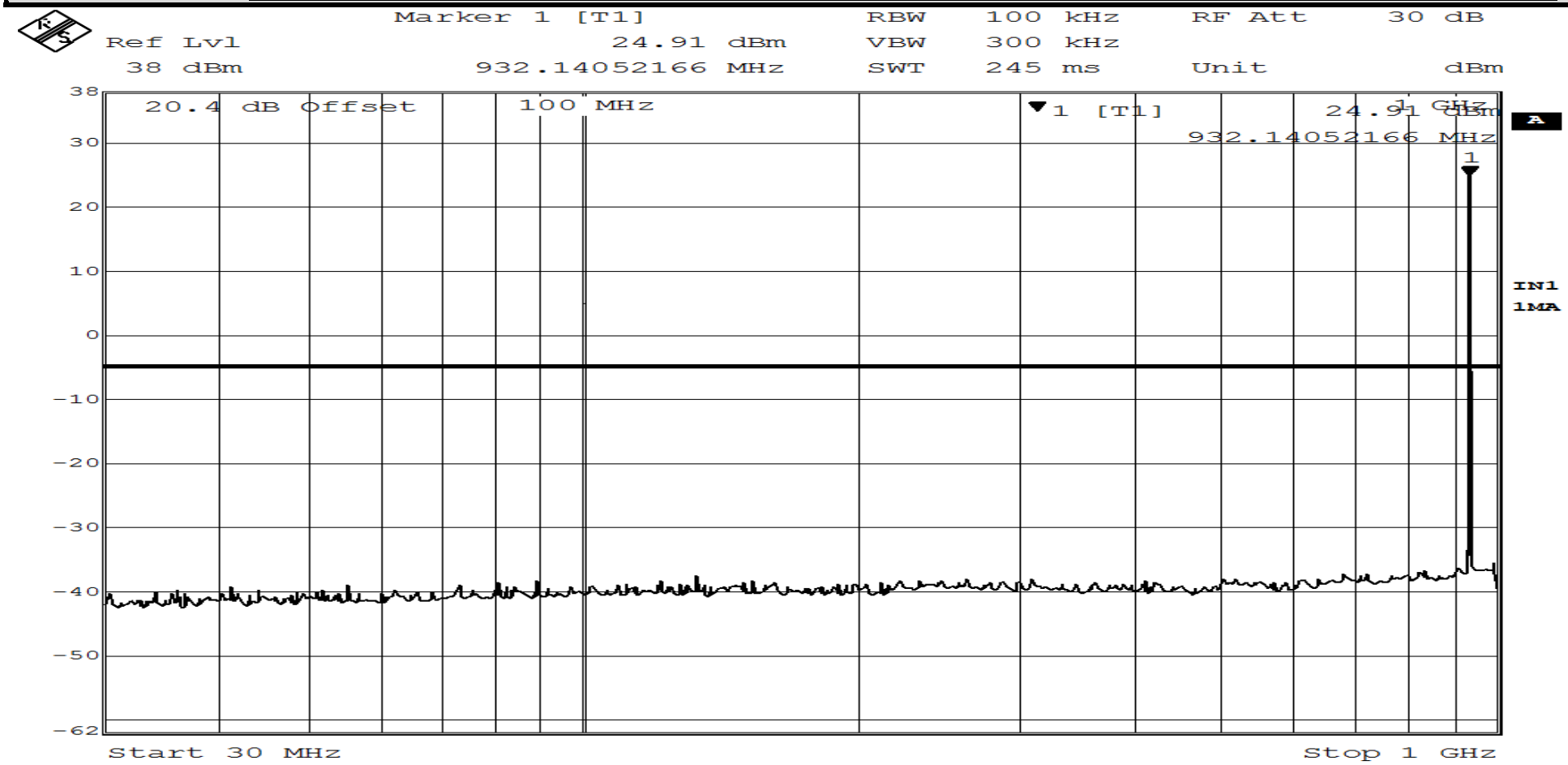


Date: 31.MAR.2015 07:42:19

Page 4 of 6

RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 30 MHz to 10 GHz		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 927.5 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	March 31st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Limit: - 5.09 dBm (30dB down from Output Power)		

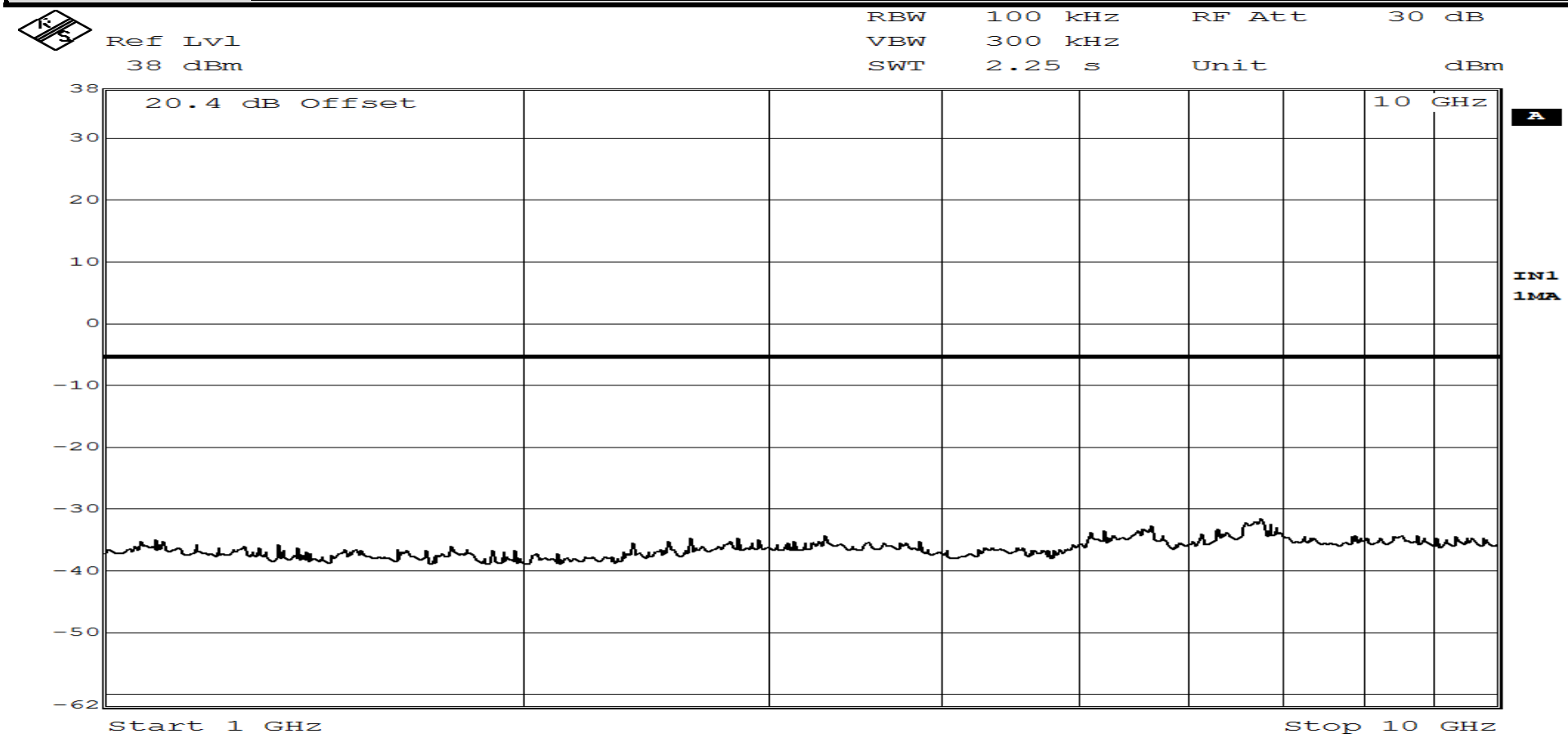


Date: 31.MAR.2015 07:48:12

Page 5 of 6

RETLIF TESTING LABORATORIES

Test Method:	Out of Band Conducted Emissions 30 MHz to 10 GHz		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 927.5 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	March 31st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Limit: - 5.09 dBm (30dB down from Output Power)		

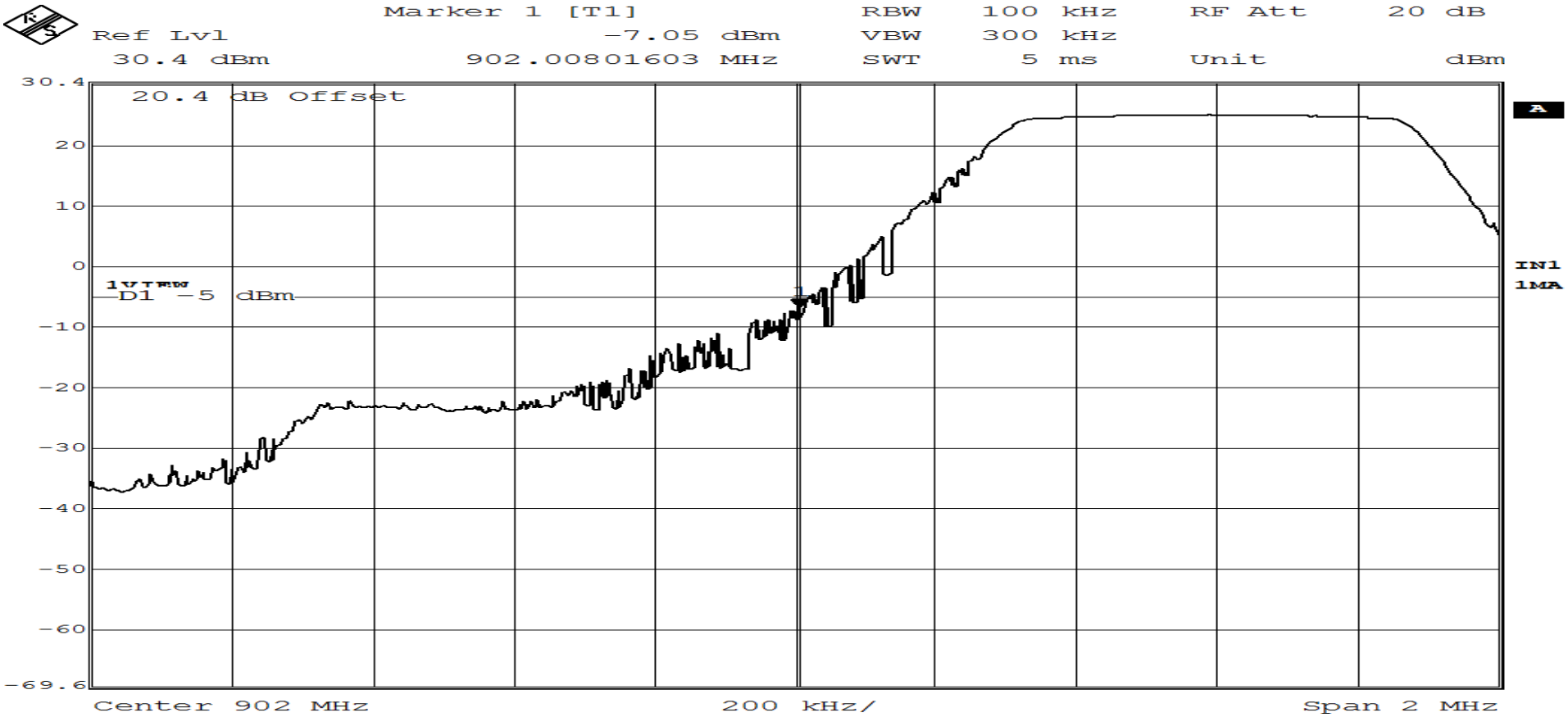


Date: 31.MAR.2015 07:50:44

Page 6 of 6

RETLIF TESTING LABORATORIES

Test Method:	Band Edge Conducted		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 902.60 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	March 31st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Lower Band Edge Reading: -7.05 dBm Limit: -5.00 dBm (30dB down from Output Power)		

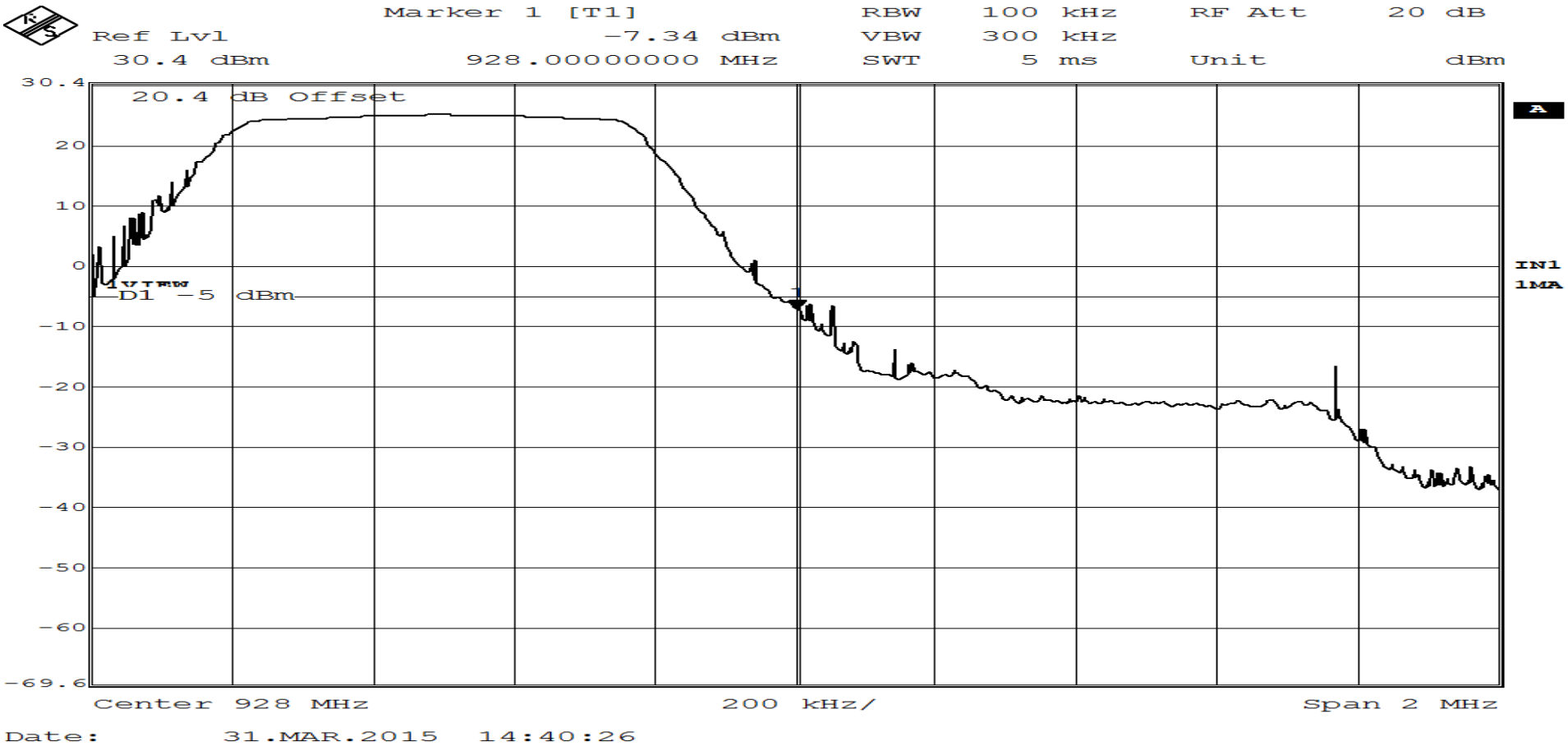


Date: 31.MAR.2015 14:38:13

Page 1 of 2

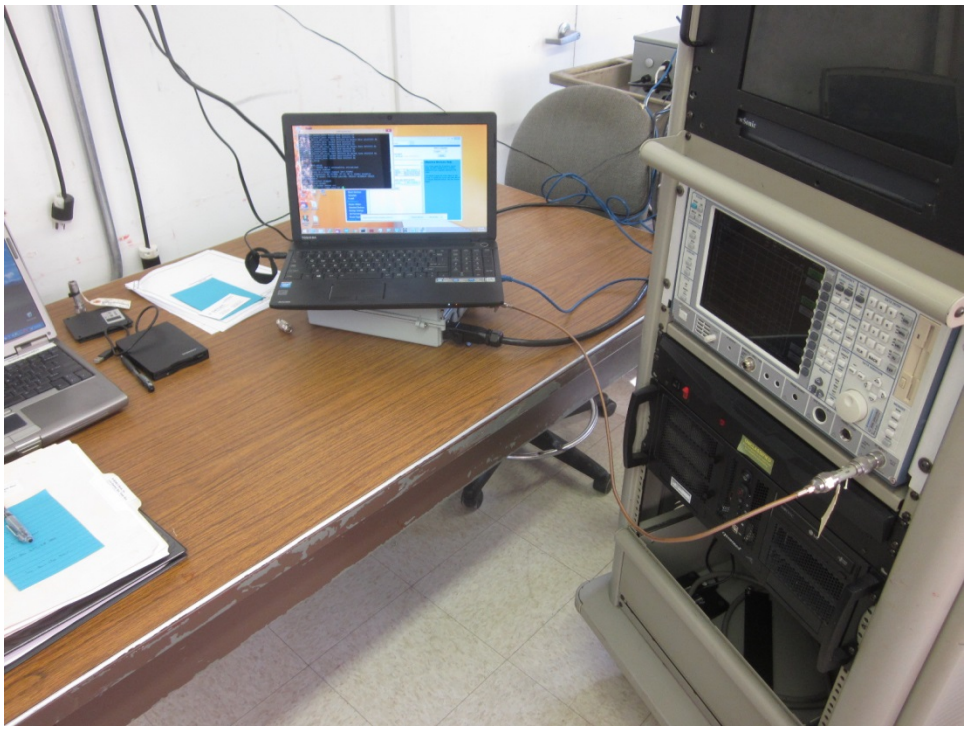
RETLIF TESTING LABORATORIES

Test Method:	Band Edge Conducted		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Part Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 927.5 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (d)		
Technician	M. Seamans	**Date**	March 31st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Upper Band Edge Reading: -7.34 dBm Limit: -5.00 dBm (30dB down from Output Power)		



Page 2 of 2

Test Photograph
Restricted Band Emissions



FCC Part 15, Subpart C, Section 15.247(d)
Restricted Band Emissions
Test Data

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Restricted Band Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	April 6th, 2015	

Notes: Conducted Measurement per 12.2.2 of the Measurement Guidance Document
Detector: Quasi-Peak <1GHz, Average >1GHz **Correction Factor**: 8dBi(Antenna)+4.7dB(Max Ground Reflection 30MHz to 1GHz, 0dB for Frequencies above 1GHz)

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading(EIRP)		Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dBm		dBuV/m	uV/m	uV/m
37.50	-	-	-	-			-	100.00
|	38.00*	-70.32*	12.7	-57.62		37.64	76.21	|
38.25	-	-	-	-			-	100.00
73.00	-	-	-	-			-	100.00
|	73.50*	-70.99*	12.7	-58.29		36.97	70.55	|
75.20	-	-	-	-			-	100.00
108.00	-	-	-	-			-	150.00
|	115.00*	-70.78*	12.7	-58.08		37.18	72.28	|
121.94	-	-	-	-			-	150.00
123.00	-	-	-	-			-	150.00
|	132.00*	-70.72*	12.7	-58.02		37.24	72.78	|
138.00	-	-	-	-			-	150.00
149.90	-	-	-	-			-	150.00
|	150.00*	-70.59*	12.7	-57.89		37.37	73.88	|
150.05	-	-	-	-			-	150.00
156.52475	-	-	-	-			-	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).

Data Sheet 1 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Restricted Band Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	April 6th, 2015	

Notes: Conducted Measurement per 12.2.2 of the Measurement Guidance Document
Detector: Quasi-Peak <1GHz, Average >1GHz **Correction Factor**: 8dBi(Antenna)+4.7dB(Max Ground Reflection 30MHz to 1GHz, 0dB for Frequencies above 1GHz)

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading(EIRP)		Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dBm		dBuV/m	uV/m	uV/m
|	156.52500*	-70.53*	12.7	-57.83		37.43	74.39	|
156.52525	-	-	-	-			-	150.00
156.70	-	-	-	-			-	150.00
|	156.80*	-70.53*	12.7	-57.83		37.43	74.39	|
156.90	-	-	-	-			-	150.00
162.0125	-	-	-	-			-	150.00
|	164.00*	-70.41*	12.7	-57.71		37.55	75.42	|
167.1700	-	-	-	-			-	150.00
167.72	-	-	-	-			-	150.00
|	170.00*	-70.43*	12.7	-57.73		37.53	75.25	|
173.20	-	-	-	-			-	150.00
240.00	-	-	-	-			-	200.00
|	260.00*	-70.02*	12.7	-57.32		37.94	78.89	|
285.00	-	-	-	-			-	200.00
322.00	-	-	-	-			-	200.00
|	330.00*	-70.51*	12.7	-57.81		37.45	74.56	|

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).

Data Sheet 2 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Restricted Band Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	April 6th, 2015	

Notes: Conducted Measurement per 12.2.2 of the Measurement Guidance Document
Detector: Quasi-Peak <1GHz, Average >1GHz **Correction Factor**: 8dBi(Antenna)+4.7dB(Max Ground Reflection 30MHz to 1GHz, 0dB for Frequencies above 1GHz)

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading(EIRP)		Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dBm		dBuV/m	uV/m	uV/m
335.40	-	-	-	-			-	200.00
399.90	-	-	-	-			-	200.00
|	409.00*	--70.23*	12.7	-57.53		37.73	77.00	|
410.00	-	-	-	-			-	200.00
608.00	-	-	-	-			-	200.00
|	611.00*	--70.48*	12.7	-57.78		37.48	74.82	|
614.00	-	-	-	-			-	200.00
960.00	-	-	-	-			-	500.00
|	980.00*	--70.04*	12.7	-57.34		37.92	78.70	|
1240.00	-	-	-	-			-	500.00
1300.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
1427.00	-	-	-	-			-	500.00
1435.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
1646.50	-	-	-	-			-	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).

Data Sheet 3 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Restricted Band Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	April 6th, 2015	

Notes: Conducted Measurement per 12.2.2 of the Measurement Guidance Document
Detector: Quasi-Peak <1GHz, Average >1GHz **Correction Factor**: 8dBi(Antenna)+4.7dB(Max Ground Reflection 30MHz to 1GHz, 0dB for Frequencies above 1GHz)

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading(EIRP)		Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dBm		dBuV/m	uV/m	uV/m
1660.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
1710.00	-	-	-	-			-	500.00
1718.80	-	-	-	-			-	500.00
|	-	-	-	-			-	|
1722.20	-	-	-	-			-	500.00
2200.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
2300.00	-	-	-	-			-	500.00
2310.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
2390.00	-	-	-	-			-	500.00
2483.50	-	-	-	-			-	500.00
|	-	-	-	-			-	|
2500.00	-	-	-	-			-	500.00
2690.00	-	-	-	-			-	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).

Data Sheet 4 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Restricted Band Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	April 6th, 2015	

Notes: Conducted Measurement per 12.2.2 of the Measurement Guidance Document
Detector: Quasi-Peak <1GHz, Average >1GHz **Correction Factor**: 8dBi(Antenna)+4.7dB(Max Ground Reflection 30MHz to 1GHz, 0dB for Frequencies above 1GHz)

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading(EIRP)		Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dBm		dBuV/m	uV/m	uV/m
|	2706.90	-56.69	8	-48.69		46.57	213.05	|
|	2744.70	-52.61	8	-44.61		50.65	340.80	|
|	2782.50	-59.92	8	-51.92		43.34	146.89	|
2900.00	-	-	-	-			-	500.00
3260.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
3267.00	-	-	-	-			-	500.00
3332.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
3339.00	-	-	-	-			-	500.00
3345.80	-	-	-	-			-	500.00
|	-	-	-	-			-	|
3358.00	-	-	-	-			-	500.00
3600.00	-	-	-	-			-	500.00
|	3609.02*	-76.68*	8	-68.68		26.58	21.33	|
|	3659.60*	-76.80*	8	-68.80		26.46	21.03	|
|	3710.00*	-76.84*	8	-68.84		26.42	20.94	|

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).

Data Sheet 5 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Restricted Band Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	April 6th, 2015	

Notes: Conducted Measurement per 12.2.2 of the Measurement Guidance Document
Detector: Quasi-Peak <1GHz, Average >1GHz **Correction Factor**: 8dBi(Antenna)+4.7dB(Max Ground Reflection 30MHz to 1GHz, 0dB for Frequencies above 1GHz)

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading(EIRP)		Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dBm		dBuV/m	uV/m	uV/m
4400.00	-	-	-	-			-	500.00
4500.00	-	-	-	-			-	500.00
|	4511.50*	-77.06*	8	-69.06		26.20	20.41	|
|	4574.50*	-77.19*	8	-69.19		26.07	20.11	|
|	4637.50*	-76.74*	8	-68.74		26.52	21.18	|
5150.00	-	-	-	-			-	500.00
5350.00	-	-	-	-			-	500.00
|	5413.80*	-76.98*	8	-68.98		26.28	20.60	|
|	-	-	-	-			-	
5460.00	-	--	-	-			-	500.00
7250.00	-	-	-	-			-	500.00
|	7319.20*	-73.39*	8	-65.39		29.87	31.15	
|	7420.00*	-73.46*	8	-65.46		29.80	30.90	
7750.00	-	-	-	-			-	500.00
8025.00	-	-	-	-			-	500.00
|	8120.70*	-74.01*	8	-66.01		29.25	29.00	|
|	8234.10*	-74.10*	8	-66.10		29.16	28.70	|

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).

Data Sheet 6 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Restricted Band Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	April 6th, 2015	

Notes: Conducted Measurement per 12.2.2 of the Measurement Guidance Document
Detector: Quasi-Peak <1GHz, Average >1GHz **Correction Factor**: 8dBi(Antenna)+4.7dB(Max Ground Reflection 30MHz to 1GHz, 0dB for Frequencies above 1GHz)

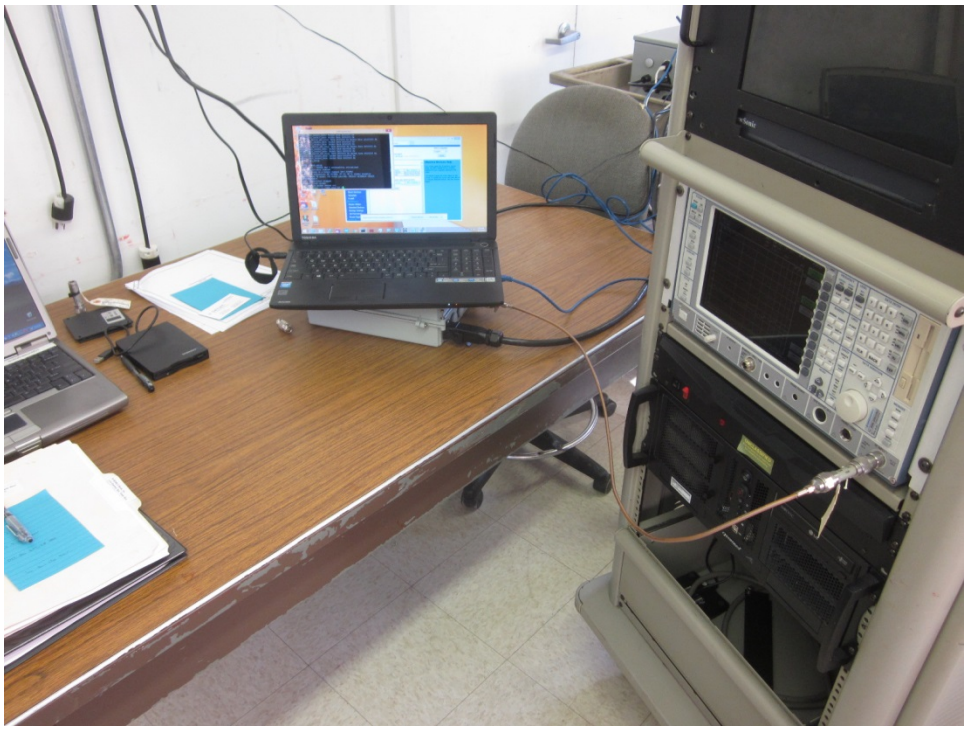
TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading(EIRP)		Field Strength	Converted Reading	Limit at 3M
MHz	MHz	dBm	dB	dBm		dBuV/m	uV/m	uV/m
|	8347.50*	-74.06*	8	-66.06		29.20	28.84	|
8500.00	-	-	-	-			-	500.00
9000.00	-	-	-	-			-	500.00
|	9023.00*	-74.03*	8	-66.03		29.93	28.94	|
|	9149.00*	-74.05*	8	-66.05		29.21	28.87	|
9200.00	-	-	-	-			-	500.00
9300.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
10000.00	-	-	-	-			-	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).

Data Sheet 7 of 7

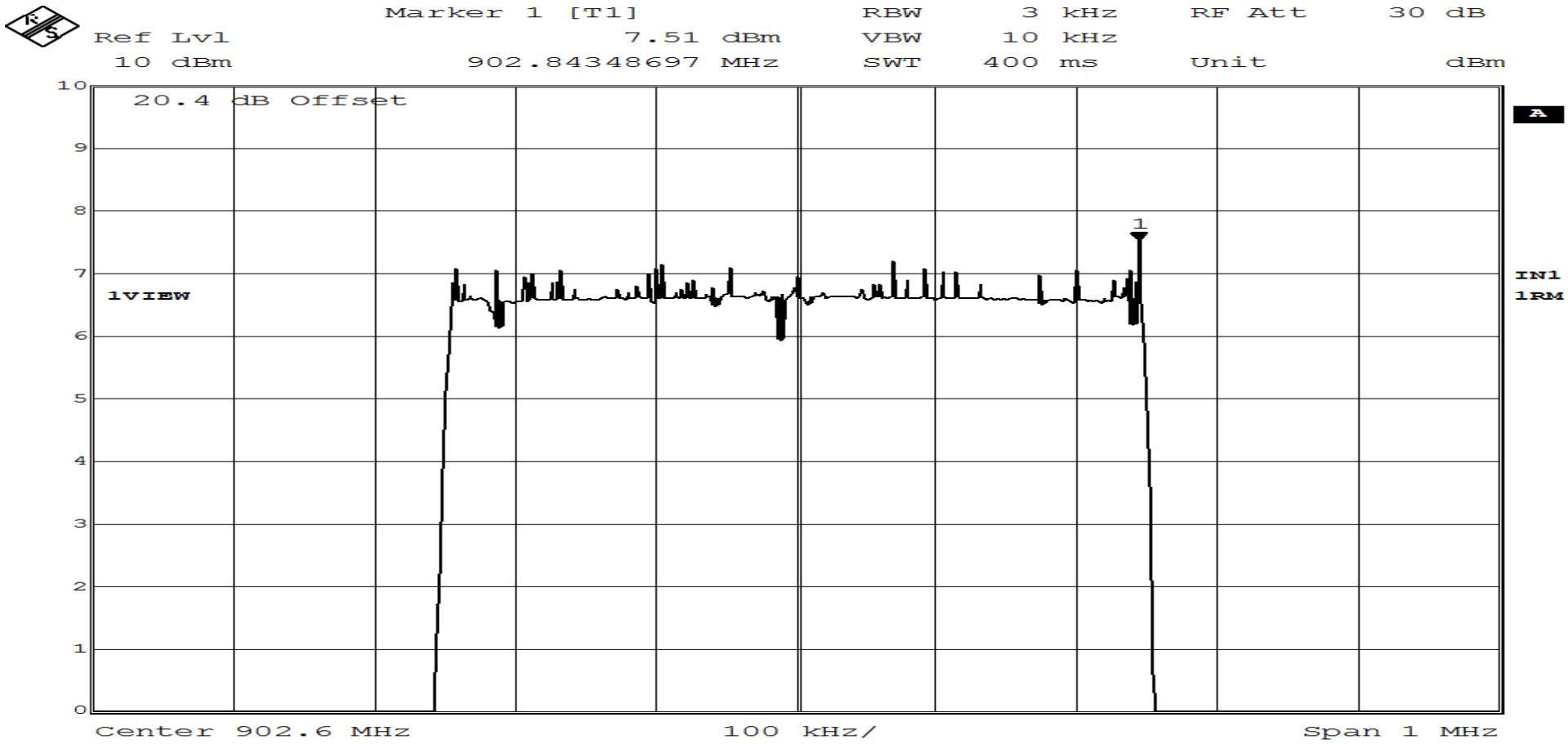
Test Photograph
Power Density



FCC Part 15, Subpart C, Section 15.247(e)
Power Density
Test Data

RETLIF TESTING LABORATORIES

Test Method:	Power Spectral Density		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 902.60 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (e) FCC DTS Guidance Document: KDB 558074 D01 DTS, Method 10.4		
Technician	M. Seamans	**Date**	April 21st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 23.0 %		
Notes	Power Spectral Density: 7.51 dBm Limit: 8.0 dBm		

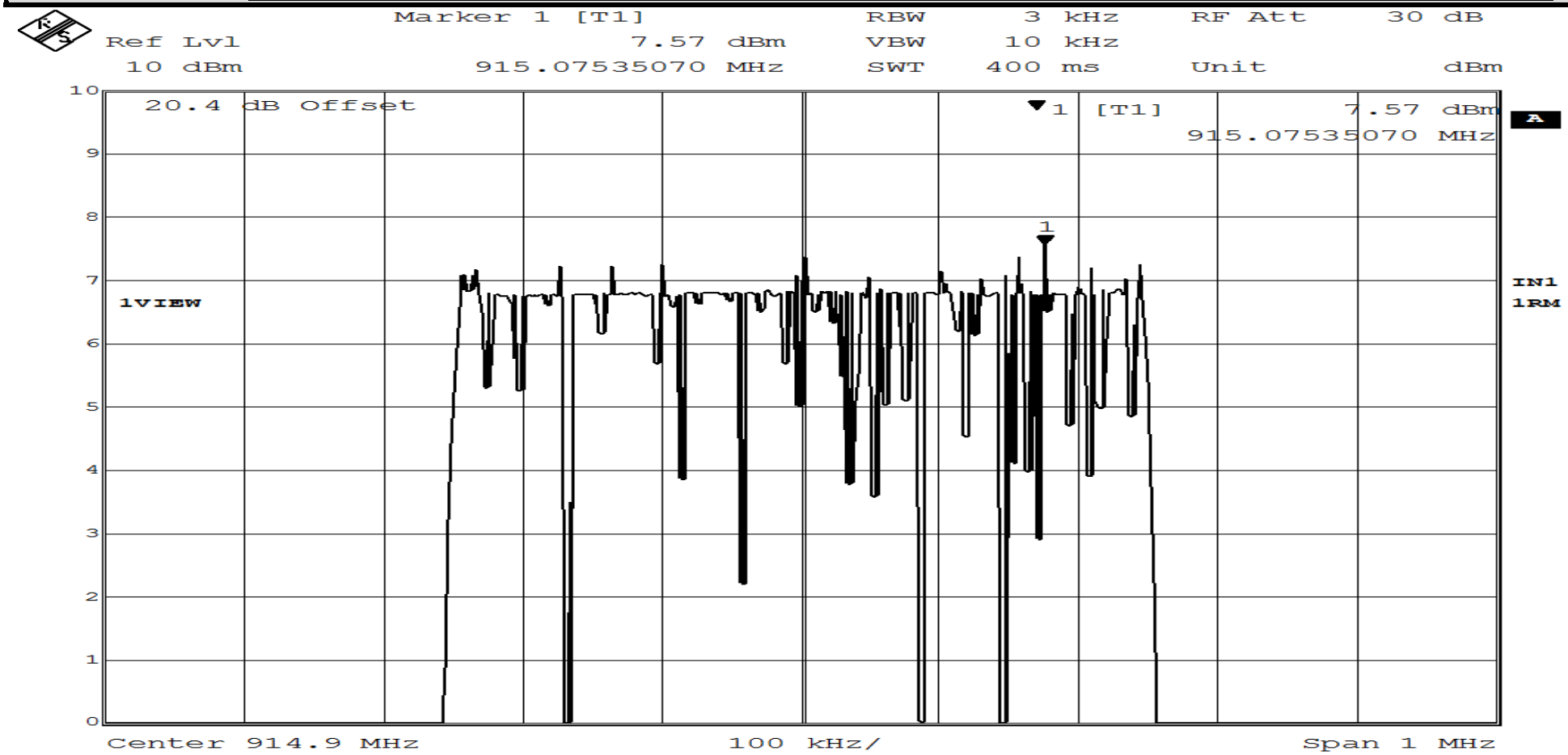


Date: 21.APR.2015 09:14:01

Page 1 of 3

RETLIF TESTING LABORATORIES

Test Method:	Power Spectral Density		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal at 914.9 MHz		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (e) FCC DTS Guidance Document: KDB 558074 D01 DTS, Method 10.4		
Technician	M. Seamans	**Date**	March 30th, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Power Spectral Density: 7.57 dBm Limit: 8.0 dBm		

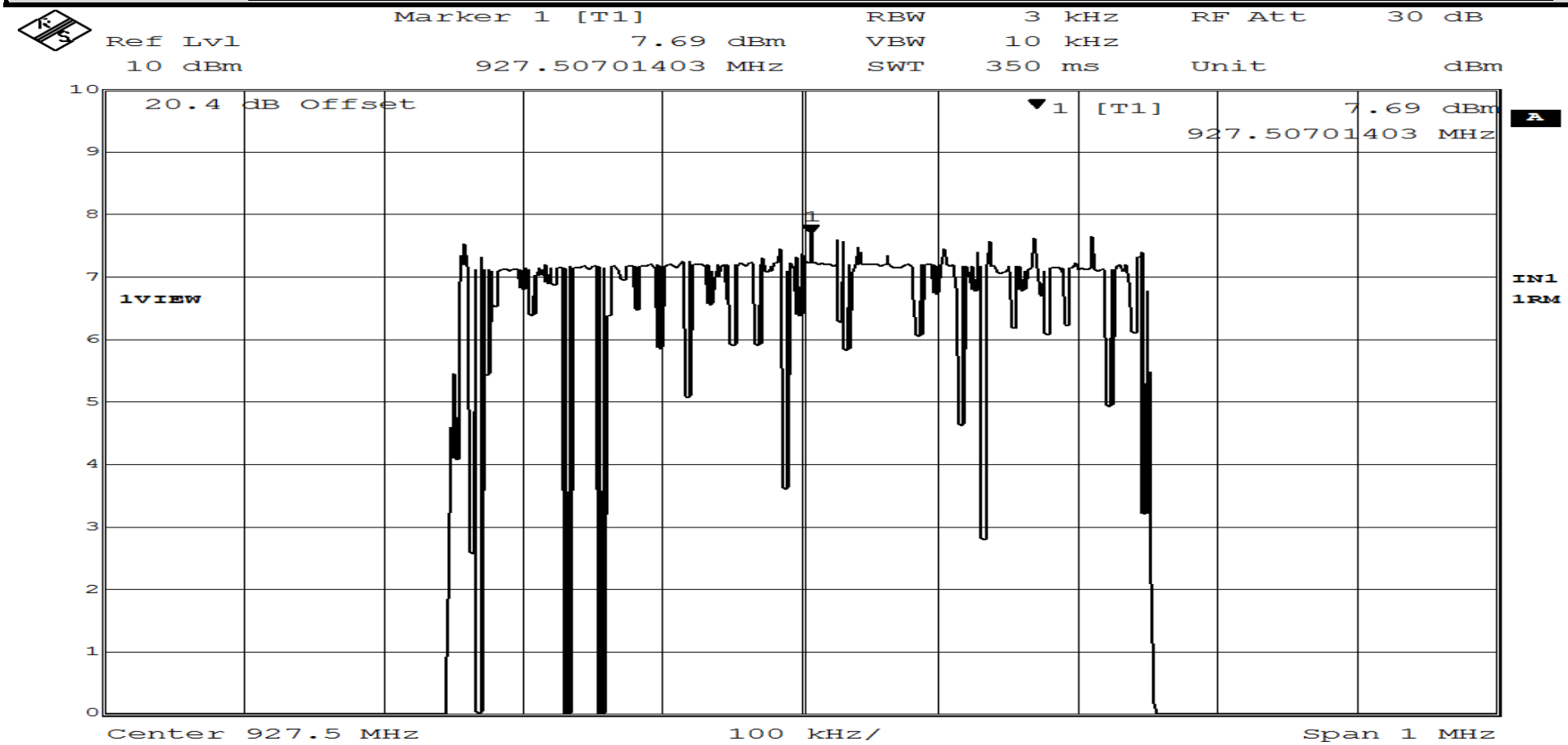


Date: 30.MAR.2015 15:09:33

Page 2 of 3

RETLIF TESTING LABORATORIES

Test Method:	Power Spectral Density		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model Number	5863	**Serial No.**	000012
Operating Mode	FCC Part 15, Subpart C Paragraph: 15.247 (e) FCC DTS Guidance Document: KDB 558074 D01 DTS, Method 10.4		
Test Specification	FCC Part 15, Subpart C Paragraph: 15.247 (e)		
Technician	M. Seamans	**Date**	March 30th, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 17.0 %		
Notes	Power Spectral Density: 7.69 dBm Limit: 8.0 dBm		



Date: 30.MAR.2015 15:01:49

Page 3 of 3

Test Photographs
Radiated Spurious Emissions, 30 MHz to 1 GHz

30 MHz to 1 GHz, Horizontal Antenna Polarization

30 MHz to 1 GHz, Vertical Antenna Polarization

Test Photographs
Radiated Spurious Emissions, 1 GHz to 10 GHz

1 to 10 GHz, Horizontal Antenna Polarization

1 to 10 GHz, Vertical Antenna Polarization

FCC Part 15, Subpart C, Section 15.247(d)
Radiated Spurious Emissions, 30 MHz to 10 GHz
Test Data

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Radiated Spurious Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	March 30, 2015	

Notes: Test Antenna Distance: 3 meters Detector: Quasi-Peak <1GHz, Average >1GHz

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading			Converted Reading	Limit at 3M
MHz	MHz	dBuV	dB	dBuV/m			uV/m	uV/m
37.50	-	-	-	-			-	100.00
|	38.00*	15.53	14.42	29.95			31.44	|
38.25	-	-	-	-			-	100.00
73.00	-	-	-	-			-	100.00
|	73.50*	8.04*	8.73	16.77			6.89	|
75.20	-	-	-	-			-	100.00
108.00	-	-	-	-			-	150.00
|	115.00*	6.09*	9.87	15.96			6.28	|
121.94	-	-	-	-			-	150.00
123.00	-	-	-	-			-	150.00
|	132.00*	5.01*	9.72	14.73			5.45	|
138.00	-	-	-	-			-	150.00
149.90	-	-	-	-			-	150.00
|	150.00*	1.35*	11.97	13.32			4.63	|
150.05	-	-	-	-			-	150.00
156.52475	-	-	-	-			-	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).

Data Sheet 1 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Radiated Spurious Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	March 30, 2015	

Notes: Test Antenna Distance: 3 meters Detector: Quasi-Peak <1GHz, Average >1GHz

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading			Converted Reading	Limit at 3M
MHz	MHz	dBuV	dB	dBuV/m			uV/m	uV/m
|	156.52500*	9.6 *	12.84	22.44			13.24	|
156.52525	-	-	-	-			-	150.00
156.70	-	-	-	-			-	150.00
|	156.80*	8.34*	12.87	21.21			11.49	|
156.90	-	-	-	-			-	150.00
162.0125	-	-	-	-			-	150.00
|	164.00*	9.17*	13.57	22.74			13.71	|
167.1700	-	-	-	-			-	150.00
167.72	-	-	-	-			-	150.00
|	170.00*	8.51*	13.97	22.48			13.30	|
173.20	-	-	-	-			-	150.00
240.00	-	-	-	-			-	200.00
|	260.00*	8.06*	18.92	26.98			22.34	|
285.00	-	-	-	-			-	200.00
322.00	-	-	-	-			-	200.00
|	330.00*	1.01*	22.05	23.06			14.22	|

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).

Data Sheet 2 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Radiated Spurious Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	March 30, 2015	

Notes: Test Antenna Distance: 3 meters Detector: Quasi-Peak <1GHz, Average >1GHz

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading			Converted Reading	Limit at 3M
MHz	MHz	dBuV	dB	dBuV/m			uV/m	uV/m
335.40	-	-	-	-			-	200.00
399.90	-	-	-	-			-	200.00
|	409.00*	-1.64*	24.70	23.06			14.22	|
410.00	-	-	-	-			-	200.00
608.00	-	-	-	-			-	200.00
|	611.00*	-2.39*	30.97	28.58			26.85	|
614.00	-	-	-	-			-	200.00
960.00	-	-	-	-			-	500.00
|	980.00*	-3.33*	36.79	33.46			47.10	|
1240.00	-	-	-	-			-	500.00
1300.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
1427.00	-	-	-	-			-	500.00
1435.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
1646.50	-	-	-	-			-	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).

Data Sheet 3 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Radiated Spurious Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	March 30, 2015	

Notes: Test Antenna Distance: 3 meters Detector: Quasi-Peak <1GHz, Average >1GHz

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading			Converted Reading	Limit at 3M
MHz	MHz	dBuV	dB	dBuV/m			uV/m	uV/m
1660.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
1710.00	-	-	-	-			-	500.00
1718.80	-	-	-	-			-	500.00
|	-	-	-	-			-	|
1722.20	-	-	-	-			-	500.00
2200.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
2300.00	-	-	-	-			-	500.00
2310.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
2390.00	-	-	-	-			-	500.00
2483.50	-	-	-	-			-	500.00
|	-	-	-	-			-	|
2500.00	-	-	-	-			-	500.00
2690.00	-	-	-	-			-	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).

Data Sheet 4 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Radiated Spurious Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	March 30, 2015	

Notes: Test Antenna Distance: 3 meters Detector: Quasi-Peak <1GHz, Average >1GHz

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading			Converted Reading	Limit at 3M
MHz	MHz	dBuV	dB	dBuV/m			uV/m	uV/m
|	2706.90*	30.90*	-4.65	26.25			20.54	|
|	2744.70*	30.67*	-4.65	26.02			20.00	|
|	2782.50*	30.85*	-4.65	26.20			20.42	|
2900.00	-	-	-	-			-	500.00
3260.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
3267.00	-	-	-	-			-	500.00
3332.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
3339.00	-	-	-	-			-	500.00
3345.80	-	-	-	-			-	500.00
|	-	-	-	-			-	|
3358.00	-	-	-	-			-	500.00
3600.00	-	-	-	-			-	500.00
|	3609.02*	30.12*	-1.64	28.48			26.55	|
|	3659.60*	29.63*	-1.64	27.99			25.09	|
|	3710.00*	28.73*	-1.64	27.09			22.62	|

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).

Data Sheet 5 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Radiated Spurious Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	March 30, 2015	

Notes: Test Antenna Distance: 3 meters Detector: Quasi-Peak <1GHz, Average >1GHz

TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading			Converted Reading	Limit at 3M
MHz	MHz	dBuV	dB	dBuV/m			uV/m	uV/m
4400.00	-	-	-	-			-	500.00
4500.00	-	-	-	-			-	500.00
|	4511.50*	29.94*	1.25	31.19			36.27	|
|	4574.50*	30.04*	1.25	31.29			36.69	|
|	4637.50*	30.24*	1.25	31.49			37.54	|
5150.00	-	-	-	-			-	500.00
5350.00	-	-	-	-			-	500.00
|	5413.80*	29.04*	2.48	31.52			37.67	|
|	-	-	-	-			-	
5460.00	-	--	-	-			-	500.00
7250.00	-	-	-	-			-	500.00
|	7319.20*	30.98*	4.29	35.27			58.01	
|	7420.00*	30.60 *	4.29	34.89			55.53	
7750.00	-	-	-	-			-	500.00
8025.00	-	-	-	-			-	500.00
|	8120.70*	31.42*	4.21	35.63			60.46	|
|	8234.10*	31.16*	4.21	35.37			58.68	|

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).

Data Sheet 6 of 7

RETLIF TESTING LABORATORIES

EMISSIONS TEST DATA SHEET

Test Method	**Radiated Spurious Emissions 25 MHz to 10 GHz**	
Customer	Senet, Inc.	
Job Number	R-5934N-2	
Test Sample	Lora Esensor System	
Model Number	5863	
Serial Number	000012	
Test Specification	FCC Part 15 Subpart C	Paragraph: 15.247(d)
Operating Mode	Transmitting modulated(DTS) signal	
Technician	M. Seamans	
Date	March 30, 2015	

Notes: Test Antenna Distance: 3 meters Detector: Quasi-Peak <1GHz, Average >1GHz

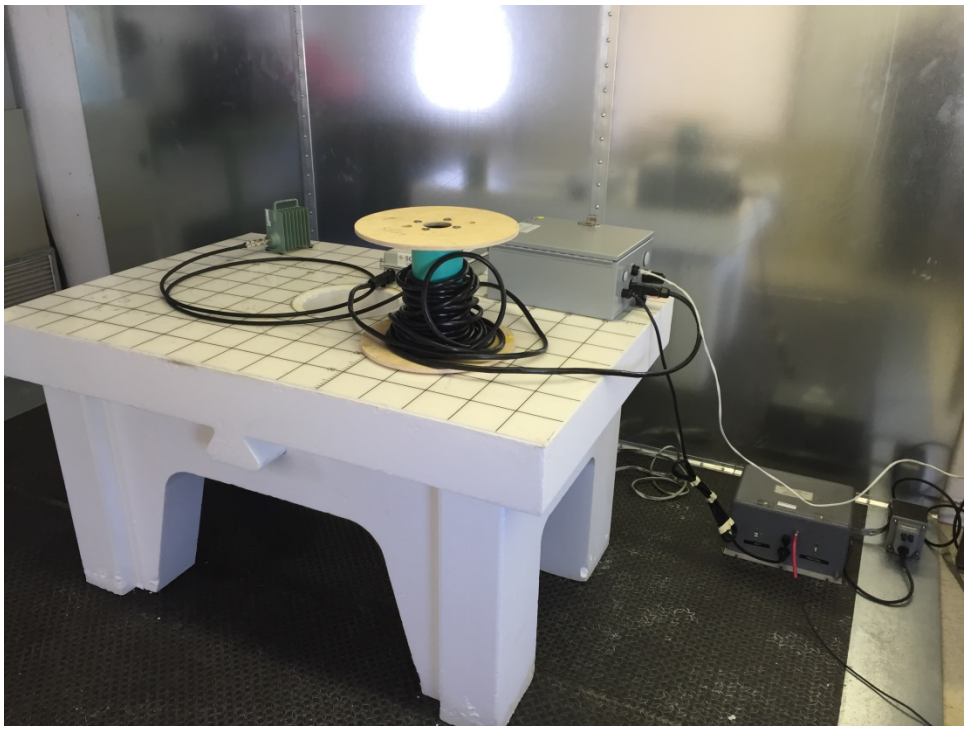
TEST PARAMETERS

Restricted Band	Measured Frequency	Meter Reading	Correction Factor	Corrected Reading			Converted Reading	Limit at 3M
MHz	MHz	dBuV	dB	dBuV/m			uV/m	uV/m
|	8347.50*	30.84*	4.21	35.05			56.56	|
8500.00	-	-	-	-			-	500.00
9000.00	-	-	-	-			-	500.00
|	9023.00*	31.01*	5.43	36.44			66.37	|
|	9149.00*	31.85*	5.43	37.28			73.11	|
9200.00	-	-	-	-			-	500.00
9300.00	-	-	-	-			-	500.00
|	-	-	-	-			-	|
10000.00	-	-	-	-			-	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).

Data Sheet 7 of 7

Test Photograph
Conducted Emissions, Power Leads, 150 kHz to 30 MHz

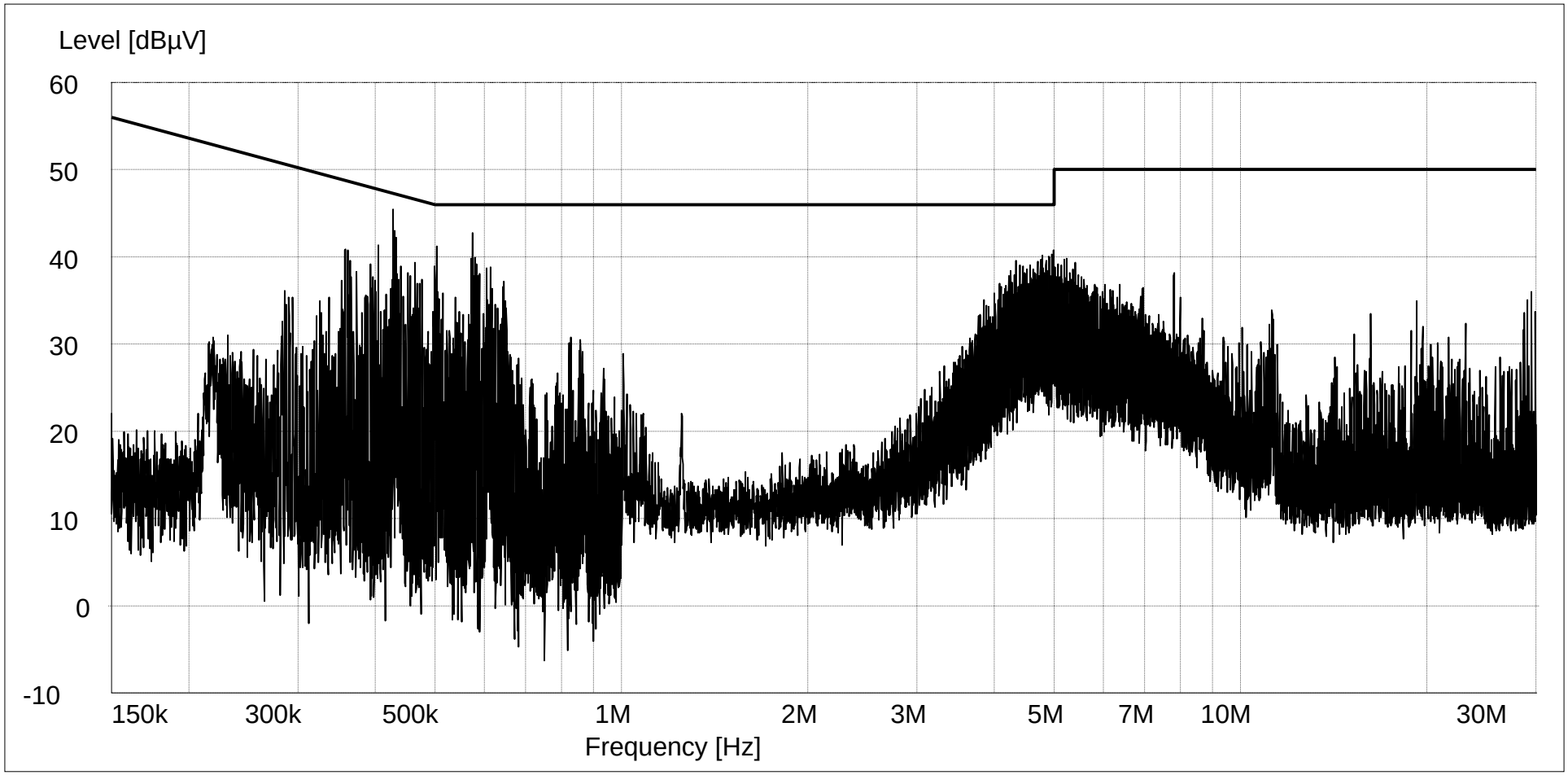


Test Setup

FCC Part 15, Subpart B, Section 15.207(a)
Conducted Emissions, Power Leads, 150 kHz to 30 MHz
Test Data

RETLIF TESTING LABORATORIES

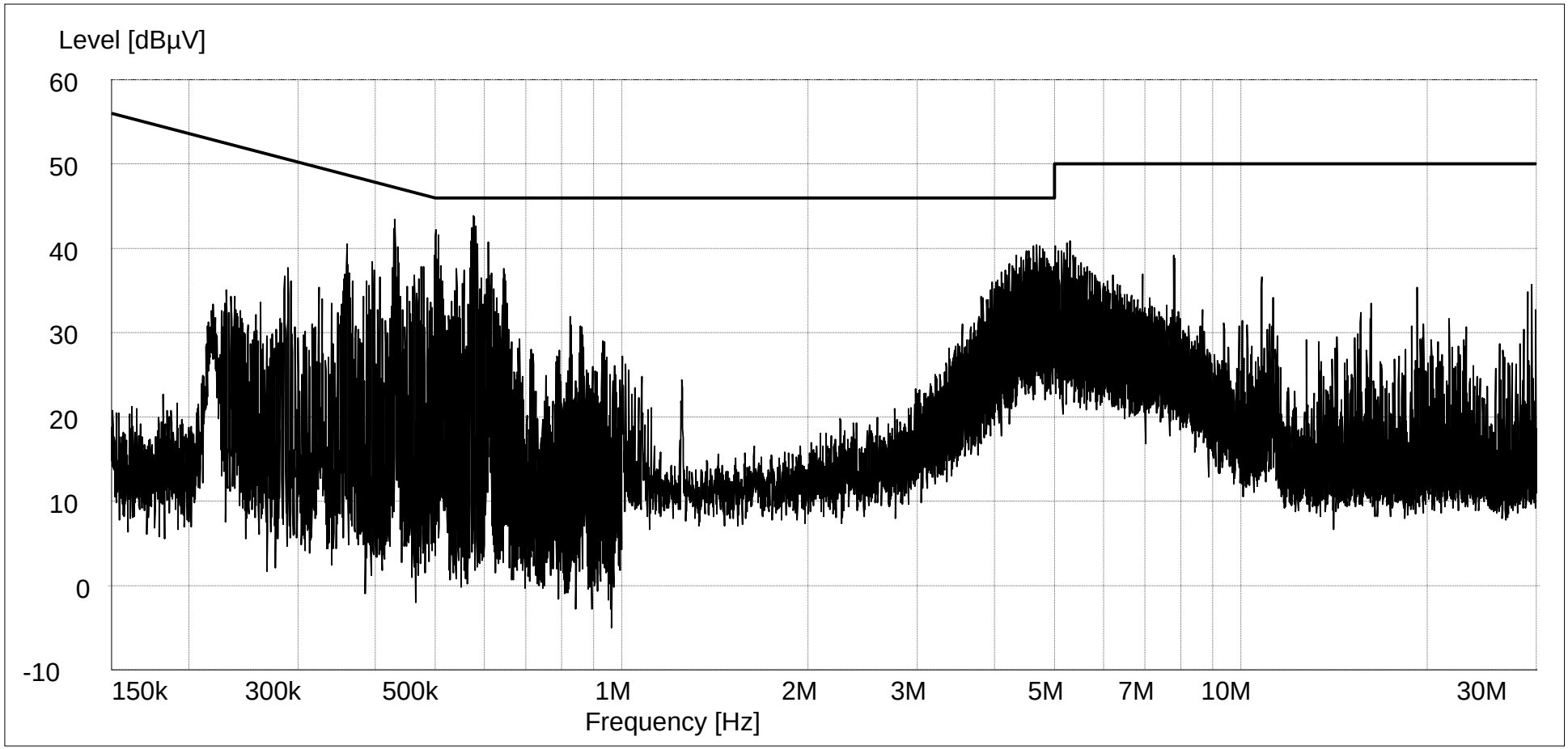
Test Method	Conducted Emissions 150 kHz to 30 MHz		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model No.	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal		
Test Specification	FCC Part 15. 207(a)		
Technician	M. Seamans	**Date**	March 30th, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 21.0 %		
Lead Tested	120 VAC 60 Hz Hot Peak Readings to Average Limits.		



Page 1 of 2

RETLIF TESTING LABORATORIES

Test Method	Conducted Emissions 150 kHz to 30 MHz		
Customer	Senet, Inc.	**Job No.**	R-5934N-2
Test Sample	Lora Esensor System		
Model No.	5863	**Serial No.**	000012
Operating Mode	Transmitting modulated(DTS) signal		
Test Specification	FCC Part 15. 207(a)		
Technician	M. Seamans	**Date**	March 31st, 2015
Climatic Conditions	Temp: 23.0 °C Relative Humidity: 21.0 %		
Lead Tested	120 VAC 60 Hz Neutral Peak Readings to Average Limits.		



Page 2 of 2