

Ottlite Technologies Inc.

TEST REPORT

SCOPE OF WORK FCC TESTING-T11FS

REPORT NUMBER 181213022SZN-002

ISSUE DATE

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12 February 2019

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TEST REPORT

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Intertek Report No.: 181213022SZN-002

Ottlite Technologies Inc.

Application For Certification

FCC ID: 2AI7B-T11FS

LED table lamp

Model: T11FS

2.4GHz Wi-Fi Transceiver

Report No.: 181213022SZN-002

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-17]

Prepared and Checked by:

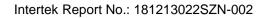
Approved by:

Jeff Liang Engineer Kidd Yang Technical Supervisor Date: 12 February 2019

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MEASUREMENT/TECHNICAL REPORT

LED table lamp

Model: T11FS

FCC ID: 2AI7B-T11FS

This report concerns (check one)	Original Grant	X	Class II Cha	inge _	
Equipment Type: <u>DTS - Part 15 Digital T</u>	ransmission Syst	ems (Wi-Fi	transmitter p	oortion)
Deferred grant requested per 47 CFR 0	.457(d)(1)(ii)?	Yes		No _	<u>X</u>
		If yes	, defer until :		
Company Name agrees to notify the Co	ommission by:				ate
company Name agrees to notify the co	<u> </u>		ate		
that date.					
Transition Rules Request per 15.37?		Yes	N	No	X
Transition Rules Request per 15.37? If no, assumed Part 15, Subpart C fo 17] Edition] provision.	r intentional ra				
If no, assumed Part 15, Subpart C fo	r intentional ra				



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List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf



Intertek Report No.: 181213022SZN-002

EXHIBIT 1

SUMMARY OF TEST RESULTS



1.0 Summary of Test results

LED table lamp

Model: T11FS

FCC ID: 2AI7B-T11FS

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.



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EXHIBIT 2

GENERAL DESCRIPTION



2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a LED table lamp with Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing. The EUT is powered by AC/DC adaptor through AC120V/60Hz. For more detailed features description, please refer to the user's manual.

Type of Modulation: BPSK, QPSK, 16QAM, 64QAM for OFDM; CCK, DQPSK, DBPSK for DSSS.

Antenna Type: Integral Antenna

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of: DTS- Part 15 Digital Transmission Systems (2.4GHz Wi-Fi transmitter portion).

For other functions were reported in the SDOC report: 181213022SZN-001.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013) and KDB 558074 D01 v05. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Justification Section" of this Application.

2.4 Test Facility

The Semi-anechoic chamber and shielded room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.

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EXHIBIT 3

SYSTEM TEST CONFIGURATION



3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by AC/DC adaptor with AC120V/60Hz input during the test.

On 802.11b/g/n-HT20 mode, only one antenna is used, and all data rate were tested and only the worst case data is shown in the report.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The rear of unit shall be flushed with the rear of the table.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.



3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by Ottlite Technologies Inc. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer	List:
1.0101	=

Description	Manufacturer	Detail
Mobile phone	SAMSUNG	S7
Cement resistor	N/A	2.4 Ohm
Resistance box	N/A	2.4 Ohm
Adapter	Provided by applicant	Model: TY1500140A1mn
Cable	(provided by Intertek)	USB cables: unshielded 0.8m



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EXHIBIT 4

MEASUREMENT RESULTS



Applicant: Ottlite Technologies Inc. Date of Test: 04 January 2019

Model: T11FS

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (Antenna Gain = 2.5dBi) (CCK, 1Mbps)		
Frequency (MHz)Output in dBm (Peak Reading)Output in mWatt		
Low Channel: 2412	14.65	29.17
Middle Channel: 2437 11.71 14.83		
High Channel: 2462	8.40	6.92

IEEE 802.11g (Antenna Gain = 2.5dBi) (16QAM, 6Mbps)		
Frequency (MHz)Output in dBm (Peak Reading)Output in mWatt		
Low Channel: 2412	18.00	63.10
Middle Channel: 2437	17.64	58.08
High Channel: 2462	12.65	18.41

IEEE 802.11n-HT20 (Antenna Gain = 2.5dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	17.58	57.28
Middle Channel: 2437	17.22	52.72
High Channel: 2462	12.18	16.52

Cable loss: 0.5 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 18.00dBm EUT max. E.I.R.P = 18.00dBm + 2.5dBi = 20.50dBm = 112.2mW

For RF Exposure, the information is saved with filename: RF exposure.pdf.



Applicant: Ottlite Technologies Inc. Date of Test: 04 January 2019

Model: T11FS

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

IEEE 802.11b (CCK, 1Mbps)		
Frequency (MHz)	6 dB Bandwidth (MHz)	
2412	8.987	
2437	9.030	
2462	8.987	

IEEE 802.11g (16QAM, 6Mbps)		
Frequency (MHz)	6 dB Bandwidth (MHz)	
2412	16.324	
2437	16.324	
2462	16.324	

IEEE 802.11n-HT20 (64QAM, 6Mbps)		
Frequency (MHz)	6 dB Bandwidth (MHz)	
2412	16.585	
2437	16.541	
2462	16.541	

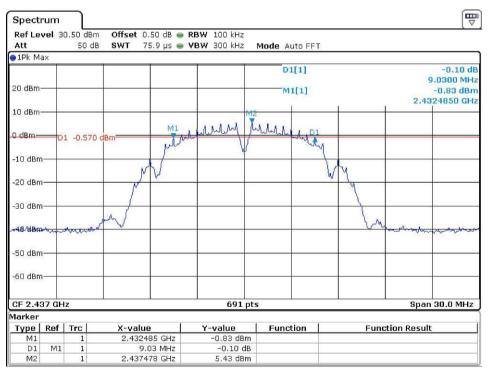
The test plots are attached as below.



802.11b

₩ Spectrum Ref Level 30.50 dBm Offset 0.50 dB 👄 RBW 100 kHz 50 dB 75.9 µs 😑 **VBW** 300 kHz SWT Mode Auto FFT Att ●1Pk Max 0.03 dB 8.9870 MHz D1[1] 20 dBm--1.05 dBm M1[1] 2.4074850 GHz 10 dBm-Mulul AMM M1 wind Asting 0 dBm— D1 -0.770 dBm -10 dBm 1 -20 dBm· -30 dBm 40-dBm -50 dBm -60 dBm-CF 2.412 GHz Span 30.0 MHz 691 pts Marker Function Result Type | Ref | Trc | X-value Y-value Function 2.407485 GHz M1 1 -1.05 dBm D1 8.987 MHz 0.03 dB M1 1 M2 2.412478 GHz 5.23 dBm

Date: 4.JAN.2019 12:49:17



Date: 4.JAN.2019 13:05:09



Intertek Report No.: 181213022SZN-002

Spect	rum						
Ref Le	vel 30	0.50 dBr	m Offset 0.50 dB 🥌	RBW 100 kHz			200
Att		50 d	В SWT 75.9 µs 👄	VBW 300 kHz r	Mode Auto FFT		
😑 1 Pk M	эх						
20 dBm					D1[1]		0.13 dB 8.9870 MHz -0.95 dBm
							2.4574850 GHz
10 dBm			-	M2			1000 1100 1000 1000 1000 1000 1000 100
0 dBm-	175.0		M1	manin th	Mulle Autor		
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-10 dBm				Ψ	Ĩ		
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-20 dBm	i		J. W			WZ	
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-30 dBm	i			-			
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-40 dBm		Manen	~ ~ ~		*	Cr.	and the second and a second
-50 dBm	1						
co Jo-							
-60 dBm	1						
CF 2.4	52 GH	z		691 pts			Span 30.0 MHz
Marker					0		
Туре	Ref	Trc	X-value	Y-value	Function	Func	tion Result
M1		1	2.457485 GHz	-0.95 dBm			
D1	M1	1	8,987 MHz	0.13 dB			-
M2		1	2.462478 GHz	5.40 dBm			

Date: 4.JAN.2019 13:10:33



802.11g

Spectrum Ref Level 30.50 dBm Offset 0.50 dB 👄 RBW 100 kHz Att 50 dB SWT 75.9 µs 🥃 **VBW** 300 kHz Mode Auto FFT ● 1Pk Max D1[1] -0.57 dB 16.3240 MHz 20 dBm-M1[1] -4.80 dBm 2.4038380 GHz 10 dBm M2 0 dBm-D1 -5.550 dBm Jahrellow brule milandary pentreally tranhappy 12 -10 dBm -20 dBm--30 dBm nowle Arm 40-88m -50 dBm--60 dBm-CF 2.412 GHz 691 pts Span 30.0 MHz Marker **Y-value** -4.80 dBm -0.57 dB Function Result Type Ref Trc Function X-value 2.403838 GHz 16.324 MHz 2.414475 GHz M1 D1 1 1 Μ1 0.45 dBm M2 1 Date: 4.JAN.2019 13:17:21 Construm

Spect	rum									
Ref Le Att	vel 2			dB 👄 RBW 100 Us 👄 VBW 300		Mode A	uto FFT			
1Pk M	ах					noue A				
20 dBm						D	1[1]		133	-0.47 dE
						0.101			16	5.3240 MHz
10 dBm					-	M	1[1]		2.42	-8.11 dBm
- I-							M2		-	Charles Charles
0 dBm–	17		M1	1 8 8		1		I Int		
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-50 dBn	non	1.								murch
-50 UBI	1									
-60 dBn							63			
-00 001										
-70 dBn	1									
CF 2.4	37 GH	lz			691 pts			A	Span	30.0 MHz
/larker				20			40			
Туре	Ref	Trc	X-value	Y-val		Func	tion	Func	tion Result	
M1		1	2.428838 0		11 dBm					
D1	M1	1	16.324 N).47 dB 73 dBm					
M2		1	2.441993 (amz -2,	rs abmi					

Date: 4.JAN.2019 14:10:14



Spectrur	n									E
Ref Level			0.50 dB 👄							1
Att	40	db SWT	75.9 µs 😑	ARM	300 KHZ	Mode A	uto FFT			
20 dBm						D:	1[1]		1	-0.47 dB 6.3240 MHz
10 dBm	6		-		~	M	1[1]	1		-13.12 dBm 538380 GHz
0 dBm					<i>î</i>	M2		-		-
-10 dBm	-D1 -13	640 dBMLA	alloution	Annah	motally ,	untruth	potent	unturne R1		8
-20 dBm—	01 -13.				Y					
-30 dBm—	16			_			5			
-40 dBm—		J	_				2		L	
-50 dBm—	month		_	_					mary	Annon
-60 dBm—			_				61			
-70 dBm—			_							
CF 2.462	GHz				691 p	ts			l Spai	n 30.0 MHz
Marker										
	ef Trc	X-va	P D I I D P P P		-value	Funct	tion	Fund	ction Resul	t
M1 D1 /	1 11 1		3838 GHz	-	13.12 dBm -0.47 dB					
M2	1		4475 GHz		-7.64 dBm					

Date: 4.JAN.2019 14:14:29



802.11n-HT20

Spectrum Ref Level 24.00 dBm Offset 0.50 dB 💿 RBW 100 kHz 40 dB SWT 75.9 µs 💿 **VBW** 300 kHz Att Mode Auto FFT ●1Pk Max -0.03 dB 16.5850 MHz D1[1] 20 dBm-M1[1] -9.03 dBm 10 dBm-2.4035770 GHz 0 dBm-D1 -8.790 dB marke A AL Amaglay A MRI -10 dBm--20 dBm· -30 dBm -40 dBm 34 which M -50 dBm--60 dBm--70 dBm-Span 30.0 MHz CF 2.412 GHz 691 pts Marker Type | Ref | Trc | X-value Y-value Function Function Result 2.403577 GHz 16.585 MHz -9.03 dBm M1 1 D1 -0.03 dB M1 1 M2 2.416993 GHz -2.79 dBm

Date: 4.JAN.2019 14:20:05

Spectr	um									E
Ref Lev	vel 2	4.00 dBm	Offset 0	.50 dB 👄	RBW 100 kHz					1
Att		40 dB	SWT 7	5.9 µs 👄	VBW 300 kHz	Mode A	uto FFT			
∋1Pk Ma	ах									
20 dBm-						D	1[1]		13	-0.37 dE
									1	6.5410 MHz
10 dBm-	9					M	1[1]		2 4	-8.88 dBm 286210 GHz
								1	2.4	200210 GH2
0 dBm—					-	2004 - 1104-1	M2			
	9.00		M1	hand and	woodman have	unhant	holanla	And D1		
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-50 dBm	w	040								marken
-50 abm	8									
-60 dBm							-01			
oo abiii	8									
-70 dBm	_									-
CF 2.43	37 GH	z			691	pts			Spar	n 30.0 MHz
Marker							- Protection	100 Million		
Type M1	Ref	Trc 1	X-value 2.4286		<u>Y-value</u> -8.88 dB	Func	tion	Fund	ction Resul	t
D1	M1	1		41 MHz	-0.37 (
M2		1	2.4419		-2.68 dB					

Date: 4.JAN.2019 14:25:04



Spect	rum										
	vel 2	4.00 dBm		0.50 dB 🧉							
Att		40 dB	SWT	75.9 µs 🧉	VBW	300 kHz	Mode A	uto FFT			
😑 1 Pk M	ax										
20 dBm			c	-			D:	[1]		1	-0.29 dB 6.5410 MHz
10 dBm	2				-		M	1[1]	i i		-13.80 dBm 536210 GHz
0 dBm—	2		k	_			M2				
-10 dBm	n	1 -13.560	M1 dBm thus	Aprolia	though,	montan	mathanter	whent	almal P1		
-20 dBm			ľ		-		<u> </u>		<u> </u>		
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-60 dBm	n							61			
-70 dBm	1		<								
CF 2.4	62 GH	Iz	<u>F</u>		<u>,</u>	691	pts		<i>x</i> .	Spar	30.0 MHz
Marker							100				
Туре	Ref	Trc	X-val			value	Funct	ion	Fund	ction Resul	t l
M1		1		8621 GHz	-	13.80 dB					
D1 M2	M1	1		541 MHz 475 GHz		-0.29 d -7.56 dBi					

Date: 4.JAN.2019 14:29:06



Intertek Report No.: 181213022SZN-002

Applicant: Ottlite Technologies Inc. Date of Test: 04 January 2019

Model: T11FS

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

IEEE 802.11b (CCK, 1Mbps)								
Frequency (MHz)	Power Density with RBW 100KHz							
2412	5.18							
2437	5.28							
2462	5.26							

IEEE 802.11g (16QAM, 6Mbps)								
Frequency (MHz) Power Density with RBW 100KHz								
2412	0.53							
2437	-2.79							
2462	-7.65							

IEEE 802.11n-HT20	IEEE 802.11n-HT20 (64QAM, 6Mbps)							
Frequency (MHz)	Power Density with RBW 100KHz							
2412	-2.81							
2437	-2.88							
2462	-7.69							

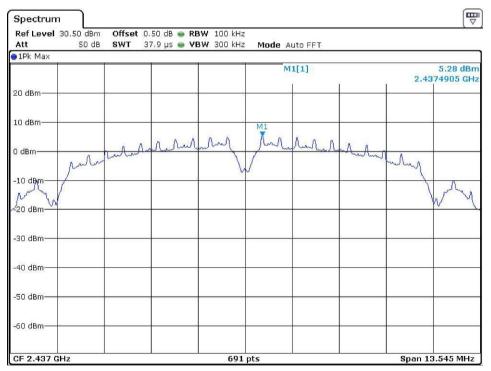
The test plots are attached as below.



802.11b

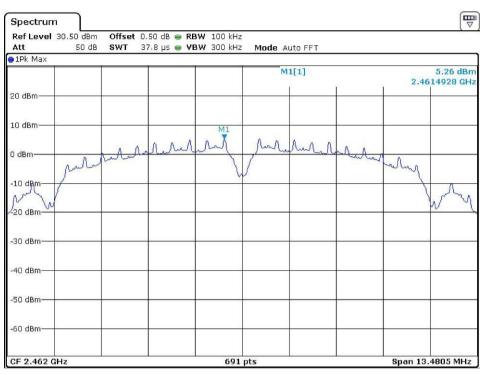
Spectrum Ref Level 30.50 dBm Offset 0.50 dB 👄 RBW 100 kHz Att 50 dB SWT 37.8 µs 😑 **VBW** 300 kHz Mode Auto FFT ● 1Pk Max M1[1] 5.18 dBm 2.4114928 GHz 20 dBm 10 dBm-M And And. Ans 1 A Λ A A 0 dBmma A ~ A -10 dBm 1 Λ, 20 dBm -30 dBm -40 dBm -50 dBm--60 dBm-CF 2.412 GHz 691 pts Span 13.4805 MHz

Date: 4.JAN.2019 12:50:10



Date: 4.JAN.2019 13:05:36





Date: 4.JAN.2019 13:11:02



802.11g

Spectrum Ref Level 30.50 dBm Offset 0.50 dB 👄 RBW 100 kHz Att 50 dB SWT 56.8 µs 😑 **VBW** 300 kHz Mode Auto FFT ●1Pk Max 0.53 dBm 2.4070040 GHz M1[1] 20 dBm-10 dBm-0 dBm-Monton malyumaniting -10 dBm--20 dBm -30 dBm mon -40 dBm -50 dBm--60 dBm-Span 24.486 MHz CF 2.412 GHz 691 pts

Date: 4.JAN.2019 13:18:07

Spectrum									₩
Ref Level	24.00 dBm	Offset	0.50 dB 👄 R	BW 100 kHz	2				
Att	40 dB	SWT	56.8 µs 😑 V	'BW 300 kHz	Mode A	uto FFT			
😑 1 Pk Max									
20 dBm					M	1[1]	i i	2.44	-2.79 dBm 19960 GHz
10 dBm			-			oy			
0 dBm			8		4	P. A.	11	a	
-10 dBm	p	monton	Imaly	handbridg	monterno	hundum	lhanhar	ling	
-20 dBm									
-30 dBm	J. J.							- hor	2
-40 dBm		5							Mur
-50 dBm						8			
-60 dBm						-			
-70 dBm									
CF 2.437 (GHz	1	1	691	pts	1	1	Span 24	.486 MHz

Date: 4.JAN.2019 14:10:42



Spectrun	n								
Ref Level Att	24.00 dBm 40 dB		.50 dB 👄 RE 6.8 µs 👄 VE		Mode A	uto FFT			
●1Pk Max		254.025 (48							
20 dBm					M	1[1]	i i		-7.65 dBm 69960 GHz
10 dBm						a			
0 dBm									
-10 dBm	M	nontorial	huntured	molony	monterior	Mulum	hundhur	An	
-20 dBm				1	/				
-30 dBm	J							- Ly	
-40 dBm								<u>\</u>	Mr. Marken
-50 dBm	7. · · ·	0				5. 			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
-60 dBm									
-70 dBm	-	7				P			
CF 2.462 C	GHz	l.		691	pts	l		Span 24	.486 MHz

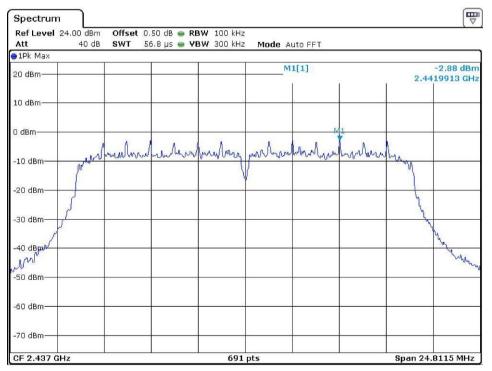
Date: 4.JAN.2019 14:15:08



802.11n-HT20

Spectrum Ref Level 24.00 dBm Offset 0.50 dB 🖷 RBW 100 kHz 40 dB 56.9 µs 💿 **VBW** 300 kHz SWT Mode Auto FFT Att ●1Pk Max -2.81 dBm 2.4169683 GHz M1[1] 20 dBm 10 dBm 0 dBm under Analan marchand multinghan workin -10 dBm -20 dBm -30 dBm 40 dBm Um and -50 dBm -60 dBm· -70 dBm CF 2.412 GHz 691 pts Span 24.8775 MHz

Date: 4.JAN.2019 14:20:55



Date: 4.JAN.2019 14:25:32



Spectrun	n									
Ref Level Att	24.00 dBm 40 dB			3W 100 kHz 3W 300 kHz		uto FFT				
😑 1Pk Max										
20 dBm					M	1[1]	7	-7.69 dBn 2.4669913 GH:		
10 dBm		v				n				
0 dBm										
-10 dBm	url	mention	when	hutry	parature	boundary	hardmen	ha.		
-20 dBm	- formation				/			- M		
-30 dBm	1					s		- Joy		
-40 dBm	-								March 1	
-50 dBm		5				5.			Warman	
-60 dBm										
-70 dBm	-	9								
CF 2.462 0	GHz	1		691	pts	L	1	Span 24.	8115 MHz	

Date: 4.JAN.2019 14:29:40



Applicant: Ottlite Technologies Inc. Date of Test: 22 January 2019

Model: T11FS

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

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. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g and 6Mbps for 802.11n-HT20.

The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.



802.11b Channel 01 (2412MHz) Reference Level: 5.18dBm

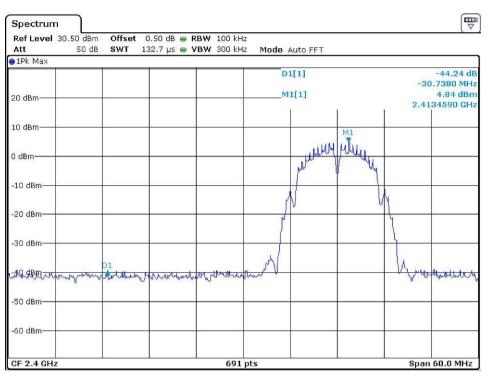
B Spectrum Offset 0.50 dB ● RBW 100 kHz SWT 24 ms ● VBW 300 kHz Ref Level 30.50 dBm 50 dB Mode Auto Sweep Att ●1Pk Max -37.89 dBm 2.26290 GHz M1[1] 20 dBm-10 dBm-0 dBm -10 dBm D1 -14.820 dBm--20 dBm--30 dBm-M1 and manual the AD dea the the the the monthly mary interesting and a second and the secon -50 dBm· -60 dBm-691 pts Start 1.0 MHz Stop 2.4 GHz

Date: 4.JAN.2019 12:58:10

Spectrun	n								
Ref Level Att	30.50 dBm 50 dB	Offset 0 SWT 2		W 100 kHz W 300 kHz		uto Sweep			
1Pk Max					- mode -				
					M	1[1]			·31.27 dBm 0.2585 GHz
20 dBm					2	a.			
10 dBm	195								
0 dBm	-								
-10 dBm	D1 -14.820	dDas							
-20 dBm	01 -14.020	ubiii							
-30 dBm						6.1.1.	M A A B		
Herd Bm	well-had me al star	howene	Murdun way	anderhelte	Mulle roler	armine h	uwutnul ^{o V}	hand	whydulward
-50 dBm		74							
-60 dBm									
Start 2.48	35 GHz			691	pts			Stop	25.0 GHz

Date: 4.JAN.2019 12:58:32





Date: 4.JAN.2019 13:01:19



Channel 06 (2437MHz) Reference Level: 5.28dBm

Spectrun	n)								
Ref Level	30.50 dBm	Offset	0.50 dB 🖷 RE	3W 100 kHz					
Att	50 dB	SWT	24 ms 🔵 ۷	3 W 300 kHz	Mode A	uto Sweep			
😑 1Pk Max			-						
					M	1[1]	-38.45 dBm 211.00 MHz		
20 dBm	54 	ŝ	-	2					
10 dBm	95								
0 dBm						v			
-10 dBm	D1 -14.720	dBm							
-20 dBm	01 11020								
-30 dBm		×							
, Ft a demont	materinghtettettettettettettettettettettettettet	nutration to	and and a second and a second	millastroky	whender	munipelineanin	withinking	unutor dato	Parknauthdurter
-50 dBm		5							
-60 dBm									
Start 1.0 M	1Hz			691	pts			Sta	p 2.4 GHz

Date: 4.JAN.2019 13:07:44

Spectrum			
Ref Level 30.50 dBm	Offset 0.50 dB 👄 RBW 10	DO kHz	
	SWT 226 ms 👄 VBW 30	00 kHz Mode Auto Sweep	
● 1Pk Max		M1[1]	-31.43 dBm 20.3235 GHz
20 dBm			
10 dBm			
0 dBm			
-10 dBm	Des.		
-20 dBm	BIII		
-30 dBm		L	MI
usterels in the methor when we	Monwood was this human server	down the war while down when the	whenter V bout mander and the
-50 dBm			
-60 dBm			
Start 2.4835 GHz		691 pts	Stop 25.0 GHz

Date: 4.JAN.2019 13:08:50



Channel 11 (2462MHz) Reference Level: 5.26dBm

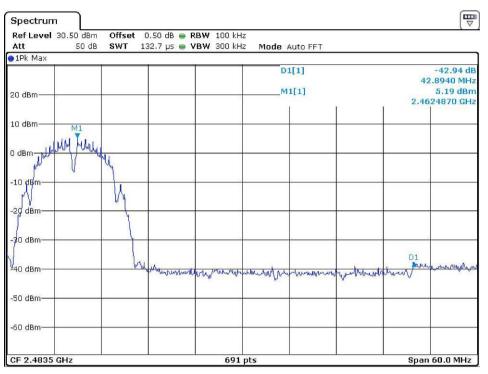
Spectru	211								(₩	
Ref Level Att	30.50 dBm 50 dB	Offset SWT	0.50 dB 👄 RB							
91Pk Max	50 UB	SWI	24 ms 😑 VE	W 3UU KHZ	MODE A	uto Sweep				
TEK Max					M	1[1]		-37.63 dBm 950.50 MHz		
20 dBm	- 5									
10 dBm	10	2				2				
0 dBm			_							
-10 dBm—		-lp				<i>u</i>				
-20 dBm—	-D1 -14.740	dBm-								
-30 dBm—	24		M							
, AQ, dB, mot	norman ter titur	millitanic	the out out of the second		Haldenham	ruhuhrhilituh	wowwww	www.www.	networkhaut	
-50 dBm—										
-60 dBm—										
Start 1.0	MHz			691	pts			Ste	p 2.4 GHz	

Date: 4.JAN.2019 13:12:57

Spectrum	ן י									
	30.50 dBm		0.50 dB 👄 RE						200	
Att 1Pk Max	50 dB	SWT	226 ms 😑 VE	SW 300 KH2	Mode A	uto Sweep				
						1[1]		-30.83 dBm 19.7705 GHz		
20 dBm	55	N.	-			2 2 2				
10 dBm	10									
0 dBm										
-10 dBm										
-20 dBm	D1 -14.740	dBm	-							
-30 dBm			-				M1			
"4 0° 08m	would have and	white	with the warder	white	hand have	Worker	my white v	manthing	un Alekenene	
-50 dBm		5				-				
-60 dBm										
Start 2.48	35 GHz			691	pts			Stor	25.0 GHz	

Date: 4.JAN.2019 13:13:57





Date: 4.JAN.2019 13:14:29



802.11g Channel 01 (2412MHz) Reference Level: 0.53dBm

Spectrum
 Offset
 0.50 dB
 ■
 RBW
 100 kHz

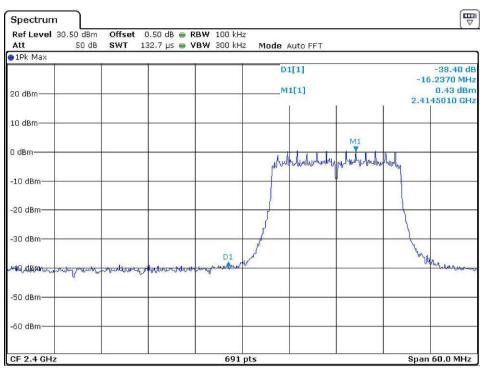
 SWT
 24 ms
 ■
 VBW
 300 kHz
Ref Level 30.50 dBm Att 50 dB Mode Auto Sweep 😑 1 Pk Max M1[1] -37.52 dBm 933.20 MHz 20 dBm-10 dBm 0 dBm -10 dBm-D1 -19.470 dBm= -20 dBm--30 dBm-M1 AQ. ABMAN untura RUMANAN House An your here we have the WWWW IN MUN -50 dBm· -60 dBm Stop 2.4 GHz Start 1.0 MHz 691 pts

Date: 4.JAN.2019 13:19:25

Spectrun	ı)									
	30.50 dBm		.50 dB 👄 RE						`	
Att	50 dB	SWT 2	26 ms 😑 🛛	300 kHz	Mode A	uto Sweep				
1Pk Max					M1[1]			-31.19 dBm 19.7705 GHz		
20 dBm	52°	ξ.								
10 dBm	16	e								
0 dBm										
-10 dBm	8									
-20 dBm	D1 -19.470	dBm								
-30 dBm						un al la c	MI			
- Adultaminu	white manufactures	weberlauber	mulurhunhuk	whether musclift	ny man	mundily	white "	halt of the	Wollinkinghuis	
-50 dBm										
-60 dBm										
Start 2.48	35 GHz			691	pts			Stop	25.0 GHz	

Date: 4.JAN.2019 13:24:16





Date: 4.JAN.2019 13:28:09



Channel 06 (2437MHz) Reference Level: -2.79dBm

Spectrur	n								
	24.00 dBm			RBW 100 kHz					
Att	40 dB	SWT	24 ms 🥃	VBW 300 kHz	Mode /	Auto Sweep			
20 dBm—					N	M1[1]			-48.00 dBm 856.80 MHz
10 dBm									
0 dBm		-							
-10 dBm—			_						
-20 dBm—	D1 -22.790	dBm		_					
-30 dBm—									3
-40 dBm—	-		M1						-
uter gener	unarchiverates	al with the set		www.www.www.	mundundan	nuntitivent	toward when the the		methorition
-60 dBm—									n
-70 dBm—									
Start 1.0	MHz			691	pts			Ste	op 2.4 GHz

Date: 4.JAN.2019 14:12:00

Ref Level	24.00 dBm	Offset	0.50 dB 👄 R	BW 100 kHz	:					
Att	40 dB	SWT	226 ms 😑 V	BW 300 kHz	Mode A	uto Sweep				
∋1Pk Max										
20 dBm					M1[1]			-40.61 dBn 19.7705 GH		
10 dBm			_			17				
0 dBm		-								
-10 dBm		ş				- 12				
-20 dBm	-D1 -22.790	dBm								
-30 dBm						0				
-40 dBm		~					M1			
worden Mu	When Million	whenne	www.	Jahrenster	and the former	the way the	uloture V	-harde-makertar	Mortenan	
-60 dBm										
-70 dBm		7								

Date: 4.JAN.2019 14:12:23



Channel 11 (2462MHz) Reference Level: -7.65dBm

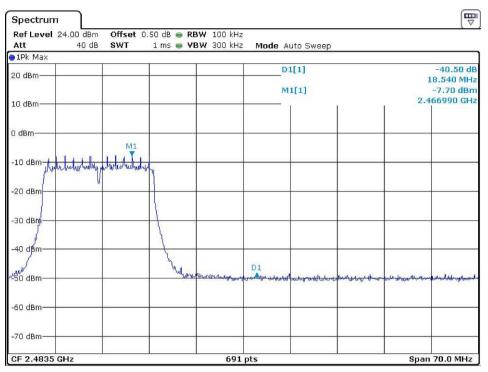
Spectrur	n									
	24.00 dBm			RBW 100 kHz						
Att	40 dB	SWT	24 ms 😑	/BW 300 kHz	Mode A	uto Sweep				
<mark>⊜1</mark> Pk Max	12	T								
20 dBm				M1[1]			ĩ	-48.39 dBm 992.20 MHz		
10 dBm	-					11				
0 dBm										
-10 dBm						-10				
-20 dBm—										
-30 dBm—	-D1 -27.650	dBm	-			4.5. - C.				
-40 dBm—			_							
JSR. ABIR Jot	And a constrained	atterry of the other	all all and and	M1 Arto Laurena un	antruttered	historentiral	Howard Murgar	an the solution	a hy my million mail in	
-60 dBm—										
-70 dBm—		- 1				1				
Start 1.0	MHz	1	1	691	pts	1.	1	Sto	p 2.4 GHz	

Date: 4.JAN.2019 14:16:04

Spectrur	n									
	24.00 dBm		.50 dB 👄 RE							
Att	40 dB	SWT :	226 ms 🔳 VE	SW 300 KHZ	Mode A	uto Sweep				
20 dBm					M1[1]			-41.41 dBm 20.2915 GHz		
10 dBm						og				
0 dBm										
-10 dBm—	5					0				
-20 dBm—										
-30 dBm—	-D1 -27.650	dBm				6.		1		
-40 dBm—					e h. Kina		EM			
"ԾՁ¹նՑՠ՞ա	wolward	notestallerigh	mitheman	and the particular	Mr. A. m.	a manana na n	humular "I	what we produced and we want	handreaded	
-60 dBm—	-									
-70 dBm—		oʻ								
Start 2.48	335 GHz	1	1	691	pts		1	Stop	25.0 GHz	

Date: 4.JAN.2019 14:16:24





Date: 4.JAN.2019 14:18:01



802.11n-HT20 Channel 01 (2412MHz) Reference Level: -2.81dBm

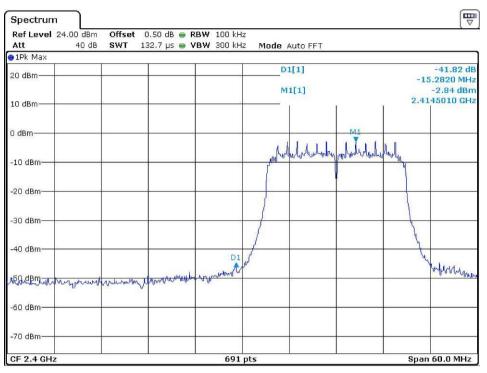
₩ Spectrum Ref Level 24.00 dBm Att 40 dB Offset 0.50 dB 🖷 RBW 100 kHz 24 ms 😑 YBW 300 kHz Att SWT Mode Auto Sweep ●1Pk Max -45.91 dBm 891.50 MHz M1[1] 20 dBm 10 dBm-0 dBm--10 dBm--20 dBm-D1 -22.810 dBm--30 dBm--40 dBm-M1 59 dam weter Allender Harden and the water work 1.000.0 Lu L all to the marked and the second and -60 dBm· -70 dBm-691 pts Stop 2.4 GHz Start 1.0 MHz

Date: 4.JAN.2019 14:21:56

Spectrun	n										
	24.00 dBm	Offset		3W 100 kHz					ð.		
Att 1Pk Max	40 dB	SWT	226 ms 😑 VI	3W 300 kHz	Mode A	uto Sweep					
20 dBm					M1[1]				-39.88 dBn 20.3235 GH:		
10 dBm	<i></i>					c <u>;</u>					
0 dBm		-									
-10 dBm		2				2					
-20 dBm	D1 -22.810	dBm									
-30 dBm											
-40 dBm					no they bread	the hade at	Ma Ma	- I we take	hubble		
weboutem	a derebarrante	m reached where	mennowedger	town the way	and the a	w - w wy	www.	- and a general and an an	nuntration		
-60 dBm											
-70 dBm											
Start 2.48	35 GHz	1	-	691	pts	1		Stop	25.0 GHz		

Date: 4.JAN.2019 14:22:17





Date: 4.JAN.2019 14:22:50



Channel 06 (2437MHz) Reference Level: -2.88dBm

Spectrum Ref Level 24.00 dBm Offset 0.50 dB 💿 RBW 100 kHz 40 dB SWT 24 ms 😑 🛛 🛛 🖉 300 kHz Att Mode Auto Sweep ●1Pk Max -47.55 dBm 1.03040 GHz M1[1] 20 dBm-10 dBm-0 dBm--10 dBm--20 dBm-D1 -22.880 dBm--30 dBm--40 dBm-MI Ashed 15. 2BChollow Mathematica Junior the wermont in approximation that the standard when a Manualit -60 dBm--70 dBm Start 1.0 MHz 691 pts Stop 2.4 GHz

Date: 4.JAN.2019 14:26:46

Spectrur	n								₩
Ref Level Att	24.00 dBm 40 dB	Offset SWT	0.50 dB 👄 RE	IW 100 kHz IW 300 kHz		uto Sweep			200
1Pk Max					mode /				2
20 dBm					M	11[1]	ĩ		41.02 dBm 9.8355 GHz
10 dBm						0			
0 dBm									
-10 dBm—									
-20 dBm	D1 -22.880	dBm							
-30 dBm	8.					5.			
-40 dBm—				11	her du rai	Man up 1	MI	al. A	
Jato dem	Mushamme	Working	unproduction	down all when	- U - M	10 mart three	Man	how we we v	Had Martin
-60 dBm—				7					
-70 dBm—		1				12			
Start 2.48	35 GHz	1		691	pts	1	1	Stop	25.0 GHz

Date: 4.JAN.2019 14:27:13



Channel 11 (2462MHz) Reference Level: -7.69dBm

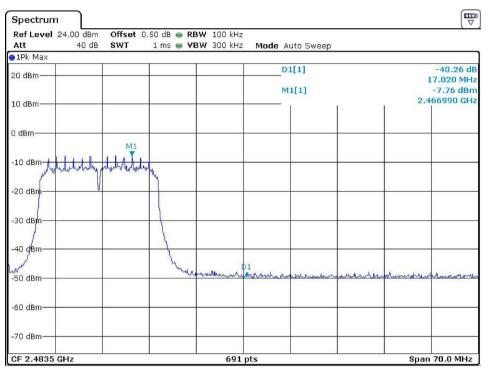
Spectrun	n								
	24.00 dBm		0.50 dB 🔵 RI						
Att	40 dB	SWT	24 ms 🥃 ٧	3W 300 kHz	Mode A	uto Sweep			
😑 1 Pk Max									
20 dBm		-			M	1[1]	l I		47.89 dBm 193.70 MHz
10 dBm		-				9			
0 dBm									
-10 dBm		0. (7				1. 			
-20 dBm									
-30 dBm	-D1 -27.690	dBm				ФА. 1.			
-40 dBm	-					e'			
T	phillippine	hyputhiden	-	to togethere we	chillen wonderte	nturnaluurta	phoneump	oling fallater	manutan
-60 dBm									
-70 dBm		1							
Start 1.0 M	IHz		1	691	pts	J		Sto	p 2.4 GHz

Date: 4.JAN.2019 14:35:45

Spectrun	ı)									
Ref Level Att	24.00 dBm 40 dB).50 dB 👄 RE 226 ms 👄 VE			uto Sweep				
1Pk Max	10 45	UIII		311 000 km	moue -	ato Sweep				
20 dBm					M1[1]			-40.32 dBm 19.7705 GHz		
10 dBm						eş				
0 dBm										
-10 dBm	2	2				- 10				
-20 dBm										
-30 dBm	D1 -27.690	dBm								
-40 dBm							M1	0.15		
aberlahm	potentia	water	white working the	munnymy	How will the way	manduly	water a	K. Mullingham	helphoneters	
-60 dBm										
-70 dBm										
Start 2.48	35 GHz	1		691	pts		I	Stop	25.0 GHz	

Date: 4.JAN.2019 14:36:03





Date: 4.JAN.2019 14:38:40



Applicant: Ottlite Technologies Inc. Date of Test: 04 January 2019

Model: T11FS

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

- [×] Not required, since all emissions are more than 20dB below fundamental
- [] See attached data sheet



Applicant: Ottlite Technologies Inc. Date of Test: 17 January 2019

Model: T11FS

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.



Applicant: Ottlite Technologies Inc. Date of Test: 17 January 2019

Model: T11FS

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where	FS = Field Strength in dBμV/m
	RA = Receiver Amplitude (including preamplifier) in $dB\mu V$
	CF = Cable Attenuation Factor in dB
	AF = Antenna Factor in dB
	AG = Amplifier Gain in dB
	PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

<u>Example</u>

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 62.0 dBμV AF = 7.4 dB CF = 1.6 dB AG = 29.0 dB PD = 0 dB FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dB μ V/m)/20] = 125.9 μ V/m



Applicant: Ottlite Technologies Inc. Date of Test: 17 January 2019

Model: T11FS

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11b-Channel 01) at 4824.0MHz is passed by 9.7dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.



Model: T11FS Transmitting (802.11b-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	60.555000	33.1	20.0	8.0	21.1	40.0	-18.9
Horizontal	79.470000	26.8	20.0	8.7	15.5	40.0	-24.5
Horizontal	319.060000	21.1	20.0	16.0	17.1	46.0	-28.9
Vertical	69.795000	19.5	20.0	8.1	7.6	40.0	-32.4
Vertical	78.985000	19.3	20.0	8.7	8.0	40.0	-32.0
Vertical	125.060000	26.2	20.0	9.4	15.6	43.5	-27.9

NOTES: 1. Quasi-Peak detector is used for frequency below 1GHz.

- All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.



Model: T11FS WIFI Link (802.11b-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	60.9	36.8	33.5	57.6	74.0	-16.4
Horizontal	*2390.000	57.7	36.4	29.1	50.4	74.0	-23.6

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	47.6	36.8	33.5	44.3	54.0	-9.7
Horizontal	*2390.000	39.2	36.4	29.1	31.9	54.0	-22.1

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Model: T11FS Transmitting (802.11b-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	59.7	36.7	33.4	56.4	74.0	-17.6
Horizontal	*7311.000	52.0	36.6	35.8	51.2	74.0	-22.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	47.4	36.7	33.4	44.1	54.0	-9.9
Horizontal	*7311.000	42.2	36.6	35.8	41.4	54.0	-12.6

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Model: T11FS Transmitting (802.11b-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	60.9	36.8	33.3	57.4	74.0	-16.6
Horizontal	*7386.000	58.4	36.5	29.3	51.2	74.0	-22.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	44.4	36.8	33.3	40.9	54.0	-13.1
Horizontal	*7386.000	38.3	36.5	29.3	31.1	54.0	-22.9

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Model: T11FS Transmitting (802.11g-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	60.9	36.8	33.5	57.6	74.0	-16.4
Horizontal	*2390.000	57.7	36.4	29.1	50.4	74.0	-23.6

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	46.5	36.8	33.5	43.2	54.0	-10.8
Horizontal	*2390.000	39.2	36.4	29.1	31.9	54.0	-22.1

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Model: T11FS Transmitting (802.11g-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	59.6	36.7	33.4	56.3	74.0	-17.7
Horizontal	*7311.000	58.0	36.6	35.8	57.2	74.0	-16.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	45.4	36.7	33.4	42.1	54.0	-11.9
Horizontal	*7311.000	42.2	36.6	35.8	41.4	54.0	-12.6

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Model: T11FS Transmitting (802.11g-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	60.9	36.8	33.3	57.4	74.0	-16.6
Horizontal	*7386.000	58.5	36.5	29.3	51.3	74.0	-22.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	45.2	36.8	33.3	41.7	54.0	-12.3
Horizontal	*7386.000	49.4	36.5	29.3	42.2	54.0	-11.8

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Model: T11FS Transmitting (802.11n20-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	63.6	36.8	33.5	60.34	74.0	-13.7
Horizontal	*2390.000	63.5	36.4	29.1	56.2	74.0	-17.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	44.4	36.8	33.5	41.1	54.0	-12.9
Horizontal	*2390.000	46.2	36.4	29.1	38.9	54.0	-15.1

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Model: T11FS Transmitting (802.11n20-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	64.1	36.7	33.4	60.8	74.0	-13.2
Horizontal	*7311.000	57.4	36.6	35.8	56.6	74.0	-17.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	43.6	36.7	33.4	40.3	54.0	-13.7
Horizontal	*7311.000	38.2	36.6	35.8	37.4	54.0	-16.6

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Model: T11FS Transmitting (802.11n20-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	62.7	36.8	33.3	59.2	74.0	-14.8
Horizontal	*7386.000	64.6	36.5	29.3	57.4	74.0	-16.6

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	43.9	36.8	33.3	40.4	54.0	-13.6
Horizontal	*7386.000	45.4	36.5	29.3	38.2	54.0	-15.8

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: Ottlite Technologies Inc. Date of Test: November 21, 2018 Model: T11FS

4.9 Conducted Emission

Worst Case Conducted Emission (802.11b-Channel 01) at 0.474MHz is passed by 9.6dB margin.

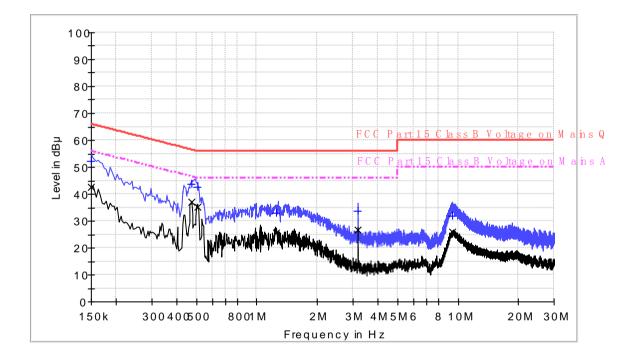
For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.



Applicant: Ottlite Technologies Inc. Date of Test: 18 November 2018 Model: T11FS Worst Case Operating Mode: Transmitting (802.11b-Channel 01) Phase: Live

Graphic / Data Table

Conducted Emissions Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

	U U					
Frequency	QuasiPeak	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dB¦ÌV)	(kHz)		(dB)	(dB)	(dB¦ÌV)
0.150000	52.2	9.000	L1	9.6	13.8	66.0
0.472000	43.7	9.000	L1	9.6	12.8	56.5
0.506000	42.5	9.000	L1	9.6	13.5	56.0
1.246000	33.1	9.000	L1	9.7	22.9	56.0
3.170000	33.7	9.000	L1	9.7	22.3	56.0
9.418000	32.0	9.000	L1	9.9	28.0	60.0

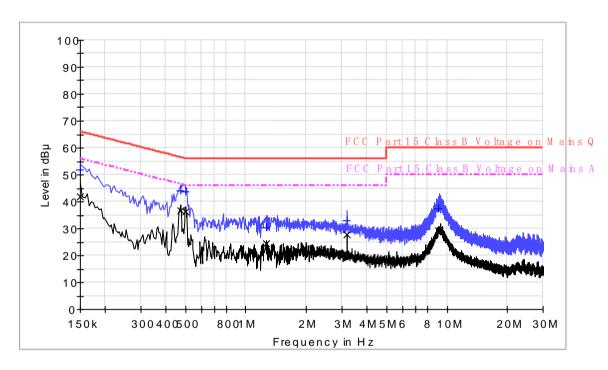
Limit and Margin AV

Frequency	Average	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dB¦ÌV)	(kHz)		(dB)	(dB)	(dB¦ÌV)
0.150000	42.7	9.000	L1	9.6	13.3	56.0
0.472000	36.9	9.000	L1	9.6	9.6	46.5
0.506000	35.3	9.000	L1	9.6	10.7	46.0
1.246000	25.6	9.000	L1	9.7	20.4	46.0
3.170000	26.5	9.000	L1	9.7	19.5	46.0
9.418000	26.1	9.000	L1	9.9	23.9	50.0



Applicant: Ottlite Technologies Inc. Date of Test: 18 November 2018 Model: T11FS Worst Case Operating Mode: Transmitting (802.11b-Channel 01) Phase: Neutral

Graphic / Data Table



Conducted Emissions Pursuant to FCC 15.207: Emissions Requirement

Limit and Margin QP

<u>0 </u>							
	Frequency	QuasiPeak	Bandwidth	Line	Corr.	Margin	Limit
	(MHz)	(dB¦ÌV)	(kHz)	Line	(dB)	(dB)	(dB¦ÌV)
	0.150000	51.7	9.000	Ν	9.6	14.3	66.0
	0.474000	44.1	9.000	Ν	9.7	12.3	56.4
	0.502000	43.9	9.000	Ν	9.7	12.1	56.0
	1.270000	30.5	9.000	Ν	9.7	25.5	56.0
	3.170000	33.1	9.000	Ν	9.7	22.9	56.0
	9.098000	37.3	9.000	Ν	9.9	22.7	60.0

Limit and Margin AV

Frequency	Average	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dB¦ÌV)	(kHz)	Line	(dB)	(dB)	(dB¦ÌV)
0.150000	42.0	9.000	Ν	9.6	14.0	56.0
0.474000	36.8	9.000	Ν	9.7	9.6	46.4
0.502000	36.2	9.000	Ν	9.7	9.8	46.0
1.270000	24.3	9.000	Ν	9.7	21.7	46.0
3.170000	27.8	9.000	Ν	9.7	18.2	46.0
9.098000	29.4	9.000	Ν	9.9	20.6	50.0



Applicant: Ottlite Technologies Inc. Date of Test: 04 January 2019 Model: T11FS

- 4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109
- [] Not required No digital part
- [] Test results are attached
- [x] Included in the separated report.



Applicant: Ottlite Technologies Inc. Date of Test: 04 January 2019 Model: T11FS

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing					
	See Transmitter timing diagram provided by manufacturer					
х	Not applicable, duty cycle was not used.					



EXHIBIT 5

EQUIPMENT PHOTOGRAPHS





5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.



EXHIBIT 6

PRODUCT LABELLING



6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

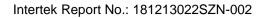
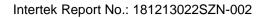




EXHIBIT 7

TECHNICAL SPECIFICATIONS





7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.



EXHIBIT 8

INSTRUCTION MANUAL



8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.





EXHIBIT 9

CONFIDENTIALITY REQUEST

Version: 01-November-2017



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9.0 <u>Confidentiality Request</u>

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.



EXHIBIT 10

MISCELLANEOUS INFORMATION



10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.



EXHIBIT 11

TEST EQUIPMENT LIST



TEST REPORT

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	05-Jun-2018	05-Jun-2019
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	05-Jun-2018	05-Jun-2019
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	14-Sep-2018	14-Sep-2019
SZ185-01	EMI Receiver	R&S	ESCI	100547	24-Jan-2018	24-Jan-2019
SZ061-08	Horn Antenna	ETS	3115	00092346	14-Sep-2018	14-Sep-2019
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	21-May-2018	21-May-2019
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	05-Jun-2018	05-Jun-2019
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	05-Jun-2018	05-Jun-2019
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	24-Jan-2018	24-Jan-2019
SZ188-01	Anechoic Chamber	ETS	RFD-F/A- 100	4102	16-Jan-2019	16-Jan-2022
SZ062-02	RF Cable	RADIALL	RG 213U		10-Jun-2018	10-Jun-2019
SZ062-05	RF Cable	RADIALL	0.04- 26.5GHz		10-Jun-2018	10-Jun-2019
SZ062-12	RF Cable	RADIALL	0.04- 26.5GHz		10-Jun-2018	10-Jun-2019
SZ067-04	Notch Filter	Micro-Tronics	BRM50702- 02		05-Jun-2018	05-Jun-2019
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	26-Oct-2018	26-Oct-2019
SZ187-01	Two-Line V- Network	R&S	ENV216	100072	26-Oct-2018	26-Oct-2019
SZ188-03	Shielding Room	ETS	RFD-100	4100	29-Oct-2018	29-Oct-2019