EMISSIONS TEST REPORT FOR A LOW POWER TRANSMITTER

I. GENERAL INFORMATION

Requirement:	FCC
Test Requirements:	FCC Part 15

Applicant: Silver Spring Networks 575 Broadway Street Redwood City, CA 94063

FCC ID:	OWS-NIC508
Model No.:	174-000084

II. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

The Silver Spring Networks (SSN) model 174-000084 is a radio module for electric power meter communications use. The board incorporates a 900 MHz frequency hopping i210 Mesh radio, a 900 MHz Zigbee Home area Network (HAN) radio, and a 2.4GHz HAN radio.

III. TEST DATES AND TEST LOCATION

Testing was performed on various dates between 15 August – 31 October 2008. Radiated emissions, 900 MHz and 2.4 GHz antenna conducted power, 2.4 GHz antenna conducted spurious, and AC line conducted emissions tests were performed at:

Compliance Certification Services 47173 Benicia Street Fremont, CA 94538

All other antenna port conducted tests were performed at Silver Spring Networks.

Y.M. Cohen_

T.N. Cokenias EMC Consultant/Agent for Silver Spring Networks

20 Nov 2008

15.203 Antenna connector requirement

The EUT uses a custom permanently attached integral antenna, a special sheet metal antenna manufactured by Silver Spring Networks for electric meters

Antenna description	Mfr.	Model No.	Gain
Built-in sheet metal electric meter	SSN	n/a	2.4 dBi at 915 MHz 1.5 dBi at 2.4 GHz

NOTE: Although all three radios share the same antenna, only one radio at a time is operating, either in receive or transmit mode.

TEST PROCEDURES

All tests were performed in accordance with the applicable procedures called out in the following documents, unless otherwise noted:

FCC 47CFR15

RSS-210 Issue 7: Low power license exempt radio frequency devices (July 2007) RSS-Gen, Issue 2:

RSS-212: Test Facilities and Test Methods for Radio Equipment

ANSI C63.4 – 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

For each radio, tests were performed at three frequencies:

900 MHz HAN Radio

Channel 1 (LOW) – 906.25 MHz Channel 5 (MID) – 914.25 MHz Channel 10 (HIGH) – 924.3 MHz

2.4 GHz HAN Radio

Channel 11 (LOW) – 2405.8 MHz Channel 18 (MID) – 2440.8 MHz Channel 26 (HIGH) – 2480.9 MHz

900 MHz FHSS

Channel 0 (LOW) – 902.3 MHz Channel 42 (MID) -914.9 MHz Channel 82 (HIFH) – 926.9 MHz

Test Equipment

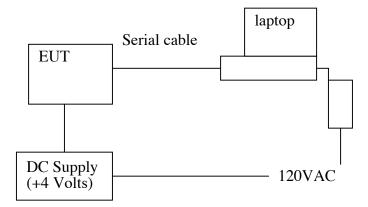
Compliance Certification Services:

Equipment	Mfr	Model	Asset No.	Cal Due
Spectrum analyzer	Agilent	E4446A	C01159	10/27/08
(radiated emissions				
2.4GHz Pout, spurs)				
EMI Receiver	HP	8542E	C00967	09/10/09
Bilog antenna	Sunol Sciences	JBI	C01016	09/28/08
Pre-amplifier	Agilent	HP8447D	C00885	03/31/09
Horn antenna	EMCO	3115	C00872	03/31/09
Pre-amplifier	Agilent	HP 8449B	C00749	09/27/08
EMI Receiver	R & S	ESHS-20	827129/006	01/27/09
LISN	FCC	LISN50/250-25-2	2023	09/27/08

Silver Spring Networks:

Equipment	Mfr	Model	Asset No.	Cal Date
Spectrum analyzer	Agilent	E44053	1077004	06/29/08

Test Set-up Diagram

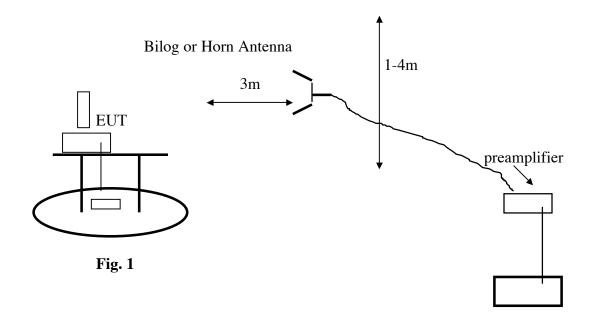


Support Equipment

Equipment	Mfr	Model	Asset No.
DC Power Supply	Agilent	E3610A	2844
Laptop PC	Dell	PP01L	TW-0791UH1280-
			OC9-6558
AC/DC adapter	CUI Inc.	DSA-60W-20	2607HB

900 MHz HAN Spread Spectrum Radio

TEST RESULTS Radiated Test Set-up, 30MHz - 10 GHz



Test Procedures

Radiated emissions generated by the transmitter portion of the EUT were measured.

1. The EUT was placed on a wooden table resting on a turntable on the test site. The search antenna was placed 3m from the EUT. The EUT antenna was mounted in the with the EUT TX antenna pointed directly to the search antenna.

2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205.

3. Emissions were investigated to the 10^{th} harmonic of the fundamental.

4. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

Test Results: Worst-case results are presented. Refer to data sheets below. Restricted band emissions meet 54 dBuV/m. Other undesired emissions from the transmitter meet the -20 dBc requirement in 15.247(d).

15.205 Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505 (1)	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

15.209 General Field Strength Limits

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

900 MHz	HAN	Radiated	Spurious	Low	Channel
200 mmL	11/11/	rautatea	opurious,	L 0 !!	Channel

Complia			deasurement vices, Morga		pen Fi	eld Site										
Company Project #: Date: Test Engi Configura Mode:	neer:		Silver Spring 08U11890 8/15/08 Thanh Nguyen EUT at Y posit Transmit DSSS	ion												
l'est Equi	pment:															
Horn 1-18GHz Pre-amplifer 1-26GHz						GHz	Pre-amp	lifer 20	6-40GHz			н	orn > 18	GHz		
	N: 6717 (T144 N	liteq 30	08A009	031 🖕			-						-	
Hi Frequency Cable 3 foot cable					-	12 f Gordon	i <mark>oot c</mark> 20313			HPF Reject Filter			RI Ave	<u>Peak Measurements</u> RBW=VBW=1MHz <u>Average Measurements</u>		
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m		vg uV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	=1MHz ; VBW=10Hz Notes (V/H)
ower Se	tting at	mx 0x05=0x	e (~24 dBm)	u19/11	ub	ub	ub	ub	ubu (/iii			ubu () iii	ubu (/m	ub		(())
		Hz ATS 107= 1							10.0							
718 625	3.0	47.98 45.23	43.63 39.94	29.2 31.6	8.6 9.6	-37.4	0.0	0.6	49.0 50.1		4.6 4.9	74	54 54	-25.0	-9.4 -9.1	V V
531	3.0	40.89	28.40	33.0	10.6	-36.5	0.0	0.6	48.6		6.1	74	54	-25.4	-17.9	v
438	3.0	41.03	30.31	33.8	11.2	-36.3	0.0	0.5	50.2	3	9.5	74	54	-23.8	-14.5	V
.156	3.0	41.36	29.36	35.5	13.1	-36.3	0.0	0.7	54.4		2.4	74	54	-19.6	-11.6	V
.063	3.0	39.79	28.15	36.5	13.6	-36.7	0.0	0.7	53.9	4	2.2	74	54	-20.1	-11.8	Noise floor
718	3.0	47.96	43.83	29.2	8.6	-37.4	0.0	0.6	48.9	4	4.8	74	54	-25.1	-9.2	Н
625	3.0	45.12	35.55	31.6	9.6	-36.9	0.0	0.6	50.0	4	0.5	74	54	-24.0	-13.5	Н
531	3.0	42.08	32.17	33.0	10.6	-36.5	0.0	0.6	49.8		9.9	74	54	-24.2	-14.1	Н
438 156	3.0	44.88 43.89	37.92 36.00	33.8 35.5	11.2 13.1	-36.3 -36.3	0.0	0.5	54.1 56.9		7.1 9.1	74	54 54	-19.9 -17.1	-6.9 -4.9	H H
063	3.0	40.45	27.97	36.5	13.6	-36.7	0.0	0.7	54.5		2.1	74	54	-19.5	-11.9	Noise floor
	f	Measureme	nt Frequency			Amp	Preamp G	ain					Avg Lim	Average Fi	eld Strength	Limit
	Dist	Distance to	1 2			D Corr			to 3 meters				Pk Lim		Strength Lir	
	Read	Analyzer Re				Avg			rength @ 3				Avg Mar		Average Li	
	AF	Antenna Fa	0			Peak			Field Streng				Pk Mar		Peak Limit	
	CL	Cable Loss				HPF	High Pass		r ielu Suellg				i k iviai	margin vs.	i cak Linilli	
	CL	Cable Loss				HPF	High Pass	Filter								

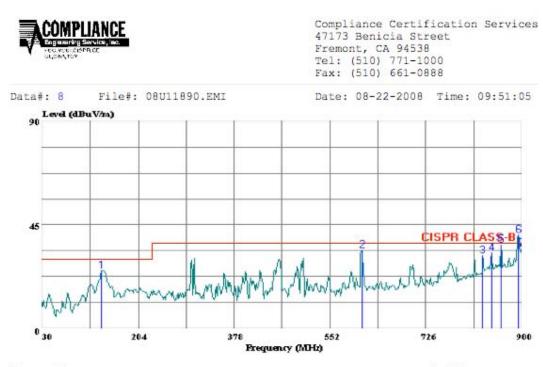
900 MHz HAN Radiated Spurious, Mid Channel

Complia			Aeasurement vices, Morga		pen Fi	eld Site									
Company Project #: Date: Cest Engin Configura Mode:	neer:		Silver Spring 08U11890 8/15/08 Thanh Nguyen EUT at Y posit Transmit DSSS	ion		4.25 MHz									
'est Equi	pment:														
Horn 1-18GHz Pre-amplifer 1-26GHz						GHz	Pre-amp	lifer 2	6-40GHz		н	orn > 18	GHz		
T73; S/N: 6717 @3m - Hi Frequency Cables					08A009	931 🖵			-					•	
Γ <u> </u>	2 foot	-	3	foot c	able			foot c			HPF	R	eject Filte	RB	k Measurements W=VBW=1MHz
						-	Gordor	20313	•4001		PF_1.5GHz	-			age Measurements 1MHz ; VBW=10Hz
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
ower Se	tting at	mx 0x05=0x	e0 (~24 dBm)												
	4.25 MH	z ATS 107= 5													
.743	3.0	45.25	39.52	29.3	8.7	-37.4	0.0	0.6	46.3	40.6	74	54	-27.7	-13.4	V
657 571	3.0	42.07 40.89	31.07 28.40	31.7 33.1	9.7 10.7	-36.9 -36.5	0.0	0.6	47.1 48.7	36.1	74	54 54	-26.9 -25.3	-17.9 -17.8	v v
438	3.0	40.89	30.68	33.8	11.2	-36.3	0.0	0.0	50.8	39.9	74	54	-23.3	-17.8	v
314	3.0	42.35	29.67	35.0	12.7	-36.2	0.0	0.6	54.4	41.7	74	54	-19.6	-12.3	v
.228	3.0	41.97	30.70	35.6	13.1	-36.3	0.0	0.7	55.1	43.8	74	54	-18.9	-10.2	v
142	3.0	40.08	27.89	36.5	13.6	-36.7	0.0	0.7	54.2	42.1	74	54	-19.8	-11.9	Noise floor
743	3.0	48.72	45.01	29.3	8.7	-37.4	0.0	0.6	49.8	46.1	74	54	-24.2	-7.9	H
657 571	3.0	43.35 40.99	35.59 28.83	31.7 33.1	9.7 10.7	-36.9 -36.5	0.0	0.6	48.4	40.6	74	54 54	-25.6	-13.4 -17.4	H H
438	3.0	40.99 43.58	28.83	33.8	10.7	-36.5	0.0	0.6	48.8	36.6 45.1	74	54	-25.2	-17.4	<u>н</u> Н
438 314	3.0	43.56	30.38	35.0	12.7	-36.2	0.0	0.5	54.0	43.1	74	54	-21.2	-3.9	Н
228	3.0	44.77	36.69	35.6	13.1	-36.3	0.0	0.0	57.9	49.8	74	54	-16.1	-4.2	н
.142	3.0	40.67	27.96	36.5	13.6	-36.7	0.0	0.7	54.8	42.1	74	54	-19.2	-11.9	Noise floor
							1						1		
			nt Frequency			Amp	Preamp G	ain				Avg Lim	Average F	ield Strength I	Limit
	f	Measureme							to 3 meters			Pk Lim		Strength Lim	
	f Dist					D Corr							i car i iciu		11
	Dist	Distance to	Antenna			D Corr						Aug Mer	Morgin		
	Dist Read	Distance to Analyzer Re	Antenna eading			Avg	Average I	Field St	trength @ 3			Avg Mar		Average Lim	iit
	Dist	Distance to	Antenna eading				Average I	Field St d Peak				Avg Mar Pk Mar			iit

900 MHz HAN Radiated Spurious, High Channel

Complia			Measurement rvices, Morga		pen Fi	eld Site	0								
Company Project # Date: Test Eng Configur Mode:	: ineer:		Silver Spring 08U11890 8/15/08 Thanh Nguyen EUT at Y posit Transmit DSS	ion		24.3 MHz									
fest Equ	ipment:														
Horn 1-18GHz Pre-amplifer 1-26GHz					Pre-amp	lifer 26	-40GHz		н	orn >18	GHz				
	/N: 6717 (iency Cables		T144 N	/liteq 30	08A009	931 🖵			-					-	
2 foot cable 3 foot cable					-	12 foot cable HPF Gordon 203134001 HPF 1.5GH					RBW=VBW=1MHz				
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	=1MHz ; VBW=10Hz
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
			e) (~19.73dBı	n)											
		ATS107=10	10 T (40.0					
773 697	3.0	45.30 43.61	38.76 34.19	29.3 31.8	8.7 9.7	-37.4	0.0	0.6	46.5 48.8	40.0	74	54 54	-27.5 -25.2	-14.0 -14.6	<u>v</u> v
.622	3.0	43.01	32.13	33.1	10.7	-36.5	0.0	0.6	40.0	40.0	74	54	-23.2	-14.0	v
.394	3.0	41.65	29.09	35.0	12.7	-36.2	0.0	0.6	53.8	41.2	74	54	-20.2	-12.8	v
.319	3.0	42.45	30.60	35.7	13.2	-36.3	0.0	0.7	55.7	43.8	74	54	-18.3	-10.2	V
773	3.0	47.77	42.52	29.3	8.7	-37.4	0.0	0.6	49.0	43.7	74	54	-25.0	-10.3	н
697	3.0	43.42	34.92	31.8	9.7	-36.8	0.0	0.6	48.7	40.2	74	54	-25.3	-13.8	Н
622	3.0	41.63	31.64	33.1	10.7	-36.5	0.0	0.6	49.5	39.6	74	54	-24.5	-14.4	Н
.394	3.0	42.71	32.00	35.0	12.7	-36.2	0.0	0.6	54.9	44.2	74	54	-19.1	-9.8	H
.319	3.0	44.32	34.58	35.7	13.2	-36.3	0.0	0.7	57.6	47.8	74	54	-16.4	-6.2	Н
	f Dist Read	Measuremen Distance to Analyzer Re		1	1	Amp D Corr Avg	Average I	Correct Field St	to 3 meters rength @ 3 Field Streng	m	1	Avg Lim Pk Lim Avg Mar Pk Mar	Peak Field	eld Strength Strength Lir Average Lir	nit

Radiated Emissions 30-1000 MHz

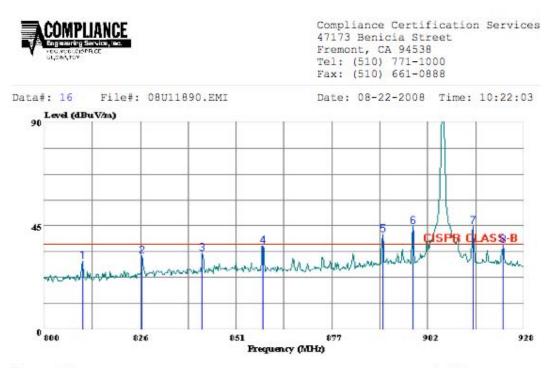


Trace: 7

Ref Trace:

Condition: CISPR CLASS-B HORIZONTAL Test Operator:: William Zhuang Project #: : 08U11890 Company: : Silver Spring Configuration:: EUT with Laptop Mode : : : Tx, 802.15.4 Ch.1, Max Power Target: : : CISPR Class B

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	107	MHz	dBuV	dB	dBuV/m	$\overline{dBuV/m}$	dB	
1		137.880	42.97	-17.92	25.05	30.00	-4.95	Peak
2		610.290	42.11	-8.30	33.81	37.00	-3.19	Peak
3		829.530	35.33	-3.89	31.44	37.00	-5.56	Peak
4		845.190	36.28	-3.60	32.68	37.00	-4.32	Peak
5		862.590	39.31	-3.16	36.15	37.00	-0.85	Peak
6	*	894.780	43.04	-2.40	40.64	37.00	3.64	Peak
7		900.000	37.14	-2.29	34.85	37.00	-2.15	Peak

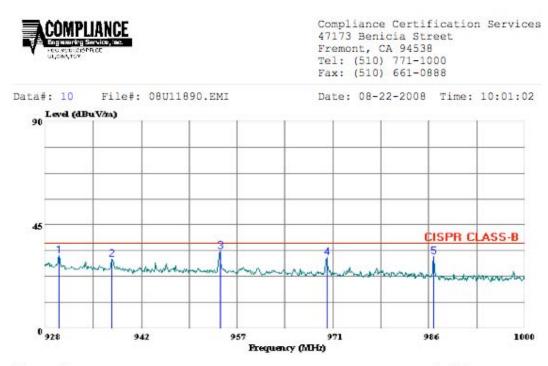


Trace: 15

Ref Trace:

Condition: CISPR CLASS-B HORIZONTAL Test Operator:: William Zhuang Project #: : 08U11890 Company: : Silver Spring Configuration:: EUT with Laptop Mode : : : Tx, 802.15.4 Ch.1, Max Power Target: : : CISPR Class B

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	100	MHz	dBuV	dB	dBuV/m	$\overline{dBuV/m}$	dB	-
1		810.112	33.98	-4.31	29.67	37.00	-7.33	Peak
2		826.112	35.77	-3.96	31.81	37.00	-5.19	Peak
3		842.112	36.73	-3.63	33.10	37.00	-3.90	Peak
4		858.240	39.31	-3.23	36.08	37.00	-0.92	Peak
5	*	890.496	43.68	-2.51	41.17	37.00	4.17	Peak
6	*	898.432	47.13	-2.32	44.81	37.00	7.81	Peak
7	*	914.432	46.91	-2.05	44.86	37.00	7.86	Peak
8		922.496	38.36	-1.82	36.54	37.00	-0.46	Peak

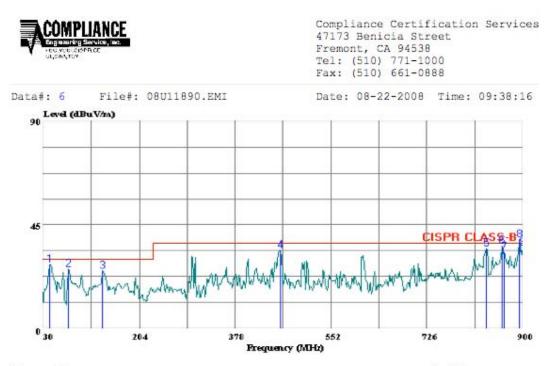


Trace: 9

Ref Trace:

Condition: CISPR CLASS-B HORIZONTAL Test Operator:: William Zhuang Project #: : 08U11890 Company: : Silver Spring Configuration:: EUT with Laptop Mode : : : Tx, 802.15.4 Ch.1, Max Power Target: : : CISPR Class B

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	$\overline{dBuV/m}$	dB	
1	929.944	33.19	-1.65	31.54	37.00	-5.46	Peak
2	938.008	31.39	-1.54	29.85	37.00	-7.15	Peak
3	954.208	34.71	-1.20	33.51	37.00	-3.49	Peak
4	970.264	31.85	-0.92	30.93	37.00	-6.07	Peak
5	986.248	31.55	-0.56	31.00	37.00	-6.00	Peak

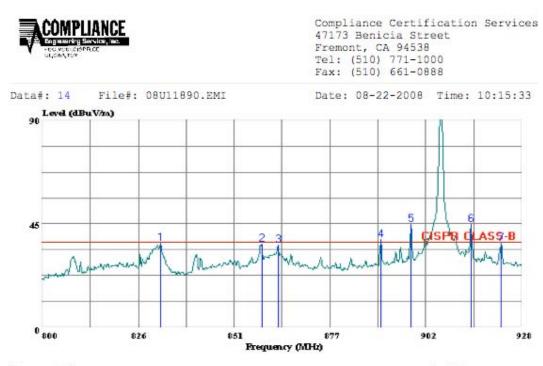


Trace: 5

Ref Trace:

Condition: CISPR CLASS-B VERTICAL Test Operator:: William Zhuang Project #: : 08U11890 Company: : Silver Spring Configuration:: EUT with Laptop Mode : : : Tx, 802.15.4 Ch.1, Max Power Target: : : CISPR Class B

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	1	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		42.180	47.35	-19.82	27.54	30.00	-2.47	Peak
2		75.240	49.10	-23.57	25.53	30.00	-4.47	Peak
3		137.880	42.76	-17.92	24.84	30.00	-5.16	Peak
4		459.780	44.85	-10.96	33.89	37.00	-3.11	Peak
5		833.880	38.44	-3.75	34.69	37.00	-2.31	Peak
6		862.590	39.14	-3.16	35.98	37.00	-1.02	Peak
7		866.940	36.00	-3.03	32.97	37.00	-4.03	Peak
8	*	894.780	40.97	-2.40	38.57	37.00	1.57	Peak
9		900.000	37.39	-2.29	35.10	37.00	-1.90	Peak

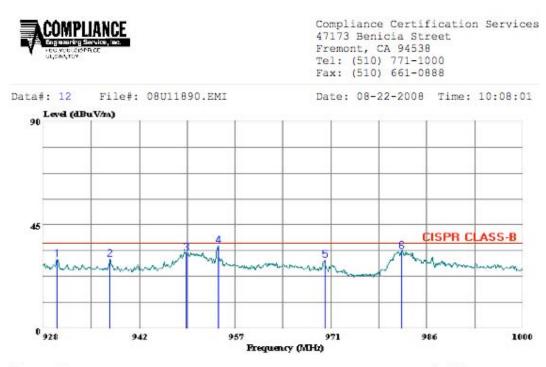


Trace: 13

Ref Trace:

Condition: CISPR CLASS-B VERTICAL Test Operator:: William Zhuang Project #: : 08U11890 Company: : Silver Spring Configuration:: EUT with Laptop Mode : : : Tx, 802.15.4 Ch.1, Max Power Target: : : CISPR Class B

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	15	MHz	dBuV	dB	dBuV/m	$\overline{dBuV/m}$	dB	-
1		831.616	40.59	-3.80	36.79	37.00	-0.21	Peak
2		858.496	39.38	-3.23	36.15	37.00	-0.85	Peak
3		862.976	39.11	-3.12	35.99	37.00	-1.01	Peak
4	*	890.496	40.72	-2.51	38.21	37.00	1.21	Peak
5	*	898.432	47.18	-2.32	44.86	37.00	7.86	Peak
6	*	914.432	46.88	-2.05	44.83	37.00	7.83	Peak
7		922.496	38.50	-1.82	36.68	37.00	-0.32	Peak



Trace: 11

Ref Trace:

Condition: CISPR CLASS-B VERTICAL Test Operator:: William Zhuang Project #: : 08U11890 Company: : Silver Spring Configuration:: EUT with Laptop Mode : : : Tx, 802.15.4 Ch.1, Max Power Target: : : CISPR Class B

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
18	MHz	dBuV	dB	dBuV/m	$\overline{dBuV/m}$	dB	-
1	930.016	31.67	-1.65	30.03	37.00	-6.97	Peak
2	938.008	31.59	-1.54	30.05	37.00	-6.95	Peak
3	949.384	34.07	-1.34	32.73	37.00	-4.27	Peak
4	954.208	36.99	-1.20	35.79	37.00	-1.21	Peak
5	970.264	30.55	-0.92	29.63	37.00	-7.37	Peak
6	981.856	34.21	-0.66	33.54	37.00	-3.46	Peak

6dB Bandwidth for DTS Test Requirement: FCC: 15.247 (a) 2 IC: RSS-210 Sec. 6.2.2(o)(iv)

Test Set-up



Test Procedures

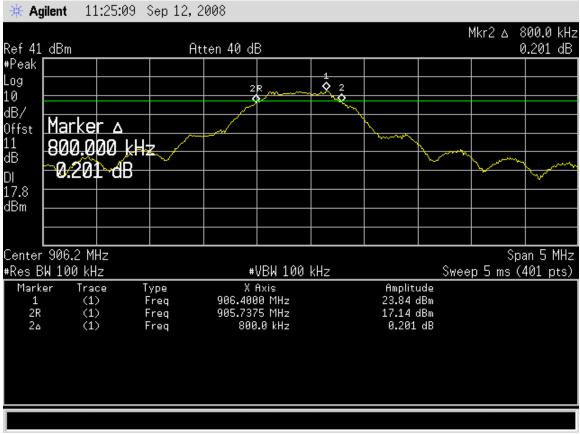
A coaxial cable was attached to the radio antenna port Murata connector. The cable's SMA connector was connected to the spectrum analyzer. The EUT transmission was continuous at the LOW channel. While the transmitter broadcast a steady stream of digital data, the analyzer OCCUPIED BW function was activated to the 99% BW, and the DELTA MARKER function was used to measure the 6 dB BW.

Test was repeated for MID and HIGH channels.

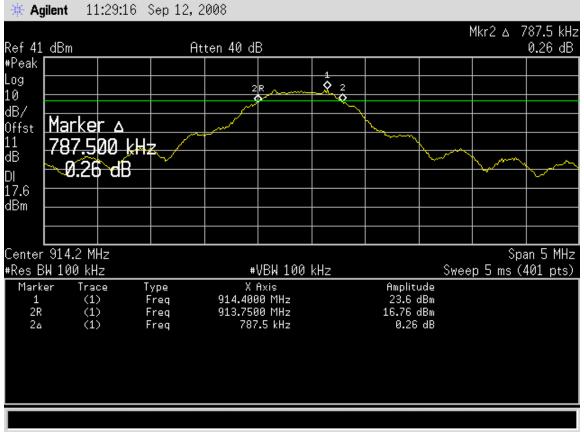
Test Results. No non-compliance noted. Refer to data sheets below.

Minimum 6 dB BW: 787 kHz Minimum Required: 500 kHz

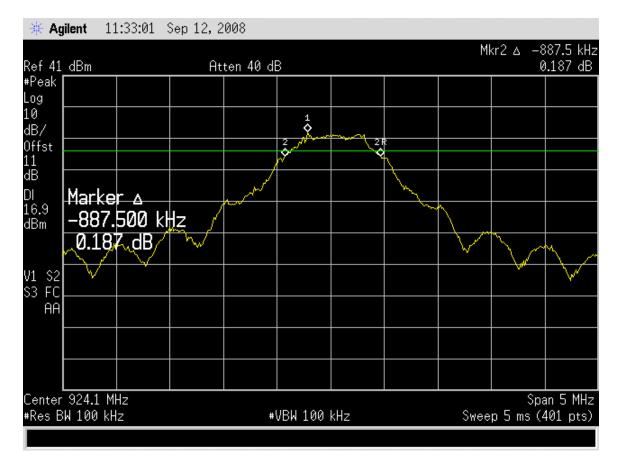
6dB Bandwidth LOW Channel



6 dB BW, MID Channel

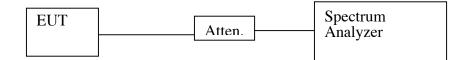


6 dB BW, HIGH Channel



99% Bandwidth

Test Setup



Limit

None: for reporting purposes only.

Test Procedure

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal OCCUPIED BW function was utilized.

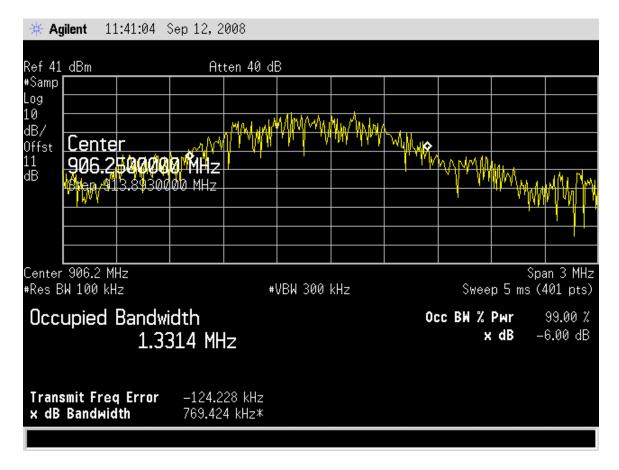
Test Results

Refer to spectrum analyzer charts below. 99% bandwidth approximately 1.41 MHz

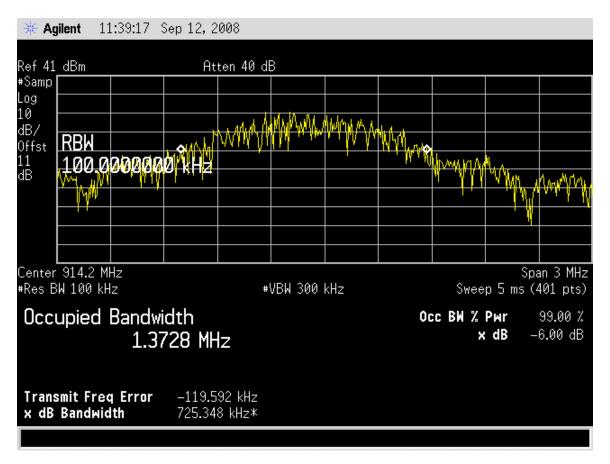
Emission Designator: 1M41G1D

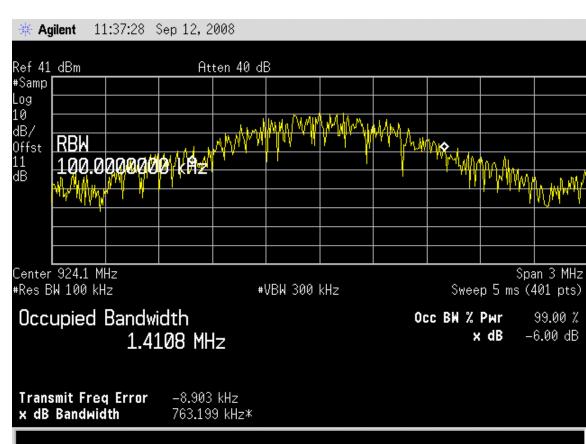


99% Bandwidth LOW Channel



99% Bandwidth MID Channel



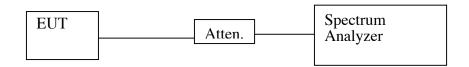


99% Bandwidth HIGH Channel

RF Power Output Test Requirement: FCC: 15.247(b)

IC: RSS-210 Sec. 6.2.2(o)(iv)

Test Setup



Test Procedures

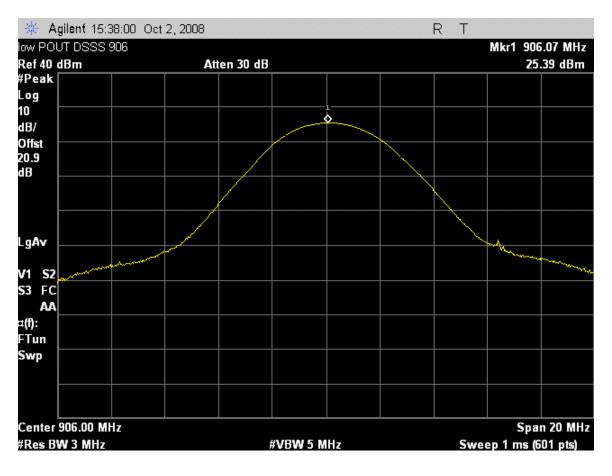
1. The EUT was configured on a test bench. RBW was set to a value higher than the 2.5 MHz 99% band width: RBW=3 MHz, VBW=8 MHz

2. The spectrum analyzer detector was set to PEAK and the highest value was recorded using the analyzer PEAK SEARCH function.

Test Results

Refer to spectrum analyzer graphs. Reference level offset corrects for external attenuation and cable loss.

Channel	Frequency, MHz	Output Power, dBm	Output Power, Watts
Low	906.07	25.39	0.346
Mid	914.15	24.89	0.308
High	924.07	24.39	0.275



Peak Output Power LOW Channel

#Res BW 3 MHz

ID POUT DSSS 914.	25				Mkr1 91	4.15 MH;
ef 40 dBm	At	ten 30 dB			24	.89 dBm
Peak						
og 🛛						
			2			
3/						
fst		/				
.9						
,						
	/	K in the second				
. A						
μΑν	hand the second s					
1 S2						mand
FC						
AA						
):						
un						
wp						

#VBW 5 MHz

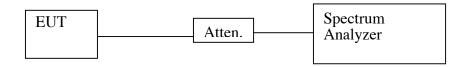
Peak Output Power MID Channel

Sweep 1 ms (601 pts)

🔆 Agilent 15:43)08				R	Т	Peak Search
HIGH POUT DSSS					Mkr1	924.07		
Ref 40 dBm	Atten 3	0 dB				24.39	dBm	Next Peak
#Peak Log								
10			i					
dB/			-					Next Pk Right
Offst								
20.9								
dB								Next Pk Left
LgAv						hanne		Min Search
M1 S2 S3 FC								Pk-Pk Search
¤(f): FTun Swp								Mkr © Cf
Center 924.30 MH #Res BW 3 MHz	enter 924.30 MHz			Span 20 MHz 5 MHz Sweep 1 ms (601 pts)				More 1 of 2

Peak Output Power HIGH Channel

Test Setup



Test Procedure

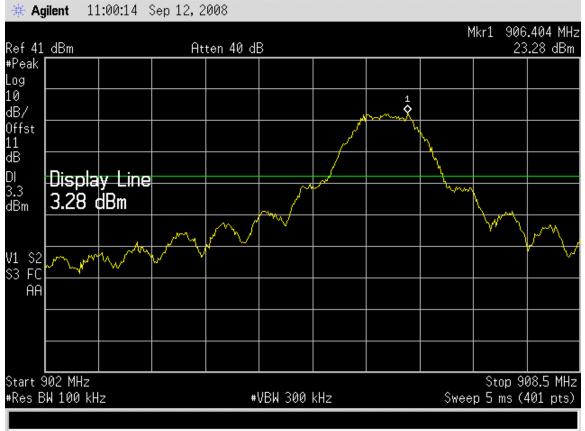
1. The EUT was configured on a test bench. The cable was connected between the EUT antenna port and the spectrum analyzer input port.

Spectrum analyzer RES BW was set to 100 kHz. While the transmitter broadcast a steady stream of digital data, the analyzer MAX HOLD function was used to capture the envelope of the transmission.

Readings were taken out to 10fo.

Test Results

Refer to spectrum analyzer plots. Data shows out of band emissions are suppressed well below the -20 dBc minimum required by the Rules.



Lower band edge, -20 dBc, LOW Channel

TX Spurious Emissions LOW Channel

Report No. 08PRO22 Rev1

Ref 41 dBm									
		At	Mkr1 909 MHz ten 40 dB 21.75 dBm						
#Peak Log									
Offst 11 dB									
^{dB} DI Marke	.r								
dBm 908./	50000	MHz							
21.7	5 dBm								
V1 S2	v	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		man	~~~~	www	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
AA									
Start 30 MHz ≢Res BW 100 kł	lz		#	VBW 300 I	kHz		Sweep 95	؟ Stop / 8.3 ms	9.28 GHz 401 pts)



-20 dBc MID Channel Reference

Report No. 08PRO22 Rev1

TX Spurious, MID Channel

🔆 Ag	jilent 10	0:55:49	Sep 12, 2	008					
Ref 41	dBm		At	ten 40 di	3				909 MHz .74 dBm
#Peak Log									
10 dB/		>							
Offst 11 dB									
DI	Displa	y Line							
dBm	2.20	dBm							
V1 S2 S3 FC		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mmm-	M.		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	 ~~~~	~~~~~	manun
S3 FC. AA									
Start 3 #Res B	80 MHz W 100 k⊦	Iz		#	VBW 300	kHz	Sweep 95	Stop 9 8.3 ms (4	9.28 GHz 401 pts)



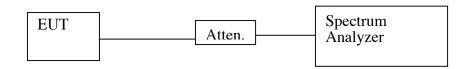
Upper band edge, -20 dBc HIGH Channel

TX Spurious, HIGH Channel

🔆 Agi		0:53:56 <								932 MHz
Ref 41	dBm		Ĥt [.]	ten 40 di	3				2	2.6 dBm
#Peak [
Log [
10 [1									
dB/		<u>}</u>								
Offst 11 dB										
dB [
DI 🛛	Displa	iy Line								
DI 2.6 dBm		dBm								
M1 S2 S3 FC	~~~~		-	Manna	· · · · · · ·	·····	~~~~~~	~~~~	~~~~	
ÂA										
Start 3	0 MHz								Stop 3	9.28 GHz
	W 100 k⊦	z		#	VBW 300	kHz		Sweep 95		

Power Spectral Density Test Requirement: 15.247(e) RSS-210 Sec. 6.2.2(o)(iv)

Test Setup



Test Procedure

1. Determine frequency at which maximum emission occurs during pre-scan.

2. Reduce SPAN to 300 kHz, while adjusting tuning frequency so that peak remains at center of screen.

3. Set RES BW = 3 kHz, VID BW = 10 kHz, SWEEP = 100 sec.

4. Record highest reading and compare to 8 dBm limit.

Test Results

Maximum PSD was 4.4 dBm. Refer to attached spectrum analyzer chart.

Power Spectral Density LOW Channel

🔆 🔆 Ag	jilent 10	0:47:42 S	бер 12, 2	.008						
Ref 41	dBm		At	ten 40 dt:	В		Mkr		2550 MHz 396 dBm	
#Peak Log										
Log 10										
dB/					<u>کم</u>					
Offst 11 dB										
dB	1									
DI 8.0 dBm	Marke							~~~~~		<u>~~~~~</u> ~
dBm		25500	MHz							
PAvg 100	4.39	6 dBm								
W1 S2										
S3 FC										
AA										
	906.3 MI 3 kHz	Hz			#VBW 10 k	(Hz		Sweep 34	Span 1.31 ms (4	300 kHz 401 pts)

🔆 Ag	jilent 10):45:12 🖇	Sep 12, 2	:008							
Ref 41	dBm	Mkr1 914.17525 M Atten 40 dB 3.44 dE									
#Peak Log											
10 dB/											
Offst											
11 dB	k land on		~~~~			1 Ø					
DI 8.0 dBm	Marke 914.1	r 75250	MHz								
PAvg 100	3.44										
W1 S2 S3 FC											
AA											
	914.2 M 3 kHz	Hz		+	•VBW 10 k	:Hz			Span 1.31 ms (4	300 kHz 401 pts)	

Power Spectral Density MID Channel

Ref 41	dBm		At	ten 40 df	IB					924.14950 MHz 3.467 dBm	
#Peak [
Log 10											
dB/ Ι											
Offst 11 dB											
dB					1						
DI ora	Marke		~~~~~		×				~~~~~		
DI 8.0 dBm	924.1	49500	MHz								
PAvg 100	3.46	7 dBm									
W1 S2 S3 FC											
AA											
	924.2 M 3 kHz	Hz		+	⊧VBW 10 k			Sweep 34		300 kHz 401 nts)	

Power Spectral Density HIGH Channel

RF Exposure (MPE) Calculations

Silver Spring I	letworks									
FCC ID: OWS-										
IC: 5975A- N	IC508									
Utility Meter \	VLAN Transcei	ver	900MHz HAN			Calculate mW/cm	2 here. Enter fr	equency in MHz	:	
RF Hazard Dis	tance Calculati	on				Calculation of Limi	ts from 1.1310 T	able 1		
									Controlled	Uncontrolled
									Ave 6 min	Ave 30 min
mW/cm2 fron	Table1:	0.60	(E: 61 V/m)			F(MHz)	Actual F, MHz		Occ, mW/c2	Gen, mW/cm2
						0.3-3	0.5		100.0	100.0
Max RF Power		MPE distance	S, mW/cm@	Comment		3.0 - 30.0	5		180.0	36.0
P, dBm	G, dBi	cm	at 20 cm			30.0-300	55		1.0	0.2
						300-1500	902		3.0	0.60
25.4	2.4	8.9	0.12			1500-100000	5555		5.0	1.0
						F	5 · · · · · · · · · · · · · · · · · · ·	ID	E . I . M	
						Enter P(mW)	Equivalent dBm	Enter dBm	Equivalent Wat	is
Basis of Calcu	lations:					64	18.1	<u>18.1</u>	64.6	
FAD (2770 C										-
$E^{2/3770} = S$	<u>, mw/cm2</u> tts*Ggain*30)/	E (al. an a traine								
	(15"Ggain"50)/ (3770*S)		Durathat Carolin 1	0.4 (D-ID	-10:) (1.0)					
			Pwatts*Ggain = 1	U^(PaBm-30+G	аві)/ TO)					-
	log (MPE dist/2		ttoro minimum or	norotion diston	an in for ECC	compliance is 20 cr				+
			distance is less			compliance is 20 cr	m,		+	+l
ever	in calculations								+	+
							-			+
										+
			+			-			+	+
									+	+
										┼───┤
										+
	I	l	1	1	l	1	1	l	1	