EMC Test Report

Project Number: 3741564

Report Number: 3741564EMC01 **Revision Level:** 1

Client: LEA SAS

Equipment Under Test: Table-top panic button

Model Number: HALTPB0R9-SMDL01

FCC ID: 2AFAYLEA001

Applicable Standards: FCC 15.249 Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHZ, and 24.0–24.25 GHz.

ANSI C63.10: 2013

Report issued on: 1 December 2015

Test Result: Compliant

Tested by: Fabian Nica, Senior Engineering Technician

Reviewed by: David Schramm, EMC/RF/SAR/HAC Manager

Remarks:
This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

Table of Contents

1 Summary of Test Results

Test Description	Test Specification	Test Result
Field strength of fundamental	15.249(a)	Compliant
Field strength of spurious radiation	15.249 (a) and 15.209	Compliant
Fixed, point-to-point	15.249(b)	Not applicable
20 dB bandwidth	15.215(c)	Report data only

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 *Client Information*

Name:	LEA SAS
Address:	Immeuble Le Linea
City, State, Zip, Country:	1, Rue du general Leclerc 92047 Paris La Defense Cedex, France

2.2 *Test Laboratory*

Name:	SGS North America, Inc.
Address:	620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country:	Suwanee, GA 30024, USA
FCC Accredited Site:	977994

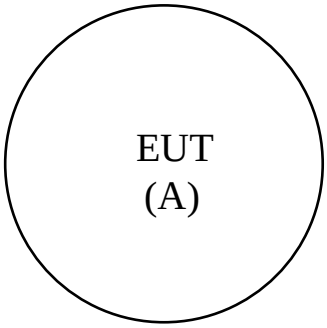
2.3 *General Information of EUT*

Product Name:	Table top panic button
Model Number:	HALTPB0R9-SMLD01
Serial Number:	0A02017C
Software Version:	Software SOFT1067-3 (eep_table_top_panic_button_915_1307).bin
Hardware Version:	2C
Rated Voltage:	CR2032 - 3Vdc, battery
Test Voltage:	Fully charged CR2032 - 3Vdc, battery
Band of Operation:	902-928 MHz band
Sample Received Date:	29 April 2015
Dates of testing:	7 May to 11 May 2015

2.4 *Operating Modes and Conditions*

The device was configured to transmit continuously with a modulated signal. The EUT operates as table top button and does not rotate

2.5 *EUT Connection Block Diagram*



2.6 *System Configurations*

Device reference	Manufacturer	Description	Model Number	Serial Number
A	LEA Networks	Table top panic button	HALTPB0R9-SMLD01	0A02017C

3 Field Strength of Fundamental

3.1 *Test Result*

Test Description	Test Specification	Test Result
Field strength of fundamental	15.249(a)	Compliant

3.2 *Test Method*

The test data was measured using a Quasi-Peak detector below 1GHz and a Peak detector above 1GHz. Average measurements were made by correcting the peak value with the duty cycle correction factor. The receivers resolution bandwidth was set to 120 kHz for measurements taken in the 30MHz to 1GHz frequency range and 1MHz for measurements for 1GHZ and higher. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits indicated in the table below.

Fundamental Frequency	Average Limits[1]			Peak Limits dBuV/m
	Millivolts/meter	Microvolts/m	dBuV/m	
902 - 928 MHz	50	50000	94	114
2400 - 2483.5 MHz	50	50000	94	114
5725 - 5875 MHz	50	50000	94	114
24 - 24.25 GHz	250	250000	108	128

Note 1: Below 1GHz detector is QP

3.3 *Test Site*

10m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature: 24.2 to 22.8 °C
Relative Humidity: 42.0 to 50.5 %
Atmospheric Pressure: 98.3 to 97.9 kPa

3.4 *Test Equipment*

Test Start Date: 7-May-2015 Tester: FRN
Test End Date: 11-May-2015

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
ANTENNA, BILOG	JB6	SUNOL	B079690	7-Oct-2015
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079711	4-Aug-2015
RF CABLE - 7500MM (10KHZ - 18GHZ)	SF106	HUBER&SUHNER	B079713	4-Aug-2015
RF CABLE	SF106	HUBER&SUHNER	B085892	5-Aug-2015
PREAMPLIFIER-ANTENNA SYS	TS-PR18	ROHDE & SCHWARZ	B094463	13-Feb-2016
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	26-Jun-2015

Note: The calibration period equipment is 1 year.

3.5 *Test Data*

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
902.20	91.8	V	156.9	100.0	22.9	2.5	32.9	-19.2	65.1	94.0	-28.9
902.20	105.8	H	207.5	100.0	22.9	2.5	32.9	-19.2	79.1	94.0	-14.9
915.22	99.4	V	114.0	143.0	23.0	2.5	32.9	-19.2	72.8	94.0	-21.2
915.22	109.9	H	360.0	152.6	23.0	2.5	32.9	-19.2	83.3	94.0	-10.7
927.86	102.5	V	121.2	244.4	23.2	2.5	32.9	-19.2	76.1	94.0	-17.9
927.86	110.9	H	54.4	347.0	23.2	2.5	32.9	-19.2	84.5	94.0	-9.5
QP Value = Level + AF + CL - Amp + Duty Cycle											
Margin = QP Value - Limit											

4 Field Strength of Spurious Radiation

4.1 *Test Result*

Test Description	Test Specification	Test Result
Field strength of spurious radiation	15.249 (a) and 15.209	Compliant

4.2 *Test Method*

Exploratory scans were performed over the frequency range as indicated in the tables below using the max hold function and incorporating a Peak detector and using TILE! software. The final test data was measured using a Quasi-Peak detector below 1GHz and a Peak detector above 1GHz. For harmonics of the fundamental, Average measurements were made by correcting the peak value with the duty cycle correction factor. For emissions other than harmonics of the fundamental, the Average measurements were made using the Average detector. The receivers resolution bandwidth was set to 120 kHz for measurements taken in the 30MHz to 1GHz frequency range and 1MHz for measurements for 1GHZ and higher. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits indicated in the table below.

Frequency	Limits		Peak Limits dBuV/m
	Microvolts/m	dBuV/m	
30 - 88 MHz	100	40 (1)	--
88 - 216 MHz	150	43.5 (1)	--
216 - 960 MHz	200	46 (1)	--
960 - 1000 MHz	500	54 (1)	--
1 - 40 GHz	500	54 (2)	74

(1) Quasi-peak limit
(2) Average limit

4.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature:	25.1 °C
Relative Humidity:	42.3 %
Atmospheric Pressure:	97.9 kPa

4.4 *Test Equipment*

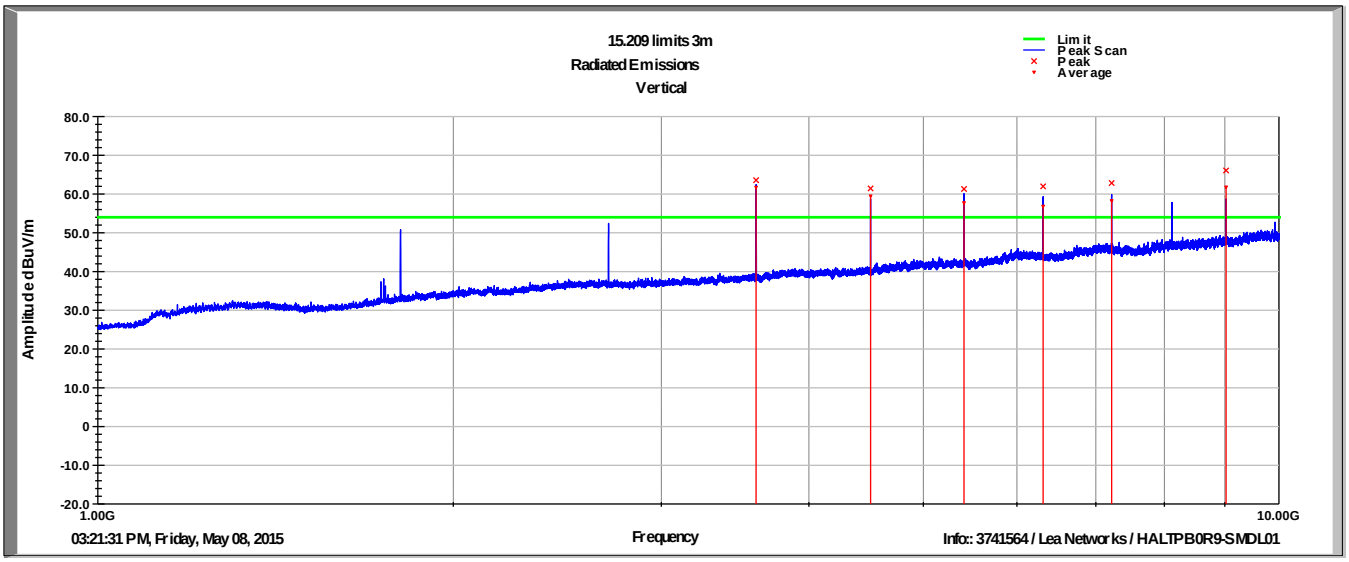
Test Date: 8-May-2015 Tester: FRN

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
DRG HORN (MEDIUM)	3117	ETS-LINDGREN	B079691	24-Jun-2015
10 FT N TYPE COAX	HS 84133215	HUBER&SUHNER	B079659	5-Aug-2015
COAXIAL CABLE	CBL-25FT-NMNM	MINI-CIRCUIT	B094941	5-Aug-2015
COAXIAL CABLE	1134	GORE	B094785	5-Aug-2015
DESKTOP AMPLIFIER 30M-18GHZ	NSP1800-25-HG	MITEQ	B085930	30-Mar-2016
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	28-Jul-2015

Note: The calibration period equipment is 1 year.

4.5 *Test Data*

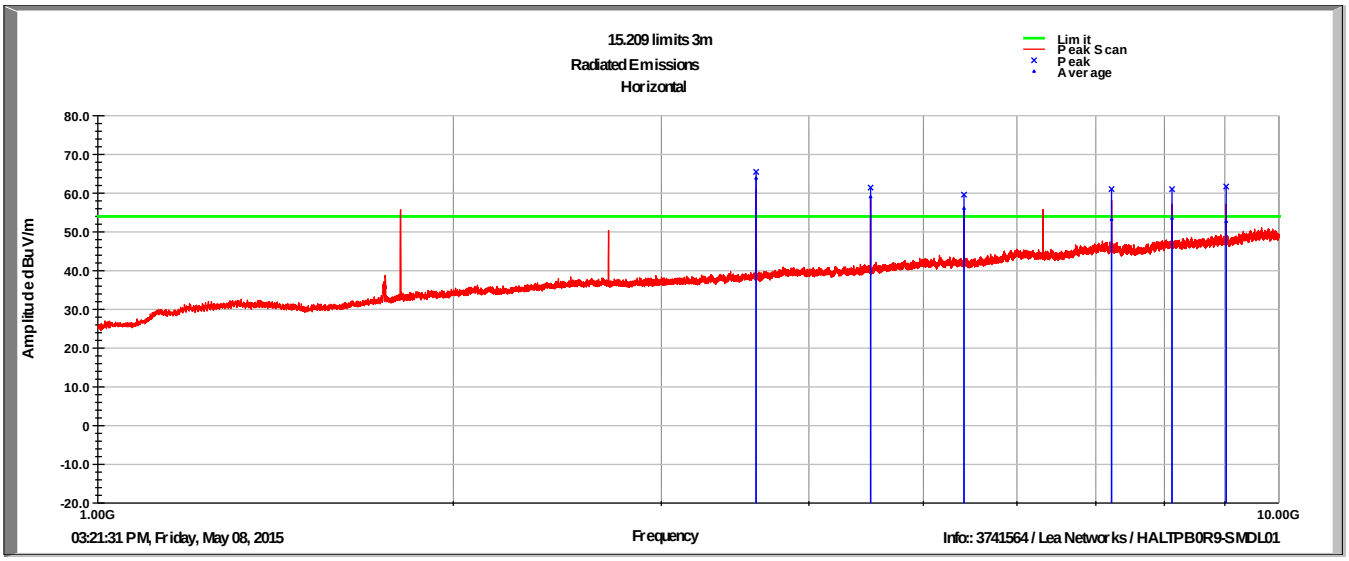
Radiated Emissions 1-10GHz (Vertical Plot)
Low Channel



Radiated Emissions 1-10GHz (Vertical Data)
Low Channel

Frequency MHz	Raw PK (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	Avg Value dBuV/m	Limit (dBuV/m)	Margin (dB)
3609.10	64.2	V	246.0	337.0	33.0	9.0	44.4	-19.2	42.6	54.0	-11.4
4511.20	59.5	V	169.0	276.0	33.9	10.2	44.1	-19.2	40.3	54.0	-13.7
5413.30	56.1	V	234.0	227.0	34.5	11.4	44.2	-19.2	38.6	54.0	-15.4
6315.40	52.2	V	41.0	279.0	35.5	12.4	43.3	-19.2	37.6	54.0	-16.4
7218.10	50.7	V	130.0	322.0	35.7	13.5	41.6	-19.2	39.1	54.0	-14.9
9022.30	50.2	V	156.0	356.0	36.3	15.4	40.1	-19.2	42.6	54.0	-11.4
Avg Value = Raw PK + AF + CL - Amp + Duty Cycle											
Margin = Avg Value - Limit											

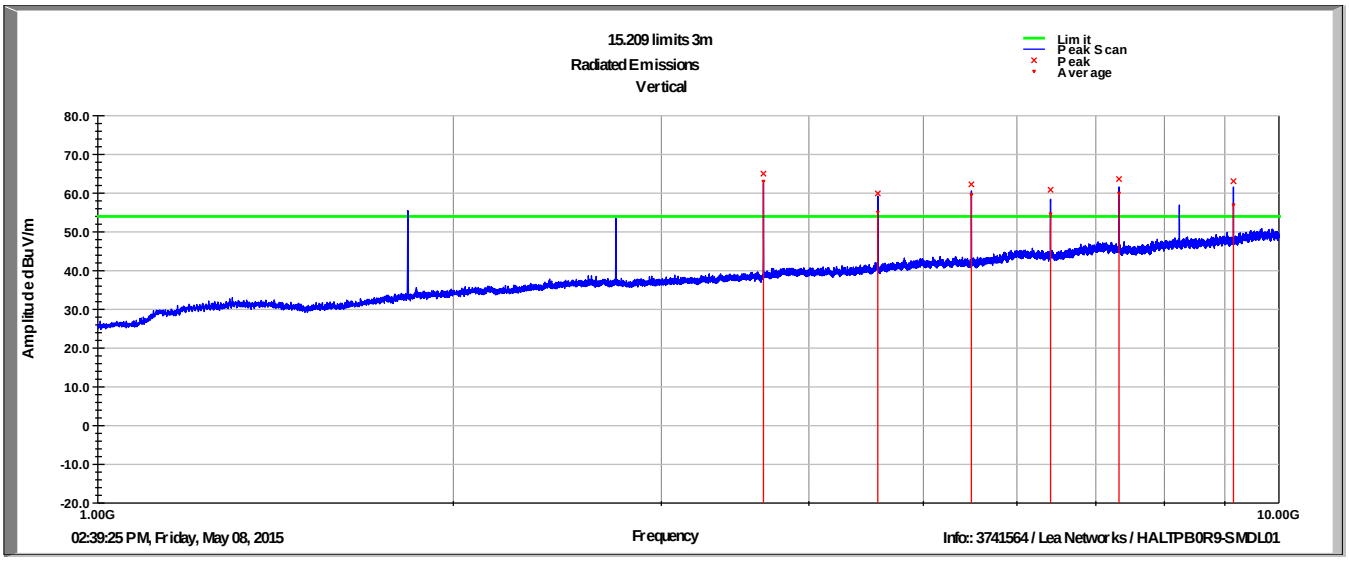
Radiated Emissions 1-10GHz (Horizontal Plot)
Low Channel



Radiated Emissions 1-10GHz (Horizontal Data)
Low Channel

Frequency MHz	Raw PK (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	Avg Value dBuV/m	Limit (dBuV/m)	Margin (dB)
3608.80	66.3	H	156.0	398.0	33.0	9.0	44.4	-19.2	44.7	54.0	-9.3
4511.20	59.0	H	110.0	262.0	33.9	10.2	44.1	-19.2	39.8	54.0	-14.2
5413.30	54.4	H	42.0	349.0	34.5	11.4	44.2	-19.2	36.9	54.0	-17.1
7217.50	45.6	H	143.0	264.0	35.7	13.5	41.6	-19.2	34.0	54.0	-20.0
8119.90	44.2	H	117.0	364.0	35.8	14.5	41.0	-19.2	34.3	54.0	-19.7
9022.90	41.1	H	179.0	105.0	36.3	15.4	40.1	-19.2	33.5	54.0	-20.5
Avg Value = Raw PK + AF + CL - Amp + Duty Cycle											
Margin = Avg Value - Limit											

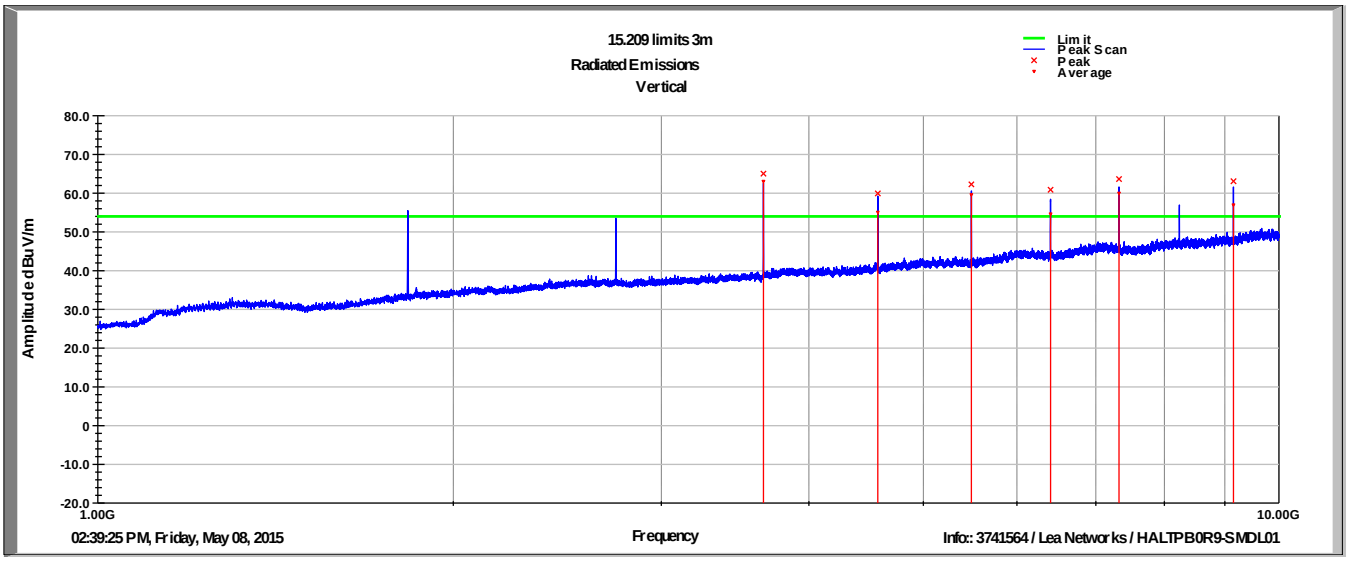
Radiated Emissions 1-10GHz (Vertical Plot)
Mid Channel



Radiated Emissions 1-10GHz (Vertical Data)
Mid Channel

Frequency MHz	Raw PK (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	Avg Value dBuV/m	Limit (dBuV/m)	Margin (dB)
3660.70	65.3	V	83.0	386.0	33.1	9.1	44.4	-19.2	43.9	54.0	-10.1
4575.70	54.8	V	189.0	274.0	34.0	10.4	44.0	-19.2	36.0	54.0	-18.0
5491.30	57.8	V	79.0	197.0	34.5	11.4	44.2	-19.2	40.3	54.0	-13.7
6406.90	49.7	V	182.0	273.0	35.6	12.5	43.2	-19.2	35.4	54.0	-18.6
7321.90	52.3	V	239.0	322.0	35.8	13.5	41.5	-19.2	40.9	54.0	-13.1
9152.50	44.9	V	130.0	329.0	36.4	15.5	39.8	-19.2	37.8	54.0	-16.2
Avg Value = Raw PK + AF + CL - Amp + Duty Cycle											
Margin = Avg Value - Limit											

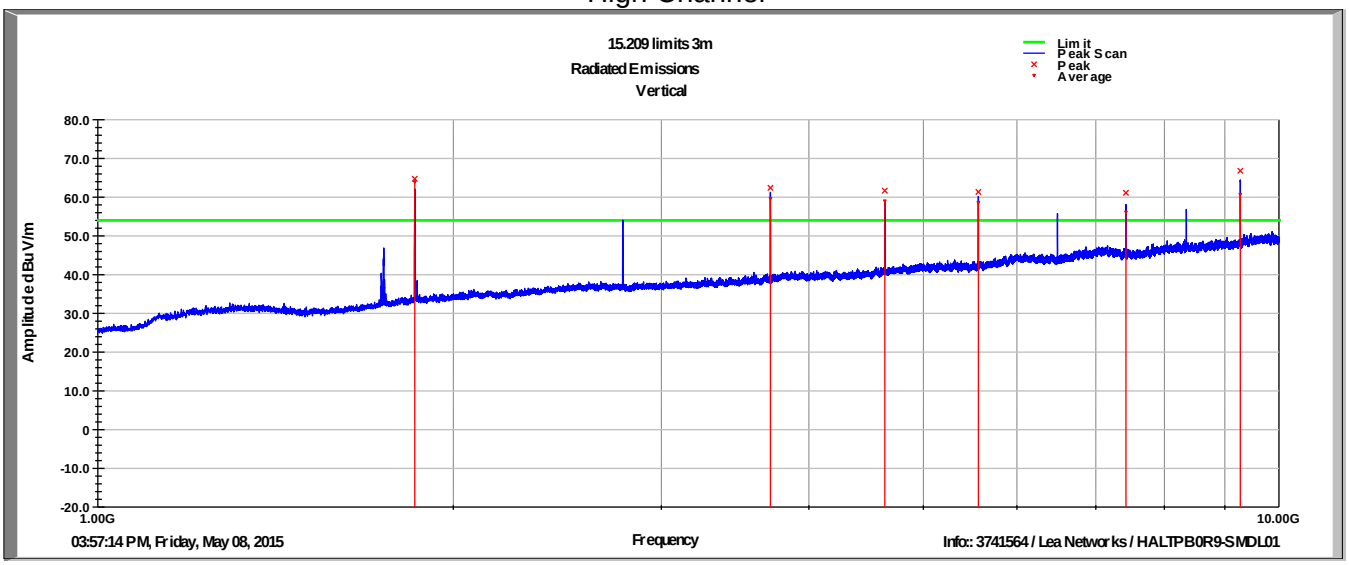
Radiated Emissions 1-10GHz (Horizontal Plot)
Mid Channel



Radiated Emissions 1-10GHz (Horizontal Data)
Mid Channel

Frequency MHz	Raw PK (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	Avg Value dBuV/m	Limit (dBuV/m)	Margin (dB)
1830.40	68.7	H	251.0	356.0	30.3	6.2	42.9	-19.2	43.1	54.0	-10.9
3661.00	64.8	H	4.0	321.0	33.1	9.1	44.4	-19.2	43.4	54.0	-10.6
4576.00	59.7	H	131.0	336.0	34.0	10.4	44.0	-19.2	40.9	54.0	-13.1
5491.30	54.7	H	156.0	328.0	34.5	11.4	44.2	-19.2	37.2	54.0	-16.8
6406.60	49.8	H	136.0	350.0	35.6	12.5	43.2	-19.2	35.5	54.0	-18.5
7321.30	44.5	H	4.0	220.0	35.8	13.5	41.5	-19.2	33.1	54.0	-20.9
Avg Value = Raw PK + AF + CL - Amp + Duty Cycle											
Margin = Avg Value - Limit											

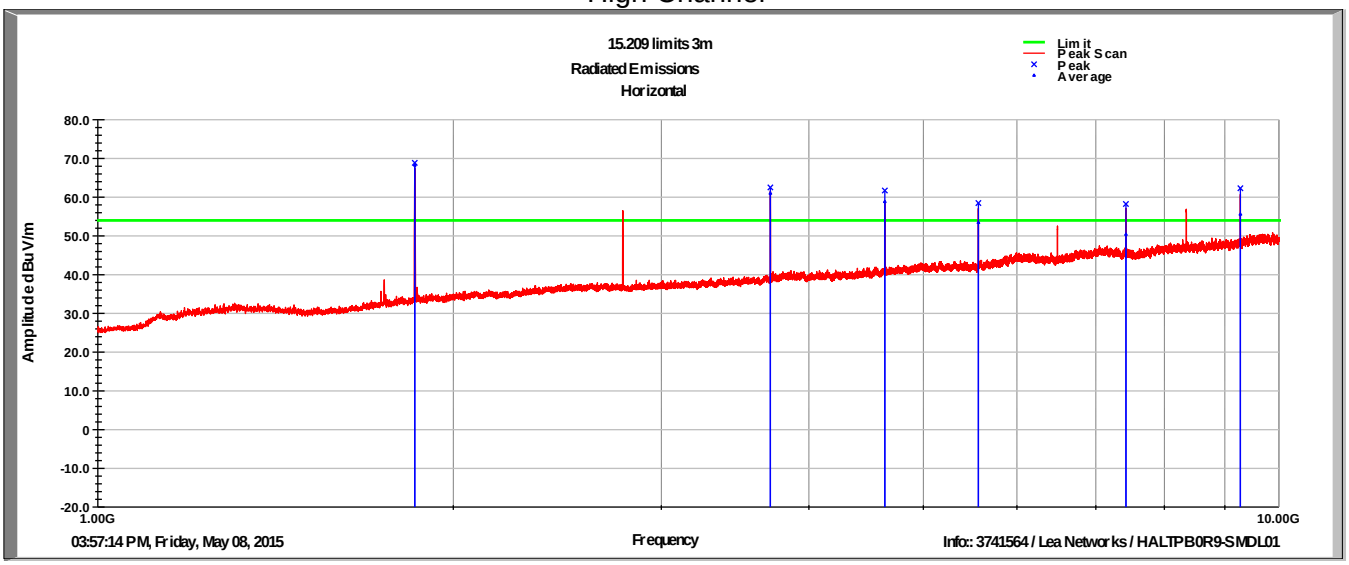
Radiated Emissions 1-10GHz (Vertical Plot)
High Channel



Radiated Emissions 1-10GHz (Vertical Data)
High Channel

Frequency MHz	Raw PK (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	Avg Value dBuV/m	Limit (dBuV/m)	Margin (dB)
1855.30	70.2	V	327.0	343.0	30.5	6.2	42.9	-19.2	44.8	54.0	-9.2
3711.10	61.8	V	52.0	272.0	33.2	9.2	44.4	-19.2	40.6	54.0	-13.4
4638.40	58.5	V	161.0	235.0	34.0	10.4	44.0	-19.2	39.7	54.0	-14.3
5566.30	56.9	V	74.0	192.0	34.5	11.5	44.2	-19.2	39.5	54.0	-14.5
7421.50	48.2	V	41.0	177.0	35.8	13.6	41.5	-19.2	36.9	54.0	-17.1
9276.70	48.2	V	157.0	321.0	36.5	15.6	39.5	-19.2	41.6	54.0	-12.4
Avg Value = Raw PK + AF + CL - Amp + Duty Cycle											
Margin = Avg Value - Limit											

Radiated Emissions 1-10GHz (Horizontal Plot)
High Channel



Radiated Emissions 1-10GHz (Horizontal Data)
High Channel

Frequency MHz	Raw PK (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	CL (dB)	Amp (dB)	Duty Cycle (dB)	Avg Value dBuV/m	Limit (dBuV/m)	Margin (dB)
1855.30	74.5	H	245.0	343.0	30.5	6.2	42.9	-19.2	49.1	54.0	-4.9
3710.80	63.1	H	131.0	328.0	33.2	9.2	44.4	-19.2	41.9	54.0	-12.1
4638.40	58.4	H	124.0	323.0	34.0	10.4	44.0	-19.2	39.6	54.0	-14.4
5566.00	51.7	H	4.0	365.0	34.5	11.5	44.2	-19.2	34.3	54.0	-19.7
7421.80	42.4	H	45.0	192.0	35.8	13.6	41.5	-19.2	31.1	54.0	-22.9
9277.30	43.0	H	194.0	214.0	36.5	15.6	39.5	-19.2	36.4	54.0	-17.6
Avg Value = Raw PK + AF + CL - Amp + Duty Cycle											
Margin = Avg Value - Limit											

5 20 dB Bandwidth

5.1 *Test Result*

Test Description	Basic Standards	Test Result
20 dB bandwidth	15.215(c)	Report data only

5.2 *Test Method*

The procedures from ANSI C63.10 (2013) clause 6.9 were used to determine the 20 dB bandwidth.

5.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature:	24.2 °C
Relative Humidity:	42 %
Atmospheric Pressure:	98.3 kPa

5.4 *Test Equipment*

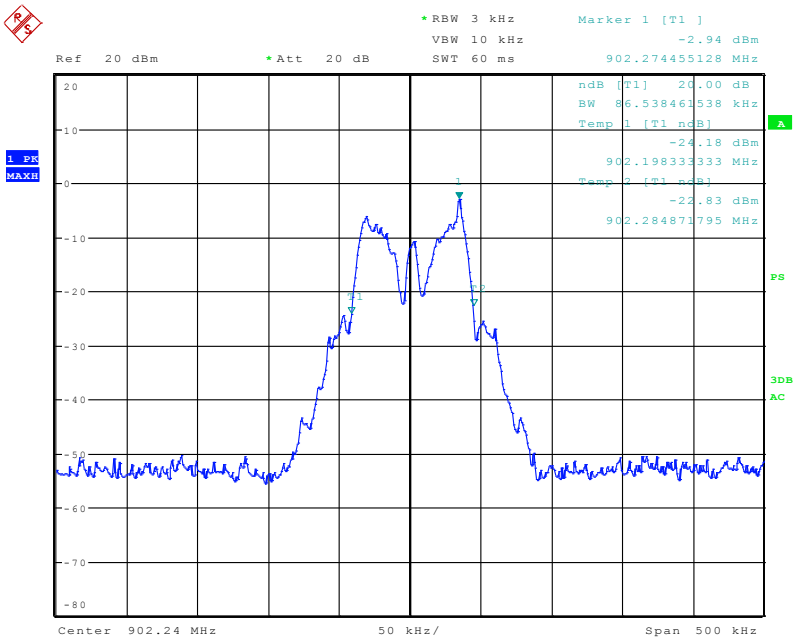
Test Date: 7-May-2015 Tester: FRN

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	26-Jun-2015

Note: The calibration period equipment is 1 year.

5.5 *Test Data*

20 dB Bandwidth Plot
Low Channel



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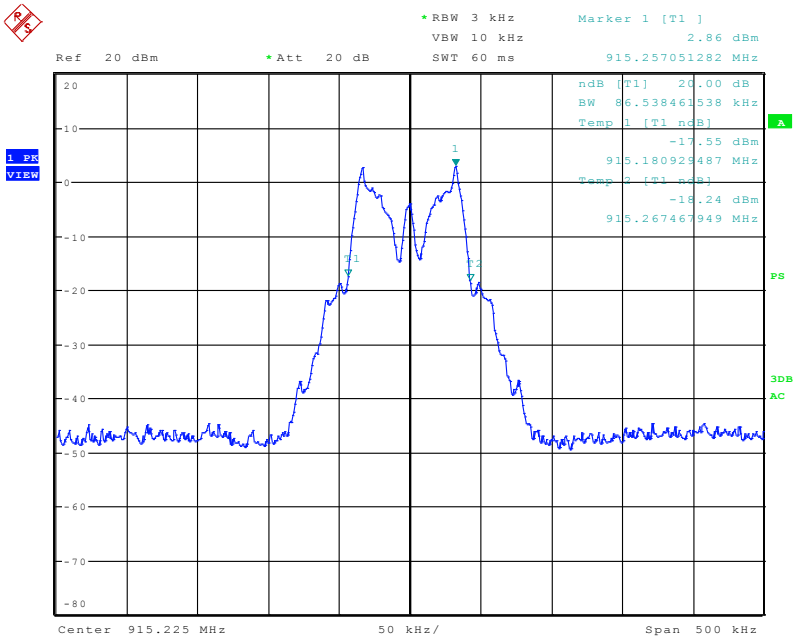
20 dB Bandwidth Plot
Mid Channel



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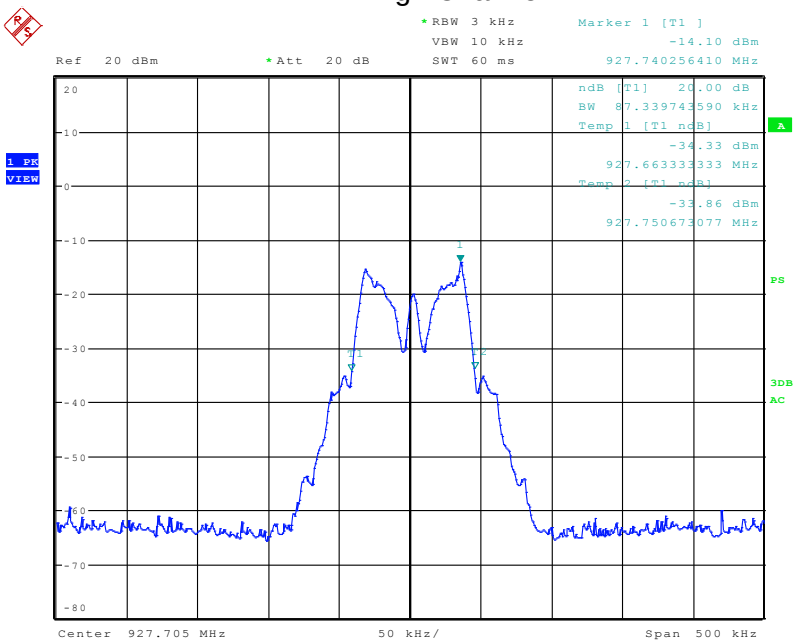
20 dB Bandwidth Plot
High Channel



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6 Duty Cycle

6.1 *Test Result*

Test Description	Basic Standards	Test Result
Duty Cycle	ANSI C63.10	Report data only

6.2 *Test Method*

The procedures from ANSI C63.10 (2013) clause 7.5 were used to determine the duty cycle.

6.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature:	24.2 °C
Relative Humidity:	42 %
Atmospheric Pressure:	98.3 kPa

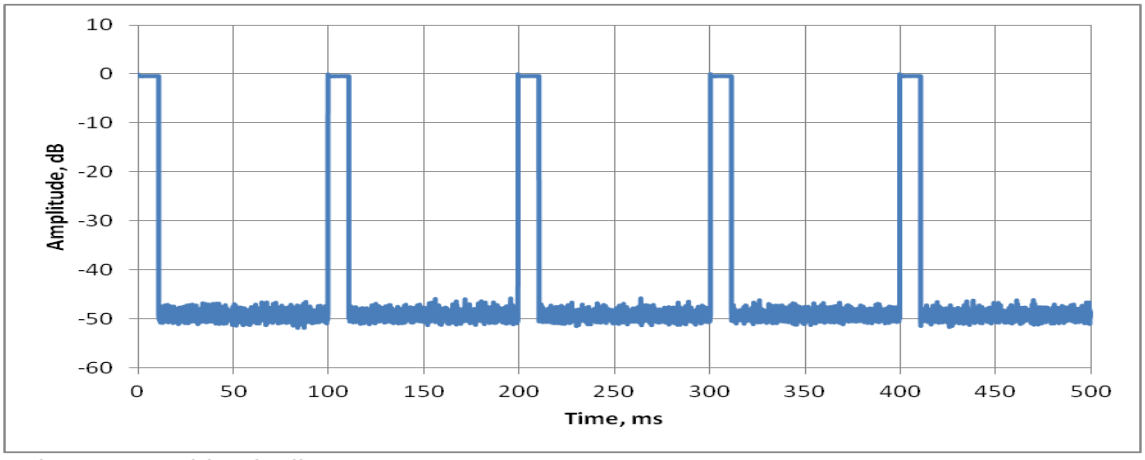
6.4 *Test Equipment*

Test Date: 7-May-2015 Tester: FRN

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	26-Jun-2015

Note: The calibration period equipment is 1 year.

6.5 *Test Data*



Pulse repeats identically every 100 ms.

On time = 11 ms
Repeat time = 100 ms
Duty Cycle = 11% ➔ -19.2 dB

7 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	20 May 2015
1	Added FCC ID on cover; Added FCC site number; Added Duty Cycle plot and results.	1 December 2015