



F2 Labs
16740 Peters Road
Middlefield, Ohio 44062
United States of America
www.f2labs.com

CERTIFICATION TEST REPORT

Manufacturing Address: Beijing Jia An Electronics Technology Co., Ltd.
No. 19 Gu Cheng West Street
Shi Jing Shan District
Beijing 100043, China

Applicant: BEA Incorporated
RIDC Park West
100 Enterprise Drive
Pittsburgh, Pennsylvania 15275 USA

Product Name: Push Plates with Integrated 900 MHz Wireless Technology

Product Description: Transmitter operating in the ISM band (902-928) MHz, compatible with BEA 10RD900 Receiver, implementing frequency hopping, intended but not limited for use as wireless door activation/sequencing devices in the industrial automatic door industry.

Model(s): **10TD900PTRI***

**Denotes actual model (BEA p/n 10EMR4751-900), tested. The following BEA part numbers represent varied mechanical plates containing model 10TD900PTRI: 10EMR61-900, 10EMR6-900, 10EMR6L-900, 10EMR4751-900, 10EMR475-900, 10EMR475L-900, 10EMS4751-900, 10EMS475-900 and 10EMS475L-900.*

FCC ID: **2ABWS-10TD900PTRI**

Testing Commenced: Feb. 9, 2016

Testing Ended: Feb. 12, 2016

Summary of Test Results: In Compliance

The EUT complies with the FCC requirements when manufactured identically as the unit tested in this report, including any required modifications. Any changes to the design or build of this unit subsequent to this testing may deem it non-compliant.



Order Number: F2LQ8135

Client: BEA Incorporated

Model: 10TD900PTRI

Standards:

- ❖ **FEDERAL REGISTER CFR 47, PART 15 – RADIO FREQUENCY DEVICES**
 - **Part 15 Subpart C, Section 15.231 - Periodic operation in the band 40.66–40.70 MHz and above 70 MHz**
 - **Part 15 Subpart C, Section 15.209 - Radiated emissions limits; general requirements**
- ❖ **ANSI C63.10:2013 – 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**

Evaluation Conducted by:

Joe Knepper, EMC Proj. Eng.

Report Reviewed by:

Ken Littell, Director of EMC & Wireless Operations

F2 Labs
26501 Ridge Road
Damascus, MD 20872
Ph 301.253.4500
Fax 301.253.5179

F2 Labs
16740 Peters Road
Middlefield, OH 44062
Ph 440.632.5541
Fax 440.632.5542

This test report may be reproduced in full; partial reproduction only may be made with the written consent of F2 Labs. The results in this report apply only to the equipment tested.



TABLE OF CONTENTS

Section	Title	Page
1	ADMINISTRATIVE INFORMATION	4
2	SUMMARY OF TEST RESULTS/MODIFICATIONS	5
3	ENGINEERING STATEMENT	6
4	EUT INFORMATION AND DATA	7
5	LIST OF MEASUREMENT INSTRUMENTATION	8
6	FCC Part 15.231(a)(1)	9
7	FCC Part 15.231(b)	16
8	FCC Part 15.231(b)(3)(c)	29
9	PHOTOGRAPHS	33



1 ADMINISTRATIVE INFORMATION

1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

1.2 Measurement Procedure:

All measurements were performed according to the 2013 version of ANSI C63.10 and recommended FCC procedure of measurement for Intermittent Transmitters and Receivers operating under Section 15.231. A list of the measurement equipment can be found in Section 6.

1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data, and are expressed with a 95% confidence factor. Note: Only measurements listed below which relate to tests included in this Test Report are applicable to it.

Measurement Range	Expanded Uncertainty	Combined Uncertainty
Radiated Emissions <1 GHz @3m	±5.07dB	±2.54
Radiated Emissions <1 GHz @10m	±5.09dB	±2.55
Radiated Emissions 1 GHz to 2.7 GHz	±3.62dB	±1.81
Radiated Emissions 2.7 GHz to 18 GHz	±3.10dB	±1.55
AC Power Line Conducted Emissions, 150kHz to 30 MHz	±2.76dB	±1.38

This Uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.4 Document History

Document Number	Description	Issue Date	Approved By
F2LQ8135-01E	First Issue	Mar. 22, 2016	K. Littell



2 SUMMARY OF TEST RESULTS

Standard(s)	Results
CFR 47 Part 15.231(a)(1)	Complies
CFR 47 Part 15.231(b) / Part 15.209	Complies
CFR 47 Part 15.231(b)(3)(c)	Complies
CFR 47 Part 15.31	Complies*

**To meet the requirements of 15.31, EUT was tested with new batteries.*

Modifications Made to the Equipment
No modifications were made to the EUT



Order Number: F2LQ8135

Client: BEA Incorporated

Model: 10TD900PTRI

3 ENGINEERING STATEMENT

This report has been prepared on behalf of BEA Incorporated to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.231 of the FCC Rules, using ANSI C63.10:2013 standards, with the modifications noted in Section 2 of this Test report. The test results found in this test report relate only to the items tested.



4 EUT INFORMATION AND DATA

4.1 Equipment Under Test:

Product: Push Plates with Integrated 900 MHz Wireless Technology

Model: 10TD900PTRI*

Serial Nos.: ENG001981, ENG001952, ENG001983

FCC ID: 2ABWS-10TD900PTRI

**Denotes actual model (BEA p/n 10EMR4751-900), tested. The following BEA part numbers represent varied mechanical plates containing model 10TD900PTRI: 10EMR61-900, 10EMR6-900, 10EMR6L-900, 10EMR4751-900, 10EMR475-900, 10EMR475L-900, 10EMS4751-900, 10EMS475-900 and 10EMS475L-900.*

4.2 Trade Name: BEA Incorporated

4.3 Power Supply:

Battery-operated (3V)

4.4 Applicable Rules:

CFR 47, Part 15.231, subpart C

4.5 Equipment Category:

Intermittent Transceiver

4.6 Antenna:

Internal wire coil with gain of -11.4 dBi at 908MHz, -11.3 dBi at 913MHz, -11.3 dBi at 918MHz.

4.7 Accessories:

N/A

4.8 Test Item Condition:

The equipment to be tested was received in good condition.

4.9 Testing Algorithm:

The EUT was set up in a normal operating manner, transmitting at low (908 MHz), mid (913 MHz) and high (918 MHz) channels. The EUT was powered via two non-rechargeable 3V batteries.



Order Number: F2LQ8135

Client: BEA Incorporated

Model: 10TD900PTRI

5 LIST OF MEASUREMENT INSTRUMENTATION

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shielded Chamber	CL166	AlbatrossProjects	B83117-DF435-T261	US140023	Feb. 26, 2016
Temp/Hum. Recorder	CL137	Extech	RH520	CH16992	May 7, 2016
Receiver	CL151	Rohde & Schwarz	ESU40	100319	Nov. 25, 2016
Active 18" Loop Antenna	CL163	A.H. Systems, Inc.	EHA-52B	100	Apr. 20, 2016
Antenna, JB3 Combination	CL175	Sunol Sciences	JB3	A030315	Mar. 12, 2016
Horn Antenna	CL098	Emco	3115	9809-5580	Dec. 10, 2016
Software:	EMC 32, Version 5.20.2			Software Verified: Feb. 9, 2016	
Software	Tile Version 1.0			Software Verified: Feb. 9, 2016	



Order Number: F2LQ8135

Client: BEA Incorporated

Model: 10TD900PTRI

6 FCC PART 15.231(a)(1)

6.1 Requirements:

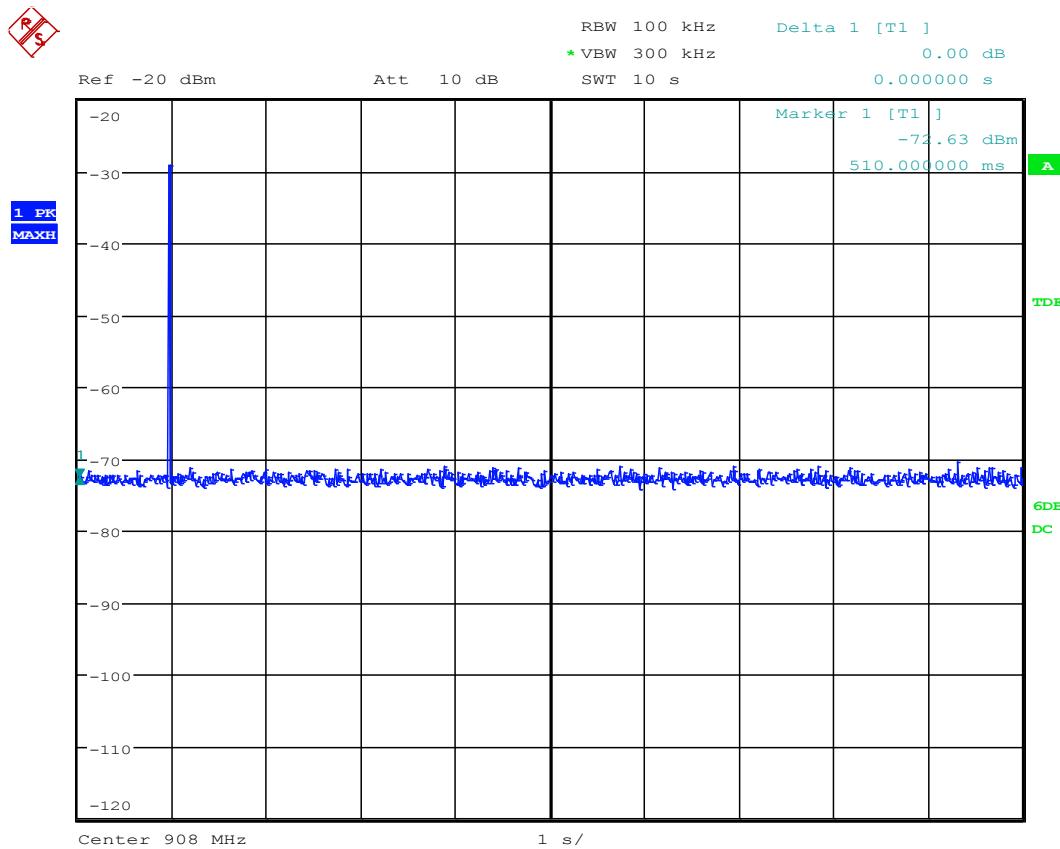
A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter with not more than 5 seconds of being released.

6.2 Test Data

Test Date:	Feb. 9, 2016	Test Engineer(s):	J. Knepper
Standards:	CFR 47 Part 15.231(a)(1);	Air Temperature:	22.0°C
		Relative Humidity:	46%

Low Channel

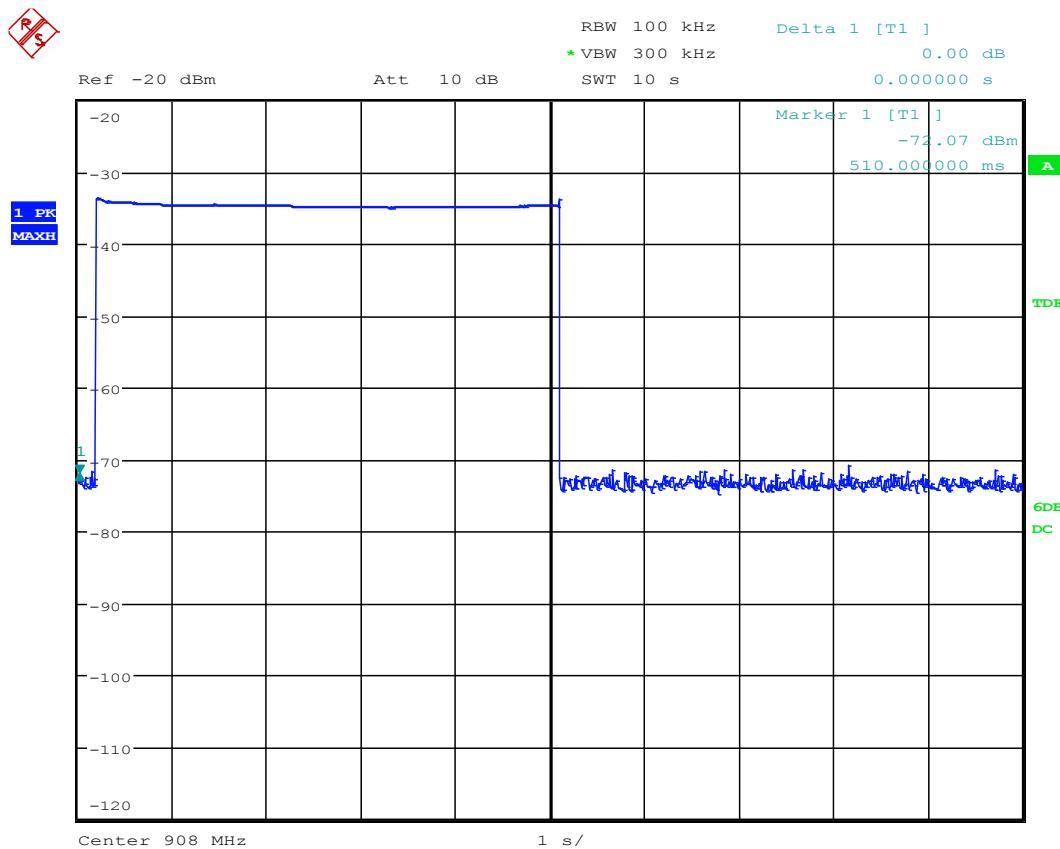
The following plot is of a single press and release of the manual push button. This is to show that the transmission ceased in less than 5 seconds of release.



Date: 19.FEB.2016 08:27:28

Low Channel, cont'd

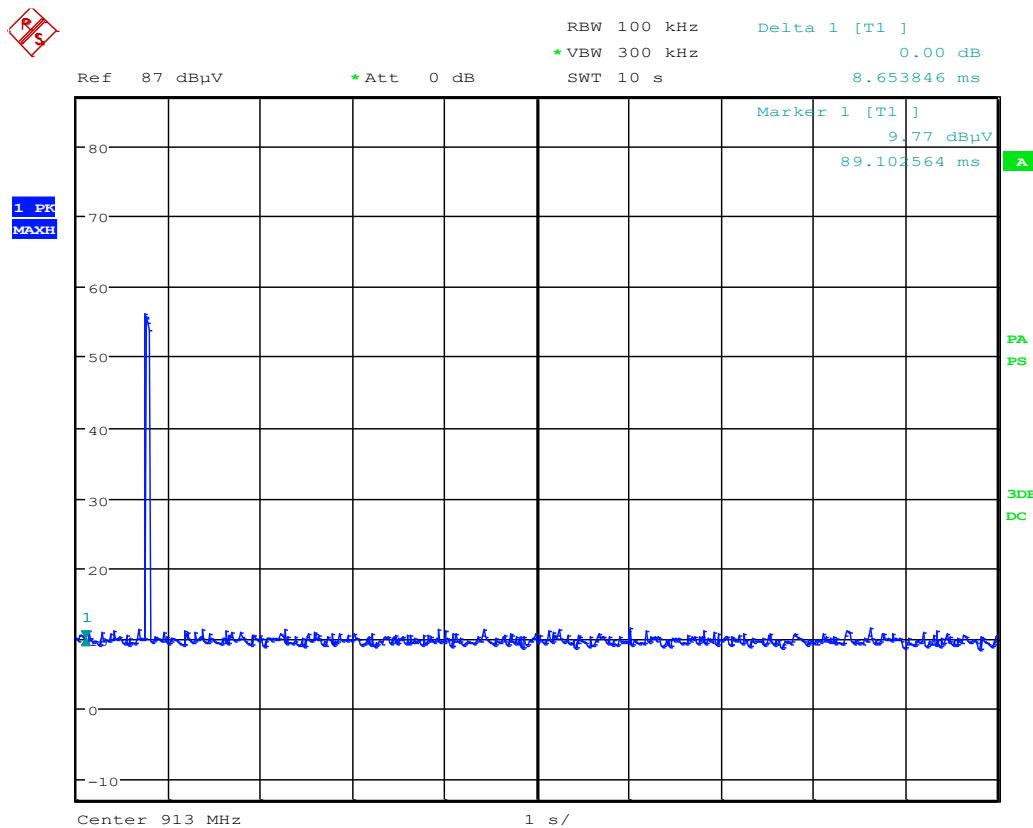
The following plot is of a press and hold for five seconds then release of the manual push button, showing that the transmission ceased prior to 5 seconds of release.



Date: 19.FEB.2016 08:27:51

Mid Channel

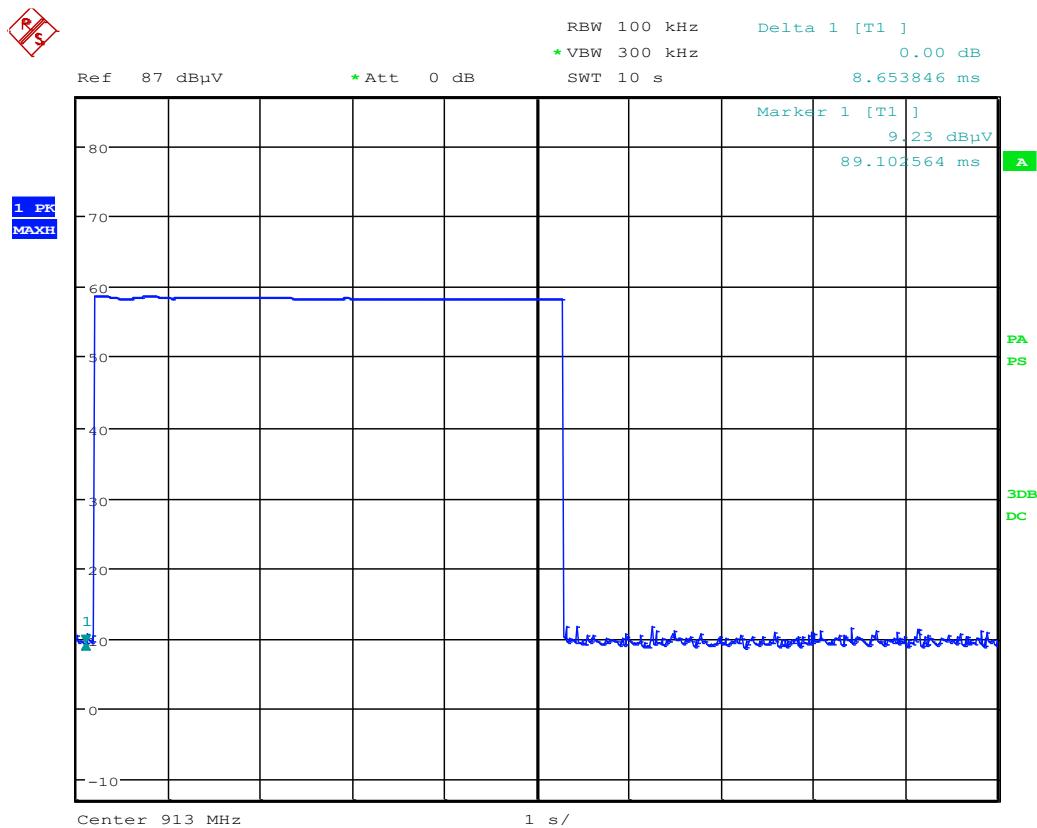
The following plot is of a single press and release of the manual push button, showing that the transmission ceased prior to 5 seconds of release.



Date: 9.FEB.2016 12:31:56

Mid Channel, cont'd

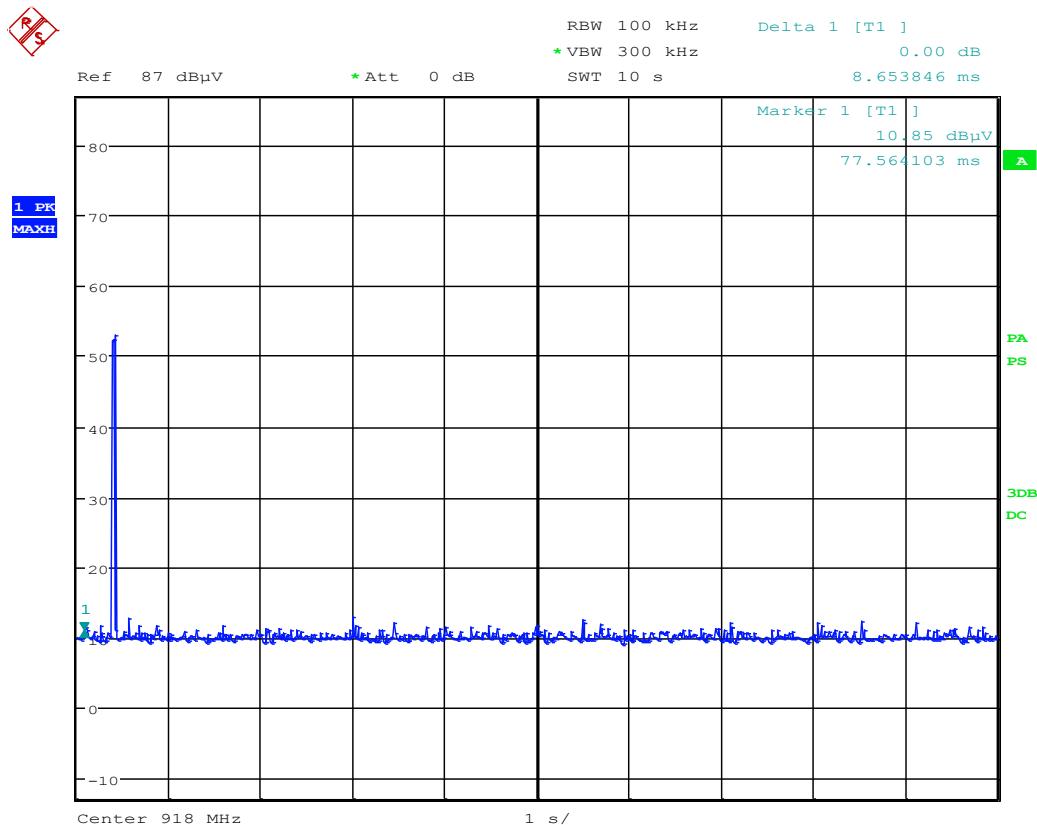
The following plot is of a press and hold for five seconds then release of the manual push button. This is to show that the transmission ceased in less than 5 seconds of release.



Date: 9.FEB.2016 12:31:08

High Channel

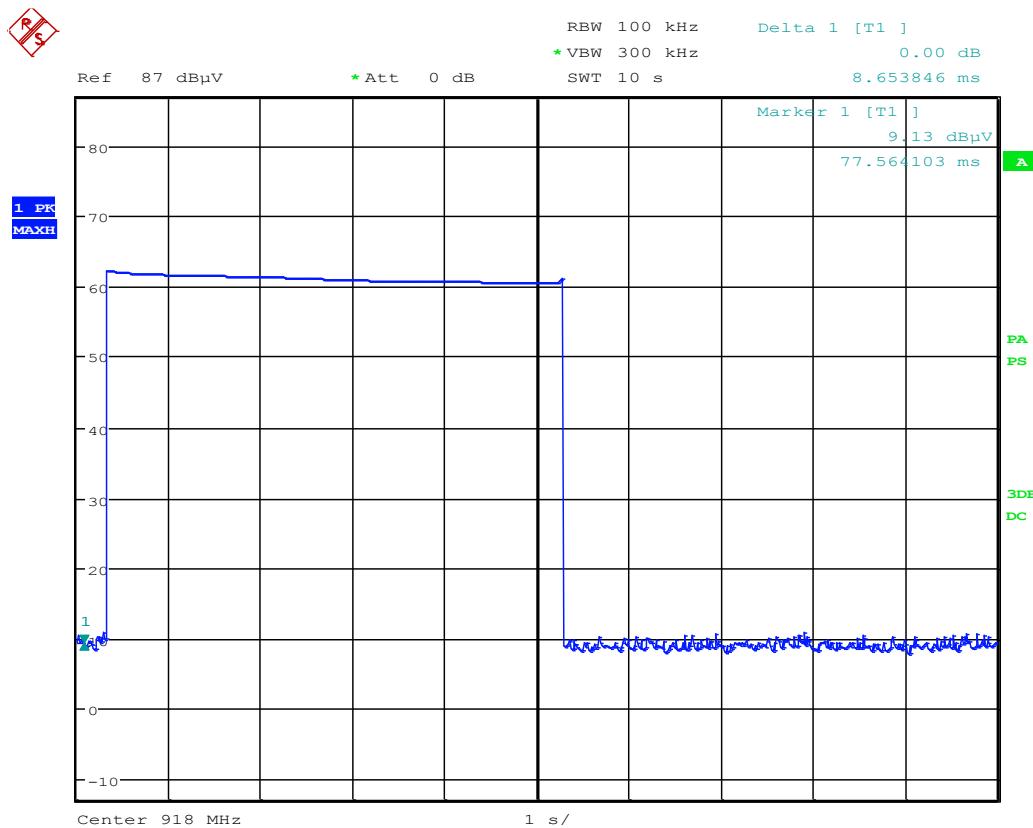
The following plot is of a single press and release of the manual push button, showing that the transmission ceased prior to 5 seconds of release.



Date: 9.FEB.2016 12:22:53

High Channel, cont'd

The following plot is of a press and hold for five seconds then release of the manual push button. This is to show that the transmission ceased in less than 5 seconds of release.



Date: 9.FEB.2016 12:23:31



7 FCC PART 15.231(b)

7.1 Requirements:

Field strength of emissions, fundamental and spurious using quasi peak detector.

Limit for fundamental frequency above 470 MHz is: 12,500 μ V/m.

Limits for spurious emissions were those specified in 15.209 and 15.231.

While the equipment was energized, the receiving antenna was scanned from 1.0 meter to 4.0 meters in both vertical and horizontal polarities while the turntable was adjusted 360 degrees to determine the maximum field strength.

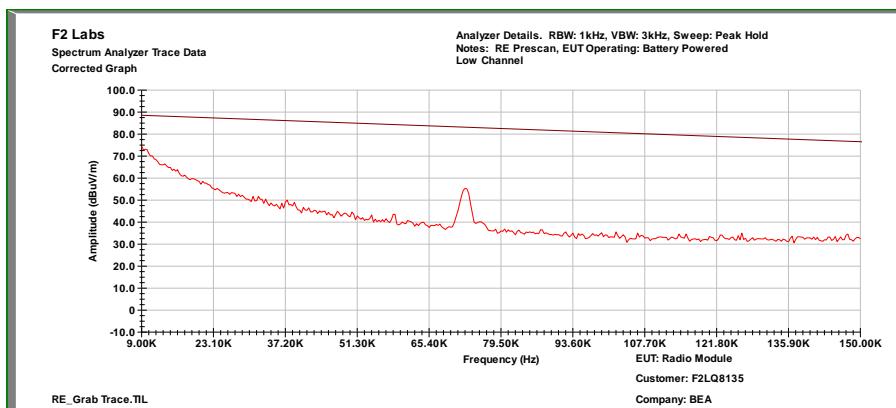
The equipment was fully exercised and was positioned for maximum emissions in all 3 orthogonal positions. The EUT antenna was positioned flat against the plastic tabletop and it was verified, by placing a foam support between the table and the antenna, that the table had no effect on the emissions at these frequency ranges.

Emissions test was checked with various wall plates, and the emissions went down. Testing without a wall plate attached was the worst case.

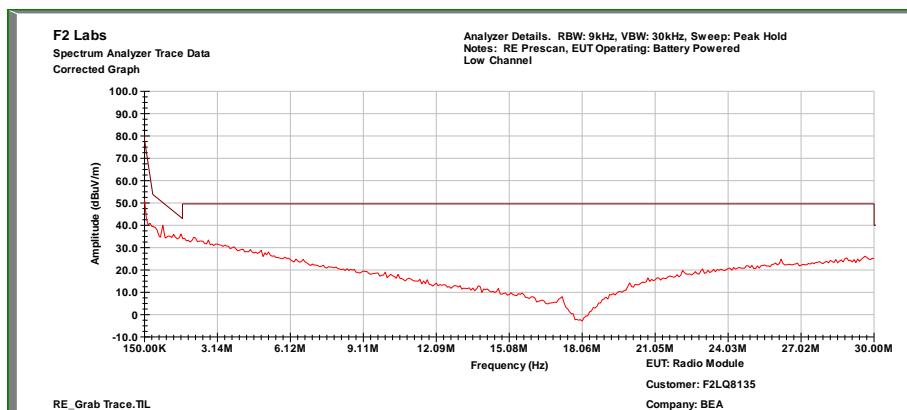
7.2 Test Data

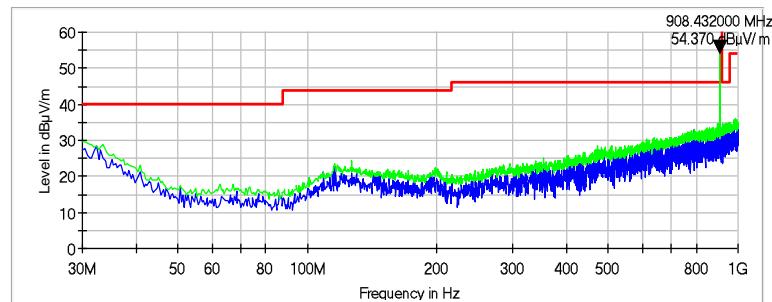
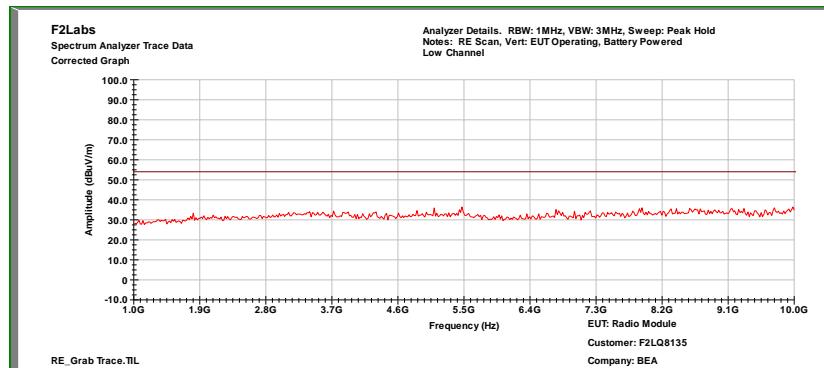
Test Date(s):	Feb. 11-12, 2016	Test Engineer(s):	J. Knepper
Standards:	CFR 47 Part 15.231(b); 15.209; C63.10:2013, Section 13.3	Air Temperature:	21.5°C

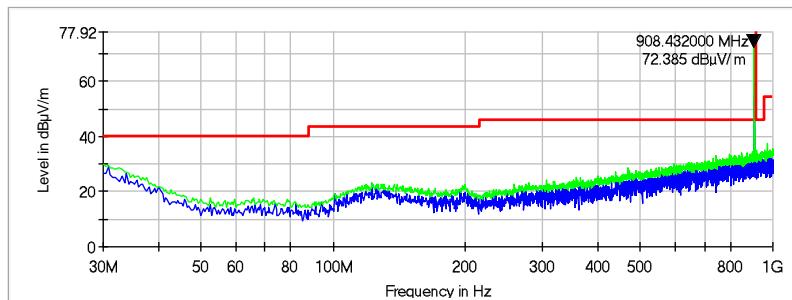
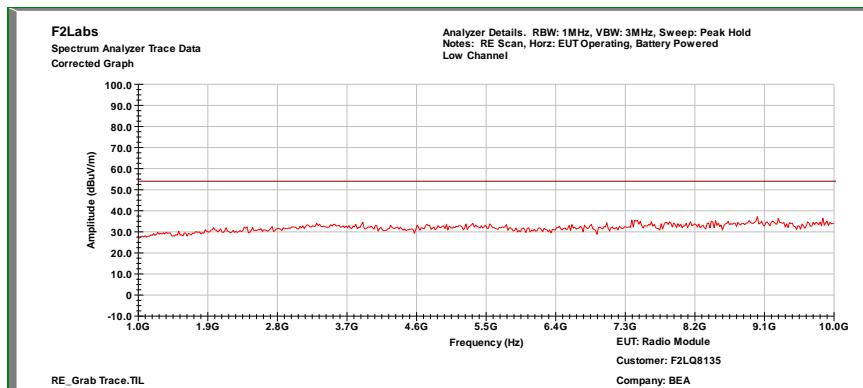
Low Channel: 9 kHz to 150 kHz



Low Channel: 150 kHz to 30 MHz



Low Channel: 30 MHz to 1 GHz, Vertical**Low Channel: 1 GHz to 10 GHz, Vertical**

Low Channel: 30 MHz to 1 GHz, Horizontal**Low Channel: 1 GHz to 10 GHz, Horizontal**



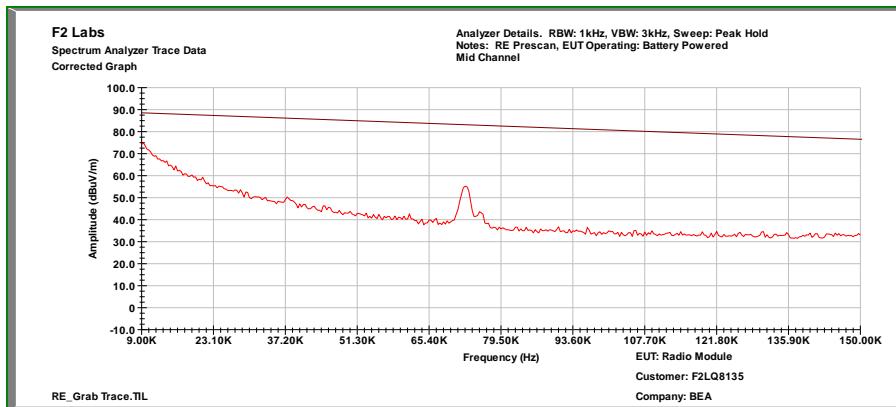
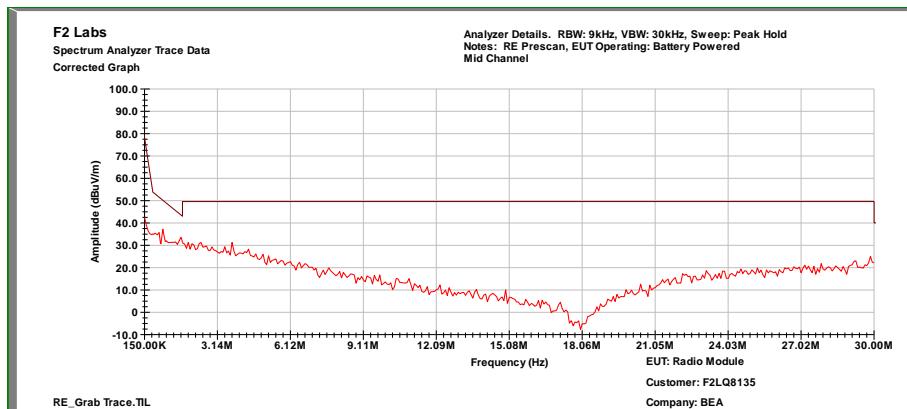
Order Number: F2LQ8135

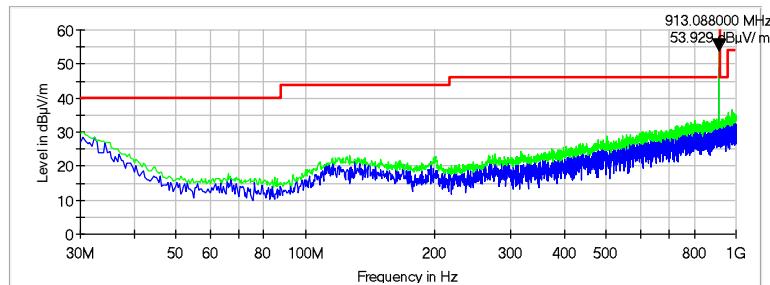
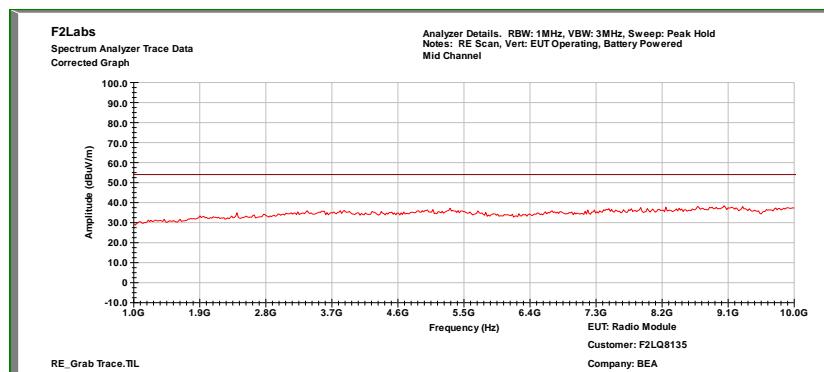
Client: BEA Incorporated

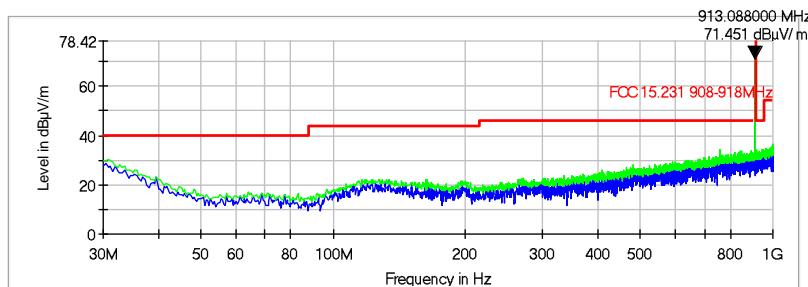
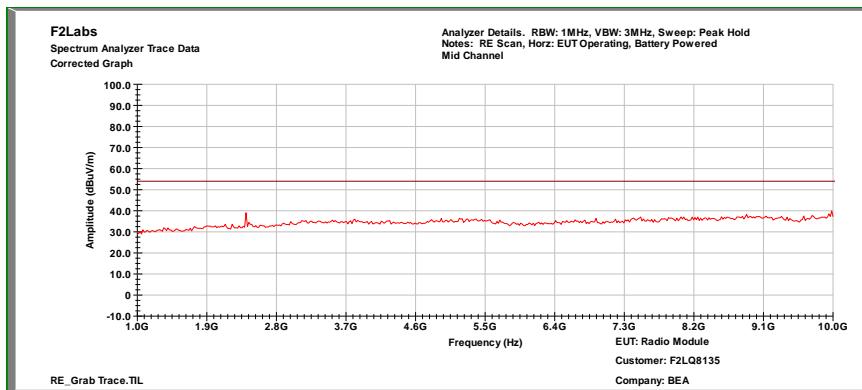
Model: 10TD900PTRI

Low Channel

Frequency (MHz)	Polarity	Corr. (dB)	QuasiPeak (dB μ V/m)	QuasiPeak (dB μ V/m) Limit	QuasiPeak Margin	Bandwidth (kHz)
30.776000	H	21.6	19.7	40	-20.3	100.000
32.328000	V	20.4	18.3	40	-21.7	100.000
115.360000	V	13.9	11.2	40	-28.8	100.000
116.136000	H	14.0	11.6	43.52	-31.9	100.000
197.616000	V	13.1	12.2	43.52	-31.3	100.000
199.168000	H	13.4	12.2	43.52	-31.3	100.000
357.084000	H	15.5	13.9	46	-32.1	100.000
470.380000	V	17.8	16.6	46	-29.4	100.000
902.000000	H	22.9	23.3	46	-22.7	100.000
902.000000	V	22.9	23.3	46	-22.7	100.000
908.000000	H	22.9	70.7	82	-11.3	100.000
908.000000	V	22.9	56.6	82	-25.4	100.000
928.000000	V	23.1	23.7	46	-22.3	100.000
928.000000	H	23.1	23.6	46	-22.4	100.000

Mid Channel: 9 kHz to 150 kHz**Mid Channel: 150 kHz to 30 MHz**

Mid Channel: 30 MHz to 1 GHz, Vertical**Mid Channel: 1 GHz to 10 MHz, Vertical**

Mid Channel: 30 MHz to 1 GHz, Horizontal

Mid Channel: 1 GHz to 10 GHz, Horizontal




Order Number: F2LQ8135

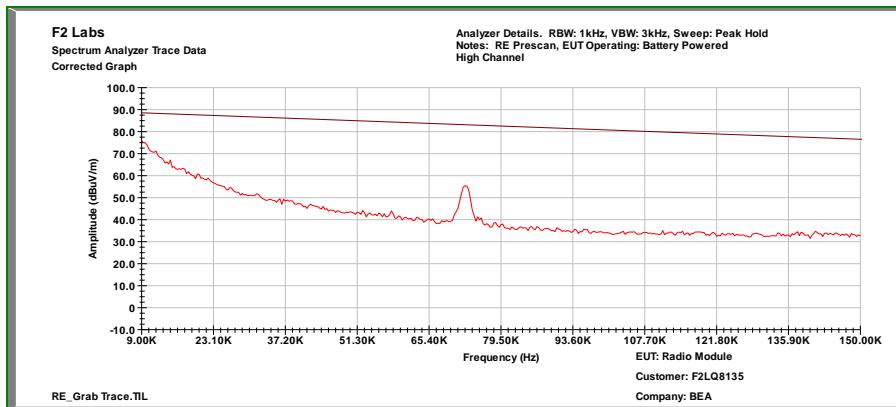
Client: BEA Incorporated

Model: 10TD900PTRI

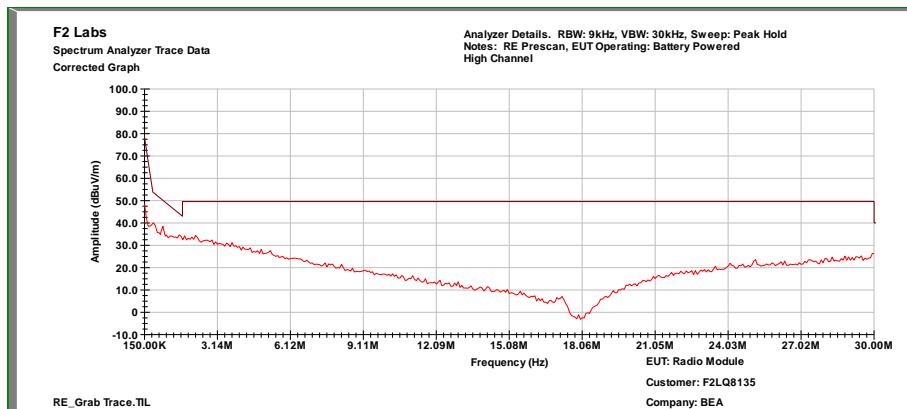
Mid Channel

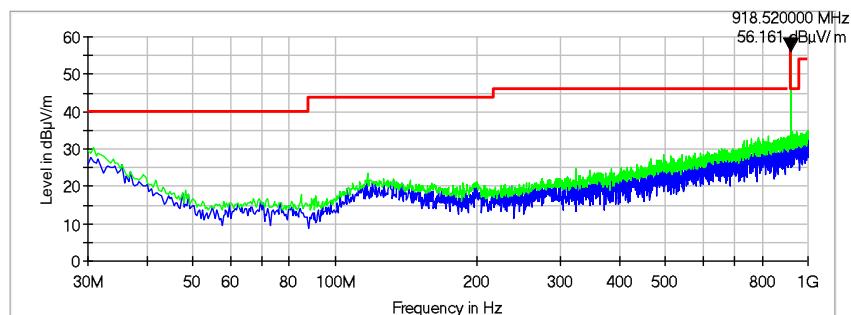
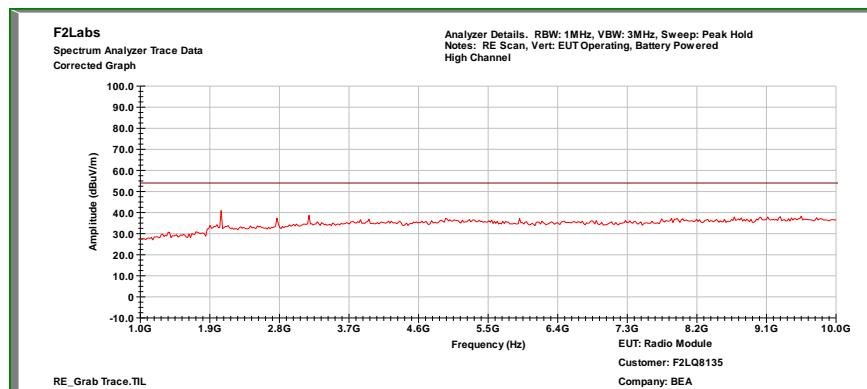
Frequency (MHz)	Polarity	Corr. (dB)	QuasiPeak (dB μ V/m)	QuasiPeak (dB μ V/m) Limit	QuasiPeak Margin	Bandwidth (kHz)
30.388000	H	21.9	20.3	40	-19.7	120.000
31.164000	V	21.3	19.1	40	-20.9	120.000
44.744000	V	11.2	8.6	40	-31.4	120.000
51.340000	H	8.3	6.7	40	-33.3	120.000
115.360000	H	13.9	11.3	43.5	-32.2	120.000
117.688000	V	14.4	11.9	43.5	-31.6	120.000
199.944000	H	13.5	12.3	43.5	-31.2	120.000
199.944000	V	13.5	12.2	43.5	-31.3	120.000
265.516000	V	13.5	11.7	46	-34.3	120.000
317.120000	H	14.5	12.8	46	-33.2	120.000
902.000000	V	22.9	23.2	46	-22.8	120.000
902.000000	H	22.9	23.3	46	-22.7	120.000
913.000000	H	23.0	70.8	82	-11.2	120.000
913.000000	V	23.0	61.1	82	-20.9	120.000
928.000000	H	23.1	23.6	46	-22.4	120.000
928.000000	V	23.1	23.7	46	-22.3	120.000

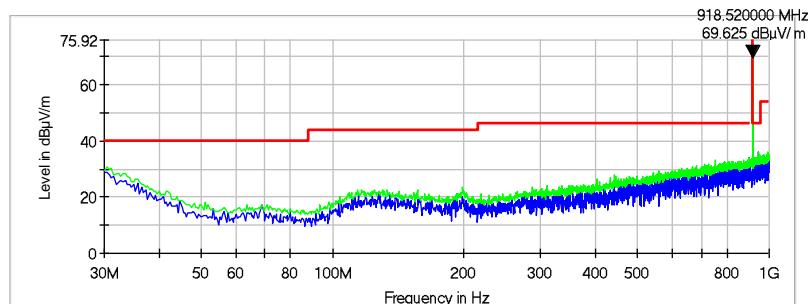
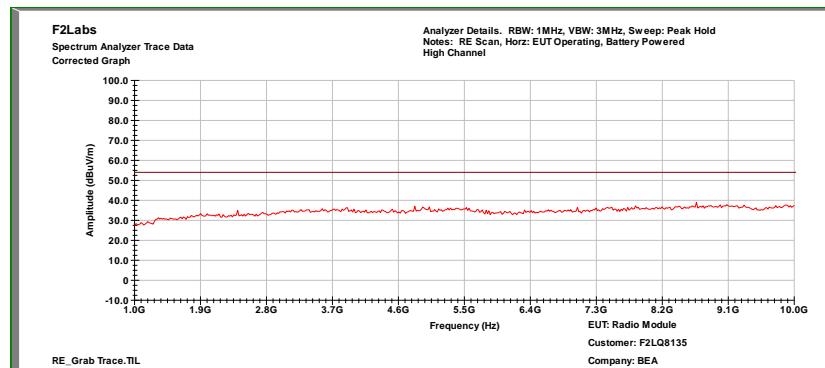
High Channel: 9 kHz to 150 kHz



High Channel: 150 kHz to 30 MHz



High Channel: 30 MHz to 1 GHz, Vertical**High Channel: 1 GHz to 10 GHz, Vertical**

High Channel: 30 MHz to 1 GHz, Horizontal**High Channel: 1 GHz to 10 GHz, Horizontal**



Order Number: F2LQ8135

Client: BEA Incorporated

Model: 10TD900PTRI

High Channel

Frequency (MHz)	Polarity	Corr. (dB)	QuasiPeak (dB μ V/m)	QuasiPeak (dB μ V/m) Limit	QuasiPeak Margin	Bandwidth (kHz)
32.328000	H	20.4	18.2	40	-21.8	120.000
32.328000	V	20.4	18.2	40	-21.8	120.000
41.252000	H	13.4	10.8	40	-29.2	120.000
52.504000	V	8.1	5.6	40	-34.4	120.000
84.708000	V	7.7	5.1	40	-34.9	120.000
117.300000	V	14.3	11.8	43.5	-31.7	120.000
117.688000	H	14.4	11.9	43.5	-31.6	120.000
135.924000	V	13.8	11.4	43.5	-32.1	120.000
199.556000	V	13.5	12.2	43.5	-31.3	120.000
199.556000	H	13.5	12.2	43.5	-31.3	120.000
261.636000	V	13.0	11.3	46	-34.7	120.000
358.636000	H	15.6	13.9	46	-32.1	120.000
902.000000	V	22.9	23.3	46	-22.7	120.000
902.000000	H	22.9	23.3	46	-22.7	120.000
918.000000	V	23.1	56.2	82	-25.8	120.000
918.000000	H	23.1	71.4	82	-10.6	120.000
928.000000	H	23.1	23.7	46	-22.3	120.000
928.000000	V	23.1	23.7	46	-22.3	120.000



8 FCC Part 15.231(b)(3)(c)

8.1 Requirements:

The bandwidth of the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20dB down from the modulated carrier. 908 MHz bandwidth must be no wider than 4.54 MHz; 913 MHz no wider than 4.566 MHz, and 918 MHz no wider than 4.59 MHz.

8.2 Test Data – OCCUPIED BANDWIDTH

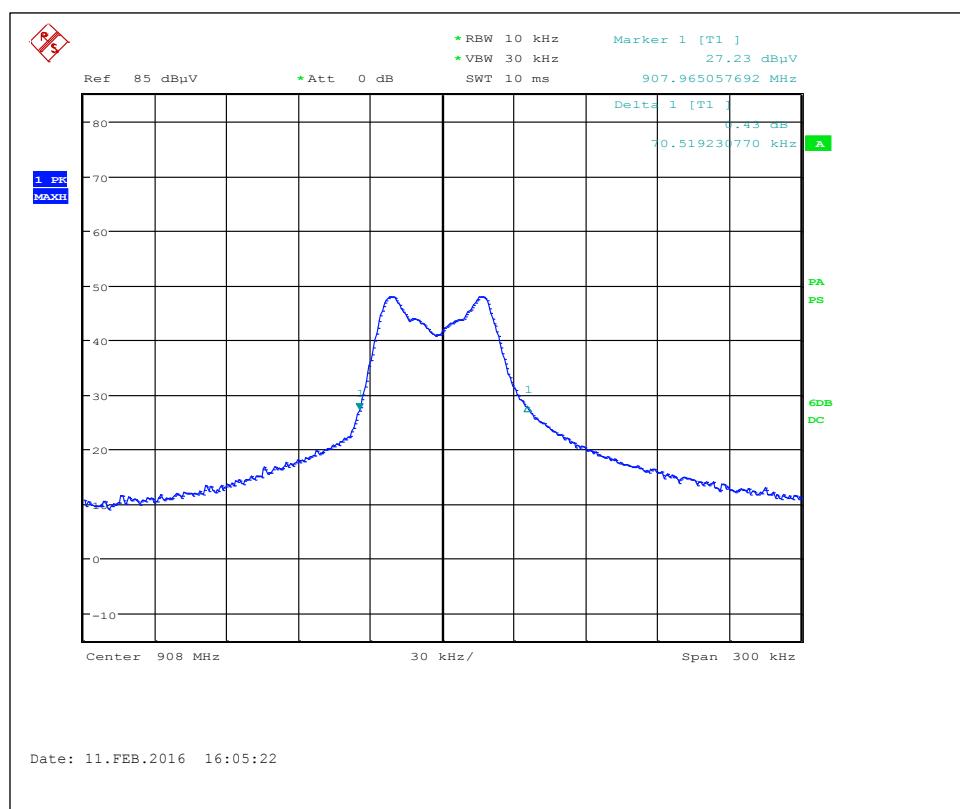
Test Date:	Feb. 9, 2016	Test Engineer:	J. Knepper
Standards:	CFR 47 Part 15.231(b)(3)(c)	Air Temperature:	20.20°C
		Relative Humidity:	35%

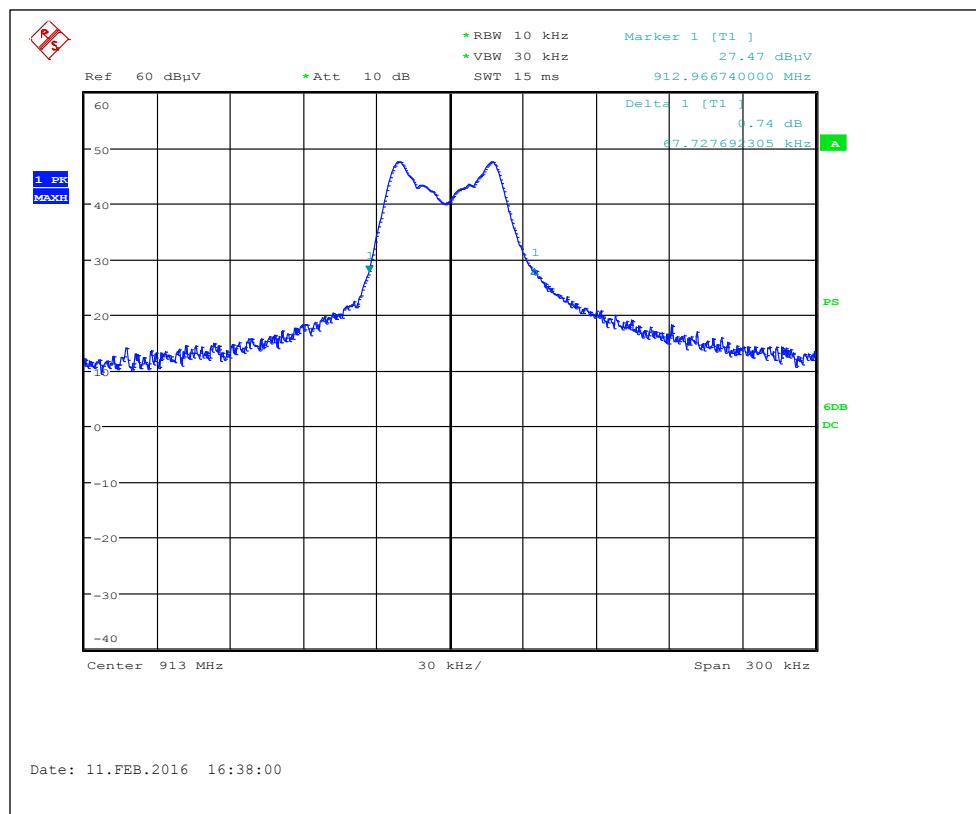
Occupied Bandwidth, Low Channel: 70.519 kHz

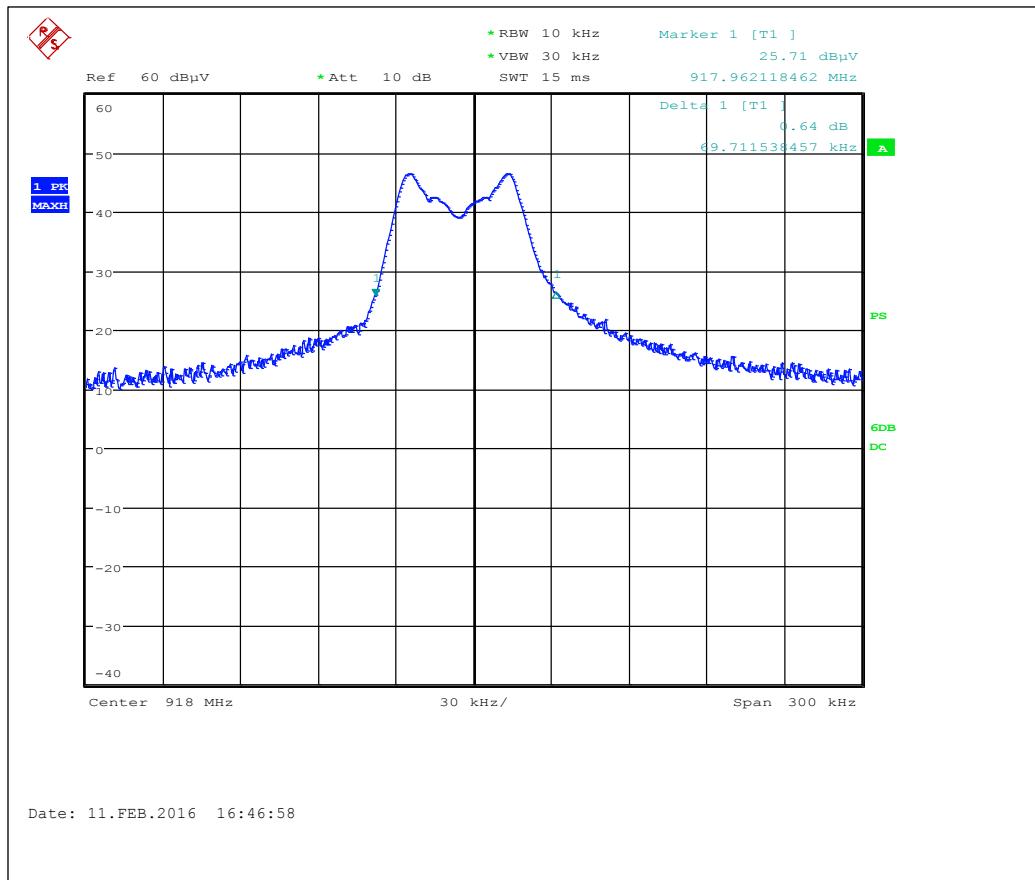
Occupied Bandwidth, Mid Channel: 67.728 kHz

Occupied Bandwidth, High Channel: 69.712 kHz

Low Channel



Mid Channel

High Channel

9 PHOTOGRAFHS**Radiated Spurious Emissions, <1 GHz****Radiated Spurious Emissions, >1 GHz**

Occupied Bandwidth