

**FCC PART 15 SUBPART B and C  
TEST REPORT**

for  
**FM 916 MHZ TRANSMITTER**  
**MODEL: TT916-TX**

Prepared for

SPECIAL ELECTRONICS & DESIGNS, INC.  
 214 BRUCE AVENUE  
 KINCARDINE, ONTARIO, CANADA, N2Z 2P3

Prepared by: 

JAMES ROSS

Approved by: 

KYLE FUJIMOTO

COMPATIBLE ELECTRONICS INC.  
 114 OLINDA DRIVE  
 BREA, CALIFORNIA 92823  
 (714) 579-0500

DATE: OCTOBER 15, 2012

REPORT BODY	APPENDICES					TOTAL
	A	B	C	D	E	
PAGES	17	2	2	11	9	43

This report shall not be reproduced except in full, without the written approval of Compatible Electronics.

## TABLE OF CONTENTS

Section / Title	PAGE
<b>GENERAL REPORT SUMMARY</b>	<b>4</b>
<b>SUMMARY OF TEST RESULTS</b>	<b>5</b>
<b>1. PURPOSE</b>	<b>6</b>
<b>2. ADMINISTRATIVE DATA</b>	<b>7</b>
2.1 Location of Testing	7
2.2 Traceability Statement	7
2.3 Cognizant Personnel	7
2.4 Date Test Sample was Received	7
2.5 Disposition of the Test Sample	7
2.6 Abbreviations and Acronyms	7
<b>3. APPLICABLE DOCUMENTS</b>	<b>8</b>
<b>4. DESCRIPTION OF TEST CONFIGURATION</b>	<b>9</b>
4.1 Description of Test Configuration – Emissions	9
4.1.1 Cable Construction and Termination	9
<b>5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT</b>	<b>10</b>
5.1 EUT and Accessory List	10
5.2 Emissions Test Equipment	11
<b>6. TEST SITE DESCRIPTION</b>	<b>12</b>
6.1 Test Facility Description	12
6.2 EUT Mounting, Bonding and Grounding	12
6.3 Facility Environmental Characteristics	12
<b>7. TEST PROCEDURES</b>	<b>13</b>
7.1 RF Emissions	13
7.1.1 Conducted Emissions Test	13
7.1.2 Radiated Emissions (Spurious and Harmonics) Test	14
7.1.3 RF Emissions Test Results	16
<b>8. CONCLUSIONS</b>	<b>16</b>

## LIST OF APPENDICES

APPENDIX	TITLE
A	Laboratory Accreditations and Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagram, Charts, and Photos <ul style="list-style-type: none"> <li>• Test Setup Diagram</li> <li>• Antenna and Amplifier Factors</li> <li>• Radiated Emissions Photos</li> </ul>
E	Data Sheets

## LIST OF FIGURES

FIGURE	TITLE
1	Conducted Emissions Test Setup
2	Plot Map And Layout of Radiated Test Site – 3 Meters

## GENERAL REPORT SUMMARY

Compatible Electronics Inc. generates this electromagnetic emission test report, which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested: FM 916 MHz Transmitter  
Model: TT916-TX  
S/N: N/A

Product Description: See Expository Statement

Modifications: The EUT was not modified in order to meet the specifications.

Customer: Special Electronics & Designs, Inc.  
214 Bruce Avenue  
Kincardine, Ontario, Canada, N2Z 2P3

Test Date(s): October 5, 2012

Test Specifications: Emission requirements  
CFR Title 47, Part 15, Subpart B; and Subpart C, Sections 15.205, 15.207, 15.209 and 15.249

Test Procedure: ANSI C63.4

Test Deviations: The test procedure was not deviated from during the testing.

## SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions 150 kHz to 30 MHz	This test was not performed because the EUT operates on battery power only and cannot be plugged into the AC public mains.
2	Radiated RF Emissions 10 kHz to 9200 MHz (Transmit and Digital Portion)	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249.

## 1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the FM 916 MHz Transmitter, Model: TT916-TX. The emissions measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.209, and 15.249 for the transmitter portion.



## 2. ADMINISTRATIVE DATA

## 2.1 Location of Testing

The emission tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California.

## 2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

## 2.3 Cognizant Personnel

Special Electronics & Designs, Inc.

Rolf Eberl  
Guy Boulianne

Compatible Electronics Inc.

Kyle Fujimoto      Test Engineer  
James Ross      Test Engineer

## 2.4 Date Test Sample was Received

The test sample was received prior to the date of testing.

## 2.5 Disposition of the Test Sample

The test sample has not yet been returned as of the date of this report.

## 2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

FCC	Federal Communications Commission
RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
ITE	Information Technology Equipment
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
N/A	Not Applicable
Ltd.	Limited
Inc.	Incorporated
LLC	Limited Liability Corporation
NCR	No Calibration Required

### 3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this emissions test report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4: 2009	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

## 4. DESCRIPTION OF TEST CONFIGURATION

### 4.1 Description of Test Configuration – Emissions

The FM 916 MHz Transmitter, Model: TT916-TX (EUT) was connected to a pair of headphones. The EUT was tested in three orthogonal axis and was continuously transmitting. The EUT operates on 3 “AA” batteries.

It was determined that the emissions were at their highest level when the EUT was operating in the above configurations. The final emissions data were taken in both modes of operation and any cables were maximized. All initial investigations were performed with the measurement receiver in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

#### 4.1.1 Cable Construction and Termination

##### Cable 1

This is a 2-meter unshielded cable connecting the headphone to the EUT. The cable has a 5-pin LEMO connector at the EUT end and is hard wired into the headphones.

**5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT****5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
FM 916 MHZ TRANSMITTER (EUT)	SPECIAL ELECTRONICS & DESIGNS, INC.	TT916-TX	N/A	QU6TT916TX
HEADPHONES	SPECIAL ELECTRONICS, & DESIGNS, INC.	DQ70-209	N/A	N/A

## 5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
<b>TEST EQUIPMENT USED FOR THE RF EMISSIONS TESTS</b>					
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8568B	2517A01563	May 30, 2012	May 30, 2013
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A15285	May 30, 2012	May 30, 2013
Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00424	May 30, 2012	May 30, 2013
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 19, 2010	November 19, 2012
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
Loop Antenna	Com-Power	AL-130	17089	January 21, 2011	January 21, 2013
Biconical Antenna	Com Power	AB-900	43028	May 24, 2012	May 24, 2013
Log Periodic Antenna	Com Power	AL-100	16252	May 24, 2012	May 24, 2013
Horn Antenna	Com-Power	AH-118	071175	February 29, 2012	March 1, 2014
Preamplifier	Com-Power	PA-102	1017	December 28, 2011	December 28, 2012
Microwave Preamplifier	Com-Power	PA-118	181656	December 28, 2011	December 28, 2012
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A

## 6. TEST SITE DESCRIPTION

### 6.1 Test Facility Description

Please refer to section 2.1 and 7.1.2 of this report for emissions test location.

### 6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

### 6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

## 7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

### 7.1 RF Emissions

#### 7.1.1 Conducted Emissions Test

The measurement receiver was used as a measuring meter. The data was collected with the measurement receiver in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the measurement receiver's input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the measurement receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

#### Test Results:

This test was not performed because the EUT is battery powered only and cannot be plugged into the AC public mains.

### 7.1.2

### Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer and EMI Receiver were used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com-Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, the Com-Power Microwave Preamplifier Model: PA-118 was used for frequencies from 1 GHz. The spectrum analyzer and EMI Receiver were used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

The frequencies above 1 GHz were averaged by using a video bandwidth of 10 Hz.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1000 MHz	120 kHz	Log Periodic Antenna
1000 MHz to 9200 MHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.

### Radiated Emissions (Spurious and Harmonics) Test (continued)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3-meter test distance to obtain the final test data, except below 30 MHz, where the EUT was tested at a 10-meter test distance to obtain the final test data.

#### Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.249.

### 7.1.3 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS  
 FM 916 MHz Transmitter, Model: TT916-TX

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
916.5 MHz (H) (Z-Axis)	93.06 (Q)	94.00	-0.94
916.5 MHz (H) (X-Axis)	92.67 (Q)	94.00	-1.33
916.5 MHz (H) (Y-Axis)	87.06 (Q)	94.00	-6.94
916.5 MHz (V) (Y-Axis)	85.85 (Q)	94.00	-8.15
916.5 MHz (V) (Z-Axis)	83.86 (Q)	94.00	-10.14
1833 MHz (V) (Z-Axis)	43.52 (A)	54.00	-10.48

Notes:

- \* The complete emissions data is given in Appendix E of this report.
- A Average Reading
- Q Quasi-peak
- V Vertical
- H Horizontal

---

## 8. CONCLUSIONS

The FM 916 MHz Transmitter, Model: TT916-TX (EUT), as tested, meets all of the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.209, and 15.249 for the transmitter portion.



## APPENDIX A

### ***LABORATORY ACCREDITATIONS AND RECOGNITIONS***

---

**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

## LABORATORY ACCREDITATIONS AND RECOGNITIONS


 NVLAP LAB CODES 200063-0,  
 200528-0, 200527-0

For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025. Please follow the link to the NIST/NVLAP site for each of our facilities' NVLAP certificate and scope of accreditation

NVLAP listing links

[Agoura Division](#) / [Brea Division](#) / [Silverado/Lake Forest Division](#)

.Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management Systems requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management Systems requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."


 ANSI listing [CETCB](#)


Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

[US/EU MRA list](#) [NIST MRA site](#)



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).

[APEC MRA list](#) [NIST MRA site](#)

We are also listed for IT products by the following country/agency:



VCCI Support member: Please visit [http://www.vcci.jp/vcci\\_e/](http://www.vcci.jp/vcci_e/)



FCC Listing, from FCC OET site  
[FCC test lab search](https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm) <https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>



Compatible Electronics IC listing can be found at:  
<http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home>

## **APPENDIX B**

### ***MODIFICATIONS TO THE EUT***

---

**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

## MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.249 and/or FCC **Class B** specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modification were made to the EUT during the testing.



## APPENDIX C

### ***ADDITIONAL MODELS COVERED UNDER THIS REPORT***

---

Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## **ADDITIONAL MODELS COVERED UNDER THIS REPORT**

### **USED FOR THE PRIMARY TEST**

FM 916 MHz Transmitter  
Model: TT916-TX  
S/N: N/A

### **ALSO APPROVED UNDER THIS REPORT:**

There were no additional models covered under this report.



## APPENDIX D

### ***DIAGRAMS, CHARTS, AND PHOTOS***

---

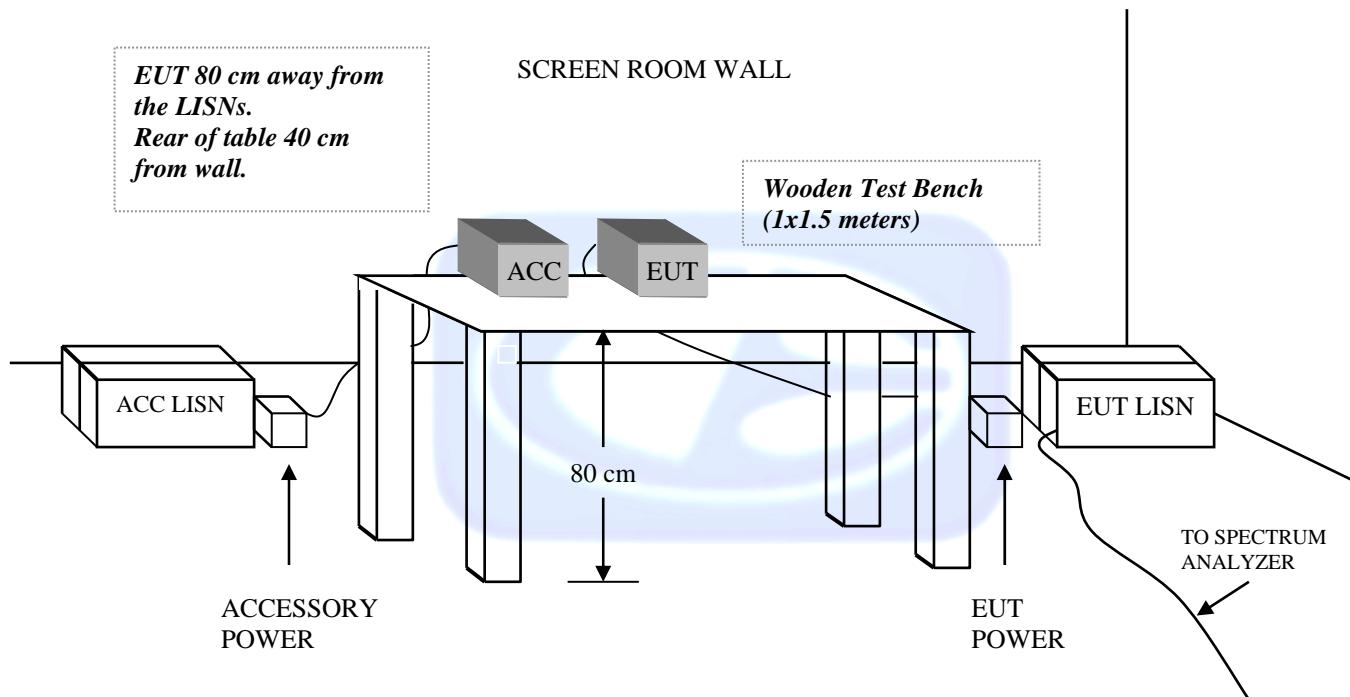
**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

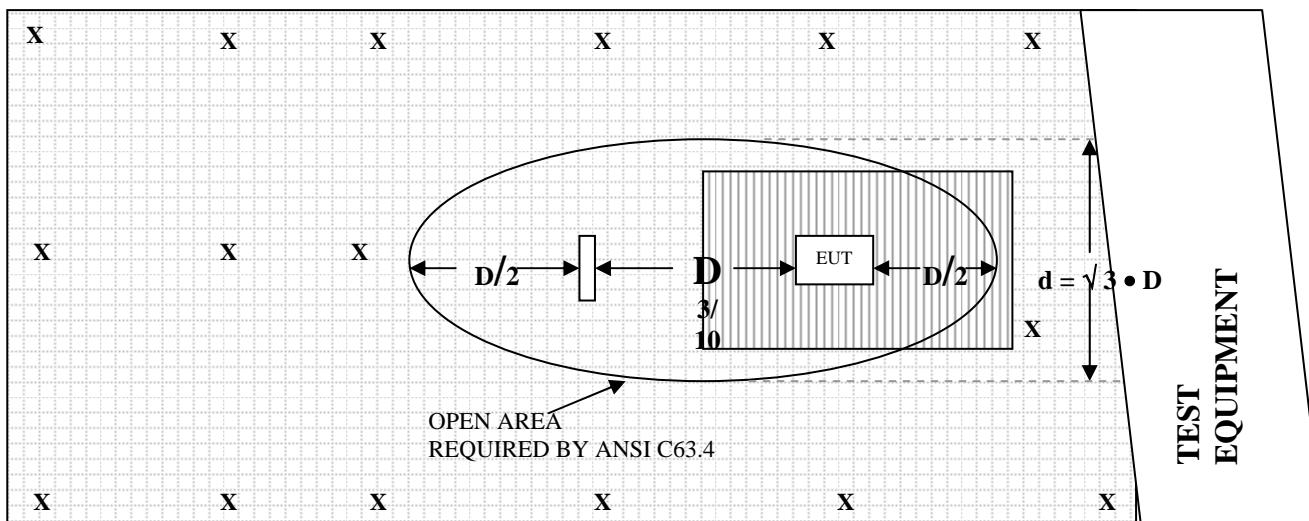
**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

**FIGURE 1: CONDUCTED EMISSIONS TEST SETUP**



**FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE – 3 METERS**

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

	= GROUND RODS		= GROUND SCREEN
	= TEST DISTANCE (meters)		= WOOD COVER

**COM-POWER AL-130**
**LOOP ANTENNA**
**S/N: 17089**
**CALIBRATION DATE: JANUARY 21, 2011**

<b>FREQUENCY (MHz)</b>	<b>MAGNETIC (dB/m)</b>	<b>ELECTRIC (dB/m)</b>
0.009	-41.9	9.6
0.01	-41.79	9.71
0.02	-41.43	10.07
0.05	-41.53	9.97
0.07	-41.47	10.03
0.1	-41.44	10.06
0.2	-41.61	9.89
0.3	-41.62	9.88
0.5	-41.66	9.84
0.7	-41.48	10.02
1	-41.13	10.37
2	-40.89	10.61
3	-41.00	10.50
4	-41.14	10.36
5	-41.02	10.48
10	-40.69	10.82
15	-40.41	11.09
20	-41.07	10.43
25	-42.10	9.40
30	-41.15	10.35

**COM-POWER AB-900**
**BICONICAL ANTENNA**
**S/N: 43028**
**CALIBRATION DATE: MAY 24, 2012**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	11.80	120	13.20
35	11.20	125	13.30
40	11.90	140	11.60
45	10.70	150	11.80
50	11.40	160	12.70
60	10.30	175	14.80
70	7.60	180	15.70
80	5.70	200	15.80
90	7.90	250	14.80
100	10.7	300	19.80

**COM-POWER AL-100**

**LOG PERIODIC ANTENNA**

**S/N: 16252**

**CALIBRATION DATE: MAY 24, 2012**

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
300	13.00	700	20.30
350	13.20	750	20.80
400	14.50	800	21.00
450	15.40	850	23.70
500	15.80	900	21.70
550	16.60	950	24.20
600	18.90	1000	24.30
650	19.10		

**COM POWER AH-118**
**HORN ANTENNA**
**S/N: 071175**
**CALIBRATION DATE: FEBRUARY 29, 2012**

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.6	10.0	37.7
1.5	22.0	10.5	38.4
2.0	28.7	11.0	38.0
2.5	29.3	11.5	38.2
3.0	30.6	12.0	39.0
3.5	30.4	12.5	42.4
4.0	31.1	13.0	40.8
4.5	33.4	13.5	40.0
5.0	35.3	14.0	39.7
5.5	35.1	14.5	43.5
6.0	36.9	15.0	42.7
6.5	37.4	15.5	39.7
7.0	37.6	16.0	39.2
7.5	36.2	16.5	39.7
8.0	38.4	17.0	42.2
8.5	39.3	17.5	47.6
9.0	37.4	18.0	51.2
9.5	38.0		

**COM-POWER PA-102**
**PREAMPLIFIER**
**S/N: 1017**
**CALIBRATION DATE: DECEMBER 28, 2011**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	38.54	300	38.45
40	38.53	350	38.47
50	38.57	400	38.36
60	38.54	450	38.07
70	38.54	500	38.31
80	38.54	550	38.37
90	38.54	600	38.28
100	38.53	650	38.19
125	38.51	700	38.24
150	38.43	750	37.88
175	38.56	800	37.94
200	38.50	850	37.65
225	38.46	900	37.50
250	38.57	950	37.47
275	38.45	1000	36.86

**COM-POWER PA-118**
**PREAMPLIFIER**
**S/N: 181656**
**CALIBRATION DATE: DECEMBER 28, 2011**

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.22	10.0	24.66
1.5	26.31	10.5	25.22
2.0	27.40	11.0	25.17
2.5	26.52	11.5	24.47
3.0	27.35	12.0	25.29
3.5	29.02	12.5	26.03
4.0	28.51	13.0	24.11
4.5	26.62	13.5	24.28
5.0	27.13	14.0	25.81
5.5	27.29	14.5	25.45
6.0	26.72	15.0	25.36
6.5	25.62	15.5	26.76
7.0	25.25	16.0	28.09
7.5	24.23	16.5	23.23
8.0	23.72	17.0	26.58
8.5	24.91	17.5	27.45
9.0	25.73	18.0	27.53
9.5	24.79		

**FRONT VIEW****SPECIAL ELECTRONICS & DESIGNS, INC.****FM 916 MHZ TRANSMITTER****MODEL: TT916-TX****FCC SUBPART B AND C – RADIATED EMISSIONS****PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

---

**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

**REAR VIEW****SPECIAL ELECTRONICS & DESIGNS, INC.****FM 916 MHZ TRANSMITTER****MODEL: TT916-TX****FCC SUBPART B AND C – RADIATED EMISSIONS****PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

---

**Brea Division**  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500**Agoura Division**  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600**Silverado Division**  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700**Lake Forest Division**  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

## APPENDIX E

### ***DATA SHEETS***

---

**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

## ***RADIATED EMISSIONS***

### ***DATA SHEETS***

---

**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

**FCC 15.249**

Special Electronics & Design, Inc.  
FM 916 MHz Transmitter  
Model: TT916-TX

Date: 10/05/2012

Lab: B

Tested By: Kyle Fujimoto

**X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
916.5	82.15	V	114	-31.85	Peak	1.25	225	
916.5	82.06	V	94	-11.94	QP	1.25	225	
1833	40.81	V	74	-33.19	Peak	1.25	155	
1833	28.04	V	54	-25.96	Avg	1.25	155	
2749.5	42.35	V	74	-31.65	Peak	1.35	165	
2749.5	30.76	V	54	-23.24	Avg	1.35	165	
3666.6	44.14	V	74	-29.86	Peak	1.35	165	
3666.6	41.32	V	54	-12.68	Avg	1.35	165	
4582.5	36.13	V	74	-37.87	Peak	1.35	165	
4582.5	29.09	V	54	-24.91	Avg	1.35	165	
5499								No Emission Detected
5499								No Emission Detected
6415.5								No Emission Detected
6415.5								No Emission Detected
7332								No Emission Detected
7332								No Emission Detected
8248.5								No Emission Detected
8248.5								No Emission Detected
9165								No Emission Detected
9165								No Emission Detected

**FCC 15.249**

 Special Electronics & Design, Inc.  
 FM 916 MHz Transmitter  
 Model: TT916-TX

 Date: 10/05/2012  
 Lab: B  
 Tested By: Kyle Fujimoto

**X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
916.5	92.75	H	114	-21.25	Peak	1.25	225	
916.5	92.67	H	94	-1.33	QP	1.25	225	
1833	45.69	H	74	-28.31	Peak	1.25	155	
1833	42.54	H	54	-11.46	Avg	1.25	155	
2749.5	40.81	H	74	-33.19	Peak	1.35	165	
2749.5	33.63	H	54	-20.37	Avg	1.35	165	
3666.6	46.27	H	74	-27.73	Peak	1.35	165	
3666.6	38.43	H	54	-15.57	Avg	1.35	165	
4582.5	37.81	H	74	-36.19	Peak	1.35	165	
4582.5	24.24	H	54	-29.76	Avg	1.35	165	
5499								No Emission Detected
5499								
6415.5								No Emission Detected
6415.5								
7332								No Emission Detected
7332								
8248.5								No Emission Detected
8248.5								
9165								No Emission Detected
9165								

**FCC 15.249**

 Special Electronics & Design, Inc.  
 FM 916 MHz Transmitter  
 Model: TT916-TX

Date: 10/05/2012

Lab: B

Tested By: Kyle Fujimoto

**Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
916.5	85.95	V	114	-28.05	Peak	1.25	225	
916.5	85.85	V	94	-8.15	QP	1.25	225	
1833	43.34	V	74	-30.66	Peak	1.25	155	
1833	38.81	V	54	-15.19	Avg	1.25	155	
2749.5	42.11	V	74	-31.89	Peak	1.35	165	
2749.5	34.95	V	54	-19.05	Avg	1.35	165	
3666.6	45.81	V	74	-28.19	Peak	1.35	165	
3666.6	39.85	V	54	-14.15	Avg	1.35	165	
4582.5	39.59	V	74	-34.41	Peak	1.35	165	
4582.5	26.11	V	54	-27.89	Avg	1.35	165	
5499								No Emission Detected
5499								No Emission Detected
6415.5								No Emission Detected
6415.5								No Emission Detected
7332								No Emission Detected
7332								No Emission Detected
8248.5								No Emission Detected
8248.5								No Emission Detected
9165								No Emission Detected
9165								No Emission Detected

**FCC 15.249**

Special Electronics & Design, Inc.  
FM 916 MHz Transmitter  
Model: TT916-TX

Date: 10/05/2012

Lab: B

Tested By: Kyle Fujimoto

**Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
916.5	87.15	H	114	-26.85	Peak	1.25	225	
916.5	87.06	H	94	-6.94	QP	1.25	225	
1833	56.88	H	74	-17.12	Peak	1.25	155	
1833	41.61	H	54	-12.39	Avg	1.25	155	
2749.5	40.62	H	74	-33.38	Peak	1.35	165	
2749.5	32.69	H	54	-21.31	Avg	1.35	165	
3666.6	43.72	H	74	-30.28	Peak	1.35	165	
3666.6	36.19	H	54	-17.81	Avg	1.35	165	
4582.5	37.44	H	74	-36.56	Peak	1.35	165	
4582.5	24.48	H	54	-29.52	Avg	1.35	165	
5499								No Emission Detected
5499								
6415.5								No Emission Detected
6415.5								
7332								No Emission Detected
7332								
8248.5								No Emission Detected
8248.5								
9165								No Emission Detected
9165								

**FCC 15.249**

Special Electronics & Design, Inc.  
FM 916 MHz Transmitter  
Model: TT916-TX

Date: 10/05/2012

Lab: B

Tested By: Kyle Fujimoto

**Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
916.5	83.96	V	114	-30.04	Peak	1.25	225	
916.5	83.86	V	94	-10.14	QP	1.25	225	
1833	47.07	V	74	-26.93	Peak	1.25	155	
1833	43.52	V	54	-10.48	Avg	1.25	155	
2749.5	41.29	V	74	-32.71	Peak	1.35	165	
2749.5	32.42	V	54	-21.58	Avg	1.35	165	
3666.6	46.65	V	74	-27.35	Peak	1.35	165	
3666.6	42.67	V	54	-11.33	Avg	1.35	165	
4582.5	35.05	V	74	-38.95	Peak	1.35	165	
4582.5	22.65	V	54	-31.35	Avg	1.35	165	
5499								No Emission Detected
5499								
6415.5								No Emission Detected
6415.5								
7332								No Emission Detected
7332								
8248.5								No Emission Detected
8248.5								
9165								No Emission Detected
9165								

**FCC 15.249**

 Special Electronics & Design, Inc.  
 FM 916 MHz Transmitter  
 Model: TT916-TX

 Date: 10/05/2012  
 Lab: B  
 Tested By: Kyle Fujimoto

**Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
916.5	93.15	H	114	-20.85	Peak	1.25	225	
916.5	93.06	H	94	-0.94	QP	1.25	225	
1833	43.57	H	74	-30.43	Peak	1.25	155	
1833	40.58	H	54	-13.42	Avg	1.25	155	
2749.5	39.69	H	74	-34.31	Peak	1.35	165	
2749.5	29.14	H	54	-24.86	Avg	1.35	165	
3666.6	46.41	H	74	-27.59	Peak	1.35	165	
3666.6	43.46	H	54	-10.54	Avg	1.35	165	
4582.5	36.75	H	74	-37.25	Peak	1.35	165	
4582.5	23.74	H	54	-30.26	Avg	1.35	165	
5499								No Emission Detected
5499								
6415.5								No Emission Detected
6415.5								
7332								No Emission Detected
7332								
8248.5								No Emission Detected
8248.5								
9165								No Emission Detected
9165								

FCC 15.249 and FCC Class B

Special Electronics & Design, Inc.  
FM 916 MHz Transmitter  
Model: TT916-TX

Date: 10/05/2012  
Labs: B and D  
Tested By: Kyle Fujimoto

## Digital Portion and Non-Harmonic Emissions from the Transmitter 10 kHz to 9.165 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Comments
						No Emissions
						Detected from 10 kHz to 9.165 GHz in either Polarization. for the Digital Portion.
						No Emissions
						Detected from 10 kHz to 9.165 GHz in either Polarization. for the Non-Harmonic Emissions from the Transmitter
						Tested in the X-Axis, Y-Axis, and Z-Axis
						No Emissions at the Band Edges at 902 MHz and 928 MHz