



# Compliance Testing, LLC

Previously Flom Test Lab

EMI, EMC, RF Testing Experts Since 1963

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## Test Report

Prepared for: Icom Incorporated

Model: IC-7610

Description: HF Transceiver with Scanning Receiver

Serial Number: 00000091

FCC ID: AFJ386400

To

FCC Part 15.121

Date of Issue: October 31, 2017

On the behalf of the applicant:

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**Greg Corbin**  
Project Test Engineer

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All results contained herein relate only to the sample tested

### Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	October 22, 2017	Greg Corbin	Original Document
2.0	October 31, 2017	Amanda Reed	Updated contact information



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**ILAC / A2LA**

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted in the table below.

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.

Testing Certificate Number: **2152.01**



**FCC Site Reg. #349717**

**IC Site Reg. #2044A-2**

**Non-accredited tests contained in this report:**

**N/A**

**The applicant has been cautioned as to the following:**

15.21 Information to User

The user's manual or instruction manual for an intentional radiator shall caution the user that changes, or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator the responsible part may employ other methods of ensuring that the special accessories are provided to the consumer, without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

## Standard Test Conditions Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing: FCC Part15.121.

In accordance with ANSI C63.10-2014 and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104°F), unless the particular equipment requirements specified testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Measurement results, unless otherwise noted, are worst-case measurements.

Environmental Conditions		
Temperature (°C)	Humidity (%)	Pressure (mbar)
24.4	30.1	973.2

### EUT Description

**Model:** IC-7610

**Description:** HF Transceiver with Scanning Receiver

**Serial Number:** 00000091

**Additional Information:**

The HF Transceiver is a high frequency transmitter and scanning receiver operating in the frequency bands and modes listed in the table below.

Refer to user manual for further details.

The receiver is powered by 13.8 vdc.

The transmitter is used for amateur radio service per Part 97 and is exempt from FCC certification.

As stated at one of the FCC Wireless Telecommunications Bureau (WTB) websites for Part 97, the FCC (OET) equipment authorization program does not generally apply to amateur radio service station transmitters.

The scanning receiver was tested to comply with part47 CFR 15.109, 15.111, and 15.121.

This scanning receiver upper operating range is 60 MHz, and is not capable of scanning in the Part 22 Cellular Radiotelephone Service band per 15.121(a)(1). Therefore this scanning receiver meets the requirements of section 15.121 (b) by design since it cannot receive any signals above 60 MHz.

Receiver Frequency Range	0.030 – 60.00 MHz
Transmitter Frequency Range	Refer to user manual
Operating modes	USB, LSB, CW, RTTY, PSK, AM, FM

### EUT Operation during Tests

It was observed during preliminary testing of the scanning receiver that the operating mode did not alter the receiver spurious emissions.

Receiver was tested in normal operating mode.



**Accessories:**

Qty	Description	Manufacturer	Model	S/N
1	Speaker	ICOM	SP-23	N/A
1	Microphone	ICOM	HM-219	N/A

**Cables:**

Qty	Description	Length (M)	Shielding Y/N	Shielded Hood Y/N	Termination
2	Speaker cable	1	N	N	Speaker

**Modifications:** None



**Test Results Summary**

Specification	Test Name	Pass, Fail, N/A	Comments
15.109(f), 15.111(a)	Conducted Spurious Emissions	Pass	
15.109	Radiated Spurious Emissions	Pass	
15.107	AC Powerline Conducted Emissions	Pass	
15.121(b)	Rejection	N/A	EUT is not capable of operating in the Part 22 Cellular Radiotelephone band

**15.203: Antenna Requirement:**

The antenna requirement does not apply



## Conducted Spurious Emissions

**Engineer:** Greg Corbin

**Test Date:** 10/20/2017

### Test Procedure

Per FCC section 15.109(f), For a receiver which employs terminals for the connection of an external receiving antenna, the receiver shall be tested to demonstrate compliance with the provisions of this section with an antenna connected to the antenna terminals unless the antenna conducted power is measured as specified in §15.111(a).

FCC section 15.111(a) states: In addition to the radiated emission limits, receivers that operate (tune) in the frequency range 30 to 960 MHz and CB receivers that provide terminals for the connection of an external receiving antenna may be tested to demonstrate compliance with the provisions of §15.109 with the antenna terminals shielded and terminated with a resistive termination equal to the impedance specified for the antenna, provided these receivers also comply with the following: With the receiver antenna terminal connected to a resistive termination equal to the impedance specified or employed for the antenna, the power at the antenna terminal at any frequency within the range of measurements specified in §15.33 shall not exceed 2.0 nanowatts.

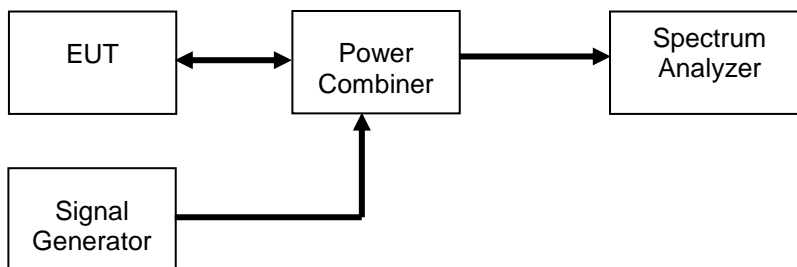
The EUT was connected as shown in the test set-up.

A receive signal at the low, middle, high frequencies of the band was injected to the receiver input and the conducted spurious emissions was measured from 30 – 1000 MHz with the receiver scanning and with the receiver scanning stopped.

It was observed during preliminary testing of the scanning receiver that the operating mode did not alter the receiver spurious emissions.

All signals measured at the receiver antenna port were below 2 nanowatts (-57 dBm).

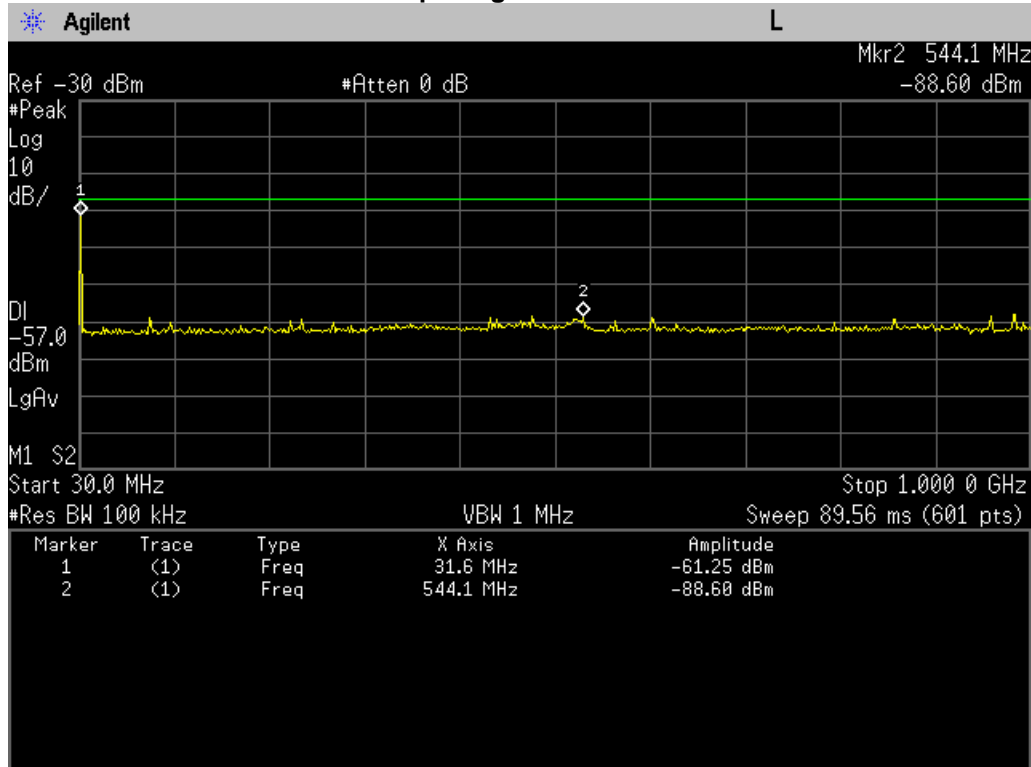
### Test Setup



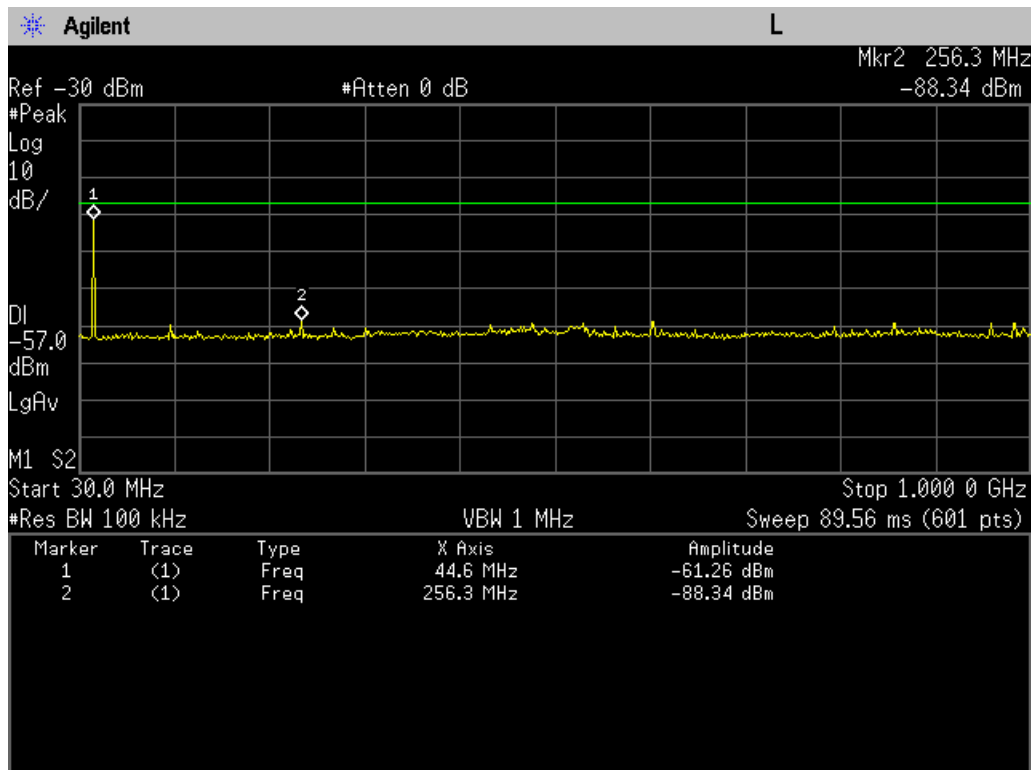


### Conducted Receiver Spurious Test Data

#### Input signal 30 MHz

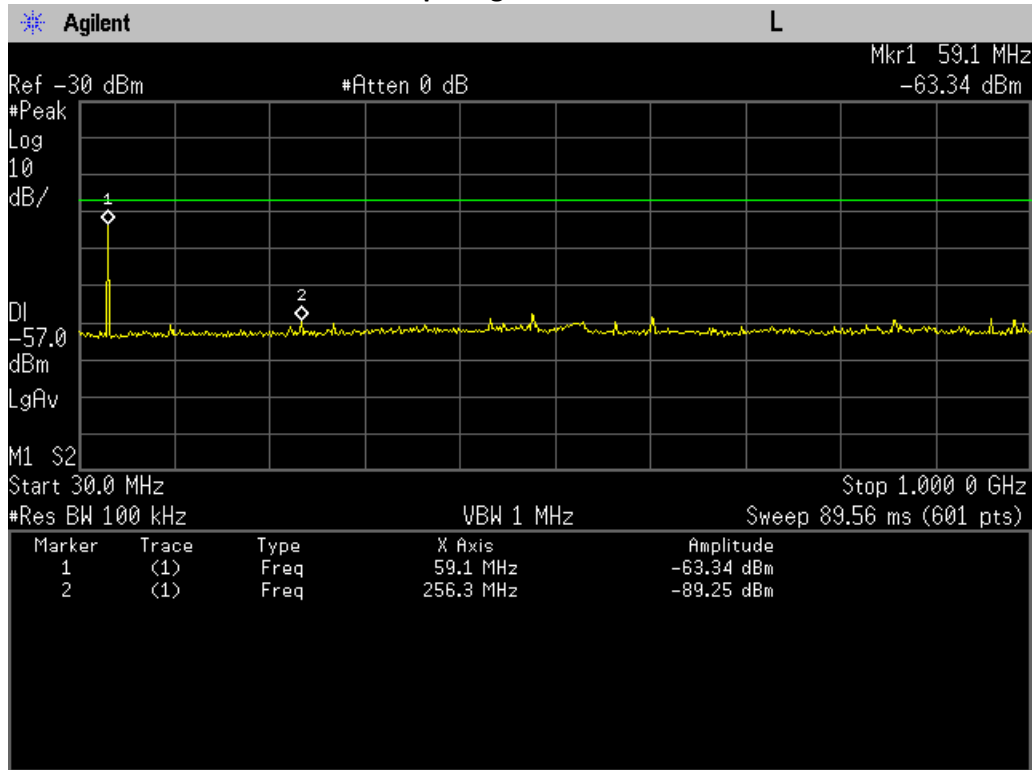


#### Input signal 45 MHz





### Input signal 59 MHz



## Radiated Spurious Emissions

**Engineer:** Greg Corbin

**Test Date:** 10/22/2017

### Test Procedure

The EUT was tested in a semi-anechoic chamber with the turntable set 3m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Emissions. The EUT was tested by rotating it 360 degrees with the antennas in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the signal levels were maximized.

All emissions from 30 MHz to 700 MHz were examined.

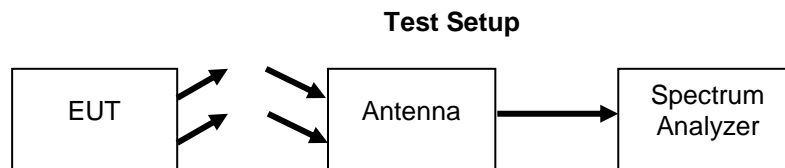
Any emission close to the limit was measured with a QP detector.

The EUT antenna ports were terminated with their characteristic impedance.

Radiated measurements were performed with the receiver set to scan from 0.030 – 60 MHz.

RBW = 120 kHz below 1 GHz.

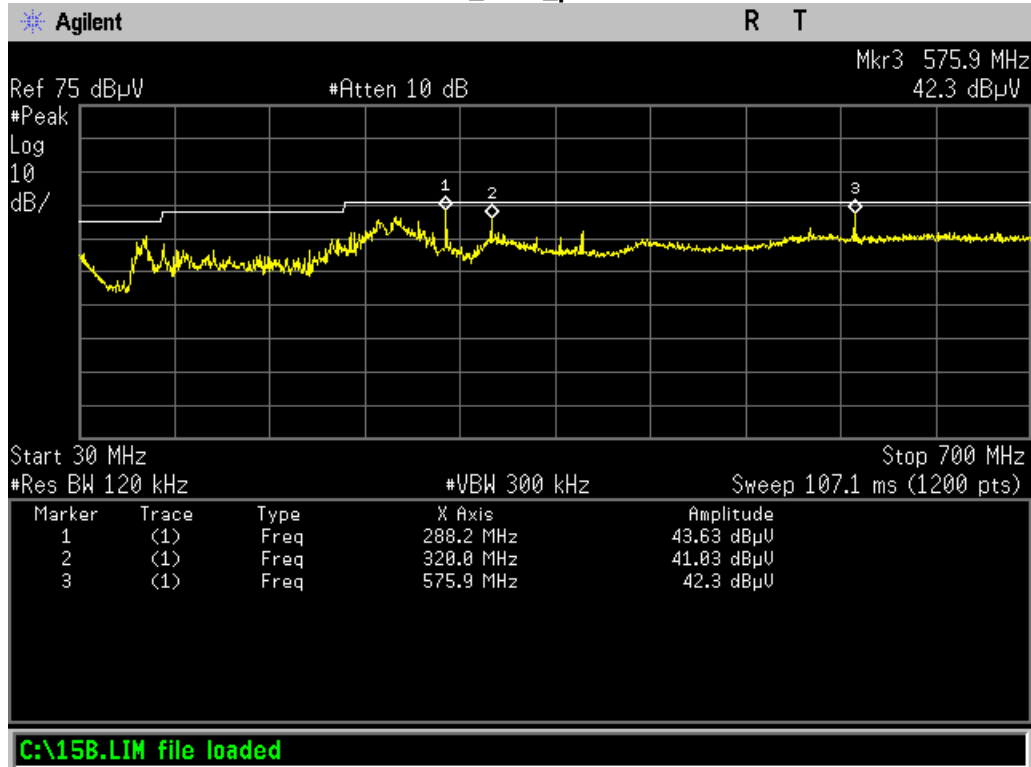
RBW = 1 MHz above 1 GHz.



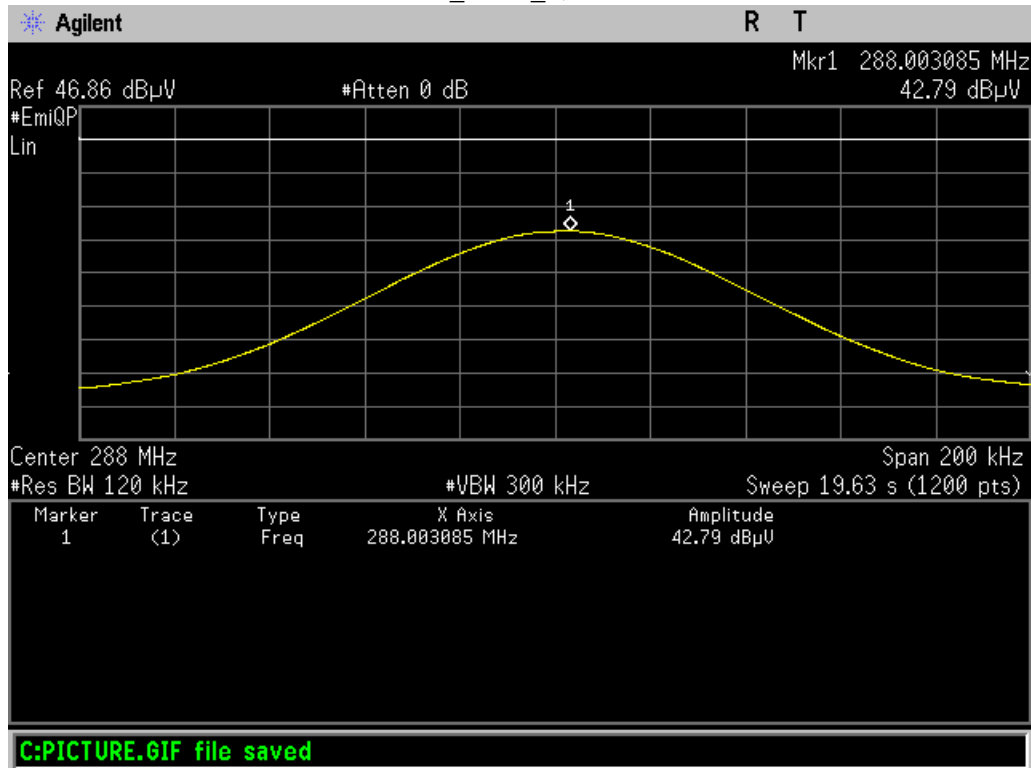


### Radiated Spurious Emission Test Data

#### 30 - 700 MHz\_Horz\_peak detector

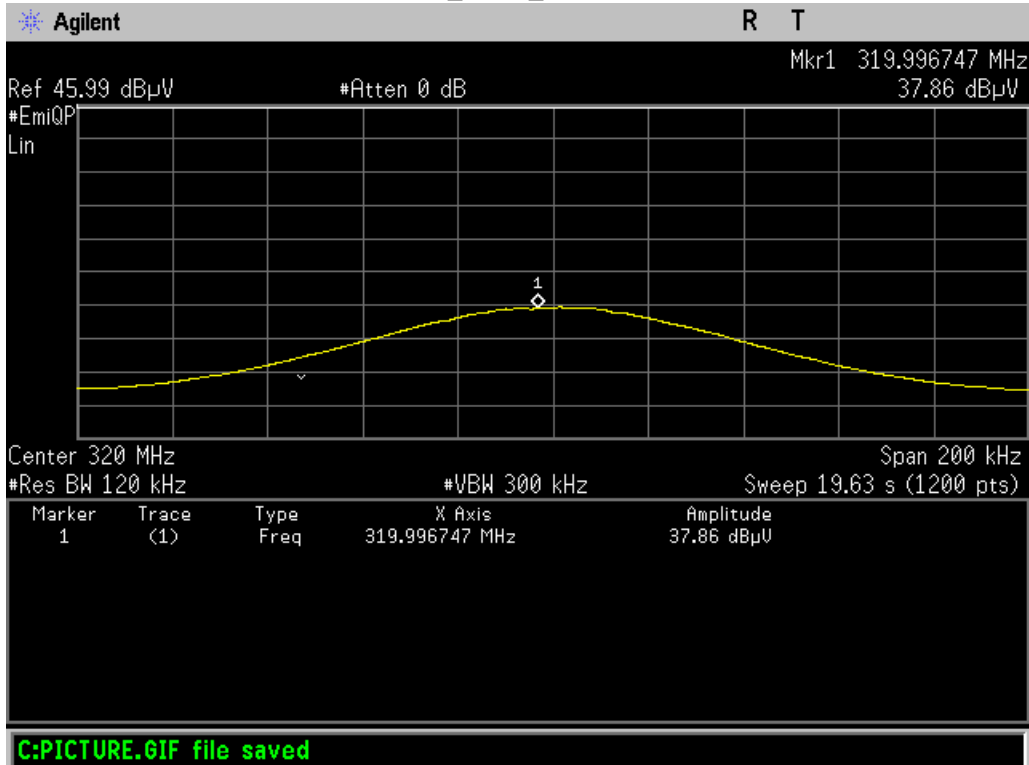


#### 288 MHz\_Horz\_QP detector

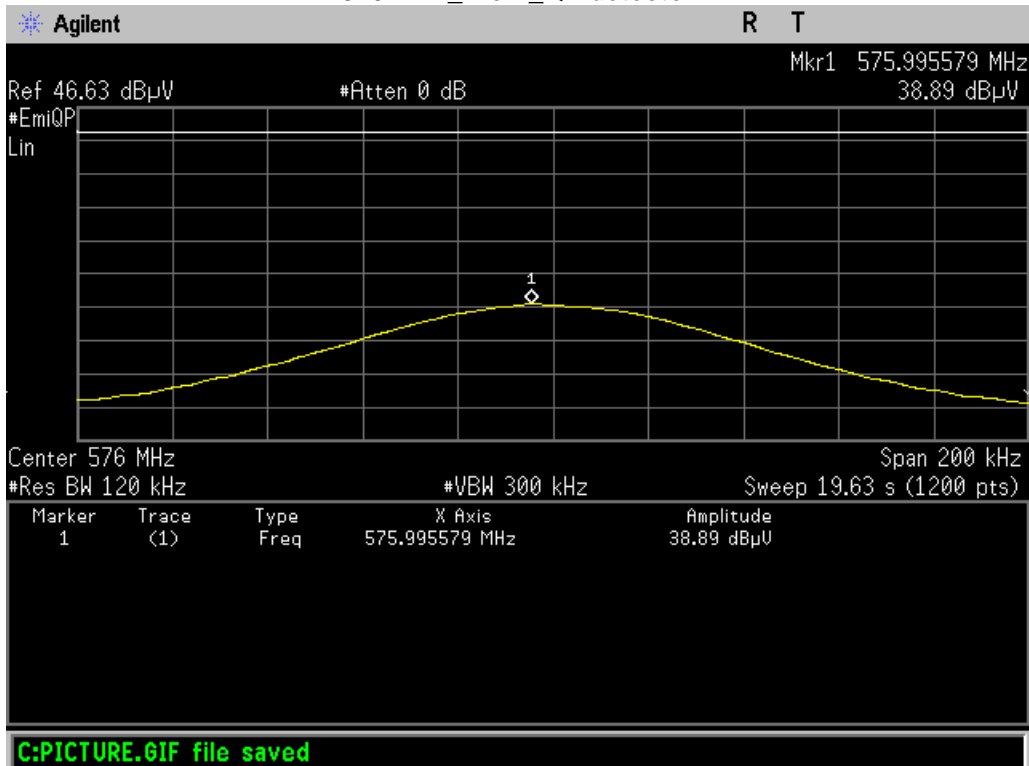




### 320 MHz\_Horz\_QP detector

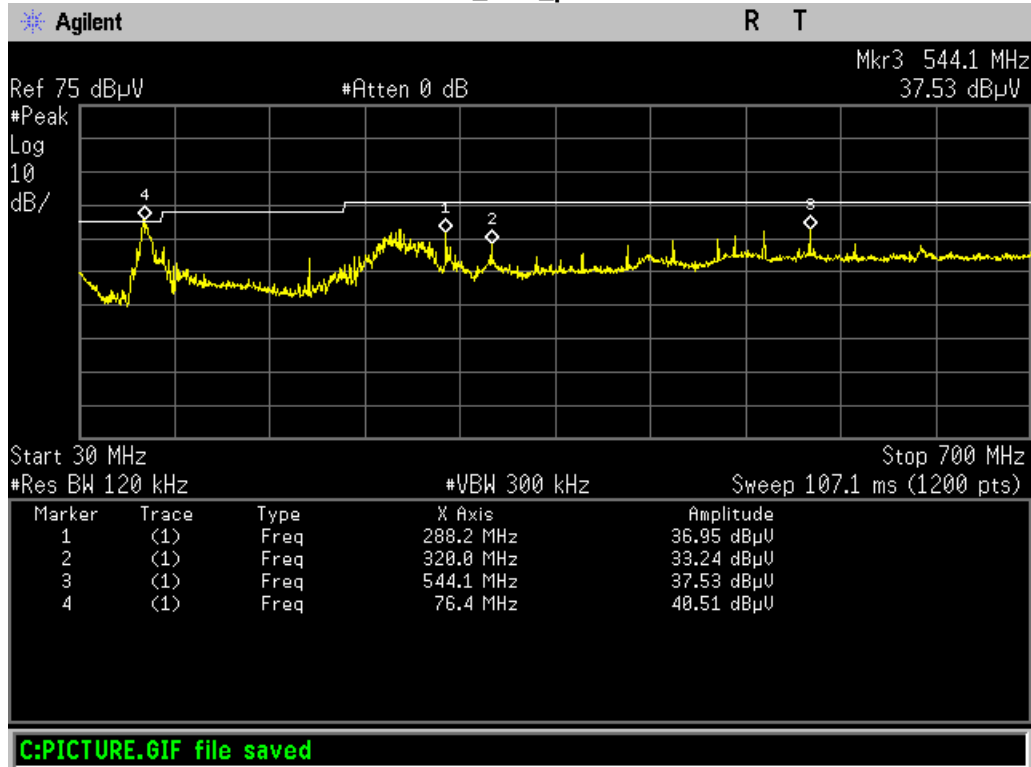


### 576 MHz\_Horz\_QP detector

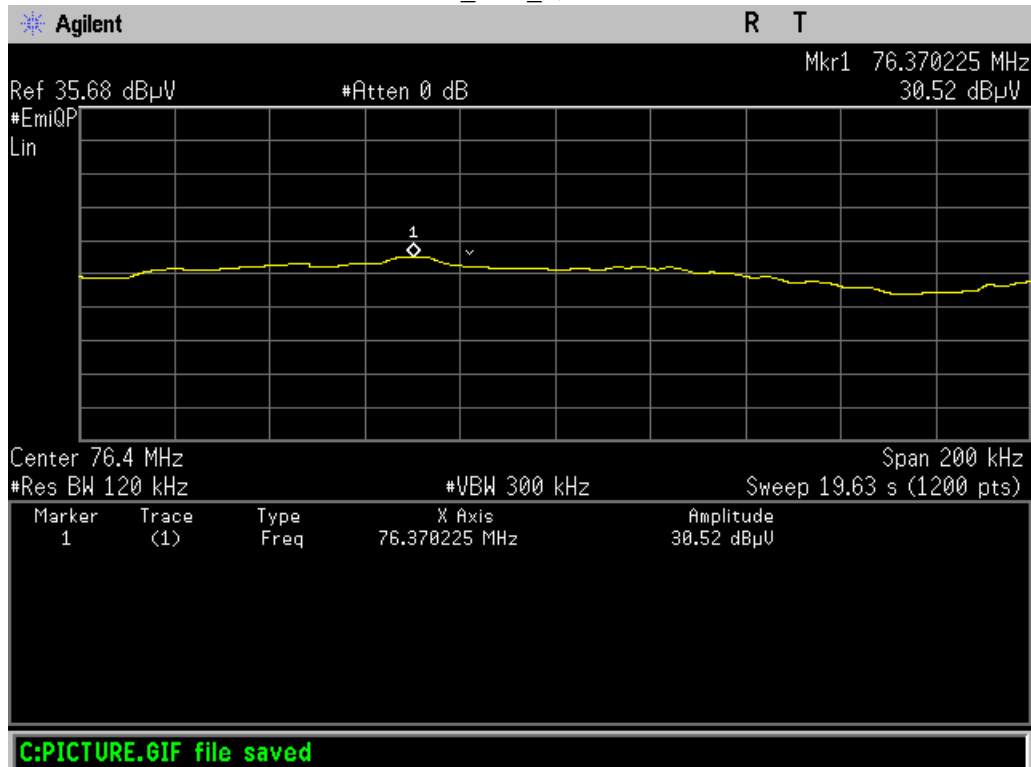




### 30 - 700 MHz\_Vert\_peak detector

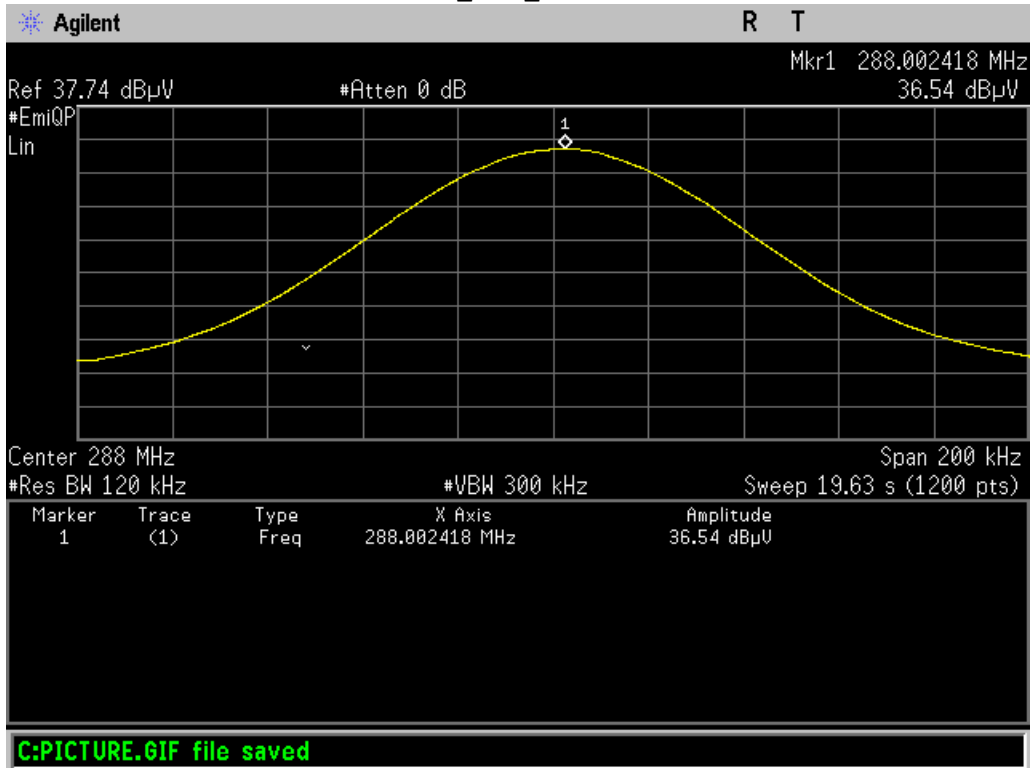


### 76.4 MHz\_Vert\_QP detector

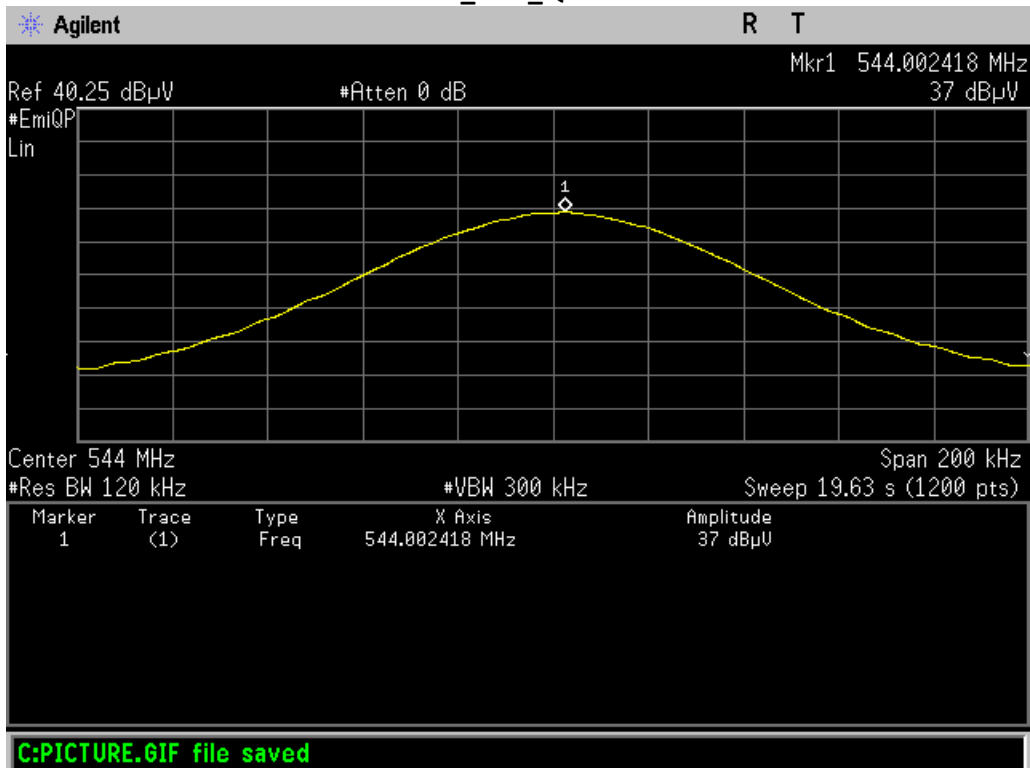




### 288 MHz\_Vert\_QP detector



### 544 MHz\_Vert\_QP detector





## 15.107 A/C Powerline Conducted Emissions

**Engineer:** Greg Corbin

**Test Date:** 10/22/2017

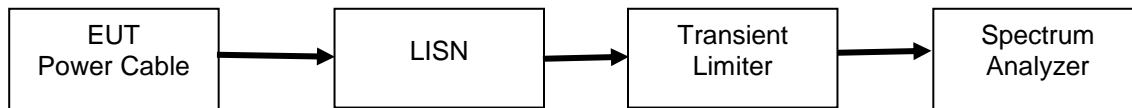
### Test Procedure

The EUT power cable was connected to a LISN and the monitored output of the LISN was connected to a transient limiter, which then connected directly to a spectrum analyzer. The conducted emissions from 150 kHz to 30 MHz were measured and compared to the specification limits.

The EUT is powered by 13.8 vdc. The EUT was powered from an automotive battery at 12.8 vdc.

There were no emissions from the 13.8 vdc input port as shown in the test data on the next page.

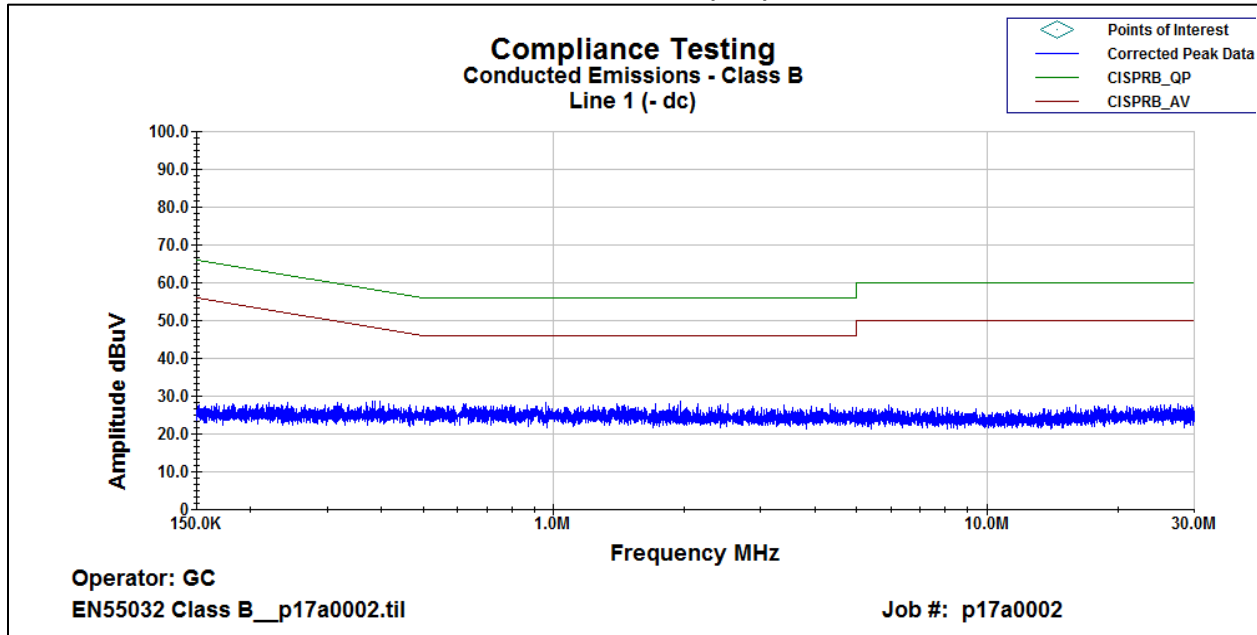
### Test Setup



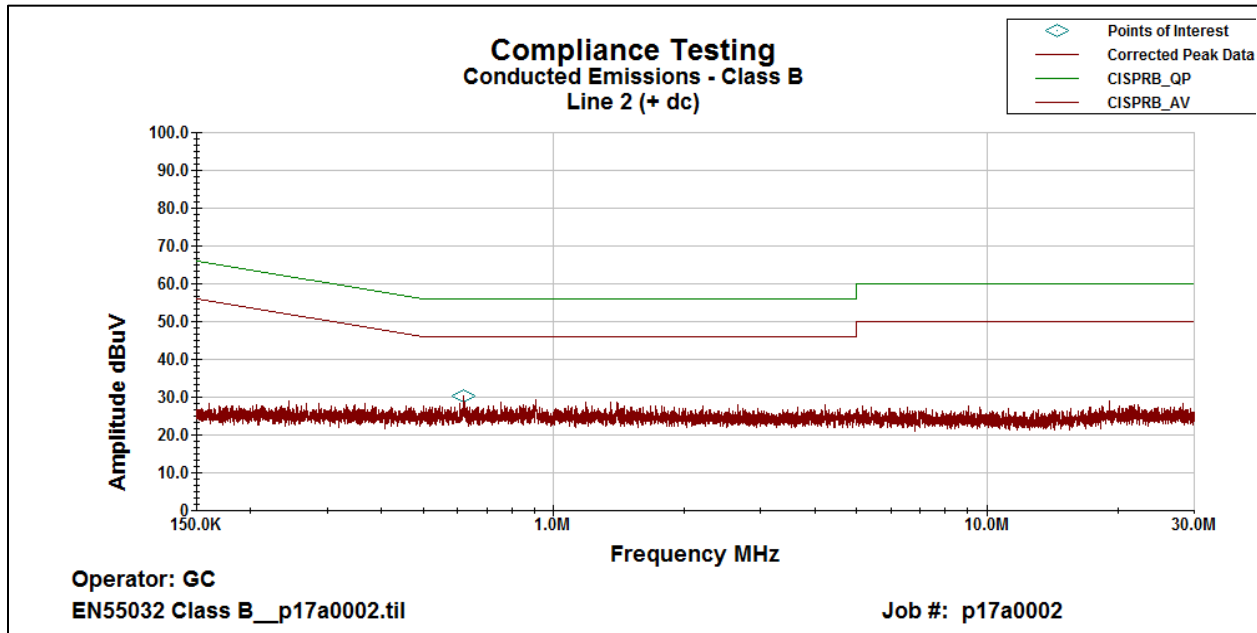


### Conducted Emissions Test Results

#### Line 1 Peak Plot (- dc)



#### Line 2 Peak Plot (+ dc)



All peak readings are below the quasi peak and average limits; therefore, no tabular data was recorded

## Test Equipment Utilized

Description	Manufacturer	Model Number	CT Asset Number	Last Cal Date	Cal Due Date
EMI Receiver	HP	8546A	i00033	3/28/17	3/28/18
Transient Limiter	Com-Power	LIT-153	i00123	Verified on:10/22/2017	
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	6/9/17	6/9/18
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	8/3/16	8/3/18
AC Power Source	Behlman	BL 6000	i00362	Verified on10/22/2017	
EMI Analyzer	Agilent	E7405A	i00379	2/22/17	2/22/18
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	8/15/16	8/15/19
LISN	COM-Power	LI-125A	i00446	4/29/16	4/29/18
LISN	COM-Power	LI-125A	i00448	4/29/16	4/29/18
Signal Generator	Agilent	E4438C	i00457	10/19/16	10/19/18
PSA Spectrum Analyzer	Agilent	E4445A	i00471	9/6/17	9/6/18

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT