



Engineering Solutions & Electromagnetic Compatibility Services

Intentional Radiated Emissions Test Report - FCC Part 15.231 & RSS-210

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FCC ID	CFS8DL582	Test Report Date	May 12, 2016
IC	573F-582	RTL Work Order Number	2016112
Model	582T	RTL Quote Number	QRTL16-112A
American National Standard Institute	ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices		
FCC Rule Part(s)	15.231 Periodic operation in the band 40.66–40.70 MHz and above 70 MHz (10-01-15)		
IC Rule Part	RSS-210 Issue 8 Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment		

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15, IC RSS-210 and ANSI C63.10.

Signature: _____

Date: May 12, 2016

Typed/Printed Name: Desmond A. Fraser

Position: President

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These test(s) are accredited under Rhein Tech Laboratories, Inc. ISO/IEC 17025 accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation AT-1445.

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1 General Information

1.1 Scope

Applicable Standards:

- FCC Part 15.231: Periodic operation in the band 40.66–40.70 MHz and above 70 MHz
- Industry Canada RSS-210 Issue 8 Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

1.2 Description of EUT

Equipment Under Test	582T
Power Supply	3 VDC battery
Frequency Range	344.94 MHz
Antenna Connector Type	Internal
Antenna Type	Internal

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

1.4 Modifications

No modifications were required for compliance.

2 Test Information

2.1 Description of Test Modes

In accordance with FCC 15.31(m) the following frequencies were tested:

Table 2-1: Frequencies Tested

Channel	Frequency
N/A	344.94 MHz

2.2 EUT Disposition

The EUT was adapted to continuously transmit for testing purposes.

2.3 Test Result Summary

Table 2-2: Test Result Summary – FCC Part 15, Subpart C (Section 15.231), IC RSS-210/IC RSS-Gen

FCC Reference	Test	Pass/Fail or N/A
FCC 15.231	Radiated Emissions	Pass

2.4 Related Submittal(s)/Grant(s)

This report is to support an application for certification under FCC ID: CFS8DL582, IC: 573F-582.

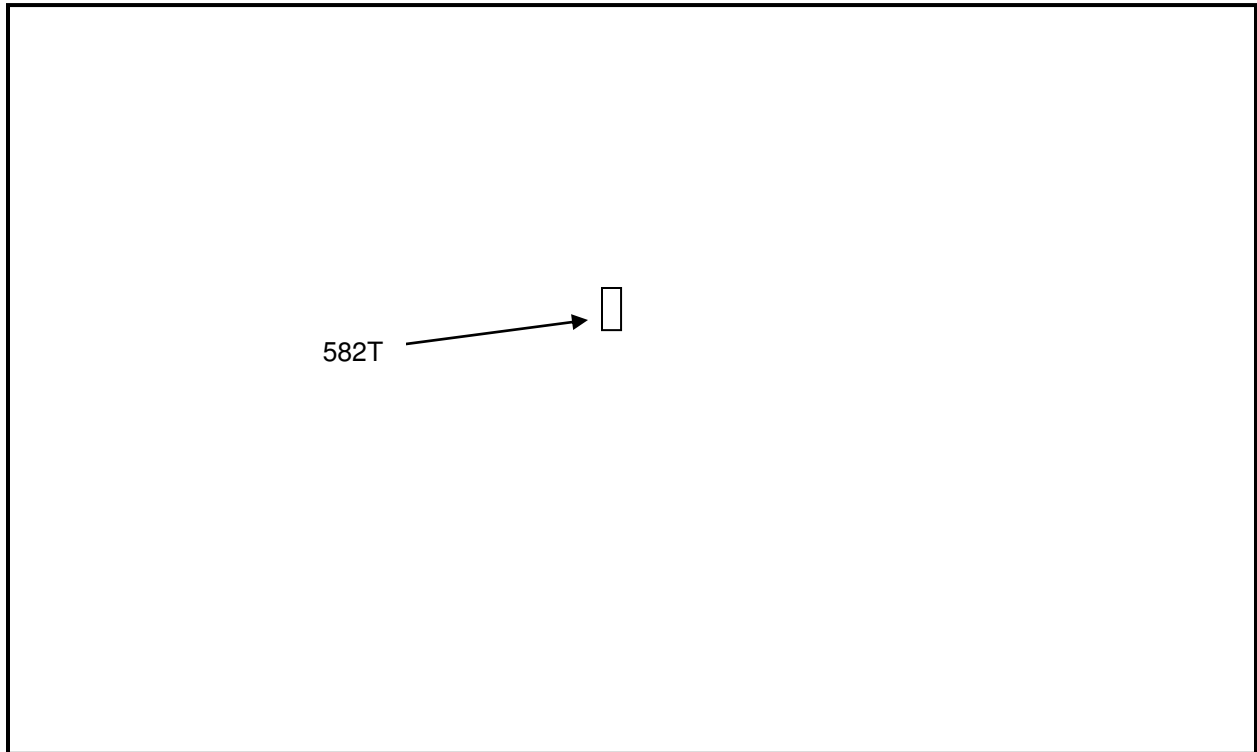
2.5 Test System Details

The test samples were received on May 5, 2016. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following tables.

Table 2-3: Equipment Under Test

Part	Manufacturer	Model	Serial Number	FCC ID	RTL Bar Code
Key Fob (modulated)	Honeywell International	582T	058-6258	CFS8DL582	22038
Key Fob (encrypted)	Honeywell International	582T	059-1284	CFS8DL582	22039
Key Fob (CW)	Honeywell International	582T	A041-1490	CFS8DL582	22040

2.6 Configuration of Tested System




3 Duty Cycle

The manufacturer attests the duty cycle to be 14.3 ms = total on time in 100ms

Duty Cycle Correction Calculation: $20\log(14.3/100) = -16.9 \text{ dB}$

Test Personnel:

Dan Baltzell		May 11, 2016
EMC Test Engineer	Signature	Date of Test

4 20 dB Bandwidth – FCC 15.231(c); RSS-Gen

A delta marker was used to determine the 20 dB bandwidth from the peak of the modulated emission.

Table 4-1: Bandwidth Test Equipment

RTL Bar Code	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18

Plot 4-1: 20 dB Bandwidth

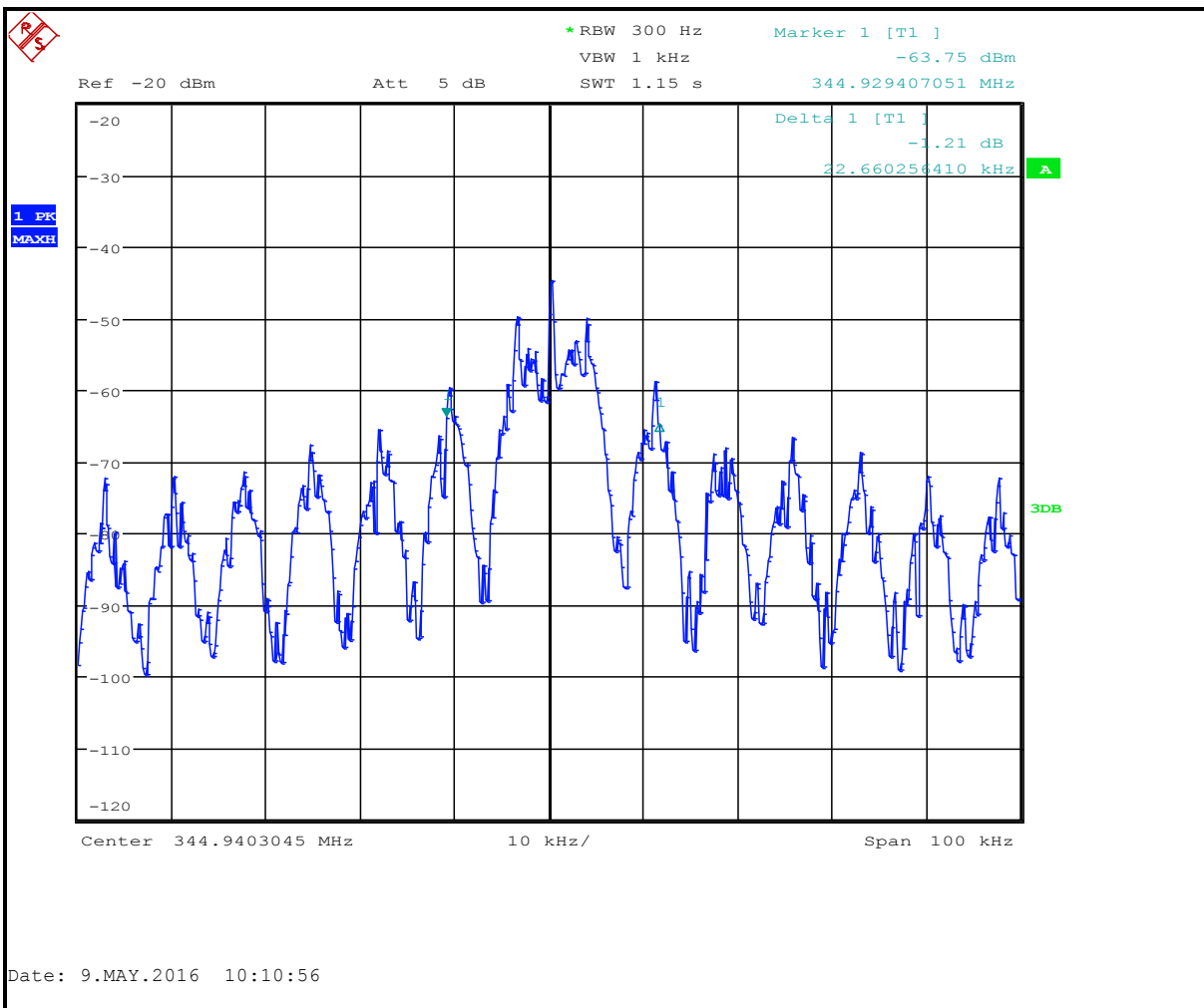



Table 4-2: Bandwidth Results

Fundamental Frequency (MHz)	20 dB Bandwidth Measured (kHz)	Limit (0.25% of CF) (kHz)	Pass/Fail
344.94	22.7	862.4	Pass

Limit 15.231(c): The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Personnel:

Dan Baltzell		May 9, 2016
EMC Test Engineer	Signature	Date of Test

5 Radiated Emissions – FCC 15.209; IC RSS-210; RSS-Gen

5.1 Limits of Radiated Emissions Measurement

The data and limits presented in this report are for radiated emissions per 15.231(b)(2) which references 15.35(b), and peak limiting for restricted bands per 15.209(e), which again references 15.35(b)(2). Data (if any) is also presented for spurious, non-harmonic radiated emissions per 15.209.

5.2 Radiated Emissions Measurement Test Procedure

Procedure: C63.10-2013 6.5, 6.6

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at a one meter distance. This was done in order to determine the emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Radiated fundamental and spurious emissions were tested at three meters. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10th harmonic of the highest fundamental transmitter frequency (344.94 MHz).

The EUT was tested in the three orthogonal planes with the receive antenna in both polarities. The emissions were maximized; that is, the measurement antenna height was varied between 1 and 4 m, and the EUT was rotated through 360° on a rotating turntable until the maximum emissions were found. Both horizontal and vertical measurement antenna polarizations were used. A resolution bandwidth of 100 kHz was used for frequencies less than 1000 MHz, and a resolution bandwidth of 1 MHz was used for frequencies greater than or equal to 1000 MHz. The video bandwidth was set to a value at least three times greater than the resolution bandwidth.

Table 5-1: Radiated Emissions Test Equipment

RTL Bar Code	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900913	Hewlett Packard	85462A	EMI Receiver RF Section (9 kHz – 6.5 GHz)	3325A00159	12/9/16
900914	Hewlett Packard	85460A	RF Filter Section (100 kHz - 6.5 GHz)	3330A00107	12/9/16
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18
900905	Rhein Tech Laboratories	PR-1040	Amplifier (30 - 2000 MHz)	N/A	9/10/16
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	4/20/17
900791	Chase	CBL6112	Antenna (30 MHz – 2 GHz)	2099	6/11/17
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	9/4/16

5.3 Radiated Emissions Test Results

5.3.1 Radiated Emissions Harmonics/Spurious

Table 5-2: Radiated Emissions Harmonics/Spurious - Peak

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail
344.940	59.5	16.0	75.5	97.3	-21.8	Pass
689.880	21.7	21.1	42.8	77.3	-34.5	Pass
1034.820	25.4	24.5	49.9	74.0	-24.1	Pass
1379.760	26.8	28.1	54.9	74.0	-19.1	Pass
1724.700	37.8	30.9	68.7	77.3	-8.6	Pass
2069.640	46.6	24.8	71.4	77.3	-5.9	Pass
2414.580	46.2	25.4	71.6	77.3	-5.7	Pass
2759.520	43.4	25.9	69.3	74.0	-4.7	Pass
3104.460	42.0	26.6	68.6	77.3	-8.7	Pass
3449.400	34.1	27.2	61.3	77.3	-16.0	Pass


Table 5-3: Radiated Emissions Harmonics/Spurious – Average (Calculated)

Emission Frequency (MHz)	Peak Less Duty Cycle (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail
344.940	42.6	16.0	58.6	77.3	-18.7	Pass
689.880	4.8	21.1	25.9	57.3	-31.4	Pass
1034.820	8.5	24.5	33.0	54.0	-21.0	Pass
1379.760	9.9	28.1	38.0	54.0	-16.0	Pass
1724.700	20.9	30.9	51.8	57.3	-5.5	Pass
2069.640	29.7	24.8	54.5	57.3	-2.8	Pass
2414.580	29.3	25.4	54.7	57.3	-2.6	Pass
2759.520	26.5	25.9	52.4	54.0	-1.6	Pass
3104.460	25.1	26.6	51.7	57.3	-5.6	Pass
3449.400	17.2	27.2	44.4	57.3	-12.9	Pass

Table 5-4: Unintentional Radiated Emissions

Emission Frequency (MHZ)	Ant. Pol (H/V)	Emission Level (dBuV)	Site Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
113.184	H	32.0	-19.6	12.4	43.5	-31.1
113.184	V	35.9	-19.6	16.3	43.5	-27.2
140.047	H	33.5	-19.9	13.6	43.5	-29.9
140.047	V	37.6	-19.9	17.7	43.5	-25.8
161.691	H	32.4	-20.3	12.1	43.5	-31.4
161.691	V	39.6	-20.3	19.3	43.5	-24.2
183.249	H	32.7	-21.0	11.7	43.5	-31.8
183.249	V	39.4	-21.0	18.4	43.5	-25.1
194.030	H	33.3	-20.7	12.6	43.5	-30.9
194.030	V	35.0	-20.7	14.3	43.5	-29.2
204.809	H	33.1	-20.5	12.6	43.5	-30.9
204.809	V	32.9	-20.5	12.4	43.5	-31.1

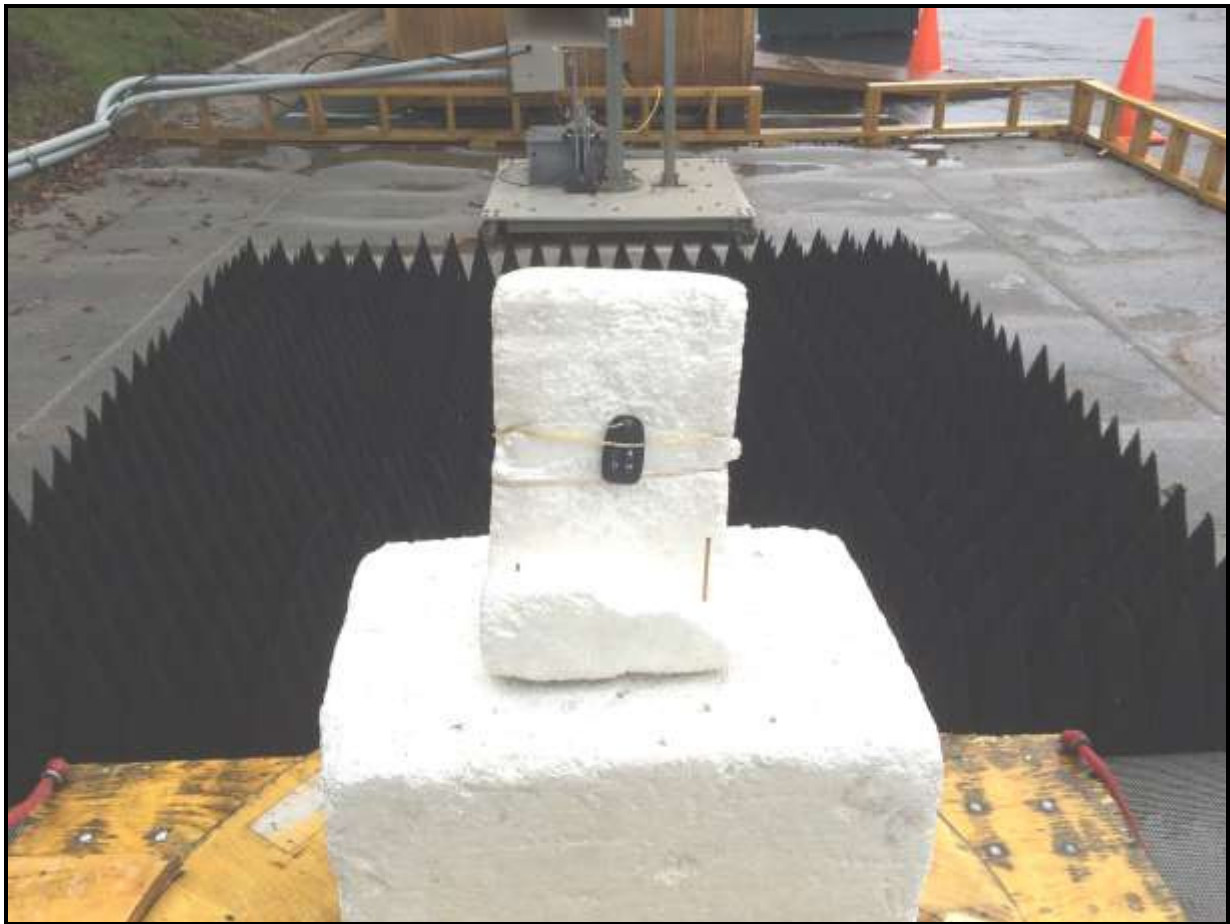
Test Personnel:

Dan Baltzell		May 9, 2016
EMC Test Engineer	Signature	Date of Test

6 Conclusion

The data in this measurement report shows that the Honeywell International Model 582T, FCC ID: CFS8DL582, IC: 573F-582, complies with the applicable intentional radiated emissions requirements of Parts 2 and 15 of the FCC rules and regulations and RSS-210 of the Industry Canada rules and regulations.

Appendix A: Test Photographs



Photograph 1: Radiated Emissions



Photograph 2: Radiated Emissions

Appendix B: EUT Photograph



Photograph 3: 582T