



EMC TEST REPORT

Applicant Ademco Inc.
FCC ID HS9-C7189W00
Product C7189WS1000
Model C7189WS1000
Marketing C7189WS1000,MSENSOR,
Smart Room Sensor
Report No. R1911A0662-E1V2
Issue Date July 21, 2020

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B (2019)/ ANSI C63.4 (2014)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

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Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	FCC Part15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	FCC Part15.107, ANSI C63.4-2014	NA
Test Date: January 13, 2020 ~ February 28, 2020			
Note: NA=Not Applicable This device can only be powered by batteries, so test items are not applicable. Note: All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

Note: This revised report (Report No.: R1911A0662-E1V2) supersedes and replaces the previously issued report (Report No.: R1911A0662-E1V1). Please discard or destroy the previously issued report and dispose of it accordingly.

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
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E-mail: fanguangchang@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Client Information

Applicant	Ademco Inc.
Applicant address	1985 Douglas Drive, Golden, Minnesota, United States
Manufacturer	Ademco Inc.
Manufacturer address	1985 Douglas Drive, Golden, Minnesota, United States

2.2 General information

EUT Description			
Device Type:	Movable device		
Model:	C7189WS1000		
SN:	1#		
HW Version:	R32346043-001		
SW Version:	V0.0.18.0		
Antenna Type:	Internal Antenna		
Frequency:	Band	Tx (MHz)	Rx (MHz)
	Bluetooth:	2402 ~ 2480	2402 ~ 2480
	Zigbee	2405 ~ 2480	2405 ~ 2480
Modulation:	Bluetooth v5.0 LE: GFSK Zigbee: O-QPSK		
Note: The information of the EUT is declared by the manufacturer.			



2.3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC Code CFR47 Part15B (2019)

ANSI C63.4 (2014)

2.4 Test Mode

Test Mode	
Mode 1	EUT + Bluetooth RX
Mode 2	EUT + Zigbee RX

During the test, the preliminary test was performed in all modes, mode 2 selected as the worst condition. The test data of the worst-case condition was recorded in this report.

3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
24°C~26°C	45%~50%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.

Set the spectrum analyzer in the following:

Below 1GHz:

RBW=100 kHz / VBW=300 kHz / Sweep=AUTO

Above 1GHz:

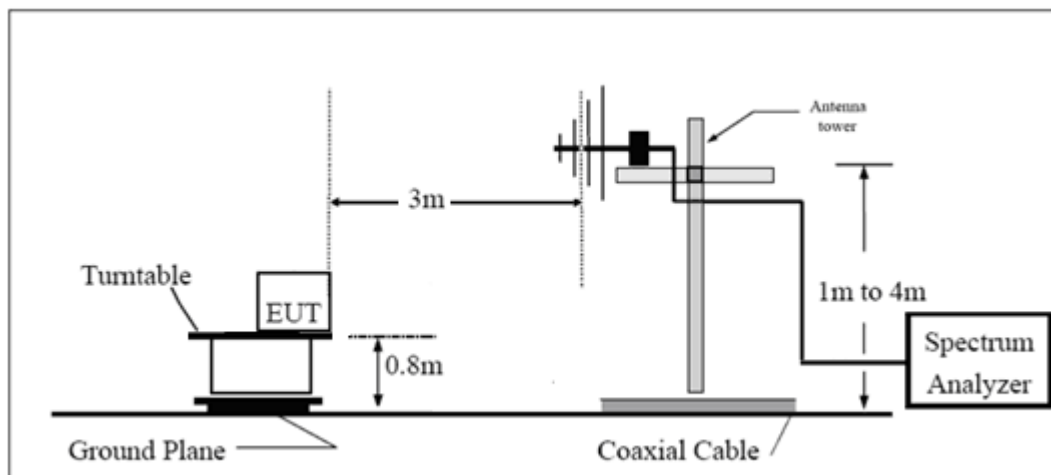
(a) PEAK detector: RBW=1MHz / VBW=3MHz/ Sweep=AUTO

(b) AVERAGE detector: RBW=1MHz / VBW=3MHz / Sweep=AUTO

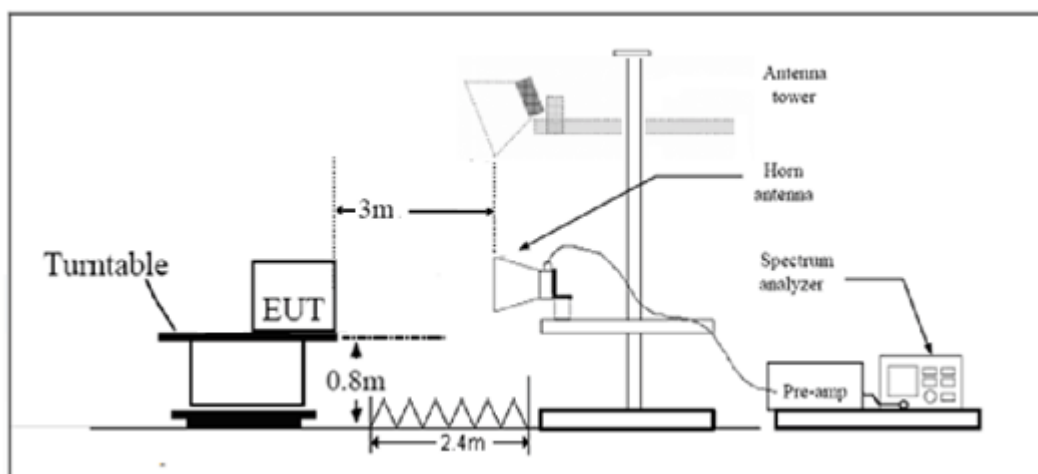
The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

Test Setup

Below 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Antenna Tower meets ANSI C63.4 requirements for measurements above 1 GHz by keeping the antenna aimed at the EUT during the antenna's ascent/ descent along the antenna mast.

Limits

Frequency (MHz)	Field Strength (dB μ V/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5 th harmonic of the highest frequency or 40GHz, which is lower	54 74	Average Peak

Measurement Uncertainty

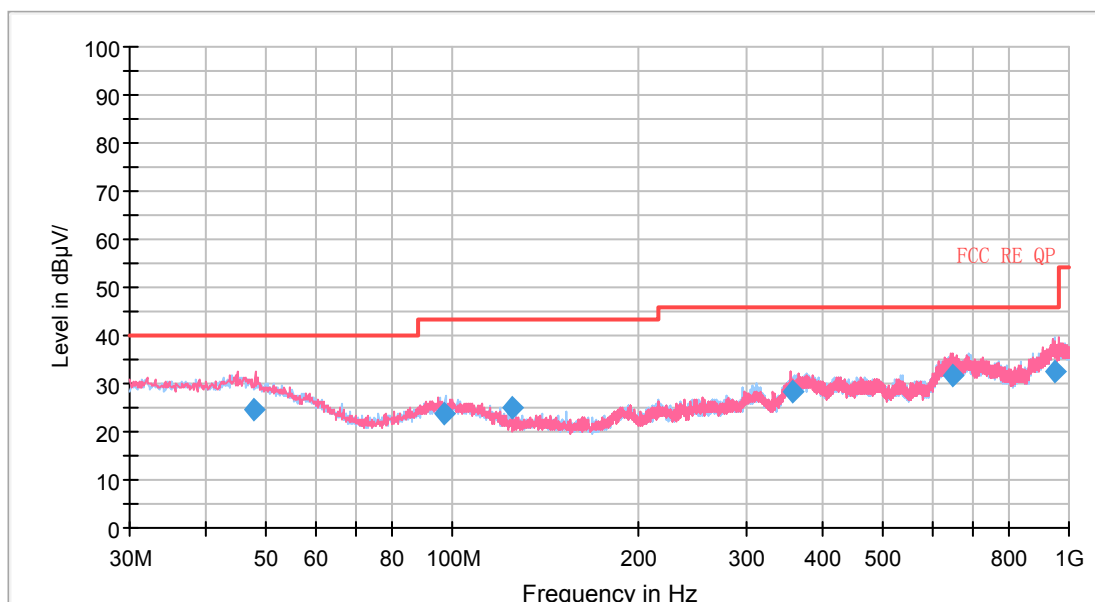
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
30MHz~200MHz	4.02 dB
200MHz~1000MHz	3.28 dB
1GHz~18GHz	3.70 dB
18GHz~26.5GHz	5.78 dB

Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier, the Emissions in the frequency band 18GHz- 26.5GHz is more than 20dB below the limit are not reported.

The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

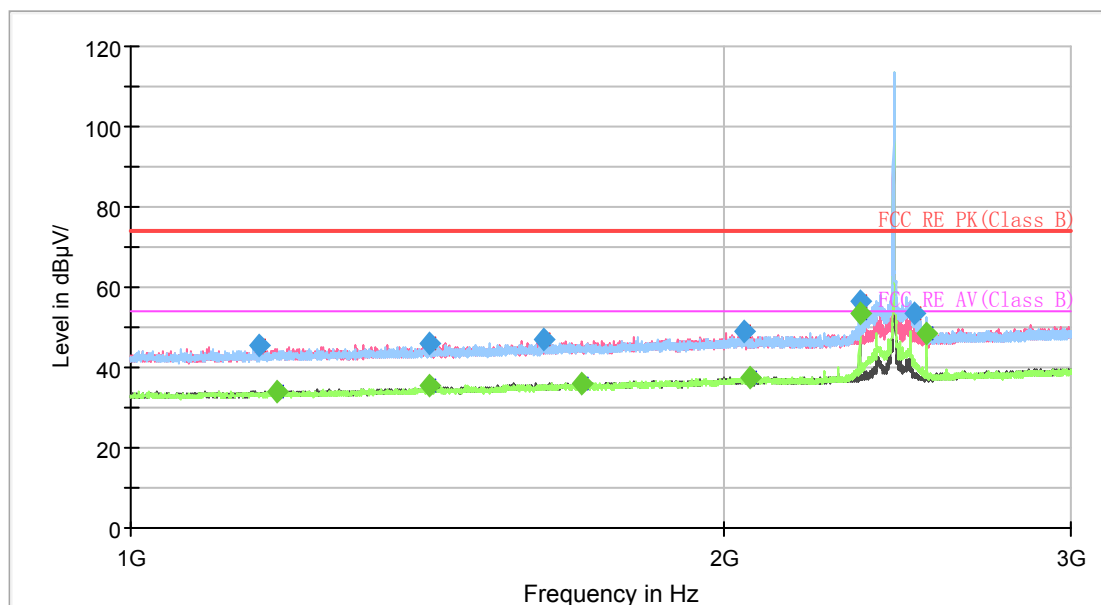


Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
47.865138	24.76	122.0	V	234.0	2.2	15.24	40.00
97.291463	23.79	109.0	H	313.0	-3.2	19.71	43.50
125.026403	25.18	125.0	V	310.0	-6.9	18.32	43.50
355.097750	28.38	198.0	V	228.0	1.0	17.62	46.00
647.137000	31.50	209.0	V	52.0	5.7	14.50	46.00
948.233500	32.40	100.0	H	300.0	8.9	13.60	46.00

Remark: 1. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

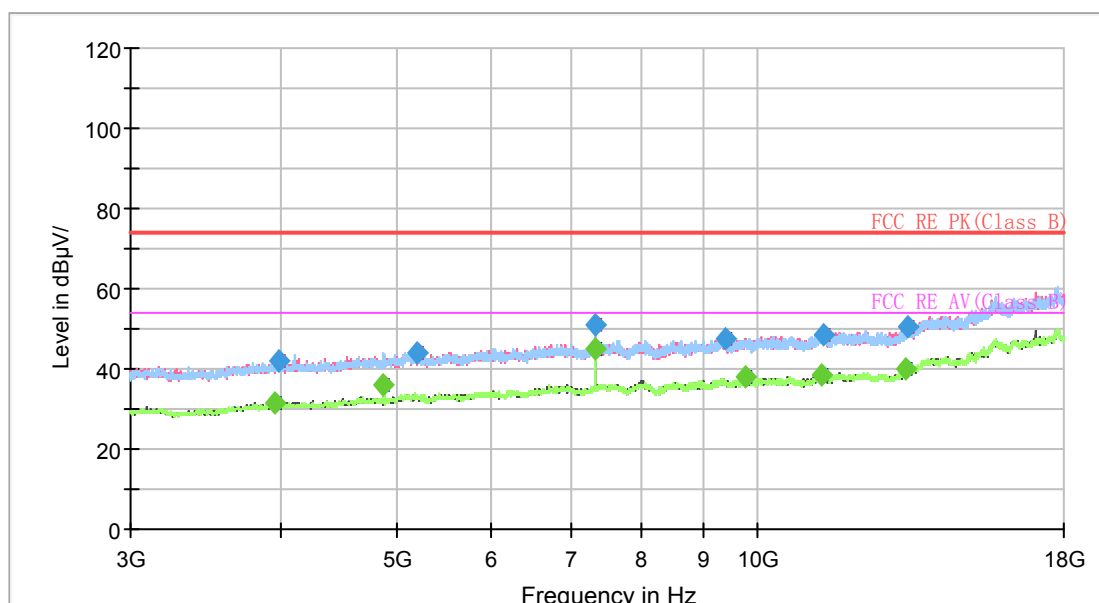
2. Margin = Limit – Quasi-Peak



Note: The signal beyond the limit is carrier.

Radiated Emission from 1GHz to 3GHz

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1162.250000	45.37	---	74.00	28.63	100.0	V	276.0	0.0
1186.250000	---	34.17	54.00	19.83	100.0	V	286.0	0.1
1418.250000	46.01	---	74.00	27.99	100.0	V	338.0	1.1
1418.750000	---	35.44	54.00	18.56	100.0	V	293.0	1.1
1622.000000	46.80	---	74.00	27.20	200.0	H	0.0	2.0
1694.000000	---	36.21	54.00	17.79	200.0	V	35.0	2.4
2049.500000	49.09	---	74.00	24.91	100.0	V	71.0	4.0
2063.000000	---	37.66	54.00	16.34	200.0	H	169.0	4.0
2343.750000	56.40	---	74.00	17.60	100.0	H	277.0	5.1
2344.000000	---	53.33	54.00	0.67	100.0	H	274.0	5.1
2500.000000	53.32	---	74.00	20.68	100.0	H	15.0	5.6
2536.000000	---	48.38	54.00	5.62	100.0	H	277.0	5.5



Radiated Emission from 3GHz to18GHz

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3960.000000	---	31.49	54.00	22.51	200.0	H	300.0	0.6
3990.000000	41.80	---	74.00	32.20	200.0	H	0.0	0.7
4878.750000	---	35.87	54.00	18.13	100.0	H	83.0	2.6
5190.000000	44.16	---	74.00	29.84	200.0	V	347.0	3.6
7318.125000	51.08	---	74.00	22.92	100.0	H	9.0	7.0
7320.000000	---	44.82	54.00	9.18	100.0	H	18.0	7.0
9384.375000	47.61	---	74.00	26.39	100.0	V	289.0	9.5
9759.375000	---	38.21	54.00	15.79	200.0	V	151.0	9.8
11306.250000	---	38.39	54.00	15.61	100.0	V	50.0	10.8
11328.750000	48.51	---	74.00	25.49	100.0	V	293.0	10.8
13299.375000	---	40.22	54.00	13.78	200.0	H	211.0	11.9
13342.500000	50.63	---	74.00	23.37	100.0	H	306.0	12.2

4 Main Test Instrument

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Time
Spectrum Analyzer	R&S	FSV40	15195-01-00	2019-05-19	2020-05-18
EMI Test Receiver	R&S	ESCI	100948	2019-05-19	2020-05-18
Trilog Antenna	SCHWARZBECK	VULB 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Standard Gain Horn	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
EMI Test Receiver	R&S	ESR	101667	2019-05-19	2020-05-18
LISN	R&S	ENV216	101171	2018-12-15	2021-12-14
Bore Sight Antenna mast	ETS	2171B	00058752	/	/
Test software	EMC32	R&S	9.26.0	/	/

*****END OF REPORT *****