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Ademco Inc. MPE REPORT

SCOPE OF WORK
MPE CALCULATION
ON THE SIXCOVA

REPORT NUMBER
105143098LEX-001b

ISSUE DATE
2/27/2024

PAGES
13

DOCUMENT CONTROL NUMBER
Non-Specific EMC Report Shell Rev. December 2017
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MPE TEST REPORT

Report Number: 105143098LEX-001b

Project Number: G105143098

Report Issue Date: 2/27/2024

Product Name: SIXCOVA

Standards: FCC Part 1.1310 Limits for Maximum
Permissible Exposure (MPE)

RSS-102 Issue 6 RF Field Strength Limits for
Devices Used by the General Public

Tested by:
Intertek Testing Services NA, Inc.
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Client:
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1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
10	FCC Part 1.1310 Limits for Maximum Permissible Exposure (MPE) (Limits for General Population / Uncontrolled Exposure)	Pass
	RSS-102 Issue 6 RF Field Strength Limits (For Devices Used by the General Public)	Pass



3 Client Information

This product was tested at the request of the following:

Client Information	
Client Name:	Ademco Inc.
Address:	2 Corporate Center Dr. Suite 100 Melville, NY 11747 USA
Contact:	Christian Fouth
Telephone:	+1 (516) 577-2312
Email:	christian.fouth@resideo.com
Manufacturer Information	
Manufacturer Name:	Ademco Inc.
Manufacturer Address:	2 Corporate Center Dr. Suite 100 Melville, NY 11747 USA



4 Description of Equipment under Test and Variant Models

Equipment Under Test	
Product Name	Smoke / CO Detector
Model Numbers	SIXCOVA
Rated Voltage	3V Battery
Wireless Technology	IEEE 802.15.4
Test Channel(s)	Channel 11 – 2405 MHz Channel 19 – 2445 MHz Channel 25 – 2475 MHz
Antenna Gain¹	Antenna 1: 1.49dBi (2405MHz), 1.14dBi (2440MHz), 1.39dBi (2475MHz) Antenna 2: 1.77dBi (2405MHz), 1.59dBi (2440MHz), 1.92dBi (2475MHz)
Output Power	Antenna 1: 18.99dBm (2405MHz), 19.40dBm (2445MHz), 19.64dBm (2475MHz) Antenna 2: 19.10dBm (2405MHz), 19.38dBm (2445MHz), 19.53dBm (2475MHz)
Description of Equipment Under Test (provided by client)	
The Smoke / CO Detector is a battery powered device with wireless (RF6) connectivity to home security panels.	

4.1 Variant Models:

The following variant models were not tested as part of this evaluation but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

- PROSIXCOV – Declared by the manufacturer to be electrically identical as the model tested.

¹ The antenna gain was taken from the Antenna Gain and Pattern Measurement Report issued Feb 21st, 2024 by Resideo Technologies Inc. Deviations may affect compliance. Intertek does not make any claims of compliance for values other than those shown.



5 Output Power

The output power was taken from Intertek report 105143098LEX-001.3 issued 2/22/2024.

Antenna	Frequency (MHz)	Conducted Output Power (dBm)
1	2405	18.99
	2445	19.40
	2475	19.64
2	2405	19.10
	2445	19.38
	2475	19.53



6 Antenna Gain

The antenna gain was taken from the Antenna Gain and Pattern Measurement Report issued Feb 21st, 2024 by Resideo Technologies Inc. Deviations may affect compliance. Intertek does not make any claims of compliance for values other than those shown.

SIXCOVA PCB Antenna1	Frequency		
	2405 MHz	2440 MHz	2475 MHz
TRP (dBm)	-4.69	-5.02	-5.04
EIRP (dBm)	1.49	1.14	1.39
Efficiency (dB)	-4.69	-5.02	-5.04
Efficiency (%)	34	31.5	31.32
Gain (dBi)	1.49	1.14	1.39

SIXCOVA PCB Antenna2	Frequency		
	2405 MHz	2440 MHz	2475 MHz
TRP (dBm)	-4.08	-3.75	-3.36
EIRP (dBm)	1.77	1.59	1.92
Efficiency (dB)	-4.08	-3.75	-3.36
Efficiency (%)	39.12	42.14	46.16
Gain (dBi)	1.77	1.59	1.92

**7 FCC Limits**

§ 1.1310: The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Part 1.1310 Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.



8 RSS-102 Issue 6 Exposure Limits:

Table 7: RF field strength and power density limits for devices used by the general public (uncontrolled environment)

Frequency range (MHz)	Electric field (V_{RMS}/m)	Magnetic field (A_{RMS}/m)	Power density (W/m^2)	Reference period (minutes)
10-20	27.46	0.0728	2	6
20-48	$58.07 / f^{0.25}$	$0.1540 / f^{0.25}$	$8.944 / f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000 / f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000 / f^{1.2}$

Note: f is frequency in MHz.



9 Test Procedure

An MPE evaluation for was performed in order to show that the device was compliant with the general population exposure limits from FCC §2.1091 and RSS-102 Issue 6. The maximum power density was calculated for each transmitter band at a separation distance of 20cm using the maximum declared output power including tune up tolerance.

For each transmitter the maximum RF exposure at a 20 cm distance using the formula:

$$\text{ConductedPower}_{mW} = 10^{\text{ConductedBwer}(dBm)/10}$$

$$\text{PowerDensity} = \frac{\text{ConductedPower}_{mW} \times \text{Ant.Gain}}{4\pi \times (20_{cm})^2}$$

**10 Results:**

The calculated maximum power density at 20cm distance was equal to or less than the required limits for general population exposure for FCC Part 1.1310 and RSS-102 Issue 6.

FCC MPE Data

Antenna	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	MPE Value @ 20cm (mW/cm ²)	MPE Limit (mW/cm ²)
1	11	2405	18.99	1.49	0.0222	1.0
	19	2445	19.40	1.18 ⁽²⁾	0.0227	1.0
	26	2475	19.64	1.39	0.0252	1.0
2	11	2405	19.10	1.77	0.0243	1.0
	19	2445	19.38	1.64 ⁽²⁾	0.0252	1.0
	26	2475	19.53	1.92	0.0278	1.0

RSS-102 Issue 6 MPE Data

Antenna	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	MPE Value @ 20cm (W/m ²)	MPE Limit (W/m ²)
1	11	2405	18.99	1.49	0.222	5.36
	19	2445	19.40	1.18 ⁽²⁾	0.227	5.42
	26	2475	19.64	1.39	0.252	5.46
2	11	2405	19.10	1.77	0.243	5.36
	19	2445	19.38	1.64 ⁽²⁾	0.252	5.42
	26	2475	19.53	1.92	0.278	5.46

² Values of antenna gain are linearly interpolated between measured points



11 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	2/27/2024	105143098LEX-001b	BZ	MC	Original Issue