RF EXPOSURE

Equipment Interface Module

FCC ID: HS9-EIM4010R01
IC: 573R-EIM4010R01

FCC 47 CFR Part 2.1091
ISED RSS-102 Issue 6
902 – 928 MHz FHSS Transceiver
Rev 1.0, Issue Date: 2025-11-14

Prepared by and for:

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REVISON HISTORY

Revision Number	Prepared by	Reviewed by	Revisions Detail	Release Date
1.0	Sean Sellergren	Christian Fouth	Added Ademco Inc to title page as part of Resideo's Canada certification identity	2025-11-14

General Information:

Applicant:	Resideo LLC
Device Category:	Mobile
Environment:	General Population/Uncontrolled Exposure

Technical Information (900 MHz Transceiver):

FCC ID: HS9-EIM4010R01
IC: 573R-EIM4010R01

Antenna Type:	¼ Wave Helical (External Antenna)
Antenna Gain:	1.73 dBi
Conducted Output Power:	10.99dBm
Exposure Conditions:	20cm

Antenna Type:	PCB – Side Antenna
Antenna Gain:	0.8 dBi
Conducted Output Power:	10.77dBm
Exposure Conditions:	20cm

Antenna Type:	PCB – Top Antenna
Antenna Gain:	0.71 dBi
Conducted Output Power:	11.34dBm
Exposure Conditions:	20cm

FCC 2.1091

The device meets the FCC determination of exemption for routine evaluation per the guidelines of Part 1.1307(b)(3)(i)(C) and using the EIP threshold shown in Table 1 of that section.

ERP (dBW) = ((output power (dBm) -30) + antenna gain(dBi)) - 2.15

ERP (W) = 10^(ERP(dBW)/10)

Time Averaged ERP (W) = ERP(W) * duty cycle

*Note: Duty cycle = duty cycle used during the measurement of conducted output power and assumed to be 100% unless otherwise noted in applicable test report

TABLE 1 TO § 1.1307(b)(3)(i)(C)—SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2 f.
1,500-100,000	19.2R^2.

FCC 2.1091 MPE Routine Evaluation Exemption Calculations:

Technical Parameters	External Antenna	Side Antenna	Top Antenna
Tx Freq (MHz)	903	903	903
λ / 2π (m)	0.053	0.053	0.053
R≥ λ / 2π	YES	YES	YES
Maximum (Source-Based) Time-Averaged ERP (W)	0.0114	0.0088	0.0098
ERP Threshold (W)	0.4623	0.4623	0.4623
Exemption	**YES**	**YES**	**YES**
Contribution Ratio (ERP / ERP_{th})	0.025	0.019	0.021

MPE Power Density Per Section 1.1310

The Power Density (mW/cm^2) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = power density (in appropriate units, e.g. mW/cm2)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

TABLE 1 TO § 1.1310(E)(1)—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)
(i) LIMITS FOR OCCUPATIONAL/CONTROLLED EXPOSURE				
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
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) 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
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

*f = frequency in MHz. * = Plane-wave equivalent power density.*

Above Table is from FCC 47 CFR Part 1.1310

MPE Power Density Calculation – External Antenna

Transmit Frequency (MHz)	Radio Power (dBm)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	Distance (cm)	Power Density (mW/cm^2)	Power Density Limit (mW/cm^2)	Results
903	10.99	12.56	1.73	1.49	20	0.0037	0.602	Pass

MPE Power Density Calculation – Side Antenna

Transmit Frequency (MHz)	Radio Power (dBm)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	Distance (cm)	Power Density (mW/cm^2)	Power Density Limit (mW/cm^2)	Results
903	10.77	11.94	0.8	1.202	20	0.0028	0.602	Pass

MPE Power Density Calculation – Top Antenna

Transmit Frequency (MHz)	Radio Power (dBm)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	Distance (cm)	Power Density (mW/cm^2)	Power Density Limit (mW/cm^2)	Results
903	11.34	13.61	0.71	1.178	20	0.0032	0.602	Pass

RSS-102

The device meets the exemption for field reference level evaluation per the guidelines of RSS-102 Issue 6 Section 6.6.

6.6 Field reference level exposure exemption limits

Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 1 W (adjusted for tune-up tolerance)
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $4.49/f^{0.5} W$ (adjusted for tune-up tolerance), where f is in MHz
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance)
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} W$ (adjusted for tune-up tolerance), where f is in MHz
- at or above 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 5 W (adjusted for tune-up tolerance)

EIRP (dBW) = ((output power (dBm) -30)) + antenna gain(dBi)

EIRP (W) = 10^(EIRP(dBW)/10)

Time Averaged EIRP (W) = EIRP(W) * duty cycle

*Note: Duty cycle = duty cycle used during the measurement of conducted output power and assumed to be 100% unless otherwise noted in applicable test report

RSS-102 Section 6.6 Field Reference Level Exemption Calculations:

Technical Parameters	External Antenna	Side Antenna	Top Antenna
Tx Freq (MHz)	903	903	903
Conducted Output Power (dBm)	10.99	10.77	11.34
Antenna Gain (dBi)	1.73	0.8	0.71
EIRP (dBm)	12.72	11.57	12.05
EIRP (W)	0.019	0.014	0.016
Time Averaged EIRP (W)	0.019	0.014	0.016
Time Averaged EIRP Threshold (W)	1.37	1.37	1.37
Exemption	**Yes**	**Yes**	**Yes**

.

Power Density Per Section 5.3.2

The Power Density (W/m^2) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = power density (in appropriate units, e.g. W/cm2)
P = power input to the antenna (in appropriate units, e.g., W)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm, m)

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	$0.158 f^{0.5}$	$4.21\times10^{-4} f^{0.5}$	$6.67\times10^{-5} f$	$616000 / f^{1.2}$

Note: f is frequency in MHz.

Above Table is from RSS-102 Issue 6

Power Density Calculation – External Antenna

Transmit Frequency (MHz)	Radio Power (dBm)	Radio Power (W)	Antenna Gain (dBi)	Antenna Gain (Linear)	Distance (m)	Power Density (W/m^2)	Power Density Limit (W/m^2)	Results
903	10.99	0.0126	1.73	1.49	20	0.037	2.74	Pass

MPE Power Density Calculation – Side Antenna

Transmit Frequency (MHz)	Radio Power (dBm)	Radio Power (W)	Antenna Gain (dBi)	Antenna Gain (Linear)	Distance (m)	Power Density (W/m^2)	Power Density Limit (W/m^2)	Results
903	10.77	0.0119	0.8	1.202	0.2	0.028	2.74	Pass

MPE Power Density Calculation – Top Antenna

Transmit Frequency (MHz)	Radio Power (dBm)	Radio Power (W)	Antenna Gain (dBi)	Antenna Gain (Linear)	Distance (m)	Power Density (W/m^2)	Power Density Limit (W/m^2)	Results
903	11.34	0.0136	0.71	1.178	0.20	0.032	2.74	Pass