MOTOROLA SOLUTIONS

COMPUTATIONAL EME COMPLIANCE ASSESSMENT OF THE APX SERIES MODEL M25SSS9PW1BN (PMUE5756A) MOBILE RADIO AND COMPANION DEVICE, DIGITAL VEHICULAR REPEATER (DVR VHF), MOBEXCOM DVRS VHF (DQPMDVR3000P)

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Introduction

This report summarizes the computational [numerical modeling] analysis performed to document compliance of the APX Series Model #M25SSS9PW1BN (PMUE5756A) Mobile Radio interfaced with, and transmitting simultaneously with companion device, DVR VHF, model # MOBEXCOM DVRS VHF (DQPMDVR3000P) and vehicle-mounted antennas with the US Federal Communications Commission (FCC) and Innovation, Science and Economic Development (ISED) Canada guidelines for human exposure to radio frequency (RF) emissions. The devices operate in the following frequency bands:

Regions	Device	Bands	Frequency Band (MHz)
FCC US	Mobile APX 6500	UHF R2	450-512
	DVR	VHF	150.8-173.4
ISED Canada	Mobile APX 6500	UHF R2	450-470
	DVR	VHF	138-174

This computational analysis supplements the measurements conducted to evaluate the compliance of the exposure from this mobile radio and companion device, DVR VHF, with respect to applicable *reference levels*, which in the following will be referred to as *maximum*

permissible exposure (MPE) limits.[1]. A total of 49 test conditions that did not conform with FCC MPE limit and 147 test conditions did not conform with ISED MPE limit were considered to determine whether those conditions complied with the *specific absorption rate* (SAR) limits for general public exposure (1.6 W/kg averaged over 1 gram of tissue and 0.08 W/kg averaged over the whole body) set forth in FCC guidelines [2] and Health Canada guidelines [1].

Employing SAR simulation reduction considerations[2], a total 16 configurations (requiring a total of 32 numerical simulations) have been performed, all of them addressing the exposure of the back seat passenger to the DVR VHF repeater featuring trunk-mount antennas and the APX 6500 UHF R2 mobile radio featuring roof-mount antennas.

For all simulations a commercial code (XFDTD™ v7.6.0, by Remcom Inc, State College, PA, USA) based on the Finite-Difference-Time-Domain (FDTD) methodology was employed to carry out the computational analysis. It is well established and recognized within the scientific community that SAR represents the basic restriction for RF energy exposure up to 6 GHz and that MPE limits are in fact derived from SAR limits. Accordingly, the SAR computations provide a scientifically valid and more relevant estimate of RF energy exposures.

Method

The XFDTD™ v7.6.0 computational suite enable simulating the heterogeneous full human body model defined according to the IEC/IEEE 62704-2:2017 standard and derived from the so-called Visible Human [3], discretized in 3 mm cubic-edge voxels. The IEC/IEEE 62704-2:2017 dielectric properties for 39 body tissues are automatically assigned by XFDTD™ at the specific simulation frequency. The "seated" man model representing the passenger was obtained from the standing model by modifying the articulation angles at the hips and the knees. Details of the computational method and model are provided in the Appendix A to this report. The evaluation of the computational uncertainties and results of the benchmark validations are provided in the Appendix B attached to this report. The related IEC/IEEE 62704-2:2017 standard numerical uncertainty budget for exposure simulations with vehicle mounted wire antennas operating in VHF and UHF band are summarized in the table on page 24 and 25 of Appendix B.

[1] This choice is made for process efficiency, since "MPE" is used in the United States. In this way, chances of making editorial mistakes that may then require extended interactions with the report examiner are reduced.
[2] SAR simulation reduction is described in the SAR Simulations Reduction Considerations section of this report.

The XFDTD code validation performed by Remcom Inc. according to the IEEE/IEC 62704-2:2017 standard requirements is also provided in conjunction with this report.

The car model has been imported into XFDTD™ from the CAD file of the sedan vehicle defined in the IEEE/IEC 62704-2:2017 standard, having dimensions 4.98 m (L) x 1.85 m (W) x 1.18 m (H), and discretized with the minimum resolution of 3 mm and the maximum resolution of 8 mm. Figure 1 below shows both the vehicle CAD model and a picture of the actual vehicle.

Figure 1: Picture of the vehicle and corresponding CAD model used in XFDTD™ simulations

For back seat passenger exposures, the mobile radio antenna position is on the roof and companion device, DVR UHF repeater antenna position is on the trunk. The distance of trunk mounted antenna from the passenger model head when the passenger model is located in the center of the back seat is set at 85 cm, replicating the experimental conditions used in MPE measurements. Figure 2 and Figure 3 shows the XFDTD™ computational models used for passenger exposure to trunk and roof mount antennas.

According to the IEC/IEEE 62704-2:2017 standard a lossy dielectric slab featuring 30 cm thickness, relative dielectric constant 8 and conductivity 0.01 S/m has been introduced in the computational model to properly account for the effect of the ground (pavement) on exposure.

The computational code employs a time-harmonic field excitation to produce a steady-state electromagnetic field in the exposed body model. Subsequently, the corresponding SAR distribution is automatically processed in order to determine the whole-body SAR and peak spatial average SAR distribution.

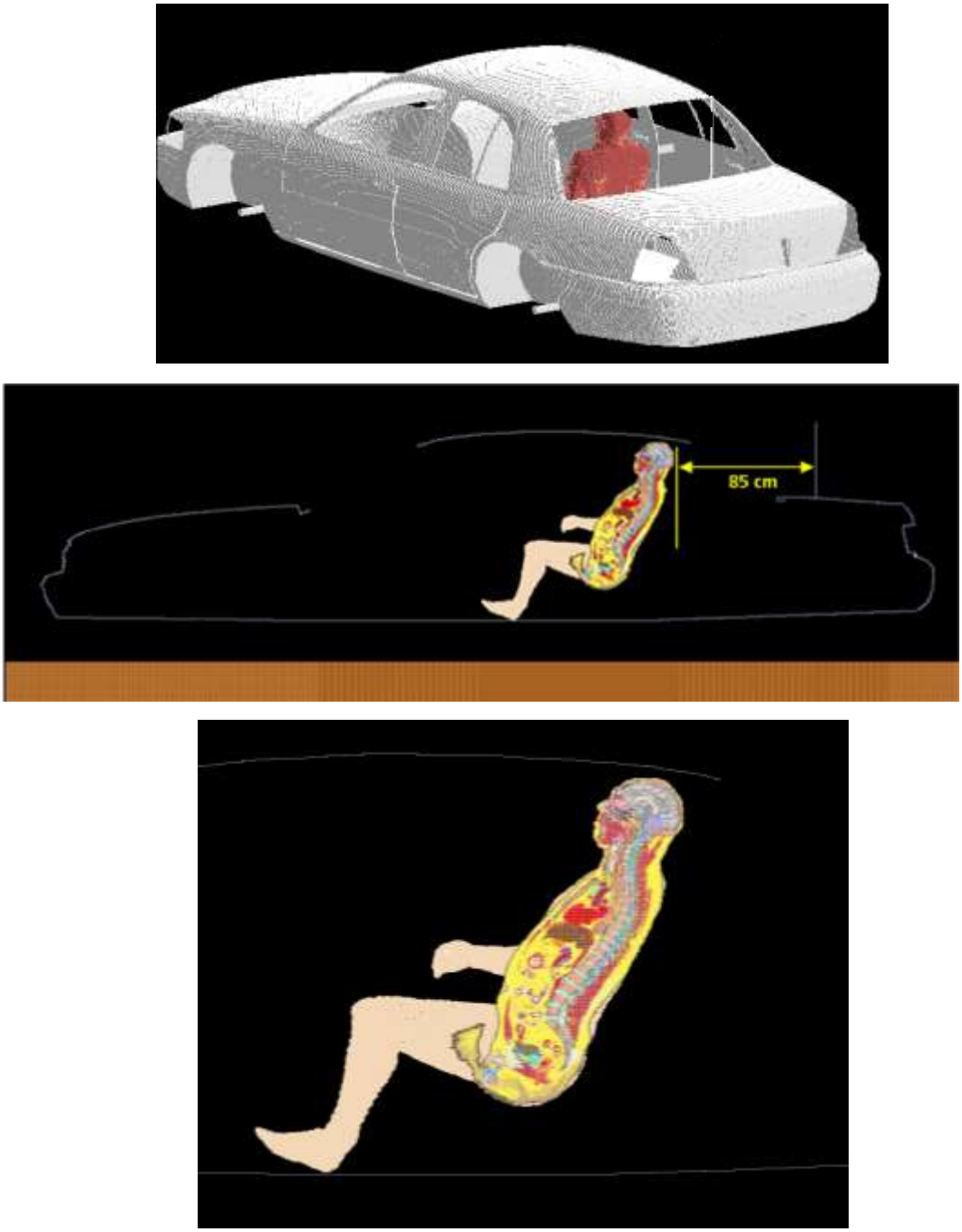


Figure 2: Passenger (back seat) model exposed to a trunk-mount antenna: XFDTD™ geometry. The antenna is installed at 85 cm from the passenger located in the center of the back seat.

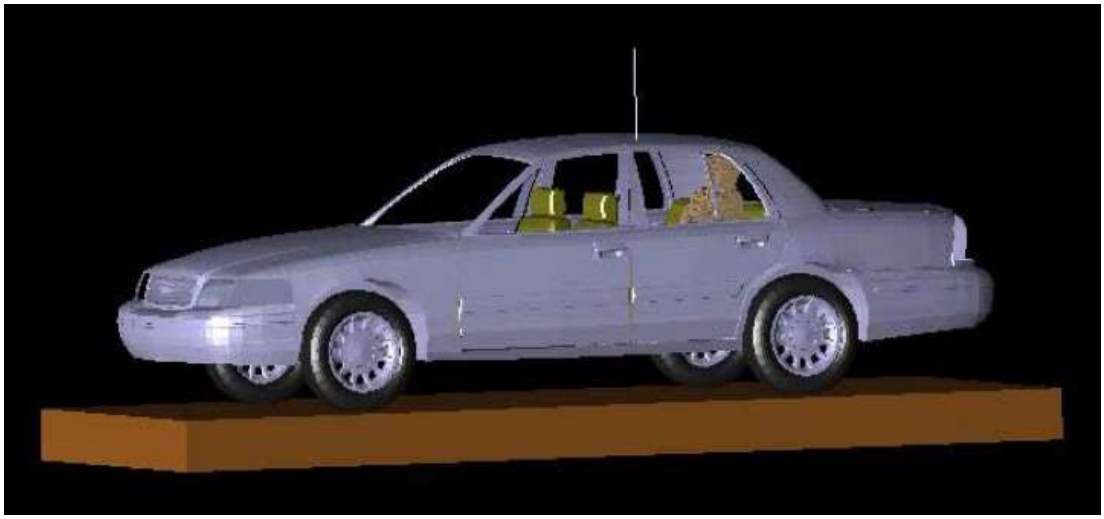


Figure 3: Passenger (back seat) model exposed to a roof-mount antenna: XFDTD™ geometry.

The maximum average output power from mobile radio antenna is 54W (450MHz-<485MHz) and 48w (485 MHz-< 512 MHz), while it is 6 W from the DVR VHF repeater antenna (138-174 MHz). Since the ohmic losses in the vehicle materials, as well as the mismatch losses at the antenna feed-point are neglected, while source-based time averaging (50% talk time for push-to-talk operation) for the APX 6500 mobile radio and (100% talk time) for DVR VHF were employed, all computational results are normalized to half of the APX 6500 mobile radio maximum average net output power, i.e., 27W (450MHz-<485MHz) & 24W (485-<512 MHz) and to full average net output power of the companion DVR VHF repeater, i.e., 6W (136-174 MHz); minus the corresponding minimum insertion loss in excess of 0.5 dB of the feed cables supplied with the antennas, in accordance with the IEC/IEEE 62704-2:2017 standard provisions.

Results of SAR computations for car passengers

The test conditions requiring SAR computations are summarized in Table 1 (APX 6500 UHF R2 mobile radio, 50% talk time) and Table 2 (DVR VHF, 100% talk time), together with the antenna data, the SAR results, and power density (P.D.) as obtained from the MPE measurements in the corresponding test conditions. The conditions are for antennas mounted on the center of the roof (APX 6500 UHF R2 mobile radio) and on the trunk (DVR VHF). The antenna length listed in the tables includes the height of the 1.8 cm magnetic mount base used in

MPE measurements to position the antenna on the vehicle. The same length was then used in the corresponding simulation model.

The passenger is located in the center or on the side of the rear seat corresponding to the respective configurations defined in the IEC/IEEE 62704-2-2017 standard.

All the transmit frequency, antenna length, and passenger location combinations reported in Tables 1 and 2 have been simulated individually. These tables also include the interpolated adjustment factor and corresponding scaled SAR values following the requirements of the IEC/IEEE 62704-2:2017 standard.

Table 1a: Computed and adjusted SAR results for back seat passenger exposure for APX 6500 UHF R2 mobile radio

(Configurations exceeding FCC MPE limits)

Mount Location	Antenna Kit#	Antenna Length (cm)	Freq (MHz)	P.D. (mW/cm^2)	Exposure Location	Computation SAR [W/kg]		Interpolated Adjustment Factors		Adjusted SAR Results [W/kg]	
						1-g	WB	1-g	WB	1-g	WB
Roof_Center	HAE4003A, 1/4 Wave, (450-470MHz)	17.8	450.0125	0.04	Back Center	0.03	0.002	2.60	1.80	0.08	0.004
					Back Side	0.07	0.002	1.70	2.90	0.11	0.006
Roof_Center	HAE4011A, 1/2 Wave, (450-470MHz)	73.2	469.9875	0.01	Back Center **Fig. 4 & 5**	0.08	0.003	2.61	1.85	**0.20**	0.005
					Back Side	0.07	0.003	1.69	2.85	0.12	0.007
Roof_Center	HAE6013A, 1/2 Wave, (380-470MHz)	30.8	450.0125	0.05	Back Center	0.04	0.002	2.60	1.80	0.10	0.004
					Back Side	0.08	0.003	1.70	2.90	0.14	0.007
Roof_Center	HAE6013A, 1/2 Wave, (380-470MHz)	30.8	460.0000	0.05	Back Center	0.07	0.003	2.60	1.83	0.19	0.005
					Back Side	0.09	0.003	1.70	2.88	0.15	**0.008**
Roof_Center	HAE6016A, 1/4 Wave, (450-512MHz)	10.1	482.5000	0.05	Back Center	0.07	0.002	2.61	1.88	0.19	0.004
					Back Side	0.08	0.003	1.69	2.83	0.13	0.008
Roof_Center	HAE6031A, 1/2 Wave, (380-512MHz)	29.8	469.9875	0.05	Back Center	0.05	0.002	2.61	1.85	0.13	0.004
					Back Side	0.05	0.002	1.69	2.85	0.08	0.007
Roof_Center	RAE4014ARB, 5/8 Wave, (445-470MHz)	94.5	450.0125	0.004	Back Center	0.02	0.001	2.60	1.80	0.06	0.002
					Back Side	0.03	0.001	1.70	2.90	0.05	0.003
Roof_Center	RAE4014ARB, 5/8 Wave, (445-470MHz)	92.3	460.0000	0.01	Back Center	0.02	0.001	2.60	1.83	0.06	0.002
					Back Side	0.03	0.001	1.70	2.88	0.04	0.003
Roof_Center	RAE4014ARB, 5/8 Wave, (445-470MHz)	90.8	469.9875	0.01	Back Center	0.02	0.001	2.61	1.85	0.06	0.001
					Back Side	0.02	0.001	1.69	2.85	0.03	0.002
Roof_Center	RAE4016ARB, 5/8 Wave, (494-512MHz)	87.5	494.9875	0.003	Back Center	0.03	0.001	2.61	1.92	0.09	0.001
					Back Side	0.03	0.001	1.69	2.80	0.06	0.002
Roof_Center	RAE4016ARB, 5/8 Wave, (494-512MHz)	85.4	503.0000	0.004	Back Center	0.02	0.001	2.62	1.94	0.05	0.001
					Back Side	0.02	0.001	1.68	2.78	0.04	0.002
Roof_Center	RAE4016ARB, 5/8 Wave, (494-512MHz)	85.1	511.9875	0.005	Back Center	0.01	0.001	2.62	1.96	0.04	0.002
					Back Side	0.05	0.001	1.68	2.76	0.08	0.002

Note:

Bold Blue – the highest adjusted SAR results for the respective frequency band.

Table 1b: Computed and adjusted SAR results for back seat passenger exposure for APX 6500 UHF R2 mobile radio

(Configurations exceeding ISED MPE limits)

Mount Location	Antenna Kit#	Antenna Length (cm)	Freq (MHz)	P.D. (mW/cm^2)	Exposure Location	Computation SAR [W/kg]		Interpolated Adjustment Factors		Adjusted SAR Results [W/kg]	
						1-g	WB	1-g	WB	1-g	WB
Roof_Center	HAE4003A, 1/4 Wave, (450-470MHz)	17.8	#450.0125	0.04	Back Center	0.03	0.002	2.60	1.80	0.08	0.004
					Back Side	0.07	0.002	1.70	2.90	0.11	0.006
Roof_Center	HAE4011A, 1/2 Wave, (450-470MHz)	73.2	#469.9875	0.01	Back Center Fig. 4 & 5	0.08	0.003	2.61	1.85	**0.20**	0.005
					Back Side	0.07	0.003	1.69	2.85	0.12	0.007
Roof_Center	HAE6013A, 1/2 Wave, (380-470MHz)	30.8	#450.0125	0.05	Back Center	0.04	0.002	2.60	1.80	0.10	0.004
					Back Side	0.08	0.003	1.70	2.90	0.14	0.007
Roof_Center	HAE6013A, 1/2 Wave, (380-470MHz)	30.8	#460.0000	0.05	Back Center	0.07	0.003	2.60	1.83	0.19	0.005
					Back Side	0.09	0.003	1.70	2.88	0.15	**0.008**
Roof_Center	HAE6016A, 1/4 Wave, (450-512MHz)	10.1	#482.5000	0.05	Back Center	0.07	0.002	2.61	1.88	0.19	0.004
					Back Side	0.08	0.003	1.69	2.83	0.13	0.008
Roof_Center	HAE6031A, 1/2 Wave, (380-512MHz)	29.8	#469.9875	0.05	Back Center	0.05	0.002	2.61	1.85	0.13	0.004
					Back Side	0.05	0.002	1.69	2.85	0.08	0.007
Roof_Center	RAE4014ARB, 5/8 Wave, (445-470MHz)	94.5	#450.0125	0.004	Back Center	0.02	0.001	2.60	1.80	0.06	0.002
					Back Side	0.03	0.001	1.70	2.90	0.05	0.003
Roof_Center	RAE4014ARB, 5/8 Wave, (445-470MHz)	92.3	#460.0000	0.01	Back Center	0.02	0.001	2.60	1.83	0.06	0.002
					Back Side	0.03	0.001	1.70	2.88	0.04	0.003
Roof_Center	RAE4014ARB, 5/8 Wave, (445-470MHz)	90.8	#469.9875	0.01	Back Center	0.02	0.001	2.61	1.85	0.06	0.001
					Back Side	0.02	0.001	1.69	2.85	0.03	0.002
Roof_Center	RAE4016ARB, 5/8 Wave, (494-512MHz)	87.5	#494.9875	0.003	Back Center	0.03	0.001	2.61	1.92	0.09	0.001
					Back Side	0.03	0.001	1.69	2.80	0.06	0.002
Roof_Center	RAE4016ARB, 5/8 Wave, (494-512MHz)	85.4	#503.0000	0.004	Back Center	0.02	0.001	2.62	1.94	0.05	0.001
					Back Side	0.02	0.001	1.68	2.78	0.04	0.002
Roof_Center	RAE4016ARB, 5/8 Wave, (494-512MHz)	85.1	#511.9875	0.005	Back Center	0.01	0.001	2.62	1.96	0.04	0.002
					Back Side	0.05	0.001	1.68	2.76	0.08	0.002

Note:
Bold Blue – the highest adjusted SAR results for the respective frequency band.
Note: # Same SAR simulation configuration as FCC US.

Table 2a: Computed and adjusted SAR results for back seat passenger exposure for DVR VHF

(Configurations exceeding FCC MPE limits)

Mount Location	Antenna Kit#	Antenna Length (cm)	Freq (MHz)	P.D. (mW/cm^2)	Exposure Location	Computation SAR [W/kg]			Interpolated Adjustment Factors			Adjusted SAR Results [W/kg]		
						1-g	10-g	WB	1-g	10-g	WB	1-g	10-g	WB
Trunk	HAD4008A, 1/4 Wave (150.8-162MHz)	47.3	162.0000	0.23	Back Center	0.16	0.10	0.007	1.92	2.02	2.42	0.31	0.20	0.018
					Back Side **Fig. 6 & 7**	0.16	0.14	0.006	4.11	4.32	2.98	**0.67**	0.61	0.019
Trunk	HAD4009A, 1/4 Wave (162-174MHz)	44.8	173.4000	0.19	Back Center	0.10	0.06	0.005	1.94	2.03	2.43	0.19	0.12	0.013
					Back Side	0.13	0.09	0.005	4.03	4.24	2.97	0.52	0.39	0.015

Note:
Bold Blue – the highest adjusted SAR results for the respective frequency band.

Table 2b: Computed and adjusted SAR results for back seat passenger exposure for DVR VHF

(Configurations exceeding ISED MPE limits)

Mount Location	Antenna Kit#	Antenna Length (cm)	Freq (MHz)	P.D. (mW/cm^2)	Exposure Location	Computation SAR [W/kg]		Interpolated Adjustment Factors		Adjusted SAR Results [W/kg]	
						1-g	WB	1-g	WB	1-g	WB
Trunk	HAD4006A, 1/4 Wave (136-144MHz)	53.8	140.0000	0.20	Back Center	0.07	0.003	1.77	2.26	0.12	0.006
					Back Side	0.05	0.003	3.74	2.71	0.20	0.008
Trunk	HAD4007A, 1/4 Wave (144-150.8MHz)	50.8	144.0000	0.15	Back Center	0.18	0.008	1.82	2.31	0.34	0.018
					Back Side	0.07	0.005	3.93	2.83	0.27	0.014
Trunk	HAD4008A, 1/4 Wave (150.8-162MHz)	47.3	#162.0000	0.23	Back Center	0.16	0.007	1.92	2.42	0.31	0.018
					Back Side **Fig. 6 & 7**	0.16	0.006	4.11	2.98	**0.67**	**0.019**
Trunk	HAD4009A, 1/4 Wave (162-174MHz)	44.8	#173.4000	0.19	Back Center	0.10	0.005	1.94	2.43	0.19	0.013
					Back Side	0.13	0.005	4.03	2.97	0.52	0.015

Note:
Bold Blue – the highest adjusted SAR results for the respective frequency band.
Note: # Same SAR simulation configuration as FCC US.

The SAR distribution in the passenger exposure condition that gave highest adjusted 1-g SAR for the APX 6500 UHF R2 mobile radio (FCC US and ISED Canada) is reported in Figure 4. (469.9875 MHz, passenger in the center of the back seat, HAE4011A antenna installed on the roof).

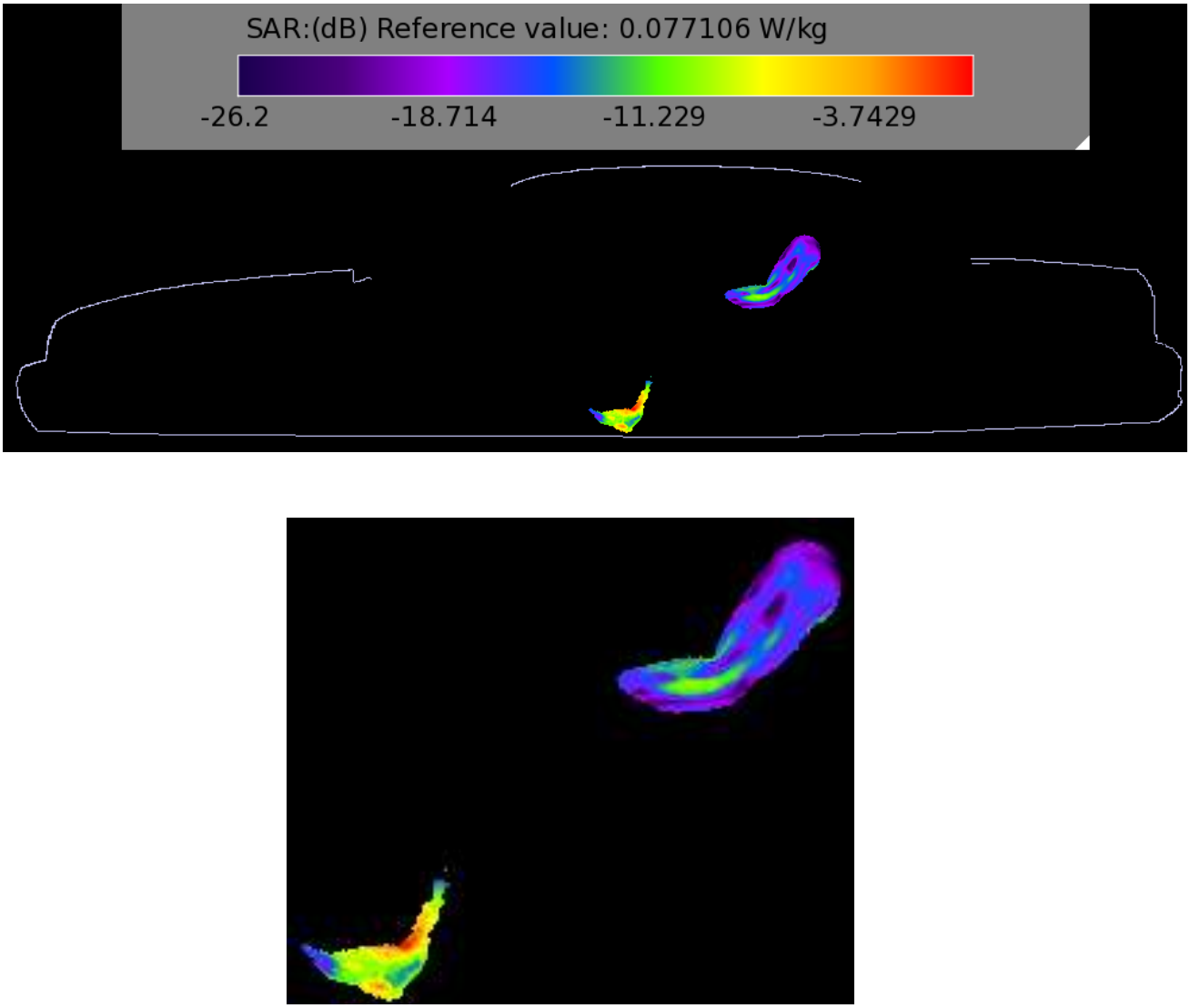
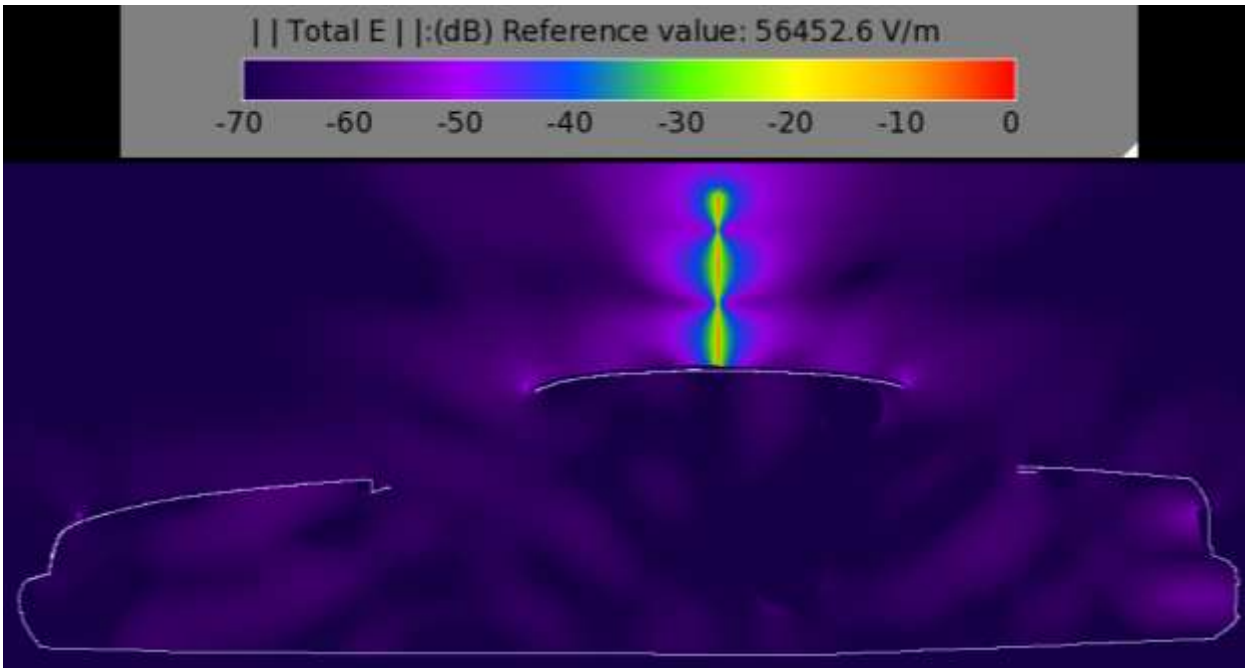
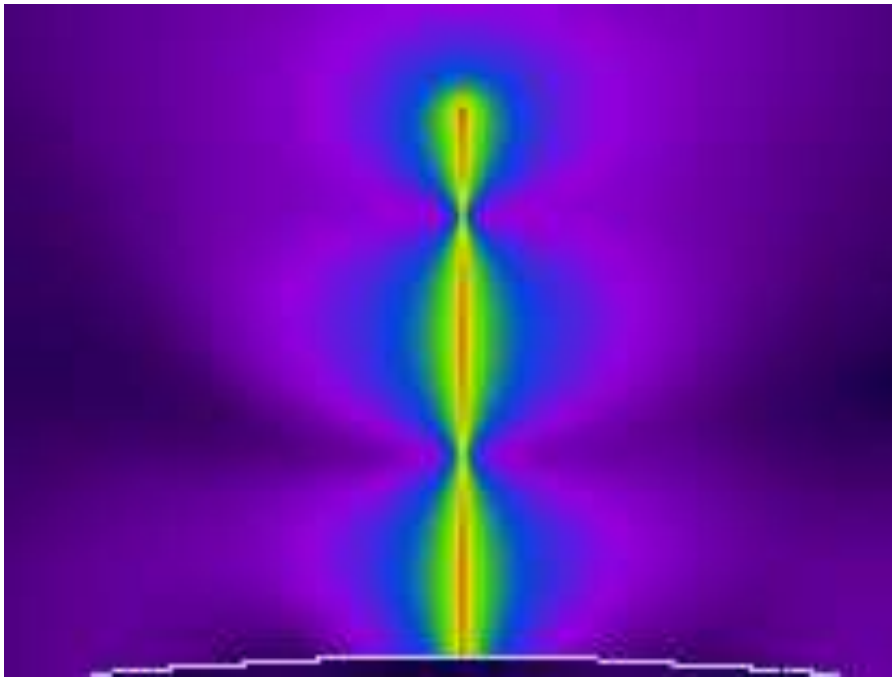


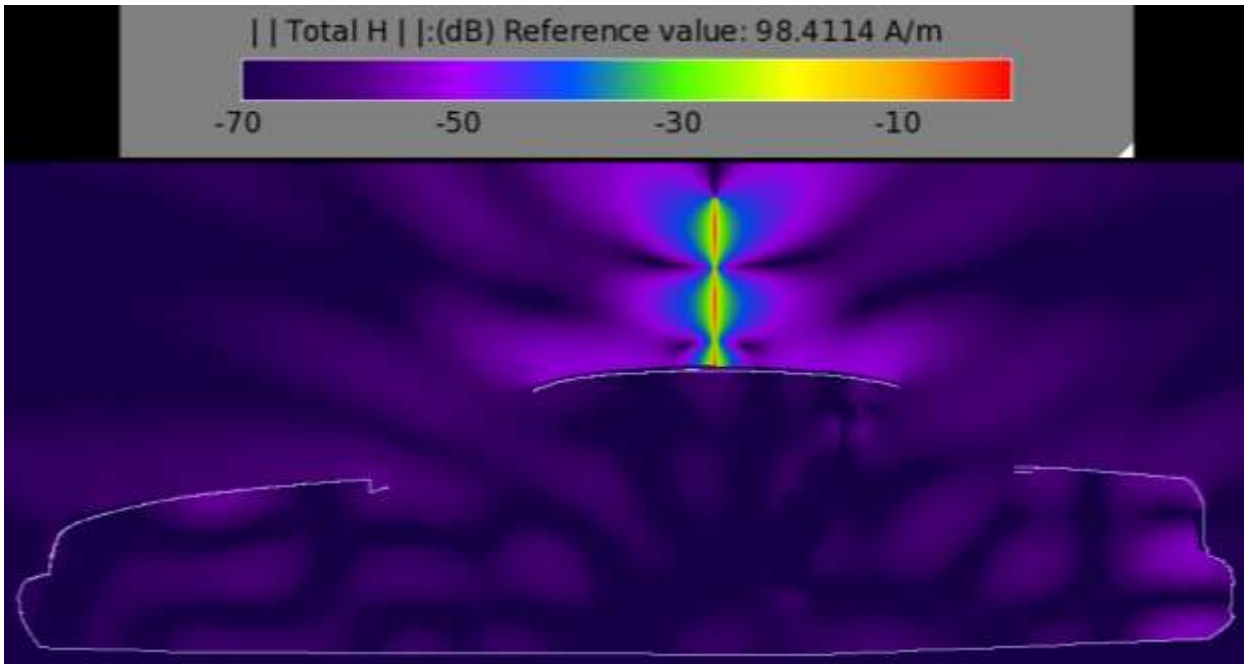
Figure 4. SAR distribution at 469.9875 MHz in the passenger model located in the center of the back seat, produced by the roof-mount HAE6013A antenna. The SAR distribution plot is relative to the plane where the peak 1-g average SAR for this exposure condition occurs.

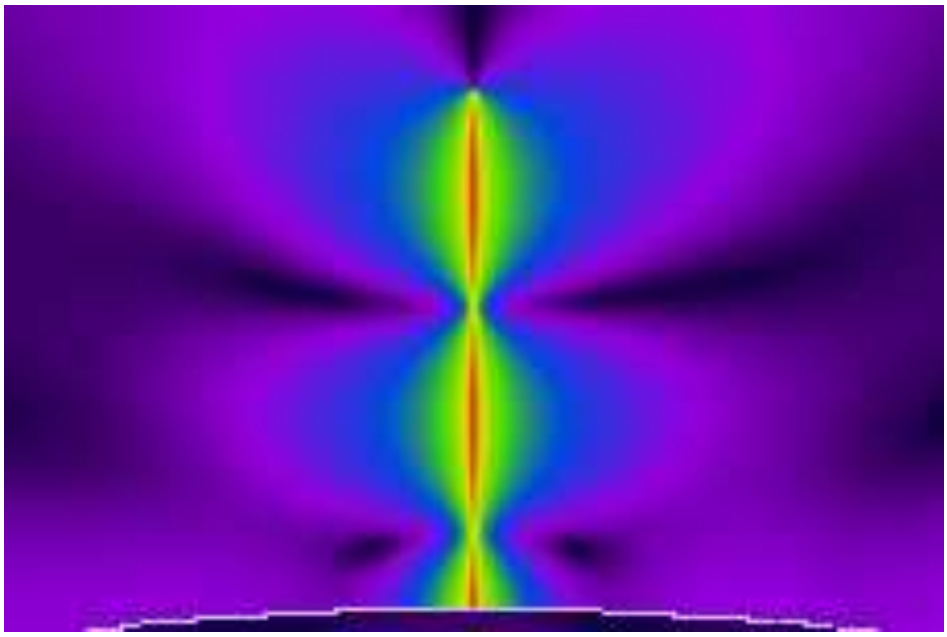
The plots in Figure 4 illustrate the E and H field distributions in the plane of the antenna corresponding to the exposure condition resulting in the SAR distribution in Figure 4.





a)





b)

Figure 5. (a) E-field magnitude distribution corresponding to exposure condition of Figure 4, and (b) H-field magnitude distribution corresponding to exposure condition of Figure 4.

The SAR distribution in the passenger exposure condition that produced the highest adjusted 1-g SAR for the Companion Device DVR VHF (FCC US and ISED Canada) is reported in Figure 6. (162.0000 MHz, passenger on the side of the back seat, HAD4008A antenna installed on the trunk).

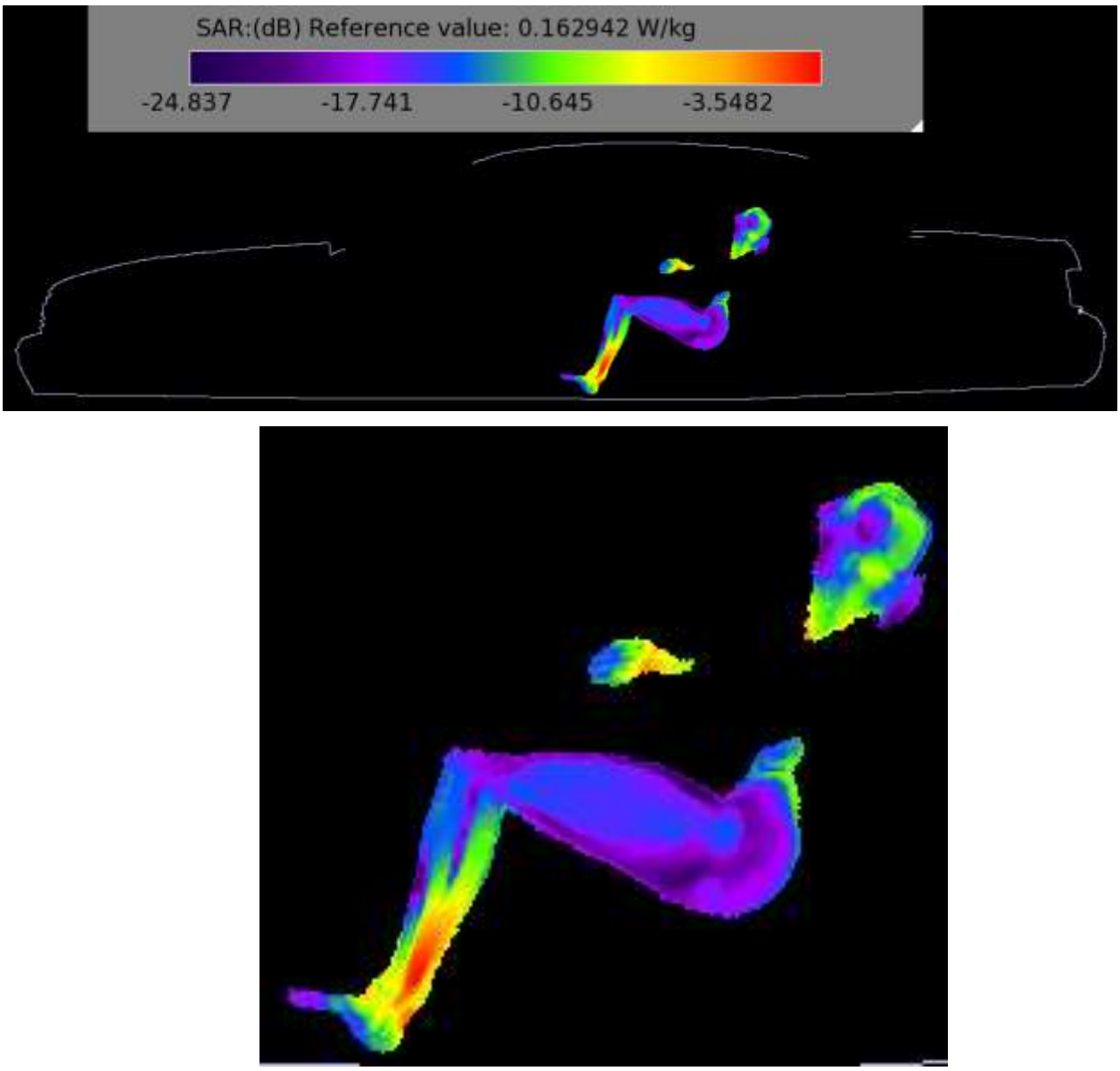
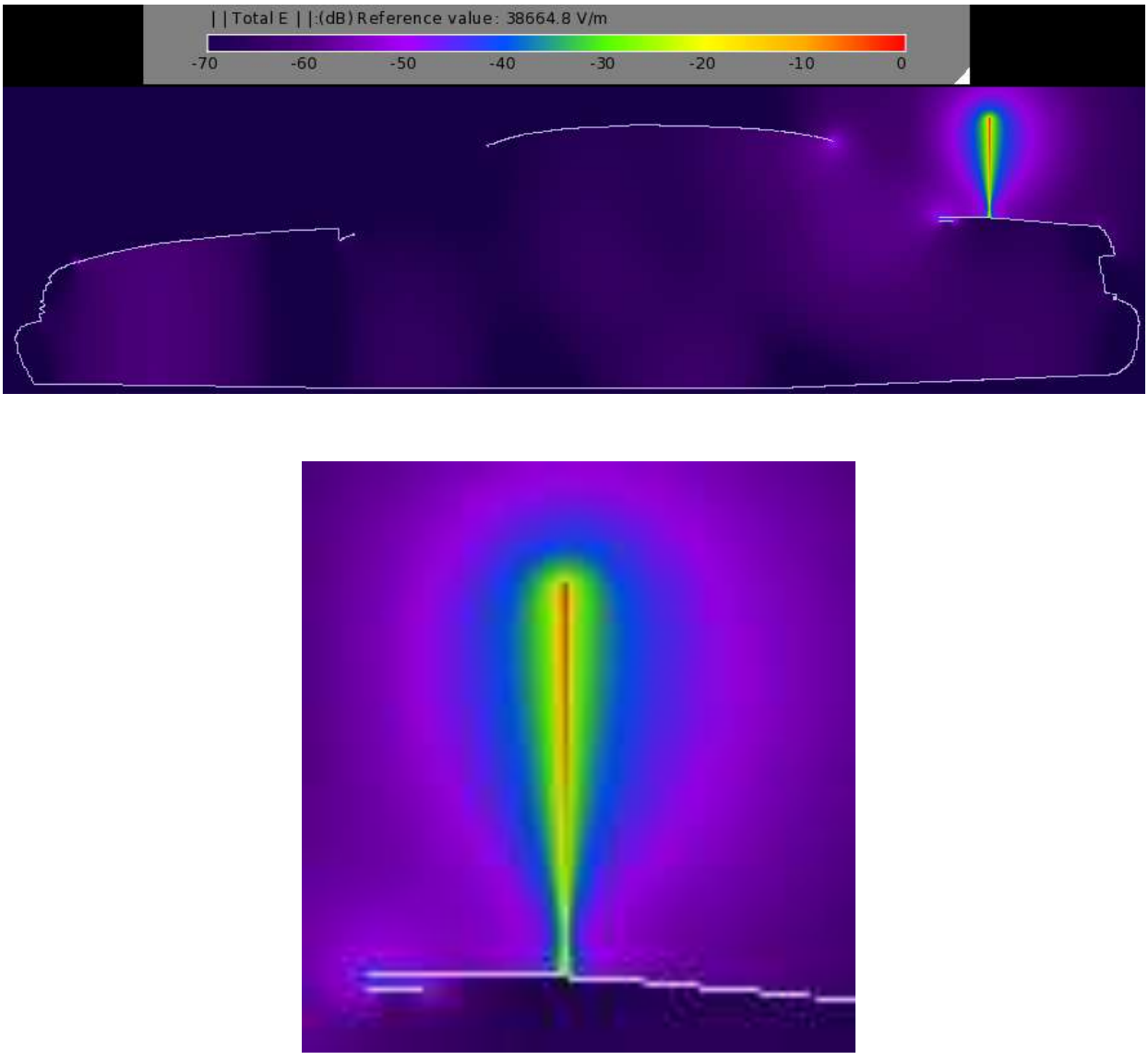
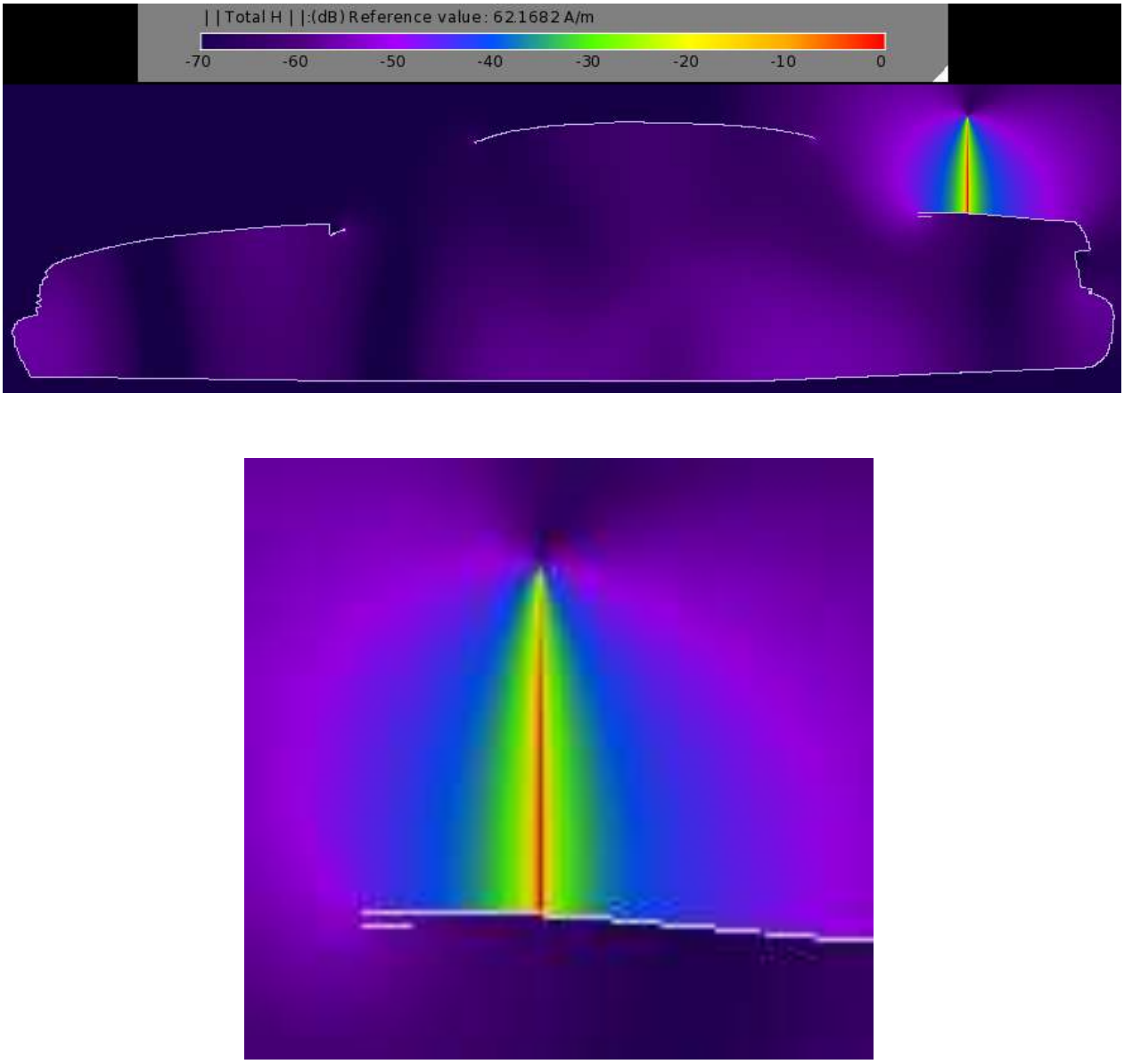


Figure 6. SAR distribution at 162.0000 MHz in the passenger model located on the side of the back seat, produced by the trunk-mount HAD4008A antenna. The SAR distribution plot is relative to the plane where the peak 1-g average SAR for this exposure condition occurs.

The plots in Figure 7 illustrate the E and H field distributions in the plane of the antenna corresponding to the exposure condition resulting in the SAR distribution in Figure 6.



a)



b)

Figure 7. (a) E-field magnitude distribution corresponding to exposure condition of Figure 6, and (b) H-field magnitude distribution corresponding to exposure condition of Figure 6.

SAR Simulation Reduction Considerations

Per the Response to Inquiry to FCC Tracking Number 528198, for a particular antenna that has more than one configuration which exceeds the MPE limit, SAR evaluations shall begin with the highest MPE configuration (mount location and frequency channel). If the adjusted SAR value is less than 50% of the SAR limit, no further SAR evaluation is needed for that antenna.

If the highest MPE configuration adjusted SAR value is above 50% of the SAR limit, a subsequent SAR simulation shall be performed on the subsequent highest MPE configuration (ranked in descending percentage of the MPE limit). If the subsequent adjusted SAR value is below 75% of the limit, no further SAR evaluation is needed for that antenna, otherwise further SAR simulations for the remaining antenna configurations shall continue until the adjusted SAR value is below 75% of the SAR limit.

Table 3 and 4 below lists all the configurations that did not conform to applicable MPE limits (ranked in descending percentage of the MPE limit), to which the aforementioned SAR simulation reduction considerations were applied.

Table 3: SAR Simulation Reduction Considerations for Back Seat Passenger

(FCC US)

APX6500 UHF R2		DVRS VHF		Combine MPE (%)	Exposure Location	APX6500 UHF R2 Adjusted SAR Result (W/kg)		DVRS VHF Adjusted SAR Result (W/kg)		Combine Adjusted SAR Results (W/kg)		SAR Simulation Reduction
Antenna Kit#	Freq (MHz)	Antenna Kit#	Freq (MHz)			1g	WB	1g	WB	1g	WB	
HAE4003A	450.01250	HAD4008A	162.0000	131.0	Back Center	0.08	0.004	0.31	0.018	0.39	0.022	
					Back Side	0.11	0.006	0.67	0.019	0.78	0.025	
HAE4003A	460.00000	HAD4008A	162.0000	130.6								The highest MPE configuration has SAR below 50% of the limit
HAE4003A	469.98750	HAD4008A	162.0000	130.3								
HAE4011A	469.98750	HAD4008A	162.0000	118.5	Back Center	0.20	0.005	0.31	0.018	0.51	0.023	
					Back Side	0.12	0.007	0.67	0.019	0.79	0.026	
HAE4011A	460.00000	HAD4008A	162.0000	118.1								The highest MPE configuration has SAR below 50% of the limit
HAE4011A	450.01250	HAD4008A	162.0000	117.9								
HAE6013A	460.00000	HAD4008A	162.0000	133.2	Back Center	0.19	0.005	0.31	0.018	0.50	0.023	
					Back Side	0.15	0.008	0.67	0.019	**0.82**	0.027	
HAE6013A	450.01250	HAD4008A	162.0000	132.9	Back Center	0.10	0.004	0.31	0.018	0.41	0.022	
					Back Side	0.14	0.007	0.67	0.019	0.81	0.026	
HAE6013A	469.98750	HAD4008A	162.0000	131.7								The 2nd highest MPE configuration has SAR below 75% of the limit
HAE6016A	482.50000	HAD4008A	162.0000	132.3	Back Center	0.07	0.002	0.31	0.018	0.38	0.020	
					Back Side	0.08	0.003	0.67	0.019	0.75	0.022	
HAE6016A	450.01250	HAD4008A	162.0000	129.6								The highest MPE configuration has SAR below 50% of the limit
HAE6016A	469.98750	HAD4008A	162.0000	127.4								
HAE6016A	511.98750	HAD4008A	162.0000	121.6								
HAE6016A	496.50000	HAD4008A	162.0000	120.3								
HAE6031A	469.98750	HAD4008A	162.0000	133.9	Back Center	0.13	0.004	0.31	0.018	0.44	0.022	
					Back Side	0.08	0.007	0.67	0.019	0.75	0.026	
HAE6031A	450.01250	HAD4008A	162.0000	133.1								The highest MPE configuration has SAR below 50% of the limit
HAE6031A	482.50000	HAD4008A	162.0000	133.0								
HAE6031A	496.50000	HAD4008A	162.0000	124.0								
HAE6031A	511.98750	HAD4008A	162.0000	121.6								
*RAE4016ARB	503.00000	HAD4008A	162.0000	117.7	Back Center	0.05	0.001	0.31	0.018	0.36	0.019	
					Back Side	0.04	0.002	0.67	0.019	0.71	0.021	
*RAE4016ARB	494.98750	HAD4008A	162.0000	117.4	Back Center	0.09	0.001	0.31	0.018	0.40	0.019	
					Back Side	0.06	0.002	0.67	0.019	0.73	0.021	
*RAE4016ARB	511.98750	HAD4008A	162.0000	117.3	Back Center	0.04	0.002	0.31	0.018	0.35	0.020	
					Back Side	0.08	0.002	0.67	0.019	0.75	0.021	
*RAE4014ARB	460.00000	HAD4008A	162.0000	120.1	Back Center	0.06	0.002	0.31	0.018	0.37	0.020	
					Back Side	0.04	0.003	0.67	0.019	0.71	0.022	
*RAE4014ARB	469.98750	HAD4008A	162.0000	119.0	Back Center	0.06	0.001	0.31	0.018	0.37	0.019	
					Back Side	0.03	0.002	0.67	0.019	0.70	0.021	
*RAE4014ARB	450.01250	HAD4008A	162.0000	117.9	Back Center	0.06	0.002	0.31	0.018	0.37	0.020	
					Back Side	0.05	0.003	0.67	0.019	0.72	0.022	

* Antenna length trimmed to frequency.

Table 3 (continued): SAR Simulation Reduction Considerations for Back Seat Passenger (FCC US)

APX6500 UHF R2		DVRS VHF		Combine MPE (%)	Exposure Location	APX6500 UHF R2 Adjusted SAR Result (W/kg)		DVRS VHF Adjusted SAR Result (W/kg)		Combine Adjusted SAR Results (W/kg)		SAR Simulation Reduction
Antenna Kit#	Freq (MHz)	Antenna Kit#	Freq (MHz)			1g	WB	1g	WB	1g	WB	
HAE4003A	450.01250	HAD4009A	173.4000	108.5	Back Center Back Side	0.08 0.11	0.004 0.006	0.19 0.52	0.013 0.015	0.27 0.63	0.017 0.021	
HAE4003A	460.00000	HAD4009A	173.4000	108.1								The highest MPE configuration has SAR below 50% of the limit
HAE4003A	469.98750	HAD4009A	173.4000	107.8								
HAE4003A	450.01250	HAD4009A	162.0000	102.4								
HAE4003A	460.00000	HAD4009A	162.0000	102.0								
HAE4003A	469.98750	HAD4009A	162.0000	101.7								
HAE6013A	460.00000	HAD4009A	173.4000	110.7	Back Center Back Side	0.19 0.15	0.005 0.008	0.19 0.52	0.013 0.015	0.38 0.67	0.018 0.023	
HAE6013A	450.01250	HAD4009A	173.4000	110.4								The highest MPE configuration has SAR below 50% of the limit
HAE6013A	469.98750	HAD4009A	173.4000	109.2								
HAE6013A	460.00000	HAD4009A	162.0000	104.6								
HAE6013A	450.01250	HAD4009A	162.0000	104.3								
HAE6013A	469.98750	HAD4009A	162.0000	103.1								
HAE6016A	482.50000	HAD4009A	173.4000	109.8	Back Center Back Side	0.07 0.08	0.002 0.003	0.19 0.52	0.013 0.015	0.26 0.60	0.015 0.018	
HAE6016A	450.01250	HAD4009A	173.4000	107.1								The highest MPE configuration has SAR below 50% of the limit
HAE6016A	469.98750	HAD4009A	173.4000	104.9								
HAE6016A	482.50000	HAD4009A	162.0000	103.7								
HAE6016A	450.01250	HAD4009A	162.0000	101.0								
HAE6031A	469.98750	HAD4009A	173.4000	111.4	Back Center Back Side	0.13 0.09	0.004 0.007	0.19 0.52	0.013 0.015	0.32 0.61	0.017 0.022	
HAE6031A	450.01250	HAD4009A	173.4000	110.6								The highest MPE configuration has SAR below 50% of the limit
HAE6031A	482.50000	HAD4009A	173.4000	110.5								
HAE6031A	469.98750	HAD4009A	162.0000	105.3								
HAE6031A	450.01250	HAD4009A	162.0000	104.5								
HAE6031A	482.50000	HAD4009A	162.0000	104.4								
HAE6031A	496.50000	HAD4009A	162.0000	101.5								

* Antenna length trimmed to frequency.

Table 4: SAR Simulation Reduction Considerations for Back Seat Passenger (ISED Canada)

APX6500 UHF R2		DVRS VHF		Combine MPE (%)	Exposure Location	APX6500 UHF R2 Adjusted SAR Result (W/kg)		DVRS VHF Adjusted SAR Result (W/kg)		Combine Adjusted SAR Results (W/kg)		SAR Simulation Reduction
Antenna Kit#	Freq (MHz)	Antenna Kit#	Freq (MHz)			1g	WB	1g	WB	1g	WB	
HAE4003A	450.01250	HAD4006A	140.0000	180.2	Back Center	0.08	0.004	0.12	0.007	0.20	0.011	
					Back Side	0.11	0.006	0.20	0.008	0.31	0.014	
HAE4003A	460.00000	HAD4006A	140.0000	179.6								The highest MPE configuration has SAR below 50% of the limit
HAE4003A	469.98750	HAD4006A	140.0000	179.2								
HAE4003A	450.01250	HAD4006A	144.0000	158.5								
HAE4003A	460.00000	HAD4006A	144.0000	157.9								
HAE4003A	469.98750	HAD4006A	144.0000	157.5								
HAE4011A	469.98750	HAD4006A	140.0000	158.1	Back Center	0.20	0.005	0.12	0.007	0.32	0.012	
					Back Side	0.12	0.007	0.20	0.008	0.32	0.015	
HAE4011A	460.00000	HAD4006A	140.0000	157.4								The highest MPE configuration has SAR below 50% of the limit
HAE4011A	450.01250	HAD4006A	140.0000	157.2								
HAE4011A	469.98750	HAD4006A	144.0000	136.4								
HAE4011A	460.00000	HAD4006A	144.0000	135.7								
HAE4011A	450.01250	HAD4006A	144.0000	135.5								
HAE6013A	460.00000	HAD4006A	140.0000	184.3	Back Center	0.19	0.005	0.12	0.007	0.31	0.012	
					Back Side	0.15	0.008	0.20	0.008	0.35	0.016	
HAE6013A	450.01250	HAD4006A	140.0000	183.4								The highest MPE configuration has SAR below 50% of the limit
HAE6013A	469.98750	HAD4006A	140.0000	181.7								
HAE6013A	460.00000	HAD4006A	144.0000	162.6								
HAE6013A	450.01250	HAD4006A	144.0000	161.7								
HAE6013A	469.98750	HAD4006A	144.0000	160.0								
HAE6016A	450.01250	HAD4006A	140.0000	177.7	Back Center	0.08	0.003	0.12	0.007	0.20	0.010	
					Back Side	0.11	0.006	0.20	0.008	0.31	0.014	
HAE6016A	469.98750	HAD4006A	140.0000	174.1								The highest MPE configuration has SAR below 50% of the limit
HAE6016A	450.01250	HAD4006A	144.0000	156.0								
HAE6016A	469.98750	HAD4006A	144.0000	152.4								
HAE6031A	469.98750	HAD4006A	140.0000	185.8	Back Center	0.13	0.004	0.12	0.007	0.25	0.011	
					Back Side	0.09	0.007	0.20	0.008	0.29	0.015	
HAE6031A	450.01250	HAD4006A	140.0000	183.8								The highest MPE configuration has SAR below 50% of the limit
HAE6031A	469.98750	HAD4006A	144.0000	164.1								
HAE6031A	450.01250	HAD4006A	144.0000	162.1								
*RAE4014ARB	460.00000	HAD4006A	140.0000	161.1	Back Center	0.06	0.002	0.12	0.007	0.18	0.009	
					Back Side	0.04	0.003	0.20	0.008	0.24	0.011	
*RAE4014ARB	469.98750	HAD4006A	140.0000	159.1	Back Center	0.06	0.001	0.12	0.007	0.18	0.008	
					Back Side	0.03	0.002	0.20	0.008	0.23	0.010	
*RAE4014ARB	450.01250	HAD4006A	140.0000	157.2	Back Center	0.06	0.002	0.12	0.007	0.18	0.009	
					Back Side	0.05	0.003	0.20	0.008	0.25	0.011	
*RAE4014ARB	460.00000	HAD4006A	144.0000	139.4	Back Center	0.06	0.002	0.34	0.018	0.40	0.020	
					Back Side	0.04	0.003	0.27	0.014	0.31	0.017	
*RAE4014ARB	469.98750	HAD4006A	144.0000	137.4	Back Center	0.06	0.001	0.34	0.018	0.40	0.019	
					Back Side	0.03	0.002	0.27	0.014	0.30	0.016	
*RAE4014ARB	450.01250	HAD4006A	144.0000	135.5	Back Center	0.06	0.002	0.34	0.018	0.40	0.020	
					Back Side	0.05	0.003	0.27	0.014	0.32	0.017	

* Antenna length trimmed to frequency.

Table 4 (continued): SAR Simulation Reduction Considerations for Back Seat Passenger (ISED Canada)

APX6500 UHF R2		DVRS VHF		Combine MPE (%)	Exposure Location	APX6500 UHF R2 Adjusted SAR Result (W/kg)		DVRS VHF Adjusted SAR Result (W/kg)		Combine Adjusted SAR Results (W/kg)		SAR Simulation Reduction
Antenna Kit#	Freq (MHz)	Antenna Kit#	Freq (MHz)			1g	WB	1g	WB	1g	WB	
HAE4003A	450.01250	HAD4007A	144.0000	141.7	Back Center	0.08	0.004	0.34	0.018	0.42	0.022	
					Back Side	0.11	0.006	0.27	0.014	0.38	0.020	
HAE4003A	460.00000	HAD4007A	144.0000	141.1								The highest MPE configuration has SAR below 50% of the limit
HAE4003A	469.98750	HAD4007A	144.0000	140.7								
HAE4003A	450.01250	HAD4007A	150.8000	108.4								
HAE4003A	460.00000	HAD4007A	150.8000	107.8								
HAE4003A	469.98750	HAD4007A	150.8000	107.4								
HAE4011A	469.98750	HAD4007A	144.0000	119.6	Back Center	0.20	0.005	0.34	0.018	0.54	0.023	
					Back Side	0.12	0.007	0.27	0.014	0.39	0.021	
HAE4011A	460.00000	HAD4007A	144.0000	118.9								The highest MPE configuration has SAR below 50% of the limit
HAE4011A	450.01250	HAD4007A	144.0000	118.7								
HAE6013A	460.00000	HAD4007A	144.0000	145.8	Back Center	0.19	0.005	0.34	0.018	0.53	0.023	
					Back Side	0.15	0.008	0.27	0.014	0.42	0.022	
HAE6013A	450.01250	HAD4007A	144.0000	144.9								The highest MPE configuration has SAR below 50% of the limit
HAE6013A	469.98750	HAD4007A	144.0000	143.2								
HAE6013A	460.00000	HAD4007A	150.8000	112.5								
HAE6013A	450.01250	HAD4007A	150.8000	111.6								
HAE6013A	469.98750	HAD4007A	150.8000	109.9								
HAE6016A	450.01250	HAD4007A	144.0000	139.2	Back Center	0.08	0.003	0.34	0.018	0.42	0.021	
					Back Side	0.11	0.006	0.27	0.014	0.38	0.020	
HAE6016A	469.98750	HAD4007A	144.0000	135.6								The highest MPE configuration has SAR below 50% of the limit
HAE6016A	450.01250	HAD4007A	150.8000	105.9								
HAE6016A	469.98750	HAD4007A	150.8000	102.3								
HAE6031A	469.98750	HAD4007A	144.0000	147.3	Back Center	0.13	0.004	0.34	0.018	0.47	0.022	
					Back Side	0.09	0.007	0.27	0.014	0.36	0.021	
HAE6031A	450.01250	HAD4007A	144.0000	145.3								The highest MPE configuration has SAR below 50% of the limit
HAE6031A	469.98750	HAD4007A	150.8000	114.0								
HAE6031A	450.01250	HAD4007A	150.8000	112.0								
*RAE4014ARB	460.00000	HAD4007A	144.0000	122.6	Back Center	0.06	0.002	0.34	0.018	0.40	0.020	
					Back Side	0.04	0.003	0.27	0.014	0.31	0.017	
*RAE4014ARB	469.98750	HAD4007A	144.0000	120.6	Back Center	0.06	0.001	0.34	0.018	0.40	0.019	
					Back Side	0.03	0.002	0.27	0.014	0.30	0.016	
*RAE4014ARB	450.01250	HAD4007A	144.0000	118.7	Back Center	0.06	0.002	0.34	0.018	0.40	0.020	
					Back Side	0.05	0.003	0.27	0.014	0.32	0.017	

* Antenna length trimmed to frequency.

Table 4 (continued): SAR Simulation Reduction Considerations for Back Seat Passenger (ISED Canada)

APX6500 UHF R2		DVRS VHF		Combine MPE (%)	Exposure Location	APX6500 UHF R2 Adjusted SAR Result (W/kg)		DVRS VHF Adjusted SAR Result (W/kg)		Combine Adjusted SAR Results (W/kg)		SAR Simulation Reduction
Antenna Kit#	Freq (MHz)	Antenna Kit#	Freq (MHz)			1g	WB	1g	WB	1g	WB	
HAE4003A	450.01250	HAD4008A	162.0000	206.6	Back Center	0.08	0.004	0.31	0.018	0.39	0.022	
					Back Side	0.11	0.006	0.67	0.019	0.78	0.025	
HAE4003A	460.00000	HAD4008A	162.0000	206.0								The highest MPE configuration has SAR below 50% of the limit
HAE4003A	469.98750	HAD4008A	162.0000	205.6								
HAE4003A	450.01250	HAD4008A	156.4000	134.7								
HAE4003A	460.00000	HAD4008A	156.4000	134.1								
HAE4003A	469.98750	HAD4008A	156.4000	133.7								
HAE4003A	450.01250	HAD4008A	150.8000	104.6								
HAE4003A	460.00000	HAD4008A	150.8000	104.0								
HAE4003A	469.98750	HAD4008A	150.8000	103.6								
HAE4011A	469.98750	HAD4008A	162.0000	184.5	Back Center	0.20	0.005	0.31	0.018	0.51	0.023	
					Back Side	0.12	0.007	0.67	0.019	0.79	0.026	
HAE4011A	460.00000	HAD4008A	162.0000	183.8								The highest MPE configuration has SAR below 50% of the limit
HAE4011A	450.01250	HAD4008A	162.0000	183.6								
HAE4011A	469.98750	HAD4008A	156.4000	112.6								
HAE4011A	460.00000	HAD4008A	156.4000	111.9								
HAE4011A	450.01250	HAD4008A	156.4000	111.7								
HAE6013A	460.00000	HAD4008A	162.0000	210.7	Back Center	0.19	0.005	0.31	0.018	0.50	0.023	
					Back Side	0.15	0.008	0.67	0.019	**0.82**	0.027	
HAE6013A	450.01250	HAD4008A	162.0000	209.8	Back Center	0.10	0.004	0.31	0.018	0.41	0.022	
					Back Side	0.14	0.007	0.67	0.019	**0.81**	0.026	
HAE6013A	469.98750	HAD4008A	162.0000	208.1								The 2nd highest MPE configuration has SAR below 75% of the limit
HAE6013A	460.00000	HAD4008A	156.4000	138.8								
HAE6013A	450.01250	HAD4008A	156.4000	137.9								
HAE6013A	469.98750	HAD4008A	156.4000	136.2								
HAE6013A	460.00000	HAD4008A	150.8000	108.7								
HAE6013A	450.01250	HAD4008A	150.8000	107.8								
HAE6013A	469.98750	HAD4008A	150.8000	106.1								
HAE6016A	450.01250	HAD4008A	162.0000	204.1	Back Center	0.08	0.003	0.31	0.018	0.39	0.021	
					Back Side	0.11	0.006	0.67	0.019	0.78	0.025	
HAE6016A	469.98750	HAD4008A	162.0000	200.5								The highest MPE configuration has SAR below 50% of the limit
HAE6016A	450.01250	HAD4008A	156.4000	132.2								
HAE6016A	469.98750	HAD4008A	156.4000	128.6								
HAE6016A	450.01250	HAD4008A	150.8000	102.1								
HAE6031A	469.98750	HAD4008A	162.0000	212.2	Back Center	0.13	0.004	0.31	0.018	0.44	0.022	
					Back Side	0.09	0.007	0.67	0.019	0.76	0.026	
HAE6031A	450.01250	HAD4008A	162.0000	210.2								The highest MPE configuration has SAR below 50% of the limit
HAE6031A	469.98750	HAD4008A	156.4000	140.3								
HAE6031A	450.01250	HAD4008A	156.4000	138.3								
HAE6031A	469.98750	HAD4008A	150.8000	110.2								
HAE6031A	450.01250	HAD4008A	150.8000	108.2								
*RAE4014ARB	460.00000	HAD4008A	162.0000	187.5	Back Center	0.06	0.002	0.31	0.018	0.37	0.020	
					Back Side	0.04	0.003	0.67	0.019	0.71	0.022	
*RAE4014ARB	469.98750	HAD4008A	162.0000	185.5	Back Center	0.06	0.001	0.31	0.018	0.37	0.019	
					Back Side	0.03	0.002	0.67	0.019	0.70	0.021	
*RAE4014ARB	450.01250	HAD4008A	162.0000	183.6	Back Center	0.06	0.002	0.31	0.018	0.37	0.020	
					Back Side	0.05	0.003	0.67	0.019	0.72	0.022	
*RAE4014ARB	460.00000	HAD4008A	156.4000	115.6	Back Center	0.06	0.002	0.23	0.017	0.29	0.019	
					Back Side	0.04	0.003	0.63	0.018	0.67	0.021	
*RAE4014ARB	469.98750	HAD4008A	156.4000	113.6	Back Center	0.06	0.001	0.23	0.017	0.29	0.018	
					Back Side	0.03	0.002	0.63	0.018	0.66	0.020	
*RAE4014ARB	450.01250	HAD4008A	156.4000	111.7	Back Center	0.06	0.002	0.23	0.017	0.29	0.019	
					Back Side	0.05	0.003	0.63	0.018	0.68	0.021	

* Antenna length trimmed to frequency.

Table 4 (continued): SAR Simulation Reduction Considerations for Back Seat Passenger (ISED Canada)

APX6500 UHF R2		DVRS VHF		Combine MPE (%)	Exposure Location	APX6500 UHF R2 Adjusted SAR Result (W/kg)		DVRS VHF Adjusted SAR Result (W/kg)		Combine Adjusted SAR Results (W/kg)		SAR Simulation Reduction
Antenna Kit#	Freq (MHz)	Antenna Kit#	Freq (MHz)			1g	WB	1g	WB	1g	WB	
HAE4003A	450.01250	HAD4009A	173.4000	171.7	Back Center	0.08	0.004	0.19	0.013	0.27	0.017	
					Back Side	0.11	0.006	0.52	0.015	0.63	0.021	
HAE4003A	460.00000	HAD4009A	173.4000	171.1								The highest MPE configuration has SAR below 50% of the limit
HAE4003A	469.98750	HAD4009A	173.4000	170.7								
HAE4003A	450.01250	HAD4009A	162.0000	162.3								
HAE4003A	460.00000	HAD4009A	162.0000	161.7								
HAE4003A	469.98750	HAD4009A	162.0000	161.3								
HAE4003A	450.01250	HAD4009A	167.7000	153.1								
HAE4003A	460.00000	HAD4009A	167.7000	152.5								
HAE4003A	469.98750	HAD4009A	167.7000	152.1								
HAE4011A	469.98750	HAD4009A	173.4000	149.6	Back Center	0.20	0.005	0.19	0.013	0.39	0.018	
					Back Side	0.12	0.007	0.52	0.015	0.64	0.022	
HAE4011A	460.00000	HAD4009A	173.4000	148.9								The highest MPE configuration has SAR below 50% of the limit
HAE4011A	450.01250	HAD4009A	173.4000	148.7								
HAE4011A	469.98750	HAD4009A	162.0000	140.2								
HAE4011A	460.00000	HAD4009A	162.0000	139.5								
HAE4011A	450.01250	HAD4009A	162.0000	139.3								
HAE4011A	469.98750	HAD4009A	167.7000	131.0								
HAE4011A	460.00000	HAD4009A	167.7000	130.3								
HAE4011A	450.01250	HAD4009A	167.7000	130.1								
HAE6013A	460.00000	HAD4009A	173.4000	175.8	Back Center	0.19	0.005	0.19	0.013	0.38	0.018	
					Back Side	0.15	0.008	0.52	0.015	0.67	0.023	
HAE6013A	450.01250	HAD4009A	173.4000	174.9								The highest MPE configuration has SAR below 50% of the limit
HAE6013A	469.98750	HAD4009A	173.4000	173.2								
HAE6013A	460.00000	HAD4009A	162.0000	166.4								
HAE6013A	450.01250	HAD4009A	162.0000	165.5								
HAE6013A	469.98750	HAD4009A	162.0000	163.8								
HAE6013A	460.00000	HAD4009A	167.7000	157.2								
HAE6013A	450.01250	HAD4009A	167.7000	156.3								
HAE6013A	469.98750	HAD4009A	167.7000	154.6								
HAE6016A	450.01250	HAD4009A	173.4000	169.2	Back Center	0.08	0.003	0.19	0.013	0.27	0.016	
					Back Side	0.11	0.006	0.52	0.015	0.63	0.021	
HAE6016A	469.98750	HAD4009A	173.4000	165.6								The highest MPE configuration has SAR below 50% of the limit
HAE6016A	450.01250	HAD4009A	162.0000	159.8								
HAE6016A	469.98750	HAD4009A	162.0000	156.2								
HAE6016A	450.01250	HAD4009A	167.7000	150.6								
HAE6016A	469.98750	HAD4009A	167.7000	147.0								
HAE6031A	469.98750	HAD4009A	173.4000	177.3	Back Center	0.13	0.004	0.19	0.013	0.32	0.017	
					Back Side	0.09	0.007	0.52	0.015	0.61	0.022	
HAE6031A	450.01250	HAD4009A	173.4000	175.3								The highest MPE configuration has SAR below 50% of the limit
HAE6031A	469.98750	HAD4009A	162.0000	167.9								
HAE6031A	450.01250	HAD4009A	162.0000	165.9								
HAE6031A	469.98750	HAD4009A	167.7000	158.7								
HAE6031A	450.01250	HAD4009A	167.7000	156.7								
*RAE4014ARB	460.00000	HAD4009A	173.4000	152.6	Back Center	0.06	0.002	0.31	0.013	0.37	0.015	
					Back Side	0.04	0.003	0.67	0.015	0.71	0.018	
*RAE4014ARB	469.98750	HAD4009A	173.4000	150.6	Back Center	0.06	0.001	0.31	0.013	0.37	0.014	
					Back Side	0.03	0.002	0.67	0.015	0.7	0.017	
*RAE4014ARB	450.01250	HAD4009A	173.4000	148.7	Back Center	0.06	0.002	0.31	0.013	0.37	0.015	
					Back Side	0.05	0.003	0.67	0.015	0.72	0.018	
*RAE4014ARB	460.00000	HAD4009A	162.0000	143.2	Back Center	0.06	0.002	0.31	0.018	0.37	0.020	
					Back Side	0.04	0.003	0.68	0.020	0.72	0.023	
*RAE4014ARB	469.98750	HAD4009A	162.0000	141.2	Back Center	0.06	0.001	0.31	0.018	0.37	0.019	
					Back Side	0.03	0.002	0.68	0.020	0.71	0.022	
*RAE4014ARB	450.01250	HAD4009A	162.0000	139.3	Back Center	0.06	0.002	0.31	0.018	0.37	0.020	
					Back Side	0.05	0.003	0.68	0.020	0.73	0.023	
*RAE4014ARB	460.00000	HAD4009A	167.7000	134.0	Back Center	0.06	0.002	0.25	0.015	0.31	0.017	
					Back Side	0.04	0.003	0.70	0.016	0.74	0.019	
*RAE4014ARB	469.98750	HAD4009A	167.7000	132.0	Back Center	0.06	0.001	0.25	0.015	0.31	0.016	
					Back Side	0.03	0.002	0.70	0.016	0.73	0.018	
*RAE4014ARB	450.01250	HAD4009A	167.7000	130.1	Back Center	0.06	0.002	0.25	0.015	0.31	0.017	
					Back Side	0.05	0.003	0.70	0.016	0.75	0.019	

* Antenna length trimmed to frequency.

Results of SAR Computations for combined exposure

From all simulated results, the highest peak 1-g SAR values were identified for both APX 6500 UHF R2 mobile radio and companion DVR VHF repeater exposures and then summed up to produce the composite combined peak SAR value for corresponding locations of the human body model. Tables 5 and 6 present the highest combined peak 1-g and whole-body SAR values, respectively.

Table 5: Worst case peak 1-g average SAR for passenger exposure conditions and combined 1-g average SAR from simultaneous exposure.

	Passenger location	Companion DVR VHF [W/kg]	Mobile APX 6500 UHF R2 [W/kg]	Total 1-g SAR [W/kg]
FCC US	Back Center	0.31	0.20	0.51
	Back Side	0.67	0.15	0.82
ISED Canada	Back Center	0.34	0.20	0.54
	Back Side	0.67	0.15	0.82

Table 6: Worst case peak whole body average SAR for passenger exposure conditions and combined whole body average SAR from simultaneous exposure.

	Passenger location	Companion DVR VHF [W/kg]	Mobile APX 6500 UHF R2 [W/kg]	Total WB SAR [W/kg]]
FCC US	Back Center	0.018	0.005	0.023
	Back Side	0.019	0.008	0.027
ISED Canada	Back Center	0.018	0.005	0.023
	Back Side	0.019	0.008	0.027

In summary, the maximum combined peak 1-g SAR is 0.82 W/kg, less than the 1.6 W/kg limit, while the maximum combined whole-body average SAR is 0.027 W/kg, less than the 0.08 W/kg limit.

Conclusions

Under the test conditions described for evaluating passenger exposure to the RF electromagnetic fields emitted by vehicle-mounted antennas used in conjunction with this mobile radio product, the present analysis shows that the computed SAR values are compliant with the FCC US and ISED Canada general public 1-g and whole body SAR limits.

References

[1] Health Canada Safety Code 6 (2015). Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz.

[2] IEEE Standard C95.1-1999. *IEEE Standard for Safety Levels with Respect to Human Exposure to RF Electromagnetic Fields*, 3 kHz to 300 GHz.

[3] http://www.nlm.nih.gov/research/visible/visible_human.html

[4] ICNIRP (International Commission on Non-Ionising Radiation Protection) 1998. *Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz)*. Health Phys. 74:494–522.

[5] IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz. IEEE Std C95.1-2019 (Revision of IEEE Std C95.1-2005/ Incorporates IEEE Std C95.1-2019/Cor 1-2019) .