

RADIO TEST REPORT – 466714

Type of assessment:

MPE Calculation report and SAR Exemption report

Applicant:

Avaya Inc.

Hardware Version Identification Number (HVIN):

B199, KT 800 IP

Product Marketing Name (PMN):

Avaya B199, Konftel KT 800

EUT description:

Avaya B199 / KT800 IP Conference phone

FCC ID:

TYM-FLAM

ISED certification number:

3794C-FLAM

Specification:

- ◆ FCC 47 CFR Part 1 Subpart I, §§1.1307, 1.1310
- ◆ FCC 47 CFR Part 2 Subpart J, §2.1091, 2.1093
- ◆ FCC KDB 447498 D01 General RF Exposure Guidance v06
- ◆ ISED Canada RSS-102 Issue 5 Amendment 1, (February 2021)
- ◆ Health Canada Safety Code 6

RSS-102 Annex B - Declaration of RF Exposure Compliance

ATTESTATION: I attest that the information provided in Annex A is correct; that the Technical Brief was prepared and the information contained therein is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed; and that the device meets the SAR and/or RF field strength limits of RSS-102.

Date of issue: July 15, 2022

Andrey Adelberg, Senior EMC/RF Specialist

Prepared by

Signature

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The tests included in this report are within the scope of this accreditation.
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SCC File Number: 15064 (Ottawa/Almonte); 151100 (Montreal); 151097 (Cambridge)

FCC and RSS-102 Annex C – MPE Calculation; Date: May 2021



Lab locations

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	Test site identifier	Organization	Ottawa/Almonte	Montreal
	FCC:	CA2040	CA2041	CA0101
	ISED:	2040A-4	2040G-5	24676
Website	www.nemko.com			

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Section 1 Evaluation summary

1.1 MPE calculation for standalone transmission

1.1.1 References, definitions and limits

FCC §2.1091(d)

- (2) (2) For operations within the frequency range of 300 kHz and 6 GHz (inclusive), the limits for maximum permissible exposure (MPE), derived from whole-body SAR limits and listed in Table 1 in paragraph (e)(1) of this section, may be used instead of whole-body SAR limits as set forth in paragraphs (a) through (c) of this section to evaluate the environmental impact of human exposure to RF radiation as specified in §1.1307(b) of this part, except for portable devices as defined in §2.1093 of this chapter as these evaluations shall be performed according to the SAR provisions in §2.1093.

Table 1.1-1: 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
300–1500			f / 300	<6
1500–100000			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
300–1500			f / 1500	<30
1500–100000			1.0	<30

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

RSS-102, Section 2.5.2

RF 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, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. 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 e.i.r.p. 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 e.i.r.p. 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 e.i.r.p. of the device is equal to or less than $0.0131 f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

References, definitions and limits, continued

Equation from page 18 of OET Bulletin 65, Edition 97-01

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

where: S = power density (mW/cm² or W/m²)
 P = power input to the antenna (mW or 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 (cm or m)

1.1.2 EUT technical information

Prediction frequency	2402 MHz
Antenna type	Integral internal antenna
Antenna gain	2.7 dBi
Number of antennas	1
Maximum transmitter conducted power	4.32 dBm
Prediction distance	20 cm

1.1.3 MPE calculation

Fundamental transmit (prediction) frequency:	<u>2402</u> MHz	
Maximum measured conducted peak output power:	<u>4.32</u> dBm	
Cable and/or jumper loss:	<u>0</u> dB	
Maximum peak power at antenna input terminal:	<u>4.32</u> dBm	
Tx On time:	<u>1.000</u> ms	
Tx period time:	<u>1.000</u> ms	
Average factor:	<u>100</u> %	
Maximum calculated average power at antenna input terminal:	<u>2.7039584</u> mW	
Single Antenna gain (typical):	<u>2.7</u> dBi	
Number of antennae:	<u>1</u>	
Total system gain:	<u>2.7</u> dBi	
MPE limit for uncontrolled exposure at prediction frequency:	FCC limit: <u>1.000000</u> mW/cm ² <u>10.000000</u> W/m ²	ISED limit: <u>0.535080</u> mW/cm ² <u>5.350805</u> W/m ²
Minimum calculated prediction distance for compliance:	<u>20</u> cm	<u>20</u> cm
Typical (declared) distance:	<u>20</u> cm	<u>20</u> cm
Average power density at prediction frequency:	0.001002 mW/cm ² <u>0.010017</u> W/m ²	0.001002 mW/cm ² <u>0.010017</u> W/m ²
Margin of Compliance:	29.99 dB	27.28 dB
Maximum allowable antenna gain:	<u>32.69</u> dBi	<u>29.98</u> dBi

1.1.4 Verdict

The calculation is below the limit; therefore, the product is passing the RF Exposure requirements for the declared distance.

1.2 SAR exemption for standalone transmission

1.2.1 References, definitions and limits

FCC §2.1093

- (2) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

FCC KDB 447498 D01

4.3.1 Standalone SAR test exclusion considerations

The SAR-based exemption formula of §1.1307(b)(3)(i)(B), repeated here, applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW). This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by formula

$$P_{th}(mW) = \begin{cases} ERP_{20\text{ cm}} \left(\frac{d}{20\text{ cm}} \right)^x & d \leq 20\text{ cm} \\ ERP_{20\text{ cm}} & 20\text{ cm} < d \leq 40\text{ cm} \end{cases}$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20\text{ cm}} \sqrt{f}} \right)$$

Table 1.2-1: Example Power Thresholds (mW)

Separation:	5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	50 mm
300 MHz	39	65	88	110	129	148	166	184	201	217
450 MHz	22	44	67	89	112	135	158	180	203	226
835 MHz	9	25	44	66	90	116	145	175	207	240
1900 MHz	3	12	26	44	66	92	122	157	195	236
2450 MHz	3	10	22	38	59	83	111	143	179	219
3600 MHz	2	8	18	32	49	71	96	125	158	195
5800 MHz	1	6	14	25	40	58	80	106	136	169

Notes: Values in the table are in mW

For mobile devices that are not exempt per Table 1 [of §1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in §1.1310 is necessary if the ERP of the device is greater than ERP 20 cm in Formula below [repeated from §2.1091(c)(1); also in §1.1307(b)(1)(i)(B)].

$$P_{th}(mW) = ERP_{20\text{ cm}}(mW) = \begin{cases} 2040f & 0.3\text{ GHz} \leq f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \leq f \leq 6\text{ GHz} \end{cases}$$

Table 1.2-2: Thresholds for single RF sources subject to routine environmental evaluation

Table 1

RF Source Frequency			Minimum Distance			Threshold ERP
f_L (MHz)		f_H (MHz)	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	(W)
0.3	–	1.34	159 m	–	35.6 m	1,920 R ²
1.34	–	30	35.6 m	–	1.6 m	3,450 R ² /f ²
30	–	300	1.6 m	–	159 mm	3.83 R ²
300	–	1,500	159 mm	–	31.8 mm	0.0128 R ² f
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2 R ²

References, definitions and limits, continued

RSS-102, Section 2.5.1

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in table below

Table 1.2-3: Exemption limits for routine evaluation based on frequency and separation distance

Separation:	≤5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	≥50 mm
≤300 MHz	71	101	132	162	193	223	254	284	315	345
450 MHz	52	70	88	106	123	141	159	177	195	213
835 MHz	17	30	42	55	67	80	92	105	117	130
900 MHz	7	10	18	34	60	99	153	225	316	431
2450 MHz	4	7	15	30	52	83	123	173	235	309
3500 MHz	2	6	16	32	55	86	124	170	225	290
5800 MHz	1	6	15	27	41	56	71	85	97	106

Notes: Values in the table are in mW

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in the table above are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in the table above are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants' device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.

1.2.2 EUT technical information

Type of EUT use	Extremity
Minimum separation distance	15 mm
Highest operating frequency	2.02 GHz
Antenna type	Internal integral antenna
Antenna gain	2.7 dBi
Maximum transmitter conducted power	4.32 dBm (2.7 mW)
Duty cycle	100 %

1.2.3 Justification for Standalone SAR test exclusion

SAR exemption verification for FCC:

ERP power (mW):	6.8753	INPUTS
Duty cycle (%):	100	
Frequency (GHz):	2.402	
Distance (cm):	1.5	

Time averaged power (mW): 6.8753 Calculated

Frequency (GHz)	λ (cm)	Power (mW)	Distance (cm)	Exemption ERP _{20cm} (mW)	x	P _{threshold} (mW)	Result	Ratio
2.402	12.5	7	1.5	3060	1.90	22.43	EXEMPT	0.31

Table 1.2-4: SAR exemption verification for ISED Canada

Transmit frequency, MHz	Maximum EIRP, mW	Separation distance, mm	Limit, mW	Margin, dB
2402	8.46	15	15.00	6.54

Note: Margin was calculated as follows: $10 \times \log_{10}(\text{Limit} / \text{Maximum EIRP})$

1.2.4 Verdict

The calculation is below the threshold, therefore, the product exempt from the SAR test requirements.

1.3 RSS-102, Annex A - RF technical brief cover sheet

ISED Certification Number	3794C-FLAM
Product marketing name (PMN)	Avaya B199, Konftel KT 800
Hardware version identification number (HVIN)	B199, KT 800 IP
Firmware version identification number (FVIN)	N/A
Host marketing name (HMN)	N/A
Applicant ISED company number	3794C
Applicant name	Avaya Inc.
SAR/RF exposure test laboratory	2040A-4 (3 m semi anechoic chamber)
Type of evaluation	<input type="checkbox"/> SAR Evaluation: Device Used in the Vicinity of the Human Head <input type="checkbox"/> SAR Evaluation: Body-Worn Device and Body-Supported Device <input type="checkbox"/> SAR Evaluation: Limb-Worn Device <input checked="" type="checkbox"/> RF Exposure Evaluation <input type="checkbox"/> Nerve Stimulation Exposure Evaluation (SPR-002)
SAR evaluation	Multiple transmitters: <input type="checkbox"/> Yes <input type="checkbox"/> No
	Evaluated against exposure limits: <input type="checkbox"/> General Public Use <input type="checkbox"/> Controlled Use
	Duty cycle used in evaluation: N/A %
	Separation distance: N/A mm
	Standard used for evaluation: N/A
	SAR value: N/A W/kg
	<input type="checkbox"/> Measured <input type="checkbox"/> Computed <input type="checkbox"/> Calculated
Nerve Stimulation Evaluation (SPR-002)	Evaluated against exposure limits: <input type="checkbox"/> General Public Use <input type="checkbox"/> Controlled Use
	Measurement distance: N/A m
	Field Strength: N/A <input type="checkbox"/> V/m (electric) <input type="checkbox"/> A/m (magnetic) <input type="checkbox"/> Measured <input type="checkbox"/> Computed <input type="checkbox"/> Calculated
	Exposure condition: <input type="checkbox"/> Whole body/Torso/Head <input type="checkbox"/> Leg <input type="checkbox"/> Arm <input type="checkbox"/> Hand/Foot
RF exposure evaluation	Evaluated against exposure limits: <input checked="" type="checkbox"/> General Public Use <input type="checkbox"/> Controlled Use
	Duty cycle used in evaluation: 100 %
	Operational frequency: 2402 MHz
	Standard used for evaluation: Safety Code 6
	Measurement distance: 0.2 m
	RF value: <input checked="" type="checkbox"/> W/m ² <input type="checkbox"/> V/m <input type="checkbox"/> A/m <input type="checkbox"/> Measured <input type="checkbox"/> Computed <input checked="" type="checkbox"/> Calculated

End of the test report