DEKRA Testing and Certification, S.A.U.
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C.I.F. A29 507 456

Assessment report No:

NIE: 48278RAN.002

Assessment report
RF EXPOSURE REPORT ACCORDING TO ISED RSS -102 Issue 5:2015

Identification of item tested.....:	Automotive Radio with Navigation
Trademark .....:	Panasonic
Model and /or type reference .....:	CA-180-CTPL-HS
Other identification of the product .....:	FCC ID: ACJ- CA180CTPLHS ISED: 216A- CA180CTPLHS
Final HW version .....:	CA180CTPLHS US HW
Final SW version .....:	CA180CTPLHS US SW
Features.....:	Car Radio with BT, Wi-Fi, Navigation transmitters
Manufacturer.....:	Panasonic Automotive Systems Company of America 776 Georgia Hwy 74 Peachtree City, GA 30269
Test method requested, standard.....:	ISED RSS-102 Issue 5 (2015-03) – Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
Summary .....:	IN COMPLIANCE
Approved by (name / position & signature) .....:	Miguel Lacave Antennas Lab Manager  MIGUEL LACAVE GARCÍA 2017.04.28 13:55:28 +02'00'
Date of issue .....:	2017-04-28
Report template No.....:	FAN24_01

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Identification of the client

Panasonic Canada Inc.

5770 Ambler Drive, Mississauga ON L4W 2T3 Canada

General description of the device under evaluation

The device under evaluation consists of a car radio with BT, Wi-Fi and navigation transmitters.

The minimum separation distance between the external antenna and anyone inside the car will be greater than 20 cm during normal use conditions. Bluetooth and Wi-Fi transmitters are not able to transmit simultaneously.

For the Bluetooth technology, as stated into DEKRA test report 51334RRF.001, the maximum output power and antenna gain values are:

Assessment	Band (MHz)	Technology	Mode	Frequency	Maximum RF output power (dBm)	Maximum antenna gain (dBi)	Average radiated power (E.I.R.P.) (dBm)
1	2450	Bluetooth	GFSK	2402	-2.63	+3.0	0.37
				2441	-1.16	+3.0	1.84
				2480	-1.41	+3.0	1.59

Table 1: Maximum output power and antenna gain values for Bluetooth mode.

For the Wi-Fi technology, as stated into DEKRA test report 1740449R-RFCAP73V00 the maximum output power and antenna gain values are:

Assessment	Band (GHz)	Technology	Mode	Frequency	Maximum RF output power (dBm)	Maximum antenna gain (dBi)	Average radiated power (E.I.R.P.) (dBm)
2	5.8	Wifi	802.11a	5745	7.61	+5.0	12.61
				5785	7.74	+5.0	12.74
				5825	7.80	+5.0	12.80

Table 2: Maximum output power and antenna gain values for Wi-Fi mode.

Assessment summary

Radiofrequency radiation exposure limits			
ISED RSS-102 Issue 5 (2015-03)			
Band (MHz)	**Technology**	**Band**	**VERDICT (Pass/Fail)**
2450	Bluetooth	ISM	Pass
5000	Wifi	UNII Bands	Pass

Table 3: Assessment summary.

Appendix A – ISED RF Exposure

ISED RF Exposure evaluation for mobile devices

According to RSS-102 Issue 5, Paragraph "4. Exposure Limits", Industry of Canada has adopted the RF field strength limits stablished in Healths Canada's RF exposure guideline, Safety code 6:

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
0.003-10[21]	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
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.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

ISED MPE Evaluation Results

In order to perform the assessment, the following equations have been used for the calculations:

Power density: $S[W/m^2] = \frac{P_{E.I.R.P.}[W]}{4\Pi R[m]^2}$

Minimum compliance distance: $R_{\min}[m] = \sqrt{\frac{P_{E.I.R.P.}[W]}{4\Pi S[W/m^2]}}$

Where:

S = power density

$P_{E.I.R.P.}$ = Equivalent isotropically radiated power

R = distance to the center of radiation of the antenna (evaluation distance)

$R_{\min}$ = distance to the center of radiation of the antenna

Assessment 1 – Bluetooth 2.45 GHz

Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	2441.0
Maximum EIRP (dBm):	1.84
Maximum EIRP (mW):	1.53
General public - Power density limit (W/m2):	5.41

Power density at minimum use distance:

Power density (W/m2):	0.0030
Verdict for general public:	PASS

The power density level for this transmission mode is below general public and controlled exposure power density limits.

Minimum compliance distance for this technology:

Minimum distance for general public (cm):	0.47
Verdict for general public:	PASS

The minimum use distance is larger than general public and controlled exposure minimum compliance distances.

Assessment 2 – Wi-Fi 5 GHz

Minimum use distance (cm):	20.0
Worst Case Frequency (MHz):	5825.0
Maximum EIRP (dBm):	12.80
Maximum EIRP (mW):	19.05
General public - Power density limit (W/m2):	9.80

Power density at minimum use distance:

Power density (W/m2):	0.04
Verdict for general public:	PASS

The power density level for this transmission mode is below general public and controlled exposure power density limits.

Minimum compliance distance for this technology:

Minimum distance for general public (cm):	1.24
Verdict for general public:	PASS

The minimum use distance is larger than general public and controlled exposure minimum compliance distances.