



Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-2339/21-01-66 MPE (FCC_ISED)

Testing Laboratory

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Accredited Test Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS). The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

Applicant

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Manufacturer

Bosch Car Multimedia Portugal, S.A.

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Certification numbers and labeling requirements

FCC ID	2AUXS-PSAAIO
ISED number	25847-PSAAIO
HVIN (Hardware Version Identification Number)	HW06
PMN (Product Marketing Name)	MyCitroen Play
FVIN (Firmware Version Identification Number)	-/-
HMN (Host Marketing Name)	-/-

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EUT technologies:

Technologies:	Frequency [MHz]	P _{max} conducted [dBm]:	Max. antenna gain [dBi]:	Tolerance +/- [dB]	Max. EIRP [dBm]:
BT BDR/DER	2402 - 2480	1.0	0.6	2.0	3.6
WLAN 802.11b	2402 - 2422	13.0	0.6	2.0	15.6
WLAN 802.11g	2402 - 2422	10.0	0.6	2.0	12.6
WLAN 802.11a	5735 - 5775	6.0	4.3	3.0	13.3
WLAN 802.11ac	5735 - 5775	2.0	5.8	4.0	11.8

Collocation overview:

Technology \ Active scenario:	1	2	3	4
BT	x		x	x
WLAN 2.4 GHz	x	x		x
WLAN 5.8 GHz		x	x	x

Prediction of MPE limit at given distance - FCC

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

$$S = PG / 4\pi R^2$$

where: S = Power density
 P = Power input to the antenna
 G = Antenna gain
 R = Distance to the center of radiation of the antenna
 PG = Output Power including antenna gain

The table below is excerpted from Table 1 - Limits for Maximum Permissible Exposure (MPE) of FCC-19-126A1 "Limits for General Population/Uncontrolled Exposure"

Frequency Range (MHz)	Power Density (mW/cm ²)	Averaging Time (minutes)
300 -1500	f/1500	30
1500 – 3 000 000	1.0	30

where f = Frequency (MHz)

Prediction: worst case

Technologies:		BT	WLAN 2.4	WLAN 5.8	
	Frequency (MHz)	2402	2402	5735	
PG	Declared max power (EIRP)	3.6	15.6	13.3	dBm
R	Distance	20	20	20	cm
S	MPE limit for uncontrolled exposure	1	1	1	mW/cm ²
	Calculated Power density:	0.0005	0.0072	0.0043	mW/cm ²
	Calculated percentage of Limit:	0.05%	0.72%	0.43%	
Collocation:					
	Scenario 1: BT + WLAN 2.4 MHz Calculated percentage of Limit:	0.77%			
	Scenario 2: BT + WLAN 5GHz Calculated percentage of Limit:	0.47%			
	Scenario 3: BT + WLAN 2.4 + WLAN 5 GHz Calculated percentage of Limit:	1.19%			

This prediction demonstrates the following:

The power density levels for FCC at a distance of 20 cm are below the maximum levels allowed by regulations.

Prediction of MPE limit at given distance - ISED

RSS-102, Issue 5, 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 $1.31 \times 10^{-2} f^{0.6834} W$ (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

Prediction: worst case

		BT 2402 MHz	WLAN 2402 MHz	WLAN 5.7 GHz	
	Frequency	2402	2402	5735	MHz
R	Distance	20	20	20	cm
P	Max power input to the antenna	3	15	9	dBm
G	Antenna gain	0.6	0.6	4.3	dBi
PG	Maximum EIRP	3.6	15.6	13.3	dBm
PG	Maximum EIRP	2.3	36.3	21.4	mW
	Exclusion Limit from above:	2.68	2.68	4.85	W
	Calculated percentage of Limit:	0.09	1.36	0.44	%
Collocation:					
	Scenario 1: BT + WLAN 2.4 MHz Calculated percentage of Limit:	1.44			%
	Scenario 2: BT + WLAN 5 GHz Calculated percentage of Limit:	1.80			%
	Scenario 3: BT + WLAN 2.4 + WLAN 5 GHz Calculated percentage of Limit:	1.88			%

Conclusion: RF exposure evaluation is not required.