

## RF Exposure / RF Technical Brief

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ATTN: Reviewing Engineer

### ***RF exposure analysis for the equipment MAZDA\_GEN\_65\_CMU (FCC ID: CB262932; IC: 279B-62932)***

**1. Introduction:**

The device **MAZDA\_GEN\_65\_CMU** (FCC ID: **CB262932**; IC: **279B-62932**) is a device designed to be installed in cars. This device is to be used only for mobile applications.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all the persons and must not be co-located or operating in conjunction with any other antenna or transmitter except as under the conditions described KDB 447498 D01 General RF Exposure Guidance.

**2. MPE limits:**

The table below is excerpted from RSS-102, Issue 4, 4.2, titled "RF Limits for Devices used by the General Public":

Frequency Range (MHz)	Power density (W/m <sup>2</sup> )	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
300 – 1500	f (MHz)/150	f (MHz) /1500	6
1500 – 15000	10	1.0	6

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
300 – 1500	f (MHz) /1500	30
1500 – 100.000	1.0	30

**3. Compliance criteria:**

Power density of individual transmitters is calculated using the equation:

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

where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)  
 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)

**3.1. Standalone compliance criteria:**

Power density must be lower than the MPE limits stated in item 2.

**3.2. Simultaneous transmission compliance criteria**

Simultaneous operation over Bluetooth and WiFi radio interfaces is not possible.

## 4. Compliance calculations:

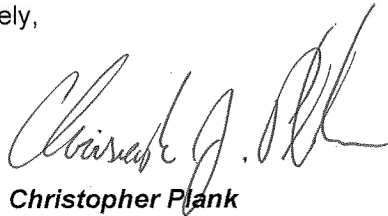
## 4.1. Standalone transmission – Bluetooth RF interface

Frequency band (MHz)	Frequency range (MHz)	Mode	Conducted output power (dBm)	Antenna gain (dBi)	Total power (W)	Duty Cycle (%)	Evaluation distance (cm)	Power Density (mW/cm <sup>2</sup> )	FCC-IC MPE limit (mW/cm <sup>2</sup> )	COMPLIANCE
2400-2483,5	2402-2480	Bluetooth Basic Rate	3,53	0,39	0,002	100%	20	0,000	1,00	COMPLIANT
2400-2483,5	2402-2480	Bluetooth EDR	5,81	0,39	0,004	100%	20	0,001	1,00	COMPLIANT

## 4.2. Standalone transmission – WiFi RF interface

Frequency band (MHz)	Frequency range (MHz)	Mode	Conducted output power (dBm)	Antenna gain (dBi)	Total power (W)	Duty Cycle (%)	Evaluation distance (cm)	Power Density (mW/cm <sup>2</sup> )	FCC-IC MPE limit (mW/cm <sup>2</sup> )	COMPLIANCE
2400-2483,5	2412 - 2462	802.11b	17,44	0,39	0,061	100%	20	0,012	1,00	COMPLIANT
2400-2483,5	2412 - 2462	802.11g	16,22	0,39	0,046	100%	20	0,009	1,00	COMPLIANT
2400-2483,5	2412 - 2462	802.11n - 20	15,28	0,39	0,037	100%	20	0,007	1,00	COMPLIANT

Sincerely,



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