

## Bluetooth Antenna Characteristics

### Bluetooth Service

The supported Bluetooth is 4.2 core version, being this an interface intended to provide connectivity with devices brought into the vehicle by the vehicle user.

Table 11 – Bluetooth Antenna Characteristics

|                     | Comments                                            | Min.          | Typ. | Max.       |
|---------------------|-----------------------------------------------------|---------------|------|------------|
| Mode                |                                                     | Bluetooth 4.1 |      |            |
| Frequency Range     |                                                     | 2402 [MHz]    | --   | 2480 [MHz] |
| Output Power        | Effective Isotropic Radiated Power (EIRP)           |               |      |            |
| Antenna Gain        | Peak Gain of Internal Antenna                       | --            | --   | 2.3 [dBi]  |
| Bandwidth           |                                                     | --            | 1MHz | --         |
| Modulation          | GFSK (1 Mbps) , n/4 DQPSK (2 Mbps), 8 DPSK (3 Mbps) |               |      |            |
| Distance to Persons |                                                     | >20cm         | --   | --         |

In Table 12 are present the pre-certifications existing for the Bluetooth used in the REM platform.

T

## Phone / Bluetooth Capabilities

Using the Bluetooth Infotainment capability of REM to connect to Phone or Smartphone it is possible to use the following capabilities:

- Via Bluetooth Hands-free profile is possible to perform:
  - Number dialing;
  - Multiparty calls / conference calls;
  - Access Address book (up to 2000 contacts);
  - Access call stacks (outgoing calls, received calls, missed calls);
- Connecting user's mobile phone / media player via Bluetooth A2DP/AVRCP profile it is possible to perform:
  - Stereo audio streaming from mobile device;
  - Controlling remote device (play, pause, stop, skip);
  - Display of meta data (title, artist, album, etc.);
- Two different Bluetooth devices can be connected simultaneously (one phone and one media player)
- One microphone supported

## Internal Antenna

REM platform uses two internal antennas for Bluetooth. The antenna can work with 2.4GHz (Bluetooth) and the antenna specifications are presented in Table 13.

**Table 13 – Internal Antenna Electrical Specifications**

|                                        |             |
|----------------------------------------|-------------|
| <b>Frequency Range [MHz]</b>           | 2400 ~ 2485 |
| <b>VSWR</b>                            | Max 3.0 : 1 |
| <b>Avg. Gain [dBi]</b>                 | -0.6        |
| <b>Efficiency [%]</b>                  | 84          |
| <b>Polarization</b>                    | Linear      |
| <b>Impedance [<math>\Omega</math>]</b> | 50 $\Omega$ |

Maximum antenna gain was measured when placed in the REM Unit,