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## MOJIX Response to TCB Questions

1) Please provide Maximum Permissible Exposure (MPE) RF safety calculations.

### **RF Exposure Compliance Requirements**

Spread spectrum transmitters operating under Section 15.247 are categorically excluded from routine environmental evaluation for demonstrating RF exposure compliance with respect to MPE and/or SAR limits. These devices are not exempted from compliance. As indicated in Section 15.247(b)(4), these transmitters are required to operate in a manner that ensures that exposure to the public (users and nearby persons) does not exceed the Commission's RF exposure guidelines (see Sections 1.1307, 2.1091 and 2.1093). Unless a device operates at substantially low output power levels, with a low gain antenna(s), supporting information is generally needed to establish the various potential operating configurations and exposure conditions of a transmitter and its antenna(s), in order to determine compliance with the RF exposure guidelines. In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed: (1) calculations that estimate the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits (defined for free-space), (2) antenna installation and device operating instructions for installers (professional and/or unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirements, (3) any caution statements and/or warning labels that are necessary in order for a device to comply with the exposure limits, and (4) any other RF exposure related issues that may affect MPE compliance.

### **Mojix Response**

EUT is a “mobile” device and will be installed on fixed locations. EUT uses a fixed 6 dBi gain antenna, and the maximum output power from the EUT is +30 dBm.

The MPE estimate from 1.1310 Table 1 is:  
3.006 mW/cm<sup>2</sup> at 902 MHz.

Using the power density formula

$$PD = (G \cdot P) / 4\pi R^2$$

Where G = Transmit Antenna Gain = 6 dBi = 4

P = Maximum Transmit Power = 30 dBm = 1000 mW

PD = Power Density = 3.006 mW/cm<sup>2</sup> (maximum permitted level)

Using 3.006 limit as PD and solving for R

$R = 10.29$  cm (minimum distance for MPE)

Therefore, the following warning will be included in User Manual:

“CAUTION: To comply with FCC RF exposure compliance requirements, a separation distance of 20 cm must be maintained between the antenna of this device and all persons.”

2) Attached is the sample label that will be used with the FCC identifier preceded by “FCC ID:” and the verbiage in section 15.19(a)(3) as well as the location of where it will be placed on devices.

3) Please provide the type of modulation employed by the device.

**Mojix Response**

EUT uses DSB-ASK, PR-ASK and SSB-ASK modulations, to modulate the carrier frequency.

4) Attached is the block diagram of the device, as per section 2.1033(a)(5).

5) Are the four RF output ports identical? During normal operation of the device, are the four RF output ports ever operated simultaneously, or are they operated successively?

**Mojix Response**

The four RF output ports of the 4-port eNode are identical. They are all outputs of a single 1:4 switch (AS221-306LF). During normal operation of the device, the four RF output ports do not operate simultaneously. The 4-port eNode is guaranteed to operate successively since the output switch can only switch to one possible output at a time.

6) Does the RF output of the device always remain constant, or will it vary in relation to the RF input?

**Mojix Response**

The RF output of the device will remain constant. The input RF level is always level corrected to meet the maximum radiated power requirements, before being radiated by the antenna.

7) Attached is a signed letter stating that the modifications done during testing will be implemented into all production models.

8) =====The operational description must describe in more detail how the device operates.

**9a):**

Describe how the EUT meets the definition of a frequency hopping spread spectrum system, found in Section 2.1, based on the technical description. *Definition of Frequency Hopping Systems per FCC Rules sec. 2.1*

A spread spectrum system in which the carrier is modulated with the coded information in a conventional manner causing a conventional spreading of the RF energy about the frequency carrier. The frequency of the carrier is not fixed but changes at fixed intervals under direction of a coded sequence. The wide RF bandwidth needed by such a system is not required by spreading of the RF energy about the carrier but rather to accommodate the range of frequencies