

## **Exhibit 2 – General Information**

### **Motorola Head-end Transceiver (HUB)**

FCC ID: MIJMILHUB-USA-01

Millitech Part No. 9031291001

## **2.0 General Information**

### **2.1 *Production Plans***

Quantity production is planned.

### **2.2 *Application References***

Pursuant 2.1061 reference is made to the following Motorola “Application References on file with the Commission:

None

### **2.3 *Data Submittal Procedure***

Data is supplied in accordance with Part 2, Sub-part J of the Commission’s rules. The standards used on measurements supplied is section 47 CFR Part 101 Subpart C.

### **2.4 *Similar Applications***

None.

### **2.5 *Types of Emissions***

The HUB transmits two signals. A Data signal and a Pilot tone. The Pilot tone is used to phase lock the local oscillator of the CPE to the HUB 100 MHz internal crystal oscillator.

The pertinent emission designator for the HUB Pilot Signal is 10M0F1D, as explained in paragraph 2.6 of this exhibit. Actual measurements of Occupied Bandwidth are shown in Exhibit 9.

The HUB itself does not modulate the Data signal. Modulation necessary to support the LMDS link is performed by equipment external to the HUB. An emission designator has been determined based on a standard Data Over Cable Service Interface Specifications (DOCSIS) signal that will be present at the input to the HUB.

The pertinent emission designator for the HUB Data Signal is 6M00D1D, as explained in paragraph 2.9 of this exhibit. Actual measurements of Occupied Bandwidth are shown in Exhibit 9.

Spurious Emissions (Radiated) are also reported in Exhibit 9.

## **2.6 Frequency Range**

The HUB employs two frequencies in the 27.5 to 28.35 GHz frequency band. The HUB Pilot frequency is 27.644 GHz and the HUB data frequency is 28.143 GHz.

Frequency stability versus temperature and voltage measurements are shown in Exhibit 9.

## **2.7 Maximum Output Power**

The Hub Data transmitter output power is +24dBm typical at room temperature. The Hub Pilot transmitter output power is also +24dBm typical at room temperature. The specified minimum output power is +22dBm minimum from  $-30^{\circ}$  to  $+50^{\circ}$  C. The HUB Data transmitter is operated at a nominal output power of +18dBm. The HUB Pilot transmitter is operated at its saturated power output (nominal +28dBm).

RF Output Power Measurements are shown in Exhibit 9.

## **2.8 Modulation Techniques**

The HUB Data modulation is as follow:

- 64 QAM
- 5 Megasymbols/sec

The HUB Pilot modulation is as follow:

- FM 10 MHz deviation
- 24.414 kHz modulation frequency

Exhibit 6, Sections 6.3 and 6.5 will provide more details of the modulating circuitry and techniques.

## **2.9 Emission Designator**

### **2.9.1 Emission, Modulation and Transmission Characteristics**

The HUB itself uses no Data modulation techniques. Modulation necessary to support the LMDS link is performed by the equipment external to the CPE. However, based on the DOCIS signal, the Data signal emission designator (6M00D1D) is based on the following:

- D - Emissions in which the main carrier is amplitude and angle-modulated either simultaneously or in a pre-established sequence
- 1 - A single channel containing quantized or digital information without the use of a modulating subcarrier, excluding time division multiplex
- D - Data transmission, telemetry, telecommand

The Pilot tone is FM modulated by the HUB's internal 100 MHz crystal oscillator divided down to 24.414 kHz. The Pilot signal emission designator (10M0F1D) is based on the following:

- F - Emissions in which the main carrier is amplitude and angle-modulated – frequency modulated
- 1 - A single channel containing quantized or digital information without the use of a modulating subcarrier, excluding time division multiplex
- D - Data transmission, telemetry, telecommand

### **2.9.2 Bandwidth**

The allocated bandwidth for the frequency band in which the HUB operates (27.5 to 28.350 GHz) is 850 MHz.