

Exhibit 9 – Measured Data Index

Motorola Head-end Transceiver (HUB)

FCC ID: MIJMILHUB-USA-01

Millitech Part No. 9031291001

9.0 Measured Data Index

9.1 *RF Output Measured Data*

9.1.1 Transmitter 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° to $+50^{\circ}$ C. The HUB Data transmitter is operated at a nominal output power of +18dBm. The HUB Pilot transmitter is operated at it's saturated power output (nominal +28dBm).

9.1.2 Effective Isotropic Radiated Power

The calculated EIRP based on the saturated output power of the HUB Data is:

$$\begin{aligned}\text{Power (nominal)} &= +18\text{dBm} = -12 \text{ dBw} \\ \text{Antenna Gain} &= 15 \text{ dBi} \\ \text{EIRP} &= -12 + 15 = 3 \text{ dBw}\end{aligned}$$

The calculated EIRP based on the saturated output power of the HUB Pilot is:

$$\begin{aligned}\text{Power (sat.)} &= +28\text{dBm} = -2 \text{ dBw} \\ \text{Antenna Gain} &= 15 \text{ dBi} \\ \text{EIRP} &= -2 + 15 = 13 \text{ dBw}\end{aligned}$$

9.2 Occupied Bandwidth Graphs

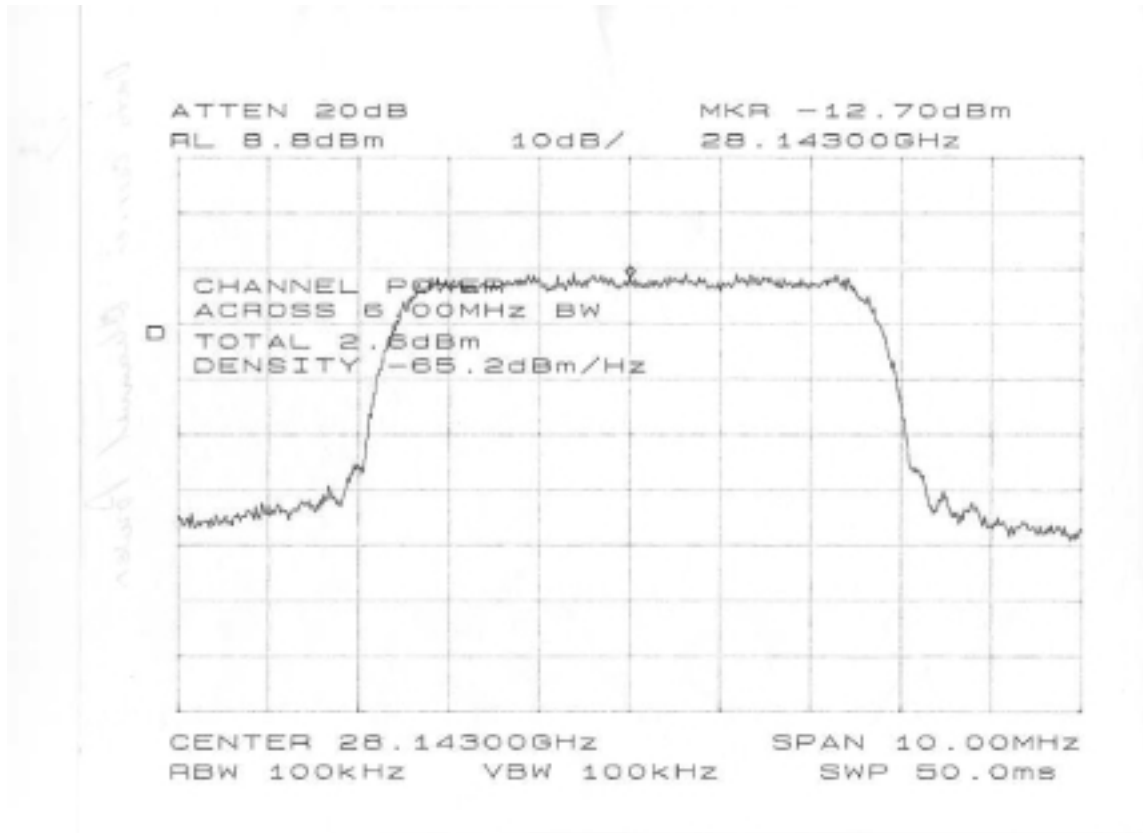


Figure 9.2-1 HUB Data Occupied Bandwidth Graph

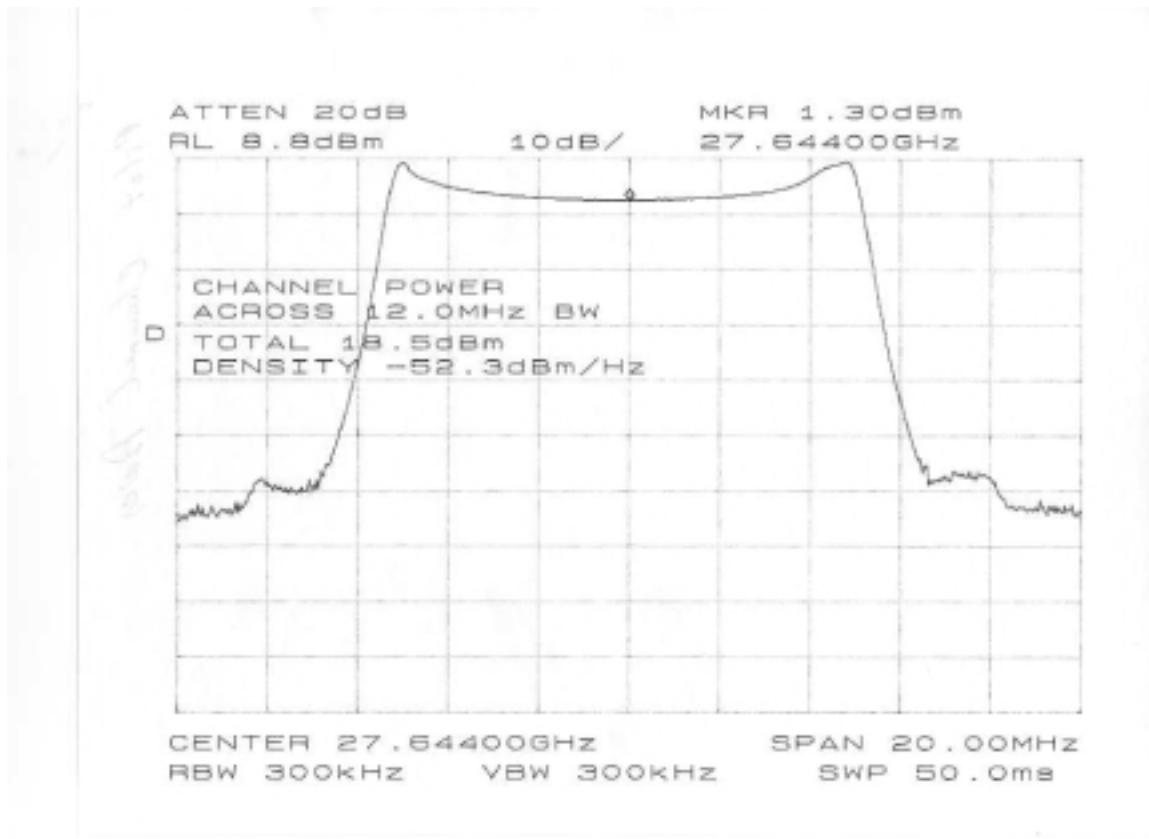


Figure 9.2-2 HUB Pilot Occupied Bandwidth Graph

9.3 FCC Radiated Spurious Emissions Graphs

Emission Frequency (GHz)	Received Power Level (dBm)	Measurement Bandwidth	Cable Loss * (dB)	Antenna Factor (dB)	Radiated Emission Level (dB μ V/m)	Limit Level (dB μ V/m)	Comments
28.143	94.3	1 MHz	6	35.6	135.9	n/a	HUB Data Carrier
56.286	40.6	4 kHz	1	41.3	82.9	104.9	2nd Harmonic

* Cable loss above 40 GHz is for external mixer IF (221MHz) cable loss.
 ** All other emissions greater than 20 dB below the specification were not reported
 *** Spectrum search performed from 30 MHz to 100GHz

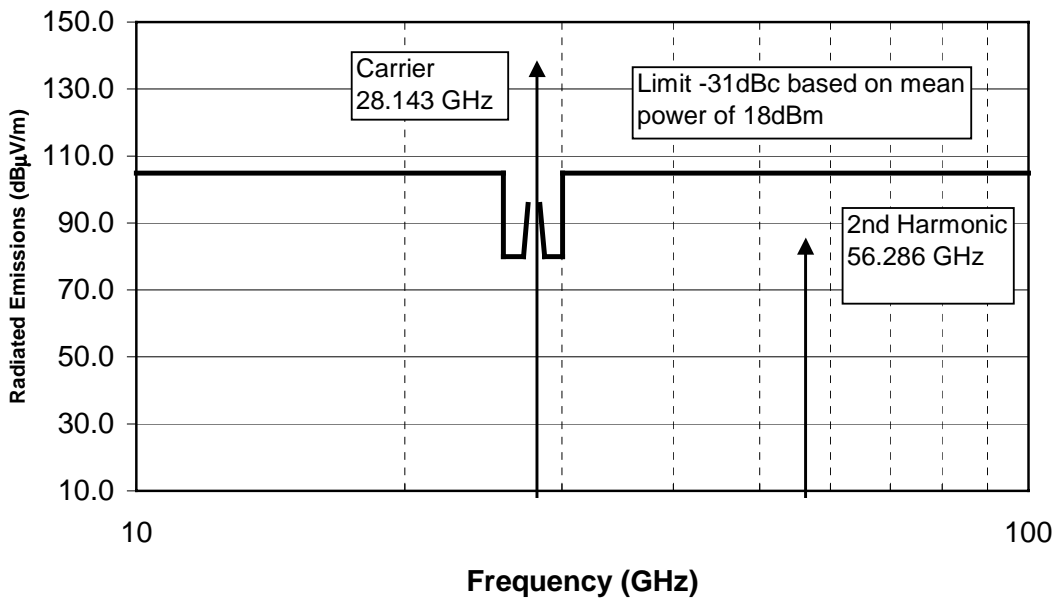


Figure 9.3-1 HUB Data radiated harmonic emissions

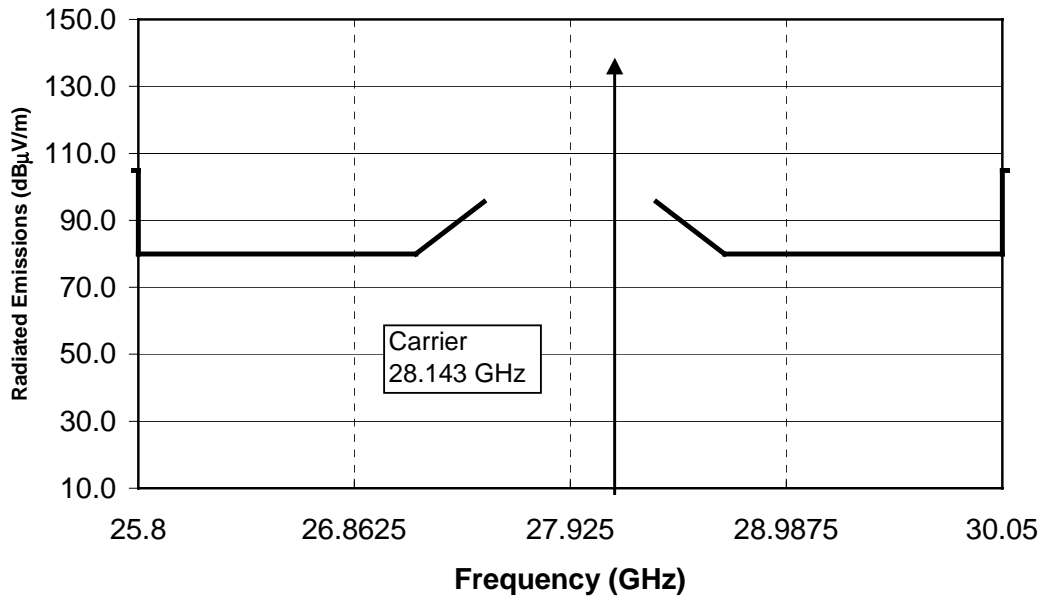


Figure 9.3-2 HUB Data radiated emissions (expanded view)

Emission Frequency (GHz)	Received Power Level (dBm)	Measurement Bandwidth	Cable Loss * (dB)	Antenna Factor (dB)	Radiated Emission Level (dB μ V/m)	Limit Level (dB μ V/m)	Comments
27.644	115.8	1 MHz	5	35.5	156.3	n/a	HUB Pilot Carrier
55.288	52.3	4 kHz	4	41.2	97.5	115.3	2nd Harmonic
82.932	40.5	4 kHz	1	46.3	87.8	115.3	3rd Harmonic

* Cable loss above 40 GHz is for external mixer IF (221MHz) cable loss.
 ** All other emissions greater than 20 dB below the specification were not reported
 *** Spectrum search performed from 30 MHz to 100 GHz

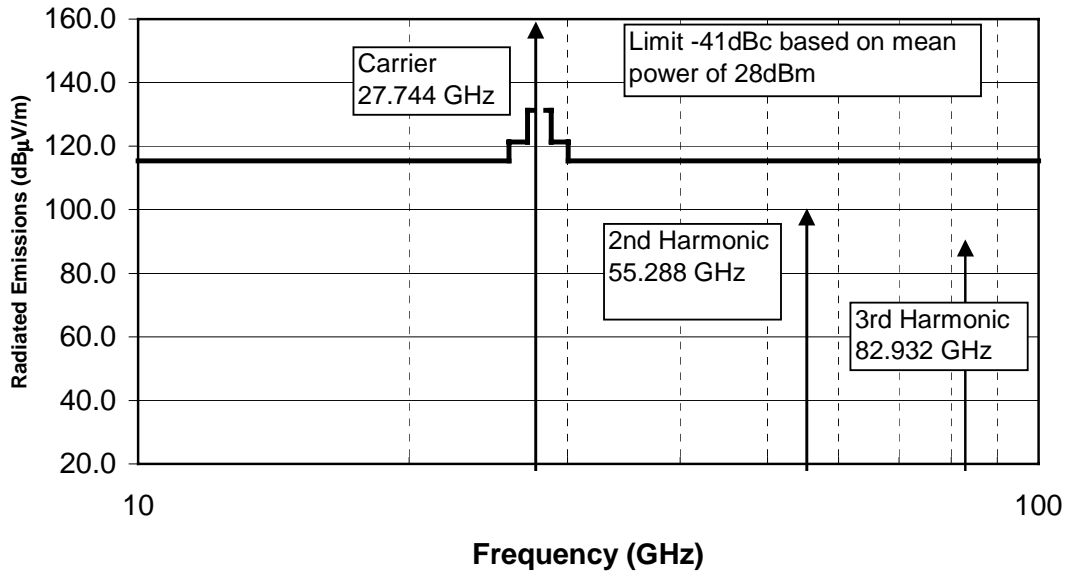


Figure 9.3-3 HUB Pilot radiated harmonic emissions

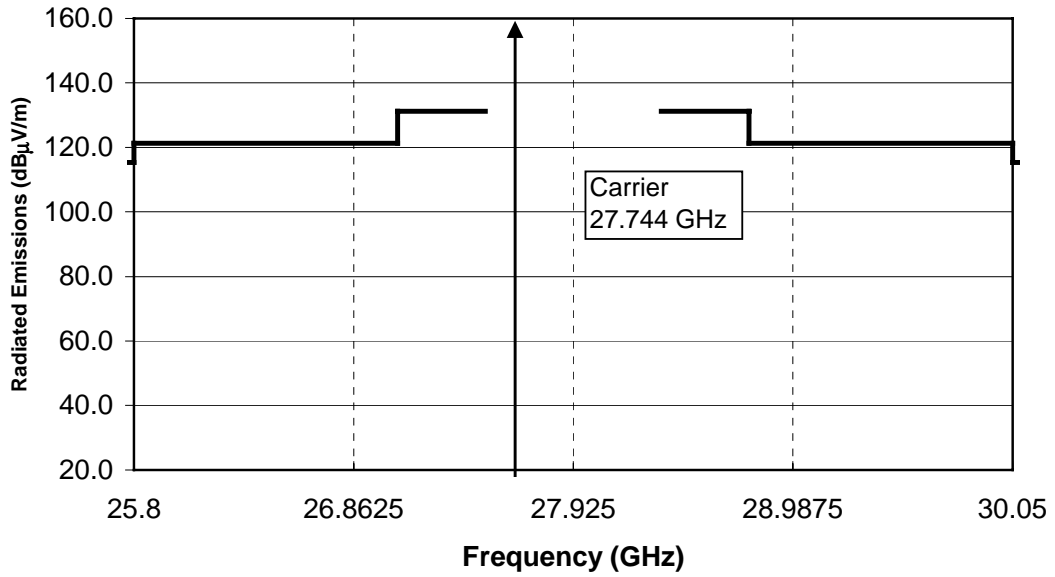


Figure 9.3-4 HUB Pilot radiated emissions (expanded view)

9.4 Frequency Stability vs Temperature

The crystal oscillator manufacturer (Wenzel) did supply frequency error data for 20 sample oscillators tested at -40C and +65C. Their test spec is +/-1ppm (See Figure 9.4-1). The worst unit had an error of only .218ppm at -40C. The frequency error allowed is .001%, or 275kHz for a carrier at 27.5GHz and 313kHz for a carrier at 31.3GHz. The frequency error from the Hub will be proportional to the reference oscillator error and the total frequency conversion from IF to RF. Worst case conversion would be 31.065 GHz (11MHz to 31076MHz). At that point if there was a total error of 2ppm, we would see a carrier frequency error of only 62kHz

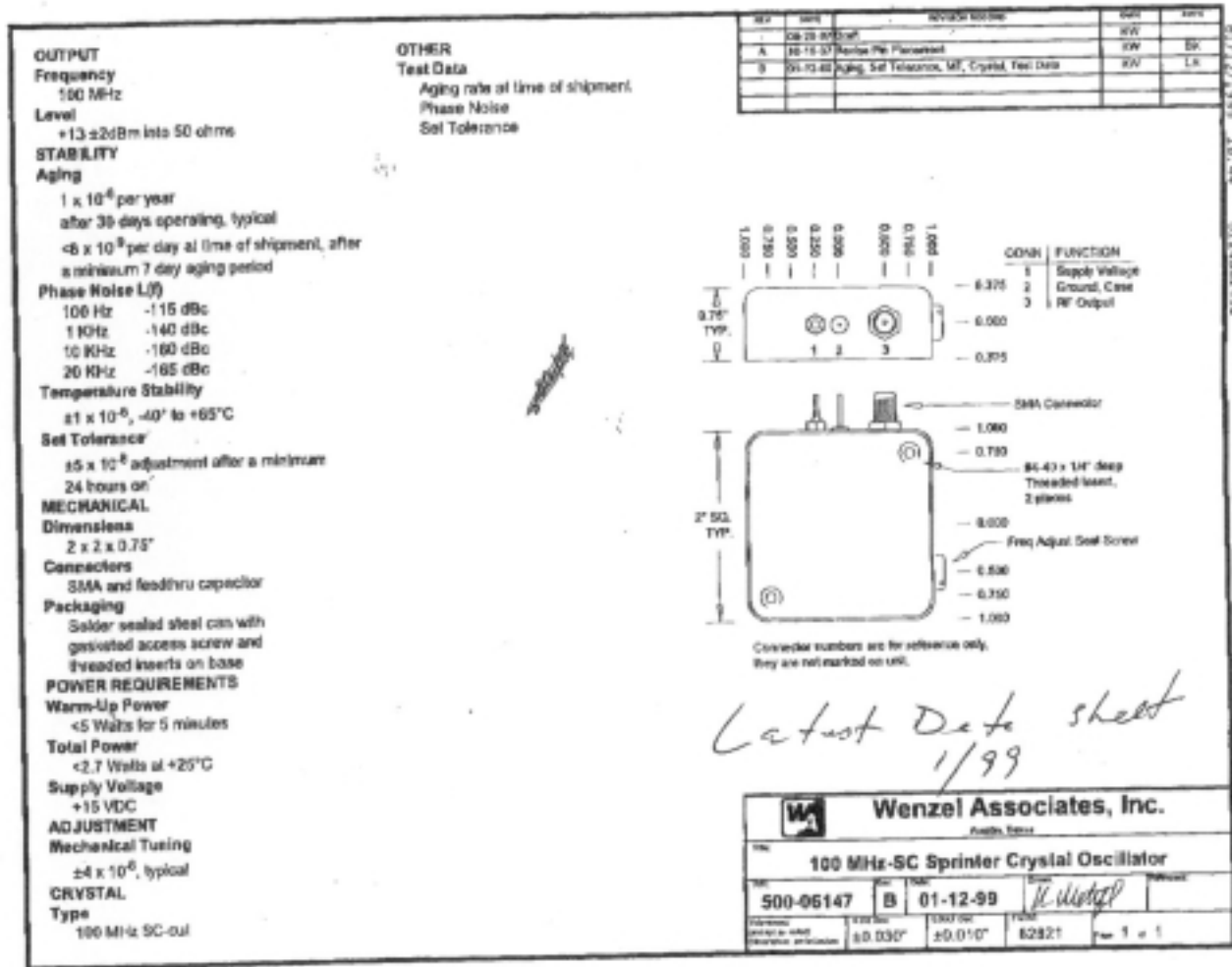


Figure 9.4-1 Crystal Oscillator Data Sheet

9.5 *Frequency Stability vs Voltage*

The DC/DC Regulators (JW series) within the Hub are guaranteed from 36 to 75 Vdc input. This is well within the +/-20% spec on the Hub input power . The output regulation on these power supplies is guaranteed to be better than 0.4% as load varies from min to max, and an additional 1% over the operating temperature range of -40C to +100C. So the worst case variation on the voltage to the 100MHz oscillator is about 1.4%. This compares to the voltage input required for the 100MHz oscillator which is specified as +/-10% (According to Wenzel, the oscillator manufacturer). From this information it appears there will be very little frequency error due to voltage variation.