RF Exposure Statement

Requirement:
According to CFR 15 §1.1307 (b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

SAR Testing:
The continuously transmitted conducted output power under normal worst-case operation of both the EUT and it's associated transceiver are +15 dBm, however neither device under normal operation transmits data with 100% on time. As measured below, the combined worst-case duty cycle detected with both devices operating normally was 52.8% in any given 100 ms window, with an average of 7.6% over all 100 ms windows collected. This presents a worst-case duty of -2.77 dB in a 100 ms window, and a conducted EIRP of 15 dBm – 2.77 dB = 12.23 dBm, or 16.7 mW which is less than 60/f(GHz) mW or 24.19 mW for d<2.5 cm (general population category). Please note this is worst-case conducted in a 100 ms window, and not the EUT radiated EIRP, which far lower. Both devices operate over a common radio channel and share that channel, so coherent power addition is not a concern. Per below, SAR measurements are not necessary.

Health Hazard:
The following table summarizes the power density at a distance of 20 cm as calculated from FCC OET Bulletin 65.

Potential Health Hazard Radiation Level

EUT	Ant.Gain (dBi)*	Po** (dBm)	Duty Cycle*** (dB)	EIRP**** (dBm)	EIRP**** (mW)	S_{20cm} (mW/cm^2)
BK8000RX	-15.1	15.0	-2.77	12.23	16.7	0.0033
BK8000TX	-14.6	15.0	-2.77	12.23	16.7	0.0033

*Gain value computed in associated test report(s).

** Conducted power output measured directly from radio output - manufacturer specified worst case is 15.0 dBm.

*** Duty is measured for both the DSS video receiver and DSS video transmitter in two modes, 1) SEARCH MODE where the associated transceiver is not present (too far away or turned off) and FUNCTIONING MODE where the DSS transmitter is sending video data (at full rate) to the DSS receiver. Duty is measured using a wide band crystal detector and high speed oscilloscope. Both peak and averaged data (over more than 500 sweeps) is provided. Duty cycle is computed only from the worst-case inverted data as shown in Figure 2, on the following page. Figure 1 data is presented to show this is the worst-case scenario.

****Note: EIRP employed is the greater of the average conducted output power and the EIRP.

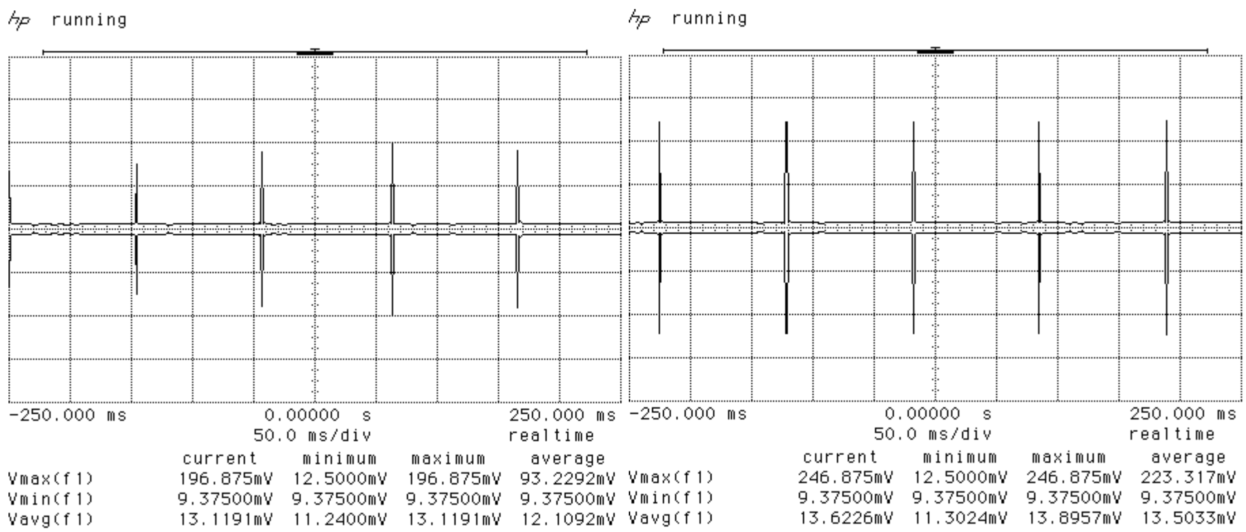

Figure 1. SEARCH Mode Duty Cycle (average values computed over >500 sweeps).
(left) DSS Video Receiver Only (BK8000RX), (right) DSS Video Transmitter Only (BK8000TX)

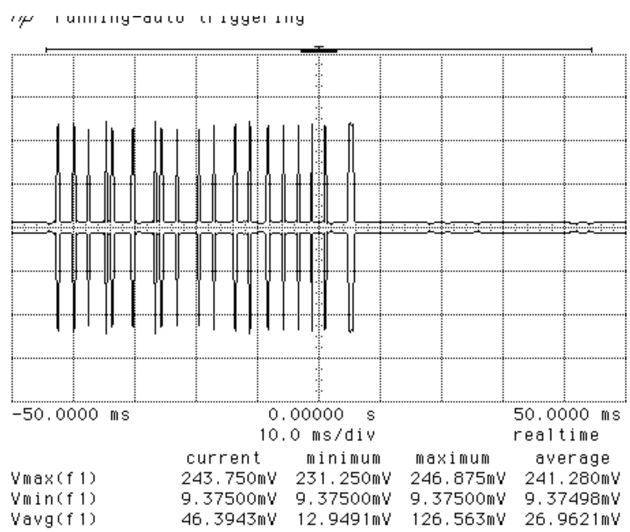

Figure 2. FUNCTIONING Mode Duty Cycle (average values computed over >500 sweeps).
WORST CASE DSS Video Transmitter + Receiver (BK8000TX+ BK8000RX)

Average duty cycle over all samples:
Duty Cycle(AVG) = (26.9621 mV – 9.37498 mV) / (241.280 mV – 9.37498 mV) = 0.0758 = -11.2 dB

Maximum duty cycle in any given 100 ms window over all samples:
Duty Cycle(WORST) = (126.563 mV – 9.3750 mV) / (231.250 mV – 9.3750 mV) = 0.528 = -2.77 dB

The following equations were used in calculating duty cycle and power density (S).

Duty Cycle(AVG) = (Vavg – Vmin) / (Vmax – Vmin) = x, 10 log(x) = Power Duty (dB)

$$EIRP(mW) = Po(mW) \cdot 10^{\frac{Gain(dB)}{10}}$$

$$S(mW/cm^2) = \frac{EIRP(mW)}{4 \cdot \Pi \cdot R(cm)^2}$$, R = 20 cm