SAHARA R50-TO-R25 PRODUCT CIRCUIT CHANGES REQUIRING FCC CLASS II PERMISSIVE FILING

- Power management architecture for improved thermal operation and higher maximum operating voltage (see Figures 1 and 2). Transmit spurs can be observed at ± 500 kHz offsets from the carrier. These spurs are due to the AM-to-PM conversion of the switching regulator's voltage ripple present at the supply connections of the transmitter power amplifier U770. U770 is a 3-stage amplifier IC.

  Details: Replaced 4.5 V linear regulators U230 and U240 with one (1) 4.5 V switching regulator (U240). A 4.3 V linear regulator (U230) was added to the output of U240 for cleaner supply to critical RF stages. Also includes changes to the regulators' application circuitry (pass transistors, bias resistors, capacitors, and inductors).

  For the R50 product, all three stages of U770 were supplied DC current by the 4.5 V linear regulator U240. For the R25 product, the first two stages of U770 are supplied DC current by the 4.3 V linear regulator U230 to reduce spur generation, as these are DC supply-ripple sensitive stages. The third stage of U770 is supplied DC current by the 4.5 V switching regulator U240 since this stage is less sensitive to DC supply ripple and requires significantly more DC current than the first two stages of U770 (efficiency and thermal design requirement).

- Higher linearity PIN diodes used in antenna switch for improved receiver 1st image rejection. These diodes are also used for transmit function of the antenna switch. Since these diodes are higher linearity devices than used on the R50 product, improved transmitter harmonic performance is achieved.

  Details: PIN diodes CR830 and CR831 changed to higher linearity devices. Also includes changes to parasitic tuning capacitors and inductors.

- Tuned antenna switch harmonic filter for improved transmitter 2nd harmonic rejection. This was not required; Re-tuned only as a transmitter performance enhancement.

  Details: C836 capacitance was changed from 1.2 pF to 1.3 pF.

See Figures 3, 4, and 5 for transmitter spectral performance that was affected.

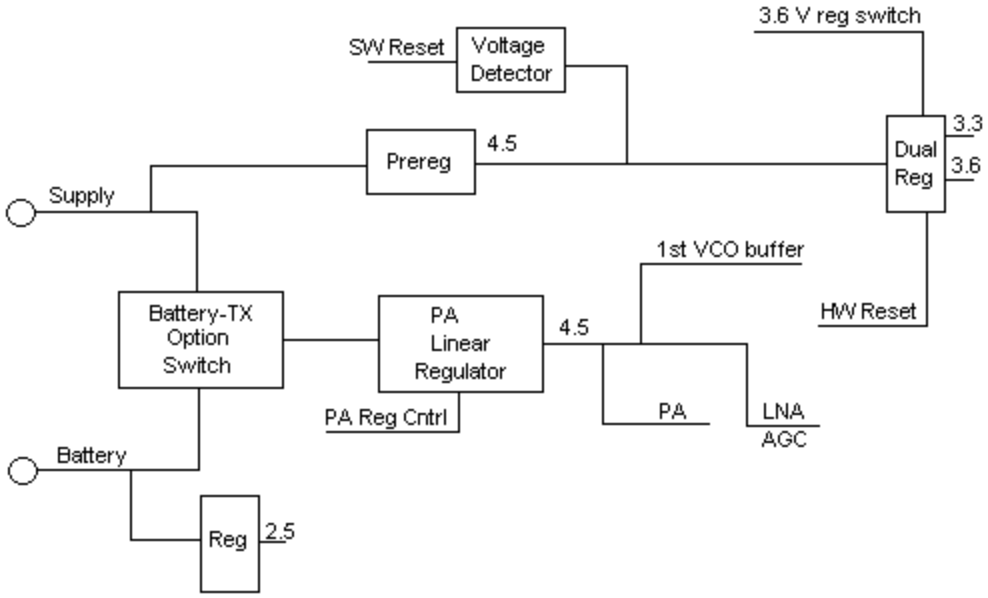

Figure 1. ReFLEX 50 Power Management

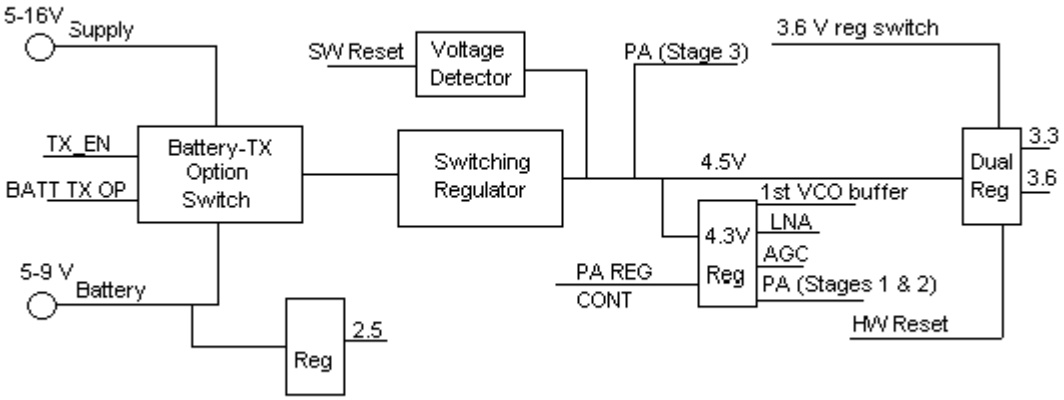

Figure 2. ReFLEX 25 Power Management

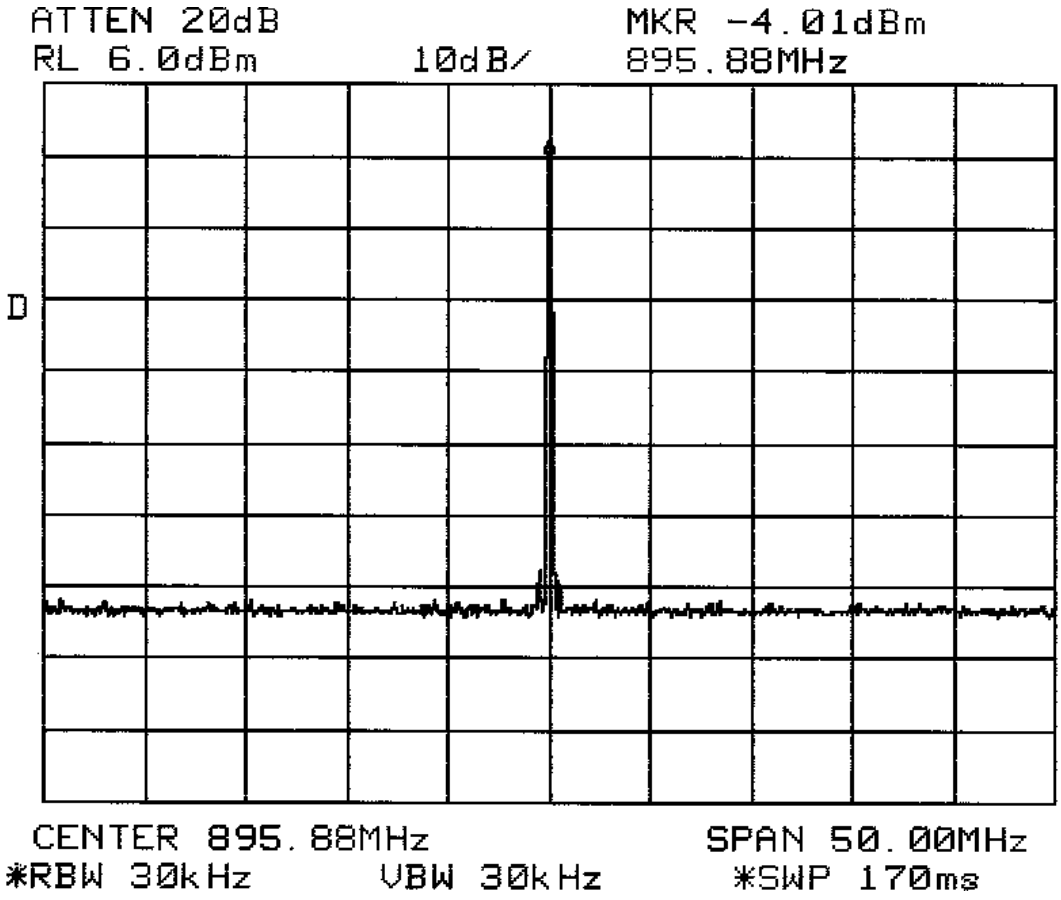

Figure 3. Spurious Emissions at Antenna Terminals: Carrier Frequency at ± 25 MHz (HP 8594E Spectrum Analyzer)

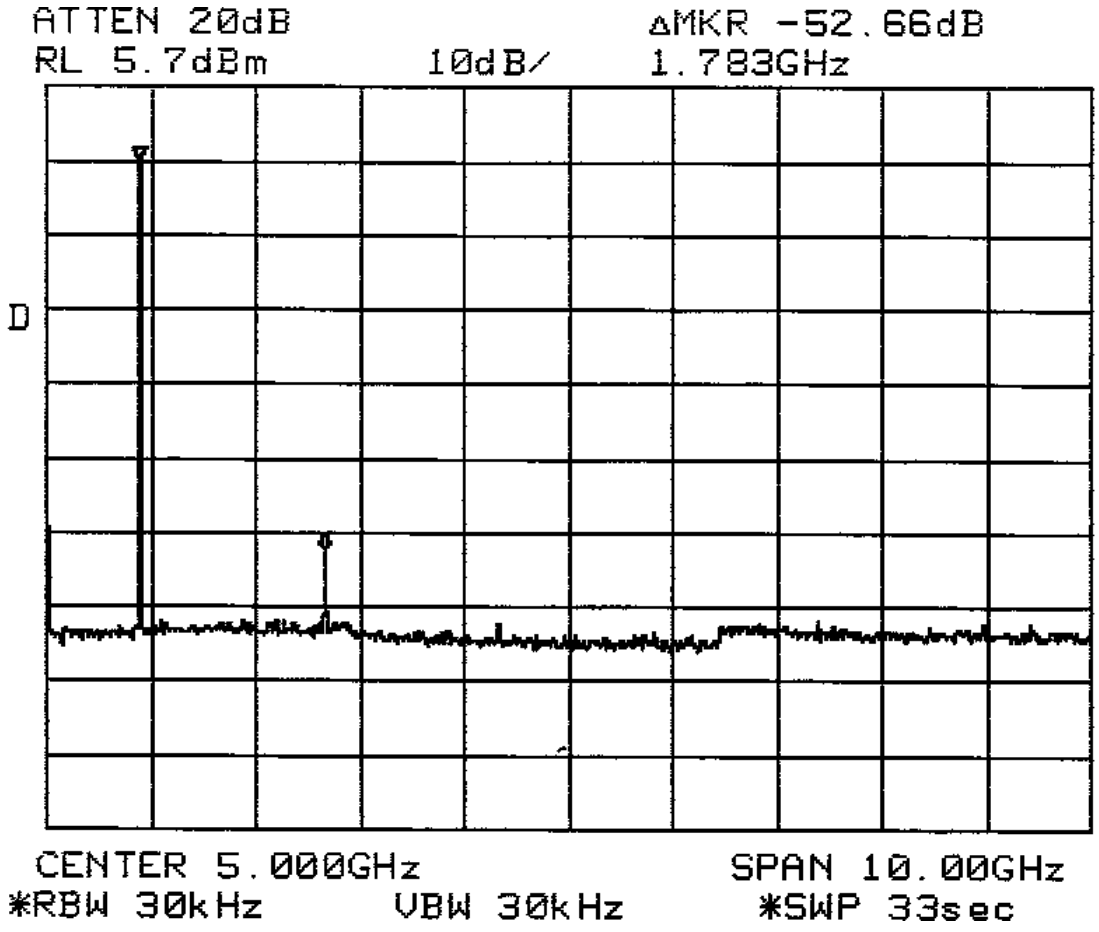

Figure 4. Spurious Emissions at Antenna Terminals: Frequency = 0 to 10 GHz (HP 8594E Spectrum Analyzer)

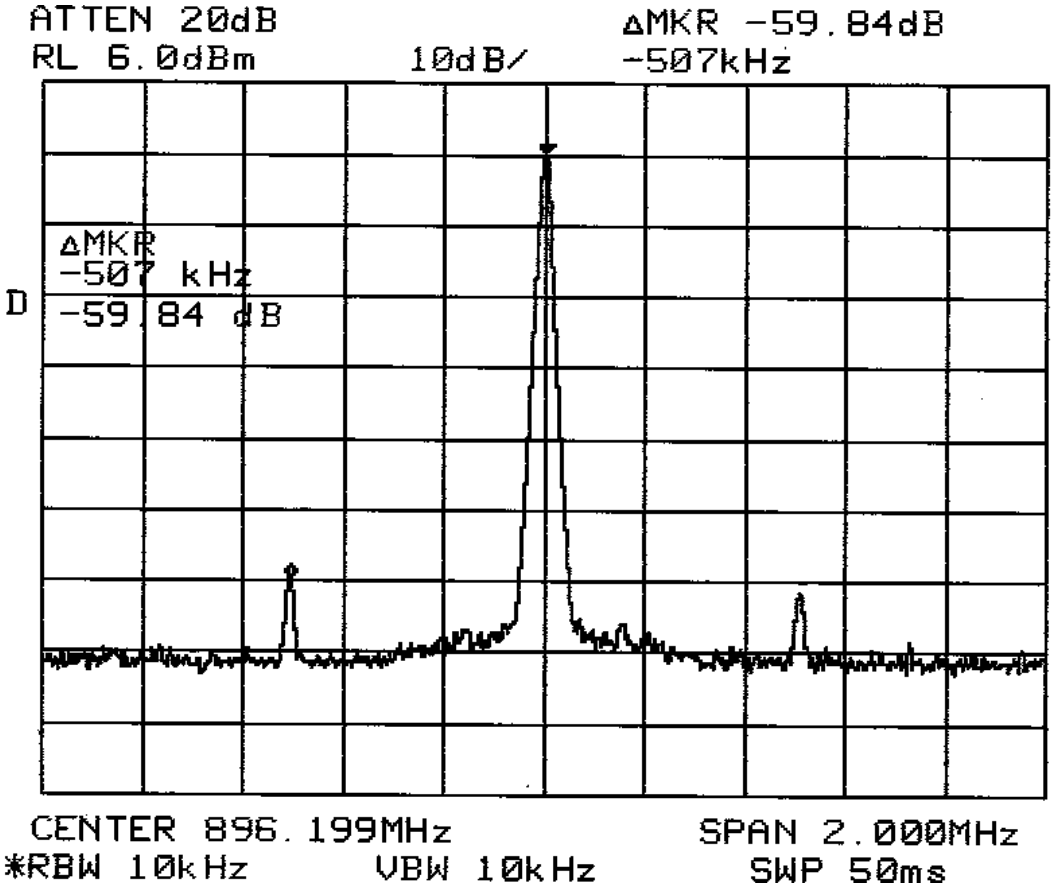

Figure 5. Spurious Emissions at Antenna Terminals: Carrier Frequency at ± 1 MHz (HP 8594E Spectrum Analyzer)