

Proxim Model 8455
WideBand Top-Hat Antenna Linearity Analysis
8/19/02

Antenna tested: Small Scale WideBand Top-Hat Antenna, PN: C35-301, as mounted on a Proxim 8455 IEEE802.11a Wireless LAN adapter operating at: 5.15-5.35GHz, 5.725-5.85GHz.

Objective: To demonstrate in brief that radiation from the WB antenna is linear in the range of 50mW to 300mW.

Antenna Construction: The WB antenna is a sheet metal stamped structure, solder attached to a printed transformer. Given the construction and comparisons to previously characterized antennas and simulations of similar structure, maximum power ratings are expected to exceed 1W CW before linearity is compromised. This analysis range is well within half of this theoretical maximum.

Transmitter: The transmitter is an OFDM 5GHz radio, step controlled and linearized using internal calibration registers.

Measurement methods: Both measurement sets were taken as peak measurements through an external LNA (in the linear region) connected to a spectrum analyzer. For ease of comparison, scaling was accomplished using adjustable attenuation on the conducted measurements so that both radiated and conducted measurements were taken in the same range (+/-2dB worst case) on the spectrum analyzer, centered and normalized at the conducted power output (measured at an on-board connector) of 20.66dBm. The receiver antenna is a commercially available half-wave dipole tuned for the test frequency. Max power for the dipole is 10W

Conclusions: Though the entire curve is reasonably linear, the linear trend observed is the most critical piece of information in this analysis, demonstrating a predictable, linear relationship between the power into the antenna vs. what is actually radiated. In particular, in the range of 100mW to 126mW (20dBm to 21dBm) is sufficiently well behaved, following the general trend of linearity.

WideBand 5GHz Top-Hat

