

Poor Antenna Efficiency Indicators

Tech Talk 3/31/2025

- 1.) Is the antenna very small in wavelength size, perhaps much less than a $\frac{1}{4}$ wavelength on the lowest frequency, with a very wide smooth continuous bandwidth?

Example 1 Alpha DuoPole <https://www.alphaantenna.com/product/hf-military-vertical-dipole-antenna/>

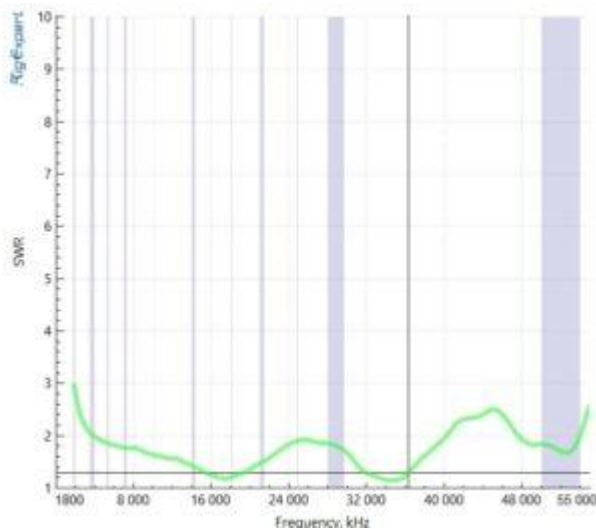


Figure 1 Alpha antenna SWR under 2:1 160-6 meters continuous

Example 2 Comet CHA-250HD https://www.cometantenna.com/product/comet_cha_250hd/

Return Loss and VSWR Data

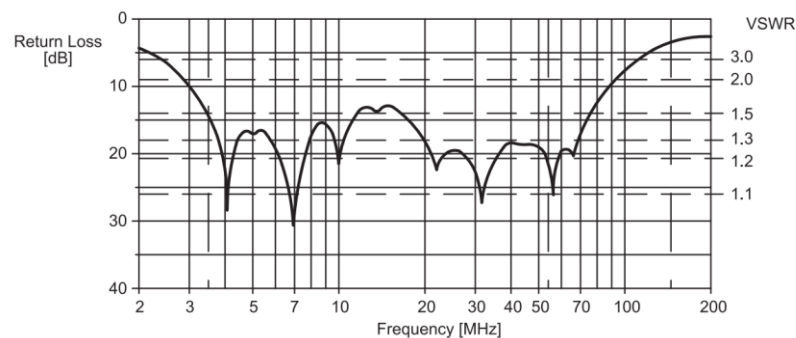


Figure 2 Comet Antenna SWR under 1.5:1 from 3.5 to 80 MHz continuous

- 2.) Does the antenna have a low average power rating when compared to peak power rating, or a power with time rating? This is a sign of heat issues, and antenna heat issues usually relate to lossy parts or systems that waste a lot of transmitter power. Peak power is usually voltage breakdown limited; average is usually heat limited.

Example 1 Alpha DuoPole

“Power Rating: 5W minimum digital input signal required with a maximum input power rating of 30W for Digital Modes. Including but not limited to the MIL-STD-188 M110a digital communications mode that is rated at **25 watts continuous with bursts of 100 watts** digital for up to 1 minute....”

Example 2 Comet CHA-250HD

Specifications

- Freq.Band : Tx / 3.5~57MHz, Rx / 2.0~90MHz
- Antenna Type : Force matching type Ground Plane
- Max Power : 250 W (SSB mode) , 75 W (Digital mode)

- 3.) Meaningless “fluff” in gain or range specs. Meaningless data like DX stations worked, or PSK Reporter or WSPR map results, rather than direct side-by-side signal comparisons or the gain referenced to some known standard antenna.

Example 1 Alpha D

250mW WSPR TX Results (7-30MHz)



Figure 3 Alpha DuoPole WSPR (WSPR is not a communications mode)

Comet CHA-250 no gain or range is given