

W287BG TPO Calculation (BPFT20190506AAX)

Antenna	Gain (dB)
BEXT TFC2K Single Bay (at 105.3 Mhz)	0.457 -3.4
Transmission System parts	Loss (dB)
Main Coax Run 200' ½" LDF4-50A Heliax	1.358
Connector loss – two junctions (top + bot) = 4 connectors	0.20
Bottom Jumper: One 10' RG214	0.23
In rack: Polyphaser Lightning Arrestor IS-50NX-C2	0.10

From Andrew LDF4 loss chart:

Freq.	Attn dB/100 ft
100	0.661
(105.3)	(0.679) <<<
108	0.688

At 105.3 MHz, LDF4-50A Heliax exhibits a loss of 0.679 dB/100ft.

Total LDF4-50A Loss: $.679 * 200 / 100 = 1.358$ dB

RG214 loss is 2.3 dB/100ft (assume 0.23 dB loss per 10' jumper at 105.3 MHz)

Transmission Systems Loss: LDF4 + 4 connectors + RG214 jumper + polyphaser

$$1.358 + .20 + .23 + .1 = 1.888 \text{ dB}$$

Licensed ERP = 73 W

Power at antenna needed to achieve 73 W: $73 / .457 = 159.7$ W

Take into account transmission system loss to get TPO:

$$\text{dB} = 10 \log P1/P2$$

$$\text{Transmission System Loss} = 10 \log (\text{TPO}/\text{Power at Antenna})$$

$$1.888 = 10 \log (\text{TPO}/159.7)$$

$$10^{0.1888} = \text{TPO}/159.7$$

$$1.5417 = \text{TPO}/159.7$$

$$1.5417 * (159.7)$$

$$\text{TPO} = 246.2 \text{ W} \rightarrow 247 \text{ watts}$$