## *Link Budget*

GS Engineering - GPS Re-radiater - Vevor Model TZT-ZF330
Model Number - UNBSU0097215391

$A_{cnom} := 66.28$ Coax loss at 1800MHz, dB/100m

$l_{coax} := 30$ Installed Coax Length, receive antenna to amplifier unit, m

$A_{csys} := \frac{A_{cnom}}{100} \cdot l_{coax} = 19.884$ Feed line loss in installed system, dB

$RSSI_{nom} := -140$ Nominal RSSI at receive antenna, dBm

$G_{LNA} := 37$ Gain of receive antenna LNA, dB

$G_{Amp} := 75$ Gain of amplifier unit, dB

$A_{att} := 30$ Transmit attenuator loss, dB

$P_t := RSSI_{nom} + G_{LNA} + G_{Amp} - A_{csys} - A_{att}$

## *Free Space Path Loss at 30m*

$P_t = -77.884$ Transmitter Power in dBmW

$D_t := 3$ Transmit Antenna Gain, in dBi

$D_r := 0$ Receive Antenna Gain. 0dBi = isotropic antenna per NTIA Redbook 8.3.28(6)

$f := 1575.42MHz$ GPS L1 C/A Carrier Frequency

$\lambda := \frac{c}{f}$

$\lambda = 0.19\,m$ Wavelength of Carrier

$d := 30m$ Distance between transmitter and receiver for interference calculation per NTIA Redbook 8.3.28(6)

Friis transmission equation:

$P_r := P_t + D_t + D_r + 20\log\left(\frac{\lambda}{4\pi d}\right)$

$P_r = -140.822$ Received power after free space path loss in dBmW.