QUICK REFERENCE SHEET

RF Units and dB Conversion Cheat Sheet

A denser offline guide to dB, dBm, watts, power ratios, and the conversion habits that make RF budgeting less error-prone.

QUICK OVERVIEW

Category: rf radar communications

Includes 2 related guide pages.

Links back to 4 calculator tools.

FORMULA HIGHLIGHTS

Watts to dBm

dBm = 10 log10(P / 1 mW)

Power ratio to dB

dB = 10 log10(P2 / P1)

WHAT THIS SHEET HELPS PREVENT

- Mixing dB and dBm in one calculation.
- Forgetting what 3 dB, 10 dB, and 20 dB imply.
- Losing time converting between watts, milliwatts, dBm, and power ratios.

CORE CONVERSION RELATIONSHIPS

- dB = 10log10(power ratio)
- power ratio = 10^(dB/10)
- dBm = 10log10(power in mW)
- power in watts = 10^(dBm/10) / 1000

QUICK ANCHORS WORTH REMEMBERING

- 0 dBm = 1 mW
- 10 dBm = 10 mW
- 20 dBm = 100 mW
- 30 dBm = 1 W
- A 3 dB change is about a factor of 2 in power

HOW THESE CONVERSIONS SUPPORT LINK BUDGETS

Power-unit conversion is not a side topic. It is the first step in making a clean budget. Once the absolute transmit power is in a useful unit, gains and losses can be added and subtracted in dB without confusion.

BEST OFFLINE USE

Keep this sheet with the link-budget pack whenever the main friction is not propagation itself, but the unit conversions around it.