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Telecommunications

Lab 3 Pre-Lab

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Formulas:

- Power in dBm: $P_{dBm} = 10log\frac{P}{1mW}$
- Power in W (assuming V is in RMS): $P = \frac{V^2}{R}$
- Power in W (assuming V is peak): $P = \frac{V^2}{2R}$

Answers:

1a) $P_{dBm} = 10log\frac{1mW}{1mW} = 0dBm$

b) $P_{dBm} = 10log\frac{10mW}{1mW} = 10dBm$

c) $P_{dBm} = 10log\frac{100mW}{1mW} = 20dBm$

d) $P_{dBm} = 10log\frac{1000mW}{1mW} = 30dBm$

e) $P_{dBm} = 10log\frac{2000mW}{1mW} = \sim 33.01dBm$

2a) $P_W = \frac{5^2}{50\Omega} = 500mW, P_{dBm} = 10log\frac{500mW}{1mW} = \sim 26.98dBm$

b) $P_W = \frac{5^2}{2*50\Omega} = 250mW, P_{dBm} = 10log\frac{250mW}{1mW} = \sim 23.97dBm$

c) $P_W = \frac{225mV^2}{50\Omega} = \sim 1.01mW, P_{dBm} = 10log\frac{\sim 1.01mW}{1mW} = \sim 0.0432dBm$