

What is the *phase margin* of the amplifier? To measure the phase margin, find the unity-gain frequency of the amplifier (the frequency at which the gain drops to one, or 0 dB). Now find the phase at this frequency. The phase margin equals 180° plus the phase at the unity gain frequency. For example, if the gain drops to 0 dB at 3MHz, and the phase at 3MHz is -150° , then the phase margin is $+30^\circ$. If the gain drops to 0 dB at 5MHz, and the phase at 5MHz is -190° , then the phase margin is -10° . Graphically, the phase margin is the distance between the phase and the -180° line, where phases above this line are reported as positive numbers.

Note: Don't be fooled if the phase plot suddenly jumps from -180° to $+180^\circ$. Most simulations restrict phase angles within this range, since -181° is mathematically equivalent to $+179^\circ$. However, for measuring phase margin, you should "unwrap" the phase for your calculations. In other words, if the phase has just jumped from -180° to $+180^\circ$, begin subtracting 360° from the phase angle to preserve the continuity of the phase lag vs. frequency. Real circuits exhibit smooth, continuous phase changes with frequency. The sudden 360° "jumps" are a numerical artifact.