

## What is Quiescent Current and why is it important?

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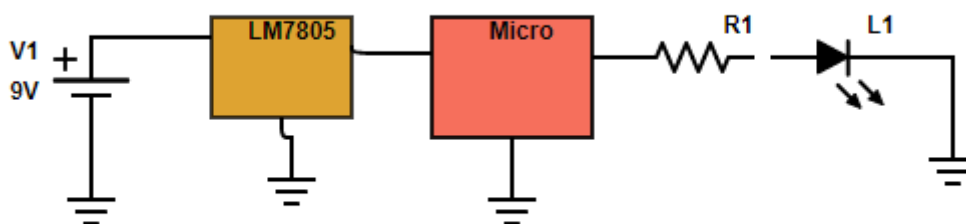
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One very important and often overlooked specification on ICs is the Quiescent Current or  $I_Q$  parameter.


Quiescent Current can be defined as the amount of current used by an IC when in a Quiescent state. The Quiescent state being any period of time when the IC is in either a no load or non-switching condition, however is still enabled.

Why is it important? The importance of this comes when you are looking to make your new design efficient when not in full operation. This is especially important when you are looking at wearables or IOT devices that need to last long periods of time on a battery power.

For example take a look at an LM7805 IC. Here I have a simple battery powered LED circuit. I am using a 9V battery, an LM7805 to drop the voltage to 5 Volts and microcontroller to turn the LED on and off.



So far it is fairly straight forward, however I want to make sure this is energy efficient for my new IOT project. Maybe my micro is going to sample air quality once an hour. You will probably pick a micro that is going to sleep while not in use to save on battery life. So while sleeping and not performing any functions we need to look at two quiescent current draws in this circuit. First the LM7805 which would have a draw of approx 6mA. While that may seem like a small draw when you are trying to save battery life 6mA can make the difference in a week of battery or a month of battery. Even more when you start adding several components that each have a draw in your circuit.

Now of course the above circuit is not complete or practical for most applications it helps  at this specification when you are designing your next project.

Below is an in depth PDF from Texas Instruments that goes into further explanation and design considerations.

 [Quiescent Current.pdf](#) (199.0 KB)

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