

Two last comments on LEDs and Photodiodes:

Why don't LEDs burn out?

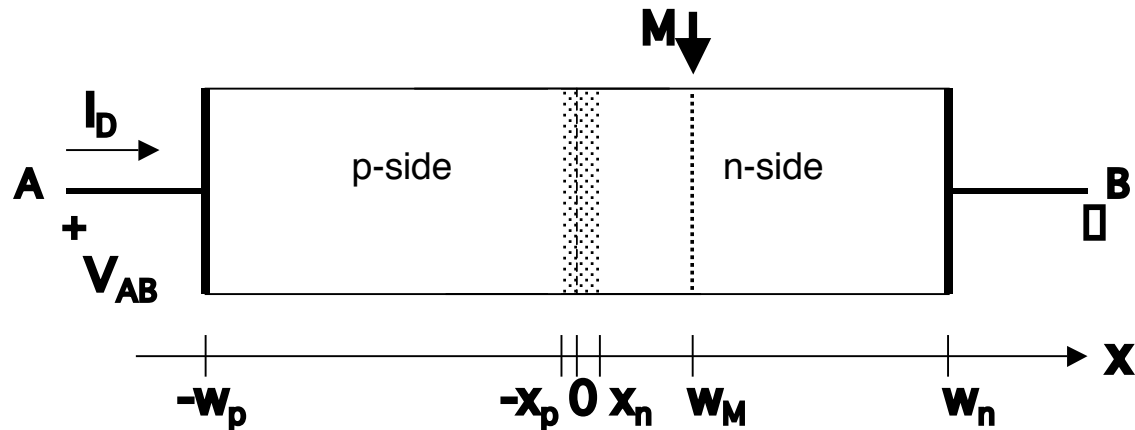
The LED emission process is an inherently cool process. The only heating sources are:

- non-radiative recombination
- resistive heating in the leads, conacts, and QNRs

We design LEDs to make both of these small.

In contrast, incandescent light bulbs (and even fluorescent tubes) involve **red-hot** tungsten filaments that deteriorate with time.

Does it matter where we illuminate a photodiode?



Yes and no.....

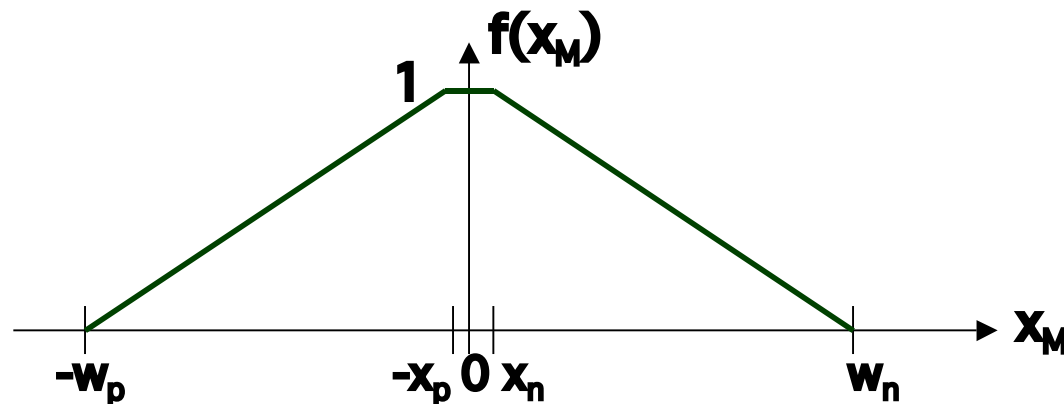
Two last comments, cont:

Does it matter where we illuminate a photodiode?

As we vary x_M we find that the photocurrent, $i_D(0,M)$ varies as:

$$i_D(0,M) = \square M f(x_M)$$

where $f(x_M)$ as the form plotted below:



Does it matter which side?

No, either side of the junction is fine.

Does the sign of the current change?

No, the photo current is negative no matter which side of the junction is illuminated.

Does it help to be near the junction?

Yes, the closer to the junction and further from recombination at ohmic contacts, the better: