

Life Time and Diffusion Length in Silicon

Illustration

Here are some values in tabulated form taken from data given by **Wacker Siltronic**.

- Note that the conversion between diffusion length L and lifetime τ involves the diffusion constant D via $L = (D\tau)^{1/2}$ which in turn contains the mobility μ via $D = (kT/e) \cdot \mu$.
- The mobility μ , however, is a [function of doping type and doping level](#). It comes as no surprise that the table must distinguish between doping type and level - and the differences can amount to a factor of 3!

Diffusion-length L [μm]	Carrier Lifetime [μs]			
	n-type		p-type	
	10 Ωcm	100 Ωcm	10 Ωcm	100 Ωcm
100	8	8	3	3
200	34	32	13	11
300	76	72	30	24
400	135	129	54	44
500	211	201	84	68
700	414	394	165	133
1 000	845	804	336	2723
5 000	21 121	20 109	8393	6 798