Life Time and Diffusion Length in Silicon

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 $\underline{\textbf{\textit{L} = (\textit{D}\tau)}^{\textbf{1/2}}}$ which in turn contains the mobility **µ** via $\underline{\textbf{\textit{D} = (k\textit{T}/e) · µ}}$.
- 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

Illustration