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# Is n-type multicrystalline silicon the best candidate for short-term high-efficiency lower-cost solar cells?

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**Abstract.** In this article we detail a theoretical and experimental investigation in order to reveal the advantageous properties of multicrystalline n-type silicon for lower-cost high-quality solar cells applications. In this study, electronic grade (EG) and compensated upgraded metallurgical grade (UMG) materials are analyzed.
Three microwave-based contactless techniques (Microwave Photoconductivity Decay "µw-PCD", Microwave Phase-Shift "µw-PS" and Large-Scale Microwave Phase-Shift "LS-µw-PS") are applied to determine the carrier lifetime behaviour in an entire EG silicon ingot. We show that, at low injection conditions, the minority carrier lifetime profile is not directly related to resistivity variation along the ingot height. The carrier lifetime variation observed in all three techniques is related to Shockley-Read-Hall recombination process.
In compensated UMG silicon a higher minority carrier lifetime is observed in n-type than p-type area at the same conditions of contamination and injection level.