

## DELIVERING MORE POWER FROM A SOLAR MODULE

### What is PID effect?

Degradation in photovoltaic output of the cell due to potential formed across the cell. Humidity, temperature, type of cell, type of encapsulation glass, ARC affects the degree of PID. Both reversible and irreversible PID effects have been observed.

### How the cell degrades? There are two possible mechanisms:

1. Effect of ion migration on the passivation layer (PL)
2. Effect of ion migration of the junction doping profile and thus the depletion region (DR)

### What is interesting about Ultrasolar and what is the relationship between QuantumBoost™ and PID?

- PID is a DC potential effect. QuantumBoost™ applies high voltage pulses to the cell. Extremely short duration of the pulses may ensure that does not add to the PID. It may in fact reduce that effect.
- QuantumBoost™ will definitely remove the PL component of the effect

So in short, Ultrasolar's QuantumBoost™ is a viable (necessary to be tested and verified in labs and through trials) to impact the long term production of the solar array. What is more interesting is how this compliments inverter technology and in particular string inverters; though it can be easily applied to Utility scale applications.