



## Low Cost Silicon Solar Cells

Single crystal and multi-crystalline silicon solar cells are manufactured using high temperature diffusion and sintering processes. This high thermal budget process results in relatively expensive solar cells. The invented process will reduce the cost of manufacturing by using low temperature deposition of thin films of silicon and metal on single- or multi-crystalline silicon substrates followed by an annealing process at temperatures of 200-300 Celsius. All the processes used have been demonstrated in the industry to be scalable to almost any desired size.

### ADVANTAGES

1. Low cost process to fabricate silicon solar cells.
2. Process involves formation of p-n junction at substantially low temperatures than what is currently used in the industry.
3. Low temperature processing of multi-crystalline silicon solar cells avoids the last diffusion and enhanced shunting along grain boundaries that yield much low efficiencies in high temperature diffused solar cells.
4. This process is expected to accompany surface texturing that provides a natural low reflectivity surface for higher light coupling and enhanced light trapping within the solar cell.
5. This process may potentially be used to manufacture thin film polycrystalline solar cells and modules on corrugated plastic film in a roll to roll process.

### INVENTION STATUS

This technology is patented under U.S. 6,339,013, 6,613,653, and 6,844,248.

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