# Title: Reflection loss dependence on length of silicon nanowire-array for photovoltaic devices

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## I. Abstract

A two-step, metal-assisted, electroless etching technique based on the sputtering of silver particles is described, using phosphorus silicate glass, doping, and screen printing processes to fabricate photovoltaic devices. Si-NW arrays on pyramid surfaces show a low reflectivity of ~1.11%, while the average length of the Si-NW arrays is ~375 nm, with an aspect ratio of ~5.4. Superior photovoltaic characteristics of the PCE (~10.26%) with a $J_{sc}$ of 28.2 mA/cm$^2$ and a $V_{oc}$ of 540mV are achieved. Power conversion efficiency shows dependence on shunt resistance while the series resistance and the NWs aspect ratio are respectively below 2.41 Ω and 10.

## II. Reference

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## III. Biography

After having got Bachelor in Physics department of NCKU in Taiwan in 1988, Dr. Shang-Chao Hung work in SONY Co. branch in Taiwan as an Electrical Engineer. He graduated from the University of Alabama in Huntsville (UAH) in June 1992, with a degree of Master of Engineering in Electrical Engineering. At that time, Shang-Chao Hung received the outstanding scholars honor in graduated study for GPA 4.0 in Institute of Engineering in UAH.

After receiving his Master degree, Shang-Chao Hung back to Taiwan and work at MATRA (France) Co. branch in Taiwan as an Electrical Engineer responsible for constructing the first subway in Taiwan. Dr. Shang-Chao Hung got his Ph.D degree in institute of microelectronics of NCKU in Taiwan in 2006.

Dr. Shang-Chao Hung has published more than 55 papers in SCI journals and interesting in renewable energy, nano-structure design, fabrication, and characterization and device application on photodector and sensor.

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