

## How Mask Data Error Rate Maintained at below 0.1% While Volume Increased 2+ Folds – Through Automation

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**Abstract:** Mask reticle assembly and release is an important part of semiconductor design and manufacturing process. The entire procedure often involves the selection of a process technology, finalization of the reticle map for IC data, process control monitoring (PCM) structures, alignment and critical dimension structures. Once the assembly is done, review and approval follows. After approval, gds or fractured data is sent for mask making. The hardware required data (CD, alignment marker location/orientation, etc.) are acquired, and certain data will be uploaded in a product life management (PLM) system for control. In an industry supplying connectivity solution for consumer electronic product, tape-out volume has experienced dramatic increase over a short period of time. Accommodating the increase with no human resource relief, while maintaining a low error rate, becomes a real challenge. A set automation solutions were the means to overcome the challenge. In this paper we will present two of the solutions, 1). Alignment mark data from reticle design to hardware tools automation, and 2). Reticle approval automation. (The green links in the flow chart.) These automation tools have been instrumental in achieving 0.1% or below error rate in the face of 2 fold volume increase w/o headcount increase in the span of a few short years.

