

## Challenges of Short Lifecycle Commercial Products In Compound Semiconductor Manufacturing

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### Abstract

With continuing expansion of RF content in the high volume commercial electronics market, compound semiconductor companies are challenged by the need to respond to very short consumer product lifecycles on the order of one year. The future winners will be those companies that can achieve fast new product development (NPD) cycle time and excellent cost and quality performance early in the manufacturing ramp. This is especially challenging for compound semiconductor wafer fabs that have traditionally had missions of high performance foundry and customization, when these factories with older equipment retool or create new commercial lines.

Since integrated circuit demand for commercial smart phones can require that 60% of production be built within the first two quarters of the ramp (Figure 1), production cycle times and yields must be very good from the outset to achieve excellent cost. In addition, with such short production lifecycles, NPD work for the next generation often overlaps the previous and the need for critical NPD prototypes can necessitate fab cycle times of less than two weeks.

This paper will look at the impact of attaining early peak yield on cost and quality, and how statistical controls, control systems in the supply base, and very fast NPD cycle times for critical prototypes can help attain higher early yields. Also, factory automation as an enabler to traditional cost drivers such as zero excursions, yield enhancement, and direct labor productivity will be investigated.

Figure 1

