

Michael C. Shores

Will Buzz Lightyear Return?

Poor manufacturing yields are slowing development of this key technology.

Introduced over a quarter century ago, optoelectronics has impacted almost every aspect of our daily lives. Innovations in lightwave technology have influenced information technology, telecom, computing, manufacturing, aerospace, military, medicine and entertainment. Today, enough fiber-optic cable has been installed to reach the moon. Despite the technology's progress, optoelectronics faces competition from disruptive technologies now under development. Within this context that we ask: Will optoelectronics technologies impact our lives and expand our opportunities as have past great technology developments? Or, better put, Will Buzz Lightyear ever return?

My answer: A resounding yes! I believe light is the future. In our understanding of light and its movement, we are about where radio was in the late 1800s. Still, look what's come about so far. In the last five to 10 years, for example, we've done amazing things with lasers.

Communications already move over a fiber backbone throughout the world. We see more R&D investment in optoelectronics. Thanks to the dip in telecom, there's been cross-pollination as talented development engineers migrated to military, medical, automotive and other industries and brought their expertise on fiber. In telecom, I think the focus will be more on optoelectronics instead of straight photonics. (We all got a little crazy with that.) Yes, Buzz Lightyear – a symbol of advanced technology – will return, bigger and stronger than ever. I strongly believe it, so I'm jumping in while others seem to be running away.

By now you're probably asking, Who is this guy and why is he writing a column? My name is Michael Shores and I'm founder and president of a company in Richardson, TX, called Texas Prototypes, or TXP. My involvement in optoelectronics dates to the late 1990s, when I worked for a new product introduction center of a Tier 1 EMS company. Our group performed board layout, prototyping and process development in the complex RF and high-speed digital areas. Given the popularity in the optoelectronics arena, our EMS parent pushed me into its photonics group.

In my new role, I met with many different photonics companies to learn about the industry. I found that they were very secretive, yet ironically a number of them were doing the same things. One thing they had in common: terrible manufacturing yields. They would build 1,000 units to get 80 to work, and I couldn't believe they sold these as qualified products.

That's when I began to look for ways to boost manufacturing yields and quality, because with higher yields prices can come down and products can become more mainstream. We are constantly trying to find new types of manufacturing processes, procedures and equipment to aid producibility. We are backing into the optoelectronics and photonics industries from a manufacturability standpoint, because without good manufacturability there can be no true product.

Because we deal with the OEM, the EMS and the ODM, and I'm involved with design, prototyping, manufacturing, test and all parts in between, I have a broad view of what's happening with opto. What do I see as some of today's manufacturing challenges? Fiber alignment is a key issue throughout the industry. Imagine sending light between two pieces of hair; you're trying to line them up and any kind of miniscule movement throws the alignment off. Alignment of all kinds is an issue, be it device alignment or anchoring devices such as laser die or photo-detectors or prisms.

At the PCB level come problems with fiber handling and management such as fiber splicing and routing. Then there are issues with hermetic sealing, and thermal considerations. Another focus is optical test, to determine the amount of light and make sure things are working the way they're supposed to.

My goal is to write something that will create some interest and discussion and, hopefully, add a bit of information to make your job a little easier. I hope this column will be a forum for sharing ideas and knowledge about optoelectronics. I look forward to the opportunities that 2005 and beyond will bring, as well as the continuing challenges of realizing opto's full potential. I invite your comments, so that we can return Buzz Lightyear to his former self. ■

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