### Case Study

#### Successful Partnering for a Rapid Ramp

**Customer**

Qorvo (Nasdaq:QRVO) is a leading provider of core technologies and RF solutions for mobile, infrastructure and aerospace/defense applications. 

[www.qorvo.com](http://www.qorvo.com)

**Application**

Bulk Acoustic Wave (BAW) filters perform signal processing functions, specifically to remove unwanted frequency components from the signal, to enhance wanted ones, or both. SPTS is a leading supplier of Physical Vapor Deposition (PVD) equipment to deposit Aluminum Nitride (AlN), which is the most commonly used material for the piezoelectric film in BAW devices.

**Background**

In mid-2014, Qorvo forecasted a growing demand for their BAW products and needed to double their weekly wafer starts at their facility. To meet expected production levels they needed to quickly make a significant investment in new equipment and install and qualify these systems as soon as possible. SPTS Technologies was their existing POR supplier of PVD systems to deposit a range of piezoelectric and metal films.

SPTS and Qorvo worked together to install and qualify a large number of systems with a variety of specific configurations and wafer sizes, in the required time, to match Qorvo's production plan. This included optimizing the process flow through SPTS manufacturing, and reducing installation and qualification times.

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<tr>
<th>OBJECTIVE</th>
<th>SOLUTION</th>
<th>RESULTS</th>
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<td>• Manufacture of a large number of PVD systems with variety of configurations</td>
<td>• Improved manufacturing flow for PVD systems at SPTS</td>
<td>• All systems manufactured, tested, installed and qualified in line with Qorvo's plan</td>
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<td>• Coordination of shipments and installation to match customer's plan</td>
<td>• Reduced time required for pre-shipment testing by ~20%</td>
<td>• Successful installation of 11 Sigma XP systems (up to 5 simultaneously) with 2 full system chamber conversions</td>
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<td>• Move existing PVD tools from second Qorvo site</td>
<td>• Reduced installation time at customer site from 5 to 3 weeks</td>
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<td>• Improve productivity of PVD equipment in production</td>
<td>• Addition of ‘High Productivity’ shielding to allow integration of lamp bake-out, reducing maintenance time from ~24hr to &lt;16hrs</td>
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"We have been impressed with the ability of SPTS to achieve the promised delivery deadlines to meet our planned ramp, with very good flexibility to allow for late changes, combined with cost-savings associated with re-configuring existing toolsets and efficient hand-over of all the tools. Open and clear communication between us has been key at all stages from PO to process qualification"  

Howard Witham, Vice President, Texas Operations, Qorvo

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