



# 2017 May Case Study

## Managing Critical Material Which Represents Small Revenue for Supplier

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# Case Study Introduction

In ~ 2005, Avago Technologies, (Broadcom), developed a liftoff process, using a bilayer resist scheme for a mask level with a very thin film and tight CD requirements.

One resist was produced by JSR, in Japan, and the other from an unrelated company.

The device process was released to production as a high value, but low volume product.

In 2010, JSR chose to consolidate their production by eliminating selected dilutions of resists with low production volumes. (A higher viscosity version of the resist was still available.)

## Case Study Challenge

The team needed to quickly identify a replacement for this unique resist dilution and qualify it in production to avoid customer disruption.



# Case Study Approach

The team considered several potential approaches:

Replacement resists from other companies.

Alternative etch integration scheme's to replace the use of liftoff.

Dilution of the parent resist from JSR, by a third party resist distributor.

## Case Study Results

Replacement resists were incompatible with the underlying resist and left visible artifacts.

Etch integration schemes were unable to re-create the critical parameters of the liftoff process.

This approach would have required significant re-qualification effort & a customer PCN.

Third party dilution of the JSR parent resist was successful, but complicates the supply chain;

Compounded lead times consume useful shelf life.

Avago, (Broadcom), assumes responsibility for the resist performance.



# Case Study Critical Success Factors

No change to the Form, Fit or Function of the device.

No supply interruption to the device customer.

Minimize costs and impact to engineering resources at Avago, (Broadcom).

## Case Study Lessons Learned

Anticipate issues with unique / critical / low volume processes and materials.

A material supply contract could have prevented the disruption or provided advance warning.

Carrying excess inventory helped to maximize the time available for re-qualification.

Neither JSR, nor the 3<sup>rd</sup> party resist distributor will extend shelf life.

Pre-qualification of alternative resists could have provided a valuable contingency.



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