

UNITED STATES PATENT AND TRADEMARK OFFICE

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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Taiwan Semiconductor Manufacturing Company Limited

Petitioner

v.

Godo Kaisha IP Bridge 1

Patent Owner

*Inter Partes* Review No. IPR2016-01264

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**PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 6,538,324**

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## I. INTRODUCTION

Patent Owner's Response (POR) attempts to distinguish the prior art based on an incorrect reading of *Zhang* and *Ding*, arguing both references teach a top layer of pure tantalum (Ta) at the surface. *See, e.g.*, POR, 21-22. According to Patent Owner, neither reference has nitrogen in its top film, so no combination of these references can render obvious the claimed first film "containing nitrogen therein," but this argument overlooks *Zhang*'s repeated disclosures of nitrogen throughout the top tantalum-rich tantalum nitride film 32, including at its surface. This fundamental error is fatal to the entirety of Patent Owner's arguments. Patent Owner does not otherwise contest, because it cannot in view of its expert's opinions, the Board's finding that a person of ordinary skill in the art (POSITA) would have been motivated to modify the diffusion barrier of *Zhang* in view of *Ding* to include a crystalline top film 32 and amorphous bottom film 22.

Further, the Board already rejected Patent Owner's attempt to narrow the claims to require nitrogen "throughout" the first film under the broadest reasonable construction (Decision, 5-7), and Patent Owner has presented no new evidence to justify changing that finding. Patent Owner also attempts to limit the claims to a particular manufacturing process. The Board rejected this approach because the challenged claims are product claims, not process claims, and regardless, the prior art of record teaches the limitations Patent Owner proposes.

Patent Owner does not separately argue for validity of any of the challenged dependent claims 2, 3, 6, and 7,<sup>1</sup> so all claims stand or fall with independent claim 1. Nothing in the record should change the Board’s reasoning or conclusion that each of the challenged claims 1-3, 5-7, and 9 of the ’324 patent is unpatentable over *Zhang* in view of *Ding* and also further in view of *Sun*.

## II. ARGUMENT

### A. The Board Correctly Rejected Patent Owner’s Claim Constructions

In its Decision, the Board found “the arguments and evidence presented to date” did not support Patent Owner’s proposed construction that the claimed “first film being composed of crystalline metal containing nitrogen therein” means “a first film consisting essentially of a mixture of crystalline or polycrystalline metal with nitrogen throughout.” Decision, 7. Patent Owner provides no intrinsic or extrinsic evidence to change that finding.

Patent Owner also offers no evidence for the Board to reverse its refusal to construe the “second film being composed of amorphous metal nitride” as “a

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<sup>1</sup> Patent Owner asserts the same argument for dependent claim 9 as for independent claims 1 and 5 (*Zhang* and *Ding* do not teach a “first film” containing “nitrogen therein”), so that argument fails for the same reasons.

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