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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 LTD.  
Petitioner

v.

GODO KAISHA IP BRIDGE 1  
Patent Owner.

Case IPR2017-01843<sup>1</sup>

**PETITIONER'S RESPONSE TO PATENT OWNER'S OBSERVATIONS  
ON CROSS-EXAMINATION**

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<sup>1</sup> Case IPR2017-01844 has been consolidated with this proceeding.

Petitioner submits this response to Patent Owner's Observations on Cross Examination. Patent Owner ("PO") presents twenty-one observations on Dr. Shanfield's testimony. While Petitioner believes that the testimony will be appropriately viewed and weighed by the Board, the specific observations presented by PO misstate or omit the full testimony of Dr. Shanfield, and are often irrelevant, as specified below. All emphasis in the following Responses is added.

### **Response to Observation #1**

PO cites to Ex. 2232 at 56:17-58:2, 160:20-23, 167:14-18, 172:8-14, 175:22-24, and 176:4-16 as allegedly showing paragraph 20 of Dr. Shanfield's Reply declaration was offered under the mistaken belief that claim 1 requires the film to impart stress. PO's observation mischaracterizes Dr. Shanfield's testimony. Contrary to PO's assertions, Dr. Shanfield testified that the description in the '501 patent "merely recognizes that a film *can* have multiple layers deposited on top of each other" and that this "does not mean that other, partially adjacent, or even fully adjacent, structures necessarily become part of the same film simply as a result of being adjacent." Ex. 1232, ¶20. PO's observation also ignores Dr. Shanfield's repeated, unambiguous testimony on cross that the claims do not require stress: "Q. Does that language require that the silicon nitride film apply stress? A. **No. The claim language doesn't require stress.**" Ex. 2232, 51:22-52:2; *id.*, 30:4-6 ("A. ... But there is no requirement in the limitations of the first claim that it has to be a

stress film.”); *id.* 52:21-53:6 (“Q. So it’s your opinion that in order for a silicon nitride film to meet the limitations of Claim 1, I must induce stress? A. No. Q. So the silicon nitride film that’s called out in Claim 1 isn’t required to apply stress to meet the limitations of the claim? A. That’s correct, yes.”); *see also* Ex. 1302, ¶46 n. 3. PO’s observation also mischaracterizes Dr. Shanfield’s testimony at 56:17-58:2 and omits Dr. Shanfield’s confirmation on re-direct that this testimony was “referring to the embodiment in the specification,” not what is required by the claims. Ex. 2232, 144:14-145:6. PO’s observation also fails to note that the immediately prior testimony makes clear that the cited testimony at 160:20-23 was based on that a misstatement of the *law*. Ex. 2026, 159:5-160:23. When the law was clarified, Dr. Shanfield confirmed, consistent with his earlier testimony from the deposition and throughout this proceeding, that as a *technical* matter, the challenged claims do not require stress. *Id.*, 167:14-21, 171:9-172:14, 174:12-23, 175:2-15, 176:4-24, 177:11-19; Ex. 1302, ¶46 n. 3.

## **Response to Observation #2**

PO asserts that Dr. Shanfield offered contradictory testimony on whether a gate is a film, citing Ex. 2232, 40:11-41:3; Ex. 2210, 311:14-312:8. PO selectively quotes and mischaracterizes Dr. Shanfield’s testimony. In the first passage PO cites, Dr. Shanfield testified that a gate is formed from a deposited film. *See also*, Ex. 2210, 312:3-5 (“[S]ince gate metal is a film deposited -- a gate is formed from

a film, is a gate a film? No. It's a gate.”). In the second passage, Dr. Shanfield was responding to questions about whether “layers form the same film.” Ex. 2232, 40:1-5. He testified consistent with his earlier testimony that a silicon oxide gate insulating layer has a different function than the film deposited on top of the gate insulator to form the gate. Ex. 2232 at 40:21-41:3 (“An example where they're not the same function in the '501 is the gate insulator layer, which is silicon oxide usually, is covered by then the gate electrode. And those two films are – *have different functions* even though they're on top of each other. So *I think a person of skill in the art wouldn't view them as one and the same film.*”).

### Response to Observation #3

PO argues that Dr. Shanfield's testimony that a film can have “a layer or layers” means that two adjacent films would be layers of a single film, citing Ex. 2232 at 7:24-8:8. PO mischaracterizes Dr. Shanfield's testimony by omitting his testimony that the “layers of material” must be “*on top of each other.*” Ex. 2232 at 7:24-8:9 (“Q. So my question is, what was your working understanding of the term "film" that you applied in opining on the claims in this case? A. The answer I gave you is an example of that and I defined -- or I understood layer 20 as shown here is an example of a silicon nitride film. It's a layer or layers of material, in this case, that are silicon nitride or -- you know, *that are on top of each other* or a single layer, silicon nitride being silicon and nitrogen and some hydrogen.”). Dr.

Shanfield has consistently testified that two adjacent films are not “layers” of a single film. *See* Reply Decl., ¶¶20, 37-43; Ex. 2232 at 15:9-17, 20:19-216, 22:10-23:2, 162:10-163:15.

#### **Response to Observation #4**

PO argues the same testimony identified for Observation #3 somehow refutes Dr. Shanfield's testimony regarding layers of film. As explained for the Response to Observation #3, PO omits Dr. Shanfield's testimony that the “layer or layers of material” must be “on top of each other.” As explained for the Response to Observation #1, PO also mischaracterizes paragraph 20 of Dr. Shanfield's Reply Declaration.

#### **Response to Observation #5**

PO argues the same testimony identified for Observation #3 is also relevant to Dr. Shanfield's earlier testimony that “‘Thin films’ refer to one or multiple layers of coverage over a surface,” quoting Ex. 2209, 55:2-4. As explained in Response to Observation #3, PO omits Dr. Shanfield's testimony that the “layer or layers of material” are formed “on top of each other.” The testimony PO cites simply confirms that Dr. Shanfield has consistently testified that films can have multiple layers formed on top of each other. PO's observation also ignores Dr. Shanfield's testimony that two separate films may be formed at different times using plasma CVD. Ex. 2232 at 28:8-22 (“Q. So if the same manufacturing step is

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