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FUJITSU SEMICONDUCTOR LIMITED, FUJITSU SEMICONDUCTOR AMERICA, INC., ADVANCED MICRO DEVICES, INC., RENESAS ELECTRONICS CORPORATION, RENESAS ELECTRONICS AMERICA, INC., GLOBALFOUNDRIES U.S., INC., GLOBALFOUNDRIES DRESDEN MODULE ONE LLC & CO. KG, GLOBALFOUNDRIES DRESDEN MODULE TWO LLC & CO. KG, TOSHIBA AMERICA ELECTRONIC COMPONENTS, INC., TOSHIBA AMERICA INC., TOSHIBA AMERICA INFORMATION SYSTEMS, INC., TOSHIBA CORPORATION, and GILLETTE COMPANY,

Petitioners

v.

ZOND, LLC
Patent Owner

U.S. Patent No. 7,811,421

Cases IPR2014-00800; IPR2014-00802; IPR2014-00805

Patent Owner's Demonstrative Exhibits

'421 Patent

Low Power Pulse to Create A Weakly Ionized Plasma

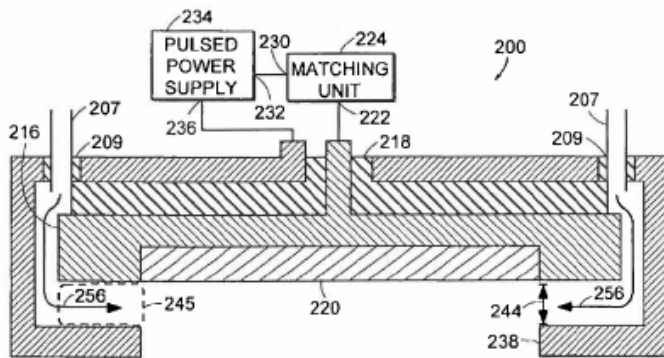


FIG. 5A

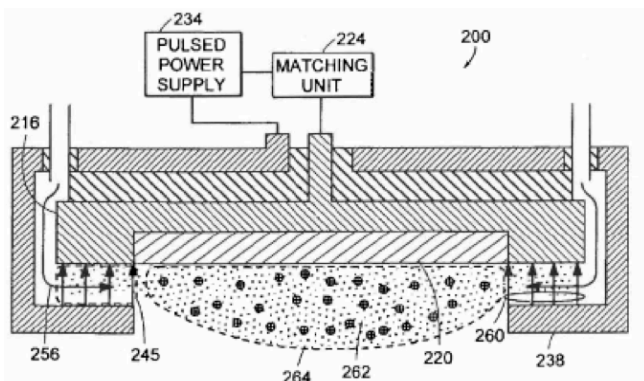


FIG. 5B

"In operation, the pulsed power supply 102 provides a **voltage pulse** between the cathode assembly 110 and the anode 130 that has a **sufficient amplitude** to ionize **the argon feed gas** in the vacuum chamber 100." '421 patent, col. 4, lines 13 - 16.

"In one embodiment, the pulsed power supply 102 provides a **low power pulse** ... in order to generate a **weakly-ionized plasma**." Ex. 1001, '421 patent, col. 8, lines 13 - 16; also col. 11, lines 21 - 22.

"The **characteristics of the voltage pulse** are such that an electric field 260 develops between the cathode assembly 216 and the anode 238 that generates a **weakly-ionized plasma** 262 in the region 240 between the anode 238 and the cathode assembly 216." '421 patent, col. 11, lines 9 - 25.

"In one embodiment, the pulsed power supply 102 generates the **weakly-ionized plasma** 262 by providing a **low power pulse** having an initial voltage in a range of 100V to 5 kV with a discharge current of 100A to 1000A." '421 patent, col. 11, lines 26 - 31.

'421 Patent

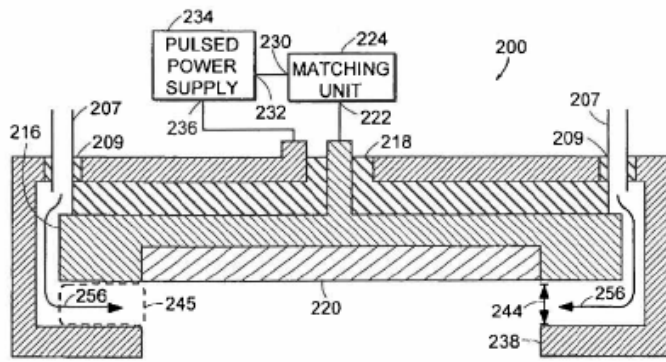


FIG. 5A

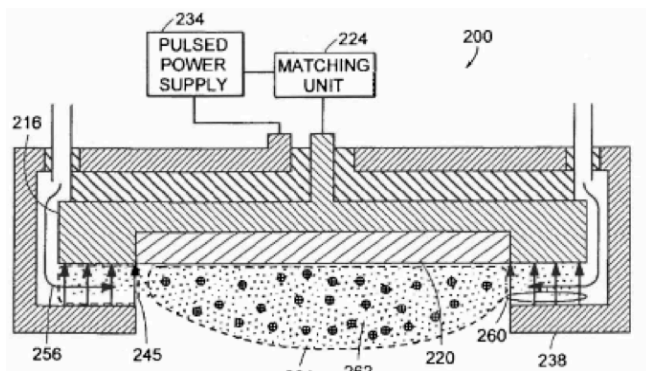


FIG. 5B

Weakly Plasma's Density Has Sufficient Co Suppress Arc When High Power Ap

"Forming a weakly-ionized or pre-ionized pl
substantially eliminates the probability of
a breakdown condition in the chamber 202
power pulses are applied between the cath
assembly 216 and the anode 238. ...

The probability of establishing a breakdown
substantially eliminated because the weakly
plasma has a low-level of ionization that **pro**
electrical conductivity through the plasma.
conductivity greatly reduces or prevents th
of a breakdown condition when high power
to the plasma." *Ex. 1001, '421 patent, Col. 9, line*
also, col. 15, lines 67 – col. 16, line 3.

'421 Patent

High Pulse Power For Transition to Strongly-Ionized Plasma

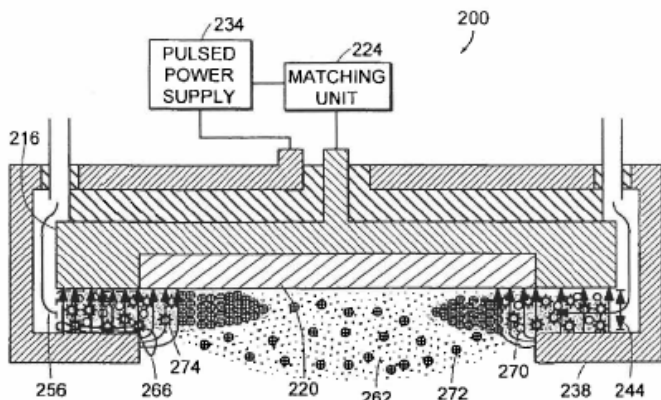


FIG. 5C

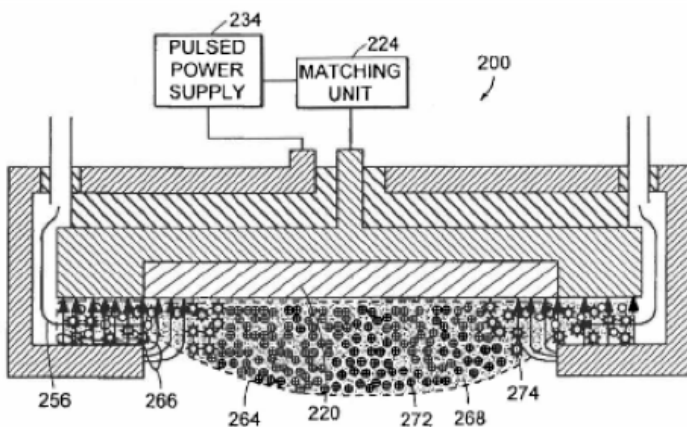


FIG. 5D

“Once the weakly-ionized plasma is formed, high power pulses are then generated between the cathode assembly 216 and the anode 238. In one embodiment, the pulsed power supply 234 generates the high-power pulses. The desired power level of the high-power pulses depends on several factors including the desired deposition rate, the density of the pre-ionized plasma, and the volume of the plasma, for example. *Ex. 1001, '421 patent, col. 9, lines 29 – 36.*”

“In one embodiment, the pulsed power supply 234 generates the weakly-ionized plasma 262 by generating a low power pulse The pulsed power supply 234 generates high-power pulses between the cathode assembly 216 and the anode 238 (FIG. 5C) and the weakly-ionized plasma 262 is formed.” *Ex. 1002, '421 patent, col. 11, lines 21 – 62.*”

'421 Patent

Choose Voltage Amplitude, Rise Time and Duration

“The particular **size, shape, width, and frequency of the high-power pulses** depend on various factors The **shape and duration of the leading edge** 356 and the trailing edge 358 of the power pulse 354 is **chosen** so as to sustain the weakly-ionized plasma 262 while controlling the rate of ionization of the strongly-ionized plasma 268.” *Ex. 1001, '421 patent, col. 16, lines 61 - 64.*

“The **amplitude and shape of the voltage pulse** are such that a weakly-ionized plasma is generated in the region 246 between the anode 238 and the cathode assembly 216. ” *Ex. 1001, '421 patent, col. 10, lines 19 - 22.*

“Each of the high-power **pulses are maintained for a predetermined time ..**” *Ex. 1001, '421 patent, col. 9, lines 45 – 46.*

“The **level and duration of the high power electrical pulse is limited** by the level and duration of the power that the strongly-ionized plasma 268 can absorb before the high power discharge commences and terminates.” *Ex. 1001, '421 patent, col. 14, lines 26 - 29.*

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