

Title (en)
DISCHARGE PRODUCED PLASMA EUV LIGHT SOURCE

Title (de)
ENTLADUNGSPRODUKTIONS-PLASMA-EUV-LICHTQUELLE

Title (fr)
SOURCE LUMINEUSE UV EXTREME POUR PLASMA PRODUIT PAR DECHARGE

Publication
EP 1602116 A2 20051207 (EN)

Application
EP 04716949 A 20040303

Priority

- US 2004006551 W 20040303
- US 38496703 A 20030308
- US 40925403 A 20030408
- US 74223303 A 20031218

Abstract (en)
[origin: WO2004081503A2] An DPP EUV source is disclosed which may comprise a debris mitigation apparatus employing a metal halogen gas producing a metal halide from debris exiting the plasma. The EUV source may have a debris shield that may comprise a plurality of curvilinear shield members having inner and outer surfaces connected by light passages aligned to a focal point, which shield members may be alternated with open spaces between them and may have surfaces that form a circle in one axis of rotation and an ellipse in another. The electrodes may be supplied with a discharge pulse shaped to produce a modest current during the axial run out phase of the discharge and a peak occurring during the radial compression phase of the discharge. The light source may comprise a turbomolecular pump having an inlet connected to the generation chamber and operable to preferentially pump more of the source gas than the buffer gas from the chamber. The source may comprise a tuned electrically conductive electrode comprising: a differentially doped ceramic material doped in a first region to at least select electrical conductivity and in a second region at least to select thermal conductivity. The first region may be at or near the outer surface of the electrode structure and the ceramic material may be SiC or alumina and the dopant is BN or a metal oxide, including SiO or TiO₂. The source may comprise a moveable electrode assembly mount operative to move the electrode assembly mount from a replacement position to an operating position, with the moveable mount on a bellows. The source may have a temperature control mechanism operatively connected to the collector and operative to regulate the temperature of the respective shell members to maintain a temperature related geometry optimizing the glancing angle of incidence reflections from the respective shell members, or a mechanical positioner to position the shell members. The shells may be biased with a voltage. The debris shield may be fabricated using off focus laser radiation. The anode may be cooled with a hollow interior defining two coolant passages or porous metal defining the passages. The debris shield may be formed of pluralities of large, intermediate and small fins attached either to a mounting ring or hub or to each other with interlocking tabs that provide uniform separation and strengthening and do not block any significant amount of light.

IPC 1-7
H01J 1/52

IPC 8 full level
H01J 1/52 (2006.01); **G03F 7/20** (2006.01); **H01S 3/00** (2006.01); **H01S 3/225** (2006.01); **H05G 2/00** (2006.01); **H05H 1/06** (2006.01)

IPC 8 main group level
G01J (2006.01)

CPC (source: EP)
B82Y 10/00 (2013.01); **G03F 7/70033** (2013.01); **G03F 7/70166** (2013.01); **G03F 7/70175** (2013.01); **G03F 7/70908** (2013.01); **G03F 7/70916** (2013.01); **H01S 3/005** (2013.01); **H01S 3/225** (2013.01); **H05G 2/003** (2013.01); **H05H 1/06** (2013.01); **H05G 2/005** (2013.01)

Designated contracting state (EPC)
NL

DOCDB simple family (publication)
WO 2004081503 A2 20040923; WO 2004081503 A3 20051006; EP 1602116 A2 20051207; EP 1602116 A4 20100331; JP 2006520107 A 20060831; JP 4638867 B2 20110223; TW 200425802 A 20041116; TW I275325 B 20070301

DOCDB simple family (application)
US 2004006551 W 20040303; EP 04716949 A 20040303; JP 2006509069 A 20040303; TW 93104595 A 20040224