SPTS Plasma Processes for Compound Semiconductors

KLA is an industry-leading supplier of etch and deposition equipment for the manufacturing of compound semiconductor devices for RF, power and optoelectronic applications.

We offer production-proven processes:

- 8 of the Top 10 III-V IDMs use SPTS systems
- 4 of the Top 5 III-V foundries use SPTS systems
- 2 of the Top 5 HB-LED IDMs use SPTS systems

Our global network of sales and service offices provides world-class local support to all our customers throughout Asia, North America and Europe.

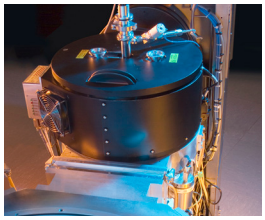
Typical applications of KLA's processes include high rate backside via etch, low damage frontside etch, high aspect ratio silicon trench etch, and deposition of metal or dielectric layers for stress control, electrical contacts, via seed layers, passivation or anti-reflective coatings.

KLA is a key partner in CSconnected, the world's first compound semiconductor cluster, which represents organisations associated with research, development and manufacturing of compound semiconductors, with the aim to promote collaborative development for the advancement of compound semiconductor expertise, technologies and products.

KLA PRODUCTS

SPTS Omega® ICP

Module for etching a wide variety of compound semiconductor materials, such as GaAs, InP, SiN_x, and GaN.

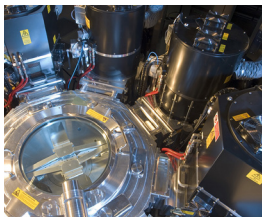


SPTS Omega® Synapse

Module with 10x ion density of ICP, designedto etch strongly bonded materials such as SiC, GaN and sapphire.

SPTS Omega® DSi-v / Rapier

Established high rate silicon DRIE modules with unique end-point solutions.



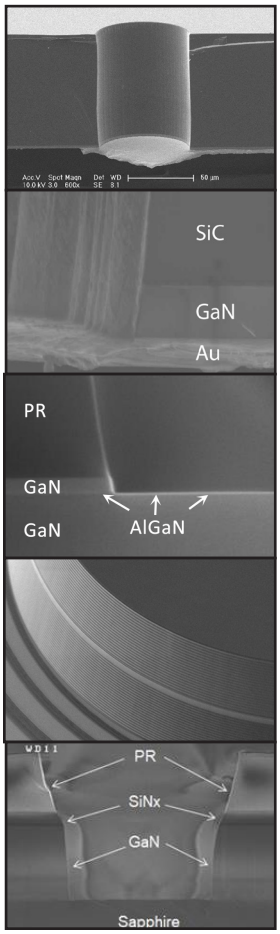
SPTS Delta™ PECVD

Deposition of low damage, stress-controlled SiO_x and SiN layers with unparalleled uniformity and deposition temperatures <250°C.

SPTS Sigma® PVD

High productivity metal layer deposition, with excellent film uniformity, for frontside and backside applications.

ETCH PROCESSES FOR COMPOUND SEMICONDUCTORS



Device Technology	Substrate	Etch Layers	Requirements
RF Devices			
GaAs	GaAs	Mesa, backside via, SiN_x, BCB/PI	Field proven processes
InP	InP	InP	High InP via etch rate
GaN on SiC	SiC	SiC backside via GaN	High rate SiC via GaN base layer
Power Devices			
GaN on Si	Si	GaN epi Si backside via	Slow, controllable, low damage epi etch High rate Si TSV
SiC	SiC	Oxide SiC	Profile control No microtrenching
Optoelectronics			
VCSELs	GaAs	Epi stack SiN	Profile, smoothness, end-point
High Brightness LEDs	Sapphire, Ge, Si	GaN Oxide	High rate, profile & high MTBC
InP Communications	InP	InP, InGaAs, InGaAsP	Profile control & smoothness

DEPOSITION PROCESSES FOR COMPOUND SEMICONDUCTORS

KLA offers PECVD and PVD deposition process modules which are compatible with handling smaller and often fragile wafers commonly used in the compound semiconductor industry - down to 3" for PECVD and 4" for PVD. Our processes offer films with excellent stress and uniformity control, on reliable, high thoughput, production-proven SPTS Sigma® and SPTS Delta™ cluster platforms.

SPTS Delta™ PECVD

KLA has the largest PECVD installed base in high volume manufacturing of MIMCAP (metal-insulator-metal capacitors) insulators and other passivation layers in GaAs RF-ICs. Delta™ PECVD offers excellent SiN reliability for MIMCAP insulation with a WIW thickness uniformity 2x better than competing systems. We are also the only supplier to offer remote plasma clean for wafer sizes smaller than 200mm, to increase productivity and reduce chamber damage during cleans.

SPTS Sigma® PVD

KLA has a wide range of PVD module technologies to meet the demands of compound RF-IC and MMIC manufacturing. Typical applications include frontside Au interconnects, thin film resistors, backside via seed, RDL/UBM, BAW electrodes & piezoelectric layers, and SAW electrode & encapsulation. Our SPTS Sigma® PVD system includes a unique electrostatic clamp which is compatible with sapphire carriers, without the need for a back-coat of metal.

KLA SUPPORT
Maintaining system productivity is an integral part of KLA's yield optimization solution. Efforts in this area include system maintenance, global supply chain management, cost reduction and obsolescence mitigation, system relocation, performance and productivity enhancements, and certified tool resale.

KLA Corporation
One Technology Drive
Milpitas, CA 95035
www.kla.com

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