



JULIA JEAN, LLC

ON-CHIP ELECTRON BEAMS FOR X-RAY GENERATION

ADVANCING NEW IMAGING TECHNOLOGIES

Electron sources are core components in x-ray technologies. They are typically hot cathodes, which have critical limitations, including the inability to discriminate between materials, such as soft tissues and controlled substances. They also require significant heat management and power supplies to operate.

To advance beyond these limitations, our patent-pending, chip-based cold cathode sources are a necessary enabler of future imaging systems. This novel on-chip solution allows for distributed arrays of x-ray sources that drives disruptive change by improving energy efficiency, extending device lifetime, and reducing x-ray generator footprint, thus leading to new imaging modalities. For medical applications, these advances result in early-stage cancer detection. In the security field, unambiguous materials identification offers streamlined non-invasive inspection.



BENEFITS

Controllable. On-chip electrode structures provide independently addressable electron beams.

Distributable. Proprietary technology results in arrayed x-ray sources for stationary imaging.

Efficiency. Cold electron sources reduce overall energy consumption and heat.

High Resolution. Multiple parallel sources improve image contrast and resolution.

Materials Identification. Multiple x-ray energies allow color- or diffraction-based discrimination.

Thermal Management. Cold sources eliminate the power supply and cooling required for hot sources.

Please contact us to discuss your requirements.

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APPLICATIONS

IRRADIATION. Food & materials sterilization, curing & polymer cross-linking

MEDICAL IMAGING. Stationary CT, compression-less mammography, dental & veterinary, portable & handheld radiography

NON-DESTRUCTIVE TESTING. In-line manufacturing quality control, PCB & pipeline defect detection

SECURITY SCREENING. Airport baggage, cargo inspection, border control, military checkpoint screening based on diffraction imaging

TECHNICAL INFORMATION

Brightness. 1-10 A/cm² continuous or pulsed current

Compact. Reduced electron optics and heat management

Compatible. Swappable with existing electron sources

Fabrication. Scalable silicon carbide wafer-based process

Geometry. Multi-electrode capability for on-chip switching

Longevity. Nanostructured for built-in redundancy

Quality. Low emittance (beam spread) electron sources

