

Hitachi High-Tech Science America, Inc.

Vortex[®] SDD

Silicon Drift Detectors
for Science at the Speed of Light



Vortex[®] ME-7

Technologically Advanced Silicon Drift Detectors

Vortex[®] silicon drift detectors are a range of high quality and technology leading x-ray detectors.

The Vortex[®] SDD are produced from high purity silicon using state-of-the-art CMOS production technology and offer best-in-class count rate capability and excellent resolution when coupled with a DPP.

Outstanding Throughput

The Vortex[®] SDD is capable of input count rates in excess of 7,000,000 counts per second. As a result of the superior short rise times and the ASIC CUBE technology, the Vortex[®] SDD can generate output count rates in excess of 4,000,000 counts per second.

The throughput of the Silicon Drift Detector is a function of the sensors rise time and the digital pulse processor capability.

The Vortex[®] silicon drift detectors are compatible with all the leading commercially available digital pulse processors, including the Quantum Detectors Xpress 3 and the XIA FalconX.

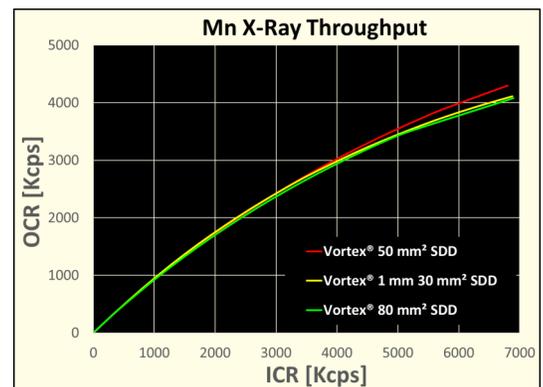


Figure 1: Output count rate (OCR) vs. Input count rate (ICR)



Technologically Advanced Silicon Drift Detectors

Throughput (cont.)

The rise time of the sensor used in the Vortex[®] SDD is the shortest available. This short rise time means that high counts can optimally processed by the detector and digital pulse processor.

The advanced digital pulse processors such as the FalconX and Xspress 3 are able to process >7 Mcps with extremely low dead times resulting in out put count rates of over 4 Mcps.

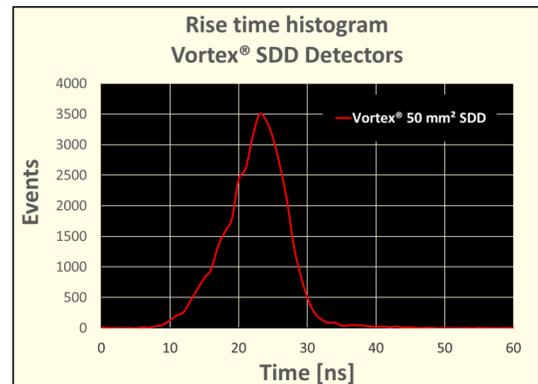


Figure 2: Rise time histogram

Superior Energy Resolution

Energy resolution is an important characteristic in silicon drift detectors, especially when the application calls for output count rates over 3,000,000 counts per second. The Vortex[®] silicon drift detectors provide superior energy resolution at all output count rates, from <127eV at low count rates to <230eV at 3 Mcps output.

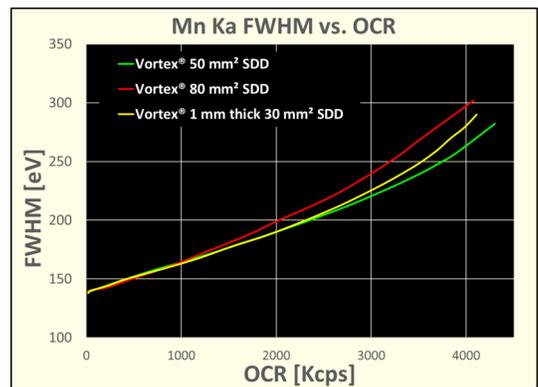


Figure 3: Resolution at increasing OCR

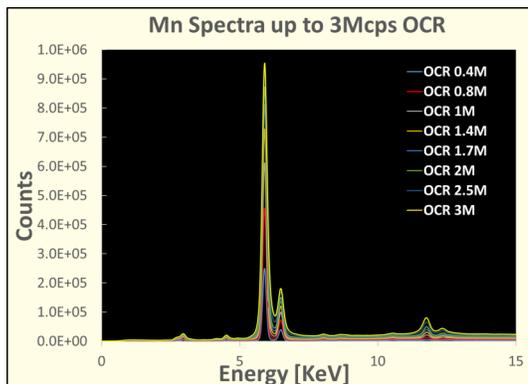


Figure 4: MnK_α Spectra at varying OCR

The combination of outstanding throughput and superior energy resolution provides the end user with excellent spectra from low to ultra high count rates.

Unique Sensor Thickness

SDD sensors are traditionally 500 μm thick, these are excellent for energies up to 10keV. For energies over 10 keV, the Quantum Efficiency will begin to decline, reaching <40% at 20keV and 12% at 30keV.

The Vortex[®] SDD offers the unique 1000 μm and 2000 μm sensors resulting in superior Quantum Efficiencies for energies >10keV

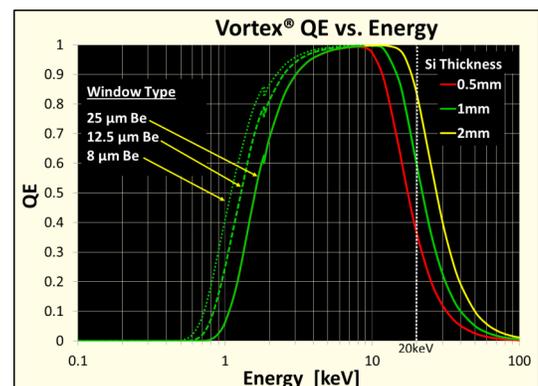


Figure 5: Quantum Efficiency curve of SDD sensors

For more information, contact
Hitachi High-Tech Science America, Inc.
20770 Nordhoff St. Chatsworth, CA 91311
www.hitachi-hightech.com/hhs-us/
Tel: +44 (0)747 1086 241
Email: del.redfern@hitachi-hightech.com