



Company Presentation 2023

www.dstsensor.eu

Leader In Detection and Sensing

DSt have established a successful business supplying markets requiring high performance detector and sensor technologies

Strengths

- **Interactive design optimisation with customers**
- **Strong technical support**
- **In-depth process knowledge**
- **Detailed understanding of X-ray sensor requirements**
- **Best performance ultra low noise JFETS and PIN diodes.**
- **Supplies JFETs/PIN Diodes to >50% end markets**
- **Familiar with MEMS sensor technologies for a broad set of applications**

Expert

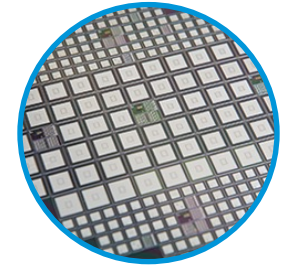


DSt Sensor Technologies is an expert developer and supplier of semiconductor sensor devices for the X-Ray detector, X-Ray fluorescence, Radiotherapy dosimeter and Radiation detector markets.



Products include

- **High performance PIN diodes,**
- **Ultra low noise JFETs (3 pin for high transconductance**
- **Low noise amplifiers and 4 pin with integrated charge reset mechanism and feedback capacitor for large area nuclear detectors coupled with charge sensitive amplifiers - available for both positive and negative charge collection)**
- **Neutron detectors**



Service and Product form factor

Full custom design and manufacturing
service

We can supply in:

- Wafer form, as 100% tested die
- Die in waffle trays
- Devices in packages
- Fully assembled and tested modules



Products and Markets Served

- **Further Areas of Activity**

- ✓ **Packaged PiN diodes for Neutron radiation monitoring.**
- ✓ **Customer specific charged particle detectors.**
- ✓ **Medical dosimetry using PiN diode and Radfet devices.**
- ✓ **MEMS based thermal conductivity gauge for O2 sensing**
- ✓ **Gas Sensing ; Micro hotplates, IR emitters**
- ✓ **Thin silicon PiN diodes for advanced medical dosimetry.**
- ✓ **MEMS breathing sensor for Sleep Apnea, COPD, Asthma**

X-Ray & Other Detection Markets

Market Size

- End user market - >\$500M p.a.
- Component Sales – c.100,000 p.a.
- Growth Rate - >10% p.a.

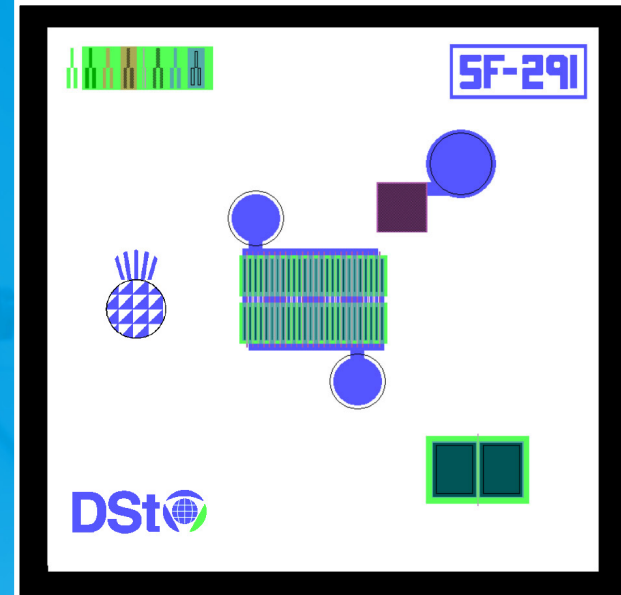
Market Drivers

- RoHS Compliance
- Homeland Security
- Handheld Instrumentation
- In home medical diagnostic devices

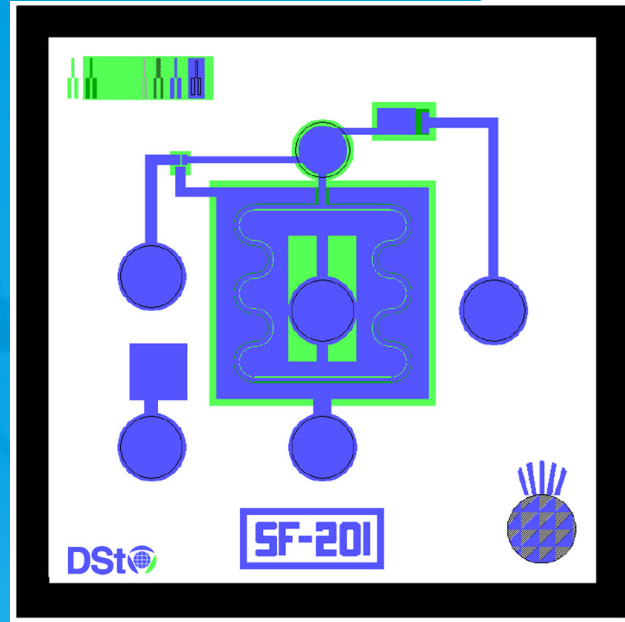
Design and Modelling Capability

- In house design and layout using LEDIT software
- Device modelling using Silvaco
- Characterisation using in house SEM and EDAX
- Detailed reverse engineering analysis at MCS for FIB, device cross sections and elemental analysis

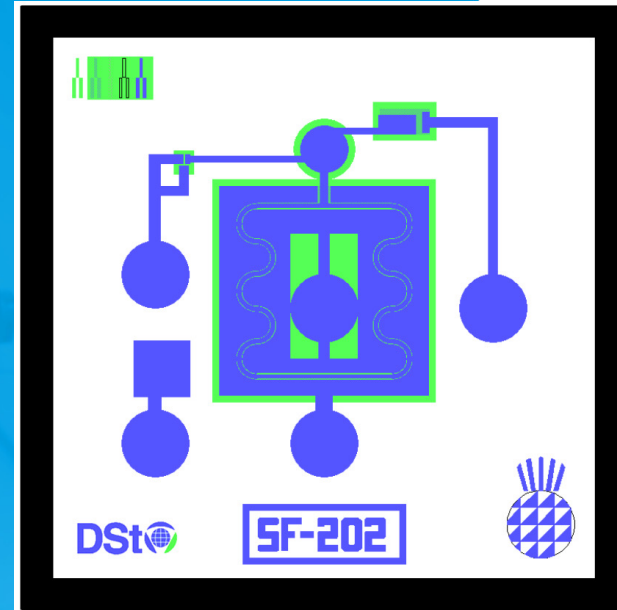
SF291 JFET Layout



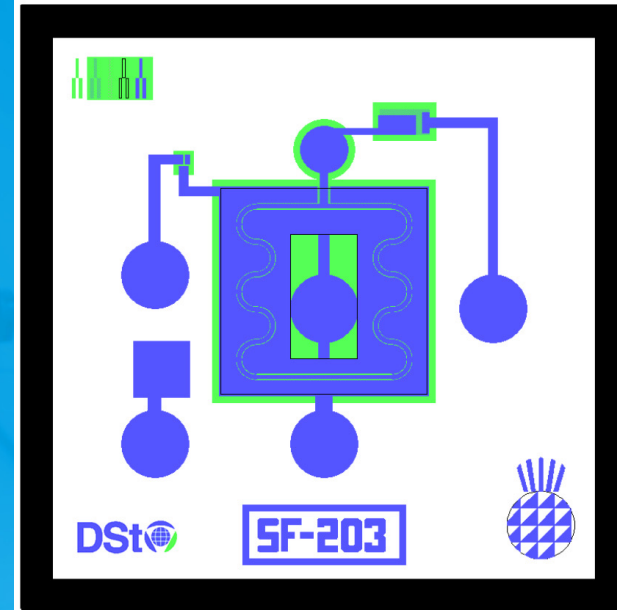
SF201 JFET Layout



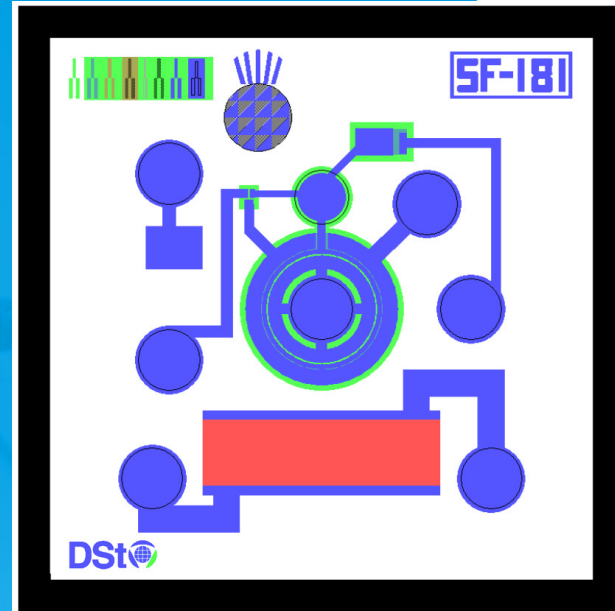
SF202 JFET Layout



SF203 JFET Layout



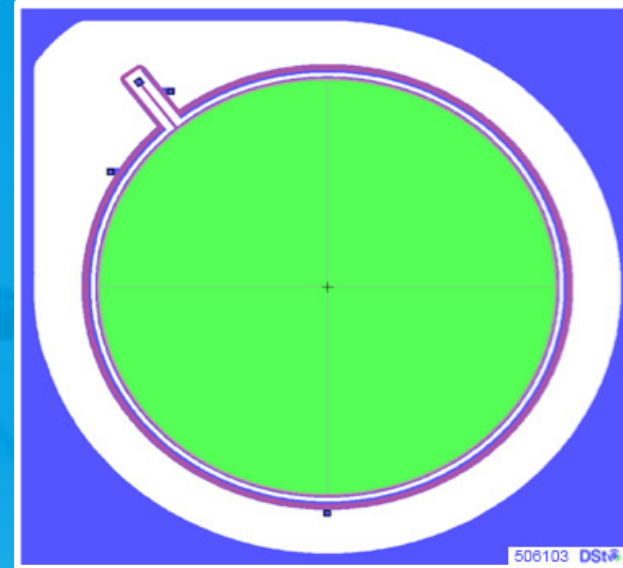
SF181 JFET Layout



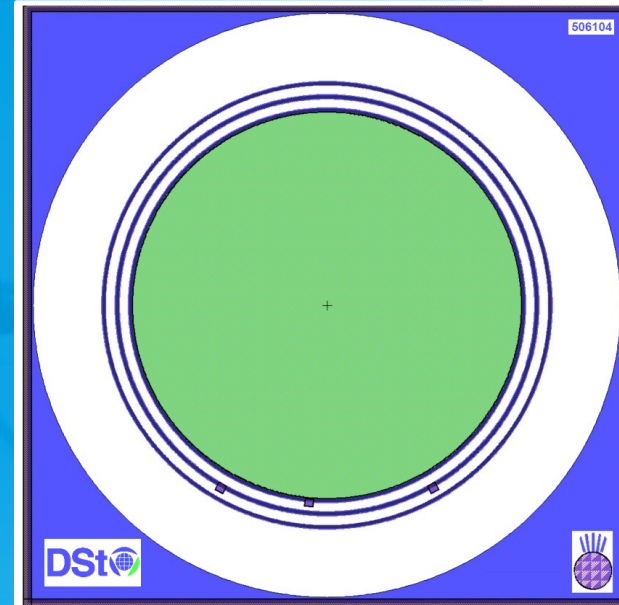
SF51-75 JFET Layout



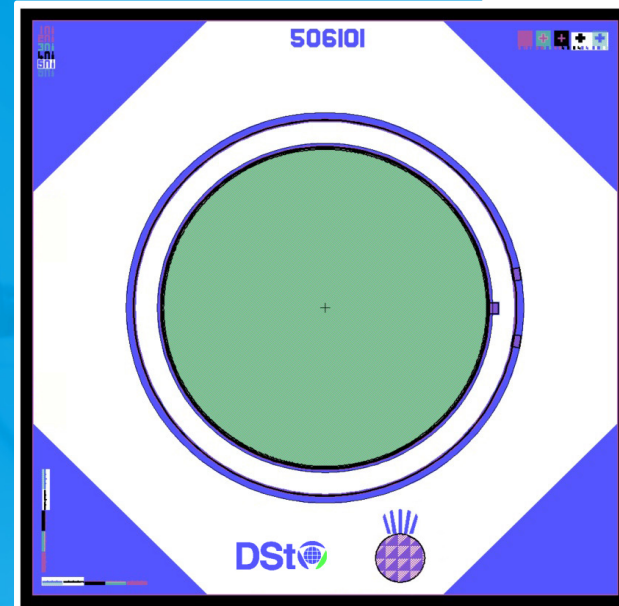
506103 PiN diode layout



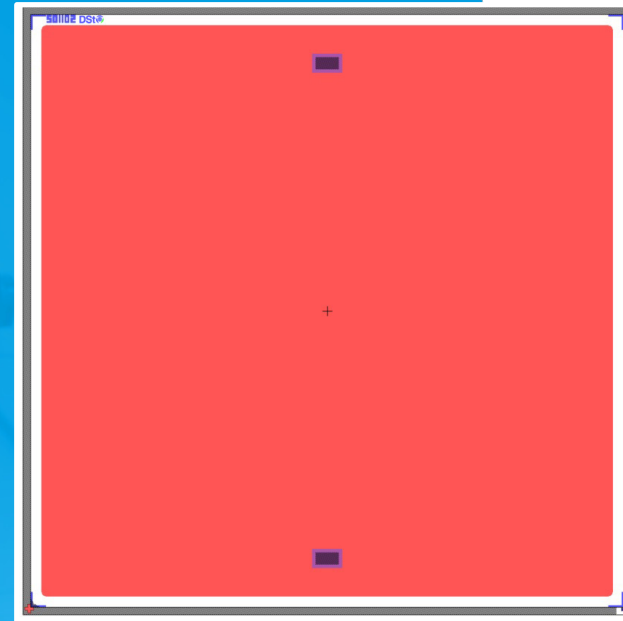
506104 PiN diode layout



506101 PiN diode layout



506102 PiN diode layout



DSt Low Noise JFET Products

Low Noise JFETs					
Device No.	Input Cap. Ciss (pF) Vds=0V, Vgs=0V	Gm (mS) Vds=3V Vgs=0V	Noise, En nV /Root HZ Vds=3V, f=100kHz	Die size	Additional Information
SF291	8.0	45	0.65	900 x 900 μ m	Three terminal device for amplifiers requiring high transconductance and low noise.
SF201	1.6	10	1.3	900 x 900 μ m	Four terminal device with an integrated charge reset mechanism and feedback capacitance. Suitable for large area nuclear detectors coupled to charge sensitive amplifiers. For electron charge collection (negative biased detectors)
SF202	1.6	10	1.3	900 x 900 μ m	Four terminal device with an integrated charge reset mechanism and feedback capacitance. Suitable for large area nuclear detectors coupled to charge sensitive amplifiers. For hole charge collection (positive biased detectors)
SF181	0.8	5	1.8	900 x 900 μ m	Four terminal device with an integrated charge reset mechanism and feedback capacitance. Suitable for medium area nuclear detectors coupled to charge sensitive amplifiers. For electron charge collection (negative biased detectors)
SF51	0.4	2.3	2.2	900 x 900 μ m	Four terminal device with an integrated charge reset mechanism and feedback capacitance. Suitable for small area nuclear detectors coupled to charge sensitive amplifiers. For electron charge collection (negative biased detectors)

DSt Silicon Detector Products

Silicon Detectors PiN						
Device No.	Active area (sqmm)	Thickness	Capacitance	Leakage current at full Depletion	Mn Energy Resolution at -40C	Additional Information
506103	25	500um	5.5pF	1nA typical	170eV	Large area circular silicon PiN diode suitable for X-ray, and electron detection.
506104	13	500um	3.0pF	600pA typical	156eV	Medium area circular silicon PiN diode suitable for X-ray, and electron detection
506101	6	500um	1.3pF	350pA typical	149eV	Small area circular silicon PiN diode suitable for X-ray, and electron detection
501102	4.1x4.1	380um	3.2pF	600pA typical		Supplied in 18ld LCC package with Kapton window for use as Neutron detector.

DSt Silicon Detector Products



PPS506 PiN Diodes - Test Limits

Parameter	Test Conditions	506101	506103	506104	506105	506106
Diode Vf	5mA	0.3V to 1V	0.3V to 1V	0.3V to 1V	0.3V to 1V	0.3V to 1V
Guard Ring Vf	5mA	0.3V to 1V	0.3V to 1V	0.3V to 1V	0.3V to 1V	0.3V to 1V
Diode Leakage	Vr=200V			Max = 1nA		Max = 1nA
Diode Leakage	Vr=225V	Max = 700pA	Max = 1.5nA		Max = 700pA	
Guard Ring Leakage	Vr=200V			Max = 1nA		Max = 1nA
Guard Ring Leakage	Vr=225V	Max = 700pA	Max = 1.5nA		Max = 700pA	
Breakdown Voltage		>225V	>225V	>225V	>225V	>225V
Die Size		4.9 x 4.9 μm	6.4 x 6.4 μm	6.4 x 6.4 μm	6.4 x 6.4 μm	6.4 x 6.4 μm











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