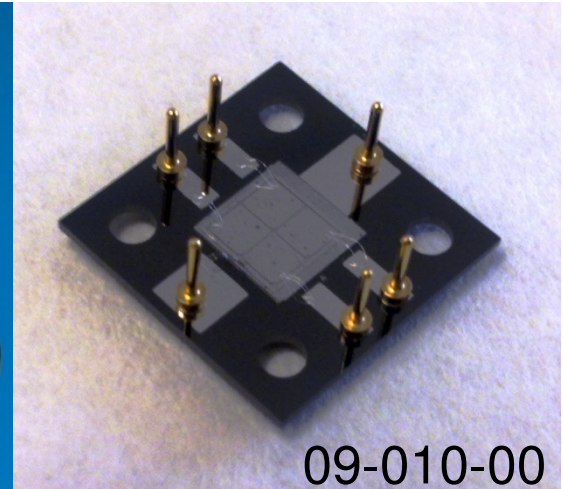
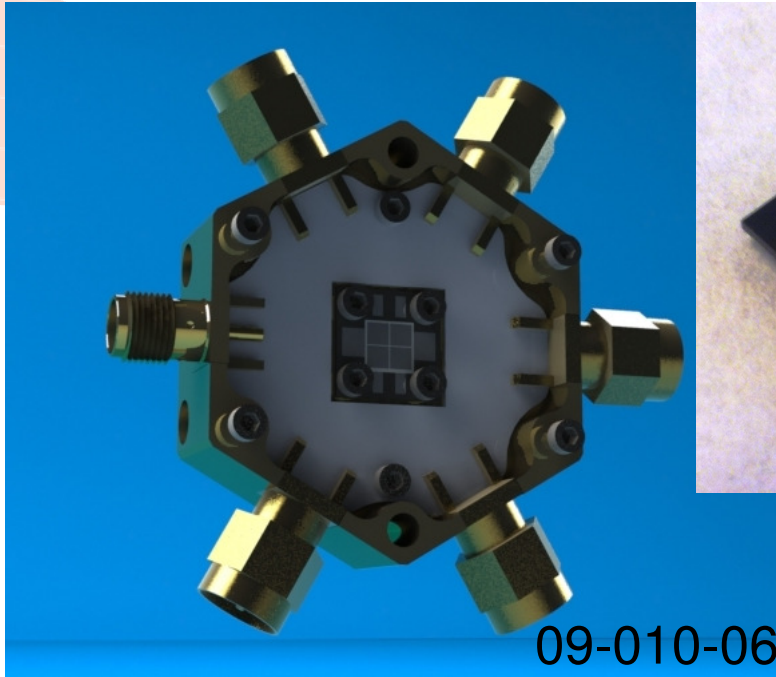


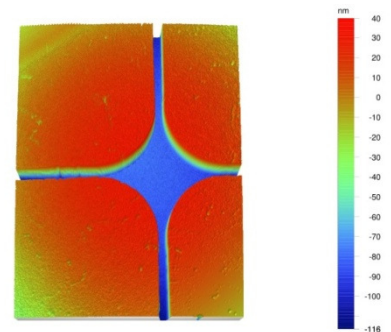
# Real Time High Purity Single Crystal Diamond beam position monitoring



The Quadrant beam position monitor is suitable for a range of beam applications including X-ray synchrotron and charged particle beam lines. The low-Z diamond based detector is mounted over a hole on either a conventional PCB or on a diamond carrier substrate for thermal loads. Standard detector thickness options are 50, 100, 300 and 500 micron on a 4.5x4.5mm device, custom thickness and sizes available on request also available on electronic grade polycrystalline diamond for larger devices.

The advantages of single crystal diamond include

- Low X-ray absorption ( $Z=6$ ).
- Radiation hard (permanent in-situ placement).
- Excellent thermal and mechanical properties.
- Compact ,UHV compatible.
- High positional resolution.
- Time resolution ( $<1$  ns).
- Homogenous (no grain boundaries).
- Spectroscopic grade material (better than 1% energy resolution)



Technical Specifications	
Detector type	High Purity CVD Diamond Single Crystal
Detector thickness	50,100,200 & 500 micron (20 micron available soon)
Transmission	Thickness specific
Bias voltage	Typically 0.3V/micron
Die size	4.7x4.7mm which Includes 4 pads with guard ring and back electrode.
Metallization	Aluminium 100nm thickness.
Package size	Module 09-010-00 10x10x0.5mm with a centre 3mm hole over which the die is mounted. Package 09-010-06 ~40mm Diameter by 15mm thickness (6mm window).
DDL can provide a range of custom processing options including :- thickness, lithography ,metallization and package design	

### **Electronic packages available**

- **I400** 4 Channel electrometer  
Four gated integrator channels with adjustable bias voltage to 400V ,  
Dynamic range <0.1 pA to >70 uA .



- **DBA-IV** 2 GHz broad band diamond Amplifier, with analogue gain input.  
(fast counting and time of flight)

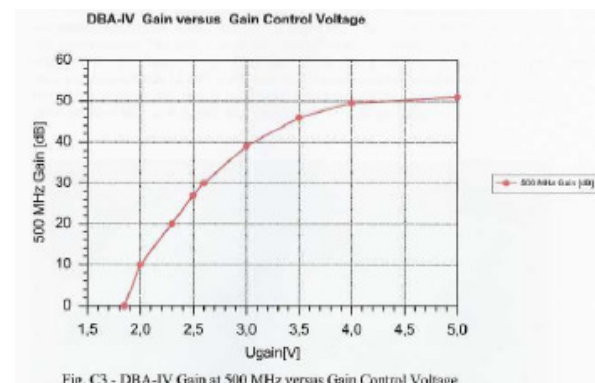


Fig. C3 - DBA-IV Gain at 500 MHz versus Gain Control Voltage

\* These applications will require thermal management solutions.