

QMC Instruments Ltd. has been serving the Terahertz research community for nearly 40 years. Throughout that period it has partnered its academic astronomer colleagues to bring their unique experience and technology to a wider science field. Our recent clients and projects include:



Herschel and Planck Satellites Launched May 14<sup>th</sup> 2009



The EAST Tokamak Hefei, China

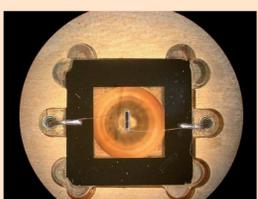


Highlights of our product range are shown below. These technologies are available to you directly from our UK based operation or through our local agents and distributors:

- Japan** *Infrared Ltd.* (Tokyo) Contact: Mr. Tetsuo Mori  
 T: 03 5372 7575 F: 03 5372 7577 E: info@infrared.co.jp W: www.infrared.co.jp
- China** *Zhiwa Trading Co Ltd.* (Hong Kong) Contact: Ray Tsang  
 T: 02380 6080 F: 02789 8656 E: zhiwa@hkstar.com W: www.zhiwa.com
- South Korea** *Sellex, Inc.* (Seoul) Contact: Bob Chang  
 T: 031-717-9245 F: 031-717-9248 E: bob@sellexinc.com W: www.sellexinc.com

## THz Detectors

### Cryogenically Cooled



Germanium Bolometer Model QGeB/X  
60GHz – 20THz

- Low Impedance Germanium Thermistor
- Low Susceptibility to Vibration

#### Germanium Bolometer Performance Guide

Temp K	Detector Optical NEP W Hz <sup>-1/2</sup>	Time Constant ms (-3dB)
4.2	5x10 <sup>-13</sup>	1
1.5	5x10 <sup>-14</sup>	5
0.35	5x10 <sup>-15</sup>	10
0.1	5x10 <sup>-17</sup>	30

#### InSb Hot-Electron Bolometer Performance Summary

Detector Type	Frequency Range
QFI/X	10 – 500 GHz
QFI/XBI	60GHz – 2THz
QFI/XB	1 – 2.5THz

Detector Opt. NEP = 5x10<sup>-13</sup> W Hz<sup>-1/2</sup>  
 Time Constant = 0.3µs (-3dB) at 4.2K



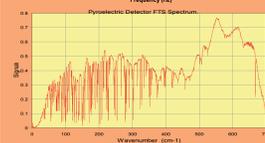
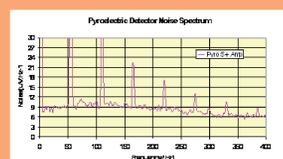
InSb Hot-Electron Bolometer Model QFI/X

### Room Temperature **NEW NEW**

#### Cone-coupled DLATGS Pyroelectric Detectors



- Integral Amplifier
- Winston Cone Coupling
- Integral multi-mesh filter
- Optical Calibration
- Room Temperature Operation
- Optical NEP 5 E<sup>-10</sup> W.Hz<sup>-1/2</sup> at 10Hz  
1 E<sup>-9</sup> W.Hz<sup>-1/2</sup> at 200Hz



Noise spectrum, speed curve and FTS spectrum measured with Pyroelectric Detector

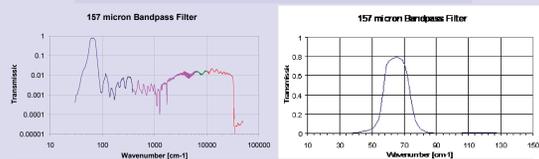
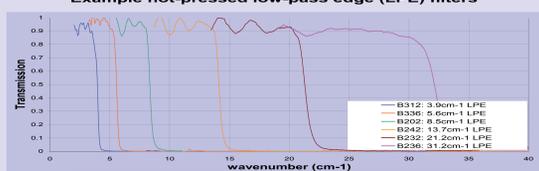
## THz Optical Components

### Filters



Our Unique multi-mesh filter technology is available in Band-pass, Low-pass and High-pass formats in the range 30GHz to 30THz

T(op) 0-350K  
Space qualified.



Performance of a 157µm band-pass filter. Left: Broad blocking. Right: Efficient passband.

### Polarisers



A photolithographic polariser, 500mm in diameter, 10µm pattern period

A wire-wound polariser, 500mm diameter.

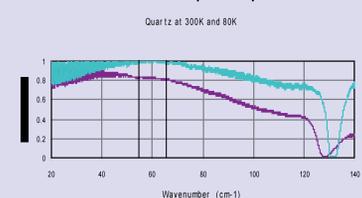


Our photolithographic polarisers are available with a pattern repeat period as small as 2 microns to give excellent polarising efficiency up to 30THz

### Coatings



Anti-reflection and reflection coatings can be applied to many materials commonly used in the THz region. The technology is vacuum compatible and has been space qualified.



Temperature-dependence of Quartz transmissivity in the THz

## THz Instrumentation

### Cooled Detector Systems

We offer a comprehensive cryogenic system design service. Detectors and optical components can be assembled in our range of liquid helium cryostats. We also offer cryogen-free systems based on pulsed-tube coolers. Contact us for details.



A 100mK Bolometer



Our range of liquid helium cryostats. 24 hours to 8 weeks operation on a single fill.

Cryogen-free operation!  
2 hour cool-down to 3K.



A linear detector Array.



Light-pipe mounted InSb hot-electron bolometers

### Spectrometers

In association with our partners Bluesky we offer bespoke FT spectrometers



- High optical throughput
- Polarising optics
- Mach-Zehnder and Martin-Puplett configurations
- Bespoke design service