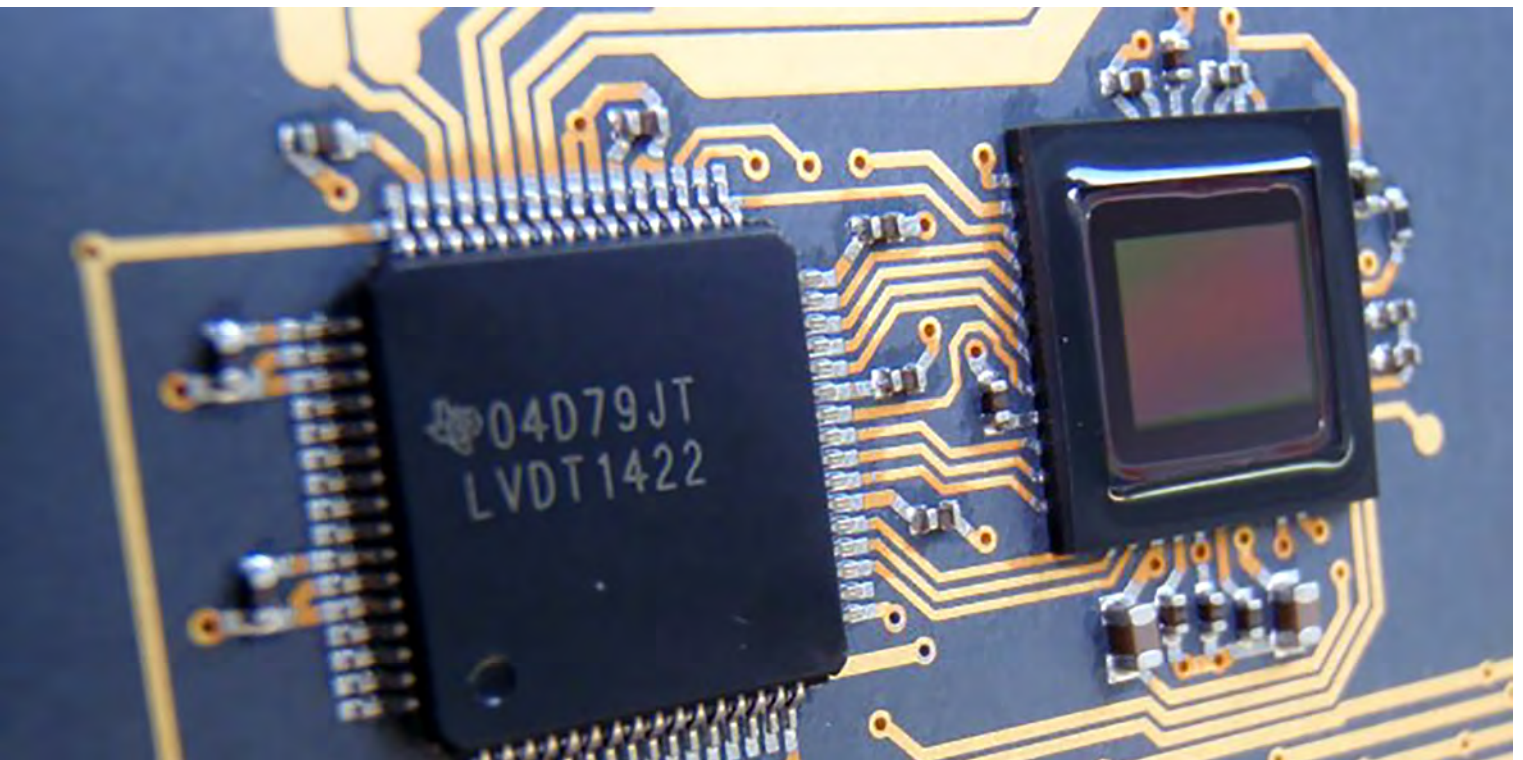




DEVELOPED FOR: Customer under NDA  
3D-MID Camera System



**ELECTRONIC DESIGN AND DEVELOPMENT SERVICES**

Investigation and evaluation of materials, technologies, manufacturing and assembly processes.

Design and development of a highly integrated multi-sensor-array imaging system on a curved substrate.

# 3D-Moulded Interconnect Devices (3D-MID)

3D-MID technology allows the combination of plastic substrates or mechanical housings with integrated electronic circuitry into single parts via selective metallisation. The use of high-temperature injection moulded thermoplastics with integrated conducting circuits to combine mechanical, optical and electronic functions (into 3-dimensional designs) aids the miniaturisation of electronic devices and the realisation of complex shapes and designs that are not possible with conventional electronics and manufacturing methods, offering potentially significant space and weight savings compared to conventional design approaches.

## Heritage

Since its introduction in the 1980's, the use of 3D-MID technology has been growing steadily in acceptance and is now used in a variety of industries and applications, e.g.

- Automotive: radar for adaptive cruise control, sun sensors, seat and headrest adjustment switches, turbocharger and headlight regulation, remote control units and LED blinkers
- Medical: microphone module for hearing aids, braille modules, LED carriers, switch elements and tweezers
- Other: antennas and coaxial connectors for mobile phones, pressure and flow sensors, magnetic field sensors, camera modules, watches and security housings for PIN entry devices

## Our contribution

Evaluation of materials, technologies and manufacturing processes to be used in the design and development of a highly integrated multi-sensor-array (6 x 2) imaging system with an extremely large view angle, on a curved substrate.

### Phase I

- system analysis & concept study
- technology study & packaging options
- definition of packaging form
- selection of assembly technology
- production of technology demonstrator
- reliability testing

### Phase II

- design & development of technology demonstrator
- optical path design, image processing & viewer
- definition of FPGA programming requirements
- production support & test of technology demonstrator
- reliability testing & system demonstration

## Production processes

There are a number of alternative manufacturing processes currently in use today, the most common being:

- 2-step injection moulding
- 3D photo-imaging
- hot embossing
- laser direct structuring
- laser resist imaging

## Advantages

- geometric design freedom
- reduced space requirements
- defined angles between components
- stacking and precision placement of components
- more efficient assembly, integration and test
- low production costs (higher initial costs)
- ecologically friendly



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