A UNIQUE fast and flexible pixel evaluation & demonstration's platform

Very flexible approach:

- Up to 8 signal control per pixel line
- Rising and falling edge slew rate control
- Up to 3 level voltage applied on signal control lines
- Large range of power supplies
- Timing adjustment through IHM /EK
- Column bandwidth adjustment
- Column current control
- Matrix power supply dynamic control
- XY addressing through column control
- Test unit to visualize pixel signal control

Compatible with:

- Different pixel sizes ( <1µm up to >500µm)
- Different architectures (3T, 4T, 5T ...)
- Shared architectures
- Ultra low noise pixel measurement
- Backside illumination
- High resistivity substrate
- Negative voltage on pixel control line
- Large range of power supply inputs
- HDR pixel with multiple readout
- Bulk biasing
- TDI operation
- NMOS/PMOS pixel type
- 3V3 & 5V option
- Non destructive readout
- Post process options
- CCD (charge transfer) concept
- Mechanical shutters and/or flash lights

Figure: Pixel evaluation platform overview
CREAPYX chip

Maximum resolution: VGA format

The chip package is a 84 lead ceramic LCC, sealed with an epoxy glued glass lid (Can be removed through heating)

The total die size is 6,0 mm (V) x 5,9 mm (H), compatible with standard MPW site.

Design and layout is made out of:

- Core (Pixel array and interconnections)
- Frame (Needed driving and readout circuitry)
- Core has a total available area of 3,3 mm (H) x 2,5 mm (V)
- Pixel array area
- Interconnections to frame (for pitch fitting)
- Frame can be black-boxed for LVS purposes (abstract view to be used)

Delivery comprises:

- Frame layout view
- Frame symbol view
- Frame empty schematic view (only pins)
- Frame abstract view
- Pixel integration user’s guide

Pixel integration in the frame takes only a few hours

EVALUATION KIT

Usage of a Cypress FX3 MCU and Xilinx Artix7 FPGA
USB3 for frame-grabbing and EK control
FX3 handles CREAPYX register interface, power supplies and data-link
FPGA handles frame and line sequencing
Dedicated low-noise supplies / analog inputs
Jumper and probes for observability / external supply
Auxiliary voltage/current measurements

Delivery comprises:

- Evaluation kit (packaged)
  - Digital and FSI analog boards (fully assembled and tested)
  - Optional BSI analog board
  - Optical mount with basic lens, tripod
  - Power supply, USB cable

- Software (digital download)
  - Graphical User interface with interface DLL (Matlab, Labview…)
  - Optional characterization scripts for automation (Matlab only)

Evaluation kit is compatible with Creapyx chip in different processes

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