

ArrayJ

PRODUCT BRIEF

ArrayJ - High Fill-Factor Arrays of J-Series SiPM Sensors

SensL's custom range of J-Series TSV SiPM sensors have been used to create high fill-factor, scalable arrays. The sensors are mounted onto PCB boards with minimal dead space. The ArrayJ products are available in a variety of formats and formed of either 3mm, 4mm or 6mm pixels. Details of the arrays available are given in the table below and in the **Ordering Information** section.

The back of the larger ArrayJ products has one or more multi-way connectors that allow access to the *fast* output and *standard* I/O from each pixel in the array, and a *common* I/O from the summed substrates of the pixels. SensL SiPM sensors are unique in offering an additional *fast* output* that carries a signal with fast rise times and narrow pulse widths, allowing for precision timing and fast count rates.

The ArrayJ connectors can be used to interface with the user's own readout via the mating connector, or to SensL's Breakout Boards (BOBs). The BOBs allow for easy access to the pixel signals and performance evaluation of the arrays. For certain arrays, a summed BOB is also available, that allows all of the pixel outputs to be summed together to create a single, large-area sensor.

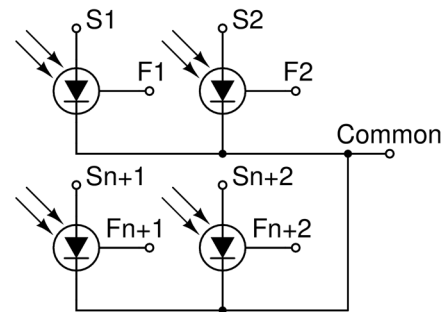
The smaller ArrayJ-60035-4P has a BGA (ball grid array) in place of a connector, and only provides access to the *standard* and *common* I/Os with no access to the *fast* output.

Each SiPM pixel in the ArrayJ therefore has three electrical connections;

- Fast output*
- Standard I/O
- Common I/O

All pixel *common* I/O (cathode) are summed together, but each individual *fast** output and *standard* I/O (anode) will be routed to its own output pin, as shown in the schematic below.

ArrayJ products are available in variety of configurations (see table below), using J-Series, TSV-packaged sensors. Please consult the [J-Series](#) datasheet for pixel-level performance data.



Array format	Pixel size	Microcell size	Breakout boards available **
2 x 2	6mm	35 μ m	Standard
8 x 8			Standard & summed
8 x 8	4mm	35 μ m	Standard
4 x 4		20 μ m	Standard
	8 x 8	3mm	35 μ m
20 μ m			Standard
35 μ m			Standard

* The fast output is not available on the 2x2 array (ArrayJ-60035-4P).

** The 'standard' BOB allows the readout of individual pixels, the 'summed' BOB sums all of the pixel signals together, giving a single output.

BREAKOUT BOARDS

To facilitate easy testing and performance evaluation of the ArrayJ products with connectors, SensL have developed corresponding Breakout Boards (BOBs).

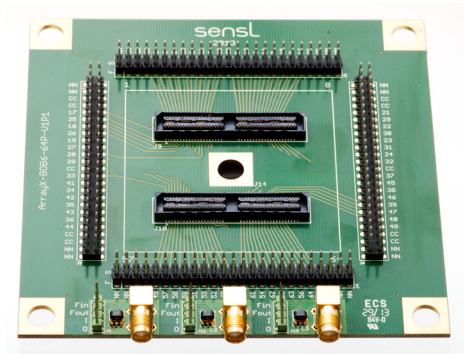
The ArrayJ connectors plug into the mating connectors located on the BOB. The *fast* output and *standard* I/O from each pixel, along with the *common* I/O (which consists of all of the substrate connections connected together) are routed to header pins for easy access.

Each BOB has three SMA connectors that can be used for supplying bias voltage and accessing signals. To interface signals from the array header pins to the SMA connectors, each connector has a 4-pin header. In addition, each SMA has an optional balun transformer in close proximity for impedance matching of the signals from the fast output.

For certain ArrayJ products there is a summed BOB available that allows all of the pixel outputs to be easily summed

together to create one single-channel, large-area sensor.

An evaluation board is available for the ArrayJ-60035-4P-BGA. It has 8-pin, DIL-socket-compatible pins and does not provide access to the fast output.



ORDERING INFORMATION

Product Code	Microcell size (Total number per pixel)	Array Size	I/O Interface
6 mm Sensor Arrays			
ArrayJ-60035-4P-BGA	35 μm	2 x 2	BGA
ArrayJ-60035-64P-PCB	(22,292 microcells)	8 x 8	Connector
4 mm Sensor Arrays			
ArrayJ-40035-64P-PCB	35 μm (9,260 microcells)	8 x 8	Connector
3 mm Sensor Arrays			
ArrayJ-30035-16P-PCB	35 μm	4 x 4	Connector
ArrayJ-30035-64P-PCB	(5,676 microcells)	8 x 8	Connector
ArrayJ-30020-16P-PCB	20 μm	4 x 4	Connector
ArrayJ-30020-64P-PCB	(14,850 microcells)	8 x 8	Connector
Optional Breakout Boards			
ArrayX-BOB6-64P	Breakout board for use with the ArrayJ-60035-64P-PCB		
ArrayJ-BOB3-16P	Breakout board for use with the ArrayJ-300XX-16P-PCB		
ArrayJ-BOB3-64P	Breakout board for use with the ArrayJ-300XX-64P-PCB & ArrayJ-40035-64P-PCB		
Optional Summed Breakout Boards			
ArrayX-BOB6-64S	Summed breakout board for use with the ArrayJ-60035-64P-PCB		
Evaluation Board with ArrayJ Permanently Attached			
ArrayJ-60035-4P-PCB	Evaluation board with a permanently attached ArrayJ-60035-4P-BGA and output pins		