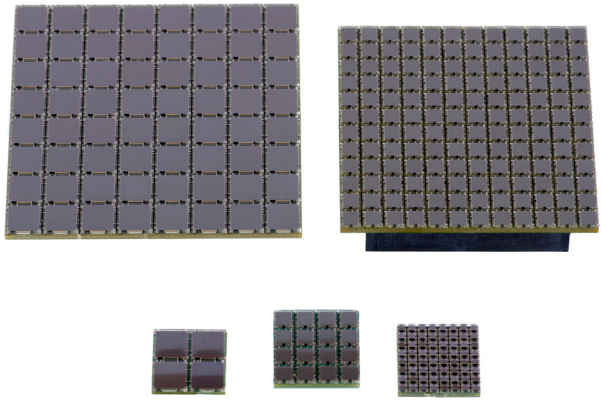
Compact, 4-Side Scaleable SiPM Arrays

SensL's custom range of C-Series, SMT (surface mount technology) SiPM sensors have been used to create compact and scaleable arrays. The sensors are mounted onto PCB boards with minimal dead space. The ArrayC products are available in a variety of formats and formed of pixels of different size. Details of the arrays available are given in the table below and in the **Ordering Information** section.



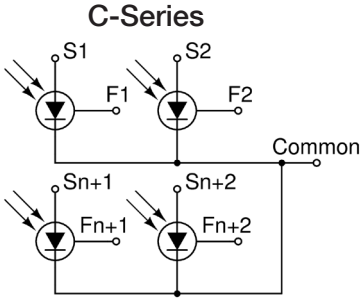
The back of each ArrayC has either one or more multi-way connectors, or a BGA (ball grid array), that allow access to the *fast* output* and *standard* I/O from each pixel in the array, and a *common* I/O from the summed substrates of the pixels. The ArrayC products with connectors can be used to interface with the user's own readout via the mating connector, or to one of SensL's Breakout Boards (BOBs). The BOBs allow for easy access to the pixel signals and performance evaluation of the arrays.

ArrayC products with the BGA can be reflow soldered to the user's readout boards, or purchased ready-mounted on a Evaluation Board (EVB) for easy testing. The BGA ArrayC sensors cannot be removed from their EVBs. This contrasts with the ArrayCs that have connectors, where multiple arrays can be evaluated with a single BOB.

A summed BOB is also available for certain ArrayCs, which allows all of the pixel outputs to be summed together to create a single, large-area sensor.

ARRAY DETAILS

SensL SiPM sensors are unique in offering an additional *fast* output* that carries a signal with intrinsic rise times of ~300ps and recovery times of <1ns, allowing for precision timing and fast count rates.



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

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

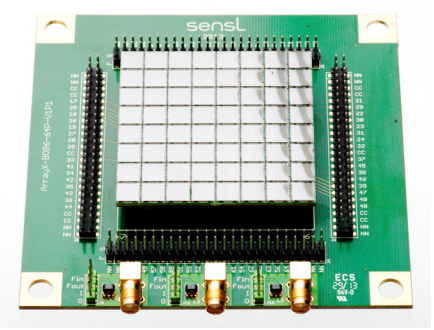
All pixel *common* I/O (cathode) are summed together, but each individual *fast* output and *standard* I/O (anode) will be routed to its own output pin.

ArrayC products are available in variety of configurations (see table below), using C-Series SMT-package sensors. For intrinsic pixel level performance data the C-Series datasheet should be consulted.

Array Format	Sensor	Readout	Pixel Pitch	Array Size	No. Connections
2x2*	60035	Pixel	7.2mm	14.2 x 14.2 mm^2	9*
8x8	60035	Pixel	7.2mm	57.4 x 57.4 mm^2	160
4x4	30035	Pixel	4.2mm	16.6 x 16.6 mm^2	40
12x12	30035	Pixel	4.2mm	50.2 x 50.2 mm^2	320
8x8	10035	Pixel	2.0mm	15.8 x 15.5 mm^2	144

** The ArrayC-60035-4P does not have access to the fast output.*

BREAKOUT BOARDS



Each ArrayC format has a corresponding Breakout Board (BOB) or Evalution Board (EVB) which can be used for easy testing and performance evaluation of the ArrayC products.

ArrayC products with 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.

Alternatively, there is a summed BOB available for the 8x8 array of 6mm pixels, and the 4x4 array of 3mm pixels. This allows all of the pixel outputs to be easily summed together to create one single-channel, large-area sensor.

ArrayC products with BGA are reflow soldered onto EVBs and therefore are permanently attached. Each EVB can only be used to evaluate the ArrayC supplied with it, and that array cannot then be removed to use elsewhere. The EVB for the ArrayC-10035-64P is otherwise the same as the BOBs described above. The EVB for the ArrayC-60035-4P has 8, DIL-socket-compatible pins and fits within the footprint of the array. The ArrayC-60035-4P-EVB does not provide access to the fast output.

More details on the ArrayC products, their Breakout Boards and Evaluation Boards can be found in the ArrayC User Manual.

ORDERING INFORMATION

Product Code	Microcell size (Total number per pixel)	Array Size	I/O Interface
6mm Sensor Arrays			
ArrayC-60035-4P-BGA	35um (18980 microcells)	2x2	BGA
ArrayC-60035-64P-PCB		8x8	Connector
3mm Sensor Arrays			
ArrayC-30035-16P-PCB	35um (4774 microcells)	4x4	Connector
ArrayC-30035-144P-PCB		12x12	Connector
1mm Sensor Arrays			
ArrayC-10035-64P-BGA	35um (504 microcells)	8x8	BGA
Optional Breakout Boards			
ArrayX-BOB6-64P	Breakout board with connectors for use with the 8x8 arrays of 6mm pixels		
ArrayX-BOB3-16P	Breakout board with connectors for use with the 4x4 arrays of 3mm pixels		
ArrayX-BOB3-144P	Breakout board with connectors for use with the 12x12 arrays of 3mm pixels		
Optional Summed Breakout Boards			
ArrayX-BOB6-64S	Summed breakout board for the 8x8 array of 6mm pixels		
ArrayX-BOB3-16S	Summed breakout board for the 4x4 array of 3mm pixels		
Evaluation Board with ArrayC Permanently Attached			
ArrayC-60035-4P-EVB	Evaluation board with a permanently attached 2x2 array of 6mm pixels		
ArrayC-10035-64P-EVB	Evaluation board with a permanently attached 8x8 array of 1mm pixels		

www.sensl.com
sales@sensl.com
+353 21 240 7110 (International)
+1 650 641 3278 (North America)