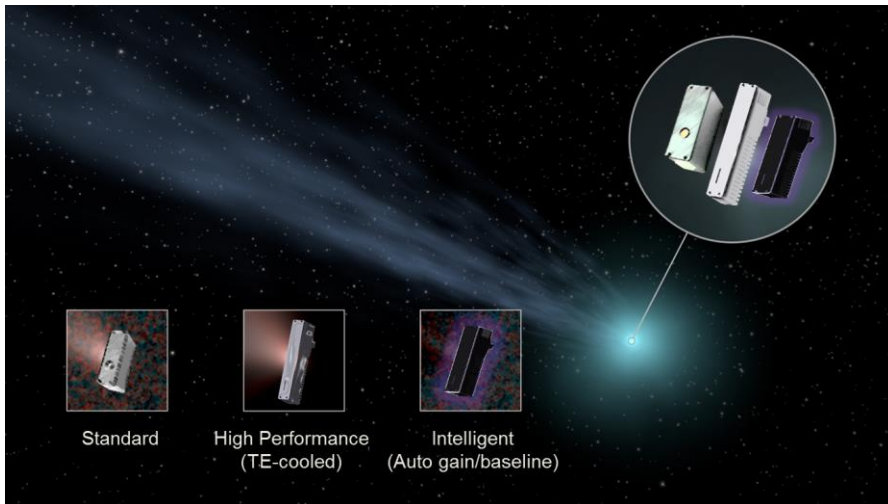


WhisperT Comet[®]

Solid-State Detector Modules for Life Science

Solid-State Detectors (SSD), including avalanche photodiodes (APD), silicon photomultipliers (SiPM), and other semiconductor photo-detectors are evolving rapidly (thanks to the semiconductor industry). They can be packaged with cooling options, PCB layers, special optics and other functional components in a modular format for life science instrumentation with excellent performance and reliability. Together with PIC's innovative, compact, low-noise direct-diode lasers, they drive towards smaller, reliable, and highly integrated systems in diagnostics, clinical, and point-of-care applications.

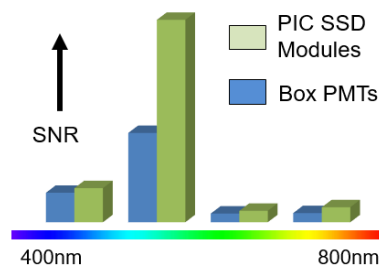
- Scalable solid-state sensor
- High quantum efficiency (even in NIR)
- Superior reliability
- Single-photon sensitivity
- Ultra-compact
- Integratable with function PCB layers



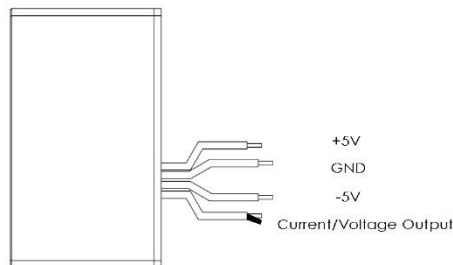
APPLICATIONS

- Diagnostics
- Clinical
- Point-of-care
- Flow Cytometry
- DNA Sequencing
- Medical Imaging
- Confocal Microscopy
- Optogenetics
- Metrology
- Semiconductor Instrumentation

FEATURES



PIC SSD modules have higher sensitivity, verified by various fluorescently-labeled 2µm beads.



PIC SSD modules input/output can be easily customized to specific instrument needs.



As for PIC's Standard SSD, here are 2 types of single-channel SSD, one is **Red wavelength enhanced SSD** (e.g. LPD0A3R1), the other one is **Blue wavelength enhanced SSD** (e.g. LPD0A3B2).

Red wavelength enhanced SSD (LPD0A3R1) Product Specifications

Parameter	Specifications			Units
	Min.	Typ.	Max.	
Input positive supplier voltage	+4.75	+5.0	+5.50	V
Positive current dissipation ^{Note 1}		100	130	mA
Input negative supplier voltage	-4.75	-5.0	-5.50	V
Negative current dissipation ^{Note 2}		50	80	mA
Spectral response range	350		1000	nm
Peak response wavelength		600		nm
Effective sensing area		Φ3		mm
Photoelectric sensitivity ^{Note 3}	4.5x10 ⁷	6.0x10 ⁷		V/W
Minimum detection limit ^{Note 3}		3	8	pW
I-V Conversion factor at high gain mode		750		V/A
Output offset voltage	-5		+5	mV
Rise time		50	120	ns
Operating ambient temperature	+5		40	°C
Storage ambient temperature	-20		60	°C

Note 1. Input positive supply voltage = +5V, Gain = 500, D.C. = 0, tested in darkness.
 Note 2. Input negative supply voltage = -5V, Gain = 500, D.C. = 0, tested in darkness.
 Note 3. Wavelength = 532 nm, Gain = 500, Dark compensation = 0.

Table 1. General specs

Pin No.	Name	I/O	Function Description
1	+5.0V	Power supply	Analog negative power supply, +4.75 to +5.25 V
2	-5.0V	Power supply	Analog negative power supply, -4.75 to -5.25 V
3	GND	Power supply	Common mode input pin to set DC level of the differential output signals (Connected to ground usually)
4	V cont_1	Analog input	Gain adjust control, 0 to +1.2
5	Output Signal_1	Signal output	Positive output signal, 0 to +3V / Current output

Table 2. Interface Pinouts

Mechanical Specifications

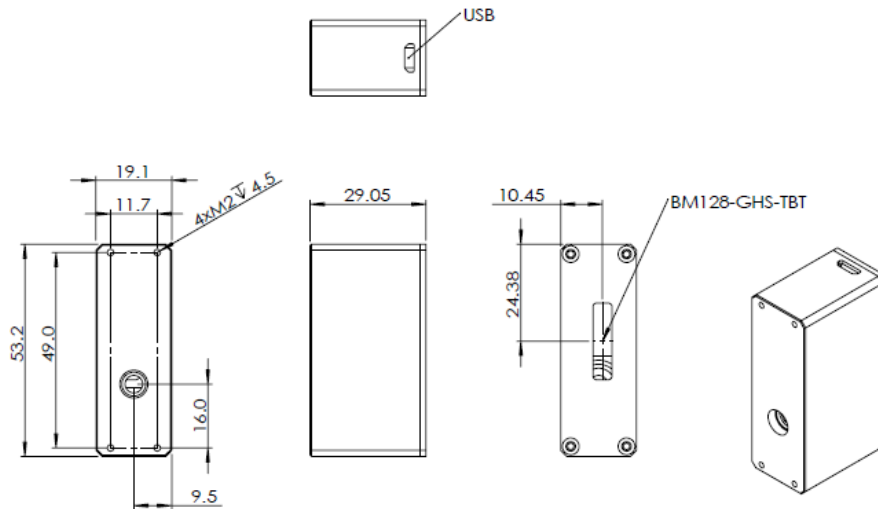


Figure 1. Module Schematic Drawing

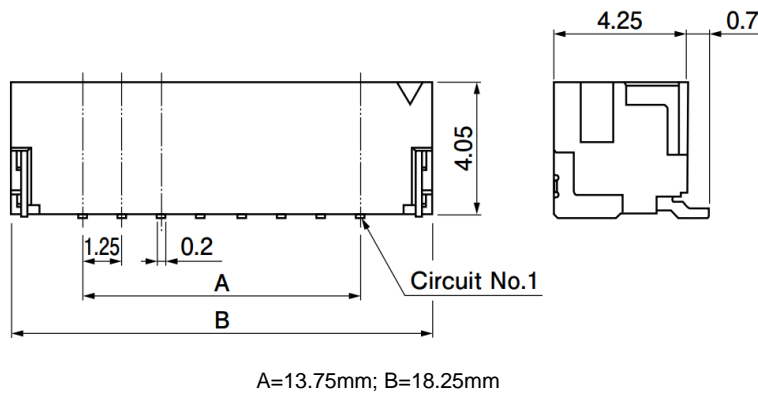
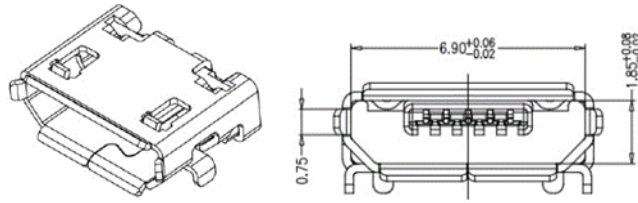


Figure 2. Interface Connector Drawing (JST GH PN: BM12B-GHS-TBT)



Gain setting range: 0 ~ 1023.
 Dark compensation setting range: 0 ~ 1023

Figure 3. Micro USB2.0 interface Connector to Set Gain and Dark Compensation

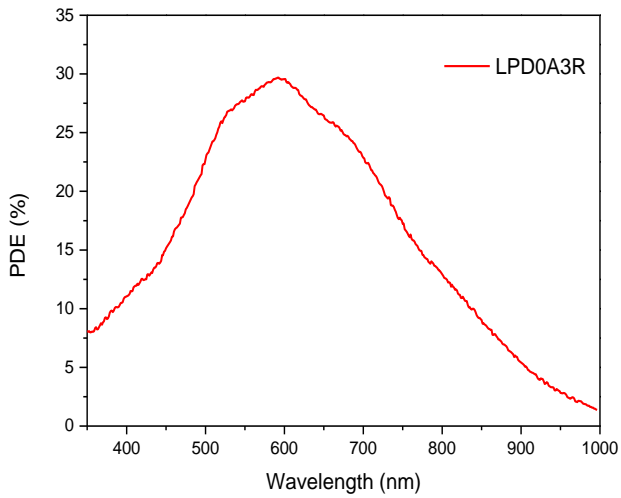


Fig 4a: Light Spectral Response

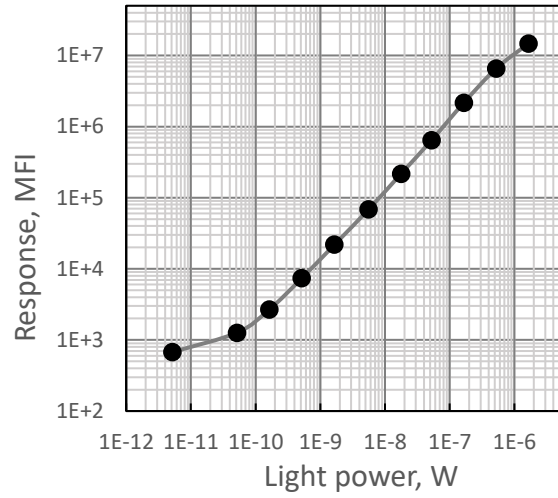


Fig 4b: Light Intensity Response

Charts 1. Typical Responses Charts

Blue wavelength enhanced SSD (LPD0A3B2) Product Specifications

Parameter	Specifications			Units
	Min.	Typ.	Max.	
Input positive supplier voltage	+4.75	+5.0	+5.50	V
Positive current dissipation ^{Note 1}		100	130	mA
Input negative supplier voltage	-4.75	-5.0	-5.50	V
Negative current dissipation ^{Note 2}		50	80	mA
Spectral response range	300		900	nm
Peak response wavelength		430		nm
Effective sensing area		3x3		mm
Photoelectric sensitivity ^{Note 3}	1.2x10 ⁷	1.8x10 ⁷		V/W
Minimum detection limit ^{Note 3}		2	5	pW
I-V Conversion factor at high gain mode		400		V/A
Output offset voltage	-5		+5	mV
Rise time		50	120	ns
Operating ambient temperature	+5		40	°C
Storage ambient temperature	-20		60	°C

Note 1. Input positive supply voltage = +5V, Gain = 500, D.C. = 0, tested in darkness.

Note 2. Input negative supply voltage = -5V, Gain = 500, D.C. = 0, tested in darkness.

Note 3. Wavelength = 532 nm, Gain = 500, Dark compensation = 0.

Table 3. General specs

Pin No.	Name	I/O	Function Description
1	+5.0V	Power supply	Analog negative power supply, +4.75 to +5.25 V
2	-5.0V	Power supply	Analog negative power supply, -4.75 to -5.25 V
3	GND	Power supply	Common mode input pin to set DC level of the differential output signals (Connected to ground usually)
4	V cont_1	Analog input	Gain adjust control, 0 to +1.2
5	Output Signal_1	Signal output	Positive output signal, 0 to +3V / Current output

Table 4. Interface Pinouts

Mechanical Specifications

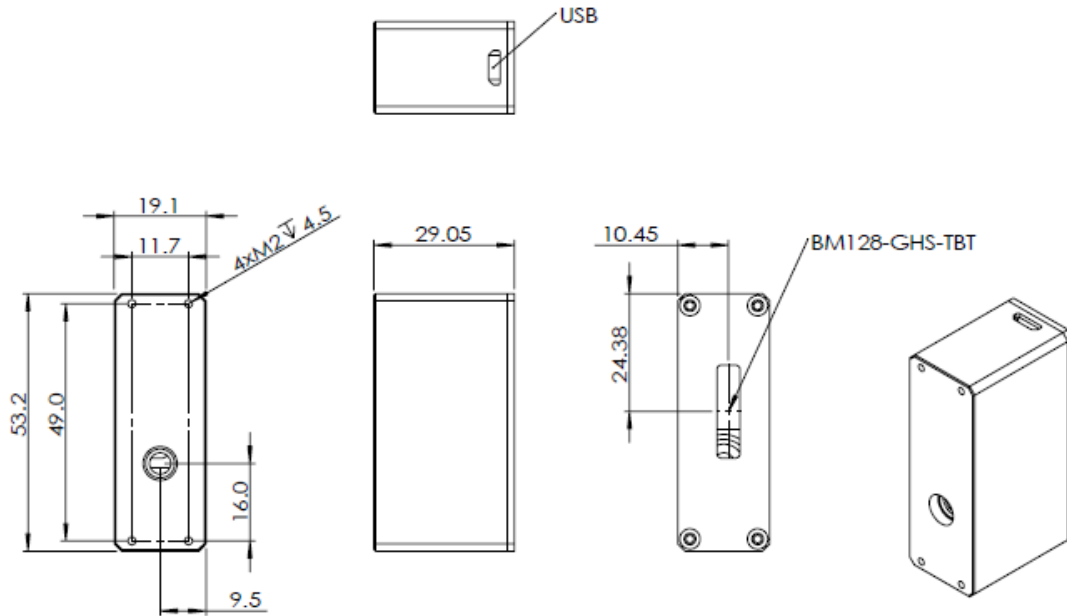
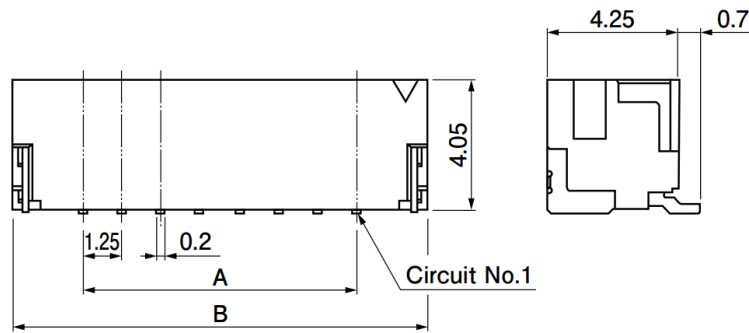
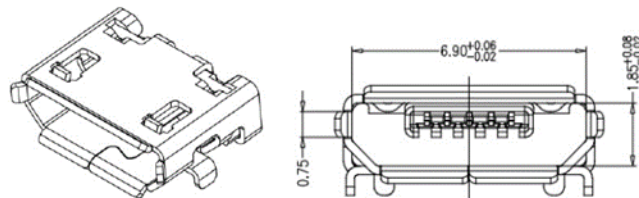


Figure 5. Module Schematic Drawing



A=13.75mm; B=18.25mm

Figure 6. Interface Connector Drawing (JST GH PN: BM12B-GHS-TBT)



Gain setting range: 0 ~ 1023.
 Dark compensation setting range: 0 ~ 1023

Figure 7. Micro USB2.0 interface Connector to Set Gain and Dark Compensation

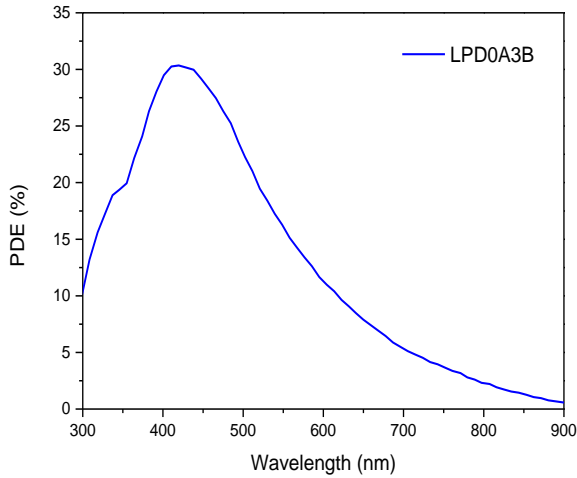


Figure 8a: Light Spectral Response

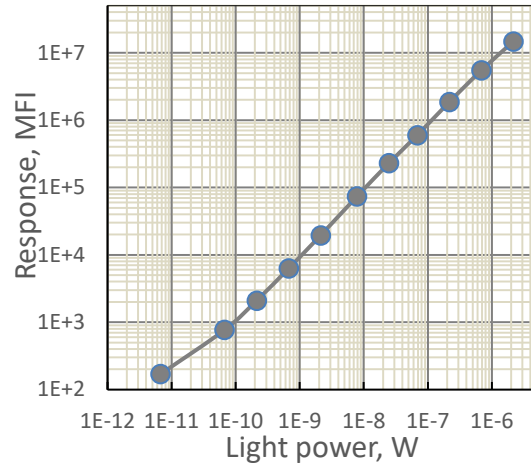


Figure 8b: Light Intensity Response

Charts 2. Typical Responses Charts

Order Code

Example: LPD0A3R1

Whisper Comet	LPD	0	A	3	R	1
---------------	-----	---	---	---	---	---

Lapis Photo Detector

With or without cooler
 (e.g. 0 = without cooler, 1 = with cooler)

Photosensitive area (Φ3 mm)

Red wavelength

Channel no.

Company Assigned