



E-VNG0031PSD

Two-Dimensional Position Sensitive Detector (PSD) Analog Module

The E-VNG0031PSD module features a 2mm diameter active area 2D tetra-lateral extended visible InGaAs position sensitive detector (PSD) with integrated transimpedance amplifiers (TIA) offering industry-first enhanced spectral sensitivity from 400nm to 1700nm. The PSDs are available with two options of 0.5kΩ and 2.2kΩ interelectrode resistance. While quadrant detectors require overlap in all quadrants, the lateral effect PSDs provide positional information of any location within the detector region, independent of beam shape, size, and power distribution. All analog inputs and outputs utilize standard SMA connectors. The housing can accommodate standard UNC for optical and cage mount and any C-Mount threaded camera lenses.

Applications

Two-Dimensional Measurements

Optical Axis Alignment

Free Space Communication

Distance Sensors

Features

SMA Connectors Input/Output

UNC for Cage and Optical Mount

400nm to 1700nm Spectral Range

5MHz Cutoff Frequency

20µm Position Detection Error

Absolute Maximum Ratings at $T_A=23\text{ }^\circ\text{C}$

Parameter	Symbol	Min	Max	Unit
Supply Voltage (V+ - V-)	V_S	3.1	5.25	V
Reverse Bias	V_R	-	4	V
Operating Temperature	T_{OP}	0	+70	$^\circ\text{C}$
Storage Temperature	T_{STG}	-10	+80	$^\circ\text{C}$

Typical Electro-Optical Specifications at $T_A=23\text{ }^\circ\text{C}$

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Active Area	-	A.A.	-	3.1	-	mm^2
Active Area Diameter	-	A.A. $_\varnothing$	-	2	-	mm
Spectral Range	Spot Scan	$\Delta\lambda$	400	-	1700	nm
Responsitivity	$\lambda=632\text{nm}$	R_λ	0.26	0.29	-	A/W
	$\lambda=1060\text{nm}$	R_λ	0.69	0.73	-	A/W
	$\lambda=1550\text{nm}$	R_λ	0.9	1.06	-	A/W
Cutoff frequency - 3dB Lower	$V_R=0\text{V}$	f_c	-	DC	-	Hz
Cutoff frequency - 3dB Upper	$V_R=0\text{V}$	f_c	-	5	-	MHz
Offset Voltage Dark State	$V_R=0\text{V}$	V_{OS}	-	-50	-	μV
Transimpedance Gain	-	-	-	5000	-	V/A
Position Detection Error*	$V_R=1\text{V}$	PDE	-	20	-	μm

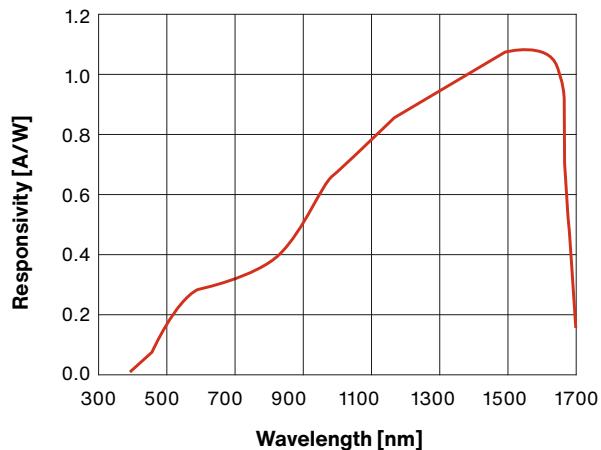
* Position detection error is specified for a 0.8mm x 0.8mm rectangular scan centered on the photosensitive area.

Ordering Part Number

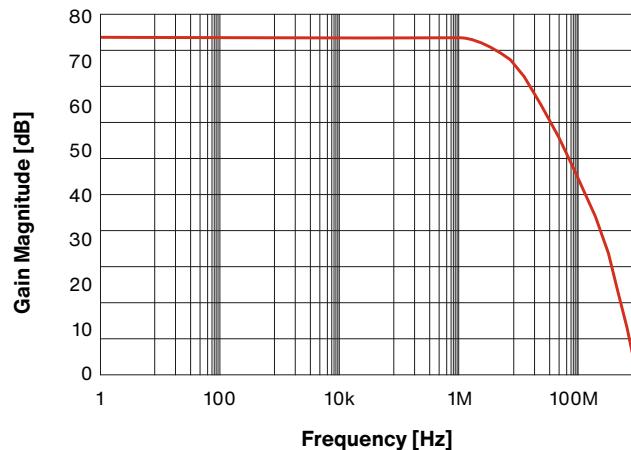
Part Number	PSD Inter-Electrode Resistance Typ [k Ω]**	PSD Package Type
E-VNG0031PSD-001	2.2	TO-5
E-VNG0031PSD-002	0.5	TO-5
E-VNG0031PSD-003	2.2	Ceramic LCC
E-VNG0031PSD-004	0.5	Ceramic LCC

** Inter-electrode resistance is measured between diagonally opposing contacts.

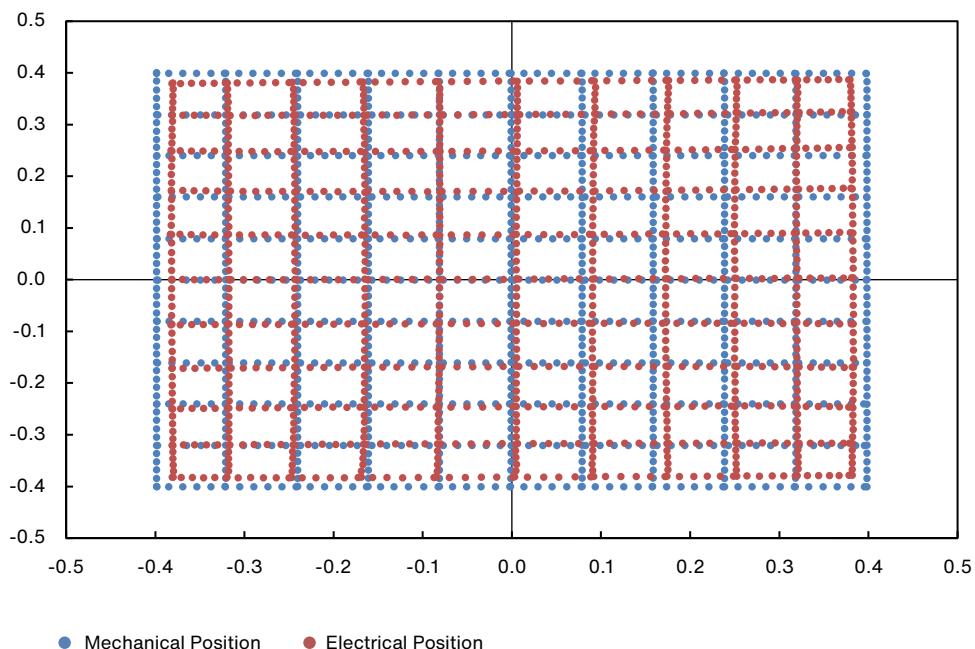
Typical Spectral Response



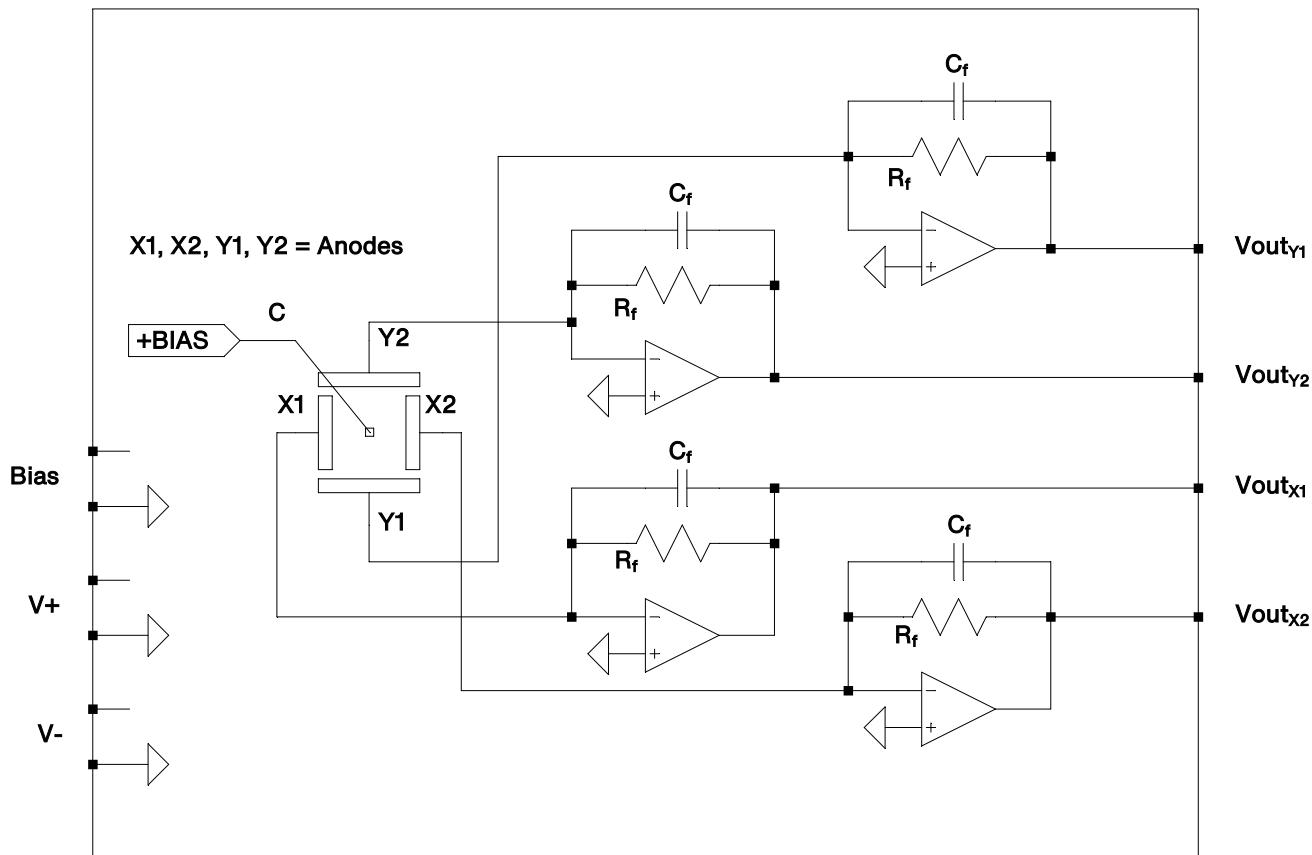
Frequency Response



Position Error Scan



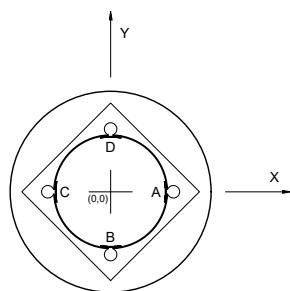
Block Diagram



Equations

$$X = \frac{L}{2} \times \frac{V_{X2} - V_{X1}}{V_{X1} + V_{X2}}$$

$$Y = \frac{L}{2} \times \frac{V_{Y2} - V_{Y1}}{V_{Y1} + V_{Y2}}$$

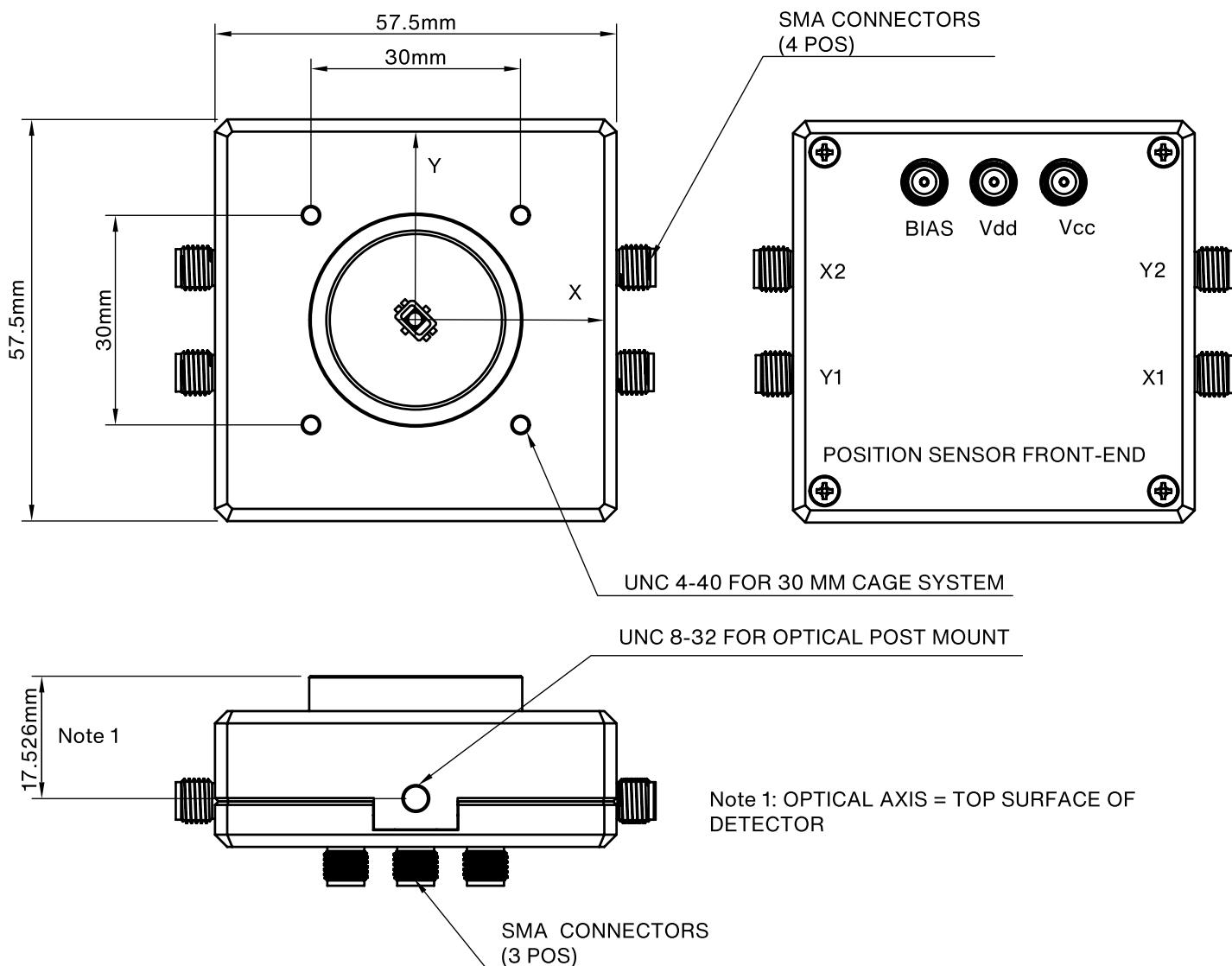


X,Y: Position (mm) of light spot centroid position with respect to the geometrical center of the active area.

L: 3.1mm (APX-VNG0031PSD-00X)

Mechanical Specifications

Units are in millimeters [mm]



General Care and Handling Instructions

Photodiodes:

Handling and Storage

- Handle Photodiodes gently to prevent damage.
- Avoid exposing Photodiodes to temperatures exceeding the storage temperature rating of the device.
- Maintain a non-condensing environment for optimum performance and lifetime.

Cleaning

- Gently clean the glass (borosilicate or quartz window) using a 50/50 mixture of Methanol and isopropyl alcohol and a soft, optical-grade pad.

Special Considerations for Plastic or Epoxy Encapsulated Photodiodes

- Protect from intense light sources such as direct sunlight.
- Avoid exposure to harsh chemicals like THINNERS, ACETONE, and TRICHLOROETHYLENE.
- Cleaning with a 50/50 mixture of Methanol and isopropyl alcohol (IPA) is recommended. Cleaning in an ultrasonic bath is generally not recommended.

CdS Photocells:

Handling and Storage

- Handle CdS Photocells gently to prevent damage.
- Avoid exposing CdS Photocells to temperatures exceeding the storage temperature rating of the device.
- Maintain a non-condensing environment for optimum performance and lifetime.

Cleaning

- Gently clean the glass or plastic covering using a 50/50 mixture of Methanol and isopropyl alcohol and a soft, optical-grade pad.

Special Considerations

- DO NOT use Vapor Phase Soldering or Reflow Soldering for CdS components.

Optocouplers and LEDs:

Handling and Storage

- Handle Optocouplers and LEDs gently to prevent damage.
- Avoid exposing the devices to temperatures exceeding the storage temperature rating of the device.
- Maintain a non-condensing environment for optimum performance and lifetime.

Cleaning

- For plastic molded devices, cleaning with a 50/50 mixture of Methanol and isopropyl alcohol is recommended. Cleaning in an ultrasonic bath is generally not recommended.

Special Considerations

- Avoid exposing plastic molded devices or epoxy glob top devices to harsh chemicals like THINNERS, ACETONE, and TRICHLOROETHYLENE.

Legal Disclaimer

Information in this data sheet is believed to be correct and reliable. However, no responsibility is assumed for possible inaccuracies or omission. Specifications are subject to change without notice.



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