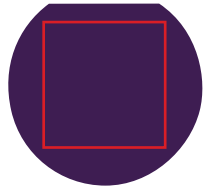


# Product Data Sheet

## SiPM – Silicon Photomultiplier Module with integrated Transimpedance Amplifier and Bias Source


**KETEK**

### PE3315-WL-TIA-SP



### Key Features Overview

- PM3315-WL SiPM based
- Integrated Transimpedance Amplifier (TIA)
- Integrated Controllable Bias Source for SiPM
- Optionally with integrated Gain Stabilization
- Plug and Play Solution to replace PMTs
- Compatible with Thorlabs® SM05 Optics, 16 mm Optical Cage Systems, Hamamatsu® PMT mounts

### Application Examples



#### Biophotonics

- Cytometry
- Fluorescence Measurements
- Point-of-Care Diagnostics



#### Hazard & Threat Detection

- Single Photon Counting
- Scintillator Readout
- Handheld Devices



#### High Energy Physics

- Low Light Level Detection
- High Linearity Measurements
- Energy Measurements

### General Parameters and Order Information

SiPM Type <sup>A</sup>	Active Area [mm <sup>2</sup> ]	Microcell Size [μm]	No. of Microcells	Gain stabilized vs. Temperature	Order-Code
PM3315-WL-A0	3.0 x 3.0	15	38400	No	PE3315-WL-TIA-SP

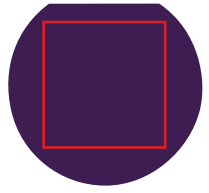
### Recommended Operation Parameters

Parameter	Description
Ctrl Voltage	0.7 V (resulting SiPM over voltage of about 5 V)
Operating Temperature	0°C - 60 °C

### Electrical and Optical Characteristics at 21°C (typ.)

Module Type <sup>A</sup>	Photo Detection Efficiency [%]	Dark Count Rate [kHz/mm <sup>3</sup> ]	Crosstalk Probability [%]	Afterpulsing Probability [%]	Recovery Time [ns]
PE3315-WL-TIA-SP @ Ctrl = 0.7 V	29 (@ 430 nm)	45	14	3	9

<sup>A</sup> Full SiPM specification can be found in the corresponding SiPM datasheet, please visit [www.ketek.net/sipm-downloads](http://www.ketek.net/sipm-downloads)



## PE3315-WL-TIA-SP

## Interfaces and Electrical Ratings

Parameter	Description
Outer Dimensions	40.0 x 50.0 x 19.8 mm <sup>3</sup> (L x W x H)
Mechanical Compatibility	Thorlabs® SM05 Optics and 16 mm cage system Hamamatsu® PMT mounts
Power Supply Input	+5 V DC (± 0.5 V, max + 12 V DC), 500 mA, MCX connector Recommended ripple noise < 10 mV
Typical Power Consumption	350 mW (69 mA @ 5 V power supply)
Bias Voltage / Gain Control (Ctrl)	0 V to +1 V (min. -0.2 V, max. +1.2 V), 50 mA, MCX connector
Signal Output (Signal)	Output range 0 V to +1 V, positive polarity, MCX connector matched to 50 Ω impedance
Max. recommended Cable Length	3 m

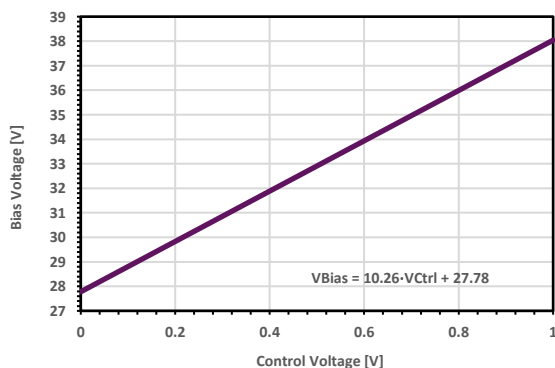
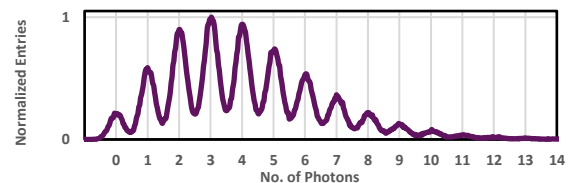
## Electrical Characteristics of Signal Output

Parameter	Description
Transimpedance Amplifier Gain	2 stage design, total gain 150 V/A
Signal Output Bandwidth	12.5 MHz
Signal Output Amplitude Noise	500 μV (σ, AC coupled, 20 MHz bandwidth)
Bias Voltage / Gain Control (Ctrl)	0 V to +1 V, 50 mA, MCX connector
Output Offset Drift with Temperature	< 0.5 mV/K

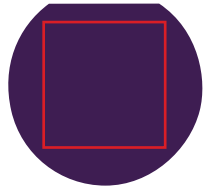
## Electrical Characteristics of Internal SiPM Bias Supply

Parameter	Description
Bias Voltage Range PE3315-WL-TIA-SP	27.78 V to 38.04 V (SiPM V <sub>bd</sub> between 29.5 V and 29.75 V @ 21°C, no internal SiPM amplification below V <sub>bd</sub> )
Ripple Noise	< 2 mV min-max (1 MΩ input resistance, 22 pF capacitive load, 0.5 m RG-174-U cable)
Stability	< 5 mV min-max (f = 0.1 Hz)
Input Impedance	400 kΩ
Settling Time	0.5 s (time to reach stable SiPM bias after change of Ctrl voltage)
Output Current Limit	10 mA

## Typical Performance Characteristics

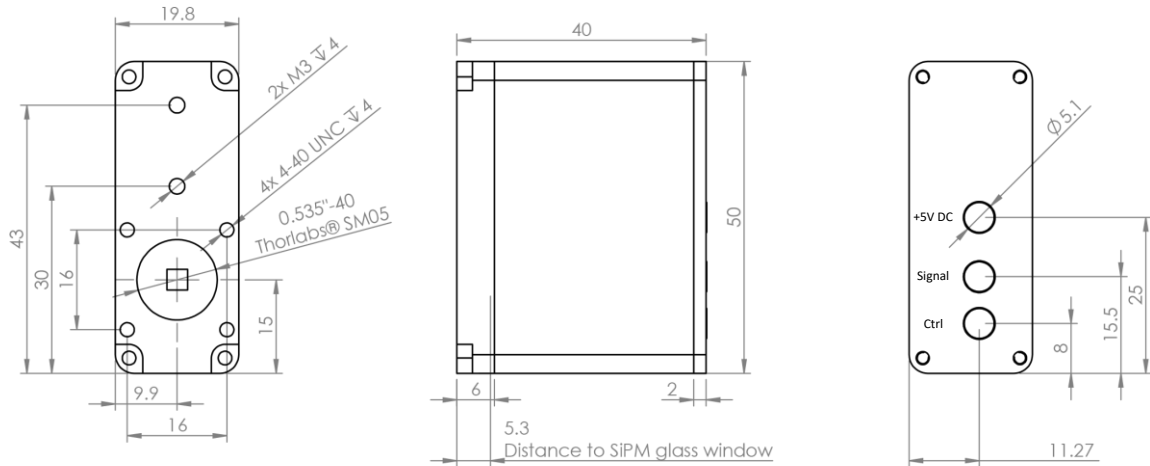
SiPM Bias Voltage vs. Ctrl Voltage  
PE3315-WL-TIA-SPSingle Photon Spectrum  
Example

## Mechanical Specifications



## PE3315-WL-TIA-SP

## Dimensions\*



\* General tolerances  $\pm 0.1$  mm unless otherwise noted

## Revision History

Revision and Date	Changes
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Rev. 2021-A May 2021	Initial release
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