

Key Features Overview

- 3 x 3 mm² Active Area, 15 μm Microcells
- High Dynamic Range
- Fastest Recovery Time
- Replacement for PMTs, APDs and PIN Diodes
- Low Voltage Operation (typ. about 30 V)
- Cost Efficient and Robust (MSL1 approved)

Application Examples

- Cytometry
- X-Ray Photon Counting
- Medical Imaging (PET, SPECT)
- Bright Scintillator Readout
- Handheld and Mobile Devices
- Hazard & Threat Detection
- Biophotonics & Analytics
- High Energy Physics
- Optical Sorting and XRT

Spectral Response

Photo Detection Efficiency at 5 V Overvoltage

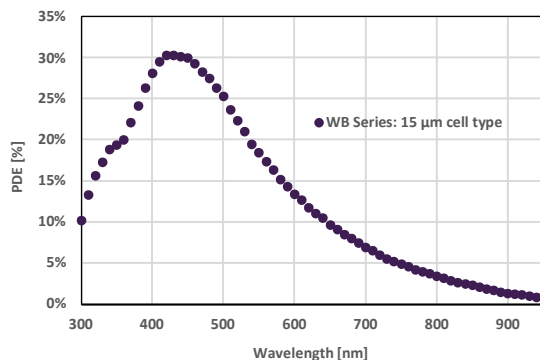
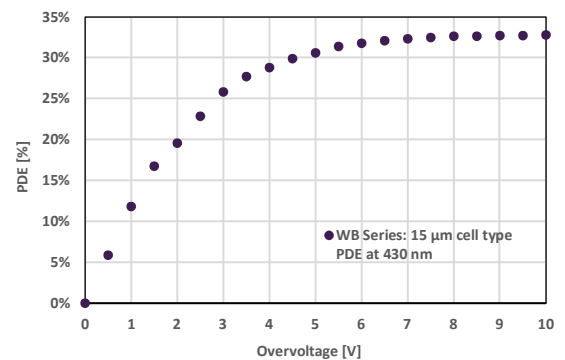


Photo Detection Efficiency vs. Overvoltage at 21°C

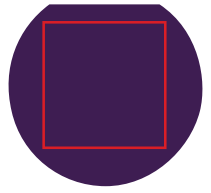


General Parameters and Order Information

SiPM Type	Active Area [mm ²]	Microcell Size [μm]	No. of Microcells	Dimensions [mm ³]	Order-Code
PM3315-WB	3.0 x 3.0	15	38800	3.315 x 3.315 x 0.595	PM3315-WB-C0

Main Characteristics

Parameter	Typ.	Unit
Breakdown Voltage (V _{BD}) at 21°C	min. 26.0, max. 28.0	V
Breakdown Voltage Variation per Reel	±0.125	V
Recommended Overvoltage (V _{OV})	2.0 – 5.0 (max. 6.0)	V
Temperature Dependency of V _{BD}	22.0	mV/K
Temperature Dependency of Gain	0.3% @ 5.0 V _{OV}	1/K
Operating Temperature Range	-40 to + 60	°C
Reliability Classification	MSL1	
Index of Refraction of Glass Entrance Window	1.52 @ 430 nm	



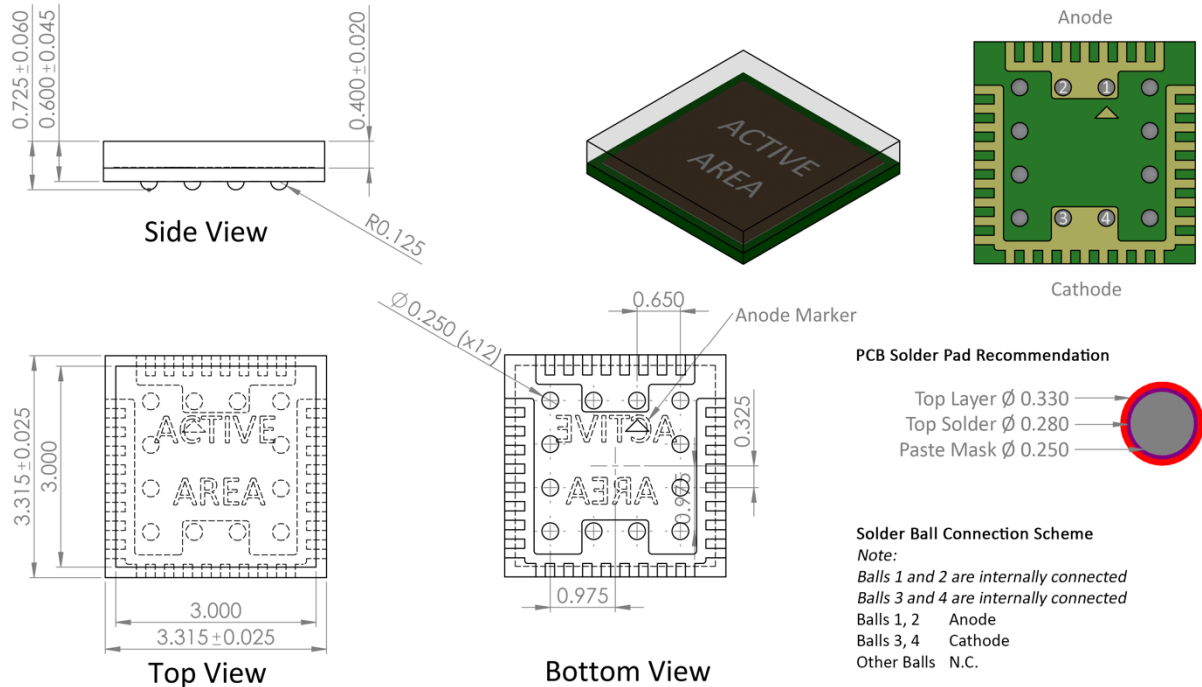
Electrical and Optical Characteristics at 21°C

Parameter	Typ. @ 2.5 V _{OV}	Typ. @ 5.0 V _{OV}	Unit
Photo Detection Efficiency at 430 nm	22	31	%
Dark Count Rate	50	125	kHz/mm ²
Dark Current	0.08 (max. 0.16)	0.19 (max. 0.3)	μA
Gain	0.35	0.70	x 10 ⁶
Crosstalk Probability*	8	18	%
Afterpulsing Probability	1	5	%
Terminal Capacitance	0.8		nF
Recovery Time τ	13 (at 1 Ω load), 47 (at 50 Ω load)		ns
Signal Rise Time	630		ps

* Including delayed crosstalk with a probability < 0.1%

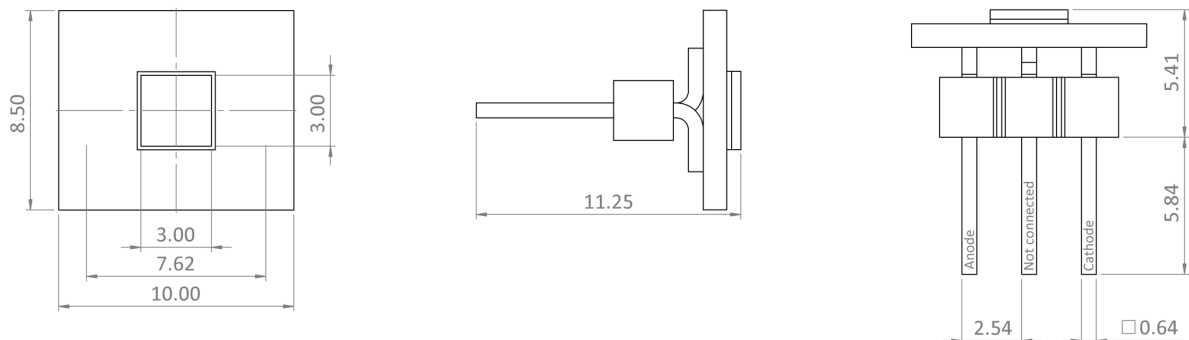
Mechanical Specifications

Dimensions and Recommended Footprint*

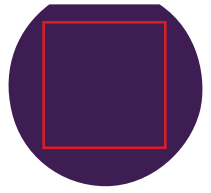


* Footprint and 3D model are available for download at www.ketek.net/sipm-downloads/

PM3315-WB preassembled on PCB with Pins (available for Evaluation Purposes)*

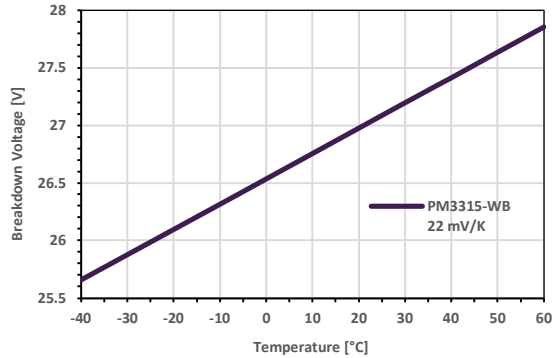


* Mates e.g. with Preci-Dip 801-87-003-10-001101

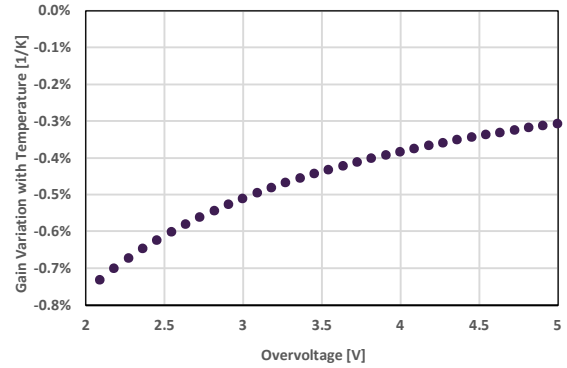


Typical Performance Characteristics

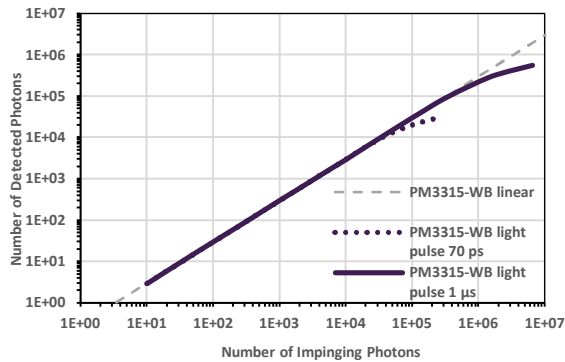
Temperature Coefficient of the Breakdown Voltage



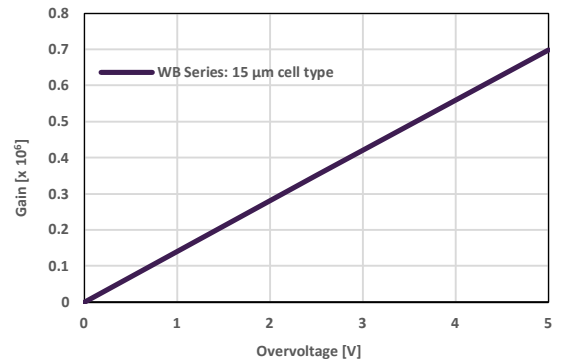
Temperature Coefficient of the Gain



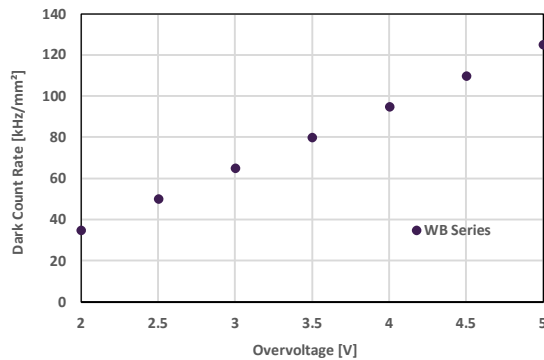
Linearity at 430 nm



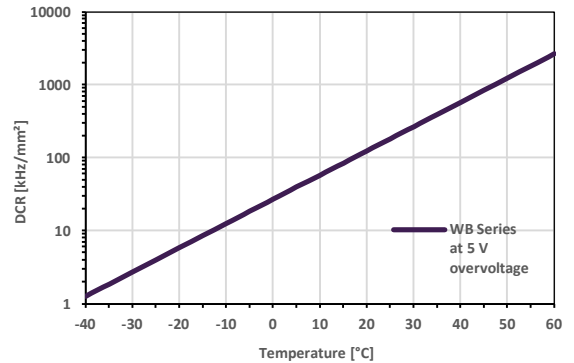
Gain of WB Series



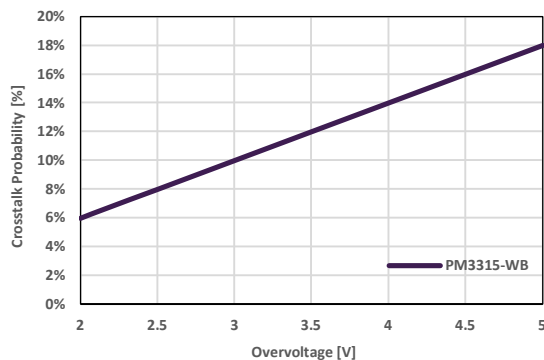
Dark Count Rate at 21°C



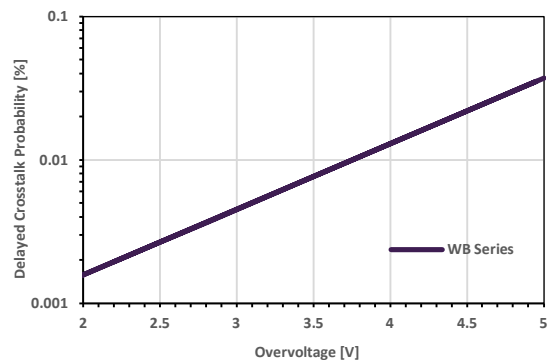
Dark Count Rate vs. Temperature

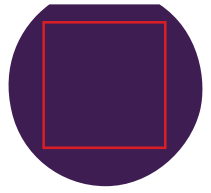


Direct Optical Crosstalk

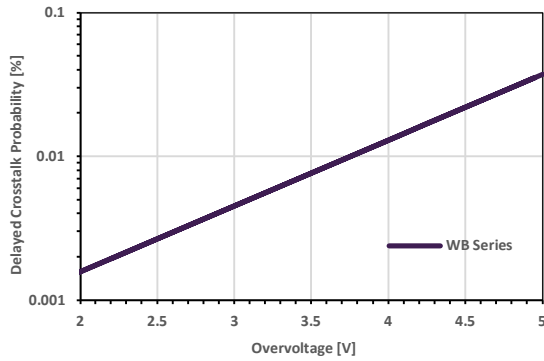


Delayed Optical Crosstalk

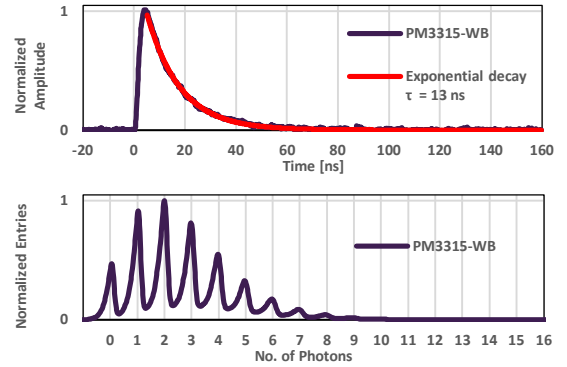




Afterpulsing Probability

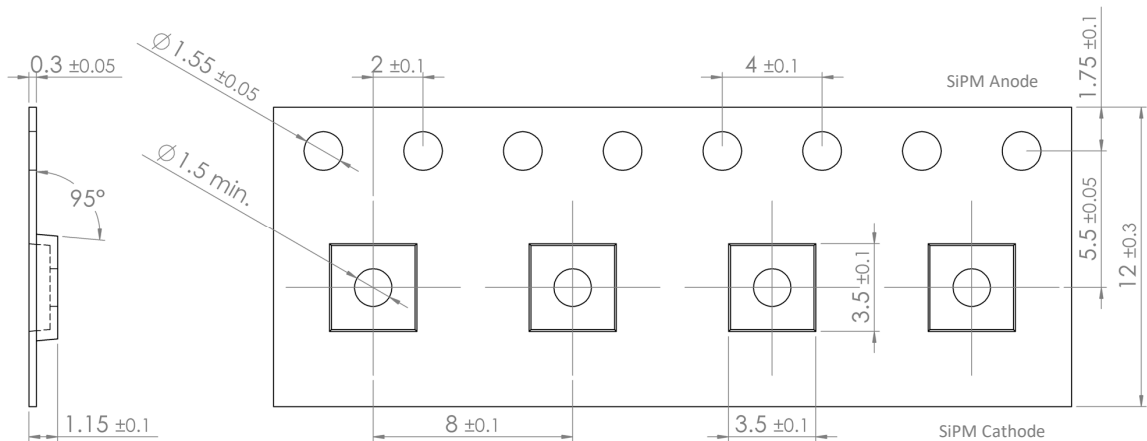


Pulse Shape at 1 Ω Load, Single Photon Spectrum Example

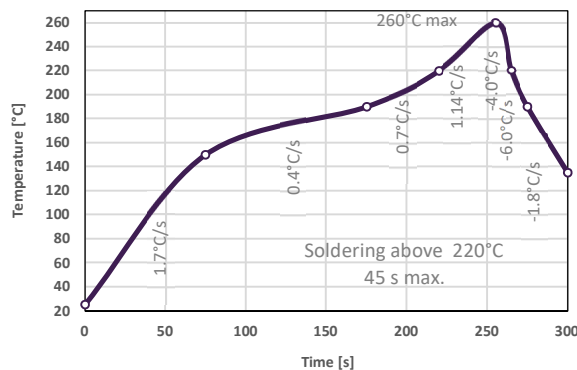


Assembly Specifications

Tape and Reel



Recommended Reflow Solder Profile*



* Lead-free no-clean solder paste Type 4 is recommended, e.g. SAC305 ROL0 Nihon Handa PF305-118
SMD stencil thickness of 80 μm is recommended

Revision History

Revision and Date	Changes
Rev. 2020-B April 2020	Updated "Afterpulsing Probability" (specified at 2.5 V and 5 V overvoltage)
Rev. 2020-A February 2020	Updated design and layout
Rev. 2019-C July 2019	Updated table "Main Characteristics" and corresponding plots Updated table "Performance Overview at 21°C" corresponding plots Updated "Recommended Reflow Solder Profile" Updated "Tape and Reel Specifications" with number of pcs per reel
Rev. 2019-B June 2019	Added part orientation to "Tape and Reel Specifications"
Rev. 2019-A January 2019	Updated design and layout Updated "Technical Drawing and Recommended Footprint" Added performance plots for all key parameters
Rev. 2018-A December 2018	Added "Tape and Reel Specifications"
Rev. 2017-B April 2017	Updated table "Performance Overview at 21°C" Added "Recommended Reflow Solder Profile"
Rev. 2017-A February 2017	Added "PM33xx-WB preassembled on PCB with Pins (available for Evaluation Purposes)"
Rev. 2016-A October 2016	Initial Release

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