

MPPC (S13360 for DUNE)

Nov. 11, 2019

SPECIFICATION SHEET

■ Structure

| Type No. | S13360 -6050HS-LRQ (S13360-9932) | S13360 -6050HS-HRQ (S13360-9933) | S13360 -6075HS-LRQ (S13360-9934) | S13360 -6075HS-HRQ (S13360-9935) | Unit |
|-------------------------------|--|--|--|--|-----------------|
| Parameters | | | | | |
| Effective photosensitive area | 6.0 x 6.0 | | | | mm ² |
| Pixel pitch | 50 | | 75 | | μm |
| Number of pixel | 14,331 | | 6,364 | | - |
| Window | Silicone resin | | | | - |
| Window refractive index | 1.57 | | | | - |
| Package | Surface mount type | | | | - |

■ Absolute Maximum Ratings

| Parameters | Symbol | Value | Unit |
|---|--------|-----------------------------------|------|
| Operating temperature *1 | Topr | -196 to +60 (TBD) | °C |
| Storage temperature *1 | Topr | -196 to +80 (TBD) | °C |
| Maximum temperature cycle (below -40°C to room temperature) *2 | - | 10 times (TBD) | - |
| Soldering conditions *3 | Tsol | Peak temperature 240 °C x 3 times | - |

*1: No condensation

*2: Please avoid rapid temperature change.

*3: Moisture sensitivity Level: 5A (Defined by IPC/JEDEC J-STD-020E)

■ Electrical and optical characteristics (Typ. T = 25 deg C, Vr = Vop unless otherwise noted)

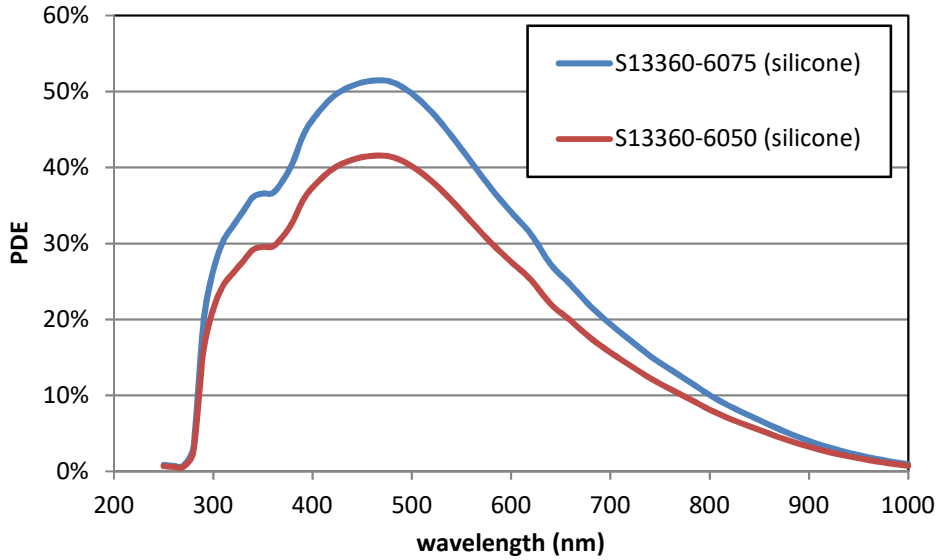
| Type No. | Symbol | S13360 -6050HS-LRQ (S13360-9932) | S13360 -6050HS-HRQ (S13360-9933) | S13360 -6075HS-LRQ (S13360-9934) | S13360 -6075HS-HRQ (S13360-9935) | Unit |
|--|--------|--|--|--|--|-------|
| Parameters | | | | | | |
| Spectral response range | λ | 280 to 900 | | | | nm |
| Peak sensitivity wavelength | λp | 450 | | | | nm |
| Photon detection efficiency at λp *4 | - | 40 | | 50 | | % |
| Breakdown voltage | Vbr | 53 +/- 5 | | | | V |
| Recommended operating voltage *5 | Vop | Vbr + 3.0 | | | | V |
| Dark count rate | DCR | 2.0 (MAX:6.0) | | | | Mcps |
| Terminal capacitance at Vop | Ct | 1280 | | | | pF |
| Gain | M | 1.7 x 10 ⁶ | | 4.0 x 10 ⁶ | | - |
| Temperature coefficient of reverse voltage | ΔTVop | 54 | | | | mV/°C |
| quenching resistor around room temperature | Rq | 280 | 500 (TBD) | 280 | 500 (TBD) | kΩ |
| Temperature coefficient of quenching resistor | ΔTRq | Low | High | Low | High | Ω/°C |

*4 : Photon detection efficiency does not include crosstalk and after pulse.

*5 : Refer to the data attached for each products.

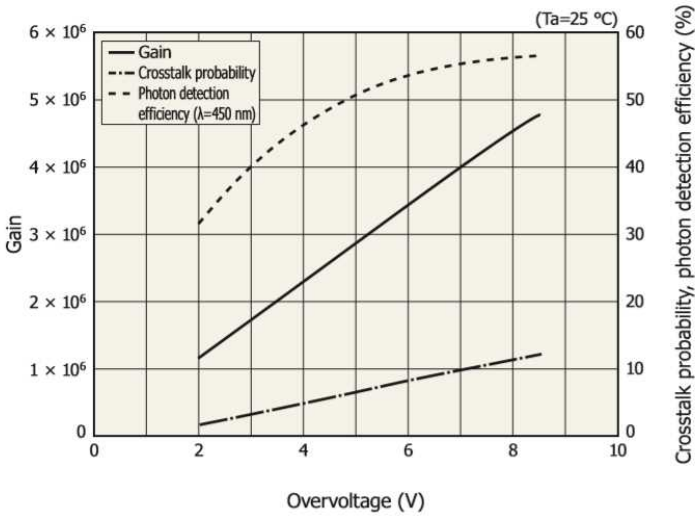
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- Photon detection efficiency v.s. Wavelength ($V_r = V_{op} = V_{br} + 3.0V$, measurement example)

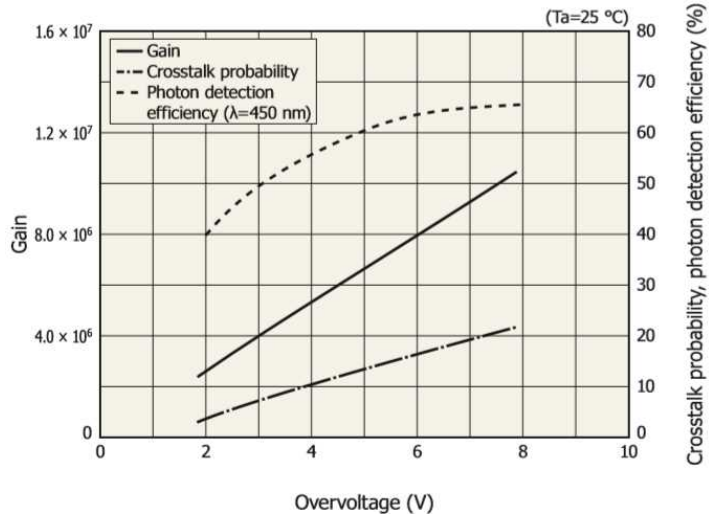


- Overvoltage specifications of gain, crosstalk probability, photon detection efficiency ($V_r = V_{op} = V_{br} + 3.0V$, typical example)

[S13360-6050HS-LRQ, -HRQ]

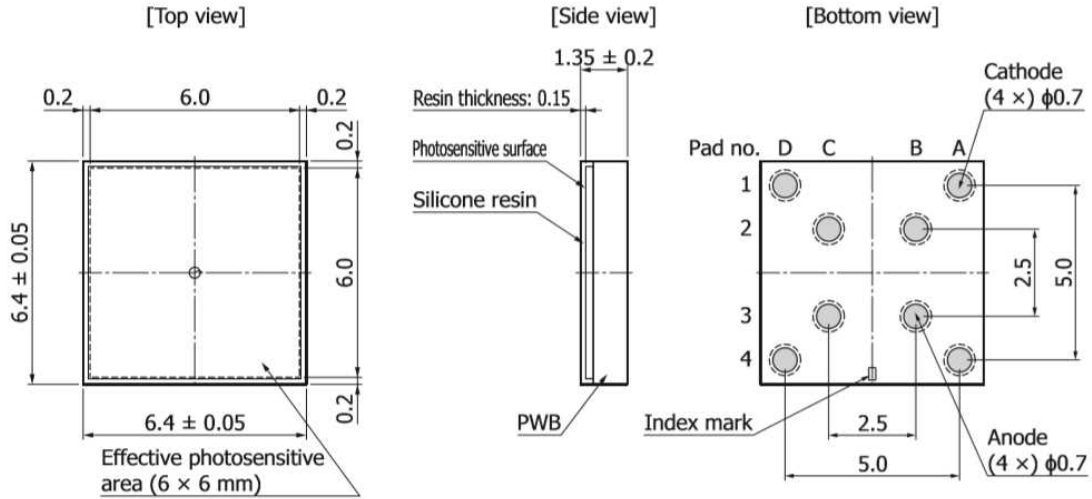


[S13360-6075HS-LRQ, -HRQ]



SPECIFICATION SHEET (S13360 for DUNE)

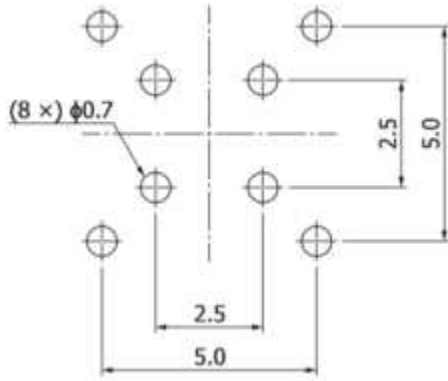
■ Dimensional outline (unit: mm)



Tolerance unless otherwise noted: ± 0.1

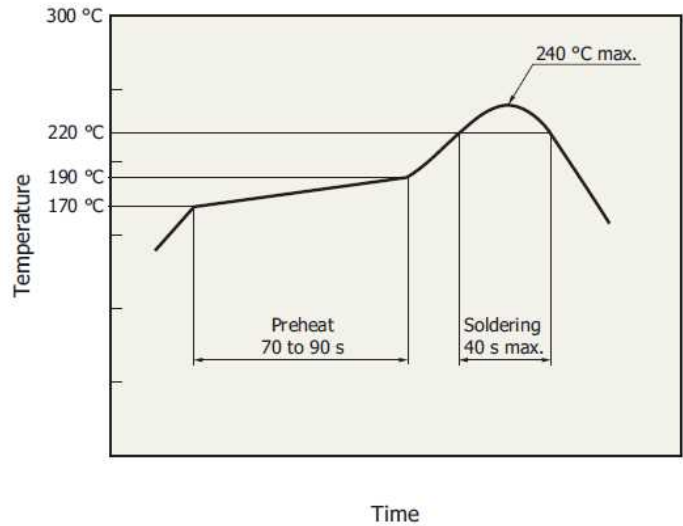
| Pad no. | Connection |
|----------------|----------------|
| A1, A4, D1, D4 | Cathode common |
| B2, B3, C2, C3 | Anode common |

■ Recommended land pattern (unit: mm)



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- Temperature profile measurement example using our experimental hot-air reflow oven



- This surface mount type package product supports lead-free soldering. After unpacking, store it in an environment at a temperature of 25°C or less and a humidity of 60% or less, and perform soldering within 24 hours.
- The effect that the product is subject to during reflow soldering varies depending on the circuit board and reflow furnace that are used. Before actual reflow soldering, check for any problems by testing out the reflow soldering methods in advance.
- When three or more months have passed or if the packing bag has not been stored in an environment described above, perform baking in a clean dryer for duration of 24 hours at 125°C.