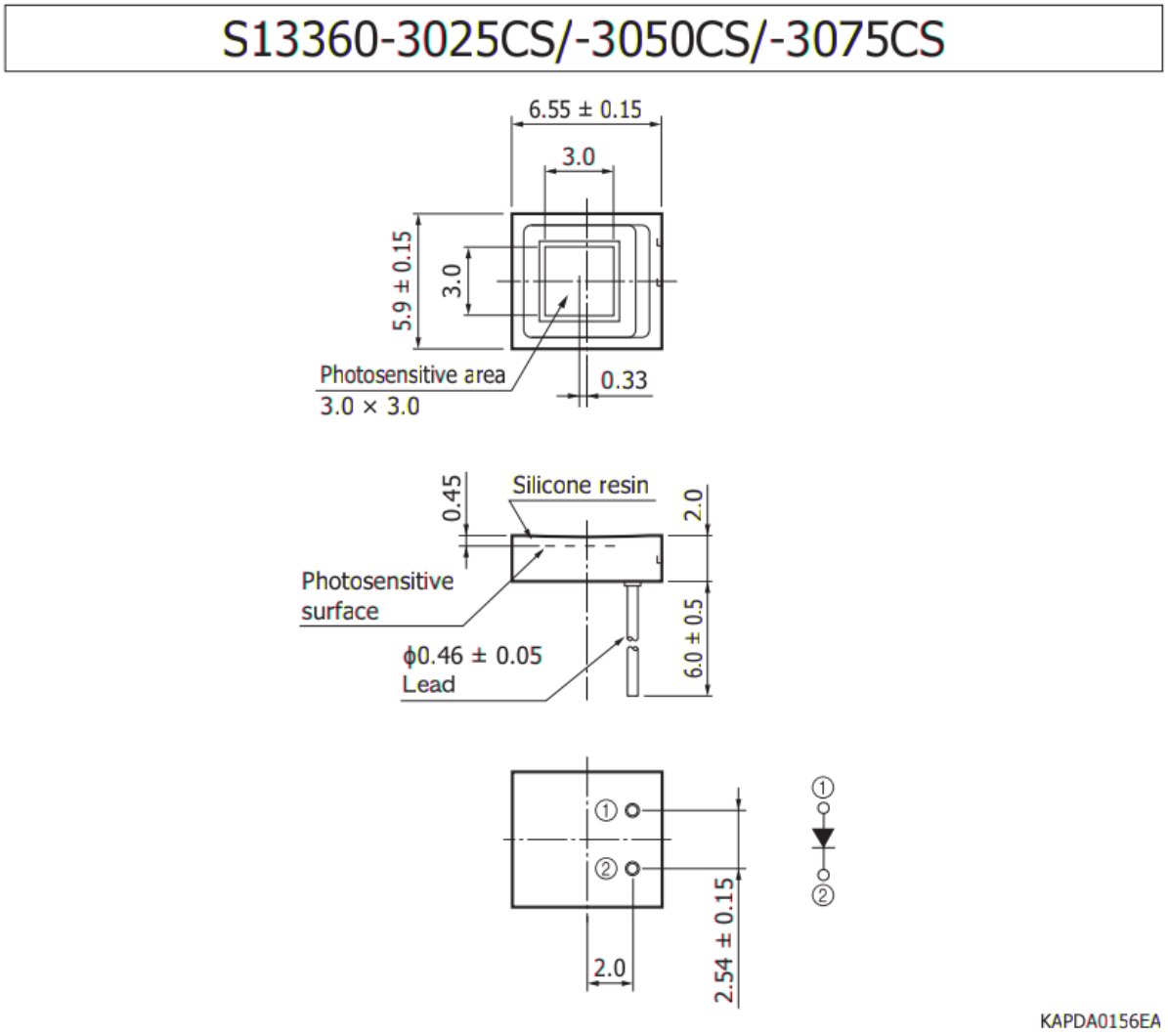
NEW HAMAMATSU VUV MPPC

Schematic



source: http://www.hamamatsu.com/resources/pdf/ssd/mppc_kapd0004e.pdf

Contents of the box

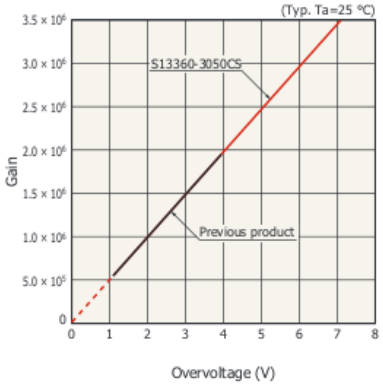
element	Vop(V)	GAIN	DARK NOISE (kcps)	UM
A0001	53.80	5.50E+06	409	100
A0002	53.85	5.50E+06	534	100
A0005	55.15	2.00E+06	594	50
A0006	54.84	2.00E+06	723	50
A0007	55.01	2.00E+06	805	50
A0008	54.83	2.00E+06	690	50
A0009	54.71	2.00E+06	792	50
A0010	55.03	2.00E+06	689	50

All the measurements are taken at 25 C (77 F / 298.15 K)
kcps = kilo counts per second
UM = pixel size in micrometers
MPPC = multi pixel photon counter

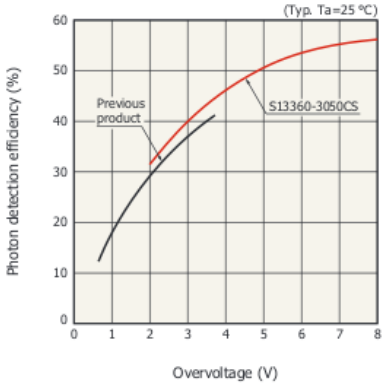
Operation Voltage (Vop)

The MPPC operation voltage Vop can be expressed as breakdown voltage (Vbr) + overvoltage (Vov). As the operating voltage is increased, the gain and photon detection efficiency improve, but at the same time, crosstalk and dark count, which are noise components, also increase. With previous products, the voltage dependency of noise components was high, and increasing the operating voltage caused a significant increase in noise components. On the other hand, with the MPPC for precision measurement, increase in noise components is suppressed even when the operating voltage is increased. Therefore, it can be used with high operating voltage (high gain and high photon detection efficiency).

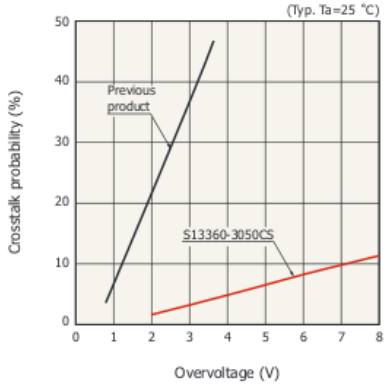
Gain vs. overvoltage



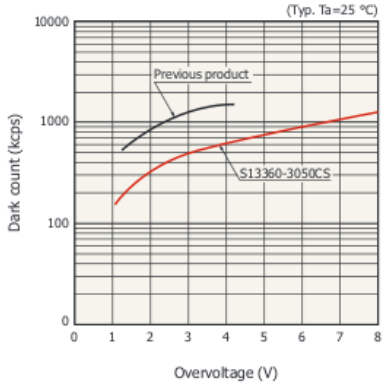
Photon detection efficiency vs. overvoltage



Crosstalk probability vs. overvoltage



Dark count vs. overvoltage



Note: Dark pulse overlap (pile-up effect) is eliminated.

source: http://www.hamamatsu.com/resources/pdf/ssd/mppc_kapd0004e.pdf

Protection

- contact person: Donna L Kubik [kubik@fnal.gov]
- we have now: 2 protective coats, 2 pairs shoes protectors, 2 protective hair caps, some gloves
- everything is inside the hamamatsu box
- always use all items to protect the MPPCs from electrostatic discharges
- blu gloves have been tested: they protect from electrostatic discharges