

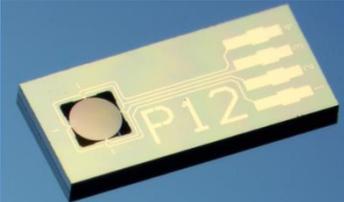
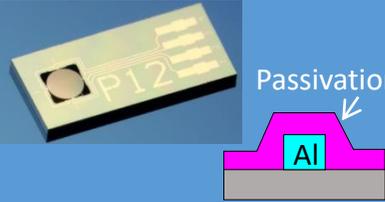
SD-MSS-1K series

Device information

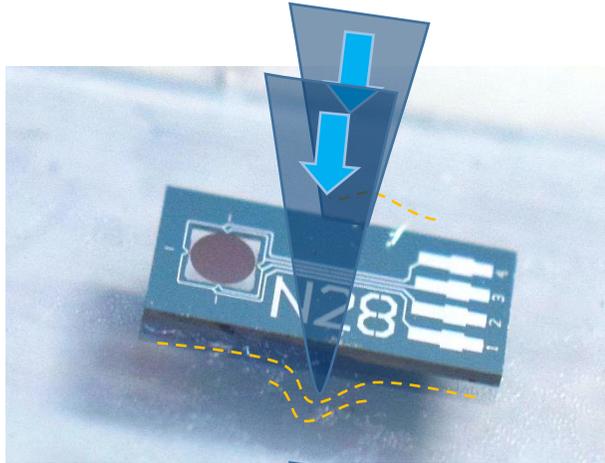
SD-MSS-1K2G

SD-MSS-1K2GP

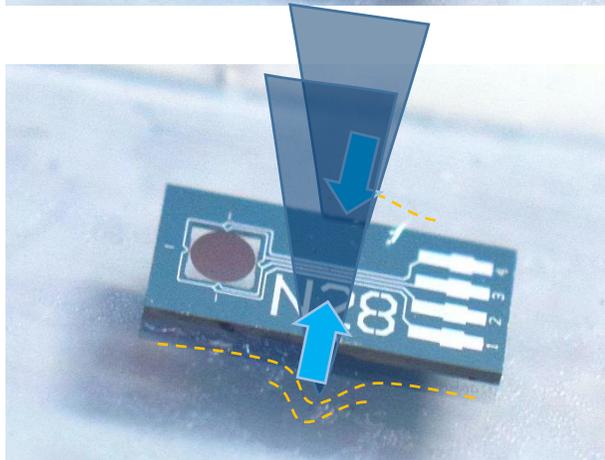
for Gas/Odor sensing

| | | |
|-------------------------|--|--|
| Code |  SD-MSS-1K2G |  SD-MSS-1K2GP |
| Membrane size [μm] | 1000 round | |
| Membrane thickness [μm] | 2.8 (typical) | |
| Chip dimensions [mm] | 5.5 x 2.5 x 0.3 | |
| Resistance value [kΩ] | 2 – 6 | |
| Electric configuration | Full bridge, 4 pads 0.5 mm pitch | |
| Coating | No | |
| Passivation | No | Yes |

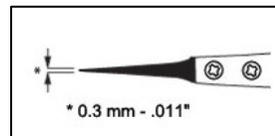
To remove the chip from gel sheet, it is recommended to use a sharp plastic tweezers.



- (1) Carefully push the tips of tweezers into the gel sheet, like to create a little space in between the chip back and the gel sheet. Don't clamp the chip at this step.
- (2) Slowly move the tips laterally and clamp the chip. Carefully pick up the chip.



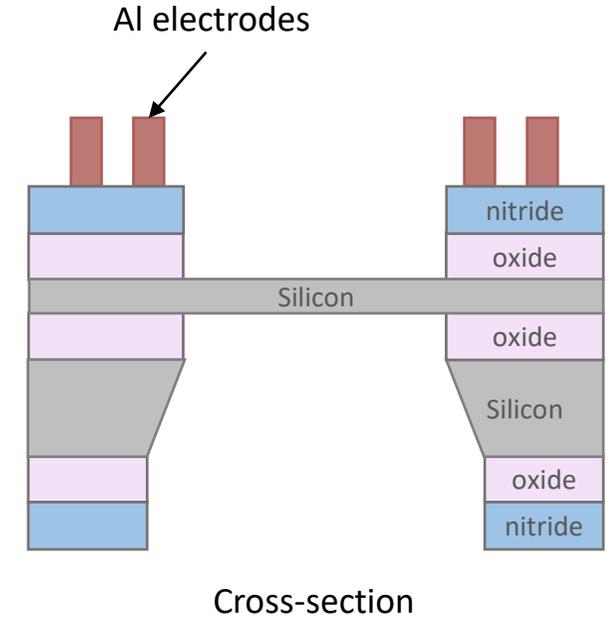
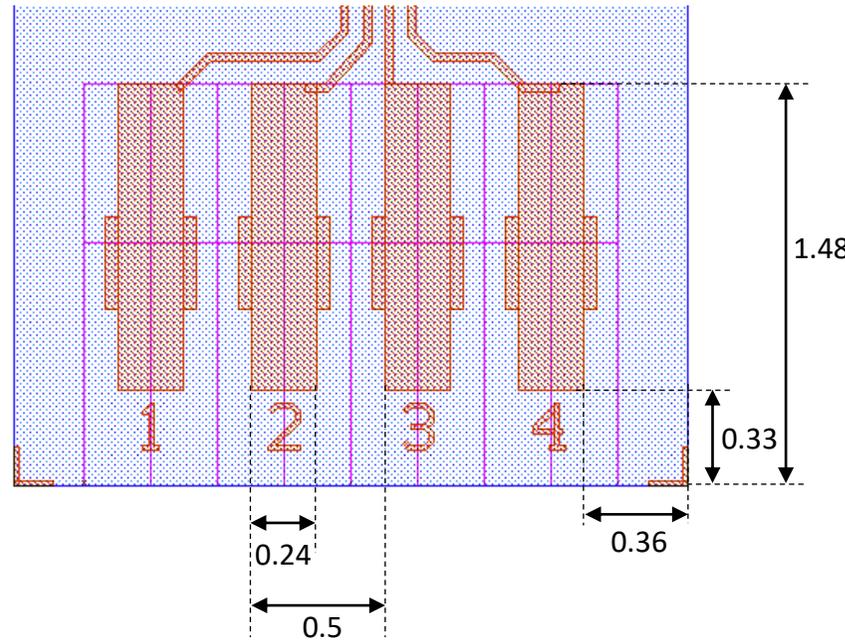
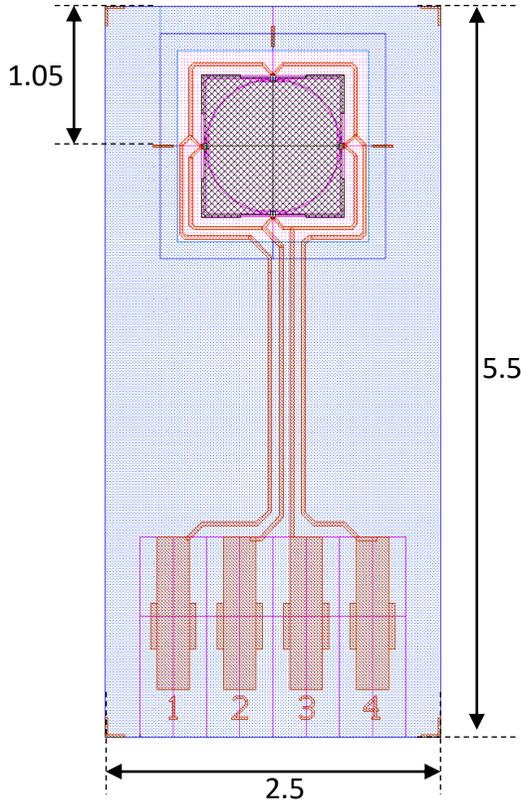
Example: SIPEL 1315-SA



If the tips are too sharp, make them blunt.

SD-MSS-1K2G

SD-MSS-1K2GP



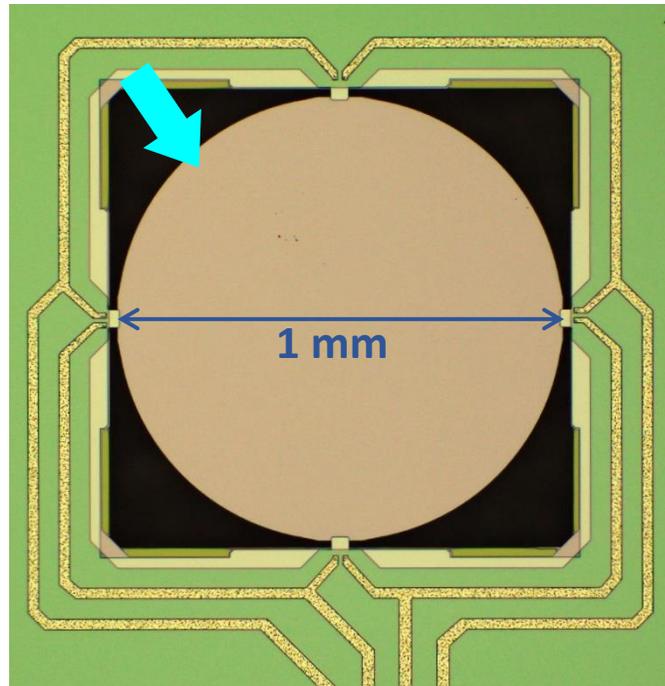
The chip thickness is approximately 0.3 mm.
Approximate values, Unit [mm]

SD-MSS-1K2G

SD-MSS-1K2GP

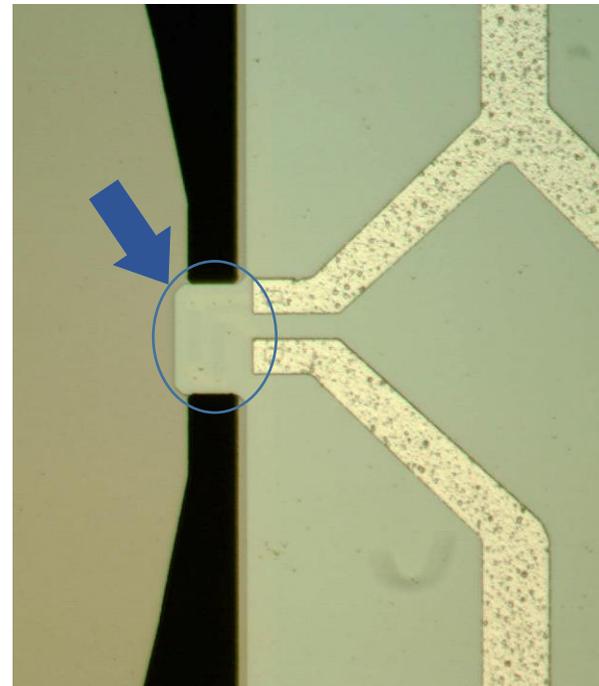
Silicon membrane:

No oxide (only native oxide) at both top and back surfaces



Piezoresistors:

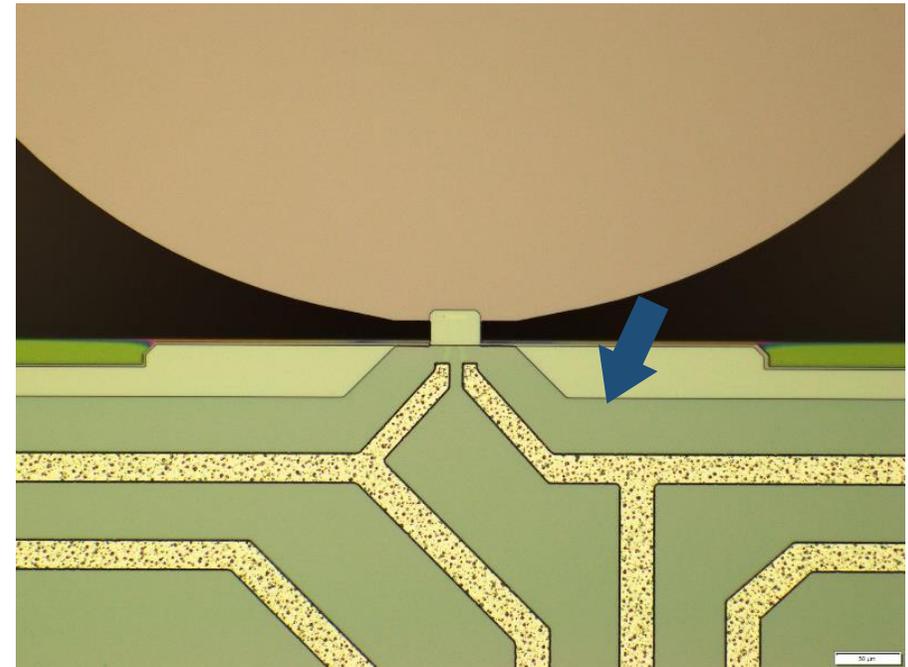
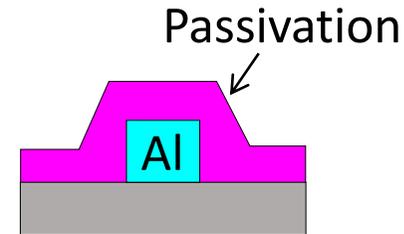
The piezoresistors are covered with silicon nitride.



ONLY SD-MSS-1K2GP

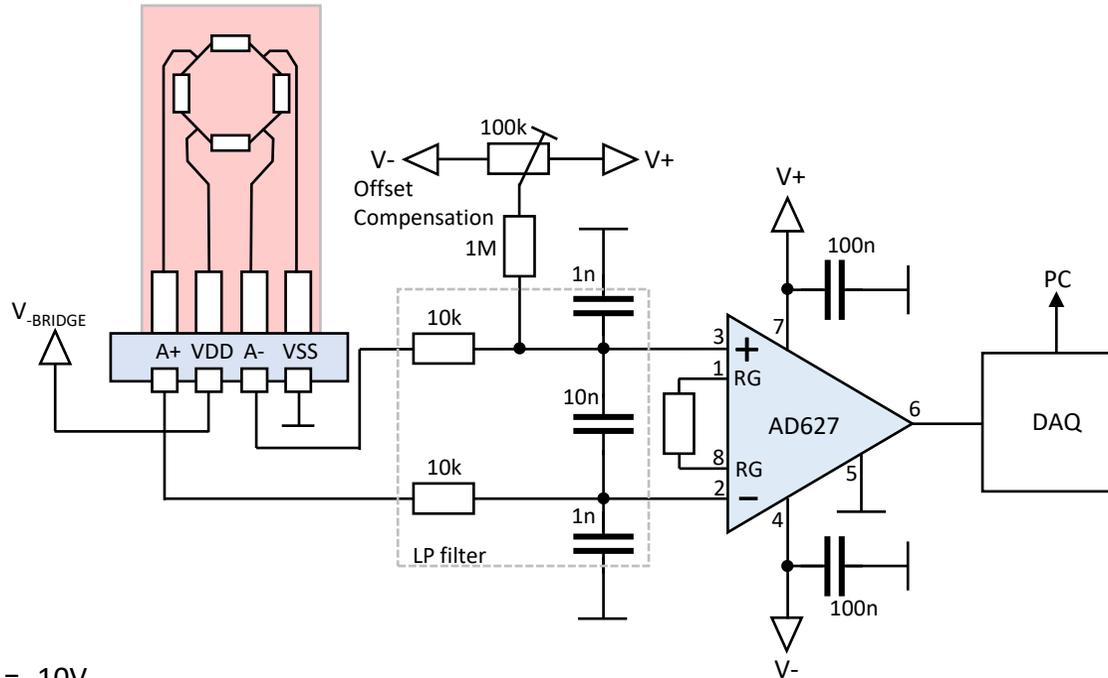
The aluminum electrodes excepts the pads are covered with an oxide layer.

For any “liquid” or “wet” applications, please use SD-MSS-1K2GP.



Example

The bridge voltage should be a **NEGATIVE** voltage, if the substrate has to be the ground potential (0V).



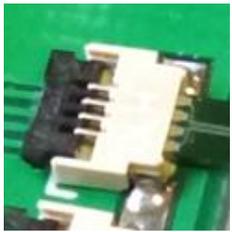
Typical values

- $V+ = +10V$, $V- = -10V$
- AD627 (Instrumentation amplifier)
- Gain = 100 ~ 500
- $V_{-BRIDGE} = -1V$
- Resistance between VDD-VSS: approximately 2.0 k Ω - 15.0 k Ω
- Filter frequency = 760 Hz
- Connector: FH34S-4S-0.5SH (Hirose Electric Co Ltd)
- DAQ (National Instruments), Microcontroller, or similar

- Don't apply too high voltage. Maximum voltage = -1V
- This is an example and all components should be carefully selected according to your own application.
- All specifications are subjected to change without notice.

SD-MSS-1K2G

SD-MSS-1K2GP



- ❑ Hirose FH34(S) series, e.g., FH34SRJ-4S-0.5SH (4 pin) : Back rotary clamp, easy to use. Although it does not strongly clamp the chip, **this connector is good for most of the E-nose applications.**

<https://www.digikey.ch/product-detail/en/hirose-electric-co-ltd/FH34SRJ-4S-0.5SH-50/H125780CT-ND/9216315>

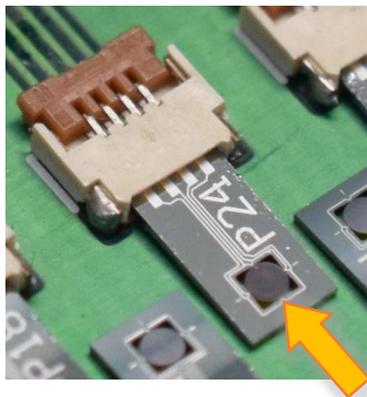
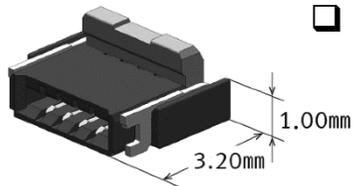
- ❑ Molex 54550-0471 (4 pin) : Front slider type. Not simple to fix the chip, but the chip can be strongly clamped. The alignment between the pads on the chip and the connector pins is highly visible. The footprint of the connector is relatively large. **This connector is good for Torque Magnetometry applications.**

<http://www.digikey.ch/product-detail/en/molex-llc/0545500471/WM8825CT-ND/3197255>

- ❑ Panasonic AYF530435 (4 pin) : Back rotary clamp, easy to mount the chip. This is almost the same features as Hirose FH34. An advantage is its compact size.

<https://www.digikey.ch/product-detail/en/panasonic-electric-works/AYF530435/255-3056-1-ND/2504454>

- ❑ Other bland are of course usable if the following conditions are met.



**Gently insert the chip.
Don't push too much.**

- FPC (Flexible Printed Circuit)/ FFC (Flexible Flat Cable) connectors
- 0.5 mm pitch
- For 0.3 mm-thick cable
- Top, or top&bottom, contact

❑ Receptor Materials (Only Polymer Examples):

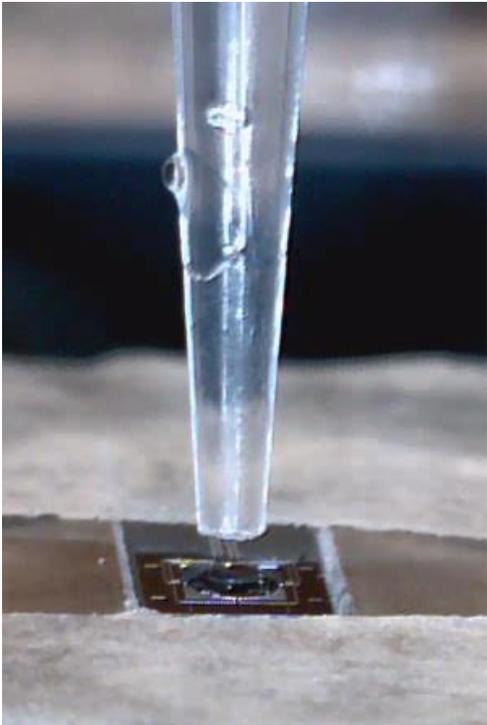
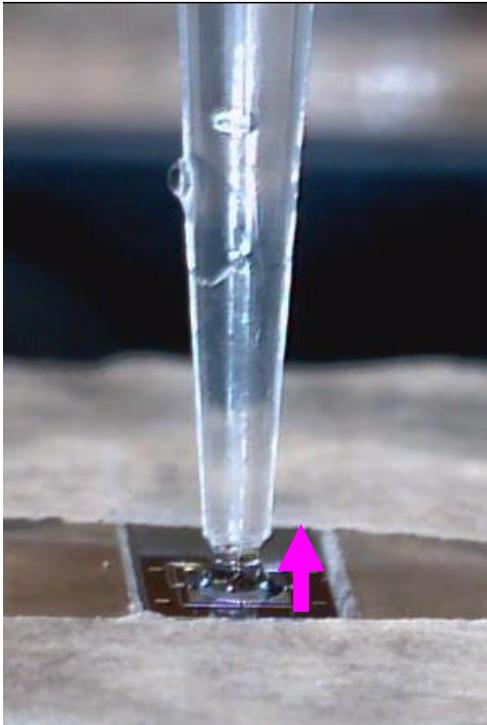
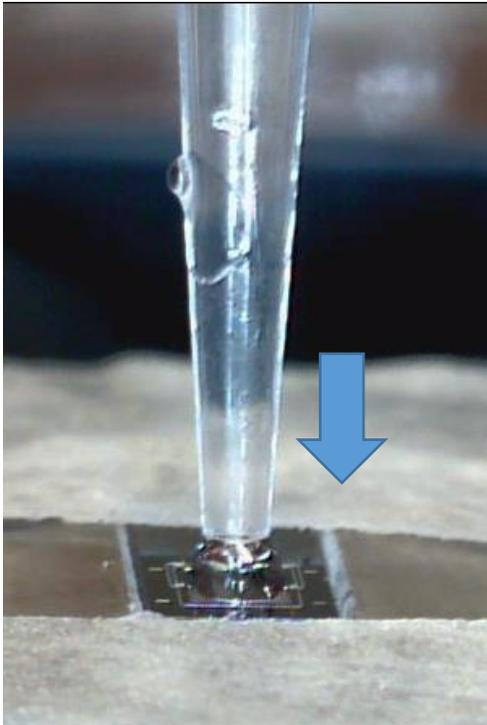
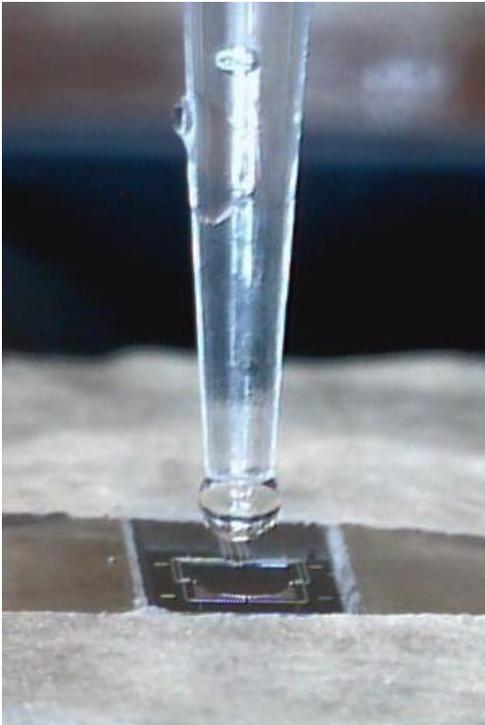
- CMC = carboxy methyl cellulose
- PEO = poly-(2-ethyl-2-oxazoline)
- PEGMEMA = polyethylene glycol methyl ether methacrylate macromere
- HPC = hydroxypropyl cellulose
- PAA-AA = poly(acrylic acid)-acetic acid
- PVPy = poly(vinylpyridine)
- PIB = butyl rubber
- PEI = polyethylenimine

Hans Peter Lang, *et al*, “Piezoresistive Membrane Surface Stress Sensors for Characterization of Breath Samples of Head and Neck Cancer Patients”, *Sensors* (Basel). 2016 Jul; 16(7): 1149, doi: 10.3390/s16071149

❑ Manual Coating Setup



Simple coating method



(1) The drop in the photo is about 0.85 mm in diameter. That corresponds approximately 0.32 μ L.

(2) Slowly move down the tip until the drop touches the membrane.

(3) Fix the tip position and suck-out extra volume.

(4) A small amount in the order of 0.1 μ L is left on the membrane.

Used pipette tip: no bland, described 0.1-10 μ L, external diameter = about 0.7 mm, internal hole = about 0.4 mm in diameter.

MSS-8RM

AVAILABLE

