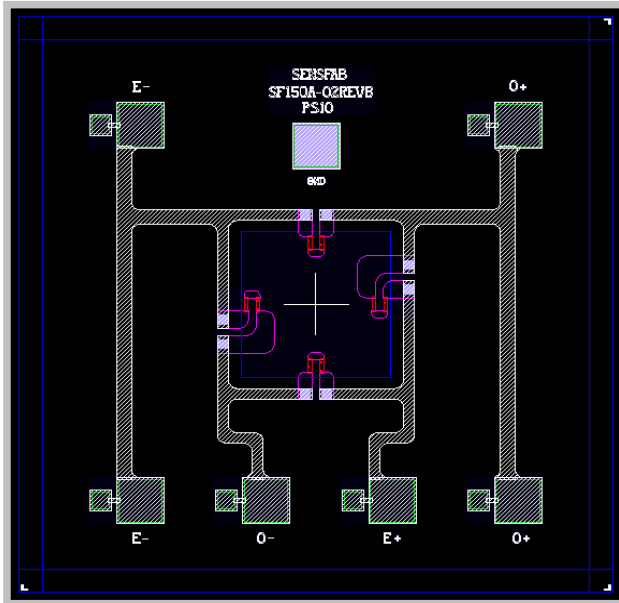
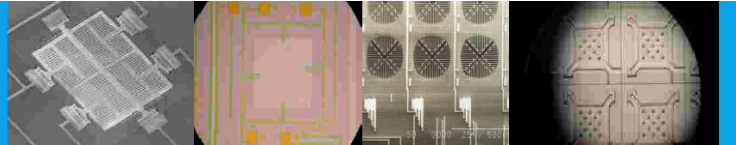


## MTPD-2000G-14S

Uncompensated Pressure Sensor Die



The MTPD2000 series piezo-resistive pressure sensor dies are manufactured on six inch silicon wafers in a class 100 clean room using a state of the art 1.2 micron CMOS facility and are then bulked micro-machined in a class 1000 clean room. The wafers are batch manufactured using an electrochemical etch stop process to achieve excellent repeatability.

Applied pressure deforms a diaphragm causing piezo-resistors to change their resistance. This change in four resistors, which constitute a Wheat Stone Bridge, results in a pressure-proportional voltage.

Die are probed, inked, diced and visually inspected and shipped on tapes, in rings or in waffle packs. Dies can be mounted on ceramic or PCB substrates or packaged in application specific packages for measuring pressure in non-corrosive media.

### FEATURES

- Piezo-resistive bridge
- Solid state
- High reliability
- Optimally sized for application
- Low cost design
- Meets industry specifications
- 6" wafer availability
- 100% factory tested
- Excellent repeatability
- Rated pressure of sensor 0 to 2000 psi

### THE MAIN FIELD OF APPLICATIONS

- ✓ Air conditioning systems
- ✓ Fluid hydraulics
- ✓ Pneumatic gauges
- ✓ Marine
- ✓ Industrial machinery and equipment
- ✓ Test and measurement

MEMSENZ™ I  
 Transduction Principle  
 Capacitive  
 Processing Technology  
 Bulk/Deep RIE  
 Actuation Mechanism  
 Force (External)  
 Signal Condition  
 Two chips/Single chip

MEMSENZ™ II  
 Transduction Principle  
 Piezoresistive  
 Processing Technology  
 Bulk/Deep Wet Etch  
 Actuation Mechanism  
 Pressure (External)  
 Signal Condition  
 Two chips/Single chip

MEMSENZ™ III  
 Transduction Principle  
 Resistive  
 Processing Technology  
 Surface  
 Actuation Mechanism  
 Thermal  
 Signal Condition  
 Two chips

MEMSENZ™ IV  
 Transduction Principle  
 Capacitive  
 Processing Technology  
 Bulk  
 Actuation Mechanism  
 Sound  
 Signal Condition  
 Two chips

## MTPD-2000G-14S

### Uncompensated Pressure Sensor Die

#### TECHNICAL DATA

##### Maximum ratings

Specification	Min.	Typ.	Max.	Unit
Operating Temperature	-40	-	+125	°C
Storage Temperature	-40	-	+125	°C
Supply Voltage	+1	5	+10	V
Operating Current	-	0.7	-	mA

##### Data

Temperature=22±2°C, Relative humidity=45±5%, Supply voltage=5V

Specification	Min.	Typ.	Max.	Unit
Operating Pressure Range	0	-	103400	mmHg
	0	-	2000	psi
	0	-	13790	kpa
	0	-	138	bar
Over Pressure	0	-	10000	psi
	0	-	68.9	Mpa
	0	-	689.4	bar
Zero Pressure Offset Voltage (before bonding)	-15	-	+15	mV
Sensitivity	0.3	0.4	0.5	µV/V/mmHg
	0.015	0.02	0.025	mV/V/psi
	0.002	0.003	0.004	mV/V/kpa
	1.1	1.5	1.8	mV/bar
Full Scale Span	150	200	250	mV
Non-linearity	-2	-	+2	%FS
Bridge Resistance (see note 5)	4500	5000	5500	Ω
Temperature coefficient of offset, TCO	-45	0.1	45	µV/V / °C
Temperature coefficient of resistance, TCR	1180	1300	1410	ppm/°C
Temperature coefficient of sensitivity, TCS	-98	-1	96	%FS/100°C

- Supply voltage DC and AC up to 5kHz,  $V_{pp} = 10V \pm 0.1$  VDC
- Current is linear in full range
- Total error at half span is based on the difference between half span measurement and a straight line projection over the span of the device where

$$NL(\%) = \frac{O(\frac{s}{2}) - \frac{O(0) + O(s)}{2}}{O(\frac{s}{2})} \times 100$$

- Top side pressure application
- Resistance is measured by sourcing a constant current of 0.7mA.
- Parameters (except zero pressure offset which is measured directly) are computed from individual piezo-resistance measurements made at different pressures under application of a current of 0.7mA, which represents the typical operating conditions
- Linearity and Sensitivity are based on calculated values
- TCO, TCR & TCS are tested from 0°C to 50°C

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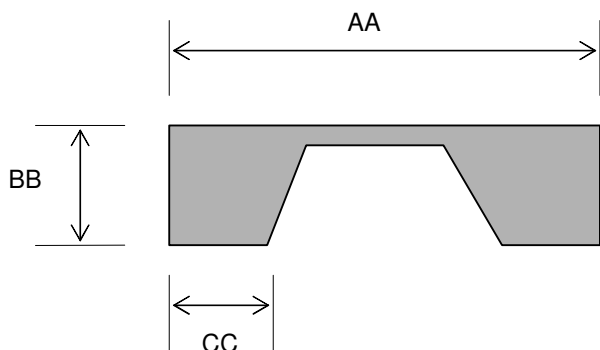
MEMSENZ™ III  
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MEMSENZ™ IV  
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 Bulk  
 Actuation Mechanism  
 Sound  
 Signal Condition  
 Two chips

## MTPD-2000G-14S

### Uncompensated Pressure Sensor Die

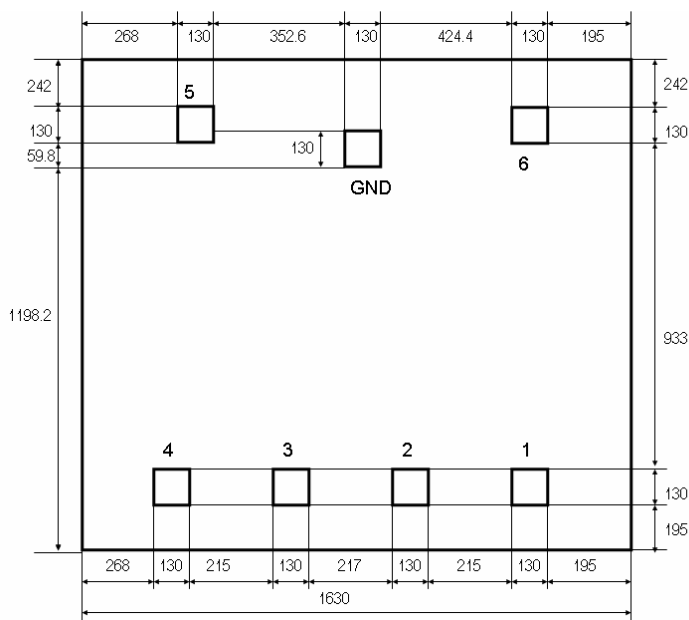
#### DIMENSIONS



Dim.	Typical	Tolerance	Units
AA	1630	± 0.33	µm
BB	397	± 10	µm
CC	333.5	± 2.33	µm
Dicing process	60	± 15	µm

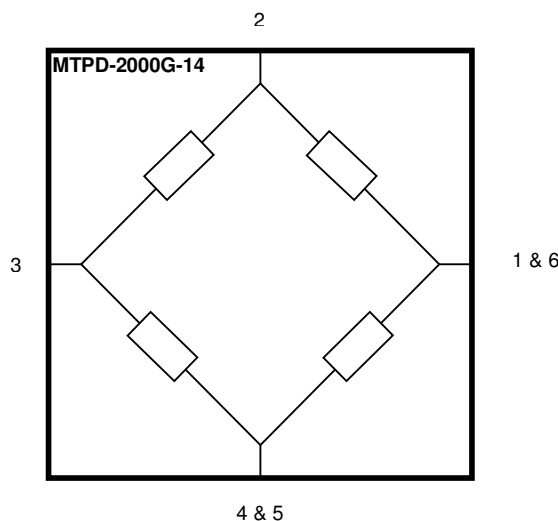
Note: Dimension AA & CC are prior to dicing process.

#### ELECTRICAL AND DIE LAYOUT



#### Note

- All dimensions are in µm.
- Mask fabrication tolerance of ±0.3µm
- Design fabrication tolerance of ±0.03µm



Pad	Symbol	Description
1	O+	Output voltage
2	E+	Supply voltage
3	O-	Output voltage
4	E-	Supply voltage
5	E-	Supply voltage
6	O+	Output voltage
GND	GND	Ground

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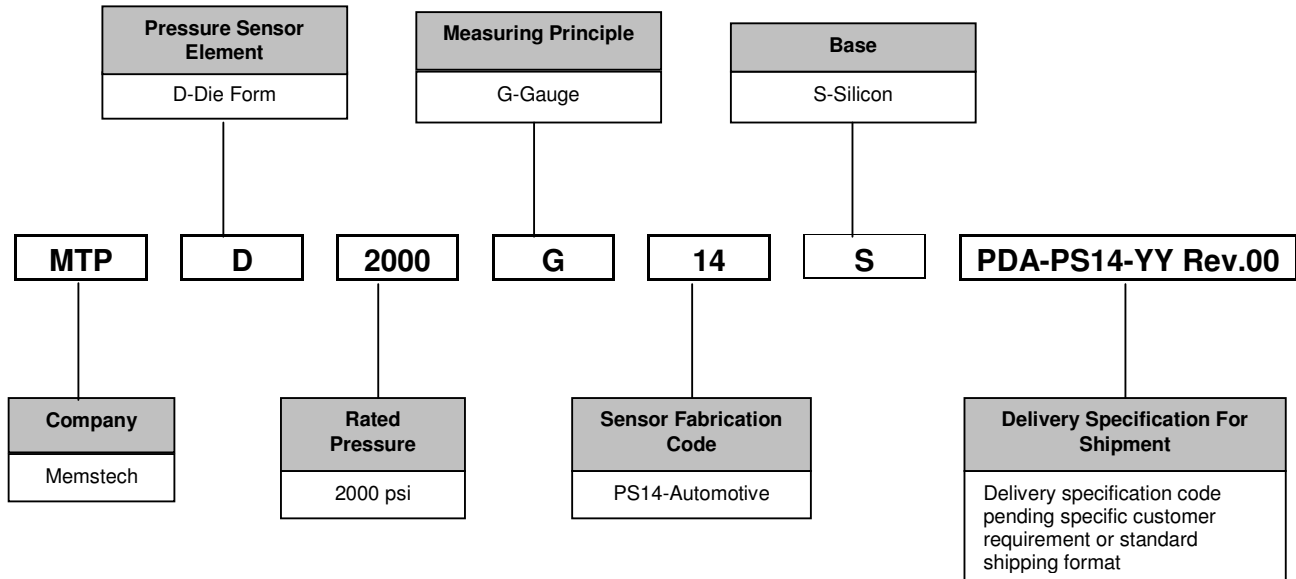
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 Actuation Mechanism  
 Sound  
 Signal Condition  
 Two chips

## MTPD-2000G-14S

Uncompensated Pressure Sensor Die

### HOW TO SPECIFY PART NUMBER



USA **Srini Naidu** Executive Director, 42503 Steeple View, Northville MI 48167 **Tel:** 734 560 5506 **Fax:** 734 420 3004 **Email:** srini@memstech.com  
 WORLWIDE Bryan K Patmon Chief Marketing Officer  
 Singapore: 85 Science Park Drive, #01-01/02, The Cavendish, Singapore 118259 **Tel:** +65-68222889 **Fax:** +65-67793711 **Email:** bkpatmon@memstech.com  
 Malaysia: PTD 43005 Jalan Perindustrian Murni 11, Taman Perindustrian Murni, 81400 Senai Johor Malaysia **Tel:** +607 - 5996323 **Fax:** +607 - 598 6388  
**Email:** [bkpatmon@memstech.com](mailto:bkpatmon@memstech.com) **Website:** [www.memstech.com](http://www.memstech.com)

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 Sound  
 Signal Condition  
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