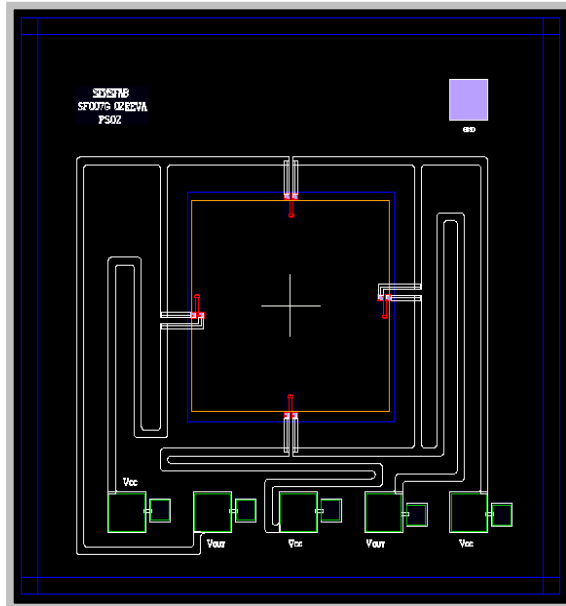
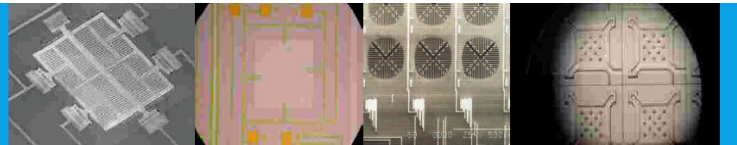


MTPD-007G-02S

Uncompensated Pressure Sensor Die



The MTPD007 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.

Dies are probed, inked, diced and visually inspected and shipped on tapes, in rings or in wafer 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
- Surface passivation
- Solid state
- High reliability
- 6" wafer availability
- 100% factory tested
- Excellent repeatability
- Rated pressure of sensor 0 to 7 psi
- Optimally sized for application
- Low cost design
- Suitable for invasive applications
- Meets industry specifications

THE MAIN FIELD OF APPLICATIONS

- ✓ Medical instrumentation
- ✓ Blood pressure measurement
- ✓ Infusion pumps
- ✓ Kidney dialysis machines

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

MEMSENZ™ II
Transduction Principle
Piezo-resistive
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-007G-02S

Uncompensated Pressure Sensor Die

TECHNICAL DATA

Maximum ratings

Specification	Min.	Typ.	Max.	Unit
Operating Temperature	-40	-	85	°C
Storage Temperature	-40	-	125	°C
Supply Voltage	+1	6	10	V
Operating Current	-	2.5	-	mA

Data

Temperature=22±2°C, Relative humidity=45±5%, Supply voltage=6V

Specification	Min.	Typ.	Max.	Unit
Operating Pressure Range	-30	-	+300	mmHg
	-0.6	-	5.8	psi
	-4.0	-	40.0	kpa
	-0.04	-	0.4	bar
Over Pressure	125	-	-	psi
	6463	-	-	mmHg
	862	-	-	kpa
	9	-	-	bar
Zero Pressure Offset Voltage	-3	-1.5	0	mV/V
Sensitivity	20	30	40	μV/V/mmHg
	1.0	1.6	2.1	mV/V/psi
	0.1	0.2	0.3	mV/V/kpa
	91	136	181	mV/bar
Span	43	65	87	mV
Non-linearity	-	+0.5	+1	%FSO
Bridge Resistance (see note 5)	260	285	300	Ω
Temperature coefficient of offset, TCO	-	-	±0.3	mmHg/°C
Temperature coefficient of resistance, TCR	1100	1500	1800	ppm/°C
Temperature coefficient of sensitivity, TCS	-	-	-0.1	%/°C

- Supply voltage DC and AC up to 5kHz, $V_{pp} = 10V \pm 0.1VDC$
- 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 2.5mA
- 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 2.5mA, which represents the typical operating conditions
- TCO, TCR & TCS are tested from 0°C to 50°C

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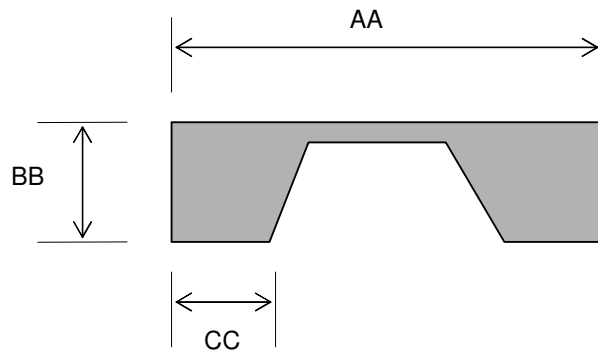
MEMSENZ™ III
Transduction Principle
Resistive
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Surface
Actuation Mechanism
Thermal
Signal Condition
Two chips

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

MTPD-007G-02S

Uncompensated Pressure Sensor Die

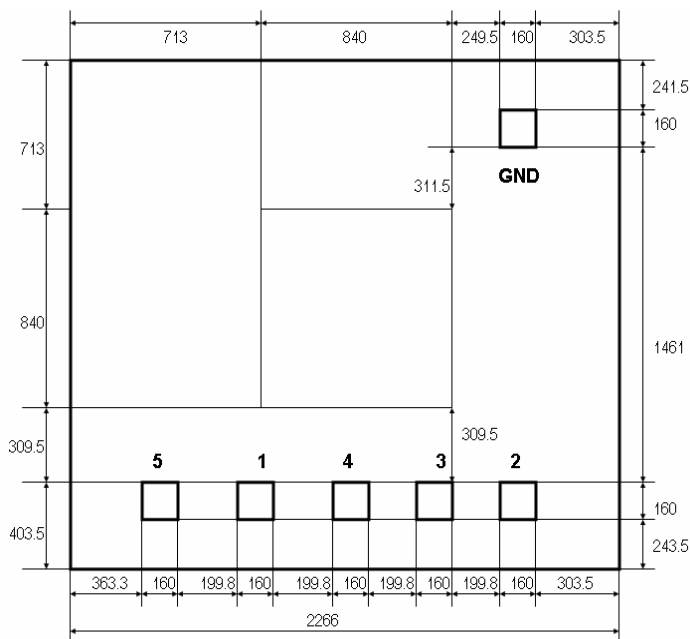
DIMENSIONS



Dim.	Typical	Tolerance	Units
AA	2266	± 0.33	μm
BB	541	± 10	μm
CC	345.5	± 2.33	μm
Dicing process	60	± 15	μm

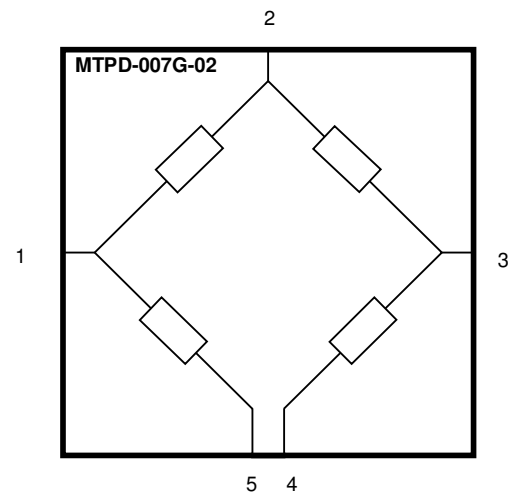
Note: Dimension AA & CC are prior to dicing process.

ELECTRICAL AND DIE LAYOUT



Note

- All dimensions are in μm .
- Mask fabrication tolerance of $\pm 0.3\mu\text{m}$
- Design fabrication tolerance of $\pm 0.03\mu\text{m}$



Pad	Symbol	Description
1	$V_{\text{out}+}$	Output voltage
2	$V_{\text{cc}+}$	Supply voltage
3	$V_{\text{out}-}$	Output voltage
4	$V_{\text{cc}-}$	Supply voltage
5	$V_{\text{cc}-}$	Supply voltage
GND	GND	Ground

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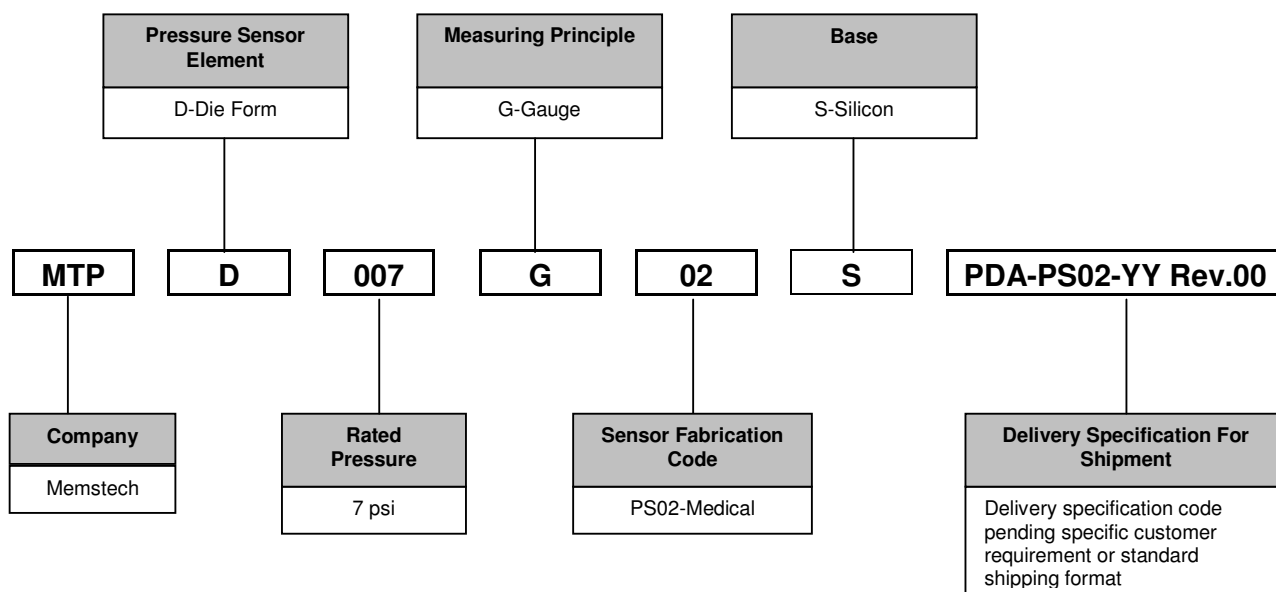
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Capacitive
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Actuation Mechanism
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Signal Condition
Two chips

MTPD-007G-02S

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
 WORLDWIDE **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 **Website:** www.memstech.com

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