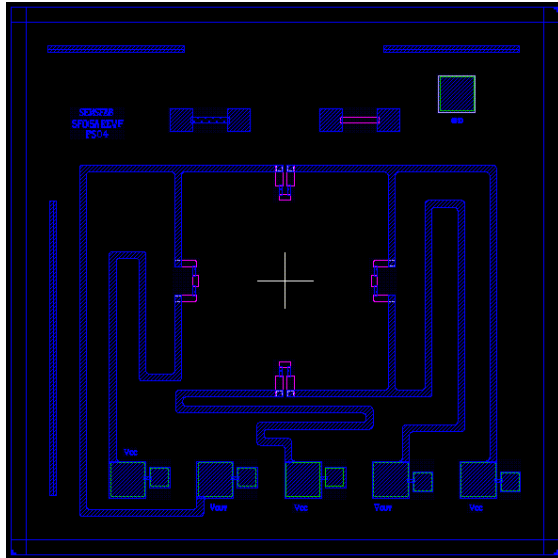
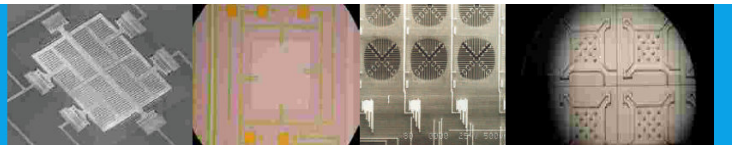


MTPD-015A-04G-F

Uncompensated Pressure Sensor Die



The MTPD015 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
- Optimally sized for application
- Low cost design
- Meets industry specifications
- 6" wafer availability
- 100% factory tested
- Excellent repeatability
- Rated pressure of sensor 0 to 15 psi

THE MAIN FIELD OF APPLICATIONS

- ✓ Mobile altimeter/barometer
- ✓ Weather forecast
- ✓ Automotive
- ✓ Industrial electronics
- ✓ Consumer electronics

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-015A-04G-F

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	-	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	-	15	psiA
	0.0	-	776	mmHg
	0	-	103	kpa
	0	-	1	bar
Max. Pressure	0	-	75	psiA
	0	-	3876	mmHg
	0	-	517	kpa
	0	-	5.2	bar
Zero Pressure Offset Voltage (before bonding)	-3	-	3	mV/V
Sensitivity	19	29	39	μV/V/mmHg
	1.0	1.5	2.0	mV/V/psi
	0.1	0.2	0.3	mV/V/kpa
	72	111	145	mV/bar
Full Scale Span	75	115	150	mV
Non Linearity	-0.5	0	+0.5	%FS
Bridge Resistance (see note 5)	4500	5000	5500	Ω
TCO	-215	-65	85	μV/V/°C
TCR	1900	2300	2700	ppm/°C
TCS	-12	-18	-24	%FS/°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 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
- TCO, TCR & TCS are tested from 0°C to 50°C

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

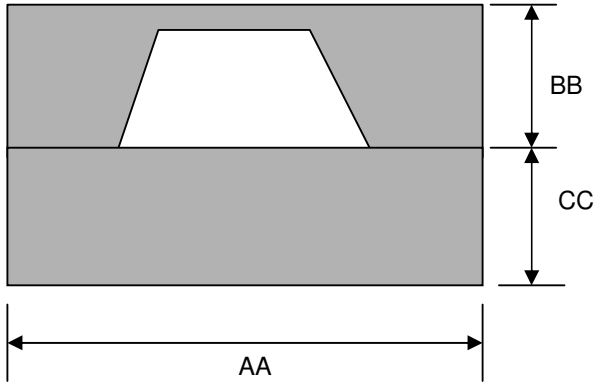
MEMSENZ™ III
 Transduction Principle
 Resistive
 Processing Technology
 Surface
 Actuation Mechanism
 Thermal
 Signal Condition
 Two chips

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

MTPD-015A-04G-F

Uncompensated Pressure Sensor Die

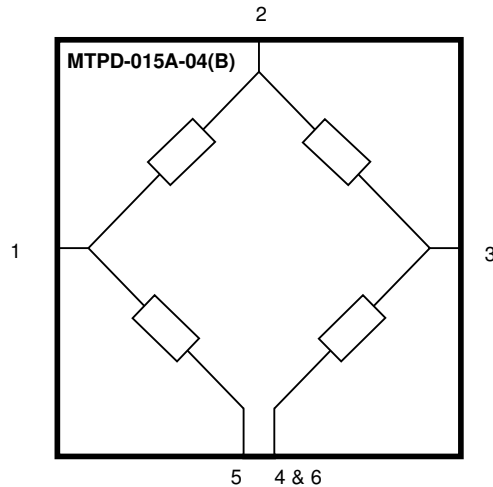
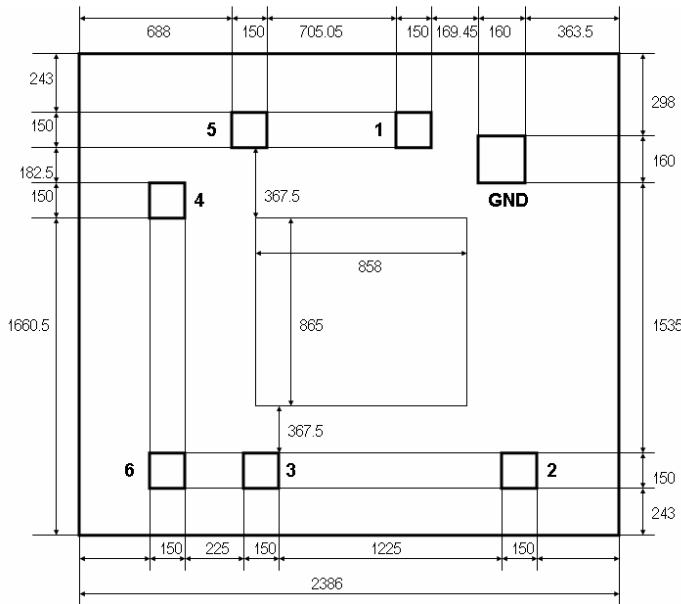
DIMENSIONS



Dim.	Typical	Tolerance	Units
AA	2386	± 0.33	µm
BB	403	± 10	µm
CC	700	± 25	µm
Dicing process	100	± 15	µm

Note: Dimension AA is 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	$V_{out +}$	Output voltage
2	$V_{in +}$	Supply voltage
3	$V_{out -}$	Output voltage
4	$V_{in -}$	Supply voltage
5	$V_{in -}$	Supply voltage
6	$V_{in -}$	Supply voltage
GND	GND	Ground

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

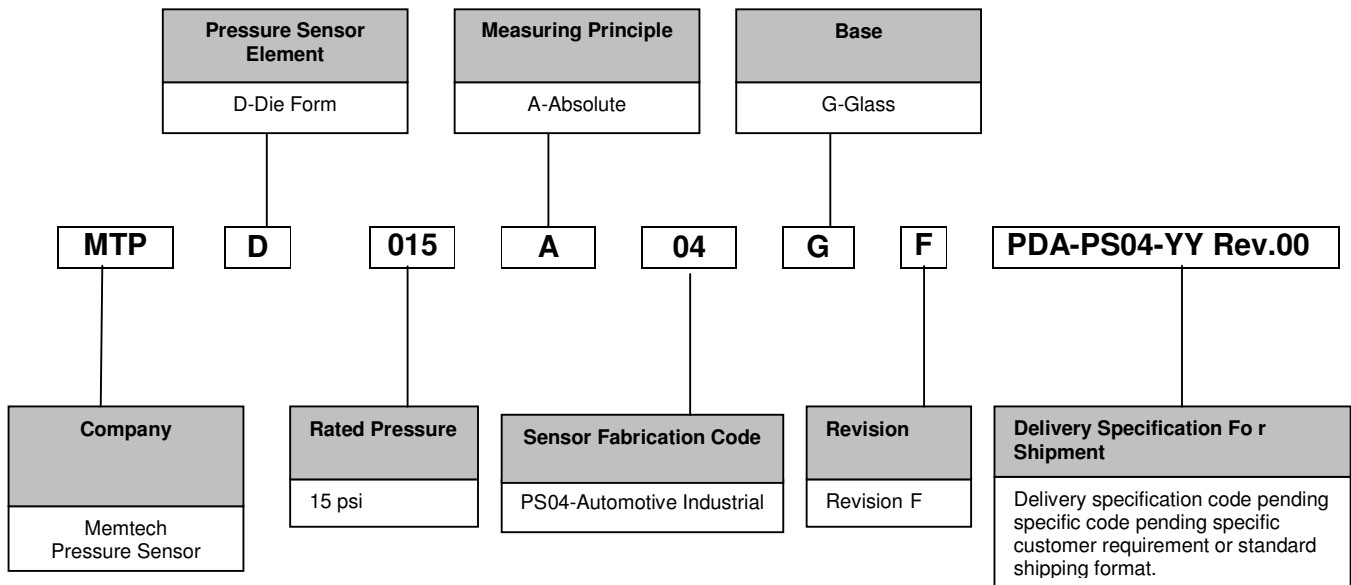
MEMSENZ™ III
 Transduction Principle
 Resistive
 Processing Technology
 Surface
 Actuation Mechanism
 Thermal
 Signal Condition
 Two chips

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

MTPD-015A-04G-F

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 Website: www.memstech.com

SALES TERMS:

MemsTech's Standard Sales Terms apply. Price and specifications are subject to change without notice.

WARRANTY:

Subject to the conditions set out below in this Clause, MemsTech and its subsidiaries warrants its products against defects in material and workmanship for a period of 12 months from the date of shipment. Products that are not subjected to misuse will be repaired or replaced. MemsTech and its subsidiaries reserves the right to make changes to any product herein without further notice. MemsTech and its subsidiaries makes no warranty, representation or guarantee regarding the suitability of its products for any application, nor does MemsTech and its subsidiaries assume liability arising out of the application or use of any product or circuit and specifically disclaims all liability without limitation consequential or incidental damages. The foregoing warranties are exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. NO IMPLIED STATUTORY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. This warranty does not extend to parts, materials or equipment not manufactured by MemsTech and its subsidiaries and this warranty is further subject to the conditions that MemsTech and its subsidiaries shall be under no liability whatsoever in respect of any defect in the products arising from any drawing design or specification supplied by the buyer or any defect arising from fair wear and tear, wilful damage, negligence, abnormal working conditions, failure to follow MemsTech and its subsidiaries' instructions (whether oral or in writing), misuse or alteration or repair of the products without MemsTech and its subsidiaries' approval. The provisions herein are governed by the laws of Singapore.

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