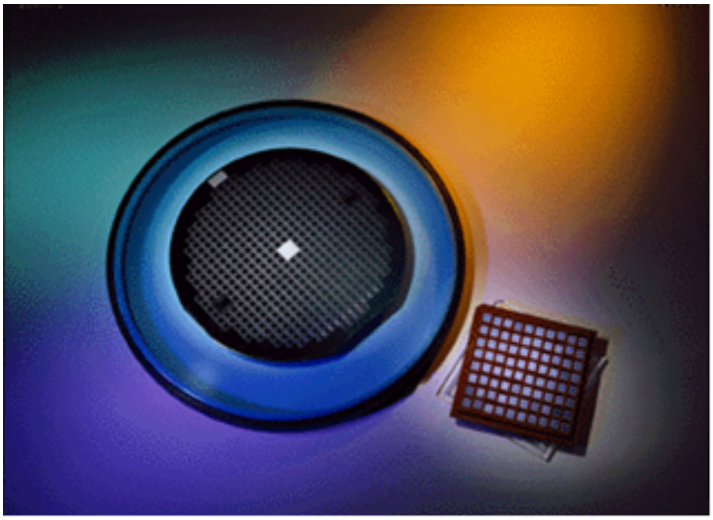
SM2120 Harsh Environment Differential Pressure Die

SILICON MICROSTRUCTURES INCORPORATED
Member of the ELMOS Group

Product Number: SM2120

HIGHLIGHTS

→ Small profile
→ High volume, low cost for OEM use
→ Mountable on ceramic or PCB substrates
→ Available for proprietary and custom packaging
→ Harsh Environment



TYPICAL APPLICATIONS

→ Exhaust Gas Recirculation (EGR)
→ Media Resistant
→ Medical Instrumentation
→ Industrial Controls
→ Engine Controls

FEATURES

→ High Volume, Cost Effective
→ Gage Configuration without constraint wafer
→ Constant Voltage Drive
→ Millivolt Output
→ Available in 0.35 & 1.0 bar (5 & 15 PSIG) full-scale
→ Ratiometric with Supply Voltage up to 10 V

Covered under U.S. Patent 5,812,047.

DESCRIPTION

The SM2120 is a silicon micro-machined, piezoresistive pressure sensing die utlizing a noble Metallization for media resistance. These devices are available in full-scale ranges from 0.35 to 1.0 bar (5 & 15 PSIG) and are ideal for OEM and high-volume applications.

Provided in die form, these sensors can be mounted on ceramic or PC board substrates as part of an OEM system. They also may be packaged into proprietary or application specific sensor lines.

Dies are electrically probed, diced, inspected, and shipped on tape.

TÜV MANAGEMENT SERVICE ISO / TS 16949

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ABSOLUTE MAXIMUM RATING TABLE FOR SM2120 DIE

All parameters are specified at V_{SUPPLY} = 5.00 V DC supply at room temperature, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
1	Excitation Voltage[a]	V_{SUPPLY}	—	—	10	V
2	Proof Pressure[b]	p_{PROOF}	500	—	—	%FS
3	Burst Pressure[b]	p_{BURST}	700	—	—	%FS
4	Operating Temperature[b]	T_{OP}	-40	—	125	°C
5	Storage Temperature[b]	T_{STG}	-55	—	150	°C

NOTES:
(a) Bridge may be driven with positive or negative voltage as long as Vsub is not connected
(b) Tested on a sample basis

OPERATING CHARACTERISTICS FOR SM2120 DIE

All parameters are specified at V_{SUPPLY} = 5.00 V DC supply at room temperature, unless otherwise noted.

No.	Characteristic	Symbol	Minimum	Typical	Maximum	Units
6	FS Span (0.35 Bar)[b, c]	V_{SPAN}	125	145	175	mV
7	FS Span (1.0 Bar)[b, c]	V_{SPAN}	135	155	185	mV
8	Zero Offset	V_{OFFSET}	-50	19	50	mV
9	TC Span[b]	TCS	-0.24	-0.19	-0.155	%FS/°C
10	TC Resistance	TCR	0.30	0.34	0.40	%/°C
11	TC Zero Offset[b, c]	TCZ	-0.03	-0.01	0.03	%FS/°C
12	Linearity[b, d]	NL	-0.3	±0.1	0.3	%FS
13	Bridge Resistance	R_B	3.6	4.3	5.4	kΩ

NOTES:
(a) Bridge may be driven with positive or negative voltage as long as Vsub is not connected
(b) Tested on a sample basis
(c) Determined by measurements taken at 25°C & 75°C
(d) Defined as best fit straight line

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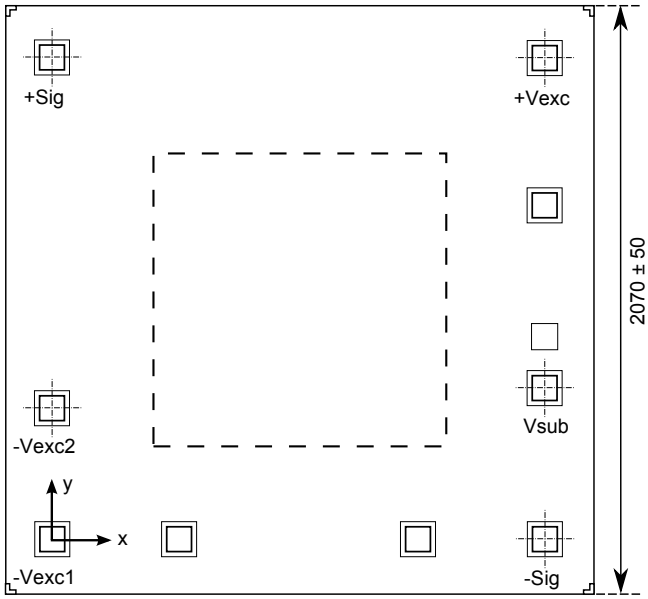
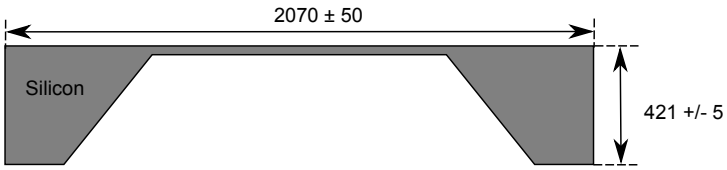
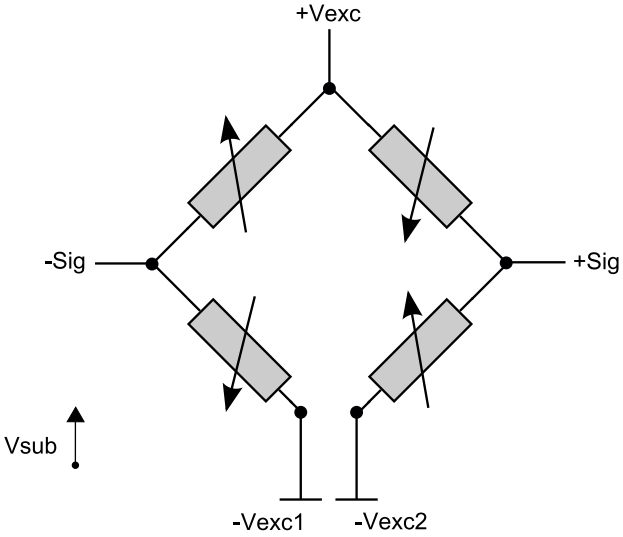
Diagrams and Dimensions





All dimensions are in Micrometer

Pad-Out



Typical Operation		
PAD DESCRIPTION	TYPE	VALUE
-Vexc1	Power	0 V
+Vexc	Power	+5 V
+Sig	Analog Out	–
-Vexc2	Power	0 V
-Sig	Analog Out	–
Vsub	Power	+5 V

Pad Sizes = 100 x 100

Coordinates	(x, y)
-Vexc1:	(0, 0)
-Sig:	(1750, 0)
-Vexc2:	(0, 429)
Vsub	(1750, 496)
+Sig	(0, 1692)
+Vexc	(1750, 1692)

Ordering information

Order Code	Full-Scale Pressure Range	Pressure Type	Minimum Order Quantity (MOQ)
SM2120-005-G	.35 Bar / 5.08 PSI	Gage	2 Wafers ≈ 900 Die Per Wafer (Actual die quantity subject to +/- 10% yield variance)
SM2120-015-G	1.0 Bar / 15 PSI		

For samples, please contact: sales@si-micro.com

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