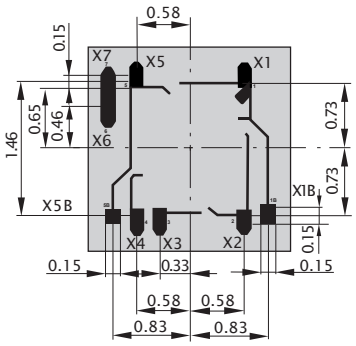
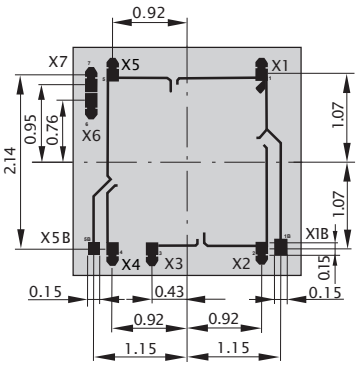
High Stability Line STARe

Silicon Pressure Sensor Die – Absolute, Gauge and Differential Measurements

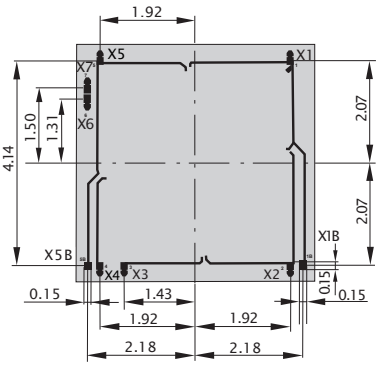
First Sensor



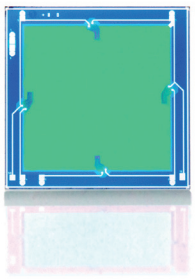
M-Layout
Die size: 2.15 x 2.15mm



L-Layout
Die size: 2.75 x 2.75mm



V-Layout
Die size: 4.75 x 4.75mm



Overview

The High Stability Line STARe is a piezoresistive silicon pressure sensor die line with a pressure proportional output signal and high bridge resistance. The die has side layouts as well as round layouts with an electrical shield. Our optimized designs and technologies allow the highest accuracy measurements of absolute, gauge or differential pressure for required applications. Key features of our STARe Technology (Sensor Technology for Advanced Resistors) are the highest stability, lowest temperature hysteresis and extremely high over pressure. Ask us for your custom solution.

Applications

- Industrial controls
- Medical instrumentations

Features

- Very high long term stability
- Very low pressure and temperature hysteresis
- High static pressures applicable
- Fast response
- High bridge resistance
- Pressure ranges
  V-Layout:
  0...3kPa to 0...10kPa
  L-Layout:
  0...35kPa to 0...100kPa
  M-Layout:
  0...250kPa to 0...40MPa

Common Characteristics

Type	Pressure range	Parameter	min.	typ.	max.	Unit
HS20V-03k0-D05	3kPa	Span voltage	50	80	120	mV at 5V
HS20V-06k0-A/G/DXX	6kPa					
HS20V-10k0-A/G/DXX	10kPa					
HS20L-35k0-A/G/DXX	35kPa					
HS20L-100k-A/G/DXX	100kPa					
HS20M-250k-A/G/DXX	250kPa		60	100	140	
HS20M-500k-A/G/DXX	500kPa					
HS20M-01M0-A/G/DXX	1.0MPa					
HS20M-03M0-A/GXX	3.0MPa					
HS20M-10M0-A/GXX	10.0MPa		200	250	300	
HS20M-20M0-A08	20.0MPa		60	100	140	
HS20M-40M0-A08	40.0MPa					

Other pressure ranges are possible.

Order No.

HS20 X - XXXX – X YY
1 2 3 4 5

1. **Product Code**
   High Stability Line STARe
2. **Outside Dimension**
   V: 4.75 X 4.75mm (3kPa...10kPa)
   L: 2.75 X 2.75mm (35kPa...100kPa)
   M: 2.15 X 2.15mm (250kPa...40MPa)
3. **Pressure Range**
   03k0: 3kPa = 30mbar
   40M0: 40MPa = 400bar
4. **Type (X)**
   A: Absolute
   G: Gauge (Glass)
   D: Differential (Si)
5. **Thickness Back Plate**
   YY: Back Plate Thickness in 100µm

Certificate

ISO/TS 16949

Contact

First Sensor AG
www.first-sensor.com

Electrical Characteristics
(measured at 5V supply and 25˚C, unless otherwise specified)

Parameter	min.	typ.	max.	Unit
Bridge resistance	5,000	6,000	7,000	Ω
Offset voltage	-25	0	+25	mV
Temperature coefficient of bridge resistance[1]	+0.07	+0.09	+0.11	%/K
Temperature coefficient of offset[1] A/G (>100kPa) D (3kPa - 1MPa) A/G (<250kPa)	 -0.05 0.00	 ±0.01 +0.05	 +0.05 +0.10	%F.S.S./K
Temperature coefficient of span[1] A/G (>10kPa) D (3kPa – 1MPa)	-0.23	-0.20	-0.17	
Temperature hysteresis[1A]	–		–	±%F.S.S.
Pressure hysteresis	–	<0.05	–	
Long term stability	–		–	±%F.S.S./year
Linearity error[2,3] (higher than 10kPa) p-range: higher than 10MPa	 –	<0.30 <1.00	0.50	±%F.S.S.

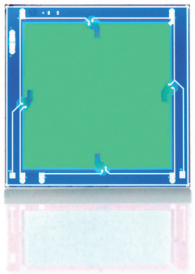
1) Measured from 25˚C to 85˚C · 1A) Measured from 25˚C - 125˚C
2) End point straight line setting · 3) Pressure applied onto the front side of the die

Maximum Ratings

Type	Over Pressure (100kPa)		Burst Pressure (100kPa)	
	FS min.	RS min.	FS min.	RS min.
HS20V-03k0-D05	3	1.5	3	1.5
HS20V-06k0-A/G/D05	4**	2*	>4**	>2*
HS20V-10k0-A/G/D05	6**	3*	>6**	>3*
HS20L-35k0-A/G/DXX	10	5	>10	>5
HS20L-100k-A/G/DXX	20	10	>20	>10
HS20M-250k-A/G/DXX	40	20	>40	>20
HS20M-500k-A/G/DXX	50	25	>50	>25
HS20M-01M0-A/G/DXX	60	30	>60	>30
HS20M-03M0-A/GXX	150	75	>150	>75
HS20M-10M0-A/GXX	200		>200	
HS20M-20M0-A08	600	–	>600	–
HS20M-40M0-A08	800	–	>800	–

FS: Front side; RS: Rear side · *) 100kPa for G-Type · **) 300kPa for A/G-Type

Parameter	Limit Values			Unit
	min.	typ.	max.	RS min.
Operating temperature range (Higher temperature on demand)	-40	–	+125	˚C
Storage temperature range	-50	–	+150	
Supply voltage	–	5	12	V



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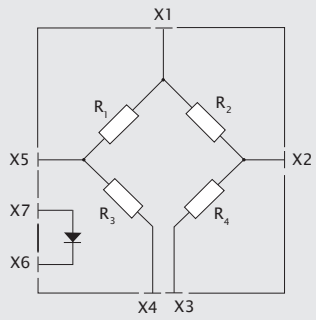
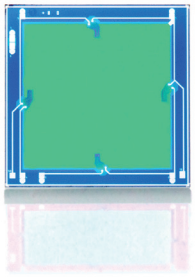
Bondpad Configuration



Bondpad No.	Connection
X1/X1B	$+V_{SUPPLY}$
X2	$+V_{OUT}$
X3	$-V_{SUPPLY}$
X4	$-V_{SUPPLY}$
X5/X5B	$-V_{OUT}$
X6	$-I_{DIODE}$
X7	$+I_{DIODE}$

pressure applied to the front side

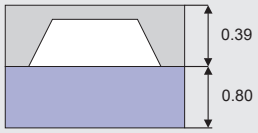
Substrate and cathode of diode have the same electrical potential. To avoid bias effects diode and bridge cannot be used simultaneously.



Technical Options

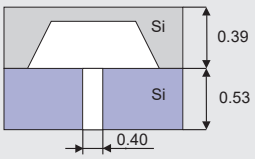
Absolute Types

HS20X-XXXX-A08



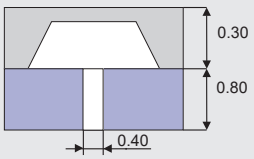
Differential Types

HS20X-XXXX-D05



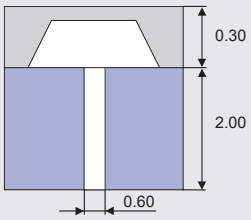
Gauge Types

HS20X-XXXX-G08



0.4mm (M Layout)
0.5mm (L Layout)

HS20X-XXXX-G20



Dimensions in mm

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