ALGRA GROUP

Datasheet

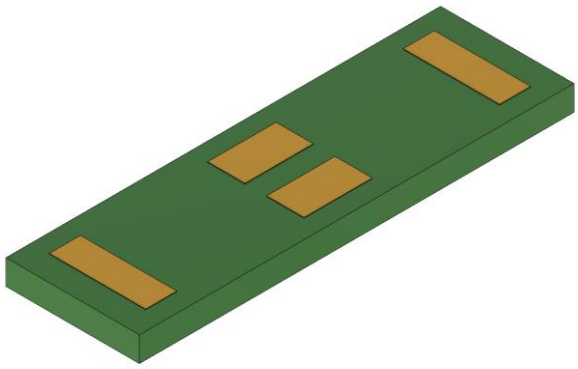
Agnostic Force Sensor

PT061 – Strain gauge sensor

V2.0

FEATURES

- High sensitivity / high linearity
- Low power consumption
- High durability
- Small footprint
- SMD solderable
- AEC-Q200 compliant (Automotive)
- Small size



TYPICAL APPLICATION

- Input systems with minimal deformation of the surface
- Force sensing applications

DESCRIPTION

The PT061 sensor is a piezo-resistive sensor offering low profile, low power consumption, high sensitivity and high durability. The Micro Strain Gauge material is directly printed on a FR4 substrate. The PT061 sensor is produced as a SMD type device with solder pads.

Enabled by its unique properties, the PT061 sensor provides accurate measurements of small forces in a wide range of applications. Mounted on printed circuit board, it detects micromovements on any type of material to which it is bonded.

The PT061 sensor consists of an array of piezoresistors in a Wheatstone-bridge configuration. When a force is applied, the deformation of the sensor leads to a change in resistance, which is then converted to a voltage output signal.

ORDERING INFORMATION

Order Number	Part	Size	Packaging	MOQ
159756	PT061	7 * 2.15 * 0.4 mm	Tape & Reel	1000
162912	PT061	7 * 2.15 * 0.4 mm	Tape	100

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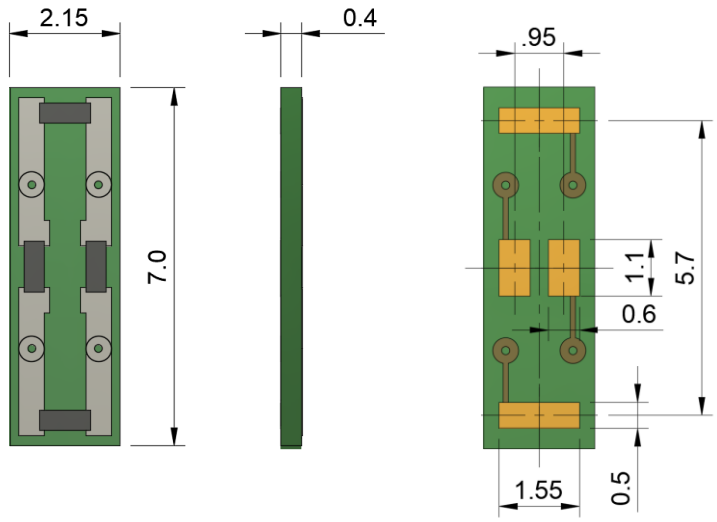
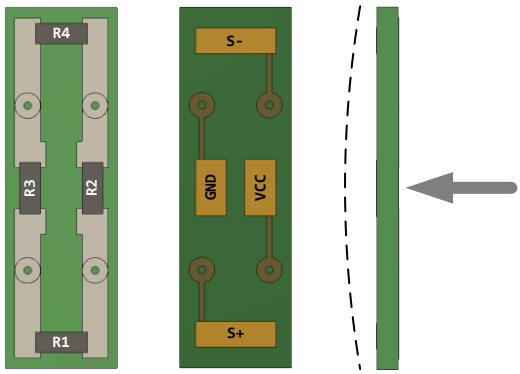
PRODUCT DIMENSIONS



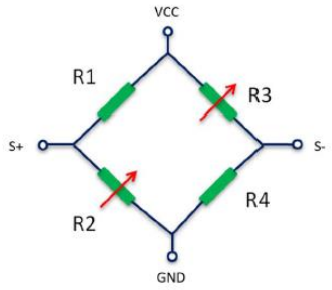
PIN CONFIGURATION & FUNCTION



Top View Bottom View

A small force applied to PT061 will bend R2 and R3. This changes the resistance value and results in an output signal.

Pin name	Pin description
VCC	Sensor supply voltage
S+	Sensor positive output terminal
S-	Sensor negative output terminal
GND	Ground



ABSOLUTE MAXIMUM RATINGS

Parameter	Unit	Min	Max
Supply voltage	V		10
Storage temperature	°C	-40	105
Operating temperature	°C	-40	105
Curvature	m^{-1}		5

ELECTRICAL CHARACTERISTICS

Parameter	Condition	Unit	Min	Typ	Max
Sensitivity	@ 3Vdc	uV/m^{-1}		7000	
Temp. coeffizient		ppm/K			3000
Curvature Range		m^{-1}			1.1
Offset [1]	@ 3Vdc	mV	-200	0	200
Offset [2]	@ 3Vdc	mV	-400	0	400
vbias [1]	@ 3Vdc	mV	-1300	0	1700
vbias [2]	@ 3Vdc	mV	-1100	0	1900
Bridge resistance		kOhm	2	6	10
Drift		uV/min			140

[1] Limits used for 100% outgoing inspection
[2] Limits after exposure to high temperature / high humidity (AEC-Q200)

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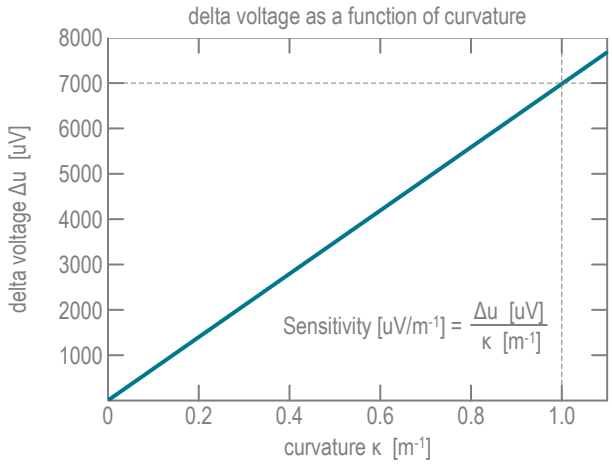
CURVATURE RANGE & SENSITIVITY

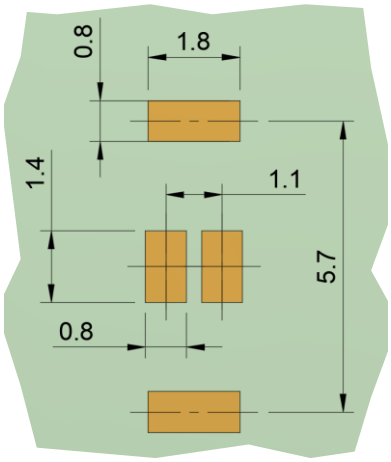


Curvature is defined as the change in direction as the curve is traversed. The curvature of a straight line is zero everywhere because its direction remains the same. A circle of radius r has the same curvature everywhere. The smaller the radius, the greater the curvature. For a circle:

$$\text{curvature } \kappa \ [m^{-1}] = \frac{1}{\text{radius } [m]}$$

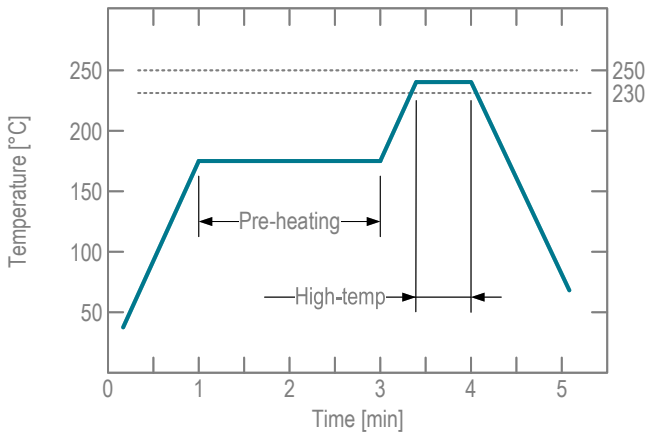
The characteristic range for the PT061 sensor is 0 to 1.1 m^{-1}.
This results in a bending radius of infinite to 0.9m.

SMT-FOOTPRINT & LAYOUT INSTRUCTION



Recommendation:
Solder paste mask: 0.2mm smaller than footprint
Stencil thickness: 100um

SOLDERING PROFILE & PLACEMENT INSTRUCTION



Pre-heating period	≥ 60s
Pre-heating temperature	<180°C
High-temperature period	30 to max 60s
Maximum soldering temperature	250°C

SMD Placement:
Placement force at SMD assembly: 1.5N with a soft nozzle (Max 2N)

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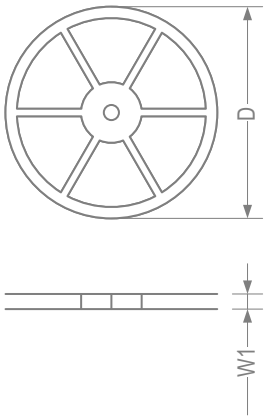
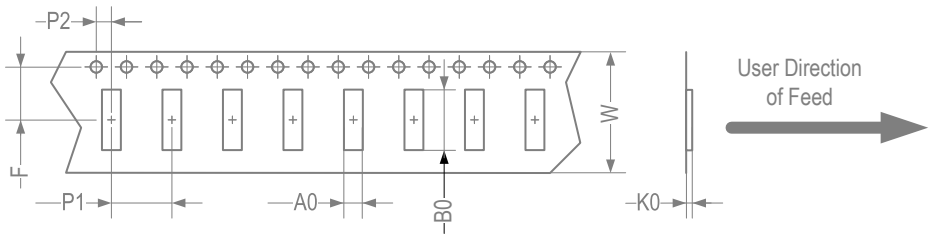
PACKAGE INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



	Unit	D	W1	A0	B0	P1	P2	F	W	K0
Dimension	mm	180	20	2.35	7.40	8.00	2.00	7.50	16	1.10

Sensors are loaded with the solder pad (bottom) in contact with the tape.
There are 1000pcs per reel.

MOISTURE SENSITIVE LEVEL (MSL) & ESD RATING

The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications is Level-2.
The ESD protection (Human-body model - according to ANSI/JEDEC JS-001-2014) is ±4000V.

COMPLIANCE INFORMATION

The PT061 sensor is in compliance with RoHS, REACH and CMRT. A written certification can be supplied upon request.

REVISION HISTORY

Version	Date	Description	Pages
V2.0	2024-03-25	Update of datasheet layout	-

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