GMFPC102 Analog Force Sensor

General Introduction

GMFPC102 is an analog force sensor especially designed for applications like touch panels, stylus, seamless button and smart shoes. It is assembled on an FPC with a thickness less than 0.65mm. The force sensor is based on the industry-recognized piezo-resistive technology featuring long-term stability and EMC robustness. The force sensor is capable of continuously measuring forces up to 10N.

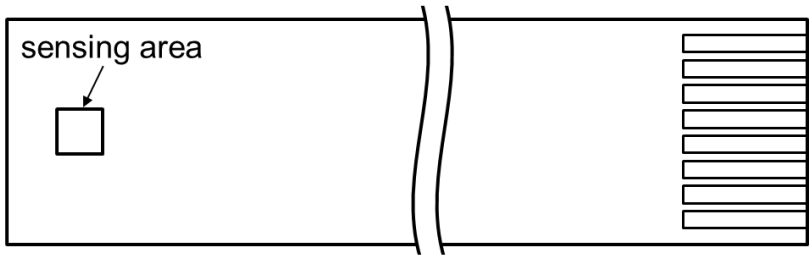
Focusing on micro force (less than 1N) measurement, the high sensitivity, and the high resolution makes GMFPC102 especially suitable for applications that detect forces from delicate hand related movement such as finger taps or pen drawing.

Features

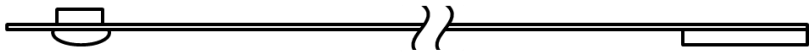
- Operation range:
  - Force: 0~10N
  - Temperature: -40~+85℃
- Supply voltage:
  - VCC: 0~+10V
- RoHS-compliance package:
  - FPC package
  - FPC size: 30 × 4.5 mm^2
  - Height: less than 0.65 mm.

Applications

Force buttons, active stylus, gaming, robotic end-effectors, and insoles of smart shoes



Top View



Side View

Specifications

Table 1: Pin Descriptions

Pin#	Name	Description
1-2	NC	No connection inside
3	VCC	Power supply in
4	Vout+	+ Output
5	GND	Ground pin
6	Vout-	- Output
7-8	NC	No connection inside

Table 2: Specification

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operation voltage	VCC		0	—	10	V
Temperature range	Ta		-40	25	+85	°C
Force range	F		0	—	10	N
Bridge resistance	BR		—	5.4	—	kΩ
Full scale span	FS			500		mV/V
Zero offset				0		LSB
Zero offset shift		25 to 50°C		TBD		LSB
Sensitivity			—	50	—	mV/V/N
Sensitivity shift		25 to 50°C		TBD		%FS
Linearity[1]				±1		%FS
Noise (RMS)				0.01		mV/V
Long term stability	FSTAB			TBD		%FS

1. Calibration is required.

Table 3: Absolute Maximum Rating

Parameter	Symbol	Min.	Max.	Unit
Power supply voltage	VCC	-0.3	10	V
Overload force	FMAX	0	TBD	N
Storage temperature	TST	-40	+125	°C
ESD	HBM	—	±2	kV

Connection

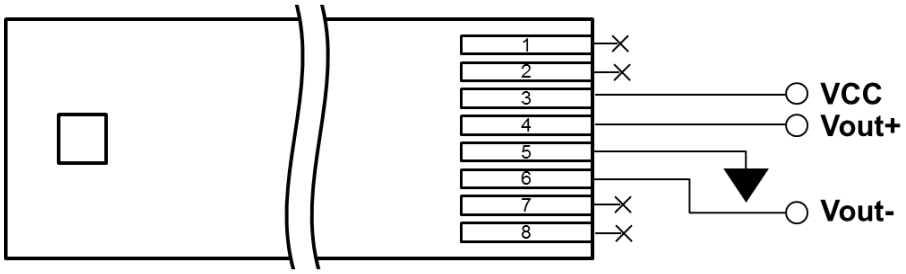


Figure 1: GMFPC102 Connection Example

Package

Outline Dimension

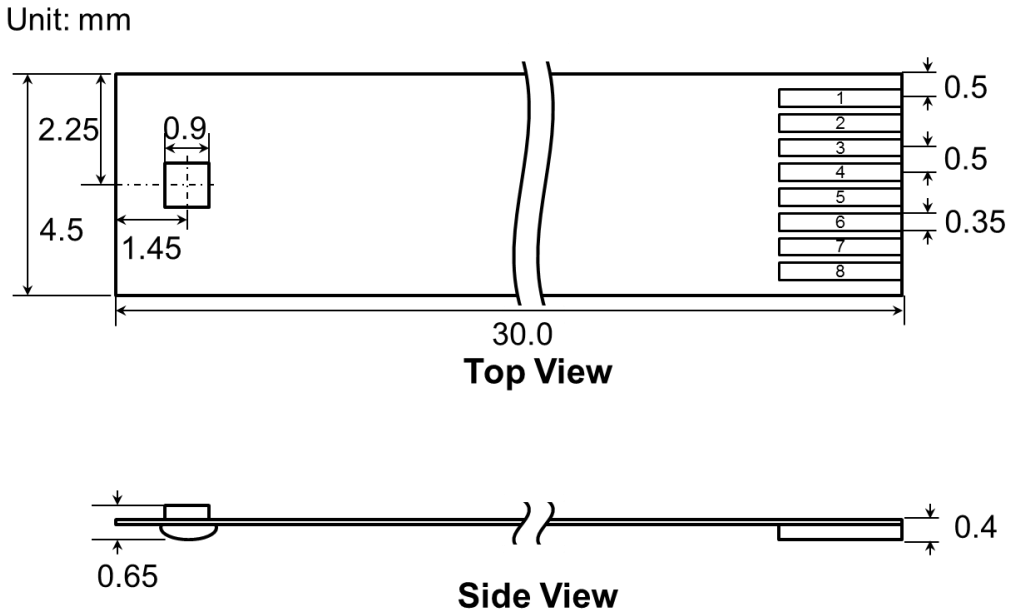


Figure 2: Package Outline Dimension

RoHS Compliance

GMEMS FPC packaged sensors are compliant with Restrictions on Hazardous Substances (RoHS) and having lead-free terminations. Reflow profiles applicable to those processes can be used successfully for soldering the devices.

Moisture Sensitivity Level

GMFPC102 package MSL rating is Level 3.