

Description

The PMA1000 series of Custom Air Mass Meter Modules is designed to be integrated into MAF sensors for OEM and aftermarket applications. A typical MAF sensor consists of a main housing that connects to engine air-intake passage, and a plug-in sensor that incorporates a sensor element and circuitry. The PMA1000 caters to those OEM customers who have their own housing design and are looking for high-performance, robust, and economical sensor elements and circuitry.

The PMA1000 consists of a thermal flow sensor die, micro-controller based signal conditioning circuitry, and custom packaging to fit a target MAF sensor's form factor. Posifa also provides PC-based calibration software to match PMA1000's output to the target MAF sensor's characteristic curve.

At the core of PMA1000 module is Posifa's PTFD10 Thermal Flow Sensor Die. Using the same hot-film principle, Posifa has made a breakthrough improvement by eliminating the fragile membrane used in conventional designs. The PTFD10 Thermal Flow Sensor Die uses an innovative "solid state" thermal isolation base to support the heating resistor, making the sensor element more robust and ideal for the harsh automotive environment. Additionally, Posifa replaced the traditional temperature resistors with thermopile to achieve enhanced signal to noise ratio and simplified circuitry.

Recognizing an OEM customer's need for sensor characteristic-curve compatibility, Posifa provides calibration software with PMA1000. The customer can tailor the number of calibration points and how to distribute the points over the flow range, achieving the desired balance between the accuracy requirements and calibration cost.



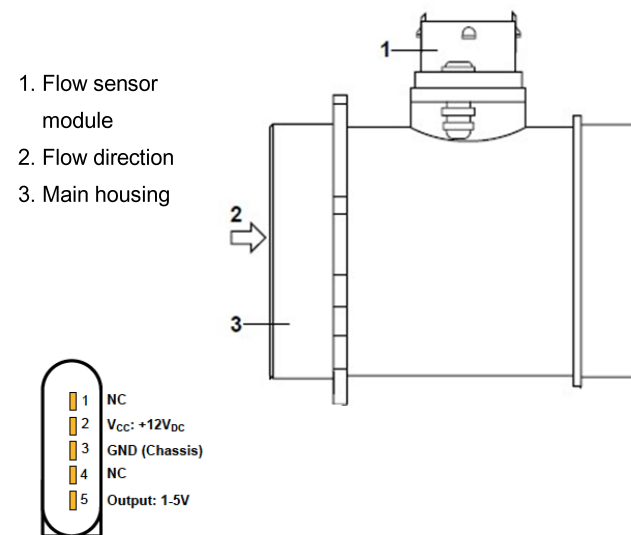
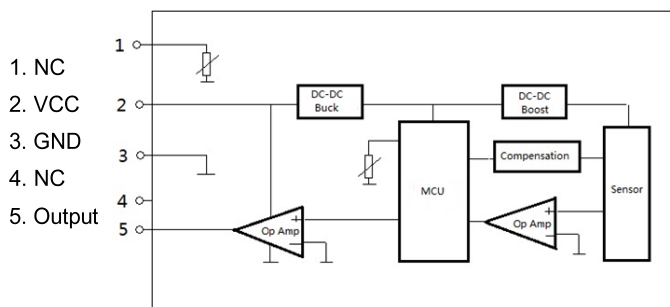
POSiFA Microsystems, Inc.,
1925 Zanker Rd., San Jose CA 95112

Features

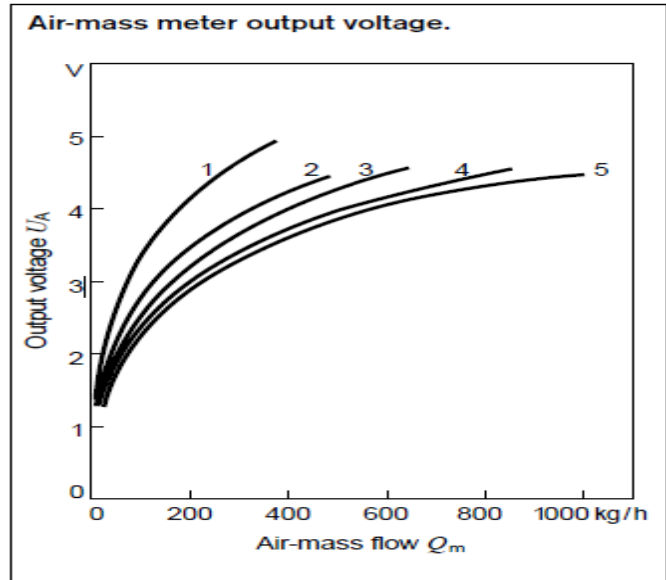
- Greatly Improved reliability
- Compact design to fit into any custom housing
- Rapid response (< 8 ms)
- Low power input (< 250 mW)
- Return flow detection
- Resistant to pressure shock and vibration
- Ceramic coating resist abrasive wear and tear
- Can clean contaminants off sensor elements by immersing in solvent

Applications

Measuring the air-mass flow in internal combustion engines



Performance Specifications	
Nominal supply voltage	14 V
Supply-voltage range	8...17 V
Output voltage	1...5 V
Input current	< 30 mA
Permissible vibration acceleration	$\leq 150 \text{ ms}^{-2}$
Response time	< 8 ms
Temperature range	-40°C to +120 °C
Measuring range	8 - 1000 kg/h
Accuracy	$\leq 1.5\%$
Repeatability	$\leq 0.5\%$
Pressure drop	< 20hPa



Complete Customization

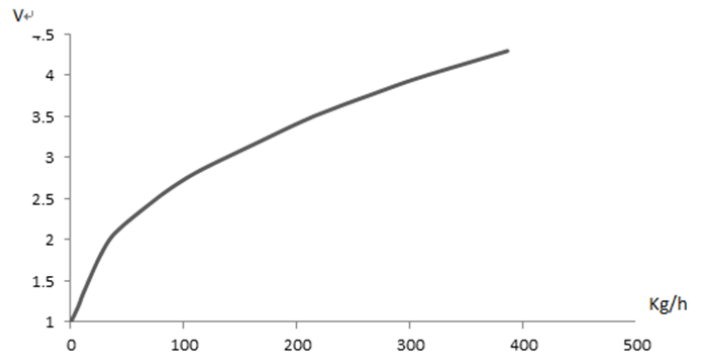
One Posifa part fits all new and existing air-mass flow requirements. Air Mass Meter Modules are designed to meet the specific needs of a single model engine. The graph to the top-right shows the wide variation in output voltages that can be required. Inventorying dozens or more part types can be cost prohibitive.

The PMA1000 module provides adjustable heating currents to fit to your characteristics curve within $\pm 20\%$. Further, the PMA1000 is a completely programmable device, allowing perfect curve fitting through the dynamic implementation of digital technology that adjusts the output voltage using up to 16 unique calibration points. The PMA1000 is calibrated using curve fitting algorithm to match the exact needs of any Air-mass flow application.

The table to the right shows an example MAF characteristic output, and the graph to the bottom-right shows the customized output voltage curve after calibration.

Further customization is available via the connect-or interface. Posifa will create the proper connect-or interface for your application as well correctly design the sensor element assembly to ensure proper positioning and correct orientation in your custom MAF sensor housing.

KG/H	V
0	1.003
6.77238	1.19746
10.03188	1.31876
17.44509	1.55402
33.8373	1.9966
70.479	2.44462
114.3666	2.84488
165.558	3.18624
264.45	3.76024
386.22	4.2969



Package Dimensions

Posifa provides customized sensor element packaging and circuit board dimensions to fit the target MAF sensor's form factor

Ordering Information

Part Number	Specifications*
PMA 1001	1 to 5V, up to 450 kg/h; Compatible OEM part # 0280217122, 0281002757
PMA 1001L	1 to 5V linear, 0 to 353 kg/h

* An electrical connector is included with every part