

### Description

Posifa's PMFc3000 series of Mass Air Flow Sensors offer pin compatible upgrade solutions to the popular AWM3000 series. Using the robust Posifa Thermal Flow Sensor Die, and incorporating the latest microcontroller technology, PMFc3000 offers drastically improved interchangeability (< 2% full scale), temperature stability (< 3% full scale from 0°C to +50°C), and resistance to adverse environmental factors such as dust particles and water vapor that have plagued the AWM3000.

Tailored to meet the exacting packaging and calibration specifications of AWM3000, PMFc3000 also offers enhanced interchangeability by improving the output tolerance by 200% to < 2% full scale. Additionally, PMFc3000 is temperature compensated to < 3% full scale drift over the temperature range of 0°C to +50°C. For those more stringent applications, Posifa offers other precision versions with output tolerance as low as 1%.

Posifa designed the PMFc3000 series of Mass Air Flow Sensors from the ground up, incorporating the latest MEMS and microelectronics innovations. The sensor die uses a pair of thermopiles to detect changes in temperature gradient caused by mass flow, delivering ultra-low noise to signal, and unsurpassed repeatability. The "solid state" thermal isolation on the die eliminates the need for surface cavity or fragile membrane, making the sensor resistant to clogging (from water vapor or dust particles) and pressure shock. The sensor's signal conditioning circuitry leverages off-the-shelf microcontroller, providing proven reliability and low cost.

Applications in medical, industrial and transportation industries are benefiting by:

- Taking advantage of tighter tolerances
- Eliminating complicated and expensive temperature compensation schemes
- Inherent immunity to adverse environmental factors



### Features

- Resistance to dust, water vapor and shock
- Sensitivity to low flows
- Fast response time (1ms typ.)
- Amplified analog output 1 - 5V
- Digitally improved sensor interchangeability (2% F.S. Max.)
- Custom flow ranges available (10 to 2,000 sccm)
- Replaced AWM3000 series sensors

### Applications

- HVAC damper control
- Industrial process control
- Medical respirators, ventilators, O2 concentrators and anesthesia equipment
- Gas leak detectors
- Gas analyzing, monitoring and metering equipment

### Maximum Ratings

- Operating Temperature: -25 °C to 85 °C
- Storage Temperature: -40 °C to 90 °C
- Humidity: 0 to 100% RH \*
- Shock: 100 g peak (5 drops, 3 axis)
- Common Mode Pressure: 25 psi\*\*

\*Sensor is resistant to water condensation

\*\*Packaging with higher common model pressure rating is available

## ELECTRICAL CHARACTERISTICS

Test Conditions:  $V_{in}=10\pm 0.01VDC$ ,  $T_a=25^{\circ}C$

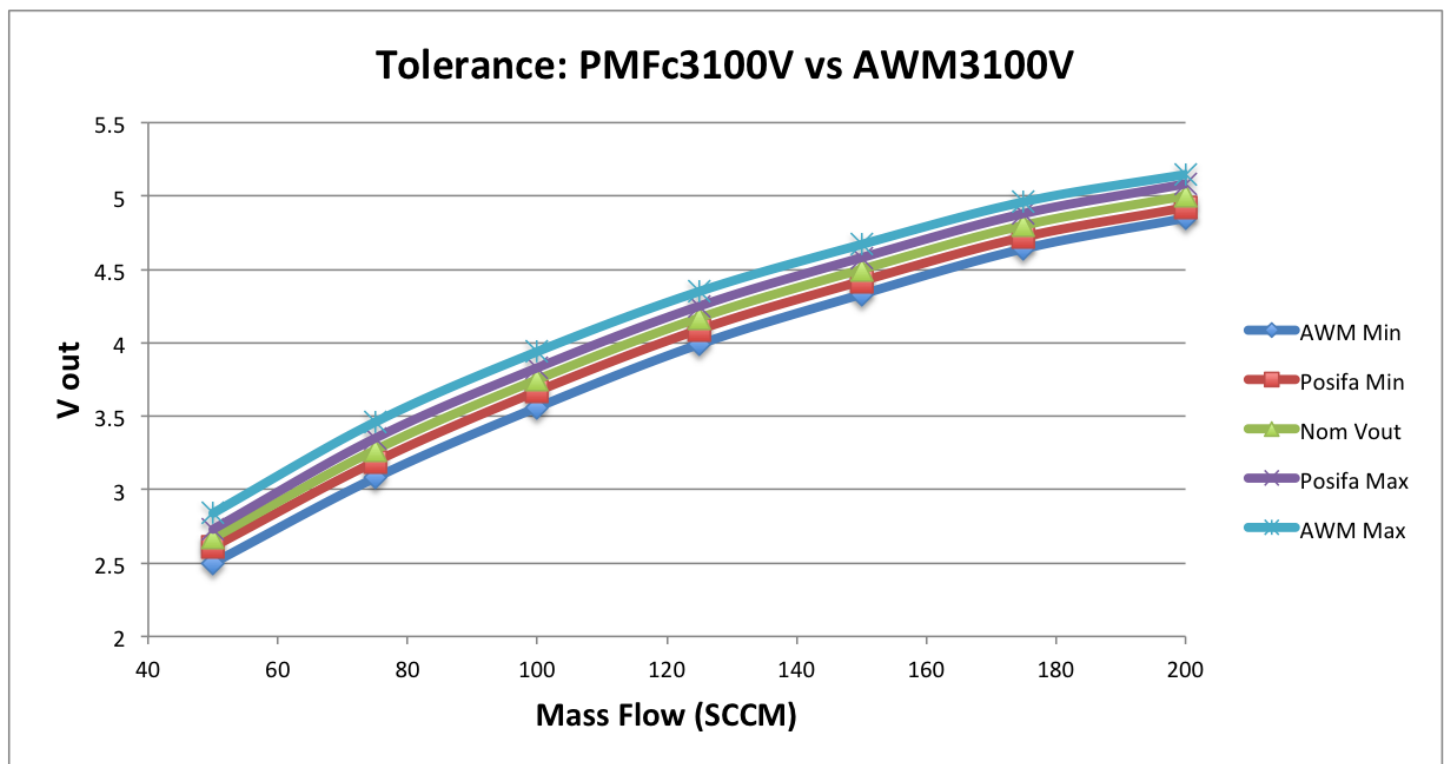
PARAMETERS	PMFc3100V			UNIT	CONDITIONS
	MIN	TYP	MAX		
Flow Range			200	SCCM	
Output Voltage	4.92	5	5.02	VDC	@200 sccm
Null Voltage		1.00±0.05		VDC	
Null Voltage Shift			±10	mV	0°C - +50°C
Output Voltage Shift			±3	%	0°C - +50°C
Repeatability & Hysteresis			±0.20	%	
PARAMETERS	PMFc3150V			UNIT	CONDITIONS
	MIN	TYP	MAX		
Flow Range			30	SCCM	
Output Voltage		3.75		VDC	@30 sccm
Null Voltage		1.00±0.03		VDC	
Null Voltage Shift			±10	mV	0°C - +50°C
Output Voltage Shift			±3	%	0°C - +50°C
Repeatability & Hysteresis			±0.20	%	
PARAMETERS	PMFc3300V			UNIT	CONDITIONS
	MIN	TYP	MAX		
Flow Range (Full Scale)			1000	SCCM	
Output Voltage	4.92	5	5.02	VDC	@1000 sccm
Null Voltage		1.00±0.05		VDC	
Null Voltage Shift			±10	mV	0°C - +50°C
Output Voltage Shift			±3	%	0°C - +50°C
Repeatability & Hysteresis			±0.20	%	
PMFc3000 SERIES					
Supply Voltage	8	10	14	VDC	
Operating Current	22		24	mA	
Inrush Current <sup>1</sup>			550	mA	Duration: 2 ms
Response Time		1	3	msec	
Common Mode Pressure			25	psi	
Wetted Materials	Silicon carbide, Silicon, Epoxy, PPS, FR4, Silicone as static seal				

Notes:

1. A series resistance of 5 ohms on the source supply will reduce inrush current to under 250 mA (duration: 8 ms)

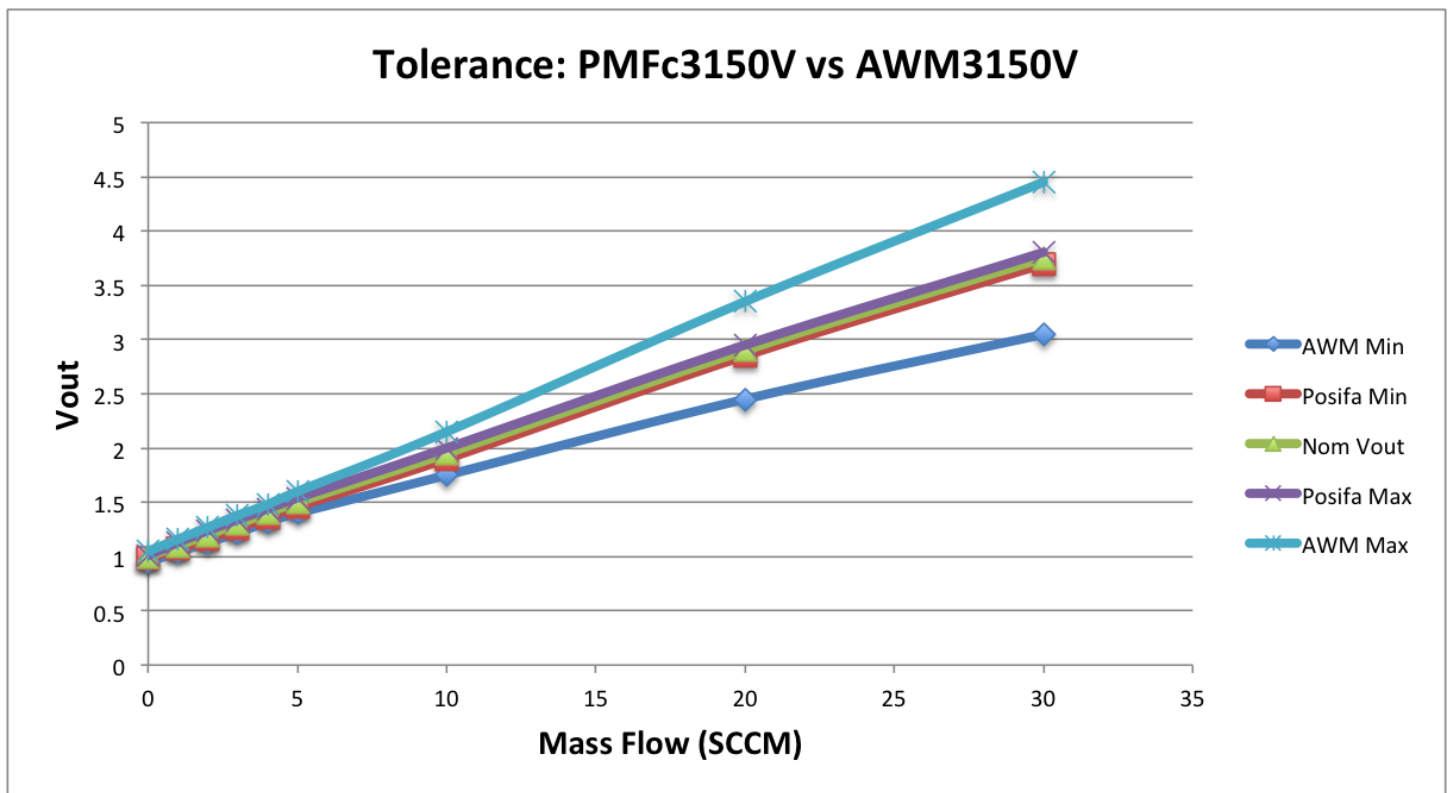
Output Flow vs. Interchangeability; Supply =10VDC, Ta=25°C

PMFc3100V				AWM3100V
Press. mBar	Flow sccm	Nom. Vout	Tol. ±V	Tol. ±V
0.49	200	5.00	0.08	0.15
0.42	175	4.80	0.08	0.16
0.35	150	4.50	0.08	0.17
0.28	125	4.17	0.08	0.18
0.21	100	3.75	0.08	0.19
0.14	75	3.27	0.08	0.19
0.09	50	2.67	0.08	0.17
0.04	20	1.90	0.08	0.13
0.00	0	1.00	0.05	0.05



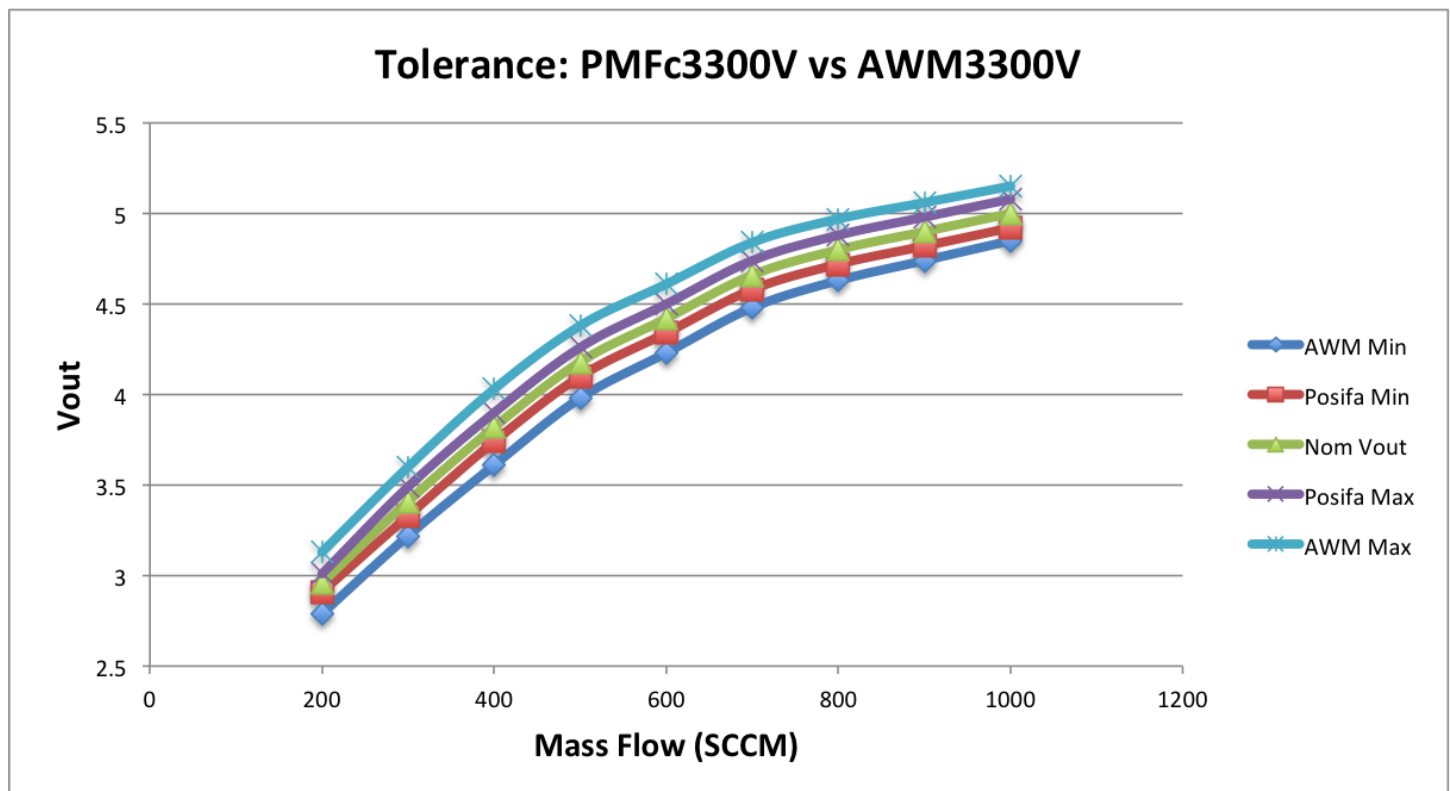
Output Flow vs. Interchangeability; Supply =10VDC, Ta=25°C

PMFc3150V				AWM3150V
Press. mBar	Flow sccm	Nom. Vout	Tol. ±V	Tol. ±V
2.50	30	3.75	0.10	0.70
1.70	20	2.90	0.10	0.45
0.84	10	1.95	0.10	0.20
0.42	5	1.50	0.05	0.10
0.34	4	1.40	0.05	0.08
0.26	3	1.30	0.05	0.08
0.17	2	1.20	0.05	0.07
0.08	1	1.10	0.05	0.06
0.00	0	1.00	0.05	0.05

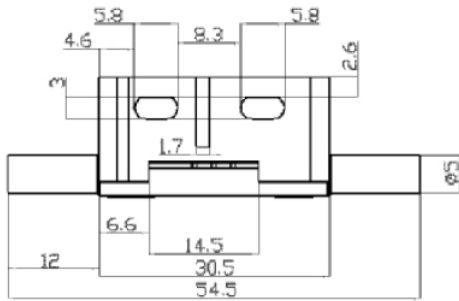


Output Flow vs. Interchangeability; Supply =10VDC, Ta=25°C

PMFc3300V				AWM3300V
Press. mBar	Flow sccm	Nom. Vout	Tol. ±V	Tol. ±V
3.40	1000	5.00	0.08	0.15
2.90	900	4.90	0.08	0.16
2.40	800	4.80	0.08	0.17
2.00	700	4.66	0.08	0.18
1.60	600	4.42	0.08	0.19
1.20	500	4.18	0.08	0.20
0.80	400	3.82	0.08	0.21
0.54	300	3.41	0.08	0.19
0.31	200	2.96	0.08	0.17
0.12	100	2.3	0.08	0.14
0.00	0	1	0.05	0.10

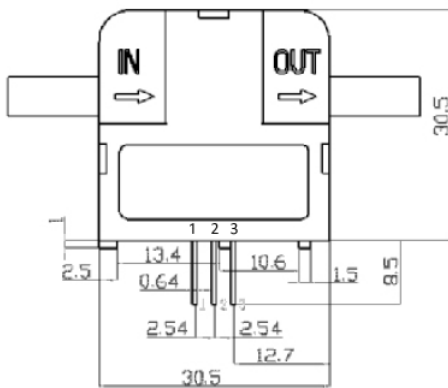


## Package Dimensions



### Pin-out

- 1 Vout
- 2 Vcc
- 3 GND



## Ordering Information

Part Number	Specifications
PMFc3100V	Compatible with AWM3100V; 1 to 5 V; 0 to 200 SCCM
PMFc3150V	Compatible with AWM3150V; 1 to 5 V; 0 to 30 SCCM
PMFc3300V	Compatible with AWM3300V; 1 to 5 V; 0 to 1000 SCCM