



New Product Announcement

AS333Q

Micropower, High-Precision, RRIO Operational Amplifier for Automotive Sensors, Pumps, and Signal Conditioning

The AS333Q is an automotive-compliant, high-precision, operational amplifier (op amp). The device has an ultra-low input offset voltage ($8\mu\text{V}$), and near zero-drift over time and temperature for high-accuracy signal conditioning in automotive electronic control units (ECU).

This RRIO (rail-to-rail input and output) op amp uses chopper stabilization to minimize input offset voltage, reduce $1/f$ noise, and decrease input crossover-distortion present in most rail-to-rail input op amps. Its common-mode range is extended to 100mV beyond the supply rail and provides near zero-drift over time and temperature. The device is fully specified to operate from 1.8V to 5.5V single power supply.

The AS333Q features a good speed/power consumption ratio, offering 350kHz gain bandwidth while consuming only $17\mu\text{A}$ quiescent current. With a low input offset voltage of $8\mu\text{V}$ and a near zero-drift of $0.02\mu\text{V}/^\circ\text{C}$, combined with its 50mV from the rails output swing, this device is ideal for applications that require high precision and low power consumption.

The automotive-compliant AS333Q is AEC-Q100 grade 1 qualified, supporting a -40°C to $+125^\circ\text{C}$ ambient temperature range, and is available in the industry-standard SOT25 package. Its wide temperature range and high ESD capability facilitate its use in harsh automotive applications.

Automotive-compliant - AEC qualified, manufactured in IATF 16949 certified sites supporting PPAP documents.

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The DIODES Advantage

This micropower, zero-drift op amp is suitable for automotive, high-precision, current-consumption-sensitive applications.

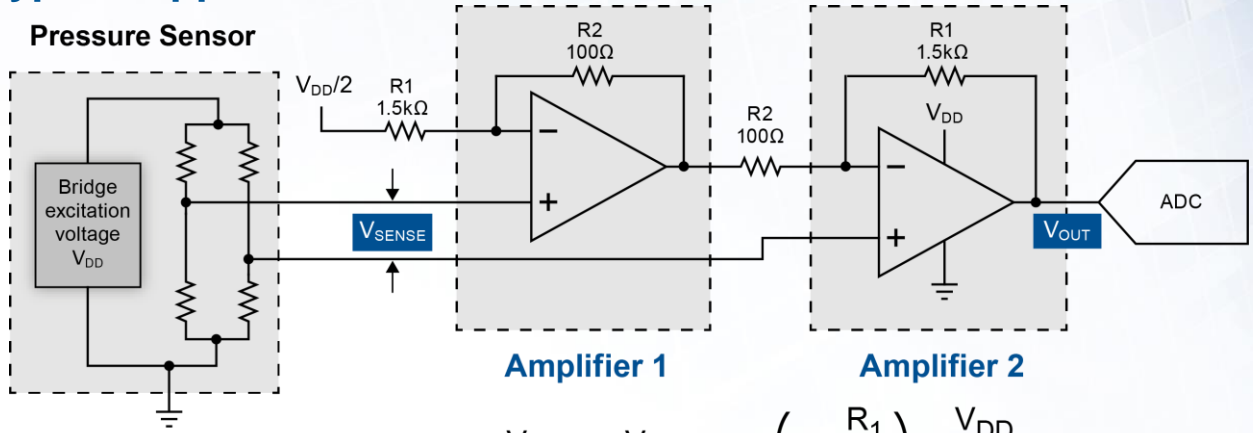
- Low $8\mu\text{V}$ Input Offset Voltage with Zero Drift Without Rail-Rail Input Crossover Disturbance**
 Maintains accuracy across the input range, offering high-precision signal conditioning
- High Input Impedance With Tiny 70pA Input Bias Currents**
 Enables interfacing with high-resistance sources without degradation of DC precision
- Micropower $17\mu\text{A}$ Quiescent Current**
 Supports signal-conditioning applications that need to remain live even when the IC engine is not running
- 350kHz Gain-Bandwidth Product with Low $1.1\mu\text{V}$ Input Noise Voltage**
 Provides accurate signal conditioning from DC up to hundreds of kHz
- Robust ESD Capability (HBM: 4kV)**
 Improves system reliability

Applications

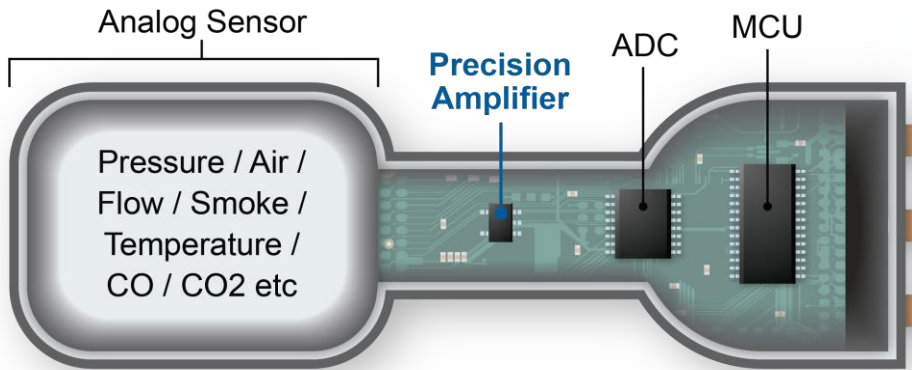
Automotive DC low-frequency signal conditioning in:

- Vehicle sensor signal conditioning
 - Vehicle sensors
 - Vehicle pumps
- Current sensing
 - Filters

Typical Application



$$V_{OUT} = V_{SENSE} \times \left(1 + \frac{R_1}{R_2}\right) + \frac{V_{DD}}{2}$$



Precision Micropower Automotive-Compliant Op Amps

Part Number	RRIO	Supply Voltage	V_{CM}	V_{OS}	I_{IB}	Channels	Supply Current	V_{OUT}	GBW	Low-Frequency Input Voltage Noise	Ambient Temperature Range	Package
		V	V	μV	pA		μA	V		kHz		
AS333Q	Yes	1.8 to 5.5	$V_{CC} \pm 0.1$	8	0.2	1	17	$V_{CC} \mp 0.05$	350	1.1	-40 to +125	SOT25
AS2333Q	Yes	1.8 to 5.5	$V_{CC} \pm 0.1$	8	0.2	2	24	$V_{CC} \mp 0.05$	350	1.1	-40 to +125	SO-8

Ordering Information

Orderable Part Number	Compliance (Only Automotive Supports PPAP)	Package	Moisture Sensitivity	Packing	
				Quantity	Carrier
AS333QW5-7	Automotive	SOT25	MSL-1	3,000	7" Tape & Reel