

Ultra-Low Power, Zero Drift Op-Amps



Electrochemical Toxic Gas Sensor

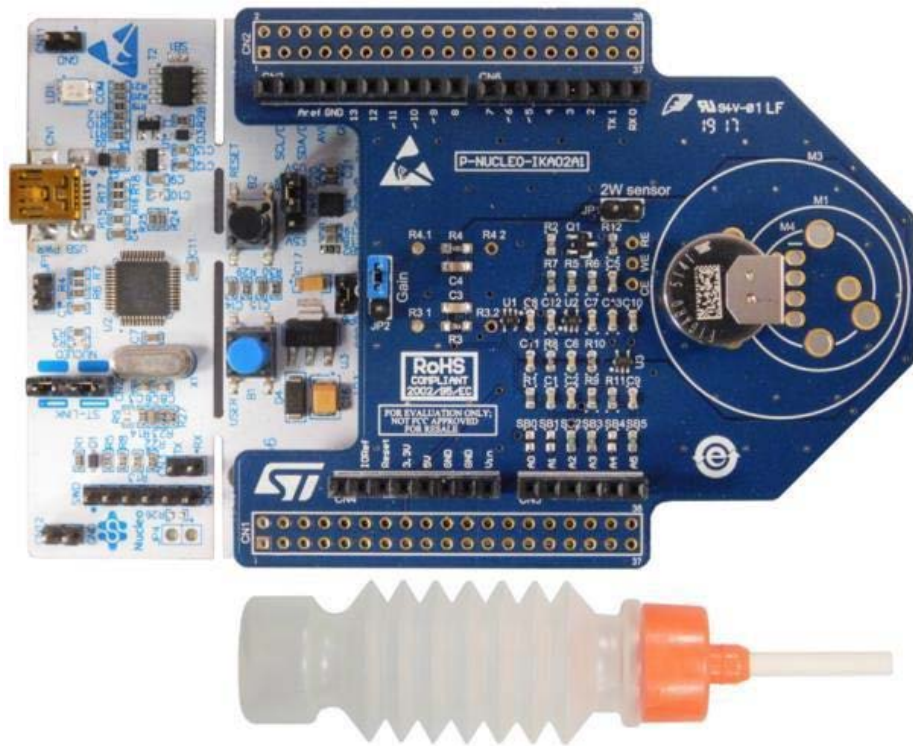
TSZ Series Zero-Drift Op-Amps

ST Precision Amplifiers

Mobile App and e-Design Suite

Electrochemical Toxic Gas Sensor

TSU111 High-precision and low-power Zero-Drift Operational Amplifiers



- Footprint compatible with two-, three- and four-electrode electrochemical sensors (PCD13,5, PCD17, Mini and TGS5141)
- **Signal conditioning based on TSU111 High-precision and low-power Zero-Drift Operational Amplifiers**
- Ultra-low-current precision analog temperature sensor STLM20 for compensation of gas readings
- STM32 Ultra-low-power Arm® Cortex®-M0+ MCU (32 MHz max.) with 64 Kbytes Flash and 8 Kbytes of SRAM
- Figaro TGS5141 Carbon monoxide coin-cell sensor
- Expected lifetime > 10 years

TSU11x Zero-Drift Op-Amps

Nanopower (900 nA) high-accuracy (150 μ V) 5V CMOS Op-Amp

- Sub-micro amp current consumption: 900 nA typ. at 25 °C
- Low input offset voltage:
 - 150 μ V max. at 25 °C
 - 235 μ V max. over temperature (-40 to 85 °C)
- Low noise over 0.1 to 10 Hz bandwidth: 3.6 μ Vpp
- Low supply voltage: 1.5 V to 5.5 V (CR2032 compatible)
- Rail-to-rail input and output
- Gain bandwidth product: 11.5 kHz typ.
- Low input bias current: 10 pA max. at 25 °C
- High tolerance to ESD: 4 kV HBM
- High accuracy without calibration
- Tolerance to power supply transient drops

Tiny nano-power op amp
Enables longer battery life



Related products

See TSU101 , TSU102 , and TSU104	for further power savings
See TSZ121 , TSZ122 , and TSZ124	for increased accuracy

TSZ Series: Zero-Drift Op-Amps

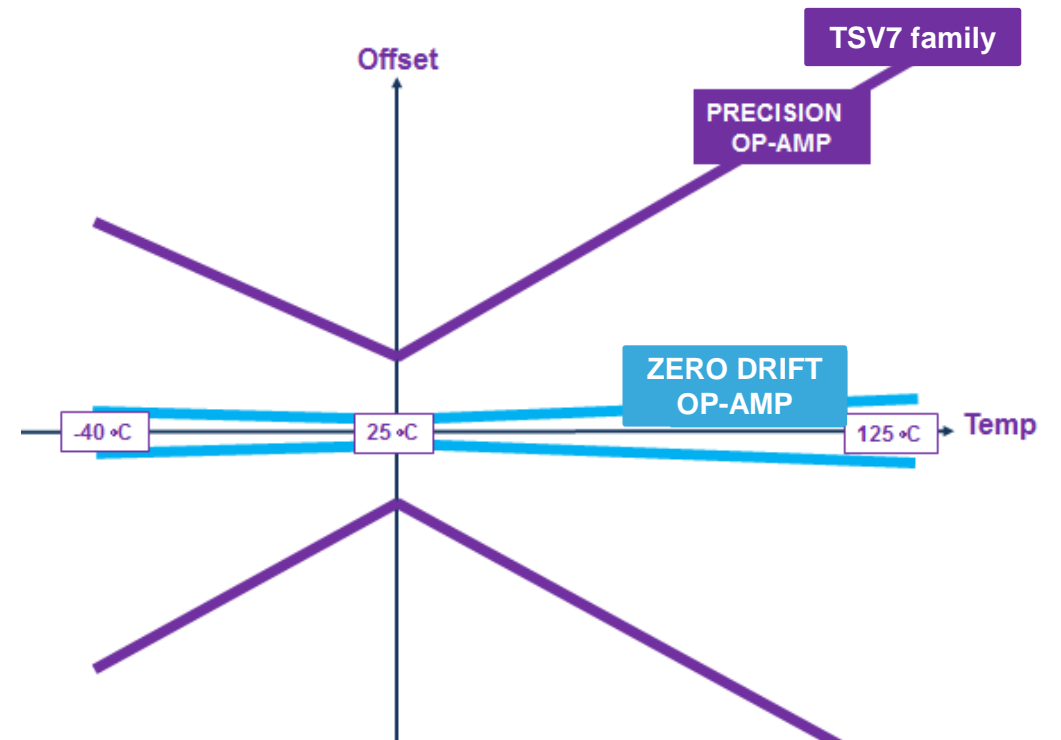
Zero-Drift Op-Amps do not drift!

FEATURES

- Offset: (TSZ12x)
+/- 1 μV typ
+/- 8 μV worst case
- Offset drift: (TSZ12x)
10 nV/ $^{\circ}\text{C}$ typ
30 nV/ $^{\circ}\text{C}$ max
- 400 kHz GBW (TSZ12x)
- 3 MHz GBW (TSZ18x)
- Operating range: 1.8 to 5.5 V
- Temperature range: -40 to 125 $^{\circ}\text{C}$
- Rail-to-rail input and output
- ESD: 4kV HBM
- Qualified for automotive applications
- Available in tiny packages:
 - SOT23 and SC70, DFN6 1,2x1,3 for single
 - MiniSO8, SO8, DFN8 2x2 for dual
 - QFN16 3x3, TSSOP14 for quad

APPLICATIONS

- Portable instrumentation
- Battery-powered devices
- Sensor interfaces
- Medical instrumentation
- Electronic scales
- Temperature measurement
- Automotive current measurement



Precision Operational Amplifiers



Electrochemical sensors need
High performance Op-Amps
Different Op-Amp solutions depending on Sensors &
Application constraints.



Products	Features (all specifications given at 3.3 V)
TSU111	Ultra low consumption: 900 nA typ
TSU112	Low low noise: 3.7 μVpp from 0.1 Hz to 10 Hz
TSU114	Good precision: 150 μV max
TSU101	Ultra low consumption: 600 nA typ
TSU102	Battery life extension
TSU104	
TSV711	Good compromise between consumption and precision
TSV712	I_{cc} : 9 μA typ
TSV714	V_{io} : 200 μV max
TSZ121	Excellent precision: V_{io} 5 μV max
TSZ122	Ultra low noise: 0.8 μVpp from 0.1 Hz to 10 Hz
TSZ124	Ideal for galvanic use





Op-Amps & Comparators

The best choice for longevity,
business and power efficiency



Key Op-Amp Product Lines

TSZ series Ultra High Precision

TSU series Ultra-Low Power

TSX series 16V Low Power and Precision

TSV series Low Voltage, Low Power

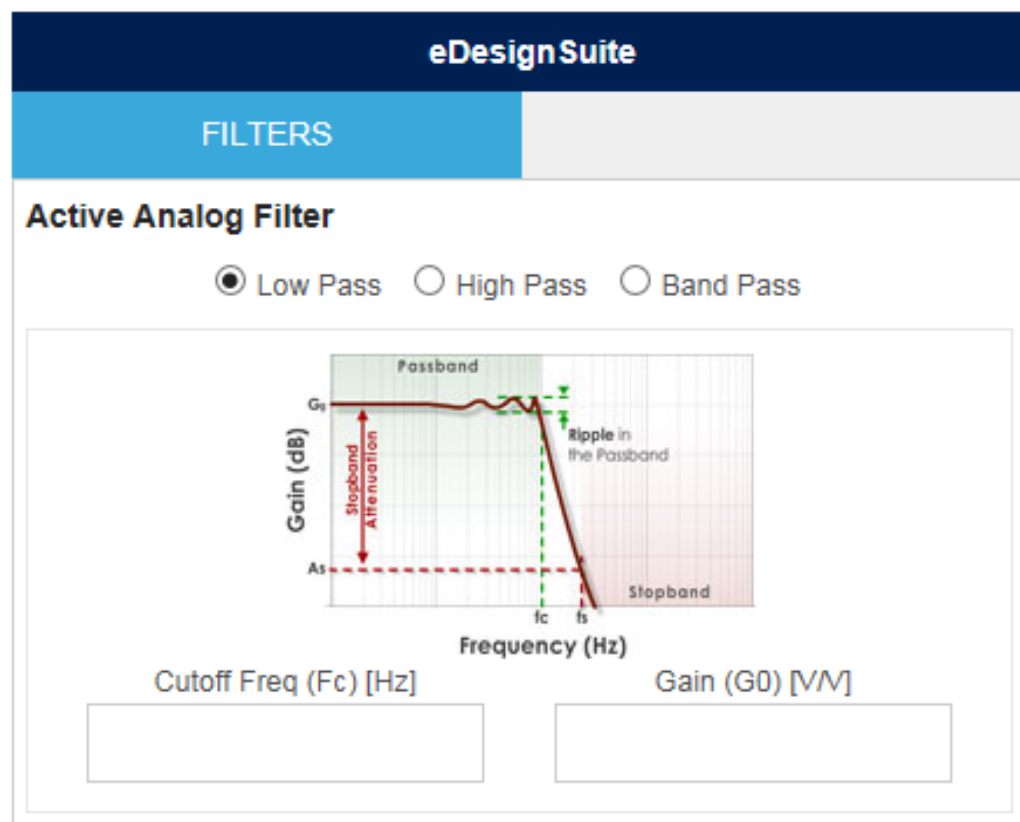
TSC series High Side Current Sensing

TSB series 36 V, Low Power and Precision

State-of-the-art analog technologies for
high-performance products



Mobile App and e-Design Suite



START DESIGN



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ST op-amps
STMICROELECTRONICS INC

OPEN

☆☆☆☆☆
Not Enough Ratings

4+
Age

What's New [Version History](#)

Version 2.0.1 11mo ago

- Minor bug fix
- User experience improved

Preview

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Cross reference Technical information

3 MHz chopper op amp
for high-accuracy signal conditioning

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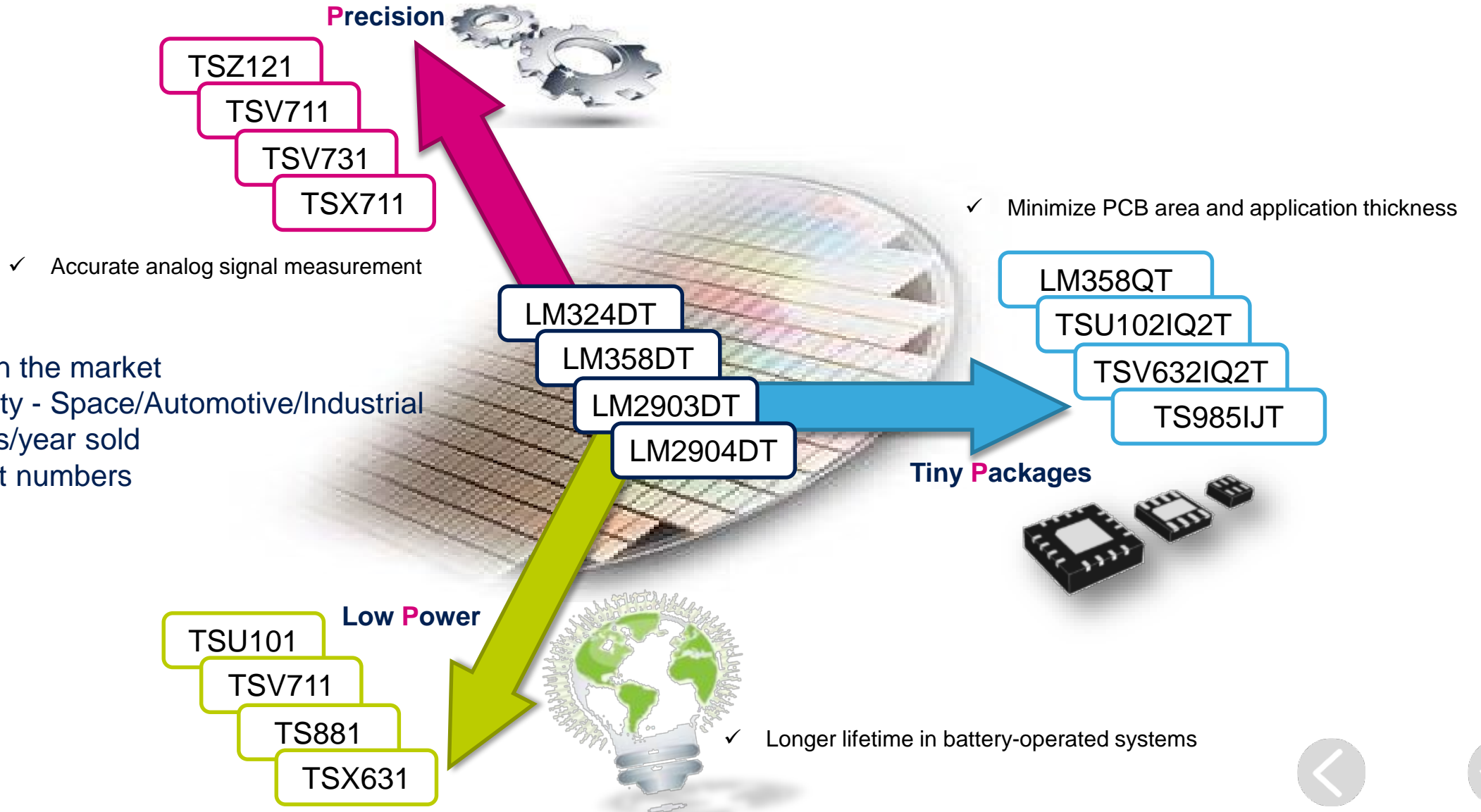
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Amplifiers / Comparators

From General Purpose to High End



- 40+ years on the market
- High reliability - Space/Automotive/Industrial
- 4 billion units/year sold
- 350 root part numbers