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ST's portfolio of current sensing solutions

Our current sensing portfolio offers precision, reliability, and versatility across a wide range of industries and applications.



ST's portfolio of current sensing solutions

Current sensing solutions add valuable safety and protection features to system design

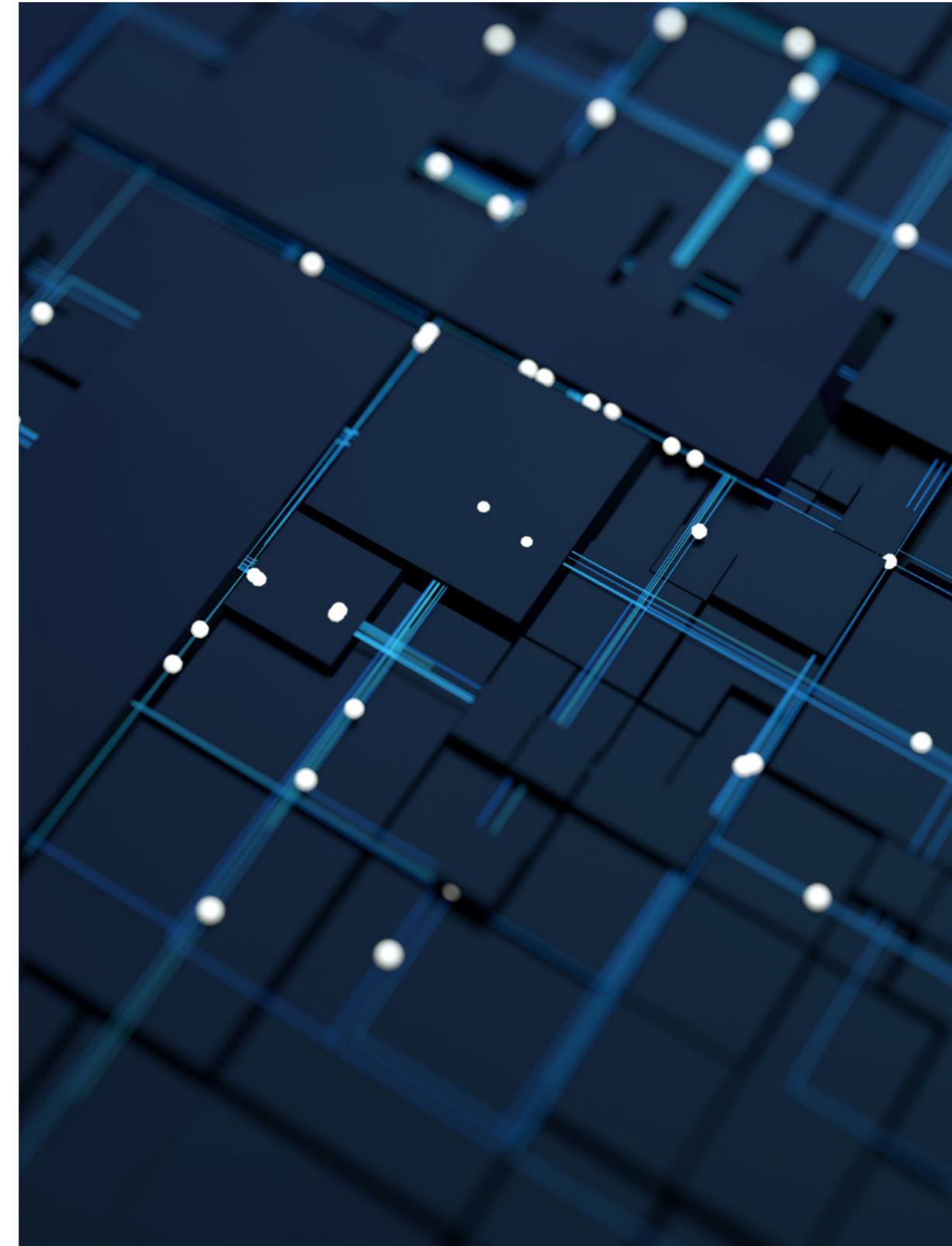
They are essential for energy metering, ensuring power efficiency and minimizing environmental impact—key priorities in today's sustainable technology landscape. Our current sense amplifiers serve a wide range of industries, including motor control, battery management, power management, automotive, medical devices, drone accessories, servo motors, renewable energy, robotics, and more.

High-voltage current sensing

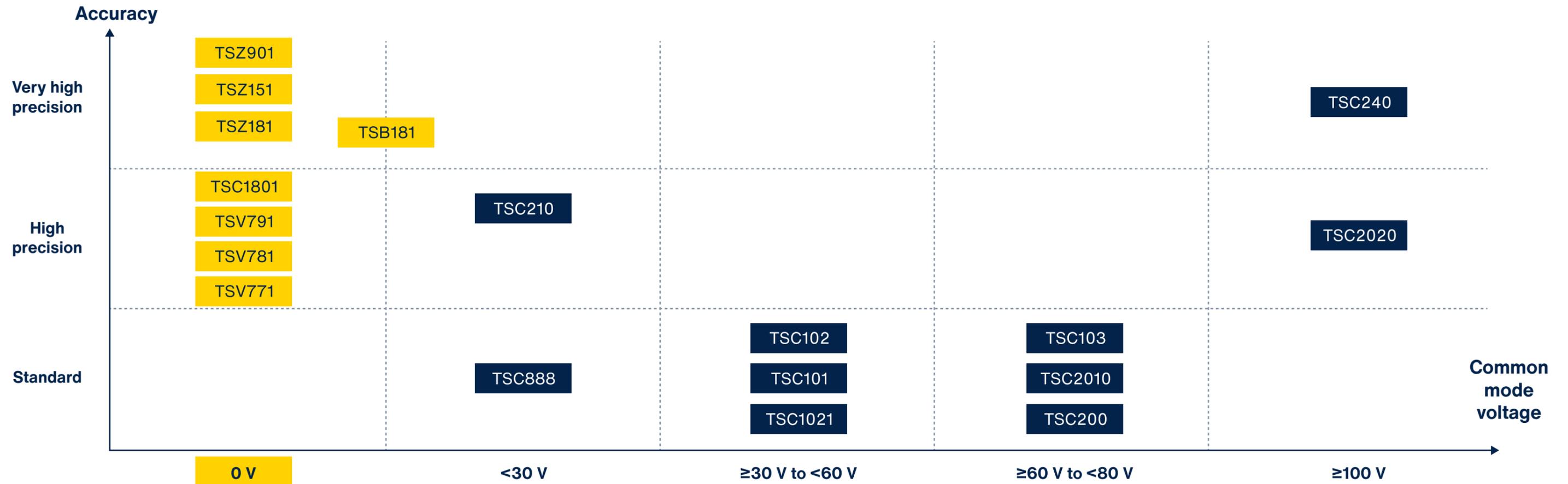
With a wide input common-mode voltage range, our current sensing solutions simplify schematics by eliminating the need for additional protection components.

Precision and performance

Our precision current sense amplifiers enhance system efficiency and accurate fault detection thermal performance by enabling high-accuracy current measurements.



Pick your product



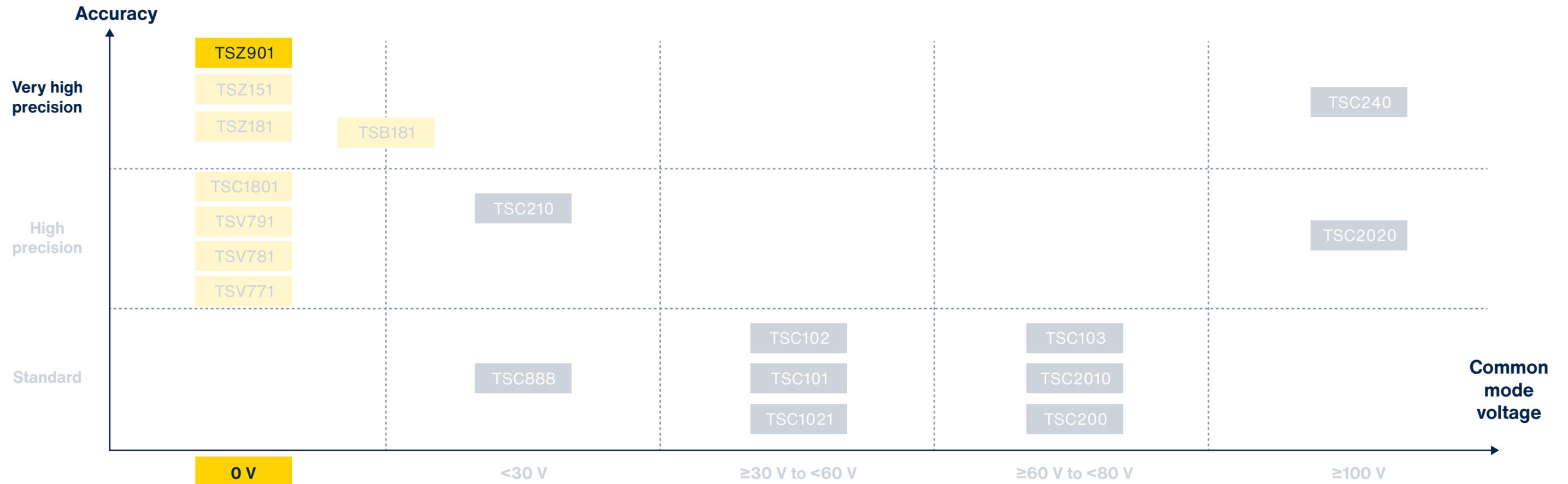
Our current sensing portfolio offers precision, reliability, and versatility across a wide range of industries and applications.

Whether you are designing automotive safety systems, industrial automation equipment, or consumer electronics, our solutions help you achieve superior performance and energy efficiency.

Explore our full range of current sensing products, detailed datasheets, and design resources to accelerate your development process.

Discover more and get started today: [Current sensing solutions](#)

Pick your product



TSZ901

The TSZ901 delivers ultra-precise, zero-drift performance for sensor accuracy.

[> Discover all the features](#)

Key features

- Very high accuracy and stability: offset voltage
- Rail-to-rail input and output.

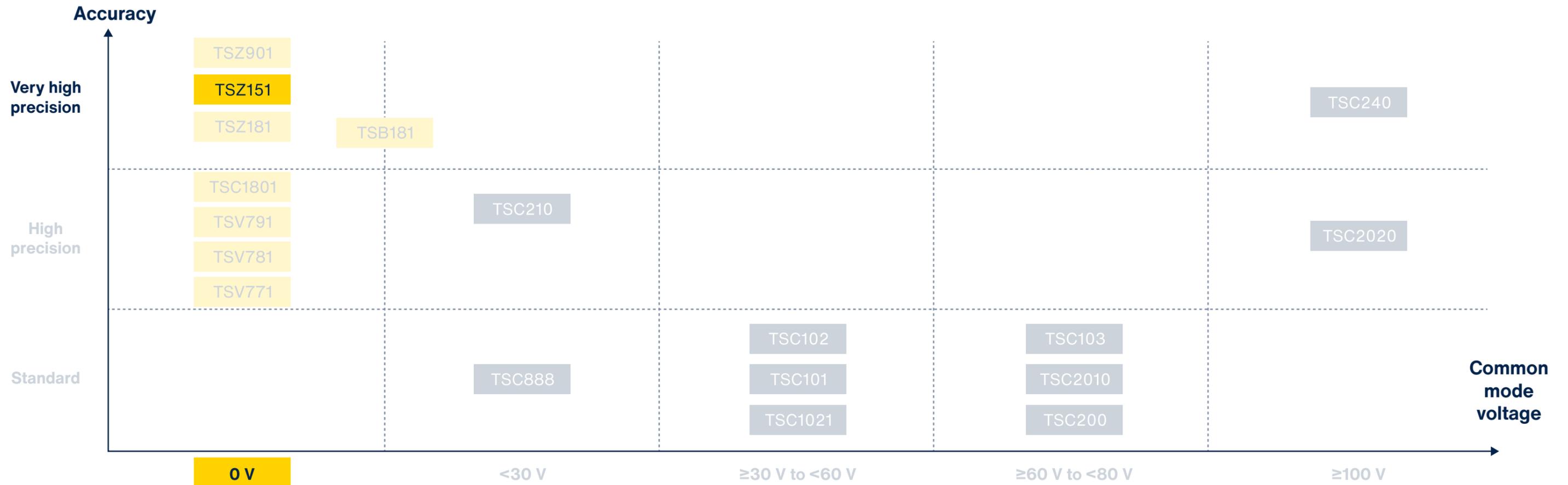
Key benefits

- Higher accuracy without calibration.
- Accuracy virtually unaffected by temperature change.

Applications

- Industrial

Pick your product



TSZ15 series

TSZ151 and TSZ152 feature low offset voltages with virtually zero-drift vs temperature changes.

[> Discover all the features](#)

Key features

- Very high accuracy zero-drift operational amplifiers.
- 7 μ V input offset voltage gain.

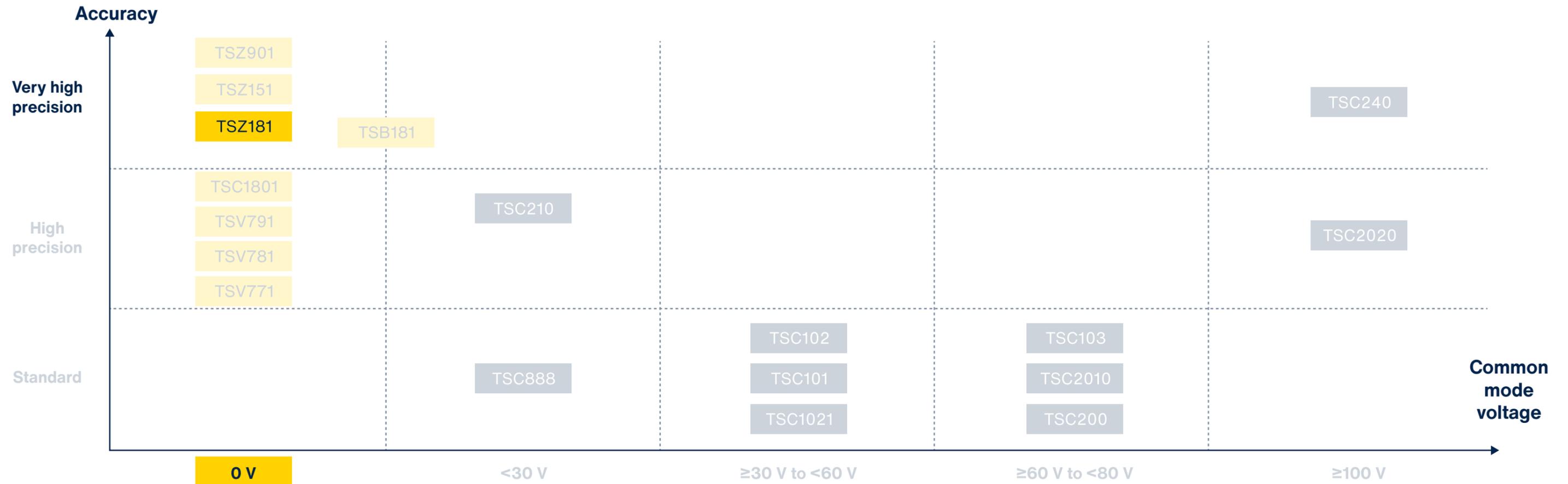
Key benefits

- Higher accuracy without calibration
- Accuracy is virtually unaffected by temperature change

Applications

- Communications equipment, computers and peripherals
- Industrial

Pick your product



TSZ18 series

The TSZ181, TSZ182 are 5 V zero-drift, very-high accuracy operational amplifiers.

[> Discover all the features](#)

Key features

- Gain bandwidth product 30 MHz, unity gain stable
- Rail-to-rail input and output

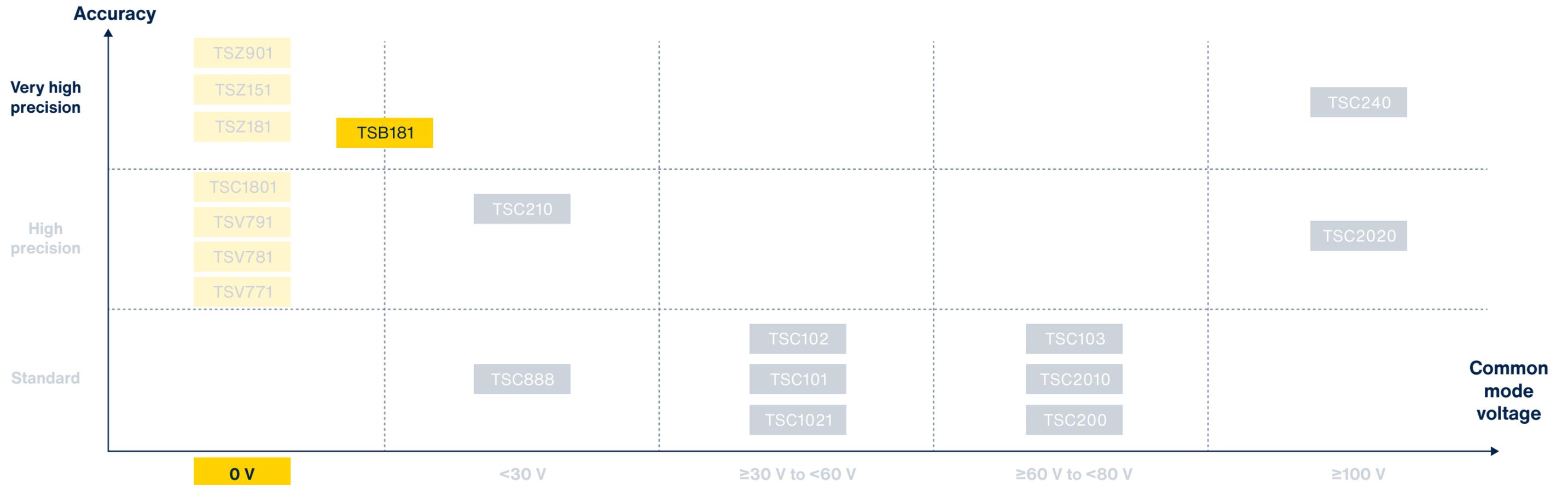
Key benefits

- Higher accuracy without calibration
- Accuracy virtually unaffected by temperature change

Applications

- Automotive
- Industrial

Pick your product



TSB18 series

The TSB181 and TSB182 are very high precision operational amplifiers.

[> Discover all the features](#)

Key features

- Very high accuracy zero-drift operational amplifiers.
- 20 μV input offset voltage gain.

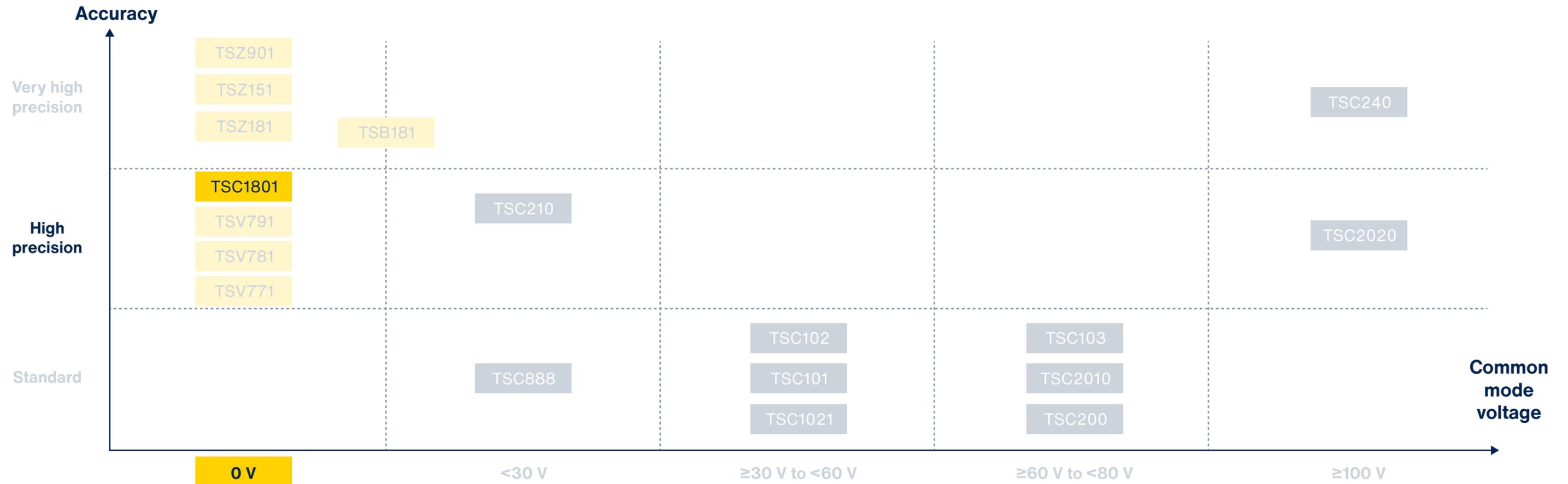
Key benefits

- Excellent speed/current consumption ratio with 3 MHz gain bandwidth

Applications

- Communications equipment, computers and peripherals
- Industrial

Pick your product



TSC1801

A low-side current measurement amplifier.

[> Discover all the features](#)

Key features

- Bidirectional low-side current measurement
- Integrated gain x20

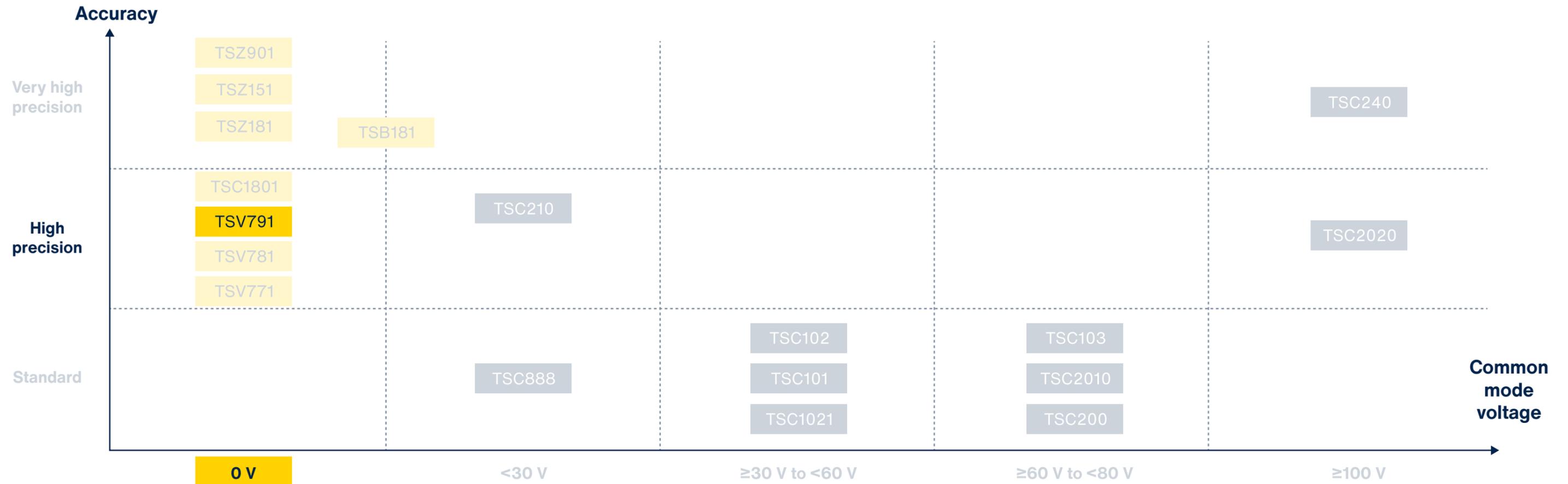
Key benefits

- With low offset voltage, minimize measurement errors, providing reliable data
- Accurate monitoring and control of your systems

Applications

- Industrial
- Personal electronics

Pick your product



TSV79 series

The TSV791, TSV792 and TSV794 are 50 MHz-bandwidth unity-gain-stable amplifiers.

[> Discover all the features](#)

Key features

- High bandwidth low offset operational amplifiers.
- 50 MHz gain bandwidth product.

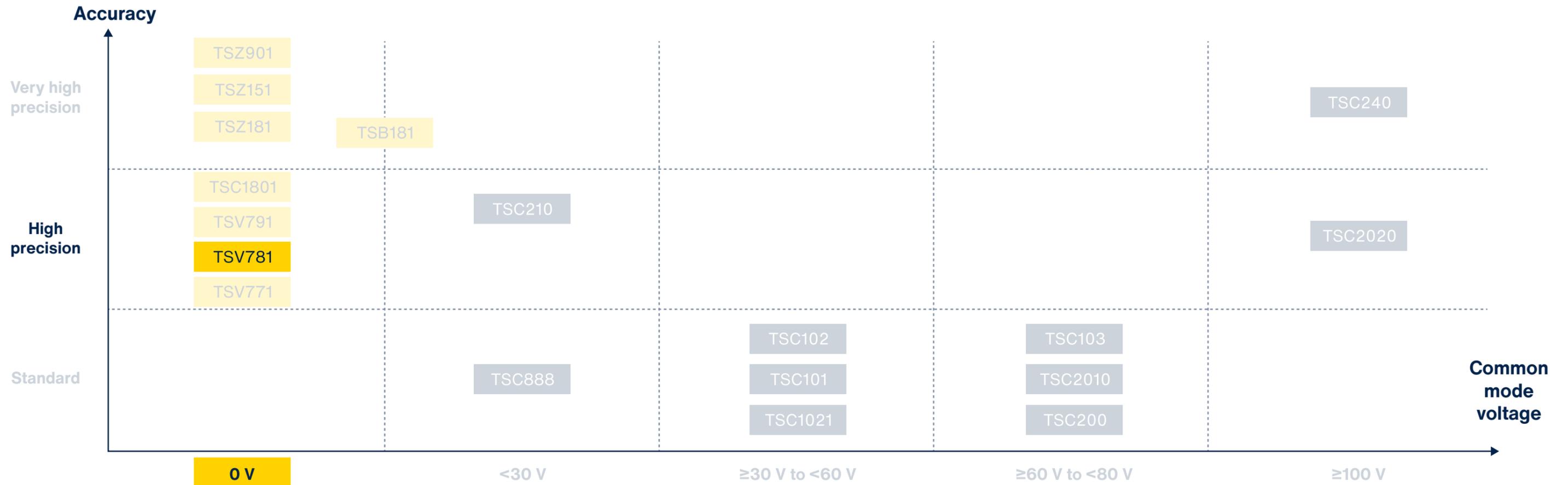
Key benefits

- Accuracy of measurement virtually unaffected by noise or input bias current
- Signal conditioning for high frequencies

Applications

- Automotive
- Communications equipment, computers and peripherals
- Industrial
- Personal electronics

Pick your product



TSV781 series

The TSV781 and TSV782 are 30 MHz bandwidth unity-gain-stable amplifiers.

[> Discover all the features](#)

Key features

- High bandwidth low offset operational amplifiers.
- 30 MHz gain bandwidth product.

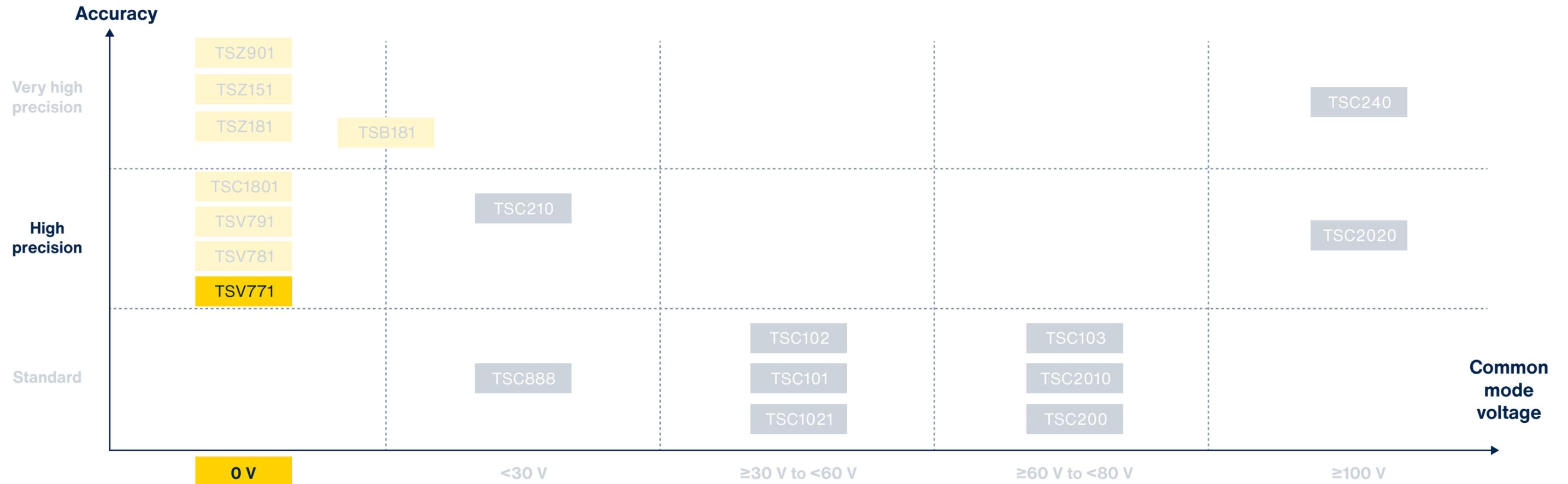
Key benefits

- Accuracy of measurement virtually unaffected by noise or input bias current
- Signal conditioning for high frequencies.

Applications

- Automotive
- Communications equipment, computers and peripherals
- Industrial
- Personal electronics

Pick your product



TSV77 series

The TSV771, TSV772 and TSV774 are 20 MHz-bandwidth unity-gain-stable amplifiers.

[> Discover all the features](#)

Key features

- High bandwidth low offset operational amplifiers.
- 20 MHz gain bandwidth product.

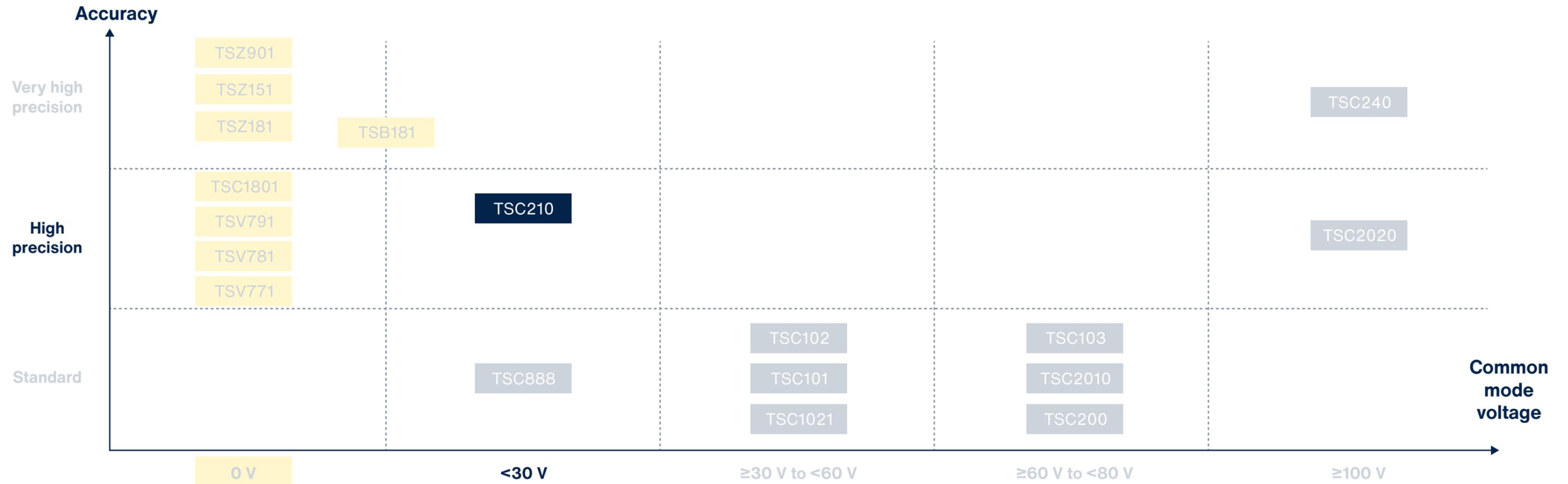
Key benefits

- Accuracy of measurement virtually unaffected by noise or input bias current.
- Signal conditioning for high frequencies.

Applications

- Industrial
- Personal electronics

Pick your product



TSC210 series

This series includes TSC210, TSC211, TSC212, TSC213, TSC214 and TSC215.

[> Discover all the features](#)

Key features

- Bidirectional
- Operating -0.3 to 26V
- Gain x200 x500
x1000 x50 x100 x75
- V_{IO} max 35 μ V

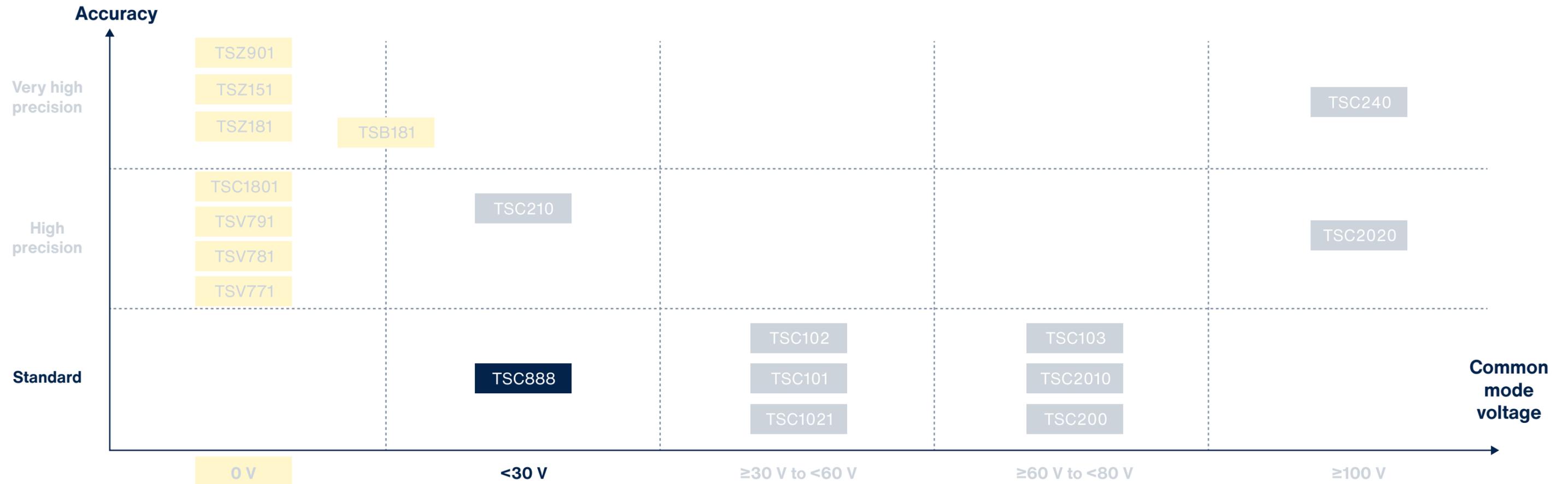
Key benefits

- High-side/Low side current measurement
- Extreme precision
- 6 gain available

Applications

- Industrial
- Personal electronics

Pick your product



TSC888

The TSC888 measures a small differential voltage on a high-side shunt resistor.

[> Discover all the features](#)

Key features

- SOT23-5
- Operating 2.8 to 24V
- AMR -0.3 to 30V
- Gain x20 x50 x100

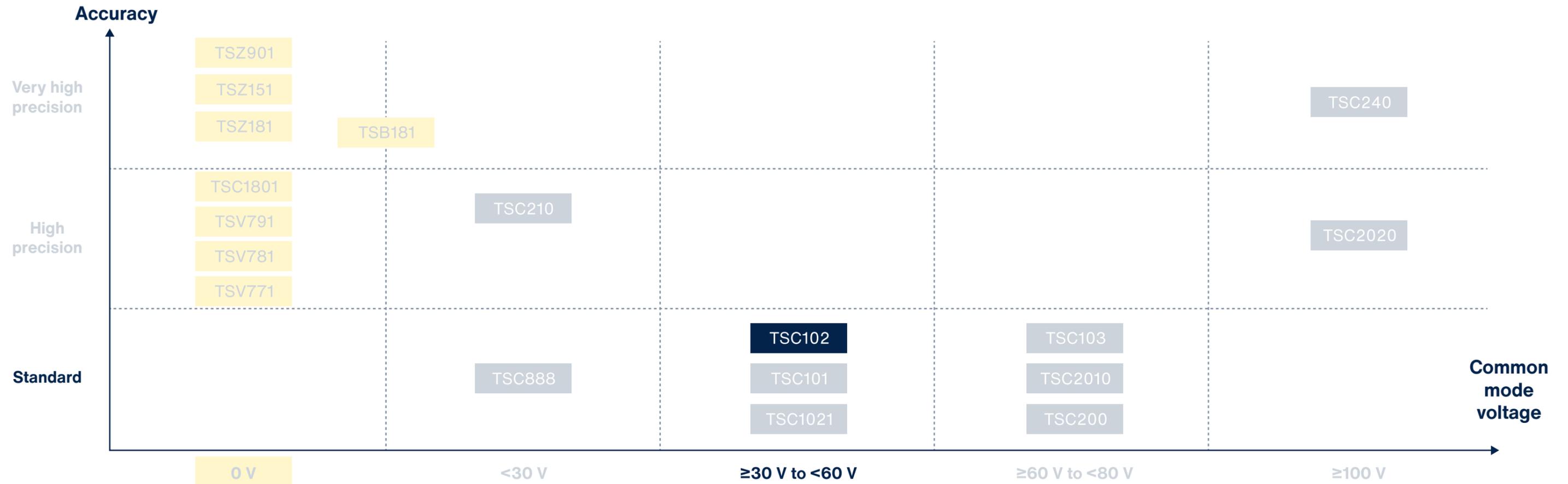
Key benefits

- Wide V_{CC} range
- Low cost

Applications

- Industrial

Pick your product



TSC102

The TSC102 measures a small differential voltage on a high-side shunt resistor.

[> Discover all the features](#)

Key features

- TSSOP8 SO8
- Operating 2.8 to 30 V
- AMR -16 to 60V
- Gain x20 adj.

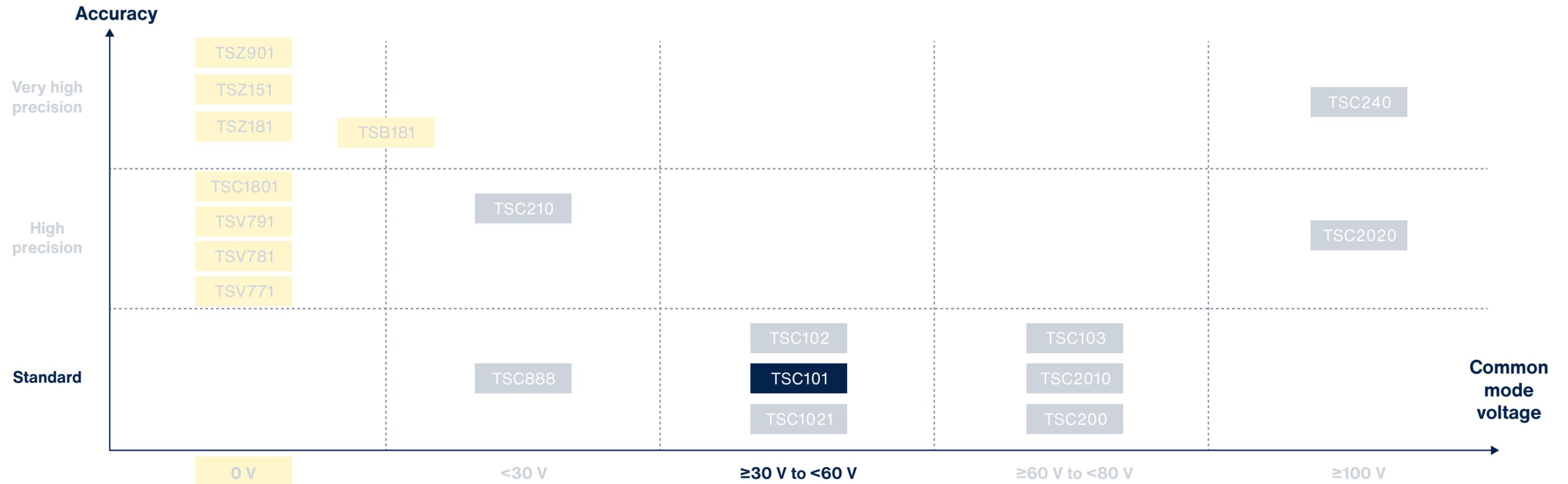
Key benefits

- Wide common-mode surviving range: -16 to 60 V and 4kV ESD.
- Current sensing amplifier

Applications

- Industrial

Pick your product



TSC101

The TSC101 measures a small differential voltage on a high-side shunt resistor.

[> Discover all the features](#)

Key features

- SOT23-5
- Operating 2.8 to 30V
- AMR -0.3 to 60V
- Gain x20 x50 x100

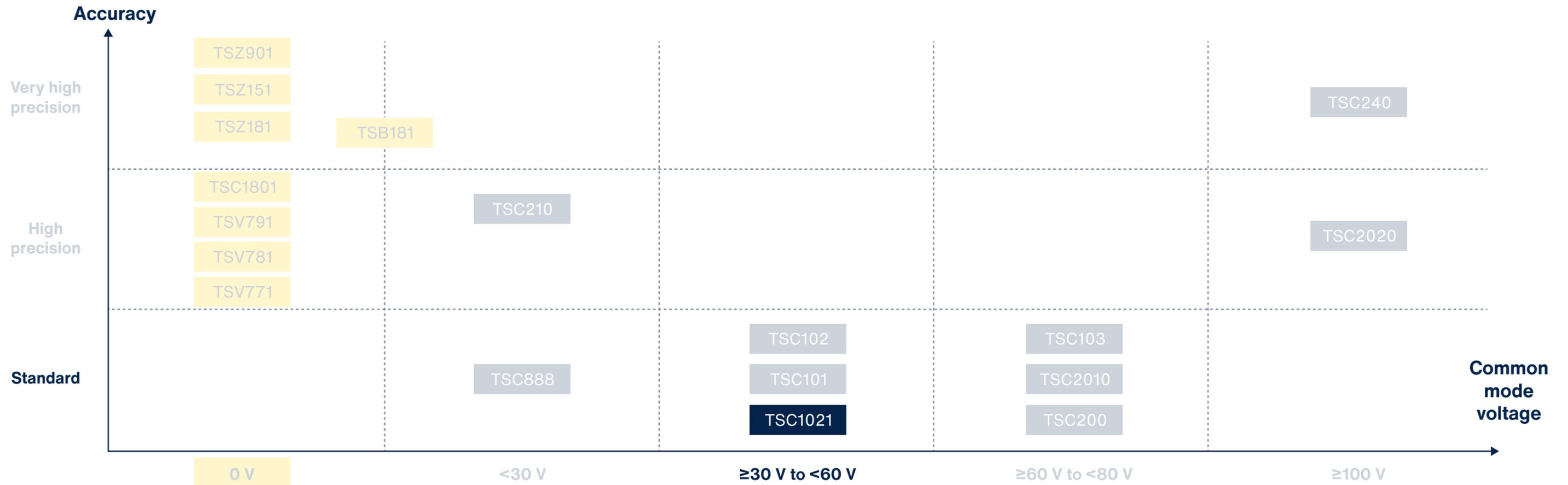
Key benefits

- Wide Vcc range
- Low quiescent current

Applications

- Industrial

Pick your product



TSC1021

The TSC1021 measures a small differential voltage on a high-side shunt resistor.

[> Discover all the features](#)

Key features

- TSSOP8 SO8
- Operating 2.8 to 30V
- AMR -32 to 60V
- Gain x20 x50

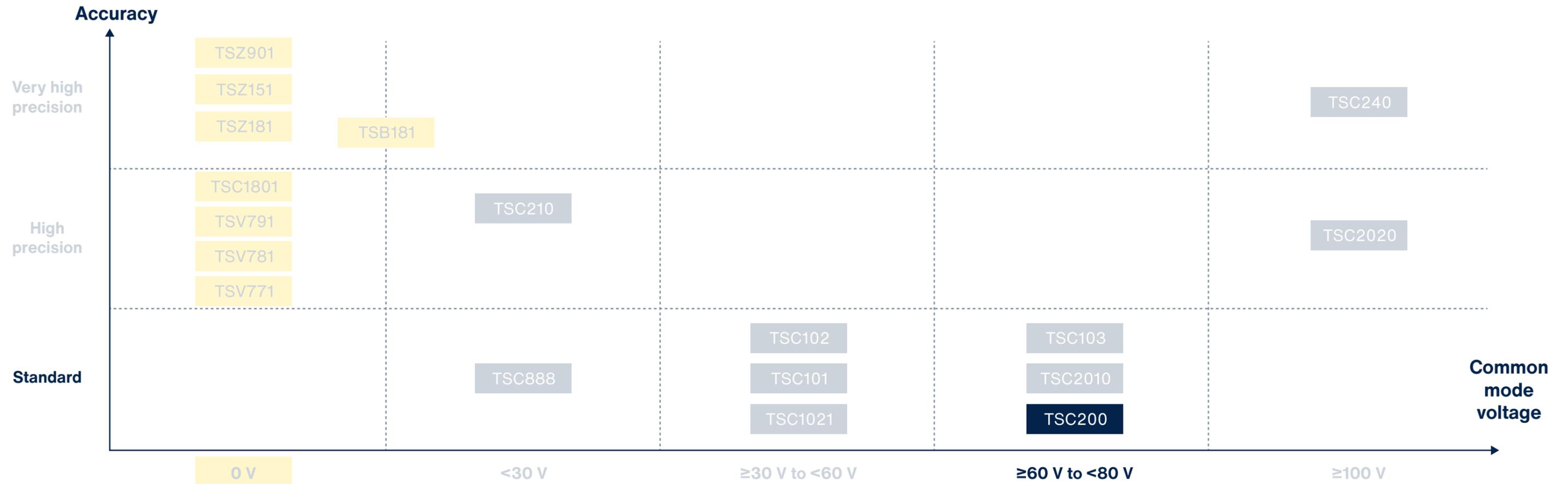
Key benefits

- Wide common-mode surviving range: -32 to 60 V and 4kV ESD
- Selectable and fine tunable gain

Applications

- Automotive
- Communications equipment, computers and peripherals
- Industrial
- Personal electronics

Pick your product



TSC200 series

This series includes TSC200, TSC201 and TSC202 high-side current sense amplifiers.

[> Discover all the features](#)

Key features

- Unidirectional with alert function
- Operating -16 to 80 V
- AMR -18 to 82 V
- Gain x20 x50 x100

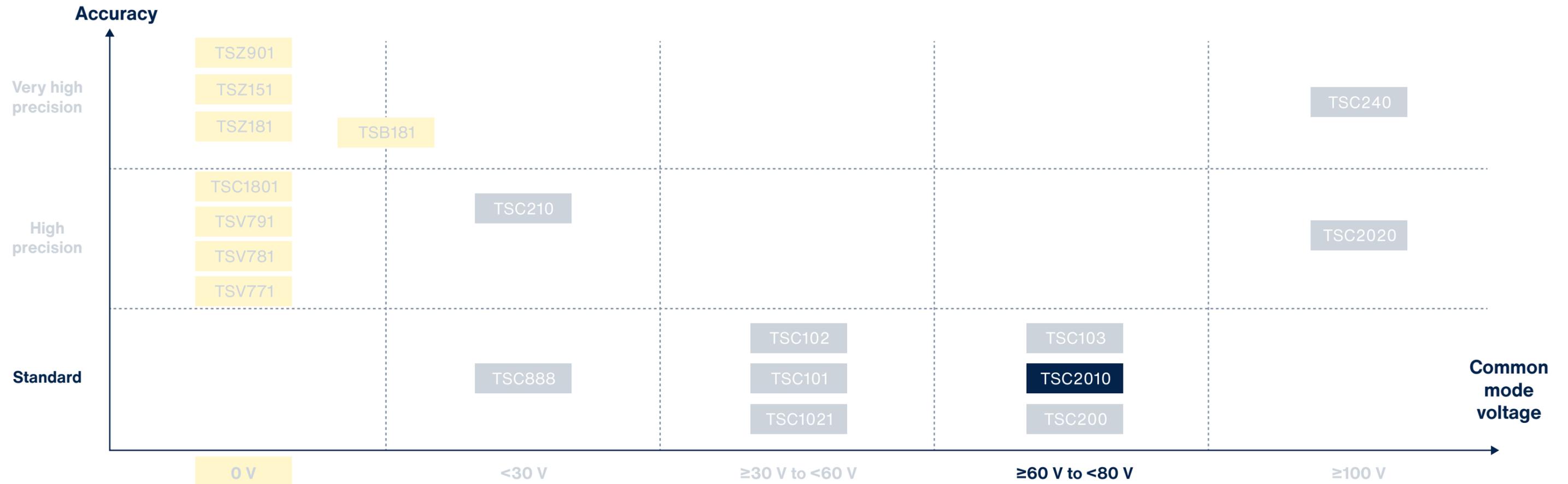
Key benefits

- High-side/Low side current measurement on high voltages
- Internal open-drain comparator for OCP function

Applications

- Automotive
- Communications equipment, computers and peripherals
- Industrial
- Personal electronics

Pick your product



TSC2010 series

The TSC2010, TSC2011 and TSC2012 are precision bidirectional current sense amplifiers.

[> Discover all the features](#)

Key features

- Bidirectional
- Operating -20 to 70V
- AMR -25 to 75V
- Gain x60 100x

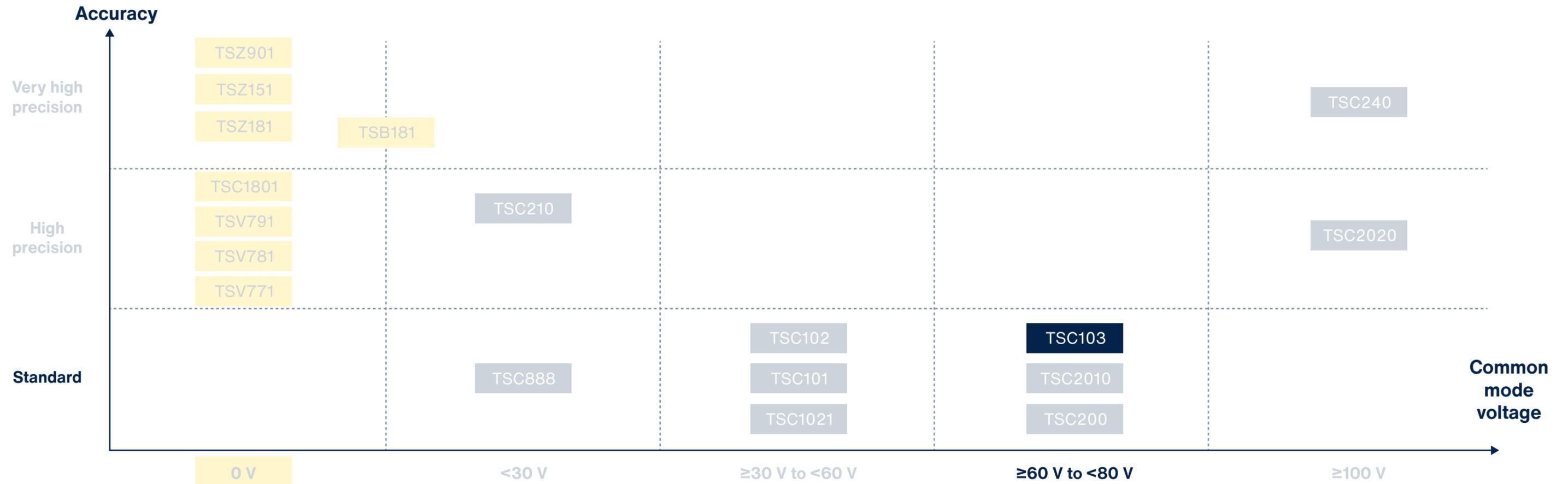
Key benefits

- High-side/Low side current measurement on high voltages
- Tolerant to battery reverse
- Vref selection

Applications

- Automotive
- Communications equipment, computers and peripherals
- Industrial
- Personal electronics

Pick your product



TSC103

The TSC103 measures a small differential voltage on a high-side shunt resistor.

[> Discover all the features](#)

Key features

- TSSOP8 SO8
- Operating 2.9 to 70V
- AMR -16 to 75V
- Gain x50 x100

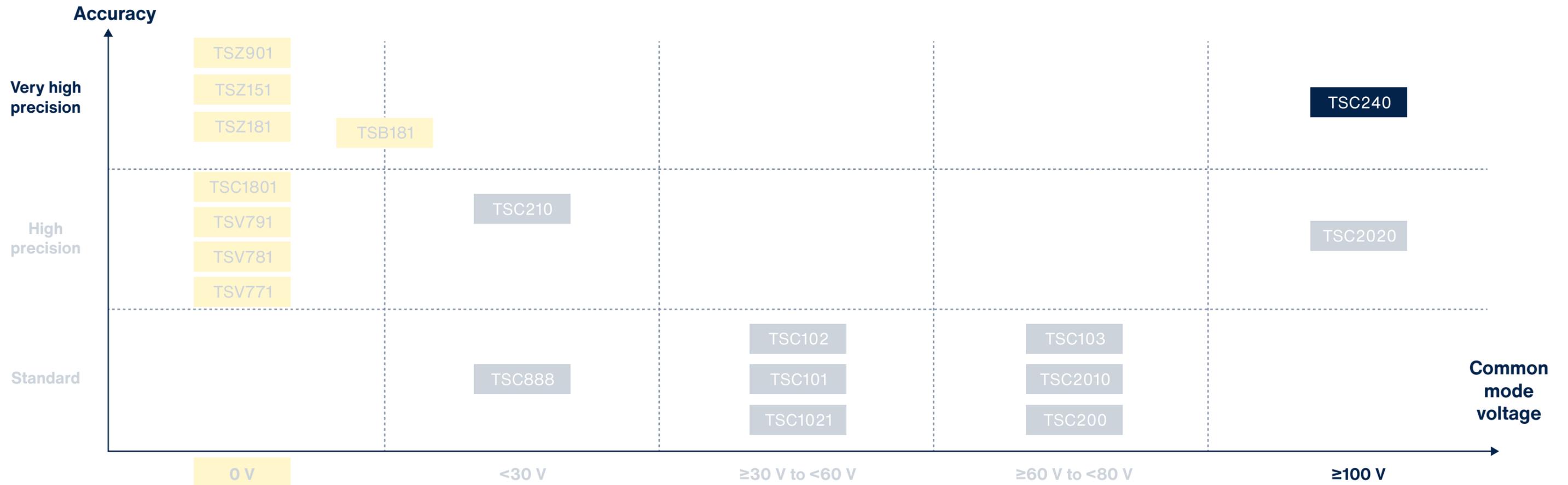
Key benefits

- Wide common-mode surviving range: -16 to 75 V and 2.5kV ESD

Applications

- Industrial

Pick your product



TSC240

High-side and low-side bidirectional zero-drift current sense amplifier with PWM rejection.

[> Discover all the features](#)

Key features

- Vicm range [-4V:100V]
- Offset voltage: $\pm 20 \mu\text{V}$ max.
- Offset drift: $0.15 \mu\text{V}/^\circ\text{C}$ max.
- Internal fixed gain (x20)
- Gain error: 0.2% max.

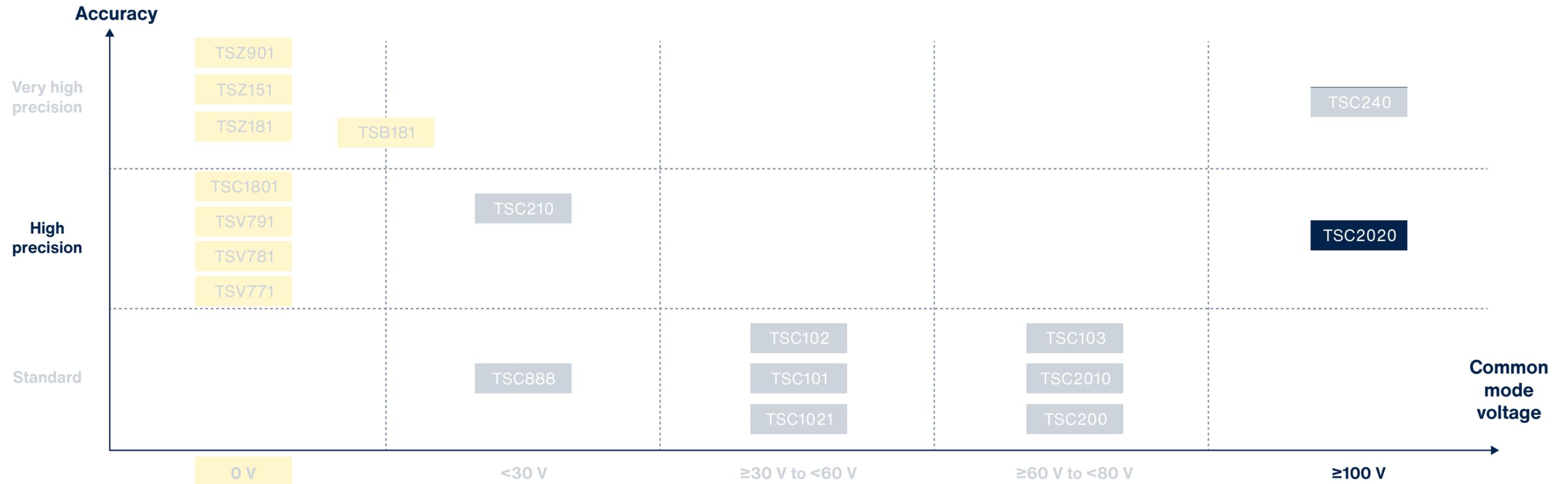
Key benefits

- Extremely accurate device
- Advanced PWM rejection features
- No temperature drift

Applications

- Automotive
- Communications equipment, computers and peripherals
- Industrial
- Personal electronics

Pick your product



TSC2020 series

TSC2020, TSC2021 and TSC2022 are a series of precision bidirectional current sense amplifier.

[> Discover all the features](#)

Key features

- Bidirectional
- Operating -4 to 100V
- AMR -7 to 110V
- Gain x20 x50 x100

Key benefits

- High-side/Low side current measurement on high voltages
- Optimized PWM rejection
- Precision

Applications

- Automotive
- Communications equipment, computers and peripherals
- Industrial
- Personal electronics



Automotive

The automotive industry demands highly reliable and precise current sensing solutions to ensure safety, performance, and compliance with evolving regulations.



Communications equipment, computers, and peripherals

Reliable current sensing ensures performance and uptime in data centers, telecom infrastructure, and computing devices.



Industrial

Industrial environments require robust and precise current sensing to maintain operational efficiency and safety.



Personal electronics

Current sensing supports the performance and safety of consumer electronic devices.

Automotive



Automotive motor control

Current sensing is essential to drive electric motor with the best efficiency, in electric power steering, window lifters, and pump motors applications.

TSC240*

TSC2020

TSV791*

TSV771

TSZ181*

Body and convenience

Enhances vehicle comfort and safety features by monitoring current in lighting, seat adjustment motors, and other body electronics.

TSC2010

Automotive radar

Supports radar systems by providing accurate current feedback to improve detection accuracy and system reliability.

TSC2010

Chassis and safety

Monitors current in safety-critical systems such as airbags and anti-lock braking systems (ABS) to ensure rapid response and reliability.

TSC2010

TSC2020

TSC240*

Electro-mobility

Supports electric and hybrid vehicles by monitoring battery management systems, powertrain components, and charging infrastructure.

TSC200*

TSC2010

TSC2020

TSC240*

TSV791

TSV771

TSV781*

Powertrain for ICE

Enhances fuel efficiency and emissions control by monitoring current in engine control units.

TSC2010

Mobility services

Enables shared and autonomous vehicle technologies with precise current sensing for various onboard systems.

TSC2010

*Most relevant products for the application

Data center - servers

Monitors power consumption to optimize server performance and prevent downtime.

TSC2020

TSC240*

TSC2010

TSB181

TSV791

TSV771

TSV781

TSZ151*

TSC200

Telecom infrastructure - Mobile base station

Ensures stable operation of base stations by monitoring power supplies and signal processing units.

TSC2020

TSC240*

TSC2010

TSB181

TSZ151*

TSC200

Communications equipment



*Most relevant products for the application

Industrial motor control

Controls large and small motors used in conveyors, pumps, and machinery, optimizing performance and reducing energy consumption.

- TSC1801*
- TSC2020
- TSC240*
- TSV791*
- TSV771
- TSV781

Energy generation and distribution

Enables metering and monitoring of power generation systems, including renewable energy sources, ensuring grid stability.

- TSC240*
- TSZ901
- TSC1801
- TSC200
- TSC210
- TSC2020
- TSB181
- TSV791
- TSV771
- TSV781
- TSC2010

Programmable logic controllers

Ensures reliable operation of programmable logic controllers (PLCs) by monitoring current in input/output modules.

- TSC210
- TSB181
- TSC2010

Power tools

Enhances safety and efficiency in power tools by monitoring motor currents and battery status.

- TSC210
- TSC1801*
- TSC200
- TSC2010*
- TSC2020*
- TSC240*
- TSC210
- TSV791
- TSC101
- TSC102
- TSC103

Air conditioner

Improves energy efficiency and comfort by monitoring current in air conditioners and heating systems.

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200*
- TSC2020*
- TSC240*
- TSC888

Central indoor/outdoor HVAC unit

Ensure efficient motor control in central HVAC systems for precise temperature regulation and energy savings.

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200
- TSC2020
- TSC240*
- TSC210
- TSC2010*
- TSZ151
- TSB181*
- TSC888

City infrastructure management

Supports smart city applications such as street lighting and traffic control through precise current measurement.

- TSC101
- TSC103
- TSC1801
- TSC200*
- TSC2020*
- TSC240*
- TSC2010
- TSC210
- TSV791*
- TSV771
- TSV781
- TSB181

Commercial HVAC unit

Ensures optimal performance of commercial heating and cooling systems.

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200*
- TSC2020*
- TSC240*
- TSC2010
- TSC888

[View other industrial applications](#)

*Most relevant products for the application



Mobile refrigeration

Maintains temperature control in transport refrigeration units.

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200*
- TSC2020*
- TSC240*
- TSC2010
- TSC888

Bridge and gateway

Home automation enables smart home devices like gateways to monitor and control power usage.

- TSC200
- TSC2010
- TSC2020
- TSC240*
- TSC210*
- TSV791
- TSV771*
- TSV781
- TSC1801

Residential smart plug

Home automation enables smart home devices like smart plugs to monitor and control power usage.

- TSC200
- TSC2010
- TSC2020
- TSC240*
- TSC210*
- TSV791
- TSV771
- TSV781
- TSC1801

Large appliances

Monitors current in refrigerators, washing machines, and ovens for energy efficiency and fault detection.

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200
- TSC2010*
- TSC2020
- TSC240*
- TSC888
- TSZ151

Small appliances and kitchen aids

Ensures reliable operation and safety in devices like blenders and coffee makers.

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200
- TSC2010*
- TSC2020
- TSC240*
- TSC888
- TSZ151
- TSV791

Garden tools and robots

Supports battery-powered garden equipment with accurate current sensing.

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200
- TSC2010*
- TSC2020
- TSC240*
- TSC888
- TSZ151
- TSV791

Lighting and controls

Enhances lighting systems with current monitoring to improve energy efficiency and lifespan.

- TSC1801*
- TSC200
- TSC2010
- TSC2020
- TSC240*
- TSC210*
- TSB181
- TSZ151*
- TSV791*
- TSV771
- TSV781

CPAP, ventilators, and respirators

Monitors current in critical respiratory devices to ensure consistent performance and patient safety.

- TSC1801
- TSC200
- TSC2010
- TSC2020
- TSC240*
- TSC210*
- TSV771
- TSV781
- TSV791

[View other industrial applications](#)

*Most relevant products for the application



Heat metering

Measures energy consumption in heating systems for efficient energy use.

- TSC2010
- TSC102
- TSC101
- TSC103
- TSC1801
- TSC200
- TSC2020
- TSC240*
- TSC210*

Gas metering

Enables accurate measurement of gas flow and consumption.

- TSC2010
- TSC102
- TSC101
- TSC103
- TSC1801
- TSC200
- TSC2020
- TSC240*
- TSC210*
- TSV791

Water metering

Supports water usage monitoring to promote conservation and detect leaks.

- TSC2010
- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200
- TSC2020
- TSC240*
- TSC210*
- TSV791

Banking automation - Currency counter

Ensures accurate operation and fault detection in currency handling machines

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200
- TSC2010
- TSC2020
- TSC240*
- TSZ901

Server & telecom power

Monitors power supplies to ensure uninterrupted operation.

- TSC2020*
- TSC240*
- TSC210*
- TSC200*
- TSC101
- TSC102
- TSC103
- TSC1801
- TSC2010

DC/DC converters

Optimizes conversion efficiency.

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200
- TSC2010*
- TSC2020*
- TSC240*
- TSC210
- TSC888

Power bank

Enhances battery management and charging safety.

- TSC101
- TSC102
- TSC103
- TSC1801
- TSC200
- TSC2010
- TSC2020
- TSC240*
- TSC210
- TSV771
- TSC200

Industrial sensors

Ensure accurate and reliable monitoring. It helps to control and protect system in real time.

- TSC210
- TSC1801
- TSC200*
- TSC2020
- TSC240*
- TSB181
- TSV791
- TSV771
- TSV781*
- TSZ151
- TSZ901*
- TSC2010

[Go back to previous industrial applications](#)

*Most relevant products for the application



Robotic and motorized toys

Ensures smooth operation and battery management in toys and hobbyist robots.

TSC210

TSC1801*

TSC2020*

TSC240*

TSC2010

TSV791

TSV771

TSV781

TSC200

Personal electronics



*Most relevant products for the application