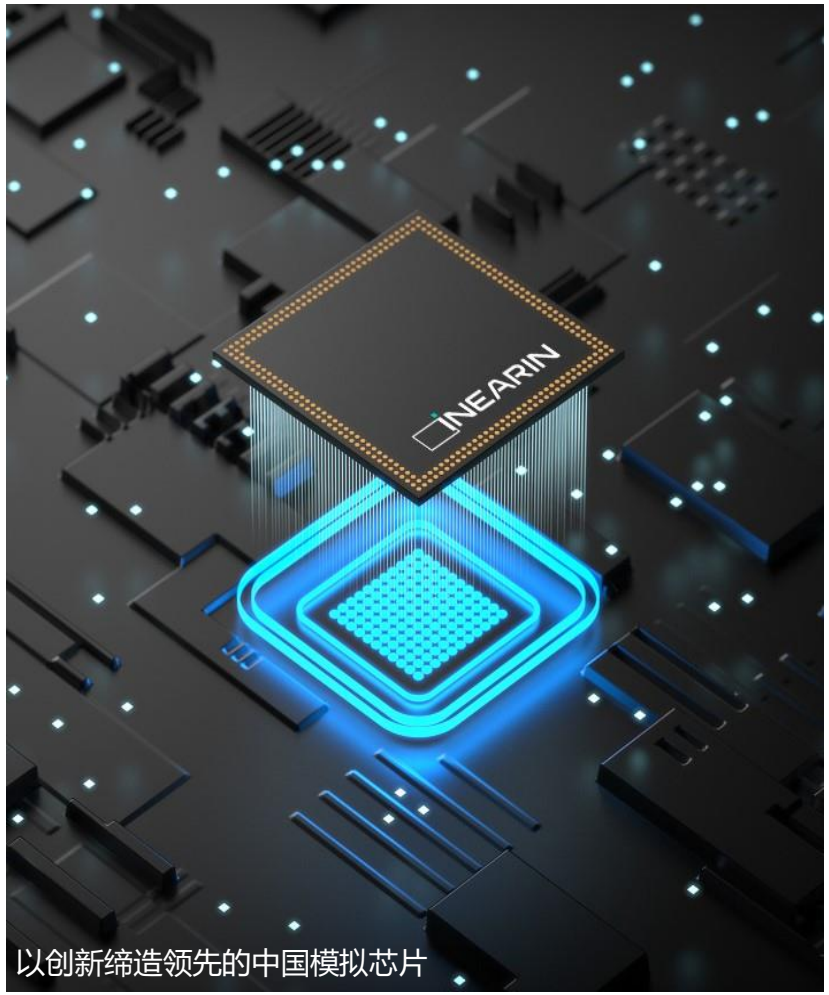
LINEARIN CORPORATION INTRODUCTION
2021Q3

上海先积集成电路有限公司
LINEARIN TECHNOLOGY CORPORATION

CONTENTS

1 COMPANY INTRODUCTION

COMPANY INTRODUCTION



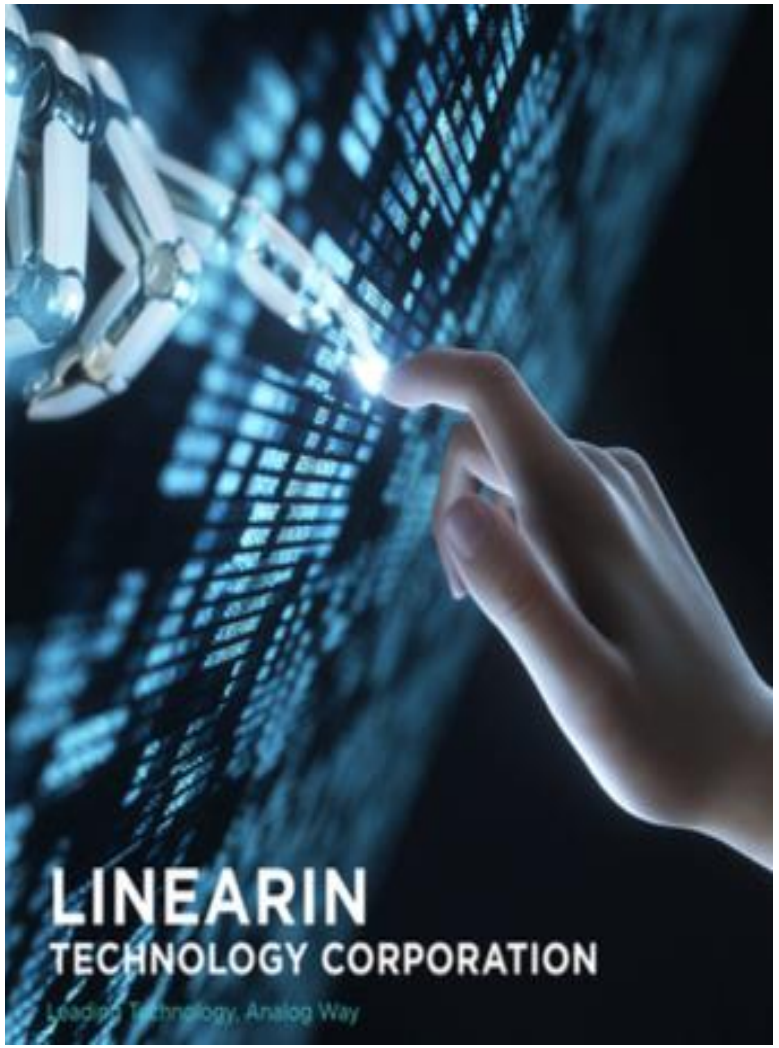
以创新缔造领先的中国模拟芯片

Linearin Technology Corporation was founded in Feb, 2016, and we are a fabless semiconductor IC design company with global ambition. Linearin specializes in high performance analog products and advanced sensor solutions.

Linearin emphasizes in research & development and continuous innovation. All of Linearin's innovative IP's were independently developed. Our products are widely used in applications including white goods, wearable, IOT, smart sensors, medical equipment, new energy, industrial control, electric tools, E-bike, etc.

Linearin was acquired by Holyview Electronics (www.holyview.cn) in 2021. Holyview is the leader of a specialized electronic field and has scheduled for IPO next year. With the strong foundation built from years of R&D and finance the strength of a IPO-ready company, Linearin is well-positioned to become the analog product leader.

COMPANY VISION



Vision

To become a world-class analog solution provider through relentless innovation

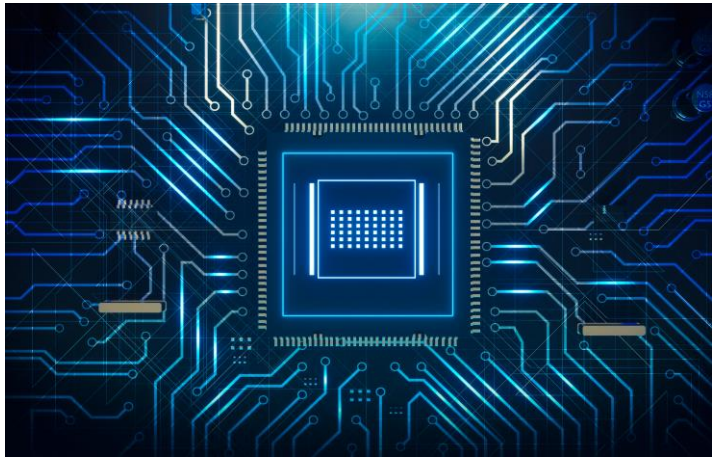
Mission

Help make customers' signal conditioning, data transmission, and power management solution simple by offering innovative, quality analog solution

Linearin : Linear Integrated

Why “Linear”?

Because linear technology is often used in analog signal processing, LINEAR is often referred to as analog products in semiconductor industry. The “LINEAR” part of our name points out the development direction of the company.



What is “Integrated”?

IN is the abbreviation of integrated. On one hand, it puts forward the general direction of technology integration. The company hopes to build a product portfolio which is highly differentiated through the accumulation of various analog IP. Provide customers with high performance products and simplify their system design.

On the other hand, we hope to remain humble and open to attract and retain the best talents in the industry and create an environment for sustainable development. This is the meaning of “IN”.

COMPANY EXECUTIVES

- William Koon: William has a M.S.E.E. from University of Illinois at Urbana Champaign. He has more than 20 years of analog industry experiences through working at top analog companies including ADI, TI, and Onsemi. William is a seasoned analog veteran who has worked in product definition, design, application, field marketing, etc. at top analog companies. Sales revenue from products William personally defined exceeded US $100 million

- Sean Wang: Sean has 20 years of experiences in semiconductor industry including multinational semiconductor companies (NXP, AOS, fyrestorm...) and local fabless company (3Peak). Sean takes the different roles include product definition, product marketing, project management, and operation management, etc. He has strong insight into analog technology, market trend, system application

- Mark Ma: Mark graduated from Xidian University. He has rich experiences in semiconductor market development and sales. He worked at Texas Instruments for 15 years, covering roles in business development and sales management areas. He has deep understanding of the China market. especially in new energy, industrial, and automotive market

Core teams are from top semiconductor companies , with unique, innovative thinking and operation efficiency. They have rich experience in R & D engineering, process management, product definition, and customer technical services in analog IC and advanced sensor products.

We have excellent team, talents, and entrepreneurial leaders. We want to gather, cultivate and grow the best high-end analog chip design and application talents in China. We aim to achieve state-of-the-art analog performance through talent and technology accumulation, intellectual property development and advanced products design. The accumulation of talents, technology and intellectual property will lead us to become leading player in analog market world-wide.

OUR CORE TEAM

Cultivate and grow best analog design and application Talents

- More than 70% are in R&D function
- Strong Sales and Marketing team
- Excellent management team

Core teams are from top semiconductor companies , with unique innovative thinking and operation mode. They have rich experience in R&D engineering, process management, product definition, and customer technical services in analog chips and advanced sensor products.

DESIGN TEAM OVERVIEW

DESIGN TEAM OVERVIEW

75% master degree or above, key designers have rich experience in analog and mixed signal circuit design

Research the principle in deep-level for continuous innovation, both the artist's creativity and follow the basic design principles

Emphasize project management, resource planning and design process control

100% Independent intellectual property

CONSTRUCTION AND DEVELOPMENT

Collect and develop China's high end analog chip design and application talents

In terms of talent and technology accumulation, IP development, reaches the same level as the WW top analog companies. Relying on talents, technology, and IP, to build the access barrier for competitors in technical, cost and market

Core competitiveness sustainable grow

FOUR R&D TEAMS

Technical innovation for cost-effective catalog products

+200 products in 16 families launched already, which have been widely used in White goods, wearable devices, IOT, Smart sensor, Medical, New energy, Industrial control, Electric tools, E-bike…es and other markets

Complete product portfolio and IP

ACCELERATION OF PRODUCT LAUNCH

Sufficient "IP cores" for market and application have been accumulated to lay the solid foundation for the quick launch for new products; continue to strengthen the development, reserve, technological innovation of basic technologies

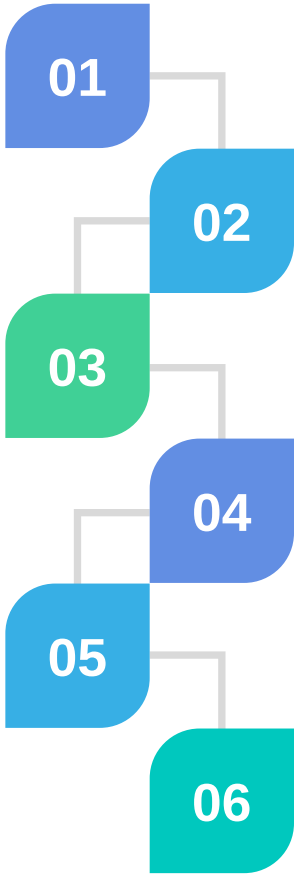
"one core covers all" to reduce development cost, operational investment, and accelerate time to market

Acceleration of product planning and design

QUALIFICATION HONOR

- Certification for intellectual property rights
- Third party test certification
- High tech enterprise

CORE TECHNOLOGY



01 High stability trimming technology

02 Consecutive stable CMFB control for improvement of slew transition and fast settling

03 Slew booster technique of operational amplifiers

04 Digital self-calibration of chopper with ripple reduction

05 Short current protection circuits for high reliability amplifiers

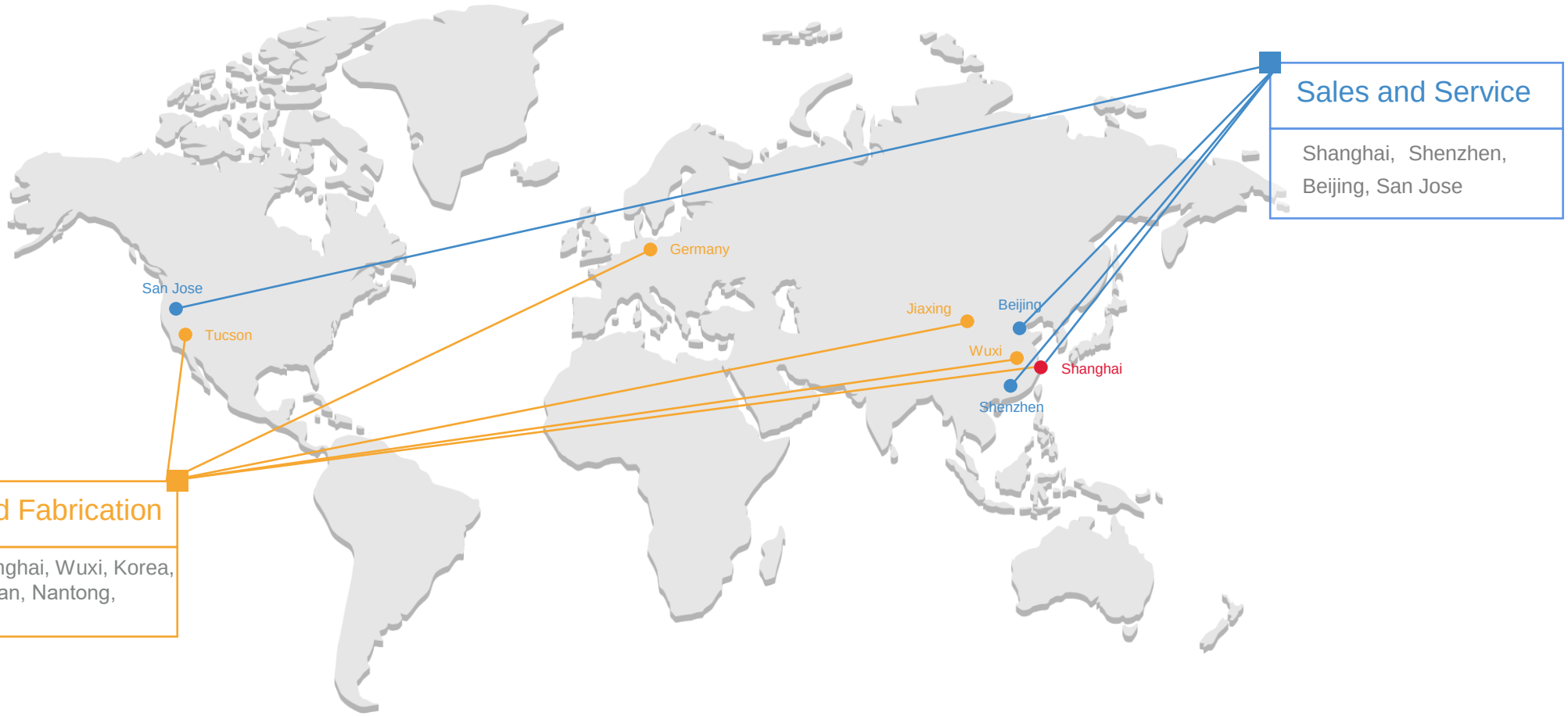
06 Intermediate/high side voltage domain generation circuit of current sensing amplifier

SUPPLY CHAIN

- **Full Quality Monitoring (QA & QC):** Quality and reliability are on top of the priority list at the Linearin at all times. We continually improve our technologies and operational systems in an ongoing effort to meet and exceed the customers' expectations. all products are fully characterized and comprehensively tested with Advanced Product Quality Planning (APAQ), and product reliability is fully verified internally and validated by third-party independent laboratories.
- **World Class Consistency and Reliability:** Through stringent execution of an advanced, reliable, and continuously improving QA system and policy, Linearin assures each produced chip of excellent quality and reliability.

Design	• All ISO9001, Design Flow Control • USA R&D Center, China Design Team
Fab	• All ISO9001 • RoHS Compliant & Halogen Free
Assembly	• All ISO9001 • RoHS Compliant & Halogen Free
Test	• FT Development & Improvement • All ISO9001 & ISO14001
Logistics	• Wafer & Backlog Control • Worldwide Delivery

WORLD WIDE SITES



Sales and Service

Shanghai, Shenzhen, Beijing, San Jose

Design and Fabrication

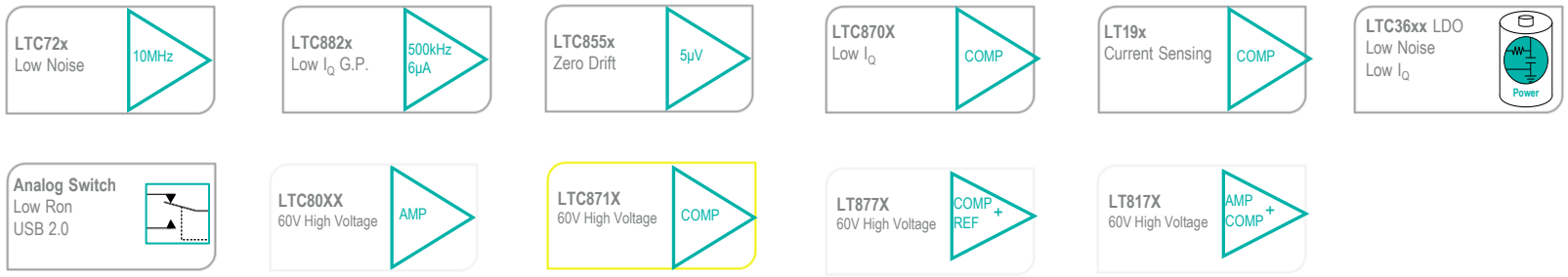
Tucson, Shanghai, Wuxi, Korea, Germany, Xi'an, Nantong, Jiaxing …

2 PRODUCT INTRODUCTION

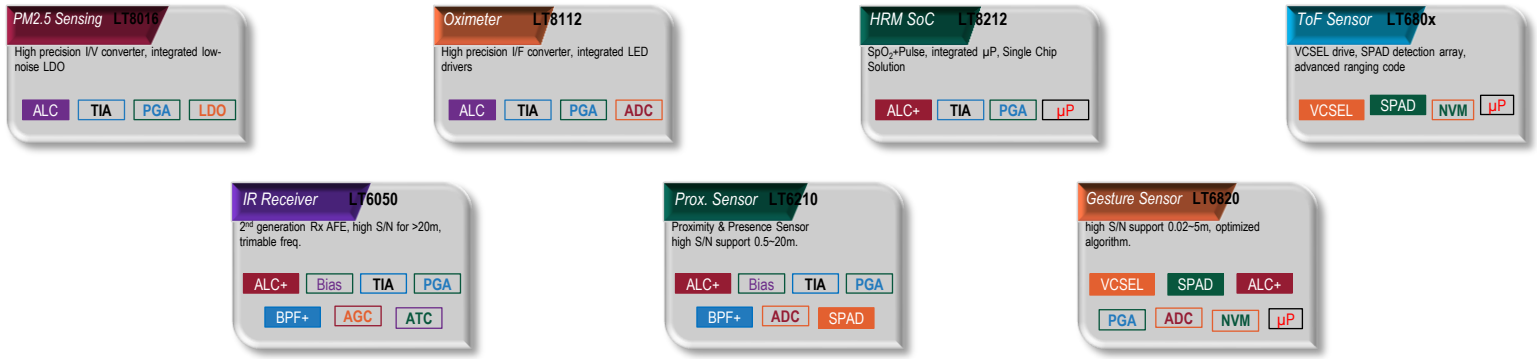
PRODUCT OVERVIEW

Standard Catalog IC Products

☞+200 Parts, Build the most complete high-precision amplifier series

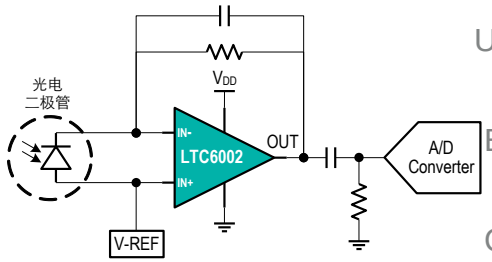


Sensor AFE & ASSP



HIGH PERFORMANCE, LOW COST, GENERAL PURPOS AMPLIFIER

Get more with your general-purpose op-amp: Cut costs… not performance

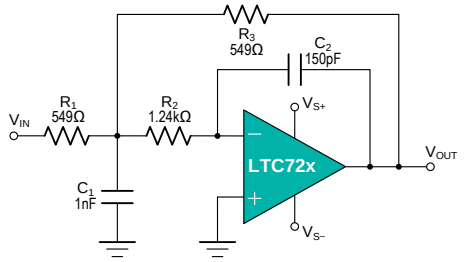


Ultra-low power	Significantly reduce system power without compromising performance
Low offset	Improve DC accuracy with low offset and precision performance
EMI harderned	High EMI rejection for sensitive circuits with families up to 30MHz
Small footprint	Shrink your design with space-saving IC and package options
Cost optimized	Attain an excellent price-to-performance ratio for cost-conscious systems

Device	Features	Advantages	Remarks	Packages	Application
LTC8821	Up to 500kHz general purpose bandwidth but with as low as 6.6μA power consumption, 1.8V to 5.5V, 2.5mV maximum V_{OS}, 6μV_{PP} low noise, RRIO	A unique combination of high speed (500kHz) and ultra-low power (6.6μA) to extend battery life in portable products	Higher performance replacement for a large number of **100kHz~1MHz or 1~50μA** op-amps; ideally suitable for small signal processing applications while requiring ultra-low power	SOT23-5, SC70-5	
LTC8822				**DFN1.5x1.5**, SO8, MSOP8	
LTC8823				SOT23-5, SC70-5	
LTC8824				SO-14, TSSOP14	
LTC6001	Micropower (75μA) 1.5MHz, 2.5mV maximum V_{OS} , 5.6μV_{PP} low noise, down to 1.8V operation, RRIO, available in small DFN package	Combination of precision, μPower, and wide band; Optimize low noise, low distortion and output drive for audio application	Patented step response (1.2V/μs, 1.2μs settling time) and wide band (1.5MHz); **Robust design**: integrated RF/EMI rejection filter, no phase reversal in overdrive, 5kV ESD protection	SOT23-5, SC70-5	
LTC6002				DFN2x2, MSOP-8, SO-8	
LTC6004				TSSOP14, SO-14	
LTC8541	Low cost, 1.1MHz BW, 70μA micropower, CMOS inputs and full swing I/O (RRIO), available in micro-size packages	General purpose op-amps with optimized step response performance	Dual-channel of LTC8542 available in DFN2x2-8L package	SC70-5, SOT23-5	
LTC8542				DFN2x2-8, MSOP-8, SO-8	
LTC8544				TSSOP14, SO-14	
LTC321	General purpose, full swing input and output (RRIO), micro-power op-amps	1MHz GBP, 1V/μs slew rate, 70μA quiescent current per amplifier, 0.003% THD+N	Low cost replacement for general purpose 1MHz operational amplifiers	SOT23-5, SC70-5	
LTC358				SO-8, MSOP-8	
LTC324				SO-14, TSSOP-14	

LOW NOISE AMPLIFIER

Implement high AC performance in your critical systems design

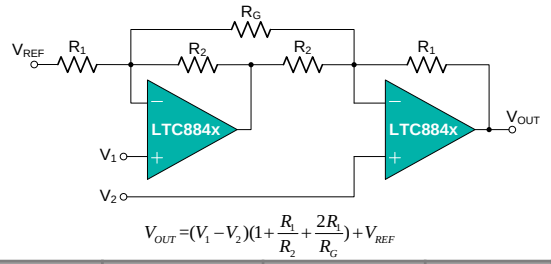


- Low noise → Achieve lower distortion and higher performance
- Low THD+N → Lossless" sound: Hear the finest details with a clean audio signal path
- High Slew-Rate and Wide BW → Process and acquire faster signals with high AC performance, faster step response suitable for motor phase current sensing
- Low power → Reduce system power without compromising performance

Device	Amp #	V_{DD}	Max. Rating (VDD)	GBW	I_Q	E_{NOISE} (1kHz)	V_{NOISE} (0.1~10Hz)	Slew Rate	Settling time (to 0.1%)	VOS (Max.)	Packages
LTC721	1	1.8~5.5 V	10.0 V	11 MHz	780 μA	8 nV/√Hz	3.7 μV_{P-P}	11.5 V/μs	0.26 μs	3.0 mV	SOT23-5, SC70-5, SO8
LTC722	2	1.8~5.5 V	10.0 V	11 MHz	1.56 mA	8 nV/√Hz	3.7 μV_{P-P}	11.5 V/μs	0.26 μs	3.0 mV	SO8, MSOP8, TSSOP8
LTC724	4	1.8~5.5 V	10.0 V	11 MHz	3.12 mA	8 nV/√Hz	3.7 μV_{P-P}	11.5 V/μs	0.26 μs	3.0 mV	SO-14, TSSOP-14
LTC8831	1	2.0~5.5 V	10.0 V	9 MHz	700 μA	12 nV/√Hz	4 μV_{P-P}	8.5 V/μs	0.3 μs	3.5 mV	SOT23-5, SC70-5
LTC8832	2	2.0~5.5 V	10.0 V	9 MHz	1.4 mA	12 nV/√Hz	4 μV_{P-P}	8.5 V/μs	0.3 μs	3.5 mV	SO8, MSOP8, TSSOP8
LTC8834	4	2.0~5.5 V	10.0 V	9 MHz	2.8 mA	12 nV/√Hz	4 μV_{P-P}	8.5 V/μs	0.3 μs	3.5 mV	SO-14, TSSOP-14
LTC8871	1	2.0~5.5 V	10.0 V	20 MHz	1.1 mA	8 nV/√Hz	3 μV_{P-P}	20 V/μs	0.22 μs	3.0 mV	SOT23-5, SC70-5
LTC8872	2	2.0~5.5 V	10.0 V	20 MHz	2.2 mA	8 nV/√Hz	3 μV_{P-P}	20 V/μs	0.22 μs	3.0 mV	SO8, MSOP8, TSSOP8
LTC8874	4	2.0~5.5 V	10.0 V	20 MHz	4.4 mA	8 nV/√Hz	3 μV_{P-P}	20 V/μs	0.22 μs	3.0 mV	SO-14, TSSOP-14

HIGH PRECISION AMPLIFIER

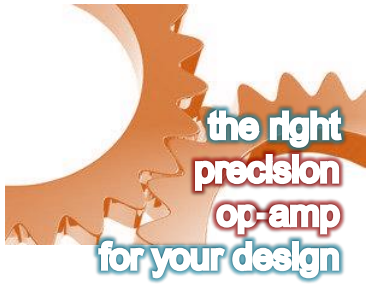
The right precision op-amp for your design: Achieve high DC accuracy and AC performance in your precision system!



$$V_{OUT}=(V_1-V_2)(1+\frac{R_1}{R_2}+\frac{2R_1}{R_G})+V_{REF}$$

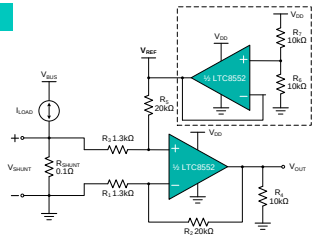
Low offset	Improve DC accuracy with low offset and precision
Low noise	Achieve lower distortion and higher performance
Wide Bandwidth	Acquire faster signals with high AC performance
Low power	Reduce system power w/o compromising performance

Device	Amp #	V_{DD}	Max. Rating (VDD)	GBW	I_Q	E_{NOISE} (1kHz)	V_{NOISE} (0.1~10Hz)	Slew Rate	Settling time (to 0.1%)	VOS (Max.)	Packages
LTC8825	1	1.8~5.5 V	10.0 V	500 kHz	15 μA	63 nV/√Hz	6 μV_{P-P}	0.25 V/μs	6 μs	350 μV	SOT23-5, SC70-5
LTC8826	2	1.8~5.5 V	10.0 V	500 kHz	30 μA	63 nV/√Hz	6 μV_{P-P}	0.25 V/μs	6 μs	350 μV	SO8, DFN-8L, MSOP8
LTC8827	1	1.8~5.5 V	10.0 V	500 kHz	15 μA	63 nV/√Hz	6 μV_{P-P}	0.25 V/μs	6 μs	350 μV	SOT23-5, SC70-5
LTC8828	4	1.8~5.5 V	10.0 V	500 kHz	60 μA	63 nV/√Hz	6 μV_{P-P}	0.25 V/μs	6 μs	500 μV	SO-14, TSSOP-14
LTC8841	1	1.8~5.5 V	10.0 V	1.5 MHz	85 μA	25 nV/√Hz	5.6 μV_{P-P}	1.2 V/μs	1.2 μs	350 μV	SOT23-5, SC70-5
LTC8842	2	1.8~5.5 V	10.0 V	1.5 MHz	170 μA	25 nV/√Hz	5.6 μV_{P-P}	1.2 V/μs	1.2 μs	350 μV	SO8, DFN-8L, MSOP8
LTC8844	4	1.8~5.5 V	10.0 V	1.5 MHz	340 μA	25 nV/√Hz	5.6 μV_{P-P}	1.2 V/μs	1.2 μs	500 μV	SO-14, TSSOP-14
LTC725	1	1.8~5.5 V	10.0 V	11 MHz	750 μA	8 nV/√Hz	3 μV_{P-P}	11 V/μs	0.26 μs	350 μV	SOT23-5, SC70-5
LTC726	2	1.8~5.5 V	10.0 V	11 MHz	1.5 mA	8 nV/√Hz	3 μV_{P-P}	11 V/μs	0.26 μs	350 μV	SO8, MSOP8, TSSOP8
LTC728	4	1.8~5.5 V	10.0 V	11 MHz	3.0 mA	8 nV/√Hz	3 μV_{P-P}	11 V/μs	0.26 μs	500 μV	SO-14, TSSOP-14
LTC8875	1	2.0~5.5 V	10.0 V	20 MHz	1.1 mA	8 nV/√Hz	3 μV_{P-P}	20 V/μs	0.22 μs	350 μV	SOT23-5, SC70-5
LTC8876	2	2.0~5.5 V	10.0 V	20 MHz	2.2 mA	8 nV/√Hz	3 μV_{P-P}	20 V/μs	0.22 μs	350 μV	SO8, MSOP8, TSSOP8
LTC8878	4	2.0~5.5 V	10.0 V	20 MHz	4.4 mA	8 nV/√Hz	3 μV_{P-P}	20 V/μs	0.22 μs	500 μV	SO-14, TSSOP-14
LTC321A	1	1.8~5.5 V	10.0 V	1 MHz	85 μA	29 nV/√Hz	6 μV_{P-P}	1 V/μs	1.2 μs	**0~1 mV**	SOT23-5
LTC358A	2	1.8~5.5 V	10.0 V	1 MHz	170 μA	29 nV/√Hz	6 μV_{P-P}	1 V/μs	1.2 μs	**0~1 mV**	SO8, MSOP8
LTC358H	2	1.8~5.5 V	10.0 V	1 MHz	190 μA	30 nV/√Hz	6 μV_{P-P}	1 V/μs	1.2 μs	**1~2.5 mV**	SO8, MSOP8
LTC324H	4	1.8~5.5 V	10.0 V	1.2 MHz	375 μA	30 nV/√Hz	6 μV_{P-P}	1 V/μs	1.5 μs	**0~2.5 mV**	SO-14, TSSOP-14



ZERO DRIFT AMPLIFIER

Zero-drift op-amps suiting for precision measurement are the industry's high-end analog products

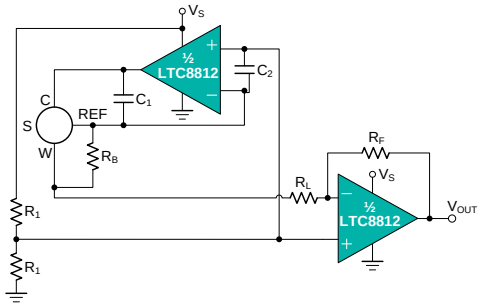


- Linearin zero-drift amplifiers incorporate patented techniques and optimized circuit topology, which make the devices extremely low-offset, low-drift and low-noise, while have extremely high-gain, high-CMR and high-PSR. These devices can achieve high precision requirement for sensor signal conditioning
- In addition, our patented CMFB control techniques give the devices faster step response, reduce signal output errors and ensure long-term stable operation.

Device	Amp #	V_{DD}	Max. Rating (VDD)	VOS (Max.)	VOS TC (Max.)	VNOISE (0.1~10Hz	Settling time (to 0.1%)	Recovery time	GBW	Slew Rate	IQ	Packages
LTC8331	1	1.8~5.5 V	10.0 V	15 μV	0.05 μV/℃	1.1 μV_{PP}	6 μs	55 μs	350 kHz	0.22 V/μs	26 μA	SOT23-5, SO8
LTC8332	2	1.8~5.5 V	10.0 V	15 μV	0.05 μV/℃	1.1 μV_{PP}	6 μs	55 μs	350 kHz	0.22 V/μs	52 μA	SO8, DFN8, MSOP8
LTC8333	1	1.8~5.5 V	10.0 V	15 μV	0.05 μV/℃	1.1 μV_{PP}	6 μs	55 μs	350 kHz	0.22 V/μs	26 μA	SOT23-5, SC70-5
LTC8381	1	1.8~5.5 V	10.0 V	50 μV	0.15 μV/℃	1.1 μV_{PP}	6 μs	55 μs	350 kHz	0.2 V/μs	27 μA	SOT23-5, SO8
LTC8382	2	1.8~5.5 V	10.0 V	50 μV	0.15 μV/℃	1.1 μV_{PP}	6 μs	55 μs	350 kHz	0.2 V/μs	54 μA	SO8, MSOP8
LTC8391	1	1.8~5.5 V	10.0 V	120 μV	0.5 μV/℃	2.0 μV_{PP}	6 μs	55 μs	330 kHz	0.2 V/μs	28 μA	SOT23-5, SO8
LTC8392	2	1.8~5.5 V	10.0 V	120 μV	0.5 μV/℃	2.0 μV_{PP}	6 μs	55 μs	330 kHz	0.2 V/μs	56 μA	SO8
LTC8551	1	1.8~5.5 V	10.0 V	8 μV	0.04 μV/℃	0.45 μV_{PP}	1.2 μs	35 μs	1.5 MHz	1.2 V/μs	125 μA	SOT23-5, SO8， MSOP8
LTC8552	2	1.8~5.5 V	10.0 V	8 μV	0.04 μV/℃	0.45 μV_{PP}	1.2 μs	35 μs	1.5 MHz	1.2 V/μs	250 μA	SO8, DFN8, MSOP8
LTC8554	4	1.8~5.5 V	10.0 V	8 μV	0.04 μV/℃	0.45 μV_{PP}	1.2 μs	35 μs	1.5 MHz	1.2 V/μs	500 μA	SO14, TSSOP14
LTC8553	1	1.8~5.5 V	10.0 V	8 μV	0.04 μV/℃	0.45 μV_{PP}	1.2 μs	35 μs	1.5 MHz	1.2 V/μs	125 μA	SOT23-5, SC70-5
LTC8581	1	1.8~5.5 V	10.0 V	40 μV	0.5 μV/℃	1.0 μV_{PP}	1.2 μs	35 μs	2.0 MHz	1.3 V/μs	150 μA	SOT23-5, SO8
LTC8582	2	1.8~5.5 V	10.0 V	40 μV	0.5 μV/℃	1.0 μV_{PP}	1.2 μs	35 μs	2.0 MHz	1.3 V/μs	300 μA	SO8, DFN8, MSOP8
LTC8584	4	1.8~5.5 V	10.0 V	40 μV	0.5 μV/℃	1.0 μV_{PP}	1.2 μs	35 μs	2.0 MHz	1.3 V/μs	600 μA	SO14, TSSOP14
LTC8591	1	1.8~5.5 V	10.0 V	90 μV	0.5 μV/℃	0.6 μV_{PP}	1.2 μs	35 μs	1.2 MHz	1.2 V/μs	125 μA	SOT23-5, SO8
LTC8592	2	1.8~5.5 V	10.0 V	90 μV	0.5 μV/℃	0.6 μV_{PP}	1.2 μs	35 μs	1.2 MHz	1.2 V/μs	250 μA	SO8, DFN8, MSOP8
LTC8593	1	1.8~5.5 V	10.0 V	90 μV	0.5 μV/℃	0.6 μV_{PP}	1.2 μs	35 μs	1.2 MHz	1.2 V/μs	125 μA	SOT23-5, SC70-5
LTC8594	4	1.8~5.5 V	10.0 V	40 μV	0.5 μV/℃	0.45 μV_{PP}	1.2 μs	35 μs	1.5 MHz	1.2 V/μs	500 μA	SO14, TSSOP14

NANO POWER AMPLIFIER AND COMPARATOR

Ensure 10-Year Coin-Cell Battery Life, even "Always ON" Sensing Applications Ultra-low power extend system life without battery replacement or charging!



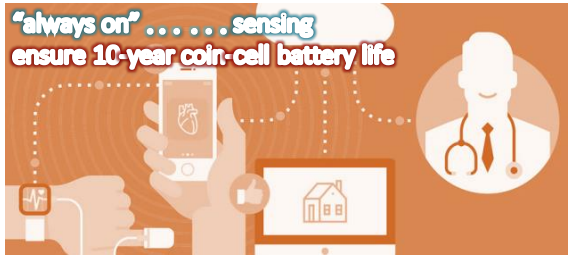
Nanopower — Maximize your battery life with <1µA power consumption per channel

Precision — Achieve high DC accuracy and AC performance while still consuming ultra-low power

Small footprint — Shrink your design with space-saving IC and package options

Cost optimized — Attain an excellent price-to-performance ratio for cost- and power-conscious systems

Device	Features	Advantages	Remarks	Packages
LTC8811	600nA ultra-low supply current, 1.7V~5.5V wide supply voltage, 15kHz bandwidth, V_{OS} ≤3.0mV, 6.3µV_{PP} low-noise, RRIO	Supports 1.8V/2.5V/3.3V/5V system, ultra-low power extends battery life of portable applications	Higher performance replacement for **≤1µA op-amps**: TI OPA369/ TLV881x, Microchip MCP604x, SG-Micro SGM804x/ SGM814x	SOT23-5, SC70-5
LTC8812				DFN-8L, SO8, MSOP8
LTC8813				SOT23-5, SC70-5
LTC8814				SO-14, TSSOP14
LTC8701	355nA ultra-low power comparators, 1.7V~ 5.5V wide supply voltage, 12µs propagation delay, internal 3mV hysteresis for clean switching, RRI, push-pull output	Integrated RF/EMI suppression, 5kV ESD protection, 30mA output short-circuit current, available in micro-size DFN package	Higher performance replacement for **≤1µA comparators**: TI TLV3491/ TLV3691, Microchip MCP654x, SG-Micro SGM870x	SOT23-5, SC70-5
LTC8702				DFN2x2-8, MSOP-8, SO-8
LTC8703				SOT23-5, SC70-5
LTC8704				TSSOP14, SO-14
LTC8705	Nano-power 355nA, 1.7V~5.5V, 13µs propagation delay, internal 3mV hysteresis, RRI, open-drain output	Integrated RF/EMI rejection filter, 5kV ESD protection, available in DFN package	Ultra-low power ideal for "Always-On" sensing applications	SC70-5, SOT23-5
LTC8706				DFN2x2-8, MSOP-8, SO-8
LTC8708				TSSOP14, SO-14



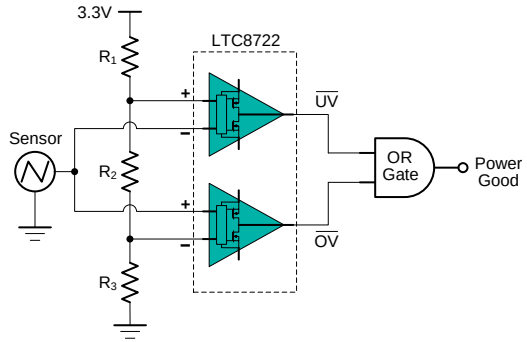
HIGH PERFORMANCE LOW MICRO-POWER COMPARATOR

Comparators without compromise

Linearin comparators feature faster speed and very low current losses. Because these devices incorporate a unique designed output stage to limit supply current fluctuations during switching, the problem of power supply interfering signal that is common to many other comparators is almost completely eliminated, and the overall power consumption under dynamic conditions is reduced, also, current surges can be limited during transition and high impedance can be maintained even in the event of power down.

General Purpose	Compatibility for all systems, including support for open drain, push-pull and more
High Speed	Low time-to-response and with support for various output types
Micro power	Power efficiency for all applications, including battery systems
Small footprint	Shrink your design with space-saving IC and package options
Cost optimized	Attain an excellent price-to-performance ratio for cost- and power-conscious systems

Device	Amp #	V_{DD}	Max. Rating (VDD)	I_Q	t_{PD+} (L–H)	t_{PD-} (H–L)	V_{HYST}	V_{OS-MAX}	Output	Packages
LTC8721	1	1.7~5.5 V	10.0 V	22 μA	78 ns	66 ns	3.0 mV	±3.5 mV	Push-Pull	SOT23-5, SC70-5
LTC8722	2	1.7~5.5 V	10.0 V	44 μA	78 ns	66 ns	3.0 mV	±3.5 mV	Push-Pull	SO8, DFN-8L, MSOP8
LTC8724	4	1.7~5.5 V	10.0 V	88 μA	78 ns	66 ns	3.0 mV	±3.5 mV	Push-Pull	SO-14, TSSOP-14
LTC8725	1	1.7~5.5 V	10.0 V	22 μA	-	66 ns	3.0 mV	±3.5 mV	Open-Drain	SOT23-5, SC70-5
LTC8726	2	1.7~5.5 V	10.0 V	44 μA	-	66 ns	3.0 mV	±3.5 mV	Open-Drain	SO8, DFN-8L, MSOP8
LTC8728	4	1.7~5.5 V	10.0 V	88 μA	-	66 ns	3.0 mV	±3.5 mV	Open-Drain	SO-14, TSSOP-14
LTC8741	1	1.8~5.5 V	10.0 V	135 μA	39 ns	33 ns	3 mV	±3.5 mV	Push-Pull	SOT23-5, SC70-5
LTC8742	2	1.8~5.5 V	10.0 V	265 μA	39 ns	33 ns	3 mV	±3.5 mV	Push-Pull	SO8, MSOP8, DFN-8L
LTC8744	4	1.8~5.5 V	10.0 V	530 μA	39 ns	33 ns	3 mV	±3.5 mV	Push-Pull	SO-14, TSSOP-14
LTC8745	1	1.8~5.5 V	10.0 V	135 μA	-	35 ns	3 mV	±4.0 mV	Open-Drain	SOT23-5, SC70-5
LTC8746	2	1.8~5.5 V	10.0 V	265 μA	-	35 ns	3 mV	±4.0 mV	Open-Drain	SO8, MSOP8, TSSOP8
LTC8748	4	1.8~5.5 V	10.0 V	530 μA	-	35 ns	3 mV	±4.0 mV	Open-Drain	SO-14, TSSOP-14
LTC331	1	1.8~5.5 V	10.0 V	37 μA	-	100 ns	3 mV	±5 mV	Open-Drain	SOT23-5, SC70-5
LTC393	2	1.8~5.5 V	10.0 V	74 μA	-	100 ns	3 mV	±5 mV	Open-Drain	SO8, MSOP8, TSSOP8



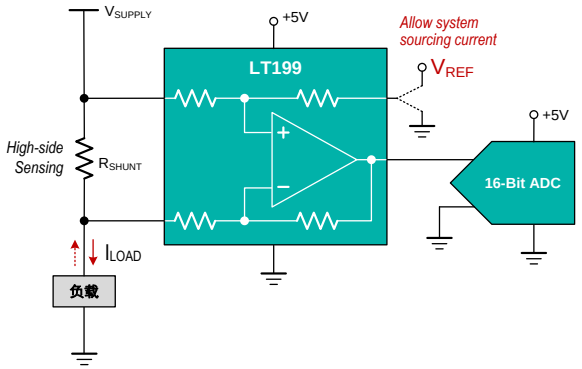
ZERO DRIFT CURRENT SENSE AMPLIFIER

Current sensing solutions for protection, feedback control and system monitoring

The current sense amplifier (CSA) monitors battery current to estimate battery life and determine safety of the system. It can help improve the system power management architecture in computing devices and can also be used to monitor solar cell efficiency. In tablets, smart phones and handheld devices with a small form factor, the system power management is required to extend battery life and optimize overall system performance. Servers require powerful power management to reduce system heating by reducing energy consumption. In some designs, the CSA also provides over-current protection to identify unexpected fault conditions such as open circuits or short circuits.

- Easy to design, more precise, less prone to noise
- Maximize your system with current sense amplifiers

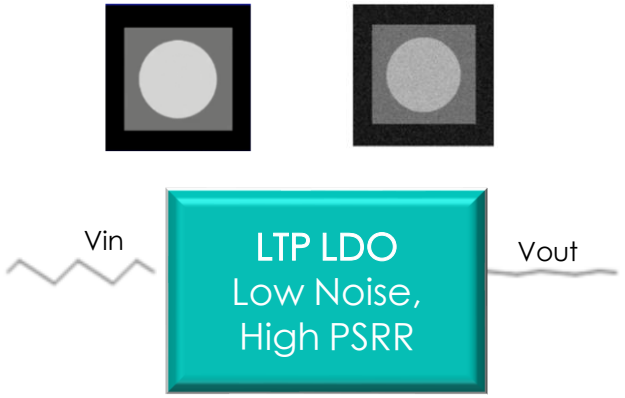
Device	Output	V_{DD}	V_{CM} Range	CMRR	V_{OS} (Max.)	V_{OS} TC (Max.)	Gain	Gain Error	I_Q	Packages
LT199G1	Voltage	2.5~18 V	-0.3~26 V	110 dB	150 μV	0.5 μV/℃	50 V/V	< ±1.5%	70 μA	SC70-6, TQFN10
LT199G2	Voltage	2.5~18 V	-0.3~26 V	110 dB	150 μV	0.5 μV/℃	100 V/V	< ±1.5%	70 μA	SC70-6, TQFN10
LT199G3	Voltage	2.5~18 V	-0.3~26 V	110 dB	150 μV	0.5 μV/℃	200 V/V	< ±1.5%	70 μA	SC70-6, TQFN10
LT180A1 / B1	Voltage	2.7~5.5 V	-0.2~26 V	100 dB	500 μV	1 μV/℃	20 V/V	< ±1%	80 μA	SOT23-5
LT180A2 / B2	Voltage	2.7~5.5 V	-0.2~26 V	100 dB	500 μV	1 μV/℃	50 V/V	< ±1 %	80 μA	SOT23-5
LT180A3 / B3	Voltage	2.7~5.5 V	-0.2~26 V	100 dB	500 μV	1 μV/℃	100 V/V	< ±1 %	80 μA	SOT23-5
LT180A4 / B4	Voltage	2.7~5.5 V	-0.2~26 V	100 dB	500 μV	1 μV/℃	200 V/V	< ±1 %	80 μA	SOT23-5



LOW NOISE, HIGH PSRR RF LDO

Achieve low noise in your precision system

The RF LDO， suitable for noise sensitive analog/RF circuits, such as ADC, RF receiver and transmitter, LNA, PLL, VCO, audio amplifier, image processing, instruments, precision sensors, high-resolution data converter, etc., to provide low noise and high PSRR



- Low Dropout → Stable operation when the input / output voltage is close
- Low Noise → Make useful signals cleaner
- High PSRR → Better Rejection of input ripple
- Discharge → Power on/off time sequence control, to protect the expensive and sensitive load system

Device	Input Voltage	Output Voltage fix	Output Current	Output Noise	PSRR(1kHz)	Iq	Vdrop	Output discharge Y/N	Packages
LTP31XX	1.9V~5.5V	1.2V ~ 4.5V	300mA	10uV	90dB	14uA	180mV	Y	SOT23-5, UTDFN1*1, DFN1*1
LTP33XX	2.5V~6.0V	1.1V ~ 3.6V	300mA	45uV	70dB	40uA	190mV	Y	SOT23-5, SC70-5,SOT89, UTDFN1*1, DFN1*1
LTP3452-XX	2.1V~5.5V	1.2V ~ 4.5V	500mA	20uV	76dB	18uA	180mV	Y	SOT23-5, SOT89, , DFN1*1
LTP3454-XX	1.2V~5.5V	0.5V ~ 3.8V	400mA	40uV	80dB	48uA	220mV	Y	SOT23-5, SOT89, , DFN1*1

LOW POWER LDO

Reduce the standby power consumption of your system and improve the battery life

Suitable for battery powered scenarios and extends battery life by reducing standby power consumption. Applied to the IOT, intelligent wear, handheld instruments/meters, wireless acquisition equipment, environmental monitoring, audio and video equipment, etc.

Low IQ → Low quiescent current to maximize battery life

High Voltage → High input voltage up to 45V

Discharge → Protect the expensive and sensitive load system

Device	Input Voltage	Output Voltage fix	Output Current	Iq	PSRR(1KHZ)	Output Noise	Vdrop	Output discharge Y/N	Enable Y/N	Packages
LTP3631	2.2V~5.5V	1.1V ~ 3.6V	200mA	0.6uA	55dB	55uV	250mV	Y	Y	SOT23-5, DFN1*1
LTP3633	2.2V~5.5V	1.1V ~ 3.6V	200mA	0.8uA	60dB	55uV	250mV	Y	N	SOT23-5
LTP3635	2.0V~5.5V	1.2V ~ 3.6V	300mA	0.4uA	55dB	100uV	170mV	Y	N	SOT23-3,SOT23-5
LTP3636	2.0V~5.5V	1.2V ~ 3.6V	300mA	0.8uA	55dB	100uV	170mV	Y	N	SOT23-3,SOT23-5
LTP3637	2.0V~5.5V	1.2V ~ 3.6V	300mA	0.8uA	55dB	100uV	170mV	Y	Y	SOT23-5
LTP3564	24V	3.0V, 3.3V, 3.6V, 5.0V	300mA	1.8uA	39dB	200uV	320mV	N	N	SOT23-3, SOT-89
LTP3558	36V	1.8V, 2.5V , 3.0V 3.3V, 3.6V, 5.0V	200mA	1.5uA	39dB	200uV	720mV	N	N	SOT23-3,SOT23-5, SOT-89, DFN1*1
LTP3559	45V	1.8V, 2.5V , 3.0V 3.3V, 3.6V, 5.0V	350mA	2.5uA	60dB	100uV	690mV	N	N	SOT23-3,SOT23-5, SOT-89, DFN1*1

LTP LDO
Low Iq

3 Market and Application

MARKET AND APPLICATION

Focus on the two application area for high performance amplifiers

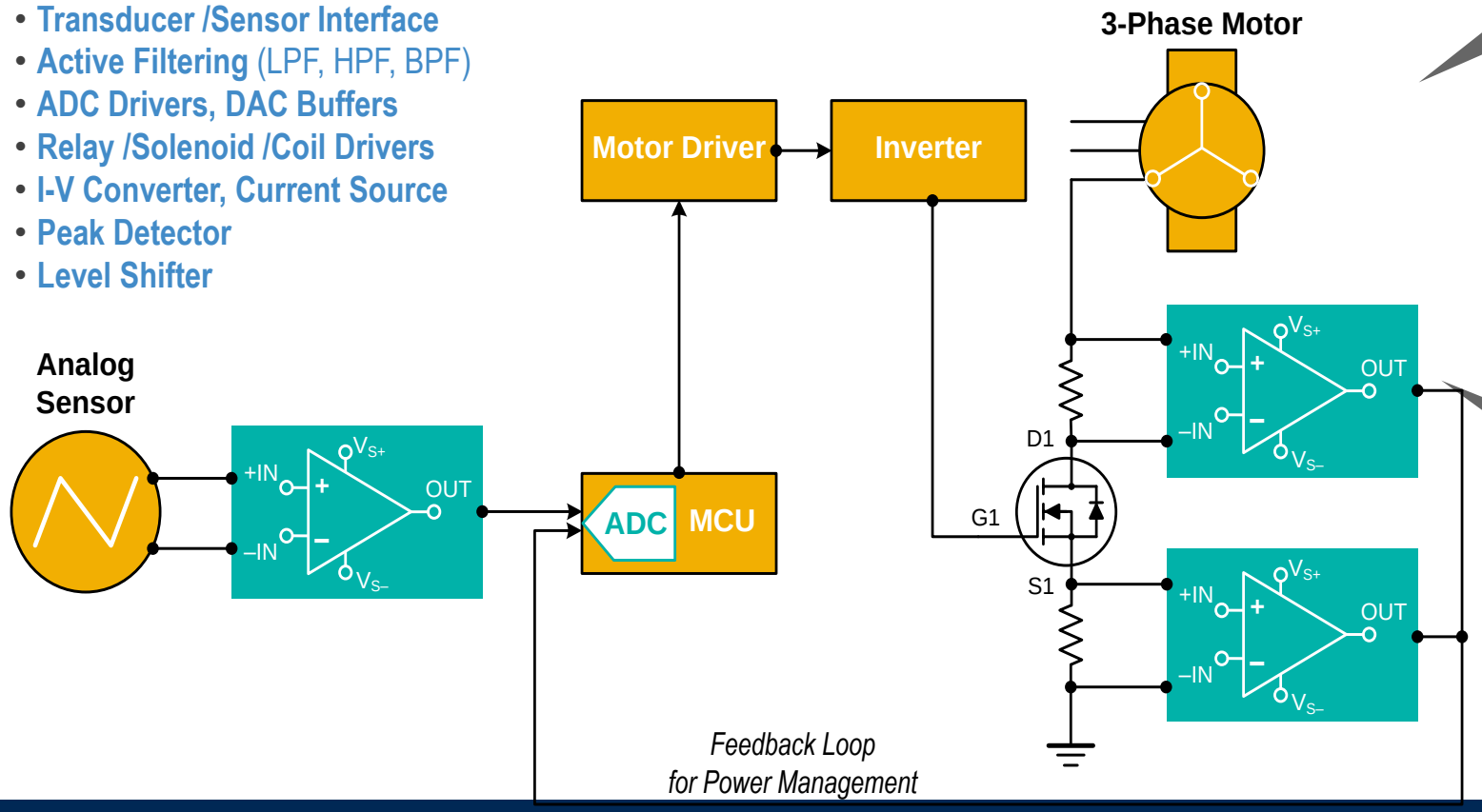
APPLICATIONS OF HIGH PERFORMANCE AMPLIFIERS

Two Primary Applications for High Performance Op-amps

- **Signal Conditioning** for Analog Sensors
- **Current Sensing / Power Monitor** for Power Management

Signal Conditioning

- Small Signal Amplification
- Transducer /Sensor Interface
- Active Filtering (LPF, HPF, BPF)
- ADC Drivers, DAC Buffers
- Relay /Solenoid /Coil Drivers
- I-V Converter, Current Source
- Peak Detector
- Level Shifter



High-side Current Sensing

Advantages	Disadvantages
• Detects load shorts • No ground path resistance	• More expensive due to high voltage fab

Power Supplies, Motor Control

- Current Sensing, Power Monitoring
- Voltage Detection
- Over-/Under- current Protection
- Overload Monitoring
- Reverse Current Protection
- Current Sensing for Feedback Control

Low-side Current Sensing

Advantages	Disadvantages
• Straight Forward • Inexpensive	• Cannot detect load shorts • Resistance in ground path

MAJOR MARKET OF HIGH PERFORMANCE AMPLIFIERS

'Analog' connects real-world and digital domains, and we're committed to high-performance analog chips and advanced sensor solutions!

WEARABLES

- The industry first compact DFN1.5x1.5 (general) packaged dual-channel high-performance amplifiers
- Featured products: 6.6μA ultra-low power, up to 500kHz bandwidth, 6μV_{PP} low noise, 2.5mV maximum V_{OS}

SMART HOME

- Featured products: Patented techniques ensure faster step response and optimized V_{ICM} step immunity for improving system efficiency in motor control
- A single customer shipped >20kk
- Innovative sensors help customers enhance product value and improve user experience

IOT DEVICES

- Zero-drift amplifiers support a wide range of precision applications
- Nano-power op-amps and comparators ensure 10-year coin-cell battery life
- Covering a wide range of new market applications

PORTABLES

- Including portable medicals, learning machines, K song microphone, barcode scanners, POS machines, walkie-talkies, portable speakers, etc.
- Low noise op-amps support audio signal conditioning; zero-drift op-amps accommodate precision applications …

BMS, LIGHTING, WIRELESS/FAST CHARGING …

- Precision op-amps provide cost-effective I/V detecting solution, zero-drift op-amps support precision current/voltage sensing
- Small size DFN-8L package supports wireless charging of smart watch/wristband

AUTOMOTIVES

- Fast step response op-amps support high-efficiency motor control solutions; Low noise amplifiers support audio applications; Innovative sensors help customers improve their product application experience…
- 5V devices but with >10V withstand voltage; Level-1 package further improving reliability …
- Shipped over 50kk in the market of electric vehicles & bikes (practically strict reliability requirements) and no quality issues

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THANK YOU

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World-class analog solution provider through relentless innovation

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