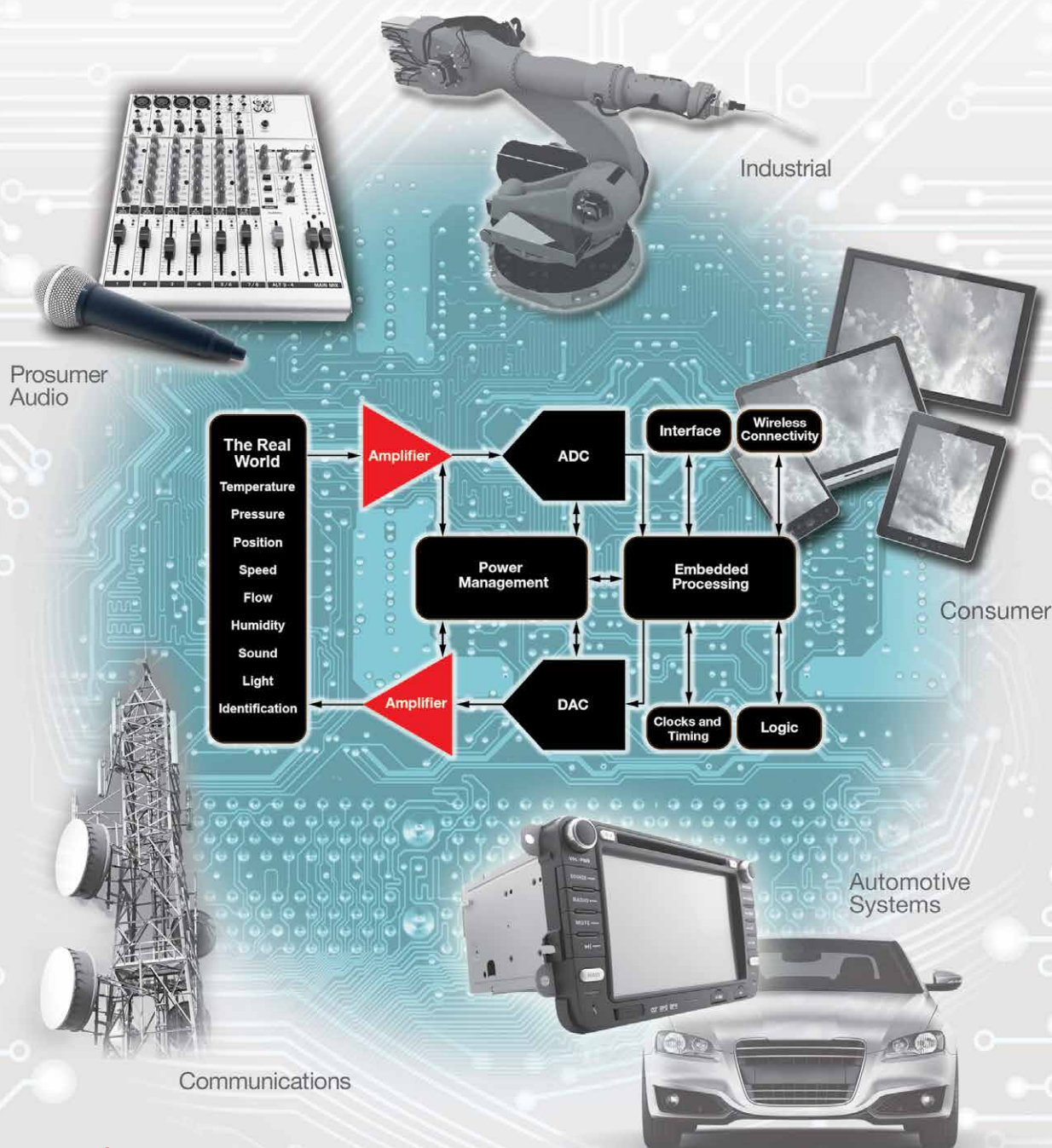


Precision Operational Amplifiers



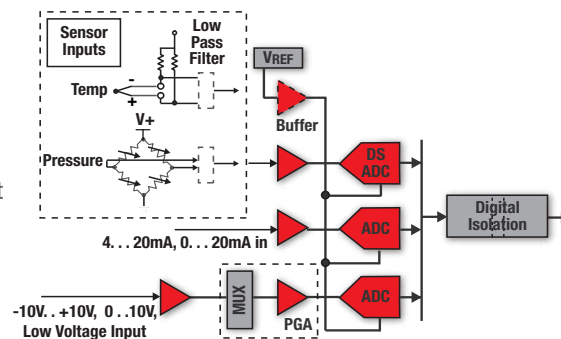
Precision Operational Amplifiers

Industrial Applications

Texas Instruments (TI) offers the industry's largest portfolio of precision amplifiers. TI services our industrial customers with leading performance in low-noise, precision offset, zero-drift and low-input bias current for precision sensor signal conditioning and accurate system monitoring.

Applications

- Programmable logic controllers
- Test and measurement equipment
- Industrial electronic weigh scales
- Factory automation
- Precision medical systems



Industrial Applications

Device	GBW (typ, MHz)	I _Q at 25°C (max, mA)	V _{OS} at 25°C (max, mV)	Drift (max, μV/°C)	I _B at 25°C (max)	Noise at 1 kHz (typ, nV/√Hz)	V _S Range (V)	Price*	
Sensor Input									
OPAx333	0.35	0.025	0.01	0.02	200 pA	55	1.8 to 5.5	0.95	
LMP2021	5	1.25	0.005	0.02	100 pA	11	2.2 to 5.5	1.20	
OPAx188	2	0.475	0.025	0.085	850 pA	8.8	4 to 36	0.96	
OPAx180	2	0.525	0.075	0.35	1 nA	10	4 to 36	1.26**	
OPAx277	1	0.825	0.02	1	1 nA	8	4 to 36	0.85	
OPAx140	11	2	0.12	1	10 pA	5.1	4.5 to 36	1.55	
OPAx376	5.5	0.95	0.025	1	10 pA	7.5	2.2 to 5.5	0.65	
LMP770x	2.5	1.1	0.2	1	1 pA	9	2.7 to 12	0.99	
OPAx369	0.012	0.0012	0.75	1.75	50 pA	290	1.8 to 5.5	0.65	
LMV861	31	2.25	1	2.6	500 pA	8	2.7 to 5.5	0.65	
LMP7721	17	1.3	0.15	4	20 fA	6.5	1.8 to 5.5	4.70	
OPAx320S	20	1.75	0.15	5	0.9 pA	8.5	1.8 to 5.5	0.80	
OPAx320	20	1.75	0.15	5	0.9 pA	8.5	1.8 to 5.5	0.80	
PGA281	6 (Gain=4)	0.13	±(20 + 235/G)	±(0.17 + 0.45/G) μV	2 nA	22 (Gain=128)	2.7 to 5.5	2.55	
ADC Input									
OPAx365	50	5	0.2	1 (typ)	10 pA	13	2.2 to 5.5	0.65	
OPAx211	45	4.5	0.125	0.85	175 nA	1.1	4.5 to 36	3.45	
OPA827	22	5.2	0.15	2	10 pA	4	8 to 36	3.75	
OPAx227	8	3.8	0.75	2	10 nA	3	5 to 36	1.10	
LMP773x	22	2.7	0.5	0.5	30 nA	2.9	1.8 to 5.5	1.05	
OPAx335	2	0.35	0.005	0.05	200 pA	62	2.7 to 5.5	1.00	
Active Filters									
OPA1662	22	1.8	1.5	8	1200 nA	3.3	3 to 36	0.95	
LMP867x	55	6	0.4	2	75 nA	4.7	5 to 40	1.20	
LM6211	17	1.05	2.5	2 (typ)	10 pA	5.5	5 to 24	1.08	
OPAx376	5.5	0.95	0.025	1	10 pA	7.5	2.2 to 5.5	0.65	
OPAx604	20	7	5	8 (typ)	50 pA	11	9 to 48	1.05	
OPAx171	3	0.595	1.8	2	15 pA	14	2.7 to 36	0.40	
OPAx350	38	7.5	0.5	4 (typ)	10 pA	18	2.7 to 5.5	1.15	
OPAx137	1	0.27	3	15 (typ)	100 pA	45	4.5 to 36	0.60	
High Output Drivers (I_{SC} or I_{OUT} ≥ 30 mA)									
Device	GBW (typ, MHz)	I _Q at 25°C (max, mA)	V _{OS} at 25°C (max, mV)	Drift (max, μV/°C)	I _B at 25°C (max)	Noise at 1 kHz (typ, nV/√Hz)	I _{SC} or I _{OUT} (typ)	V _S Range (V)	Price*
OPAx564	17	50	20	10 (typ)	100 pA	102.8	I _{OUT} = 1.5 A	7 to 24	2.75
LM732x	20	1.7	6	2 (typ)	1 μA	15	I _{OUT} = +70/-85 mA	2.5 to 32	0.85
LM7332	21	1.25	5	2 (typ)	2 μA	17	I _{OUT} = +65/-100 mA	2.5 to 32	1.10
OPAx209	18	2.5	0.15	1	4.5 nA	2.2	I _{SC} = +65 mA	4.5 to 36	0.95
OPAx141	10	2.3	3.5	10	20 pA	6.5	I _{SC} = +36/-30 mA	4.5 to 36	0.85
OPA827	22	5.2	0.15	2	50 pA	4	I _{OUT} = 30 mA	8 to 36	3.75
Featured Data Converters									
Device	Recommended Amps	Resolution (Bits)	Sample Rate max (SPS)	No. of Input Channels	Interface	SNR (dB)	Architecture	Price*	
ADS8568	OPA211	16	500 kSPS	8	Parallel CMOS, Serial SPI	91.5	SAR	15.90	
ADS8638	OPA140	12	1 MSPS	8	Serial	71.8	SAR	3.25	
ADS8332	OPA320	16	500 kSPS	8	Serial	91	SAR	6.25	
ADS8881	THS4521	18	1 MSPS	1	Serial	100	SAR	19.95	
Device	Recommended Amps	Resolution (Bits)	Channel Count	Interface	Output Voltage Range (V)	Price*			
DAC8564	OPAx140	16	4	Serial SPI	0 to 5.5	5.95			
DAC7311	OPAx171	12	1	Serial SPI	0 to 5.5	0.95			

*Suggested resale price, for single channel, in U.S. dollars in quantities of 1,000. **Dual channel pricing.

New products are listed in bold red.

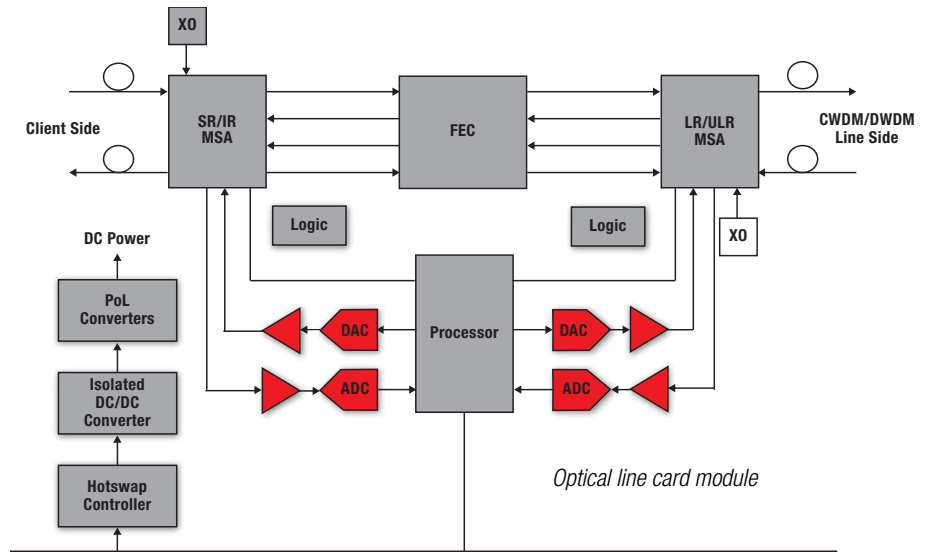
Precision Operational Amplifiers

Communications Applications

Precision amplifiers are required to maintain accuracy and efficiency in monitoring and control functions found in base stations, optical networking, and telecom infrastructure. The TI amplifier portfolio combines precision measurement with fast response times, low noise and low input bias currents to address all of the functional requirements of precision networking systems.

Applications

- Optical networking
- Telecom infrastructure
- Wired networking
- Baseband stations



Communications Applications

Device	GBW (typ, MHz)	Noise at 1 kHz (typ, nV/√Hz)	V _{OS} at 25°C (max, mV)	I _B at 25°C (max)	CMRR (min, dB)	I _Q at 25°C (max, mA)	V _S Range (V)	Rail to Rail	Price*			
Monitoring and Control												
OPAx211	45	1.1	0.125	175 nA	114	4.5	4.5 to 36	Out	3.45			
OPAx322	20	8.5	2	10 pA	90	1.75	1.8 to 5.5	In, Out	0.50			
OPAx227	8	3	0.75	10 nA	120	3.8	5 to 36	—	1.10			
OPAx376	5.5	7.5	0.025	10 pA	76	0.95	2.2 to 5.5	Out	0.65			
OPAx335	2	62	0.005	200 pA	110	0.35	2.7 to 5.5	Out	1.00			
OPAx170	1.2	19	1.8	15 pA	104	0.145	2.7 to 36	Out	0.40			
OPAx171	1.2	14	1.8	15 pA	104	0.595	2.7 to 36	Out	0.40			
OPAx317	0.3	55	0.09	275 pA	95	0.035	1.8 to 5.5	In, Out	0.55			
OPAx330	0.35	55	0.05	500 pA	100	0.035	1.8 to 5.5	In, Out	0.70			
Active Filters												
OPAx365	50	13	0.2	10 pA	100	5	2.2 to 5.5	In, Out	0.65			
OPAx209	18	2.2	0.15	4.5 nA	120	2.5	4.5 to 36	Out	0.95			
OPAx364	7	17	0.5	10 pA	74	0.75	1.8 to 5.5	In, Out	0.60			
OPAx377	5.5	7.5	1	10 pA	70	1.05	2.2 to 5.5	Out	0.40			
OPAx313	1	25	2.5	10 pA	70	0.06	1.8 to 5.5	In, Out	0.30			
OPAx314	3	14	2.5	10 pA	75	0.19	1.8 to 5.5	In, Out	0.30			
OPA1S2384/5	250	26 (f=10 MHz)	8	50 pA	66	12	2.7 to 5.5	In, Out	1.10**			
Wide GBW/ADC Drivers												
OPAx354	100	6.5	8	50 pA	66	7.5	2.7 to 5.5	In, Out	0.70			
OPAx365	50	13	0.2	10 pA	100	5	2.2 to 5.5	In, Out	0.65			
OPAx350	38	18	0.5	10 pA	74	7.5	2.7 to 5.5	In, Out	1.15			
OPA827	22	4	0.15	50 pA	114	5.2	8 to 36	—	3.75			
OPAx322	20	8.5	2	10 pA	90	1.9	1.8 to 5.5	In, Out	0.50			
Featured Data Converters												
Device	Recommended Amps		Resolution (Bits)		Channel Count		Interface		Output Voltage Range (V)		Price*	
DAC8568	OPAx140		16		8		Serial SPI		0 to 5.5		10.95	
DAC7678	OPAx171		12		8		Serial I ² C		0 to 5.5		6.00	
DAC8562	OPAx171		16		2		Serial SPI		0 to 5		4.20	
DAC7311	OPAx314		12		1		Serial SPI		0 to 5.5		0.95	
Device	DAC/ADC Res (Bits)	No. ADC Inputs	No. DAC Outputs	ADC Sample-Rate (kSPS)	ADC Input Range (V)	DAC Output Voltage-max (V)	No. of Local/Remote Temp Sensors	No. of GPIOs	Interface	Additional Features	Packages	Price
LMP92001	12	16 SE	12	100	0 to 5	0 to 5	1/None	8	I ² C	Out-of-range alarms	WQFN-54	9.50
LMP92018/AMC7891	10	8 SE	4	500	0 to 5	5	1/None	12	SPI	Out-of-range alarms	QFN-36	4.50

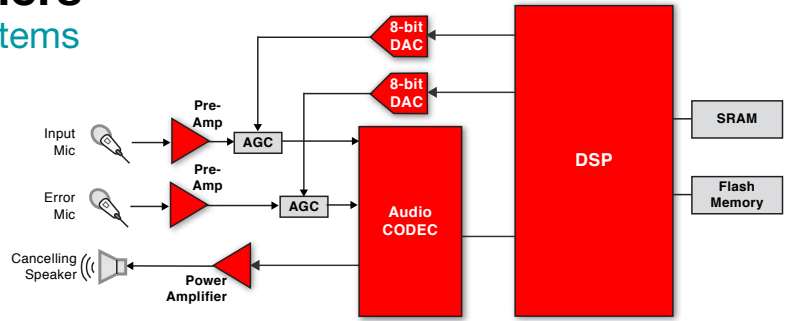
*Suggested resale price, for single channel, in U.S. dollars in quantities of 1,000. **Dual channel pricing.

Preview products are listed in bold blue. New products are listed in bold red.

Precision Operational Amplifiers

Audio Applications and Automotive systems

From headlights to taillights and all systems in between, TI offers precision amplifiers that provide the perfect combination of performance, package and price for the modern automotive. TI also offers a wide range of consumer and prosumer audio precision amplifiers to meet the varying demands of our customers.



Consumer

- White goods
- Computers/tablets
- Cellphones
- Security systems

Prosumer Audio

- Audio mixer
- A/V equipment
- DVD/Blu-Ray players
- Car audio systems

Automotive Systems

- Advanced driver/assistance system
- Body electronics
- Infotainment
- Power train
- Safety

Consumer Applications

Device	I _Q at 25°C (max, mA)	GBW (typ, MHz)	V _{OS} at 25°C (max, mV)	I _B at 25°C (max)	Noise at 1 kHz (typ, nV/√Hz)	V _S Range (V)	Rail to Rail	Price*
Low Power								
OPA320S***	1.75	20	0.15	0.9	8.5	1.8 to 5.5	In, Out	0.80
TLV27x	0.66	3	5	60 pA	39	2.7 to 16	Out	0.35
OPA314	0.19	3	2.5	10 pA	14	1.8 to 5.5	In, Out	0.30
OPA170	0.145	1.2	1.8	10 pA	19	2.7 to 36	Out	0.40
LMV651	0.116	12	1.5	100 nA	17	2.7 to 5.5	Out	0.40
OPA348	0.065	1	5	10 pA	35	2.1 to 5.5	In, Out	0.20
OPA313	0.06	1	2.5	10 pA	25	1.8 to 5.5	In, Out	0.30
OPA317	0.035	0.3	0.09	275 pA	55	1.8 to 5.5	In, Out	0.55
OPA330	0.035	0.35	0.05	500 pA	55	1.8 to 5.5	In, Out	0.70
OPA379	0.0055	0.09	1.5	50 pA	80	1.8 to 5.5	In, Out	0.40
OPA369	0.0012	0.012	0.75	50 pA	290	1.8 to 5.5	In, Out	0.65
LPV521	0.0004	0.0062	1	1 pA	265	1.6 to 5.5	In, Out	0.49
Low-Voltage								
OPA322	1.75	20	2	10 pA	8.5	1.8 to 5.5	In, Out	0.50
LMV951	0.78	2.8	2.8	85 nA	25	0.9 to 3	In, Out	0.52
OPA364	0.75	7	0.9	10 pA	17	1.8 to 5.5	In, Out	0.60
OPA374	0.75	6.5	5	10 pA	30	2.3 to 5.5	In, Out	0.36
LMV85x	0.52	8	1	10 pA	11	2.7 to 5.5	Out	0.63
OPA378	0.15	0.9	0.05	550 pA	20	2.2 to 5.5	In, Out	0.70
OPA349	0.002	0.065	10	10 pA	300	1.8 to 5.5	In, Out	0.45

Automotive Systems

Device	GBW (typ, MHz)	Noise at 1 kHz (typ, nV/√Hz)	V _{OS} at 25°C (max, mV)	I _B at 25°C (max)	CMRR (min, dB)	I _Q at 25°C (max, mA)	V _S Range (V)	Rail to Rail	Price*
OPA333-Q1	0.35	18	0.01	200 pA	106	0.025	1.8 to 5.5	In, Out	1.15
OPA348-Q1	1	35	5	10 pA	60	0.065	2.1 to 5.5	In, Out	0.41**
OPA376-Q1	5.5	7.5	0.025	10 pA	76	0.95	2.2 to 5.5	Out	0.80
OPA1662-Q1	22	3.3	1.5	1200 nA	106	1.8	3 to 36	In, Out	1.21
OPA171-Q1	1.2	14	1.8	15 pA	104	0.595	2.7 to 36	Out	0.47
OPA365-Q1	50	13	0.2	10 pA	100	5	2.2 to 5.5	In, Out	0.80
LMV321-N-Q1	1	46	7	250 nA	50	170	2.7 to 5.5	Out	0.39
LMC6035-Q1	1.4	27	5	90 pA	63	1.6	2.0 to 15.5	Out	0.61
LMV93x-N-Q1	1.4	60	4	35 nA	60	0.185	1.8 to 5.5	Out	0.46
OPA322-Q1	20	8.5	2	10 pA	90	1.75	1.8 to 5.5	In, Out	0.63

Prosumer Audio

Device	GBW (typ, MHz)	SR (typ, V/μs)	THD+N at 1 kHz (typ, %)	Noise at 1 kHz (typ, nV/√Hz)	A _{OL} (min, dB)	V _S Range (V)	Package	Price*
LME4990	110	22	0.0001	0.88	120	10 to 36	MSOP, QFN	1.75
OPA1611/1612	40	27	0.00015	1.1	130	4.5 to 36	SOIC	1.75
OPA1632	180	50	0.00022	1.3	66	±2.5 to ±16	SOIC, MSOP-PowerPad	1.84
OPA1602/1604	35	20	0.0003	2.5	120	5 to 36	MSOP, TSSOP, SOIC	1.45**
LME49870	55	20	0.0003	2.7	125	±2.5 to ±22	MSOP	1.05
LME49600	160	2000	0.00035	2.9	NA	±2.25 to ±18	TO-263	4.05
OPA1652/1654	18	10	0.0005	4.5	106	4.5 to 36	MSOP, TSSOP, SOIC	0.65**
OPA1641/1642/1644	11	20	0.0005	5	120	4.5 to 36	MSOP, TSSOP, SOIC	0.95
OPA1662/1664	22	17	0.0006	3.3	110	3 to 36	MSOP, TSSOP, SOIC	0.95**

*Suggested resale price, for single channel, in U.S. dollars in quantities of 1,000. **Dual channel pricing.

***I_Q (in shutdown); 0.2μA/ch (typ)

Preview products are listed in bold blue. New products are listed in bold red.

Precision Operational Amplifiers

Selection Tree

Precision Amp Quick-Select – Low Voltage ($V_s \leq 5.5\text{ V}$)

Low power ($I_Q < 500\ \mu\text{A}$)	Low I_B ($\leq 10\ \text{pA}$)	High Output Current ($> 30\ \text{mA}$)	Low V_{OS} ($\leq 500\ \mu\text{V}$)	Wide GBW ($> 5\ \text{MHz}$)	Low Noise ($\leq 10\ \text{nV}/\sqrt{\text{Hz}}$)	Rail-to-Rail In & Out
LPV521 0.4 μA , 6.2 kHz	LMP7721 0.02 pA, 17 MHz	OPA350 $I_{sc} = \pm 80\ \text{mA}$, $SR = 22\ \text{V}/\mu\text{s}$	OPA376 0.025 mV, 0.26 $\mu\text{V}/\text{C}$	LMV791 17 MHz, 9.5 $\text{V}/\mu\text{s}$	LMP7715 5.8 $\text{nV}/\sqrt{\text{Hz}}$	OPA335 $V_{OS} = 0.005\ \text{mV}$
OPA369 1.2 μA , 12 kHz	OPA320 0.9 pA, 20 MHz	OPA353 $I_{sc} = \pm 80\ \text{mA}$, $SR = 22\ \text{V}/\mu\text{s}$	LMP7721 0.15 mV, 1.5 $\mu\text{V}/\text{C}$	OPA320 20 MHz, 10 $\text{V}/\mu\text{s}$	LMP7721 6.5 $\text{nV}/\sqrt{\text{Hz}}$	OPA333 $V_{OS} = 0.01\ \text{mV}$
OPA349 2 μA , 65 kHz	LMV791 1 pA, 17 MHz	OPA320 $I_{OUT} = 65\ \text{mA}$, $SR = 16\ \text{V}/\mu\text{s}$	OPA320 0.15 mV, 1.5 $\mu\text{V}/\text{C}$	OPA322 20 MHz, 10 $\text{V}/\mu\text{s}$	OPA376, OPA377 7.5 $\text{nV}/\sqrt{\text{Hz}}$, 0.8 μVpp	OPA376 $V_{OS} = 0.025\ \text{mV}$
OPA333 25 μA , 350 kHz	LMC6001 2 pA, 1.3 MHz	OPA320 $I_{OUT} = 65\ \text{mA}$, $SR = 16\ \text{V}/\mu\text{s}$	LMP2231 0.15 mV, 0.3 $\mu\text{V}/\text{C}$	LMV861 31 MHz, 18 $\text{V}/\mu\text{s}$	LMV861 8 $\text{nV}/\sqrt{\text{Hz}}$	OPA320 0.15 mV, zero-crossover
OPA348 65 μA , 1 MHz	OPA313 10 pA, 1 MHz	OPA322 $I_{OUT} = 65\ \text{mA}$, $SR = 10\ \text{V}/\mu\text{s}$	OPA365 0.2 mV, 1 $\mu\text{V}/\text{C}$	OPA350 38 MHz, 22 $\text{V}/\mu\text{s}$	OPA320, OPA322 8.5 $\text{nV}/\sqrt{\text{Hz}}$, 2.8 μVpp	OPA365 $V_{OS} = 0.2\ \text{mV}$, zero-crossover
LMV651 116 μA , 12 MHz	OPA314 10 pA, 3 MHz		LMP7731 0.5 mV, 1 $\mu\text{V}/\text{C}$	OPA353 44 MHz, 22 $\text{V}/\mu\text{s}$	OPA365 13 $\text{nV}/\sqrt{\text{Hz}}$, 5 μVpp	OPA364 $V_{OS} = 0.5\ \text{mV}$, zero-crossover
OPA378 150 μA , 0.9 MHz	OPA365 10 pA, 50 MHz		OPA364 0.5 mV, 3 $\mu\text{V}/\text{C}$	OPA365 50 MHz, 25 $\text{V}/\mu\text{s}$		OPA369 $V_{OS} = 0.75\ \text{mV}$, zero-crossover
OPA313 50 μA , 1 MHz	OPA348 10 pA, 1 MHz		OPA350 0.5 mV, 4 $\mu\text{V}/\text{C}$	OPA354 100 MHz, 150 $\text{V}/\mu\text{s}$		OPA369 $V_{OS} = 0.75\ \text{mV}$, zero-crossover
OPA314 190 μA , 3 MHz	OPA322 10 pA, 20 MHz		Zero-Drift ($\leq 0.1\ \mu\text{V}/\text{C}$)			LPV521 $V_{OS} = 1\ \text{mV}$
LMV831 270 μA , 3.3 MHz	OPA376 10 pA, 5.5 MHz		LMP2021 0.005 mV, 0.02 $\mu\text{V}/\text{C}$			OPA313 $V_{OS} = 2.5\ \text{mV}$
OPA335 350 μA , 2 MHz	LMV831 10 pA, 3.3 MHz		OPA335 0.005 mV, 0.02 $\mu\text{V}/\text{C}$			OPA314 $V_{OS} = 2.5\ \text{mV}$
	LMV85x 10 pA, 8 MHz		OPA333 0.01 mV, 0.02 $\mu\text{V}/\text{C}$			OPA348 $V_{OS} = 5\ \text{mV}$
			OPA330 0.05 mV, 0.02 $\mu\text{V}/\text{C}$			

Precision Amp Quick-Select – High Voltage ($V_s > 5.5\ \text{V}$)

Low power ($I_Q < 750\ \mu\text{A}$)	Low I_B ($\leq 20\ \text{pA}$)	High Output Current ($> 30\ \text{mA}$)	Low V_{OS} ($\leq 500\ \mu\text{V}$)	Wide GBW ($> 5\ \text{MHz}$)	Low Noise ($\leq 10\ \text{nV}/\sqrt{\text{Hz}}$)	Performance Audio (Noise, THD at 1 kHz)
LPV511 1.2 μA , 25 kHz	OPA827 10 pA, 22 MHz	LM7332 $I_{out} = \pm 70\ \text{mA}$, $SR = 15.2\ \text{V}/\mu\text{s}$	OPA277 0.02 mV, 0.1 $\mu\text{V}/\text{C}$	LMP8671 55 MHz, 20 $\text{V}/\mu\text{s}$	OPA211 1.1 $\text{nV}/\sqrt{\text{Hz}}$, 0.08 μVpp	LME49990 0.9 $\text{nV}/\sqrt{\text{Hz}}$, 0.00001%
OPA241 30 μA , 35 kHz	LM6211 10 pA, 17 MHz	LM7321 $I_{out} = +65/-100\ \text{mA}$, $SR = 18\ \text{V}/\mu\text{s}$	OPA140 0.12 mV, 1 $\mu\text{V}/\text{C}$	OPA211 45 MHz, 27 $\text{V}/\mu\text{s}$	OPA209 2.2 $\text{nV}/\sqrt{\text{Hz}}$, 0.13 μVpp	OPA1611/12 1.1 $\text{nV}/\sqrt{\text{Hz}}$, 0.000015%
OPA251 38 μA , 35 kHz	OPA627 10 pA, 16 MHz	OPA209 $I_{sc} = \pm 65\ \text{mA}$, $SR = 6.4\ \text{V}/\mu\text{s}$	OPA211 0.12 mV, 0.35 $\mu\text{V}/\text{C}$	OPA827 22 MHz, 28 $\text{V}/\mu\text{s}$	LMP8671 2.5 $\text{nV}/\sqrt{\text{Hz}}$	OPA1632 1.3 $\text{nV}/\sqrt{\text{Hz}}$, 0.000022%
OPA170 145 μA , 1.2 MHz	OPA140 10 pA, 11 MHz	OPA827 $I_{sc} = \pm 65\ \text{mA}$, $SR = 28\ \text{V}/\mu\text{s}$	OPA209 0.15 mV, 1 $\mu\text{V}/\text{C}$	OPA727 20 MHz, 30 $\text{V}/\mu\text{s}$	OPA227 3 $\text{nV}/\sqrt{\text{Hz}}$, 0.09 μVpp	OPA1602 2.5 $\text{nV}/\sqrt{\text{Hz}}$, 0.00003%
OPA188 475 μA , 2 MHz	OPA141 10 pA, 10 MHz	OPA141 $I_{sc} = +36/-30\ \text{mA}$, $SR = 20\ \text{V}/\mu\text{s}$	OPA827 0.15 mV, 1.5 $\mu\text{V}/\text{C}$	LM7321 20 MHz, 18 $\text{V}/\mu\text{s}$	OPA827 4 $\text{nV}/\sqrt{\text{Hz}}$, 0.25 μVpp	LME49870 2.7 $\text{nV}/\sqrt{\text{Hz}}$, 0.00003%
TLV237x 560 μA , 3 MHz	OPA171 10 pA, 3 MHz	OPA564 $I_{OUT} = 1.5\ \text{A}$, $SR = 20\ \text{V}/\mu\text{s}$	LMP8671 0.4 mV, 2 $\mu\text{V}/\text{C}$	LM7332 20 MHz, 13.2 $\text{V}/\mu\text{s}$	OPA140 5.1 $\text{nV}/\sqrt{\text{Hz}}$, 0.25 μVpp	LME49600 2.9 $\text{nV}/\sqrt{\text{Hz}}$, 0.000035%
TLV27x 660 μA , 3 MHz	OPA170 10 pA, 1.2 MHz	OPA211 $I_{OUT} = 30\ \text{mA}$, $SR = 27\ \text{V}/\mu\text{s}$	Zero-Drift ($\leq 0.1\ \mu\text{V}/\text{C}$)	OPA140 11 MHz, 20 $\text{V}/\mu\text{s}$	OPA188 8.8 $\text{nV}/\sqrt{\text{Hz}}$, 0.25 μVpp	OPA1662 3.3 $\text{nV}/\sqrt{\text{Hz}}$, 0.00006%
OPA171 475 μA , 3 MHz			OPA2180 0.075 mV, 0.35 $\mu\text{V}/\text{C}$	OPA141 10 MHz, 20 $\text{V}/\mu\text{s}$	OPA180 10 $\text{nV}/\sqrt{\text{Hz}}$, 0.25 μVpp	OPA1652 4.5 $\text{nV}/\sqrt{\text{Hz}}$, 0.00005%
			OPA735 0.005 mV, 0.01 $\mu\text{V}/\text{C}$	OPA211 45 MHz, 27 $\text{V}/\mu\text{s}$		
			OPA188 0.025 mV, 0.085 $\mu\text{V}/\text{C}$			

New products are listed in bold red.

Precision Operational Amplifiers

Analog Packaging Solutions Data - Snapshot for Op Amps

Surface Mount Packages

Pin Count	Package Type	TI Package Designator	Body Length min (mm)	Body Length max (mm)	Body Width min (mm)	Body Width max (mm)	Lead Width min (mm)	Lead Width max (mm)	Pitch Nom (mm)	Lead Foot min (mm)	Lead Foot max (mm)	Pkg Width min (mm)	Pkg Width max (mm)	Height max (mm)
5	SC-70	DCK	1.85	2.15	1.1	1.4	0.15	0.3	0.65	0.26	0.46	1.8	2.4	1.1
5	SOT23	DBV	2.8	3	1.5	1.7	0.3	0.5	0.95	0.35	0.55	2.6	3	1.45
5	SOT553	DRL	1.5	1.7	1.1	1.3	0.15	0.25	0.5	0.2	0.4	1.5	1.7	0.6
6	SOT23	DBV	2.8	3	1.5	1.7	0.25	0.5	0.95	0.35	0.55	2.6	3	1.45
6	SOT563	DRL	1.5	1.7	1.1	1.3	0.15	0.25	0.5	0.2	0.4	1.5	1.7	0.6
6	X2SON (Small Scale SON)	DSF	0.95	1.05	0.95	1.05	0.14	0.2	0.35	0.35	0.45	0.95	1.05	0.4
8	SOIC	D	4.8	5	3.81	4	0.35	0.51	1.27	0.4	1.12	5.8	6.2	1.75
8	SON	DRG	2.9	3.1	2.9	3.1	0.2	0.3	0.5	0.4	0.6	2.9	3.1	0.8
8	MSOP	DGK	2.9	3.1	2.9	3.1	0.25	0.38	0.65	0.4	0.7	4.75	5.05	1.1
8	VSSOP/US8	DCU	1.9	2.1	2.2	2.4	0.17	0.25	0.5	0.2	0.35	3	3.2	0.9
8	VSSOP/US8	DDU	1.9	2.1	2.2	2.4	0.17	0.25	0.5	0.2	0.35	3	3.2	0.9
8	SOT23	DCN	2.8	3	1.45	1.75	0.22	0.38	0.65	0.3	0.6	2.6	3	1.45
8	X2QFN (Small Scale QFN)	RUG	1.45	1.55	1.45	1.55	0.2	0.3	0.5	0.3	0.4	1.45	1.55	0.4
14	QFN	RGY	3.35	3.65	3.35	3.65	0.18	0.3	0.5	0.3	0.5	3.35	3.65	1
14	SOIC	D	8.55	8.75	3.81	4	0.35	0.51	1.27	0.4	1.12	5.8	6.2	1.75
14	TSSOP	PW	4.9	5.1	4.3	4.5	0.19	0.3	0.65	0.5	0.75	6.2	6.6	1.2
16	TSSOP	PW	4.9	5.1	4.3	4.5	0.19	0.3	0.65	0.5	0.75	6.2	6.6	1.2
16	SOIC	D	9.8	10	3.81	4	0.35	0.51	1.27	0.4	1.12	5.8	6.2	1.75
20	QFN	RGY	4.35	4.65	3.35	3.65	0.18	0.3	0.5	0.3	0.5	3.35	3.65	1

Surface Mount Packages

Pin Count	Package Type	TI Package Designator	Pkg Length Nom (mm)	Pkg Width Nom (mm)	Thickness Nom (mm)	Pitch Nom (mm)	Height max (mm)
8	DSBGA	YZD	1.3	2.3	0.65	0.5	1
5	DSBGA	YFF	1.1	1.45	0.4	0.4	0.625

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