

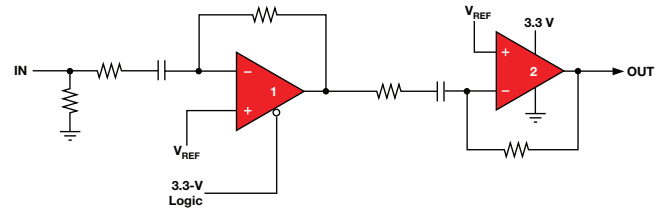
Standard Amplifier Quick Select Guide

Technology ideal for all applications



Amplifiers

Texas Instruments offers a wide range of standard operational amplifiers, including JFET, low-voltage, precision, high-voltage, audio, high-speed, and special function amplifiers. TI's operational amplifiers fit in a wide variety of applications performing various functions like filtering, driving ADC's, buffering DAC's, level shifting, and adding gain to analog signal chains.



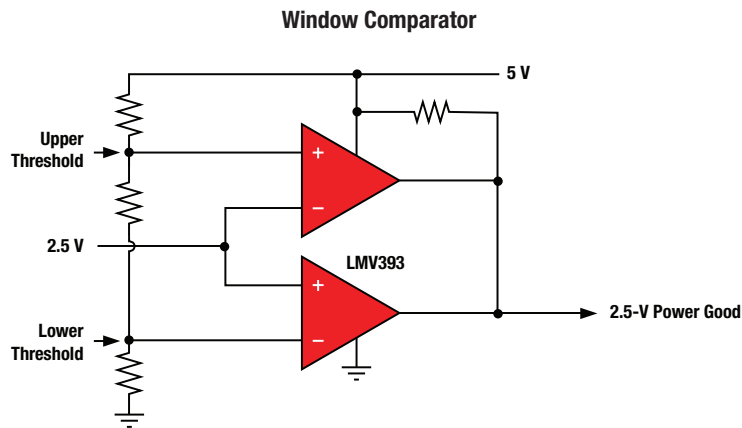
Device	No. of Outputs	Vrange (V)	I _q per Channel (mA)	GBW (MHz)	Slew Rate (V/us)	V _{os} at 25 °C (mV)	Offset Drift (μV/C)	IIB (max)
JFET								
LF347/B	4	7 to 36	2.75	3	13	10/5	18	200 pA
LF353	2	7 to 36	3.25	3	13	10	10	200 pA
LF411/2	1/2	7 to 36	3.4	3	13	2/3	10	200 pA
TL031	1	10 to 30	0.28	1.1	5.1	2	6	200 pA
TL032/A	2	10 to 30	0.28	1.1	5.1	1.5/0.8	11	200 pA
TL034/A	4	10 to 30	0.28	1.1	5.1	4/1.5	12	200 pA
TL051/A	1	10 to 30	3.2	3.1	20	1.5/0.8	8	200 pA
TL052/A	2	10 to 30	2.8	3	20.7	1.5/0.8	8	200 pA
TL054/A	4	10 to 30	2.8	2.7	17.8	4/1.5	23	200 pA
TL071/2/4	1/2/4	7 to 36	2.5	3	13	10	18	400 pA
TL071A/2A/4A	1/2/4	7 to 36	2.5	3	13	6	18	200 pA
TL071B/2B/4B	1/2/4	7 to 36	2.5	3	13	3	18	200 pA
TL081/2/4	1/2/4	7 to 36	2.8	3	13	15	18	400 pA
TL081A/2A/4A	1/2/4	7 to 36	2.8	3	13	6	18	200 pA
TL081B/2B/4B	1/2/4	7 to 36	2.8	3	13	3	18	200 pA
TL061/2/4	1/2/4	7 to 36	0.25	1	3.5	15	10	400 pA
TL092	2	6 to 36	2.5	1	0.6	15	10	400 pA
TL288	2	10 to 30	2.8	3	18	1	8	400 pA
Low Voltage								
TLV341/A	1	1.5 to 5.5	0.15	2.3	0.9	4/1.25	1.9	3 nA
TLV342/A/S	2	1.5 to 5.5	0.15	2.2	0.9	4/1.25	1.9	3 nA
LMV341/2	1/2	2.5 to 5.5	0.17	1	1	4	1.7	120 pA
LMV321	1	2.7 to 5.5	0.17	1	1	7	5	250 nA
LMV324	4	2.7 to 5.5	0.17	1	1	7	5	250 nA
LMV358	2	2.7 to 5.5	0.17	1	1	7	5	250 nA
TLV2361/2	1/2	2 to 5	2.25	6	3	6	—	150 nA
Precision								
OP07C/D	1	6 to 36	5	0.6	0.3	0.15	0.5/0.7	7/12 nA
LT1014/D	4	5 to 44	0.55	1	0.4	0.3/0.8	2	30 nA
LT1013/D	2	4 to 44	0.55	1	0.4	0.3/0.8	2.5	30 nA
LT1014A	4	5 to 22	0.5	1	0.4	0.18	2.5	20 nA
Logarithmic								
Device	No. of Inputs	No. of Outputs	Gain (typ) (mV/dB)	Input Impedance (Ω)	Output Impedance (Ω)	Rise Time (ns)		
TL441	4	2	8	500	200	20		

Amplifiers

Device	No. of Outputs	Vrange (V)	Iq per Channel (mA)	GBW (MHz)	Slew Rate (V/us)	Vos at 25°C (mV)	IIB (max) (nA)	CMRR (dB)
High Voltage								
LP324	4	3 to 32	0.037	0.1	0.05	4	10	80
LM358/A	2	3 to 32	0.6	0.7	0.3	7/3	250	65
LM2904/V	2	3 to 26	0.6	0.7	0.3	7	250	50/65
LM258/A	2	3 to 32	0.6	0.7	0.3	5	150/100	70
TS321	1	3 to 30	1	0.8	0.4	4	200	65
TL103W/A	2	3 to 32	0.6	0.9	0.4	4/3	150	70
LM224/A/K/KA	4	3 to 32	0.3	1.2	0.5	5/3	150/80	65
LM324/A/K/KA	4	3 to 32	0.3	1.2	0.5	7/3	250/100	65
LM2902/K	4	3 to 26	0.3	1.2	0.5	7	250	50
UA741/7	1/2	7 to 36	2.8	1	0.5	6	1,500	70
MC1458	2	10 to 30	2.8	1	0.5	6	500	70
MC3x03	4	5 to 30	1.75	1	0.6	8/10	500	70
TL343	1	3 to 30	2.8	1	1	10	500	70
TL3472/4/4A	2/4	4 to 36	4.5	4	13	10/3	500	65/80
Device	No. of Outputs	Vrange (V)	Iq per Channel (mA)	GBW (MHz)	Iout per Channel (mA)	Vos at 25°C (mV)	IIB (max) (nA)	Vn at 1kHz (nV//√Hz)
High Current								
ALM2402-Q1	2	5 to 18	5	0.27	400	5	100	90
Device	No. of Outputs	Vrange (V)	Iq per Channel (mA)	GBW (MHz)	Slew Rate (V/us)	Vos at 25°C (mV)	IIB (max) (nA)	Vn at 1kHz (nV//√Hz)
Audio								
SA/NE5534	1	10 to 30	8	10	13	4	1,500	4
SA/NE5532	2	10 to 30	4	10	9	4	800	5
TL971/2/4	1/2/4	2.7 to 12	2.8	12	5	4	0.75/750	5
RC4580	2	4 to 32	4.5	12	5	3	500	6.2
TL5580/A	2	4 to 32	4.5	12	5	1.5/1	500	7
RC4558/9	2	10 to 30	2.8	3/4	1.7/2	6	500/250	8
TLV2361/2	1/2	2 to 5	2.25	6	3	6	150	9
Device	No. of Outputs	Vrange (V)	Iq per Channel (mA)	GBW (MHz)	Slew Rate (V/us)	Vos at 25°C (mV)	IIB (max) (nA)	CMRR (dB)
High Speed								
MC33078	2	10 to 36	2.5	16	7	2	750	80
TL971/2	1/2	2.7 to 12	—	12	5	4	0	60
TL974	4	2.7 to 12	2.8	12	5	4	750	60
Device	No. of Outputs	Vrange (V)	Iq per Channel (mA)	GBW (MHz)	Slew Rate (V/us)	Vos at 25°C (mV)	IIB (max) (nA)	Function
Special Function								
LM2x00	4	4.5 to 32	2.5	2.5	20	—	200	Norton Op-Amp
LM392	2	3 to 32	0.5	1	—	5	400	Op-Amp + Comp
TL103W/WA	2	3 to 32	0.6	0.9	0.4	4/3	150	Op-Amp + Vref
TSM102/A	4	3 to 30	0.375	2.1	2	5	200	Op-Amp + Vref
TSM104W/WA	4	3 to 30	0.6	0.9	0.3	5	150	Op-Amp + Vref
Device	No. of Outputs	Vrange(V)	Vrange (V)	Temperature Range (°C)				
Timers								
NA555/6		1/2	4.5 to 16	-40 to 105				
NE555/6		1/2	4.5 to 16	0 to 70				
SA555/6		1/2	4.5 to 16	-40 to 85				

Comparators

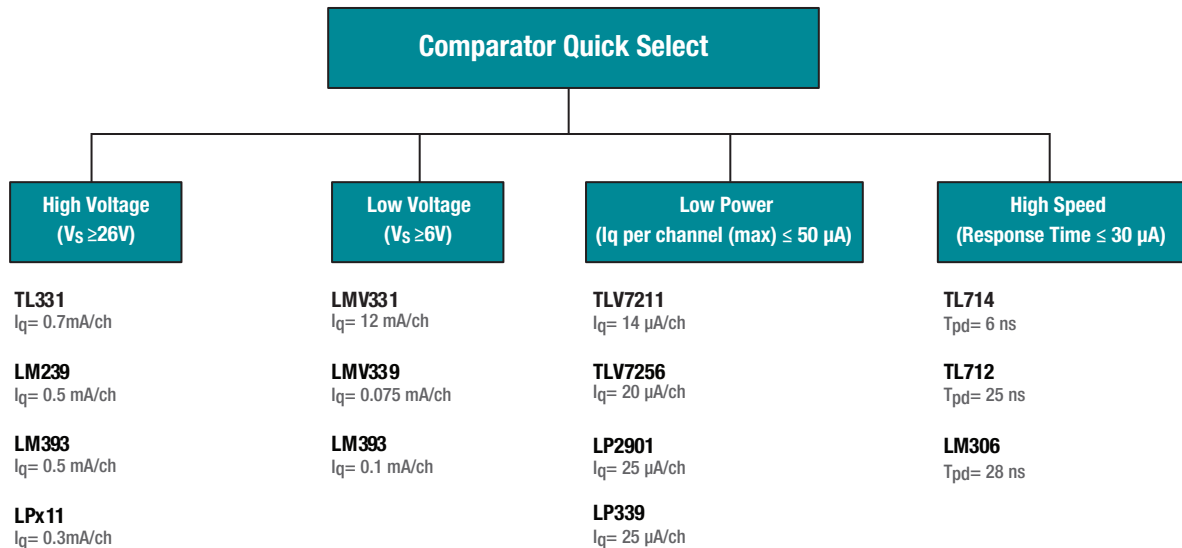
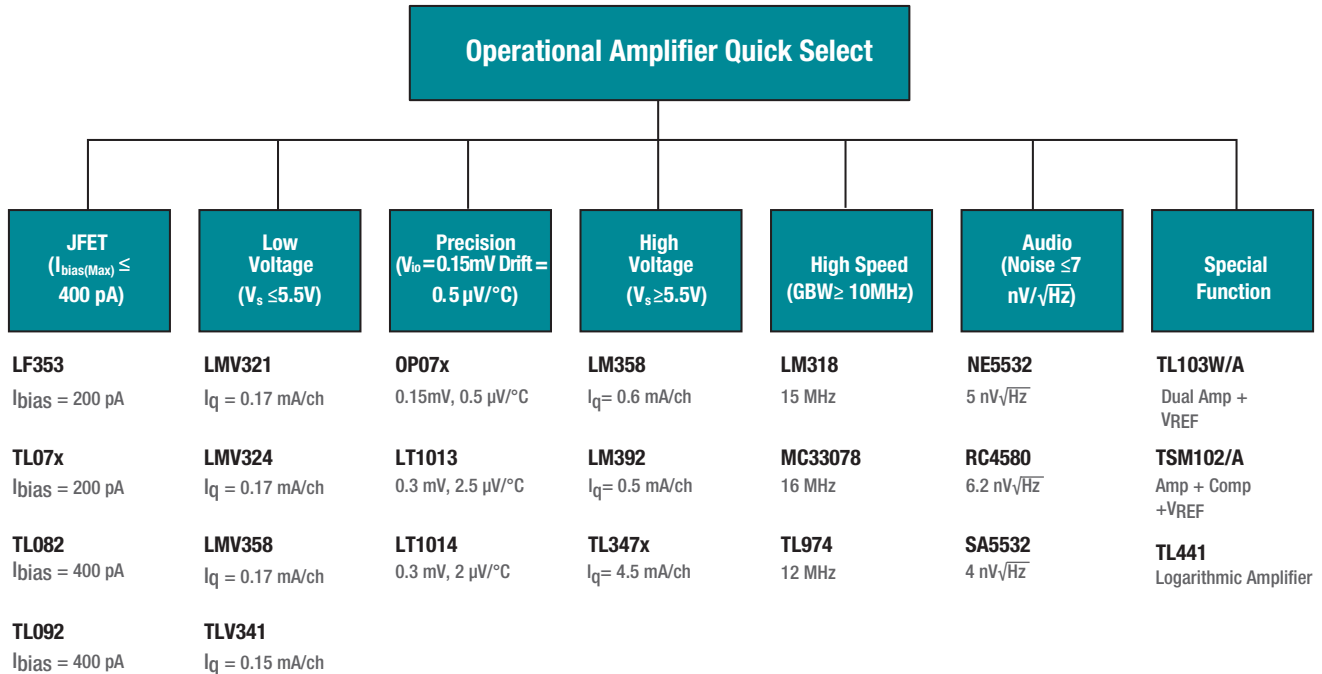
Texas Instruments offers a variety of comparators with wide supply ranges, from 2 V to 36 V, and low supply currents enabling low power operation. These features, along with fast rise and fall times, make TI's comparators the perfect choice for a wide variety of industrial and commercial uses.



Device	No. of Outputs	I _q per Channel (mA)	Output Current (mA)	t _{RESP} (μs)	V _s (min) (V)	V _s (max) (V)	V _{IO} at 25°C (mV)
High Voltage							
LMx11	1	6	50	0.115	3.5	30	3
LM239/A	4	0.5	6	0.3	2	30	5
LM2901/3	4/2	0.5	6	0.3	2	30	7
LM293/A	2	0.5	6	0.3	2	30	5
LM3302	4	0.2	6	0.3	2	28	20
LM339/A	4	0.5	6	0.3	2	30	5
LM393/A	2	0.5	6	0.3	2	30	5
TL331	1	0.7	6	0.3	2	36	5
LPx11	1	0.3	25	1.2	3.5	30	7.5
Low Voltage							
TLV1391	1	0.15	0	0.18	2	7	5
LMV331	1	0.12	10	0.2	2.7	5.5	7
LMV339	4	0.075	10	0.2	2.7	5.5	7
LMV393	2	0.1	5	0.2	2.7	5.5	7
Low Power							
TLV7211/A	1	0.014	5	4	2.7	15	15
TLV7256	2	0.02	5	0.5	1.8	5	7
LP2901	4	0.025	20	1.3	5	30	5
LP339	4	0.025	20	1.3	5	30	5
High Speed							
TL714	1	12	16	0.006	4.75	5	10
TL712	1	20	16	0.025	4.75	5	5
LM306	1	10	100	0.028	15	24	5

Operational Amplifiers and Comparator Quick Select Tool

TI has developed the industry's largest selection of low-power and low-voltage analog parts with features designed to satisfy an extensive range of applications. Use the below tool to help make the selection process easier.



Small Packaging

TI offers industry standard packaging options. In addition, TI has a variety of small packages, including μ QFN and QFN.

Pin Count	Package Type	TI Package Designator	Body Length (mm)	Body Width (mm)	Lead Width (mm)	Pitch Nom (mm)	Lead Foot (mm)	Pkg Width (mm)	Height (max) (mm)
5	SC-70	DCK	1.85-2.14	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
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
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	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	X2QFN	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	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
18	SOIC	DWR	11.35-11.75	7.4-7.6	0.31-0.51	1.27	0.4-1.27	9.97-10.63	2.65

Design Resources, References and Support

TI provides many resources to help you design systems faster, including TI designs and guides. We also offer worldwide support to ensure your questions are answered fast.



Jump start your design process

- Comprehensive reference designs
- Complete schematics/block diagrams
- BOMs
- Design files and test reports

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Amplifiers Forum: ti.com/ampsforum

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