Bipolar Operational Amplifiers

Motorola offers a broad line of operational amplifiers to meet a wide range of applications. From low-cost industry-standard types to high precision circuits, the span encompasses a large range of performance capabilities. These linear integrated circuits are available as single, dual, and quad monolithic devices in a variety of temperature ranges and package styles. Most devices may be obtained in unencapsulated "chip" form as well. For price and delivery information on chips, please contact your Motorola Sales Representative or Distributor.

Single Operational Amplifiers

Noncompensated

Device	I_{IB} μA Max	V_{IO} mV Max	TC_{VIO} μV/°C Typ	I_{IO} nA Max	A_{vol} V/mV Min	BW (A_V=1) MHz Typ	SR (A_V=1) V/μs Typ	Supply Voltage V Min	Supply Voltage V Max	Description	Packages
Military Temperature Range (−55°C to +125°C)											
LM101A	0.075	2.0	10	10	50	1.0	0.5	±3.0	±22	General Purpose	601,693
LM108A	0.002	0.5	1.0	0.2	80	1.0	0.3	±3.0	±20	Precision	601
MC1709	0.5	5.0	15	200	25	1.0	0.3	±3.0	±18	General Purpose	601
MC1748	0.5	5.0	15	200	50	1.0	0.5	±3.0	±22	General Purpose	601,693
Commercial Temperature Range (0°C to +70°C)											
LM301A	0.25	7.5	10	50	25	1.0	0.5	±3.0	±18	General Purpose	601,626,693,751
LM308	7.0	7.5	15	1.0	25	1.0	0.3	±3.0	±18	Precision	601,751
LM308A	7.0	0.5	5.0	1.0	80	1.0	0.3	±3.0	±18	Precision	601,751
MC1439	1.0	7.5	15	100	15	2.0	4.2	±6.0	±18	High Slew Rate	601
MC1709C	1.5	7.5	15	500	15	1.0	0.3	±3.0	±18	General Purpose	601,626
MC1748C	0.5	6.0	15	200	20	1.0	0.5	±3.0	±18	General Purpose	601,626,693
Industrial Temperature Range (−25°C to +85°C)											
LM201A	0.075	2.0	10	10	50	1.0	0.5	±3.0	±22	General Purpose	601,626,693
LM208A	0.002	0.5	1.0	0.2	80	1.0	0.3	±3.0	±20	Precision	601,751

Internally Compensated

Device	I_{IB} μA Max	V_{IO} mV Max	TC_{VIO} μV/°C Typ	I_{IO} nA Max	A_{vol} V/mV Min	BW (A_V=1) MHz Typ	SR (A_V=1) V/μs Typ	Supply Voltage V Min	Supply Voltage V Max	Description	Packages
Military Temperature Range (−55°C to +125°C)											
MC1556	0.015	4.0	10	2.0	100	1.0	2.5	±3.0	±22	High Performance	693
MC1733	0.20	—	—	3.0 μA	90	90	—	±4.0	±8.0	Differential Wideband Video Amp	603,632
MC1741	0.5	5.0	15	200	50	1.0	0.5	±3.0	±22	General Purpose	601,693
MC1741N	0.5	5.0	15	200	50	1.0	0.5	±3.0	±22	Low Noise	601
MC1776	0.0075	5.0	15	3.0	200	1.0	0.2	±1.5	±18	μPower, Programmable	601,632
MC35001A	75 pA	2.0	10	25 pA	50	4.0	13	±5.0	±22	JFET Input	601,693
MC35001B	100 pA	5.0	10	50 pA	50	4.0	13	±5.0	±22	JFET Input	601,693
MC35071	0.5	3.5	10	75	25	4.5	13	±3.0	±44	High Performance	693
MC35071A	0.5	1.5	10	50	50	4.5	13	±3.0	±44	Single Supply	693
MC35171	100 nA	4.5	10	20 nA	50	1.8	2.1	+3.0	+44V	Micropower Single Supply	693
MC35080	200 pA	4	10	100 pA	25	16	50	±3	±22	Decompensated	601,693
MC35080A	200 pA	3.5	10	100 pA	50	16	50	±3	±22	HC 35081 Avcl >2	601,693
MC35081	200 pA	4	10	100 pA	25	8	30	±3	±22	High Speed	601,693
MC35081A	200 pA	3.5	10	100 pA	50	8	30	±3	±22	JFET Input	601,693

AMPLIFIERS (continued)

Quad Operational Amplifiers (continued)

Internally Compensated

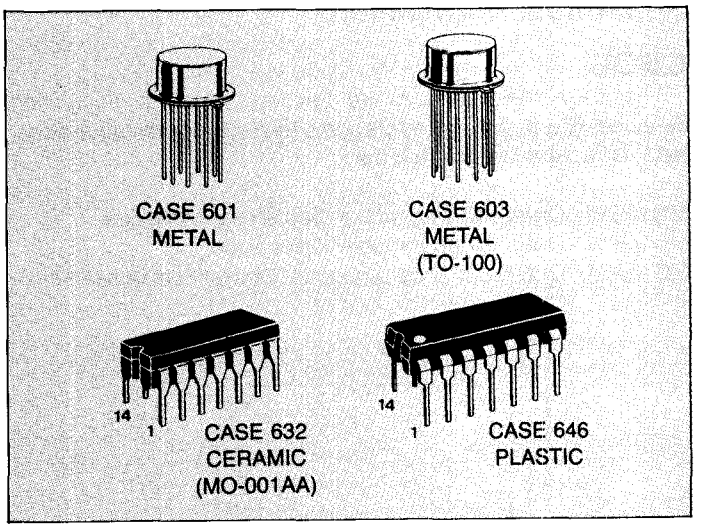
Device	I_{IB} μA Max	V_{IO} mV Max	TC_{VIO} μV/°C Typ	I_{IO} nA Max	A_{vol} V/mV Min	BW (A_V=1) MHz Typ	SR (A_V=1) V/μs Typ	Supply Voltage V Min	Supply Voltage V Max	Description	Packages
Commercial Temperature Range (0°C to +70°C)											
LF347	200 pA	10	10	100 pA	25	4.0	13	±5.0	±18	JFET Input	646,751A
LF347B	200 pA	5.0	10	100 pA	50	4.0	13	±5.0	±18	JFET Input	646
LF444	100 pA	10	20	50	25	1.0	1.0	±3.0	±18	Quad Bifet Low Power	626,693,751
LF444A	50 pA	5.0	10	25	50	1.0	1.0	±3.0	±22	Quad Bifet Low Power	626,693,751
LM324	0.25	6.0	7.0	50	25	1.0	0.6	±1.5 +3.0	±16 +32	Low Power Consumption	632,646,751A
LM324A	0.10	3.0	7.0	30	25	1.0	0.6	±1.5 +3.0	±16 +32	Low Power Consumption	632,646,751A
LM348	0.20	6.0	—	50	25	1.0	0.5	±3.0	±18	Quad MC1741	632,646,751A
MC3401	0.3	—	—	—	1.0	5.0	0.6	±1.5	±18	Norton Input	646,751A
MC3403	0.5	10	7.0	50	20	1.0	0.6	±1.5 +3.0	±18 +36	No Crossover Distortion	632,646,751A
MC4741C	0.5	6.0	15	200	20	1.0	0.5	±3.0	±18	Quad MC1741	632,646,751A
MC34004	200 pA	10	10	100 pA	25	4.0	13	±5.0	±18	JFET Input	632,646,751
MC3400B	200 pA	5.0	10	100 pA	50	4.0	13	±5.0	±18	JFET Input	632,646
MC34074	0.50	4.5	10	75	25	4.5	13	+3.0	+44	High Performance	632,646
MC34074A	0.50	2.0	10	50	50	4.5	13	+3.0	+44	Single Supply	632,646,751
MC33174	100 nA	4.5	10	20 nA	50	1.8	2.1	+3.0	+44	Micropower Single Supply	626,751
MC34084	200 pA	14	10	50 pA	25	10	40	±3.0	±22	Hi-Speed, JFET Input	632,646
MC34084A	200 pA	8.0	10	50 pA	50	10	40	±3.0	±22	Hi-Speed, JFET Input	632,646
MC34085	200 pA	14	10	50 pA	25	20	80	±3.0	±22	Decompensated	632,646
MC34085A	200 pA	8.0	10	50 pA	50	20	80	±3.0	±22	MC34084 for $A_V \geq 2$	632,646
MC34184	100 pA	10	10	100 pA	25	4.0	15	—	±22	Quad Micropower High Speed	632,646
TL064	200 pA	15	10	200 pA	4.0	1.0	3.5	±3.0	±18	Quad Bifet Low Power	626,693
TL064A	200 pA	6.0	10	200 pA	4.0	1.0	3.5	±3.0	±18	Quad Bifet Low Power	626, 693
TL064B	200 pA	3.0	10	100 pA	3.0	1.0	3.5	±3.0	±18	Quad Bifet Low Power	626,693
TL074AC	200 pA	6.0	10	50 pA	50	4.0	13	±5.0	±18	Low Noise, JFET Input	632,646
TL074BC	200 pA	3.0	10	50 pA	50	4.0	13	±5.0	±18	Low Noise, JFET Input	632,646
TL074C	200 pA	10	10	50 pA	25	4.0	13	±5.0	±18	Low Noise, JFET Input	632,646,751
TL084AC	200 pA	6.0	10	100 pA	50	4.0	13	±5.0	±18	JFET Input	632,646
TL084BC	200 pA	3.0	10	100 pA	50	4.0	13	±5.0	±18	JFET Input	632,646
TL084C	400 pA	15	10	200 pA	25	4.0	13	±5.0	±18	JFET Input	632,646,751
Automotive Temperature Range (−40°C to 85°C)											
LM2902	0.5	10	—	50	—	1.0	0.6	±1.5 +3.0	±13 +26	Differential Low Power	646,751A
MC3301	0.3	—	—	—	1.0	4.0	0.6	±2.0	±15	Norton Input	646,751A
MC3303	0.5	8.0	10	75	20	1.0	0.6	±1.5 +3.0	±18 +36	Differential General Purpose	646
MC33074	0.50	4.5	10	75	25	4.5	10	+3.0	+44	High Performance	632,646
MC33074A	0.50	2.0	10	50	50	4.5	10	+3.0	+44	Single Supply	632,646
MC143403	1 nA	30	20	200 pA	1.0	0.8	1.0	4.75	12.6	CMOS Low Power	632,646
MC143404	1 nA	30	20	200 pA	1.0	0.8	1.0	4.75	12.6	CMOS Low Power	632,646
Industrial Temperature Range (−25°C to +85°C)											
LM224	0.15	5.0	7.0	30	50	1.0	0.6	±1.5 ±3.0	±16 ±32	Split or Single Supply OP Amp	632,646,751A
LM248	0.2	6.0	—	50	25	1.0	0.5	±3.0	±18	Quad MC1741	632,646

Non AGC Amplifiers

MC1733	MC1733C	52 @ 40 40 90 20 120	+6/−6	603,632,646
	NE592	55 @ 40 45 @ 90	+6/−6	

High Frequency Amplifiers

A variety of high-frequency circuits with features ranging from low-cost simplicity to multi-function versatility marks Motorola's line of integrated amplifiers. Devices described here are intended for industrial and communications applications. For devices especially dedicated to consumer products, i.e., TV and entertainment radio, see "Circuits for Consumer Applications."



Non-AGC Amplifiers

SE/NE592 — Differential Two Stage Video Amplifier

A monolithic, two state differential output, wideband video amplifier. It offers fixed gains of 100 and 400 without external components and adjustable gains from 400 to 0 with one external resistor. The input stage has been designed so that with the addition of a few external reactive elements between the gain select terminals, the circuit can function as a high pass, low pass, or band pass filter. This feature makes the circuit ideal for use as a video or pulse amplifier in communications, magnetic memories, display and video recorder systems.

MC1733/MC1733C — Video Amplifier

Differential input and output amplifier provides three fixed gain options with bandwidth to 120 MHz. External resistor permits any gain setting from 10 to 400 v/v. Extremely fast rise time (2.5 ns typ) and propagation delay time (3.6 ns typ) makes this unit particularly useful as pulse amplifier in tape, drum, or disc memory read applications.

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Operating Temperature Range		A_V dB	@	Bandwidth MHz	V_{CC}/V_{EE} Vdc	Case
−55 to +125°C	0 to +75°C					
SE592	NE592	55 45		40 90	+6/−6	603, 632 646
MC1733	MC1733C	52 40 20		40 90 120	+6/−6	603, 632, 646