Operational Amplifiers/Buffers

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Note. For additional information on operational amplifiers, see National Semiconductor's Special Functions Databook.

PART NUMBER	DC ELECTRICAL CHARACTERISTICS				AC ELECTRICAL CHARACTERISTICS	
	V_{OS} – MAX OFFSET VOLTAGE (mV) ($T_A = 25°C$)	$\Delta V_{OS}/\Delta T$ – T.C. OF V_{OS} ($\mu V/°C$) TYP	I_B – MAX BIAS CURRENT (pA) ($T_J = 25°C$)	A_{VOL} LARGE SIGNAL VOLTAGE GAIN (V/mV) MIN ($T_A = 25°C$)	SR – SLEW RATE ($V/\mu s$)	e_n – EQUIV. INPUT NOISE VOLTAGE ($nV/\sqrt{Hz}$) (Note 2)
MILITARY BI-FET OP AMP (Note 1)						
LF155	5	5	100	50	5	20
LF155A	2	5 (max)	50	50	5	20
LF156	5	5	100	50	12	12
LF156A	2	5 (max)	50	50	12	12
LF157	5	5	100	50	50	12
LF157A	2	5 (max)	50	50	50	12
INDUSTRIAL BI-FET OP AMP (Note 1)						
LF255	5	5	100	50	5	20
LF256	5	5	100	50	12	12
LF257	5	5	100	50	50	12
COMMERCIAL BI-FET AND BI-FET II OP AMP (Note 3)						
LF351	10	10	200	25	13	16
LF351A	2	10	100	25	13	16
LF351B	5	10	200	25	13	16
LF355	10	5	200	25	5	25
LF355A	2	5 (max)	50	25	5	25
LF356	10	5	200	25	12	15
LF356A	2	5 (max)	50	25	12	15
LF357	10	5	200	25	50	15
LF357A	2	5 (max)	50	25	50	15
LF13741	15	10	200	25	0.5	37
BI-FET II DUAL OP AMPS (Characteristics for Each Amplifier) (Note 3)						
LF353	10	10	200	25	13	16
LF353A	2	10	100	25	13	16
LF353B	5	10	200	25	13	16
BI-FET II QUAD OP AMPS (Characteristics for Each Amplifier) (Note 3)						
LF347	10	10	200	25	13	16
LF347A	2	10	100	25	13	16
LF347B	5	10	200	25	13	16

SELECTION BY DESIGN PARAMETER

Max Input Offset Voltage (T_A = 25°C)

2 mV	5 mV	10 mV	15 mV
LF155A/LF355A	LF351B	LF355/LF356/LF357	LF13741
LF156A/LF356A	LF347B	LF351	
LF357A	LF353B	LF353	
LF351A	LF155/LF156/LF157	LF347	
LF353A	LF255/LF256/LF257		
LF347A			

Max Input Bias Current (T_J = 25°C)

50 pA	100 pA	200 pA
LF155A/LF156A/LF157A	LF155/LF156/LF157	LF355/LF356/LF357
LF355A/LF356A/LF357A	LF255/LF256/LF257	LF351/LF351B
	LF351A	LF347/LF347B
	LF353A	LF353/LF353B
	LF347A	LF13741

Typ Equivalent Input Noise Voltage per $\sqrt{Hz}$, f = 1000 Hz, R_S = 100Ω

12 nV or Less	15 nV To 20 nV			25 nV To 37 nV	
LF156/LF156A	LF356	LF351	LF155	LF355	LF13741
LF157/LF157A	LF356A	LF351A	LF155A	LF355A	
LF256/LF257	LF357	LF351B	LFT155		
	LF357A	LF347	LF255		
		LF347A			
		LF347B			
		LF353			
		LF353A			
		LF353B			

Typ Slew Rate

0.5 V/μs	5 V/μs	12 V/μs	13 V/μs	50 V/μs
LF13741	LF155/LF155A	LF156	LF351	LF157
	LF255	LF156A	LF351A	LF157A
	LF355/LF355A	LF256	LF351B	LF357
		LF356	LF353	LF357A
		LF356A	LF353A	
			LF353B	
			LF347	
			LF347A	
			LF347B	

ADDITIONAL NS PRODUCTS USING BI-FET TECHNOLOGY

- LF111 Comparator
- LF198 Sample and Hold
- LF11201 Series of Analog Switches
- LF11331 Series of Analog Switches
- LF11508 Series of Analog Multiplexers
- LF152 Instrumentation Amplifier
- LF13300 Integrating A/D Building Block

MILITARY TEMPERATURE RANGE: $-55°C \leq T_A \leq +125°C$

Device	Input Offset Voltage Max (mV)	Input Offset Voltage Drift Max ($\mu V/°C$)	Input Offset Current Max (nA)	Input Bias Current Max (nA)	Voltage Gain Min (Volts/V)	Bandwidth $A_V = 1$ Typ (MHz)	Slew Rate $A_V = 1$ Typ ($V/\mu s$)	Output Current Min @ R_L = 2k (mA)	Supply Voltage Min (V)	Supply Voltage Max (V)	Common Mode Range (V)	Differential Input Voltage (V)	Supply Current $T_A = 25°C$ Max (mA)	Compensation Components Per Amplifier	Package Types
SINGLE OP AMPS															
LH101	6	6 typ	500	1500	25k	1	0.5	5	±3	±22	±12	±30	3	0	TO-5 F.P.
LM101A	3	15	20	100	25k	1	0.5	5	±3	±22	±12	±30	3	1	TO-5 DIP F.P.
LM101	6	6 typ	500	1500	25k	1	0.5	5	±3	±22	±12	±30	3	1	TO-5 F.P.
LM102	7.5	6 typ	*	100	0.999	10	10	1 (R_L = 8 kΩ)	±12	±18	±10	*	5.5	0	TO-5
LM107	3	15	20	100	25k	1	0.5	7.5	±3	±22	±12	±30	3	0	TO-5 DIP F.P.
LM108A	1	5	0.4	3	40k	1	0.3	1	±2	±20	±14	(Note 1)	0.6	1	TO-5 DIP F.P.
LM108	3	15	0.4	3	25k	1	0.3	1	±2	±20	±14	(Note 1)	0.6	1	TO-5 DIP F.P.
LM110	6	12	*	10	0.999	20	30	1 (R_L = 8 kΩ)	±5	±18	±10	*	5.5	0	TO-5 DIP
LM112	3	15	0.4	3	25k	1	0.2	1.3 (R_L = 10 kΩ)	±2	±20	±14	(Note 1)	0.6	0	TO-5 DIP F.P.
LM118	4	*	50	250	20k	15	50 min	6	±5	±18	±11.5	(Note 1)	8	0	TO-5 DIP F.P.
LM121A (R_{SET}=70k)	0.65	0.2	1	30	16k	0.5	*	*	±5	±20	±15	±15	1.5	1	TO-5 DIP F.P.
LM121 (R_{SET}=70k)	1	1	3	30	16k	0.5	*	*	±5	±20	±15	±15	1.5	1	TO-5 DIP F.P.
LM143	6	*	7	35	50k	1	2.5	4.4 ($R_L \geq$ 5k)	±4	±40	±38	±40	4	0	TO-5 DIP F.P.
LM144	6	*	7	35	50k	2	30 ($A_V > 10$)	4.4 ($R_L \geq$ 5k)	±4	±40	±38	±40	4	1	TO-5 DIP F.P.
LF155A	**2.5**	**10**	**25**	**0.05**	**25k**	**2.5**	**5**	**5**	**±5**	**±22**	**±20**	**±40**	**4**	**0**	**TO-5**
LF155	**7**	**20**	**50**	**0.1**	**25k**	**2.5**	**5**	**5**	**±5**	**±22**	**±20**	**±40**	**4**	**0**	**TO-5**
LF156A	**2.5**	**10**	**25**	**0.05**	**25k**	**5**	**15**	**5**	**±5**	**±22**	**±20**	**±40**	**7**	**0**	**TO-5**
LF156	**7**	**20**	**50**	**0.1**	**25k**	**5**	**15**	**5**	**±5**	**±22**	**±20**	**±40**	**7**	**0**	**TO-5**
LF157A ($A_V \geq 5$)	**2.5**	**10**	**25**	**0.05**	**25k**	**25**	**75**	**5**	**±5**	**±22**	**±20**	**±40**	**7**	**0**	**TO-5**
LF157 ($A_V \geq 5$)	**7**	**20**	**50**	**0.1**	**25k**	**25**	**75**	**5**	**±5**	**±22**	**±20**	**±40**	**7**	**0**	**TO-5**
LM709A	3	15	250	600	25k	1	0.3	5	±5	±22	±20	±40	3.6	3	TO-5
LM709	6	6 typ	500	1500	25k	1	0.3	5	±9	±18	±8	±5	5.5	3	TO-5 DIP
LM725A	0.7	2	18	180	1000	0.5	0.005	5	±3	±22	±13.5	±5	3.5	4	TO-5 DIP
LM725	1.5	5	40	200	1000	0.5	0.005	5	±3	±22	±13.5	±5	3.5	4	TO-5 F.P.
LM741A	4	15	70	210	32k	1	0.5	7.5	±3	±22	±12	±30	4.0	0	TO-5 DIP F.P.
LM741	6	15 typ	500	1500	25k	1	0.5	5	±3	±22	±12	±30	2.8	0	TO-5 DIP F.P.
LM748	6	*	500	1500	25k	1	0.5	5	±3	±22	±12	±30	2.8	1	TO-5
LM4250 (V_S = ±15V)	4	*	3	7.5	50k	0.1	0.03	0.12 ($R_L \geq$ 100k)	±1	±18	±12	±15	0.011 set	0	TO-5 DIP

Note 1: Inputs have shunt-diode protection; current must be limited. *Not specified

Military Op Amp Selection Guide

MILITARY TEMPERATURE RANGE: $-55°C \leq T_A \leq +125°C$

Device	Input Offset Voltage Max (mV)	Input Offset Voltage Drift Max ($\mu V/°C$)	Input Offset Current Max (nA)	Input Bias Current Max (nA)	Voltage Gain Min (Volts/V)	Bandwidth $A_V = 1$ Typ (MHz)	Slew Rate $A_V = 1$ Typ ($V/\mu s$)	Output Current Min @ $R_L = 2k$ (mA)	Supply Voltage Min (V)	Supply Voltage Max (V)	Common Mode Range (V)	Differential Input Voltage (V)	Supply Current $T_A = 25°C$ Max (mA) (Note 2)	Compensation Components Per Amplifier	Package Types
DUAL OP AMPS															
LM158	5	*	30	150	25k	1	*	0.8	±1.5	±16	$V^+-1.5$	V^+	1.2	0	TO-5 DIP
LM1558	6	*	500	1500	25k	1	0.5	5	±3	±22	±12	±30	5.0	0	TO-5
LM747A	4	15	70	210	32k	1	0.5	7.5	±3	±22	±12	±30	5.6	0	DIP
LM747	6	*	500	1500	25k	1	0.5	5	±3	±22	±12	±30	5.6	0	DIP
QUAD OP AMPS															
LM124	7	7 typ	±30	150	50	1.0	*	10	−16	+16	0 to $V^+-1.5V$	V^+_{DC}	3	0	D, F, J
LM146 ($I_{SET} = 10\ \mu A$)	5	5 typ	20	100	100k	1.2	0.4	1.2	±2	±22	±0.7	±30	2	0	DIP
LM148	6	15 typ	75	325	25k	1	0.6	5	±3	±22	±12	±30	3.6	0	DIP F.P.
LM149 ($A_V \geq 5$)	6	15 typ	75	325	25k	4	3	5	±3	±22	±12	±30	3.6	0	DIP F.P.
LM1900	*	*	*	150	0.8k	2.5	*	10 source 1 sink	±4	±36	*	*	12	0	DIP

Note 2: Supply current for all channels of amplifier in the package.

INDUSTRIAL TEMPERATURE RANGE: $-25°C \leq T_A \leq +85°C$

Device	Input Offset Voltage Max (mV)	Input Offset Voltage Drift Max ($\mu V/°C$)	Input Offset Current Max (nA)	Input Bias Current Max (nA)	Voltage Gain Min (Volts/V)	Bandwidth $A_V = 1$ Typ (MHz)	Slew Rate $A_V = 1$ Typ ($V/\mu s$)	Output Current Min @ $R_L = 2\ k\Omega$ (mA)	Supply Voltage Min (V)	Supply Voltage Max (V)	Common Mode Range (V)	Differential Input Voltage (V)	Supply Current $T_A = 25°C$ Max (mA) (Note 2)	Compensation Components Per Amplifier	Package Types
SINGLE OP AMPS															
LM201A	3	15	20	100	25k	1	0.5	5	±3	±22	±12	±30	3	1	TO-5 DIP F.P.
LM202	10	15 typ	*	15	0.999	10	10	1	±12	±18	±10	*	5.5	0	TO-5
LM207	2	20	20	100	25k	1	0.5	5	±3	±22	±12	±30	3	0	TO-5 DIP F.P.
LM208A	1.0	5	0.4	3	40k	1	0.3	1	±2	±20	±14	(Note 1)	0.6	1	TO-5 DIP F.P.
LM208	3	15	0.4	3	25k	1	0.3	1	±2	±20	±14	(Note 1)	0.6	1	TO-5 DIP F.P.
LM210	4	*	*	3	0.999	20	30	1	±5	±18	±10	*	5.5	0	TO-5 DIP F.P.
LM212	2	15	0.2	2	25k	1	0.3	1	±2	±20	±14	(Note 1)	0.6	0	TO-5 DIP F.P.
LM216A	3	*	0.015	0.05	20k	1	0.3	1	±5	±20	±13	(Note 1)	0.6	0	TO-5 DIP F.P.
LM216	10	*	0.05	0.15	10k	1	0.3	1	±5	±20	±13	(Note 1)	0.8	0	TO-5 DIP F.P.
LM218	4	*	50	500	25k	15	50 min	5	±5	±18	±11.5	(Note 1)	8	0	TO-5 DIP F.P.
LM221A (R_{SET} = 70k)	0.65	0.2	1	30	16k	0.5	*	*	±5	±20	±15	±15	1.5	1	TO-5 DIP F.P.
LM221 (R_{SET} = 70k)	1	1	3	30	16k	0.5	*	*	±5	±20	±15	±15	1.5	1	TO-5 DIP F.P.
LF255	**6.5**	**5 typ**	**20**	**50**	**25k**	**2.5**	**5**	**5**	**±5**	**±22**	**±20**	**±40**	**4**	**0**	**TO-5**
LF256	**6.5**	**5 typ**	**20**	**50**	**25k**	**5**	**15**	**5**	**±5**	**±22**	**±20**	**±40**	**7**	**0**	**TO-5**
LF257 ($A_V \geq 5$)	**6.5**	**5 typ**	**20**	**50**	**25k**	**25**	**75**	**5**	**±5**	**±22**	**±20**	**±40**	**7**	**0**	**TO-5**
DUAL OP AMPS															
LM258	7.5	7 typ	150	500	15k	1	0.5	10—source 5—sink	3 (±1.5)	32 (±16)	V^+ −1.5	32	1.2	0	TO-5 DIP
QUAD OP AMPS															
LM224	9	7 typ	150	500	15k	1	*	10	3	32	V^+−1.5	32	2	0	DIP F.P.
LM246	6	7 typ	100	250	50k	0.5	0.4	1.2	±2	±18	±1.5	±30	2.5	0	DIP
LM248	7.5	15 typ	125	500	15k	1	0.5	5	±5	±18	±18	±36	4.5	0	DIP
LM249	7.5	15 typ	125	500	15k	4	2	5	±5	±18	±18	±36	4.5	0	DIP
LM2900	*	*	*	200	1.2k	2.5	*	3—source 0.5—sink	+4	+36	*	*	10	0	DIP
LM2902	10 (T_A=25°)	*	±50 (T_A=25°C)	500 (T_A=25°C)	100k typ	1	*	20—source 8—sink	3.0 single ±1.5 dual	26 single ±13 dual	−0.3 V_{DC} to +26 V_{DC}	26 V_{DC}	2	0	DIP

Note 1: Inputs have shunt-diode protection; current must be limited.
Note 2: Supply current for all channels of amplifier in the package.

*Not specified

Commercial Op Amp Selection Guide

COMMERCIAL TEMPERATURE RANGE: $0°C \leq T_A \leq +70°C$

Device	Input Offset Voltage Max (mV)	Input Offset Voltage Drift Max ($\mu V/°C$)	Input Offset Current Max (nA)	Input Bias Current Max (nA)	Voltage Gain Min (Volts/V)	Bandwidth $A_V = 1$ Typ (MHz)	Slew Rate $A_V = 1$ Typ ($V/\mu s$)	Output Voltage Swing $R_L = 10\,k\Omega$ (V)	Supply Voltage Min (V)	Supply Voltage Max (V)	Common Mode Rejection Ratio (dB) Min	Differential Input Voltage (V)	Supply Current $T_A = 25°C$ Max (mA) (Note 2)	Compensation Components	Package Types
SINGLE OP AMPS															
LM201	10	10 typ	750	200	15k	1	0.5	5	±3	±22	±12	±30	3	1	TO-5 F. P.
LM301A	10	30	70	300	15k	1	0.5	5	±3	±18	±12	±30	3	1	TO-5 DIP
LM302	20	20 typ	*	30	0.9985	10	10	1	±12	±18	±10	*	5.5	0	TO-5
LM307	10	30	50	250	15k	1	0.5	5	±3	±18	±12	±30	3	0	TO-5 DIP F.P.
LM308A	0.73	5	1.5	10	60k	1	0.3	1	±2	±20	±14	(Note 1)	0.8	1	TO-5 DIP F.P.
LM308	10	30	1.5	10	15k	1	0.3	1	±2	±18	±14	(Note 1)	0.8	1	TO-5 DIP F.P.
LM310	10	10 typ	*	10	0.999	20	30	1	±5	±18	±10	*	5.5	0	TO-5 DIP F.P.
LM312	10	30	1.5	10	15k	1	0.3	1	±2	±18	±14	(Note 1)	0.8	0	TO-5 DIP F.P.
LM316A	6	*	0.03	0.1	30k	1	0.3	1	±5	±20	±13	(Note 1)	0.6	0	TO-5 DIP F.P.
LM316	15	*	0.1	0.25	15k	1	0.3	1	±5	±20	±13	(Note 1)	0.8	0	TO-5 DIP F.P.
LM318	15	*	300	750	20k	15	50	5	±5	±18	±11.5	(Note 1)	10	0	TO-5 DIP
LM321A (R_{SET} = 70k)	0.65	0.2	1	25	12k	0.5	*	*	±5	±20	±15	±15	2.2	1	TO-5 DIP F.P.
LM321 (R_{SET} = 70k)	2.5	1	4	28	12k	0.5	*	*	±5	±20	±15	±15	2.2	1	TO-5 DIP F.P.
LM343	10	*	14	55	50k	1	2.5	4 ($R_L \geq 5k$)	±4	±34	±34	±34	5.0	0	TO-5 DIP F.P.
LM344	10	*	14	55	50k	2	30	4 ($R_L \geq 5k$)	±4	±34	±34	±34	5.0	1	TO-5 DIP F.P.
LF351	**10**	**10 typ**	**0.1**	**0.2**	**25k**	**4**	**13**	**±12**	**−18**	**18**	**70**	**±30**	**3.4**	**0**	**H, N**
LF351A	**2**	**10 typ**	**0.05**	**0.2**	**50k**	**4**	**13**	**±12**	**−18**	**18**	**80**	**±30**	**2.8**	**0**	**H, N**
LF351B	**5**	**10 typ**	**0.1**	**0.1**	**50k**	**4**	**13**	**±12**	**−18**	**18**	**80**	**±30**	**2.8**	**0**	**H, N**
LF355A	**2.3**	**5**	**1**	**5**	**25k**	**2.5**	**5**	**5**	**±5**	**±22**	**±20**	**±40**	**4**	**0**	**TO-5, Mini-DIP**
LF355	**13**	**5 typ**	**2**	**8**	**15k**	**2.5**	**5**	**5**	**±5**	**±18**	**±16**	**±30**	**4**	**0**	**TO-5, Mini DIP**
LF356A	**2.3**	**5**	**1**	**5**	**25k**	**5**	**15**	**5**	**±5**	**±22**	**±20**	**±40**	**10**	**0**	**TO-5, Mini-DIP**
LF356	**13**	**5 typ**	**2**	**8**	**15k**	**5**	**15**	**5**	**±5**	**±18**	**±16**	**±30**	**10**	**0**	**TO-5, Mini-DIP**
LF357A ($A_V \geq 5$)	**2.3**	**5**	**1**	**5**	**25k**	**25**	**75**	**5**	**±5**	**±22**	**±20**	**±40**	**10**	**0**	**TO-5, Mini-DIP**
LF357 ($A_V \geq 5$)	**13**	**5 typ**	**2**	**8**	**15k**	**25**	**75**	**5**	**±5**	**±18**	**±16**	**±30**	**10**	**0**	**TO-5, Mini DIP**
LF13741	**20**	**10 typ**	**2**	**8**	**15k**	**1**	**0.5**	**5**	**±4**	**±18**	**±16**	**±30**	**4**	**0**	**TO-5, Mini-DIP**

Note 1: Inputs have shunt-diode protection; current must must be limited. *Not specified

COMMERCIAL TEMPERATURE RANGE $0°C \leq T_A \leq +70°C$

Device	Input Offset Voltage Max (mV)	Input Offset Voltage Drift Max ($\mu V/°C$)	Input Offset Current Max (nA)	Input Bias Current Max (nA)	Voltage Gain Min (Volts/V)	Bandwidth $A_V = 1$ Typ (MHz)	Slew Rate $A_V = 1$ Typ ($V/\mu s$)	Output Voltage Swing $R_L = 10\,k\Omega$ (V)	Supply Voltage Min (V)	Supply Voltage Max (V)	Common Mode Rejection Ratio (dB) Min	Differential Input Voltage (V)	Supply Current $T_A = 25°C$ Max (mA) (Note 2)	Compensation Components	Package Types
SINGLE OP AMPS (Continued)															
LM709C	10	12 typ	500	1500	15k	1	0.3	5	±9	±18	±8	±5	6.6	3	TO-5 DIP
LM725C	3.5	2 typ	50	250	125k	0.5	0.005	5	±3	±22	±13.5	±5	5	4	TO-5 DIP
LM741C	7.5	15 typ	300	800	15k	1	0.5	5	±3	±18	±12	±30	2.8	0	TO-5 DIP F.P.
LM741E	4	15	70	210	32k	1	0.5	7.5	±3	±18	±12	±30	3.75	0	TO-5 DIP F.P.
LM748C	6	6	0.5	1.5	25k	1	0.5	5	±3	±18	±12	±30	2.8	1	TO-5 DIP
LM4250C	6	*	8	10	50k	0.1	0.03 ($A_V > 10$)	0.12 ($R_L \geq 100k$)	±1	±18	±12	±15	0.011 (Set)	0	TO-5 DIP
DUAL OP AMPS															
LF353	**10**	**10 typ**	**0.1**	**0.2**	**25k**	**4**	**13**	**±12**	**−18**	**18**	**70**	**±30**	**3.4**	**0**	**N, H**
LF353A	**2**	**10 typ**	**0.05**	**0.2**	**50k**	**4**	**13**	**±12**	**−18**	**18**	**80**	**±30**	**2.8**	**0**	**N, H**
LF353B	**5**	**10 typ**	**0.1**	**0.1**	**50k**	**4**	**13**	**±12**	**−18**	**18**	**80**	**±30**	**2.8**	**0**	**N H**
LM358	7.5	7 typ	150	500	15k	1	*	8	±1.5	±15	$V^+ - 1.5$	V^+	1.2	0	TO-5 DIP
LM1458	6	*	300	800	15k	1	0.2	5	±3	±18	±15	±30	5.6	0	TO-5 DIP
LM747C	6	*	300	800	15k	1	0.5	5	±3	±18	±12	±30	5.6	0	DIP
LM747E	4	15	70	210	32k	1	0.5	7.5	±3	±18	±12	±30	5.6	0	DIP
QUAD OP AMPS															
LF347	**10**	**10 typ**	**0.01**	**0.2**	**25k**	**4**	**13**	**±12**	**−18**	**18**	**70**	**±30**	**3.4**	**0**	**N, J**
LF347A	**2**	**10 typ**	**0.05**	**0.2**	**50k**	**4**	**13**	**±12**	**−18**	**18**	**80**	**±30**	**2.8**	**0**	**N, J**
LF347B	**5**	**10 typ**	**0.1**	**0.1**	**50k**	**4**	**13**	**±12**	**−18**	**18**	**80**	**±30**	**2.8**	**0**	**N, J**
LM324	9	7 typ	150	500	15k	1	*	10–source 5–sink	3 (±1.5)	32 (±16)	$V^+ - 1.5$	32	2	0	DIP F. P.
LM346	5	10 typ	100	250	100k	0.8	0.4	±12	−18	18	70	±30	0.62	0	N, J
LM348	7.5	15 typ	100	400	15k	1	*	5	±5	±18	±18	±36	4.5	0	DIP F. P.
LM349 ($A_V \geq 5$)	7.5	15 typ	100	400	15k	4	3	5	±5	±18	±18	±36	4.5	0	DIP F. P.
LM3900	*	*	*	200	2.8k	2.5	20	10	4 (±2)	36 (±18)	*	*	10	0	DIP

Note 2: Supply current for all channels of amplifier in the package