



JFET Input Quad Operational Amplifiers

Description

The TL084 is a high-speed JFET input quad operational amplifier composed of high-voltage JFETs and bipolar transistors. It features a high slew rate, low input bias current, low input offset current, and a low offset voltage temperature coefficient.

The TL084 is available in SOP-14 and DIP-14 package types.

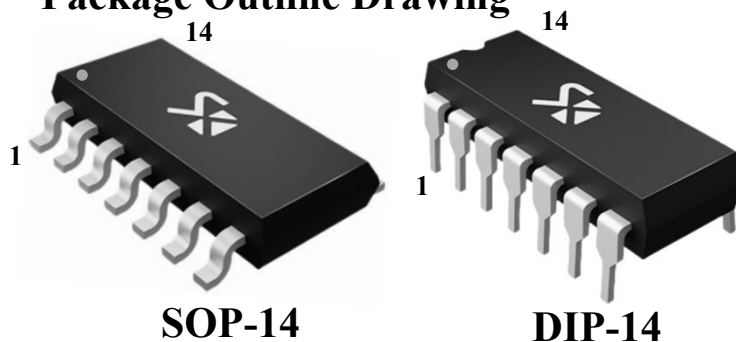
Features

- Low power consumption: 1.4mA/ch
- Wide common-mode input voltage range
- Wide differential-mode input voltage range
- Low input bias current: 200pA
- Low input offset current: 50pA
- Output short-circuit protection
- Low distortion: approximately 0.003%
- High input impedance
- High slew rate: 13V/ μ s
- High gain bandwidth product: 3MHz

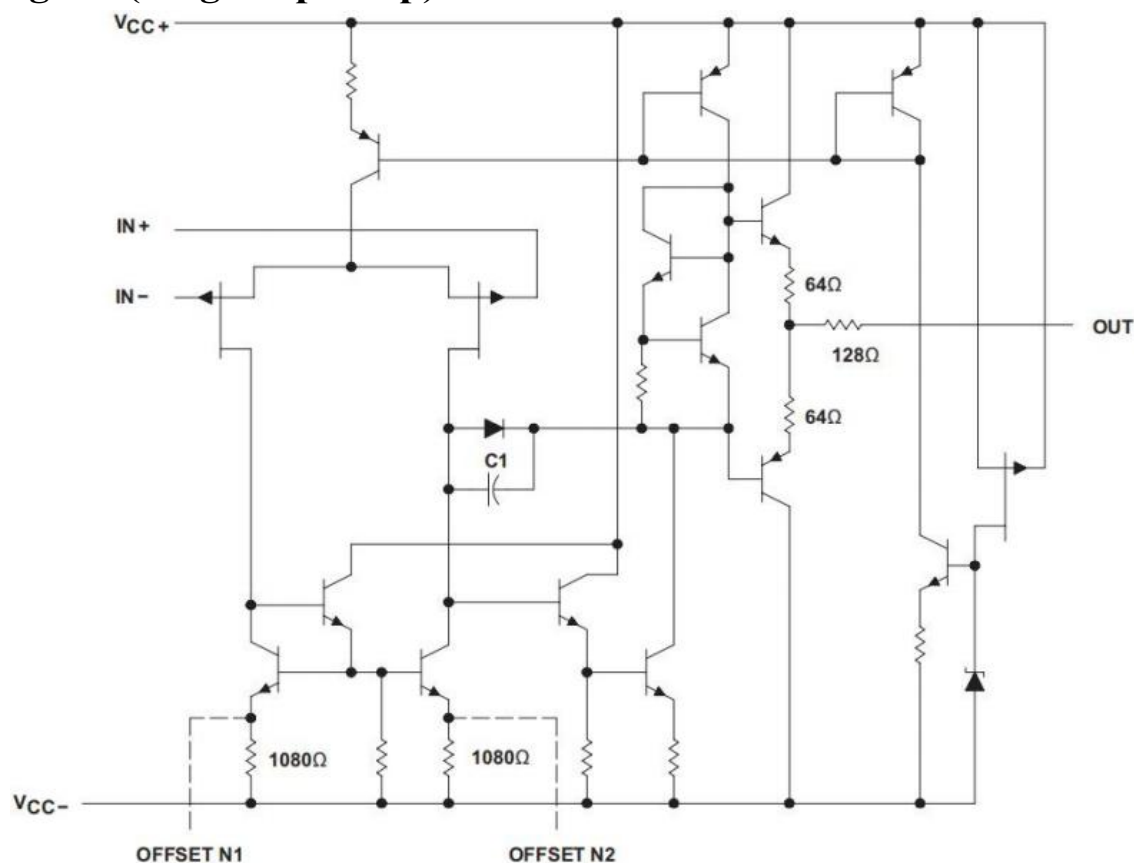
Applications

- White goods
- Mobile electronic devices

Package Outline Drawing



Block Diagram(Single Op-Amp)



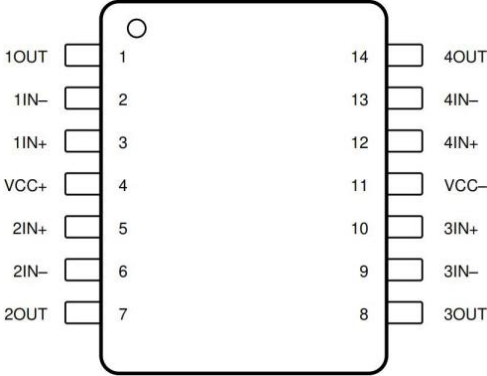


TL084

Ordering Information

Type	Marking	Package
TL084-D14	TL084	DIP-14
TL084-P14	TL084	SOP-14

Pin Description

Pin Number	Pin Name	I/O	Description	
1	1OUT	O	Channel 1 Output	
2	1IN-	I	Channel 1 Inverting Input	
3	1IN+	I	Channel 1 Non-Inverting Input	
4	V _{CC} +	P	Positive Power Supply	
5	2IN+	I	Channel 2 Non-Inverting Input	
6	2IN-	I	Channel 2 Inverting Input	
7	2OUT	O	Channel 2 Output	
8	3OUT	O	Channel 3 Output	
9	3IN-	I	Channel 3 Inverting Input	
10	3IN+	I	Channel 3 Non-Inverting Input	
11	V _{CC} -	P	Negative Power Supply	
12	4IN+	I	Channel 4 Non-Inverting Input	
13	4IN-	I	Channel 4 Inverting Input	
14	4OUT	O	Channel 4 Output	

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	±18	V
Input Voltage	V _I	±15	V
Differential Input Voltage	V _{ID}	±30	V
Maximum Operating Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-65~+150	°C
Lead Temperature(Soldering , 10 s)	T _W	260	°C

Recommended Operating Conditions(T_A=25°C unless otherwise noted)

Parameter	Symbol	Min	Max	Unit
Positive Power Supply	V _{CC} +	+5	+15	V
Negative Power Supply	V _{CC} -	-5	-15	V
Common Mode Input Voltage	V _{CM}	(V _{CC} -)+4	(V _{CC} +) -4	V
Operating Temperature Range	T _A	-20	+85	°C
Operating Junction Temperature	T _J	-20	+125	°C



TL084

Electrical Characteristics($T_A=25^{\circ}\text{C}$, $V_{CC+}=15\text{V}$, $V_{CC-}=-15\text{V}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Supply Current(per channel)	I_{CC}	$V_O=0\text{V}, R_L=\infty$	-	1.4	2.8	mA
Input Offset Voltage	V_{IO}	$V_O=0\text{V}$	-	± 2	± 6	mV
Input Offset Current	I_{IO}	$V_O=0\text{V}$	-	± 50	-	pA
Input Bias Current	I_B	$V_O=0\text{V}$	-	± 200	-	pA
Input Common-mode Voltage	V_{ICM}		± 11	-	-	V
Output Voltage swing	V_{OM}	$R_L=10\text{K}\Omega$	± 12	± 13.5	-	V
		$R_L=2\text{K}\Omega$	± 10	± 12	-	
Output Short-circuit Current	I_{SC}	$V_O=0\text{V}$	± 40	± 60	± 80	mA
Open-Loop Voltage Gain	A_{OL}	$V_O=\pm 10\text{V}, R_L<2\text{K}\Omega$	-	100	-	V/mV
Common Mode Rejection Ratio	CMRR		-	95	-	dB
Power Supply Rejection Ratio	PSRR		-	100	-	dB
Gain Bandwidth Product	GBWP		-	3	-	MHz
Slew Rate	S_R		8	13	-	V/uS
Input Impedance	R_I		-	10^{12}	-	Ω

Typical Applications

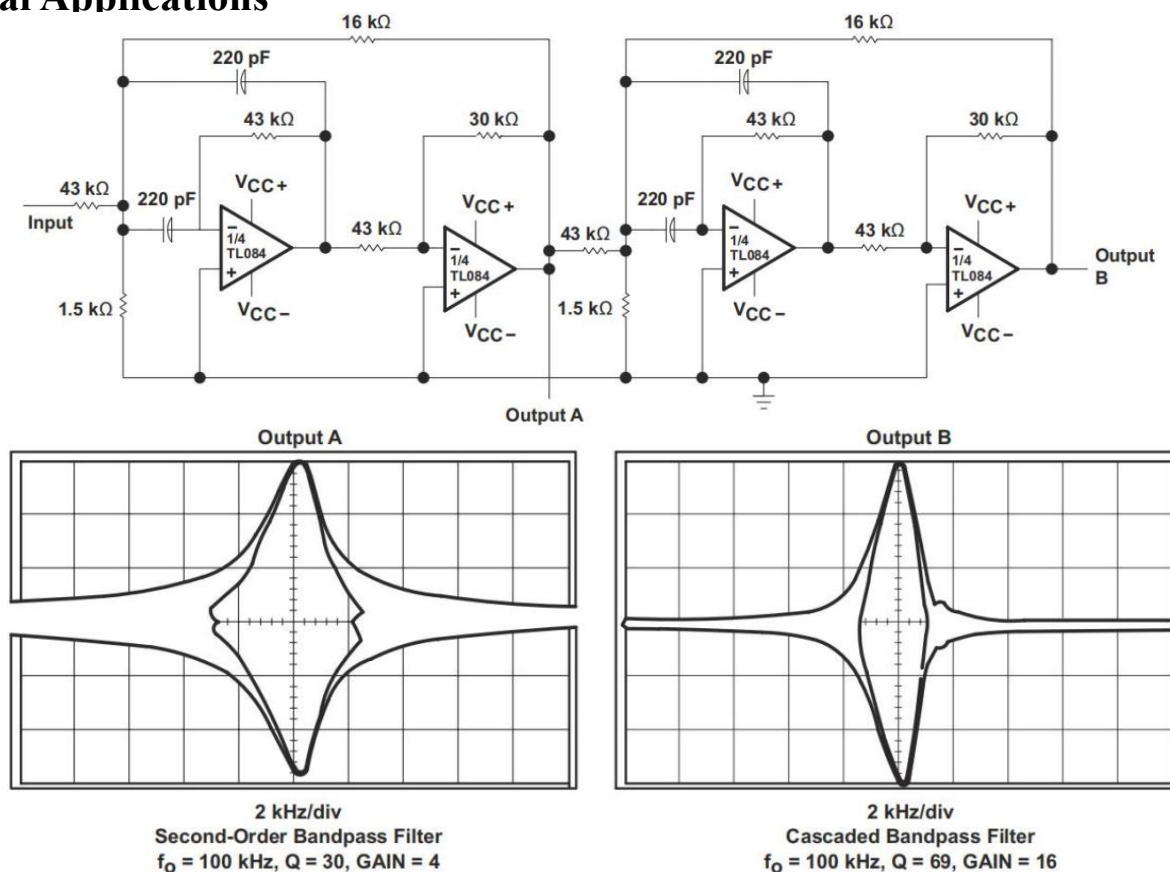


Figure 1. Positive Feedback Bandpass Filter

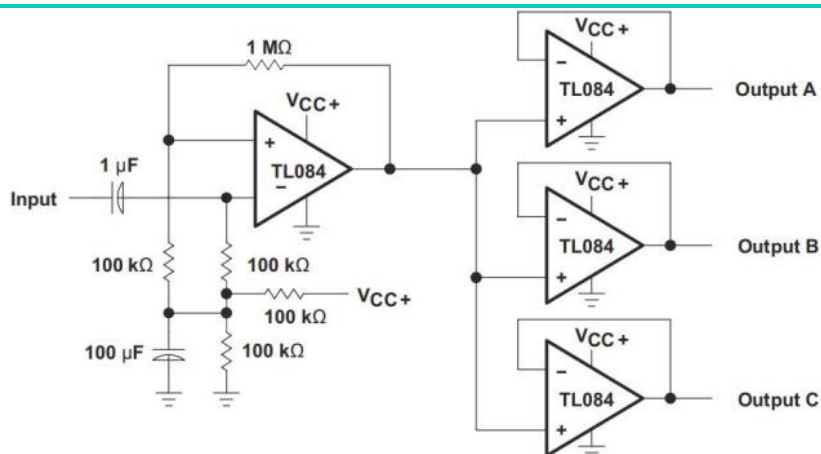


Figure 2. Audio Distribution Amplifier

Typical Characteristics

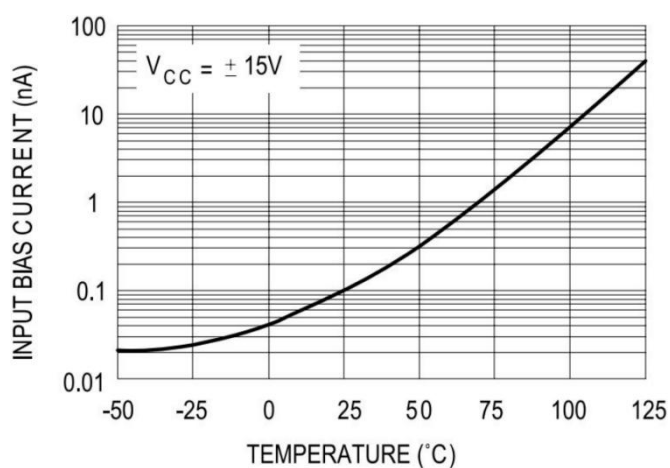


Fig 3. Input Bias Current vs. Ambient Temperature

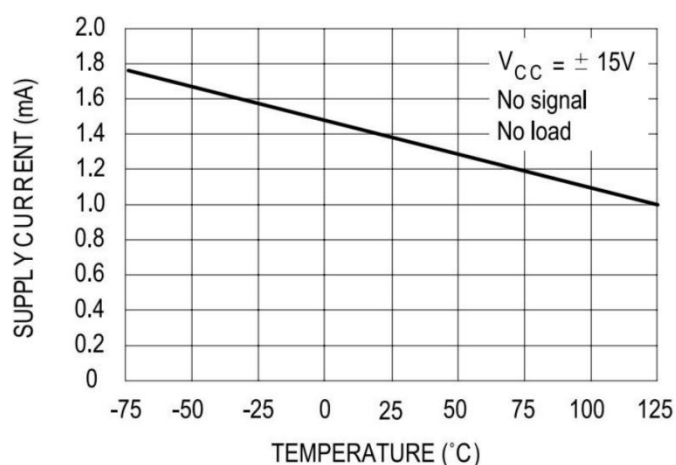


Fig 4. Supply Current vs. Ambient Temperature(per Channel)

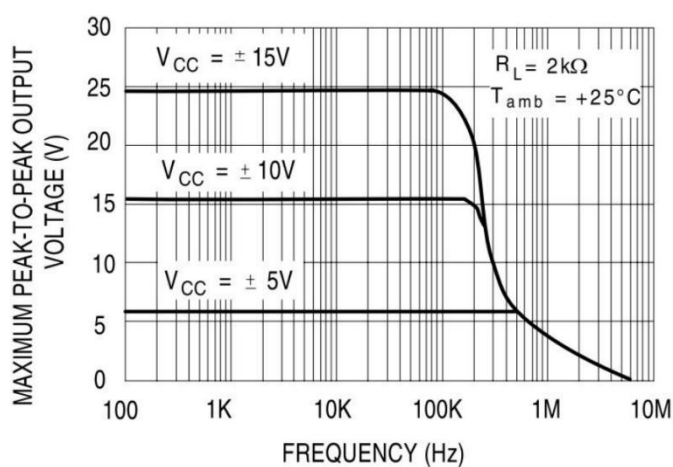


Fig 5. Maximum Output Voltage Swing vs. Frequency

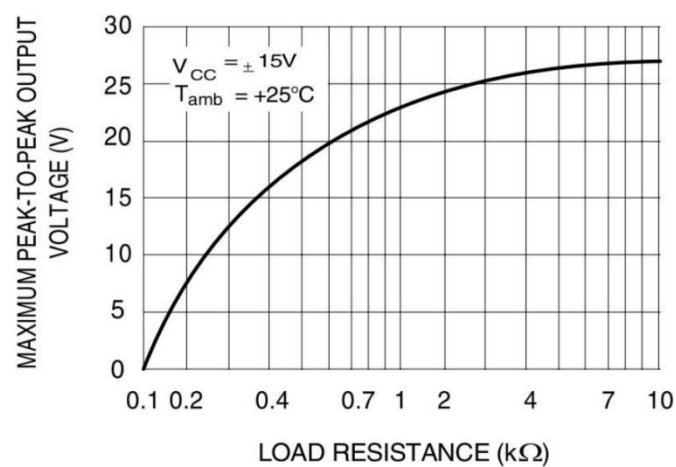


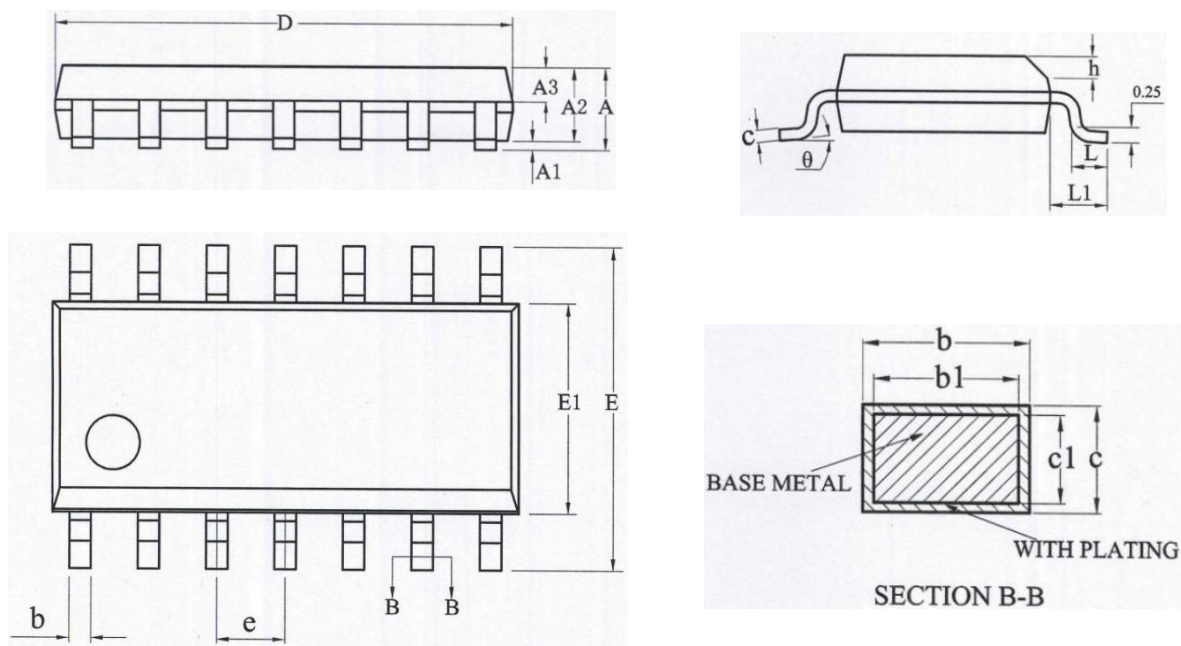
Fig 6. Maximum Output Voltage Swing vs. Load



Package Information

SOP-14

Dimensions in mm



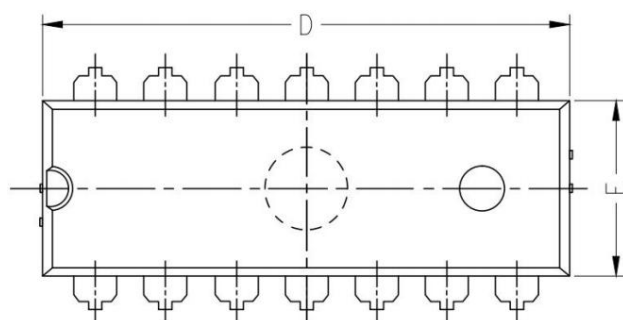
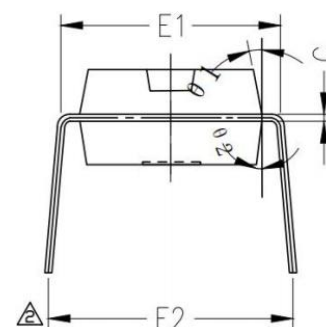
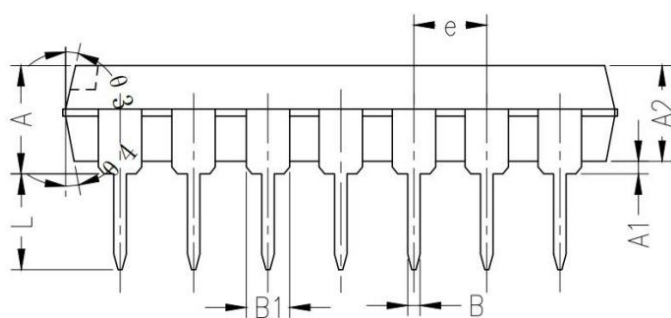
Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	1.75	D	8.55	8.65	8.75
A1	0.10	-	0.225	E	5.80	6.00	6.20
A2	1.30	1.40	1.50	E1	3.80	3.90	4.00
A3	0.60	0.65	0.70	e	1.27 (BSC)		
b	0.39	-	0.47	h	0.25	-	0.50
b1	0.38	0.41	0.44	L	0.50	-	0.80
c	0.20	-	0.24	L1	1.05 (REF)		
c1	0.19	0.20	0.21	θ	0°	-	8°



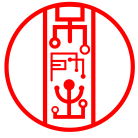
Package Information

DIP-14

Dimensions in mm



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	3.75	3.81	3.95	E1	7.35	7.62	7.85
A1	0.51	-	-	e	2.54 (BSC)		
A2	3.20	3.30	3.45	L	3.00	3.30	3.60
B	0.38	0.48	0.56	E2	8.00	8.40	8.80
B1	1.52 (BSC)			θ1	9°	-	15°
C	0.20	0.25	0.34	θ2	7°	-	13°
D	18.80	19.05	19.30	θ3	8°	-	14°
E	6.20	6.35	6.50	θ4	5°	-	12°



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