

General purpose JFET quad operational amplifiers

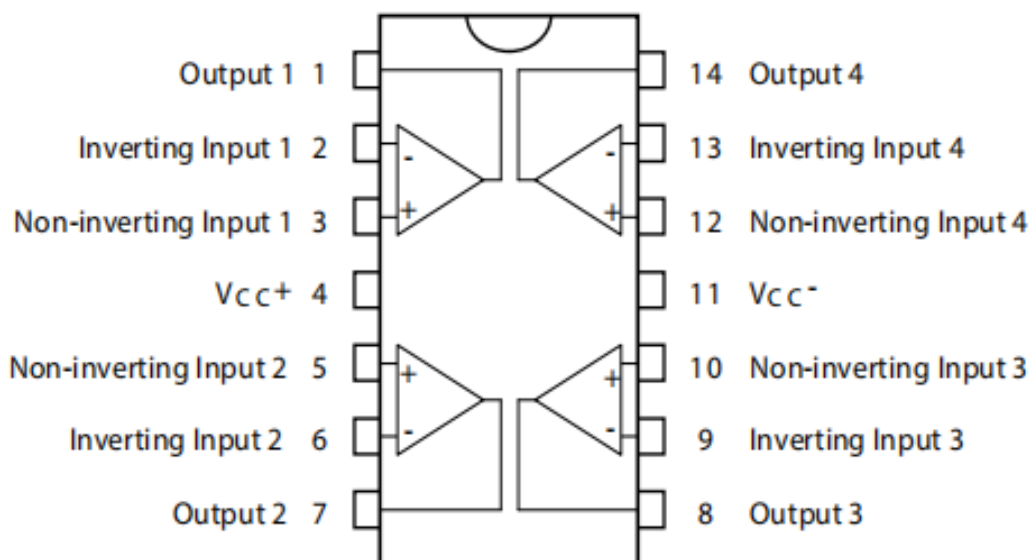
Description

The TL084, TL084A, and TL084B are high-speed, JFET input, quad operational amplifiers incorporating well matched, high voltage JFET and bipolar transistors in a monolithic integrated circuit.

The devices feature high slew rates, low input bias and offset currents, and low offset voltage temperature coefficient.

Features

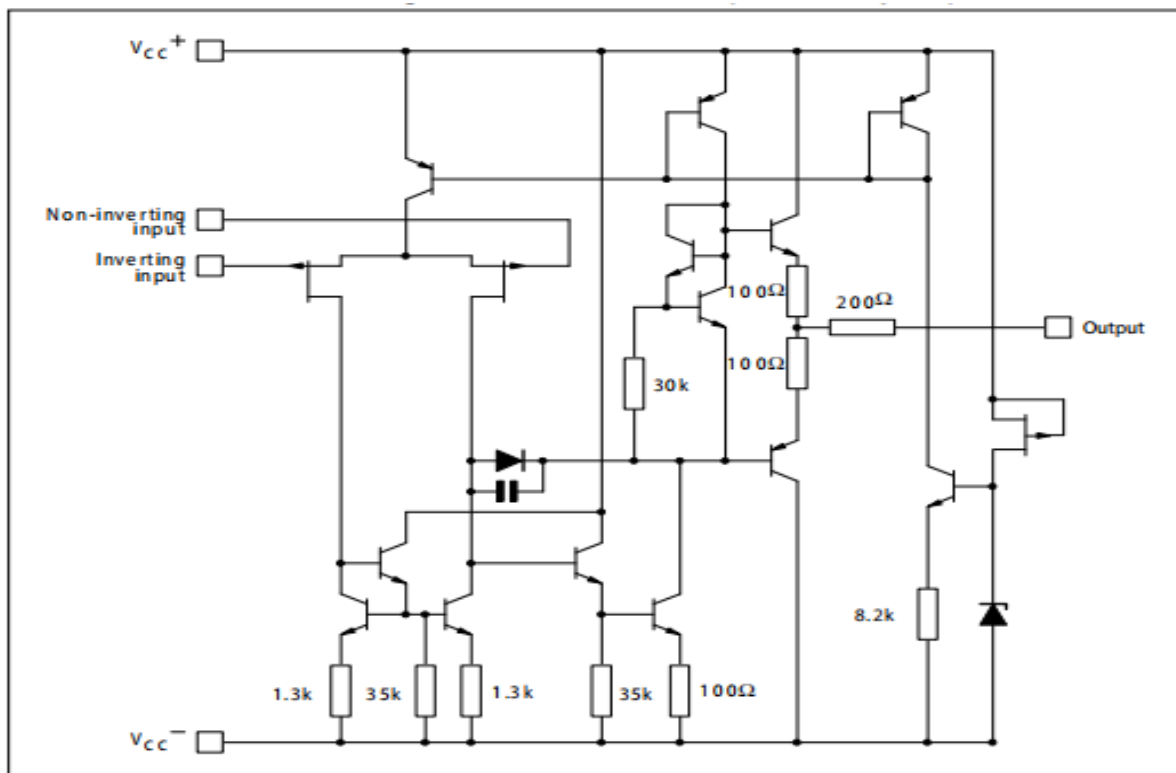
- Wide common-mode (up to V_{CC}^+) and differential voltage range
- Low input bias and offset current
- Output short-circuit protection
- High input impedance JFET input stage
- Internal frequency compensation
- Latch up free operation
- High slew rate: 16 V/ μ s (typical)



Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CC}	Supply voltage	± 18	V
V_{in}	Input voltage	± 15	
V_{id}	Differential input voltage	± 30	
R_{thja}	Thermal resistance junction to ambient SO-14	105	$^{\circ}\text{C}/\text{W}$
P_{tot}	Power dissipation	680	mW
	Output short-circuit duration	Infinite	
T_{oper}	Operating free-air temperature range: for TL084A	-40 to +125	$^{\circ}\text{C}$
	Operating free-air temperature range: for TL084C/TL084AC	0 to +70	
T_{stg}	Storage temperature range	-65 to +150	
ESD	HBM: human body model	1000	V
	MM: machine model	150	
	CDM: charged device model	1500	

Schematic diagram

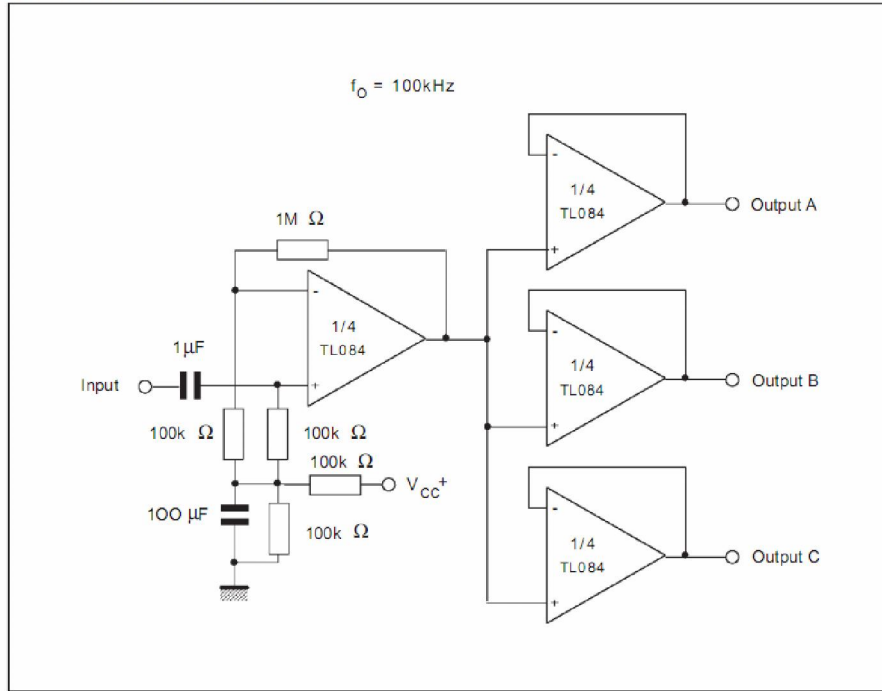


Electrical characteristics

Table 3. $V_{CC} = \pm 15\text{ V}$, $T_{amb} = +25\text{ }^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	TL084I/AI/AC/BI/BC			TL084C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
V_{io}	Input offset voltage ($R_S = 50\ \Omega$)							mV
	$T_{amb} = +25\text{ }^\circ\text{C}$ TL084		3	10		3	10	
	$T_{amb} = +25\text{ }^\circ\text{C}$ TL084A		3	6				
	$T_{amb} = +25\text{ }^\circ\text{C}$ TL084B		1	3				
	$T_{min} \leq T_{amb} \leq T_{max}$ TL084			13			13	
$T_{min} \leq T_{amb} \leq T_{max}$ TL084A			7					
$T_{min} \leq T_{amb} \leq T_{max}$ TL084B			5					
$\Delta V_{io}/\Delta T$	Input offset voltage drift		10			10		$\mu\text{V}/^\circ\text{C}$
I_{io}	Input offset current							pA nA
	$T_{amb} = +25\text{ }^\circ\text{C}$		5	100		5	100	
$T_{min} \leq T_{amb} \leq T_{max}$				4		4		
I_{ib}	Input bias current ⁽¹⁾							pA nA
	$T_{amb} = +25\text{ }^\circ\text{C}$		20	200		30	200	
$T_{min} \leq T_{amb} \leq T_{max}$				20		20		
A_{vd}	Large signal voltage gain ($R_L = 2\text{ k}\Omega$, $V_o = \pm 10\text{ V}$)							V/mV
	$T_{amb} = +25\text{ }^\circ\text{C}$	50	200		25	200		
$T_{min} \leq T_{amb} \leq T_{max}$		25			15			
SVR	Supply voltage rejection ratio ($R_S = 50\ \Omega$)							dB
	$T_{amb} = +25\text{ }^\circ\text{C}$	80	86		70	86		
$T_{min} \leq T_{amb} \leq T_{max}$		80			70			
I_{cc}	Supply current, no load							mA
	$T_{amb} = +25\text{ }^\circ\text{C}$		1.4	2.5		1.4	2.5	
$T_{min} \leq T_{amb} \leq T_{max}$				2.5		2.5		
V_{icm}	Input common mode voltage range	± 11	+15 -12		± 11	+15 -12		V
CMR	Common mode rejection ratio ($R_S = 50\ \Omega$)							dB
	$T_{amb} = +25\text{ }^\circ\text{C}$	80	86		70	86		
$T_{min} \leq T_{amb} \leq T_{max}$		80			70			
I_{os}	Output short-circuit current							mA
	$T_{amb} = +25\text{ }^\circ\text{C}$	10	40	60	10	40	60	
$T_{min} \leq T_{amb} \leq T_{max}$		10		60	10		60	
$\pm V_{opp}$	Output voltage swing							V
	$T_{amb} = +25\text{ }^\circ\text{C}$ $R_L = 2\text{ k}\Omega$	10	12		10	12		
	$R_L = 10\text{ k}\Omega$	12	13.5		12	13.5		
	$T_{min} \leq T_{amb} \leq T_{max}$ $R_L = 2\text{ k}\Omega$	10			10			
$R_L = 10\text{ k}\Omega$	12			12				
SR	Slew rate $V_{in} = 10\text{ V}$, $R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$, unity gain	8	16		8	16		V/ μs

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