

低功率 J-FET 输入运算放大器

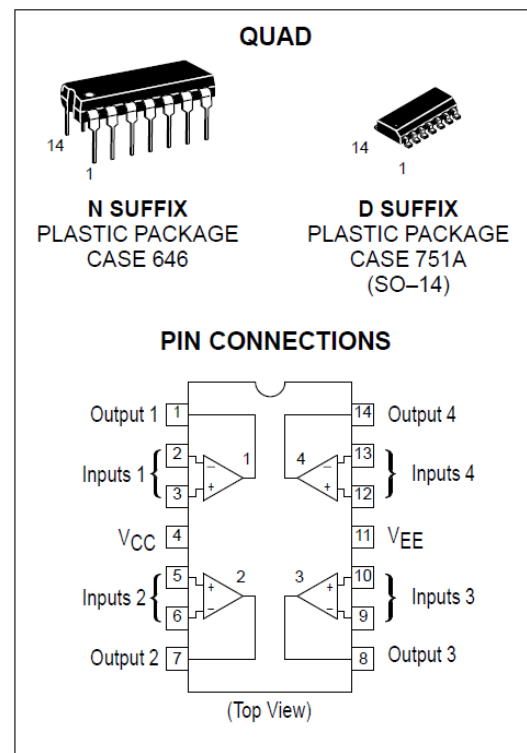
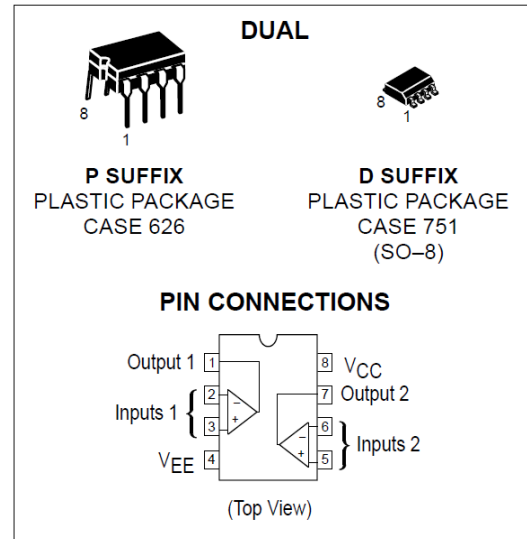
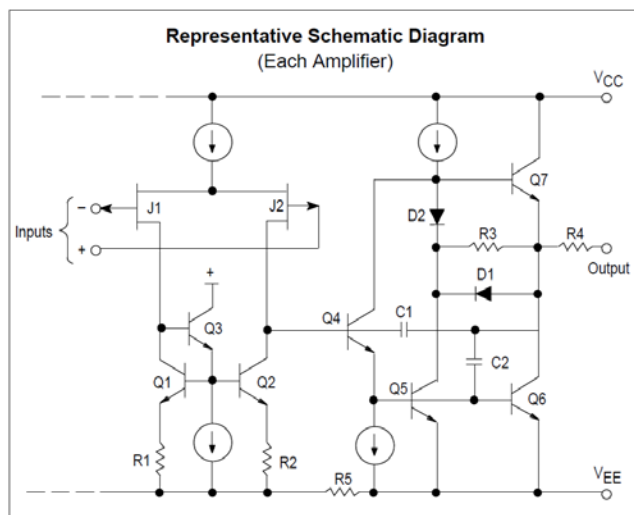
概述

这类 J-FET 输入运算放大器专为低功耗应用而设计，它们的特点是高输入阻抗，低输入偏置电流和低输入失调电流。

先进的设计技术保证了更高的转换速率，增益带宽积和输出摆幅。商业和车辆设备可用塑料双列直插和 SOP 封装。

主要特点

- 低电源电流：200uA/Amplifier
- 低输入偏置电流：5.0pA
- 高增益带宽：2.0MHz
- 高转换率：6.0V/uS
- 高输入阻抗： $10^{12} \Omega$
- 大输出电压摆幅： $\pm 14V$
- 输出短路保护



最大额定值

类别	符号	值	单位
电源（从 VCC 到 VEE）	VS	+36	V
输入差分电压范围（注 1）	V_{IDR}	± 30	V
输入电压范围（注 1 和注 2）	V_{IR}	± 15	V
输出短路持续时间（注 3）	tsc	待定	sec
工作结温	T_J	+125	$^{\circ}\text{C}$
存贮温度范围	T_{stg}	-60 to +150	$^{\circ}\text{C}$

- 注：1. 差分电压相对于反相输入端子位于同相输入端。
 2. 输入电压的大小绝不能超过供电电压 15 伏的幅度，以较小者为准。
 3. 必须考虑功耗，以确保不超过最大结温。

电特性（Vcc=20V，Tamp=25 $^{\circ}\text{C}$ 特殊情况另外说明）

参数	符号	TL062C/TL064C			单位
		Min	Typ	Max	
输入失调电压 (RS=50 Ω ，V0=0V) TA=25 $^{\circ}\text{C}$ TA=0 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$	V_{IO}	— —	3.0 —	15 20	mV
偏移电压的平均温度系数 (RS=50 Ω ，V0=0V)	$\Delta V_{IO}/\Delta T$	—	10	—	$\mu\text{V}/^{\circ}\text{C}$
输入失调电流 (VCM=0V，V0=0V) TA=25 $^{\circ}\text{C}$ TA=0 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$	I_{IO}	— —	0.5 —	200 2	pA nA
输入偏置电流 (VCM=0V，V0=0V) TA=25 $^{\circ}\text{C}$ TA=0 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$	I_{IB}	— —	3 —	200 10	pA nA
输入共模电压范围 TA=25 $^{\circ}\text{C}$	V_{ICR}	— -11	+14.5 -12	+11 —	V
大信号电压增益 (RL=10K Ω ，V0= ± 10 V0) TA=25 $^{\circ}\text{C}$ TA=0 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$	A_{VOL}	3.0 3.0	58 —	— —	V/mV
输出电压幅度 (RL=10K Ω ，VID=10 V0) TA=25 $^{\circ}\text{C}$ TA=0 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$	V_{O+} V_{O-} V_{O+} V_{O-}	+10 — +10 —	+14 -14 — —	— -10 — -10	V
共模抑制比 (RS=50 Ω ，VCM=VICR min，V0=0V，TA=25 $^{\circ}\text{C}$)	CMR	70	84	—	dB

共模抑制比 ($R_S=50\ \Omega$, $V_{CM}=0V$, $V_O=0V$, $T_A=25^\circ C$)	PSR	70	86	—	dB
电源电流 (每个独立运放) (空载, $V_O=0V$, $T_A=25^\circ C$)	I_D	—	200	250	μA
总功耗 (每个独立运放) (空载, $V_O=0V$, $T_A=25^\circ C$)	P_D	—	6.0	7.5	mW

交流电气特性 ($V_{CC}= +15V$, $V_{EE}= -15V$, $T_A= +25^\circ C$, 除非特殊说明)

参数	符号	Min	Typ	Max	单位
转换速率 ($V_{in}= -10V$ to $+10V$, $R_L=10k\ \Omega$, $C_L=100pF$, $AV=+1.0$)	SR	2.0	5.0	—	V/ μS
上升时间 ($V_{in}= 20mV$, $R_L=10k\ \Omega$, $C_L=100pF$, $AV=+1.0$)	T_r	—	0.1	—	μS
偏离值 ($V_{in}= 20mV$, $R_L=10k\ \Omega$, $C_L=100pF$, $AV=+1.0$)	OS	—	10	—	%
建立时间 ($V_{CC}= +15V$, $V_{EE}= -15V$, $AV=+1.0$, T_o within 10mV $R_L=10k\ \Omega$, $V_O=0V$ to $+10V$ step) T_o within 1.0mV	t_s	—	1.5 2.2	—	μS
增益带宽积 ($f=200KHz$)	GBW	—	2.0	—	MHz
等效输入噪声 ($R_S=100\ \Omega$, $f=1.0KHz$)	e_n	—	47	—	nV/ \sqrt{Hz}
输入电阻	R_i	—	10^{12}	—	Ω
信道分离 ($f=10KHz$)	CS	—	120	—	dB

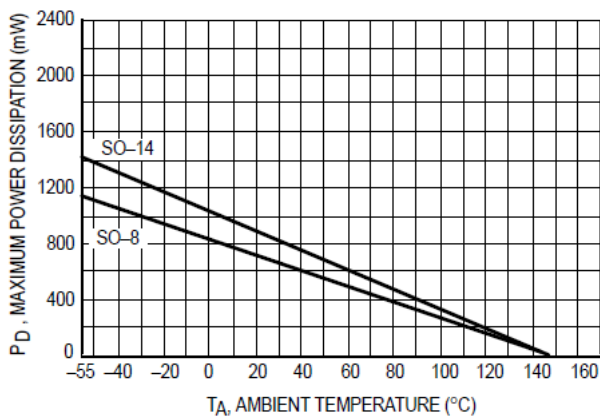
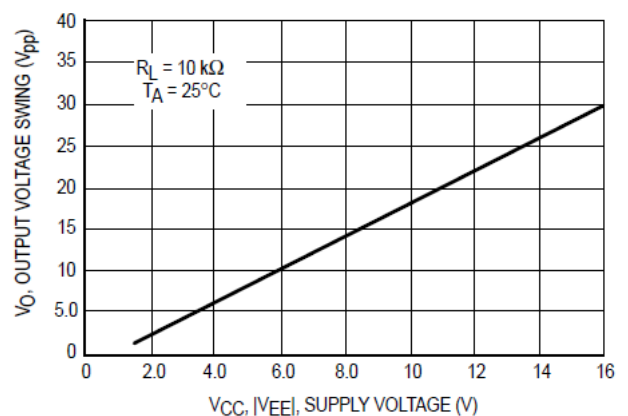
Figure 1. Maximum Power Dissipation versus Temperature for Package Variations

Figure 2. Output Voltage Swing versus Supply Voltage


Figure 3. Output Voltage Swing versus Temperature

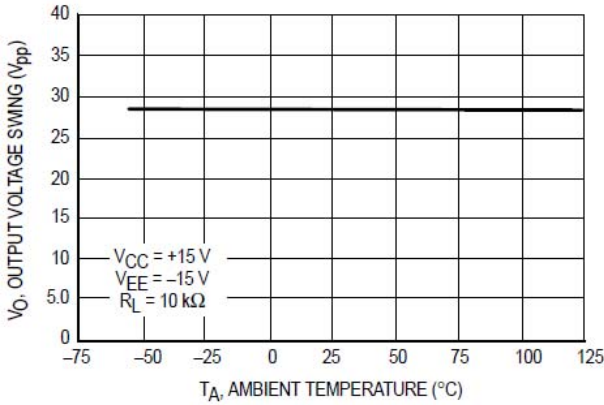


Figure 4. Output Voltage Swing versus Load Resistance

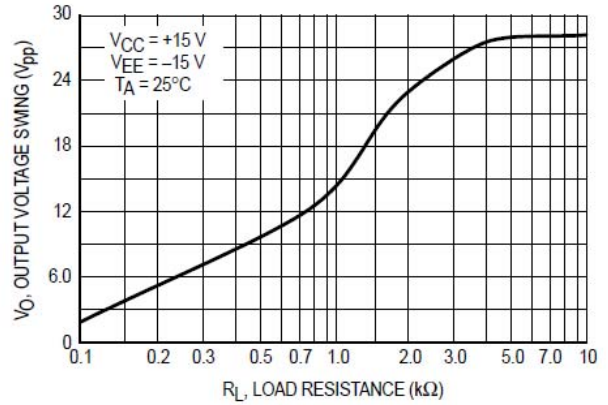


Figure 5. Output Voltage Swing versus Frequency

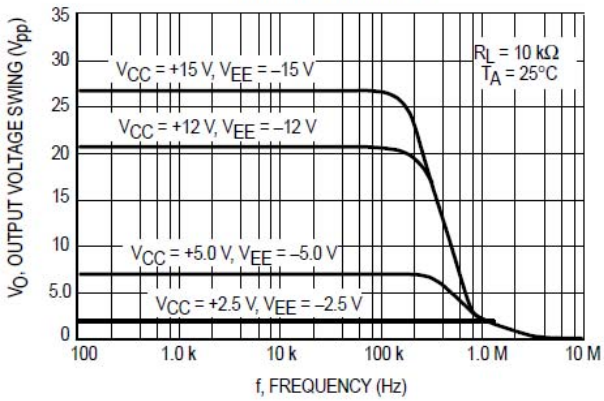


Figure 6. Large Signal Voltage Gain versus Temperature

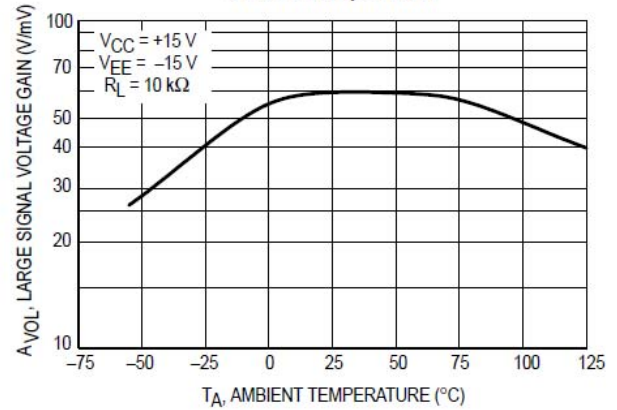


Figure 7. Open Loop Voltage Gain and Phase versus Frequency

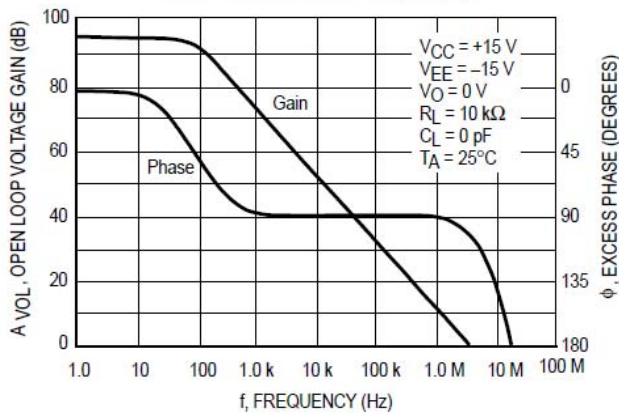


Figure 8. Supply Current per Amplifier versus Supply Voltage

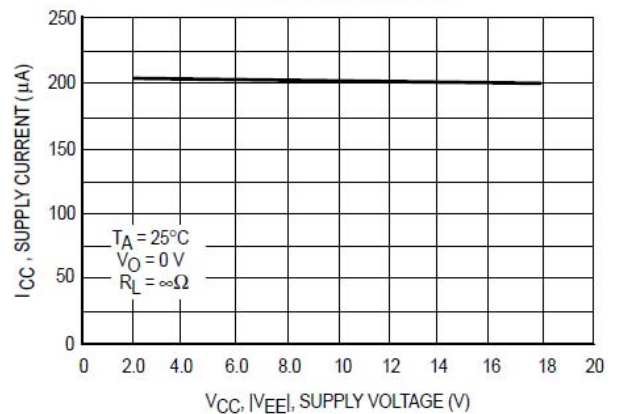


Figure 9. Supply Current per Amplifier versus Temperature

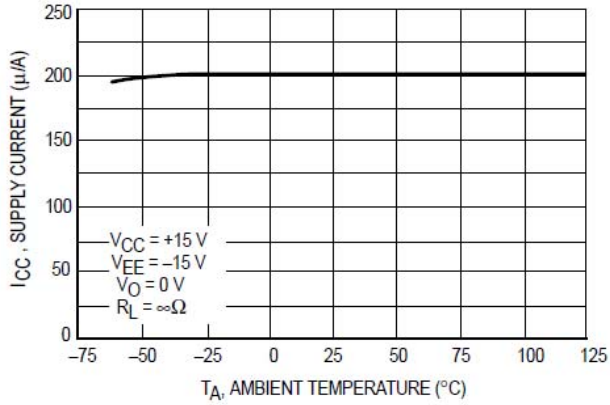


Figure 10. Total Power Dissipation versus Temperature

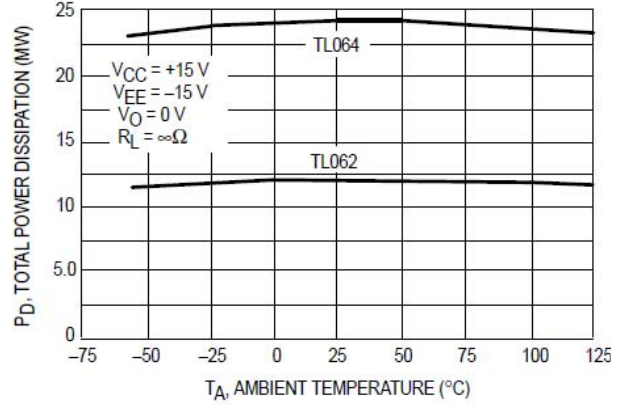


Figure 11. Common Mode Rejection versus Temperature

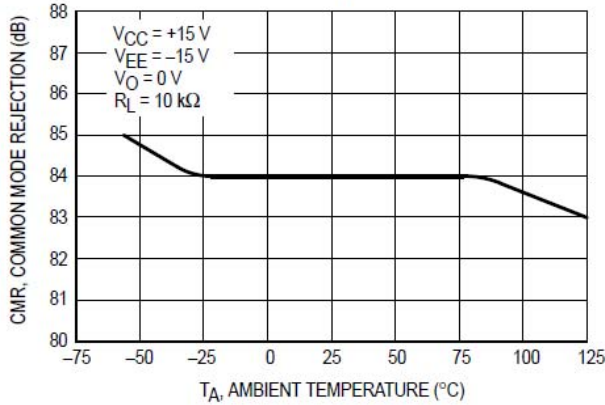


Figure 12. Common Mode Rejection versus Frequency

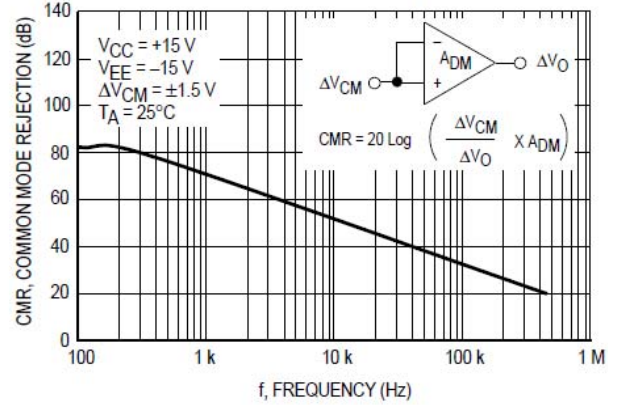


Figure 13. Power Supply Rejection versus Frequency

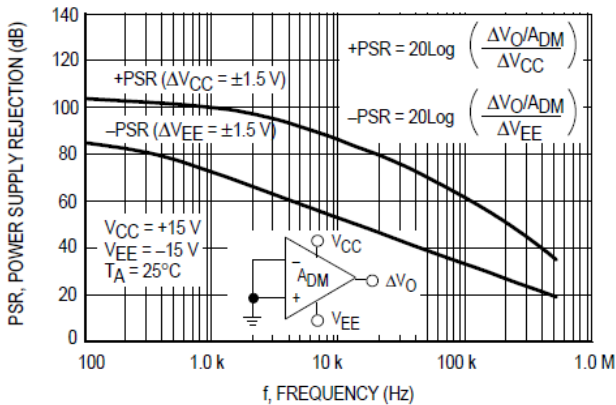


Figure 14. Normalized Gain Bandwidth Product, Slew Rate and Phase Margin versus Temperature

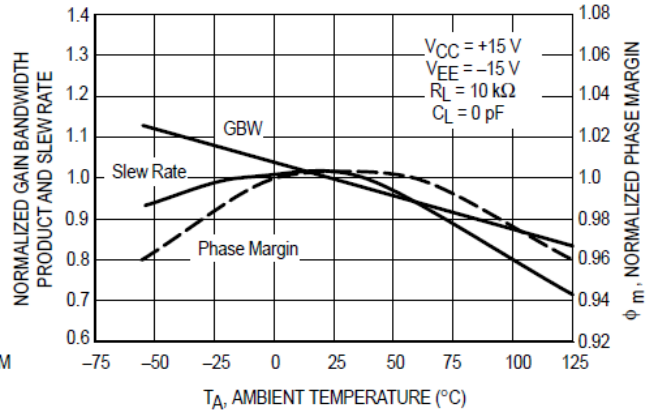


Figure 15. Input Bias Current versus Temperature

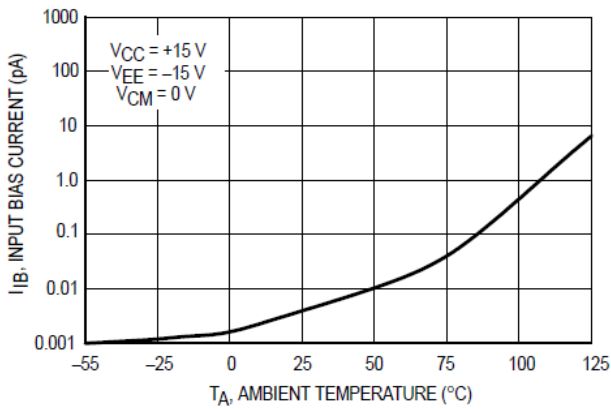


Figure 16. Input Noise Voltage versus Frequency

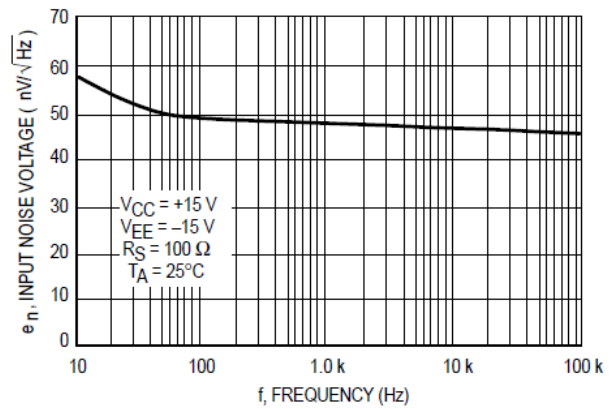


Figure 17. Small Signal Response

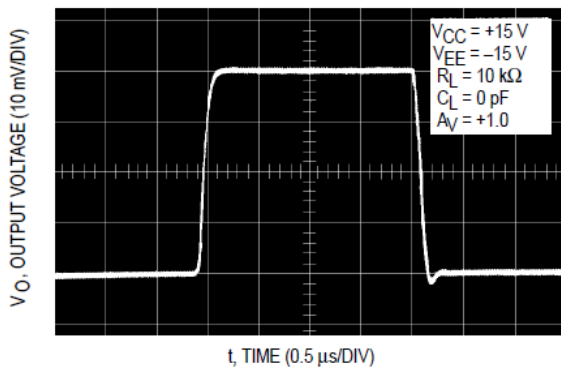


Figure 18. Large Signal Response

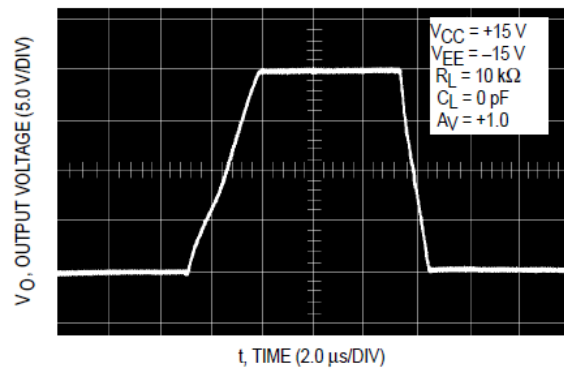


Figure 19. AC Amplifier

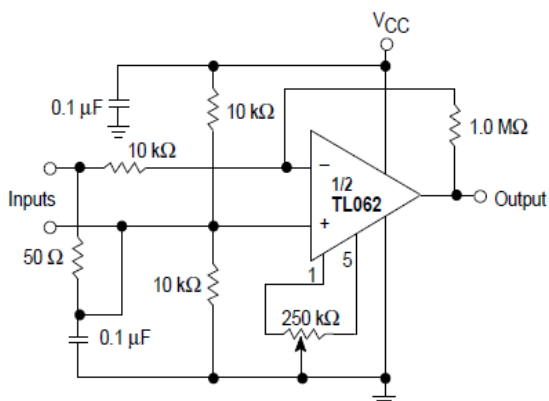


Figure 20. High-Q Notch Filter

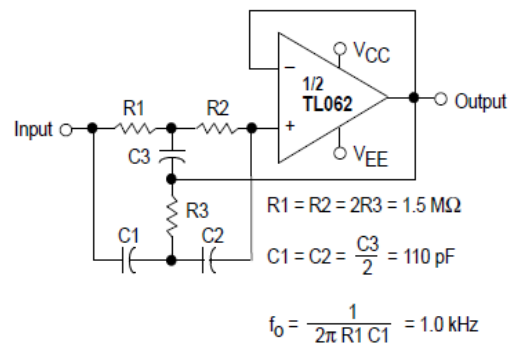


Figure 21. Instrumentation Amplifier

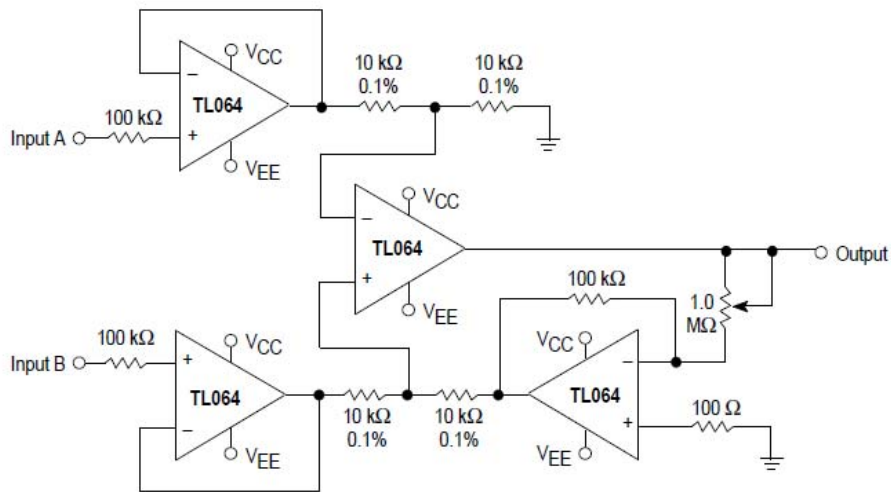


Figure 22. 0.5 Hz Square-Wave Oscillator

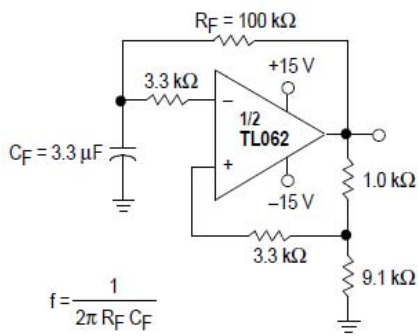


Figure 23. Audio Distribution Amplifier

