

## 低功耗 JFET 输入运算放大器

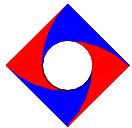
### » 概述

TL062/TL064 是一组适于低功耗工作的 JFET 输入运算放大器。

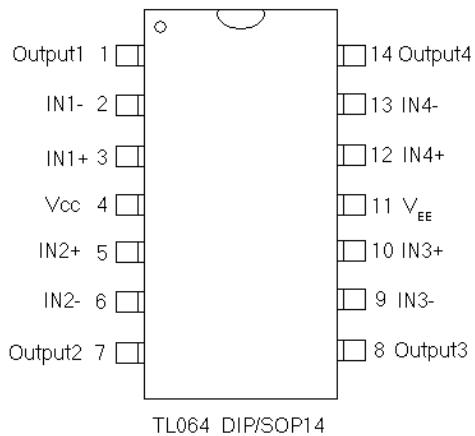
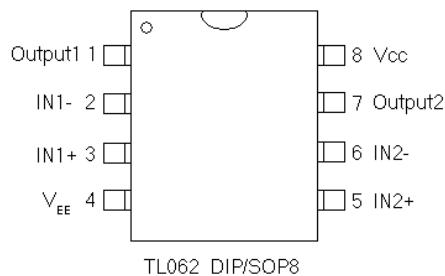
由于采用 JFET 做输入差分对，它们均具有很高的输入阻抗，很低的输入偏置电流和输入失调电流。先进的设计和工艺还实现了较高的限摆率，增益带宽增益积和输出信号摆幅。

### » 特点

- 低电源电流：每个放大器 200uA
- 低达 5. 0pA 的输入偏置电流
- 较高的带宽增益：2. 0MHz
- 较高的限摆率：6. 0V/uS
- 较高的输入阻抗： $10^{12}\Omega$
- 较大输出电压摆动：±14V
- 输出短路保护



## » 顶视图



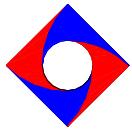
## » 极限值

参数	符号	取值范围	单位
电源电压 ( $V_{CC} \sim V_{EE}$ )	$V_S$	+36	V
输入差分电压 (注释 1)	$V_{IDR}$	±30	V
输入电压范围 (注释 1 和 2)	$V_{IR}$	±15	V
输出短路持续时间 (注释 3)	$t_{SC}$	未定义	S
焊接结点温度	$T_J$	+150	°C
贮存温度范围	$T_{stg}$	-60~+150	°C

注释：1. 差分电压是指同相输入端相对于反相输入端的电压。

2. 输入电压不得超过电源电压或低于 15V。

3. 必须考虑功耗，以确保不超过最高结温度。



电参数 ( $V_{cc} = +15V$ ,  $V_{ee} = -15V$ ,  $T_A = 0^\circ C \sim 70^\circ C$ , 除非特殊说明)

参数	符号	TL062/TL064			单位
		最小值	典型值	最大值	
输入失调电压 ( $R_s = 50\Omega$ , $V_o = 0V$ ) $T_A = 25^\circ C$ $T_A = 0^\circ C \sim +70^\circ C$	$V_{io}$	— —	3.0 —	6.0 7.5	mV
失调电压的平均温度系数 ( $R_s = 50\Omega$ , $V_o = 0V$ )	$\Delta V_{io} / \Delta T$	—	10	—	uV/°C
输入失调电流 ( $V_{cm} = 0V$ , $V_o = 0V$ ) $T_A = 25^\circ C$ $T_A = 0^\circ C \sim +70^\circ C$	$I_{io}$	— —	0.5 —	100 2.0	pA nA
输入偏置电流 ( $V_{cm} = 0V$ , $V_o = 0V$ ) $T_A = 25^\circ C$ $T_A = 0^\circ C \sim +70^\circ C$	$I_{ib}$	— —	3.0 —	200 2.0	pA nA
输入共模电压范围 $T_A = 25^\circ C$	$V_{icr}$	— —11.5	+14.5 —12.0	+11.5 —	V
大信号电压增益 $T_A = 25^\circ C$ $T_A = 0^\circ C \sim +70^\circ C$	$A_{vol}$	4.0 4.0	58 —	— —	V/mV
输出电压摆动 $T_A = 25^\circ C$ $T_A = 0^\circ C \sim +70^\circ C$	$V_o^+$	+10 —	+14 —14	— —10	V
	$V_o^-$	+10 —	— —	— —10	
共模抑制比 ( $R_s = 50\Omega$ , $V_{cm} = V_{icr}$ 最小值, $V_o = 0V$ , $T_A = 25^\circ C$ )	CMR	80	84	—	dB
电源抑制比 ( $R_s = 50\Omega$ , $V_{cm} = 0V$ , $V_o = 0V$ , $T_A = 25^\circ C$ )	PSR	80	86	—	dB
电源电流 (每个放大器) 无负载 $V_o = 0V$ , $T_A = 25^\circ C$	$I_d$	—	200	250	uA
功耗 (每个放大器) 无负载 $V_o = 0V$ , $T_A = 25^\circ C$	$P_d$	—	6.0	7.5	mW

## 交流电参数特性

( $V_{cc} = +15V$ ,  $V_{EE} = -15V$ ,  $T_A = 25^\circ C$ , 除非特殊说明)

参数	符号	最小值	典型值	最大值	单位
压摆率 ( $V_{in} = -10V \sim +10V$ , $R_L = 10K\Omega$ , $C_L = 100pF$ , $A_v = +1.0$ )	SR	2.0	6.0	-	V/us
上升沿时间 ( $V_{in} = 20mV$ , $R_L = 10K\Omega$ , $C_L = 100pF$ , $A_v = +1.0$ )	$t_r$	-	0.1	-	us
过冲 ( $V_{in} = 20mV$ , $R_L = 10K\Omega$ , $C_L = 100pF$ , $A_v = +1.0$ )	OS	-	10	-	%
建立时间 ( $V_{cc} = +15V$ , $V_{EE} = -15V$ , $A_v = -1.0$ , $\leq 10mv$ $R_L = 10K\Omega$ , $V_o = 0V \sim 10V$ $\leq 1.0mv$ )	$t_s$	-	1.6	-	us
-	-	-	2.2	-	
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	-	$nV\sqrt{Hz}$
输入阻抗	$R_i$	-	$10^{12}$	-	W
信道分离度 ( $f = 10KHz$ )	CS	-	120	-	dB

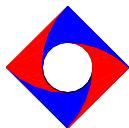


图1 最大功耗与不同封装焊接温度的关系曲线

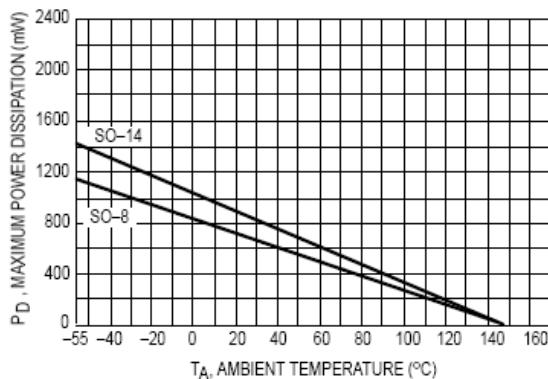


图2 输出电压摆动与电源电压的关系曲线

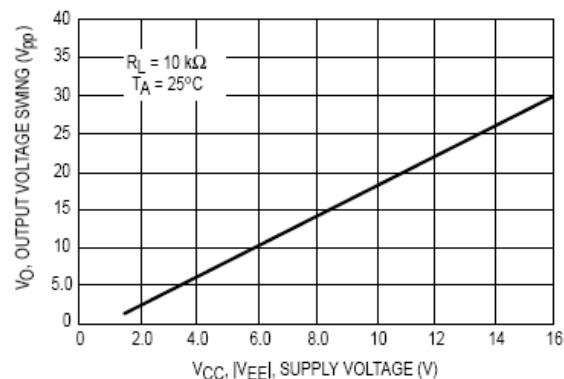


图3 输出电压摆动与温度的关系曲线

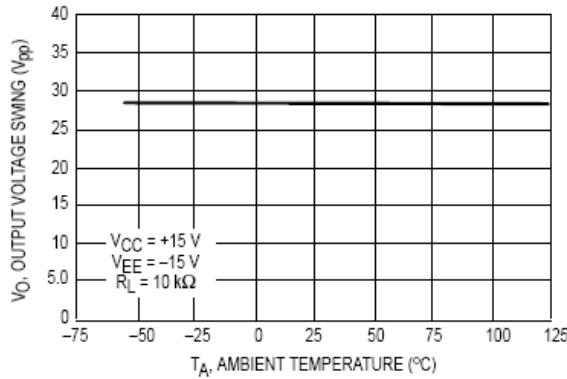


图4 输出电压摆动与负载电阻的关系曲线

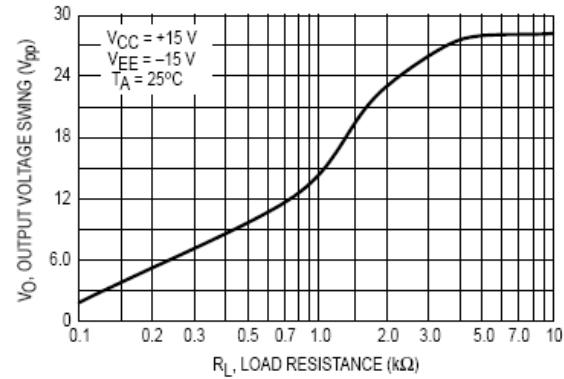


图5 输出电压摆动与频率的关系曲线

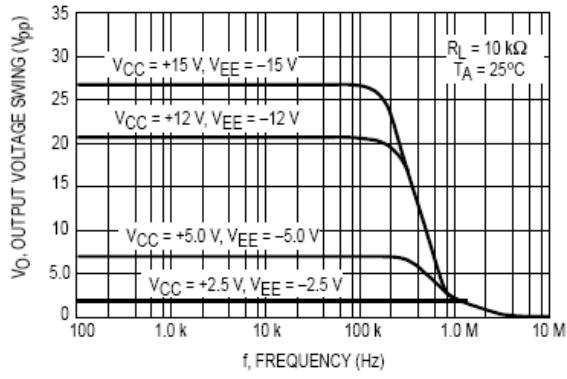
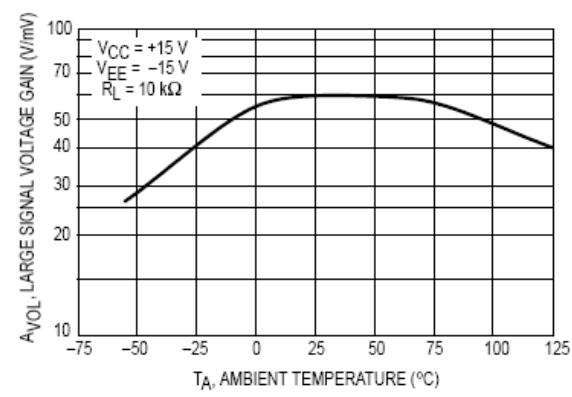


图6 大信号电压增益与温度的关系曲线



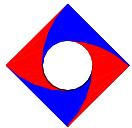


图7 开环电压增益/相位与频率的关系曲线

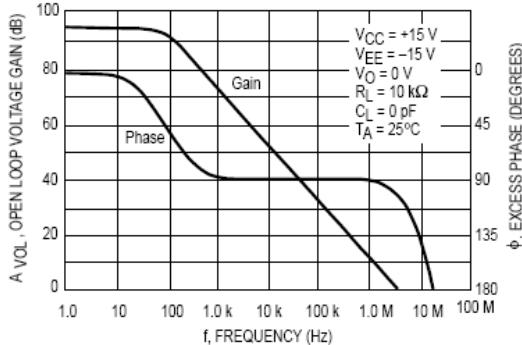


图8 每个放大器的供电电流与供电电压的关系曲线

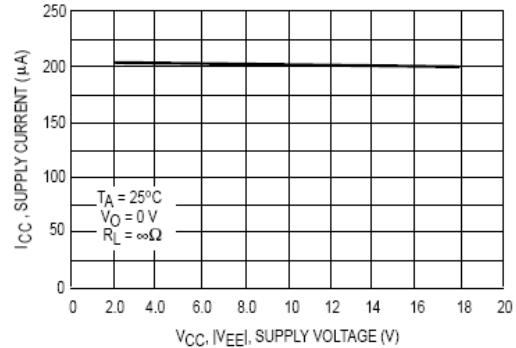


图9 每个放大器的供电电流与温度的关系曲线

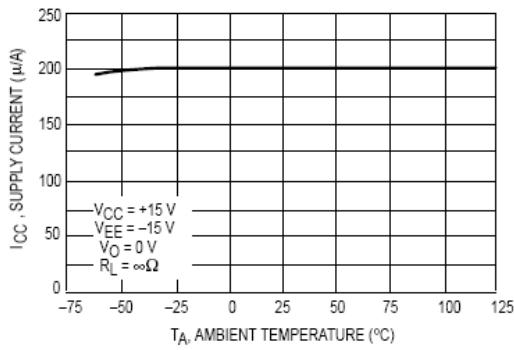


图10 总功耗与温度的关系曲线

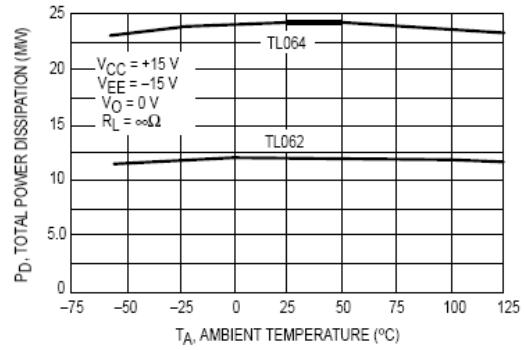


图11 共模抑制比与温度的关系曲线

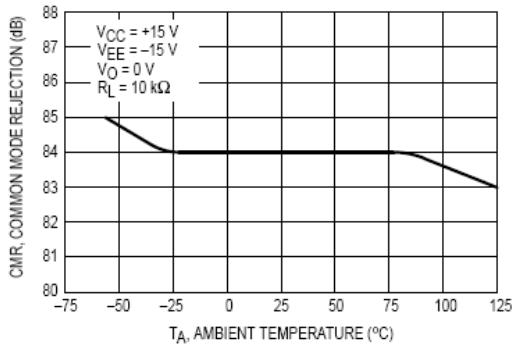
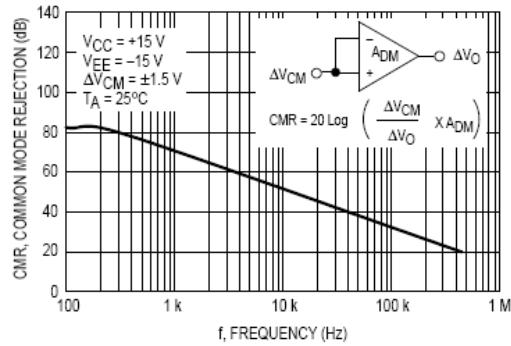


图12 共模抑制比与频率的关系曲线



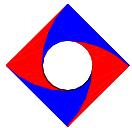


图13 电源抑制比与频率的关系曲线

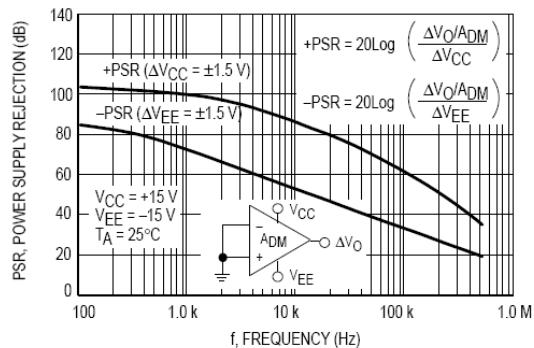


图14 标准增益带宽积、限摆率、相位差与温度的关系曲线

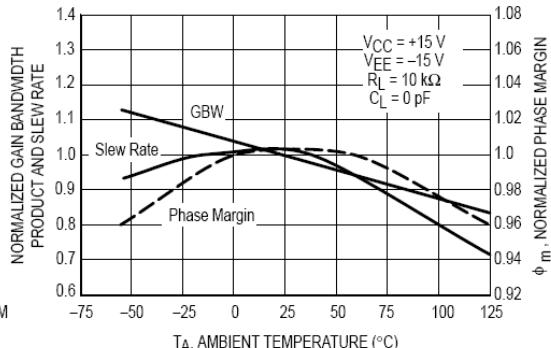


图15 输入偏置电流与温度的关系曲线

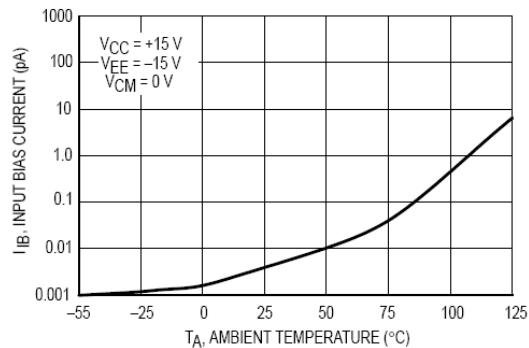


图16 输入噪声电压与频率的关系曲线

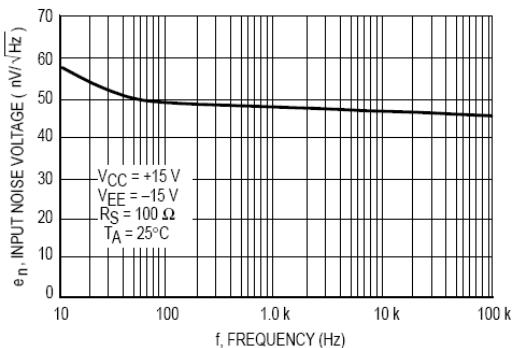


图17 小信号响应

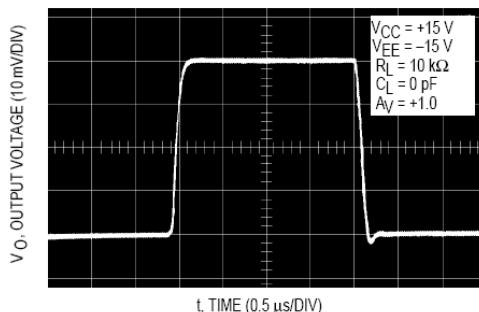
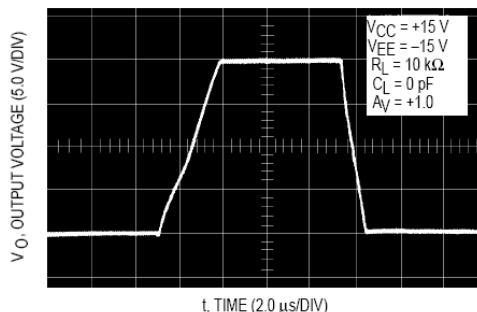


图18 大信号响应



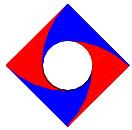


图19 交流放大器

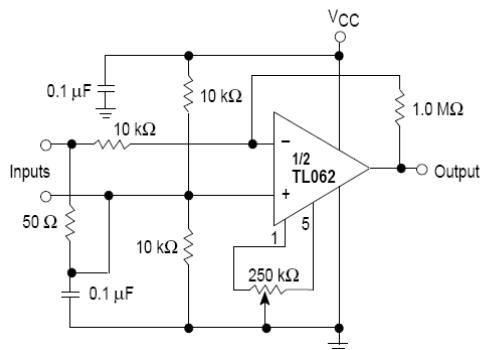


图20 高品质陷波滤波器

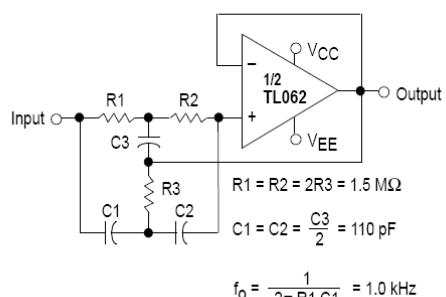


图21 仪表放大器

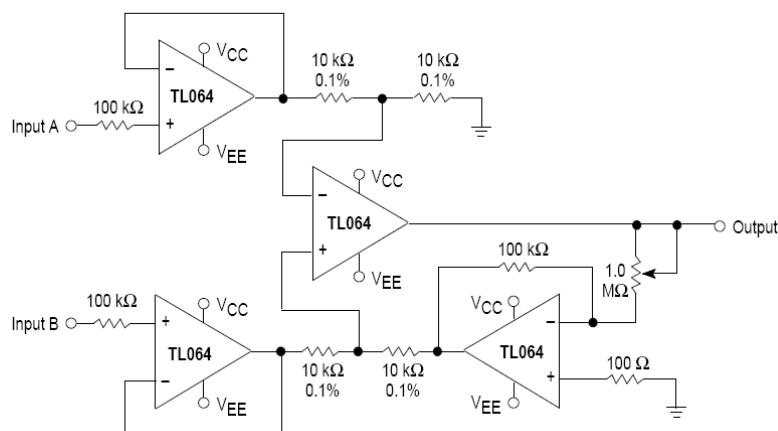


图22 0.5Hz方波振荡器

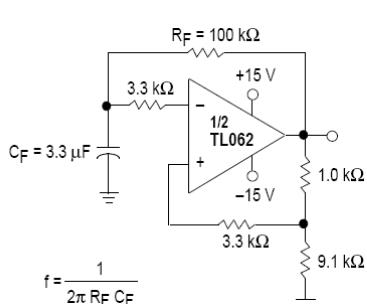
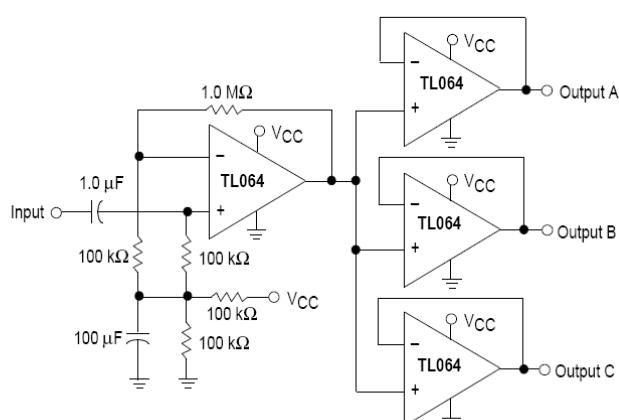
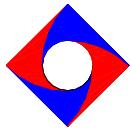


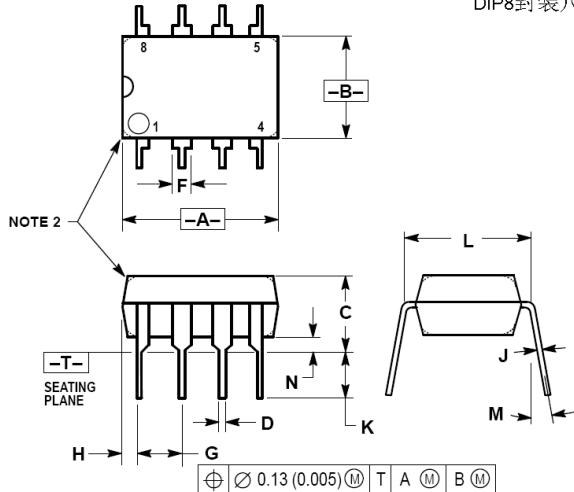
图23 音频分配放大器





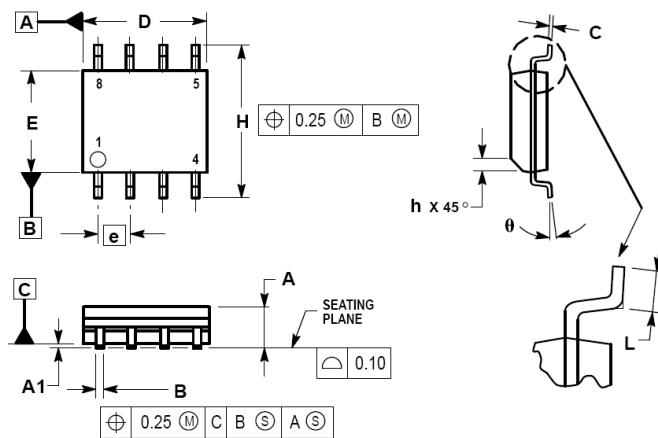
## ☒ 封装尺寸

DIP8封装尺寸

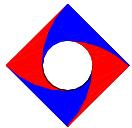


	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	9.40	10.16	0.370	0.400
B	6.10	6.60	0.240	0.260
C	3.94	4.45	0.155	0.175
D	0.38	0.51	0.015	0.020
F	1.02	1.78	0.040	0.070
G	2.54 BSC		0.100 BSC	
H	0.76	1.27	0.030	0.050
J	0.20	0.30	0.008	0.012
K	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300 BSC	
M	—	10°	—	10°
N	0.76	1.01	0.030	0.040

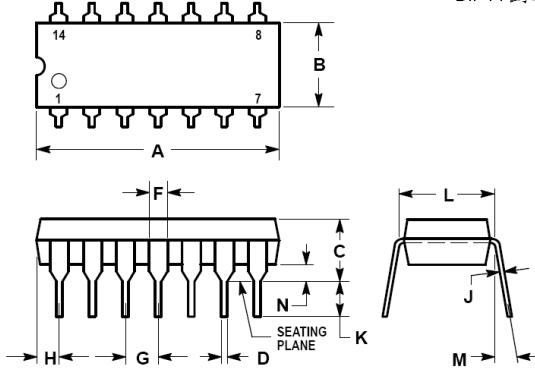
SOP8封装尺寸



DIM	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.18	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27	BSC
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
Ø	0 °	7 °

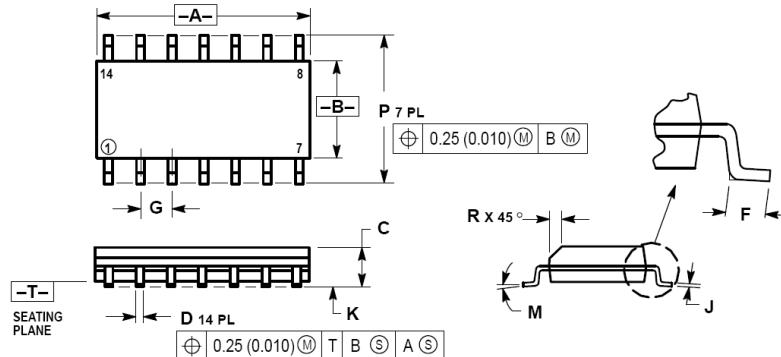


DIP14 封装尺寸



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.715	0.770	18.16	19.56
B	0.240	0.260	6.10	6.60
C	0.145	0.185	3.69	4.69
D	0.015	0.021	0.38	0.53
F	0.040	0.070	1.02	1.78
G	0.100 BSC		2.54 BSC	
H	0.052	0.095	1.32	2.41
J	0.008	0.015	0.20	0.38
K	0.115	0.135	2.92	3.43
L	0.300 BSC		7.62 BSC	
M	0°	10°	0°	10°
N	0.015	0.039	0.39	1.01

SOP14 封装尺寸



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.55	8.75	0.337	0.344
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.228	0.244
R	0.25	0.50	0.010	0.019

## 订货信息

产品型号	供货方式
TL062AD/AT	DIP8 引脚封装, 塑管, 每管 50 只; T=TSSOP封装
TL062AP	SOP8 引脚封装, 塑管, 每管 100 只
TL064AD/AT	DIP14 引脚封装, 塑管, 每管 25 只; T=TSSOP封装
TL064AP	SOP14 引脚封装, 塑管, 每管 50 只

## 文档信息

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