

54/74381

4 位算术逻辑单元/函数产生器（8 个功能）

简要说明：

54/74S381 为算术逻辑单元/函数产生器，其主要电特性的典型值如下（具体厂家有可能不是完全一至）：

| 型号 | 加法时间 | P _D |
|-----------|------|----------------|
| 54/74S381 | 17ns | 525mW |

54/74S381 能执行 8 种算术/逻辑运算，由功能选择端 S0~S2 决定运算功能。

利用进位产生输出端/G 和进位传输输出端/P 与超前进位产生器 54/74182 或者 54/74S182 相连，可完成高速运算。

引出端符号：

S0~S2

A0~A3

B0~B3

F0~F3

/G

/P

C_n

功能选择端

运算数据输入端

运算数据输入端

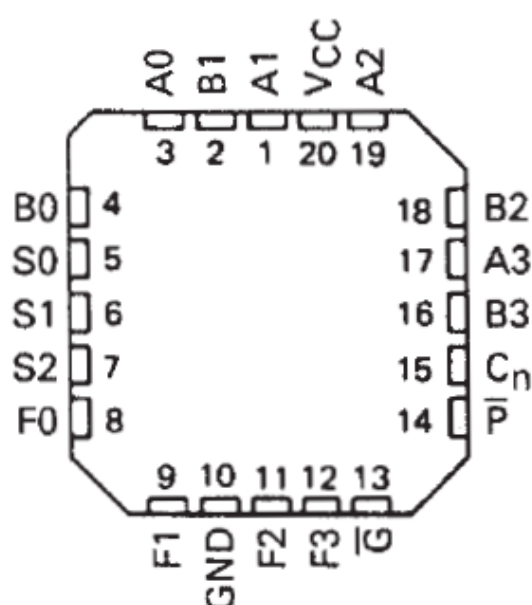
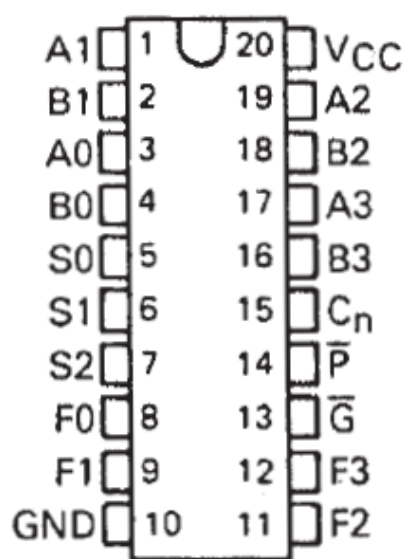
运算输出端

进位产生输出端（低电平有效）

进位传输输出端（低电平有效）

进位输入端

外接管腿；



功能表：

| ARITHMETIC/LOGIC OPERATION | INPUTS | | | | | | OUTPUTS | | | | ('LS381A, 'S381) | | ('LS382A) | |
|-------------------------------|--------|----|----|----------------|----------------|----------------|---------|----|----|----|------------------|-----------|-----------|------------------|
| | S2 | S1 | S0 | C _n | A _n | B _n | F3 | F2 | F1 | F0 | \bar{G} | \bar{P} | OVR | C _{n+4} |
| CLEAR | L | L | L | X | X | X | L | L | L | L | H | H | L | L |
| B MINUS A | L | L | H | L | L | L | H | H | H | H | H | L | L | L |
| | | | | L | L | H | H | H | H | L | L | H | L | H |
| | | | | L | H | L | L | L | L | L | H | H | L | L |
| | | | | L | H | H | H | H | H | H | H | L | L | L |
| | | | | H | L | L | L | L | L | L | H | L | L | H |
| | | | | H | L | H | H | H | H | H | L | H | L | H |
| | | | | H | H | L | L | L | L | H | H | H | L | L |
| | | | | H | H | H | L | L | L | L | H | L | L | H |
| A MINUS B | L | H | L | L | L | L | H | H | H | H | H | L | L | L |
| | | | | L | L | H | L | L | L | L | H | H | L | L |
| | | | | L | H | L | H | H | H | L | L | H | L | H |
| | | | | L | H | H | H | H | H | H | H | L | L | L |
| | | | | H | L | L | L | L | L | L | H | L | L | H |
| | | | | H | L | H | L | L | L | H | H | H | L | L |
| | | | | H | H | L | H | H | H | H | L | H | L | H |
| | | | | H | H | H | L | L | L | L | H | L | L | H |
| A PLUS B | L | H | H | L | L | L | L | L | L | L | H | H | L | L |
| | | | | L | L | H | H | H | H | H | H | L | L | L |
| | | | | L | H | L | H | H | H | H | H | L | L | L |
| | | | | L | H | H | H | H | H | L | L | H | L | H |
| | | | | H | L | L | L | L | L | H | H | H | L | L |
| | | | | H | L | H | L | L | L | L | H | L | L | H |
| | | | | H | H | L | L | L | L | L | H | L | L | H |
| | | | | H | H | H | H | H | H | H | L | H | L | H |
| $A \oplus B$ | H | L | L | X | L | L | L | L | L | L | H | H | L | L |
| | | | | L | L | H | H | H | H | H | H | L | L | L |
| | | | | H | L | H | H | H | H | H | H | L | H | H |
| | | | | L | H | L | H | H | H | H | H | L | L | L |
| | | | | H | H | L | H | H | H | H | H | L | H | H |
| | | | | X | H | H | L | L | L | L | H | H | L | L |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| A + B | H | L | H | X | L | L | L | L | L | L | H | H | L | L |
| | | | | L | L | H | H | H | H | H | H | L | L | L |
| | | | | H | L | H | H | H | H | H | H | L | H | H |
| | | | | L | H | L | H | H | H | H | H | L | L | L |
| | | | | H | H | L | H | H | H | H | H | L | H | H |
| | | | | L | H | H | H | H | H | H | H | L | L | L |
| | | | | H | H | H | H | H | H | H | H | L | H | H |
| | | | | | | | | | | | | | | |
| AB | H | H | L | X | L | L | L | L | L | L | H | H | L | L |
| | | | | X | L | H | L | L | L | L | H | H | L | L |
| | | | | X | H | L | L | L | L | L | H | H | L | L |
| | | | | L | H | H | H | H | H | H | H | L | L | L |
| | | | | H | H | H | H | H | H | H | H | L | H | H |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| PRESET | H | H | H | L | X | X | H | H | H | H | H | L | L | L |
| | | | | H | X | X | H | H | H | H | H | L | H | H |

极限值:

| | | |
|-------------------|-------|----------|
| 电源电压 | | 7V |
| 输入电压 | | 5.5V |
| 发射极间电压 | | |
| 每一对应的 A、B 之间..... | | 5.5V |
| 工作环境温度 | | |
| 54XXX..... | | -55~125℃ |
| 74XXX..... | | 0~70℃ |
| 存储温度 | | -65~150℃ |

推荐工作条件:

| | | 54/74S381 | | | 单位 |
|------------------------|----|-----------|----|------|----|
| | | 最小 | 额定 | 最大 | |
| 电源电压 Vcc | 54 | 4.5 | 5 | 5.5 | V |
| | 74 | 4.75 | 5 | 5.25 | |
| 输入高电平电V _{IH} | | 2 | | | V |
| 输入低电平电V _{IL} | | | | 0.8 | V |
| 输出高电平电流I _{OH} | | | | -1 | mA |
| 输出低电平电流I _{OL} | | | | 20 | mA |

静态特性 (TA 为工作环境温度范围)

| 参 数 | | 测 试 条 件 ^[1] | | S381 | | 单位 |
|--------------------------------|-------|--|----|------|------|----|
| | | | | 最小 | 最大 | |
| V _{IK} 输入嵌位电压 | | Vcc=最小, I _{ik} =-18mA | | | -1.5 | V |
| V _{OH} 输出高电平电压 | | Vcc=最小, V _{IL} =0.8V, V _{IH} =2V, I _{OH} =-1mA | 54 | 2.5 | | V |
| | | | 74 | 2.7 | | |
| V _{OL} 输出低电平电压 | | Vcc=最小, V _{IL} =0.8V, V _{IH} =2V, I _{OL} =20mA | | | 0.5 | V |
| I _I 最大输入电压时输入 电流 | | Vcc=最大, V _I =5.5V | | | 1 | mA |
| I _{IH} 输入高 电平电流 | S0~S2 | Vcc=最大, V _{IH} =2.4V | | | 50 | uA |
| | Cn | | | | 250 | |
| | 其余输入 | | | | 200 | |
| I _{IL} 输入低 电平电流 | S0~S2 | Vcc=最大, V _{IL} =0.5V | | | -2 | mA |
| | Cn | | | | -8 | |
| | 其余输入 | | | | -6 | |
| I _{OS} 输出短路电流 | | Vcc=最大 | | -40 | -100 | mA |
| I _{cc} 电源电流 | | Vcc=最大 | | | 160 | mA |

[1]: 测试条件中的“最小”和“最大”用推荐工作条件中的相应值。

动态特性(T_A=25℃)

| 参 数 ^[2] | | 测 试 条 件 | S381 | 单位 |
|--------------------|------------------------|--|------|----|
| | | | 最大 | |
| t _{PLH} | Cn 到 F0~F3 | V _{cc} =5V R _L =280 Ω C _L =15pF | 17 | ns |
| t _{PHL} | | | 17 | |
| t _{PLH} | A0~A3,B0~B3 到/G | | 20 | ns |
| t _{PHL} | | | 20 | |
| t _{PLH} | A0~A3,B0~B3 到/P | | 18 | ns |
| t _{PHL} | | | 18 | |
| t _{PLH} | A、B 到 F | | 27 | ns |
| t _{PHL} | | | 25 | |
| t _{PLH} | S0~S2 到 F0~F3,/G,/P | | 30 | ns |
| t _{PHL} | | | 30 | |

[2] t_{PLH} 输出由低到高传输延迟时间
t_{PHL} 输出由高到低传输延迟时间