

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

SN74LVC1G14

产品手册

产品简介

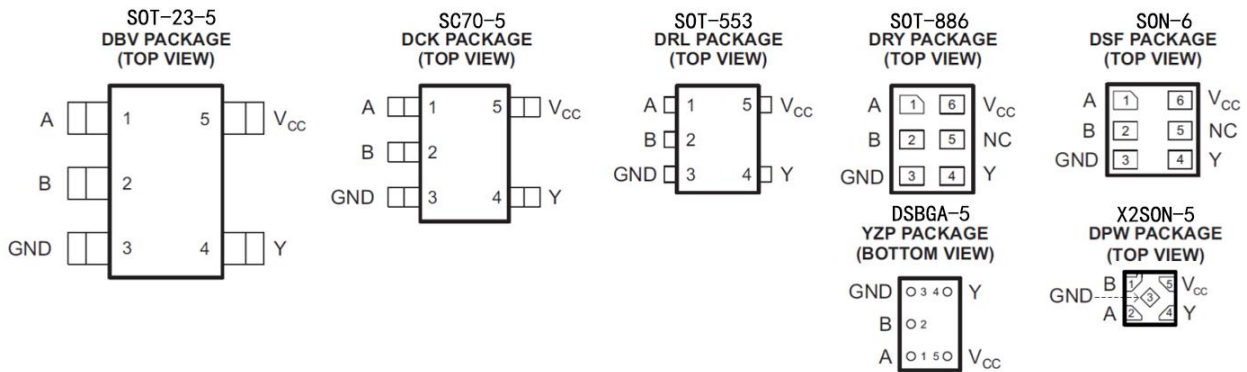
SN74LVC1G14 是一款的施密特触发功能的非门集成电路,可实现 $Y = \bar{A}$ 的数学逻辑运算。采用先进 CMOS 工艺设计,具有低功耗和高输出驱动能力的工作特点,电源电压 VCC 在 1.65V 和 5.5V 之间芯片均可正常工作。并且 SN74LVC1G14 具有多种小型封装外形,可广泛应用于高端精密仪器和小型化低功耗的手持设备,以及人工智能等领域。

产品特点

- 低输入电流: 典型值 0.1uA
- 低静态功耗: 典型值 0.1uA
- 高输出驱动: VCC=4.5V, 大于 32MA
- 宽工作电压范围: 1.65V to 5.5V
- 封装形式: DBV/DCK/DRL/YZP/ DRY/DSF/ DPW

产品用途

- 便携式音频接口
- 蓝光播放器和家庭影院
- 数字电视
- 固态硬盘
- 无线耳机, 智能手表等
- 智能穿戴设备



| 名称 | 管脚 | | | | 说明 |
|-----|-------------|---------|--------|-----|-----|
| | DBV/DCK/DRL | DRY/DSF | YZP | DPW | |
| NC | 1 | 1, 5 | A1, B2 | 1 | 空脚 |
| A | 2 | 2 | B1 | 2 | 输入 |
| GND | 3 | 3 | C1 | 3 | 电源地 |
| Y | 4 | 4 | C2 | 4 | 输出 |
| VCC | 5 | 6 | A2 | 5 | 电源正 |

注: NC---空脚, 内部无连接线

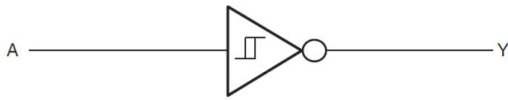
极限参数

| 参数 | 符号 | 极限值 | 单位 |
|-------------------|-----------|----------|----|
| 工作电压 | V_{CC} | 6.5 | V |
| 输入 | V_{IN} | -0.5~6.5 | V |
| 输出电压 (1) | V_{OUT} | -0.5~6.5 | V |
| 单个管脚输出电流 | I_{OUT} | 25 | mA |
| V_{CC} 或 GND 电流 | I_{CC} | 50 | mA |
| 存储温度 | T_S | -65~150 | °C |
| 引脚焊接温度 | T_W | 260, 10s | °C |

注：1、在 $V_{CC}=0V$ 断电状态下，输出所能承受的极限电压，

2、极限参数是指无论在任何条件下都不能超过的极限值。万一超过此极限值，将有可能造成产品劣化等物理性损伤；同时在接近极限参数下，不能保证芯片可以正常工作。

原理逻辑图



真值表

| Inputs | Output |
|--------|--------|
| A | Y |
| L | H |
| H | L |

工作条件

| 项目 | 符号 | 测试条件 | 最小值 | 典型值 | 最大值 | 单位 |
|---------|----------|-----------------------------|-----------------|-----|-----------------|----|
| 工作电压 | V_{CC} | - | 1.65 | - | 5.5 | V |
| 输入高电平电压 | V_{IH} | $V_{CC} = 1.65V \sim 1.95V$ | $0.65 * V_{CC}$ | - | - | V |
| | | $V_{CC} = 2.3V \sim 2.7V$ | 1.7V | - | - | |
| | | $V_{CC} = 3V \sim 5.5V$ | $0.7 * V_{CC}$ | - | - | |
| 输入高电平电压 | V_{IH} | $V_{CC} = 1.65V \sim 1.95V$ | - | - | $0.35 * V_{CC}$ | V |
| | | $V_{CC} = 2.3V \sim 2.7V$ | - | - | 0.7 | |
| | | $V_{CC} = 3V \sim 5.5V$ | - | - | $0.3 * V_{CC}$ | |
| 输入电压 | V_I | - | 0 | - | 5.5 | V |
| 输出电压 | V_O | - | 0 | - | V_{CC} | V |
| 高电平输出电流 | I_{OH} | $V_{CC} = 1.65V$ | - | - | -4 | mA |
| | | $V_{CC} = 2.3V$ | - | - | -8 | |
| | | $V_{CC} = 3V$ | - | - | -16 | |
| | | $V_{CC} = 4.5V$ | - | - | -32 | |
| 低电平输出电流 | I_{OL} | $V_{CC} = 1.65V$ | - | - | 4 | mA |
| | | $V_{CC} = 2.3V$ | - | - | 8 | |
| | | $V_{CC} = 3V$ | - | - | 16 | |
| | | $V_{CC} = 4.5V$ | - | - | 32 | |

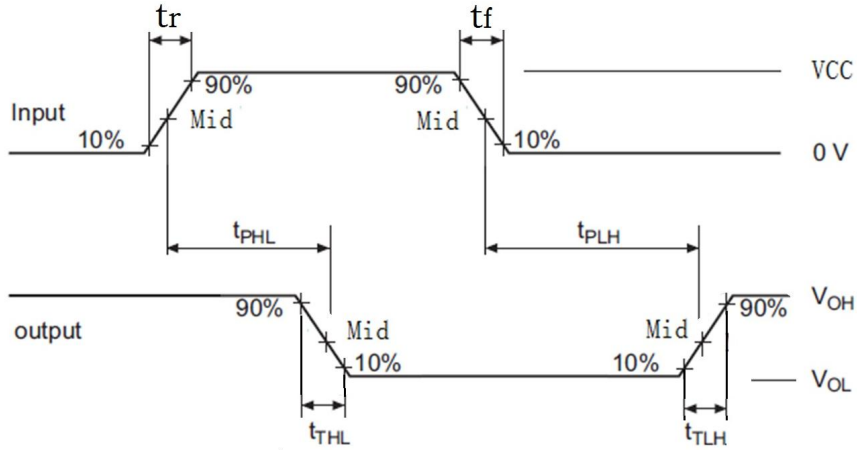
电学特性

直流电学特性: TA=25°C

| 项目 | 符号 | | 测试条件 | V _{cc} | 典型值 | 最大值 | 单位 |
|---------|--|---|--|-----------------|------|-----|----|
| 上临界电压 | V _{T+} | - | - | 1.65V | 1 | - | V |
| | | | | 2.3V | 1.35 | - | |
| | | | | 3V | 1.7 | - | |
| | | | | 4.5V | 2.5 | - | |
| | | | | 5.5V | 3 | - | |
| 下临界电压 | V _{T-} | - | - | 1.65V | 0.5 | - | V |
| | | | | 2.3V | 0.7 | - | |
| | | | | 3V | 1.1 | - | |
| | | | | 4.5V | 1.65 | - | |
| | | | | 5.5V | 1.9 | - | |
| 滞后宽度电压 | D V _T (V _{T+} - V _{T-}) | - | - | 1.65V | 0.5 | - | V |
| | | | | 2.3V | 0.65 | - | |
| | | | | 3V | 0.6 | - | |
| | | | | 4.5V | 0.85 | - | |
| | | | | 5.5V | 1.1 | - | |
| 高电平负载电压 | V _{OH} | | I _{OH} = -100uA | 1.65V~5.5V | 1.64 | - | V |
| | | | I _{OH} = -4 mA | 1.65V | 1.47 | - | |
| | | | I _{OH} = -8 mA | 2.3V | 2.15 | - | |
| | | | I _{OH} = -16 mA | 3V | 2.73 | - | |
| | | | I _{OH} = -32 mA | 4.5V | 4.0 | - | |
| 低电平负载电压 | V _{OL} | | I _{OH} = 100uA | 1.65V~5.5V | 0.01 | - | V |
| | | | I _{OH} = 4 mA | 1.65V | 0.11 | - | |
| | | | I _{OH} = 8 mA | 2.3V | 0.11 | - | |
| | | | I _{OH} = 16 mA | 3V | 0.2 | - | |
| | | | I _{OH} = 32 mA | 4.5V | 0.35 | - | |
| 输入电流 | I _I | A | V _I = 5.5V 或 GND | 0~5.5V | 0.01 | ±5 | uA |
| 关断电流 | I _{OFF} | V _I | V _I = 5.5V | 0 | 0.01 | ±10 | uA |
| | | V _O | V _O = 5.5V | 0 | 0.01 | ±10 | |
| 工作电流 | I _{CC} | V _I = 5.5V, I _O = 0 | V _I = GND, I _O = 0 | 1.65V~5.5V | 0.01 | 10 | uA |
| | | V _I = GND, I _O = 0 | | | 0.01 | 10 | |
| 工作电流变化值 | ΔI _{CC} | | A = V _{CC} - 0.6V | 3V~5.5V | 25 | - | uA |

交流电学特性: $T_a=25^{\circ}\text{C}$ $V_{CC}=5.0\text{V}$, $t_r=t_f \leq 20\text{ns}$ 见测试方法。

| 项目 | 符号 | 测试条件 | 最小值 | 典型值 | 最大值 | 单位 |
|----------|-----------|------------------|-----|-----|-----|----|
| 最大传输延迟时间 | t_{PHL} | $CL=15\text{pF}$ | - | 20 | - | ns |
| A、B to Y | t_{PLH} | $CL=15\text{pF}$ | - | 20 | - | ns |

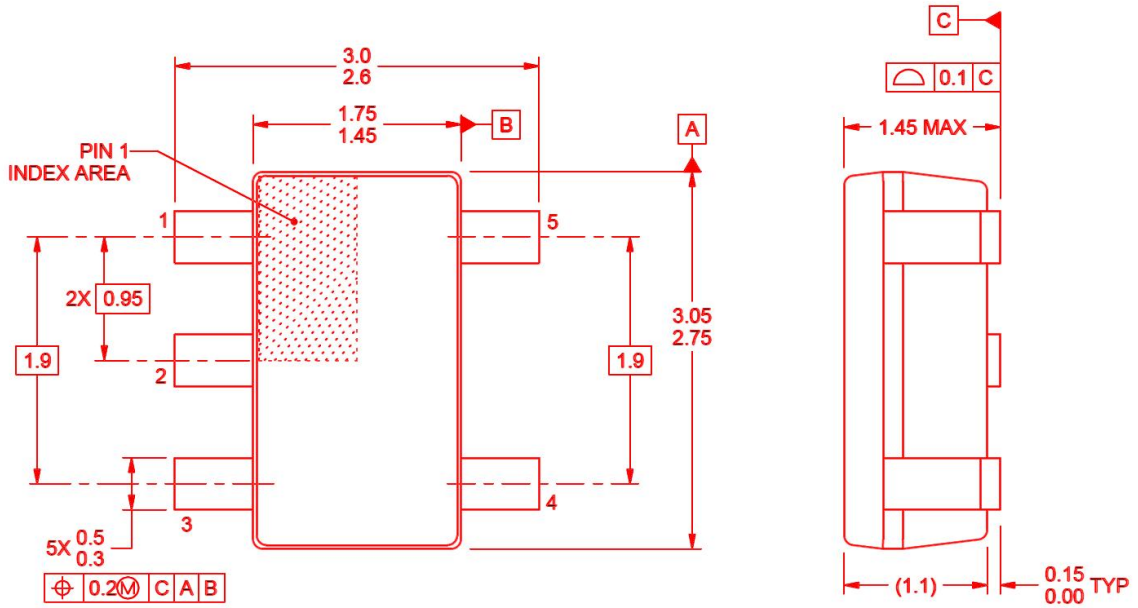


- 注：1、CL电容为外接贴片电容（0603），靠近输出管脚接入，电容地靠近芯片GND；
2、Input：端口输入电平， $f=500\text{kHz}$, $D=50\%$ ； $t_r=t_f \leq 20\text{ns}$ ；
3、Output：Y 端输出测试。

封装信息

单位：毫米 / 英寸

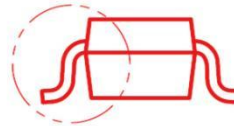
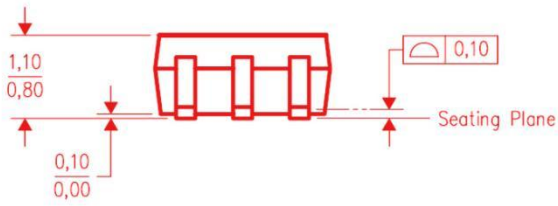
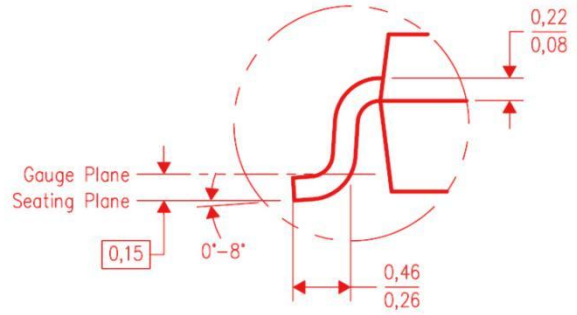
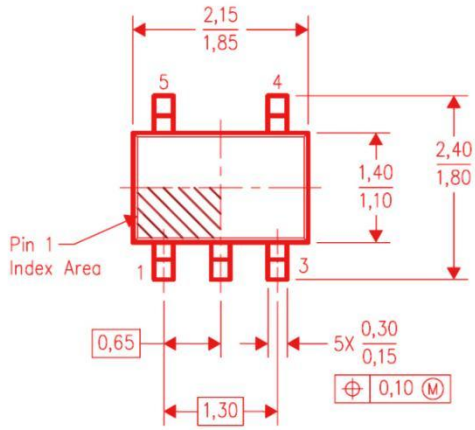
DBV (SOT-23-5)



卷轴规格

| P/N | PKG | QTY |
|--------------------|----------|------|
| SN74LVC1G14DBVR-MS | SOT-23-5 | 3000 |

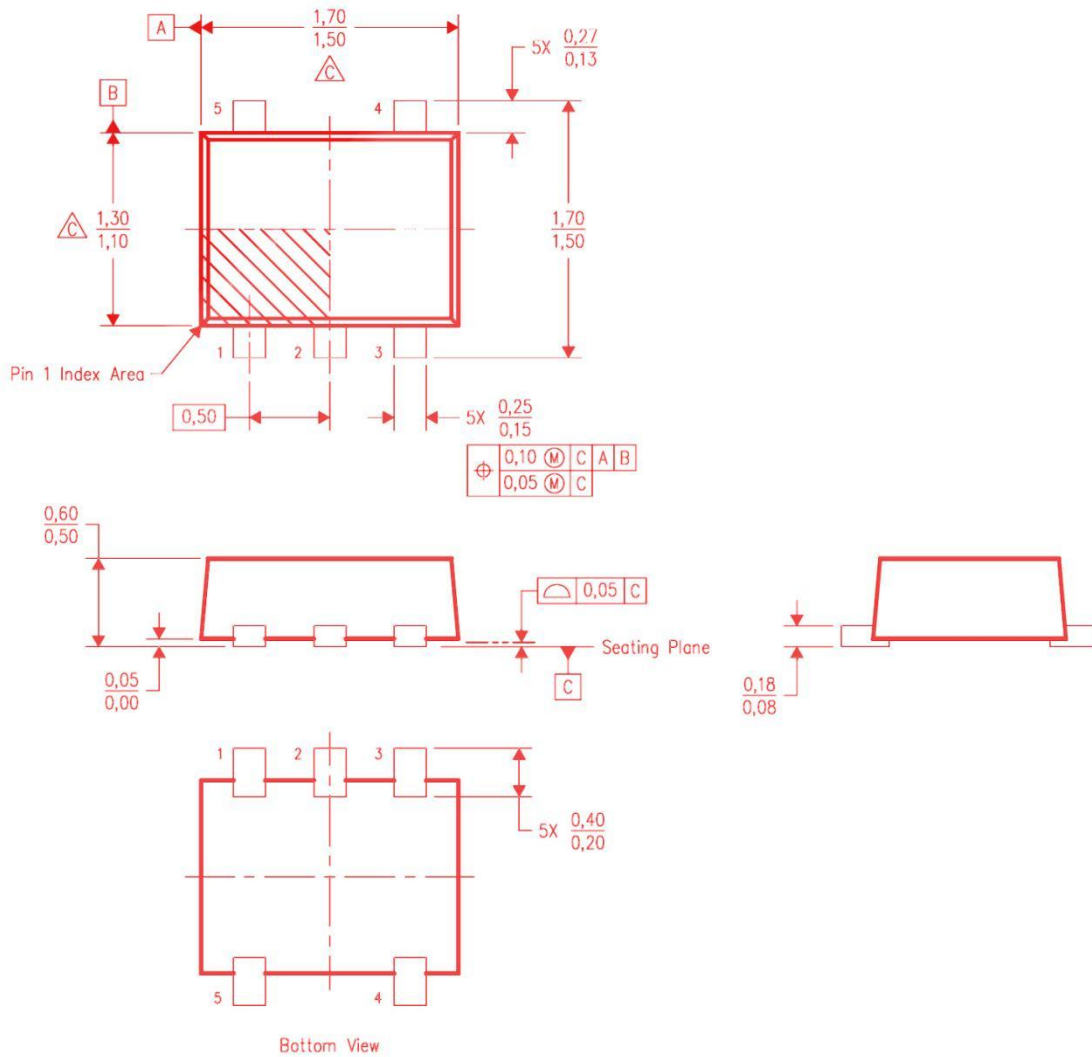
DCK (SC70-5)



卷轴规格

| P/N | PKG | QTY |
|--------------------|--------|------|
| SN74LVC1G14DCKR-MS | SC70-5 | 3000 |

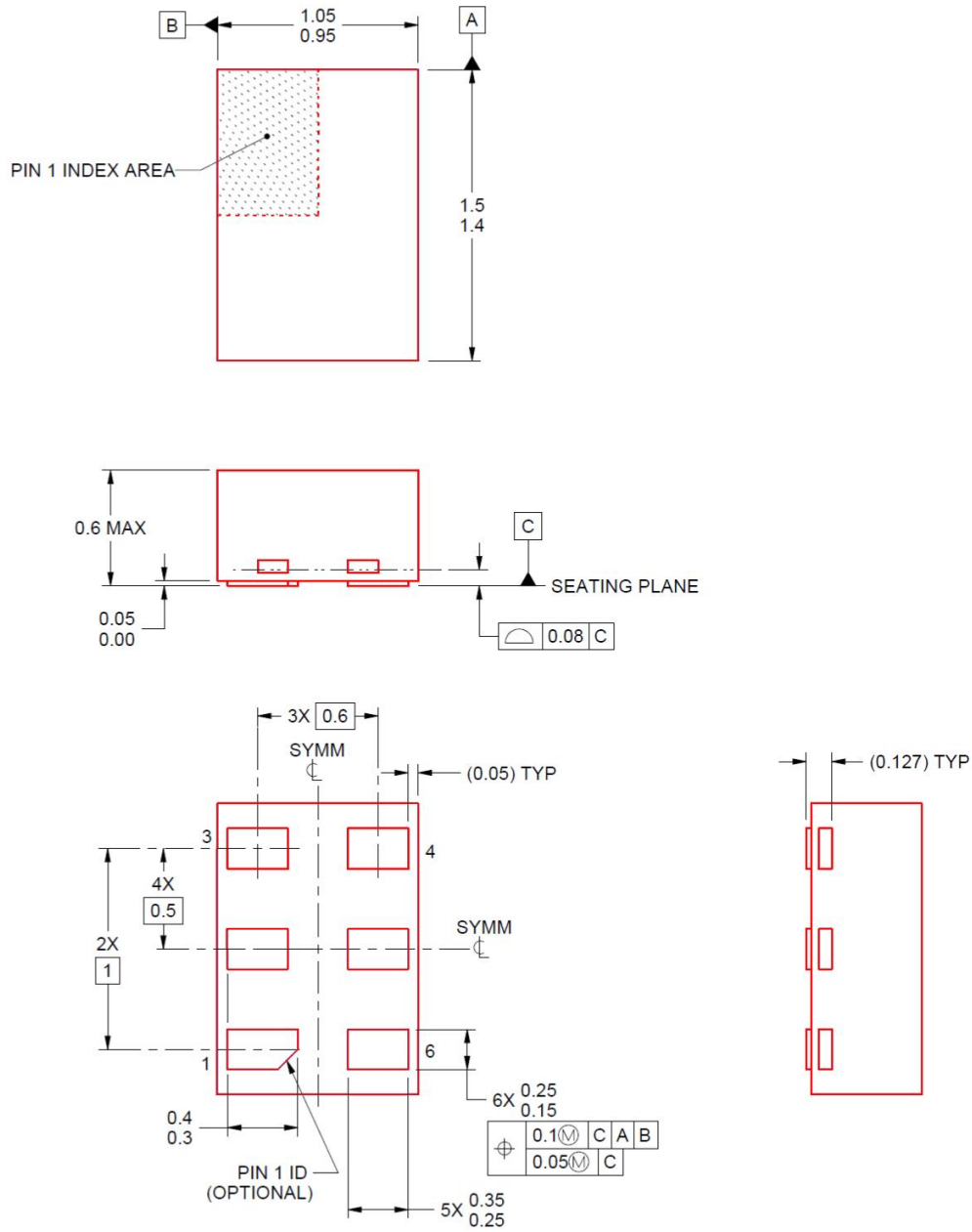
DRL (SOT-553)



卷轴规格

| P/N | PKG | QTY |
|--------------------|---------|------|
| SN74LVC1G14DBLR-MS | SOT-553 | 4000 |

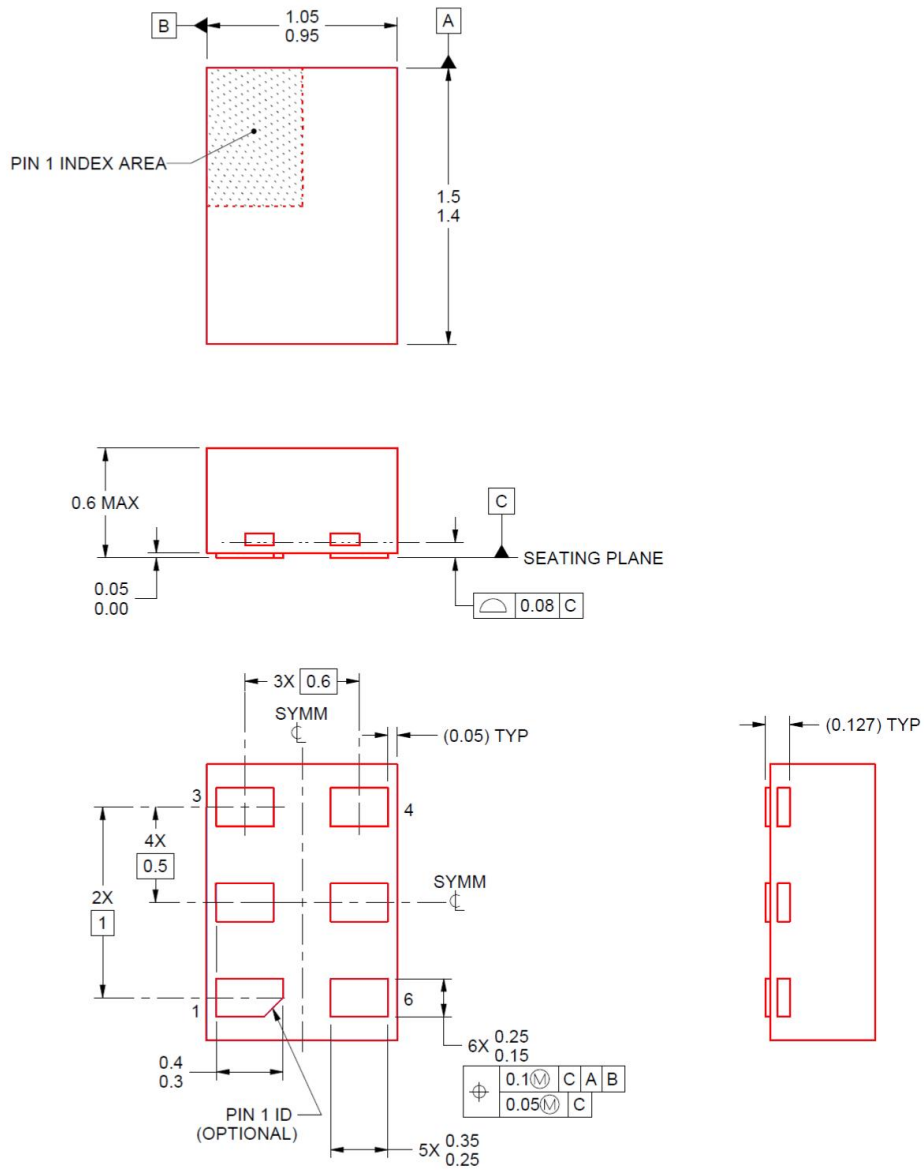
DRY (SOT-886)



卷轴规格

| P/N | PKG | QTY |
|--------------------|---------|------|
| SN74LVC1G14DBYR-MS | SOT-886 | 5000 |

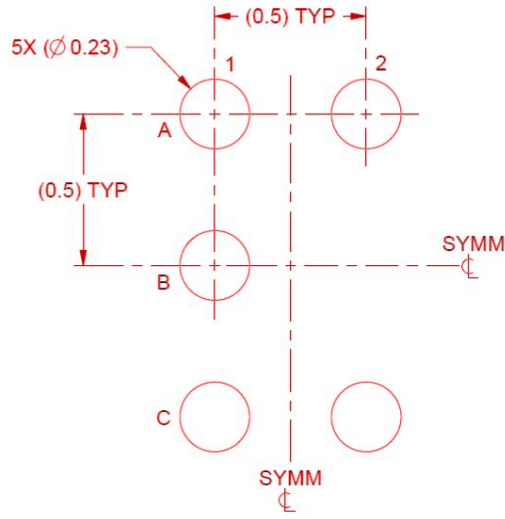
DSF (SON-6)



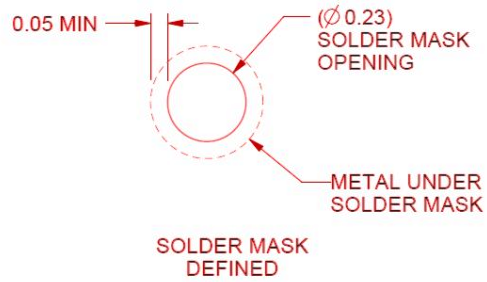
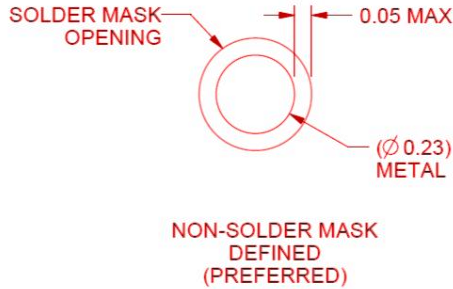
卷轴规格

| P/N | PKG | QTY |
|--------------------|-------|------|
| SN74LVC1G14DSFR-MS | SON-6 | 5000 |

YZP (DSBGA-5)



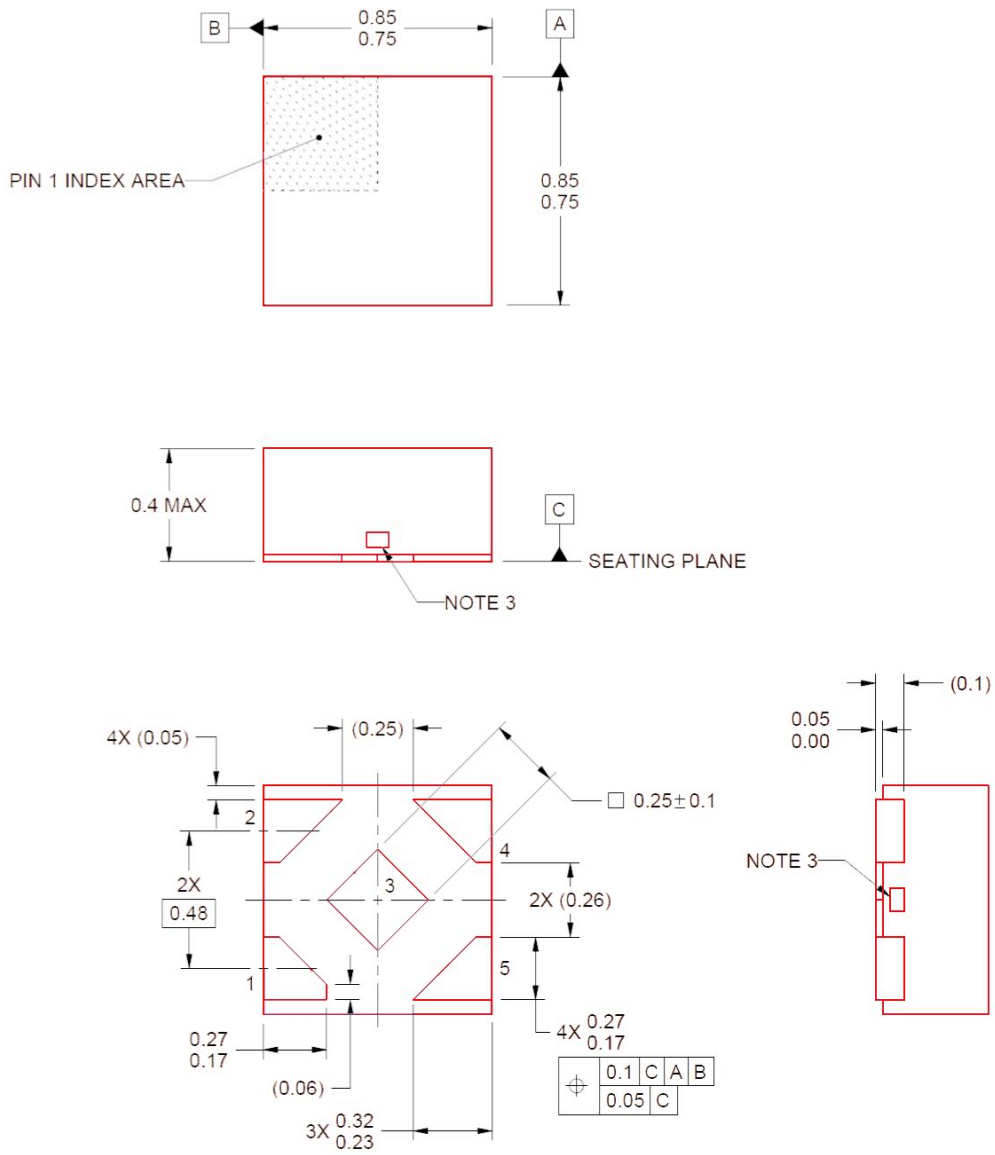
LAND PATTERN EXAMPLE
SCALE:40X



卷轴规格

| P/N | PKG | QTY |
|--------------------|---------|------|
| SN74LVC1G14YZPR-MS | X2SON-5 | 3000 |

DPW (X2SON-5)



卷轴规格

| P/N | PKG | QTY |
|--------------------|---------|------|
| SN74LVC1G14DPWR-MS | DSBGA-5 | 5000 |

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