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## KA2803B 接地漏电检测器

### 特性

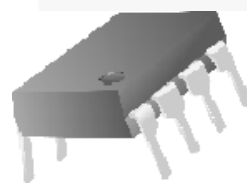
- 低功耗：5 mW, 100 V/200 V
- 内置稳压器
- 高增益差分放大器
- 可触发 SCR 的 0.4 mA 输出电流脉冲
- 很少的外部部件数量
- DIP 和 SOP 封装，高封装密度
- 高抗噪能力，较大的喘振边界
- 输入敏感的超级温度特性
- 宽工作温度范围：  
 $T_A = -25^{\circ}\text{C}$  至  $+80^{\circ}\text{C}$
- 12 V 至 20 V 输入下的运行

### 功能

- 差分放大器
- 电平比较器
- 门锁电路

### 说明

KA2803B 是为接地漏电电路中断器应用而设计，您可以直接使用断路器关闭 AC 线路。差分放大器的输入将会连接至 ZCT（零电流互感器）的次级线圈。在外部电容器中会集成差分放大器的放大输出，以便获得 KSC4613 中规定的充足时间延迟。电平比较器会在接地漏电电流大于固定电平时生成高电平。



8-DIP



8-SOP

### 订购信息

器件编号	工作温度范围	封装	包装方法
KA2803B	-25 至 +80°C	8 引脚、双列直插封装 (DIP)	塑料管

## 框图

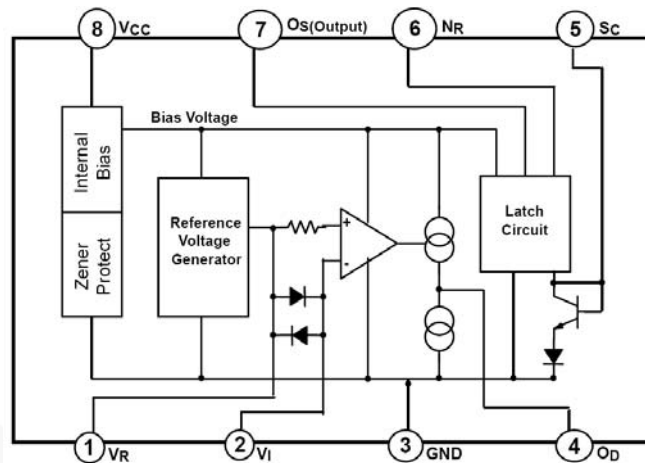


图 1. 框图

## 应用电路

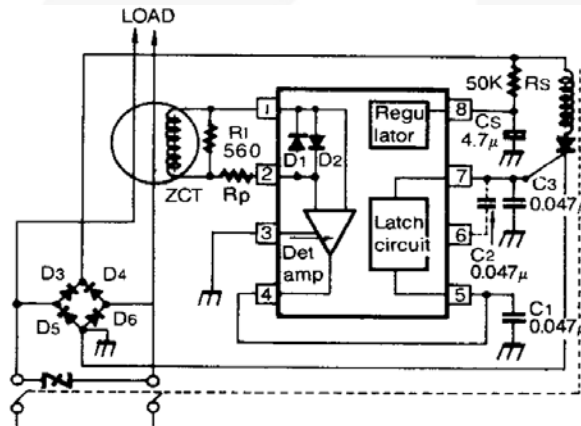


图 2. 全波应用电路

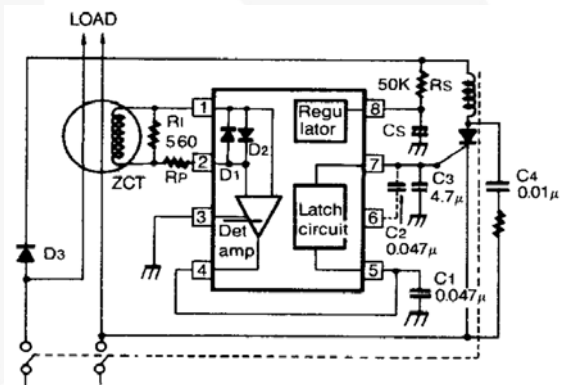


图 3. 半波应用电路

## 应用信息

(参见图 2 中的全波应用电路)

图 2 显示典型漏电流检测器系统中连接的 KA2803B。电源直接从电源线施加到  $V_{CC}$  端子 (引脚 8)。选择了电阻  $R_S$  和电容  $C_S$  从而保证引脚 8 电压至少是 12 V。建议  $C_S$  值高于  $1 \mu\text{F}$ 。

如果漏电流在负载上, 可通过零电流互感器 (ZCT) 检测。ZCT 的输出电压信号由 KA2803B 内部电路的差分放大器放大, 并显示为半周期正弦波信号, 称为放大器输出端的输入信号。通过内部反馈电阻, 放大器闭环增益固定为大约 1000 倍, 用于补偿零电流互感器 (ZCT) 变化。电阻  $R_L$  的选择应该保证断路器满足所需的检测电流。当断路器中注入高电流时, 通常不使用保护电阻  $R_P$ ; 该电

阻应该用于保护接地漏电检测器 IC (KA2803B)。  $R_P$  的范围是从几百  $\Omega$  到几  $\text{k}\Omega$ 。

电容器  $C_1$  用作噪声消除器,  $C_1$  标准值是  $0.047 \mu\text{F}$ 。电容器  $C_2$  也是一个噪声消除器电容, 但通常不用。

当存在较大的噪声时, 可在引脚 6 和 7 之间连接一个  $0.047 \mu\text{F}$  的电容器。被放大的信号与通过 KA2803B 内部门锁电路的脉冲信号一起最终出现在引脚 7 处。该信号驱动外部 SCR 栅极, 使跳闸线圈通电, 从而打开电路断路器。断路器的跳闸时间由电容  $C_3$  和机构断路器确定。选择的电容器应该小于  $1 \mu\text{F}$ , 从而满足所需的跳闸时间。在线路电压正向和负向半周期内, 全波整流桥为 KA2803B 供电。这样允许互换火线和零线。

## 绝对最大额定值

应力超过绝对最大额定值，可能会损坏器件。在超出推荐的工作条件下，该器件可能无法正常工作，所以不建议让器件在这些条件下长期工作。此外，长期在高于推荐的工作条件下工作，会影响器件的可靠性。绝对最大额定值仅是应力规格值。

符号	参数	最小值	最大值	单位
$V_{CC}$	电源电压		20	V
$I_{CC}$	电源电流		8	mA
$P_D$	功耗		300	mW
$T_L$	引脚温度（焊接，10 秒）		260	°C
$T_A$	工作温度范围	-25	+80	°C
$T_{STG}$	存储温度范围	-65	+150	°C

## 电气特性

$T_A = -25^{\circ}\text{C}$  至  $+80^{\circ}\text{C}$  除非另有说明

符号	参数	工作条件	测试电路	最小值	典型值	最大值	单位	
$I_{CC}$	电源电流 1	$V_{CC}=12\text{ V}$ $V_R=\text{开路}$ $V_I=2\text{ V}$	图 4	$T_A = -25^{\circ}\text{C}$		580	$\mu\text{A}$	
				$T_A = +25^{\circ}\text{C}$	300	400		530
				$T_A = +80^{\circ}\text{C}$				480
$V_T$	跳闸电压	$V_{CC}=16\text{ V}$ , $V_R=2\text{ V}\sim 2.02\text{ V}$ , $V_I=2$ 注意 1	图 5		14	16	18	mV (ms)
					12.5	14.2	17.0	
$I_{O(D)}$	差分放大器电流 电流 1	$V_{CC}=16\text{ V}$ , $V_R\sim V_I=30\text{ mV}$ , $V_{OD}=1.2\text{ V}$	图 7	-12	20	-30	$\mu\text{A}$	
	差分放大器电流 电流 2	$V_{CC}=16\text{ V}$ , $V_{OD}=0.8\text{ V}$ , $V_R$ , $V_I$ 短路= $V_P$	图 8	17	27	37		
$I_O$	输出电流	$V_{SC}=1.4\text{ V}$ , $V_{OS}=0.8\text{ V}$ , $V_{CC}=16.0\text{ V}$	图 9	$T_A = -25^{\circ}\text{C}$	200	400	800	$\mu\text{A}$
				$T_A = +25^{\circ}\text{C}$	200	400	800	
				$T_A = +80^{\circ}\text{C}$	100	300	600	
$V_{SCON}$	门锁导通电压	$V_{CC}=16\text{ V}$	图 10	0.7	1.0	1.4	V	
$I_{SCON}$	门锁输入电流	$V_{CC}=16\text{ V}$	图 11	-13	-7	-1	$\mu\text{A}$	
$I_{OSL}$	输出低电流	$V_{CC}=12\text{ V}$ , $V_{OSL}=0.2\text{ V}$	图 12	200	800	1400	$\mu\text{A}$	
$V_{IDC}$	差分输入箝位电压	$V_{CC}=16\text{ V}$ , $I_{IDC}=100\text{ mA}$	图 13	0.4	1.2	2.0	V	
$V_{SM}$	最大电流电压	$I_{SM}=7\text{ mA}$	图 14	20	24	28	V	
$I_{S2}$	电源电流 2	$V_{CC}=12.0\text{ V}$ , $V_{OSL}=0.6\text{ V}$	图 15	200	400	900	$\mu\text{A}$	
$V_{SOFF}$	门锁关断电源电压	$V_{OS}=12.0\text{ V}$ $V_{SC}=1.8\text{ V}$ $I_{IDC}=100.0\text{ mA}$	图 16		7	8	9	V
$t_{ON}$	响应时间	$V_{CC}=16\text{ V}$ , $V_R-V_I=0.3\text{ V}$ , $1\text{ V}<V_X<5\text{ V}$	图 17	2	3	4	ms	

注:

1. 由设计保证；未经产品测试。

测试电路

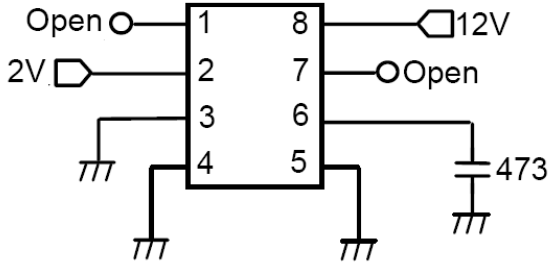


图 4. 电源电流 1

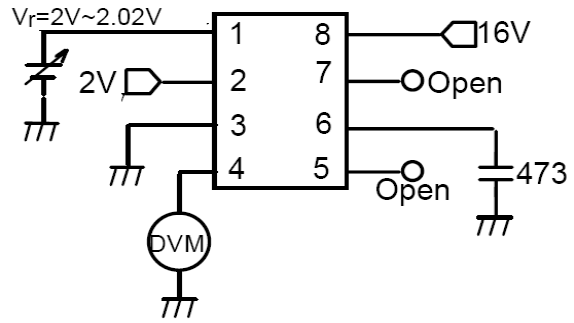
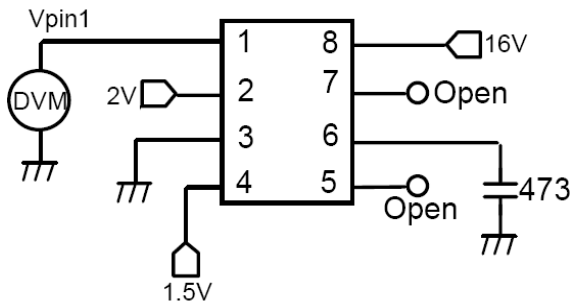


图 5. 跳闸电压



\*  $V_p = V_{pin1} - 0.03V$

图 6.  $V_{PN1}$ , 用a于  $V_p$  测量

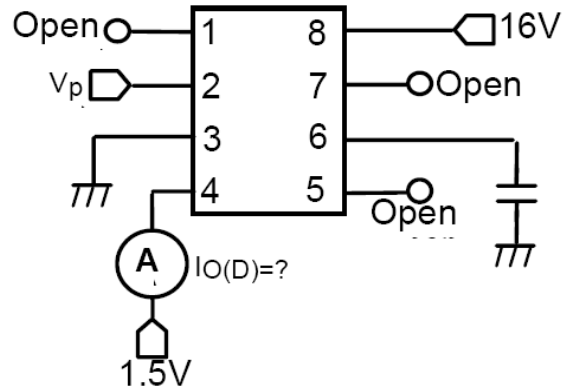


图 7. 差分放大器输出电流 1

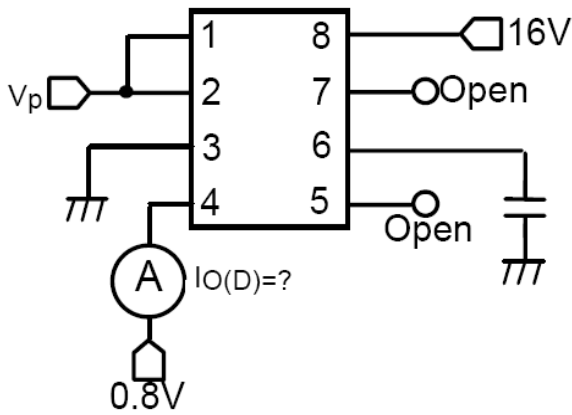


图 8. 差分放大器输出电流 2

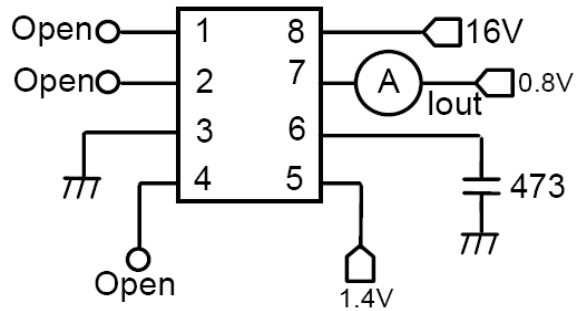


图 9. 输出电流

测试电路 (续)

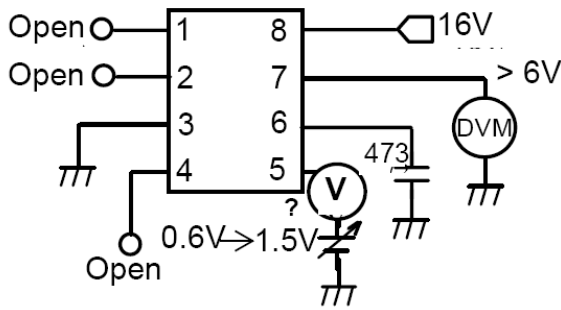


图 10. 门锁导通电压

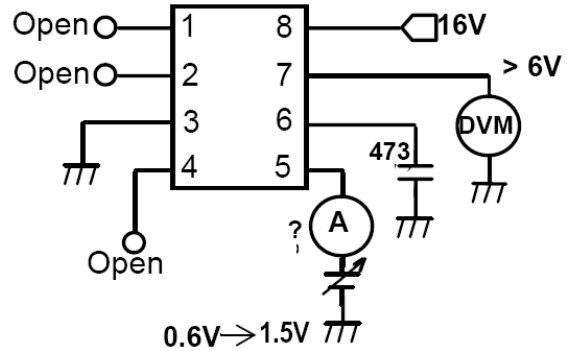


图 11. 门锁输入电流

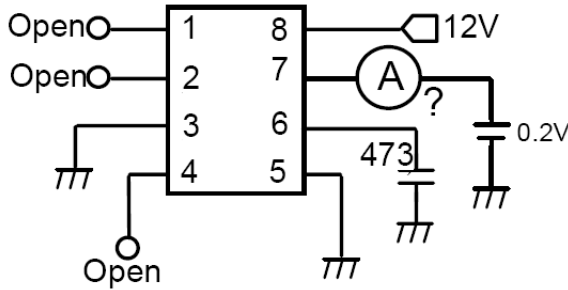


图 12. 输出低电流

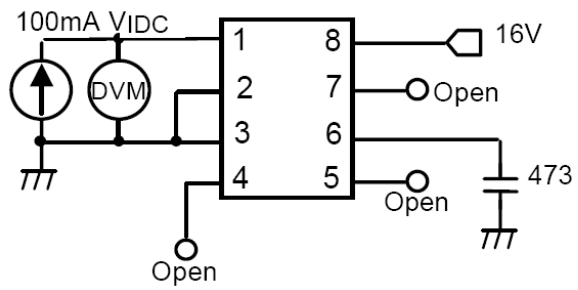


图 13. 差分输入箝位电压

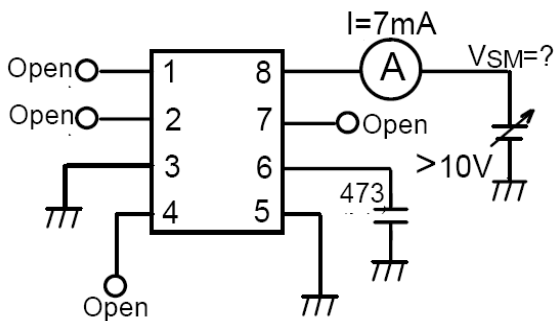


图 14. 最大电流电压

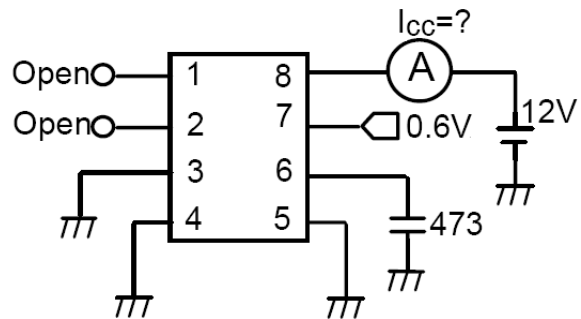


图 15. 电源电流 2

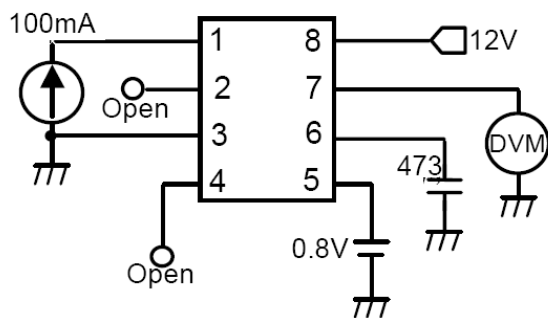


图 16. 门锁关断电源电压

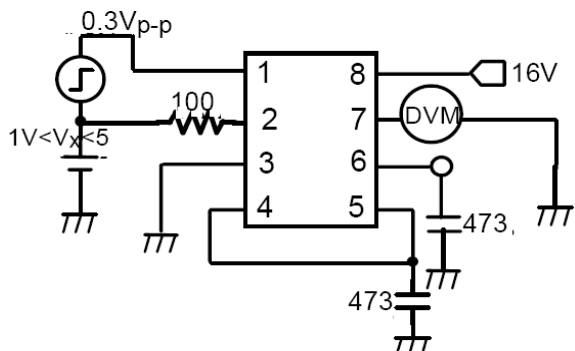


图 17. 响应时间

### 典型性能特征

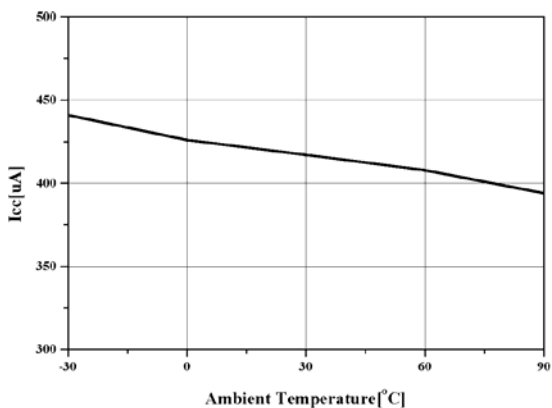


图 18. 电源电流

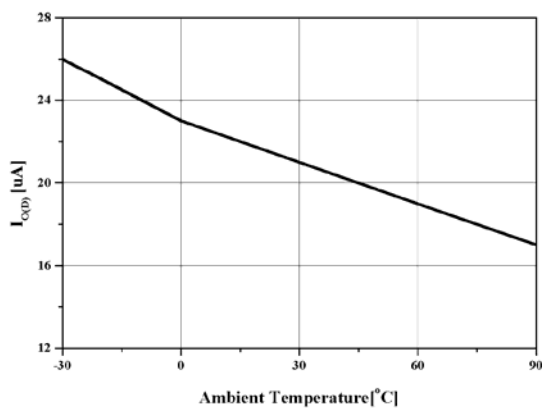


图 19. 差分放大器输出电流 ( $V_R - V_I = 30 \text{ mV}$ ,  $V_{OD} = 1.2 \text{ V}$ )

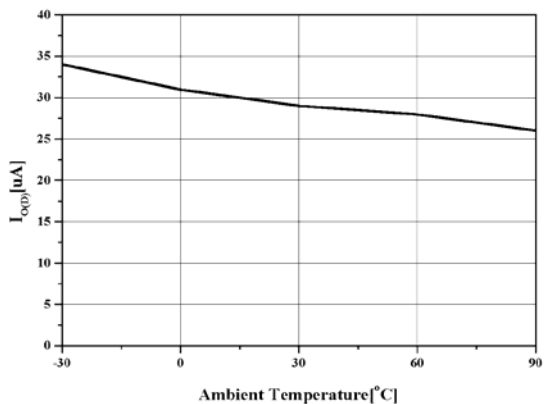


图 20. 差分放大器输出电流 ( $V_R$ ,  $V_I = V_P$ ,  $V_{OD} = 0.8 \text{ V}$ )

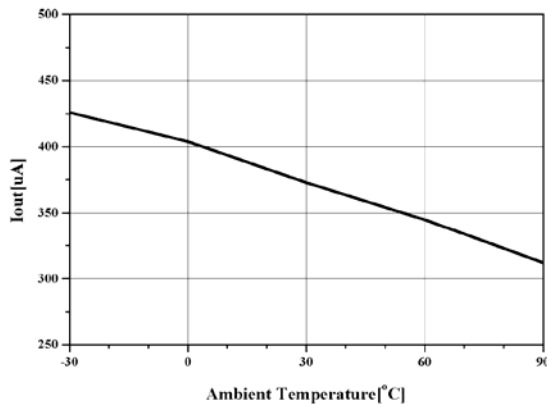


图 21. 输出电流

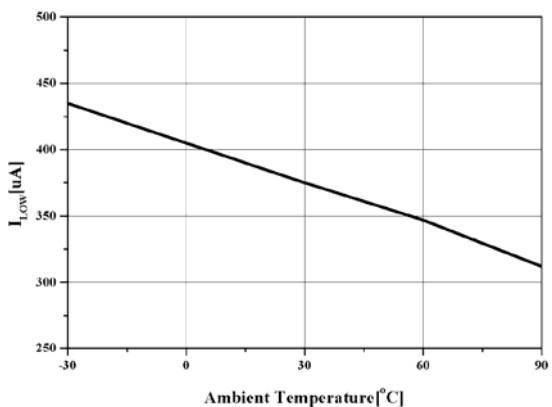


图 22. 输出低电流

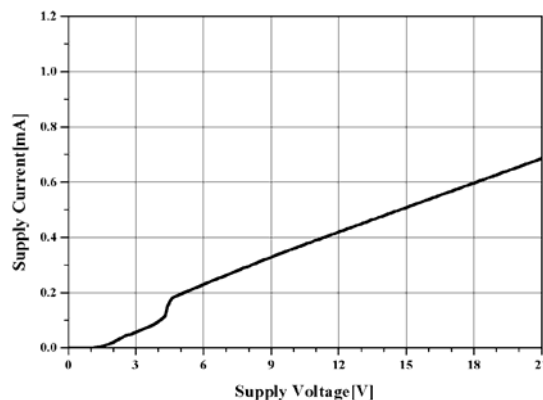


图 23.  $V_{CC}$  电压与电源电流 1 的关系

典型性能特征 (接上页)

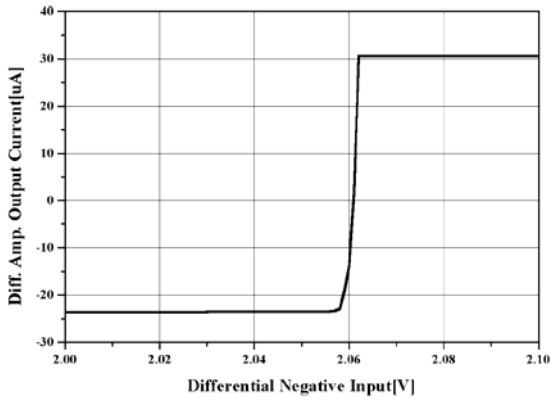


图 24. 差分放大器输出电流 1

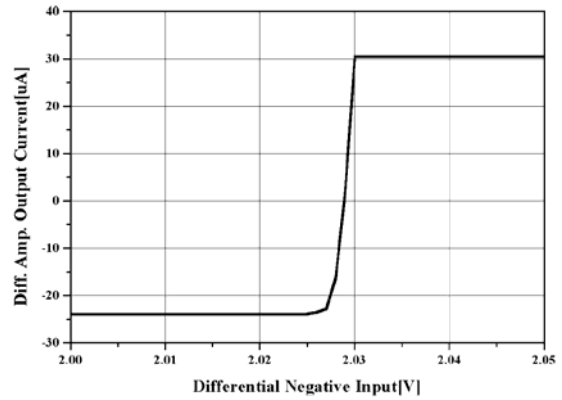


图 25. 差分放大器输出

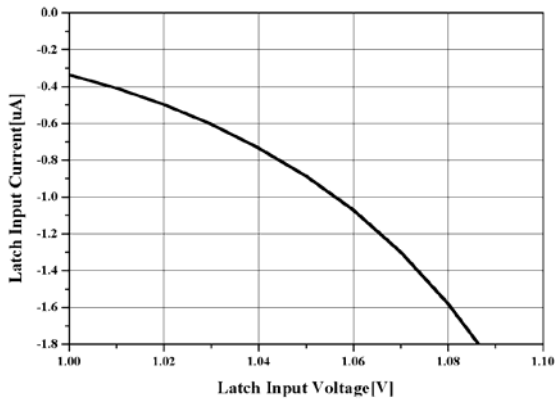


图 26. 门锁输入电流

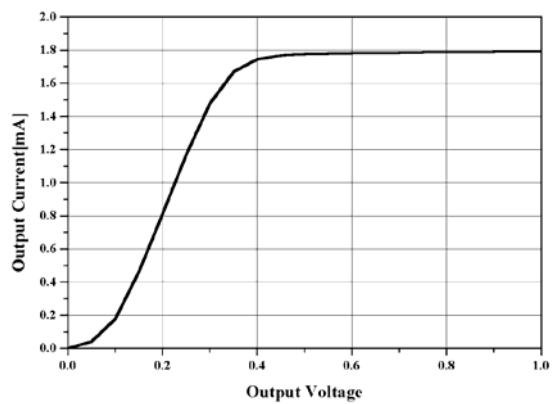


图 27. 输出低电流

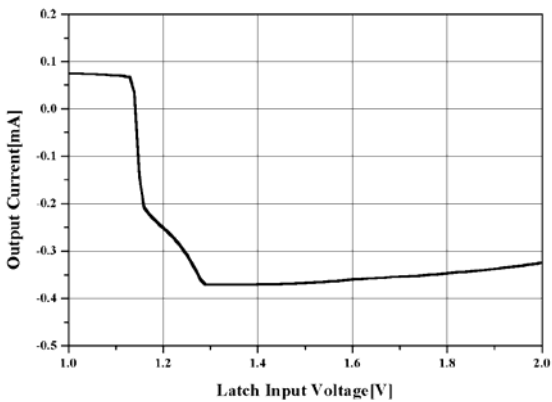


图 28. 输出电流

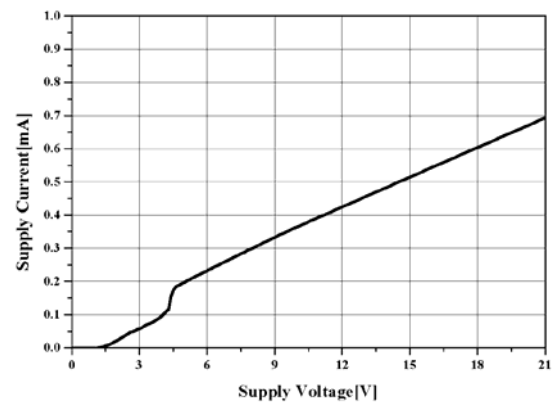


图 29.  $V_{CC}$  电压与电源电流 2 的关系



典型性能特征 (接上页)

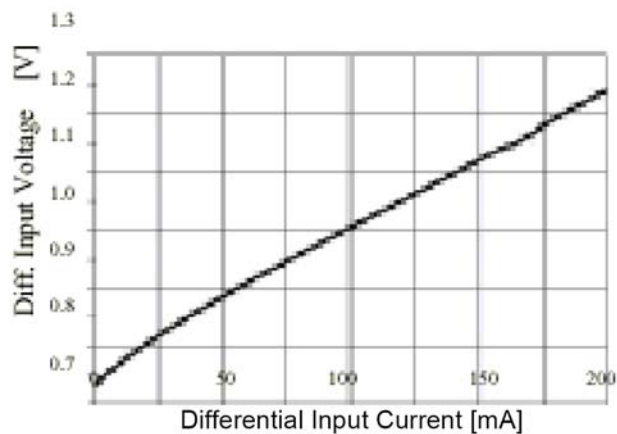


图 30. 差分输入箱位电压

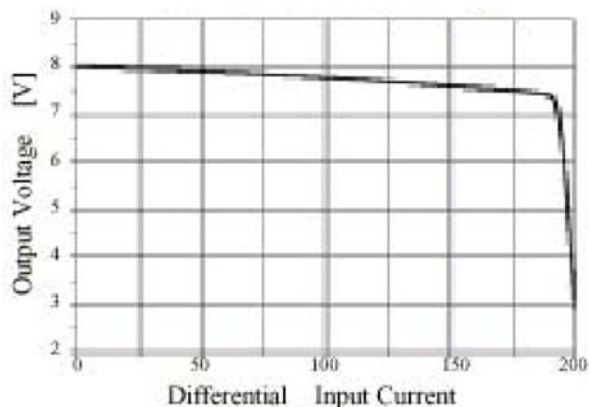


图 31. 闭锁关断电源电压

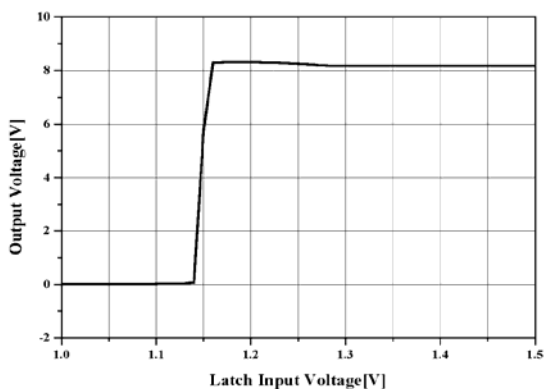


图 32. 闭锁导通输入电压

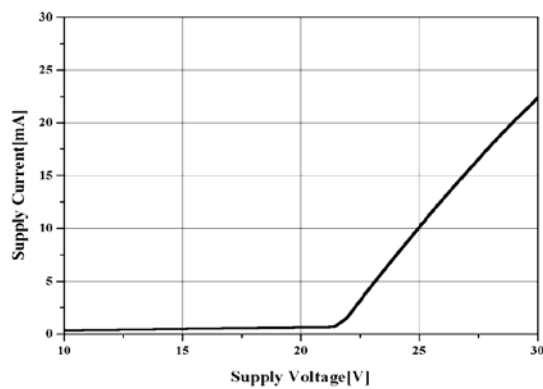


图 33. 最大电源

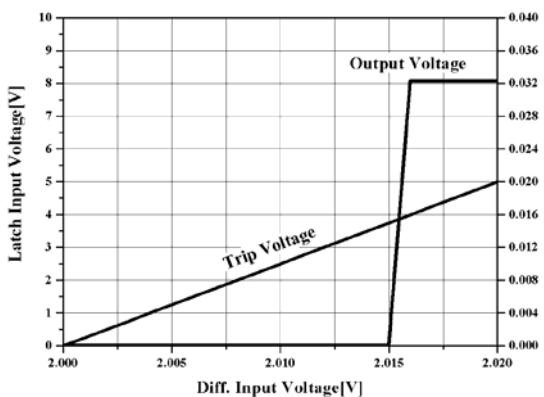


图 34. 跳闸和输出

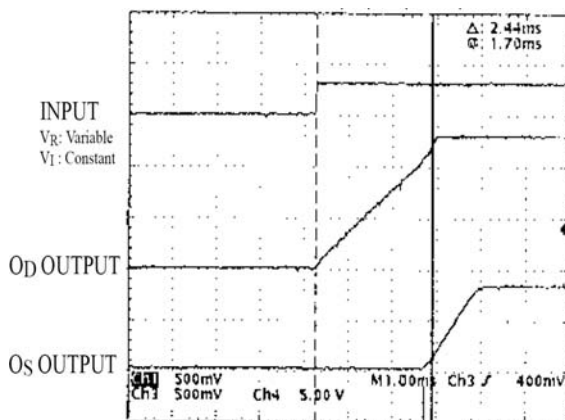


图 35. 输出响应时间



## 物理尺寸

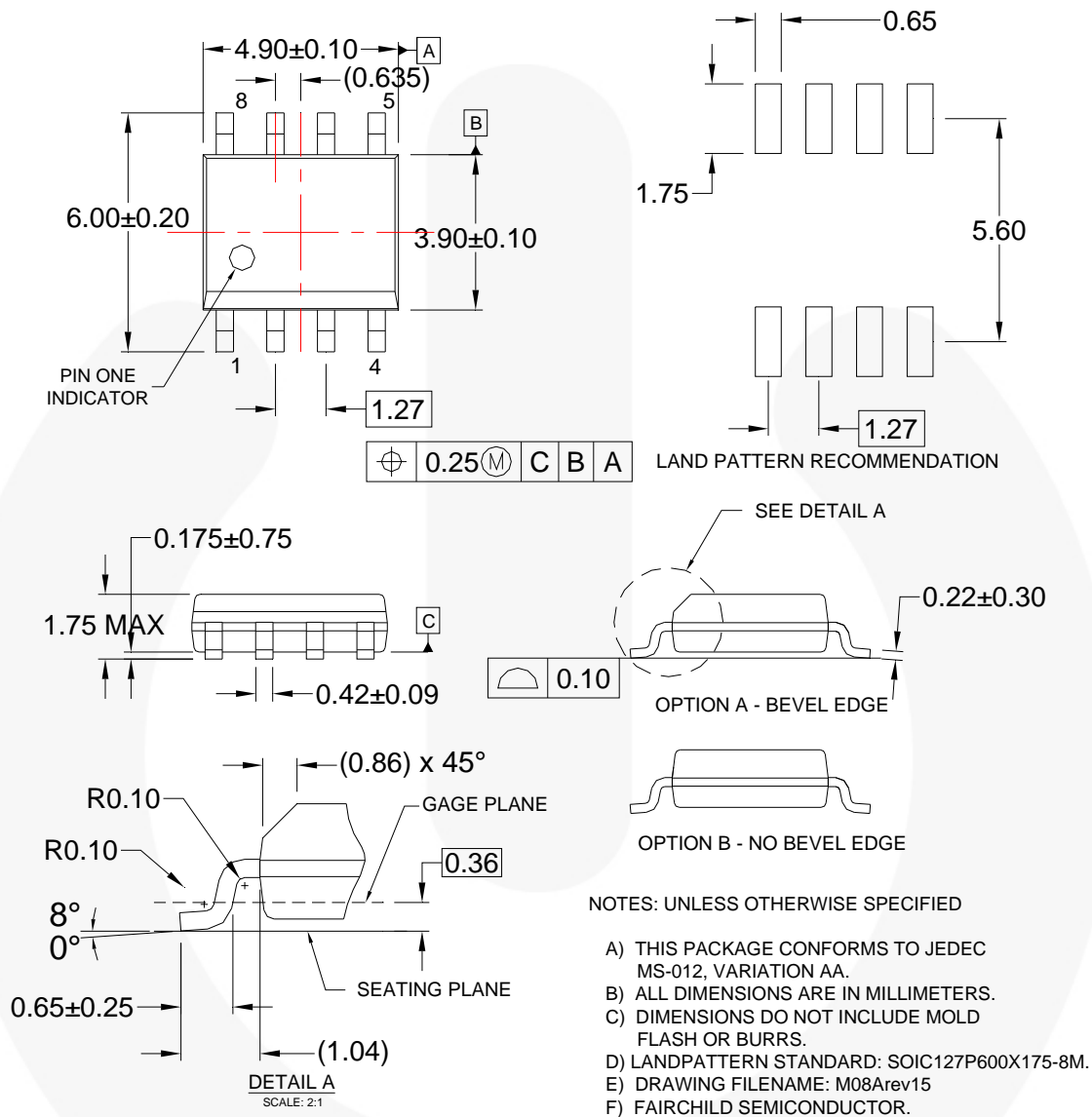


图 37. 8 引脚式小尺寸封装(SOP)

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