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Product data sheet

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GENERAL DESCRIPTION

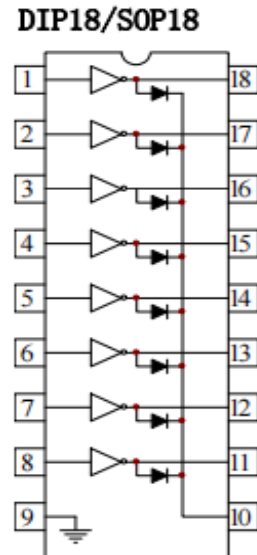
ULN2803 是单片集成高耐压、大电流达林顿管阵列，电路内部包含八个独立的达林顿管驱动单路。电路内部设计有钳位二极管，可用于驱动继电器、步进电机等感性负载，将达林顿管并联可实现更高的输出电流能力。该电路可广泛应用于继电器驱动、照明驱动、显示屏驱动(LED)、步进电机驱动和逻辑缓冲器。ULN2803 的每一路达林顿管串联一个 2.7K 的基极电阻，在 5V 的工作电压下可直接与 TTL/CMOS 电路连接，可直接处理标准逻辑缓冲器所处理的数据。

FEATURES

- 宽输入耐压：0~30V, Ta=25°C
- 输出最大电流：500MA, Ta=25°C
- 输出关态耐压：50V Ta=25°C
- 输入兼容 TTL/CMOS 逻辑信号

PIN CONFIGURATION

管脚序号	管脚定义	管脚功能描述	管脚序号	管脚定义	管脚功能描述
1	1IN	1 通道输入	18	10UT	1 通道输出
2	2IN	2 通道输入	17	20UT	2 通道输出
3	3IN	3 通道输入	16	30UT	3 通道输出
4	4IN	4 通道输入	15	40UT	4 通道输出
5	5IN	5 通道输入	14	50UT	5 通道输出
6	6IN	6 通道输入	13	60UT	6 通道输出
7	7IN	7 通道输入	12	70UT	7 通道输出
8	8IN	8 通道输入	11	80UT	8 通道输出
9	GND	接地	10	COMMON	钳位二极管公共端



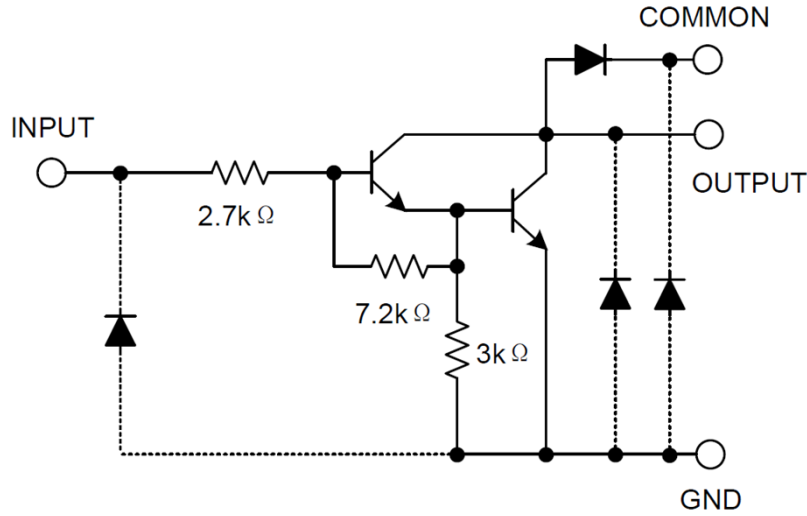
极限参数

参数	符号	极限值	单位
输入电压	V_{IN}	30	V
输出电压	V_{CE}	50	V
集电极电流	I_C	500	mA
基极电流	I_B	25	mA
工作温度	T_A	-40~85	°C
存储温度	T_S	-65~150	°C

注：（1）功率测试条件为玻璃环氧树脂PCB板上（30×30×1.6mm 铜50%）；（2）极限参数是指无论在任何条件下都不能超过的极限值。

如果超过此极限值，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



电学特性

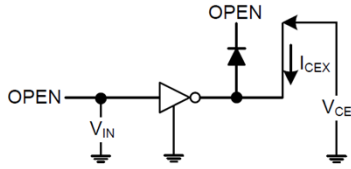
直流电学特性: $T_A=25^{\circ}\text{C}$

符号	项目	测试条件		测试电路	最小值	典型值	最大值	单位
I_{CEX}	输出漏电电流	$V_{CE} = 50V$	$T_a=25^{\circ}\text{C}$	1	-	0	50	μA
			$T_a=85^{\circ}\text{C}$		-	0	100	μA
$V_{CE(SAT)}$	低电平有效输入电压	$I_{OUT} = 350\text{mA}, I_{IN} = 500\mu\text{A}$	2	-	1.02	1.6	V	
				$I_{OUT} = 200\text{mA}, I_{IN} = 350\mu\text{A}$	-	0.96	1.3	V
				$I_{OUT} = 100\text{mA}, I_{IN} = 250\mu\text{A}$	-	0.85	1.1	V
$I_{IN(ON)}$	输入电流	$V_{IN} = 3.85V, I_{OUT} = 350\text{mA}$	3	-	0.71	1.35	mA	
$I_{IN(OFF)}$		$I_{OUT} = 500\mu\text{A}, T_a=85^{\circ}\text{C}$	4	50	63	-	μA	
$V_{IN(ON)}$	输入电压	$V_{CE} = 2V$	5	$I_{OUT} = 200\text{mA}$	-	1.8	2.4	V
				$I_{OUT} = 250\text{mA}$	-	1.85	2.7	V
				$I_{OUT} = 300\text{mA}$	-	1.9	3.0	V
I_R	钳位二极管反向漏电流	$V_R = 50V,$	$T_a=25^{\circ}\text{C}$	6	-	0	50	μA
			$T_a=85^{\circ}\text{C}$		-	0	100	μA
V_F	钳位二极管正向导通电压	$I_F = 350\text{mA}$	15	-	1.7	2.0	V	
t_{ON}	开启延迟时间	$V_{OUT}=50V, R_L=125\Omega, C_L=15\text{pF}$		-	0.1	1	μS	
t_{OFF}	关断延迟时间	$V_{OUT}=50V, R_L=125\Omega, C_L=15\text{pF}$		-	0.2	1	μS	

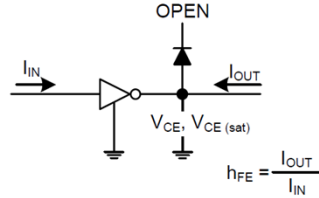
测试方法

1、测试接线图

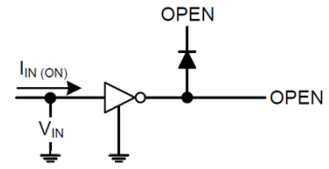
1. I_{CEX}



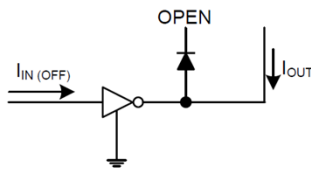
2. $V_{CE(sat)}$, h_{FE}



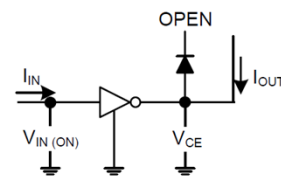
3. $I_{IN(ON)}$



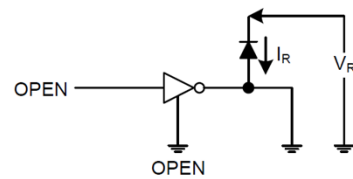
4. $I_{IN(OFF)}$



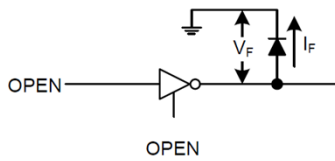
5. $V_{IN(ON)}$



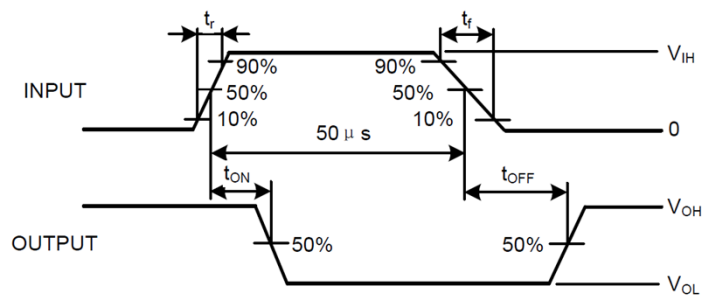
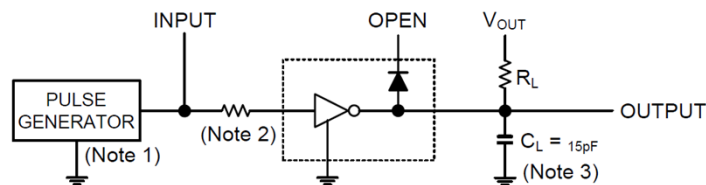
6. I_R



7. V_F



8. t_{ON} , t_{OFF}



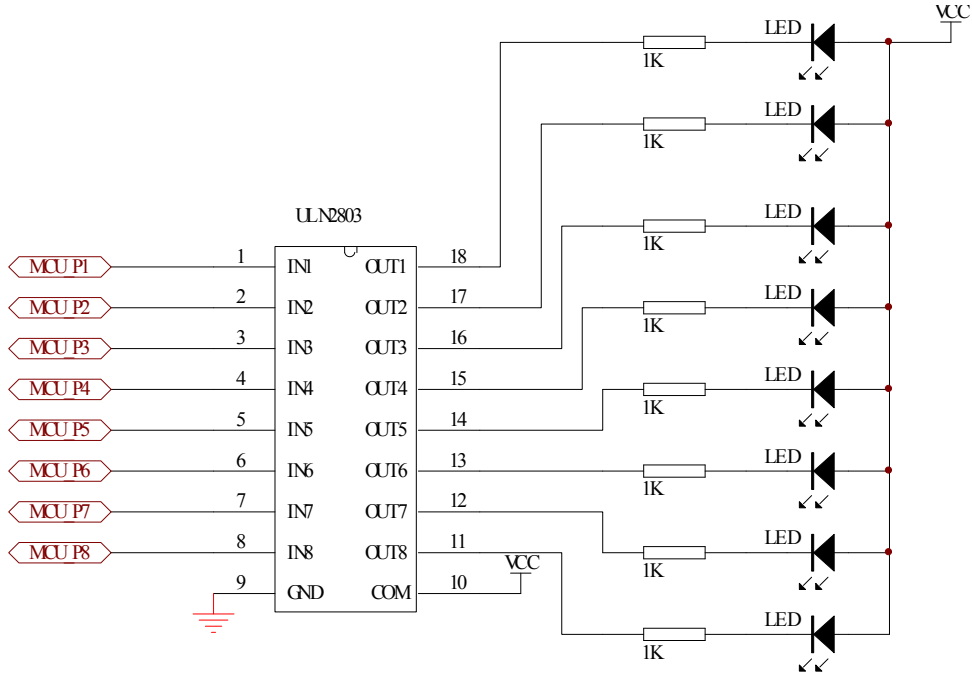
注：（1）脉冲宽度为 50US，占空比为 10%，输出负载 125Ω， $t_r \leq 5ns$ ， $t_f \leq 10ns$ ；

（2） $R=0$ ， $V_{IH}:3V$

（3）包括探针和测试夹具的电容

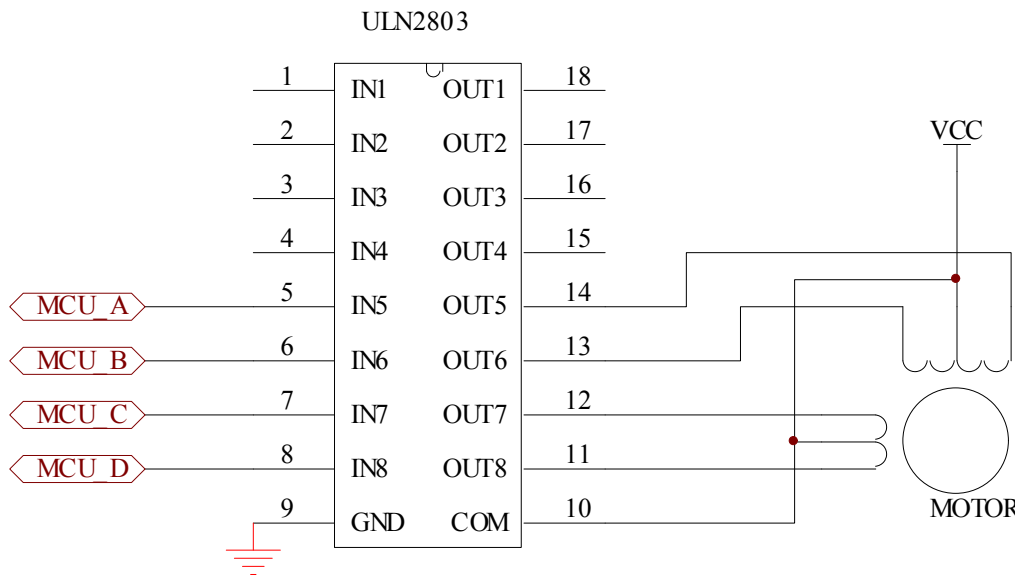
典型应用线路

1、LED 驱动电路



注：1K 的电阻可根据 VCC 的电压和所需 LED 的电流进行调整

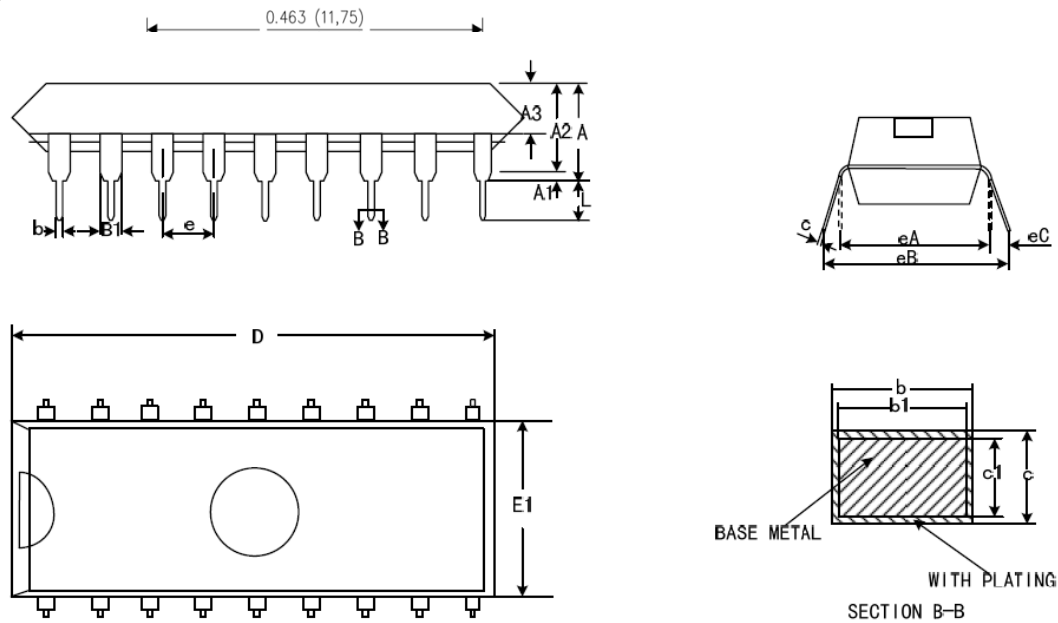
2、步进电机驱动电路



PACKAGE MECHANICAL DATA

单位：毫米 / 英寸

DIP18



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	3.60	3.80	4.00
A1	0.51	—	—
A2	3.10	3.30	3.50
A3	1.42	1.52	1.62
b	0.44	—	0.53
b1	0.43	0.46	0.48
B1	1.52BSC		
c	0.25	—	0.31
c1	0.24	0.25	0.26
D	22.70	22.90	23.10
E1	6.40	6.60	6.80
e	2.54BSC		
eA	7.62BSC		
eB	7.62	—	9.50
eC	0	—	0.94
L	3.00	—	—

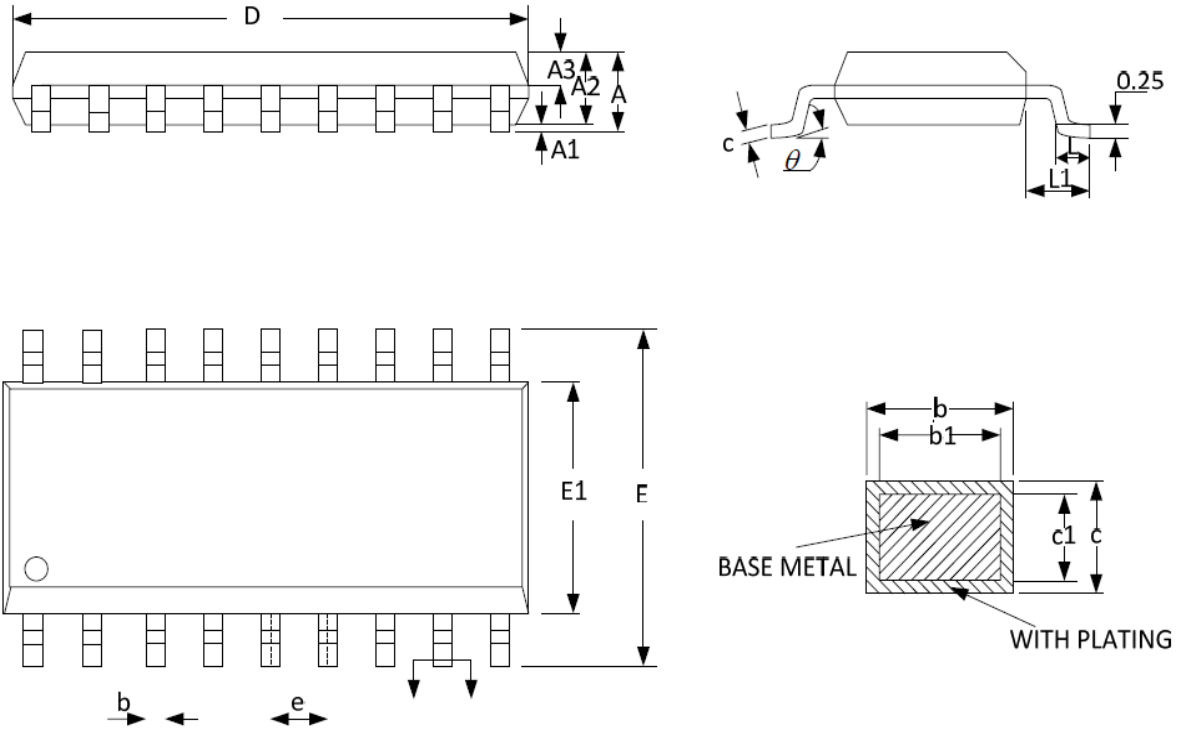
REEL SPECIFICATION

P/N	PKG	QTY
ULN2803	DIP-18	20/管

PACKAGE MECHANICAL DATA

单位：毫米 / 英寸

SOP-18



SYMBOL	MILLMETER		
	MIN	NOM	MAX
A	-	-	2.70
A1	0.08	0.18	0.28
A2	2.10	2.30	2.50
A3	0.92	1.02	1.12
b	0.35	-	0.44
b1	0.34	0.37	0.39
c	0.26	-	0.31
c1	0.24	0.25	0.26
D	11.25	11.45	11.65
E	10.10	10.30	10.50
E1	7.30	7.50	7.70
e	1.27BSC		
L	0.70	0.85	1.00
L1	1.40BSC		
θ	0°	-	8°

REEL SPECIFICATION

P/N	PKG	QTY
ULN2803	SOP-18	2000

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