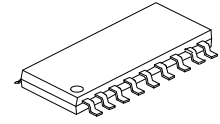


### ■ DESCRIPTION

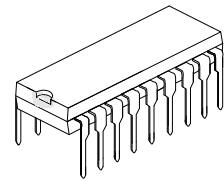
The HLF **ULN2803** is high-voltage, high-current Darlington drivers comprised of eight NPN Darlington pairs.

### ■ FEATURES

- \*Output current (single output) 500mA MAX.
- \*High sustaining voltage output 50V MIN.
- \*Output clamp diodes
- \*Inputs compatible with various types of logic

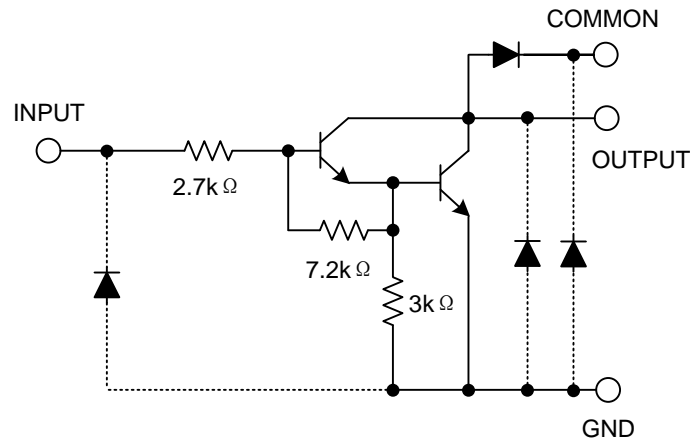


SOP-18



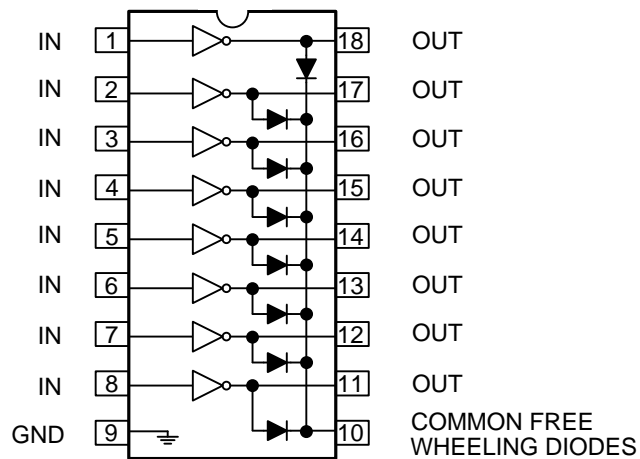
DIP-18

### ■ SCHEMATICS (EACH DRIVER)



Note: The input and output parasitic diodes cannot be used as clamp diodes.

### ■ PIN CONFIGURATIONS



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		$V_{IN}$	-0.5~30	V
Output Sustaining Voltage		$V_{CE(SUS)}$	-0.5~50	V
Output Current		$I_{OUT}$	500	mA/ch
Clamp Diode Reverse Voltage		VR	50	V
Clamp Diode Forward Current		$I_F$	500	mA
Power Dissipation	DIP-18	$P_D$	1.47	W
	SOP-18		0.54/0.625(Note)	
Operating Temperature		$T_{OPR}$	-40 ~ +85	°C
Storage Temperature		$T_{STG}$	-40 ~ +150	°C

Note 1. On glass epoxy PCB (30x30x1.6mm Cu 50%)

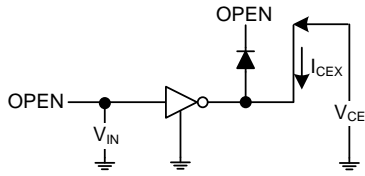
2. Absolute maximum ratings are stress ratings only and functional device operation is not implied. The device could be damaged beyond Absolute maximum ratings.

### ■ ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified.)

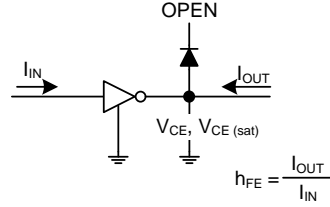
PARAMETER		SYMBOL	TEST CIRCUIT	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Leakage Current		$I_{CEX}$	1	$V_{CE}=50V, T_a=25^\circ C$ $V_{CE}=50V, T_a=85^\circ C$			50 100	$\mu A$
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	2	$I_{OUT}=350mA, I_{IN}=500\mu A$ $I_{OUT}=200mA, I_{IN}=350\mu A$ $I_{OUT}=100mA, I_{IN}=250\mu A$		1.3 1.1 0.9	1.6 1.3 1.1	V
Input Current	ON	$I_{IN(ON)}$	3	$V_{IN}=3.85V, I_{OUT}=350mA$		0.93	1.35	mA
	OFF	$I_{IN(OFF)}$	4	$I_{OUT}=500\mu A, T_a=85^\circ C$	50	65		$\mu A$
Input Voltage (output on)		$V_{IN(ON)}$	5	$V_{CE}=2.0V$ $I_{OUT}=200mA$ $I_{OUT}=250mA$ $I_{OUT}=300mA$			2.4 2.7 3.0	V
Clamp Diode Reverse Current		$I_R$	6	$V_R=50V, T_a=25^\circ C$ $V_R=50V, T_a=85^\circ C$			50 100	$\mu A$
Clamp Diode Forward Voltage		$V_F$	7	$I_F=350mA$			2.0	V
Input Capacitance		$C_{IN}$				15	25	pF
Turn-On Delay		$t_{ON}$	8	$V_{OUT}=50V, R_L=125\Omega, C_L=15pF$		0.1	1	$\mu S$
Turn-Off Delay		$t_{OFF}$	8	$V_{OUT}=50V, R_L=125\Omega, C_L=15pF$		0.2	1	$\mu S$

### ■ TEST CIRCUIT

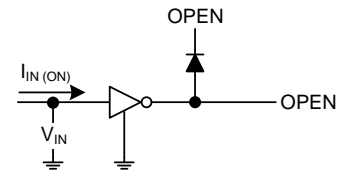
1.  $I_{CEX}$



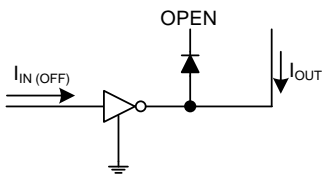
2.  $V_{CE(sat)}$ ,  $h_{FE}$



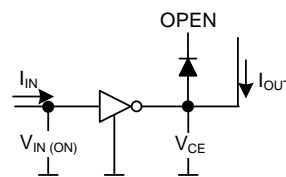
3.  $I_{IN(ON)}$



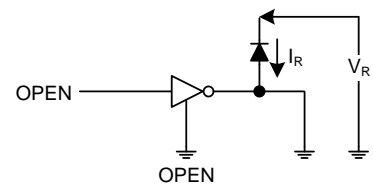
4.  $I_{IN(OFF)}$



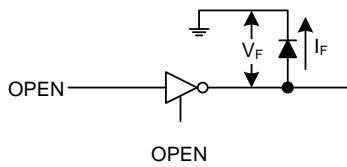
5.  $V_{IN(ON)}$



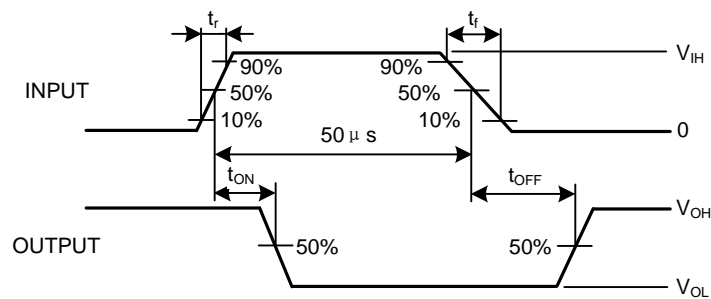
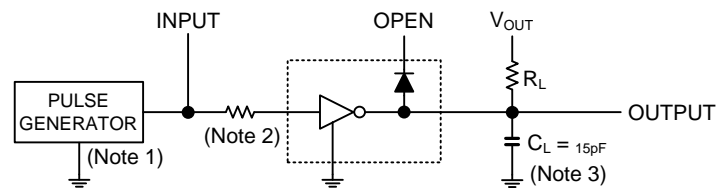
6.  $I_R$



7.  $V_F$



8.  $t_{ON}$ ,  $t_{OFF}$



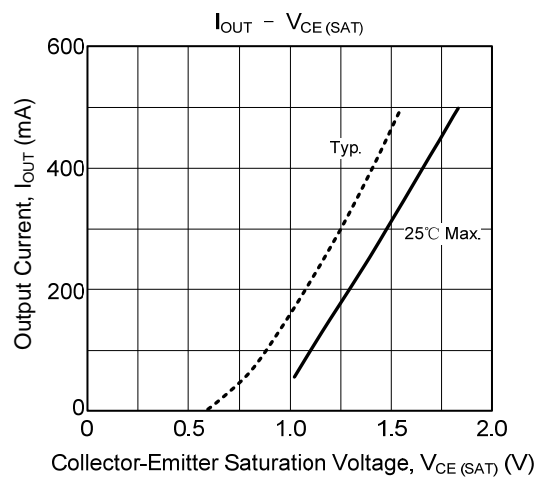
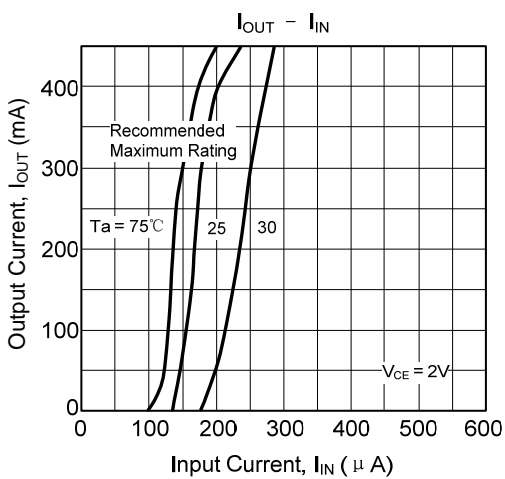
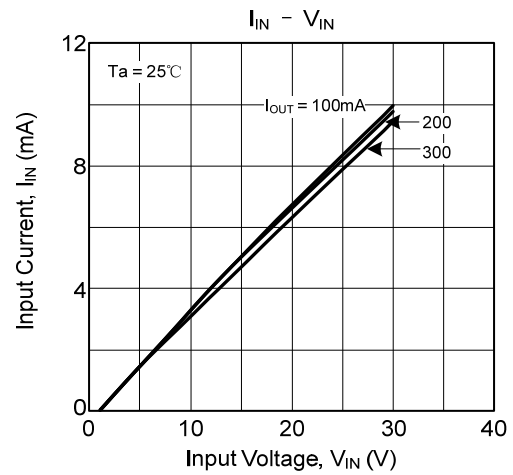
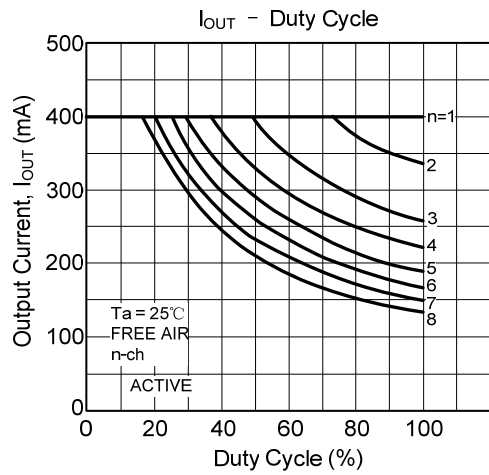
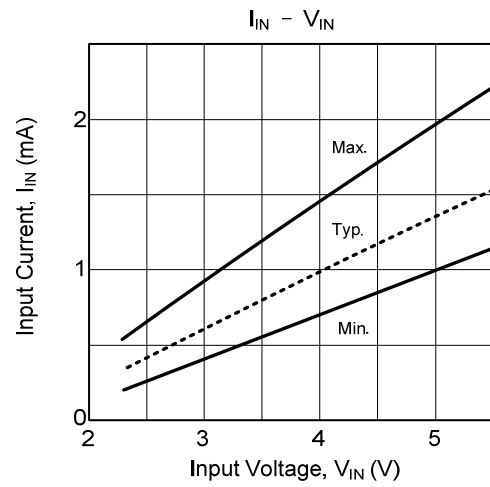
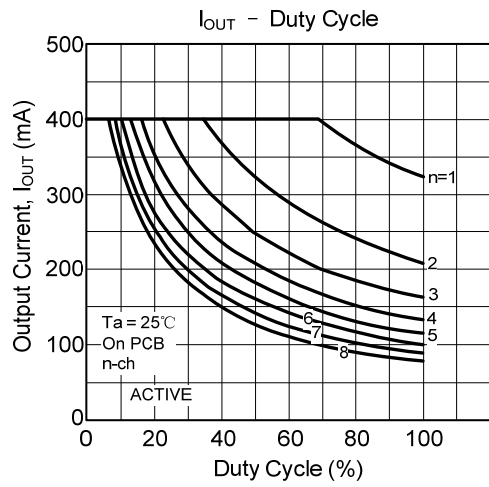
Note1: Pulse width 50µs, duty cycle 10%

Output impedance 50Ω,  $t_r \leq 5ns$ ,  $t_f \leq 10ns$

Note2:  $R_1 = 0$ ,  $V_{IH} = 3V$

Note3:  $C_L$  includes probe and jig capacitance.

### ■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)

