

## DH0011A High Voltage High Current Driver

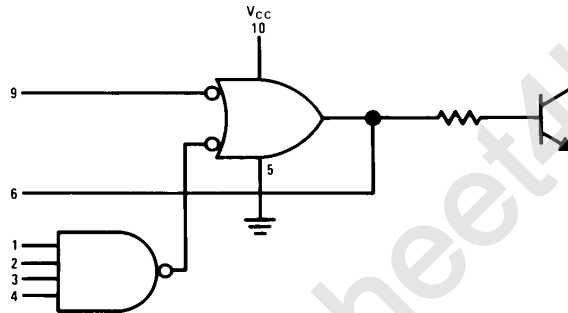
### General Description

The DH0011A High Voltage, High Current Driver family consists of hybrid integrated circuits which provide a wide range of variations in temperature range, package, and output current drive capability.

Applications include driving lamps, relays, cores, and

other devices requiring several hundred milliamp currents at voltages up to 50V. Logic flexibility is provided through a 4-input NAND gate, a NOR input and an input which bypasses the gating and connects to the base of the output transistor.

### Logic Diagram



TL/K/6863-1

### Ordering Information

NSC Designation	Package	Temperature Range	Output Capability
DH0011AH	H10C	-55°C to +125°C	500mA

## Absolute Maximum Ratings

$V_{CC}$	8V	Power Dissipation	800 mW
Collector Voltage (Output)	50V	Operating Temperature Range	-55°C to +125°C
Input Reverse Current	1.0 mA	Storage Temperature	-65°C to +150°C

## Electrical Characteristics

Test Pin	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10	Sense	Min	Max
1	$V_{IH}$	$V_{IH}$	$V_{IH}$	$V_{IH}$	GND		GND	$I_{OL1}$		$V_{CC}$	$V_8$		$V_{OL1}$
2	$V_{IL}$				GND		GND	$I_{OL1}$	$V_{IL}$	$V_{CC}$	$V_8$		$V_{OL1}$
3	$V_{IL}$				GND	$I_{OL2}$				$V_{CC}$	$V_6$		$V_{OL2}$
4		$V_{IL}$			GND	$I_{OL2}$				$V_{CC}$	$V_6$		$V_{OL2}$
5			$V_{IL}$		GND	$I_{OL2}$				$V_{CC}$	$V_6$		$V_{OL2}$
6				$V_{IL}$	GND	$I_{OL2}$				$V_{CC}$	$V_6$		$V_{OL2}$
7				GND	GND	$I_{OL2}$			$V_{IH}$	$V_{CC}$	$V_6$		$V_{OL2}$
8	$V_R$	GND	GND	GND	GND					$V_{CC}$	$I_1$		$I_R$
9	GND	$V_R$	GND	GND	GND					$V_{CC}$	$I_2$		$I_R$
10	GND	GND	$V_R$	GND	GND					$V_{CC}$	$I_3$		$I_R$
11	GND	GND	GND	$V_R$	GND					$V_{CC}$	$I_4$		$I_R$
12					GND				$V_R$	$V_{CC}$	$I_9$		$I_R$
13	$V_F$	$V_R$	$V_R$	$V_R$	GND					$V_{CC}$	$I_1$		$-I_F$
14	$V_R$	$V_F$	$V_R$	$V_R$	GND					$V_{CC}$	$I_2$		$-I_F$
15	$V_R$	$V_R$	$V_F$	$V_R$	GND					$V_{CC}$	$I_3$		$-I_F$
16	$V_R$	$V_R$	$V_R$	$V_F$	GND					$V_{CC}$	$I_4$		$-I_F$
17				GND	GND				$V_F$	$V_{CC}$	$I_9$		$-I_F$
18					GND		GND			$V_{CC}$	$V_6$	$V_{OH}$	
19	GND				GND		GND	$V_{OX}$		$V_{CC}$	$I_8$		$I_{OX}$
20					GND					$V_{PD}$	$I_{10}$		$I_{PD}$
21	GND				GND					$V_{MAX}$	$I_{10}$		$I_{MAX}$
22*					GND					$V_{PD}$			$t_{ON}$
23*					GND					$V_{PD}$			$t_{OFF}$

\*See Test Circuits and Waveforms

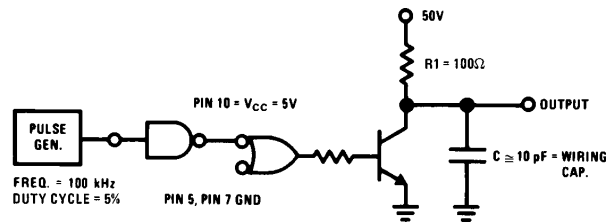
## Forcing Functions

Parameter	-55°C	+25°C	+125°C	Units
				V
$V_{CC}$	5.0	5.0	5.0	V
$V_{PD}$		5.0		V
$V_{MAX}$		8.0		V
$V_{IL}$	0.85	0.85	0.85	V
$V_{IH}$	1.9	1.8	1.6	V
$V_R$	4.5	4.5	4.5	V
$V_F$	0.45	0.45	0.45	V
$I_{OL1}$	400	400	400	mA
$I_{OL2}$	20	20	20	mA
$V_{OX}$	50.0	50.0	50.0	V

## Limits

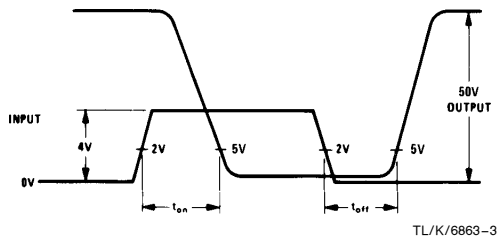
Parameter	-55°C		+25°C		+125°C		Units
	Min	Max	Min	Max	Min	Max	
V <sub>OL1</sub>		0.6		0.6		0.6	V
V <sub>OL2</sub>		0.45		0.45		0.45	V
V <sub>OH</sub>	1.95		1.85		1.65		V
I <sub>R</sub>				60		60	μA
-I <sub>F</sub>		1.6		1.6		1.6	mA
I <sub>OX</sub>				5.0		200	μA
I <sub>PD</sub>				12.2			mA
I <sub>MAX</sub>				10			mA
t <sub>ON</sub>				160			ns
t <sub>OFF</sub>				220			ns

## Switching Time Test Circuit

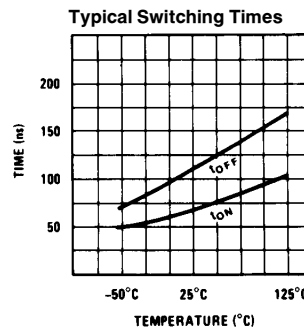


TL/K/6863-2

## Switching Time Waveforms

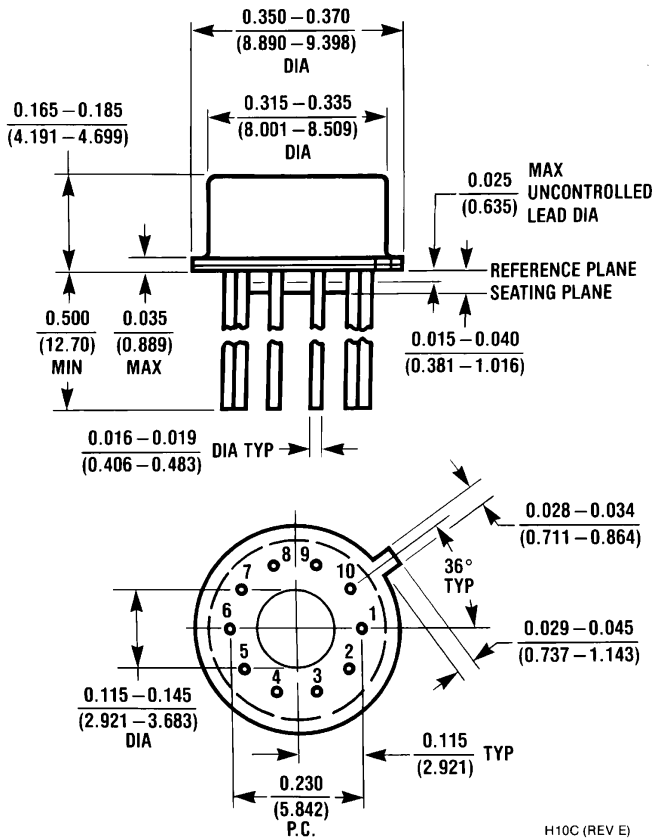


TL/K/6863-3



TL/K/6863-4

**Physical Dimensions** inches (millimeters)



**10-Lead TO-5 Metal Can Package (H)**  
**Order Number DH0011A**  
**NS Package H10C**

H10C (REV E)

**LIFE SUPPORT POLICY**

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.



**National Semiconductor Corporation**  
 1111 West Bardin Road  
 Arlington, TX 76017  
 Tel: 1(800) 272-9959  
 Fax: 1(800) 737-7018

**National Semiconductor Europe**  
 Fax: (+49) 0-180-530 85 86  
 Email: cnjwge@tevm2.nsc.com  
 Deutsch Tel: (+49) 0-180-530 85 85  
 English Tel: (+49) 0-180-532 78 32  
 Français Tel: (+49) 0-180-532 93 58  
 Italiano Tel: (+49) 0-180-534 16 80

**National Semiconductor Hong Kong Ltd.**  
 19th Floor, Straight Block,  
 Ocean Centre, 5 Canton Rd.  
 Tsimshatsui, Kowloon  
 Hong Kong  
 Tel: (852) 2737-1600  
 Fax: (852) 2736-9960

**National Semiconductor Japan Ltd.**  
 Tel: 81-043-299-2309  
 Fax: 81-043-299-2408

National does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and National reserves the right at any time without notice to change said circuitry and specifications.