

## DH0035/DH0035C PIN Diode Driver

### General Description

The DH0035/DH0035C is a high speed digital driver designed to drive PIN diodes in RF modulators and switches. The device is used in conjunction with an input buffer such as the DM7830/DM8830 or DM5440/DM7440.

### Features

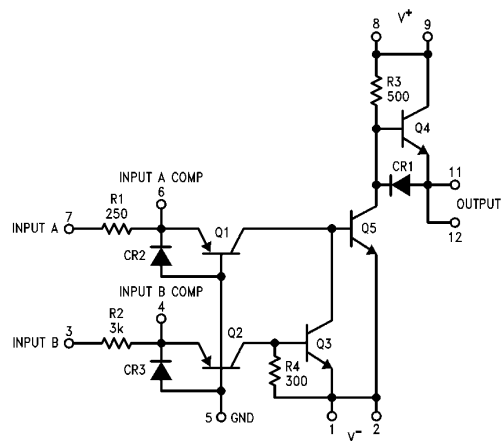
- Large output voltage swing—30V
- Peak output current in excess of 1A
- Inputs TTL/DTL compatible

- Short propagation delay—10 ns
- High repetition rate—5 MHz

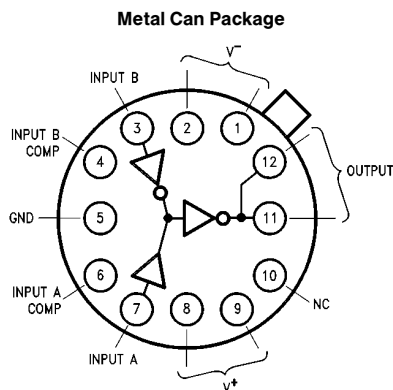
The DH0035/DH0035C is capable of driving a variety of PIN diode types including parallel, serial, anode grounded and cathode grounded. For additional information, see *AN-49 PIN Diode Drivers*.

The DH0035 is guaranteed over the temperature range  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  whereas the DH0035C is guaranteed from  $0^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ .

### Schematic and Connection Diagrams



TL/K/10124-1



TL/K/10124-2

Order Number DH0035G-MIL or DH0035CG  
See NS Package Number G12B

## Absolute Maximum Ratings

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

$V^-$ Supply Voltage Differential (Pin 5 to Pin 1 or 2)	40V
$V^+$ Supply Voltage Differential (Pin 1 or 2 to Pin 8 or 9)	30V
Input Current (Pin 3 or 7)	$\pm 75$ mA
Peak Output Current	$\pm 1.0$ A

Power Dissipation (Note 3)	1.5W
Storage Temperature Range	$-65^\circ\text{C}$ to $+150^\circ\text{C}$
Operating Temperature Range	
DH0035	$-55^\circ\text{C}$ to $+125^\circ\text{C}$
DH0035C	$0^\circ\text{C}$ to $+85^\circ\text{C}$
Lead Temperature (Soldering, 10 sec.)	$300^\circ\text{C}$

## Electrical Characteristics (Notes 1 and 2)

Parameter	Conditions	Limits			Units
		Min	Typ	Max	
Input Logic "1" Threshold	$V_{OUT} = -8\text{V}$ , $R_L = 100\Omega$		1.0	2.0	V
Input Logic "0" Threshold	$V_{OUT} = +8\text{V}$ , $R_L = 100\Omega$	0.4	0.6		V
Positive Output Swing	$I_{OUT} = 100$ mA	7.0	+8.0		V
Negative Output Swing	$I_{OUT} = 100$ mA		-8.0	-7.0	V
Positive Short Circuit Current	$V_{IN} = 0\text{V}$ , $R_L = 0\Omega$ (Pulse Test, Duty Cycle $\leq 3\%$ )	400	800		mA
Negative Short Circuit Current	$V_{IN} = 1.5\text{V}$ , $I_{IN} = 50$ mA, $R_L = 0\Omega$ (Pulse Test, Duty Cycle $\leq 3\%$ )	800	1000		mA
Turn-On Delay	$V_{IN} = 1.5\text{V}$ , $V_{OUT} = -3\text{V}$		10	15	ns
Turn-Off Delay	$V_{IN} = 1.5\text{V}$ , $V_{OUT} = +3\text{V}$		15	30	ns
On Supply Current	$V_{IN} = 1.5\text{V}$		45	60	mA

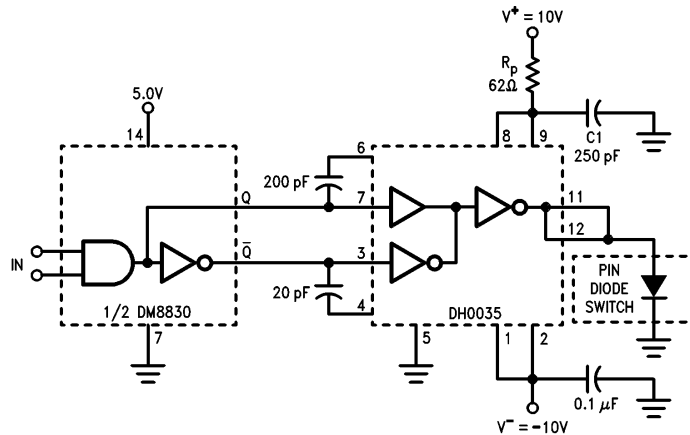
**Note 1:** Unless otherwise specified, these specifications apply for  $V^+ = 10.0\text{V}$ ,  $V^- = -10.0\text{V}$ , pin 5 grounded, over the temperature range  $-55^\circ\text{C}$  to  $+125^\circ\text{C}$  for the DH0035, and  $0^\circ\text{C}$  to  $+85^\circ\text{C}$  for the DH0035C.

**Note 2:** All typical values are for  $T_A = 25^\circ\text{C}$ .

**Note 3:** Derate linearly at  $10$  mW/ $^\circ\text{C}$  for ambient temperatures above  $25^\circ\text{C}$ .

## Typical Applications

### Grounded Cathode Design

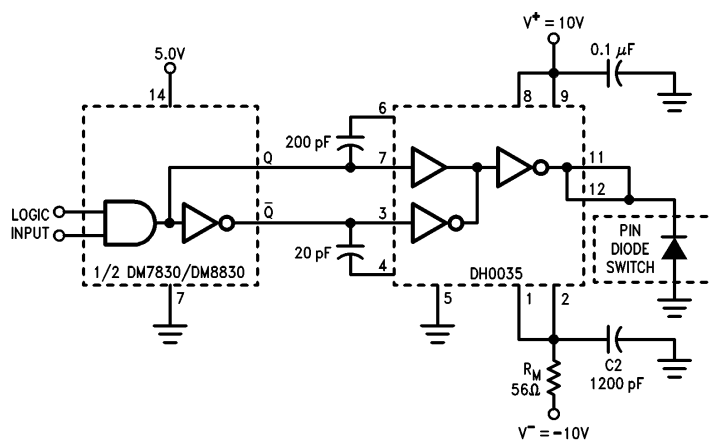


**Note:** Cathode grounded PIN diode:  $R_p = 62\Omega$  limits diode forward current to 100 mA. Typical switching for HP33604A, RF turn-on 25 ns, turn-off 5 ns.  $C_2 = 250$  pF,  $R_p = 0\Omega$ ,  $C_1 = 0.1\text{F}$ .

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### Typical Applications (Continued)

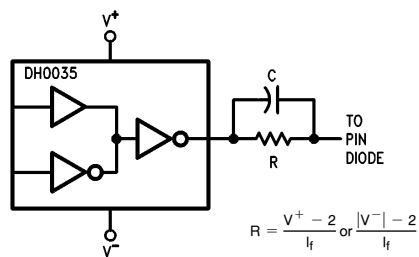
### Grounded Anode Design



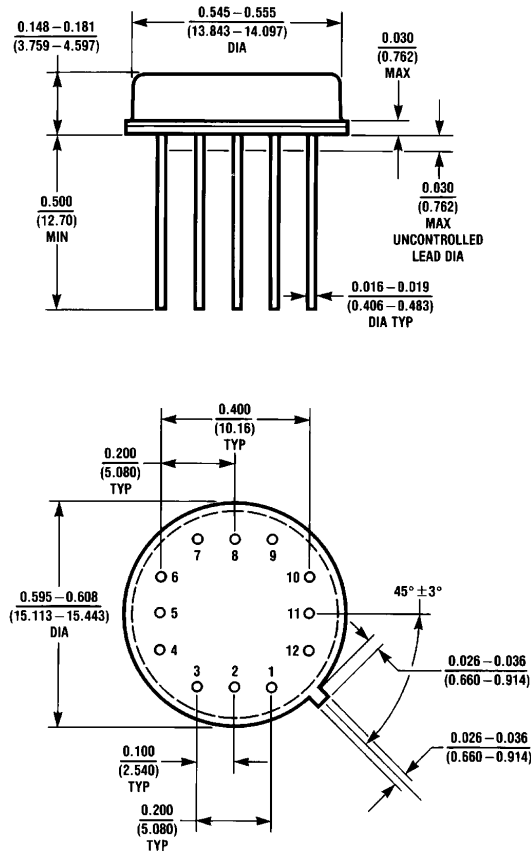
TL/K/10124-4

**Note:** Anode Grounded PIN diode:  $R_M = 56\Omega$  limits diode forward current to 100 mA. Typical switching for HP33622A, RF turn-on 5 ns; turn-off 4 ns.  $C1 = 470$  pF,  $C2 = 0.1$   $\mu$ F,  $R_M = 0\Omega$ .

### Alternate Current Limiting



TL/K/10124-5

**Physical Dimensions** inches (millimeters)

G12B (REV C)

**12 Lead Metal Can Package**  
**Order Number DH0035G-MIL or DH0035CG**  
**NS Package Number G12B**

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