

4825898 INTEGRATED POWER

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T-52-13-25

INTEGRATED POWER SEMICONDUCTORS, LTD.

Universal Quad Driver

Description

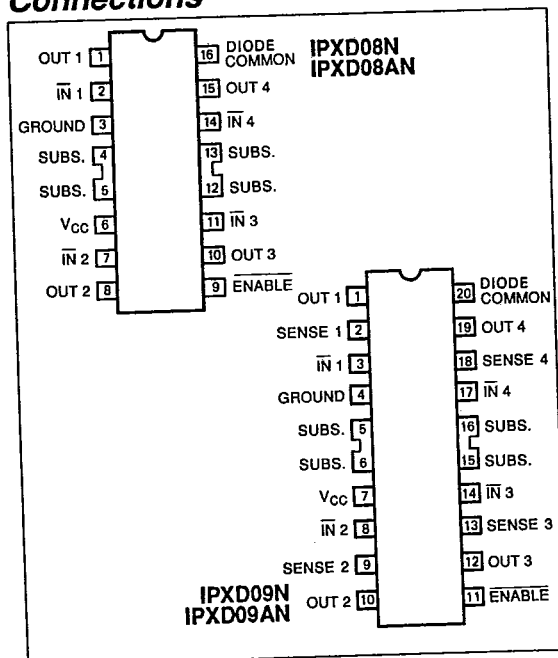
This family of universal quad drivers are high voltage, high current, high gain integrated circuits that provide an interface between stepper motors and motor control circuitry. Both part types, the D08 and D09, allow split supply operation to both positive and negative rails. The D09 allows for external current sensing via an emitter sense pin. The D08/D09 are capable of sinking up to 2.5A and can withstand output OFF voltages to 50V. The D08A/D09A are rated to 80V. All outputs offer voltage suppression capability with internal clamp diodes and all versions are supplied in dual-in-line packages with heat sink contact tabs for maximum power dissipation.

Features

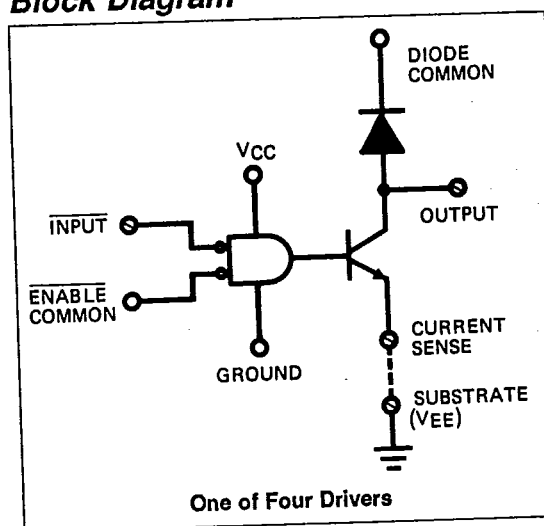
- Output currents to 2 amps
- Current sense on D09/D09A
- 50/80 volt output breakdown
- Low output saturation voltage
- Low diode forward voltage
- Split supply operation
- Clamp diodes for transient suppression
- Compatible with standard logic families
- Improved noise immunity and parasitic suppression
- 50 volt output sustaining voltage

Section 4 - Power Drivers
IP2D08, IP2D08A, IP2D09, IP2D09A,
IP3D08, IP3D08A, IP3D09, IP3D09A

Connections



Block Diagram



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$)

Output Voltage, V_{CE}		Current Sense Voltage, V_S	
D08/D09	50V	D09/D09A	1V
D08A/D09A	80V	Power Dissipation	2.77W
Input Voltage, V_{IN}	-0.3V to +80V	Operating Junction Temperature	+150°C
Logic Supply Voltage, V_{CC}		Operating Ambient Temperature Range	
D08/D09	50V	IP2D08/D08A/D09/D09A	-25°C to +85°C
D08A/D09A	80V	IP3D08/D08A/D09/D09A	0°C to +70°C
Output Current, I_{OUT}	2.5A	Storage Temperature Range	-65°C to +150°C
Diode Reverse Voltage, V_R	80V	Lead Temperature (Soldering, 10 sec.)	+300°C
Diode Forward Current, I_D	2.5A		

Absolute maximum ratings are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the devices should be operated at these limits. The electrical characteristics provide conditions for actual device operation.

Electrical Characteristics ($V_{CC} = 15V$)

Parameter	Conditions	Min	Typ	Max	Unit
Supply Current, I_S	All Inputs = 0.8V	•	25	40	mA
	All Inputs = 5.0V	•	2	5	mA
Logic Input Low Current, I_{IL}	$V_{IL} = 0.8V$	•	-50		μA
Logic Input High Current, I_{IH}	$V_{IH} = 2.0V$	•		10	μA
Logic Input Low Voltage, V_{IL}		•	-0.3	0.8	V
Logic Input High Voltage, V_{IH}		•	2.0	V_{CC}	V
Output Saturation Voltage, $V_{CE (SAT)}$	$I_{OUT} = 2.0A$	•		1.8	V
Output Leakage Current, I_{CEX}	$V_{OUT} = V_{CE MAX}$	•		50	μA
Output Sustaining Voltage, $V_{CE (SUS)}$	$I_{OUT} = 100mA$ (Figure 2)	•	50		V
Diode Leakage Current, I_R	$V_R = 80V$	•		50	μA
Diode Forward Voltage, V_F	$I_{OUT} = 2.0A$	•		1.5	V

The • denotes the specifications which apply over the full operating range, all others apply at $T_A = 25^\circ\text{C}$ unless otherwise specified.

Switching Characteristics ($V_{CC} = 15V$, $f = 10KHz$ and $T_A = 25^\circ\text{C}$)

Parameter	Conditions	Min	Typ	Max	Unit
Turn-on Delay, t_{on}	$I_{OUT} = 2.0A$			TBD	μs
Turn-off Delay, t_{off}	$I_{OUT} = 2.0A$			TBD	μs
Diode Reverse Recovery, t_{rr}	$I_{OUT} = 2.0A$			TBD	ns

Note: Switching times apply for resistive loads only and are not tested in production.

Section 4 - Power Drivers
IP2D08, IP2D08A, IP2D09, IP2D09A,
IP3D08, IP3D08A, IP3D09, IP3D09A

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Test Configurations

Reverse Bias Safe Operating Area — Test Circuit & Waveforms

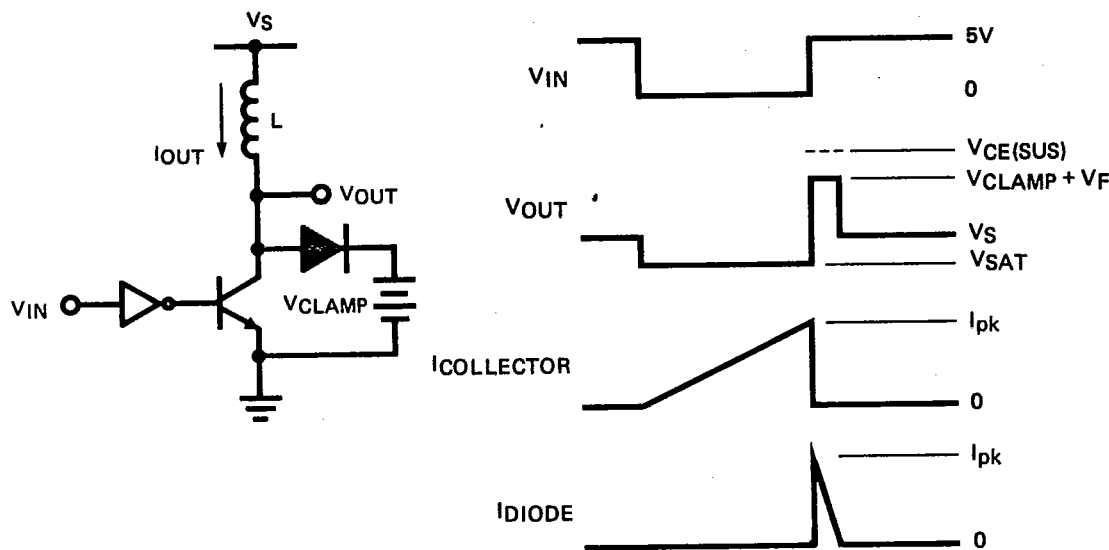


Figure 1.
Sustaining Voltage — Test Circuit & Waveforms

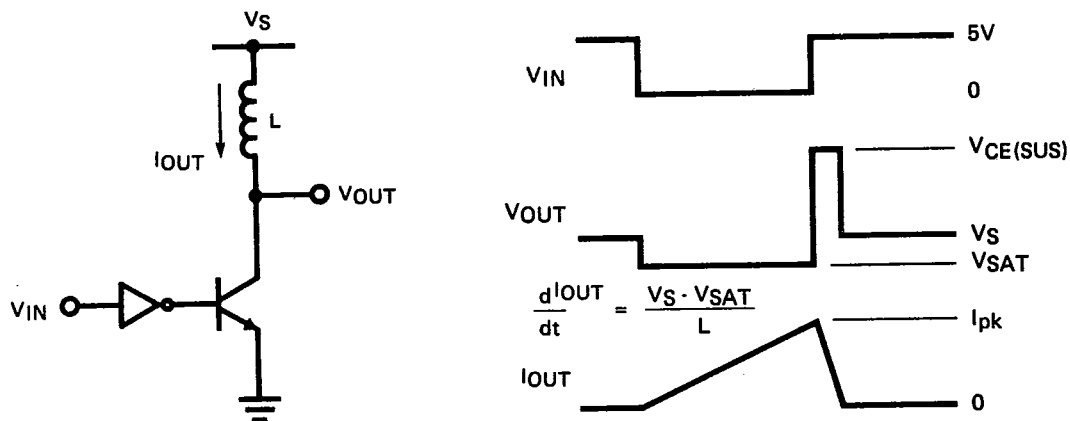


Figure 2.
For this test the internal flyback diode is disconnected.

IPS

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Order Information

Part Number	Temperature Range	Package
IP2D08N	-25°C to +85°C	16 pin power DIP
IP3D08N	0°C to +70°C	16 pin power DIP
IP2D08AN	-25°C to +85°C	16 pin power DIP
IP3D08AN	0°C to +70°C	16 pin power DIP
IP2D09N	-25°C to +85°C	20 pin power DIP
IP3D09N	0°C to +70°C	20 pin power DIP
IP2D09AN	-25°C to +85°C	20 pin power DIP
IP3D09AN	0°C to +70°C	20 pin power DIP

Section 4 - Power Drivers
 IP2D08, IP2D08A, IP2D09, IP2D09A,
 IP3D08, IP3D08A, IP3D09, IP3D09A

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