

CS-293D

CS-293D

600mA, 4 Channel Push Pull Driver

Description

The CS-293D is a quad push pull driver capable of delivering output current to 600mA per channel. Each channel is controlled by a TTL-compatible logic input. Each full-bridge driver is equipped with an enable input which turns off all four transistors. A separate logic supply input is provided so that it may

operate from a lower voltage to reduce power dissipation. The CS-293D also includes output clamping diodes for interfacing with inductive loads.

The CS-293D is available in a 16 lead plastic power DIP.

Features

Output Current 600mA per Channel

Peak Output Current 1.2A per Channel

Inhibit Capability

High Noise Immunity

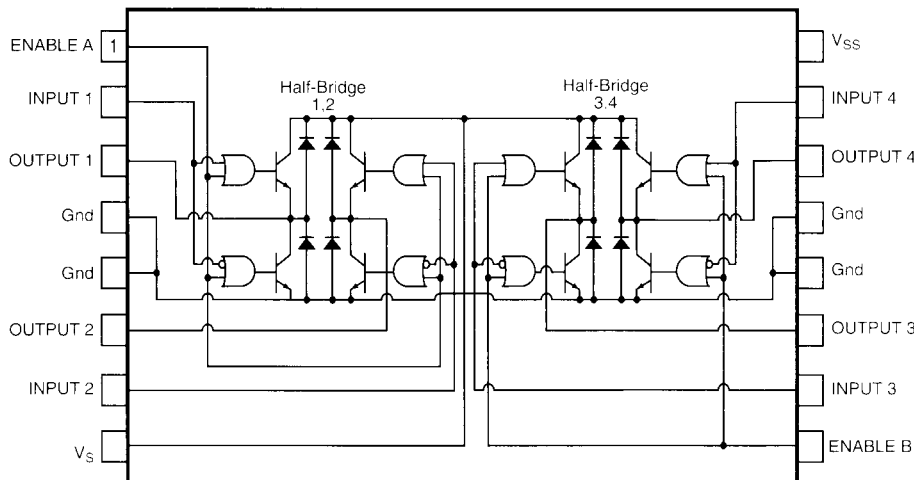
Separate Logic Supply

Over-Temperature Protection

Absolute Maximum Ratings

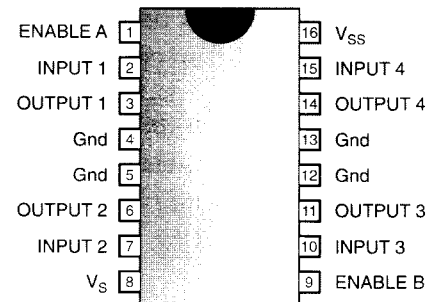
Collector Supply Voltage.....	36V
Logic Voltage.....	36V
Peak Output Current (non-repetitive).....	1.2A
Total Power Dissipation (80°C)	5W
Storage and Junction Temperature.....	-40 to +150°C

Block Diagram



Package Options

16L PDIP Batwing



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Electrical Characteristics: For each channel, $V_S = 24V$, $V_{SS} = 5V$, $T_{amb} = 25^\circ C$, unless otherwise specified

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage		V_{SS}		36	V
Logic Supply Voltage		4.5		36.0	
Total Quiescent Supply Current	$V_{IN} = L; I_{OUT} = 0; V_{ENABLE} = H$ $V_{IN} = H; I_{OUT} = 0; V_{ENABLE} = H$ $V_{ENABLE} = L$		12 75	32 95 4	mA
Total Quiescent Logic Supply Current			3.5	7.0	mA
Input Low Voltage		-0.3		0.8	V
Input High Voltage		2.0		V_S	V
Low Voltage Input Current	$V_I \leq V_{IL} \text{ max}$		-50	-100	μA
High Voltage Input Current	$V_I \geq V_{IH} \text{ min}$			10	μA
Enable Low Voltage		-0.3		0.8	V
Enable High Voltage		2.0		V_S	V
Low Voltage Enable Current			-50	-100	μA
High Voltage Enable Current				10	μA
Source Output Saturation Voltage	$I_{OUT} = 600mA$		1.4	1.8	V
Sink Output Saturation Voltage	$I_{OUT} = 600mA$		1.2	1.8	V
Diode Forward Voltage	$I_D = 0.6A$		1.6	1.8	V

Switching Characteristics: (See diagram) $V_S = 24V$, $V_{SS} = 5V$, $f_C = 30KHz$, $T_A = 25^\circ C$

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Sink Current Turn-on Delay			2000		ns
Sink Current Rise Time			200		ns
Sink Current Turn-off Delay			600		ns
Sink Current Fall Time			200		ns
Source Current Turn-on Delay			2000		ns
Source Current Rise Time			600		ns
Source Current Turn-off Delay			700		ns
Source Current Fall Time			400		ns
Sink to Source Deadtime		0	1000		ns
Source to Sink Deadtime		0	1000		ns

Package Pin Description

PACKAGE PIN #	PIN SYMBOL	FUNCTION
16L PDIP Batwing		
1	ENABLE A	Enables and disables control of outputs #1 and #2.
2	INPUT 1	Logic input of #1 half H-bridge.
3	OUTPUT 1	Output connection of #1 half of H-bridge.
4, 5, 12, 13	Gnd	Ground connection; also conducts heat from die to PC board copper.
6	OUTPUT 2	Output connection of #2 half of H-bridge.
7	INPUT 2	Logic input of #2 half of H-bridge; controls source/sink of output current.
8	V _S	Voltage supply of output stages.
9	ENABLE B	Enables and disables control of outputs #3 and #4.
10	INPUT 3	Logic input of #3 half of H-bridge.
11	OUTPUT 3	Output of #3 half of H-bridge.
14	OUTPUT 4	Output of #4 half of H-bridge.
15	INPUT 4	Logic input of #4 half of H-bridge.
16	V _{SS}	Supply voltage for logic circuitry.

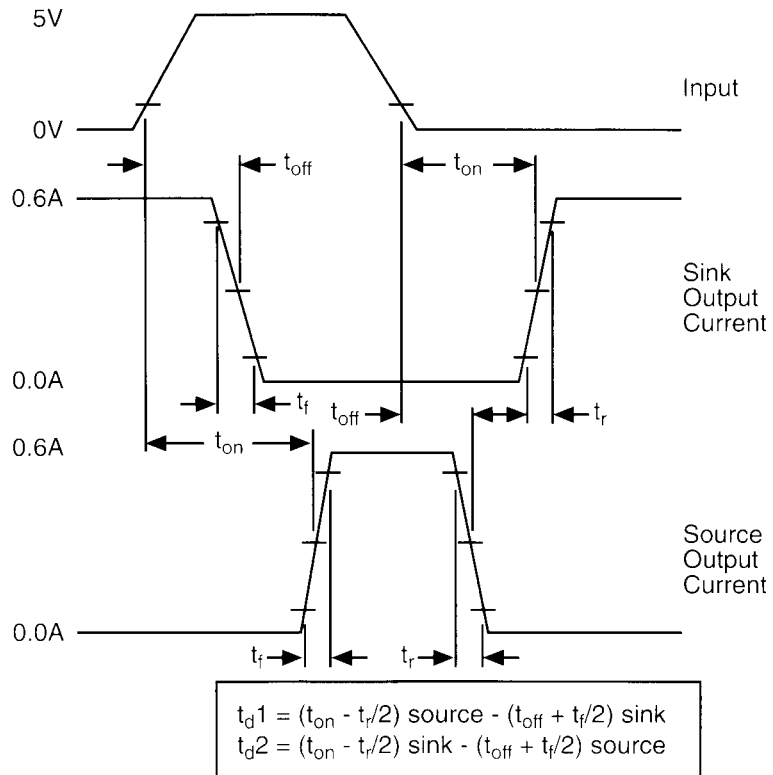
Switching Diagram

TRUTH TABLE

INPUT	ENABLE	OUTPUT
H	H	H
L	H	L
H	L	Z
L	L	Z

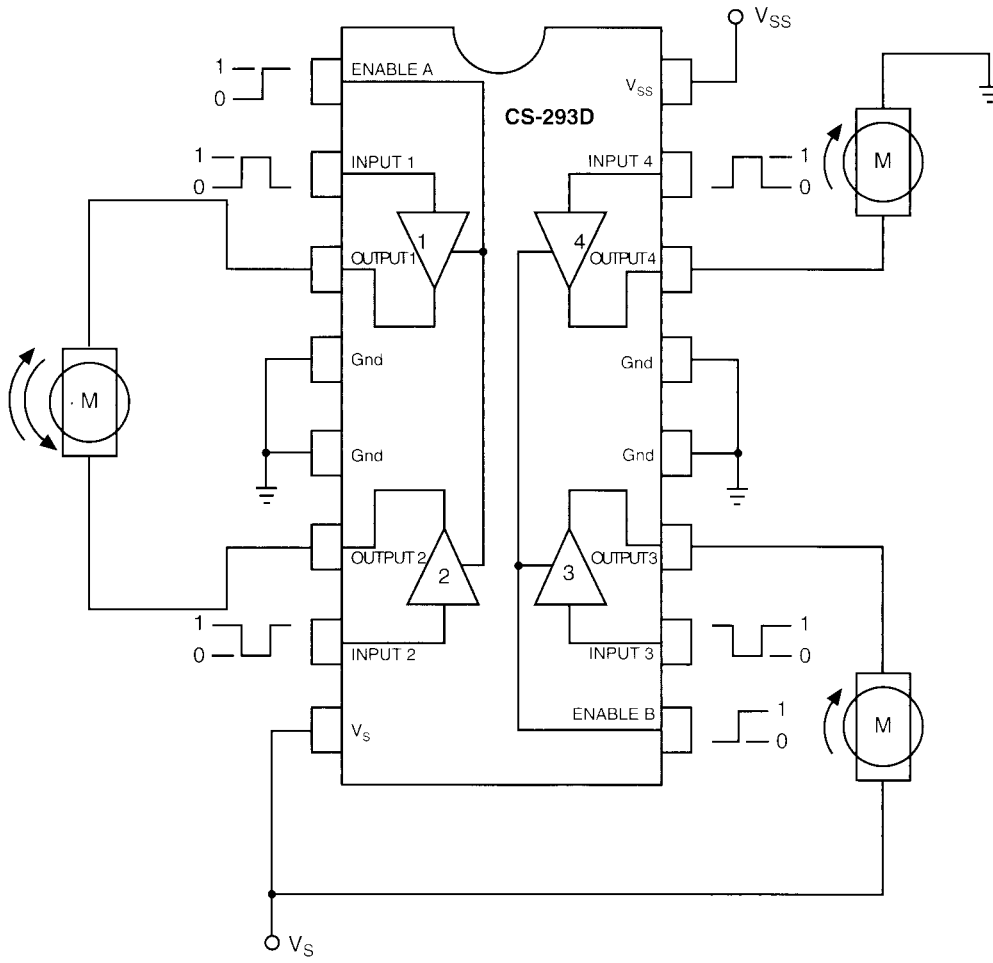
* Relative to the considered channel

Z = High Impedance



Typical Application Diagram

CS-293D



Mounting Instructions

The $R\theta_{JA}$ of the CS-293 can be reduced by soldering the Gnd pins to a suitable copper area of the printed circuit board or to an external heatsink.

The diagram of Figure B shows the maximum package power P_{tot} and the θ_{JA} as a function of the side "l" of two equal square copper areas having a thickness of 35μ (see figure C).

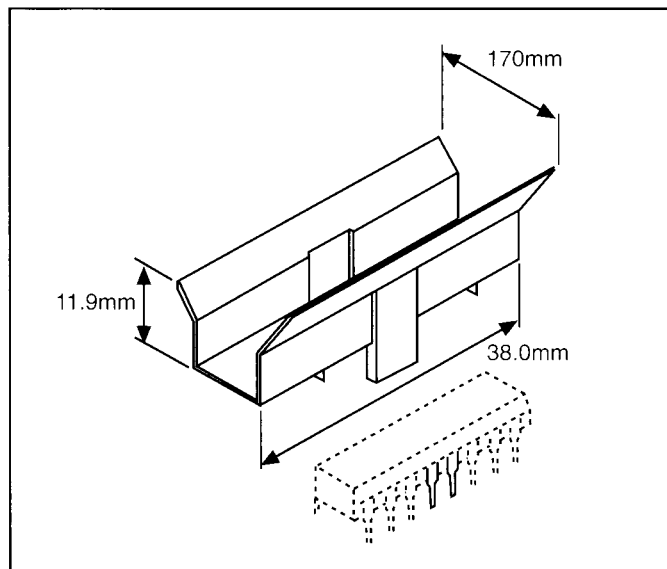


Figure A - External Heatsink Mounting Example ($\theta_{JA} = 25^\circ\text{C/W}$)

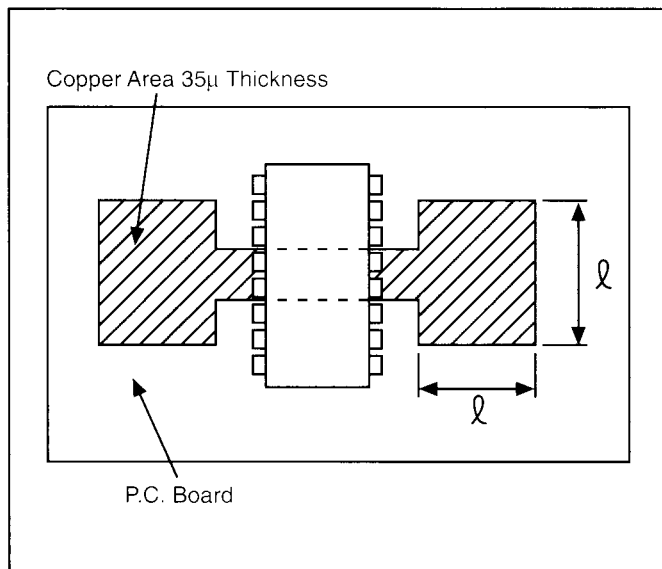


Figure C - Example of PC Board Copper Area which is used as Heatsink

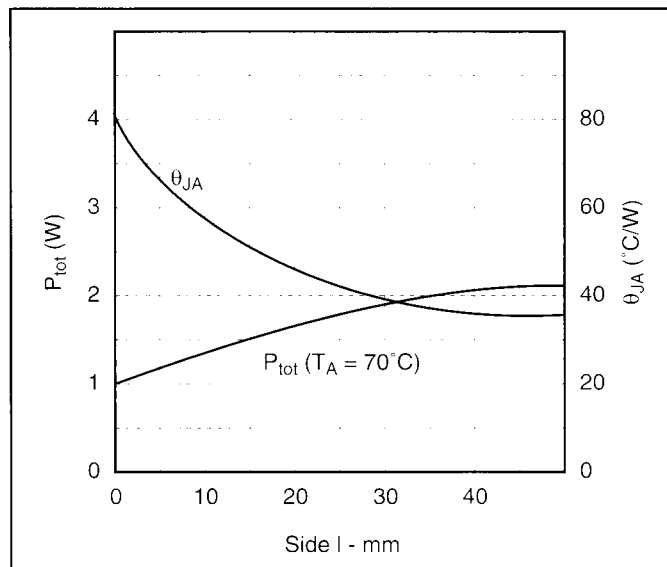


Figure B - Maximum Power Dissipation and Junction to Ambient Thermal Resistance vs. Side "l"

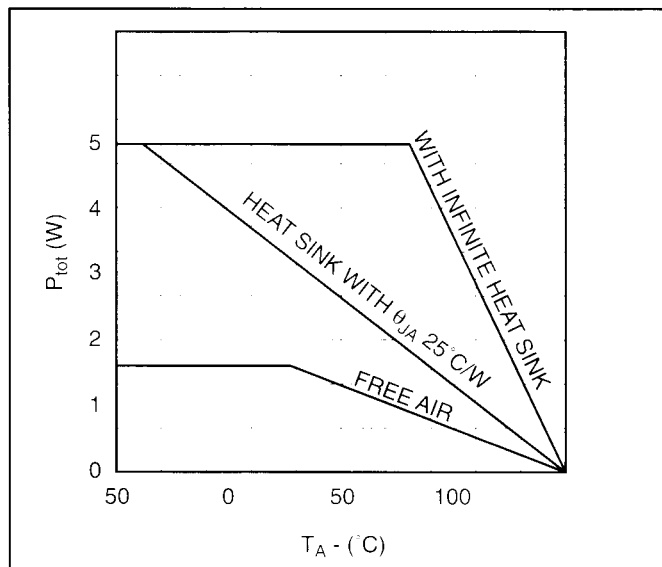


Figure D - Maximum Allowable Power Dissipation vs. Ambient Temperature

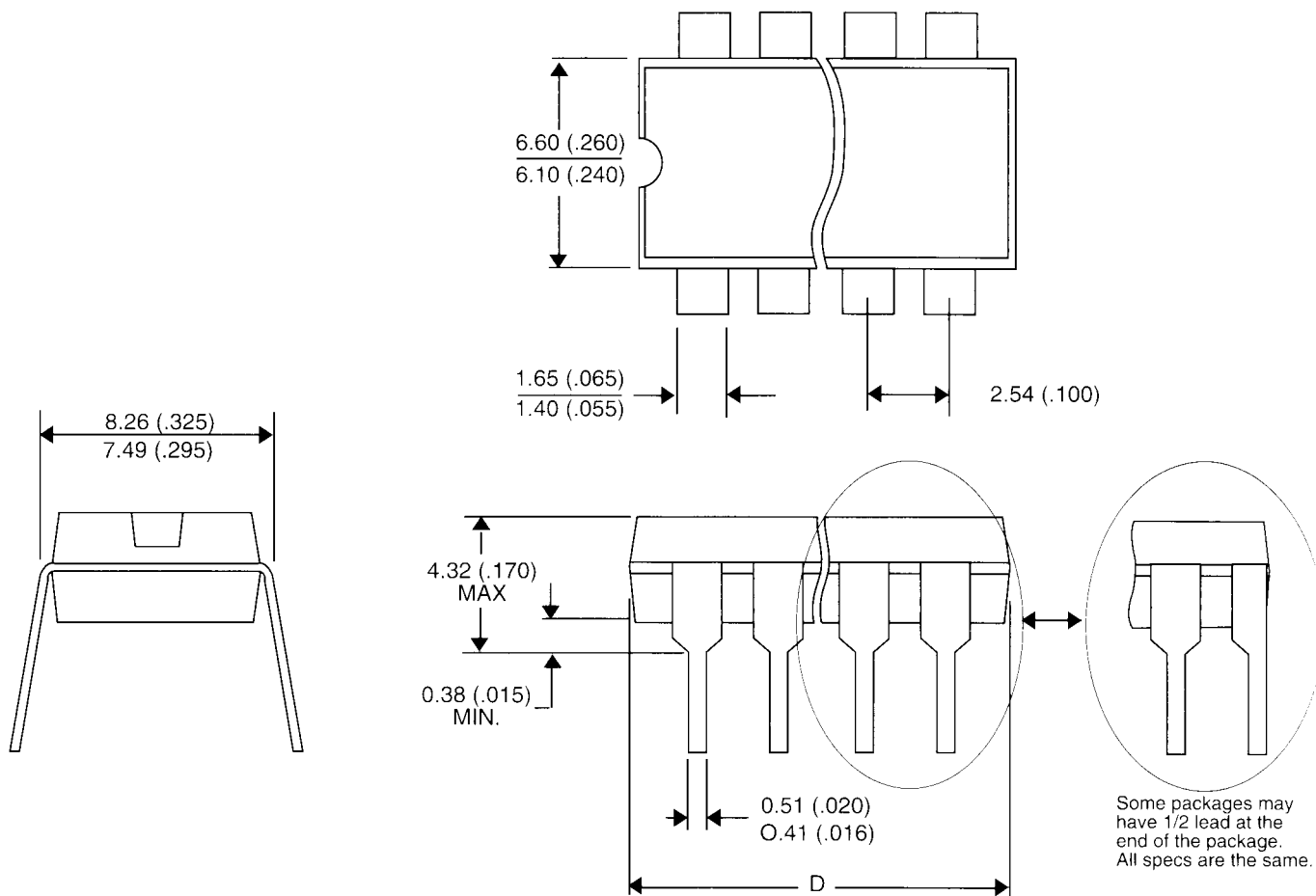
Package Specification

PACKAGE DIMENSIONS IN mm (INCHES)

PACKAGE THERMAL DATA

Lead Count	Metric		English		Thermal Data		16L PDIP Batwing	
	Max	Min	Max	Min	R θ_{JC}	typ		
16L PDIP Batwing	19.18	18.92	.755	.745	R θ_{JA}	typ	50	°C/W

16L PDIP Batwing



Ordering Information

Part Number	Description
CS-293DN16BW	16 Lead Plastic Power DIP

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