High and Low side driver

General Description

The product is a high voltage, high speed power MOSFET and IGBT driver based on P-SUB P-EPI process. The floating channel driver can be used to drive two N-channel power MOSFET or IGBT independently which operates up to 150V. Logic inputs are compatible with standard CMOS or LSTTL output, down to 3.3V logic. The output drivers feature a high pulse current buffer stage designed for minimum driver cross conduction. Propagation delays are matched to simplify use in high frequency applications.

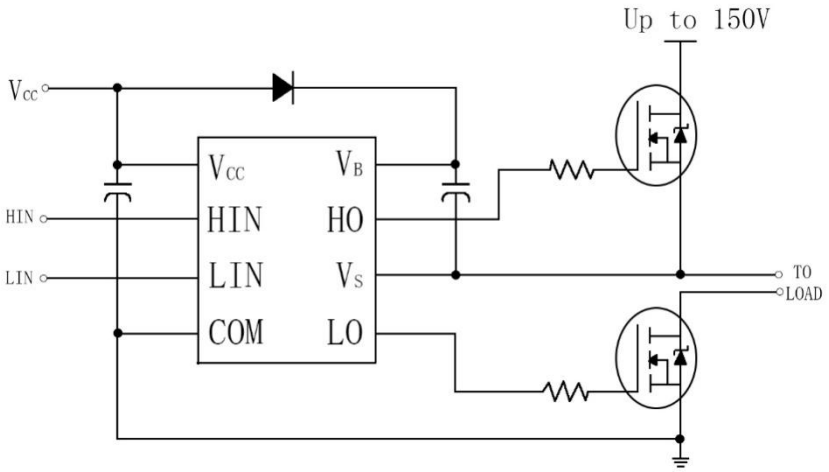
Features

- 3.3V logic compatible
- Fully operational to +150V
- Floating channel designed for bootstrap operation
- Gate drive supply range from 5.5V to 20V
- Output Source/Sink current capability 450mA/850mA
- Independent Logic input to accommodate all topologies
- -5V negative Vs ability
- Matched propagation delay for both channels

Applications

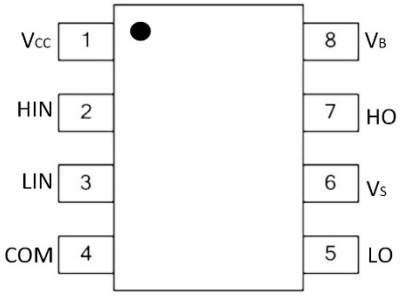
- Power MOSFET or IGBT driver
- Small and medium-power motor driver

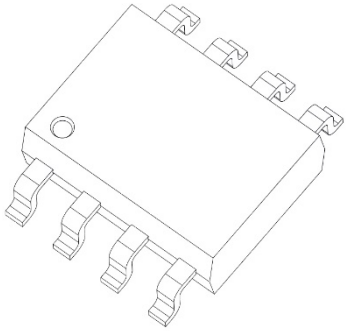
Application Circuit



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Package and Pin Description

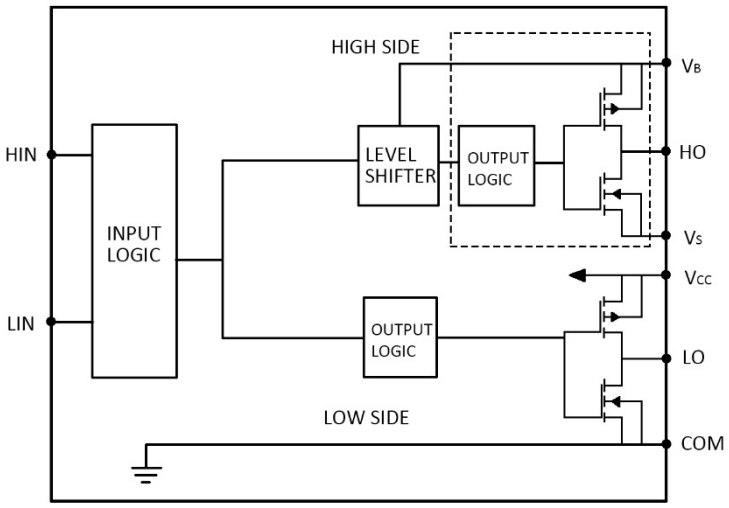




SOP-8

Pin Number	Pin Name	Pin Function
1	Vcc	Low side and main power supply
2	HIN	Logic input for high side gate driver output(HO)
3	LIN	Logic input for low side gate driver output(LO)
4	COM	Ground
5	LO	Low side gate drive output, in phase with LIN
6	Vs	High side floating supply return or bootstrap return
7	HO	High side gate drive output, in phase with HIN
8	VB	High side floating supply

Functional Block Diagram



High and Low side driver

Absolute Maximum Ratings

Symbol	Definition	MIN.	MAX.	Units
V_B	High side floating supply	-0.3	150	V
V_S	High side floating supply return	V_B-20	V_B+0.3	
V_{HO}	High side gate drive output	V_S-0.3	V_B+0.3	
V_{CC}	Low side and main power supply	-0.3	25	
V_{LO}	Low side gate drive output	-0.3	V_{CC}+0.3	
V_{IN}	Logic input of HIN&LIN	-0.3	V_{CC}+0.3	
ESD	HBM Model	2500		V
	Machine Model	200		V
P_D	Package Power Dissipation @$T_A \leqslant 25^oC$	—	0.63	W
Rth_{JA}	Thermal Resistance Junction to Ambient	—	200	$^oC/W$
T_J	Junction Temperature	—	150	^oC
T_S	Storage Temperature	-55	150	
T_L	Lead Temperature	—	300	

Note: Exceeding these ratings may damage the device

Recommended Operating Conditions

Symbol	Definition	MIN.	MAX.	Units
V_B	High side floating supply	V_S+5.5	V_S+20	V
V_S	High side floating supply return	—	150	
V_{HO}	High side gate drive output	V_S	V_B	
V_{CC}	Low side and main power supply	5.5	20	
V_{LO}	Low side gate drive output	0	V_{CC}	
V_{IN}	Logic input of HIN&LIN	0	V_{CC}	
T_A	Ambient Temperature	-40	125	^oC

Dynamic Electrical Characteristics

$V_{BIAS}(V_{CC},V_{BS})$=15V,C_L=1000pF , T_A=25℃。

Symbol	Definition	TYP.	MAX.	Units
t_{onH}	High side turn-on propagation delay	200	230	ns
t_{offH}	High side turn-off propagation delay	80	120	
t_{onL}	Low side turn-on propagation delay	90	120	
t_{offL}	Low side turn-off propagation delay	80	110	
MT	Delay matching	100	130	
t_r	Turn-on rise time	70	90	
t_f	Turn-off fall time	60	85	

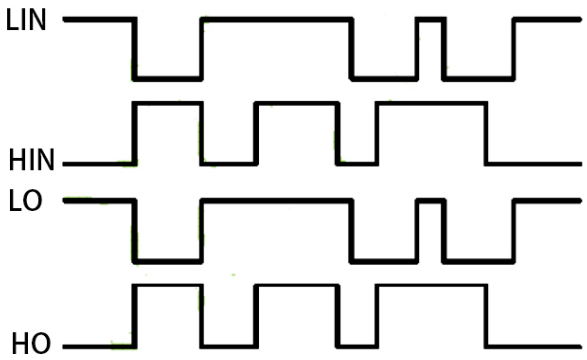
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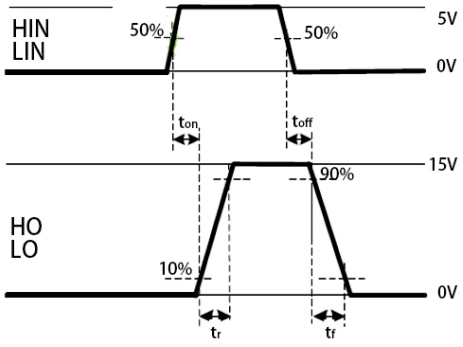
Static Electrical Characteristics

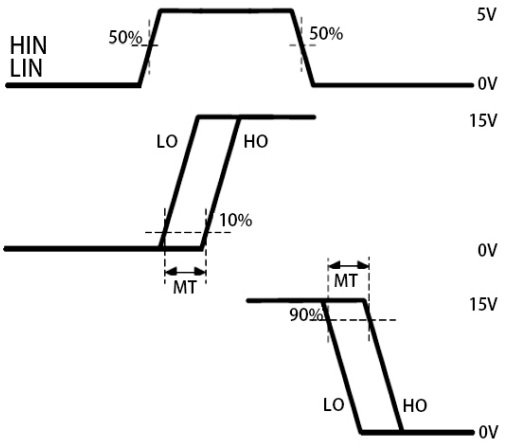
$V_{BIAS}(V_{CC},V_{BS})$=15V,C_L=1000pF , T_A=25° C。

Symbol	Definition	MIN.	TYP.	MAX.	Units
V_{IH}	Logic"1"(HIN&LIN) input voltage	2.5	—	—	V
V_{IL}	Logic"0" (HIN&LIN) input voltage	—	—	0.8	
V_{OH}	High Level output voltage, V_{BIAS} - V_O	—	—	0.3	
V_{OL}	Low level output voltage, V_O	—	—	0.3	
I_{QCC}	Quiescent V_{CC} supply current		70	100	uA
I_{QBS}	Quiescent V_B supply current	—	300	355	uA
I_{LK}	Leakage current from V_S(600V) to Gnd	—	—	50	
I_{IN+}	Logic"1" input bias current	—	5	10	
I_{IN-}	Logic"0" input bias current	—	—	2	
I_{O+}	Output high short circuit pulsed current	—	450	—	mA
I_{O-}	Output low short circuit pulsed current	—	850	—	

Logic Function & Timing Spec

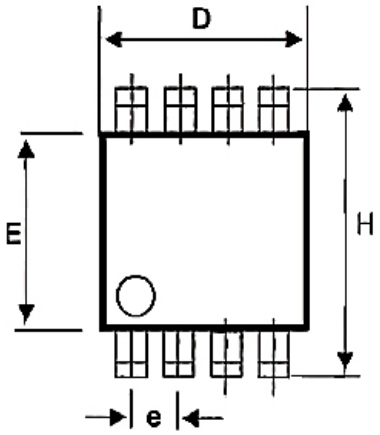


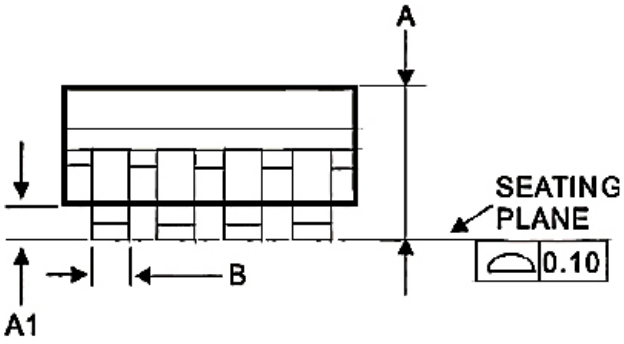


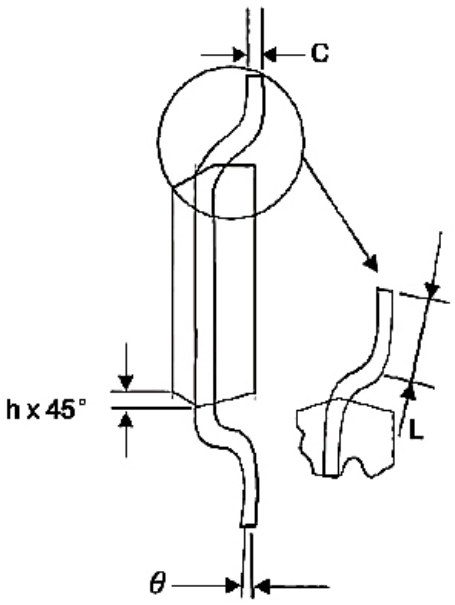


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PACKAGE OUTLINE







DIM	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.18	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
θ	0°	7°