HM2006

High and Low Side Driver

General Description

The HM2006 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 120 V. 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. It has two versions HM2006A & HM2006B.

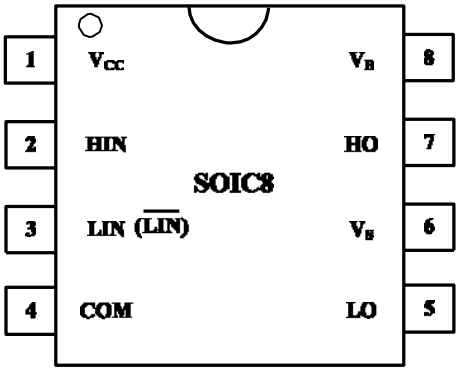
Features

- Fully operational to +120 V
- 3.3 V logic compatible
- Floating channel designed for bootstrap operation
- Gate drive supply range from 10 V to 20 V
- Output Source / Sink Current Capability 450mA / 900mA
- Independent Logic Inputs to Accommodate All Topologies
- -5V negative Vs ability
- Matched propagation delay for both channels

Applications

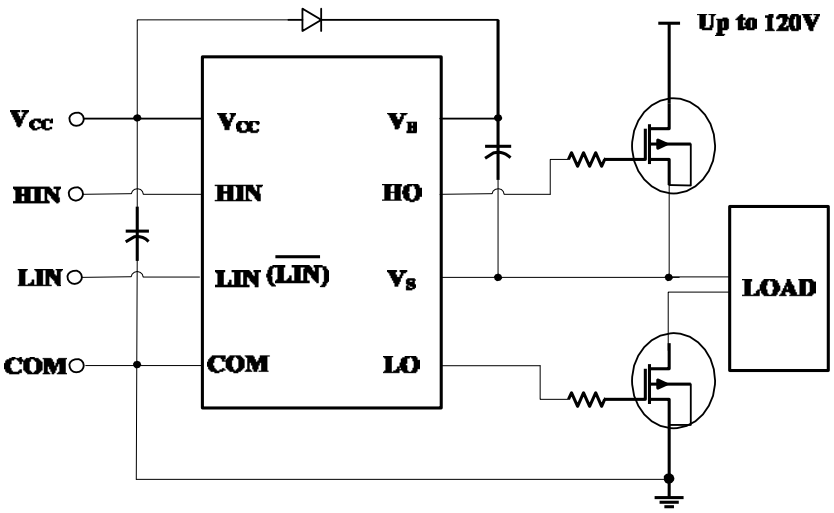
- Small and medium- power motor driver
- Power MOSFET or IGBT driver

Packages/Order information



Part number	Order Code	Package
HM2006A	HM2006A	SOIC8
HM2006B	HM2006B	SOIC8

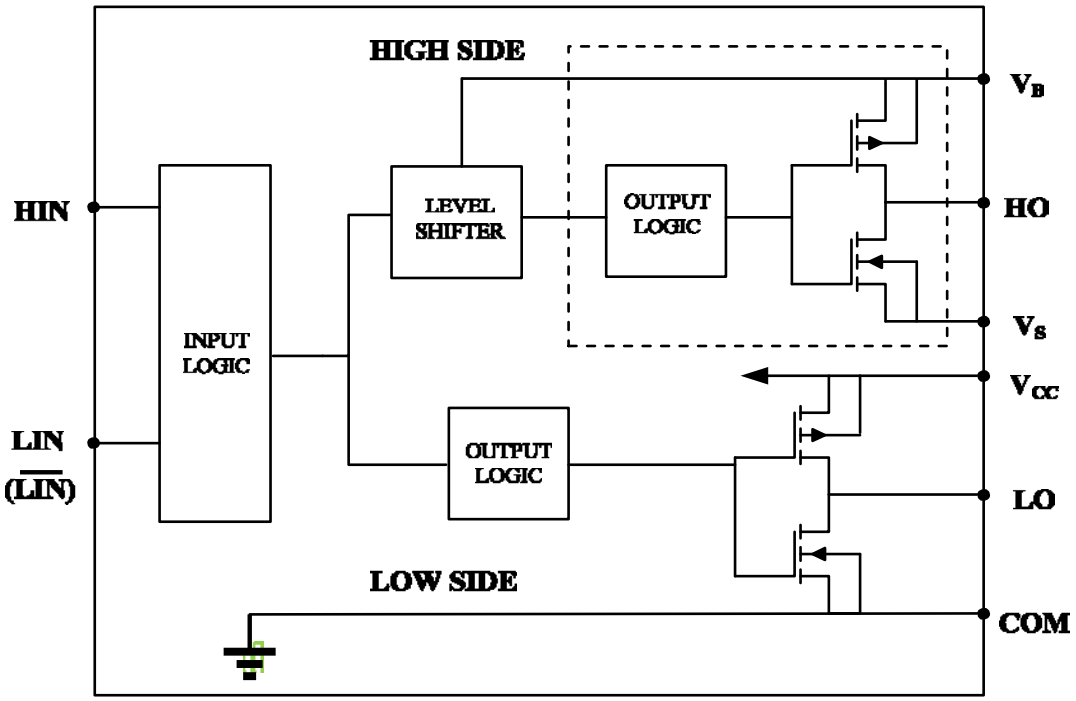
Typical Application Circuit



Pin Description

PIN NO.	PIN NAME	PIN FUNCTION
1	V_{CC}	Low side and main power supply
2	HIN	Logic input for high side gate driver output (HO)
3	LIN($\overline{LIN}$)	Logic input for low side gate driver output (LO)
4	COM	Ground
5	LO	Low side gate drive output A version: in phase with LIN B version: out of phase with
6	V_S	High side floating supply return or bootstrap return
7	HO	High side gate drive output, in phase with HIN
8	V_B	High side floating supply

Functional Block Diagram



Absolute Maximum Ratings [Note1]

Symbol	Definition		MIN.	MAX.	Units
V_B	High side floating supply		-0.3	130	V
V_S	High side floating supply return		V_B – 22	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	22	
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		2.5		kV
	Machine Model		200		V
P_D	Package Power Dissipation @ TA	8 Lead SOIC	--	0.625	W
Rth_{JA}	Thermal Resistance Junction to	8 Lead SOIC	--	200	°C /W
T_J	Junction Temperature		--	150	°C
T_S	Storage		-55	150	
T_L	Lead Temperature (Soldering, 10 seconds)		--	300	

Note 1: Exceeding these ratings may damage the device.

Recommended Operating Conditions

Symbol	Definition	MIN.	MAX.	Units
V_B	High side floating supply	V_S +10	V_S +20	V
V_S	High side floating supply return	-	120	
V_{HO}	High side gate drive output voltage	V_S	V_B	
V_{CC}	Low side supply	10	20	
V_{LO}	Low side gate drive output voltage	0	V_{CC}	
V_{IN}	Logic input voltage(HIN & LIN)	0	V_{CC}	
T_A	Ambient temperature	-40	125	℃

Dynamic Electrical Characteristics

V_{BIAS} (V_{CC}, V_{BS}) = 15V, C_L = 1000 pF and T_A = 25°C unless otherwise specified.

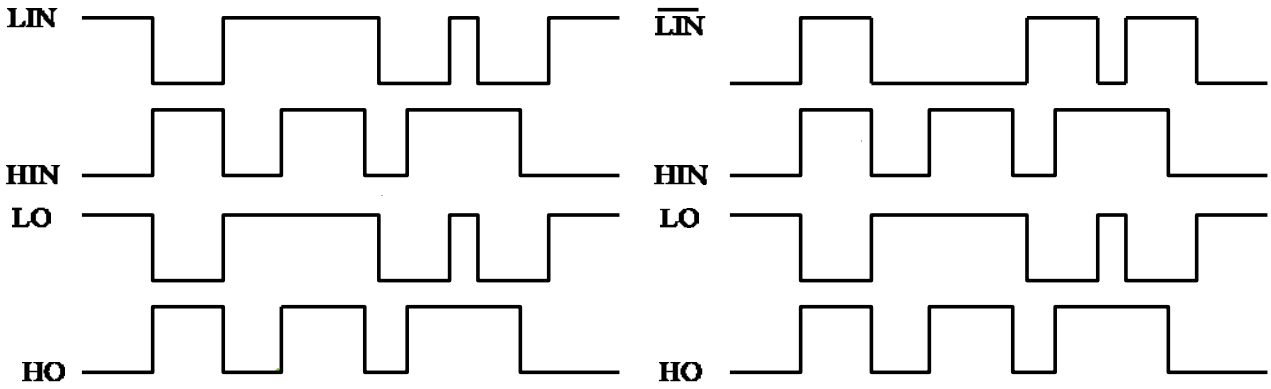
Symbol	Definition	TYP.	MAX.	Units
t_{onH}	High side turn-on propagation delay	220	250	ns
t_{offH}	High side turn-off propagation delay	90	120	
t_{onL}	Low side turn-on propagation delay	100	120	
t_{offL}	Low side turn-off propagation delay	90	110	
MT	Delay matching	120	150	
t_r	Turn-on rise time	70	90	
t_f	Turn-off fall time	60	80	

Static Electrical Characteristics

V_{BIAS} (V_{CC}, V_{BS}) = 15V, C_L = 1000 pF and T_A = 25°C unless otherwise specified.

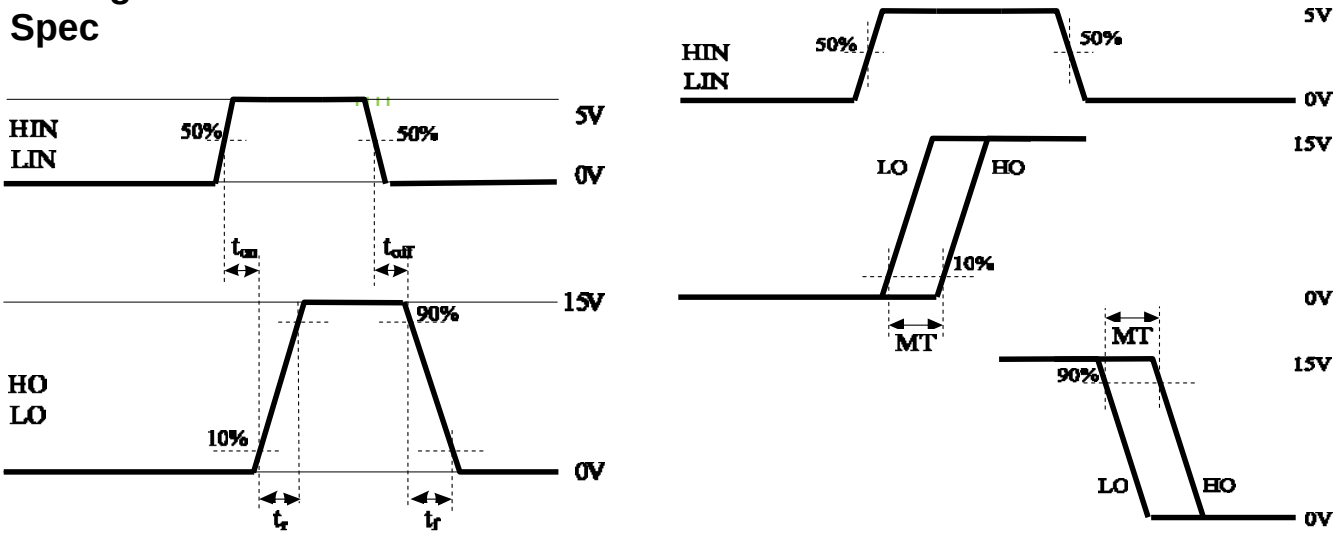
Symbol	Definition	MIN.	TYP.	MAX.	Units
V_{IH}	Logic "1"(HIN & LIN) input voltage	2.5	-	-	V
V_{IL}	Logic "0" (HIN & LIN) input voltage	-	-	0.8	
V_{OH}	High level output voltage, V_{BIAS} - V_O	-	-	0.3	
V_{OL}	Low level output voltage, V_O	-	-	0.3	
I_{QCC}	Quiescent V_{CC} supply current	-	150	270	μA
I_{QBS}	Quiescent V_B supply current	-	30	55	
I_{LK}	Leakage current from V_S(600V) to GND		-	50	
I_{IN+}	Logic "1" input bias current	-	6	10	
I_{IN-}	Logic "0" input bias current	-	1	2	
I_{O+}	Output high short circuit pulsed current		450		mA
I_{O-}	Output low short circuit pulsed current		900		

Logic Function



A version B version

Timing Spec

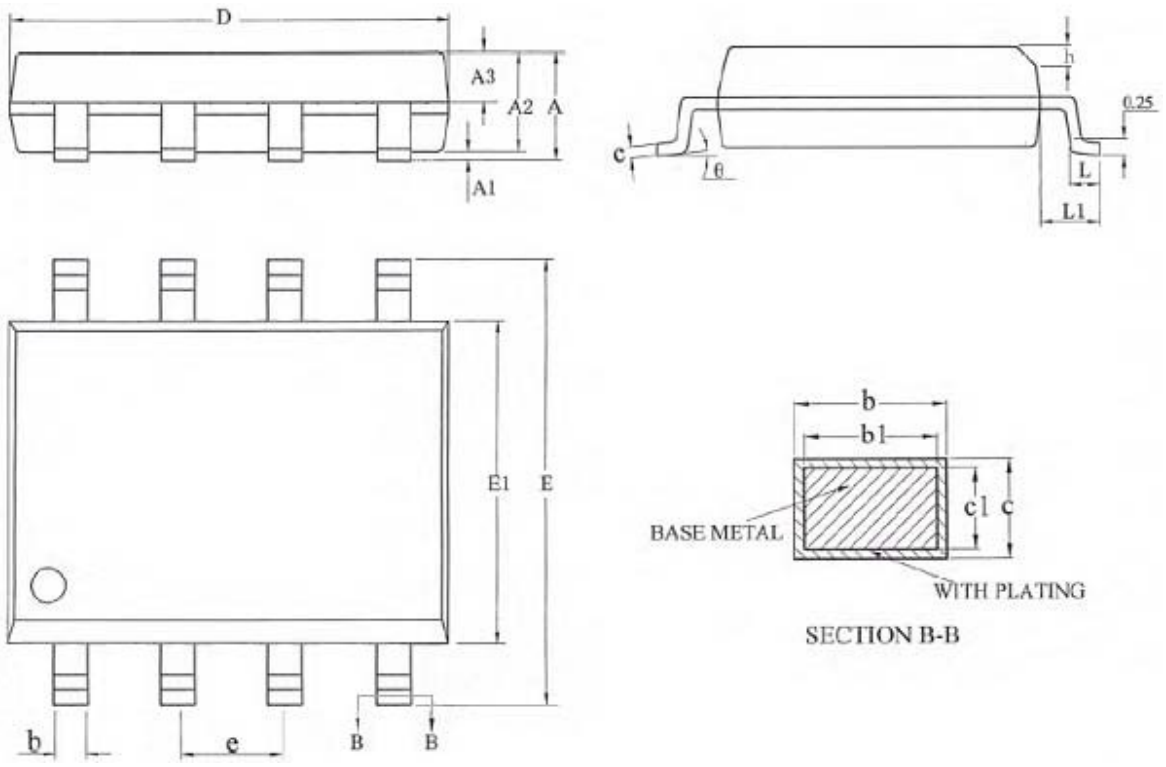


Package Information

SOIC8 Package Dimensions

Size / Symbol	MIN(mm)	TYP(mm)	MAX(mm)	Size / Symbol	MIN(mm)	TYP(mm)	MAX(mm)
A	-	-	1.75	D	4.70	4.90	5.10
A1	0.10	-	0.225	E	5.80	6.00	6.20
A2	1.30	1.40	1.50	E1	3.70	3.90	4.10
A3	0.60	0.65	0.70	e		1.27BSC	
b	0.39	-	0.48	h	0.25	-	0.50
b1	0.38	0.41	0.43	L	0.50	-	0.80
c	0.21	-	0.26	L1		1.05BSC	
c1	0.19	0.20	0.21	θ	0	-	8°

Package Outlines



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