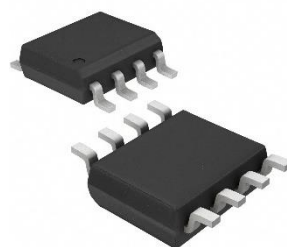


HX2005-S 250V

Integrated bootstrap single-phase high and low side power MOSFET/IGBT driver chip

The HX2005-S is a high-voltage, high-speed power MOSFET high-low driver chip with separate high-side and low-side reference output channels. The chip adopts high and low voltage compatible technology, which makes the high and low side grid driving circuits can be integrated in a single chip. Its logic input levels are compatible with CMOS or LSTTL logic output levels as low as 3.3V. The output has high current pulse capability and straight-through dead-zone logic. The floating channel of the HX2005-S can be used to drive the N-channel power MOSFETs on the high voltage side, and the floating channel can operate up to 250V. The chip is packaged in SOP-8 and can operate in a temperature range of -40 °C to 125 °C. The HX2005-S integrates a bootstrap diode to charge the high side and simplify the peripheral circuit of the chip



SOP-8

Peculiarity

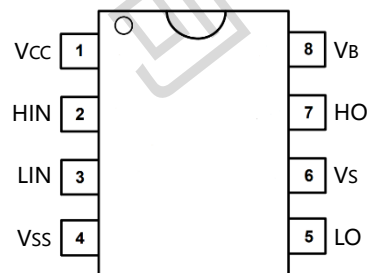
- Floating channel for bootstrap work
- maximum working voltage: 250v
- Compatible input logic: 3.3v, 5v and 15v
- vs Negative bias capability: -9v
- dvs/dt tolerance: $\pm 50\text{v/ns}$
- Range of gate driving voltage: 10v to 20v
- Anti direct dead zone logic
Dead time setting: 520ns
- Chip transmission delay characteristics
Enable/disable transmission delay: $t_{on}/t_{off} = 160\text{ns}/150\text{ns}$
Delay matching time: 60ns
- Integrated undervoltage locking circuit
Under voltage locking forward threshold: 8.9v
Undervoltage lockout negative threshold: 8.2v
- wide temperature range: -40°C to 125°C
- Output stage current pulling/pouring capability: 290ma/600ma
- Packaging type: SOP-8

Application

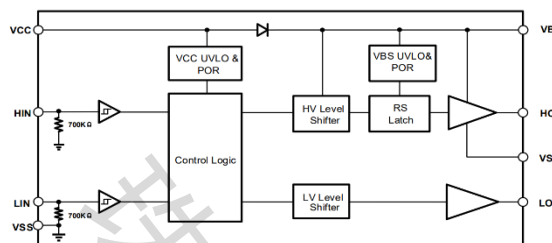
- Micro inverter drive
- Motor control
- Air conditioning/washing machine
- Universal inverter
- MOSFET/IGBT Driver chip

Chip pin description

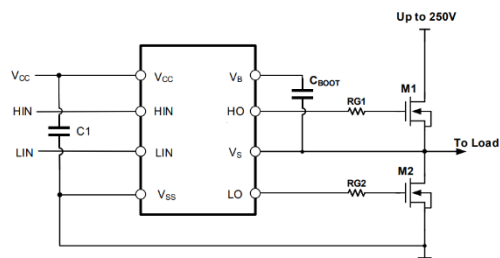
ID	Name	Function
1	Vcc	power supply
2	HIN	High side signal input
3	LIN	Low side signal input
4	Vss	Ground
5	LO	Low side output
6	Vs	High side floating ground
7	HO	High side output
8	Vb	High side floating power supply



Functional Block Diagram



Typical application circuit diagram



Specifications

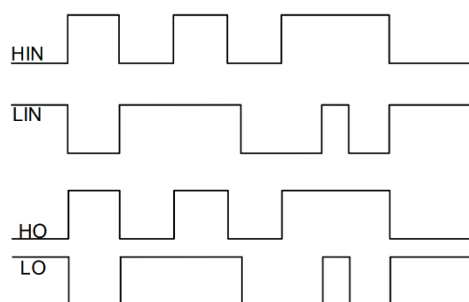
Product specifications				
Maximum operating range				
Symbol	Definition	Min	Max	Unit
V _B	High side floating power supply voltage	-0.3	275	V
V _S	High side floating ground voltage	V _B - 25	V _B + 0.3	
V _{HO}	High side output voltage	V _S - 0.3	V _B + 0.3	
V _{CC}	Low side supply voltage	-0.3	25 ¹	
V _{LO}	Low side output voltage	COM -0.3	V _{CC} + 0.3	
V _{IN}	Logic input voltage	COM-0.3	V _{CC} + 0.3	
dV _S /dt	Allow transient V _S voltage conversion rate		50	V/ns
ESD RATING				
E _{SD}	HBM	1.5		kV
	Machine discharge mode	500		V
rated power				
P _D	Encapsulation power (T _A ≤25°C)		0.625	W
Thermal information				
R _{thJA}	thermal resistance		200	°C/W
T _J	Junction temperature		150	°C
T _S	storage temperature	-55	150	
T _L	Pin temperature		300	
Recommended scope of work				
V _B	High side floating power supply voltage	V _S + 10	20	V
V _S	High side floating ground voltage	COM-9 ²	250	
V _{HO}	High side output voltage	V _S	V _B	
V _{CC}	Low side supply voltage	10	20	
V _{LO}	Low side output voltage	COM	V _{CC}	
V _{IN}	Logic input voltage	0	V _{CC}	
T _A	ambient temperature	-40	125	°C

Note: 1 All power sources tested at 25V

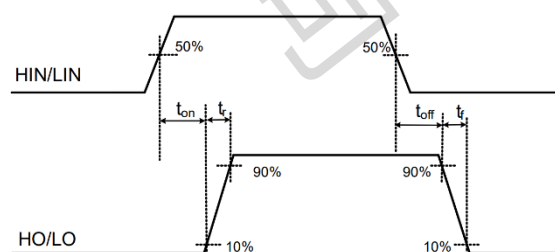
2To ensure the normal operation of the chip, please ensure that it operates between -8V-200V

Electrical characteristics Unless otherwise specifiedTA= 25°C, VCC = VB= 15V, CL=1nF						
Dynamic parameter characteristics						
Symbol	Definition	Min	Typ	Max	Unit	Test condition
tON	Enable transmission delay		150	220	ns	Vs=0/250V
tOFF	Turn off transmission delay		150	220		Vs=0V
tR	Enable rise time		70	170		
tF	Close the descent time		30	90		
MT	Delay matching time (tON, tOFF)			60		
Static parameters have no special description VCC=VBS=15V, TA= 25°C						
VCCUV+	VCC Under voltage positive threshold	8.0	8.9	9.8	V	
VCCUV	VCC Undervoltage negative threshold	7.4	8.2	9		
VBSUV+	VBS Under voltage positive threshold	8.0	8.9	9.8		
VBSUV-	VBS Undervoltage negative threshold	7.4	8.2	9		
ILK	Leakage current of high side floating power supply			50	μA	VB=Vs=250V
IQBS	VBS static current		50	75	μA	All inputs are in a closed state
IQCC	VCC static current		120	250	μA	
VIH	Input logic high-level threshold voltage	2.5			V	VCC=10Vto 20V
VIL	Input logic low threshold voltage			0.8		
VOH	Output high-level voltage drop VBIAS - VO		0.05	0.2		Io=2mA
VOL	Output low-level voltage drop VO		0.02	0.1		
IIN+	Logic " 1" Input bias current		3	10	μA	VIN =5V
IIN-	Logic '0' input bias current			5	μA	VIN =0V
IO+	Output pulling current	200	290		mA	Vo=0V PW≤10us
IO-	Output current injection	420	600		mA	Vo=15V PW≤10us
RBSD	Internal resistance of bootstrap diode		200		Ω	IBSD=1mA
VBSD	Bootstrap diode conduction voltage drop		0.6		V	IBSD=1mA

Input and output waveform diagram

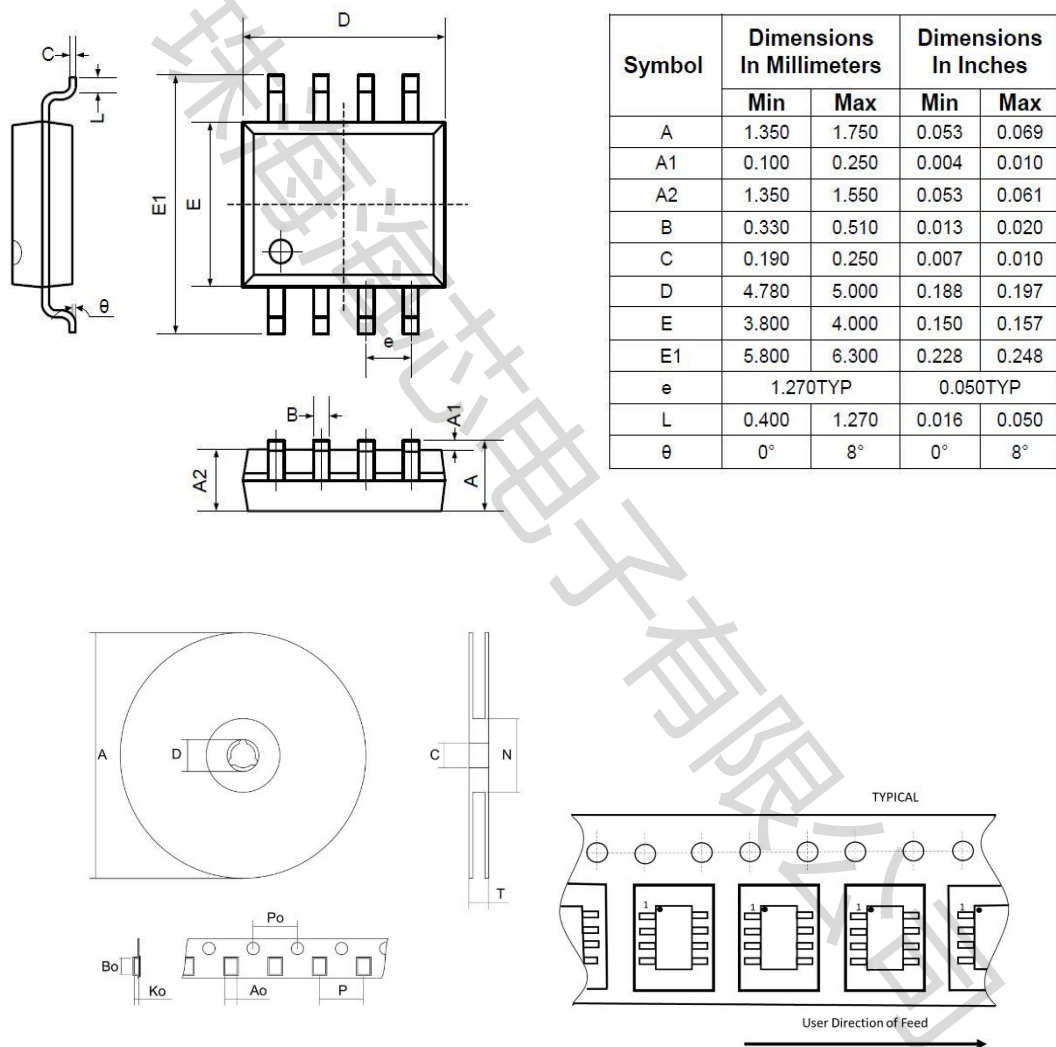


Switching waveform



Packaging and packaging

SOP8 (Package Outline Dimensions)



Packing method	Number
Braid	2500PCS/Disk