

# FD2606S

## 600V Half bridge gate driver

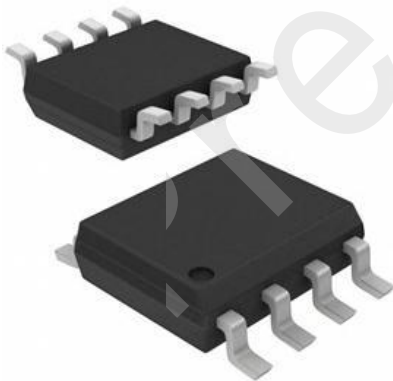
### Description

FD2606S is a high voltage, high speed half bridge gate driver. It can drive N-type power MOSFETs and IGBTs

FD2606S has also built-in VCC and VB undervoltage (UVLO) protection to prevent the power semiconductor devices from operation under very low voltage.

FD2606S logic input is compatible with TTL and CMOS (down to 3.3V) for easy interface with control devices. The driver outputs a high pulse current buffer designed with the best driver transconductance.

### Packages



SOP8

### Features

- Suspension absolute voltage +600V
- Power supply pressure range: 10V ~20V
- 3.5V/5V input logic compatible
- VCC/VBS Undervoltage protection (UVLO)
- Output is in phase with the input
- Cross-conduction prevention logic
- Built-in dead time
- High and low channel matching
- RoHS compliant

### Applications

- Motor drives
- DC-AC inverter drives

**1. Absolute Maximum Rating** (All pins are referenced to COM unless otherwise stated)

Parameter	Symbol	Min~Max	Units
High side floating absolute voltage	$V_B$	-0.3~625	V
High side floating offset	$V_S$	$V_B-25 \sim V_B+0.3$	V
High side output voltage	$V_{HO}$	$V_S-0.3 \sim V_B+0.3$	V
Low side supply voltage	$V_{CC}$	-0.3~25	V
Low side output voltage	$V_{LO}$	$-0.5 \sim V_{CC}+0.3$	V
Logic input voltage (HIN,LIN)	$V_{IN}$	$-0.5 \sim V_{CC}+0.3$	V
Offset voltage slew rate range	$dV_S/dt$	$\leq 50$	V/ns
Power dissipation @ $T_A \leq 25^\circ\text{C}$	$P_D$	$\leq 0.625$	W
Thermal resistance, junction to ambient	$R_{thJA}$	$\leq 200$	$^\circ\text{C}/\text{W}$
Junction temperature	$T_j$	$\leq 150$	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55~150	$^\circ\text{C}$

**Note1:** In any case, power dissipation should not exceed  $P_D$ .

**Note2:** Voltages above the absolute maximum ratings may damage the chip.

**2. Recommended Operating Conditions** (All voltages are referenced to COM)

Definition	Symbol	Min	Max	Units
High-side float absolute voltage	$V_B$	$V_S+10$	$V_S+20$	V
High-side floating offset voltage	$V_S$	Note1	600	V
High-side output voltage	$V_{HO}$	$V_S$	$V_B$	V
Low-side supply voltage	$V_{CC}$	10	20	V
Low side output voltage	$V_{LO}$	0	$V_{CC}$	V
Logic input voltage (HIN, LIN)	$V_{IN}$	0	$V_{CC}$	V
Environment temperature	$T_A$	-40	125	$^\circ\text{C}$

**Note1:** Logic operational for  $V_S$  of (COM – 5V) to (COM + 600V). Logic state held for  $V_S$  of (COM – 5V) to (COM –  $V_{BS}$ ).

**Note2:** The long-term operation of the chip outside the recommended conditions may affect its reliability. It is not recommended to work in an environment that exceeds the recommended conditions.

### 3. Static Electrical Characteristics

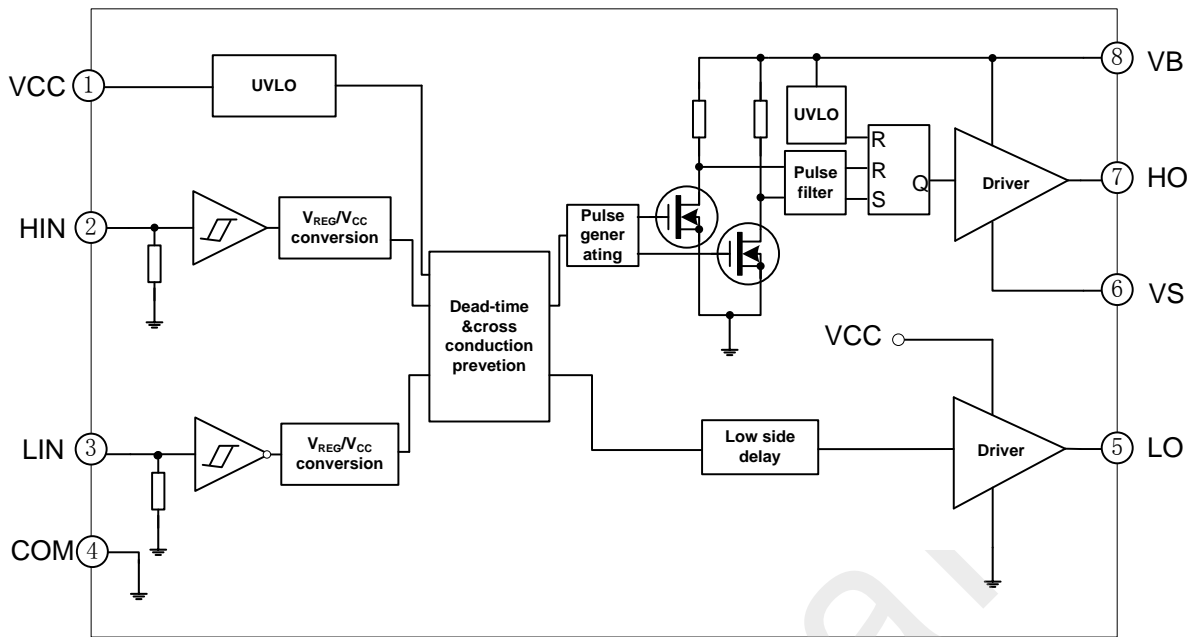
$V_{BIAS} (V_{CC}, V_{BS}) = 15V$  and  $T_A = 25^\circ C$  unless otherwise specified. All the parameters are referenced to COM.

Definition	Symbol	Test conditions	Min.	Typ.	Max.	Units
Logic "1" input voltage	$V_{IH}$	$I_O = 20mA$	2.7	-	-	V
Logic "0" input voltage	$V_{IL}$		-	-	0.8	
High level output voltage, $V_{BIAS} - V_O$	$V_{OH}$		-	0.7	1.2	
low level output voltage, $V_O$	$V_{OL}$		-	0.24	0.4	
Offset supply leakage current	$I_{LK}$	$V_B = V_S = 600V$	-	1.0	5.0	uA
Quiescent $V_{BS}$ supply current	$I_{QBS}$	$V_{IN} = 0V$ or $5V$	-	75	120	
Quiescent $V_{CC}$ supply current	$I_{QCC}$		-	160	300	
Logic "1" input bias current	$I_{IN+}$	$V_{IN} = 5V$	-	25	50	
Logic "0" input bias current	$I_{IN-}$	$V_{IN} = 0V$	-	-	1	
$V_{CC}$ and $V_{BS}$ supply undervoltage positive going threshold	$V_{CCUV+}$ $V_{BSUV+}$		7.9	8.8	9.7	V
$V_{CC}$ and $V_{BS}$ supply undervoltage negative going threshold	$V_{CCUV-}$ $V_{BSUV-}$		7.2	8.0	8.8	
$V_{CC}$ and $V_{BS}$ Supply Under-Voltage Lock- Out Hysteresis	$V_{CCUVH}$ $V_{BSUVH}$		0.4	0.8	-	
Output high short circuit pulsed current	$I_{O+}$	$V_O = 0V, PW \leq 10\mu s$	130	210	-	mA
Output low short circuit pulsed current	$I_{O-}$	$V_O = 15V, PW \leq 10\mu s$	230	360	-	

### 4. Transient electrical parameters ( $T_A = 25^\circ C$ , $V_{CC} = V_{BS} = 15V$ , $C_L = 1000pF$ , $V_S = COM$ , unless otherwise specified)

Parameter	Symbol	Condition for testing	Min	Typical	Max	Unit
Output rising edge transmission time	$t_{on}$	$V_S = 0V$	--	140	220	ns
Output falling edge transmission time	$t_{off}$	$V_S = 600V$	--	140	220	ns
High-low side delay match	MT		--	0	50	ns
Output rising time	$t_r$		--	100	160	ns
Output falling time	$t_f$		--	60	100	ns
Dead-time	DT		--	470	650	ns

### 5. Circuit diagram



### 6. Chip pin configuration

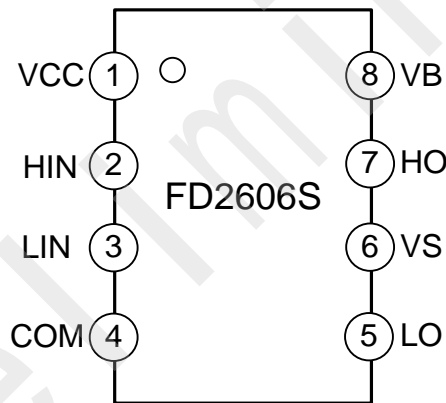
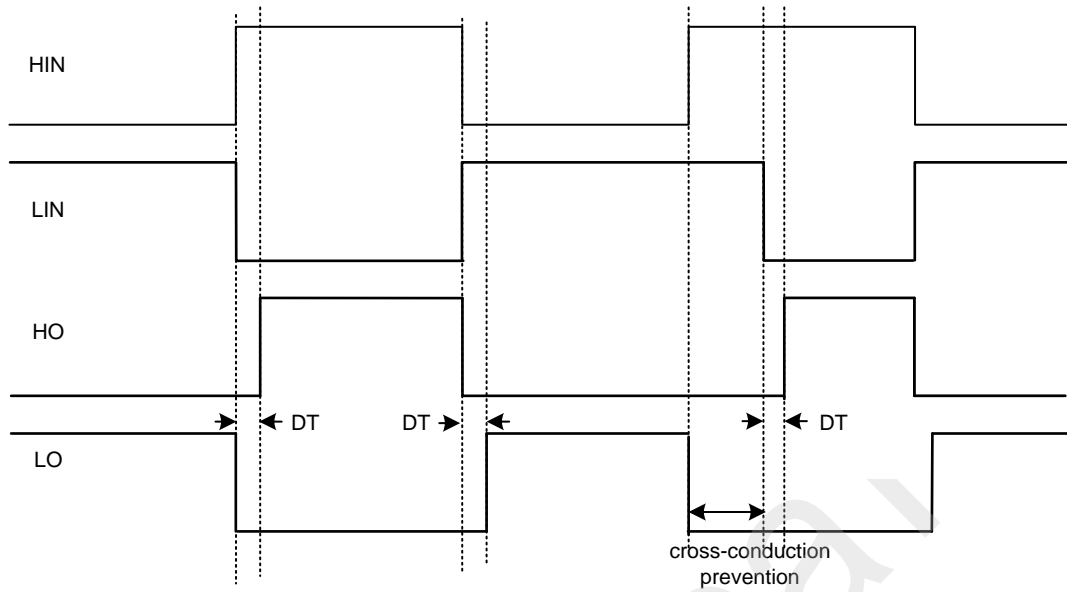


Figure 6-1 Package pin diagram

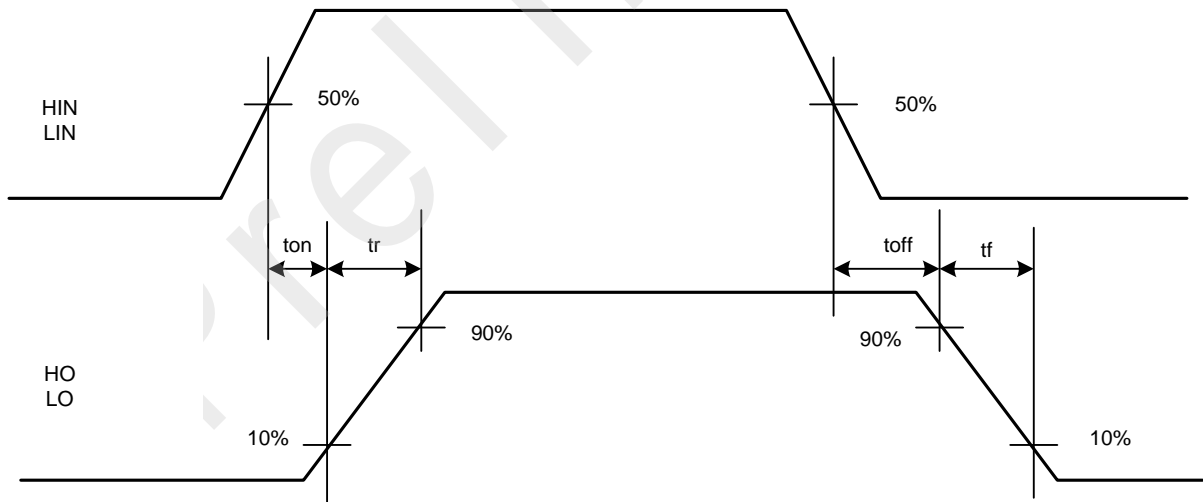
Table 6-1 Package pin

Pin no.	Pin name	Pin description
1	VCC	Low-side supply voltage
2	HIN	High-side input
3	LIN	Low-side input
4	COM	Ground
5	LO	Low-side output
6	VS	High-side floating offset voltage
7	HO	High-side output
8	VB	High-side float absolute voltage

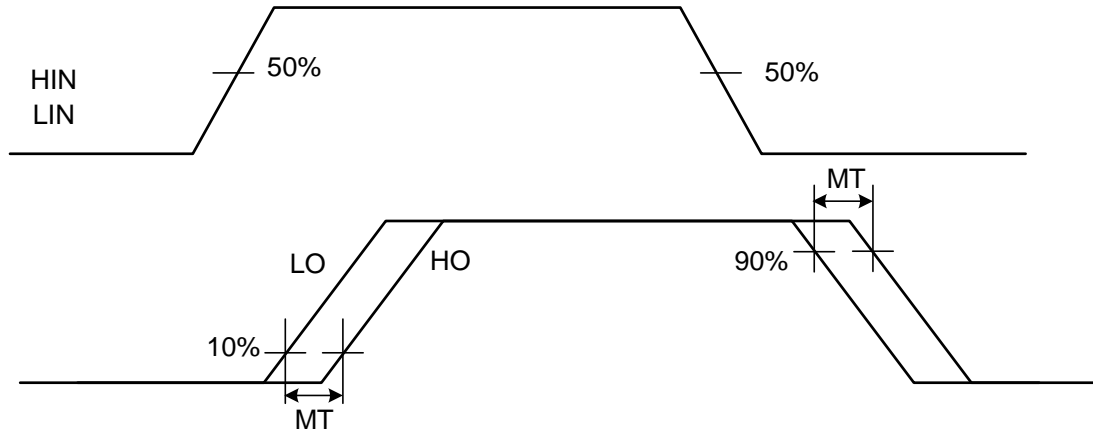
7. Logic timing diagram



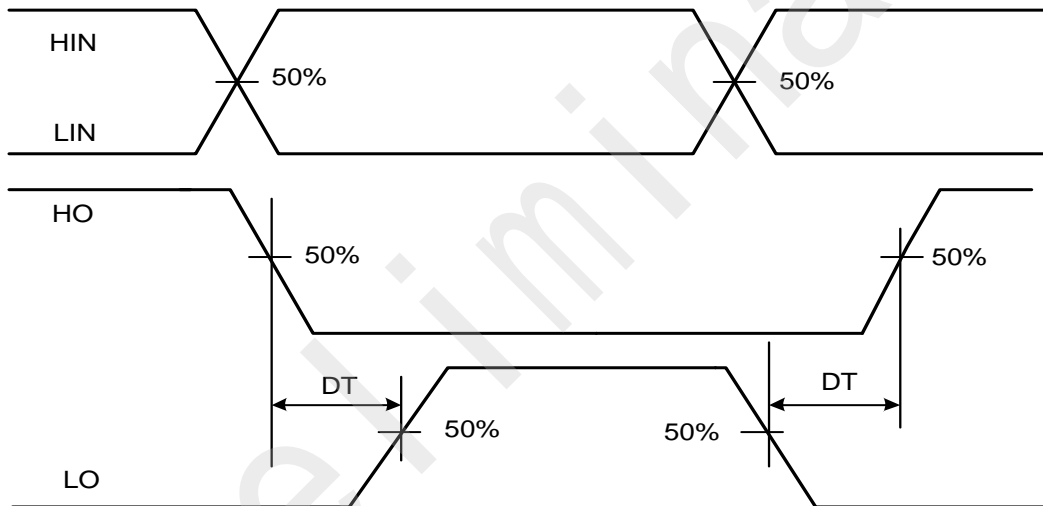
8. Switching time test standards

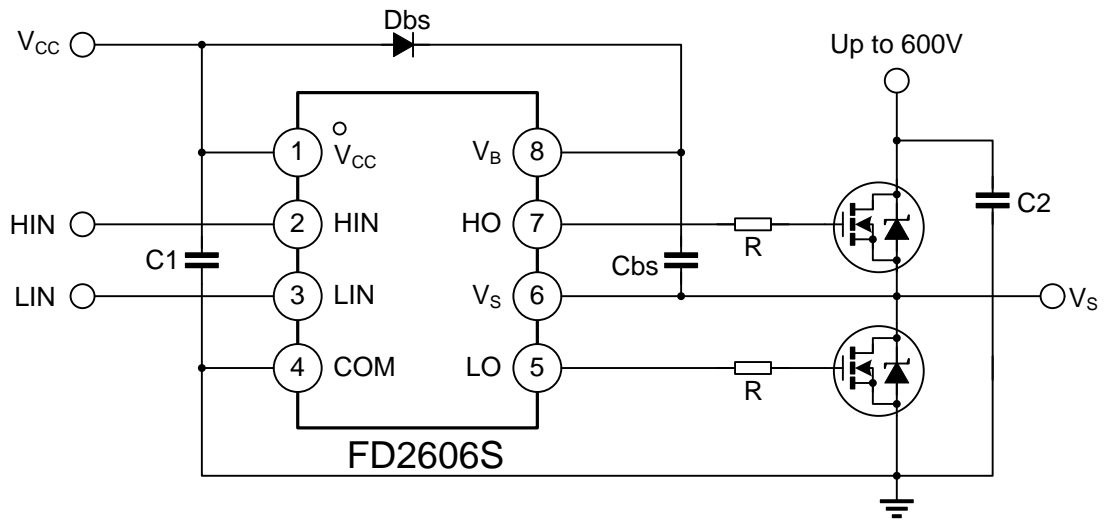


**9. Transmission time matching test standards**



**10. Dead time test standards**



**11. Typical application circuit**


**C1:** Power filter capacitor, according to the circuit can choose  $1\mu\text{F} \sim 10\mu\text{F}$ , as close to the chip pin as possible.

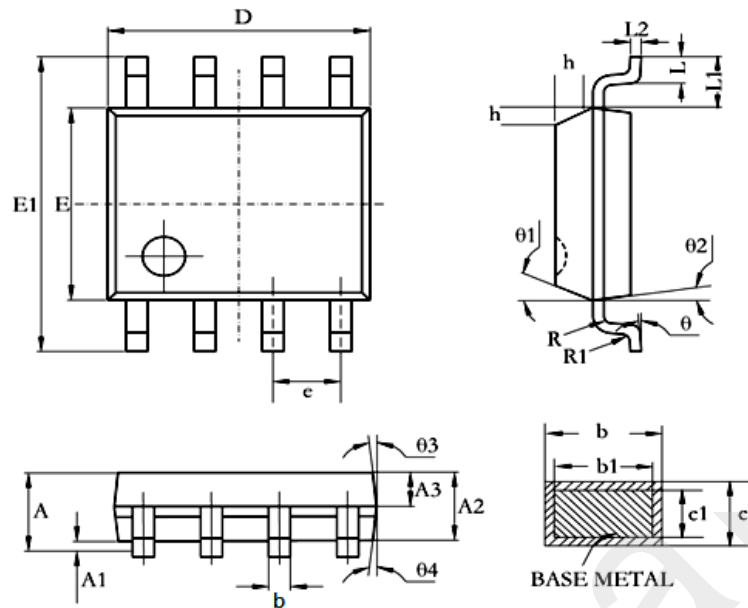
**R:** Gate drive resistor, and the resistance depends on the device being driven.

**Dbs:** Bootstrap diodes. It should be selected for high reverse breakdown voltage Schottky diodes.

**Cbs:** Bootstrap capacitors. Ceramic capacitors or tantalum capacitors should be selected, according to the circuit can choose  $0.22\mu\text{F} \sim 10\mu\text{F}$ . The capacitor should be as close as possible to the chip pin.

**Note:**

The above circuits and parameters are for reference only. The actual application circuit should be designed with the measured results in setting the parameters.

**12. Package size ( SOIC-8 )**


Symbol	Dimensions in mm			Dimensions in inches		
	Min	Nom	Max	Min	Nom	Max
A	1.36	1.55	1.75	0.053	0.061	0.069
A1	0.10	0.15	0.25	0.004	0.006	0.010
A2	1.25	1.40	1.65	0.049	0.055	0.065
A3	0.50	0.60	0.70	0.020	0.024	0.028
b	0.38	-	0.51	0.015	-	0.020
b1	0.37	0.42	0.47	0.015	0.017	0.019
c	0.17	-	0.25	0.007	-	0.010
c1	0.17	0.20	0.23	0.007	0.008	0.009
D	4.80	4.90	5.00	0.189	0.193	0.197
E1	5.80	6.00	6.20	0.228	0.236	0.244
E	3.80	3.90	4.00	0.150	0.154	0.157
e	1.27BSC					
L	0.45	0.60	0.80	0.018	0.024	0.031
L1	1.04REF					
L2	0.25BSC					
R	0.07	-	-	0.003	-	-
R1	0.07	-	-	0.003	-	-
h	0.30	0.40	0.50	0.012	0.016	0.020
θ	0°	-	8°	0°	-	8°
θ1	15°	17°	19°	15°	17°	19°
θ2	11°	13°	15°	11°	13°	15°
θ3	15°	17°	19°	15°	17°	19°
θ4	11°	13°	15°	11°	13°	15°

Product number	Package	Marking	Packing	Quantity
FD2606S	SOP8	FD2606S	Tape & Reel	3000



## Copyright Notice

Copyright by Fortior Technology (Shenzhen) Co., Ltd. All Rights Reserved.

Right to make changes —Fortior Technology (Shenzhen) Co., Ltd reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. The information contained in this manual is provided for the general use by our customers. Our customers should be aware that the personal computer field is the subject of many patents. Our customers should ensure that they take appropriate action so that their use of our products does not infringe upon any patents. It is the policy of Fortior Technology (Shenzhen) Co., Ltd. to respect the valid patent rights of third parties and not to infringe upon or assist others to infringe upon such rights.

This manual is copyrighted by Fortior Technology (Shenzhen) Co., Ltd. You may not reproduce, transmit, transcribe, store in a retrieval system, or translate into any language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual, or otherwise, any part of this publication without the expressly written permission from Fortior Technology (Shenzhen) Co., Ltd.

## Fortior Technology(Shenzhen) Co.,Ltd.

Room203,2/F, Building No.11,Keji Central Road2,

Software Park, High-Tech Industrial Park, Shenzhen, P.R. China 518057

Tel: 0755-26867710

Fax: 0755-26867715

URL: <http://www.fortiortech.com>

## Contained herein

**Copyright by Fortior Technology (Shenzhen) Co.,Ltd, all rights reserved.**