FAIRCHILD SEMICONDUCTOR®

November 2006

FAN7361, FAN7362
High-Side Gate Driver

Features

- Floating Channel Designed for Bootstrap Operation to +600V
- Typically 250mA/500mA Sourcing/Sinking Current Driving Capability
- Common-Mode dv/dt Noise Canceling Circuit
- V_{CC} & V_{BS} Supply Range from 10V to 20V
- UVLO Function
- Output In-phase with Input
- 8-SOP

Applications

- PDP Scan Driver
- Motor Control
- SMPS
- Electronic Ballast

Description

The FAN7361/FAN7362, a monolithic high-side gate driver IC, can drive MOSFETs and IGBTs that operate up to +600V. Fairchild's high-voltage process and common-mode noise canceling techniques provide stable operation of the high-side driver under high dv/dt noise circumstances. An advanced level shift circuit offers high-side gate driver operation up to V_S=-9.8V(typ.) for V_{BS}=15V.

The UVLO circuit prevents malfunction when V_{BS} is lower than the specified threshold voltage. Output drivers typically source/sink 250mA/500mA, respectively, which is suitable for fluorescent lamp ballast, PDP scan driver, motor control, and so on.

8-SOP

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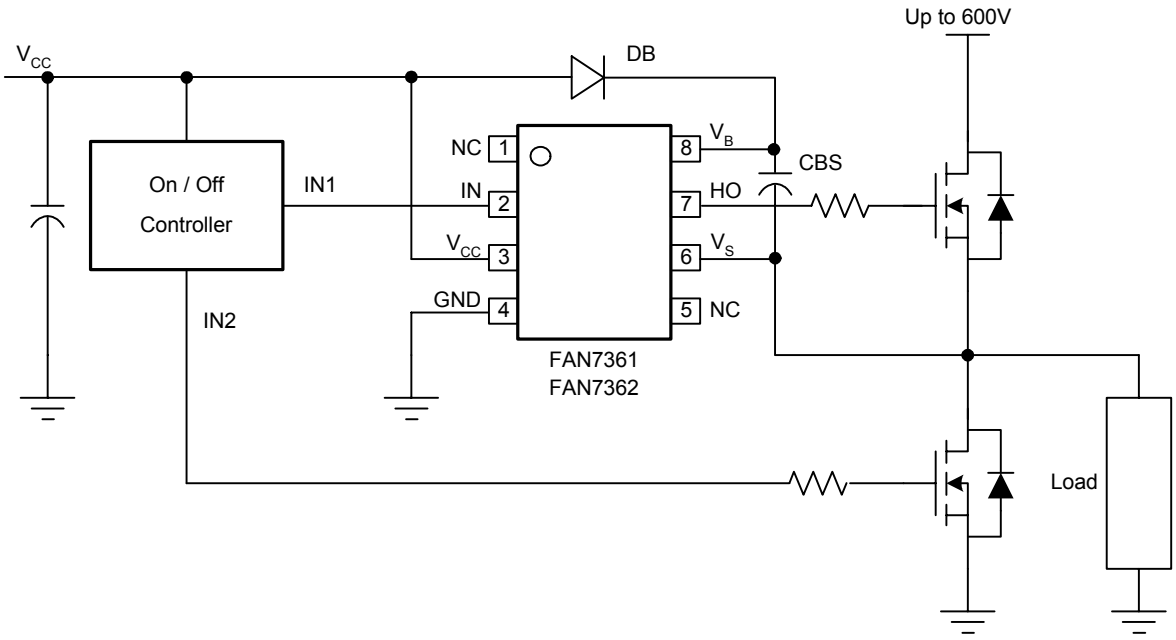
Ordering Information

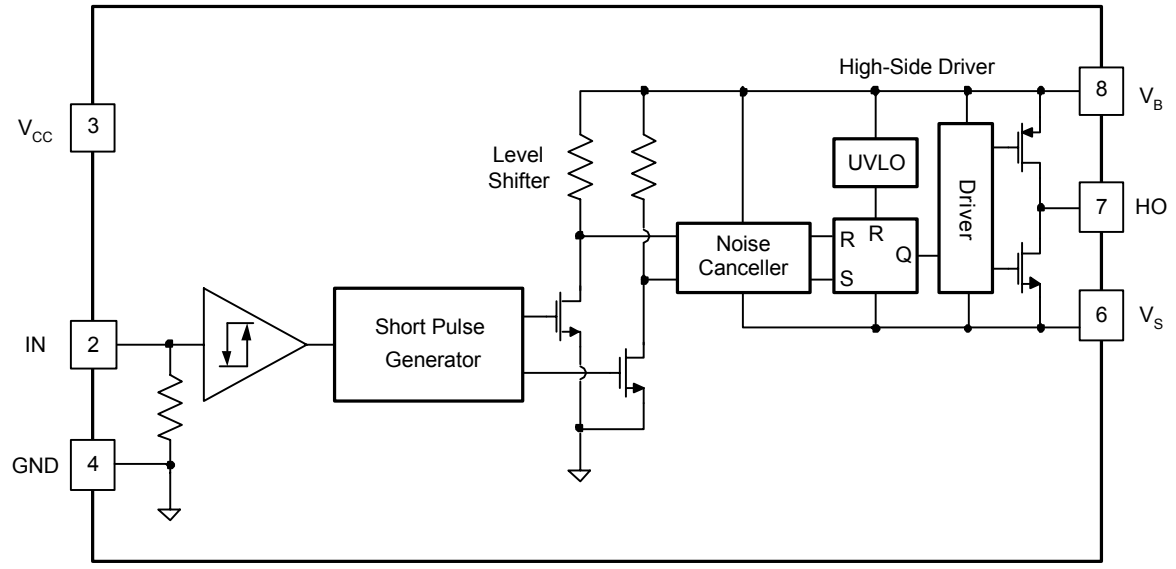
Part Number	Package	Pb-Free	Operating Temperature Range	Packing Method
FAN7361M	8-SOP	Yes	-40°C ~ 125°C	TUBE
FAN7361MX				TAPE & REEL
FAN7362M				TUBE
FAN7362MX				TAPE & REEL

Typical Application Circuit



FAN7361 Rev.03

Internal Block Diagram



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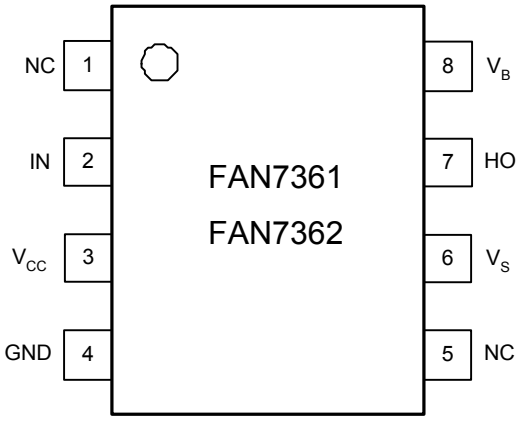
Pin Assignments



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Pin Definitions

Pin	Name	Function/ Description
1	N.C.	No Connection
2	IN	Logic Input for High-Side Gate Driver Output
3	V_{CC}	Supply Voltage
4	GND	Logic Ground
5	N.C.	No Connection
6	V_S	High-Voltage Floating Supply Return
7	HO	High-Side Driver Output
8	V_B	High-Side Floating Supply

Absolute Maximum Ratings

The “Absolute Maximum Ratings” are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The “Recommended Operating Conditions” table defines the conditions for actual device operation.

Symbol	Characteristics	Min.	Max.	Unit
V_S	High-Side Offset Voltage	V_B-25	V_B+0.3	V
V_B	High-Side Floating Supply Voltage	-0.3	625	
V_{HO}	High-Side Floating Output Voltage	V_S-0.3	V_B+0.3	
V_{CC}	Logic Fixed Supply Voltage	-0.3	25	
V_{IN}	Logic Input Voltage	-0.3	V_{CC}+0.3	
dV_S/dt	Allowable Offset Voltage Slew Rate		± 50	V/nsec
P_D	Power Dissipation		0.625	W
Rthja	Thermal Resistance, Junction-to-Ambient		200	°C/W
T_J	Junction Temperature		150	°C
T_S	Storage Temperature		150	°C

Recommended Operating Conditions.

Symbol	Parameter	Min.	Max.	Unit
V_B	High-Side Floating Supply Voltage	V_S+10	V_S+20	V
V_S	High-Side Floating Supply Offset Voltage	6-V_{CC}	600	
V_{HO}	High-Side Output Voltage	V_S	V_B	
V_{IN}	Logic Input Voltage	GND	V_{CC}	
V_{CC}	Logic Supply Voltage	10	20	
T_A	Ambient Temperature	-40	125	°C

Electrical Characteristics

V_{BIAS}(V_{CC}, V_{BS})=15.0V, T_A = 25°C, unless otherwise specified. The V_{IN}, V_{TH} and I_{IN} parameters are referenced to COM. The V_O and I_O parameters are referenced to COM and V_S is applicable to HO and LO.

Symbol	Characteristics	Test Condition		Min.	Typ.	Max.	Unit
V_{BSUV+}	V_{BS} Supply Under-Voltage Positive Going Threshold	V_{IN}=0V	FAN7361	8.2	9.2	10.2	V
			FAN7362	7.6	8.6	9.6	
V_{BSUV-}	V_{BS} Supply Under-Voltage Negative Going Threshold	V_{IN}=0V	FAN7361	7.4	8.6	9.2	
			FAN7362	7.2	8.2	9.2	
V_{BSHYS}	V_{BS} Supply Under-Current Lockout Hysteresis	V_{IN}=0V	FAN7361		0.5		
			FAN7362		0.4		
I_{LK}	Offset Supply Leakage Current	V_B=V_S=H =600V				10	µA
I_{QBS}	Quiescent V_{BS} Supply Current	V_{IN}=0V or 5V			50	80	
I_{QCC}	Quiescent V_{CC} Supply Current	V_{IN}=0V			30	75	
I_{PBS}	Operating V_{BS} Supply Current	C_L=1nF, f=10kHz			420	550	
V_{IH}	Logic "1" Input Voltage		FAN7361	3.6			V
			FAN7362	2.9			
V_{IL}	Logic "0" Input Voltage		FAN7361			1.0	
			FAN7362			0.8	
V_{OH}	High Level Output Voltage, V_B-V_{HO}	No load				0.1	
V_{OL}	Low Level Output Voltage, V_{HO}	No load				0.1	
I_{IN+}	Logic "1" Input Bias Current	V_{IN}=5V			50	90	µA
I_{IN-}	Logic "0" Input Bias Current	V_{IN}=0V			1.0	2.0	
I_{O+}	Output High Short Circuit Pulse Current	V_{HO}=0V, V_{IN}=5V, PW ≤ 10µs		200	250		mA
I_{O-}	Output Low Short Circuit Pulse Current	V_{HO}=15V, V_{IN}=0V,PW ≤ 10µs		400	500		
V_S	Allowable Negative V_S P Voltage for IN Signal Propagation to HO				-9.8	-7	V

Dynamic Electrical Characteristics

V_{BIAS}(V_{CC}, V_{BS})=15.0V, V_S=COM, C_L=1000pF and T_A = 25°C, unless otherwise specified.

Symbol	Characteristics	Test Condition	Min.	Typ.	Max.	Unit
t_{on}	Turn-on Propagation Delay	V_S=0V		120	200	nsec
t_{off}	Turn-off Propagation Delay	V_S=0V or 600V		90	180	
t_r	Turn-on Rise Time			70	160	
t_f	Turn-off Fall Time			30	100	

Typical Characteristics

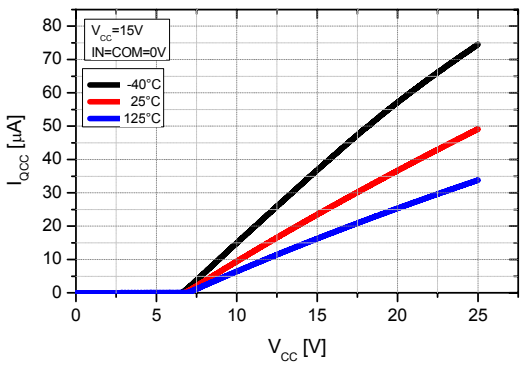

Figure 1. I_{QCC} vs. Supply Voltage

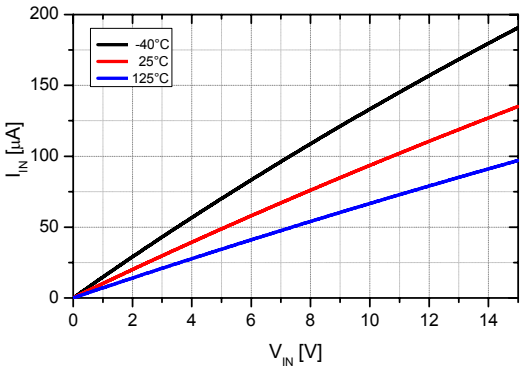

Figure 2. Input Bias Current vs. Input Voltage

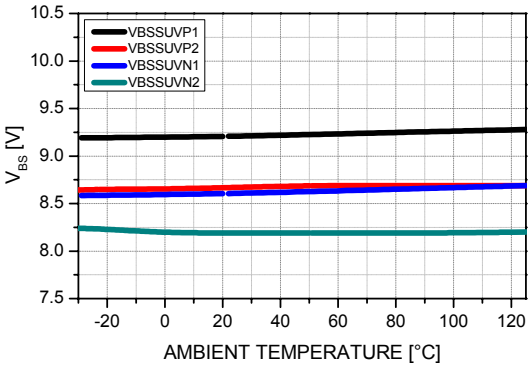

Figure 3. V_{BS} UVLO vs. Temp.

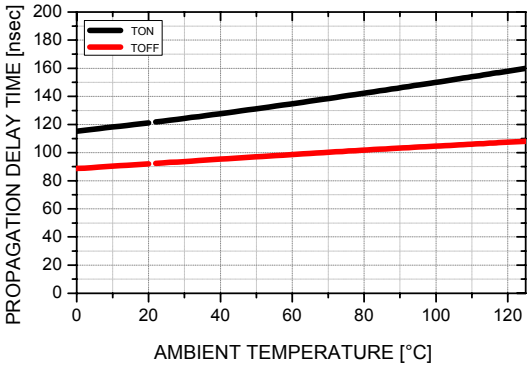

Figure 4. Turn On/Off Propagation Time vs. Temp.

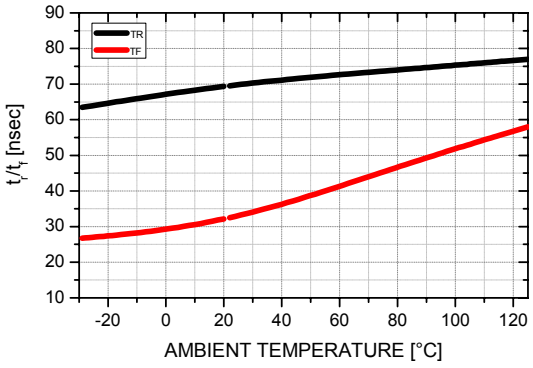

Figure 5. Rising/Falling Time vs. Temp.

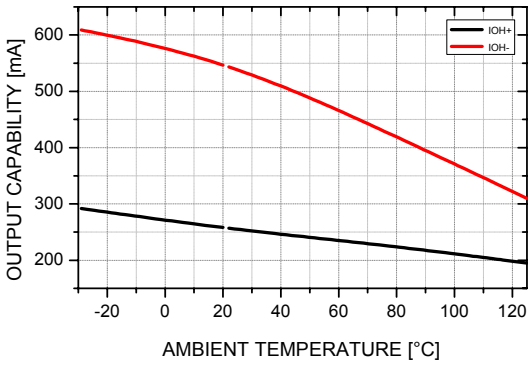

Figure 6. Output Sinking/Sourcing Current vs. Temp.

Switching Time Definition

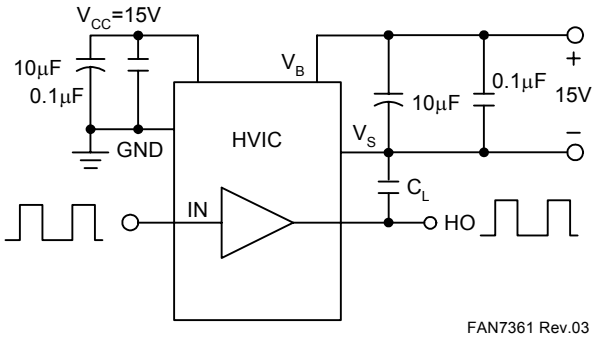

Figure 7. Switching Time Test Circuit

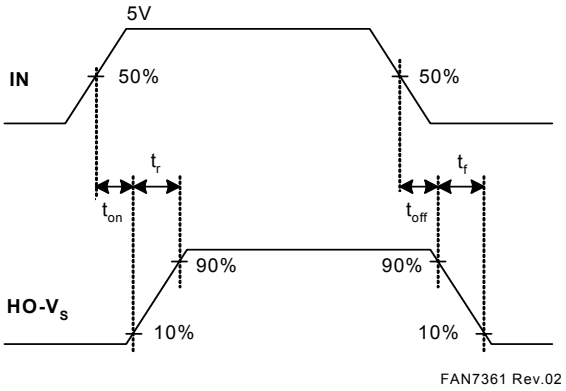

Figure 8. Input / Output Timing Diagram

Mechanical Dimensions

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Dimensions are in millimeters (inches) unless otherwise noted.

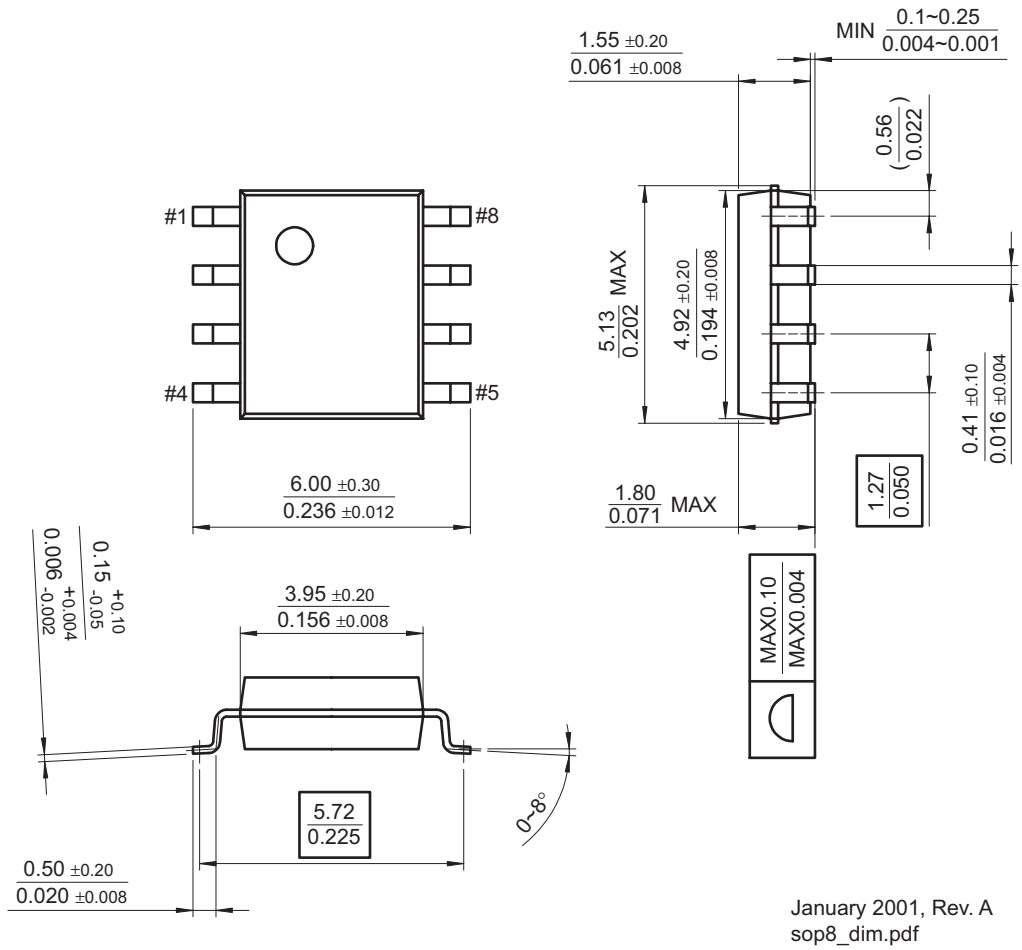

Figure 9. 8-Lead Small Outline Package (SOP)

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