FAIRCHILD SEMICONDUCTOR®

September 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
- VCC & VBS 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 VS=-9.8V(typ.) for VBS=15V.

The UVLO circuit prevents malfunction when VBS 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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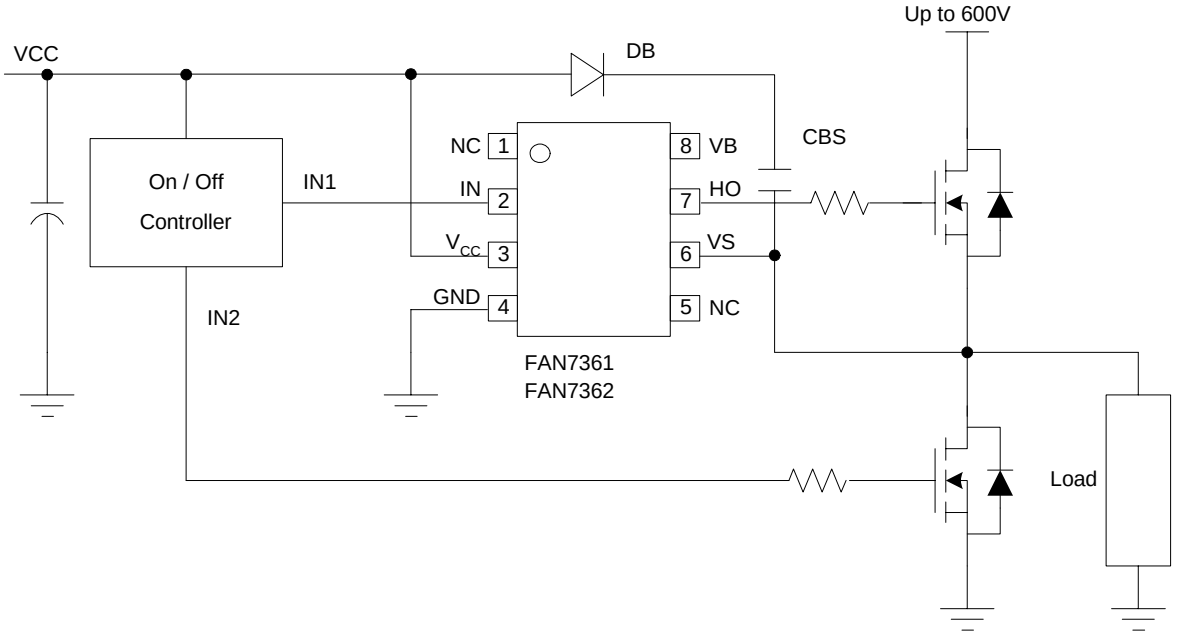
Ordering Information

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



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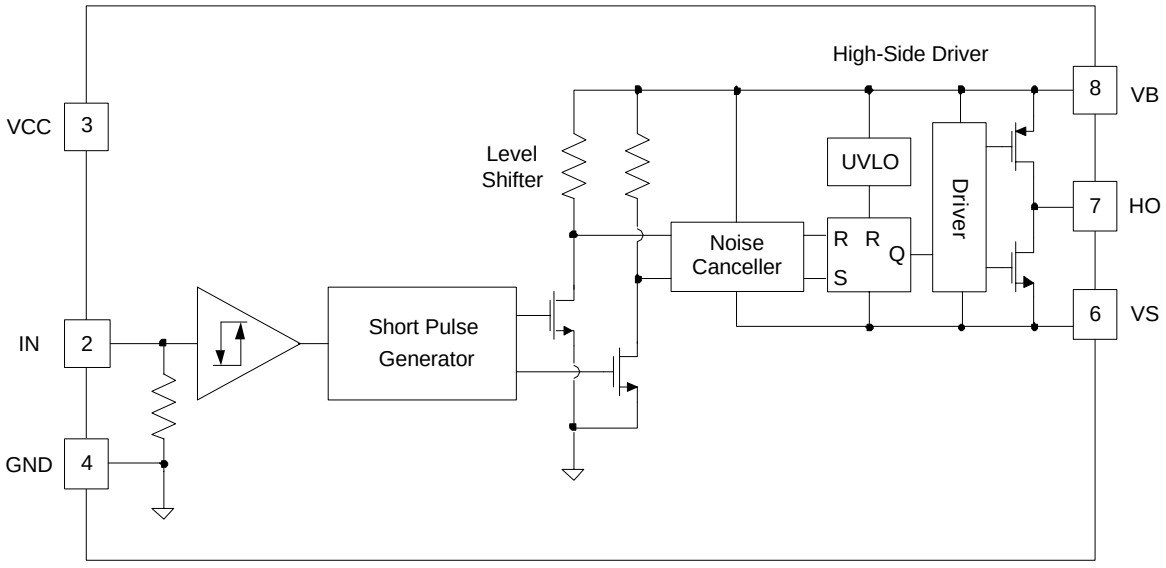
Internal Block Diagram



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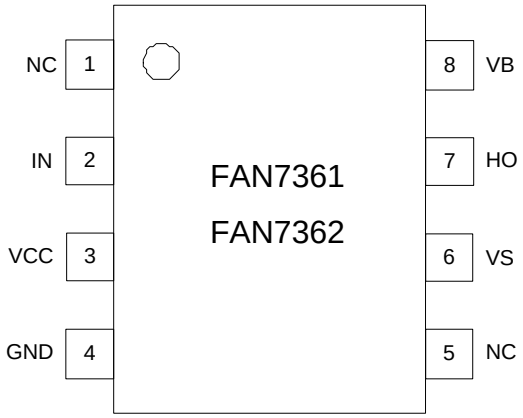
Pin Assignments



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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	VCC	Supply Voltage
4	GND	Logic Ground
5	N.C.	No Connection
6	VS	High-Voltage Floating Supply Return
7	HO	High-Side Driver Output
8	VB	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	VB-25	VB+0.3	V
V_B	High Side Floating Supply Voltage	-0.3	625	
V_{HO}	High Side Floating Output Voltage	VS-0.3	VB+0.3	
VCC	Logic Fixed Supply Voltage	-0.3	25	
V_{IN}	Logic Input Voltage	-0.3	VCC+0.3	
dVs/dt	Allowable Offset Voltage Slew Rate	-	± 50	V/ns
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
VB	High-Side Floating Supply Voltage	VS+10	VS+20	V
VS	High-Side Floating Supply Offset Voltage	6-VCC	600	
V_{HO}	High-Side Output Voltage	VS	VB	
V_{IN}	Logic Input Voltage	GND	VCC	
VCC	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
VBSUV+	VBS Supply Under-Voltage Positive Going Threshold	V_{IN}=0V	FAN7361	8.2	9.2	10.2	V
			FAN7362	7.6	8.6	9.6	
VBSUV-	VBS Supply Under-Voltage Negative Going Threshold	V_{IN}=0V	FAN7361	7.4	8.6	9.2	
			FAN7362	7.2	8.2	9.2	
VBSHYS	VBS Supply Under-Current Lockout Hysteresis	V_{IN}=0V	FAN7361	-	0.5	-	
			FAN7362	-	0.4	-	
I_{LK}	Offset Supply Leakage Current	VB=VS=H =600V		-	-	10	µA
I_{QBS}	Quiescent VBS Supply Current	V_{IN}=0V or 5V		-	50	80	
I_{QCC}	Quiescent VCC Supply Current	V_{IN}=0V		-	30	75	
I_{PBS}	Operating VBS 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, VB-VHO	No load		-	-	0.1	
V_{OL}	Low Level Output Voltage, VHO	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	-	
VS	Allowable Negative VS 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	ns
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

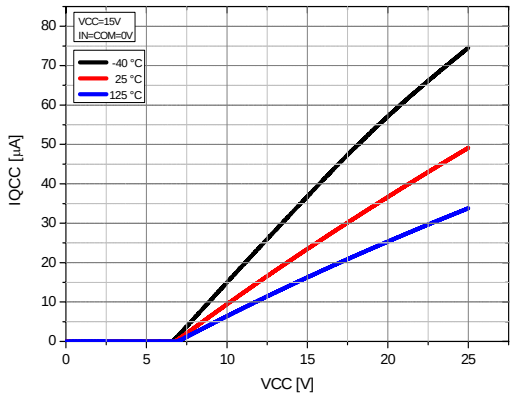

Figure 1. IQCC vs. Supply Voltage

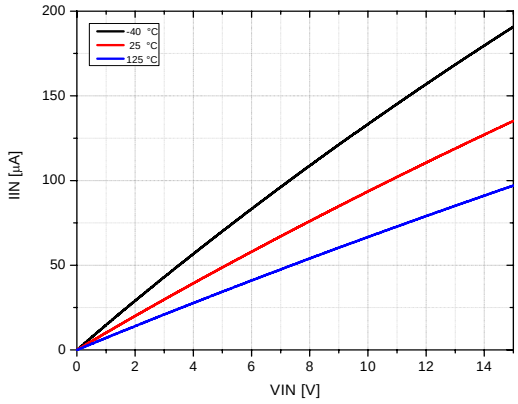

Figure 2. Input Bias Current vs. Input Voltage

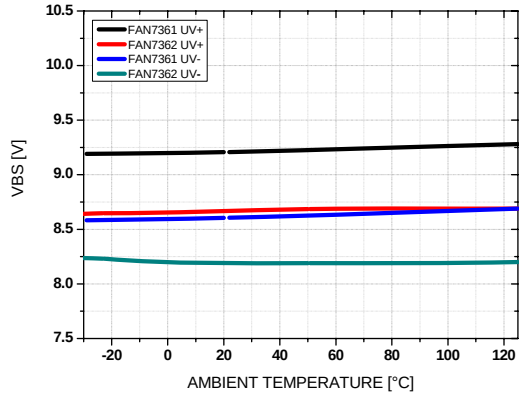

Figure 3. VBS UVLO vs. Temp.

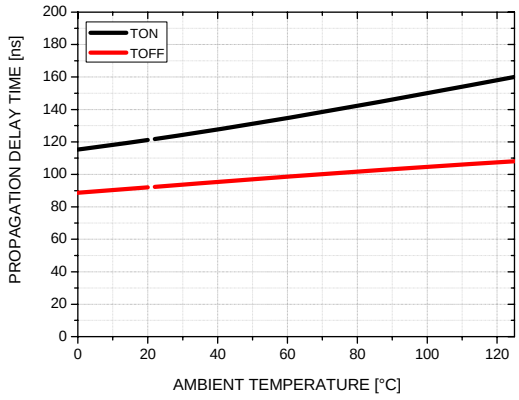

Figure 4. Turn On/Off Propagation Time vs. Temp.

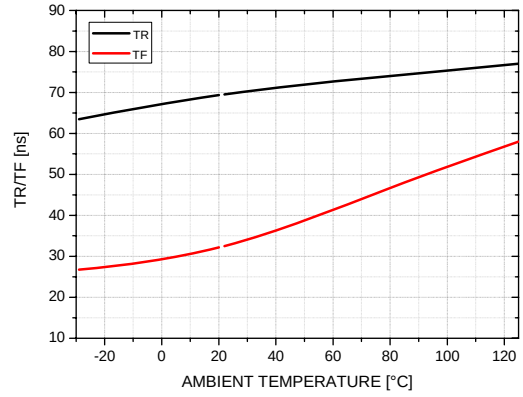

Figure 5. Rising/Falling Time vs. Temp.

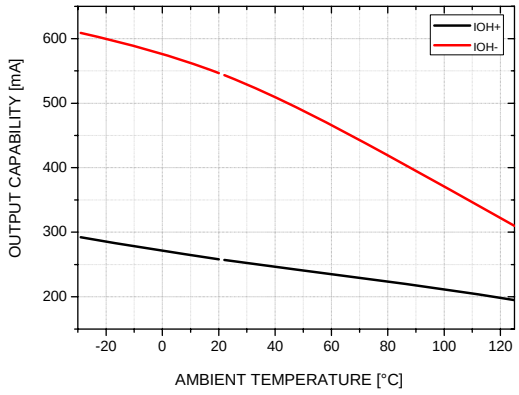

Figure 6. Output Sinking/Sourcing Current vs. Temp.

Switching Time Definition

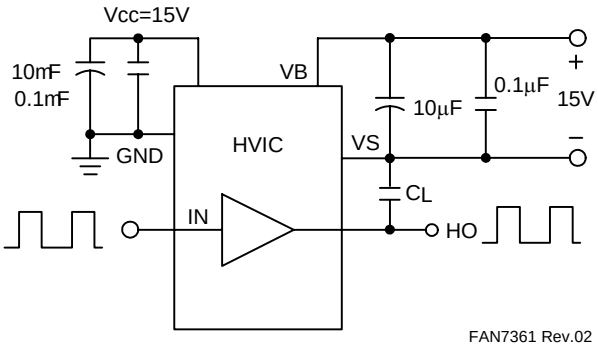

Figure 7. Switching Time Test Circuit

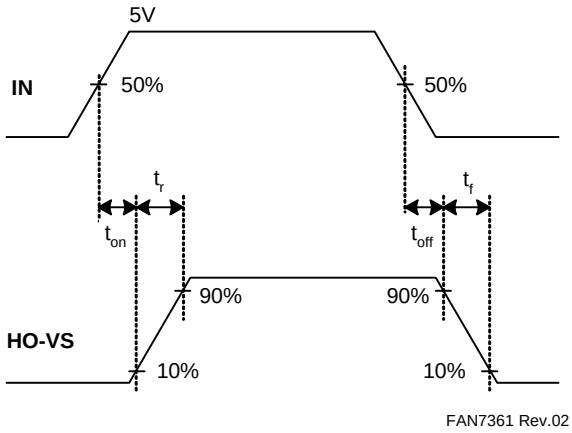

Figure 8. Input / Output Timing Diagram

Mechanical Dimensions

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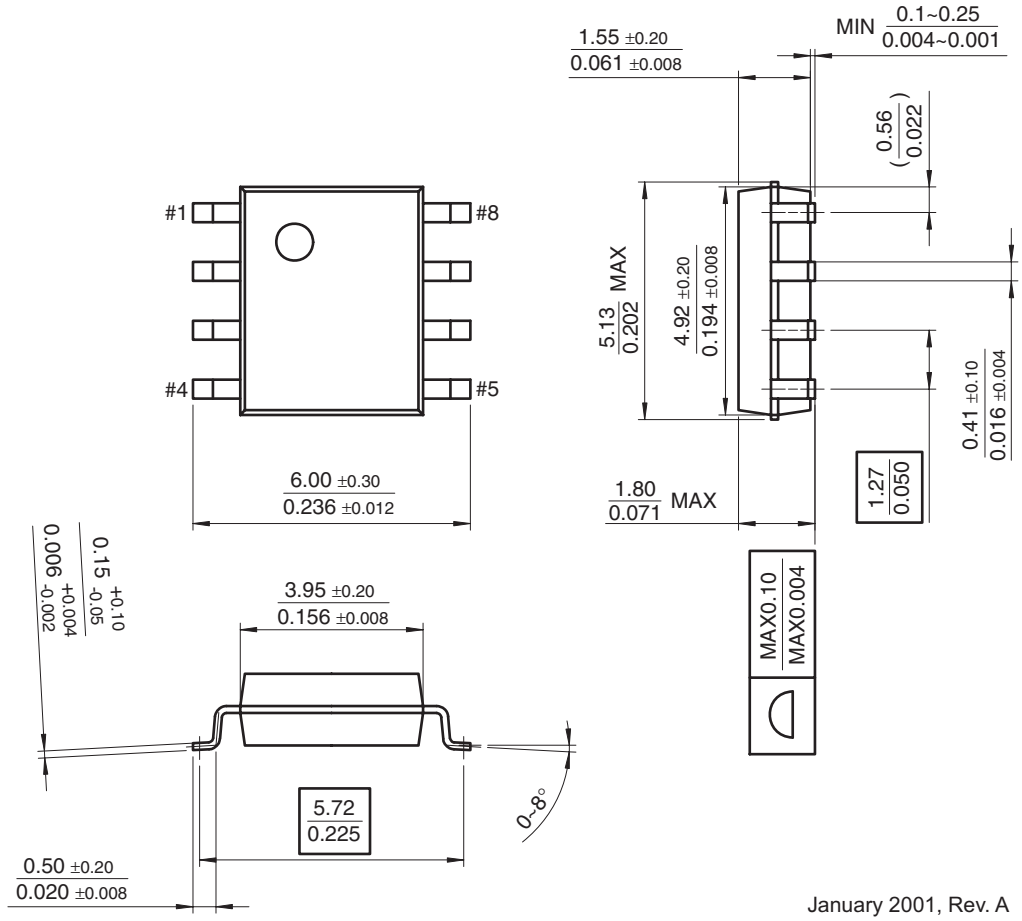
Dimensions are in millimeters (inches) unless otherwise noted.



January 2001, Rev. A

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