

600 V / 4 A, High-Side Automotive Gate Driver IC

FAD7171MX

Description

The FAD7171MX is a monolithic high-side gate drive IC that can drive high-speed MOSFETs and IGBTs that operate up to +600 V. It has a buffered output stage with all NMOS transistors designed for high pulse current driving capability and minimum cross-conduction. **onsemi'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 °C

MARKING DIAGRAM

FAD7171MX	SOIC8 (Pb-Free / Halogen Free)	2500 / Tape & Reel
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Applications

- Common Rail Injection Systems
- DC-DC Converter
- Motor Drive (Electric Power Steering, Fans)

Related Product Resources

- FAN7171 Product Folder
- FAD7171 Product Folder
- [AND9674](#) Design and Application Guide of Bootstrap Circuit for High-Voltage Gate-Drive IC
- [AN-8102](#) Recommendations to Avoid Short Pulse Width Issues in HVIC Gate Driver Applications
- [AN-9052](#) Design Guide for Selection of Bootstrap Components

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PIN DESCRIPTION

Pin No.	Symbol	Description
1	V_{DD}	Supply Voltage
2	IN	Logic Input for High-Side Gate Driver Output
3	NC	No Connection
4	GND	Ground
5	NC	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

Symbol	Characteristics	Min	Max	Unit
V_S	High-Side Floating Offset Voltage	$V_B - 25$	$V_B + 0.3$	V
V_B	High-Side Floating Supply Voltage	-0.3	625.0	V
V_{HO}	High-Side Floating Output Voltage	$V_S - 0.3$	$V_B + 0.3$	V
V_{DD}	Low-Side and Logic Supply Voltage	-0.3	25	V
V_{IN}	Logic Input Voltage	-0.3	$V_{DD} + 0.3$	V
dV_S/dt	Allowable Offset Voltage Slew Rate	-	± 50	V/ns
P_D	Power Dissipation (Notes 2, 3, 4)	-	0.625	W
θ_{JA}	Thermal Resistance	-	200	$^{\circ}\text{C/W}$
T_J	Junction Temperature			

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ELECTRICAL CHARACTERISTICS (V_{BIAS} (V_{DD} , V_{BS}) = 15 V, $-40^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$, unless otherwise specified. The V_{IN} and I_{IN} parameters are referenced to GND. The V_O and I_O parameters are relative to V_S and are applicable to the respective output HO)

Symbol

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TYPICAL PERFORMANCE CHARACTERISTICS

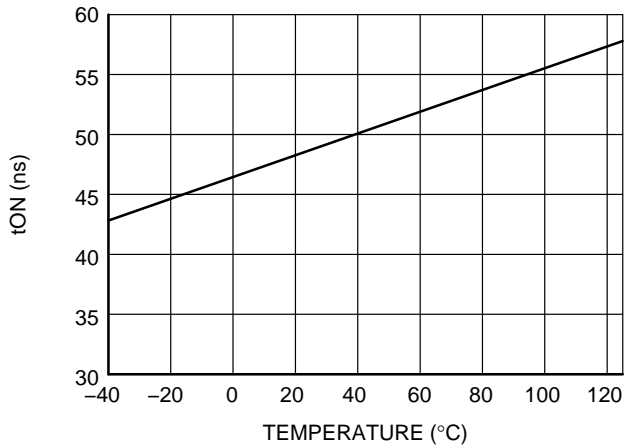


Figure 4. Turn-On Propagation Delay vs. Temperature

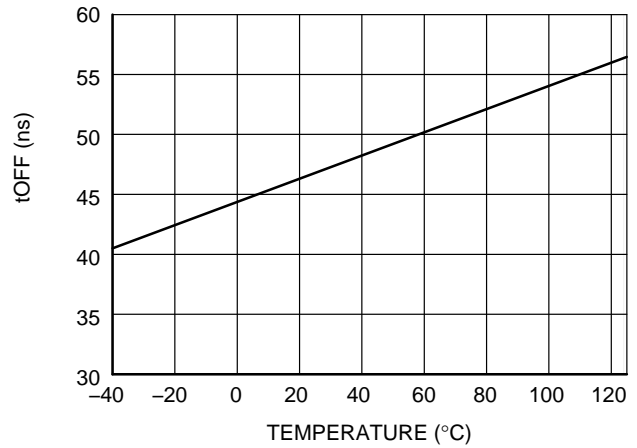


Figure 5. Turn-Off Propagation Delay vs. Temperature

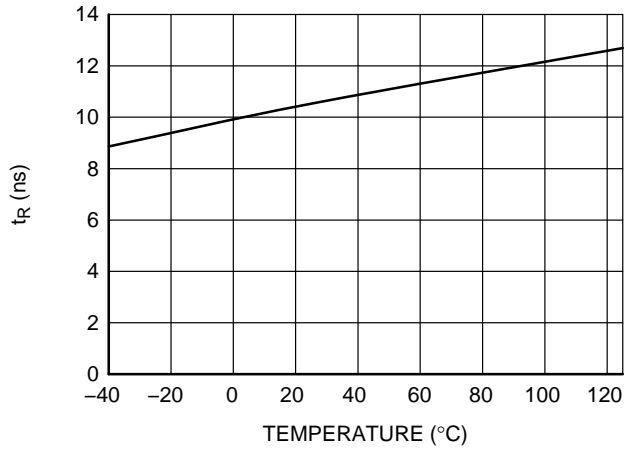


Figure 6. Turn-On Rise Time vs. Temperature

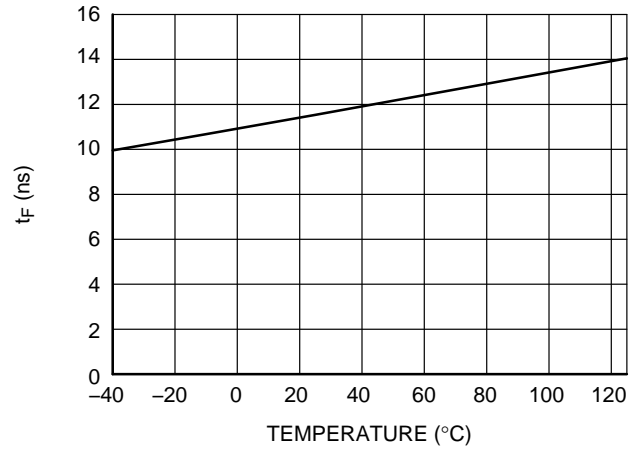


Figure 7. Turn-Off Fall Time vs. Temperature

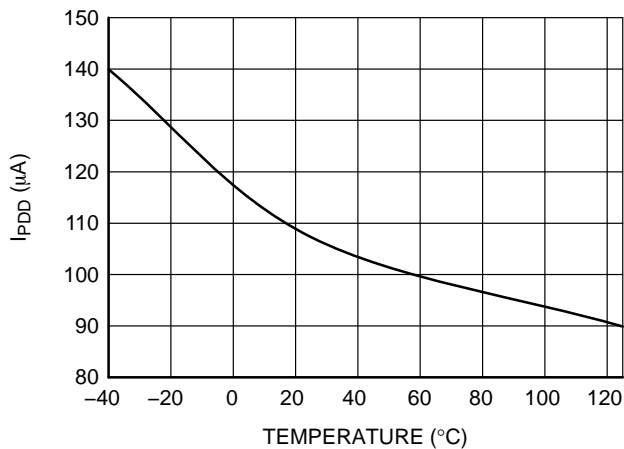


Figure 8. Operating V_{DD} Supply Current vs. Temperature

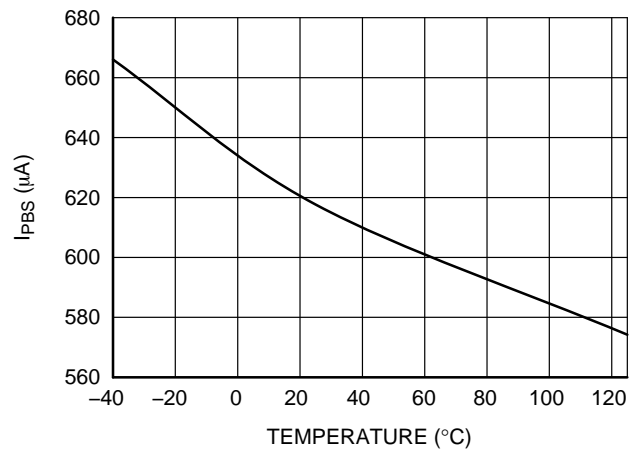


Figure 9. Operating V_{BS} Supply Current vs. Temperature

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TYPICAL PERFORMANCE CHARACTERISTICS (continued)

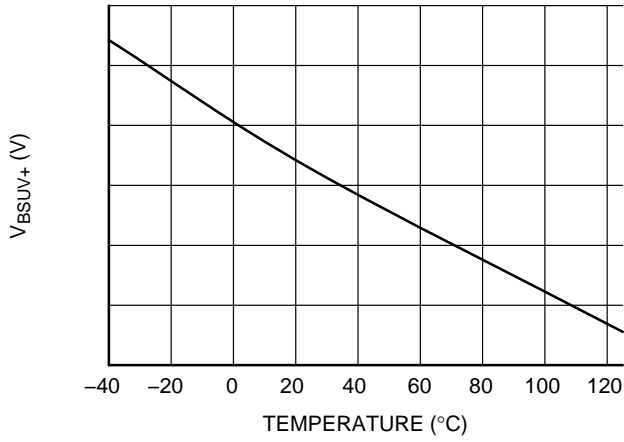


Figure 10. V_{BS} UVLO+ vs. Temperature

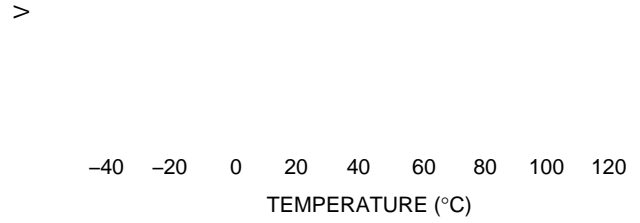


Figure 11. V_{BS} UVLO- vs. Temperature

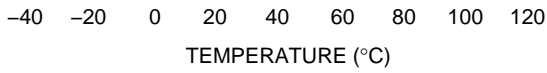


Figure 12. Logic High Input Voltage vs. Temperature

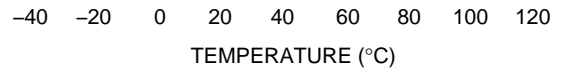


Figure 13. Logic Low Input Voltage vs. Temperature

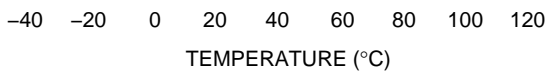


Figure 14. RIN vs. Temperature

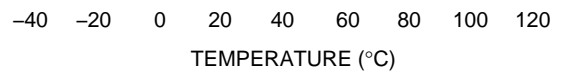


Figure 15. Output Voltage vs. Temperature

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SWITCHING TIME DEFINITIONS

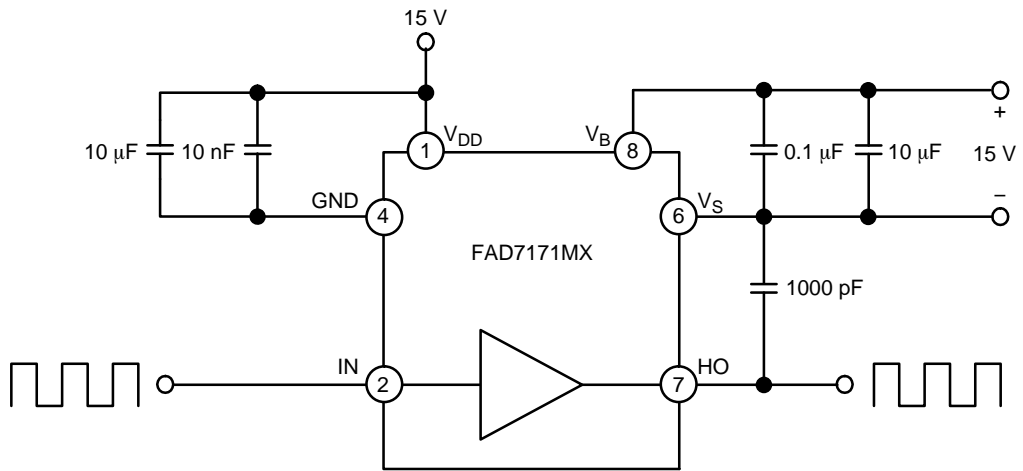


Figure 22. Switching Time Test Circuit (Referenced 8-SOIC)

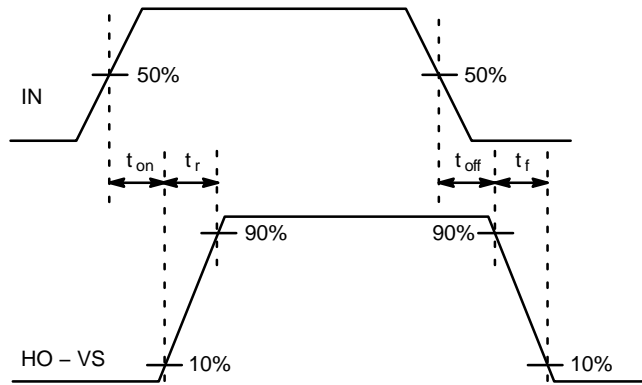
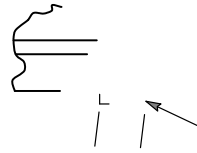
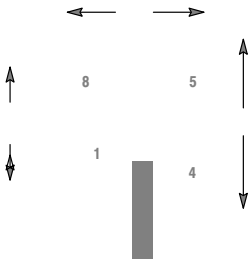


Figure 23. Switching Time Waveform Definitions

SOIC 8 NB
CASE 751-07
ISSUE AK

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SEATING
PLANE



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