2A Single-Channel, Low-Side, Non-Inverting Gate Driver

Description

The IRS44273 device is a low voltage power MOSFET and IGBT in phase gate driver. Proprietary latch-immune of CMOS technology enables single-chip integrated architectures with high robustness. The IRS44273 logic input level is compatible with CMOS or TTL logic output levels down to 3.3V. The output driver has Internal Undervoltage Lockout (UVLO) circuitry with hysteresis and buffer stage of output current . The IRS44273 is designed to operate over a wide VCC range of 5 V to 25 V and wide temperature range of –40°C to 125°C.

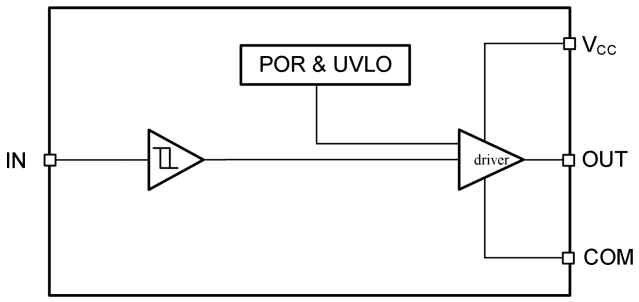
Applications

- Switch-Mode Power Supplies
- General Gate Driver
- Driving MOSFETs and IGBTs

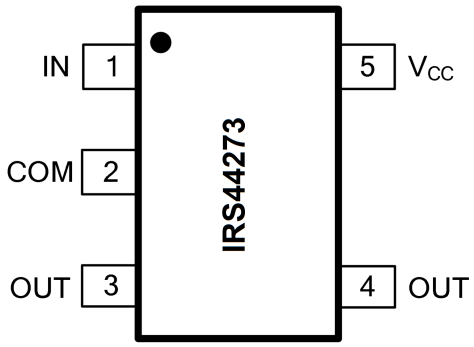
Features

- CMOS schmidt trigger input
- Input output in-phase
- Compatible with 3.3V input logic
- 5 to 25-V Single-Supply Range
- High capacitance load driving capability
- Operating Temperature Range of -40 to 125°C
- Undervoltage Lockout
  -- Undervoltage Lockout turn-on threshold 4.0V
  -- Undervoltage Lockout turn-off threshold 3.9V
- Turn on/Turn off Delays:
  -- Ton/Toff =25ns/25ns
- 2-A Peak Source and Sink-Drive Current

Pin Configuration



Pin Configuration and Functions



5-Pin SOT23-5 Package Top View

Pin Functions

PIN	NAME	DESCRIPTION
1	IN	Logic input.
2	COM	Ground: All signals are referenced to this pin.
3	OUT	Gate drive output.
4	OUT	Gate drive output.
5	VCC	Bias supply input.

Absolute Maximum Ratings

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. All voltages are with respect to COM unless otherwise noted, Currents are positive into, negative out of the specified terminal, environment temperature is 25 ℃.

Symbol	Definition	MIN	MAX	UNIT
V_{CC}	Supply voltage range	-0.3	25	V
V_O	OUT voltage range	-0.3	V_{CC}+0.3	
V_{IN}	IN voltage	-12	25	

Thermal Information

Symbol	Definition	MIN	MAX	UNIT
R_{thJA}	thermal resistance		151	°C/W
T_S	Storage temperature	-55	+150	°C
T_J	Operating junction temperature		+150	
T_L	Lead temperature		300	

Recommended Operating Conditions

To properly operate, device should be used in the following recommended conditions. All voltages are with respect to COM unless otherwise noted, Currents are positive into, negative out of the specified terminal, environment temperature is 25 ℃.

Symbol	Definition	MIN	MAX	UNIT
V_{CC}	Supply voltage range	5.0	20	V
V_O	OUT voltage range	0	V_{CC}	
V_{IN}	IN voltage	-10	V_{CC}	
T_A	ambient temperature	-40	125	°C

Electrical Characteristics

TA= 25℃, VCC=15V, CL=1nF(unless otherwise noted)

Symbol	Definition	MIN	TYP	MAX	UNIT
V_{IH}	Input signal high threshold	2.7			V
V_{IL}	Input signal low threshold			0.8	V
V_{CCUV+}	Undervoltage Lockout (UVLO) turn-on threshold VCC		4.0		V
V_{CCUV-}	Undervoltage Lockout (UVLO) turn-off threshold VCC		3.9		V
V_{CCUVHY}	UVLO threshold hysteresis VCC		0.1		V
I_{IN+}	Input current (IN=5V)		50	100	μA
I_{IN-}	Input current (IN=0V)			5	μA
V_{OH}	High output voltage			0.35	V
V_{OL}	Low output voltage			0.35	V
I_Q	VCC quiescent supply current		180	400	μA
I_{O+}	Output high short-circuit pulse current		2		A
I_{O-}	Output low short-circuit pulse current		2		A
t_R	Rise time			30	ns
t_F	Fall time			30	ns
t_{ON}	Turn-on propagation delay		25	50	ns
t_{OFF}	Turn-off propagation delay		25	50	ns

Function Description

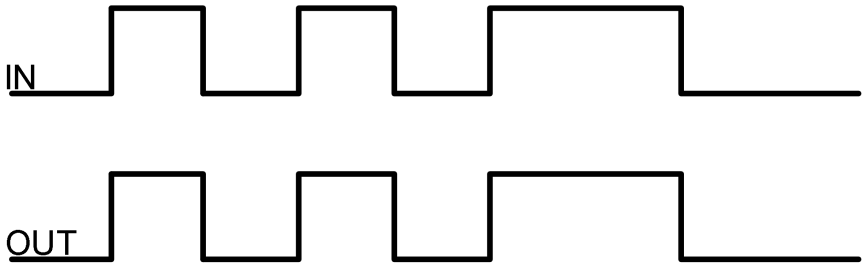


Figure 1 Input-Output waveform

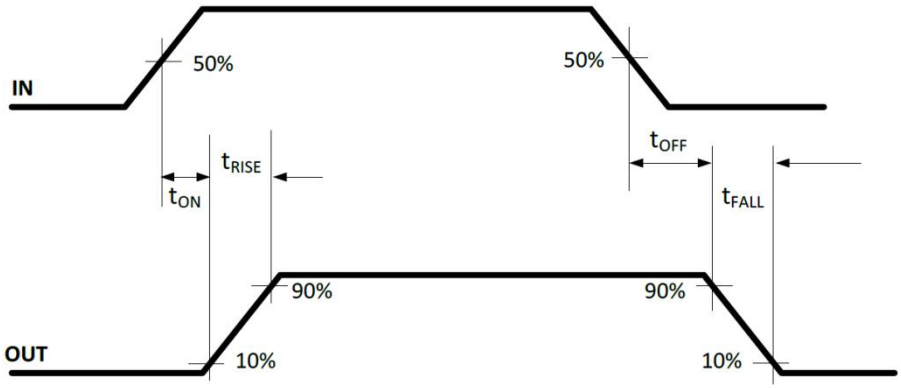


Figure 2 Propagation Time Waveform Definition

Function Block Diagram

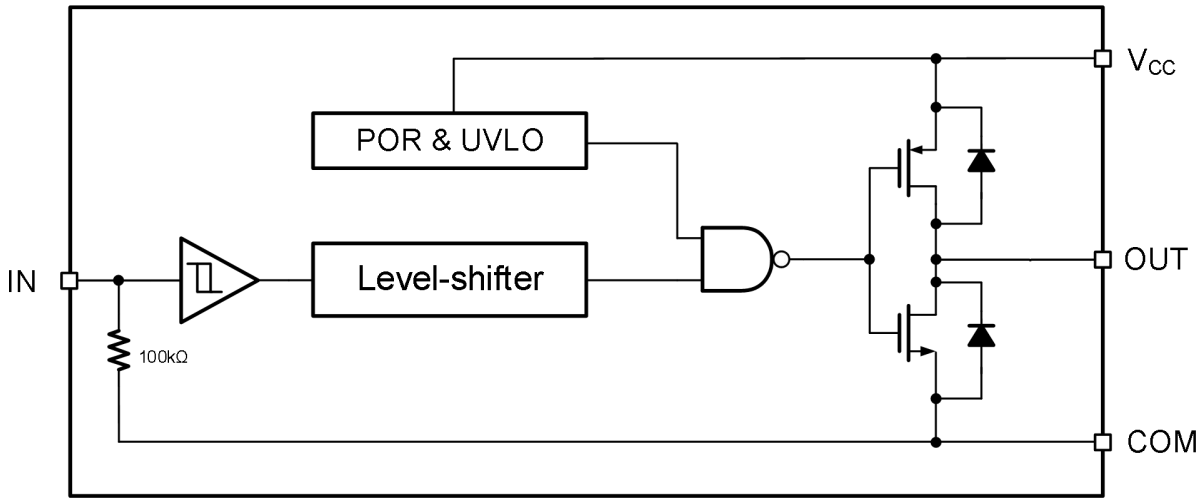


Figure 10-1 Function Block Diagram of IRS44273

Application message

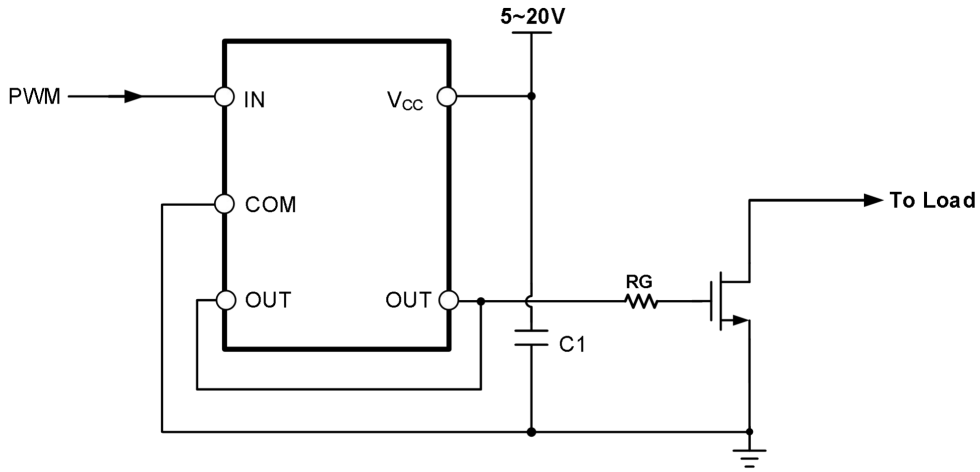
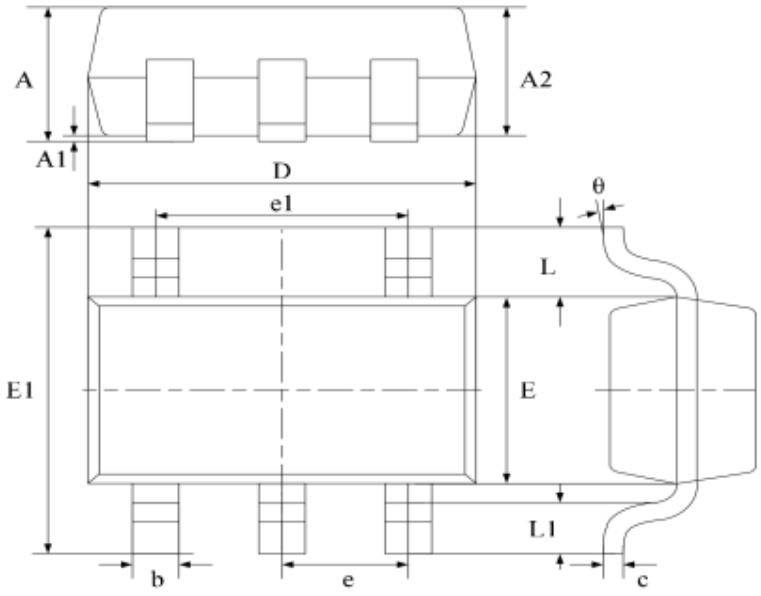


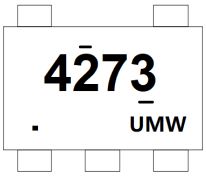
Figure10-2 Typical application circuit of IRS44273

SOT23-5



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.040	1.350	0.042	0.055
A1	0.040	0.150	0.002	0.006
A2	1.000	1.200	0.041	0.049
b	0.380	0.480	0.015	0.020
c	0.110	0.210	0.004	0.009
D	2.720	3.120	0.111	0.127
E	1.400	1.800	0.057	0.073
E1	2.600	3.000	0.106	0.122
e	0.950 typ.		0.037 typ.	
e1	1.900 typ.		0.078 typ.	
L	0.700 ref.		0.028 ref.	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW IRS44273LTR	SOT23-5	3000	Tape and reel