

DO1416 2A Single-Channel, Low-Side Gate Driver

1 Features

- Input output in phase / out of phase
- Compatible with 3.3V、5V input logic
- 4.5 to 25-V Single-Supply Range
- High capacitance load driving capability
- Operating Temperature Range of -40 to 125°C
- Undervoltage Lockout
- Turn on/Turn off Delays:
-- Ton/Toff =25ns/25ns
- 2-A Peak Source and Sink-Drive Current
- SOT23-5 Package

DO1416 logic input level is compatible with Comos 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 DO1416 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.

Device Information

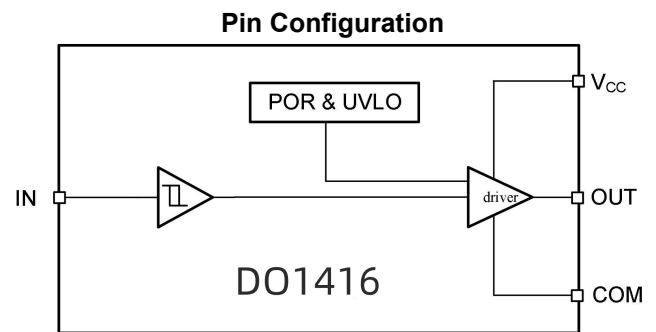
PART NUMBER	PACKAGE	BODY SIZE(NOM)
DO1416	SOT23-5	2.9mm x 1.6mm

2 Applications

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

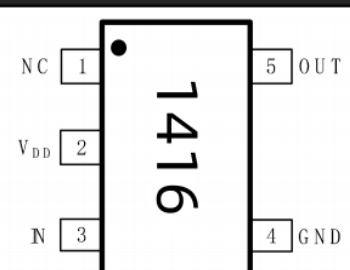
3 Description

The DO1416 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



4 Pin Configuration and Functions

Table 4 - 1 DO1416 pin description

PIN	NAME	DESCRIPTION	top view
1	NC	No connection	
2	VDD	Power supply	
3	IN	Logic input	
4	GND	Ground	
5	OUT	Gate driven output(in-phase)	

5 Specifications

5.1 Absolute Maximum Ratings

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

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	$V_{CC}+0.3$	

5.2 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	

5.3 Recommended Operating Conditions

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

Symbol	Definition	MIN	MAX	UNIT
V _{CC}	Supply voltage range	4.5	20	V
V _O	OUT voltage range	0	V _{CC}	
V _{IN}	IN voltage	-10	V _{CC}	
T _A	ambient temperature	-40	125	°C

5.4 Electrical Characteristics

T_A = 25°C, V_{CC} = 15V (unless otherwise noted)

Symbol	Definition		MIN	TYP	MAX	UNIT
V _{IH}	Input signal high threshold		2.5	—	—	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=HIGH)	DO1416, IN=5V	—	50	100	μA
I _{IN-}	Input current(IN= LOW)	DO1416, IN=0V	—	—	5	μA
V _{OH}	High output voltage		—	—	0.1	V
V _{OL}	Low output voltage		—	—	0.1	V
I _Q	VCC quiescent supply current		—	—	500	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(CL=1nF)		—	—	30	ns
t _F	Fall time(CL=1nF)		—	—	30	ns
t _{ON}	Turn-on propagation delay(CL=1nF)		—	25	50	ns
t _{OFF}	Turn-off propagation delay(CL=1nF)		—	25	50	ns

6 Function Description

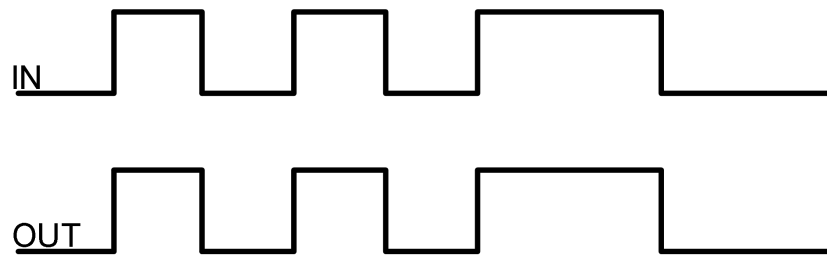


Figure 6-1 DO1416 Input-Output waveform

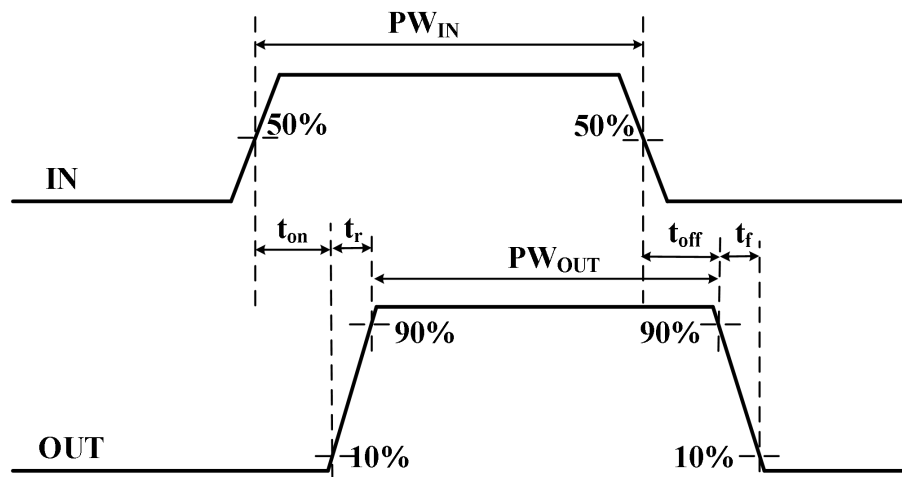


Figure 6 -2 DO1416 Propagation Time Waveform Definition

7 DO1416 Description

7.1 Function Block Diagram

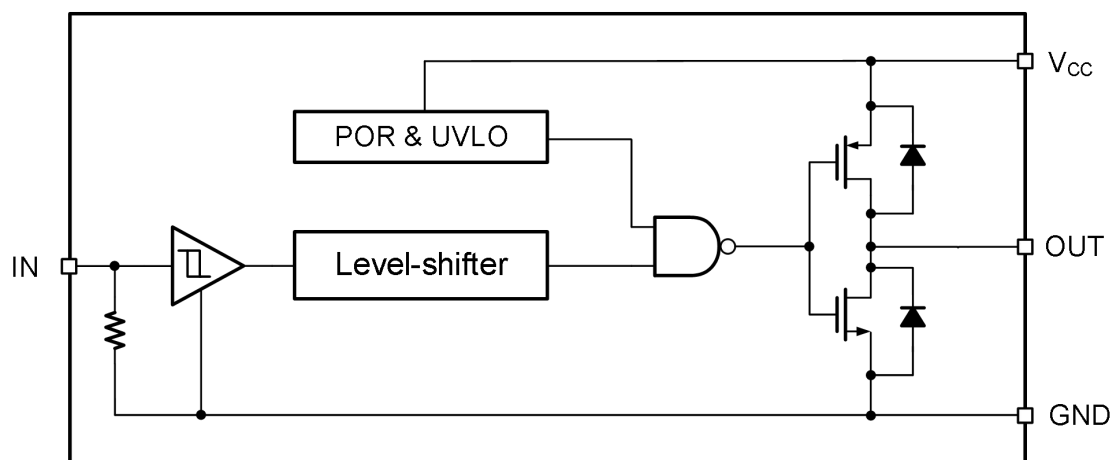


Figure 7 -1 Function Block Diagram of DO1416

7.2 Application message

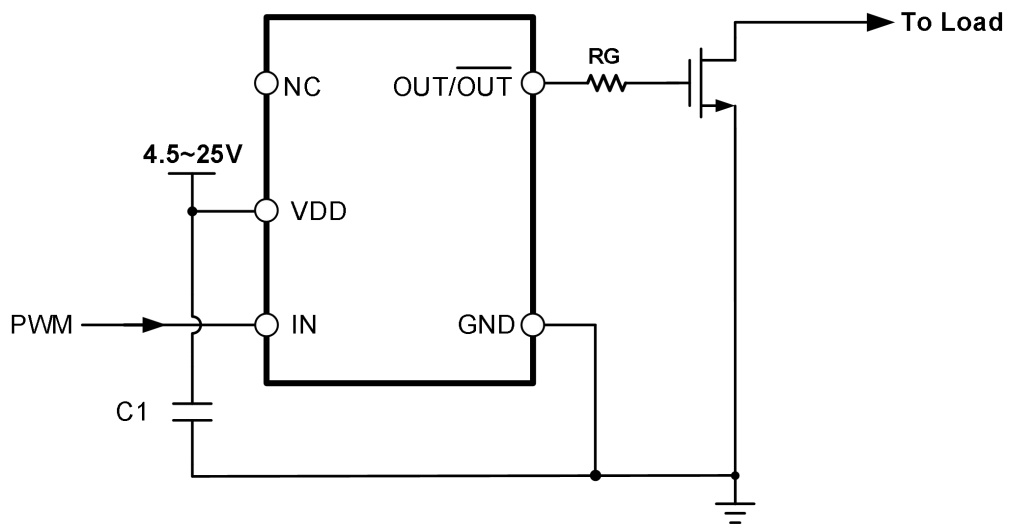


Figure7-2 Typical application circuit of DO1416

8 PACKAGING INFORMATION

SOT23-5 Package Dimensions

Size Symbol	MIN(mm)	TYP(mm)	MAX(mm)	Size Symbol	MIN(mm)	TYP(mm)	MAX(mm)
A	0.9	-	1.45	E	1.50	-	1.75
A1	0.00	-	0.15	e	-	0.95	-
A2	0.90	-	1.30	H	2.60	-	3.00
b	0.30	-	0.50	L	0.30	-	0.60
c	0.09	-	0.20	θ	0.00	-	10.00
D	2.80	-	3.05				

SOT23-5 Package Outlines

