DOS4427 Dual 2A Peak High-Speed Low-Side Power-MOSFET Drivers

1 Features

- Latch Protection: withstand 0.5 A reverse current
- Ability to Handle Negative Voltages (-10 V) at Inputs
- Low Output Impedance
- Two Independent Gate-Drive Channel
- 2-A Peak Output Current
- 4.5 to 25-V Single-Supply Range
- High Ability of driving capacitive load
- Rise/Fall time matching
- Operating Temperature Range of -40 to 125° C
- Turn on/Turn off Delays: 30ns
- The RoSH Standard
- SOIC8 package

2 Applications

- Switch-Mode Power Supplies
- line drivers
- Pulse transformer driver
- Driving MOSFETs and IGBTs
- Motor drives
- pulse generator
- Switch-Mode Power Supplies
- DC-to-DC Converters
- class D switching amplifier

3 Description

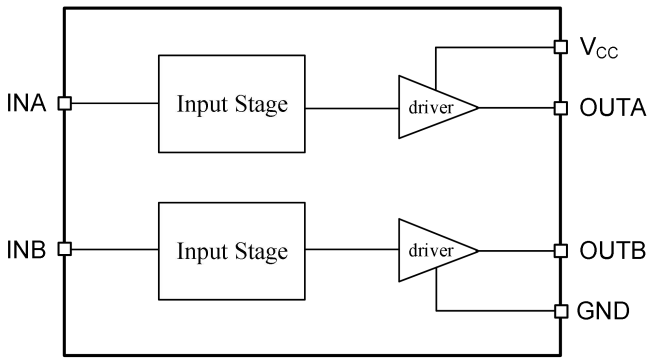
DOS4427 is power switch driver. It has a matching rise and fall time when charging and discharging the gate of the power switch.

DOS4427 has high latch resistance under all conditions in its rated power and voltage range. When noise spikes of up to 5V (either polarity) occur on the ground pin, the DOS4427 is not damaged. DOS4427 can accept reverse currents up to 500 mA to force back its output without damage or logic confusion. All ports are fully protected by up to 2.0 kV electrostatic discharge (ESD).

Device Information

PART NUMBER	PACKAGE	BODY SIZE(NOM)
DOS4427	SOIC8	4.9mm x 3.9mm

Pin Configuration



4 Pin Configuration and Functions

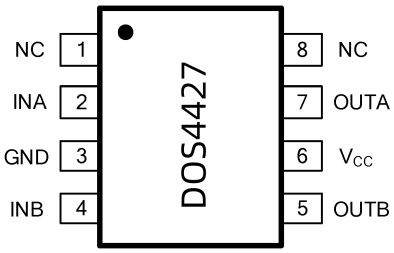


Figure4-1 8-Pin SOIC8 Top view

Table4-1 Lead Definitions

PIN	NAME	DESCRIPTION
1	NC	--
2	INA	Input to Channel A
3	GND	Ground: All signals are referenced to this pin.
4	INB	Input to Channel B
5	OUTB	Output of Channel B
6	V_{CC}	Bias supply input
7	OUTA	Output of Channel A
8	NC	--

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 ℃.

Symbol	Definition	MIN	MAX	UNIT
V_{CC}	Supply voltage range	—	25	V
V_{IN}	INA, INB voltage	GND-5	V_{CC}+0.3	

5.2 ESD Ratings

Symbol	Definition	MIN	MAX	UNIT
ESD	Human body model (HBM)	—	2000	V
	Charged device model (CDM)	—	500	V

5.3 Power Ratings

Symbol	Definition	MIN	MAX	UNIT
PD	SOIC package power（TA≤70°C）	—	470	mW

5.4 Thermal Information

Symbol	Definition	MIN	MAX	UNIT
T_J	Operating junction temperature	—	+150	°C
T_S	Storage temperature	-45	+150	

5.5 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 ℃.

Symbol	Definition	MIN	MAX	UNIT
V_{CC}	Supply voltage range	4.5	20	V
T_C	ambient temperature	-40	125	°C

5.6 Electrical Characteristics

T_A= 25℃, 4.5V ≤V_{CC}≤18V(unless otherwise noted)

Symbol	Definition	MIN	TYP	MAX	UNIT
V_{IH}	Input signal high threshold	2.4	—	—	V
V_{IL}	Input signal low threshold	—	—	0.8	V
I_{IN}	Input current (V_{IN}=5V)	—	50	100	μA
V_{OH}	High output voltage	V_{CC}– 0.025	—	—	V
V_{OL}	Low output voltage	—	—	0.025	V
R_{OH}	Output pullup resistance(V_{CC}=18V,I_O=100mA)	—	1.3	—	Ω
R_{OL}	Output pulldown resistance(V_{CC}=18V,I_O=100mA)	—	0.8	—	Ω
I_{PK}	Peak output source current	—	2	—	A
I_{REV}	Reverse current that latch protection can withstand(Working cycle≤2%, V_{CC}=18V,t≤300us)	—	>0.5	—	A
t_R	Rise time(V_{CC}=18V,C_{LOAD}=1800pF)	—	—	30	ns
t_F	Fall time(V_{CC}=18V,C_{LOAD}=1800pF)	—	—	30	ns
t_{ON}	Turn-on propagation delay(V_{CC}=18V,C_{LOAD}=1800pF)	—	30	50	ns
t_{OFF}	Turn-off propagation delay(V_{CC}=18V,C_{LOAD}=1800pF)	—	30	50	ns
I_{Q1}	VCC quiescent supply current(V_{INA}=V_{INB}=HIGH)	—	—	1	mA
I_{Q0}	VCC quiescent supply current(V_{INA}=V_{INB}=LOW)	—	—	1	mA

6 Detailed description

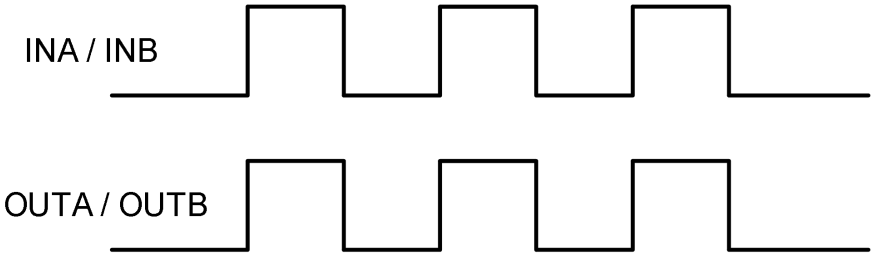


Figure 6 -1 Input-Output Functionality Diagram

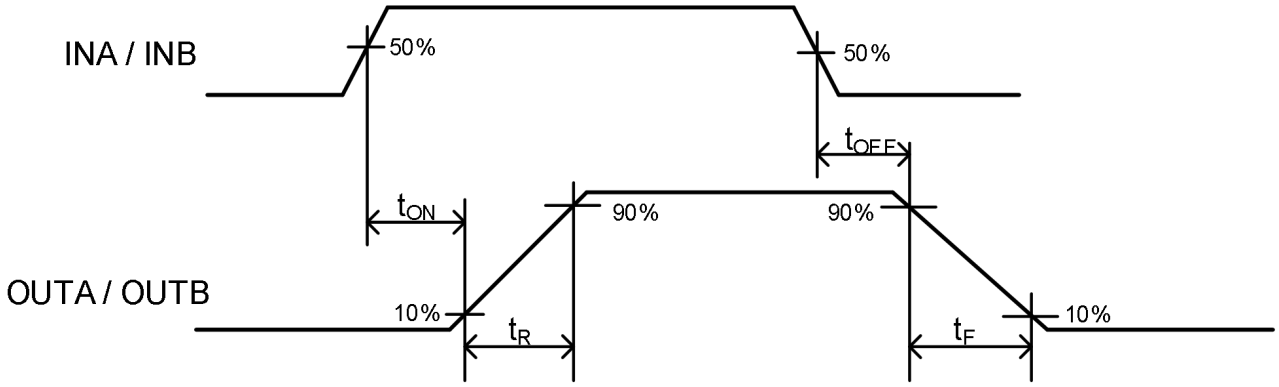


Figure 6 -2 Switching Time Waveforms

7 DOS4427 Description

7.1 Functional Block Diagram

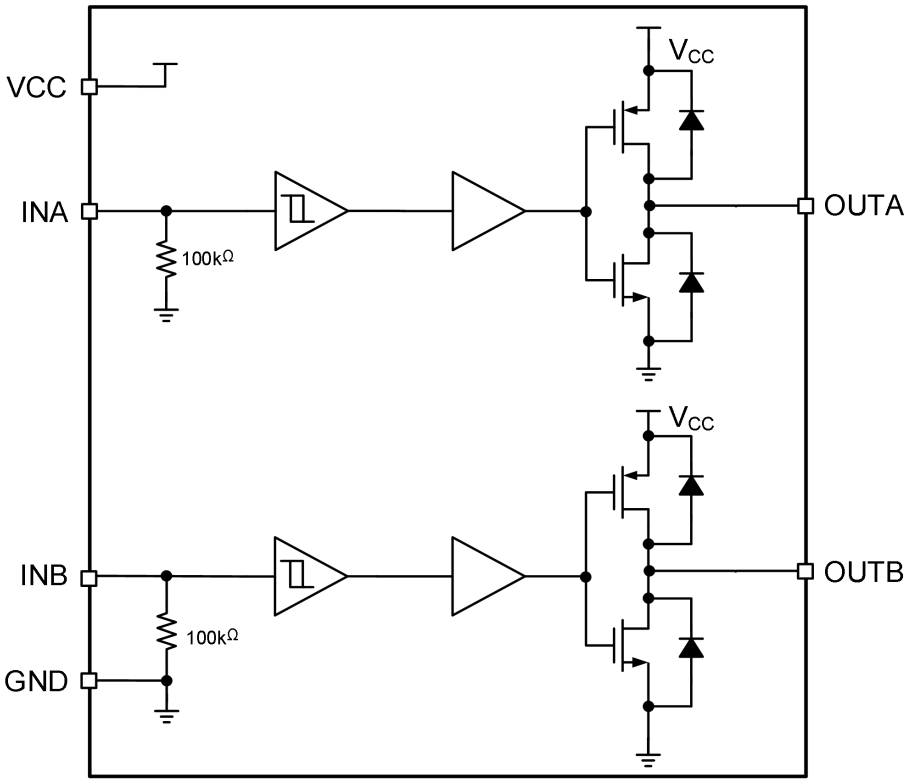


Figure 7 -1 Function Block Diagram of DOS4427

7.2 Typical Application

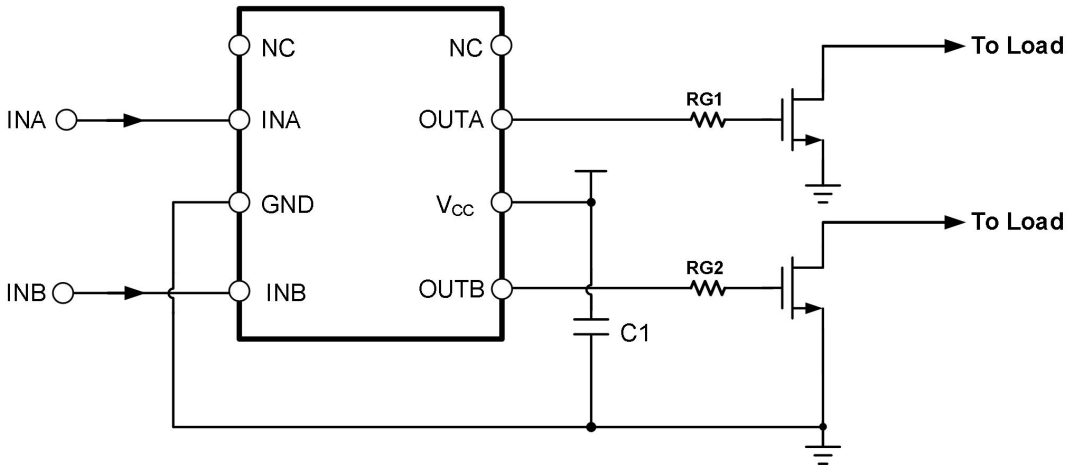


Figure 7 -2 Typical Application Diagram of DOS4427

8 PACKAGING INFORMATION

SOIC-8 Package Dimensions

Size / Symbol	MIN(mm)	TYP(mm)	MAX(mm)	Size / Symbol	MIN(mm)	TYP(mm)	MAX(mm)
A	-	-	1.75	D	4.70	4.90	5.10
A1	0.10	-	0.225	E	5.80	6.00	6.20
A2	1.30	1.40	1.50	E1	3.70	3.90	4.10
A3	0.60	0.65	0.70	e		1.27BSC	
b	0.39	-	0.48	h	0.25	-	0.50
b1	0.38	0.41	0.43	L		0.50	
c	0.21	-	0.26	L1	1.05BSC		
c1	0.19	0.20	0.21	θ	0	-	8°

SOIC-8 Package Outlines