6A High-Speed Power MOSFET Drivers

Features

- High Peak Output Current: 6A
- Wide Supply Voltage Operating Range: 4.5V to 25V
- High Capacitive Load Drive Capability 10 nF
- Short Delay Times: 44ns (typ.)
- Matched Rise/Fall Times (14ns typ.)
- Low Output Impedance：1.0Ω (typ.)
- Low Supply Current
- Over-temperature Protection
- Under-voltage Lockout (UVLO)
- Non-overlapped Drive Tech
- Input withstands negative inputs up to 5V
- Available in Green SOP8, DIP8 and DFN8 Packages

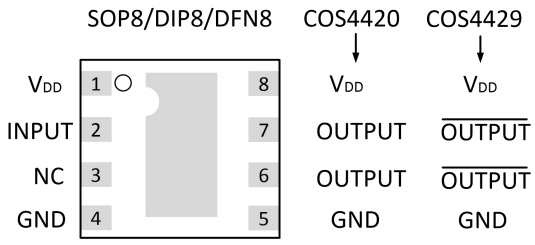
Applications

- Switch Mode Power Supplies
- Power MOSFET Drivers
- Pulse Transformer Drivers
- Line Drivers
- CCD Driver
- Class D Switching Amplifiers

General Description

The COS4420/4429 are single-output power MOSFET drivers. Unique circuit design enables high speed operation capable of delivering peak currents of 6A into 10,000pF capacitive loads. Improved speed and drive capability are enhanced by matched rise and fall delay times. Dynamic switching losses are minimized with non-overlapped drive techniques. These devices are highly latch-up resistant within their power and voltage ratings. They are not subject to damage when up to 5V of noise spiking (of either polarity) occurs on the ground pin.

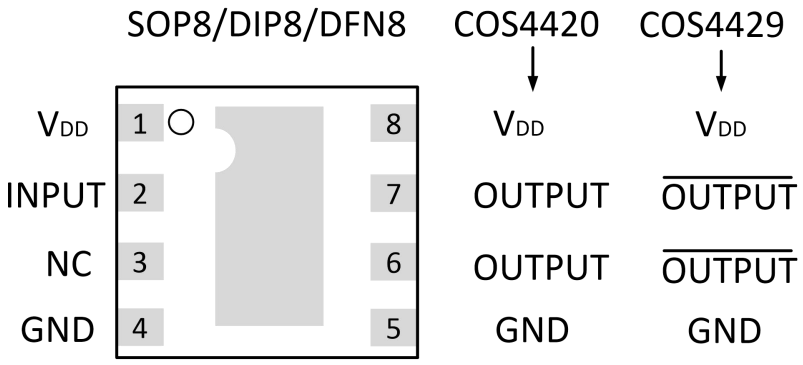
The COS4420/4429 inputs can be driven directly from either TTL or CMOS (1.6V to 25V). In addition, the 300 mV of built-in hysteresis provides noise immunity and allows the device to be driven from slow rising or falling waveforms. Output is held LOW if Input is unbiased or floating.



Pin Diagram

Rev1.0

1. Pin Configuration and Functions



COS4420: Output in phase with input

COS4429: Output out of phase with input

Figure 1. Pin Diagram

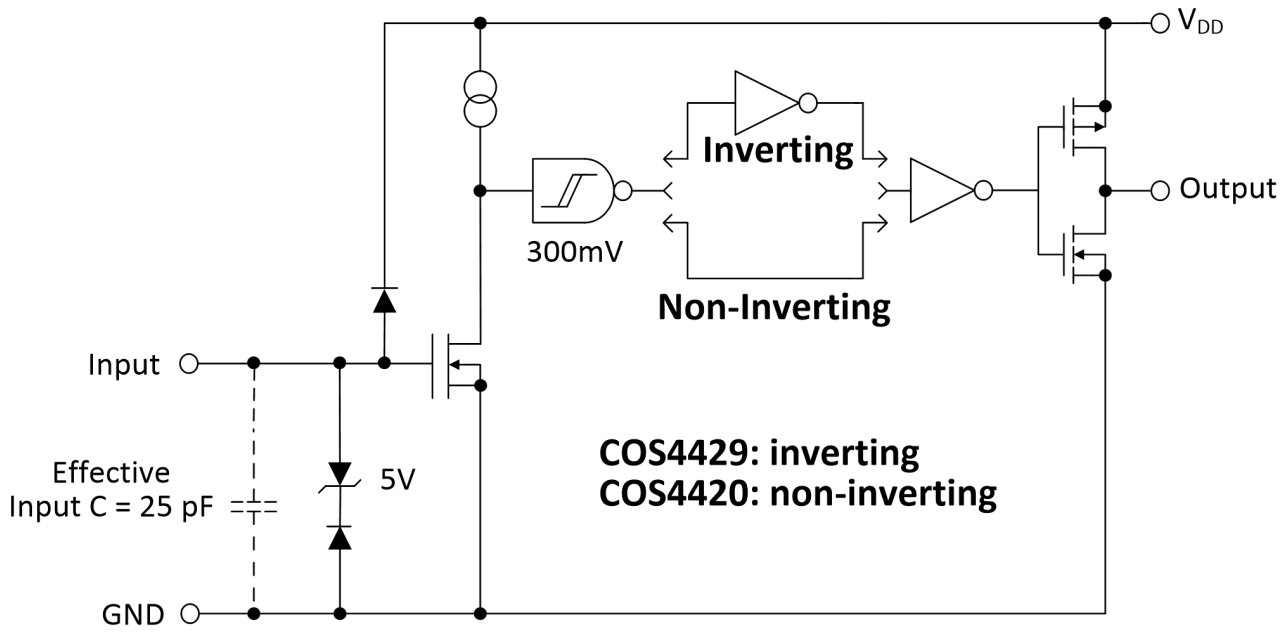


Figure 2. Functional Block Diagram

Pin Description

Pin	Name	Description
1	VDD	Power Supply
2	INPUT	Control input, TTL/CMOS compatible input
3	NC	No Connection
4	GND	Ground
5	GND	Ground
6	OUTPUT	CMOS push-pull output
7	OUTPUT	CMOS push-pull output
8	VDD	Power Supply
-	PAD	Exposed Metal Pad, electrically isolated

Note: Duplicate pins must both be connected for proper operation.

1.1 Input

MOSFET driver input is a high-impedance, TTL/CMOS compatible input. It also has 300 mV of hysteresis between the high and low thresholds that prevents output glitching even when the rise and fall time of the input signal is very slow.

1.2 Ground (GND)

Ground is the device return pin. The Ground pin(s) should have a low-impedance connection to the bias supply source return. High peak current flows out the Ground pin(s) when the capacitive load is being discharged.

1.3 Output

MOSFET driver outputs are low-impedance, CMOS push-pull style outputs. The pull-down and pullup devices are of equal strength, making the rise and fall times equivalent. The Output is held LOW if Input is unbiased or floating.

1.4 Supply Input (VDD)

The VDD input is the bias supply for the MOSFET driver and is rated for 4.5V to 25V with respect to the Ground pin. The VDD input should be bypassed with local ceramic capacitors. The value of these capacitors should be chosen based on the capacitive load that is being driven. A value of 1.0 μF is suggested.

1.5 Exposed Metal Pad

The exposed metal pad of the DFN-S package is not internally connected to any potential. Therefore, this pad can be connected to a ground plane or other copper plane on a Printed Circuit Board (PCB), to aid in heat removal from the package.

2. Ordering Information

Model	Order Number	Package	Package Option	Marking Information
COS4420	COS4420SR	SOP-8	Tape and Reel, 3000	COS4420SR
	COS4420FR	DFN-8	Tape and Reel, 3000	COS4420FR
	COS4420DR	DIP-8	Tube 50	COS4420DR
COS4429	COS4429SR	SOP-8	Tape and Reel, 3000	COS4429SR
	COS4429FR	DFN-8	Tape and Reel, 3000	COS4429FR
	COS4429DR	DIP-8	Tube 50	COS4429DR

3. Product Specification

3.1 Absolute Maximum Ratings (1)

Parameter	Min	Max	Unit
DC supply voltage V_{DD}		28	V
Operating junction temperature	-40	+125	°C
Storage temperature	-55	+150	°C
Maximum input voltage	GND-5	VDD+0.3	V

(1) Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

3.2 Thermal Data

Parameter	Rating	Unit
Package Thermal Resistance	155(SOP8) 125(DIP8) 118(FDN8,2x2)	°C/W

3.3 Recommended Operating Conditions

Parameter	Rating	Unit
DC Supply Voltage	4.5V ~ 25V	V
Operating ambient temperature	-40 to +125	°C

3.4 Electrical Characteristics

(Typical values are tested at T_A=25 ºC, V_{DD}=18V)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
INPUT						
Input Signal High Threshold	V_{IH}		1.6			V
Input Signal Low Threshold	V_{IL}				0.7	V
Input Signal Hysteresis	V_{HYS}			0.3		V
Input Signal High Current	I_{IH}	Inverting Input Current, V_{INX}=18V			0.01	µA
		Non-inverting Input Current, VI_{NX}=18V		88	125	
Input Signal High Current	I_{IL}	Inverting Input Current, V_{INX}=0V		88	125	µA
		Non-inverting Input Current, V_{INX}=0V			0.01	
OUTPUT						
High Output Voltage VOH	V_{OH}	DC Test	V_{DD} – 0.025			V
Low Output Voltage	V_{OL}	DC Test			0.025	V
Pull-Up Resistance	R_{OH}	Source Current = 10mA		1.25		Ω
Pull-Down Resistance	R_{OL}	Sink Current = -10mA		0.75		Ω
Peak Output Current	I_{PK}	10V≤ V_{DD} ≤18V		6.0		A
POWER SUPPLY						
Power Supply Current	I_{CC}	V_{IN}=3V		0.85		mA
		V_{IN}=0V		0.65		
Operating Voltage Range	V_{DD}		4.5		25	V
Under-Voltage Lockout ON Threshold				3.7	4.1	V
Under-Voltage Lockout Hysteresis				0.5		V
SWITCHING CHARACTERISTICS						
Rise Time	t_R	C_L =2500pF, See Figure 3		14		ns
Fall Time	t_F	CL =2500pF, See Figure 3		14		ns

Turn-On Delay Time	t_{D1}	COS4420		42		ns
		COS4429		44		ns
Turn-Off Delay Time	t_{D2}	COS4420		45		ns
		COS4429		44		ns
OVER-TEMPERATURE PROTECTION						
Thermal Shutdown Threshold				150		°C
Thermal Shutdown Threshold Hysteresis				25		°C

4. Application Information

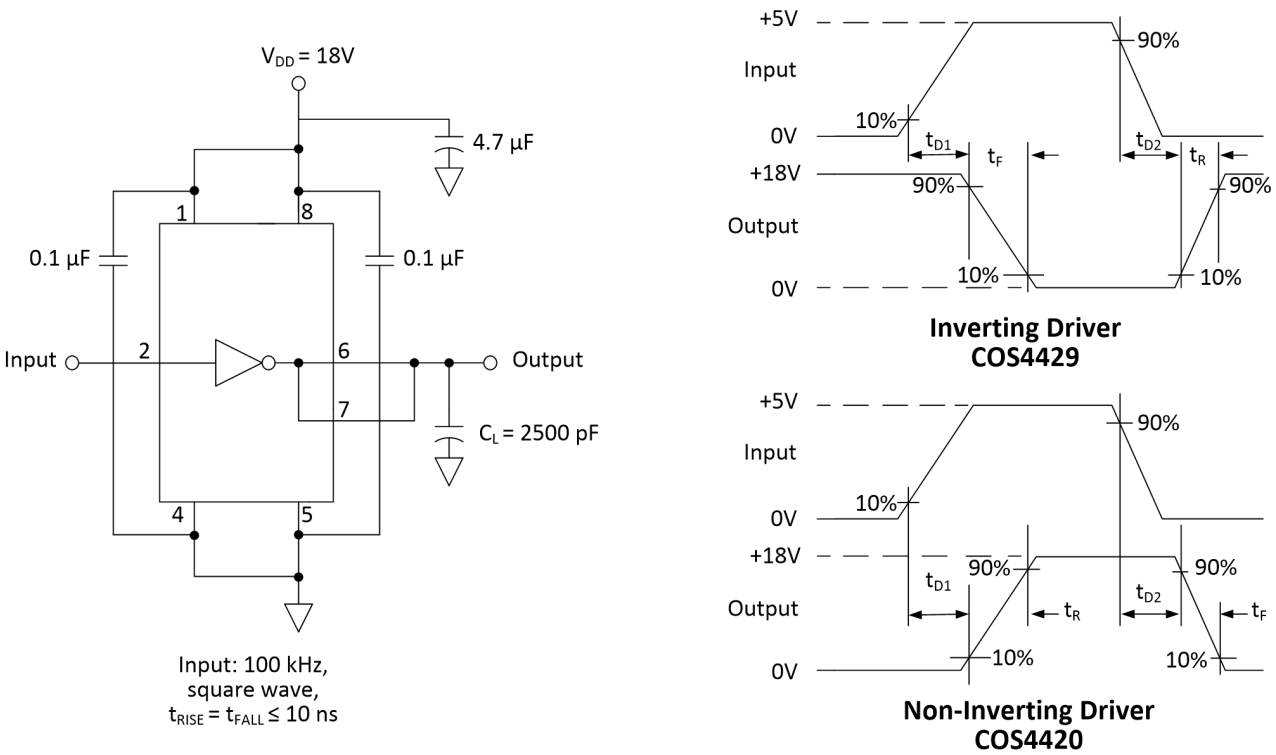
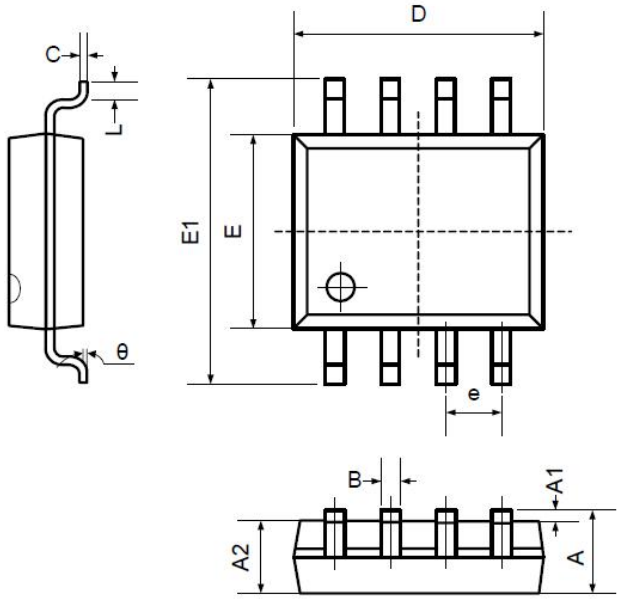


Figure 3. Switching Time Test Circuit

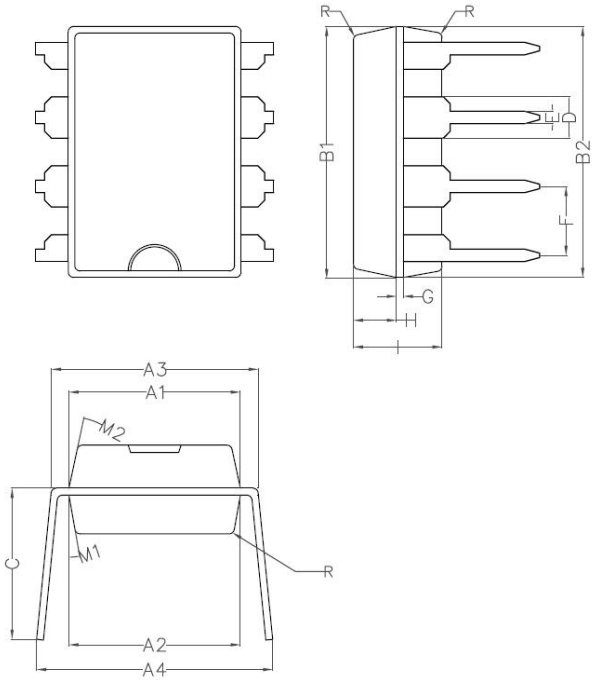
5. Package Information

5.1 SOP8 (Package Outline Dimensions)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
B	0.330	0.510	0.013	0.020
C	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

5.2 DIP8 (Package Outline Dimensions)



Symbol	Min	Non	Max
A1	6.28	6.33	6.38
A2	6.33	6.38	6.43
A3	7.52	7.62	7.72
A4	7.80	8.40	9.00
B1	9.15	9.20	9.25
B2	9.20	9.25	9.30
C		5.57	
D		1.52	
E	0.43	0.45	0.47
F		2.54	
G		0.25	
H	1.54	1.59	1.64
I	3.22	3.27	3.32
R		0.20	
M1	9°	10°	11°
M2	11°	12°	13°

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Gate Drivers ***category:***

Click to view products by COSINE ***manufacturer:***

Other Similar products are found below :

56956 57.404.7355.5 LT4936 57.904.0755.0 00600P0005 5951900000 0131700000 00-2240 LTP70N06 LVP640 5J0-1000LG-SIL LY2-US-AC240 LY3-UA-DC24 00576P0020 LZNQ2-US-DC12 LZP40N10 0207100000 0207400000 60100564 60249-1-CUT-TAPE 0134220000 6035 60713816 M15730061 61161-90 61278-0020 6131-204-23149P 6131-205-17149P 6131-209-15149P 6131-218-17149P 6131-220-21149P 6131-260-2358P 6131-265-11149P CS1HCPU63 6150300002 6150-5001 CSK-38-60006 CSK-38-60008 621A 622-4053LF 6273 M37730026 M40N08MA-H M55155/29XH06 64-807 65-1930-6 M82310002 CV500ISB02 M83723/88Y1407N CWD012-2