

**6A, High Speed MOSFET Drivers**

**FEATURES**

- Latch Up Protected >1.5A
- Logic Input Swing Negative 5V
- ESD 4kV
- Matched Rise And Fall Times 20ns
- Reverse Output Current
- High Peak Output Current..... 6A Peak
- Wide Operating Range..... 4.5V to 18V
- High Capacitive Load Drive..... 10,000pF
- Short Delay Time..... 20ns Typ
- Logic High Input, Any Voltage..... 2.4V to  $V_{DD}$
- Low Supply Current With Logic..... "1" Input 450 $\mu$ A
- Output Voltage Swing to Within 25mV of Ground or  $V_{DD}$
- Pin Out Same as AS429

**APPLICATIONS**

- Motor Controls
- Switch-Mode Power Supplies
- Pulse Transformer Driver
- Class D Switching Amplifiers

**PRODUCT DESCRIPTION**

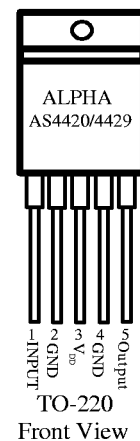
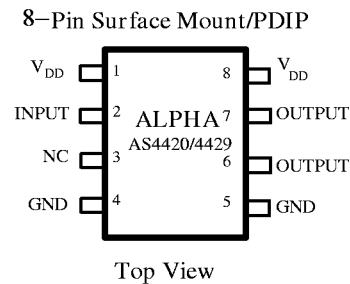
The ALPHA Semiconductor AS4420 and AS4429 family operates over 4.5V to 18V, can withstand high current peaking of 6A and have matched rise and fall times under 25ns. The product has been designed utilizing ALPHA Semiconductor's rugged CMOS process with protection for latch up and ESD. The product is available in inverting (AS4429) and noninverting (AS4420) configurations.

**ORDERING INFORMATION**

Part Number	Package Type	Logic
AS4420XS	8-Pin SOIC	Noninverting
AS4420XU	5-Pin TO-220	Noninverting
AS4420XP	8-Pin PDIP	Noninverting
AS4429XS	8-Pin SOIC	Inverting
AS4429XU	5-Pin TO-220	Inverting
AS4429XP	8-Pin PDIP	Inverting

X= I Industrial; C Commercial; M Military

**PIN CONNECTIONS**



## ABSOLUTE MAXIMUM RATINGS

Supply Voltage.....	+20V
Input Voltage.....	-5V to >V <sub>DD</sub>
Input Current (V <sub>IN</sub> > V <sub>DD</sub> ).....	50mA
Power Dissipation, T <sub>A</sub> ≤ 25°	
PDIP .....	1W
SOIC .....	500mW
5-Pin TO-220 .....	1.5W
Power Dissipation, T <sub>C</sub> ≤ 25°C	
5-Pin TO-220 .....	12.5W
Derating Factors (To Ambient)	
PDIP .....	8mW/°C
SOIC .....	4mW/°C
5-Pin TO-220 .....	12mW/°C

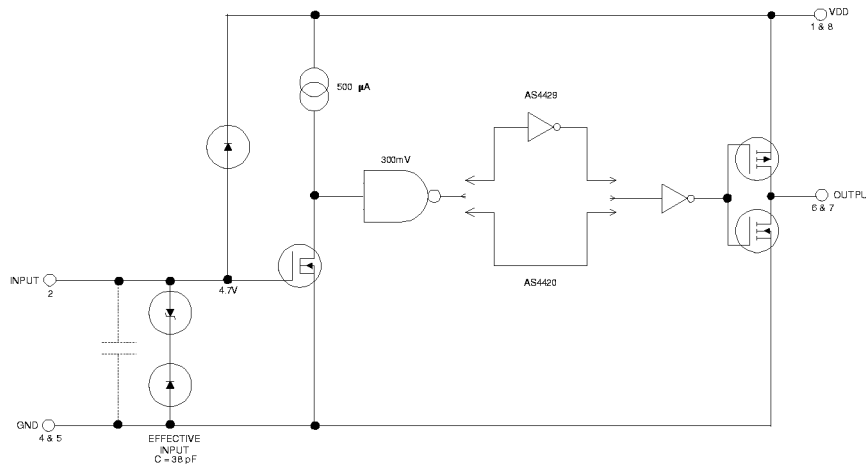
## Thermal Impedances (To Case)

5-Pin TO-220 R <sub>θJA</sub> .....	10°C/W
Storage Temperature Range.....	-55°C to +150°C
Operating Temperature (Chip) .....	+150°C
Operating Temperature Range (Ambient)	
C Version .....	0°C to +70°C
I Version .....	-40°C to +85°C
Lead Temperature (Soldering, 10 sec).....	+300°C

## ELECTRICAL CHARACTERISTICS: T<sub>A</sub> = +25°C with 4.5V ≤ V<sub>DD</sub> ≤ 18V, unless otherwise specified.

Parameter	Conditions	Min	Typ	Max	Units
<b>INPUT</b>					
Logic 1 High Input Voltage		2.4	1.8		V
Logic 0 Low Input Voltage			1.3	0.8	V
Input Voltage Range		-5		V <sub>DD</sub> +0.3	
Input Current	0V ≤ V <sub>IN</sub> ≤ V <sub>DD</sub>	-10		10	μA
<b>OUTPUT</b>					
High Output Voltage	See Figure 1	V <sub>DD</sub> -0.025			V
Low Output Voltage	See Figure 1			.025	V
Output Resistance, High	I <sub>OUT</sub> = 10mA, V <sub>DD</sub> = 18V		2.1	2.8	Ω
Output Resistance, Low	I <sub>OUT</sub> = 10mA, V <sub>DD</sub> = 18V		1.5	2.5	Ω
Peak Output Current	V <sub>DD</sub> = 18V (See Figure 5)		6		A
Latch-Up Protection Withstand Reverse Current	Duty Cycle ≤ 2% t ≤ 300μA	>1.5			A
<b>SWITCHING TIME (Note 1)</b>					
Rise Time	Figure 1, C <sub>L</sub> = 2500pF		25	35	ns
Fall Time	Figure 1, C <sub>L</sub> = 2500pF		25	35	ns
Delay Time	Figure 1		20	40	ns
Delay Time	Figure 1		20	40	ns
<b>POWER SUPPLY</b>					
Power Supply Current	V <sub>IN</sub> = 3V V <sub>IN</sub> = 0V		1 55	1.5 150	mA μA
Operating Input Voltage		4.5		18	V

## BLOCK DIAGRAM



**ELECTRICAL CHARACTERISTICS:** Measured over operating temperature range with  $4.5V \leq V_{DD} \leq 18V$ , unless otherwise specified.

Parameter	Conditions	Min	Typ	Max	Units
<b>INPUT</b>					
Logic 1 High Input Voltage		2.4			V
Logic 0 Low Input Voltage				0.8	V
Input Voltage Range		-5		$V_{DD}+0.3$	V
Input Current	$0V \leq V_{IN} \leq V_S$	-10		10	$\mu A$
<b>OUTPUT</b>					
High Output Voltage	See Figure 1	$V_{DD}-0.025$			V
Low Output Voltage	See Figure 1			.025	V
Output Resistance, High	$I_{OUT} = 10mA, V_{DD} = 18V$		3	5	$\Omega$
Output Resistance, Low	$I_{OUT} = 10mA, V_{DD} = 18V$		2.3	5	$\Omega$
<b>SWITCHING TIME (Note 1)</b>					
Rise Time	Figure 1, $C_L = 2500pF$		35	60	ns
Fall Time	Figure 1, $C_L = 2500pF$		34	60	ns
Delay Time	Figure 1		20	50	ns
Delay Time	Figure 1		20	50	ns
<b>POWER SUPPLY</b>					
Power Supply Current	$V_{IN} = 3V$ $V_{in} = 0V$		1 60	3 400	mA $\mu A$
Operating Input Voltage		4.5		18	V

Note: 1. Switching times guaranteed by design.

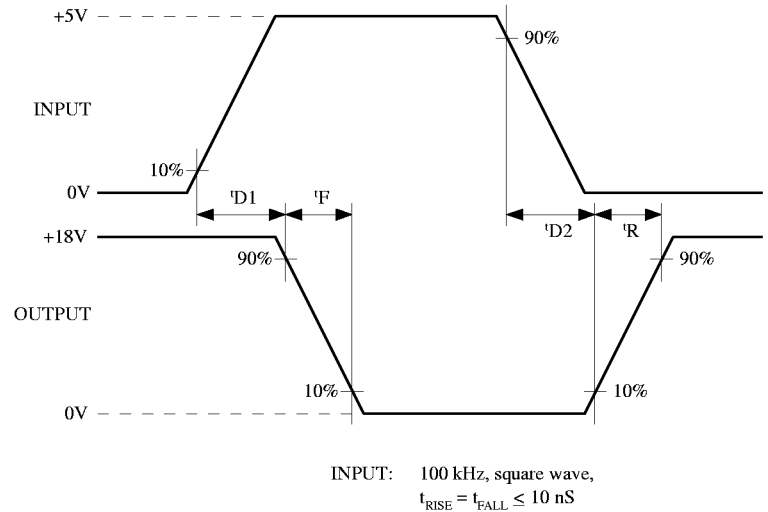
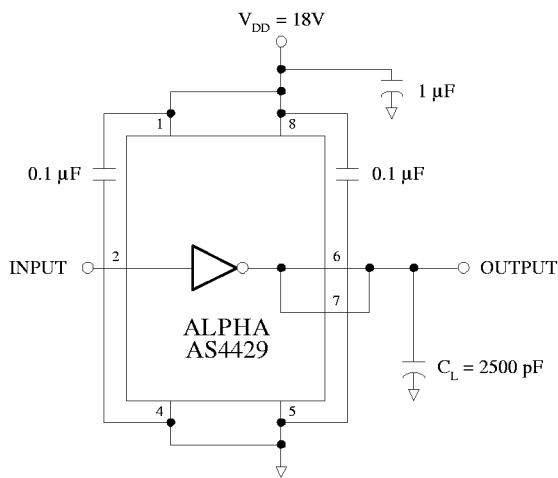
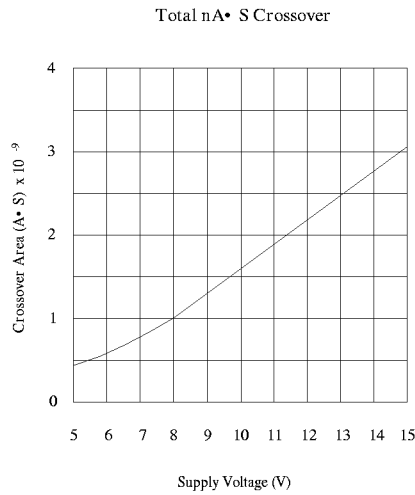
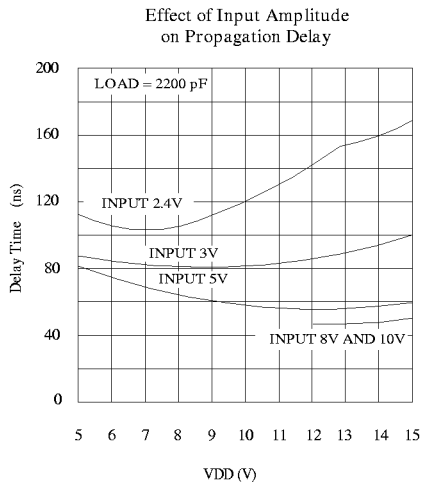
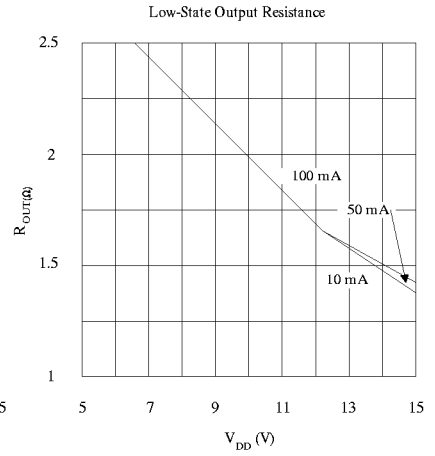
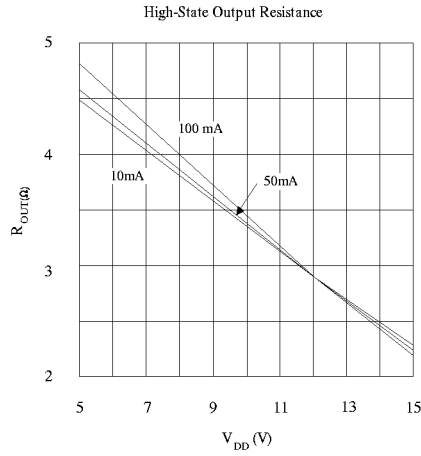
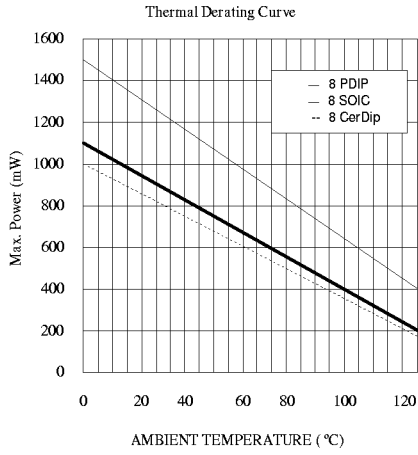


Figure 1. Switching Time Test Circuit

## TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS (Cont.)

