calogic
CORPORATION

High Speed MOSFET Drivers

Preliminary Product Announcement

CA4420 / CA4429

FEATURES

- **Latch Up Protected** ..... **>1.5A**
- **Logic Input Swing** ..... **Negative 5V**
- **ESD** **4kV**
- **Matched Rise and Fall Times** **20ns**

APPLICATIONS

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

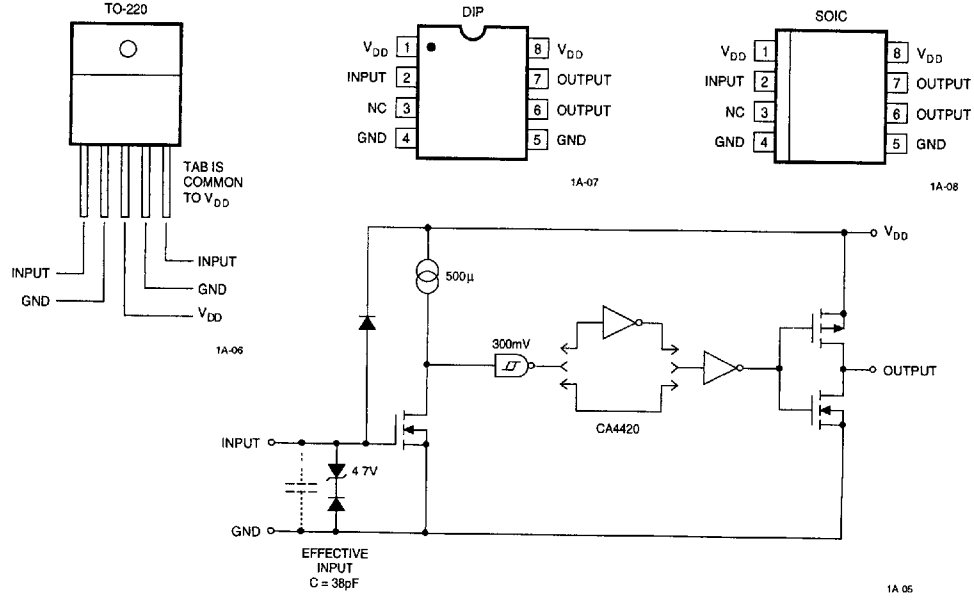
DESCRIPTION

The CA4420 and CA4429 family operate 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 Calogic's rugged CMOS process with protection for latch up and ESD. The product is available in inverting (CA4429) and noninverting (CA4420) configurations.

ORDERING INFORMATION

Part#	Logic	Package	Temperature Range
CA4420	Noninverting	8-Pin PDIP	0°C to +70°C
CA4420	Noninverting	8-Pin PDIP	-40°C to +85°C
CA4420	Noninverting	8-Pin SOIC	0°C to +70°C
CA4420	Noninverting	8-Pin SOIC	-40°C to +85°C
CA4420	Noninverting	5-Pin TO-220	0°C to +70°C
CA4429	Inverting	8-Pin PDIP	0°C to +70°C
CA4429	Inverting	8-Pin PDIP	-40°C to +85°C
CA4429	Inverting	8-Pin SOIC	0°C to +70°C
CA4429	Inverting	8-Pin SOIC	-40°C to +85°C
CA4429	Inverting	5-Pin TO-220	0°C to 70°C

FUNCTIONAL DIAGRAM AND PIN CONFIGURATIONS



ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... +20V
Input Voltage ..... -5V to >V_{DD}
Input Current (V_{IN} > V_{DD}) 50mA
Power Dissipation, $T_A \leq 25^{\circ}C$
PDIP 1W
SOIC 500mW
5-Pin TO-220 ..... 1.5W
Power Dissipation $T_C \leq 25^{\circ}C$
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 $R_{\theta J-A}$ ..... 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 ..... -25°C to +85°C
E Version ..... -40°C to +85°C
Lead Temperature (Soldering, 10 sec) ..... +300°C

Static-sensitive device. Unused devices must be stored in conductive material. Protect devices from static discharge and static fields. Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operation sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended-periods may affect device reliability.

ELECTRICAL CHARACTERISTICS: $T_A = +25^{\circ}C$ with $4.5V \leq V_{DD} \leq 18V$, unless otherwise specified.

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT	TEST CONDITIONS
INPUT						
V_{IH}	Logic 1 High Input Voltage	2.4	1.8		V	
V_{IL}	Logic 0 Low Input Voltage		1 3	0 8	V	
V_{IN} (Max)	Input Voltage Range	-5		V_{DD}+0.3	V	
I_{IN}	Input Current	-10		10	µA	$0V \leq V_{IN} \leq V_{DD}$
OUTPUT						
V_{OH}	High Output Voltage	V_{DD}-0.025			V	See Figure 1
V_{OL}	Low Output Voltage			0.025	V	See Figure 1
R_O	Output Resistance, High		2.1	2.8	Ω	I_{OUT} = 10mA, V_{DD} = 18V
R_O	Output Resistance, Low		1.5	2.5	Ω	I_{OUT} = 10mA, V_{DD} = 18V
I_{PK}	Peak Output Current		6		A	V_{DD} = 18V (See Figure 5)
I_{REV}	Latch-Up Protection Withstand Reverse Current	>1.5			A	Duty Cycle ≤ 2% t ≤ 300µA
SWITCHING TIME (Note 1)						
t_R	Rise Time		25	35	ns	Figure 1, C_L = 2500pF
t_F	Fall Time		25	35	ns	Figure 1, C_L = 2500pF
t_{D1}	Delay Time		20	40	ns	Figure 1
t_{D2}	Delay Time		20	40	ns	Figure 1
POWER SUPPLY						
I_S	Power Supply Current		1 55	1.5 150	mA µA	V_{IN} = 3V V_{IN} = 0V
V_{DD}	Operating Input Voltage	4.5		18	V	

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT	TEST CONDITIONS
INPUT						
V_{IH}	Logic 1 High Input Voltage	2.4			V	
V_{IL}	Logic 0 Low Input Voltage			0.8	V	
V_{IN} (Max)	Input Voltage Range	-5		V_{DD}+0.3	V	
I_{IN}	Input Current	-10		10	µA	$0V \le V_{IN} \le V_S$
OUTPUT						
V_{OH}	High Output Voltage	V_{DD}-0.025			V	See Figure 1
V_{OL}	Low Output Voltage			0.025	V	See Figure 1
R_O	Output Resistance, High		3	5	Ω	I_{OUT} = 10mA, V_{DD} = 18V
R_O	Output Resistance, Low		2.3	5	Ω	I_{OUT} = 10mA, V_{DD} = 18V
SWITCHING TIME (Note 1)						
t_R	Rise Time		32	60	ns	Figure 1, C_L = 2500pF
t_F	Fall Time		34	60	ns	Figure 1, C_L = 2500pF
t_{D1}	Delay Time		20	50	ns	Figure 1
t_{D2}	Delay Time		20	50	ns	Figure 1
POWER SUPPLY						
I_S	Power Supply Current		1 60	3 400	mA µA	V_{IN} = 3V V_{IN} = 0V
V_{DD}	Operating Input Voltage	4.5		18	V	

Note: 1. Switching times guaranteed by design.

FIGURE 1. SWITCHING TIME TEST CIRCUIT