



## DESCRIPTION

The AG8424 is a matched dual power MOSFET driver designed for high-speed switching applications. Its advanced circuit architecture enables it to deliver peak currents up to 4A into capacitive loads as large as 1800pF, making it ideal for fast and efficient power switching.

A key feature of the AG8424 is its matched rise and fall delay times, which preserve input-to-output pulse widths. This helps minimize timing errors and clock skew, ensuring accurate signal integrity in high-speed digital systems.

The device incorporates non-overlapping drive techniques to reduce dynamic switching losses. It also offers high immunity to latch-up within its specified power and voltage ratings and can tolerate ground pin noise spikes of up to 5V without damage.

The inputs are compatible with TTL and CMOS logic levels across a wide input voltage range of 1.6V to 25V. Integrated 300mV hysteresis enhances noise immunity and allows reliable operation even with slow input signal transitions.

The AG8424 is available in SOP8 package

## ORDERING INFORMATION

| Package Type                   | Part Number                                                |            |
|--------------------------------|------------------------------------------------------------|------------|
| SOP8<br>SPQ: 4,000pcs/Reel     | M8                                                         | AG8424M8VR |
| Note                           | V: Halogen free Package<br>R: Tape & Reel ; U: Tape & Tube |            |
| AiT provides all RoHS products |                                                            |            |

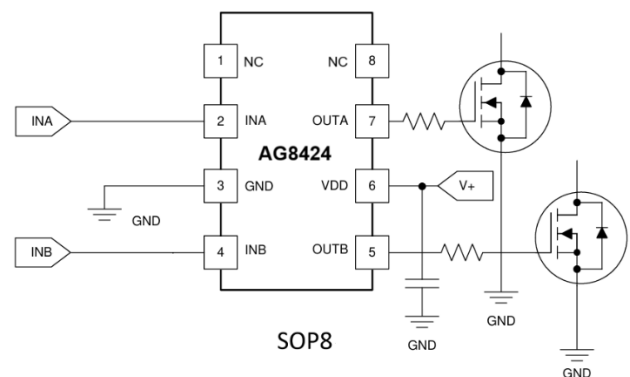
## FEATURES

- High Peak Output Current: 4A
- Wide Supply Voltage Range: 4.5V to 25V
- High Capacitive Load Drive Capability: 1800pF in 12ns (typical)
- Short Propagation Delay: 36ns (typical)
- Matched Rise and Fall Times
- Low Output Impedance: 1.6Ω (typical)
- Low Quiescent Supply Current
- Over-Temperature Protection
- Under-Voltage Lockout (UVLO)
- Non-Overlapped Drive Technique
- Input Tolerance: Withstands negative transients up to 5V

## APPLICATION

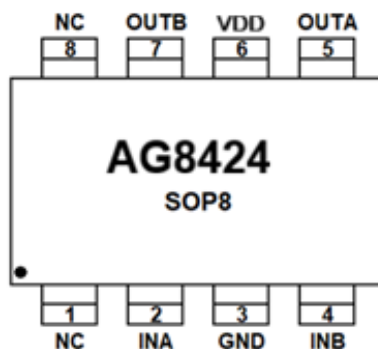
- Switch Mode Power Supplies
- Power MOSFET Drivers
- Pulse Transformer Drivers
- Line Drivers
- CCD Driver
- Class D Switching Amplifier

## TYPICAL APPLICATION





## PIN DESCRIPTION



SOP8, M8

Top View

| Pin# | Symbol          | Function                         |
|------|-----------------|----------------------------------|
| SOP8 |                 |                                  |
| 1    | NC              | No Connection                    |
| 2    | INA             | Input A                          |
| 3    | GND             | Ground                           |
| 4    | INB             | Input B                          |
| 5    | OUTB            | Output of Channel B              |
| 6    | V <sub>DD</sub> | Power Supply                     |
| 7    | OUTA            | Output of Channel A              |
| 8    | NC              | No Connection                    |
| -    | PAD             | Exposed Metal Pad of DFN package |

**ABSOLUTE MAXIMUM RATINGS**

T<sub>A</sub> = 25°C, unless otherwise specified.

|                                |      |                                |
|--------------------------------|------|--------------------------------|
| Vs, DC Supply Voltage          |      | 26V                            |
| Package Thermal Resistance     | SOP8 | 155°C/W                        |
| Operating Junction Temperature |      | -40°C~+125°C                   |
| Storage Temperature            |      | -55°C ~ +150°C                 |
| Maximum Input Voltage          |      | GND-5V ~ V <sub>DD</sub> +0.3V |

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**RECOMMENDED WORKING RANGE**

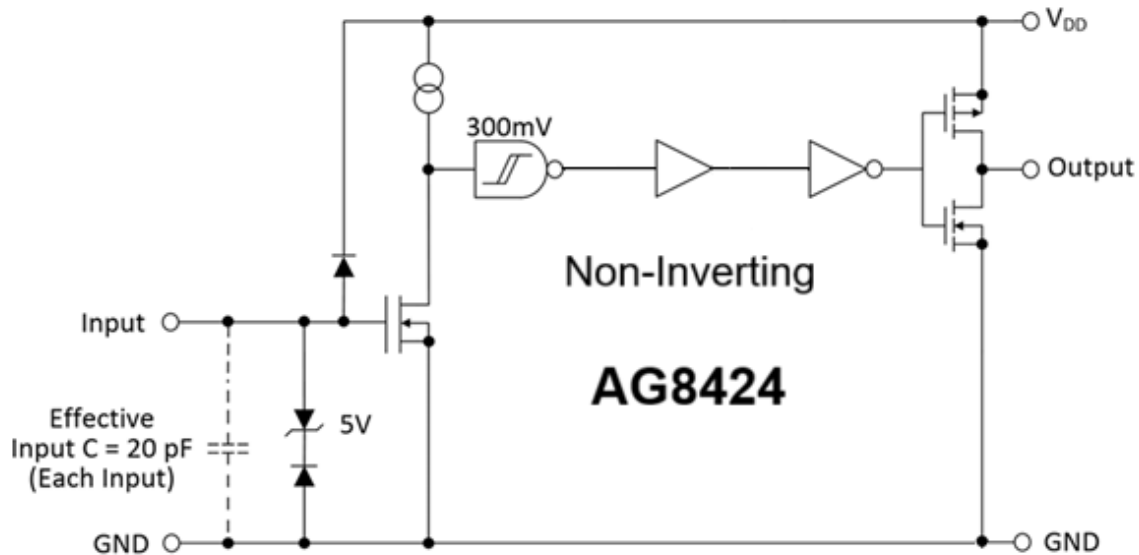
|                         |         |
|-------------------------|---------|
| DC Supply Voltage       | 4.5~25V |
| INA, INB, Input Voltage | 5V      |
| Max Output Current      | 4A      |

**ELECTRICAL CHARACTERISTICS**T<sub>A</sub> = 25°C, V<sub>DD</sub>=18V, unless otherwise specified

| Parameter                             | Symbol           | Conditions                                | Min.                       | Typ. | Max.  | Unit |
|---------------------------------------|------------------|-------------------------------------------|----------------------------|------|-------|------|
| INPUT                                 |                  |                                           |                            |      |       |      |
| Input Signal High Threshold           | V <sub>IH</sub>  | T <sub>J</sub> =25°C, I <sub>O</sub> =1mA | 1.60                       | -    | -     | V    |
| Input Signal Low Threshold            | V <sub>IL</sub>  | 12≤V <sub>IN</sub> ≤25V                   | -                          | -    | 0.70  | V    |
| Input Signal Hysteresis               | V <sub>HYS</sub> | 1≤I <sub>O</sub> =20mA                    | -                          | 0.30 | -     | V    |
| Input Current                         | I <sub>IN</sub>  | 0V ≤ V <sub>IN</sub> ≤ V <sub>DD</sub>    | -                          | -    | ±1    | μA   |
| OUTPUT                                |                  |                                           |                            |      |       |      |
| High Output Voltage V <sub>OH</sub>   | V <sub>OH</sub>  | DC Test                                   | V <sub>DD</sub> -<br>0.025 | -    | -     | V    |
| Low Output Voltage                    | V <sub>OL</sub>  | DC Test                                   | -                          | -    | 0.025 | V    |
| Pull-Up Resistance                    | R <sub>OH</sub>  | Source Current=10mA                       | -                          | 1.60 | -     | Ω    |
| Pull-Down Resistance                  | R <sub>OL</sub>  | Sink Current= -10mA                       | -                          | 1.50 | -     | Ω    |
| Peak Output Current                   | I <sub>PK</sub>  | 10V ≤ V <sub>DD</sub> ≤18V                | -                          | 4.00 | -     | A    |
| POWER SUPPLY                          |                  |                                           |                            |      |       |      |
| Power Supply Current                  | I <sub>CC</sub>  | V <sub>INA</sub> =V <sub>INB</sub> =3V    | -                          | 0.90 | -     | mA   |
|                                       |                  | V <sub>INA</sub> =V <sub>INB</sub> =0V    | -                          | 0.50 | -     |      |
| Operating Voltage Range               | V <sub>DD</sub>  | -                                         | 4.50                       | -    | 25    | V    |
| Under-Voltage Lockout ON Threshold    | -                | -                                         | -                          | 3.70 | 4.10  | V    |
| Under-Voltage Lockout Hysteresis      | -                | -                                         | -                          | 0.50 | -     | V    |
| SWITCHING CHARACTERISTICS             |                  |                                           |                            |      |       |      |
| Rise Time                             | t <sub>R</sub>   | C <sub>L</sub> =1800pF,<br>See Figure 1   | -                          | 12   | -     | ns   |
| Fall Time                             | t <sub>F</sub>   | C <sub>L</sub> =1800pF,<br>See Figure 1   | -                          | 12   | -     |      |
| Turn-On Delay Time                    | t <sub>D1</sub>  | Non-Inverting Input                       | -                          | 36   | -     |      |
|                                       |                  | Inverting Input                           | -                          | 35   | -     |      |
| Turn-On Delay Time                    | t <sub>D2</sub>  | Non-Inverting Input                       | -                          | 36   | -     |      |
|                                       |                  | Inverting Input                           | -                          | 35   | -     |      |
| OVER-TEMPERATURE PROTECTION           |                  |                                           |                            |      |       |      |
| Thermal Shutdown Threshold            | -                | -                                         | -                          | 150  | -     | °C   |
| Thermal Shutdown Threshold Hysteresis | -                | -                                         | -                          | 25   | -     | °C   |



## BLOCK DIAGRAM



## DETAILED INFORMATION

### FUNCTION TABLE

| INA | INB | OUTA | OUTB |
|-----|-----|------|------|
| L   | L   | L    | L    |
| L   | H   | L    | H    |
| H   | L   | H    | L    |
| H   | H   | H    | H    |

### Inputs A and B

MOSFET driver inputs A and B are high-impedance, TTL/CMOS compatible inputs. These inputs also have 300mV 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.



## Ground (GND)

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

## Output A and B

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

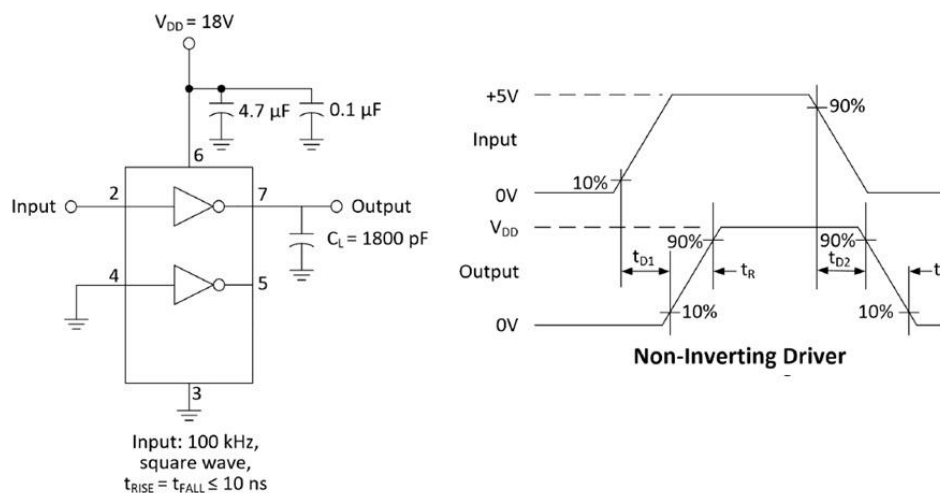
## Supply Input ( $V_{DD}$ )

The  $V_{DD}$  input is the bias supply for the MOSFET driver and is rated for 4.5V to 25V concerning the Ground pin. The  $V_{DD}$  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 $\mu$ F is suggested.

## Exposed Metal Pad

The exposed metal pad of the DFN-S package is electrically isolated (not internally connected to any potential). It may be connected to a ground plane or any other copper plane on the PCB to enhance thermal dissipation and improve overall heat removal from the package.

## APPLICATION INFORMATION

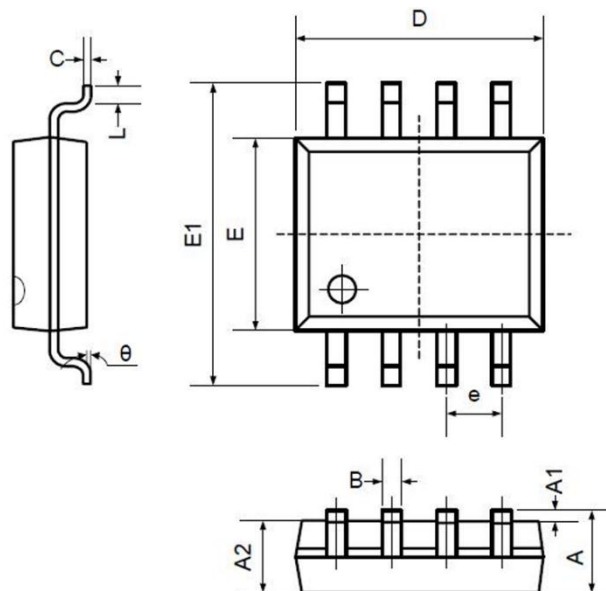


**Figure 1. Switching Time Test Circuit**



## PACKAGE INFORMATION

Dimension in SOP8 (Unit: mm)



| Symbol | Min.       | Max.  |
|--------|------------|-------|
| A      | 1.350      | 1.750 |
| A1     | 0.100      | 0.250 |
| A2     | 1.350      | 1.550 |
| B      | 0.330      | 0.510 |
| C      | 0.190      | 0.250 |
| D      | 4.780      | 5.000 |
| E      | 3.800      | 4.000 |
| E1     | 5.800      | 6.300 |
| e      | 1.270 TYP. |       |
| L      | 0.400      | 1.270 |
| θ      | 0°         | 8°    |



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