

### Description

UMW TC4424AVOA713 is power switch driver. It has a matching rise and fall time when charging and discharging the gate of the power switch.

UMW TC4424AVOA713 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 UMW TC4424AVOA713 is not damaged. UMW TC4424AVOA713 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).

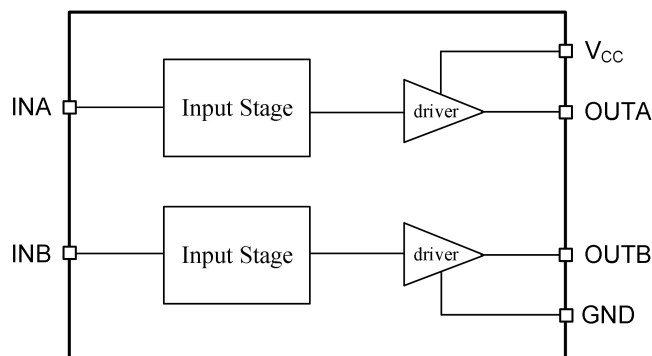
### Features

- 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
- 4-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:
  - Ton/Toff =25ns/25ns

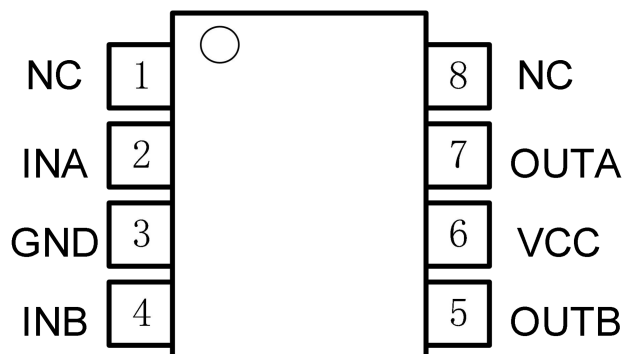
### Applications

- 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

### Pin Configuration



## Pin Configuration and Functions



8-Pin SOIC8 Package Top View

Pin Functions

| 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   | $\overline{\text{OUTB}}$ | Output of Channel B                             |
| 6   | VCC                      | Bias supply input                               |
| 7   | $\overline{\text{OUTA}}$ | Output of Channel A                             |
| 8   | NC                       | --                                              |

## 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 °C.

| Symbol          | Definition                     | MIN    | MAX                  | UNIT |
|-----------------|--------------------------------|--------|----------------------|------|
| V <sub>CC</sub> | Supply voltage range           | —      | 25                   | V    |
| V <sub>IN</sub> | INA, INB voltage               | GND-10 | V <sub>CC</sub> +0.3 |      |
| ESD             | Human body model (HBM)         | —      | 2000                 | V    |
|                 | Charged device model (CDM)     | —      | 500                  | V    |
| PD              | SOIC package power (TA ≤70°C)  | —      | 470                  | mW   |
| T <sub>J</sub>  | Operating junction temperature | —      | +150                 | °C   |
| T <sub>S</sub>  | Storage temperature            | -45    | +150                 |      |
| V <sub>CC</sub> | Supply voltage range           | 4.5    | 20                   | V    |
| T <sub>C</sub>  | ambient temperature            | -40    | 125                  | °C   |

## Electrical Characteristics

TA= 25℃, VCC=15V(unless otherwise noted)

| Symbol           | Definition                                                                     | MIN       | TYP  | MAX   | UNIT |
|------------------|--------------------------------------------------------------------------------|-----------|------|-------|------|
| V <sub>IH</sub>  | Input signal high threshold                                                    | 2.4       | —    | —     | V    |
| V <sub>IL</sub>  | Input signal low threshold                                                     | —         | —    | 0.8   | V    |
| I <sub>IN+</sub> | Input current(V <sub>IN</sub> =5V)                                             | —         | 50   | —     | μA   |
| I <sub>IN-</sub> | Input current(V <sub>IN</sub> =0V)                                             | —         | —    | 1     | μA   |
| V <sub>OH</sub>  | High output voltage                                                            | VCC-0.025 | —    | —     | V    |
| V <sub>OL</sub>  | Low output voltage                                                             | —         | —    | 0.025 | V    |
| R <sub>OH</sub>  | Output pullup resistance(I <sub>O</sub> =100mA)                                | —         | 0.7  | —     | Ω    |
| R <sub>OL</sub>  | Output pulldown resistance(I <sub>O</sub> =100mA)                              | —         | 0.4  | —     | Ω    |
| I <sub>PK</sub>  | Peak output source current                                                     | —         | 4    | —     | A    |
| I <sub>REV</sub> | Reverse current that latch protection can withstand(Working cycle≤2%, t≤300us) | —         | >0.5 | —     | A    |
| t <sub>R</sub>   | Rise time(C <sub>LOAD</sub> =1800pF)                                           | —         | —    | 10    | ns   |
| t <sub>F</sub>   | Fall time(C <sub>LOAD</sub> =1800pF)                                           | —         | —    | 10    | ns   |
| t <sub>ON</sub>  | Turn-on propagation delay(C <sub>LOAD</sub> =1800pF)                           | —         | 25   | 35    | ns   |
| t <sub>OFF</sub> | Turn-off propagation delay(C <sub>LOAD</sub> =1800pF)                          | —         | 25   | 35    | ns   |
| I <sub>Q1</sub>  | VCC quiescent supply current(V <sub>INA</sub> =V <sub>INB</sub> =HIGH)         | —         | —    | 1     | mA   |
| I <sub>Q0</sub>  | VCC quiescent supply current(V <sub>INA</sub> =V <sub>INB</sub> =LOW)          | —         | —    | 1     | mA   |

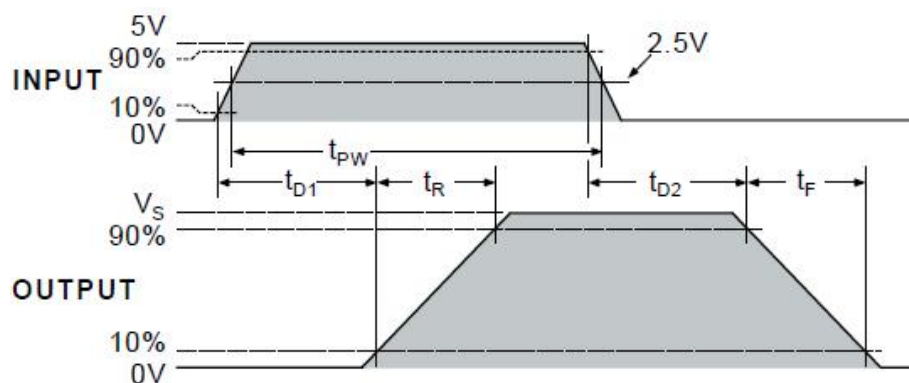
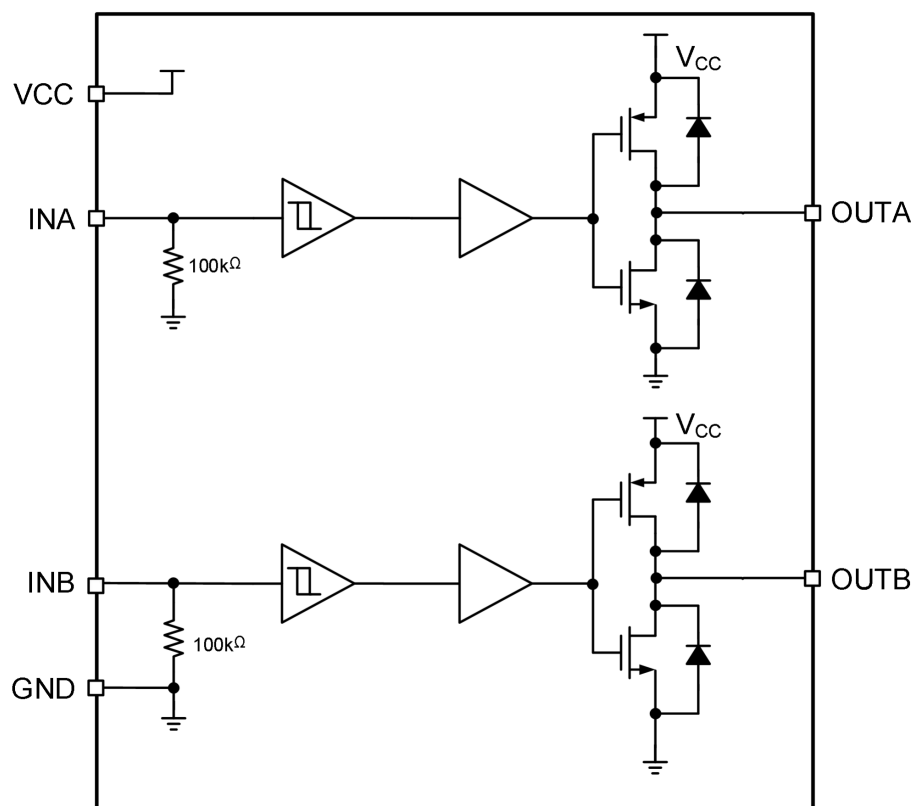


Figure 1 Input-Output waveform(non-inverting)

## Functional Block Diagram



## Typical Application

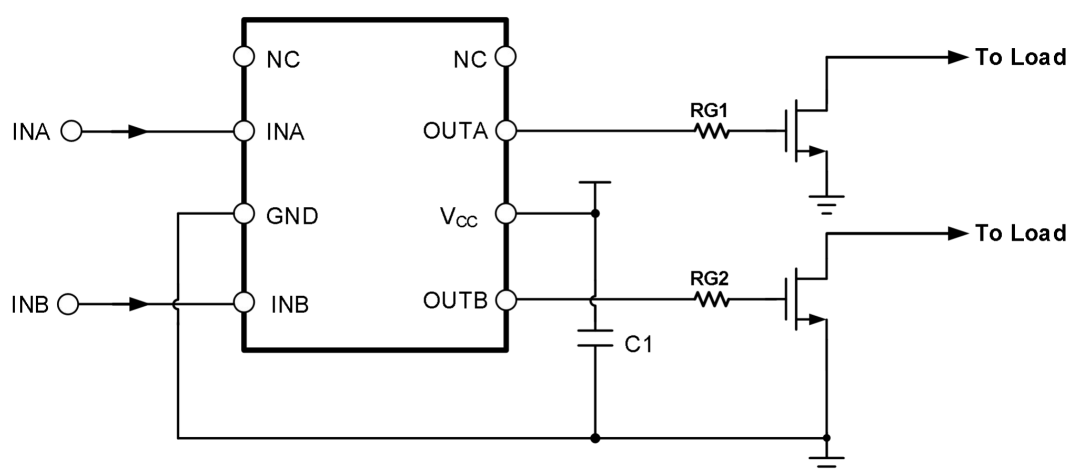
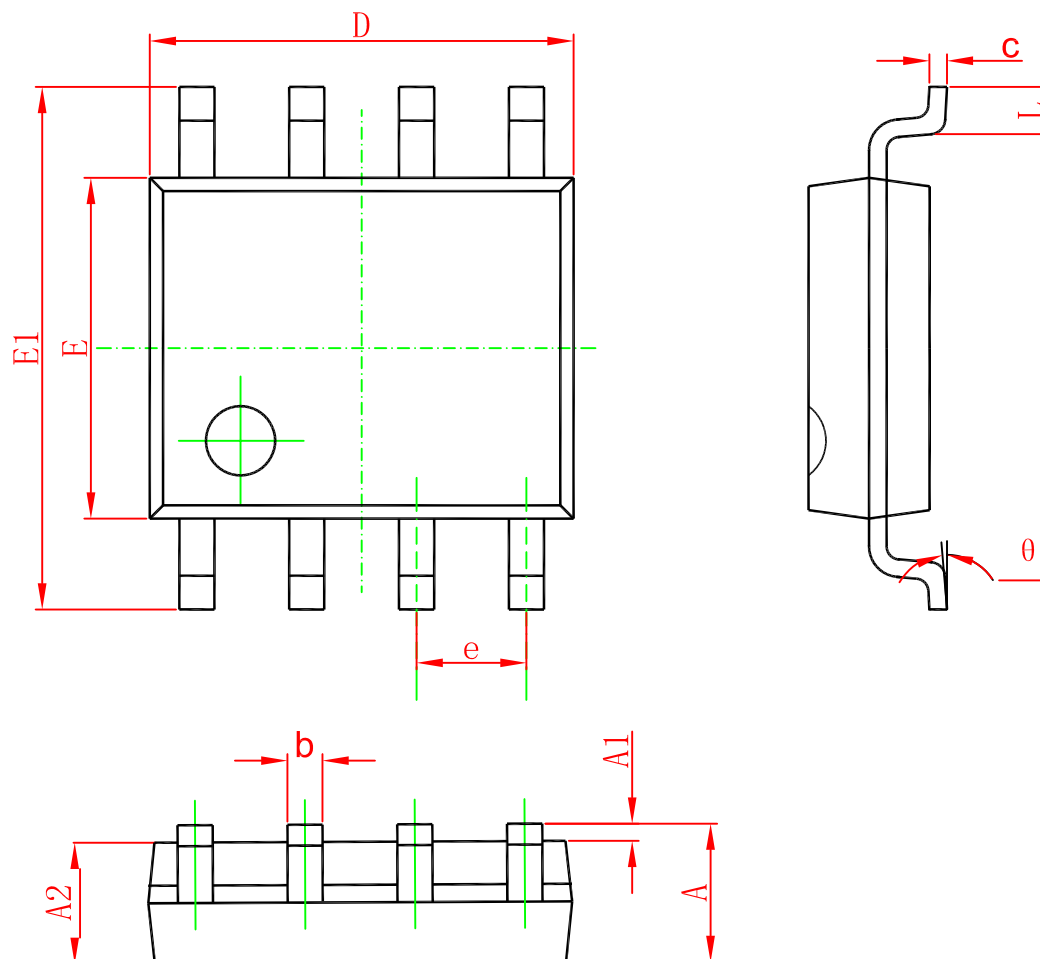


Figure 2 Typical Application Diagram of TC4424AVOA713

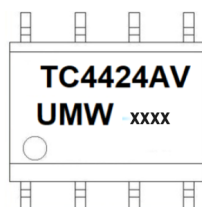
# PACKAGING INFORMATION

## SOP-8



| 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      | 0.170                     | 0.250 | 0.006                | 0.010 |
| D      | 4.700                     | 5.100 | 0.185                | 0.200 |
| E      | 3.800                     | 4.000 | 0.150                | 0.157 |
| E1     | 5.800                     | 6.200 | 0.228                | 0.244 |
| e      | 1.270(BSC)                |       | 0.050(BSC)           |       |
| L      | 0.400                     | 1.270 | 0.016                | 0.050 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

## Marking



## Ordering information

| Order code        | Package | Baseqty | Deliverymode  |
|-------------------|---------|---------|---------------|
| UMW TC4424AVOA713 | SOP-8   | 2500    | Tape and reel |

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