



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

LV8018W Bi-CMOS IC For Portable MD 4ch PWM H-bridge Driver

Overview

The LV8018W is 4-channel PWM-drive H-bridge driver for portable MD.

Functions

- 4-channel PWM-drive H-bridge driver.
- Built-in charge pump circuit.
- Built-in thermal shutdown circuit.

Specifications

Absolute Maximum Ratings at Ta = 25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------------------|---------------------|----------------|-------------|------|
| Supply voltage (Output block) | VBAT max | | 7 | V |
| Supply voltage (Control block) | V _{CC} max | | 7 | V |
| Predrive voltage (gate voltage) | VG max | | 9.5 | V |
| Maximum output current (ch1-ch4) | I _O max | | 500 | mA |
| Allowable power dissipation | Pd max | Independent IC | 0.5 | W |
| Operating temperature | T _{opr} | | -20 to +85 | °C |
| Storage temperature | T _{stg} | | -55 to +150 | °C |

Operating Ratings at Ta = 25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---------------------|------------|---------|------|
| Recommended supply voltage (Output block) | VBAT max | | 7 | V |
| Recommended supply voltage (Control block) | V _{CC} max | | 7 | V |
| Predrive voltage (gate voltage) | VG max | | 9.5 | V |

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LV8018W

Electrical Characteristics at Ta = 25°C, VCC1, 2 = 3.0V, VBAT = 3.0V

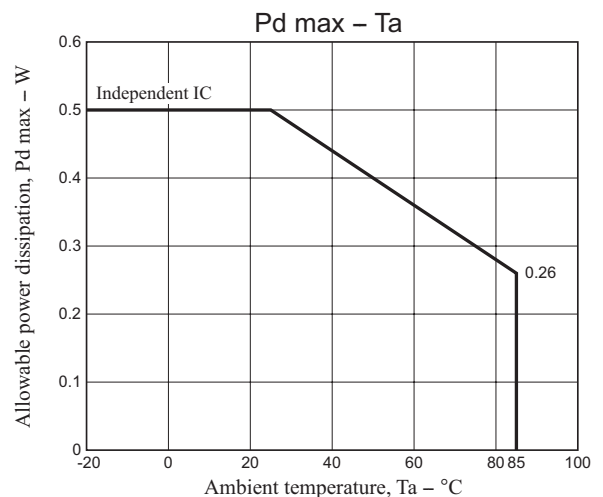
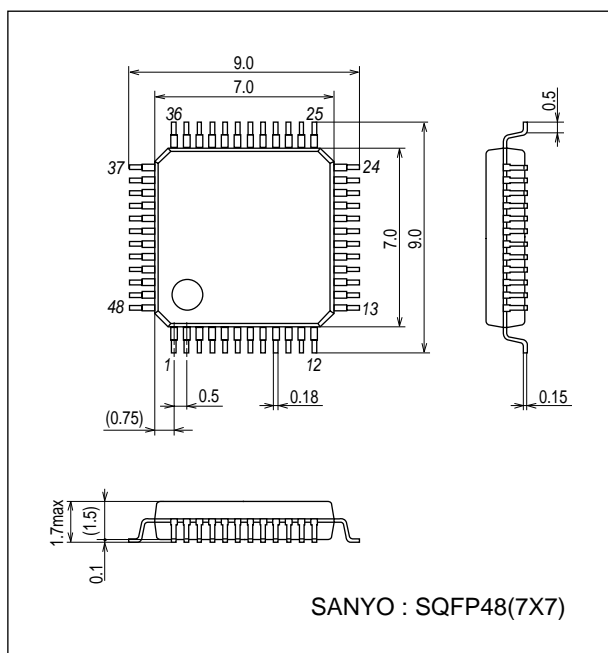
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---------------------------|--|-----------------------|------------------|------------------|------|
| | | | min | typ | max | |
| Standby current dissipation | I _{CCO} | | | | 10 | μA |
| Current dissipation | I _{CC} (A) | V _G OFF = "L" | | 1.4 | 1.9 | mA |
| | I _{CC} (B) | V _G OFF = "H" | | 1.0 | 1.5 | mA |
| Pre-drive block current dissipation | I _{GO} | V _G = 7V, each logic input = "L" | | 70 | 105 | μA |
| | I _G | V _G = 7, input frequency 88kHz | | 1.0 | 1.5 | mA |
| S/S bias current | I _{SS} | S/S = 3.0V | | 80 | 120 | μA |
| S/S input "High" voltage | V _{SSH} | | V _{CC2} -0.6 | | V _{CC1} | V |
| S/S input "Low" voltage | V _{SSL} | | 0 | | 0.6 | V |
| VBATT/2 set voltage accuracy | ΔV _{MON} | | | | ±10 | % |
| VBATT/2 limit voltage | V _{MONLIM} | | V _{CC1} -0.2 | V _{CC1} | | V |
| VBATT monitor input resistance | R _{MON} | | 35 | 50 | 75 | kΩ |
| Logic input bias current | I _{LG} | | | | ±1 | μA |
| Logic input "High" voltage | V _{LGH} | | V _{CC2} -0.6 | | V _{CC2} | V |
| Logic input "Low" voltage | V _{LGL} | | 0 | | 0.6 | V |
| Booster circuit | | | | | | |
| Output voltage | V _{GO} | No load | 8.5 | 8.8 | | V |
| | V _G | I _G OUT = -1mA | 6.7 | 7.2 | | V |
| Output oscillation-frequency | F _{OSC} | | 100 | 115 | 130 | kHz |
| Clamp voltage | V _{GLIM} | V _G OFF = "L", V _{CC1, 2} = 3.6V | 9.2 | 9.5 | 9.8 | V |
| MOS driver output stage (V_G = 7V) | | | | | | |
| Output ON resistance | R _{on1, 2, 3, 4} | I _O = 100mA, sum of upper and lower outputs | | 1.3 | 2.0 | Ω |
| Output propagation delay time | TRISE | * | | 0.2 | 1.0 | μs |
| | YFALL | * | | 0.1 | 0.7 | μs |
| Minimum pulse width | T _{min} | Output pulse width ≥ (2/3) T _{min} * | 200 | | | ns |
| TSD circuit | | | | | | |
| Operating temperature | TSD | * | 150 | 180 | | °C |
| Hysteresis width | ΔTSD | * | | 30 | | °C |

* : "Design" indicates the design target, not the measured value.

Package Dimensions

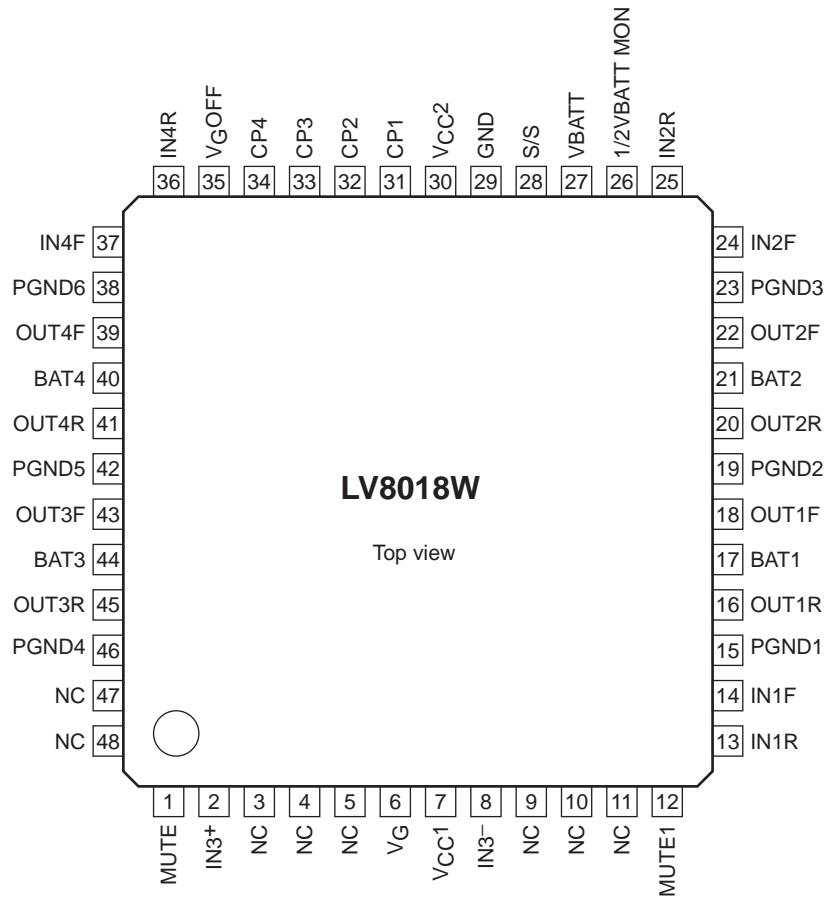
unit : mm (typ)

3163B



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Pin Assignment



Truth table

Ch1, 2, 4 (for focus, tracking, and traverse)

| S/S | MUTE1 | IN1, 2, 4F | IN1, 2, 4R | OUT1, 2, 4F | OUT1, 2, 4R |
|-----|-------|------------|------------|-------------|-------------|
| H | H | L | L | L | L |
| H | H | H | L | H | L |
| H | H | L | H | L | H |
| H | H | H | H | L | L |
| H | L | x | x | Z | Z |
| L | x | x | x | Z | Z |

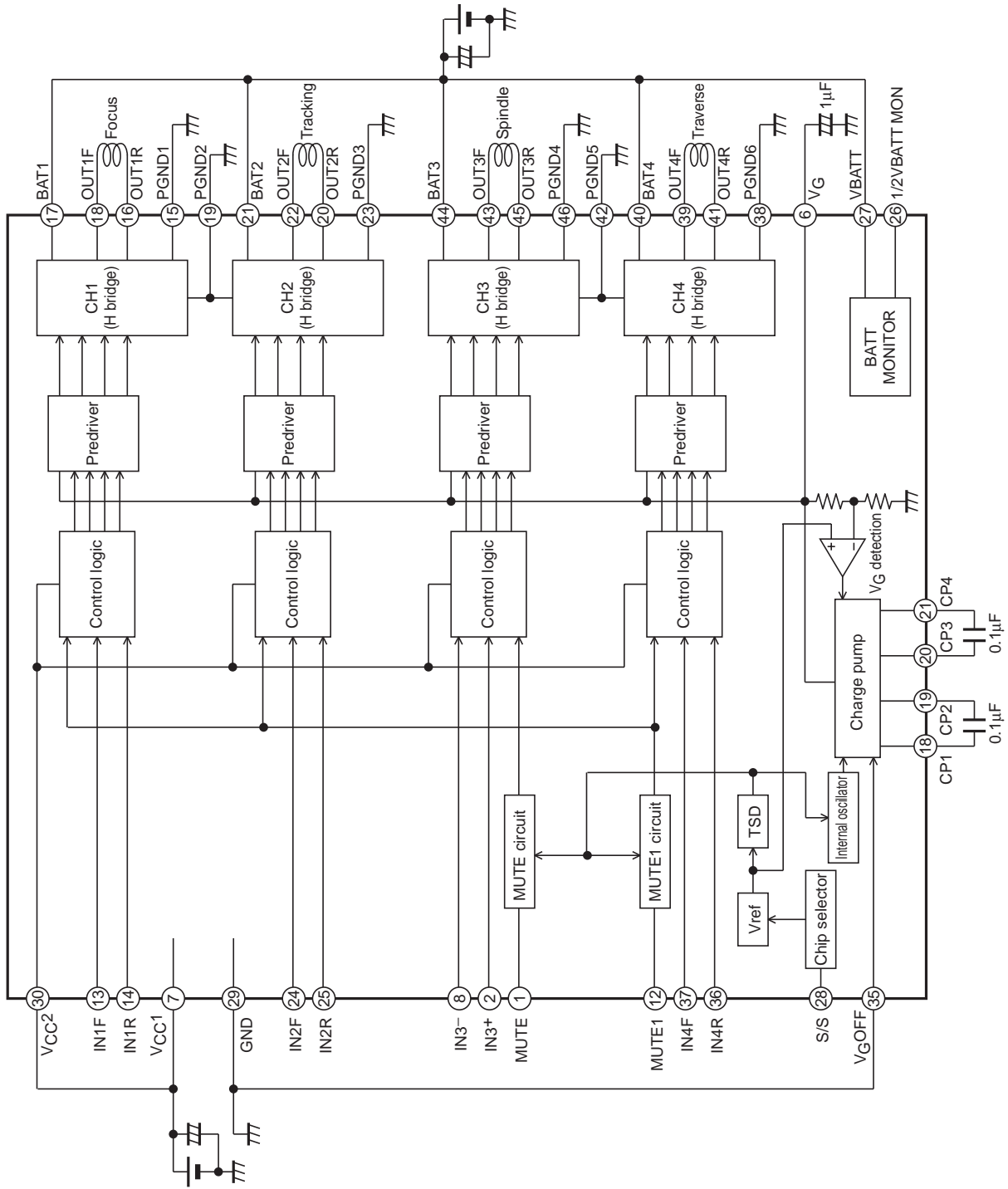
x : Don't Care, Z : Open

Ch3 (for spindle)

| S/S | MUTE | IN3+ | IN3- | OUT3F | OUT3R |
|-----|------|------|------|-------|-------|
| H | H | L | L | L | L |
| H | H | H | L | H | L |
| H | H | L | H | L | L |
| H | H | H | H | L | H |
| H | L | x | x | Z | Z |
| L | x | x | x | Z | Z |

x : Don't Care, Z : Open

Block Diagram



* Constants of external parts are for reference and not guaranteed

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Pin Functions

| Pin No. | Pin name | Function | Equivalent Circuit |
|----------------------------|--|--|--------------------|
| 1 | MUTE | Channel 3 MUTE pin. L for MUTE ON. | |
| 2 8 | IN3+ IN3- | Input pins, each on the forward side and reverse side of Channel 3. (Digital input) | |
| 6 | V _G | Pin to provide the supply voltage to the predrive. With V _G OFF = "L", the output voltage of booster circuit is output to this pin. This voltage acts directly as the supply voltage of predrive. | |
| 7 | V _{CC1} | Pin to provide the supply voltage of analog signal system. | |
| 12 | MUTE1 | MUTE pin common to Channel 1, 2, and 4. L for MUTE ON. | |
| 14 13 | IN1F IN1R | Input pins, each on the forward side and reverse sides of Channel 1. (Digital input) | |
| 18 16 17 15 19 | OUT1F OUT1R BAT1 PGND1 PGND2 | OUT1F : Channel 1 forward side output pin. OUT1R : Channel 1 reverse side output pin. BAT1 : Channel 1 output power pin. PGND1, 2 : Power GND pin. | |
| 22 20 21 23 | OUT2F OUT2R BAT2 PGND3 | OUT2F : Channel 2 forward side output pin. OUT2R : Channel 2 reverse side output pin. BAT2 : Channel 2 output power pin. PGND3 : Power GND pin. | |
| 24 25 | IN2F IN2R | Input pins, each on the forward side and reverse side of Channel 2. (Digital input) | |

Continued on next page.

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Continued from preceding page.

| Pin No. | Pin name | Function | Equivalent Circuit |
|----------------------------|--|---|--------------------|
| 27 26 | VBATT 1/2VBATT MON | Output power connection pin Pin to monitor 1/2 of output power supply. Used to monitor the output power supply at the digital servo and to correct the voltage dependence of servo. | |
| 28 | S/S | Start/stop pin. H for start and L for stop. | |
| 29 | GND | Signal GND pin. | |
| 30 | V _{CC2} | Pin to provide supply voltage of the logic signal system. | |
| 31 32 33 34 | CP1 CP2 CP3 CP4 | CP1, 3 : Switching pins of booster circuit CP2, 4 : Pins to which the rectifier transistor of booster circuit is connected | |
| 35 | V _G OFF | Booster circuit ON/OFF selector pin. L for booster circuit ON H for booster circuit OFF | |
| 37 36 | IN4F IN4R | Input pins, each on the forward side and reverse side of Channel 4. | |
| 39 41 40 42 38 | OUT4F OUT4R BAT4 PGND5 PGND6 | OUT4F : Channel 4 forward side output pin. OUT4R : Channel 4 reverse side output pin. BAT4 : Channel 4 output power pin. PGND5, 6 : Power GND pin. | |
| 43 45 44 46 | OUT3F OUT3R BAT3 PGND4 | OUT3F : Channel 3 forward side output pin. OUT3R : Channel 3 reverse side output pin. BAT3 : Channel 3 output power pin. PGND4 : Power GND pin. | |

Cautions for use

1. Apply power in the order from V_{CC} to each BAT. When the external power supply is used for V_G , apply power in the order from V_{CC} , through V_G , to each BAT. For each BAT, turn ON power supply after complete rising of V_{CC} and V_G voltages.
2. Each power supply must be stabilized by inserting a capacitor to GND to prevent entry of ripple and noise. In particular, the capacitor of sufficient capacitance must be used for the output because the large current flows here. The capacitor to be inserted in each power supply should be installed as near as possible to the IC pin.

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