



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 <sub>CC</sub> max		7	V
Predrive voltage (gate voltage)	VG max		9.5	V
Maximum output current (ch1-ch4)	I <sub>O</sub> max		500	mA
Allowable power dissipation	Pd max	Independent IC	0.5	W
Operating temperature	T <sub>opr</sub>		-20 to +85	°C
Storage temperature	T <sub>stg</sub>		-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 <sub>CC</sub> 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

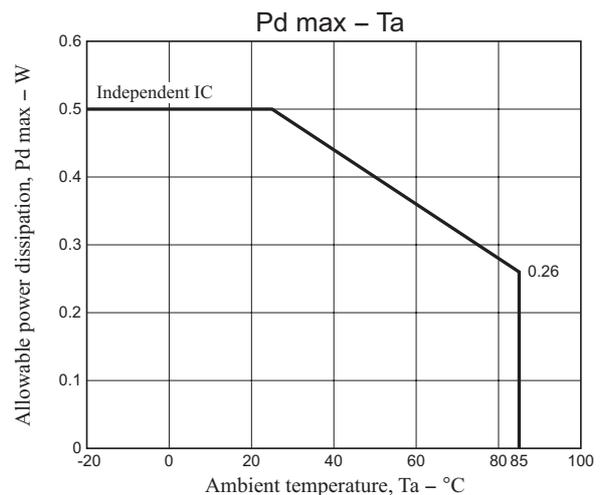
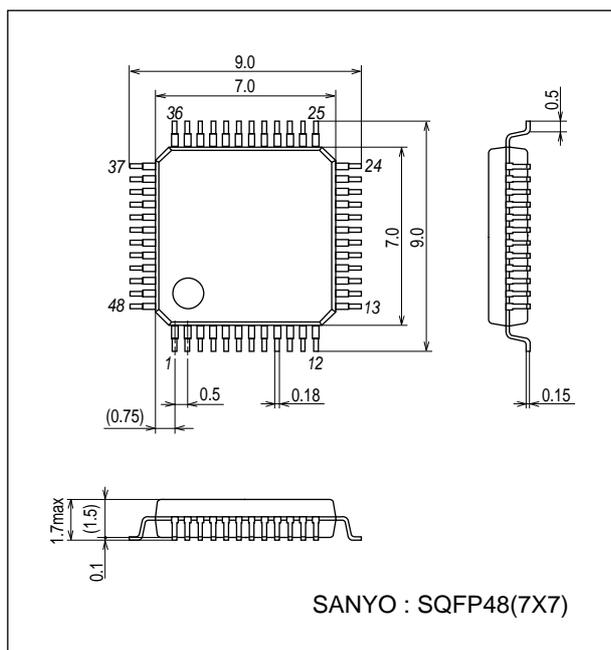
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Standby current dissipation	I <sub>CCO</sub>				10	μA
Current dissipation	I <sub>CC</sub> (A)	V <sub>G</sub> OFF = "L"		1.4	1.9	mA
	I <sub>CC</sub> (B)	V <sub>G</sub> OFF = "H"		1.0	1.5	mA
Pre-drive block current dissipation	I <sub>GO</sub>	V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

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

## Package Dimensions

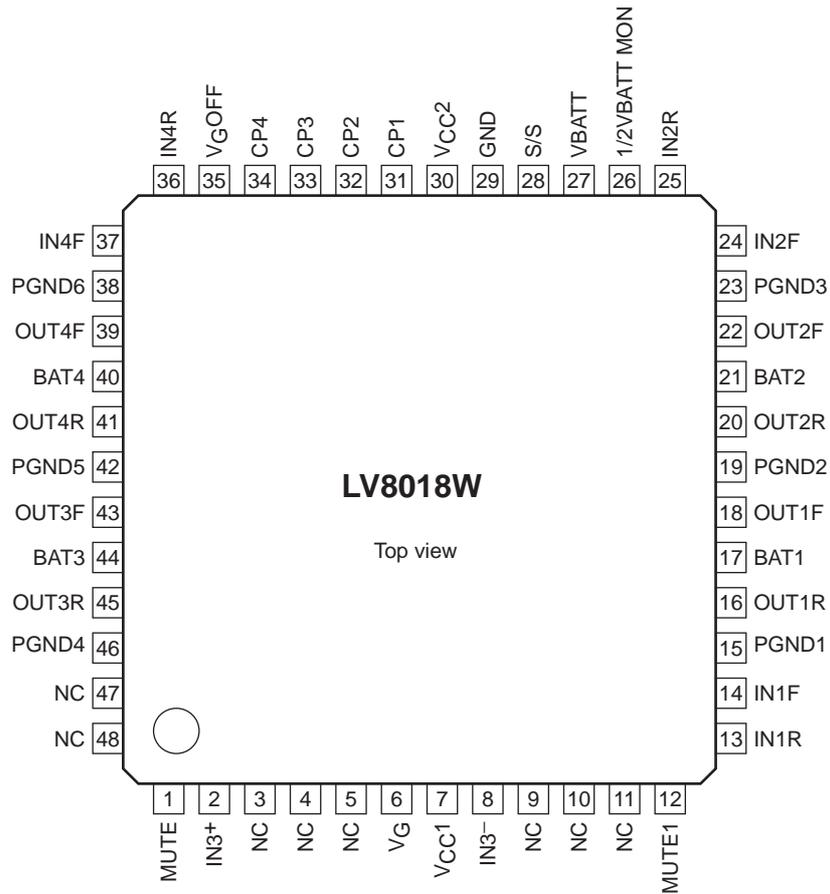
unit : mm (typ)

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

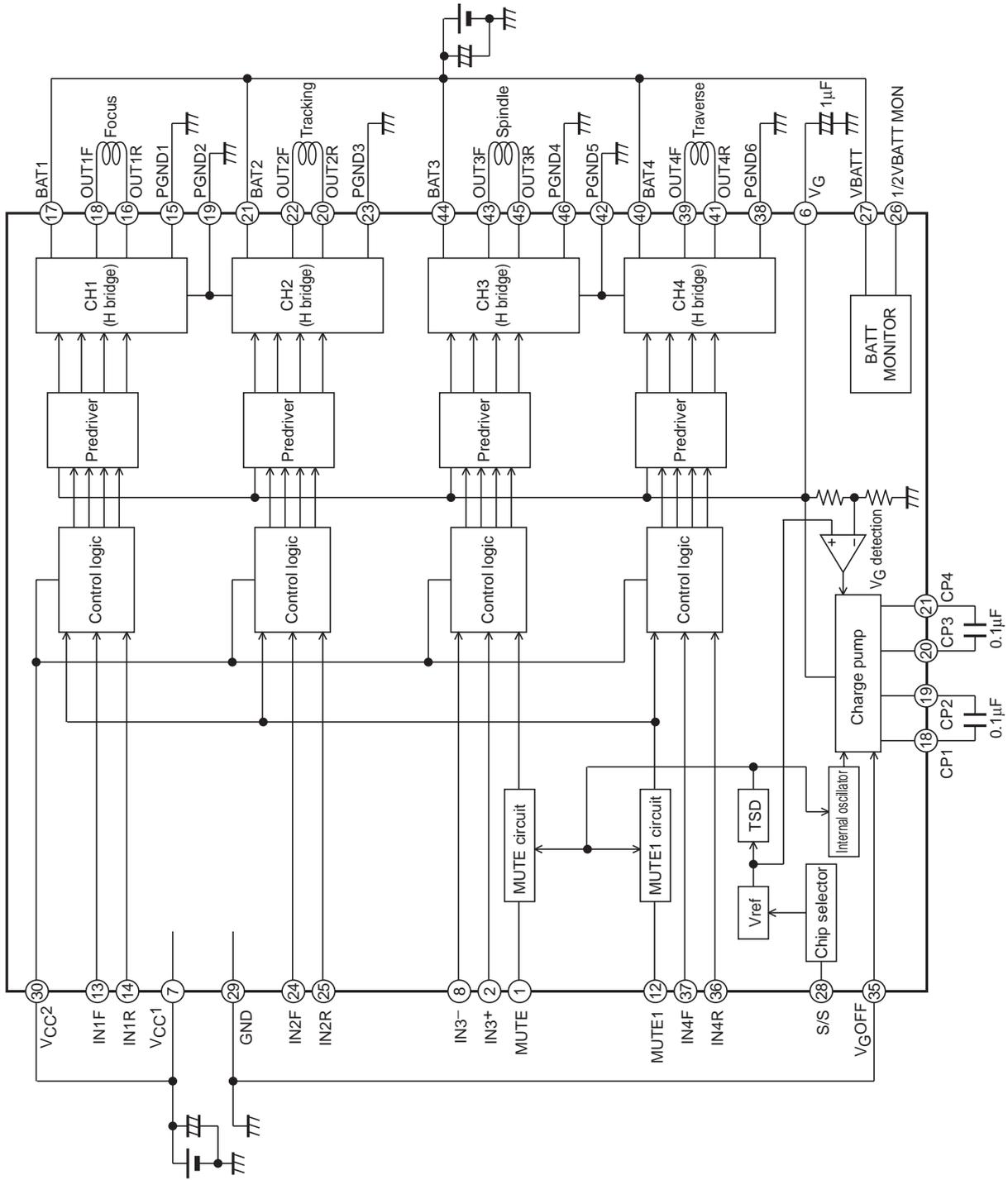
x : Don't Care, Z : Open

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 <sub>G</sub>	Pin to provide the supply voltage to the predrive. With V <sub>G</sub> 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 <sub>CC1</sub>	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)	

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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 <sub>CC2</sub>	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 <sub>G</sub> 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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