SANYO

SANYO Semiconductors
DATA SHEET

Monolithic Linear IC

LA5688H — **Multi power supply regulator+1.5ch forward/reverse motor driver**

Overview

The LA5688H is Multi power supply regulator+1.5ch forward/reverse motor driver.

Functions

- One circuit of 2.6V regulator (I_O = 100mA)
- 3.1V regulator-2 circuit (I_O = 50mA)
- One circuit of 3.3V regulator (I_O = 150mA)
- Independent ON/OFF of each regulator
- 1.5ch forward/reverse motor driver incorporated

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		-0.3 to 9	V
Input voltage	V_{IN} max		-0.3 to 9	V
Allowable power dissipation	Pd max	Ta ≤ 25°C Independent IC	0.79	W
		Ta ≤ 25°C Mounted on a specified board. *	1.8	W
OUT pin output current	I_{OUT} max		±1	A
Operating temperature	Topr		-20 to +85	°C
Storage temperature	Tstg		-55 to +150	°C

* Mounted on a board : 76.1×114.3×1.6mm^3, glass epoxy board.

www.DataSheet.in

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage 1	$V_{CC}1$		4.1 to 7.5	V
Supply voltage 1'	$V_{CC}1'$	*	3.5 to 7.5	V
Supply voltage 2	$V_{CC}2$		0 to 7.5	V
Supply voltage 3	$V_{CC}3$		3.5 to 7.5	V
VREF voltage	VREF		0.3 to $V_{CC}3$-1	V
REG2.6 output current	REG2.6		0 to 100	mA
REG3.1A•B output current	REG3.1A•B		0 to 50	mA
REG3.3 output current	REG3.3		0 to 150	mA
Input "H" level voltage	V_{IH}		2.0 to 7.5	V
Input "L" level voltage	V_{IL}		-0.3 to 0.7	V

* When only the motor driver is used without using the regulator

Electrical Characteristics at Ta = 25°C

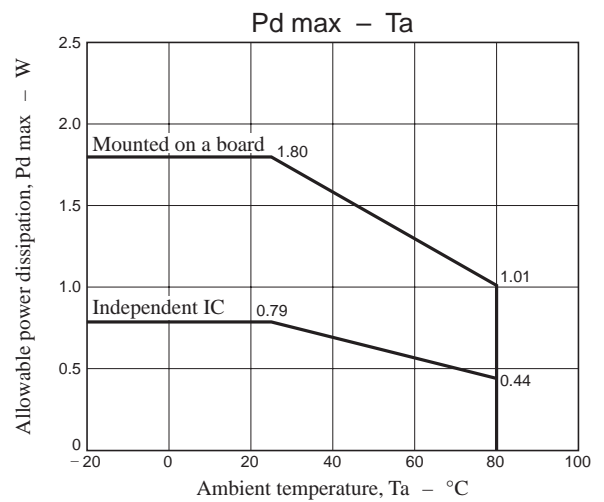| Parameter	Symbol	Conditions	Ratings min	Ratings typ	Ratings max	Unit
All regulator blocks Power dissipation $V_{CC}1$ = 6V IREG2.6 = 100mA, IREG3.3A•B = 50mA, IREG3.3 = 150mA						
$V_{CC}1$ power dissipation	$I_{CC}1$			30	47	mA
REG2.6 Regulator block $V_{CC}1$ = 6V, IREG2.6 = 100mA						
Output voltage 1	V_O_REG2.6		2.55	2.6	2.65	V
Dropout voltage	VDROP_REG2.6			0.25	0.5	V
Line regulation	ΔVOLN_REG2.6	$V_{CC}1$ = 4.1 to 7.5V			200	mV
Load regulation	ΔVOLD_REG2.6	IREG2.6 = 5 to 100mA			200	mV
Peak output current	IOP_REG2.6		100	140		mA
Output short-circuit current	IOSC_REG2.6			50	100	mA
Input "H" level voltage	V_{IH}_EN2.6		2.0			V
Input "L" level voltage	V_{IL}_EN2.6				0.7	V
"H" level input current	I_{IH}_EN2.6	VEN2.6 = 2V		50	70	μA
REG3.1A•B Regulator block $V_{CC}1$ = 6V, IREG3.1A•B = 50mA						
Output voltage	V_O_REG3.1A•B		3.04	3.1	3.16	V
Dropout voltage	VDROP_REG3.1A•B			0.25	0.5	V
Line regulation	ΔVOLN_REG3.1A•B	$V_{CC}1$ = 4.1 to 7.5V			200	mV
Load regulation	ΔVOLD_REG3.1A•B	IREG3.1A•B = 5 to 50mA			200	mV
Peak output current	IOP_REG3.1A•B		50	70		mV
Output short-circuit current	IOSC_REG3.1A•B			25	50	mA
Input "H" level voltage	V_{IH}_ENB3.1A•B		2.0			V
Input "L" level voltage	V_{IL}_ENB3.1A•B				0.7	V
"H" level input current	I_{IH}_ENB3.1A•B	VEN3.1A•B = 2V		50	70	μA
REG3.3 Regulator block $V_{CC}1$ = 6V, IREG3.3 = 150mA						
Output voltage	V_O_REG3.3		3.23	3.3	3.37	V
Dropout voltage	VDROP_REG3.3			0.25	0.5	V
Line regulation	ΔVOLN_REG3.3	$V_{CC}1$ = 4.1 to 7.5V			200	mV
Load regulation	ΔVOLD_REG3.3	IREG3.3 = 5 to 150mA			200	mV
Peak output current	IOP_REG3.3		150	210		mA
Output short-circuit current	IOSC_REG3.3			75	150	mA
Input "H" level voltage	V_{IH}_EN3.3		2.0			V
Input "L" level voltage	V_{IL}_EN3.3				0.7	V
"H" level input current	I_{IH}_EN3.3	VEN3.3 = 2V		50	70	μA

LA5688H

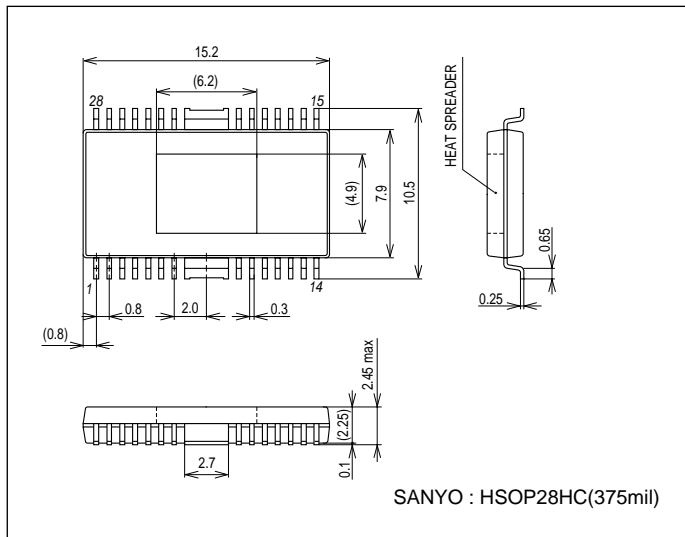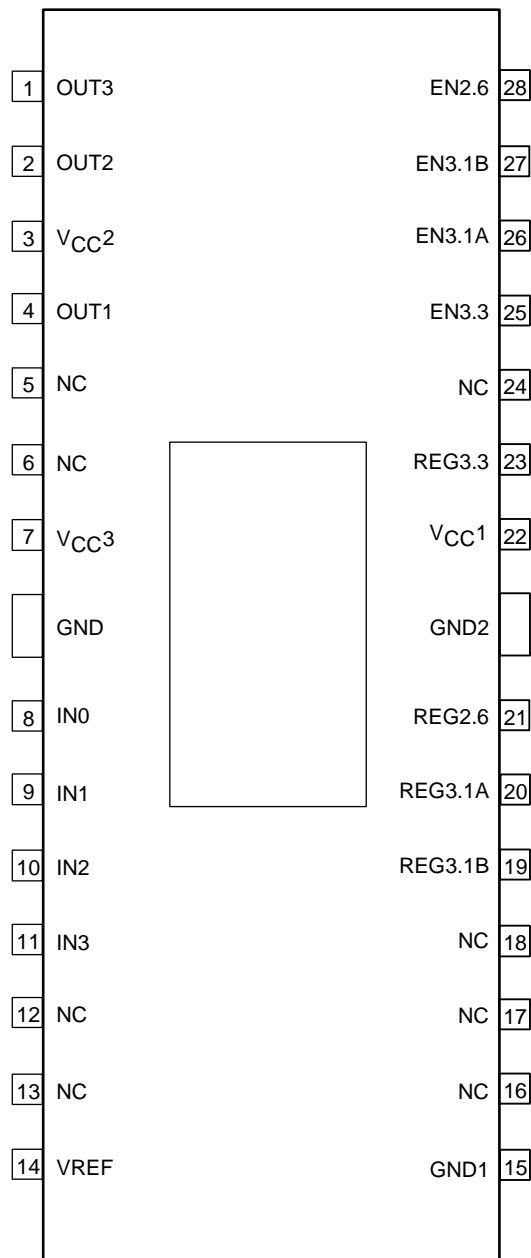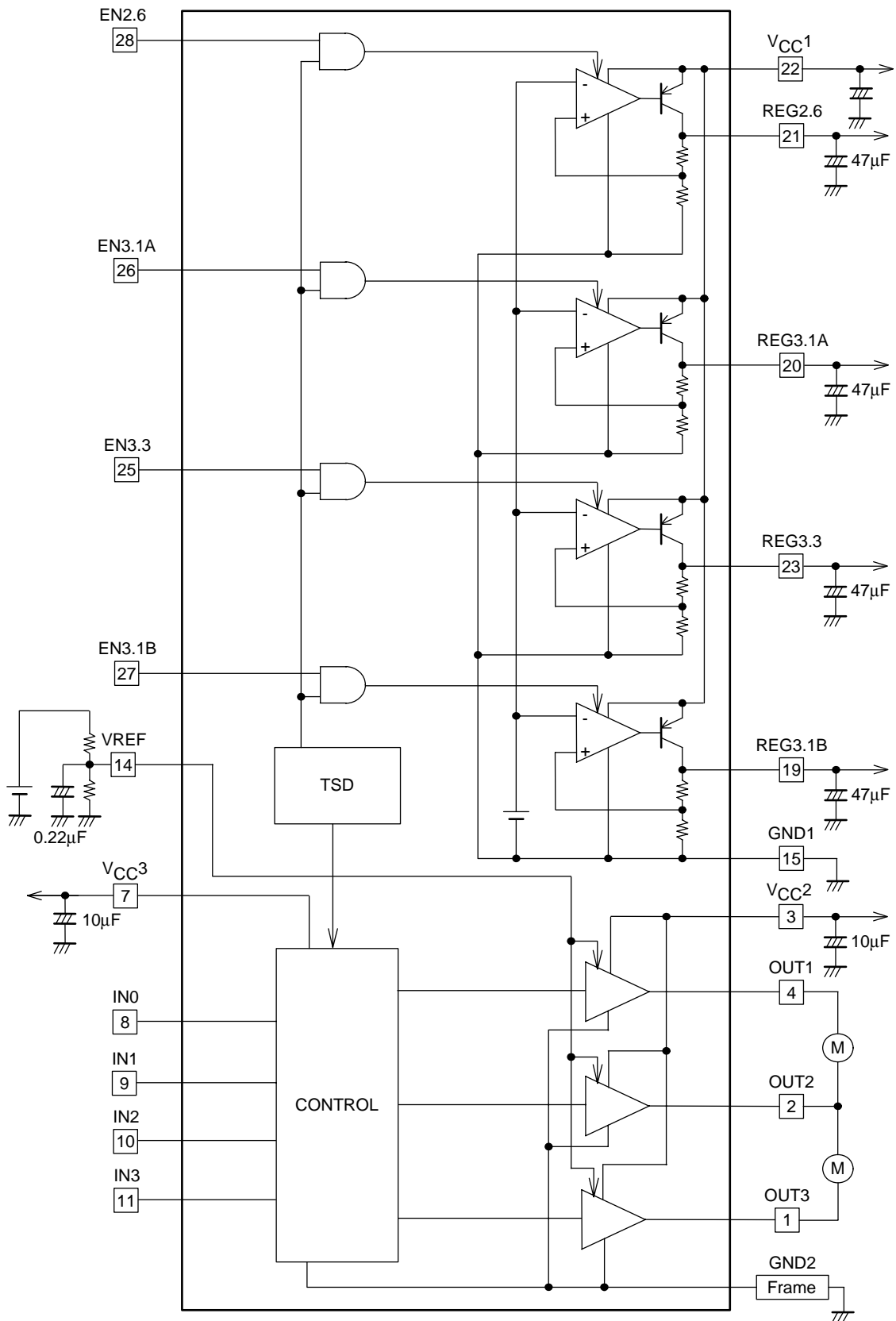| Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Motor driver block V$_{CC}$1 = V$_{CC}$2 = V$_{CC}$3 = 6V						
V$_{CC}$3 power dissipation 1	I$_{CC}$3_1	Forward/Reversed, VREF = V$_{CC}$3		38	58	mA
V$_{CC}$3 power dissipation 2	I$_{CC}$3_2	Brake		48	68	mA
V$_{CC}$3 power dissipation 3	I$_{CC}$3_3	Standby			15	µA
Output saturation voltage	VSAT_OUT	I$_{OUT}$ = 200mA, VREF = V$_{CC}$3 (Upper side + Lower side)		1.0	1.5	V
VREF pin outflow current	IREF	VREF = 2.5V (Forward/Reversed)		1.3	3.5	µA
V$_{OUT}$-VREF offset	VOF	VREF = 2.5V, IO = 100mA	-200		200	mV
Output TR current capacity 1	I$_{OUT}$ max1	V$_{CC}$3 = 3.5V, VREF = V$_{CC}$3 Lower side Tr VCE = 1V	900			mA
Output TR current capacity 2	I$_{OUT}$ max2	V$_{CC}$3 = 4.0V, VREF = V$_{CC}$3 Lower side Tr VCE = 1V	1000			mA
Input "H" level voltage	V$_{IH\_IN}$		2.0			V
Input "L" level voltage	V$_{IL\_IN}$				0.7	V
"H" level input current	I$_{IH\_IN}$	V$_{IN}$ = 2V		50	70	µA

Package Dimensions

unit : mm (typ)

3234B

SANYO : HSOP28HC(375mil)

Pd max − Ta

Pin Assignment

1	OUT3	EN2.6 28
2	OUT2	EN3.1B 27
3	$V_{CC}2$	EN3.1A 26
4	OUT1	EN3.3 25
5	NC	NC 24
6	NC	REG3.3 23
7	$V_{CC}3$	$V_{CC}1$ 22
	GND	GND2
8	IN0	REG2.6 21
9	IN1	REG3.1A 20
10	IN2	REG3.1B 19
11	IN3	NC 18
12	NC	NC 17
13	NC	NC 16
14	VREF	GND1 15

Top view

NC for no contact

Block Diagram

Truth table for 1.5ch forward/reverse motor driver

Input				Output			Mode	
IN0	IN1	IN2	IN3	OUT1	OUT2	OUT3		
L	L	L	L				Standby	
L	L	H	L	H	L		ch1	Forward
L	L	L	H	L	H		ch1	Reversed
L	L	H	H	L	L		ch1	Brake
H	L	L	L		L	H	ch2	Forward
L	H	L	L		H	L	ch2	Reversed
H	H	L	L		L	L	ch2	Brake

Blank column is for OFF.

1.5ch forward/reverse motor driver output circuit
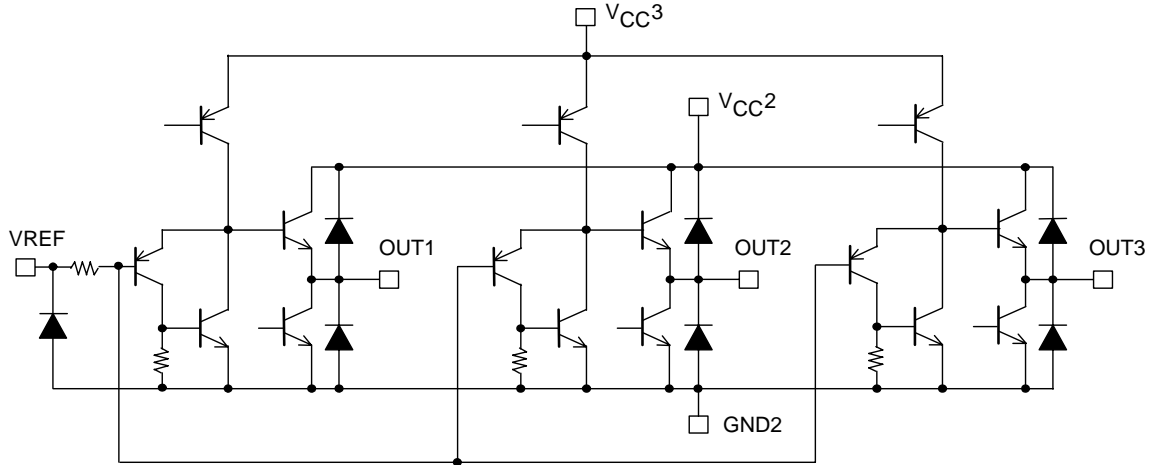
Each regulator output circuit
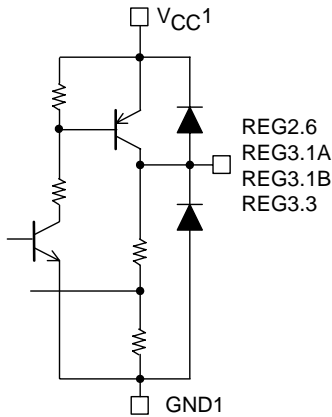
EN2.6, EN3.1A, EN3.1B, EN3.3, INO to IN3 input circuit
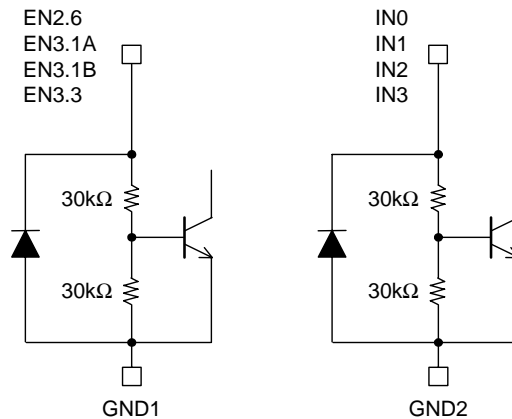
*Resistance values are TYP values.

Cautions for Use

(1) GND1 and GND2

When using, short-circuit GND1 and GND2 externally.

(2) Supply voltage when only the motor driver is used without using the regulator

As the reference power supply in IC is taken from $V_{CC}1$, apply the voltage also to $V_{CC}1$.

In this case, the operation condition of $V_{CC}1$ ranges from 3.5 to 7.5V.

(Refer to page 2. Operation Conditions, Supply Voltage 1')
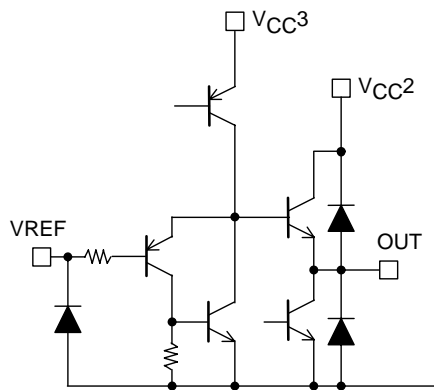
(3) Supply voltage when only the regulator is used without using the motor driver

The regulator operates with $V_{CC}1$ (without need of applying voltage to $V_{CC}2$, $V_{CC}3$, and VREF)

(4) VREF pin

Application of the voltage to VREF pin enables setting of each OUT Hi voltage.

In this case, the input to VREF ranges from 0.3 to $(V_{CC}3-1)$ V.

(Refer to page 2. Operation conditions, VREF voltage)

VREF pin equivqlent circuit

This catalog provides information as of June, 2007. Specifications and information herein are subject to change without notice.