



SANYO Semiconductors

DATA SHEET

LA6585T — Monolithic Linear IC

BTL Drive Single-Phase Full-Wave Fan Motor Driver

Overview

The LA6585T is a single-phase bipolar fan motor driver that achieves quiet operation, power savings, silent operation and high efficiency that suppresses reactive current through BTL output linear drive. It provides lock protection and rotation signal circuits on chip, and is optimal for applications that require high reliability and low noise, such as notebook personal computers, power supplies in consumer electronic equipment, car audio, and CPU cooling systems.

Features

- BTL output single-phase full-wave linear drive (gain resistor : 1 to 360k Ω , 51dB)
- Supports low-voltage drive and features a wide usable voltage range (2.2 to 14.0V)
- Low saturation output (high side + low side saturation voltage : Vosat (total) = 1.2V (typical), I_O = 250mA)
- Built-in lock protection and automatic return circuits
- Built-in FG output
- Built-in Hall sensor bias (VHB = 1.5V)
- Thermal protection circuit
- Small-sized, high thermal capacity package

Specifications

Absolute Maximum Ratings at T_a = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V _{CC} max		15	V
Output current	I _{OUT} max		0.5	A
Output voltage	V _{OUT} max		15	V
FG output pin output withstand voltage	V _{FG} max		15	V
FG output current	I _{FG} max		10	mA

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Parameter	Symbol	Conditions	Ratings	Unit
Allowable power dissipation	$P_d \text{ max}$	When mounted on a circuit board *1	400	mW
Operating temperature	T_{opr}		-30 to +90	°C
Storage temperature	T_{stg}		-55 to +150	°C

*1 Specified circuit board : $114.3 \times 76.1 \times 1.6\text{mm}^3$, glass epoxy.**Recommended Operating Conditions** at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		2.2 to 14.0	V
Common-phase input voltage range of hall input	VICM		0 to $V_{CC} - 1.5$	V

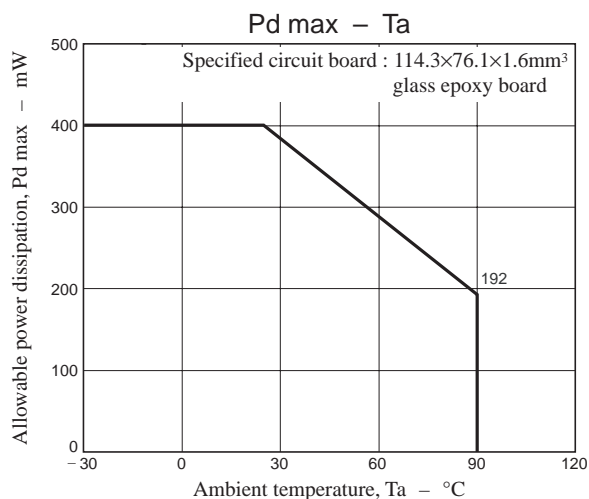
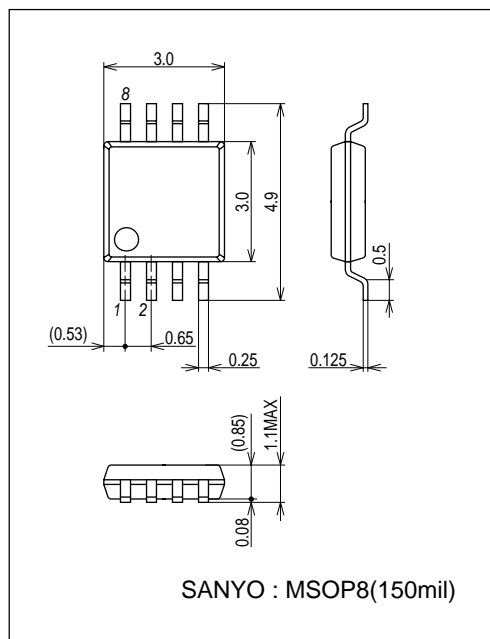
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 12\text{V}$, Unless otherwise specified.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Circuit current	I_{CC1}	Drive mode (CT = low)	3	6	9	mA
	I_{CC2}	Lock protection mode (CT = high)	2.5	5	7.5	mA
Lock detection capacitor charge current	ICT1		0.9	1.2	1.5	μA
Capacitor discharge current	ICT2		0.10	0.18	0.25	μA
Capacitor charge/discharge current ratio	RCT	$RCD = ICT1/ICT2$	5	6.5	8	
CT charge voltage	VCT1		1.3	1.5	1.7	V
CT discharge voltage	VCT2		0.3	0.5	0.7	V
OUT output low saturation voltage	V_{OL}	$I_O = 200\text{mA}$		0.25	0.45	V
OUT output high saturation voltage	V_{OH}	$I_O = 200\text{mA}$		0.95	1.2	V
Hall input sensitivity	VHN	Zero peak value (including offset and hysteresis)		7	15	mV
FG output pin low-level voltage	VFG	IFG = 5mA		0.15	0.3	V
FG output pin leakage current	IFGL	VFG = 15V		1	30	μA

Package Dimensions

unit : mm (typ)

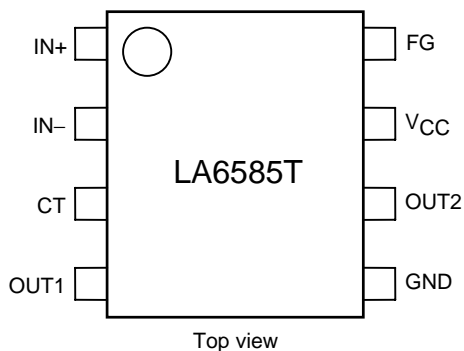
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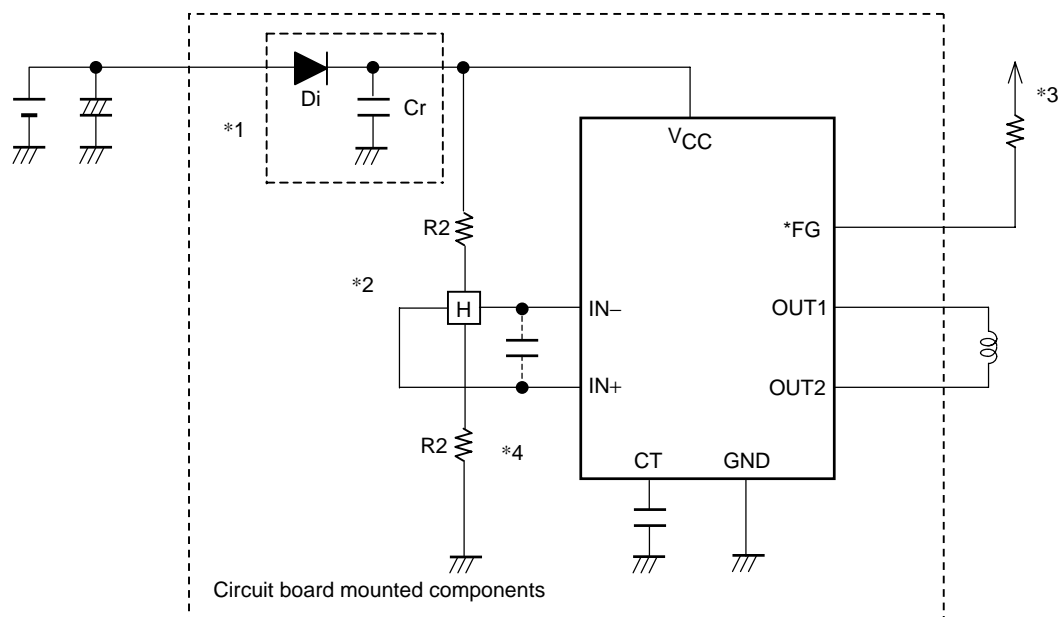
Truth Table

IN-	IN+	CT	OUT1	OUT2	FG	Mode
High	Low	Low	High	Low	Low	During rotation
Low	High		Low	High	High	
-	-	High	Off	Off	-	Lock protection

Pin Assignment

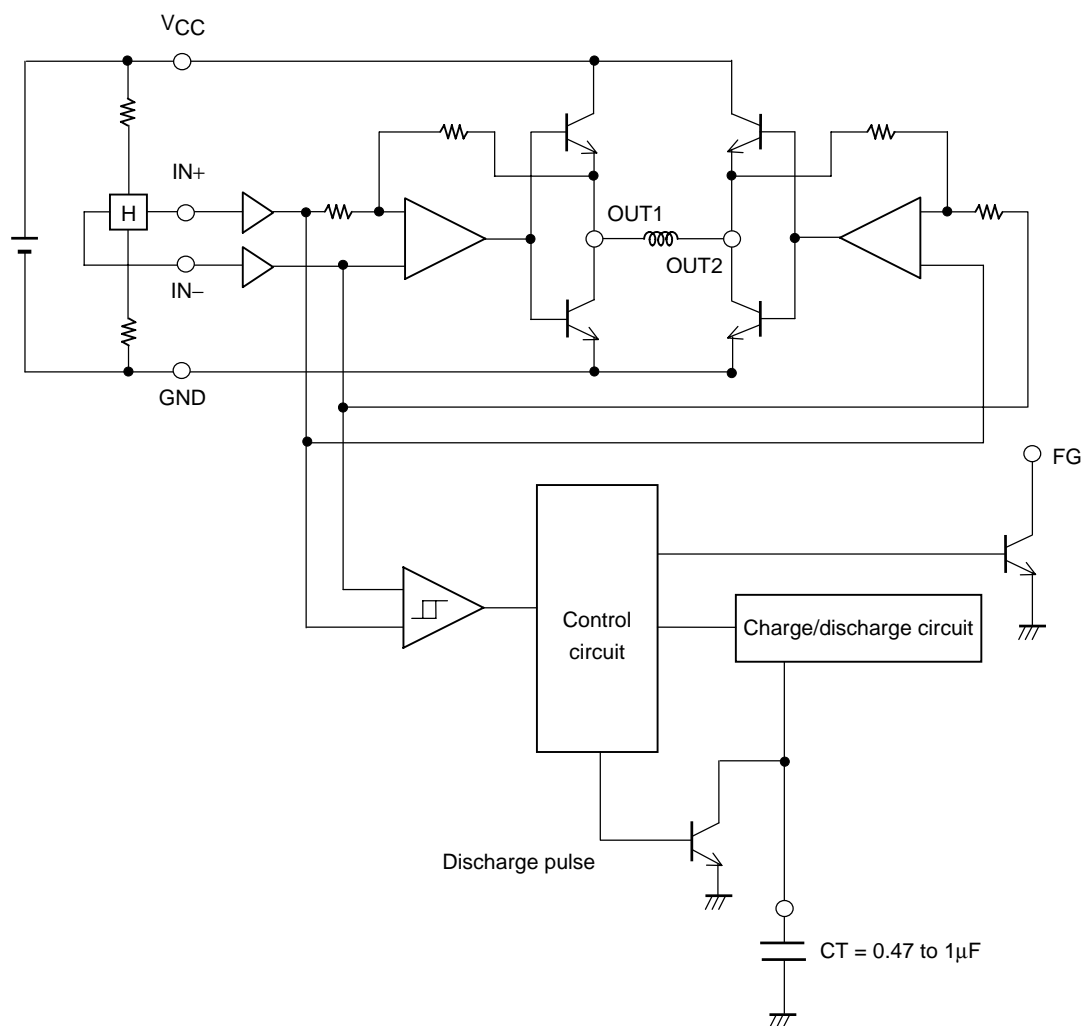


Application Circuit Example



- *1. If the diode Di (which protects the IC destruction by reverse connection) is used, it is necessary to insert the capacitor Cr and provide a regenerative current route. Similarly, if there is no nearby capacitor on the fan power supply line, Cr will also be necessary to improve reliability.
- *2. If the Hall sensor bias is taken from VCC, a $1/2 V_{CC}$ bias, as shown in the figure, must be used. Linear drive is implemented by amplifying the Hall sensor output and applying voltage control to the coil. If the Hall effect sensor provides a strong output, the startup characteristics and efficiency will be good, then even quieter operation will be achieved by adjusting the Hall effect sensor.
- *3. This pin must be left open if unused.
- *4. If the line from the Hall sensor output to the Hall sensor input of IC are long, noise may enter the system from that line. If that becomes a problem, insert a capacitor as shown in the figure.

Internal Equivalent Circuits



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