


SANYO Semiconductors

DATA SHEET

LA6583M — Monolithic Linear IC Fan Motor Driver BTL Driver Single-Phase Full-Wave

Overview

The LA6583M is a low-saturation BTL output linear driving motor driver for single-phase bipolar fan motors. It features quite, low power, high efficiency drive that suppresses reactive current. It is optimal for use in applications that require miniaturization and low noise, such as CPU cooling fan motors and 5 to 12V electronic game products.

Features

- Single-phase full-wave linear drive with BTL output (gain resistance 1K-360K)
: Most appropriate for consumer appliances power supply and car audio system, namely equipment that requires silence because this has no switching noise.
- Low-voltage operation possible, with wide operable voltage range (2.8 to 13.8V)
- Low saturation output (Upper + lower saturation voltage: $V_{O\text{ sat (total)}} = 1.1V_{\text{typ}}$, $I_O = 200mA$)
: High coil efficiency with low current drain. IC itself does not generate much heat.
- Lock protection and auto return circuits built-in
- Lock protection signal output (L during rotation, H at stop; open collector output)
- FG output (rotation speed detection output: open collector output)
- Hall bias built-in ($V_{HB} = 1.3V$)
- Heat protection circuit (Design guarantee)
: When the large current flows because of output short-circuit, raising the IC chip temperature above 180°C, the heat protection circuit suppresses the drive current, preventing IC burn and breakdown.
- Compact and high heat capacity package

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Specifications

Maximum Ratings at $T_a = 25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC} max		15	V
Output current	I_{OUT} max		0.8	A
Output withstand voltage	V_{OUT} max		15	V
RD/FG output withstand	VRD/FG max		15	V
RD/FG output current	IRD/FG max		5	mA
HB output current	IB max		10	mA
Allowable dissipation	P_d max	Mounted on a specified board *1	800	mW
Operating temperature	T_{opr}	*2	-30 to +90	$^{\circ}\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^{\circ}\text{C}$

*1: Mounted on a specified board: 114.3mm×76.1mm×1.6mm glass epoxy

*2: $T_j = 150^{\circ}\text{C}$ Use this IC within a range where the chip temperature does not exceed $T_j = 150^{\circ}\text{C}$ during operation.

Recommended Operating Conditions at $T_a = 25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		2.8 to 14.0	V
Common-phase input voltage range of Hall input	VICM		0 to $V_{CC}-1.5$	V

Electrical Characteristics at $T_a = 25^{\circ}\text{C}$, $V_{CC} = 12.0\text{V}$, unless especially specified.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Circuit Current	I_{CC1}	During drive (CT=L)	4	6	9	mA
	I_{CC2}	At lock protection (CT=H)	2	4	6	mA
Lock detection capacitor charge current	ICT1		2.0	2.8	3.5	μA
Capacitor discharge current	ICT2		0.15	0.23	0.30	μA
Capacitor charge/discharge current ratio	RCT	$RCT=ICT1/ICT2$	9	12	15	-
CT charge voltage	VCT1		1.6	1.7	1.8	V
CT discharge voltage	VCT2		0.6	0.7	0.8	V
OUT output L saturation voltage	V_{OL}	$I_O=200\text{mA}$		0.2	0.3	V
OUT output H saturation voltage	V_{OH}	$I_O=200\text{mA}$		0.9	1.2	V
Hall input sensitivity	VHN	Zero peak value (Including offset and hysteresis)		7	15	mV
RD/FG output pin L voltage	VRD/FG	IRD/FG=5mA		0.1	0.2	V
RD/FG output pin leak current	IRD/FGL	VRD/FG=15V		1	30	μA
HB output voltage	VHB	IHB=5mA	1.3	1.5	1.7	V
Thermal protection circuit	TSD	Design target value *3	150	180	210	$^{\circ}\text{C}$

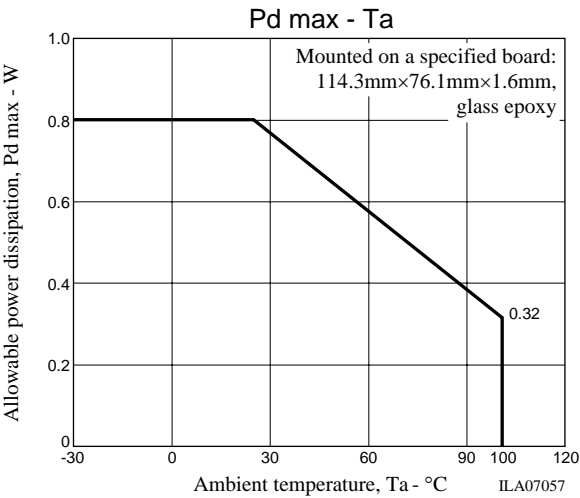
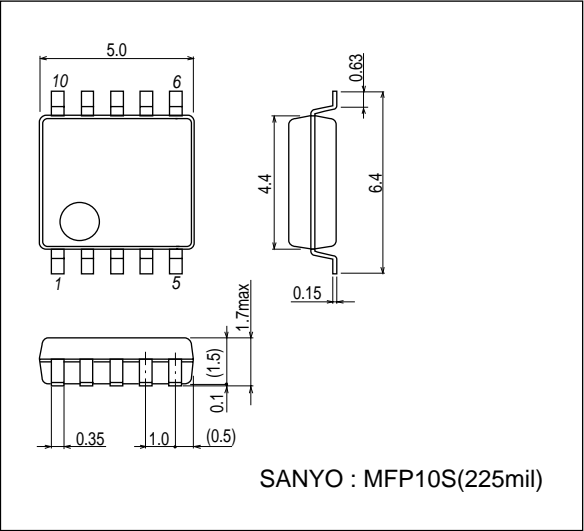
*3: This is a design guarantee value and no measurement with an independent unit is made.

Thermal protection circuit is built in this IC for the prevention of burnout of IC and thermal destruction.

But, since the operation is outside the guarantee temperature range, thermal design must be made so that the thermal protection circuit is not activated during normal fan operation.

Package Dimensions

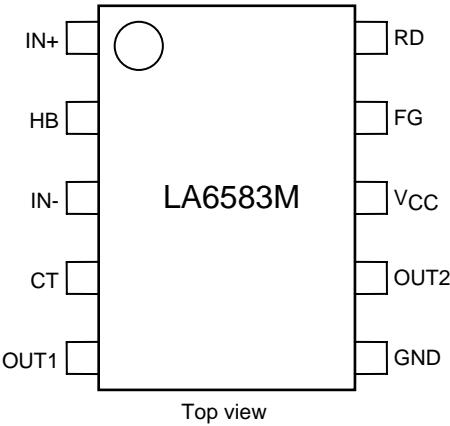
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3086B

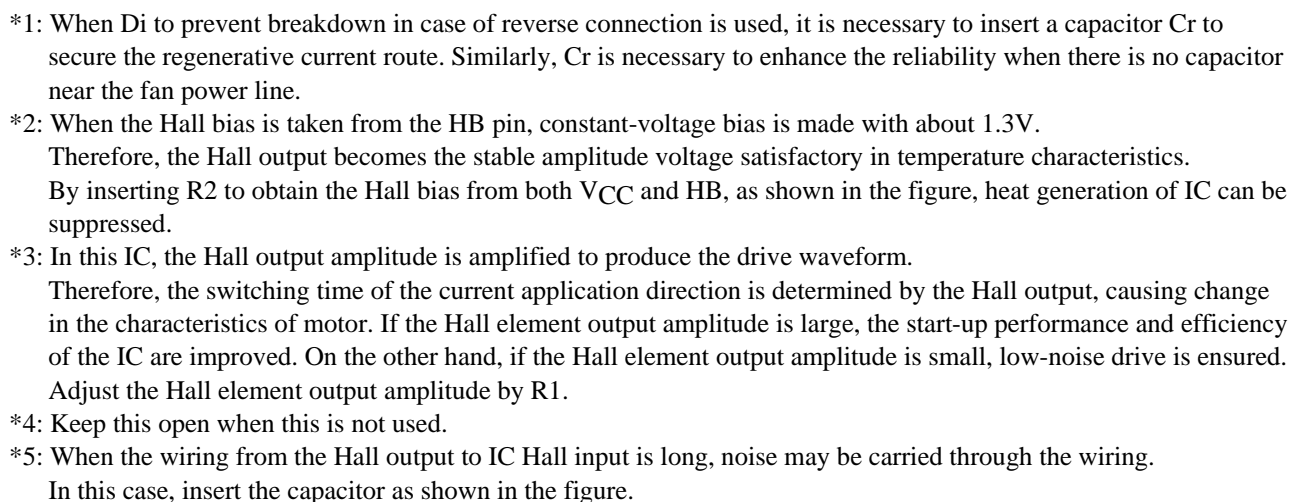


Truth Table

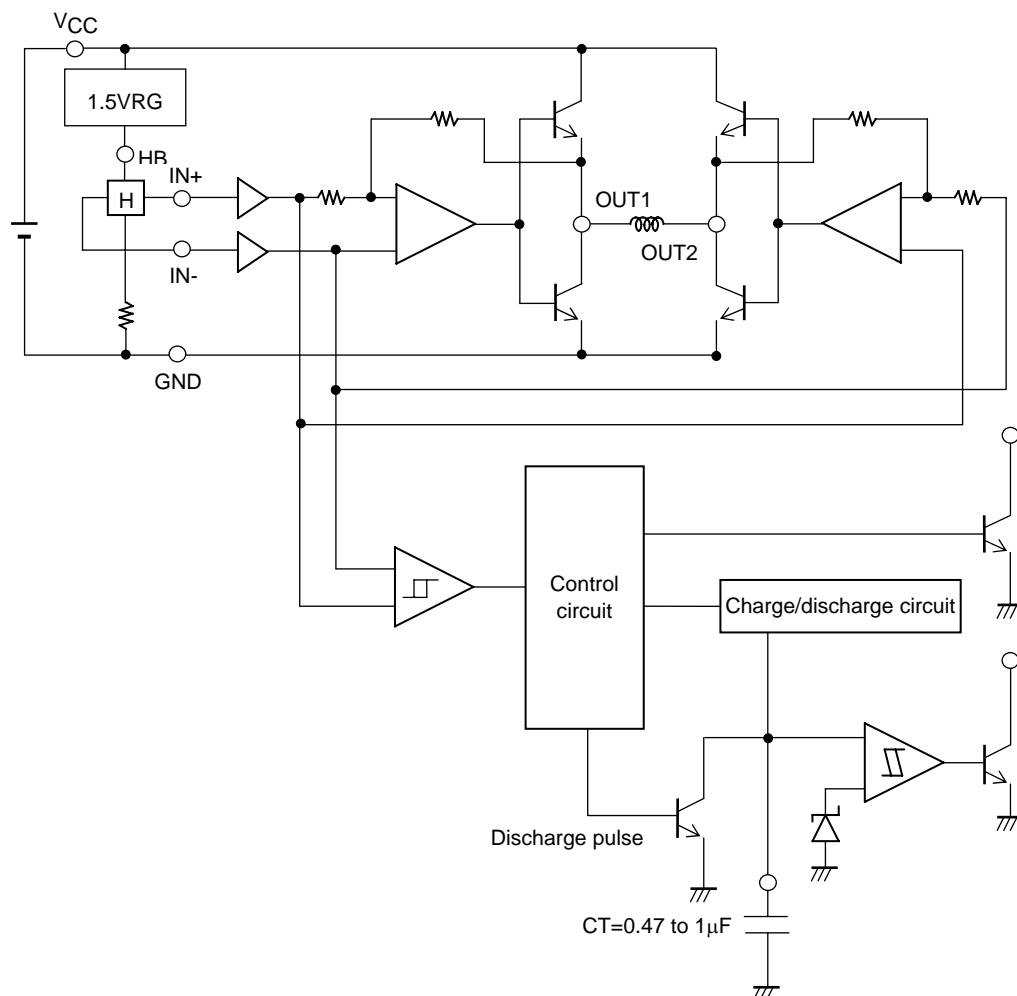
IN-	IN+	CT	OUT1	OUT2	FG	RD	Mode
H	L	L	H	L	L	L	During rotation
L	H		L	H	H		
-	-	H	OFF	OFF	-	H	Lock protection

Pin Assignment





Internal Equivalent Circuit Diagram



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