Ordering number : ENA2125

LA6584JA

Monolithic Linear IC

Single-phase Full-wave Driver For Fan Motor

ON Semiconductor®

http://onsemi.com

Overview

The LA6584JA is Single-phase bipolar fan motor is put into silent driving by means of BTL output linear drive, offering high efficiency and power saving by suppressing the reactive current. Lock protection and rotation signal (FG, RD) circuits are built in, ensuring optimum application to small fans for notebook PC, consumer equipment power supply, car audio system, CPU cooler, etc. that require high reliability and low noise.

Functions and Applications

- Single-phase full-wave driver for fan motor

Specitications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Output voltage	V_{CC} max		15	V
Output current	I_{OUT} max		1.2	A
Output withstand voltage	V_{OUT} max		15	V
RD/FG output pin output Withstand voltage	$V_{RD/FG}$ max		15	V
RD/FG output current	$I_{RD/FG}$ max		5	mA
HB output voltage	I_B max		10	mA
Allowable dissipation	Pd max	Mounted on a specified board*	0.8	W
Operating temperature range	Topr		-30 to +90	°C
Storage temperature range	Tstg		-55 to +150	°C

* Mounted on a specified board (114.3mm × 76.1mm × 1.6mm, Glass epoxy)

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Recommended Operating Range at Ta = 25°C

Parameter	Conditions	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

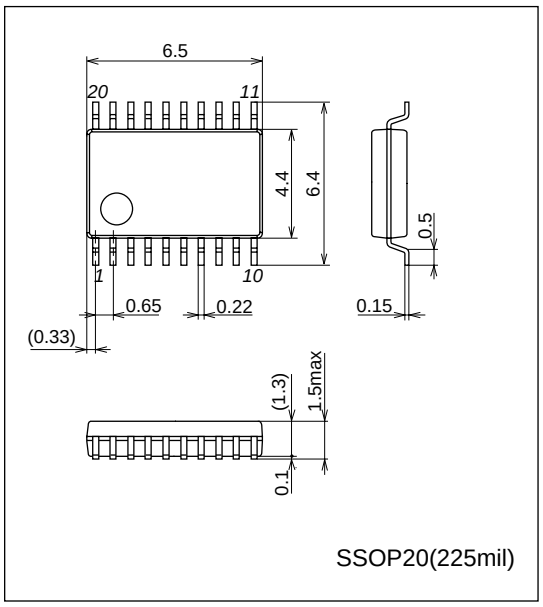
Electrical Characteristics at Ta = 25°C V_{CC} = 12V, unless otherwise specified.

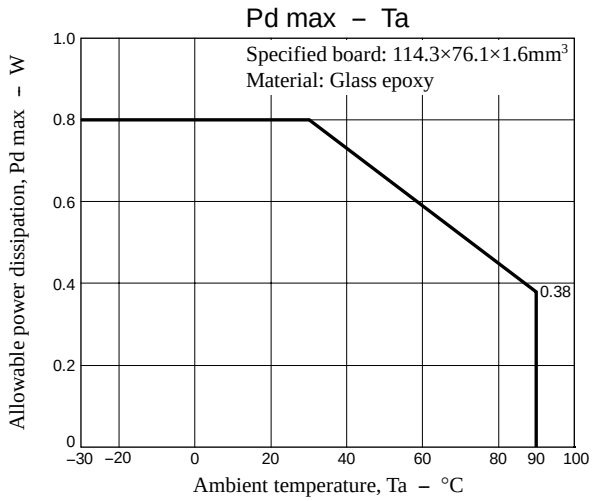
Parameter	Conditions	Conditions	Ratings			Unit
			min	typ	max	
Circuit current	$I_{CC}1$	During drive (CT = L)	4	6	9	mA
	$I_{CC}2$	During lock protection (CT = H)	2	4	6	mA
Lock detection capacitor charge current	$I_{CT}1$		2.0	2.8	3.5	μA
Capacitor discharge current	$I_{CT}2$		0.15	0.23	0.30	μA
Capacitor charge and discharge current ratio	RCT	RCD = $I_{CT}1/I_{CT}2$	9	12	15	-
CT charge voltage	$V_{CT}1$		1.6	1.7	1.8	V
CT discharge voltage	$V_{CT}2$		0.6	0.7	0.8	V
OUT output L saturation voltage	V_{OL}	I_O = 200mA		0.2	0.3	V
OUT output H saturation voltage	V_{OH}	I_O = 200mA		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	$V_{RD/FG}$	$I_{RD/FG}$ = 5mA		0.1	0.2	V
RD/FG output pin leak current	$I_{RD/FGL}$	$V_{RD/FG}$ = 15V		1	30	μA
HB output L voltage	V_{HBL}	I_{HB} = 5mA	1.3	1.5	1.7	V

Package Dimensions

unit : mm (typ)

3179C

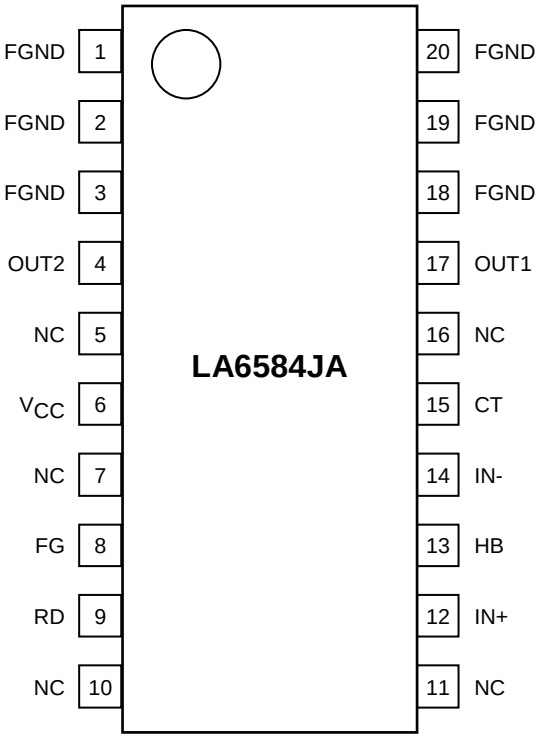




Truth Table

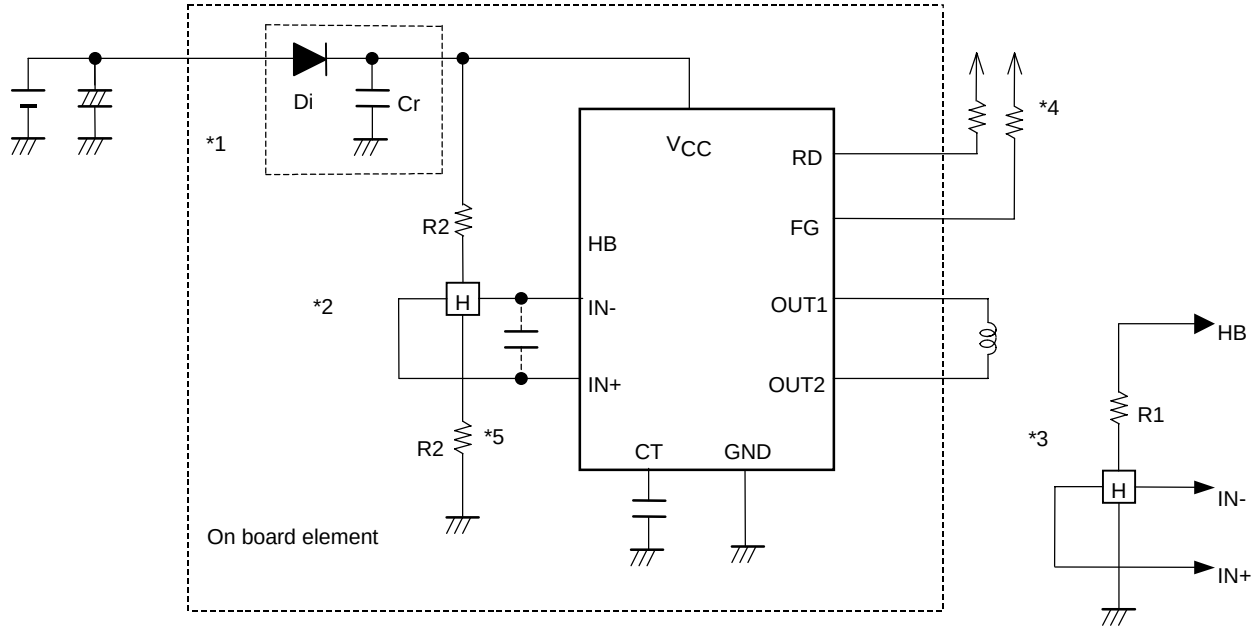
IN-	IN+	CT	OUT1	OUT2	FG	RD	Mode
H	L	L	H	L	L	L	During rotation
L	H		L	H	H		
-	-	H	OFF	OFF	-	H	Lock protection

Pin Assignment



Top view

Sample Application Circuit



*1 When Di to prevent breakdown in case of reverse connection is used, it is necessary to insert a capacitor Cr to secure the regenerative current route. Similarly, Cr is necessary to enhance the reliability when there is no capacitor near the fan power line.

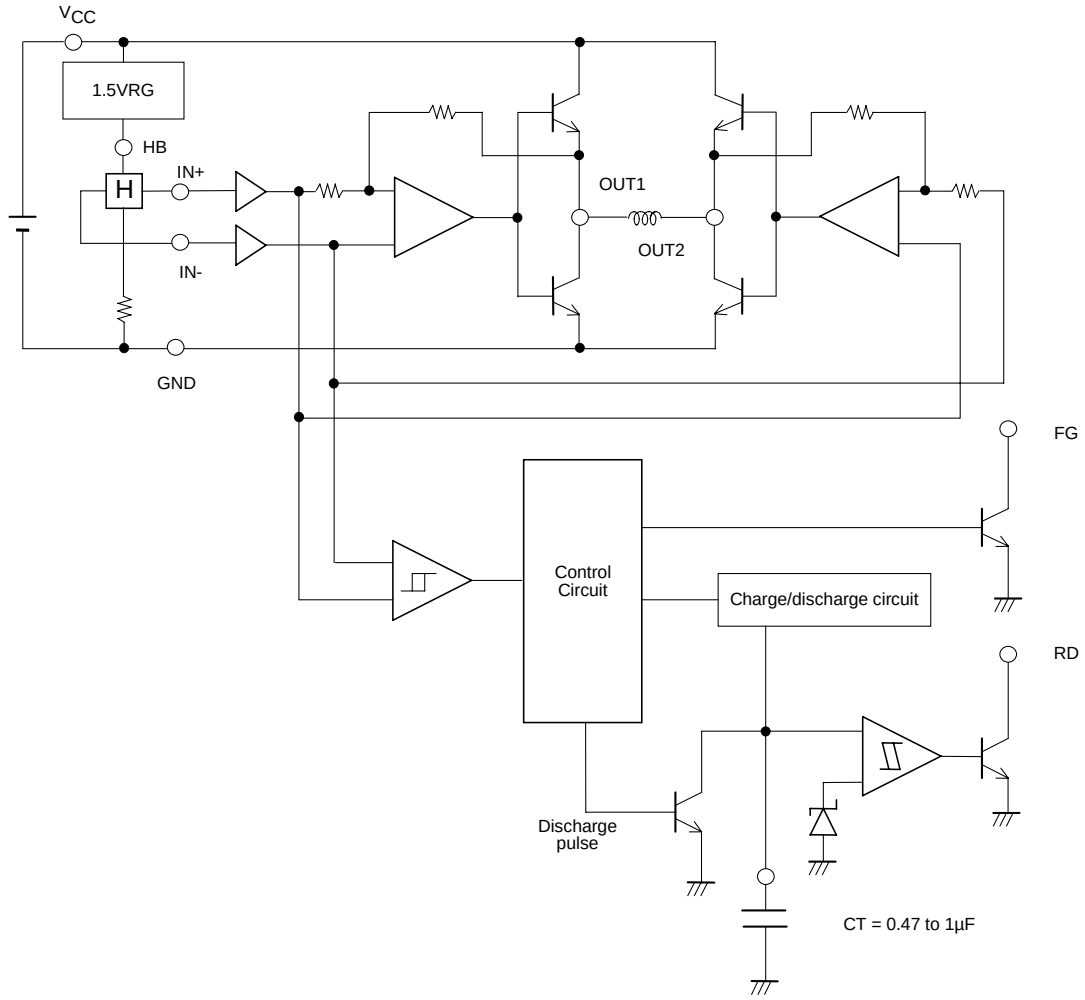
*2 To obtain Hall bias from V_{CC}, carry out $1/2 \times V_{CC}$ bias as shown in the figure. Linear driving is made through voltage control of the coil by amplifying the Hall output. When the Hall element output is large, the startup performance and efficiency are improved. Adjustment of the Hall element can reduce the noise further.

*3 When the Hall bias is taken from the HB pin, constant-voltage bias is made with about 2.0V. Therefore, the Hall element can provide the output satisfactory in temperature characteristics. Adjustment of the Hall output amplitude is made with R1. (When V_{CC} = 12V, the step *2 above proves advantageous for IC heat generation.)

*4 Keep this open when not used.

*5 When the wiring from the Hall output to IC Hall input is long, noise may be carried through the wiring. In this case, insert the capacitor as shown in the figure.

Internal Equivalent Circuit



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  401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
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- ### Sales :

  Direct +86 (21) 6401-6692

  Email amall@ameya360.com

  QQ 800077892

  Skype ameyasales1 ameyasales2

- ### Customer Service :

  Email service@ameya360.com

- ### Partnership :

  Tel +86 (21) 64016692-8333

  Email mkt@ameya360.com