



# LA6581T

## BTL Driver Single-Phase Full-Wave Fan Motor Driver

### Overview

The LA6581T 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 12 V electronic game products.

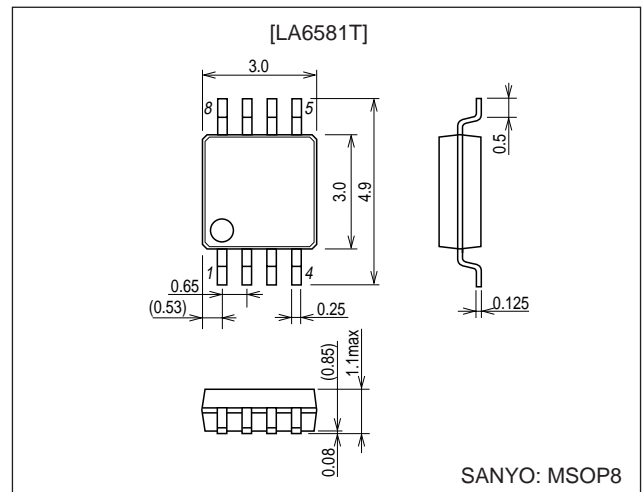
### Functions and Features

- Single-phase full-wave linear drive with BTL output (gain resistance 500-284k, 55dB): Suitable for the equipment requiring silent operation, such as game equipment, CPU cooler, etc. because of its freedom from switching noise
- Low-voltage operation possible, with wide operable voltage range (3 to 16 V)
- Low saturation output (Upper + lower saturation voltage:  $V_{Osat(total)} = 0.3 V_{typ}$ ,  $I_O = 100 \text{ mA}$ ): High coil efficiency with low current drain. IC itself does not generate much heat.
- High impedance of Hall input pin
- FG output (rotation speed detection output: open collector output)
- Heat protection circuit: When the large current flows because of output short-circuit, raising the IC chip temperature above  $180^\circ\text{C}$ , the heat protection circuit suppresses the drive current, preventing IC burn and breakdown.
- Ultraminiature package (MSOP-8:  $3.0 \times 4.0 \times 0.93 \text{ mm typ}$ ): Small substrate while allowing larger blades.

### Package Dimensions

unit: mm

#### 3245A-MSOP8



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## LA6581T

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Output voltage	$V_{CC}$ max	Mounted on a specified board*	18	V
Allowable dissipation	$P_d$ max	$V_{CC2}$ pin	400	mW
Output current	$I_{OUT}$	Pins UL, VL, WL, UH, VH, WH	0.30	A
Output withstand voltage	$V_{OUT}$ max		18	V
FG output withstand	$V_{FG}$ max		18	V
FG output current	$I_{FG}$ max		5	mA
Operating temperature	$T_{opr}$		-20 to +90	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

Note\*: Mounted on a board ( $20.0 \times 10.1 \times 0.8$  mm: Paper Phenol, wiring density 20%)

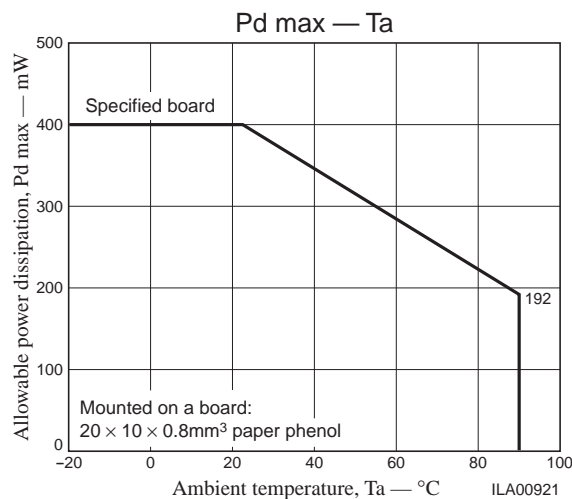
#### Recommended Operating Range at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	$V_{CC}$		2.5 to 16	V
Common-phase input voltage range of Hall input	$V_{ICM}$		0.3 to $V_{CC} - 1.5$	V

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Circuit Current	$I_{CC}$	$I_{N-} = 5.8$ V, $I_{N+} = 6.0$ V, $R_L = \infty$		14	19	mA
OUT output low voltage	$V_{OL}$	$I_O = 100$ mA		0.1	0.2	V
OUT output high voltage	$V_{OH}$	$I_O = 100$ mA		0.1	0.2	V
Hall bias voltage	$V_{HB}$	$R_H = 360 \Omega + 91 \Omega$	1.85	1.95	2.05	V
Hall amplifier gain	$V_g$		52	55	58	dB
Hall amplifier input current	$V_{INR}$		-10	-2	10	$\mu\text{A}$
FG output low voltage	$V_{FG}$	$I_{FG} = 3$ mA		0.2	0.3	V
FG output leakage current	$I_{FGL}$	$V_{FG} = 7$ V			30	$\mu\text{A}$
Thermal protection circuit	$T_h$	*Design guarantee	150	180	200	$^\circ\text{C}$

Note\*: Design guarantee: Design target. Measurement with a single unit not made.

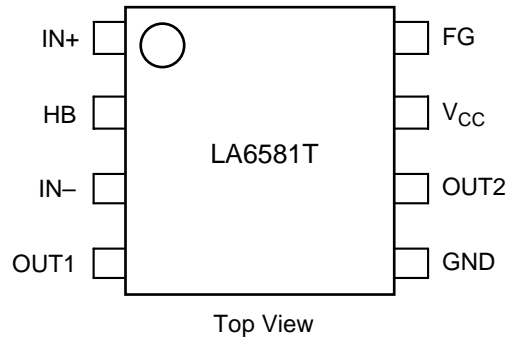


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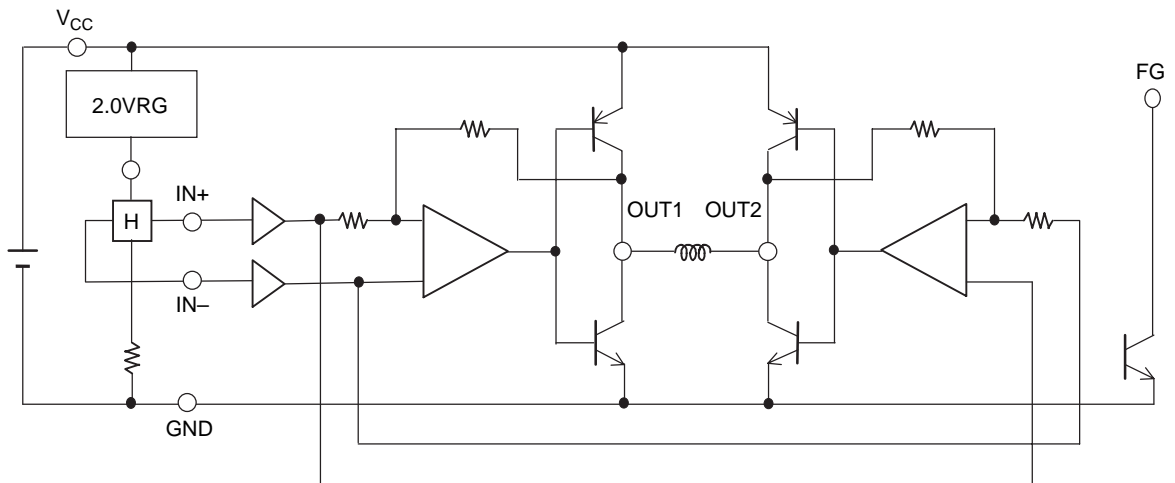
## Truth Table

IN-	IN+	OUT1	OUT2	FG	Mode
H	L	H	L	L	During rotation
L	H	L	H	Off	
—	—	Off	Off	—	During overheat protection

## Pin Assignment



## Block Diagram





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