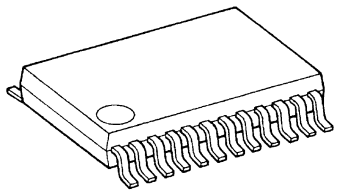
TOSHIBA Bi-CMOS Integrated Circuit Silicon Monolithic

# TB9056FNG

## Automotive DC Servo Motor Driver

The TB9056FNG is an automotive DC servo motor driver (0.5 A class). With a target motor rotational position supplied with an external LIN (Local Interconnect Network) signal, it measures the current motor position using a potentiometer and controls motor rotation so that its rotational position coincides with the target position. Up to 16 TB9056FNG devices can be connected as slaves on a single bus.



SSOP24-P-300-0.65A

Weight: 0.13 g (typ.)

## Features

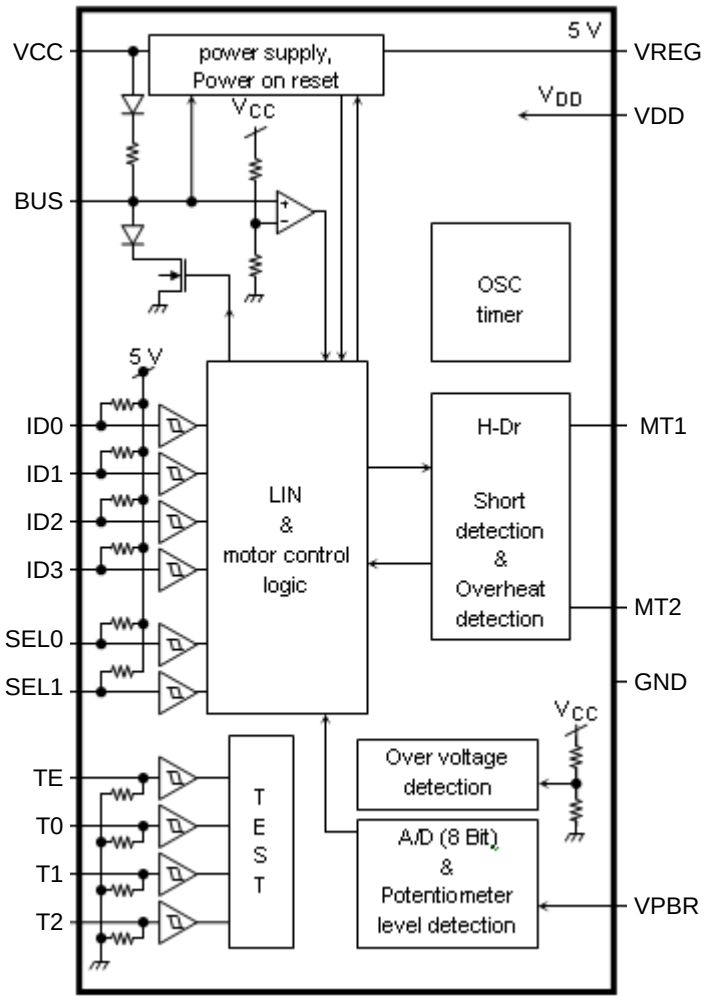
- Data communications with LIN (slave)
  Communication rate: 19200 / 9600 / 2400 bps (with pins switched)
  LIN Protocol Specification 1.3 base
- Bidirectional DC motor driver : 1 channel (Ron typ.: Pch+Nch = 2.2 Ω)
- Driver short-circuit protection : ±1.5 A (typ.)
- Overheat and overvoltage detection
- Standby current : 10 μA or less (when $V_{CC}$ = 16 V or less)
- Operating supply voltage range : 7 to 18 V
- Operating temperature range : –40 to 85°C (125°C)
- 24-pin SSOP flat package
- The product(s) is/are compatible with RoHS regulations (EU directive 2002 / 95 / EC) as indicated, if any, on the packaging label ("[[G]]/RoHS COMPATIBLE", "[[G]]/RoHS [[Chemical symbol(s) of controlled substance(s)]]", "RoHS COMPATIBLE" or "RoHS COMPATIBLE, [[Chemical symbol(s) of controlled substance(s)]]>MCV").

About solder ability, following conditions were confirmed

- Solder ability
  (1) Use of Sn-37Pb solder bath
    · Solder bath temperature = 230°C
    · Dipping time = 5 seconds
    · Number of times = once
    · Use of R-type flux

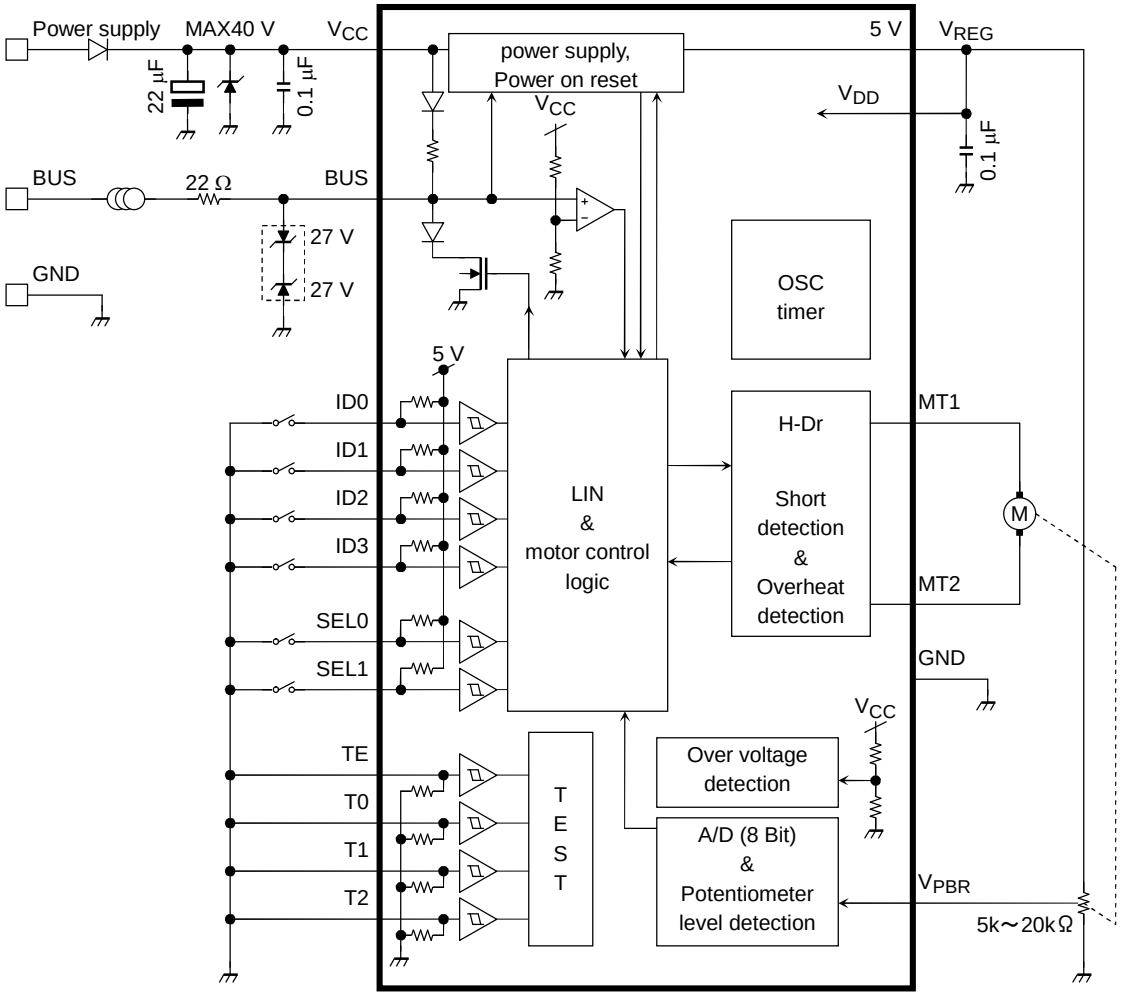
  (2) Use of Sn-3.0Ag-0.5Cu solder bath
    · Solder bath temperature = 245°C
    · Dipping time = 5 seconds
    · Number of times = once
    · Use of R-type flux

## Block Diagram




Note: Some of the functional blocks, circuits, or constants in the block diagram are omitted or simplified to clarify the descriptions of the relevant features.

## Example Slave Application Circuit




## Notes on Use

-The TB9056FNG does not have features that guard against reverse battery connection or over current on the $V_{CC}$ and $V_{REG}$ pins and does not detect when the $V_{PBR}$ pin is left open. The “current data” has tendency to become FFh. But VPBR pin keeps high impedance.

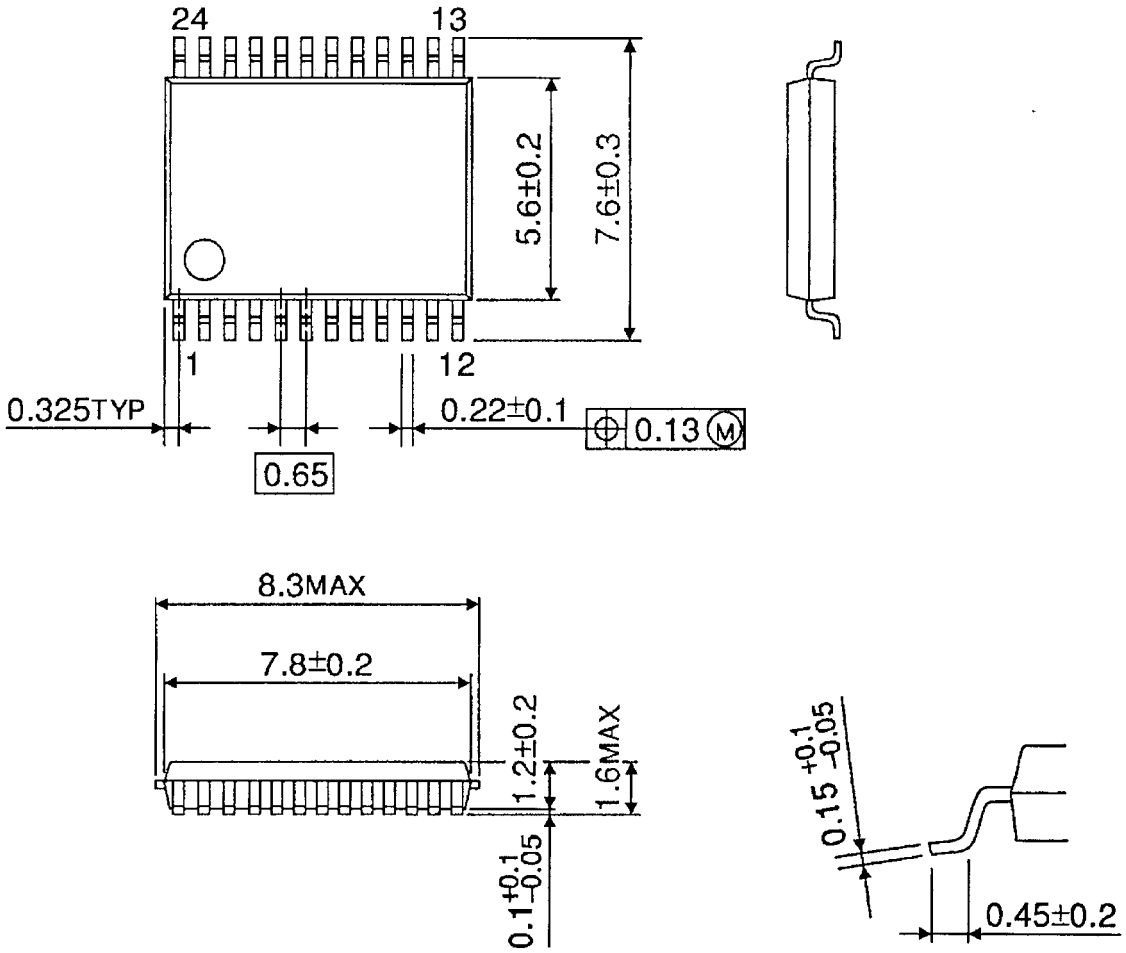
-Note also that a $V_{CC}$ pin voltage of 40 V or higher may cause damage to the TB9056FNG. Protection circuit is necessary in the case that the induced voltage becomes more than 40V.

-If operating voltage at Vcc increases above 18V the standby current may be higher than specified and it may happen that the IC leaves the standby state

-27V Zener diode should be connected to BUS in order to protect the IC. For the case that GND is open, two Zener diodes should be used so that BUS line remains unaffected by GND voltage.

## Package Dimensions

SSOP24-P-300-0.65A Unit : mm




Weight: 0.13 g (typ.)

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