

**SANYO**
**LA5645T**
**Constant-Voltage/Constant-Current Control IC**

## Overview

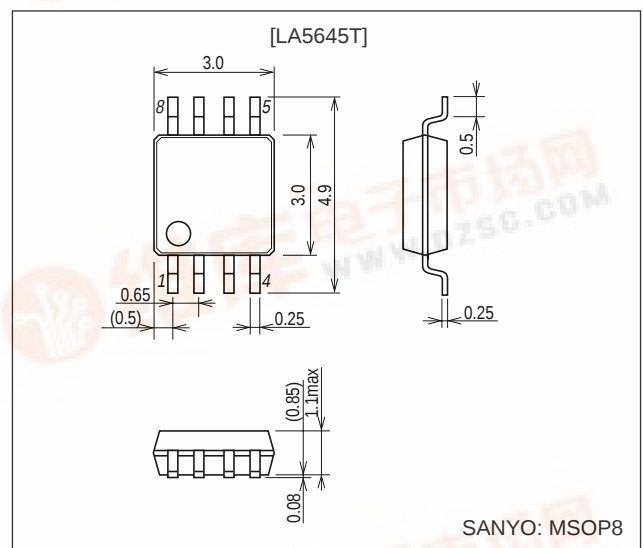
The LA5645T is a constant-voltage/constant-current control IC that incorporates low-voltage operational amplifiers and a high-precision reference voltage circuit ( $V_{REF} = 1.5 \text{ V} \pm 1.0\%$ ). This device is optimal for use as a secondary side controller in battery chargers, switching regulators, and similar products.

## Features

- Operating supply voltage: 2.5 to 14 V
- High-precision reference voltage:  $1.5 \text{ V} \pm 1.0\%$
- PC pin current: 60 mA (max)
- Current drain: 3 mA (max)
- Input offset voltage: 2 mV (max)

## Package Dimensions

unit: mm

**3245-MSOP8**


## Specifications

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

| Parameter                   | Symbol               | Conditions                                      | Ratings     | Unit             |
|-----------------------------|----------------------|-------------------------------------------------|-------------|------------------|
| Supply voltage              | $V_{CC \text{ max}}$ |                                                 | 14.5        | V                |
| Differential input voltage  | $V_{ID \text{ max}}$ |                                                 | 14.5        | V                |
| Allowable power dissipation | $P_d \text{ max}$    | Independent IC                                  | 200         | mW               |
|                             |                      | Mounted on the specified printed circuit board* | 370         | mW               |
| PC pin current              | $I_{PC \text{ max}}$ |                                                 | 60          | mA               |
| Operating temperature       | $T_{opr}$            |                                                 | -40 to +85  | $^\circ\text{C}$ |
| Storage temperature         | $T_{stg}$            |                                                 | -50 to +150 | $^\circ\text{C}$ |

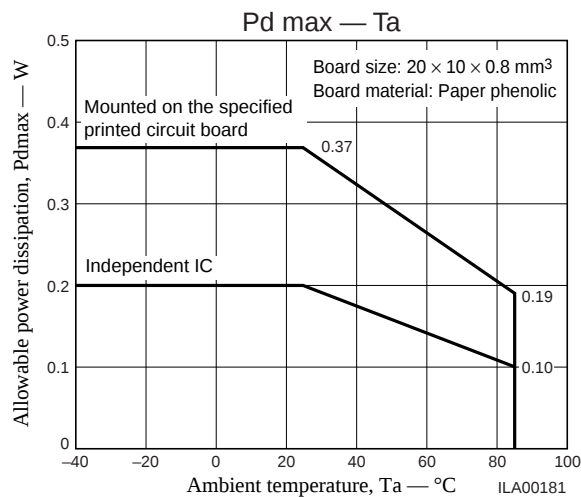
 Note: \* Specified printed circuit board:  $20 \times 10 \times 0.8 \text{ mm}^3$ , paper phenolic board.

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

| Parameter                  | Symbol    | Conditions | Ratings   | Unit |
|----------------------------|-----------|------------|-----------|------|
| Recommended supply voltage | $V_{opr}$ |            | 2.5 to 14 | V    |

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LA5645T

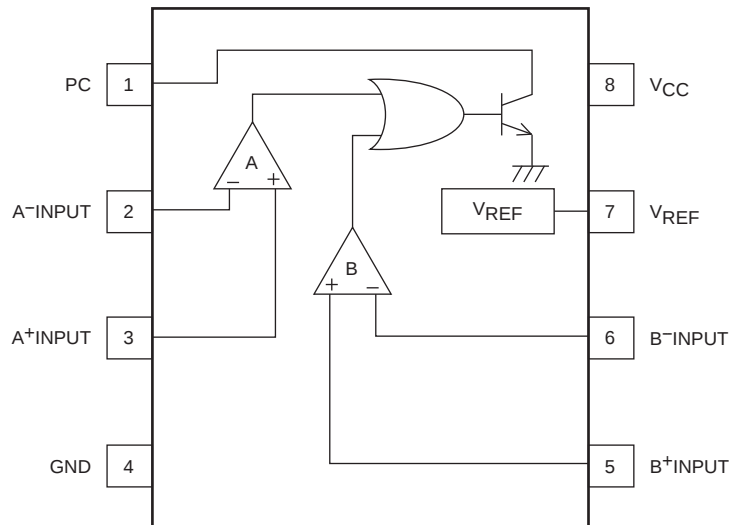


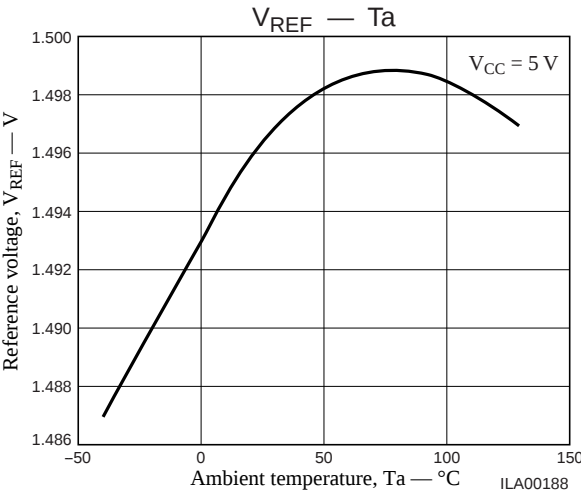
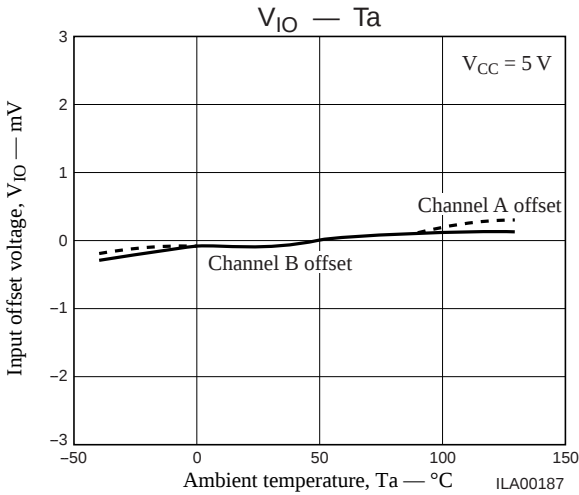
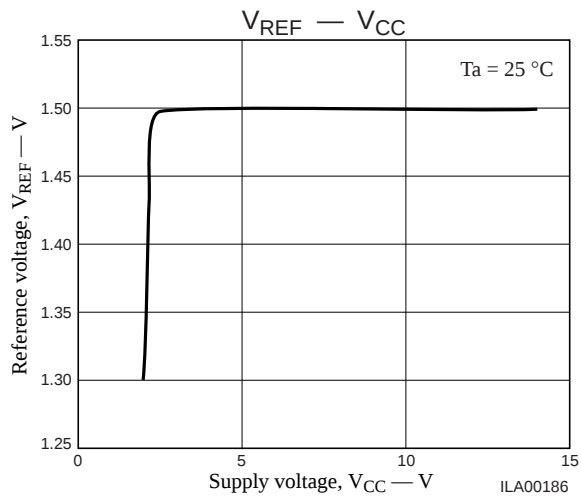
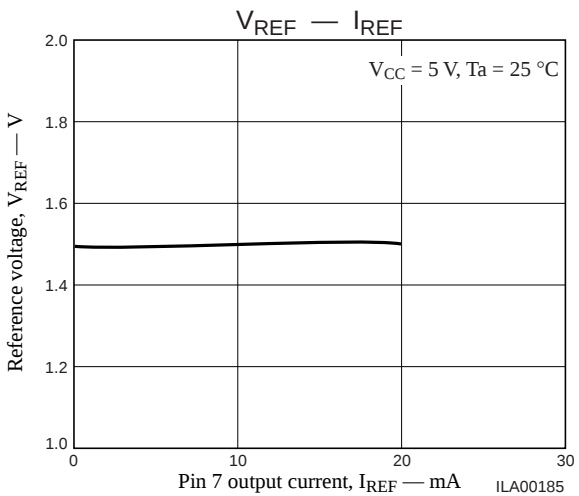
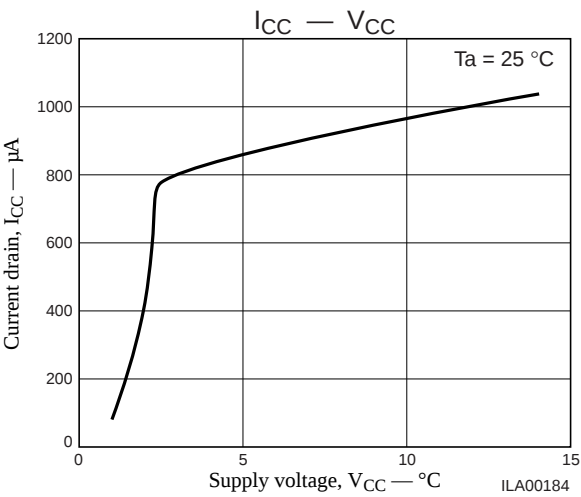
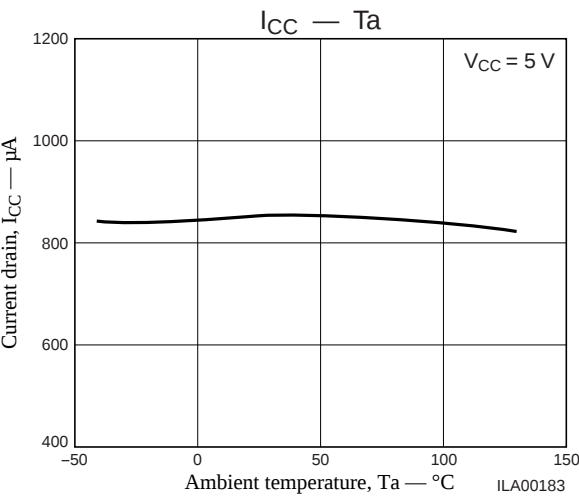
**Electrical Characteristics at Ta = 25°C, V<sub>CC</sub> = 5 V**

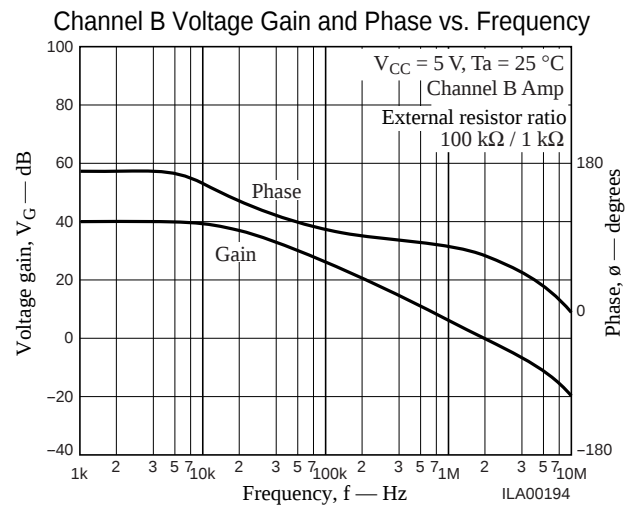
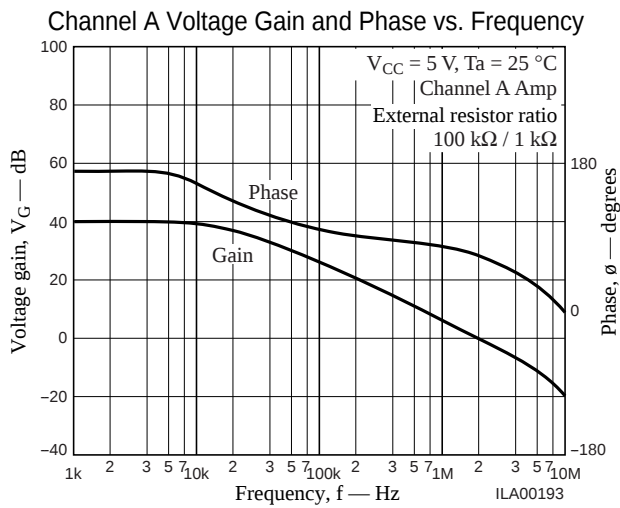
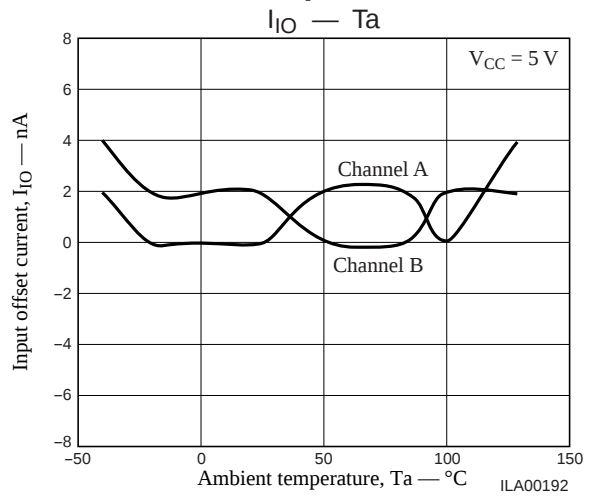
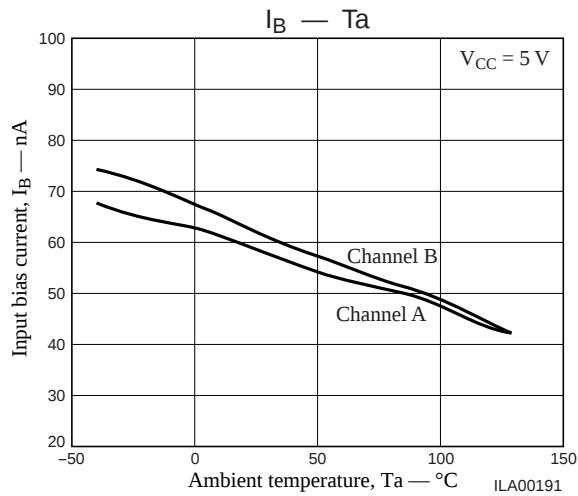
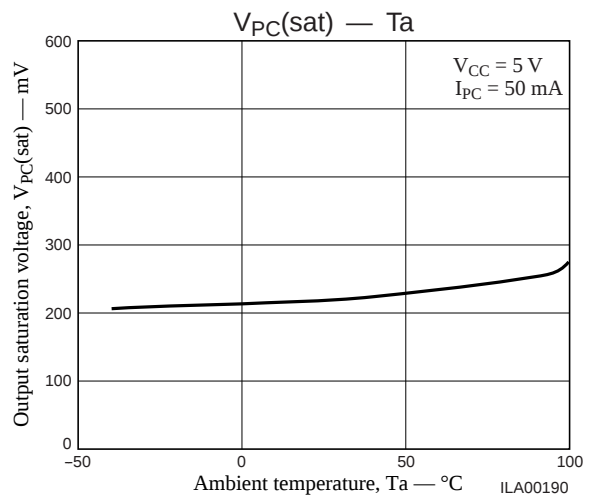
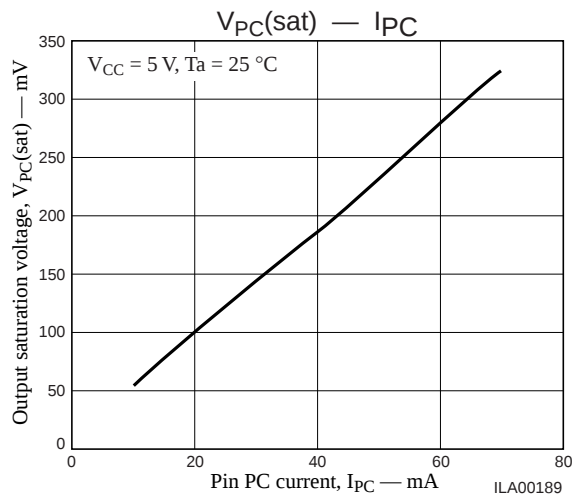
| Parameter                                                           | Symbol                               | Conditions                               | Ratings |      |                     | Unit |
|---------------------------------------------------------------------|--------------------------------------|------------------------------------------|---------|------|---------------------|------|
|                                                                     |                                      |                                          | min     | typ  | max                 |      |
| Current drain                                                       | I <sub>CC</sub>                      | I <sub>PC</sub> = OFF                    |         | 1    | 3                   | mA   |
| Leakage current                                                     | I <sub>PC</sub> LEAK                 | V <sub>CC</sub> = V <sub>PC</sub> = 14 V |         |      | 100                 | μA   |
| Saturation voltage                                                  | V <sub>PC</sub> (sat)                | I <sub>PC</sub> = 50 mA                  |         | 0.5  | 0.7                 | V    |
| Reference voltage                                                   | V <sub>REF</sub>                     | I <sub>REF</sub> = 0 mA                  | 1485    | 1500 | 1515                | mV   |
| Reference voltage regulation                                        | ΔV <sub>REF</sub> /ΔI <sub>REF</sub> | I <sub>REF</sub> = 0 to 5 mA             |         |      | 30                  | mV   |
| [Amplifier Block] (Characteristics common to both channels A and B) |                                      |                                          |         |      |                     |      |
| Input offset voltage                                                | V <sub>IO</sub>                      |                                          |         | 0.5  | 2                   | mV   |
| Input offset current                                                | I <sub>IO</sub>                      |                                          |         | 5    | 50                  | nA   |
| Input bias current                                                  | I <sub>B</sub>                       |                                          |         | 80   | 250                 | nA   |
| Voltage gain                                                        | A <sub>V</sub>                       | Open loop gain (design guarantee*)       |         | 80   |                     | dB   |
| Common-mode input voltage range                                     | V <sub>ICM</sub>                     |                                          | 0       |      | V <sub>CC</sub> - 2 | V    |
| Slew rate                                                           | SR                                   | Design guarantee*                        |         | 0.8  |                     | V/μs |
| Gain-bandwidth product                                              | GB                                   | Design guarantee*                        |         | 2    |                     | MHz  |

Note: \* Design guarantee value. These parameters are not measured.

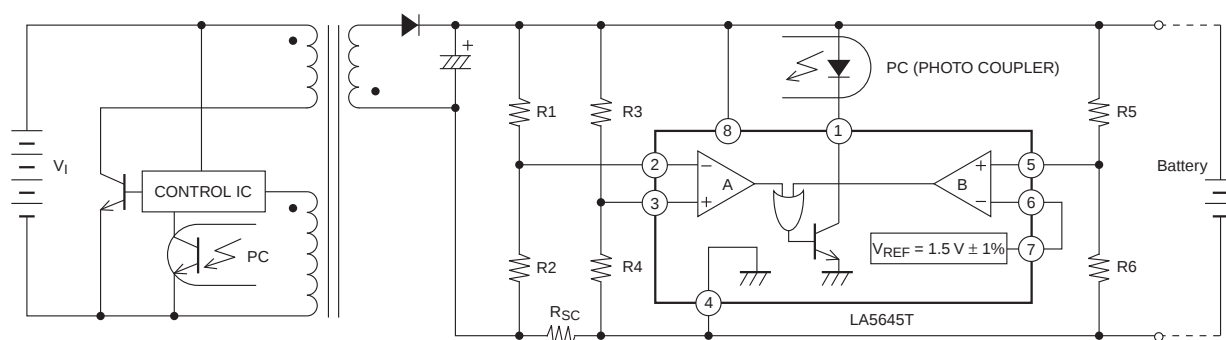
**Pin Assignment**







## Sample Application Circuit



ILA00195

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