Ordering number : ENN6520

Monolithic Linear IC

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 V ±1.0%). This device is optimal for use as a secondary side controller in battery chargers, switching regulators, and similar products.

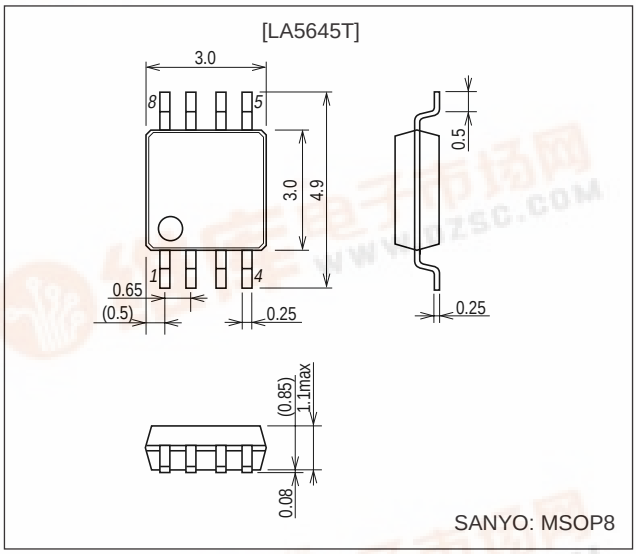
Features

- Operating supply voltage: 2.5 to 14 V
- High-precision reference voltage: 1.5 V ±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

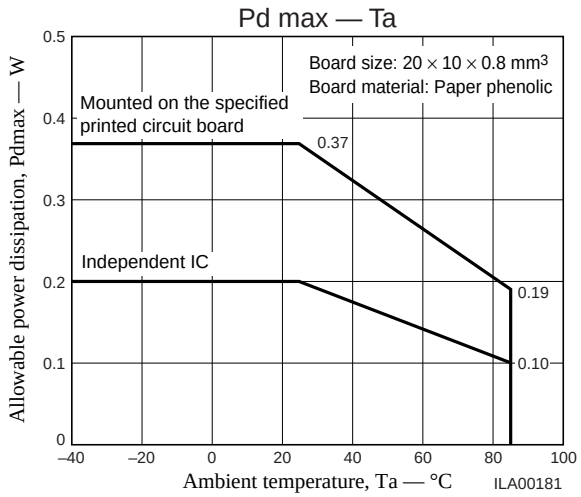
Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC} max		14.5	V
Differential input voltage	V_{ID} max		14.5	V
Allowable power dissipation	Pd max	Independent IC	200	mW
		Mounted on the specified printed circuit board*	370	mW
PC pin current	I_{PC} max		60	mA
Operating temperature	Topr		–40 to +85	°C
Storage temperature	Tstg		–50 to +150	°C

Note: * Specified printed circuit board: 20 × 10 × 0.8 mm^3, paper phenolic board.

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	Vopr		2.5 to 14	V

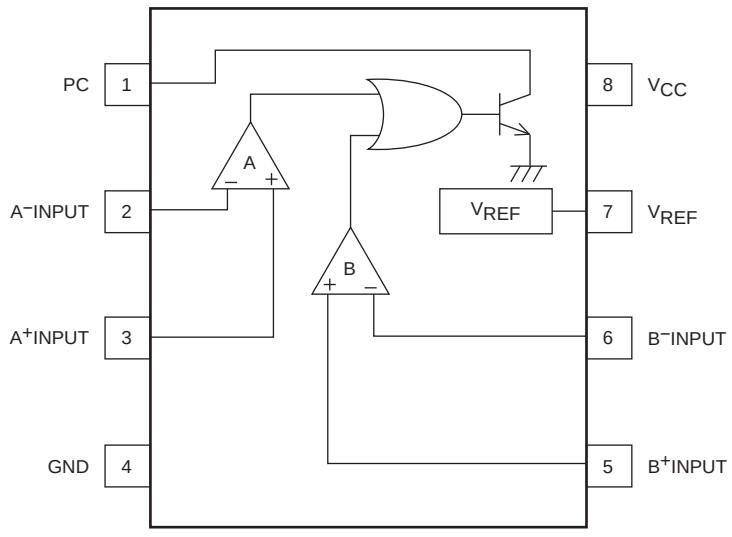


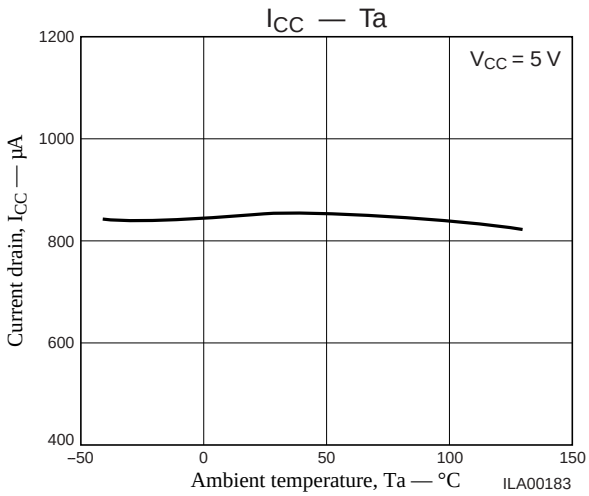
Electrical Characteristics at Ta = 25°C, V_{CC} = 5 V

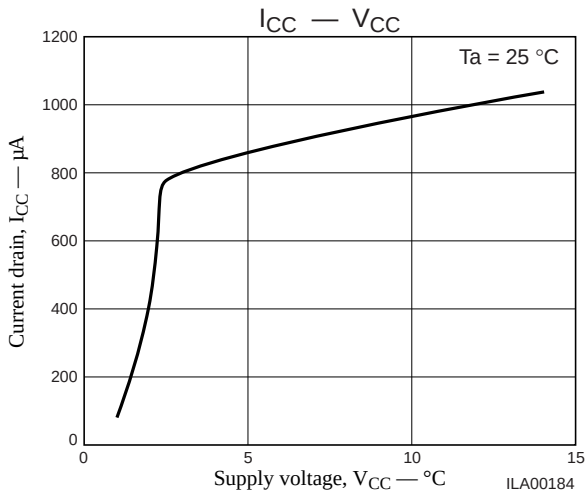
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	I_{CC}	I_{PC} = OFF		1	3	mA
Leakage current	I_{PC} LEAK	V_{CC} = V_{PC} = 14 V			100	µA
Saturation voltage	V_{PC} (sat)	I_{PC} = 50 mA		0.5	0.7	V
Reference voltage	V_{REF}	I_{REF} = 0 mA	1485	1500	1515	mV
Reference voltage regulation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

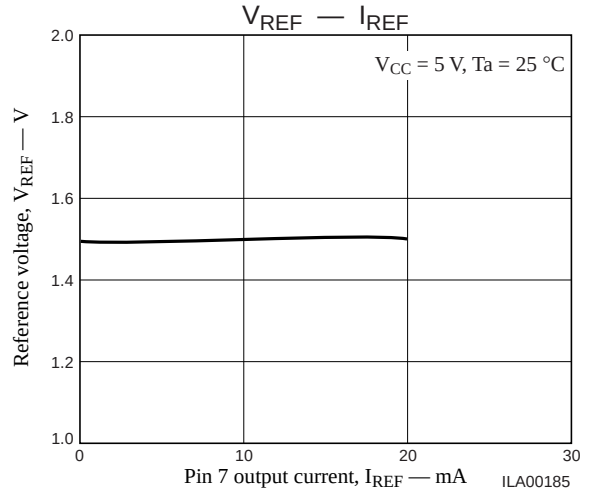
Note: * Design guarantee value. These parameters are not measured.

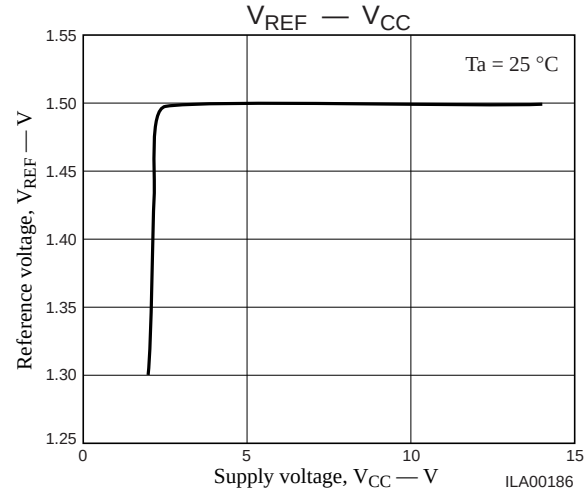
Pin Assignment

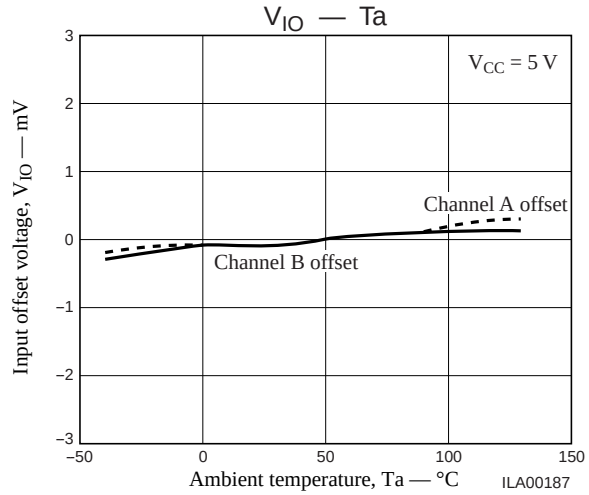


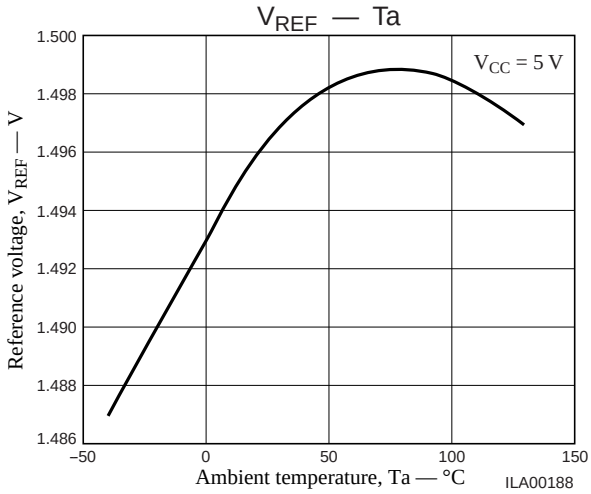

I_{CC} — Ta
V_{CC} = 5 V
Current drain, I_{CC} — µA
1200
1000
800
600
400
–50
0
50
100
150
Ambient temperature, Ta — °C
ILA00183


I_{CC} — V_{CC}
Ta = 25 °C
Current drain, I_{CC} — µA
1200
1000
800
600
400
200
0
0
5
10
15
Supply voltage, V_{CC} — °C
ILA00184

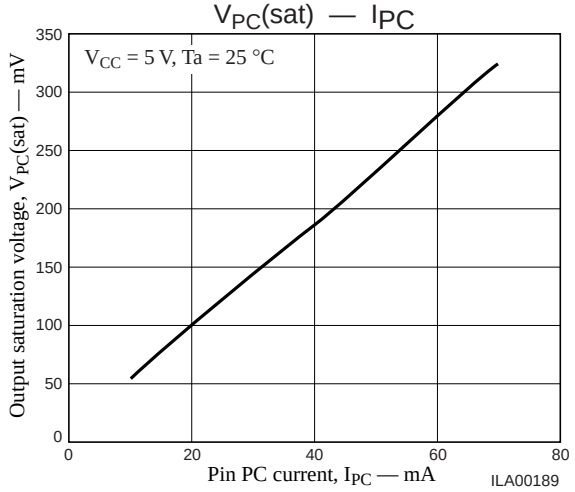

V_{REF} — I_{REF}
V_{CC} = 5 V, Ta = 25 °C
Reference voltage, V_{REF} — V
2.0
1.8
1.6
1.4
1.2
1.0
0
10
20
30
Pin 7 output current, I_{REF} — mA
ILA00185


V_{REF} — V_{CC}
Ta = 25 °C
Reference voltage, V_{REF} — V
1.55
1.50
1.45
1.40
1.35
1.30
1.25
0
5
10
15
Supply voltage, V_{CC} — V
ILA00186

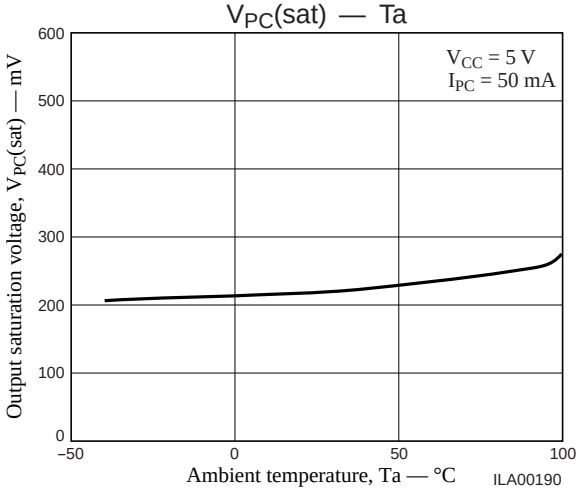

V_{IO} — Ta
V_{CC} = 5 V
Channel A offset
Channel B offset
Input offset voltage, V_{IO} — mV
3
2
1
0
–1
–2
–3
–50
0
50
100
150
Ambient temperature, Ta — °C
ILA00187


V_{REF} — Ta
V_{CC} = 5 V
Reference voltage, V_{REF} — V
1.500
1.498
1.496
1.494
1.492
1.490
1.488
1.486
–50
0
50
100
150
Ambient temperature, Ta — °C
ILA00188

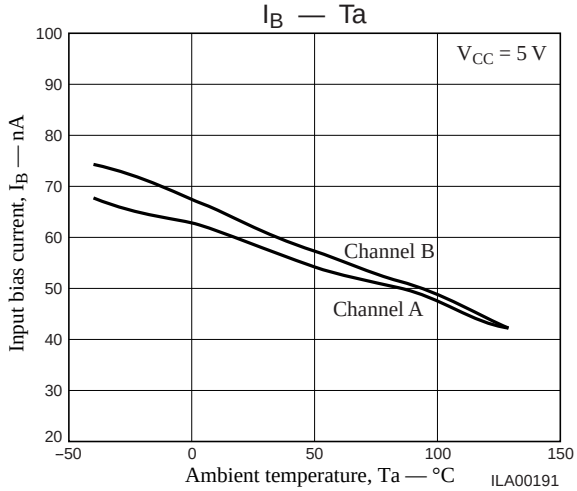
$V_{PC}(sat)$ — I_{PC}



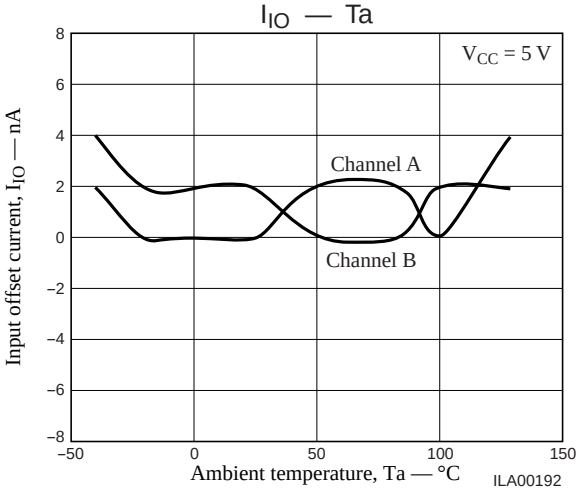
$V_{PC}(sat)$ — Ta



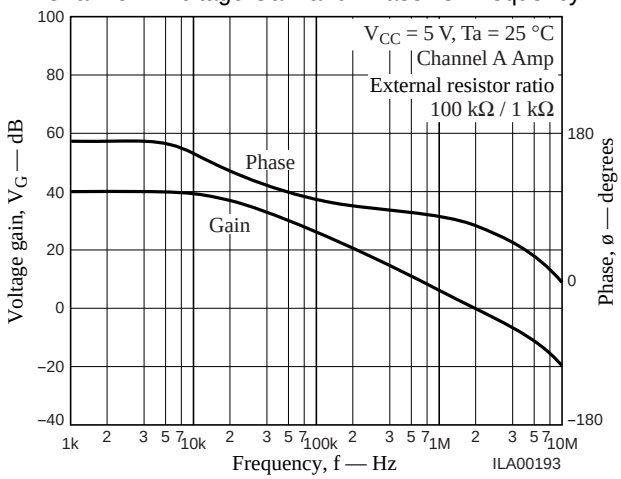
I_B — Ta



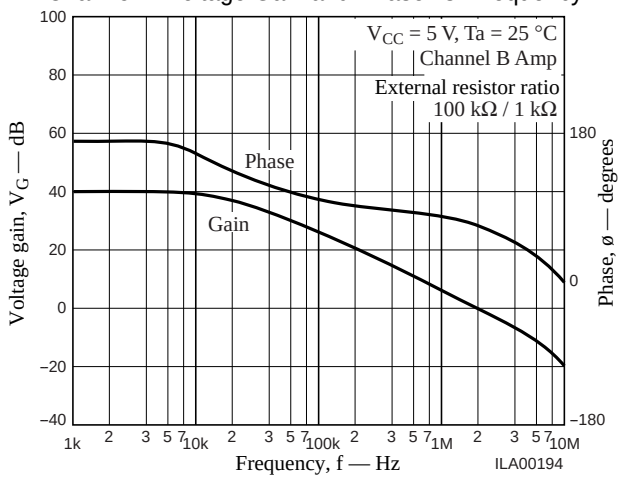
I_{IO} — Ta



Channel A Voltage Gain and Phase vs. Frequency



Channel B Voltage Gain and Phase vs. Frequency



Sample Application Circuit