Ordering number : ENA0352A

SANYO Semiconductors
DATA SHEET

Monolithic Digital IC

LB1800CL — Stepping Motor Driver IC

Overview

The LB1800CL is a 2-channel low-saturation drive low-voltage operation forward/reverse motor driver IC.
Its ultraminiature package makes it optimal for 1-2 or 2 phase excitation drive of 2-phase bipolar stepping motors which are commonly used in various portable devices such as digital still cameras.

Features

- Low saturation voltage, V_O (sat) = 0.3V typ. at I_O of 150mA
- Built-in through current prevention circuit
- Zero current drawn in standby mode
- On-chip index comparator (open collector output)
- Built-in thermal shutdown circuit
- ECSP2828-12 ultraminiature leadless package (2.8mm×2.8mm×0.8mm typ)

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		-0.3 to +8.0	V
Output voltage	V_{OUT} max	OUT1, OUT2, OUT3, OUT4 pin	V_{CC}+VSF	V
Input voltage	V_{IN} max	IN1, IN2, IN3, IN4 pin	-0.3 to +8.0	V
GND pin outflow current	I GND	Per channel	350	mA
Allowable power dissipation	Pd max	Mounted on a circuit board *	450	mW
Operating temperature	Topr		-20 to +75	°C
Storage temperature	Tstg		-40 to +150	°C

* Mounted on a specified board: 20.0mm×10.0mm×0.8mm, paper phenol

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Allowable Operating Range at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		2.2 to 7.5	V
Input high level voltage	V_{IH}	IN1, IN2, IN3, IN4 pin	1.5 to 7.5	V
Input low level voltage	V_{IL}		-0.3 to +0.3	V

Electrical Characteristics at Ta = 25°C, V_{CC} = 3.3V

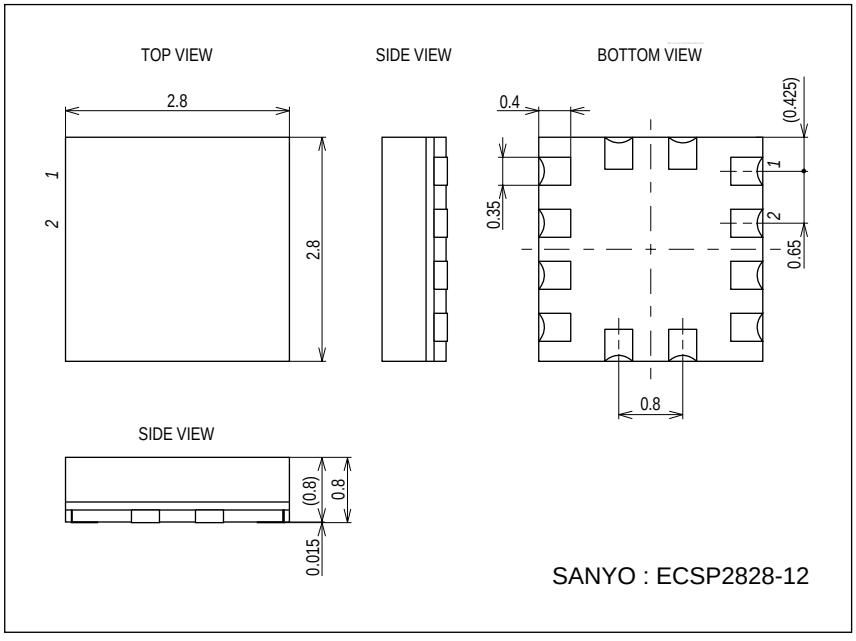
Parameter	Symbol	Conditions	Ratings			unit
			min	typ	max	
Power source current	$I_{CC}0$	V_{IN} = 0V		0.1	1	μA
	$I_{CC}1$	IN1 or IN2 = 3V,IN3 or IN4 = 3V		15	20	mA
Output saturation voltage	$V_{OUT}1$	V_{IN} = 3V or 0V,I_{OUT} = 100mA		0.2	0.25	V
	$V_{OUT}2$*	V_{IN} = 3V or 0V,I_{OUT} = 200mA		0.4		
Input current	I_{IN}	V_{IN} = 3V		60	70	μA
[Index comparator]						
Internal reference voltage	$V_{IN}M$		1.30	1.35	1.40	V
Input voltage range	VCOM		0		V_{CC}	V
Input hysteresis width	VFGHYS1		0.1	0.2	0.25	V
Low-level output voltage	VLCOMP	Sink = 0.1mA		0.2	0.4	V
[Spark killer diode]						
Reverse current	IS(leak)				1	μA
Forward voltage	VSF*	I_{OUT} = 200mA		1.7		V

*: Design assured value

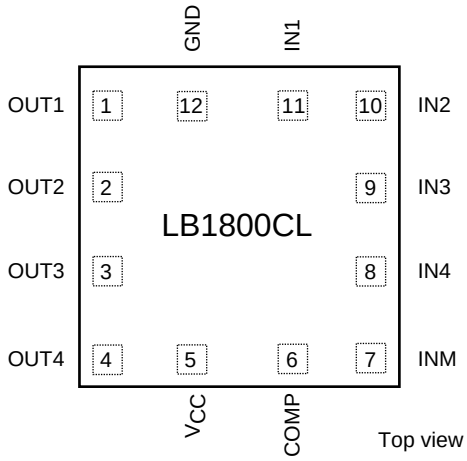
Package Dimensions

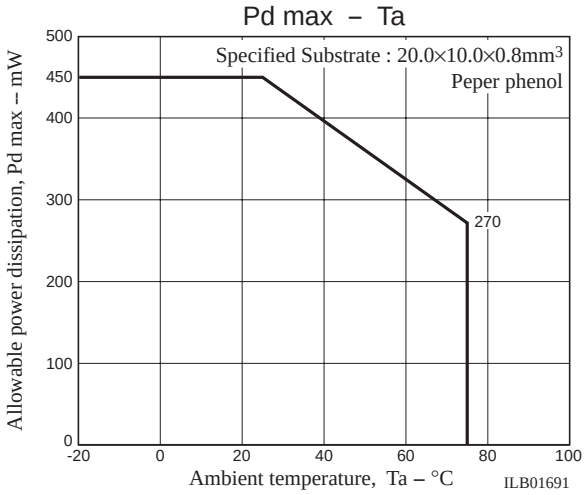
unit : mm (typ)

3324

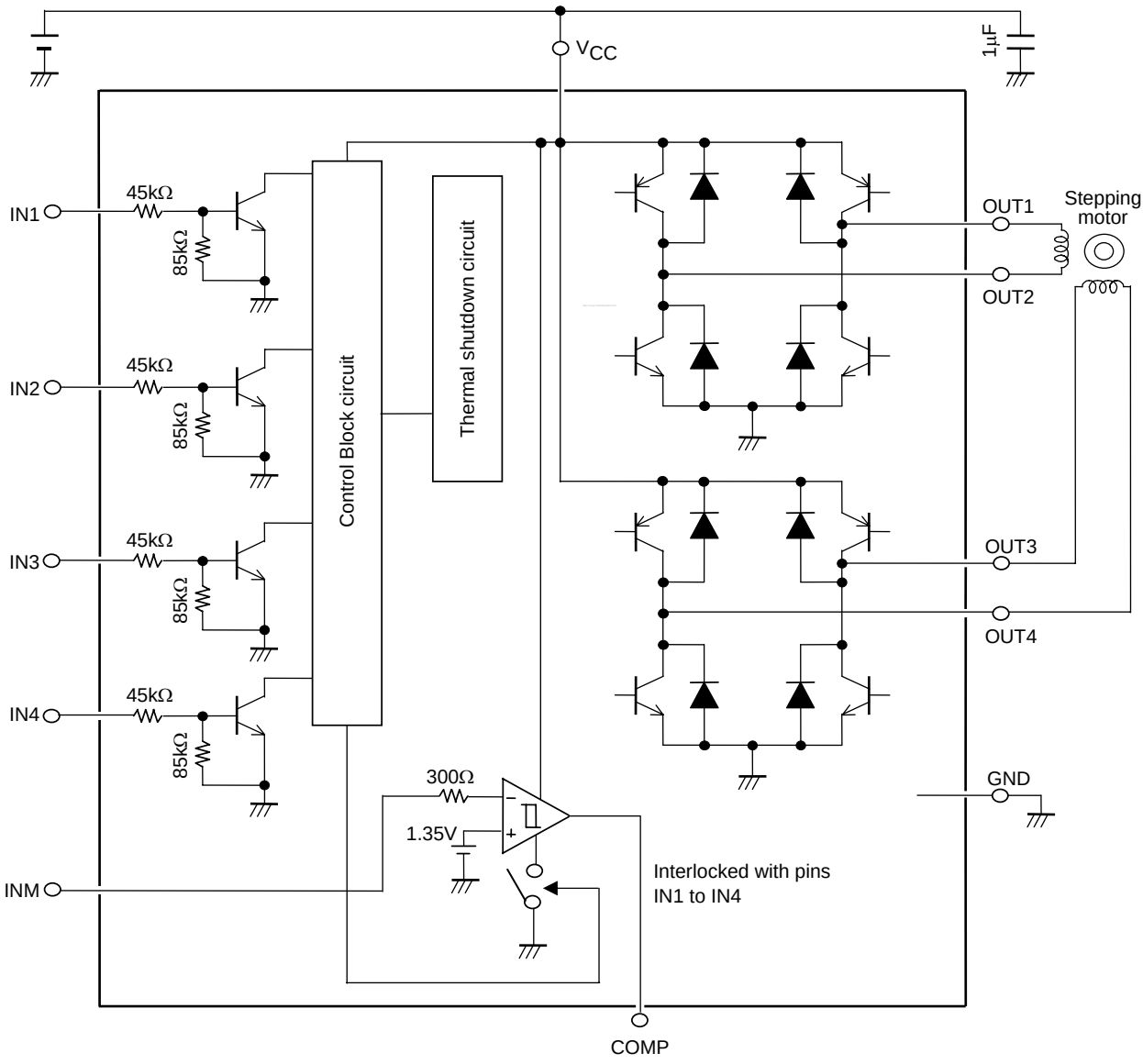


Pin Assignments





Block Diagram



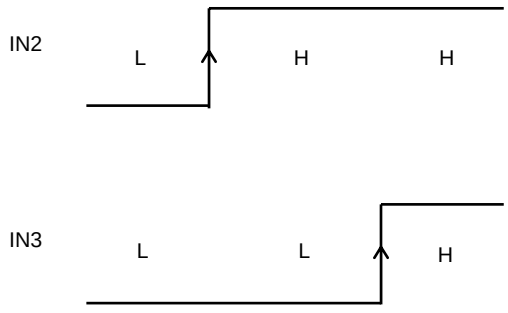
Truth Table

Input				Output					Remarks
IN1	IN2	IN3	IN4	OUT1	OUT2	OUT3	OUT4	COMP	
L	L	L	L	OFF	OFF	OFF	OFF	OFF	Standby
H	L	L	L	H	L	OFF	OFF	ON	1-2 phase excitation
H	L	H	L	H	L	H	L		
L	L	H	L	OFF	OFF	H	L		
L	H	H	L	L	H	H	L		
L	H	L	L	L	H	OFF	OFF		
L	H	L	H	L	H	L	H		
L	L	L	H	OFF	OFF	L	H		
H	L	L	H	H	L	L	H		
H	H			Logic output corresponding to the earliest high input is honored (Note 2).					
-		H	H						

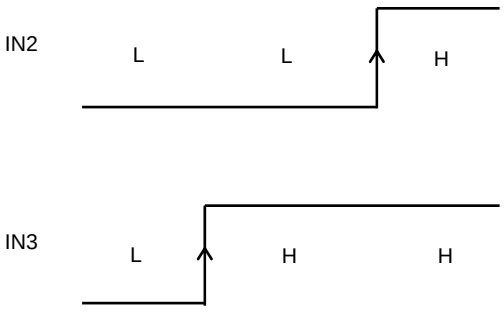
Note 1: Hyphens in the "Output" columns denote the off (high impedance) state.

Note 2: When inputs IN2/IN3=H/H are applied at the timing shown in (1) in the figure below, the latter input IN3 is ignored and the input logic IN2//IN3=H/L is performed. Similarly, IN2/IN3=L/H is performed in the input timing case of (2).

(1)

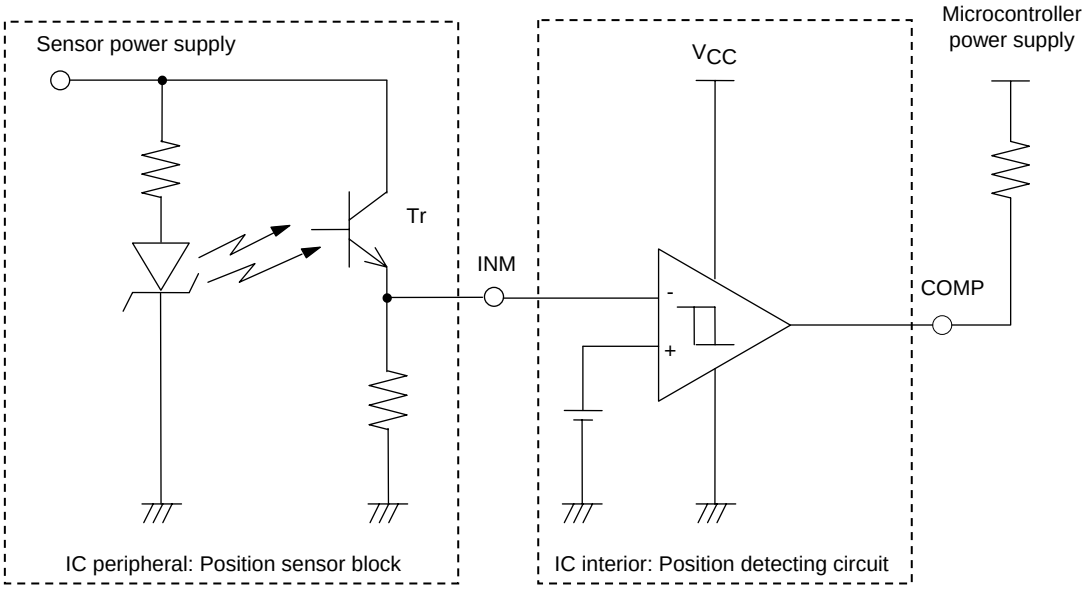


(2)

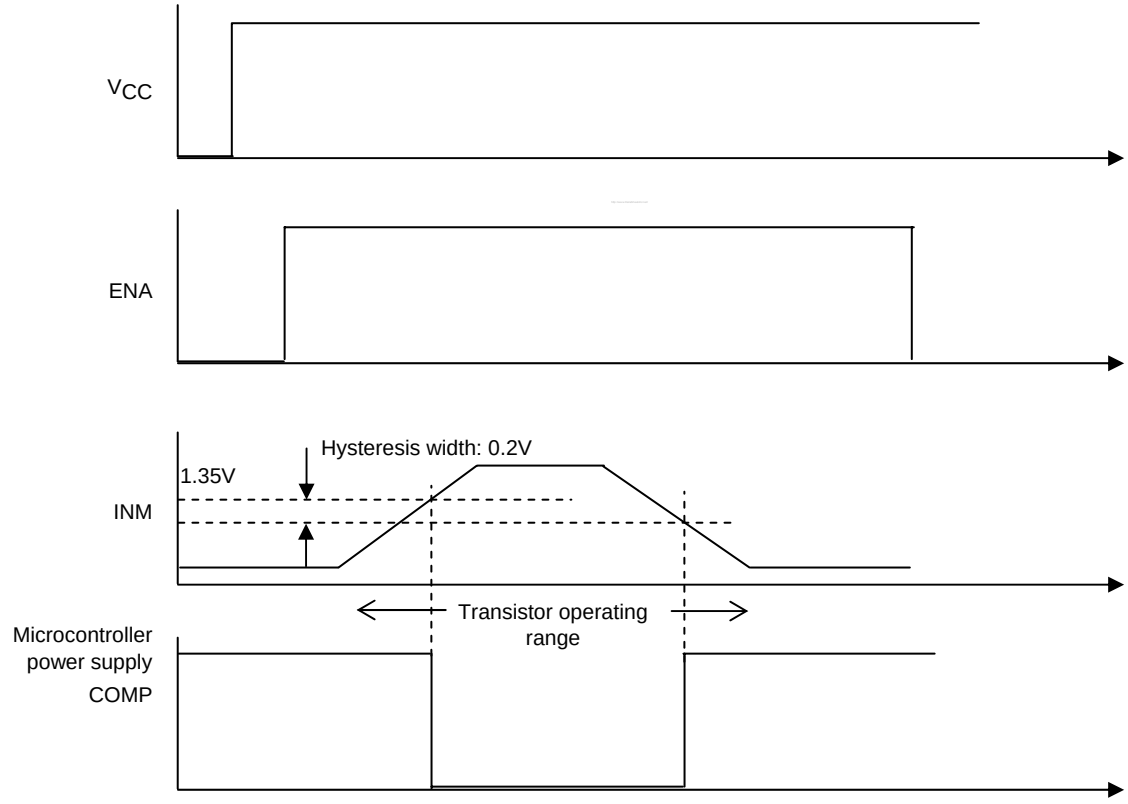


Position Detecting Comparator Application Circuit Example 1

a) Circuit diagram

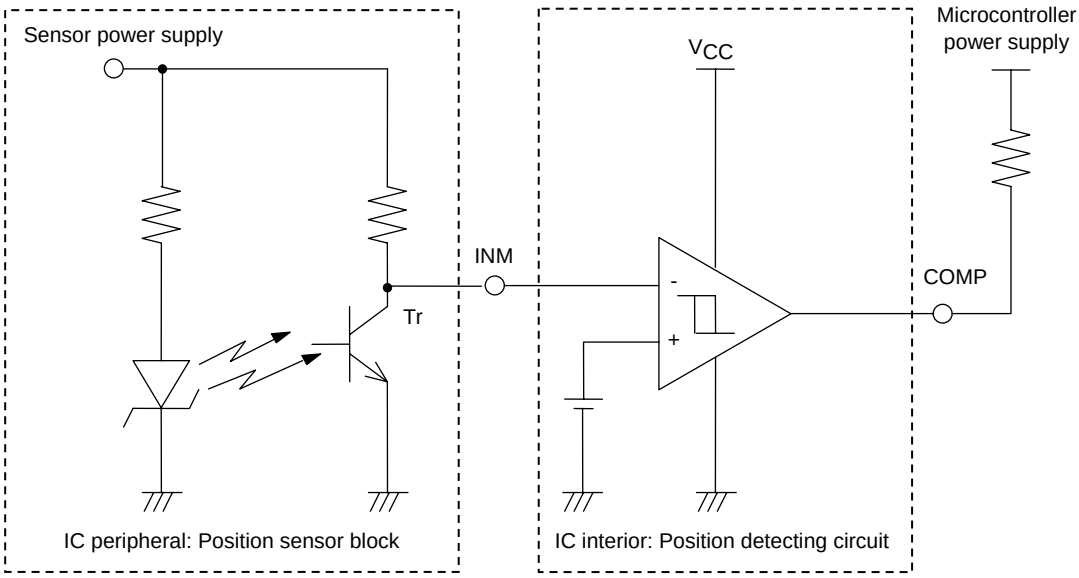


b) Timing chart

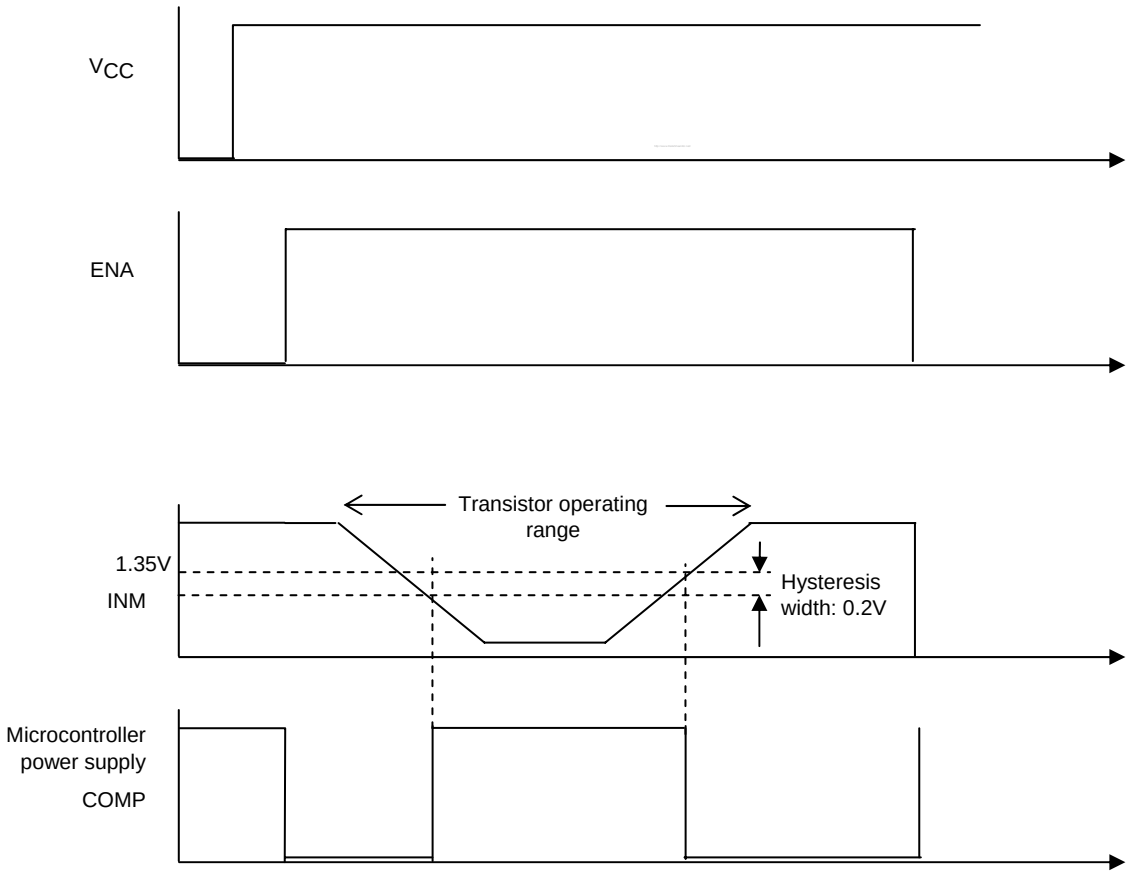


Position Detecting Comparator Application Circuit Example 2

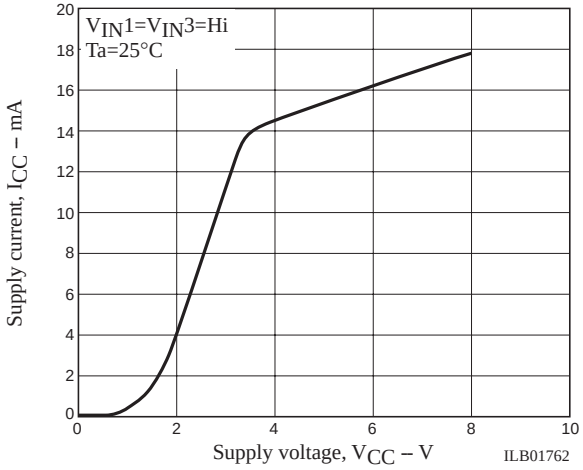
a) Circuit diagram



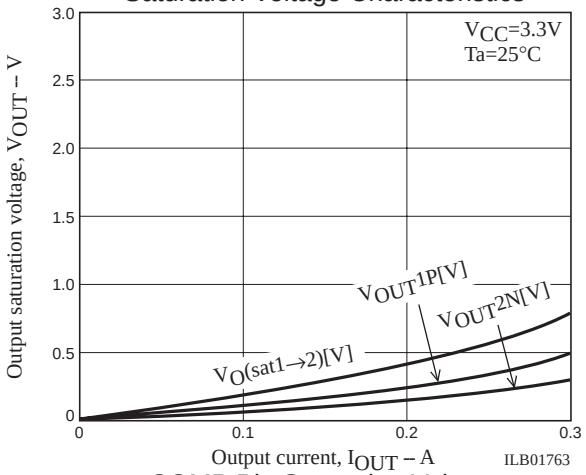
b) Timing chart



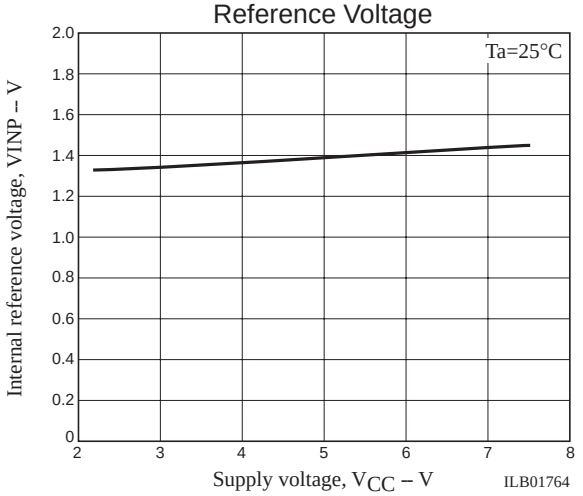
Current Drain



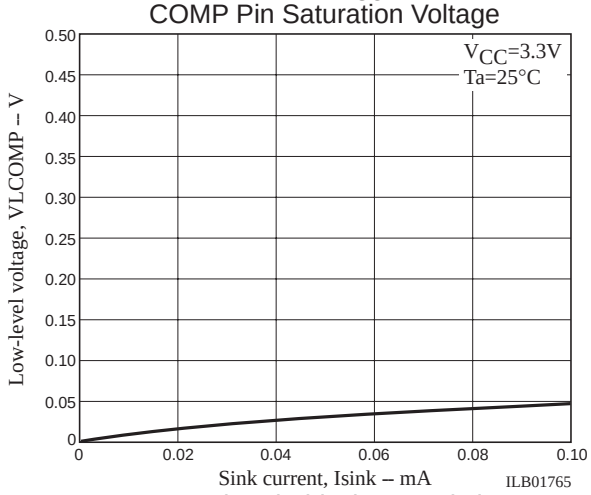
Saturation Voltage Characteristics



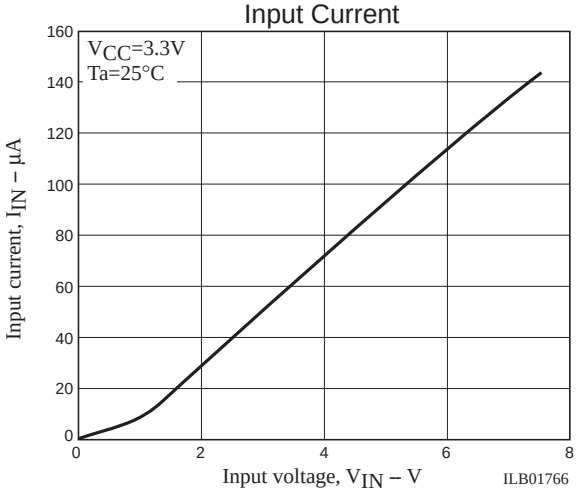
Reference Voltage



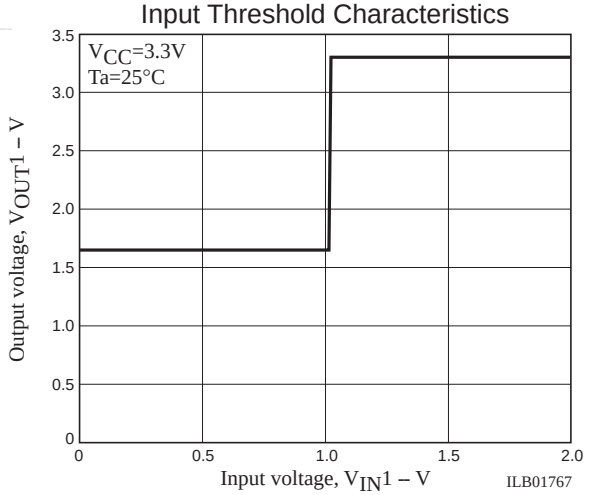
COMP Pin Saturation Voltage



Input Current



Input Threshold Characteristics



Comparator Hysteresis Characteristics, Enlarged