



SANYO Semiconductors DATA SHEET

LB1935T LB1935CL — Monolithic Digital IC Stepping Motor Driver IC

Overview

LB1935T/LB1935CL is IC with forward/reverse motor drive 2-channel in which low saturation voltage and low voltage operation possible. Its small sized package is optimal for 2 phase excitation drive of 2 phase bipolar stepping motors for various portable devices such as digital still cameras.

Features

- Low saturation voltage, $V_{O(sat)} = 0.3V$ typ at $I_O = 150mA$
- Built-in shoot-through current protection circuit
- No standby current consumption (or zero)
- Built-in thermal shutdown circuit
- MSOP10 small-sized package (3.0mm×4.9mm×1.1mm typ) [LB1935T]
- ECSP2828-10 ultraminiature leadless package (2.8mm×2.8mm×0.8mm typ) [LB1935CL]

Absolute Maximum Ratings at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum Power Source Voltage	$V_{CC \max}$		-0.3 to +8.0	V
Applied Output Voltage	$V_{OUT \max}$	OUT1, OUT2, OUT3, OUT4 pin	$V_{CC}+V_{SF}$	V
Applied Input Voltage	$V_{IN \max}$	ENA, IN1, IN2 pin	-0.3 to +8.0	V
GND Pin Outflow Current	I GND	Per channel	400	mA
Allowable Power Consumption	$P_d \max$	With substrate* [LB1935T]	400	mW
	$P_d \max$	With substrate* [LB1935CL]	450	
Operating Temperature	T_{opr}		-20 to +75	$^\circ C$
Storage Temperature	T_{stg}		-40 to +150	$^\circ C$

* Specified substrate : 20.0mm×10.0mm×0.8mm paper phenol

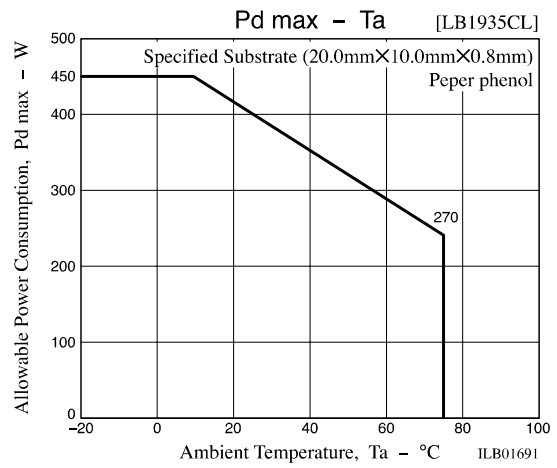
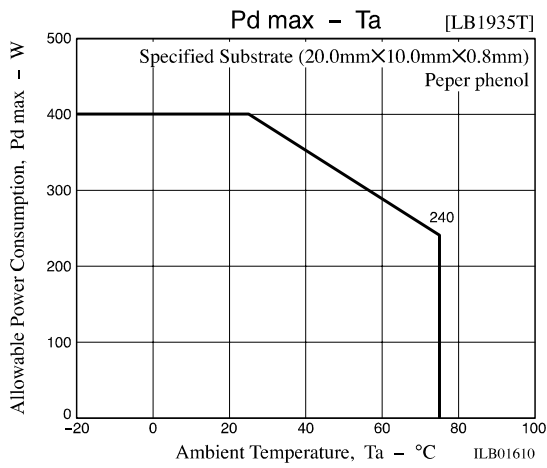
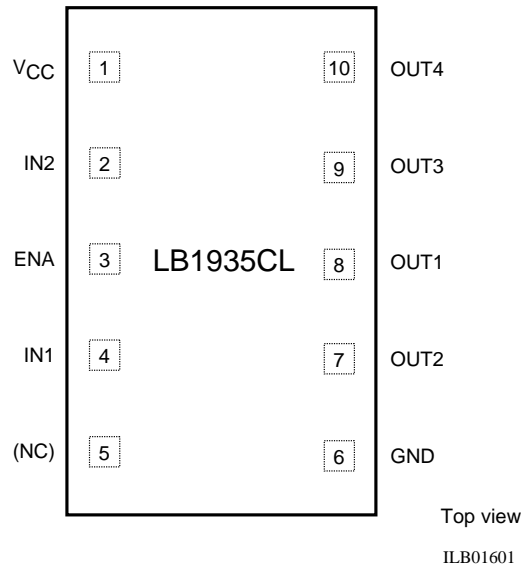
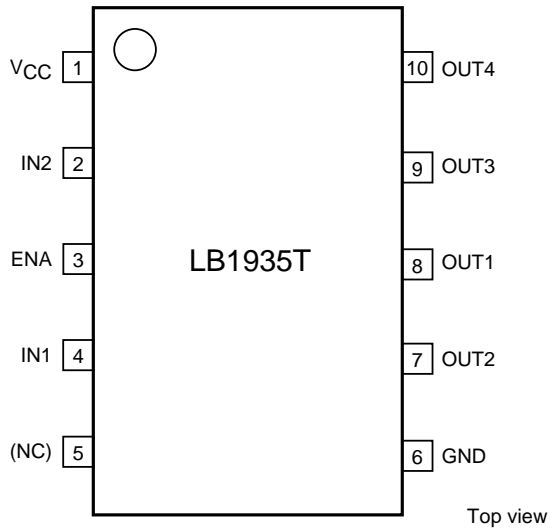
Allowable Operating Range at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Source Voltage	V_{CC}		2.2 to 7.5	V
Input High Level Voltage	V_{IH}	ENA, IN1, IN2 pin	1.8 to 7.5	V
Input Low Level Voltage	V_{IL}	ENA, IN1, IN2 pin	-0.3 to +0.7	V

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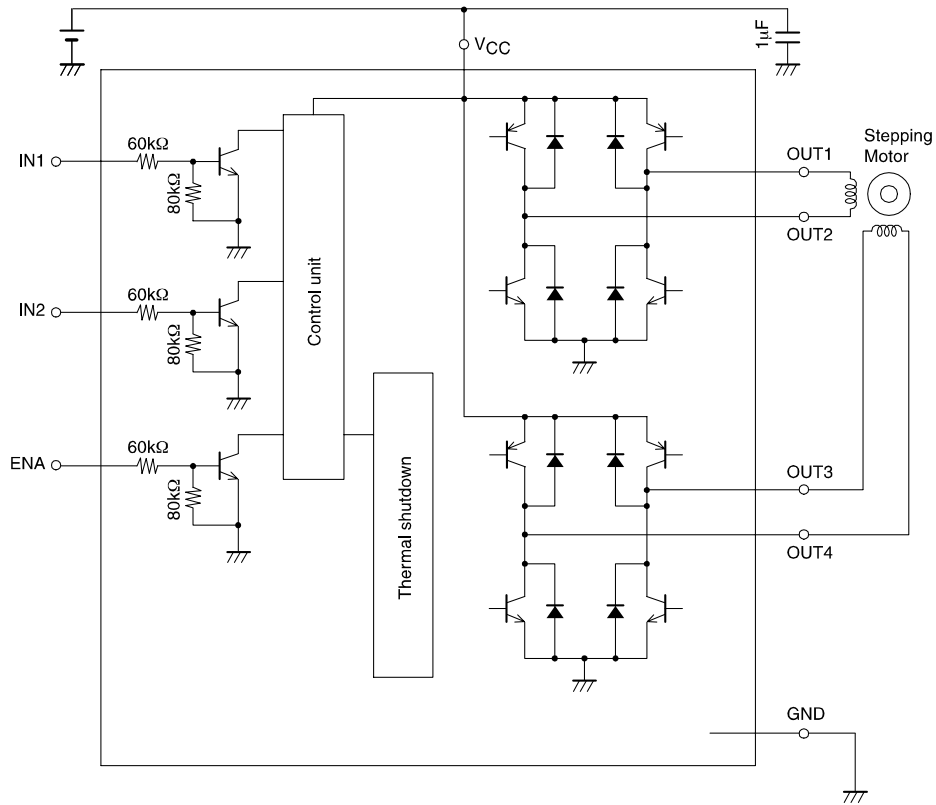
LB1935T, LB1935CL

Pin Assignments



LB1935T, LB1935CL

Block Diagram



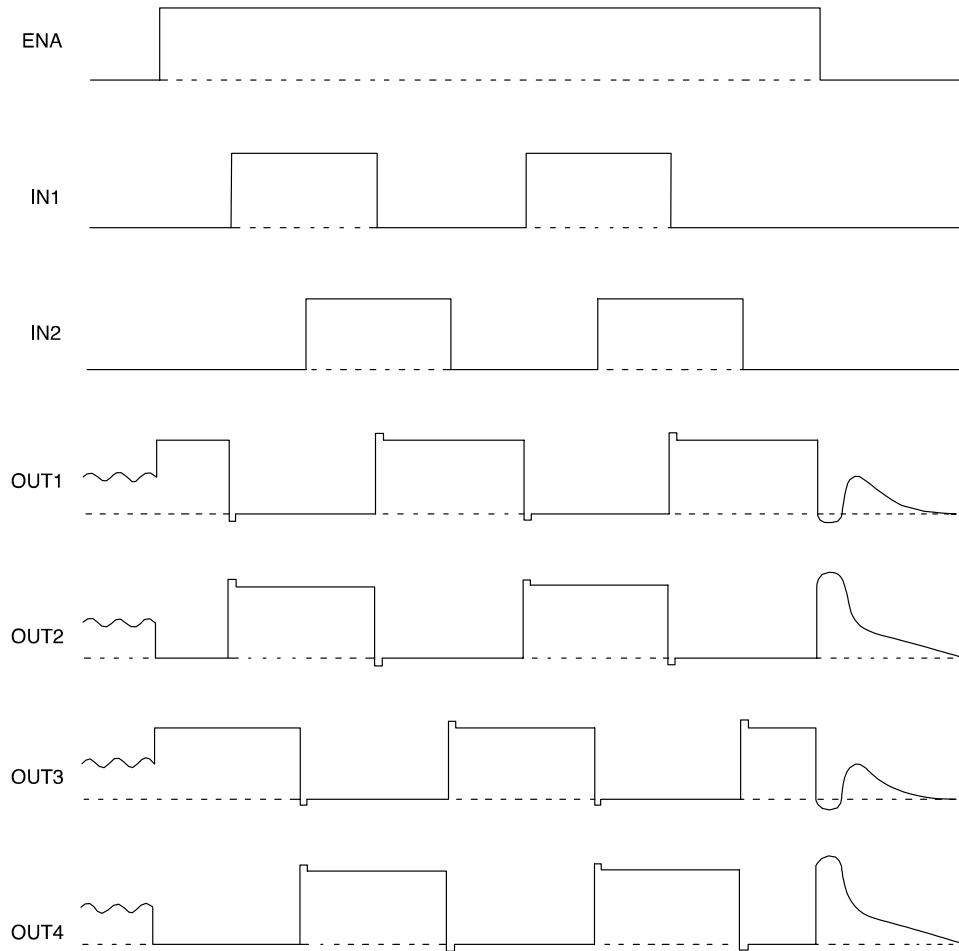
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Truth Table

Input			Output				Remarks
ENA	IN1	IN2	OUT1	OUT2	OUT3	OUT4	
L	-	-	OFF	OFF	OFF	OFF	Stdby
H	L	L	H	L	H	L	2-phase excitation
	L	H	H	L	L	H	
	H	H	L	H	L	H	
	H	L	L	H	H	L	

Timing Chart

Timing chart below shows the 2 phase excitation stepping motor.



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