

Monolithic Digital IC

LB8681CL — Constant Current Driver IC with H-bridge × 1.5 Channel

Overview

The LB8681CL is a low-voltage, low-saturation 1.5-channel constant current forward/reverse driver IC provided in a miniature package suitable for use in cell phone cameras. The LB8681CL can be driven directly from a microcontroller and is optimal for control of the voice coil motors used for shutter and aperture control in cell phone cameras.

Features

- Supports low-voltage drive. (2.2V or more)
- Ultraminiature package (ECSP2828-10)

Functions

- Constant current control ($I_{OUT} = 100\text{mA}$ at $R_F = 2\Omega$)
- Built-in thermal protection circuit
- Built-in reference voltage (0.2V typical)
- Built-in spark killer diode

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\text{ max}}$		-0.3 to +8.0	V
Output voltage	$V_{OUT\text{ max}}$	OUT1, OUT2, OUT3	$V_{CC} + V_{SF}$	V
Input voltage	$V_{IN\text{ max}}$	IN1, IN2, IN3	-0.3 to +8.0	V
Ground pin source current	IGND	Per channel	400	mA
Allowable power dissipation	$P_d\text{ max}$	When mounted on a circuit board *	450	mW
Operating temperature	T_{opr}		-30 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +150	$^\circ\text{C}$

* Specified circuit board : $20.0 \times 10.0 \times 0.8\text{mm}^3$, paper-phenol

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Allowable Operating Ranges at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V _{CC}		2.2 to 7.5	V
High-level input voltage	V _{IH}	IN1, IN2, IN3	1.8 to 7.5	V
Low-level input voltage	V _{IL}		-0.3 to 0.7	V

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

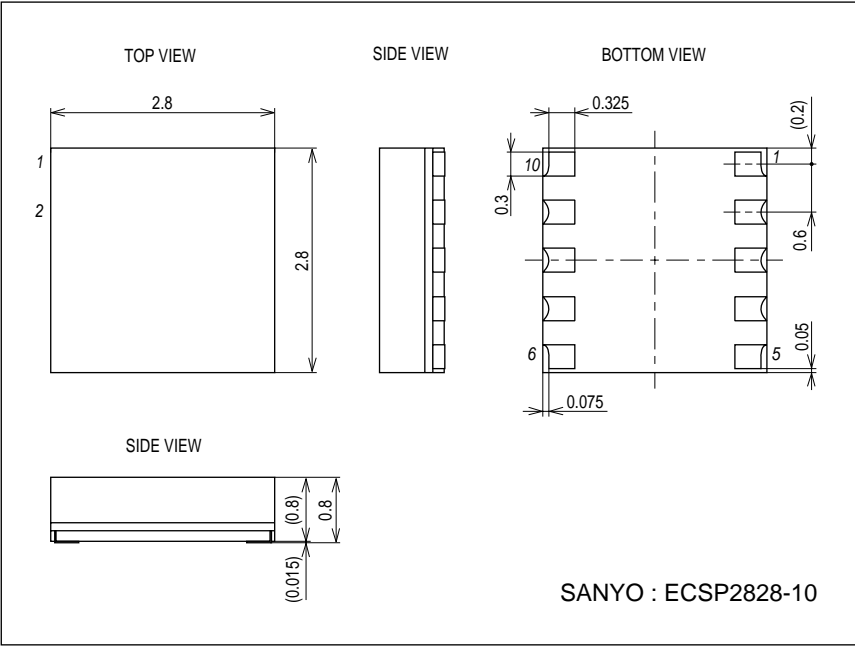
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current	I _{CC0}	IN1 = IN2 = IN3 = 0V		0.1	1	μA
	I _{CC1}	IN1, IN2, or IN3 = 3V		13.9	18	mA
Output saturation voltage	V _{OUT1}	IN1, IN2, or IN3 = 3V, I _{OUT} = 100mA		0.20	0.32	V
	V _{OUT2}	IN1, IN2, or IN3 = 3V, I _{OUT} = 200mA*		0.41	0.62	V
Output constant current	I _{OUT1}	Between REF and GND : 2Ω	95	100	105	mA
	I _{OUT2}	Between REF and GND : 1Ω*	190	200	210	mA
Input current	I _{IN}	V _{IN} = 3V		40	60	μA
Spark killer diode						
Reverse current	I _{S(leak)}				1	μA
Forward voltage	V _{SF}	I _{OUT} = 200mA*			1.7	V

* Design guarantee: These characteristics are design targets and are not measured.

Package Dimensions

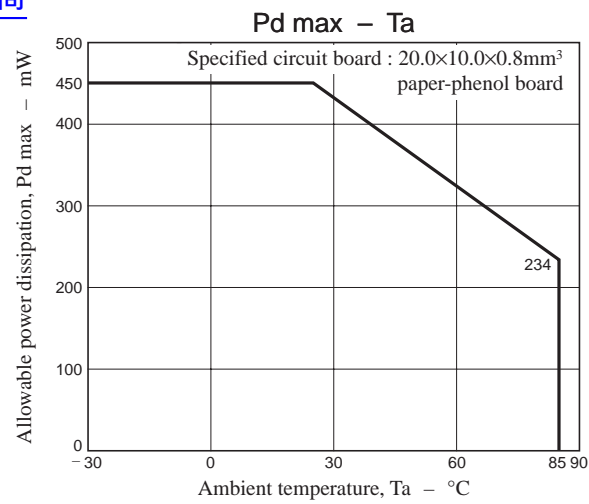
unit : mm (typ)

3301A

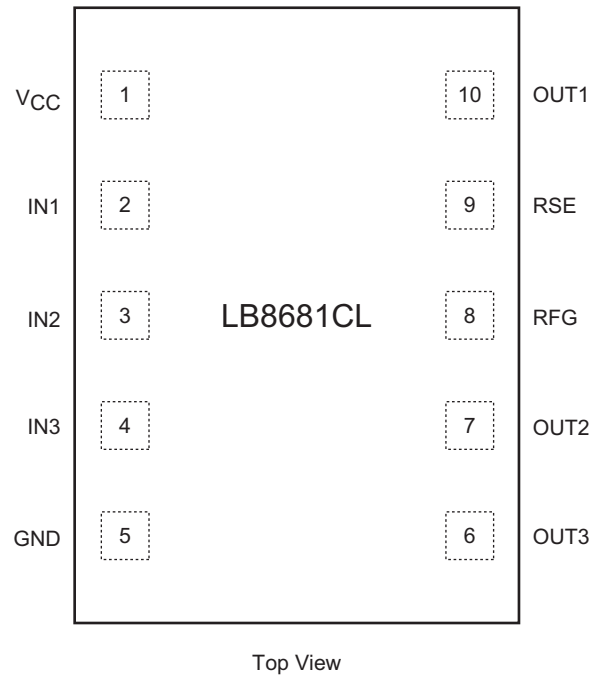


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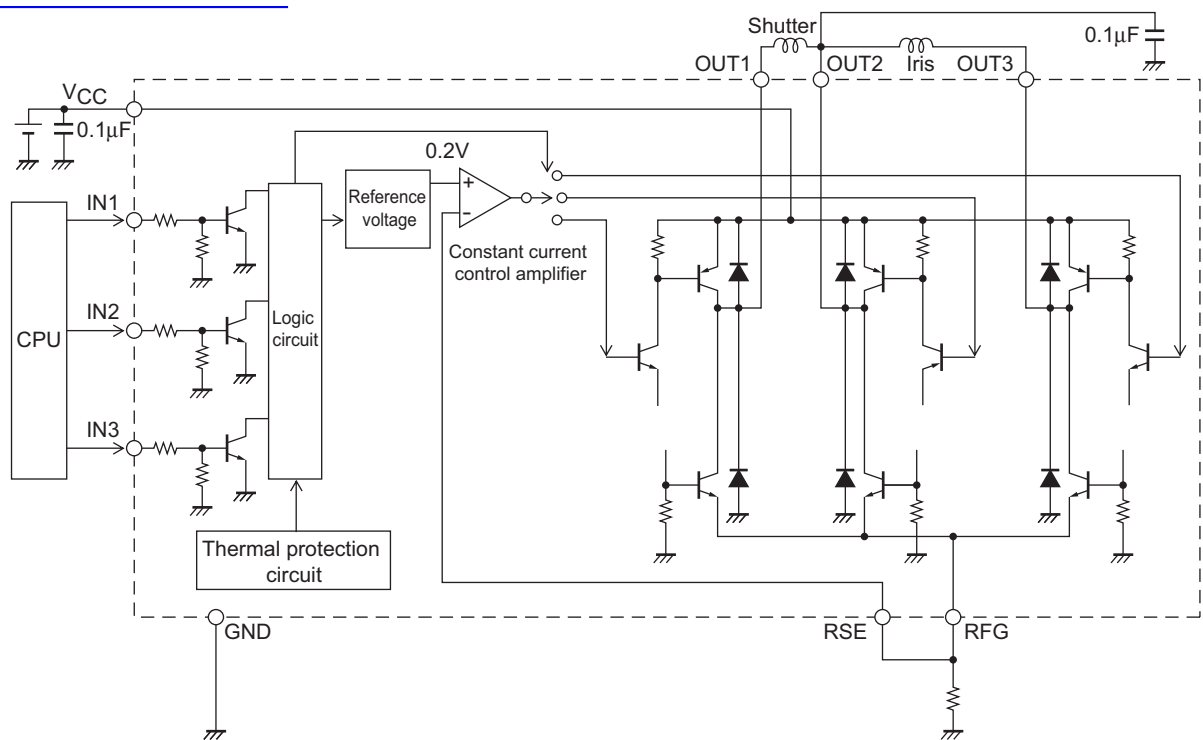


Pin Assignment



Block Diagram

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[Constant current formula] $I_{OUT} = 0.2 \div R_F$
When V_{CC} is high, the $0.01\mu F$ capacitor may be inserted between OUT and OUT.

Truth Table

Input			Output			Notes	
IN1	IN2	IN3	OUT1	OUT2	OUT3		
Low	Low	Low	–	–	–	Standby	
	High	Low	High	Low	–	Shutter	Forward
	Low	High	Low	High	–		Reverse
	High	High	Low	High	–		
High	Low	Low	–	–	–	Aperture	Off
	High	Low	–	Low	High		Forward
	Low	High	–	High	Low		Reverse
	High	High	–	High	Low		

Note : "–" indicates the output off state. (high-impedance)

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