Ordering number : ENA1991

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

Bi-CMOS LSI

LV5099CB — For HDMI controller Charge pump power supply

Overview

The LV5099CB is a charge pump power supply for HDMI controllers for portable devices.

Features and Functions

Features

- 5.0V and 3.3V constant voltage outputs composed of 2-hold mode charge pump boost circuit.
- Built-in overload detection function for constant voltage output circuit.
  Overcurrent limit (70mA) operates with 1.5Ω external resistor.
  Constant voltage output after time-latch: OFF (100msec).
- Reverse flow prevention function is built into constant voltage output.

(An external diode for reverse flow prevention is not necessary.)

  There is no reverse current from 5.0V output to V_{CC}.
  The current flow into 3.3V output is less than 1μA, when EN: Low

- Ultra-small chip package (Those with backcourt processing (those with a resin tabulation side protective film))

Function

- Charge pump circuit. 2-hold mode
- Constant voltage output. 3.3V output/10mA(max) 5.0V output/60mA(max)
- Thermal shutdown

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum power supply voltage	V_{CC}		4.8	V
Maximum DC voltage	V_1 max	C+ CPOUT VO50 VO33	6	V
Allowable power dissipation	Pd max	with specified substrate *	0.75	W
Operating temperature	Topr		-30 to +85	°C
Storage temperature	Tstg		-55 to +125	°C

* : Specified substrate : 50mm×50mm×1.6mm, glass epoxy board

Caution 1) Absolute maximum ratings represent the value which cannot be exceeded for any length of time.

Caution 2) Even when the device is used within the range of absolute maximum ratings, as a result of continuous usage under high temperature, high current, high voltage, or drastic temperature change, the reliability of the IC may be degraded. Please contact us for the further details.

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Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Puwer supply voltage 1	V_{BAT}		3 to 4.5	V

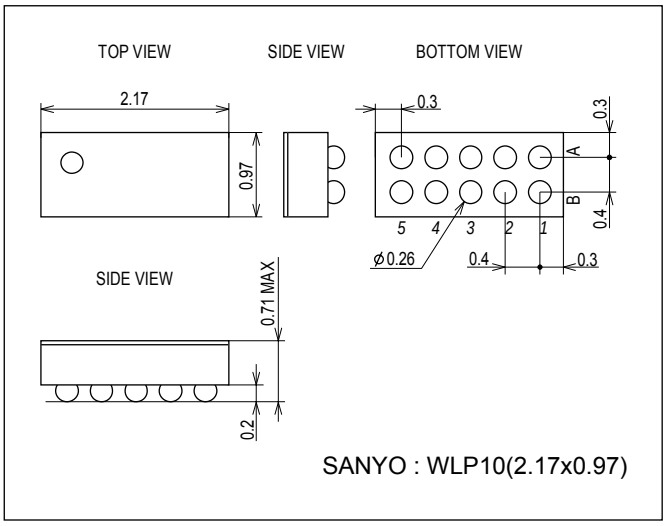
Electrical Characteristics at Ta = 25°C, V_{CC} = 3.7V

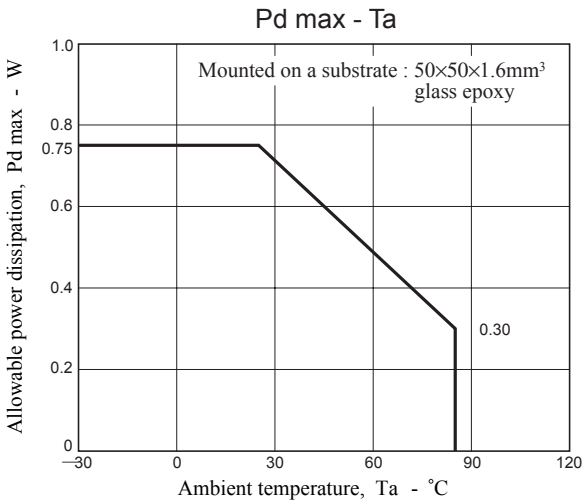
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current	$I_{CC}1$	EN: L		0	2	μA
	$I_{CC}2$	EN : H When no load		3.5	6	mA
	$I_{CC}3$	EN: H load VO50=60mA VO33=10mA		145		mA
Output voltage	V_O1_1	VO50 I_L=60mA	4.85	5.0	5.15	V
	V_O1_2	VO50 I_L=60mA V_{CC}=3.3V	4.85	5.0	5.15	V
	V_O2_1	VO33 I_L=10mA	3.0	3.3	3.6	V
Voltage keep control pin = High	$V_{IN}H$	EN	1.5		VCC	V
Voltage keep control pin = Low	$V_{IN}L$	EN	0		0.6	V
Sink current	I_B1	Sink current of VO50 when VO50=5V, EN: L		100	200	μA
	I_B2	Sink current of VO50 when VO50=5.3V, EN: H		65	130	μA
	I_B3	Sink current of VO33 when VO33=3.3V, EN: L		0	1	μA
	I_B4	Sink current of VO33 when VO33=3.3V and EN: L and V_{CC}=0V		0	1	μA
Source current 1	$I_{LIM}1$	Source current when VO50=4V and an external resistor=1.5Ω	63	70	77	mA

Package Dimensions

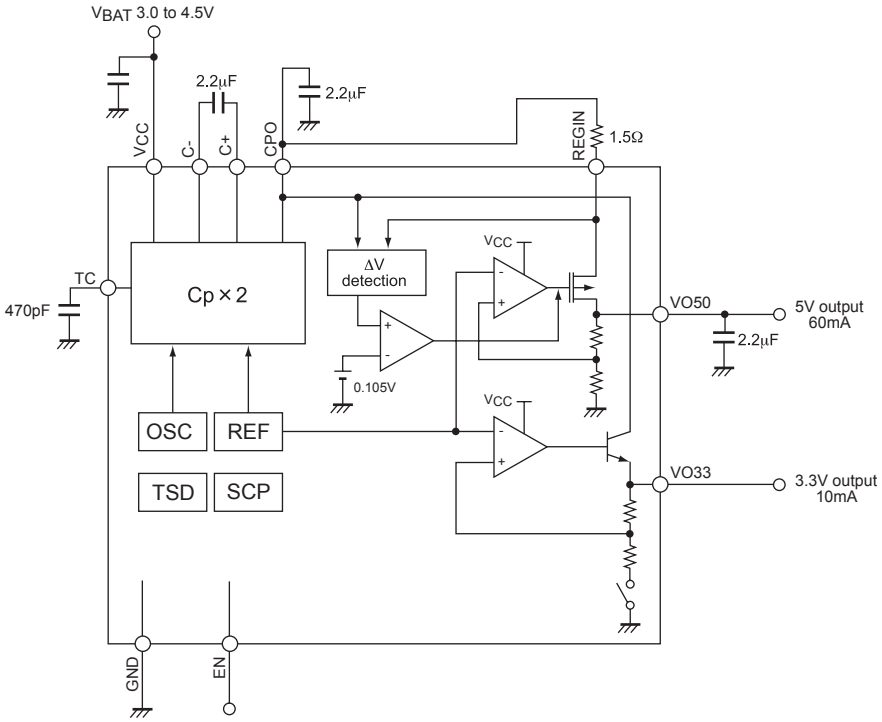
unit : mm (typ)

3416

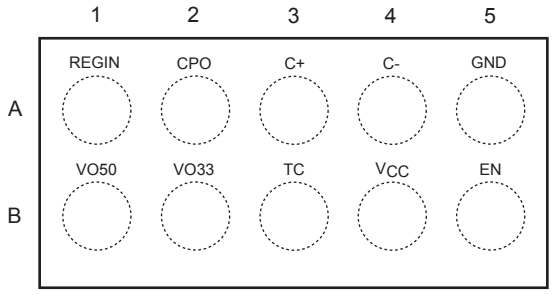




Block Diagram



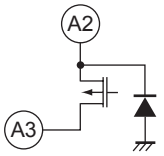
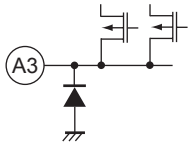
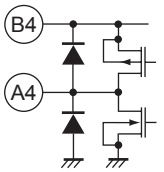
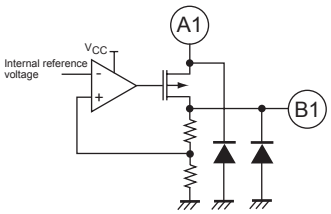
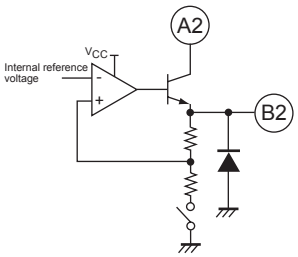
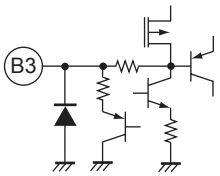
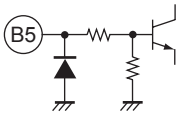
Pin Assignment



Top view (BALL side Down)

Pin Function

Pin No.	Name	I/O	Function	Connect protection device to V_{CC}	Connect protection device to GND
A1	REGIN	I	5V regurator power supply input pin	NO	YES
A2	CPO	O	Output pin of charge pump	NO	YES
A3	C+	-	Charge transfer drive pin of charge pump	NO	YES
A4	C-	-	Clock driver pin of charge pump	YES	YES
A5	GND	-	GND pin	NO	NO
B1	VO50	O	5V regulator output pin	NO	YES
B2	VO33	O	3.3V regulator output pin	NO	YES
B3	TC	-	Capacitor connection pin for charge pump soft start	NO	YES
B4	V_{CC}	-	Power supply pin	NO	NO
B5	EN	I	Enable pin	NO	YES

Pin No.	Pin name	Equvalent Circuit	Description
A2	CPO		Output pin of charge pump
A3	C+		Charge transfer drive pin of charge pump
A4	C-		Clock driver pin of charge pump
A1 B1	REGIN VO50		5V regurator power supply input pin 5V regurator output pin
B2	VO33		3.3V regurator output pin No connect capacitor
B3	TC		Capacitor connection pin for charge pump soft start Charge pump can be soft started by connecting a capacitor.
B5	EN		Enable pin Charge pump, 5V output, and 3.3V output are outputted by enable = H. Pull down registor : 130kΩ

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