



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## LV5099CB — Bi-CMOS LSI 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<sub>CC</sub>.  
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 <sub>CC</sub>		4.8	V
Maximum DC voltage	V <sub>1</sub> max	C+ CPOUT VO50 VO33	6	V
Allowable power dissipation	P <sub>d</sub> max	with specified substrate *	0.75	W
Operating temperature	T <sub>opr</sub>		-30 to +85	°C
Storage temperature	T <sub>stg</sub>		-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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# LV5099CB

## Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Puwer supply voltage 1	V <sub>BAT</sub>		3 to 4.5	V

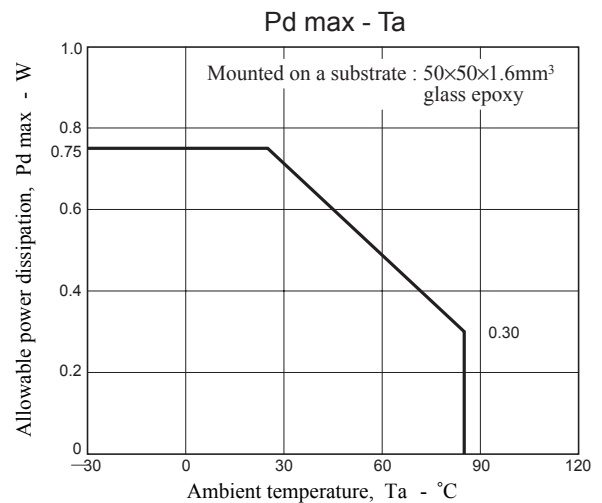
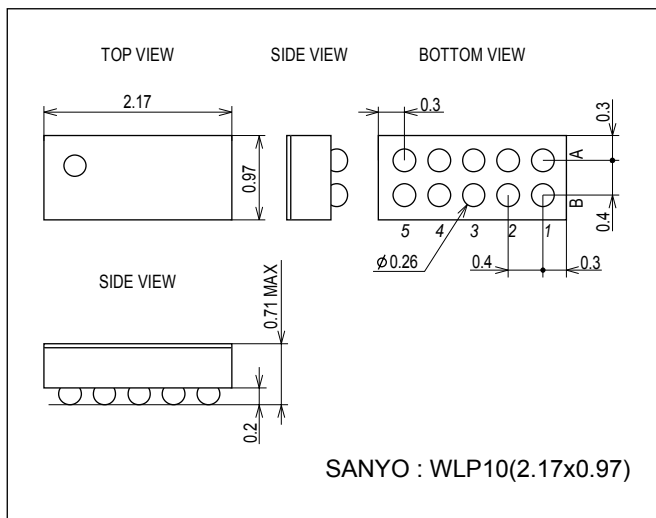
## Electrical Characteristics at Ta = 25°C, V<sub>CC</sub> = 3.7V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current	I <sub>CC1</sub>	EN: L		0	2	μA
	I <sub>CC2</sub>	EN: H When no load		3.5	6	mA
	I <sub>CC3</sub>	EN: H load VO50=60mA VO33=10mA		145		mA
Output voltage	V <sub>O1_1</sub>	VO50 I <sub>L</sub> =60mA	4.85	5.0	5.15	V
	V <sub>O1_2</sub>	VO50 I <sub>L</sub> =60mA V <sub>CC</sub> =3.3V	4.85	5.0	5.15	V
	V <sub>O2_1</sub>	VO33 I <sub>L</sub> =10mA	3.0	3.3	3.6	V
Voltage keep control pin = High	V <sub>INH</sub>	EN	1.5		V <sub>CC</sub>	V
Voltage keep control pin = Low	V <sub>INL</sub>	EN	0		0.6	V
Sink current	I <sub>B1</sub>	Sink current of VO50 when VO50=5V, EN: L		100	200	μA
	I <sub>B2</sub>	Sink current of VO50 when VO50=5.3V, EN: H		65	130	μA
	I <sub>B3</sub>	Sink current of VO33 when VO33=3.3V, EN: L		0	1	μA
	I <sub>B4</sub>	Sink current of VO33 when VO33=3.3V and EN: L and V <sub>CC</sub> =0V		0	1	μA
Source current 1	I <sub>LIM1</sub>	Source current when VO50=4V and an external resistor=1.5Ω	63	70	77	mA

## Package Dimensions

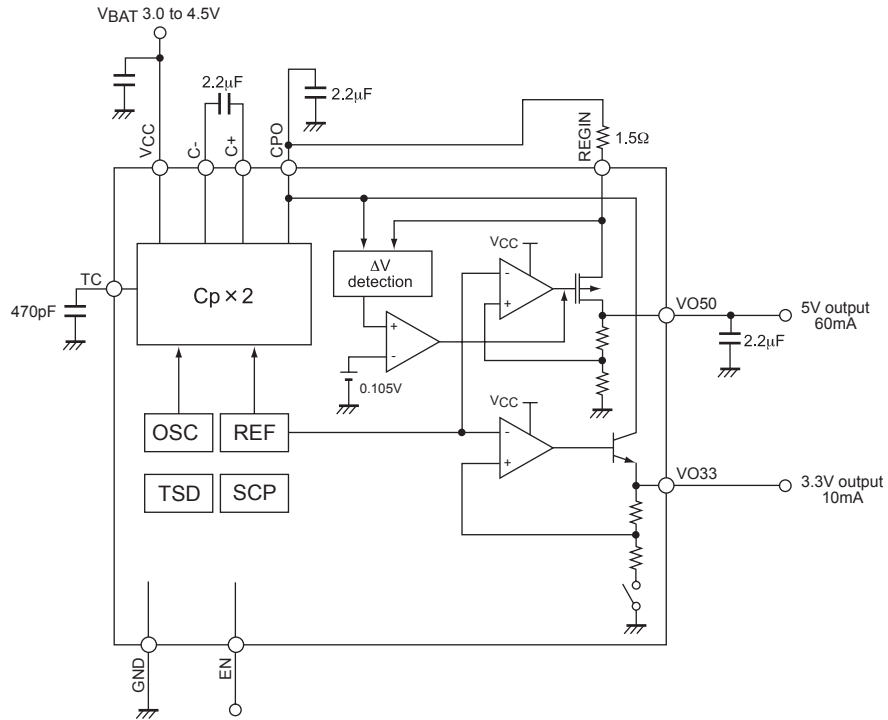
unit : mm (typ)

3416

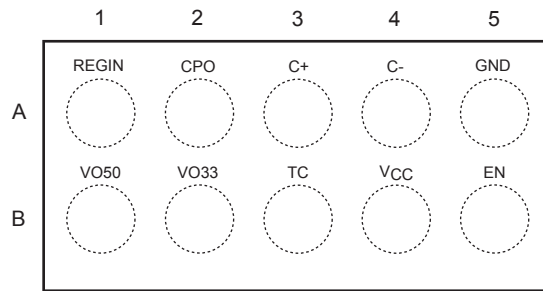


# LV5099CB

## Block Diagram



## Pin Assignment



Top view (BALL side Down)

## Pin Function

Pin No.	Name	I/O	Function	Connect protection device to V <sub>CC</sub>	Connect protection device to GND
A1	REGIN	I	5V regulator 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 <sub>CC</sub>	-	Power supply pin	NO	NO
B5	EN	I	Enable pin	NO	YES

# LV5099CB

Pin No.	Pin name	Equivalent 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 regulator power supply input pin 5V regulator output pin
B2	VO33		3.3V regulator 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 resistor : 130kΩ

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