LC898111AXB

CMOS LSI

Optical Image Stabilization (OIS) Controller & Driver

ON Semiconductor®

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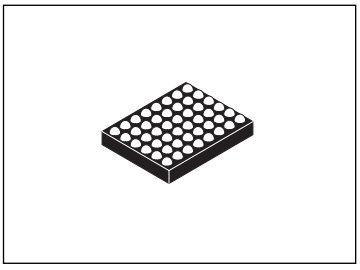
Overview

The LC898111AXB is Optical Image Stabilization (OIS) system control LSI for smartphone camera modules.
The LSI have built-in digital signal processing circuits, such as a 2ch saturation H-Bridge Driver and a Flexible Filter circuit, and control VCM type actuators.
The LC898111AXB is identical LSI except for the dimensions, i.e. XB has WLP thickness, max. 0.69 mm with B/C.



WLCSP48, 3.22x2.57

Function

■ Digital signal processing LSI (Logic LSI)
- Built-in digital servo circuit
- Built-in Gyro filter
- AD converter
  - 12-bit
  - input 5ch
  - Equipped with a sample-hold circuit
- DA converter
  - 8-bit
  - Output 2ch (Constant current Bias : max 7mA)
- Built-in Serial I/F circuit
  (2-wire I^2C-Bus or 4-wire SPI Bus interface)
- Built-in Hall Bias circuit
- Built-in Hall Amp
  (Gain of Opamp : x25, x50, x75, x100, x150, x200)
- Built-in OSC (Oscillator)
  48MHz ± 5% (Frequency adjustment function)
- External Clock input is possible
  from TSTCLK (48MHz ± 5%)
- Built-in LDO (Low Drop-Out regulator)
- Digital Gyro I/F for the companies (SPI Bus)
  (Please refer for the details)
- Support Hall sensor and Photo Reflector as means to detect a position

■ Motor Driver
- Saturation-drive H bridge x2ch
- I_O max : 220mA

■ Package
- WLCSP48, 3.22mm x 2.57mm, thickness max 0.69mm, with B/C
- Pb-Free
- Halogen Free

■ Power supply voltage
- Logic : DVDD30 = 2.6 to 3.6 V
- Driver : VM = 2.6 to 3.6 V

* I^2C Bus is a trademark of Philips Corporation.

ORDERING INFORMATION
See detailed ordering and shipping information on page 6 of this data sheet.

Block Diagram

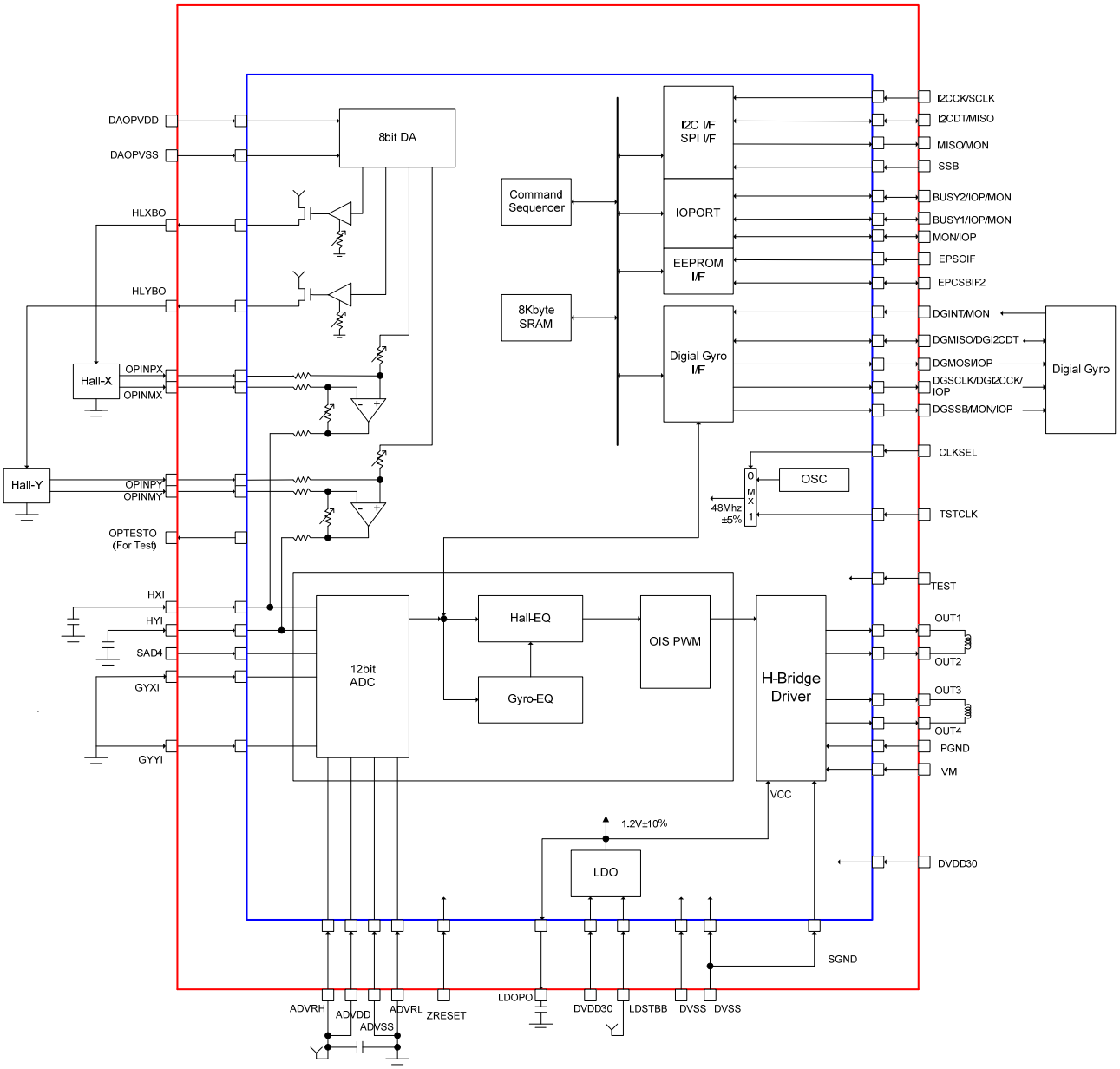
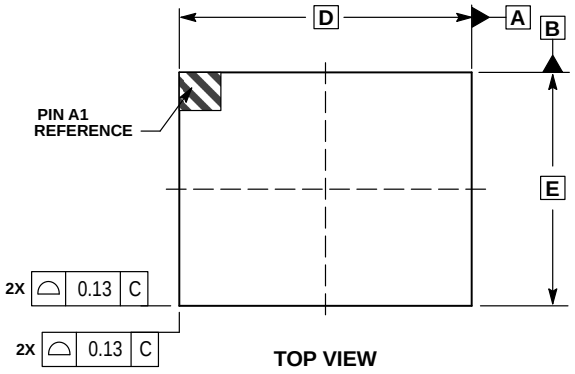


Figure 3.1 Example of wiring diagram (Hall) in LC898111AXB

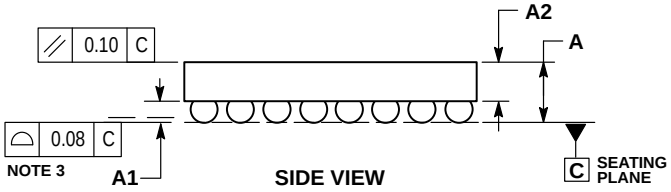
Package Dimensions

unit : mm

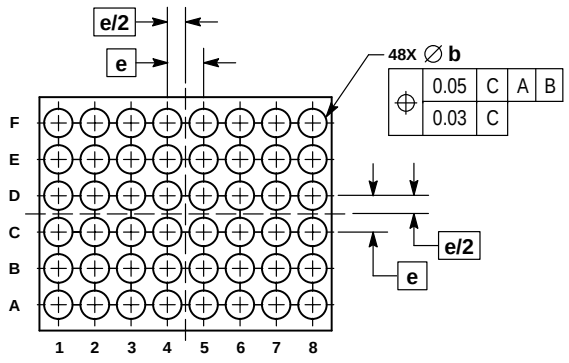
WLCSP48, 3.22x2.57
CASE 567GE
ISSUE O



TOP VIEW



SIDE VIEW



BOTTOM VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. COPLANARITY APPLIES TO SPHERICAL CROWNS OF SOLDER BALLS.

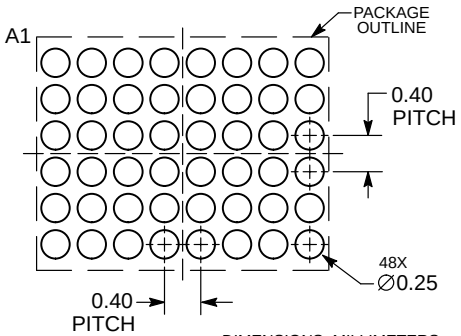
	MILLIMETERS	
DIM	MIN	MAX
A	---	0.69
A1	0.16	0.26
A2	0.43 REF	
b	0.21	0.31
D	3.22 BSC	
E	2.57 BSC	
e	0.40 BSC	

GENERIC MARKING DIAGRAM*

XXXXXXX = Device Code
A = Assembly Location
WL = Wafer Lot
YY = Year
WW = Work Week
▪ = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking.

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

Pin Assignment

Top View

	F	E	D	C	B	A
1	OPTESTO	OPINPY	ADVDD	ADVSS	GYYI	HXI
2	HLXBO	OPINMY	ADVRH	GYXI	DVSS	I2CDT
3	EPSOIF	DAOPVDD	ADVRL	HYI	EPCSBIF2	I2CCK
4	DVDD30	DAOPVSS	OPINPX	SAD4	SSB	MISO
5	BUSY2	HLYBO	OPINMX	ZRESET	LDOPO	DVDD30
6	BUSY1	TEST	DVSS	TSTCLK	LDSTBB	DGSCLK
7	VM	MON	CLKSEL	DGMOSI	DGMISO	DGINT
8	OUT4	OUT3	OUT2	OUT1	PGND	DGSSB

Driver
DAC
OpAmp
ADC

EEPROM i/f
Logic GND
IO VDD (2.6V to 3.6V)
Logic Core VDD (1.14 to 1.26V)

<typ> I : INPUT, O : OUTPUT, B : BIDIRECTION, P : Power, GND

Ball No	Pin Name	type	Description
F8	OUT4	O	Driver Output
F7	VM	P	Driver VDD (2.6V to 3.6V)
F6	BUSY1	B	EEPROM I/F (at I^2C type EEPROM) / BUSY1(O) / General-purpose IOPORT(B) / inner signal Monitor(O)
F5	BUSY2	B	BUSY2(O) / General-purpose IOPORT(B) / inner signal Monitor(O)
F4	DVDD30	P	Logic IO VDD (2.6V to 3.6V)
F3	EPSOIF	I	EEPROM I/F
F2	HLXBO	O	Hall-X Bias (Current Drive)
F1	OPTESTO	O	OpAmp Test out
E8	OUT3	O	Driver output
E7	MON	B	inner signal monitor / General-purpose IOPORT
E6	TEST	I	SPI & External clock case sets “1” other cases set “0”
E5	HLYBO	O	Hall-Y Bias (Current Drive)
E4	DAOPVSS	P	DA&Opamp VSS
E3	DAOPVDD	P	DA&Opamp VDD (2.6V to 3.6V)
E2	OPINMY	I	Hall-Y OpAmp input–
E1	OPINPY	I	Hall-Y OpAmp input+
D8	OUT2	O	Driver Output
D7	CLKSEL	I	change pin of OSC(0) and External clock(1)
D6	DVSS	P	Logic GND
D5	OPINMX	I	Hall-X OpAmp input–
D4	OPINPX	I	Hall-X OpAmp input+
D3	ADVRL	I	ADC Reference Voltage Low input
D2	ADVRH	I	ADC Reference Voltage High input
D1	ADVDD	P	AD VDD (2.6V to 3.6V)
C8	OUT1	O	Driver Output
C7	DGMOSI	B	Digital Gyro (4-wire)IF data(O) / HPS Control(O) / General-purpose IOPORT(B)
C6	TSTCLK	I	CLKSEL=1 : External Clock, CLKSEL=0 : change pin of I^2C(0) and SPI(1)
C5	ZRESET	I	Hard Wafer Reset
C4	SAD4	I	General-purpose AD input
C3	HYI	I	Hall-Y AD input
C2	GYXI	I	Gyro-X AD input
C1	ADVSS	P	AD GND
B8	PGND	P	Driver GND
B7	DGMISO	B	Digital Gyro SPI IF Data(I) / Digital Gyro I^2C IF Data(B)
B6	LDSTBB	I	LDO Standby (0 : Standby On, 1 : Standby Off)
B5	LDOPO	P	LDO Power supply out (Logic Core VDD (1.14V to 1.26V))
B4	SSB	I	SPI I/F Chip Select / VDD fix at I^2C i/f
B3	EPCSBIF2	B	EEPROM I/F
B2	DVSS	P	Logic GND
B1	GYYI	I	Gyro-Y AD input
A8	DGSSB	B	Digital Gyro SPI IF Chip Select(O) / inner signal monitor(O) / General-purpose IOPORT(B)
A7	DGINT	B	Digital Gyro SPI IF Data Busy(I) / inner signal monitor(O) / General-purpose IOPORT(B)
A6	DGSCLK	B	Digital Gyro SPI IF clock (O) / Digital Gyro I^2C IF clock(O) / HPS Control 1(O) / General-purpose IOPORT (B)
A5	DVDD30	P	Logic IO VDD (2.6V to 3.6V) and power supply to LDO
A4	MISO	O	SPI I/F Data / General-purpose IOPORT / inner signal monitor
A3	I2CCK	I	I^2C_IF clock / SPI IF clock
A2	I2CDT	B	I^2C_IF Data(B) / SPI IF Data
A1	HXI	I	Hall-X AD input

ORDERING INFORMATION

Device	Package	Shipping (Qty / Packing)
LC898111AXB-MH	WLCSP48, 3.22x2.57 (Pb-Free / Halogen Free)	4000 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF