Single Clock Generator
AK8110B

Features

- **Output Frequency Range:**
  38.0MHz / 45.0MHz (Selectable)
- **Input Frequency:**
  27MHz
- **Low Jitter Performance:**
  15 ps（Typ.） Period, 1 σ
- **Low Current Consumption:**
  2.5 mA（Typ.）
- **Output Load:**
  15pF (max.)
- **Supply Voltage:**
  2.7 – 3.6V
- **Operating Temperature Range:**
  -20℃ to +85℃
- **Package:**

6-pin USON (lead-free)
6-pin USON: Body Size 2.0mm x 1.8mm
6-pin USON: Body Size 1.4mm x 1.4mm

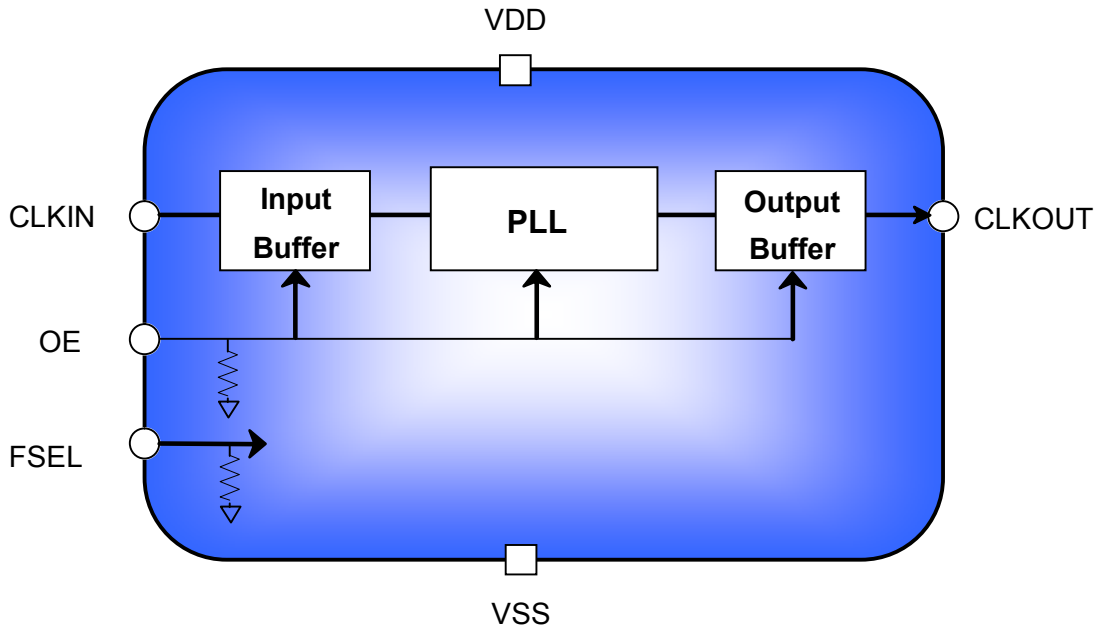
Description

The AK8110B is a single clock generator IC with an integrated PLL. It can generate either a 45.0MHz or 38.0MHz clock from a 27MHz master clock input frequency. Through pin control, the output can be enabled or disabled, and the frequency can be changed. The high performance PLL locks to the master clock input, generating a low jitter, highly accurate clock output without an external crystal.

Applications

- Digital Still Camera

Block Diagram



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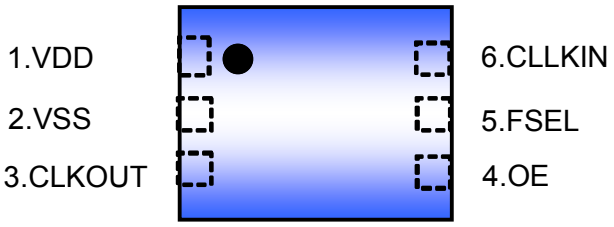
Pin Descriptions



Package: 6-Pin USON (Top View)
***lead-free**

Pin No.	Pin Name	Pin Type	Description
1	VDD	--	Power Supply
2	VSS	--	Ground
3	CLKOUT	OUT	Clock output Output clock frequency is selectable to 36.0MHz or 38.0MHz by setting the FSEL pin. In power down mode (OE = "L"), this pin is "L".
4	OE	IN	CLKOUT output enable control "L": CLKOUT="L" and power down. "H": active (1)
5	FSEL	IN	Clock frequency select "L": 36.0MHz, "H": 45.0MHz (1)
6	CLKIN	IN	Clock input (27MHz) Place the AK8110B in power down (OE = "L") mode when an input clock is not supplied. Unstable input to the CLKIN causes the unstable CLKOUT signal. DC input to the CLKIN also causes the unstable CLKOUT signal.

(1) Internal pull down 100k□(Typ.)

Ordering Information

Part Number	Marking	Shipping Packaging	Package	Temperature Range
AK8110BU	10B(AK8110B)	Tape and Reel	6-pin USON (2.0mm x 1.8mm)	-20 to 85 °C
AK8110BU2	10B(AK8110B)	Tape and Reel	6-pin USON2 (1.4mm x 1.4mm)	-20 to 85 °C

Absolute Maximum Rating

Over operating free-air temperature range unless otherwise noted (1)

Items	Symbol	Ratings	Unit
Supply Voltage	VDD	-0.3 to 4.6	V
Input Voltage	Vin	VSS-0.3 to VDD+0.3	V
Input Current (any pins except supplies)	I_{IN}	±10	mA
Storage Temperature	Tstg	-55 to 130	°C

Note

(1) Stress beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to absolute-maximum-rating conditions for extended periods may affect device reliability. Electrical parameters are guaranteed only over the recommended operating temperature range.

ESD Sensitive Device

This device is manufactured on a CMOS process, therefore, generically susceptible to damage by excessive static voltage. Failure to observe proper handling and installation procedures can cause damage. AKM recommends that this device is handled with appropriate precautions.

Recommended Operation Conditions

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating Temperature	Ta		-20		85	°C
Supply Voltage	VDD		2.7	3.0	3.6	V
Output Load Capacitance	Cp1	Pin: CLKOUT			15	pF

DC Characteristics

All specifications at VDD: over 2.7 to 3.6V, Ta: -20 to +85°C, Input Frequency: 27MHz, unless otherwise noted

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
High Level Input Voltage	V_{IH}	Pin: CLKIN, FSEL, OE	0.8VDD			V
Low Level Input Voltage	V_{IL}	Pin: CLKIN, FSEL, OE			0.2VDD	V
Input Current 1	I_L 1	Pin: CLKIN	-10		+10	μA
Input Current 2	I_L 2	Pin: OE, FSEL	-10		+75	μA
High Level Output Voltage	V_{OH}	Pin: CLKOUT I_{OH}=-4mA (VDD=3.0V, Ta=25 °C)	0.8VDD			V
Low Level Output Voltage	V_{OL}	Pin: CLKOUT I_{OL}=+4mA (VDD=3.0V, Ta=25 °C)			0.2VDD	V
Current Consumption	I_{DD}	No load (VDD=3.0V, Ta=25 °C)		2.1		mA
Power down current	I_{pd}	OE="L" FSEL="L" or open		0	10	μA

AC Characteristics

All specifications at VDD: over 2.7 to 3.6V, Ta: -20 to +85 °C, Input Frequency: 27MHz, unless otherwise noted

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
Output Clock Duty Cycle(2) (3)			45	50	55	%
Output Clock Rise Time(2) (3)	t_{rise}	0.2VDD to 0.8VDD			4.0	ns
Output Clock Fall Time(2) (3)	t_{fall}	0.2VDD to 0.8VDD			4.0	ns
Output Clock Jitter (2) (3)	Jit	Period, 1σ		15		ps
Output Lock Time(1)	t_{lock}	Power-up		1		ms

(1) The time that output reaches the target frequency within accuracy of ±0.1% from the point that the power supply reaches VDD

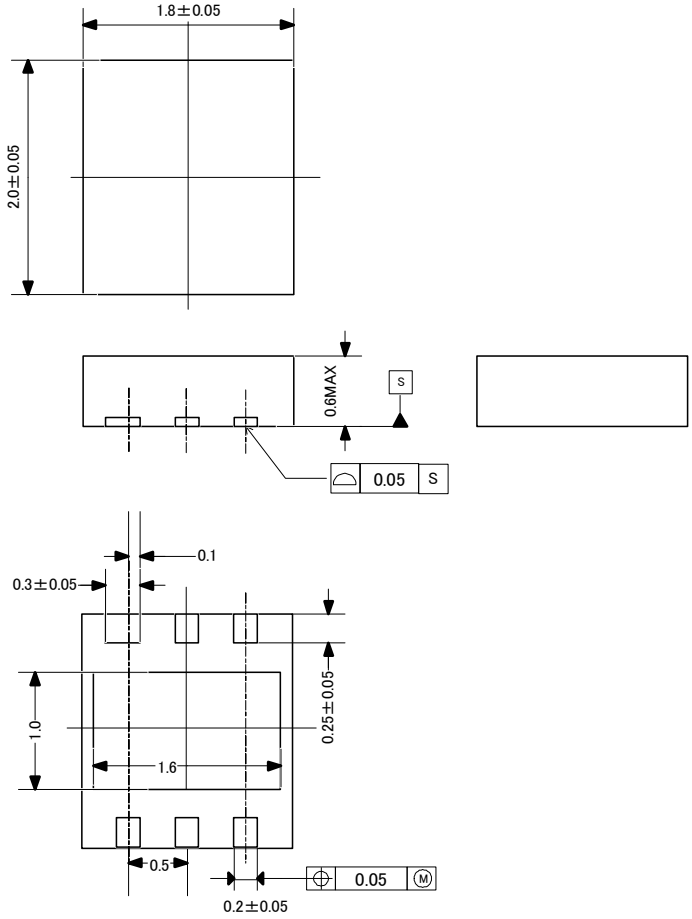
(2) With the load capacitance specified by the recommended operation conditions

(3) Design value

Package Information

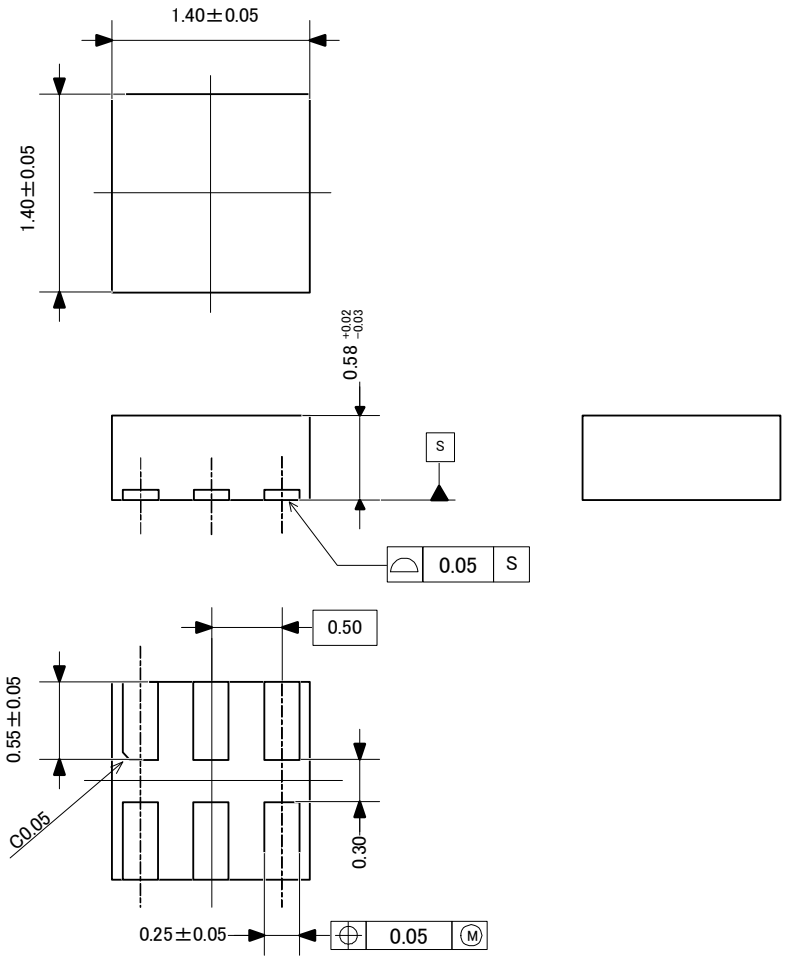
＜AK8110BU 6pin-USON＞

- **Mechanical data (Units:mm)**

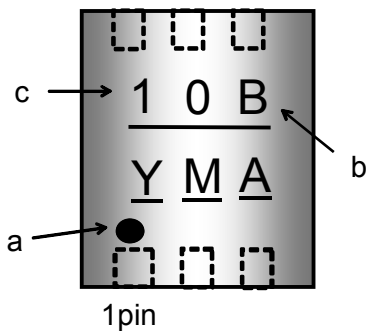


＜AK8110BU2 6pin-USON1＞

- **Mechanical data (Units:mm)**



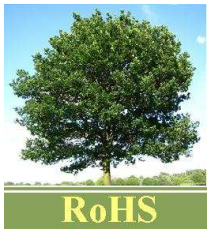
- **Marking**



a: #1 Pin Index
b: Part number
c: Date code (3 digits)

AKM and the logo - AKM - are the brand of AKM's IC's and identify that AKM continues to offer the best choice for high performance mixed-signal solution under this brand.

- **RoHS Compliance**



All integrated circuits form Asahi Kasei Microdevices (AKM) assembled in "lead-free" packages* are fully compliant with RoHS.

(*) RoHS compliant products from AKM are identified with "Pb free" letter indication on product label posted on the anti-shield bag and boxes.