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Single Clock Generator

AK8172A

Features

- **Output Frequency Range:**
72.36MHz
- **Input Frequency:**
27.000MHz
- **Low Jitter Performance:**
15 ps (Typ.) Period, 1σ
- **Low Current Consumption:**
3.6mA (Typ.)
- **Output Load:**
15pF (max.)
- **Supply Voltage:**
VDD:1.7-1.9V
- **Operating Temperature Range:**
-20 to +85°C
- **Package:**
4-pin USON(lead free)
Body size: 1.3 mm x 1.1mm

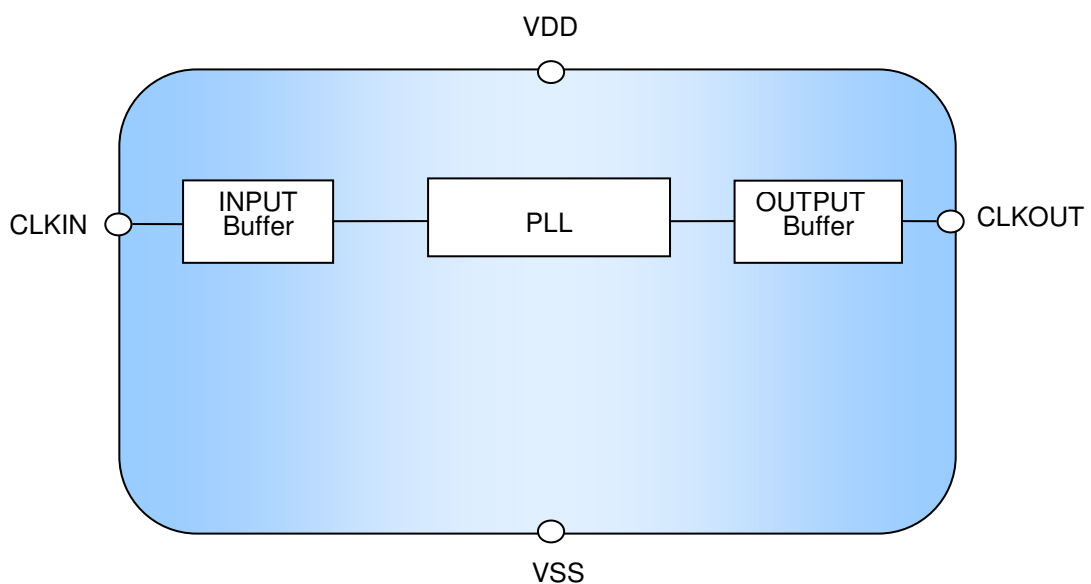
Description

The AK8172A is a single clock generator IC with an integrated PLL. It can generate a 72.36MHz clock from a 27MHz master clock input frequency. A high performance PLL locks to the master clock input, generating a low jitter, highly accurate clock output without an external crystal.

Applications

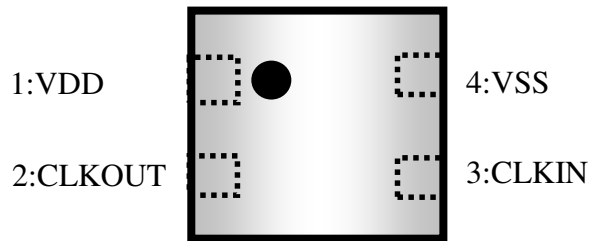
- Digital still camera

Block Diagram



AK8172A Single Clock Generator

Pin Descriptions



Package: 4-Pin USON (Top View)
*lead-free

Pin No.	Pin Name	Pin Type	Description
1	VDD	--	Power Supply
2	CLKOUT	OUT	Clock output Output clock frequency is 72.36MHz.
3	CLKIN	IN	Clock input. (27MHz) 1.8V or 3.3V available. When CLKIN connects VDD or VSS, CLKOUT outputs low.
4	VSS	--	Ground.

Ordering Information

Part Number	Marking	Shipping Packaging	Package	Temperature Range
AK8172AU	72A(AK8172A)	Tape and Reel	4-pin USON	-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	V _{in}	VSS-0.3 to 3.6	V
Input Current (any pins except supplies)	I _{IN}	±10	mA
Storage Temperature	T _{stg}	-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	T _a		-20		85	°C
Supply Voltage ⁽¹⁾	VDD		1.7	1.8	1.9	V
Input Clock Frequency	F _{in}			27.0000		MHz
Input Clock Duty Cycle	F _{indc}	At VDDI/2	30	50	70	%
Output Load Capacitance	C _{pl}	Pin: CLKOUT			15	pF

(1) A decoupling capacitor of 0.1μF for power supply line should be installed close to each VDD pin.

DC Characteristics

All specifications at VDD: over 1.7 to 1.9V, Ta: -20 to +85°C, Input Frequency: 27MHz, unless otherwise noted

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
High Level Input Voltage ⁽¹⁾	V _{IH}	Pin: CLKIN	0.7VDDI			V
Low Level Input Voltage ⁽¹⁾	V _{IL}	Pin: CLKIN			0.3VDDI	V
Input Current	I _{L1}	Pin: CLKIN	-1		+1	μA
High Level Output Voltage	V _{OH}	Pin: CLKOUT I _{OH} =-4mA	0.8VDD			V
Low Level Output Voltage	V _{OL}	Pin: CLKOUT I _{OL} =+4mA			0.2VDD	V
Current Consumption	I _{DD}	No load		3.6		mA

(1) VDDI=1.7-1.9V, 2.7-3.6V. VDDI means XO operation voltage.

AC Characteristics

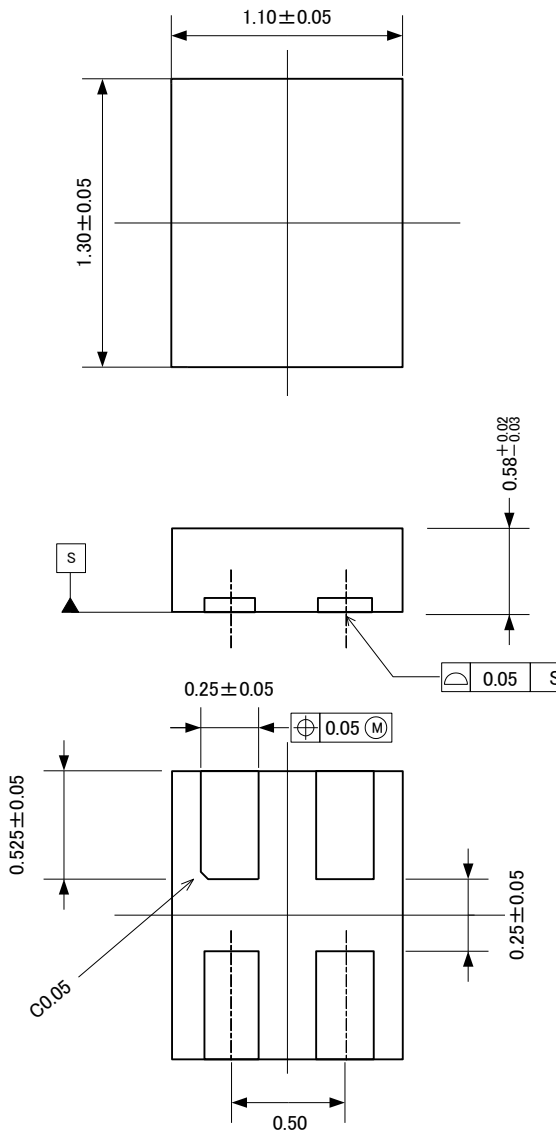
All specifications at VDD: over 1.7 to 1.9V, Ta: -20 to +85°C, Input Frequency: 27MHz, unless otherwise noted

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
Output Clock Frequency	F _o	CLKIN=27MHz		72.36		MHz
Output Clock Duty Cycle ^{(2) (3)}	F _{odc}	At VDD/2	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		0.2		ms

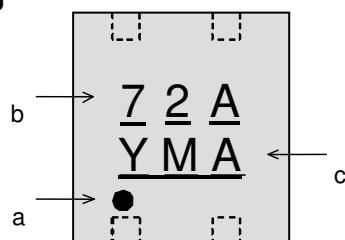
- (1) The time that output reaches the target frequency within accuracy of ±0.1% from the point that the power supply reaches VDD
- (2) With the load capacitance specified by the recommended operation conditions
- (3) Design value

Package Information

• **Mechanical data (Units:mm)**



• **Marking**

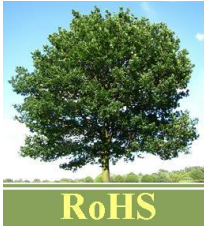


- a: #1 Pin Index
- b: Part number
- c: Date code (3 digits)

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AKM and the logo - - 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 from Asahi Kasei Microdevices Corporation (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.

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 - Note2) A hazard related device or system is one designed or intended for life support or maintenance of safety or for applications in medicine, aerospace, nuclear energy, or other fields, in which its failure to function or perform may reasonably be expected to result in loss of life or in significant injury or damage to person or property.
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