



MK3200 32.768 kHz Clock Oscillator

Description

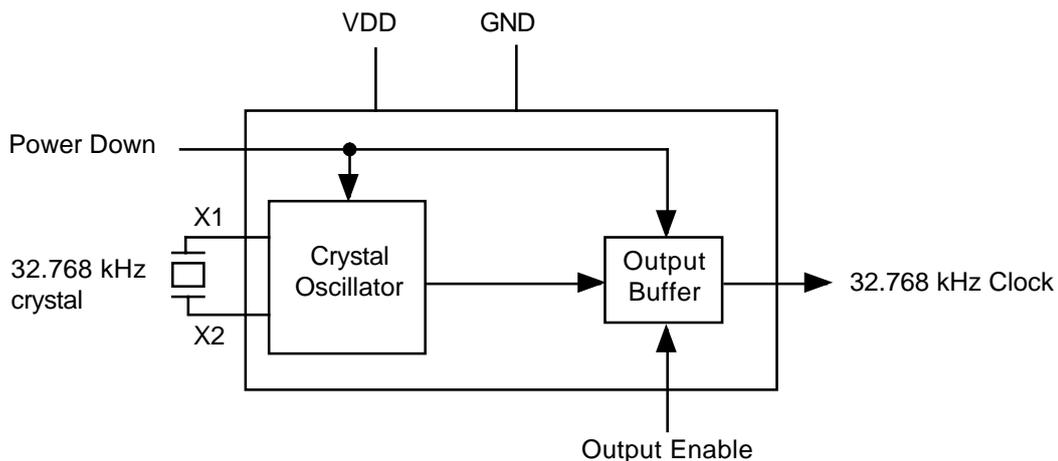
The MK3200 is ICS' lowest cost, low power clock oscillator that generates a low power 32.768 kHz output from an inexpensive 32.768 kHz watch crystal. This part includes a power down pin and allows you to tri state the output clock for in-circuit testing.

ICS manufactures the largest variety of clock synthesizers for all applications. If more clock outputs are needed, including MHz frequencies, see the MK32xx family of parts. Consult ICS to eliminate VCXOs, crystals and oscillators from your board.

Features

- Packaged in 8 pin SOIC
- Operates from 2.5 V to 5 V
- Consumes only 3.5 μ A in normal operation
- Accepts an inexpensive 32.768 kHz crystal input
- Offers power down mode
- Includes an Output Enable pin to tri state the output for in-circuit testing
- Advanced, low power, sub-micron CMOS process
- For other 32.768 kHz-based clocks with MHz outputs, please consult ICS
- Industrial temperature version available

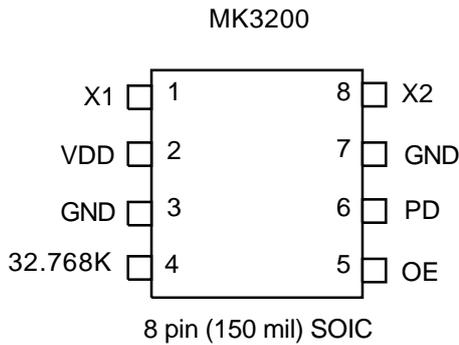
Block Diagram





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Pin Assignment



Power Down Select Table

PD	32.768K	Oscillator
0	On	On
1	Low	Off

Output Enable Select Table

OE	32.768K	Oscillator
0	Tri state (Hi-Z)	On
1	On	On

0 = connect directly to GND
1 = connect directly to VDD

Pin Descriptions

Number	Name	Description
1	X1	Crystal connection. Connect to a 32.768 kHz crystal.
2	VDD	VDD. Connect to + 3.3 V.
3	GND	Connect to ground.
4	32.768K	32.768 kHz clock output.
5	OE	Output Enable.
6	PD	Power Down. Turns off entire chip when high.
7	GND	Connect to ground.
8	X2	Crystal connection. Connect to a 32.768 kHz crystal.



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Electrical Specifications

Parameter	Conditions	Minimum	Typical	Maximum	Units
ABSOLUTE MAXIMUM RATINGS (note 1)					
Supply voltage, VDD	Referenced to GND			7	V
Inputs and Clock Outputs	Referenced to GND	-0.5		VDD+0.5	V
Ambient Operating Temperature		-40		85	°C
Storage temperature		-65		150	°C
DC CHARACTERISTICS (VDD = 3.3 V unless noted)					
Operating Voltage, VDD		2.375		5.250	V
Output High Voltage, VOH	IOH=-3mA	2.4			V
Output Low Voltage, VOL	IOL=3mA			0.4	V
Output High Voltage, VOH, CMOS level	IOH=-1.5mA	VDD-0.4			V
Operating Supply Current, IDD, PD=0, OE=1	No Load		3.5		µA
Short Circuit Current			±6		mA
AC CHARACTERISTICS (VDD = 3.3 V unless noted)					
Input Crystal Frequency			32.768		kHz
Input Crystal Accuracy				±30	ppm
Output Clock Rise Time	0.8 to 2.0V			8	ns
Output Clock Fall Time	2.0 to 0.8V			8	ns
Output Clock Duty Cycle	At VDD/2	40	50	60	%

Notes: 1. Stresses beyond those listed under Absolute Maximum Ratings could cause permanent damage to the device. Prolonged exposure to levels above the operating limits but below the Absolute Maximums may affect device reliability.

External Components

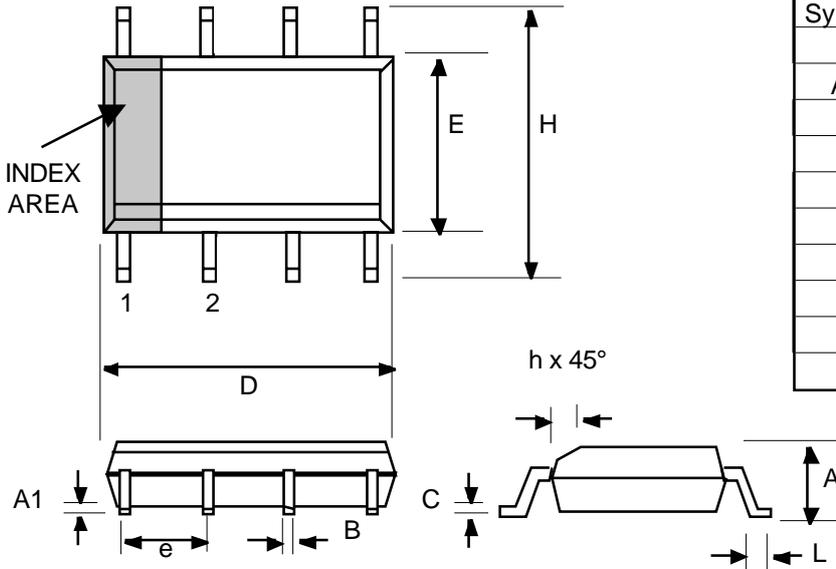
The MK3200 requires a minimum number of external components for proper operation. A decoupling capacitor of 0.01µF should be connected between VDD and GND on pins 2 and 3, as close to the MK3200 as possible. A series termination resistor of 33 Ω may be used for the clock output if the trace is longer than a few inches. The input crystal must be connected as close to the chip as possible. The input crystal should be a parallel mode watch crystal with 12 pF load capacitance.



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Package Outline and Package Dimensions
(For current dimensional specifications, see JEDEC Publication No. 95.)

8 pin SOIC



Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A	0.0532	0.0688	1.35	1.75
A1	0.0040	0.0098	0.10	0.24
B	0.0130	0.0200	0.33	0.51
C	0.0075	0.0098	0.19	0.24
D	0.1890	0.1968	4.80	5.00
E	0.1497	0.1574	3.80	4.00
e	.050 BSC		1.27 BSC	
H	0.2284	0.2440	5.80	6.20
h	0.0099	0.0195	0.25	0.50
L	0.0160	0.0500	0.41	1.27

Ordering Information

Part/Order Number	Marking	Shipping packaging	Package	Temperature
MK3200S	MK3200S	tubes	8 pin SOIC	0-70 °C
MK3200STR	MK3200S	tape and reel	8 pin SOIC	0-70 °C
MK3200SI	MK3200SI	tubes	8 pin SOIC	-40-85 °C
MK3200SITR	MK3200SI	tape and reel	8 pin SOIC	-40-85 °C

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