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MK1432/MK1434
Green PC and Local Bus Clock Source

Description

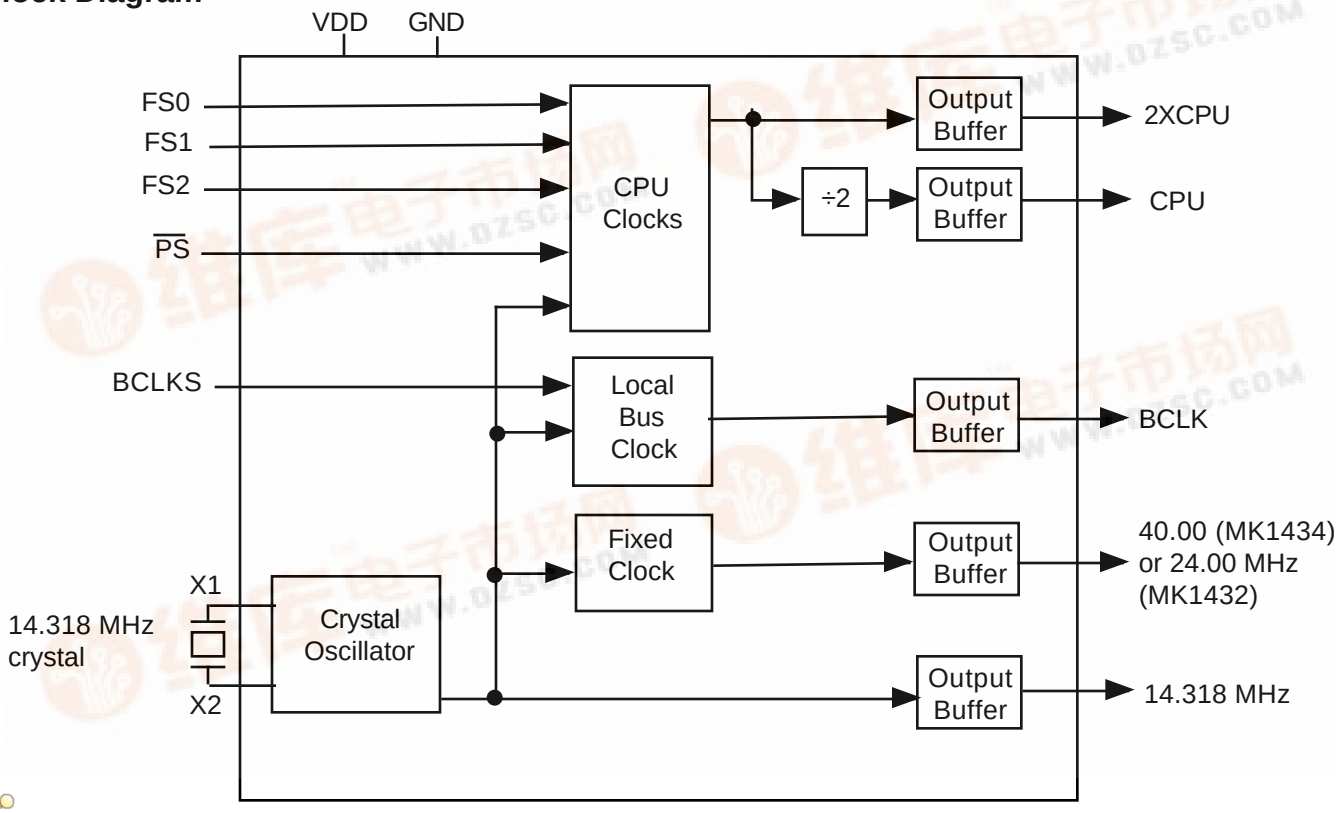
The MK1432 and MK1434 are low cost, high performance triple clock synthesizers for green PC and local bus desktop and notebook applications. Using analog Phase-Locked Loop (PLL) techniques, the devices accept a 14.318 MHz crystal input to produce multiple output clocks up to 100 MHz. They provide selectable 2XCPU and CPU, selectable local bus clock, ISA clock, and one fixed peripheral clock. The chips support PCI and VL buses. The fixed clock is either 24MHz or 40MHz. The devices can operate at 5V or 3.3V up to and including 80MHz on the 2XCPU clock.

The Power Saving pin causes the CPU clocks to smoothly transition to 33.33 MHz for Pentiums, and 16.67 MHz for 486DX4. In addition, a single pin can be made to slow DX2s to 8 MHz.

Features

- Packaged in 16 pin narrow (150 mil) SOIC
- Supports all Pentium™ Processor timing specs
- Supports synchronous and asynchronous local bus
- Selectable local bus frequencies of 25, 33, or 50MHz
- SCSI or VL bus 40MHz clock on MK1434
- Floppy or super I/O clock on MK1432
- Single Power Saving pin switches to low power mode (for 486 and Pentium)
- 5V or 3.3V (up to 80MHz) operation
- Smooth transitions for Pentium and 486 based Green PC
- Low skew (<250ps) Pentium compatible 2X and 1X outputs
- Duty cycle of 45/55 up to 100 MHz
- 25mA output drive capability at TTL levels
- Compatible with all popular microprocessors
- Packaged in 16 pin narrow SOIC
- For Early Clock support, consult MicroClock

Block Diagram



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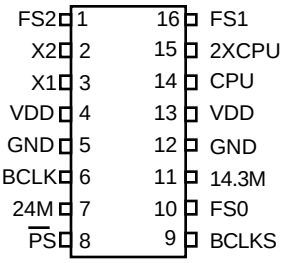
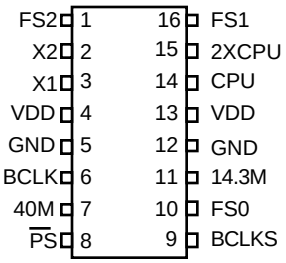
Pin Assignment





CPU Clock Decoding Table (in MHz)

PS	FS2	FS1	FS0	2XCPU	CPU
1	0	0	0	16.00	8.00
1	0	0	1	100.00 note	50.00 note3
1	0	1	0	80.00	40.00
1	0	1	1	75.00	37.50
1	1	0	0	40.00	20.00
1	1	0	1	50.00	25.00
1	1	1	0	66.66	33.33
1	1	1	1	60.00	30.00
0	X	X	X	33.33	16.67

Local Bus Clock Decoding Table (in MHz)

BCLKS	BCLK (MHz)
0	25.00
M	33.33
1	50.00

Notes:
1. Actual frequencies are within 0.05% of those shown.
2. Transitions between mean frequencies on any CPU pin are smooth, and do not violate Intel's 0.1% per cycle specification.
3. These selections are not guaranteed to operate at 3V.
4. M = mid level. Leave pin tri-stated, unconnected, or floating to select this level.
5. X = don't care (either 0 or 1).

Pin Descriptions

1432	1434	Name	Type	Description
1	1	FS2	I	Select 2 for 2XCPU and CPU frequencies. See table above. Internal Pull-Up.
2	2	X2	O	Crystal connection. Connect to 14.31818 MHz crystal.
3	3	X1	I	Crystal connection. Connect to 14.31818 MHz crystal or clock.
4	4	VDD	P	Connect to +5V or 3.3V. Must be same voltage as pin 13.
5	5	GND	P	Connect to ground.
6	6	BCLK	O	Local Bus Clock output. See table above.
7	-	24M	O	24.00 MHz clock output (MK1432 only).
-	7	40M	O	40.00 MHz clock output (MK1434 only).
8	8	PS	I	Power Saving pin. Smoothly changes CPU to/from 33.33 and 16.67 MHz. IPU
9	9	BCLKS	TI	Local Bus Clock Select pin. See table above.
10	10	FS0	I	Select 0 for 2XCPU and CPU frequencies. See table above. Internal Pull-Up.
11	11	14.3M	O	14.318 MHz Reference Clock Output.
12	12	GND	P	Connect to ground.
13	13	VDD	P	Connect to +5V or 3.3V. Must be same voltage as pin 4.
14	14	CPU	O	CPU Clock output. See table above for frequencies.
15	15	2XCPU	O	2X CPU Clock output. See table above for frequencies.
16	16	FS1	I	Select 1 for 2XCPU and CPU frequencies. See table above. Internal Pull-Up.

Key: TI = Tri-level Input, I = Input, O = output, P = power supply connection

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		0		70	°C
Soldering Temperature	Max of 20 seconds			260	°C
Storage temperature		-65		150	°C
DC CHARACTERISTICS (VDD = 5V unless noted)					
Operating Voltage, VDD		3.0		5.5	V
Input High Voltage, VIH		2			V
Input Low Voltage, VIL				0.8	V
Mid-level pin Input High Voltage, VIH	Pin 9 only	VDD-0.5			V
Mid-level pin Input Low Voltage, VIL	Pin 9 only			0.5	V
Output High Voltage, VOH	IOH=-25mA	2.4			V
Output Low Voltage, VOL	IOL=25mA			0.4	V
Output High Voltage, VOH	VDD=3.3V, IOH=-8mA	2.4			V
Output Low Voltage, VOL	VDD=3.3V, IOL=8mA			0.4	V
Operating Supply Current, IDD	No Load, note 2		40		mA
Operating Supply Current, IDDPS	No Load, $\overline{PS}$=0		27		mA
Short Circuit Current	Each output (except X2)		±100		mA
On-Chip Pull-up Resistor	Pins 1, 8, 10, 16		250		kΩ
Input Capacitance			7		pF
AC CHARACTERISTICS (VDD = 5V unless noted)					
Input Frequency			14.31818		MHz
Output Clock Rise Time	0.8 to 2.0V			1.5	ns
Output Clock Fall Time	2.0 to 0.8V			1.5	ns
Output Clock Duty Cycle	At VDD/2	45	49 to 51	55	%
Cycle to Cycle Jitter, CPU Clocks				1000	ps
Absolute Clock Period Jitter	14-40 MHz clocks	-500		500	ps
Skew of 2XCPU with respect to CPU	Rising edges at 1.5V	-250	0	250	ps
Transition time, 33.3MHz to 66.6MHz	VDD=3.3 or 5V		3		ms
Transition time, 66.6MHz to 33.3MHz	VDD=3.3 or 5V		2		ms

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.

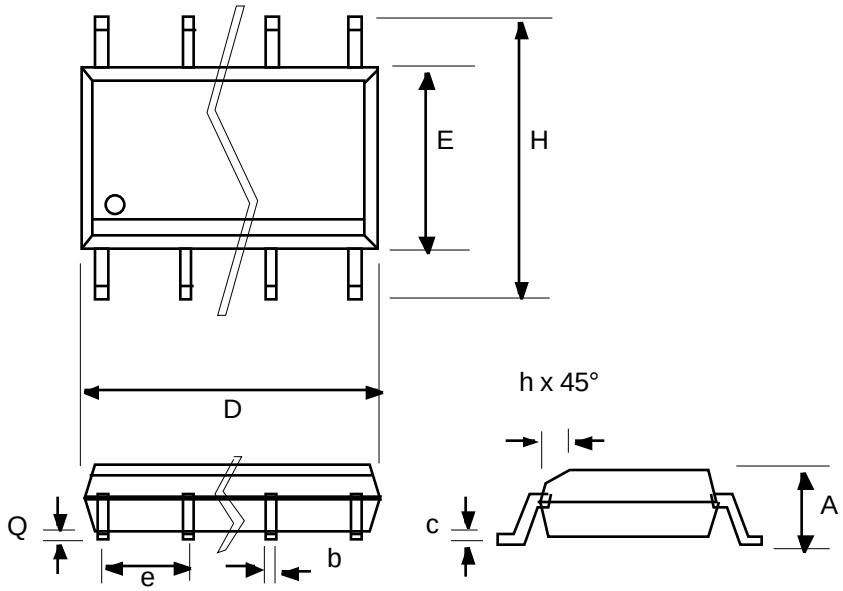
2. With 2XCPU clock at 66.66MHz, and BCLK at 33.33MHz

External Components

The MK1432/4 requires a minimum number of external components for proper operation. Decoupling capacitors of 0.1µF should be connected between VDD and GND, as close to the MK1432/4 as possible. A series termination resistor of 33Ω may be used for each clock output. The device does not require (nor do we recommend) capacitors connected to the crystal pins. The 14.31818 MHz crystal must be connected as close to the chip as possible. Recommended load capacitance for the crystal is 12pF.

Package Outline and Package Dimensions

16 pin SOIC narrow



	Inches		Millimeters	
Symbol	Min	Max	Min	Max
A	0.055	0.070	1.397	1.778
b	0.013	0.019	0.330	0.483
c	0.007	0.010	0.191	0.254
D	0.385	0.400	9.779	10.160
E	0.150	0.160	3.810	4.064
H	0.225	0.245	5.715	6.223
e	.050 BSC		1.27 BSC	
h		0.016		0.406
Q	0.004	0.01	0.102	0.254

Ordering Information

Part/Order Number	Marking	Fixed Output Clock Frequency	Package	Temperature
MK1432S	MK1432S	24 MHz	16 pin SOIC	0-70°C
MK1434S	MK1434S	40 MHz	16 pin SOIC	0-70°C
MK1432STR	MK1432S	-	Add Tape & Reel	-
MK1434STR	MK1434S	-	Add Tape & Reel	-

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