Description

The MK1704A is an upgraded version of the MK1704 and is recommended for all new designs. It offers more reduction in the frequency amplitude peaks, and will support frequencies up to 140 MHz.

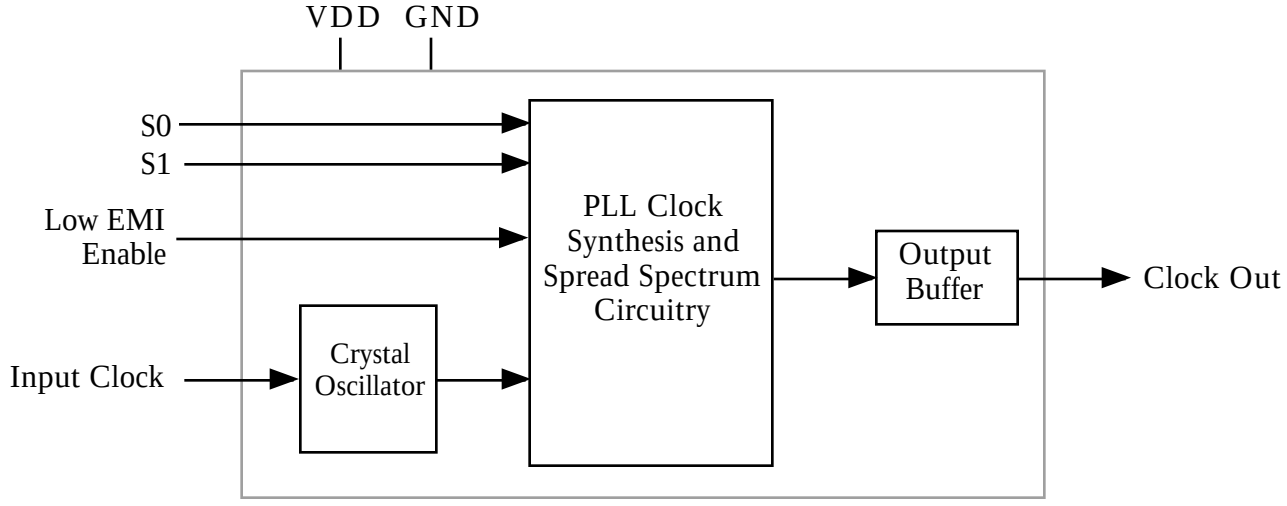
The MK1704A generates a low EMI output clock from a clock input. The part is designed to dither the LCD interface clock or other clocks for flat panel graphics controllers. The MK1704A uses ICS/MicroClock's proprietary mixture of analog and digital Phase-Locked Loop (PLL) technology to synthesize the frequency, and our patented technique to spread the frequency spectrum of the output, thereby reducing the frequency amplitude peaks by several dB.

We offer many other clocks for computers and computer peripherals. Consult us when you need to remove crystals and oscillators from your board.

Features

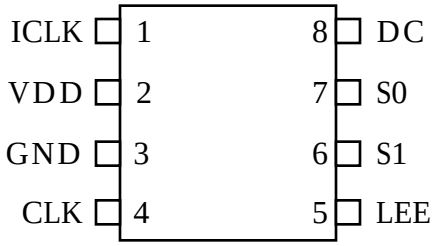
- Packaged in 8 pin SOIC
- Provides a spread spectrum output clock
- Supports leading flat panel controllers
- Accepts a clock input, provides same frequency dithered output
- Optimized for higher resolutions that require up to 140 MHz, as well as 40 MHz (SVGA) and 65 MHz (XVGA) clocks
- Peak reduction by 7dB - 14 dB typical on 3rd-19th odd harmonics
- Low EMI feature can be disabled
- 3.3 V or 5 V ±10% supply voltage
- Advanced, low power CMOS process
- See the MK1714-01 for a multiplier with low EMI which can operate from a crystal

Block Diagram



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Pin Assignment



8 pin SOIC

Clock Output Select Table (in MHz)

S1	S0	Input Min	Input Nom	Input Max	Multiplier	Mode	Freq. spread vs. CLK
0	0	60	135	140	x1	*	+0.5, -1.5%
0	1	60	80	120	x1	*	+0.5, -1.5%
1	0	30	40	60	x1	SVGA	Down 2.5%
1	1	40	65	100	x1	XGA	+0.5, -1.5%

*Note: Use only MK1704A with date code of 9909 or later.

Pin Descriptions

Pin #	Name	Type	Description
1	ICLK	I	Connect to a clock input as shown in the table above.
2	VDD	P	Connect to +3.3V or +5V.
3	GND	P	Connect to ground.
4	CLK	O	Clock Output; equal to input frequency.
5	LEE	I	Low EMI Enable. Turns on the spread spectrum when high. Internal pull-up.
6	S1	I	Frequency Select 1 Input. Selects input/output clock range per table above. Internal pull-up.
7	S0	I	Frequency Select 0 Input. Selects input/output clock range per table above. Internal pull-up.
8	DC	-	Don't Connect. Do not connect anything to this pin.

Key: I = Input, O = output, P = power supply connection

External Components

A minimum number of external components are required for proper operation. A decoupling capacitor of 0.01µF should be connected between VDD and GND on pins 2 and 3, and a 33 Ω terminating resistor may be used on the clock output if the trace is longer than 1 inch. The MK1704A is designed for use with a clock input only. For a crystal input, use the MK1704S or the MK1714-01R.

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Electrical Specifications

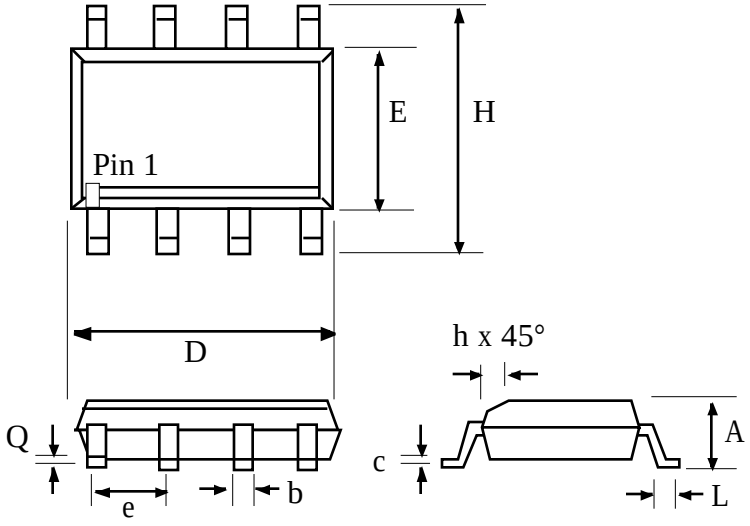
Parameter	Conditions	Minimum	Typical	Maximum	Units
ABSOLUTE MAXIMUM RATINGS (note 1)					
Supply Voltage, VDD	Referenced to GND			7	V
Inputs	Referenced to GND	-0.5		VDD+.5V	V
Clock Outputs	Referenced to GND	-0.5		VDD+.5V	V
Ambient Operating Temperature		0		70	°C
Soldering Temperature	Max of 10 seconds			260	°C
Storage temperature		-65		150	°C
DC CHARACTERISTICS (at 5.0V unless otherwise noted)					
Operating Voltage, VDD		3		5.5	V
Input High Voltage, VIH, input clock only	Clock input	(VDD/2)+1	VDD/2		V
Input Low Voltage, VIL, input clock only	Clock input		VDD/2	(VDD/2)-1	V
Output High Voltage, VOH	IOH=-4mA	VDD-0.4			V
Output High Voltage, VOH	IOH=-25mA	2.4			V
Output Low Voltage, VOL	IOL=25mA			0.4	V
Operating Supply Current, IDD, 5V	No Load		15		mA
Operating Supply Current, IDD, 3.3V	No Load		10		mA
Input Capacitance	S0, S1 pins		7		pF
Internal Pull-up Resistor	LEE pin only		500		kΩ
AC CHARACTERISTICS (at 5.0V unless otherwise noted)					
Input Clock Frequency	S1=0, S0=0	60	135	140	MHz
(Note 3)	S1=0, S0=1	60	80	120	
	S1=1, S0=0	30	40	60	
	S1=1, S0=1	40	65	100	
Input Clock Duty Cycle	Time above VDD/2	20		80	%
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	Time above 1.5V	40	50	60	%
Output Clock Frequency Variation from Mean			1 - 2.5		%
EMI Peak Frequency Reduction	3rd-19th odd harmonics		10 to 16		dB

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. Typical values are at 25°C.
3. Not tested; guaranteed by design.

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Package Outline and Package Dimensions

8 pin SOIC



	Inches		Millimeters	
Symbol	Min	Max	Min	Max
A	0.055	0.068	1.397	1.7272
b	0.013	0.019	0.330	0.483
D	0.185	0.200	4.699	5.080
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		0.015		0.381
L	0.016	0.035	0.406	0.889
Q	0.004	0.01	0.102	0.254

Ordering Information

Part/Order Number	Marking	Package	Temperature
MK1704A	MK1704A	8 pin SOIC	0 to 70 °C
MK1704ATR	MK1704A	Add tape and reel	0 to 70 °C

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