÷2, ÷4, ÷8 Clock Generation Chip

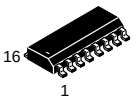
MC10EL34
MC100EL34

The MC10/100EL34 is a low skew ÷2, ÷4, ÷8 clock generation chip designed explicitly for low skew clock generation applications. The internal dividers are synchronous to each other, therefore, the common output edges are all precisely aligned. The device can be driven by either a differential or single-ended ECL or, if positive power supplies are used, PECL input signal. In addition, by using the V_{BB} output, a sinusoidal source can be AC coupled into the device (see Interfacing section of the ECLinPS™ Data Book DL140/D). If a single-ended input is to be used, the V_{BB} output should be connected to the CLK input and bypassed to ground via a 0.01µF capacitor. The V_{BB} output is designed to act as the switching reference for the input of the EL34 under single-ended input conditions, as a result, this pin can only source/sink up to 0.5mA of current.

The common enable ($\overline{EN}$) is synchronous so that the internal dividers will only be enabled/disabled when the internal clock is already in the LOW state. This avoids any chance of generating a runt clock pulse on the internal clock when the device is enabled/disabled as can happen with an asynchronous control. An internal runt pulse could lead to losing synchronization between the internal divider stages. The internal enable flip-flop is clocked on the falling edge of the input clock, therefore, all associated specification limits are referenced to the negative edge of the clock input.

Upon startup, the internal flip-flops will attain a random state; the master reset (MR) input allows for the synchronization of the internal dividers, as well as multiple EL34s in a system.

- 50ps Output-to-Output Skew
- Synchronous Enable/Disable
- Master Reset for Synchronization
- 75kΩ Internal Input Pulldown Resistors
- >1000V ESD Protection



D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751B-05

PIN DESCRIPTION

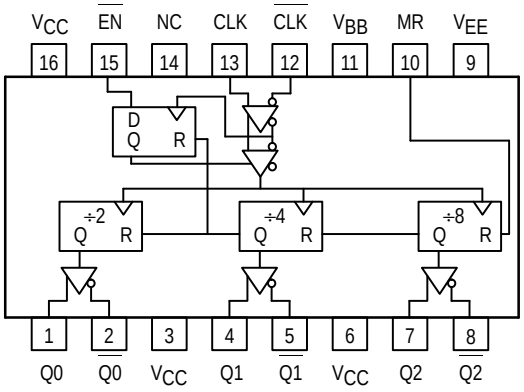
PIN	FUNCTION
$\overline{CLK}$	Diff Clock Inputs
EN	Sync Enable
MR	Master Reset
V_{BB}	Reference Output
Q_0	Diff ÷2 Outputs
Q_1	Diff ÷4 Outputs
Q_2	Diff ÷8 Outputs

FUNCTION TABLE

CLK	$\overline{EN}$	MR	FUNCTION
Z	L	L	Divide
ZZ	H	L	Hold $Q_{0–3}$
X	X	H	Reset $Q_{0–3}$

Z = Low-to-High Transition
ZZ = High-to-Low Transition

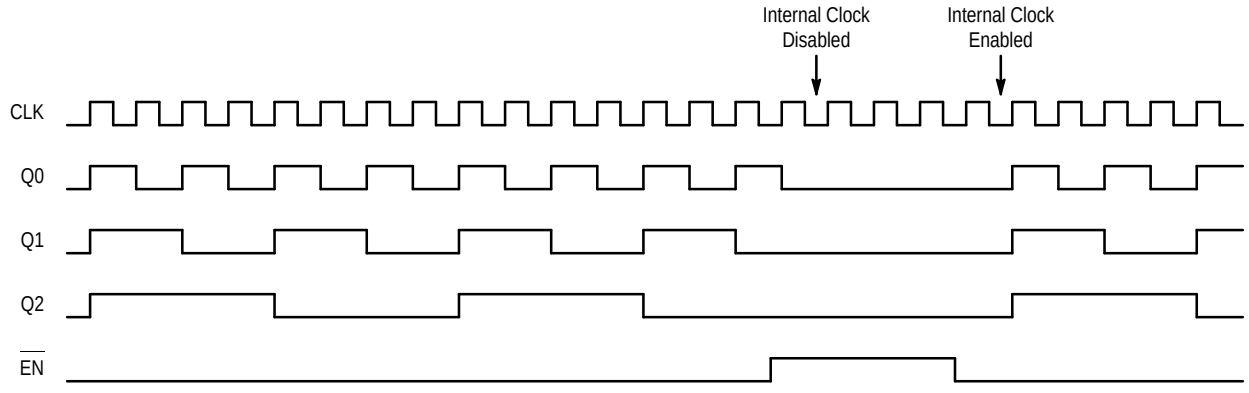
LOGIC DIAGRAM AND PINOUT ASSIGNMENT



MOTOROLA

AC/DC CHARACTERISTICS (V_{EE} = V_{EE}(min) to V_{EE}(max); V_{CC} = GND)

		–40°C			0°C			25°C			85°C			
Symbol	**Characteristic**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Unit**
f_{MAX}	Max Toggle Frequency	1100			1100			1100			1100			MHz
I_{EE}	Power Supply Current 10EL 100EL			39 39			39 39			39 39			39 42	mA
V_{BB}	Output Reference Voltage 10EL 100EL	–1.43 –1.38		–1.30 –1.26	–1.38 –1.38		–1.27 –1.26	–1.35 –1.38		–1.25 –1.26	–1.31 –1.38		–1.19 –1.26	V
I_{IH}	Input High Current	150					150			150			150	µA
t_{PLH} t_{PHL}	Propagation Delay to Output CLK→Q0 CLK→Q1,2 MR→Q	960 900 750		1200 1140 1060	960 900 750		1200 1140 1060	960 900 750		1200 1140 1060	970 910 790		1210 1150 1090	ps
t_{SKEW}	Within-Device Skew		100			100			100			100		ps
t_S	Setup Time $\overline{EN}$	400			400			400			400			ps
t_H	Hold Time $\overline{EN}$	250			250			250			250			ps
V_{PP}	Minimum Input Swing CLK	250			250			250			250			mV
V_{CMR}	Common Mode Range CLK	–2.0		–0.4	–2.0		–0.4	–2.0		–0.4	–2.0		–0.4	V
t_r t_f	Output Rise/Fall Times Q (20% – 80%)	275		525	275		525	275		525	275		525	ps

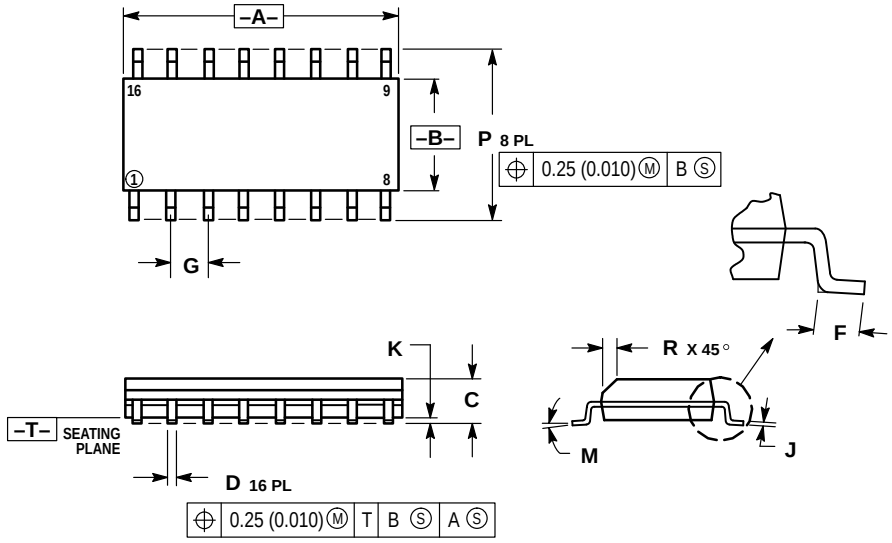


The $\overline{EN}$ signal will freeze the internal clocks to the flip–flops on the first falling edge of CLK after its assertion. The internal dividers will maintain their state during the internal clock freeze and will return to clocking once the internal clocks are unfrozen. The outputs will transition to their next states in the same manner, time and relationship as they would have had the EN signal not been asserted.

Figure 1. Timing Diagram

OUTLINE DIMENSIONS

D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751B-05
ISSUE J



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	9.80	10.00	0.386	0.393
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

How to reach us:
USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1–800–441–2447 or 602–303–5454

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE 602–244–6609
INTERNET: http://Design–NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi–SPD–JLDC, 6F Seibu–Butsuryu–Center, 3–14–2 Tatsumi Koto–Ku, Tokyo 135, Japan. 03–81–3521–8315

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park, 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298