

**MOTOROLA**  
**SEMICONDUCTOR TECHNICAL DATA**

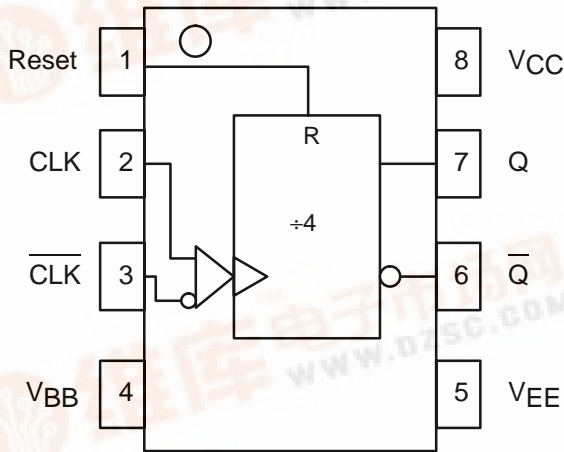
**÷4 Divider**

The MC10EL/100EL33 is an integrated ÷4 divider. The differential clock inputs and the V<sub>BB</sub> allow a differential, single-ended or AC coupled interface to the device. If used, the V<sub>BB</sub> output should be bypassed to ground with a 0.01μF capacitor. Also note that the V<sub>BB</sub> is designed to be used as an input bias on the EL33 only, the V<sub>BB</sub> output has limited current sink and source capability.

The reset pin is asynchronous and is asserted on the rising edge. Upon power-up, the internal flip-flops will attain a random state; the reset allows for the synchronization of multiple EL33's in a system.

- 650ps Propagation Delay
- 4.0GHz Toggle Frequency
- High Bandwidth Output Transitions
- 75kΩ Internal Input Pulldown Resistors
- >1000V ESD Protection

**LOGIC DIAGRAM AND PINOUT ASSIGNMENT**



**MC10EL33**  
**MC100EL33**



**D SUFFIX**  
PLASTIC SOIC PACKAGE  
CASE 751-05

**PIN DESCRIPTION**

PIN	FUNCTION
CLK	Clock Inputs
Reset	Asynch Reset
V <sub>BB</sub>	Ref Voltage Output
Q	Data Outputs



# MC10EL33 MC100EL33

## DC CHARACTERISTICS ( $V_{EE} = V_{EE(min)}$ to $V_{EE(max)}$ ; $V_{CC} = GND$ )

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$I_{EE}$	Power Supply Current 10EL 100EL		27 27	33 33		27 27	33 33		27 27	33 33		27 31	33 37	mA
$V_{EE}$	Power Supply Voltage 10EL 100EL		-5.2 -4.5		-4.75 -4.20	-5.2 -4.5	-5.5 -5.5	-4.75 -4.20	-5.2 -4.5	-5.5 -5.5	-4.75 -4.20	-5.2 -4.5	-5.5 -5.5	V
$V_{BB}$	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	$\mu$ A

## AC CHARACTERISTICS ( $V_{EE} = V_{EE(min)}$ to $V_{EE(max)}$ ; $V_{CC} = GND$ )

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$f_{MAX}$	Maximum Toggle Frequency	3.4	4.2		3.8	4.2		3.8	4.2		3.8	4.2		GHz
$t_{PLH}$ $t_{PHL}$	Propagation Delay CLK to Q Reset to Q	490 310	630 460	770 610	540 360	630 460	720 560	550 360	640 460	730 560	590 380	670 480	760 580	ps
$V_{PP}$	Minimum Input Swing <sup>1</sup>	150			150			150			150			mV
$t_r$ $t_f$	Output Rise/Fall Times Q (20% – 80%)	100	225	350	100	225	350	100	225	350	100	225	350	ps

1. Minimum input swing for which AC parameters are guaranteed.

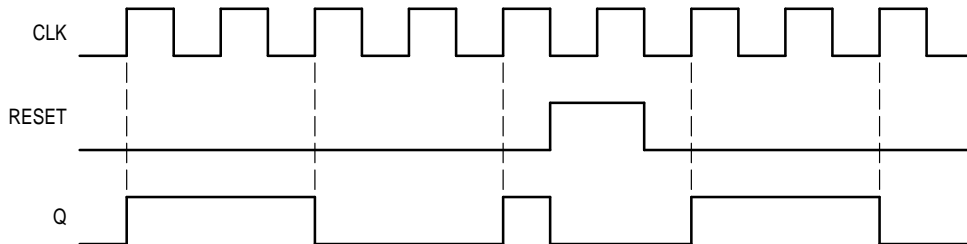
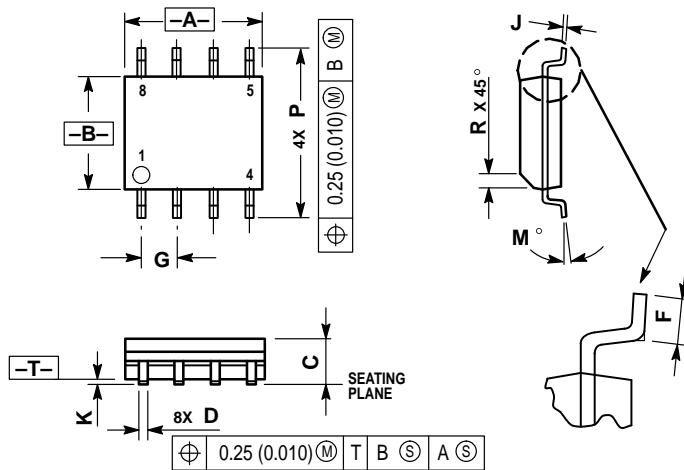


Figure 1. Timing Diagram

OUTLINE DIMENSIONS

D SUFFIX  
PLASTIC SOIC PACKAGE  
CASE 751-05  
ISSUE P



NOTES:

1. DIMENSIONS A AND B ARE DATUMS AND T IS A DATUM SURFACE.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
3. DIMENSIONS ARE IN MILLIMETER.
4. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
5. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
6. DIMENSION D DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS	
	MIN	MAX
A	4.80	5.00
B	3.80	4.00
C	1.35	1.75
D	0.35	0.49
F	0.40	1.25
G	1.27 BSC	
J	0.18	0.25
K	0.10	0.25
M	0°	7°
P	5.80	6.20
R	0.25	0.50

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