# Dual 1:3 Fanout Buffer

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MC100LVEL13
MC100EL13

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The MC100LVEL13 is a dual, fully differential 1:3 fanout buffer. The MC100EL13 is pin and functionally equivalent to the MC100LVEL13 but is specified for operation at the standard 100E ECL voltage supply. The Low Output–Output Skew of the device makes it ideal for distributing two different frequency synchronous signals.

The differential inputs have special circuitry which ensures device stability under open input conditions. When both differential inputs are left open the D input will pull down to V_{EE}, The D input will bias around $V_{CC}/2$ and the Q output will go LOW.

- Differential Inputs and Outputs
- 20–Lead SOIC Packaging
- 500ps Typical Propagation Delays
- 50ps Output–Output Skews
- Supports Both Standard and Low Voltage 100K ECL
- >2000V ESD Protection

DW SUFFIX
PLASTIC SOIC PACKAGE
CASE 751D–04

Logic Diagram and Pinout: 20–Lead SOIC (Top View)
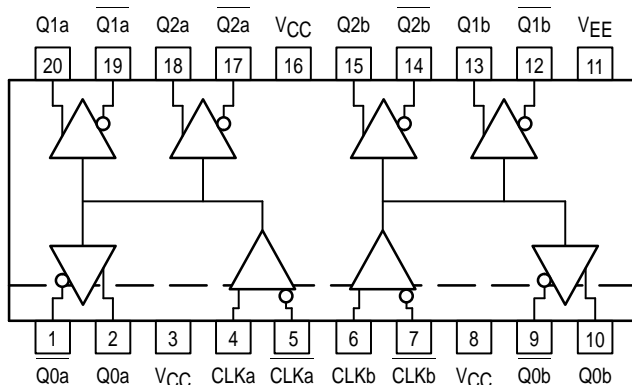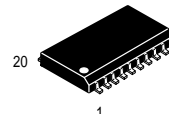
PIN NAMES

Pins	Function
Qna, $\overline{Qna}$	Differential Clock Outputs
Qnb, $\overline{Qnb}$	Differential Clock Outputs
CLKn, $\overline{CLKn}$	Differential Clock Inputs

MC100LVEL13
DC CHARACTERISTICS (V_{EE} = –3.0V to –3.8V; 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			30	38		30	38		30	38		32	40	mA
I_{IH}	Input HIGH Current				150			150			150			150	μA
I_{INL}	Input LOW Current	Dn	0.5			0.5			0.5			0.5			μA
		$\overline{Dn}$	−300			−300			−300			−300			

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MC100LVEL13 MC100EL13

MC100LVEL13
AC CHARACTERISTICS (V_{EE} = −3.0V to −3.8V; V_{CC} = GND)

Symbol	Characteristic	−40°C Min	Typ	Max	0°C Min	Typ	Max	25°C Min	Typ	Max	85°C Min	Typ	Max	Unit
t_{PLH} t_{PHL}	Propagation Delay CLK→Q/$\overline{Q}$	410		600	420		610	430		620	450		640	ps
$t_{sk(O)}$	Output–Output Skew Any Qa→Qa, Any Qb→Qb Any Qa→Any Qb			50 75			50 75			50 75			50 75	ps
$t_{sk(DC)}$	Duty Cycle Skew $\lvert t_{PLH} - t_{PHL} \rvert$			50			50			50			50	ps
V_{PP}	Minimum Input Swing[1]	150		1000	150		1000	150		1000	150		1000	mV
V_{CMR}	Common Mode Range[2] V_{PP} < 500mV V_{PP} ≥ 500mV	−2.0 −1.8		−0.4 −0.4	−2.1 −1.9		−0.4 −0.4	−2.1 −1.9		−0.4 −0.4	−2.1 −1.9		−0.4 −0.4	V
t_r t_f	Output Rise/Fall Times Q (20% − 80%)	230		500	230		500	230		500	230		500	ps

1. Minimum input swing for which AC parameters guaranteed. The device has a DC gain of ≈40.
2. The CMR range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V_{PP}min and 1V. The lower end of the CMR range varies 1:1 with V_{EE}. The numbers in the spec table assume a nominal V_{EE} = −3.3V. Note for PECL operation, the V_{CMR}(min) will be fixed at 3.3V − $\lvert V_{CMR}(min) \rvert$.

MC100EL13
DC CHARACTERISTICS (V_{EE} = −4.2V to −5.5V; V_{CC} = GND)

Symbol	Characteristic	−40°C Min	Typ	Max	0°C Min	Typ	Max	25°C Min	Typ	Max	85°C Min	Typ	Max	Unit
I_{EE}	Power Supply Current		30	38		30	38		30	38		32	40	mA
I_{IH}	Input HIGH Current			150			150			150			150	μA
I_{INL}	Input LOW Current Dn $\overline{Dn}$	0.5 −300			0.5 −300			0.5 −300			0.5 −300			μA

MC100EL13
AC CHARACTERISTICS (V_{EE} = −4.2V to −5.5V; V_{CC} = GND)

Symbol	Characteristic	−40°C Min	Typ	Max	0°C Min	Typ	Max	25°C Min	Typ	Max	85°C Min	Typ	Max	Unit
t_{PLH} t_{PHL}	Propagation Delay CLK→Q/$\overline{Q}$	410		600	420		610	430		620	450		640	ps
$t_{sk(O)}$	Output–Output Skew Any Qa→Qa, Any Qb→Qb Any Qa→Any Qb			50 75			50 75			50 75			50 75	ps
$t_{sk(DC)}$	Duty Cycle Skew $\lvert t_{PLH} - t_{PHL} \rvert$			50			50			50			50	ps
V_{PP}	Minimum Input Swing[1]	150		1000	150		1000	150		1000	150		1000	mV
V_{CMR}	Common Mode Range[2] V_{PP} < 500mV V_{PP} ≥ 500mV	−3.2 −3.0		−0.4 −0.4	−3.3 −3.1		−0.4 −0.4	−3.3 −3.1		−0.4 −0.4	−3.3 −3.1		−0.4 −0.4	V
t_r t_f	Output Rise/Fall Times Q (20% − 80%)	230		500	230		500	230		500	230		500	ps

1. Minimum input swing for which AC parameters guaranteed. The device has a DC gain of ≈40.
2. The CMR range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V_{PP}min and 1V. The lower end of the CMR range varies 1:1 with V_{EE}. The numbers in the spec table assume a nominal V_{EE} = −4.5V. Note for PECL operation, the V_{CMR}(min) will be fixed at 5.0V − $\lvert V_{CMR}(min) \rvert$.

OUTLINE DIMENSIONS

DW SUFFIX
PLASTIC SOIC PACKAGE
CASE 751D–04
ISSUE E
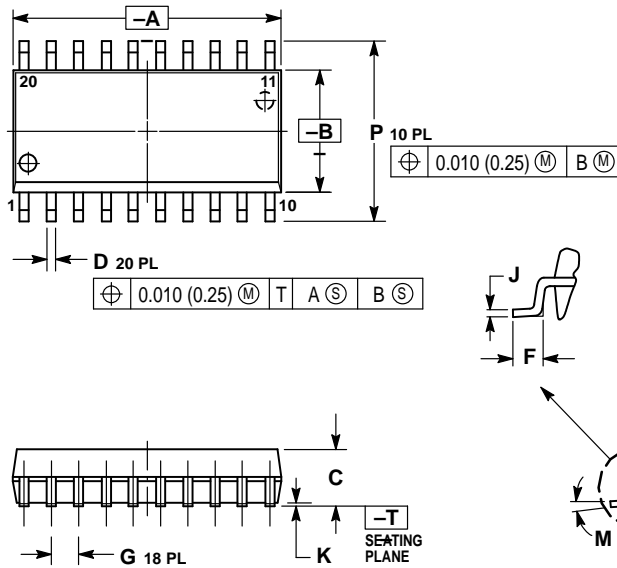
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.150 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.13 (0.005) TOTAL IN EXCESS OF D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	12.65	12.95	0.499	0.510
B	7.40	7.60	0.292	0.299
C	2.35	2.65	0.093	0.104
D	0.35	0.49	0.014	0.019
F	0.50	0.90	0.020	0.035
G	1.27 BSC		0.050 BSC	
J	0.25	0.32	0.010	0.012
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	10.05	10.55	0.395	0.415
R	0.25	0.75	0.010	0.029

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