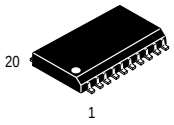
Triple D Flip-Flop With Set and Reset

MC100LVEL30
MC100EL30

The MC100LVEL30 is a triple master–slave D flip flop with differential outputs. The MC100EL30 is pin and functionally equivalent to the MC100LVEL30 but is specified for operation at the standard 100E ECL voltage supply. Data enters the master latch when the clock input is LOW and transfers to the slave upon a positive transition on the clock input.

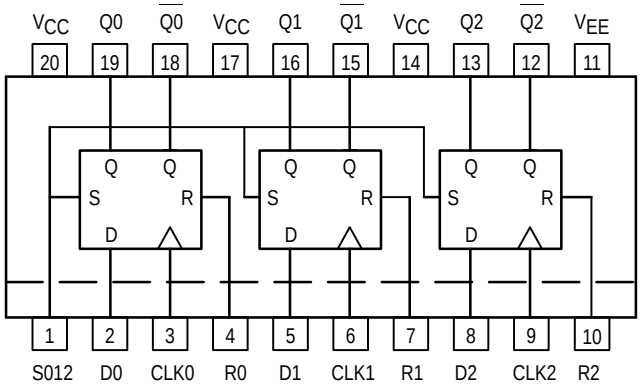
In addition to a common Set input individual Reset inputs are provided for each flip flop. Both the Set and Reset inputs function asynchronous and overriding with respect to the clock inputs.

- 1200MHz Minimum Toggle Frequency
- 20–Lead SOIC Packaging
- 550ps Typical Propagation Delays
- Set and Reset Inputs
- Supports both Standard and Low Voltage 100K ECL
- Internal Input Pulldown Resistors
- >2000V ESD Protection



DW SUFFIX
PLASTIC SOIC PACKAGE
CASE 751D–04

Logic Diagram and Pinout: 20-Lead SOIC (Top View)



TRUTH TABLE

R	S	D	CLK	Q	$\overline{Q}$
L	L	L	Z	L	H
L	L	H	Z	H	L
H	L	X	X	L	H
L	H	X	X	H	L
H	H	X	X	Undef	Undef

Z = LOW to HIGH Transition

PIN NAMES

Pins	Function
D0–D2	Data Inputs
R0–R2	Reset Inputs
CLK0–CLK2	Clock Inputs
S012	Common Set Input

MC100LVEL30
DC CHARACTERISTICS (V_{EE} = –3.0V to –3.8V; 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**
I_{EE}	Power Supply Current		55	62		55	62		55	62		55	64	mA
I_{IH}	Input HIGH Current			150			150			150			150	µA

MC100LVEL30
AC CHARACTERISTICS (V_{EE} = –3.0V to –3.8V; 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}	Maximum Toggle Frequency	1.0			1.2			1.2			1.2			GHz
t_{PLH} t_{PHL}	Propagation Delay CLK to Output S, R	460 470		690 710	470 480		700 720	480 490		710 730	500 515		730 755	ps
t_S t_H	Setup Time Hold Time	150 200	0 100		150 200	0 100		150 200	0 100		150 200	0 100		ps
t_{RR}	Set/Reset Recovery	400	200		400	200		400	200		400	200		ps
t_{PW}	Minimum Pulse Width CLK Set, Reset	 400 650			 400 650			 400 650			 400 650			ps
t_r t_f	Output Rise/Fall Times Q (20% – 80%)	280		550	280		550	280		550	280		550	ps

MC100EL30
DC CHARACTERISTICS (V_{EE} = –4.2V to –5.5V; V_{CC} = GND)

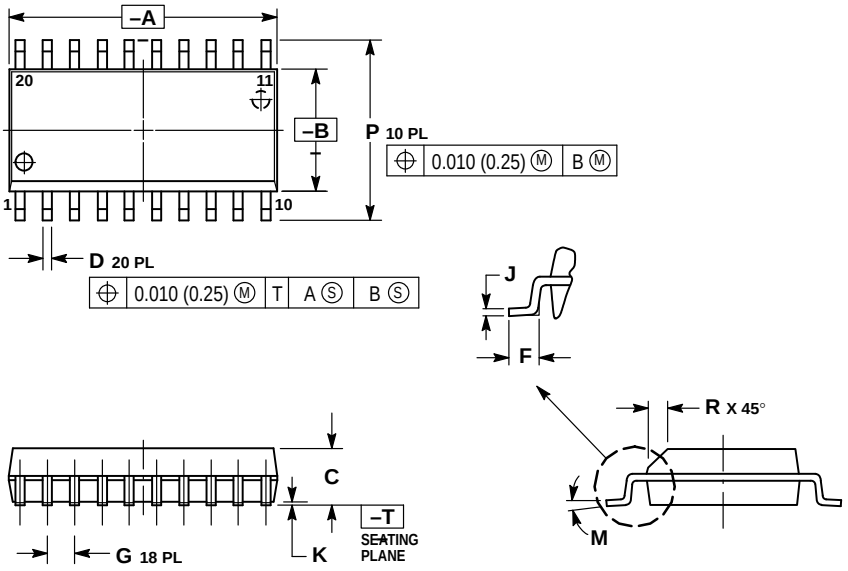
		–40°C			0°C			25°C			85°C			
Symbol	**Characteristic**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Unit**
I_{EE}	Power Supply Current		55	62		55	62		55	62		55	64	mA
I_{IH}	Input HIGH Current			150			150			150			150	µA

MC100EL30
AC CHARACTERISTICS (V_{EE} = –4.2V to –5.5V; 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}	Maximum Toggle Frequency	1.0			1.2			1.2			1.2			GHz
t_{PLH} t_{PHL}	Propagation Delay CLK to Output S, R	460 470		690 710	470 480		700 720	480 490		710 730	500 515		730 755	ps
t_S t_H	Setup Time Hold Time	150 200	0 100		150 200	0 100		150 200	0 100		150 200	0 100		ps
t_{RR}	Set/Reset Recovery	400	200		400	200		400	200		400	200		ps
t_{PW}	Minimum Pulse Width CLK Set, Reset	 400 650			 400 650			 400 650			 400 650			ps
t_r t_f	Output Rise/Fall Times Q (20% – 80%)	280		550	280		550	280		550	280		550	ps

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.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	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

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