

MOTOROLA
SEMICONDUCTOR TECHNICAL DATA

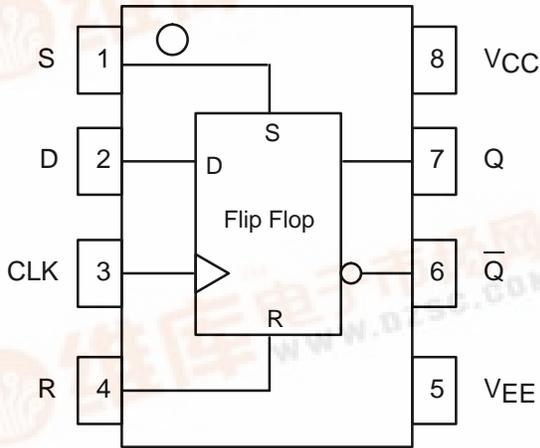
D Flip-Flop With Set and Reset

The MC10EL/100EL31 is a D flip-flop with set and reset. The device is functionally equivalent to the E131 device with higher performance capabilities. With propagation delays and output transition times significantly faster than the E131 the EL31 is ideally suited for those applications which require the ultimate in AC performance.

Both set and reset inputs are asynchronous, level triggered signals. Data enters the master portion of the flip-flop when clock is LOW and is transferred to the slave, and thus the outputs, upon a positive transition of the clock.

- 475ps Propagation Delay
- 2.8GHz Toggle Frequency
- 75kΩ Internal Input Pulldown Resistors
- >1000V ESD Protection

LOGIC DIAGRAM AND PINOUT ASSIGNMENT



MC10EL31 MC100EL31



D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751-05

TRUTH TABLE

D	S	R	CLK	Q
L	L	L	Z	L
H	L	L	Z	H
X	H	L	X	H
X	L	H	X	L
X	H	H	X	Undef

Z = LOW to HIGH Transition

MC10EL31 MC100EL31

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

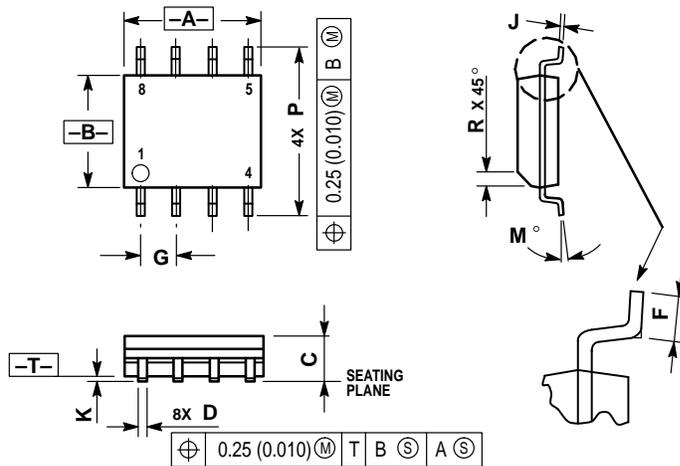
Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit	
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
I _{EE}	Power Supply Current	10EL	27	32		27	32		27	32		27	32	mA	
		100EL	27	32		27	32		27	32		31	37		
V _{EE}	Power Supply Voltage	10EL	-4.75	-5.2	-5.5	-4.75	-5.2	-5.5	-4.75	-5.2	-5.5	-4.75	-5.2	-5.5	V
		100EL	-4.20	-4.5	-5.5	-4.20	-4.5	-5.5	-4.20	-4.5	-5.5	-4.20	-4.5	-5.5	
I _{IH}	Input HIGH Current			150			150			150			150	μA	

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

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	2.0	2.5		2.2	2.8		2.2	2.8		2.2	2.8		GHz
t _{PLH} t _{PHL}	Propagation Delay to Output CLK S, R	315	465	630	365	465	580	375	475	590	430	530	645	ps
		295	455	630	345	455	580	355	465	590	400	510	645	
t _S t _H	Setup Time Hold Time	150	0		150	0		150	0		150	0		ps
t _{RR}	Set/Reset Recovery	400	200		400	200		400	200		400	200		ps
t _{PW}	Minimum Pulse Width CLK, Set, Reset	400			400			400			400			ps
t _r t _f	Output Rise/Fall Times Q (20% – 80%)	100	225	350	100	225	350	100	225	350	100	225	350	ps

OUTLINE DIMENSIONS

D SUFFIX
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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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