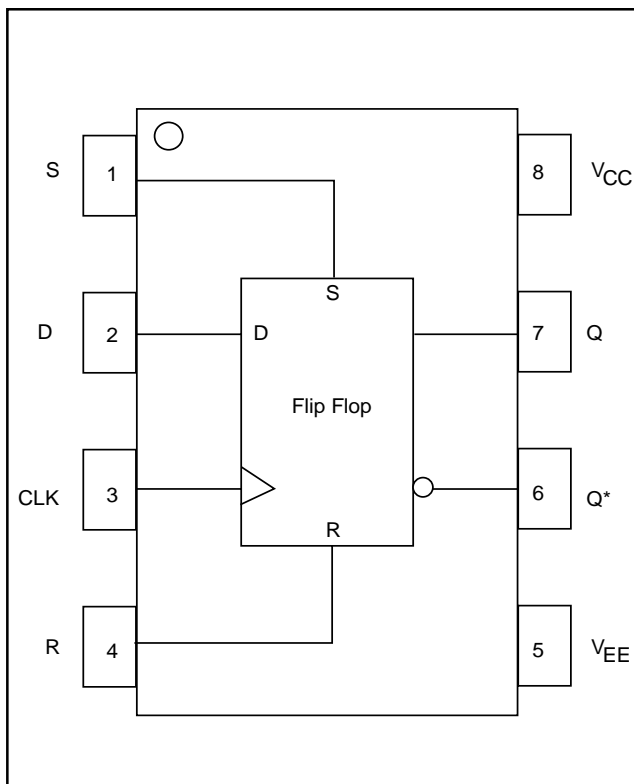


**D Flip - Flop with Set and Reset**
**HIGH-PERFORMANCE PRODUCTS**
**Description**

The SK10/100EL31W is a D Flip-Flop with Set and Reset. The device is fully compatible with the MC10/100EL31 and MC10/100LVEL31 devices, but operates from a -5.5V to -3.3V supply. With propagation delays and output transition times significantly faster than the E131, SK10/100EL31W 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, is transferred to the slave and thus the outputs, upon a positive transition of the clock.

**Features**

- Extended Supply Voltage Range: (VEE = -5.5V to -3.0V, VCC = 0V) or (VCC = +3.0V to +5.5V, VEE = 0V)
- 475 ps Propagation Delay
- 2.9 GHz Toggle Frequency
- Fully Compatible with MC10/100EL31 and MC10/100LVEL31
- 75KΩ Internal Input Pulldown Resistors
- Specified Over Industrial Temperature Range: -40°C to 85°C
- ESD Protection of >4000V
- Small Outline SOIC Package

**Functional Block Diagram**

**PIN Description**

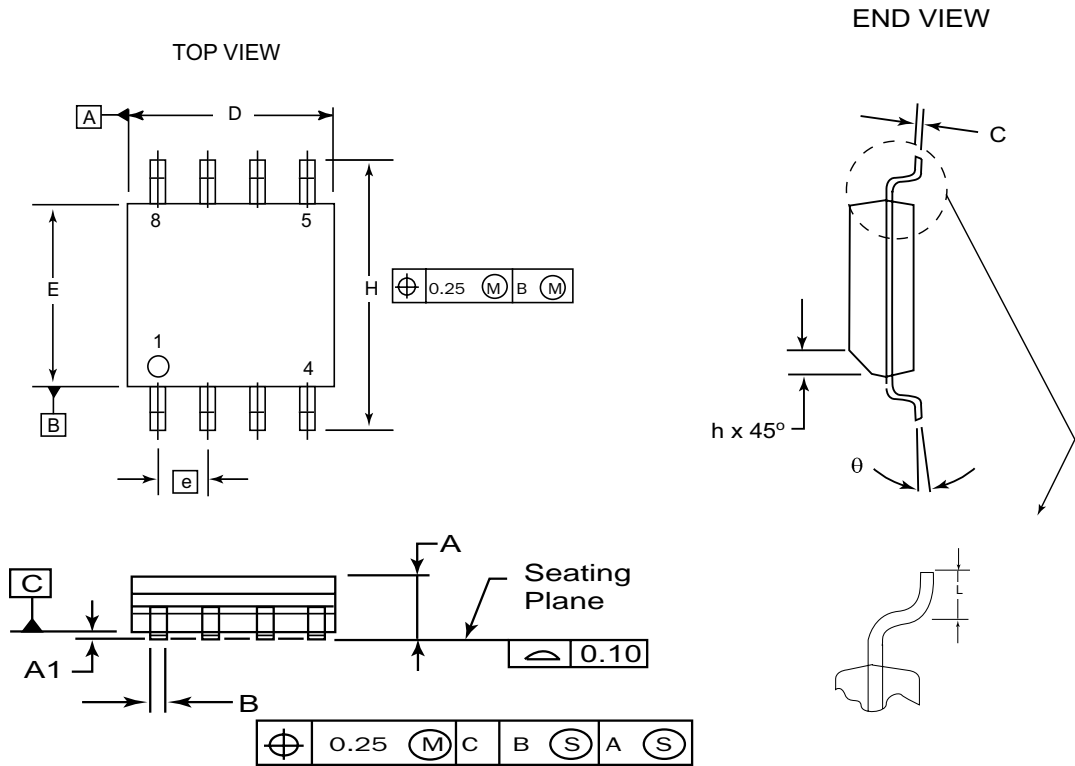
Pin	Function
Q, Q*	Data Outputs
S	Set
D	Data Input
CLK	Clock Input
R	Reset

**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

## 8 Pin SOIC Package



DIM	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.33	0.51
C	0.19	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.27
θ	0°	8°

**NOTES:**

1. Dimensions are in millimeters.
2. Dimensions D and E do not include mold protrusion.
3. Maximum mold protrusion 0.15 per side.
4. Dimension B does not include Dambar protrusion. Allowable Dambar protrusion shall be 0.127 total in excess of the B dimension at maximum material condition.

**HIGH-PERFORMANCE PRODUCTS**
**DC Characteristics**
**SK10/100EL31W DC Characteristics (Notes 1, 2)**
 $(V_{CC} - V_{EE} = 3.0V \text{ to } 5.5V; V_{OUT} \text{ Loaded } 50\Omega \text{ to } V_{CC} - 2.0V)$ 

Symbol	Characteristic	TA = -40°C			TA = 0°C			TA = +25°C			TA = +85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
IEE	Power Supply Current													
		10EL	22	30		22	30		22	30		22	30	mA
		100EL	27	34		27	34		27	34		31	38	mA
V <sub>CC</sub> - V <sub>EE</sub>	Power Supply Current	3.0		5.5	3.0		5.5	3.0		5.5	3.0		5.5	V
I <sub>IH</sub>	Input HIGH Current			150			150			150			150	μA

**AC Characteristics**
**SK10/100EL31W AC Characteristics (Notes 1, 2)**
 $(V_{CC} - V_{EE} = 3.0V \text{ to } 5.5V; V_{OUT} \text{ Loaded } 50\Omega \text{ to } V_{CC} - 2.0V)$ 

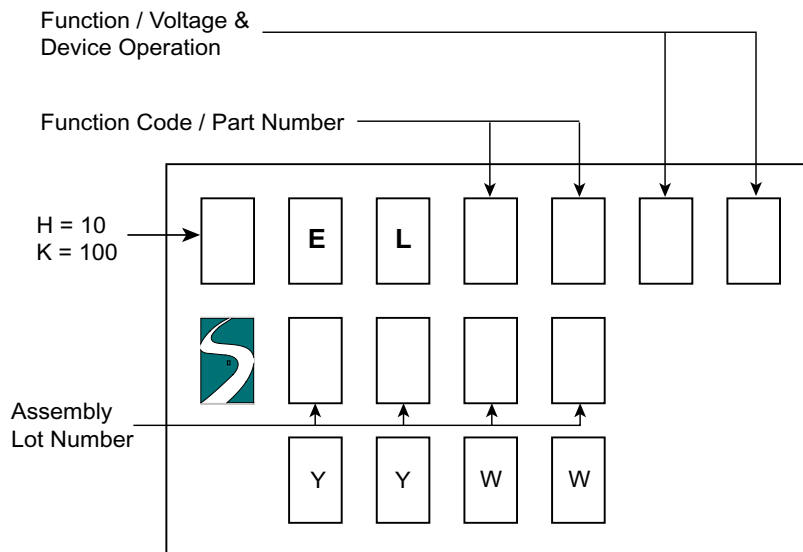
Symbol	Characteristic	TA = -40°C			TA = 0°C			TA = +25°C			TA = +85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
f <sub>max</sub>	Maximum Toggle Frequency	2.6	2.9		2.6	2.9		2.6	2.9		2.6	2.9		GHz
t <sub>PLH</sub> t <sub>PHL</sub>	Prop Delay to Output CLK S, R	430 420	465 500	580 620	440 420	475 500	560 600	440 420	475 490	550 590	440 420	475 500	550 580	ps ps
t <sub>S</sub> t <sub>H</sub>	Setup Time Hold Time	150 250			150 250			150 250			150 250			ps
t <sub>RR</sub>	Set/Reset Recovery	400			400			400			400			ps
t <sub>PW</sub>	Minimum Pulse Width CLK, Set, Reset	400			400			400			400			ps
t <sub>r</sub> t <sub>f</sub>	Output Rise/Fall Times Q (20% - 80%)	130	175	215	135	180	225	140	190	230	145	200	240	ps

**Notes:**

- 10EL circuits are designed to meet the DC specifications shown in the table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse airflow greater than 500 lfpm is maintained. Outputs are terminated through a 50Ω resistor to V<sub>CC</sub> - 2.0V except where otherwise specified on the individual data sheets.
- 100K circuits are designed to meet the DC specifications shown in the table where transverse airflow greater than 500 lfpm is maintained.
- For standard ECL DC specifications, refer to the ECL Logic Family Standard DC Specifications Data Sheet.
- For part ordering description, see HPP part ordering information Data sheet.

**HIGH-PERFORMANCE PRODUCTS**
**Ordering Information**

Ordering Code	Package ID	Temperature Range
SK10EL31WD	8-SOIC	Industrial
SK10EL31WDT	8-SOIC	Industrial
SK100EL31WD	8-SOIC	Industrial
SK100EL31WDT	8-SOIC	Industrial
SK10EL31WU	Die	
SK100EL31WU	Die	

**Marking Information**
**8 PIN SOIC PACKAGE**


YY: Last two digits of the Year  
 WW: Working Week

**Contact Information**

Division Headquarters  
 10021 Willow Creek Road  
 San Diego, CA 92131  
 Phone: (858) 695-1808  
 FAX: (858) 695-2633

**Semtech Corporation**  
**High-Performance Products Division**

Marketing Group  
 1111 Comstock Street  
 Santa Clara, CA 95054  
 Phone: (408) 566-8776  
 FAX: (408) 727-8994