

HIGH-PERFORMANCE PRODUCTS

Description

The SK10/100EL16W is a differential receiver with higher performance capabilities. The device is functionally equivalent to MC10/100EL16 and MC100LVEL16. With output transition times significantly faster than the E116, the SK10/100EL16W is ideally suited for interfacing with high frequency sources (>2.5 GHz).

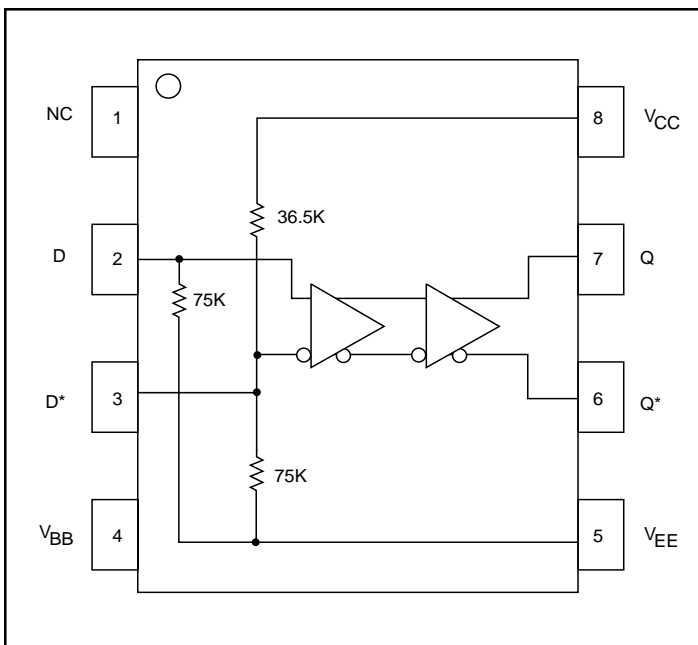
The SK10/100EL16W provides a VBB output for either single-ended use or as a DC bias for AC coupling to the device. The VBB pin should be used only as a bias for the EL16W as its current sink/source capability is limited. Whenever used, the VBB pin should be bypassed to VCC via a 0.01 μ F capacitor.

Under open input conditions, the pulldown resistor on D, pulldown and pullup resistors on D* will force the Q output LOW and Q* output HIGH.

Features

- Extended Supply Voltage Range: (VEE = -5.5V to -3.0V, VCC = 0V) or (VCC = +3.0V to +5.5V, VEE = 0V)
- High Bandwidth Output Transitions
- 300 ps Propagation Delay
- VBB Output
- Internal Input Resistors: Pulldown on D, Pulldown and Pullup on D*
- Q Output will Default Low with Inputs Open or at VEE
- New Differential Input Common Mode Range
- Functionally equivalent to MC10/100EL16 and MC100LVEL16
- ESD Protection of >4000V
- Specified Over Industrial Temperature Range: -40°C to 85°C
- Available in Both 8 Pin SOIC (150 mil) and MSOP (3mm x 3mm) Packages
- Flammability Rate: UL-94 code V-0.
- Moisture Sensitivity: Level 1.

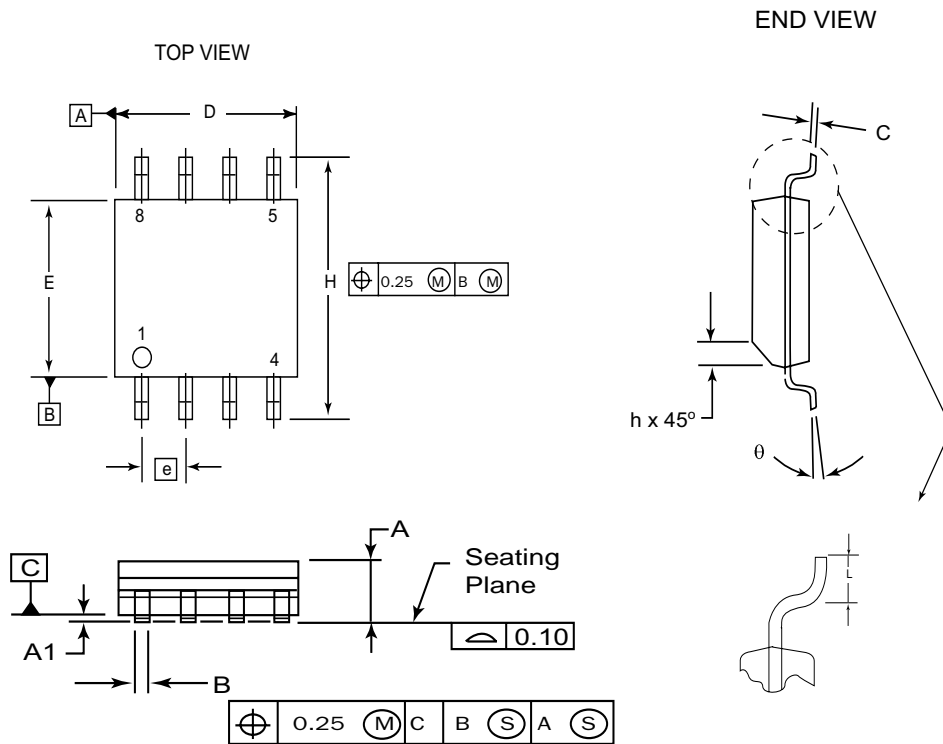
Functional Block Diagram



PIN Description

Pin	Function
D, D*	Differential Data Inputs
Q, Q*	Differential Data Outputs
VBB	Reference Output Voltage

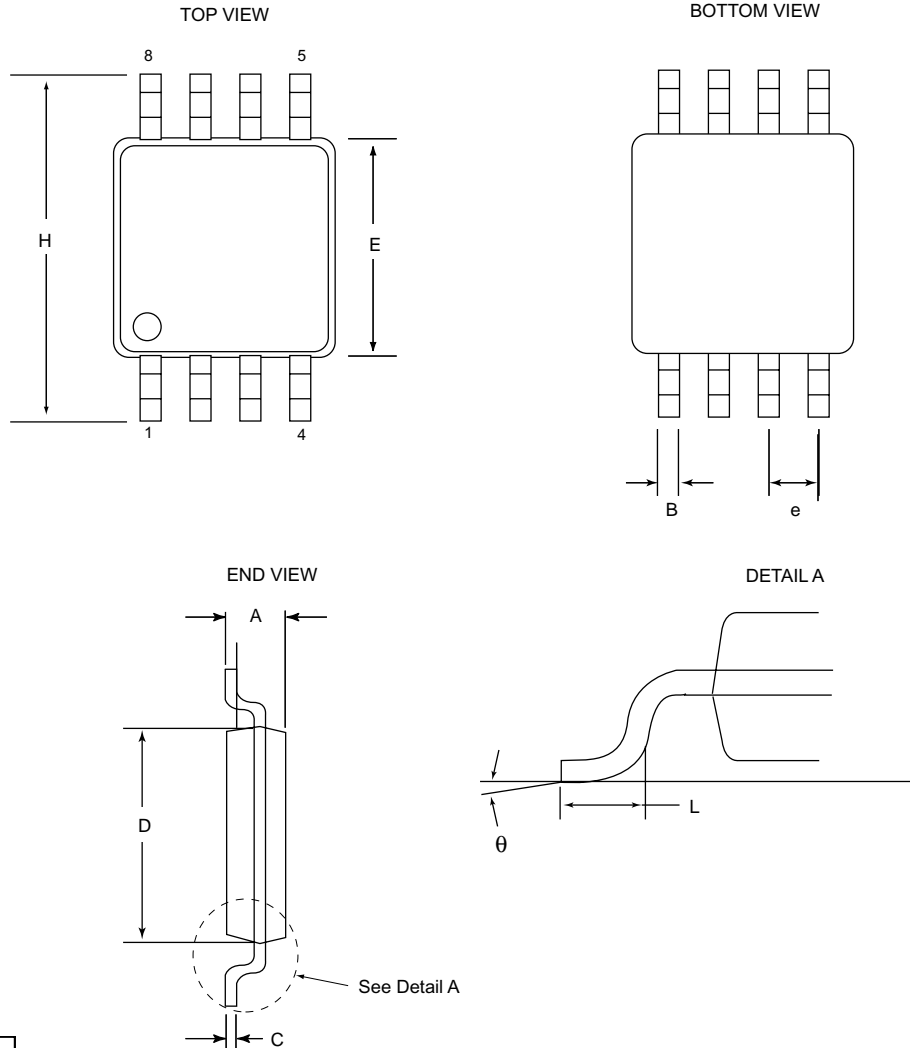
8 Pin SOIC Package



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.

8 Pin MSOP Package


DIM	Millimeters	
	MIN	MAX
A	0.94	1.1
B	0.21	0.45
C	0.13	0.22
D	2.90	3.10
E	2.90	3.10
e	0.65 BSC	
H	4.7	5.1
L	0.4	0.7
θ	0°	6°

NOTES:

1. Dimensions are in mm.
2. Controlling dimension: mm
3. Dimension does not include mold flash or protrusions, either of which shall not exceed 0.20.

HIGH-PERFORMANCE
DC Characteristics
SK10EL16W DC Electrical Characteristics (Note 1)
 $(V_{CC} - V_{EE} = 3.0V \text{ to } 5.5V; V_{OUT} \text{ loaded } 50\Omega \text{ to } V_{CC} - 2.0V)$

Symbol	Characteristic	TA = - 40°C		TA= 0°C		TA = + 25°C		TA= + 85°C		Unit
		Min	Max	Min	Max	Min	Max	Min	Max	
V _{OH}	Output HIGH Voltage	- 1080	- 890	- 1020	- 840	-980	- 810	- 910	- 720	mV
V _{OL}	Output LOW Voltage	- 1950	- 1650	- 1950	- 1630	- 1950	- 1630	- 1950	- 1595	mV
V _{IH}	Input HIGH Voltage	- 1230	- 890	- 1170	- 840	- 1130	- 810	- 1060	- 720	mV
V _{IL}	Input LOW Voltage	- 1950	- 1500	- 1950	- 1480	- 1950	- 1480	- 1950	- 1445	mV
V _{BB}	Reference Output Voltage	-1430	-1300	-1380	-1270	-1350	-1250	-1310	-1190	mV

SK100EL16W DC Electrical Characteristics (Note 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 to +85°C		Unit	Condition
		Min	Max	Min	Max		
V _{OH} V _{OL}	Output HIGH Voltage Output LOW Voltage	- 1085 - 1950	- 880 - 1555	- 1035 - 1950	- 880 - 1620	mV mV	V _{IN} = V _{IHmax} or V _{ILmin}
V _{IH}	Input HIGH Voltage	- 1165	- 880	- 1165	- 880	mV	Guaranteed HIGH signal for all inputs
V _{IL}	Input LOW Voltage	- 1810	- 1475	- 1810	- 1475	mV	Guaranteed LOW signal for all inputs
V _{BB}	Reference Output Voltage	-1430	-1260	-1430	-1260	mV	

HIGH-PERFORMANCE PRODUCTS
DC Characteristics (continued)
SK10/100EL16W DC Electrical Characteristics (Notes 1, 2)
 $(V_{CC} - V_{EE} = 3.0V \text{ to } 5.5V; V_{OUT} \text{ loaded } 50\Omega \text{ to } V_{CC} - 2.0V)$

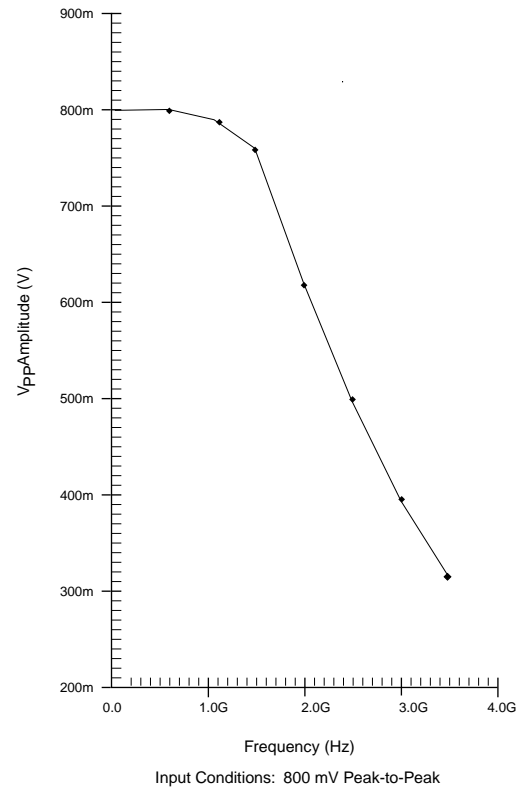
Symbol	Characteristic	TA = -40°C		TA = 0°C		TA = + 25°C		TA = +85°C		Unit
		Min	Max	Min	Max	Min	Max	Min	Max	
I _{EE}	Power Supply Current									
	10EL	14	27	14	27	14	27	14	27	mA
	100EL	16	32	16	32	16	32	16	32	mA
I _{IN}	Input Current: D, D*, (Diff)	-150	150	-150	150	-150	150	-150	150	μA

AC Characteristics
SK10/100EL16W AC Electrical Characteristics (Notes 1, 2)
 $(V_{CC} - V_{EE} = 3.0V \text{ to } 5.5V; V_{OUT} \text{ loaded } 50\Omega \text{ to } V_{CC} - 2.0V)$

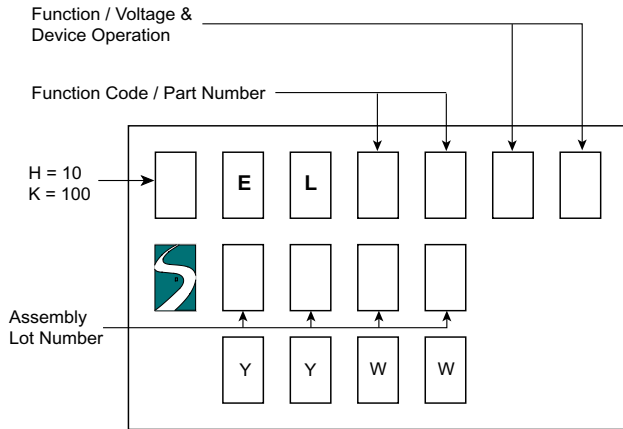
Symbol	Characteristic	TA = -40°C			TA = 0°C			TA = + 25°C			TA = +85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
f _{max}	Maximum Toggle Frequency ⁴	2.5			2.5			2.5			2.5			GHz
t _{PLH}	Propagation Delay to Output D(Diff)	190	230	270	190	230	270	200	240	280	210	255	300	ps
t _{PHL}	Propagation Delay to Output D (SE)	150	225	300	150	225	300	150	230	310	150	235	320	ps
t _{skew}	Duty Cycle Skew ³ (DIFF)			20			20			20			20	ps
t _r , t _f	Output Rise/Fall Times Q, Q* (20% to 80%)	110	140	175	125	155	185	125	160	200	130	180	230	ps
V _{CMR}	Common Mode Range ⁵	VEE + 1.7		VCC - 0.4	VEE + 1.7		VCC - 0.4	VEE + 1.7		VCC - 0.4	VEE + 1.7		VCC - 0.4	V
V _{pp}	Differential Input Swing ⁷	150	1000		150		1000	150		1000	150		1000	mV

HIGH-PERFORMANCE
AC Characteristics (continued)
Notes:

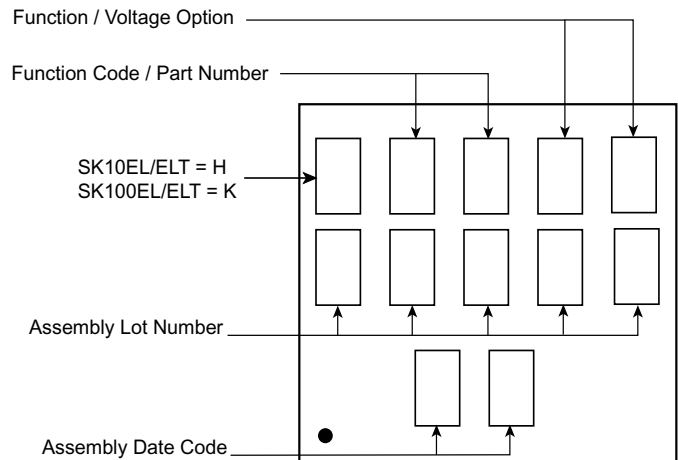
1. 10EL circuits are designed to meet the DC specification shown in the table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board, and transverse airflow greater than 500 lfpm is maintained.
2. 100K circuits are designed to meet the DC specification shown in the table where transverse airflow greater than 500 lfpm is maintained.
3. Duty cycle skew is the difference between T_{PLH} and T_{PHL} propagation delay through a device.
4. F_{MAX} guaranteed for functionality only. See Figure 1 for typical output swing. V_{OL} and V_{OH} are guaranteed at DC only.
5. 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} and is equal to $V_{EE} + 1.7V$.
6. Input swing for which AC parameters are guaranteed. This device has a DC gain of ≈ 40 .
7. Voltages referenced to $V_{CC} = 0V$
8. For part ordering descriptions, see HPP Part Ordering Information Data Sheet.


Figure 1. Typical Output V_{PP} vs. Frequency
Ordering Information

Ordering Code	Package ID	Temperature Range
SK10EL16WD	8-SOIC	Industrial
SK10EL16WDT	8-SOIC	Industrial
SK100EL16WD	8-SOIC	Industrial
SK100EL16WDT	8-SOIC	Industrial
SK10EL16WMS	8-MSOP	Industrial
SK10EL16WMST	8-MSOP	Industrial
SK100EL16WMS	8-MSOP	Industrial
SK100EL16WMST	8-MSOP	Industrial
SK10EL16WU	Die	
SK100EL16WU	Die	

HIGH-PERFORMANCE PRODUCTS
Marking Information
8 PIN SOIC PACKAGE


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

8/10 PIN MSOP PACKAGES

Application Notes

- AN1002** - Interfacing Between ECL / LVECL / PECL / LVPECL - to - TTL / LVTTTL / CMOS / LVCMOS
- AN1003** - Termination Techniques for ECL / LVECL / PECL / LVPECL Devices
- AN1004** - Interfacing Between LVDS and ECL / LVECL / PECL / LVPECL
- AN1005** - Using ECL / LVECL Devices as PECL / LVPECL
- AN1006** - Designing with 10K and 100K ECL / PECL Devices

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