SK10/100EL16B
Differential Receiver with Monitoring Output

Description

The SK10/100EL16B is a differential receiver with higher performance capabilities. This device is similar to SK10/100EL16W except for an added single-ended Monitoring Output, Q_m*, feature. Furthermore, it is fully compatible with MC10/100EL16 and MC10/100LVE16. With output transition time much faster than E116, SK10/100EL16B is ideally suited for interfacing with high frequency sources (minimum 1.25 GHz). These outputs are ideal for applications such as the design of crystal oscillators.

The SK10/100EL16B provides a V_{BB} output for either single-ended use or DC bias for AC coupling to the device. V_{BB} is an output pin and should be used as a bias for the EL16B as its current sink/source capability is limited. Whenever used, the V_{BB} output pin should be bypassed to V_{CC} via a 0.01 µF capacitor.

Under open input conditions, the Pulldown resistors on D, Pulldown and Pullup on D* will force the output Q to a LOW state and output Q*and Q_m* to a HIGH state.

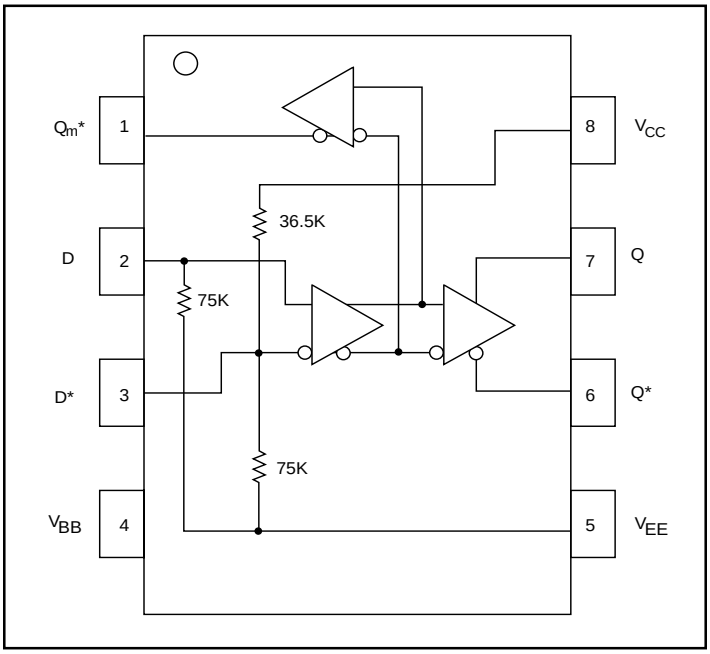
Features

- Extended Supply Voltage Range: (VEE = –5.5V to –3.0V, VCC = 0V) or (VCC = +3.0V to +5.5V, VEE = 0V)
- Single-Ended Monitoring Output
- High Bandwidth Output Transition
- 300 ps Propagation Delay
- V_{BB} Output
- Internal Input Resistors: Pulldown on D, Pulldown and Pullup on D*
- Q Output will Default Low with Inputs Open or at V_{EE}
- New Differential Input Common Mode Range
- Functionally Equivalent to MC10/100EL16 and MC10/100LVEL16
- ESD Protection of >4000V
- Industrial Temperature Range: –40°C to +85°C
- Available in both 8 Lead SOIC (150 mils) and MSOP (3mm x 3mm) Packages
- Flammability Rate: UL-94 code V-0.
- Moisture Sensitivity: Level 1.

Applications

- Signal Monitoring Applications
- LOS Detect Signals
- Fundamental and Overtone Crystal Oscillators

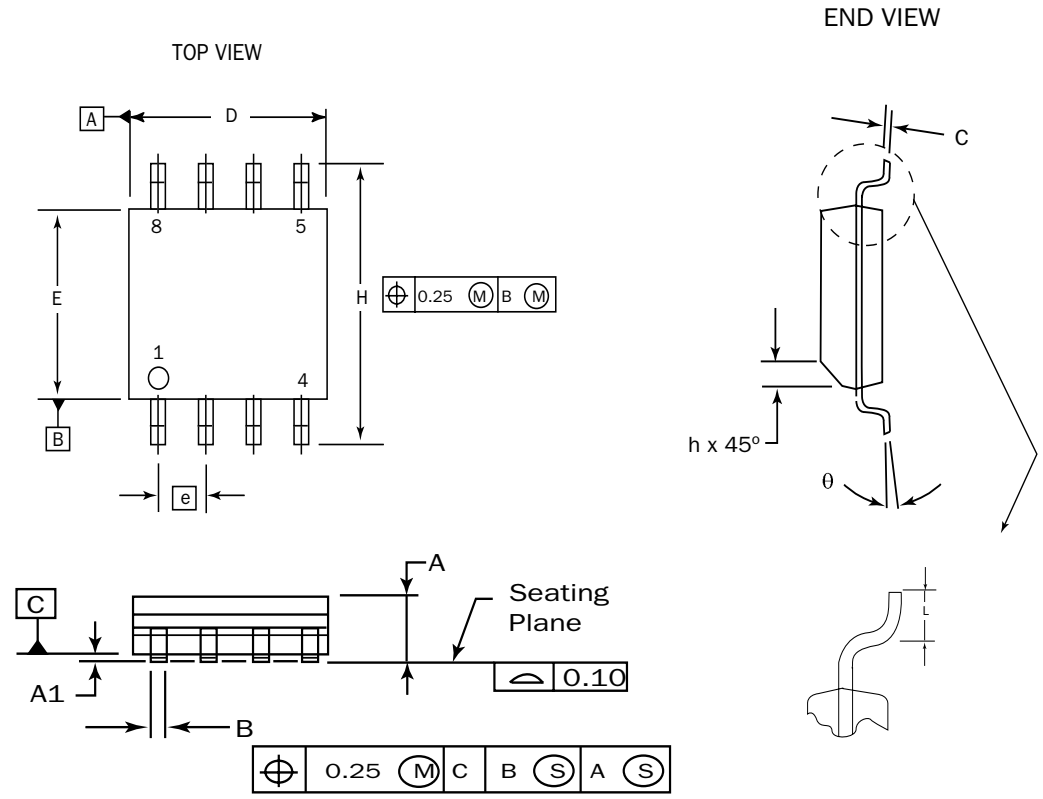
Functional Block Diagram



PIN Description

Pin	Function
D, D*	Differential Data Inputs
Q, Q*	Differential High Gain Data Outputs
Q_m*	Single-ended Data Output
V_{BB}	Reference Output Voltage

8 Pin SOIC Package

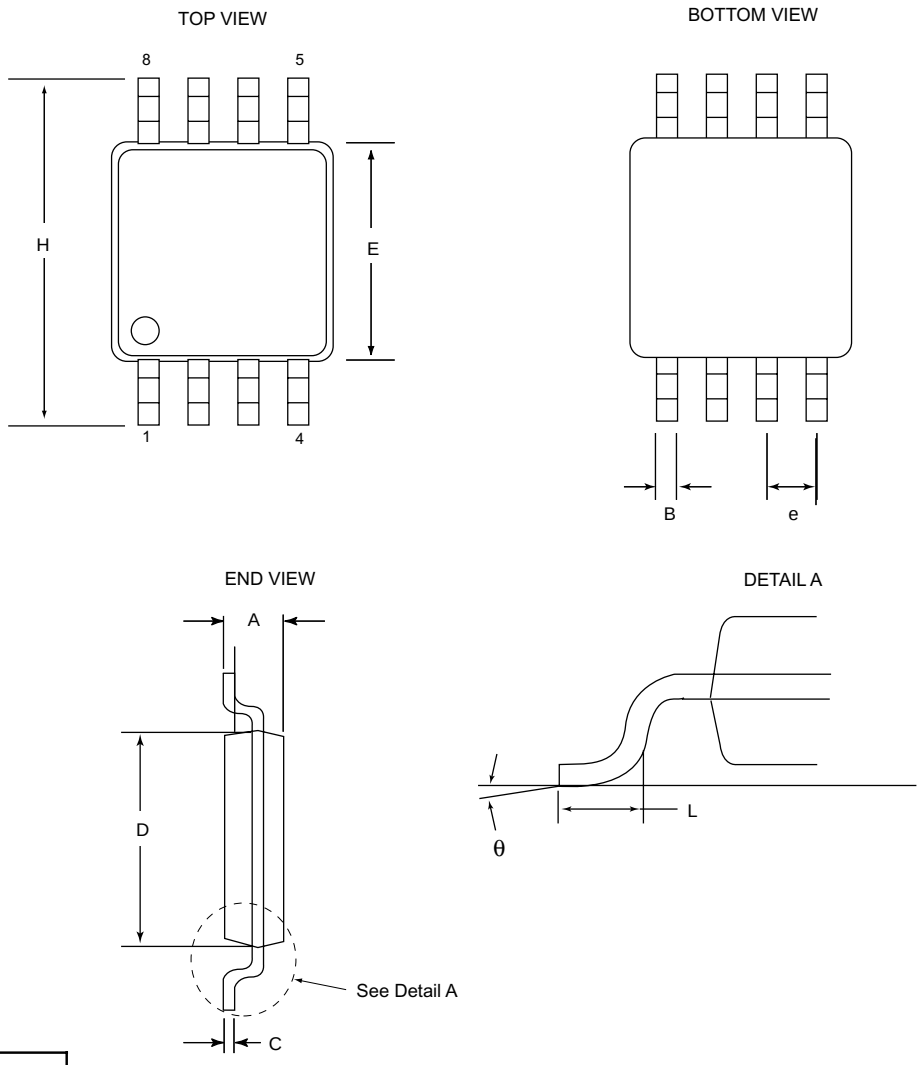


DIM	MILLIMETERS	
	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.33	0.51
C	0.19	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.27
θ	0°	8°

NOTES:
1. Dimensions are in millimeters.
2. Dimensions D and E do no 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.

Package Information *(continued)*

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.

DC Characteristics

SK10/100EL16B DC Electrical Characteristics *(Notes 1, 2, 7)*

(V_{CC} – V_{EE} = 3.0V to 5.5V; V_{OUT} loaded 50Ω to V_{CC}– 2.0V)

		TA = -40°C			TA = 0°C			TA = +25°C			TA = +85°C			
Symbol	**Characteristic**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Unit**
I_{IN}	Input Current D, D*	- 150		150	- 150		150	- 150		150	- 150		150	µA
I_{EE}	Power Supply Current 10EL 100EL	17 19	24 29	33 39	17 19	24 29	33 39	17 19	24 29	33 39	17 19	24 29	33 39	mA mA
V_{BB}	Output Reference Voltage[5] 10EL 100EL	-1.43 -1.43		-1.30 -1.26	-1.38 -1.43		-1.27 -1.26	-1.35 -1.43		-1.25 -1.26	-1.31 -1.43		-1.19 -1.26	V V
V_{CC} – V_{EE}	Supply Voltage Range	3.0		5.5	3.0		5.5	3.0		5.5	3.0		5.5	V

AC Characteristics

SK10/100EL16B AC Electrical Characteristics *(Notes 1, 2)*

(V_{CC} – V_{EE} = 3.0V to 5.5V; V_{OUT} loaded 50Ω to V_{CC}– 2.0V)

		TA = -40°C			TA = 0°C			TA = + 25°C			TA = +85°C			
Symbol	**Characteristic**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Unit**
t_{PLH} t_{PHL}	Input to Output Delay Q, Q* (DIFF)	200	250	320	210	260	330	220	280	340	230	290	350	ps
t_{PLH} t_{PHL}	Input to Output Delay Q_m* (DIFF)	290	350	400	300	350	400	300	350	400	300	355	410	ps
t_{skew}	Duty Cycle Skew[3](DIFF)		5	20		5	20		5	20		5	20	ps
V_{PP}	Diff. Input Swing[6]	150		1000	150		1000	150		1000	150		1000	mV
V_{CMR}	Common Mode Range[4]	V_{EE} + 1.7		V_{CC} - 0.4	V_{EE} + 1.7		V_{CC} - 0.4	V_{EE} + 1.7		V_{CC} - 0.4	V_{EE} + 1.7		V_{CC} - 0.4	V
t_r , t_f	Output Rise/Fall Times (20% to 80%) Q, Q*	100	125	150	100	125	150	100	130	160	100	150	200	ps
t_r , t_f	Output Rise/Fall Times (20% to 80%) Q_m*	280	415	550	300	365	465	305	375	475	310	390	495	ps

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. 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 $VPP_{(min)}$ and 1V. The lower end of the CMR range varies 1:1 with VEE and is equal to VEE + 1.7V.
5. Voltages are referenced to VCC = 0V. (ECL Mode)
6. Input swing for which AC parameters are guaranteed. This device has a DC gain of ≅40.
7. For standard ECL DC specifications, refer to the ECL Logic Family Standard DC Specifications Data Sheet.
8. For part ordering description, see HPP Part ordering Information Data Sheet.

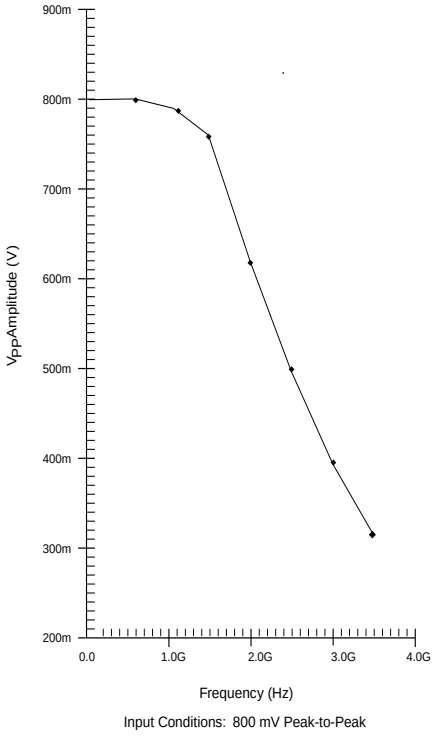


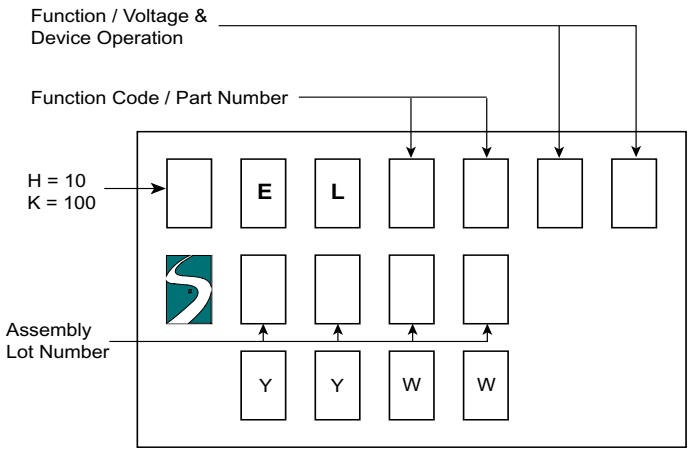
Figure 1. Typical Output V_{PP} vs. Frequency

Ordering Information

Ordering Code	Package ID	Temperature Range
SK10EL16BD	8-SOIC	Industrial
SK10EL16BDT	8-SOIC	Industrial
SK100EL16BD	8-SOIC	Industrial
SK100EL16BDT	8-SOIC	Industrial
SK10EL16BMS	8-MSOP	Industrial
SK10EL16BMST	8-MSOP	Industrial
SK100EL16BMS	8-MSOP	Industrial
SK100EL16BMST	8-MSOP	Industrial
SK10EL16BU	Die	
SK100EL16BU	Die	

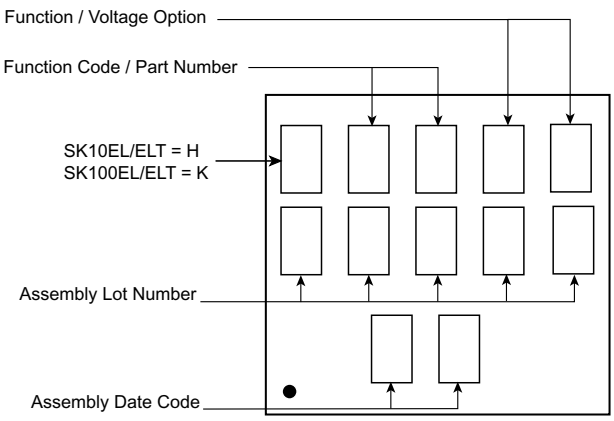
Marking Information

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 / LVTTL / 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
AN1007 - Crystal Oscillators

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