Low-Voltage Quad Differential Receiver

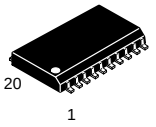
MC100LVEL17
MC100EL17

The MC100LVEL17 is a low-voltage, quad differential receiver. The device is functionally equivalent to the E116 device with the capability of operation from either a –3.3V or +3.3V supply voltage. The MC100EL17 is pin and functionally equivalent to the MC100LVEL17, but is specified for operation at the standard 100E ECL voltage supply.

The LVEL17 provides a V_{BB} output for either single-ended use or as a DC bias for AC coupling to the device. The V_{BB} pin should be used only as a bias for the LVEL17 as its current sink/source capability is limited. Whenever used, the V_{BB} pin should be bypassed to ground via a 0.01µf capacitor.

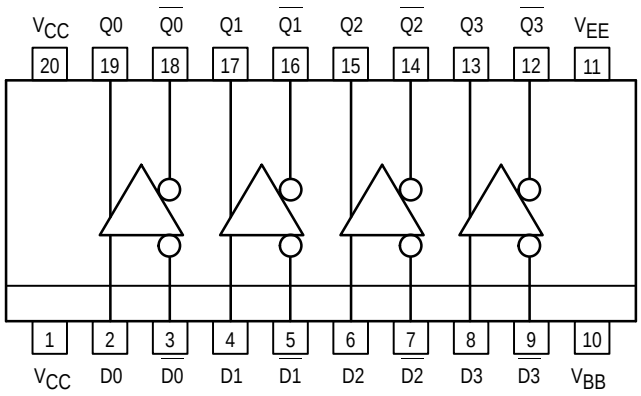
Under open input conditions, the $\overline{D}$ input will be biased at $V_{CC}/2$ and the D input will be pulled down to V_{EE}. This operation will force the Q output LOW and ensure stability.

- 325ps Propagation Delay
- High Bandwidth Output Transitions
- >2000V ESD Protection
- Operates from –3.3/–4.5V (or +3.3/+5.0V) Supply



DW SUFFIX
PLASTIC SOIC PACKAGE
CASE 751D-04

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



PIN NAMES

Pins	Function
Dn	Data Inputs
Qn	Data Outputs
V_{BB}	Reference Voltage Output

MC100LVEL17
DC CHARACTERISTICS (V_{EE} = –3.0V to –3.8V; V_{CC} = GND) Note 1

		–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		26	31		26	31		26	31		27	33	mA
V_{BB}	Output Reference Voltage	–1.38		–1.26	–1.38		–1.26	–1.38		–1.26	–1.38		–1.26	V
I_{IH}	Input HIGH Current			150			150			150			150	µA
I_{INL}	Input LOW Current $\underline{Dn}$ Dn	0.5 –300			0.5 –300			0.5 –300			0.5 –300			µA

1. All other DC characteristics are the same as Standard 100K ECL.

MC100LVEL17
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**
t_{PLH} t_{PHL}	Propagation Delay Diff D to Q S.E.	330 280		530 580	340 290		540 590	350 300		550 600	360 310		560 610	ps
t_{SKEW}	Skew Output–to–Output[1] Part–to–Part (Diff)[1] Duty Cycle (Diff)[2]			75 200 25			75 200 25			75 200 25			75 200 25	ps
V_{PP}	Minimum Input Swing[3]	150			150			150			150			mV
V_{CMR}	Common Mode Range[4] V_{PP} < 500mV V_{PP} ≥ 500mV	 –2.0 –1.8		 –0.4 –0.4	 –2.1 –1.9		 –0.4 –0.4	 –2.1 –1.9		 –0.4 –0.4	 –2.1 –1.9		 –0.4 –0.4	V
t_r t_f	Output Rise/Fall Times Q (20% – 80%)	280		550	280		550	280		550	280		550	ps

1. Skews are valid across specified voltage range, part–to–part skew is for a given temperature.
2. Duty cycle skew is the difference between a TPLH and TPHL propagation delay through a device.
3. Minimum input swing for which AC parameters guaranteed. The device has a DC gain of ≈40.
4. The 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}. The numbers in the spec table assume a nominal V_{EE} = –3.3V. Note for PECL operation, the V_{CMR}(min) will be fixed at 3.3V – |V_{CMR}(min)|.

MC100EL17
DC CHARACTERISTICS (V_{EE} = –4.2V to –5.5V; V_{CC} = GND) Note 1

		–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		26	31		26	31		26	31		27	33	mA
V_{BB}	Output Reference Voltage	–1.38		–1.26	–1.38		–1.26	–1.38		–1.26	–1.38		–1.26	V
I_{IH}	Input HIGH Current			150			150			150			150	µA
I_{INL}	Input LOW Current $\underline{Dn}$ Dn	0.5 –300			0.5 –300			0.5 –300			0.5 –300			µA

1. All other DC characteristics are the same as Standard 100K ECL.

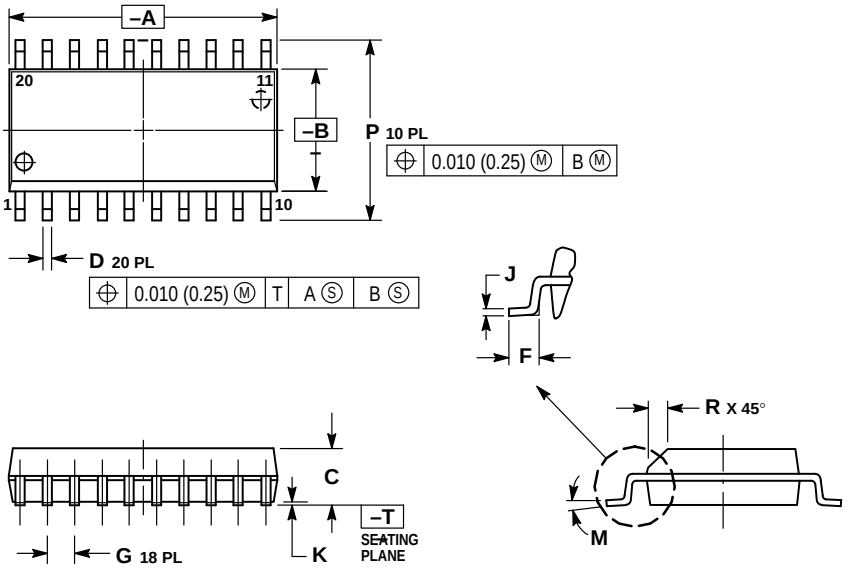
MC100EL17
AC CHARACTERISTICS (V_{EE} = –4.20V to –5.5V; V_{CC} = GND)

		–40°C			0°C			25°C			85°C			
Symbol	**Characteristic**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Min**	**Typ**	**Max**	**Unit**
t_{PLH} t_{PHL}	Propagation Delay Diff D to Q S.E.	330 280		530 580	340 290		540 590	350 300		550 600	360 310		560 610	ps
t_{SKEW}	Skew Output–to–Output[1] Part–to–Part (Diff)[1] Duty Cycle (Diff)[2]			75 200 25			75 200 25			75 200 25			75 200 25	ps
V_{PP}	Minimum Input Swing[3]	150			150			150			150			mV
V_{CMR}	Common Mode Range[4] V_{PP} < 500mV V_{PP} ≥ 500mV	 –3.2 –3.0		 –0.4 –0.4	 –3.3 –3.1		 –0.4 –0.4	 –3.3 –3.1		 –0.4 –0.4	 –3.3 –3.1		 –0.4 –0.4	V
t_r t_f	Output Rise/Fall Times Q (20% – 80%)	280		550	280		550	280		550	280		550	ps

1. Skews are valid across specified voltage range, part–to–part skew is for a given temperature.
2. Duty cycle skew is the difference between a TPLH and TPHL propagation delay through a device.
3. Minimum input swing for which AC parameters guaranteed. The device has a DC gain of ≈40.
4. The 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}. The numbers in the spec table assume a nominal V_{EE} = –4.5V. Note for PECL operation, the V_{CMR}(min) will be fixed at 5.0V – |V_{CMR}(min)|.

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

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