

Product Preview
Phase-Frequency Detector

The MC100LVEL40 is a phase/frequency detector intended for phase-locked loop applications which require a minimum amount of phase and frequency difference at lock. The device is a basic three state phase detector with differential inputs and outputs. The device is designed to work from either a 3.3V or 5.0V power supply.

When the reference (R) and the feedback (FB) inputs are unequal in frequency and/or phase the differential up (U) and down (D) outputs will provide pulse streams which when subtracted and integrated provide an error voltage for control of a VCO.

- 250MHz Typical Bandwidth
- Small Outline 20-Lead SOIC Packaging
- >2000V ESD Protection

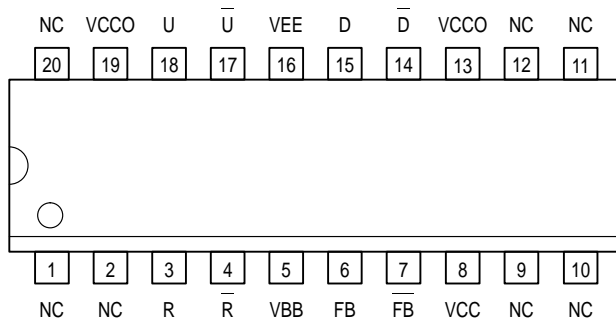
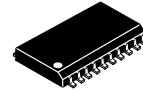


Figure 1. 20-Lead Pinout (Top View)

MC100LVEL40



DW SUFFIX
20-LEAD PLASTIC SOIC WIDE PACKAGE
CASE 751D-04

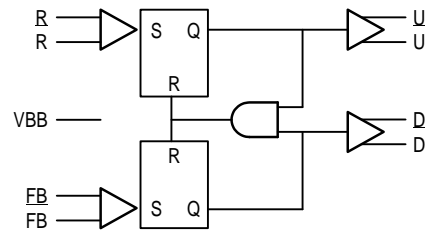


Figure 2. Logic Diagram

3.3V ECL DC CHARACTERISTICS ($T_A = -40^\circ\text{C}$ to 85°C ; $V_{EE} = -3.0\text{V}$ to -3.8V ; $V_{CC} = \text{GND}$)

Symbol	Parameter	-40°C			0°C to $+85^\circ\text{C}$			Unit
		Min	Typ	Max	Min	Typ	Max	
V_{OH}	Output HIGH Voltage	-1085	-1005	-880	-1025	-955	-880	V
V_{OL}	Output LOW Voltage	-1830	-1695	-1555	-1810	-1705	-1620	V
V_{IH}	Input HIGH Voltage	-1165		-880	-1165		-880	V
V_{IL}	Input LOW Voltage	-1810		-1475	-1810		-1475	V
I_{IL}	Input LOW Current	0.5			0.5			μA
I_{EE}	Power Supply Current		45			45		mA

This document contains information on a product under development. Motorola reserves the right to change or discontinue this product without notice.



MC100LVEL40

PECL DC CHARACTERISTICS ($T_A = -40^{\circ}\text{C}$ to 85°C ; $V_{CC} = V_{CC}(\text{min})$ to $V_{CC}(\text{max})$; $V_{EE} = \text{GND}$)

Symbol	Characteristic	-40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
V_{OH}	Output HIGH Voltage ¹	2.215	2.295	2.420	2.275	2.345	2.420	2.275	2.345	2.420	2.275	2.345	2.420	V
V_{OL}	Output LOW Voltage ¹	1.470	1.605	1.745	1.490	1.595	1.680	1.490	1.595	1.680	1.490	1.595	1.680	V
V_{IH}	Input HIGH Voltage ¹	2.135		2.420	2.135		2.420	2.135		2.420	2.135		2.420	V
V_{IL}	Input LOW Voltage ¹	1.490		1.825	1.490		1.825	1.490		1.825	1.490		1.825	V
V_{BB}	Output Reference Voltage ¹	1.92		2.04	1.92		2.04	1.92		2.04	1.92		2.04	V
V_{CC}	Power Supply Voltage	3.0		3.8	3.0		3.8	3.0		3.8	3.0		3.8	V
I_{IH}	Input HIGH Current			150			150			150			150	μA
I_{IL}	Input LOW Current	-300 0.5			-300 0.5			-300 0.5			-300 0.5			μA
I_{EE}	Power Supply Current		45			45			45			45		mA

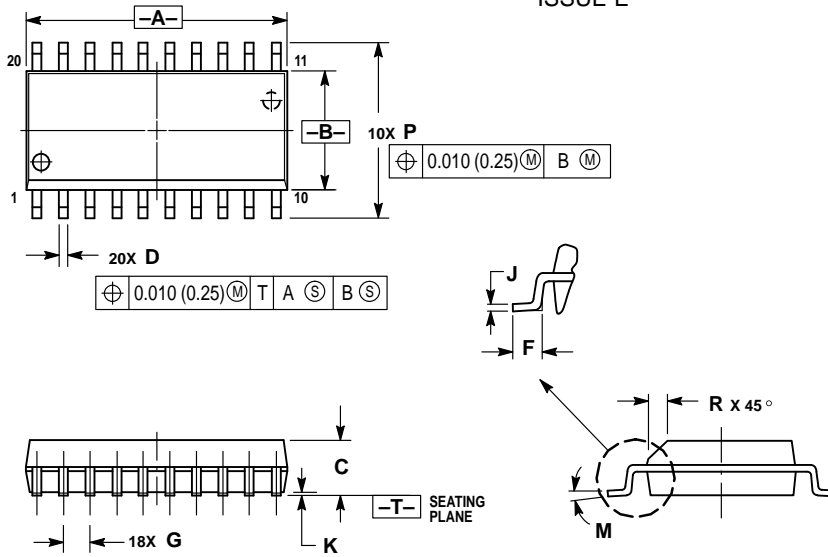
1. These values are for $V_{CC} = 3.3\text{V}$. Level Specifications will vary 1:1 with V_{CC} .

AC Characteristics ($T_A = -40^{\circ}\text{C}$ to 85°C)

Symbol	Parameter	Min	Typ	Max	Unit
f_{max}	Maximum Toggle Frequency		250		MHz
t_{PLH} , t_{PHL}	Propagation Delay		1100 450 450 1100		ps
t_r/t_f	Output Rise/Fall Time		350		ps

OUTLINE DIMENSIONS

DW SUFFIX
 PLASTIC SOIC WIDE 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.

DIM	MILLIMETERS		INCHES	
	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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How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution; P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

JAPAN: Nippon Motorola Ltd.: SPD, Strategic Planning Office, 4-32-1, Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan. 81-3-5487-8488

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609
 – US & Canada ONLY 1-800-774-1848

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park, 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

INTERNET: <http://motorola.com/sps>

