

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

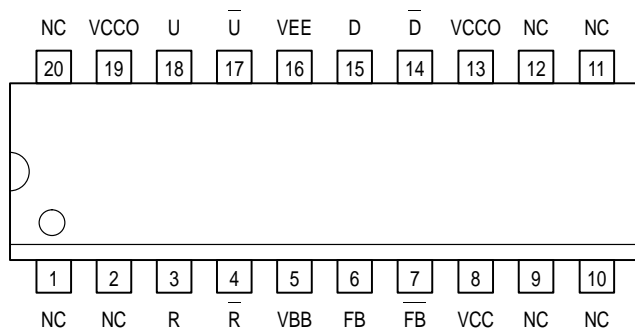
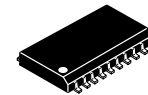


Figure 1. 20-Lead Pinout (Top View)

MC100LVEL40



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

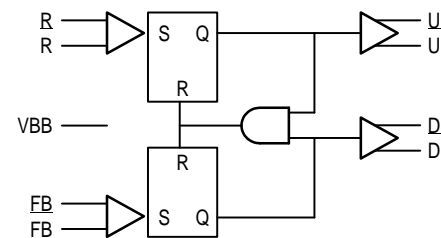


Figure 2. Logic Diagram

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

Symbol	Parameter	-40°C			0°C to +85°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°C to 85°C; V_{CC} = V_{CC}(min) to V_{CC}(max); V_{EE} = 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													μA
I _{EE}	Power Supply Current		45			45			45			45		mA

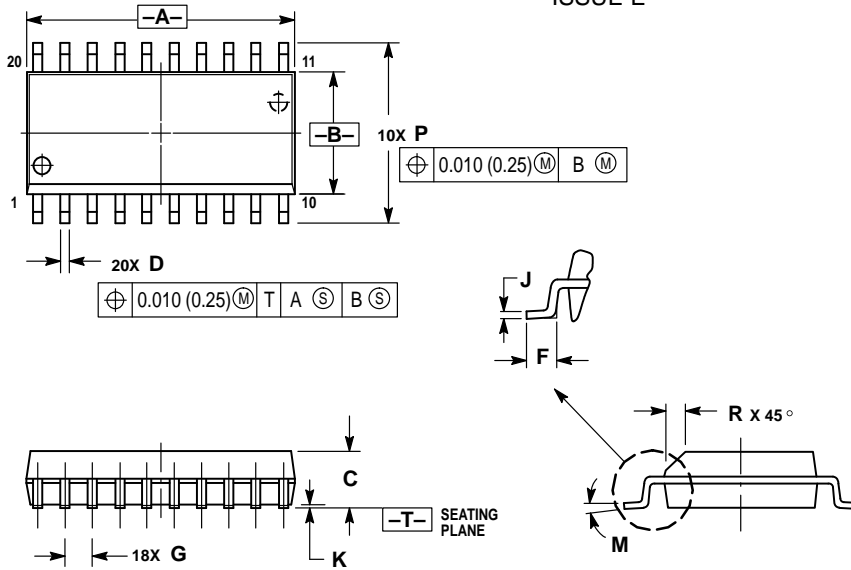
1. These values are for V_{CC} = 3.3V. Level Specifications will vary 1:1 with V_{CC}.

AC Characteristics (T_A = -40°C to 85°C)

Symbol	Parameter	Min	Typ	Max	Unit
f _{max}	Maximum Toggle Frequency		250		MHz
t _{PLH} , t _{PHL}	Propagation Delay R to D R to U FB to D FB to U		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

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Mfax is a trademark of Motorola, Inc.

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>

