Rochester Electronics

Datasheet

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

    - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

SN74LS377

Octal D Flip-Flop with Enable

The SN74LS377 is an 8-bit register built using advanced Low Power Schottky technology. This register consists of eight D-type flip-flops with a buffered common clock and a buffered common clock enable.

- 8-Bit High Speed Parallel Registers
- Positive Edge-Triggered D-Type Flip Flops
- Fully Buffered Common Clock and Enable Inputs
- True and Complement Outputs
- Input Clamp Diodes Limit High Speed Termination Effects

GUARANTEED OPERATING RANGES

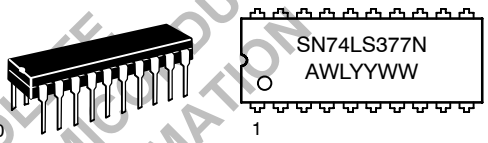
Symbol	Parameter	Min	Typ	Max	Unit
V_{CC}	Supply Voltage	4.75	5.0	5.25	V
T_A	Operating Ambient Temperature Range	0	25	70	°C
I_{OH}	Output Current – High			–0.4	mA
I_{OL}	Output Current – Low			8.0	mA

ON Semiconductor

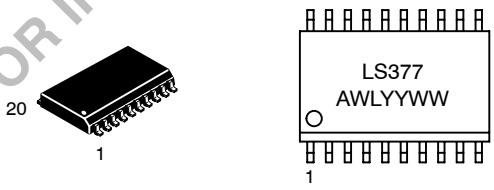
http://onsemi.com

LOW POWER SCHOTTKY

MARKING DIAGRAMS



PDIP–20
N SUFFIX
CASE 738



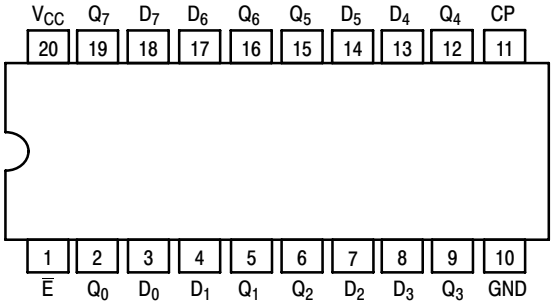
SOIC–20
DW SUFFIX
CASE 751D

A = Assembly Location
WL = Wafer Lot
YY = Year
WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping
SN74LS377N	PDIP–20	1440 Units/Box
SN74LS377DW	SOIC–WIDE	38 Units/Rail
SN74LS377DWR2	SOIC–WIDE	2500/Tape & Reel

CONNECTION DIAGRAM DIP (TOP VIEW)



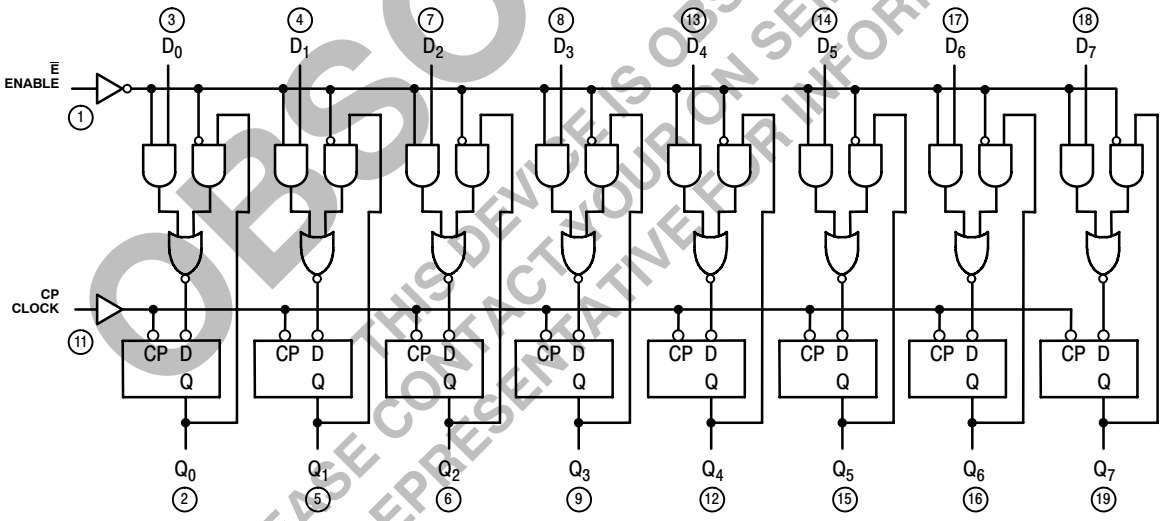
NOTE:
The Flatpak version has the same pinouts (Connection Diagram) as the Dual In-Line Package.

PIN NAMES

		LOADING (Note a) HIGH	LOW
$\overline{E}$	Enable (Active LOW) Input	0.5 U.L.	0.25 U.L.
$D_0 - D_3$	Data Inputs	0.5 U.L.	0.25 U.L.
CP	Clock (Active HIGH Going Edge) Input	0.5 U.L.	0.25 U.L.
$Q_0 - Q_3$	True Outputs	10 U.L.	5 U.L.
$\overline{Q}_0 - \overline{Q}_3$	Complemented Outputs	10 U.L.	5 U.L.

NOTES:
a) 1 TTL Unit Load (U.L.) = 40 μA HIGH/1.6 mA LOW.

LOGIC DIAGRAM



DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	Parameter	Limits			Unit	Test Conditions	
		Min	Typ	Max			
V_{IH}	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage for All Inputs	
V_{IL}	Input LOW Voltage			0.8	V	Guaranteed Input LOW Voltage for All Inputs	
V_{IK}	Input Clamp Diode Voltage		−0.65	−1.5	V	V_{CC} = MIN, I_{IN} = −18 mA	
V_{OH}	Output HIGH Voltage	2.7	3.5		V	V_{CC} = MIN, I_{OH} = MAX, V_{IN} = V_{IH} or V_{IL} per Truth Table	
V_{OL}	Output LOW Voltage		0.25	0.4	V	I_{OL} = 4.0 mA	V_{CC} = V_{CC} MIN, V_{IN} = V_{IL} or V_{IH} per Truth Table
			0.35	0.5	V	I_{OL} = 8.0 mA	
I_{IH}	Input HIGH Current			20	μA	V_{CC} = MAX, V_{IN} = 2.7 V	
				0.1	mA	V_{CC} = MAX, V_{IN} = 7.0 V	
I_{IL}	Input LOW Current			−0.4	mA	V_{CC} = MAX, V_{IN} = 0.4 V	
I_{OS}	Short Circuit Current (Note 1)	−20		−100	mA	V_{CC} = MAX	
I_{CC}	Power Supply Current			28	mA	V_{CC} = MAX, NOTE 1	

NOTE: With all inputs open and GND applied to all data and enable inputs, I_{CC} is measured after a momentary GND, then 4.5 V is applied to clock.
1. Not more than one output should be shorted at a time, nor for more than 1 second.

AC CHARACTERISTICS (T_A = 25°C, V_{CC} = 5.0 V)

Symbol	Parameter	Limits			Unit	Test Conditions
		Min	Typ	Max		
f_{MAX}	Maximum Clock Frequency	30	40		MHz	V_{CC} = 5.0 V C_L = 15 pF
t_{PLH} t_{PHL}	Propagation Delay, Clock to Output		17 18	27 27	ns	

AC SETUP REQUIREMENTS (T_A = 25°C, V_{CC} = 5.0 V)

Symbol	Parameter		Limits			Unit	Test Conditions
			Min	Typ	Max		
t_W	Any Pulse Width		20			ns	V_{CC} = 5.0 V
t_s	Data Setup Time		20			ns	
t_s	Enable Setup Time	Inactive — State	10			ns	
		Active — State	25			ns	
t_h	Any Hold Time		5.0			ns	

DEFINITION OF TERMS

SETUP TIME (ts) — is defined as the minimum time required for the correct logic level to be present at the logic input prior to the clock transition from LOW-to-HIGH in order to be recognized and transferred to the outputs.

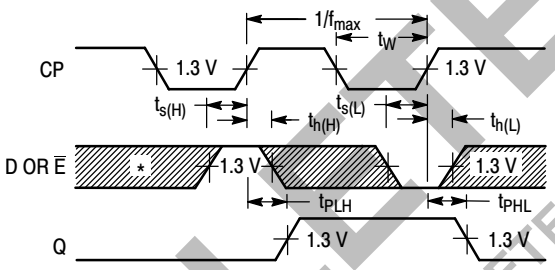
HOLD TIME (t_h) — is defined as the minimum time following the clock transition from LOW-to-HIGH that the logic level must be maintained at the input in order to ensure continued recognition. A negative HOLD TIME indicates that the correct logic level may be released prior to the clock transition from LOW-to-HIGH and still be recognized.

TRUTH TABLE

$\overline{E}$	CP	D_n	Q_n	$\overline{Q}_n$
H	⎍	X	No Change	No Change
L	⎍	H	H	L
L	⎍	L	L	H

L = LOW Voltage Level
H = HIGH Voltage Level
X = Immaterial

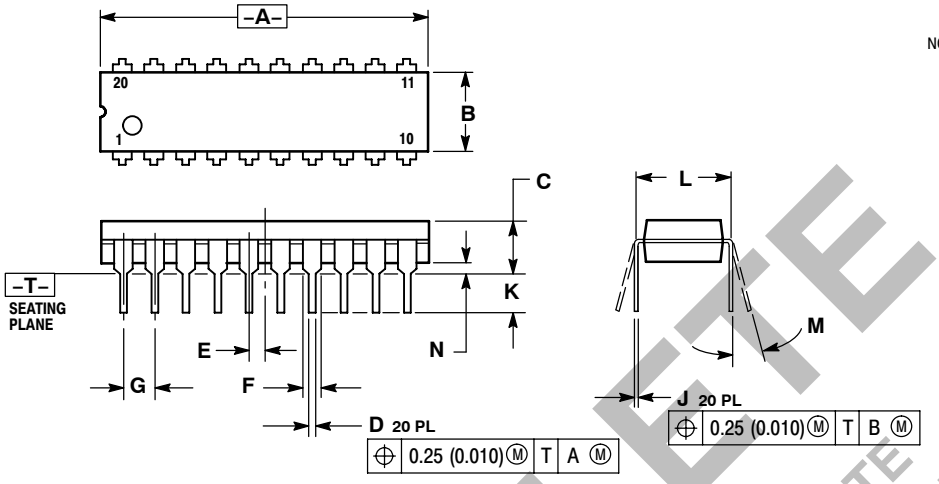
AC WAVEFORM



*The shaded areas indicate when the input is permitted to change for predictable output performance.

PACKAGE DIMENSIONS

N SUFFIX
PLASTIC PACKAGE
CASE 738−03
ISSUE E

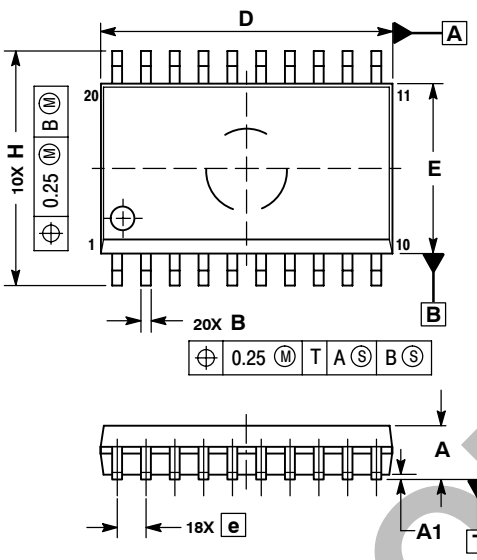


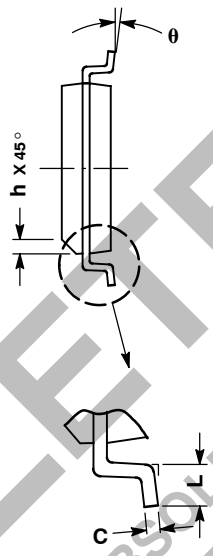
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	1.010	1.070	25.66	27.17
B	0.240	0.260	6.10	6.60
C	0.150	0.180	3.81	4.57
D	0.015	0.022	0.39	0.55
E	0.050 BSC		1.27 BSC	
F	0.050	0.070	1.27	1.77
G	0.100 BSC		2.54 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.140	2.80	3.55
L	0.300 BSC		7.62 BSC	
M	0°	15°	0°	15°
N	0.020	0.040	0.51	1.01

PACKAGE DIMENSIONS

DW SUFFIX
PLASTIC SOIC PACKAGE
CASE 751D–05
ISSUE F





NOTES:
1. DIMENSIONS ARE IN MILLIMETERS.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE PROTRUSION SHALL BE 0.13 TOTAL IN EXCESS OF B DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS	
DIM	MIN	MAX
A	2.35	2.65
A1	0.10	0.25
B	0.35	0.49
C	0.23	0.32
D	12.65	12.95
E	7.40	7.60
e	1.27 BSC	
H	10.05	10.55
h	0.25	0.75
L	0.50	0.90
θ	0°	7°

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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