DP802518

DP802518 TROPIC Tsunami(TM) TROPIC II(TM) Microcode ROM

Literature Number: SNOS698A

National Semiconductor

PRELIMINARY
October 1993

DP802518 TROPIC Tsunami™ TROPIC II™ Microcode ROM

General Description

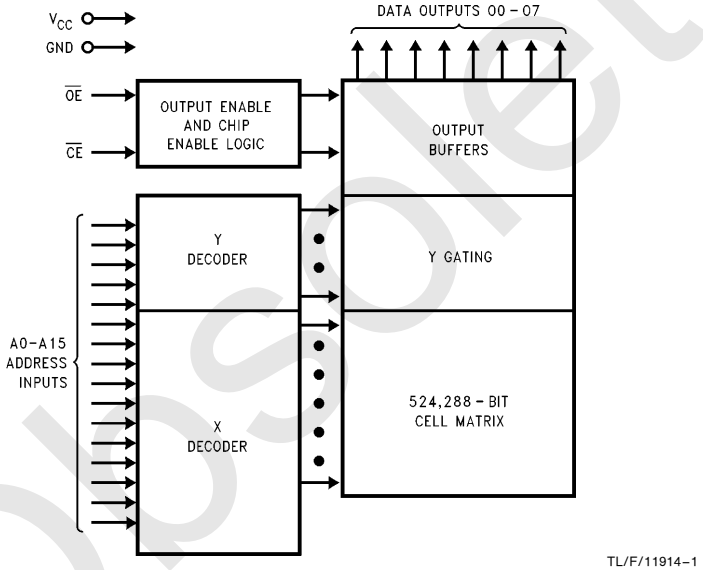
The DP802518 Tsunami is the microcode device for the high performance Token Ring Protocol Interface Controller—TROPIC II Token Ring chipset. this device features an interface compatible to the DP80253 controller, which allows direct connection without the use of glue logic.

The DP802518 Tsunami is implemented using National Semiconductor's Advanced CMOS process, and operates from a single 5V ± 10% power supply. The Tsunami is available in either a 28-pin DIP or 32-pin PLCC package.

Features

- TROPIC II compatible
  - Glueless interface
- High performance CMOS
- Surface Mount and DIP Packages
  - 28-pin molded plastic DIP
  - 32-pin PLCC

Block Diagram



TL/F/11914–1

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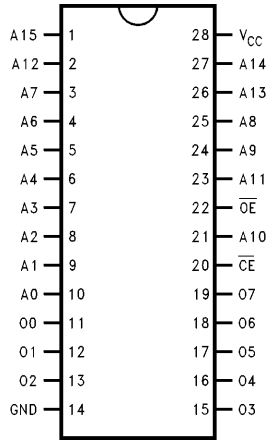
Connection Diagrams

DIP



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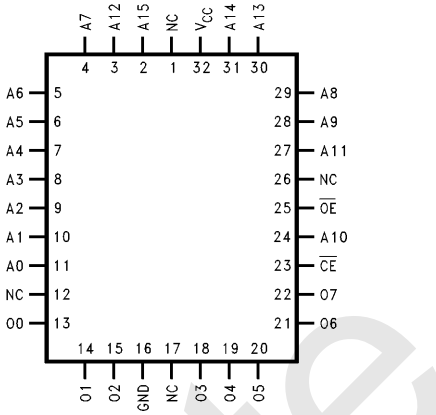
Order Number DP802518N
See NS Package Number N28B

PLCC



TL/F/11914–3

Order Number DP802518V
See NS Package Number VA32A

Commercial Temperature Range (0°C to +70°C)
V_{CC} = 5V ±10%

Parameter/Order Number	Check Sum
DP802518 N, V	xxxx

Pin Names

A0–A15	Addresses
$\overline{CE}$	Chip Enable
$\overline{OE}$	Output Enable
O0–O7	Outputs
NC	No Connect

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Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Storage Temperature	−65°C to +150°C
All Input Voltages with Respect to Ground	−0.6V to +7V
V_{CC} Supply Voltage with Respect to Ground	−0.6V to +7V
ESD Protection	>2000V
All Output Voltages with Respect to Ground	V_{CC} +1.0V to GND −0.6V

Operating Range

Range	Temperature	V_{CC}
Commercial	0°C to +70°C	5V ±10%

Read Operation

DC Electrical Characteristics Over operating range

Symbol	Parameter	Test Conditions	Min	Max	Units
V_{IL}	Input Low Level		−0.5	0.8	V
V_{IH}	Input High Level		2.0	V_{CC} + 1	V
V_{OL}	Output Low Voltage	I_{OL} = 2.1 mA		0.4	V
V_{OH}	Output High Voltage	I_{OH} = −400 μA	3.5		V
I_{SB1}	V_{CC} Standby Current (CMOS)	$\overline{CE}$ = V_{CC} ±0.3V		100	μA
I_{SB2}	V_{CC} Standby Current	$\overline{CE}$ = V_H		1	mA
I_{CC}	V_{CC} Active Current	$\overline{CE}$ = $\overline{OE}$ = V_{IL}, I/O = 0 mA		40	mA
I_{LI}	Input Load Current	V_{IN} = 5.5V or GND	−1	1	μA
I_{LO}	Output Leakage Current	V_{OUT} = 5.5V, OR GND	−10	10	μA

AC Electrical Characteristics Over operating range

Symbol	Parameter	Min	Max	Units
t_{ACC}	Address to Output Delay		120	ns
t_{CE}	$\overline{CE}$ to Output Delay		120	
t_{OE}	$\overline{OE}$ to Output Delay		50	
t_{DF} (Note 2)	Output Disable to Output Float		25	
t_{OH} (Note 2)	Output Hold From Addresses, $\overline{CE}$ or $\overline{OE}$, Whichever Occurred First	7		

Capacitance T_A = +25°C, f = 1 MHz (Note 2)

Symbol	Parameter	Conditions	Typ	Max	Units
C_{IN}	Input Capacitance	V_{IN} = 0V	13	20	pF
C_{OUT}	Output Capacitance	V_{OUT} = 0V	13	20	pF

AC Test Conditions

Output Load	1 TTL Gate and C_L = 100 pF (Note 8)
Input Rise and Fall Time	≤5 ns
Input Pulse Levels	0.45V to 2.4V
Timing Measurement Level (Note 8)	(Note 8)
Inputs	0.8V and 2V
Outputs	0.8V and 2V

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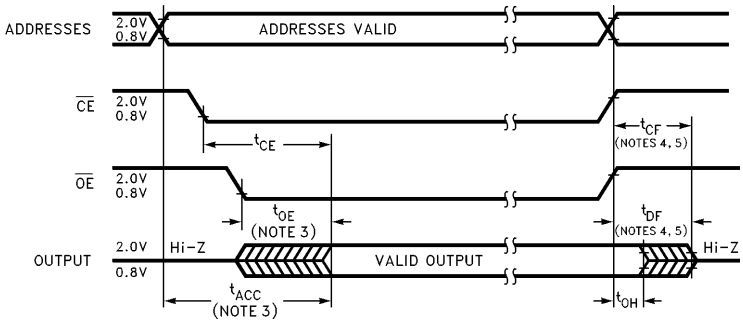
AC Waveforms (Notes 6, 7 and 9)



TL/F/11914–4

Note 1: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operations sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Note 2: This parameter is only sampled and is not 100% tested.

Note 3 $\overline{OE}$ may be delayed up to $t_{ACC} - t_{OE}$ after the falling edge of $\overline{CE}$ without impacting t_{ACC}.

Note 4: The t_{DF} and t_{CF} compare level is determined as follows:

High to TRI-STATE®, the measure V_{CH1} (DC) − 0.10V;

Low to TRI-STATE, the measured V_{OL1} (DC) + 0.10V.

Note 5: TRI-STATE may be attained using $\overline{OE}$ or $\overline{CE}$.

Note 6: The power switching characteristics of EPROMs require careful device decoupling. It is recommended that at least a 0.2 μF ceramic capacitor be used on every device between V_{CC} and GND.

Note 7: The outputs must be restricted to V_{CC} + 1.0V to avoid latch-up and device damage.

Note 8: 1 TTL Gate: $I_{OL} = 1.6$ mA, $I_{OH} = -400$ μA.

C_L: 100 pF includes fixture capacitance.

Note 9: Inputs and outputs can undershoot to −2.0V for 20 ns max.

Functional Description

DEVICE OPERATION

The three modes of operation of the Tsunami are listed in Table I. It should be noted that all inputs of the three modes are at TTL levels. The power supply required is supplied via the V_{CC} pin and the power supply tolerance should be 5V ±10%.

Read Mode

The Tsunami has two control functions, both of which must be logically active to obtain data at the outputs. Chip Enable ($\overline{CE}$) is the power control and should be used for device selection. Output Enable ($\overline{OE}$) is the output control and should be used to gate data to the output pins, independent of device selection. Assuming that addresses are stable, address access time (t_{ACC}) is equal to the delay from $\overline{CE}$ to output (t_{CE}). Data is available at the outputs t_{OE} after the falling edge of $\overline{OE}$, assuming that $\overline{CE}$ has been low and addresses have been stable for at least $t_{ACC} - t_{OE}$.

Standby Mode

The Tsunami has a standby mode which reduces the active power dissipation drastically, from 275 mW to 0.55 mW. The DP802518 is placed in the standby mode by applying a CMOS high signal to the $\overline{CE}$ input. When in standby mode, the outputs are in a high impedance state, independent of the $\overline{OE}$ input.

Output Disable

The DP802518 is placed in output disable by applying a TTL high signal to the $\overline{OE}$ input. When in output disable, all circuitry is enabled except the outputs are in a high impedance state (TRI-STATE).

APPLICATION

In application, the DP802518 is connected to the DP80253 TROPIC II high performance token ring controllers as shown in *Figure 1*. The DP802518 is connected to the TROPIC II with outputs O0 to O7 connected to L__D0–L__D7 respectively.

SYSTEM CONSIDERATION

The power switching characteristics of Tsunami require careful decoupling of the devices. The supply current I_{CC} has three segments that are of interest to the system designer: The standby current level, the active current level, and the transient current peaks that are produced by the voltage transition on the input pins. The magnitude of these transient current peaks is dependent on the output capacitance loading of the device. The associated V_{CC} transient voltage peaks can be suppressed by properly selecting decoupling capacitors. It is recommended that a 0.2 μF ceramic capacitor be used between V_{CC} and GND for each of the eight devices. The bulk capacitor should be located near the point where the power supply is connected to the subsystem. The bulk capacitor is used to overcome the voltage drop caused by the inductive effects of the PC board traces.

Obsolete

Mode Selection

The modes of operation for the Tsunami are listed in Table I. A single 5V power supply is required and all inputs are at TTL levels.

TABLE I. Mode Selection

Mode	$\overline{CE}$	$\overline{OE}$	V_{CC}	Outputs
Read	V_{IL}	V_{IL}	5.0V	D_{OUT}
Standby	V_{IH}	X	5.0V	High Z
Output Disable	X	V_{IH}	5.0V	High Z

Note 1: X can be V_{IL} or V_{IH}.

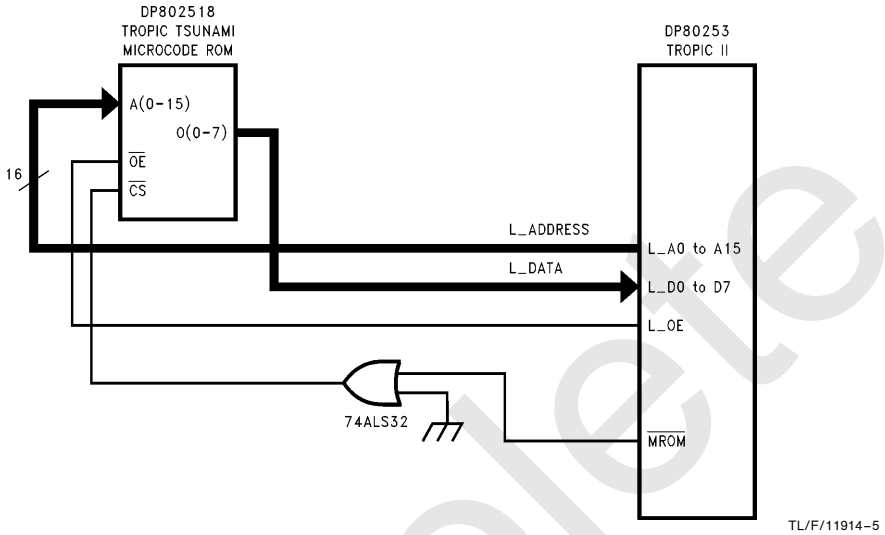
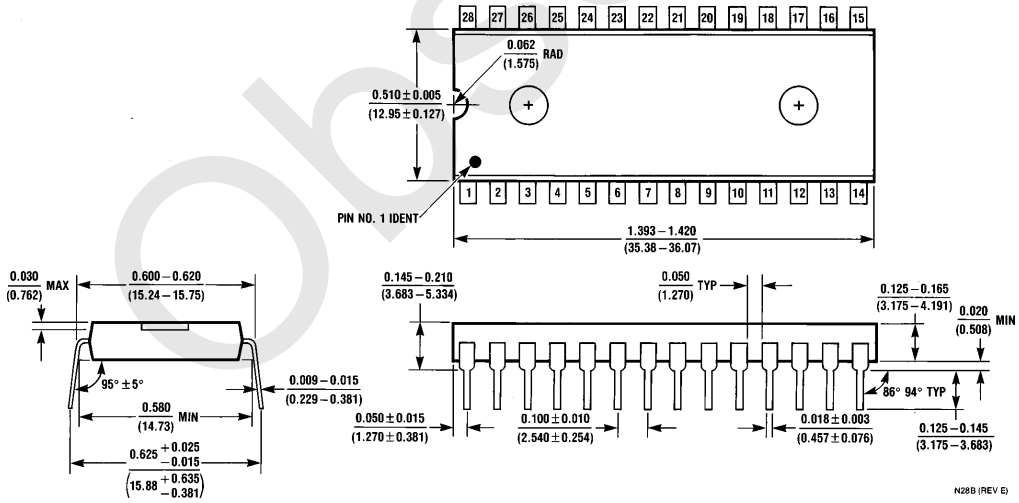


FIGURE 1. Typical Interfacing of the TROPIC Tsunami Microcode ROM

Physical Dimensions inches (millimeters)



28-Lead (0.600″ Wide) Molded Dual-In-Line Package
Order Number DP802518N
NS Package Number N28B

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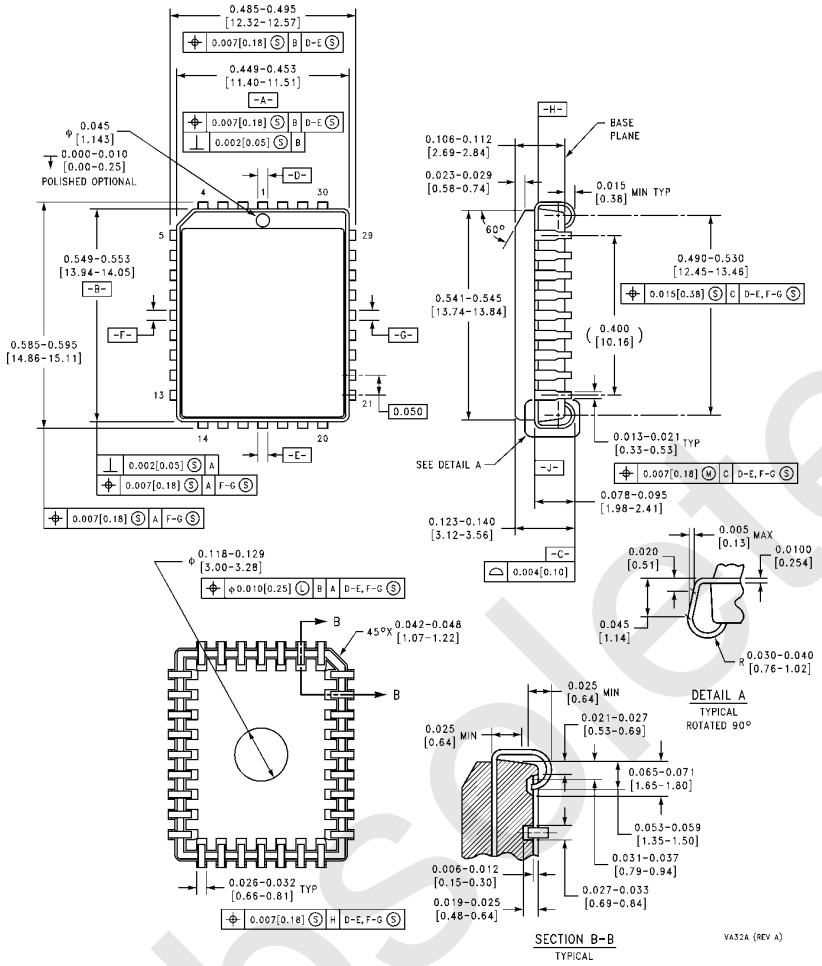
Physical Dimensions inches (millimeters) (Continued)



28-Lead Molded Dual-In-Line Package
Order Number DP802518V
NS Package Number VA32A

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