

DESCRIPTION

Series 82S Schottky TTL circuits are implemented with Schottky-barrier-diode clamping to achieve ultra-high speeds previously obtainable only with emitter-coupled logic, yet they retain the desirable features of, and are completely compatible with, most of the popular saturated logic circuits.

Schottky-barrier-diode clamping prevents transistors from achieving classic saturation and thereby effectively eliminates excess charge storage and subsequent recovery times. These recovery times contribute significantly to overall propagation delays experienced with saturated digital-logic circuits.

The Schottky-clamped transistors are formed by using Schottky-barrier-diodes in parallel with the base-collector junctions. This is realized physically by depositing metal over the base and N region of the collector forming a metal-silicon diode. The effect of this diode, which has a lower forward voltage than the collector-base junction is to hold the transistor out of saturation by diverting most of the excess base current. The reduction in stored-charge plus the use of smaller geometries results in a major improvement of switching characteristics.

By eliminating gold-doping normally employed in conventional TTL processing to reduce storage time, PNP transistors can be used to advantage by the circuit designers.

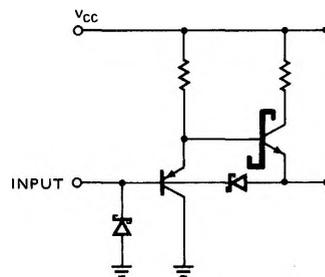
In 82S MSI, PNP transistors are used to reduce input loading as illustrated in Fig. 1. Maximum low level input current is specified at 400 μA which allows the systems designer to upgrade existing designs without encountering fanout limitations.

FEATURES

- 3ns TYPICAL GATE PROPAGATION DELAY
- 20mW PER-GATE TYPICAL POWER DISSIPATION
- LOW LEVEL INPUT CURRENT (PER UNIT LOAD = 0.4mA MAX.)

EASE OF SYSTEM DESIGN

- FULLY COMPATIBLE WITH SERIES 8000, 54/74 TTL, AND MOST DTL
- SCHOTTKY-DIODE-CLAMPED INPUTS SIMPLIFY SYSTEM DESIGN
- TERMINATED, CONTROLLED-IMPEDANCE LINES NOT NORMALLY REQUIRED
- LOW OUTPUT IMPEDANCE: PROVIDES LOW AC NOISE SUSCEPTABILITY AND DRIVES HIGHLY CAPACITIVE LOADS



LOW CURRENT PNP INPUT STRUCTURE

Figure 1

ABSOLUTE MAXIMUM RATINGS (Over operating free-air temperature range unless otherwise noted)

SUPPLY VOLTAGE V_{CC}	+7V
INPUT VOLTAGE	+6V
OUTPUT VOLTAGE	+7V
OPERATING FREE-AIR TEMPERATURE RANGE	0°C to 75°C