

MNDS0026-X REV 0A0

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5MHZ TWO PHASE MOS CLOCK DRIVER

General Description

DS00026 is a low cost monolithic high speed two phase MOS clock drivers and interface circuits. Unique circuit design provides both very high speed operation and the ability to drive large capacitive loads. The device accepts standard TTL outputs and converts them to MOS logic levels. They may be driven from standard 54/74 series and 54S/74S series gates and flip-flops or from drivers such as the DS8830 or MD7440. The DS0026 is intended for applications in which the output pulse width is logically controlled; i.e., the output pulse width is equal to the input pulse width.

The DS0026 is designed to fulfill a wide variety of MOS interface requirements. As a MOS clock driver for long silicon-gate shift registers, a single device can drive over 10k bits at 5 MHz. Six devices provide input address and precharge drive for a 8k by 16-bit 1103 RAM memory system. Information on the correct usage of the DS0026 in these as well as other systems is included in the application note AN-76.

Industry Part Number

DS0026

NS Part Numbers

DS0026G-MIL
DS0026H/883
DS0026J/883

Prime Die

DS0026

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

| Subgrp | Description | Temp (°C) |
|--------|---------------------|------------|
| 1 | Static tests at | +25 |
| 2 | Static tests at | +125 |
| 3 | Static tests at | -55 |
| 4 | Dynamic tests at | +25 |
| 5 | Dynamic tests at | +125 |
| 6 | Dynamic tests at | -55 |
| 7 | Functional tests at | +25 |
| 8A | Functional tests at | +125 |
| 8B | Functional tests at | -55 |
| 9 | Switching tests at | +25 |
| 10 | Switching tests at | +125 |
| 11 | Switching tests at | -55 |

Features

- Fast rise and fall times-20 ns 1000 pF load
- High output swing-20V
- High output current drive- ± 1.5 amps
- TTL compatible inputs
- High rep rate-5 to 10 MHz depending on power dissipation
- Low power consumption in MOS "0" state-2 mW
- Drives to 0.4V of GND for RAM address drive

(Absolute Maximum Ratings)

(Note 1)

| | |
|---|-----------------|
| V+ - V ⁻ Differential | 22V |
| Input Current | 100mA |
| Input Voltage (V _{in} - V ⁻) | 5.5V |
| Peak Output Current | 1.5A |
| Maximum Power Dissipation At 25 C (Note 2) | |
| Cavity Package (8-Pin) | 1150 mW |
| Cavity Package (14-Pin) | 1380 mW |
| Header Package (8-Pin) | TBD |
| Header Package (12-Pin) | TBD |
| Operating Temperature Range | -55 C to +125 C |
| Maximum Junction Temperature | 150 C |
| Storage Temperature Range | -65 C to +150 C |
| Lead Temperature (Soldering, 10 sec.) | 300 C |
| Thermal Resistance ThetaJA | |
| Cavity Package 8-Pin | 130 C/W |
| Cavity Package 14-Pin | 110 C/W |
| Header Package 8-Pin | 230 C/W |
| Header Package 12-Pin | TBD |

Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits. For guaranteed specification and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed. Some performance characteristics may degrade when the device is not operated under the listed test conditions.

Note 2: The maximum power dissipation must be derated at elevated temperatures and is dictated by T_{jmax} (maximum junction temperature), ThetaJA (package junction to ambient thermal resistance), and T_A (ambient temperature). The maximum allowable power dissipation at any temperature is P_{dmax} = (T_{jmax} - T_A)/ThetaJA or the number given in the Absolute Maximum Ratings, whichever is lower.

Electrical Characteristics

DC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: Power dissipation must be externally controlled at elevated temperatures.

| SYMBOL | PARAMETER | CONDITIONS | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|----------------------|----------------------------|--|-------|----------|-----|-----|------|------------|
| V _{o11} | Logical "0" Output Voltage | V _{in} = 2.4V, V ₊ - V ₋ = 20V, I _{o1} = 1mA | | | | 1 | V | 1, 2, 3 |
| V _{o12} | Logical "0" Output Voltage | V _{in} = 2.4V, V ₊ - V ₋ = 10V, I _{o1} = 1mA | | | | 1 | V | 1, 2, 3 |
| V _{o11} | Logical "1" Output Voltage | V _{in} - V ₋ = 0.4V, V ₊ - V ₋ = 20V, I _{oh} = -1mA | | | 19 | | V | 1, 2, 3 |
| V _{o12} | Logical "1" Output Voltage | V _{in} - V ₋ = 0.4V, V ₊ - V ₋ = 10V, I _{oh} = -1mA | | | 9 | | V | 1, 2, 3 |
| I _{i11} | Logical "0" Input Current | V _{in} = 0V, V ₊ = 20V, V ₋ = 0V | | | | -10 | uA | 1, 3 |
| | | | | | | -15 | uA | 2 |
| I _{i12} | Logical "0" Input Current | V _{in} = 0V, V ₊ = 10V, V ₋ = 0V | | | | -10 | uA | 1, 3 |
| | | | | | | -15 | uA | 2 |
| I _{i11} | Logical "1" Input Current | V _{in} = 2.4V, V ₊ = 20V, V ₋ = 0V | | | | 15 | mA | 1, 2, 3 |
| I _{i12} | Logical "1" Input Current | V _{in} = 2.4V, V ₊ = 10V, V ₋ = 0V | | | | 15 | mA | 1, 2, 3 |
| I _{cc(OFF)} | "OFF" Supply Current | V _{in} = 0V, V ₊ = 20V, V ₋ = 0V | | | | 500 | uA | 1, 2, 3 |
| I _{cc1(ON)} | "ON" Supply Current | V _{in} = 2.4V, V ₊ = 20V, V ₋ = 0V, (SIDE A ON) | | | | 40 | mA | 1, 2, 3 |
| I _{cc2(ON)} | "ON" Supply Current | V _{in} = 2.4V, V ₊ = 20V, V ₋ = 0V, (SIDE B ON) | | | | 40 | mA | 1, 2, 3 |
| V _{i11} | Logical "1" Input Voltage | V ₊ = 20V, V ₋ = 0V | 1 | | 2 | | V | 1, 2, 3 |
| V _{i12} | Logical "1" Input Voltage | V ₊ = 10V, V ₋ = 0V | 1 | | 2 | | V | 1, 2, 3 |
| V _{i11} | Logical "0" Input Voltage | V ₊ = 20V, V ₋ = 0V | 1 | | | 0.4 | V | 1, 2, 3 |
| V _{i12} | Logical "0" Input Voltage | V ₊ = 10V, V ₋ = 0V | 1 | | | 0.4 | V | 1, 2, 3 |

Electrical Characteristics

AC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: Power dissipation must be externally controlled at elevated temperatures.

| SYMBOL | PARAMETER | CONDITIONS | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|----------|----------------|----------------------------|-------|----------|-----|-----|------|------------|
| tON | Turn-On Delay | V+ = 20V | 3 | | 5 | 15 | nS | 9 |
| | | | 3 | | 4 | 19 | nS | 10, 11 |
| tOFF | Turn-Off Delay | V+ = 20V | 3 | | | 15 | nS | 9 |
| | | | 3 | | | 19 | nS | 10, 11 |
| tr(tPD1) | Rise Time | V+ - V- = 20V, Cl = 1000pF | 3, 4 | | | 35 | nS | 9 |
| | | | 3, 4 | | | 44 | nS | 10, 11 |
| tF(tPD0) | Fall Time | V+ - V- = 20V, Cl = 1000pF | 3 | | | 35 | nS | 9 |
| | | | 3 | | | 44 | nS | 10, 11 |

AC PARAMETERS: Transistor Driver

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: Power dissipation must be externally controlled at elevated temperatures.

| | | | | | | | | |
|----|-----------|------------|------|--|--|----|----|---|
| tR | Rise Time | Cl = 500pF | 2, 4 | | | 18 | nS | 9 |
| tF | Fall Time | Cl = 500pF | 2 | | | 16 | nS | 9 |

AC PARAMETERS: Gate Driven

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: Power dissipation must be externally controlled at elevated temperatures.

| | | | | | | | | |
|----|-----------|-------------|------|--|--|----|----|---|
| tR | Rise Time | Cl = 500pF | 2, 4 | | | 40 | nS | 9 |
| | | Cl = 1000pF | 2, 4 | | | 50 | nS | 9 |
| tF | Fall Time | Cl = 500pF | 2 | | | 35 | nS | 9 |
| | | Cl = 1000pF | 2 | | | 40 | nS | 9 |

Note 1: Parameter tested go-no-go only.

Note 2: Guaranteed parameter not tested.

Note 3: Tested at +25 C, guaranteed but not tested at +125 C and -55 C.

Note 4: Rise Time is the transition time from a Logical "0" to a Logical "1" and actually represents a voltage drop.