National Semiconductor

MICROCIRCUIT DATA SHEET

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 (^{o}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 (Vin - 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 Tjmax (maximum junction temperature), ThetaJA (package junction to ambient thermal resistance), and TA (ambient temperature). The maximum allowable power dissipation at any temperature is Pdmax = (Tjmax - TA)/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
Vol1	Logical "0" Output Voltage	Vin = 2.4V, V+ - V- = 20V, Iol = 1mA				1	V	1, 2, 3
Vol2	Logical "0" Output Voltage	Vin = 2.4V, V+ - V- = 10V, Iol = 1mA				1	V	1, 2, 3
Voh1	Logical "1" Output Voltage	Vin - V- = 0.4V, V+ - V- = 20V, Ioh=-1mA			19		V	1, 2, 3
Voh2	Logical "1" Output Voltage	Vin - V- = 0.4V, V+ - V- = 10V, Ioh=-1mA			9		V	1, 2, 3
Iil1	Logical "0" Input Current	Vin = 0V, V+ = 20V, V- = 0V				-10	uA	1, 3
						-15	uA	2
Iil2	Logical "0" Input Current	Vin = 0V, V+ = 10V, V- = 0V				-10	uA	1, 3
						-15	uA	2
Iih1	Logical "1" Input Current	Vin = 2.4V, V+ = 20V, V- = 0V				15	mA	1, 2, 3
Iih2	Logical "1" Input Current	Vin = 2.4V, V+ = 10V, V- = 0V				15	mA	1, 2, 3
Icc(OFF)	"OFF" Supply Current	Vin = 0V, V+ = 20V, V- = 0V				500	uA	1, 2, 3
Icc1(ON)	"ON" Supply Current	Vin=2.4V, V+ = 20V, V- = 0V, (SIDE A ON)				40	mA	1, 2, 3
Icc2(ON)	"ON" Supply Current	Vin=2.4V, V+ = 20V, V- = 0V, (SIDE B ON)				40	mA	1, 2, 3
Vih1	Logical "1" Input Voltage	V+ = 20V, V- = 0V	1		2		V	1, 2, 3
Vih2	Logical "1" Input Voltage	V+ = 10V, V- = 0V	1		2		V	1, 2, 3
Vil1	Logical "0" Input Voltage	V+ = 20V, V- = 0V	1			0.4	V	1, 2, 3
Vil2	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.