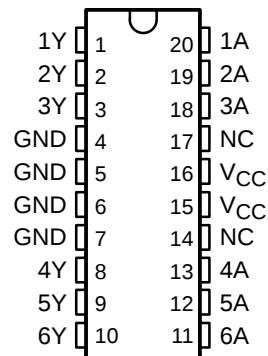


- Replaces 74AC11203
- Low-Skew Propagation Delay Specifications for Clock Driver Applications
- Operates at 3.3-V V_{CC}
- Flow-Through Architecture Optimizes PCB Layout
- Center-Pin V_{CC} and GND Pin Configurations Minimize High-Speed Switching Noise
- EPIC™ (Enhanced-Performance Implanted CMOS) 1- μ m Process
- 500-mA Typical Latch-Up Immunity at 125°C
- Packaged in Plastic Small-Outline Package

DW PACKAGE
(TOP VIEW)



NC – No internal connection

description

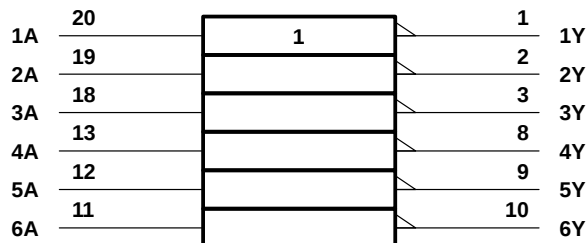
The CDC203 contains six independent inverters. The device performs the Boolean function $Y = \bar{A}$. It is designed specifically for applications requiring low skew between switching outputs.

The CDC203 is characterized for operation from 25°C to 70°C.

FUNCTION TABLE

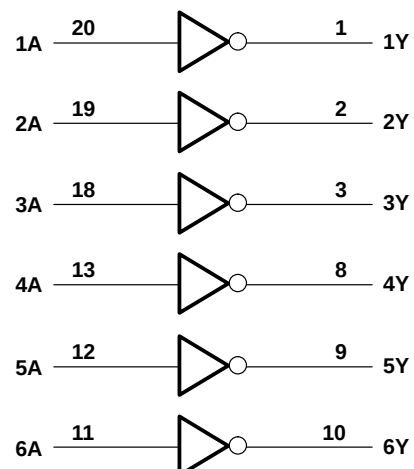
INPUT A	OUTPUT Y
H	L
L	H

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



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**TEXAS
INSTRUMENTS**

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CDC203

3.3-V HEX INVERTER/CLOCK DRIVER

SCAS324A – OCTOBER 1989 – REVISED NOVEMBER 1995

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)[†]

Supply voltage range, V_{CC}	–0.5 V to 7 V
Input voltage range, V_I (see Note 1)	–0.5 V to $V_{CC} + 0.5$ V
Output voltage range, V_O (see Note 1)	–0.5 V to $V_{CC} + 0.5$ V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$)	±20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$)	±50 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	±50 mA
Continuous current through V_{CC} or GND	±150 mA
Maximum power dissipation at $T_A = 55^\circ\text{C}$ (in still air) (see Note 2)	1.6 W
Storage temperature range, T_{stg}	–65°C to 150°C

[†] Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
 2. The maximum package power dissipation is calculated using a junction temperature of 150°C and a board trace length of 750 mils. For more information, refer to the *Package Thermal Considerations* application note in the 1994 ABT *Advanced BiCMOS Technology Data Book*, literature number SCBD002B.

recommended operating conditions

		MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage	3	3.3	3.6	V
V_{IH}	High-level input voltage	$V_{CC} = 3$ V		2.1	V
		$V_{CC} = 3.6$ V		2.5	
V_{IL}	Low-level input voltage	$V_{CC} = 3$ V		0.9	V
		$V_{CC} = 3.6$ V		1.1	
V_I	Input voltage	0		V_{CC}	V
V_O	Output voltage	0		V_{CC}	V
I_{OH}	High-level output current	$V_{CC} = 3$ V		–12	mA
		$V_{CC} = 3.6$ V		–12	
I_{OL}	Low-level output current	$V_{CC} = 3$ V		12	mA
		$V_{CC} = 3.6$ V		12	
$\Delta t/\Delta v$	Input transition rise or fall rate	0		10	ns/V
f_{clock}	Input clock frequency			40	MHz
T_A	Operating free-air temperature	25		70	°C



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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	V _{CC}	TA = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
V _{OH}	I _{OH} = – 50 µA	3 V	2.9			2.9		V
		3.6 V	3.5			3.5		
	I _{OH} = – 12 mA	3 V	2.58			2.48		
		3.6 V	3.18			3.08		
V _{OL}	I _{OL} = 50 µA	3 V			0.1		0.1	V
		3.6 V			0.1		0.1	
	I _{OL} = 12 mA	3 V			0.36		0.44	
		3.6 V			0.36		0.44	
I _I	V _I = V _{CC} or GND	3.6 V			±0.1		±1	µA
I _{CC}	V _I = V _{CC} or GND, I _O = 0	3.6 V			4		40	µA
C _i	V _I = V _{CC} or GND	3.3 V		4				pF

switching characteristics over recommended operating free-air temperature range, V_{CC} = 3.3 V ± 0.3 V (see Note 3 and Figures 1 and 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	MIN	MAX	UNIT
t _{PLH}	A	Y	3.5	6.1	ns
t _{PHL}			3.5	6.1	
t _{sk(o)}	A	Y		0.7	ns

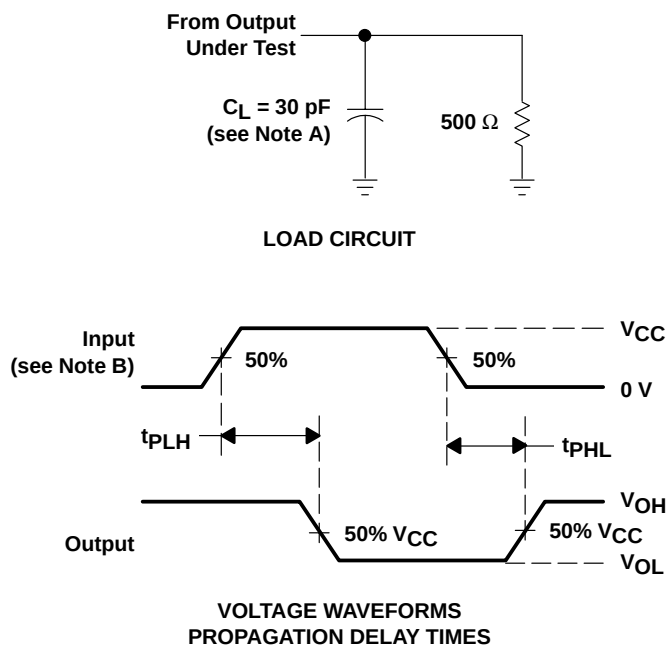
NOTE 3: All specifications are valid only for all outputs switching in phase simultaneously.

CDC203

3.3-V HEX INVERTER/CLOCK DRIVER

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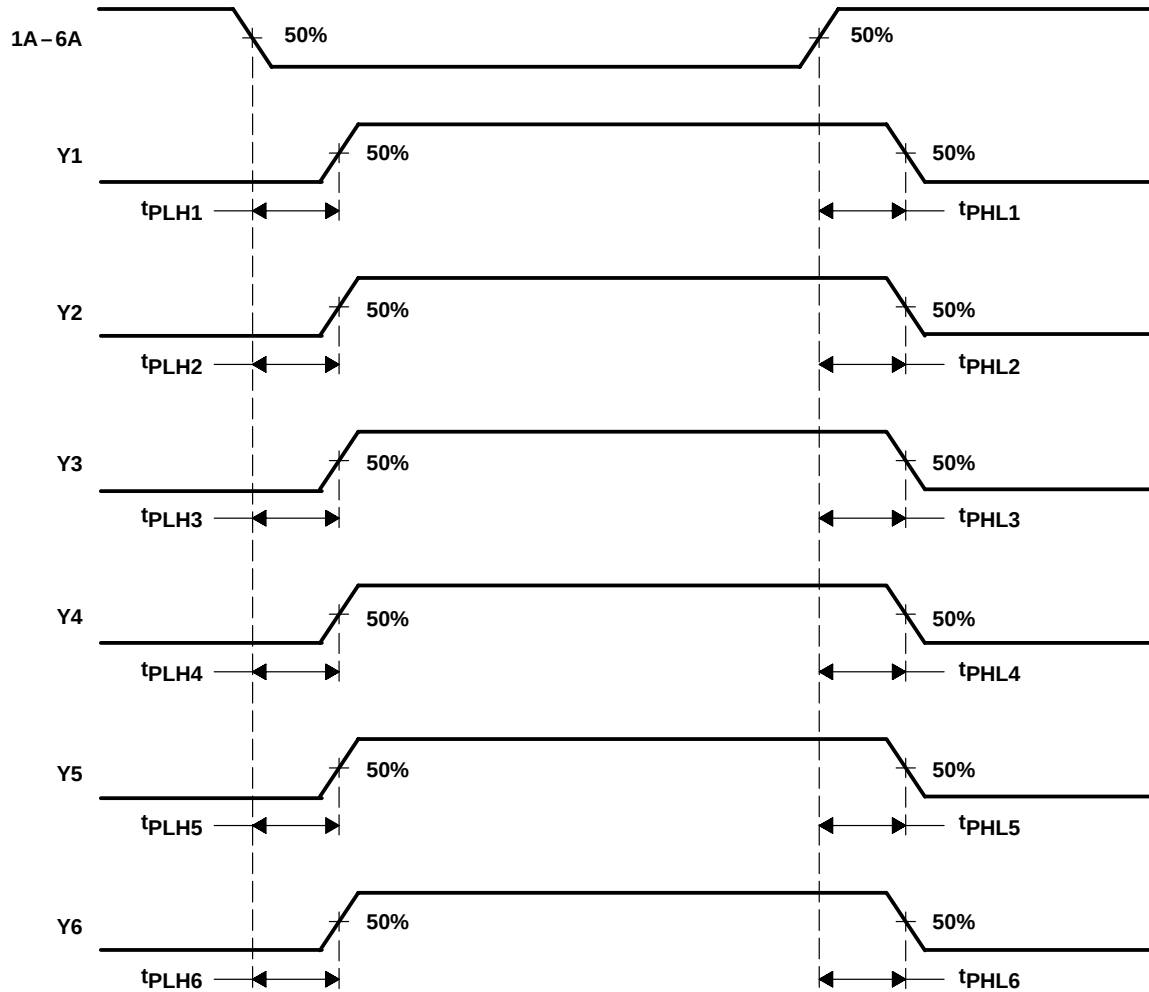
PARAMETER MEASUREMENT INFORMATION



- NOTES: A. C_L includes probe and jig capacitance.
B. Input pulses are supplied by generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r = 3 \text{ ns}$, $t_f = 3 \text{ ns}$.
C. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION



NOTE A: Output skew, $t_{sk(o)}$, is calculated as the greater of:

- The difference between the fastest and slowest of t_{PLHn} ($n = 1, 2, \dots, 6$)
- The difference between the fastest and slowest of t_{PHLn} ($n = 1, 2, \dots, 6$)

Figure 2. Waveforms for Calculation of $t_{sk(o)}$

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
CDC203DW	Active	Production	SOIC (DW) 20	25 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	25 to 70	CDC203
CDC203DW.A	Active	Production	SOIC (DW) 20	25 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	25 to 70	CDC203
CDC203DWG4	Active	Production	SOIC (DW) 20	25 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	25 to 70	CDC203

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
CDC203DW	DW	SOIC	20	25	507	12.83	5080	6.6
CDC203DW.A	DW	SOIC	20	25	507	12.83	5080	6.6
CDC203DWG4	DW	SOIC	20	25	507	12.83	5080	6.6

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