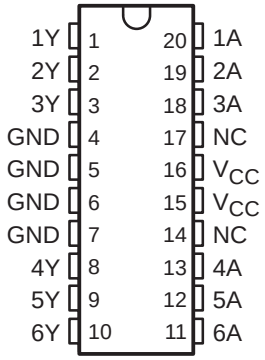
- **CDC204 Replaces 74AC11204**
- **Low-Skew Propagation Delay Specifications for Clock-Driver Applications**
- **CMOS-Compatible Inputs and Outputs**
- **Flow-Through Architecture Optimizes PCB Layout**
- **Center-Pin V_{CC} and GND Pin Configurations Minimize High-Speed Switching Noise**
- ***EPIC*™ (Enhanced-Performance Implanted CMOS) 1-μm Process**
- **500-mA Typical Latch-Up Immunity at 125°C**
- **Package Options Include Plastic Small-Outline Package (DW))**

DW PACKAGE
(TOP VIEW)



NC – No internal connection

description

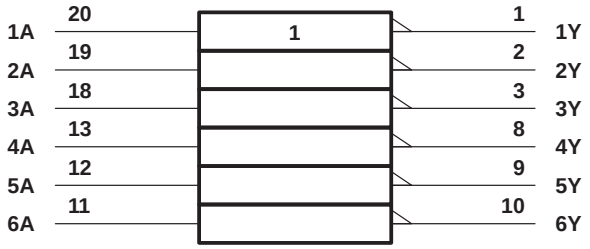
The CDC204 contains six independent inverters. The device performs the Boolean function $Y = \overline{A}$. It is designed specifically for applications requiring low skew between switching outputs.

The CDC204 is characterized for operation from T_A = 25°C to 70°C.

FUNCTION TABLE

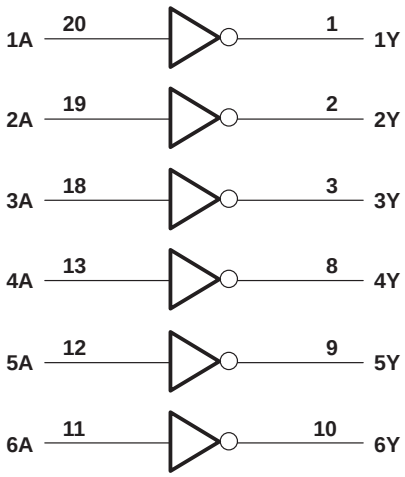
INPUT A	OUTPUT Y
H	L
L	H

logic symbol†



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

logic diagram (positive logic)



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°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		4.75	5	5.25	V
V_{IH}	High-level input voltage	V_{CC} = 4.75 V	3.3			V
		V_{CC} = 5.25 V	3.7			
V_{IL}	Low-level input voltage	V_{CC} = 4.75 V			1.4	V
		V_{CC} = 5.25 V			1.6	
V_I	Input voltage		0		V_{CC}	V
I_{OH}	High-level output current	V_{CC} = 4.75 V			–24	mA
		V_{CC} = 5.25 V			–24	
I_{OL}	Low-level output current	V_{CC} = 4.75 V			24	mA
		V_{CC} = 5.25 V			24	
$\Delta t/\Delta v$	Input transition rise or fall rate		0		10	ns/V
f_{clock}	Input clock frequency				80	MHz
T_A	Operating free-air temperature		25		70	°C

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

PARAMETER		TEST CONDITIONS		T_A†	MIN	TYP	MAX	UNIT
V_{OH}	High-level voltage output	I_{OH} = – 50 µA	V_{CC} = 4.75 V	25°C	4.65			V
				Full range	4.65			
			V_{CC} = 5.25 V	25°C	5.15			
				Full range	5.15			
		I_{OH} = – 24 mA	V_{CC} = 4.75 V	25°C	4.19			
				Full range	4.05			
			V_{CC} = 5.25 V	25°C	4.68			
				Full range	4.55			
		I_{OH} = –75 mA‡,	V_{CC} = 5.25 V	Full range	3.6			
V_{OL}	Low-level voltage output	I_{OL} = 50 µA	V_{CC} = 4.75 V	25°C			0.1	V
				Full range			0.1	
			V_{CC} = 5.25 V	25°C			0.1	
				Full range			0.1	
		I_{OL} = 24 mA	V_{CC} = 4.75 V	25°C			0.36	
				Full range			0.44	
			V_{CC} = 5.25 V	25°C			0.36	
				Full range			0.44	
		I_{OL} = 75 mA‡,	V_{CC} = 5.25 V	Full range			1.65	
I_I	Input current	V_I = V_{CC} or GND	V_{CC} = 5.25 V	25°C			±0.1	µA
				Full range			±1	
I_{CC}	Supply current	V_I = V_{CC} or GND, I_O = 0	V_{CC} = 5.25 V,	25°C			4	µA
				Full range			40	
C_i	Input capacitance	V_I = V_{CC} or GND,	V_{CC} = 5 V	25°C		4		pF

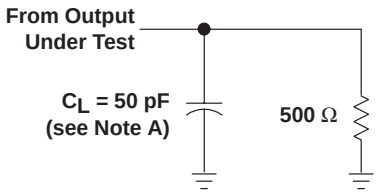
† Full range is T_A = 25°C to 70°C.
‡ Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.

switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V ± 0.25 V (see Note 3 and Figures 1 and 2)

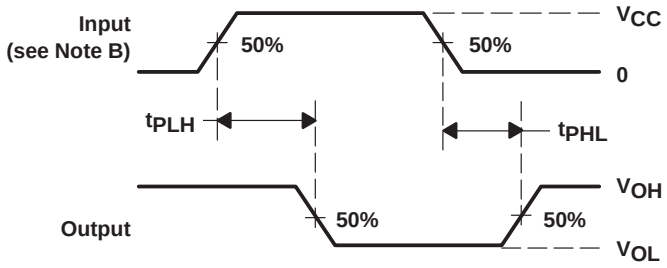
PARAMETER		FROM (INPUT)	TO (OUTPUT)	MIN	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high level (see Figure 1)	A	Y	3.7	5.7	ns
t_{PHL}	Proagation delay time, high-to-low level (see Figure 1)			2.9	5.7	
$t_{sk(o)}$	Output skew time (see Figure 2)	A	Y		1	ns

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

PARAMETER MEASUREMENT INFORMATION



LOAD CIRCUIT

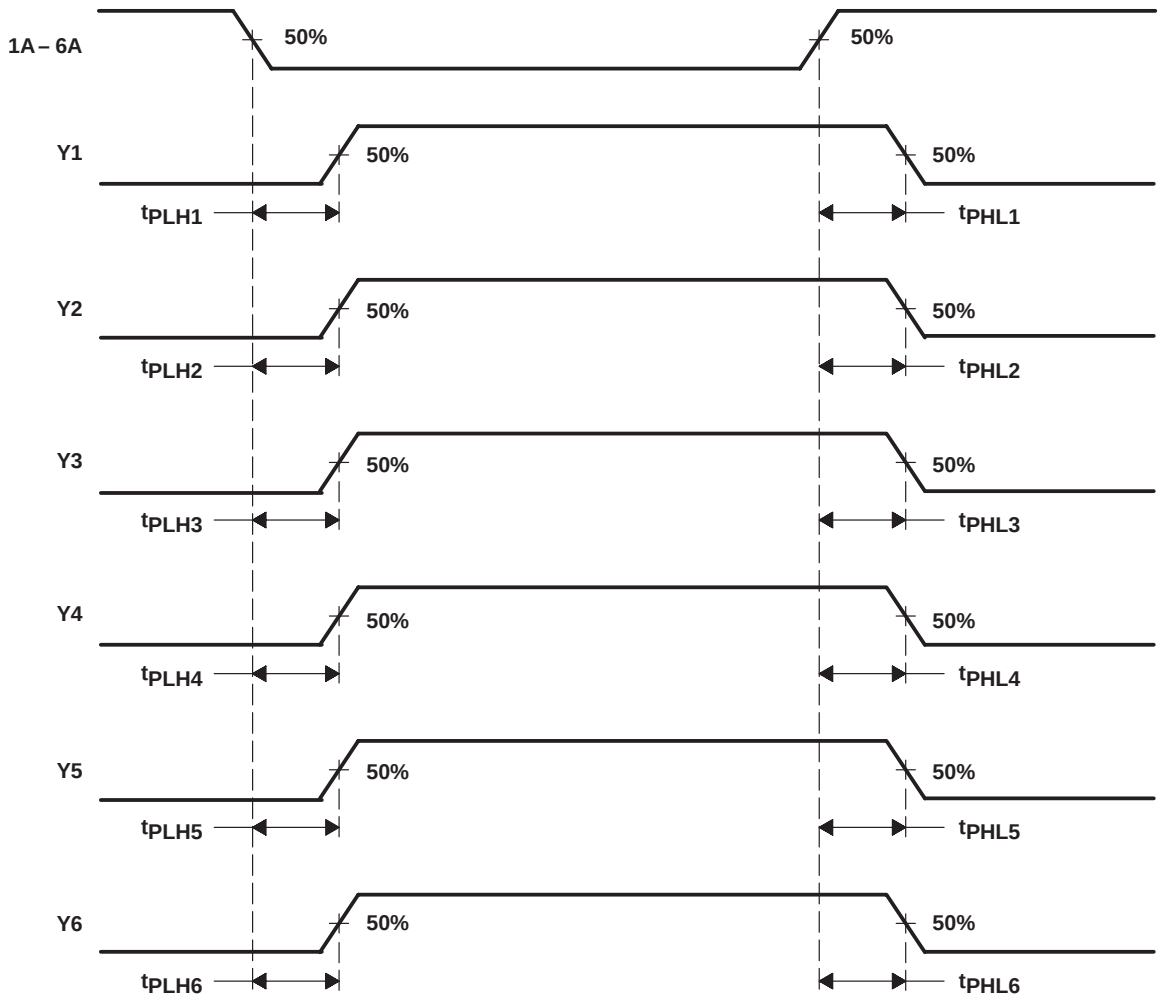


VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

NOTES: A. C_L includes probe and jig capacitance.
B. Input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω, t_r = 3 ns, t_f = 3 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



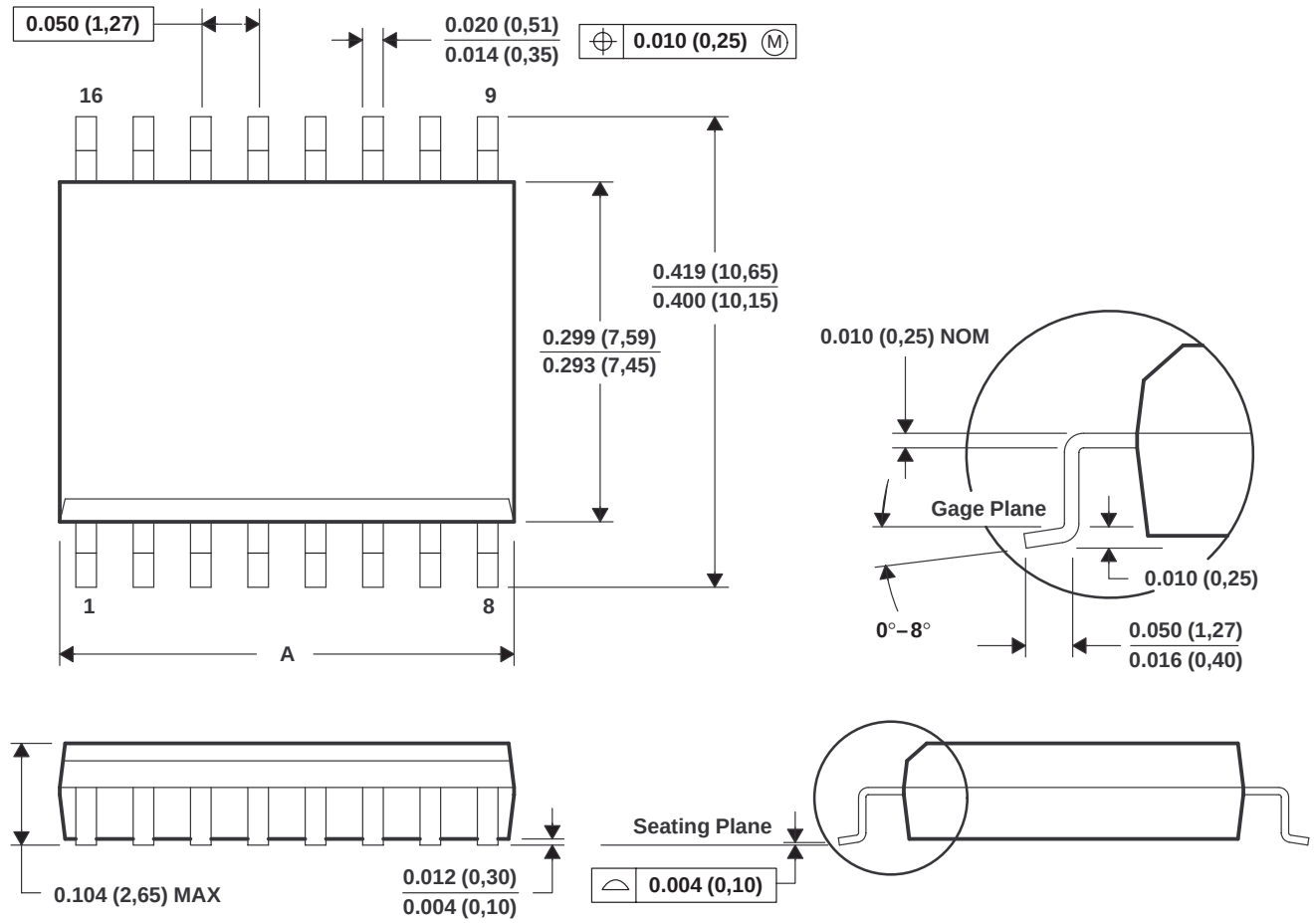
NOTE A: Output skew, $t_{sk(o)}$, is calculated as the greater of:
- The difference between the fastest and slowest of t_{PHLn} (n = 1, 2, . . . , 6)
- The difference between the fastest and slowest of t_{PLHn} (n = 1, 2, . . . , 6)

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

MECHANICAL INFORMATION

DW (R-PDSO-G)** **PLASTIC SMALL-OUTLINE PACKAGE**

16 PIN SHOWN



DIM \ PINS **	16	20	24
A MAX	0.410 (10,41)	0.510 (12,95)	0.610 (15,49)
A MIN	0.400 (10,16)	0.500 (12,70)	0.600 (15,24)

4040000/D 02/98

NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
D. Falls within JEDEC MS-013

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