FAIRCHILD
A Schlumberger Company

F100104
Quint AND/NAND Gate

October 1985 - Rev. 1

Memory & High Speed Logic

Description

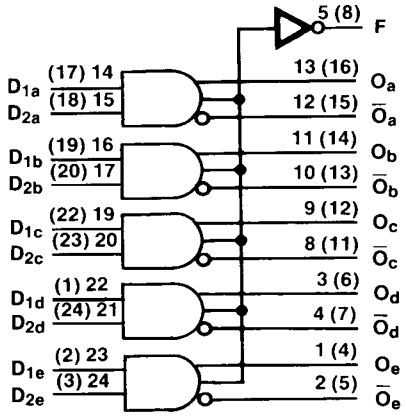
The F100104 is a monolithic quint AND/NAND gate. The Function output is the wire-NOR of all five AND gate outputs. $F = \overline{(D_{1a} \bullet D_{2a}) + (D_{1b} \bullet D_{2b}) + (D_{1c} \bullet D_{2c}) + (D_{1d} \bullet D_{2d}) + (D_{1e} \bullet D_{2e})}$. All inputs have 50KΩ pull-down resistors.

- **Available in Ceramic DIP or Flatpak**
- **Data Input to Output Propagation Delay 1.75 ns Max**
- **Outputs Specified to Drive a 50 Ω Load**
- **Moderate Edge Rates Minimize Ringing and Reflections on Interconnecting Wiring**

Pin Names

D_{na}-D_{ne}	Data Inputs
F	Function Output
O_a-O_e	Data Outputs
$\overline{O}_a$-$\overline{O}_e$	Complementary Data Outputs

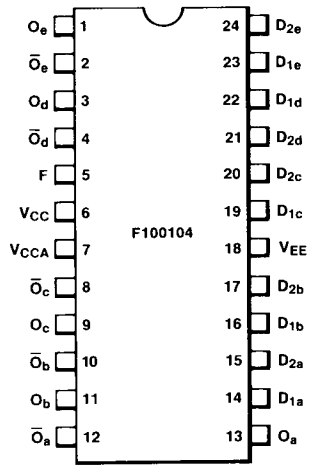
Logic Symbol



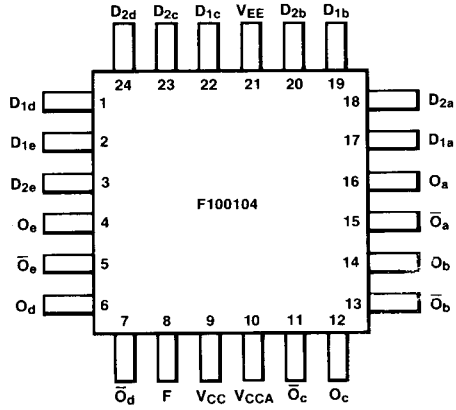
V_{CC} = Pin 6 (9)
V_{CCA} = Pins 7 (10)
V_{EE} = Pin 18 (21)
( ) = Flatpak

Connection Diagrams

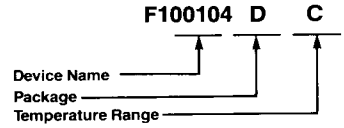
24-Pin DIP (Top View)



24-Pin Flatpak (Top View)



Ordering Information



Packages
D = Ceramic DIP
F = Flatpak

Temperature Range
C = 0°C to +85°C

26 Rev Orig
003974
3974 FSC

Fairchild Camera and Instrument Corporation, Memory & High Speed Logic
P.O. Box 5000, M/S 2C17, Puyallup, Washington 98373-0900
TWX 510 101 0846

DC Characteristics: V_{EE} = −4.2 V to −4.8 V unless otherwise specified, V_{CC} = V_{CCA} = GND, T_C = 0°C to +85°C

Symbol	Characteristic	Min	Typ	Max	Unit	Condition
I_{IH}	Input HIGH Current D_{2a}-D_{2e} D_{1a}-D_{1e}			250 350	μA	V_{IN} = $V_{IH(max)}$
I_{EE}	Power Supply Current	−96	−66	−46	mA	Inputs Open

For further information, see F100K DC Specification in the F100K ECL Data Book.

Ceramic Dual In-line Package AC Characteristics: V_{EE} = −4.2 V to −4.8 V, V_{CC} = V_{CCA} = GND

		T_C = 0°C		T_C = +25°C		T_C = +85°C			
Symbol	Characteristic	Min	Max	Min	Max	Min	Max	Unit	Condition
t_{PLH} t_{PHL}	Propagation Delay D_{na}-D_{ne} to O, $\overline{O}$	0.40	1.75	0.40	1.65	0.40	1.75	ns	
t_{PLH} t_{PHL}	Propagation Delay Data to F	1.00	2.60	1.00	2.60	1.15	3.20	ns	*Figures 1* and *2*
t_{TLH} t_{THL}	Transition Time 20% to 80%, 80% to 20%	0.35	1.70	0.35	1.55	0.35	1.70	ns	

Flatpak AC Characteristics: V_{EE} = −4.2 V to −4.8 V, V_{CC} = V_{CCA} = GND

		T_C = 0°C		T_C = +25°C		T_C = +85°C			
Symbol	Characteristic	Min	Max	Min	Max	Min	Max	Unit	Condition
t_{PLH} t_{PHL}	Propagation Delay D_{na}-D_{ne} to O, $\overline{O}$	0.40	1.55	0.40	1.45	0.40	1.55	ns	
t_{PLH} t_{PHL}	Propagation Delay Data to F	1.00	2.40	1.00	2.40	1.15	3.00	ns	*Figures 1* and *2*
t_{TLH} t_{THL}	Transition Time 20% to 80%, 80% to 20%	0.35	1.60	0.35	1.45	0.35	1.60	ns	

Absolute Maximum Ratings: Above which the useful life may be impaired

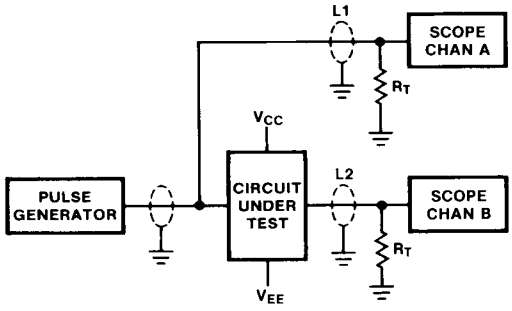
Storage Temperature	−65°C to +150°C
Maximum Junction Temperature (T_J)	+150° C
Supply Voltage Range	−7.0 V to +0.5 V
Input Voltage (dc)	V_{EE} to +0.5 V
Output Current (dc Output HIGH)	−50 mA
Operating Range	−5.7 V to −4.2 V *
Lead Temperature (Soldering 10 sec.)	300°C

*Parametric values specified at -4.8V to -4.2V

Guaranteed Operating Ranges

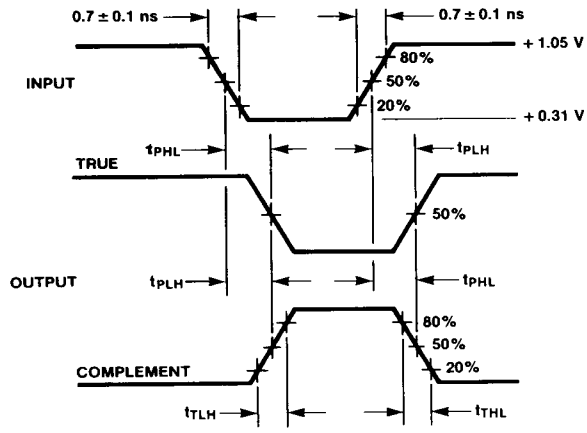
Supply Voltage (V_{EE})			Case Temperature (T_C)
Min	Typ	Max	
−4.8 V	−4.5 V	−4.2 V	0° C to +85° C

Figure 1 AC Test Circuit



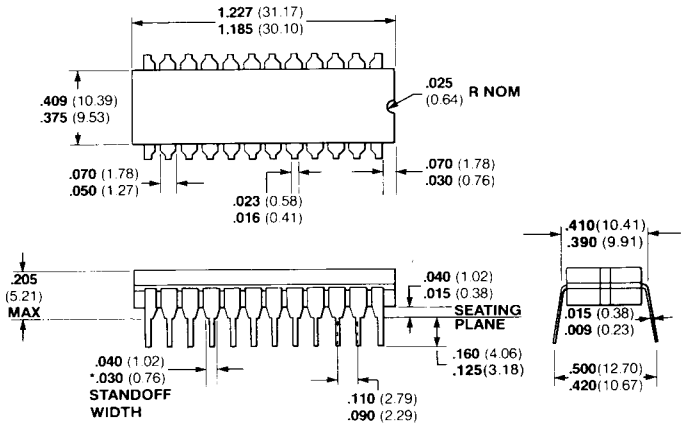
Notes
V_{CC}, V_{CCA} = +2 V, V_{EE} = −2.5 V
L1 and L2 = equal length 50 Ω impedance lines
R_T = 50 Ω terminator internal to scope
Decoupling 0.1 μF from GND to V_{CC} and V_{EE}
All unused outputs are loaded with 50 Ω to GND
C_L = Fixture and stray capacitance ≤ 3 pF

Figure 2 Propagation Delay and Transition Times



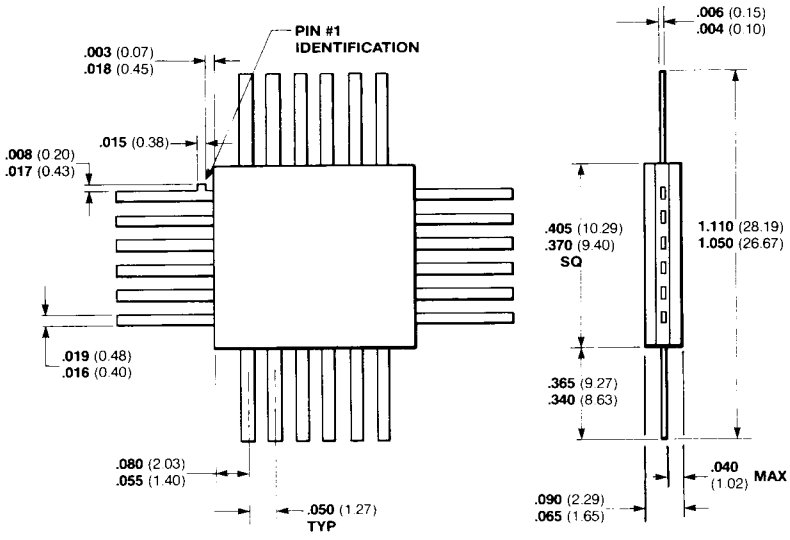
Package Outlines

24-Pin Cerdip (.400)



Notes
Pins are tin-plated alloy 42 or equivalent
Hermetically sealed alumina package
Pins are intended for insertion in hole rows on **.400** (10.16) centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Package weight is 6.0 grams
Board-drilling dimensions should equal your practice for **.030** (0.76) inch diameter holes
These dimensions include misalignment, glass over-run etc. . . .
*The **.040**-**.030** dimension does not apply to the corner pins

24-Pin Quad Cerpak



Notes
Pins are tin-plated alloy 42 or equivalent
Cavity size is **.200" SQ.** (5.08 SQ.)
Package weight is 0.7 gram
These dimensions include misalignment, glass over-run etc....

All dimensions in inches **bold** and millimeters (parentheses)