TRIPLE 5-INPUT OR/NOR GATE

SY100S301

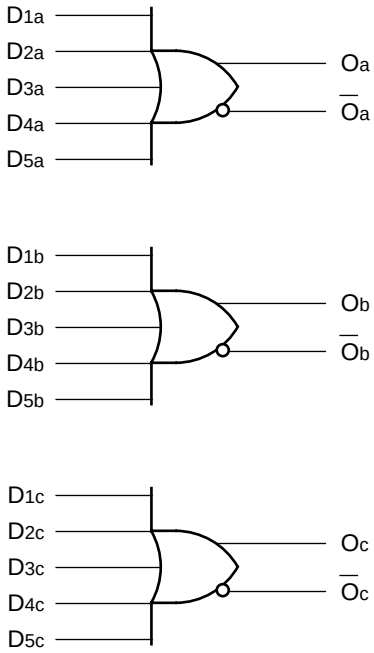
FEATURES

- **Max. propagation delay of 750ps**
- **I_{EE} min. of –25mA**
- **Industry standard 100K ECL levels**
- **Extended supply voltage option: V_{EE} = –4.2V to –5.5V**
- **Voltage and temperature compensation for improved noise immunity**
- **20% faster than Fairchild 300K at lower power**
- **Internal 75KΩ input pull-down resistors**
- **Function and pinout compatible with Fairchild F100K**
- **Available in 24-pin CERPACK and 28-pin PLCC packages**

DESCRIPTION

The SY100S301 is an ultra-fast triple 5-input OR/NOR gate designed for use in high-performance ECL systems. The inputs on this device have 75KΩ pull-down resistors.

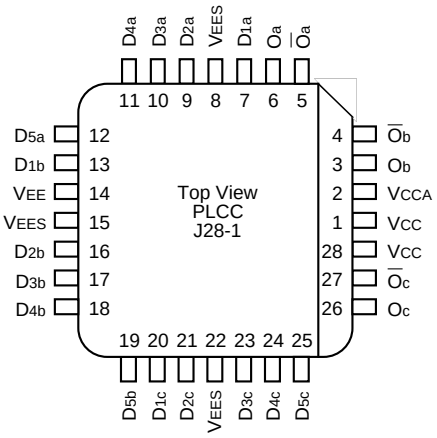
BLOCK DIAGRAM



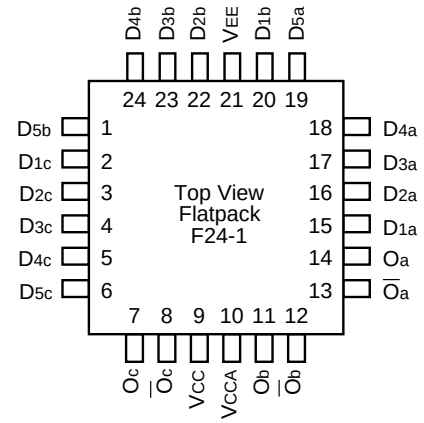
PIN NAMES

Pin	Function
D_{na}, D_{nb}, D_{nc}	Data Inputs (n-1...5)
$\overline{O}_a$, $\overline{O}_b$, $\overline{O}_c$	Data Outputs
O_a, O_b, O_c	Complementary Data Outputs
V_{EES}	V_{EE} Substrate
V_{CCA}	V_{CCO} for ECL Outputs

PACKAGE/ORDERING INFORMATION



28-Pin PLCC (J28-1)



24-Pin Cerpack (F24-1)

Ordering Information

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY100S301FC	F24-1	Commercial	SY100S301FC	Sn-Pb
SY100S301FCTR(1)	F24-1	Commercial	SY100S301FC	Sn-Pb
SY100S301JC	J28-1	Commercial	SY100S301JC	Sn-Pb
SY100S301JCTR(1)	J28-1	Commercial	SY100S301JC	Sn-Pb
SY100S301JZ(2)	J28-1	Commercial	SY100S301JZ with Pb-Free bar-line indicator	Matte-Sn
SY100S301JZTR(1, 2)	J28-1	Commercial	SY100S301JZ with Pb-Free bar-line indicator	Matte-Sn

Notes:

1. Tape and Reel.
2. Pb-Free package is recommended for new designs.

LOGIC EQUATION

$O_a = D_{1a} + D_{2a} + D_{3a} + D_{4a} + D_{5a}$

$O_b = D_{1b} + D_{2b} + D_{3b} + D_{4a} + D_{5b}$

$O_c = D_{1c} + D_{2c} + D_{3c} + D_{4c} + D_{5c}$

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{EE}	Input HIGH Current	–5.5	–4.5	–4.2	V
T_A	Power Supply Current	0	25	85	˚C

ABSOLUTE MAXIMUM RATINGS(1)

Symbol	Rating	Value	Unit
V_{EE}	Power Supply	–0.5 to +7.0	V
V_{IN}	Input Voltage	–0.5 to V_{EE}	V
I_{OUT}	DC Output Current	–50	mA
T_C	Temperature Under Bias	–55 to +125	˚C
T_J	Junction Temperature	+150	˚C
T_{LEAD}	Lead Temperature (soldering, 20 sec.)	+260	˚C
T_{store}	Storage Temperature	–65 to +150	˚C

Note:

1. Permanent device damage may occur if absolute maximum ratings are exceeded. This is a stress rating only and functional operation is not implied at conditions other than those detailed in the operational sections of this data book. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

DC ELECTRICAL CHARACTERISTICS

V_{EE} = –4.2V to –5.5V unless otherwise specified, V_{CC} = V_{CCA} = GND

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
I_{IH}	Input HIGH Current	—	—	200	µA	—
I_{EE}	Power Supply Current	–25	–17	–11	mA	Inputs Open

AC ELECTRICAL CHARACTERISTICS

CERPACK

V_{EE} = –4.2V to –5.5V unless otherwise specified, V_{CC} = V_{CCA} = GND

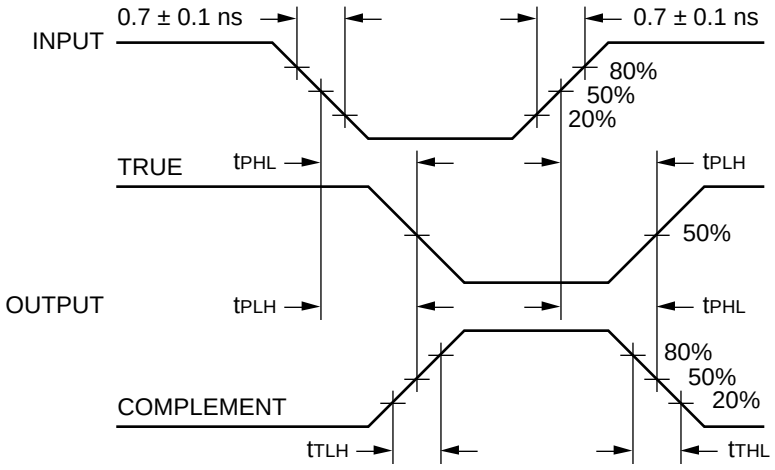
Symbol	Parameter	T_A = 0°C		T_A = +25°C		T_A = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
t_{PLH} t_{PHL}	Propagation Delay Data to Output	300	800	300	800	300	800	ps	
t_{TLH} t_{THL}	Transition Time 20% to 80%, 80% to 20%	300	900	300	900	300	900	ps	

PLCC

V_{EE} = –4.2V to –5.5V unless otherwise specified, V_{CC} = V_{CCA} = GND

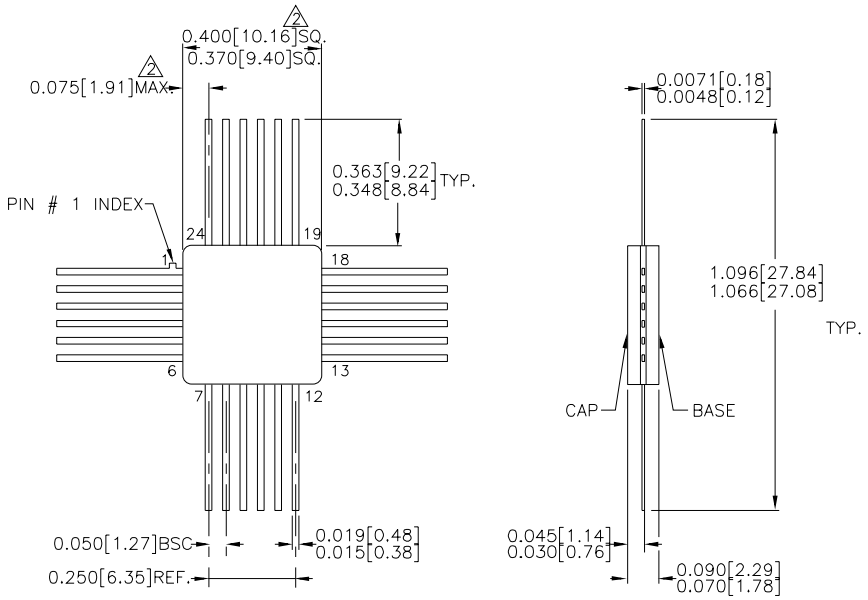
Symbol	Parameter	T_A = 0°C		T_A = +25°C		T_A = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
t_{PLH} t_{PHL}	Propagation Delay Data to Output	300	750	300	750	300	750	ps	
t_{TLH} t_{THL}	Transition Time 20% to 80%, 80% to 20%	300	900	300	900	300	900	ps	

TIMING DIAGRAM



Propagation Delay and Transition Times

24-PIN CERPACK (F24-1)



NOTES:
1. DIMENSIONS ARE IN INCHES[MM].
2. THIS DIMENSION INCLUDES GLASS PROTRUSION AND CAP TO BASE ALIGNMENT TOLERANCES.
3. DIMENSIONS SHOWN ARE MAX/MIN, WHERE NOTED.

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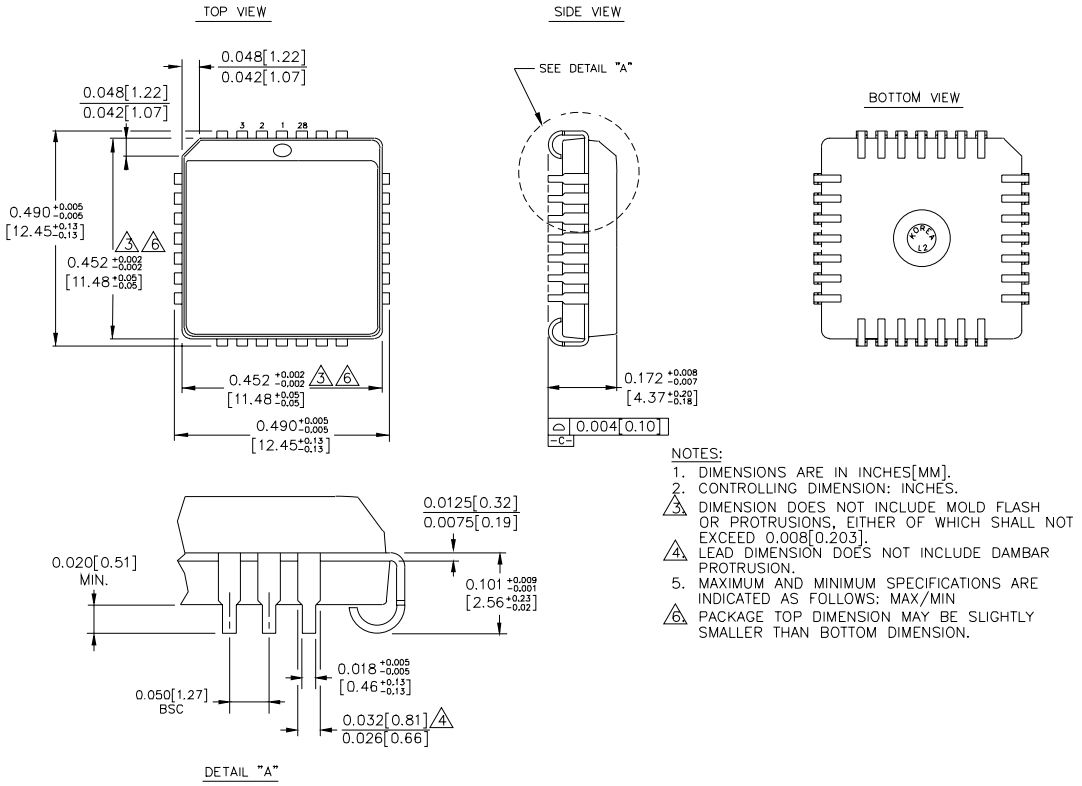
28-PIN PLCC (J28-1)



NOTES:
1. DIMENSIONS ARE IN INCHES[MM].
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.008[0.203].
4. LEAD DIMENSION DOES NOT INCLUDE DAMBAR PROTRUSION.
5. MAXIMUM AND MINIMUM SPECIFICATIONS ARE INDICATED AS FOLLOWS: MAX/MIN
6. PACKAGE TOP DIMENSION MAY BE SLIGHTLY SMALLER THAN BOTTOM DIMENSION.

Rev. 03

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