

**FEATURES**

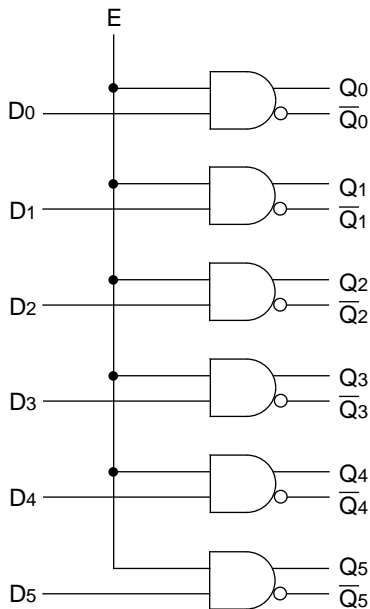
- Operates from a single +5V supply
- Differential PECL outputs
- Function and pinout compatible with Fairchild F100K
- Available in 28-pin PLCC packages

**DESCRIPTION**

The SY100S391 is a hex TTL-to-PECL translator for converting TTL logic levels to 100K logic levels. The unique feature of this translator is the ability to do this translation using only one +5V supply. The differential outputs allow each circuit to be used as an inverting/non-inverting translator, or as a differential line driver. A common enable (E), when LOW, holds all inverting outputs HIGH and all non-inverting inputs LOW.

The SY100S391 is ideal for those mixed PECL/TTL applications which only have a +5V supply available. When used in the differential mode, the S391, due to its high common mode rejection, overcomes voltage gradients between the TTL and PECL ground systems.

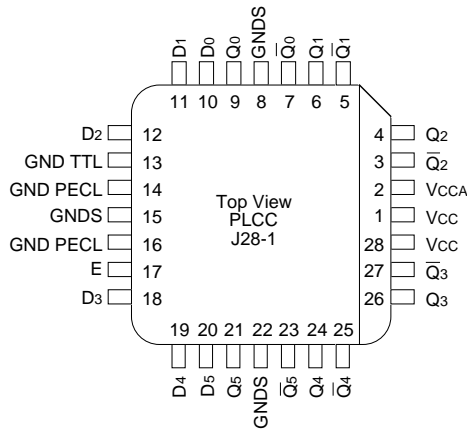
**BLOCK DIAGRAM**



**PIN NAMES**

Pin	Function
D0 — D5	Data Inputs (TTL)
Q0 — Q5	Data Outputs (PECL)
$\bar{Q}_0$ — $\bar{Q}_5$	Inverting Data Outputs (PECL)
E	Enable Input (TTL)
VCCA	VCCO for ECL Outputs

**PACKAGE/ORDERING INFORMATION**



**28-Pin PLCC (J28-1)**

**Ordering Information**

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY100S391JC	J28-1	Commercial	SY100S391JC	Sn-Pb
SY100S391JCTR <sup>(1)</sup>	J28-1	Commercial	SY100S391JC	Sn-Pb
SY100S391JZ <sup>(2)</sup>	J28-1	Commercial	SY100S391JZ with Pb-Free bar-line indicator	Matte-Sn
SY100S391JZTR <sup>(1, 2)</sup>	J28-1	Commercial	SY100S391JZ with Pb-Free bar-line indicator	Matte-Sn

**Notes:**

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

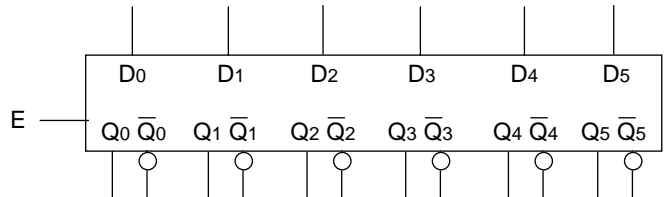
**TRUTH TABLE**

Inputs		Outputs	
$D_n$	E	$Q_n$	$\bar{Q}_n$
H	H	H	L
L	H	L	H
H	L	L	H
L	L	L	H

**Note:**

1. H = High Voltage Level, L = Low Voltage Level

**LOGIC SYMBOL**



**ABSOLUTE MAXIMUM RATINGS<sup>(1)</sup>**

Symbol	Rating	Value	Unit
—	TTL Input Voltage <sup>(2)</sup>	-0.5 to +7.0	V
—	TTL Input Current <sup>(2)</sup>	-30 to +5.0	V
—	PECL Output Current (DC Output HIGH)	-50	V
—	Vcc Pin Potential to Ground Pin	-0.5 to +7.0	V
T <sub>store</sub>	Storage Temperature	-65 to +150	°C
T <sub>J</sub>	Max. Junction Temp. Ceramic Plastic	+175 +150	°C

**Notes:**

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 sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.
2. Either voltage limit or current limit is sufficient to protect inputs.

**GUARANTEED OPERATING CONDITIONS<sup>(1)</sup>**

Symbol	Rating	Value	Unit
T <sub>A</sub>	Operating Temperature Commercial	0 to +85	°C
V <sub>cc</sub>	Supply Voltage	+4.5 to +5.5	V

**Note:**

1. Do not exceed.

**TTL-TO-PECL DC ELECTRICAL CHARACTERISTICS<sup>(1)</sup>**V<sub>CC</sub> = +5.0V ± 10%; GND = 0V

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition	
V <sub>OH</sub>	Output HIGH Voltage	V <sub>CC</sub> -1025	V <sub>CC</sub> -955	V <sub>CC</sub> -870	mV	V <sub>IN</sub> = V <sub>IH</sub> (Max.) or V <sub>IL</sub> (Min.) Loading with 50Ω to V <sub>CC</sub> -2V	
V <sub>OL</sub>	Output LOW Voltage	V <sub>CC</sub> -1890	V <sub>CC</sub> -1705	V <sub>CC</sub> -1620			
V <sub>OHC</sub>	Output HIGH Voltage Corner Point High	V <sub>CC</sub> -1035	—	—	mV	V <sub>IN</sub> = V <sub>IH</sub> (Min.) or V <sub>IL</sub> (Max.) Loading with 50Ω to V <sub>CC</sub> -2V	
V <sub>OLC</sub>	Output LOW Voltage Corner Point Low	—	—	V <sub>CC</sub> -1610	mV		
V <sub>IH</sub>	Input HIGH Voltage	2.0	—	5.0	V	Over V <sub>TTL</sub> , V <sub>EE</sub> , T <sub>A</sub> Range	
V <sub>IL</sub>	Input LOW Voltage	0	—	0.8	V	Over V <sub>TTL</sub> , V <sub>EE</sub> , T <sub>A</sub> Range	
I <sub>IH</sub>	Input HIGH Current	—	—	10	μA	V <sub>IN</sub> = +2.7V	
	Breakdown Current	—	—	100	μA	V <sub>IN</sub> = +5.5V, V <sub>CC</sub> = Max.	
I <sub>IL</sub>	Input LOW Current	D <sub>n</sub> E	—	—	-0.8	mA	V <sub>IN</sub> = +0.5V
			—	—	-4.2		
V <sub>CD</sub>	Input Clamp Diode Voltage	—	—	-1.2	V	I <sub>IN</sub> = -18mA	
I <sub>CC</sub>	V <sub>CC</sub> Supply Current	25	—	69	mA	Inputs Open	

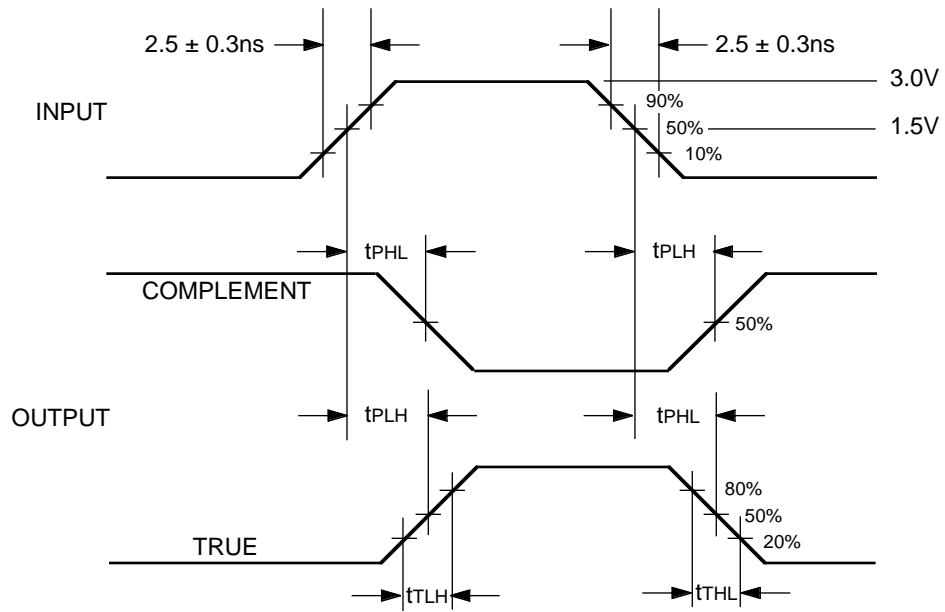
**Note:**

1. The specified limits represent the "worst case" value for the parameter. Since these values normally occur at the temperature extremes, additional noise immunity and guardbanding can be achieved by decreasing the allowable system operating ranges. Conditions for testing shown in the tables are chosen to guarantee operation under "worst case" conditions.

**AC ELECTRICAL CHARACTERISTICS**V<sub>CC</sub> = +5.0V ± 10%

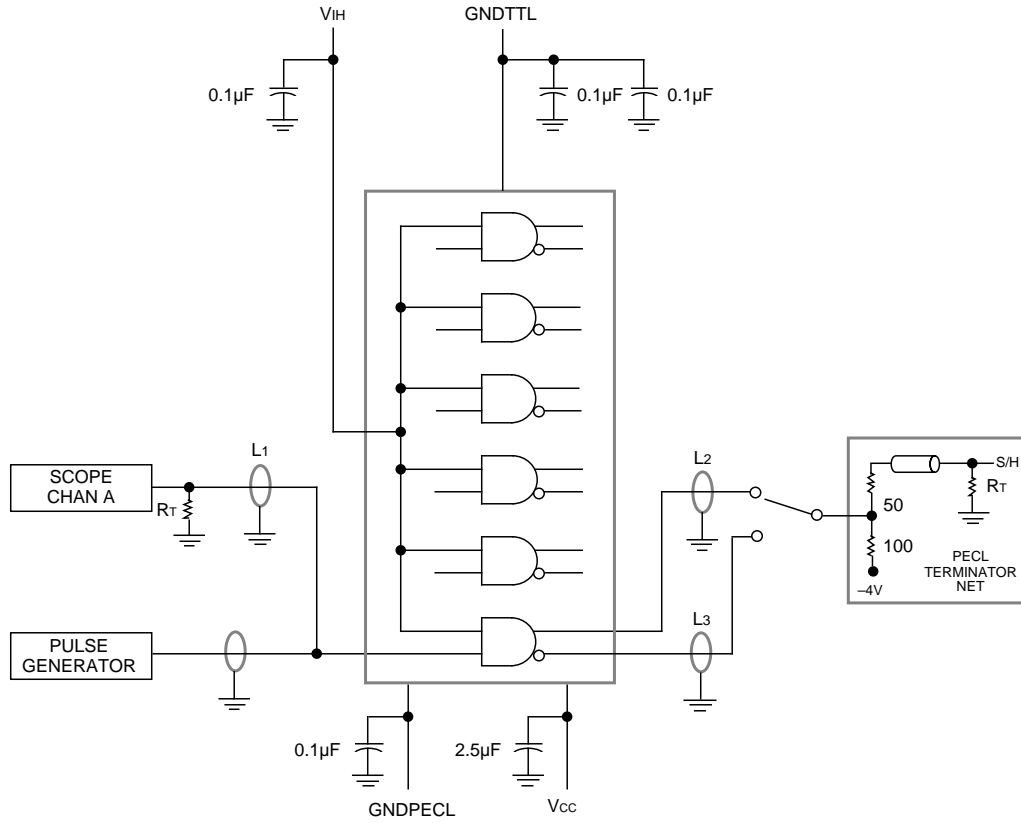
Symbol	Parameter	T <sub>A</sub> = 0°C		T <sub>A</sub> = +25°C		T <sub>A</sub> = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay Data and Enable to Output	400	1400	400	1400	400	1400	ps	
t <sub>TLH</sub> t <sub>THL</sub>	Transition Time 20% to 80%, 80% to 20%	350	1700	350	1700	350	1700	ps	

**TIMING DIAGRAM**

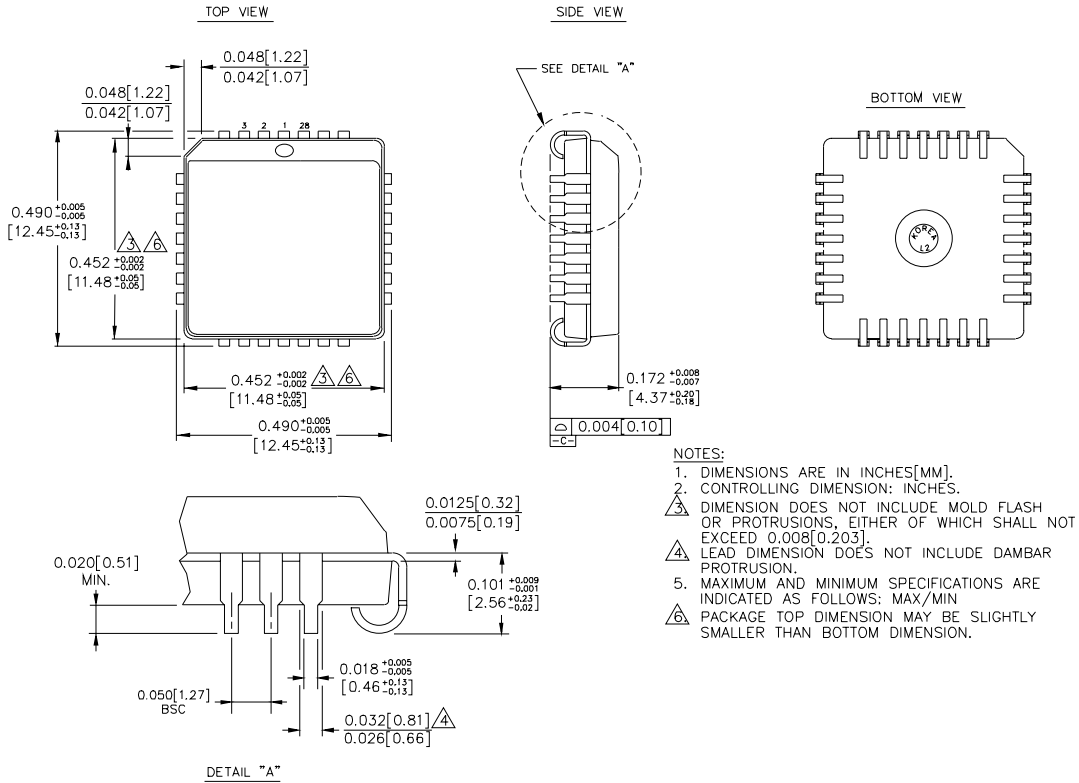


**Propagation Delay and Transition Times**

**TEST CIRCUIT**



**28-PIN PLCC (J28-1)**



Rev. 03

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