MICREL
The Infinite Bandwidth Company™

LOW-POWER HEX TTL-TO-PECL TRANSLATOR

SY100S391

FEATURES

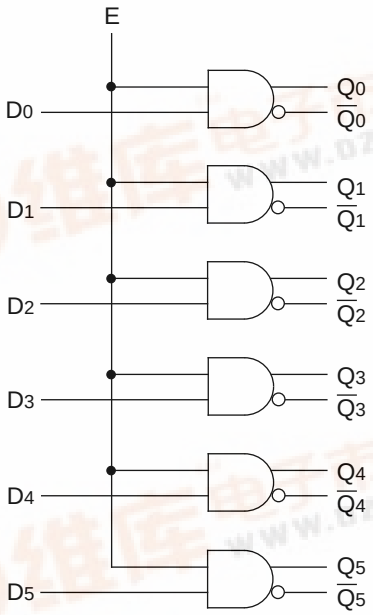
- **Operates from a single +5V supply**
- **Differential PECL outputs**
- **Function and pinout compatible with Fairchild F100K**
- **Available in 24-pin CERPACK and 28-pin PLCC packages**

DESCRIPTION

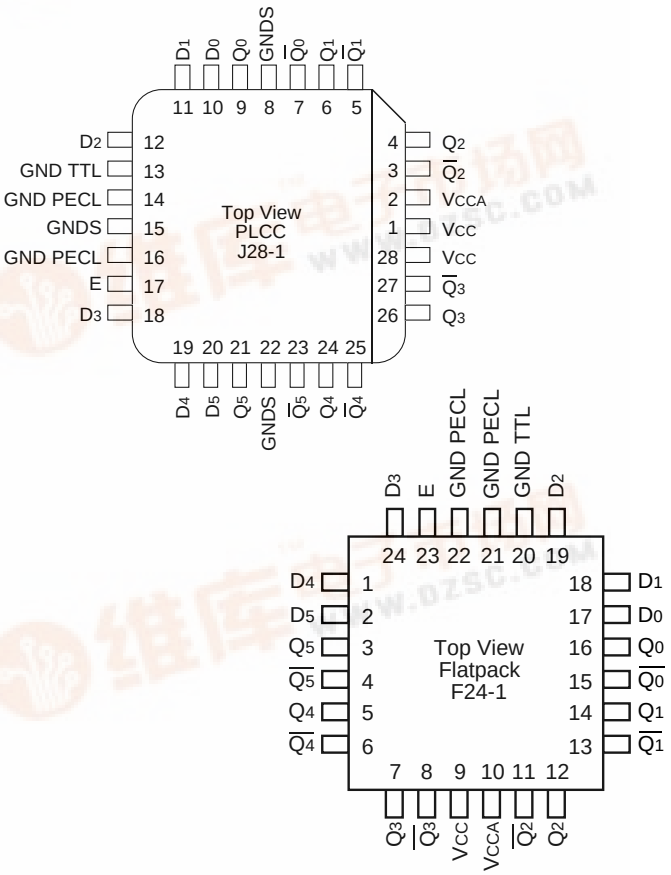
The SY100S391 is a hex TTL-to-PECL translator for converting TTL logic levels to 100K logic levels. The unique feature of this translator is the ability to do this translation using only one +5V supply. The differential outputs allow each circuit to be used as an inverting/non-inverting translator, or 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 CONFIGURATIONS



PIN NAMES

Pin	Function
D_0 — D_5	Data Inputs (TTL)
Q_0 — Q_5	Data Outputs (PECL)
$\overline{Q}_0$ — $\overline{Q}_5$	Inverting Data Outputs (PECL)
E	Enable Input (TTL)
V_{CCA}	V_{CCO} for ECL Outputs

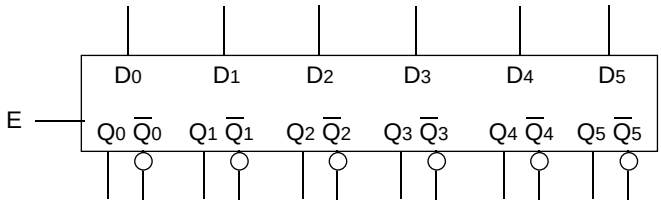
TRUTH TABLE

Inputs		Outputs	
D_n	E	Q_n	$\overline{Q}_n$
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



GUARANTEED OPERATING CONDITIONS[1]

Symbol	Rating	Value	Unit
T_A	Operating Temperature Commercial	 0 to +85	˚C
V_{CC}	Supply Voltage	+4.5 to +5.5	V

NOTE:

1. Do not exceed.

ABSOLUTE MAXIMUM RATINGS[1]

Symbol	Rating	Value	Unit
—	TTL Input Voltage[2]	–0.5 to +7.0	V
—	TTL Input Current[2]	–30 to +5.0	V
—	PECL Output Current (DC Output HIGH)	–50	V
—	V_{CC} Pin Potential to Ground Pin	–0.5 to +7.0	V
T_{store}	Storage Temperature	–65 to +150	˚C
T_J	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 siffucient to protect inputs.

TTL-TO-PECL DC ELECTRICAL CHARACTERISTICS[1]

V_{CC} = +5.0V ± 10%; GND = 0V

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
V_{OH}	Output HIGH Voltage	V_{CC} –1025	V_{CC} –955	V_{CC} –870	mV	V_{IN} = V_{IH} (Max.) or V_{IL} (Min.)
V_{OL}	Output LOW Voltage	V_{CC} –1890	V_{CC} –1705	V_{CC} –1620		Loading with 50Ω to V_{CC} –2V
V_{OHC}	Output HIGH Voltage Corner Point High	V_{CC} –1035	—	—	mV	V_{IN} = V_{IH} (Min.) or V_{IL} (Max.) Loading with 50Ω to V_{CC} –2V
V_{OLC}	Output LOW Voltage Corner Point Low	—	—	V_{CC} –1610	mV	
V_{IH}	Input HIGH Voltage	2.0	—	5.0	V	Over V_{TTL}, V_{EE}, T_A Range
V_{IL}	Input LOW Voltage	0	—	0.8	V	Over V_{TTL}, V_{EE}, T_A Range
I_{IH}	Input HIGH Current	—	—	10	µA	V_{IN} = +2.7V
	Breakdown Current	—	—	100	µA	V_{IN} = +5.5V, V_{CC} = Max.
I_{IL}	Input LOW Current D_n E	—	—	–0.8 –4.2	mA	V_{IN} = +0.5V
V_{CD}	Input Clamp Diode Voltage	—	—	–1.2	V	I_{IN} = –18mA
I_{CC}	V_{CC} 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.

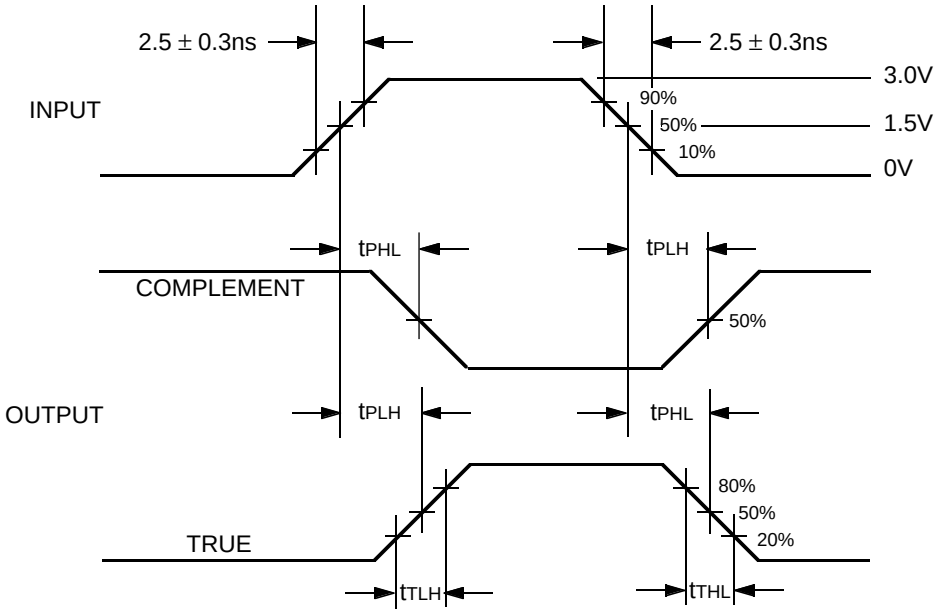
AC ELECTRICAL CHARACTERISTICS

CERPACK AND PLCC

V_{CC} = +5.0V ± 10%

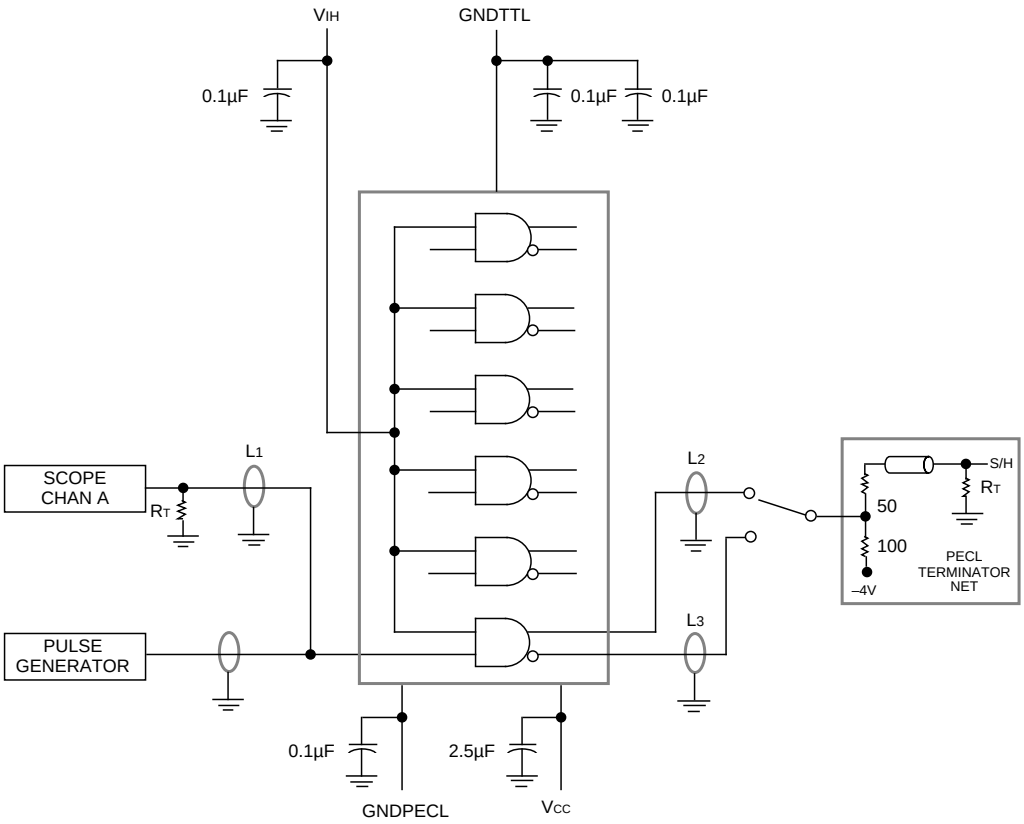
Symbol	Parameter	T_A = 0°C		T_A = +25°C		T_A = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
t_{PLH} t_{PHL}	Propagation Delay Data and Enable to Output	400	1400	400	1400	400	1400	ps	
t_{TLH} t_{THL}	Transition Time 20% to 80%, 80% to 20%	350	1700	350	1700	350	1700	ps	

TIMING DIAGRAM



Propagation Delay and Transition Times

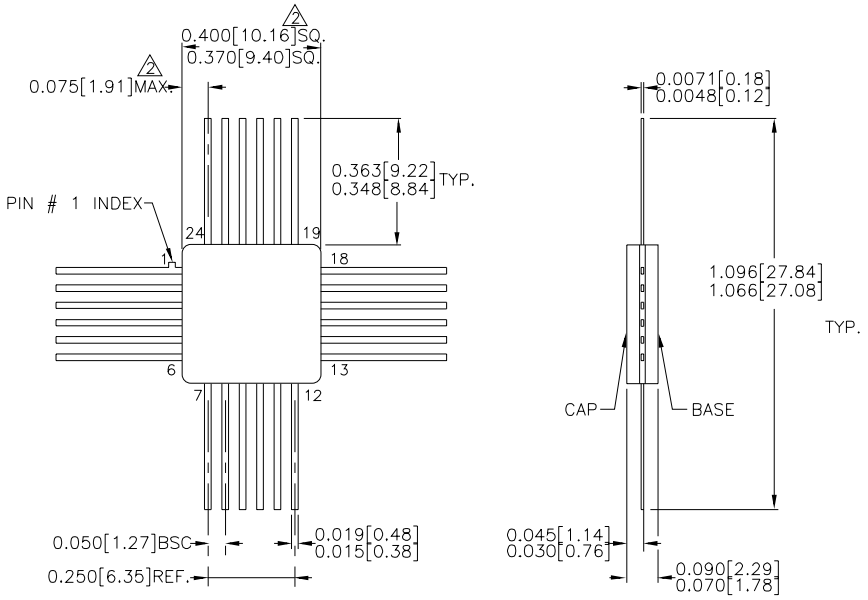
TEST CIRCUIT



PRODUCT ORDERING CODE

Ordering Code	Package Type	Operating Range
SY100S391FC	F24-1	Commercial
SY100S391JC	J28-1	Commercial
SY100S391JCTR	J28-1	Commercial

24 LEAD 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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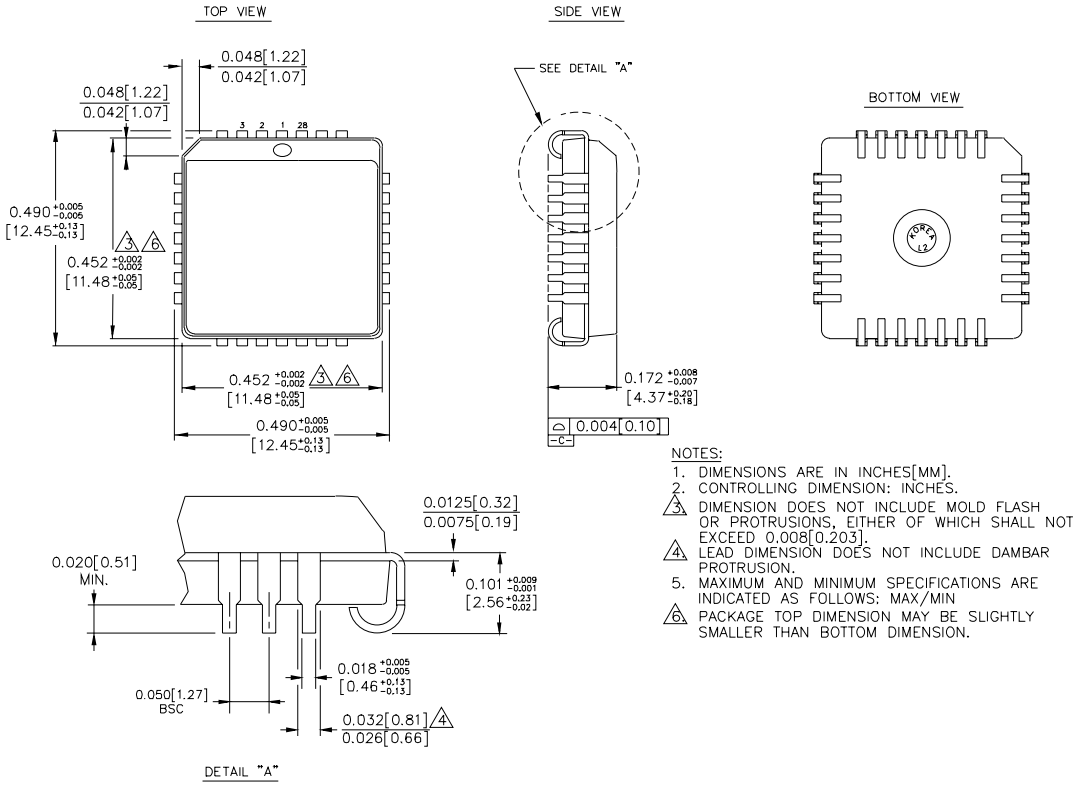
28 LEAD PLCC (J28-1)



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.

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