

**FEATURES**

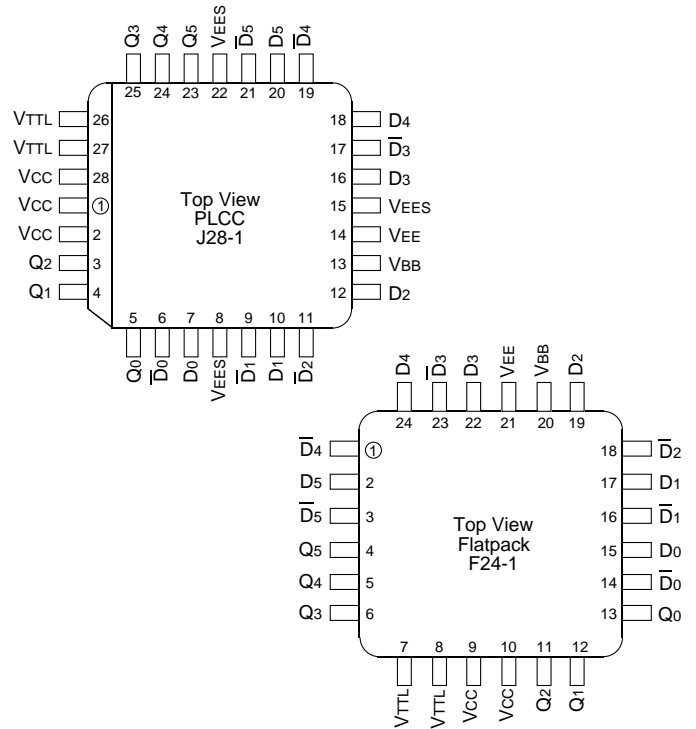
- Max. propagation delay of 3.7ns
- IEE min. of -37mA
- TTL outputs
- Extended supply voltage option:  
VEE = -4.2V to -5.5V
- 25% faster than National's 325
- Differential inputs with built-in offset
- Voltage and temperature compensation for improved noise immunity
- VBB output for single-ended use
- Internal 75KΩ input pull-down resistors
- Function and pinout compatible with Fairchild F100K
- Available in 24-pin CERPACK and 28-pin PLCC packages

**DESCRIPTION**

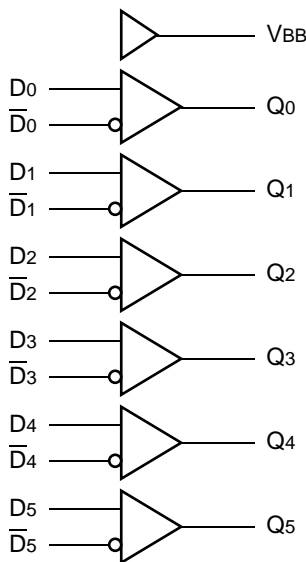
The SY100S325 are hex translators for converting 100K ECL logic levels to TTL logic levels. Inputs can be used as inverting, non-inverting or differential receivers. An internal reference voltage generator provides VBB for single-ended operation or for use in Schmitt trigger applications. All inputs have 75KΩ pull-down resistors. The outputs will go LOW when the inputs are either open or have the same potential.

When used in single-ended operation, the apparent input threshold of the true inputs is 20mV to 40mV higher (positive) than the threshold of the complementary inputs. The VTTL and VEE power may be applied in either order.

**PIN CONFIGURATIONS**



**BLOCK DIAGRAM**



**PIN NAMES**

Pin	Function
D0-D5	Data Inputs
D0-D5	Inverting Data Inputs
Q0-Q5	Data Outputs
VEES	VEE Substrate
VTTL	TTL Vcc Power Supply
VCCA	Vcco for ECL Outputs

## DC ELECTRICAL CHARACTERISTICS

$V_{EE} = -4.2V$  to  $-4.8V$  unless otherwise specified,  $V_{CC} = V_{CCA} = GND$ ,  $V_{TTL} = +4.5V$  to  $+5.5V$

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition	
$V_{OH}$	Output HIGH Voltage	2.5	—	—	V	$I_{OH} = -2.0mA$	$V_{IN} = V_{IH} (Max.)$
$V_{OL}$	Output LOW Voltage	—	—	0.5	V	$I_{OL} = 24mA$	$V_{IN} = V_{IL} (Min.)$
$V_{DIFF}$	Input Voltage Differential	150	—	—	mV	Required for Full Output Swing	
$V_{CM}$	Common Mode Voltage	—	—	1.0	V	Permissible $\pm V_{CM}$ with Respect to $V_{BB}$	
$I_{IH}$	Input HIGH Current	—	—	350	$\mu A$	$V_{IN} = V_{IH} (Max.)$ , $D_0-D_5 = V_{BB}$ , $\underline{D_0-D_5} = V_{IL} (Min.)$	
$I_{IL}$	Input LOW Current	0.5	—	—	$\mu A$	$V_{IN} = V_{IH} (Min.)$ , $D_0-D_5 = V_{BB}$	
$I_{OS}$	Output Short Circuit Current	-150	-80	-60	mA	$V_{OUT} = GND$	
$I_{EE}$	$V_{EE}$ Power Supply Current	-37	-24	-17	mA	$D_0-D_5 = V_{BB}$	
$I_{TTL}$	$V_{TTL}$ Power Supply Current	—	42	65	mA	$D_0-D_5 = V_{BB}$	
$V_{BB}$	Output Reference Voltage	-1380	-1320	-1260	mV	$I_{V_{BB}} = -2.1mA$	
$V_{IH}$	Single-Ended Input HIGH Voltage	-1165	—	-880	mV	Guaranteed HIGH Signal for All Inputs (with One Tied to $V_{BB}$ )	
$V_{IL}$	Single-Ended Input LOW Voltage	-1810	—	-1475	mV	Guaranteed LOW Signal for All Inputs (with One Tied to $V_{BB}$ )	

## AC ELECTRICAL CHARACTERISTICS

### PLCC/FLATPACK

$V_{EE} = -4.2V$  to  $-5.5V$  unless otherwise specified,  $V_{CC} = V_{CCA} = GND$ ,  $V_{TTL} = +4.5V$  to  $+5.5V$

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
$t_{PLH}$ $t_{PHL}$	Propagation Delay Data to Output	900	2100	2900	ps	$C_L = 15pF$ , Figure 2
$t_{PLH}$ $t_{PHL}$	Propagation Delay Data to Output	900	3100	3700	ps	$C_L = 50pF$ , Figure 2

**SWITCHING WAVEFORM**

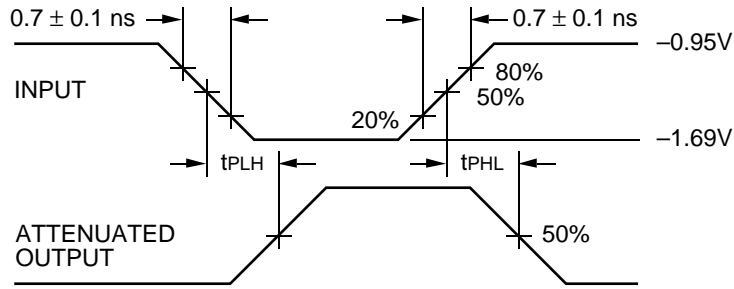


Figure 1. Propagation Delay

**NOTE:**

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

**TEST CIRCUITS**

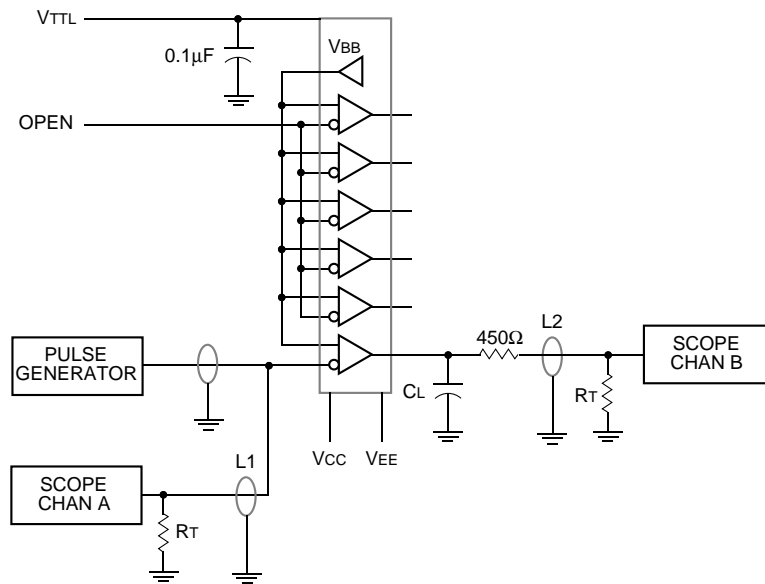


Figure 2. AC Test Circuit for 15pF Loading

**NOTES:**

$V_{CC} = 0V$ ,  $V_{EE} = -4.5V$ ,  $V_{TTL} = +5V$

L1 and L2 = equal length 50Ω impedance lines

$R_T = 50\Omega$  terminator internal to scope

Decoupling 0.1µF from GND to  $V_{CC}$ ,  $V_{EE}$  and  $V_{TTL}$

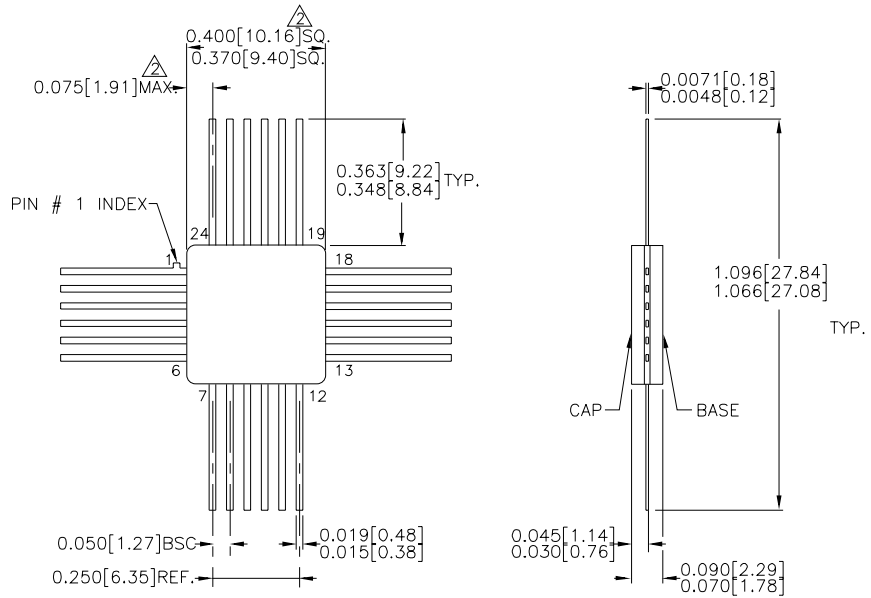
All unused outputs are loaded with 500Ω to GND

$C_L$  = Fixture and stray capacitance = 3pF

**PRODUCT ORDERING CODE**

Ordering Code	Package Type	Operating Range
SY100S325FC	F24-1	Commercial
SY100S325JC	J28-1	Commercial
SY100S325JCTR	J28-1	Commercial

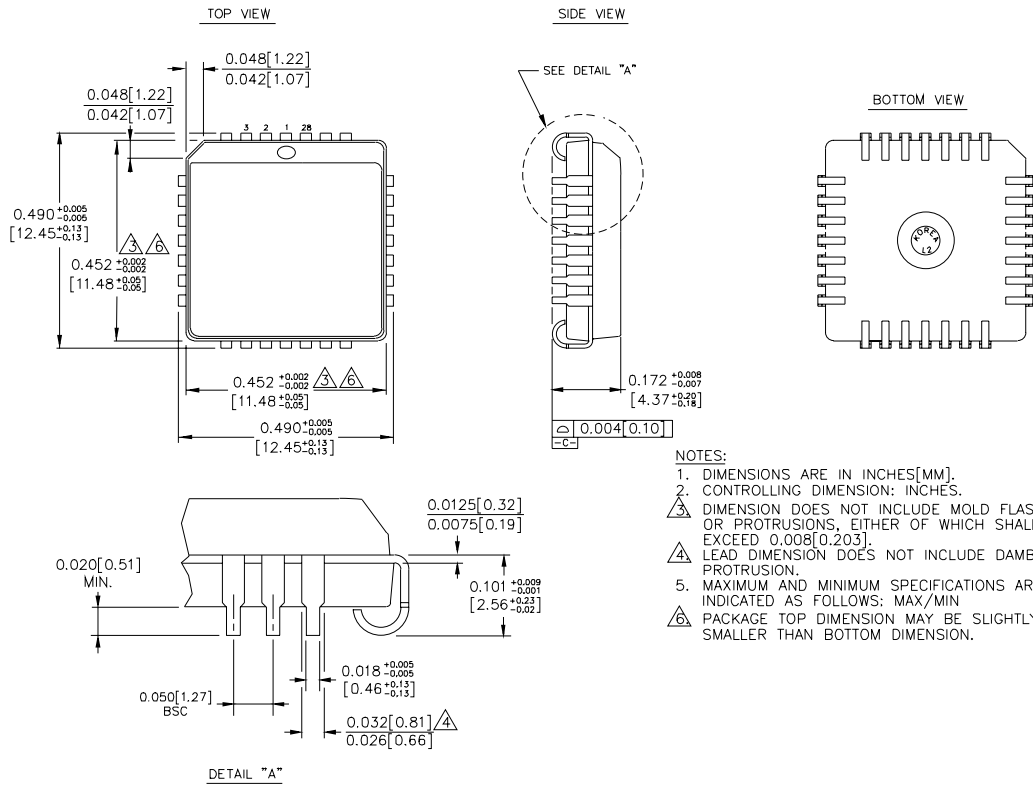
**24 LEAD CERPACK (F24-1)**



- 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.

Rev. 03

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



Rev. 03

**MICREL-SYNERGY 3250 SCOTT BOULEVARD SANTA CLARA CA 95054 USA**

TEL + 1 (408) 980-9191 FAX + 1 (408) 914-7878 WEB <http://www.micrel.com>

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