

**FEATURES**

- Max. propagation delay of 1200ps
- IEE min. of -92mA
- Industry standard 100K ECL levels
- Extended supply voltage option:  
VEE = -4.2V to -5.5V
- Voltage and temperature compensation for improved noise immunity
- Internal 75KΩ input pull-down resistors
- 60% faster than National or Signetics
- Approximately 40% lower power than Fairchild
- Function and pinout compatible with Fairchild F100K
- Available in 24-pin CERPACK and 28-pin PLCC packages

**DESCRIPTION**

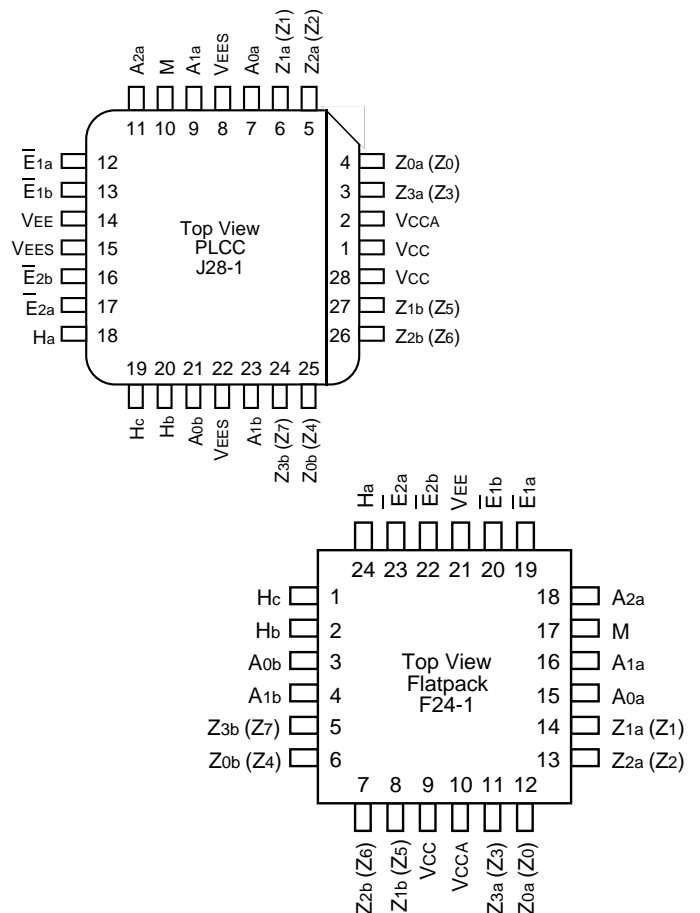
The SY100S370 is a universal demultiplexer/decoder that can be used as either a dual 1-of-4 decoder or as a single 1-of-8 decoder and is designed for use in high-performance ECL systems. The Mode control (M) input determines the function. In the dual 1-of-4 mode, each 4-input group has a pair of active-LOW Enable ( $\bar{E}$ ) inputs. The Enable pins are assigned such that in the single 1-of-8 mode they can be tied together in pairs to result in two active-LOW Enable inputs.  $\bar{E}_{1a}$  will be tied to  $\bar{E}_{1b}$  and  $\bar{E}_{2a}$  to  $\bar{E}_{2b}$ .

The auxiliary inputs ( $H_n$ ) are used to determine whether the outputs are active-HIGH or active-LOW. The address inputs for the dual 1-of-4 mode are  $A_{0a}$ ,  $A_{1a}$ ,  $A_{0b}$ .  $A_{2a}$  is unused. In the 1-of-8 mode, the address inputs are  $A_{0a}$ ,  $A_{1a}$ ,  $A_{2a}$ . The inputs on the device have 75KΩ pull-down resistors.

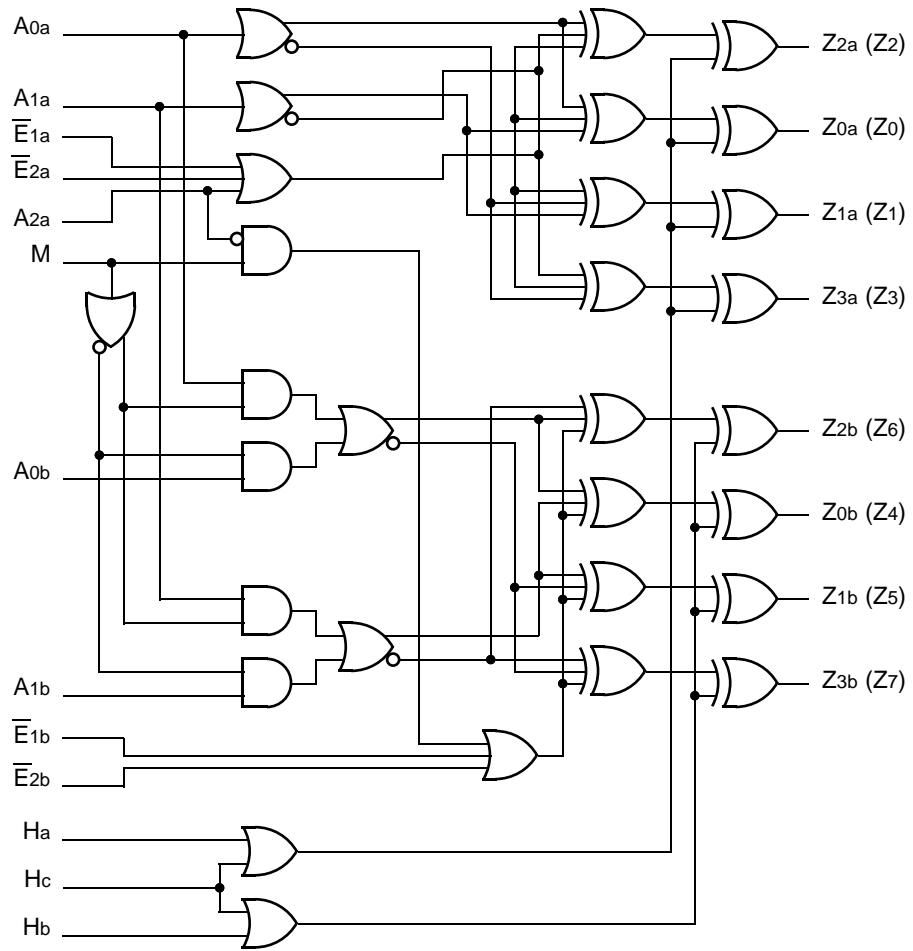
**PIN NAMES**

Pin	Function
$A_{na}$ , $A_{nb}$	Address Inputs ( $n = 0,1,2$ )
$\bar{E}_{na}$ , $\bar{E}_{nb}$	Enable Inputs ( $n = 1,2$ )
M	Mode Control Input
$H_a$	$Z_0 - Z_3$ ( $\bar{Z}_{0a} - \bar{Z}_{3a}$ ) Polarity Select Input
$H_b$	$Z_4 - Z_7$ ( $\bar{Z}_{0b} - \bar{Z}_{3b}$ ) Polarity Select Input
$H_c$	Common Polarity Select Input
$Z_0 - Z_7$	Single 1-of-8 Data Outputs
$Z_{na}$ , $Z_{nb}$	Dual 1-of-4 Data Outputs ( $n = 1...4$ )
VEES	VEE Substrate
VCCA	VCCO for ECL Outputs

**PIN CONFIGURATIONS**



**BLOCK DIAGRAM**



**TRUTH TABLES<sup>(1)</sup>**

Dual 1-of-4 Mode (M = A2a = Hc = LOW)											
Inputs				Active HIGH Outputs (Ha and Hb Inputs HIGH)				Active LOW Outputs (Ha and Hb Inputs LOW)			
$\bar{E}1a, \bar{E}1b$	$\bar{E}2a, \bar{E}2b$	A1a, A1b	A0a, A0b	Z0a, Z0b	Z1a, Z1b	Z2a, Z2b	Z3a, Z3b	Z0a, Z0b	Z1a, Z1b	Z2a, Z2b	Z3a, Z3b
H	X	X	X	L	L	L	L	H	H	H	H
X	H	X	X	L	L	L	L	H	H	H	H
L	L	L	L	H	L	L	L	L	H	H	H
L	L	L	H	L	H	L	L	H	L	H	H
L	L	H	L	L	L	H	L	H	H	L	H
L	L	H	H	L	L	L	H	H	H	H	L

Single 1-of-8 Mode (M = HIGH; A0b = A1b = Ha = Hb = LOW)												
Inputs					Active HIGH Outputs* (Hc Input HIGH)							
$\bar{E}1$	$\bar{E}2$	A2a	A1a	A0a	Z0	Z1	Z2	Z3	Z4	Z5	Z6	Z7
H	X	X	X	X	L	L	L	L	L	L	L	L
X	H	X	X	X	L	L	L	L	L	L	L	L
L	L	L	L	L	H	L	L	L	L	L	L	L
L	L	L	L	H	L	H	L	L	L	L	L	L
L	L	L	H	L	L	L	H	L	L	L	L	L
L	L	L	H	H	L	L	L	H	L	L	L	L
L	L	H	L	L	L	L	L	L	H	L	L	L
L	L	H	L	H	L	L	L	L	L	H	L	L
L	L	H	H	L	L	L	L	L	L	L	H	L
L	L	H	H	H	L	L	L	L	L	L	L	H

**NOTE:**

- 1. H = HIGH Voltage Level
- L = LOW Voltage Level
- X = Don't Care
- \* for Hc = LOW, output states are complemented
- $\bar{E}1 = \bar{E}1a$  and  $\bar{E}1b$  wired;  $\bar{E}2 = \bar{E}2a$  and  $\bar{E}2b$  wired

**DC ELECTRICAL CHARACTERISTICS**

V<sub>EE</sub> = -4.2V to -5.5V unless otherwise specified; V<sub>CC</sub> = V<sub>CCA</sub> = GND

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
I <sub>IH</sub>	Input HIGH Current Hc, A0a, A1a, A2a All Others	—	—	310 250	μA	V <sub>IN</sub> = V <sub>IH</sub> (Max.)
I <sub>EE</sub>	Power Supply Current	-92	-73	-46	mA	Inputs Open

## AC ELECTRICAL CHARACTERISTICS

### CERPACK

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

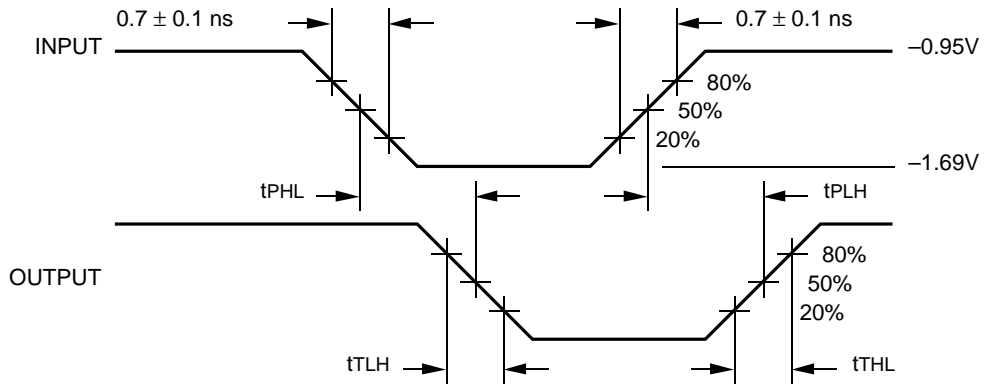
Symbol	Parameter	$T_A = 0^\circ C$		$T_A = +25^\circ C$		$T_A = +85^\circ C$		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
tPLH tPHL	Propagation Delay $\bar{E}_{na}, \bar{E}_{nb}$ to Output	300	1300	300	1300	300	1300	ps	
tPLH tPHL	Propagation Delay $A_{na}, A_{nb}$ to Output	500	1600	500	1600	500	1600	ps	
tPLH tPHL	Propagation Delay $H_a, H_b, H_c$ to Output	500	1600	500	1600	500	1600	ps	
tPLH tPHL	Propagation Delay M to Output	600	2100	600	2100	600	2100	ps	
tTLH tTHL	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	$T_A = 0^\circ C$		$T_A = +25^\circ C$		$T_A = +85^\circ C$		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
tPLH tPHL	Propagation Delay $\bar{E}_{na}, \bar{E}_{nb}$ to Output	300	1200	300	1200	300	1200	ps	
tPLH tPHL	Propagation Delay $A_{na}, A_{nb}$ to Output	500	1500	500	1500	500	1500	ps	
tPLH tPHL	Propagation Delay $H_a, H_b, H_c$ to Output	500	1500	500	1500	500	1500	ps	
tPLH tPHL	Propagation Delay M to Output	600	2100	600	2100	600	2100	ps	
tTLH tTHL	Transition Time 20% to 80%, 80% to 20%	300	900	300	900	300	900	ps	

**TIMING DIAGRAM**



**Propagation Delay and Transition Times**

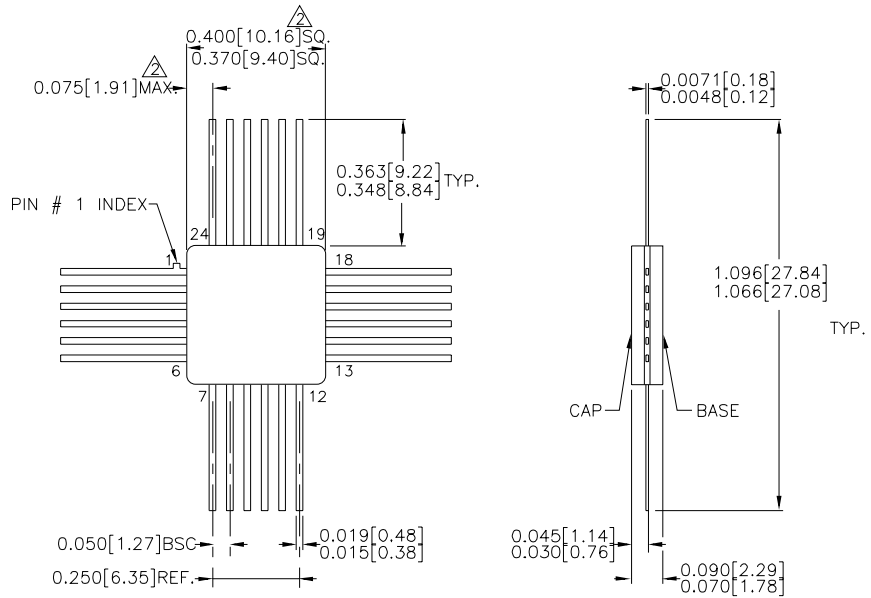
**NOTE:**

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

**PRODUCT ORDERING CODE**

Ordering Code	Package Type	Operating Range
SY100S370FC	F24-1	Commercial
SY100S370JC	J28-1	Commercial
SY100S370JCTR	J28-1	Commercial

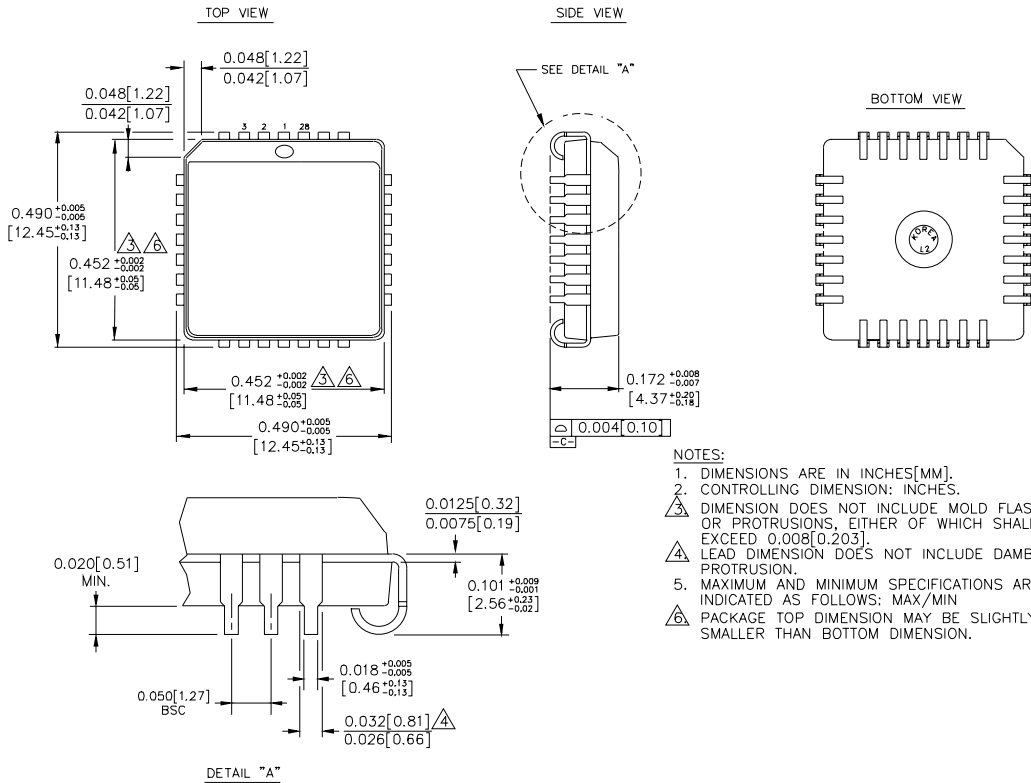
**24 LEAD CERPACK (F24-1)**



- 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**

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