

**FEATURES**

- Input frequencies up to 80MHz
- PECL-to-TTL version of popular ECLinPS E111
- Guaranteed low skew specification
- Latched input
- Differential ECL internal design
- VBB output for single-ended operation
- Single +5V supply
- Reset/enable
- Extra TTL and ECL power/ground pins
- Choice of ECL compatibility: MECL 10KH (10Hxxx) or 100K (100Hxxx)
- ESD protection of 2000V
- Fully compatible with Motorola MC10H641/100H641
- Available in 28-pin PLCC package

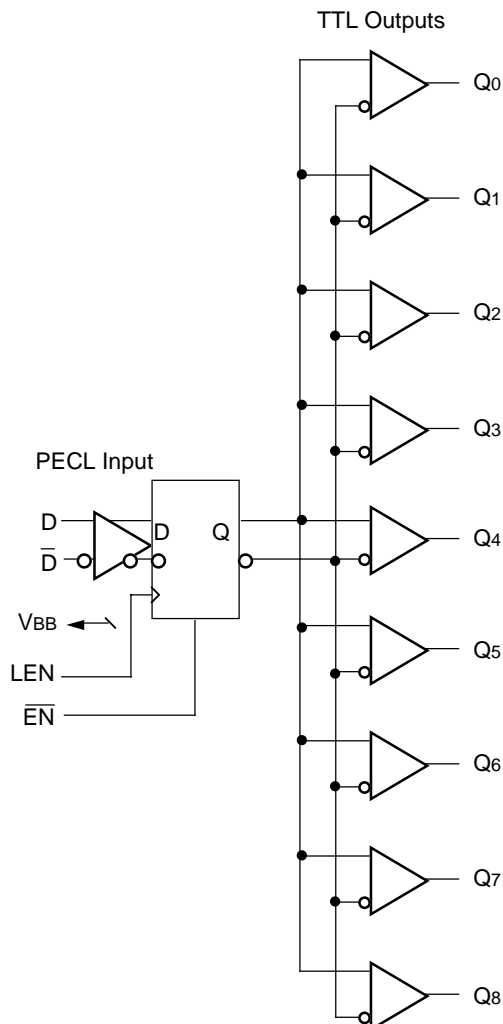
**DESCRIPTION**

The SY10/100H641A are single supply, low skew translating 1:9 clock drivers. Devices in the Synergy H600 translator series utilize the 28-lead PLCC for optimal power pinning, signal flow-through and electrical performance.

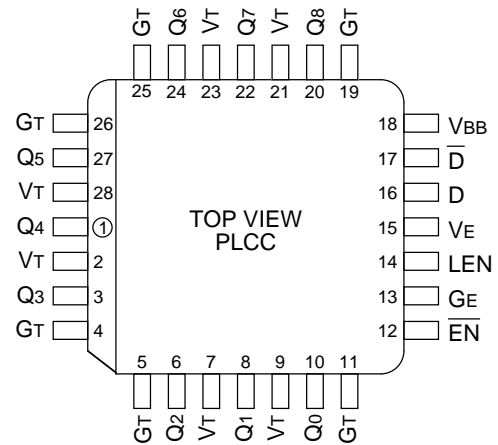
The devices feature a 24mA TTL output stage with AC performance specified into a 50pF load capacitance. A latch is provided on-chip. When LEN is LOW (or left open, in which case it is pulled LOW by the internal pull-downs), the latch is transparent. A HIGH on the enable pin (EN) forces all outputs LOW.

The 10H version is compatible with MECL 10KH ECL logic levels. The 100H version is compatible with 100K levels.

**BLOCK DIAGRAM**



**PIN CONFIGURATION**



**PIN NAMES**

Pin	Function
GT	TTL Ground (0V)
VT	TTL Vcc (+5.0V)
VE	ECL Vcc (+5.0V)
GE	ECL Ground (0V)
D, D-bar	Signal Input (PECL)
VBB	VBB Reference Output (PECL)
Q0 - Q8	Signal Outputs (TTL)
EN	Enable Input (PECL)
LEN	Latch Enable Input (PECL)

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

Symbol	Rating	Value	Unit
V <sub>E</sub> (ECL) V <sub>T</sub> (TTL)	Power Supply Voltage	-0.5 to +7.0 -0.5 to +7.0	V
V <sub>I</sub> (ECL)	Input Voltage	0.0 to V <sub>E</sub>	V
V <sub>OUT</sub> (TTL)	Disabled 3-State Output	0.0 to V <sub>T</sub>	V
I <sub>OUT</sub> (ECL)	Output Current - Continuous - Surge	50 100	mA
T <sub>store</sub>	Storage Temperature	-65 to +150	°C
T <sub>A</sub>	Operating Temperature	0 to +85	°C

### TRUTH TABLE

D	LEN	$\overline{EN}$	Q
L	L	L	L
H	L	L	H
X	H	L	Q <sub>0</sub>
X	X	H	L

**NOTE:**

- Do not exceed.

### VCC AND CLOAD

Ranges to meet duty cycle requirement: 0°C ≤ T<sub>A</sub> ≤ 85°C. Output duty cycle measured relative to 1.5V.

Symbol	Parameter		Min.	Typ.	Max.	Unit	Condition
PW1	Ranges of V <sub>CC</sub> and C <sub>L</sub> to meet min. pulse width (HIGH or LOW) at f <sub>OUT</sub> ≤ 40MHz	V <sub>CC</sub>	4.75	5.0	5.25	V	All Outputs
		C <sub>L</sub>	10	—	50	pF	
		P <sub>w</sub>	11	—	—	ns	
PW2	Ranges of V <sub>CC</sub> and C <sub>L</sub> to meet min. pulse width (HIGH or LOW) at f <sub>OUT</sub> ≤ 50MHz	V <sub>CC</sub>	4.875	5.0	5.125	V	All Outputs
		C <sub>L</sub>	15	—	27	pF	
		P <sub>w</sub>	9.0	—	—	ns	

### DC ELECTRICAL CHARACTERISTICS

V<sub>T</sub> = V<sub>E</sub> = 5.0V ± 5%

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.		
I <sub>EE</sub>	Power Supply Current	ECL	—	30	—	30	—	30	mA	V <sub>E</sub> Pin
I <sub>CC</sub> H		TTL	—	30	—	30	—	30		Total all V <sub>T</sub> pins
I <sub>CC</sub> L		—	37	—	37	—	37			

### TTL DC ELECTRICAL CHARACTERISTICS

V<sub>T</sub> = V<sub>E</sub> = 5.0V ± 5%

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.		
V <sub>OH</sub>	Output HIGH Voltage	2.5	—	2.5	—	2.5	—	V	I <sub>OH</sub> = -15mA
V <sub>OL</sub>	Output LOW Voltage	—	0.5	—	0.5	—	0.5	V	I <sub>OL</sub> = 24mA
I <sub>OS</sub>	Output Short Circuit Current	-100	-225	-100	-225	-100	-225	mA	V <sub>OUT</sub> = 0V

## 10H ECL DC ELECTRICAL CHARACTERISTICS

$V_T = V_E = 5.0V \pm 5\%$

Symbol	Parameter	TA = 0°C		TA = +25°C		TA = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
I <sub>IH</sub>	Input HIGH Current	—	225	—	175	—	175	μA	—
I <sub>IL</sub>	Input LOW Current	0.5	—	0.5	—	0.5	—	μA	—
V <sub>IH</sub>	Input HIGH Voltage <sup>(1)</sup>	3.830	4.160	3.870	4.190	3.940	4.280	V	V <sub>E</sub> = 5.0V
V <sub>IL</sub>	Input LOW Voltage <sup>(1)</sup>	3.050	3.520	3.050	3.520	3.050	3.555	V	V <sub>E</sub> = 5.0V
V <sub>BB</sub>	Output Reference Voltage <sup>(1)</sup>	3.620	3.730	3.650	3.750	3.690	3.810	V	V <sub>E</sub> = 5.0V

**NOTE:**

1. V<sub>IH</sub>, V<sub>IL</sub> and V<sub>BB</sub> are referenced to V<sub>E</sub> and will vary 1:1 with the power supply. The levels shown are for V<sub>E</sub> = +5.0V.

## 100H ECL DC ELECTRICAL CHARACTERISTICS

$V_T = V_E = 5.0V \pm 5\%$

Symbol	Parameter	TA = 0°C		TA = +25°C		TA = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
I <sub>IH</sub>	Input HIGH Current	—	225	—	175	—	175	μA	—
I <sub>IL</sub>	Input LOW Current	0.5	—	0.5	—	0.5	—	μA	—
V <sub>IH</sub>	Input HIGH Voltage <sup>(1)</sup>	3.835	4.120	3.835	4.120	3.835	4.120	V	V <sub>E</sub> = 5.0V
V <sub>IL</sub>	Input LOW Voltage <sup>(1)</sup>	3.190	3.525	3.190	3.525	3.190	3.525	V	V <sub>E</sub> = 5.0V
V <sub>BB</sub>	Output Reference Voltage <sup>(1)</sup>	3.620	3.740	3.620	3.740	3.620	3.740	V	V <sub>E</sub> = 5.0V

**NOTE:**

1. V<sub>IH</sub>, V<sub>IL</sub> and V<sub>BB</sub> are referenced to V<sub>E</sub> and will vary 1:1 with the power supply. The levels shown are for V<sub>E</sub> = +5.0V.

## AC ELECTRICAL CHARACTERISTICS

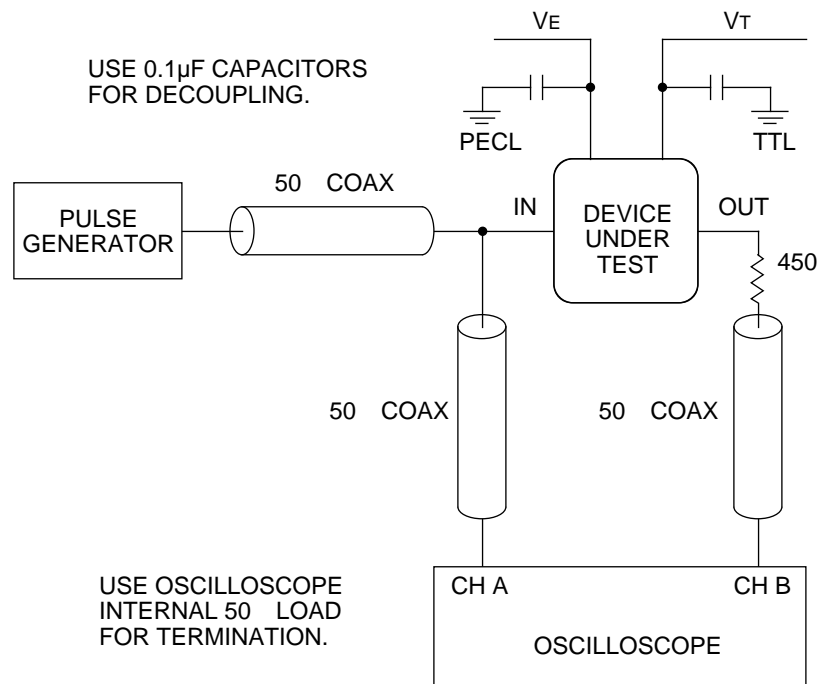
$V_T = V_E = 5.0V \pm 5\%$

Symbol	Parameter	TA = 0°C		TA = +25°C		TA = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay D to Output	5.0	6.0	5.0	6.0	5.0	6.0	ns	CL = 50pF
t <sub>skpp</sub>	Part-to-Part Skew <sup>(1,4)</sup>	—	0.5	—	0.5	—	0.5	ns	CL = 50pF
t <sub>skew++</sub>	Within-Device Skew <sup>(2,4)</sup>	—	0.3	—	0.3	—	0.3	ns	CL = 50pF
t <sub>skew--</sub>	Within-Device Skew <sup>(3,4)</sup>	—	0.3	—	0.3	—	0.3	ns	CL = 50pF
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay LEN to Output	4.9	6.9	4.9	6.9	5.0	7.0	ns	CL = 50pF
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay EN to Output	5.0	7.0	4.9	6.9	5.0	7.0	ns	CL = 50pF
t <sub>r</sub> t <sub>f</sub>	Output Rise/Fall Time 0.8V to 2.0V	—	1.7	—	1.7	—	1.7	ns	CL = 50pF
f <sub>MAX</sub>	Maximum Input Frequency <sup>(5,6)</sup>	80	—	80	—	80	—	MHz	CL = 50pF
—	Pulse Width	1.5	—	1.5	—	1.5	—	ns	—
—	Recovery Time	1.25	—	1.25	—	1.25	—	ns	—
t <sub>S</sub>	Set-up Time	0.5 (typ.)		0.5 (typ.)		0.5 (typ.)		ns	—
t <sub>H</sub>	Hold Time	0.5 (typ.)		0.5 (typ.)		0.5 (typ.)		ns	—

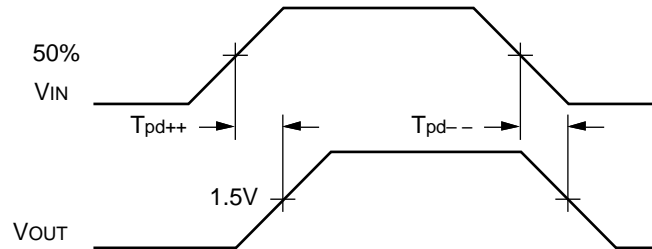
**NOTES:**

- Device-to-Device Skew considering HIGH-to-HIGH transitions at common power supply voltage.
- Within-Device Skew considering HIGH-to-HIGH transitions at common power supply voltage.
- Within-Device Skew considering LOW-to-LOW transitions at common power supply voltage.
- All skew parameters are guaranteed but not tested.
- Frequency at which output levels will meet a 0.8V to 2.0V minimum swing.
- The f<sub>MAX</sub> value is specified as the minimum guaranteed maximum frequency. Actual operational maximum frequency may be greater.

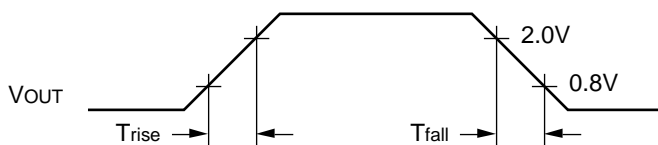
## TTL SWITCHING CIRCUIT



## ECL/TTL PROPAGATION DELAY — SINGLE ENDED



## ECL/TTL WAVEFORMS: RISE AND FALL TIMES



## PRODUCT ORDERING CODE

Ordering Code	Package Type	Operating Range
SY10H641AJC	J28-1	Commercial
SY10H641AJCTR	J28-1	Commercial
SY100H641AJC	J28-1	Commercial
SY100H641AJCTR	J28-1	Commercial

**28 LEAD PLASTIC LEADED CHIP CARRIER (J28-1)**

FILE/REV #: PD0008A03

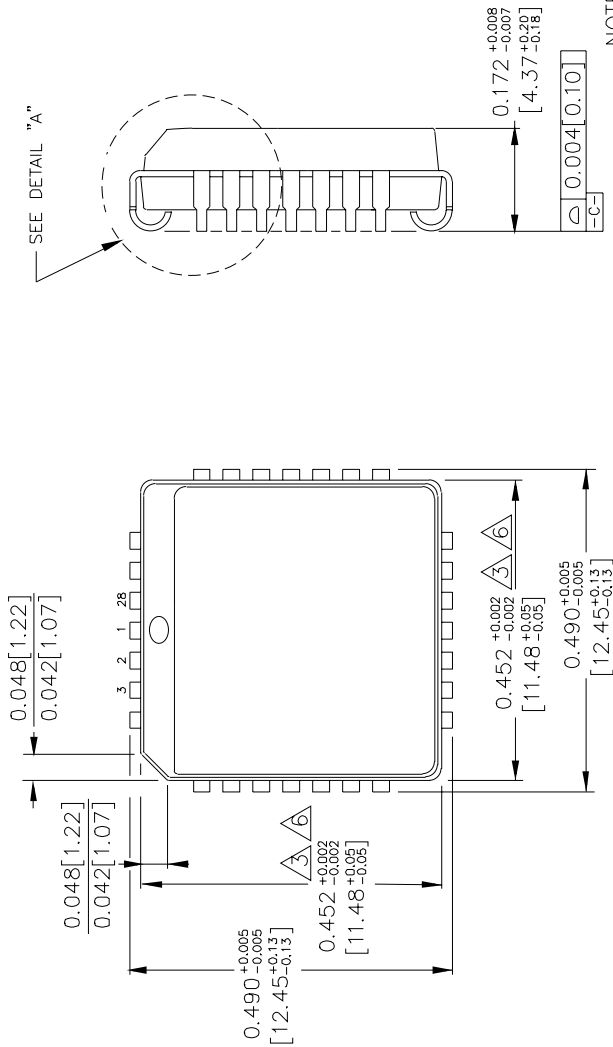
PD/0008/ASCORP

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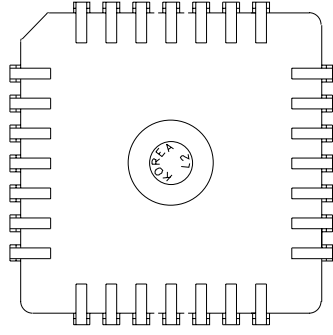
REV.	REVISION DESCRIPTION	DATE
01	CONVERT TO DESIGNER VERSION 4.0 FORMAT. ADD COVER PAGE TO SPEC. CHANGE BODY WIDTH DIMENSION FROM 0.450[1.43] TO 0.443[11.25]. TYPOGRAPHICAL ERROR.	08/18/94
02	CONVERT DWG FROM DESIGNER TO AUTOCAD. REL. 12. REFERENCE AMKOR.DWG. NO. 34855. REV. 00.	02/22/96
03	CONVERT DWG TO REL. 13 AND ONE PAGE DOCUMENT.	02/18/98

TOP VIEW

SIDE VIEW

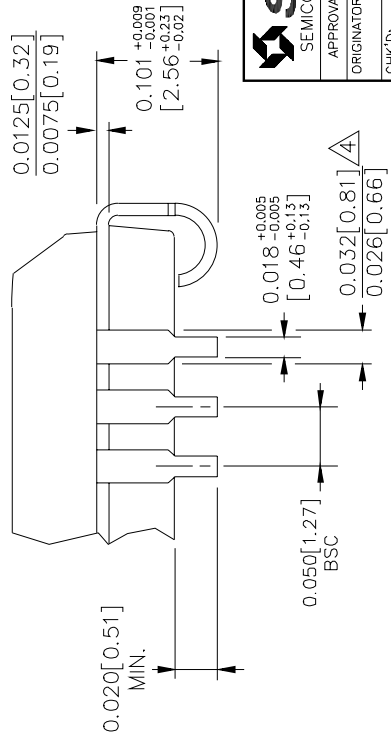


BOTTOM VIEW



**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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APPROVALS	DATE	APPROVALS	DATE	SIZE	SCALE
ORIGINATOR:	02/23/98	QUALITY:		A	28 LEAD PLCC
CHK'D:		DOCUMENT CONTROL:			PACKAGE OUTLINE
RELEASE DATE:					THESE SPECIFICATIONS ARE THE PROPERTY OF SYNERGY SEMICONDUCTOR. ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE REPRODUCED, COPIED, OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.
					SCALE N/A
					REVISION 03