

FEATURES

- Input frequencies up to 135MHz
- PECL-to-TTL version of popular ECLinPS E111
- Guaranteed low skew specification
- Latched input
- Differential internal design
- V_{BB} output VECL 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)
- Available in 28-pin PLCC package



Precision Edge®

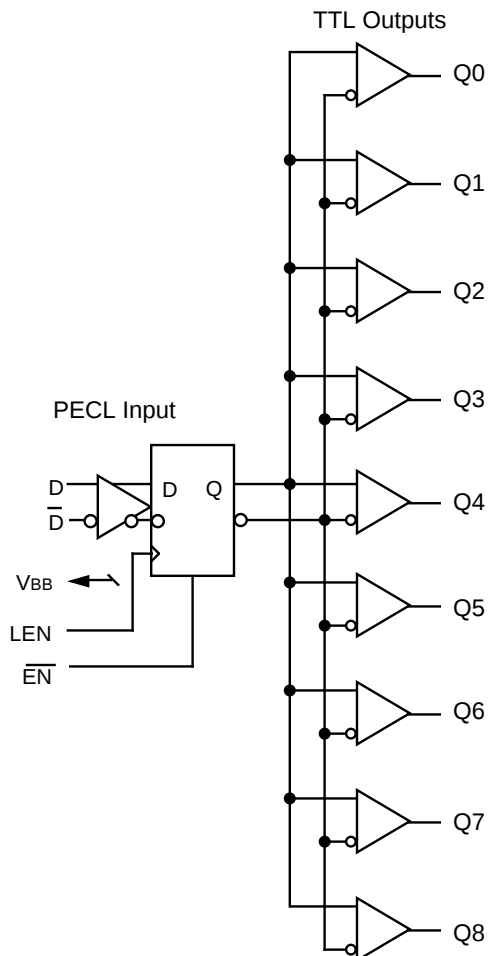
DESCRIPTION

The SY10/100H641 are single supply, low skew translating 1:9 clock drivers. Devices in the Micrel 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 ($\overline{EN}$) forces all outputs LOW.

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

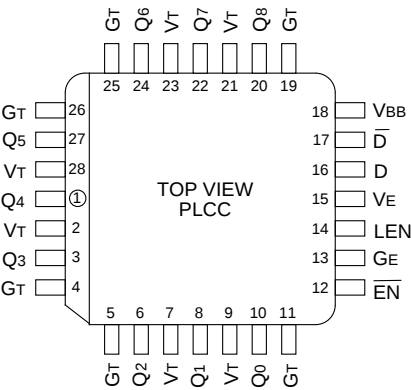
BLOCK DIAGRAM



PIN NAMES

Pin	Function
G _T	TTL Ground (0V)
V _T	TTL V _{cc} (+5.0V)
V _E	ECL V _{cc} (+5.0V)
G _E	ECL Ground (0V)
D, $\overline{D}$	Signal Input (PECL)
V _{BB}	V _{BB} Reference Output (PECL)
Q ₀ - Q ₈	Signal Outputs (TTL)
$\overline{EN}$	Enable Input (PECL)
LEN	Latch Enable Input (PECL)

PACKAGE/ORDERING INFORMATION



28-Pin PLCC (J28-1)

Ordering Information⁽¹⁾

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10H641JC	J28-1	Commercial	SY10H641JC	Sn-Pb
SY10H641JCTR ⁽²⁾	J28-1	Commercial	SY10H641JC	Sn-Pb
SY100H641JC	J28-1	Commercial	SY100H641JC	Sn-Pb
SY100H641JCTR ⁽²⁾	J28-1	Commercial	SY100H641JC	Sn-Pb
SY10H641JZ ⁽³⁾	J28-1	Commercial	SY10H641JZ with Pb-Free bar-line indicator	Matte-Sn
SY10H641JZTR ^(2, 3)	J28-1	Commercial	SY10H641JZ with Pb-Free bar-line indicator	Matte-Sn
SY100H641JZ ⁽³⁾	J28-1	Commercial	SY100H641JZ with Pb-Free bar-line indicator	Matte-Sn
SY100H641JZTR ^(2, 3)	J28-1	Commercial	SY100H641JZ with Pb-Free bar-line indicator	Matte-Sn

Notes:

- 1. Contact factory for die availability. Dice are guaranteed at T_A = 25°C, DC Electricals only.
- 2. Tape and Reel.
- 3. Pb-Free package is recommended for new designs.

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

Symbol	Rating	Value	Unit
V _E (ECL) V _T (TTL)	Power Supply Voltage	−0.5 to +7.0 −0.5 to +7.0	V
V _I (ECL)	Input Voltage	0.0 to V _{EE}	V
V _{OUT} (TTL)	Disabled 3-State Output	0.0 to V _{CC} T	V
I _{OUT} (ECL)	Output Current - Continuous - Surge	50 100	mA
T _{LEAD}	Lead Temperature Range (soldering, 20sec)	+260	°C
T _{store}	Storage Temperature	−65 to +150	°C
T _A	Operating Temperature	0 to +85	°C

Note:

1. Do not exceed.

TRUTH TABLE

D	LEN	$\overline{\text{EN}}$	Q
L	L	L	L
H	L	L	H
X	H	L	Q ₀
X	X	H	L

VCC AND CLOAD

Ranges to meet duty cycle requirement: 0°C ≤ T_A ≤ 85°C. Output duty cycle measured relative to 1.5V.

Symbol	Parameter		Min.	Typ.	Max.	Unit	Condition
Pw1	Ranges of V _{CC} and C _L to meet min. pulse width (HIGH or LOW) at f _{OUT} ≤ 40MHz	V _{CC} C _L Pw	4.75 10 11	5.0 — —	5.25 50 —	V pF ns	All Outputs
Pw2	Ranges of V _{CC} and C _L to meet min. pulse width (HIGH or LOW) at f _{OUT} ≤ 50MHz	V _{CC} C _L Pw	4.875 15 9.0	5.0 — —	5.125 27 —	V pF ns	All Outputs

DC ELECTRICAL CHARACTERISTICS

V_T = V_E = 5.0V ± 5%

Symbol	Parameter		T _A = 0°C		T _A = +25°C		T _A = +85°C		Unit	Condition
			Min.	Max.	Min.	Max.	Min.	Max.		
I _{EE}	Power Supply Current	ECL	—	30	—	30	—	30	mA	V _E Pin
I _{CC} H		TTL	—	30	—	30	—	30		Total all V _T pins
I _{CC} L			—	35	—	35	—	35		

TTL DC ELECTRICAL CHARACTERISTICS

V_T = V_E = 5.0V ± 5%

Symbol	Parameter	T _A = 0°C		T _A = +25°C		T _A = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
V _{OH}	Output HIGH Voltage	2.0	—	2.0	—	2.0	—	V	I _{OH} = −15mA
V _{OL}	Output LOW Voltage	—	0.5	—	0.5	—	0.5	V	I _{OL} = 24mA
I _{OS}	Output Short Circuit Current	−100	−225	−100	−225	−100	−225	mA	V _{OUT} = 0V

10H ECL DC ELECTRICAL CHARACTERISTICS

VT = VE = 5.0V ± 5%

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

Note:1. V_{IH}, V_{IL} and V_{BB} are referenced to V_E and will vary 1:1 with the power supply. The levels shown are for V_E = +5.0V.**100H ECL DC ELECTRICAL CHARACTERISTICS**

VT = VE = 5.0V ± 5%

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

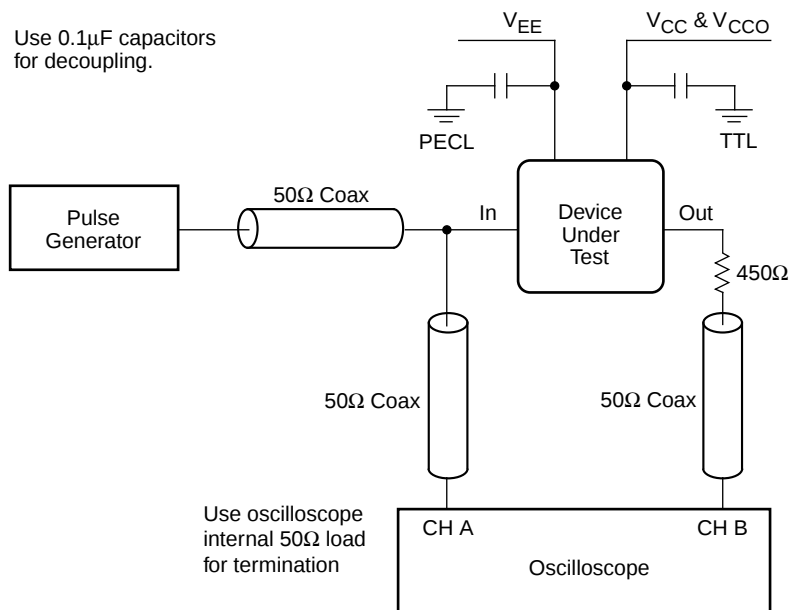
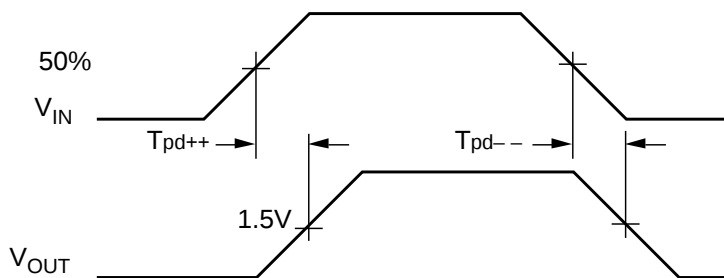
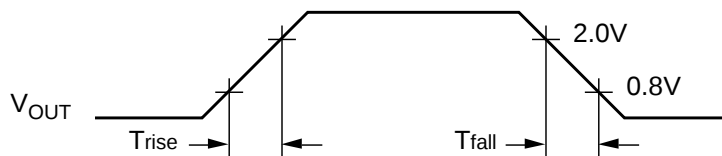
Note:1. V_{IH}, V_{IL} and V_{BB} are referenced to V_E and will vary 1:1 with the power supply. The levels shown are for V_E = +5.0V.**AC ELECTRICAL CHARACTERISTICS**

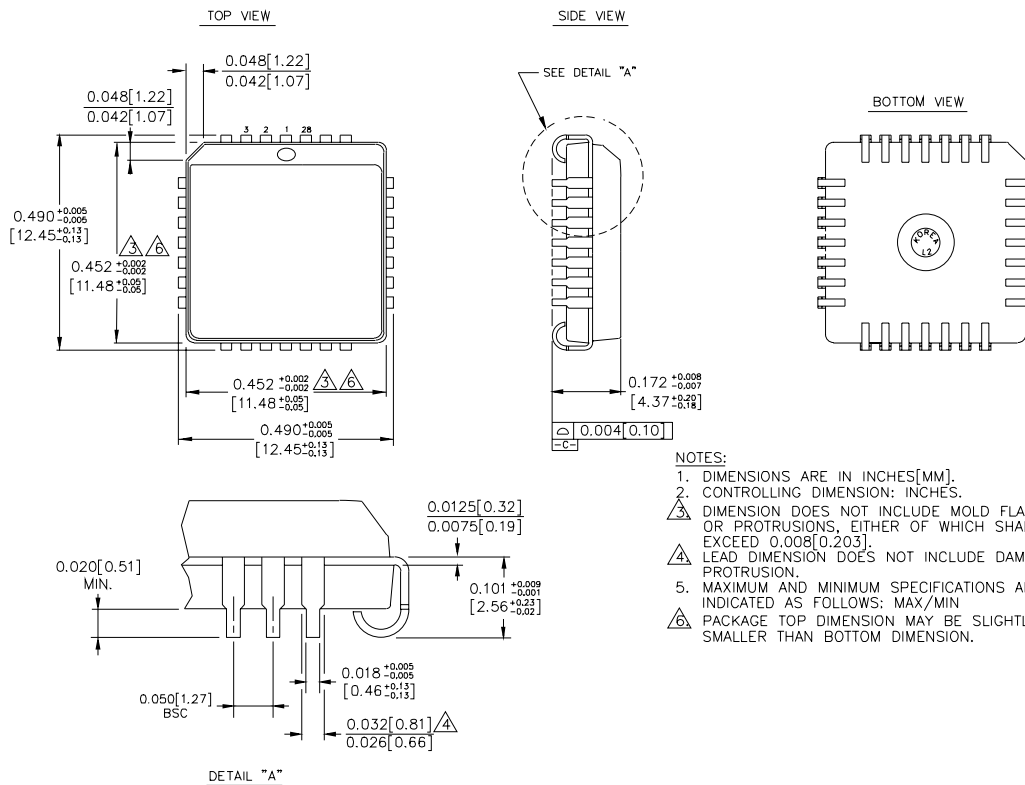
VT = VE = 5.0V ± 5%

Symbol	Parameter	TA = 0°C		TA = +25°C		TA = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
t _{PD}	Propagation Delay D to Output	5.0	6.0	4.8	5.8	5.3	6.3	ns	CL = 50pF
t _{skpp}	Part-to-Part Skew ^(1,4)	—	1.0	—	1.0	—	1.0	ns	CL = 50pF
t _{skew++}	Within-Device Skew ^(2,4)	—	0.5	—	0.5	—	0.5	ns	CL = 50pF
t _{skew--}	Within-Device Skew ^(3,4)	—	0.5	—	0.5	—	0.5	ns	CL = 50pF
t _{PLH} t _{PHL}	Propagation Delay LEN to Output	4.9	6.9	4.9	6.9	5.0	7.0	ns	CL = 50pF
t _{PLH} t _{PHL}	Propagation Delay EN to Output	5.0	7.0	4.9	6.9	5.0	7.0	ns	CL = 50pF
t _r t _f	Output Rise/Fall Time 0.8V to 2.0V	—	1.7 1.6	—	1.7 1.6	—	1.7 1.6	ns	CL = 50pF
f _{MAX}	Maximum Input Frequency ^(5,6)	135	—	135	—	135	—	MHz	CL = 50pF
—	Pulse Width	1.5	—	1.5	—	1.5	—	ns	—
—	Recovery Time	1.25	—	1.25	—	1.25	—	ns	—
t _S	Set-up Time	0.5 (typ.)		0.5 (typ.)		0.5 (typ.)		ns	—
t _H	Hold Time	0.5 (typ.)		0.5 (typ.)		0.5 (typ.)		ns	—

Notes:

1. Device-to-Device Skew considering HIGH-to-HIGH transitions at common power supply voltage.
2. Within-Device Skew considering HIGH-to-HIGH transitions at common power supply voltage.
3. Within-Device Skew considering LOW-to-LOW transitions at common power supply voltage.
4. All skew parameters are guaranteed but not tested.
5. Frequency at which output levels will meet a 0.8V to 2.0V minimum swing.
6. The f_{MAX} 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**

28-PIN PLCC (J28-1)

Rev. 03

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