

## FEATURES

- 3.3V power supply
- PECL-to-TTL version of popular ECLinPS E111
- Guaranteed low skew specification
- Latched input
- Differential ECL internal design
- VBB output for single-ended operation
- 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®

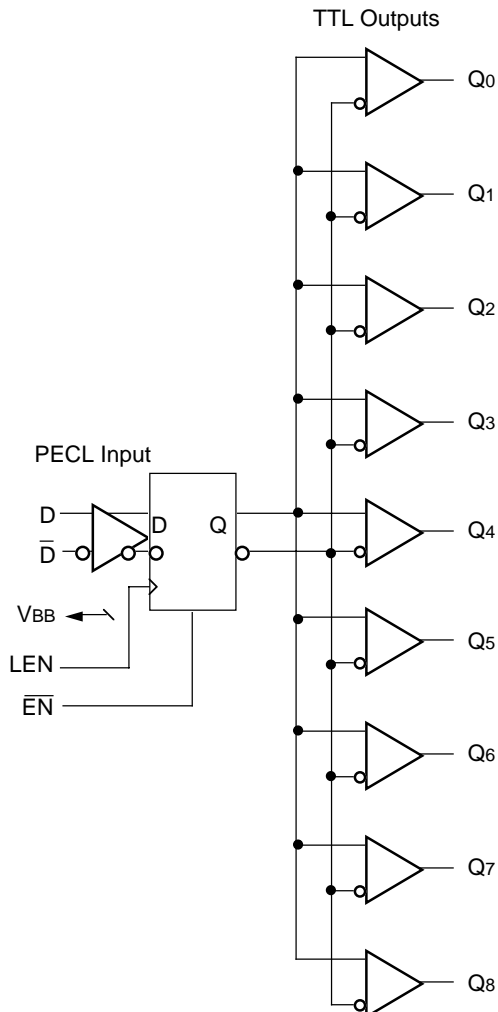
## DESCRIPTION

The SY10/100H641L 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 20pF 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.

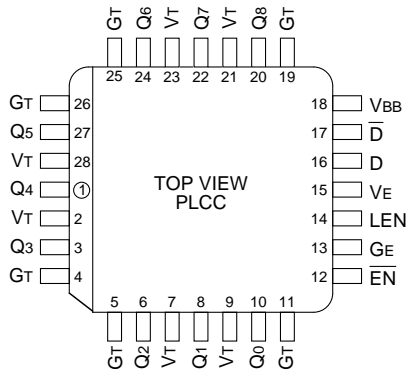
## BLOCK DIAGRAM



## PIN NAMES

Pin	Function
GT	TTL Ground (0V)
VT	TTL Vcc (+3.0V)
VE	ECL Vcc (+3.0V)
GE	ECL Ground (0V)
D, /D	Signal Input (PECL)
VBB	VBB Reference Output (PECL)
Q0 – Q8	Signal Outputs (TTL)
/EN	Enable Input (PECL)
LEN	Latch Enable Input (PECL)

**PACKAGE/ORDERING INFORMATION**



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

**Ordering Information<sup>(1)</sup>**

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10H641LJC	J28-1	Commercial	SY10H641LJC	Sn-Pb
SY10H641LJCTR <sup>(2)</sup>	J28-1	Commercial	SY10H641LJC	Sn-Pb
SY100H641LJC	J28-1	Commercial	SY100H641LJC	Sn-Pb
SY100H641LJCTR <sup>(2)</sup>	J28-1	Commercial	SY100H641LJC	Sn-Pb
SY10H641LJZ <sup>(3)</sup>	J28-1	Commercial	SY10H641LJZ with Pb-Free bar-line indicator	Matte-Sn
SY10H641LJZTR <sup>(2, 3)</sup>	J28-1	Commercial	SY10H641LJZ with Pb-Free bar-line indicator	Matte-Sn
SY100H641LJZ <sup>(3)</sup>	J28-1	Commercial	SY100H641LJZ with Pb-Free bar-line indicator	Matte-Sn
SY100H641LJZTR <sup>(2, 3)</sup>	J28-1	Commercial	SY100H641LJZ with Pb-Free bar-line indicator	Matte-Sn

**Notes:**

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

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

Symbol	Rating	Value	Unit
VE (ECL) VT (TTL)	Power Supply Voltage	-0.5 to +7.0 -0.5 to +7.0	V
VI (ECL)	Input Voltage	0.0 to VE	V
VOUT (TTL)	Disabled 3-State Output	0.0 to VT	V
IOUT (ECL)	Output Current - Continuous - Surge	50 100	mA
TLEAD	Lead Temperature Range (soldering, 20sec)	+260	°C
Tstore	Storage Temperature	-65 to +150	°C
TA	Operating Temperature	0 to +85	°C

**TRUTH TABLE**

D	LEN	/EN	Q
L	L	L	L
H	L	L	H
X	H	L	Q0
X	X	H	L

**Note:**

1. Do not exceed.

**DC ELECTRICAL CHARACTERISTICS**

VT = VE = +3.0V to +3.6V

Symbol	Parameter		TA = 0°C		TA = +25°C		TA = +85°C		Unit	Condition
			Min.	Max.	Min.	Max.	Min.	Max.		
IEE	Power Supply Current	ECL	—	30	—	30	—	30	mA	VE Pin
ICCH		TTL	—	30	—	30	—	30		Total all VT pins
ICCL			—	35	—	35	—	35		

**TTL DC ELECTRICAL CHARACTERISTICS**

VT = VE = +3.0V to +3.6V

Symbol	Parameter	TA = 0°C		TA = +25°C		TA = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
VOH	Output HIGH Voltage	2.0	—	2.0	—	2.0	—	V	IOH = -3.0mA
VOL	Output LOW Voltage	—	0.5	—	0.5	—	0.5	V	IOL = 24mA
Ios	Output Short Circuit Current	-100	—	-100	—	-100	—	mA	VOUT = 0V

**10H ECL DC ELECTRICAL CHARACTERISTICS**

VT = VE = +3.0V to +3.6V

Symbol	Parameter	TA = 0°C		TA = +25°C		TA = +85°C		Unit	Condition
		Min.	Max.	Min.	Max.	Min.	Max.		
IiH	Input HIGH Current	—	225	—	175	—	175	µA	—
IiL	Input LOW Current	0.5	—	0.5	—	0.5	—	µA	—
ViH	Input HIGH Voltage <sup>(1)</sup>	2.130	2.460	2.170	2.490	2.240	2.580	V	VE = 3.3V
ViL	Input LOW Voltage <sup>(1)</sup>	1.350	1.820	1.350	1.820	1.350	1.855	V	VE = 3.3V
VBB	Output Reference Voltage <sup>(1)</sup>	1.920	2.030	1.950	2.050	1.990	2.110	V	VE = 3.3V

**Note:**

1. ViH, ViL and VBB are referenced to VE and will vary 1:1 with the power supply. The levels shown are for VE = +3.3V.

**100H ECL DC ELECTRICAL CHARACTERISTICS**

VT = VE = +3.0V to +3.6V

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>	2.135	2.420	2.135	2.420	2.135	2.420	V	VE = 3.3V
V <sub>IL</sub>	Input LOW Voltage <sup>(1)</sup>	1.490	1.825	1.490	1.825	1.490	1.825	V	VE = 3.3V
V <sub>BB</sub>	Output Reference Voltage <sup>(1)</sup>	1.920	2.040	1.920	2.040	1.920	2.040	V	VE = 3.3V

**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> = +3.3V.

**AC ELECTRICAL CHARACTERISTICS**

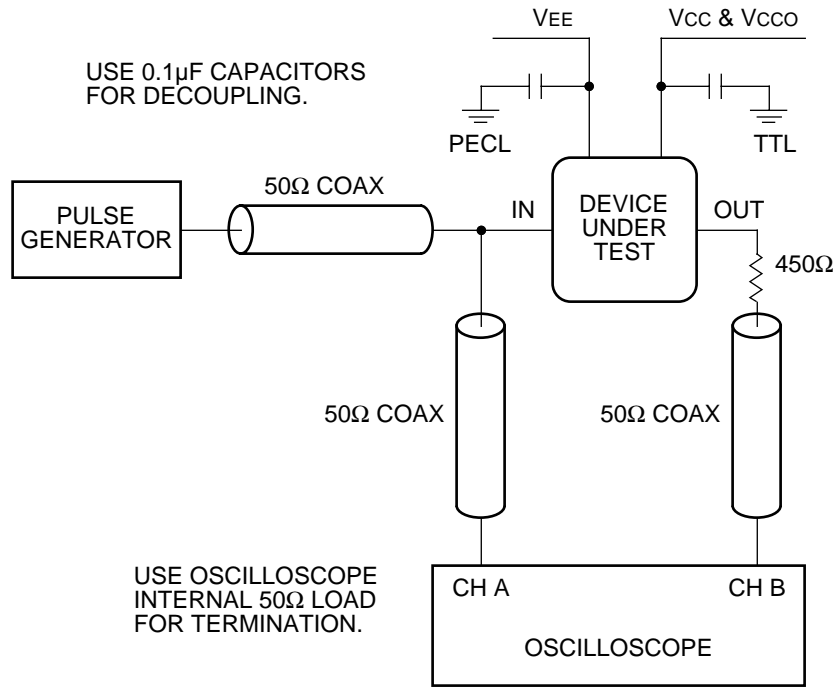
VT = VE = +3.0V to +3.6V

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	2.0	3.0	2.0	3.0	2.0	3.0	ns	CL = 20pF
t <sub>skpp</sub>	Part-to-Part Skew <sup>(1,4)</sup>	—	0.5	—	0.5	—	0.5	ns	CL = 20pF
t <sub>skew++</sub> t <sub>skew--</sub>	Within-Device Skew <sup>(2,3,4)</sup>	—	0.3 <sup>(7)</sup> 0.35 <sup>(8)</sup>	—	0.3 <sup>(7)</sup> 0.35 <sup>(8)</sup>	—	0.3 <sup>(7)</sup> 0.35 <sup>(8)</sup>	ns	CL = 20pF CL = 20pF
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay LEN to Output	2.0	3.5	2.0	3.5	2.0	3.5	ns	CL = 20pF
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay /EN to Output	2.0	3.5	2.0	3.5	2.0	3.5	ns	CL = 20pF
t <sub>r</sub> t <sub>f</sub>	Output Rise/Fall Time 1.0V to 2.0V	—	1.7 1.6	—	1.7 1.6	—	1.7 1.6	ns	CL = 20pF
f <sub>MAX</sub>	Maximum Input Frequency <sup>(5,6)</sup>	135	—	135	—	135	—	MHz	
—	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	—

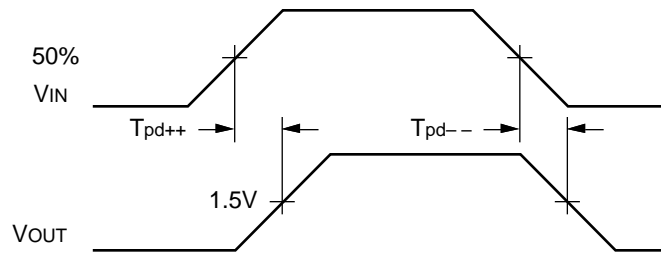
**Notes:**

1. Device-to-Device Skew considering HIGH-to-HIGH transitions at common V<sub>CC</sub> level.
2. Within-Device Skew considering HIGH-to-HIGH transitions at common V<sub>CC</sub> level.
3. Within-Device Skew considering LOW-to-LOW transitions at common V<sub>CC</sub> level.
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<sub>MAX</sub> value is specified as the minimum guaranteed maximum frequency. Actual operational maximum frequency may be greater.
7. VT = VE = +3.15V to +3.45V, (i.e. VE +/- 5%).
8. VT = VE = +3.0V to +3.6V, (i.e. VE +/- 10%).

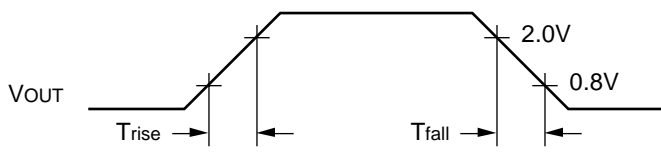
**TTL SWITCHING CIRCUIT**



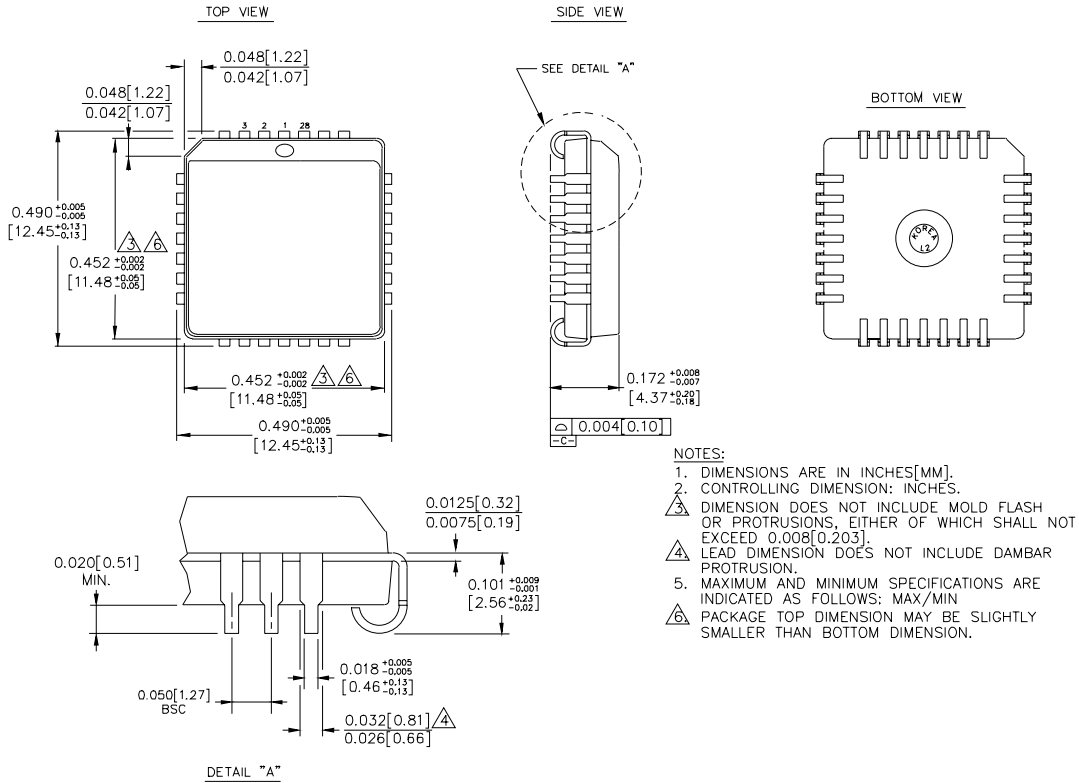
**ECL/TTL PROPAGATION DELAY — SINGLE ENDED**



**ECL/TTL WAVEFORMS: RISE AND FALL TIMES**



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



Rev. 03

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