

## FEATURES

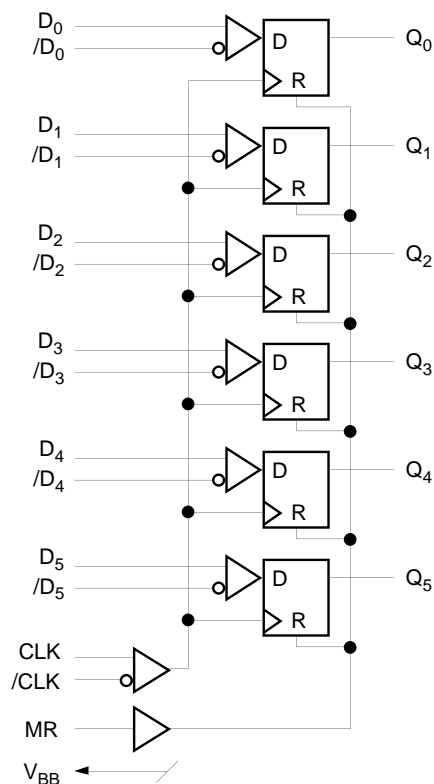
- 1100MHz min. toggle frequency
- Extended 100E  $V_{EE}$  range of  $-4.2V$  to  $-5.5V$
- Differential inputs: data and clock
- $V_{BB}$  output for single-ended use
- Asynchronous Master Reset
- Fully compatible with industry standard 10KH, 100K ECL levels
- Internal 75K $\Omega$  input pulldown resistors
- Fully compatible with Motorola MC10E/100E451
- Available in 28-pin PLCC package

## DESCRIPTION

The SY10/100E451 offer six D-type flip-flops with single-ended outputs and differential data and clock inputs, designed for use in new, high-performance ECL systems. The registers are triggered by the rising edge of the CLK input.

A logic HIGH on the Master Reset (MR) input resets all outputs to a logic LOW. The  $V_{BB}$  output is provided for use as a reference voltage for single-ended reception of ECL signals to that device only. When used for this purpose, it is recommended that  $V_{BB}$  is decoupled to  $V_{CC}$  via a 0.01 $\mu F$  capacitor.

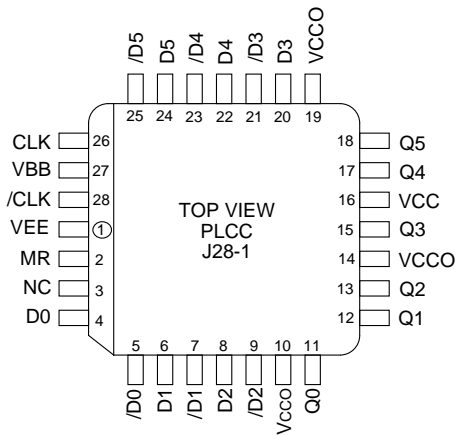
## BLOCK DIAGRAM



## PIN NAMES

Pin	Function
D0–D5	+ Data Input
/D0–/D5	– Data Input
CLK	+ Clock Input
/CLK	– Clock Input
Q0–Q5	Data Outputs
MR	Master Reset Input
$V_{BB}$	$V_{BB}$ Output
$V_{CCO}$	$V_{CC}$ to Output

**PACKAGE/ORDERING INFORMATION**



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

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

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY10E451JI	J28-1	Industrial	SY10E451JI	Sn-Pb
SY10E451JITR <sup>(2)</sup>	J28-1	Industrial	SY10E451JI	Sn-Pb
SY100E451JI	J28-1	Industrial	SY100E451JI	Sn-Pb
SY100E451JITR <sup>(2)</sup>	J28-1	Industrial	SY100E451JI	Sn-Pb
SY10E451JC	J28-1	Commercial	SY10E451JC	Sn-Pb
SY10E451JCTR <sup>(2)</sup>	J28-1	Commercial	SY10E451JC	Sn-Pb
SY100E451JC	J28-1	Commercial	SY100E451JC	Sn-Pb
SY100E451JCTR <sup>(2)</sup>	J28-1	Commercial	SY100E451JC	Sn-Pb
SY10E451JY <sup>(3)</sup>	J28-1	Industrial	SY10E451JY with Pb-Free bar-line indicator	Matte-Sn
SY10E451JYTR <sup>(2, 3)</sup>	J28-1	Industrial	SY10E451JY with Pb-Free bar-line indicator	Matte-Sn
SY100E451JY <sup>(3)</sup>	J28-1	Industrial	SY100E451JY with Pb-Free bar-line indicator	Matte-Sn
SY100E451JYTR <sup>(2, 3)</sup>	J28-1	Industrial	SY100E451JY 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.

**DC ELECTRICAL CHARACTERISTICS** $V_{EE} = V_{EE} \text{ (Min.) to } V_{EE} \text{ (Max.)}; V_{CC} = V_{CCO} = \text{GND}$ 

Symbol	Parameter	TA = -40°C			TA = 0°C			TA = 25°C			TA = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
V <sub>BB</sub>	Output Reference Voltage	10E			-1.38	—	-1.27	-1.35	—	-1.25	-1.31	—	-1.19	V
		100E			-1.38	—	-1.26	-1.38	—	-1.26	-1.38	—	-1.26	
I <sub>IH</sub>	Input HIGH Current				—	—	150	—	—	150	—	—	150	μA
I <sub>EE</sub>	Power Supply Current	10E			—	84	101	—	84	101	—	84	101	mA
		100E			—	84	101	—	84	101	—	97	116	
V <sub>CMR</sub>	Common Mode Range <sup>(1)</sup>				-2.0	—	-0.4	-2.0	—	-0.4	-2.0	—	-0.4	V

**Note:**

- V<sub>CMR</sub> is referenced to the most positive side of the differential input signal. Normal operation is obtained when the "HIGH" input is within the V<sub>CMR</sub> range and the input swing is greater than V<sub>pp</sub> (min) and < 1V.

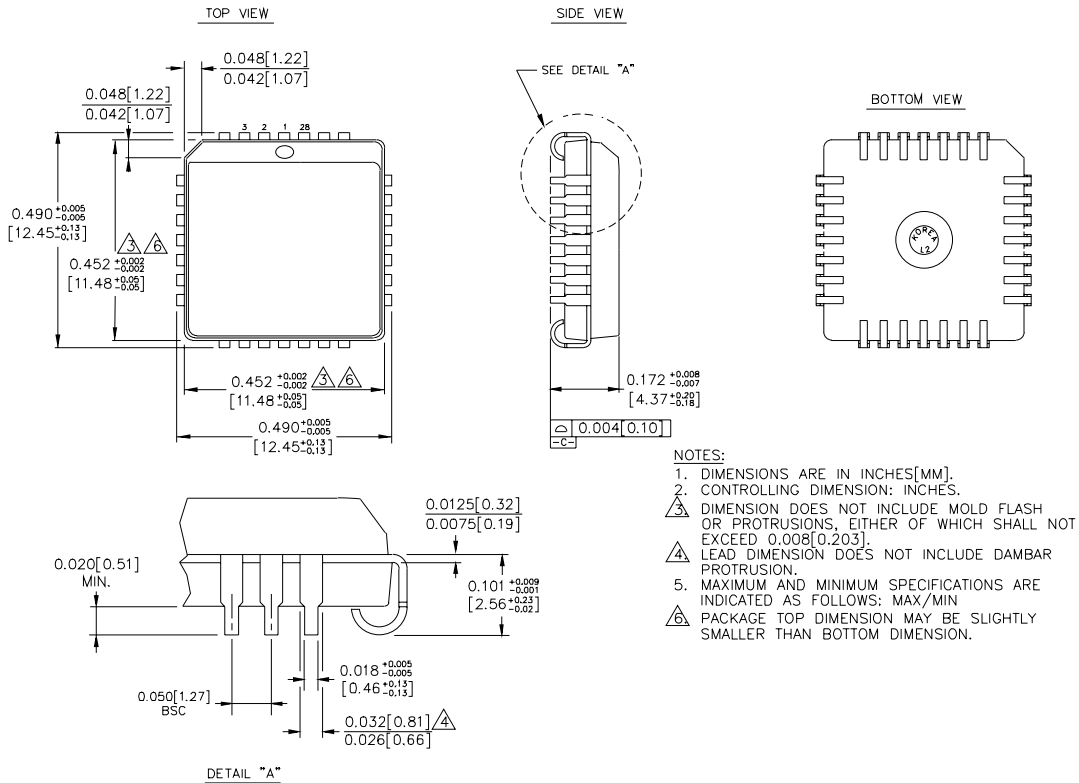
**AC ELECTRICAL CHARACTERISTICS** $V_{EE} = V_{EE} \text{ (Min.) to } V_{EE} \text{ (Max.)}; V_{CC} = V_{CCO} = \text{GND}$ 

Symbol	Parameter	TA = -40°C			TA = 0°C			TA = 25°C			TA = +85°C			Unit	
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
f <sub>MAX</sub>	Max. Toggle Frequency				1100	1400	—	1100	1400	—	1100	1400	—	MHz	
t <sub>PD</sub>	Propagation Delay to Output				CLK (Diff)	475	650	800	475	650	800	475	650	800	ps
					CLK (SE)	425	650	850	425	650	850	425	650	850	
					MR	425	600	850	425	600	850	425	600	850	
t <sub>S</sub>	Set-up Time	D			150	-100	—	150	-100	—	150	-100	—	ps	
t <sub>H</sub>	Hold Time	D			250	100	—	250	100	—	250	100	—	ps	
V <sub>PP (AC)</sub>	Minimum Input Swing <sup>(1)</sup>				150	—	—	150	—	—	150	—	—	mV	
t <sub>RR</sub>	Reset Recovery Time				750	600	—	750	600	—	750	600	—	ps	
t <sub>PW</sub>	Minimum Pulse Width				400	—	—	400	—	—	400	—	—	ps	
t <sub>skew</sub>	Within-Device Skew <sup>(2)</sup>				—	100	—	—	100	—	—	100	—	ps	
t <sub>r</sub> t <sub>f</sub>	Rise/Fall Time				275	450	800	275	450	800	275	450	800	ps	
	20% to 80%														

**Notes:**

- Minimum input voltage for which AC parameters are guaranteed.
- Within-device skew is defined as identical transitions on similar paths through a device.

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



Rev. 03

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