

## FEATURES

- Differential D, CLK and Q
- Extended 100E VEE range of -4.2V to -5.5V
- VBB output for single-ended use
- 1100MHz min. toggle frequency
- Asynchronous Master Reset
- Fully compatible with Motorola MC10E/100E452
- Available in 28-pin PLCC package

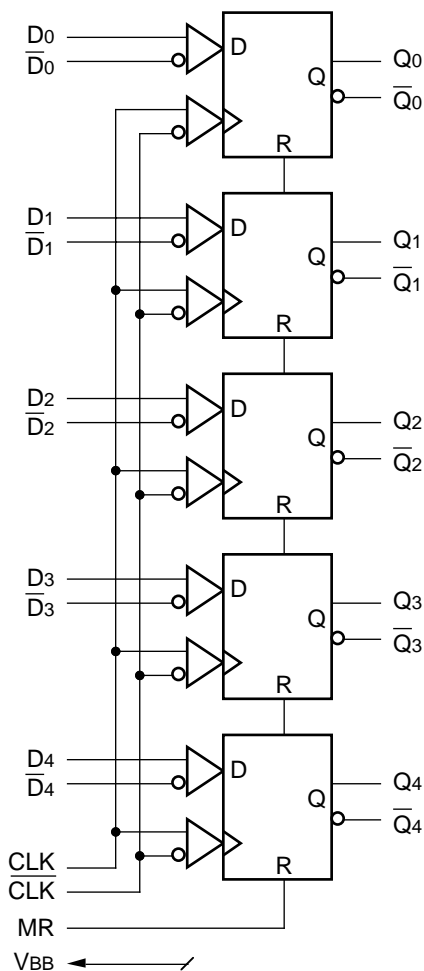
## DESCRIPTION

The SY10/100E452 are 5-bit differential registers with differential data (inputs and outputs) and clock. The registers are triggered by a positive transition of the positive clock (CLK) input. A high on the Master Reset (MR) asynchronously resets all registers so that the Q outputs go LOW.

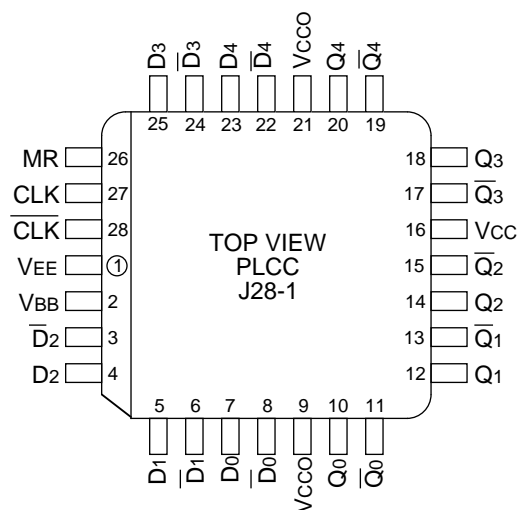
The differential input structures are clamped so that the inputs of unused registers can be left open without upsetting the bias network of the devices. The clamping action will assert the /D and the /CLK sides of the inputs. Because of the edge-triggered flip-flop nature of the devices, simultaneously opening both the clock and data inputs will result in an output which reaches an unidentified but valid state.

The fully differential design of the devices makes them ideal for very high frequency applications where a registered data path is necessary.

## BLOCK DIAGRAM



## PIN CONFIGURATION



## PIN NAMES

Pin	Function
D [0:4], /D [0:4]	Differential Data Inputs
MR	Master Reset Input
CLK, /CLK	Differential Clock Input
VBB	VBB Reference Output
Q [0:4], /Q [0:4]	Differential Data Outputs
VCCO	Vcc to Output

**DC ELECTRICAL CHARACTERISTICS**V<sub>EE</sub> = V<sub>EE</sub> (Min.) to V<sub>EE</sub> (Max.); V<sub>CC</sub> = V<sub>CCO</sub> = GND

Symbol	Parameter	T <sub>A</sub> = -40°C			T <sub>A</sub> = 0°C			T <sub>A</sub> = +25°C			T <sub>A</sub> = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
V <sub>BB</sub>	Output Reference Voltage	10E -1.43 100E -1.38	—	-1.30 -1.26	-1.38 -1.38	—	-1.27 -1.26	-1.35 -1.38	—	-1.25 -1.26	-1.31 -1.38	—	-1.19 -1.26	V
I <sub>IH</sub>	Input HIGH Current	—	—	150	—	—	150	—	—	150	—	—	150	μA
I <sub>EE</sub>	Power Supply Current	10E — 100E —	74 74	89 89	— —	74 74	89 89	— —	74 74	89 89	— —	74 85	89 102	mA
V <sub>CMR</sub>	Common Mode Range <sup>(1)</sup>	-2.0	—	-0.4	-2.0	—	-0.4	-2.0	—	-0.4	-2.0	—	-0.4	V

**NOTE:**

1. V<sub>CMR</sub> is referenced to the most positive side of the differential input signal. Normal operation is obtained when the input signals are 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<sub>EE</sub> = V<sub>EE</sub> (Min.) to V<sub>EE</sub> (Max.); V<sub>CC</sub> = V<sub>CCO</sub> = GND

Symbol	Parameter	T <sub>A</sub> = -40°C			T <sub>A</sub> = 0°C			T <sub>A</sub> = +25°C			T <sub>A</sub> = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
f <sub>MAX</sub>	Max. Toggle Frequency	1000	1400	—	1100	1400	—	1100	1400	—	1100	1400	—	MHz
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay to Output CLK (Diff) CLK (SE) MR	425 375 375	600 600 625	850 900 900	475 425 425	600 600 625	800 850 850	475 425 425	600 600 625	800 850 850	475 425 425	600 600 625	800 850 850	ps
t <sub>S</sub>	Set-up Time, D	175	-50	—	150	-50	—	150	-50	—	150	-50	—	ps
t <sub>H</sub>	Hold Time, D	225	50	—	200	50	—	200	50	—	200	50	—	ps
t <sub>RR</sub>	Reset Recovery Time	750	450	—	700	450	—	700	450	—	700	450	—	ps
t <sub>PW</sub>	Minimum Pulse Width CLK MR	400 400	— —	— —	400 400	— —	— —	400 400	— —	— —	400 400	— —	— —	ps
t <sub>skew</sub>	Within-Device Skew <sup>(1)</sup>	—	50	—	—	50	—	—	50	—	—	50	—	ps
V <sub>PP</sub> (AC)	Minimum Input Swing <sup>(2)</sup>	150	—	—	150	—	—	150	—	—	150	—	—	mV
t <sub>r</sub> t <sub>f</sub>	Rise/Fall Time 20–80%	250	475	725	275	475	675	275	475	675	275	475	675	ps

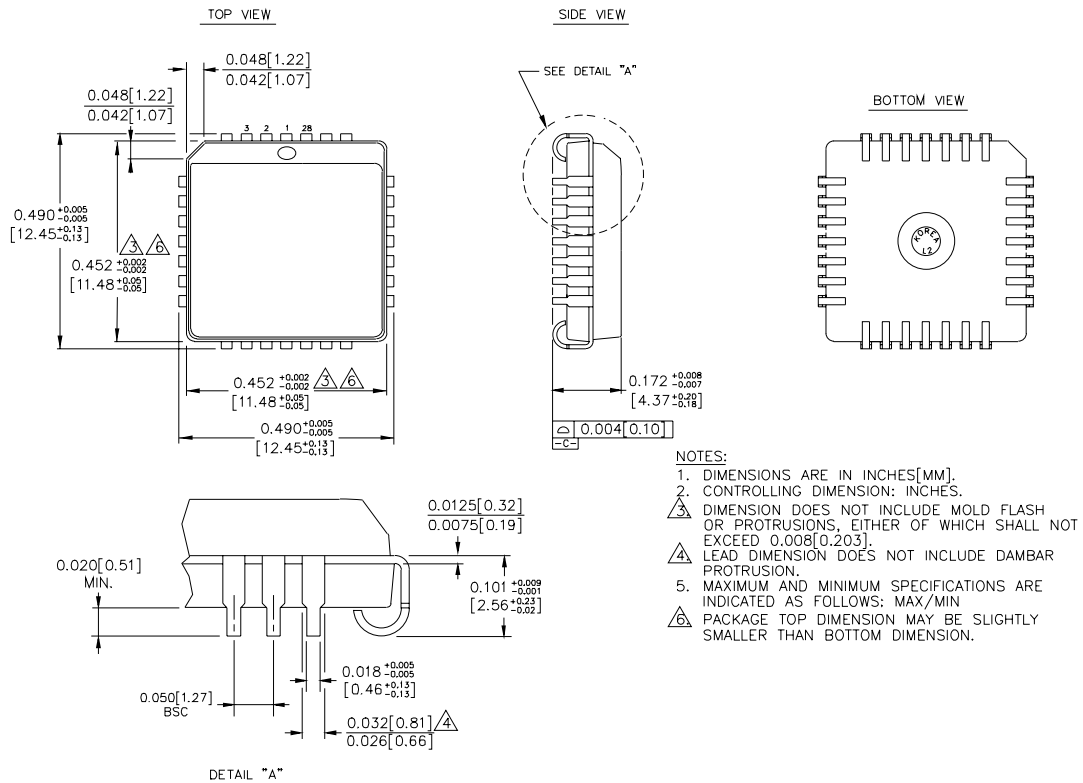
**NOTES:**

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

**PRODUCT ORDERING CODE**

Ordering Code	Package Type	Operating Range	Ordering Code	Package Type	Operating Range
SY10E452JC	J28-1	Commercial	SY10E452JI	J28-1	Industrial
SY10E452JCTR	J28-1	Commercial	SY10E452JITR	J28-1	Industrial
SY100E452JC	J28-1	Commercial	SY100E452JI	J28-1	Industrial
SY100E452JCTR	J28-1	Commercial	SY100E452JITR	J28-1	Industrial

## 28 LEAD PLCC (J28-1)



Rev. 03

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