6-Bit D Register Differential Data and Clock

MC10E451
MC100E451

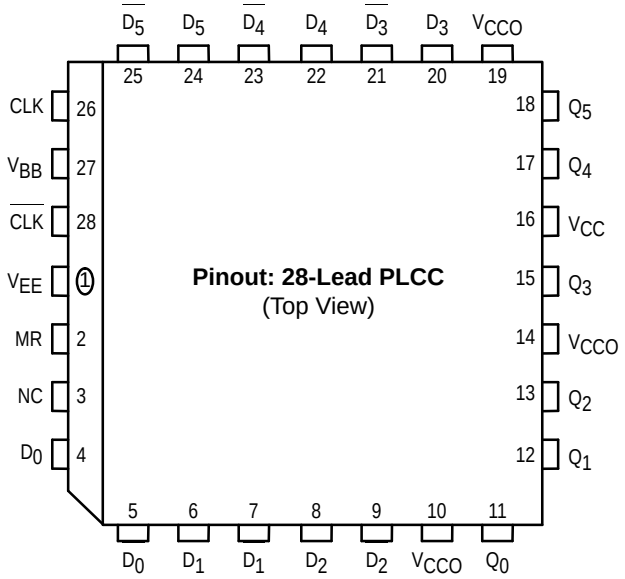
6-BIT D REGISTER DIFFERENTIAL DATA AND CLOCK

The MC10E/100E451 contains six D-type flip-flops with single-ended outputs and differential data inputs. The common clock input is also differential. The registers are triggered by a positive transition of the positive clock (CLK) input.

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

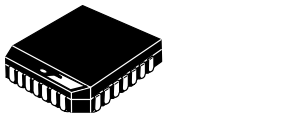
The differential input structures are clamped so that the inputs of unused registers can be left open without upsetting the bias network of the device. The clamping action will assert the D and the CLK sides of the inputs. Because of the edge triggered flip-flop nature of the device simultaneously opening both the clock and data inputs will result in an output which reaches an unidentified but valid state. Note that the input clamps only operate when both inputs fall to 2.5V below V_{CC}.

- Differential Inputs: Data and Clock
- V_{BB} Output
- 1100MHz Min. Toggle Frequency
- Asynchronous Master Reset
- Extended 100E V_{EE} Range of – 4.2V to – 5.46V
- 75kΩ Input Pulldown Resistors



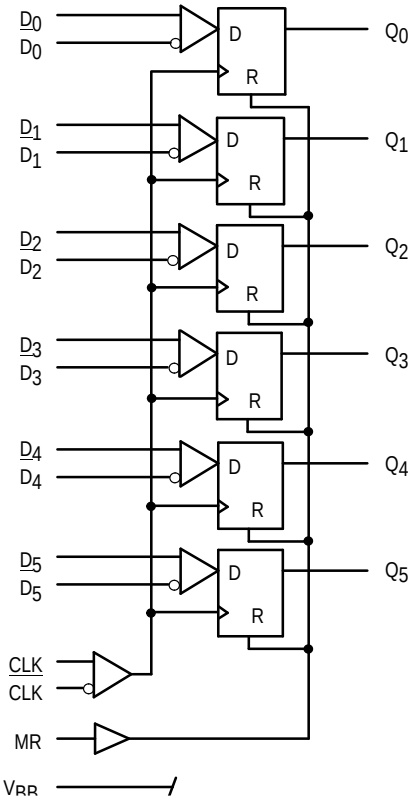
Pinout: 28-Lead PLCC
(Top View)

* All V_{CC} and V_{CCO} pins are tied together on the die.



FN SUFFIX
PLASTIC PACKAGE
CASE 776-02

LOGIC DIAGRAM



PIN NAMES

Pin	Function
$\underline{D_0} - \underline{D_5}$	+Data Input
$D_0 - D_5$	– Data Input
$\underline{CLK}$	+Clock Input
$\overline{CLK}$	– Clock Input
MR	Master Reset Input
V_{BB}	V_{BB} Output
$Q_0 - Q_5$	Data Outputs

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MOTOROLA

DC CHARACTERISTICS (V_{EE} = V_{EE}(min) to V_{EE}(max); V_{CC} = V_{CCO} = GND)

Symbol	Characteristic	0°C			25°C			85°C			Unit	Condition
		min	typ	max	min	typ	max	min	typ	max		
V_{BB}	Output Reference Voltage										V	
	10E	–1.38		–1.27	–1.35		–1.25	–1.31		–1.19		
	100E	–1.38		–1.26	–1.38		–1.26	–1.38		–1.26		
I_{IH}	Input HIGH Current			150			150			150	µA	
I_{EE}	Power Supply Current										mA	
	10E		84	101		84	101		84	101		
	100E		84	101		84	101		97	116		
V_{CMR}	Common Mode Range	– 2.0		– 0.4	– 2.0		– 0.4	– 2.0		– 0.4	V	2

1. V_{CMR} is referenced to the most positive side of the differential input signal. Normal operation is obtained when the “HIGH” input is within the V_{CMR} range and the input swing is greater than $V_{PP\ MIN}$ and < 1.0V.

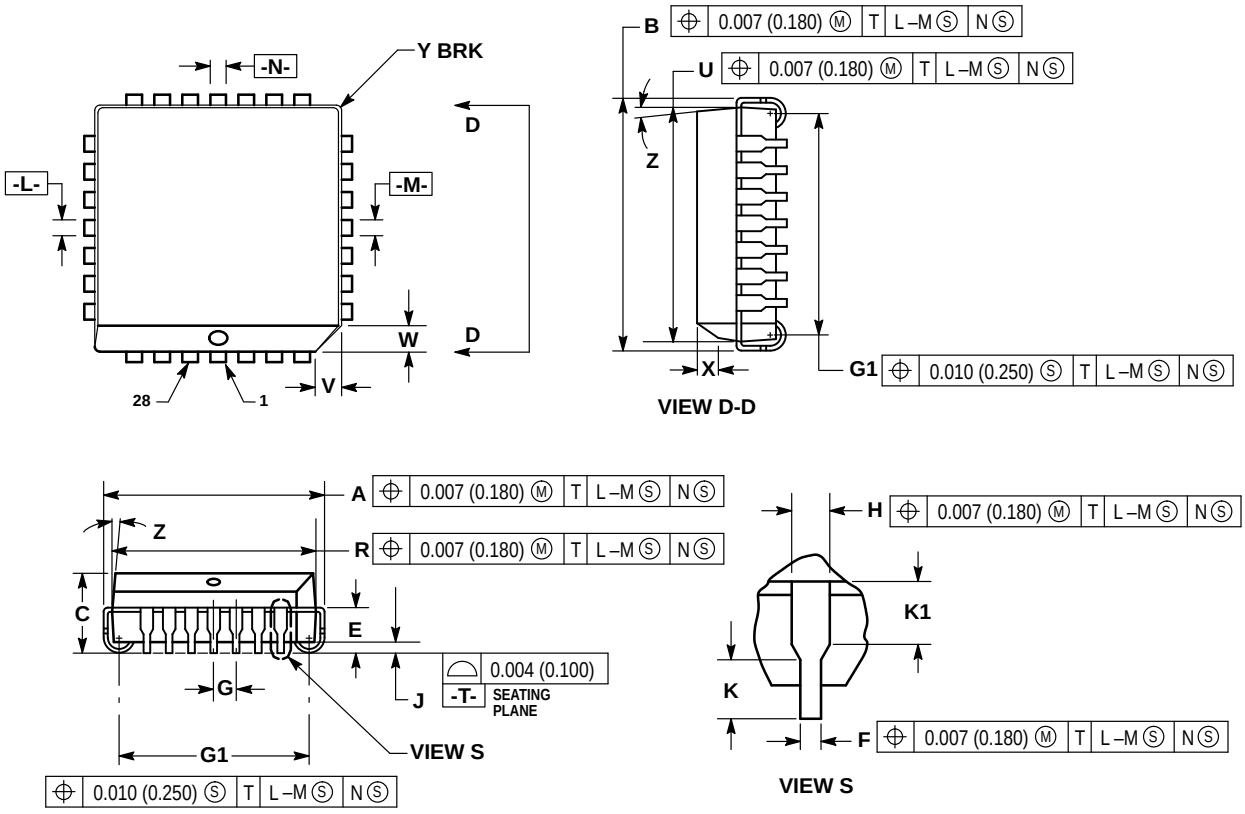
AC CHARACTERISTICS (V_{EE} = V_{EE}(min) to V_{EE}(max); V_{CC} = V_{CCO} = GND)

Symbol	Characteristic	0°C			25°C			85°C			Unit	Condition
		min	typ	max	min	typ	max	min	typ	max		
f_{MAX}	Max, Toggle Frequency	1100	1400		1100	1400		1100	1400		MHz	
t_{PLH} t_{PHL}	Propagation Delay to Output										ps	
	CLK (Diff)	475	650	800	475	650	800	475	650	800		
	CLK (SE)	425	650	850	425	650	850	425	650	850		
	MR	425	600	850	425	600	850	425	600	850		
t_S	Setup Time										ps	
	D	150	–100		150	–100		150	–100			
t_h	Hold Time										ps	
	D	250	100		250	100		250	100			
V_{PP}(AC)	Minimum Input Swing	150			150			159			mV	1
t_{RR}	Reset Recovery Time	750	600		750	600		750	600		ps	
t_{PW}	Minimum Pulse Width										ps	
	CLK, MR	400			400			400				
t_{SKEW}	Within-Device Skew		100			100			100		ps	2
t_r t_f	Rise/Fall Times										ps	
	20 - 80%	275	450	800	275	450	800	275	450	800		

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

OUTLINE DIMENSIONS

FN SUFFIX
PLASTIC PLCC PACKAGE
CASE 776–02
ISSUE D



NOTES:
1. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
2. DIM G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
3. DIM R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
5. CONTROLLING DIMENSION: INCH.
6. THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
7. DIMENSION H DOES NOT INCLUDE DAMBAR PROTRUSION OR INTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE GREATER THAN 0.037 (0.940). THE DAMBAR INTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE SMALLER THAN 0.025 (0.635).

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.485	0.495	12.32	12.57
B	0.485	0.495	12.32	12.57
C	0.165	0.180	4.20	4.57
E	0.090	0.110	2.29	2.79
F	0.013	0.019	0.33	0.48
G	0.050 BSC		1.27 BSC	
H	0.026	0.032	0.66	0.81
J	0.020	—	0.51	—
K	0.025	—	0.64	—
R	0.450	0.456	11.43	11.58
U	0.450	0.456	11.43	11.58
V	0.042	0.048	1.07	1.21
W	0.042	0.048	1.07	1.21
X	0.042	0.056	1.07	1.42
Y	—	0.020	—	0.50
Z	2°	10°	2°	10°
G1	0.410	0.430	10.42	10.92
K1	0.040	—	1.02	—

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