

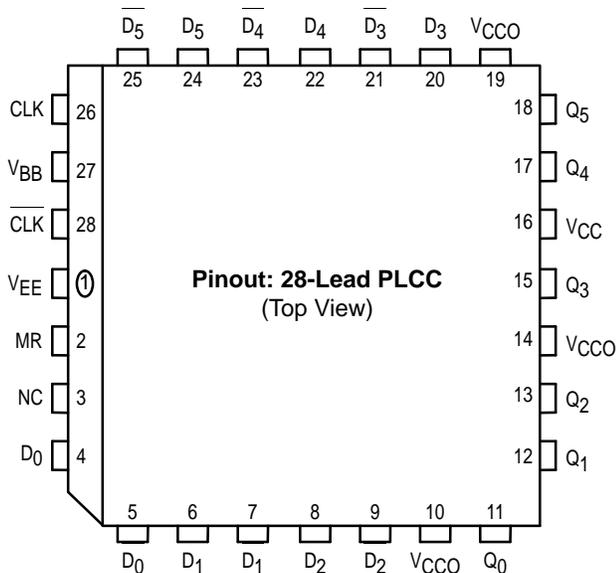
6-Bit D Register Differential Data and Clock

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 0.01 μ F 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
- 75k Ω Input Pulldown Resistors



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

PIN NAMES

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

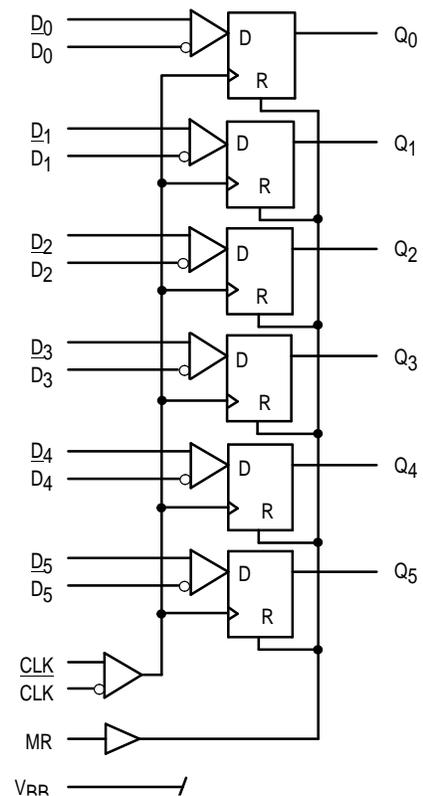
MC10E451
MC100E451

6-BIT D REGISTER
DIFFERENTIAL
DATA AND CLOCK



FN SUFFIX
PLASTIC PACKAGE
CASE 776-02

LOGIC DIAGRAM



MC10E451 MC100E451

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 | -1.3 8 | -1.2 7 | | -1.3 5 | -1.2 5 | | -1.3 1 | -1.1 9 | | | |
| | 100E | -1.3 8 | -1.2 6 | | -1.3 8 | -1.2 6 | | -1.3 8 | -1.2 6 | | | |
| 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 |

- 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.

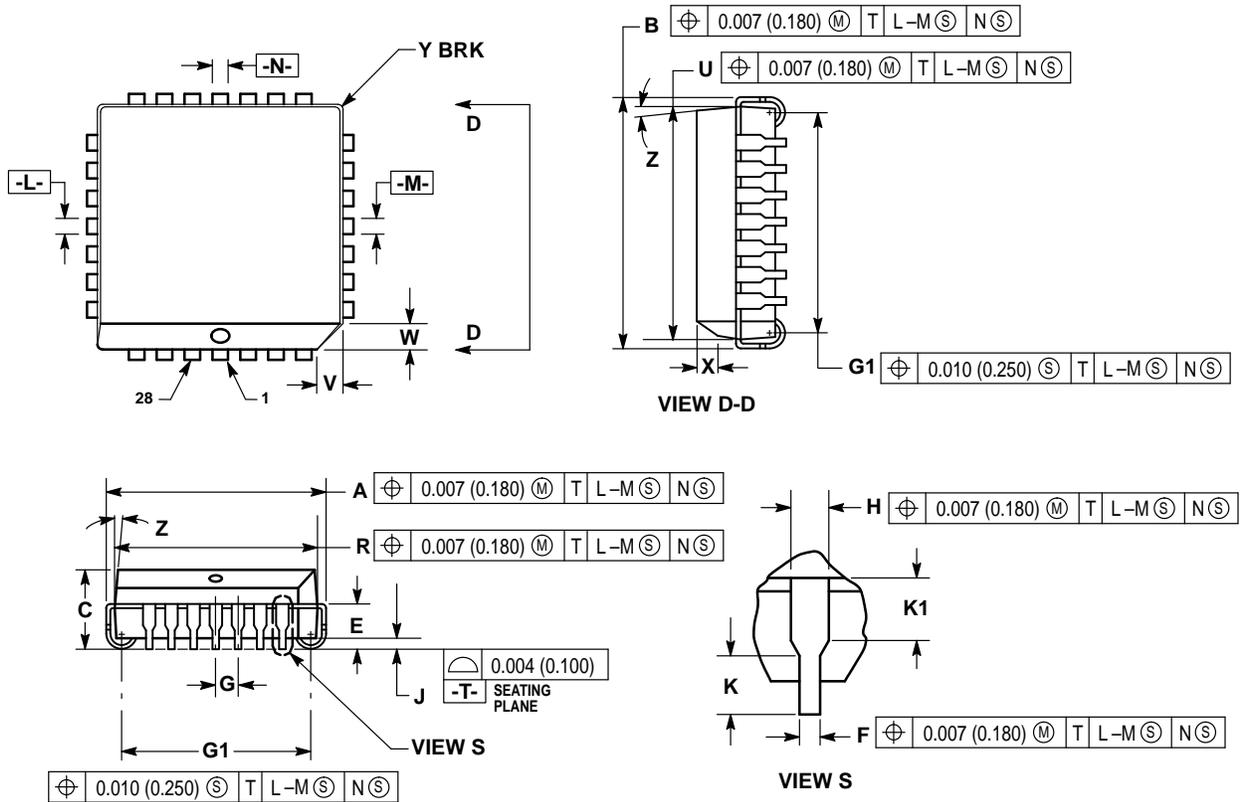
AC CHARACTERISTICS (V_{EE} = V_{EE}(min) to V_{EE}(max); V_{CC} = V_{CCO} = GND)

| 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) MR | 425 | 650 | 850 | 425 | 650 | 850 | 425 | 650 | 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 CLK, MR | 400 | | | 400 | | | 400 | | | ps | |
| t _{SKREW} | 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 | | |

- Minimum input voltage for which AC parameters are guaranteed.
- 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:

- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- DIM G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
- DIM R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.
- 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.
- 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).

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | 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° | |
| G1 | 0.410 | 0.430 | 10.42 | 10.92 |
| K1 | 0.040 | — | 1.02 | — |

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