5-Bit Differential Register

MC10E452
MC100E452

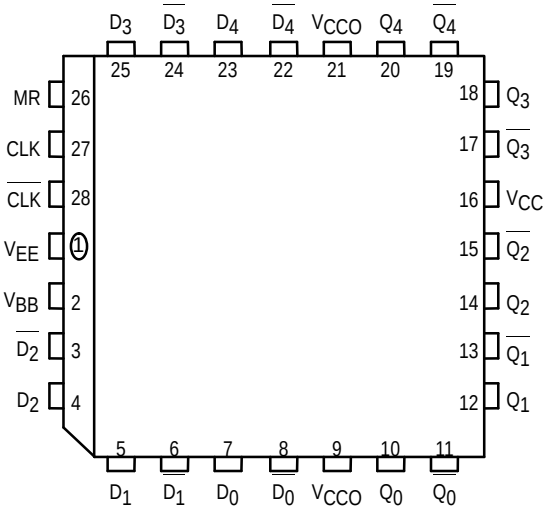
5-BIT DIFFERENTIAL REGISTER

The MC10E/100E452 is a 5-bit differential register 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.

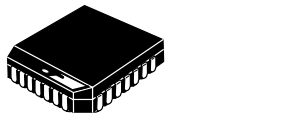
The differential input structures are clamped so that the inputs of unused registers can be left open without upsetting the bias network of the device. The clamping action will assert the D and the CLK sides of the inputs. Because of the edge triggered flip-flop nature of the device simultaneously opening 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}.

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

- Differential D, CLK and Q; V_{BB} Reference Available
- 1100MHz Min. Toggle Frequency
- Asynchronous Master Reset
- Extended 100E V_{EE} Range of – 4.2V to – 5.46V

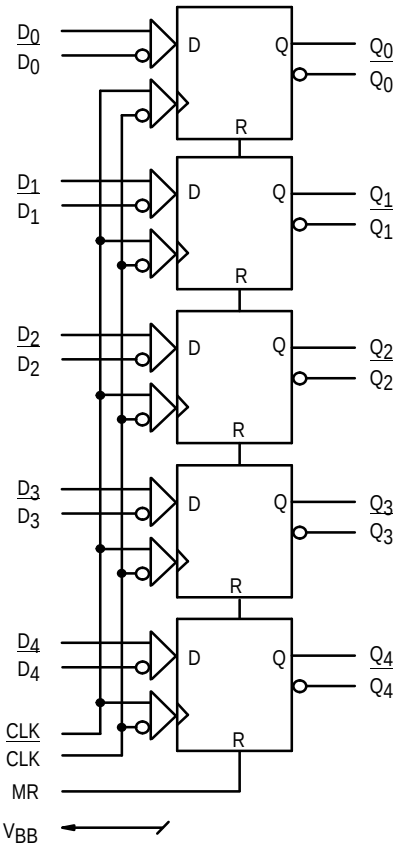


* All V_{CC} and V_{CCO} pins are tied together on the die.



FN SUFFIX
PLASTIC PACKAGE
CASE 776-02

LOGIC DIAGRAM



PIN NAMES

Pin	Function
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

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

Symbol	Characteristic	–40°C			0°C			25°C			85°C			Unit	Cond
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
V_{BB}	Output Reference Voltage 10E	–1.43		–1.30	–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	–1.38		–1.26		
I_{IH}	Input HIGH Current			150			150			150			150	µA	
I_{EE}	Power Supply Current 10E		74	89		74	89		74	89		74	89	mA	
	100E		74	89		74	89		74	89		85	102		
V_{CMR}	Common Mode Range	–2.0		–0.4	–2.0		–0.4	–2.0		–0.4	–2.0		–0.4	V	1

1. V_{CMR} is referenced to the most positive side of the differential input signal. Normal specified operation is obtained when the input signals are within the V_{CMR} range and the input swing is greater than V_{PP}.

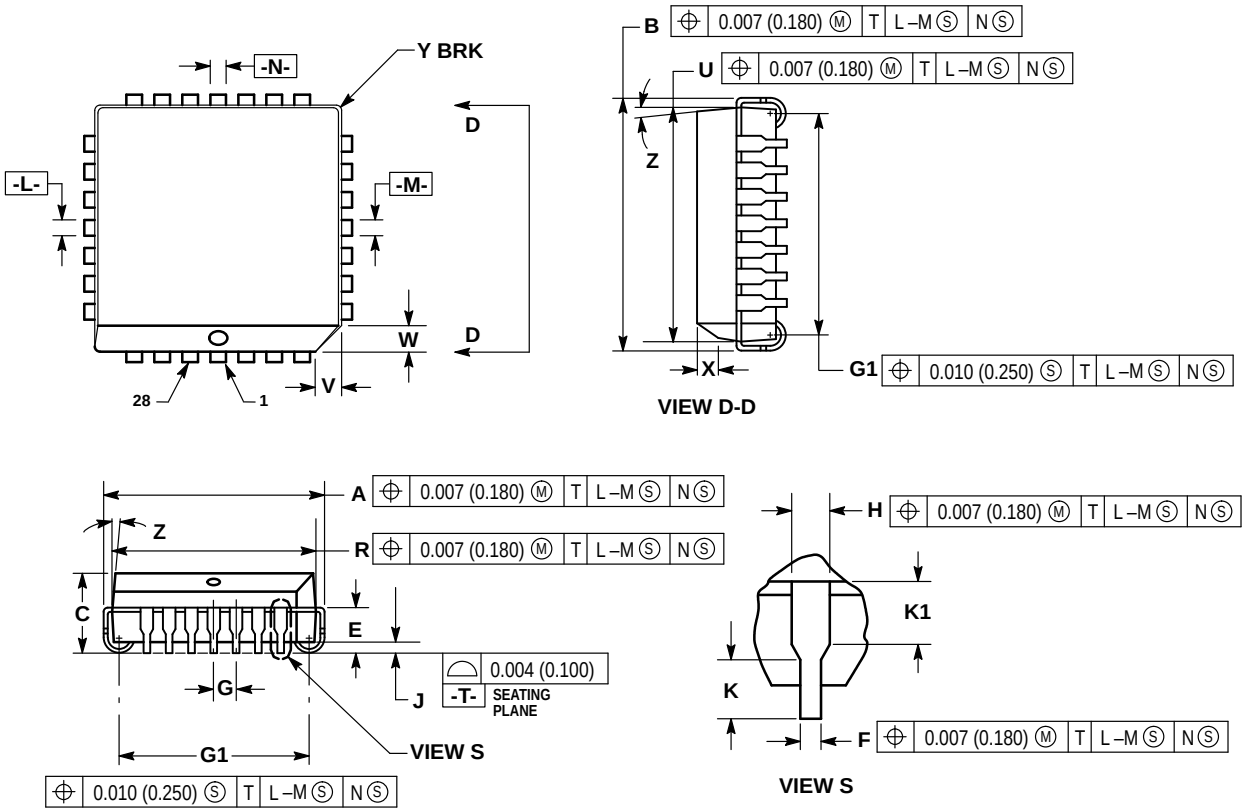
AC CHARACTERISTICS (V_{EE} = V_{EE}(min) to V_{EE}(max); V_{CC} = V_{CCO} = GND)

Symbol	Characteristic		–40°C			0°C to 85°C			Unit	Condition
			Min	Typ	Max	Min	Typ	Max		
f_{MAX}	Maximum Toggle Frequency		1000	1400		1100	1400		MHz	
t_{PLH} t_{PHL}	Propagation Delay to Output	CLK (Diff)	425	600	850	475	600	800	ps	
		CLK (SE)	375	600	900	425	600	850		
		MR	375	625	900	425	625	850		
t_S	Setup Time	D	175	–50		150	–50		ps	
t_H	Hold Time	D	225	50		200	50		ps	
t_{RR}	Reset Recovery Time		750	450		700	450			
t_{PW}	Minimum Pulse Width	CLK	400			400			ps	
		MR	400			400				
t_{skew}	Within-Device Skew			50			50		ps	1
V_{PP}	Minimum Input Swing		150			150			mV	2
t_r/t_f	Rise/Fall Times		250	475	725	275	475	675	ps	20–80%

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.

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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How to reach us:
USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1–800–441–2447 or 602–303–5454

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE 602–244–6609
INTERNET: http://Design–NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi–SPD–JLDC, 6F Seibu–Butsuryu–Center,
3–14–2 Tatsumi Koto–Ku, Tokyo 135, Japan. 03–81–3521–8315

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298