MOTOROLA
SEMICONDUCTOR TECHNICAL DATA
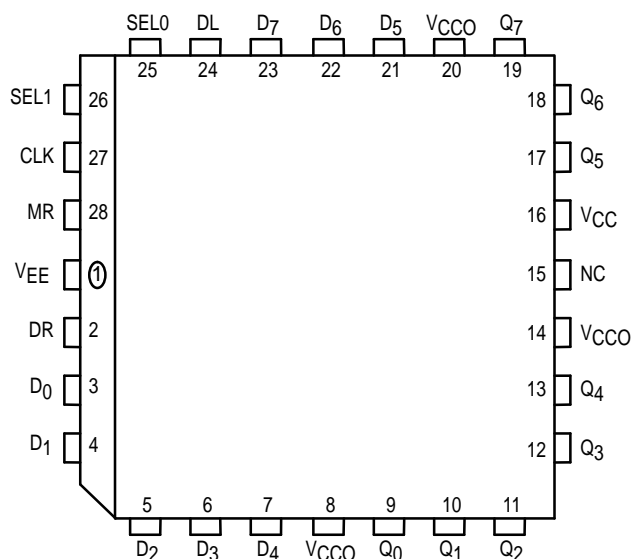
8-Bit Shift Register

The MC10E/100E141 is an 8-bit full-function shift register. The E141 performs serial/parallel in and serial/parallel out, shifting in either direction. The eight inputs $D_0 - D_7$ accept parallel input data, while DL/DR accept serial input data for left/right shifting. The Qn outputs do not need to be terminated for the shift operation to function. To minimize noise and power, any Q output not used should be left unterminated.

- 700MHz Min. Shift Frequency
- 8-Bit
- Full-Function, Bi-Directional
- Asynchronous Master Reset
- Pin-Compatible with E241
- Extended 100E V_{EE} Range of $-4.2V$ to $-5.46V$
- 75kΩ Input Pulldown Resistors

The select pins, SEL0 and SEL1, select one of four modes of operation: Load, Hold, Shift Left, Shift Right, according to the Function Table.

Input data is accepted a set-up time before the positive clock edge. A HIGH on the Master Reset (MR) pin asynchronously resets all the registers to zero.
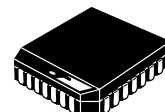
Pinout: 28-Lead PLCC (Top View)

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

MC10E141
MC100E141

8-BIT SHIFT REGISTER

FN SUFFIX
PLASTIC PACKAGE
CASE 776-02

FUNCTION TABLE

SEL0	SEL1	Function
L	L	Load
L	H	Shift Right (D_n to D_{n+1})
H	L	Shift Left (D_n to D_{n-1})
H	H	Hold

PIN NAMES

Pin	Function
$D_0 - D_7$	Parallel Data Inputs
DL, DR	Serial Data Inputs
SEL0, SEL1	Mode Select In Inputs
CLK	Clock
$Q_0 - Q_7$	Data Outputs
MR	Master Reset

EXPANDED FUNCTION TABLE

Function	DL	DR	SEL0	SEL1	MR	CLK	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Load	X	X	L	L	L	Z	D0	D1	D2	D3	D4	D5	D6	D7
Shift Right	X	L	L	H	L	Z	L	Q0	Q1	Q2	Q3	Q4	Q5	Q6
	X	H	L	H	L	Z	H	L	Q0	Q1	Q2	Q3	Q4	Q5
Shift Left	L	X	H	L	L	Z	L	Q0	Q1	Q2	Q3	Q4	Q5	L
	H	X	H	L	L	Z	Q0	Q1	Q2	Q3	Q4	Q5	L	H
Hold	X	X	H	H	L	Z	Q0	Q1	Q2	Q3	Q4	Q5	L	H
	X	X	H	H	L	Z	Q0	Q1	Q2	Q3	Q4	Q5	L	H
Reset	X	X	X	X	H	X	L	L	L	L	L	L	L	L

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REV 3

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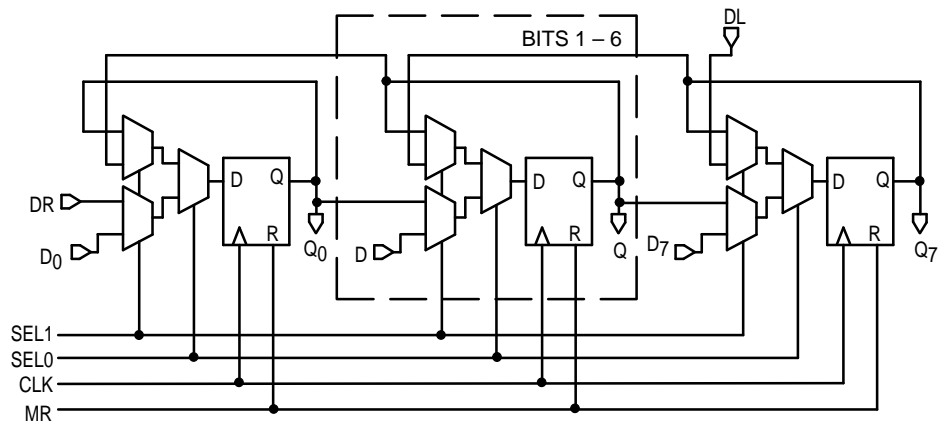
DC CHARACTERISTICS ($V_{EE} = V_{EE}$(min) to V_{EE}(max); $V_{CC} = V_{CCO}$ = GND)

Symbol	Characteristic	0°C			25°C			85°C			Unit	Condition
		min	typ	max	min	typ	max	min	typ	max		
I_{IH}	Input HIGH Current			150			150			150	µA	
I_{EE}	Power Supply Current										mA	
	10E		131	181		131	181		131	181		
	100E		131	181		131	181		151	181		

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_{SHIFT}	Max. Shift Frequency	700	900		700	900		700	900		MHz	
t_{PLH} t_{PHL}	Propagation Delay To Output										ps	
	Clk	625	750	975	625	750	975	625	750	975		
	MR	600	725	975	600	725	975	600	725	975		
t_s	Setup Time										ps	
	D	175	25		175	25		175	25			
	SEL0	350	200		350	200		350	200			
	SEL1	300	150		300	150		300	150			
t_h	Hold Time										ps	
	D	200	− 25		200	− 25		200	− 25			
	SEL0	100	− 200		100	− 200		100	− 200			
	SEL1	100	−150		100	−150		100	−150			
t_{RR}	Reset Recovery Time	900	700		900	700		900	700		ps	
t_{PW}	Minimum Pulse Width										ps	
	Clk, MR	400			400			400				
t_{SKEW}	Within-Device Skew		60			60			60		ps	1
t_r t_f	Rise/Fall Times										ps	
	20 - 80%	300	525	800	300	525	800	300	525	800		

1. 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

VIEW D-D

VIEW S

VIEW S

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).

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°	2°	10°
G1	0.410	0.430	10.42	10.92
K1	0.040	—	1.02	—

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