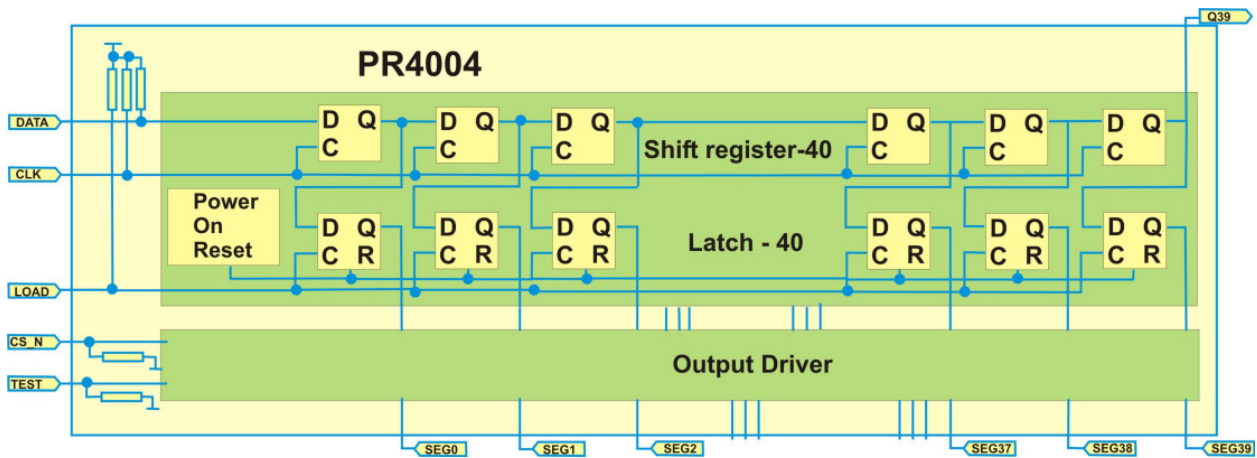


40-Channel LED Driver PR4004



Features

- 40 output channels
- LED current output with maximum sink current 25mA per channel
- Serial interface, shift register with latch
- External brightness control
- Cascodable for 80, 120, ... channels
- Supply voltage 6V

The PR4004 chip contains a 40 bit shift register (pins DATA and CLK), made by positive-edge-trigger D-type flip-flops.

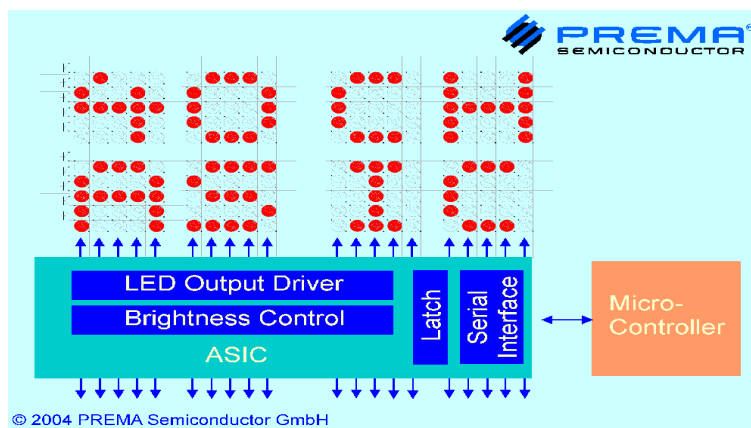
Three logical outputs from stages 24, 26 and 39 are available. The outputs of the shift register are latched (pin LOAD) by a 40 bit latch, made of positive-edge-trigger D-type flip-flops with reset. This latch controls the segment drivers: if the '1' had been loaded into a certain bit, the respective segment driver will be switched on. A power-on reset circuit provides an internal 'Reset' signal being active if the supply voltage V_{CC} drops below specified value.

The TEST signal can be used to switch ON all output stages without reloading the latch, e.g. for blink mode (TEST = 0V: Test Mode active, all output stages on, TEST = open / not connected = Operation Mode).

The CS_N signal is a chip select pin (CS_N = 0V: Chip is selected, CS_N = open / not connected: Chip is not selected).

The PR4004 is available in a SSOP-56 package.

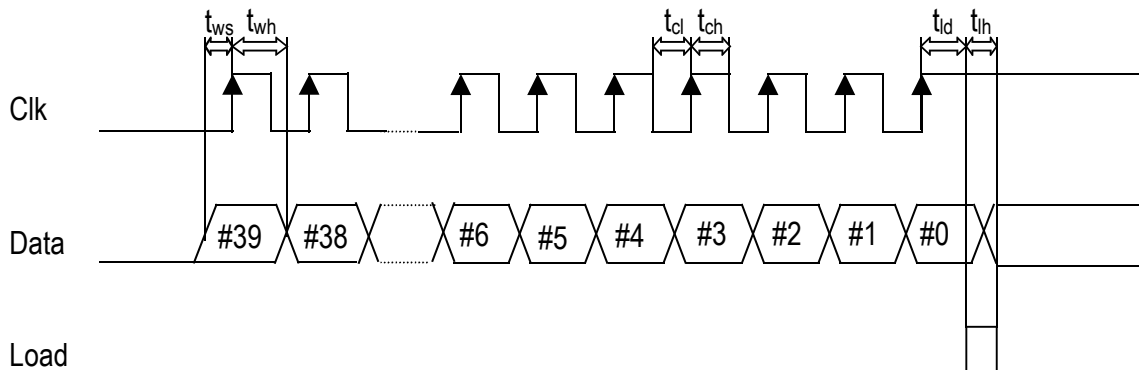
Typical Application (LED Display)



PIN	Name	Description
1	n.c.	Not connected
2	n.c.	Not connected
3	CS_N	Chip Select Input
4	Data	'Data' line input
5	Seg0	Segment 0 output
6	Seg1	Segment 1 output
7	Seg2	Segment 2 output
8	Seg3	Segment 3 output
9	Seg4	Segment 4 output
10	Seg5	Segment 5 output
11	Seg6	Segment 6 output
12	Seg7	Segment 7 output
13	Seg8	Segment 8 output
14	Seg9	Segment 9 output
15	Vdd	Ground
16	Seg10	Segment 10 output
17	Seg11	Segment 11 output
18	Seg12	Segment 12 output
19	Seg13	Segment 13 output
20	Seg14	Segment 14 output
21	Seg15	Segment 15 output
22	Seg16	Segment 16 output
23	Seg17	Segment 17 output
24	Seg18	Segment 18 output
25	Seg19	Segment 19 output
26	DGND	Logic Ground
27	TEST	Test Line Input
28	n.c.	Not connected
29	Load	'Load' line input
30	Q26	Segment 26 logic output
31	Q24	Segment 24 logic output
32	Seg20	Segment 20 output
33	Seg21	Segment 21 output
34	Seg22	Segment 22 output
35	Seg23	Segment 23 output
36	Seg24	Segment 24 output
37	Seg25	Segment 25 output
38	Seg26	Segment 26 output
39	Seg27	Segment 27 output
40	Seg28	Segment 28 output
41	Seg29	Segment 29 output
42	Vdd	Ground
43	Seg30	Segment 30 output
44	Seg31	Segment 31 output
45	Seg32	Segment 32 output
46	Seg33	Segment 33 output
47	Seg34	Segment 34 output
48	Seg35	Segment 35 output
49	Seg36	Segment 36 output
50	Seg37	Segment 37 output
51	Seg38	Segment 38 output
52	Seg39	Segment 39 output
53	Vcc	Positive power supply +5V
54	Clock	'Clock' line input
55	Q39	Segment 39 logic output
56	TS	Temperature sensor output

Communication

Typical sequence of signals to control all 40 segments



Signal timing is represented in the following table:

Description	Name	Time / μs	
		Min	Max
'Clock' signal low level hold time	t_{cl}	5	-
'Clock' signal high level hold time	t_{ch}	5	-
'Write bit' setup time	t_{ws}	2	$t_{cl}-2$
'Write bit' hold time	t_{wh}	$t_{ch}+2$	$t_{ch}+t_{cl}-2$
'Load' signal delay	t_{id}	5	-
'Load' signal hold time	t_{h}	5	-

Electrical Characteristics

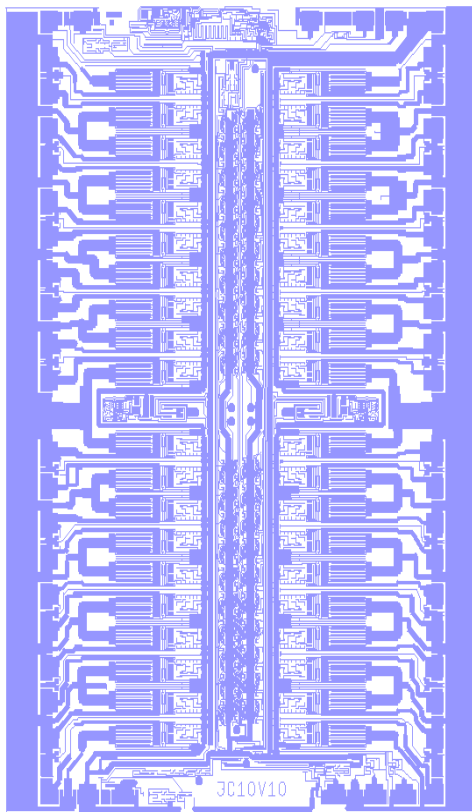
Maximum ratings

Parameter	Rating	Unit
Maximum voltage at all ASIC pins	15	V
Maximum sink current though pins Seg0..Seg39	25	mA
Maximum sink current though pins Q24, Q26, Q39	0.5	mA

Electrical parameters

Parameter	Condition	Min	Typ	Max	Unit
Vcc			6		V
Current through pins Seg0..Seg39	Vcc = 5V	-	25		mA
Power-on reset voltage		2.2	2.55	2.9	V

***Note:** all parameters at operating temperature T=20°C.



n.c.	1	56	TS
n.c.	2	55	Q39
CS_N	3	54	Clock
Data	4	53	Vcc
Seg0	5	52	Seg39
Seg1	6	51	Seg38
Seg2	7	50	Seg37
Seg3	8	49	Seg36
Seg4	9	48	Seg35
Seg5	10	47	Seg34
Seg6	11	46	Seg33
Seg7	12	45	Seg32
Seg8	13	44	Seg31
Seg9	14	43	Seg30
Vdd	15	42	Vdd
Seg10	16	41	Seg29
Seg11	17	40	Seg28
Seg12	18	39	Seg27
Seg13	19	38	Seg26
Seg14	20	37	Seg25
Seg15	21	36	Seg24
Seg16	22	35	Seg23
Seg17	23	34	Seg22
Seg18	24	33	Seg21
Seg19	25	32	Seg20
DGnd	26	31	Q24
Test	27	30	Q26
n.c.	28	29	Load

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