8-bit compatible shift / store register
## BU4094BC / BU4094BCF / BU4094BCFV

The BU4094BC, BU4094BCF, and BU4094BCFV are shift / store registers, each consisting of an 8-bit register and an 8-bit latch.

As the data in the shift register can be latched by an asynchronous strobe input, it is possible to hold the output in the data transfer mode.
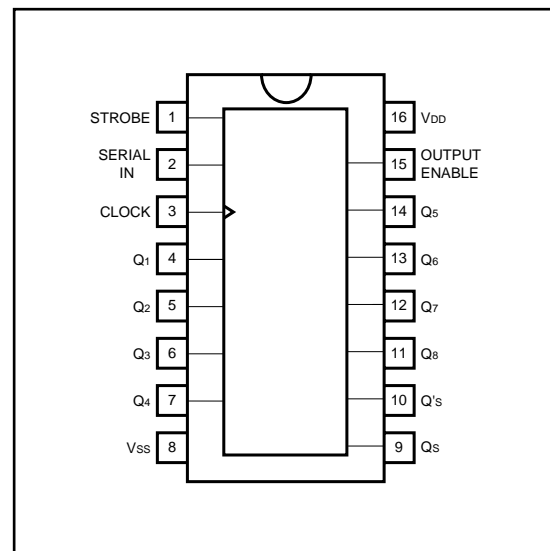
The tri-state parallel output can be connected directly with an 8-bit bus line.

These registers are suitable for in-line / parallel data conversion, data receivers and other similar applications.

●Logic circuit diagram
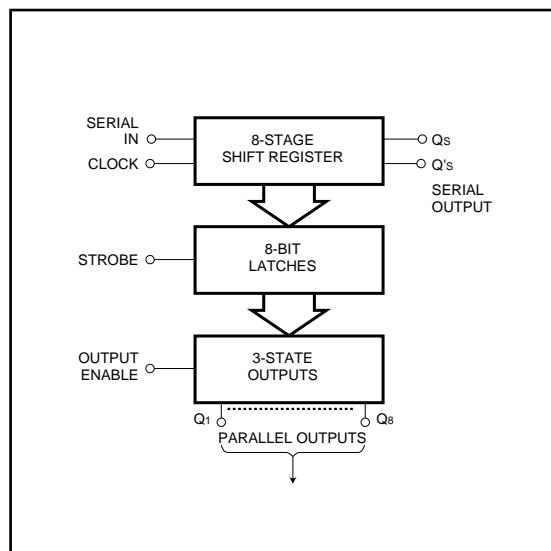
●Block diagram

●Truth table

CLOCK	OUTPUT ENABLE	STROBE	SERIAL IN	Parallel output		Serial output	
				Q_1	Q_n	Q_S	Q'_S
⌐⌐	H	H	L	L	Q_{n-1}	Q_7	NC
⌐⌐	H	H	H	H	Q_{n-1}	Q_7	NC
⌐⌐	H	L	X	NC	NC	Q_7	NC
⌐⌐	L	X	X	Z	Z	Q_7	NC
⌐⌐	H	X	X	NC	NC	NC	Q_S
⌐⌐	L	X	X	Z	Z	NC	Q_S

NC: No Change   Z: High Impedance   X: Irrelevant

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	− 0.5 ~ + 20	V
Power dissipation	Pd	1000 (DIP), 500 (SOP) 400 (SSOP)	mW
Operating temperature	Topr	− 40 ~ + 85	°C
Storage temperature	Tstg	− 55 ~ + 150	°C
Input voltage	V_{IN}	− 0.5 ~ V_{DD} + 0.5	V

●Electrical characteristics
DC characteristics (unless otherwise noted, V_{SS} = 0V, Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	V_{DD} (V)	Conditions
Input high level voltage	V_{IH}	3.5	—	—	V	5	—
		7.0	—	—		10	
		11.0	—	—		15	
Input low level voltage	V_{IL}	—	—	1.5	V	5	—
		—	—	3.0		10	
		—	—	4.0		15	
Input high level current	I_{IH}	—	—	0.3	μA	15	V_{IH} = 15V
Input low level current	I_{IL}	—	—	− 0.3	μA	15	V_{IL} = 0V
Output high level voltage	V_{OH}	4.95	—	—	V	5	I_O = 0mA
		9.95	—	—		10	
		14.95	—	—		15	
Output low level voltage	V_{OL}	—	—	0.05	V	5	I_O = 0mA
		—	—	0.05		10	
		—	—	0.05		15	
Output high level current	I_{OH}	− 0.44	—	—	mA	5	V_{OH} = 4.6V
		− 1.1	—	—		10	V_{OH} = 9.5V
		− 3.0	—	—		15	V_{OH} = 13.5V
Output low level current	I_{OL}	0.44	—	—	mA	5	V_{OL} = 0.4V
		1.1	—	—		10	V_{OL} = 0.5V
		3.0	—	—		15	V_{OL} = 1.5V
Output high level disable current	I_{DH}	—	—	1.0	μA	15	V_{OUT} = 15V
Output low level disable current	I_{DL}	—	—	− 1.0	μA	15	V_{OUT} = 0V
Static current dissipation	I_{DD}	—	—	20	μA	5	V_I = V_{DD}, or GND
		—	—	40		10	
		—	—	80		15	

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Switching characteristics (unless otherwise noted, Vss = 0V, Ta = 25°C, C$_L$ = 50pF)

| Parameter	Symbol	Min.	Typ.	Max.	Unit	V$_{DD}$ (V)	Conditions	Measurement circuit
Output rise time	t$_{TLH}$	—	100	—	ns	5	—	Fig.1
		—	50	—	ns	10		
		—	40	—	ns	15		
Output fall time	t$_{THL}$	—	100	—	ns	5	—	Fig.1
		—	50	—	ns	10		
		—	40	—	ns	15		
Propagation delay time, CLOCK to Qs	t$_{PLH}$ t$_{PHL}$	—	350	600	ns	5	—	Fig.1
		—	125	250	ns	10		
		—	95	190	ns	15		
Propagation delay time, CLOCK to Qs	t$_{PLH}$ t$_{PHL}$	—	230	460	ns	5	—	Fig.1
		—	110	220	ns	10		
		—	75	150	ns	15		
Propagation delay time, CLOCK to Qn	t$_{PLH}$ t$_{PHL}$	—	420	840	ns	5	—	Fig.1
		—	195	390	ns	10		
		—	135	270	ns	15		
Propagation delay time, STROBE to Qn	t$_{PLH}$ t$_{PHL}$	—	290	580	ns	5	—	Fig.1
		—	145	290	ns	10		
		—	100	200	ns	15		
3-state propagation delay time, Output Enable to Qn	t$_{PHZ}$ t$_{PZH}$	—	140	280	ns	5	R$_L$ = 1kΩ	Fig.2
		—	75	150	ns	10		
		—	55	110	ns	15		
3-state propagation delay time, Output Enable to Qn	t$_{PLZ}$ t$_{PZL}$	—	140	280	ns	5	R$_L$ = 1kΩ	Fig.2
		—	75	150	ns	10		
		—	55	110	ns	15		
Minimum setup time, DATA to CLOCK	t$_{SU}$	—	20	125	ns	5	—	Fig.1
		—	8	55	ns	10		
		—	6	35	ns	15		
Minimum hold time, CLOCK to DATA	t$_H$	—	10	40	ns	5	—	Fig.1
		—	10	20	ns	10		
		—	5	15	ns	15		
Minimum clock pulse width	t$_W$	—	100	200	ns	5	—	Fig.1
		—	50	100	ns	10		
		—	40	80	ns	15		
Maximum clock rise time and fall time	t$_{r (CL)}$ t$_{f (CL)}$		NO Limit		μs	5	—	Fig.1
					μs	10		
					μs	15		
Maximum clock frequency	f$_{CL}$	1.25	5	—	MHz	5	—	Fig.1
		2.5	10	—	MHz	10		
		3.0	12.5	—	MHz	15		
Minimum strobe pulse width	t$_{WH}$	—	100	200	ns	5	—	Fig.1
		—	40	80	ns	10		
		—	35	70	ns	15		
Input capacitance	C$_{IN}$	—	5	—	pF	—	—	—

●Measurement circuits
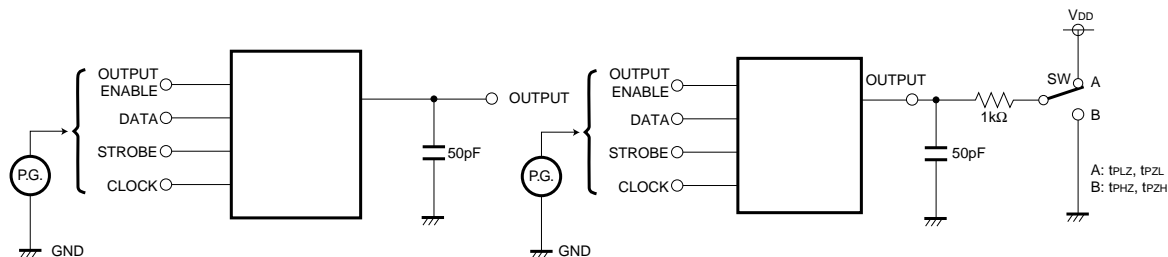
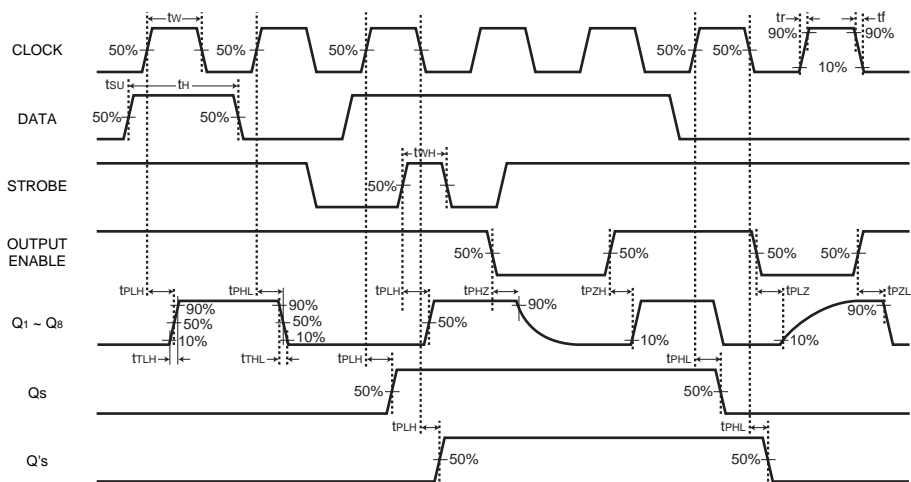Fig. 1 Switching waveform   Fig. 2 3-state delay time

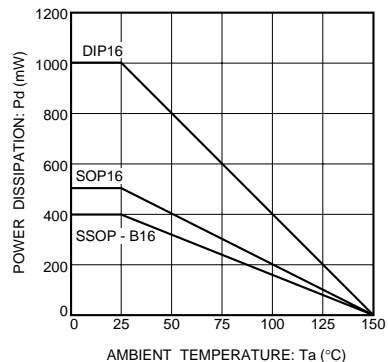Fig. 3 Switching time test waveform

●Electrical characteristic curve
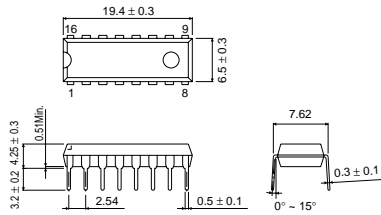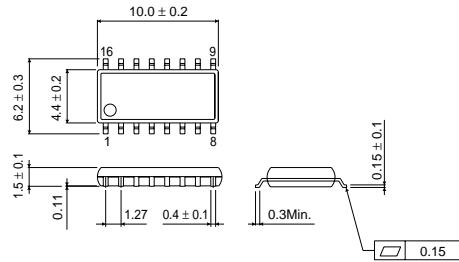
Fig. 4 Power dissipation vs.
ambient temperature

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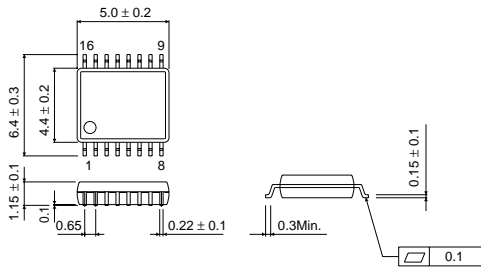
●External dimensions (Units: mm)

BU4094BC

19.4 ± 0.3

16   9

6.5 ± 0.3

1   8

0.5Min.

4.25 ± 0.3

3.2 ± 0.2

2.54   0.5 ± 0.1

7.62

0.3 ± 0.1

0° ~ 15°

DIP16

BU4094BCF

10.0 ± 0.2

16   9

6.2 ± 0.3

4.4 ± 0.2

1   8

1.5 ± 0.1

0.11

1.27   0.4 ± 0.1

0.3Min.

0.15 ± 0.1

0.15

SOP16

BU4094BCFV

5.0 ± 0.2

16   9

6.4 ± 0.3

4.4 ± 0.2

1   8

1.15 ± 0.1

0.1

0.65   0.22 ± 0.1

0.3Min.

0.15 ± 0.1

0.1

SSOP-B16

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