

DN8646FBP

4×8-bit Shift Register Latch Driver IC

Overview

The DN8646FBP is an IC which incorporates a 4×8-bit shift register and a latch driver to meet high-speed operation, low power consumption and high-density printout of the thermal printers for the work processors, and so on. It employs the Bi-CMOS process in which the 4-circuit serial-in and 8-bit parallel-out functions are incorporated, the 4×8-step shift register block and latch block are composed of CMOS, and the 4×8-step parallel driver block is bipolar.

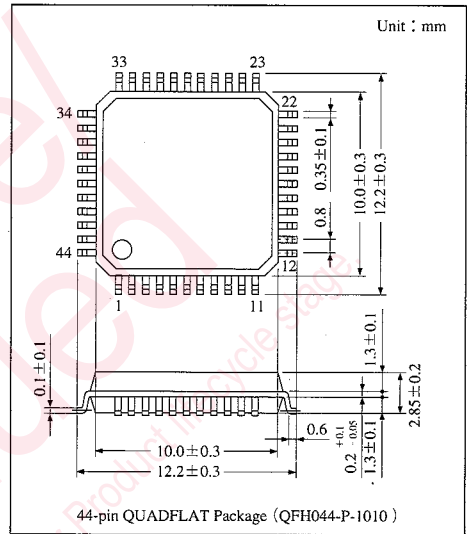
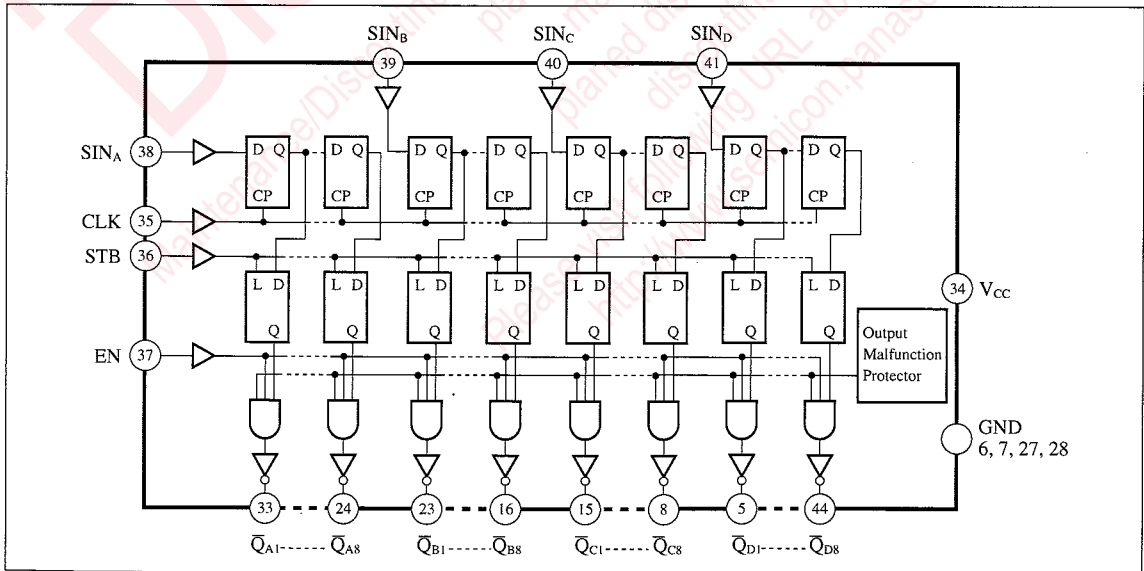
Features

- 4-circuit serial-in and parallel-out
- Provided with clock (CLK), enable (EN), and strobe (STB) input pins common to the 4-circuit
- Built-in output malfunctioning preventive circuit
- Low current consumption at standby $I_{CC} \leq 100 \mu A$
- High-breakdown, large current drive type output steps
Breakdown : 30V
Output current : 120mA (per pin)
- Surface mountable 44-pin flat package (pin pitch : 0.8mm)

Applications

- Driving of the thermal heads
- Driving of the relays, LEDs, solenoids, etc.

Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V _{CC}	0 to 7	V
Output voltage	V _O	0 to 30	V
Output current	I _O	120 (Per one pin)	mA
Power dissipation	P _D	1.8 *	W
Operating ambient temperature	T _{opr}	-20 to +75	°C
Storage temperature	T _{stg}	-55 to +125	°C

* When mounting onto the PCB, power dissipation is reduced at a rate of 15mW/°C from Ta=25°C.

■ Recommended Operating Range (Ta=25°C)

Parameter	Symbol	Range	
Operating supply voltage range	V _{CC}	4 to 6V	
Output voltage	V _O	below 30V	
Output current	I _O	below 100mA *1	
Clock frequency	f _{CLK}	below 10MHz *2	
Input pulse width	CLK	t _w	40ns and over
	STB		40ns and over
Setup time	SIN	t _{su}	30ns and over
	STB		40ns and over
Hold time	SIN	t _h	20ns and over
	STB		0ns and over
Clock pulse rise time	t _r	below 500ns	
Clock pulse fall time	t _f	below 500ns	

*1 An allowable value changes depends on the number of simultaneously turned-on circuits and the duty. Use with power dissipation taken into full account.

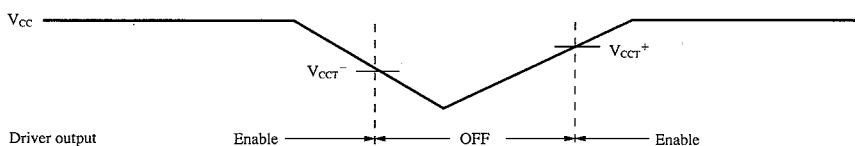
*2 Input duty : 40 to 60%

■ Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	min	typ	max	Unit
Input voltage	V _{IH}	V _{CC} =4 to 6V	0.7V _{CC}	—	V _{CC}	V
	V _{IL}		0	—	0.3V _{CC}	V
Input current	I _{IH}	V _{IH} =5V	—	—	25	μA
	I _{IL}	V _{IL} =0V	—	—	-25	μA
Output saturation voltage (Qn)	V _{CE(sat)1}	I _{OL} =100mA	—	—	0.4	V
	V _{CE(sat)2}	I _{OL} =80mA	—	—	0.35	V
Output leak current	I _{OLK1}	V _O =30V (Output OFF)	—	—	50	μA
	I _{OLK2}	V _O =15V (Output OFF)	—	—	25	μA
Supply current	I _{CC1}	Total driver output OFF	—	—	100	μA
	I _{CC2}	Driver output 1 circuit ON	—	—	5	mA
Output malfunctioning preventive circuit operating voltage	V _{CCT+}	*	2.9	—	3.9	V
	V _{CCT-}	*	2.6	—	3.6	V

Note) V_{CC}=5V unless otherwise specified

* Output malfunctioning preventive circuit operating voltage timing chart.



Others

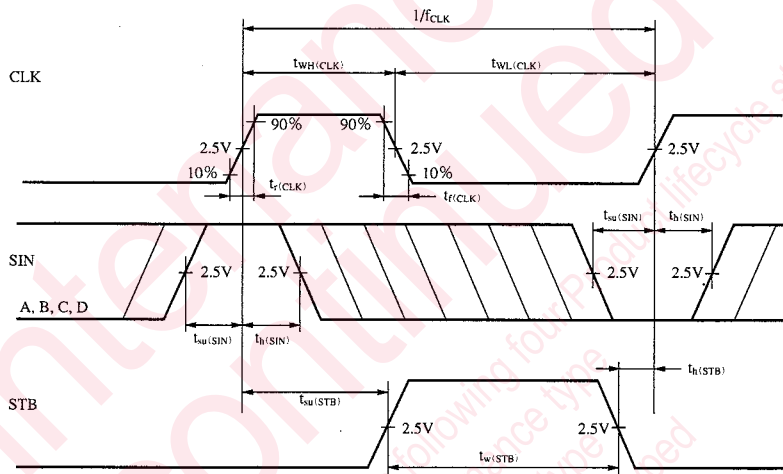
■ Switching Characteristics (Ta=25°C)

Parameter	Symbol	Input	Output	Condition	min	typ	max	Unit
Maximum clock frequency	f_{max}	CLK			10	—	—	MHz
Propagation delay time	t_{PLH}	CLK	\bar{Q}_n	$V_{CC}=5V$ $R_L=100\Omega$ $C_L=15pF$	—	—	2	μs
	t_{PHL}				—	—	0.5	μs
	t_{PLH}	EN	\bar{Q}_n		—	—	2	μs
	t_{PHL}				—	—	0.5	μs

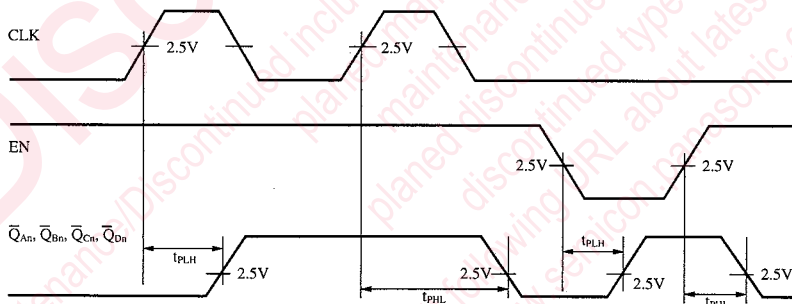
■ Supplementary Descriptions

● Timing Chart

1. Input Timing



2. Propagation Delay Time



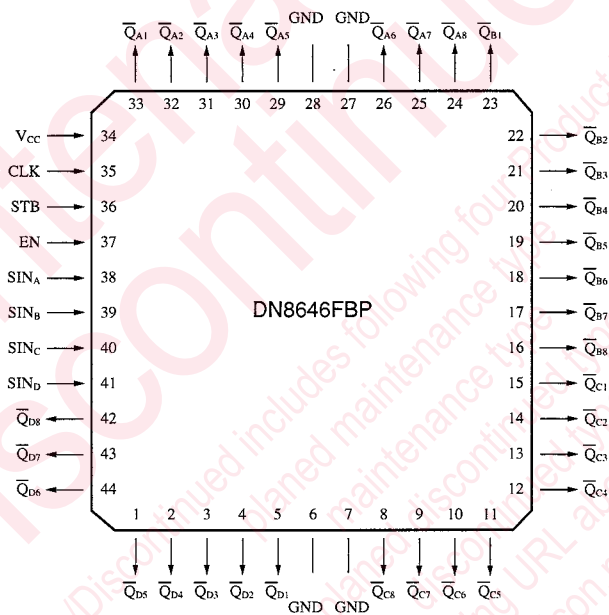
■ Supplementary Descriptions (cont.)

● Functions Table

Input							Driver output							
CLK	EN	STB	SIN _A	SIN _B	SIN _C	SIN _D	\overline{Q}_{A1}	\overline{Q}_{An}	\overline{Q}_{B1}	\overline{Q}_{Bn}	\overline{Q}_{C1}	\overline{Q}_{Cn}	\overline{Q}_{D1}	\overline{Q}_{Dn}
↑	L	×	×	×	×	×	H	H	H	H	H	H	H	H
↓	L	×	×	×	×	×	H	H	H	H	H	H	H	H
↑	H	L	×	×	×	×	nc	nc	nc	nc	nc	nc	nc	nc
↑	H	H	L	L	L	L	H	\overline{Q}_{An-1}	H	\overline{Q}_{Bn-1}	H	\overline{Q}_{Cn-1}	H	\overline{Q}_{Dn-1}
↑	H	H	H	H	H	H	L	\overline{Q}_{An-1}	L	\overline{Q}_{Bn-1}	L	\overline{Q}_{Cn-1}	L	\overline{Q}_{Dn-1}
↓	H	H	×	×	×	×	nc	nc	nc	nc	nc	nc	nc	nc

Note) H=High level, L=Low level, ×=Either "H" or "L" will do, ↑=Transition from "H" to "L", ↓=Transition from "H" to "L", nc=No change

● Pin Assignments



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