

**TOSHIBA**

**TD62801P/F**

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62801P, TD62801F

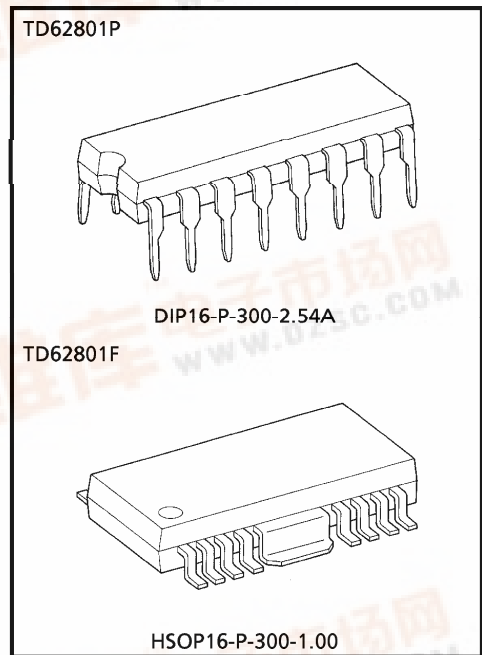
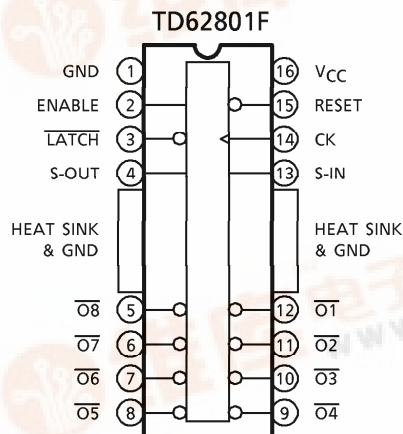
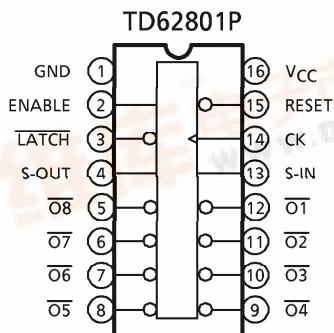
## 8BIT SHIFT REGISTER / LATCH / DRIVER

The TD62801P, TD62801F are specifically designed for thermal printing head drivers utilizing a new high speed, high voltage I<sup>2</sup>L process.

### FEATURES

- 8bit serial-in parallel-out shift register/latch/8bit driver transistors.
- Output current (Single Output) I<sub>OUT</sub> = 70mA MAX.
- High output voltage V<sub>OUT</sub> = 24V MIN.
- Input compatible with TTL
- Internal auto reset function
- Standard supply voltage
- Package type-P : DIP-16pin
- Package type-F : PFP-16pin

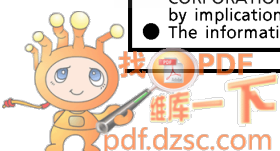
### PIN CONNECTION (TOP VIEW)



Weight  
DIP16-P-300-2.54A : 1.11g (Typ.)  
HSOP16-P-300-1.00 : 0.50g (Typ.)

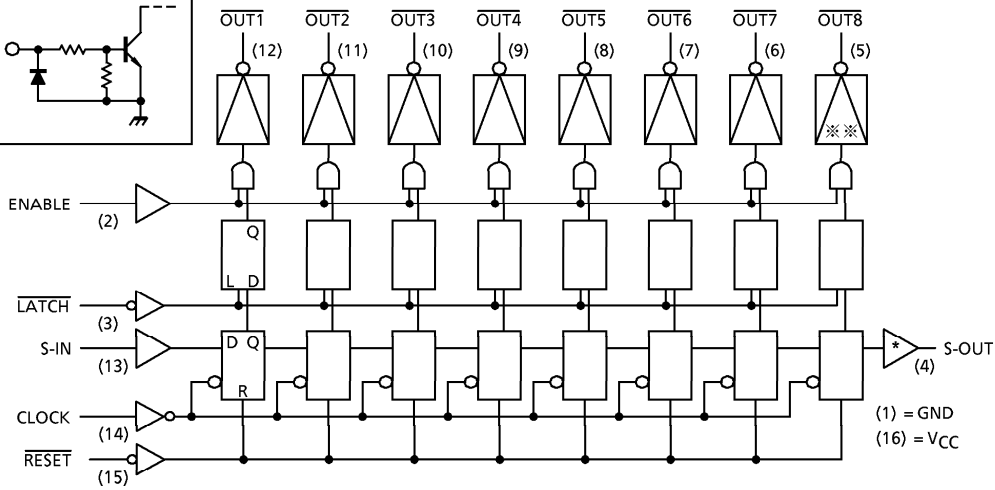
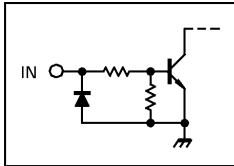
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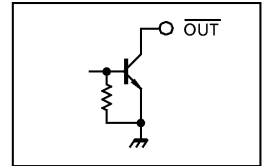


**BLOCK DIAGRAM**

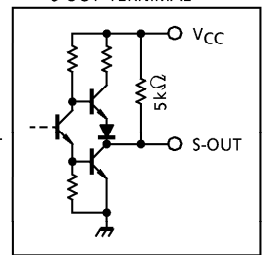
EQUIVALENT CIRCUIT OF INPUTS



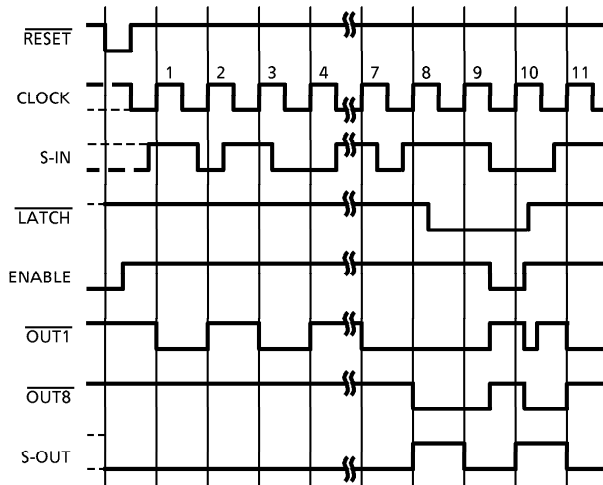
\*\* EQUIVALENT CIRCUIT OF OUTPUTS



\* EQUIVALENT CIRCUIT OF S-OUT TERMINAL



**TIMING DIAGRAM**



**TRUTH TABLE**

CK	E	R	LATCH	S-IN	OUT		S-OUT
					O1	On	
	H	H	H	L	OFF	On - 1	Q7
	H	H	H	H	ON	On - 1	Q7
	H	H	L	*	NC	NC	Q7
	L	H	*	*	OFF	OFF	Q7
	*	*	*	*	NC	NC	Q7
*	*	L	H	*	OFF	OFF	L
*	H		L	*	NC	NC	L

CK = CLOCK                      \* = DON'T CARE  
 E = ENABLE                      NC = NO CHANGE  
 R = RESET                        L = LOW LEVEL  
 LATCH = LATCH                H = HIGH LEVEL  
 S-IN = SERIAL IN  
 OUT = PARALLEL OUT  
 S-OUT = SERIAL OUT

**MAXIMUM RATINGS (Ta = 0~75°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	- 0.3~6.0	V
Input Voltage	V <sub>IN</sub>	- 0.3~V <sub>CC</sub> + 0.3	V
Output Voltage	V <sub>OUT</sub> (Note 1)	- 0.3~V <sub>CC</sub> + 0.3	V
Output Sustaining Voltage	V <sub>CE (SUS)</sub> (Note 2)	- 0.3~26	V
Input Current	I <sub>IN</sub>	± 1	mA
Output Current	I <sub>OUT2</sub> (Note 2)	70	mA / ch
Power Dissipation	P	P <sub>D</sub> (Note 4)	1.47
			1.4 (Note 3)
Operating Temperature	T <sub>opr</sub>	0~70	°C
Storage Temperature	T <sub>stg</sub>	- 55~150	°C

(Note 1) S-OUT

(Note 2) O1~O8

(Note 3) On PCB (60×30×1.6mm Cu 30%)

(Note 4) Delated above 25°C in the proportion of 11.7mW/°C (P-Type), 11.2mW/°C (F-Type)

**RECOMMENDED OPERATING CONDITIONS** (Ta = 0~70°C)

CHARACTERISTIC			SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage			V <sub>CC</sub>	—	4.5	5.0	5.5	V
Output Voltage	"H" Level	On	V <sub>OH</sub>	—	0	—	24	V
	Input Voltage		V <sub>IN</sub>	—	0	—	V <sub>CC</sub>	V
Output Current	"H" Level	S-OUT	I <sub>OH</sub>	—	0	—	-0.4	mA
	"L" Level	S-OUT	I <sub>OL</sub>	—	0	—	8	
		On	I <sub>OL</sub>	—	0	—	60	
Clock Frequency			f <sub>CLOCK</sub>	—	0	—	500	kHz
Clock Pulse Width			f <sub>w</sub> CLOCK	—	1	—	—	μs
Data Set Up Time			t <sub>setup</sub>	—	100	—	—	μs
Data Hold Time			t <sub>hold</sub>	—	100	—	—	μs

**ELECTRICAL CHARACTERISTICS** (Ta = 0~70°C)

CHARACTERISTIC			SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Voltage	"H" Level		V <sub>IH</sub>	—	—	2.0	—	—	V
	"L" Level		V <sub>IL</sub>	—	—	—	—	0.8	
Input Current	"H" Level		I <sub>IH</sub>	—	V <sub>CC</sub> = 5.5V V <sub>IN</sub> = 2.4V V <sub>IN</sub> = 5.5V	—	0.14	0.3	mA
	"L" Level		I <sub>IL</sub>	—	V <sub>CC</sub> = 5.5V, V <sub>IL</sub> = 0.4V	—	20	50	
Output Voltage	"H" Level	S-OUT	V <sub>OH</sub>	—	V <sub>CC</sub> = 5.0V, V <sub>OH</sub> = -10μA	4.0	—	—	V
				—	V <sub>CC</sub> = 4.5V, I <sub>OH</sub> = -400μA	2.4	2.8	—	
	"L" Level	S-OUT	V <sub>OL</sub>	—	V <sub>CC</sub> = 4.5V, I <sub>OL</sub> = 8mA	—	0.2	0.4	
On				V <sub>CC</sub> = 4.5V, I <sub>OL</sub> = 60mA	—	0.2	0.6		
Output Current	"H" Level	On	I <sub>OH</sub>	—	V <sub>CC</sub> = 4.5V, V <sub>OH</sub> = 2.4V	—	—	100	μA
Short-Circuit Output Current		"H" Level	I <sub>OS</sub>	—	V <sub>CC</sub> = 5.5V	-5	-16	-50	mA
Supply Current			I <sub>CC</sub>	—	V <sub>CC</sub> = 5.5V	—	55	80	mA

**SWITCHING CHARACTERISTICS (Ta = 25°C)**

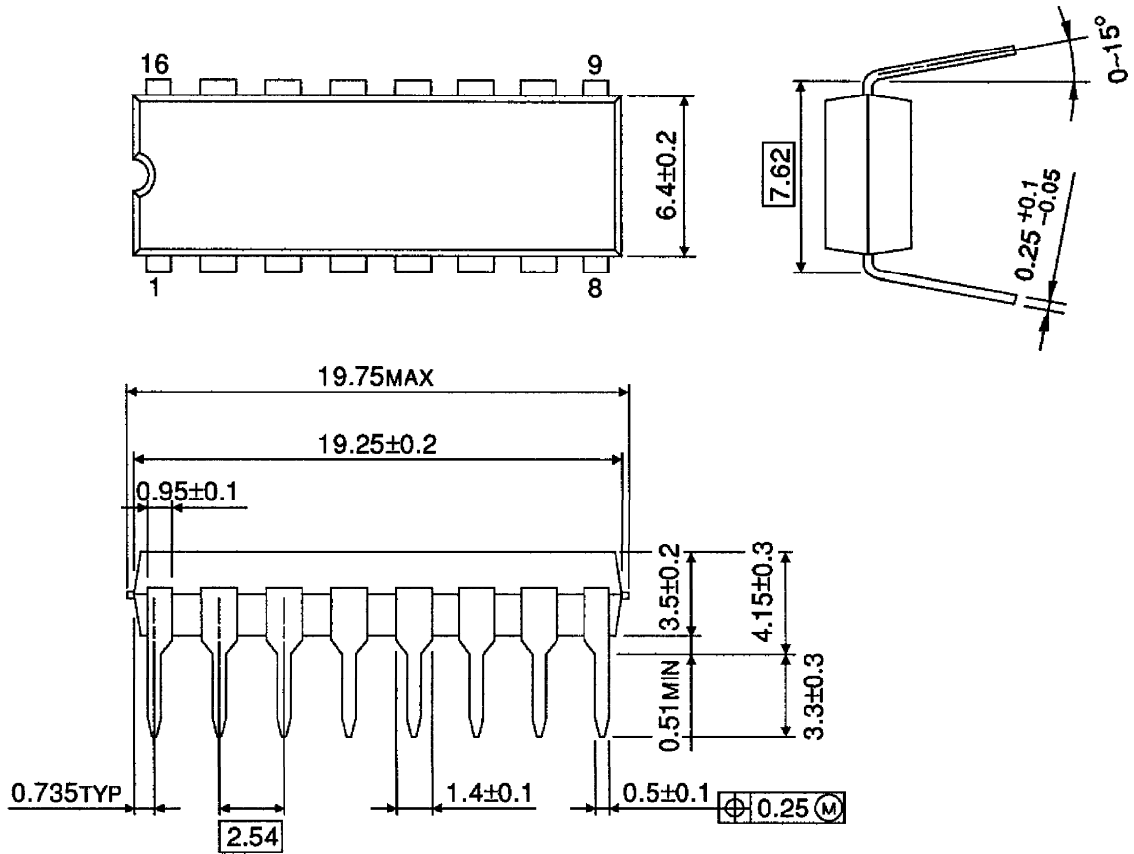
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Propagation Delay Time	"H" Level	CK-S-OUT	t <sub>pLH</sub>	V <sub>CC</sub> = 5.0V V <sub>IH</sub> = 3.0V V <sub>IL</sub> = 0V Duty = 50% R <sub>L</sub> S-OUT = 2kΩ R <sub>L</sub> On = 82Ω C <sub>L</sub> = 15pF	—	0.6	1.5	μs
		CK-On			—	2.5	6.5	
		L-On			—	2.1	5.0	
		R-On			—	2.2	6.0	
		E-On			—	1.5	4.0	
	"L" Level	CK-S-OUT	t <sub>pHL</sub>		—	0.35	1.0	
		CK-On			—	0.6	1.5	
		L-On			—	0.32	1.0	
		R-S-OUT			—	0.3	1.0	
		E-On			—	0.1	0.3	
Maximum Clock Frequency		f <sub>MAX</sub>	—	—	1.6	—	MHz	
Minimum Pulse Width	CK	t <sub>wCK</sub>	—	—	250	600	ns	
	CK	t <sub>wCK</sub>	—	—	280	700		
	L	t <sub>wL</sub>	—	—	230	600		
	R	t <sub>wR</sub>	—	—	300	1000		
Data Set Up Time		t <sub>setup</sub>	—	—	20	50	ns	
Data Hold Time		t <sub>hold</sub>	—	—	20	50	ns	
Rise Time		t <sub>r</sub>	—	—	70	—	ns	
Fall Time		t <sub>f</sub>	—	—	70	—	ns	

**PRECAUTIONS for USING**

Utmost care is necessary in the design of the output line, V<sub>CC</sub> and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

OUTLINE DRAWING  
DIP16-P-300-2.54A

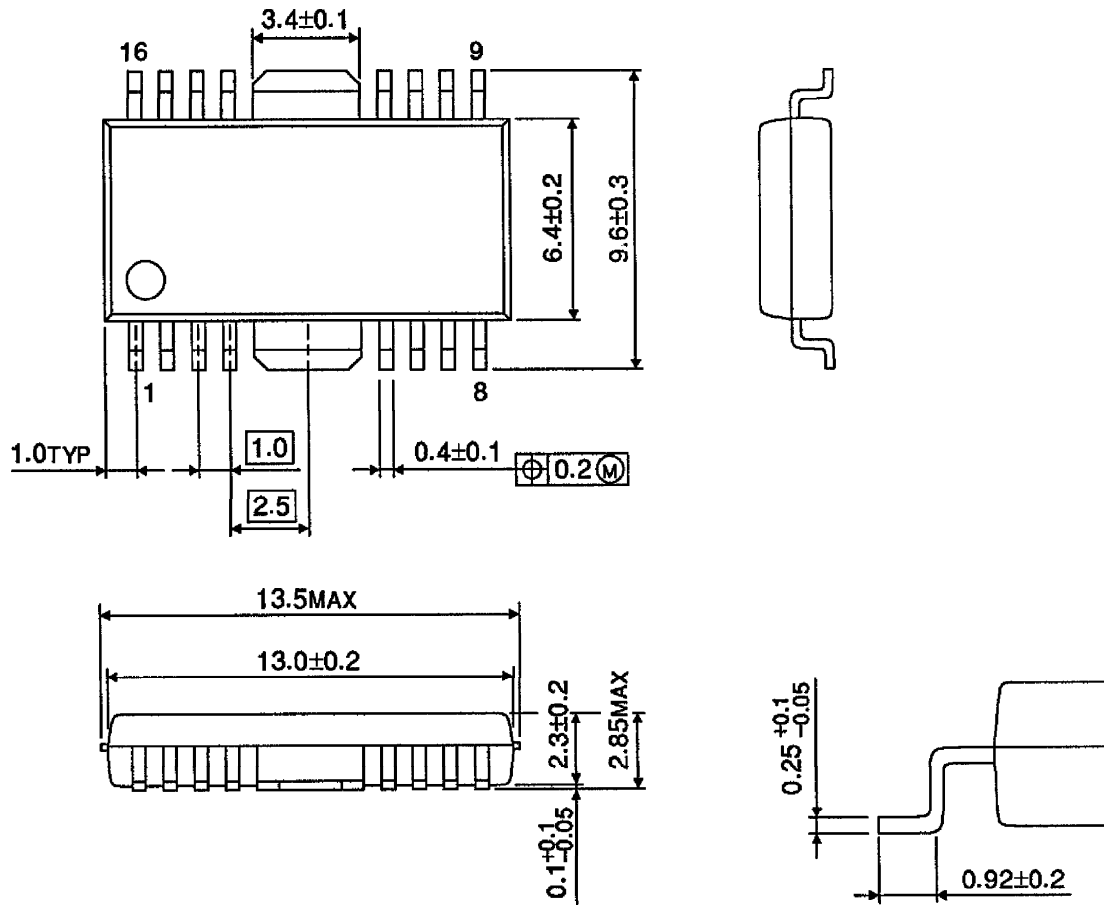
Unit : mm



Weight : 1.11g (Typ.)

OUTLINE DRAWING  
HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)