

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62801P, TD62801F

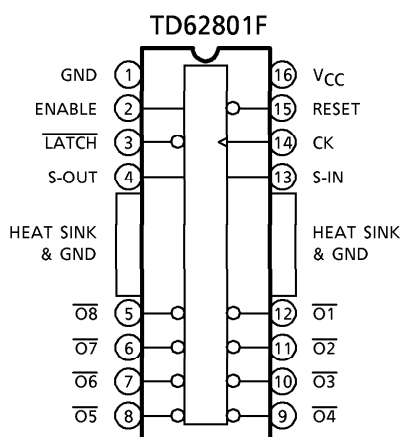
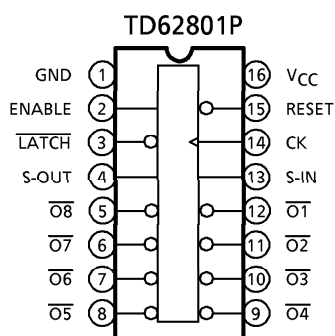
8BIT SHIFT REGISTER / LATCH / DRIVER

The TD62801P, TD62801F are specifically designed for thermal printing head drivers utilizing a new high speed, high voltage I²L process.

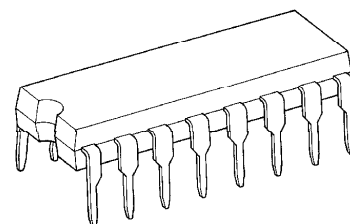
FEATURES

- 8bit serial-in parallel-out shift register / latch / 8bit driver transistors.
- Output current (Single Output) I_{OUT} = 70mA MAX.
- High output voltage V_{OUT} = 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)

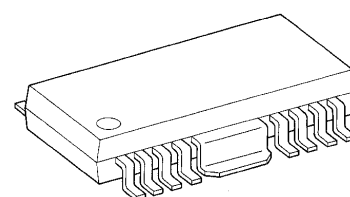


TD62801P



DIP16-P-300-2.54A

TD62801F



HSOP16-P-300-1.00

Weight

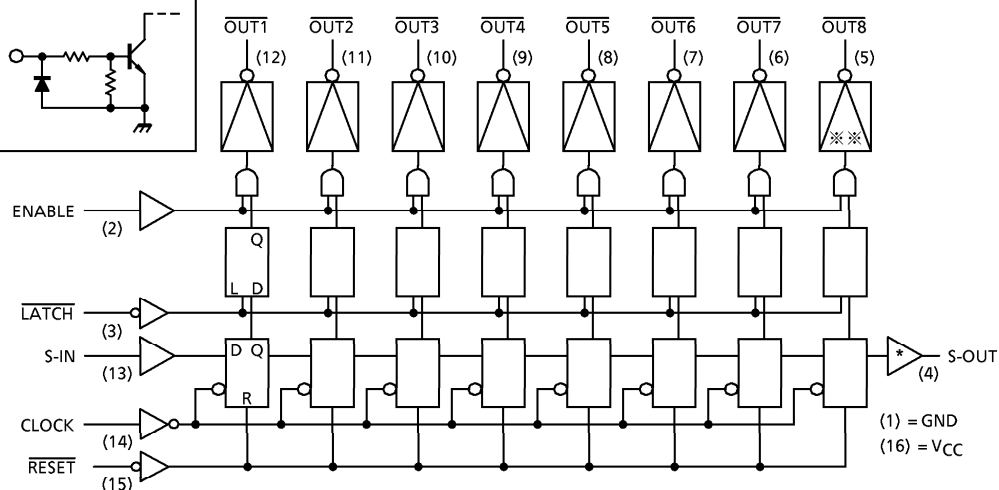
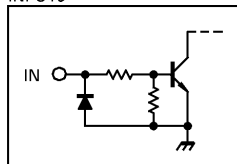
DIP16-P-300-2.54A : 1.11g (Typ.)
HSOP16-P-300-1.00 : 0.50g (Typ.)

961001EBA2

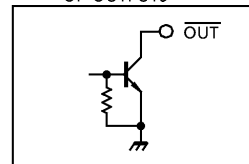
- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

BLOCK DIAGRAM

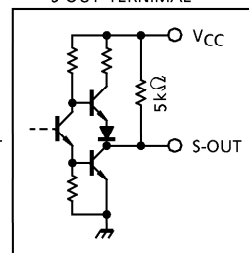
EQUIVALENT CIRCUIT OF INPUTS



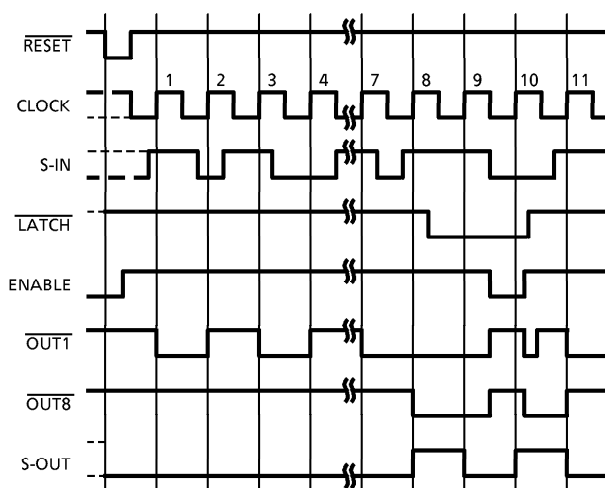
** EQUIVALENT CIRCUIT OF OUTPUTS



* EQUIVALENT CIRCUIT OF S-OUT TERNINAL



TIMING DIAGRAM



TRUTH TABLE

CK	E	R	$\overline{\text{LATCH}}$	S-IN	OUT		S-OUT
					$\overline{\text{O1}}$	$\overline{\text{On}}$	
	H	H	H	L	OFF	$\overline{\text{On}} - \overline{1}$	Q ₇
	H	H	H	H	ON	$\overline{\text{On}} - \overline{1}$	Q ₇
	H	H	L	*	NC	NC	Q ₇
	L	H	*	*	OFF	OFF	Q ₇
	*	*	*	*	NC	NC	Q ₇
	*	L	H	*	OFF	OFF	L
	H		L	*	NC	NC	L
CK = CLOCK E = ENABLE R = RESET $\overline{\text{LATCH}}$ = LATCH S-IN = SERIAL IN OUT = PARALLEL OUT S-OUT = SERIAL OUT * = DON'T CARE NC = NO CHANGE L = LOW LEVEL H = HIGH LEVEL							

MAXIMUM RATINGS (Ta = 0~75°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V _{CC}	-0.3~6.0	V
Input Voltage		V _{IN}	-0.3~V _{CC} +0.3	V
Output Voltage		V _{OUT} (Note 1)	-0.3~V _{CC} +0.3	V
Output Sustaining Voltage		V _{CE(SUS)} (Note 2)	-0.3~26	V
Input Current		I _{IN}	±1	mA
Output Current		I _{OUT2} (Note 2)	70	mA / ch
Power Dissipation	P	P _D (Note 4)	1.47	W
	F		1.4 (Note 3)	
Operating Temperature		T _{opr}	0~70	°C
Storage Temperature		T _{stg}	-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 _{CC}	—	4.5	5.0	5.5	V
Output Voltage	"H" Level	On	V _{OH}	—	0	—	24	V
Input Voltage			V _{IN}	—	0	—	V _{CC}	V
Output Current	"H" Level	S-OUT	I _{OH}	—	0	—	−0.4	mA
	"L" Level	S-OUT	I _{OL}	—	0	—	8	
		On	I _{OL}	—	0	—	60	
Clock Frequency			f _{CLOCK}	—	0	—	500	kHz
Clock Pulse Width			f _w CLOCK	—	1	—	—	μs
Data Set Up Time			t _{setup}	—	100	—	—	μs
Data Hold Time			t _{hold}	—	100	—	—	μs

ELECTRICAL CHARACTERISTICS (Ta = 0~70°C)

CHARACTERISTIC			SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Voltage	"H" Level		V _{IH}	—	—	2.0	—	—	V
	"L" Level		V _{IL}	—	—	—	—	0.8	
Input Current	"H" Level		I _{IH}	—	V _{CC} = 5.5V, V _{IN} = 2.4V	—	0.14	0.3	mA
				—	V _{CC} = 5.5V, V _{IN} = 5.5V	—	0.37	0.7	
	"L" Level		I _{IL}	—	V _{CC} = 5.5V, V _{IL} = 0.4V	—	20	50	μA
Output Voltage	"H" Level	S-OUT	V _{OH}	—	V _{CC} = 5.0V, V _{OH} = -10μA	4.0	—	—	V
				—	V _{CC} = 4.5V, I _{OH} = -400μA	2.4	2.8	—	
	"L" Level	S-OUT	V _{OL}	—	V _{CC} = 4.5V, I _{OL} = 8mA	—	0.2	0.4	
				—	V _{CC} = 4.5V, I _{OL} = 60mA	—	0.2	0.6	
Output Current	"H" Level	On	I _{OH}	—	V _{CC} = 4.5V, V _{OH} = 2.4V	—	—	100	μA
Short-Circuit Output Current	"H" Level		I _{OS}	—	V _{CC} = 5.5V	-5	-16	-50	mA
Supply Current			I _{CC}	—	V _{CC} = 5.5V	—	55	80	mA

SWITCHING CHARACTERISTICS (Ta = 25°C)

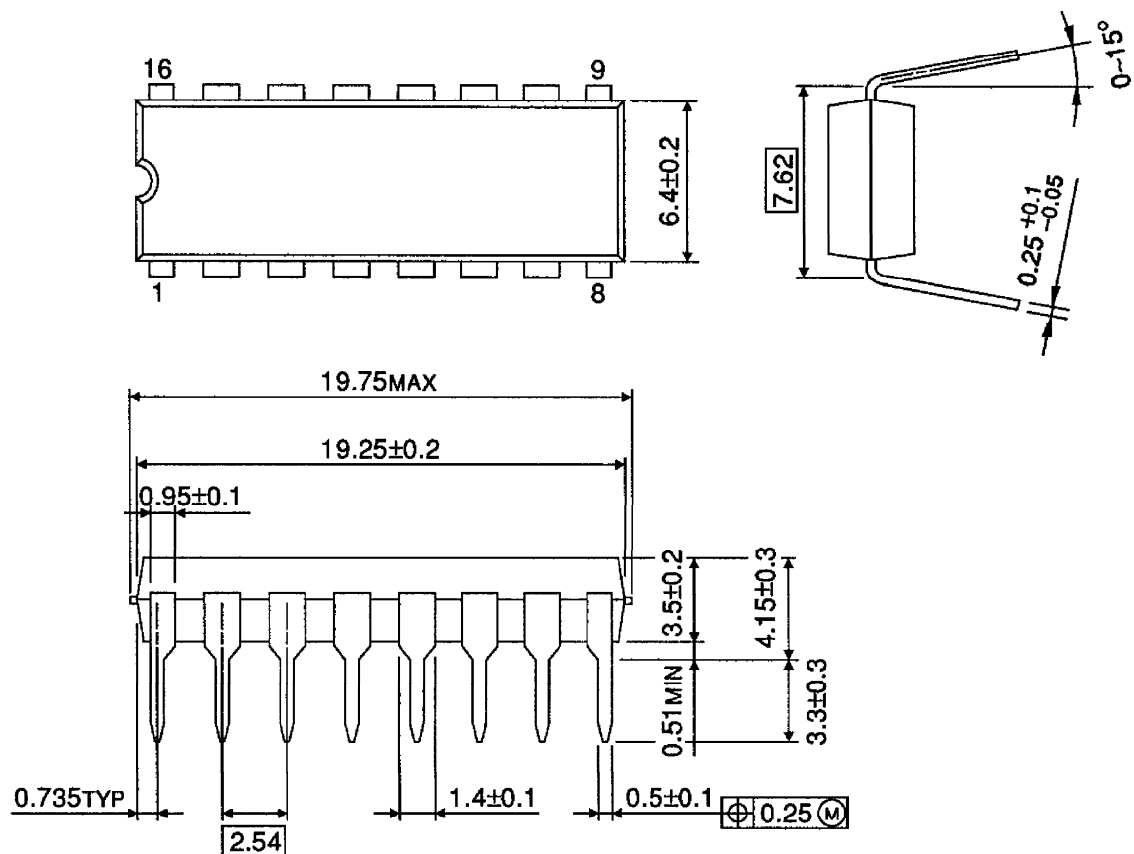
CHARACTERISTIC			SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Propagation Delay Time	"H" Level	CK-S-OUT	t_{pLH}	—	$V_{CC} = 5.0V$ $V_{IH} = 3.0V$ $V_{IL} = 0V$ Duty = 50%	—	0.6	1.5	μs
		CK-On				—	2.5	6.5	
		L-On				—	2.1	5.0	
		R-On				—	2.2	6.0	
		E-On				—	1.5	4.0	
	"L" Level	CK-S-OUT	t_{pHL}	—		—	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_{MAX}	—	R_L S-OUT = 2k Ω R_L On = 82 Ω C_L = 15pF	—	1.6	—	MHz
Minimum Pulse Width		CK	t_{wCK}	—	—	250	600	ns	
		CK	t_{wCK}	—	—	280	700		
		L	t_{wL}	—	—	230	600		
		R	t_{wR}	—	—	300	1000		
Data Set Up Time			t_{setup}	—		—	20	50	ns
Data Hold Time			t_{hold}	—		—	20	50	ns
Rise Time			t_r	—		—	70	—	ns
Fall Time			t_f	—		—	70	—	ns

PRECAUTIONS for USING

Utmost care is necessary in the design of the output line, V_{CC} 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

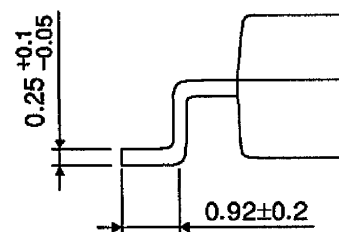
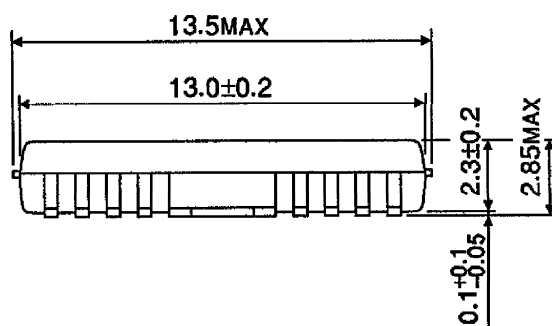
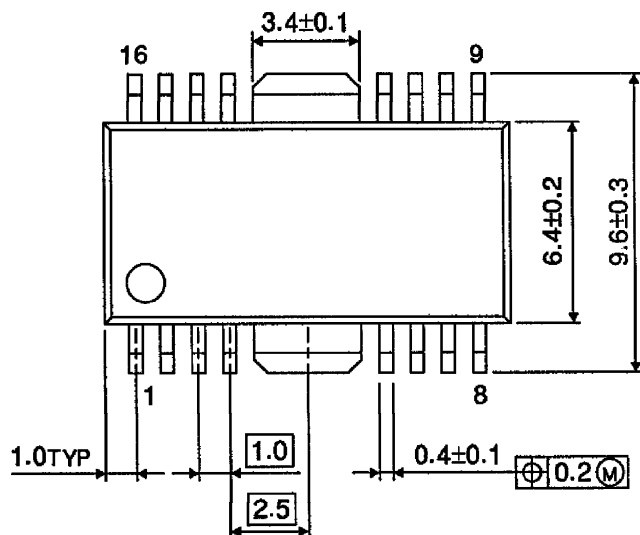


Weight : 1.11g (Typ.)

OUTLINE DRAWING

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)