

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

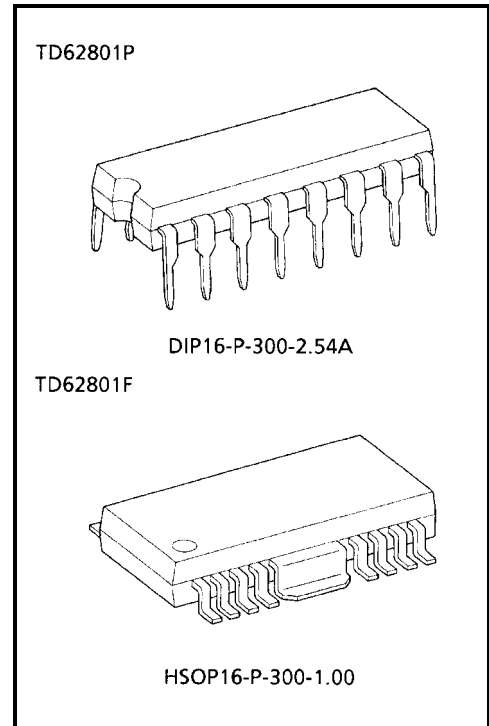
TD62801P, TD62801F

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.

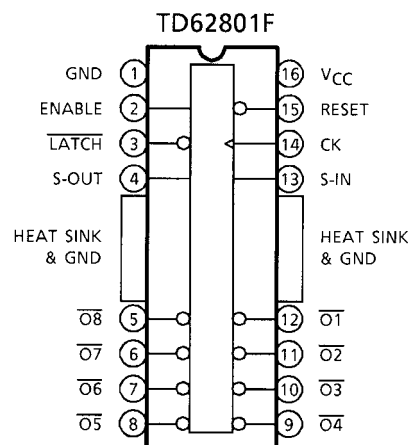
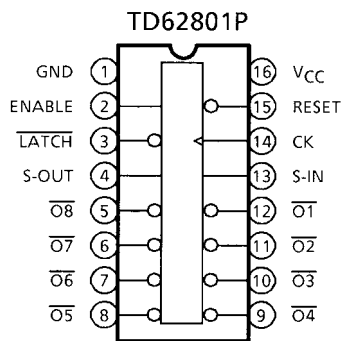
FEATURES

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



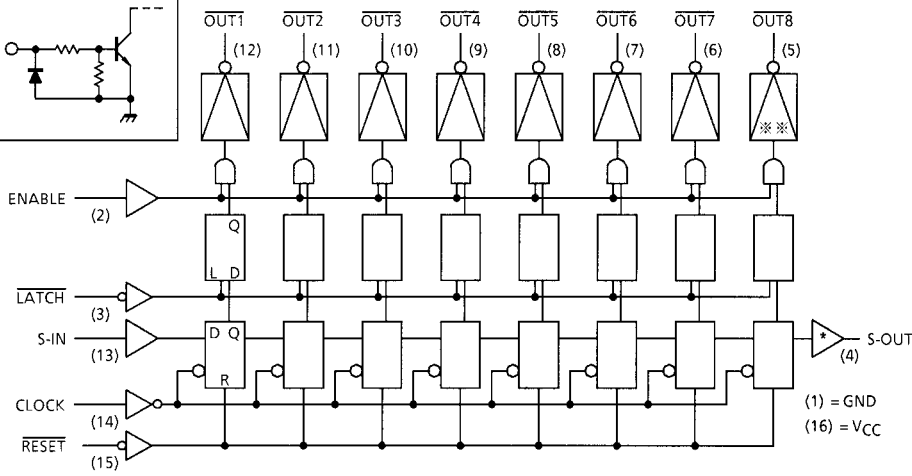
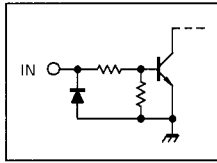
Weight
 DIP16-P-300-2.54A : 1.11 g (Typ.)
 HSOP16-P-300-1.00 : 0.50 g (Typ.)

PIN CONNECTION (TOP VIEW)

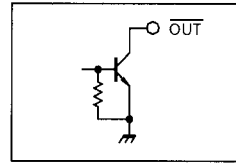


BLOCK DIAGRAM

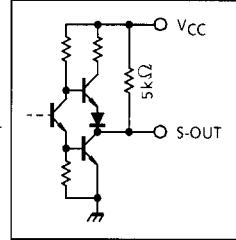
EQUIVALENT CIRCUIT OF INPUTS



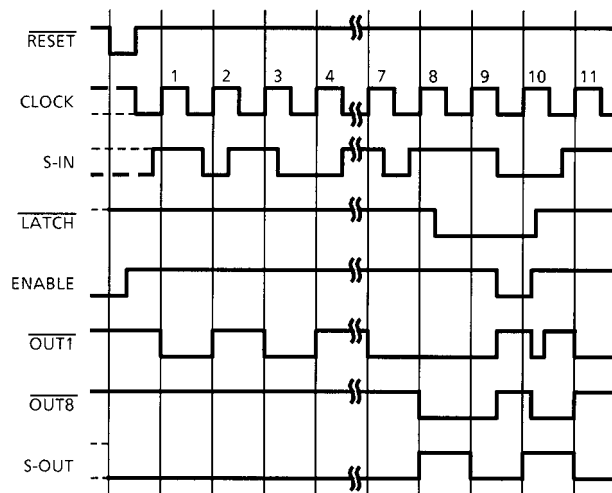
** EQUIVALENT CIRCUIT OF OUTPUTS



* EQUIVALENT CIRCUIT OF S-OUT TERMINAL



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	$\overline{\text{On}}-1$	Q ₇
	H	H	H	H	ON	$\overline{\text{On}}-1$	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
 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	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 × 1.6 mm Cu 30%)

Note 4: Delated above 25°C in the proportion of 11.7 mW / °C (P-Type), 11.2 mW / °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 CIRCUIT	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}	—	$V_{CC} = 5.5$ V	$V_{IN} = 2.4$ V	—	0.14	0.3	mA
					$V_{IN} = 5.5$ V	—	0.37	0.7	
	"L" Level	I_{IL}	—	$V_{CC} = 5.5$ V, $V_{IL} = 0.4$ V	—	20	50	μA	
Output Voltage	"H" Level	S-OUT	V_{OH}	—	$V_{CC} = 5.0$ V, $V_{OH} = -10$ μA	4.0	—	—	V
				—	$V_{CC} = 4.5$ V, $I_{OH} = -400$ μA	2.4	2.8	—	
	"L" Level	S-OUT	V_{OL}	—	$V_{CC} = 4.5$ V, $I_{OL} = 8$ mA	—	0.2	0.4	
		On		—	$V_{CC} = 4.5$ V, $I_{OL} = 60$ mA	—	0.2	0.6	
Output Current	"H" Level	On	I_{OH}	—	$V_{CC} = 4.5$ V, $V_{OH} = 2.4$ V	—	—	100	μA
Short-Circuit Output Current		"H" Level	I_{OS}	—	$V_{CC} = 5.5$ V	-5	-16	-50	mA
Supply Current			I_{CC}	—	$V_{CC} = 5.5$ V	—	55	80	mA

SWITCHING CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Propagation Delay Time	"H" Level	CK-S-OUT	t _{pLH}	V _{CC} = 5.0 V V _{IH} = 3.0 V V _{IL} = 0 V Duty = 50% R _{L S-OUT} = 2 kΩ R _{L On} = 82 Ω C _L = 15 pF	—	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}	—	—	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

This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.

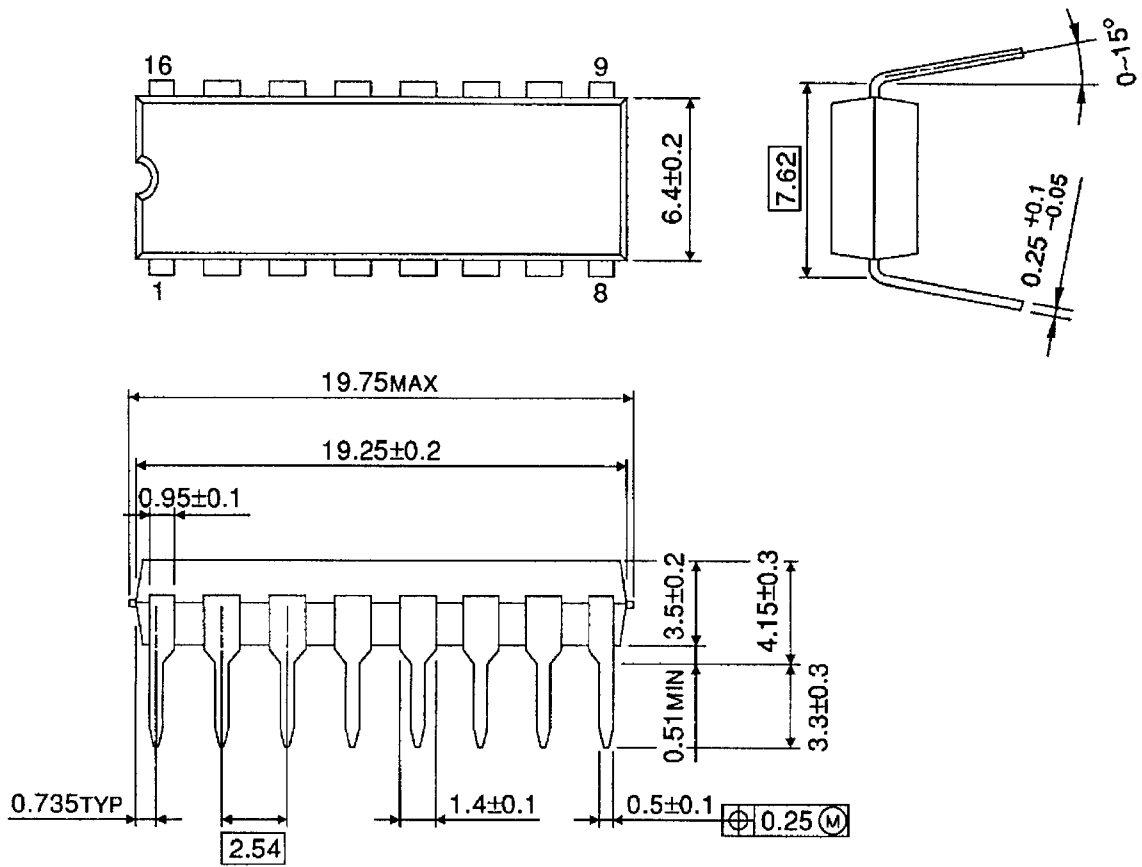
Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.

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.

PACKAGE DIMENSIONS

DIP16-P-300-2.54A

Unit: mm

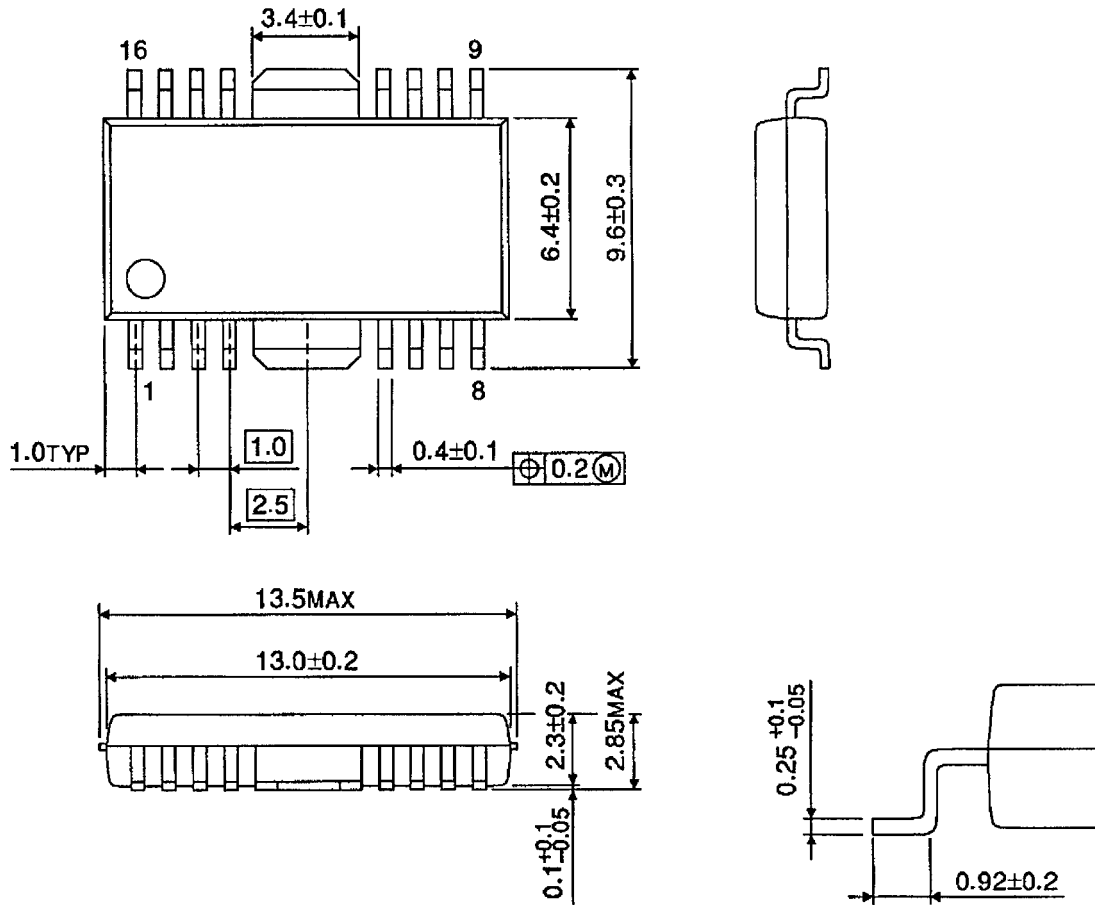


Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

HSOP16-P-300-1.00

Unit: mm



Weight: 0.50 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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