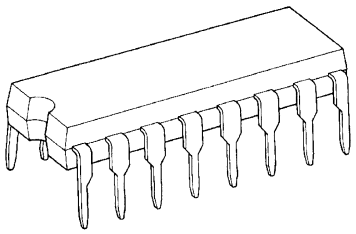
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62801P,TD62801F

8BIT SHIFT REGISTER / LATCH / DRIVER

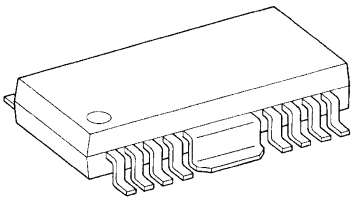
The TD62801P, TD62801F are specifically designed for thermal printing head drivers utilizing a new high speed, high voltage I^2L process.

TD62801P



DIP16-P-300-2.54A

TD62801F



HSOP16-P-300-1.00

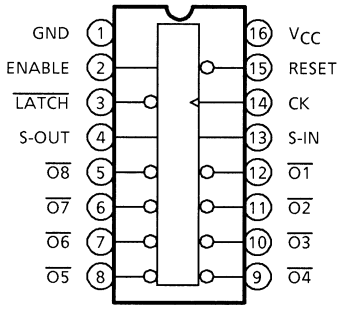
Weight
DIP16−P−300−2.54A : 1.11 g (Typ.)
HSOP16−P−300−1.00 : 0.50 g (Typ.)

FEATURES

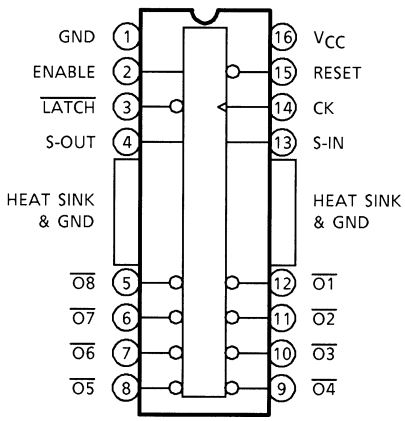
- 8bit serial−in parallel−out shift register / latch / 8bit driver transistors.
- Output current (Single Output) I_{OUT} = 70 mA MAX.
- High output voltage V_{OUT} = 24 V MIN.
- Input compatible with TTL
- Internal auto reset function
- Standard supply voltage
- Package type−P : DIP−16 pin
- Package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

PIN CONNECTION (TOP VIEW)

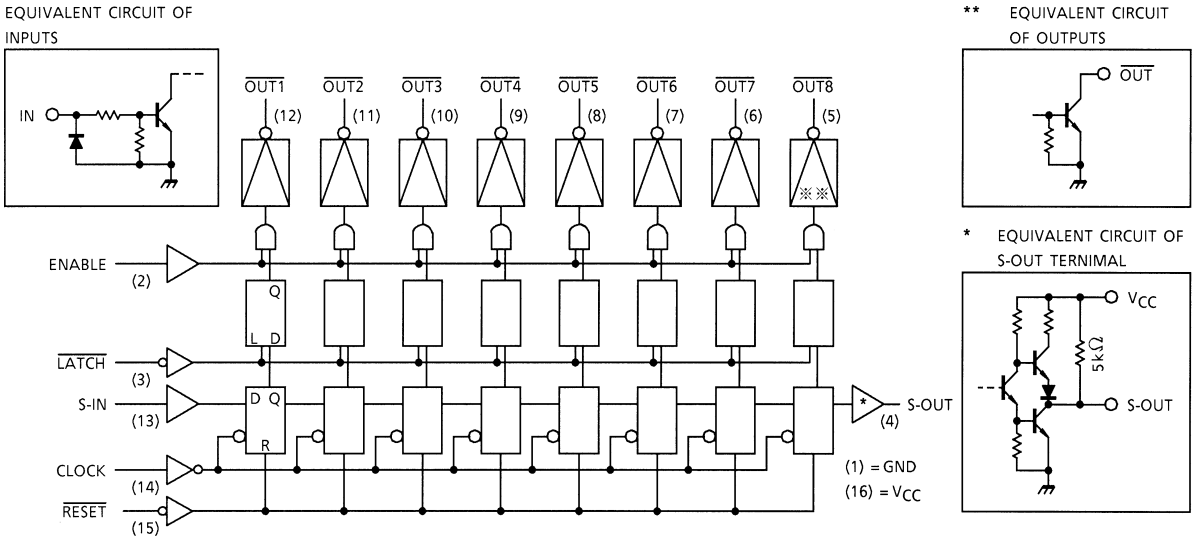
TD62801P



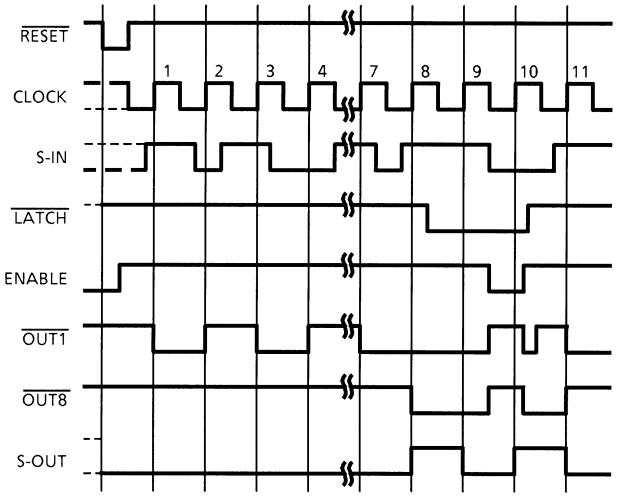
TD62801F



BLOCK DIAGRAM



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
$\overline{\text{LATCH}}$ = 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 × 1.6 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 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} = 5.5 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)

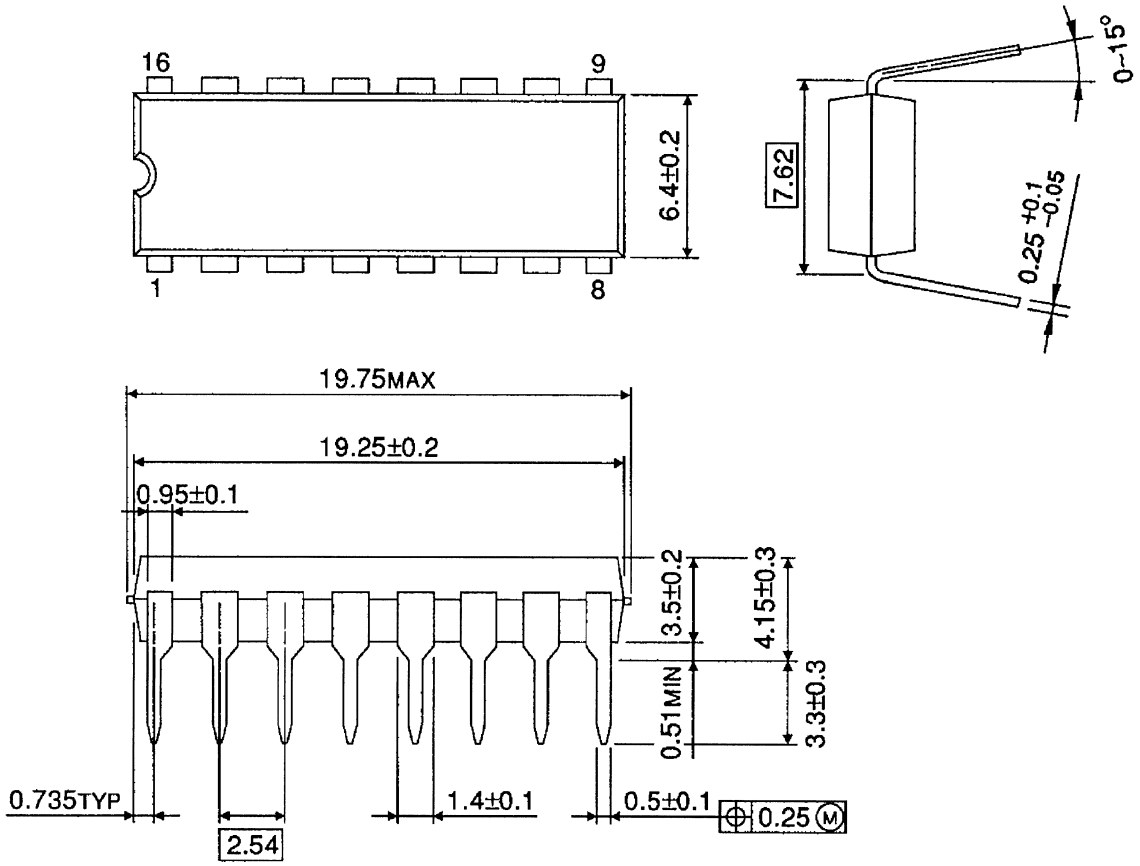
CHARACTERISTIC			SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Propagation Delay Time	"H" Level	CK-S-OUT	t_{pLH}	—	V_{CC} = 5.0 V V_{IH} = 3.0 V V_{IL} = 0 V Duty = 50% $R_{L\ S-OUT}$ = 2 kΩ R_L On = 82 Ω C_L = 15 pF	—	0.6	1.5	μs
		CK-On				—	2.5	6.5	
		L-On				—	2.1	5.0	
		R-On				—	2.2	6.0	
		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

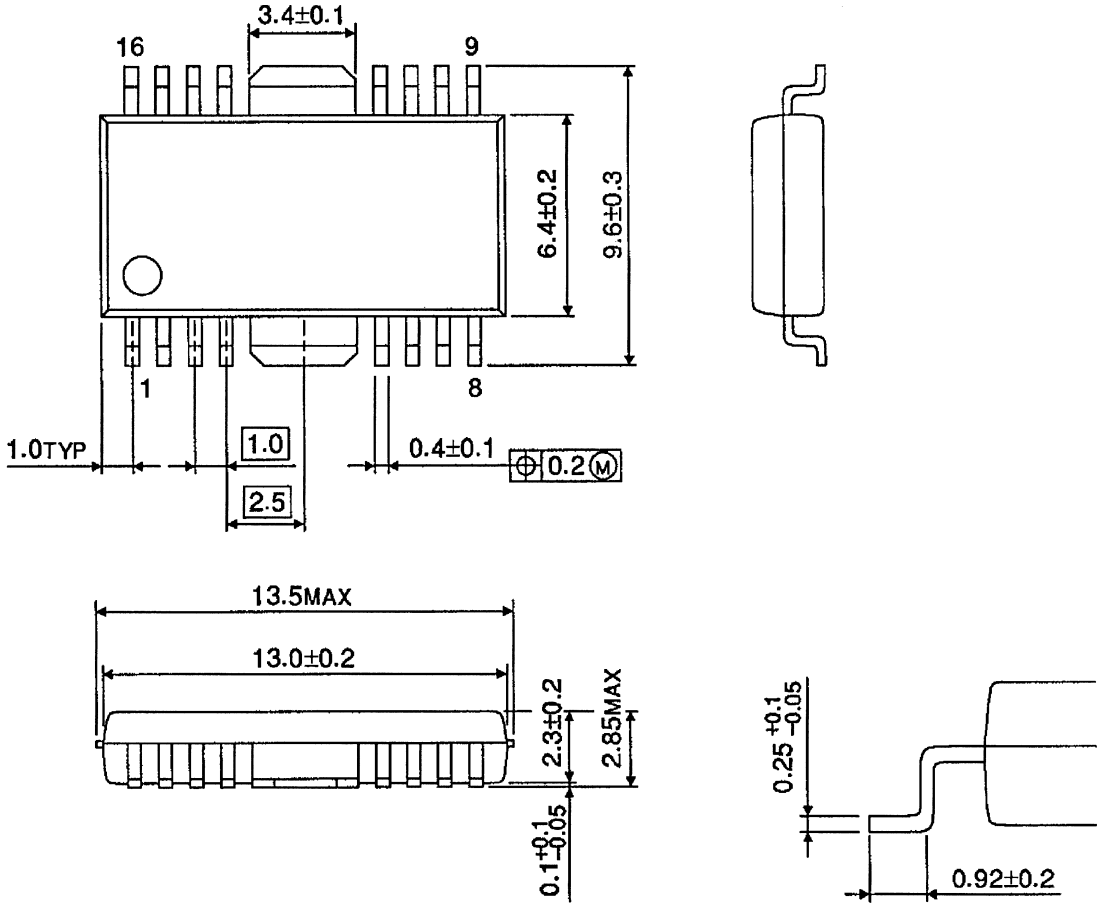
DIP16−P−300−2.54A Unit: mm



Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

HSOP16−P−300−1.00 Unit: mm



Weight: 0.50 g (Typ.)

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000707EBA

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