

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

T D 6 2 8 2 4 P**8×3 PARALLEL SHIFT REGISTER / DRIVER**

The TD62824P is a general purpose 24bit driver IC consisting of 8 block 3bit shift register and 24bit driver (open collector).

The TD62824P is best suited as a 24 dot printer head driver.

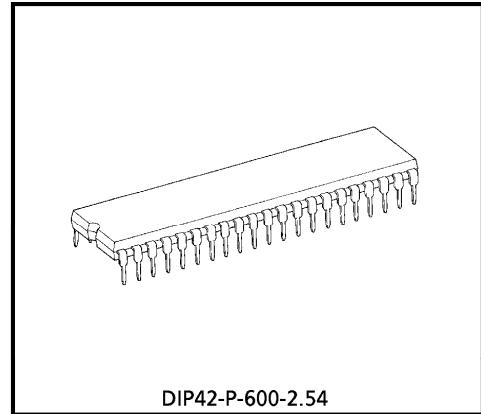
FEATURES

- Power-down function for reducing power consumption during standby or when printing is not made.
($I_{CC\ off} < 10\ \mu A$)
- Independent 2 output enable terminals (even / add outputs)
- Effective as measures for regenerative effect during high-speed and high-density printing.
- 8bit parallel input and 3bit parallel shift configuration : High-speed operation and direct interface with CPU.
- Large output drive capacity

Output with standing voltage ... 30V

Output current 80mA DC
15mA 10%

- Built-in CR-Timer for load burning prevention.
- Less output saturation voltage difference in package : Within $\pm 50mV$ (standard) at $I_{OUT} = 120mA$

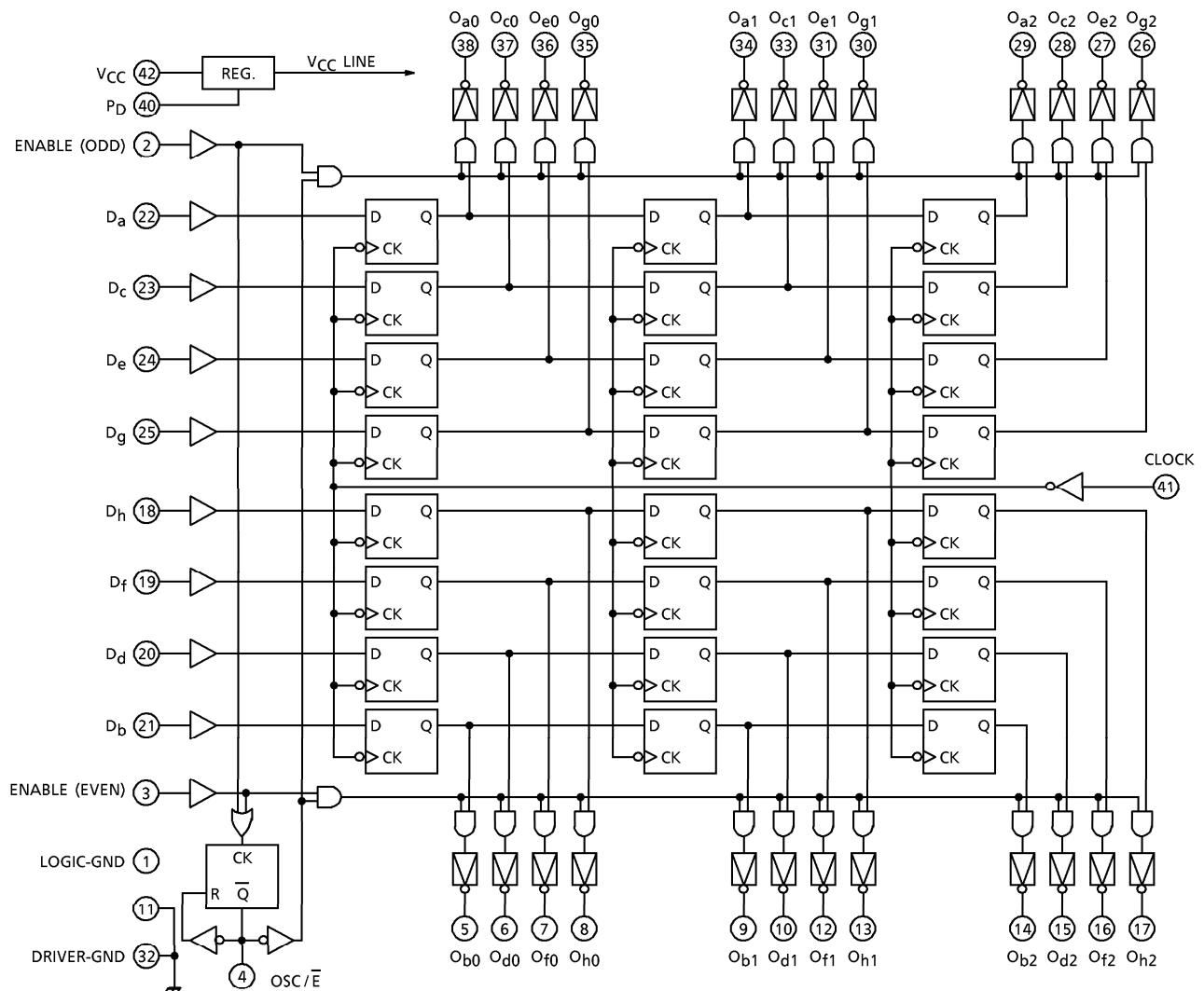
**PIN CONNECTION (TOP VIEW)**

L-GND	1	42	V _{CC}
E (ODD)	2	41	CK
E (EVEN)	3	40	P _D
OSC/E	4	39	NC
O _{b0}	5	38	O _{a0}
O _{d0}	6	37	O _{c0}
O _{f0}	7	36	O _{e0}
O _{h0}	8	35	O _{g0}
O _{b1}	9	34	O _{a1}
O _{d1}	10	33	O _{c1}
P-GND	11	32	P-GND
O _{f1}	12	31	O _{e1}
O _{h1}	13	30	O _{g1}
O _{b2}	14	29	O _{a2}
O _{d2}	15	28	O _{c2}
O _{f2}	16	27	O _{e2}
O _{h2}	17	26	O _{g2}
D _h	18	25	D _g
D _f	19	24	D _e
D _d	20	23	D _c
D _b	21	22	D _a

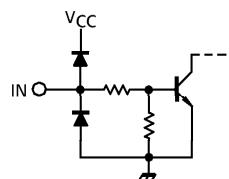
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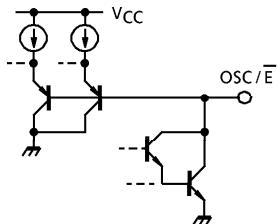
BLOCK DIAGRAM



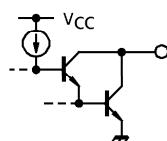
INPUT EQUIVALENT CIRCUIT



OSC / E TERMINAL EQUIVALENT CIRCUIT



OUTPUT EQUIVALENT CIRCUIT



TRUTH TABLE A

P _D	OSC/E	E (ODD)	E (EVEN)	O (ODD)	O (EVEN)	COMMENT
L	(*)	(*)	(*)	OFF	OFF	I _{CC} <10μA
H	(*)	L	L	OFF	OFF	—
H	L	H	L	D	OFF	—
H	L	L	H	OFF	D	—
H	L	H	H	D	D	—
H	CR	↑	L	D	OFF	OUTPUT ON time is according to CR constant.
H	CR	L	↑	OFF	D	
H	CR	↑	↑	D	D	
H	CR	H	(*)	OFF	OFF	—
H	CR	(*)	H	OFF	OFF	—

(Note) If "H" level power is applied by force, OSC/E terminal may be destructed and therefore, it should be used with CR added or grounded.

(*) "H" or "L"

TRUTH TABLE B

P _D	CLOCK	D _X	Q _{X0}	Q _{X1}	Q _{X2}	COMMENT
L	(*)	(*)	OFF	OFF	OFF	—
H	↑	L	OFF	Q _{X0}	Q _{X1}	DATA SHIFT
H	↑	H	ON	Q _{X0}	Q _{X1}	
H	↓	(*)	Q _{X0}	Q _{X1}	Q _{X2}	
H	L	↑↓	Q _{X0}	Q _{X1}	Q _{X2}	NO CHANGE
H	H	↑↓	Q _{X0}	Q _{X1}	Q _{X2}	

(*) "H" or "L"

MAXIMUM RATING (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	7.0	V
Output Voltage	V _{OUT}	30	V
Output Current	I _{OUT1} (Note)	80	mA / ch
	I _{OUT2} (Note)	150	
Input Voltage	V _{IN}	V _{CC}	V
External Resistor	R _{EXT}	1000	kΩ
External Capacitor	C _{EXT}	50	μF
Max. Operating Frequency	f _{MAX}	750	kHz
Power Dissipation	P _D	1.6	W
Operating Temperature	T _{opr}	0~75	°C
Storage Temperature	T _{stg}	-55~150	°C

(Note) I_{OUT} 1 : DC, I_{OUT} 2 : Duty-10%**RECOMMENDED OPERATING CONDITION (Ta = 0~70°C)**

CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{CC}	—	4.5	5.0	5.5	V
Output Voltage	V _{OUT}	—	0	—	28	V
Output Current	I _{OUT1}	—	0	—	80	mA
	I _{OUT2}	Duty 20%	0	—	130	
Input Voltage	V _{IN}	—	0	—	V _{CC}	V
External Resistor	R _{EXT}	—	0.1	—	500	kΩ
External Capacitor	C _{EXT}	—	—	—	50	μF
Max. Operating Frequency	f _{MAX}	—	—	—	400	kHz
Clock Pulse Width	t _w (CK)	—	300	—	—	μs
	t _w (CK)	—	2.2	—	—	
Data Setup Time	t _{setup}	—	0.0	—	—	μs
Data Hold Time	t _{hold}	—	1.0	—	—	μs
Power Dissipation	P _D	T _j = 130°C, on PCB	—	—	1.5	W

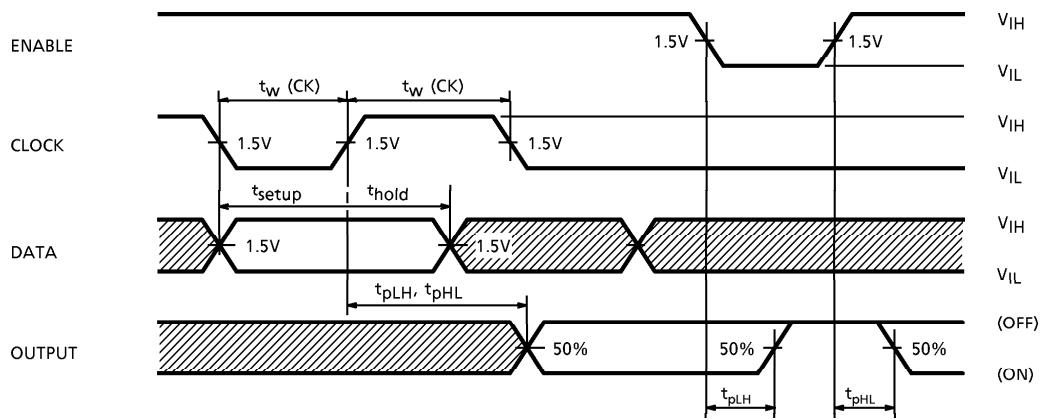
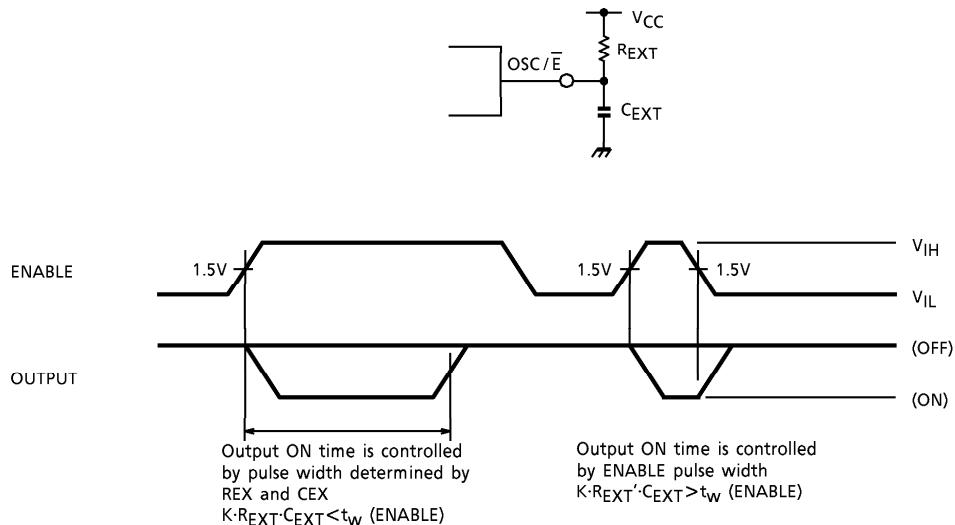
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT	
Input Voltage	"H" Level	V_{IH}	—	—		2.0	—	V_{CC}	V	
	"L" Level	V_{IL}	—	—		0	—	0.6		
Input Current	"H" Level	I_{IH}	—	$V_{CC} = 5.5\text{V}$, $V_{IN} = 2.4\text{V}$	—	0.12	0.2	mA	μA	
	"L" Level	I_{IL}	—	$V_{CC} = 5.5\text{V}$, $V_{IN} = 5.5\text{V}$	—	0.32	0.5			
				$V_{CC} = 5.5\text{V}$, $V_{IN} = 0.3\text{V}$	—	—	30	μA		
Output Leak Current		I_{OH}	—	$V_{CC} = 4.5\text{V}$, $V_{OUT} = 28\text{V}$	—	—	30	V	μA	
Output Saturation		V_{OL}	—	$V_{CC} = 4.5\text{V}$, $I_{OUT} = 60\text{mA}$	—	0.9	1.15			
				$V_{CC} = 4.5\text{V}$, $I_{OUT} = 120\text{mA}$	—	1.1	1.5			
Supply Current	I_{CC}	—	$V_{CC} = 5.5\text{V}$	$P_D = \text{GND}$	—	—	10	mA	μA	
	$I_{CC}(\text{ON})$			$P_D = \text{GND}$ ALL OUTPUT "ON"	—	12	20			
	$I_{CC}(\text{OFF})$			$P_D = \text{GND}$ ALL OUTPUT "OFF"	—	9.5	16			
Input Voltage	"H" Level	V_{TH+}	—	—		2.5	2.8	3.1	V	
	"L" Level	V_{TH-}	—	—		1.2	1.4	1.6		
Hysteresis Voltage	V_H	—	—	—		—	1.4	—	V	

SWITCHING CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{CC} = 5.0\text{V}$)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Max. Operating Frequency		f_{MAX}	t_{pLH}	$R_L = 68\Omega$, $C_L = 15\text{pF}$ $V_{IH} = 3.0\text{V}$, $V_{IL} = 0\text{V}$		500	850	—	kHz
Propagation "H" Level	CK-OUT	—				0.7	1.3	μs	
	E-OUT	—				5.5	10		
	OSC-OUT	—				7.5	13		
	P_D -OUT	—				9	30		
Delay Time "L" Level	CK-OUT	t_{pHL}	$t_w \text{ MIN}$	$R_L = 68\Omega$, $C_L = 15\text{pF}$ $V_{IH} = 3.0\text{V}$, $V_{IL} = 0\text{V}$		—	0.8	1.3	μs
	E-OUT					—	0.6	1.3	
	OSC-OUT					—	0.8	1.3	
Min. Pulse Width	CLOCK	$t_w \text{ MIN}$	t_{setup}	$R_L = 68\Omega$, $C_L = 15\text{pF}$ $V_{IH} = 3.0\text{V}$, $V_{IL} = 0\text{V}$		—	0.06	0.1	μs
	CLOCK					—	1.1	1.85	
	ENABLE					—	0.1	0.2	
	ENABLE					—	1.0	2.0	
Set Up Time	CK-DATA	t_{setup}	t_{hold}	$R_L = 68\Omega$, $C_L = 15\text{pF}$ $V_{IH} = 3.0\text{V}$, $V_{IL} = 0\text{V}$		—	-0.2	0	μs
	P_D					—	-0.22	0.8	
Data Hold Time	t_{hold}	—	—	$R_{EXT} = 10\text{k}\Omega$, $C_{EXT} = 10\mu\text{F}$		—	0.15	0.5	μs
Max. Clock Rise Time	t_r	—	—			—	—	5	μs
Max. Clock Fall Time	t_f	—	—			—	—	5	ms
Enable Output Pulse Width	$t_w \text{ ON}$	—	—			—	3	—	ms

SWITCHING CHARACTERISTICS TEST CONDITION

A. Timing waveform (OSC / \bar{E} = GND)B. Usage of OSC/ \bar{E} terminal

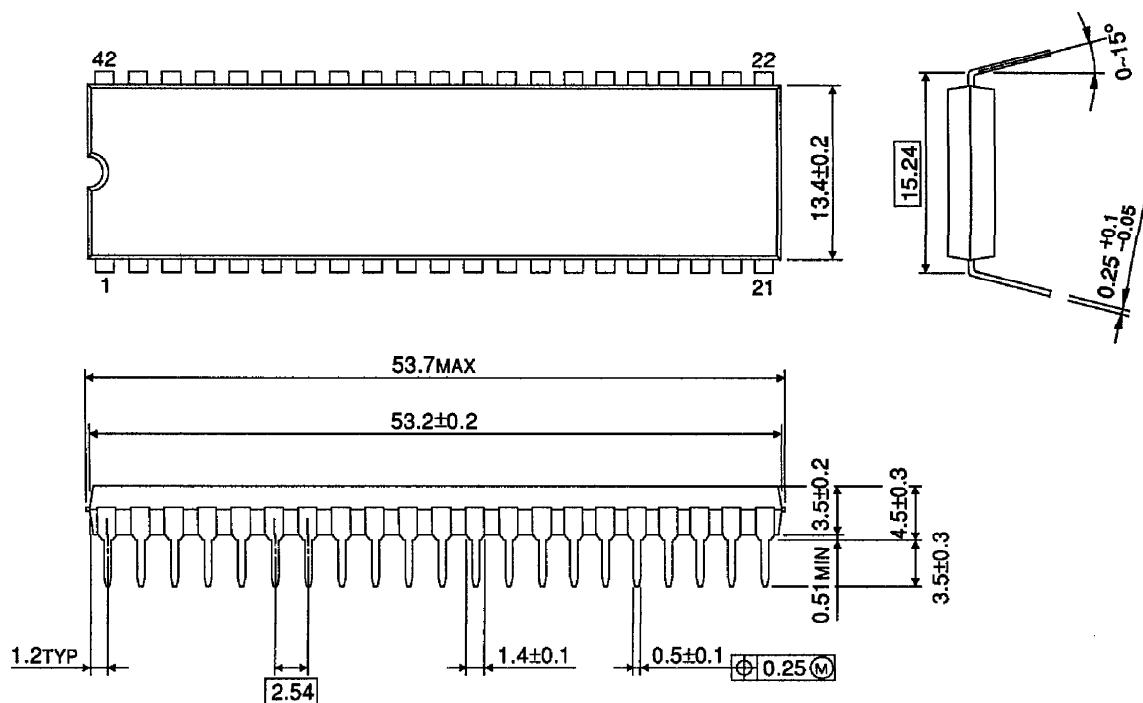
PRECAUTIONS for USING

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

DIP42-P-600-2.54

Unit : mm



Weight : 6.37g (Typ.)