TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC
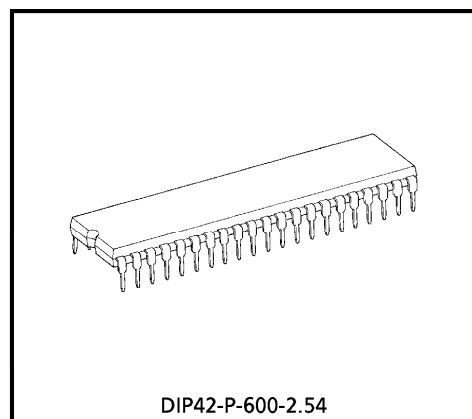
TD62824P

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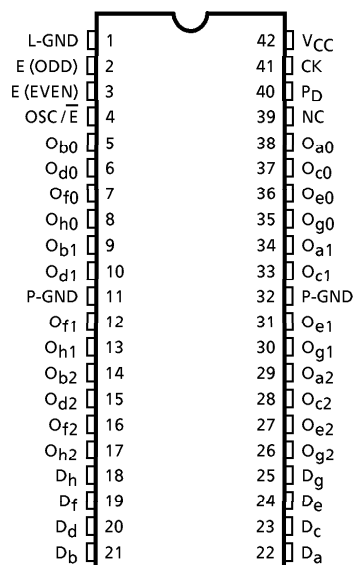The TD62824P is best suited as a 24 dot printer head driver.

DIP42-P-600-2.54

Weight : 6.37g (Typ.)

FEATURES

● Power-down function for reducing power consumption during standby or when printing is not made.
(I_{CC} off < 10μA)

● 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 ±50mV (standard) at I_{OUT} = 120mA

PIN CONNECTION (TOP VIEW)

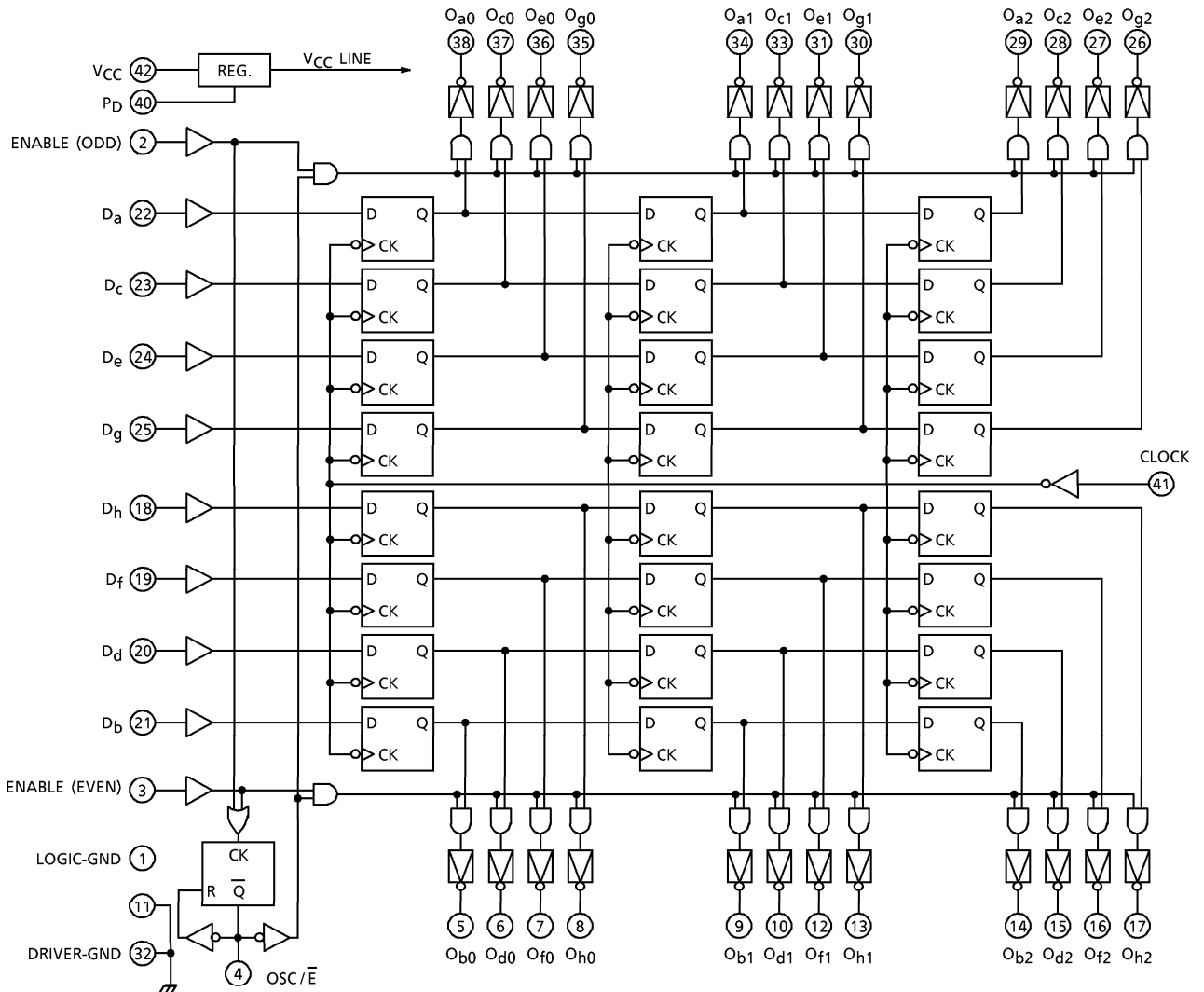|		
L-GND	1	42	V_{CC}
E (ODD)	2	41	CK
E (EVEN)	3	40	P_D
OSC / $\overline{E}$	4	39	NC
O_{b0}	5	38	O_{a0}
O_{d0}	6	37	O_{c0}
O_{f0}	7	36	O_{e0}
O_{h0}	8	35	O_{g0}
O_{b1}	9	34	O_{a1}
O_{d1}	10	33	O_{c1}
P-GND	11	32	P-GND
O_{f1}	12	31	O_{e1}
O_{h1}	13	30	O_{g1}
O_{b2}	14	29	O_{a2}
O_{d2}	15	28	O_{c2}
O_{f2}	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

961001EBA2

BLOCK DIAGRAM

INPUT EQUIVALENT CIRCUIT
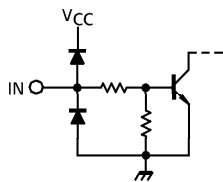
OSC / E TERMINAL EQUIVALENT CIRCUIT

OUTPUT EQUIVALENT CIRCUIT
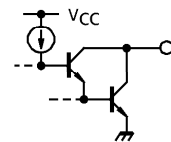
TRUTH TABLE A

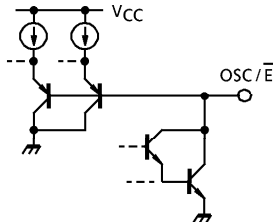| P$_D$	OSC/E	E (ODD)	E (EVEN)	O (ODD)	O (EVEN)	COMMENT
L	(*)	(*)	(*)	OFF	OFF	I$_{CC}$ < 10 μA
H	(*)	L	L	OFF	OFF	—
H	L	H	L	D	OFF	—
H	L	L	H	OFF	D	—
H	L	H	H	D	D	—
H	CR	↑	L	D	OFF	OUTPUT ON time is according to CR constant.
H	CR	L	↑	OFF	D	
H	CR	↑	↑	D	D	
H	CR	H	(*)	OFF	OFF	—
H	CR	(*)	H	OFF	OFF	—

(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$_{X2}$	NO CHANGE
H	L	↑↓	Q$_{X0}$	Q$_{X1}$	Q$_{X2}$	
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 ($\overline{CK}$)	—	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 (Ta = 25°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}	—	$V_{CC} = 5.5V$, $V_{IN} = 2.4V$		—	0.12	0.2	mA	
				$V_{CC} = 5.5V$, $V_{IN} = 5.5V$		—	0.32	0.5		
	"L" Level	I_{IL}	—	$V_{CC} = 5.5V$, $V_{IN} = 0.3V$		—	—	30	μA	
Output Leak Current		I_{OH}	—	$V_{CC} = 4.5V$, $V_{OUT} = 28V$		—	—	30	μA	
Output Saturation		V_{OL}	—	$V_{CC} = 4.5V$, $I_{OUT} = 60mA$		—	0.9	1.15	V	
				$V_{CC} = 4.5V$, $I_{OUT} = 120mA$		—	1.1	1.5		
Supply Current		I_{CC}		$V_{CC} = 5.5V$	$P_D = GND$	—	—	10	μA	
		$I_{CC (ON)}$	—		$P_D = GND$ ALL OUTPUT "ON"	—	12	20	mA	
		$I_{CC (OFF)}$			$P_D = GND$ 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 (Ta = 25°C, $V_{CC} = 5.0V$)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Max. Operating Frequency		f_{MAX}			500	850	—	kHz
Propagation "H" Level	CK-OUT	t_{pLH}			—	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}			—	0.8	1.3	
	E-OUT				—	0.6	1.3	
	OSC-OUT			$R_L = 68\Omega$, $C_L = 15pF$ $V_{IH} = 3.0V$, $V_{IL} = 0V$	—	0.8	1.3	
Min. Pulse Width	CLOCK	t_W MIN	—		—	0.06	0.1	μs
	$\overline{CLOCK}$				—	1.1	1.85	
	ENABLE				—	0.1	0.2	
	$\overline{ENABLE}$				—	1.0	2.0	
Set Up Time	CK-DATA	t_{setup}			—	-0.2	0	μs
	P_D				—	-0.22	0.8	
Data Hold Time		t_{hold}			—	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 ON	—	$R_{EXT} = 10k\Omega$, $C_{EXT} = 10\mu F$	—	3	—	ms

SWITCHING CHARACTERISTICS TEST CONDITION

A. Timing waveform (OSC / $\overline{E}$ = GND)

B. Usage of OSC / $\overline{E}$ terminal

Output ON time is controlled by pulse width determined by REX and CEX
$K \cdot R_{EXT} \cdot C_{EXT} < t_W$ (ENABLE)

Output ON time is controlled by ENABLE pulse width
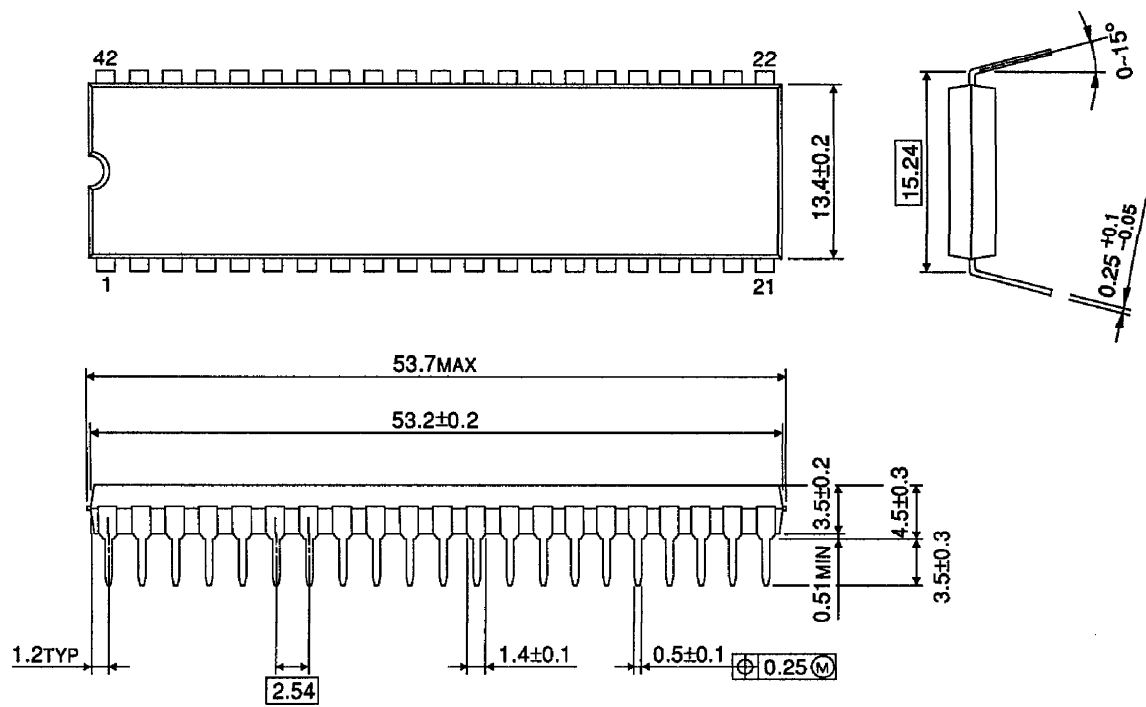$K \cdot R_{EXT}' \cdot C_{EXT} > t_W$ (ENABLE)
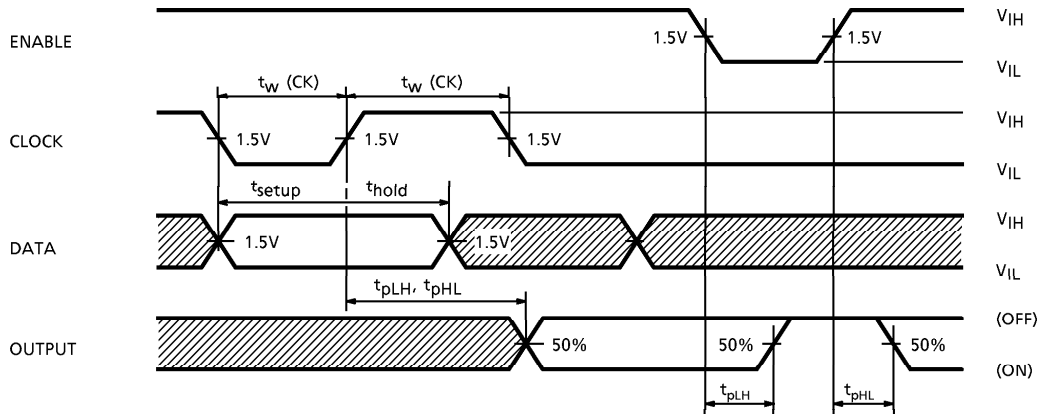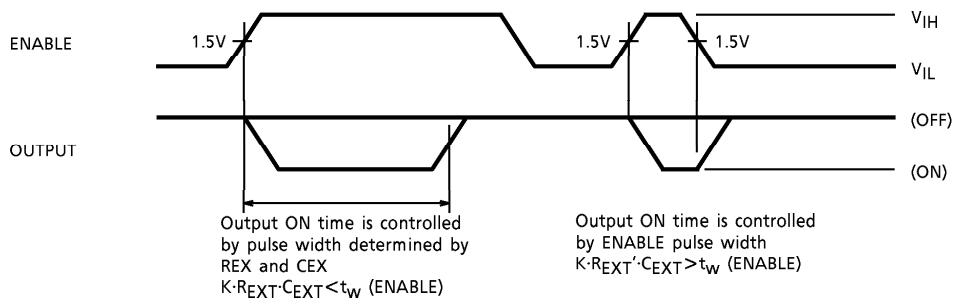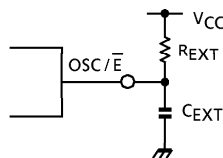
PRECAUTIONS for USING

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.)