High speed thermal printhead (300 dots / inch)
NM3004-UA10A

The NM3004-UA10A is a flat thin-film thermal printhead with a built in heat history control function, suited for general purpose compact printers as well as label printers with printing speeds up to 6 inch / second.

●Applications
High definition bar code label printers
High definition ticket printers
General purpose compact printers

●Features
1) High resolution of 300 dots / inch.
2) Special glazed components for high speed, high quality printing.
3) Our heat history control circuit reduces the load on the printer to control heat history.
4) Using a hard conductive film as a protective film on the heating element offers excellent resistance to electrostatic damage.

●External dimensions (Units: mm)
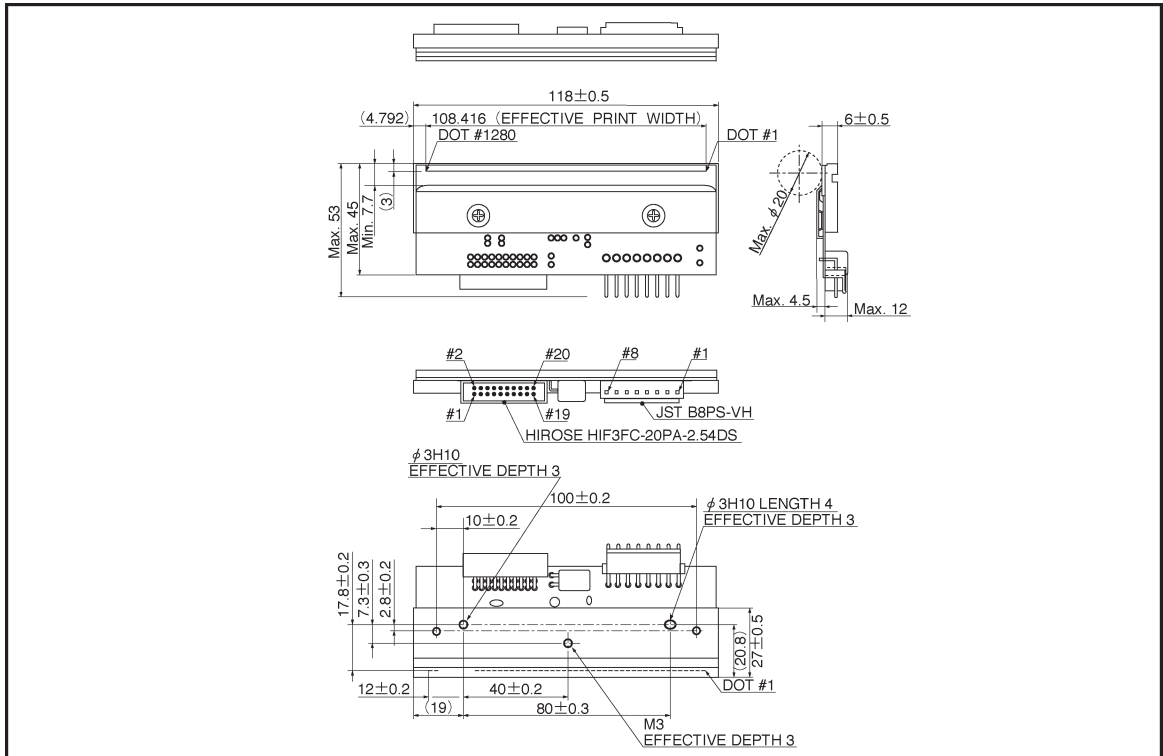
●Characteristics

Parameter	Symbol	Typical						Unit
Effective printing width	—	108.4						mm
Dot pitch	—	0.0847						mm
Total dot number	—	1280						dots
Average resistance value	Rave	1000						Ω
Applied voltage	V_H	24.2						V
Applied power	P_O	0.45						W / dot
Print cycle	SLT	0.6						ms
Applied energy	LEVEL	1	2	3	4	5	6	—
	E_O	0.23	0.23	0.17	0.14	0.14	0.11	mJ / dot
Pulse width	T_{ON}	0.50	0.50	0.38	0.30	0.30	0.25	ms
Maximum number of dots energized simultaneously	—	1280						dots
Maximum clock frequency	—	5						MHz
Maximum roller diameter	—	20						mm
Running life / pulse life	—	$50 / 10^8$						km / pulses
Operating temperature	—	5〜45						℃

ROHM

●Level map

	Print Pattern			On Time	SLT＝0.6ms
Level 1				Ton a	0.5 ms
Level 2				Ton b	0.5 ms
Level 3				Ton c	0.38 ms
Level 4				Ton d	0.3 ms
Level 5				Ton e	0.3 ms
Level 6				Ton f	0.25 ms

■: Heated dot.
□: Non-heated dot.
●: Dot to be printed.

This table shows a simple example. In actuality, the history of the previous level and the level before of the adjacent dots are included.

●Pin assignments

HIROSE

No.	Circuit	No.	Circuit
1	GND	11	CLK
2	N.C.	12	DI
3	N.C.	13	START
4	N.C.	14	LOAD
5	V_{DD}	15	RESET
6	V_{DD}	16	DO
7	INC	17	STB2
8	SET	18	STB1
9	E-OUT	19	TM
10	OR-ON	20	TM

JST

No.	Circuit
1	VH
2	VH
3	VH
4	VH
5	GND
6	GND
7	GND
8	GND

Added functions

    SET :Sets all data to "HIGH". (Usable for preheating, etc.)

OR-ON :Set at "HIGH" when considering the adjoining of the previous columns; otherwise set at "LOW".

 E-OUT :Outputs "HIGH" when a data transmission error occurs inside the head.

    INC :Supports the increment function from level 1 to level 6. One level is incremented for one pulse. (See Fig. 2)

RESET :Sets all data at "LOW". Clears data when printing is resumed after a pause. (See Fig. 2)

Note:Signals of SET, INC, START, and RESET detect the falling edge; the START signal transmits data to the driver IC at the falling edge and latches at the rising edge.

    For two-part split printing, enter INC after 34 μ seconds of START7. (See Fig. 2)
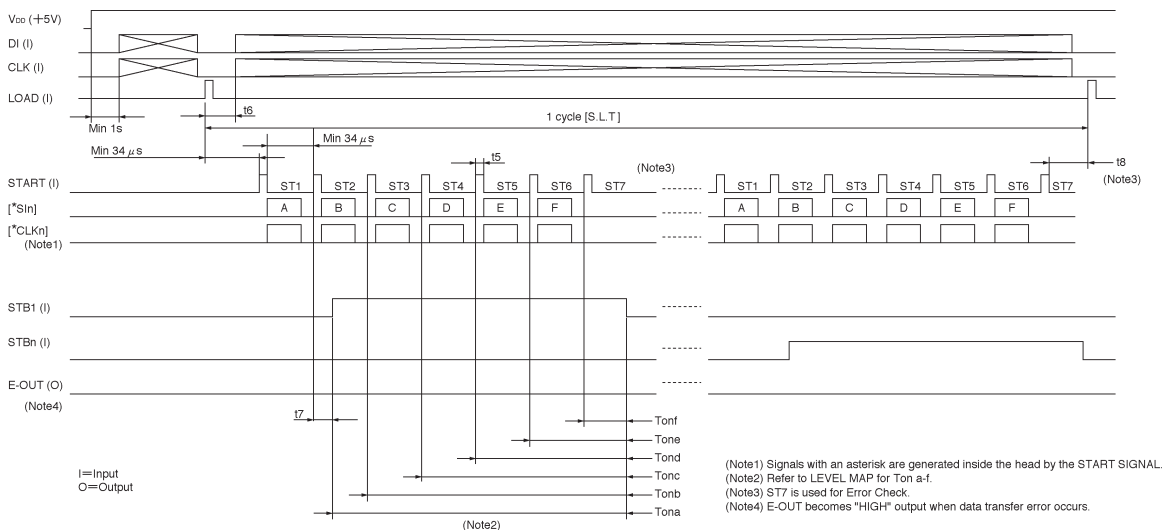
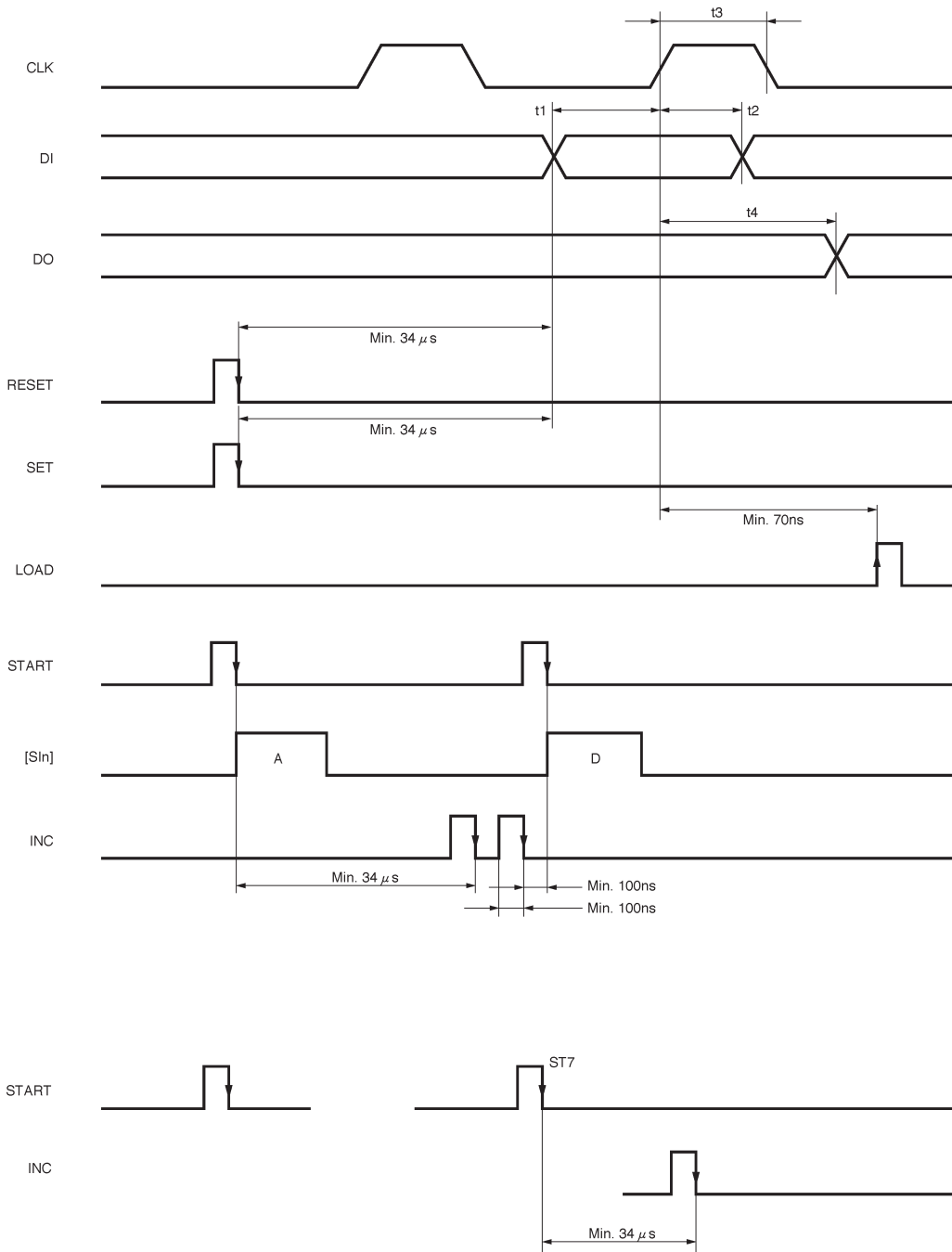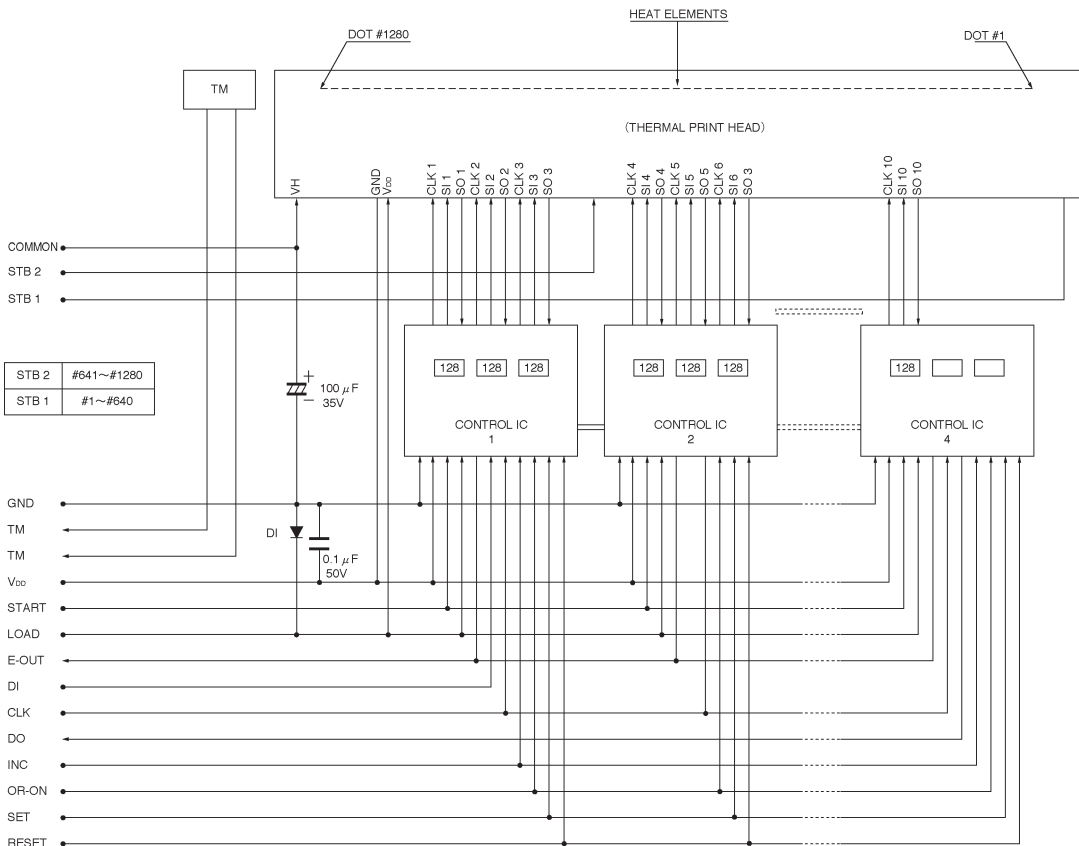## ●Timing chart

Fig.1

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●Timing chart

CLK

t3

DI

t1   t2

DO

t4

RESET   Min. 34 μs

SET   Min. 34 μs

LOAD   Min. 70ns

START

[Sln]   A   D

INC   Min. 34 μs   Min. 100ns
                                  Min. 100ns

START   ST7

INC

Min. 34 μs

Fig. 2

●Equivalent circuit

Fig. 3

●Supported speeds chart

Inch / second [IPS]											
0	1	2	3	4	5	6	7	8	9	10	OVER

Internal heat history control
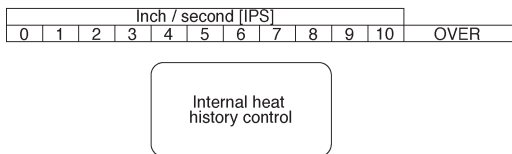
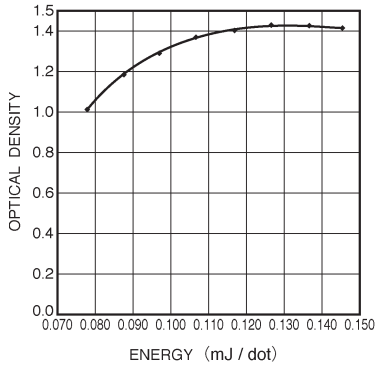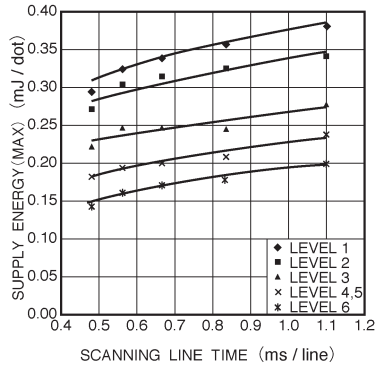●Electrical characteristic curves

Fig. 4 Representative density curve

Fig. 5 Maximum energy curve

Fig. 6 Thermistor curve