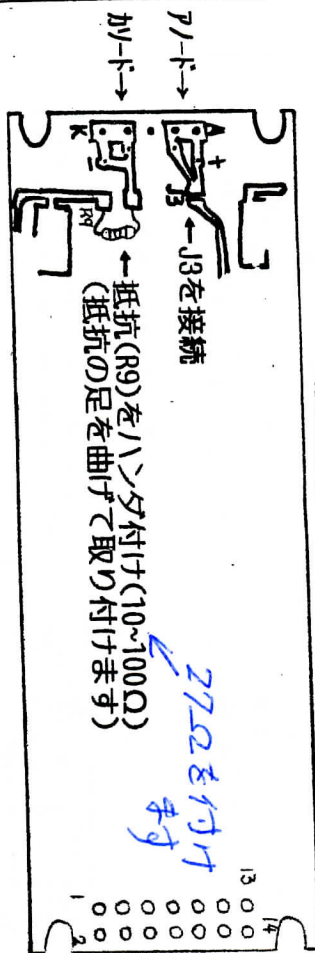


液晶基板のラ面



$V_{DD}=5V \pm 5\%$
 $V_{SS}=0V, T_{op}=0-50^{\circ}C$

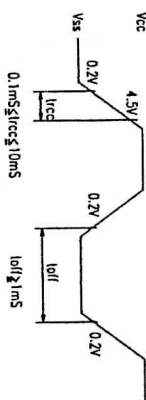
Item	Symbol	Condition	Standard Value			Unit	Applicable terminal
			min.	typ.	max.		
Power Voltage	V _{dd}	4.75	5	5.25	V	V _{dd}
Input H-level voltage	V _{IH}	2.2	...	V _{dd}	V	RS,R/W,E
Input L-level voltage	V _{IL}	-0.3	...	0.6	V	DB0-DB7
Output H-level voltage	V _{OH}	I _{OH} =0.205mA	2.4	V	DB0-DB7
Output L-level voltage	V _{OL}	I _{OL} =1.2mA	0.4	V	RS,R/W,E
I/O leakage current	I _{IL}	V _{IN} =0-V _{DD}	-1	...	1	μA	DB0-DB7
Supply current	I _{DD}	V _{dd} =5V	...	0.35	0.6	mV	V _{dd}
LCD operation voltage	V _{LDC}	V _{dd} -V _o	3	...	11	V	V ₀

■ Timing chart

Item	Symbol	Min.	Max.	Unit
Enable cycle time	t_{CYCE}	500	...	ns
Enable pulse width	P_{WEH}	220	...	ns
Enable rise/fall time	t_{ER}, t_{FR}	...	25	ns
Set-up time	t_{AS}	40	...	ns
Address hold time	t_{AH}	10	...	ns
Data set-up time	t_{DSW}	60	...	ns
Data delay time	t_{DDR}	60	120	ns
Data hold time (writing)	t_H	10	...	ns
Data hold time (reading)	t_{DHR}	20	...	ns
Clock oscillating frequency	f_{OSC}	270 (TYP)		KHz

The internal reset circle will be operated properly when the following power supply conditions are satisfied. If it is not operated properly, please perform initial setting along with the instruction.

Item	Symbol	Measuring Condition	Standard Value		Unit
			min.	typ. max.	
Power Supply Rise Time	t _{cc}	—	0.1	—	10 mS
Power Supply Off Time	t _{off}	—	1	—	5 mS



Note: *lall* defines period that power supply is off while power supply shut down momentarily or repeats on/off state.

Reset function

● Initialization mode by Internal Reset Circuit

HD44780 automatically initializes (resets) when power is supplied (built-in internal reset circuit). The following instructions are executed in initialization. The busy flag (BF) is kept in busy state until initialization ends. (BF=1)

The busy state is 10ms after Vdd reach 10 4.5V

1. Display clear

2. Function set

DL=1:8bit long interface data

DL=0:4bi F=0:5 X doi character font

$N=1:2$ lines

$N=0:1$ lines

3. Display. ON/OFF control

D=0:Display OFF C=0:Cursor OFF B=0:Blink OFF

4. Entry mode sei

$1/D=1:+1(\text{increment})S=0:\text{No shift}$

Note: When conditions stated in "Power Supply Conditions Using Internal Reset Circuit" are not satisfied, the internal reset circuit will not operate properly and initialization will not be performed. Please make initialization using MPU along with Initialization (along with) instructions.

If power supply conditions are not satisfied, which for proper operation of internal reset circuit, it is required to make initialization along with instruction. Please make following procedures:

