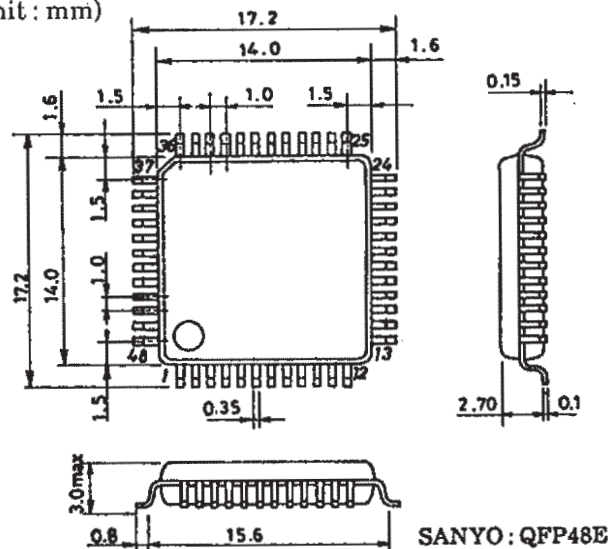


Static Drivers Vacuum Fluorescent Display for Frequency Display Applications



Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$, $V_{SS} = 0\text{V}$

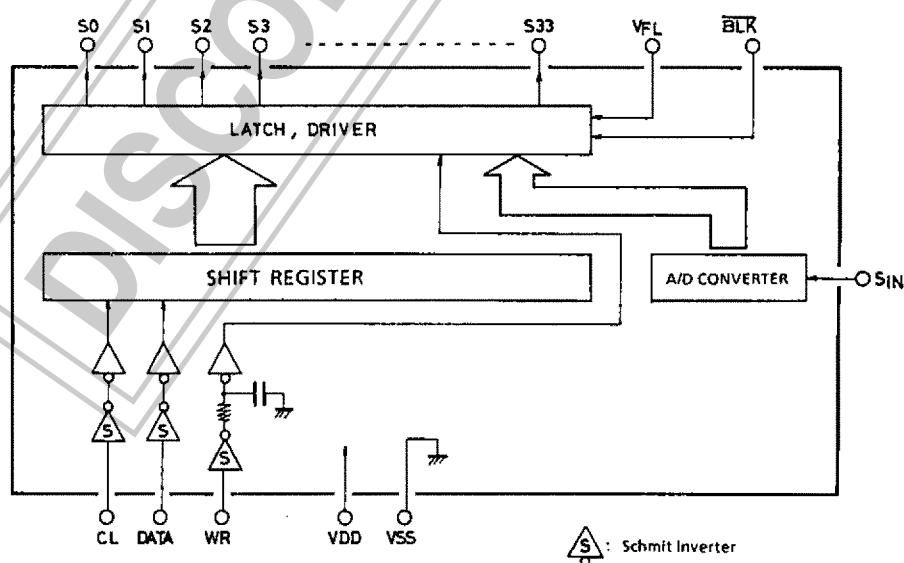
Absolute Maximum Ratings at Ta=25°C, VSS=0V					unit
Maximum Supply Voltage	VDD max	VDD	-0.3 to +9.0	V	
Maximum Input Voltage	VIN max	CL, DATA, WR, SIN, $\overline{\text{BLK}}$	-0.3 to VDD+0.3	V	
Maximum Output Voltage	VOU max	S0 to S33, VFL	VDD-28 to VDD+0.3	V	
Maximum Output Current	IOU max	S0 to S33	3.0	mA	
Allowable Power Dissipation	Pd max	Ta=75°C	LC7570	500	mW
			LC7570E	480	mW
Operating Temperature	Topr		-30 to +75	°C	
Storage Temperature	Tstg		-40 to +125	°C	

Allowable Operating Ranges at $T_a = -30$ to $+75^\circ\text{C}$, $V_{SS} = 0\text{V}$

			min	typ	max	unit
Supply Voltage	V_{DD}	V_{DD}	4.5		8.0	V
Input High Level Voltage	V_{IH}	$\overline{\text{BLK}}$	$0.7V_{DD}$		V_{DD}	V
Input Low Level Voltage	V_{IL}	$\overline{\text{BLK}}$	0	$0.3V_{DD}$	V_{DD}	V
Rise Trigger Threshold Voltage	V_P	CL, DATA, WR	$0.8V_{DD}$		V_{DD}	V
Fall Trigger Threshold Voltage	V_N	CL, DATA, WR	0	$0.2V_{DD}$	V_{DD}	V
Output Voltage	V_{OUT}	S0 to S33, V_{FL}	$V_{DD} - 28$		V_{DD}	V
Write Pulse Width	P_w	WR	20			μs

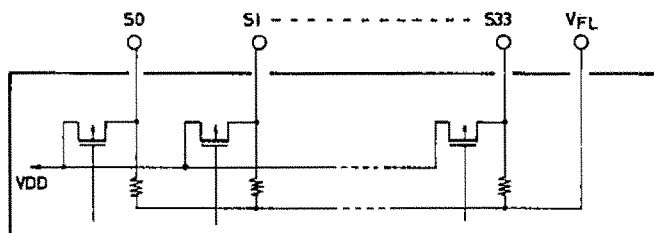
Electrical Characteristics in the Allowable Operating Ranges

			min	typ	max	unit
Hysteresis Width	V_H	CL, DATA, WR	$0.15V_{DD}$	$0.6V_{DD}$		V
Input High Level Current	I_{IH}	CL, DATA, WR, SIN, $\overline{\text{BLK}}$: $V_I = 8\text{V}$			5.0	μA
Input Low Level Current	I_{IL}	CL, DATA, WR, SIN, $\overline{\text{BLK}}$: $V_I = 0\text{V}$	-5.0			μA
Output High Level Voltage	V_{OH}	S0 to S33 : $I_O = 2.5\text{mA}$	$V_{DD} - 2.8$			V
Output OFF-State Voltage	V_{OFF}	S0 to S33 : $V_{FL} = V_{DD} - 25\text{V}$, output OFF		$V_{DD} - 24$		V
Self-Contained Resistance in Output	r_o	S0 to S33 : $V_{DD} = 5\text{V}$, $V_{FL} = -20\text{V}$	70	170	400	$\text{k}\Omega$
A/D Converter						
1st Step Light-Up Voltage	AD1	SIN	$0.1V_{DD}$			V
2nd Step Light-Up Voltage	AD2	SIN	$0.2V_{DD}$			V
3rd Step Light-Up Voltage	AD3	SIN	$0.3V_{DD}$			V
4th Step Light-Up Voltage	AD4	SIN	$0.4V_{DD}$			V
5th Step Light-Up Voltage	AD5	SIN	$0.5V_{DD}$			V
Supply Current	I_{DD}	V_{DD} : input = 0V, output = open			3.0	mA

Equivalent Circuit Block Diagram

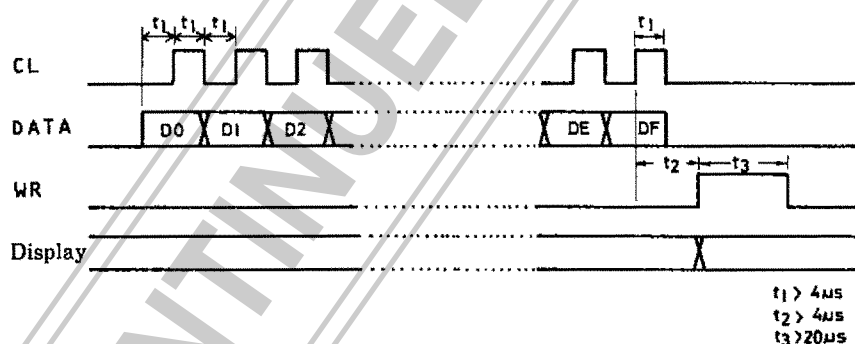
Pin Description

S0 to S33, V_{FL} : Segment outputs and common pin for pull-down resistors.

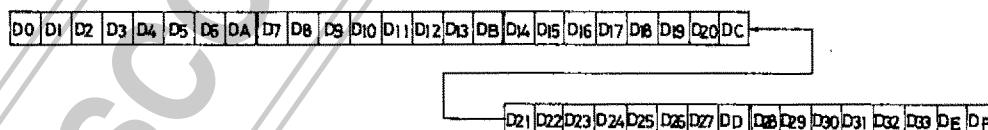


- $\overline{\text{BLK}}$: Input for making display unlighted
 $\overline{\text{BLK}} = \text{「 0 」} (V_{SS})$ Unlighted
 $\overline{\text{BLK}} = \text{「 1 」} (V_{DD})$ Lighted
- CL, DATA, WR : Data input
- V_{DD}, V_{SS} : Power supply pin
- SIN : A/D converter input
- | | | |
|-------------------------|-------|--------------------------|
| 1st step light-up level | | 0.1V _{DD} (typ) |
| 2nd step light-up level | | 0.2V _{DD} (typ) |
| 3rd step light-up level | | 0.3V _{DD} (typ) |
| 4th step light-up level | | 0.4V _{DD} (typ) |
| 5th step light-up level | | 0.5V _{DD} (typ) |
- NC : No connect

Data Input



Inputting starts at D0.



D0 to D33 : Display data
 DA to DE : Dummy bit (don't care)
 DF : S29 to S33 select

D_n = 「 1 」 : S_n = 「 1 」 (= V_{DD})
 D_n = 「 0 」 : S_n = 「 0 」 (= V_{FL})
 DF = 「 0 」 : D29 to D33 → S29 to S33
 DF = 「 1 」 : AD1 → S33
 AD2 → S32
 AD3 → S31
 AD4 → S30
 AD5 → S29

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