



MOS DIGITAL INTEGRATED CIRCUIT

μ PD848C

AUTOMOTIVE CLOCK CMOS LSI

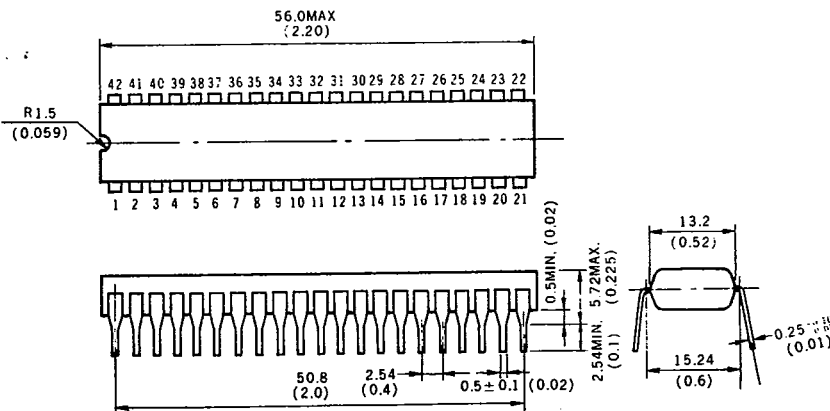
GENERAL DESCRIPTION

The μ PD848C is a monolithic CMOS integrated circuit designed for automotive instrument clocks. The circuits interface directly with fluorescent 4 digit displays. The display format is 12 or 24 hours with leading-zero blanking and colon indication. The time keeping function operates from a 4.2MHz crystal controlled source.

FEATURES

- Crystal controlled oscillator (4.194304 MHz)
- Direct interface to fluorescent 4 digit display (LD8164/FIP4A8S)
- 12 or 24 hour display format
- 1Hz output
- Leading-zero blanking
- Display mode select (hours/minutes or minutes/seconds)
- Hours and minutes set controls
- Minutes and seconds reset control
- Brightness control (Dimmer)
- Hour signal output (1024 Hz 1 sec.)
- Hours, minutes and seconds reset control
- 2048Hz output

PACKAGE DIMENSIONS in millimeters (inches)



CONNECTION DIAGRAM (Top View)

Seconds Display	1	42	Test. (2048Hz Out)
12 24 Hour Select	2	41	Reset
Blanking	3	40	Hours Set
Dimmer	4	39	Minutes Set
e _a	5	38	g ₁
a ₁ , d ₁	6	37	f ₁
c ₁	7	36	b ₁
g ₂	8	35	f ₂
e ₂	9	34	a ₂
d ₂	10	33	b ₂
c ₂	11	32	Signal Output
g ₃	12	31	1 Hz Output
e ₃	13	30	f ₃
c ₃	14	29	a ₃ , d ₃
g ₄	15	28	b ₃
e ₄	16	27	f ₄
d ₄	17	26	a ₄
c ₄	18	25	b ₄
Test.	19	24	OSC Out
Auto Clear	20	23	OSC In
V _{DD}	21	22	V _{SS}

637

NEC cannot assume any responsibility for any circuits shown or represent that they are free from patent infringement. NEC reserves the right to make changes at any time without notice in order to improve design and supply the best product possible.

Nippon Electric Co., Ltd.

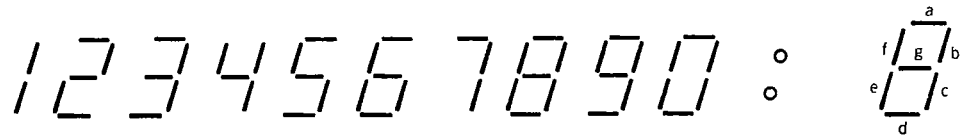
ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Voltage at any pin	$V_{DD} - V_{SS}$	-0.3 to 8	V
Voltage at any input pin	V_{IN}	-0.3 to V_{DD}	V
Voltage at any output pin	V_{OUT}	20	V
Operating temperature	T_{opt}	-40 to +85	°C
Storage temperature	T_{stg}	-55 to +125	°C

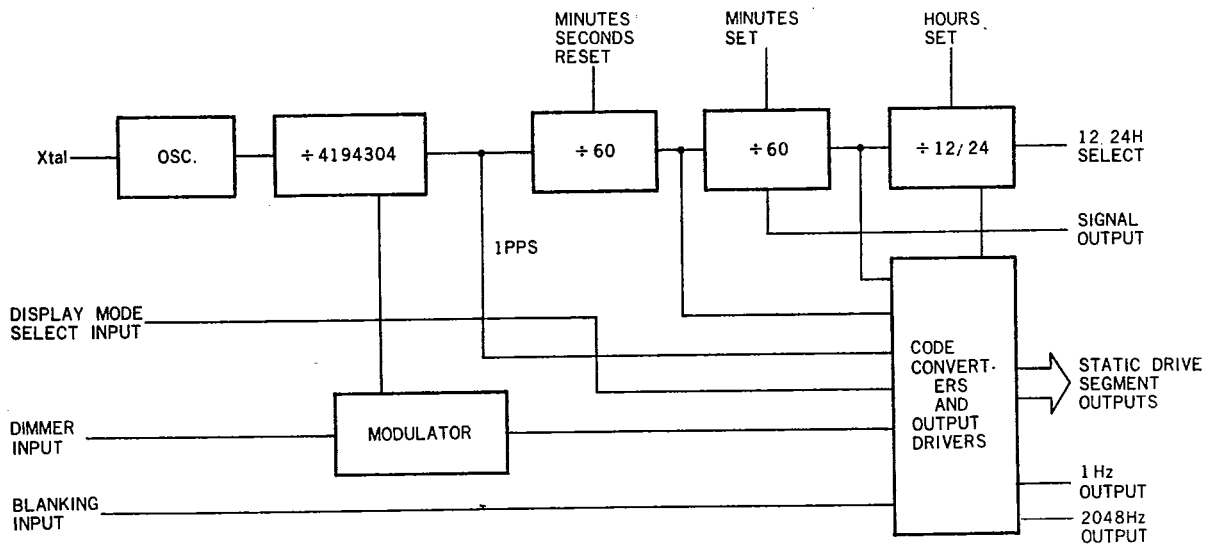
ELECTRICAL CHARACTERISTICS (Ta=25°C, Xtal freq.=4.194304MHz, $C_D=C_G=15\mu F$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Power Supply Current	I_{DS}			2.0	mA	$V_{DD}-V_{SS}=6V$, no output loads
Power Supply Current	I_{DS}			20	μA	$V_{DD}-V_{SS}=6V$, OSC In= V_{DD} or V_{SS}
Operating Voltage	$V_{DD}-V_{SS}$	3.0		7.0	V	
High Level Output Current	I_{OH}	-500	-900		μA	$V_{DD}-V_{SS}=6V$, $V_{out}=V_{DD}-0.5V$
Low Level Output Current	I_{OL}			-1	μA	$V_{DD}-GND=12V$, $V_{out}=0V$
High Level Input Current	I_{IH}			1	μA	$V_{DD}=V_{in}=6V$
Low Level Input Current	I_{IL}	-14		-140	μA	$V_{DD}=6V$, $V_{in}=0V$

DISPLAY CHARACTERS



BLOCK DIAGRAM



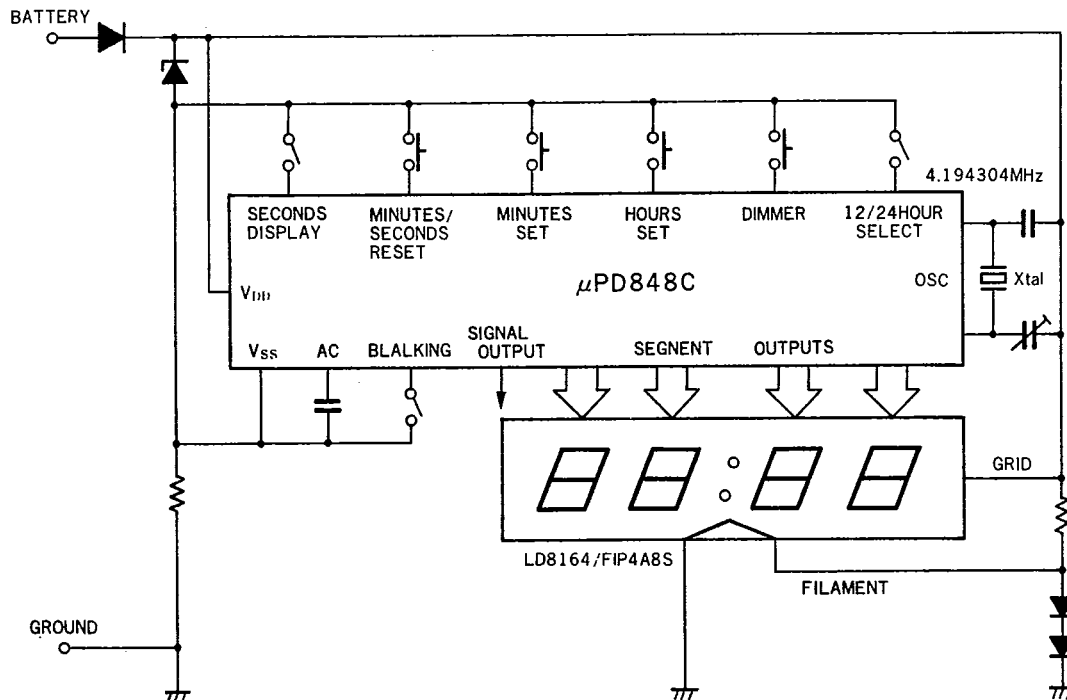
DISPLAY MODES

DISPLAY MODE	DIGIT No.1	DIGIT No.2	DIGIT No.3	DIGIT No.4
Time display	10's of hours	Hours	10's of minutes	Minutes
Seconds display	10's of minutes	Minutes	10's of seconds	Seconds

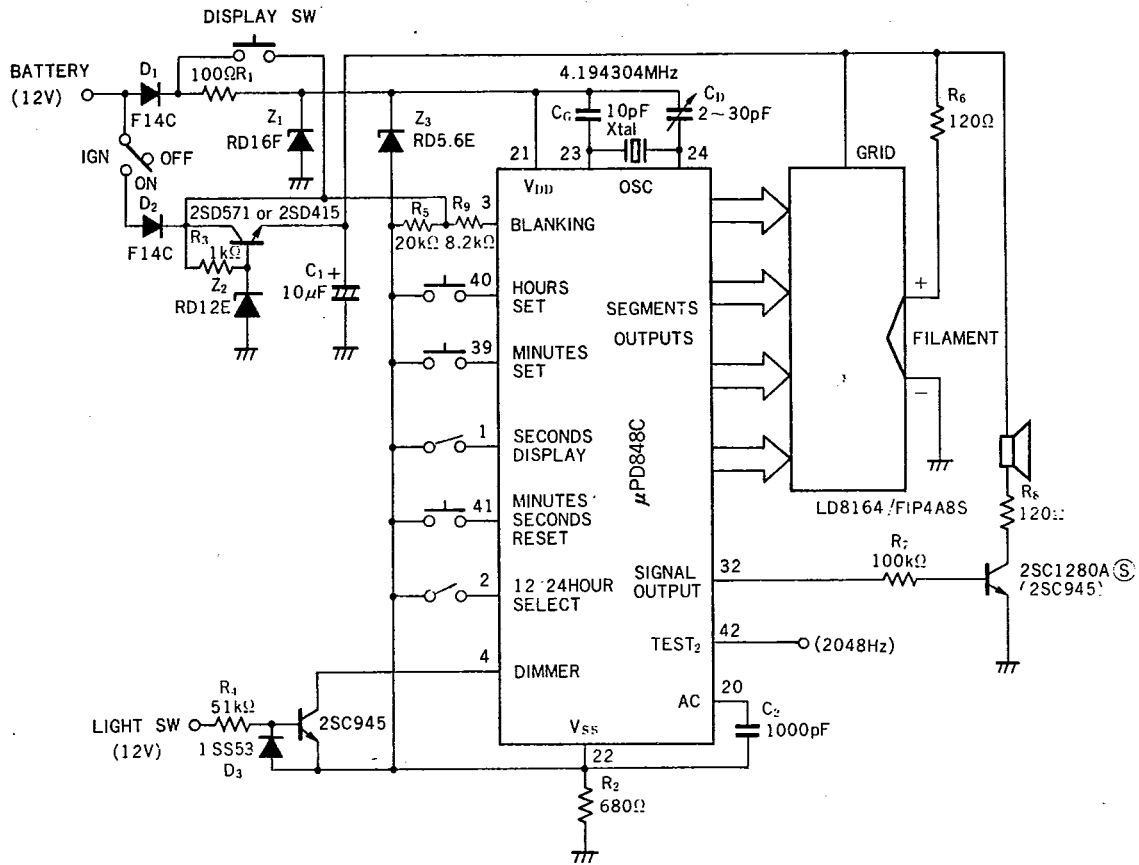
CONTROL FUNCTIONS

CONTROL/INPUT	CONTROL FUNCTION
Minutes/seconds reset	Between -30'00" and +29'59", both minutes and seconds are reset to 00'00". Advance one hour between 30'00" and 59'59".
Minutes set	Minutes advance at 2 Hz rate.
Hours set	Hours advance at 2 Hz rate.
Dimmer	Display brightness down to 25% intensity.
Blanking	Inhibit display.
Minutes set Hours set Both	Reset { 12 - Hour format ; 1 : 00 (00'') 24 - Hour format ; 0 : 00 (00'')

TYPICAL APPLICATION 1



TYPICAL APPLICATION 2



Nippon Electric Co., Ltd.

NEC Building, 33-1, Shiba-Gochome, Minato-ku, Tokyo 108, Japan
Tel: Tokyo 454-1111
Telex Address: NECTOK A J22686
Cable Address: MICROPHONE TOKYO

IC-1139B
MAR.-20-79M
Printed in Japan

640