PCK-50 UNIVERSAL CLOCK

USER'S MANUAL

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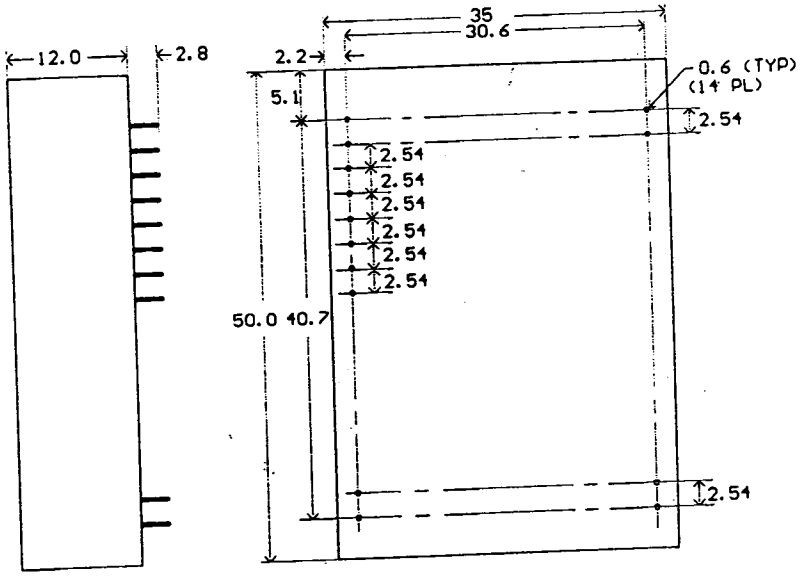
Function Description

The PCK-50 is wide band clock source utilizing 32 Bits Direct Digital Synthesis technique. It provides any frequency output from 1Hz to 50MHz in 1Hz step. The frequency can be controlled by parallel data such as DIP SW or serial data which can be connected to PC communication port. The frequency can be memorized into the EEPROM and in case of setting the power off, and on again, the stored frequency can be output.

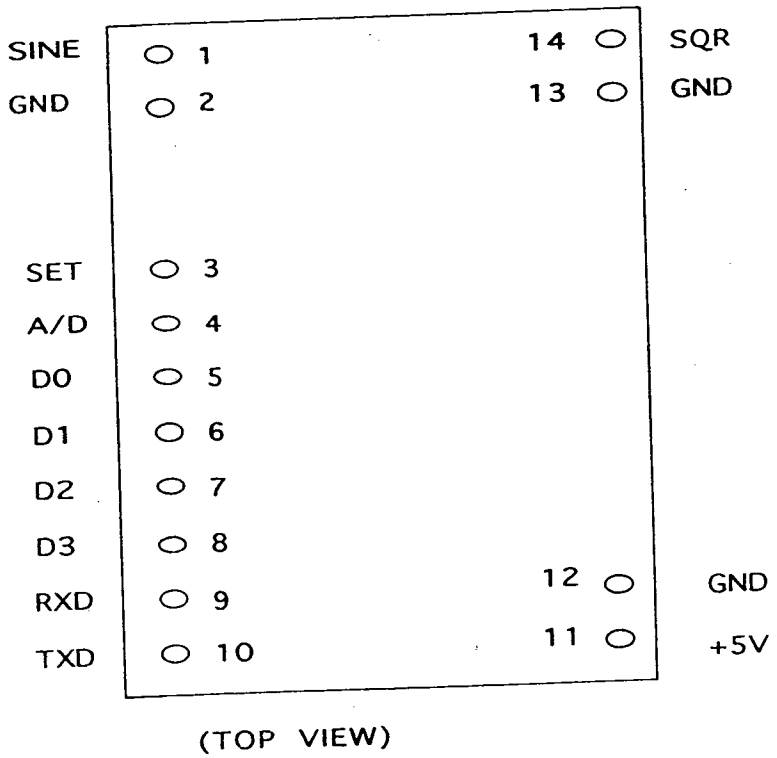
Electrical Specifications

Power Supply/Current	+5V ±5%, 200mA
Output level	
Digital output	CMOS/TTL
Analog output	1Vp-p±20%(without termination) 0.5Vp-p±20%(50Ω termination)
Analog output impedance	50Ω
Output frequency range	1Hz - 50,000,000Hz 100Hz - 50,000,000Hz (Analog output 50Ω termination)
Frequency resolution	1Hz
Output wave duty	50% ± 10%
Frequency accuracy	±50ppm, 0°C～50°C
Phase noise	<-90dBc at 1KHz OFFSET
Spurious	40dB(except harmonics)
Analog output	
harmonics spurious	-35dB
Frequency save times	more than 10,000 times
Frequency control	
Parallel input	Six(6) control pins 4-bit BCD input, 1 bit digit/data selection 1 bit strobe signal
Serial input	two(2) data pins 9600 BPS, 8 bit non-parity 1 stop bit, ASCII 8 digit numeric data and carriage return code
Frequency switching time	within 2mS(time from the end of data loading)
Dimensions	50 x 35 x 12mm

OUTLINE



PIN ASSIGNMENT



(TOP VIEW)

PIN DESIGNATION AND DESCRIPTION

Pin Number	Designation	Description
1	SINE	Analog, sign wave output terminal
2	GND	GND of power supply and signal
3	SET	Strobe signal to set with parallel data. Pulled-up internally, the data of A/D. D0-D3 can be read by falling to GND The data is taken from falling edge.
4	A/D	Select the digit or value of parallel data D0-D3. Set the digit to be changed from the 8-digit frequency data, with A/D pin high(open). Set the value of selected digit with A/D pin low(short to GND). Pulled up internally.
5	D0	Input of bit 0(2^0)of frequency data digit or value data. Internally pulled-up, 1 for H(open), 0 for L(short to GND) .
6	D1	Input of bit 1(2^1) of frequency data digit or value data.
7	D2	Input of bit 2(2^2)of frequency data digit or value data.
8	D3	Input of bit 3(2^3) of frequency data digit or value data.
9	RXD	A synchronous serial RX data, CMOS/ TTL. As input is pulled-up, keep open when not used.
10	TXD	A synchronous serial TX data, CMOS/ TTL. Keep open when not used
11	+5V	Power supply pin. Supply +5V
12	GND	GND of power supply and signal
13	GND	GND of power supply and signal
14	SQR	Square wave output signal pin

How to set frequency

(1) Setting frequency by parallel data
In case of setting 8-digits frequency data, select the digit tobe input first, and set the frequency data then. Selection of either the digit or frequency data of BCD SW can be made by A/D input. Here explains how to set 42,000,000Hz for example.

(a) With S2 open, set DIP SW to 0(digit of 1Hz) and push S1(short to GND).
(b) Close S2(short to GND), set BCD SW to 0(frequency data of 1Hzdigit), and push S1. Thus the frequency of 1Hz digit is to be set.
(c) For 10Hz digit, similarly shown above (a) and (b), set BCD SW to1(10Hz digit) when setting the digit, and push S1.
(d) Set the frequency data 0 from the 100Hz digit to 100KHz digit inthe same way.
(e) In order to set 1MHz digit, open S2, set BCD SW to 6 and pushS1, and then, close S2, set BCD SW to 2, and push S1.
(f) In case of 10MHz digit,with S1 open, set BCD SW to 7 and pushS1, then close S2 and set BCD SW to 4, and push S1.
(g) The desired frequency can be obtained in this way. In case of memorizing the set frequency into the built-in EEPROM semi permanently, with S2 open and set BCD SW to A(10), then push S1 to memorize.

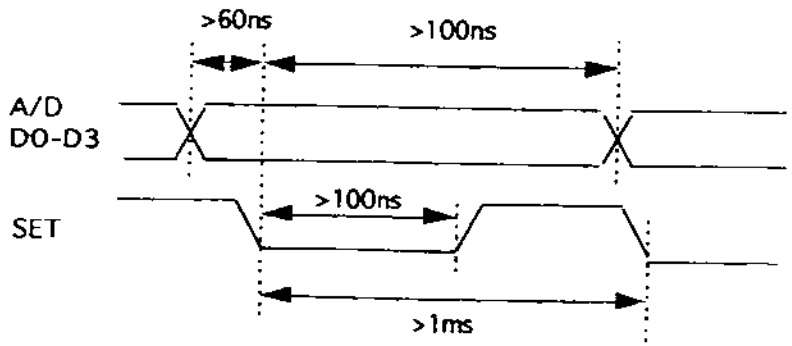
(Remarks) Immediately after the power supply is enabled, input buffer of the parallel data is initially set to "0". The data with 0 can be omitted. In the above example, procedure (a)~(d) can be skipped.

<How to memorize frequency>
The current frequency can be memorized into the built-in EEPROM semi-permanently by making S2 open and setting BCD SW to A(10), then pushing S1.

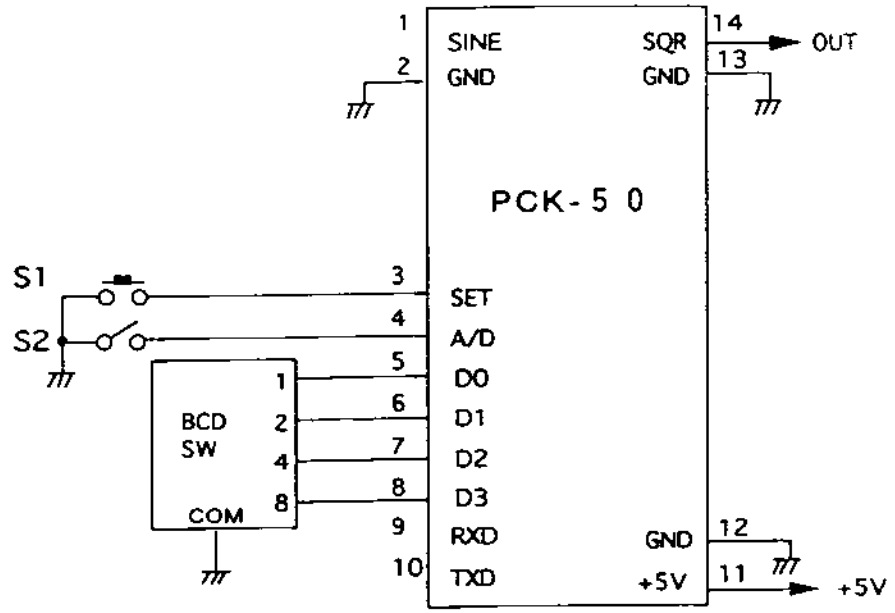
<Caution to set the data consecutively>

If frequency setting is made in consecutive condition, wait 1mS to set new frequency(refer to the following timing chart.)

Parallel data timing chart



Circuit example by Parallel data



Use complementary type for BCD SW.

Function Table

A/D	D3	D2	D1	D0	Function
L	L	L	L	L	Frequency Data 0
L	L	L	L	H	Frequency Data 1
L	L	L	H	L	Frequency Data 2
L	L	L	H	H	Frequency Data 3
L	L	H	L	L	Frequency Data 4
L	L	H	L	H	Frequency Data 5
L	L	H	H	L	Frequency Data 6
L	L	H	H	H	Frequency Data 7
L	H	L	L	L	Frequency Data 8
L	H	L	L	H	Frequency Data 9
H	L	L	L	L	Set 1 Hz digit
H	L	L	L	H	Set 10 Hz digit
H	L	L	H	L	Set 100 Hz digit
H	L	L	H	H	Set 1 KHz digit
H	L	H	L	L	Set 10 KHz digit
H	L	H	L	H	Set 100 KHz digit
H	L	H	H	L	Set 1 MHz digit
H	L	H	H	H	Set 10 MHz digit
H	H	L	H	L	Memory frequency

H: open L: short to GND

Input data of D0~D3 and A/D is taken at the falling edge of SET signal.

(2) Setting frequency by serial data

The following message is returned when the power on.

PCK-50 UNIVERSAL CLOK VX.X
*

After prompt * is returned from PCK-50, frequency data can be input. The frequency data has three format; MHz unit input, KHz unit input and Hz unit input.When the PCK-50 received the data correctly and completed the frequency setting, it returns "*" code(24hex) as a prompt. When the data received incorrectly or some errors occured during the transfer, it returns "INVALID DATA". In case of setting the frequency data consecutively, make sure whether * code is returned.

MHz unit

The following table shows the data in case of setting 30MHz.

3	0	M	CR
33 hex	30 hex	4D hex	0D hex

The data below 100KHz is set at "0" automatically.

KHz unit

The following table shows the data in case of setting 30,000KHz.

3	0	0	0	0	K	CR
33 hex	30 hex	30 hex	30 hex	30 hex	4B hex	0D hex

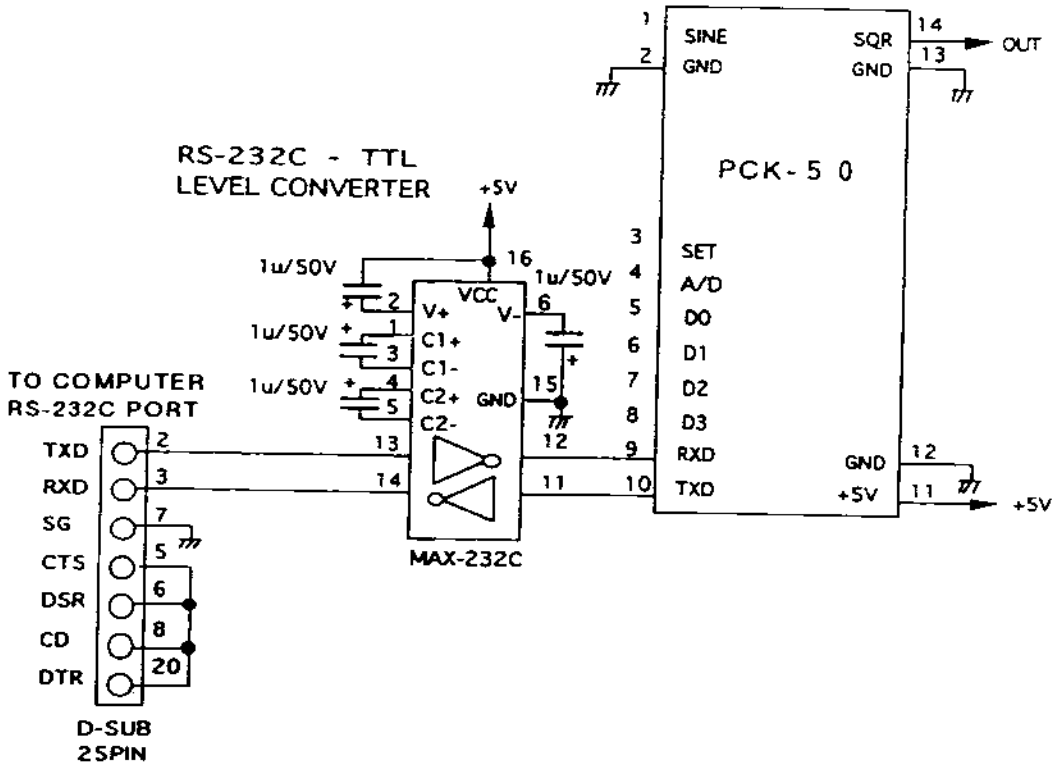
The data below 100Hz is set at 0 automatically.

Hz unit

The following table shows the data in case of setting 30,000,000Hz.

3	0	0	0	0	0	0	0	CR
33 hex	30 hex	30 hex	30 hex	30 hex	30 hex	30 hex	30 hex	0D hex

Serial data frequency setting circuit example



<How to memorize the frequency from serial port>

In order to memorize the current frequency into the built-in EEPROM, enter "SAVE"command as shown below. "EEPROM SAVED!"message is returned, if the command is received correctly.

S	A	V	E	CR
53 hex	41 hex	56 hex	45 hex	0D hex

<How to read-out frequency data from serial port>

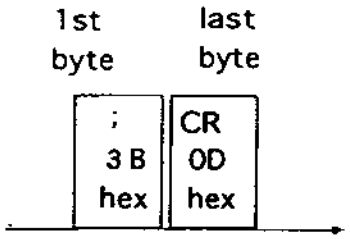
The current frequency can be read out with "READ" command as below.

R	E	A	D	CR
53 hex	45 hex	41 hex	44 hex	0D hex

1～8 digit frequency data of ASCII code can be returned by entering the above command.

<How to adjust the internal reference clock>

The following command adjust the frequency of the internal reference clock on frequency adjustable mode of serial data.



As the frequency is changed by entering the following code, adjust it keeping watch the frequency readout from a frequency counter. For the end, input any other code except the below.

To step the frequency up finely : "u" 75hex
To step the frequency up coarsely : "u" 55hex
To step the frequency down finely : "d" 65hex
To step the frequency down coarsely : "D" 45hex

The new data is memorized into the built-in EEPROM when this menu is escaped.