Preliminary Specification

RCL Semiconductors Ltd.

5 DIGITS STEP COUNTER C6008

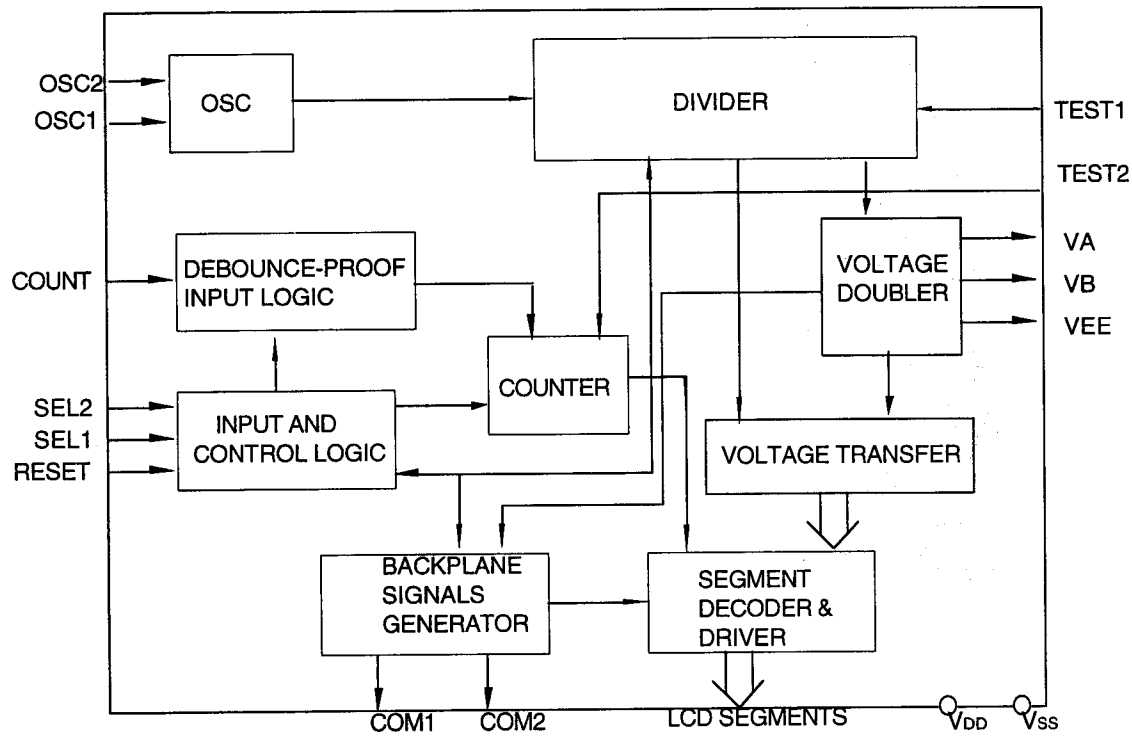
GENERAL DESCRIPTION

The C6008 is a five digits counter CMOS LSI circuit. It can directly drive 5 digits LCD.It can be applied as step counter or in other counting systems.The maximum count number is 99999. When RESET is depressed, the counter is reset to 00000. The input pulse can be generated by mechanical triggering,.electrical wave form or optoelectrical signals according to external circutts.The maximum counting speed can be selected by bonding SEL1 and SEL2 to VDD or VSS..

FEATURES

- Single 1.5V battery operation
- 32768 Hz quartz crystal time base
- 5 digits LCD display
- Built in voltage doubler
- Reset function
- Low power consumption
- Maximum counting speed selectable

BLOCK DIAGRAM



PIN DESCRIPTION

COUNT - Counting pulse input pin

RESET - The counter is reset to 00000 when this pin is forced high. It normally pulled down to Vss.

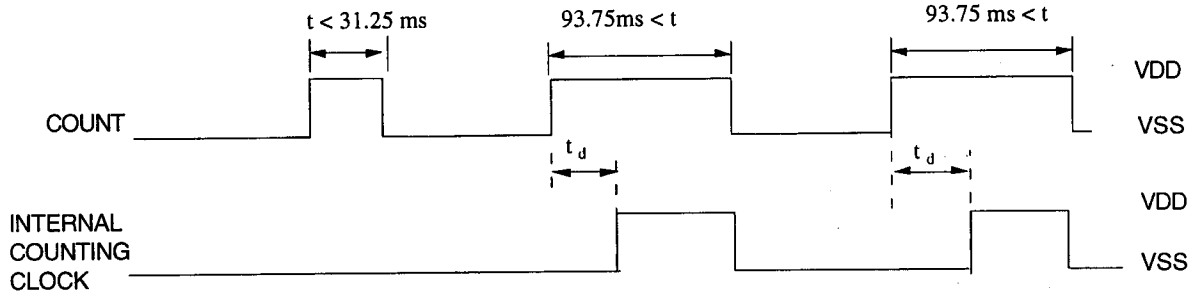
OSCI / OSCO - Oscillator Input and Output Pins

A 32768 Hz quartz crystal oscillator is connected to these two pins to generate the system timing. Both OSCI and OSCO have a built-in capacitance.

SEL1, SEL2 - The maximum counting speed selecting pins. (For C6008-1 only, check OPTION LIST)

s1	s2	Maximum counting speed
0	0	32 HZ
1	0	2 HZ
0	1	8 HZ
1	1	4 HZ

For example, When S1 and S2 both connected to VDD, then the minmun and maximum debounce time are 31.25ms and 93.75ms respectively. If input pulse width less than 31.25ms, this pulse will be omitted. If input pulse great than 93.75ms, this pulse will sure be counted.



VDD , Vss - Power Supply Pins
VDD is positive power supply, Vss is ground.

VEE - Voltage doubler output
VA ,VB - Voltage doubler capacitor pins

COM1,COM2,1B/1C,1A/1G,1F/1E,2D/1D,2B/2C,2A/2G,2F/2E,3B/3C,3A/3G,3F/3E,3D/4D,4B/4C, 4A/4G,4F/4E,-/5D,5B/5C,5A/5G,5F/5E - LCD Display Pins
These are LCD display pins. COM1 and COM2 are backplane pins and the others are segment driving pins.

TEST1 and TEST2 - Test1 and Test2 Input Pins
These two test pins are used for speeding up the testing.

FUNCTIONAL DESCRIPTION

a. After power on, LCD will display 88888 for about one second and then return to 00000.
b. The counter will advance 1 by one count triggering.
c. The maximum count number is 99999, the counter will display 00000 by another count triggering .
d. Whenever RESET is forced high, the counter will display 00000.
e. Maximum counting speed can be selected by connecting SEL1 , SEL2 to VDD or VSS.

ABSOLUTE MAXIMUM RATINGS(Ta = 25 °C)

Parameter	Symbol	Limits
Power supply voltage range	Vss - VDD	-0.3 V to +1.8V
Input voltage range	Vin	Vss -0.3 to VDD +0.3
Operating temperature range	TA	-20 to +60°C
Storage temperature range	Tstg	-40 to +70°C

DC ELECTRICAL CHARACTERISTICS

Unless otherwise specified, Ta = 25°C, VDD = 1.5V, Vss = 0V, Fosc = 32768 Hz

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Operating voltage range	VDD	1.3	1.5	1.8	V	-
Doubler Output Voltage	VEE	-1.8	-1.5	-1.3	V	-
Supply current	IDD	-	-	3	μA	**no load
LCD Driving Current	ILCD	0.1	-	-	μA	
Input high voltage	VIH	1.3	1.5	1.8	V	
Input low voltage	VIL	-0.3	0	0.3	V	
Frequency Stability	Δf/f	-	-	1	ppm	VDD =1.3V to 1.8V
Oscillator Built-in Capacitor	CD	-	20	-	pF	-
Oscillator Start up Time	TOSC	-	-	5	sec	VDD= 1.3V

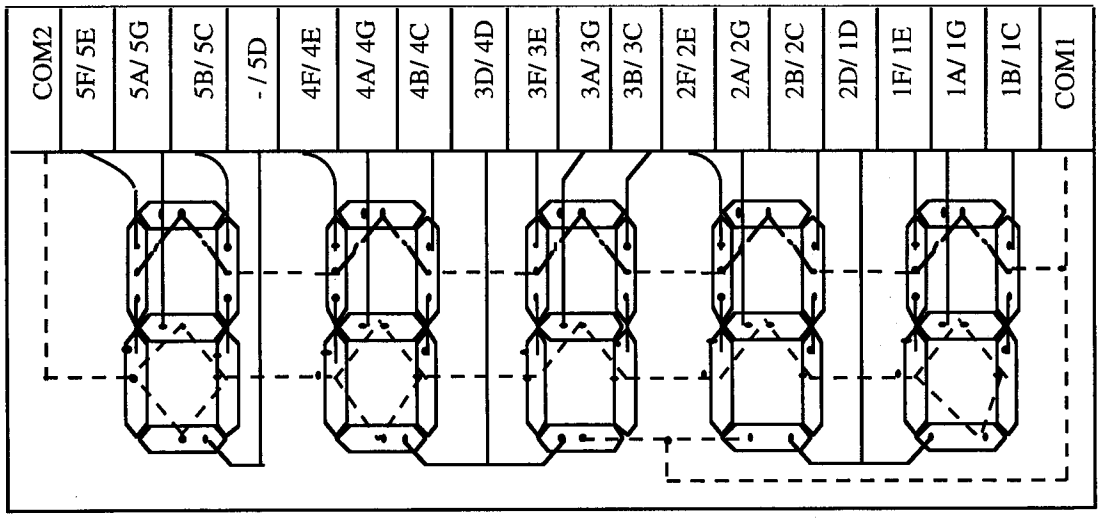
Note: ** refers to LCD unload.

OPTION LIST

s1	s2	Maximum counting speed	
		C6008	C6008-1
0	0	1KHZ	32 HZ
1	0	64 HZ	2 HZ
0	1	16 HZ	8 HZ
1	1	4 HZ	4 HZ

JUNE 5, 1997

5-DIGITS LCD FORMAT



18 LCD SEGMENT OUTPUT PADS:

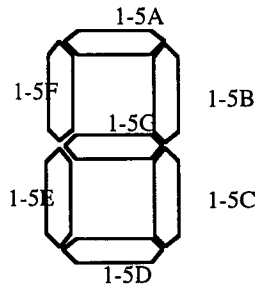
1B / 1C	1A / 1G	1F / 1E	2D / 1D
2B / 2C	2A / 2G	2F / 2E	
3B / 3C	3A / 3G	3F / 3E	3D / 4D
4B / 4C	4A / 4G	4F / 4E	- / 5D
5B / 5C	5A / 5G	5F / 5E	

2 LCD BACKPLANES OUTPUT PADS

COM1 COM2

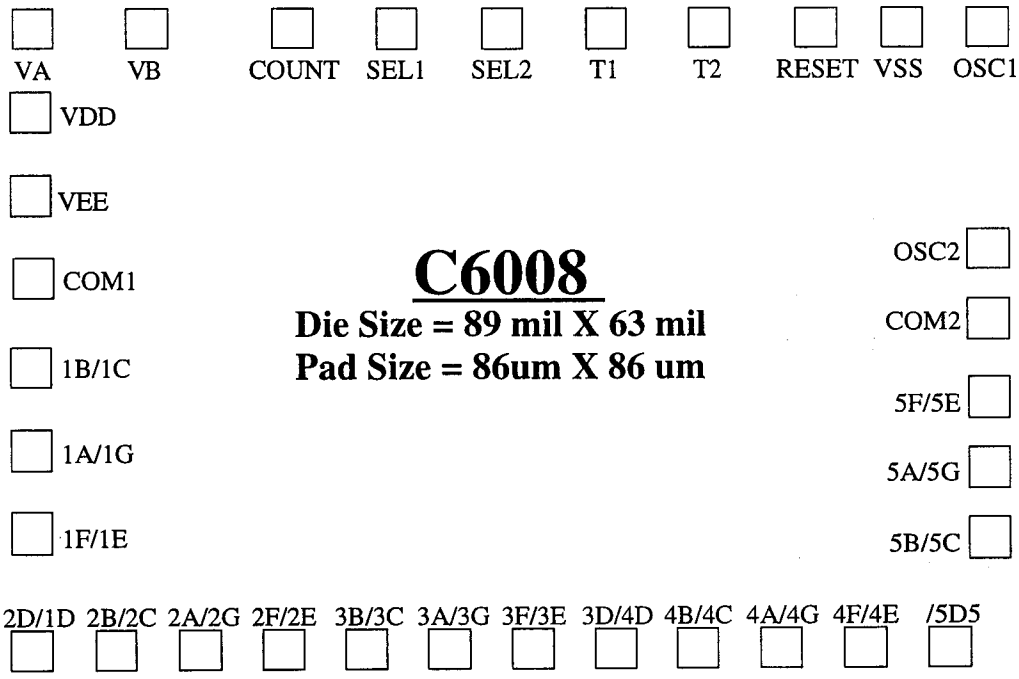
LCD BIPLEX SEGMENT ARRANGEMENT

Pad NO in IC	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
		1C	1G	1E	1D	2C	2G	2E	3C	3G	3E	4D	4C	4G	4E	5D	5C	5G	5E	COM2
	COM1	1B	1A	1F	2D	2B	2A	2F	3B	3A	3F	3D	4B	4A	4F	-	5B	5A	5F	



The 1st - 5th digits

PAD ASSIGNMENT



The Co-ordiante For Low Left Corner of Each Pad

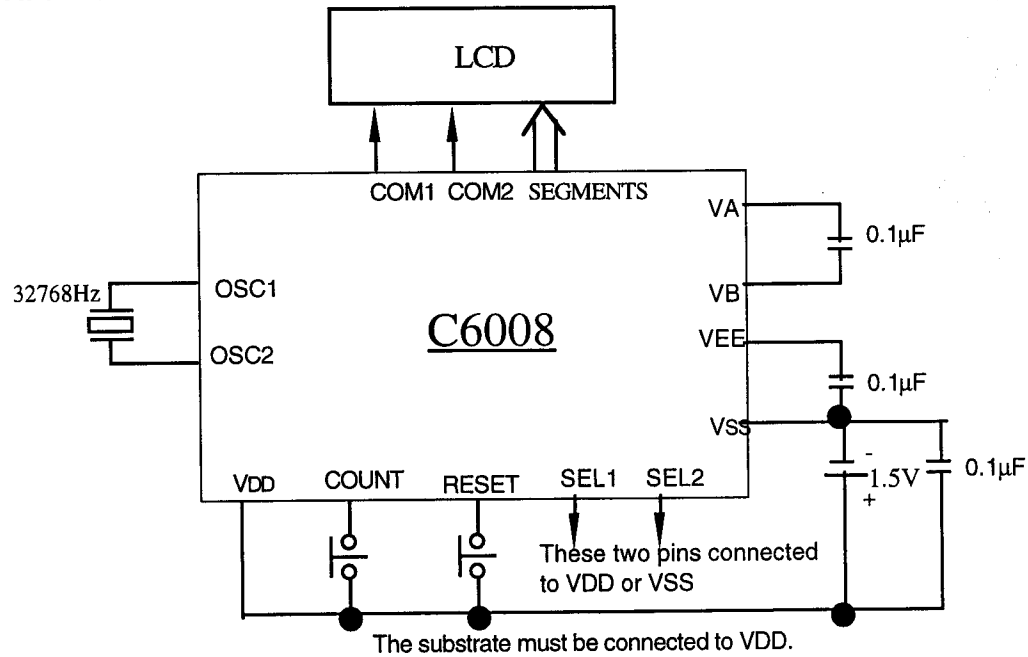
2D/1D (-1028.6, -692.3)
2B/2C (- 856.6, -692.3)
2A/2G (- 684.6, -692.3)
2F/2E (- 512.6, -692.3)
3B/3C (- 340.6, -692.3)
3A/3G(- 168.6, -692.3)
3F/3E (3.4, -692.3)
3D/4D (175.4, -692.3)
4B/4C (347.4, -692.3)
4A/4G (519.4, -692.3)
4F/4E (691.4, -692.3)
/5D (863.4, -692.3)

5B/5C (944.4, -463.8)
5A/5G (944.4, -317.8)
5F/5E (944.4, -171.8)
COM2 (944.4, - 5.8)
OSC2 (944.4, 140.2)
OSC1 (944.4, 599.4)

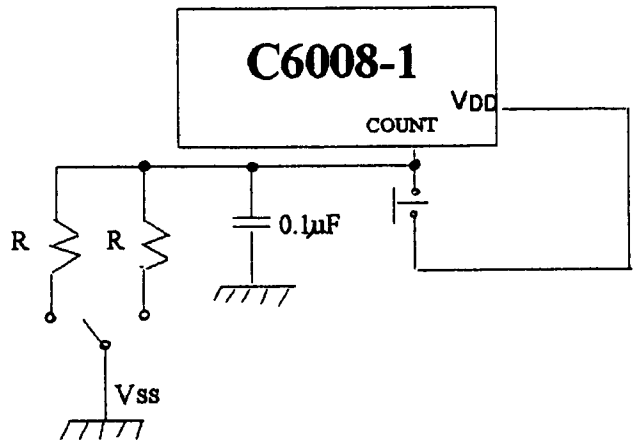
VSS (771.0, 599.4)
RESET (595.0, 599.4)
T2 (376.0, 599.4)
T1 (160.0, 599.4)
SEL2 (- 56.0, 599.4)
SEL1 (-272.0, 599.4)
COUNT (-488.0, 599.4)
VB (-788.5, 599.4)
VA (-1023.6, 599.4)

VDD (-1028.6, 427.4)
VEE (-1028.6, 255.4)
COM1 (-1023.5, 83.4)
1B/1C (-1028.6, -103.8)
1A/1G (-1028.6, -275.8)
1F/1E (-1028.6, -447.8)

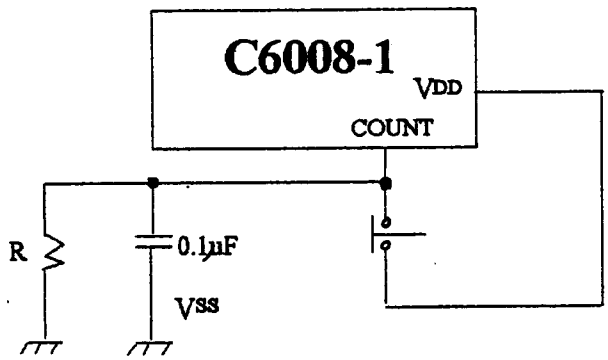
APPLICATION CIRCUIT



步行及跑步器



計步器



備註：R = 1MΩ~3MΩ