



GENERAL DESCRIPTION

C9792 is a CMOS LSI calculator chip with 8 digit arithmetic operations, one accumulating memory and one special memory which can retent the content(exchange rate) after power off, single two currency exchange and following operations, percentage calculations, designed for triplex LCD application with either 1.5V battery or solar cell power supply. Especially, the result of currency exchange and following operation is rounded to two decimals if it exceeds two decimals. The rate can be set, otherwise the rate is default value which has been built in .

FUNCTIONS

- Two currency exchange. No auto-constant operation in currency exchange mode (i.e. after secondly pressing key country 1 or country 2, the exchange result remains the same).
- The result of currency exchange and the following "+", "-", "X" and "/" operation is rounded to two decimals if it exceeds two decimals. If it is less than two decimals, it will not add '0'.
- Four standard functions (+, -, x, +).
- Auto-constant calculations (constant : multiplicand, divisor, addend and subtrahend) in normal calculator mode.
- Mark-up and mark-down calculations.
- Percentage calculations.
- Chain addition, subtraction, multiplication and division .

APPLICATION

This specification contains complete informations of functional operations, electrical characteristics, packaging, and crating requirements of C9792.

FEATURES

- Special memory : SET, RATE, COUNTRY1, COUNTRY2.
- Special memory can retent the content (i.e. exchange rate from country 2 to country 1) after power off.
- Exchange rate can be set, otherwise it is the default rate which has been built in and can be changed by mask option.
- Exact reverse between Country 1 & Country 2.
- Automatic power off function.
- Punctuation comma display.
- Floating decimal in calculator operation.
- Overflow indication : E.

ABSOLUTE MAXIMUM RATINGS

Parameters	Symbol	Value	Unit	Note
Extremely voltage	VDD	- 0.3 ~ + 2.0	V	1
	VIN	- 0.3 ~ VDD + 0.3	V	1
Solar Supply Voltage	VSB	1.1 ~ 3.0	V	2
	VGG (LIM)	1.1 ~ 1.8	V	3
Operating temperature range	TOPR	0 ~ + 50	°C	--
Storage temperature range	TSTG	- 55 ~ + 125	°C	--

Note 1 : Maximum voltage on any pin is referenced to GND.

Note 2 : VSB is solar supply voltage.

Note 3 : VGG (lim) is limited voltage.

ELECTRICAL CHARACTERISTICS

(Ta = 25°C, VDD = 1.5V unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition	Note
Input Voltage	V _{IH}	VDD-0.4	--	--	V	--	4
	V _{IL}	--	--	0.4	V	--	
Input Current	I _{IH}	--	--	1	μA	V _{IN} = VDD	5
	I _{IL}	0.3	1	3	μA	V _{IN} = 0V	
Output Voltage 1	V _{OH}	VDD-0.15	--	--	V	No load	6
	V _{OL}	--	--	0.15	V	I _{OUT} = 15μA	
Output Voltage 2	V _{OA}	2.8	2.95	--	V	No load	7
	V _{OB}	1.3	1.5	1.7	V	No load	
	V _{OC}	--	0	0.2	V	No load	
Display Frequency	F _d	40	55	65	Hz	VDD = 1.3V while display is ON.	7
Dissipation Current	I _{OFF}	--	--	0.1	μA	Display is OFF	8
	I _{DIS}	--	4.2	6	μA	VDD = 1.3V while display is on.	9
	I _{OP}	--	6.8	--	μA	VDD = 1.1V, while operation.	10

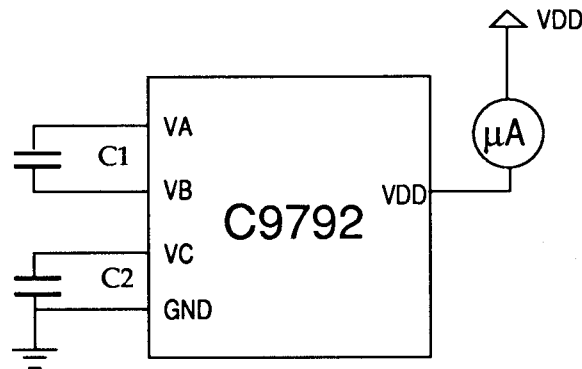
Note 4 : Applies to Pins K2 ~ K6.

Note 5 : Applies to Pins K2 ~ K6.

Note 6 : Applies to P1, P2, A2X ~ A5X.

Note 7 : Applies to H1 ~ H3, A1 ~ A8, B1 ~ B8, C1 ~ C8.

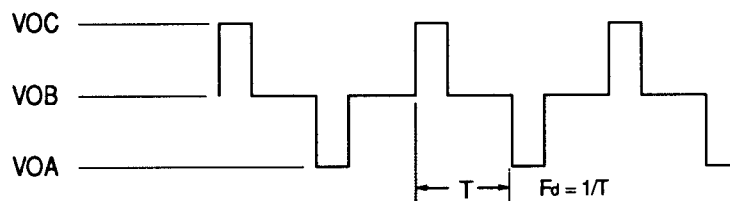
Note 8 : Measured by the test circuit below after power supply automatically turns off.



Note 9 : Measured by the test circuit while "0" is being displayed after auto - clear operation and while key is not being depressed.

Note 10 : Measured by the test circuit while operation is being made by ON/C key and while key is not being depressed.

LCD BACKPLANE OUTPUT WAVEFORM



DISPLAY FONTS

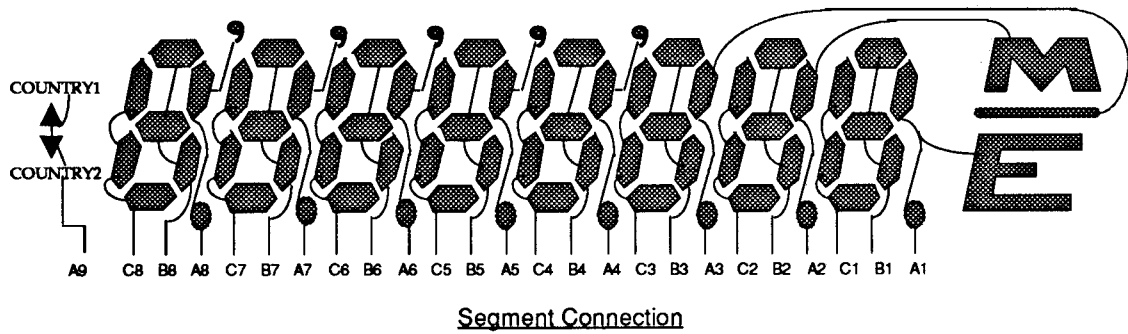
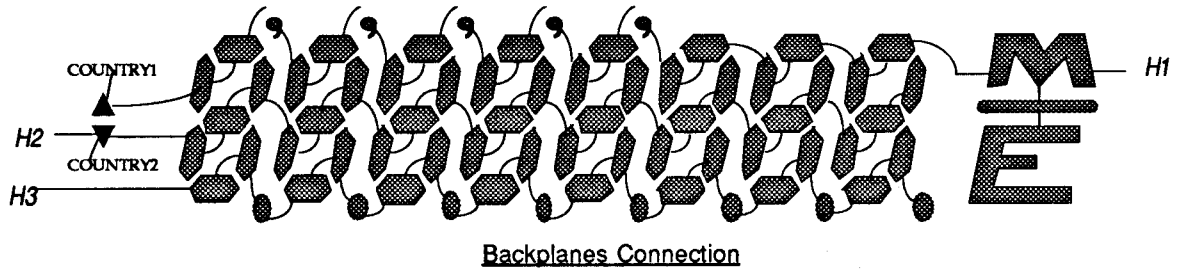
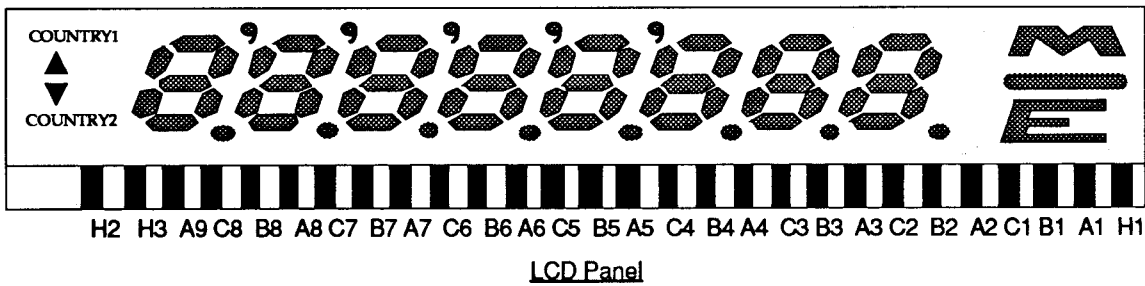
a. Numerical Font



b. Sign Font



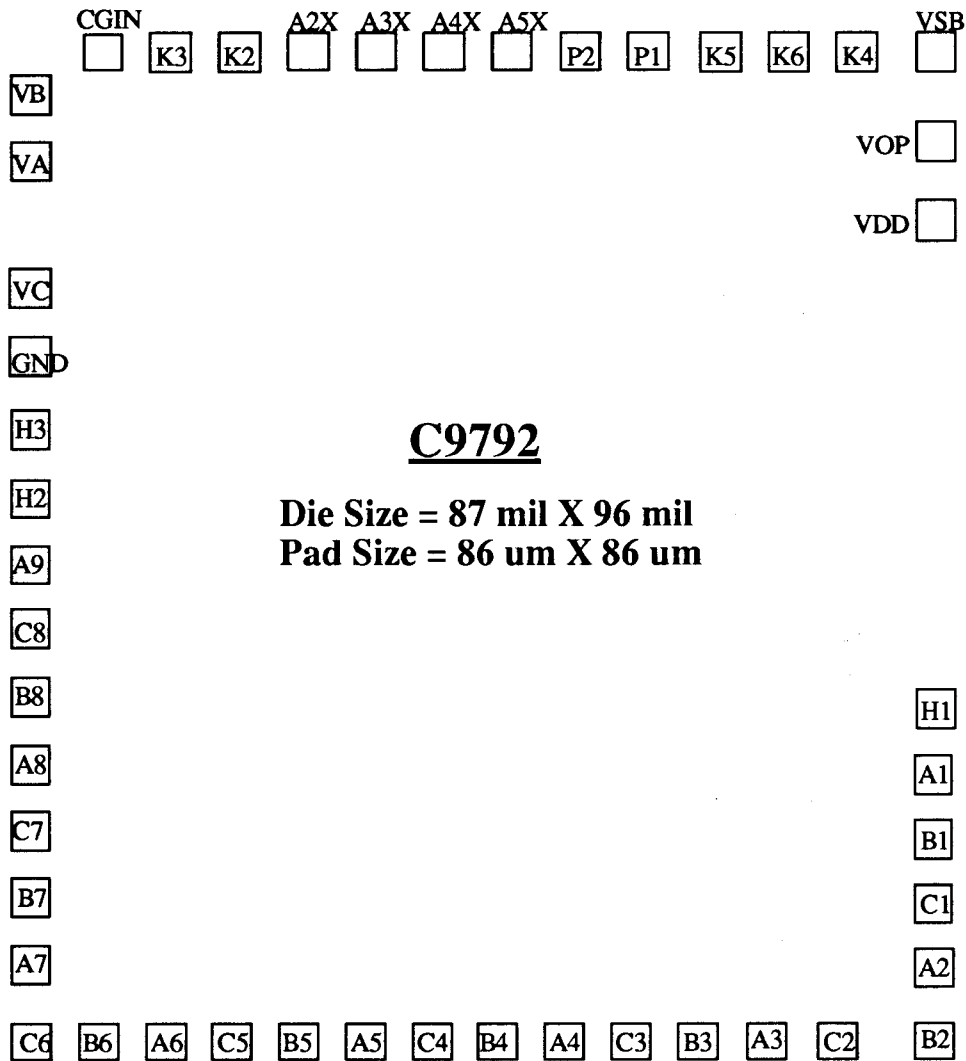
LCD CONNECTOR



PIN DESCRIPTION

Pin No.	Signal	I/O	Description	Pin No.	Signal	I/O	Description
1	VSB	1	Solar Battery	25	B7	O	Display output.
2	Vop	1	Option Pin	26	C7	O	Display output.
3	VDD		Power supply.	27	A8	O	Display output.
4	H1	O	Display output.	28	B8	O	Display output.
5	A1	O	Display output.	29	C8	O	Display output.
6	B1	O	Display output.	30	A9	O	Display output.
7	C1	O	Display output.	31	H2	O	Display output.
8	A2	O	Display output.	32	H3	O	Display output.
9	B2	O	Display output.	33	GND		Ground.
10	C2	O	Display output.	34	VC	O	Cap terminal for voltage step-up.
11	A3	O	Display output.	35	VA	O	Cap terminal for voltage step-up.
12				36	VB	O	Cap terminal for voltage step-up.
13	B3	O	Display output.	37	CGin	I	Input terminal for CG.
14	C3	O	Display output.	38	K3	I	Key input.
15	A4	O	Display output.	39	K2	I	Key input.
16	B4	O	Display output.	40	A2X	O	Strobe output.
17	C4	O	Display output.	41	A3X	O	Strobe output.
18	A5	O	Display output.	42	A4X	O	Strobe output.
19	B5	O	Display output.	43	A5X	O	Strobe output.
20	C5	O	Display output.	44	P2	O	Strobe output.
21	A6	O	Display output.	45	P1	O	Strobe output.
22	B6	O	Display output.	46	K5	I	Key input.
23	C6	O	Display output.	47	K6	I	Key input.
24	A7	O	Display output.	48	K4	I	Key input.

PAD DIAGRAM



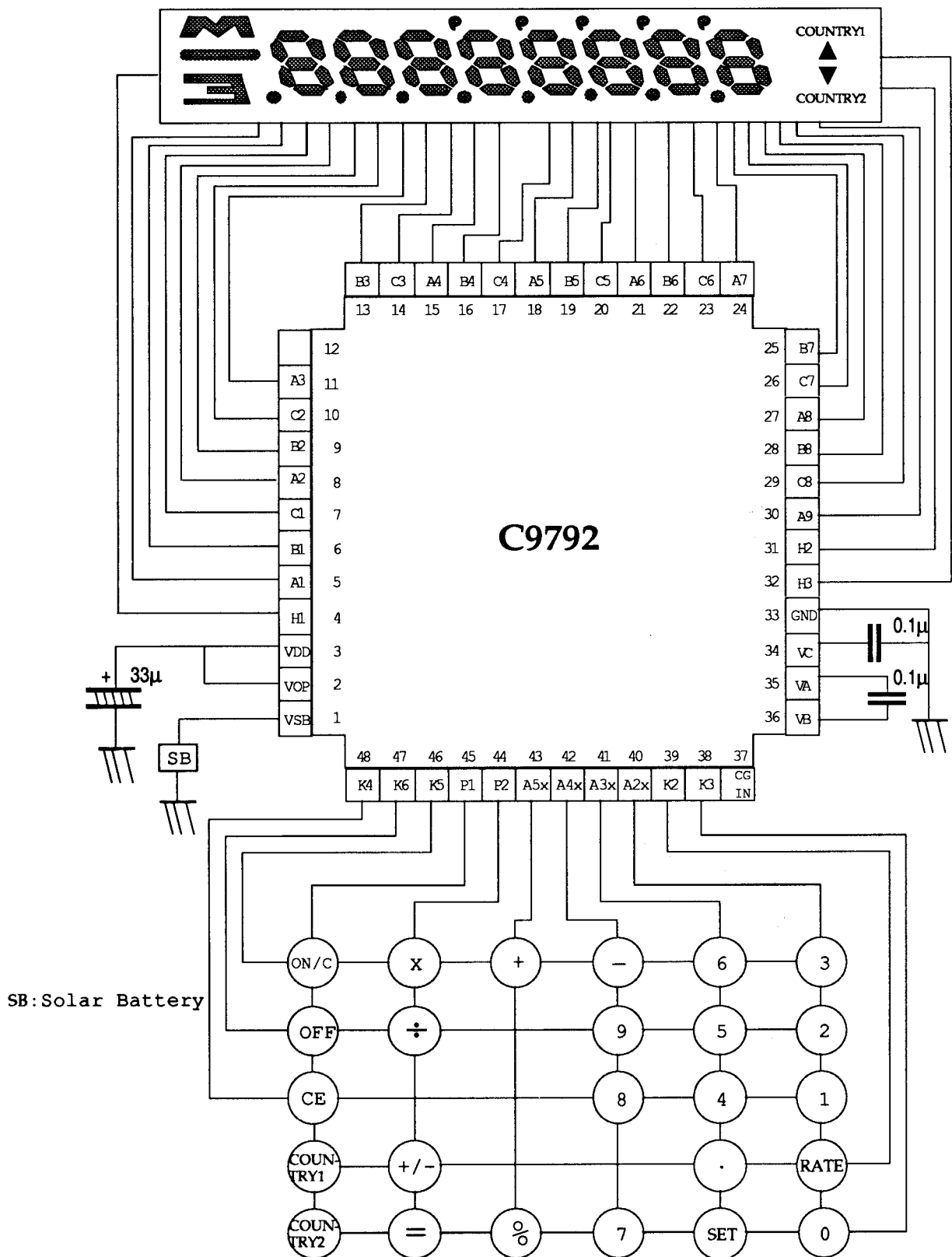
C9792

Die Size = 87 mil X 96 mil
Pad Size = 86 um X 86 um

The Co-ordiante For Low Left Corner of Each Pad

C6(-1017.0, -1130.1)	A2 (929.9, -967.0)	K4 (765.9, 1046.2)	VB (-1017.0, 951.7)
B6(-871.5, -1130.1)	C1 (929.9, -827.1)	K6 (618.4, 1046.2)	VA (-1017.0, 805.5)
A6(-728.7, -1130.1)	B1 (929.9, -687.4)	K5 (470.9, 1046.2)	VC (-1017.0, 527.2)
C5(-585.9, -1130.1)	A1 (929.9, -547.6)	P1 (317.7, 1046.2)	GND(-1017.0, 376.2)
B5(-441.3, -1130.1)	H1 (934.9, -401.3)	P2 (170.7, 1046.2)	H3 (-1017.0, 215.5)
A5(-296.8, -1130.1)	VDD(934.8, 672.6)	A5X (23.7, 1046.2)	H2 (-1017.0, 66.5)
C4(-154.3, -1130.1)	VOP(934.9, 847.7)	A4X (-123.3, 1046.2)	A9 (-1017.0, -78.9)
B4(-11.9, -1130.1)	VSB(934.9, 1046.3)	A3X (-270.3, 1046.2)	C8 (-1017.0, -225.8)
A4(132.7, -1130.1)		A2X (-417.3, 1046.2)	B8 (-1017.0, -373.1)
C3(277.2, -1130.1)		K2 (-567.4, 1046.2)	A8 (-1017.0, -520.4)
B3(422.9, -1130.1)		K3 (-714.4, 1046.2)	C7 (-1017.0, -666.0)
A3(570.5, -1130.1)		CGIN(-861.4, 1046.2)	B7 (-1017.0, -811.6)
C2(721.1, -1130.1)			A7 (-1017.0, -960.6)
B2(930.8, -1130.2)			

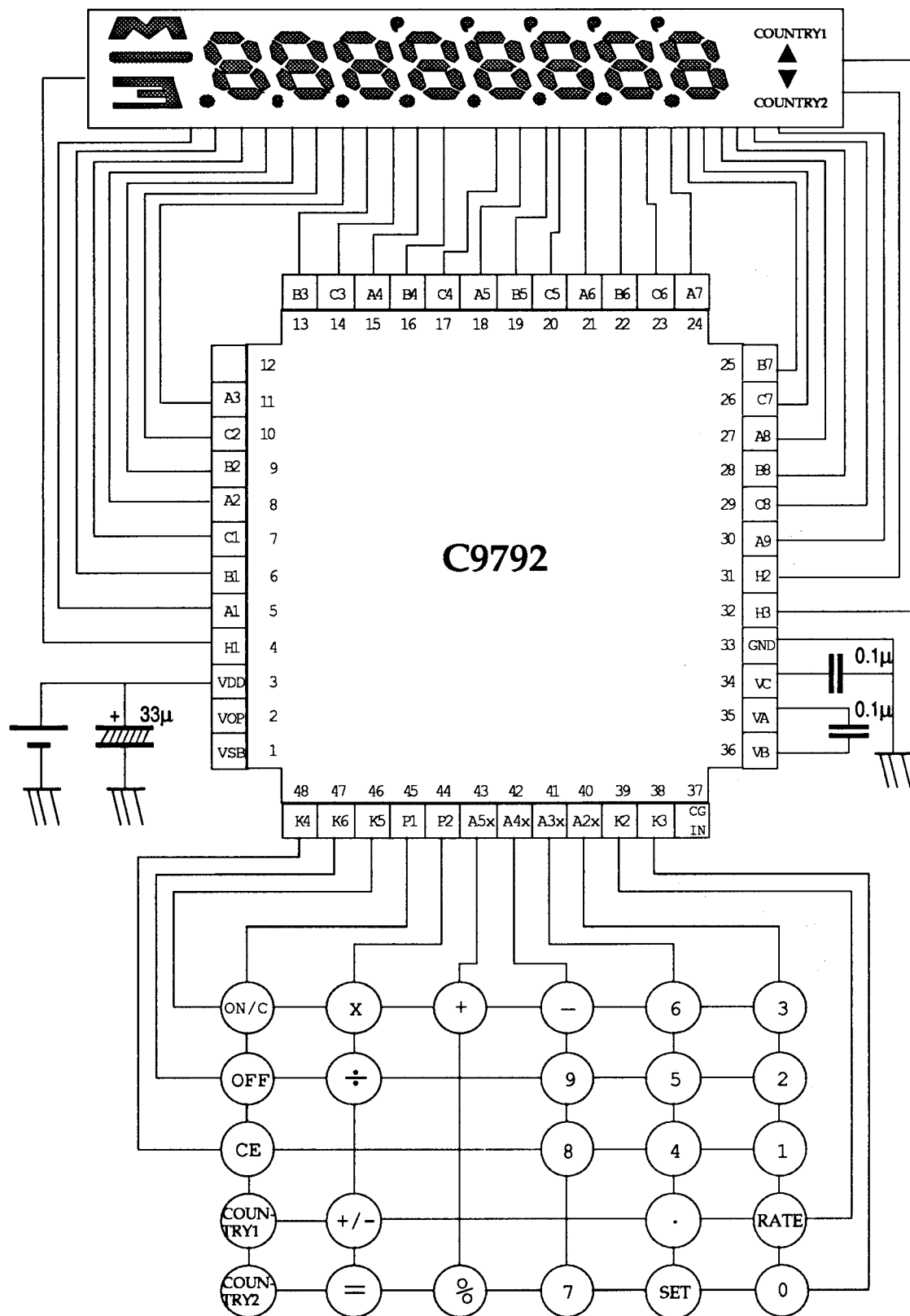
APPLICATION DIAGRAM WITH SOLAR CELL SUPPLY



SB: Solar Battery

Note : Chip substract must be floating or connected to GND.

APPLICATION DIAGRAM WITH BATTERY SUPPLY



Note : Chip substract must be floating or connected to GND.