SC876F（文件编号:S&CIC0758） 八位计算器

BASIC FUNCTION 8 DIGITS LCD CALCULATOR

The SC876F is a single chip CMOS LSI with 8-digit arithmetic operation, single memory extraction-of-square-root, percentage calculation and auto power off function, designed for FEM LCD operation with a 1.5V power supply or dual power supply.

FUNCTIONS

- Four standard functions(＋，－，×，÷)
- Auto constant calculations (constant: multiplicand, divisor, addend and subtrahend).
- Square and reciprocal calculations.
- Mark-up and mark -down calculations.
- Extraction of square root.
- Percentage calculations.
- Chain multiplication and division.
- Power calculations.
- Rough estimate calculations.
- Clear key: ON/C, ON/CE, CE

FEATURES

- Single chip CMOS construction.
- Rollover capability.
- Floating decimal point.
- LCD direct drive.
- Overflow indication: E.
- Accumulating memory: M+, M-, RM, CM, RM/CM.
- Only bare chip available.
- On chip supply voltage limiter by application.

ABXOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Rating	Unit	Note
Terminal voltage	V_{GG}	-0.3~+2.1	V	1
	V_{IN}	-0.3~VGG+0.3	V	
Solar supply voltage	V_{SB}	1.1~3.0	V	2
	V_{GG}(lim)	1.1~1.8	V	3
Battery supply voltage	V_{GG}	1.1~1.8	V	
Operating temperature	Topr	0~+50	℃	
Storage temperature	Tstg	-55~+125	℃	

Note: 1. Maximum voltage on any pin with respect to the GND.
2. Vsb is solar supply voltage.
3. V_{GG}(lim) is limited voltage.

ELECTRICAL CHARACTERISTICS(Ta = 25℃, V_{GG} = 1.5V, unless otherwise specified)

Characteristic	Symbol	Test conditions	Min	Typ	Max	Unit	Note
Input voltage	$V_{IH}1$		V_{GG}-0.4			V	4
	$V_{IL}1$				0.4		
Input current	$I_{IH}1$	V_{IN} = V_{GG}			1	uA	5
	$I_{IL}1$	V_{IN} = 0V	0.3	1	3		
Output voltage 1	VOH1	Without load	V_{GG}-0.15			V	6
	VOL1	Lout = 15uA			0.15		
Output voltage 2	VOA	Without load	2.80	2.95		V	7
	VOB	Without load	1.30	1.50	1.70		
	VOC	Without load		0	0.20		
Display frequency	Fd	V_{GG} = 1.3V, while Display is on, Rf = 560Kohm	40	45	50	Hz	7
Dissipation	Ioff	Display off			0.1	uA	8
	I_{DIS}	V_{GG} = 1.3V While display is on		3.5	5		9
	Iop	V_{GG} = 1.1V While operation		5.6			10

Note: 4. Applies to pins K2~K6.

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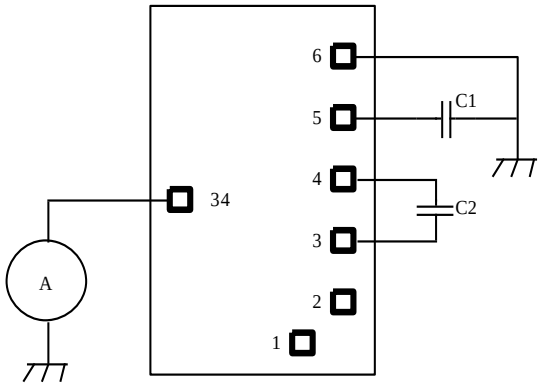
6. Applies to P1, P2, A2~A5.

7. Applies to H1~H3, a1~a8, b1~b8, c1~c8.

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

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

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



TEST CIRCUIT
{C1,C2:0.1uF}

FUNCTIONAL DESCRIPTION

Decimal point system

Complete floating decimal point system.

Integral number: 8 digits leading zero suppression. Zero shift.

Symbols: -: negative number display.
E: error display.
M: memory display.

Error detections

System errors occur when:

1. The integral part of any memory calculation result exceeds 8 digits.
2. The division by zero.
3. The extraction of square root of a negative number.

Rough estimate calculation error

When the integral part of the result of any standard functions, percentage, square, reciprocal, or power calculations exceed 8 digits.

Error indications

System error

"0" is indicated in the 1-digit position and "E" in the sign-digit position.

Rough estimate calculation error

The high-order 8-digit calculation result is indicated together with "E".

The decimal point is indicated in the position corresponding to a calculation result of time 10^{-8}, and no zero shift is performed.

Error release

System error

A system error can be released by the ON/C or ON/CE key.

Rough estimate calculation error

A rough estimate calculation error can be released by the ON/C, ON/CE, CE key.

A calculation result is not cleared by ON/CE, CE key but is retained.

Number entry

Numerical can be entered up to 8 digits. Numerical entries equal to 9 digits or more are ignored.

Memory protection

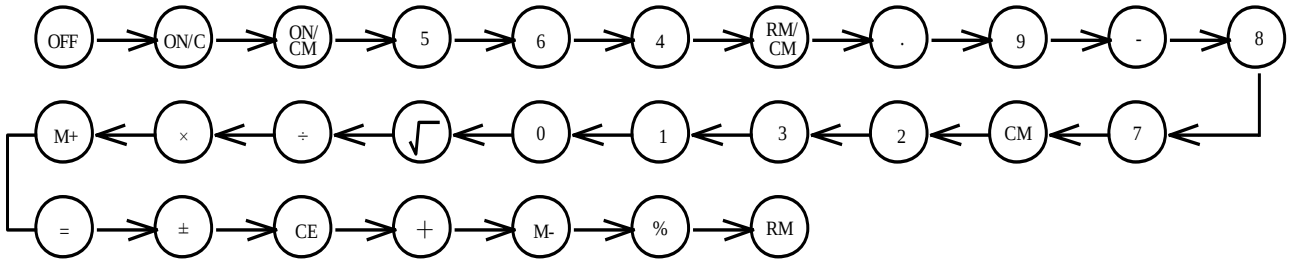
In any error detection, the memory contents is retained.

Memory indication

If the memory content is not zero, "M" is indicated in the sign-digit position.

Doublers key depression

The order of the priority when two keys are being depressed simultaneously, is as follows:



when the OFF and ON/C key are depressed simultaneously, the OFF key is given priority.

Key bounce protection

Front edge

Down to 1 word and up to about 3 words.

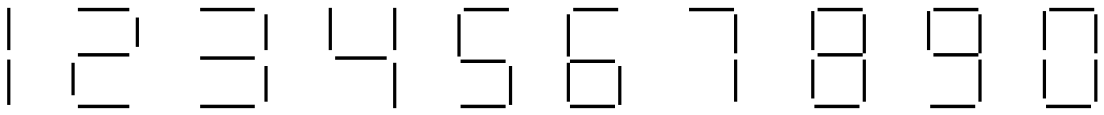
Trailing edge

9 words

1 words is 3.3ms when display frequency is fd = 100Hz.

DISPLAY FONTS

Numericals font



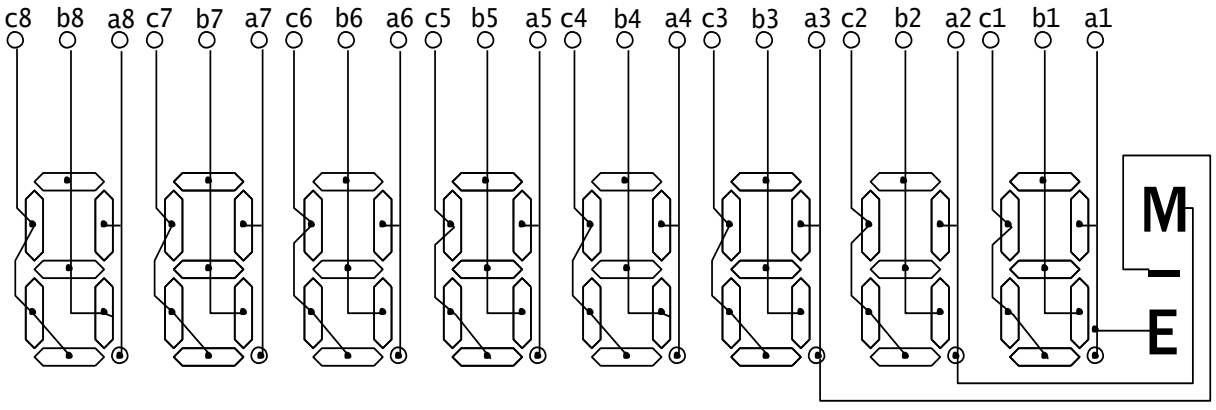
Sign font



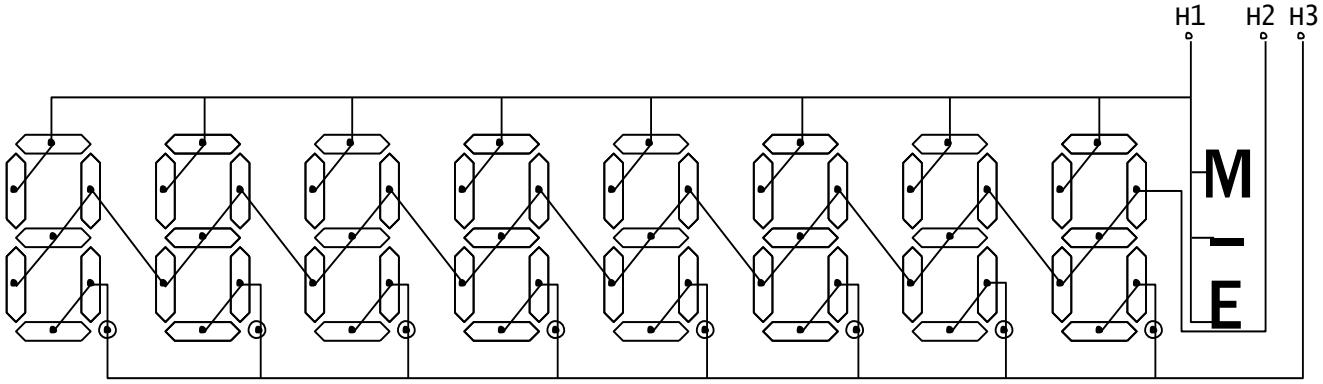
Memory Error Minus

CONNECTION OF LCD

SEGMENT



COMMON



AUTO POWER OFF

Power automatically turns off after 9-11 minutes pass from the last key pressure.

ON/C KEY

All operations except memory content are clared by ON/C key.

MARK-UP AND MARK-DOWN CALCULATION

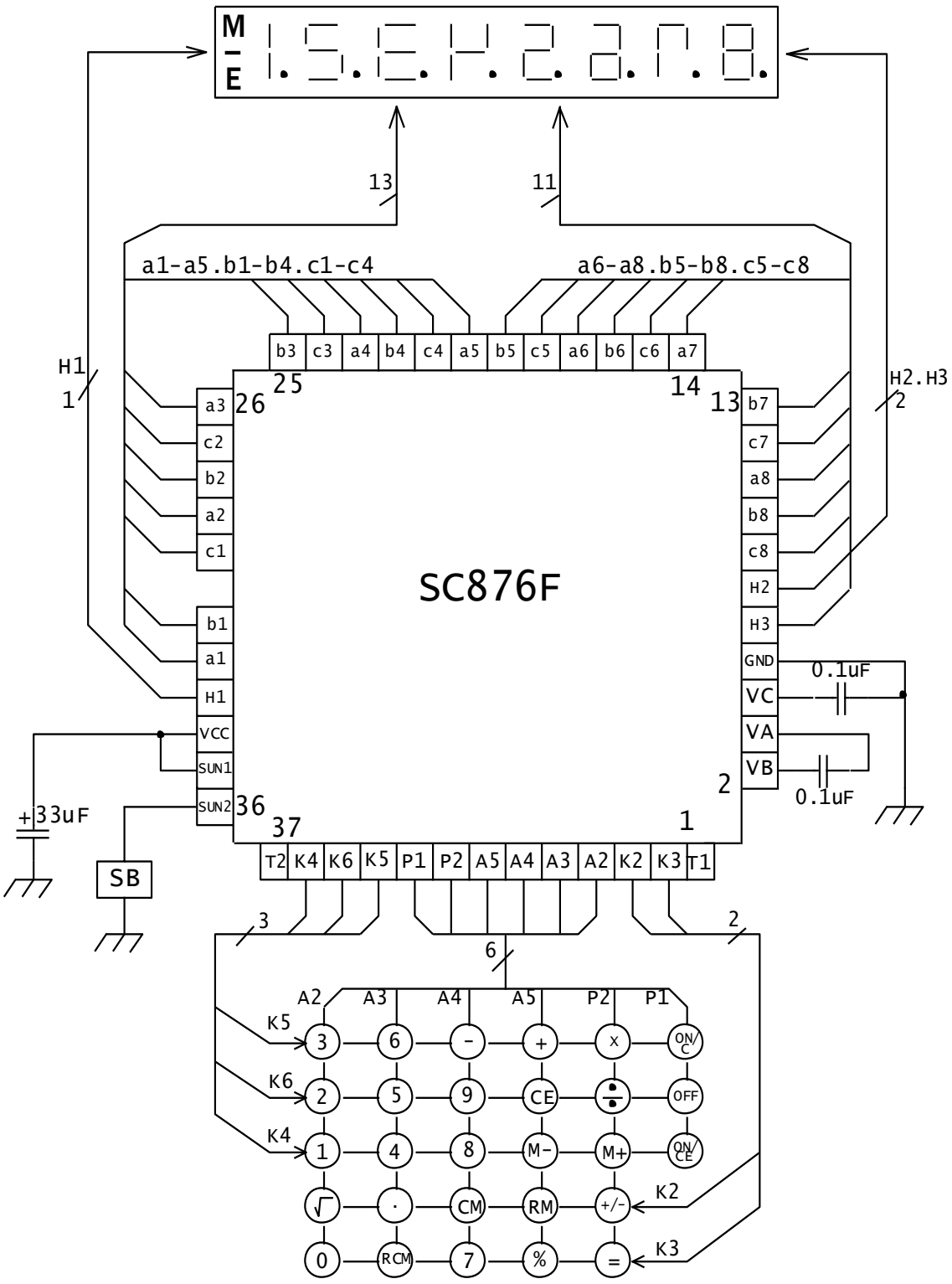
Mark-up and mark -down calculations are performed as follows.

ENTRY		DISPLAY	
A	A	A	A
±	×	A	A
B	B	B	B
%	%	A+AM/100	AM/100
	+OR-		AM/100
	=		A+ AM/100 OR A- AM/100

*AM : AMOUNT

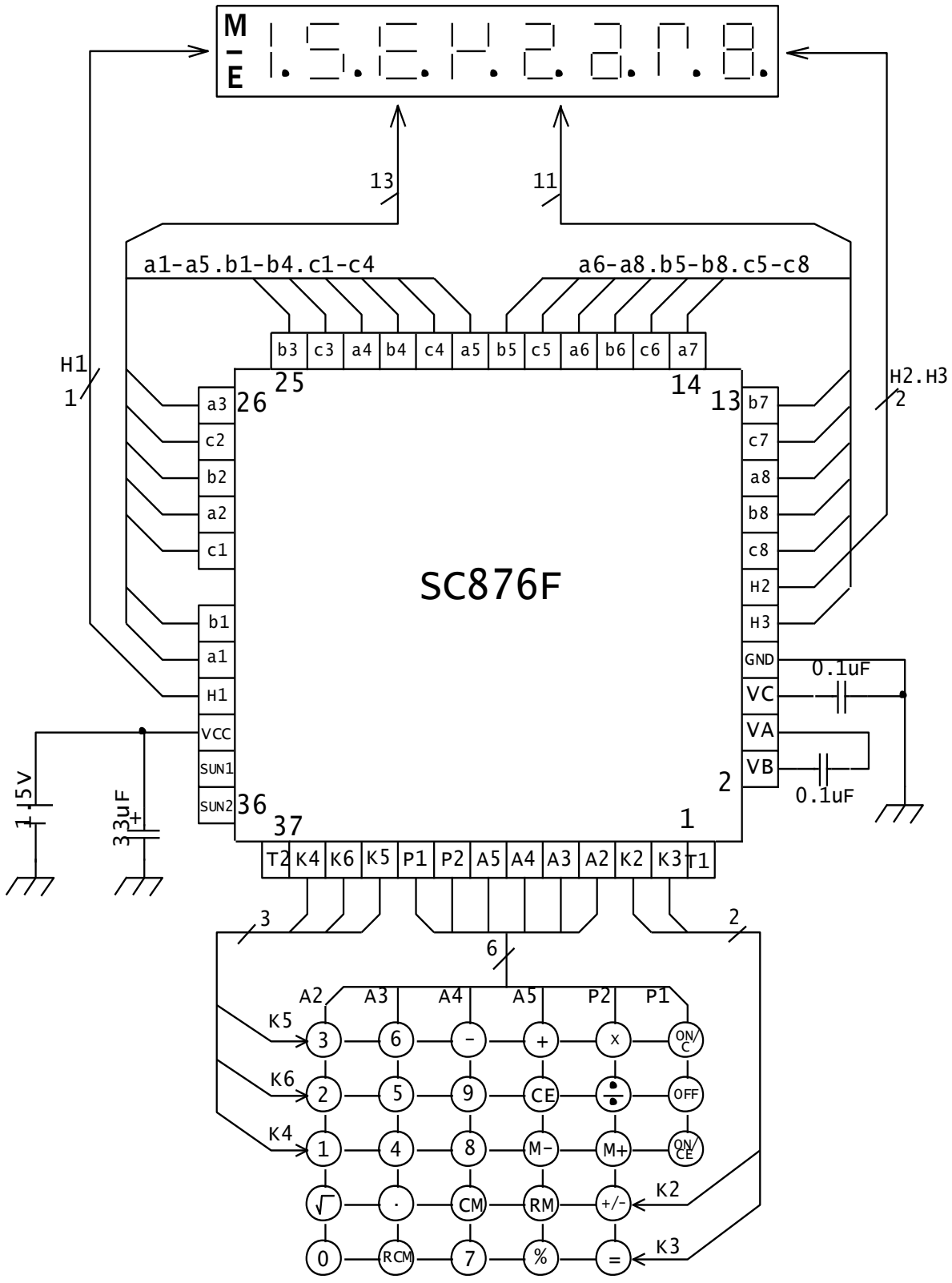
APPLICATION CIRCUIT(for use with a solar cell)

图 1：



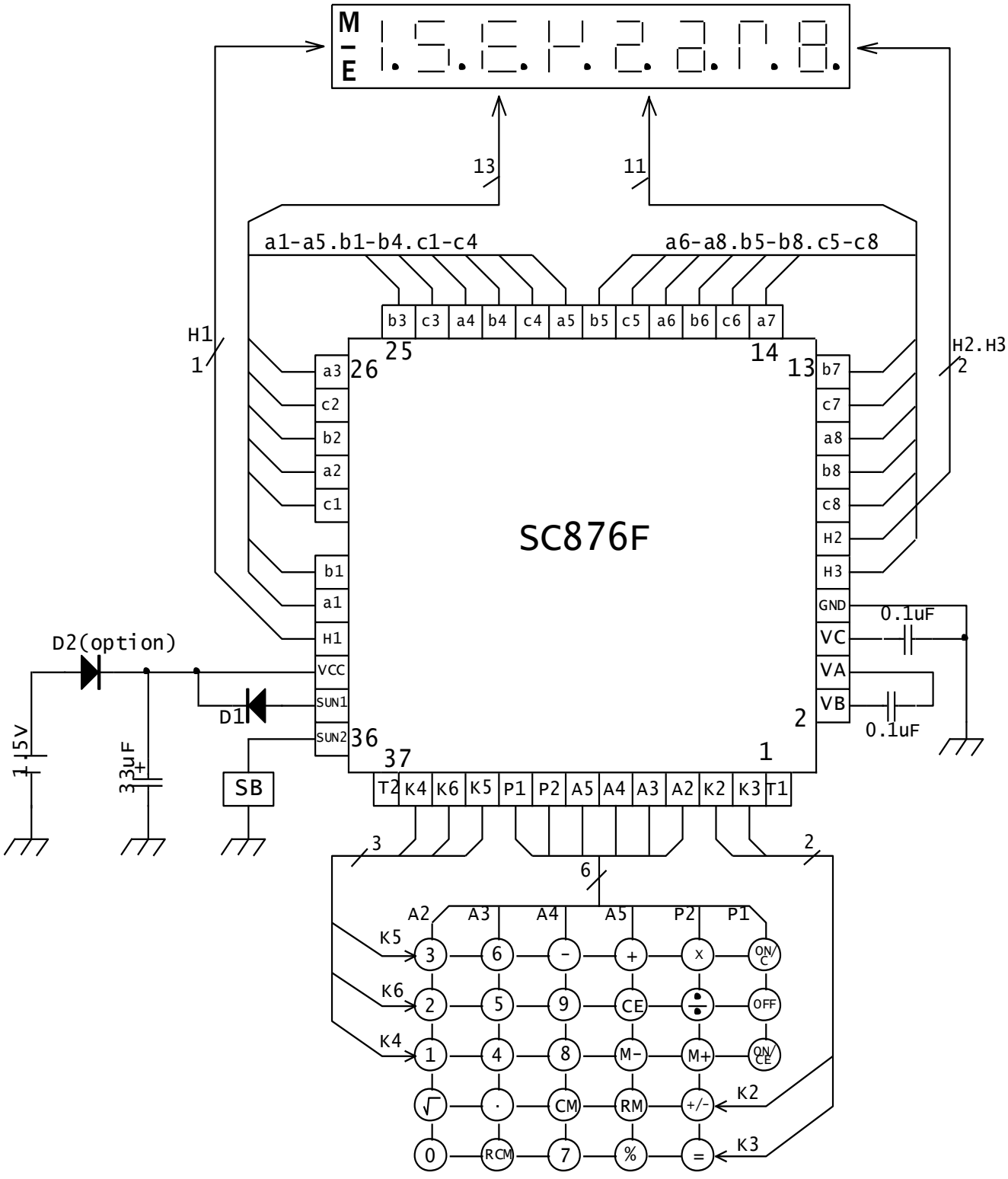
*SC876F's substrate(the back side of SC876F's chip)should be connected to the GND level.

图 2：



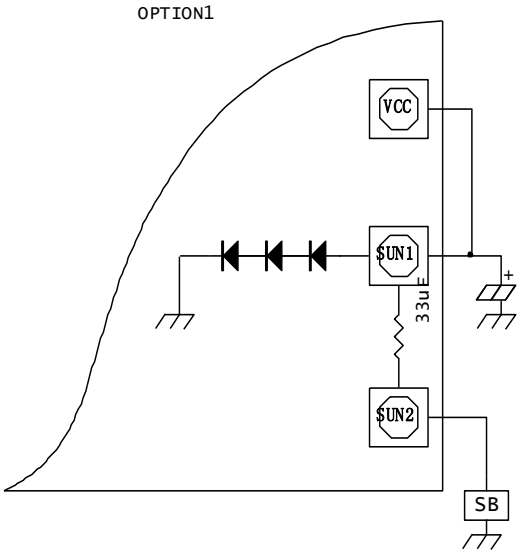
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图 3：

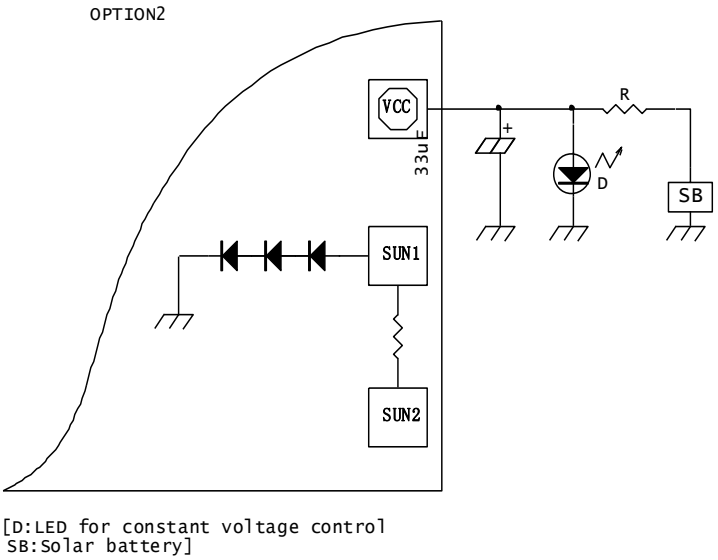


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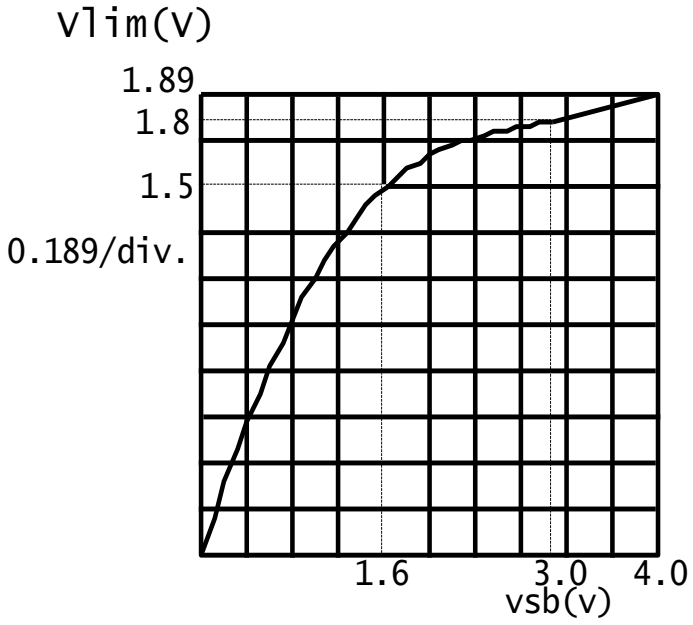
INTERNAL VOLTAGE LIMITER BONDING OPTION METHOD



(configuration using internal voltage limiter

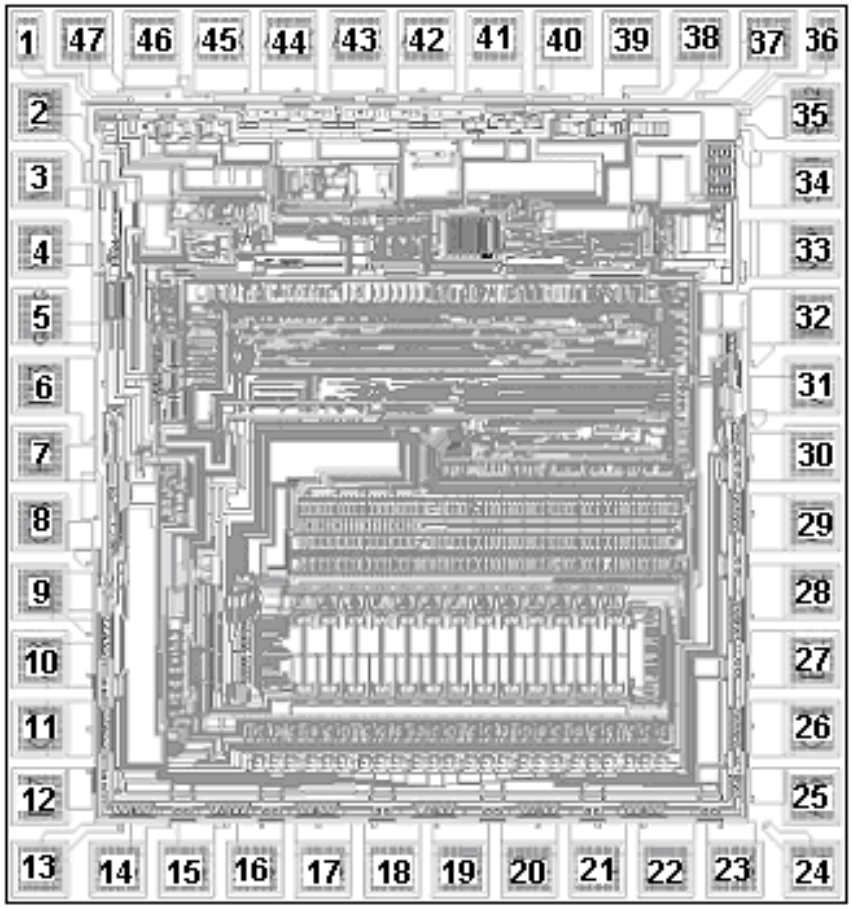


(configuration using external voltage limiter)



VOLTAGE LIMITER CHARACTERISTIC

PAD ASSIGNMENT



The IC substrate should be connected to VSS in the PCB layout artwork

Pad No.	Pad Name	X	Y	Pad No.	Pad Name	X	Y
1	T1	-640.00	665.00	25	A3	620.00	-550.00
2	VB	-620.00	550.00	26	C2	620.00	-440.00
3	VA	-620.00	440.00	27	B2	620.00	-330.00
4	VC	-620.00	330.00	28	A2	620.00	-220.00
5	GND	-620.00	220.00	29	C1	620.00	-110.00
6	H3	-620.00	110.00	30	B1	620.00	0.00
7	H2	-620.00	0.00	31	A1	620.00	110.00
8	C8	-620.00	-110.00	32	H1	620.00	220.00
9	B8	-620.00	-220.00	33	VCC	620.00	330.00
10	A8	-620.00	-330.00	34	SUN1	620.00	440.00
11	C7	-620.00	-440.00	35	SUN2	620.00	550.00
12	B7	-620.00	-550.00	36	T2	640.00	665.00
13	A7	-620.00	-665.00	37	K4	550.00	664.95
14	C6	-495.00	-665.00	38	K6	440.00	665.00

15	B6	-385.00	-665.00	39	K5	330.00	665.00
16	A6	-275.00	-665.00	40	P1	220.00	665.00
17	C5	-165.00	-665.00	41	P2	110.00	665.00
18	B5	-55.00	-665.00	42	A5X	0.00	665.00
19	A5	55.00	-665.00	43	A4X	-110.00	665.00
20	C4	165.00	-665.00	44	A3X	-220.00	665.00
21	B4	275.00	-665.00	45	A2X	-330.00	665.00
22	A4	385.00	-665.00	46	K2	-440.00	665.00
23	C3	495.00	-665.00	47	K3	-550.00	665.00
24	B3	620.00	-665.00				