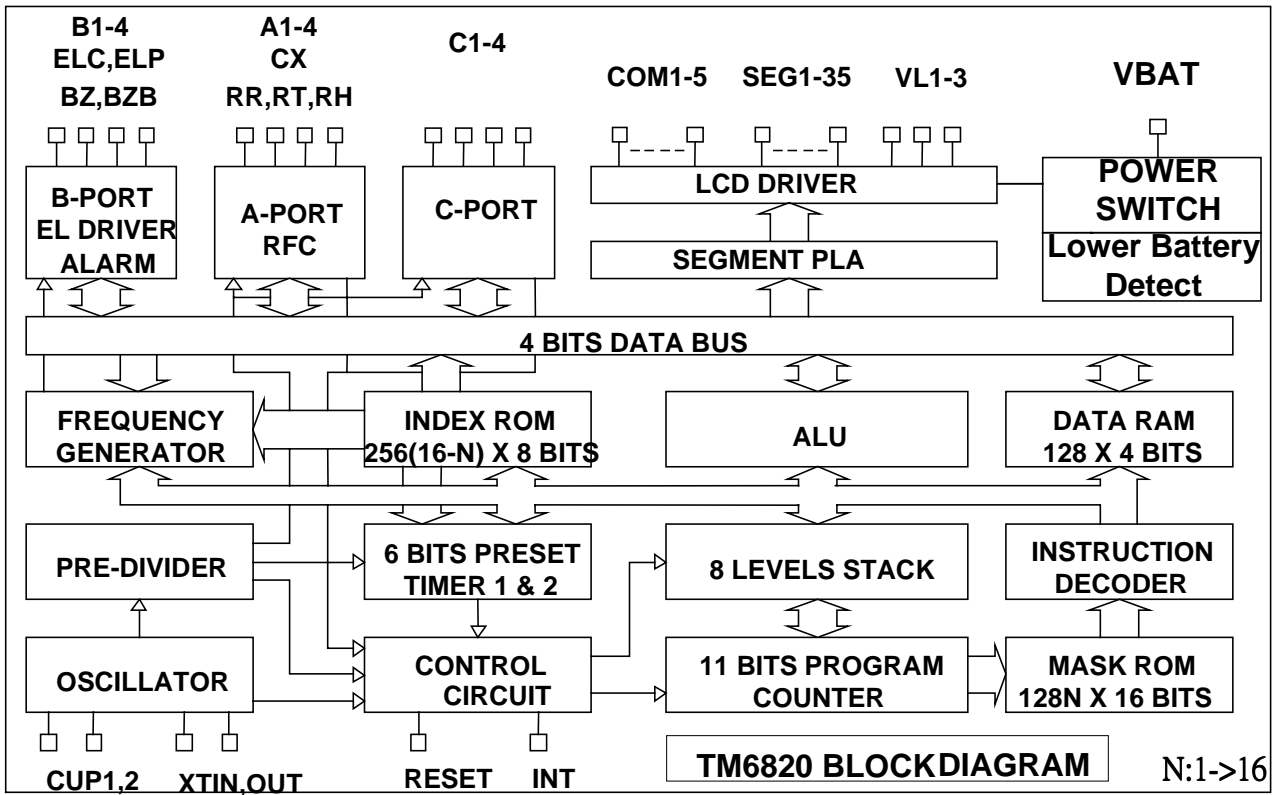


9. Built in Alarm, clock or single tone melody generator.
 - BZB, BZ (Muxed with SEG30, SEG31).
10. Built-in R to F Converter circuit.
 - CX, RR, RT, RH (Muxed with SEG24~SEG27).
11. Two 6-bit programmable timer with programmable clock source.
12. Watch dog timer.
13. Built-in Voltage doubler, tripler charge pump circuit.
14. Dual clock operation
 - slow clock oscillation can be defined as X'tal or external RC type oscillator by mask option.
 - fast clock oscillation can be defined as 3.58MHz ceramic resonator, internal R or external R type oscillator by mask option.
15. HALT function.
16. STOP function.
17. Built-in control circuitry to switch the internal operating voltage in order to perform the low power consumption or provide a stable operating voltage.
18. Built-in Low Battery Detect function
19. Heavy Loading protection function

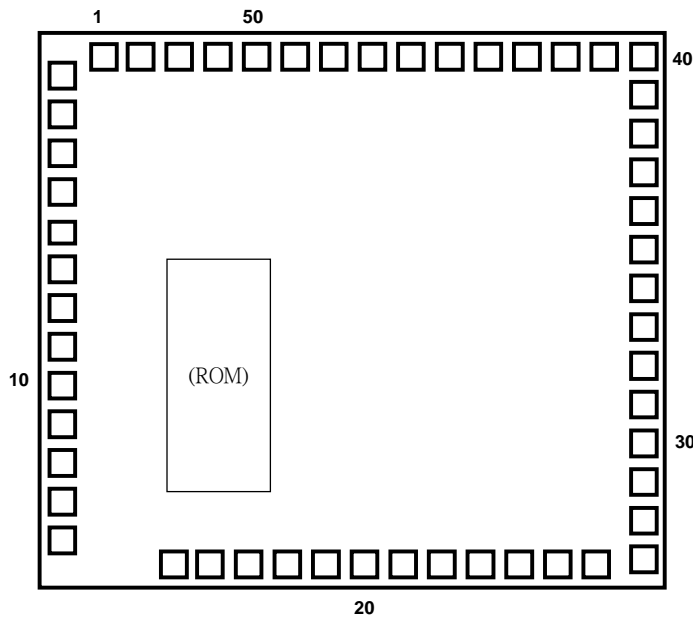
APPLICATION

- Timer / Calendar / Calculator / Thermometer

BLOCK DIAGRAM



PAD DIAGRAM



The substrate of chip should be connected to GND.

PAD COORDINATE

No	Name	X	Y	No	Name	X	Y
1	BAK	197.5	1602.5	27	SEG13	1822.5	77.5
2	XIN	77.5	1576.5	28	SEG14	1822.5	207.5
3	XOUT	77.5	1446.5	29	SEG15	1822.5	322.5
4	GND	77.5	1331.5	30	SEG16	1822.5	437.5
5	VL1	77.5	1216.5	31	SEG17	1822.5	552.5
6	VL2	77.5	1101.5	32	SEG18	1822.5	667.5
7	VL3	77.5	986.5	33	SEG19	1822.5	782.5
8	CUP1	77.5	871.5	34	SEG20	1822.5	897.5
9	CUP2	77.5	756.5	35	SEG21	1822.5	1012.5
10	COM1	77.5	641.5	36	SEG22	1822.5	1127.5
11	COM2	77.5	526.5	37	SEG23	1822.5	1242.5
12	COM3	77.5	411.5	38	SEG24/IOA1/CX	1822.5	1357.5
13	COM4	77.5	296.5	39	SEG25/IOA2/RR	1822.5	1472.5
14	COM5	77.5	166.5	40	SEG26/IOA3/RT	1822.5	1602.5
15	SEG1	427.5	77.5	41	SEG27/IOA4/RH	1692.5	1602.5
16	SEG2	542.5	77.5	42	SEG28/IOB1/ELC	1577.5	1602.5
17	SEG3	657.5	77.5	43	SEG29/IOB2/ELP	1462.5	1602.5
18	SEG4	772.5	77.5	44	SEG30/IOB3/BZB	1347.5	1602.5
19	SEG5	887.5	77.5	45	SEG31/IOB4/BZ	1232.5	1602.5
20	SEG6	1002.5	77.5	46	SEG32/IOC1	1117.5	1602.5
21	SEG7	1117.5	77.5	47	SEG33/IOC2	1002.5	1602.5
22	SEG8	1232.5	77.5	48	SEG34/IOC3	887.5	1602.5
23	SEG9	1347.5	77.5	49	SEG35/IOC4	772.5	1602.5
24	SEG10	1462.5	77.5	50	RESET	657.5	1602.5
25	SEG11	1577.5	77.5	51	INT	542.5	1602.5
26	SEG12	1692.5	77.5	52	TEST	427.5	1602.5
				53	VBAT	312.5	1602.5

PIN DESCRIPTION

Name	I/O	Description
VBAT	P	Positive supply voltage.
BAK	P	Positive Back-up voltage. Connected a 0.1u capacitor to GND.
VL1,2,3	P	LCD supply voltage. Connect 0.1u capacitors between VL1,2,3 and GND.
RESET	I	Input pin for external reset request signal, built-in internal pull-down resistor. . Reset cycle time can be defined as "PH15/2" or "PH12/2" by mask option. . Reset Type can be defined as "Level reset" or "Pulse reset" by mask option..
INT	I	Input pin for external INT request signal. . Falling edge or rising edge triggered is defined by mask option. . Internal pull-down or pull-up resistor is defined by mask option.
TESTA		Test signal input pin.
CUP1,2	O	Switching pins for supply the LCD driving voltage to the VL1,2,3 pins. . Connect the CUP1 and CUP2 pins with non-polarized electrolytic capacitor when chip operated in 1/2 or 1/3 bias mode. . In no BIAS mode application, leave these pins opened.
XIN XOUT	I O	Time base counter frequency (clock specified. LCD alternating frequency. Alarm signal frequency) or system clock oscillation. . 32KHz Crystal oscillator. . In FAST mode, connect an external resistor could compose the RC oscillator(mask option). . In SLOW mode, connect an external resistor could compose the RC oscillator(mask option).
COM1~5	O	Output pins for driving the common pins of the LCD panel.
SEG1-35	O	Output pins for driving the LCD panel segment.
IOA1-4	I/O	Input / Output port A. (Muxed with SEG24~SEG27)
IOB1-4	I/O	Input / Output port B. (Muxed with SEG28~SEG31)
IOC1-4	I/O	Input / Output port C. (Muxed with SEG32~SEG35)
CX RR/RT/RH	I O	1 input pin and 3 output pins for RFC application. (Muxed with SEG24~SEG27)
ELC/ELP	O	Output port for EL panel driver. (Muxed with SEG28,SEG29)
BZB/BZ	O	Output port for alarm, clock or single tone melody generator. (Muxed with SEG30~SEG31)
GND	P	Negative supply voltage.

ABSOLUTE MAXIMUM RATINGS

at Ta= -20 to 70°C, GND= 0V

Name	Symbol	Range	Unit
Maximum Supply Voltage	VBAT	-0.3 to 3.6	V
Maximum Input Voltage	Vin	-0.3 to VBAT +0.3	V
Maximum output Voltage	Vout	-0.3 to BAK, VL1/2/3+0.3	V
Maximum Operating Temperature	Topg	-20 to +70	°C
Maximum Storage Temperature	Tstg	-25 to +125	°C

POWER CONSUMPTION

at Ta=-20°C to 70°C, GND= 0V

Name	Sym.	Condition	Min.	Typ.	Max.	Unit
HALT mode	IHALT1	Only 32.768KHz Crystal oscillator operating, without loading. Ag mode, VBAT =1.5V, BCF = 0		2	5	uA
	IHALT2	Only 32.768KHz Crystal oscillator operating, without loading. Li mode, VBAT =3.0V, BCF = 0		2	5	uA
STOP mode	ISTOP				1	uA

Note : When RC oscillator function is operating, the current consumption will depend on the frequency of oscillation.

ALLOWABLE OPERATING CONDITIONS

at Ta= -20 to 70°C,GND= 0V

Name	Symb.	Condition	Min.	Max.	Unit
Oscillator Start-Up Voltage	BAK	Crystal Mode	1.3		V
Oscillator Sustain Voltage	BAK	Crystal Mode	1.0		V
Supply Voltage	VBAT	Ag Mode	1.2	1.8	V
Supply Voltage	VBAT	Li Mode	2.4	3.6	V
Input "H" Voltage	Vih1		VBAT-0.7	VBAT+0.7	V
Input "L" Voltage	Vil1		-0.7	0.7	V
Input "H" Voltage	Vih2	OSCIN	0.8xBAK	BAK	V
Input "L" Voltage	Vil2		0	0.2xBAK	V
Input "H" Voltage	Vih3	RC Mode	0.8xBAK	BAK	V
Input "L" Voltage	Vil3		0	0.2xBAK	V
Operating Freq	Fopg1	Crystal Mode	32		KHZ
	Fopg2	RC Mode	10	500	KHZ

ELECTRICAL CHARACTERISTICS

at#1:VBAT=1.2V(Ag);

at#2:VBAT=2.4V(Li):

Input Resistance

Name	Sym.	Condition	Min.	Typ.	Max.	Unit
"L" Level Hold Tr.(IOC)	Rllh1	Vi=0.2VBAT,#1	10	40	100	Kohm
	Rllh2	Vi=0.2VBAT,#2	10	40	100	Kohm
IOA/B/C Pull-Down Tr.	Rmad1	Vi=VBAT,#1	200	500	1000	Kohm
	Rmad2	Vi=VBAT#2	200	500	1000	Kohm
INT Pull-up Tr.	Rintu1	Vi=VBAT,#1	200	500	1000	Kohm
	Rintu2	Vi=VBAT,#2	200	500	1000	Kohm
INT Pull-Down Tr.	Rintd1	Vi=GND,#1	200	500	1000	Kohm
	Rintd2	Vi=GND,#2	200	500	1000	Kohm
RES Pull-Down R	Rres1	Vi=GND or VBAT,#1	10	50	100	Kohm
	Rres2	Vi=GND or VBAT,#2	10	50	100	Kohm

DC Output Characteristics

Name	Symb.	Condition	Port	Min.	Typ.	Max.	Unit
Output "H" Voltage	Voh1c	Ioh=-200uA,#1	SEG1~35	0.8	0.9	1.0	V
	Voh2c	Ioh=-1mA,#2		1.5	1.8	2.1	V
Output "L" Voltage	Vol1c	Iol=400uA,#1		0.2	0.3	0.4	V
	Vol2c	Iol=2mA,#2		0.3	0.6	0.9	V

Analog Circuit Characteristics

(In operation mode)

(VBAT=3.0V for Li-B or 1.5V for Ag-B, GND=0V, fosc=32,768Hz,Ta=25°C)

Name	Symb.	Condition	Min.	Typ.	Max.	Unit
Internal Voltage	VL1	Connects a 1M Ω load resistance between GND and VL1 (No panel load)	0.95	1.05	1.15	V
	VL2	Connects a 1M Ω load resistance between GND and VL2 (No panel load)	2xVL1 x0.9		2xVL1 +0.1	V
	VL3	1/2Bias Display Mode(VL3 connect to VL2) Connects a 1M Ω load resistance between GND and VL3 (No panel load)	2xVL1 x0.9		2xVL1 +0.1	V
		1/3Bias Display Mode Connects a 1M Ω load resistance between GND and VL3 (No panel load)	3xVL1 x0.9		3xVL1 +0.1	V
BLD voltage	VBLD	Li-B	2.25	2.40	2.55	V
	VBLD	Ag-B	1.10	1.20	1.30	V
BLD circuit response time	TBLD				100	us

TYPICAL APPLICATION CIRCUIT

This application circuit is simply an example, and is not guaranteed to work.

