

Japanese/Chinese Character LCD Watch with EL Driver

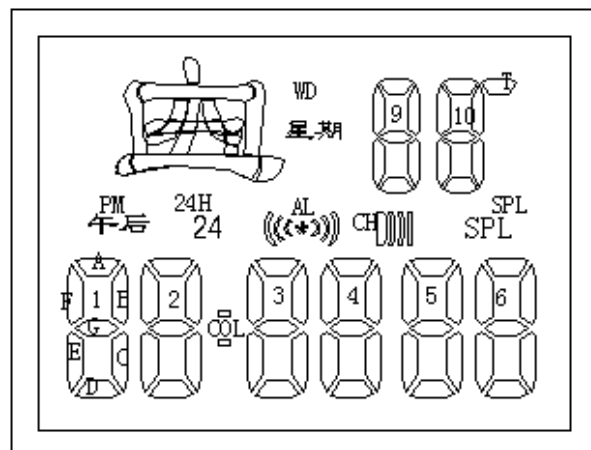
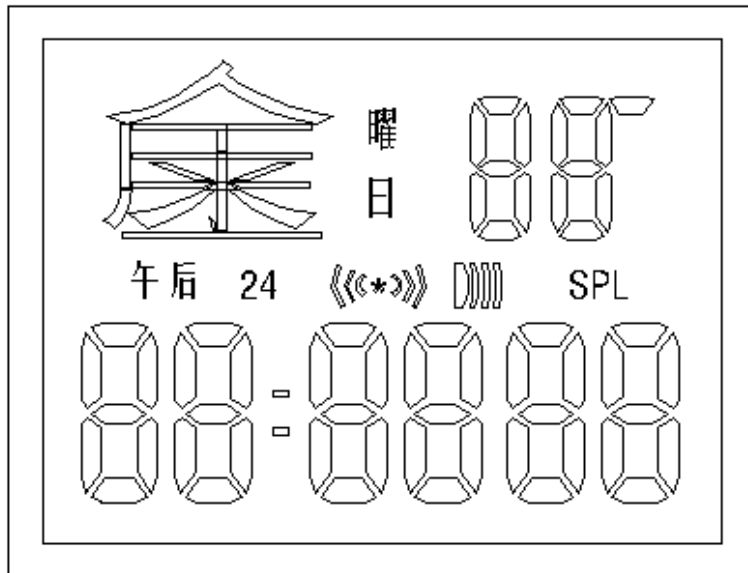
Features

- * 5 Function Real time clock.
Hour, Minute, Second, Date, Weekday
- * Alarm and chime.
- * 12/24Hour format user select.
- * 4 year calendar.
- * 3 keys operation, KSET, KMODE, KADJ.
- * 1/100 second stop watch.
- * EL Driver built in
- * 1/2 bias 1/3 duty LCD format
- * Very low power consumption
- * 32768 Crystal oscillator
- * Single 3.0V operation.
- * Direct buzzer driver.

General Description

The LS6108 is a LCD watch which display Hour:Minute Second, Date and Weekday. 12/24Hour display format user select. Hourly chime function. Alarm function. 1/100 second stop watch counter. It is simple three keys operation : KSET, KMODE, KADJ. Built-in EL driver. It has low power consumption.

LCD Drawing



Operation Modes

The LS6108 has 4 modes – Clock, Alarm, Chronograph and Time Set Mode.
By pressing KMODE, it is shift from one mode to another as follow :

Time Mode => Alarm Mode => Chronograph Mode=> Time Set Mode => Time Mode....

Time Mode

In Time Mode , the LS6108 display the current time information, Day, Hour, Minute, Second and Weekday. It also display the ON/OFF status of Alarm and Chime and 12Hr/24Hr format.

In Time Mode, press KADJ to toggle between 12HR and 24Hr display format.

Time Set Mode

In Time Mode, press KMODE 3 times to go to Time Set Mode.
On entering Time Set Mode, the second digits flash..

In Time Set Mode, press KSET to select the setting item with the sequence as follow :

Second => Hour => Minute => Month => Day => Weekday.

In Time Set Mode, press KADJ to adjust the value. Press and hold KADJ will cause rapid increment.
In Time Set Mode, press KMODE to exit setting mode.

Alarm Mode

In Time Mode, press KMODE to go to Alarm Mode.

In Alarm Mode, press KADJ to enable/disable Alarm and Chime which follows the sequence :

Alarm off Alarm on Alarm on Alarm off Alarm off
Chime off => Chime off => Chime on => Chime on => Chime off

In Alarm Mode, press KSET to set Alarm Hour, the Alarm will be set to ON, press KADJ to set value.
Press KSET to set Alarm Minute, press KADJ to set value.
Press KSET again exit Alarm Setting.
Press KMODE exit Alarm Mode.

Chronograph Mode

In Time Mode, press KMODE 2 times to go to Chronograph Mode. The sport timer counts up to 99 minutes 59.99 second with 1/100 second and Lap time function.

It is operated as follows:

Press KADJ to start/stop the timer.

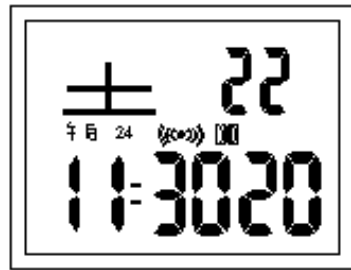
If the timer is started, press KSET to have the Lap time.

If the timer is stopped, press KSET to reset the timer to 00:00 00.

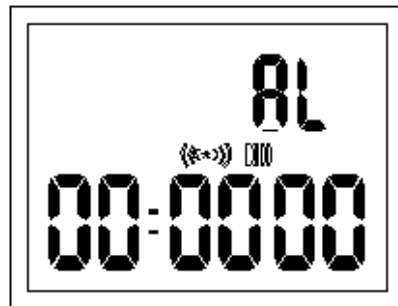
EL Output

The EL driver output is controlled by KEL. When KEL is connected to VDD, the EL driver is enabled. The EL pump frequency is 32kHz (1/2 duty cycle) at 512hz(1/2 duty cycle).

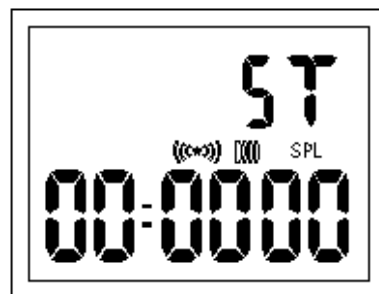
Time Mode



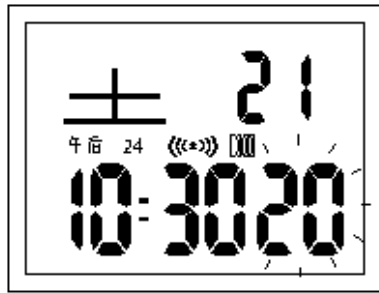
Alarm Mode



Chronograph Mode



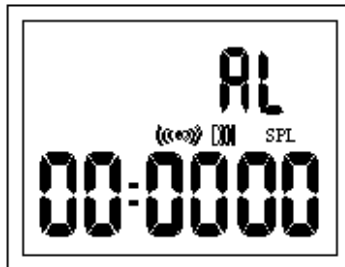
Setting Mode



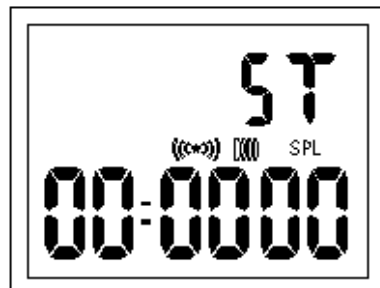
Time Mode



Alarm Mode



Chronograph Mode



Pin Assignment

DESIGNATION	TYPE	DESCRIPTION
B [0:1]	OUTPUT	Buzzer output
VC1, VC2	OUTPUT	Halfer output
VEE	OUTPUT	Halfer voltage
T2, T1	INPUT (PL)	TEST pin
OO	OUTPUT	oscillator output
OI	INPUT	oscillator input
VDD	POWER	+3.0V power supply
GND	POWER	Ground
KS, KR, KD, KEL	INPUT(PL)	Input key/option
BSP0, BSP1	BONDING OPTION	Input /Output.
R[0:1]	OUTPUT	Output /EL output
C[1:4]	OUTPUT	LCD Common output
S[1:28]	OUTPUT	LCD Segment output

Note: (PL) – pull low
(PH) - pull high

Absolute Maximum Ratings

- Supply voltage Vdd - Vss.....0 to 5V
- Input voltage Vin.....Vss to Vdd
- Operating temperature Top-10°C to 60°C
- Storing temperature Tst-40°C to 70°C

***Comments**

Stress above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress rating only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

D.C. Electrical Characteristics

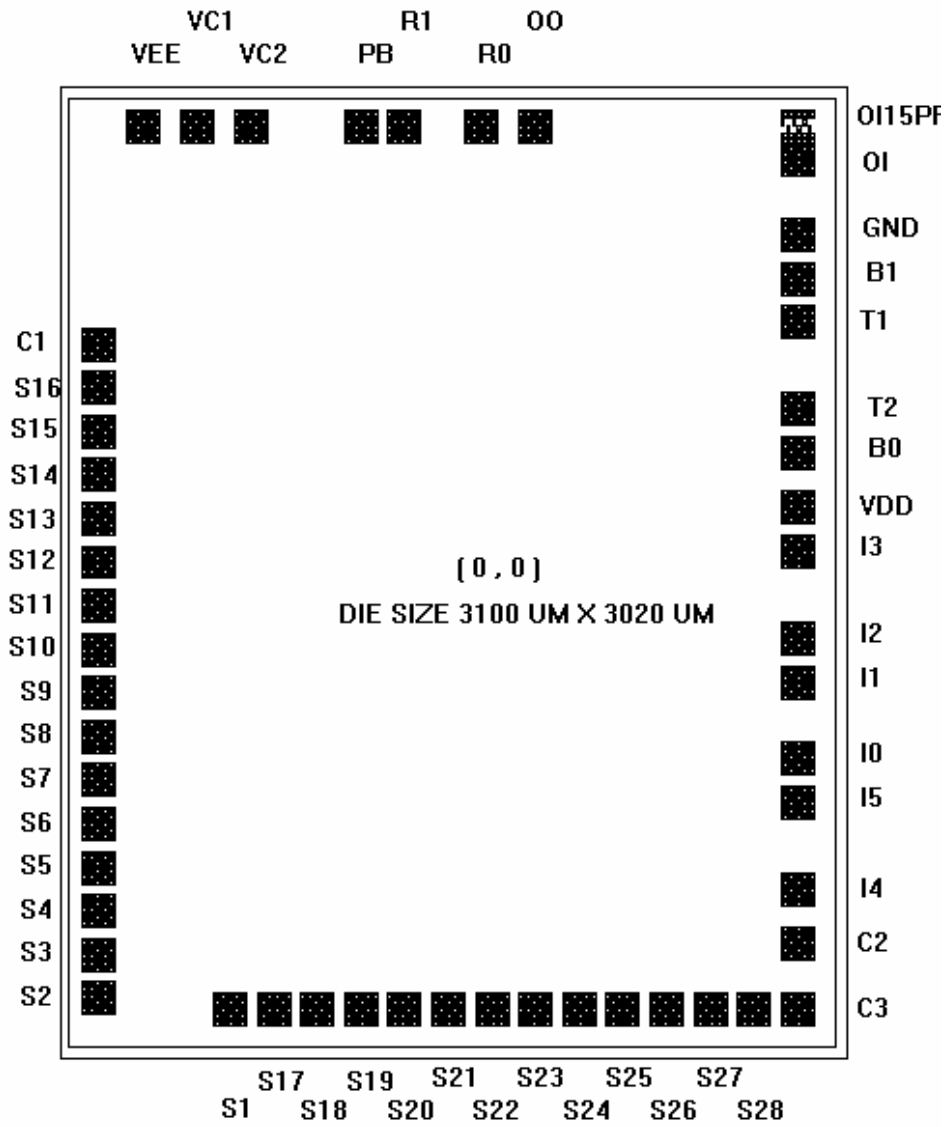
(GND = 0V, Vdd = 3.0V, Ta = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	Vdd	2.5	3.0	3.6	V	
Operating current	Idd	-	3	7	µA	No load
OSC. built-in cap	Cd	-	20	-	pF	
OSC. trimmer cap	Ctrim	5	-	35	pF	
Buzzer output current	Ib	500	-	-	µA	Vbd-Vss=0.5
LCD frequency	Flcd	-	64	-	Hz	
Segment current	Is	0.15	-	-	µA	Vseg=0.2V
Common current	Ic	3.0	-	-	µA	Vcom=0.2V
Trigger output current	Ir	100	-	-	µA	Vr-Vss=0.5

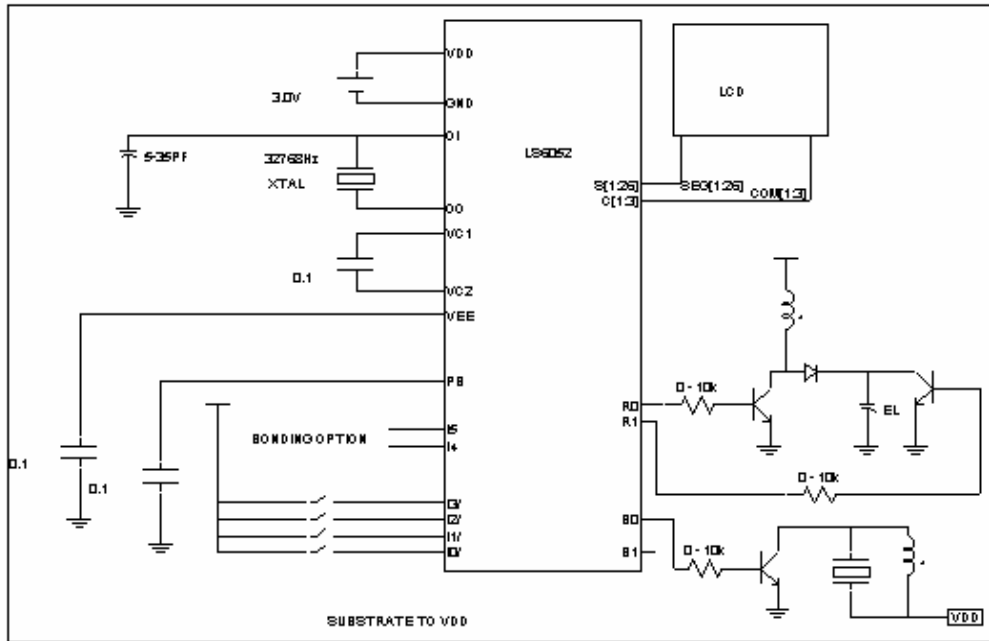
Pad Coordinate

PAD	X(μm)	Y(μm)	PAD	X(μm)	Y(μm)
C1	-1408.20	506.10	S26	942.20	-1513.90
S16	-1408.20	372.10	S27	1076.20	-1513.90
S15	-1408.20	238.10	S28	1210.20	-1513.90
S14	-1408.20	104.10	C3	1344.20	-1513.90
S13	-1408.20	-29.90	C2	1408.00	-1287.00
S12	-1408.20	-163.90	I4/BSP0	1408.00	-1151.00
S11	-1408.20	-297.90	I5/BSP1	1408.00	-741.60
S10	-1408.20	-431.90	I0/KM	1408.00	-597.60
S9	-1408.20	-565.90	I1/KR	1408.00	-188.20
S8	-1408.20	-699.90	I2/KEL	1408.00	-44.20
S7	-1408.20	-833.90	I3/KS	1408.00	365.20
S6	-1408.20	-967.90	VDD	1408.00	509.20
S5	-1408.20	-1101.90	B0	1408.00	653.20
S4	-1408.20	-1235.90	T2	1408.00	797.20
S3	-1408.20	-1369.90	T1	1408.00	941.20
S2	-1408.20	-1503.90	B1	1408.00	1085.20
S1	-570.50	-1513.90	GND	1408.00	1229.20
S17	-436.50	-1513.90	OI	1400.30	1423.00
S18	-238.70	-1513.90	OI 15pF	1400.30	1513.00
S19	-104.70	-1513.90	OO	184.00	1499.30
S20	93.10	-1513.90	R0	-56.30	1499.30
S21	227.10	-1513.90	R1	-425.20	1499.30
S22	406.20	-1513.90	PB	-561.20	1499.30
S23	540.20	-1513.90	VC1	-1045.70	1499.30
S24	674.20	-1513.90	VC2	-1179.70	1499.30
S25	808.20	-1513.90	VEE	-1313.70	1499.30

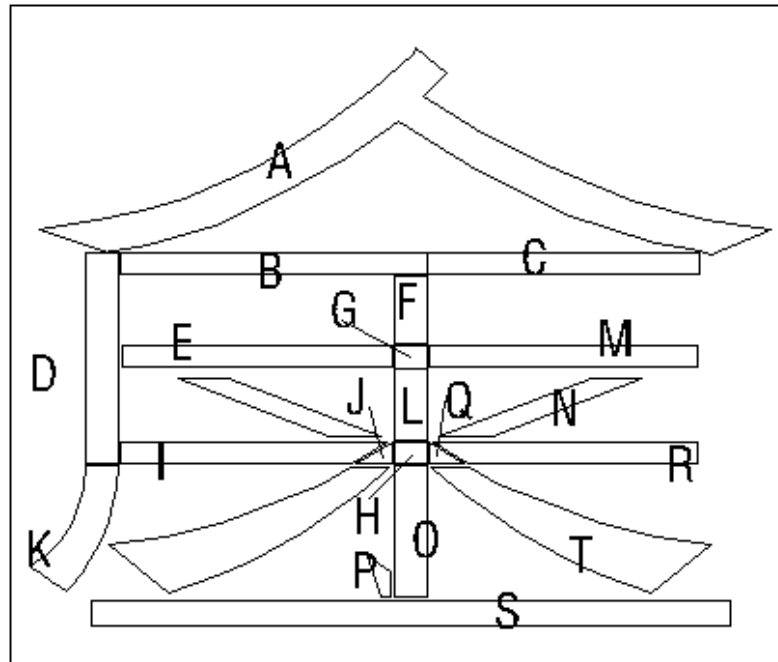
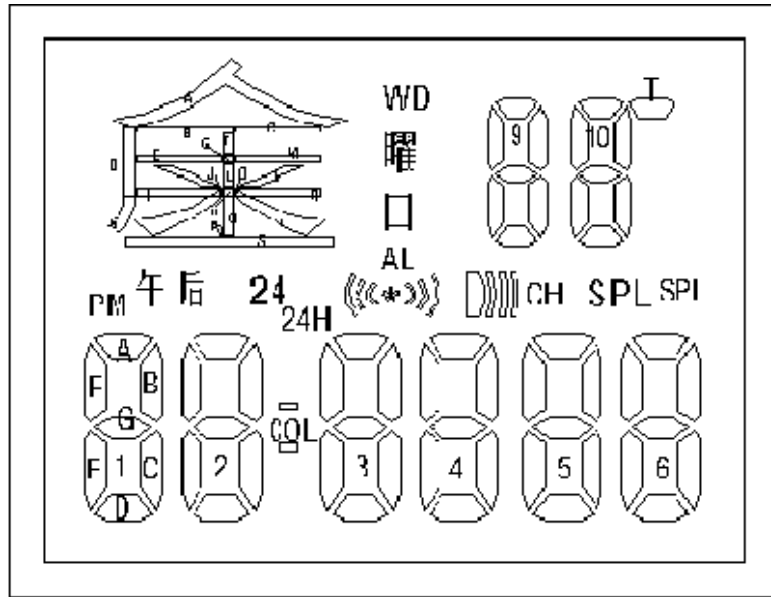
Pad Location



Application Circuit

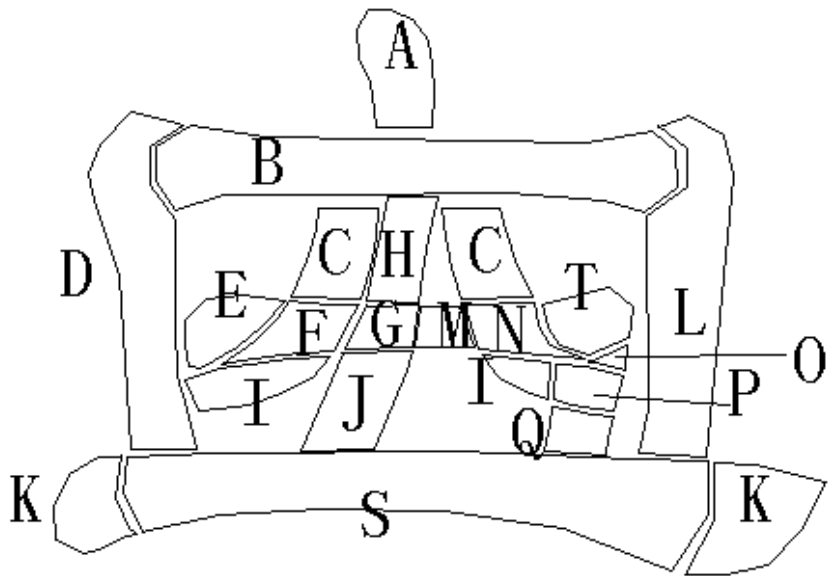
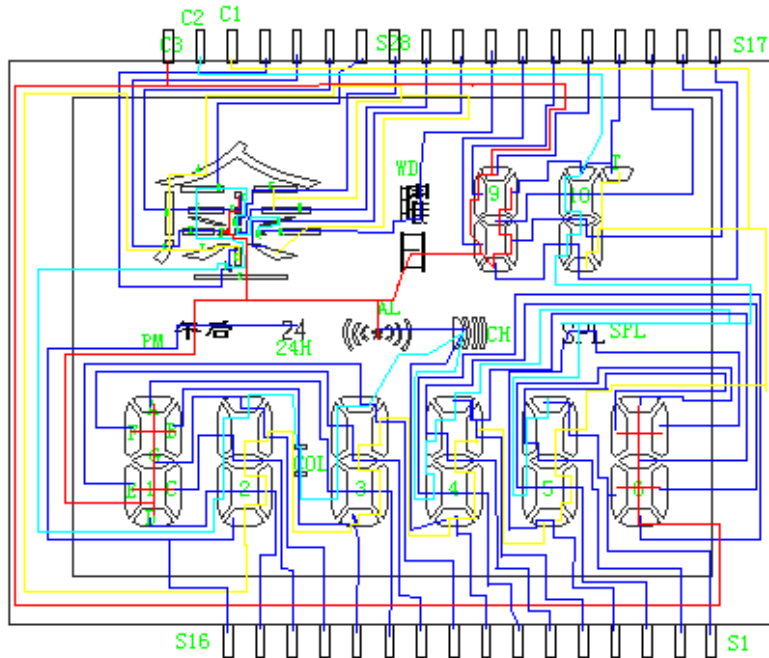


LCD Drawing



PIN	SEG	C1	C2	C3
1	S1	5B	5A	6E
2	S2	5G	5F	6F
3	S3	5C	5E	6A
4	S4	5D	SPL	6B
5	S5	4B	4A	6G
6	S6	4G	4F	6C
7	S7	4C	4E	6D
8	S8	4D	CH	AL(*))
9	S9	3B	3A	1E
10	S10	3G	3F	1F
11	S11	3C	3E	1A
12	S12	3D	COL	1B
13	S13	2B	2A	1G
14	S14	2G	2F	1C
15	S15	2C	2E	1D
16	S16	2D	24H	PM
17	S17	10D	10E	9D
18	S18	10C	10G	9C
19	S19	10B	10F	9G
20	S20	10T	10A	9B
21	S24	/	/	9A
22	S23	/	/	9F
23	S22	/	/	9E
24	S21	R	Q	FL
25	S22	T	N	/
26	S23	M	L	/
27	S24	C	H	/
28	S25	A	B	WD
29	S26	D	E	G
30	S27	K	I	J
31	S28	O	P	S
32	C1	C1	/	/
33	C2	/	C2	/
34	C3	/	/	C3

LCD Drawing



PIN	SEG	C1	C2	C3
1	S1	5B	5A	6E
2	S2	5G	5F	6F
3	S3	5C	5E	6A
4	S4	5D	SPL	6B
5	S5	4B	4A	6G
6	S6	4G	4F	6C
7	S7	4C	4E	6D
8	S8	4D	CH	AL(*))
9	S9	3B	3A	1E
10	S10	3G	3F	1F
11	S11	3C	3E	1A
12	S12	3D	COL	1B
13	S13	2B	2A	1G
14	S14	2G	2F	1C
15	S15	2C	2E	1D
16	S16	2D	24H	PM
17	S17	10D	10E	9D
18	S18	10C	10G	9C
19	S19	10B	10F	9G
20	S20	10T	10A	9B
21	S24	/	/	9A
22	S23	/	/	9F
23	S22	/	/	9E
24	S21	WD	Q	FL
25	S22	T	N	/
26	S23	M	L	/
27	S24	C	H	/
28	S25	A	B	F
29	S26	D	E	G
30	S27	K	I	J
31	S28	O	P	S
32	C1	C1	/	/
33	C2	/	C2	/
34	C	/	/	C3

