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The information of the product number change
Starting April 1, 2001, the product number will be changed as listed below. To order from April 1, 2001 please use the new product number. For further information, please contact Epson sales representative.

Configuration of product number

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Development tools

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*1: For details about tool types, see the tables below. (In some manuals, tool types are represented by one digit.)
*2: Actual versions are not written in the manuals.

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1. INTRODUCTION

1.1 S5U1C62N51E1 Outline

The S5U1C62N51E1 is a development tool for the S1C62N51, 6S3N7, 60N01, 60N02 and 60N05. Almost the same functions that the S1C62N51/6S3N7/60N01/60N02/60N05 CPU has can be implemented by writing application program and option data created by the option generator into EPROM, and installing it in the S5U1C62N51E1.

In addition, the S5U1C62N51E1 can interface with the in-circuit emulator ICE (S5U1C62000H), and so perform a higher level of debugging.

1.2 S5U1C62N51E1 Components

When unpacking the S5U1C62N51E1, check that the following goods are present:

1. S5U1C62N51E1 main unit ............................................................... 1
2. LCD connection cable and connector (60-pin flat type) ....................... 1 set
3. I/O connection cable and connector (50-pin flat type) ....................... 1 set
4. Power cable (3-pin) ...................................................................... 1 set
5. Fuse (3 A) .................................................................................... 1
6. S5U1C62N51E1 Manual (Evaluation Board for S1C60N01/60N02/60N05/62N51/6S3N7) (this manual) ....................... 1
7. Warranty registration card ................................................................ 1
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∗ The name ‘EVA6251R’ on the development tool is the old name of the product.
2. PRODUCT SPECIFICATIONS

The components specifications of the S5U1C62N51E1 are listed below.

### S5U1C62N51E1

- **Dimensions:** 203 mm (width) x 275 mm (depth) x 65 mm (height) (Including rubber feet)
- **Weight:** About 2.04 kg (main unit only)
- **Color:** Cygnus white
- **Power supply:** 5 V (±10%) DC, 3 A or more (from external power supply)
  
  When connected to the ICE, power is supplied by the ICE.
- **Board:**
  - Main board x 1
  - Sub board x 1
- **Operating conditions:**
  - Operating temperature: 5°C to 40°C
  - Storage temperature: -20°C to +60°C
  - Operating humidity: 35% to 80%
  - Storage humidity: 20% to 90%
  - Resistance to vibration:
    - Operating: 0.25G Max.
    - Transportation: 2G Max.
  - Resistance to impulse:
    - Operating: 1G Max.
    - Standby: 2G Max.

### LCD connection cable

- **S5U1C62N51E1 connector:** J3372-P302VE or equivalent
- **Cable connector:** 7960-6500SC
- **Cable:** 60-pin flat cable x 1
- **Interface:** CMOS interface (5 V)
- **Length:** About 50 cm

### I/O cable

- **S5U1C62N51E1 connector:** J3433-P302VE or equivalent
- **Cable connector:** 7950-6500SC
- **Cable:** 50-pin flat cable x 1
- **Interface:** CMOS interface (5 V)
- **Length:** About 50 cm

### Power cable

- **S5U1C62N51E1 connector:** MOLEX 5276-03A or equivalent
- **Cable connector:** MOLEX 5196-03
- **Other side connector:** (According to power supply specifications)
- **Cable length:** About 80 cm
- **Capacity:** 5 V DC, 3 A or more
3. NAMES AND FUNCTIONS OF PARTS
This section describes the names and functions of the parts of the S5U1C62N51E1.

3.1 Basic Functions
The S5U1C62N51E1 has the following basic functions:

■ Program execution (Run function)
Install the EPROM containing the application program and execute the program.

■ Interface with ICE
The S5U1C62N51E1 can interface with the ICE so that a higher level debugging environment may be established.

■ Setting hardware options by installing function option and segment option ROMs
Hardware options, i.e., I/O ports and segments, can be specified by writing option data for the function option created by the function option generator and the segment option created by the segment option generator into EPROM, and installing the EPROM.

Note: Be sure to use option data created by the function and segment option generators compatible with the S5U1C62N51E1 to make the EPROMs. Data created by the old function and segment option generators cannot be used.

3.2 Functions of Parts
3.2.1 Front panel

![Fig. 3.2.1.1 Front panel](image)

■ Connectors
- I/O #0, I/O #1
  Connector for the I/O cable. The I/O cable is used to connect the S5U1C62N51E1 to the target system. I/O #1 cannot be used.
- LCD #0, LCD #1
  Connector for the LCD cable. The LCD cable is used to connect the S5U1C62N51E1 to the target system. LCD #1 cannot be used (reserved connector).
- LCDEMU
  Connector for the LCD emulator cable.

3.2.2 Rear panel

![Fig. 3.2.2.1 Rear panel](image)

■ Connectors
- DC IN 5 V
  This is a connector with external power supply source. The external power supply should be in direct current of 5 V for 3 A or more.
- F1, F5
  Connectors for the ICE interface cable.

Note: Be sure to disconnect external power source before connection with ICE, because power is supplied from ICE when you connect S5U1C62N51E1 to ICE.
3. NAMES AND FUNCTIONS OF PARTS

3.2.3 Board (under top cover)

![Diagram of the board](image.png)

Fig. 3.2.3.1 Layout on the board

- **ROM sockets**
  - **L.HEX, H.HEX**
    These are IC sockets for target program ROMs. Insert the ROM (L.HEX) containing the 8 low-order bits (I7 to I0) of the machine code into the L.HEX socket, and the ROM (H.HEX) containing the 4 high-order bits (I17 to I18) into the H.HEX socket.
  - **F.HEX**
    This is the IC socket into which the ROM (F.HEX) is inserted. This ROM includes the function options generated by the function option generator (FOG62N51, 6S3N7, 60N01, 60N02, 60N05) for the S5U1C62N51E1.
  - **S.HEX**
    This is the IC socket into which the ROM (S.HEX) is inserted. This ROM includes the segment options generated by the segment option generator (SOG62N51, 6S3N7, 60N01, 60N02, 60N05) for the S5U1C62N51E1.

Note: Do not use the option data generated by the function and segment option generators for an Evaluation Board other than the S5U1C62N51E1. Data created by the old function and segment option generators cannot be used. It will cause a malfunction.

- **Switch**
  - **RESET switch**
    This switch resets the CPU and starts the target program from page 01H, step 00H.

- **Controls**
  - **OSC1 ADJ**
    This is the control for varying the CR oscillation frequency. This control is effective only when CR oscillation is selected for the OSC1 oscillator type by mask option. The CR oscillation frequency can be checked with an oscilloscope or other instrument by connecting to the test pin "CR-FREQ".
  - **VSVD**
    This is the control for varying the power supply voltage in simulation to check SVD operation. (Refer to Section 6.2, "Differences from Actual IC".

- **FUSE**
  - **FUSE1**
    This is 3 A tubular fuse for external power supply, and is blown off by current of 3 A or more.
3. NAMES AND FUNCTIONS OF PARTS

■ LEDs

- **POWER**
  This LED lights when the S5U1C62N51E1 turns on.

- **HLT/SLP**
  This LED lights when the CPU enters HALT or SLEEP status. (The S5U1C62N51E1 does not support SLEEP mode.)

- **AD0**
  This LED indicates the status of the address 0 (AD0) signal. It can be used to check whether or not the S5U1C62N51E1 works.

- **SHEXLD**
  This LED lights when segment option data from a personal computer is loaded using the in-circuit emulator ICE. As a result, it can differentiate whether the currently specified segment option is due to the ROM (S.HEX) or has been loaded from a personal computer. Refer to the development tool manual for the S1C62N51, 6S3N7, 60N01, 60N02 or 60N05 in regard to the loading of the segment option using the ICE.

  Note: Be sure to use S.HEX created by the segment option generator compatible with the S5U1C62N51E1. Data created by the old segment option generator cannot be used.

- **LFHX**
  This LED lights when function option data from a personal computer is loaded using the in-circuit emulator ICE. As a result, it can differentiate whether the currently specified function option is due to the ROM (F.HEX) or has been loaded from a personal computer. Refer to the development tool manual for the S1C62N51, 6S3N7, 60N01, 60N02 or 60N05 in regard to the loading of the function option using the ICE.

  Note: Be sure to use F.HEX created by the function option generator compatible with the S5U1C62N51E1. Data created by the old function option generator cannot be used.

- **CSDC, SWRUN**
  These LEDs indicate the values ("1" or "0") of the following registers. LED lights when "1" is set in the register, and it goes off when "0" is set in the register.

  - **CSDC**
    CSDC register (address 0FBH•D3)
  - **SWRUN**
    SWRUN register (address 09H•D1) (Available only when S5U1C62N51E1 is set for the S1C6S3N7.)

- **OSC1XT**
  This LED lights when the OSC1 oscillation circuit is set to crystal oscillation by function option.

- **OSC1CR**
  This LED lights when the OSC1 oscillation circuit is set to CR oscillation by function option.

- **HVLD, SVDON**
  These LEDs indicate the values ("1" or "0") of the following registers. LED lights when "1" is set in the register, and it goes off when "0" is set in the register.

  - **HVLD**
    HLMD register (address 0AH•D3)
  - **SVDON**
    SVDON register (address 0AH•D0)

  In the actual IC, power saving needs to stop the HVLD and SVD functions when they are unnecessary.

■ Test pins

- **RS, TH1, TH2, CS pins (sockets)**
  These pins (or the socket) are used to connect external parts, such as resistors, thermistors and capacitors, when using the R/F converter (available only when S5U1C62N51E1 is set for the S1C62N51, 60N02 or 60N05).
  When using the connecting pins, pay attention to the stray capacitance of the connecting cable and noise. When using the socket, insert the parts in the correct position (TH1: between pins 1 and 16, TH2: between pins 3 and 14, RS: between pins 5 and 12, CS: between pins 7 and 10).
  The connecting pins and socket pins have approximately 10 pF stray capacitance. Furthermore, the measurement results may differ from those of the actual IC because the characteristics of the parts used for R/F conversion are different. In particular, pay attention when the software uses an MSB or LSB area in the measurement counter.
3. NAMES AND FUNCTIONS OF PARTS

- **ADOUT**
  This pin is used for monitoring the signal (analog waveform) input to the CS pins while the R/F converter is operating. (The R/F converter function is available when the S5U1C62N51E1 is set for S1C62N51, 60N02 or 60N05.) The frequency in each mode can be measured without affecting the R/F conversion accuracy.

- **OSC1CR**
  This pin outputs high level when the CR oscillator is selected for the OSC1 oscillation circuit.

- **LFHX**
  This pin outputs high level when function option data has been loaded from personal computer through the ICE.

- **SVDON**
  This pin outputs high level when the SVDON register (address 0FAH, bit D0) is set to "1" and outputs low level when the register is set to "0".

### 3.3 S5U1C62N51E1 I/O and LCD Connectors

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
<th>Pin No.</th>
<th>Signal name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VDD (+5 V)</td>
<td>2</td>
<td>VDD (+5 V)</td>
</tr>
<tr>
<td>3</td>
<td>VDD (+5 V)</td>
<td>4</td>
<td>VDD (+5 V)</td>
</tr>
<tr>
<td>5</td>
<td>Cannot be connected</td>
<td>6</td>
<td>K00</td>
</tr>
<tr>
<td>7</td>
<td>K01</td>
<td>8</td>
<td>K02</td>
</tr>
<tr>
<td>9</td>
<td>K03</td>
<td>10</td>
<td>Cannot be connected</td>
</tr>
<tr>
<td>11</td>
<td>Cannot be connected</td>
<td>12</td>
<td>Cannot be connected</td>
</tr>
<tr>
<td>13</td>
<td>P00</td>
<td>14</td>
<td>P01</td>
</tr>
<tr>
<td>15</td>
<td>P02</td>
<td>16</td>
<td>P03</td>
</tr>
<tr>
<td>17</td>
<td>Cannot be connected</td>
<td>18</td>
<td>Cannot be connected</td>
</tr>
<tr>
<td>19</td>
<td>Cannot be connected</td>
<td>20</td>
<td>Cannot be connected</td>
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<td>23</td>
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<td>25</td>
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<td>27</td>
<td>Cannot be connected</td>
<td>28</td>
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<td>29</td>
<td>Cannot be connected</td>
<td>30</td>
<td>R00</td>
</tr>
<tr>
<td>31</td>
<td>R01</td>
<td>32</td>
<td>R02</td>
</tr>
<tr>
<td>33</td>
<td>R03</td>
<td>34</td>
<td>Cannot be connected</td>
</tr>
<tr>
<td>35</td>
<td>Cannot be connected</td>
<td>36</td>
<td>Cannot be connected</td>
</tr>
<tr>
<td>37</td>
<td>Cannot be connected</td>
<td>38</td>
<td>Cannot be connected</td>
</tr>
<tr>
<td>39</td>
<td>Cannot be connected</td>
<td>40</td>
<td>Cannot be connected</td>
</tr>
<tr>
<td>41</td>
<td>Cannot be connected</td>
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<td>43</td>
<td>Cannot be connected</td>
<td>44</td>
<td>Cannot be connected</td>
</tr>
<tr>
<td>45</td>
<td>RESET</td>
<td>46</td>
<td>Cannot be connected</td>
</tr>
<tr>
<td>47</td>
<td>Vss (GND)</td>
<td>48</td>
<td>Vss (GND)</td>
</tr>
<tr>
<td>49</td>
<td>Vss (GND)</td>
<td>50</td>
<td>Vss (GND)</td>
</tr>
</tbody>
</table>

* R02 and R03 are not available when the S5U1C62N51E1 is set for the S1C60N01.

Table 3.3.1  I/O #0 connector pins

Table 3.3.2  LCD #0 connector pins

- **COM0**
- **COM1**
- **COM2**
- **COM3**
- **COM4**
- **COM5**
- **COM6**
- **COM7**

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
<th>Pin No.</th>
<th>Signal name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SEG0</td>
<td>2</td>
<td>SEG1</td>
</tr>
<tr>
<td>3</td>
<td>SEG2</td>
<td>4</td>
<td>SEG3</td>
</tr>
<tr>
<td>5</td>
<td>SEG4</td>
<td>6</td>
<td>SEG5</td>
</tr>
<tr>
<td>7</td>
<td>SEG6</td>
<td>8</td>
<td>SEG7</td>
</tr>
<tr>
<td>9</td>
<td>SEG8</td>
<td>10</td>
<td>SEG9</td>
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<tr>
<td>11</td>
<td>SEG10</td>
<td>12</td>
<td>SEG11</td>
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<td>13</td>
<td>SEG12</td>
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<td>21</td>
<td>SEG20</td>
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<td>SEG21</td>
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<td>23</td>
<td>SEG22</td>
<td>24</td>
<td>SEG23</td>
</tr>
<tr>
<td>25</td>
<td>SEG24</td>
<td>26</td>
<td>SEG25</td>
</tr>
</tbody>
</table>

* When set for S1C62N51 or 6S3N7, SEG0 to SEG25 are available. When set for S1C60N01, 60N02 or 60N05, only SEG0 to SEG19 are available.
4. CABLE CONNECTION

This section describes how to connect the power cable to the S5U1C62N51E1, and the S5U1C62N51E1 to the ICE and the target system.

Note: Turn the power of all equipment off before connecting or disconnecting cables.

4.1 Connection to ICE

The S5U1C62N51E1 is connected to the ICE by connecting the two interface cables (F1 and F5). Use S5U1C62N51E1 connectors F1 and F5 with the projections facing outwards. Use ICE connectors F1 and F5 with the projections facing inwards (cable side).

Figures 4.1.1 and 4.1.2 show the external view and connection diagram of the ICE interface cable.

Note: The S5U1C62N51E1 has an external power input connector for +5 V (VDD) and GND (VSS). Leave these connectors unconnected when the S5U1C62N51E1 is connected to the ICE.

4.2 Power Cable Connection

When using the S5U1C62N51E1 on its own, it must be supplied with power (5 V DC, 3 A or more) from an external source through the power cable. When the S5U1C62N51E1 is connected to the ICE, power is supplied by the ICE; therefore, the power cable is not necessary. Disconnect the power cable if it is already connected.

Figure 4.2.1 shows the connection of the power cable pins.

4.3 Connection to Target System

The I/O #0 and LCD #0 connectors are used to connect the S5U1C62N51E1 to the target system. The signals output from the LCD #0 connector are the same as those of the actual IC at the function level. Therefore, the S5U1C62N51E1 may be connected to the LCD of the target system without any changes.

Fig. 4.2.1 Connection of power cable pins

Fig. 4.3.1 Connection of target system
5. OPERATION METHOD OF S5U1C62N51E1

5.1 Preparation
This section describes the common preparation work necessary when the S5U1C62N51E1 is used by itself and when it is connected to the ICE.
Before doing the following, be sure to turn the POWER switch of the S5U1C62N51E1 off.

5.1.1 Creation of target system
Mount the LCD panel, keys, and switches on the board to build a target system. Use the I/O connector and LCD connector supplied with the S5U1C62N51E1 to connect the S5U1C62N51E1 to the target system. (For the pin layout of each connector, refer to Section 3.3, "S5U1C62N51E1 I/O and LCD Connectors".)

Note: There is some difference in specifications between the S5U1C62N51E1 and the actual CPU. Refer to Section 6.2, "Differences from Actual IC" when building a target system.

5.1.2 Creation and installation of ROMs
Create the program ROMs, function option ROM and segment option ROM, and insert them into the sockets of the S5U1C62N51E1.

- Program ROMs (two)
The program ROMs contain the application program machine code. Write the HEX files output by the ASM62N51, 6S3N7, 60N01, 60N02, 60N05 cross-assembler for S5U1C62N51E1 into EPROMs to create program ROMs. Since two HEX files containing the high-order section (C251XXXH.HEX*) and the low-order section (C251XXXL.HEX*) of the machine code are output, two ROMs are created. Insert them into the socket H.HEX and L.HEX under the top cover, respectively.
These ROMs are not necessary when connecting the S5U1C62N51E1 to the ICE. In addition, it is necessary to write the object data into the EPROM attaching the offset address as Table 5.1.2.1 according to the type of EPROM that is used.

<table>
<thead>
<tr>
<th>EPROM type</th>
<th>Offset value</th>
</tr>
</thead>
<tbody>
<tr>
<td>27C64</td>
<td>0000H (without offset)</td>
</tr>
<tr>
<td>27C128</td>
<td>0000H (without offset)</td>
</tr>
<tr>
<td>27C256</td>
<td>4000H</td>
</tr>
<tr>
<td>27C512</td>
<td>C000H</td>
</tr>
</tbody>
</table>

- Function option ROM (one)
The function option ROM is used to specify function options, such as I/O ports. Create the option ROM from the function option HEX file (C251XXXF.HEX*) output by the function option generator, and insert it into the F.HEX socket under the top cover.
This ROM is effective even when the ICE is connected, however, this ROM is disregarded due to the loading of the data from the ICE.

- Segment option ROM (one)
The segment option ROM is used to specify segment output port. Create the segment ROM from the segment option HEX file (C251XXXS.HEX*) output by the segment option generator, and insert it into the S.HEX socket in the top cover.
This ROM is effective even when the ICE is connected, however, this ROM is disregarded due to the loading of the data from the ICE.

- EPROM specifications
Use EPROMs with the following specifications:

  Program ROM: 27C64 to 27C512 (250 ns or less access time)
  Function option ROM: 27C64 to 27C512 (250 ns or less access time)
  Segment option ROM: 27C64 to 27C512 (250 ns or less access time)

* "C251XXX" is an example when set for the S1C62N51.
5.2 Independent Use of S5U1C62N51E1

This section describes operation when using the S5U1C62N51E1 by itself. The S5U1C62N51E1 may be used independently by connecting a power supply to it. Use a 5 V DC regulator (more than 3 A) as an external power supply. Connect it with the correct polarity (+ and -). (Refer to Section 4.2, "Power Cable Connection").

5.2.1 Power on/off

Before turning the POWER switch of the S5U1C62N51E1 on, confirm the following:

1. The power cable is connected correctly.
2. The target system is connected correctly.
3. The ROMs have been installed correctly.

After confirming the above items, turn the POWER switch of the S5U1C62N51E1 on using the following procedure:

1. Turn the regulator on. If the regulator is a variable-voltage type, set the output voltage to 5 V ±10%.
2. Turn the POWER switch of the S5U1C62N51E1 on.

5.2.2 Debugging

When the S5U1C62N51E1 is used alone, it provides the following debugging function. The method of operation is given below.

- Program free run
  
  When the RESET switch (under the top cover) is pressed, the S5U1C62N51E1 enters the program run state, and executes the application program from page 1, step 0.

5.3 Operation When ICE is Connected

This section explains the operation and use of the S5U1C62N51E1 when it is connected to the ICE. Set up the S5U1C62N51E1 as follows when it is connected to the ICE:

1. Do not connect the power supply.
2. Keep on turning the POWER switch off.

5.3.1 Power on/off

Power to the S5U1C62N51E1 is supplied by the ICE, and the power is switched on and off by pressing the POWER switch of the ICE. Keep the POWER switch of the S5U1C62N51E1 off.

5.3.2 Debugging

Debugging is done with the host computer, and the S5U1C62N51E1 is controlled by the ICE. For the method of operation, refer to the development tool manual for the S1C62N51, 6S3N7, 60N01, 60N02 or 60N05. The S5U1C62N51E1 can control the following two functions:

1. RESET switch
2. OSC1 CR oscillation frequency adjustment
6. PRECAUTIONS

Take the following precautions when using the S5U1C62N51E1:

6.1 Precautions for Operation

- Be sure to use the Development Tool that supports the S5U1C62N51E1. Development Tools for the EVA6251, 6S37, 6001, 6002 and 6005 must never been used.
- Turn the power of all equipment off before connecting or disconnecting cables.
- To turn the POWER switch of the S5U1C62N51E1 off, then on again, wait for at least 10 seconds after turning off before turning on.
- When ROMs are inserted into the ROM sockets, lock the lever securely by positioning it horizontally. After the ROMs have been removed from the sockets, lock the lever at the same position above. If the lever is left upright, poor contact may result.
- Confirm that the following ROMs have been installed correctly, then operate the S5U1C62N51E1.
  - (Top panel) Program ROM 2 L.HEX, H.HEX
  - (Under top cover) Function option ROM 1 F.HEX
  - (Under top cover) Segment option ROM 1 S.HEX
- When developing and debugging the program by connecting the S5U1C62N51E1 to the ICE, the S5U1C62N51E1 reset switch and the target board cannot reset the CPU while the ICE is in monitor status. In this case, reset the CPU by executing the "I" command from the ICE. In Run status, resetting by the S5U1C62N51E1 or target board will be accepted.

6.2 Differences from Actual IC

There are some differences in functions between the S5U1C62N51E1 and the actual IC.

- **I/O**
  - The response time has been changed by the differences in logic level, output drive capability, and pull-down resistance. The minimum operating voltage is also different from the actual IC.
  - When the segment terminals are set to DC output, the output signals are delivered with 0 V and +5 V ±10%.

- **LCD**
  - The output drive capability is different.
  - When the S5U1C62N51E1 is set for the S1C62N51, the LCD drive voltages are set at \( V_{L1} = 1.0 \text{ V}, V_{L2} = 2.0 \text{ V} \) and \( V_{L3} = 3.0 \text{ V} \).
  - When the S5U1C62N51E1 is set for the S1C63N7, 60N01, 60N02 or 60N05, the LCD drive voltages can be selected from the following three types by function option:
    1) \( V_{L1} = 1.0 \text{ V}, V_{L2} = 2.0 \text{ V}, V_{L3} = 3.0 \text{ V} \)
    2) \( V_{L1} = 1.5 \text{ V}, V_{L2} = 3.0 \text{ V}, V_{L3} = 4.5 \text{ V} \)
    3) \( V_{L1} = V_{L2} = 1.5 \text{ V}, V_{L3} = 3.0 \text{ V} \)
  - However, external voltage cannot be supplied from outside of the S5U1C62N51E1 even when "external power" is selected for the LCD power supply. The S5U1C62N51E1 generates the LCD drive voltage inside and outputs it to the LCD panel.

- **Oscillation circuit**
  - The type of OSC1 oscillation circuit can be set by function option as follows:
    - 32.768 kHz crystal oscillation or 30 kHz to 90 kHz CR oscillation
    - The CR oscillation clock frequency can be adjusted using the OSC1 ADJ control mounted on the board.
6. PRECAUTIONS

- The oscillation start and stop times are different from those of the IC. Because the logic level of S5U1C62N51E1 is higher than it of the actual IC.

■ R/F converter (when set for the S1C62N51, 60N02 or 60N05 is selected by function option)
  - The CR oscillation characteristics are different from those of the actual IC because the operating voltage and parts of the oscillation circuit are different.